

18,470

1700 Swift Street, North Kansas City, MO 64116 Phone: 816.741.4600 www.garney.com

at 10:40 o'clock _____M

11/8/2023

Commissioner Hutchins Hunt County Courthouse Greenville, TX 75401

RE: CR 1043 Road Crossing

Dear Hunt County,

BECKY LANDRUM County Clerk, Hunt County, Tex.

NOV 14 2023

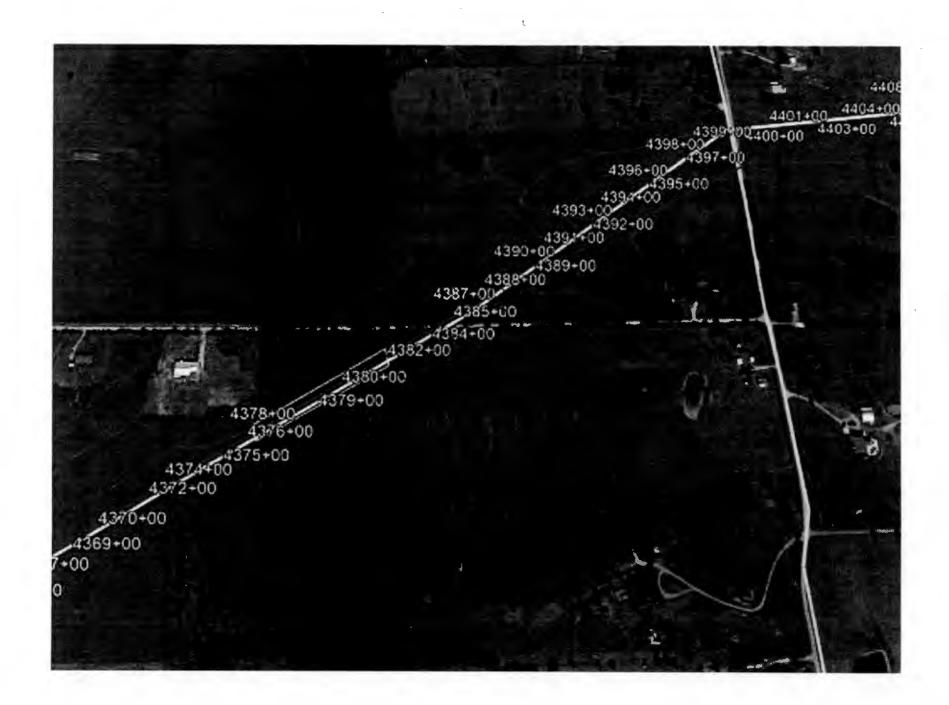
1047 - M.H.

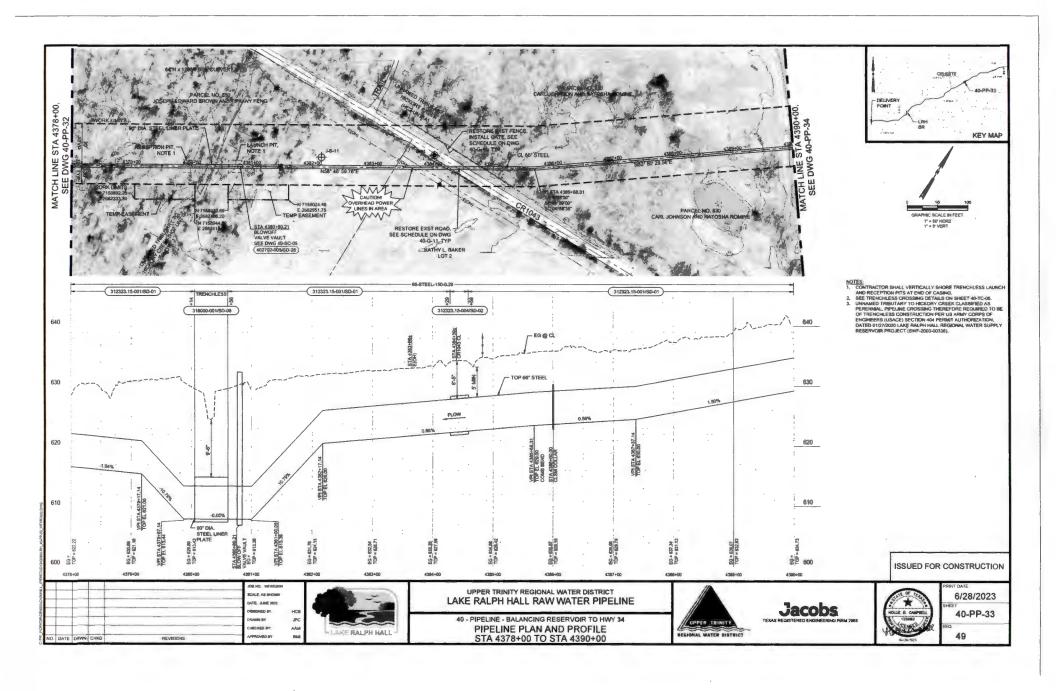
McKee Utilities is seeking permission from Hunt County to Cross County Road 1088 with the Lake Ralph Hall Pipeline. This work is anticipated to start on 11/22/2023. McKee Utilities will be crossing the road following the attached construction details. The access road will be re-routed during the utility crossing utilizing proper TXDOT detour signs. Construction will take roughly three days with the road detour in place. The contractor will notify the residents of the lane closure in advance.

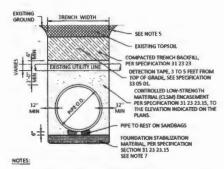
Sincerely,

GARNEY COMPANIES, INC.

Andrew Beck Sr. Project Manager







- 1. SEE PLAN AND PROFILE FOR PROJECT SPECIFIC AND PERMITTED CROSSING
- 2. THE CONTRACTOR SHALL BE REQUIRED TO USE WOOD MATS FOR --------WATERLINES, OR REQUIRED BY CROSSING PERMIT.
- THE CONTRACTOR SHALL CONTACT UTILITY OWNER AT LEAST (3) DAYS PRIOR TO CROSSING THE UTILITY.
- FOR CROSSING UTILITIES 6" OR LARGER IN DIAMETER, EXTEND CLSM ENCASEMENT ON PROPOSED PIPE TO 5" ON EACH SIDE OF UTILITY CROSSING.
- CONTRACTOR SHALL SLOPE TRENCH WALLS AND/OR SHORE EXCAVATIONS FOR CONSTRUCTION AND SAFETY IN ACCORDANCE WITH CURRENT OSHA REQUIREMENTS AND SPECIFICATIONS.
- THE CROSSING UTILITY IS LESS THAN 6-INCHES AND 3 FEET OR HIGHER FROM THE TOP OF THE PIPE THEN THE CONTRACTOR MAY SUPPORT THE CROSSING UTILITY AND USE THE STANDARD GRANULAR EMBEDMENT DETAIL.
- 7. CONTRACTOR TO SEEK APPROVAL FROM THE DESIGNATED OWNER'S REPRESENTATIVE PRIOR TO PLACEMENT OF FOUNDATION STABILIZATION MATERIAL WHERE UNSTABLE GROUND CONDITION OCCUR. FOUNDATION STABILIZATION MATERIAL SHALL BE UTILIZED IF UNSTABLE GROUND CONDITIONS ARE ENCOUNTERED.

UTILITY LINE CROSSING DETAIL - 02 10 01 - 001



- 1. MARKER SHALL BE LOCATED ON BOTH SIDES OF ALL ROADS AND RAILROADS, AT MARKER SHALL BE LOCATED ON BOTH SIGES OF ALL ROADS AND RALIROADS, AT ALL MANILINE VALVES, AND ENOMOFF VALVES, AT ALL HORIZONTAL BEADS, ROAD CROSSINGS, OTHER VISIBLE STRUCTURES. AND MAX SPACING OF 2000 IF ALONG PPELINE AUSGINERENT.
 EACH MARKER SHALL HAVE A STICKER WITH THE FOLLOWING INFORMATION "CALIFOR WATER PREJILIE BEFORE DIGGING CONTACT UTRING 1972) 129-1228, STA 2004/SC" ALL INFORMATION MUST BE TYPED OR STAMPED WITH MANILED BILL MY MOT HAND WRITTEN
- NON-FADING INK, NOT HAND WRITTEN.

PIPELINE MARKER - 33 05 01 - 001

ISSUED FOR CONSTRUCTION

BCALE AB SHOWN DATE SEPTEMBER 3027 DEBIGHED BY CLF SEMMEN BY FAC WOLED BY OLF steoutney can



UPPER TRINITY REGIONAL WATER DISTRICT LAKE RALPH HALL RAW WATER PIPELINE

PROGRAM STANDARD DETAILS SHEET 2 CLSM EMBEDMENT, UTILITY LINE CROSSING AND PIPELINE MARKER DETAILS









03/09/2023 SD-02

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

- The Borricode and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction povement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Troffic Control Devices" (TMUTCD).
- The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
- The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.
- The Controctor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move ar change the approximate location of any device without the approval of the Engineer.
- Geometric design of lane shifts and detours should, when possible, meet the opplicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highwoys and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.
- When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the odjacent project is completed first, the Controctor shall erect the necessary worning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shoul be revised to show appropriate work zone distance.
- The Engineer may require duplicate worning 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," lotest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.
- The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.
- 10. Where highway construction or maintenance work is being undertaken, other than mabile operations as defined by the Texas Manual on Uniform Traffic Control Devices, CSJ limit signs are required. CSJ limit signs ore 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 ploque sholl 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 timits. For mobile operations, CSJ limit signs are not required.
- 11. Troffic control devices should be in place only while work is octually in progress or o definite need exists.
- 12. The Engineer has the final decision on the location of all traffic control
- 13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lones. 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 apparet meeting the requirements of ISEA "American Notional Standard for High-Visibility Apparel," or equivalent revisions, and labeled as ANSI 107-2004 standard performance for Class 2 or 3 risk exposure. Class 3 garments should be considered for high traffic volume work areas or night time work.
- 2. Except in emergency situations, flagger stations shall be illuminated when flagging is used at night.

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT

http://www.bxdot.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

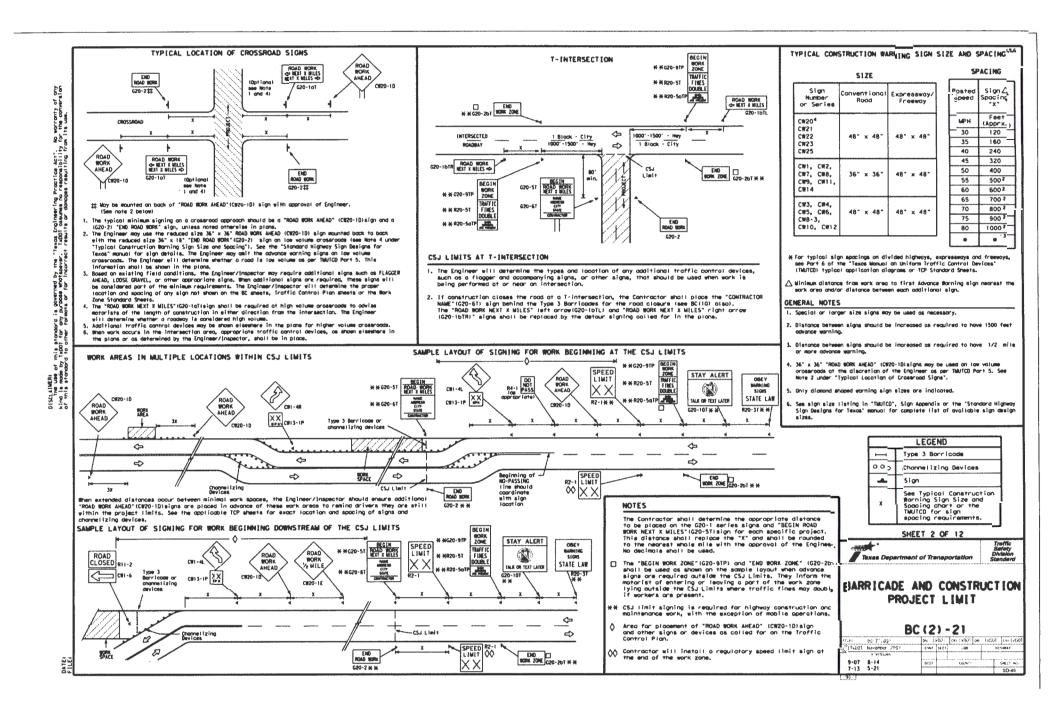
SHEET 1 OF 12

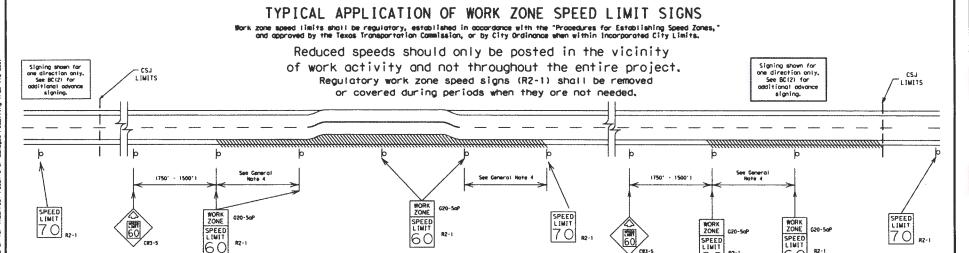
■ Texas Department of Transportation

BARRICADE AND CONSTRUCTION **GENERAL NOTES** AND REQUIREMENTS

BC(11)-21

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(C) Tx(OT Novemb	er 200% to	Cract	:acs	, C#	-	н	CHARAY
4-03 7-13	LIM'S						
9-07 8-14		0101		CG(M)+			SHECT MIT
5-10 5-21							SD-45





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

- a) rough road or damaged povement surface
- b) substantial afteration 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 troffic control plans when workers or equipment one not behind concrete borrier, when work activity is within 10 feat 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.

R2-1

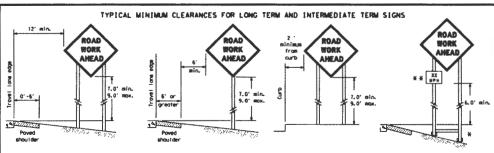
60

60

- 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 bet 40 mph and areater 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)).
- 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 poid for directly, but shall be considered subsidiory to Item 502.
- Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
- B. Techniques that may help reduce traffic speeds include but are not limited to: A. Law enforcement.
 - B. Flogger stationed next to sign.
 - C. Portable changeable message sign (PCMS).
 - D. Low-power (drone) rodar 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.

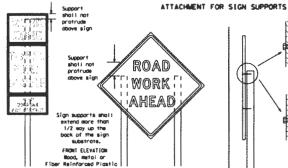


SD-47



* When plooting skid Supports on unlevel ground, the leg post lengths sust be adjusted so the sign appears straight and plumb.

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



Spilicing ambedded perforated aquare metal tubing in order to extend post height till only be allowed when the splice is made using four boils, two doors and two below the splice point. Splice must be located entirely behind the sign abstracts, not near the base of the support. Splice liner! lengths should be at least 5 times nominal post size, centered on the splice and of at least the same gauge material.

procedures for attaching sign SIDE ELEVATION Wood

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, flood supports shall not be extended or repaired by splicing or other means.

Attachment to wooden supports

will be by bolts and nuts

or scraws. Use TxDOT's or monufacturer's recommended

substrates to other types of

alon aupports

STOP/SLOW PADDLES

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



- 24" ---



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

- Permanent signs are used to give notice of traffic laws or regulations, coll attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, representant, specific service 41,000), or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed an a roadway without
- When permanent regulatory or warning signs conflict with work zone conditions. remove or cover the personent signs until the personent sign sessage restore reading condition. For details for covering large guide signs see the TS-CD standard.
- When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists of all times. If existing signs are to be relocated on their original supports, they shall be instolled on organisorthy bases as shown on the SMD Standard sheets. The signs shall seet the required wounting heights shown on the BC Sheets or the SMD Standards. This work should be pold for under the appropriate pay itse for relocating existing signs.
- If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use organizating supports as shown on the EC stondard sheets. TLRS standard sheets or the CEZTEC 11st. The signs shall neet the required sounting heights shown on the EC, or the SMD standard sheets during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
- Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soon as possible by the Contractor to ensure proper guidance for the materists, This will be subsidiary to [1em 502.

GENERAL NOTES FOR NORK ZONE SIGNS

- Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
- Booden sign posts shall be painted white
- Borricodes shall NOT be used as sign supports.
 All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to requiste, worn, and
- All aigns shall be installed in occordance with the plots of ds directed by the Engineer's Signs shall be used to requisite, work, and guide the travelling quibit safety through the sort zone. The Contractor say furnish either the sligh design shown in the plans or in the "Standard Righway Sign Designs for Essas" (SHSD). The Engineer'/inspector say require the Contractor to furnish other sorts zone aligns that one shown in the Ballico but say have been an either from the plans, any varietion in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All romages awate the documented in writing before being implemented. This can include document gither changes in the Inspector's 1900 (Sicy and howing both the Inspector's and Initial and doze the operations) and the Contractor and I furnish sligh supports I lated in the "Compillant Sort Zone Fraffic Control Device List" (CEZICO) for small roadside.
- signs, Supports for temporary large roadside signs shall see the requirements detailed on the Improry Large Roadside Signs (ILRS) standard sheets, the Contractor shall install the sign support in occordance with the sourceturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer's copy of the sound-source's installation recommendations so the Engineer can verify the correct procedures are being followed.
- The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or sorred reflective sheeting as directed by the Ingineer/Inspector.

 Lamifiliant installing as signs on the back of the signs substrate. The maximum height of letters and/or company logos used for identification shall be I inch.
- 9. The Contractor shall replace damaged wood poets. New or damaged wood aign posts shall not be spliced.

QURATION OF SORK (on defined by the "Texos Monus) on Uniform Traffic Control Devices" Port 6)

- The types of sign supports, sign sounting height, the size of signs, and the type of sign substrates con vary based on the type of work being performed. The Engineer is responsible for selecting the oppropriate size sign for the type of work being performed. The Contractor is responsible for ensuring the sign support, sign sounting height and substrate seets soundocturer's recommendations in regard to organize thiness and duration of work requirements.
 - Long-term stationary work that accumies a location more than 3 days.
- diate-term stationary work that accupies a location more than one daylight period up to 3 days, or nighttime work lasting
- Short-term applicancy doyline work that occupies a location for more than I hour to a single doylinht period.
- Short, duration work that accupies a location up to 1 hour.
 Mobile work that wows continuously or intermittently (stapping for up to approximately 15 minutes.)

- SIGN MODERTING MEIGHT

 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
- The bottom of Short-term/Short Durotion signs shall be a minimum of I foot above the powerent surface but no more than 2 feet above
- 3. Long-term/intermediate-term Signs may be used in life of Short-term/Short Burotion signing.
 4. Short-term/Short Burotion 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.
- ulatory signs shall be sounted at least 7 feet, but not more than 9 feet, above the poved surface regardless of work duration.

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

SIGN SUBSTRATES

- The Contractor shall ensure the sign substrate is installed in accordance with the manufacturer's recommendations for the type of sign
- The Contractor shall ensure the aign substrate is installed in occordance with the send-octurer's recommendations for the type of eight support into its being used. The IRECID lists each substrate that can be used on the different types and excels a 6 eign supports.
 "Mesh" type sorterials are MDI on opproved sign substrate, regardless of the tightness of the second.
 All second inclinication sign panels forficiented from 2 or some pieces shall have one or some pieces shall have one or simple sign on the sign, using second or the sign and extending fully concess that sign, the clear shall be oftended to the back of the sign using second screen fort do not premature the face of the sign panel. The screen shall be placed in both side of the spillos and sposed or 5". centers. The Engineer may approve other methods of splicing the sign face.

MEFLECTIVE SHEETING

- 1. All signs shall be retroreflective and constructed of sheeting seeting the color and retro-reflectivity requirements of DMS-8300 for rigid signs or DMS-8310 for roll-up signs. The web outeress for DMS specifications is shown on BC(1), 2. Shite sheeting, seeting the requirements or DMS-8300 Type A, sholl be used for signs with orbits bookground.

 3. Orange sheeting, seeting the requirements of DMS-8300 Type B pro Type C_{EL}, shall be used for rigid signs with orange bookgrounds.

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 (FMMA) and as published in the "Standard Highway Sign Design for Texas" manual. Signs, letters and numbers shall be of first class workmanship in occordance with Department Standards and Specifications.

REMOVING OR COVERING

- Then sign messages may be confusing or do not apply, the signs shall be removed or completely covered. Long-term stationary or intermediate stationary against station of successful to the stationary or intermediate stationary or intermediate stationary against installed an aguaine station tubling may be turned away from treffic 90 degrees when the sign essaces is not applicable. This teaming way not be used for signs installed in the section of divided highests or near any intersections where the sign may be seen from approximating treffic.
- Signs installed an wooden skids shall not be turned at 90 degree angles to the readersy. These signs should be removed or completely
- Cover ad when her required. Shen signs ore covered, the moterial used shall be apaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their apoque properties under automobile headlights at night, without damaging the sign sheeting.
- Burlop sholl MOT be used to cover signs.

 Duct tope or other adhesive material shall MOT be offixed to a sign face.
- Duct tope or other adhesive material stall mur or ottogen to output.
 Signs and anchor stube shall be resoved and notes backfilled upon completion of sork.

SIGN SUPPORT WEIGHTS

- Blace sign supports require the use of weights to keep from turning over, the use of sombous eith dry, conscionises sond should be used.
 The sombous either it led shut to keep the conditions shill be interested in a constant selight.
 Rock, concrete, from, steel or other solid objects shall not be permitted.

- Rock, concrete, fron, steel or other solid objects shall not be perelited for use as sign aupport weights. Sandbags shall not leg on sinilaus of 35 lbs and on excitus of 50 lbs. Sandbags shall be eaded of auroble material that tears upon weblicular ispect. Rubber (auch as tirs inner fubes) and 1801 be used. Inspect, Rubber (auch as tirs inner fubes) and 1801 be used. Delication portable align supports. Sign supports deligned and mounfactured with rubber bases may be used shen shown on the CRETCO list. Sandbags shall be supported in 101 dower the base supports of the froffic control device and shall not be suspended above ground level or hung offit notes, viric, chains or other factioners. Sandbags shall be alload sand by a closed sand to a placed sand to a located sand to a l

FLAGS ON SIGNS

Flogs stoy be used to drow attention to warning signs. When used, the flog shall be 16 inches square or larger and shall be arrange or fluorescent red-orange in color. Flogs shall not be allowed to cover any portion of the sign face.

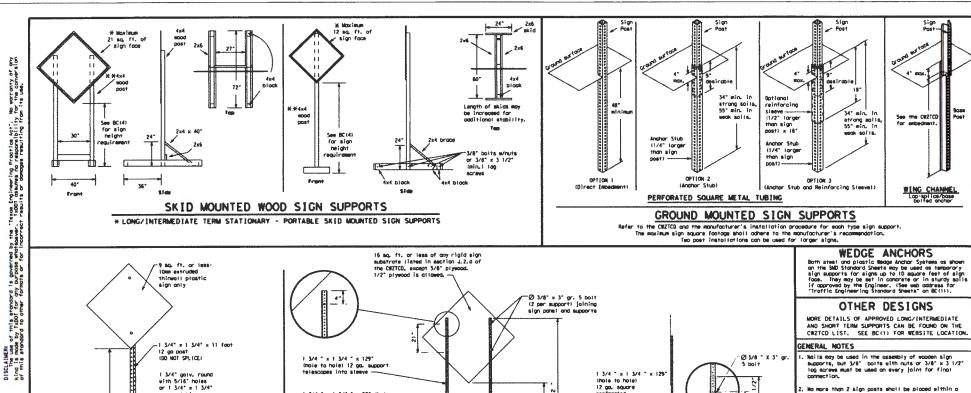
SHEET 4 OF 12

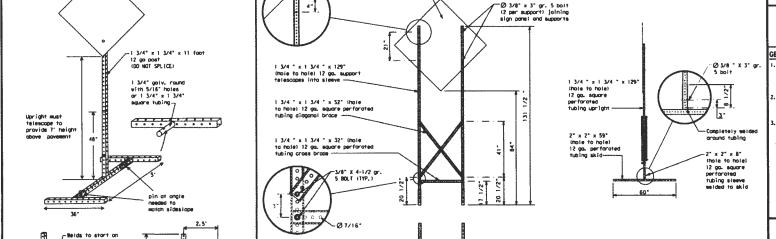
Texas Department of Transportation

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC (4) -21

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(C) 1x601	November 2007	CONCT	:4.01	- SR		H\$GARAT
	HEMISTONS					
9-07	8-14	D(2)		tant-		SHLET HIL
7-13	5-21					SD-48





 When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.

CWZTCD List.

I ft. circle, except for specific materials noted on the

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

** Wood sign posts MUST be one piece. Spiicing will NOT be gligged. Posts sholl be pointed white.

See the CRZTCD for the type of sign substrate that can be used for each approved sign support.
SHEET 5 OF 12



TYPICAL SIGN SUPPORT

BC (5) -21

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© 1x501 November 2007	CONT	3E.C1	. CA		н:	2-dat7 t
HEVESTON'S	7					
9-07 8-14	DIST		COST		т.	SML1 NO.
7-13 5-21						SD-49
99						

SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

32'

12 ga. upright

5'
SINGLE LEG BASE

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

JATE:

apposite sides going in apposite directions, Minimum weld, do not book fill puddle, MNEN MOT IN USE, REMOVE THE POWS FROM THE RIGHT-OF-WAY OR PLACE THE POWS BEHIND BARRIER OR GUARDRAIL WITH SIGN PANEL TURNED PARALLEL TO TRAFFIC

PORTABLE CHANGEABLE MESSAGE SIGNS

- The Engineer/Inspector shall approve all messages used on partiable analysable message signs (POSS). Messages on POSS should contain no more than 8 words labout four to
- racters per word), not including simple words such as "10,"
- Messages should consist of a single phase, or two phases that alternate. Three-phase westages are not allowed. Each phase of the message should convey a single thought, and must be understood by
- Use the word "EXIT" to refer to on exit romp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP." Always use the route or interstate designation (IH, US, SH, FM)
- along with the number shen referring to a roadway. When in use, the bottom of a stationary POMS message panel should be
- a minimum 7 feet above the roodway, where possible.
- o minister if rear coover the cooper, where positions.

 The message them "MEEDER" discussed only if the work is no stort on Softunday worning and end by Sunday evening or miningth.

 Actual days and hours of ends should be disableyed on the POAS if work is to begin on Friday evening one/or continue into Monday sorning.

 The Engineer/Inspector way select one of two options which or evoli-
- oble for disploying a two-phase message on a PCMS. Each phase may be displayed for either four seconds each or for three seconds each.
- Do not "flosh" messages or words included in a message. The message should be steady burn or continuous while alleadyed.

 10. Do not present redundant information on a teo-phose message; 1, e.,
- to, so not present required the message the same and changing the third il line.

 11. Do not use the word "Danger" in message.

 12. Do not display the word "Danger" in message.

 12. Do not display the seasoge "LAMES SHIFT LEFT" or "LAMES SHIFT RICHT" on PCMS. Drivers do not understond the messages.

 13. Do not display messages that scoral horizontally or vertically across
- the face of the sign.

 14. The following table lists abbreviated words and two-word phrases that
- 14. The following toble lists obbrevioted words and two-word phrobes that are acceptable for use on a PDES. Both words in a phrobes such be displayed together, Bords or phroses not on this list should not be obbrevioted, unless shown in the TBUTCD.
 15. PDES character helight should be at least 18 inches for troller sounted unlist. They should be visitate from at least 19, 13 in lie and the text should be legible from at least 500 feet or hight one bod feet in and wast be legible from at least 500 feet or hight one bod feet. The conditions the legible from at least 400 feet.
 15. Each line of text should be centered on the sessage board rather than left or right just 1910.
- left or right justified.

 17. If displied, the PCBS should defout to on illegible disploy that will
- not alors motorists and will only be used to alort workers that the PCMS has maifunctioned. A pattern such as a series of horizontal solid bors is appropriate.

WORD OR PHRASE	ABBREY] AT [OH	WORD OR PHRASE	ABBREVIATION
Access Rood	ACCS RD	Mojor	LUI J
Alternate	ALT	Miles	W
Avenue	AVE	Miles Per Hour	ME.AH
Best Route	BEST RTE	Minor	W R
Boulevard	BL VD	Monday	MON
Br I dge	BRDG	Normal	HORM
Cannot	CANT	North	N.
Center	ÇTŘ	Nor Mbound	(tripute) N
Construction Ahead	CONST AHD	Parking Road	PK ING
CROSS (NG	X I NG	Right Lane	RT LN
Detour Route	DETOUR RIE	Saturday	SAI
Do Not	SONT	Service Road	SEIN RD
East	E.	Shoulder	SHI_DR
Eastbound	(route) E		SLIP
Emergency	EMER	\$11ppery South	15¢ IP
Emergency Vehicle			(coute) \$
Entrance, Enter	ENT	Southbound	SP0
Express Lane	EXP LN	Speed	151
Expressway	EXPWY	Street	G N
XXXX Feet	XXXX FT	Sunday	PHONE
Fog Ahead	FOG AHD	Telephone	TEMP
Frequery	FRWY, FWY	Temporary Thursday	THURS
Freeway Blocked	FRY BLKD	To Downtown	TO DINTA
Friday	FRI	Troffic	T THE DESCRIPTION
Hazardaus Driving			
Hozardous Moterial	HA THAT	Trovelers	TRIVLRS
High-Occupancy	HOV	Yuesday	TUES
Vehicie		Time Minutes	TY ME WIN
Highway	HBY	Upper Level	UPR LEVEL
Hour (a)	HR, HRS	Vehicles (s)	VEH, VEHS
Information	INFO	Marning	WARN
It is	IYS	Bednesday	WED
Junction	JCY	Beight Limit	WY LIMIT
Left	LFY	Test	16
Left Lane	LFY LN	Bestbound	(ribute) #
Lane Closed	LN CLOSED	Bet Povement	BE PWIT
	LING LEVEL	Will Not	WONE
Lower Level Mg intendnce	MAINE LIBR CEVEL		

Roadway dealignation * IH-number, US-number, SH-number, FN-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/Ramo Clasure List Other Condition List FRONTAGE ROADWORK ROAD CLOSED ROAD REPAIRS X MILE CLOSED XXXX FT ROAD SHOULDER FLAGGER LAME CLOSED CLOSED XXXX FT NARROWS XXXX FT AT SH XXX XXX FT ROAD RIGHT LN RIGHT LN TWO-WAY NARROWS TRAFFIC CLSD AT CLOSED XXXX FT XX MILE FM XXXX XXX FT MERGING CONST RIGHT X RIGHT X TRAFFIC LANES LANES CLOSED OPEN XXXX FT XXX FT UNEVEN CENTER DAYTIME LOOSE GRAVEL LANES CLOSED CLOSURES XXXX FT XXXX FT NIGHT 1-XX SOUTH DETOUR BUILDA FXIT X MILE ROAD XXXX FT CLOSURES CLOSED EXIT XXX ROADWORK ROADWORK VARIOUS. CLOSED LANES CLOSED SH XXXX FR1-SUN X MILE RIGHT LN BI MP US XXX XXXX FT CLOSED TO BE FYIT CLOSED X MILES

XXXXXXXX * LANES SHIFT in Prose 1 must be used with STAY IN LANE in Prose BLVD CLOSED

TRAFFIC

SIGNAL

XXXX FT

Phase 2: Possible Component Lists

A		/E	ffect on Trav	el	Location List		Warning List		* # Advance Notice List
	MERGE RIGHT		FORM X LINES RIGHT		AT FM XXXX		SPEED LIMIT XX MPH		TUE-FRI XX AM- X PM
	DETOUR NEXT X EXITS		USE XXXXX RD EX[T		BEFORE RAILROAD CROSSING		MAXIMUM SPEED XX MPH		APR XX- XX X PM-X AM
	USE EXIT XXX		USE EXIT I-XX NORTH		NEXT X MILES		MINIMUM SPEED XX MPH		BEGINS MONDAY
	STAY ON US XXX SOUTH		USE I-XX E TO I-XX N		PAST US XXX EXIT		ADVISORY SPEED XX MPH		BEGINS MAY XX
	TRUCKS USE US XXX N		WATCH FOR TRUCKS		TO TO XXXXXXX		RIGHT LANE EXIT		MAY X-X XX PM - XX AM
	WATCH FOR TRUCKS		EXPECT DELAYS		US XXX TO FM XXXX		USE CAUTION		NEXT FRI-SUN
	EXPECT DELAYS		PREPARE TO STOP				DRIVE SAFELY		XX AM TO XX PM
	REDUCE SPEED XXX FT		END SHOULDER USE				DRIVE WITH CARE		NEXT TUE AUG XX
,	USE OTHER ROUTES		WATCH FOR WORKERS						TONIGHT XX PM- XX AM
2.	STAY IN LANE	*			*	¥ See A	pplication Guide	ines	Note 6.

APPLICATION GUIDELINES

X LANES

CLOSED

TUE - FRI

- 1. Only I or 2 phases are to be used on a POWS.
- The lat phase for both) should be selected from the "Road/Lone/Romp Clobure List" and the "Other Condition List".
 A 2nd phase can be selected from the "Action to Toke/Effect on Travel, Location, General Marning, or Advance Natice
- Phose Lists".
 4. A Location Phose is necessary only if a distance or location
- is not included in the first phose selected.
- is not included in the first phase selected.

 If two POSS are used in sequence, they must be separated by a sinisum of 1000 ft. Each POSS shall be limited to two phases, and should be understandable by themselves.

 6. For advance notices, when the ourrant date is within seven days of the actual such days, colaridat polys should be replaced with days of the seek. Advance notification should typically be for no some those one seek. Advance notification should typically be for no some those one seek.

WORDING ALTERNATIVES

- The words RIGHT, LEFT and ALL can be interchanged as appropriate.
 Roadway designations 1H, US, SH, FM and LP can be interchanged as
- 3. EAST, MEST, MORTH and SOUTH (or abbreviations E, W, N and S) con
- be Interchanged as appropriote.
 4. Highest name on an appropriote.
 5. Roub, Highest and FRESH on be interchanged as needed.
 6. ARAD may be used instead of distances if necessary.
 7. Fill 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.

LANES

SHIFT

FULL MATRIX PCMS SIGNS

same size arrow.

MALL

DRIVEWAY

CLOSED

- 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
- CHANCEABLE MESSAGE SIGNS one bear, the process response to the process respons 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 slop-4. A full earlix PORS may be used to simulate a flashing arrow board provided it meets the visibility, flosh rate and disming requirements on BC(7), for the

SHEET 6 OF 12

BARRICADE AND CONSTRUCTION

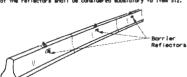
Texas Department of Transportation

PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC (6) -21

Afte:	bo 21.cgm	on: In	(A)	rer in 1931	GÆ.	TATAL.	17. Fx(2)
(€) 1x601	November: 7007	C/MCT	SEC1	, CB		H!	-was
	PCY151(n/s						
9-07	8-14	0:51		1657		T	SML(: #J.
7-13	5-21		-				SD-50
1023							

- Borrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8500. A list of prequalified Borrier Reflectors can be found at the Materiol Producer List web address. shown on BC(1).
- 2. Color of Borrier Reflectors shot) be as specified in the TMUTCD. The

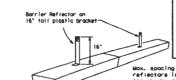


CONCRETE TRAFFIC BARRIER (CTB)

- 3. Where traffic is an one side of the CTB, two (2) Barrier Reflectors shall be sounted in approximately the midsection of each section of CTB. An alternate sounting location is uniformly spaced of one end of each CTB. This will allow for oftochment of a barrier grapple without damaging the reflector. The Barrier Reflector sounted on the side of the CTB shall be located directly below the reflector sounded on top of
- the borrier, as shown in the detail above.

 There CTB separates to-way traffic, three barrier reflectors shall be sounted on each section of CTB. The reflector unit on top shall have two velice reflective faces (Bi-Directional) while the reflectors on each side of the borrier sholl have one yellow reflective face, as show the detail above.
- When CTB separates traffic traveling in the same direction, no barrier
- reflectors will be required on top of the CTB.

 Borrier Reflector units shall be yellow or white in color to match
- the edge line being supplemented,
 Maximum spacing of Borrier Reflectors is forty (40) feet.
 Powement markers or temporary flexible-reflective roadway marker tabs
 sholl MOT be used as CIB delineation.
- 9. Attochment of Borrier Reflectors to CTB shoul be per monufocturer's smendations.
- 10. Missing or domoged Borrier Reflectors sholl be replaced as directed
- by the Engineer.
 11. Single stope borriers shall be delineated as shown on the above detail.

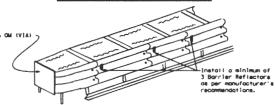


LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

LPCR is opproved for use in work zone locations, where the posted speed is 45mph, or less. See oodway Standard Sheet LPCR.

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

LOW PROFILE CONCRETE BARRIER (LPCB)



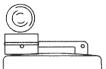
DELINEATION OF END TREATMENTS

END TREATMENTS FOR CTB'S USED IN WORK ZONES

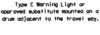
End treatments used on CTB's in work zones shall meet the apppropriate crashworthy standards as defined in the Manual for Assessing Safety Hardware (MASH). Refer to the CWZTCD List for approved and treatments and sanufacturers.

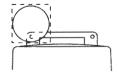
BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS



Type C Warning Light or





Marning reflector may be round or soupre. Must have a velice reflective surface area of at least 30 soupre inches

- Worning Eights sholl meet the requirements of the TMUTCD.
 Worning Eights sholl NOT be installed on borricodes.
- Sporting lights shall MOI be installed on borrloodes.
 Type A-Low Intensity Filashing Borning Lights are commonly used with drums. They are intended to worn of an ark a potentially hozordous area. Their use shall be as indicated on this sheet and/or other sheets of the pians by the designation "FL". The Type A Borning Lights shall not be used with signs, accurately are with Type B₀ or C₁ Steeting seeting the requirements of borrhemstoll laterial Specification IBS-3500.
 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 signation "SB".
 The Engineer/Inspector or the plans shall specify the location and type of worning lights to be installed on the traffic control devices.
 Shen required by the Engineer, the Contractor shall furnish a capy of the worning lights shall any unring lights shall any unring lights shall not carried.
 The under the destination curves, Type-C and Type D Steady Burn Lights shall only be placed to use unstalled of the curve, not the Inside.
 The location of worning lights and worning reflectors on drums shall be as shown elsewhere in the plans.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

- 1. Type A flashing worning lights are intended to worn drivers that they are approaching or are in a potentially hazardous area.
 2. Type A random flashing worning lights are not intended for delineation and shall not be used in a series.
 3. A series of sequential flashing worning lights placed on charmetizing devices to force a merging taper way be used for delineation. If used, the successive flashing worning lights placed on charmetizing devices to force a merging taper way be used for delineation. If used, the successive flashing of the sequential worning lights should occur from the beginning of the taper to the end of the merging taper in order to identify the desired whicle path. The rate of flashing for each light should be plus or minus to flashes.
- 4. Type C and D steady-burn worning lights are intended to be used in a series to delineate the edge of the frowt lone on detaurs, on lone changes, on lone closures, and on other stellar conditions.

 5. Type C, Type C and Type D worning lights are intended to be used in a series to delineate the edge of the frowt lone on detaurs, on lone closures, and on other stellar conditions.
- 6. Marning lights should not be installed on a drum that has a sign, chevron or vertical panel.
 7. The maximum spacing for worning 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

- 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 atherwise noted in the plans.
- 2. The sorning reflector shall be yellow in color and shall be sanufactured using a sign substrate approved for use with plastic druss listed
- The worning reflector shall have a minimum retroreflective auritoce area lone-side) of 30 square inches.
- Round reflectors shall be fully reflectorized, including the area where attached to the drum.
 Square substrates must have a minimum of 30 square inches of reflectorized sheeting. They do not have to be reflectorized where it
- ottoches to the drum.
- The side of the worning reflector facing approaching traffic shall have sheeting seeting the color and retroreflectivity requirements for
- DMS 8300-Type 6 or Type C.

 7. When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
- The worning reflector should be wounted on the side of the hondle necrest approaching troffic.
 The maximum spacing for worning reflectors should be identical to the channelizing device spacing requirements.

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

- The Floshing Arrow Board should be used for all lone closures on multi-lone roodways, or slow moving saintenance or construction activities on the travel lones.
 Floshing Arrow Boards should not be used on two-lone, two-way roodways, detours, diversions or sork on shoulders unless the "CAUTION" display less detail below! is used.
 The Fighter/Impactor should be used in conjunction either the Fighting Arrow Board.
 The Fighting Arrow Board should be used in conjunction eith the Fighting Arrow Board.

- - OR





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



SEQUENTIAL CHEVRON tright chevron shown;

- The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Atternating

- The "CAUTION" display consists of four corner large flashing simultaneously, or the Atternating Diocond Courtion sade as shown.
 The straight line caution display is NOT ALLORED.
 The Flashing Arrow Board sholl be capable of minimum 50 percent disming from rated large voltage. The flashing arrow food sholl be capable of minimum 50 percent of the flashing prote of the large shall not be less than 25 nor more than 40 flashes per minute.
 Minimum large flashing carrow and flashing the shall be approximately 50 percent for the flashing arrow and clipping is NOT ALLORED.
 The sequential arrow display is NOT ALLORED.
 The flashing arrow display is the TubOI standard, however, the sequential chevron display arrow board shall be southed on a vehicle, tholler or other suitable support.
 The Flashing arrow South MINIMA LECON to thereby shift that it is not a construction of the sequential chevron display arrow board shall be southed on a vehicle, tholler or other suitable support.
 Flashing arrow source shall be southed on a vehicle, tholler or other suitable support.
 Flashing arrow source shall be southed on a vehicle, tholler or other suitable support.
 Flashing arrow source shall be southed on a vehicle, tholler or other suitable support.
 Flashing arrow source shall be sourced on a vehicle, tholler source shall be supported to the source of the sourc

REQUIREMENTS							
TYPE	MINIMAM 51ZE	MINIMAM HAMBER OF PANEL LAMPS	WINTHUM VISIBILITY DISTANCE				
В	30 × 60	13	3/4 mile				
C	48 x 96	15	1 mile				

ATTENTION
Floshing Arrow Boards
shall be equipped with
automatic disming devices

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

FLASHING ARROW BOARDS

SHEET 7 OF 12

Texas Department of Transportation

TRUCK-MOUNTED ATTENUATORS

- Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the Monual for Assessing Safety Hardware (MASH).

- This are required on freeways unless otherwise noted
- 4. Issis one required on freewoys unless otherwise noted in the plotte.

 5. A Tisk stabulid be used drynline that it can be positioned. 30 to 100 feet in advance of the area of cree exposure eithout obsersely offseting the sork performance.

 6. The only reason o Tisk should not be required is when a work or so is spread down the roodedy and the work cree is an extended oils stored from the Tisk.

Assessing Sofety Hordwore (MASH). Refer to the CRITCD for the requirements of Level 2 or Level 3 TMAs. Refer to the CRITCD for a list of approved TMAs. ARROW PANEL, REFLECTORS, WARNING LIGHTS & ATTENUATOR

В	C	(7)	-	2	1

BARRICADE AND CONSTRUCTION

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10341	Hoverber 7007	C*861	SACT	- 08		HIGHER
	REVESTORS.					
9-07 7-13	8-14 5-21	0(2)		Comit		SHOUCH AD.
7-13	2-21					SD-51

GENERAL NOTES

- For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
- For Intermediate term stationary work zones on freeways, drums should be used as the prisony channel lizing davio but may be replaced in tangent sections by vertical panels, or 42' two-piece comes. In tangent sections, one-piece comes may be used with the approval of the Engineer but only if personnel are present on the project at all times to maintain the
- comes 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.
- opproved by the Inglister.

 Pruss and oil related items shall comply with the requirements of the current version of the "lexos Marqual on Uniform Intelligences." (RMITCE) and the "Compliant Bork Zone Fraffic Control Bevices."
- Drums, bases, and related materials shall exhibit good workmanship and Oruse, boses, and related sateriors shall be free from objectionable small as free from objectionable small free from objection shall be free o maximum of 24 hours to replose any plastic druss identified for replocessent by the Engineer/Inspector. The reploce-
- ment device must be an approved device.

GENERAL DESIGN REQUIREMENTS

- Pre-qualified plastic drums shall meet the following requirements:
- Plastic druss shall be a two-place designs the "body" of the drus shall be the top portion and the "bose" shall be the boffon.
 The body and bose shall lock together in auch a samer that the body
- separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles,
- Plastic drums shall be constructed of lightwelight flexible, and deformable materials. The Contractor shall NOT use setal drums or single piece plostic drums as channelization devices or sign supports. Drums shall present a profile that is a minimum of 18 inches in width
- at the 36 inch height when viewed from any direction. The height of drum unit (body installed on base) shall be a minimum of 36 inches and a maximum of 42 inches,
- The top of the drue shall have a built-in handle for easy pickup and shall be designed to drain water and not collect debris. The handle shall have a minimum of two widely spaced 9/16 Inch diameter hales to ollow attachment of a worning light, worning reflector unit or approved
- compliant sign.
 The exterior of the drum body shall have a minimum of four alternating 4 Inches nor greater than 8 Inches in width, Any non-reflectorized space between any two adjacent stripes shall not exceed 2 inches in
- Boses shall have a maximum width of 36 inches, a maximum height of 4 inches, and a minimum of two footholds of sufficient size to allow base to be held down while separating the drum body from the base.
 Plastic drums shall be constructed of ultra-violet stabilized, arange,
- high-density polyethylene (NDPE) or other approved material.

 9. Drum body shall have a maximum unballosted weight of 11 lbs.
- 10. Brum and base shall be sorked with saturfacturer's name and made! number.

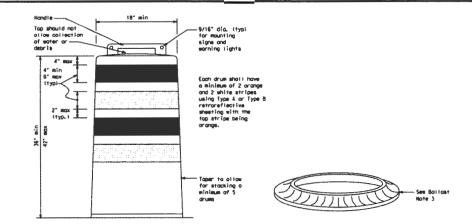
RETROREFLECTIVE SHEETING

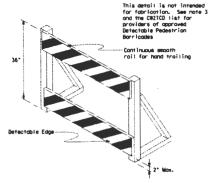
- The attribes used on druss shall be constructed of sheeting meeting the color and retroreflectivity requirements of Bepartmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective lamenting shall be auspited unless otherwise specified.
- The sheeting shall be suitable for use on and shall adhere to the drus surface such that, upon varifular impact, the sheeting shall remain adhered in-place and suitable no deladinating, creaking, or loss of retroreflectivity other than that loss due to obrasion of the sheeting

BALLAST

- 1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the bollost material, should weigh between 35 lbe (minimum) and 50 lbs (maximus). The bollost may be sand in one to three sandbook separate from the base, sand in a sand-filled plastic to three sandbags separate from the bose, sond in a sand-filled plast to base, or other bollasting devices as agaroved by the Engineer. Stocking of sandbags will be allowed, however height of sandbags above povement surface may not exceed 12 inches. Boses with built-in bailost shaft weigh between 40 lbs. and 50 lbs.
- Builtt-in bottost can be constructed of an integral crust rubber base or
- o solid rubber boss.
 Recycled truck tire sidewolls may be used for bollost on drums approved for this type of bollost on the CWZTCD list.
- The bollost shall not be heavy abjects, water, or any material that would become hazardous to materials, pedestrions, or workers when the drum is atruck by a vehicle.
- then used in regions susceptible to freezing, drums should have drainage holes in the bottoms so that water will not collect and freeze becoming
- o hazard when struck by a vehicle.

 Ballost shall not be placed on top of drums.
- Adhesives may be used to secure base of drums to povement.





DETECTABLE PEDESTRIAN BARRICADES

- DETECTABLE PEDESTRIAN BARRICADES

 1. Shen saisting pedestrion focilities are disrupted, closed, or relocated in a TIC zone, the temporary facilities shall be detectable and include accessibility fedurac consistent with the features present in the existing peasant for facility. Reference of a facility of the second state of t

- 4. Tope, rope, or plastic chain strung between devices are not Tops, rops, or plastic chain strung between devices are not detectable, ab 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
- Marning Hights shott not be offerhed to detectable padestrion
- bericodes. Detection bericodes should use 8" nominol bericode personate pedestrion bericodes should use 8" nominol berricode rolls as shown on BCI10) provided that the top roll provides a secont continuous roll suitable for hand trolling with no splinters, burns, or shorp edges.



18" x 24" Sign (Maximum Sign Dimension) Chevron CE1-8, Opposing Troffic Lone Divider, Driveway sign D70o, Keep Right R4 series or other signs as approved by Engineer



Vertical Panel mount with diagonals stoping down towards

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 ploatic drums shall be manufactured using
- Chevrons and other work zone signs with an orange bookground shall be extrufactured with Type B₂, or Type C₁₇ Grange sheeting exeting the color and retronsflectivity requirements of DBG-3300, "Sign Foos Materiol," unless otherwise apporting in the pions.
- Vertical Panels shall be exhibitatived with orange and white sheeting smetling the requirements of DMS-8300 Type & or Type is Diagonal stripes on Vertical Panels shall slope down toward
- 4. Other sign susages (text or symbolic) may be used as opproved 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 should be instolled using a 1/2 inch bolt (nominal) and nuft, two washers, and one lacking washer for each
- 6. Mounting boits and muts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2
- 7. Chevrons may be placed on drums on the outside of curves, Cherrons may be placed on drume on the outside of curves, on merging topers or on shifting topers. When used in these locations, they may be placed on every drue 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 ore 24 inches wide may be mounted on plastic drums, with approval of the Engineer.

SHEET 8 OF 12

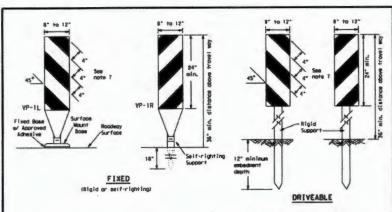
Texas Department of Transportation

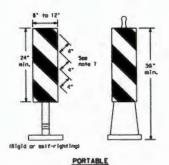
Treffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (8) -21

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1.1-13		_		-		30-32





- Vertical Panals (VP's) are normally used to channellize traffic or allyles apposing tames of traffic.
 VP's may be used in dyline or night-lise alluations.
 They may be used at the edge of shoulder argo-offs and other cross such as lone transitions share positive daytime and night-lime delineation is required. The fraginer/impactor's shill refer to the Roadeay Bealgh Manual for additional requirements on the use VP's for grop-offs.
- for grop-offs.

 y. P° a should be isounted book to book if used of the edge of cuts adjocent to two-way two lone roadways. Stripes are to be reflective organge and reflective white and about a toler stope of the roadways stope downward toward the trovel lone.

 4. Y° a used on expressively and freeways or other high speed roadways, may have some than 210 square inches of retrovellective core facing traffic.

 5. Self-righting supports are evaluable with portable base. See "Compilant Bork Zone Troffic Control Bevices List" (CRITCD).

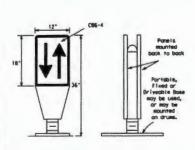
 Seet from for the Y° a shall be retroper[set]us Tows & or Seet Compilant Bork & Seet Compilant Bork & Tower Bork & Seet Compilant Bork & Seet Bor

- (CRITCH).

 Sheering for the VP's sholl be retroreflective Type & or Type B conforming to Departmental Material Specification DBS-8500, unises noted otherwise.

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

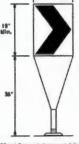
VERTICAL PANELS (VPs)



- Opposing Traffic Lone Dividers (OTLD) are delineation devices designed to convert a normal one-way randway section to two-way operation, OTLD's are used an temporary centerlines. The upward and doeseard arrows on the sign's face indicate the direction of traffic an either side of the divider. The base is secured to the povement with an achesive or rubber weight to minimize mor caused by a vehicle impact or wind guet.
- 2. The OTLD may be used in agets ingolan with 42"
- Specing between the OTLD shall not exceed 500 feet, 42" comes or VPs placed between the OTLD's should not exceed 100 foot specing.
- 4. The OTLD shall be arrange with a black nor reflective legend, Sheeting for the OTLB shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Materiol Specification DMS-8300, unless noted otherwise. The legend shold met the requirements of DMS-8300.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)





Fixed Bone w/ Approved Adhesive (Orlvarbte from or Flexible

- The chevron shall be a vertical rectangle with a minimum size of 12 by 18 indres.
- Chevrona are interested to give notice of a sharp change of alignment with the direction of framel and provide additional emphasis and guidance for vehicle operators with regard to changes in harizontal alignment of the roadway
- Chevrone, when used, shall be erected on the out-side of a sharp curve or turn, or on the for side of an intersection. They shall be in line with and at right angles to approaching traffic.
 Spacing should be such that the 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.
- Chevrons shall be arongs with a black nonreflec-tive legand, Sheeting for the chevron shall be retroralisative type By or type Cq. conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall seet the
- 6. For Long Term Stationary use on topers or transitions on freeways and divided highways, self-righting chevrons may be used to supplemen plastic drums but not to replace plastic drums.

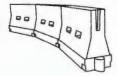
CHEVRONS

GENERAL NOTES

- Work Zone channelizing devices litustrated on this sheet may be installed in close praximity to traffic and are suitable for use on high or law speed roadleys. The Engineer/Impector and il ensure that appoing and processent is uniform and in apportance with the "Texas Manual on Uniform Traffic Control Devices" (TMITCD).
- 2. Charmetizing devices shown on this sheet may have a driveable, fixed ar portable base. The requirement for self-righting channelizing devices must be specified in the General Notes or other plan sheets,
- Channelizing devices on self-righting supports should be used in early zone areas where channelizing devices are frequently impacted by errant vehicles or vehicle related eind gusts making alignment of the charmelizing devices difficult to maintain. Locations of these devices shall be desired elsewhere in the plans. These devices shall conform to the MAJICD and the "Compilant Bork Zone Traffic Control Devices List" (CMZTCD).
- 4. The Contractor shall maintain devices in a steam condition and replace dataged, nonreflective, foded, or broken devices and bases as required by the Engineer/Inspector. The Contractor shall be required to maintain proper
- the Engineer/Inspector. The Contractor shall be required to maintain proper device spocing and oil greater.

 5. Portable bases shall be fabricated from virgin ans/or recycled rubber. The portable bases shall set for a sinitum of 30 lbs.

 6. Powement surfaces shall be prepared in a somer that ensures proper banding between the otherives, the filed mount bases and the powement surface. Adhesives shall be prepared and applied according to the somutacturer's recommendations.
- recommendations. The installation and removal of channellzing devices shall not cause derienental effects to the final powement surfaces, including powement surfaces arfaces and solderarion or surface integrity, the liveoble bases shall not be permitted on final powement surfaces. The Engineer/Inspector shall approve all application and restored procedures of filed bases.



LONGITUDINAL CHANNELIZING DEVICES (LCD)

- LCDs are proshed thy, lightweight, deformable devices that are highly visible, have good target value and
 can be connected together. They are not designed to contain or redirect a vehicle on impact.
 LCDs any be used instead of a line of cones or drawn.
 LCDs any be used instead of a line of cones or drawn.
 LCDs any services are the contained of the contained of the contained of the contained of the contained only the contained only the contained on the contained only the contained on the contai
- should not be used to provide positive protection for obstacles, pedestrione or workers.
- 5. LCDs shall be supplemented with retroreflective delineation as required for temporary barriers
- on 8C(7) when placed roughly porcified to the trovel lones,

 6. LCbs used as barricades placed perpendicular to traffic should have at least one ray of reflective enseting meeting the requirements for borricode rolls do shown on SC(10). Place reflective sheeting near the top of the LCD along the full length of the device.

WATER BALLASTED SYSTEMS USED AS BARRIERS

- 1. Noter ballosted systems used as borriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate banual for Assessing Safety Hardware (MSSI) creatyporthiness requirements based on roadway seed and borrier application.
 2. Noter ballosted systems used to channelize weblaular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve delytimar/injertime visibility. They may also be supplemented with powement markings.
 3. Noter ballosted systems used as borriers should be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CEXTCO list.
 4. Noter ballosted systems used as borriers should not be used for a serging taper except in low speed (less than 45 MPH) urban roses. When used on a taper in a law speed urban area, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the evaluate geometric conditions.

 5. When worth ballosted systems used as borriers have blurt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flored to a point autside the clear zone.

If used to channelize pedestrians, longitudinal channelizing devices or eater bollosted systems must have a continuous devicable bottom for users of lang cares and the top of the unit shall not be less than 32 inches in height.

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

Posted Speed	Formula		Minimus estrob er Len **	10	Suggested Maximum Spacing of Channellzing Devices		
		10' Offset	Offset	12' Offset	On o Toper	On a Tangent	
30	. 2	150"	165"	180'	30'	60'	
35	L - WS2	205	225'	245"	35'	70'	
40	- 60	265'	295	320"	40'	80'	
45		450'	495	540"	45'	90'	
50	1	500	550"	600	50"	100'	
55	LOWS	550"	605	660	55'	110'	
60	F-#2	600	660	720'	60'	120'	
65		650"	715'	780'	65'	130"	
70		700'	770"	840"	70'	140'	
75		750"	825"	900'	75'	150'	
80	1	800	880	960'	80"	160"	

** Toper lengths have been rounded off. .
L-Length of Toper (FT.) E-Eight of Offset (FT.)
S-Posted Soeed (MPM)

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

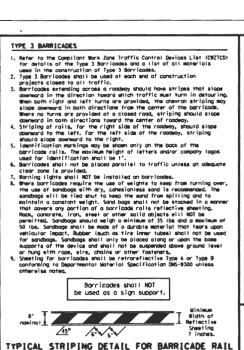
SHEET 9 OF 12

Texas Department of Transportal

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) -21

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9-07 7-13	8-14 5-21	EGST		CO #413		SHELL HAVE
7-13	2-21				1	SD-53
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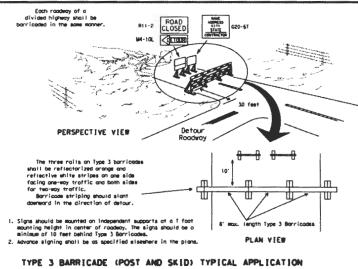


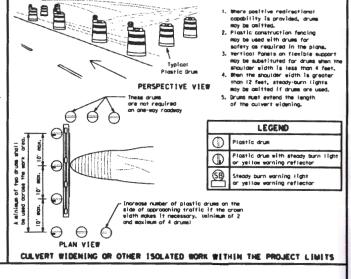
4' mln., 8' mox.

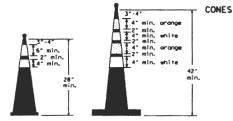
Stiffener may be inside or outside of support, but no more than

TYPICAL PANEL DETAIL

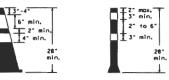
Flat rail





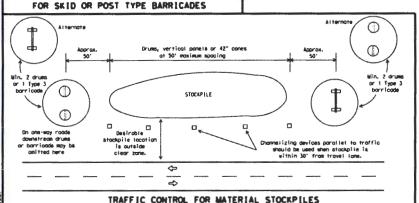






One-Piece cones

Tubular Marker



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 comes and tubular markers shall be predominantly arange, and

meet the height and weight requirements shown above.

2. One-place cones have the body and base of the cone molded in one consolidated unit. Two-piece comes have a come shaped body and a separate rubber base, or ballost, that is added to keep the daylor upright and in place.

or bollost, mr is account response or hondle or loop extending up to 8" doors the sinisus height shown, in order to did in retrieving the device.

1. Conse or tabulor shorkers shall have shits or white and orange reflective bonds as shown above. The reflective bonds shall have a assort, sealed outer surface and seet the requirements of Departmental Material Specification DMS-8300 Type A or Type B.

5. 28" comes and tubular markers are generally suitable for short duration and short-term stationary work as defined on BC(4). These should not be use for intermediate-term or long-term atotionary work unless personnel is on-site to maintain them in their proper upright position.

5. 42" two-piece cones, vertical panels or drums are suitable for all work zone

7. Comes or fubular markers used on each project should be of the same size



WORK ZONE PAVEMENT MARKINGS

GENERAL

- The Contractor shall be responsible for maintaining work zone and existing powement workings, in accordance with the standard specifications and special provisions, on oil roadways open to troffic within the CSJ limits unless otherwise stated in the plants.
- Color, potterns and dimensions should be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
- Additional supplemental povement marking details may be found in the plane or exertifications.
- Povement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
- When short term morkings are required on the pions, short term morkings shall conform with the INUICD, the pions and details as shown on the Standard Pion Sheet M2(SPM).
- 6. When stondard povement markings are net in place and the roadway is operaed to troffic, DD NOT PASS signs shall be erected to mark the beginning of the sections where possing is prohibited and PASS BITM CARE signs of the beginning of sections where possing is paralithed.
- All work zone payement markings shall be installed in accordance with Item 662, "Bark Zone Payement Workings."

RAISED PAVEMENT MARKERS

- Roised povement workers are to be placed according to the patterns on BC(12).
- All roised powement morkers used for bork zone morkings shall meet the requirements of Item 672, "RAISED PAYEMENT MARKERS" one Departmental Material Specification DMS-4200 or DMS-4300.

PREFABRICATED PAVEMENT MARKINGS

- Removable prefabricated povement earkings shall seet the requirements of DMS-8241.
- Non-removable prefabricated payement workings (foi) back) shall meet the requirements of DMS-8240,

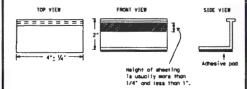
MAINTAINING WORK ZONE PAVEMENT MARKINGS

- The Contractor will be responsible for maintaining work zone payement markings within the work limits.
- Bork zone powerent workings shall be inspected in occardance with the frequency and reporting requirements of work zone traffic control device inspections or required by Form 599.
- The morkings 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 readway geometries.
- Morkings falling to meet this criteria within the first 30 days after placement shall be replaced at the expense of the Contractor as per Specification [new 662.

REMOVAL OF PAVEMENT MARKINGS

- Povement starkings that are no longer applicable, could create confusion or direct a sobraist tosura or into the clased portion of the roadery shall be resoved or abiliterated before the roadery is opened to traffic.
- The above shall not apply to detaurs in place for less than three days, where flaggers and/or sufficient channelizing devices are used in lieu of sankings to outline the detaur route.
- Povement morkings shall be removed to the fullest extent possible, so as not to leave a discernable marking. This shall be by any method approved by YEDD Specification (free 677 for "Eliminating Existing Povement Morkings and Morkers".
- The removal of povement markings may require resurfacing or seal coating portions of the roadway as described in 11em 677.
- Subject to the approval of the Engineer, any method that proves to be successful on a particular type powerent may be used.
- Bloat cleaning may be used but will not be required unless specifically shown in the plans.
- 7. Over-pointing of the markings SHALL NOT BE permitted.
- Removal of roised povement markers shall be as directed by the foolneer.
- Removed of existing powement workings and morkers will be poid for directly in accordance with Item 677, "ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS," unless otherwise stoted in the plans.
- 10. Block-out marking tape way be used to cover conflicting existing markings for periods less than two weeks when approved by the Engineer.

Temporary Flexible-Reflective Roodway Marker Tabs



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

- Temporary flexible-reflective roodway marker tabs used as guidemorks shall meet the requirements of DNS-8242.
- fobs detailed on this steet are to be inspected and accepted by the Engineer or designated representative. Sampling and testing is not normally required, however at the cotion of the Engineer, either "A" or "8" below say be imposed to assure quality before placement on the contemp.
 - A. Select five (5) or more tobs at random from each lot or shipment and submit to the Construction Division, Materials and Powement Section to determine specification compliance.
 - 8. Select five (5) tobs and perform the following test. Affix five (5) tobs of 24 inch intervals on on canabitic powersmit in a straight line. Using a medium size passenger vehicle or pickup, not over the moriers with the front out ran rires of a speed of 35 to 8 miles per hour, four (4) Yiess in each direction, to more than one (1) out of the five (3) reflective surfaces enall be lost or displaced so result of this test.
- 3. Smott design variances may be noted between tab manufacturers.
- See Standard Sheet RZ(STPM) for tab processent on new povestents. See Standard Sheet TCP(7-1) for tab processent on seal coat work.

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

- Roised povement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
- All temporary construction raised powerent markers provided on a project shall be of the same manufacturer.
- Adhesive for guidenorius shall be bituninous material hat applied or butyl rubber pad for all surfaces, or themsoplastic for concrete surfaces.
- Guidemarks shall be designated as: YELLOS - (two outer reflective surfaces with yellow body). BMITE - (one bilver reflective surface with white body).

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

A list of prequalified reflective raised powement morkers, non-reflective traffic buttons, roodway morker tobs and other powement markings can be found at the Material Producer List web address shown on BC(1).

SHEET 11 OF 12

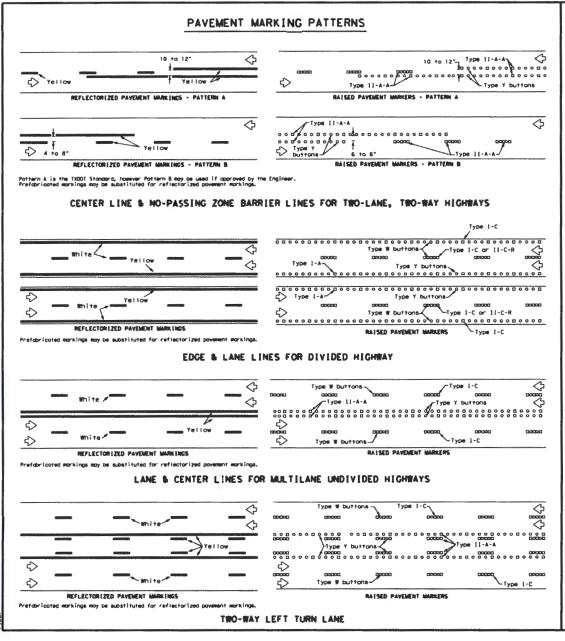


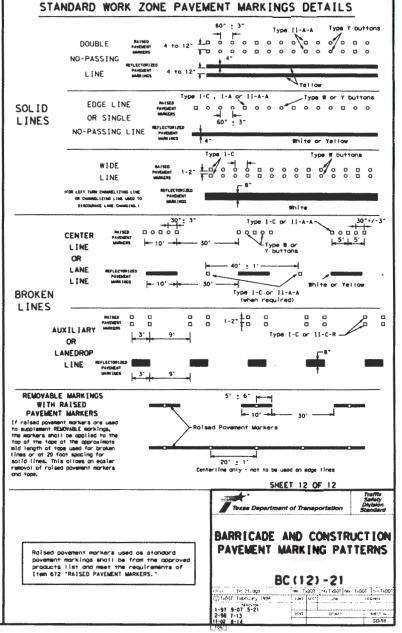
BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

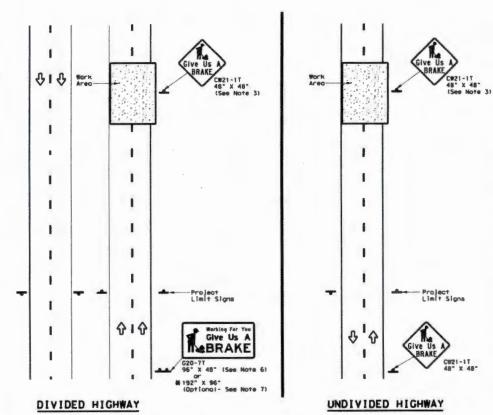
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DATE









SUMMARY OF LARGE SIGNS GAL VANIZED STRUCTURAL DRILLED REFLECTIVE BACKGROUND SIGN SIGN STEEL SIGN SQ FT DESIGNATION DIMENSIONS SHEETING COLOR. 24" DIA. (LF) Size (1) (LF) BRAKE Orange G20-7T 96" X 48" 32 Type Bp or CpL \blacktriangle Orange G20-7T 192" X 96" Type B_{FL} or C_{FL} 128 12 88x18

	LEGEND
-	Stgn
	Large Sign
4	Traffic Flow

DEPARTMENTAL	MATERIAL	SPECIFIC.	ATIONS
PLYWOOD SIGN BLANKS			DMS-7100
ALUMINUM SIGN BLANKS			DMS-7110
SIGN FACE MATERIALS			DWS-8300

COLOR	USAGE SHEETING MATERIAL		
ORANGE	BACKGROUND	TYPE BEL OR TYPE CEL	
BLACK	LEGEND & BORDERS	NON-REFLECTIVE ACRYLIC FILM	

GENERAL NOTES

- 1. See BC and SMD sheets for additional sign support details.
- 2. 51gh locations shall be approved by the Engineer.
- 3. For projects more than two miles in length, Give Us a BRAKE signs should be repeated halfway through the project. The Give Us a Brake (CW21-17) may be used for this purpose.
- Bork zone speed limits are sametimes used in conjunction with GIVE US A BRAKE signing. See BCI31 for location and specing of construction speed zone signing when required.
- 5. Give Us a Broke (CM21-1T) signs and supports shall be considered subsidiary to Item 502, "Barricades, Signs and Traffic Handling."
- The 96" X 48" Working For You Give Us A BRAKE (G20-7T) may use a 1/2" or 5/8" plysood substrate or 0,125" aluminum sheeting substrate and may be supported by two 4" x 5" wood posts with drilled holes for breakway as per BC(5) and will be subsidiery to Item 502.
- The Working For You Give Us A BRAKE (G20-7T) 192" X 96" sign shall be paid for under the fallowing specification Items:

Item 636 - Aluminum Signs Item 637 - Lorge Roadside Sign Supports and Assemblies, Item 416 - Drilled Shaft Foundations

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

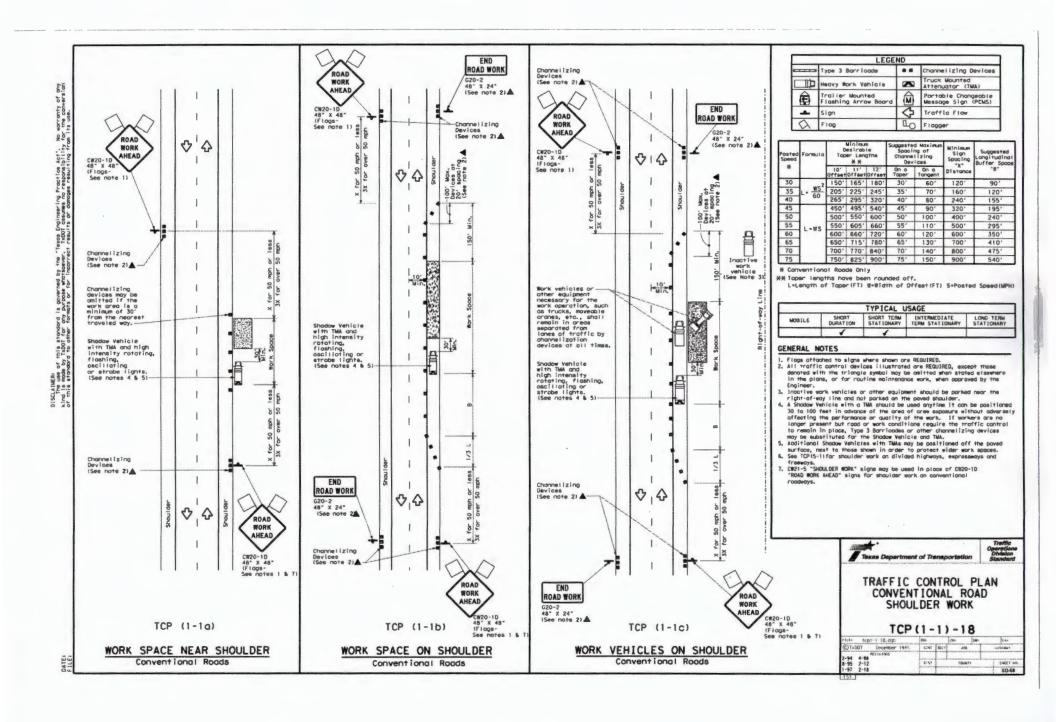
WORK ZONE "GIVE US A BRAKE" SIGNS

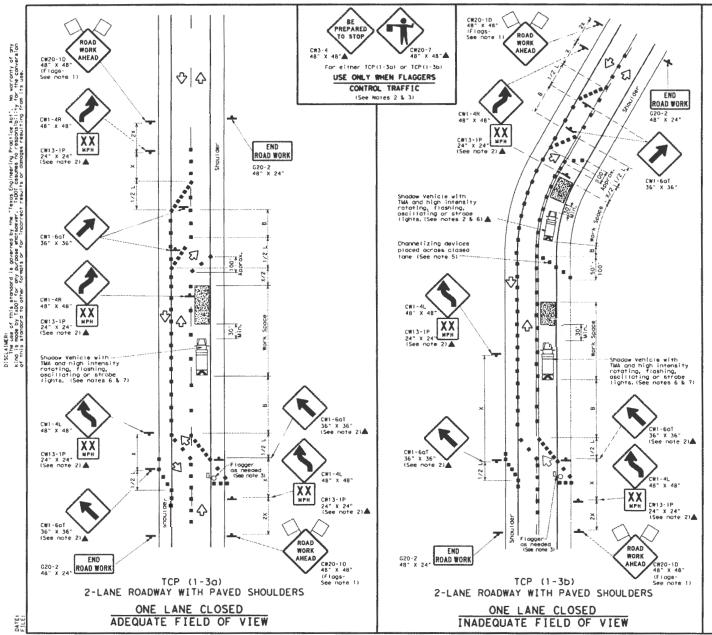
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then the optional larger BORKING FOR YOU GIVE US A BRAKE (G20-7T) 192" x 96" sign is required, the locations shall be noted elsewhere in the plans.

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL





LEGEND							
Type 3 Borricade # # Chonnelizing							
口中	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)				
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)				
_	Sign	♦	Traffic Flow				
a	Flag	00	Flagger				

Posted Formula		Minimum Desirable Taper Lengths W.K.			Spaci Channe	d Maximum ng of Lizing Lices	Winimum Sign Specing	Suggested Longitudings Buffer Space
*		10° Offset	11' Offset	12' Offset	On a Taper	On a tangent	Distance	.6.
30	2	150"	165'	1801	30,	60'	120'	90'
35	L * 100	2051	225	245'	35′	70'	1601	120'
40	80	2651	295	320'	40'	80'	240'	155'
45		450'	4951	540'	45.	90′	320'	195'
50		500'	550'	600,	50'	100'	400'	240'
55	L=WS	550'	6051	660	55′	110	500'	295'
60	L-#3	600'	660'	7201	60'	120'	6001	350'
65		650	715	7801	65′	130′	700'	410'
70		7001	770'	840'	70'	140	8001	475'
75		750	8251	9001	75'	150"	900	540'

* Conventional Roads Only

** Taper lengths have been rounded off.

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

TYPICAL USAGE								
MOBILE	TACHT MOTTARUD	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY				
	1	1						

GENERAL NOTES

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

3. Flagger control should MOT be used unless roadway conditions or heavy

traffic valume require additional emphasis to safely control traffic.
Additional flaggers may be positioned in advance of traffic queues to great traffic to reduce speed.

DO NOT PASS, PASS RITH CARE and construction regulatory speed zone signs may be installed downstream of the ROAD WORK AHEAD signs.

When the work zone is made up of several work spaces, channelizing devices should be placed laterally across the closed lane to re-emphasize clasure. Laterality proced channelizing devices should be repeated every 500 to 1000 feet in urban oreas and every 174 to 127 mile in rural oreas.

6. A Shooky Vehicle with a TMA should be used onytime it can be positioned.

6. A Shodow Yehicle with a TMA should be used onytime it can be positioned 30 to 100 feet in advance of the one of crew exposure without adversely affecting the performance or quality of the work. If workers ore 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 Yehicle and TMA.
7. Additional Shadow Yehicles with TMAs may be positioned off the powed surface, hext to those shown in order to protect wider work spaces.
8. Where troffic is directed over a yellow centerline, channelizing devices

which separate two-way traffic should be spaced on tapers at 20', or 15' if posted speed are 35 mph or slower, and for tangent sections, at 1/25 where S is the speed in mph. This tighter device spacing is intended for the area of conflicting markings not the entire work zone.

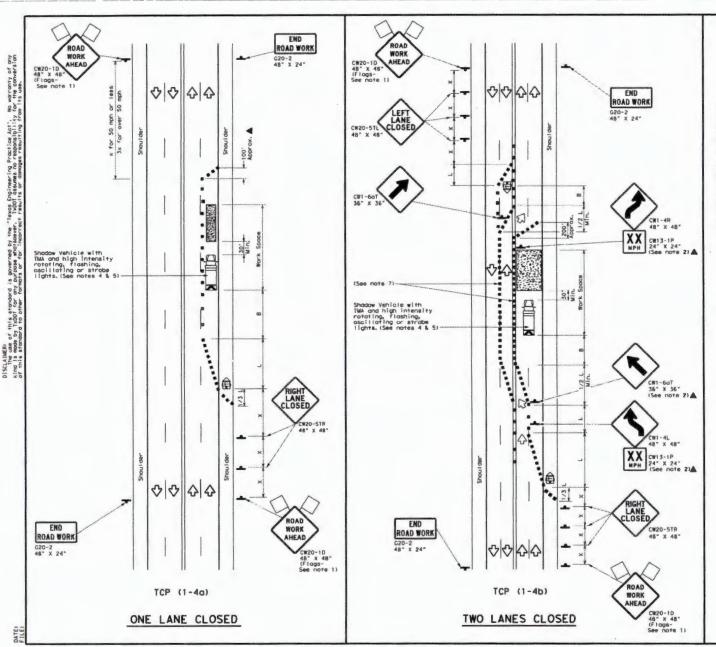
Texas Department of Transportation

Treffic Operations Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO LANE RIDAUS

TCP(1-3)-18

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(1) 120	101	lectorer 146	5 (4.	stc:	1.78	~15+ #A/
2-94	4-98	distant.				
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1-97	5-18					SD-59



LEGEND Type 3 Barricade .. Channelizing Devices Truck Mounted Attenuator (TMA) Heavy Work Vehicle A Trailer Wounted Flashing Arrow Box Portable Changeable Message Sign (PCMS) -Sign Yraffia Flow a Fing Do Flagger

Posted Formula Speed	Formula	Minisum Desirable Taper Lengths **			Spaci	d Maximum ng of Hizing vices	Minimum Sign Specing	Suggested Longitudings Buffer Space
		10' Offset	Offset	12' Offset	On a Taper	On q Tangent	Distance	.8.
30	2	150"	165'	180'	30'	60'	120'	90'
35	L = WS	205"	225'	245'	35'	70'	160	120'
40	60	265"	295'	320"	40'	80'	240'	155'
45		450"	495'	540'	45'	90'	320'	195'
50		500'	550"	600'	50'	100	400'	240'
55	L-#5	550'	605	660'	55'	110"	500	295'
60	F-#2	6001	660	720'	60'	120'	600'	350"
65		6501	715'	780"	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750"	825	900'	75'	150	900*	540'

Conventional Roads Only

* Toper lengths have been rounded off.
L*Length of Toper(FT) #*Width of Offset(FT) 5*Posted Speed(MPH)

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

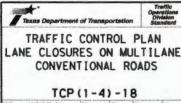
GENERAL NOTES

Flogs attached to signs where shown are REQUIRED.

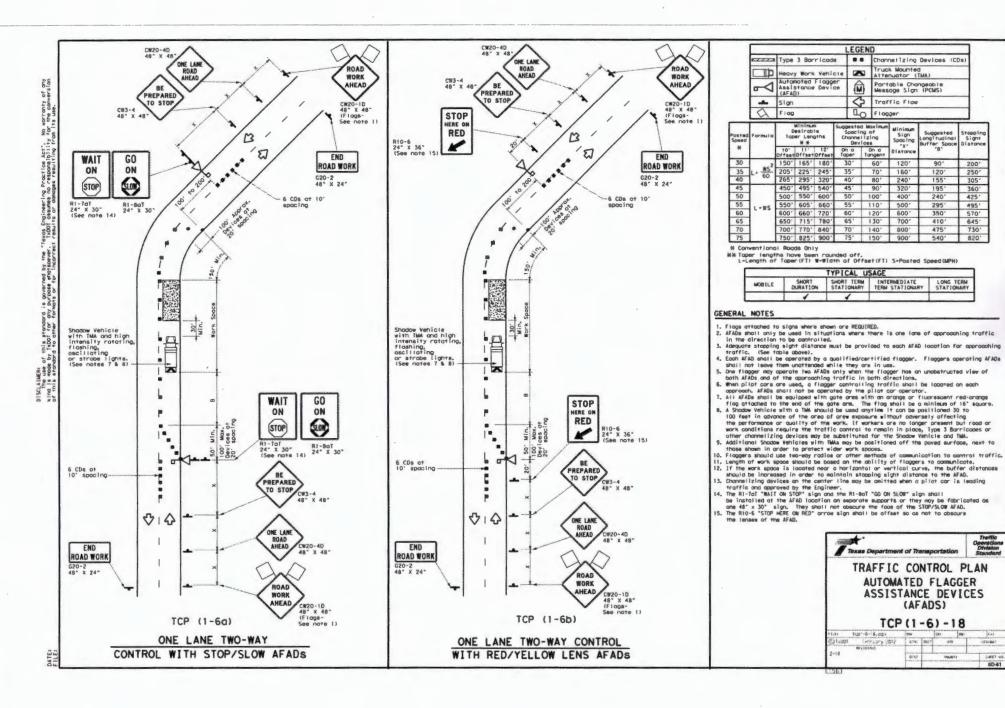
- Flogs attached to signs where shown are REQUIRED, except those denoted with the triangle symbol key be anitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
 The CR20-10 "RADIA BORK AMERIO" stay may be repeated if the visibility of the work zone is less than 1500 feet.
 A Shadow twhicle with a TBA should be used anytime if on be positioned 30 to 100 feet in advance of the area of order 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 channel izing devices may be substituted for the Shadow Vehicles with TBAs may be positioned off the poved surface, next to those shown in order to protect wider work spaces.

 If this TCP is used for o left ions closure, CR20-51L 'LEFT LANE CLOSED' signs shall be used and charmerlizing devices shall be plosed on the conterline where needed to protect the work space from opposing troffic with the arrow panel placed in the closed lane near the end of the merging taper

The state of the s



ILF: 1001 4 18. dgs	Emer	CK1 (06)	641
December 134	CAT SEC	JOS .	HIDE BAY
2-94 4-98	9151		7 7960 10
2-94 4-98 8-95 2-12 1-97 2-18	-		SD-60



200'

250'

305"

360

425

495'

570"

645

730'

820"

Traffic Operation Division

5D-61

120

195

240

295

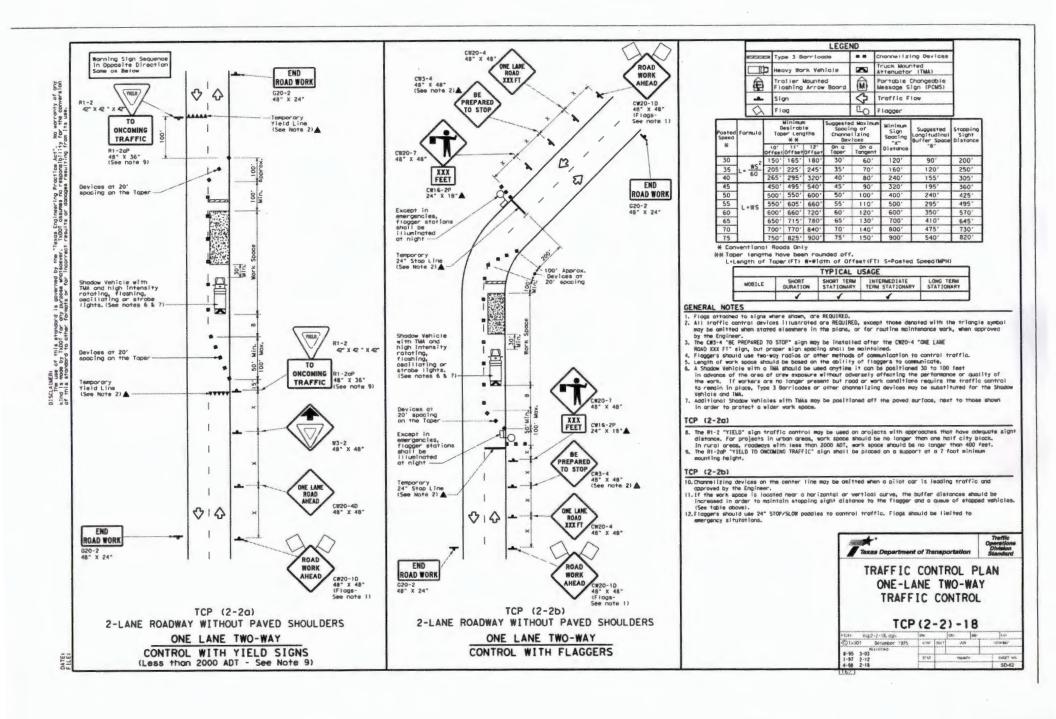
350

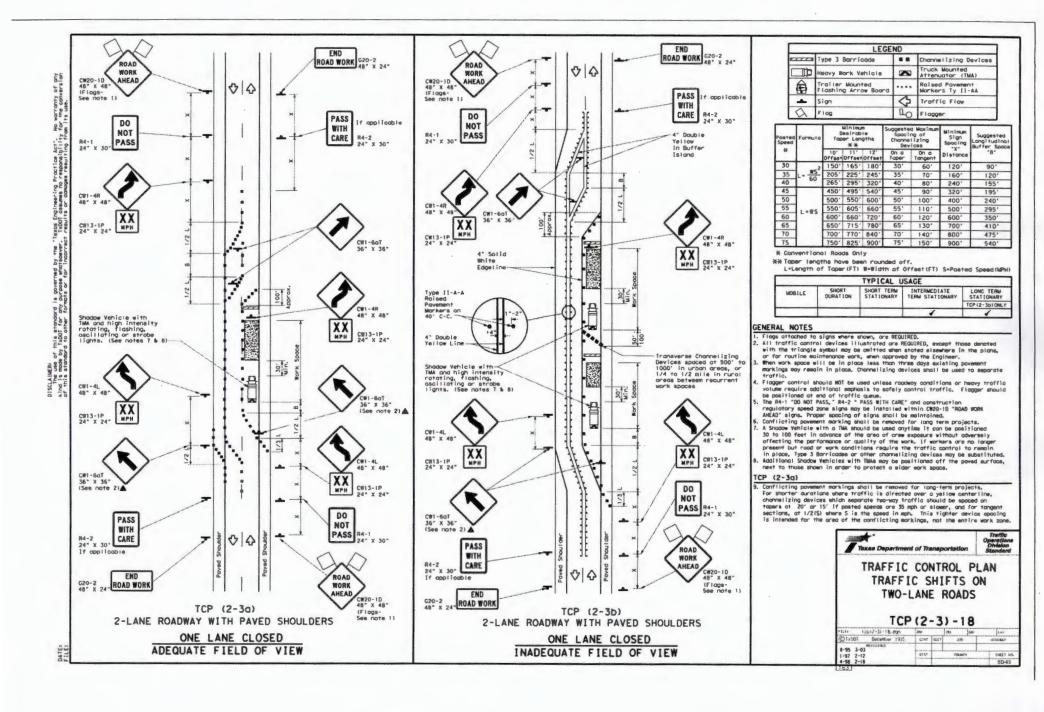
410'

475

540

LONG TERM STATIONARY







Commissioner Hutchins Hunt County Courthouse Greenville, TX 75401 11/8/2023

RE: CR 1088 Road Crossing

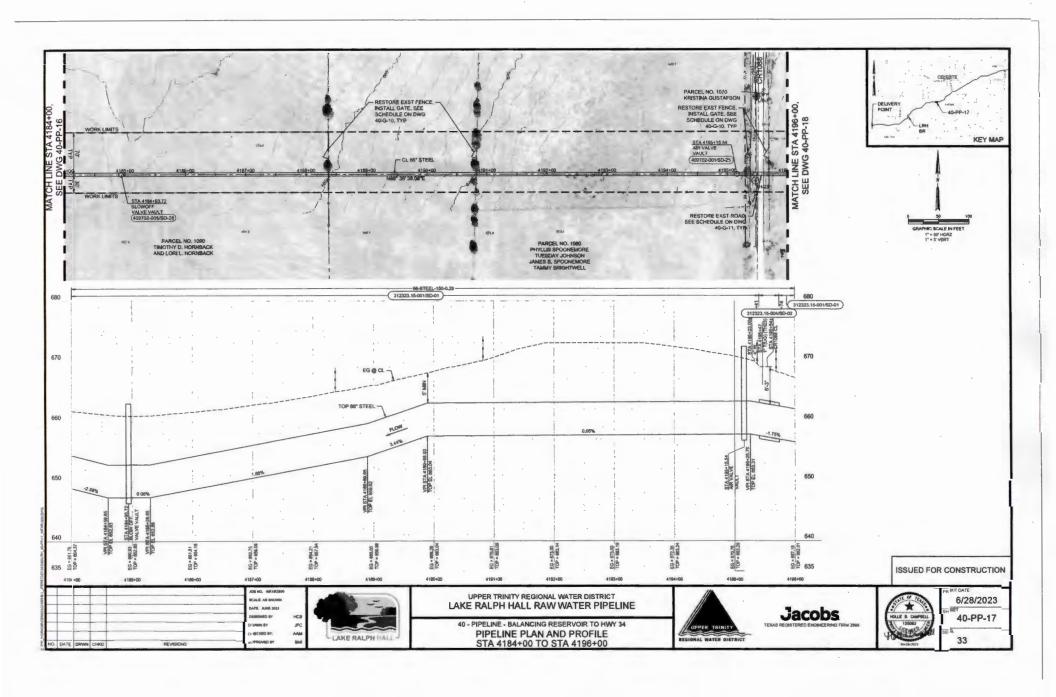
Dear Hunt County,

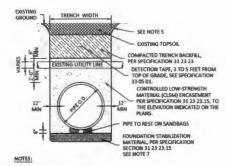
McKee Utilities is seeking permission from Hunt County to Cross County Road 1088 with the Lake Ralph Hall Pipeline. This work is anticipated to start on 11/16/2023. McKee Utilities will be crossing the road following the attached construction details. The access road will be re-routed during the utility crossing utilizing proper TXDOT detour signs. Construction will take roughly three days with the road detour in place. The contractor will notify the residents of the lane closure in advance.

Sincerely,
GARNEY COMPANIES, INC.

Andrew Beck Sr. Project Manager

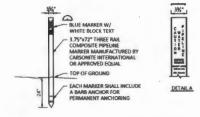






- 1. SEE PLAN AND PROFILE FOR PROJECT SPECIFIC AND PERMITTED CROSSING
- THE CONTRACTOR SHALL BE REQUIRED TO USE WOOD MATS FOR
 WATERLINES, OR REQUIRED BY CROSSING PERMIT.
- THE CONTRACTOR SHALL CONTACT UTILITY OWNER AT LEAST (3) DAYS PRIOR TO CROSSING THE UTILITY.
- 4. FOR CROSSING UTILITIES 6" OR LARGER IN DIAMETER, EXTEND CLSM ENCASEMENT ON PROPOSED PIPE TO 5' ON EACH SIDE OF UTILITY CROSSING.
- 5. CONTRACTOR SHALL SLOPE TRENCH WALLS AND/OR SHORE EXCAVATIONS FOR CONSTRUCTION AND SAFETY IN ACCORDANCE WITH CURRENT OSHA
- IF THE CROSSING UTILITY IS LESS THAN 6-INCHES AND 3 FEET OR HIGHER FROM THE TOP OF THE PIPE THEN THE CONTRACTOR MAY SUPPORT THE CROSSING UTILITY AND USE THE STANDARD GRANULAR EMBEDMENT DETAIL.
- CONTRACTOR TO SEK APPROVAL FROM THE DESIGNATED OWNER'S REPRESENTATIVE PRIOR TO PLACEMENT OF FOUNDATION STABILIZATION MATERIAL WHERE UNSTABLE GROUND CONDITION OCCUR. FOUNDATION STABILIZATION MATERIAL SHALL BE UTILIZED IF UNSTABLE GROUND

UTILITY LINE CROSSING DETAIL - 02 10 01 - 001



- MARKER SHALL BE LOCATED ON BOTH SIDES OF ALL ROADS AND RAILROADS, AT ALL MAINLINE VALVES, AIR VALVES, AND BLOWOFF VALVES, AT ALL
- ALL MAINLINE VALVES, AIR VALVES, AND BLOWOFF VALVES, AT ALL HONIZONTIAL BRODS, ROAD, CROSSINS, OTHER VISIBLE STRUCTURES, AND MAX SPACING OF 2000 LF ALDNG PIPELINE ALISMMENT.
 EACH MARKER SHALL HAVE A STICKER WITH THE FOLLOWING INFORMATION "CAUTION WATER PIPELINE BEFORE DISGING CONTACT UTRWO (972) 219-1228, STAXXXXXXXX LIL MFORMATION MUST BE TYPED OR STAMPED WITH NON-FADING INK, NOT HAND WRITTEN.

PIPELINE MARKER - 33 05 01 - 001

ISSUED FOR CONSTRUCTION

SCALE AS SHOWN DATE BEFTEMBER 3022 COMMEDON OLF HECKED BY, CLF



UPPER TRINITY REGIONAL WATER DISTRICT LAKE RALPH HALL RAW WATER PIPELINE

PROGRAM STANDARD DETAILS SHEET 2 CLSM EMBEDMENT, UTILITY LINE CROSSING AND PIPELINE MARKER DETAILS









03/09/2023 SD-02

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

- The Borricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction payement markings, and typical work zone signs. The information contained in these sheets meet ar 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.
- 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.
- Geometric design of Lone shifts and detaurs should, when passible, meet the applicable design criteria cantained 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 "Roodway Design Manual" or engineering judgment.
- When projects obut, 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 necessory warning signs as shown an these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.
- The Engineer may require duplicate worning signs on the median side of divided highways where median width will permit and traffic valumes justify the signing.
- 8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.
- The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.
- 10. Where highway construction or maintenance work is being undertoken, other than mabile 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 odvance of the CSJ limits. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at an near the CSJ limits. For mobile operations, CSJ limit signs are not required.
- 11. Troffic 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
- 13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lones. They should be as close to the right-of-way line as passible, or located behind a barrier or guardrail, or as approved by the Engineer.

WORKER SAFETY NOTES:

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

- 1. Only pre-qualified products shall be used. The "Compliant Work Zone Troffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.
- 2. Work zone traffic cantral devices shall be compliant with the Manual for Assessing sofety Hordwore (MASH).

THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT

http://www.bxdot.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

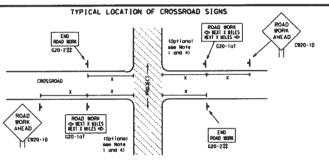
SHEET 1 OF 12

Texas Department of Transportation

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

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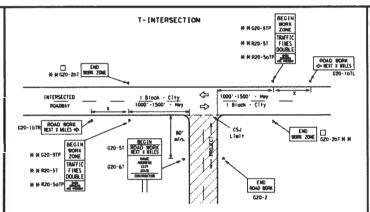


May be wounted on back of "ROAD WORK AHEAD" (CW20-10) sign with approval of Engineer. (See note 2 below)

- 1. The typical minimum signing on a crossrood approach should be a "ROAD WORK AMEAD" (CW20-ID) sign and a
- (G20-2) "END ROAD BORK" sign, unless noted otherwise in plans.

 2. The Engineer may use the reduced size 36" × 35" ROAD WORK AM€AD (CM20-1D) sign mounted back to back with the reduced size 35° x 18° "DBR RNOD BORK" (G20-21) sign on low volume crossroods less have 4 under "typical Construction Borning Sign Size and Specing"). See the "Standard Righway Sign Designs for Texas" manual for sign details. The Engineer may only the advance working signs and not working crossroods. The Engineer will determine what her or ord is low volume as per TMUTCD Port 5. This
- Information what is element in the proper in the proper in the proper information what is been in the proper information what is element in the proper information when the proper interest in a prope
- Zone Standard Sheets.
 The "ROAD BORK MEXT X MILES" (G20-toTision shall be required at high valume crossroods to advise motorlats of the length of construction in either direction from the intersection. The Engineer witt determine whether a roodway is considered high valume.
- 5. Additional troffic control devices may be shown elsewhere in the plans for higher volume crossroads Stein 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.

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



CSJ LIMITS AT T-INTERSECTION

BEGIN

- 1. The Engineer will determine the types and location of ony additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.
- . If construction closes the road at a T-intersection, the Contractor shall place the "CONTRACTOR NAME" (620-611 sign behind the Type 3 Barricodes for the road closure (see BC(10) also). The "ROAD BORK NEXT X MILES" left arraw(620-1bTL) and "ROAD BORK NEXT X MILES" right orraw (620-1bTR)" signs shall be replaced by the detaum signing called for in the plans.

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING 15.6

SIZE						
Sign Number or Series	Conventional Road	Expressway/ Freeway	Pos			
CW20 ⁴ CW21 CW22 CW23 CW25	48" × 48"	48" x 48"	3			
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" × 36"	48" × 48"	5			
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" × 46"	7			

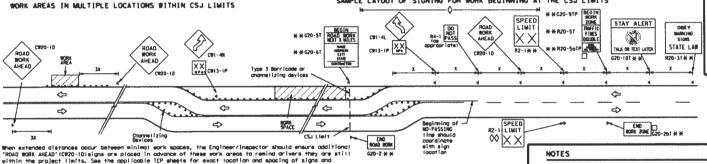
-	
Posted Speed	Sign 4
₩РН	(Apprx,)
30	120
35	160
40	240
45	320
50	400
55	500 ²
60	600 3
65	700 2
70	800 4
75	900 7
80	10003
•	*

SPACING

- % For typical sign spacings on divided highways, expresseays and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.
- △ Winlaws distance from work area to first Advance Marning 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
- 3. Bistance between signs should be increased as required to have 1/2 mile
- 4. 36" x 36" "ROAD BORK AHEAD" (CB20-1D) signs may be used on low volume crossroods at the discretion of the Engineer as per TMUTCD Port 5. See Note 2 under "Typical Location of Crossrood Signs".
- 5. Only diamond shaped warning sign sizes are indicated.
- 6. See sign size listing in "TMUTCD", Sign Appendix or the "Standard Higheay Sign Designs for Texas' manual for complete tist of avoilable sign design 8 i 288.



WORK STAY ALERT OBEY SPEID ROAD WORK TRAFF H ROAD ¥ #G20-51 RAINIENS SECRES FINES ROAD ROAL WORK STATE LAW 1/2 MILE TALK OR TEXT LATER G20-10T (R20-31 UB20-19/ **\$** Channellzing Devices -CSJ Limit ➾ B SPEED RZ-D END ROAD WORK EMD C30-SP1 * *

G20-2 × ×

The Contractor shall determine the appropriate distance The Contractor shall determine the appropriate distance to be piosed on the GSO-1 series signs and "BEGIN ROND RORK NEXT X MILES" GZO-5TI 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 odvance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a port of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.
- K# CSJ timit algning 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 Troffic Control Plan.
- Contractor will install a regulatory speed limit sign at the end of the work zone.

	Type 3 Barricade
000	Channelizing Devices
-	Sign
x	See Typical Construction Morning Sign Size and Spacing chart or the TMUTCD for sign spacing requirements.

SHEET 2 OF 12

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Toxa	Department of Transportation	Divisio Standa

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

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(E) 15501	November 2009	COMI	14.61	. 68	I	K!SAFET
	H-ALZEONZ					
9-07	8-14	0151		COME		SHILCT NO.
7-13	5~21					SD-46

channelizing devices.

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

Bork 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.

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

WORK ZONE

SPEED

LIMIT R2-1

60

G20-50P

(750" - 1500"

WORK

SPEED

G20-5cf

R2-1

CSJ

LIMITS

SPEED LIMIT

70 AZ-1

GUIDANCE FOR USE:

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

signing.

SPEED

LIMIT

70 82-1

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

CSJ 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 negatiote the work area, including:

(750' - 1500')

WORK ZONE

SPEED

See General Note 4

G20-5aP

R2-1

- a) rough road or damaged pavement surface
- b) substantial attenation of roodway 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 borrier, when work activity is within 10 feet of the traveled way or actually in the troveled way.

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

GENERAL NOTES

WORK G20-5af

SPEED

60

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

SPEED

- 3. Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
- 4. Frequency of work zone speed timit 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)).
- Fabrication, erection and maintenance of the ADVANCE SPEED LIMIT*(CN3-5) sign, *WORK ZONE*(G20-50P) plaque and the "SPEED LIMIT*(R2-1) signs shall not be paid for directly, but shall be considered subsidiory to Item 502.
- Turning signs from view, laying signs over or down will not be allowed, unless as atherwise 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) rodar transmitter.
 - E. Speed monitor trailers or signs.
- Speeds shown on details above are for illustration only.
 Work Zone Speed Limits should only be posted as approved for each project.
- 10. For more specific guidance concerning the type of work, work zone candifions and factors impacting oil lowble regulatory construction speed zone reduction see TxDOT form #1204 in the TxDOT e-form system.

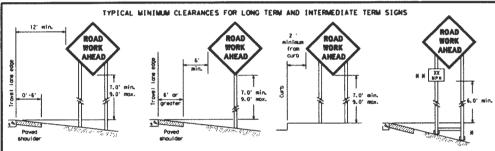
SHEET 3 OF 12

Texas Department of Transportation

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

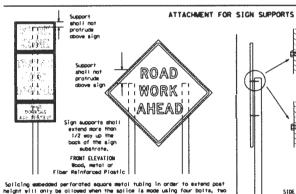
BC(3)-21

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2 1684	bs-21.dgn	0A: 1 x	101	un Extitor	or Lette	in late
(C) Tx0:01	November 700'r	COM1	SACT	√GB		HISHMAY
9-07	8-14	B153		(05'		Cast 1 mg
7-13	5-21	B101				SD-47



then placing akid supports on unlevel ground, the leg post lengths sust be adjusted so the sign appears straight and plusb. Objects shall NOT be placed under skids as a wears of leveling.

Then plagues are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plagues todylsory or distances should not cover the surface of the parent sign.



SIDE ELEVATION

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.

Attachment to wooden supports

will be by bolts and nuts or screws. Use TxDOT's or

monufacturer's recommended

procedures for attaching sign

substrates to other types of

alon supports

STOP/SLOW PADDLES

above and two below the spice paint. Splice must be located entirely behind

sign substrate, not near the base of the support. Spilce insert lengths should be at least 5 times nominal post size, centered on the splice and of at teast the same gauge material.

- 1. STOP/SLOB paddles are the primary method to control troffic
- by floggers, The STOP/SLOB poddle size should be 24" x 24".

 2. STOP/SLOB poddles should be retroraflectorized when used at night. STOP/SLOW paddles may be attached to a staff with a minimum
- length of 6' to the bottom of the sign. Any lights incorporated into the STOP or \$4.00 poddle foces shall only be as specifically described in Section 6E.03 Hand Signaling Devices in the TMUTCO.





- 24*-Bookground - Orange Legend & Border - 4

SHEETING R	QUIREMENTS	(MHEN USED AT NIGHT)
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	ORANGE	TYPE By OR CyL 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.

- Permonent signs are used to give notice of traffic laws or regulations, call removement signal or used to give notice of motivic loss or registrous, contention to conditions that are potentially hozordous to traffic operations, shoe route designations, destinations, distances, services, points shoe route designations, destinations, distances, services, points of interest, and other agolgraphical, representant, specific services (L000), or cultural information. Drivers proceeding through a work zone need the same, if not better route guidence as nameally installed on a roudous without processing through the content of the content o
- When personent regulatory or worning signs conflict with work zone conditions, remove or cover the personent signs until the personent sign essage wordnes the roadery condition. For details for covering longe guide signs see the TS-CD standard.
- When existing personent signs are solved and relocated due to construction purposes, they shall be visible to solverists of all times. If existing algres are to be relocated on their original supports, they shall be
- installed on crostworthy bases as shown on the SWD Standard sheets. The signs shall weet the required wounting heights shown on the BC Sheets or the SWD Standards. This work should be poid for under the appropriate pay item for
- 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 CRZICD fist. The signs shall meet the required mounting heights shown on the 8C, or the SMD standard sheets during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
- Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soon as possible by the Contractor to ensure proper guidance for the motorists. This will be subsidiary

GENERAL NOTES FOR WORK ZONE SIGHS

- Contractor shall install and maintain sig Booden sign posts shall be painted white. signs in a straight and plumb condition and/or as directed by the Engineer.
- Barricades shall NOT be used as sign supports.
 All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, worn, and
- All signs shall be Installed in occordance with the plane or as directed by the Engineer. Signs shall be used to regulate, work, and guide the inventing public sofely innount has work zone.

 The Contractor may furnish either the sign design shown in the plane or in the "Standard Nigneey Sign begins for Texas" (SHSD). The Engineer/Inspector may furnish either the sign design shown in the plane or in the "Standard Nigneey Sign begins for Texas" (SHSD). The Engineer/Inspector may require the Contractor to furnish other work zone signs that one shown in the INSUICD but may have been combined from the plane. Any variation in the plane shall be documented by written agreement between the Engineer and the Contractor's Recommission Person. All changes must be documented in writing before being inplemented. This controlled documenting the changes in the Inspector's Install of the Inspector and Contractor initial and date the agreed upon changes. The Contractor shall immain sign supports I sized in the "Compliant Stark Zone Intel® Countries Lists" (CRETCD) for small roadside signs, Supports for temporary large roadside signs shall seet the requirements detailed on the Temporary Large Roadside Signs (ILRS).
- 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.
- The Contractor is responsible for Installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or entered reflective sheeting as directed by the Engineer/Inspector.

 Identification smalling may be shown only on the back of the sign substrate. The maximum helight 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 top defined by the "Texas Manual on Uniform Traffic Control Devices" Part. 6)

- The types of sign supports, sign mounting height, the size of signs, and the type of sign substrates con very based on the type of work being performed. The Engineer is responsible for selecting the operacyllate size sign for the type of work being performed. The Engineer is responsible for selecting the operacyllate size sign for the type of work being performed. The Controctor is responsible for ensuring the sign support, sign mounting height and substrate meets manufacturer's recumendations in regard to ordermorthiness and duration of work requirements.
 - Long-term stationary work that accupies a location more than 3 days.
- lighte-herm stationary work that occupies a location more than one daylight period up to 3 days, or nighttime work losting
- Short-term attrionery daytime work that accupies a location for more than I hour in a single daylight period
- Short, duration work that occupies a location up to 1 hour.

 Mobile work that soves continuously or intermittently (stopping for up to opproximately 15 minutes.)

- SIGN MOUNTING HEIGHT

 I. 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 alons.
 The bottom of Short-term/Short Duration signs shall be a minimum of 1 foot above the povement surface but no more than 2 feet above
- 3. Long-term/untermediote-term Signs may be used in itsu of Short-term/Short Durotion signing.
 4. Short-term/Short Durotion signs shall be used only during daylight and shall be resoved at the end of the workday or raised to appropriate Long-term/intermediate sign height.
 5. Regulatory signs shall be sounted or teast 7 feet, but not more than 9 feet, above the powed surface regardless of work durotion.
- SIZE OF SIGHS

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

SIGN SUBSTRATES

- The Contractor shall ensure the sign substrate is installed in accordance with the manufacturer's recommendations for the type of sign
- The Contractor sholl ensure the aign substrate is installed in accordance with the somutacturer's recommendations for the types of sign support that is being used. The (RECCD) lists each substrate that can be used on the different types and models of sign supports.
 "Mesh" type soterials are NDT on approved sligh substrate, regardless of the tightness of the weave.
 All second individual sign ponels forincred from 2 or more pieces shall have one or more placed cleat, 1/2" thick by 6" wide, fastened to the back of the sign and extending fully across the sign. The clear shall be attached to the back of the sign using wood screen that do not penetrate the facion of the sign ponel. The screens shall be placed on both sides of the sign cancers. The Engineer may approve other esthods of spicing the sign face.

REFLECTIVE SHEETING

- I. All signs what its 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 BCL10. 2. Bittle exheting, meeting the requirements of DMS-8300 type A, short its used for a signs with a white background.

 3. Orange sheeting, seeting the requirements of DMS-8300 Type B $_{\rm RL}$ or Type $C_{\rm RL}$, short be used for rigid signs with a conge backgrounds.

SIGN LETTERS All sign (etters and numbers shall be clear, and open rounded type uppercase alphabet letters as approved by the Federal Highway Administration (Field) and as published in the "Standard Highway Sign Design for Taxos" manual. Signs, letters and numbers shall be of first closs workmanhill in occurations with Department Standards and Specifications.

REMOVING OR COVERING

- Elman sign messages may be confusing or do not apply, the signs shall be removed or completely covered.

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

SIGN SUPPORT BEIGHTS

- Shere sign supports require the use of weights to keep from turning over, the use of sondbogs with dry, constionless sond should be used. The sondbogs will be tide insult to keep the sond from spilling and to solintoin a constant weight. Sock, concrete, iron, steel or other soild objects wholi not be penalthed.

- Rock, concerts, from, steel or other solld objects shall not be perelited solves on the first support selects. Sendong should select a shall be seed or of shall be seed or of suppose shall be seed or of suppose shall select a shall

FLAGS ON SIGNS

Flogs say be used to drow attention to worning signs. When used, the flog shall be 16 inches seucre or larger and shall be arrange or fluorescent red-orange in color. Flogs shall not be allowed to cover any portion of the slap focus.

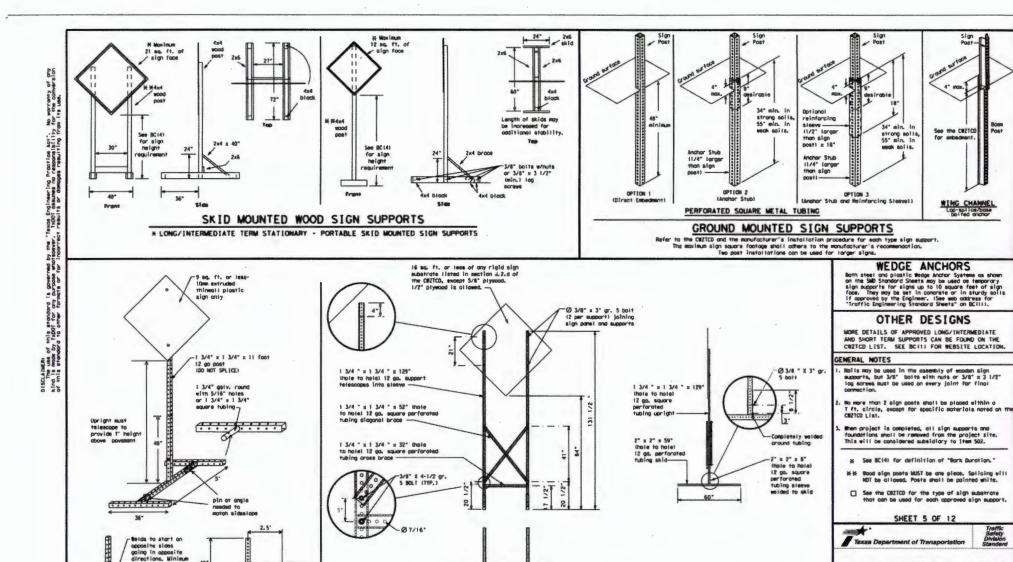
SHEET 4 OF 12

Traffic Safety Division Texas Department of Transportation

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC (4) -21

Fruit Du 21, ngn	on 12	dia!	LKI TYCKN	on type)T (**)	X
(E) Tx001 havember 2007	13813	A.C.1	. on	T	HIGHWAY	
H-VISION						_
9-07 8-14	0423		1.Ge-17-		SHE'S	Č.
7-13 5-21					SD-	ŧ-
						~



BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC (5) -21

bc-71, 300 on 1x001 in 1x001 on 1x001 in 1x00 CINEOT Revember 200) 409 Sept 1 mg T-13 S-21 SD-49

SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS * LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

48

SINGLE LEG BASE

12 ga. uprignt

weld, do not back fill puddle.

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

PORTABLE CHANGEABLE MESSAGE SIGNS

- The Engineer/Inspector shall approve all messages used an particle
- the Engineer/Impercor and Improve all messages taked on portouter changable message signs (PCMS). Messages on PCMS should contoin no more than 8 words tabout four to eight characters per words, not including simple words such as "TQ," "CR," "AI," etc.
- Messages should consist of a single phase, or two phases that alternate. Three-phase messages are not allowed. Each phase of the message should convey a single thought, and must be understood by
- Use the word "EXIT" to refer to an exit ramp on a freeway; I.a., "EXIT CLOSED, " Do not use the term "RAMP."
- Always use the route or interstore designation (III, US, SII, Fill) along with the number when referring to a roodway.

 When in use, the bottom of a stationary PCMS message panel should be
- When I'm use, the bottom of a storionary POKS message panel should be a similism. If feet doors the rockery, where possible. The message term "MEEKEMO" should be used only If the work is to storion Saturday aroming and end by Sanday evening at milanight. Actual days and hours of work should be displayed on the POKS I'mank is to begin on Friday evening and/or continue linto Manday maning. The Engineer/Inspector may select one of two options which are evolu-cable for displaying a two-phase message on a POKS. Each phase may be displayed for either four seconds each or for three seconds each. Do not "flash" messages or words included in a message. The message should be search burn or continuous will elisalever.
- should be steady burn or continuous while displayed.

- should be attedly turn or continuous while displayed.

 10. Do not present redundnt information on a tea-shotes essagge; i.e., keeping the lines of the message the same and changing the third line.

 11. Do not use the word "Danger" in seasone.

 12. Do not display the message "LAMES SHIFT LEFT" or "LAMES SHIFT REGHT" on a PDAS. Drivers do not understand the message.

 13. Do not display seasones that scroll harlzontolly or vertically across the face of the sign.
- The following toble liefs abbrevioted words and two-word phroses that ore acceptable for use on a POSS. Both words in a phrose sust be displayed together. Bords or phroses not on this list should not be abbrevioted, unless shown in the TMUCD.
- observationed, unless shown in the NB/ICO.

 CAS concern helps included at least 18 Inches for trailing sounded contrat. They around be visible from at least 1/2 (.5) mile and the text should be visible from at least 1/2 (.5) mile and the text should be legible from at least 600 feet on Implicational from at least 1/2 (.5) mile and the text should be applied from at least 400 feet.

 Second line of text should be centered on the season board other than left or right justificational descript the only the post should be applied to the property of the post should default to an itagipte display that all processing and processing the post should be processed to dier text should be post to the post should be processed to dier text should be post to the post should be processed to the processed to the post should be processed to the processed to the post should be processed to the proce

WORD OR PHRASE	ASSREY]ATION	SORD OR PHRASE	ABBREVIATION
Access Rood	ACCS RD	Mojor	MAJ
Alternate	ALT	Miles	M
Averue	AVE	Miles Per Hour	MPH .
Beat Route	BEST RTE	Minor	MAR
	BLVD	Monday	MON
Br I dge	BRDG	Normal	MORM
	CANT	North	N
Center	CTR	Northbound	(route) N
Construction Ahead	CONST AHD	Parking	PKING
		Rood	RD
CROSS ING	XING	Right Lone	RT LM
Detour Route	DETOUR RTE	Saturday	SAT
On Not	DONT	Service Rood	SERV RD
East	E	Shoulder	SHLOR
Eastbound	(route) E	Slippery	SLIP
Emergency	EMER	South	5
Emergency Vehicle	EMER VEH	Southbound	(route) S
	ENT	Speed	SPD
Express Lone	EXP LM	Street	ST
Expressway	EXPRY	Sunday	SUM
XXXX Feet	XXXX FT	Telephone	PHONE
Fog Ahead	FOG AHD	Temporary	TEMP
Freeway	FRMY, FMY	Thursday	THURS
Freeway Blocked	FWY BLAD	To Doentown	TO DWNTN
Friday	FRI	Traffic	TRAF
Hozordous Driving	HAZ DRIVING	Trovelers	TRYLRS
Hozordous Material		Tuesday	TUES
High-Occupancy	HOY	Time Minutes	TIME MIN
Yehicle	1997	Upper Level	UPR LEVEL
Highway		Vehicles (s)	VEH. YEHS
Hour (s)	HR, HRS	Warning	WARN
Information	INFO	Bednesday	WED
17 16	TYS	Beight Limit	BT LIMIT
Junction	JCT	Best	
Left	LFT	Bestbound	(route) ¥
Left Lone	LFT LN	Bet Povement	SET PVMT
Lame Closed	LM CLOSED	Bill Not	WONT
Lower Level	LMA LEVEL		T Real
Waintenance	MATRI		

Roodway designation 4 1H-number, US-number, SH-number, Fel-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/Ram	p Closure List	Other Cond	dition List
FREEWAY CLOSED X MILE	FRONTAGE ROAD CLOSED	ROADWORK XXX FT	ROAD REPAIRS XXXX FT
ROAD CLOSED AT SH XXX	SHOULDER CLOSED XXX FT	FLAGGER XXXX FT	LANE NARROWS XXXX FT
ROAD	RIGHT LN	RIGHT LN	TWO-WAY
CLSD AT	CLOSED	NARROWS	TRAFFIC
FM XXXX	XXX FT	XXXX FT	XX MILE
RIGHT X	RIGHT X	MERGING	CONST
LANES	LANES	TRAFFIC	TRAFFIC
CLOSED	OPEN	XXXX FT	XXX FT
CENTER	DAYTIME	LOOSE	UNEVEN
LANE	LANE	GRAVEL	LANES
CLOSED	CLOSURES	XXXX FT	XXXX FT
NIGHT LANE CLOSURES	I-XX SOUTH EXIT CLOSED	DETOUR X MILE	ROUGH ROAD XXXX FT
VARIOUS	EXIT XXX	ROADWORK	ROADWORK
LANES	CLOSED	PAST	NEXT
CLOSED	X MILE	SH XXXX	FRI-SUN
EX1T CLOSED	RIGHT LN TO BE CLOSED	BUMP XXXX FT	US XXX EXIT X MILES
MALL	X LANES	TRAFFIC	LANES
DRIVEWAY	CLOSED	SIGNAL	

CLOSED TUE - FRI XXXX FT XXXXXXXX

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel Location Warning List 116+ List AT SPEED FM XXXX RIGHT X LINES LIMIT RIGHT XX MPH DETOUR LISE BEFORE MAXIMUM RAILROAD XXXXX SPEED NEXT X EXITS RD EXIT CROSSING XX MPH USE EXIT NEXT MINIMUM USE EXIT XXX SPEED NORTH MILES XX MPH STAY ON PAST ADVISORY US XXX I-XX E US XXX SPEED TO I-XX N EXIT SOUTH XX MPH TRUCKS WATCH XXXXXXX RIGHT LANE USE FOR TO US XXX N TRUCKS XXXXXXX WATCH EXPECT US XXX LISE CAUTION FOR DELAYS TO FM XXXX TRUCKS PREPARE DRIVE EXPECT DELAYS TO STOP REDUCE END DRIVE SPEED SHOULDER. WITH

% See Application Guidelines Note 6.

CARE

APPLICATION GUIDELINES

- 1. Only I or 2 phoses are to be used on a PDMS.
 2. The last prices for boths should be selected from the "Rood/Land-Room Closure" List" and the "Other Condition List".
 3. A 2nd phose can be selected from the "Action to Toke/Effect on Travel, Location, Ceneral Strains, or Advance Notice

- on Travel, Location, Ceneral Barning, or Jalvance Notice
 Phase Lists*.

 4. A Location Phase is measury only if a distance or location
 Is not included in the first phase selected.

 5. If two POSS are used in sequence, they must be separated by
 a minimum of 1000 ft. Each POSS small be lielled 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, colendor days should be replaced with
 days of the week. Jalvance contilication should typically be for
 no sore than one week prior to the sork.

SORDING ALTERNATIVES

XXX FT

LISE OTHER

ROUTES

STAY

LANE

- . The words RIGHT, LEFT and ALL can be interchanged as appropriate. Roadway designations IH, US, SH, FM and LP can be interchanged as
- EAST, MEST, MORTH and SOUTH (or abbreviations E, B, N and S) con

USE WATCH

FOR

WORKERS

- 3. Last, #Est, months and south for converterions t, w, w but a be interchanged as appropriate.
 4. Highway names and numbers replaced as appropriate.
 5. MOA, Highest nor PREENT can be interchanged as needed.
 6. MEAD may be used instead of distances if necessary.
 7. F7 and MI, MILE and MILES interchanged as appropriate.
 6. A.T. BEFORC and PAST interchanged as appropriate.
 6. A.T. BEFORC and PAST interchanged on needed.
 6. Distances or AMEAD 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

BLVD

- 1. When Full Matrix POMS signs are used, the character height and legibility/visibility requirements shall be maintained as listed in Note 15 under "PORTABLE
- CHANCEAEL MESSAGE SIGNS' doors.

 2. When symbol aligns, such as the "Fragger Symbol" (CECO-T) are represented graphically on the Full Matrix POAS align and, with the approval of the Engineer, it shall maintain the legibility/visibility requirement listed doors.

 3. When symbol aligns are represented graphically on the Full Matrix POAS, they shall only supplement the use of the statio align represented, and shall not substitute
- for, or replace that sign.

 4. A full matrix POMS may be used to simulate a floating arrow board provided it meets the visibility, float rate and dissing requirements on BC(7), for the
- some size orrow.

SHEET 6 OF 12

* * Advance

Notice List

TUE-FRI

XX AM-

X PM

APR XX-

XX

BEGINS

BEGINS

MAY XX

MAY X-X

XX PM -

XX AM MEXT

FRI-SUN

XX AM

TO

XX PM

NEXT

TUE

AUG XX

TONIGHT

XX PM-

XX AM

PM-X AM

Texas Department of Transportation

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC (6) -21

FELEI	60-21, 00h	5NI 1	N(V)	" X 12.	04	18891	CAN FREEDY	
(C) fx601	fxEGT hovember 2007		CHART TECT		-56		HIGHWAY	
9-07 8-14 7-13 5-21		8157		FEAT		-1	SMC1 NO.	
7-13	5-21						SD-50	
102.1					_		_	

 \subseteq

Type C Morning Light or

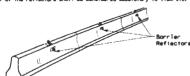
approved substitute mounted on a

drum adjacent to the travel way.

rning reflector stay be round or square. Must have a yellow

reflective surface area of at least 30 square inches

- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of pregualified Barrier Reflectors can be found at the Material Producer List web address
- 2. Color of Barrier Reflectors shall be as specified in the IMUTCD. The coat of the reflectors shall be considered subsidiary to Itus 512.

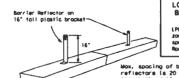


CONCRETE TRAFFIC BARRIER (CTB)

- Where traffic is on one side of the CTB, two (2) Borrier Reflectors shall be wounted in approximately the addsection of each section of CTB. An alternate sourhing location is uniformly spood of one and of each CTB. This will allow for attachment of a barrier grapple without domoping the reflector. The Borrier Reflector sounted on the side of the CTB shall be located directly below the reflector sounted on top of
- The borrier, as shown in the detail above.

 Shere CTB separates two-say traffic, three barrier reflectors shall be sounted an each section of CTB. The reflector unit on top shall have two wellow reflective focus (Bi-Directional) while the reflectors on each the barrier shall have one yellow reflective face, as show the detail above.
- When CTB separates traffic traveling in the same direction, no barrier
- reflectors will be required on top of the CTB. Borrier Reflector units should be yellow or white in color to motch the edgetine being suppresented.
- Moximum specing of Borrier Reflectors Is forty (40) feet. Powement workers or temporary flexible-reflective roodway worker tobe shall NOT be used as CTB delineation.
- Attodreent of Borrier Reflectors to CTB sholl be per monufacturer's
- 10. Missing or damaged Barrier Reflectors shall be replaced as directed
- by the Engineer.

 13.5ingle slope borriers shall be delineated as shown on the above detail.

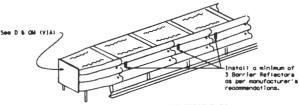


LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

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

LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

- 1. Sorning-lights sholl weet the requirements of the IBUICD,
 2. Sorning lights sholl will be installed on borricodes.
 3. Type A-Low Intensity Filosoning Sorning Lights are commonly used with druss. They are Intended to worn of ar work a potentially hazardous ones. Their use shall be as indicated on this steet and/or other sheets of the plans by the designation "FL". The type A Barning Lights shall not be used with tights, accurately service with Type By or Cy. Sheeting meeting the requirements of brancheshold before its Specification IBS-8300.
 4. Type-C and Type D 360 degree Steedy Burn Lights are intended to be used in a series for delinantion to auxplement other traffic control devices. Their use shall be as indicated on this sheet and/or other sheets of the plans by the seignation "SS".
 5. The Engineer/Inspector or the plans shall specify the location and type of sorning lights are loss intended in the traffic control devices. See the plans by the control of the plans that the plans the control of the plans that do delineare curves. Two-controls plans about only be closed on white of the curves, are the Inside.

- 7. Shan used to delineate curves, Type-C and Type D Steady Burn Lights should only be placed on 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

- Type & flashing worning lights are intended to worn drivers that they are approaching or are in a patentially hazardous area.
 Type & random flashing worning lights are not intended for delineation and shall not be used in a series.
 A series of escuential flashing worning lights placed on channel light gold exists forms a serging toper say be used for delineation. If used, the successive flashing of the sequential worning lights should occur from the beginning of the toper to the end of the serging toper in order to identify the desired whicle path. The rather of flashing for each light should expend the place of the should occur this should be placed to be placed to be placed to the serging toper.
- 4. Type C and D steady-burn earning lights are intended to be used in a series to delineate the edge of the travel lane on detaurs, on lone changes, on lane closures, and on other shall are conditions.
 5. Type A, Type C and Type D sorting lights shall be intended at locations as detailed on other sheets in the plans.
- Storning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
 The maximum specing for worning lights on drums should be identical to the channelizing device specing.

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

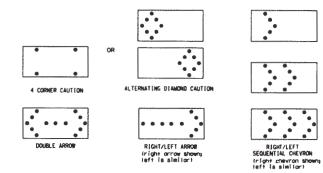
- 1. A warning reflector or approved substitute may be mounted on a plastic drum as a substitute for a Type C, steady burn warning light at the
- discretion of the Contractor unless otherelse noted in the plane.

 2. The sorning reflector shall be yettoe in color and shall be warufactured using a sign substrate approved for use with plastic druss listed
- warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
- Round refrectors shall be fully reflectorized, including the area where attached to the drum.

 Square substrates must have a minimum of 30 square inches of reflectorized sheeting. They do not have to be reflectorized where it
- oftcomes to the drum.
 The side of the worning reflector facing approaching traffic shall have sheeting meeting the color and retrareflectivity requirements for
- DMS 8300-Type B or Type C.
- Shen used near two-way traffic, both sides of the worning reflector shall be reflectorized.
 The worning reflector should be wounted on the side of the bondle morest approaching traffic.
- 9. The staxistum specing for worning reflectors should be identical to the channelizing device specing requirements.

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

- 1. The floshing Arrow Board should be used for all lone closures on sulfillione roadways, or slow soving scintenance or construction activities on the travel lones.
 2. Floshing Arrow Boards should not be used on two-lone, two-way roadways, detours, diversions or sorts on shoulders unless the "CAUTION" display (see detail below) is used.
 3. The Engineer/Inspector should choose all appropriate signs, borricades and/or other traffic control devices that should be used in conjunction with the floshing Arrow Boards.
 4. The Floshing Arrow Board should be done to display the following systolis:



- 5. The "CAUTION" display consists of four corner lasse flashing simultaneously, or the Atternating Diacond Courton space as stream.

 No service of the control of spaley is NOT ALLORED.

 The strong harver board shall be coopbie of minimum 50 percent disming from rated lass voltage. The flashing rate of five lasses shall not be less than 25 nor earse than 45 relatives per eliquies.

 Noting an lass of 25 percent for each sequential chase of the flashing cross and equal intervals of 25 percent for each sequential chase of the flashing chevron.

 The sequential arrow display is the TALLORED.

 The flashing arrow display is the TALDED standardy however, the sequential chevron display may be used during daylight operations.

 The flashing Arrow Board SMALL NOT BE USED to interaity shift traffic.

 A full matrix PORS may be used to simulate a Flashing Arrow Board of SMALL NOT BE USED to interaity shift traffic.

 A full matrix PORS may be used to simulate a Flashing Arrow Board shift by saluration of committee and disming requirements on this sheet for the sales size arrow.

 Note that the sale of the sale size arrow.

 Note that the sale size arrow.

	Ŕ	EQUIREMENTS		l
PE	MINIMUM SIZE	MENIMUM HUMBER OF PAMEL LAMPS	AIZIBITILA AIZIBITILA	

13

15

B 30 x 60

C 48 x 96

TRUCK-MOUNTED ATTEMUATORS

ATTENTION shoil be equipped with WHEN NOT IN USE, REMOVE THE ARROW BOARD FROM THE RIGHT-OF-WAY OR PLACE THE TRAFFIC BARRIER OR GUARDRAIL

FLASHING ARROW BOARDS

3/4 mî ie

i nite

Truck-sounted oftenucrons (TMA) used on TaDDT focilities must seet the requirements outlined in the laterusi for Assessing Sofety handbores (MASH).
 Refer to the DEZED for the requirements of Level 2 or Level 3 TMB outlines (MASH).
 Refer to the DEZED for o list of opproved TMAs.
 Refer to the CHZED for or list of opproved TMAs.

- in the pions.
- In the plans.

 A TMB should be used anytime that it can be positioned.

 30 to 100 feet in advance of the area of cree exposure without adversely offsecting the early performance.

 The only reason a TMB should not be required is even a sork or a le spread dom the reading and the sork or each and extended of stance from the TMB.

SHEET 7 OF 12 Texas Department of Transportation

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

BC (7) -21

i.e.	bo 21. dyn	SA: TXDD:		one labor	0e: 1×0	100 tes (100)	
10041	hovember 2002	CONT	SEC1	- 98	-	HIGHNAY	
	#CV/SLAN						
	8-14 5-21	0123	CQM11			SMLET NO.	
1-13	3-21				SD-51		

GENERAL NOTES

- 1. For long term stationary work zones on freeways, drums shall be used as
- for long term servictory years of revesors, or use and location, the prisony chome litting service.
 for intermediate term stationary work zones on freewoys, or use should be used as the prisony chome litting device but may be replaced in tempent sections by vertical penels, or 42 two-place comes. In tempent sections, one-blace comes any be used with the operand of the Engineer but only if personnel are present on the project at all times to maintain the
- comes in proper position and location.

 3. For short term stationary work zones on freeways, drums are the preferred channelizing device but say be replaced in topers, transitions and tangent sections by vertical panels, two-piece cones or one-piece cones as approved by the Engineer.
- brums and all related items shall comply with the requirements of the current version of the "Texos Manual on Uniform Traffic Control Devices" (TAUTCO) and the "Compliant Bark Zone Traffic Control Devices List" (CWZTCD).
- Drume, bases, and related materials shall exhibit good workmanship and shall be free from objectionable marks or defects that would adversely
- offect 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 plaetic drums shall meet the following requirements:
- Plostic drums shall be a two-place design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
 The body and base shall lock together in such a samer that the body separates from the base when ispaced by a vehicle traveling at a speed. of 20 BMH or greater but prevents occidental separation due to normal nonaling and/or air turbulence created by passing vehicles. 3. Plastic drums shall be constructed of lighthelight flexible, and
- deformable materials. The Contractor shall but use metal drums or single place plastic drums as channelization devices or sign supports. Drums shall present a profile that is a minimum of 18 inches in width at the 36 inch height when viewed from any direction. The height of drus unit (body installed on base) shall be a sinium of 36 inches and a maximum of 42 inches. The top of the drus shall have a built-in handle for easy pictup and
- shall be designed to droin eater and not collect debris. The handle shall have a minisus of two midely spaced 9/16 inch diseaser holes to allow artschment of a sorning light, worning reflector unit or approved
- compilant sign.

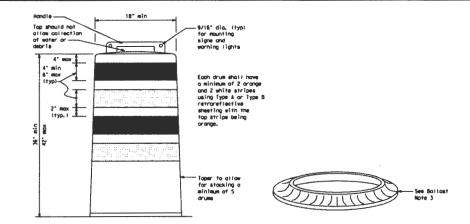
 5. The exterior of the drum body shall have a minimum of four alternating orange and white retroreflective circusferential stripes not less than 4 inches nor greater than 8 inches in sidth, Any non-reflectorized space between any two adjacent stripes shall not exceed 2 inches in
- Bases shalf have a maximum width of 36 inches, a maximum height of 4 Inches, and a sinisum of two foothoids of sufficient size to allow base to be held down while separating the drum body from the base to be held down while separating the drum body from the base. Plastic drums shall be constructed of ultra-violet stabilized, orange,
- high-density polyethylane (HDPE) or other approved material,
- 9. Drum body sholl have a maximum untalliasted weight of 11 lbs. 10. Drum and base shall be sorked with provided turer's name and made! number

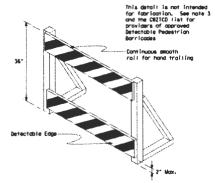
RETROREFLECTIVE SHEETING

- The stripes used on druss shall be constructed of sheeting seeting the color and retronfisctivity requirements of becomeshed Materials specification 085-9500, "Sign Fock Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plana.
- The amering and I be suitable for use on and shall adhere to the drus surface such that, upon vehicular lepoct, the sheeting shall result adhered In-place and exhibit no delasharting, cracking, or loss of retroreflectivity other than that loss due to abrasion of the sheeting

BALLAST

- 1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This bose, when filled with the billost anderein; should weigh between 35 lbs (afnisus) and 50 lbs (accium). The borrows more of some filled with the billost anderein; should weigh between 35 lbs (afnisus) and 50 lbs (accium). The borrows may be sond in one of three sondoogs separche from the bose, and in a sond-filled plastic bose, or other bollosting devices as approved the Engineer. Snooking of sandbags still be allosed, hosever height of sandbags above powsent surface step and the sandbags above powsent surface step and the sandbags above powsent surface step.
- Boses with built-in bollost shall weigh between 40 lbs, and 50 lbs. Builtt-in bollost con be constructed of an integral crumb rubber base or
- a solid rubber base. Recycled truck tire eldewalls may be used for ballost on drums approved for this type of bolicat on the CMZTCD list.
 4. The bolicat sholl not be heavy objects, water, or any material that
- would become hozordous to motorists, pedestrions, or workers when the drum is struck by a vehicle.
- When used in regions ausceptible to freezing, drums shoul have drainage a hazard when struck by a vehicle.
- Balloet shall not be placed on top of drums.
 Adhesives may be used to secure base of drums to povement.





DETECTABLE PEDESTRIAN BARRICADES

- When existing pedestrion facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with
- detectoble and include accessionality requires containers are frequency present in the existing possist for facility. Refet to EX(815-2) for Pedestrion tomorrol regularismins for Sidewolk Diversions, Sidewolk bottom and Crossocial Coopers. Bitters pedestrions with visual discollities named by use the closed sidewolk, a Detection Pedestrion Borricode and it by places the process may full width of the closed sidewolk instead of a type 3 Borricode.
- Detectobis pedestrian barricades similar to the one pictured dove, langitudinol channelizing devices, some concrete barriers, and sood or chain (ink fending with a continuous detectable edging can satisfactorily delineate a pedestrion
- 4. Tope, rope, or plastic chain strung between devices are not derectable, do not comply with the design standards in the "Americans with Disabilities Act Accessibility Guidelines (ADAAO)" and should not be used as a control for pedestrian
- movements. Marning lights shall not be attached to detectable pedestrian
- borrioosse sedestrion berrioods should use 8° nominal borrioods borrioosse sedestrion berrioods should use 8° nominal borrioods critic as shown on 85(10) provided that the top rall provides a smooth continuous rall suitable for hand trailing sith no spilnters, burrs, or shorp adges.



18" x 24" Sign (Maximum Sign Dimension) Chevron C91-8, Opposing Traffic Lone Divider, Driveway sign D70a, Keep Right R4 series or other signs as approved by Engineer



12" x 24" Vertical Panel mount with diagonals travel way

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

SIGNS, CHEVRONS, AND VERITICAL PANELS MOUNTED ON PLACTED DRUMS

- Signs used on plostic drume shall be manufactured using substrates listed on the CBZTCD.
- 2. Chevrans and other work zone signs with an arange background should be monufactured with Type $B_{\rm R}$ or Type $C_{\rm R}$ Orange sheating meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless othereise specified in the plans.
- 3. Vertical Panels shall be manufactured with arange 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 ions.
- 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 6 below.
- 5. Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each
- 6. Mounting boits and nuts shall be fully engaged and inch beyond nuts.
- 7. Chevrons may be placed on drums on the outside of curves. on merging topers or on shifting topers. Shen 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 R9-11o Sidewalk Closed signs which ore 24 inches wide may be mounted on plastic drums, with approval of the Engineer.

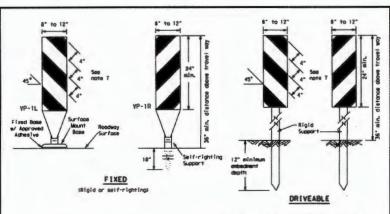
SHEE!T 8 OF 12

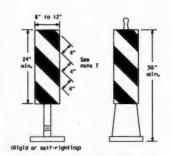
Texas Department of Transportation

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

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PORTABLE

- Vertical Paneta (VP's) are normally used to channellize traffic or divide apposing iones of traffic.
 VP's may be used in dayline or injertille a situations. They say be used of the edge of shoulder around a other creas such as lone transitions share positive daytime and nighttime delineation is required. The Engineer/Inspector sholl refer to the Roadway besign Monaul for additional requirements on the use VP's
- Monusi for additional requirements on the use MP*s for drop-offs.

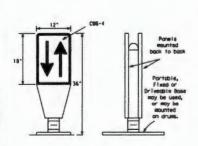
 3. WP*s should be mounted back to back if used of the edge of cuts adjacent to two-way two lone roadways. Stripes are to be reflective arrange and reflective shifts and should always slope downward feared the travel lone.

 4. WP*s used on expressedys and fraeways or other high speed roadways, say have sore than 270 aguars inches of retraceflective area facing traffic.

 5. Self-righting supports are worldolle with portable base. See "Compilant Bark Zone Traffic Control Devices List" (CEXTOD).

- CEZION.
 Sheering for the VP's shoil be retrorefactive Type A or Type B conforming to Deportmental Material Specification DMS-1800, unless noted otherwise.
 7. Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 5 inches shall be used.

VERTICAL PANELS (VPs)



- 1. Opposing Troffic Lane Dividers (OTLD) are delination devices designed to convert a normal one-say roadway section to two-say operation, OTLD's are used on temporary centerlines. The upward and downsord arrows on the sign's face indicate the direction of traffic an either side of the divider. The base is secured to the powement with an odhesive or rubber weight to minimize mov caused by a vehicle impact or wind gues.
- 2. The OTLD may be used in combination with 42" cones or VPs.
- 3. Specing between the OTLD shall not exceed 500 feet, 42" cones or VPs placed between the OTLD's should not exceed 100 foot appoing.
- 4. The OTLD shall be arange with a black non-reflective legend. Sheeting for the OTLD shall be retroreflective type By. or type Cg. conforming to Departmental Waterial Specification DMS-8500, unless noted otherwise. The legend shall make? the requirements of DKS-6300.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)





lvecble Bose, or Flexible

- The chevron shall be a vertical rectangle with a minimum size of 12 by 18 Inches.
- Chewrons are intended to give notice of a sharp change of alignment with the direction of trows and provide additional septods and guidance for vehicle operators with regard to changes in harizontal alignment of the roadway.
- 3. Chevrone, when used, shall be erected on the outalde of a shorp curve or turn, or on the for side of on intersection. They shall be in line with and at right angles to approaching traffic.
 Spacing should be such that the material always has three in view, until the change in alignment eliminates its need.
- 4. To be effective, the chavron should be visible for at least 500 feet.
- Chevrons shall be arange with a black nameflec-tive legend. Sheeting for the chevron shall be ratroreflective Type Bg or Type Cg conforming to Departmental Moteriol Specification DMS-8300, unless noted otherwise. The legend shall west the requirements of DMS-8300.
- 6. For Long Term Stationary use on tapers or ran long term stationary use on topers or transitions on freeways and divided highways, self-righting otherons may be used to supplement plastic drums but not to replace plastic drums.

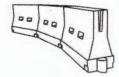
CHEVRONS

GENERAL MOTES

- 1. Bark Zone channelizing devices illustrated on this sheet may be installed In close proviety to traffic and are suitable for use an high or low speed raadways. The Engineer/Inspector shall ensure that spacing and placement is uniform and in accordance with the "Texas Manual on Uniform
- Professional Devices "INUICO».

 Channel Izing devices shown on this sheef may have a driveable, fixed or portable lates. The requirement for self-righting channel Izing devices sust be appelified in the General Moreta or other pion sheets.
- Channellizing devices on self-righting supports should be used in work zone charmentaring devices on self-regiming appoints institute or used in early con-orces where channel izing devices are frequently impacted by errors vehicles or vehicle related wind guests asking all green of the channel izing devices difficult to maintain. Locations of these devices shall be devolved else-where in the plans. These devices shall conform to the TAUTCD and thu "Compilant Work Zone Traffic Control Devices List" (CWZTCD).
- The Contractor shall maintain devices in a alean 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 specing and alignment.

 Periods bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall beigh a sinimum of 30 lbs.
- Powerent surfaces shall be prepared in a server that ensures proper bonding between the odhesless, the fixed ecunt bases and the powerest surface. Adhesless shall be prepared and applied according to the seruiracturer's.
- 7. The installation and removal of channelizing devices shall not cause datrimental effects to the final powerent surfaces, including powerent surface alsocioration or surface integrity. Driveoble bases shall not be permitted on final powement aurfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.



LONGITUDINAL CHANNELIZING DEVICES (LCD)

- LCDs are creshworthy, lightweight, deformable devices that are highly visible, have good target value and on the corrected tagether. They are not designed to contain or redirect a whicle on legact.
 LCDs exp be used instead of a line of comes or drums.
 LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the GZTCO list.
- 4. LCDs should not be used to provide positive protection for obstacles, pedestrions or workers.
- 5. LCDs shall be supplemented with retroreflective delineation as required for temporary barriers
- and SCT1 when ploced roughly parallel to the froyet lones.

 LCDs used as borricodes ploced perpendicular to traffic should have at least one ray of reflective smerting severing the result ments for borricode rolls as shown on SCT101. Place reflective sheeting near the top of the LCD along the full length of the device.

WATER BALLASTED SYSTEMS USED AS BARRIERS

- Noter bolloated systems used on borriers shall not be used solely to choncelize road users. But also to protect the work spoke per the appropriate Servaid for Assessing Safety Workshore MMSSH crashworthiness requirements based on 2. Outdoor speed and borrier application.
 State bolloated systems used to channelize vehicular traffic shall be supplemented with retrareflective delineation or channelizing devices to legarde dystems/nightspeed solitify. They say also be supplemented with powerement mornings.
 Noter bolloated systems used on borriers shall be placed in appointment of position and installation to once to application and installation of the control of the position and installation of the control of the position and installation of the control of the position and installation of the position of the position and installation of the position o

- Noter bollosted systems used as borriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CRITCO lists. Noter bollosted systems used as borriers should not be used for a serging taper except in low speed clies, than 45 MPHI urbon areas. Shen used on a taper in a low speed urbon area, the toper shall be delinence and the taper length should be designed to optimize road user operations considering the avoilable geometric conditions. Then water bollosted systems used as borriers have blurst ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flored to a point outside the clear zone.

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

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

Posted Speed	Formuta		esirob er Len		Suggested Maximum Spacing of Channel lzing Devices		
		Offset	Offeet	Offast	On a Taper	On a Tangent	
30	2	150"	165"	180'	30'	60'	
35	L - 60	205	225'	245"	35'	70'	
40		265'	295"	320'	40'	80'	
45		450"	495	540"	45'	90'	
50	L-#S	500	550"	600	501	100'	
55		550	605	660	55'	110'	
60	C-W3	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'	601	160'	

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMA DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation

BARRICADE AND CONSTRUCTION CHANNEL IZING DEVICES

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- Refer to the Comptiont Bork Zone Traffic Control Devices List (CBZTCD) for details of the Type 3 Barricodes and a list of all materials used in the construction of Type 3 Barricodes.
- Type 3 Barricades shall be used at each end of construction
- . Type 3 BOTF (occase must be used or scon and of construction projects closed to all fraffic. BorFloodse strending occase or econ wholish have stripes that slope downword in the direction record which troffic must turn in detouring. When both right and left turns are provided, the chemical striping may slope downword in both directions from the centre of the borFloods.
- Share no turns are provided at a closed road, striping should slope document in both directions toward the center of roadway, Striping of rolls, for the right side of the roadway, should slope
- deserved to the left. For the left side of the rodowy, should stope downard to the left. For the left side of the rodowy, striping should stope downard to the right. Identification sonkings say be shown only on the bock of the borrloads ralls. The socieum height of letters and/or company topos used for identification shoul be 1".
- Barricades shall not be placed parallel to traffic unless on adequate
- sorricose shall not be placed persistent or training unless on danguare clear zone is provided.

 Barning lights shall NOT be installed on borricoses.

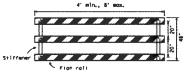
 Barning lights shall NOT be installed on borricoses, the use of sendous requires the use of sendous returning over, the use of sendous ethics require the use of sendous ethics and is recommended. The composition of the returning over, the use of sendous ethics returned to the provided of the composition of the compos Rock, concrete, Iron, steel or other solid objects will NOT be permitted. Sondbogs should weigh o minitum of 35 bis and a moximum of 50 bis. Sondbogs sholl be made of a durable material that tears upon vehicular lapact, Rubber (auch as tire Inner tubes) shall not be used venicular reports, nuover tauch de trie inner trates arout from use for anothogo, Sordioga should not be a proced along or upon the bose auports of the device and should not be auporade doore ground level or fung eith rope, effer, chains or other feasiners.

 Sheeting for bordiodas shall be retrorestisctive Type A or Type B conforming to Bipportmentol tother follower[filt] from 10 Bis-3300 unless
- otherwise noted.

Barricades shall NOT be used as a sign support.

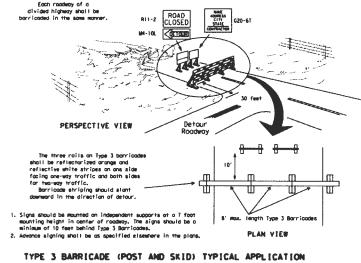


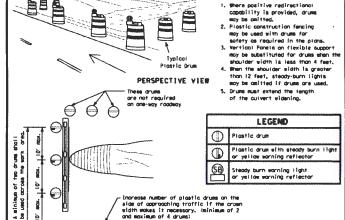
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES





and maximum of 4 drums)

CONES 4º min. orange 2" min. 4" min. white 2" min. 4" min. oronge Î6" min. 1 4" min, white mio.

Two-Piece cones

6" min.

 Θ

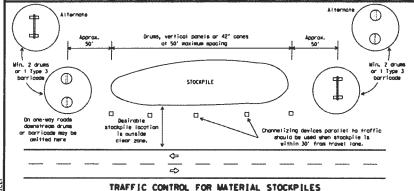
PLAN VIEW

2" to 6" TT 31 min.

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

One-Piece cones

Tubular Marker



28" Cones shall have a minimum weight of 9 1/2 lbs.

42" 2-piece canes shall have a minimum weight of 30 lbs. including base.

- 1. Traffic comes and tubular markers shall be predominantly arange, and meet the height and weight requirements shown above.
- seet the height and weight requirements show about 500 ms. One-please comes have the body and base of the come moided in one consolidated unit. Teo-please comes have a come should be depend body and a separate rubber base, or boillost, that is added to keep the device upright and in place.

 3. Teo-please comes say have a handle or loop entereding up to \$1' above the sinisus-height shown, in order to old in retrieving the device.
- neight ander, in order to did in retrieving the device.

 4. Comes or tubulor morkers shall have white or white and orange reflective bonds as shown blows. The reflective bonds shall have a smooth, sealed outer surface and seet the requirements of Departmental Marterlat Specification SMS-9300 Type & or Type B.
- 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-place comes, vertical panels or druss are suitable for all work zone durations.
- 7. Cones or tubular markers used on each project should be of the same size

SHEET 10 OF 12

Texas Department of Transportation

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

CENERAL

- The Contractor shall be responsible for maintaining early zone and existing powerent workings, in accordance with the standard specifications and special provisions, on all readers pen to traffic within the CSI limits unless otherwise stated in the plans.
- Color, potterns and disensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
- Additional supplemental povement storking details may be found in the plans or specifications.
- Powerent markings shall be installed in accordance with the TMUTCD and as shoen on the plans.
- When short term markings are required on the plans, short term markings shall conform with the BMECD, the plans and details as shown on the Standard Pion Sheet 8Z(STRB).
- When standard poversent sorkings are not in place and the roadeay is opened to proffic, to NoT PASS algae shall be erected to sork the beginning of the sections where possing is prohibited and PASS WITH CARE signs of the beginning of sections where possing is perellited.
- All work zone powerent markings shall be installed in accordance with Item 662, "Bork Zone Powerent Markings."

RAISED PAVEMENT MARKERS

- Roised povement markers are to be placed according to the potterns on BC(12).
- All roised povement markers used for sork zone markings shall meet the requirements of lites 672, "RaiSED PAYEMENT MARKERS" and Departmental Matterial Specification DMS-4200 or DMS-4300.

PREFABRICATED PAVEMENT MARKINGS

- Removable prefabricated povement workings shall meet the requirements of DMS-8241.
- Mon-removable prefabricated povement markings (foli back) shall meet the requirements of DMS-8240.

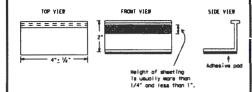
MAINTAINING WORK ZONE PAVEMENT MARKINGS

- The Contractor will be responsible for maintaining work zone powerent markings within the work (imits.
- Sork zone povement markings shall be inspected in accordance with the frequency and reporting requirements of sork zone traffic control device inspections as required by Farm 599.
- The morkings should provide a visible reference for a minimum distance of 300 feet during normal daylight hours and 160 feet when lituminated by automobile low-beam headlights at night, unless sight distance is restricted by readway geometrics.
- Markings falling to meet this oriteria within the first 30 days ofter placement shall be replaced of the expense of the Contractor as per Specification I tem 662.

REMOVAL OF PAVEMENT MARKINGS

- Povement workings that are no larger applicable, could create confusion or direct a satoriat toward or into the closed portion of the receiver shall be removed or obliterated before the roodery is opened to traffic.
- The above shall not apply to detaure in place for less than three days, where flaggers and/or sufficient charmelizing devices are used in lieu of sorkings to autilize the detaur route.
- Povement markings shall be resoved to the fullest extent possible, so as not to leave a discernable marking. This shall be by any method approved by TSOOT Specification Item 677 for "Etiminating Existing Povement Markings and Markers".
- The removal of povement markings may require resurfacing or seal conting portions of the readers as described in Item 677.
- Subject to the approval of the Engineer, any method that proves to be successful on a particular type povement may be used.
- Bloat cleaning may be used but will not be required unless specifically shown in the slons.
- 7. Over-pointing of the workings SHALL NOT BE permitted.
- Removal of roised powerent markers shall be as directed by the Engineer.
- Resovoi of existing povestant markings and markers still be pold for directly in accordance with Ites 677, "ELIMINATING EXISTING PAYDMENT MARKINGS AND MARKINS," unless otherwise stated in the plans.
- Black-out marking tope stoy be used to cover conflicting existing markings for periods less than two weeks when approved by the Engineer.

Temporary Flexible-Reflective Roadway Marker Tabs



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

- Temporary flexible-reflective roadedy earlier tabs used as guidemarks shall meet the requirements of DMS-8242.
- 2. Tobs detoiled on this sheet one to be Impacted and occepted by the Engineer or designated representative. Sompting 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 tobs at random from each lot or shipment and aubsit to the Construction Division, Sateriols and Payement Section to determine specification compliance.
 - 8. Select five (5) tobs and perform the following test, Affix five (5) tobs of 24 inch intervals on on expitatio powement in a straight line. Using a medium size passenger vehicle or pickup, nur over the morkers with the firont and rear fires of a pased of 35 to 40 miles per nour, four (4) times in each direction, to 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.
- See Standard Sheet RZ(STPM) for tab placement on new povements. See Standard Sheet TCP(7-1) for tab placement on seal coat work.

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

- Roised povement markers used as guidemarks shall be from the approved product liet, and meet the requirements of DMS-4200.
- All temporary construction relaed powerent markers provided on a project shall be of the same manufacturer.
- Adhesive for guidamorks shall be bituminous materiol not applied or butyl rubber and for all surfaces, or thereoplastic for concrete surfaces.
- Guidemorks shall be designated as:
 YELLOW (two amber reflective surfaces with yellow body),
 WHITE tank sliver reflective surface with white body).

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

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

SHEET 11 OF 12

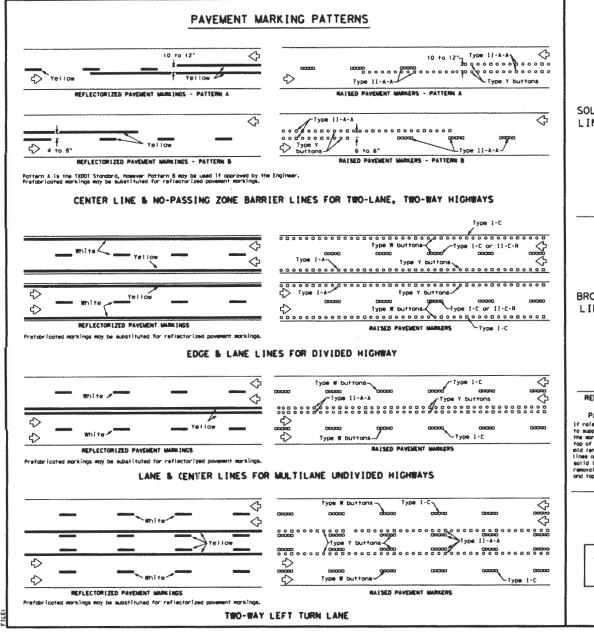
Texas Department of Transportation

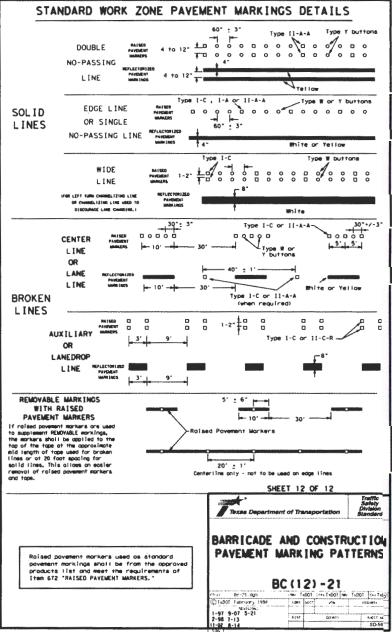
BARRICADE AND CONSTRUCTION
PAVEMENT MARKINGS

BC (11) -- 21

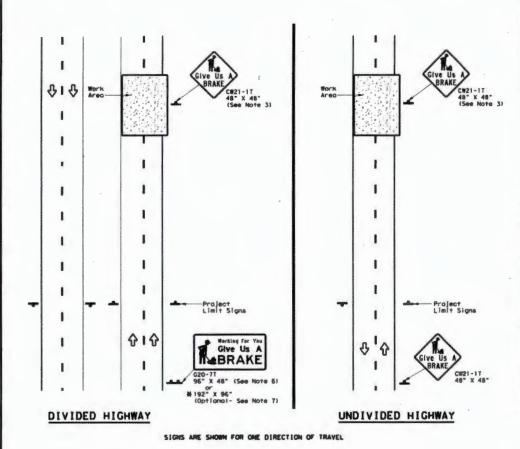
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DATE





Additional title accorded is governed by the "feeds Explinesting Propriets Ast", No workman's of ony file seeds of this second of the seeds with the seeds by the seeds of the seeds with the seeds of the seeds of the seeds with the seeds of the seeds of the filecards of the filecards of the filecards of the filecards of the seeds of the filecards of the filecard of the filecards of the



Then the optional larger WORKING FOR YOU GIVE US A BRAKE (G20-7T)
192" x 96" sign is required, the locations shall be noted

elsewhere in the plans.

SUMMARY OF LARGE SIGNS GALVANIZED STRUCTURAL DRILLED BACKGROUND REFLECTIVE 50 FT SIGN DIMENSIONS COLOR DESIGNATION SHEETING M' DIA (LF) Size 0 2 (LF) BRAKE Orange G20-71 96" X 48" Type Bp or Cp 32 . SW US A G20-7T Orange 192" X 96" Type Byl or CFL 128 W8×18 16 12

▲ See Note 6 Below

LEGEND					
- Sign					
Lorge Sign					
Troffic Flo					

DEPARTMENTAL	TERIAL SPECIFICATIONS
PLYWOOD SIGN BLANKS	DMS-7100
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DW5-8300

COLOR	COLOR USAGE SHEETING MATERIAL	
ORANGE	BACKGROUND	TYPE BEL OR TYPE CEL
BLACK	LEGEND & BORDERS	NON-REFLECTIVE ACRYLIC FILM

GENERAL NOTES

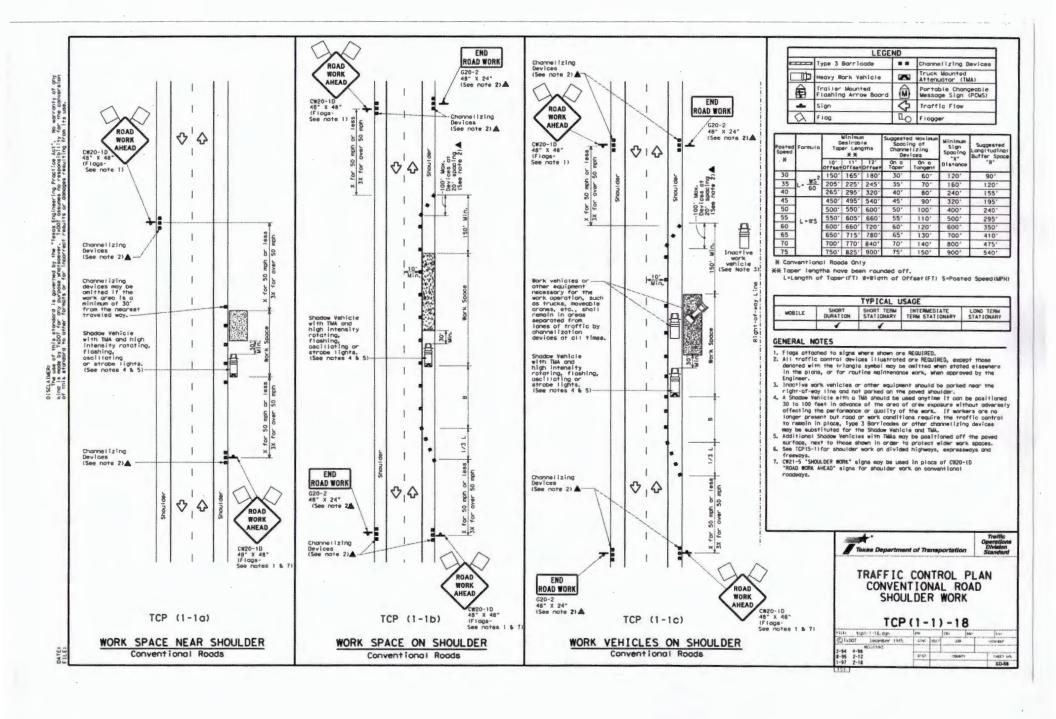
- 1. See BC and SMD sheets for additional sign support details.
- 2. Sign locations shall be approved by the Engineer.
- For projects more than two miles in length, Give Us a BRAKE signs should be repeated halfway through the project. The Give Us a Brake (CW21-17) may be used for this purpose.
- Bork zone speed limits are sometimes used in conjunction with GIYE US A BRAKE signing. See BC(3) for location and specing of construction speed zone signing when required.
- Give Us a Broke (CW21-17) signs and supports shall be considered subsidiory to Item 502, "Barricades, Signs and Traffic Handling."
- 6. The 95" X 46" Morking For You Give Us A BRAKE (G20-71) may use a 1/2" or 5/8" plywood substrate or 0.125" aluminum sheeting substrate and may be supported by two 4" x 6" wood posts with drilled holes for breakway as per BC(5) and will be
- 7. The Working For You Give Us A BRAKE (G20-77) 192" X 96" sign shall be paid for under the following specification items:
 Item 636 - Aluminum Signs
 Item 647 - Lorge Roodside Sign Supports and Assemblies.

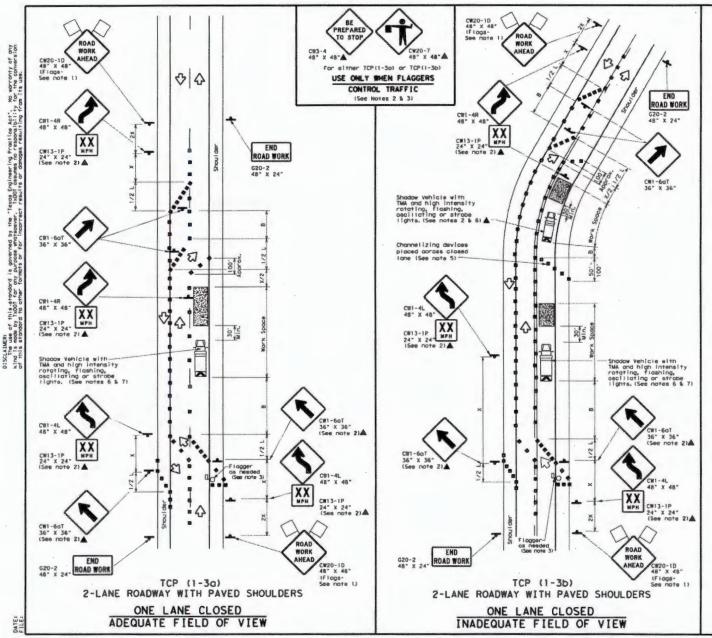
Item 416 - Drilled Shoft Foundations

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.

> Texas Department of Transportation WORK ZONE "GIVE US A BRAKE" SIGNS WZ (BRK) -13 THE THOO CENTROOT ON THOO CAN THOO

4 JOST 1995 J18 6-96 5-90 7-13 1910 SD-57





	LEGE	ND	
22773	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portoble Changeable Message Sign (PCMS)
-	Sign	4	Traffic Flow
a	Flag	0	Flagger

Posted Formula Speed	Posted Speed	Formula		Minimu lesirab ler Len **	le	Speci	nd Maximum ing of stizing vices	Sign Specing	Suggested Longitudinal Buffer Space
	10' Offset	11' Offset	12' Offaet	On a Taper	On a Tangent	Distance	.0.		
30	2	150'	165"	180	30'	60'	120'	90'	
35	L = W5	205"	225	245"	35'	70'	160'	120'	
40	60	2651	295"	320'	40'	80'	240'	155'	
45		450'	495	540'	45'	90'	320'	195'	
50		500"	550'	600'	50'	100'	400'	240'	
55	L-WS	550'	605'	660	55'	110'	500'	295'	
60	- ""	600'	660'	720	60'	120'	600'	350'	
65		6501	715'	780"	65'	130'	700'	410'	
70		7001	770'	840"	70'	140	8001	475'	
75		750	825"	9001	75"	150'	900'	540'	

Conventional Roads Only

Toper lengths have been rounded off.

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

TYPICAL USAGE							
WOBILE	SHORT DURATION	SHORT TERM STATJONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY			
	1	1					

GENERAL NOTES

Flags attached to signs where shown are REQUIRED.

All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be amitted when stated elsewhere in the plans,

with the friongle symbol may be omitted when storded elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.

Floager control should NOT be used unless roadway conditions or neavy throffic value require additional emphasis to sofely control traffic. Additional floagers may be positioned in advance of traffic queues to client traffic to reduce speed.

DO NOT PASS, PASS BITH CAME and construction regulatory speed zone signs may be installed downstroom of the ROAD BORK ANEAD signs.

Then the work zone is made up of several work socces, charmelizing devices

When the work zone is mode up of several work spaces, channelizing devices rebuild be placed interailly across the closed lone for pre-expinage allosser. Laterally placed schannelizing devices should be repeated every 500 to 1000 feet in urban areas on every 1/4 to 1/2 selle in runal areas.

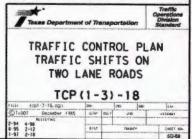
A Shadow Yehlote with a TMA should be used anytime if can be positioned 30 to 100 feet in advance of the area of area exposure without other presents of the present put road or work conditions require the traffic control to resoln in place, Type 3 Berricodes or other channelizing devices may be substituted for the Shadow Yehlote and TMA.

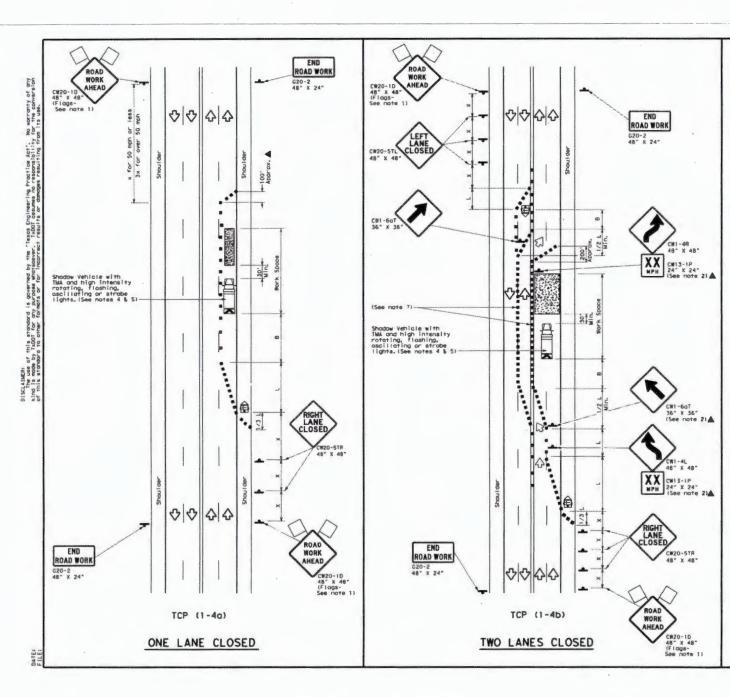
Additional Shadow Yehlotes with TMMS step be positioned off the powed surfaces, not to those when in order to proster wider mores.

surface, next to those shown in order to protect wider sorts spaces.

There is not the stown in order to protect wider sorts spaces.

There is not for the stown in order of set of the stown of the sto area of conflicting markings not the entire work zone.





	LEGEND							
CITTE	Type 3 Barrioade		Channelizing Devices					
	Heavy Work Vehicle	200	Truck Mounted Attenuator (TMA)					
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)					
-	Sign	<>>	Traffic Flow					
a	Flag	10	Flagger					

Speed		Desirable			Speci	nd Maximum ing of mizing rices	Minimum Sign Spacing	Suggested Longitudinal Buffer Space
*	10' Offeet	Offset	12' Offset	On a Taper	On a Tangent	Distance	.0.	
30	2	150'	165'	180'	30'	60'	120'	901
35	L - WS2	205	225'	245"	35'	70'	160'	120'
40	90	265	295"	320'	40"	80'	240'	155'
45		450"	495'	540"	45'	90'	320'	195'
50		500'	550'	600'	50'	100	400'	240'
55	L-WS	550'	605	660'	55'	110'	500	295'
60	6-43	600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70	1	700"	770'	840"	70'	140'	800'	475'
75		750"	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

* Toper lengths have been rounded off, L*Length of Toper(FT) W*Width of Offset(FT) S*Posted Speed(MPH)

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

GENERAL NOTES

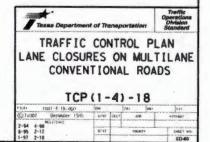
Flags attached to signs where shown are REQUIRED.
 All traffic control devices illustrated are REQUIRED, except those denoted

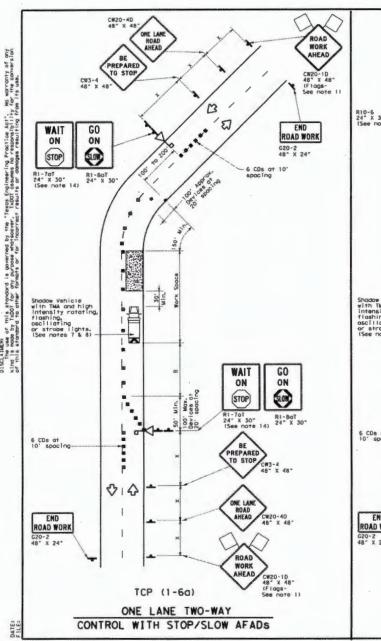
- 2. All traffic control devices litustrated are REQUIRED, except those denoted with the triangle systol may be onlitted when stated elementare in the plans, or for routine maintenance work, when approved by the Engineer.
 3. The CR20-10 "RADA BORK AMEAD" sign may be respected if the visibility of the work zone is less than 1500 feet.
 4. A Shadow Pehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of order 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 commerciating devices may be substituted for the Shadow Vehicles with TMAs may be positioned off the powed surface, next to those shown in order to protect wider work spaces.

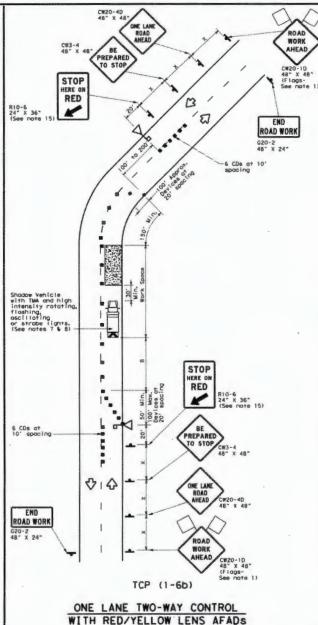
6. If this TCP is used for a left lane closure , CM20-5IL "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline where needed to protect the work space from apposing traffic with the arrow panel placed in the closed lane near the end of the merging taper.

TCP (1-4b)

7. Share troffic is directed over a yellow centerline, channellzing devices which esparate two-way traffic should be spaced on tapers at 20' or 15' if posted apsects are 55 spah or slower, and for trangent sections, or 1/25 where 5 is the speed in sph. This tighter device spacing is intended for the oreas of conflicting markings, not the entire work zone.







LEGEND							
***	Type 3 Borricode		Channellzing Devices (CDs)				
	Heavy Work Vehicle	A	Truck Mounted Attenuator (TMA)				
₽\	Automoted Flagger Assistance Device (AFAD)	M	Portable Changeable Message Sign (PCMS)				
-	Sign	4	Traffic Flow				
a	Flag	00	Flagger				

Posted Formula Speed	Desirobte			Suggested Moximum Spacing of Channelizing Devices		Sign Specing	Suggested Long!tudinar Buffer Space	Stopping Sight Distance	
*		to' Offset	Offset	12' Offset	On a Taper	On a On a history		-8-	
30	2	150"	165"	180"	30'	60'	120'	90'	200'
35	L= WS2	2051	225'	245	35'	70'	160'	120'	250'
40	60	265	295	320'	40'	80'	240'	155'	305
45		450"	495"	540'	45'	90'	320'	195'	360
50		500"	550"	600'	50'	100'	400'	240'	425'
55	L-WS	550"	605	660	55'	110'	500'	295'	495'
60		6001	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

#X 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		
	1	1				

GENERAL NOTES

Flage attached to signs where shown are REGUIRED.
 AFADe shall only be used in altuations where there is one lane of approaching traffic in the direction to be controlled.
 Adequate stopping sight distance must be provided to each AFAD lacation for approaching

3. Adequate stopping sight distance must be provided to each AFAD location for approaching traffic. (See tools obove).

4. Each AFAD shall be operated by a qualified/certified flagger. Flaggers operating AFADs shall be operated by a qualified/certified flagger.

5. One flagger may operate two AFADs only when the flagger has an unabstructed view of both AFADs and of the approaching traffic in both directions.

6. Shan pilot cars are used, a flagger controlling traffic shall be located an each approach. AFADs shall be too protect by this pilot our operator.

7. All AFADs shall be equipped with gote arms with an arrange or fluorescent red-orange flag attached to the end of the gote arm. The flag shall be included to the end of the gote arm. The flag shall be ominimum of 16° square.

8. A Shadow Vehicle with a TAM should be used anytime it can be positioned 30 to 100 feet in advance of the area of are exposure without adversely affecting the performance or qualify of the work. If workers are no longer areasent but road or work conditions require the traffic control to remain in place, type 3 Barricanes or other charmelizing devices may be substituted for the Shadow Vehicle and IMA.

9. Additional Shadow Vehicles with TAMs may be positioned of the power autroe, next to those shown in order to protect wider work spaces.

10. Flaggers ahould use two-say radios or other sethods of communication to control traffic.

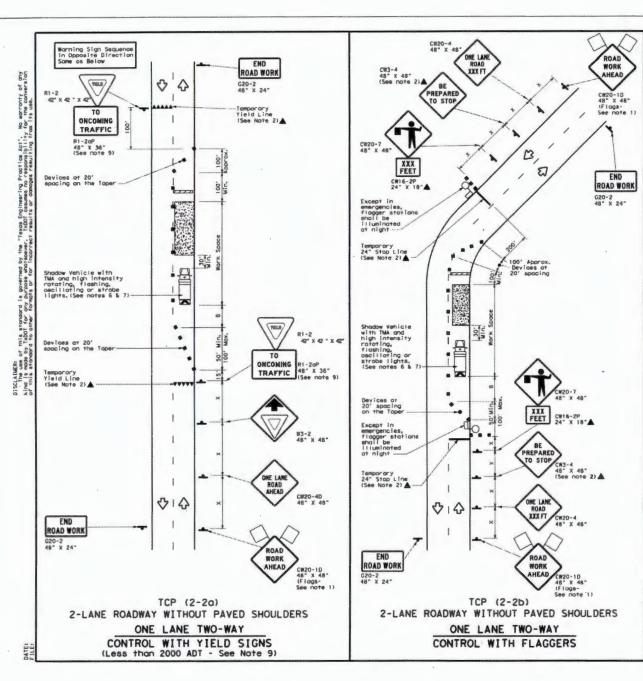
11. Length of work space should be based on the collisity of flaggers to communicate.

12. Channelizing devices an the center line may be antitred when a pilot cor in leading traffic and approved by the Engineer.

13. Channelizing devices an the center line may be antitred when a pilot cor is leading traffic and approved by the Engineer.

14. The R1-101 "MAIT ON STOP" sign and the R1-801 TO ON \$100" sign shall be installed at the AFAD location on second examples of the \$100 per \$100

Traffic Operations Division Standard Taxas Department of Transportati TRAFFIC CONTROL PLAN AUTOMATED FLAGGER ASSISTANCE DEVICES (AFADS) TCP (1-6)-18 tcp1 6-18, dgr Myselac D: 51 SD-81



	LEGEND							
Type 3 Barricade • Channelizing Dev								
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)					
Ê	Trailer Mounted Flashing Arrow Board	M	Partable Changeable Message Sign (PCMS)					
-	Sign '	\$	Traffic Flow					
a	Flog	00	Flagger					

Posted Formula	Desiroble			Suggested Moximum Spacing of Channellzing Devices		Minimum Sign Specing	Suggested Longitudinal Buffer Space	Stopping Sight Distance		
*		Offset	Offset	12' Offset	On a Taper	On a Tangent	Distance	"B"		
30	2	150"	165'	180"	30'	60'	120'	90'	500,	
35	L = WS2	205"	225'	245"	35'	70'	160'	120'	250'	
40	60	265'	295"	320'	40'	80'	240'	155	305*	
45		450"	495'	540"	45"	901	320'	195"	3601	
50		500	550'	6001	50'	100'	400'	240'	425'	
55	L-WS	550'	605	660"	55"	110'	500'	295'	495	
60	6-43	6001	6601	720'	60'	120'	600'	350	570	
65		650"	715'	780'	65'	130'	700'	410'	645	
70		7001	770'	840	70"	140'	800'	475'	730'	
75		750"	825"	9001	75'	150"	900'	540"	820'	

* Conventional Roads Only

NH Toper lengths have been rounded off.

L*Length of Toper (FT) #=Wigth of Offset (FT) S=Posted Speed (MPH)

		TYPICAL L	JSAGE	
MOSTLE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	1	1	1	

GENERAL NOTES

- Flags officend to signs where shown, ore REGUIRED.
 All traffic control devices litustrated are REGUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or far routine maintenance work, when appro-

- may be amilted when stated elsewhere in the pions, or for routine mointenance work, when approved by the Engineer.

 3. The CHS-4 "BE PREPARED TO STOP" sign may be installed ofter the CHSO-4 "GME LAME ROAD XXXX FT" sign, but proper sign spacing shall be maintained.

 4. Flaggers should use two-way roalss or other methods of communication to control traffic.

 5. Length of work space should be based on the dollity of flaggers to communicate.

 6. A Shadow Vehicle with a TMA should be used cryfine it on the positioned 30 to 100 feet in advance of the oras of cree exposure without adversely of feeting 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 IMA.
- Additional Shadow Vehicles with TMAs may be positioned off the poved surface, next to those shown in order to protect a wider work space.

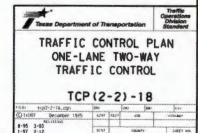
- 8. The RI-2 "YIELD" sign troffic control may be used an orajects with approaches that have adequate signi distance. For projects in urban areas, sork space should be no longer than one haif city block. In urban areas, sork space should be no longer than one haif city block. In urban areas, sork space should be no longer than 400 feet, 5. The RI-26* "YIELD 10 OKCOMING TRAFIC" sign should be placed on a support or a 7 foor influence.

TCP (2-26)

- 10. Channellizing devices on the center line may be amitted when a pilot car is leading traffic and approved by the Engineer.

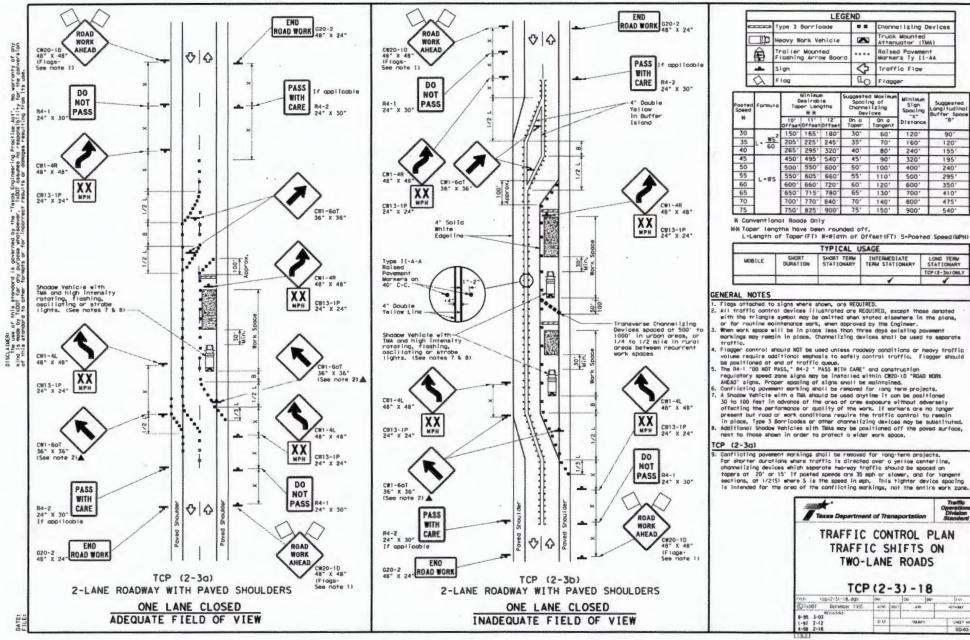
 11. If the work apoce is located near a horizontal or vertical curve, the buffer distances should be
- increased in order to maintain stopping sight distance to the flogger and a queue of stopped vehicles. (See table above).

 12.Flaggers should use 24" STOP/SLOW paddles to control troffic. Flags should be limited to
- emergency situtotions.



SD-62

8-95 3-03 1-97 2-12 4-98 2-18



LEGEND Channelizing Devices Truck Mounted Attenuator (TMA) Raised Pavement Markers Ty II-AA Traffic Flow O.D

Posted Speed #	Formula	Minimum Desiroble Toper Lengths **			Spac I Channe	d Maximum ng of Ilizing rices	Minimum Sign Specing	Suggested Longitudinal Buffer Space
		10' Offset	11' Offaet	0ffset	On a Taper	On a Tangent	Distance	-8-
30	2	150'	165	180'	30'	60'	120'	90'
35	L - WS2	205"	225'	245"	35'	70"	160'	120*
40	60	265	295"	320"	40"	80'	240'	155'
45		450"	495	540"	45'	90'	320'	195'
50		500"	550'	600"	50'	100'	400'	240'
55	L-WS	550"	605	660'	55'	110'	500'	295'
60	L-43	600'	660	720"	60'	120'	600'	350'
65		650'	715	780	65'	130'	700°	410"
70		700"	770"	840	70'	140"	800'	475'
75		750'	825	900"	75'	150"	900'	540"

TYPICAL USAGE						
MOBILE	SHORT	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY		
				TCP (2-36) ONLY		
			1	1		

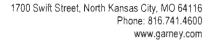
- All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be amitted when stated elsewhere in the plans,
- or for routine mointenance work, when approved by the Engineer.

 The mork space will be in place less than three days existing pavement workings may remain in place. Charmefizing devices shall be used to asparate

- offecting the performance or quality of the work. If workers are no larger present but road or work conditions require the troffic control to resolt in place, Type 3 Barricolose or other channelizing devices may be substituted. Additional Shodow Vehicles with TABAs may be positioned off the powed surface, next to those shown in order to protect a wider work space.

 Conflicting powerent markings shall be removed for long-term projects.
 For shorter durations where traffic is directed over a yellow center line, channel [zing devices which separate two-way fraffic should be sposed on topers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2(5) where 5 is the speed in mph. This tighter device specing is intended for the orea of the conflicting earlings, not the entire work zone.







Commissioner Hutchins Hunt County Courthouse Greenville, TX 75401 11/8/2023

RE: CR 1100 Road Crossing

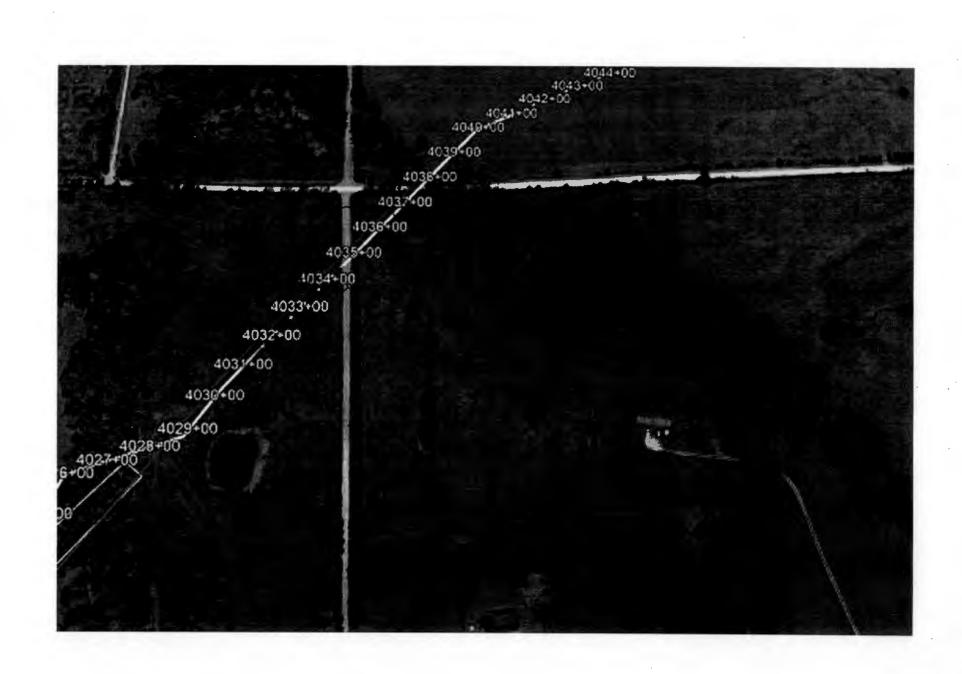
Dear Hunt County,

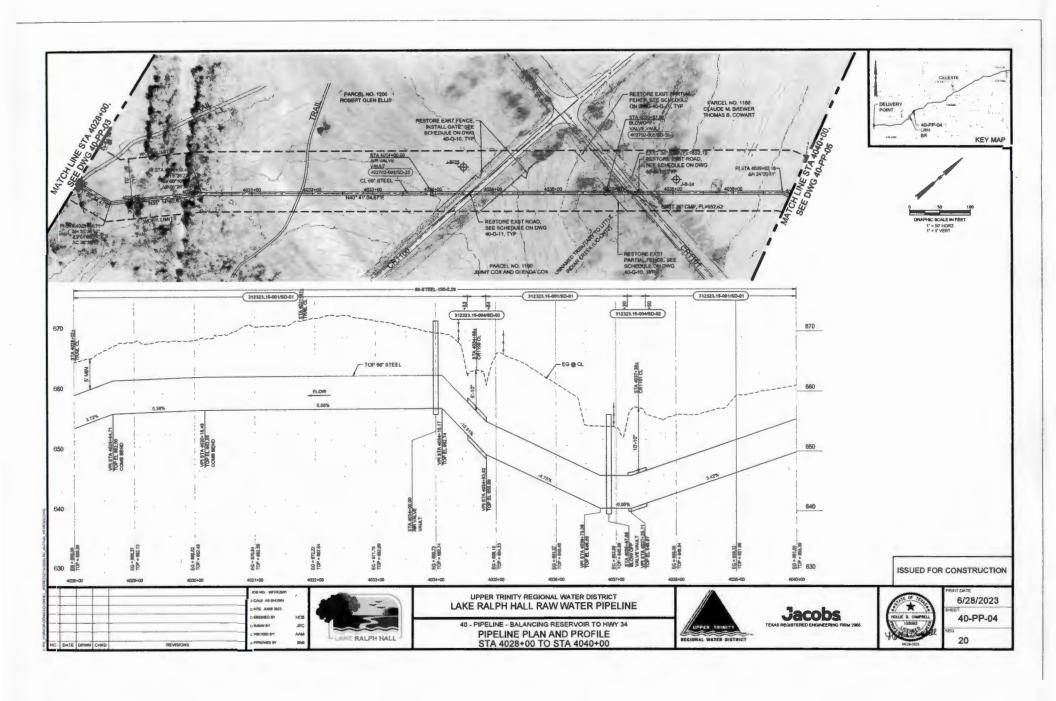
McKee Utilities is seeking permission from Hunt County to Cross County Road 1100 with the Lake Ralph Hall Pipeline. McKee Utilities will be crossing the road following the attached construction details. The access road will be re-routed during the utility crossing utilizing proper TXDOT detour signs. Construction will take roughly three days with the road detour in place. The contractor will notify the residents of the lane closure in advance.

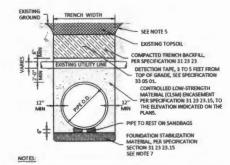
Sincerely,

GARNEY COMPANIES, INC.

Andrew Beck Sr. Project Manager







- 1. SEE PLAN AND PROFILE FOR PROJECT SPECIFIC AND PERMITTED CROSSING
- 2. THE CONTRACTOR SHALL BE REQUIRED TO USE WOOD MATS FOR WATERLINES, OR REQUIRED BY CROSSING PERMIT.
- 9. THE CONTRACTOR SHALL CONTACT UTILITY OWNER AT LEAST (9) DAYS PRIOR TO CROSSING THE UTILITY.
- 4. FOR CROSSING UTILITIES 6" OR LARGER IN DIAMETER, EXTEND CLSM ENCASEMENT ON PROPOSED PIPE TO 5' ON EACH SIDE OF UTILITY CROSSING.
- CONTRACTOR SHALL SLOPE TRENCH WALLS AND/OR SHORE EXCAVATIONS FOR CONSTRUCTION AND SAFETY IN ACCORDANCE WITH CURRENT OSHA
 REQUIREMENTS AND SPECIFICATIONS.
- IF THE CROSSING UTILITY IS LESS THAN 6-INCHES AND 3 FEET OR HIGHER
- IF THE CROSSING UTILITY IS LESS THAN 6-INCHES AND 3 FEET OR HIGHER FROM THE FOO PT THE PIRE THE CONTRACTOR MAY SUPPORT THE CROSSING UTILITY AND USE THE STANDARD GRAMFULAR EMBEDMENT DETAIL CONTRACTOR TO SEEK APPROVAL FROM THE DESIGNATIO OWNER PREPARESENTATIVE PROOR TO PLACEMENT OF FOUNDATION STABULZATION MATERIAL WINDER UNSTABLE GROUND CONDITION OCCUR. FOUNDATION STABULZATION MATERIAL SHALL BE UTILIZED IF UNSTABLE GROUND COMPITIONS ARE ENCOUNTERED.

UTILITY LINE CROSSING DETAIL - 02 10 01 - 001



NOTES:

- 1. MARKER SHALL BE LOCATED ON BOTH SIDES OF ALL ROADS AND RALIRDADS, AT ALL MAINNINE VALVES, AIR VALVES, AID BLOWOFF VALVES, AT ALL HORZOWITH, BENDS, ROAD CROSSINGS, OTHER VISIBLE STRUCTURES. AND MAX SPACING OF 2000 IF ALONG PRELINE ALIGNMENT.

 2. EACH MARKER SHALL MAYE A STICKER WITH THE FOLLOWING INFORMATION "CAUTION WATER PRELINE BEFORE DIGGING CONTACT UTRIVO (972) 219-1228, STA XOCHAZ". ALL INFORMATION MUST BE TYPED OR STAMPED WITH MOH-FADING INK, NOT HAND WRITTEN.

PIPELINE MARKER - 33 05 01 - 001

ISSUED FOR CONSTRUCTION

CALE: AB BHOWN DATE SEPTEMBER 2022 EBIGHED BY CLF AMIN BY FJC HECKED BY OUT PROVED BY CRM



UPPER TRINITY REGIONAL WATER DISTRICT LAKE RALPH HALL RAW WATER PIPELINE

PROGRAM STANDARD DETAILS SHEET 2 CLSM EMBEDMENT, UTILITY LINE CROSSING AND PIPELINE MARKER DETAILS









03/09/2023 SD-02

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

- The Borricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary troffic control devices, construction povement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
- The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
- The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for opproval. 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 passible, meet the opplicable design criteria cantained in manuals such as the American Association of State Highway and Transpartation Officials (AASHIO), "A Policy on Geometric Design of Highways and Streets," the TXDOT "Roadway Design Manual" or engineering judgment.
- 6. When projects obut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance worning signs if the signing would be redundant and the work areas appear continuous to the matarists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.
- The Engineer may require duplicate warning signs on the medion side of divided highways where median width will permit and traffic valumes 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 shawn in this manual shall be shown in the plans or the Engineer shall provide a detail to the Controctor before the sign is manufactured.
- The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most oppropriate traffic control devices to be used.
- 10. Where highway construction ar 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 sholl be erected in advance of the CSJ limits. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected of or near the CSJ limits. Far mobile operations, CSJ limit signs are not required.
- Traffic cantral 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
- 13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as clase to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

WORKER SAFETY NOTES:

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

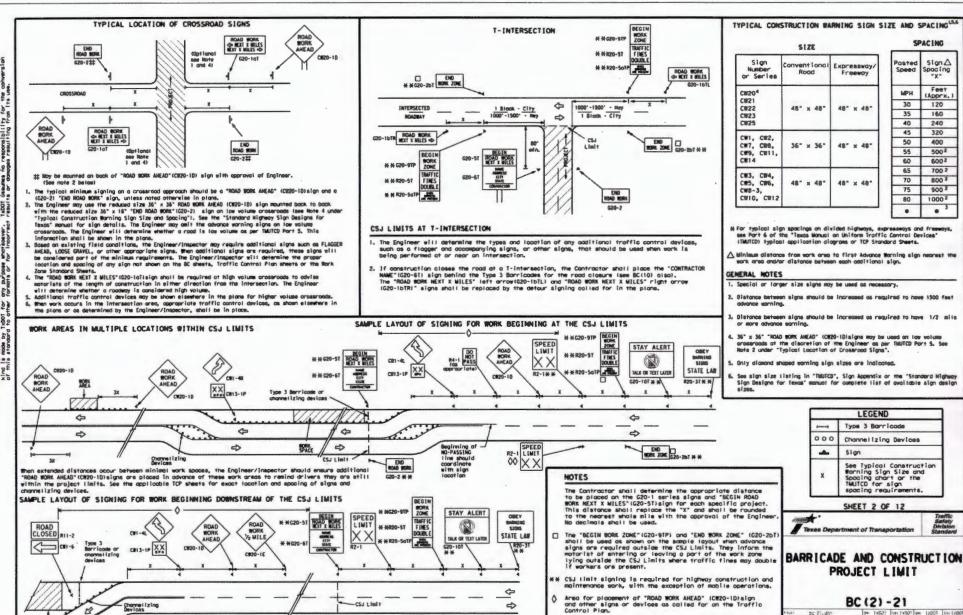
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Contractor will install a regulatory speed limit sign of the end of the work zone,

SPEED R2-1

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END BORK

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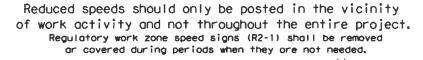
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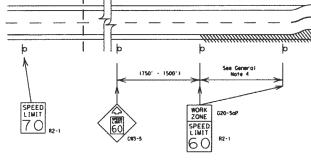
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TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

Mork 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.



See General Note 4



LIMITS

GUIDANCE FOR USE:

Signing shown for

See RC (2) for

additional advar

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 orea, including:

- a) rough road or damaged pavement surface
- b) substantial alteration of roodway geometrics (diversions)
- c) construction detours
- 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 borrier, when work activity is within 10 feet of the traveled way or actually in the troveled way.

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

GENERAL NOTES

WORK ZONE

SPEED

G20-5af

R2-1

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

SPEED

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

40 mph and areater 0.2 to 2 miles

35 mon 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)).
- Fabrication, erection and maintenance of the ADVANCE SPEED LIMIT (CW3-5) sign, "WORK ZOK" (G20-5aP) plaque and the "SPEED LIMIT (R2-1) signs shall not be poid for directly, but shall be considered subsidianty to Item 502.
- Turning signs from view, laying signs over or down will not be allowed, unless as atherwise noted under "REMOVING OR COVERING" on 8C(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) rodor 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.

SHEET 3 OF 12

Staning shown for

See RC (2) for

additional advance

signing.

ь

ZONE

SPEED

60

G20-5aP

R2-1

See General

G20-5aP

R2-1

(750" - 1500")

WORK

SPEED LIWIT

60

LIMITS

SPEED

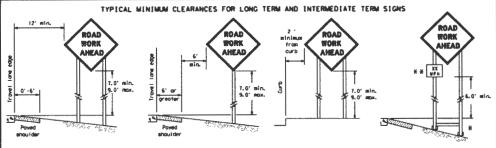
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R2-1

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

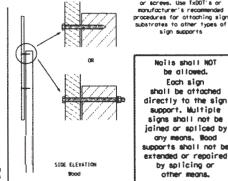
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- * When placing akid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears atroight and plumb. Objects shall NOT be placed under skids as a means of leveling.
 - 3.4. Shen plogues are placed on dupl-leg augusts, they should be attached to the upright regreat the travel lone. Supplemental plaques ladvisory or distance) should not cover the surface of the parent sign.



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 naminal post size, centered on the splice and of at least the same gauge material.



Noits shall NOT be allowed. Foch sign shall be attached directly to the sign support. Multiple signs shall not be igined or spliced by any means. Wood supports shall not be extended or required by splicing or other means.

Attachment to wooden supports

will be by boits and nuts or acrews, Use TxDOT's or

sign supports

STOP/SLOW PADDLES

- I. STOP/SLOW poddles are the primary method to control troffic by floogers. The STOP/SLOW poddle size should be 24" x 24".
- STOP/SLOW poddies shall be retroreflectorized who
- 3. STOP/SLOW poddles may be attached to a staff with a minimum
- length of 6" to the bottom of the sign.
 4. Any lights incorporated into the SIGP or SLOW paddle faces shall only be as specifically described in Section 6E.03 Hand Stancting Devices in the TMUTCO.







SHEETING RE	QUIREMENT	S (MHEN USED AT NIGHT)
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	ORANGE	TYPE BPL OR CPL 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

- Personant 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 (1,000), or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as named by installed on a roadway without construction.
- When personant regulatory or worning aligns conflict with work zone conditions, remove or cover the personant aligns until the personant aligns settle the roadway condition. For details for covering large guide aligns see the
- Shen existing permonent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
- If existing signs are to be relocated on their original supports, they shall be installed an croshworthy bases as shown on the SMD Standard sheets. The signs sholl seet the required southing heights shown on the BC Sheets or the SMD Standards. This work should be pold for under the appropriate pay item fo relocating existing signs.
- if permanent sions are to be removed and rejocated using temporary supports. the Contractor shall use crasheorthy supports as shown on the BC standard sheets, TLRS standard sheets or the CWZTCD list. The signs shall meet the required mounting heights aboun on the BC, or the SMD standard sheets during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
- Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soon as possible by the Contractor to ensure proper guidance for the motorists. This will be subsidiary

GENERAL NOTES FOR WORK ZONE SIGNS

- Contractor shall install and maintain eigns in a straight and plumb condition and/or at directed by the Engineer. den sion costs shall be painted white.
- Borricodes shall be used as sign supports.
 All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to requists, worn, and
- All aligns and to de instatled in docordonce with the plants or a circleted by the Engineer. Signs and to be used to regulate, sort, and quide the investing quality caseful year. The Contractor may furnish either the sign design shown in the plants or in the "Standard Rightery Sign Dealpas of Texas" (SMSD). The Engineer/Imagestor may require the Contractor to furnish other sork zone signs that are shown in the IMATCD but say have been calified from the plants. Any variation in the plants shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All oftengas exist be documented in writing before being insplanted. This can include documented in the inspector of contractor in its inspector's 18007 diary and having both the inspector and Contractor in initial and support provided in a sign support is listed in the "Compilant Sort Zome Traffic Control Device List" (CMZTCD) for small roadside
- aligns, Supports for temporary large rocaside signs shall neer the requirements detailed on the Temporary large Rocaside Signs shall neer the requirements detailed on the Temporary large Rocaside Signs (TIRS) shadow defects. The Contractor shall install the sign support in occordance with the soundstructurer's recommendations. If there is a question regarding installation procedures, the Contractor shall familiate the Englineer to one you'll be installation recommendations so
- The Engineer can verify the correct procedures are being followed.

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

 Leantification senkings sky be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used
- identification shall be I inch.
- The Contractor shall replace damaged wood posts. New or damaged wood stan posts shall not be spliced

DURATION OF SORE tos defined by the "Texos Monuol on Uniform Traffic Control Devices" Part 6)

- The types of aign exports, sign exacting height the size of signs, and the type of sign subcross con vary based on the type of work being performed. The Engineer is responsible for selecting the oppropriate size sign for the type of work being performed. The Engineer is responsible for selecting the oppropriate size sign for the type of work being performed. The Controctor is responsible for ensuring the sign support, sign mounting height and substrate meets manufacturer's recommendations in regard to creative thineas and duration of work requirements.
- Long-term stationary work that accupies a location more than 3 days.
 Intermediate-term stationary work that accupies a location more than one daylight period up to 3 days, or nightflee work lasting
- Short-term stationary daytime work that occupies a location for more than I hour in a single daylight period.
- Short, duration work that accupies a location up to 1 hour.
- e. Mobile work that moves continuously or intermittently (stopping for up to opproximately 15 minutes.)

- Sign adjusting MEIGHT

 1. The bottom of Lang-treat/intermediate-terms 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.

 1. The bottom of Start-terms/fort furction signs shall be a finitum of 1 foot above the povement surface but no sore than 2 feet above.
- the ground. Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing. Short-term/Short Duration signs shall be used only during daylight and shall be removed at the end of the workday or raised to
- oppropriate 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 SIGHS

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

SION SUBSTRATES

- 1. The Controctor 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 CEZICO lists each substrate that can be used on the different types and sodels of sign supports.

 2. "Mesh" type saterials are NDT an approved sign substrate, repardiess of the rightness of the weave.

 3. All seader individual sign panels fabricated from 2 or more pieces shall have one or more plysood clean, 1/2" thick by 6" vide, fastened to the book of the sign one strending fully across the sign. The clears shall be proceed not the top the control the control of the sign panel. The screen shall be proced on both sides of the sign one species that do not panel type the face of the sign panel. The screen shall be proced on both sides of the spilo and spaced of 6" center." The fooliess were recommendated and into the land from centers. The Engineer may approve other methods of epticing the sign face.

REFLECTIVE SHEETING

- All signs should be retroreflective and constructed of sheeting seeting the color and retro-reflectivity requirements of DBS-8300 for rigid aligns or DBS-8310 for roll-up signs. The web oddress for DBS specifications is shown on BC(1). Since the requirements of DBS-8300 Typs $R_{\rm R}$ and the bused for signs with a white background. Orange sheeting, seeting the requirements of DBS-8300 Typs $R_{\rm R}$ or Typs $C_{\rm R}$, shall be used for signs with a white background.

SICK LETTERS

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

REMOVING OR COVERING

- Shen align messages may be confusing or do not coply, the signs shall be removed or completely covered.
 Long-term stationary or intermediate stationary signs installed on square metal tubing may be turned dway from traffic 90 degrees when the sign message is not coplicable. This teachique may not be usef for signs installed in the median of divided highways or near any intersections where the sign may be seen from approaching traffic.
- Signs Installed an wooden skilds shall not be turned at 90 degree angles to the roodway. These signs should be removed or completely covered when not required.
- When signs are covered, the moterial used shall be apaque, such as heavy mill black plastic, or other materials which will cover the entire sign face and maintain their coopus properties under outsmobile headlights at night, without damaging the sign sheeting. Burlop shall MOT be used to over signs. Duct tope or other othersive saterial shall MOT be offized to a sign face.
- Signs and anchor stubs shall be resoved and holes backfilled upon completion of work,

SIGN SUPPORT MEIGHTS

- Ehere sign supports require the use of saights to keep from turning over, the use of sandbogs with ary, cohesioniess send should be used.

 The sandbogs will be field shut to keep the sand from splitting and to maintain o
- constant weight.
 Rock, concrete, iron, steel or other solid objects shall not be permitted

- Rock, concrete, from, steel or other soild objects shoil not be permitted for use das ign auport weights. Sondbogs should weight dainings of 35 tos and a exclusion of 30 lbs. Sondbogs should weight dainings of 35 tos and a exclusion of 30 lbs. Sondbogs should be side of o durable water lat that sears upon vehicular ispact. Rubber touch as fire inner tubes) shoil MOI be used. Rubber bottoats designed for channelizing devices should not be used for bottoat on particule sign supports. Sign supports designed and woru/factured with rubber boses may be used when shown on the CRZCO list. Sandbogs shoil only be placed along or laid over the base supports of the raffic control device and shall not be suspended done ground level or interficial control device and shall not be suspended done ground level or conducting the length of the skids to weigh down the grounds and of the special MOI beload under the skid and shall not be used to level align supports placed on alopes.

FLAGS ON SIGNS

Figgs may be used to draw attention to worning signs. When used, the fing shall be 16 inches source or larger and shall be orange or fluorescent red-arange in color. Figgs shall not be allowed to cover any portion of the slap focus

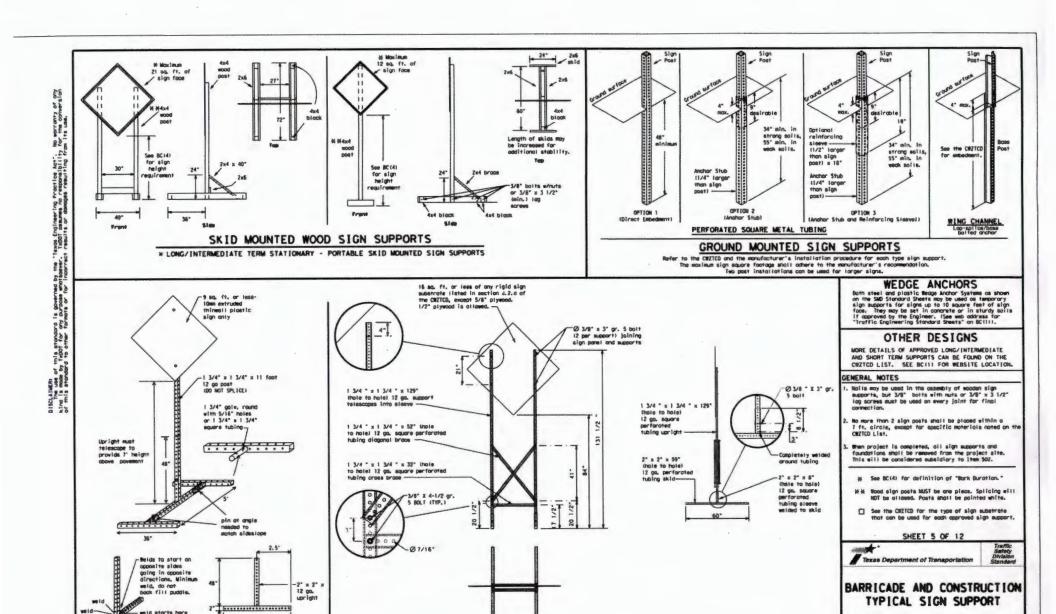
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Taxas Department of Transportation

EJARRICADE AND CONSTRUCTION **TEMPORARY SIGN NOTES**

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SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

BC (5) -21

9-07 8-14

7-13 9-21

DA: 1 MEG: CEN 1 MAN DER 1 MEGEBAN COMT SECTI COM MICHAEL

SD-49

ATE

SINGLE LEG BASE

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

PORTABLE CHANGEABLE MESSAGE SIGNS

- The Engineer/Inspector sholl approve all messages used on portable changeable message signs (PCMS).
- Messages on PCMS should contain no more than 8 words tabout four to eight characters per word), not including simple words such as "TO," "FOR," "AT," etc.
- Messages should consist of a single phase, or two phases that alternate. Three-phase messages are not allowed. Each phase of the message should convey a single thought, and must be understood by
- Itself.
 Use the word "EXII" to refer to on exit ramp on a freeway; i.e.,
 "EXII CLOSED." Do not use the term "RAMP."
 Always use the route or interstate designation (IH, US, SH, PMI
- along with the number when referring to a roadeay.

 When in use, the bottom of a stationary POUS message panel should be
- o sinium? feet obove the roodery, where possible.

 The message term "BEEKEND" should be used only if the work is to start an Saturday worning 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 Manday worning.
- The Engineer/Inspector may select one of two options which are available for displaying a two-phase wassage on a PCMS. Each phase may be displayed for either four seconds each or for three seconds each.
- Do not "floah" mesages or words included in a mesage. The mesage should be steady burn or continuous this displayed.
 Do not present redundant information on a two-phase wesage; 1.e.,
- Leging 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 "LMES SHIFT LEFT" or "LMES SHIFT RIGHT" on PCMS.

 13. Do not display the message "LMES SHIFT LEFT" or "LMES SHIFT RIGHT" on PCMS.

 14. Do not display messages that scall the rizentally or vertically across
- the face of the sign.

 14. The following table lists abbreviated words and two-word phrases that
- ore acceptable for use on a PCBs. Both words in a phrase sust be displayed together. Bords or phrases not on this list should not be obbreviated, unless shown in the TABLTCD.
- observiored, unless shown in the TBUTCD.

 3 POES character relight should be or least 18 inches for trailler sounted units. They should be visible from at least 10 12 (.3) mile and the text should be legible from at least 50 Fest or light not 800 feet 1 days light. I ruck sounted units sust have a character helpin of 10 inches and sust be legible from at least 400 feet.

 16, Each line of text should be cantered on the spessop bond rather than left or right justified.
- If disobled, the POSS should defoult to on illegible display that will not alone sortorists and will only be used to oler't workers that the POSS has selfunctioned. A partern such as a series of horizontal solid bars is appropriate.

WORD OR PHRASE	ABBREVIATION	MORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD	Mo or	MAJ
Alternate	ALT	Wiles	6 1
Avenue	AVE	Miles Per Hour	MPH
Best Route	BEST REE	Minor	Medic
Boulevard	BLVD	Monday	MON
Bridge	BRDG	Normal	NORM
Cannot	CANT	North	N
Center	CTR	Nor thbound	(route) N
Construction Ahead	CONST AHD	Parking	PRING
	w.1140	Rood	RD
CROSS INC	DEYOUR RITE	Right Lane	RT LN
Detour Route		Saturday	SAT
Do Mot	DONT	Service Road	SERV RD
East	in the second	Shoulder	SHLDR
Eastbound	(route) E	Slippery	SLIP
Emergency	EMER	South	<u> S</u>
Emergency Vehicle	EMEN AFM	Southbound	(route) \$
Entrance, Enter	ENT	Speed	TSP0
Express Lone	EXP LM	Street	ST
Expressury	EXPRY	Siunday	SUN
XXXX Feet	XXXX FT	Tiellephone	PHONE
Fog Ahead	FOG AHD	Temporary	TEMP
Freeway	FRWY, FWY	Tinureday	THURS
Freeway Blacked	FBY BLKD	Tip Doentown	TO DWNTN
Fridgy	FRI	Tireffic	TRAF
Hozordous Driving	HAZ DRIVING	Tirovelers	TRVLRS
Hozardova Materia		Yiuesday	TUES
High-Occupancy	HOV	Time Minutes	TIME MIN
Vehicle	HELY	Lipper Level	UPR LEVEL
Highway	HR. HRS	Venicles (6)	VEH, VEHS
Hour (a)		Warning	WARN
Information	INFO	Bednesday	WED.
1+ [6	175	Seight Limit	MT LIMIT
Junction	JCY	Vest	
Left	LFY	flestbound	(route) #
Left Lane	LFY EN	Bet Povement	BET PWIT
Lane Closed	LN CLOSED	Will Not	WONT
Lower Level	LWA LEVEL		

Roadway designation * [H-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	Clasure List	Other Cond	ition List
FREEWAY CLOSED X MILE	FRONTAGE ROAD CLOSED	ROADWORK XXX FT	ROAD REPAIRS XXXX FT
ROAD CLOSED AT SH XXX	SHOULDER CLOSED XXX FT	FLAGGER XXXX FT	LANE NARROWS XXXX FT
ROAD CLSD AT FM XXXX	RIGHT LN CLOSED XXX FT	RIGHT LN NARROWS XXXX FT	TWO-WAY TRAFFIC XX MILE
RIGHT X LANES CLOSED	RIGHT X LANES OPEN	MERGING TRAFFIC XXXX FT	CONST TRAFFIC XXX FT
CENTER LANE CLOSED	DAYTIME LANE CLOSURES	LOOSE GRAVEL XXXX FT	UNEVEN LANES XXXX FT
NIGHT LANE CLOSURES	1-XX SOUTH EXIT CLOSED	DETOUR X MILE	ROUGH ROAD XXXX FT
VARIOUS LANES CLOSED	EXIT XXX CLOSED X MILE	ROADWORK PAST SH XXXX	ROADWORK NEXT FRI-SUN
EXIT CLOSED	RIGHT LN TO BE CLOSED	BUMP XXXX FT	US XXX EXIT X MILES
MALL	X LANES	TRAFFIC	LANES

XXXXXXXX BI VD * LANES SHIFT in Prope I must be used with STAY IN LANE In Phose CLOSED

SIGNAL

XXXX FT

Phase 2: Possible Component Lists

A	ction to Take	/Effect on Trovel	Location	Warning	* * Advance
	L	ist	List	List	Notice List
	MERGE RIGHT	FORM X LINES RIGHT	AT FM XXXX	SPEED LIMIT XX MPH	TUE-FRI XX AM- X PM
	DETOUR NEXT X EXITS	USE XXXXX RD EX[T	BEFORE RAILROAD CROSSING	MAXIMUM SPEED XX MPH	APR XX- XX X PM-X AM
	USE EXIT XXX	USE EXIT I-XX NORTH	NEXT X MILES	MINIMUM SPEED XX MPH	BEGINS MONDAY
	STAY ON US XXX SOUTH	USE I-XX E TO I-XX N	PAST US XXX EXIT	ADVISORY SPEED XX MPH	BEGINS MAY XX
	TRUCKS USE US XXX N	WATCH FOR TRUCKS	XXXXXXX TO XXXXXXX	RIGHT LANE EXIT	MAY X-X XX PM - XX AM
	WATCH FOR TRUCKS	EXPECT DELAYS	US XXX TO FM XXXX	USE CAUTION	NEXT FRI-SUN
	EXPECT DELAYS	PREPARE TO STOP		DRIVE SAFELY	XX AM TO XX PM
	REDUCE SPEED XXX FT	END SHOULDER USE		DRIVE WITH CARE	NEXT TUE AUG XX
	USE OTHER ROUTES	WATCH FOR WORKERS			TONIGHT XX PM- XX AM
2.	STAY IN LANE	X	## S	ee Application Guideline	sa Note 6.

APPLICATION GUIDELINES

CLOSED

TUE - FRI

- 1. Only 1 or 2 phases are to be used on a POAS.
- The lat phase for both) should be selected from the "Road/Lone/Romp Closure List" and the "Other Condition List".
 A 2nd phase can be selected from the "Action to Toke/Effect on Travel, Location, General Marning, or Advance Notice
- on Irover, Locurion, seems only if a distance or location is not included in the first phase selected.

 1. A Location Phase is necessary only if a distance or location is not included in the first phase selected. If two POMS are used in sequence, they must be separated by a minimum of 1000 ft. Each POMS 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 dote, actender days anguid be replaced eith 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.
- Roadway designations IH, US, SH, FM and LP con be interchanged as appropriate.
 EAST, MEST, MORTH and SOUTH (or abbreviations E, B, N and S) con

- be interchanged as oppropriate.
 Highway names and numbers replaced as appropriate.
 RADAD, HIGHMAY and FRECENY con be interchanged as needed.
 AMEAD may be used instead of distances if necessary.
- T. FT and MIN, MILE and MILES Interchanged as appropriate.
 AT, BEFORE and PAST interchanged as appropriate.
 Distances or AMEAD can be eliminated from the message if a

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.

SHIFT

FULL MATRIX POMS SIGHS

DRIVEWAY

CLOSED

- 1. When Full Matrix PCMS signs are used, the character height and legibility/visibility requirements shall be maintained as listed in Note 15 under "PDRTABLE
- 1. When Full secrets ruse signs are used, the conductor integrit and requirements of the full Matrix PCMS sign and, with the approval of the Engineer, it shall sential the control in the sign integrit in the symbol signs, such as the "Flagger Symbol" (CR20-7) are represented graphically and the Full Matrix PCMS sign and, with the approval of the Engineer, it shall sential integrit in the 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 floating arrow board provided it meets the visibility, float rate and dimming requirements on BC(7), for the

SHEET 6 OF 12

Texas Department of Transportation

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC (6) -21

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Ptuer	to 21.com	0A I	dià:	with the	U-F	lxf-v1	LELIZ	ā
(C) Ta6:01	Navember 7002	[OH]	2.01	.58		14	1-1917	••
	E.A421000							-
	8-14	0151		Light		'Ţ	SHEET N	
7-13	5-21						SD-50	-
165								

(

Type C Marning Light or

opproved substitute mounted on a

drum adjacent to the travel way.

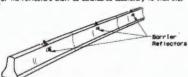
Marning reflector may be round or source. Must have a veilor

reflective surface area of at least

30 square inches

 Berrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of OMS-8500. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address. shown on BC(3).

Color of Borrier Reflectors shall be as specified in the INUTCO. The cost of the reflectors shall be considered subsidiory to item 512.



CONCRETE TRAFFIC BARRIER (CTB)

3. Where troffic is on one side of the CTB, two 121 Borrier Reflectors shall be mounted in oppositionarity the sidection of each section of CTB, an attendore southing location is uniformly sposed or one and of each CTB. This will olice for otrocheert of a borrier groppie without dospoing the reflector. The Borrier Reflector source on the side of the CTB shall be located directly below the reflector sounted on top of the borrier, as shown in the detail above.

4. Where CTB separates two-way troffic, three borrier reflectors shall be mounted on each section of CTB. The reflector will not so plant in one the specific or cTB. The reflector will not so plant in one the perior will not seen as the control of the control of

of the barrier shall have one yellow reflective face, as shown the detail above.

5. Shen CEB separates traffic traveling in the same direction, no barrier reflectors will be required on top of the CEB.

Borrier Reflector units shall be yellow or white in color to motch

the edgeline being supplemented. Maximum specing of Borrier Reflectors is forty (40) feet.

Rovement morkers or temporary flexible-reflective roadeay morker toos anal MOT be used as CES delineation.
 Artachment of Borrier Reflectors to CES shall be per manufacturer's.

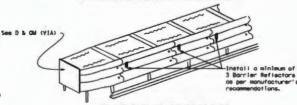
10. Missing or damaged Barrier Reflectors angli be replaced as directed

by the Engineer.

11. Single stope borriers shall be delineated as shown on the glove detail.

LOW PROFILE CONCRETE BARRIER (LPCB) USED Borrier Reflector on 16" tall plastic bracket IN WORK ZONES LPCB is approved for use in work zone lacations, where the posted speed is 45mph, or less. See Roodway Standard Sheet LPCS. 16" Wax, spacing of barrier reflectors is 20 feet. Attach the delineators as per

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 neet the apppropriate grashworthy atondords as defined in the Manual for Assessing Safety Nandwore GMASH), Refer to the CHIZTCD List for approved and

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

1. Roming lights shall went the requirements of the IBBITCD.
2. Borning lights shall went the requirements of the IBBITCD.
2. Borning lights shall woll be installed on bornlooks.
3. Type A-Low intensity Fissining Borning Lights are commonly used with drums. They are intended to worn of or mark a potentially hazardous area. Their use shall be as indicated on this steet and/or other sheets of the plans by the designation "FL". The type A Borning Lights shall not be used with signs, mountactured with type B₀ or C₁. Steeling neeting the requirements of bornhematol laterial Specification BSS-5300.
4. Type-C and type D 350 degree Steedy Burn Lights are intended to be used in a series for delinearion to supplement other traffic control devices. Their russ shall be as indicated on this sheet and/or other sheets of the plans by the seligion to "SB".
5. The Engineer/Inspector or the plans shall specify the location and type of worning lights are be installed on the traffic control devices.
6. Then required by the Engineer, the Controlor's shall furnish a copy of the worning lights are uning lights asset the requirements of the lotest IEE Purchase Specifications. The seminal curvals, Type-C and Type D Steedy Burn Lights shall only be placed on the unfailed.
6. The location of worning lights and worning reflectors on drums shall be as shown elsewhere in the plans.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

1. Type A floating earning lights are intended to sorn drivers that they are approaching or one in a potentially hazardous area.

2. Type A readous floating earning lights are not intended for delineation and shall not be used in a series.

3. A series of esceptified (floating earning lights placed on channel light getwices to form a engine page say be used for delineation. If used, the successive floating of the sequential earning lights should occur from the beginning of the taper to the end of the enright topic in order to identify the centre earlier earlier port. The rate of floating for each light should earlier should earlier by plus or entire. In 6 floating, the centre earlier earlier earlier conditions, and the earlier earli

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

1. A worning reflector or approved substitute may be mounted on a plostic drum as a substitute for a Type C, steady burn saming light of the discretion of the Contractor unless otherwise noted in the plane.
2. The worning reflector shall be yettled in color and shall be assumed.

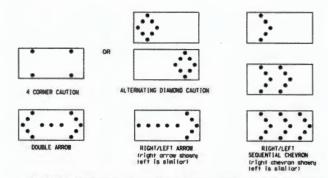
on the CEZICO.
The worning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.

4. Round reflectors shall be fully reflectorized, including the area where attached to the drum.
5. Square substrates must have a minimum of 30 square inches of reflectorized wheeling. They do not have to be reflectorized where it attaches to the drum.

The side of the worning reflector facing expressions traffic shall have sheeting meeting the color and retroreflectivity requirements for the side of the working reflector focing opproaching refrict shall nove sweeting seering the color and remove DES. \$300-7/ppe 5 or Type CFC;
 the manused near two-way traffic, both sides of the working reflector shall be reflectorized.
 The working reflector should be mounted on the side of the handle nearest opproaching traffic.
 The maximum spacing for working reflectors should be identical to the charmatizing device spacing requirements.

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

1. The Ficating Arrow Board should be used for all lane cleaures on multi-lane roadways, or slow maying saintenance or construction activities on the three! Janua.
2. Finaning Arrow Boards should not be used on teo-lane, two-way roadways, detours, diversions or surk on shoulders unless the "CLUITOR" display less defail before it used.
3. The Engineer/Impactor should not see all appropriate signs, borroundes and/or other traffic control devices that should be used in conjunction with the Figshing Arrow Board.
4. The Finaning Arrow Board amout be used in conjunction with the Figshing Arrow Board.



The "CAUTION" display consists of four corner toxos flashing simultaneously, or the Alternating

5. The "CANTION" display consists of four corner large flaghing significances; or the Attendeding Diamond Courties made as shown.

8. The straight line courties display is NOT ALLORED.

7. The Floating Arrow Board should be capacite of minimum 50 percent disming from roted large voitage. The flashing rote of the large should not less than 25 nor more than 40 floatine per minute.

8. Minimum large "on time" shall be approximately 50 percent for the flashing arrow and equal intervals of 25 percent for each sequential phase of the flashing arrow and equal flashing arrow display is the LADDI strandard; however, the sequential cross display is NOT ALLORED.

10. The flashing arrow Board shall will be flashed to exhibit, that is a support.

11. The flashing arrow Board shall will be USED to Intervaling shift from the support.

12. A floating arrow Board shall will be USED to Intervaling shift from the support of the flashing arrow board shall will be USED to Intervaling shift from the support of the support of the flashing arrow board of the support of the suppo

REQUIREMENTS						
TYPE	MINIMUM	MINIMAM HABER OF PANEL LAMPS	VISIBILITY DISTANCE			
B	30 × 60	13	3/4 mile			
C	48 x 96	15	1 ml te			

ATTENTION
Flashing Arrow Boards shall be equipped with automatic disming 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.

Traffic Safety Division

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

1. Truck-mounted attenuators (TMA) used on 1x001 facilities irluci-mounted unterluctors is that used on ispoir occurrence of the mount ment the requirements outlined in the Monual for Assessing Sofety Nordware (MSH), Refer to the CMZTCD for the requirements of Level 2 or Level 3 TMAs.
Refer to the CMZTCD for a list of approved TMAs.

THAS are required on freeways unless otherwise noted

DMAS over required on freescops unless otherwise noted in the plans. A DMA should be used only time that on the positioned 30 to 100 feet in advance of the area of once exposure siftout observely offecting the work performance. The only reason a DMA should not be resultaired is when a work of the production of the should not be resultaired in when o work actually distinct of the resultance of the factor of the should not be resulted as when of which the plans of the should not be resulted as the order of the should not be resulted as the plans of the should not be resulted as the plans of the pla

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

BC (7) -21

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GENERAL NOTES

- I. For long term stationary sork zones on freeways, drums shott be used as the orimary channelizing device.
- For intermediate term stationary eark zones on freeways, drums should be used as the primary channel Izing device but stub are replaced in tangent sections by vertical press, or 42 two-place comes. In tangent sections. one-place comes may be used with the approval of the Engineer but only if personnel are present on the project at all times to maintain the comes in proper position and location.
- For short term stationary work zones on freeways, drums are the preferred channelizing device but say be replaced in topers, transitions and tangent sactions by vertical panels, two-piece comes or one-piece comes as approved by the Engineer.
- Bruss and all related items shall comply with the requirements of the current version of the "Texas Manual on Uniform Troffic Control Devices" (TMUTCD) and the "Compilant Bark Zone Traffic Control Devices List"
- Drume, bases, and related materials shall exhibit good workmanship and shall be free from objectionable marks or defects that would adversely
- affect their appearance or serviceobility.

 6. The Contractor sholl 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 grums sholl 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 "bose" shall be the body.

 1. The body and base shall lock topether in such a sonner that the body seponders from the bode when lepacted by a vehicle throweling at a speed of 20 MPH or greater but prevents accidental sepondrion due to normal handling and/or aff rutbulence created by possing vehicles.
- Plastic drums shall be constructed of lightweight flexible, and deformable materials. The Contractor shall NOT use setal drums or
- single piece plostic drums as channelization devices or sign supports. Drums shall present a profile that is a minimum of 18 inches in width at the 36 inch height when viewed from any direction. The height of drus unit (body installed on base) shall be a stinisus of 36 inches and a saxisus of 42 inches.
- The top of the drus shall have a built-in handle for easy pickup and shall be designed to drain water and not collect debris. The handle shoull have a minimum of two widely spaced 9/16 inch diameter hales to compliant stan.
- . The exterior of the drum body sholl have a minimum of four alternating orange and white retroreflective circumferential stripes not less than A inches nor greater than 8 inches in width, Any non-reflectorized space between dry two adjacent stripes shall not exceed 2 inches in
- Boses sholl have a maximum width of 36 inches, a maximum height of 4 inches, and a minimum of teo footholde of sufficient size to allow base to be held down while separating the drum body from the base.
 Plostic drume shall be constructed of ultra-violet stabilized, arange,
- high-density polyethylene (HDPE) or other approved material.
- 10. Bruss and base shall be worked with wanufacturer's name and made! number.

RETROREFLECTIVE SHEETING

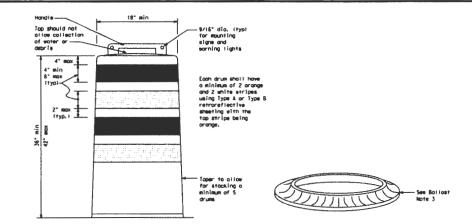
- The stripes used on druss sholl be constructed of sheeting seeting the color and retroeffectivity requirements of Departments Materials. Specification DMS-8300, "Sign Face Naterials." Type A or Type B reflective sheeting shall be aupoiled unless otherwise specified. in the plans.
- The sheeting shall be suitable for use on and shall adhere to the drum surface such that, upon vehicular impact, the sheeting shall remain adhered in-place and exhibit no departments, cracking, or loss of retrorefisctivity other than that loss due to obtain of the sheeting

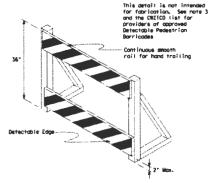
BALLAST

- . Unbailasted 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 (winimus) and 50 lbs (maximus). The ballast may be sand in one to three sandbags separate from the base, eand in a sand-filled plastic base, or other ballosting devices as approved by the Engineer. Stacking of sandback will be allowed, however height of sandback above povere
- surface may not exceed 12 inches.
 Boses with built-in ballost shall weigh between 40 lbs, and 50 lbs. Built-in bollost can be constructed of an integral crueb rubber base or
- o solid rubber bose.

 Recycled truck life aldesolls may be used for bollast on drums approved for this truck life sidesolls may be used for bollast on drums approved for this type of bollast on the CWZICD list.
- The boilost shall not be heavy objects, water, or any material that would become hazardous to materiats, pedestrions, or workers when the drum is struck by a vehicle.
- then used in regions susceptible to fraezing, drums shall have drainage holes in the bottoms so that water will not collect and freeze becoming
- a hazard when atruck by a vehicle.

 6. Bollost shall not be placed on top of drums.
- Adhesives may be used to secure base of drums to povement.





DETECTABLE PEDESTRIAN BARRICADES

- DETECTABLE PEDESTRIAN BANKICADES

 1. Shen estaining pedestrion focilities are disrupted, closed, or relocated in a TIC zone, the temporary facilities should be detected and include accessibility features consistent with the features present in the selsting pedestrion facility. Before 18 2013-22 for Pedestrion Control regularisations for Sidepolis to 82 013-22 for Pedestrion Control regularisations for Sidepolis control to the selsting pedestrion and the selsting pedestrion and the selsting selsting the selsting selsting

- 4. Tape, rope, or plastic chain strung between devices are not Tops, rope, or plastic chain strung between devices ore not devectable, do not comply with the design standards in the "Americans with Disabilities Act Accessibility Guidelines (ADAAO)" and should not be used as a contral for pedestrian
- movements.
 5. Worning lights shall not be attached to detectable pedestrian
- 6. Detectoble pedestrion borricodes should use 8" nominol borricode o amount continuous roll suitable for hand trailing with no splinters, burrs, or shorp edges.



Nacional Sign Dimension Chevron CBI-8, Opposing Traffic Lane Divider, Driveway sign D70a, Keep Right R4 series or other signs as approved by Engineer



Vertical Panel mount with diagonals stoping down towards

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

- 1. Sions used on plostic drums shall be manufactured using
- Crewrons and other work zone signs with an arange background shall be wanufactured with Type 8_{HL} or Type C_{TL} Orange sheeting weeting the color and retrareflectivity requirements of BLS-2300, "Sign Face Material," unless athernise
- 3. Vertical Panels shall be manufactured with argume 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 lone.
- 4. Other align measures (text or symbolic) may be used as opproved by the Engineer. Sign disensions shall not exceed is inches in width or 24 inches in height, except for the R9 series signe discussed in note 8 below.
- 5. Signa shott be installed using a 1/2 inch bolt (noming) and nut, two washers, and one lacking washer for each
- 6. Mounting botts and nuts shall be fully engaged and adequately torqued, Bolts should not extend more than 1/2
- 7. Chevrone say be placed on drums on the outside of curves, on merging topers or on shifting topers. Then used in these locations, they way be placed on every drum or apposed not more than on every third drum. A elinimum of three (3) should be used of each location on leaf for in the plans.
- 8. R9-9, R9-10, R9-11 and R9-11a Sidewalk Closed signs which ore 24 inches wide may be mounted an plastic drums, with approval of the Engineer.

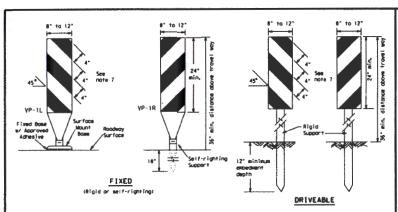
SHEET 8 OF 12

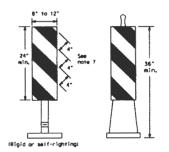
Texas Department of Transportation

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

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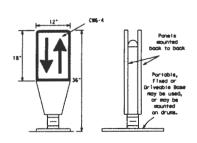




PORTABLE

- Vertical Ponels (YP's) pre normally used to channelize traffic or divide apposing lones of traffic.
 YP's early be used in daytime or nightlime situations. They say be used or the edge of shoulder drop-offs and other oreas such as lone transitions where positive daytime and nightlime delineation is required. The Engineer/Imapetor's should refer to the Rooseay basign Monual for additional requirements on the use VP's
- YP's should be sounted book to book if used of the edge of cuts adjacent to two-say two lone roadways. Stripes are to be reflective arange and reflective white and should always slape downward toward the travel lane.
- YP's used on expresseous and freeways or other high speed roodways, may have more than 270 square inches of retrareflective area facing traffic.
- Self-righting supports are ovaliable with portable base.
 See "Compliant Bork Zone Traffic Control Devices List" See "Comp (CHZTCD).
- 6. Sheeting for the YP's shoil be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300, unless noted otherwise. 7. Where the height of reflective enterior on the vertical
- panel is 36 inches or greater, a panel stripe of 6 inches shall be used.

VERTICAL PANELS (VPs)



- 1. Opposing Troffic Lone Dividers (OTLD) are opposing frontic Law billions (only in a delineation devices designed to convert a normal one-say roadeay section to two-say operation. OTLD's are used an temporary centerlines. The upward and downward arrows on the sigh's face indicate the direction of base is secured to the povement 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"
- 3. Spacing between the OTLD shall not exceed 500 feet, 42" cones or YPS placed between the OTLD's should not exceed 100 foot specing.
- 4. The OTLD shall be arange with a black non-reflective legand. Sheeting for the OTLD shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unissa noted otherwise. The legend shall meet the requirements of DMS-8300.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



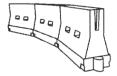
Fixed Base w/ Approved Adhesive (Orlvechte Bose, or Flexible

- 1. The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
- 2. Chewrons 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 harizontal alignment of the randway.
- 3. Chevrons, when used, shall be erected on the outside of a sharp curve or turn, or on the for side of an intersection. They shott be in line with and at right angles to approaching traffic. Spacing should be such that the motorist gloops in view, until the change in alignme eliminotes its need.
- To be effective, the chevron should be visible for at least 500 feet.
- 5. Chevrons shall be arange with a black namreflective legand. Sheeting for the chevron shall be retroreflective Type By or Type Cy conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legand shall meet the requirements of DMS-8300.
- 5. For Long Term Statlanary use an tapers or transitions on freeways and divided highways. self-righting chevrons may be used to supplemen plastic drums but not to replace plastic drums,

CHEVRONS

GENERAL NOTES

- 1. Nork Zone channelizing devices illustrated on this sheet may be installed in close proximity to traffic and are sultable for use an high or law speed roodways. The Engineer/Inspector shall ensure that specing and placement is uniform and in accordance with the "Texas Manua: on Uniform Traffic Control Devices" (TMUTCD).
- 2. Channelizing devices shown on this sheet may have a drivedble, fixed or use. The requirement for self-righting channelizing devices must be specified in the General Notes or other pion sheets.
- be appointed in the Canners inverse or other pion sheets.
 Channelizing devices on self-righting supports should be used in work zone
 ores shere channelizing devices are frequently imposted by erront whichse
 or vehicle related wind, gusts making oil imparts of the channelizing devices
 difficult to maintain, Locations of these devices should be detailed elsewhere in the plans. These devices shall conform to the TMUSCO and the 'Compilant Bork Zone Traffic Control Devices List' (CRZTCD).
- 4. The Contractor shall maintain devices in a clean condition and replace damaged, nonreflective, foded, or braken devices and bases as required by the Engineer/Inspector. The Contractor shall be required to maintain proper device specing and alignment.
 Portable bases shall be fobricated from virgin and/or recycled rubber. The
- portiotio bases shall settle incurred virus Virgini assume recycles russes. The portiotio bases shall self or sininus of 30 lbs. Powerent surfoces shall be prepared in a senner that ensures proper banding between the othesives, the fixed mount bases and this powerent surfoce. idhesives shall be prepared and applied according to the manufacturer recommendations.
- 7. The installation and removal of channelizing devices shall not cause derimental artifacts to the final powerest surfaces, including powerent surfaces, including powerent surfaces alsostantian or surface integrity. Driveoble boses shall not be permitted on final powerent surfaces. The Engineer/Inspector shall approve all application and restroit procedures of fixed boses.



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 ar redirect a vehicle on impact.

 2. LCDs atty be used instead of a line of comes or drusts.

 3. LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when show on the CRIZTCO list.
- 4. LCDs should not be used to provide positive protection for obstacles, pedestrions or workers.
- 5. LCDs shall be supplemented with retroreflective delineation as required for temporary barriers
- on 8C(7) when placed roughly parallel to the travel lanes. 6. ICDs used as parricules placed percendicular to traffic should have at least one row of reflective
- sheeting meeting the requirements for bornicode rolls as shown on 80(10). Place reflective sheeting near the top of the LCD along the full length of the device.

WATER BALLASTED SYSTEMS USED AS BARRIERS

- Sofer bollosted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate Scruel for Assessing Sofety Nordwore (SASSI) orderporthiness real/resents boaded on roadway scene and containing the containing the same state of the containing the same state of the containing very solely soless solely solely solely solely solely solely solely solely solel

- apecific to the device, and used only when shown on the CEXTCD list.

 Better bolloand systems used as borriers abould not be used for a Bergling toper except in low speed (less than 45 MPH) urban areas. Bhen used on a toper in a low speed urban area, the toper shall be delimented and the toper length should be designed to optimize road user operations considering the available geometric conditions.

 Been earlier bolloated systems used as borriers have blunt ends exceed to traffic, they should be attenuated.
- as per manufacturer recommendations or flored to a point outside the clear zone.

If used to channelize pedestrions, longitudinal channelizing devices or eater balloated aystems must have a continuous detractable battom for users of long comes and the top of the unit shall not be less than 32 increa in helight.

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

Posted Speed	formula	0	Desirable Toper Lengths ***			Suggested Maximum Spacing of Channellzing Devices		
		10° Offset	Offset	12' 0ff861	On o Toper	On a Tangent		
30	2	150	165'	180	30'	60'		
35	L- WS2	2051	2251	245'	35′	70'		
40	60	265'	2951	3201	40'	80'		
45		450"	4951	540'	45'	90'		
50		5001	550'	600,	50'	100'		
55	L=#S	5501	605'	660	55'	110'		
60	L-#3	6001	660.	720'	60'	120'		
65		650'	715'	780'	65'	130'		
70		700'	770'	840"	70'	140'		
75		7501	825"	9001	75'	150'		
80		8001	8801	9601	80'	160′		

**Toper lengths have been rounded off, L-Length of Toper (FT,) W-Width of Offset (FT.)

SUGGESTED MAXIMUM SPACING OF CHANNEL [ZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET OF 12

Texas Department of Transportation

Traffic Safety Division

BARRICADE AND CONSTRUCTION CHANNEL 1ZING DEVICES

BC (9) -21

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- 1. Refer to the Compilant Work Zone Troffic Control Devices List (CMZTCD) for details of the Type 3 Barricades and a list of all materials used in the construction of Type 3 Barricades.
- used in the construction of Type 3 Barricades.

 2. Type 3 Barricades shall be used at each end of construction
- Type 3 Borrisoness shall be used at each and a second projects closed to all traffic, Borricodes extending corose a roadway should have stripes that slope downward in the direction toward shick traffic must turn in detauring, then both right and left turns are provided, the chevron striping may when both right and saft turns are provided, the cameron arriging a slope downward in both directions from the center of the borricade. Where no turns are provided at a closed road, striping should slope downward in both directions toward the center of roadway.
- downword in loan offections toward the center of robusty; Striping of rolls, for the right side of the roadway, should slope downword to the left. For the left side of the roadway, striping should slope downword to the right.
- snourd alope downword to the right.
 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".
- used for identification shall be 17.

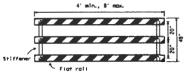
 6. Barricodes shall not be placed parallel to traffic unless on adequate clear zone is provided.

 7. Warning lights shall MOT be installed on barricodes.
- Shere barr loads require the use of seights to keep from turning over, the use of sambags with dry, cohesionless sand is recommended. The sambags will be tied shut to keep the sand from splitting and to annothings will be titled shurt to keep the and from spilling and to scintain a constant weight. Sand bogs shall not be stocked in a monner that covers any portion of a barricode rails reflective sheeting. Rock, concrete, from, seel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 the and a maximum of 50 that. Sandbags should weigh a minimum of 35 the and a maximum of weight land to the standard should be should not be weight and the should be should be should be when the should be should be to should be should be for sandbags. Sorthous should not be longed group or upon the boast for sandbags. Sorthous should should be longed group of the should be should should be should ventuation reports, shower teach on a Tire Inner process practit not be used for sandbook. Sandbook shall only be placed along or upon the base supports of the device and shall not be austended above ground level or hung eith rope, eitre, choins or other frastners. Sheeting for borricodes shall be retracefactive Type 8, or Type 8 conforming to Bepartmentol steberiol Specification Disc 9300 unless



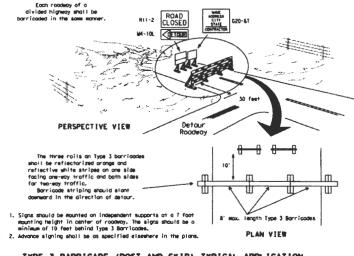


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL

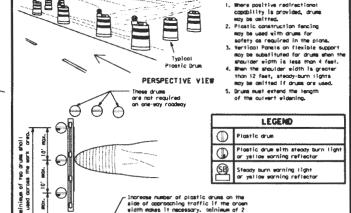


Stiffener may be inside or outside of support, but no wore than 2 stiffeners shall be allowed on one barricade.

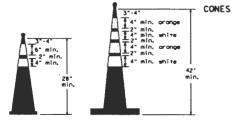
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES



TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



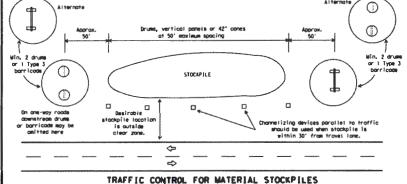
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PLAN VIEW

One-Piece cones



Tubular Marker



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

1. Troffic comes and tubular markers shall be predominantly arange, and

meet the height and weight requirements shown above.

2. One-piece cones have the body and base of the cone maided in one consolidated

4. Ware place comes now the county on boas of this control solded in the consolitored unit. Text-place comes have a come shrough copy of a separate rubber bose, or boilost, that is added to large the device upright and in place.
3. Teo-Piece comes any have a handle or loop extending up to 8" above the minimum height shown, in order to aid in retrieving the device.

Cones or 'tubulor morture's shall have white or white and orange reflective bonds as shown above. The reflective bonds shall have a smooth, sealed outer surface and meet the requirements of Departmental Material Specification DMS-8300 Type A or Type B.

- 5. 28" conse and fuburar argues in a rigue a. 28" conse and fuburar argues argues and should argue argues a result and to short the start across a set and a result and to used for intersellater-term or languests a start across years for languests. to maintain them in their proper upright position. 6. 42" two-piece comes, vertical panels or druss are suitable for all work zone
- 7. Comes or tubular markers used on each project should be of the same size

SHEET 10 OF 12



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

Traffic Safety Division Standard

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

- 1. The Contractor shall be responsible for maintaining work zone and existing powerent markings, in occordance with the standard specifications and special provisions, on all readers open to traffic within the CSJ limits unless otherwise stated in the plane.
- 2. Color, patterns and disensions shall be in conformance with the Texas Manual on Uniform Traffic Control Devices' (TMUTCD).
- 3. Additional aupplemental povement marking details may be found in the
- 4. Povement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
- When short term markings are required on the plans, short term markings shall conform with the TMUTCD, the plans and details as shown on the Standard Plan Sheet #Z(STPM).
- 6. When standard payement markings are not in place and the roadway la opened to traffic, DO HOT PASS signs shall be erected to mark the beginning of the sections where possing is granibited and PASS WITH CARE signs at the beginning of sections where possing
- All work zone powement morkings sholl be installed in occordance with Item 662, "Mork Zone Powement Morkings."

RAISED PAVEMENT MARKERS

- 1. Raised povement markers are to be placed according to the patterns
- All roised povement monkers used for work zone monkings shall seet the requirements of Item 672, "RAISED PAYEMENT MARKERS" and Departmental Material Specification DMS-4200 or DMS-4300.

PREFABRICATED PAVEMENT MARKINGS

- 1. Removable prefabricated povement markings shall seet the requirements
- 2. Non-removable prefabricated povement markings (foll back) shall meet the requirements of DMS-8240.

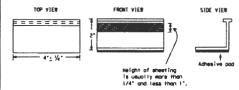
MAINTAINING WORK ZONE PAYEMENT MARKINGS

-). The Contractor will be responsible for esintaining work zone povement morkings within the work timits.
- 2. Mark zone povement workings 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 law-beam headlights at night, unless sight distance is restricted by roodedy geometrics.
- 4. Markings falling to meet this ariteria 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 langer applicable, could create confusion or direct a motorist toward or into the clased partian of the roa shall be removed or abiliterated before the randway is opened to traffic.
- 2. The obove 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.
- Povement morkings shall be removed to the fullest extent possible, so as not to serve a discernable marking. This shall be by any method approved by Tx007 Specification I tem 677 for "Elisinating Existing
- 4. The removal of pavement markings may require resurfacing or seal conting portions of the roadway as described in line 677.
- Subject to the approval of the Engineer, any method that proves to be successful on a particular type powerent may be used.
- 6. Blost cleaning may be used but will not be required unless specifically shown in the alons.
- 7. Over-pointing of the markings SHALL NOT BE permitted.
- 8. Removal of raised povement markers shall be as directed by the
- Removed of existing powerent workings and workers will be poid for directly in occordance with Item 677, "ELMINATING EXISTING PAVEMENT MARKINGS AND MARKERS," unless otherwise stoted in the plans.
- 10.Black-out marking tope may be used to cover conflicting existing markings for periods less than two weeks when approved by the Engineer.

Temporary Flexible-Reflective Roodway 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 roodway marker tabs used as guidemarks
- 2. Table detailled on this sheet are to be inspected and accepted by the Engineer or designated representative. Sompting 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
 - A. Select five (5) or more tobs at random from each lot or shipment and submit to the Construction Division, Materiols and Powement Section to determine specification compliance.
 - B. Select five (5) tobs and perform the following test. Affix five (S) table of 24 inch intervals on an asphaltic poverent in a stroight line. Using a medium size passenger vehicle or pickup. of 35 to 40 miles per hour, four (4) times in each direction, to 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,
- See Standard Steet NZ(STPM) for tab placement on new povements. See Standard Sheet YCP(7-1) for tab placement on seal coat work.

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

- 1. Raised povement markers used as guidemarks shall be from the approved
- All temporary construction relaed payement markers provided on a project shall be of the same constaurer.
- 3. Adhesive for guidemarks shall be bituminous material hat applied or butyl rubber pad for all surfaces, or thereoplastic for concrete

Guidemarks shall be designated as: YELLOW - (two omber reflective surfaces with yellow body). SMITE - (one sliver reflective surface with shife body).

DEPARTMENTAL MATERIAL SPECIFICA	TIONS
PAVEMENT WARKERS (REFLECTORIZED)	DWS-420
TRAFFIC BUTTONS	DWS-430
EPOXY AND ADHESIVES	DWS-610
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DWS-613
PERMANENT PREFABRICATED PAVEMENT WARKINGS	DWS-824
TEMPORARY REMOVABLE, PREFABRICATED PAVEMENT MARKINGS	DWS-824
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS	DMS-824

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

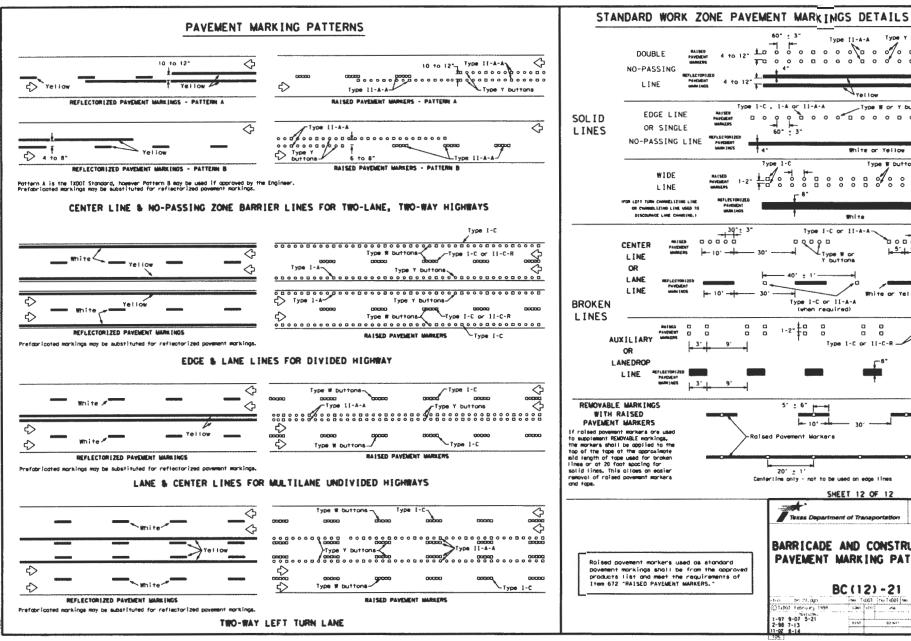
SHEET 11 OF 12

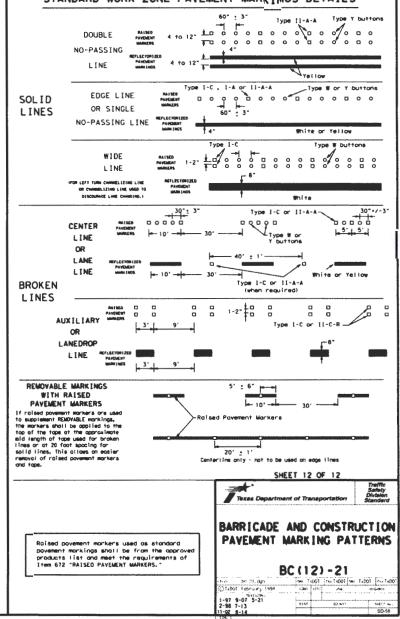
Texas Department of Transportation

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

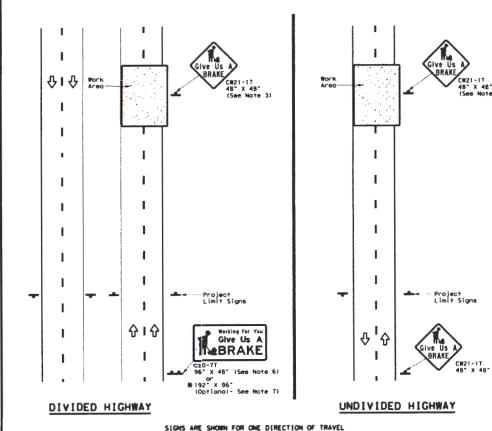
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of this standard is governed by the "fexas Engineering Practics Act". No warranty of any se by 1500 for any purpose shortsower in 1500 ossesses no resonantial title for the conversion and to other formula of for Incornect results or Compage resulting from its use.



When the optional larger WORKING FOR YOU GIVE US A BRAKE (G20-7T) $192^{\prime\prime}$ x $96^{\prime\prime}$ sign is required, the locations shall be noted elsewhere in the plans.

SUMMARY OF LARGE SIGNS GAL VANIZED DRILLED STRUCTURAL REFLECTIVE MCKGROUND SIGN SQ FT SIGN DIMENSIONS SHEETING COLOR DESIGNATION 24" DIA. (LF) (LF) Size 00 BRAKE Orange G20~7T 96" X 48" Type B_{FL} or C_{FL} 32 BRAKE G20-7T 192" X 96" Type B_{FL} or C_{FL} Orange 128 #8×18 12

▲ See Note 6 Below

	LEGEND
4	Sign
4	Large Sign
4	Traffic Flow

DEPARTMENTAL	MATERIAL	SPECIFICATIONS
PLYWOOD SIGN BLANKS		DMS-7100
ALUMINUM SIGN BLANKS		DMS-7110
SIGN FACE MATERIALS		DMS-8300

COLOR	USAGE	SHEBTING MATERIAL
ORANGE	BACKGROUND	TYPE BFL OR TYPE CFL
BLACK	LEGEND & BORDERS	NON-REFLECTIVE ACRYLIC FILM

GENERAL NOTES

- 1. See BC and SMD sheets for additional sign support details.
- 2. Sign locations shall be approved by the Engineer.
- For projects more than two miles in length, Give Us a BRAKE signs should be repeated halfway through the project. The Give Us a Brake (CW21-1T) may be
- 4. Work zone speed limits are sometimes used in conjunction with GIVE US A BRAKE signing. See BC(3) for location and spacing of construction speed zone signing when required.
- Give Us a Brake (CW21-1T) signs and supports shall be considered subsidiary to Item 502, "Barricades, Signs and Traffic Handling."
- The 96" x 48" Working For You Give Us A BRAKE (G20-71) may use a 1/2" or 5/8" plywood substrate or 0,125" aluminum sheeting substrate and may be supported by two 4" x 6" wood posts with artilled holes for breakway as per BC(5) and will be subsidiory to Item 502.
- 7. The Working For You Give Us A BRAKE (G20-7T) 192" X 96" sign shall be paid for under the following specification items:

Item 636 - Aluminum Signs Item 647 - Lorge Roadside Sign Supports and Assemblies.

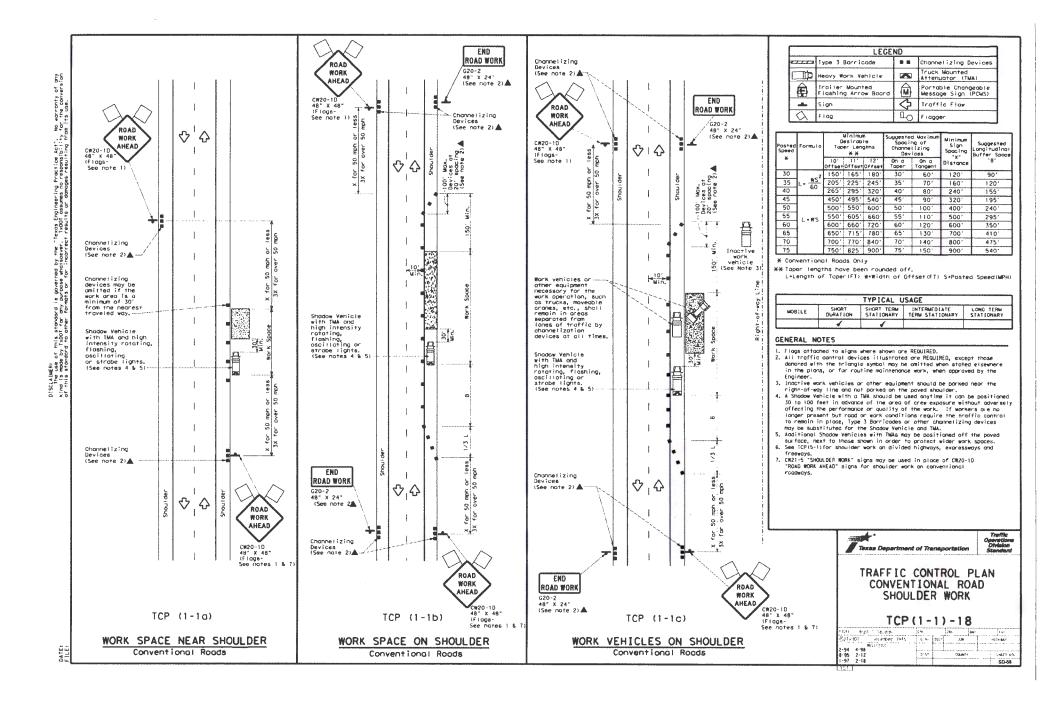
Item 416 - Drilled Shaft Foundations

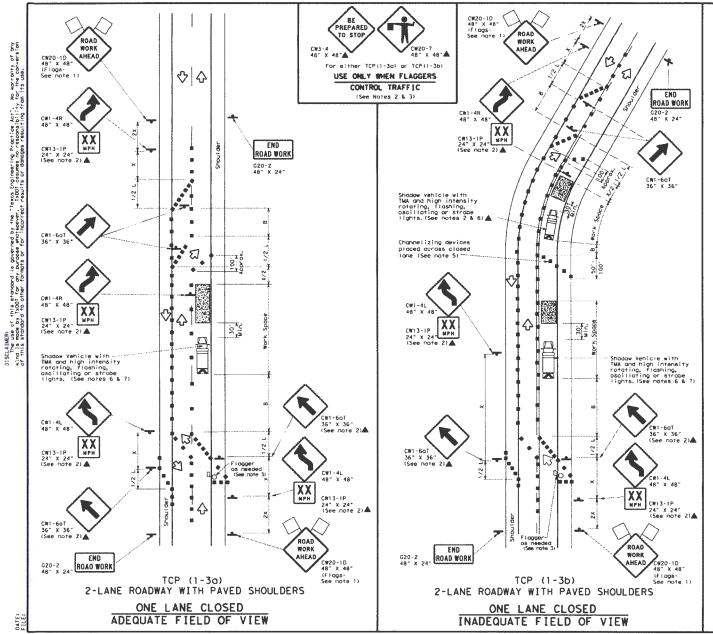
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," lotest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor. before the sign is manufactured.

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BIRK) -13

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	LEGEND								
	Type 3 Barricade		Channelizing Devices						
口中	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)						
	Traiter Mounted Flashing Arrow Board	M	Portoble Changeable Message Sign (PCMS)						
4	Sign	♦	Traffic Flow						
Q	Flog	10	Flagger						

Speed	Formula	C	Minimu Masirob Mar Len **	l e	Spoci Channe	d Maximum ng of Lizing rices	Minimum 51gn Spacing	Suggested Longitudinal Buffer Space: "8"	
*		10' Offset	Offset	12' Offset	On a Taper	On a Tangent	Distance		
30	2	150'	1651	180"	30'	60'	1201	901	
35	_ WS ²	205	225'	245'	35′	70'	1601	1201	
40	80	2651	295	3201	40′	80'	240'	155'	
45		4501	4951	540'	45'	90'	3201	1951	
50		500'	5501	600,	50'	1001	400'	2401	
55	L=WS	550'	6051	660'	55'	110'	500'	2951	
60	L-#3	6001	660'	7201	60.	120'	600'	350'	
65		650'	715'	7801	65'	130'	7001	410'	
70		7001	770'	840'	70'	140	800'	475'	
75		750'	825'	900'	75	150'	900'	540'	

- * Conventional Roads Only
- XX Taper lengths have been rounded off.

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

		TYPICAL L	ISAGE	
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	1			

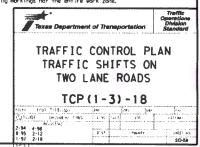
GENERAL NOTES

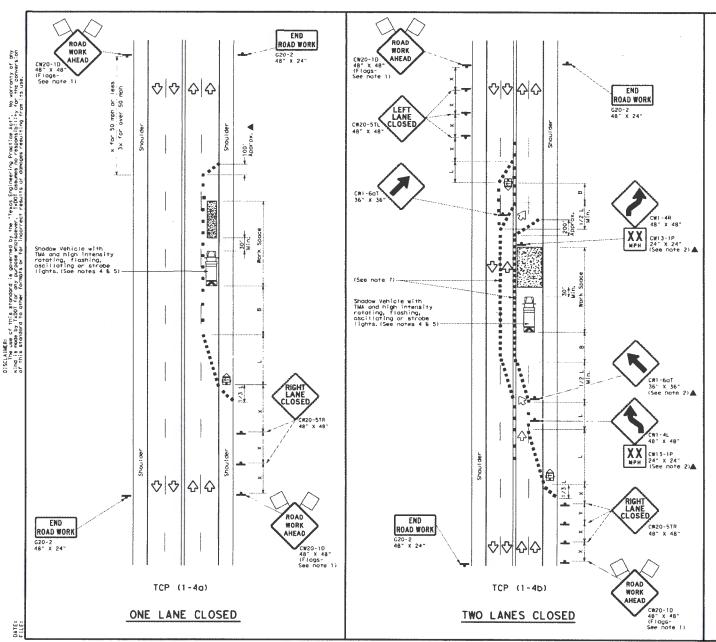
- Flags attached to signs where shown are REQUIRED.
 All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be amitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
- Fiagger control should NOT be used unless roading conditions or beavy troffic volume require additional emphasis to safely control traffic. Additional flaggers may be positioned in advance of traffic queues to alert traffic to reduce speed.
 4. DO NOT PASS, PASS RITH LARK and construction regulatory speed
- zone signs may be installed downstream of the ROAD MORK AHEAD aigns.

 When the work zone is made up of several work spaces, channelizing devices should be placed laterally across the closed tone to re-employee.
- ehould be placed interailly coross the closed lane to re-explasize closure. Laterailly placed charmelizing devices should be repeated every 500 to 1000 feet in urban areas and every 1/4 to 1/2 mile in rural areas.

 A Shadow Phicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of area exposure without adversely offeeting 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 Bornicades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.

 Additional Shadow Vehicles with TMA may be positioned off the poved surface, next to those shown in order to protect wider work, spaces.
- Where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20', or 15' if posted speed are 35 mph or slower, and for tangent sections, at 1/25 where S is the speed in mph. This tighter device spacing is intended for area of conflicting markings not the entire work zone.





LEGEND Type 3 Borricode . . Channelizing Devices frack Mounted Heavy Work Vehicle Attenuator (TMA) Traiter Mounted Flashing Arrow Board M Portable Changeable Message Sign (PCMS) Traffic Flow -Sign Q Flag F (agger

Speed	Formula	Þ	Winimus estrob er Len **	16	Spacii Channe	Suggested Maximum Spacing of Channetizing Devices Minimum Sign		Suggested Longitudinal Buffer Space
*		10' Offset	il. Offset	12' Offset	On o Toper	On a Tongent	Distance	.8.
30	2	150'	1651	1801	30'	601	1201	90'
35	L - WS2	2051	225"	245"	351	701	1601	1201
40	80	265	2951	320'	40'	80'	240'	155′
45		4501	4951	540'	45'	90'	320'	1951
50		5001	5501	600'	50'	1001	400'	240'
55	L-WS	550'	6051	660'	551	110'	500'	2951
60	5-113	600'	660'	7201	60'	1201	600'	350′
65		650'	715'	780'	65'	130'	700'	410'
70		7001	770'	840'	70′	140'	800'	475'
75		7501	8251	900	75′	1501	9001	5401

- ¥ Conventional Roads Only
- ₩ Toper lengths have been rounded off.

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

		TYPICAL L	ISAGE	
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTÉRMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	1	1		

GENERAL NOTES

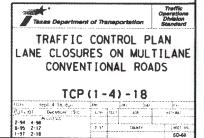
- Flags attached to signs where shown are REQUIRED.
 All traffic control devices illustrated are REQUIRED, except those denoted
- all traffic control devices. Illustrated are etublished, except those denoted with the fringile symbol may be omitted when stated elsewhere in the plans, or for routine mointenance work, when opproved by the Engineer.
 The CW20-10 "MoND MONE AMEAD" sign may be respected if the visibility of the work zone is less than 1500 feet.
 A Shadow Yehicle with a TML should be used only time if can be positioned.
- a shoote venture will to like shoot be used dryrimm it can be post-timed to 30 to 100 feet in advance of the dred of cree exposure without adversely diffecting the performance or quality of the work. If workers are no longer present but prod or work conditions require the traffic control to remain it. place, Type 3 Barricodes or other channel time married married by the substituted for the Shadow Vehicles and TMA.

 5. Additional Shadow Vehicles with TMAs may be positioned off the paved.
- surface, next to those shown in order to protect wider work spaces.

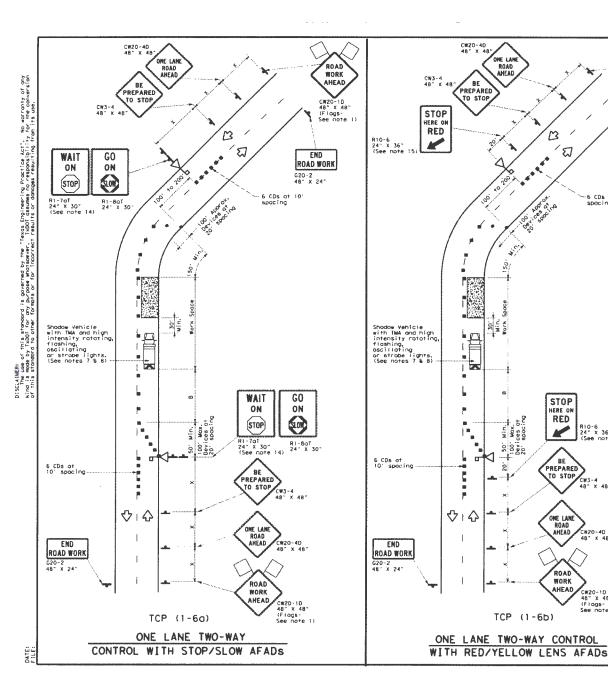
6. If this TCP is used for o left lone closure , CW20-51L "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline where needed to protect the work space from opposing traffic with the arrow ponel placed in the closed labe near the end of the merging taper.

TCP (1-4b)

7. Where traffic is directed over a yellow centerline, channellzing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/25 where 5 is the speed in mph. This tighter device spacing is intended for the oreas of conflicting markings, not the entire work zero.



5D-60



	LEGEND								
****	Type 3 Borricode		Channelizing Devices (CDs)						
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)						
М	Automated Flagger Assistance Device (AFAD)	M	Portoble Changeable Message Sign (PCMS)						
-4-	Sign	♦	Traffic Flow						
Q	Fiog	10	Flogger						

Speed	Formula	0	Minimum estrab er Lena **	le	Spac I Channe		Minimum Sign Specing	Suggested Longitudinal Buffer Space	Stopping Signt Distance
*		10' Offset	11' Offset	12° Offset	On a Taper	On a Tangent	Distance	8	
30	2	1501	1651	1801	30,	601	1201	90'	2001
35	L * WS2	2051	2251	2451	35′	70'	1601	120'	250'
40	60	2651	2951	320'	40'	80,	240'	155'	3051
45		4501	4951	540'	45'	901	320'	1951	360'
50		500'	550'	600'	50′	1001	400'	240'	425'
55	1. • W.S	550'	6051	6601	55'	110'	500'	295′	495'
60		600'	660'	7201	601	150,	600	350'	570'
65		650'	7151	7801	651	130'	7001	410'	645
70		7001	770'	840"	70'	140'	8001	475'	730
75		7501	8251	9001	751	1501	900'	540'	820'

* Conventional Roads Only

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

		TYPICAL U	SAGE	
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	1	1		

GENERAL NOTES

ROAD

WORK

AHEAD

CW20-10 48" X 48" (Flags-

END

ROAD WORK

G20-2 48" X 24"

-6 CDs at 10"

R10-6 24" x 36" (See note 15)

CW20-40 48" x 48

CW20-1D 48" X 48" (Flogs-

See note 1)

See note 1)

- Flags attached to signs where shown are REQUIRED.
 AFAIDs shall only be used in situations where there is one lone of approaching traffic in the direction to be controlled.
- Adequate stopping sight distance must be provided to each AFAD location for approaching traffic. (See table above).
- Adequare stopping bight distance must be provided to each AFAD location for opproaching traffic. (See table above).
 Each AFAD shall be operated by a qualified/certified flagger. Flaggers operating AFADS shall be operated by a qualified retrief in use.
 One flagger may operate two AFADS only when the flagger has an unabstructed view of both AFADS and of the opproaching traffic in both directions.
 The proper may operate two AFADS only shall be flagger to the operated by the first directions.
 The proper may operate two AFADS shall be footbacked as a flagger controlling traffic shall be located on each opproach. AFADS shall be to the operate by the pility operated by the first error person.

- 8. Then pilot cors are used, a flagger controlling traffic shall be located on each approach. AFADs shall not be operated by the pilot aor operator.
 7. All AFADs shall be equipped with gate arms with an orange or fluorescent red-orange flog attached to the end of the gate arm. The flog shall be a minimum of 16" square.
 8. A Shadow Vehicle with a TAM should be used anytime it can be positioned 30 to 100 feet in advance of the area of orce exposure without obversely affecting the performance or quality of the work. If verkers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Borricoses or work conditions require the traffic control to remain in place, Type 3 Borricoses or other charmed training devices may be substituted for the Shadow Vehicle and IAM.
 9. The properties of the properties of the power of the powe

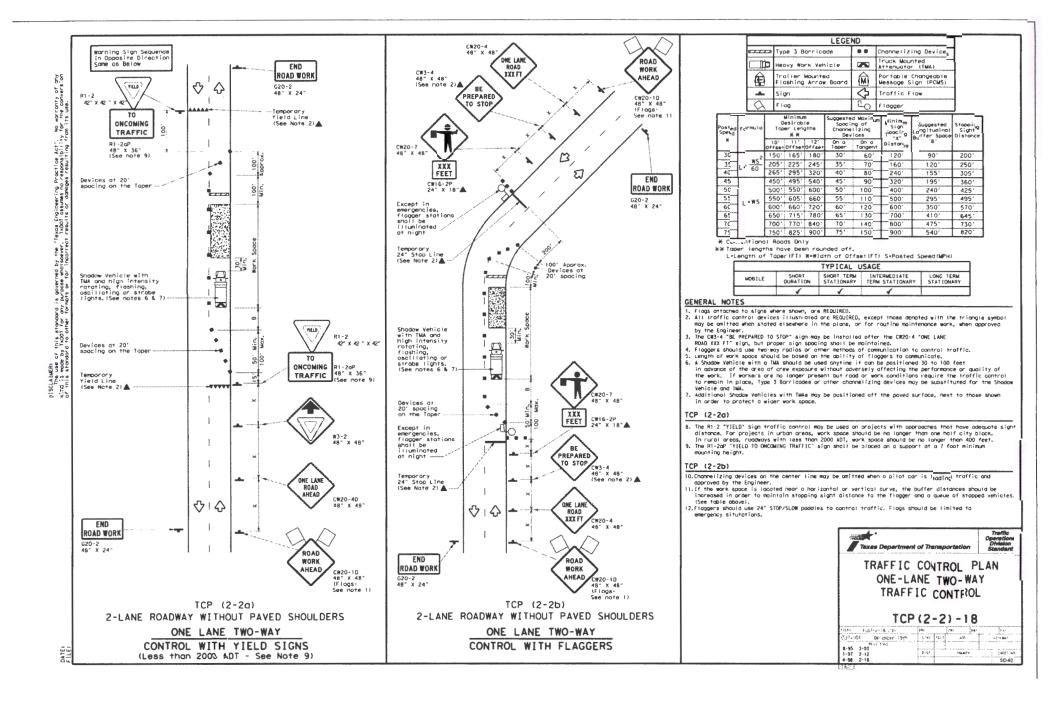
- Leight of work space should be based on the dollfly of floggers to communicate.
 If the work space is located near a horizontal or vertical curve, the buffer distances should be loncreased in order to mointain stocoling eight distance to the Africa.
- should be increased in order to maintain stopping alpht distance to the AFAD.

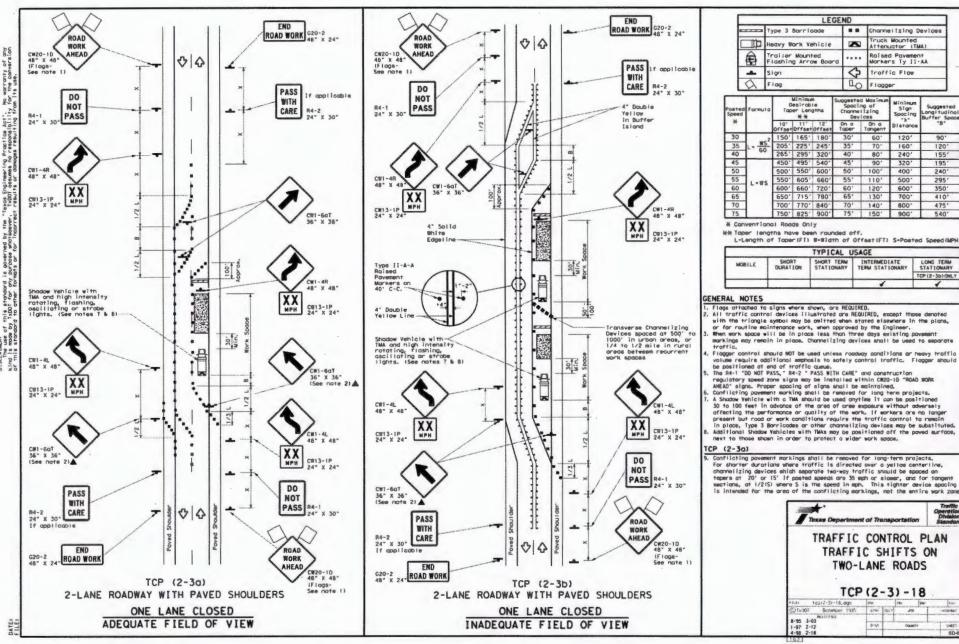
 15. Channel sizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.

 14. The RIT-OT "MAIT ON STOP" sign and the RIT-BOT "GO ON SLOW" sign shall be installed at the AFAD location on separate supports or they may be fobricated as one 48" x 30" sign. They shall not obscure the face of the STOP/SLOW AFAD.

 15. The RIO-6 "STOP HERE ON RED" arrow sign shall be offset so as not to obscure the language of the AFAD.
- the lenses of the AFAD.







LEGEND Channelizing Devices Truck Mounted Attenuator (TMA) Raised Pavement Morkers Ty II-AA Traffic Flow DO

Speed		Desirobie			Suggested Maximum Specing of Channetizing Devices		Minimum Sign Specing	Suggested Longitudinal Buffer Space
*		10' Offset	0ffset	12' Offset	On a Taper	On a Tangent	Distance	-8-
30	. 2	150'	165	180'	30'	60'	120'	90'
35	- WS2	205	225'	245"	35'	70"	160'	120'
40	60	265	295	320"	40'	80'	240'	155'
45		450'	495	540"	45'	90'	320'	195"
50		500	550'	600'	50'	100'	4001	240'
55	L-WS	550'	605	660	55'	110'	5001	295'
60	F-M3	600'	660	720'	60'	120'	6001	350'
65		650'	715	780'	65'	130'	700"	410"
70		700'	770'	840	70'	140"	800'	475'
75		750"	825	900'	75"	150'	900'	540'

WW Toper lengths have been rounded off.

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

		TYPICAL L	ISAGE	
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	STATIONARY
				TCP (2-36) ONL
	1		1	1

traffia.
Flagger control should NOT be used unless roodway conditions or heavy traffia volume require additional emphasis to safely control traffic. Flagger should be positioned at and of traffic quase.
The R4-1 "D0 NOT PASS," R4-2 " PASS BITH CAME" and construction

9. Conflicting pavement markings shall be removed for long-term projects. For shorter durations where traffic is directed over a yellow centerline, channelizing devices shich separate two-way traffic should be apposed on topers of 20' or 15' If posted apieces one 35 sph or slower, and for tongent sections, or 1/25' shere 5 is the speed in sph. This tighter device specify is intended for the orea of the conflicting markings, not the antire sprk zone.





Commissioner Hutchins Hunt County Courthouse Greenville, TX 75401 11/8/2023

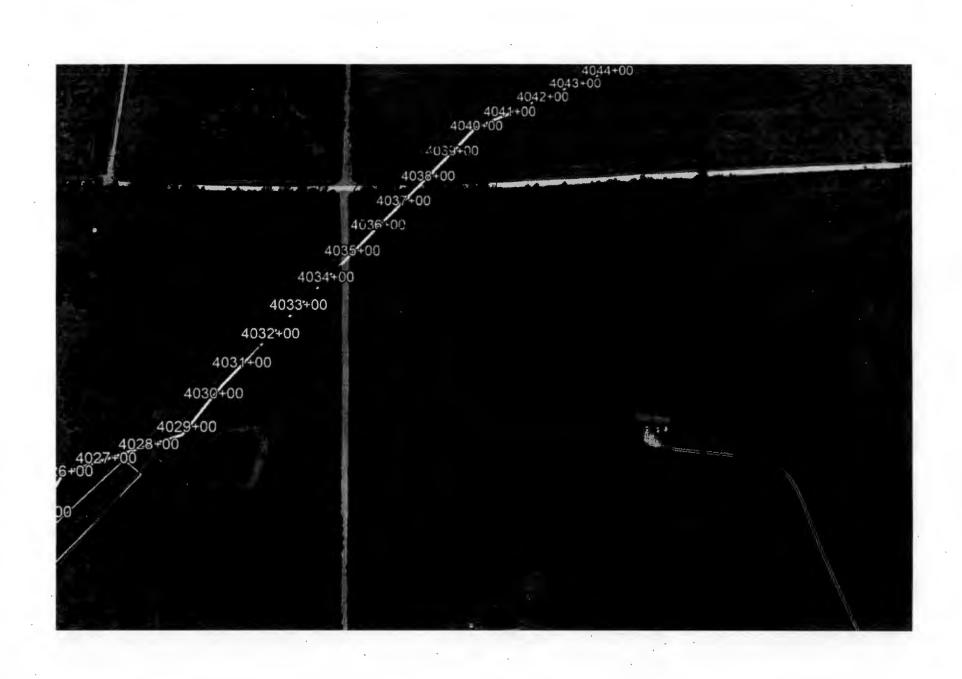
RE: CR 1101 Road Crossing

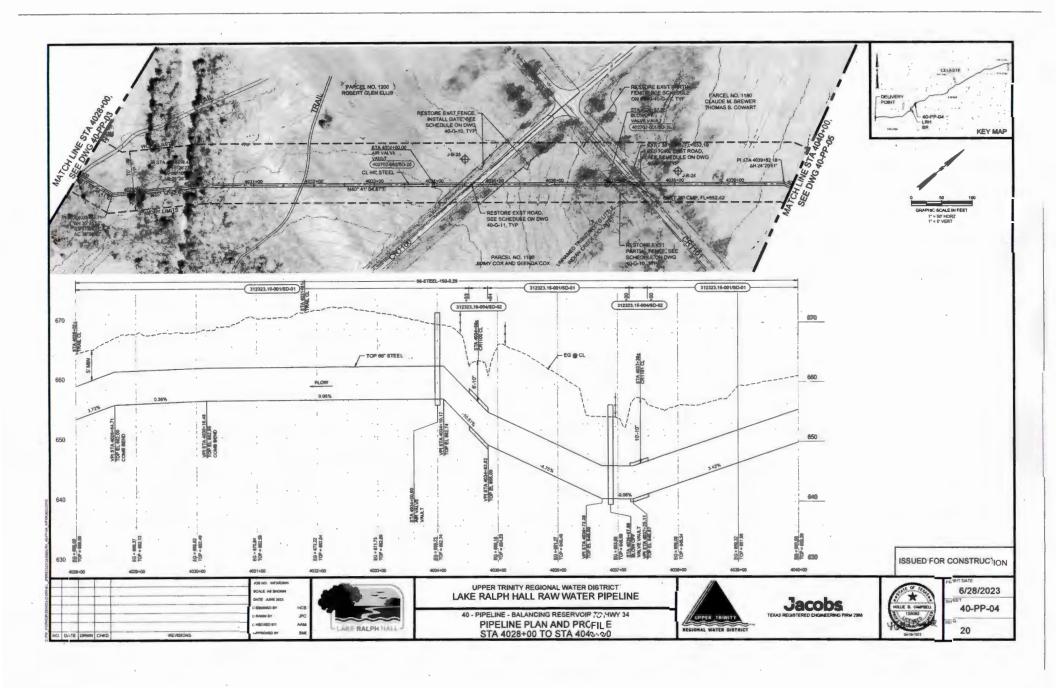
Dear Hunt County,

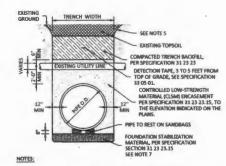
McKee Utilities is seeking permission from Hunt County to Cross County Road 1101 with the Lake Ralph Hall Pipeline. McKee Utilities will be crossing the road following the attached construction details. The access road will be re-routed during the utility crossing utilizing proper TXDOT detour signs. Construction will take roughly three days with the road detour in place. The contractor will notify the residents of the lane closure in advance.

Sincerely, GARNEY COMPANIES, INC.

Andrew Beck Sr. Project Manager

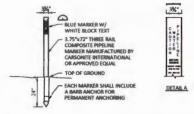






- SEE PLAN AND PROFILE FOR PROJECT SPECIFIC AND PERMITTED CROSSING DETAILS.
- THE CONTRACTOR SHALL BE REQUIRED TO USE WOOD MATS FOR WATERINES, OR REQUIRED BY CROSSING PERMIT.
- THE CONTRACTOR SHALL CONTACT UTILITY OWNER AT LEAST (5) DAYS PRIOR TO CROSSING THE UTILITY.
- FOR CROSSING UTILITIES 6" OR LARGER IN DIAMETER, EXTEND CLSM ENCASEMENT ON PROPOSED PIPE TO 5" ON EACH SIDE OF UTILITY CROSSING.
 CONTRACTOR SHALL SLOPE TRENCH WALLS AND/OR SHORE EXCAVATIONS
- CONTRACTOR SHALL SLOPE TRENCH WALLS AND/OR SHORE EXCAVATIONS FOR CONSTRUCTION AND SAFETY IN ACCORDANCE WITH CURRENT OSHA REQUIREMENTS AND SPECIFICATIONS.
- IF THE CROSSING UTILITY IS LESS THAN 6-INCHES AND 3 FEET OR HIGHER FROM THE TOP OF THE PIPE THEN THE CONTRACTOR MAY SUPPORT THE CROSSING UTILITY AND USE THE STANDARD GRANULAR EMBEDMENT DETAIL.
- CONTRACTOR TO SEEK APPROVAL FROM THE DESIGNATED OWNER'S REPRESENTATIVE PRIOR TO PLACEMENT OF FOUNDATION STABILIZATION MATERIAL WHERE UNSTABLE GROUND CONDITION OCCUR. FOUNDATION STABILIZATION MATERIAL SHALL BE UTILIZED IF UNSTABLE GROUND CONDITIONS ARE ENCOUNTERED.

UTILITY LINE CROSSING DETAIL - 02 10 01 - 001



NOTES:

- MARKER SHALL BE LOCATED ON BOTH SIDES OF ALL ROADS AND RAILROADS, AT ALL MAINLINE VALVES, AIR VALVES, AND BLOWOFF VALVES, AT ALL HORIZONTAL BENDS, ROAD CROSSINGS, OTHER VISIBLE STRUCTURES. AND MAX SPACING OF 2020 IS A LONG PIPPELINE ALEGMAPTIT.
- RORACHI RA, DRINDS, ROAD L'ROSSINOS, UT HER YESINEZ STRUCTURES, ARID MAN SPACING OF 2000 LF ALDRO SPIELINE ALIGNMENT.

 2. EACH MARKER SHALL HAVE A STICKER WHIT THE FOLLOWING INFORMATION "CAUTION WATER PRELIES BEGNE DIGGING CONTACT UTIWD (972) 219–1228, STA 2004/32" ALL INFORMATION MUST BE TYPED OR STAMPED WITH MOH-FADIRG INI, NOT HAND WRITTEN.

PIPELINE MARKER - 33 05 01 - 001

ISSUED FOR CONSTRUCTION

OB NO DOX
SCALE AS BROWN
DAYS INSTRUMENTAL YES
ORISINFOR Y AC
GROWN BY Y.C.
GROWN BY Y.C.
GROWN BY Y.C.
AMPROVED BY CITY
AMPROVED BY CITY
AMPROVED BY CITY



UPPER TRINITY REGIONAL WATER DISTRICT LAKE RALPH HALL RAW WATER PIPELINE

PROGRAM STANDARD DETAILS SHEET 2 CLSM EMBEDMENT, UTILITY LINE CROSSING AND PIPELINE MARKER DETAILS





Lockwood, Andrews & Newnern, Inc.





03/09/2023 SHEET

SD-02

TEXAS REGISTRAD BRIGHTSOM FROM P.19

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

- The Borricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary troffic control devices, construction povement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Troffic Control Devices" (TMUTCD).
- The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
- The Contractor may propose changes to the TCP that one signed and seoled by a licensed professional engineer for approval. The Engineer may develop, sign and seol 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 approximate location of any device without the approximate.
- 5. Geometric design of lone shifts and detours should, when possible, meet the opplicable design criterio controlled in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Palicy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.
- 6. When projects obut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.
- The Engineer may require duplicate worning 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 prayide a detail to the Contractor before the sign is manufactured.
- The temporary troffic 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 and Uniform Traffic Control Devices, CSJ limit signs ore required. CSJ limit signs ore 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 of or near the CSJ limits. For mobile operations, CSJ limit signs are not required.
- Troffic control devices should be in place only while work is actually in progress or a definite need exists.
- The Engineer has the final decision on the location of all traffic control devices.
- 13. Inactive equipment and work vehicles, including workers' private vehicles must be porked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

WORKER SAFETY NOTES!

- Workers on foot who are exposed to troffic or to construction equipment
 within the right-of-way sholl wear high-visibility sofety appored 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 valume work areas or night time work.
- Except in emergency situations, flagger stations shall be illuminated when flagging is used at night.

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

- Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.
- Work zone troffic control devices shall be compliant with the Monuol for Assessing sofety Hordware (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

Standard

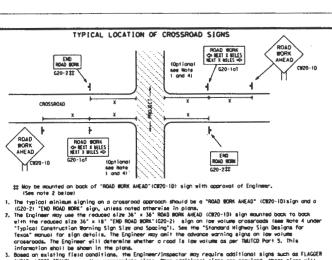
BARRICADE AND CONSTRUCTION GENERAL NOTES
AND REQUIREMENTS

BC(1)-21

| Columbia | Columbia

ATE





innomerion and it does aroun in majoras.

Bosso on saiting field conditions, the Engineer/Inspector may require additional signs such as FLACCER
ANCED, LOOSE CRAPEL, or other appropriate signs. Then additional signs are required, these signs will
be considered port of the minisum 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 Bark

4. The "ROAD WORK MEXT X MILES" (G20-10Tisign sholl be required at high volume crossroods to advise motorists of the length of construction in either direction from the intersection. The Engineer

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

will describe sharing a coding it considered high volume.

5. Additional traffic control devices any be drown elsewhere in the plans for higher volume crossroods.

6. When early 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 NORK ₩ ₩ G2Q-9TP * * R20-51 FINES * # R20-5qTP ROAD WORK O- MEXT X MILES 1000" - 1500" - Hey INTERSECTED 1 Block - City 1 Black - City ROADBAY ➾ G20-15TR MENT X MILES 4 80° G20-51 ROAD WORK ¥ ¥ G20-9TP FINES ¥ ¥ R20-5T

CSJ LIMITS AT T-INTERSECTION

- The Engineer will determine the types and location of any additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.
- 2. If construction closes the road at a T-intersection, the Contractor shall place the "CONTRACTOR NAME"(G20-6T) sign behind the Type 3 Borricodes for the road closure (see BC(10) also).

 The "ROAD WORK MEXT X MILES" left arrow(G20-1bTL) and "ROAD WORK MEXT X MILES" right arrow (G20-1bTR)" signs shall be replaced by the detour signing coiled for in the plans.

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING LS.6

SPACING

SIZE						
Sign Number or Series	Conventional Road	Expresswoy/ Freewoy				
CW20 ⁴ CW21 CW22 CW23 CW25	48" x 48"	48" × 48"				
CW1, CW2, CW7, CW0, CW9, CW11, CW14	36" × 36"	48" × 48"				
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" × 48"				

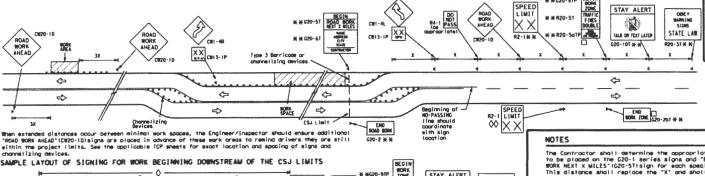
1	Posted Speed	Sign △ Spacing
1	MPH	Feet (Apprx.)
	30	120
ì	35	160
1	40	240
1	45	320
1	50	400
1	55	500 ²
1	60	600 ²
1	65	700 ²
	70	800 ²
	75	900 ²
1	80	10002
_	•	9 3
	Total or	

For typical sign spacings on divided highways, expressions and freeways Port 6 of the "Texas Manual on Uniform Troffic Control Devices" (TMUTCD) typical application diagrams or ICP Standard Sheets.

 \triangle Minimum distance from work area to first Advance Marning sign nearest the work area and/or distance between each additional sign.

ENERAL NOTES

- . Special or larger size signs may be used as necessary.
- 2). Distance between signs should be increased as required to have 1500 feet
- 3L. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- . 36" x 36" "ROAD WORK AHEAD" (CM20-1D) 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
- See sign size listing in 'TMUTCD', Sign Appendix or the "Standard Higheon Sign Designs for Texas" manual for complete list of available sign design



STAY ALERT # #G20-51 RCAD WORK OBEY BARNING SIGKS SPEED TRAFFIC ROAD ROAD WORK AHEAD ROAD ¥ ¥#20-5T CLOSED RI1-2 DOUBL F STATE LAW TALK OR TEXT LAYER Type 3 Berricode or channelizing \R20-31 CBI 3- IP XX C#20-1E ⇦ -CSJ Limit ➾ SPEED R2-1 ENO ROAD WORK END CORK ZONE C20-26T # # 620-2 # #

The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN RADD WORK MEXT MILES" (G20-31) sign for each specific oraject. This distance shall replace the "X" and shall be rounded to the nearest whole mile with 7th approval of the Engineer

No decimals shall be used.

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

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 ٥ and other signs or devices as called for an the Traffic

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

	LEGEND
ш.	Type 3 borricode
000	Channelizing Devices
4	Sign
х	See Typical Construction Starning Sign Size and Spacing chart or the TMUTCD for Sign spacing requirements.

SHEET 2 OF 12

Texas Department of Transportation

BARRICADE AND CONSTRUCTION PROJECT L IMIT

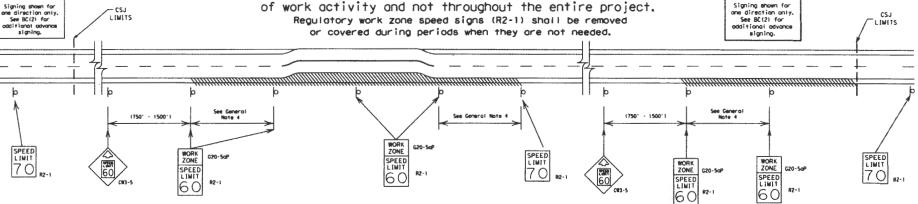
BC(2)-21

At 20.21,401	ca: I	day:	1.51 : x30" Lee.	TABY TON TAGOT
Third hovember 2007	START	SECT	-ca	HIGHNA "
₩ YISKW				
9-07 8-14	DIST		(Q.M.)	S4LC1 43.
7-13 5-21				SD-46

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

Bork zone speed (Imits 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 povement surface
- b) substantial atteration of roodway 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 8C(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 bet 40 mph and greater 0.2 to 2 miles
- 35 moh 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 8C(4)).
- Fabrication, erection and maintenance of the ADVANCE SPEED LIMIT*(CH3-5) sign, **MORK ZOME*(ZOD-5dP) plaque and the "SPEED LIMIT*(R2-1) signs shall not be paid for directly, but shall be considered subsidiary to Item 502.
- Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
- 8. Techniques that may help reduce traffic speeds include but are not limited to: A. Low enforcement
- B. Flogger stationed next to sign.
- C. Portable changeable message sign (PCMS).
- D. Low-power (drone) radar transmitter.
- E. Speed monitor trailers or signs.
- 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,

SHEET 3 OF 12

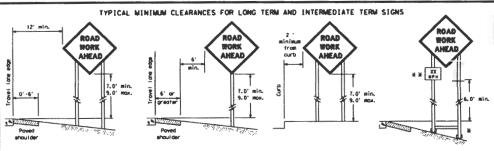
Texas Department of Transportation

Signing shown for

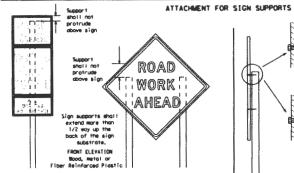
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

Title: to /1,dyn	gar Txi		.e. WWT o	e. 1×001	LA: TXGO
(City of November 2002	TIMES	SACI	√OR	,	4;7,4002.1
9-07 8-14 7-13 5-21	8(5)		Country	. 1	S# (1 4).
	L				SD-47



- * then placing akid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb.
 - ## Shen ploques are placed on dual-leg supports, they should be attached to the upright nearest the troval ions. Supplemental ploques (advisory or distance) should not cover the surface of the porent sign.



Splicing embedded perforated equare metal tubing in order to extend post helight will only be allowed when the splice is ende using four bolts, he dowe and he before the splice point. Splice must be incorted entirely behind the sign substrate, not near the base of the support. Splice Insert impairs should be at least 5 times naminal post size, centered on the splice and of at least the same gauge material.

procedures for attaching sign substrates to other types of SEDE FLEVATION

Noils shall NOT be allowed. Foch sign shall be attached directly to the sign Support. Multinie aions shall not be loined or spliced by any means. Wood supports shall not be extended or repaired by splicing or other means.

Attachment to wooden supports

will be by bolts and nuts

or screws, Use TxDOT's or

manufacturer's recommended

sign supports

STOP/SLOW PADDLES

- 1, STOP/SLOW paddles are the primary method to control troffic
- by flaggers. The STOP/SLOW paddle size should be 24" x 24".
 2. STOP/SLOW paddles should be retroreflectorized when used of night.
- 1. STOP/SLOB poddles 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 65.03 Hand Signaling Devices in the TMUTCO.







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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

- Personery signs are used to give notice of traffic laws or requiptions, call attention to conditions that are potentially hazardous to troffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, specific service (LOCO), or cultural information. Drivers aracseding through a work zone need the same, if not better route guidance as normally installed on a roadway eithout construction.
- When personent regulatory or warning signs conflict with work zone conditions, remove or cover the personent signs until the personent sign seasoge sections the roadway condition. For details for covering large guide signs see the
- When existing permonent signs are moved and relocated due to construction purposes, they shall be visible to materiats of all times. If existing signs are to be relocated on their original supports, they shall be
- installed on crasheorthy bases as shown on the SMD Standard sheets. The signs shoul meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be poid for under the appropriate pay Item for relocating existing signs.
- If permonent along one to be removed and relocated using temporary authorits the Confractor shall use crasmoorthy supports as shown on the BC standard sheets, TLRS standard sheets or the CRZYCO list. The signs shall used the required mounting heights shown on the BC, or the SMD standard sheets during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
- Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment sholl be replaced as soon as possible by the Contractor to ensure proper guidance for the motorists. This will be subsidiary to [tem 502.

GENERAL NOTES FOR WORK ZONE SIGNS

- Contractor shall install and saintain signs in a straight and plust condition and/or as directed by the Engineer.

- Borricodes shot! MOT be used as sign supports.
 All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, worn, and
- All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, work, and guide the traveling public safety through the work zone. The Contractor way furnish either the sign design shown in the plans or in the "Standard Rightway Sign begins for Texas" (SHSD). The Engineer/Inspector way require the Contractor to furnish other work zone signs should not be shown in the IMAICD but any howe been ositted from the plans. Any world ion in the plans shall be documented in self-the operation between the Engineer and the Contractor's Responsible Person. All otherwise the commentation of the IMAICD but any howe been as in the Inspector in the Image of Image of the Image of the Image of Image of the Image of Image o
- The Contractor shoil furnish sign supports listed in the "Compliant Bork Zone Traffic Control Device List" (MEZCO) for smoll roadslide signs. Supports for temporary trage roadslide signs shot lisset the requirements destolled on the Economic Control Device List" (MEZCO) for smoll readslide signs shot in section of the Economic Control Contr
- 6.
- The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

DURATION OF BORK (on defined by the "Texon Monun) on Uniform Traffic Control Devices" Part 61

- The types of sign supports, sign southing height, the size of signs, and the type of sign substrates con 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 somufacturer's recommendations in regard to organize thiness and duration of work requirements.
- Lang-term stationary work that accupies a location ware than 3 days.
 Intermediate-term stationary work that accupies a location ware than one daylight period up to 3 days, or nighttime work losting more than one hour.
- more man one hour.

 Short-term stationary doylims work that occupies a location for more than 1 hour in a single doylight period.

 Short, duration work that occupies a location up to 1 hour,
 Mabile work that sous continuously or intermittenity (etapping for up to approximately 15 minutes,)

- SIGN MODATING HE CONT

 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 sounted below other signs.
 The bottom of Short-Hermi-Short Durotion signs shall be a minimum of 1 foot above the povement surface but no more than 2 feet above

- the ground. Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing. Short-term/Short Duration signs shall be used only during daylight and shall be removed at the end of the workday or raised to
- appropriate Long-term/intermediate sign height.
 Regulatory signs shall be mounted at least I feet, but not more than 9 feet, above the paved surface regardless of work duration.

SIZE OF SIGNS

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

SIGN SUBSTRATES

- 1. The Contractor shall ensure the aim substrate is installed in accordance with the constacturer's recommendations for the type of aim
- The Contractor shall ensure the sign substrate is installed in accordance with the sounfacturer's recommendations for the type of sign support that it being used. The CEXTON lists each substrate that on be used on the different type and substrate. "Mash" type materials are NOT on approved sign substrate, reportless of the Hightness of the serve.
 All souths individual sign pones is forticated from 2 or more pieces shall however on store provides, fastered to the book of the sign and extending fully across the sign. The cleat shall be oftended to the book of the sign using wood screws that do not penetrate the face of the sign ponel. The screws shall be placed on both sides of the spilor and spaced at 6" centers. The Engineer may approve other methods of aplicing the sign face.

REFLECTIVE SHEETING

- All signs shoul be retroreflective and constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300 for rigid signs or DMS-8310 for rati-up signs. The web address for DMS specifications is shown on BC(1). When the sheeting, meeting the requirements of DMS-8300 Type A, shoul be used for signs with a sheeting background. Orange sheeting, meeting the requirements of DMS-8300 Type $B_{\rm RL}$ or Type $C_{\rm RL}$, 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 (ISBB) and as mutilated in the Scandard Might are not in the Scandard Might And ministration (FMM) and as published in the "Standard Highey Sign Beign for "Each" excess manual. Signs, letters and numbers shall be of first class workeapship in accordance with Department Standards and Specifications.

REMOVING OR COVERING

- Bits in ign exceptions
 Bits in ign exceptions
 Bits in ign exceptions
 Bits in ign exception to the confusing or do not copply, the signs sholl be removed or completely covered.
 Long-term stationary or intermediate stationary signs installed on square metal tubing say be turned away from traffic 90 degrees when
 the sign essage is not copicable. This technique say not be used for signs installed in the median of divided highways or near any
 intermedians where the sign say be seen from approaching traffic.
- Signs installed on social with a sign was been from approaching invited.

 Signs installed on social skids shall not be furned or 90 degree angles to the roadway. These signs should be removed or completely covered when not required.

 Been signs are covered, the saferior used shall be oppose, such as beany sli block plastic, or other saferiors which will cover the entire sign face and maintain their apague properties under automobile headlights at night, without damaging the sign sheeting.
- Burlop shall MOT be used to cover aligns.

 Duct tope or other adhesive material shall MOT be offixed to a sign face.
- 7. Signs and anchor stubs shall be removed and noise backfilled upon completion of work.

SIGN SUPPORT REIGHTS

- There sign supports require the use of weights to keep from turning over, the use of sondbogs with dry, carealoniess sand should be used. The sondbogs will be tied shut to keep the send from soliting and to maintain a constant weight. Rock, connected, iron, steel or other soild objects should not be permitted.

- Rock, concrete, from, steel or other solid objects sholl not be permitted for use as sign ausport selights. Sandbogs should welgh a sinifact of 35 lbs and a social selection of 50 lbs, Sandbogs should be added of a durable material that theors upon vehicular ispace, Rubber total as fire inner tubes sholl NOT be used. Rubber battosts designed for channel zing devices should not be used for batlact on particle sign ausports. Sign supports designed and sandractured with rubber bases say be used when shown on the CRZICO list. Sandbogs sholl only be placed along or fold over the base supports of the traffic control device and shall not be suspended above ground level or nurgi sith rope, life, chalins or other footners. Sandbogs shall be placed under the skild one sign supports of the spoot of the footners.

FLAGS ON SIGNS

Flags may be used to draw attention to worning signs. When used, the flag shall be 15 inches square or larger and shall be arrange or fluorescent red-arrange in color. Flags shall not be allowed to cover any portion of the sign face.

SHEET 4 OF 12

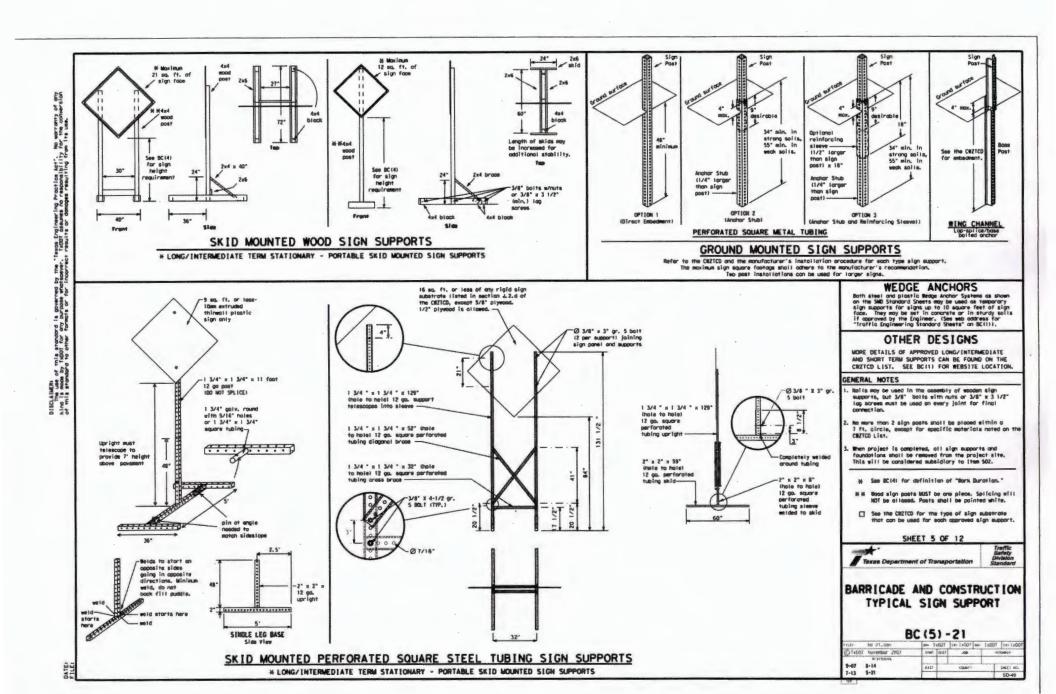
Texas Department of Transportation

BARRICADE AND CONSTRUCTION **TEMPORARY SIGN NOTES**

Treffic Safety Division

BC (4) -21

	on to	CA:	an inggr	04. I	ADOT .	LK1 F/00
©TxU01 hovember 2002	Creet	54.C1	-98	1	H14	-WAT
9-07 8-14	B121	. [tant-	1	13	MLC: H1.
7-13 5-21						SD-48



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

PORTABLE CHANGEABLE MESSAGE SIGHS

- The Engineer/Inspector shot! approve oil messages used on portable
- changedble message signs (PCMS). Messages on PCMS should contain no more than 8 words tabout four to eight characters per word), not including simple words such as "TO,"
- *Resogns should consist of a single show, or two phoses that alternate. Three-phose wassages are not allowed. Each phose of the message should convey a single thought, and must be understood by

- message should convey a single thought, and must be understood by litestif.

 Use the word "EXIT" to refer to an exit ramp on a freeway i.e.,
 "EXIT CLOSED," be not use the term "RAMP."

 A Itwoys use the route or interstate designation (II, US, 3H, PM) along with the nuster when referring to a roadery.

 Been in use, the bottom of a starilonary PDSs message panel should be a sinimum 7 feet down the roadery, where passible.

 7. The message term "REEXEMD" should be used only if it the work is to start on Soturday soming and end by Sunday exeming at alongist. Actual days and hours of work should be displayed an the PDSS if work is to start on Soturday soming and end by Sunday exeming at alongist. Actual days and hours of work should be displayed an the PDSS if work is to begin an Friday eventing ander continue into bearday soming.

 By The Engineer/Inspector may select one of two options which are would include the sessage in the possible special some of for three seconds each.

 By Do not floating when the continuous while alliphoyed.

 Do not present redundant information on a two-phose message. The emessage has been and changing the third line.

 Do not use the word "Danger" in sensora.

 The following successions and the message.

 The following tools i last abbrevious words in a phrose such be read of the sign.

 The following tools i last abbrevious lands on the mose difference that are also provided in a phrose such be read and continuous the food of the sign.

- ore acceptable for use on a POSS. Both words in a phrase must be displayed together. Stards or phrases not on this first should not be abbreviated, unless shown in the TMUTCO.
- observiored, unless shown in the TMATCO.

 3) PCMS character height should be or least 18 inches for troiller sounted units. They should be visible from at least 1/2 (.5) mile and the text should be legible from at least 100 feet or night and 800 feet 1n day light. Truck mounted units sust how a character height of 10 inches and east be legible from at least 400 feet.

 16, Each line of text should be centered on the message board rother than set or right justified.

 17, If disabled, the PCMS should default to an illegible display that will not close stories and will only be used to olert sorters that the PCMS has softwareloned. A pattern such de a series of horizontal solid bars is accorder lote.

WORD OR PHRASE	ABBREYLATION	WORD OR PHRASE	ABBREVLATION
Access Road	ACCS RD	Mojor	MAJ
Aiternate	ALT	Miles	MI
Averue	AVE	Miles Per Hour	MpH
Best Route	BEST RTE	Minor	MMR
Boulevard	BLVD	Monday	MON
Br idge	BADC	Normal .	NORM
Connot	CANT	North	N
Center	CTR	Horthbound	(route) N
Construction	CONST AND	Parking	PKING
Altread		Rood	RD
CROSS ING	XING	Right Lone	RTLM
Detour Route	DETOUR RTE	Saturday	SAT
Do Not	THOS	Service Road	SERV RD
East	E	Shoulder	SHLDR
Eastbound	(route) E	Slippery	SLIP
Emergency	EMER	South	15
Emergency Vehicle	ENER VEH	Southbound	(route) 5
Entrance, Enter	ENT	Speed	SPD
Express Lone	EXP F#	Street	151
Expressedy	EXPRY	Sunday	SUM
XXXX Feet	XXXX FT	Tellephone	PHOME
Fog Ahead	FOG AHD	Temporary	TEMP
Freeway	FRMY, FMY	Thursday	THUMS
Freegoy Blocked	FRY BLKD	To Doentoen	TO DWNTH
Friday	FRI	traffic	TRAF
Hazardous Driving	HAZ DREVENG	Trovelers	TRYLRS
Hazardous Waterlai	HAZMAT	Tuesday	TUES
High-Occupancy	HQY	Time Winutes	TIME MEN
Vehicle	HEY	Upper Level	UPR LEVEL
Highway		Vehicles (s)	VEH, YEHS
Hour (s)	HR, HRS	Barning	WARN
Information	INFO	Bednesday	WED
11 [8	ITS	Weight Limit	WT LIMIT
Junction	JCY	Best	18
Left	LFY	flestbound	(route) #
Left Lane	LFY LM	Set Pavement	BET PVMT
Lane Closed	LM CLOSED	Will Not	THOR
Lower Level	LMI LEVEL		
Maintenance	MAINT		

Roodway 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

FREEWAY CLOSED X MILE	FRONTAGE ROAD CLOSED	ROADWORK XXX FT	ROAD REPAIRS XXXX FT
ROAD CLOSED AT SH XXX	SHOULDER CLOSED XXX FT	FLAGGER XXXX FT	LANE NARROWS XXXX FT
ROAD CLSD AT FM XXXX	RIGHT LN CLOSED XXX FT	RIGHT LN NARROWS XXXX FT	TWO-WAY TRAFFIC XX MILE
RIGHT X LANES CLOSED	RIGHT X LANES OPEN	MERGING TRAFFIC XXXX FT	CONST TRAFFIC XXX FT
CENTER LANE CLOSED	DAYTIME LANE CLOSURES	LOOSE GRAVEL XXXX FT	LANES XXXX FT
NIGHT LANE CLOSURES	I-XX SOUTH EXIT CLOSED	DETOUR X MILE	ROUGH ROAD XXXX FT
VARIOUS LANES CLOSED	EXIT XXX CLOSED X MILE	ROADWORK PAST SH XXXX	ROADWORK NEXT FRI-SUN
EX1T CLOSED	RIGHT LN TO BE CLOSED	BUMP XXXX FT	US XXX EXIT X MILES
MALL DRIVEWAY CLOSED	X LANES CLOSED TUE - FRI	TRAFFIC SIGNAL XXXX FT	LANES SHIFT

Phase 2: Possible Component Lists

	Effect on Travel	Location List	Warning List	** Advance Notice Lis
MERGE RIGHT	FORM X LINES RIGHT	FM XXXX	SPEED LIMIT XX MPH	TUE-FRI XX AM- X PM
DETOUR NEXT X EXITS	USE XXXXX RD EXIT	BEFORE RAILROAD CROSSING	MAXIMUM SPEED XX MPH	APR XX- XX X PM-X AM
USE EXIT XXX	USE EXIT I-XX NORTH	NEXT X MILES	MINIMUM SPEED XX MPH	BEGINS MONDAY
STAY ON US XXX SOUTH	USE I-XX E TO I-XX N	PAST US XXX EXIT	ADVISORY SPEED XX MPH	BEGINS MAY XX
TRUCKS USE US XXX N	WATCH FOR TRUCKS	XXXXXXX TO XXXXXXX	RIGHT LANE EXIT	MAY X-X XX PM - XX AM
WATCH FOR TRUCKS	EXPECT DELAYS	US XXX TO FM XXXX	USE	NEXT FRI-SUN
EXPECT DELAYS	PREPARE TO STOP		DRIVE SAFELY	TO XX PM
SPEED XXX FT	END SHOULDER USE		DRIVE WITH CARE	NEXT TUE AUG XX
USE OTHER ROUTES	WATCH FOR WORKERS			TONIGHT XX PM- XX AM
STAY IN LANE	*	# # Se	e Application Guideli	nes Hote 6.

APPLICATION GUIDELINES

* LAMES SHIFT In Phose I must be used with STAY IN LAME In Phose

- Anity 1 or 2 phases are to be used on a PCMS.
 The lat shows for bothi should be selected from the "Road/Lone/Roap Clearer List" and the "Other Condition List".
 A 2nd phase can be selected from the "Action to Tose/Effect on Trovel, Location, Ceneral Serving, or Advance Motion

- Phose Lists."

 A Location Phose is necessary only if a distance or location is not included in the first shoes selected.

 If two POSS are used in adquence, they must be separated by a miniaum of 1000 ft. Each POSS shall be limited to two phoses, and should be understanded by themselves.

 For advence natice, when the current date is within seven days of the actual each date, colerated adps should be replicated with days of the seak. Advance not if front on the day is a facility be for no more than one week prior to the advanced space in the control of the control of the service of the

BORDING ALTERNATIVES

- The words RIGHT, LEFT and ALL can be interchanged as appropriate.
 Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
- 3. EAST, MEST, MORTH and SOUTH for abbreviations E, 16, 16 and 5) con

- 3. EAST, WEST, MORHIN and SOUTH for obbreviolitone E, B, N and S be interchanged as appropriate.

 4. Highway names and numbers replaced as appropriate.

 5. ROLD, HIGHERY and PREEDER can be interchanged as needed.

 6. AMEAD may be used instead of distances if necessary.

 7. Ff and MJ, MILE and MILES interchanged as appropriate.

 8. AT, BEFORE and PAST interchanged as appropriate.

 9. Distances or AMEAD 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 POWS SIGNS

XXXXXXXX BLVD

- 1. When Full Matrix PCMS signs are used, the character height and tegibility/visibility requirements shall be maintained as listed in Note 15 under "PORTABLE
- CHANGEARL MESSAGE SIGHS' above.
 2. When symbol signs, such as the "Flagger Symbol" (CR20-7) are represented graphically on the Full Matrix POAS 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 POMS, they shall only supplement the use of the static sign represented, and shall not substitute
- for, or replace that sign.
 4. A full matrix PORS may be used to simulate a floating arrow board provided it meets the visibility, float rate and disming requirements on BCCT1, for the
- some size orrow.

SHEET 6 OF 12

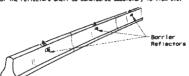
Taxes Department of Transportation

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC (6) -21

	bc-21, cgn	SAY I	KIN2	CK INNI OF	1<003	- A 1 / (20)
Dixuot	November 2002	EUMA	34.61	40B	1	e, GIRMAY
1	SE VESTONS	-	1	11.7/		
9-07 7-13	8-14	BitS1		COUNTY	1	94E1 M1
7-13	5-21					SD-50

2. Color of Borrier Reflectors sholl be as specified in the DAUTCO. The



CONCRETE TRAFFIC BARRIER (CTB)

3. Where proffic is on one side of the CTB, two 121 Bornier Reflectors shot to expure of no oppositionally the middection of each section of CTB, an attended expuring location is uniformly spaced or one and of soch CTB. This will alice for oftoment of a bornier graphic without deapoing the reflector. The Bornier Reflector southed on the side of the CTB shot is be located directly below the reflector southed on the side of the bornier, as shown in the block of the bornier of the control of the souther on the control of the control of the bornier of the control of the

two yellow reflective faces (8)-Directionalismile the reflectors on each side of the barrier shall have one yellow reflective face, as shown in the detail above.

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. Mozimus spocing of Borrier Reflectors is forty (40) feet.

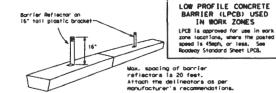
8. Powemant soriers or temporary flexible-reflective roddecy marker tobs shall NOT be used as CTB delineation.

of Barrier Reflectors to CTB shall be per manufacturer's

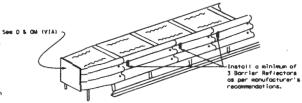
recommendations.

10. Missing or damaged Borrier Reflectors shall be replaced as directed by the Engineer.

11. Single slape borriers shall be defineded as shown on the above detail.



LOW PROFILE CONCRETE BARRIER (LPCB)



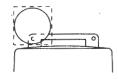
DELINEATION OF END TREATMENTS

END TREATMENTS FOR CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones sholl weet the apppropriate ordehworthy atondords as defined in the Manual for Assessing Sofety Hordwore (MASN), Refer to the CWZTCD List for approved treatments and manufacturers.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

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



Marning reflector way be round or square, Must have a vellow reflective surface area of at least 30 square inches

WARNING LIGHTS

1. Norning lights shall neet the requirements of the TAUICD.
2. Norning lights shall NOT be installed on borricodes.
3. Type A-Loc Intensity Finshing Norning Lights are commonly used sith drums. They are intended to worn of a mark a potentially hazardous area. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "Fi.". The Type A Borning Lights shall not be used sith signs mountactured with Type B₀ or C₀. Sheeting weeting the requirements of Departmental Material Specification in MS-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 ovelcas, Their use shall be as indicated on this sheet and/or other sheets of the plans by the assignation "SB".
5. The Engineer/Inspector or the plans shall specify the local for and Type of worning lights to be installed on the traffic control devices.

men required by the Engineer, the Contractor shall furnish a copy of the sorning lights cartification. The sorning light source of the contractor shall furnish a copy of the sorning lights cartification. The sorning light source of the contractor of the latest light source of the contractor of the c

The location of worning lights and worning reflectors on drums shall be as shown elsewhere in the plans.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

1. Type A ronger floating exching lights are intended to exch at they are opproaching or are in a potentially hozordous area.

2. Type A ronger floating exching lights are intended for definentian and shall not be used in a series.

3. A series of sequential of floating exching lights placed on channel fizing devices to force a sergial paper sty be used for definentian. If used, the successive floating of the sequential sexhing lights should occur from the beginning of the taper to the end of the serging toper in order to identify the desired vehicle path. The order of floating is not lie to 55 the place of the from the place of the frower in the serging toper in order to identify the desired vehicle path. The order of floating for each light should be 55 the place of the frower in the serging toper in order to identify the desired vehicle path. The order of floating for each light should be 55 the place of the frower increases.

4. Type C and D steady-burn sorning lights are intended to be used in a series to defined the edge of the frower lone on detours, on lone orders and the content of the place of the frower in the plants.

Sorning lights small not be installed on a drum that has a sign, chevron or vertical panel. The maxisum spacing for worning 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 worning reflector or approved substitute may be sounted on a plastic drum as a substitute for a Type C, steady burn worning light at the

discretion of the Contractor unless otherwise noted in the plans.

The worning reflector shall be yettaw in color and shall be sanufactured using a sign substrate approved for use with plastic druss listed

on the Lecture.

3. The sonting reflector shall have a minimum retroreflective auridos area (one-eids) of 30 square inches.

4. Round reflectors small be fully reflectorized, including the ones were ortached to the drus.

5. Square substrates must have a minimum of 30 square inches of reflectorized shareting. They do not have to be reflectorized where it

attaches to the arus.

6. The side of the warning reflector facing approaching traffic shall have sheeting meeting the color and retrareflectivity requirements for The social aspecting reflector social cape occurring the state of the soming reflector should be reflector set.
 The soming reflector should be southed on the side of the handle nearest approaching troffic.
 The socialized specing for sorting reflectors should be identical to the channel izing device spacing requirements.

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

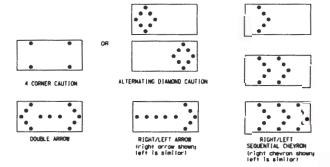
The Figshing Arrow Board should be used for all lons closures on multi-lone roodways, or slow moving maintenance or construction activities on the travel lanes.

moving adintendose or construction activities on the trows loses.

Fideling Arrow Boords should not be used on two-lone, two-way roadways, detaurs, alversions or work on shoulders unless the "CAUTION" alsotor (see detail below) is used.

The Engineer/Inspector should choose oil appropriates signs, burricades and/or other traffic control devices that should be used in conjunction with the Fideling Arrow Boord.

The Figeling Arrow Boord should be called to display the following symbols:



5. The "CANTION" display consists of four corner lamps floating simultoneously, or the Alternating Diamond Carlion mode as shown.

1. The straight line outling display is NOT ALLORED.

7. The Floating Arrow Board shoull be apposed of minisus 50 percent disming from crated lamp voltage the floating rote of the lamps shoull not be less than 25 nor more than 40 floating amount of the same should be approximately 50 percent for the floating arrow and equal intervals of 25 percent for each sequential prose of the floating chevron.

5. The sequential arrow also by is NOT ALLORED.

10. The floating arrow also by is NOT ALLORED.

11. The floating arrow also by it is NOT ALLORED.

12. The floating arrow also by it is NOT ALLORED.

13. A full matrix PORS may be used to simulate a simulation, trailer or other suitable support.

13. A full matrix PORS may be used to simulate of loating arrow Board provided it meets visibility, floating and one and display of trailer sounted Arrow Board should be 1 feet from readour. to botton of page!

REQUIREMENTS						
TYPE	MENEMUM SEZE	MINIMUM NUMBER OF PAMEL LAMPS	WINIMM VISIBILITY DISTANCE			
В	30 x 60	13	3/4 mile			
С	48 x 96	15	l mile			

ATTENTION Floathing Arrow Boards automatic disming devices WHEN NOT IN USE, REMOVE
THE ARROW BOARD FROM THE
RIGHT-OF-WAY OR PLACE THE
ARROW BOARD BEHIND CONCRETE
TRAFFIC BARRIER OR GUIRDRAIL.

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the Natural for Assessing Sofety Hordeare (MASH).
 Refer to the CRITCO for the requirements of Level 2 or

American service of the second service of the second service of the STE(S) for a list of approved that,
 Baffer to the STE(S) for a list of approved that,
 Baffer to the STE(S) for a list of approved that,
 Baffer to the STE(S) for a list of approved that,
 Baffer to the STE(S) for a list of approved that approved that approved the second s

30 to 100 rear in downsor or the area or chee exposure sifteed oversety offecting the such perforance.
6. The only resean a TBA should not be required is when a work one is approad down the roadedy and the work cree is an extended distance from the TBA.

SHEET 7 OF 12





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GENERAL NOTES

- For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
- The pristry Consentring certain.

 For intermediate term stafforary earth zones on freeways, drums should be used as the pristry channel izing device but say be replaced in tangent sections by vertical parels, or 42* two-place cones. In tangent sections, one-place comes may be used with the approval of the Engineer but only if personnel are present on the project at all times to maintain the comes in proper position and location.
- consert in proper position and location.

 For short term stationary work zones on freeways, drums are the preferred commelizing device but say be replaced in topers, transitions and tangent sections by wertical panets, two-piece cones or one-piece cones as opproved by the Engineer.

 4. Druss and all related items shall comply with the requirements of the
- current version of the "Texos Manual on Uniform Traffic Control Devices" (TMUTCD) and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
- bruss, bases, and related materials shall exhibit good workmanship and shall be free from abjectionable marks or defects that would obversely
- offset 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 on approved device.

GENERAL DESIGN REQUIREMENTS

- Pre-qualified plastic drums shall meet the following requirements:
- Plostic drums shall be a two-place designs the "body" of the arun shall be the top portion and the "base" shall be the bottom.
 The body and base shall lock together in such a cannor that the body sporotes from the base when lapacted by a vehicle triveling at a speed
- of 20 BMI or greater but prevents accidental separation due to normal nand ling and/or of turbulence created by possing vehicles. Pleatic drums shall be constructed of 1 (phrelight (fixe) bis, and deformable materials. The Contractor shall list use setal drums or single piece pleatic oruse as channel 1 gatterial drums are single piece pleatic oruse as channel 1 gatterial devices or sign supports.
- Drums shall present a profile that is a minimum of 18 inches in width at the 36 inch height when viewed from any direction. The height of drum unit (body installed on base) shall be a minimum of 36 inches and a soziamum of 42 inches.

 5. The top of the drum shall have a built-in nandle for easy pickup and
- shall be designed to drain water and not collect dearls. The handle shall have a minimum of two widely spaced 9/16 Inch diameter hales to allow attachment of a worning light, worning reflector unit or approved
- compliant sign.

 6. The exterior of the drus body shall have a minimum of four diternating the exterior or the crus loops and into a similar to the other corongs 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
- 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.
- Prostic drums should be constructed of ultro-violet stabilized, organs. nigh-density polyethylene (HDPE) or other approved material.
- 9. Drum body shall have a maximum unballosted weight of 11 lbs. 10, Drum and base shall be marked with manufacturer's name and model number.

RETROREFLECTIVE SHEETING

- The stripes used on drums shall be constructed of sheeting seeting the color and retroreflectivity requirements of Departments (Motariols: Specification DMs-1300, "Sign Fook Motariols: Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
- The sheeting shall be suitable for use on and shall adhere to the drum surface such that, upon vehicular lepoch, the sheeting shall remain adhered in-place and smilat no deligathating, cracking, or loss of retrorefisativity other than that loss due to obrasion of the sheeting

BALLAST

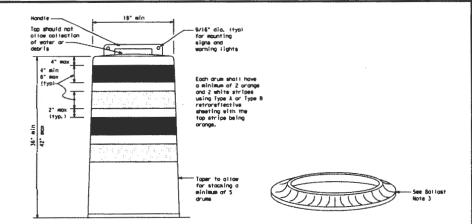
- 1. Unpollosted bases shall be large enough to hold up to 50 lbs, of sands This base, when filled with the bolloat material, should weigh between 35 bis delinieus) and 50 bis described. The bolloat may be sond in one 16 three sonbooks separate from the base, and in a sand-filled plastic. To three songoogs supporter from the does, and the supported by the Engineer. Stocking of sondboogs will be allowed, nosewer helight of sondboogs both sondboogs will be allowed, hosewer helight of sondboogs doors powerent surface any not exceed 12 inches.

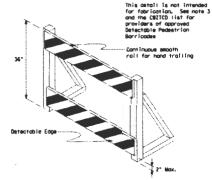
 Boess eith built-in bolloes sholl seligh between 40 lbs, and 50 lbs.

 Built-in bolloes con be constructed of on integral crush rubber boss or
- o solid rubber base.
- o solid rubber boss.

 Ascycled truck tire sloseotis stoy be used for bottost on druss opproved for this type of bottost on the CRZCD list.

 A The bottost sholl not be heavy dojects, enter, or any staterful that
- would become hazardous to motorists, pedestrians, or workers when the drum is struck by a wehicle.
- then used in regions susceptible to freezing, drums shall have drainage holes in the battoms so that water will not collect and freeze becoming o hazard when struck by a yehicle.
- Ballast shall not be placed on top of drums,
 Adhesives may be used to secure base of drums to povement.





DETECTABLE PEDESTRIAN BARRICADES

- In the Library of the Control of the
- above, longitudinol channelizing devices, some concrete barriers, and wood or chain link fencing with a continuous detectable edging can satisfactorily delineate a pedestrion
- tope, rope, or plostic chain strung between devices ore not detectorie, 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 pedestrion
- Harning lights shall not be attached to detectable pedestrian
- borricades.

 Detectoble pedestrion borricades should use 3" nominal borricade rails as shown on 8C(10) provided that the top rail provides a second continuous rail suitable for hand trailing with no spilinters, burrs, or shorp edges.



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



12" x 24" Vertical Panel mount with diagonals stopino down towards

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

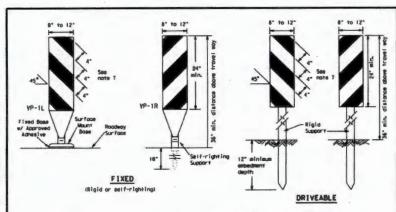
- Signs used on plostic drums shall be manufactured using substrates listed on the CWZTCD.
- 2. Chevrons and other work zone signs with an arange background shall be accurately all the state of the sta
- 3. Vertical Ponels shall be manufactured with orange and white sheeting meeting the requirements of SMS-8300 Type A or Type B. Diagonal stripes on Vertical Ponels shall slape down toward the intended traveled lane.
- Other sign messages (text or symbolic) may be used as approved by the Engineer. Sign dimensions shall not exceed 18 Inches in width or 24 Inches in height, except for the R9 series signs discussed in note 8 below.
- Signs shall be installed using a 1/2 inch bolt incelnat) and nut, two waters, and one tacking water for each connection.
- 6. Mounting boits and nuts shall be fully engaged and adequately torqued. Botts should not extend more than 1/2 inch beyond nuts.
- Chevrons may be placed on drums on the butside of curves, on merging topers or on shifting topers. Shen used in these locations, they may be placed on every drum or spoond not more than on every third drus. 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 ore 24 inches wide may be mounted on plastic drums, with approval of the Engineer.

Traffic Safety Division Texas Department of Transportation BARRICADE AND CONSTRUCTION CHANNEL IZING DEVICES

SHEET 8 OF 12

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(Rigid or self-righting

PORTABLE

 Yertical Panels 19P's) are normally used to channellize traffic or divide apposing larges of traffic.
 YP's may be used in dyttle or night-line situations.
 They may be used at the edge of shoulder drop-orfs and other areas such as large transitions where positive day-time and night-line as investion is required. The Engineer/Imagector soil rafer to the Roodery Besign Manual for additional requirements on the use 1P's for drop-offs,

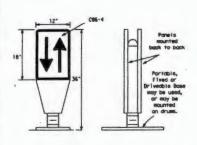
for drap-offs,
y" a should be souried book to book if used of the edge of rate adjacent to hex-way two lone readings. Stripss
are to be reflective orange and reflective white and
about old views slope downard toward the travel lane.
Y" used on expressivity and freeways or offer high
pased readings, say have sore than 210 square inches
of retroverlective error facing traffic.
5. Self-righting supports are available with portable base.
See "Compiliant Bork Zone Traffic Control Devices List"
(SEZICI).

(CRITCID).

Sherting for the YP's shell be retroreflective Type A or Type B conforming to Beportmental Monerial Specification BMS-8300, unless noted otherwise.

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

VERTICAL PANELS (VPs)



- Opposing Troffic Lone Dividers (OTLD) are delineation devices designed to convert a normal ane-way randway section to two-way operation, OTLD's are used an temporary center lines. The upward and dominard arrows on the sign's face indicate the direction of traffic on either side of the divider. The base is secured to the povement with an adhesive or rubber weight to minimize mov caused by a vehicle impact or wind gust.
- 2. The OTLB may be used in combination with 42"
- Spacing between the OTLD shall not exceed 500 feet, 42" cones or VPs placed between the OTLB's should not exceed 100 foot spacing.
- 4. The OTLD shall be arange with a black nor reflective legend. Sneeting for the OTLD shall be retroreflective Type B_E or Type C_E conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The tegend shall meet the requirements of DMS-8300.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



- Chewrons are intended to give notice of a sharp change of dilgment with the direction of travel and provide additional emphasis and guidance for rehicle operators with regard to changes in harizontal alignment of the readway.
- Chewrons, when used, shall be erected on the out-aide of a sharp curve or turn, or on the for side of on intersection. They shall be in line with and of right angles to approaching traffic. Specing should be such that the motorist always has three in view, until the change in allignment eliminotes its need.
- 4. To be effective, the chevron should be visible for of least 500 feet.
- 5. Chevrons shall be orange with a black nonreflective legand. Sheeting for the chevron shall be retroreflective Type B_{Σ_1} or Type C_{Σ_1} conforming to Departmental Material Specification (MS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.
- 6. For Long Term Statlanary 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

- Nork Zone channelizing devices lituatrated on this sheet may be installed in close proximity to traffic and are suitable for use on high or law. readways. The Engineer/Inspector shall ensure that specing and ant is uniform and in accordance with the "Texas Monual on Uniform Troffic Control Devices" (TAUTCD).
- Transactionards unwices "restricts."

 2. Channel light devices shown on this sheet may have a drivedble, fixed or partable base. The requirement for self-righting channel light devices must be specified in the General Notes or other pion sheets.

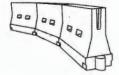
 3. Channel Izing devices on self-righting supports should be used in work zone
- oreon where charmed 2 ling devices ore frequently lispaced by errant vehicles or which related wind gusts making all greater of the charmed 2 ling devices of the charmed 2 ling devices of the charmed 2 ling devices. where in the plans. These devices shall conform to the MAJICD and the "Compilant Bork Zone Traffic Control Devices List" (CMZTCD).
- "Compilant Bork Zone Troffic Control Devices List" (CRITCO).

 4. The Controctor shall senitrate devices in a clean condition and replace damaged, nonreflective, foated, or broken devices and bosse as required by the Engineer/Inspector. The Controctor shall be required to maintain proper device specing and oligoment.

 5. Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall be ign a minimum of 30 lbs.

 6. Powement surfaces shall be prepared in a sonner that ensures proper banding between the offsel was the fixed mount bases and the powement surface. Achesives shall be prepared and applied according to the segrufacturer's recommendations.

- recommendations.
 The installation and removal of channellying devices shall not cause detrimental effects to the final povement surfaces, including povement surface discolaration or surface integrity. Briveable bases shall not be permitted on final powerent surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.



LONGITUDINAL CHANNELIZING DEVICES (LCD)

Fixed Base w/ Approved Adhesive (Orivectie Base, or Fiexible

- LCDs are creshworthy, lightweight, deforable devices that are highly visible, how good target value and con be connected together. They are not designed to contain or redirect a vehicle on lapact.
 LCDs may be used instead of a line of comes or drums.
- 2. LCDs may be used introduct or a line or comes or cruse.
 3. LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CRICTO 11st.
 4. LCDs should not be used to provide positive protection for obstacles, pedestrions or workers.
- LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the trovel lones. CDB used as berlicates placed perpendicular to traffic should have at least one row of reflective sheeting meeting the requirements for barricade rolls as shown on BCttol. Place reflective sheeting

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

- In their bollosted systems used as borriers shall not be used solely to channelize rood users, but also to protect the sork space per the appropriate Manual for Assessing Sofety Marchard (MASA) oroshed these requirements based on roodway speed and borrier application.

 The production of the supplements of the device, and used only she shown on the ISETCO lists, the supplements of the supple

If used to channelize pedestrions, tongitudinol channelizing devices or water ballosted systems must have a confinance detectable bottom for users of long cones and the top of the unit sholl not be least than 32 inches in height.

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

Posted Speed	Formula	Minimum Desirable Toper Lengths **			Suggested Maximum Specing of Channellzing Devices		
			Offset	12' Offset	On a Toper	On a Tongent	
30	2	150"	165"	180'	30'	60'	
35	L. WS	205	225"	245'	35'	70'	
40	60	265"	295"	320'	40"	80'	
45		450"	495"	540"	45'	90'	
50		5001	550"	600	50"	100'	
55	L-WS	550	605	660	55'	110"	
60	F-83	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'	

**Toper lengths have been rounded off, ength of Toper (FT.) #-Width of Offset (FT.) Posted Speed (MPH)

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMAN DESIRABLE TAPER LENGTHS

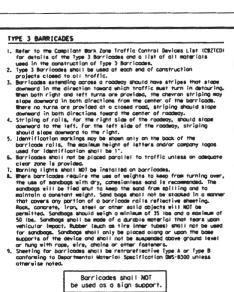
SHEET 9 OF 12

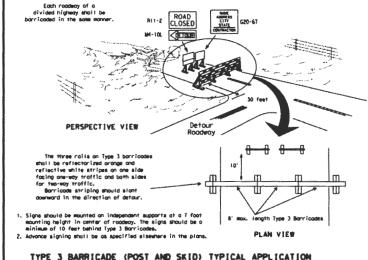
Texas Department of Transportati

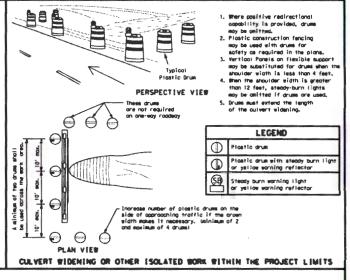
BARRICADE AND CONSTRUCTION CHANNEL IZING DEVICES

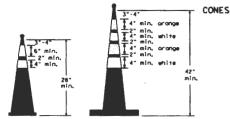
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Taput	PUNAME SULS	1.OH	SECT	119		113	GRESS
	PENTATON.				1		
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6" min. 2" min 4" min.

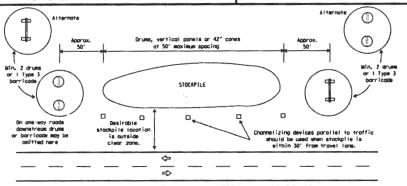
2" max." 3" min. 2" to 6"

One-Piece cones

Tubular Marker



TYPICAL STRIPING DETAIL FOR BARRICADE RAIL 4' min., 8' mox.



42" 2-piece cones shoul have a minimum weight of

- Cones or tubular markers shall have write or white and arange reflective bonds as shown above. The reflective bonds shall have a stooth, sealed outer surface and meet the requirements of Departmental Material Specification 065-8300 Type A or Type B.
- to maintain them in their proper upright position.

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

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BC(10)-21

TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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Flat rall Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade. FOR SKID OR POST TYPE BARRICADES

Two-Piece cones

28" Cones shall have a minimum weight of 9 1/2 lbs.

30 lbs. including base.

Traffic comes and tubular markers shall be predominantly aronge, and seems the height and weight requirements shown above.
 One-place comes have the body and base of the came solded in one consolidated.

2. One-place comes have the body and bose of the core molded in one consolidated unit. Teo-place comes have a come shaped body and a separate rubber bose, or bollest, that is added to keep the device upright and in place.
3. Iso-place comes may have a handle or loop extending up to 8" above the minimum helight shown, in order to all in retrieving the device.

28" cones and hubular markers are generally suitable for short duration and short-term stationary work as defined an BC(4). Trees should not be used for intermediate-term or long-term stationary work unless personnel is an-site

6. 42° two-piece comes, vertical panels or drums are suitable for all eark zone

7. Cones or tubular sarkers used on each project should be of the same size

WORK ZONE PAVEMENT MARKINGS

GENERAL

- The Contractor shall be responsible for solintaining work zone and existing powerent sorkings, in accordance with the standard specifications and special provisions, on all readerys open to traffic within the CSJ Helits unless otherwise stated in the plans.
- Color, potterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
- Additional supplemental povement marking details may be round in the plans or specifications.
- Powerent markings shall be installed in accordance with the TMATCO and as shown on the glans.
- then short term markings are required on the plans, short term markings shall conform with the NAUTCH, the plans and details as shown on the Standard Pion Sheet #ZISTMI.
- 6. Shen standard povement markings are not in place and the roodway is opened to graffic, Do NoT PASS signs sign; be exected to mark the beginning of the sections where possing is profibited and PASS SITH CARE signs of the beginning of sections where possing is neverlied.
- All work zone payament markings shall be installed in accordance with less 662, "Bark Zone Payament Workings."

RAISED PAVEMENT MARKERS

- Roised povement markers are to be placed according to the patterns on Br (12)
- All raised povement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAYDEMY MARKERS" and Departmental Matter Lai Specification IMS-4200 or IMS-4300.

PREFABRICATED PAVEMENT MARKINGS

- Removable prefabricated povement markings shall meet the requirements of DMS-8241.
- Non-removable prefabricated powerent workings (foll back) shall meet the requirements of DMS-8240,

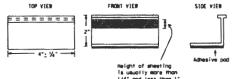
MAINTAINING WORK ZONE PAVEMENT MARKINGS

- The Contractor will be responsible for maintaining work zons povement markings eithin the work limits.
- Bork zone povement workings should be inspected in occordance with the frequency and reporting requirements of work zone traffic control device inspections as required by form 599.
- The markings should provide a visible reference for a minimum distance of 300 feet during normal deplight hours and 160 feet when illuminated by audreable law-seem feed lights at night, unless sight distance is restricted by roadery geometrics.
- Norkings falling to meet this ariterio 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

- Poyestent monkings that are no tanger applicable, could create confusion or direct a solar-list foward or into the closed partition of the roadway shall be resoured or doll-tered before the roadway is opered to troffic.
- The above shall not apply to detaurs in place for less than three days, where flaggers and/or sufficient channelizing devices are used in lies of markings to outline the detaur route.
- Povement workings shall be removed to the fullest extent possible, so as not to leave a discernable working. This shall be by any sethod approved by TXDOT Specification Item 677 for "Elleinoting Existing Povement Markings and Markers".
- The removal of povement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
- Subject to the approval of the Engineer, any method that proves to be auccessful on a particular type powement may be used.
- Blost cleaning may be used but will not be required unless specifically shown in the plans.
- T. Over-pointing of the markings SHALL NOT BE permitted.
- 8. Removal of raised pavement markers shall be as directed by the
- Removed of existing povement markings and markers will be paid for directly in accordance with item 617, "ELIMINATING EXISTING PAYMENT MARKINGS AND MARKERS," unless otherwise stated in the plans.
- 10.Block-out marking tope may be used to cover conflicting existing markings for periods less than two weeks when approved by the Engineer.

Temporary Flexible-Reflective Roodway Marker Tabs



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

- Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
- Tobs detailed on this sheaf 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 "8" below may be imposed to assure quality before placement on the roadway.
 - A. Select five (5) or more tobs at random from each lot or shipment and submit to the Construction Division, Materials and Powement Section to determine specification compliance.
 - 8. Select five (5) tobe one perform the following test. Affix five (5) tobe of 24 inch intervals on on osphaltic powement in a straight line. Using a medium size possenger vehicle or pickup, run over the morkers with the front and rear fires of a speed of 35 to 40 miles per nour, four (4) these in soon direction. No more than ons (1) out of the five (5) reflective surfaces shall be lost or displaced on a result of this test.
- 3. Small design variances may be noted between tab manufacturers.
- See Standard Sheet #Z(STPM) for tab placement on new povements. See Standard Sheet TCP(7-1) for tab placement on seal coat work.

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

- Relaed powement workers used as guidemorks shall be from the approved product list, and meet the requirements of DMS-4200.
- All temporary construction raised povement markers provided on o project shall be of the same manufacturer.
- Adhesive for guidemorks shall be bituminous material hat applied or butyl rubber pad for all surfaces, or thermoplastic for concrete surfaces.

Guidemorks shall be designated as:
YELLOB - (two amber reflective surfaces with yellow body),
MHITE - (one sliver reflective surface with white body),

DEPARTMENTAL MATERIAL SPECIFICA	TIONS
PAYEMENT MARKERS (REFLECTORIZED)	DMS-42
TRAFFIC BUTTONS	DMS-43
EPOXY AND ADHESIVES	DWS-6
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DWS-6
PERMANENT PREFABRICATED PAVEMENT MARKENGS	DWS-8
TEMPORARY REMOVABLE, PREFABRICATED PAYEMENT MARKINGS	DM42-8
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS	DMFS-8

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

SHEET 11 OF 12

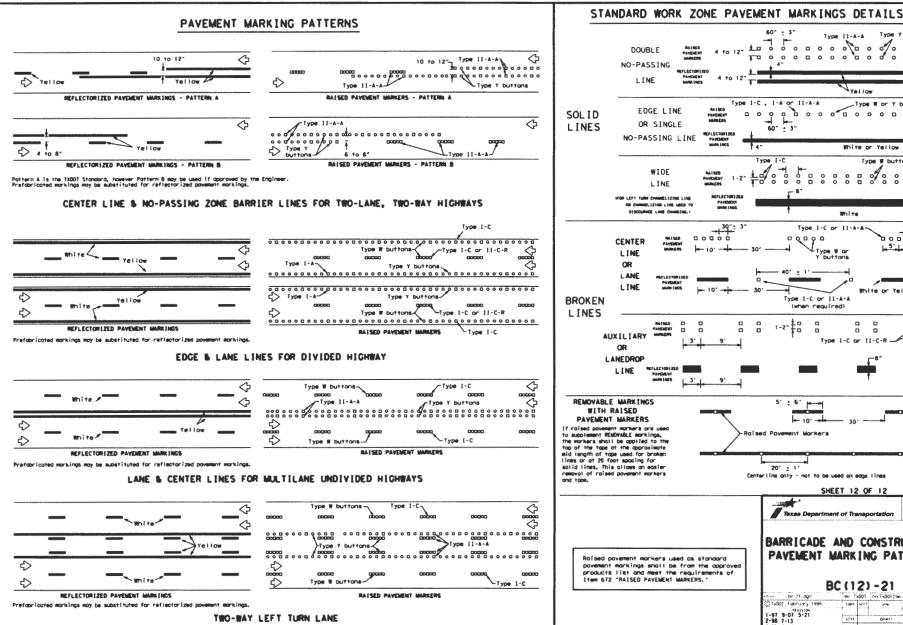
Texas Department of Transportation

BARRICADE AND CONSTRUCTION PAYEMENT MARKINGS

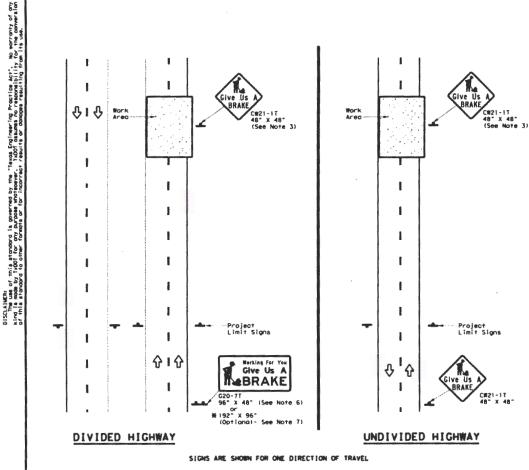
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() Lybric February 1998	Colory	bc1 73d	Pri Greek.
ACYLSTONS 2-98 9-07 5-21 1-02 7-13	6145	COLM1*	SHEET N
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DATE



60" Type Y buttons Ŧ-O 0 0 1 AGI 10A Type I-C , I-A or II-A-A Type W or Y button _Type # or Y buttons Type # buffons White 30-: 3 30,-1-3. Type I-C or II-A-A-0000 White or Yellow Type 1-C or 11-A-A (when required) 0 8 8 0 Type 1-C or II-C-R 5′ : 6" |----- Raised Povement Warkers 20' : 1' Centertine only - not to be used on edge lines SHEET 12 OF 12 Texas Department of Transportation BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS BC(12)-21 bc 21. dan Own TxDDT ces FxDDT own Tx5001 [cest txDD © 1s001 February 1998 1-97 9-07 5-21 2-98 7-13 /A HIGHN SD-56



then the optional larger BORKING FOR YOU GIVE US A BRAKE (G20-7T) 192" x 96" sign is required, the locations shall be noted

elsewhere in the plans.

SUMMARY OF LARGE SIGNS **GALVANIZED** DRILLED STRUCTURAL BACKGROUND REFLECTIVE STEEL SQ FT SIGN COLOR DESIGNATION DIMENSIONS SHEETING (LF) Size (LF) ON UL A Orange G20-7T 96" X 48" Type B_{FL} or C_{FL} 32 4 OW US A Oronge G20-7T 192" X 96" Type B_{FL} or C_{FL} 128 #8×18 16 12

A See Note 6 Below

LEGEND						
-	sign .					
-44	Large Sign					
⟨⇒ Traffic Flow						

DEPARTMENTAL	MATERIAL	SPECIFICATIONS
PLYWOOD SIGN BLANKS		DMS-7100
ALUMINUM SIGN BLANKS		DMS-7110
SIGN FACE MATERIALS		DMS-8300

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE BFL OR TYPE CFL
BLACK	LEGEND & BORDERS	NON-REFLECTIVE ACRYLIC FILM

GENERAL NOTES

- 1. See BC and SMD sheets for additional sign support details.
- 2. Sign locations shall be approved by the Engineer.
- For projects more than two miles in length, Give Us a BRAKE signs should be repeated halfway through the project. The Give Us a Brake (CW21-17) may be
- Work zone speed limits are sometimes used in conjunction with GIYE US A BRAKE signing. See BC(3) for location and spacing of construction speed zone signing when required.
- Give Us a Brake (CM21-1T) signs and supports shall be considered subsidiary to 1tem 502, "Barricodes, Signs and Traffic Handling."
- 6. The 96" X 48" Working For You Give Us A BRAKE (020-71) may use a 1/2" or 5/8" plywood substrate or 0.125" aluminum sheeting substrate and may be supported by two 4" x 6" wood posts with drilled hales for breakway as per BC(5) and will be subsidiory to Item 502.
- 7. The Working For You Give Us A BRAKE (G20-7T) 192" X 96" sign shall be paid for under the following specification items:

them 636 - Aluminum Signs Item 636 - Aluminum Signs Item 647 - Lorge Roodside Sign Supports and Assemblies, Item 416 - Drilled Shoft Foundotions

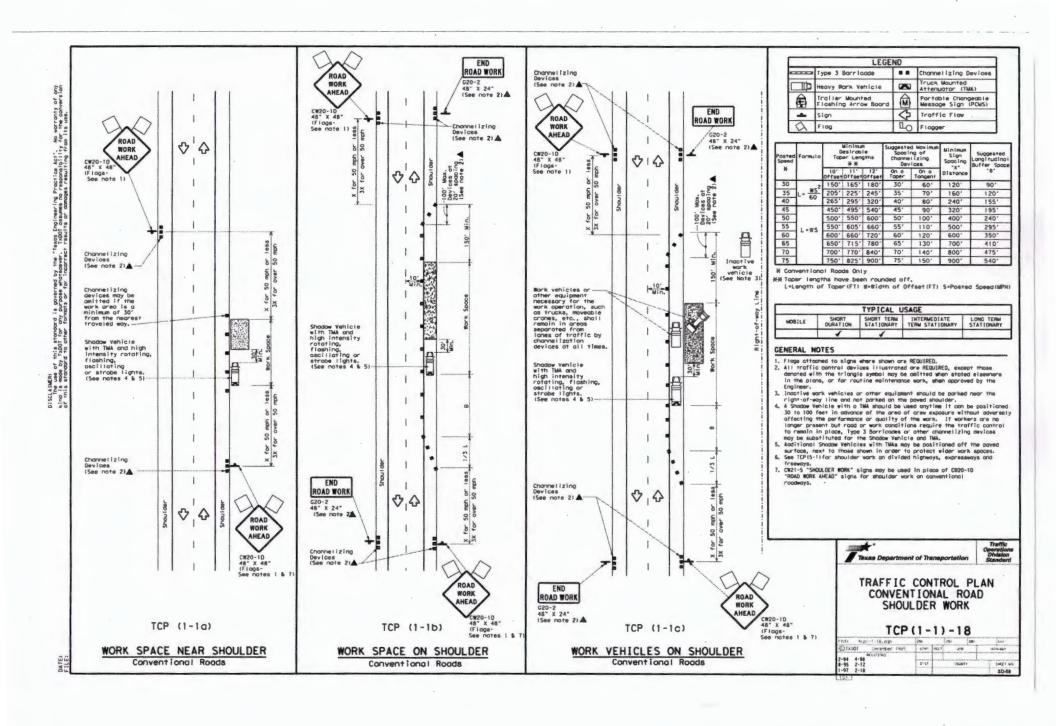
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor. before the sign is manufactured.

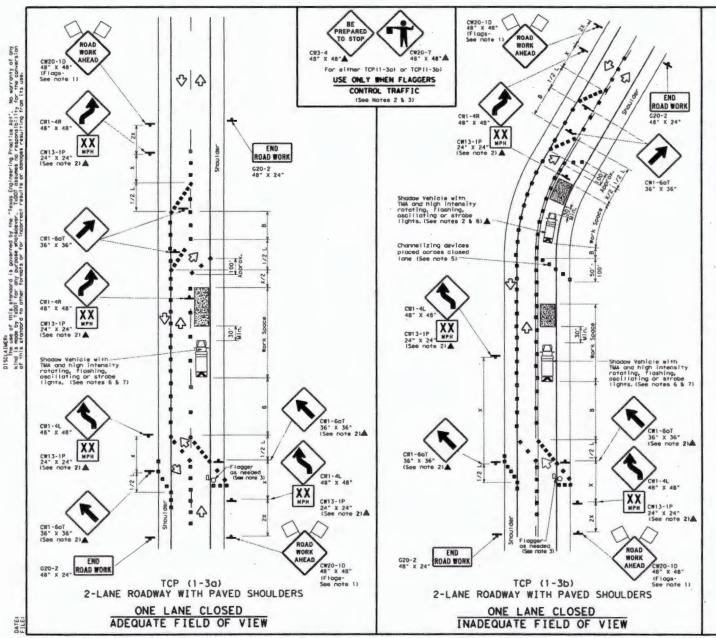
Texas Department of Transportation

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ (BRK) -13

OCATES TODAT ON TODATESS FORET ON WZDCK 13, con August 1995 COM SECT AND SHET W.





	LEGEND							
	Type 3 Borricode		Channelizing Devices					
中	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)					
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)					
4	Sign	4	Troffic Flow					
a	Flog	0	Fiagger					

Posted Speed	Formula		Minimu Mesirab Mer Len	le	Suggested Moximum Spacing of Channelizing Devices		Minimum Sign Specing	Suggested Longitudings Buffer Space
*		10' Offset	Offset	Offeet	On a Taper	On a Tangent	Distance	-8-
30	2	150'	165	180"	30'	60'	120'	90'
35	L = W5"	205	225'	245"	35'	70'	160'	120'
40	- 60	265"	295'	320"	40"	80'	240'	155'
45	-	450"	495	540"	45'	90'	320"	195"
50		500'	550'	600	50"	100'	400'	240'
55	L=WS	550"	605	660'	55'	110"	5001	2951
60	F-#3	600'	660'	720"	60.	120"	600'	350'
65		650'	715	7801	65'	130'	7001	410"
70		700'	770'	840"	70'	140	800'	475"
75		750"	825"	900"	75"	150'	900'	5401

* Conventional Roads Only

XX Taper lengths have been rounded off.

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

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

GENERAL NOTES

Flags attached to signs where shown are REQUIRED.

All traffic control devices illustrated are ROUINED, except those denoted with the friangle symbol may be mainted when stated elsewhere in the plans, or for routine maintenace work, when approved by the Engineer.
Flagger control should ROT be used unless roadway conditions or heavy traffic volume require additional emphasis to sofely control traffic.

Additional flaggers may be positioned in odverce of traffic gauses to under traffic to reduce speed.

1. DN NOT PASS, PASS Bill PLOME and construction regulatory speed zone signs may be installed demantration of the ROAD MORE AMEAD signs.

5. When the work zone is made up of everal sorks posses, channelizing devices

is then the work zone is mode up of several work spaces, channelizing devices about a be placed interaily parass the closed fare to re-emphasize closure. Laterally placed channelizing devices should be repeated every 500 to 1000 feet in outcome every 1/4 to 1/2 alie in runel oreas.

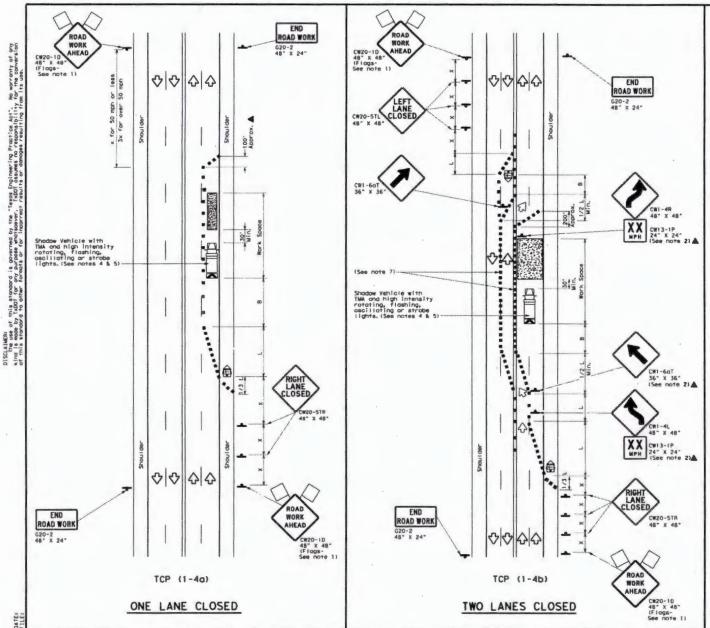
A Shadow Yehicle eith a TMM should be used onytime it can be positioned 30 to 100 feet in outcome of the orea of cree sepacer without odversely affecting the performance or quality of the work. If workers or en longer present but road or work contributes require the traffic control to resoln in place, Type 3 Barricodes or other channelizing devices may be abstituted for the Shadow Yehicle and TMM.

Additional Shadow Yehicles with TMMM may be positioned off the paved surface, next to those shown in order to protect wider work sources.

surface, next to those sheen in order to protect vider sork spaces. there traffic is all recred over a yel low center line, channel lizing devices which separate two-vey traffic should be spaced on topers at 20°, or 15° if posted speed or 35 sigh or is lower; and for foreigness sections, or 1/25 sheet speed in sigh. This illighter device spacing is intended for area of conflicting markings not the entire work zone.

> Texas Department of Transportation TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO LANE ROADS TCP (1-3)-18

10Ux1(5) NX. H150 8A7 2-94 4-98 8-95 2-12 1-97 2-16 SD-59



	LEGE	ND	
	Type 3 Barrioade	•	Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
Ê	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
-	Sign	4	Traffic Flow
a	Flag	O.D	Flagger

Posted Speed	Formula	Desiroble			Spac I Channe	nd Maximum ing of Hizing vices	Minimum Sign Specing	Suggested Longitudinal Buffer Space
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tongent	Distance	"8"
30	2	150"	165'	180'	30'	60'	120'	901
35	L - 60	2051	225'	245"	35'	70'	160*	120'
40		265	295"	3201	40'	80'	240'	155'
45		450"	495'	540'	45'	90'	320'	195'
50		5001	550'	600'	50'	1001	400'	240'
55	L-WS	550'	605	660'	55'	110'	5001	295"
60	F-43	6001	660'	720'	601	120'	600'	3501
65		650'	715'	780"	65'	130	700'	410'
70		7001	770	840"	70'	140'	800'	475'
75		750"	825"	900	75"	150	900.	540'

Conventional Roads Only

Toper lengths have been rounded off.

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

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

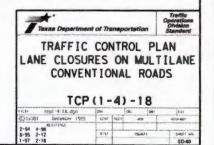
GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.

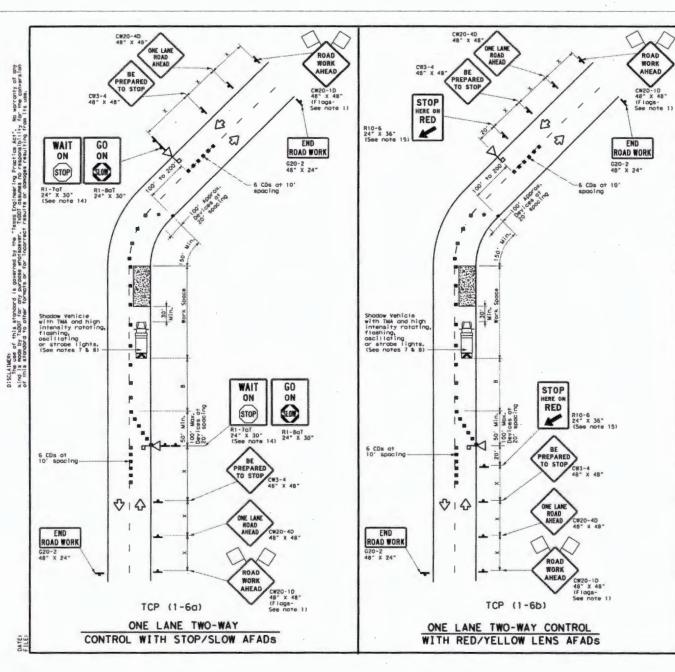
- 1. Flogs oftoched to along where shown ore REQUIRED, except those denoted with the triongie symbol may be omitted when storted attempted in the plans, or for routine mointenance sorts, when approved by the Engineer.
 3. The CR20-1D "ROAD BORK AREAD" sign may be repeated if the plans, or for routine mointenance orts, when provided in the relationship of the work zone is less from 1500 feet.
 4. A Shodow Pehicle with a TMA should be used only like if can be positioned 30 to 100 feet in advance of the oreo of oree 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 channel izing devices may be substituted for the Shodow Yehicle and TMA.
 5. Additional Shodow Yehicles with TMAs may be positioned off the poved surface, next to those shown in order to protect wider work spaces.

5. If this TDP is used for a left ions closure, DE20-51L "LEFT LAME CLOSED" aligns shall be used and charmelizing devices shall be placed on the centerline where needed to protect the such apose from apposing traffic with

7. Share traffic is directed over a yellow centerline, channellizing devices which asporate two-say traffic should be spood on topers at 20' or 15' if posted seeds are 35 sph or slower, and for nangent sections, at 1/25 where 5 is the speed in sph. This tighter device spocing is Intended for the areas of conflicting eachings, not the entire work zone.



SD-60



LEGEND							
	Type 3 Borricode		Channellzing Devloes (CDs)				
口ゆ	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)				
4	Automoted Flagger Assistance Device (AFAD)	M	Portable Changeable Message Sign (PCMS)				
-flu	Sign	4	Traffic Flow				
a	Flag	10	Flogger				

Posted Speed	Formula	Minimum Desirable Taper Lengths		Suggested Moximum Spacing of Channellzing Devices		Sign	Suggested Langitudinal Buffer Space	Stopping Sight Distonce	
*		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent	Distance	.8.	
30	. 2	150"	165'	180"	30'	60'	120"	90'	200'
35	L= WS2	2051	225	245"	35'	70'	160'	120'	250'
40	- 60	265	295"	320	40'	80'	240'	155"	3051
45		450"	495	540"	45"	90'	320'	195'	360'
50		5001	550"	600"	50'	100'	400'	240'	425'
55	L-WS	550"	605	660'	55"	110	500'	295'	495'
60	F-M2	6001	660"	720"	60'	150,	600'	350'	570'
65		650"	715'	780'	65	130'	7001	410'	6451
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) #-Width of Offset (FT) 5-Posted Speed (MPH)

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

GENERAL NOTES

- Fings attached to signs where shown are REQUIRED.
 AFADs shall anly be used in situations where there is one ione of approaching traffic in the direction to be controlled.
- Adequate stopping eight distance must be provided to each AFAD location traffic. (See table above).

- 3. Adequate stopping sight distance must be provised to each AFAD location for approaching traffic. (See table above).

 4. Each AFAD shall be aperated by a qualified/certified flagger. Flaggers coerating AFADe shall not leave them undertance while they are in use.

 5. One flagger may operate the AFADs only when the flagger has an unabstructed view of both AFADs and of the approaching traffic in both directions.

 6. When pilot core are used, a flagger controlling traffic shall be located on each approach. AFADs shall not be operated by the pilot our operator.

 7. All AFADs shall be equipped with gate arms with an arrange of fluorescent red-orange flag attacked to the end of the agree and the flagger is an experience of the arms of a flagger.

 8. A Shadow Vehicle with a TAB should be used anytime it can be positioned 30 to 100 feet in advance of the area of orde exposure without obversely offecting the performance or quality of the work. If workers are no longer present but road or order to protect without object, type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and IBAB.

 9. Additional Shadow Vehicles with TABB may be positioned of the powed surface, next to those shown in order to protect wider work spoces.

 10. Flaggers should use two-way radios or other enthods of communication to control traffic.

 11. Length of work spoce is located next or hard partial or vertical curve, the wifer distances should be increased in order to approach of the spot our vertical curve, the wifer distances about to be increased in order to animation stopping sight distance to the AFAD.

 12. Channel Elling devices on the center line may be emitted when a pilot or in a leading traffic on accordance on the scale radio of the stopping sight of the powed surfer distances about a before on the protect of the surface of the STOP AEA of the

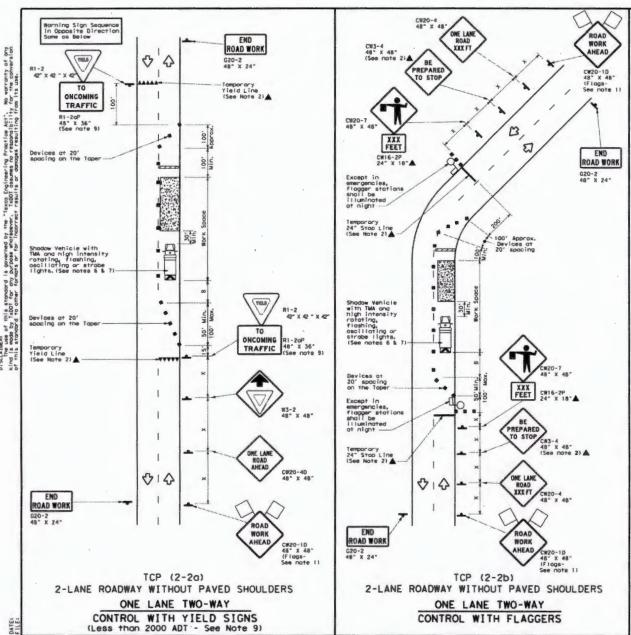
- the tenses of the AFAD.

Treffic Texas Department of Transportation

> TRAFFIC CONTROL PLAN AUTOMATED FLAGGER ASSISTANCE DEVICES (AFADS)

> > TCP (1-6)-18

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	LEGE	ND	
-	Type 3 Borricode		Channelizing Devices
口中	Heovy Work Vehicle		Truck Mounted Attenuator (TMA)
â	Trailer Mounted Floshing Array Board	M	Portable Changeable Message Sign (PCMS)
-	Sign	4	Troffic Flow
a	Flag	10	Flagger

Posted Speed	Formulo	Minimum Destrable Formula Taper Lengths **		Spaci	d Moximum ng of Hizing vices	Minimum Sign Specing	Suggested Longitudings Buffer Sogge	Stopping Sight Distance	
		10' Offset	Offset	12' Offset	On a Taper	On a Tangent	Distance	-B-	
30	2	150'	165	180"	30'	60'	120'	90'	2001
35	L= WS2	2051	225"	245"	35'	70'	160'	120'	250'
40		265	295"	320'	40"	80'	240'	155'	3051
45		450"	495	540'	45'	90.	320'	195'	360'
50		5001	550'	600'	50'	100'	400'	240'	425
55	L +WS	550"	605	660'	55'	110'	500'	295'	495"
60	6-83	6001	660	720'	60'	120'	600'	350'	570'
65		650'	715	780'	65'	130'	700'	410'	645
70		7001	770	840"	70'	140'	800'	475'	730
75		750"	825"	900'	75"	150"	900'	540*	820'

* Conventional Roads Only

NH Taper lengths have been rounded off.
L=Length of Taper(FT) #=#ldth of Offset(FT) S=Posted Speed(MPH)

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

GENERAL NOTES

Flags attached to signs where shown, are REQUIRED.
 All traffic control devices lituatrated are REQUIRED, except those denoted with the triangle systol say be affected when stated elsewhere in the plans, or far routine sointenance work, when approved

may be anitited when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.

3. The CRS-4 "BE PREPARED TO STOP" sign may be installed offer the CR20-4 "ONE LAME ROAD XXX FT" sign, but proper sign spooling shall be maintained.

4. Flaggers should use thermay radios or other methods of communication to control traffic.

5. Length of work mades should be based on the ability of flaggers to communicate.

6. A Shadow Yehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without odversely affecting the performance or quality of the work. If worker are no larger present but rade or conditions regulier the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and MA.

7. Additional Shadow Vehicles with TMAs may be positioned off the powed surface, next to those shown in order to protect a wider work space.

in order to protect a wider work space.

8. The R1-2 "YIELD" sign traffia control may be used on projects with approaches that have adequate sigh distance. For projects in urban areas, work space should be no longer than one half city black. In curol creas, roadways with leas than 2000 ABT, work space should be no longer than 400 feet. The RI-26° YIELD TO GMCOMING TRAFIC* sign shall be placed on a support at a 7 foot sinisum.

TCP (2-20)

10. Channellizing devices on the center line may be amitted when a pilot car is leading traffic and

opproved by the Engineer.

11. If the work apose is isocited near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stapping sign) distance to the tiagger and a queue of stapped vehicles. (See table above).

Flaggers should use 24" STOP/SLOW poddles to control traffic. Flags should be limited to emergency situtations.

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

Traffic Operation Division Standard

TCP (2-2) -18

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