INDEX OF SHEETS

SEE SHEET NO. 2

ROUTINE MAINTENANCE CONTRACT PROJECT NUMBER			
6420-77-001			
CONT.	SECT.	JOB	HIGHWAY
6420	77	001	US 87
DIST.	COUNTY		SHEET NO.
07	TOM GREEN		1

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

ROUTINE MAINTENANCE CONTRACT 6420-77-001

VARIOUS LOCATIONS IN THE SAN ANGELO DISTRICT NORTH EAST COUNTIES
US 87
TOM GREEN

NET LENGTH OF PROJECT = 0.001 MI

LIMITS: VARIOUS LOCATIONS IN SAN ANGELO DISTRICT

FOR THE INSTALLATION OF
DELINEATORS
ON MBGF NORTH

FINAL PLANS

Letting Date: _____

Name of Contractor: _____

Date Work Began: _____

Date Work Completed: _____

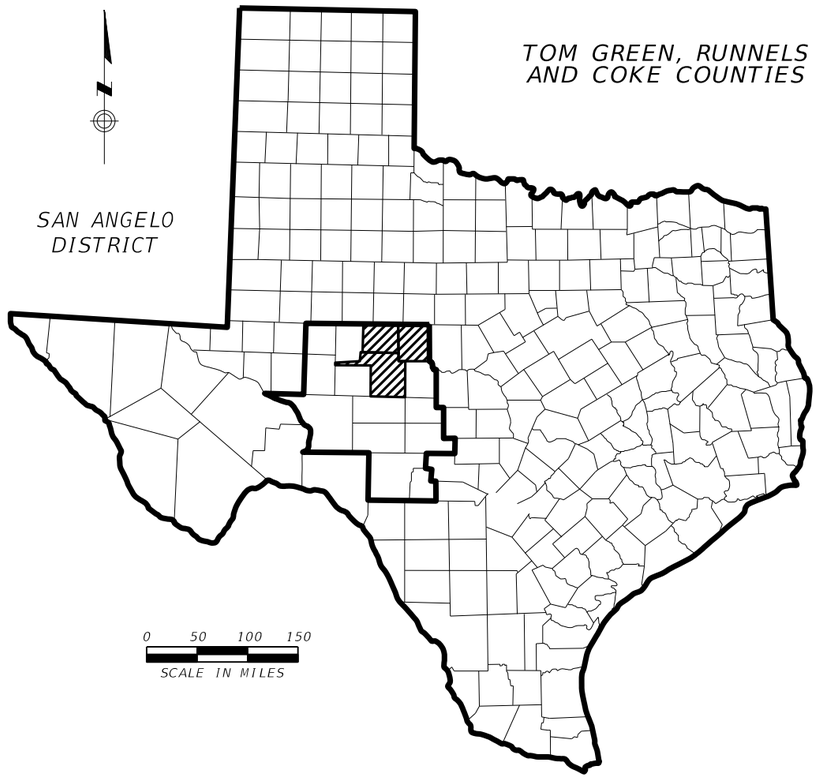
Date Work Accepted: _____

Final Contract Cost: _____

Project was built according to the Plans & Specifications.
These final plans reflect the work done and the quantities shown thereon and on the Final Estimate are Final Quantities.

Area Engineer Date

Summary of Change Orders:



TOM GREEN, RUNNELS
AND COKE COUNTIES

EXCEPTIONS
NONE

EQUATIONS
NONE

RAILROAD CROSSINGS
NONE

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

2024
Texas Department of Transportation

RECOMMENDED FOR LETTING: 3/5/2024

DocuSigned by:
F08D7F53E78F492...
District Maintenance Engineer

APPROVED FOR LETTING: 3/5/2024

DocuSigned by:
419BB3F998B54C8...
, P.E.
District Director of Operations

DATE: 02/21/2024 09:20

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	INDEX OF SHEETS
3	GENERAL NOTES
4	ESTIMATE & QUANTITY SHEET
5	QUANTITY SUMMARY
	TRAFFIC CONTROL PLAN STANDARDS
6-17	BC (1)-21 THRU BC (12)-21
18	TCP (1-2)-18
19-21	TCP (3-1) THRU TCP (3-2)-13 AND TCP (3-3)-14
	LOCATION AND QUANTITY DATA
22-28	TOM GREEN COUNTY
29-34	COKE COUNTY
35-36	RUNNELS COUNTY
	D&OM STANDARDS
37-43	D&OM (1)-20 THRU D&OM (VIA)-20

Texas Department of Transportation

San Angelo District

INDEX OF SHEETS

©TxDOT	CONT	SECT	JOB	HIGHWAY
SHEET ISSUED OR LAST REVISED	6420	77	001	US 87
	DIST	COUNTY		SHEET NO.
	07	Runnels		2

DATE:
FILE:

GENERAL NOTES

The following Standard Sheets have been modified: None

Locate the project bulletin board at an approved location within the project limits such as at a field office, staging area, or stockpile, and make accessible to the public at all times. Do not remove the bulletin board from the project until approved. If a construction site notice is required for the project, post a copy at each geographically separated work location.

Contractor questions on this project are to be addressed by the following individual:

Jordan Sefcik, P.E.; email Jordan.Sefcik@txdot.gov and Mitchell Gatlin, P.E.; email Thomas.Gatlin@txdot.gov

William McLane, P.E.; email William.McLane@txdot.gov and Roy Wright, P.E.; email Roy.Wright@txdot.gov

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

Questions may be submitted via the Letting Pre-Bid Q&A web page. This webpage can be accessed from the Notice to Contractors dashboard located at the following address: https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors

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

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

Item 5, "Control of the Work"

The contractor shall notify the Area Engineer and Maintenance Supervisor 24 hours prior to starting work in a county.

Item 6, "Control of Materials"

When allowed store materials and equipment in approved areas within the right of way.

Access the work area from the right of way.

Item 7, "Legal Relations and Responsibilities"

No significant traffic generator events have been identified.

Item 8, "Prosecution and Progress"

Submit the sequence of work and estimated progress schedule on paper or as a Portable Document Format (PDF) electronic file compatible with Adobe Systems Incorporated "Acrobat Reader XI".

Item 9, "Measurement and Payment"

The progress payment period shall end two working days before the last working day of the month. Deliver invoices to be paid as material on hand on or before the end of the progress payment period.

Item 500, "Mobilization"

Once the notice to proceed is issued then work shall commence and continue until all work has been completed.

Item 502, "Barricades, Signs and Traffic Handling"

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

Use mobile operations, TCP(3) series for typical installations. Use Lanes Closures, TCP (1-2), for 2 lane roadways with restricted sight distances.

Item 658, "Delineator and Object Marker Assemblies"

Remove existing delineators that are not consistent with those being installed. Removal will be considered subsidiary to the various bid items.

The barrier reflectors shall be the cup mount type reflector with holes for mounting with screws appropriate for the material of the barrier. Barrier reflector may be epoxied if manufacturer recommendations are followed.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 6420-77-001 **DISTRICT** San Angelo **COUNTY** Tom Green
HIGHWAY US0087

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**6420-77-001**			
		PROJECT ID		**A00190901**			
		COUNTY		**Tom Green**			
		HIGHWAY		**US0087**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	3.000		3.000	
	658-6013	INSTL DEL ASSM (D-SW)SZ (BRF)CTB	EA	516.000		516.000	
	658-6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	527.000		527.000	
	658-6026	INSTL DEL ASSM (D-SY)SZ (BRF)CTB	EA	243.000		243.000	
	658-6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	529.000		529.000	
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	1,936.000		1,936.000	
	658-6064	INSTL DEL ASSM (D-SY)SZ 1(BRF)GF2	EA	359.000		359.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	292.000		292.000	

County		(D-SW)SZ 1(BRF)GF2(BI) 658-6062 EA	(D-SW)SZ (BRF)CTB (BI) 658-6014 EA	(D-SW)SZ (BRF)CTB 658-6013 EA	(D-SW)SZ 1(BRF)GF2 658-6061 EA	(D-SY)SZ (BRF)CTB 658-6026 EA	(D-SY)SZ 1(BRF)GF2 658-6064 EA	TMA (Mobile Operations) 6185-6005 DAY
Coke		784	133	4	19	4	11	65
Runnels		682	121	6	38	6	30	20
Tom Green		470	273	506	472	233	318	206
	TOTALS	1936	527	516	529	243	359	292

DATE:
FILE:

Texas Department of Transportation

San Angelo District

QUANTITY SUMMARY

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6420	77	001	US 87
DIST	COUNTY		SHEET NO.
07	Runnels		5

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

SHEET 1 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6420	-77	001	US 87
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14		TOM GREEN		6
5-10 5-21				

DATE:
FILE:

DATE:
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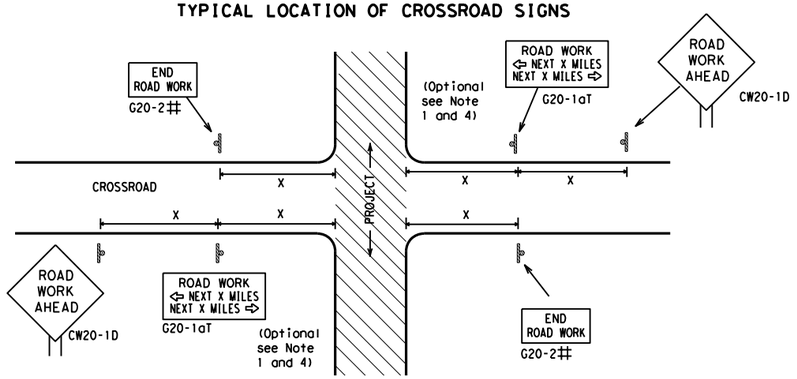
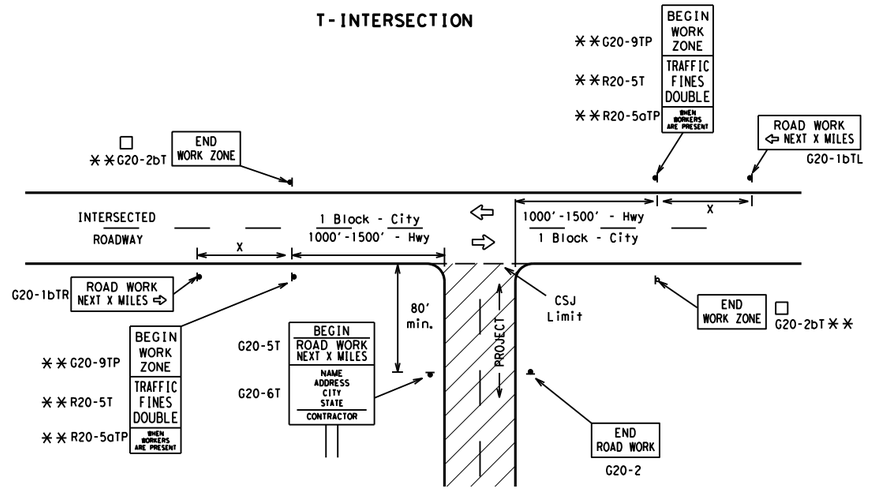
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

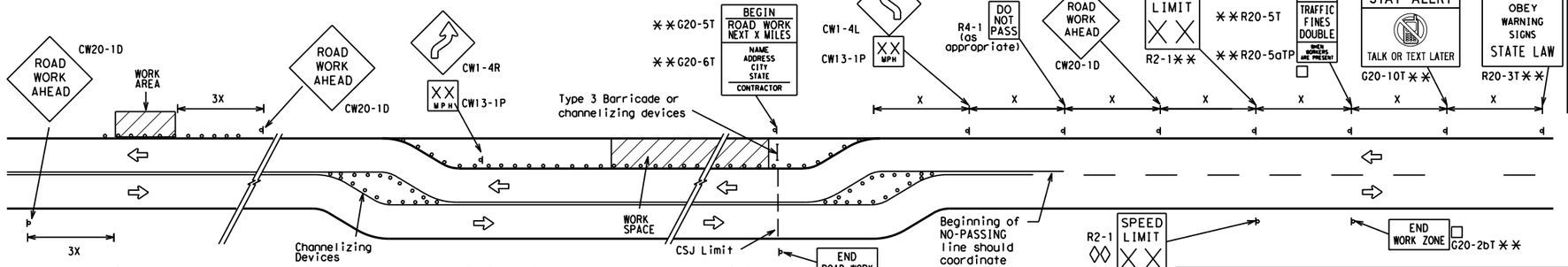
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

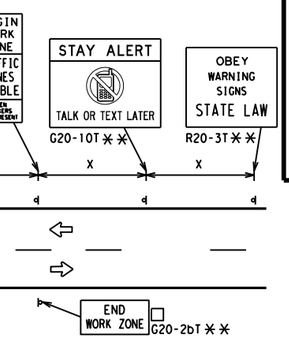
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

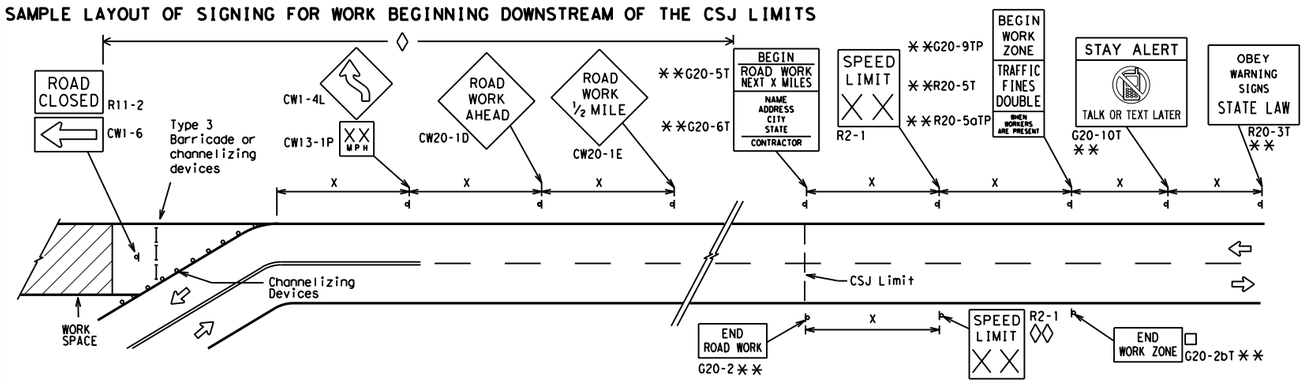


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-1D)signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



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



NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

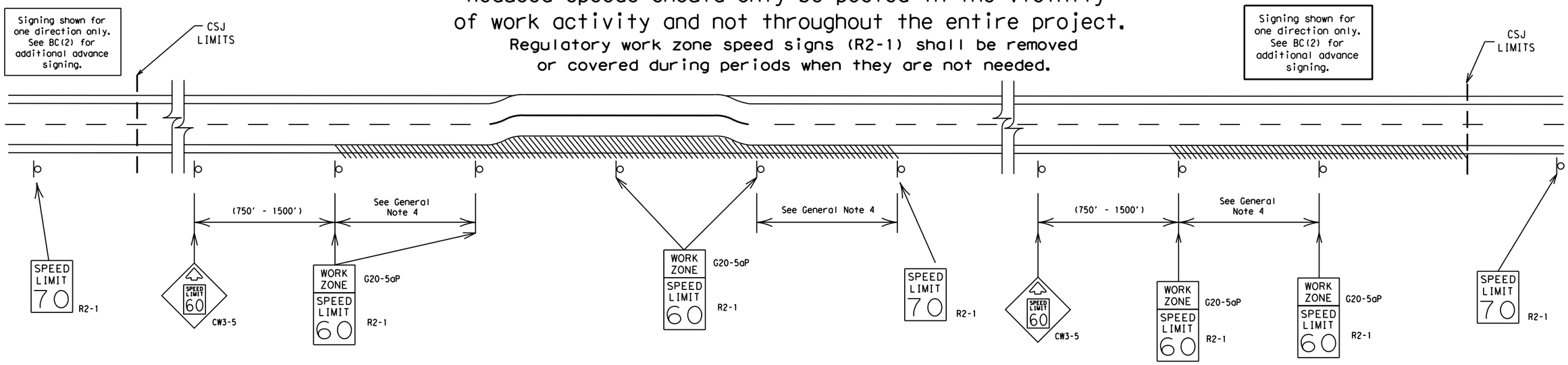
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6420-77		001	US 87
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SIT	TOM GREEN		7

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

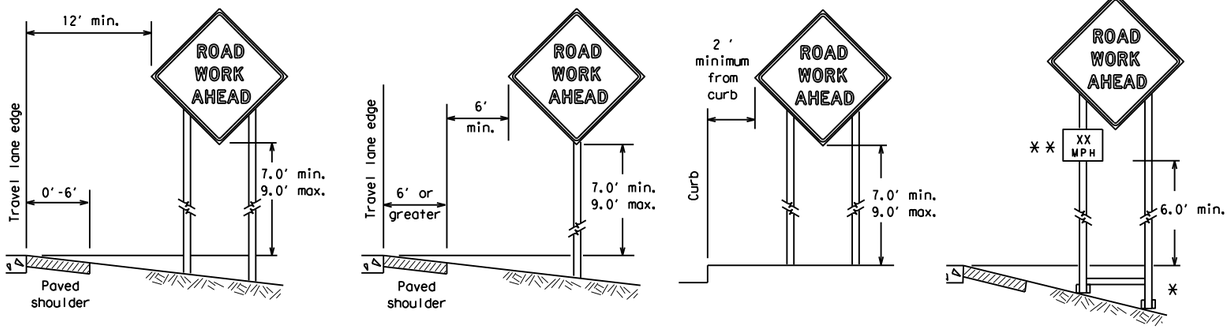
BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6420	-77	001	US 87
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SJT	TOM GREEN		8

DATE:
FILE:

DATE:
FILE:

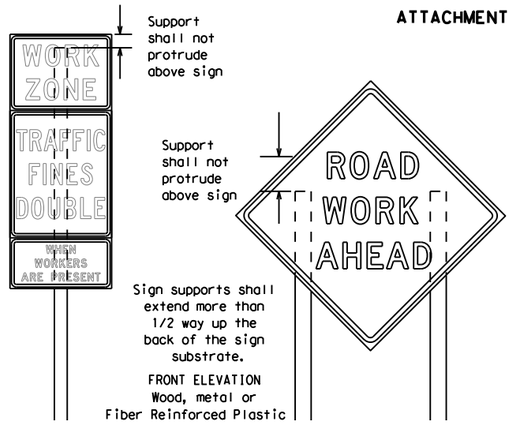
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

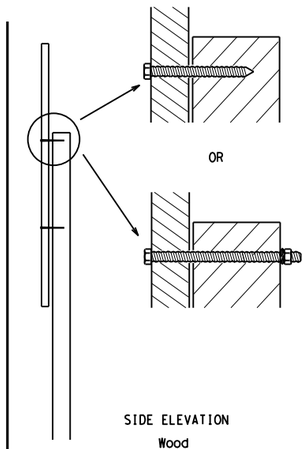


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





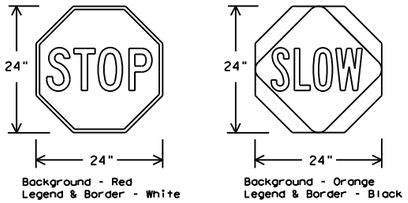
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

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9-07 8-14	DIST	COUNTY		SHEET NO.
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DATE:
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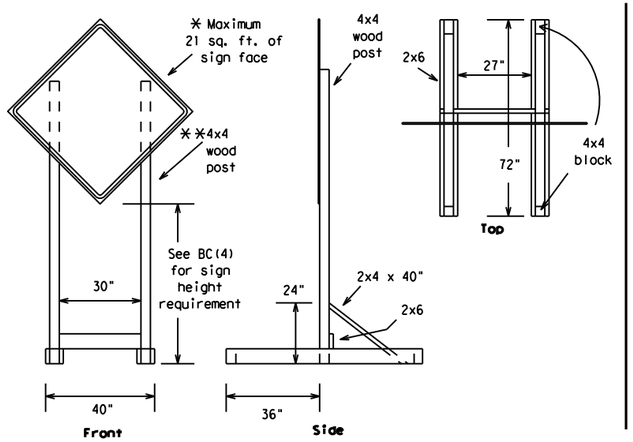
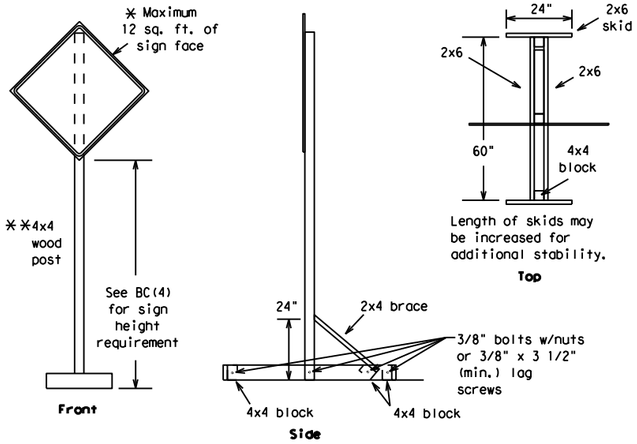
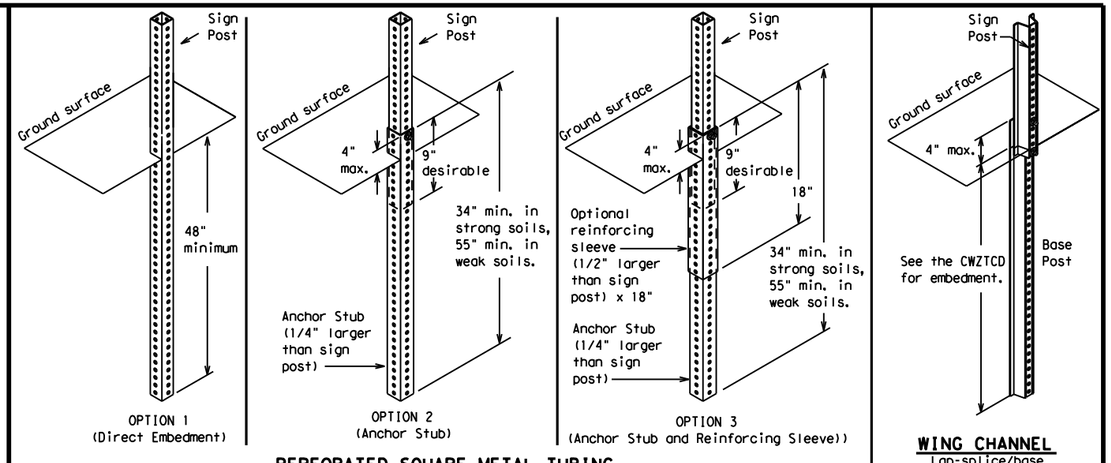




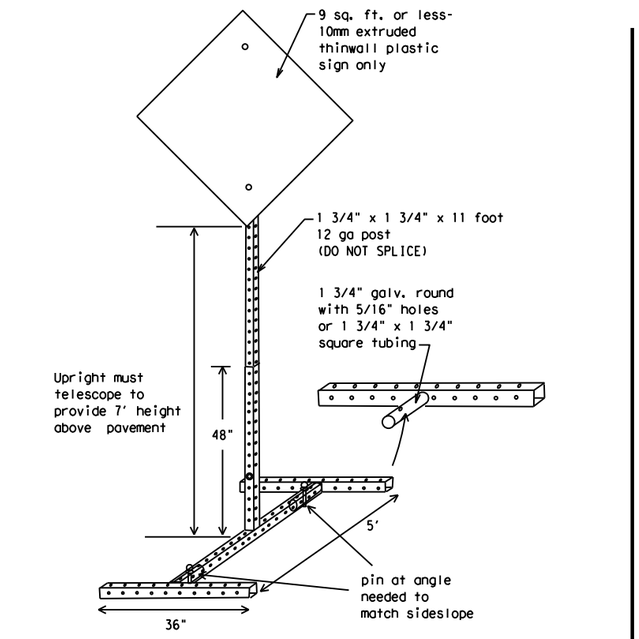
SKID MOUNTED WOOD SIGN SUPPORTS

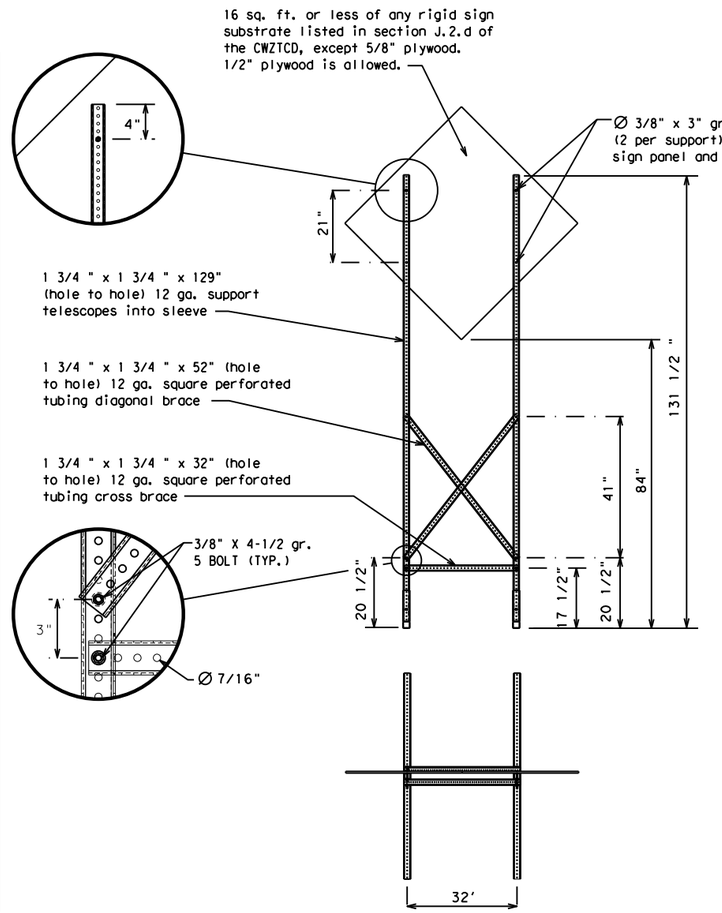
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

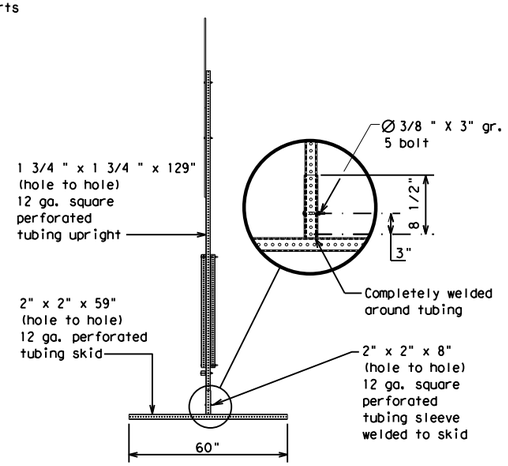


GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

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BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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FILE:

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

- AT FM XXXX
- BEFORE RAILROAD CROSSING
- NEXT X MILES
- PAST US XXX EXIT
- XXXXXXX TO XXXXXXX
- US XXX TO FM XXXX

Warning List

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

** Advance Notice List

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

* See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

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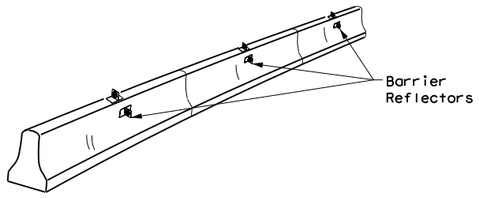
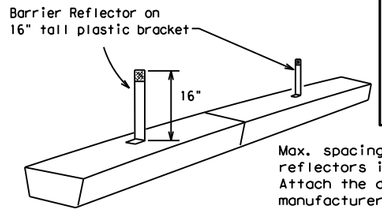
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



CONCRETE TRAFFIC BARRIER (CTB)

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

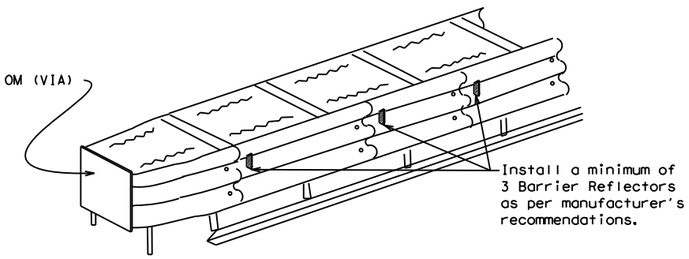


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) 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.

LOW PROFILE CONCRETE BARRIER (LPCB)

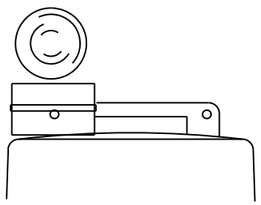


DELINEATION OF END TREATMENTS

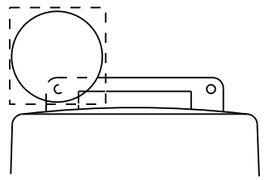
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

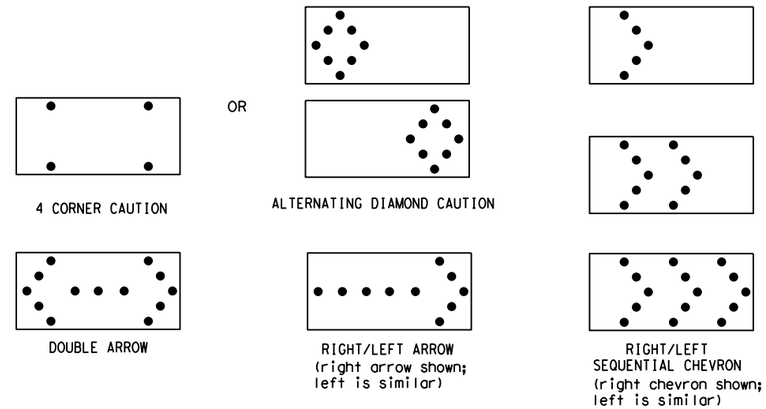
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6420-77	001		US 87
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SJT	TOM GREEN		12

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DATE:
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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

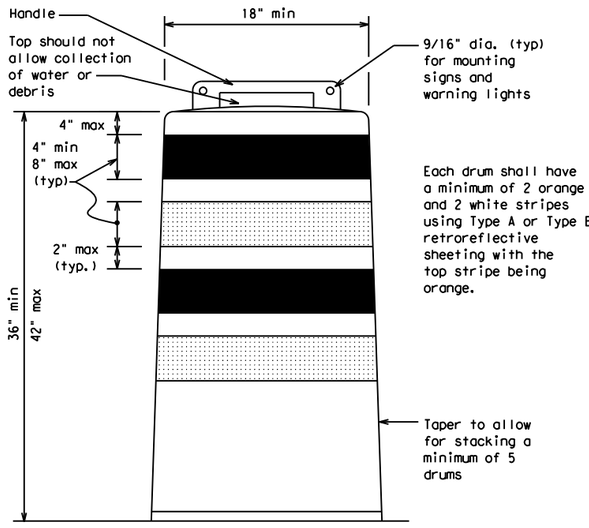
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

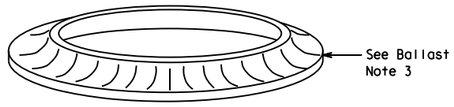
RETROREFLECTIVE SHEETING

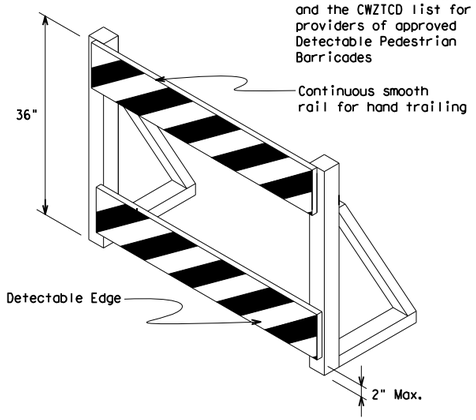
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

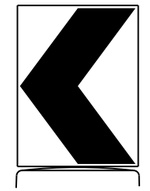




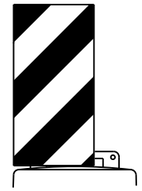


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6420	77	001	US 87
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	SJT	TOM GREEN		13
7-13				

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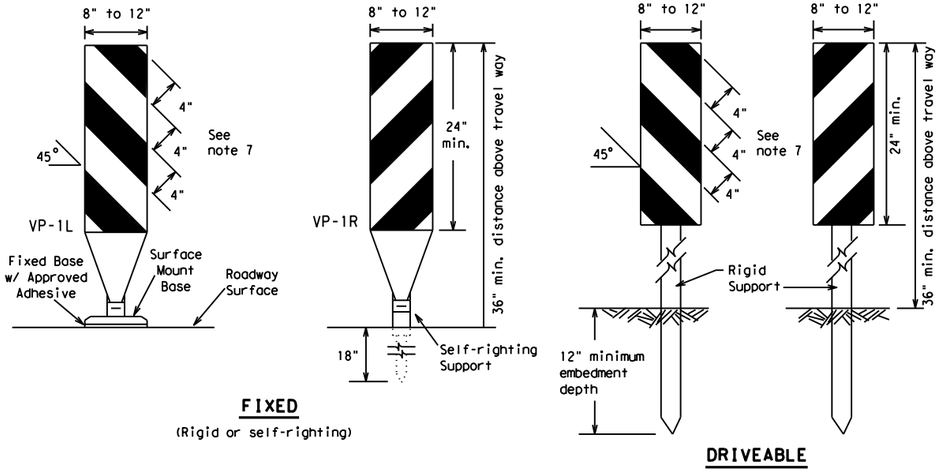
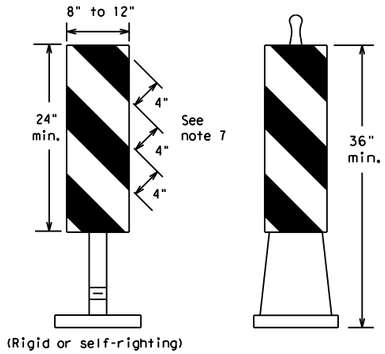


FIXED
(Rigid or self-righting)

DRIVEABLE

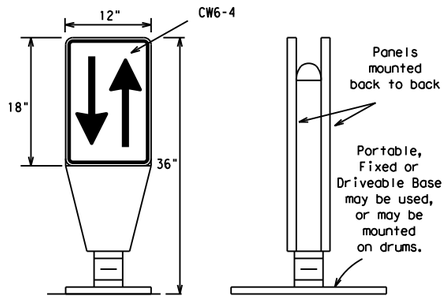


(Rigid or self-righting)

PORTABLE

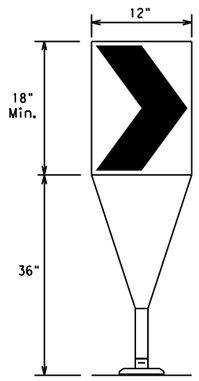
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



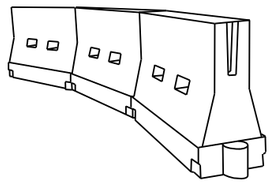
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

Posted Speed	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'
35		205'	225'	245'	35'	70'
40		265'	295'	320'	40'	80'
45	L = WS	450'	495'	540'	45'	90'
50		500'	550'	600'	50'	100'
55		550'	605'	660'	55'	110'
60		600'	660'	720'	60'	120'
65		650'	715'	780'	65'	130'
70		700'	770'	840'	70'	140'
75		750'	825'	900'	75'	150'
80		800'	880'	960'	80'	160'

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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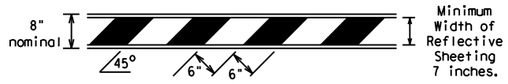
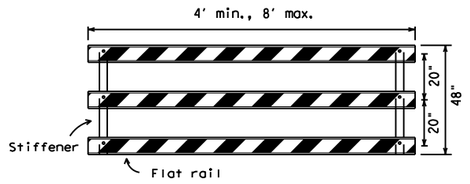
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



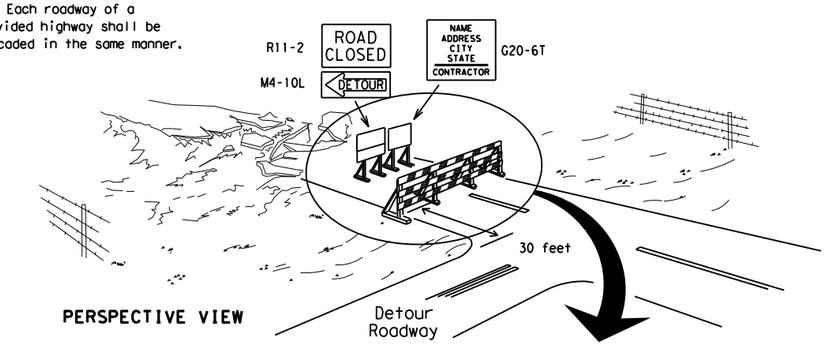
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

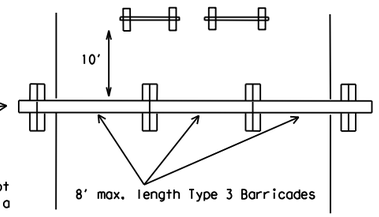
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

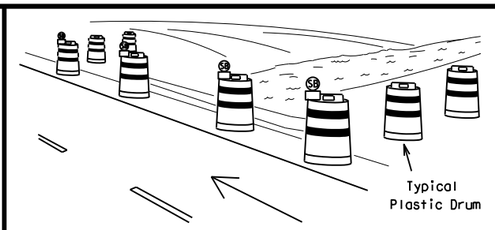
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

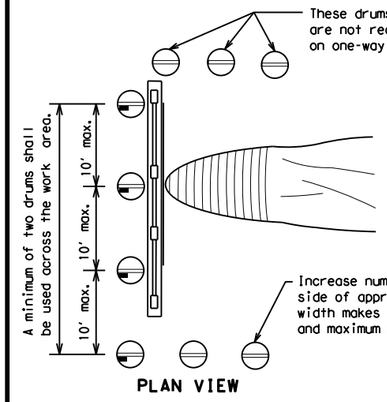
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

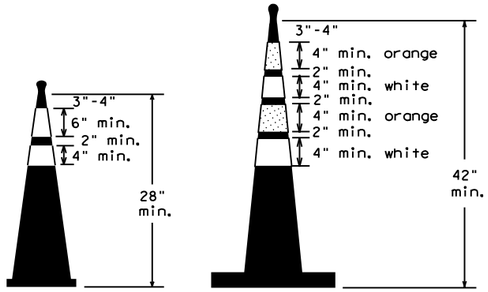
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



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

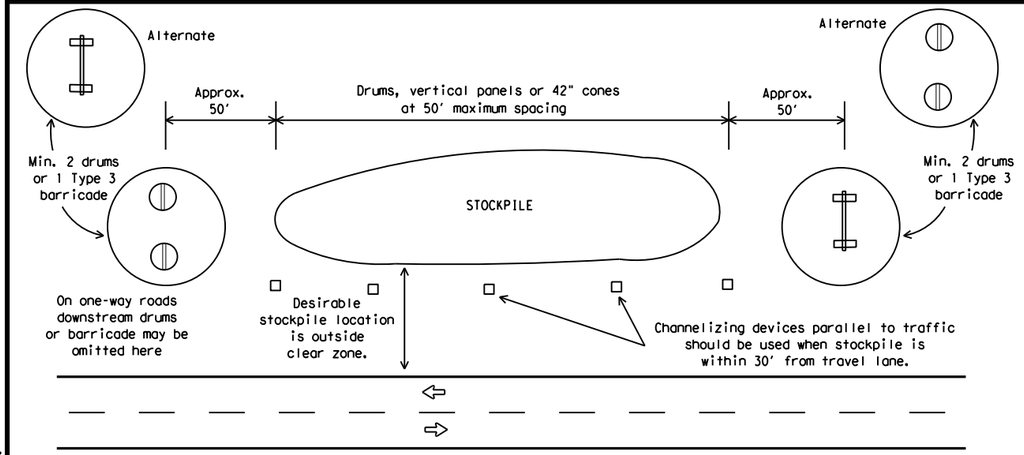
PLAN VIEW

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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SHEET 10 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

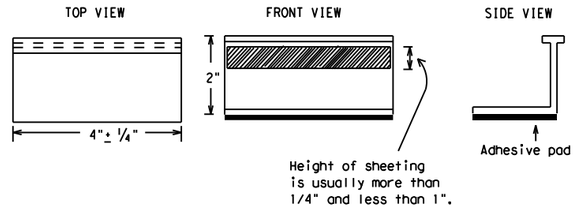
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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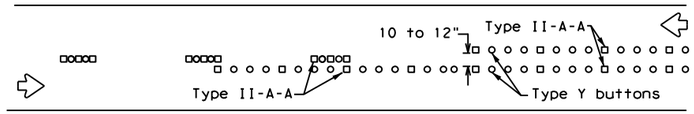
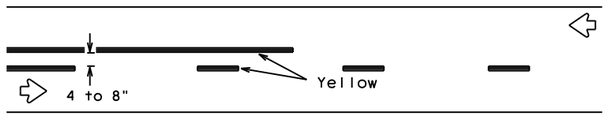
FILE:

PAVEMENT MARKING PATTERNS

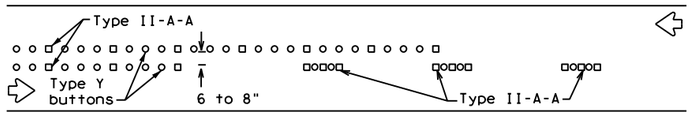
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



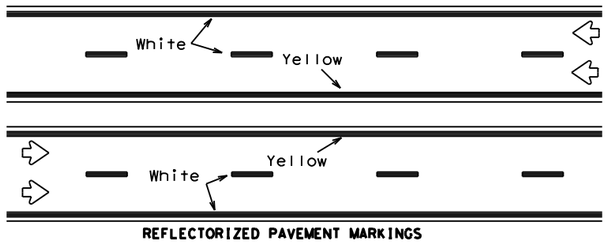
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



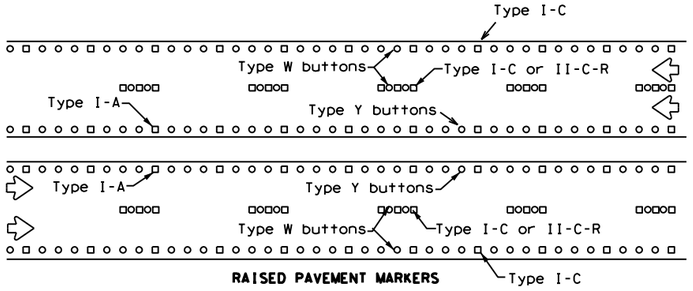
RAISED PAVEMENT MARKERS - PATTERN B

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

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



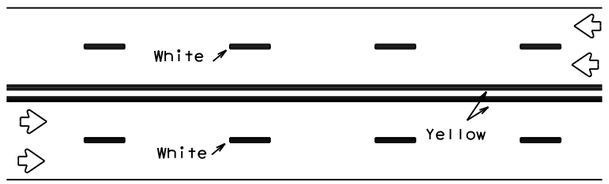
REFLECTORIZED PAVEMENT MARKINGS



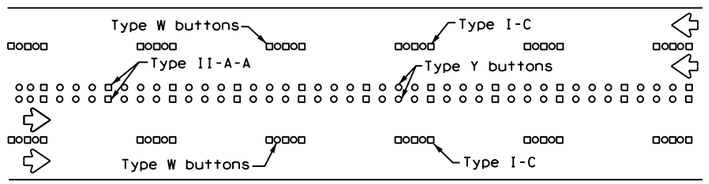
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



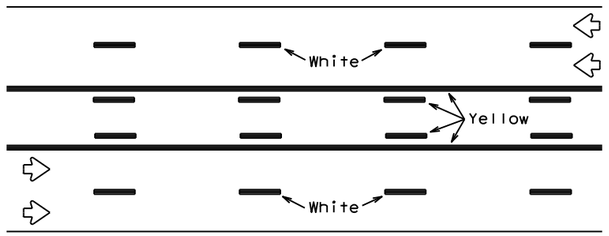
REFLECTORIZED PAVEMENT MARKINGS



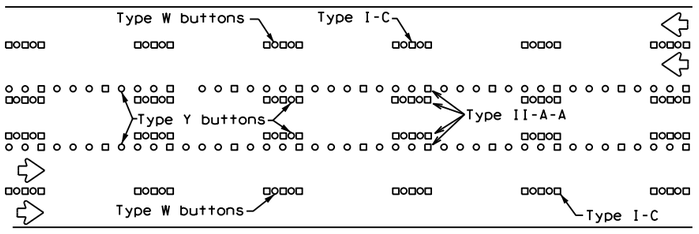
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

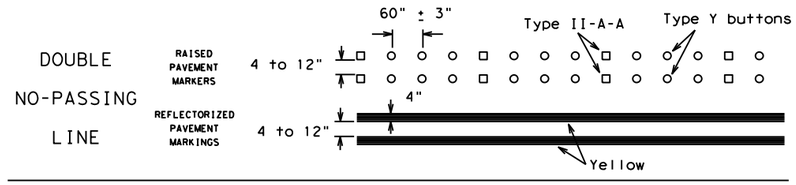
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

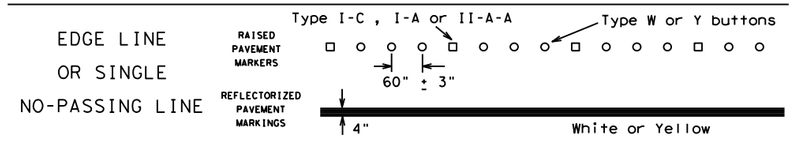
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

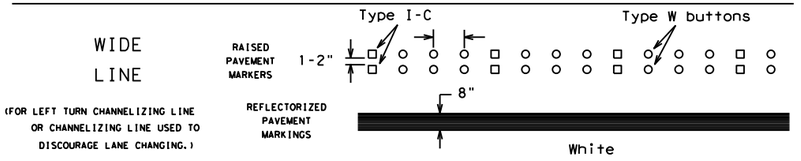


EDGE LINE OR SINGLE NO-PASSING LINE



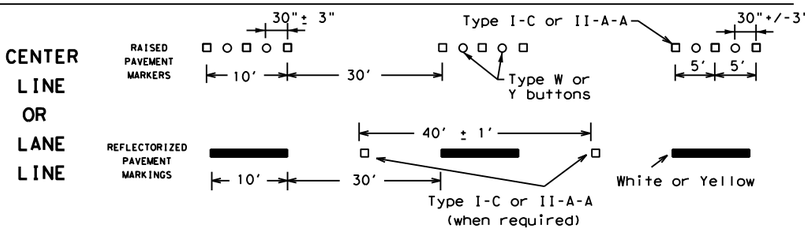
WIDE LINE

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

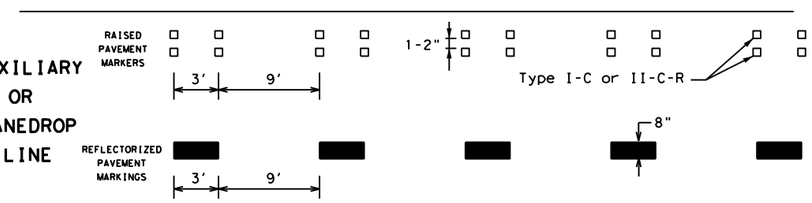


BROKEN LINES

CENTER LINE OR LANE LINE

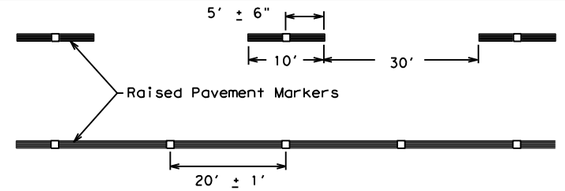


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

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BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

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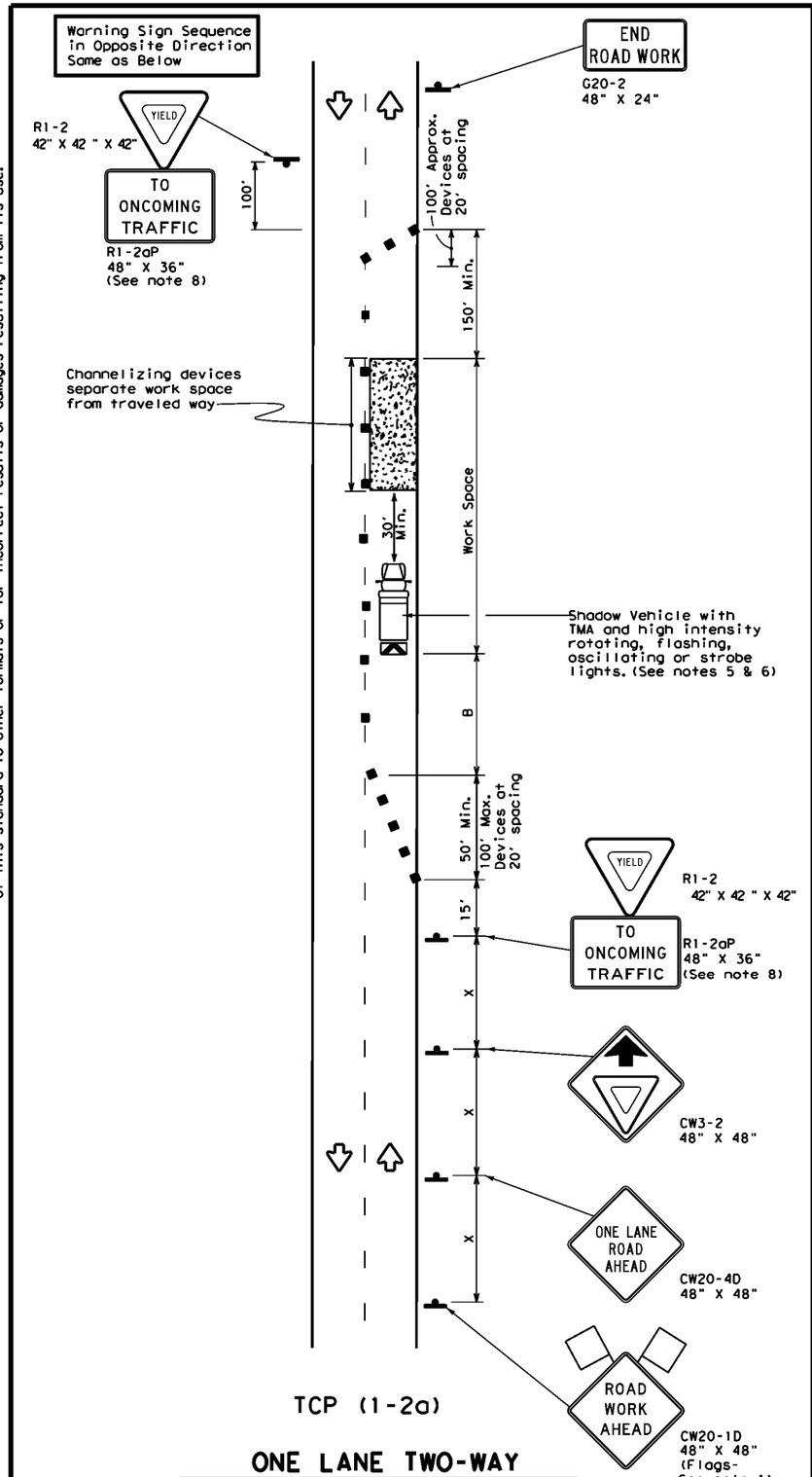
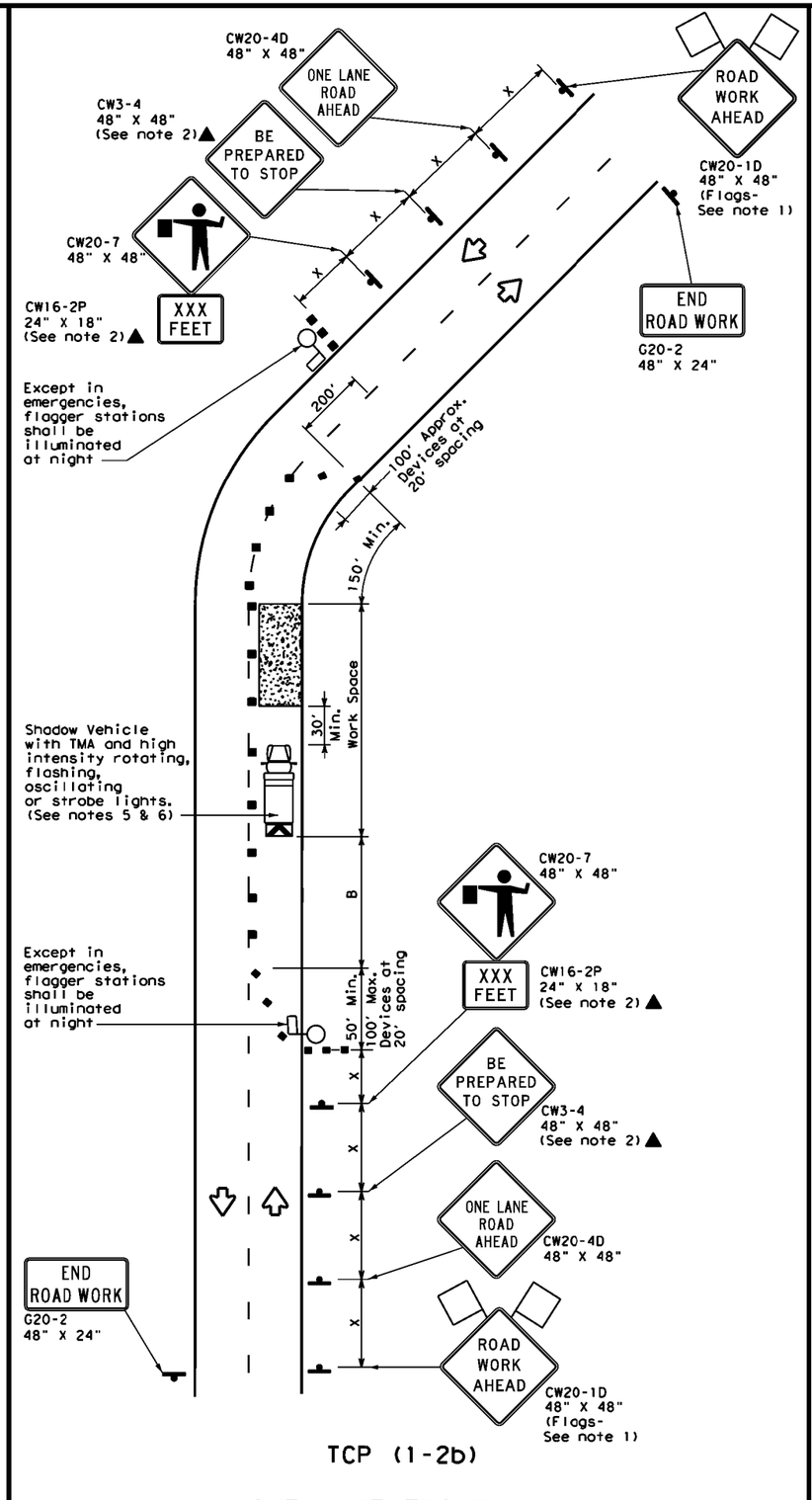


TCP (1-2a)

ONE LANE TWO-WAY CONTROL WITH YIELD SIGNS

(Less than 2000 ADT - See note 7)



TCP (1-2b)

ONE LANE TWO-WAY CONTROL WITH FLAGGERS

LEGEND

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L=WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

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

TYPICAL USAGE

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

GENERAL NOTES

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

TCP (1-2a)

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

TCP (1-2b)

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

Texas Department of Transportation

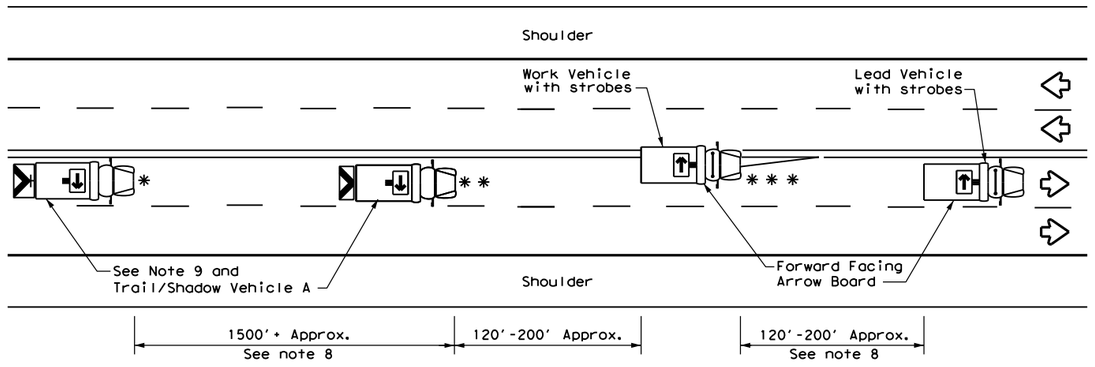
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(1-2)-18

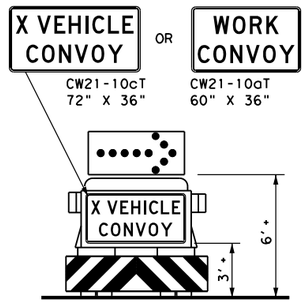
FILE: tcp1-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-90 4-98 2-94 2-12 1-97 2-18	6420-77	001		US 87
	DIST	COUNTY		SHEET NO.
	SJT	TOM GREEN		18

DATE:
FILE:



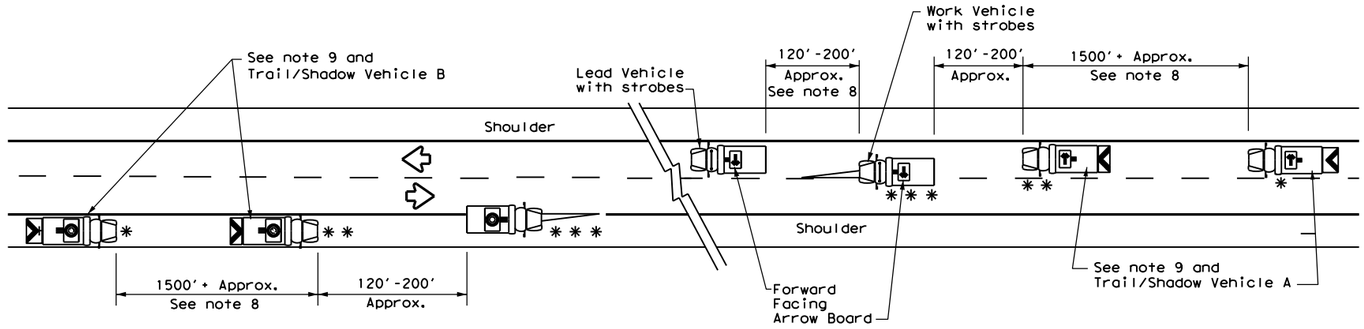
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

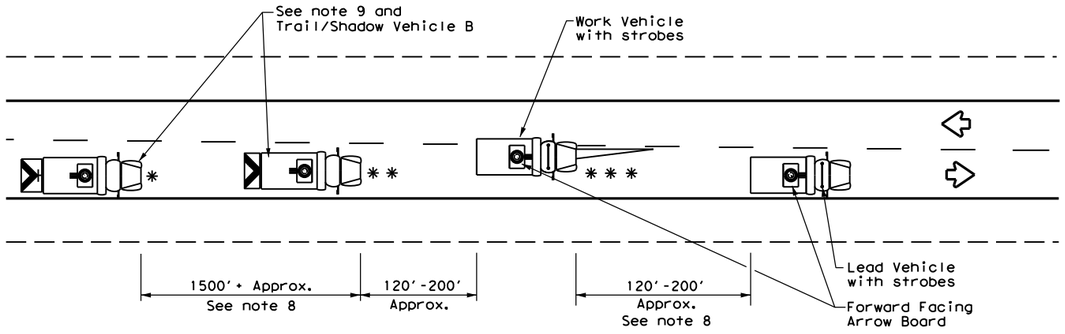


WORK ON SHOULDER

WORK ON TRAVEL LANE

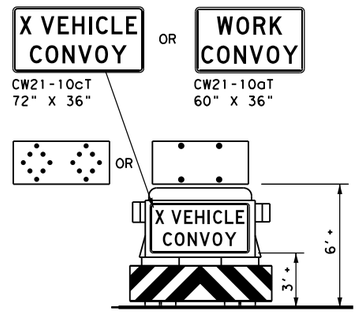
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

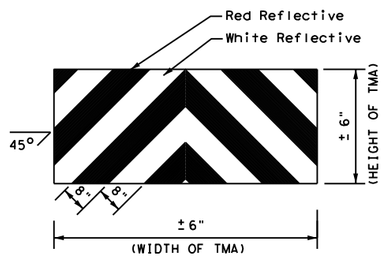
with Flashing Arrow Board in CAUTION display

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

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

GENERAL NOTES

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



STRIPING FOR TMA

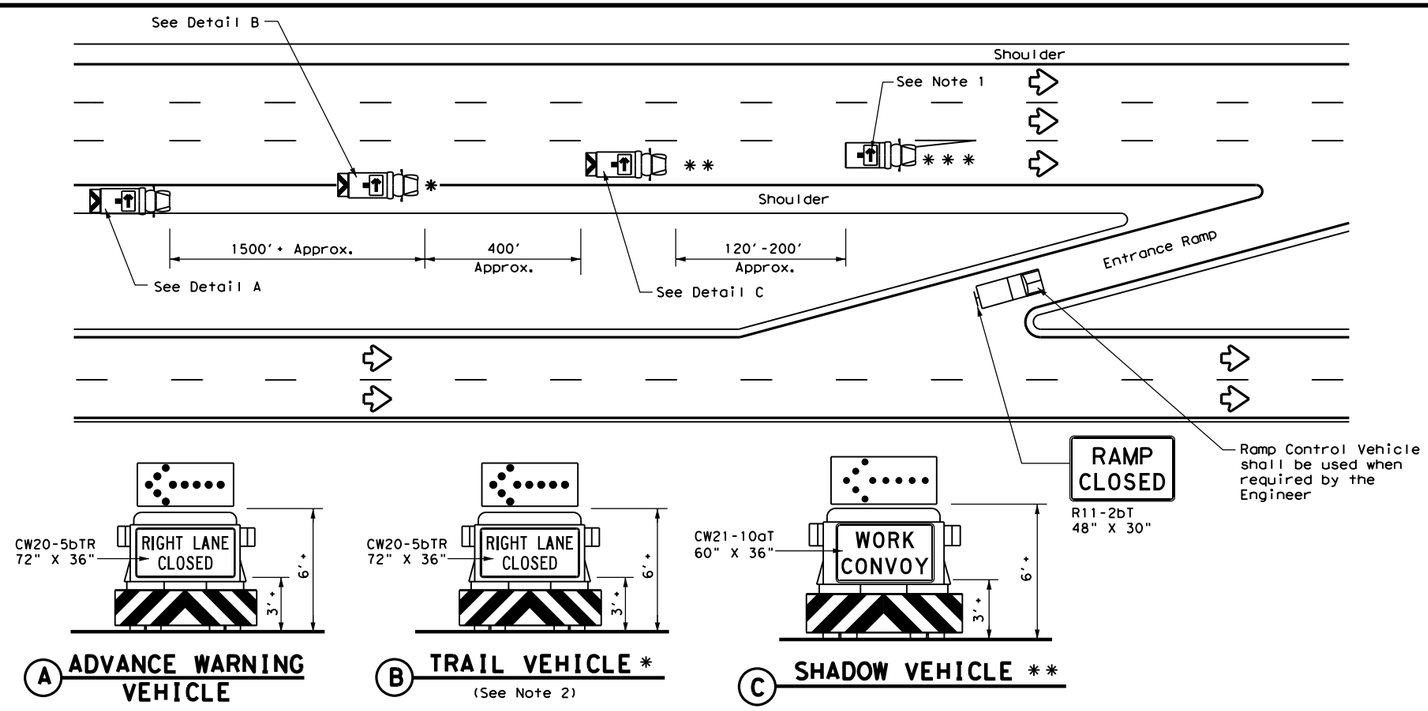
Texas Department of Transportation

Traffic Operations Division Standard

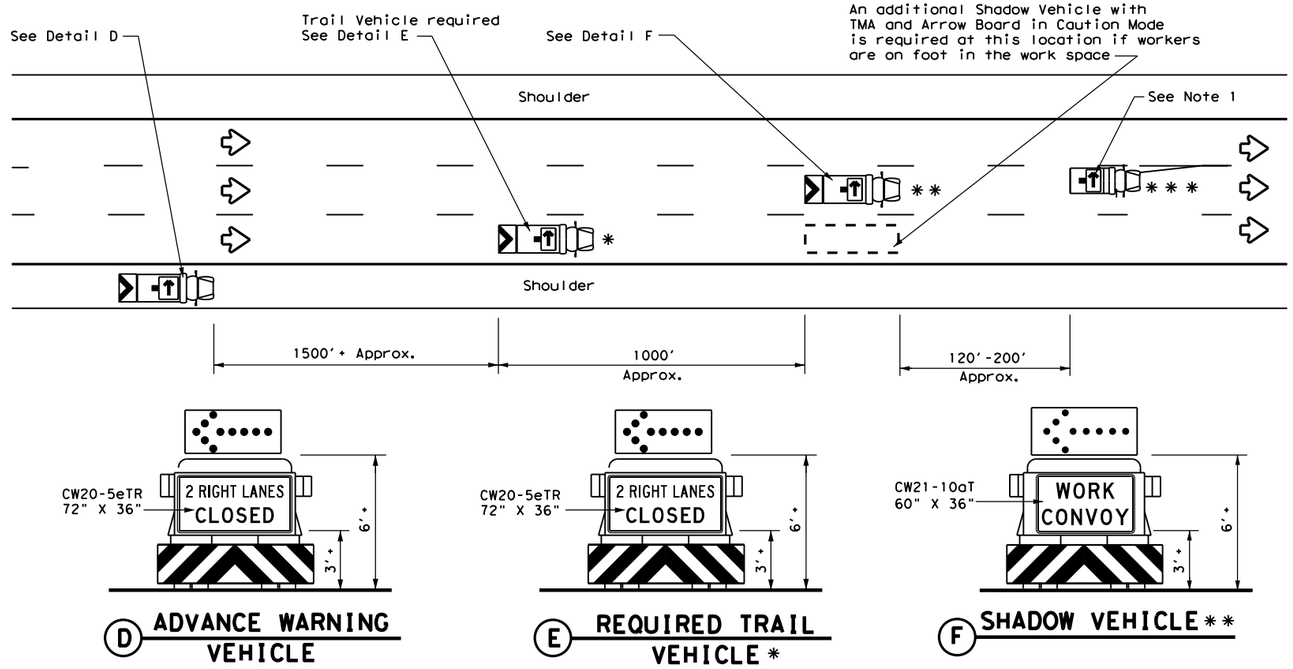
TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

FILE: tcp3-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	6420-	77	001	US 87
	DIST	COUNTY		SHEET NO.
	SJT	TOM GREEN		19



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



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

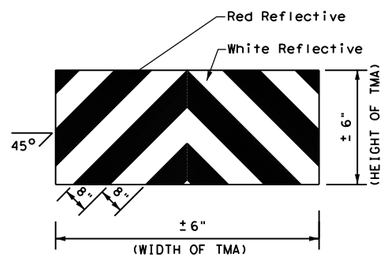
DATE:
FILE:

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

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

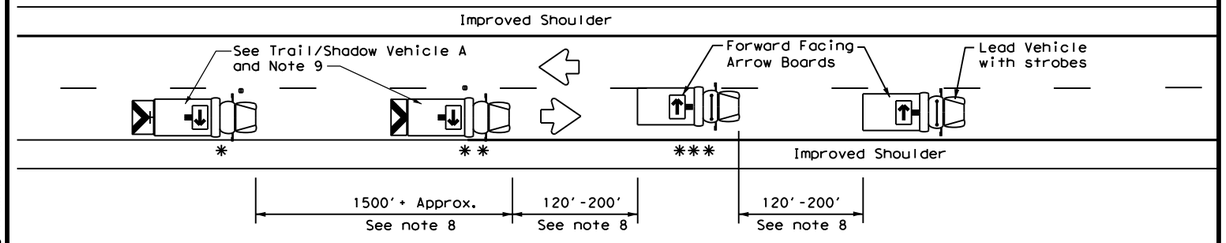
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

TCP(3-2)-13

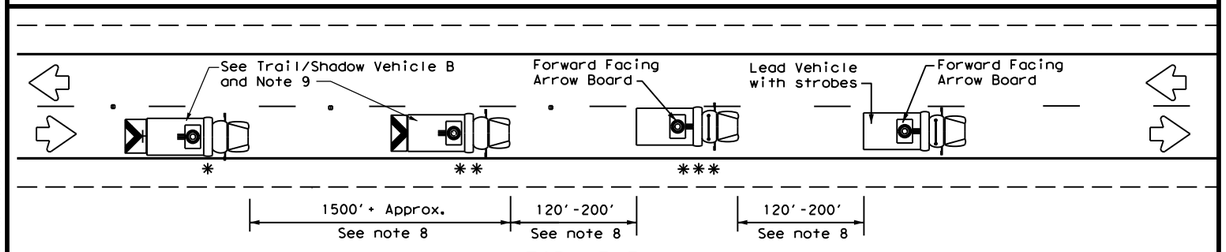
FILE: tcp3-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	6420-	77 001		US 87
	DIST	COUNTY		SHEET NO.
	SJT	TOM GREEN		20

176



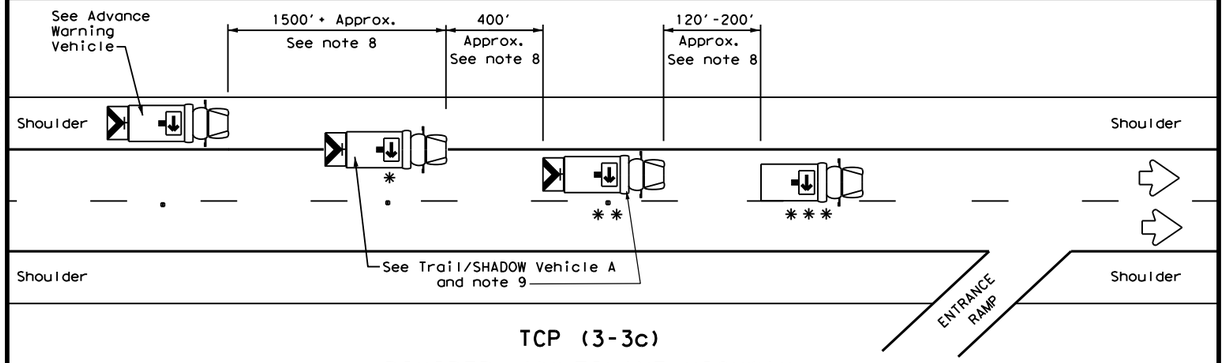
TCP (3-3a)

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



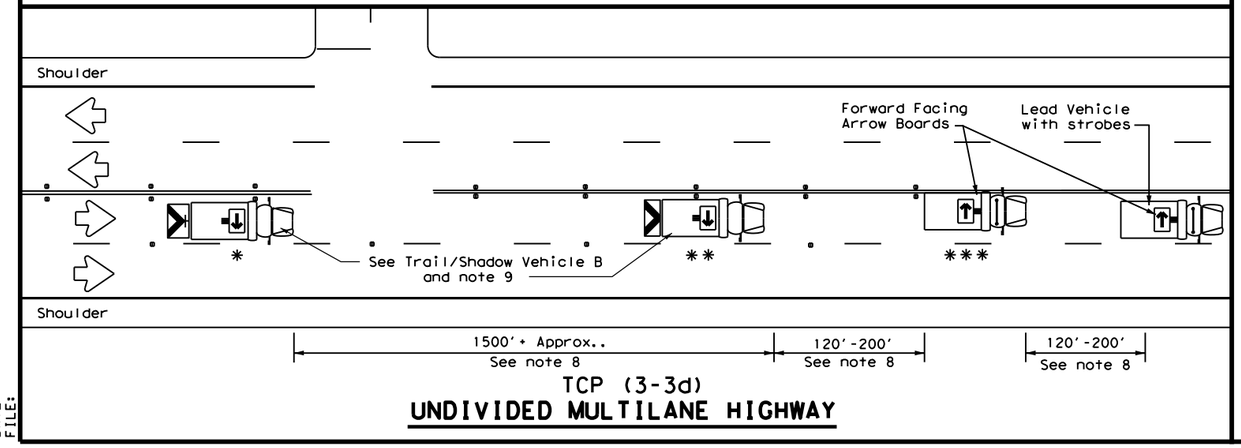
TCP (3-3b)

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



TCP (3-3c)

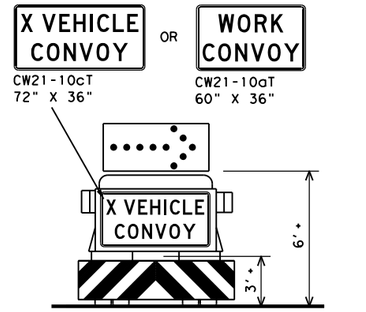
DIVIDED MULTILANE HIGHWAY



TCP (3-3d)

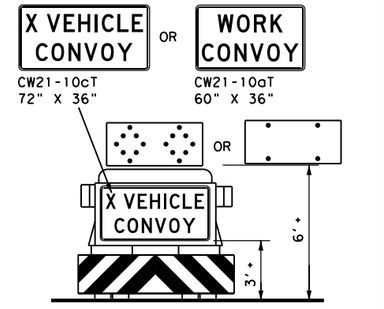
UNDIVIDED MULTILANE HIGHWAY

DATE:
FILE:



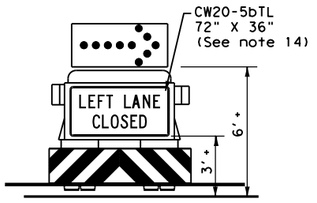
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

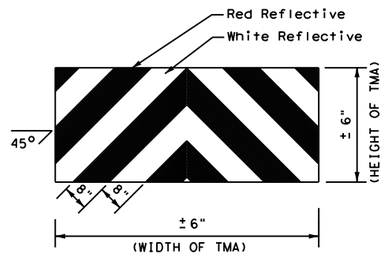


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

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

FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	6420	77	001	US 87
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	SJT	TOM GREEN		21
1-97 7-14				

INSTALLED	OBJECTID	County	Highway	Closest Reference Marker	Displacement Miles	ID	Rdway Orientation	Right or Left	Latitude	Longitude	2 or 4 Lane	Approach MBGF	Concrete barrier	Departing MBGF	spacing	(D-SW)SZ 1(BRF)GF 2(BI) 658-6062	(D-SW)SZ (BRF)CT B (BI) 658-6014	(D-SW)SZ (BRF)CT B 658-6013	(D-SW)SZ 1(BRF)GF 2 658-6061	(D-SY)SZ (BRF)CT B 658-6026	(D-SY)SZ 1(BRF)GF 2 658-6064
	26	Tom Green	US 87	458	-0.727	10	EB Right	Right	31.558799	-100.544867	4	30	2560	0	97.69	0	0	26	1	0	0
	27	Tom Green	US 87	458	-0.727	10	WB Right	Right	31.558799	-100.544867	4	30	2550	0	97.31	0	0	26	1	0	0
	28	Tom Green	US 87	458	-0.727	10	WB Left	Left	31.558799	-100.544867	2	30	4230	30	98.60	2	42	0	0	0	0
	33	Tom Green	US 87	464	-0.028	12	SB Right	Right	31.516361	-100.480719	4	820	220	1015	95.48	0	0	2	20	0	0
	34	Tom Green	US 87	464	-0.028	12	SB Left	Left	31.516361	-100.480719	4	270	235	213	95.43	0	0	0	0	3	5
	35	Tom Green	US 87	464	-0.028	12	NB Right	Right	31.516361	-100.480719	4	1065	225	967	95.96	0	0	3	21	0	0
	36	Tom Green	US 87	464	-0.028	12	NB Left	Left	31.516361	-100.480719	4	265	240	92	91.17	0	0	0	0	3	4
	37	Tom Green	US 87	468	-0.141	13	SB Right	Right	31.468047	-100.447815	4	856	0	0	89.56	0	0	0	10	0	0
	38	Tom Green	US 87	468	0.748	14	SB Right	Right	31.456044	-100.442368	4	38	390	25	80.60	0	0	5	1	0	0
	39	Tom Green	US 87	468	0.748	14	SB Left	Left	31.456044	-100.442368	4	25	375	0	87.50	0	0	0	0	4	1
	40	Tom Green	US 87	468	0.742	15	NB Right	Right	31.456799	-100.44062	4	0	650	0	100.00	0	0	7	0	0	0
	41	Tom Green	US 87	468	0.742	15	NB Left	Left	31.456799	-100.44062	4	0	600	0	91.67	0	0	0	0	7	0
	42	Tom Green	US 87	472	-0.254	16	SB Right	Right	31.414818	-100.439491	4	150	432	160	98.86	0	0	4	4	0	0
	43	Tom Green	US 87	472	-0.254	16	SB Left	Left	31.414818	-100.439491	4	150	432	30	93.67	0	0	0	0	4	3
	44	Tom Green	US 87	472	-0.254	16	NB Right	Right	31.414818	-100.439491	4	150	432	160	98.86	0	0	4	4	0	0
	45	Tom Green	US 87	472	-0.254	16	NB Left	Left	31.414818	-100.439491	4	150	432	30	93.67	0	0	0	0	4	3
	46	Tom Green	US 87	472	0.293	17	SB Right	Right	31.407	-100.437742	4	290	0	0	80.00	0	0	0	4	0	0
	47	Tom Green	US 87	472	0.293	17	SB Left	Left	31.407	-100.437742	4	280	0	0	76.67	0	0	0	0	0	4
	48	Tom Green	US 87	472	0.293	17	NB Left	Left	31.407	-100.437742	4	290	0	0	80.00	0	0	0	0	0	4
	49	Tom Green	US 87	472	0.293	17	W Frtg Rd NB		31.407	-100.437742	2	330	0	0	93.33	4	0	0	0	0	0
	50	Tom Green	US 87	474	-0.874	18	OP The Crossings Ave EB		31.397658	-100.434973	2	150	430	150	97.14	4	4	0	0	0	0
	51	Tom Green	US 87	474	-0.874	18	OP The Crossings Ave WB		31.397658	-100.434973	2	150	430	150	97.14	4	4	0	0	0	0
	52	Tom Green	US 87	474	-0.594	19	SB Right	Right	31.393119	-100.433084	4	160	293	160	93.83	0	0	3	4	0	0
	53	Tom Green	US 87	474	-0.594	19	SB Left	Left	31.393119	-100.433084	4	155	293	12	82.00	0	0	0	0	4	2
	54	Tom Green	US 87	474	-0.594	19	NB Right	Right	31.393119	-100.433084	4	150	293	150	90.50	0	0	3	4	0	0
	55	Tom Green	US 87	474	-0.594	19	NB Left	Left	31.393119	-100.433084	4	150	293	12	81.00	0	0	0	0	4	2
	88	Tom Green	US 67	668	-0.849	30	EB Right	Right	31.476772	-100.398134	4	1350	315	600	96.30	0	0	4	20	0	0
	89	Tom Green	US 67	668	-0.849	30	EB Left	Left	31.476772	-100.398134	4	325	201	0	95.20	0	0	0	0	2	4
	90	Tom Green	US 67	668	-0.849	30	WB Right	Right	31.476772	-100.398134	4	300	310	1346	95.30	0	0	4	17	0	0
	91	Tom Green	US 67	668	-0.849	30	WB Left	Left	31.476772	-100.398134	4	305	210	0	93.00	0	0	0	0	2	4
	92	Tom Green	US 67	668	-0.607	31	On Ramp left	Left	31.476284	-100.402232	4	450	0	0	100.00	0	0	0	0	0	5
	93	Tom Green	US 67	668	-0.571	32	Smith Blvd Exit Right	Right	31.475531	-100.402852	4	418	0	0	92.00	0	0	0	5	0	0
	94	Tom Green	US 67	668	-0.571	32	Smith Blvd Exit Left	Left	31.475531	-100.402852	4	300	0	0	83.33	0	0	0	0	0	4
	95	Tom Green	US 67	668	0.048	33	OP Bell St NB		31.475691	-100.413341	2	0	410	0	90.00	0	5	0	0	0	0
	96	Tom Green	US 67	668	0.048	33	OP Bell St SB		31.475691	-100.413341	2	0	410	0	90.00	0	5	0	0	0	0
	97	Tom Green	US 67	668	0.379	34	EB Right	Right	31.475681	-100.418957	4	425	358	535	97.54	0	0	3	11	0	0
	98	Tom Green	US 67	668	0.379	34	EB Left	Left	31.475681	-100.418957	4	225	335	0	85.00	0	0	0	0	4	3
	99	Tom Green	US 67	668	0.379	34	WB Right	Right	31.475681	-100.418957	4	525	300	0	96.88	0	0	3	6	0	0
	100	Tom Green	US 67	668	0.379	34	WB Left	Left	31.475681	-100.418957	4	225	300	0	95.00	0	0	0	0	3	3
	101	Tom Green	US 67	668	0.517	35	EB Right	Right	31.475701	-100.421302	4	225	150	0	81.25	0	0	2	3	0	0
	102	Tom Green	US 67	668	0.517	35	EB Left	Left	31.475701	-100.421302	4	225	150	0	81.25	0	0	0	0	2	3
															Totals	14	60	99	136	46	54

DATE:
FILE:

Texas Department of Transportation

San Angelo District

Delineator Locations

©TxDOT	CONT	SECT	JOB	HIGHWAY
SHEET ISSUED OR LAST REVISED	6420	77	001	US 87
	DIST	COUNTY		SHEET NO.
	07	Runnels		22

INSTALLED	OBJECTID	County	Highway	Closest Reference Marker	Displacement Miles	ID	Rdway Orientation	Right or Left	Latitude	Longitude	2 or 4 Lane	Approach MBGF	Concrete barrier	Departing MBGF	spacing	(D-SW)SZ 1(BRF)GF 2(BI) 658-6062	(D-SW)SZ (BRF)CT B (BI) 658-6014	(D-SW)SZ (BRF)CT B 658-6013	(D-SW)SZ 1(BRF)GF 2 658-6061	(D-SY)SZ (BRF)CT B 658-6026	(D-SY)SZ 1(BRF)GF 2 658-6064
	103	Tom Green	US 67	668	0.517	35	WB Right	Right	31.475701	-100.421302	4	530	150	0	90.00	0	0	2	6	0	0
	104	Tom Green	US 67	668	0.517	35	WB Left	Left	31.475701	-100.421302	4	250	150	0	87.50	0	0	0	0	2	3
	105	Tom Green	US 67	670	-0.812	36	OP Main St Right	Right	31.474263	-100.43215	2	0	245	0	97.50	0	3	0	0	0	0
	106	Tom Green	US 67	670	-0.812	36	OP Main St Left	Left	31.474263	-100.43215	2	0	245	0	97.50	0	3	0	0	0	0
	107	Tom Green	US 67	670	-0.577	37	WB Right	Right	31.472755	-100.435727	4	25	800	0	96.88	0	0	8	1	0	0
	108	Tom Green	US 67	670	-0.530	38	On Ramp WB Right	Right	31.472619	-100.436556	4	75	1465	0	99.33	0	0	15	1	0	0
	109	Tom Green	US 67	670	-0.530	38	On Ramp WB Left	Left	31.472619	-100.436556	4	0	1100	0	95.45	0	0	0	0	12	0
	110	Tom Green	US 67	670	-0.560	39	EB 41B Right	Right	31.472305	-100.435757	4	0	550	0	100.00	0	0	6	0	0	0
	111	Tom Green	US 67	670	-0.544	40	Exit Main St EB Left	Left	31.472024	-100.435881	4	25	650	0	89.29	0	0	0	0	7	1
	112	Tom Green	US 67	670	-0.379	41	EB Right	Right	31.471051	-100.438437	4	740	1555	0	97.61	0	0	16	8	0	0
	113	Tom Green	US 67	670	-0.379	41	EB Left	Left	31.471051	-100.438437	4	300	200	0	90.00	0	0	0	0	2	4
	114	Tom Green	US 67	670	-0.380	42	WB Left	Left	31.471324	-100.438612	4	300	200	0	90.00	0	0	0	0	2	4
	115	Tom Green	US 67	670	-0.177	43	WB Right	Right	31.469898	-100.441626	4	300	888	0	94.83	0	0	10	3	0	0
	116	Tom Green	US 67	670	-0.177	43	WB Left	Left	31.469898	-100.441626	4	300	200	0	90.00	0	0	0	0	2	4
	117	Tom Green	US 67	670	-0.158	44	EB Left	Left	31.469503	-100.441723	4	300	200	0	90.00	0	0	0	0	2	4
	118	Tom Green	US 67	670	-0.083	45	EB On Ramp Right	Right	31.468831	-100.442743	4	75	1075	0	100.00	0	0	11	1	0	0
	119	Tom Green	US 67	670	-0.026	46	WB Right	Right	31.468793	-100.443824	4	30	800	0	97.50	0	0	8	1	0	0
	120	Tom Green	US 67	670	-0.013	47	On Ramp Left	Left	31.468836	-100.444214	4	75	395	0	84.00	0	0	0	0	5	1
	121	Tom Green	US 67	670	0.012	48	EB Right	Right	31.468219	-100.444186	4	0	950	0	100.00	0	0	10	0	0	0
	122	Tom Green	US 67	670	0.063	49	EB Chadbourne Exit Left	Left	31.467693	-100.444824	4	25	466	0	88.20	0	0	0	0	5	1
	123	Tom Green	US 67	670	0.214	50	EB Chadbourne Exit Right	Right	31.466844	-100.447227	4	300	1975	0	96.74	0	0	21	3	0	0
	124	Tom Green	US 67	670	0.214	50	EB Left	Left	31.466844	-100.447227	4	300	955	100	93.21	0	0	0	0	11	4
	125	Tom Green	US 67	670	0.176	51	WB Right	Right	31.467377	-100.446817	4	75	2200	30	98.04	0	0	22	2	0	0
	126	Tom Green	US 67	670	0.176	51	WB Left	Left	31.467377	-100.446817	4	300	980	0	94.62	0	0	0	0	11	3
	127	Tom Green	US 67	670	0.275	52	Caddo St Appr OnlyRight	Right	31.466152	-100.447952	4	265	0	0	71.67	0	0	0	4	0	0
	128	Tom Green	US 67	670	0.275	52			31.466152	-100.447952	4	328	0	0	92.67	0	0	0	0	0	0
	129	Tom Green	US 67	670	0.288	53	W 7th St WB Right	Right	31.466904	-100.448713	4	250	430	72	87.75	0	0	5	4	0	0
	130	Tom Green	US 67	670	0.288	53	W 7th St WB Left	Left	31.466904	-100.448713	4	342	430	88	90.00	0	0	0	0	5	5
	131	Tom Green	US 67	672	-0.317	54	EB Exit MLK Left	Left	31.462081	-100.45699	4	80	250	0	93.33	0	0	0	0	3	1
	132	Tom Green	US 67	672	-0.307	55	WB On Ramp Left	Left	31.462604	-100.457513	4	75	478	0	83.83	0	0	0	0	6	1
	133	Tom Green	US 67	672	-0.216	56	Jefferson St OP E Wrap Around		31.461737	-100.458705	2	0	760	0	88.75	0	9	0	0	0	0
	134	Tom Green	US 67	672	-0.202	57	Jefferson St OP W Wrap Around		31.461555	-100.458863	2	430	280	550	93.08	11	3	0	0	0	0
	135	Tom Green	US 67	672	0.059	58	OP N Van Buren E Side		31.460002	-100.462915	2	425	214	192	97.63	7	2	0	0	0	0
	136	Tom Green	US 67	672	0.059	58	OP N Van Buren W Side		31.460002	-100.462915	2	1450	214	174	99.33	17	2	0	0	0	0
	137	Tom Green	US 67	672	0.345	59	OP N Howard St E Side		31.457922	-100.46714	2	1085	210	55	100.00	12	2	0	0	0	0
	138	Tom Green	US 67	672	0.345	59	OP N Howard St W Side		31.457922	-100.46714	2	600	210	265	93.18	10	2	0	0	0	0
	139	Tom Green	US 67	672	0.514	60	On Ramp Left	Left	31.457041	-100.469818	4	370	0	0	80.00	0	0	0	0	0	5
	140	Tom Green	US 67	672	0.609	61	Exit Howard St EB Left	Left	31.455783	-100.470883	4	894	0	0	93.78	0	0	0	0	0	10
	141	Tom Green	US 67	674	-0.907	62	EB Right	Right	31.453353	-100.47694	4	225	1116	0	99.31	0	0	11	3	0	0
	142	Tom Green	US 67	674	-0.907	62	EB Left	Left	31.453353	-100.47694	4	250	194	0	98.50	0	0	0	0	2	3
	143	Tom Green	US 67	674	-0.905	63	WB Right	Right	31.453603	-100.477091	4	200	300	0	90.00	0	0	4	2	0	0
															Totals	57	26	149	39	77	54

DATE:
FILE:

Texas Department of Transportation

San Angelo District

Delineator Locations

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6420	77	001	US 87
DIST	COUNTY		SHEET NO.
07	Runnels		23

INSTALLED	OBJECTID	County	Highway	Closest Reference Marker	Displacement Miles	ID	Rdway Orientation	Right or Left	Latitude	Longitude	2 or 4 Lane	Approach MBGF	Concrete barrier	Departing MBGF	spacing	(D-SW)SZ 1(BRF)GF 2(BI) 658-6062	(D-SW)SZ (BRF)CT B (BI) 658-6014	(D-SW)SZ (BRF)CT B 658-6013	(D-SW)SZ 1(BRF)GF 2 658-6061	(D-SY)SZ (BRF)CT B 658-6026	(D-SY)SZ 1(BRF)GF 2 658-6064
	144	Tom Green	US 67	674	-0.905	63	WB left	Left	31.453603	-100.477091	4	300	194		88.80	0	0	0	0	2	4
	145	Tom Green	US 67	674	-0.699	64	EB Right	Right	31.452622	-100.480396	4	150	0	0	50.00	0	0	0	3	0	0
	146	Tom Green	US 67	674	-0.266	65	OP Glenna NB		31.451586	-100.488316	2	0	240	0	95.00	0	3	0	0	0	0
	147	Tom Green	US 67	674	-0.266	65	OP Glenna SB		31.451586	-100.488316	2	0	240	0	95.00	0	3	0	0	0	0
	148	Tom Green	US 67	674	-0.141	66	Houston Harte Merging Ramp S Side Right	Right	31.450217	-100.489712	4	690	0	0	91.43	0	0	0	8	0	0
	149	Tom Green	US 67	674	-0.192	67	Houston harte Merging Ramp N Side left	Left	31.451277	-100.489809	4	680	0	0	90.00	0	0	0	0	0	8
	150	Tom Green	US 67	674	0.056	68	EB On Ramp to Glenna Exit Right	Right	31.44829	-100.492203	4	225	2580	0	98.39	0	0	26	3	0	0
	151	Tom Green	US 67	674	0.056	68	EB Left	Left	31.44829	-100.492203	4	250	245	0	89.00	0	0	0	0	3	3
	152	Tom Green	US 67	674	0.069	69	WB On Ramp to Mertzon Exit Right	Right	31.44838	-100.49266	4	225	2025	0	100.00	0	0	20	3	0	0
	153	Tom Green	US 67	674	0.069	69	WB Left	Left	31.44838	-100.49266	4	350	250	0	91.67	0	0	0	0	3	4
	154	Tom Green	US 67	674	0.617	70	S Houston Harte Frtg Rd Right	Right	31.441807	-100.497974	4	242	110	0	75.50	0	0	2	3	0	0
	155	Tom Green	US 67	674	0.617	70	S Houston Harte Frtg Rd left	Left	31.441807	-100.497974	4	95	86	115	82.00	0	0	0	0	1	3
	156	Tom Green	US 67	674	0.617	71	EB Right	Right	31.442031	-100.498291	4	275	270	0	99.00	0	0	3	3	0	0
	157	Tom Green	US 67	674	0.617	71	EB Left	Left	31.442031	-100.498291	4	225	270	0	89.00	0	0	0	0	3	3
	158	Tom Green	US 67	674	0.617	72	WB Right	Right	31.442216	-100.498538	4	275	270	0	99.00	0	0	3	3	0	0
	159	Tom Green	US 67	674	0.617	72	WB left	Left	31.442216	-100.498538	4	225	270	0	89.00	0	0	0	0	3	3
	160	Tom Green	US 67	674	0.617	73	N Houston Harte Frtg Rd Right	Right	31.44245	-100.498876	4	145	110	115	80.00	0	0	1	4	0	0
	161	Tom Green	US 67	674	0.617	73	N Houston Harte Frtg Rd Left	Left	31.44245	-100.498876	4	345	87	65	89.40	0	0	0	0	1	5
	162	Tom Green	US 67	676	-0.792	74	NB Right	Right	31.431012	-100.506262	4	150	210	0	77.50	0	0	3	2	0	0
	163	Tom Green	US 67	676	-0.792	74	NB Left	Left	31.431012	-100.506262	4	225	210	0	96.25	0	0	0	0	2	3
	164	Tom Green	US 67	676	-0.775	75	SB Right	Right	31.430892	-100.506519	4	180	205	0	83.75	0	0	3	2	0	0
	165	Tom Green	US 67	676	-0.775	75	SB Left	Left	31.430892	-100.506519	4	230	200	0	95.00	0	0	0	0	2	3
	166	Tom Green	US 67	676	-0.827	76	EB Underpass Right	Right	31.431285	-100.505774	4	95	242	0	95.67	0	0	3	1	0	0
	167	Tom Green	US 67	676	-0.827	76	WB Underpass Right	Right	31.431285	-100.505774	2	0	902	0	94.67	0	10	0	0	0	0
	168	Tom Green	US 67	678	0.803	77	EB		31.405339	-100.559972	2	198	0	0	74.00	3	0	0	0	0	0
	169	Tom Green	US 67	678	0.803	77	WB		31.405339	-100.559972	2	198	0	0	74.00	3	0	0	0	0	0
	170	Tom Green	US 67	680	0.615	78	EB		31.391495	-100.585765	2	250	0	0	100.00	3	0	0	0	0	0
	171	Tom Green	US 67	680	0.615	78	WB		31.391495	-100.585765	2	250	0	0	100.00	3	0	0	0	0	0
	172	Tom Green	US 67	682	0.293	79	EB		31.378439	-100.609252	2	245	245	250	98.57	6	2	0	0	0	0
	173	Tom Green	US 67	682	0.293	79	WB		31.378439	-100.609252	2	250	245	245	98.57	6	2	0	0	0	0
	174	Tom Green	US 67	682	0.614	80	EB		31.375643	-100.613601	2	215	435	118	89.75	5	4	0	0	0	0
	175	Tom Green	US 67	682	0.614	80	WB		31.375643	-100.613601	2	220	435	118	90.38	5	4	0	0	0	0
	176	Tom Green	US 67	682	0.768	81	EB		31.374318	-100.615709	2	300	0	0	83.33	4	0	0	0	0	0
	177	Tom Green	US 67	682	0.768	81	WB		31.374318	-100.615709	2	300	0	0	83.33	4	0	0	0	0	0
	178	Tom Green	US 67	684	-0.766	82	EB		31.370271	-100.622035	2	750	0	0	100.00	8	0	0	0	0	0
	179	Tom Green	US 67	684	-0.766	82	WB		31.370271	-100.622035	2	500	0	0	90.00	6	0	0	0	0	0
	180	Tom Green	US 67	684	-0.538	83	EB		31.368283	-100.625142	2	300	0	0	83.33	4	0	0	0	0	0
	181	Tom Green	US 67	684	-0.538	83	WB		31.368283	-100.625142	2	300	0	0	83.33	4	0	0	0	0	0
	182	Tom Green	US 67	686	0.379	84	EB		31.348885	-100.666004	2	250	0	0	100.00	3	0	0	0	0	0
	183	Tom Green	US 67	686	0.379	84	WB		31.348885	-100.666004	2	250	0	0	100.00	3	0	0	0	0	0
															Totals	70	28	64	35	20	39

Texas Department of Transportation

San Angelo District

Delineator Locations

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6420	77	001	US 87
DIST	COUNTY		SHEET NO.
07	Runnels		24

DATE:
FILE:

INSTALLED	OBJECTID	County	Highway	Closest Reference Marker	Displacement Miles	ID	Rdway Orientation	Right or Left	Latitude	Longitude	2 or 4 Lane	Approach MBGF	Concrete barrier	Departing MBGF	spacing	(D-SW)SZ 1(BRF)GF2 (BI) 658-6062	(D-SW)SZ (BRF)CTB (BI) 658-6014	(D-SW)SZ (BRF)CTB 658-6013	(D-SW)SZ 1(BRF)GF2 658-6061	(D-SY)SZ (BRF)CTB 658-6026	(D-SY)SZ 1(BRF)GF2 658-6064
	184	Tom Green	US 67	690	-0.669	85	EB		31.348094	-100.679631	2	170	90	95	76.25	3	2	0	0	0	0
	185	Tom Green	US 67	690	-0.669	85	WB		31.348094	-100.679631	2	170	90	95	76.25	3	2	0	0	0	0
	186	Tom Green	US 67	690	-0.197	86	EB		31.347024	-100.687525	2	195	125	95	91.25	3	2	0	0	0	0
	187	Tom Green	US 67	690	-0.197	86	WB		31.347024	-100.687525	2	170	125	95	85.00	3	2	0	0	0	0
	188	Tom Green	SH Loop 306	374	-1.679	87	EB Left	Left	31.427078	-100.503559	4	275	0	0	75.00	0	0	0	0	0	4
	189	Tom Green	SH Loop 306	374	-1.679	87	WB Left	Left	31.427078	-100.503559	4	350	0	0	100.00	0	0	0	0	0	4
	190	Tom Green	SH Loop 306	374	-1.207	88	EB Right	Right	31.424198	-100.496302	4	752	240	845	99.28	0	0	2	17	0	0
	191	Tom Green	SH Loop 306	374	-1.207	88	EB Left	Left	31.424198	-100.496302	4	250	240	0	88.00	0	0	0	0	3	3
	192	Tom Green	SH Loop 306	374	-1.206	89	WB Right	Right	31.424374	-100.496188	4	925	240	635	97.22	0	0	2	17	0	0
	193	Tom Green	SH Loop 306	374	-1.206	89	WB Left	Left	31.424374	-100.496188	4	250	240	0	88.00	0	0	0	0	3	3
	194	Tom Green	SH Loop 306	374	-0.827	90	WB Right	Right	31.422333	-100.490228	4	1490	0	0	96.00	0	0	0	16	0	0
	195	Tom Green	SH Loop 306	374	-0.828	91	N Frtg Rd Left	Left	31.422502	-100.490174	4	1482	0	0	95.47	0	0	0	0	0	16
	196	Tom Green	SH Loop 306	374	-0.494	92	EB Right	Right	31.420315	-100.485119	4	650	240	440	98.46	0	0	2	12	0	0
	197	Tom Green	SH Loop 306	374	-0.494	92	EB Left	Left	31.420315	-100.485119	4	250	240	140	96.67	0	0	0	0	2	5
	198	Tom Green	SH Loop 306	374	-0.495	93	WB Right	Right	31.420505	-100.485028	4	850	240	770	95.26	0	0	3	17	0	0
	199	Tom Green	SH Loop 306	374	-0.495	93	WB Left	Left	31.420505	-100.485028	4	230	240	140	93.33	0	0	0	0	2	5
	200	Tom Green	SH Loop 306	374	0.216	94	EB Right	Right	31.416404	-100.473969	4	270	0	0	73.33	0	0	0	4	0	0
	201	Tom Green	SH Loop 306	374	0.216	94	EB Left	Left	31.416404	-100.473969	4	330	0	0	93.33	0	0	0	0	0	4
	202	Tom Green	SH Loop 306	374	0.260	95	WB Right	Right	31.416351	-100.473186	4	270	0	0	73.33	0	0	0	4	0	0
	203	Tom Green	SH Loop 306	374	0.260	95	WB Left	Left	31.416351	-100.473186	4	330	0	0	93.33	0	0	0	0	0	4
	204	Tom Green	SH Loop 306	374	0.237	96	584 OP NB		31.41639	-100.473592	4	75	230	65	80.00	0	0	0	0	0	0
	205	Tom Green	SH Loop 306	374	0.237	96	584 OP SB		31.41639	-100.473592	2	70	230	65	78.75	2	3	0	0	0	0
	206	Tom Green	SH Loop 306	374	0.465	97	EB Right	Right	31.415033	-100.470072	4	230	240	785	92.69	0	0	2	12	0	0
	207	Tom Green	SH Loop 306	374	0.465	97	EB Left	Left	31.415033	-100.470072	4	220	240	0	82.00	0	0	0	0	3	3
	208	Tom Green	SH Loop 306	374	0.471	98	WB Right	Right	31.415191	-100.469897	4	208	240	150	91.33	0	0	2	5	0	0
	209	Tom Green	SH Loop 306	374	0.471	98	WB left	Left	31.415191	-100.469897	4	208	240	0	99.50	0	0	0	0	3	2
	210	Tom Green	SH Loop 306	376	-0.668	99	Center Guardrail Underpass		31.410634	-100.457039	2	25	178	25	89.00	1	2	0	0	0	0
	211	Tom Green	SH Loop 306	376	-0.664	100	Foster Rd OP NB		31.410922	-100.456816	2	180	263	186	96.50	4	3	0	0	0	0
	212	Tom Green	SH Loop 306	376	-0.664	100	Foster Rd OP SB		31.410922	-100.456816	2	186	250	180	94.33	4	3	0	0	0	0
	213	Tom Green	SH Loop 306	376	-0.491	101	S Frtg Rd Right	Right	31.409299	-100.454414	4	490	0	0	88.00	0	0	0	6	0	0
	214	Tom Green	SH Loop 306	376	-0.491	101	S Frtg Rd Left	Left	31.409299	-100.454414	4	300	0	0	83.33	0	0	0	0	0	4
	215	Tom Green	SH Loop 306	376	-0.489	102	EB Right	Right	31.409558	-100.454276	4	460	0	0	82.00	0	0	0	6	0	0
	216	Tom Green	SH Loop 306	376	-0.489	102	EB Left	Left	31.409558	-100.454276	4	465	0	0	83.00	0	0	0	0	0	6
	217	Tom Green	SH Loop 306	376	-0.485	103	WB Right	Right	31.409745	-100.454109	4	182	255	0	96.75	0	0	3	2	0	0
	218	Tom Green	SH Loop 306	376	-0.485	103	WB Left	Left	31.409745	-100.454109	4	155	255	0	90.00	0	0	0	0	3	2
	219	Tom Green	SH Loop 306	376	-0.502	104	N Frtg Rd Right	Right	31.410086	-100.454244	4	650	0	0	100.00	0	0	0	7	0	0
	220	Tom Green	SH Loop 306	376	-0.502	104	N Frtg Rd Left	Left	31.410086	-100.454244	4	368	0	0	79.50	0	0	0	0	0	5
	221	Tom Green	SH Loop 306	376	-0.157	105	EB Right	Right	31.407788	-100.449049	4	2020	0	0	98.50	0	0	0	21	0	0
	222	Tom Green	SH Loop 306	376	-0.157	105	EB Left	Left	31.407788	-100.449049	4	1005	0	0	95.50	0	0	0	0	0	11
															Totals	23	19	16	146	19	81

DATE:
FILE:

Texas Department of Transportation

San Angelo District

Delineator Locations

©TxDOT SHEET ISSUED OR LAST REVISED	CONT.	SECT	JOB	HIGHWAY
	6420	77	001	US 67
	DIST	COUNTY		SHEET NO.
	07	Runnels		25

INSTALLED	OBJECTID	County	Highway	Closest Reference Marker	Displacement Miles	ID	Rdway Orientation	Right or Left	Latitude	Longitude	2 or 4 Lane	Approach MBGF	Concrete barrier	Departing MBGF	spacing	(D-SW)SZ 1(BRF)GF2 (BI) 658-6062	(D-SW)SZ (BRF)CTB (BI) 658-6014	(D-SW)SZ (BRF)CTB 658-6013	(D-SW)SZ 1(BRF)GF2 658-6061	(D-SY)SZ (BRF)CTB 658-6026	(D-SY)SZ 1(BRF)GF2 658-6064
	223	Tom Green	SH Loop 306	376	-0.157	106	WB Right	Right	31.407983	-100.448942	4	1970	0	0	96.00	0	0	0	21	0	0
	224	Tom Green	SH Loop 306	376	-0.157	106	WB Left	Left	31.407983	-100.448942	4	1565	0	0	94.69	0	0	0	0	0	17
	225	Tom Green	SH Loop 306	376	0.279	107	EB Right	Right	31.405376	-100.442206	4	1200	0	0	95.83	0	0	0	13	0	0
	226	Tom Green	SH Loop 306	376	0.279	107	EB Left	Left	31.405376	-100.442206	4	780	0	0	91.25	0	0	0	0	0	9
	227	Tom Green	SH Loop 306	376	0.279	108	WB Right	Right	31.405545	-100.442122	4	840	295	650	96.39	0	0	3	16	0	0
	228	Tom Green	SH Loop 306	376	0.279	108	WB Left	Left	31.405545	-100.442122	4	158	295	0	80.60	0	0	0	0	4	2
	229	Tom Green	SH Loop 306	376	0.280	109	Underpass NB		31.405207	-100.442259	2	235	0	0	92.50	3	0	0	0	0	0
	230	Tom Green	SH Loop 306	376	0.280	109	Ubderpass SB		31.405207	-100.442259	2	230	0	0	90.00	3	0	0	0	0	0
	231	Tom Green	SH Loop 306	376	0.553	110	OP EB (Highest Elevation) Right	Right	31.403838	-100.437922	4	330	600	670	96.88	0	0	6	11	0	0
	232	Tom Green	SH Loop 306	376	0.553	110	OP EB (Highest Elevation) Left	Left	31.403838	-100.437922	4	235	586	150	92.10	0	0	0	0	6	5
	233	Tom Green	SH Loop 306	376	0.634	111	OP WB CTB with Metal Rail		31.403402	-100.436642	4	150	460	144	88.00	0	0	0	0	0	0
	234	Tom Green	SH Loop 306	376	0.634	111	OP WB CTB with Metal Rail		31.403402	-100.436642	4	155	460	0	94.17	0	0	0	0	0	0
	235	Tom Green	SH Loop 306	382	-0.941	112	Underpass Below 87 NB		31.387554	-100.373839	4	220	0	0	85.00	0	0	0	0	0	0
	236	Tom Green	SH Loop 306	382	-0.941	112	Underpass Below 87 SB		31.387554	-100.373839	4	220	0	0	85.00	0	0	0	0	0	0
	237	Tom Green	SH Loop 306	384	-0.608	113	NB Right	Right	31.421405	-100.373325	4	25	2275	0	97.83	0	0	23	1	0	0
	238	Tom Green	SH Loop 306	384	-0.608	113	NB Left	Left	31.421405	-100.373325	4	300	170	0	84.00	0	0	0	0	2	4
i	239	Tom Green	SH Loop 306	384	-0.608	114	SB Right	Right	31.421416	-100.37359	4	25	2183	0	98.09	0	0	22	1	0	0
	240	Tom Green	SH Loop 306	384	-0.608	114	SB Left	Left	31.421416	-100.37359	4	300	175	0	85.00	0	0	0	0	2	4
	249	Tom Green	SH Loop 306	386	0.921	119	NB Puliam Exit Right	Right	31.470595	-100.386005	4	375	860	0	98.75	0	0	9	4	0	0
	250	Tom Green	SH Loop 306	386	1.053	120	OP 380 EB		31.472477	-100.386417	2	0	225	0	87.50	0	3	0	0	0	0
	251	Tom Green	SH Loop 306	386	1.053	120	OP 380 WB		31.472477	-100.386417	2	0	225	0	87.50	0	3	0	0	0	0
	252	Tom Green	SH Loop 306	386	1.056	121	EB Right 380 to W Frtg Rd		31.472236	-100.387548	2	95	840	0	98.33	1	9	0	0	0	0
	259	Tom Green	US 277	408	-0.196	125	NB		31.309873	-100.446753	2	170	300	100	86.67	3	4	0	0	0	0
	260	Tom Green	US 277	408	-0.196	125	SB		31.309873	-100.446753	2	170	300	70	98.00	3	3	0	0	0	0
	261	Tom Green	US 277	410	0.845	126	NB		31.269843	-100.468339	2	250	0	0	100.00	3	0	0	0	0	0
	262	Tom Green	US 277	410	0.845	126	SB		31.269843	-100.468339	2	250	0	0	100.00	3	0	0	0	0	0
	263	Tom Green	US 277	414	-0.818	127	NB		31.239864	-100.486075	2	350	0	0	100.00	4	0	0	0	0	0
	264	Tom Green	US 277	414	-0.818	127	SB		31.239864	-100.486075	2	260	0	0	70.00	4	0	0	0	0	0
	265	Tom Green	US 277	414	-0.050	128	NB		31.228912	-100.488497	2	405	0	0	88.75	5	0	0	0	0	0
	266	Tom Green	US 277	414	-0.050	128	SB		31.228912	-100.488497	2	405	0	0	88.75	5	0	0	0	0	0
	267	Tom Green	US 277	416	0.926	129	NB		31.18792	-100.502091	2	170	1390	800	96.25	11	14	0	0	0	0
	268	Tom Green	US 277	416	0.926	129	SB		31.18792	-100.502091	2	950	1390	520	96.90	16	14	0	0	0	0
	269	Tom Green	US 277	418	0.337	130	NB		31.169685	-100.511799	2	375	0	0	81.25	5	0	0	0	0	0
	270	Tom Green	US 277	418	0.337	130	SB		31.169685	-100.511799	2	23	50	90	56.50	2	1	0	0	0	0
	271	Tom Green	US 277	420	-0.020	131	NB		31.147974	-100.513472	2	320	75	143	97.60	6	0	0	0	0	0
	272	Tom Green	US 277	420	-0.020	131	SB		31.147974	-100.513472	2	218	75	180	84.60	5	1	0	0	0	0
	273	Tom Green	US 277	422	0.694	132	NB		31.110539	-100.511843	2	143	75	143	77.75	4	1	0	0	0	0
	274	Tom Green	US 277	422	0.694	132	SB		31.110539	-100.511843	2	143	75	143	77.75	4	1	0	0	0	0
	275	Tom Green	US 277	422	0.853	133	NB		31.108225	-100.511878	2	165	260	165	90.00	4	3	0	0	0	0
	276	Tom Green	US 277	422	0.853	133	SB		31.108225	-100.511878	2	165	260	140	85.83	4	3	0	0	0	0
															Totals	98	60	63	67	14	41

DATE:
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Texas Department of Transportation

San Angelo District

Delineator Locations

SHEET ISSUED OR LAST REVISED

CONT.	SECT.	JOB	HIGHWAY
6420	77	001	US 67
DIST.	COUNTY		SHEET NO.
07	Runnels		26

NSTALLED	OBJECTID	County	Highway	Closest Reference Marker	Displacement Miles	ID	Rdway Orientation	Right or Left	Latitude	Longitude	2 or 4 Lane	Approach MBGF	Concrete barrier	Departing MBGF	spacing	(D-SW)SZ 1(BRF)GF2 (BI) 658-6062	(D-SW)SZ (BRF)CTB (BI) 658-6014	(D-SW)SZ (BRF)CTB 658-6013	(D-SW)SZ 1(BRF)GF2 658-6061	(D-SY)SZ (BRF)CTB 658-6026	(D-SY)SZ 1(BRF)GF2 658-6064
	277	Tom Green	US 277	422	0.989	134	NB		31.106244	-100.511883	2	400	0	0	87.50	5	0	0	0	0	0
	278	Tom Green	US 277	422	0.989	134	SB		31.106244	-100.511883	2	300	0	0	83.33	4	0	0	0	0	0
	298	Tom Green	FM 1223	362	-1.106	145	NB		31.435743	-100.434515	2	70	165	0	92.50	1	2	0	0	0	0
	299	Tom Green	FM 1223	362	-1.106	145	SB		31.435743	-100.434515	2	70	165	0	92.50	1	2	0	0	0	0
	300	Tom Green	FM 1223	362	-0.730	146	NB		31.430768	-100.431247	2	65	550	0	94.17	1	6	0	0	0	0
	301	Tom Green	FM 1223	362	-0.730	146	SB		31.430768	-100.431247	2	65	550	0	94.17	1	6	0	0	0	0
	328	Tom Green	FM 2288	362	-0.957	160	SB	Right	31.45874	-100.515934	4	475	0	0	85.00	0	0	0	6	0	0
	329	Tom Green	FM 2288	360	0.988	161	NB		31.460842	-100.516049	2	700	0	0	92.86	8	0	0	0	0	0
	330	Tom Green	FM 2288	360	0.866	162	SB		31.462303	-100.517328	2	1330	0	0	98.46	14	0	0	0	0	0
	331	Tom Green	FM 2288	360	0.746	163	NB		31.463488	-100.518816	2	670	0	0	88.57	8	0	0	0	0	0
	332	Tom Green	FM 2288	360	0.649	164	SB		31.464266	-100.520193	2	615	0	0	94.17	7	0	0	0	0	0
	333	Tom Green	FM 2288	360	0.224	165	SB	Right	31.468123	-100.525806	4	480	0	0	86.00	0	0	0	6	0	0
	334	Tom Green	FM 2288	360	-0.632	166	EB		31.473832	-100.538555	2	1300	0	0	96.15	14	0	0	0	0	0
	335	Tom Green	FM 2288	360	-0.632	166	WB		31.473832	-100.538555	2	1300	0	0	96.15	14	0	0	0	0	0
	336	Tom Green	FM 2288	358	0.187	167	NB		31.485985	-100.547766	2	705	0	0	93.57	8	0	0	0	0	0
	337	Tom Green	FM 2288	358	0.187	167	SB		31.485985	-100.547766	2	705	0	0	93.57	8	0	0	0	0	0
	338	Tom Green	FM 2288	354	0.253	168	NB		31.532168	-100.563674	2	150	0	0	50.00	3	0	0	0	0	0
	339	Tom Green	FM 2288	354	0.253	168	SB		31.532168	-100.563674	2	150	0	0	50.00	3	0	0	0	0	0
	340	Tom Green	FM 2288	354	-0.633	169	EB		31.542665	-100.555512	2	435	0	0	96.25	5	0	0	0	0	0
	341	Tom Green	FM 2288	354	-0.633	169	WB		31.542665	-100.555512	2	430	0	0	95.00	5	0	0	0	0	0
	342	Tom Green	FM 2288	354	-0.925	170	EB		31.545244	-100.551497	2	560	0	0	85.00	7	0	0	0	0	0
	349	Tom Green	Sherwood	360	0.416	174	EB Right	Right	31.458547	-100.449503	4	50	540	0	90.00	0	0	6	1	0	0
	350	Tom Green	Sherwood	360	0.416	174	WB Right	Right	31.458547	-100.449503	4	0	530	0	96.00	0	0	6	0	0	0
	351	Tom Green	Sherwood	360	0.416	174	EB (Middle) Left	Left	31.458547	-100.449503	2	0	550	0	100.00	0	6	0	0	0	0
	352	Tom Green	Sherwood	362	1.428	175	EB		31.43789	-100.493523	2	245	0	0	97.50	3	0	0	0	0	0
	353	Tom Green	Sherwood	362	1.428	175	WB		31.43789	-100.493523	2	265	0	0	71.67	4	0	0	0	0	0
	362	Tom Green	Ave L	370	-0.965	180	EB		31.445064	-100.424958	2	235	1460	300	97.25	6	15	0	0	0	0
	363	Tom Green	Ave L	370	-0.965	180	WB		31.445064	-100.424958	2	150	1460	525	99.29	8	14	0	0	0	0
	364	Tom Green	Knickerbocker	360	-0.861	181	WB		31.430074	-100.457133	4	250	0	0	100.00	3	0	0	0	0	0
	365	Tom Green	Knickerbocker	360	-0.357	182	EB		31.425146	-100.463437	4	200	120	0	90.00	2	2	0	0	0	0
	366	Tom Green	Knickerbocker	360	-0.357	182	WB		31.425146	-100.463437	4	90	120	115	91.67	2	2	0	0	0	0
	367	Tom Green	Knickerbocker	362	-0.065	183	EB		31.398707	-100.485098	4	470	0	0	84.00	6	0	0	0	0	0
	368	Tom Green	Knickerbocker	362	-0.065	183	WB		31.398707	-100.485098	4	795	0	0	93.13	9	0	0	0	0	0
	369	Tom Green	Knickerbocker	362	0.440	184	NB		31.392962	-100.490372	4	225	80	135	97.50	5	0	0	0	0	0
	370	Tom Green	Knickerbocker	362	0.440	184	SB		31.392962	-100.490372	4	250	80	95	93.75	4	1	0	0	0	0
	371	Tom Green	Knickerbocker	364	-0.553	185	NB		31.380656	-100.490316	4	525	1200	1300	99.17	19	12	0	0	0	0
	372	Tom Green	Knickerbocker	364	-0.553	185	SB		31.380656	-100.490316	4	1420	1190	480	98.06	20	12	0	0	0	0
		Tom Green	SH Loop 306					Right	31.47941	-100.387484	4	463	0	0	82.60	0	0	0	6	0	0
		Tom Green	SH Loop 306					Left	31.47941	-100.387484	4	510	0	0	92.00	0	0	0	0	0	6
		Tom Green	US 67					Right	31.494282	-100.37596	4	90	2000	0	97.14	0	0	21	1	0	0
															Totals	208	80	33	20	0	6

DATE:
FILE:

Texas Department of Transportation

San Angelo District

Delineator Locations

SHEET ISSUED OR LAST REVISED

CONT.	SECT	JOB	HIGHWAY
6420	77	001	US 67
DIST	COUNTY		SHEET NO.
07	Runnels		27

INSTALLED	OBJECTID	County	Highway	Closest Reference Marker	Displacement Miles	ID	Rdway Orientation	Right or Left	Latitude	Longitude	2 or 4 Lane	Approach MBGF	Concrete barrier	Departing MBGF	spacing	(D-SW)SZ 1(BRF)GF2 (BI) 658-6062	(D-SW)SZ (BRF)CTB (BI) 658-6014	(D-SW)SZ (BRF)CTB 658-6013	(D-SW)SZ 1(BRF)GF2 658-6061	(D-SY)SZ (BRF)CTB 658-6026	(D-SY)SZ 1(BRF)GF2 658-6064
		Tom Green	US 67					Left	31.494282	-100.37596	4	205	290	0	89.00	0	0	0	0	3	3
		Tom Green	US 67					Right	31.494282	-100.37596	4	80	2000	0	96.67	0	0	21	1	0	0
		Tom Green	US 67					Left	31.494282	-100.37596	4	205	290	0	89.00	0	0	0	0	3	3
		Tom Green	US 67					Left	31.487577	-100.380991	4	240	1400	0	99.38	0	0	0	0	14	3
		Tom Green	US 67					Left	31.487577	-100.380991	4	205	275	290	90.00	0	0	0	0	3	6
		Tom Green	US 67					Right	31.487577	-100.380991	4	0	2200	0	97.73	0	0	23	0	0	0
		Tom Green	US 67					Left	31.487577	-100.380991	4	205	265	0	84.00	0	0	0	0	3	3
		Tom Green	US 67					Right	31.486087	-100.382529	4	0	2300	0	97.83	0	0	24	0	0	0
		Tom Green	US 67					Left	31.486087	-100.382529	4	0	1900	0	97.37	0	0	0	0	20	0
		Tom Green	US 67					Right	31.480361	-100.388006	4	660	380	0	99.00	0	0	4	7	0	0
		Tom Green	US 67					Left	31.480361	-100.388006	4	180	360	0	98.00	0	0	0	0	4	2
		Tom Green	US 67					Right	31.478418	-100.387881	4	240	260	0	90.00	0	0	3	3	0	0
		Tom Green	US 67					Left	31.478418	-100.387881	4	300	260	0	85.00	0	0	0	0	3	4
		Tom Green	US 67					Left	31.478425	-100.388485	4	300	0	0	83.33	0	0	0	0	0	4
		Tom Green	US 67					Right	31.479696	-100.387963	4	220	180	0	87.50	0	0	2	3	0	0
		Tom Green	US 67					Left	31.479696	-100.387963	4	260	190	0	100.00	0	0	0	0	2	3
		Tom Green	US 67					Right	31.479696	-100.387963	4	180	180	0	77.50	0	0	2	3	0	0
		Tom Green	US 67					Left	31.479696	-100.387963	4	230	180	0	90.00	0	0	0	0	2	3
		Tom Green	US 67					Right	31.48408	-100.383577	4	230	0	0	90.00	0	0	0	3	0	0
		Tom Green	US 67					Left	31.48408	-100.383577	4	260	0	0	70.00	0	0	0	0	0	4
		Tom Green	US 67					Right	31.480578	-100.385677	4	305	0	0	85.00	0	0	0	4	0	0
		Tom Green	US 67					Right	31.480172	-100.38551	4	350	0	0	100.00	0	0	0	4	0	0
		Tom Green	US 67					Left	31.480172	-100.38551	4	360	0	0	77.50	0	0	0	0	0	5
		Tom Green	US 67					Right	31.488403	-100.380967	4	85	220	0	85.00	0	0	3	1	0	0
															Totals	0	0	82	29	57	43

DATE:
FILE:

Texas Department of Transportation

San Angelo District

Delineator Locations

©TxDOT	CONT.	SECT	JOB	HIGHWAY
SHEET ISSUED OR LAST REVISED	6420	77	001	US 87
	DIST.	COUNTY		SHEET NO.
	07	Runnels		28

INSTALLED	OBJECTID	County	Highway	Closest Reference Marker	Displacement Miles	ID	Roadway Orientation	Right or Left	Latitude	Longitude	2 or 4 Lane	Approach MBGF	Concrete barrier	Departing MBGF	spacing	658-6062	658-6014	658-6013	658-6061	658-6026	658-6064
	130	Coke	RM 2034	352	-0.135	69	NB		31.740047	-100.725056	2	1200	0	0	96	13	0	0	0	0	0
	131	Coke	RM 2034	352	-0.135	69	SB		31.740047	-100.725056	2	1200	0	0	96	13	0	0	0	0	0
	132	Coke	RM 2034	342	0.589	70	NB		31.817797	-100.62225	2	3250	0	0	100	33	0	0	0	0	0
	133	Coke	RM 2034	336	0.234	71	EB		31.873825	-100.553939	2	250	0	0	100	3	0	0	0	0	0
	134	Coke	RM 2034	336	0.234	71	WB		31.873825	-100.553939	2	260	0	0	70	4	0	0	0	0	0
	135	Coke	RM 2059	330	0.099	72	NB		31.929197	-100.661375	2	335	155	225	95	7	1	0	0	0	0
	136	Coke	RM 2059	330	0.099	72	SB		31.929197	-100.661375	2	335	155	250	99	7	1	0	0	0	0
	137	Coke	RM 2059	328	-0.260	73	NB		31.955269	-100.685336	2	965	0	0	92	11	0	0	0	0	0
	138	Coke	RM 2059	322	-0.351	74	EB		32.019692	-100.736403	2	150	200	130	86	4	2	0	0	0	0
	139	Coke	RM 2059	322	-0.351	74	EB		32.019692	-100.736403	2	0	150	60	80	1	2	0	0	0	0
	140	Coke	RM 2059	322	-0.398	74	WB		32.019961	-100.735633	2	165	150	130	99	4	1	0	0	0	0
	141	Coke	RM 2059	322	-0.398	74	WB		32.019961	-100.735633	2	0	200	65	72	1	3	0	0	0	0
	142	Coke	FM 2662	378	0.956	75	WB		31.791081	-100.36665	2	315	0	0	88	4	0	0	0	0	0
	143	Coke	FM 2662	378	0.956	75	NB		31.791081	-100.36665	2	315	0	0	88	4	0	0	0	0	0
	144	Coke	FM 1904	370	0.536	76	WB		31.903939	-100.512961	2	0	155	0	53	0	3	0	0	0	0
	145	Coke	FM 1904	370	0.536	76	NB		31.903939	-100.512961	2	0	155	0	53	0	3	0	0	0	0
	285	Tom Green	FM 1692	354	-0.740	138	NB		31.567608	-100.293774	2	300	0	0	83.33	4	0	0	0	0	0
	286	Tom Green	FM 1692	356	-0.706	139	NB		31.56959	-100.293811	2	400	0	0	87.50	5	0	0	0	0	0
	287	Tom Green	FM 1692	356	-0.706	139	SB		31.56959	-100.293811	2	400	0	0	87.50	5	0	0	0	0	0
	288	Tom Green	FM 1692	356	-0.343	140	NB		31.583061	-100.286649	2	250	0	0	100.00	3	0	0	0	0	0
	289	Tom Green	FM 1692	356	-0.343	140	SB		31.583061	-100.286649	2	345	0	0	98.33	4	0	0	0	0	0
	385	Tom Green	FM 2034	358	-0.302	192	EB		31.664794	-100.738349	2	165	160	60	83.75	3	2	0	0	0	0
	386	Tom Green	FM 2034	358	-0.302	192	WB		31.664794	-100.738349	2	165	160	70	86.25	3	2	0	0	0	0
	387	Tom Green	FM 2034	358	-0.610	193	EB		31.661143	-100.741386	2	170	212	35	91.75	3	2	0	0	0	0
	388	Tom Green	FM 2034	358	-0.610	193	WB		31.661143	-100.741386	2	175	212	70	81.40	3	3	0	0	0	0
3	389	Tom Green	FM 2034	362	-0.123	194	EB		31.647734	-100.784477	2	0	65	0	7.50	0	8	0	0	0	0
3	390	Tom Green	FM 2034	362	-0.123	194	WB		31.647734	-100.784477	2	0	65	0	7.50	0	8	0	0	0	0
															Totals	142	41	0	0	0	0

DATE:
FILE:

Texas Department of Transportation

San Angelo District

Delineator Locations

©TxDOT	CONT	SECT	JOB	HIGHWAY
SHEET ISSUED OR LAST REVISED	6420	77	001	US 87
	DIST	COUNTY		SHEET NO.
	07	Runnels		29

INSTALLED	OBJECTID	County	Highway	Closest Reference Marker	Displacement Miles	ID	Roadway Orientation	Right or Left	Latitude	Longitude	2 or 4 Lane	Approach MBGF	Concrete barrier	Departing MBGF	spacing	658-6062	658-6014	658-6013	658-6061	658-6026	658-6064
	19	Coke	SH 158	406	0.457	10	EB		31.877442	-100.283936	2	590	0	0	90	7	0	0	0	0	0
	20	Coke	SH 158	406	0.457	10	WB		31.877442	-100.283936	2	590	0	0	90	7	0	0	0	0	0
	21	Coke	SH 158	406	-0.877	12	EB		31.88923	-100.301795	2	172	155	200	95	4	2	0	0	0	0
	22	Coke	SH 158	406	-0.877	12	WB		31.88923	-100.301795	2	172	155	140	83	4	2	0	0	0	0
	23	Coke	SH 158	400	-0.649	13	NB		31.900581	-100.395637	2	375	0	0	81	5	0	0	0	0	0
	24	Coke	SH 158	400	-0.649	13	SB		31.900581	-100.395637	2	280	0	0	77	4	0	0	0	0	0
	25	Coke	SH 158	398	0.501	14	EB		31.905308	-100.408742	2	500	0	0	90	6	0	0	0	0	0
	26	Coke	SH 158	398	0.501	14	WB		31.905308	-100.408742	2	300	0	0	83	4	0	0	0	0	0
	27	Coke	SH 158	398	0.207	15	EB		31.906089	-100.413658	2	450	0	0	100	5	0	0	0	0	0
	28	Coke	SH 158	398	0.207	15	WB		31.906089	-100.413658	2	400	0	0	88	5	0	0	0	0	0
	29	Coke	SH 158	396	-0.676	16	EB		31.904603	-100.4633	2	255	0	0	68	4	0	0	0	0	0
	30	Coke	SH 158	396	-0.676	16	WB		31.904603	-100.4633	2	630	0	0	97	7	0	0	0	0	0
	31	Coke	SH 158	394	0.892	17	EB		31.901831	-100.467828	2	225	0	0	88	3	0	0	0	0	0
	32	Coke	SH 158	394	0.892	17	WB		31.901831	-100.467828	2	245	0	0	98	3	0	0	0	0	0
	33	Coke	SH 158	394	0.009	18	EB		31.896019	-100.481225	2	930	0	0	98	10	0	0	0	0	0
	34	Coke	SH 158	394	0.009	18	WB		31.896019	-100.481225	2	500	0	0	90	6	0	0	0	0	0
	35	Coke	SH 158	392	0.868	19	EB		31.884347	-100.494169	2	1945	475	615	100	26	5	0	0	0	0
	36	Coke	SH 158	392	0.868	19	WB		31.884347	-100.494169	2	1900	475	670	100	26	5	0	0	0	0
	37	Coke	SH 158	390	0.493	20	EB		31.867014	-100.526931	2	225	165	820	97	12	1	0	0	0	0
	38	Coke	SH 158	390	0.493	20	WB		31.867014	-100.526931	2	115	165	870	100	10	2	0	0	0	0
	39	Coke	SH 158	388	0.821	21	EB		31.875844	-100.552617	2	250	0	0	100	3	0	0	0	0	0
	40	Coke	SH 158	388	0.821	21	WB		31.875844	-100.552617	2	250	0	0	100	3	0	0	0	0	0
	41	Coke	SH 158	388	-0.856	22	EB		31.888731	-100.576828	2	280	0	0	77	4	0	0	0	0	0
	42	Coke	SH 158	388	-0.856	22	WB		31.888731	-100.576828	2	280	0	0	77	4	0	0	0	0	0
	43	Coke	SH 158	386	0.560	23	EB		31.892936	-100.585653	2	250	245	75	87	4	3	0	0	0	0
	44	Coke	SH 158	386	0.560	23	WB		31.892936	-100.585653	2	150	245	165	85	4	3	0	0	0	0
	45	Coke	SH 158	386	-0.080	24	EB		31.897525	-100.595097	2	275	0	0	75	4	0	0	0	0	0
	46	Coke	SH 158	386	-0.080	24	WB		31.897525	-100.595097	2	275	0	0	75	4	0	0	0	0	0
	47	Coke	SH 158	384	0.178	25	EB		31.904215	-100.622642	2	175	82	70	92	3	1	0	0	0	0
	48	Coke	SH 158	384	0.178	25	WB		31.904215	-100.622642	2	175	82	90	99	3	1	0	0	0	0
	49	Coke	SH 158	382	0.848	26	EB		31.9046	-100.643219	2	170	0	0	60	3	0	0	0	0	0
	50	Coke	SH 158	382	0.848	26	WB		31.9046	-100.643219	2	230	0	0	90	3	0	0	0	0	0
	51	Coke	SH 158	380	0.678	27	EB		31.906464	-100.682456	2	175	115	100	85	3	2	0	0	0	0
	52	Coke	SH 158	380	0.678	27	WB		31.906464	-100.682456	2	115	105	100	90	3	1	0	0	0	0
	53	Coke	SH 158	380	0.316	28	EB		31.907282	-100.688561	2	230	165	105	90	4	2	0	0	0	0
	54	Coke	SH 158	380	0.316	28	WB		31.907282	-100.688561	2	230	165	120	93	5	1	0	0	0	0
	55	Coke	SH 158	378	0.959	29	EB		31.904136	-100.710161	2	280	0	0	77	4	0	0	0	0	0
	56	Coke	SH 158	378	0.959	29	WB		31.904136	-100.710161	2	250	0	0	100	3	0	0	0	0	0
	57	Coke	SH 158	378	0.577	30	EB		31.900772	-100.715367	2	165	0	0	58	3	0	0	0	0	0
	58	Coke	SH 158	378	0.577	30	WB		31.900772	-100.715367	2	175	0	0	63	3	0	0	0	0	0
	59	Coke	SH 158	378	0.306	31	EB		31.898369	-100.719086	2	155	0	0	53	3	0	0	0	0	0
															Total	231	31	0	0	0	0

Texas Department of Transportation

San Angelo District

Delineator Locations

©TxDOT	CONT	SECT	JOB	HIGHWAY
SHEET ISSUED OR LAST REVISED	6420	77	001	US 87
	DIST	COUNTY		SHEET NO.
	07	Runnels		30

DATE:
FILE:

INSTALLED	OBJECTID	County	Highway	Closest Reference Marker	Displacement Miles	ID	Roadway Orientation	Right or Left	Latitude	Longitude	2 or 4 Lane	Approach MBGF	Concrete barrier	Departing MBGF	spacing	658-6062	658-6014	658-6013	658-6061	658-6026	658-6064
	60	Coke	SH 158	378	0.306	31	WB		31.898369	-100.719086	2	165	0	0	58	3	0	0	0	0	0
	61	Coke	SH 158	378	-0.229	32	EB		31.896364	-100.727678	2	100	50	140	80	3	1	0	0	0	0
	62	Coke	SH 158	378	-0.229	32	WB		31.896364	-100.727678	2	175	50	95	90	3	1	0	0	0	0
	63	Coke	SH 158	376	0.647	33	EB		31.896336	-100.746211	2	175	0	0	63	3	0	0	0	0	0
	64	Coke	SH 158	376	0.554	34	EB		31.896525	-100.747789	2	175	0	0	63	3	0	0	0	0	0
	65	Coke	SH 158	376	0.141	35	EB		31.897114	-100.754811	2	230	115	125	84	5	1	0	0	0	0
	66	Coke	SH 158	376	0.141	35	WB		31.897114	-100.754811	2	230	115	155	90	5	1	0	0	0	0
	67	Coke	SH 158	376	-0.646	36	EB		31.900156	-100.767497	2	580	0	0	88	7	0	0	0	0	0
	68	Coke	SH 158	376	-0.858	37	EB		31.900842	-100.771039	2	260	0	0	70	4	0	0	0	0	0
	69	Coke	SH 158	376	-0.981	38	WB		31.900983	-100.773175	2	540	0	0	98	6	0	0	0	0	0
															Totals	42	4	0	0	0	0

Texas Department of Transportation

San Angelo District

Delineator Locations

©TxDOT	CONT	SECT	JOB	HIGHWAY
SHEET ISSUED OR LAST REVISED	6420	77	001	US 87
	DIST	COUNTY		SHEET NO.
	07	Runnels		31

DATE:
FILE:

INSTALLED	OBJECTID	County	Highway	Closest Reference Marker	Displacement Miles	ID	Roadway Orientation	Right or Left	Latitude	Longitude	2 or 4 Lane	Approach MBGF	Concrete barrier	Departing MBGF	spacing	658-6062	658-6014	658-6013	658-6061	658-6026	658-6064
	78	Coke	SH 208	336	-0.097	42	NB		31.693927	-100.441756	2	1275	0	0	94	14	0	0	0	0	0
	79	Coke	SH 208	324	0.833	43	NB		31.845372	-100.467006	2	315	0	0	88	4	0	0	0	0	0
	80	Coke	SH 208	324	0.833	43	SB		31.845372	-100.467006	2	315	0	0	88	4	0	0	0	0	0
	81	Coke	SH 208	324	0.048	44	NB		31.855358	-100.473458	2	400	0	0	88	5	0	0	0	0	0
	82	Coke	SH 208	324	0.048	44	SB		31.855358	-100.473458	2	400	0	0	88	5	0	0	0	0	0
	83	Coke	SH 208	322	0.763	45	NB		31.8731	-100.477594	2	345	0	0	98	4	0	0	0	0	0
	84	Coke	SH 208	322	0.763	45	SB		31.8731	-100.477594	2	345	0	0	98	4	0	0	0	0	0
	85	Coke	SH 208	322	0.367	46	NB		31.878753	-100.478783	2	800	0	0	94	9	0	0	0	0	0
	86	Coke	SH 208	322	0.367	46	SB		31.878753	-100.478783	2	900	0	0	94	10	0	0	0	0	0
	87	Coke	SH 208	322	-0.093	47	NB		31.885283	-100.48045	2	225	485	150	90	5	5	0	0	0	0
	88	Coke	SH 208	322	-0.093	47	SB		31.885283	-100.48045	2	150	485	225	90	5	5	0	0	0	0
	89	Coke	SH 208	320	0.599	48	SB		31.899931	-100.491586	2	650	0	0	100	7	0	0	0	0	0
	90	Coke	SH 208	320	-0.024	49	NB		31.908175	-100.495956	2	350	0	0	100	4	0	0	0	0	0
	91	Coke	SH 208	320	-0.024	49	SB		31.908175	-100.495956	2	405	0	0	89	5	0	0	0	0	0
	92	Coke	SH 208	318	0.791	50	NB		31.923778	-100.504244	2	445	0	0	99	5	0	0	0	0	0
	93	Coke	SH 208	318	0.791	50	SB		31.923778	-100.504244	2	445	0	0	99	5	0	0	0	0	0
	94	Coke	SH 208	314	-0.055	51	NB		31.984553	-100.544175	2	170	165	170	91	4	2	0	0	0	0
	95	Coke	SH 208	314	-0.055	51	SB		31.984553	-100.544175	2	170	165	170	91	4	2	0	0	0	0
	96	Coke	SH 208	312	0.216	52	NB		32.007378	-100.550375	2	110	0	0	30	3	0	0	0	0	0
	97	Coke	SH 208	312	0.216	52	SB		32.007378	-100.550375	2	225	0	0	88	3	0	0	0	0	0
	98	Coke	SH 208	312	-0.214	53	NB		32.012958	-100.553608	2	208	0	0	79	3	0	0	0	0	0
	99	Coke	SH 208	312	-0.214	53	SB		32.012958	-100.553608	2	308	0	0	86	4	0	0	0	0	0
	100	Coke	SH 208	310	0.717	54	NB		32.025967	-100.562697	2	195	140	220	84	6	1	0	0	0	0
	101	Coke	SH 208	310	0.717	54	SB		32.025967	-100.562697	2	220	140	220	88	6	1	0	0	0	0
	102	Coke	SH 208	310	0.210	55	WB		32.030797	-100.569208	2	120	0	0	35	3	0	0	0	0	0
	103	Coke	SH 208	310	0.210	55	EB		32.030797	-100.569208	2	120	0	0	35	3	0	0	0	0	0
	104	Coke	SH 208	310	-0.657	56	WB		32.039978	-100.579289	2	100	0	0	25	4	0	0	0	0	0
	105	Coke	SH 208	310	-0.657	56	EB		32.039978	-100.579289	2	100	0	0	25	4	0	0	0	0	0
	106	Coke	SH 208	310	-0.849	57	EB		32.041825	-100.581747	2	295	0	0	82	4	0	0	0	0	0
	107	Coke	SH 208	310	-0.849	57	WB		32.041825	-100.581747	2	295	0	0	82	4	0	0	0	0	0
	108	Coke	SH 208	308	0.924	58	EB		32.043439	-100.584642	2	650	0	0	100	7	0	0	0	0	0
	109	Coke	SH 208	308	0.924	58	WB		32.043439	-100.584642	2	500	0	0	90	6	0	0	0	0	0
	110	Coke	SH 208	308	-0.696	59	EB		32.055572	-100.608233	2	110	0	0	30	3	0	0	0	0	0
	111	Coke	SH 208	308	-0.696	59	WB		32.055572	-100.608233	2	110	0	0	30	3	0	0	0	0	0
	112	Coke	SH 208	306	0.835	60	EB		32.057436	-100.615497	2	150	0	0	50	3	0	0	0	0	0
	113	Coke	SH 208	306	0.835	60	WB		32.057436	-100.615497	2	150	0	0	50	3	0	0	0	0	0
	114	Coke	SH 208	306	0.244	61	EB		32.061636	-100.624267	2	165	0	0	58	3	0	0	0	0	0
	115	Coke	SH 208	306	0.244	61	WB		32.061636	-100.624267	2	165	0	0	58	3	0	0	0	0	0
	116	Coke	SH 208	306	-0.150	62	EB		32.064517	-100.630072	2	280	0	0	77	4	0	0	0	0	0
	117	Coke	SH 208	306	-0.150	62	WB		32.064517	-100.630072	2	280	0	0	77	4	0	0	0	0	0
	118	Coke	SH 208	304	0.894	63	EB		32.069769	-100.644528	2	125	0	0	38	3	0	0	0	0	0
	119	Coke	SH 208	304	0.894	63	WB		32.069769	-100.644528	2	145	0	0	48	3	0	0	0	0	0
	120	Coke	SH 208	304	0.310	64	EB		32.070769	-100.654444	2	95	0	0	23	4	0	0	0	0	0
	121	Coke	SH 208	304	0.310	64	WB		32.070769	-100.654444	2	100	0	0	25	4	0	0	0	0	0
	122	Coke	SH 208	304	0.118	65	WB		32.070789	-100.657708	2	200	0	0	75	3	0	0	0	0	0
	123	Coke	SH 208	304	0.118	65	EB		32.070789	-100.657708	2	200	0	0	75	3	0	0	0	0	0
															Totals	209	16	0	0	0	0

Texas Department of Transportation

San Angelo District

Delineator Locations

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6420	77	001	US 87
DIST	COUNTY		SHEET NO.
07	Runnels		32

DATE:
FILE:

INSTALLED	OBJECTID	County	Highway	Closest Reference Marker	Displacement Miles	ID	Roadway Orientation	Right or Left	Latitude	Longitude	2 or 4 Lane	Approach MBGF	Concrete barrier	Departing MBGF	spacing	658-6062	658-6014	658-6013	658-6061	658-6026	658-6064
	124	Coke	SH 208	304	-0.117	66	EB		32.070847	-100.661722	2	100	0	0	25	4	0	0	0	0	0
	125	Coke	SH 208	304	-0.117	66	WB		32.070847	-100.661722	2	100	0	0	25	4	0	0	0	0	0
	126	Coke	SH 208	304	-0.898	67	EB		32.075122	-100.674172	2	115	0	0	33	3	0	0	0	0	0
	127	Coke	SH 208	304	-0.898	67	WB		32.075122	-100.674172	2	120	0	0	35	3	0	0	0	0	0
	128	Coke	SH 208	302	0.273	68	EB		32.081167	-100.686206	2	85	0	0	18	4	0	0	0	0	0
	129	Coke	SH 208	302	0.273	68	WB		32.081167	-100.686206	2	90	0	0	20	4	0	0	0	0	0
	279	Tom Green	SH 208	342	-0.678	135	NB		31.61763	-100.431479	2	70	50	70	70.00	2	1	0	0	0	0
	280	Tom Green	SH 208	342	-0.678	135	SB		31.61763	-100.431479	2	70	50	70	70.00	2	1	0	0	0	0
	281	Tom Green	SH 208	340	0.361	136	NB		31.630962	-100.428948	2	380	0	0	82.50	5	0	0	0	0	0
	282	Tom Green	SH 208	340	0.361	136	SB		31.630962	-100.428948	2	380	0	0	82.50	5	0	0	0	0	0
	283	Tom Green	SH 208	340	-0.004	137	NB		31.636242	-100.428575	2	400	0	0	87.50	5	0	0	0	0	0
	284	Tom Green	SH 208	340	-0.004	137	SB		31.636242	-100.428575	2	400	0	0	87.50	5	0	0	0	0	0
															Totals	46	2	0	0	0	0

DATE:
FILE:

Texas Department of Transportation

San Angelo District

Delineator Locations

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6420	77	001	US 87
DIST	COUNTY		SHEET NO.
07	Runnels		33

INSTALLED	OBJECTID	County	Highway	Closest Reference Marker	Displacement Miles	ID	Roadway Orientation	Right or Left	Latitude	Longitude	2 or 4 Lane	Approach MBGF	Concrete barrier	Departing MBGF	spacing	658-6062	658-6014	658-6013	658-6061	658-6026	658-6064
	1	Coke	US 277	376	-0.866	1	NB		31.711059	-100.302012	2	150	170	150	84	4	2	0	0	0	0
	2	Coke	US 277	376	-0.866	1	SB		31.711059	-100.302012	2	150	170	150	84	4	2	0	0	0	0
	3	Coke	US 277	374	-0.452	2	NB		31.731594	-100.289678	2	150	125	150	94	4	1	0	0	0	0
	4	Coke	US 277	374	-0.452	2	SB		31.731594	-100.289678	2	150	125	150	94	4	1	0	0	0	0
	5	Coke	US 277	372	-0.770	3	NB		31.764244	-100.287981	2	335	0	0	95	4	0	0	0	0	0
	6	Coke	US 277	372	-0.770	3	SB		31.764244	-100.287981	2	305	0	0	85	4	0	0	0	0	0
	7	Coke	US 277	370	0.207	4	NB		31.778814	-100.289461	2	150	115	150	91	4	1	0	0	0	0
	8	Coke	US 277	370	0.207	4	SB		31.778814	-100.289461	2	150	115	150	91	4	1	0	0	0	0
	9	Coke	US 277	366	-0.368	5	NB		31.8452	-100.292122	2	665	900	420	97	12	9	0	0	0	0
	10	Coke	US 277	366	-0.368	5	SB		31.8452	-100.292122	2	405	900	600	98	10	10	0	0	0	0
	11	Coke	US 277	364	0.148	6	NB		31.866828	-100.292397	2	425	0	0	94	5	0	0	0	0	0
	12	Coke	US 277	364	0.148	6	SB		31.866828	-100.292397	2	425	0	0	94	5	0	0	0	0	0
	13	Coke	US 277	362	0.381	7	NB		31.892011	-100.289186	2	150	255	75	86	3	3	0	0	0	0
	14	Coke	US 277	362	0.381	7	SB		31.892011	-100.289186	2	150	255	75	86	3	3	0	0	0	0
	15	Coke	US 277	354	-0.220	8	NB		32.013847	-100.278008	2	125	0	0	38	3	0	0	0	0	0
	16	Coke	US 277	354	-0.220	8	SB		32.013847	-100.278008	2	125	0	0	38	3	0	0	0	0	0
	17	Coke	US 277	352	-0.457	9	NB		32.038608	-100.255117	2	150	275	150	88	4	3	0	0	0	0
	18	Coke	US 277	352	-0.457	9	SB		32.038608	-100.255117	2	150	275	150	88	4	3	0	0	0	0
	253	Tom Green	US 277	382	-0.276	122	NB		31.64371	-100.33932	2	430	0	0	95.00	5	0	0	0	0	0
	254	Tom Green	US 277	382	-0.276	122	SB		31.64371	-100.33932	2	430	0	0	95.00	5	0	0	0	0	0
	255	Tom Green	US 277	382	0.990	123	NB		31.626938	-100.348075	2	300	0	0	83.33	4	0	0	0	0	0
	256	Tom Green	US 277	382	0.990	123	SB		31.626938	-100.348075	2	300	0	0	83.33	4	0	0	0	0	0
	257	Tom Green	US 277	390	-1.268	124	NB		31.546688	-100.369113	2	460	0	0	82.00	6	0	0	0	0	0
	258	Tom Green	US 277	390	-1.268	124	SB		31.546688	-100.369113	2	460	0	0	82.00	6	0	0	0	0	0
	70	Coke	US 87	442	-0.127	39	WB right	Right	31.696978	-100.774819	4	235	0	0	93	0	0	0	3	0	0
	71	Coke	US 87	442	-0.127	39	WB left	Left	31.696978	-100.774819	4	245	0	0	98	0	0	0	0	0	3
	72	Coke	US 87	440	-0.949	40	EB	Right	31.709853	-100.789206	4	255	0	0	68	0	0	0	4	0	0
	73	Coke	US 87	440	-0.949	40	WB	Right	31.709853	-100.789206	4	265	0	0	72	0	0	0	4	0	0
	74	Coke	US 87	438	0.677	41	WB right	Right	31.715667	-100.795528	4	250	240	30	94	0	0	2	4	0	0
	75	Coke	US 87	438	0.677	41	WB left	Left	31.715667	-100.795528	4	250	240	30	94	0	0	0	0	2	4
	76	Coke	US 87	438	0.677	41	EB right	Right	31.715667	-100.795528	4	205	240	35	86	0	0	2	4	0	0
	77	Coke	US 87	438	0.677	41	EB left	Left	31.715667	-100.795528	4	205	240	30	85	0	0	0	0	2	4
															Totals	114	39	4	19	4	11

DATE:
FILE:

Texas Department of Transportation

San Angelo District

Delineator Locations

SHEET ISSUED OR LAST REVISED

CONT.	SECT.	JOB	HIGHWAY
6420	77	001	US 87
DIST.	COUNTY		SHEET NO.
07	Runnels		34

INSTALLED	OBJECTID	County	Highway	Closest Reference Marker	Displacement Miles	ID	Roadway Orientation	Right or Left	Latitude	Longitude	2 or 4 Lane	Approach MBGF	Concrete barrier	Departing MBGF	spacing	658-6062	658-6014	658-6013	658-6061	658-6026	658-6064
3	18	Runnels	US 67	632	0.175	10	No Data		31.744228	-99.938455						0	0	0	0	0	0
3	19	Runnels	US 67	632	0.175	10	No Data		31.744228	-99.938455						0	0	0	0	0	0
3	22	Runnels	US 67	654	-0.253	12	EB Right	Right	31.58283	-100.215025	4	575	310	365	100.00	0	0	3	10	0	0
3	23	Runnels	US 67	654	-0.253	12	EB Left	Left	31.58283	-100.215025	4	175	310	65	100.00	0	0	0	0	3	3
3	24	Runnels	US 67	654	-0.253	12	WB Right	Right	31.58283	-100.215025	4	275	285	570	98.18	0	0	3	9	0	0
3	25	Runnels	US 67	654	-0.253	12	WB Left	Left	31.58283	-100.215025	4	175	285	70	96.00	0	0	0	0	3	3
2	26	Runnels	US 83	396	0.110	13	NB		31.581629	-99.921758	2	500	0	0	90.00	6	0	0	0	0	0
2	27	Runnels	US 83	396	0.110	13	SB		31.581629	-99.921758	2	500	0	0	90.00	6	0	0	0	0	0
2	28	Runnels	US 83	396	-0.199	14	NB		31.586126	-99.921718	2	350	0	0	100.00	4	0	0	0	0	0
2	29	Runnels	US 83	396	-0.199	14	SB		31.586126	-99.921718	2	500	0	0	90.00	6	0	0	0	0	0
2	30	Runnels	US 83	394	0.412	15	No Data		31.605894	-99.925277	2					0	0	0	0	0	0
2	31	Runnels	US 83	394	0.412	15	No Data		31.605894	-99.925277	2					0	0	0	0	0	0
2	32	Runnels	US 83	390	0.710	16	No Data		31.659529	-99.925264	2					0	0	0	0	0	0
2	33	Runnels	US 83	390	0.710	16	No Data		31.659529	-99.925264	2					0	0	0	0	0	0
2	34	Runnels	US 83	388	0.791	17	No Data		31.685297	-99.934011	2					0	0	0	0	0	0
2	35	Runnels	US 83	388	0.791	17	No Data		31.685297	-99.934011	2					0	0	0	0	0	0
2	36	Runnels	US 83	386	-0.332	18	NB		31.730077	-99.941508	2	250	640	675	94.69	10	7	0	0	0	0
2	37	Runnels	US 83	386	-0.332	18	SB		31.730077	-99.941508	2	650	620	370	99.38	11	6	0	0	0	0
2	42	Runnels	US 83	380	0.582	20	NB		31.797514	-99.933815	2	500	475	800	95.83	14	5	0	0	0	0
2	43	Runnels	US 83	380	0.582	20	SB		31.797514	-99.933815	2	500	475	800	95.83	14	5	0	0	0	0
2	44	Runnels	US 83	376	0.799	21	NB		31.849991	-99.950123	2	200	0	0	75.00	3	0	0	0	0	0
2	45	Runnels	US 83	376	0.799	21	SB		31.849991	-99.950123	2	70	0	0	10.00	5	0	0	0	0	0
2	48	Runnels	US 83	368	-0.785	23	NB		31.987499	-99.96131	2	420	0	0	92.50	5	0	0	0	0	0
2	49	Runnels	US 83	368	-0.785	23	SB		31.987499	-99.96131	2	420	0	0	92.50	5	0	0	0	0	0
2	50	Runnels	US 83	362	0.671	24	NB		32.050641	-99.94082	2	270	0	0	73.33	4	0	0	0	0	0
2	51	Runnels	US 83	362	0.671	24	SB		32.050641	-99.94082	2	390	0	0	85.00	5	0	0	0	0	0
2	52	Runnels	US 83	362	0.371	25	NB		32.054088	-99.937689	2	575	0	0	87.50	7	0	0	0	0	0
2	53	Runnels	US 83	362	0.371	25	SB		32.054088	-99.937689	2	588	0	0	89.67	7	0	0	0	0	0
2	54	Runnels	US 83	362	-0.349	26	NB		32.062379	-99.930225	2	435	0	0	96.25	5	0	0	0	0	0
2	55	Runnels	US 83	362	-0.349	26	SB		32.062379	-99.930225	2	435	0	0	96.25	5	0	0	0	0	0
2	56	Runnels	US 83	362	-0.602	27	NB		32.065299	-99.927608	2	500	0	0	90.00	6	0	0	0	0	0
2	57	Runnels	US 83	362	-0.602	27	SB		32.065299	-99.927608	2	500	0	0	90.00	6	0	0	0	0	0
2	58	Runnels	US 277	346	0.044	28	EB		32.073819	-100.197364	2	400	0	0	87.50	5	0	0	0	0	0
2	59	Runnels	US 277	346	0.044	28	WB		32.073819	-100.197364	2	400	0	0	87.50	5	0	0	0	0	0
2	97	Runnels	SH 153	340	0.187	47	WB		31.947997	-99.913702	2	220	0	0	85.00	3	0	0	0	0	0
2	98	Runnels	SH 153	344	-0.918	48	EB		31.934373	-99.868458	2	125	220	125	84.00	4	2	0	0	0	0
2	113	Runnels	FM 382	340	-0.679	56	NB		31.84857	-99.86349	2	200	135	45	82.50	4	1	0	0	0	0
2	114	Runnels	FM 382	340	-0.679	56	SB		31.84857	-99.86349	2	200	135	45	82.50	4	1	0	0	0	0
2	119	Runnels	FM 2333	342	-0.532	59	EB		31.753909	-100.244635	2	150	150	75	81.25	3	2	0	0	0	0
2	120	Runnels	FM 2333	342	-0.532	59	WB		31.753909	-100.244635	2	150	150	75	81.25	3	2	0	0	0	0
															Totals	165	31	6	19	6	6

DATE:
FILE:

Texas Department of Transportation

San Angelo District

Delineator Locations

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6420	77	001	US 87
DIST	COUNTY		SHEET NO.
07	Runnels		35

INSTALLED	OBJECTID	County	Highway	Closest Reference Marker	Displacement Miles	ID	Roadway Orientation	Right or Left	Latitude	Longitude	2 or 4 Lane	Approach MBGF	Concrete barrier	Departing MBGF	spacing	658-6062	658-6014	658-6013	658-6061	658-6026	658-6064
2	121	Runnels	FM 3115	336	0.732	60	NB		31.792443	-100.184734	2	170	250	70	88.00	3	3	0	0	0	0
2	122	Runnels	FM 3115	336	0.732	60	SB		31.792443	-100.184734	2	170	250	70	88.00	3	3	0	0	0	0
2	129	Runnels	FM 1770	408	-0.135	64	EB		31.979573	-99.866955	2	150	160	75	83.75	3	2	0	0	0	0
2	130	Runnels	FM 1770	408	-0.135	64	WB		31.979573	-99.866955	2	150	160	75	83.75	3	2	0	0	0	0
2	131	Runnels	FM 1770	404	-0.637	65	EB		31.966347	-99.939907	2	150	210	75	96.25	3	2	0	0	0	0
2	132	Runnels	FM 1770	404	-0.637	65	WB		31.966347	-99.939907	2	150	210	75	96.25	3	2	0	0	0	0
2	149	Runnels	FM 2887	340	0.309	74	NB		31.765928	-99.964947	2	200	0	0	75.00	3	0	0	0	0	0
2	150	Runnels	FM 2887	340	0.309	74	SB		31.765928	-99.964947	2	200	0	0	75.00	3	0	0	0	0	0
															Totals	24	14	0	0	0	0

DATE:
FILE:

Texas Department of Transportation

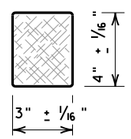
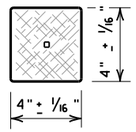
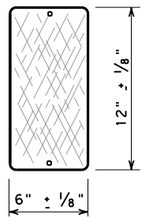
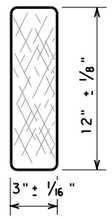
San Angelo District

Delineator Locations

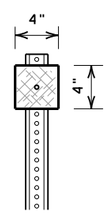
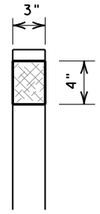
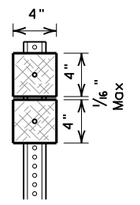
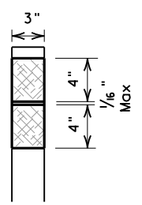
SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6420	77	001	US 87
DIST	COUNTY		SHEET NO.
07	Runnels		36

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

	SIZE 1	SIZE 2	SIZE 3	SIZE 4
DEVICE				
SHEETING	Yellow, White or Red Type B or C reflective sheeting			
NOTE	1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (flx). 2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.			

DELINEATORS

	SINGLE		DOUBLE	
DEVICE				
	1-Size 2 reflector unit	1-Size 1 reflector unit	2-Size 2 reflector units	2-Size 1 reflector units
SHEETING	Yellow, White or Red Type B or C Reflective Sheeting			
POST TYPE	WC	YFLX, WFLX	WC	YFLX, WFLX
MOUNT TYPE	GND	GND, SRF	GND	GND, SRF

D & OM DESCRIPTIVE CODES

INSTL DEL ASSM (D-XX)SZ X (XXXX)XXX(XX)

NUMBER OF REFLECTORS
S = Single
D = Double

COLOR OF REFLECTORS
W = White
Y = Yellow
R = Red

REFLECTOR UNIT SIZE
1 or 2

TYPE OF POST OR DELINEATOR
WC = Wing Channel Post
YFLX = Yellow Flexible Post
WFLX = White Flexible Post
BRF = Barrier Reflector

TYPE OF MOUNT
GND = Embedded (drivable or set in concrete)
CTB = Concrete Barrier Mount
GF1 or GF2 = Guard Fence Attachment
SRF = Surface Mount

DIRECTION
If Required
BI = Bi-Directional
BR = Bi-Directional with red on back

INSTL OM ASSM (OM-XX) (XXXX)XXX(XX)

TYPE OF OBJECT MARKER
1, 2, 3, or 4

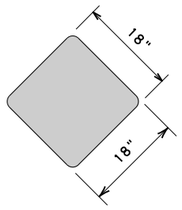
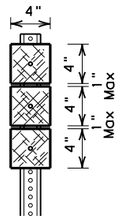
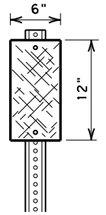
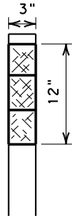
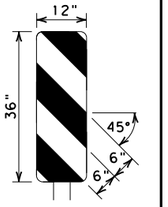
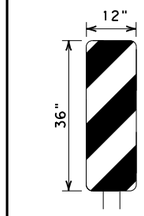
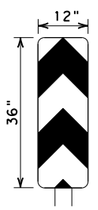
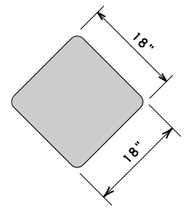
NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

TYPE OF POST
WC = Wing Channel Post
WFLX = White Flexible Post
TWT = Thin Walled Tubing

TYPE OF MOUNT
GND = Embedded (drivable)
SRF = Surface Mount
WAS = Wedge Anchor Steel
WAP = Wedge Anchor Plastic

DIRECTION
If Required
BI = Bi-Directional

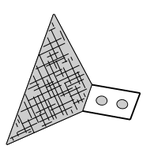
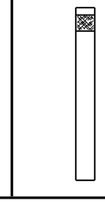
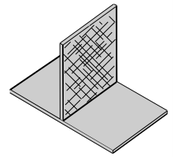
OBJECT MARKERS

	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4
DEVICE								
		3-Size 2 reflector units	1-Size 3 reflector unit	3-Size 1 reflector units or 1-Size 4 reflector unit				
SHEETING	Yellow-Type B_{FL} or C_{FL} Sheeting	Yellow - Type B or C Sheeting			Alternating acrylic black and retroflective yellow - Type B_{FL} or C_{FL} Sheeting			Red -Type B_{FL} or C_{FL} Sheeting
POST TYPE	TWT	WC	WC	WFLX	TWT			TWT
MOUNT TYPE	WAS, WAP	GND	GND	GND, SRF	WAS, WAP			WAS, WAP

DEPARTMENTAL MATERIAL SPECIFICATIONS

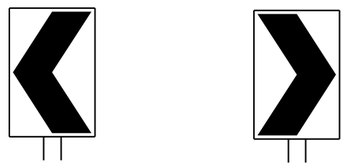
FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

BARRIER REFLECTORS (BRF)

	GF1	GF2	CTB
DEVICE			
	1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.		
SHEETING	Yellow, White, Red		
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.		

CHEVRONS

DEVICE



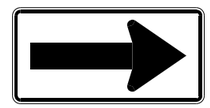
W1-8

SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)
MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only	

NOTE
1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies).
2. When there is a need to increase conspicuity, the Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTION LARGE ARROW (W1-6).

ONE DIRECTION LARGE ARROW

DEVICE



W1-6

SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
MOUNTING HEIGHT	7'-0"	

NOTE:

Delineator and object marker substrates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.

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DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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REVISIONS	6420	77	001	US 87
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	SIT	TOM GREEN		37

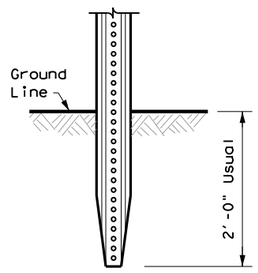
20A

DATE:
FILE:

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

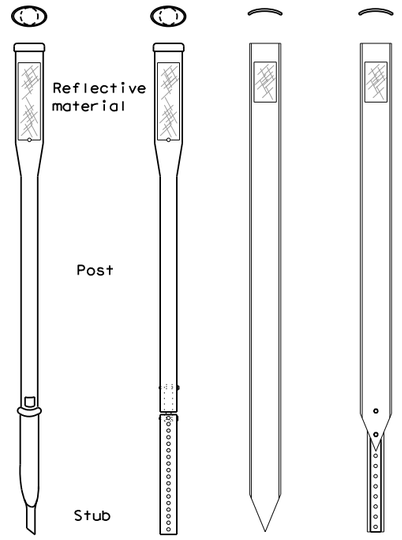


NOTES

1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only.
2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499.

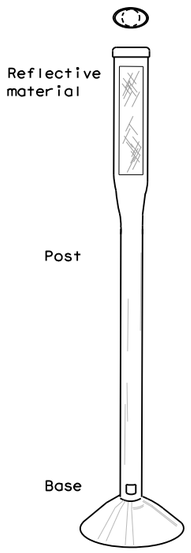
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



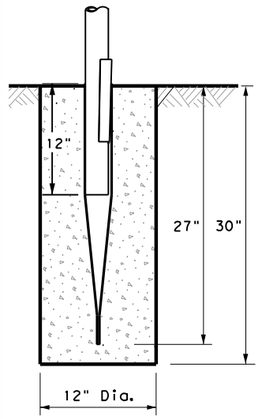
SURFACE MOUNT

NOTES

1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices.
2. Install per manufacturer's recommendations.
3. Post length may vary to meet field conditions.
4. When using yellow delineators with flexible posts to separate opposing direction of travel, such as centerline or median use, the flexible posts shall be yellow.

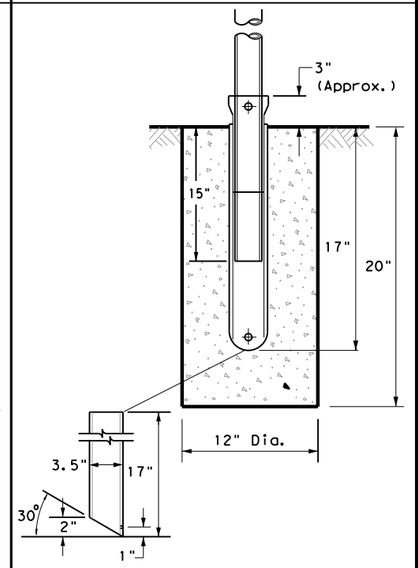
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

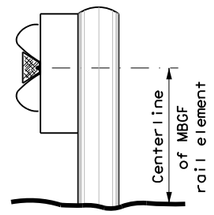
NOTE

1. Install per manufacturer's recommendations.

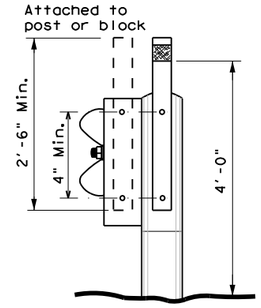
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

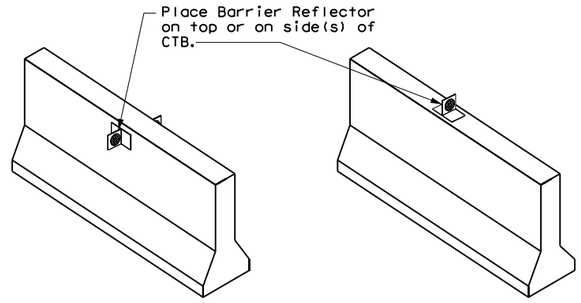
GF1



GF2



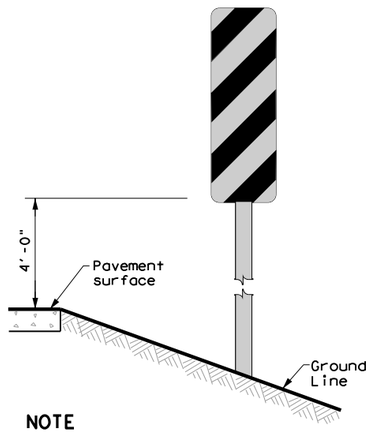
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

1. Place delineators on a section of roadway at a consistent distance from the edge of pavement.
2. Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction.
3. When Type 2 object markers and delineators are more than 8'-0" from the edge of the pavement, it may not be possible to maintain a height of approximately 4'-0". If this is the case, place the object marker or delineator as close to the desired height as possible.
4. Install all delineators, object markers and barrier reflectors in accordance with the manufacturer's recommendation.
5. Barrier reflectors should be installed a minimum of 18 inches above the edge of the pavement surface.
6. Diagonal stripes on Type 3 object markers shall slope down toward the intended travel lane.

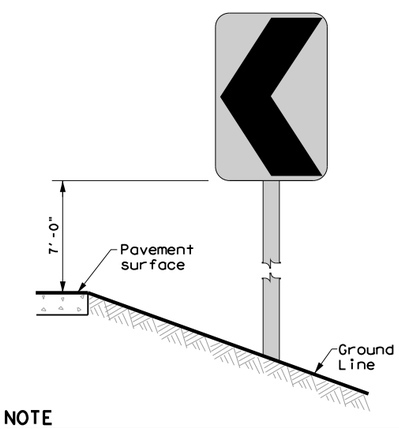
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

Mounting at 4 feet to the bottom of the chevron is permitted for chevrons that will not exceed a height of 6'-6" to the top of the chevron (sizes 24" x 30" and smaller)

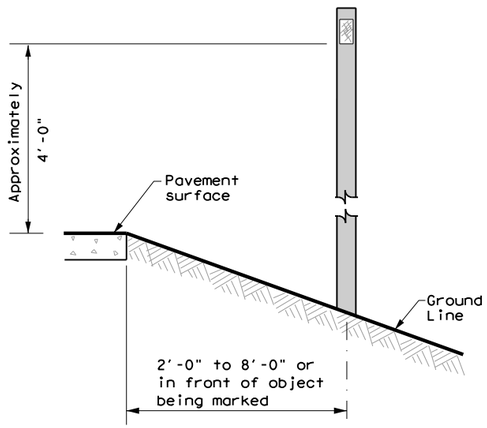
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

Chevrons 30" x 36" and larger shall be mounted at a height of 7' to the bottom of the chevron. Chevron sign and ONE DIRECTION LARGE ARROW sign (W1-9T) shall be installed per SMD standard sheets and paid under item 644.

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

FILE: dom2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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10-09 3-15	DIST	COUNTY		SHEET NO.
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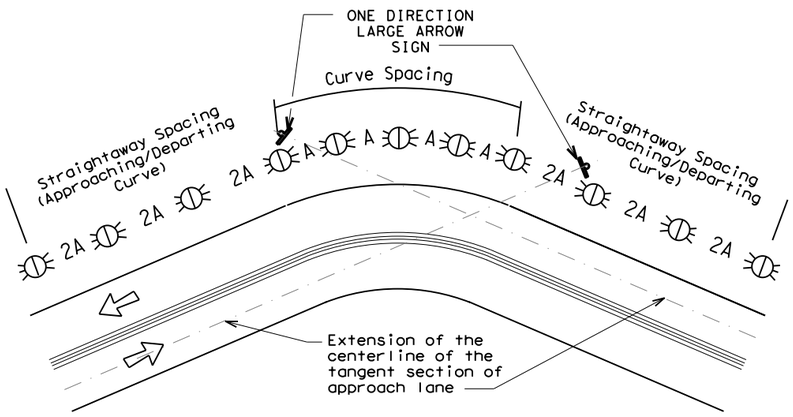
20B

DATE:
FILE:

MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

Amount by which Advisory Speed is less than Posted Speed	Curve Advisory Speed	
	Turn (30 MPH or less)	Curve (35 MPH or more)
5 MPH & 10 MPH	• RPMs	• RPMs
15 MPH & 20 MPH	• RPMs and One Direction Large Arrow sign	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons.
25 MPH & more	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons	• RPMs and Chevrons

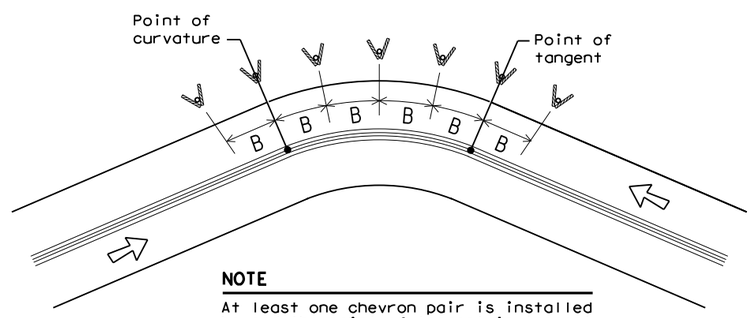
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



NOTE

ONE DIRECTION LARGE ARROW (W1-6) sign should be located at approximately and perpendicular to the extension of the centerline of the tangent section of approach lane.

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



NOTE

At least one chevron pair is installed beyond the point of tangent in tangent section.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN

Degree of Curve	FEET			
	Radius of Curve	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
		A	2A	B
1	5730	225	450	——
2	2865	160	320	——
3	1910	130	260	200
4	1433	110	220	160
5	1146	100	200	160
6	955	90	180	160
7	819	85	170	160
8	716	75	150	160
9	637	75	150	120
10	573	70	140	120
11	521	65	130	120
12	478	60	120	120
13	441	60	120	120
14	409	55	110	80
15	382	55	110	80
16	358	55	110	80
19	302	50	100	80
23	249	40	80	80
29	198	35	70	40
38	151	30	60	40
57	101	20	40	40

Curve delineator approach and departure spacing should include 3 delineators spaced at 2A. This spacing should be used during design preparation or when the degree of curve is known.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS NOT KNOWN

Advisory Speed (MPH)	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
	A	2xA	B
65	130	260	200
60	110	220	160
55	100	200	160
50	85	170	160
45	75	150	120
40	70	140	120
35	60	120	120
30	55	110	80
25	50	100	80
20	40	80	80
15	35	70	40

If the degree of curve is not known, delineator spacing may be determined based on the Advisory Speed of the curve. Use the delineator curve spacing for each Advisory Speed (MPH).

DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

CONDITION	REQUIRED TREATMENT	MINIMUM SPACING
Frwy./Exp. Tangent	RPMs	See PM-series and FPM-series standard sheets
Frwy./Exp. Curve	Single delineators on right side	See delineator spacing table
Frwy/Exp.Ramp	Single delineators on at least one side of ramp (should be on outside of curves) (see Detail 3 on D&OM(4))	100 feet on ramp tangents Use delineator spacing table for ramp curves ("straightway spacing" does not apply to ramp curves)
Acceleration/Deceleration Lane	Double delineators (see Detail 3 on D&OM(4))	100 feet (See Detail 3 on D & OM (4))
Truck Escape Ramp	Single red delineators on both sides	50 feet
Bridge Rail (steel or concrete)and Metal Beam Guard Fence	Bi-Directional Delineators when undivided with one lane each direction Single Delineators when multiple lanes each direction	Equal spacing (100'max) but not less than 3 delineators
Concrete Traffic Barrier (CTB) or Steel Traffic Barrier	Barrier reflectors matching the color of the edge line	Equal spacing 100' max
Cable Barrier	Reflectors matching the color of the edge line	Every 5th cable barrier post (up to 100'max)
Guard Rail Terminus/Impact Head	Divided highway - Object marker on approach end Undivided 2-lane highways - Object marker on approach and departure end	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5) and D & OM (6)
Bridges with no Approach Rail	Type 3 Object Marker (OM-3) at end of rail and 3 single delineators approaching rail	See D & OM(5)
Reduced Width Approaches to Bridge Rail	Type 2 and Type 3 Object Markers (OM-3) and 3 single delineators approaching bridge	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5)
Culverts without MBGF	Type 2 Object Markers	See Detail 2 on D & OM(4)
Crossovers	Double yellow delineators and RPMs	See Detail 1 on D & OM (4)
Pavement Narrowing (lane merge) on Freeways/Expressway	Single delineators adjacent to affected lane for full length of transition	100 feet

NOTES

1. Unless indicated otherwise, the delineator or barrier reflector color shall conform to the color of the pavement edge line on the side of the road where the delineators or barrier reflectors are placed.
2. Barrier reflectors may be used to replace required delineators.
3. Single red delineators may be mounted on the back side of delineator posts for wrong way driver applications

LEGEND

	Bi-directional Delineator
	Delineator
	Sign

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(3)-20

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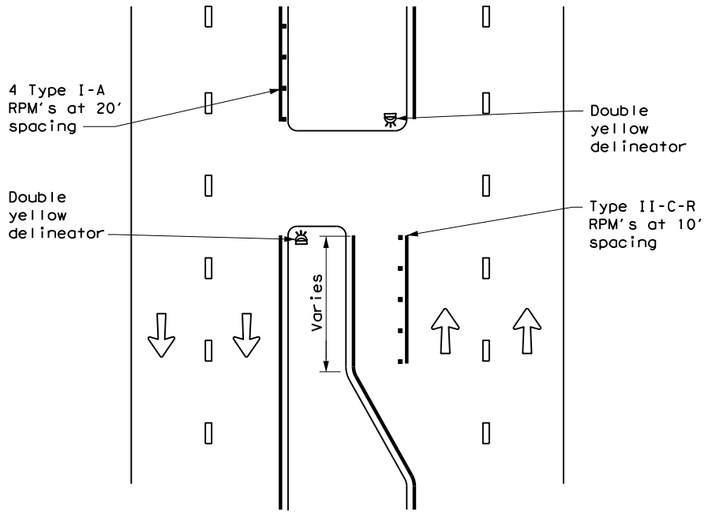
3-15 8-15	DIST	COUNTY		SHEET NO.
8-15 7-20	SJT	TOM GREEN		39

20C

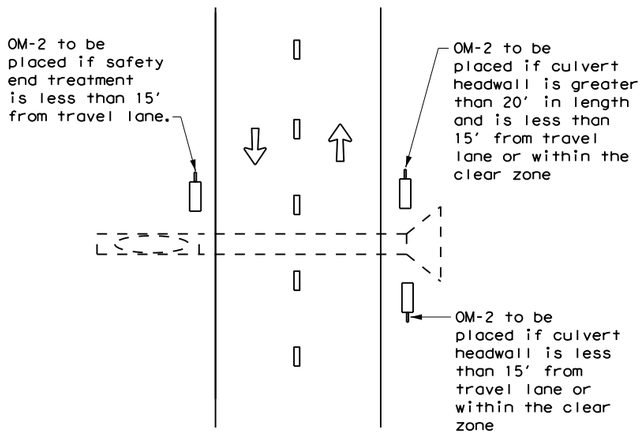
DATE:
FILE:

CROSSOVERS



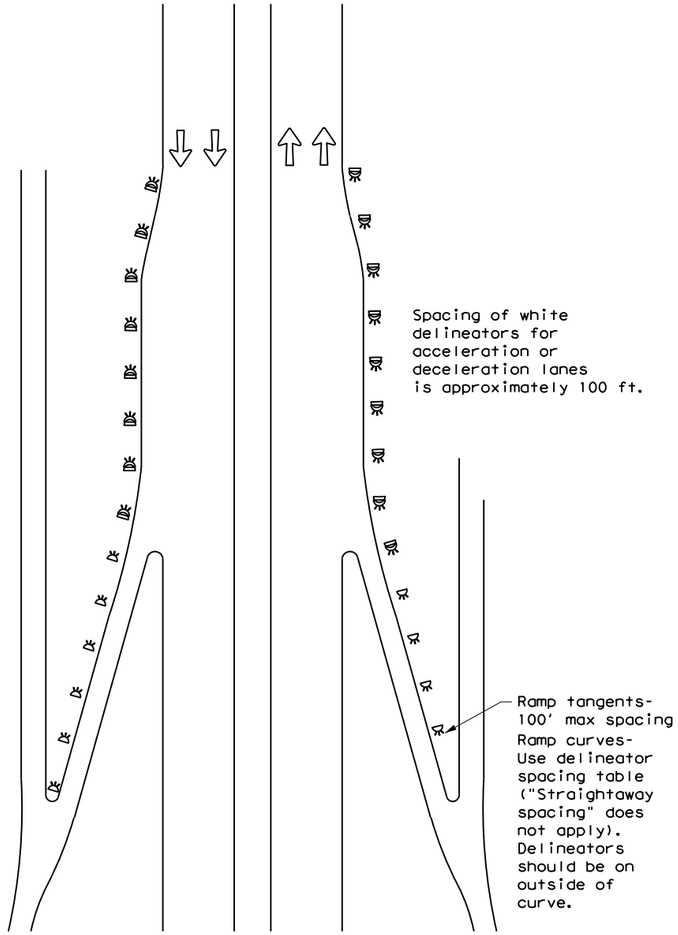
DETAIL 1

FOR CULVERTS WITHOUT MBGF



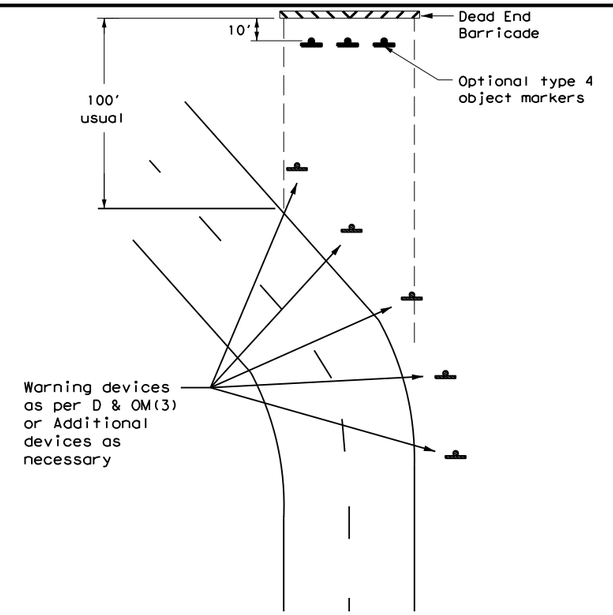
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



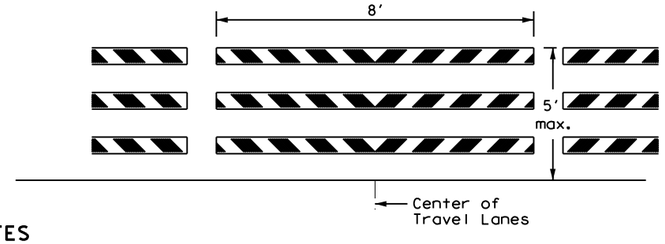
DETAIL 3

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 4

TYPICAL DEAD END BARRICADE INSTALLATION



NOTES

1. Barricade striping shall be red and white reflective sheeting for all permanent road closures.
2. Barricade striping is red and white sloping toward the center of the roadway.
3. Type 3 Barricade Supports should be anchored to soil or pavement as described in compliant Work Zone Traffic Control Devices List, section D.2.f and D.2.g.

DETAIL 5

LEGEND	
	Bidirectional Delineator
	Delineator
	OM-3
	Barricade
	Sign
	OM-2
	Double Delineator

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Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(4)-20

FILE: dom4-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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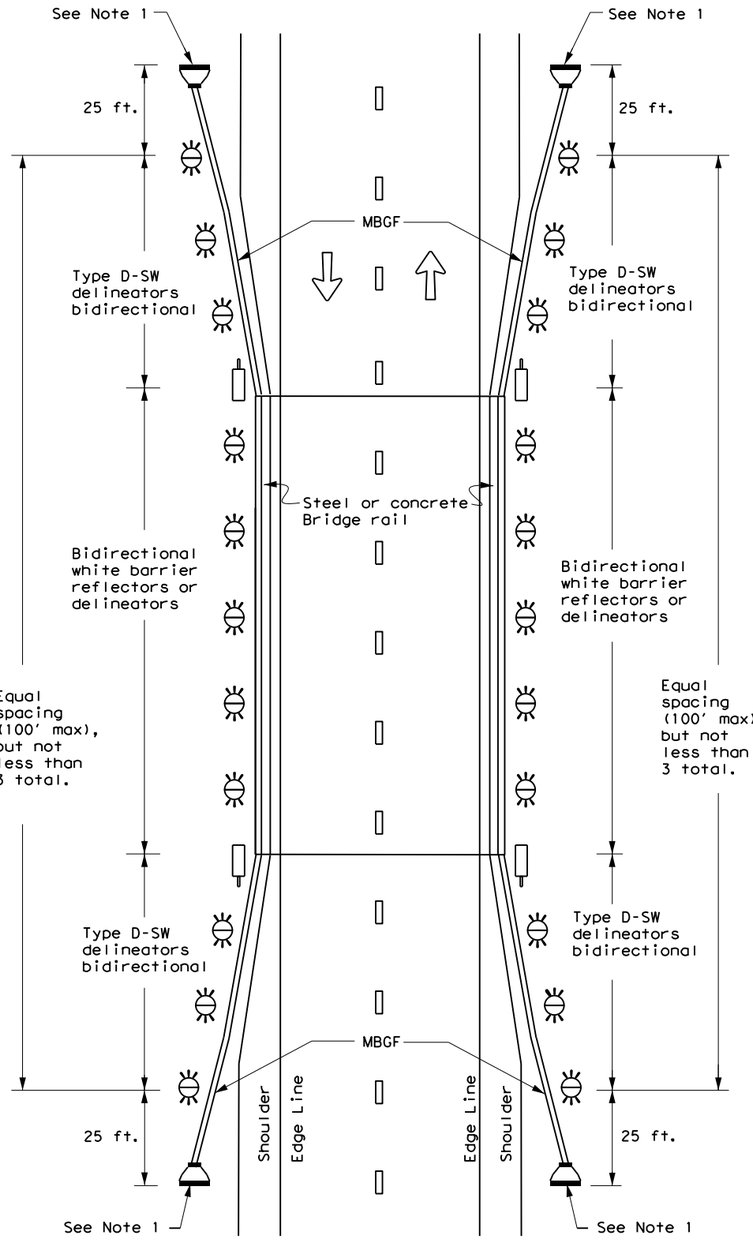
3-15	DIST	COUNTY		SHEET NO.
7-20	SIT	TOM GREEN		40

20D

DATE:
FILE:

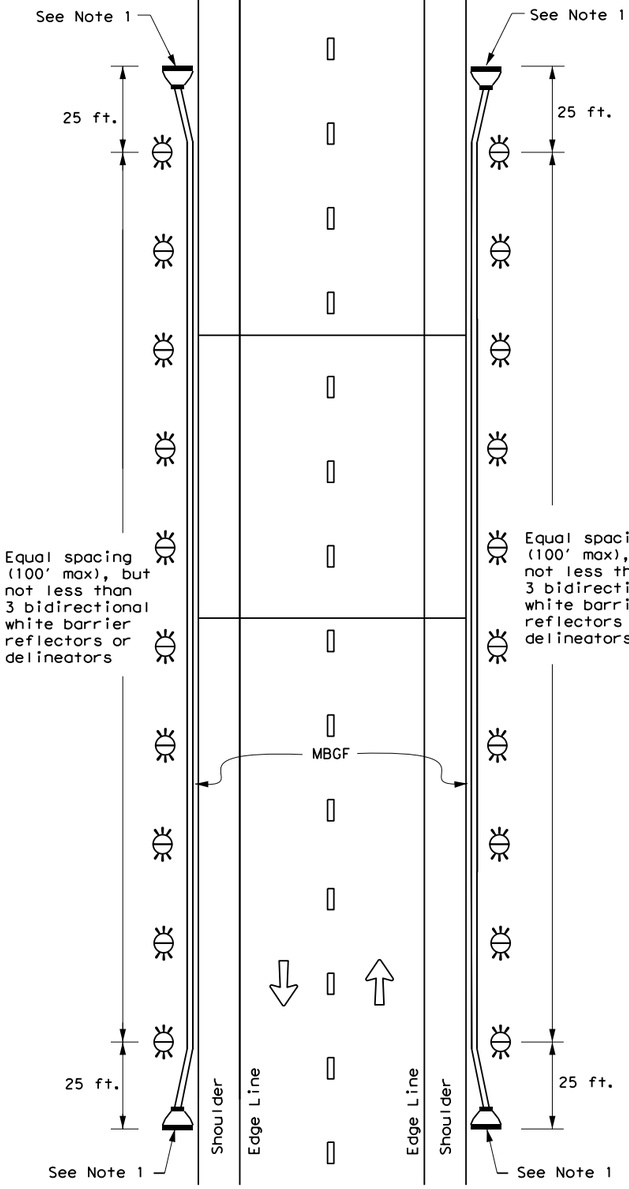
TWO-WAY, TWO LANE ROADWAY WITH REDUCED WIDTH APPROACH RAIL



NOTE:

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

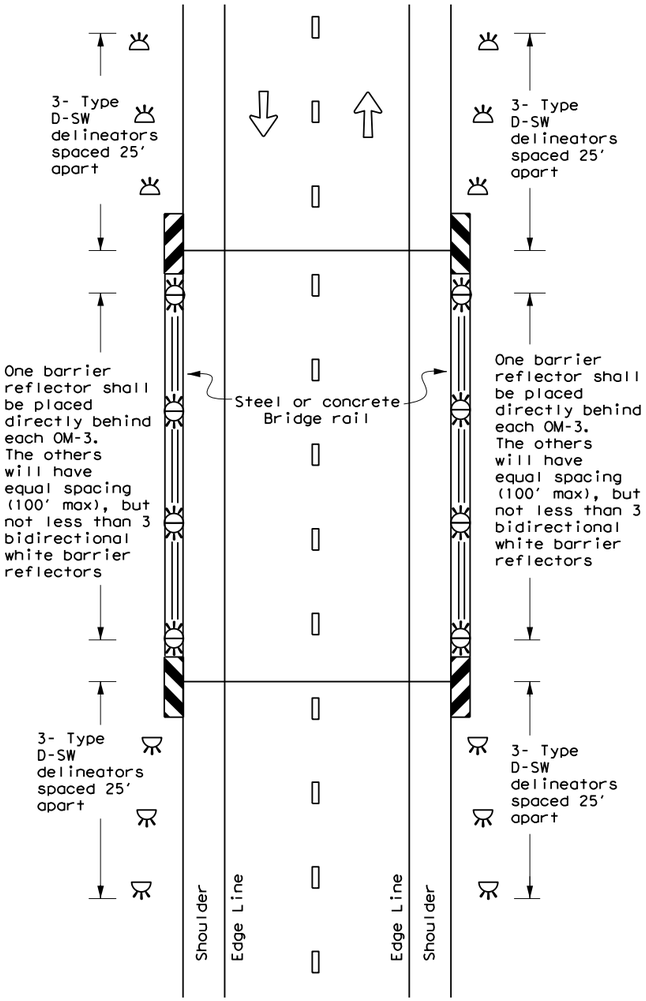
TWO-WAY, TWO LANE ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



NOTE:

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

TWO-WAY, TWO LANE ROADWAY BRIDGE WITH NO APPROACH RAIL



LEGEND	
	Bidirectional Delineator
	Delineator
	OM-3
	OM-2
	Terminal End
	Traffic Flow

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(5)-20

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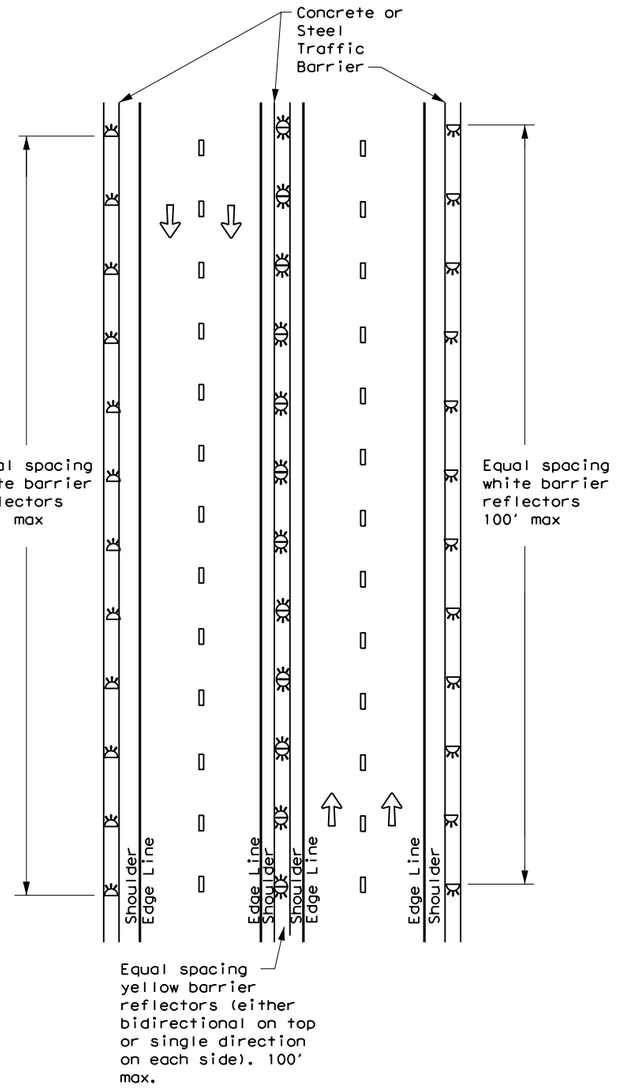
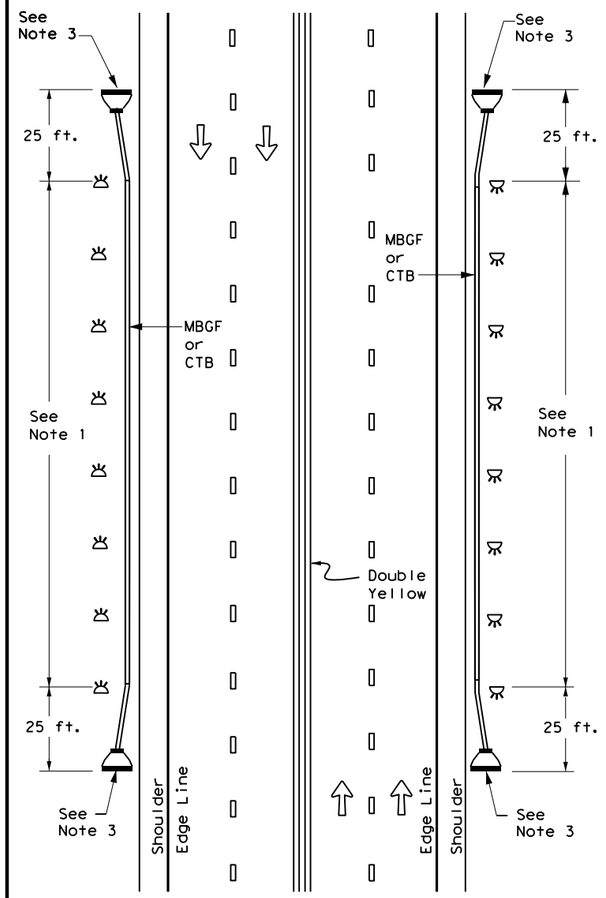
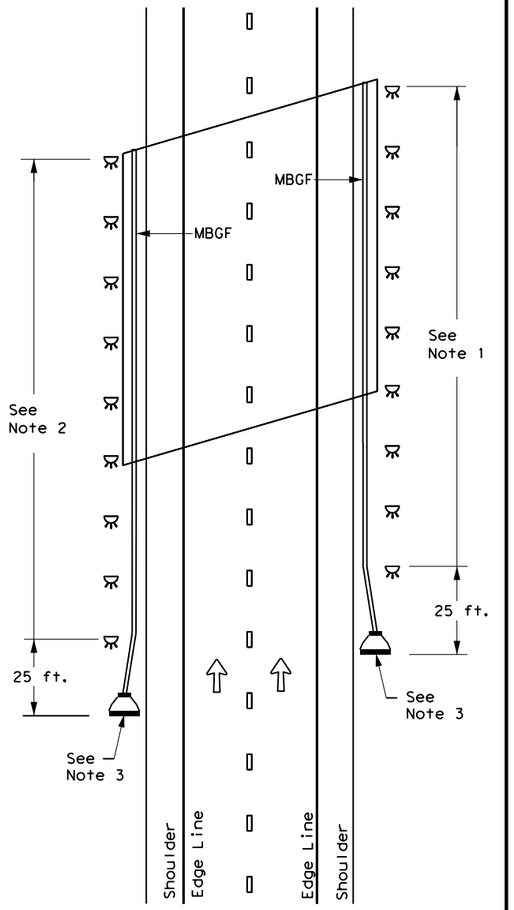
CONTINUOUS CONCRETE OR STEEL BARRIER



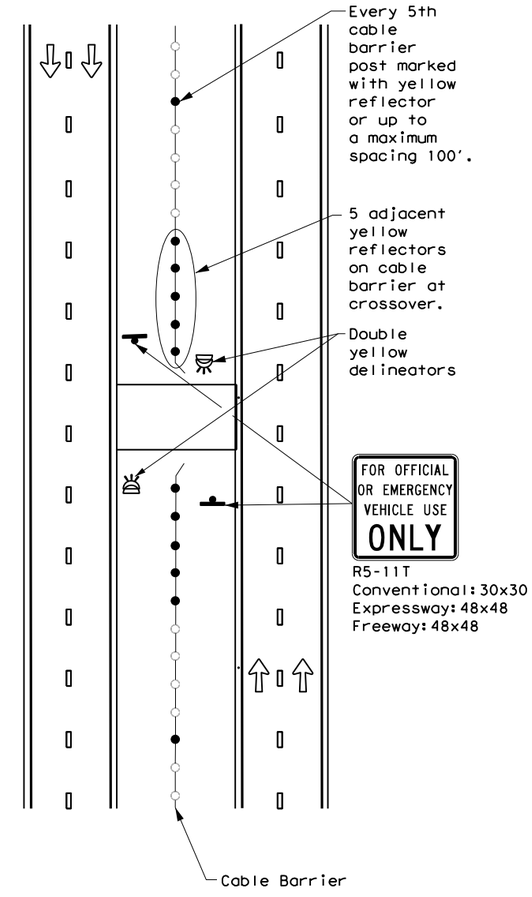
MULTI-LANE UNDIVIDED, TWO-WAY ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



DIVIDED ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



EMERGENCY CROSSOVER



NOTES

1. Equal spacing (100' max), but not less than 3 single directional white barrier reflectors or delineators. On Continuos Barrier, equal spacing (100' max.)
2. Equal spacing (100' max), but not less than 3 single directional yellow barrier reflectors or delineators.
3. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3)in front of the terminal end.

LEGEND

	Bidirectional Delineator
	Delineator
	OM-3
	OM-2
	Terminal End
	Traffic Flow

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(6)-20

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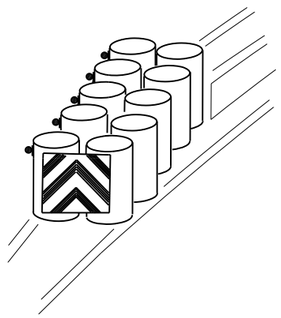
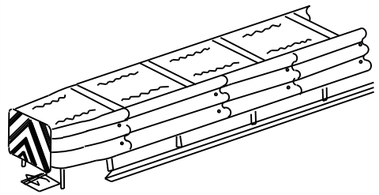
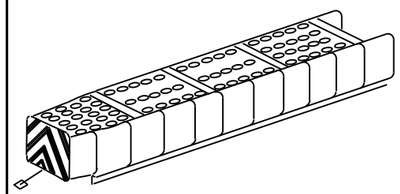
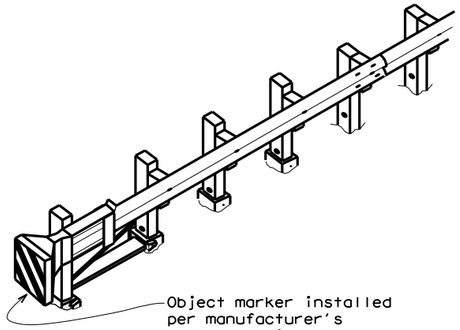
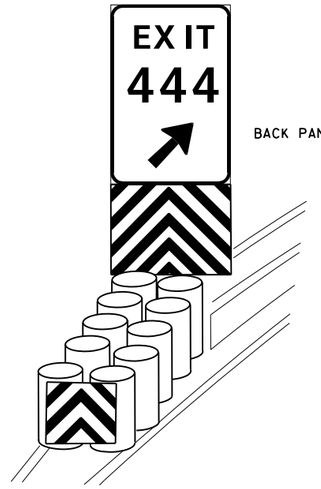




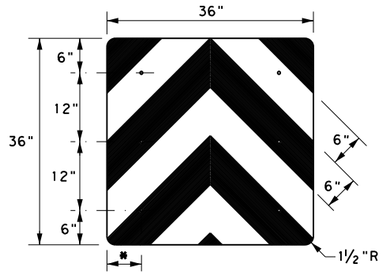


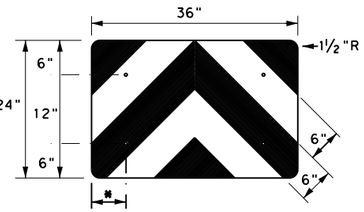


Object marker installed per manufacturer's recommendations.

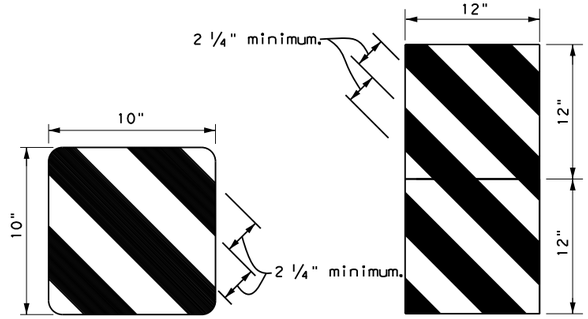


BACK PANEL (OPTIONAL)

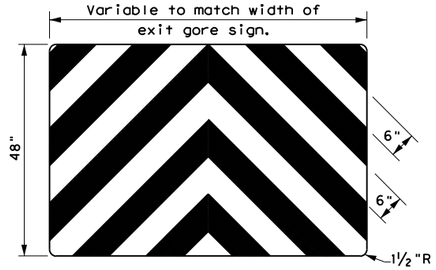


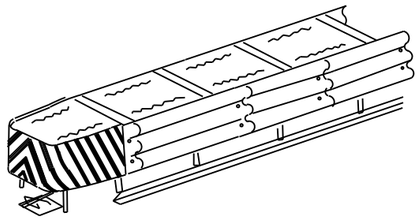


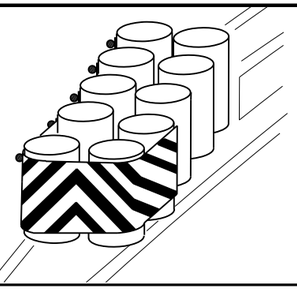
* Adjust to fit attenuator per manufacturer's recommendation, or as directed by the Engineer

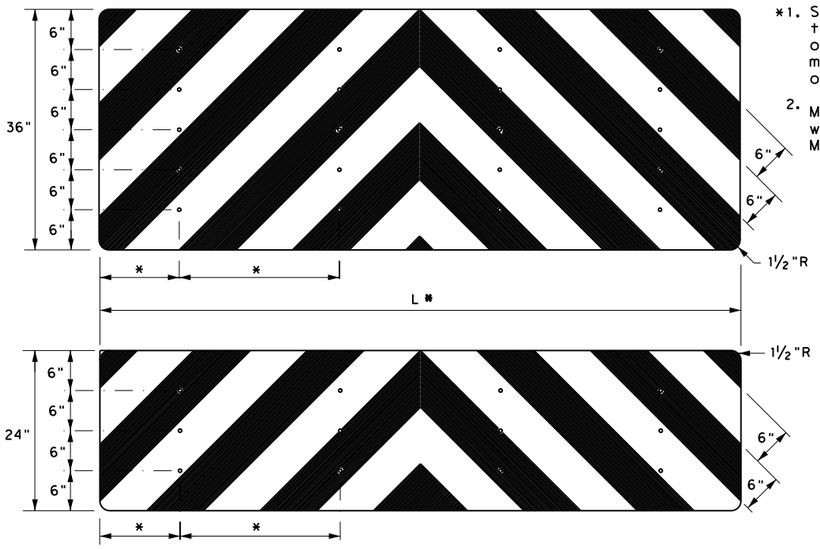


OBJECT MARKERS SMALLER THAN 3 FT^2









NOTES

*1. Spacing should be adjusted to attach through centerline of drum, per attenuator manufacturers recommendation, or as directed by the Engineer.

2. Mounting should be flush with top of attenuator. Minimum size 96" x 24".

NOTES

1. Object Markers shall conform to the Texas MUTCD and meet the color and reflectivity requirement of Department Material Specification DMS 8300. Background shall be yellow reflective sheeting (Type B or C) and Chevron shall be black.

2. Object Markers may be fabricated from adhesive backed reflective sheeting applied directly to guardrail end treatment, or applied directly to an "end cap" as per the manufacturer's recommendation. Direct applied sheeting shall provide a smooth surface and have no wrinkles, air bubbles, cuts or tears. A radius at the corners is not required for direct applied sheeting.

3. Object Marker size may be reduced to fit smaller devices. Width of alternating black and yellow stripes are typically 6". Object Markers smaller than 3ft may have reduced width stripes of a minimum of 2 ¼".

4. Pop rivets, screws, or nuts and bolts may be used to attach object markers and reflectors. Holes, slots or other openings may be cut or drilled through object markers to allow cable or other attachments.

5. Object Marker at nose of attenuator is subsidiary to the attenuator.

6. See D & OM (1-4) for required barrier reflectors.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS

D & OM(VIA)-20

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4-98 7-20				

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