STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

FEDERAL AID PROJECT NO.			
CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		1

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT NO. STP 2023(504)HES

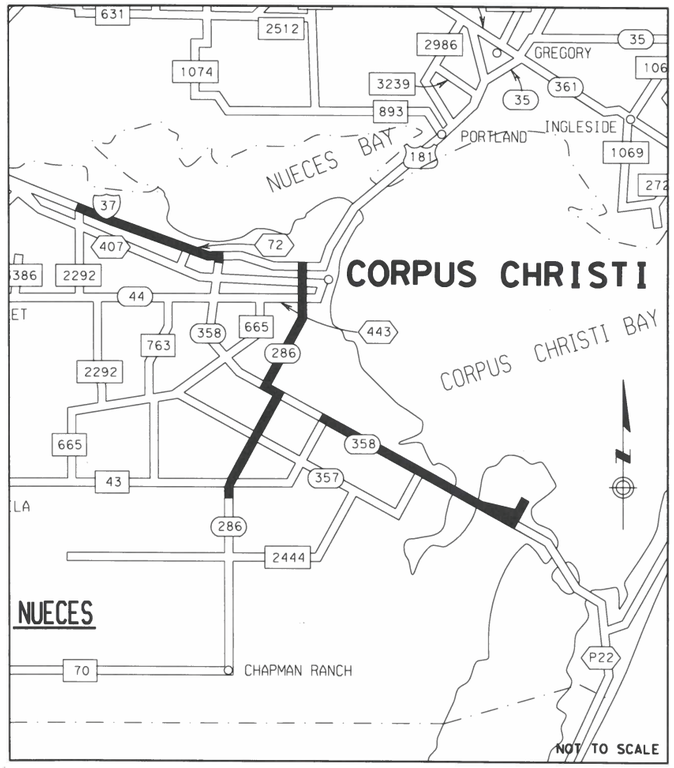
IH 37, ETC.
NUECES COUNTY

NET LENGTH OF PROJECT = 113,794.56 FT. = 21.552 MI.

WRONG WAY DRIVER ALERT WARNING SYSTEMS, SIGNING AND PAVEMENT MARKINGS

LIMITS: A CSJ 0617-01-209 (SH 358 FROM WEBER RD TO 310 FEET WEST OF CLARIDE ST)
B CSJ 0074-06-254 (IH 37 FROM SH 358 TO FM 2292)
C CSJ 0326-01-106 (SH 286 FROM SS 544 (AGNES ST) TO SH 358)
D CSJ 0326-01-066 (SH 286 FROM SH 358 TO 1/2 MILE SOUTH OF FM 43)

FOR THE REPLACMENT AND INSTALLATION OF SIGNS (SMALL GROUND-MOUNTED AND OVERHEAD), WRONG WAY DRIVER ALERT WARNING SYSTEMS AND PAVEMENT MARKINGS.



EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: SEE NOTES ABOVE.

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, JULY 2022)

INDEX OF SHEETS

PROJ. NO.
LET DATE:

DATE: $DATE$ $TIME$
FILE: $FILE$
COUNTY:
HWY:

LIMITS DESCRIPTION:

A) CSJ 0617-01-209 SH 358
FROM: WEBER RD TO: 310 FEET WEST OF CLARIDE ST
MP: 8.020 MP: 16.153
DFO: 8.020 DFO: 16.153
RM + DISP: 0564+0.120 RM + DISP: 0570+0.120

B) CSJ 0074-06-254 IH 37
FROM: SH 358 TO: FM 2292
MP: 4.322 MP: 9.729
DFO: 4.265 DFO: 9.672
RM + DISP: 0004+0.199 RM + DISP: 0009+0.585

C) CSJ 0326-03-106 SH 286
FROM: SS 544 (AGNES ST) TO: SH 358
MP: 0.778 MP: 4.548
DFO: 0.778 DFO: 4.548
RM + DISP: 0616+0.466 RM + DISP: 0620+0.290

D) CSJ 0326-01-066 SH 286
FROM: SH 358 TO: 1/2 MILE SOUTH OF FM 43
MP: 0.000 MP: 4.242
DFO: 4.548 DFO: 8.790
RM + DISP: 0620+0.290 RM + DISP: 0620+4.532

RR CROSSINGS (UNION PACIFIC RAILROAD COMPANY):

DOT # 435536J	RR OVER IH 37
DOT # 435537R	RR AT GRADE ON IH 37 SB FRONTAGE RD
DOT # 435535C	RR AT GRADE ON IH 37 NB FRONTAGE RD

NOTE: REFER TO RAILROAD SCOPE OF WORK SHEETS FOR CONTACTS AND MORE INFORMATION.

STATE OF TEXAS
KASSONDRA FIORA MUNOZ
104720
LICENSED
PROFESSIONAL ENGINEER

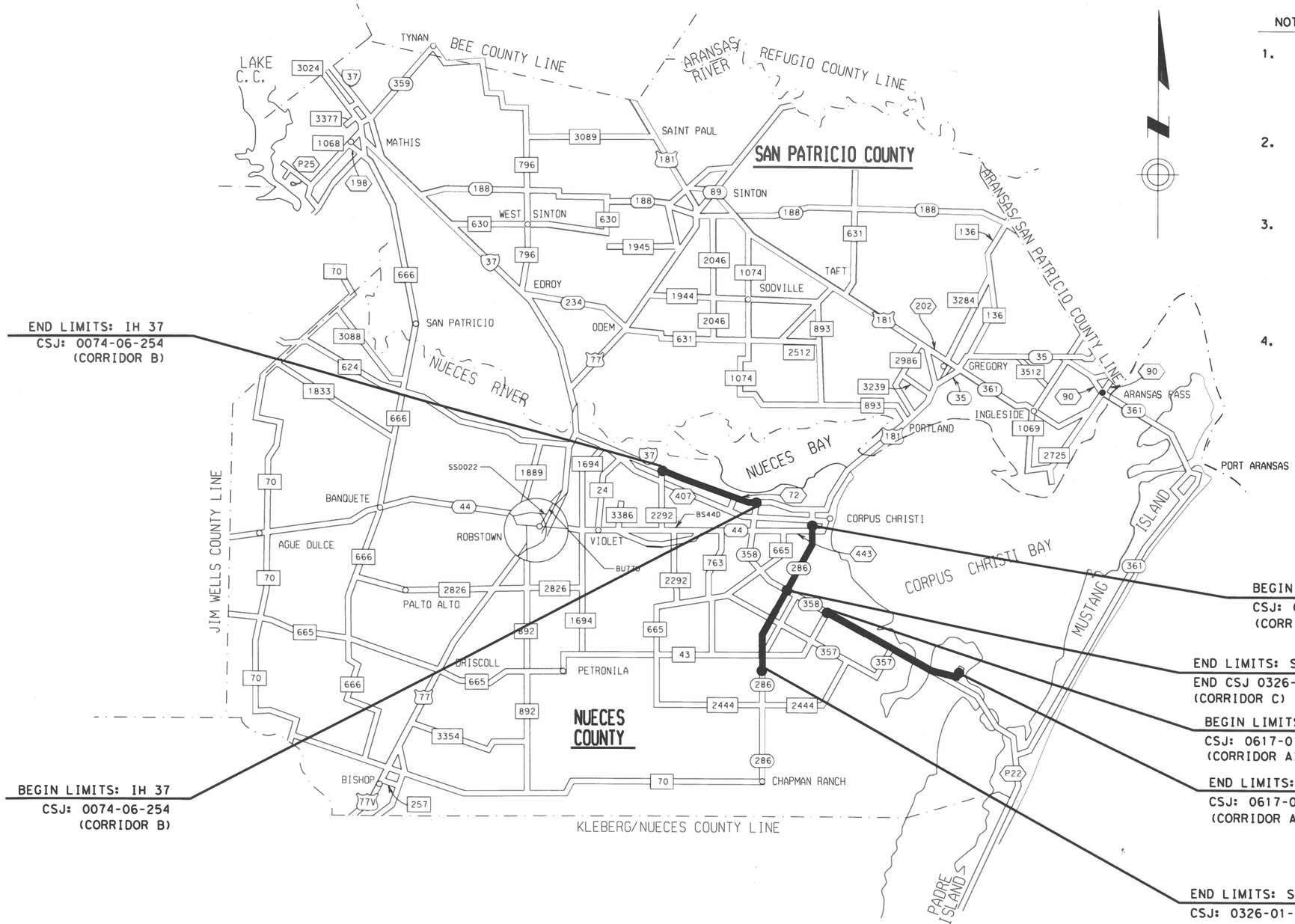
THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE WITH AN (*) HAVE BEEN ISSUED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AND ARE APPLICABLE TO THIS PROJECT.

Kassondra Fiora Munoz P.E. 1-3-23
DATE

Texas Department of Transportation

APPROVED FOR LETTING: 1/5/2023
DocuSigned by:
Valente Olivarez
303F64E8A9B44E0...
INEER

RECOMMENDED FOR LETTING: 1/4/2023
DocuSigned by:
Paula Sales-Evans, P.E.
5975450A18CC435...
PLANNING AND DEVELOPMENT
TION



NOTES:

1. REFER TO THE WRONG WAY DRIVER SYSTEM LOCATIONS MAPS AND SUMMARY OF SMALL SIGNS FOR INFORMATION ON WHERE THE DETECTION SYSTEMS ARE LOCATED.
2. SIGN LOCATIONS ARE CALLED OUT IN THE INSTALLATION AND REMOVAL SUMMARIES BY COORDINATES FOR EACH LOCATION (EX. EXIT RAMP, MAIN LANES, FRONTAGE ROAD AND INTERSECTION).
3. COORDINATES PROVIDED ARE APPROXIMATE. A KMZ FILE IS AVAILABLE UPON REQUEST. ALL SIGNS SHALL BE INSTALLED ACCORDING TO STANDARDS AND AS REQUIRED BY MANUFACTURER'S RECOMMENDATIONS (FOR DETECTION SYSTEMS). REFER TO THE GENERAL NOTES FOR MORE INFORMATION ON SIGN LOCATIONS.
4. REFER TO THE STRIPING SUMMARY AND DETAILS FOR INFORMATION ON STRIPING ENHANCEMENTS.

STATE OF TEXAS
KASSONDRA FIORA MUNOZ
104720
LICENSED
PROFESSIONAL ENGINEER

Kassondra Fiora Munoz
1-3-23

LOCATION MAP

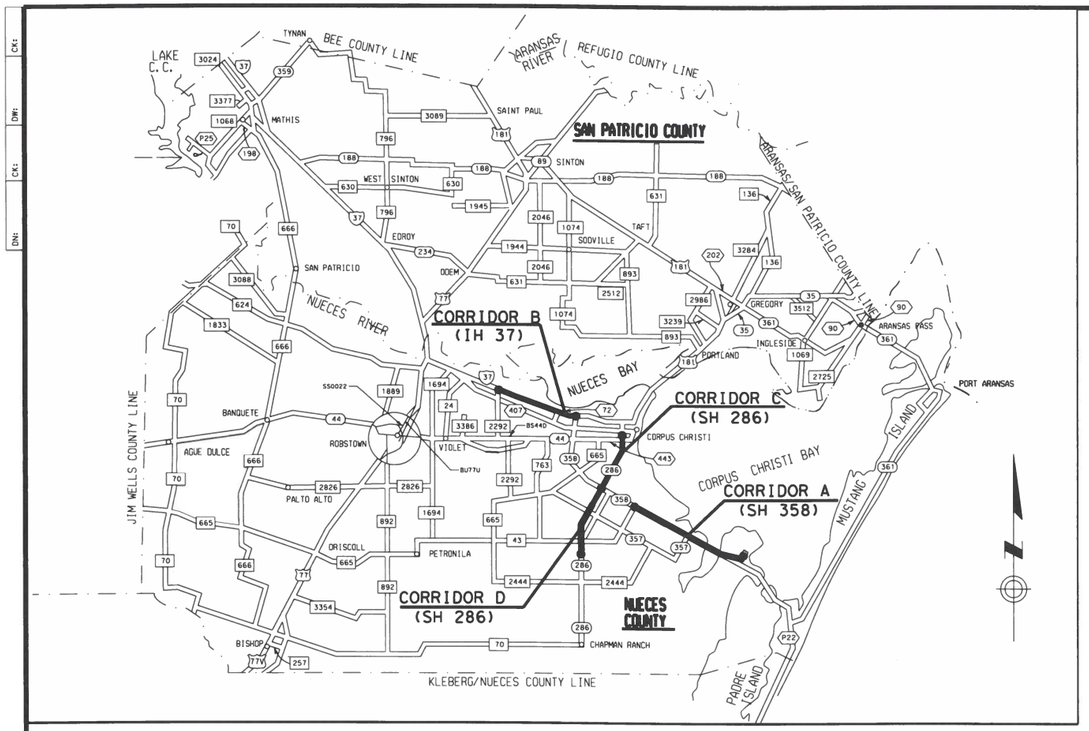
NUECES COUNTY											
CORRIDOR ID	RDWY	CSJ	FROM	TO	BDFO	EDFO	BMP	EMP	BRM	ERM	MILES
C	SH 286	0326-03-106	SS 544 (AGNES ST)	SH 358	0.778	4.548	0.778	4.548	616 + 0.466	620 + 0.290	3.770
D	SH 286	0326-01-066	SH 358	1/2 MI S OF FM 43	4.548	8.790	0	4.242	620 + 0.290	620 + 4.532	4.242
A	SH 358	0617-01-209	WEBER RD	310 FT W OF CLARIDE ST	8.020	16.153	8.020	16.153	564 + 0.120	570 + 2.304	8.133
B	IH 37	0074-06-254	SH 358	FM 2292	4.265	9.672	4.322	9.729	004 + 0.199	009 + 0.585	5.407

SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		2

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



NOTES:

1. REFER TO THE SUMMARY OF SMALL SIGNS FOR LOCATIONS OF EQUIPMENT AND SIGNS FOR THESE WRONG WAY DRIVER SYSTEMS.

2. REFER TO THE STRIPING SUMMARY AND RELEVANT STANDARDS FOR MORE INFORMATION ON PAVEMENT MARKINGS AND MARKERS BEING ADDRESSED AT EACH LOCATION.

WRONG WAY DRIVER DETECTION SYSTEMS

	ITEM 0687-6001 PED POLE ASSEMBLY EA	ITEM 6319-6002 LED WWDS(INSTALL ONLY)(THERMAL) EA	ITEM 6227-6002 SOLAR POWERED LED ROADSIDE SIGN EA
IH 37: From SH 358 to FM 2292 (CSJ 0074-06-254)--Corridor B			
NORTHBOUND			
RAND MORGAN	3	1	2
VALERO WAY/CORN PRODUCTS RD	3	1	2
SOUTHBOUND			
TULOSO RD EXIT	3	1	2
LANTANA RD EXIT	3	1	
ITEM TOTAL	12	4	6
SH 358: From Weber Rd to 310 feet West of Claride St (CSJ 0617-01-209)--Corridor A			
WESTBOUND			
WEBER RD	3	1	1
ENNIS JOSLIN AVE	3	1	2
EASTBOUND			
EVERHART RD	3	1	1
NAS DR EXIT	3	1	1
ITEM TOTAL	12	4	5
SH 286: From SS 544 to SH 358 (CSJ 0326-03-106)--Corridor C			
SOUTHBOUND			
MORGAN AVE	3	1	
GREENWOOD DR EXIT	3	1	
NORTHBOUND			
AGNES ST EXIT	3	1	1
GOLLIHAR DR EXIT	3	1	1
ITEM TOTAL	12	4	2
SH 286: From SH 358 to 0.5 miles South of FM 43 (CSJ 0326-01-066)--Corridor D			
SOUTHBOUND			
HOLLY RD EXIT	3	1	1
EXIT TO DIVIDED HWY	3	1	1
ITEM TOTAL	6	2	2

STATE OF TEXAS
KASSONDRA FIORA MUNOZ
104720
LICENSED
PROFESSIONAL ENGINEER

Kassondra Fiora Muñoz
1-3-23

WRONG WAY DRIVER SYSTEM LOCATIONS

SHEET 1 OF 5

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		3

CK:
DW:
CK:
DN:

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

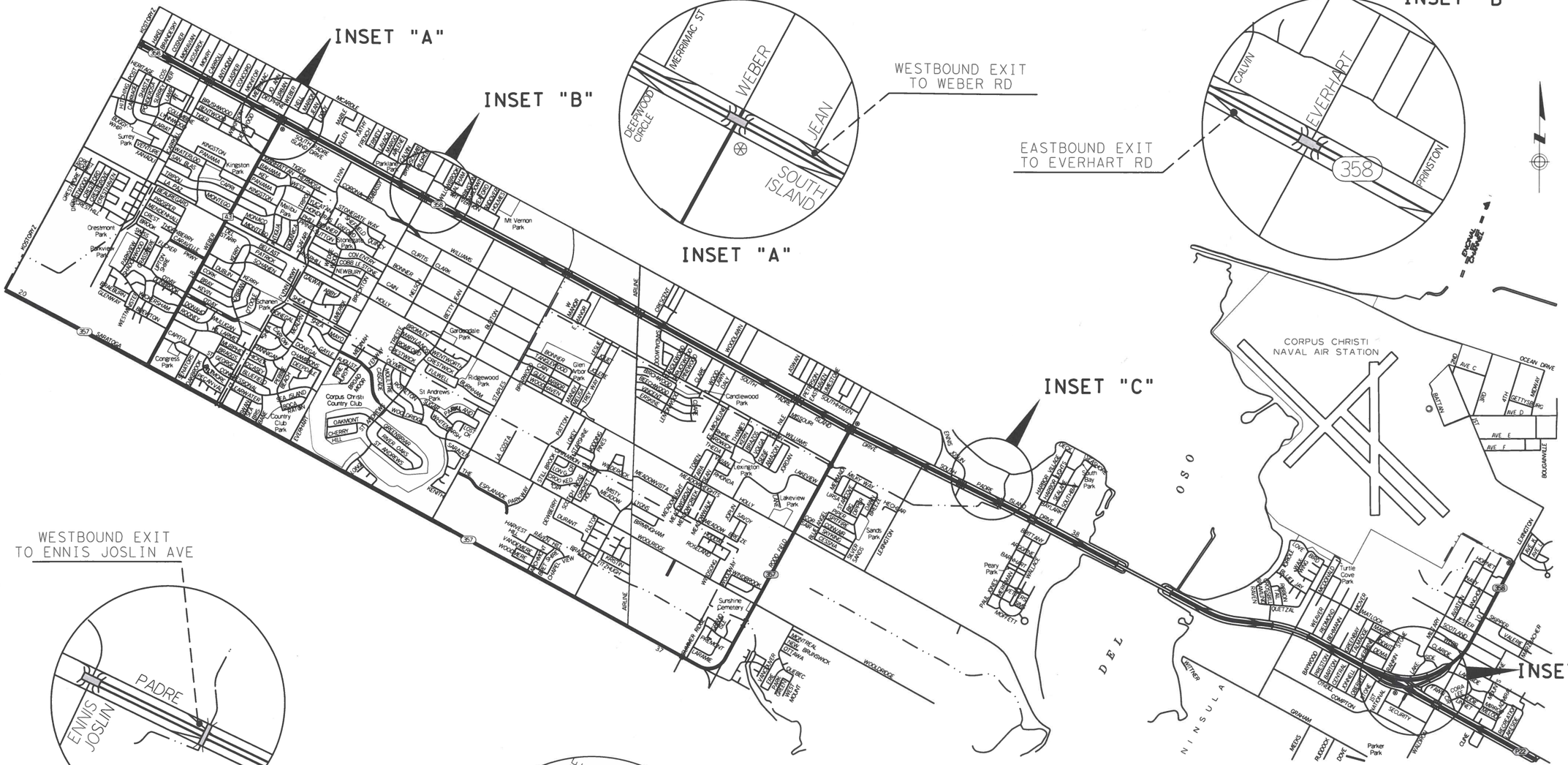
CK:
DW:
CK:

INSET "A"

INSET "B"

INSET "C"

INSET "D"



STATE OF TEXAS
KASSONDRA FIORA MUNOZ
104720
LICENSED PROFESSIONAL ENGINEER

Kassondra Fiora Munoz
1-30-23

WRONG WAY DRIVER SYSTEM LOCATIONS
SH 358
CSJ (0617-01-209)

SHEET 2 OF 5

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		4

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

INSET "E"

NORTHBOUND EXIT TO RAND MORGAN RD

INSET "F"

SOUTHBOUND EXIT TO TULOSO RD

NORTHBOUND EXIT TO CORN PRODUCTS RD

INSET "G"

INSET "H"

SOUTHBOUND EXIT TO LANTANA RD

INSET "E"

INSET "F"

INSET "G"

INSET "H"

CORPUS CHRISTI INTERNATIONAL AIRPORT

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

STATE OF TEXAS
KASSONDRA FIORA MUNOZ
104720
LICENSED
PROFESSIONAL ENGINEER

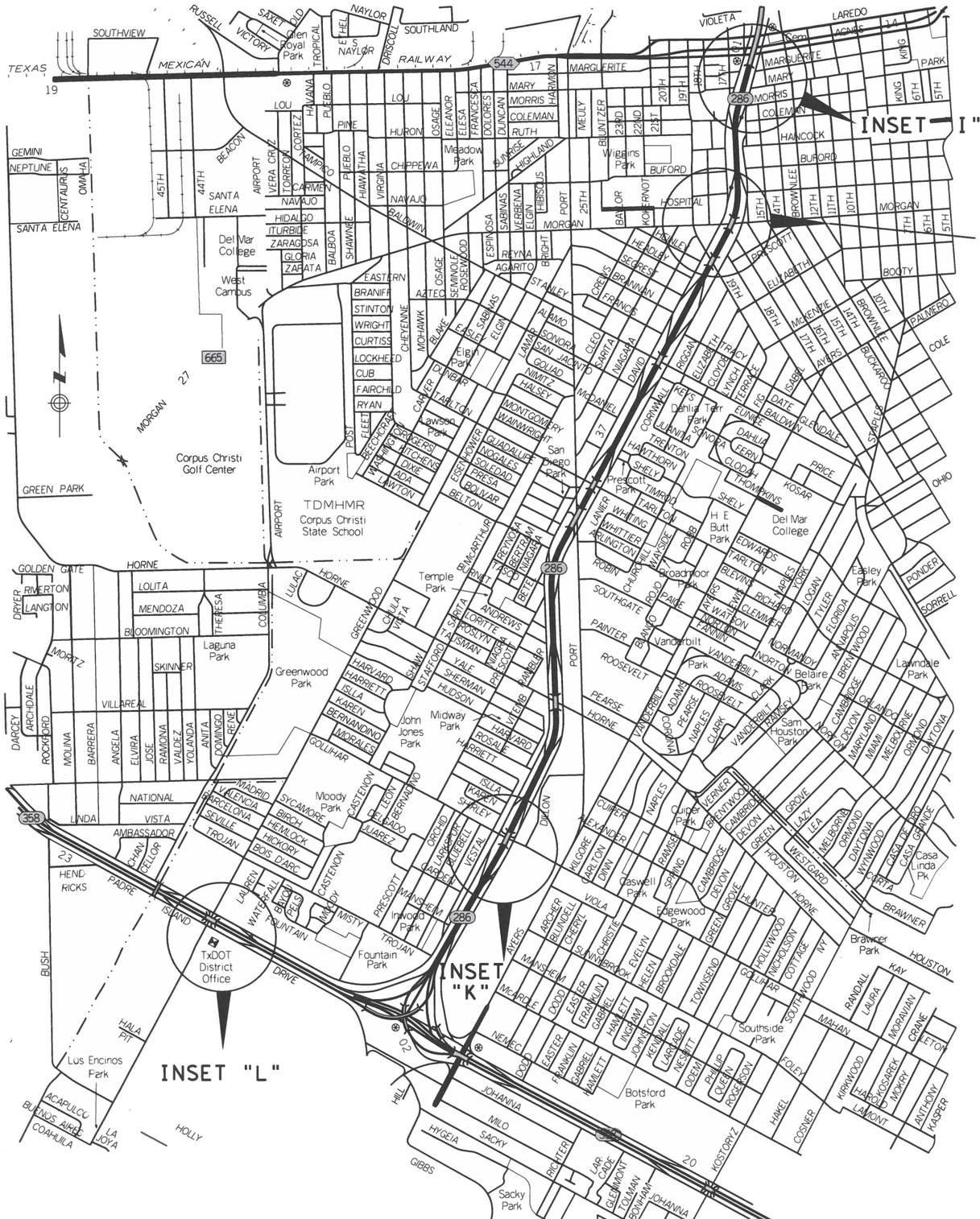
Kassondra Fiora Munoz
1-30-23

WRONG WAY DRIVER SYSTEM LOCATIONS IH 37 (CSJ 0074-06-254)

SHEET 3 OF 5

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		5



KASSONDRA FIORA MUNOZ
104720
LICENSED PROFESSIONAL ENGINEER

Kassondra Fiora Munoz
1-30-23

WRONG WAY DRIVER SYSTEM LOCATIONS
SH 286
(CSJ 0326-03-106)

SHEET 4 OF 5

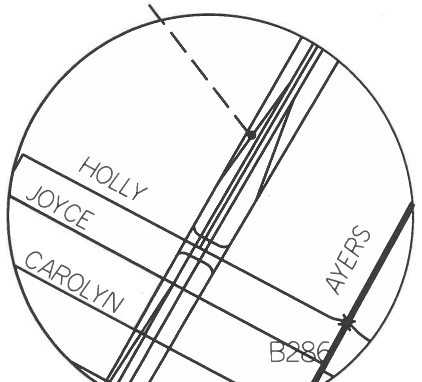
Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		6

DATE: $DATE$ TIME$
FILE: $FILE$
DN: CK: DW: CK:

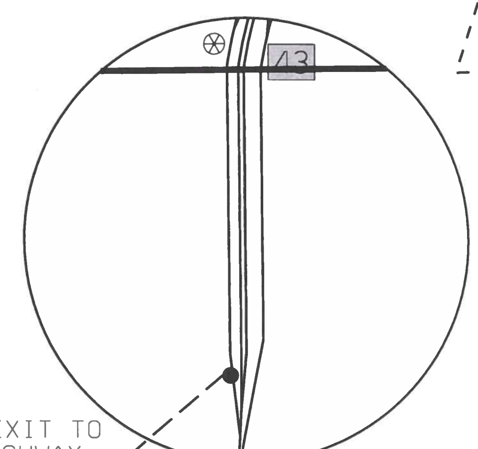
CK:
DW:
CK:
DN:

SOUTHBOUND EXIT
TO HOLLY RD

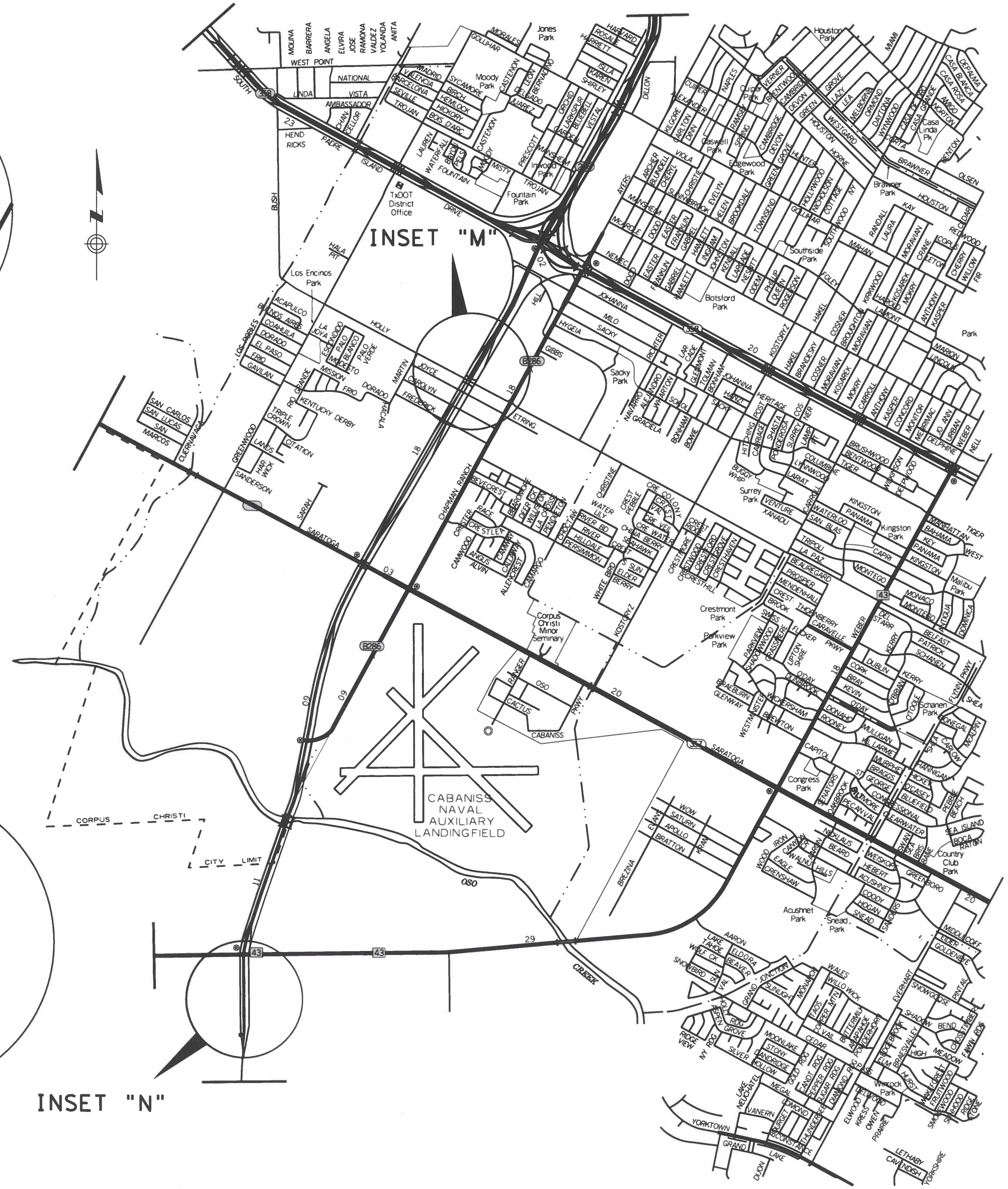


INSET "M"

INSET "N"



SOUTHBOUND EXIT TO
DIVIDED HIGHWAY



$TIME$

DATE: $DATE$
FILE: $FILE$

STATE OF TEXAS
KASSONDRA FIORA MUNOZ
104720
LICENSED
PROFESSIONAL ENGINEER

Kassondra Fiora Munoz
1-30-23

WRONG WAY DRIVER SYSTEM LOCATIONS
SH 286
(CSJ 0326-01-066)

SHEET 5 OF 5

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.

DIST	COUNTY	SHEET NO.
CRP	NUECES	7

GENERAL NOTES:

General Notes

Find, for your information and convenience, tools such as forms, software, materials, and various other information provided by the Department at https://www.txdot.gov/business.html. Please note that these tools are updated periodically and your attention is directed to the latest edition.

In the event of a called evacuation, emergencies, impending adverse weather or as directed, do not perform any work without written authorization. The District reserves the right to suspend all work in support of evacuations or emergencies occurring from other parts of the state. Any work performed, other than work directed by the Department, is unauthorized work in accordance with Item 5.

In addition to the Plans and Specifications please see the attached electronic file: Wrong Way Driver Alert Systems Locations.kmz. This file is readable with Google Earth and Google Earth Pro. This file contains the locations of all signs shown in the plans with coordinates given as approximate locations. It is the responsibility of the Contractor to obtain the proper software for opening and reading the attached files. It is recommended that prospective bidders examine the electronic files to view the locations of signs, traffic control considerations, and other factors influencing the prosecution of the work.

Sweep, clean and remove any construction waste, surplus materials or debris from the roadway and right of way at the end of each day unless otherwise approved. The work performed will not be measured or paid for directly, but will be subsidiary to pertinent Items.

All pavement markings shall be in accordance with the latest edition of Texas MUTCD.

The following standards have been modified: Reflective Wrap Detail.

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

Ernest Longoria, P.E.	Ernest.Longoria@txdot.gov
Fidencio Lopez, P.E.	Fidencio.Lopez@txdot.gov

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

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

County: Nueces, etc. **Control:** 0074-06-254, etc.

Highway: IH 37, etc.

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

ITEM 2: Instructions to Bidders

It is recommended that prospective bidders examine the specified work locations with the Engineer to view the nature of the work, the need for close coordination with the various utilities, traffic control considerations, and other factors influencing the prosecution of the work.

ITEM 5: Control of the Work

Field verify all dimensions and notify Engineer prior to initiating any work.

Verify the locations of utilities, underground or overhead, shown within the limits of the right-of-way. Adhere to OSHA Standards when working within the vicinity of overhead power lines. Coordinate with the utility companies and notify the Engineer of any possible conflicts. The work performed will not be measured or paid for directly, but will be subsidiary to pertinent Items.

Prior to beginning any excavation work, the Contractor shall contact a notification center 48 hours prior to excavating, with some exceptions such as emergencies. The notification center phone number is 1-800-245-4545. This action, however, shall in no way be interpreted as relieving the Contractor of his/her responsibilities under the terms of the contract as set out in the plans and specifications. The Contractor shall repair any damages caused by his/her operations at the Contractor's expense and shall restore facilities to service in a timely manner. All information concerning utility verifications shall be provided to the Engineer.

The 811 call services for utility locations does not include TxDOT facilities. Provide notification to the District Traffic Signal Shop by email at CRP_Utility_Locate@txdot.gov or call either 361-808-2216 or 361-739-6044 for coordination with TxDOT underground lines when planning, drilling, or excavating in areas where existing TxDOT underground utilities exist. Visual evidence of TxDOT underground utilities in the area include illumination poles, ground boxes, flashing beacons, traffic signals, etc. This notification must be provided 48 hours in advance of performing the work, but no earlier than 72 business hours before the work will commence. Drilled shaft locations or excavation areas must be staked prior to the notification so that the underground utilities can be located in relationship to the proposed work.

Notify the Engineer immediately of utility conflicts in accordance with Item 5.6. Refer to Item 4.5 for consideration of differing site conditions.

GENERAL NOTES

SHEET 1 OF 6

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254	IH 37, etc.
DIST	COUNTY		SHEET NO.
CRP	NUECES		8

The responsibility for the construction surveying on this contract will be in accordance with Item 5.9.3, “Method C”.

The locations of all pavement markings and signing are diagrammatic only and may be shifted to accommodate field conditions or as directed by the Engineer.

ITEM 6: Control of Materials

To comply with the latest provisions of Build America, Buy America Act (BABA Act) of the Bipartisan Infrastructure Law, the contractor must submit a notarized original of the TxDOT Construction Material Buy America Certification Form for all items classified as construction materials. This form is not required for materials classified as a manufactured product.

Refer to the Buy America Material Classification Sheet for clarification on material categorization.

The Buy America Material Classification Sheet is located at the below link. https://www.txdot.gov/business/resources/materials/buy-america-material-classification-sheet.html for clarification on material categorization.

For Department-furnished material, contact the Engineer or his designated representative to request material a minimum of one workday prior to pick up. Load material with contract personnel. Materials are to be stored in a safe location outside TXDOT property or right-of-way, {unless otherwise approved.} Use material furnished by the Department only on the project(s) intended. Return any unused material as soon as possible.

ITEM 7: Legal Relationships and Responsibilities

The work performed for Item 7.2.4, “Public Safety and Convenience” will not be measured or paid for directly, but will be subsidiary to pertinent Items.

When working at street, farm-to-market, state highway, and county road intersections, schedule work to minimize intersection closures. During nonworking hours, all public road intersections will be open to the traveling public.

The total disturbed area for this project is 0 acres. The disturbed area in this project, all project locations in the Contract, and Contractor project specific locations (PSLs), within 1 mile of the project limits, for the Contract will further establish the authorization requirements for storm water discharges. The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. The Contractor is to obtain any required authorization from the TCEQ for any Contractor PSLs for construction support activities on or off ROW.

County: Nueces, etc. **Control:** 0074-06-254, etc.

Highway: IH 37, etc.

When the total area disturbed for all projects in the Contract and PSLs within 1 mile of the project limits exceeds 5 acres, provide a copy of the Contractor NOI for PSLs on the ROW to the Engineer.

Establish uniform perennial vegetative coverage with a density of at least 70% of the native background vegetative cover to achieve final stabilization.

Comply with the Texas Aggregate Quarry and Pit Safety Act for waste areas or material source areas resulting from this project.

No significant traffic generator events identified.

Submit charge summary and invoices for Law Enforcement Personnel using the Department forms.

Patrol vehicles must be clearly marked to correspond with the officer’s agency and equipped with appropriate lights to identify them as law enforcement. For patrol vehicles not owned by a law enforcement agency, markings will be retroreflective and legible from 100 ft. from both sides and the rear of the vehicle. Lights will be high intensity and visible from all angles. No payment will be made for law enforcement personnel needed for moving equipment or payment for drive time to/from the event site.

If the Contractor has a field office, provide an office location for a supervisory officer when event requires a supervising officer. This work is subsidiary.

A maximum combined rate of $70 per hour for the law enforcement personnel and the patrol vehicle will be allowed. Any scheduling fee is subsidiary per Standard Specification 502.4.2.

Cancel law enforcement personnel when the event is canceled. Cancellation, minimums or “show up” fees will not be paid when cancellation is made 12 hours prior to beginning of the event. Failure to cancel within 12 hours will not be cause for payment for cancellation, minimums, or "show up" time. Payment of actual “show up” time to the event site due to cancellation will be on a case by case basis at a maximum of 2 hours per officer.

Alterations to the cancellation and maximum rate must be approved by the Engineer or pre-determined by official policy of the officers governing authority.

ITEM 8: Prosecution and Progress

Prepare the progress schedule using the Critical Path Method (CPM). Submit (2) two 11” x 17” hard copies and an electronic file of the original or updated progress schedule. Submit the original progress schedule seven (7) days before the Preconstruction Conference.

GENERAL NOTES

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254	IH 37, etc.
DIST	COUNTY		SHEET NO.
CRP	NUECES		8A

Submit an updated progress schedule as directed to show proposed major changes, changes affecting compliance with the contract requirements, or changes affecting the critical path/controlling item of work.

Working days will be computed and charge in accordance with Article 8.3.1.4, "Standard Workweek".

Work above traffic is not allowed.

Lane closures are not permitted Monday through Friday before 9 AM or after 4 PM unless approved.

Notify the Engineer at least 48 hours in advance of weekend or nighttime work.

Nighttime work is allowable.

The Engineer reserves the right to change working hours as working conditions warrant.

Any lane closed or obstructed beyond the period permitted will be assessed a lane rental charge. The following lane rental charges will apply per hour per lane that is closed or obstructed beyond the period permitted as mentioned above.

Roadway	CSJ	Lane Rental Fee ($ /lane / hour)
IH 37	0074-06-254	1399.00
SH 358	0617-01-209	1224.00
SH 286	0326-03-106	1283.00
SH 286	0326-01-066	255.00

ITEM 9: Measurement and Payment

Monthly progress payments will be made for items of work completed by the 28th day of each month. Any work completed after the 28th will be included for payment in the subsequent monthly progress estimate.

Submit signed request for compensation of material-on-hand (MOH), including any requests from subcontractors, suppliers, or fabricators for MOH, at least two (2) working days prior to the end of the month on the Departments approved forms.

County: Nueces, etc. **Control:** 0074-06-254, etc.

Highway: IH 37, etc.

ITEM 100: Preparing Right of Way

Coordinate all right of way preparation activities with the project's Storm Water Pollution Prevention Plan (SWP3) and Environmental Permit Issues, and Commitments Sheet (EPIC) or as approved.

Prune trees and shrubs as directed. Use accepted pruning practices in accordance with Item 192 and as defined by the National Arborist Association. The work performed will not be measured or paid for directly, but will be subsidiary to pertinent Items.

ITEM 416: Drilled Shaft Foundations

If casings are to be used for drilled shaft foundations below the groundwater line, casings shall be removed after placement to allow skin friction to develop in the drilled shaft per the foundation design.

ITEM 500: Miscellaneous Construction

"Materials on Hand" payments are not considered when determining partial payments.

ITEM 502: Barricades, Signs, and Traffic Engineering

Furnish and install all signs, barricades and other incidentals necessary for proper traffic control, in accordance with part VI of the "Texas Manual on Uniform Traffic Control Devices for Streets, and Highways", latest edition, and as directed.

All signs shall be erected in a manner that they shall not obstruct the travelling public's view of the normal roadway signing or necessary sight distance at intersections and curves.

There will be no direct payment for traffic control, this function (traffic control) will be considered subsidiary to the pertinent bid items. Furnish additional barricades, signs, and traffic handling as directed. The work performed will not be measured or paid for directly, but will be subsidiary to pertinent items.

Consecutive crossovers and/or ramps, on the same state route, shall not be closed at the same time unless approved by the Engineer.

Traffic control for daytime lane closures shall be in accordance with applicable standards.

When advanced warning flashing arrow panels are specified, furnish one (1) standby unit in good condition at the job site for immediate use.

GENERAL NOTES

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254	IH 37, etc.
DIST	COUNTY		SHEET NO.
CRP	NUECES		8B

Attach stop/slow paddle to a staff with a minimum length of 6 feet to the bottom of the sign.

Maintain traffic control devices by taking corrective action as soon as possible. Complete corrective action as per TxDOT form 599.

Unless otherwise shown on plan sheets, channelization device spacing shall be as shown on "BC" Standard Sheets.
For lighting purposes, nighttime is defined as occurring shortly before sunset until after sunrise.

Prior to any nighttime work, a lighting plan shall be submitted for approval by the Engineer. The plan shall outline the types of lighting systems that will be used to adhere to following conditions. Before nighttime construction may begin, the lighting systems shall be demonstrated as being operational.

Provide a photometer for use by the Engineer to check the adequacy of illumination for any nighttime operations. The meter shall have a digital display calibrated to NIST standards, shall be cosine and color corrected, and shall have an accuracy of 1 +/- five percent. The sensor shall have a level indicator to ensure measurements are taken in a horizontal plane. Readings will be taken 3 feet above the pavement or ground surface.

The lighting system shall provide a minimum of 5 foot candles of illumination throughout the work area. For stationary operations, the work area is defined as the entire area where work is being performed. For mobile operations, the work area shall be defined as 25 feet in front of and behind moving equipment.

20 foot candles of illumination shall be provided for installation of signal equipment or other electrical / mechanical equipment and other tasks involving fine details or intricate parts and equipment.

Provide shields, visors, or louvers on luminaires as necessary to reduce objectionable levels of glare. Avoid objectionable glare on roadways open to traffic. Corrections shall be made when the Engineer determines glare exceeds acceptable levels.

Lighting needed to perform work shall not be paid for directly and should be considered subsidiary to Item 502.

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

County: Nueces, etc. **Control:** 0074-06-254, etc.

Highway: IH 37, etc.

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

All items marked as optional on all traffic control standards shall be required unless otherwise approved by an Engineer.

ITEM 506: Temporary Erosion, Sedimentation, and Environmental Controls

Designate in writing a Contractor Responsible Person (CRP) for implementing, maintaining, and reviewing environmental requirements.

Do not discharge onto the ground or surface waters any pollutants such as chemicals, raw sewage, fuels, lubricants, coolants, hydraulic fluids, bitumens, or any other petroleum product. Operate and maintain equipment on site in a manner as to prevent actual or potential water pollution. Manage, control, and dispose of litter on site such that no adverse impacts to water quality occur. Prevent dust from creating a potential or actual unsafe condition, public nuisance, or condition endangering the value, utility, or appearance of any property. Wash out concrete trucks only in approved contained areas. Use appropriate controls to minimize the offsite transport of suspended sediments and other pollutants if it is necessary to pump or channel standing water (i.e. dewatering). Prevent discharges that would contribute to a violation of Edwards Aquifer Rules, water quality standards, the impairment of a listed water body, or other state or federal law.

ITEM 636: Signs

All sign wraps are subsidiary to Item 636.

Contractor is responsible for receiving deliveries and storing all signing materials including but not limited to the signs and all mounting components and brackets at a secure location in such a way as to deter damage and theft of said material.

Shop drawings for all signs in the contract requiring fabrication are to be supplied to the TxDOT Area Engineer's Office as well as to the Corpus Christi District Traffic Engineering Office.

Fabricate and install signs only after approval of the shop drawings.

Furnish new sign supports when replacing overhead signs. This will be subsidiary to pertinent items.

GENERAL NOTES

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254	IH 37, etc.
DIST	COUNTY		SHEET NO.
CRP	NUECES		8C

Disassemble, deliver and neatly stack salvageable materials at a secure location at the TxDOT Corpus Christi Maintenance Office, which is located at 844 N Padre Island Drive, Corpus Christi, TX 78406. Coordinate with the TxDOT maintenance supervisor, Mr. David Franco, for any deliveries of signs and signing materials. His office may be contacted at 361-289-1400. The work performed will not be measured or paid for directly, but will be subsidiary to pertinent Items.

ITEM 644: Small Roadside Sign Assemblies

Use crash worthy supports as shown on the BC sheets, the CWZTCD, or as directed for signs relocated using temporary supports. The work performed will not be measured or paid for directly, but will be subsidiary to pertinent Items.

All salvageable signs and sign components will become the property of the Department. Disassemble, deliver and neatly stack salvageable materials at the secure location at the TxDOT Corpus Christi Maintenance Office, which is located at 844 N Padre Island Drive, Corpus Christi, TX 78406. The Contractor shall coordinate with the TxDOT maintenance supervisor, Mr. David Franco, for any deliveries of signs and signing materials. His office may be contacted at 361-289-1400. The work performed will not be measured or paid for directly, but will be subsidiary to pertinent Items.

All slip bases and hardware including but not limited to nuts, bolts, screws and washers will be galvanized. All sign and housing components will be galvanized. Slip bases shall be clamp-style.

Any abandoned slip base footings, in the vicinity of the existing sign, shall be removed and will be subsidiary to ITEM 644-6076.

Sign Post Wraps shall be installed on Yield, Do Not Enter, and Wrong Way signs as well as One-Direction large arrow signs and as shown in the Reflective Wrap Detail provided. Post wraps shall be retroreflective with high intensity and pressure sensitive. The color of the post wraps shall be red for the Yield, Do Not Enter and Wrong Way signs and yellow for the One-Direction large arrow signs. Sheeting shall be approved by the Engineer prior to installation.

Retroreflective sheeting wrapped around a sign has a height on the post of at least 12 inches. The bottom of the retroreflective sheeting wrapped around a sign is approximately 4 feet above the edge of travel lane.

Sign Post Wraps shall be subsidiary to ITEM 644.

Coordinates provided in this plan set are approximate locations. All signs placed shall follow the Texas Department of Transportation's sign placement guidelines to include but not be limited to the Sign Crew Field Book and the latest edition of the Texas Manual on Uniform Traffic Control Devices as well as the Freeway Signing Handbook.

County: Nueces, etc. **Control:** 0074-06-254, etc.

Highway: IH 37, etc.

Sign locations shall be marked and approved by the Engineer before foundations are poured for the wrong way detection systems. Any questions regarding sign locations may be directed to the TxDOT DistrictTraffic Engineering Office.

ITEM 666: Reflectorized Pavement Markings

All markings must comply with all TxDOT standards and specifications as well as the details provided in this plan set.

As a reminder, the Contractor's attention is directed to the visibility and performance period requirements in the specifications which must be met.

Establish and mark the location of existing standard pavement markings including but not limited to edge lines, transitions, passing and no passing zones, gore areas, etc.

Striping quantities as shown in the plans are approximate. Additional striping may be required as field conditions warrant. The Contractor shall inform the Engineer of any additional striping required before placement of the permanent pavement markings.

Place pavement markings no later than 14 calendar days after the placement of the surface. When inclement weather prohibits placement of the markings, the 14-day period may be extended until weather permits proper application.

ITEM 677: Eliminating Existing Pavement Markings and Markers

Eliminate all conflicting pavement markings as work progresses or as directed.

Removal method must be approved by the Engineer.

No Surface Treatment Method on concrete surfaces.

When using Surface Treatment Method for asphaltic pavements, use a PB Grade 5 aggregate at an application rate of 1 cy/130 sy and asphalt AC-10, CRS-2 or HFRS-2 at a application rate of 0.39 Gal/sy. (For Item 677.4.1)

ITEM 687: Pedestal Pole Assemblies

Provide single-pole breakaway disconnects. Ensure the disconnects have a white colored marking and a permanently solid neutral.

The Contractor shall ensure that the poles supplied are compatible with the bases supplied so as to provide optimal fit.

GENERAL NOTES

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254	IH 37, etc.
DIST	COUNTY		SHEET NO.
CRP	NUECES		8D

Poles provided shall be 4.5" O.D schedule 80.

ITEM 6001: Portable Changeable Message Signs

Furnish the portable changeable message signs displaying the correct message at least seven (7) days prior to beginning work or as directed.

The Contractor's Responsible Person (CRP) will maintain full control of messages at all times. The Engineer will provide the sign message text to use at each sign.

A minimum of 2 PCMS will be required. However, additional units may be necessary depending on the work in progress.

Standby time will not be measured or paid for directly, but will be subsidiary to pertinent Items.

Portable changeable message signs may be moved and message changed at any time as deemed necessary by the Engineer. This will be considered subsidiary to Item 6001.

ITEM 6185: Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)

A minimum of 2 TMAS will be required. However, additional units may be necessary depending on the work in progress

Provide manufacturer's curb weight or certified scales weight ticket to the Engineer for approval.

TMAs paid by the each shall be available for the duration of the project. Relocation of TMAs will be as directed by the Engineer, and will be considered subsidiary to this Item.

ITEM 6367: Installation of Cellular Modem

The cellular modems are to be furnished and installed by the Contractor. Cellular modems shall be compatible with the Thermal Wrong Way Driver detection systems being installed here as well as with any other systems being installed in this District. Any work or costs, material or otherwise, associated with this item shall be considered subsidiary to Item 6409.

ITEM 6409: Installation of Wrong Way Driver Thermal Imaging Camera and Equipment

Provide thermal imaging cameras / sensors for detection. The system and all equipment and materials provided shall be compatible with any and all existing wrong way driver system equipment and components already in the Corpus Christi District.

County: Nueces, etc. **Control:** 0074-06-254, etc.

Highway: IH 37, etc.

Please address any questions concerning this item to the Engineer and the Corpus Christi District Traffic Engineering Office by calling 361-877-0212. The Contractor shall have the Manufacturer's representative on site to assist with the installation of all equipment before any work begins.

The locations of ramps at which detection systems are placed can be found in both the summary of small signs as well as the Wrong Way Driver System Locations maps provided in this plan set. Locations are shown per corridor (IH 37, SH 358 and SH 286) with coordinates of the specific ramps provided as approximate locations. Guidance for pole locations for the different components of the detection systems at each ramp is also provided in the Wrong Way Detection System Layout and Details provided in this plan set. The Contractor shall mark the proposed system pole locations and notify the Engineer in a timely manner to allow the Engineer to schedule a site visit in order to identify the proper sign locations at each exit before the foundations are poured.

Conduit and other materials needed to connect the detection assembly to the detection assembly's solar panel assembly may not be shown in the Wrong Way Detection System Layout and Details provided in this plan set as they are to be determined and furnished by the Manufacturer and are considered subsidiary to Item 6409.

GENERAL NOTES

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254	IH 37, etc.
DIST	COUNTY		SHEET NO.
CRP	NUECES		8E

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0074-06-254 **DISTRICT** Corpus Christi **COUNTY** Nueces
HIGHWAY IH 37, SH 286, SH 358

ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL
	500-6001	MOBILIZATION	LS	1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	7.000	
	506-6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	40.000	
	506-6042	BIODEG EROSN CONT LOGS (INSTL) (18")	LF	40.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	80.000	
	636-6001	ALUMINUM SIGNS (TY A)	SF	17.500	
	636-6003	ALUMINUM SIGNS (TY O)	SF	576.000	
	636-6007	REPLACE EXISTING ALUMINUM SIGNS(TY A)	SF	1,732.250	
	644-6027	IN SM RD SN SUP&AM TYS80(1)SA(P)	EA	55.000	
	644-6028	IN SM RD SN SUP&AM TYS80(1)SA(P-BM)	EA	2.000	
	644-6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	204.000	
	644-6070	RELOCATE SM RD SN SUP&AM TY S80	EA	5.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	18.000	
	644-6078	REMOVE SM RD SN SUP&AM (SIGN ONLY)	EA	8.000	
	668-6092	PREFAB PAV MRK TY C (W) (36")(YLD TRI)	EA	24.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	1,372.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	50.000	
	687-6001	PED POLE ASSEMBLY	EA	42.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	226.000	
	6185-6002	TMA (STATIONARY)	DAY	125.000	
	6227-6002	SOLAR POWERED LED ROADSIDE SIGN	EA	19.000	
	6409-6001	LED WRONG WAY DRIVER SYSTEM (THERMAL)	EA	14.000	
	08	CONTRACTOR FORCE ACCOUNT SAFETY CONTINGENCY (NON-PARTICIPATING)	LS	3.000	
		CONTRACTOR FORCE ACCOUNT EROSION CONTROL MAINTENANCE (NON-PARTICIPATING)	LS	3.000	
		CONTRACTOR FORCE ACCOUNT LAW ENFORCEMENT (NON-PARTICIPATING)	LS	3.000	

CK:
DW:
CK:
DW:

TRAFFIC CONTROL GENERAL NOTES:

1. ALL SIGNS, BARRICADES, WORK ZONE MARKINGS AND DEVICES AS SHOWN HEREIN SHALL BE IN ACCORDANCE WITH THE "TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES" (TMUTCD) LATEST REVISION.

2. SPACE SIGNS AND BARRICADES WITH REFERENCE TO THE "BC" AND "TCP" STANDARD SHEETS OR AS DIRECTED BY THE ENGINEER.

3. BARRICADES, SIGNS, CHANNELIZING DEVICES AND OTHER TRAFFIC HANDLING DEVICES MAY BE ADJUSTED OR SHIFTED TO FIT FIELD CONDITIONS OR AS REQUIRED FOR CONSTRUCTION AND SETUP FOR THE VARIOUS PHASES AS SHOWN IN THE PLANS AND AS DIRECTED BY THE ENGINEER.

4. ADEQUATE SIGNS AND BARRICADES SHALL BE INSTALLED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER PRIOR TO OPENING ANY PORTION OF ROADWAY TO TRAFFIC. THE ENGINEER MAY DIRECT THE CONTRACTOR TO FURNISH ADDITIONAL SIGNS, BARRICADES AND CHANNELIZING DEVICES AS REQUIRED TO MAINTAIN TRAFFIC AND MOTORIST SAFETY DURING CONSTRUCTION. ANY SUCH ADDITIONAL SIGNS AND BARRICADES, ETC SHALL BE CONSIDERED SUBSIDIARY TO ITEM 502 "BARRICADES, SIGNS, AND TRAFFIC HANDLING" AND AS SUCH WILL NOT BE PAID FOR DIRECTLY. ALL SIGNS, BARRICADES, AND POSTS SHALL BE NEW AND KEPT CLEAN FOR THE DURATION OF THE PROJECT.

5. THE CONTRACTOR SHALL PROVIDE FOR SAFE AND CONVENIENT INGRESS AND EGRESS TO ABUTTING PROPERTIES, HIGHWAYS, PUBLIC ROADS AND STREET CROSSINGS.

6. ALL TEMPORARY LANE CLOSURES SHALL BE IN ACCORDANCE WITH THE APPROPRIATE BC & TCP STANDARD SHEETS. THESE SHEETS ARE APPLICABLE FOR NORMAL DAYTIME HOURS ONLY.

7. INSTALLATION OF SIGNS AND APPLICATION OF THE BARRIER AND PAVEMENT MARKINGS SHALL BE SCHEDULED TO INTERFERE AS LITTLE AS POSSIBLE WITH TRAFFIC. NO TRAFFIC-CARRYING LANES SHALL BE BLOCKED BEFORE 9:00 AM OR AFTER 4:00 PM UNLESS OTHERWISE APPROVED BY THE ENGINEER. BEFORE BLOCKING ANY TRAFFIC LANES, THE CONTRACTOR SHALL USE A FLAGGER AND/ OR WARNING DEVICES AS APPROVED BY THE ENGINEER. THE REQUIRED BARRICADES AND SIGNS MAY NEED TO BE MODIFIED IN ORDER TO BE LOCATED SO AS TO NOT BLOCK VEHICLE OR PEDESTRIAN MOVEMENTS AND SIGHT DISTANCE. THE CONTRACTOR WILL BE REQUIRED TO SAFELY ROUTE ANY PEDESTRIANS AROUND AND THROUGH WORK SHOULD IT IMPACT SIDEWALKS.

8. MESSAGE BOARDS SHALL BE USED PRIOR TO ANY CHANGES IN TRAFFIC PATTERNS AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL PROVIDE THE ENGINEER WITH TWO WEEKS NOTICE PRIOR TO MAJOR TRAFFIC CHANGES IN ORDER TO NOTIFY THE MEDIA. MESSAGE AND LOCATION OF MESSAGE BOARDS MAY BE CHANGED AT ANY TIME BY THE ENGINEER. REFER TO THE "BC" SHEETS FOR APPROVED ABBREVIATIONS, STANDARD MESSAGE FORMAT AND PROPER PROTECTION OF MESSAGE BOARDS WITH PLASTIC DRUMS.

9. ALL ARROW BOARDS SHALL BE CONSIDERED SUBSIDIARY TO ITEM 502 "BARRICADES, SIGNS AND TRAFFIC HANDLING" AND AS SUCH WILL NOT BE PAID FOR DIRECTLY.

10. SUBJECT TO THE ENGINEER'S APPROVAL THE CONTRATOR MAY SUBMIT IN WRITING AN ALTERNATE TCP AND/OR ALTERNATE SEQUENCE OF CONSTRUCTION IN ADVANCE.

11. THE CONTRACTOR SHALL MAINTAIN ADEQUATE LIGHTING DURING CONSTRUCTION. A LIGHTING PLAN MUST BE SUBMITTED TO AND APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION. LIGHTING NEEDED TO PERFORM WORK SHALL NOT BE PAID FOR DIRECTLY BUT SHALL INSTEAD BE CONSIDERED SUBSIDIARY TO ITEM 502.

12. THE 811 CALL SERVICE FOR UTILITY LOCATIONS DOES NOT INCLUDE TXDOT FACILITIES. THE CONTRACTOR SHALL CONTACT THE CORPUS CHRISTI SIGNAL SECTION AT CRP_UTILITY_LOCATE@TXDOT.GOV OR 361-808-2216 FOR COORDINATION WITH TXDOT UNDERGROUND LINES 48 HOURS IN ADVANCE OF ANY SCHEDULED WORK.

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

SUGGESTED SEQUENCE OF CONSTRUCTION

1. Work should be completed North to South (and West to East) along a route at identified exits in order of succesive ramps. It is suggested that the Contractor begin work on SH 286, then move to SH 358 and then to IH 37.

2. Work per location is suggested in the following order:

   - Set up TCP.
   - Install biologs.
   - Perform striping and signing work at identified locations.
   - Remove biologs.

3. Work should be performed one location at a time with the locations of the poles for the sign foundations to be marked according to standards and any details provided in this plan set. The TxDOT Engineer is to be consulted if there are any questions and shall be notified once foundations are marked for concurrence. Once poles are installed and equipment for the detection system is installed on the poles , the Technicians will set up the Wrong Way Driver Detection zones and terminate connections. The Contractor may move to the next location once the striping and signing work is completed for the previous location.

4. The Contractor shall provide retroreflectivity measurements in digital Excel spreadsheet format for existing and final striping as described in Item 666, "Retroreflectorized Pavement Markings". Retroreflectivty testing frequency is to be determined by the Area Engineer.

STATE OF TEXAS
KASSONDRA FIORA MUNOZ
104720
LICENSED
PROFESSIONAL ENGINEER

Kassondra Fiora Muñoz
1-3-23

SEQUENCE OF CONSTRUCTION

SHEET 1 OF 1

NOT TO SCALE

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		10

TRAFFIC CONTROL ITEMS SUMMARY			
	ITEM	ITEM	ITEM
	6185-6002	6001-6001	502-6001
	TMA (STATIONARY)	PORTABLE CHANGEABLE MESSAGE SIGN	BARRICADES, SIGNS AND TRAFFIC HANDLING
	DAY	DAY	MO
IH 37: From SH 358 to FM 2292 (CSJ 0074-06-254)	34	68	2
SH 358: From Weber Rd to 310 feet West of Claride St (CSJ 0617-01-209)	38	58	2
SH 286: From SS 544 to SH 358 (CSJ 0326-03-106)	26	54	2
SH 286: From SH 358 to 0.5 miles South of FM 43 (CSJ 0326-01-066)	27	46	1

ENVIRONMENTAL ITEMS SUMMARY			
	ITEM	ITEM	ITEM
	0506-6041	0506-6042	0506-6043
	BIODEG EROSN CONT LOGS (INSTL)(12")	BIODEG EROSN CONT LOGS (INSTL)(18")	BIODEG EROSN CONT LOGS (REMOVE)
	LF	LF	LF
IH 37: From SH 358 to FM 2292 (CSJ 0074-06-254)	10	10	20
SH 358: From Weber Rd to 310 feet West of Claride St (CSJ 0617-01-209)	10	10	20
SH 286: From SS 544 to SH 358 (CSJ 0326-03-106)	10	10	20
SH 286: From SH 358 to 0.5 miles South of FM 43 (CSJ 0326-01-066)	10	10	20

TRAFFIC CONTROL AND ENVIRONMENTAL ITEMS SUMMARY

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		11

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

CK:
DW:
CK:
DN:

SIGN MOUNTING AND RELATED ITEMS SUMMARY

ITEM		DESCRIPTION	UNIT	QTY			
				CORRIDOR A	CORRIDOR B	CORRIDOR C	CORRIDOR D
				SH 358	IH 37	SH 286	SH 286
				(0617-01-209)	(0074-06-254)	(0326-03-106)	(0326-01-066)
636	6001	ALUMINUM SIGNS (TY A)	SF	17.5			
636	6003	ALUMINUM SIGNS (TY O)	SF	128	128	192	128
636	6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	779.25	624.25	8.75	320
644	6027	IN SM RD SN SUP&AM TYS80(1)SA(P)	EA	28	14	6	7
644	6028	IN SM RD SN SUP&AM TYS80(1)SA(P-BM)	EA		2		
644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	145	50	6	3
644	6033	IN SM RD SN SUP&AM TYS80(1)SA(U)	EA				
644	6036	IN SM RD SN SUP&AM TYS80(1)SA(U-BM)	EA				
644	6070	RELOCATE SM RD SN SUP&AM TY S80	EA			2	3
644	6076	REMOVE SM RD SN SUP&AM	EA	6	11	1	
644	6078	REMOVE SM RD SN SUP&AM (SIGN ONLY)	EA	5		3	
687	6001	PED POLE ASSEMBLY	EA	12	12	12	6
6227	6002	SOLAR POWERED LED ROADSIDE SIGN	EA	5	9	2	3
6409	6001	LED WWDS(INSTALL ONLY)(THERMAL)	EA	4	4	4	2
FORCE ACCOUNT		WWDS	LS	4	4	4	2

NOTES:

1. ANY SIGNS REMOVED UNDER THIS CONTRACT SHALL BE CONSIDERED AS SALVAGEABLE AND RETURNED TO TXDOT FOR THIER USE. THE CONTRACTOR SHALL COORDINATE WITH THE CORPUS CHRISTI MAINTENANCE OFFICE SUPERVISOR TO DELIVER THESE SIGNS TO THEIR MAINTENANCE YARD. REFER TO THE GENERAL NOTES FOR CONTACT INFORMATION.

2. ALL SIGNS ARE TO BE INSTALLED WITH NEW HARDWARE. THIS COST WILL BE CONSIDERED SUBSIDIARY TO THE PERTINENT ITEMS.

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

AND RELATED ITEMS SUMMARY

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		12

CK$
DW$
CK$
DN$

SH 358 (Nueces County): CSJ 0617-01-209

ITEM	DESCRIPTION	UNIT	QUANTITY	LATITUDE	LONGITUDE	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT
SH 358 EASTBOUND EXIT TO RODD FIELD RD								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.695632°	-97.346966°	93	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75				R6-1L	ONE WAY (LEFT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.695341°	-97.345937°	94	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.694692°	-97.344575°	95	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.694557°	-97.344659°	96	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.694295°	-97.344128°	97	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.693548°	-97.342228°	98	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.693394°	-97.342323°	99	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.693336°	-97.341837°	100	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.693212°	-97.341922°	101	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.693294°	-97.341742°	102	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75				R6-1L	ONE WAY (LEFT)
		TOTAL	95.75					
SH 358 EASTBOUND EXIT TO ENNIS JOSLIN RD								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.689529°	-97.333019°	103	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.688575°	-97.331103°	104	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.688436°	-97.331206°	105	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.688258°	-97.330813°	106	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.688333°	-97.330645°	107	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75				R6-1L	ONE WAY (LEFT)
		TOTAL	48.75					
SH 358 EASTBOUND PAUL JONES AVE INTERSECTION								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.685339°	-97.323797°	108	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.685187°	-97.323872°	109	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.685114°	-97.323389°	110	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.685013°	-97.323464°	111	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	3	27.685117°	-97.323330°	112	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	3				R6-1L	ONE WAY (LEFT)
		TOTAL	41.5					
SH 358 EASTBOUND FRONTAGE ROAD TO OSO TURNAROUND								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.684113°	-97.321200°	113	R6-1R	ONE WAY (RIGHT)
		TOTAL	6.75					
SH 358 EASTBOUND EXIT TO FLOUR BLUFF DR								
0644-6076	REMOVE SM RD SN SUP&AM	EA	1	27.677092°	-97.307151°	114	R5-1	DO NOT ENTER
		TOTAL	1					
0644-6078	REMOVE SM RD SN SUP&AM (SIGN ONLY)	EA	1	27.677176°	-97.307054°	115	R5-1	DO NOT ENTER
		TOTAL	1					
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.675185°	-97.298254°	116	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.675048°	-97.298299°	117	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.674915°	-97.297160°	118	R5-1	DO NOT ENTER
		TOTAL	26.5					

SMALL SIGN REMOVAL
SUMMARY: SH 358
(CSJ 0617-01-209)
(CORRIDOR A)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		13

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SH 358 (Nueces County): CSJ 0617-01-209 (Corridor A)								
ITEM	**DESCRIPTION**	**UNIT**	**QUANTITY**	**LATITUDE**	**LONGITUDE**	**SIGN NO.**	**SIGN DESIGNATION**	**SIGN CONTENT**
SH 358 EASTBOUND EXIT TO FRONTAGE RD								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.674669°	-97.296902°	119	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.673605°	-97.293797°	120	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.673153°	-97.292889°	121	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.672326°	-97.291078°	122	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.671345°	-97.289367°	123	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.670119°	-97.286912°	124	R6-1R	ONE WAY (RIGHT)
		TOTAL	40.5					
SH 358 EASTBOUND EXIT TO WALDRON RD								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.669325°	-97.285225°	125	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.668425°	-97.282673°	126	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.668313°	-97.282755°	127	R5-1	DO NOT ENTER
		TOTAL	27					
SH 358 EASTBOUND EXIT TO NAS DR								
0644-6076	REMOVE SM RD SN SUP&AM	EA	1	27.670211°	-97.284578°	129	R6-1R	ONE WAY (RIGHT)
		TOTAL	1					
0644-6078	REMOVE SM RD SN SUP&AM (SIGN ONLY)	EA	1	27.671239°	-97.281765°	131	R5-1	DO NOT ENTER
0644-6078	REMOVE SM RD SN SUP&AM (SIGN ONLY)	EA	1	27.671019°	-97.282687°	132	R5-1	DO NOT ENTER
0644-6078	REMOVE SM RD SN SUP&AM (SIGN ONLY)	EA	1	27.671387°	-97.281848°	133	R5-1	DO NOT ENTER
		TOTAL	3					
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.670181°	-97.284676°	128	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.670774°	-97.282922°	130	R5-1	DO NOT ENTER
		TOTAL	18					

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SMALL SIGN REMOVAL SUMMARY: SH 358 (CSJ 0617-01-209) (CORRIDOR A)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		14

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SH 358 (Nueces County): CSJ 0617-01-209 (Corridor A)

ITEM	DESCRIPTION	UNIT	QUANTITY	LATITUDE	LONGITUDE	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT
SH 358 WESTBOUND EXIT TO FLOUR BLUFF DR								
0644-6076	REMOVE SM RD SN SUP&AM	EA	1	27.670263°	-97.285532°	136	R5-1	DO NOT ENTER
		TOTAL	1					
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.669813°	-97.284940°	134	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.669882°	-97.284869°	135	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.672182°	-97.289916°	137	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.672572°	-97.290741°	138	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.674921°	-97.295619°	139	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.675053°	-97.295550°	140	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.675384°	-97.296372°	141	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.675284°	-97.296554°	142	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75				R6-1L	ONE WAY (LEFT)
		TOTAL	71					
SH 358 WESTBOUND EXIT TO OSO TURNAROUND								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.675852°	-97.299280°	143	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.676104°	-97.302189°	144	R5-1	DO NOT ENTER
		TOTAL	15.75					
SH 358 WESTBOUND EXIT TO PAUL JONES AVE								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.683458°	-97.318852°	145	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.683566°	-97.318775°	146	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.684413°	-97.320850°	147	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.685210°	-97.322445°	148	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.685359°	-97.322340°	149	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.685452°	-97.322857°	150	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.685563°	-97.322788°	151	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.685461°	-97.322903°	152	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75				R6-1L	ONE WAY (LEFT)
		TOTAL	73.75					
SH 358 WESTBOUND EXIT TO ENNIS JOSLIN RD								
0644-6078	REMOVE SM RD SN SUP&AM (SIGN ONLY)	EA	1	27.687329°	-97.327182°	153	R5-1a	WRONG WAY
		TOTAL	1					
0644-6076	REMOVE SM RD SN SUP&AM	EA	1	27.687657°	-97.327415°	154	R5-1	DO NOT ENTER
0644-6076	REMOVE SM RD SN SUP&AM	EA	1	27.687543°	-97.327605°	155	R5-1	DO NOT ENTER
		TOTAL	2					
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.688427°	-97.329541°	156	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.688570°	-97.329451°	157	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.688795°	-97.329937°	158	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.688708°	-97.330101°	159	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	3	27.688697°	-97.330132°	160	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	3				R6-1L	ONE WAY (LEFT)
		TOTAL	41.5					
SH 358 WESTBOUND EXIT TO RODD FIELD RD								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.692438°	-97.338702°	161	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.692634°	-97.339105°	162	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.693553°	-97.340716°	163	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.693714°	-97.341068°	164	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.693623°	-97.341185°	165	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.693648°	-97.341231°	166	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75				R6-1L	ONE WAY (LEFT)
		TOTAL	58					
SH 358 WESTBOUND EXIT TO NILE DR								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.696057°	-97.346154°	167	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.696199°	-97.346051°	168	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.696256°	-97.346475°	169	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.696388°	-97.346444°	170	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.696305°	-97.346590°	171	R6-1R	ONE WAY (RIGHT)
		TOTAL	42.25					
SH 358 WESTBOUND EXIT TO STAPLES ST								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.707537°	-97.369437°	172	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.707693°	-97.369333°	173	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.707754°	-97.369808°	174	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.707887°	-97.369707°	175	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	3	27.707776°	-97.369848°	176	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	3				R6-1L	ONE WAY (LEFT)
		TOTAL	41.5					

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SMALL SIGN REMOVAL SUMMARY: SH 358 (CSJ 0617-01-209) (CORRIDOR A)

Texas Department of Transportation

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0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		15

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SH 358 (Nueces County): CSJ 0617-01-209 (Corridor A)								
ITEM	DESCRIPTION	UNIT	QUANTITY	LATITUDE	LONGITUDE	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT
SH 358 WESTBOUND EXIT TO EVERHART RD								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.709790°	-97.373927°	177	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.710196°	-97.374786°	178	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.711600°	-97.377574°	179	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.712124°	-97.378618°	180	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.714537°	-97.383545°	181	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.714718°	-97.383444°	182	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.714815°	-97.384044°	183	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	3	27.714821°	-97.384102°	184	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	3				R6-1L	ONE WAY (LEFT)
TOTAL			63.75					
SH 358 WESTBOUND EXIT TO WEBER RD								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.715236°	-97.384893°	185	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.717480°	-97.389558°	186	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.720691°	-97.396138°	187	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.721469°	-97.397889°	188	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.721498°	-97.397954°	189	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.721812°	-97.398151°	190	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.721717°	-97.398341°	191	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.721745°	-97.398422°	192	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75				R6-1L	ONE WAY (LEFT)
TOTAL			67					

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SMALL SIGN REMOVAL SUMMARY: SH 358 (CSJ 0617-01-209) (CORRIDOR A)

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DIST	COUNTY		SHEET NO.
CRP	NUECES		16

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IH 37 (Nueces County): CSJ 0074-06-254

ITEM	DESCRIPTION	UNIT	QUANTITY	LATITUDE	LONGITUDE	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT
IH 37 NORTHBOUND EXIT TO VALERO WAY								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.805767°	-97.484379°	1	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.805527°	-97.484383°	2	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.805406	-97.483763	4	R5-1a	WRONG WAY
	TOTAL	26.75						
0644-6076	REMOVE SM RD SN SUP&AM	EA	1	27.805519°	-97.483737°	3	R5-1a	WRONG WAY
	TOTAL	1						
IH 37 NORTHBOUND EXIT TO SOUTHERN MINERALS								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.811343°	-97.502054°	5	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.811192°	-97.502124°	6	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.811143°	-97.501571°	7	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.811002°	-97.501640°	8	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.809604°	-97.498336°	9	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.808313°	-97.494974°	10	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.807908°	-97.494157°	11	R5-1a	WRONG WAY
	TOTAL	60						
IH 37 NORTHBOUND EXIT TO SUNTIDE RD								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	3	27.821912°	-97.520137°	12	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	3				R6-1L	ONE WAY (LEFT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.822145°	-97.520091°	13	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.821931°	-97.520104°	14	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.821161°	-97.518104°	15	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.821069°	-97.518165°	16	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.820668°	-97.517514°	17	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.820597°	-97.517598°	18	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	3	27.818400°	-97.514075°	19	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	3	27.815511°	-97.509738°	20	R6-1R	ONE WAY (RIGHT)
	TOTAL	65.5						
IH 37 NORTHBOUND INTERSECTION TULOSO RD								
0644-6076	REMOVE SM RD SN SUP&AM	EA	1	27.823363°	-97.524020°	21	R6-1R	ONE WAY (RIGHT)
							R6-1L	ONE WAY (LEFT)
	TOTAL	1						
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.823580°	-97.523797°	22	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.823371°	-97.523800°	23	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.823242°	-97.523042°	24	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.823109°	-97.523115°	25	R5-1a	WRONG WAY
	TOTAL	35.5						
IH 37 NORTHBOUND INTERSECTION N CLARKWOOD RD								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8	27.827698°	-97.535577°	26	W1-6R	LARGE ONE DIRECTION ARROW (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.827671°	-97.535306°	27	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.827582°	-97.535365°	28	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.827474°	-97.534895°	29	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.827354°	-97.534970°	30	R5-1a	WRONG WAY
	TOTAL	43.5						
IH 37 NORTHBOUND EXIT TO RAND MORGAN RD								
0644-6076	REMOVE SM RD SN SUP&AM	EA	1	27.833085°	-97.544289°	31	R5-1	DO NOT ENTER
0644-6076	REMOVE SM RD SN SUP&AM	EA	1	27.833029°	-97.544042°	32	R6-1L	ONE WAY (LEFT)
0644-6076	REMOVE SM RD SN SUP&AM	EA	1	27.833019°	-97.544103°	33	R5-1	DO NOT ENTER
0644-6076	REMOVE SM RD SN SUP&AM	EA	1	27.832544°	-97.543656°	34	R5-1a	WRONG WAY
0644-6076	REMOVE SM RD SN SUP&AM	EA	1	27.832451°	-97.543735°	35	R5-1a	WRONG WAY
	TOTAL	5						
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.832848°	-97.543486°	36	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.832893°	-97.543654°	37	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.832369°	-97.543033°	38	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.832265°	-97.543130°	39	R5-1a	WRONG WAY
	TOTAL	35.5						

SMALL SIGN REMOVAL SUMMARY: IH 37 (CSJ 0074-06-254) (CORRIDOR B)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		17

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FILE: $FILE$

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IH 37 (Nueces County): CSJ 0074-06-254 (Corridor B)

ITEM	DESCRIPTION	UNIT	QUANTITY	LATITUDE	LONGITUDE	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT
IH 37 SOUTHBOUND INTERSECTION N CLARKWOOD RD								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.833884°	-97.547691°	40	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75				R6-1L	ONE WAY (LEFT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.832925°	-97.545543°	41	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.832322°	-97.544790°	42	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.827961°	-97.536994°	43	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.827860°	-97.537060°	44	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.827692°	-97.536495°	45	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.827579°	-97.536572°	46	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8	27.827623°	-97.536388°	47	W1-6R	LARGE ONE DIRECTION ARROW (RIGHT)
		TOTAL	70.5					
IH 37 SOUTHBOUND EXIT TO TULOSO RD								
0644-6076	REMOVE SM RD SN SUP&AM	EA	1	27.823827°	-97.527186°	48	R5-1a	WRONG WAY
0644-6076	REMOVE SM RD SN SUP&AM	EA	1	27.823744°	-97.527256°	49	R5-1a	WRONG WAY
0644-6076	REMOVE SM RD SN SUP&AM	EA	1	27.822515°	-97.524128°	52	R5-1	DO NOT ENTER
0644-6076	REMOVE SM RD SN SUP&AM	EA	1	27.822258°	-97.524057°	53	R5-1	DO NOT ENTER
		TOTAL	4					
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.823456°	-97.526617°	50	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.823389°	-97.526691°	51	R5-1	DO NOT ENTER
		TOTAL	18					
IH 37 SOUTHBOUND SUNTIDE RD INTERSECTION								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.821298°	-97.520990°	54	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.821186°	-97.521065°	55	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	3	27.821106°	-97.520313°	56	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	3				R6-1L	ONE WAY (LEFT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.820840°	-97.520394°	57	R5-1	DO NOT ENTER
		TOTAL	32.5					
IH 37 SOUTHBOUND EXIT TO SOUTHERN MINERALS								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.820451°	-97.519272°	58	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8	27.817274°	-97.513765°	59	W1-6R	LARGE ONE DIRECTION ARROW (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	3	27.816937°	-97.513528°	60	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.813076°	-97.507228°	61	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.813000°	-97.507302°	62	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.812776°	-97.507116°	63	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.812610°	-97.506591°	64	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.812534°	-97.506666°	65	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.811345°	-97.503659°	66	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.811134°	-97.503089°	67	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.811015°	-97.503145°	68	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8	27.811093°	-97.502979°	69	W1-6R	LARGE ONE DIRECTION ARROW (RIGHT)
		TOTAL	94.75					
IH 37 SOUTHBOUND EXIT TO CORN PRODUCTS RD								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.805152°	-97.486793°	70	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.805054°	-97.486847°	71	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.804957°	-97.486185°	72	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.804850°	-97.486228°	73	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.804590°	-97.484630°	74	R5-1	DO NOT ENTER
		TOTAL	44.5					
IH 37 SOUTHBOUND EXIT TO LANTANA ST								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.803813°	-97.471347°	75	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.803708°	-97.471361°	76	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.803750°	-97.470413°	77	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75				R6-1L	ONE WAY (LEFT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.803710°	-97.470415°	78	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.803497°	-97.470475°	79	R5-1	DO NOT ENTER
		TOTAL	49					
IH 37 SOUTHBOUND EXIT TO LEOPARD ST								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.798981°	-97.468206°	80	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.799187°	-97.468143°	81	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.798941°	-97.468204°	82	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.798542°	-97.468244°	83	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	3	27.797720°	-97.468232°	84	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	3				R6-1L	ONE WAY (LEFT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.797765°	-97.468399°	85	R5-1	DO NOT ENTER
		TOTAL	48.25					

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

SMALL SIGN REMOVAL SUMMARY: IH 37 (CSJ 0074-06-254) (CORRIDOR B)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		18

CK:
DW:
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SH 286 (Nueces County): CSJ 0326-03-106 (Corridor C)

ITEM	DESCRIPTION	UNIT	QUANTITY	LATITUDE	LONGITUDE	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT
SH 286 NORTHBOUND EXIT TO GOLLIHAR RD								
0644-6070	RELOCATE SM RD SN SUP&AM TY S80	EA	1	27.744540° (from) 27.744587° (to)	-97.425467° (from) -97.425548° (to)	193	R5-1a	WRONG WAY
		TOTAL	1					
SH 286 NORTHBOUND EXIT TO HORNE RD								
0644-6076	REMOVE SM RD SN SUP&AM	EA	1	27.749048°	-97.422851°	194	R6-1R	ONE WAY (RIGHT)
		TOTAL	1					
SH 286 NORTHBOUND EXIT TO S PORT AVE								
0644-6070	RELOCATE SM RD SN SUP&AM TY S80	EA	1	27.761946° (from) 27.761844° (to)	-97.420322° (from) -97.420318° (to)	195	R1-2	YIELD
		TOTAL	1					
SH 286 NORTHBOUND EXIT TO AGNES ST								
0644-6078	REMOVE SM RD SN SUP&AM (SIGN ONLY)	EA	1	27.783793°	-97.410588°	196	R5-1a	WRONG WAY
		TOTAL	1					
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.784170°	-97.410453°	197	R5-1a	WRONG WAY
		TOTAL	8.75					

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

SMALL SIGN REMOVAL SUMMARY: SH 286 (CSJ 0326-03-106) (CORRIDOR C)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		19

SH 286 (Nueces County): CSJ 0326-03-106 (Corridor C)								
ITEM	**DESCRIPTION**	**UNIT**	**QUANTITY**	**LATITUDE**	**LONGITUDE**	**SIGN NO.**	**SIGN DESIGNATION**	**SIGN CONTENT**
SH 286 SOUTHBOUND EXIT TO MORGAN AVE								
0644-6078	REMOVE SM RD SN SUP&AM (SIGN ONLY)	EA	1	27.786677°	-97.410196°	198	R6-1R	ONE WAY (RIGHT)
0644-6078	REMOVE SM RD SN SUP&AM (SIGN ONLY)	EA	1	27.780178°	-97.411062°	200	R5-1a	WRONG WAY
TOTAL	2							

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

SMALL SIGN REMOVAL SUMMARY: SH 286 (CSJ 0326-03-106) (CORRIDOR C)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254,ETC.	IH 37,ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		20

SH 286 (Nueces County): CSJ 0326-01-066 (Corridor D)								
ITEM	DESCRIPTION	UNIT	QUANTITY	LATITUDE	LONGITUDE	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT
SH 286 NORTHBOUND EXIT TO WEBER RD								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.687622°	-97.454601°	236	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.687607°	-97.454356°	237	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.688080°	-97.454499°	238	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.688095°	-97.454328°	239	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.688107°	-97.454531°	240	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75				R6-1L	ONE WAY (LEFT)
TOTAL	49							
SH 286 NORTHBOUND EXIT TO GREENWOOD DR								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.700248°	-97.449861°	241	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.700367°	-97.449912°	242	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.701091°	-97.449501°	243	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.701084°	-97.449359°	244	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.703781°	-97.448420°	245	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.703741°	-97.448257°	246	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.704552°	-97.448263°	247	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.704498°	-97.448113°	248	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	3	27.704673°	-97.448299°	249	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	3				R6-1L	ONE WAY (LEFT)
TOTAL	77							
SH 286 NORTHBOUND SARATOGA BLVD INTERSECTION								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	3	27.714749°	-97.444046°	250	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	3				R6-1L	ONE WAY (LEFT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.714565°	-97.443937°	251	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.714629°	-97.444089°	252	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.713643°	-97.444745°	253	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.713566°	-97.444578°	254	R5-1a	WRONG WAY
TOTAL	41.5							

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

SMALL SIGN REMOVAL SUMMARY: SH 286 (CSJ 0326-01-066) (CORRIDOR D)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254,ETC.	IH 37,ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		21

CK$
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SH 286 (Nueces County): CSJ 0326-01-066

ITEM	DESCRIPTION	UNIT	QUANTITY	LATITUDE	LONGITUDE	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT
SH 286 SOUTHBOUND EXIT TO HOLLY RD								
0644-6070	RELOCATE SM RD SN SUP&AM TY S80	EA	1	27.730164° (from) 27.730569° (to)	-97.435211° (from) -97.434768° (to)	207	R5-1a	WRONG WAY
TOTAL	1							
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.730569°	-97.434768°	208	R5-1a	WRONG WAY
TOTAL	8.75							
SH 286 SOUTHBOUND EXIT TO GREENWOOD DR								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.710227°	-97.447601°	220	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.709498°	-97.447880°	221	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.709538°	-97.447988°	222	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.705831°	-97.448955°	223	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.705861°	-97.449120°	224	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.705259°	-97.449031°	225	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.705287°	-97.449202°	226	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	3	27.705144°	-97.449009°	227	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	3				R6-1L	ONE WAY (LEFT)
TOTAL	68.25							
SH 286 SOUTHBOUND EXIT TO WEBER RD								
0644-6070	RELOCATE SM RD SN SUP&AM TY S80	EA	1	27.694485° (from) 27.694077° (to)	-97.453079° (from) -97.453309° (to)	228	R5-1a	WRONG WAY
0644-6070	RELOCATE SM RD SN SUP&AM TY S80	EA	1	27.694441° (from) 27.694019° (to)	-97.452960° (from) -97.453147° (to)	229	R5-1a	WRONG WAY
TOTAL	2							
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.694077°	-97.453309°	228a	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.694019°	-97.453147°	229a	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.688877°	-97.455098°	230	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	8.75	27.688942°	-97.455328°	231	R5-1a	WRONG WAY
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.688469°	-97.455216°	232	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.688351°	-97.455436°	233	R5-1	DO NOT ENTER
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75	27.688361°	-97.455187°	234	R6-1R	ONE WAY (RIGHT)
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	6.75				R6-1L	ONE WAY (LEFT)
TOTAL	66.5							
SH 286 SOUTHBOUND EXIT TO UNDIVIDED HIGHWAY								
0636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	9	27.682250°	-97.454738°	235	R5-1	DO NOT ENTER
TOTAL	9							

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

SMALL SIGN REMOVAL SUMMARY: SH 286 (CSJ 0326-01-066) (CORRIDOR D)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254,ETC.	IH 37,ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		22

MAP LOCATION	SIGN NUMBER	SIGN BACK GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS WIDTH (FT)		HEIGHT (FT)	ROUTE SHIELDS, EXIT ONLY PANELS & OTHER ATTACHMENTS: DIRECT APPLY	ROUTE SHIELDS, EXIT ONLY PANELS & OTHER ATTACHMENTS: ALUMINUM (TYPE A)	BACKGROUND SUBSTRATE (SQ FT): GROUND MOUNT (TYPE G)	BACKGROUND SUBSTRATE (SQ FT): OVERHEAD TYPE (O)	ENTER "X" IF OVERHEAD SIGN	COUNTY	TYPE OF MOUNT: WIND ZONE NO.	TYPE OF MOUNT: NO. OF POSTS (1 TO 3)	TYPE OF MOUNT: ALUM/FIBER = 0 ALUMINUM = 1 FIBERGLASS = 3	"X" DIMENSION: POST 1	"X" DIMENSION: POST 2	"X" DIMENSION: POST 3	SIZE	GALVANIZED STRUCTURAL STEEL: LINEAR FEET POST 1	GALVANIZED STRUCTURAL STEEL: LINEAR FEET POST 2	GALVANIZED STRUCTURAL STEEL: LINEAR FEET POST 3	GALVANIZED STRUCTURAL STEEL: TOTAL WEIGHT LBS.	DRILLED SHAFT: LINEAR FEET NON-REINF 12"	DRILLED SHAFT: LINEAR FEET REINFORCED 24"	DRILLED SHAFT: LINEAR FEET REINFORCED 30"	DRILLED SHAFT: LINEAR FEET REINFORCED 36"
	15	RED	WRONG WAY	8	X	4				32.00	X																
			27.720740°, -97.397183°																								
			SH 358-E																								
			SH 358 EB EXIT TO EVERHART RD																								
	16	RED	WRONG WAY	8	X	4				32.00	X																
			27.671735°, -97.289692°																								
			SH 358-E																								
			SH 358 EB EXIT TO NAS DR																								
	17	RED	WRONG WAY	8	X	4				32.00	X																
			27.675681°,-97.299488°																								
			SH 358-W																								
			SH 358 WB EXIT TO OSO																								
			TURNAROUND																								
	18	RED	WRONG WAY	8	X	4				32.00	X																
			27.715738°, -97.386165°																								
			SH 358-W																								
			SH 358-WB EXIT TO WEBER RD																								
PAGE TOTALS										128.00																	

NOTES:

1. LARGE SIGNS ARE TO BE INSTALLED ON THE BACK SIDES OF TRUSSES IDENTIFIED HERE (FACING TRAFFIC THAT WOULD BE TRAVELING IN THE WRONG DIRECTION).

2. REFER TO STANDARDS FOR CONNECTION INFORMATION. ALL CONNECTIONS WILL BE NEW AND ARE SUBSIDIARY TO ITEM 0636-6003.

3. ALL BRACKETS SHALL BE TRIMMED SO THAT THEY DON'T EXTEND ANY FURTHER THAN ALLOWED ACCORDING TO STANDARDS.

LARGE SIGN SUMMARY:
SH 358
(CSJ 0617-01-209)
(CORRIDOR A)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		23

CK: DW: CK: DN:

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

MAP LOCATION	SIGN NUMBER	SIGN BACK GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS			ROUTE SHIELDS, EXIT ONLY PANELS & OTHER ATTACHMENTS		BACKGROUND SUBSTRATE (SQ FT)		ENTER "X" IF OVERHEAD SIGN	COUNTY	TYPE OF MOUNT			"X" DIMENSION				GALVANIZED STRUCTURAL STEEL				DRILLED SHAFT			
																				LINEAR FEET				LINEAR FEET			
				WIDTH (FT)		HEIGHT (FT)	DIRECT APPLY	ALUMINUM (TYPE A)	GROUND MOUNT (TYPE G)	OVERHEAD TYPE (O)			WIND ZONE NO.	NO. OF POSTS (1 TO 3)	ALUM/FIBER = 0 ALUMINUM = 1 FIBERGLASS = 3	POST 1	POST 2	POST 3	SIZE	POST 1	POST 2	POST 3	TOTAL WEIGHT LBS.	NON-REINF 12"	REINFORCED 24"	REINFORCED 30"	REINFORCED 36"
	1	RED	WRONG WAY 27.834562°, -97.547994° IH 37 SB EXIT TO TULOSO RD	8	X	4				32.00	X																
	2	RED	WRONG WAY 27.804258°,-97.475024° IH 37 SB EXIT TO LANTANA RD	8	X	4				32.00	X																
	3	RED	WRONG WAY 27.800251°,-97.467958° IH 37 SB EXIT TO LEOPARD ST	8	X	4				32.00	X																
	4	RED	WRONG WAY 27.834383°, -97.547212° IH 37 NB RAND MORGAN RD OVERPASS	8	X	4				32.00	X																
PAGE TOTALS										128.00									PAGE TOTALS								

NOTES:

1. LARGE SIGNS ARE TO BE INSTALLED ON THE BACK SIDES OF TRUSSES IDENTIFIED HERE (FACING TRAFFIC THAT WOULD BE TRAVELING IN THE WRONG DIRECTION).
2. REFER TO STANDARDS FOR CONNECTION INFORMATION. ALL CONNECTIONS WILL BE NEW AND ARE SUBSIDIARY TO ITEM 0636-6003.
3. ALL BRACKETS SHALL BE TRIMMED SO THAT THEY DON'T EXTEND ANY FURTHER THAN ALLOWED ACCORDING TO STANDARDS.

LARGE SIGN SUMMARY:
IH 37
(CSJ 0074-06-254)
(CORRIDOR B)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		24

CK:
DW:
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DATE: $DATE$ $TIME$
FILE: $FILE$

MAP LOCATION	SIGN NUMBER	SIGN BACK GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS WIDTH (FT)		HEIGHT (FT)	ROUTE SHIELDS, EXIT ONLY PANELS & OTHER ATTACHMENTS: DIRECT APPLY	ROUTE SHIELDS, EXIT ONLY PANELS & OTHER ATTACHMENTS: ALUMINUM (TYPE A)	BACKGROUND SUBSTRATE (SQ FT): GROUND MOUNT (TYPE G)	BACKGROUND SUBSTRATE (SQ FT): OVERHEAD TYPE (O)	ENTER "X" IF OVERHEAD SIGN	COUNTY	TYPE OF MOUNT: WIND ZONE NO.	TYPE OF MOUNT: NO. OF POSTS (1 TO 3)	TYPE OF MOUNT: ALUM/FIBER = 0 ALUMINUM = 1 FIBERGLASS = 3	"X" DIMENSION: POST 1	"X" DIMENSION: POST 2	"X" DIMENSION: POST 3	SIZE	GALVANIZED STRUCTURAL STEEL: LINEAR FEET POST 1	GALVANIZED STRUCTURAL STEEL: LINEAR FEET POST 2	GALVANIZED STRUCTURAL STEEL: LINEAR FEET POST 3	GALVANIZED STRUCTURAL STEEL: TOTAL WEIGHT LBS.	DRILLED SHAFT: LINEAR FEET NON-REINF 12"	DRILLED SHAFT: LINEAR FEET REINFORCED 24"	DRILLED SHAFT: LINEAR FEET REINFORCED 30"	DRILLED SHAFT: LINEAR FEET REINFORCED 36"
	9	RED	WRONG WAY	8	X	4				32.00	X																
			27.743787°, -97.426225°																								
			SH 286-N																								
			SH 286 NB EXIT TO GOLLIHAR RD																								
	10	RED	WRONG WAY	8	X	4				32.00	X																
			27.783376°, -97.410797°																								
			SH 286-N																								
			SH 286 NB EXIT TO AGNES ST																								
	11	RED	WRONG WAY	8	X	4				32.00	X																
			27.781049°,-97.410899°																								
			SH 286-N																								
			SH 286 SB EXIT TO MORGAN AVE																								
	12	RED	WRONG WAY	8	X	4				32.00	X																
			27.740820°, -97.428411°																								
			SH 286-N																								
			SH 286 SB EXIT TO KOSTORYZ RD																								
	13	RED	WRONG WAY	8	X	4				32.00	X																
			27.740876°, -97.428513°																								
			SH 286-N																								
			SH 286 SB EXIT TO GREENWOOD DR																								
	14	RED	WRONG WAY	8	X	4				32.00	X																
			27.740502°, -97.436960°																								
			SH 286-N																								
			SH 286 SB EXIT TO GREENWOOD DR																								
			PAGE TOTALS							192.00									PAGE			TOTALS					

NOTES:

1. LARGE SIGNS ARE TO BE INSTALLED ON THE BACK SIDES OF TRUSSES IDENTIFIED HERE (FACING TRAFFIC THAT WOULD BE TRAVELING IN THE WRONG DIRECTION).
2. REFER TO STANDARDS FOR CONNECTION INFORMATION. ALL CONNECTIONS WILL BE NEW AND ARE SUBSIDIARY TO ITEM 0636-6003.
3. ALL BRACKETS SHALL BE TRIMMED SO THAT THEY DON'T EXTEND ANY FURTHER THAN ALLOWED ACCORDING TO STANDARDS.

LARGE SIGN SUMMARY:
SH 286
(CSJ 0326-03-106)
(CORRIDOR C)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		25

CK: DW: CK: DN:

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

MAP LOCATION	SIGN NUMBER	SIGN BACK GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS WIDTH (FT)		HEIGHT (FT)	ROUTE SHIELDS, EXIT ONLY PANELS & OTHER ATTACHMENTS: DIRECT APPLY	ROUTE SHIELDS, EXIT ONLY PANELS & OTHER ATTACHMENTS: ALUMINUM (TYPE A)	BACKGROUND SUBSTRATE (SQ FT): GROUND MOUNT (TYPE G)	BACKGROUND SUBSTRATE (SQ FT): OVERHEAD TYPE (O)	ENTER "X" IF OVERHEAD SIGN	COUNTY	TYPE OF MOUNT: WIND ZONE NO.	TYPE OF MOUNT: NO. OF POSTS (1 TO 3)	TYPE OF MOUNT: ALUM/FIBER = 0 ALUMINUM = 1 FIBERGLASS = 3	"X" DIMENSION: POST 1	"X" DIMENSION: POST 2	"X" DIMENSION: POST 3	SIZE	GALVANIZED STRUCTURAL STEEL: LINEAR FEET POST 1	GALVANIZED STRUCTURAL STEEL: LINEAR FEET POST 2	GALVANIZED STRUCTURAL STEEL: LINEAR FEET POST 3	GALVANIZED STRUCTURAL STEEL: TOTAL WEIGHT LBS.	DRILLED SHAFT: LINEAR FEET NON-REINF 12"	DRILLED SHAFT: LINEAR FEET REINFORCED 24"	DRILLED SHAFT: LINEAR FEET REINFORCED 30"	DRILLED SHAFT: LINEAR FEET REINFORCED 36"
	5	RED	WRONG WAY	8	X	4				32.00	X																
			27.731090°, -97.434322°																								
			SH 286-S																								
			SH 286 SB EXIT TO HOLLY RD																								
	6	RED	WRONG WAY	8	X	4				32.00	X																
			27.695387°, -97.452470°																								
			SH 286-S																								
			SH 286 SB EXIT TO WEBER RD																								
	7	RED	WRONG WAY	8	X	4				32.00	X																
			27.716238°,-97.443334°																								
			SH286-S																								
			SH 286 NB EXIT TO HOLLY RD																								
	8	RED	WRONG WAY	8	X	4				32.00	X																
			27.733575°, -97.423506°																								
			SH 286-S																								
			SH 286 NB EXIT TO KOSTORYZ RD																								
PAGE TOTALS										128.00									PAGE		TOTALS						

NOTES:

1. LARGE SIGNS ARE TO BE INSTALLED ON THE BACK SIDES OF TRUSSES IDENTIFIED HERE (FACING TRAFFIC THAT WOULD BE TRAVELING IN THE WRONG DIRECTION).
2. REFER TO STANDARDS FOR CONNECTION INFORMATION. ALL CONNECTIONS WILL BE NEW AND ARE SUBSIDIARY TO ITEM 0636-6003.
3. ALL BRACKETS SHALL BE TRIMMED SO THAT THEY DON'T EXTEND ANY FURTHER THAN ALLOWED ACCORDING TO STANDARDS.

LARGE SIGN SUMMARY:
SH 286
(CSJ 0326-01-066)
(CORRIDOR D)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		26

CK: DW: CK: DN:

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

CK$ DW$ CK$ DN$

SUMMARY OF SMALL SIGNS									SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX)					BRIDGE MOUNT CLEARANCE SIGNS
									Post Type		Anchor Type	Mounting Designation		
Latitude	Longitude	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS	ALUMINUM TYPE A	ALUMINUM TYPE G	ALUMINUM TYPE O	FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sched 80	Posts (1 or 2)	UA = Univer-Conc UB = Univer-Bolt SA = Slip-Conc SB = Slip-Bolt WS = Wedge Steel WP = Wedge Plstic	P = Prefb. "Plain" T = Prefab. "T" U = Prefab. "U"	1EXT or 2EXT = # of Ext. BM = Extruded Beam WC = 1.12 #/ft Wing Chan. EXAL = Extruded Alum. Signs	TY N = Type N TY S = Type S
SH 358 EASTBOUND EXIT TO EVERHART RD														
27.720672°	-97.397278°	290	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.719934°	-97.395706°	291	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.719731°	-97.395323°	292	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.719578°	-97.394827°	293	R5-1a	WRONG WAY	42" X 30"	X			WRONG WAY NOTIFICATION ASSEMBLY--PAY AS PED POLE ASSEMBLY. THIS IS A COMPONENT OF THE DETECTION SYSTEM FOR THIS RAMP. LOCATIONS 260 AND 261 ARE ALSO PAID FOR UNDER FORCE ACCOUNT AND LED WWDS (INSTALL ONLY)(THERMAL).					
27.719315°	-97.394308°	294	THIS ASSEMBLY ONLY HOLDS SOLAR PANELS TO SUPPORT LOCATION 261.											
27.719313°	-97.394279°	295	R5-1a	WRONG WAY	42" X 30"	X								
27.719120°	-97.393878°	296	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P (MUST ALSO PAY FOR THE LED SIGN UNDER ITEM 6227-6002)		
27.719054°	-97.393763°	297	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.718699°	-97.393032°	298	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.718555°	-97.392737°	299	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.718315°	-97.392261°	300	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.717655°	-97.390873°	301	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.717456°	-97.390443°	302	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.717219°	-97.389986°	303	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.716951°	-97.389387°	304	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.716559°	-97.388773°	305	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.716473°	-97.388589°	306	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.716268°	-97.388164°	307	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.715907°	-97.387399°	308	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.715663°	-97.386887°	309	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.715167°	-97.385752°	310	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.714875°	-97.385192°	311	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.714821°	-97.385085°	312	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
SH 358 EASTBOUND EXIT TO STAPLES ST														
27.714076°	-97.383684°	313	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.713632°	-97.382763°	314	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.713363°	-97.382228°	315	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.713440°	-97.382166°	316	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.713360°	-97.382209°	317	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.713322°	-97.381942°	318	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
27.712900°	-97.381153°	319	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.712555°	-97.380448°	320	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.712091°	-97.379512°	321	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.711749°	-97.378811°	322	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.711405°	-97.378124°	323	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.710891°	-97.377238°	324	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.710706°	-97.376867°	325	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.710625°	-97.376700°	326	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.709858°	-97.375063°	328	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.709547°	-97.374438°	329	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.709036°	-97.373415°	330	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.708666°	-97.372659°	331	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.708019°	-97.371405°	332	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.707777°	-97.370970°	333	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.707697°	-97.370804°	334	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		

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

SUMMARY OF SMALL SIGNS: SH 358 (CSJ 0617-01-209) (CORRIDOR A)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		27

SUMMARY OF SMALL SIGNS									SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX)					BRIDGE MOUNT CLEARANCE SIGNS
									Post Type		Anchor Type	Mounting Designation		
Latitude	Longitude	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS	ALUMINUM TYPE A	ALUMINUM TYPE G	ALUMINUM TYPE O	FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sched 80	Posts (1 or 2)	UA = Univer-Conc UB = Univer-Bolt SA = Slip-Conc SB = Slip-Bolt WS = Wedge Steel WP = Wedge Plstic	P = Prefb. "Plain" T = Prefab. "T" U = Prefab. "U"	1EXT or 2EXT = # of Ext. BM = Extruded Beam WC = 1.12 #/ft Wing Chan. EXAL = Extruded Alum. Signs	TY N = Type N TY S = Type S
SH 358 EASTBOUND EXIT TO RODD FIELD RD														
27.695584°	-97.346433°	335	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.695018°	-97.345295°	336	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.694924°	-97.345111°	337	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.694726°	-97.344419°	338	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.694460°	-97.343997°	339	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
27.694397°	-97.344060°	340	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
27.693710°	-97.342614°	341	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
SH 358 EASTBOUND EXIT TO ENNIS JOSLIN RD														
27.689392°	-97.332753°	342	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
27.688360°	-97.330718°	343	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
SH 358 EASTBOUND PAUL JONES AVE INTERSECTION														
27.686170°	-97.325595°	344	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.685929°	-97.325079°	345	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
SH 358 EASTBOUND EXIT TO FLOUR BLUFF DR														
27.677163°	-97.307056°	346	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.677078°	-97.307122°	347	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.677020°	-97.306805°	348	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
27.676961°	-97.306843°	349	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
27.676326°	-97.304804°	350	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.675850°	-97.302878°	351	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.674651°	-97.297246°	352	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
27.674765°	-97.297127°	353	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
27.674878°	-97.297049°	354	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
			R6-1L	ONE WAY (LEFT)	54" X 18"	X								
SH 358 EASTBOUND EXIT TO FRONTAGE RD														
27.674669°	-97.296496°	355	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.674502°	-97.295950°	356	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.674296°	-97.295338°	357	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.673694°	-97.293964°	358	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.673513°	-97.293606°	359	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.673341°	-97.293258°	360	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.673288°	-97.293122°	361	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.673147°	-97.292859°	362	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
27.672579°	-97.291960°	363	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.671828°	-97.290179°	364	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.671526°	-97.289672°	365	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.671220°	-97.289149°	366	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.670879°	-97.288483°	367	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.670694°	-97.288101°	368	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.670635°	-97.287988°	369	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		

CK:
DW:
CK:
DN:

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

SUMMARY OF SMALL SIGNS: SH 358 (CSJ 0617-01-209) (CORRIDOR A)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		28

SUMMARY OF SMALL SIGNS									SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX)					BRIDGE MOUNT CLEARANCE SIGNS
									Post Type		Anchor Type	Mounting Designation		
Latitude	Longitude	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS	ALUMINUM TYPE A	ALUMINUM TYPE G	ALUMINUM TYPE O	FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sched 80	Posts (1 or 2)	UA = Univer-Conc UB = Univer-Bolt SA = Slip-Conc SB = Slip-Bolt WS = Wedge Steel WP = Wedge Plstic	P = Prefb. "Plain" T = Prefab. "T" U = Prefab. "U"	1EXT or 2EXT = # of Ext. BM = Extruded Beam WC = 1.12 #/ft Wing Chan. EXAL = Extruded Alum. Signs	TY N = Type N TY S = Type S
SH 358 EASTBOUND EXIT TO WALRON RD														
27.669712°	-97.286031°	370	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.669567°	-97.285453°	371	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.669493°	-97.285406°	372	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.669419°	-97.285175°	373	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
27.668973°	-97.283883°	374	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.668796°	-97.283815°	375	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.668420°	-97.282608°	376	R6-1L	ONE WAY (LEFT)	54" X 18"	X			S80	1	SA	T		
27.668403°	-97.282622°	377	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
SH 358 EASTBOUND EXIT TO NAS DR														
27.670351°	-97.284214°	378	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.670887°	-97.282769°	379	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.671001°	-97.282467°	380	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.671167°	-97.282086°	381	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.671245°	-97.281760°	382	R5-1a	WRONG WAY	42" X 30"	X			WRONG WAY NOTIFICATION ASSEMBLY--PAY AS PED POLE ASSEMBLY. THIS IS A COMPONENT OF THE DETECTION SYSTEM FOR THIS RAMP. LOCATIONS 260 AND 261 ARE ALSO PAID FOR UNDER FORCE ACCOUNT AND LED WWDS (INSTALL ONLY)(THERMAL).				
27.671554°	-97.281292°	383	THIS ASSEMBLY ONLY HOLDS SOLAR PANELS TO SUPPORT LOCATION 261.											
27.671570°	-97.281267°	384	R5-1a	WRONG WAY	42" X 30"	X								
27.671532°	-97.281423°	385	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.671802°	-97.281025°	386	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.671805°	-97.280917°	387	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P (MUST ALSO PAY FOR THE LED SIGN UNDER ITEM 6227-6002)		

CK:
DW:
CK:
DN:

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

SUMMARY OF SMALL SIGNS: SH 358 (CSJ 0617-01-209) (CORRIDOR A)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37,ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		29

CK:
DW:
CK:
DN:

SUMMARY OF SMALL SIGNS									SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX)					BRIDGE MOUNT CLEARANCE SIGNS
									Post Type		Anchor Type	Mounting Designation		
Latitude	Longitude	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS	ALUMINUM TYPE A	ALUMINUM TYPE G	ALUMINUM TYPE O	FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sched 80	Posts (1 or 2)	UA = Univer-Conc UB = Univer-Bolt SA = Slip-Conc SB = Slip-Bolt WS = Wedge Steel WP = Wedge Plstic	P = Prefb. "Plain" T = Prefab. "T" U = Prefab. "U"	1EXT or 2EXT = # of Ext. BM = Extruded Beam WC = 1.12 #/ft Wing Chan. EXAL = Extruded Alum. Signs	TY N = Type N TY S = Type S
SH 358 WESTBOUND EXIT TO FLOUR BLUFF DR														
27.670733°	-97.286332°	388	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
27.670836°	-97.286247°	389	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
27.671368°	-97.288187°	390	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.671550°	-97.288557°	391	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.671720°	-97.288925°	392	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.672721°	-97.291042°	393	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.672882°	-97.291409°	394	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.673162°	-97.291947°	395	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.673513°	-97.292333°	396	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.673678°	-97.292890°	397	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.673780°	-97.293173°	398	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.674244°	-97.294107°	399	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.674445°	-97.294481°	400	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.674544°	-97.294692°	401	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.674673°	-97.294998°	402	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.674829°	-97.295332°	403	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.675040°	-97.295930°	404	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.675106°	-97.296107°	405	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.675268°	-97.296464°	406	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
27.675421°	-97.296499°	407	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
SH 358 WESTBOUND EXIT TO OSO TURNAROUND														
27.675573°	-97.297030°	408	R6-1L	ONE WAY (LEFT)	54" X 18"	X			S80	1	SA	T		
27.675513°	-97.297300°	409	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.675925°	-97.300160°	410	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.675988°	-97.301407°	411	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.676094°	-97.301692°	412	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.676516°	-97.303918°	413	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
SH 358 WESTBOUND EXIT TO PAUL JONES RD														
27.683261°	-97.318616°	414	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.683400°	-97.318893°	415	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
SH 358 WESTBOUND EXIT TO ENNIS JOSLIN RD														
27.687143°	-97.326635°	416	R5-1a	WRONG WAY	42" X 30"	X			WRONG WAY NOTIFICATION ASSEMBLY--PAY AS PED POLE ASSEMBLY. THIS IS A COMPONENT OF THE DETECTION SYSTEM FOR THIS RAMP. LOCATIONS 260 AND 261 ARE ALSO PAID FOR UNDER FORCE ACCOUNT AND LED WWDS (INSTALL ONLY)(THERMAL).					
27.687429°	-97.327206°	417	THIS ASSEMBLY ONLY HOLDS SOLAR PANELS TO SUPPORT LOCATION 261.											
27.687440°	-97.327234°	418	R5-1a	WRONG WAY	42" X 30"	X								
27.687363°	-97.327281°	419	R5-1a	WRONG WAY	42" X 30"	X			PAY AS ITEM 0636-6001					
27.687513°	-97.327559°	420	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P (MUST ALSO PAY FOR THE LED SIGN UNDER ITEM 6227-6002)		
27.687678°	-97.327461°	421	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P (MUST ALSO PAY FOR THE LED SIGN UNDER ITEM 6227-6002)		
27.688178°	-97.328873°	422	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.688387°	-97.329436°	423	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		

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

SUMMARY OF SMALL SIGNS: SH 358
(CSJ 0617-01-209)
(CORRIDOR A)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		30

CK$ DW$ CK$ DN$

SUMMARY OF SMALL SIGNS									SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX)					BRIDGE MOUNT CLEARANCE SIGNS
									Post Type		Anchor Type	Mounting Designation		
Latitude	Longitude	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS	ALUMINUM TYPE A	ALUMINUM TYPE G	ALUMINUM TYPE O	FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sched 80	Posts (1 or 2)	UA = Univer-Conc UB = Univer-Bolt SA = Slip-Conc SB = Slip-Bolt WS = Wedge Steel WP = Wedge Plstic	P = Prefb. "Plain" T = Prefab. "T" U = Prefab. "U"	1EXT or 2EXT = # of Ext. BM = Extruded Beam WC = 1.12 #/ft Wing Chan. EXAL = Extruded Alum. Signs	TY N = Type N TY S = Type S
SH 358 WESTBOUND EXIT TO RODD FIELD RD														
27.689305°	-97.331394°	424	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.690406°	-97.334026°	425	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.690916°	-97.335159°	426	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.692581°	-97.338646°	427	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.693027°	-97.339891°	428	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.693299°	-97.340543°	429	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.693411°	-97.340802°	430	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
SH 358 WESTBOUND EXIT TO NILE DR														
27.694202°	-97.342314°	431	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.694437°	-97.342821°	432	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.694559°	-97.343131°	433	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.694974°	-97.343583°	434	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.695077°	-97.343797°	435	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.695709°	-97.345364°	436	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.696260°	-97.346587°	437	R6-1L	ONE WAY (LEFT)	54" X 18"	X			S80	1	SA	T		
SH 358 WESTBOUND EXIT TO STAPLES ST														
27.705146°	-97.364488°	438	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.705361°	-97.364934°	439	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.705366°	-97.365145°	440	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.705433°	-97.365101°	441	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.705468°	-97.365307°	442	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
27.705526°	-97.365272°	443	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
27.706097°	-97.366515°	444	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.706768°	-97.367796°	445	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.707066°	-97.368375°	446	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.707410°	-97.369201°	447	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
SH 358 WESTBOUND EXIT TO EVERHART RD														
27.708596°	-97.371514°	448	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.709482°	-97.373274°	449	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.709982°	-97.374432°	450	R5-1a	WRONG WAY	42" X 30"	X			PAY AS ITEM 0636-6001					
27.710128°	-97.374334°	451	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.710313°	-97.374698°	452	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
27.710331°	-97.375038°	453	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.710863°	-97.376078°	454	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.711181°	-97.376726°	455	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.711282°	-97.376951°	456	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.713281°	-97.380876°	457	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.713525°	-97.381374°	458	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.713762°	-97.381867°	459	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.714497°	-97.383463°	460	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.714591°	-97.383638°	461	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.714977°	-97.383958°	462	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
27.715150°	-97.383880°	463	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		

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

SUMMARY OF SMALL SIGNS: SH 358 (CSJ 0617-01-209) (CORRIDOR A)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		31

CK$
DW$
CK$
DN$

SUMMARY OF SMALL SIGNS									SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX)					BRIDGE MOUNT CLEARANCE SIGNS
									Post Type		Anchor Type	Mounting Designation		
Latitude	Longitude	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS	ALUMINUM TYPE A	ALUMINUM TYPE G	ALUMINUM TYPE O	FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sched 80	Posts (1 or 2)	UA = Univer-Conc UB = Univer-Bolt SA = Slip-Conc SB = Slip-Bolt WS = Wedge Steel WP = Wedge Plstic	P = Prefb. "Plain" T = Prefab. "T" U = Prefab. "U"	1EXT or 2EXT = # of Ext. BM = Extruded Beam WC = 1.12 #/ft Wing Chan. EXAL = Extruded Alum. Signs	TY N = Type N TY S = Type S
SH 358 WESTBOUND EXIT TO WEBER RD														
27.715594°	-97.385603°	464	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.716198°	-97.386842°	465	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.716075°	-97.386638°	466	R5-1a	WRONG WAY	42" X 30"	X			WRONG WAY NOTIFICATION ASSEMBLY--PAY AS PED POLE ASSEMBLY. THIS IS A COMPONENT OF THE DETECTION SYSTEM FOR THIS RAMP. LOCATIONS 260 AND 261 ARE ALSO PAID FOR UNDER FORCE ACCOUNT AND LED WWDS (INSTALL ONLY)(THERMAL).					
27.716347°	-97.387140°	467	THIS ASSEMBLY ONLY HOLDS SOLAR PANELS TO SUPPORT LOCATION 261.											
27.716354°	-97.387163°	468	R5-1a	WRONG WAY	42" X 30"	X								
27.716705°	-97.388032°	469	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P (MUST ALSO PAY FOR THE LED SIGN UNDER ITEM 6227-6002)		
27.716788°	-97.388150°	470	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.717343°	-97.389274°	471	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.719126°	-97.392969°	472	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.719374°	-97.393489°	473	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.720004°	-97.394727°	474	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.721258°	-97.397427°	475	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.721899°	-97.398264°	476	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
27.722024°	-97.398244°	477	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		

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

SUMMARY OF SMALL SIGNS: SH 358 (CSJ 0617-01-209) (CORRIDOR A)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		32

CK:
DW:
CK:
DN:

SUMMARY OF SMALL SIGNS									SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX)					BRIDGE MOUNT CLEARANCE SIGNS
									Post Type		Anchor Type	Mounting Designation		
Latitude	Longitude	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS	ALUMINUM TYPE A	ALUMINUM TYPE G	ALUMINUM TYPE O	FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sched 80	Posts (1 or 2)	UA = Univer-Conc UB = Univer-Bolt SA = Slip-Conc SB = Slip-Bolt WS = Wedge Steel WP = Wedge Plstic	P = Prefb. "Plain" T = Prefab. "T" U = Prefab. "U"	1EXT or 2EXT = # of Ext. BM = Extruded Beam WC = 1.12 #/ft Wing Chan. EXAL = Extruded Alum. Signs	TY N = Type N TY S = Type S
IH 37 NORTHBOUND EXIT TO VALERO WAY														
27.804163°	-97.471724°	478	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P (MUST ALSO PAY FOR THE LED SIGN UNDER ITEM 6227-6002)		
27.804457°	-97.473222°	479	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P (MUST ALSO PAY FOR THE LED SIGN UNDER ITEM 6227-6002)		
27.805294°	-97.483168°	480	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.805387°	-97.483141°	481	R5-1a	WRONG WAY	42" X 30"	X			WRONG WAY NOTIFICATION ASSEMBLY--PAY AS PED POLE ASSEMBLY. THIS IS A COMPONENT OF THE DETECTION SYSTEM FOR THIS RAMP. LOCATIONS 260 AND 261 ARE ALSO PAID FOR UNDER FORCE ACCOUNT AND LED WWDS (INSTALL ONLY)(THERMAL).				
27.805521°	-97.483715°	482	THIS ASSEMBLY ONLY HOLDS SOLAR PANELS TO SUPPORT LOCATION 261.											
27.805520°	-97.483751°	483	R5-1a	WRONG WAY	42" X 30"	X								
27.805505°	-97.484400°	484	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
IH 37 NORTHBOUND EXIT TO SOUTHERN MINERALS RD														
27.807801°	-97.494217°	485	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.808196°	-97.495043°	486	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
27.809186°	-97.497316°	487	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.811275°	-97.502311°	488	W1-6R	LARGE ONE DIRECTION ARROW (RIGHT)	48" X 24"	X			S80	1	SA	T		
IH 37 NORTHBOUND EXIT TO SUNTIDE RD														
27.815894°	-97.510621°	489	R6-1R	ONE WAY (RIGHT)	54" X 18"	X						T		
27.821747°	-97.519541°	490	R6-1R	ONE WAY (RIGHT)	54" X 18"	X						T		
IH 37 NORTHBOUND TULOSO RD INTERSECTION														
27.823309°	-97.523852°	491	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
			R6-1L	ONE WAY (LEFT)	54" X 18"	X								
IH 37 NORTHBOUND TULOSO RN CLARKWOOD RD INTERSECTION														
27.824923°	-97.528475°	492	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.825029°	-97.528823°	493	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.826032°	-97.531586°	494	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.828039°	-97.535842°	495	R1-2	YIELD	48"X48"X48"	X			S80	1	SA	P	BM	
IH 37 NORTHBOUND EXIT TO RAND MORGAN RD														
27.828553°	-97.536974°	496	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.828886°	-97.537530°	497	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.829360°	-97.538347°	498	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.829580°	-97.538718°	499	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.830463°	-97.540215°	500	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.830733°	-97.540715°	501	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.832364°	-97.543591°	502	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.832438°	-97.543529°	503	R5-1a	WRONG WAY	42" X 30"	X			WRONG WAY NOTIFICATION ASSEMBLY--PAY AS PED POLE ASSEMBLY. THIS IS A COMPONENT OF THE DETECTION SYSTEM FOR THIS RAMP. LOCATIONS 260 AND 261 ARE ALSO PAID FOR UNDER FORCE ACCOUNT AND LED WWDS (INSTALL ONLY)(THERMAL).				
27.832762°	-97.543978°	504	THIS ASSEMBLY ONLY HOLDS SOLAR PANELS TO SUPPORT LOCATION 261.											
27.832770°	-97.544013°	505	R5-1a	WRONG WAY	42" X 30"	X								

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

SUMMARY OF SMALL SIGNS: IH 37 (CSJ 0074-06-254) (CORRIDOR B)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		33

SUMMARY OF SMALL SIGNS									SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX)					BRIDGE MOUNT CLEARANCE SIGNS
									Post Type		Anchor Type	Mounting Designation		
Latitude	Longitude	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS	ALUMINUM TYPE A	ALUMINUM TYPE G	ALUMINUM TYPE O	FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sched 80	Posts (1 or 2)	UA = Univer-Conc UB = Univer-Bolt SA = Slip-Conc SB = Slip-Bolt WS = Wedge Steel WP = Wedge Plstic	P = Prefb. "Plain" T = Prefab. "T" U = Prefab. "U"	1EXT or 2EXT = # of Ext. BM = Extruded Beam WC = 1.12 #/ft Wing Chan. EXAL = Extruded Alum. Signs	TY N = Type N TY S = Type S
IH 37 NORTHBOUND EXIT TO RAND MORGAN RD														
27.832697°	-97.544077°	506	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.833022°	-97.544087°	507	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P (MUST ALSO PAY FOR THE LED SIGN UNDER ITEM 6227-6002)		
27.833101°	-97.544281°	508	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P (MUST ALSO PAY FOR THE LED SIGN UNDER ITEM 6227-6002)		

CK:
DW:
CK:
DN:

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

SUMMARY OF SMALL SIGNS: IH 37 (CSJ 0074-06-254) (CORRIDOR B)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		34

SUMMARY OF SMALL SIGNS									SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX)					BRIDGE MOUNT CLEARANCE SIGNS
									Post Type		Anchor Type	Mounting Designation		
Latitude	Longitude	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS	ALUMINUM TYPE A	ALUMINUM TYPE G	ALUMINUM TYPE O	FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sched 80	Posts (1 or 2)	UA = Univer-Conc UB = Univer-Bolt SA = Slip-Conc SB = Slip-Bolt WS = Wedge Steel WP = Wedge Plstic	P = Prefb. "Plain" T = Prefab. "T" U = Prefab. "U"	1EXT or 2EXT = # of Ext. BM = Extruded Beam WC = 1.12 #/ft Wing Chan. EXAL = Extruded Alum. Signs	TY N = Type N TY S = Type S
IH 37 SOUTHBOUND N CLARKWOOD RD INTERSECTION														
27.833732°	-97.547123°	509	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.833600°	-97.546866°	510	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.833124°	-97.545880°	511	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.827365°	-97.536264°	512	R1-2	YIELD	48"X48"X48"	X			S80	1	SA	P	BM	
IH 37 SOUTHBOUND EXIT TO TULOSO RD														
27.825993°	-97.533140°	513	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.823937°	-97.527381°	514	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.823631°	-97.526860°	515	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.823847°	-97.527435°	517	R5-1a	WRONG WAY	42" X 30"	X			WRONG WAY NOTIFICATION ASSEMBLY--PAY AS PED POLE ASSEMBLY. THIS IS A COMPONENT OF THE DETECTION SYSTEM FOR THIS RAMP. LOCATIONS 260 AND 261 ARE ALSO PAID FOR UNDER FORCE ACCOUNT AND LED WWDS (INSTALL ONLY)(THERMAL).					
27.823551°	-97.526962°	518	THIS ASSEMBLY ONLY HOLDS SOLAR PANELS TO SUPPORT LOCATION 261.											
27.823541°	-97.526921°	519	R5-1a	WRONG WAY	42" X 30"	X								
27.822568°	-97.524434°	520	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.822473°	-97.524479°	521	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.822526°	-97.524064°	522	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P (MUST ALSO PAY FOR THE LED SIGN UNDER ITEM 6227-6002)		
27.822258°	-97.524047°	523	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P (MUST ALSO PAY FOR THE LED SIGN UNDER ITEM 6227-6002)		
IH 37 SOUTHBOUND SUNTIDE RD INTERSECTION														
27.822275°	-97.523860°	524	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
			R6-1L	ONE WAY (LEFT)	54" X 18"	X								
27.821050°	-97.520370°	525	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	T		
IH 37 SOUTHBOUND EXIT TO SOUTHERN MINERALS RD														
27.819627°	-97.517607°	526	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.817721°	-97.514387°	527	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.817590°	-97.514236°	528	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.817512°	-97.514296°	529	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.817427°	-97.513990°	530	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
27.817351°	-97.514061°	531	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
27.811458°	-97.504031°	532	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.811226°	-97.503703°	533	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
IH 37 SOUTHBOUND EXIT TO CORN PRODUCTS RD														
27.810314°	-97.501256°	534	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.809926°	-97.500348°	535	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.808417°	-97.497103°	536	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.807690°	-97.495424°	537	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.805232°	-97.488166°	538	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.805050°	-97.487249°	539	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.804732°	-97.485520°	540	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.804624°	-97.485549°	541	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.804715°	-97.485410°	542	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.804641°	-97.485037°	543	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.804327°	-97.484633°	544	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		

SUMMARY OF SMALL SIGNS: IH 37 (CSJ 0074-06-254) (CORRIDOR B)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		35

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

CK$ DW$ CK$ DN$

SUMMARY OF SMALL SIGNS									SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX)					BRIDGE MOUNT CLEARANCE SIGNS
									Post Type		Anchor Type	Mounting Designation		
Latitude	Longitude	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS	ALUMINUM TYPE A	ALUMINUM TYPE G	ALUMINUM TYPE O	FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sched 80	Posts (1 or 2)	UA = Univer-Conc UB = Univer-Bolt SA = Slip-Conc SB = Slip-Bolt WS = Wedge Steel WP = Wedge Plstic	P = Prefb. "Plain" T = Prefab. "T" U = Prefab. "U"	1EXT or 2EXT = # of Ext. BM = Extruded Beam WC = 1.12 #/ft Wing Chan. EXAL = Extruded Alum. Signs	TY N = Type N TY S = Type S
IH 37 SOUTHBOUND EXIT TO LANTANA RD														
27.803806°	-97.471314°	545	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.803726°	-97.470748°	546	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.803707°	-97.471329°	547	R5-1a	WRONG WAY	42" X 30"	X			WRONG WAY NOTIFICATION ASSEMBLY--PAY AS PED POLE ASSEMBLY. THIS IS A COMPONENT OF THE DETECTION SYSTEM FOR THIS RAMP. LOCATIONS 260 AND 261 ARE ALSO PAID FOR UNDER FORCE ACCOUNT AND LED WWDS (INSTALL ONLY)(THERMAL).				
27.803630°	-97.470746°	548	THIS ASSEMBLY ONLY HOLDS SOLAR PANELS TO SUPPORT LOCATION 261.											
27.803631°	-97.470712°	549	R5-1a	WRONG WAY	42" X 30"	X								
27.803584°	-97.470406°	550	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
IH 37 SOUTHBOUND EXIT TO LEOPARD ST														
27.801629°	-97.467964°	551	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	P (MUST ALSO PAY FOR THE LED SIGN UNDER ITEM 6227-6002)		
27.802048°	-97.468100°	552	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	P (MUST ALSO PAY FOR THE LED SIGN UNDER ITEM 6227-6002)		
27.801625°	-97.468183°	553	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	P (MUST ALSO PAY FOR THE LED SIGN UNDER ITEM 6227-6002)		
27.800115°	-97.468190°	554	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.798722°	-97.468232°	555	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
27.798171°	-97.468223°	556	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		

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

SUMMARY OF SMALL SIGNS: IH 37 (CSJ 0074-06-254) (CORRIDOR B)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		36

SUMMARY OF SMALL SIGNS									SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX)					BRIDGE MOUNT CLEARANCE SIGNS
									Post Type		Anchor Type	Mounting Designation		
Latitude	Longitude	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS	ALUMINUM TYPE A	ALUMINUM TYPE G	ALUMINUM TYPE O	FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sched 80	Posts (1 or 2)	UA = Univer-Conc UB = Univer-Bolt SA = Slip-Conc SB = Slip-Bolt WS = Wedge Steel WP = Wedge Plstic	P = Prefb. "Plain" T = Prefab. "T" U = Prefab. "U"	1EXT or 2EXT = # of Ext. BM = Extruded Beam WC = 1.12 #/ft Wing Chan. EXAL = Extruded Alum. Signs	TY N = Type N TY S = Type S
SH 286 NORTHBOUND EXIT TO GOLLIHAR RD														
27.744497°	-97.425503°	270	R5-1a	WRONG WAY	42" X 30"	X			WRONG WAY NOTIFICATION ASSEMBLY--PAY AS PED POLE ASSEMBLY. THIS IS A COMPONENT OF THE DETECTION SYSTEM FOR THIS RAMP. LOCATIONS 260 AND 261 ARE ALSO PAID FOR UNDER FORCE ACCOUNT AND LED WWDS (INSTALL ONLY)(THERMAL).					
27.744876°	-97.425206°	271	THIS ASSEMBLY ONLY HOLDS SOLAR PANELS TO SUPPORT LOCATION 261.											
27.744896°	-97.425199°	272	R5-1a	WRONG WAY	42" X 30"	X								
27.744942°	-97.425274°	273	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.745394°	-97.424933°	274	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P (MUST ALSO PAY FOR THE LED SIGN UNDER ITEM 6227-6002)		
SH 286 NORTHBOUND EXIT TO HORNE RD														
27.747118°	-97.423856°	275	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
SH 286 NORTHBOUND EXIT TO S PORT AVE														
27.759366°	-97.421492°	276	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.761939°	-97.420311°	277	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
SH 286 NORTHBOUND EXIT TO AGNES ST														
27.783625°	-97.410565°	278	R5-1a	WRONG WAY	42" X 30"	X			WRONG WAY NOTIFICATION ASSEMBLY--PAY AS PED POLE ASSEMBLY. THIS IS A COMPONENT OF THE DETECTION SYSTEM FOR THIS RAMP. LOCATIONS 260 AND 261 ARE ALSO PAID FOR UNDER FORCE ACCOUNT AND LED WWDS (INSTALL ONLY)(THERMAL).					
27.784125°	-97.410374°	279	THIS ASSEMBLY ONLY HOLDS SOLAR PANELS TO SUPPORT LOCATION 261.											
27.784169°	-97.410369°	280	R5-1a	WRONG WAY	42" X 30"	X								
27.783793°	-97.410588°	281	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.784694°	-97.410270°	282	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P (MUST ALSO PAY FOR THE LED SIGN UNDER ITEM 6227-6002)		

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

SUMMARY OF SMALL SIGNS: SH 286 (CSJ 0326-03-106) (CORRIDOR C)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		37

CK:
DW:
CK:
DN:

SUMMARY OF SMALL SIGNS

Latitude	Longitude	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS	ALUMINUM TYPE A	ALUMINUM TYPE G	ALUMINUM TYPE O	SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX) Post Type: FRP = Fiberglass, TWT = Thin-Wall, 10BWG = 10 BWG, S80 = Sched 80	Posts (1 or 2)	Anchor Type: UA = Univer-Conc, UB = Univer-Bolt, SA = Slip-Conc, SB = Slip-Bolt, WS = Wedge Steel, WP = Wedge Plstic	Mounting Designation: P = Prefb. "Plain", T = Prefab. "T", U = Prefab. "U"	Mounting Designation: 1EXT or 2EXT = # of Ext., BM = Extruded Beam, WC = 1.12 #/ft Wing Chan., EXAL = Extruded Alum. Signs	BRIDGE MOUNT CLEARANCE SIGNS: TY N = Type N, TY S = Type S
SH 286 SOUTHBOUND EXIT TO MORGAN AVE														
27.780163°	-97.411066°	283	R5-1a	WRONG WAY	42" X 30"	X			WRONG WAY NOTIFICATION ASSEMBLY--PAY AS PED POLE ASSEMBLY. THIS IS A COMPONENT OF THE DETECTION SYSTEM FOR THIS RAMP. LOCATIONS 260 AND 261 ARE ALSO PAID FOR UNDER FORCE ACCOUNT AND LED WWDS (INSTALL ONLY)(THERMAL).					
27.779648°	-97.411188°	284	THIS ASSEMBLY ONLY HOLDS SOLAR PANELS TO SUPPORT LOCATION 261.											
27.779628°	-97.411192°	285	R5-1a	WRONG WAY	42" X 30"	X								
27.779614°	-97.411116°	286	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.779346°	-97.411184°	287	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
27.779352°	-97.411336°	288	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
SH 286 SOUTHBOUND EXIT TO HORNE RD														
27.756043°	-97.421915°	289	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
SH 286 SOUTHBOUND EXIT TO GREENWOOD DR														
27.741061°	-97.437859°	557	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
27.740920°	-97.437586°	558	R5-1a	WRONG WAY	42" X 30"	X			WRONG WAY NOTIFICATION ASSEMBLY--PAY AS PED POLE ASSEMBLY. THIS IS A COMPONENT OF THE DETECTION SYSTEM FOR THIS RAMP. LOCATIONS 260 AND 261 ARE ALSO PAID FOR UNDER FORCE ACCOUNT AND LED WWDS (INSTALL ONLY)(THERMAL).					
27.740899°	-97.437551°	559	THIS ASSEMBLY ONLY HOLDS SOLAR PANELS TO SUPPORT LOCATION 261.											
27.740645°	-97.437031°	560	R5-1a	WRONG WAY	42" X 30"	X								

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

SUMMARY OF SMALL SIGNS: SH 286 (CSJ 0326-03-106) (CORRIDOR C)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		38

SUMMARY OF SMALL SIGNS									SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX)					BRIDGE MOUNT CLEARANCE SIGNS
									Post Type		Anchor Type	Mounting Designation		
Latitude	Longitude	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS	ALUMINUM TYPE A	ALUMINUM TYPE G	ALUMINUM TYPE O	FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sched 80	Posts (1 or 2)	UA = Univer-Conc UB = Univer-Bolt SA = Slip-Conc SB = Slip-Bolt WS = Wedge Steel WP = Wedge Plstic	P = Prefb. "Plain" T = Prefab. "T" U = Prefab. "U"	1EXT or 2EXT = # of Ext. BM = Extruded Beam WC = 1.12 #/ft Wing Chan. EXAL = Extruded Alum. Signs	TY N = Type N TY S = Type S
SH 286 NORTHBOUND EXIT TO WEBER RD														
27.688103°	-97.454139°	255	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
SH 286 NORTHBOUND EXIT TO HOLLY RD														
27.723679°	-97.438327°	256	R6-1R	ONE WAY (RIGHT)	54" X 18"	X			S80	1	SA	T		
SH 286 NORTHBOUND EXIT TO KOSTORYZ RD														
27.731938°	-97.420433°	257	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
27.731794°	-97.420171°	258	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
27.735068°	-97.426712°	561	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	P (MUST ALSO PAY FOR THE LED SIGN UNDER ITEM 6227-6002)		

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

SUMMARY OF SMALL SIGNS: SH 286 (CSJ 0326-01-066) (CORRIDOR D)

SHEET 13 OF 14

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37,ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		39

CK$
DW$
CK$
DN$

SUMMARY OF SMALL SIGNS									SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX)					BRIDGE MOUNT CLEARANCE SIGNS
									Post Type	Posts (1 or 2)	Anchor Type	Mounting Designation		
Latitude	Longitude	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS	ALUMINUM TYPE A	ALUMINUM TYPE G	ALUMINUM TYPE O	FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sched 80		UA = Univer-Conc UB = Univer-Bolt SA = Slip-Conc SB = Slip-Bolt WS = Wedge Steel WP = Wedge Plstic	P = Prefb. "Plain" T = Prefab. "T" U = Prefab. "U"	1EXT or 2EXT = # of Ext. BM = Extruded Beam WC = 1.12 #/ft Wing Chan. EXAL = Extruded Alum. Signs	TY N = Type N TY S = Type S
SH 286 SOUTHBOUND EXIT TO HOLLY RD														
27.730627°	-97.434857°	259	R5-1a	WRONG WAY	42" X 30"	X			WRONG WAY NOTIFICATION ASSEMBLY--PAY AS PED POLE ASSEMBLY. THIS IS A COMPONENT OF THE DETECTION SYSTEM FOR THIS RAMP. LOCATIONS 260 AND 261 ARE ALSO PAID FOR UNDER FORCE ACCOUNT AND LED WWDS (INSTALL ONLY)(THERMAL).					
27.730192°	-97.435198°	260	THIS ASSEMBLY ONLY HOLDS SOLAR PANELS TO SUPPORT LOCATION 261.											
27.730174°	-97.435209°	261	R5-1a	WRONG WAY	42" X 30"	X								
27.729442°	-97.435621°	262	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P (MUST ALSO PAY FOR THE LED SIGN UNDER ITEM 6227-6002)		
SH 286 SOUTHBOUND EXIT TO GREENWOOD DR														
27.710099°	-97.447543°	263	R5-1a	WRONG WAY	42" X 30"	X			S80	1	SA	T		
SH 286 SOUTHBOUND EXIT TO WEBER RD														
27.694012°	-97.453165°	264	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
27.694057°	-97.453315°	265	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P		
SH 286 SOUTHBOUND EXIT TO DIVIDED HIGHWAY														
27.683326°	-97.454941°	266	R5-1a	WRONG WAY	42" X 30"	X			WRONG WAY NOTIFICATION ASSEMBLY--PAY AS PED POLE ASSEMBLY. THIS IS A COMPONENT OF THE DETECTION SYSTEM FOR THIS RAMP. LOCATIONS 260 AND 261 ARE ALSO PAID FOR UNDER FORCE ACCOUNT AND LED WWDS (INSTALL ONLY)(THERMAL).					
27.682798°	-97.454851°	267	THIS ASSEMBLY ONLY HOLDS SOLAR PANELS TO SUPPORT LOCATION 261.											
27.682776°	-97.454836°	268	R5-1a	WRONG WAY	42" X 30"	X								
27.681977°	-97.454695°	269	R5-1	DO NOT ENTER	36" X 36"	X			S80	1	SA	P (MUST ALSO PAY FOR THE LED SIGN UNDER ITEM 6227-6002)		

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

SUMMARY OF SMALL SIGNS: SH 286 (CSJ 0326-01-066) (CORRIDOR D)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37,ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		40

	668 6092	672 6010	677 6007
	PREFAB PAV MRK TY C(W)(36")(YLD TRI)	REFL PAV MRKR TY II-C-R	ELIM EXT PAV MRK&MRKS (24")
	EA	EA	LF
LOCATION			
SH 358 FROM WEBER RD TO 310 FEET WEST OF CLARIDE ST CSJ 0617-01-209			
EASTBOUND			
RODD FIELD RD EXIT__RAMP		28	
ENNIS JOSLIN AVE EXIT__RAMP		28	
FLOUR BLUFF DR EXIT__RAMP		28	
FRONTAGE RD EXIT_RAMP		28	
WALDRON RD EXIT		28	
NAS DR EXIT__RAMP		28	
WESTBOUND			
FLOUR BLUFF DR EXIT__RAMP		28	
OSO TURNAROUND EXIT__RAMP		28	
PAUL JONES AVE EXIT__RAMP		28	
ENNIS JOSLIN AVE EXIT__RAMP		28	
RODD FIELD RD EXIT__RAMP		28	
STAPLES ST EXIT_RAMP		28	
EVERHART RD EXIT_RAMP		28	
WEBER RD EXIT_RAMP		28	

DN: CK: DATE: $DATE$ $TIME$
FILE: $FILE$

STRIPING SUMMARY AND DETAILS: SH 358 (CSJ 0617-01-209) (CORRIDOR A)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0326	01	066, ETC.	SH 286, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		41

	668 6092	672 6010	677 6007
	PREFAB PAV MRK TY C(W)(36")(YLD TRI)	REFL PAV MRKR TY II-C-R	ELIM EXT PAV MRK&MRKS (24")
	EA	EA	LF
LOCATION			
IH 37 FROM SH 358 TO FM 2292 CSJ 0074-06-254			
NORTHBOUND			
VALERO WAY/ CORN PRODUCTS RD EXIT__RAMP		56	
SOUTHERN MINERALS RD EXIT__INTERSECTION	4		
__RAMP		28	
SUNTIDE RD EXIT__RAMP		28	
N CLARKWOOD RD INTERSECTION__INTERSECTION	4		18
RAND MORGAN EXIT__RAMP		28	
__FRONTAGE ROAD TO INTERSECTION		56	
SOUTHBOUND			
N CLARKWOOD RD INTERSECTION__INTERSECTION	4		18
TULOSO RD EXIT__RAMP		28	
SOUTHERN MINERALS RD EXIT__HUNTER RD INTERSECTION	8		
__RAMP		28	
__SOUTHERN MINERALS INTERSECTION	4		14
VALERO WAY/ CORN PRODUCTS RD EXIT__RAMP		28	
LANTANA RD EXIT__RAMP		56	
LEOPARD ST EXIT_RAMP		28	
IH 37 CSJ 0074-06-254 Total:	24	364	50

STRIPING SUMMARY AND DETAILS: IH 37 (CSJ 0074-06-254) (CORRIDOR B)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0326	01	066, ETC.	SH 286, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		42

CK:
DW:
CK:
DN:

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

INSTALL PREFAB PAV MRK TY C
(W)(36")(YLD TRI)
~ 4 EA

ACCESS TO SOUTHERN MINERALS RD
FROM THE NORTHBOUND AND
SOUTHBOUND FRONTAGE ROADS

PREFAB PAV MRK TY C
(W)(36")(YLD TRI)
~ 4 EA

ELIM EXT PAV MRK&
MRKS (24")
~ 14 LF

IH 37 NORTHBOUND FRONTAGE ROAD
AT HUNTER RD

INSTALL PREFAB PAV MRK TY C
(W)(36")(YLD TRI)
~ 4 EA

PREFAB PAV MRK TY C
(W)(36")(YLD TRI)
~ 4 EA

ELIM EXT PAV MRK&
MRKS (24")
~ 18 LF

ACCESS TO N CLARKWOOD RD FROM THE
NORTHBOUND AND SOUTHBOUND FRONTAGE ROADS

PREFAB PAV MRK TY C
(W)(36")(YLD TRI)
~ 4 EA

ELIM EXT PAV MRK&
MRKS (24")
~ 18 LF

STATE OF TEXAS
KASSONDRA FIORA MUNOZ
104720
LICENSED
PROFESSIONAL ENGINEER

Kassondra Fiora Munoz
1-3-23

STRIPING SUMMARY
AND DETAILS: IH 37
(CSJ 0074-06-254)
(CORRIDOR B)

SHEET 3 OF 5

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0326	01	066, ETC.	SH 286, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		43

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

	668 6092	672 6010	677 6007
	PREFAB PAV MRK TY C(W)(36")(YLD TRI)	REFL PAV MRKR TY II-C-R	ELIM EXT PAV MRK&MRKS (24")
	EA	EA	LF
LOCATION			
SH 286 FROM SS 544 TO SH 358 CSJ 0326-03-106			
NORTHBOUND			
GOLLIHAR RD EXIT__RAMP		28	
HORNE RD EXIT__RAMP		28	
S PORT AVE EXIT__RAMP		28	
BALDWIN BLVD EXIT__RAMP		28	
S 19TH ST EXIT__RAMP		28	
AGNES ST EXIT__RAMP		28	
SOUTHBOUND			
MORGAN AVE EXIT__RAMP		28	
BALDWIN BLVD EXIT__RAMP		28	
TARLTON ST EXIT__RAMP		28	
HORNE RD EXIT__RAMP		28	
GOLLIHAR RD EXIT__RAMP		28	
GREENWOOD DR EXIT__WB RAMP		28	
SH 286 CSJ 0326-03-106 Total:		336	

STRIPING SUMMARY AND DETAILS: SH 286 (CSJ 0326-03-106) (CORRIDOR C)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0326	01	066, ETC.	SH 286, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		44

DATE: $DATE$ $TIME$
FILE: $FILE$
DN: CK: DW: CK:

	668 6092	672 6010	677 6007
	PREFAB PAV MRK TY C(W)(36")(YLD TRI)	REFL PAV MRKR TY II-C-R	ELIM EXT PAV MRK&MRKS (24")
	EA	EA	LF
LOCATION			
SH 286 FROM SH 358 TO 0.5 MILES SOUTH OF FM 43 CSJ 0326-01-066			
NORTHBOUND			
WEBER RD EXIT__RAMP		56	
GREENWOOD DR EXIT__RAMP		28	
HOLLY RD EXIT__RAMP		28	
KOSTORYZ RD EXIT_RAMP		28	
SOUTHBOUND			
HOLLY RD EXIT__RAMP		28	
SARATOGA BLVD EXIT__RAMP		28	
GREENWOOD DR EXIT__RAMP		28	
WEBER RD EXIT__RAMP		28	
EXIT TO DIVIDED HIGHWAY__RAMP		28	
SH 286 CSJ 0326-01-066 Total:		280	

STRIPING SUMMARY AND DETAILS: SH 286 (CSJ 0326-01-066) (CORRIDOR D)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0326	01	066, ETC.	SH 286, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		45

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

DN: CK: DW: CK:

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

Texas Department of Transportation

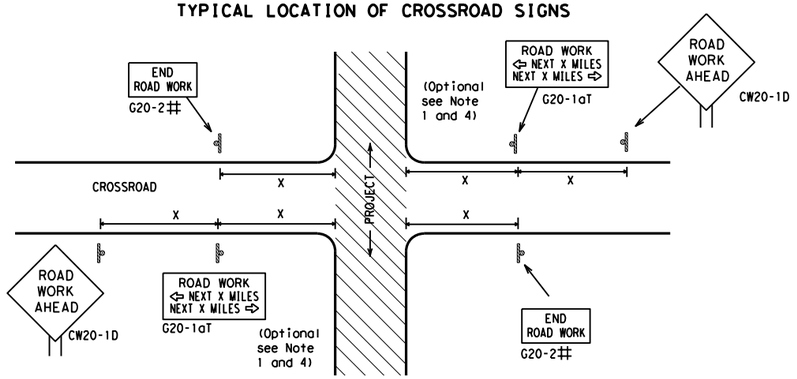
Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-03 7-13 9-07 8-14 5-10 5-21	0074	06	254, ETC	IH 37, ETC
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		46

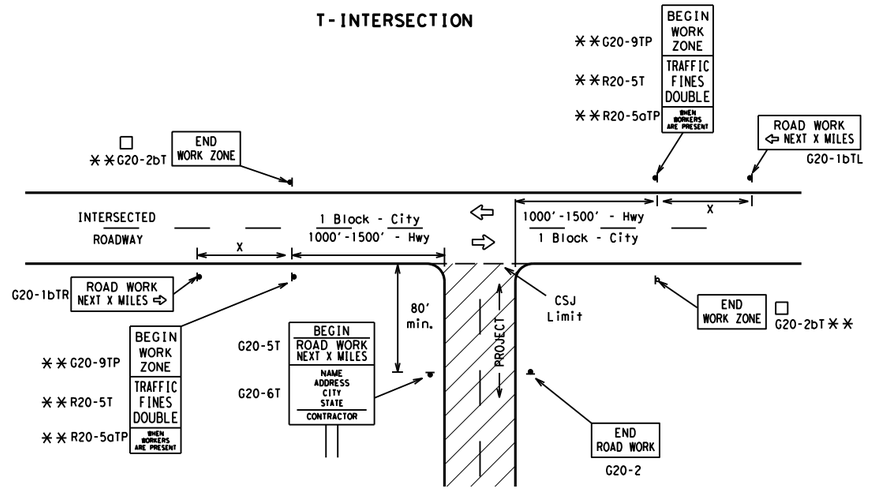
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

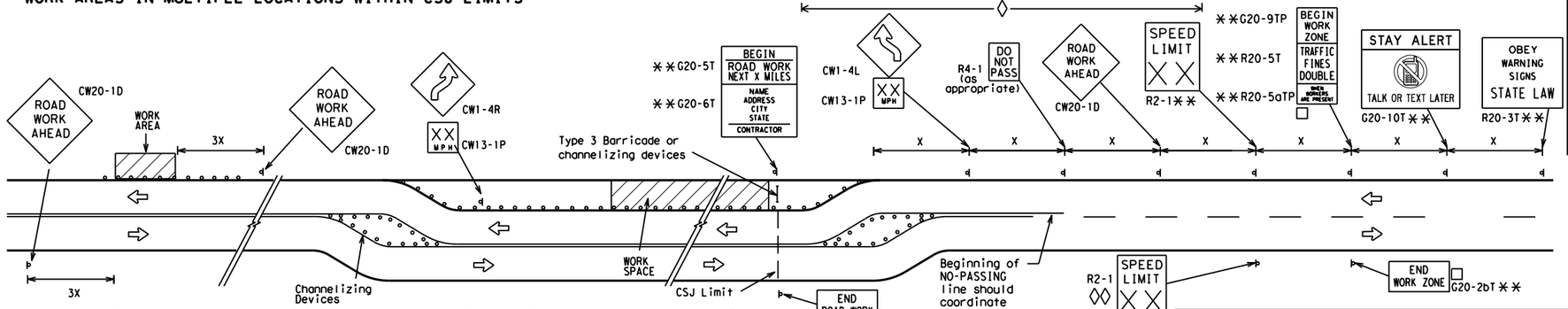
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

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

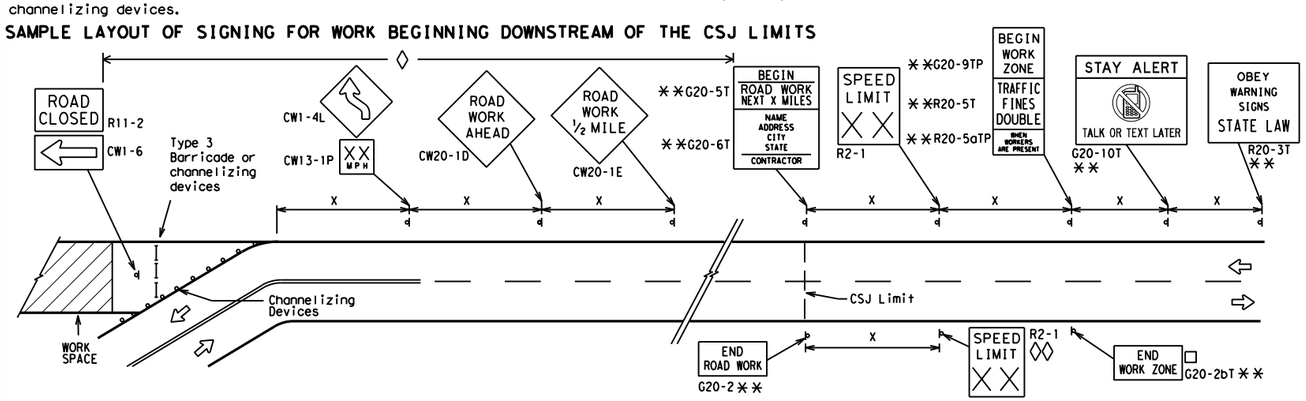
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

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



NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

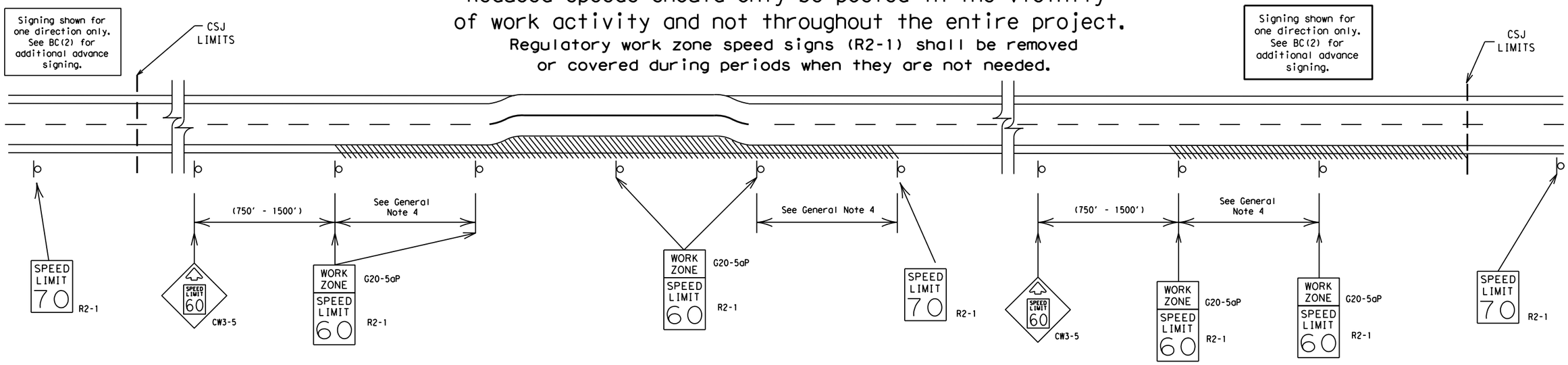
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC	IH 37, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	CRP	NUECES		47

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

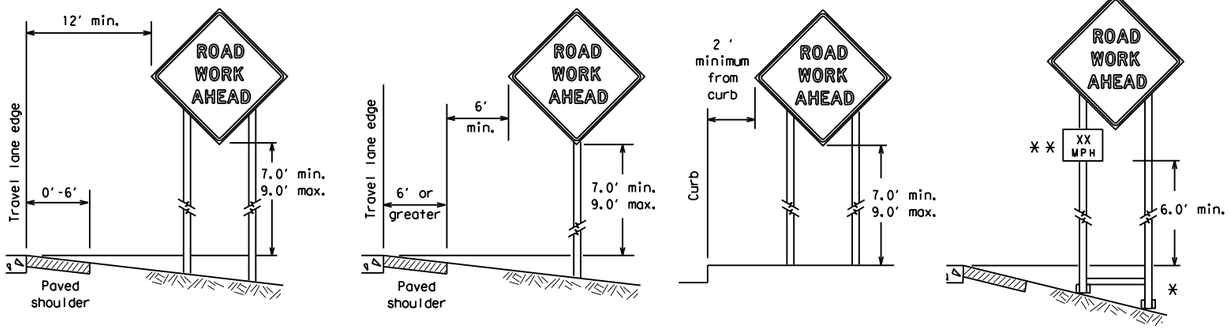
Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC	IH 37, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	CRP	NUECES		48

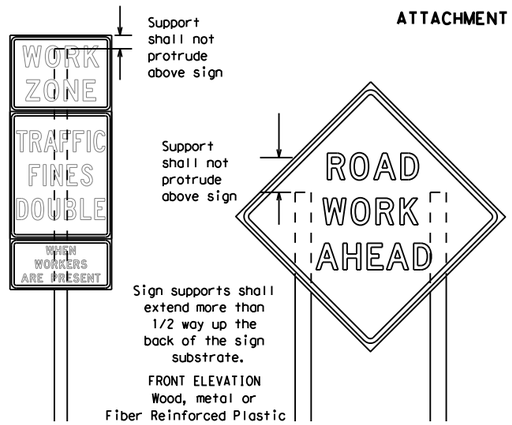
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

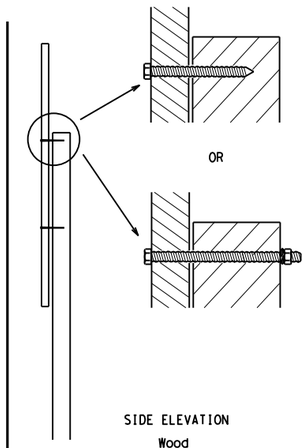


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





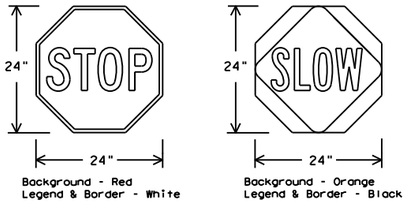
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC	IH 37, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	CRP	NUECES		49

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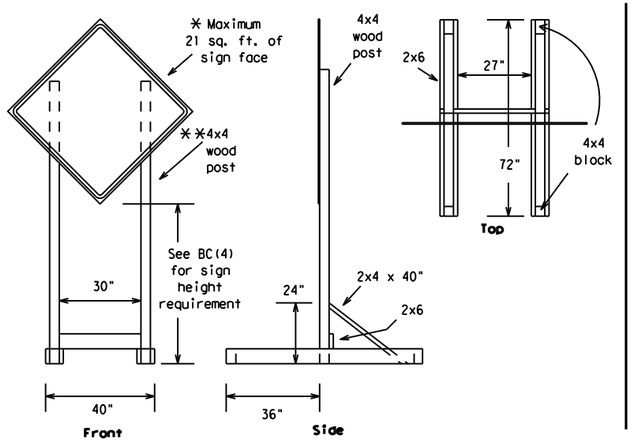
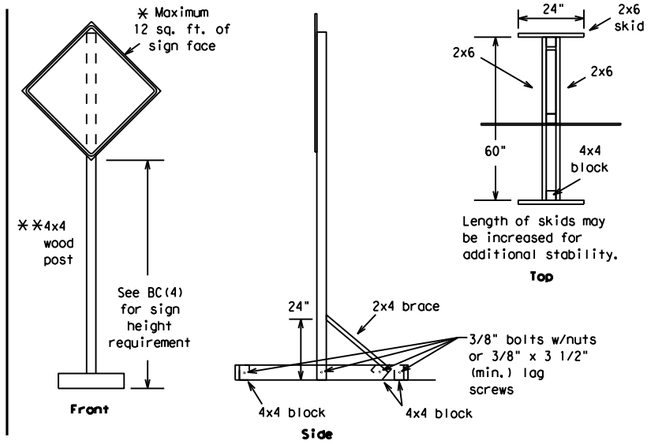
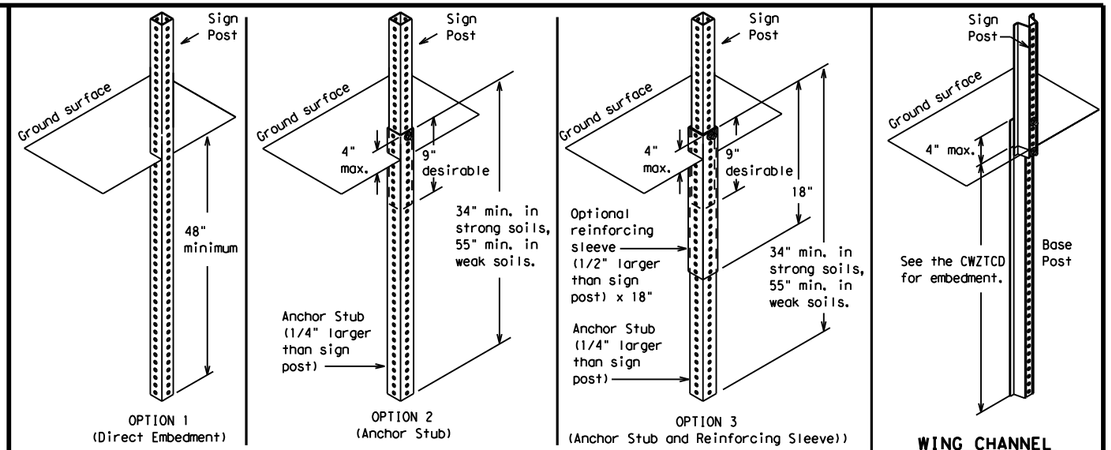




SKID MOUNTED WOOD SIGN SUPPORTS

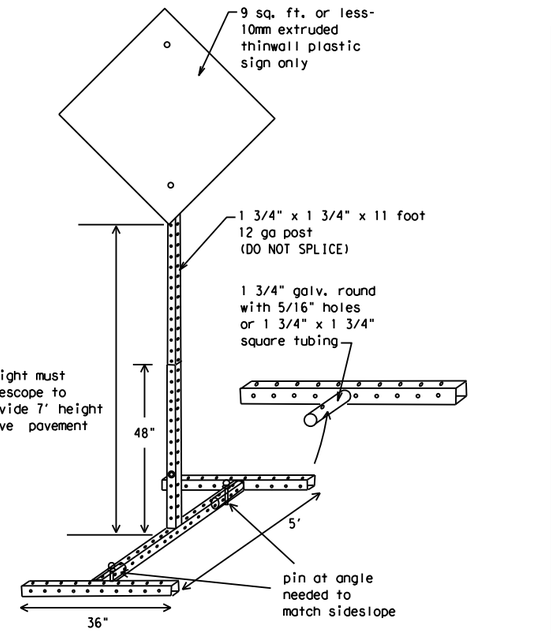
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

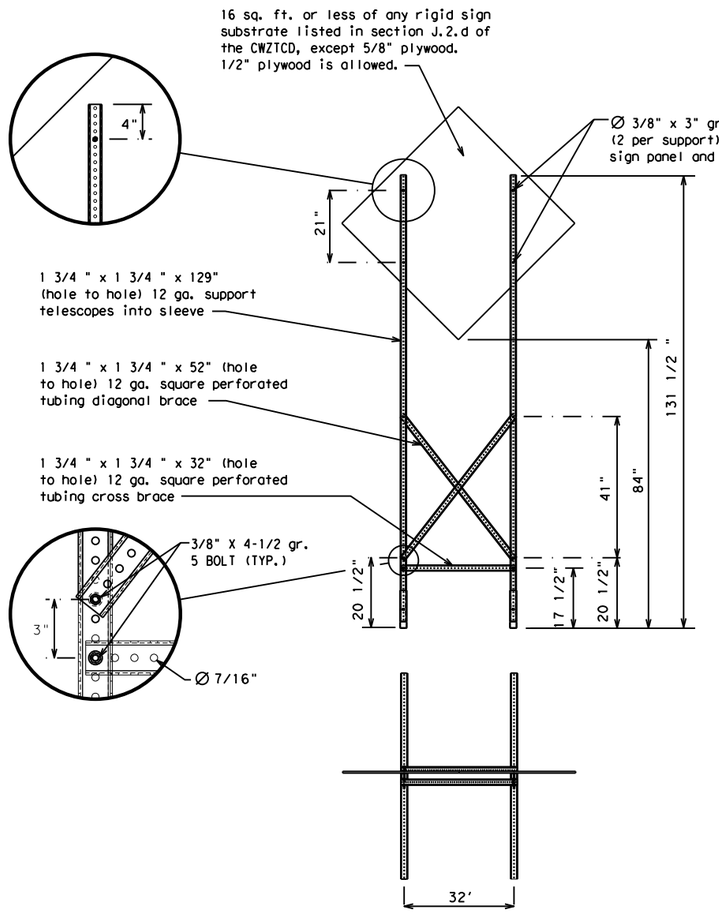


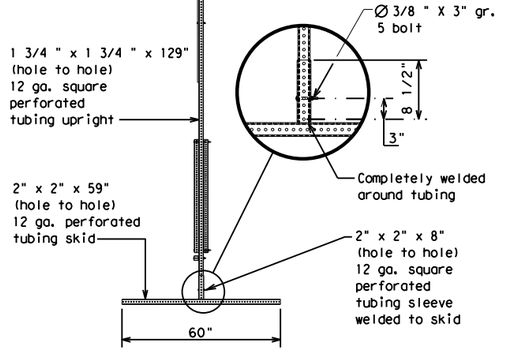
PERFORATED SQUARE METAL TUBING

GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0074	06	254, ETC	IH 37, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	CRP	NUECES		50

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

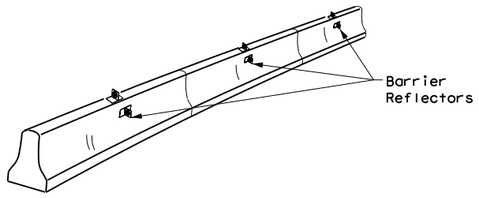
Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

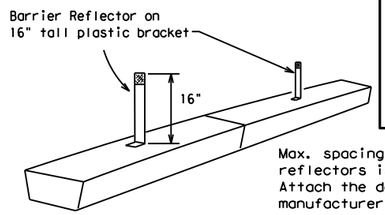
FILE:	bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS		0074	06	254, ETC	IH 37, ETC
9-07	8-14	DIST	COUNTY		SHEET NO.
7-13	5-21	CRP	NUECES		51

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



CONCRETE TRAFFIC BARRIER (CTB)

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

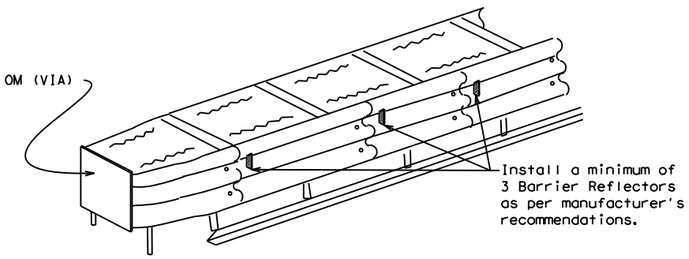


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

LOW PROFILE CONCRETE BARRIER (LPCB)

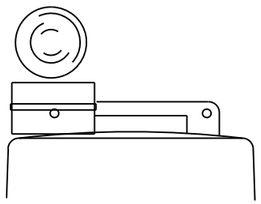


DELINEATION OF END TREATMENTS

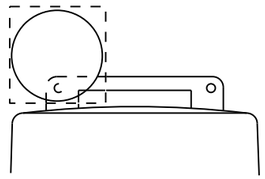
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

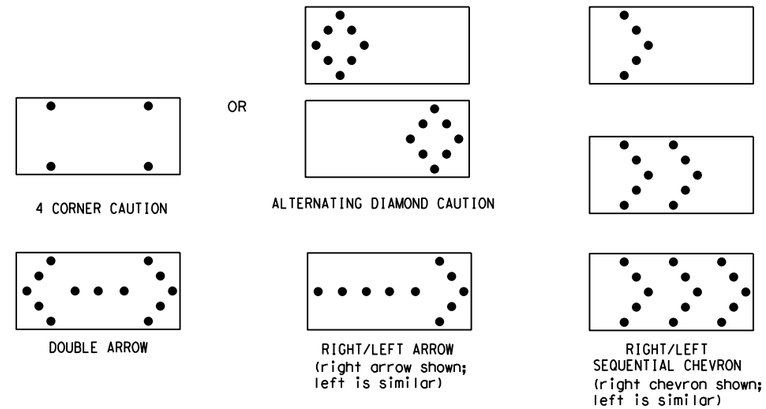
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC	IH 37, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	CRP	NUECES		52

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

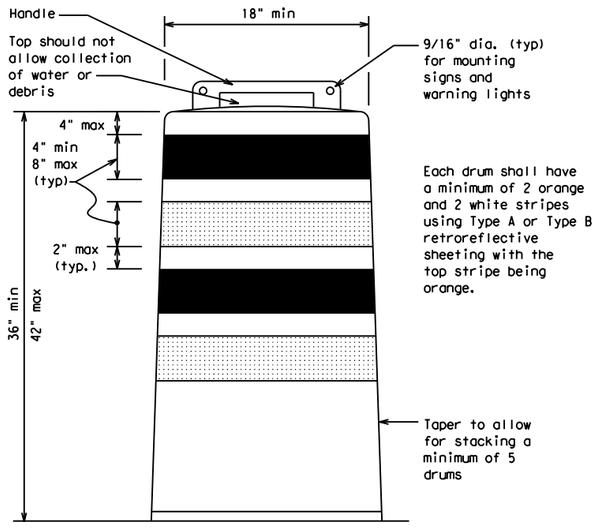
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

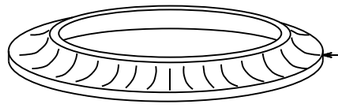
RETROREFLECTIVE SHEETING

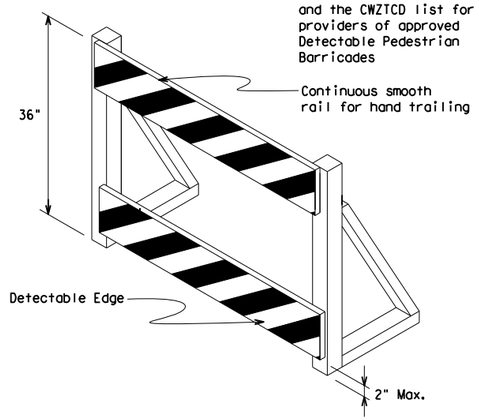
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

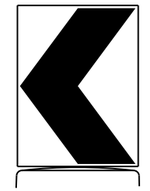




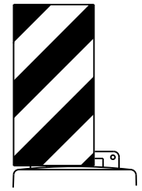


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC	IH 37, ETC
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	CRP	NUECES		53
7-13				

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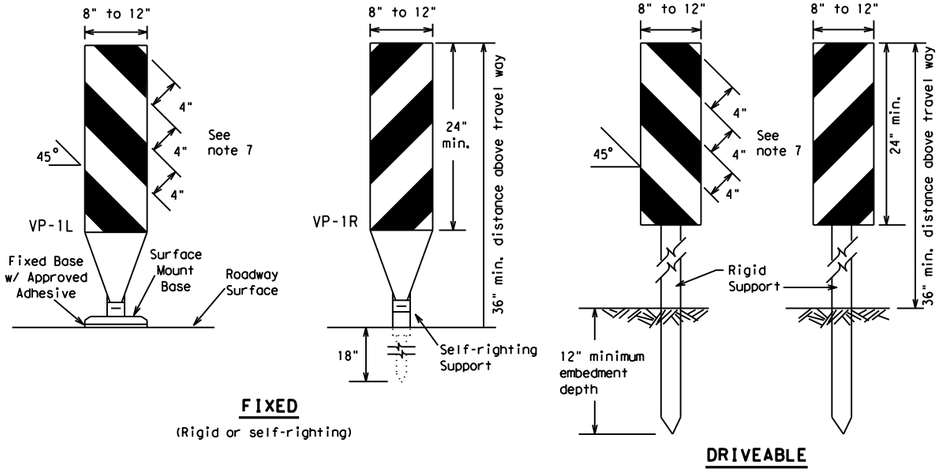
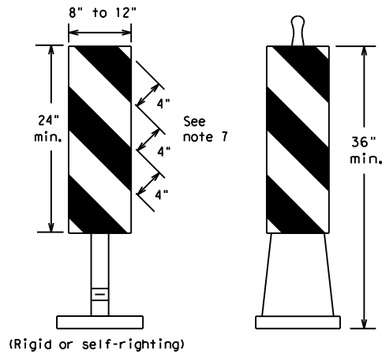


FIXED
(Rigid or self-righting)

DRIVEABLE

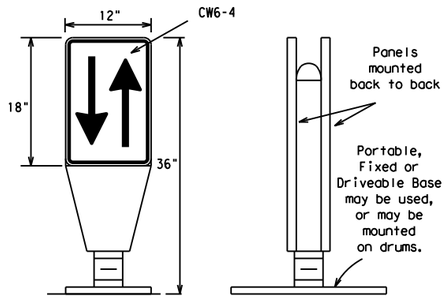


(Rigid or self-righting)

PORTABLE

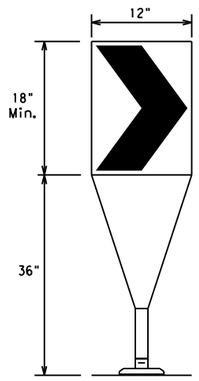
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



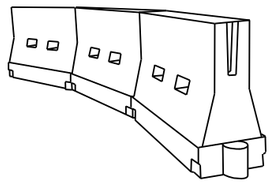
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC	IH 37, ETC
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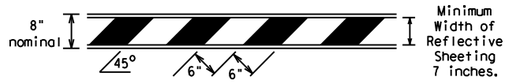
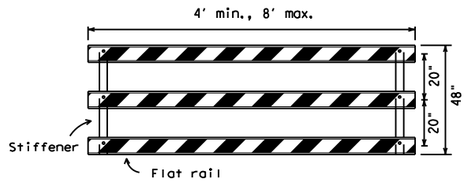
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



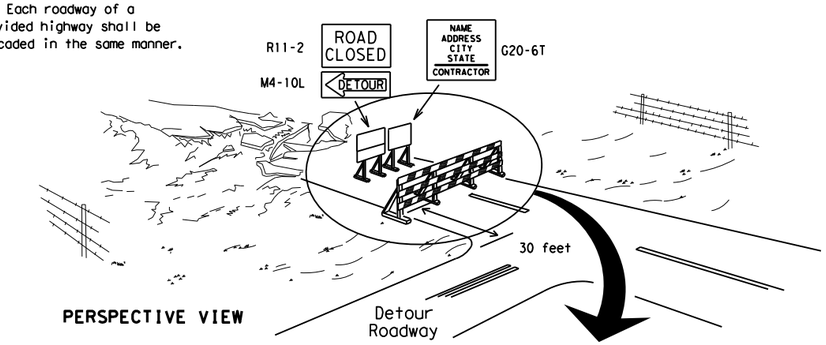
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

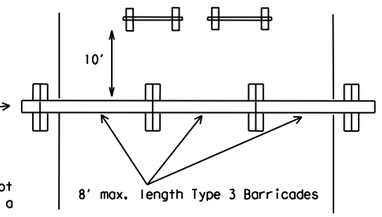
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

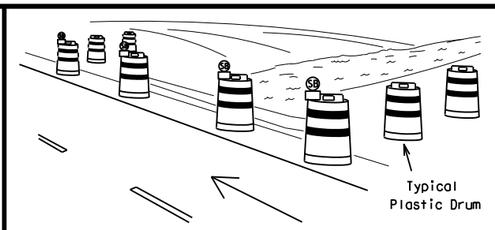
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

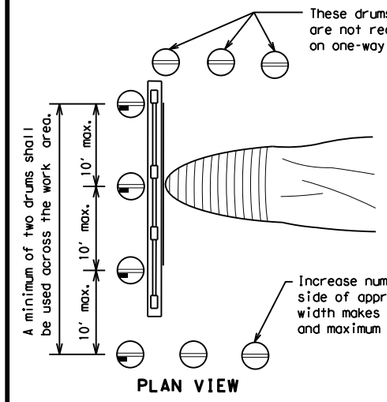
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

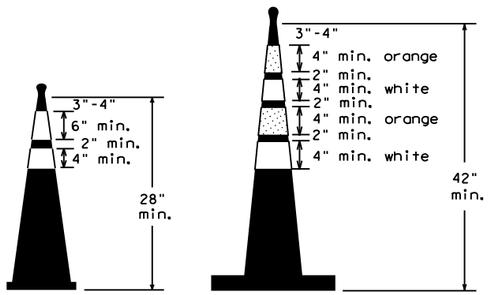
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



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

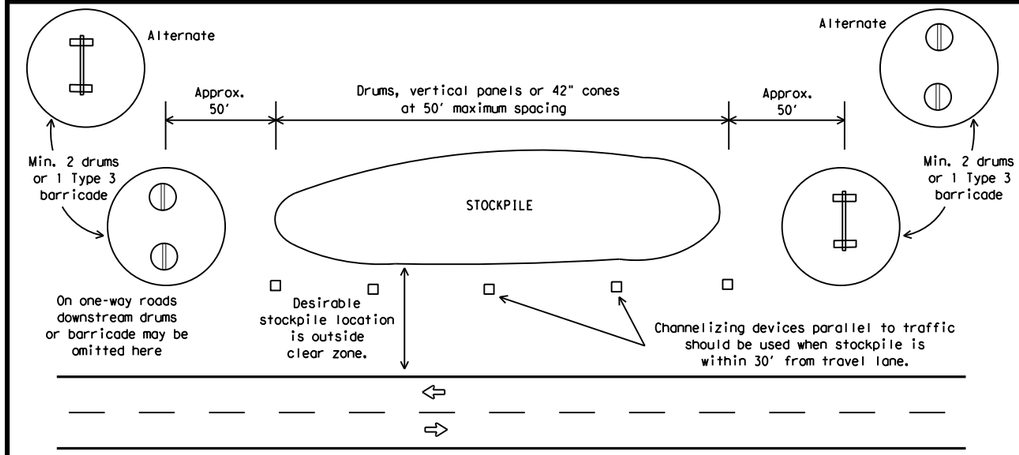
PLAN VIEW

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

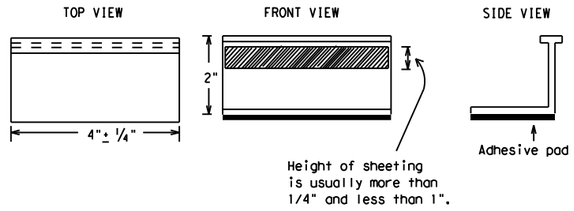
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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	DIST	COUNTY		SHEET NO.
	CRP	NUECES		56

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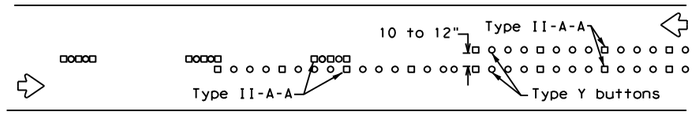
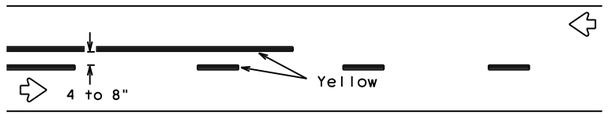
PAVEMENT MARKING PATTERNS

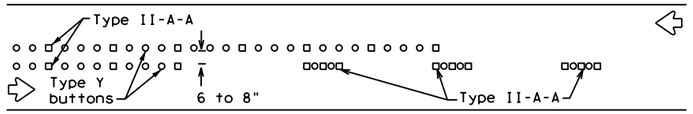
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



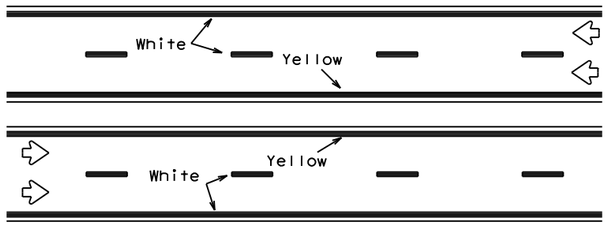
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



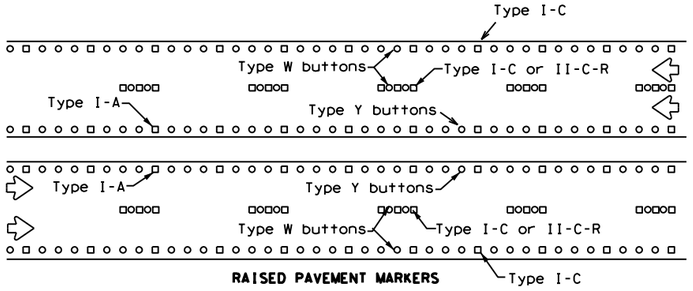
RAISED PAVEMENT MARKERS - PATTERN B

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

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



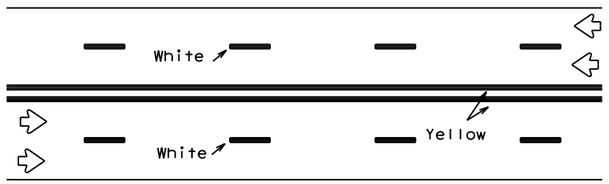
REFLECTORIZED PAVEMENT MARKINGS



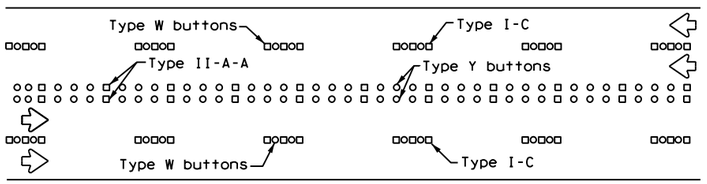
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



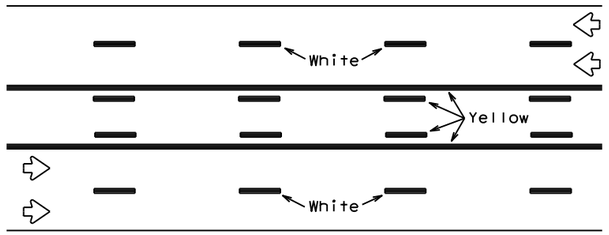
REFLECTORIZED PAVEMENT MARKINGS



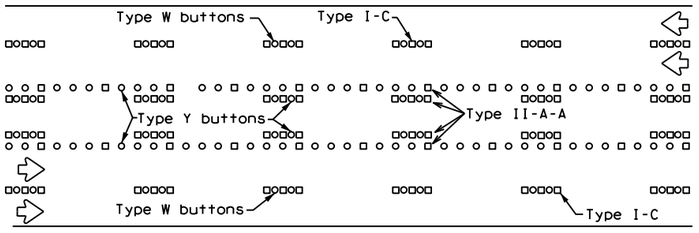
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

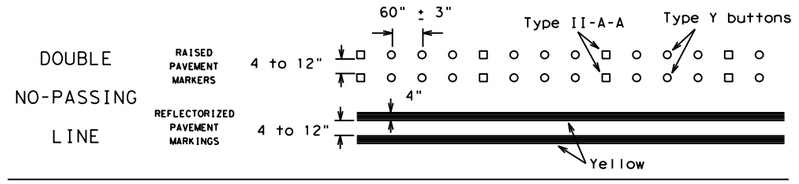
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

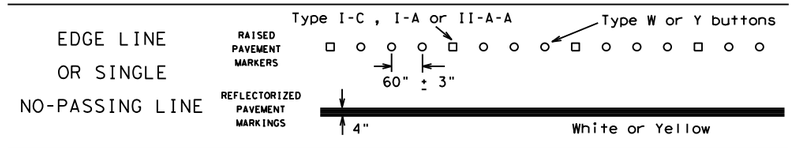
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

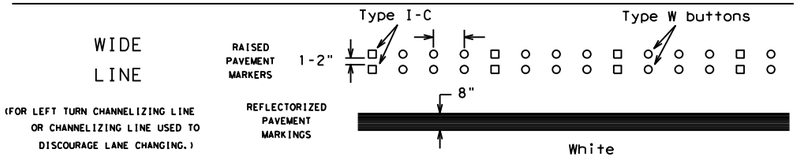


EDGE LINE OR SINGLE NO-PASSING LINE



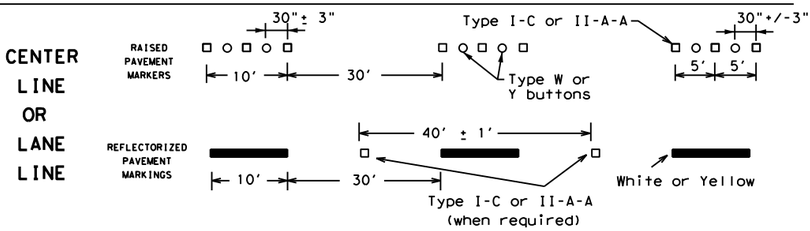
WIDE LINE

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

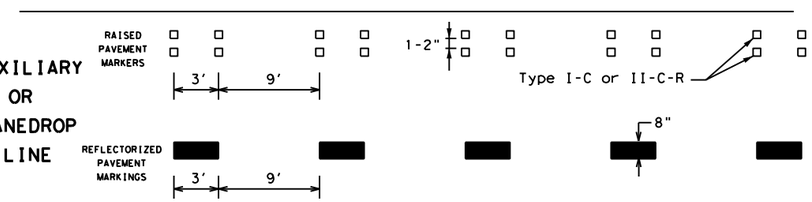


BROKEN LINES

CENTER LINE OR LANE LINE

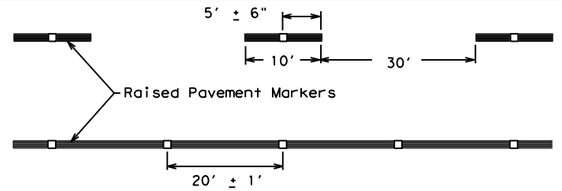


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

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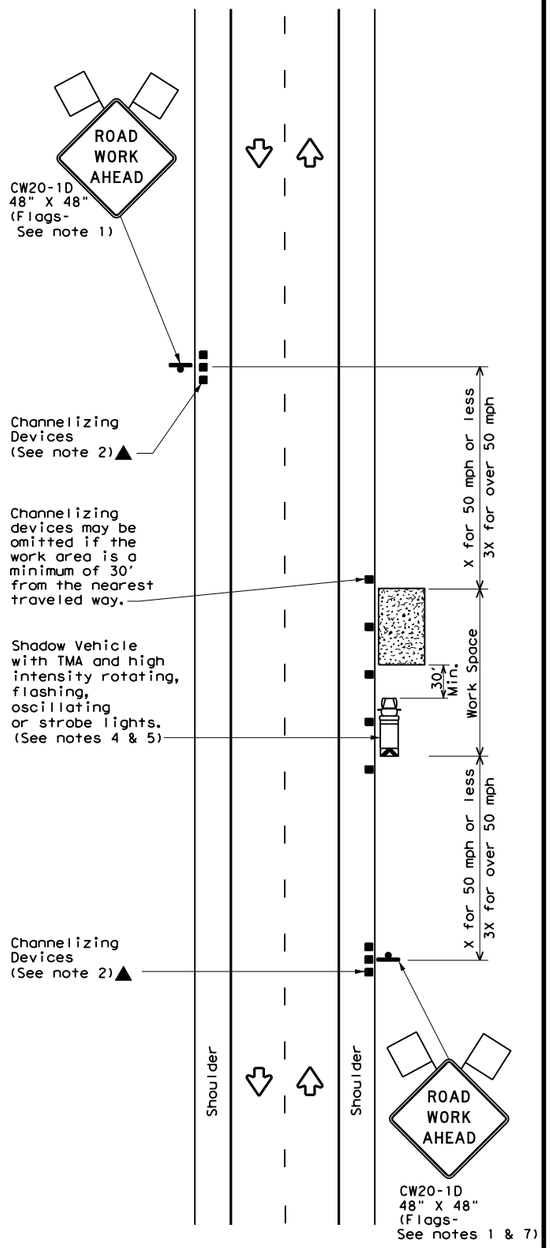
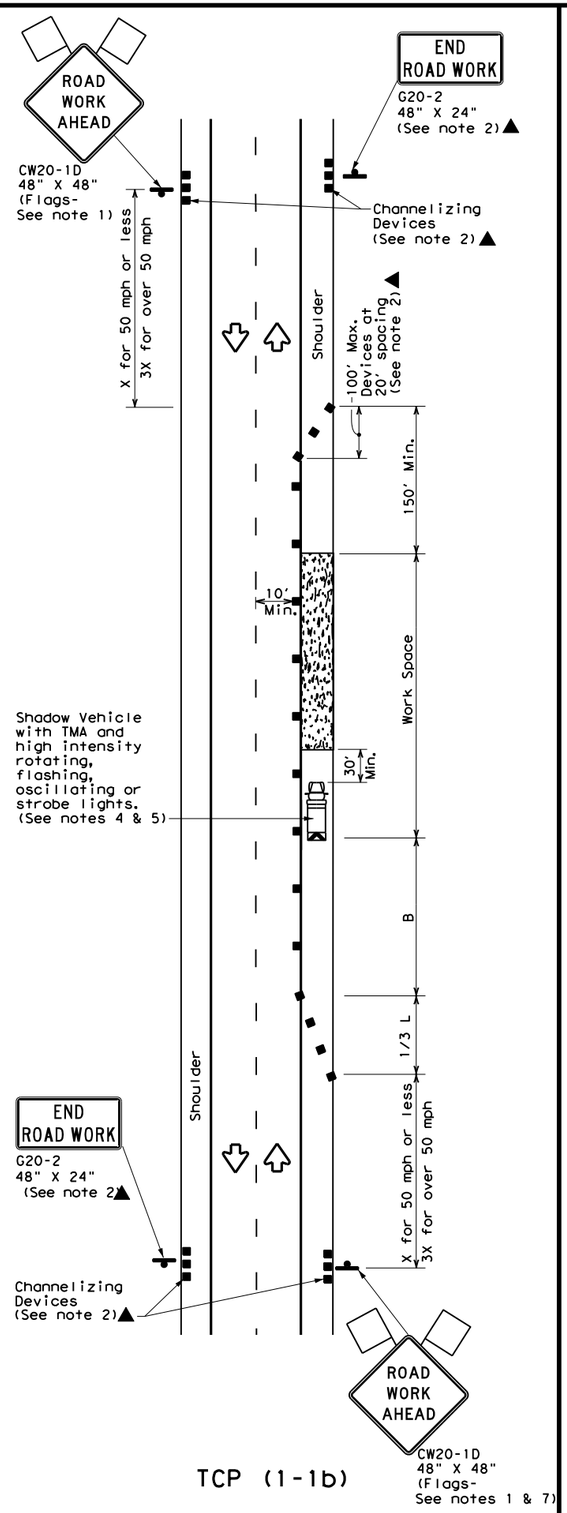
	CRP	NUECES		57



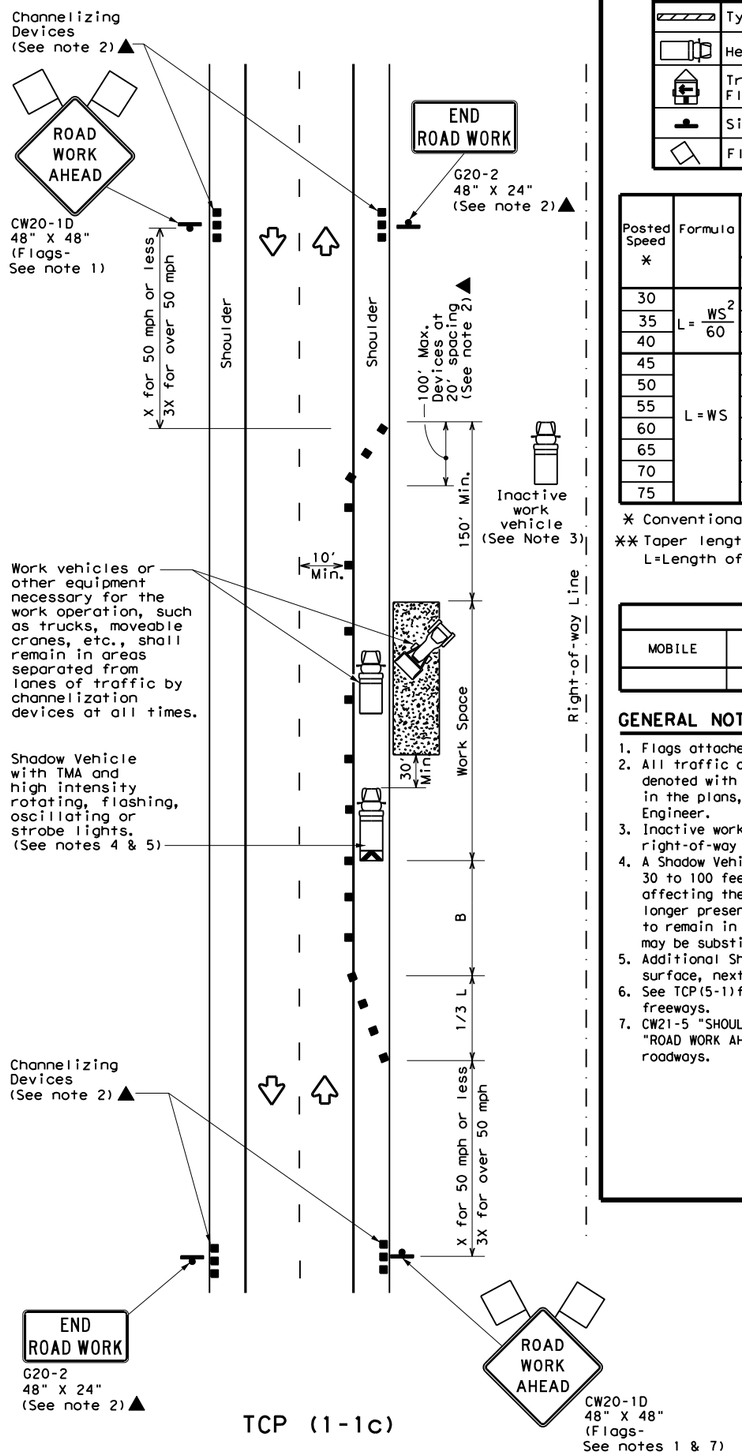
TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(1-1)-18

FILE: tcp1-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98	0074	06	254, ETC.	IH 37, ETC.
8-95 2-12	DIST	COUNTY		SHEET NO.
1-97 2-18	CRP	NUECES		58

151

DATE: 12/30/2022 04:45 PM
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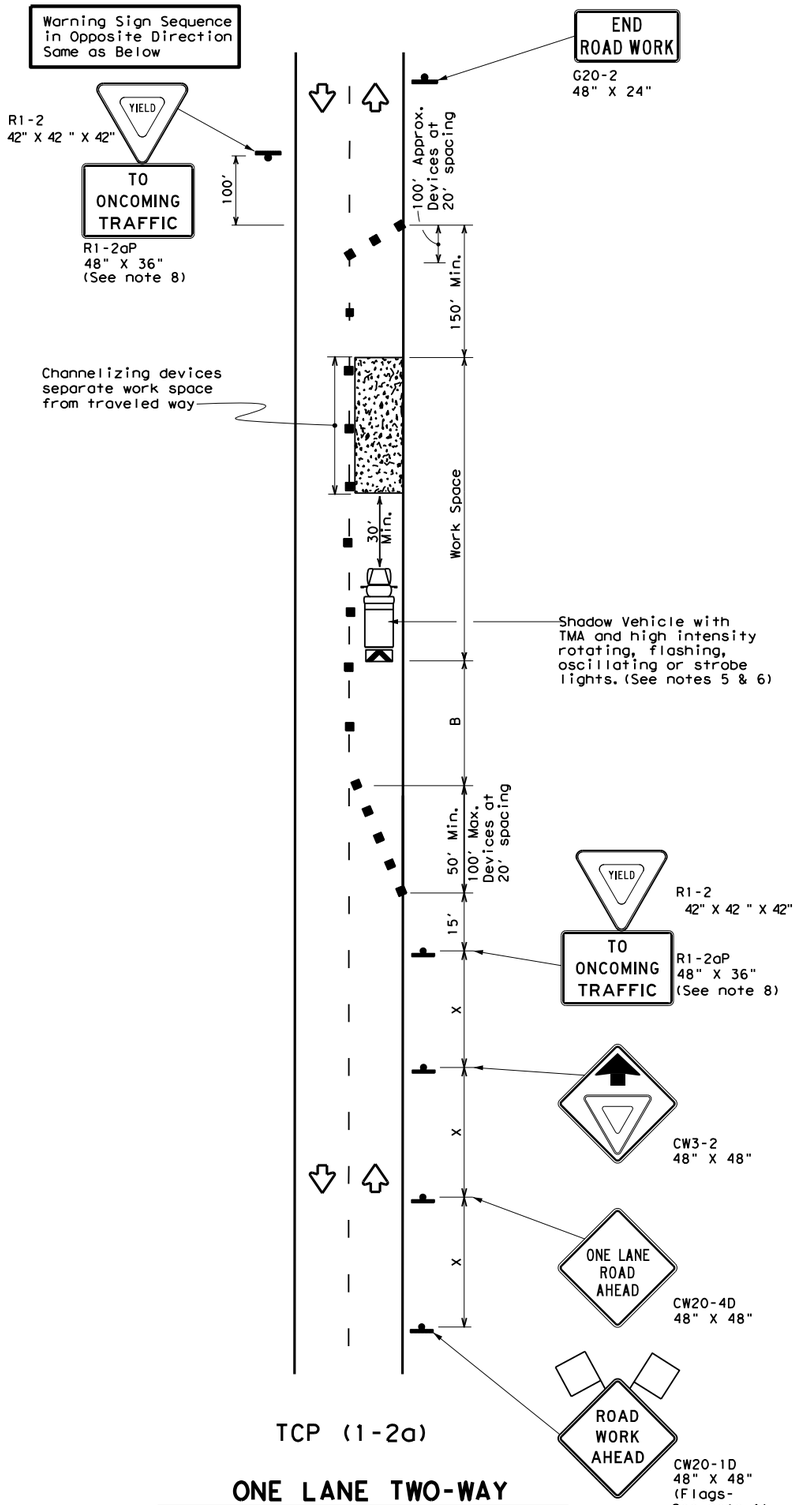
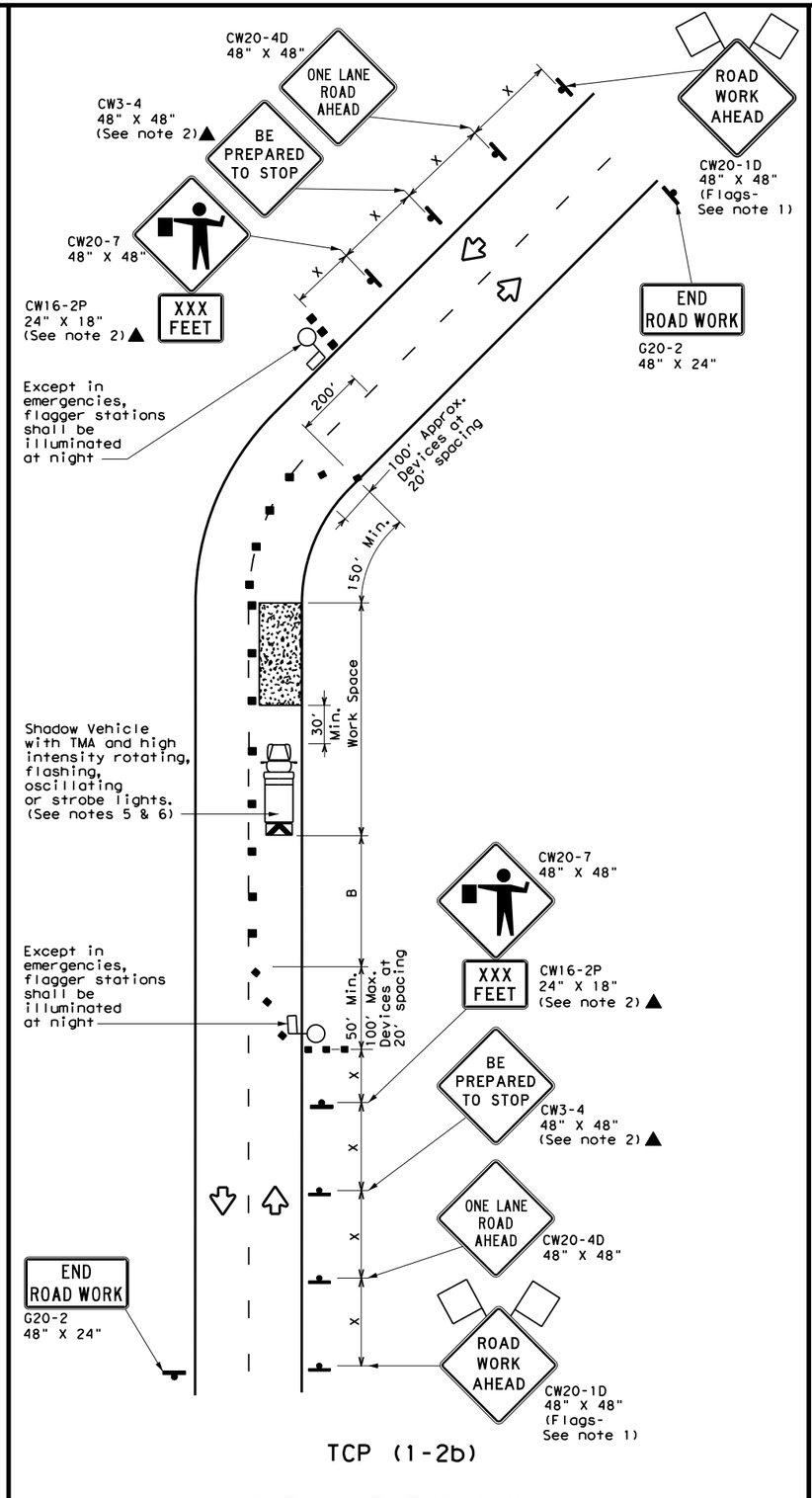


TCP (1-2a)

ONE LANE TWO-WAY CONTROL WITH YIELD SIGNS

(Less than 2000 ADT - See note 7)



TCP (1-2b)

ONE LANE TWO-WAY CONTROL WITH FLAGGERS

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

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

TCP (1-2a)

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

TCP (1-2b)

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

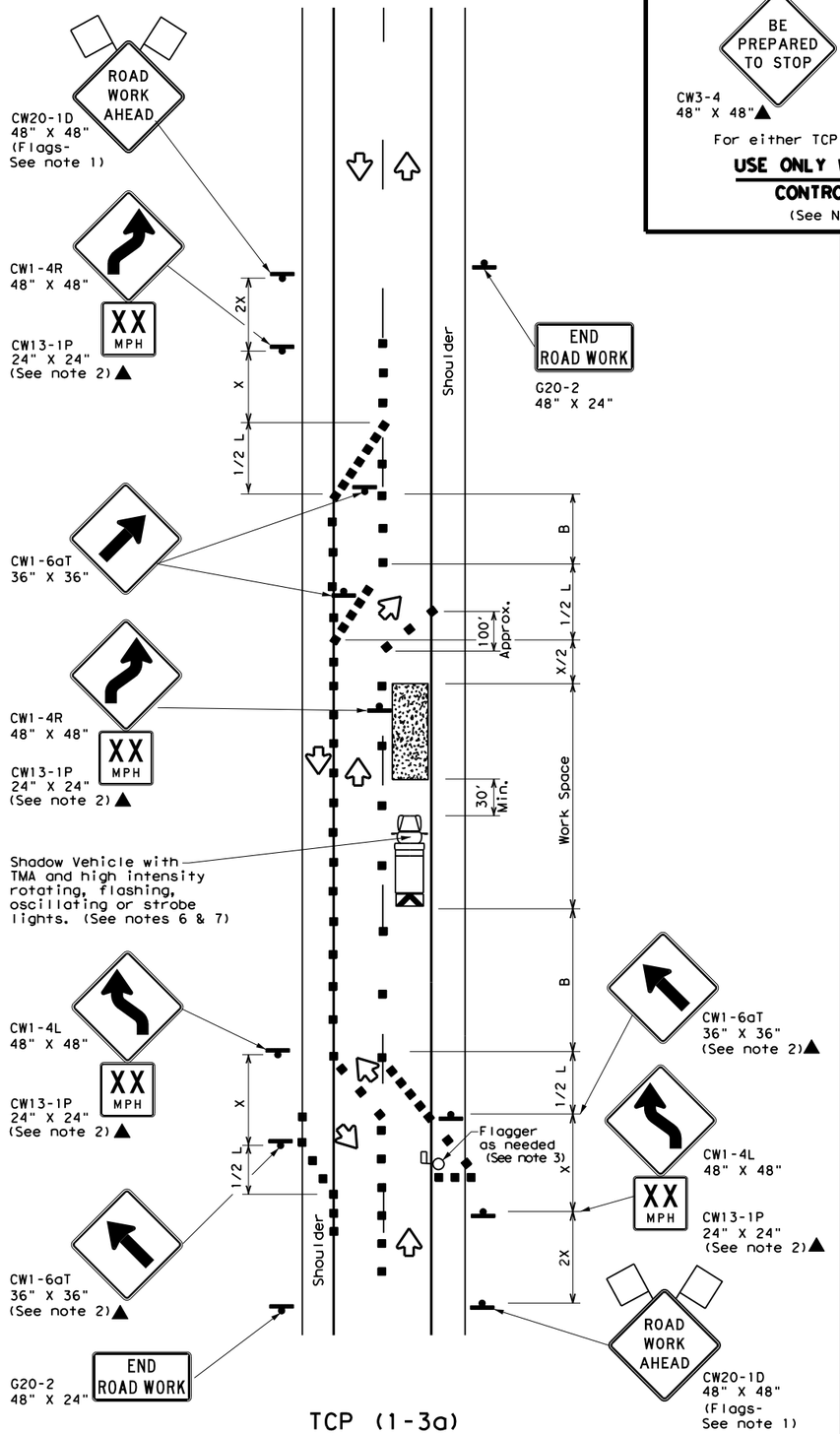
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(1-2)-18

FILE: tcp1-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-90 4-98	0074	06	254, ETC.	IH 37, ETC.
2-94 2-12	DIST	COUNTY		SHEET NO.
1-97 2-18	CRP	NUECES		59



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

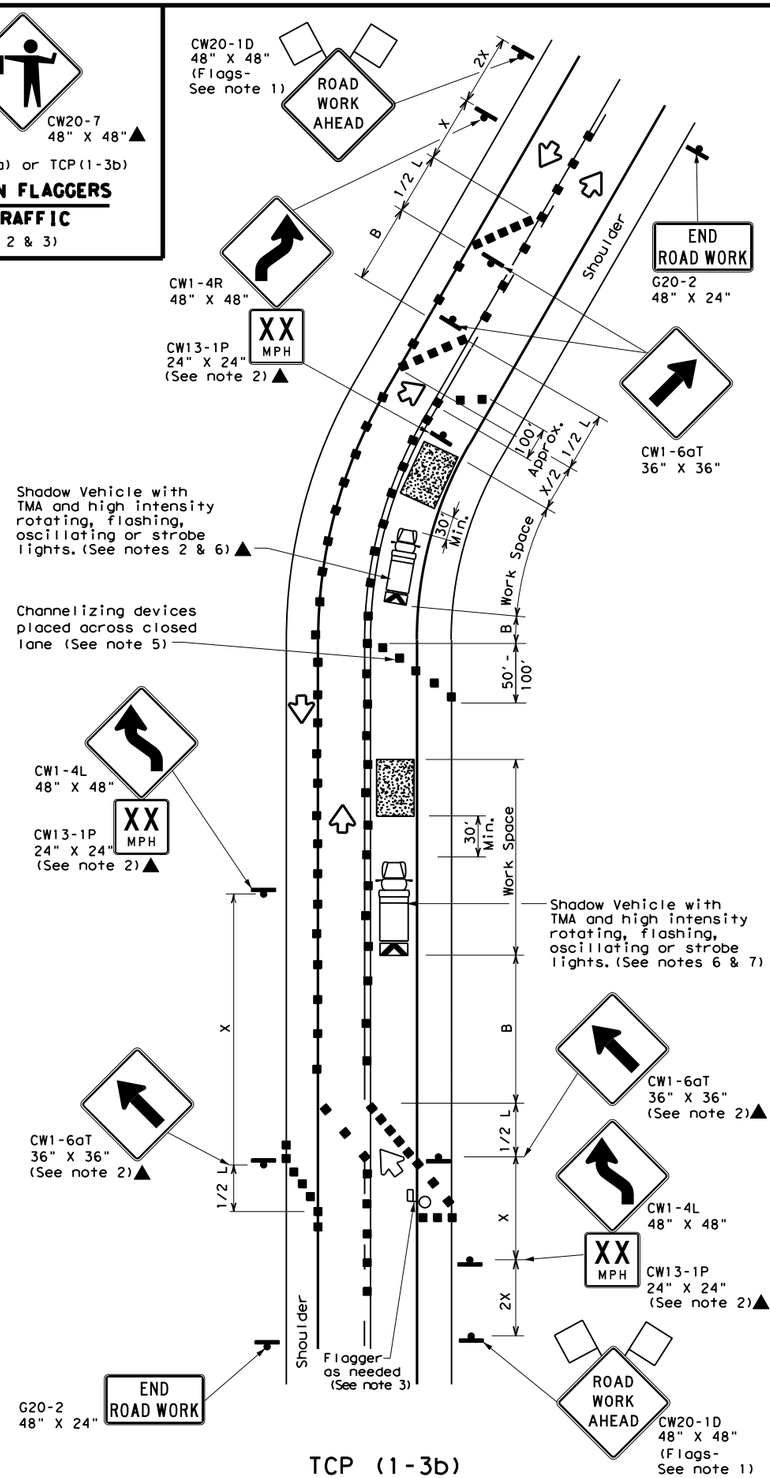
ONE LANE CLOSED
ADEQUATE FIELD OF VIEW

BE PREPARED TO STOP
CW3-4 48" X 48"
CW20-7 48" X 48"

For either TCP(1-3a) or TCP(1-3b)

USE ONLY WHEN FLAGGERS CONTROL TRAFFIC

(See Notes 2 & 3)



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

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

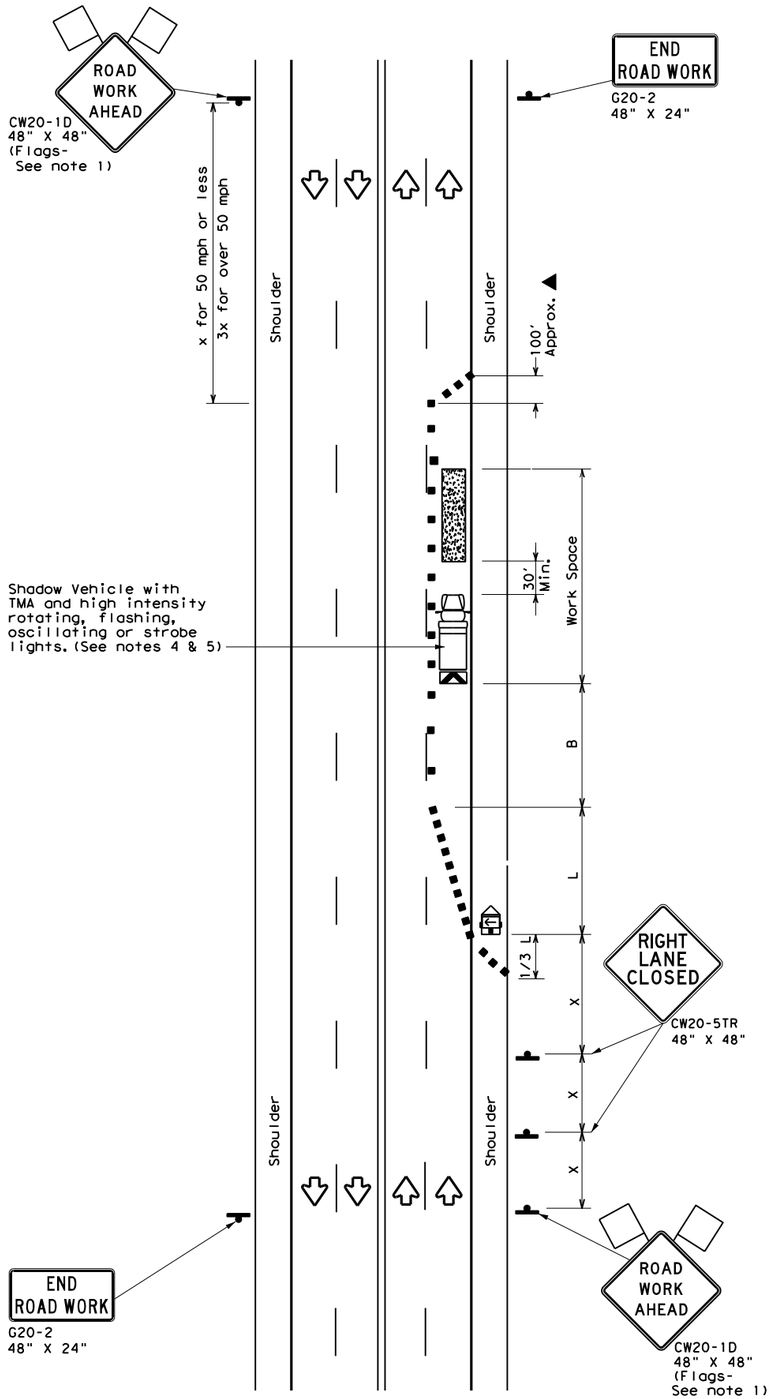
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO LANE ROADS

TCP(1-3)-18

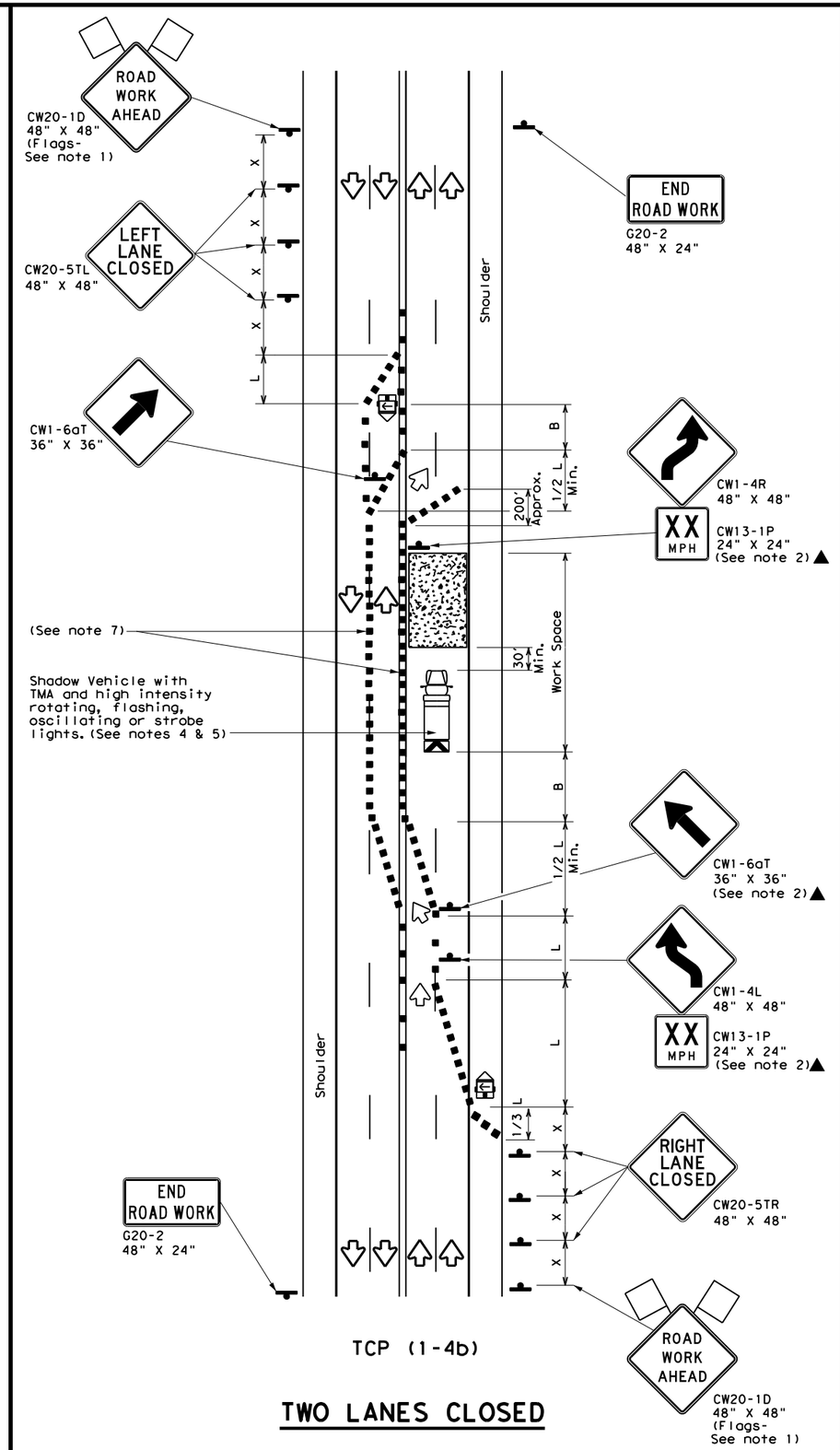
FILE: tcp1-3-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC.	IH 37, ETC.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	CRP	NUECES		60
1-97 2-18				

DATE: 12/30/2022 05:02 PM
FILE: DOCUMENT NAME



TCP (1-4a)

ONE LANE CLOSED



TCP (1-4b)

TWO LANES CLOSED

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

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

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

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

GENERAL NOTES

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

TCP (1-4a)

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

TCP (1-4b)

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

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(1-4)-18

FILE: tcp1-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC.	IH 37, ETC.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	CRP	NUECES		61
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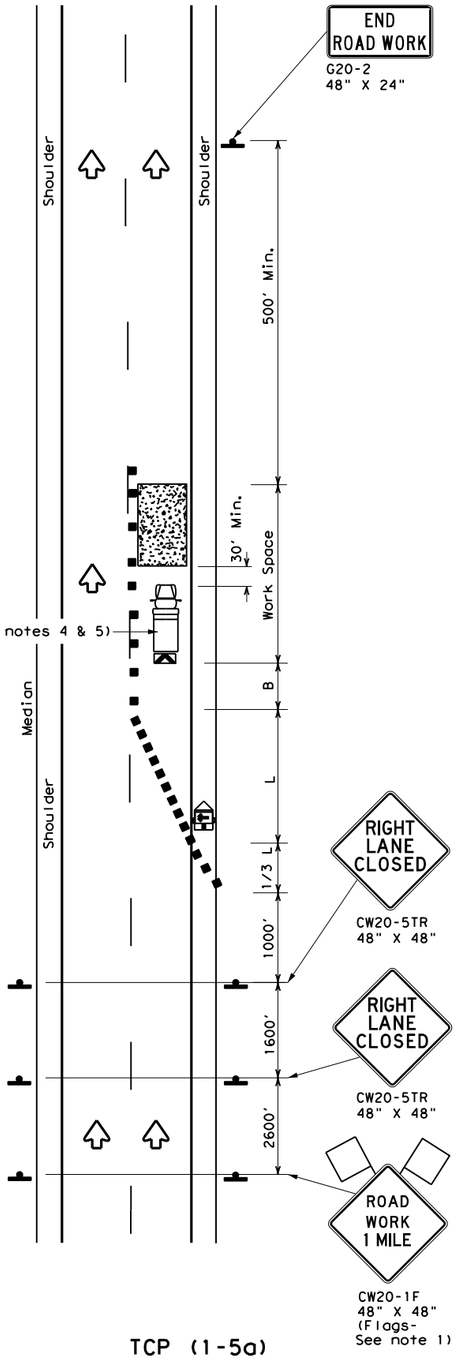
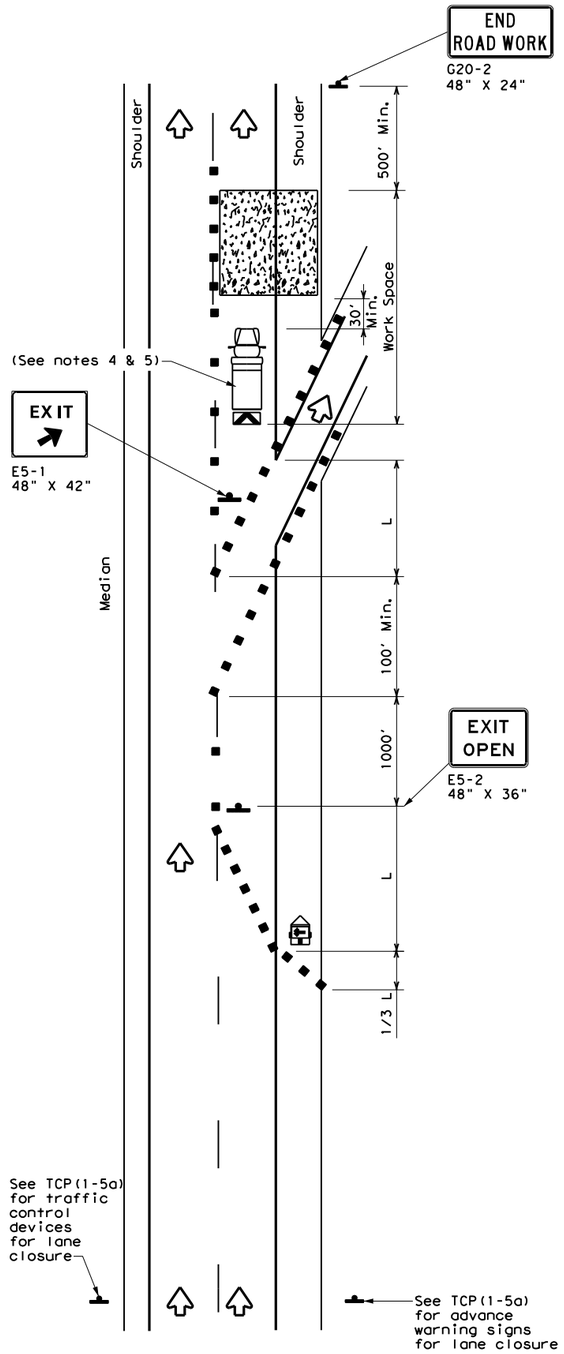


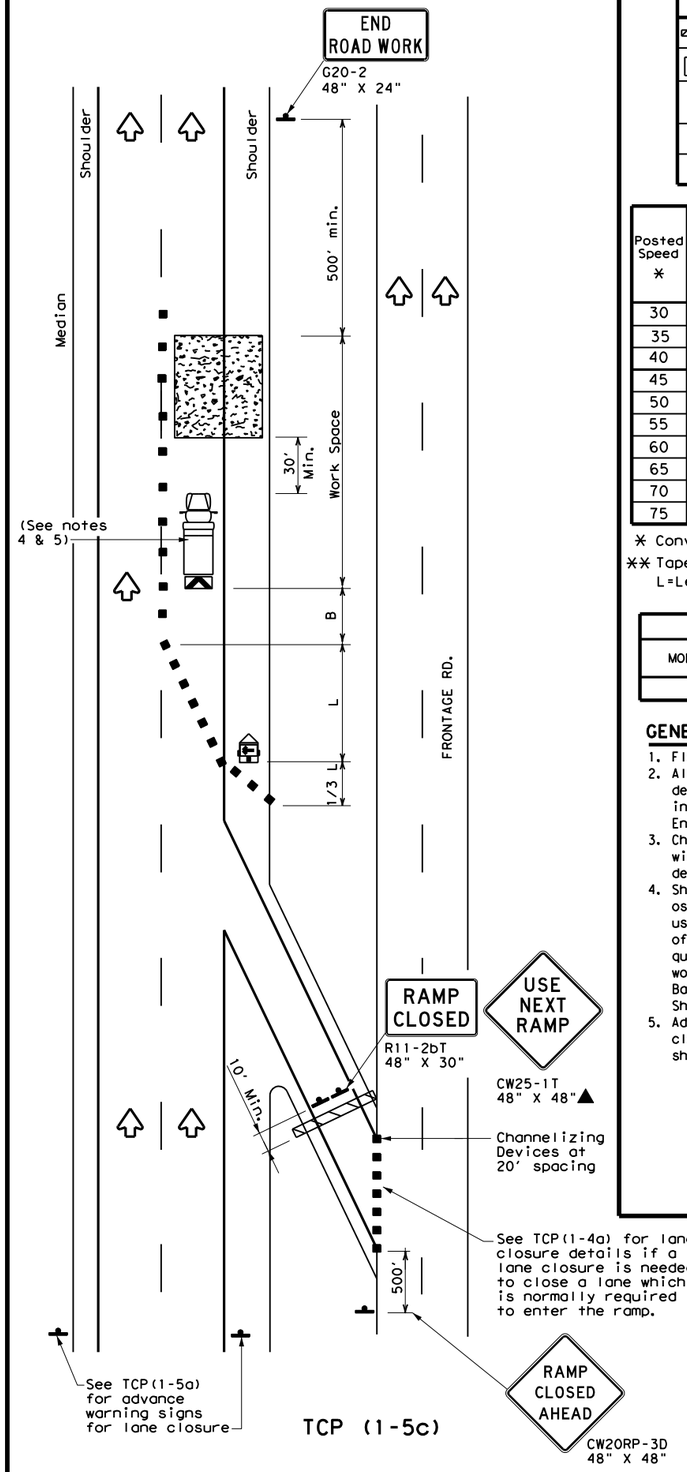
TCP (1-5a)

ONE LANE CLOSURE



TCP (1-5b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (1-5c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
4. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES FOR DIVIDED HIGHWAYS

TCP(1-5)-18

FILE: tcp1-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
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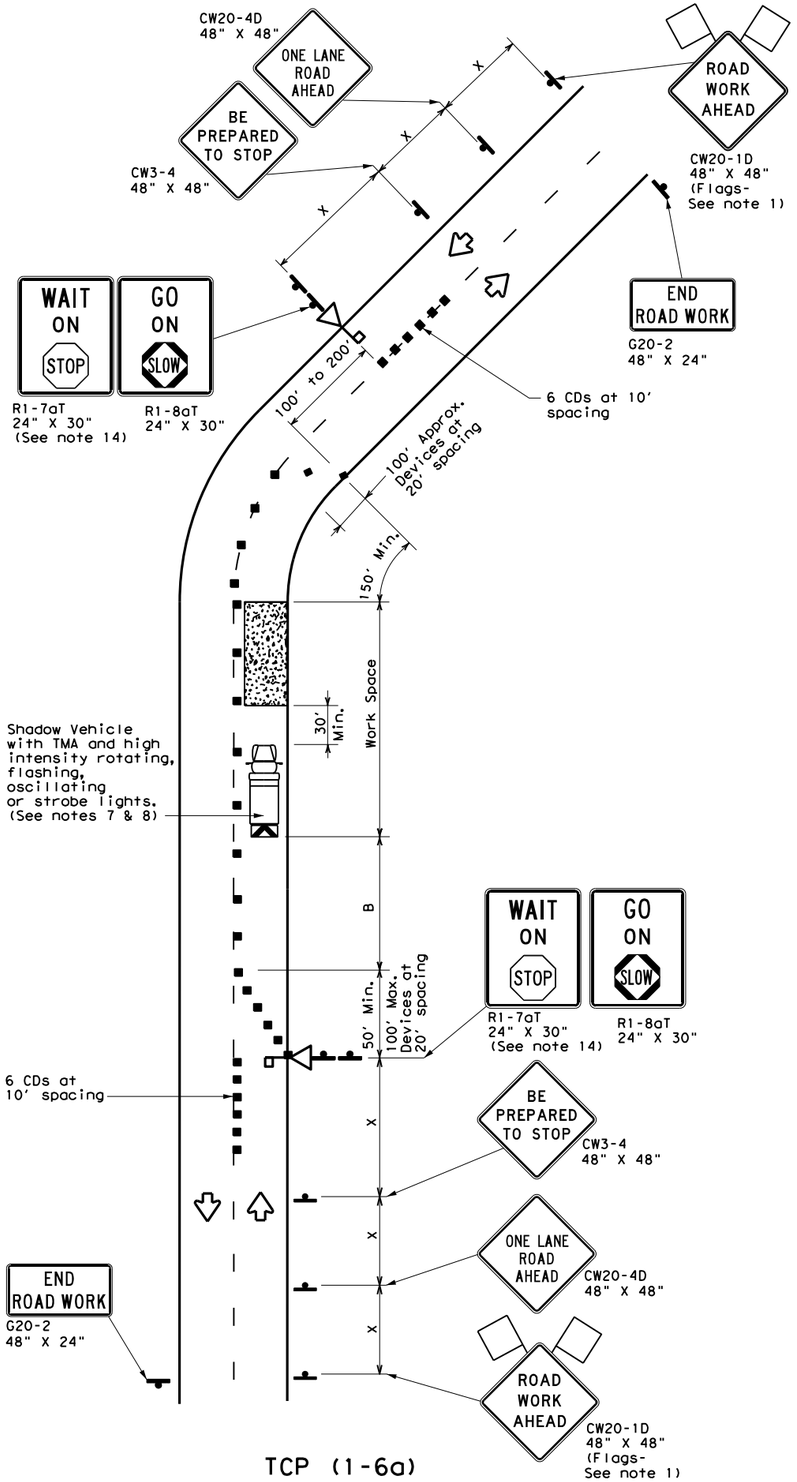
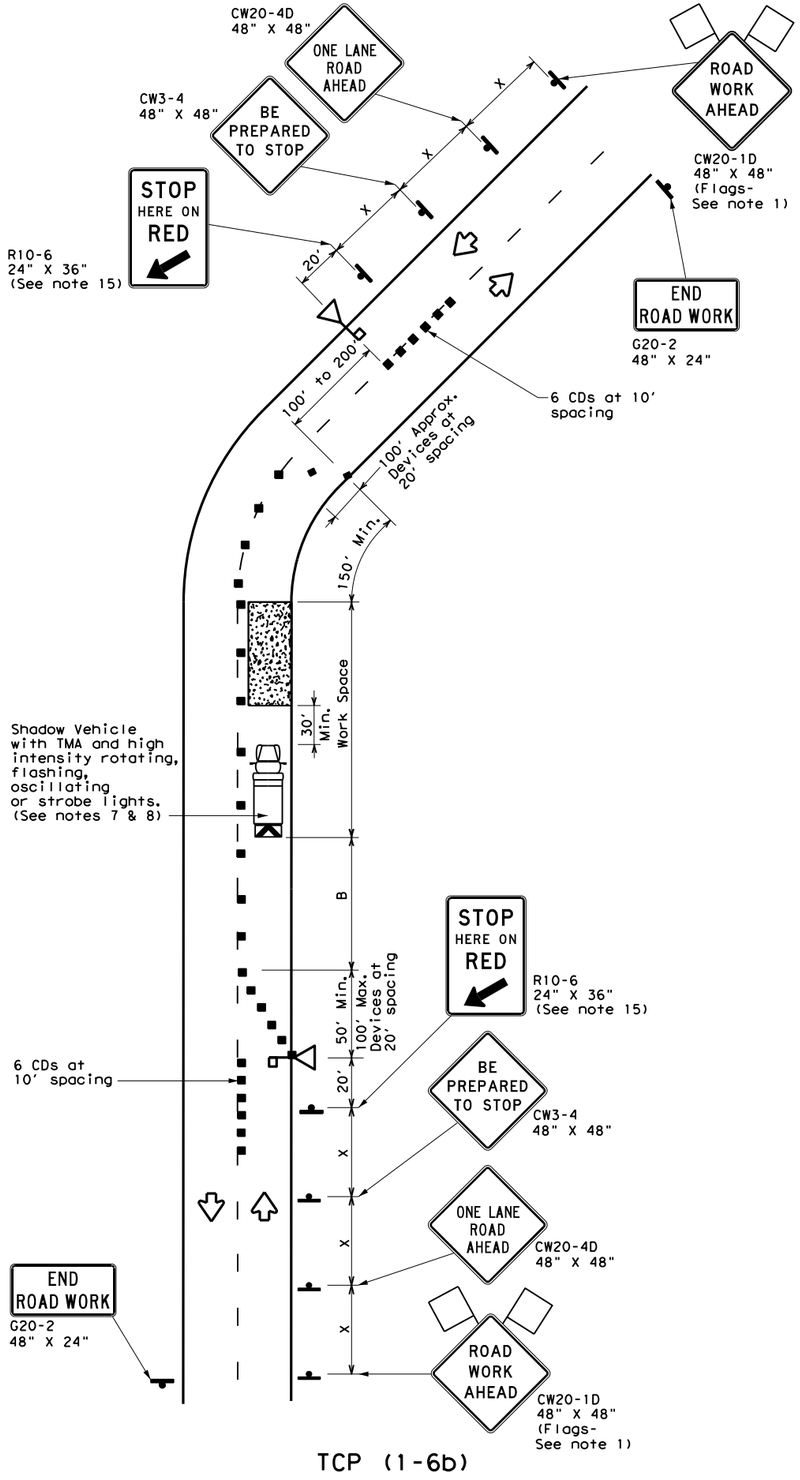
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		62



TCP (1-6a)

ONE LANE TWO-WAY CONTROL WITH STOP/SLOW AFADs



TCP (1-6b)

ONE LANE TWO-WAY CONTROL WITH RED/YELLOW LENS AFADs

LEGEND			
	Type 3 Barricade		Channelizing Devices (CDs)
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Automated Flagger Assistance Device (AFAD)	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

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

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

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. AFADs shall only be used in situations where there is one lane of approaching traffic in the direction to be controlled.
3. Adequate stopping sight distance must be provided to each AFAD location for approaching traffic. (See table above).
4. Each AFAD shall be operated by a qualified/certified flagger. Flaggers operating AFADs shall not leave them unattended while they are in use.
5. One flagger may operate two AFADs only when the flagger has an unobstructed view of both AFADs and of the approaching traffic in both directions.
6. When pilot cars are used, a flagger controlling traffic shall be located on each approach. AFADs shall not be operated by the pilot car operator.
7. All AFADs shall be equipped with gate arms with an orange or fluorescent red-orange flag attached to the end of the gate arm. The flag shall be a minimum of 16" square.
8. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
9. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
10. Flaggers should use two-way radios or other methods of communication to control traffic.
11. Length of work space should be based on the ability of flaggers to communicate.
12. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the AFAD.
13. Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
14. The R1-7aT "WAIT ON STOP" sign and the R1-8aT "GO ON SLOW" sign shall be installed at the AFAD location on separate supports or they may be fabricated as one 48" x 30" sign. They shall not obscure the face of the STOP/SLOW AFAD.
15. The R10-6 "STOP HERE ON RED" arrow sign shall be offset so as not to obscure the lenses of the AFAD.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
AUTOMATED FLAGGER ASSISTANCE DEVICES (AFADS)

TCP(1-6)-18

FILE: tcp1-6-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
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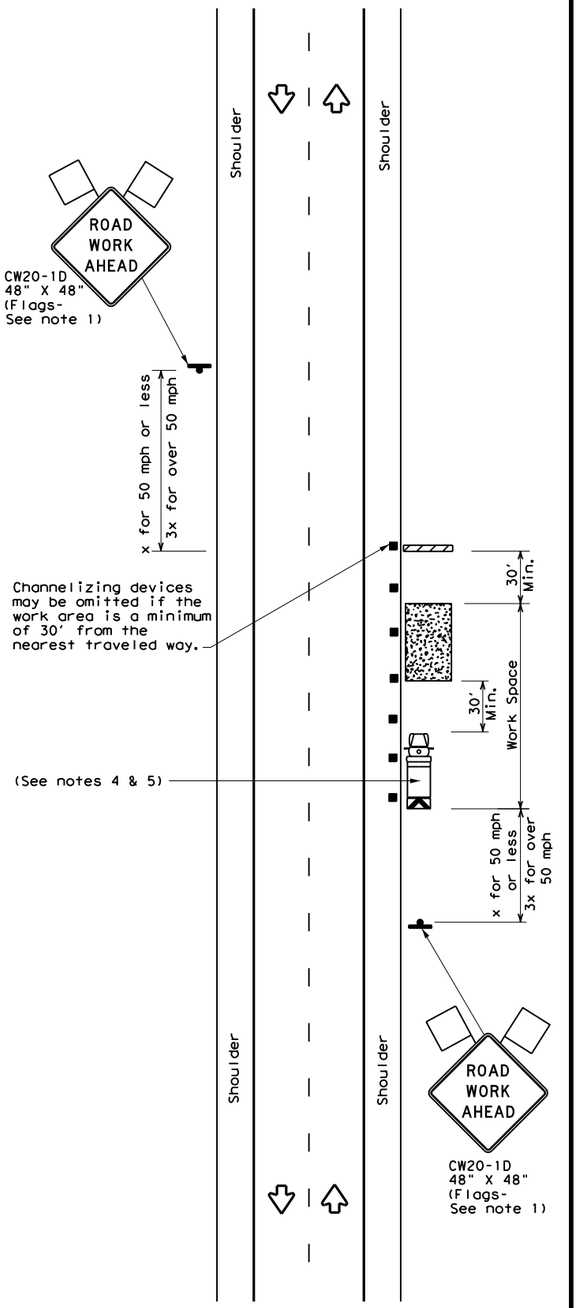
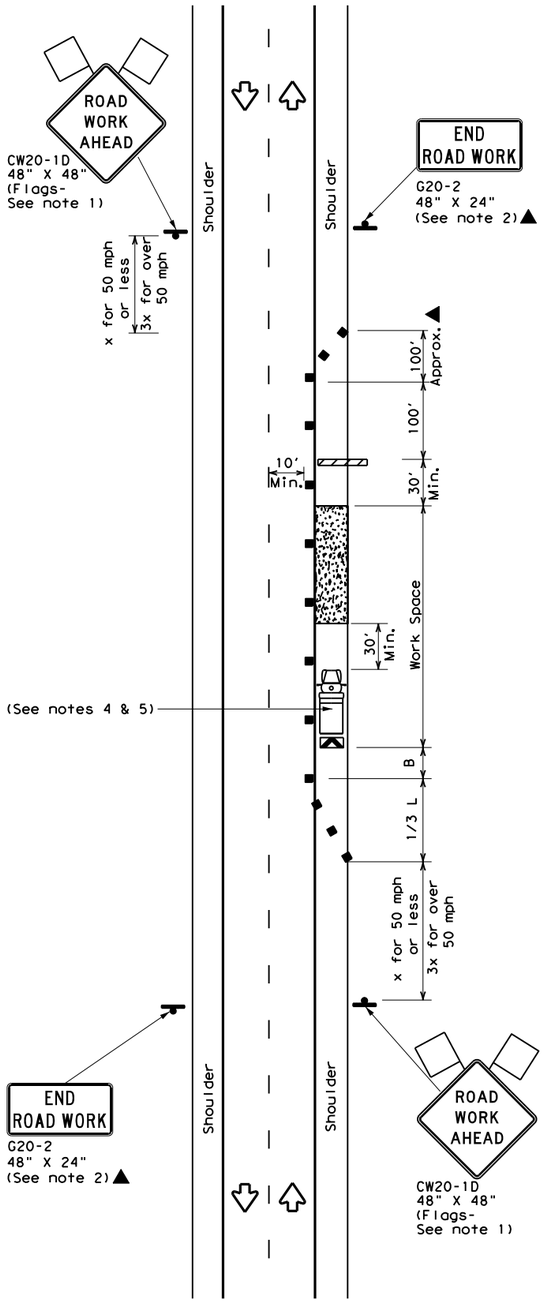
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		63



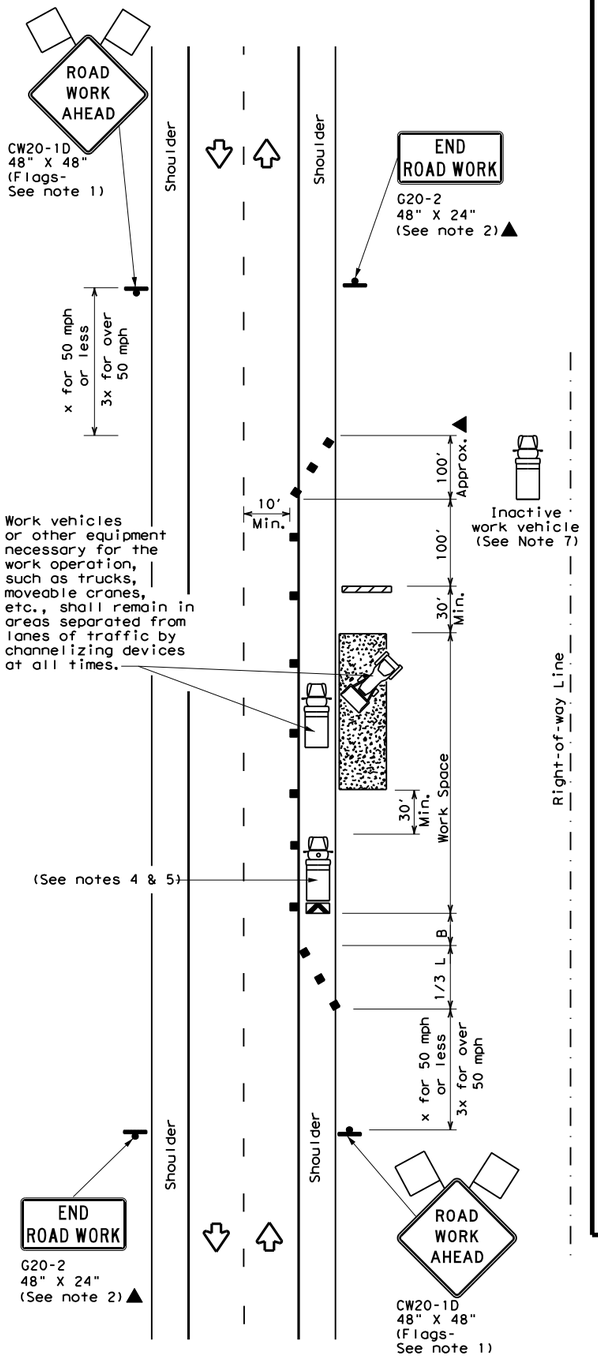
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

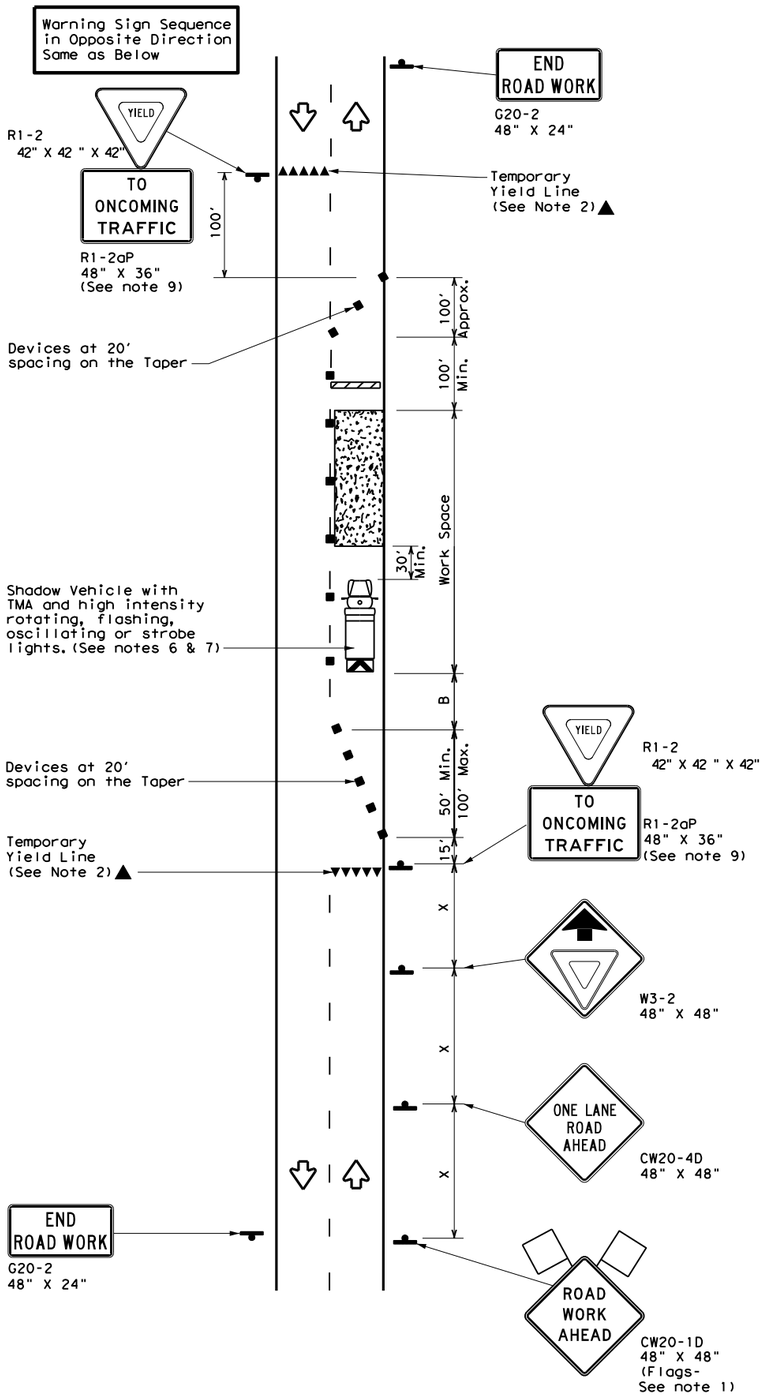
Texas Department of Transportation

Traffic Operations Division Standard

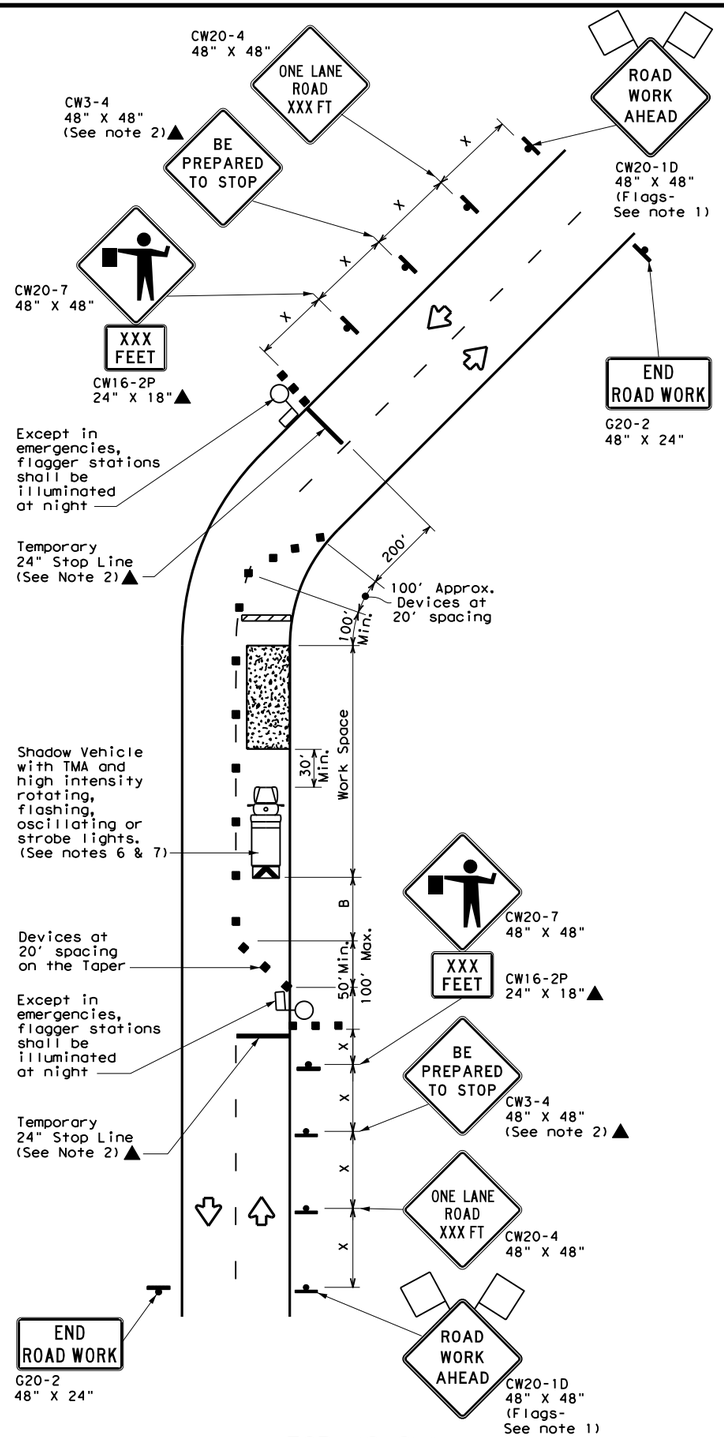
TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC.	IH 37, ETC.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	CRP	NUECES		64
1-97 2-18				



TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



TCP (2-2b)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH FLAGGERS

LEGEND

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

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

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

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

GENERAL NOTES

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

TCP (2-2a)

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

TCP (2-2b)

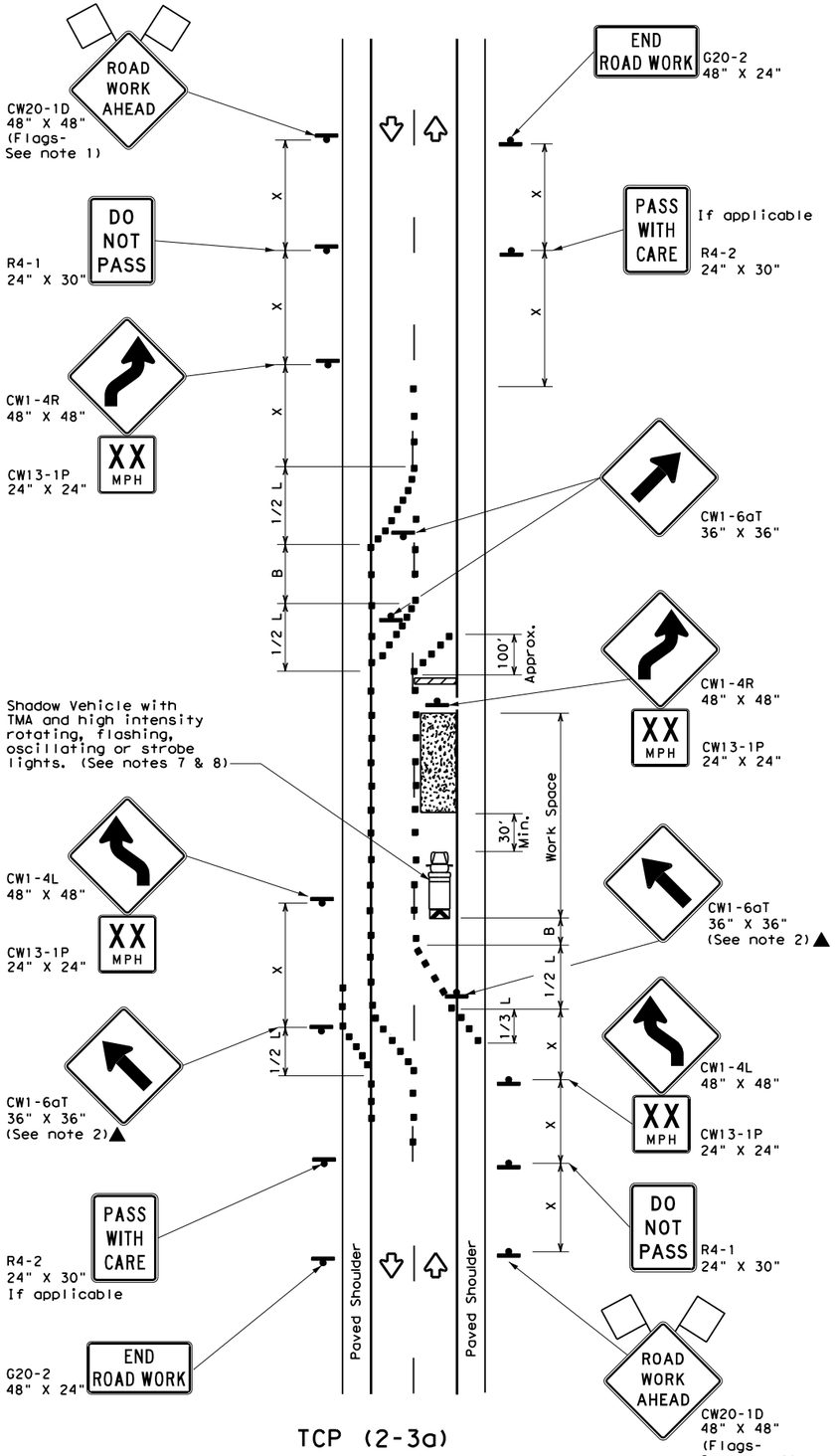
10. Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the flagger and a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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

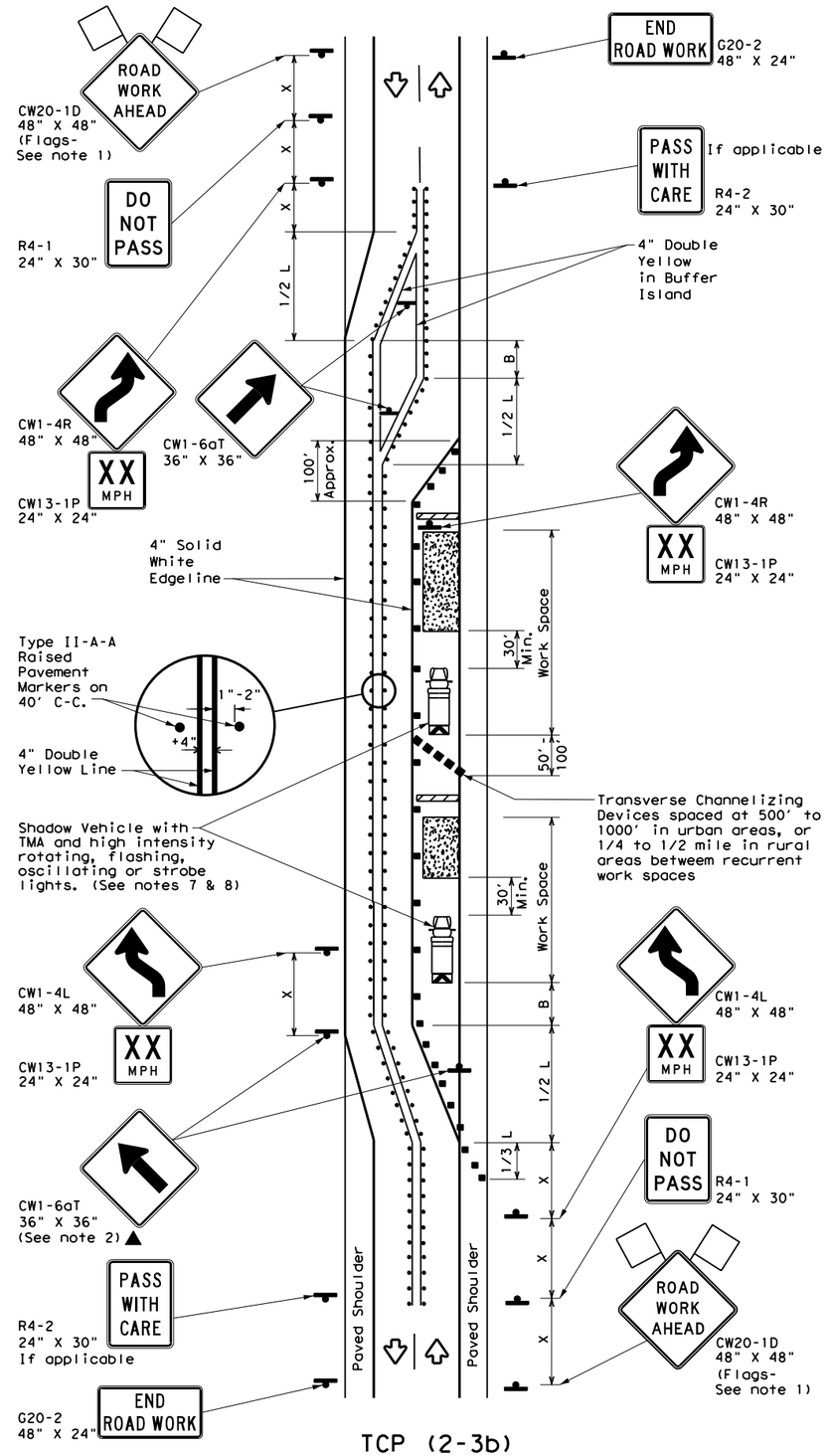
TCP(2-2)-18

FILE: tcp2-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	0074	06	254, ETC.	IH 37, ETC.
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		65



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

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



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

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

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

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

* Conventional Roads Only

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

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
				TCP(2-3b)ONLY
			✓	✓

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. When work space will be in place less than three days existing pavement markings may remain in place. Channelizing devices shall be used to separate traffic.
4. Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Flagger should be positioned at end of traffic queue.
5. The R4-1 "DO NOT PASS," R4-2 " PASS WITH CARE" and construction regulatory speed zone signs may be installed within CW20-1D "ROAD WORK AHEAD" signs. Proper spacing of signs shall be maintained.
6. Conflicting pavement marking shall be removed for long term projects.
7. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted.
8. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-3a)

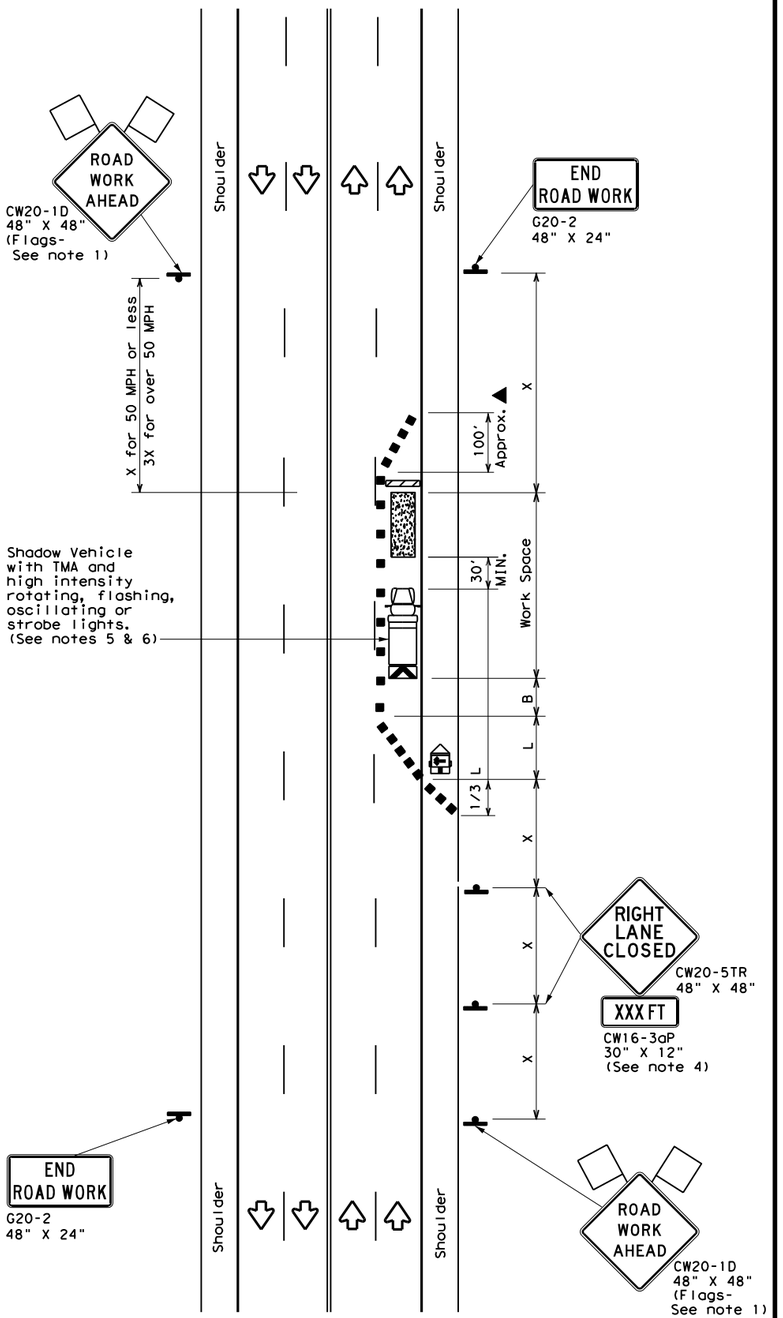
9. Conflicting pavement markings shall be removed for long-term projects. For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections,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

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO-LANE ROADS

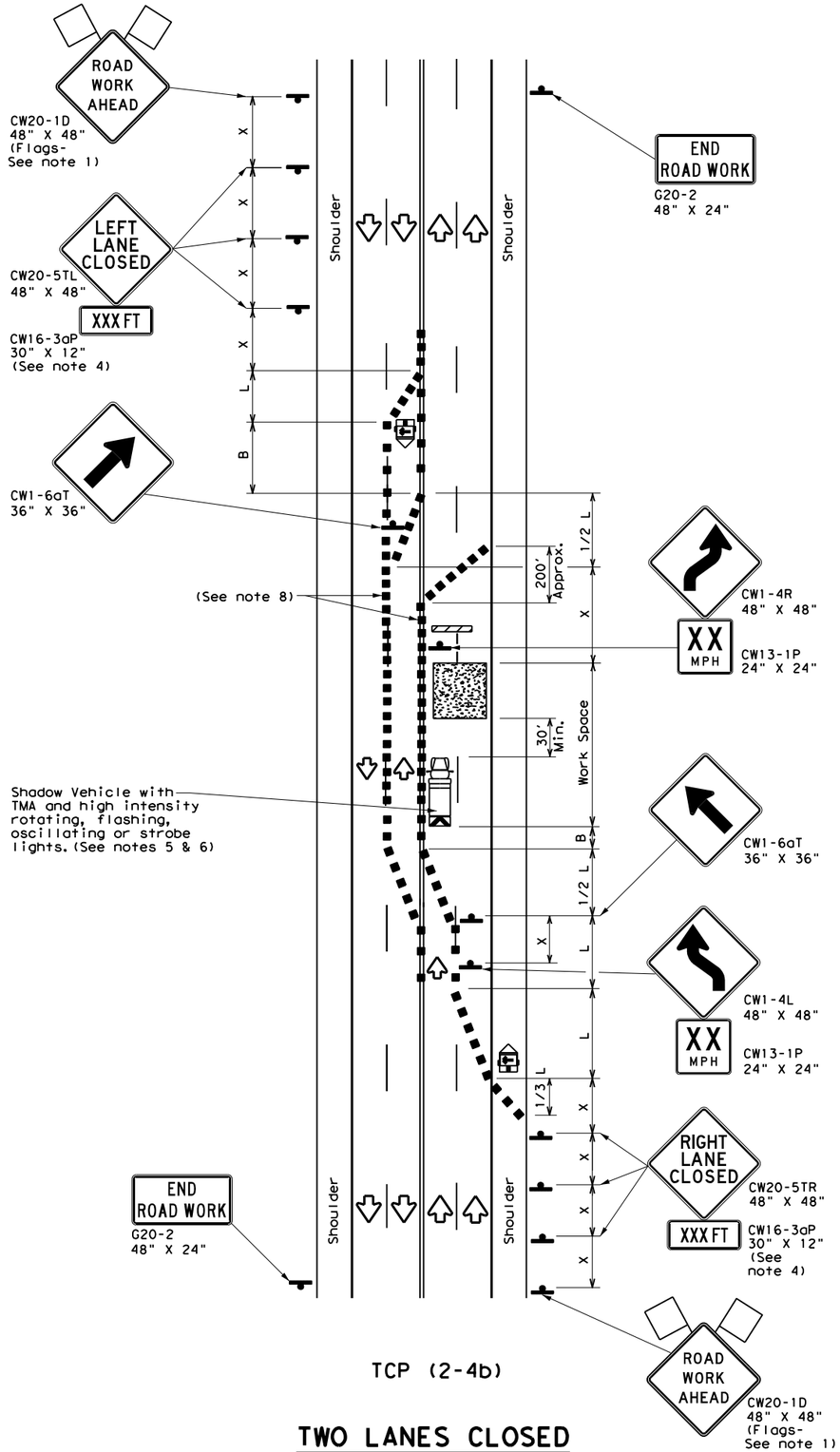
TCP(2-3)-18

FILE: tcp(2-3)-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254,ETC.	IH 37, ETC.
8-95 3-03	DIST	COUNTY		SHEET NO.
1-97 2-12	CRP	NUECES		66
4-98 2-18				



TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The downstream taper is optional. When used, it should be 100 feet minimum length per lane.
4. For short term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a CW16-3aP supplemental plaque.
5. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
6. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-4a)

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

TCP (2-4b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0074	06	254, ETC.	IH 37, ETC.
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	CRP	NUECES		67

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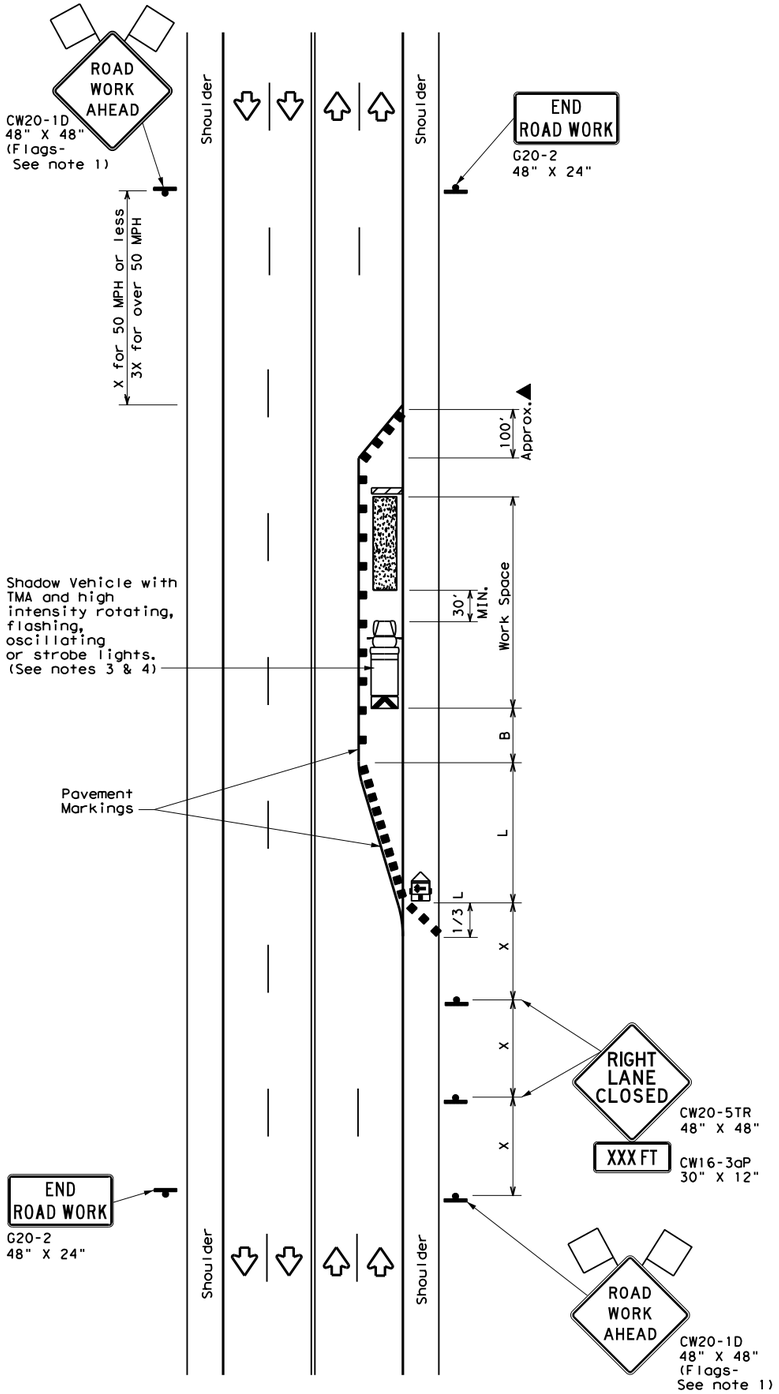
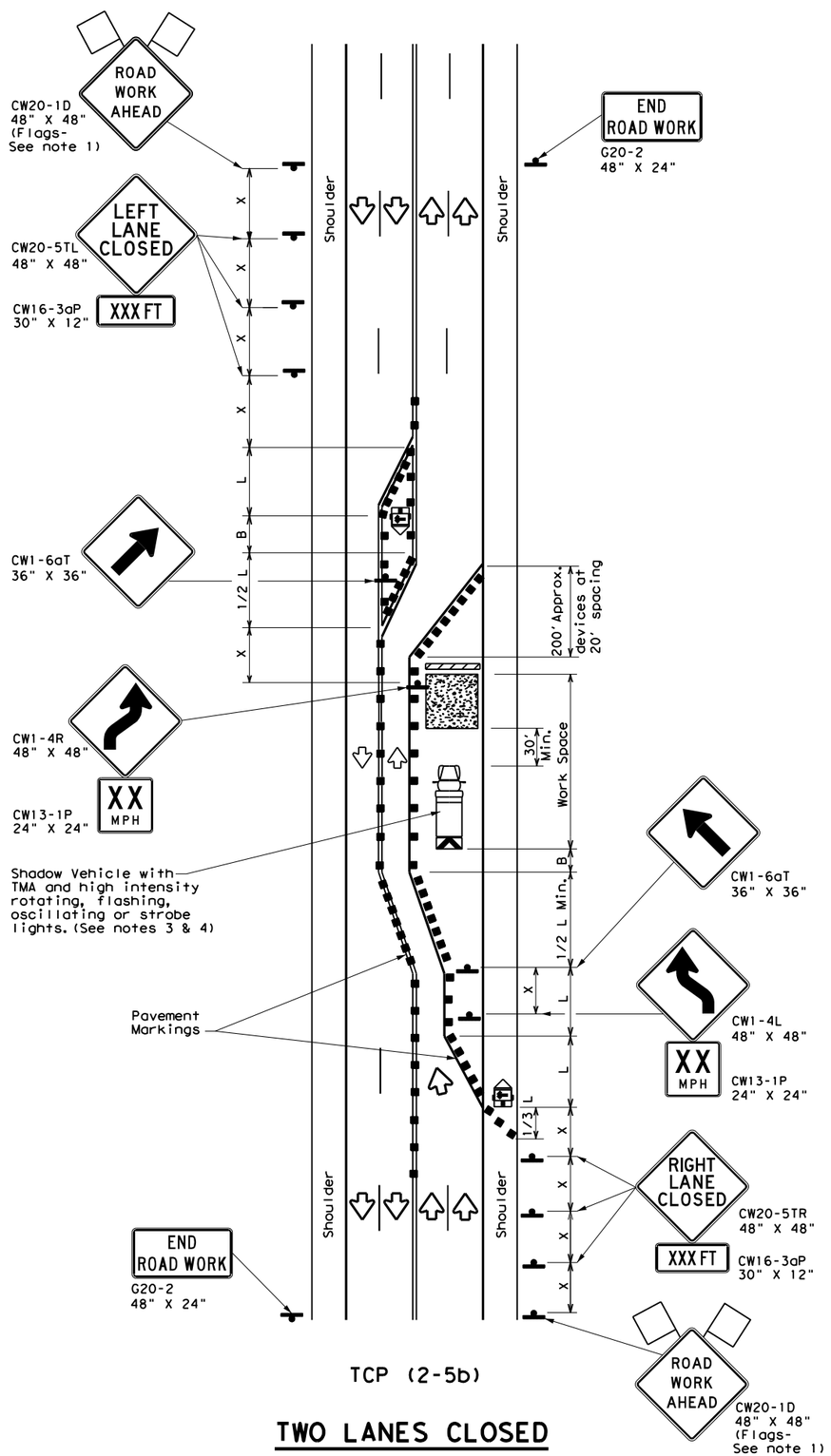


TCP (2-5a)

ONE LANE CLOSED



TCP (2-5b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew eposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substitutued for the Shadow Vehicle and TMA.
4. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.
5. The downstream taper is optional. When used, it should be 100 feet approximately per lane, with channelizing devices spaced at 20 feet.

TCP (2-5a)

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

TCP (2-5b)

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

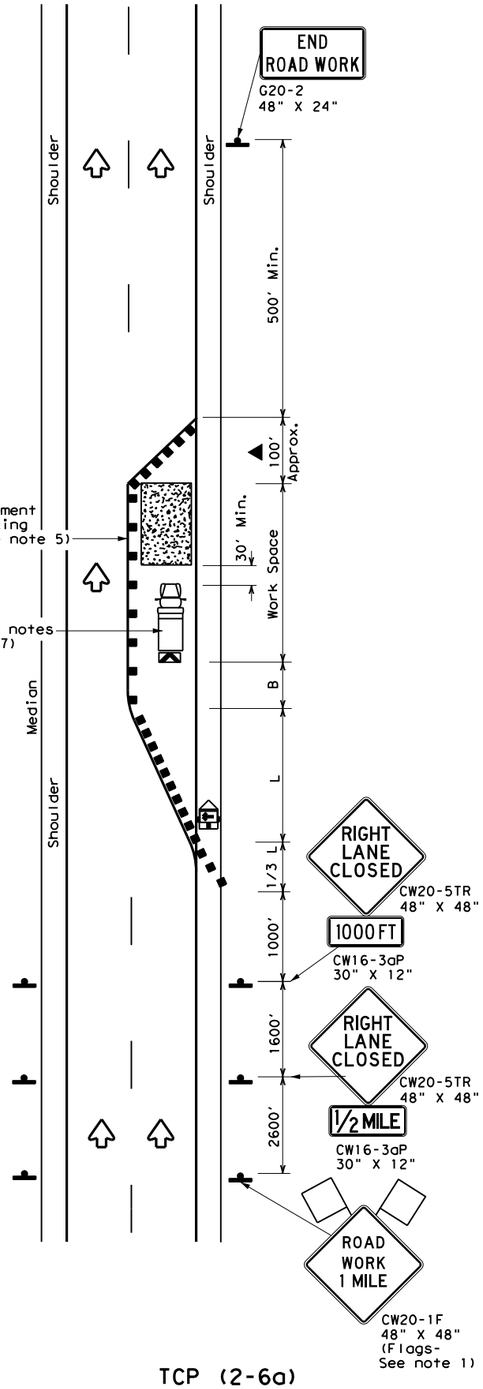
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
LONG TERM LANE CLOSURES
MULTILANE CONVENTIONAL RDS.

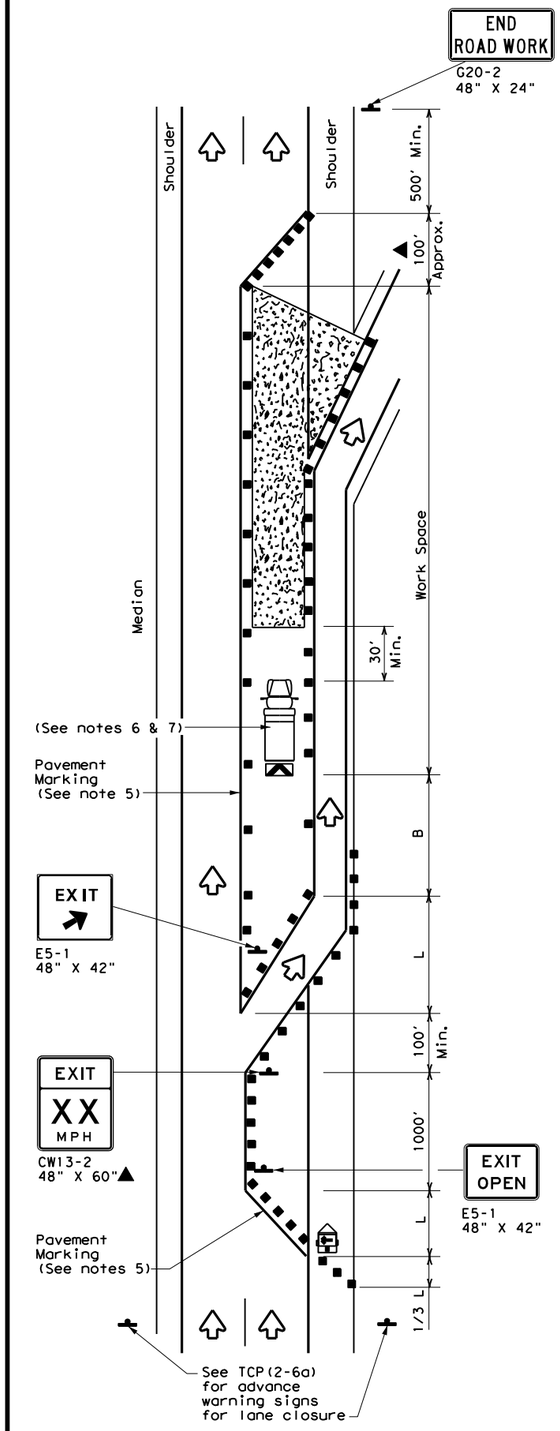
TCP(2-5)-18

FILE: tcp2-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 2-12	0074	06	254, ETC.	IH 37, ETC.
1-97 3-03	DIST	COUNTY		SHEET NO.
4-98 2-18	CRP	NUECES		68



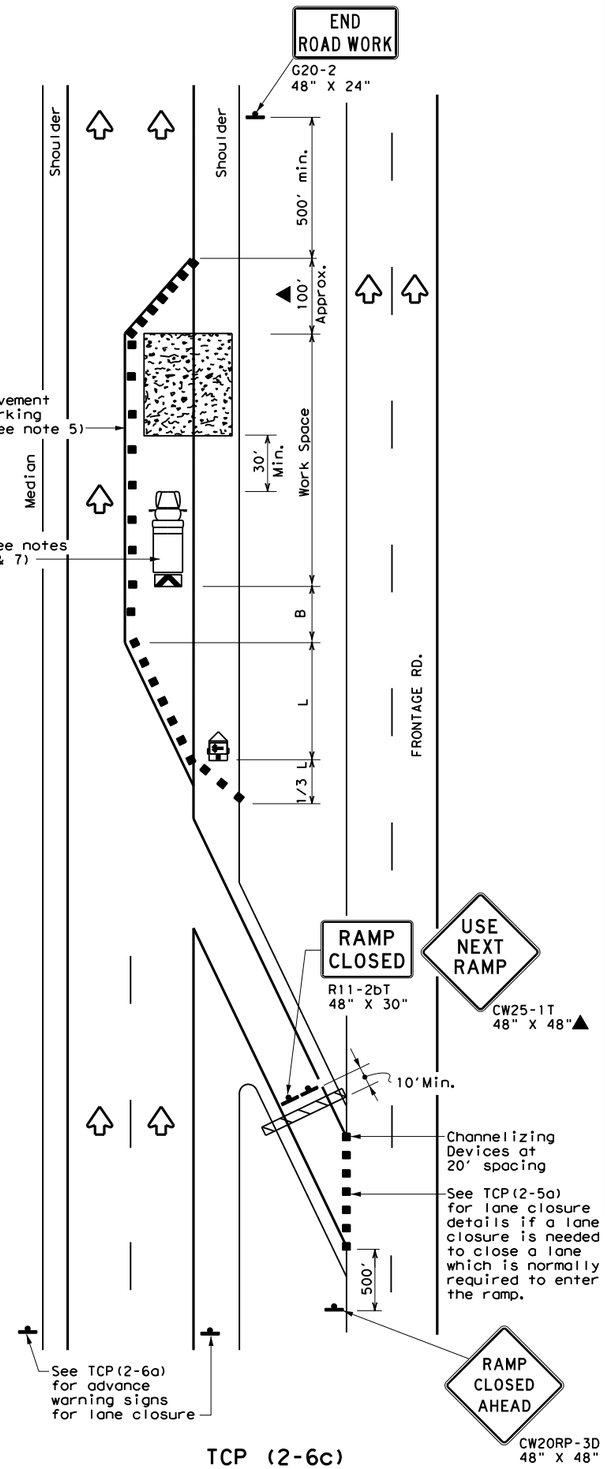
TCP (2-6a)

ONE LANE CLOSURE



TCP (2-6b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (2-6c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
4. Channelizing devices used along the work space or along tangent sections may be supplemented with vertical panels (VP) placed on everyother channelizing device. If night time conditions make it difficult to see at least two VPs, the VPs may be placed on each channelizing device.
5. The placement of pavement markings may be omitted on Intermediate-term stationary work zones with the approval of the Engineer.
6. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
7. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

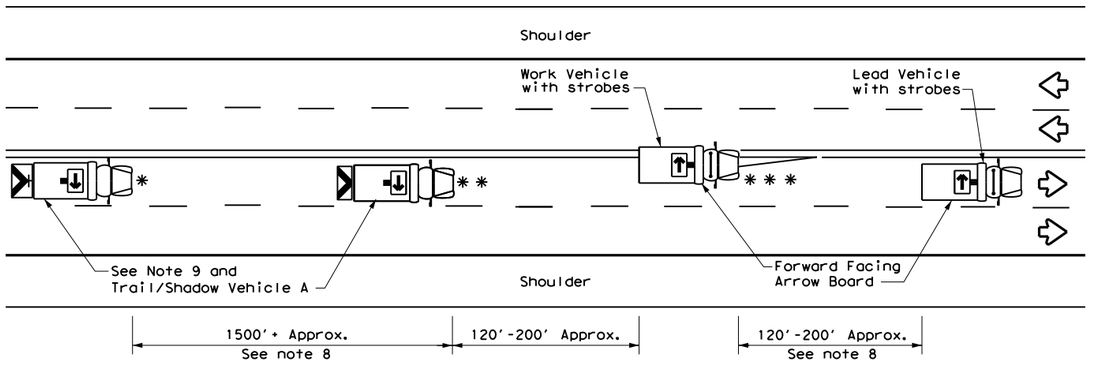
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON DIVIDED HIGHWAYS

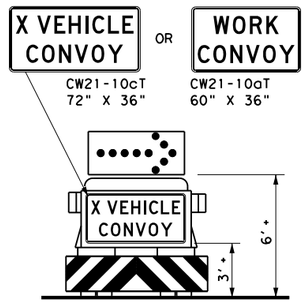
TCP(2-6)-18

FILE: tcp2-6-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	0074	06	254,ETC.	IH 37,ETC.
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		69



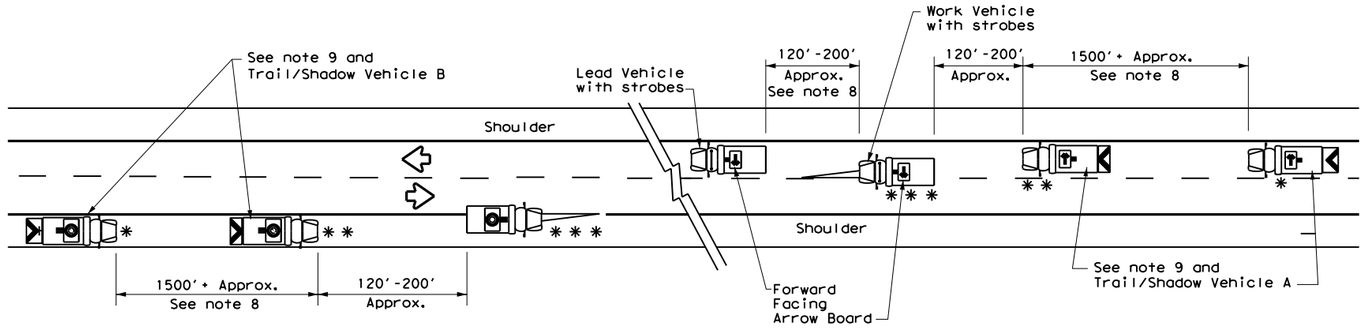
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

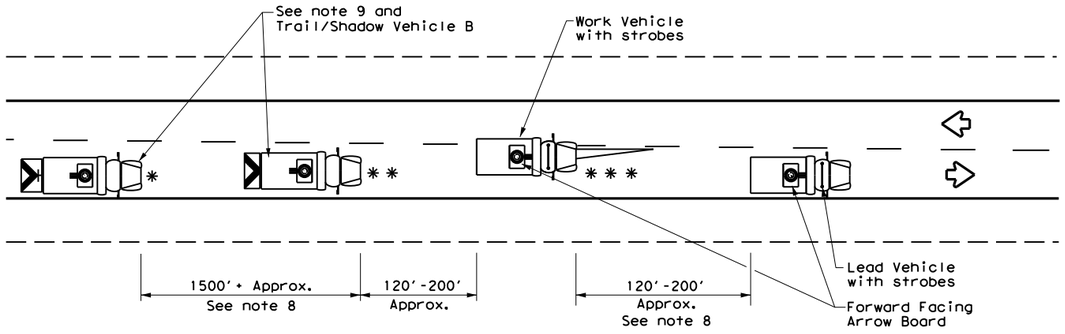


WORK ON SHOULDER

WORK ON TRAVEL LANE

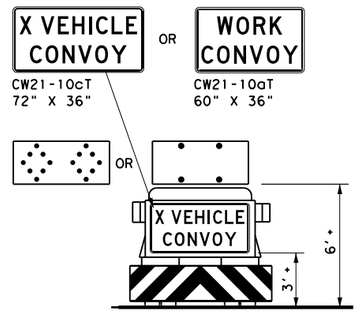
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

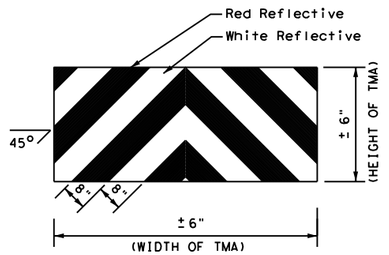
with Flashing Arrow Board in CAUTION display

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

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

GENERAL NOTES

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



STRIPING FOR TMA

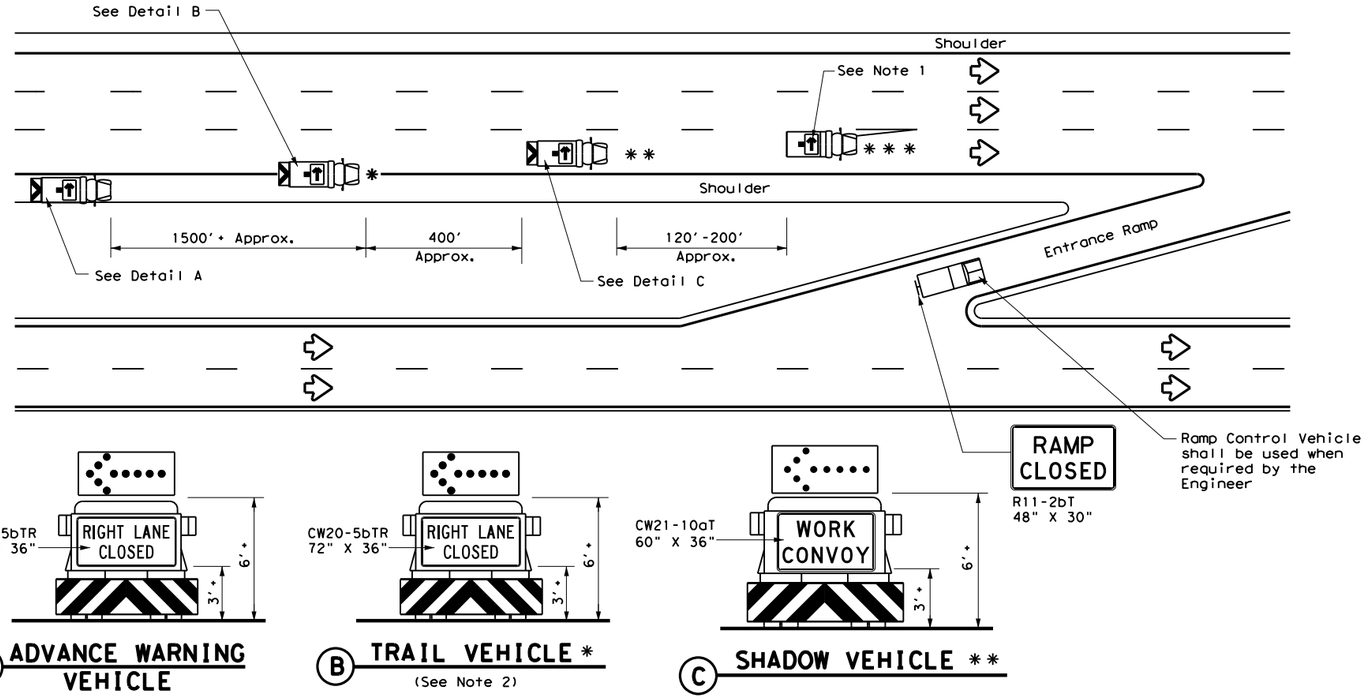
Texas Department of Transportation

Traffic Operations Division Standard

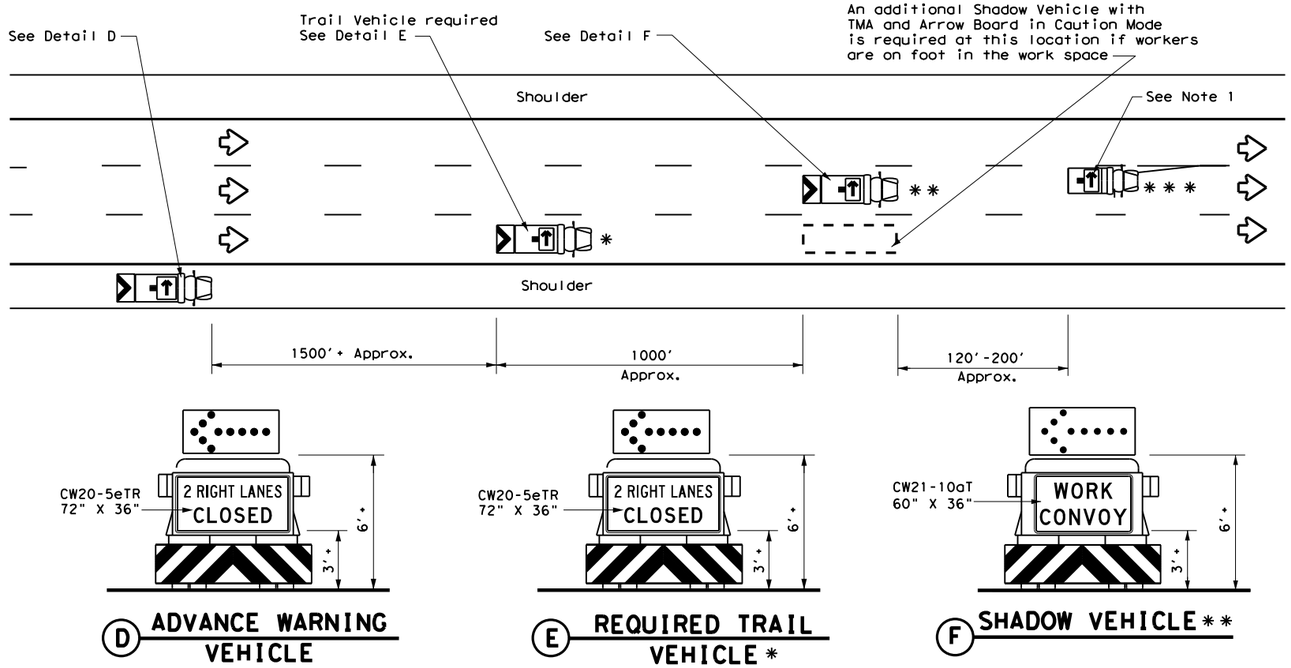
TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

FILE: tcp3-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0074	06	254, ETC.	IH 37, ETC.
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		70



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



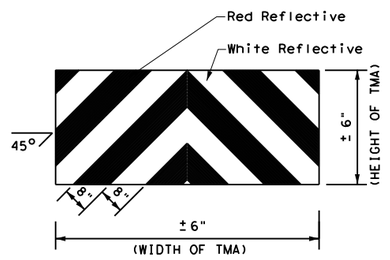
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

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

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

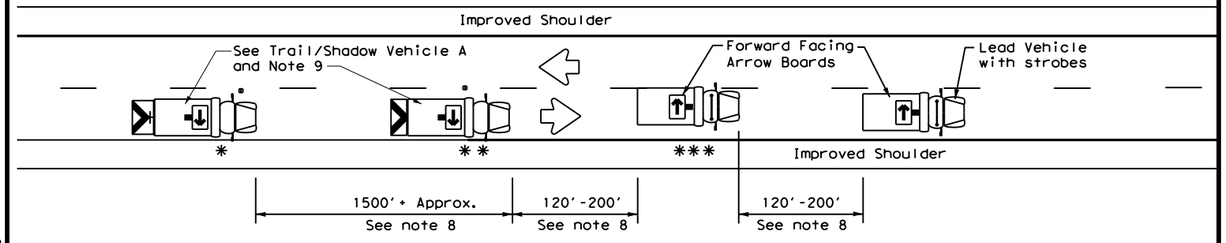
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

TCP(3-2)-13

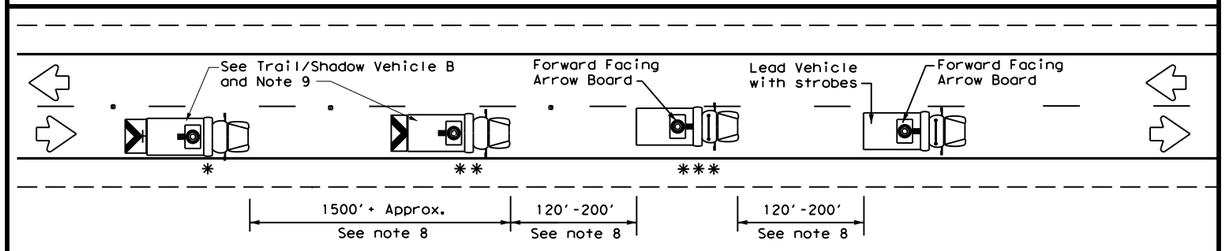
FILE: tcp3-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0074	06	254, ETC.	IH 37, ETC.
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		71

176



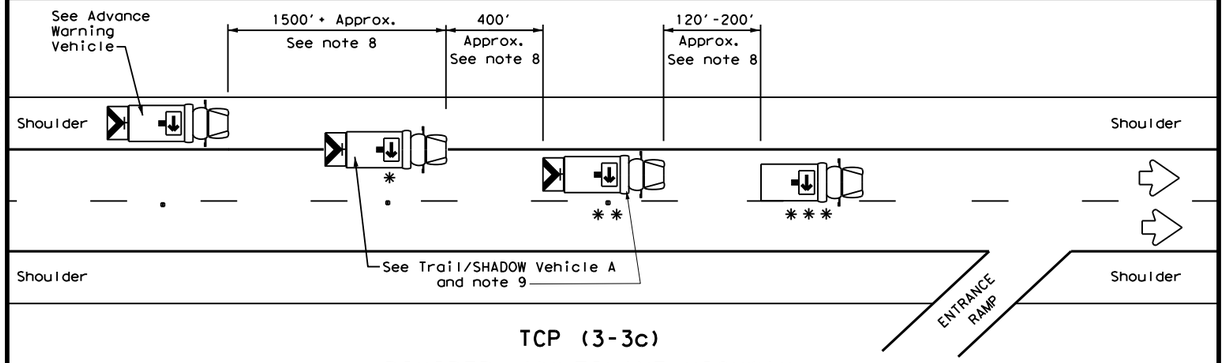
TCP (3-3a)

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



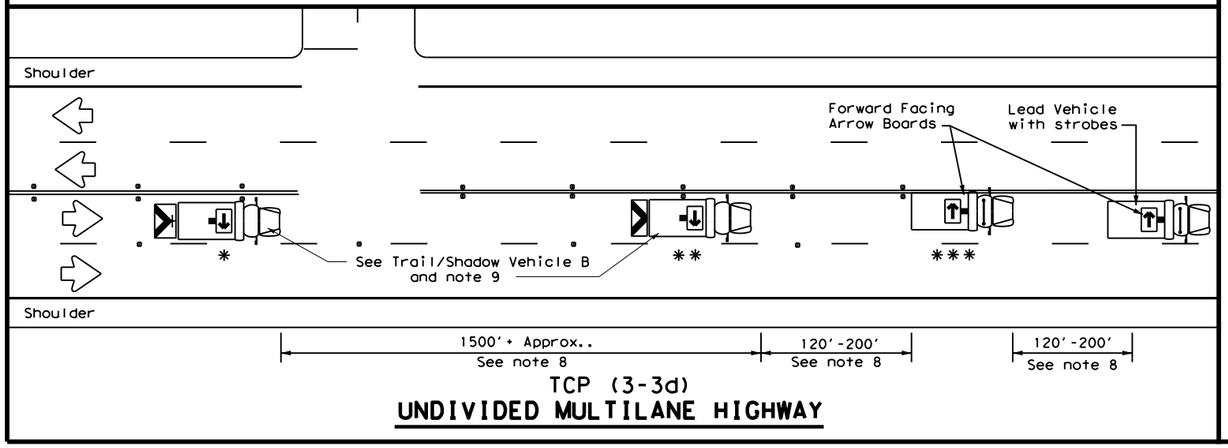
TCP (3-3b)

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



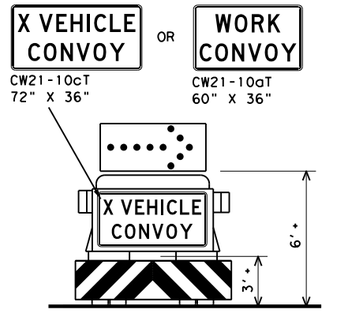
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



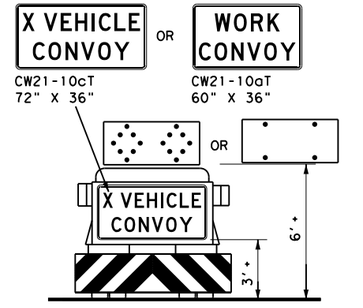
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



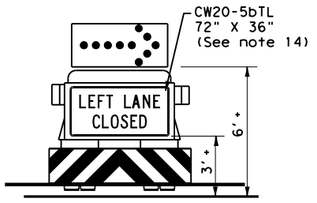
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

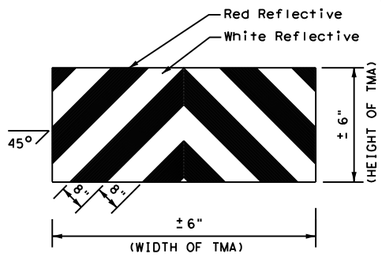


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

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

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

GENERAL NOTES

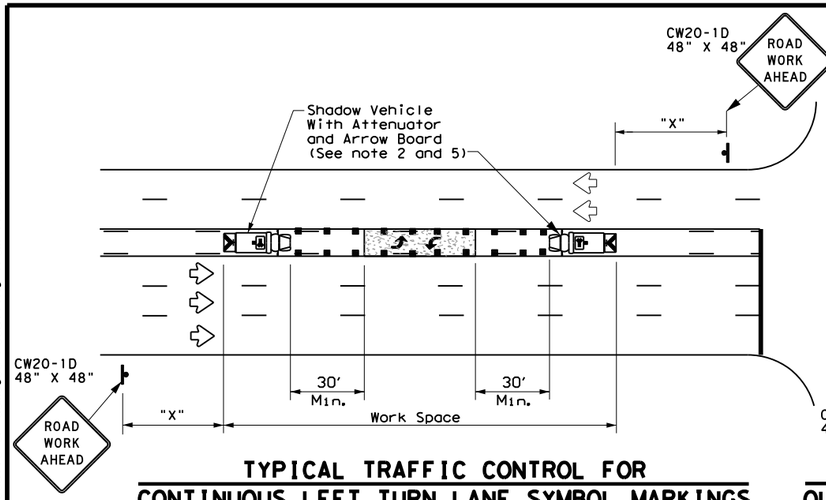
1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used on two way roads the WORK vehicle must have an arrow board. For divided roadways, the arrow board on the WORK vehicle is optional based on the type of work being performed. The Engineer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

Texas Department of Transportation

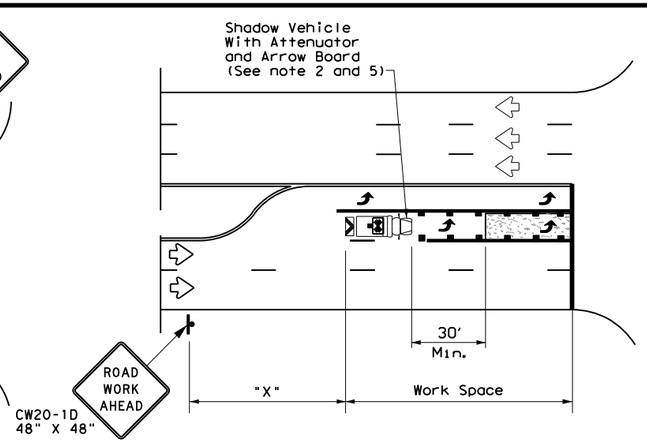
Traffic Operations Division Standard

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

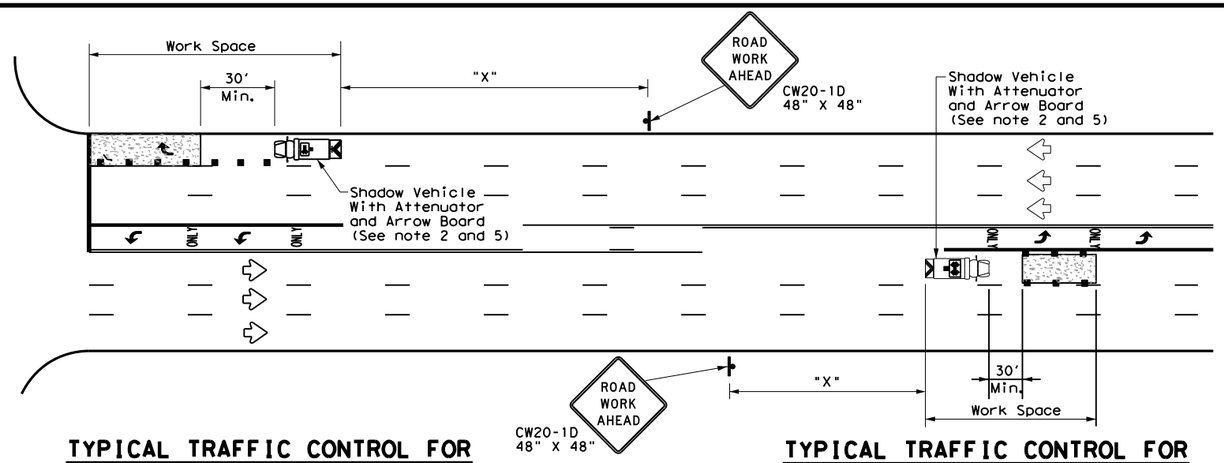
FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC.	IH 37, ETC.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	CRP	NUECES		72
1-97 7-14				



TYPICAL TRAFFIC CONTROL FOR CONTINUOUS LEFT TURN LANE SYMBOL MARKINGS

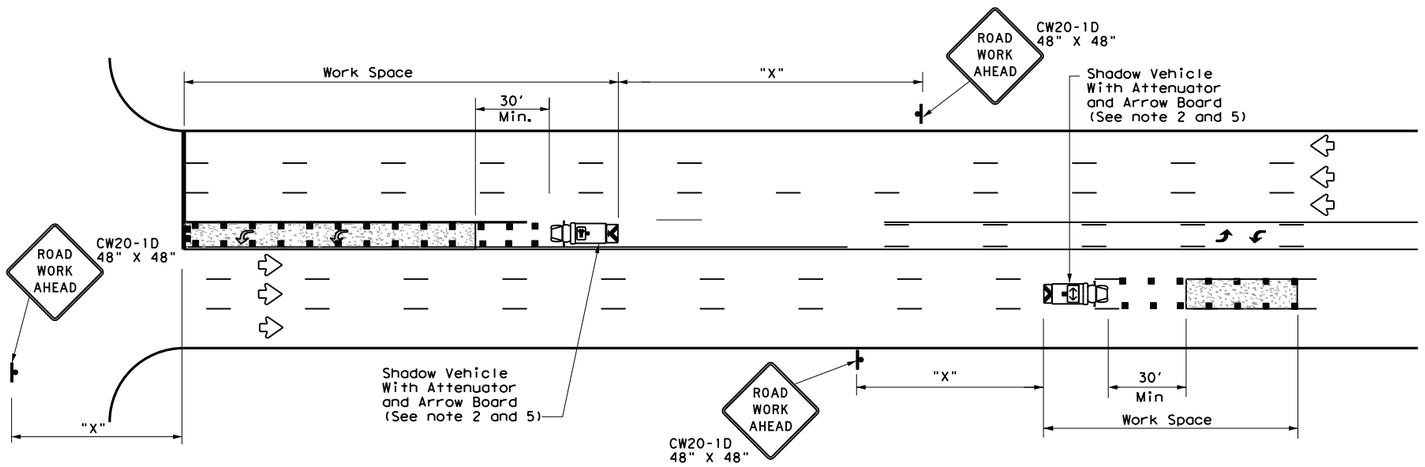


TYPICAL TRAFFIC CONTROL FOR OUTSIDE DUAL LEFT TURN LANE SYMBOL MARKINGS



TYPICAL TRAFFIC CONTROL FOR OUTSIDE LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR INSIDE LANE MARKINGS



TYPICAL TRAFFIC CONTROL FOR LEFT TURN LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR CENTER LANE MARKINGS

LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
**	Shadow Vehicle		
***	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow	■ ■ ■	Channelizing Devices

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

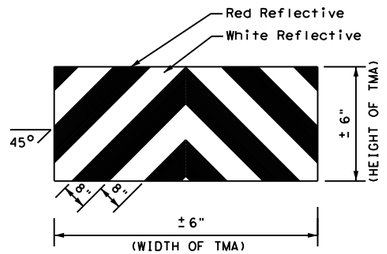
* Conventional Roads Only

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

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

GENERAL NOTES

1. This traffic control plan is for use on conventional roads posted at 45 mph or less and is intended for mobile operations that move continuously or intermittently (stopping up to approximately 15 minutes) such as short-line striping and in-lane rumble strips. When activities are anticipated to take longer amounts of time or traffic conditions warrant, a short duration or short-term stationary traffic control plan should be used.
2. A Truck Mounted Attenuator shall be used on Shadow Vehicle. Striping on the back panel of all truck mounted attenuators shall be 8" red and white reflective sheeting placed in an inverted "V" design. Reflective sheeting shall meet or exceed the reflectivity and color requirements of departmental material specification DMS-8300, Type A.
3. All traffic control devices shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD), latest edition.
4. The use of yellow rotating beacons or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the drivers side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
5. Flashing arrow board shall be used on Shadow Vehicle. Flashing arrow board shall be Type B or Type C as per BC Standards. The arrow board operation shall be controlled from inside the truck.



STRIPING FOR TMA

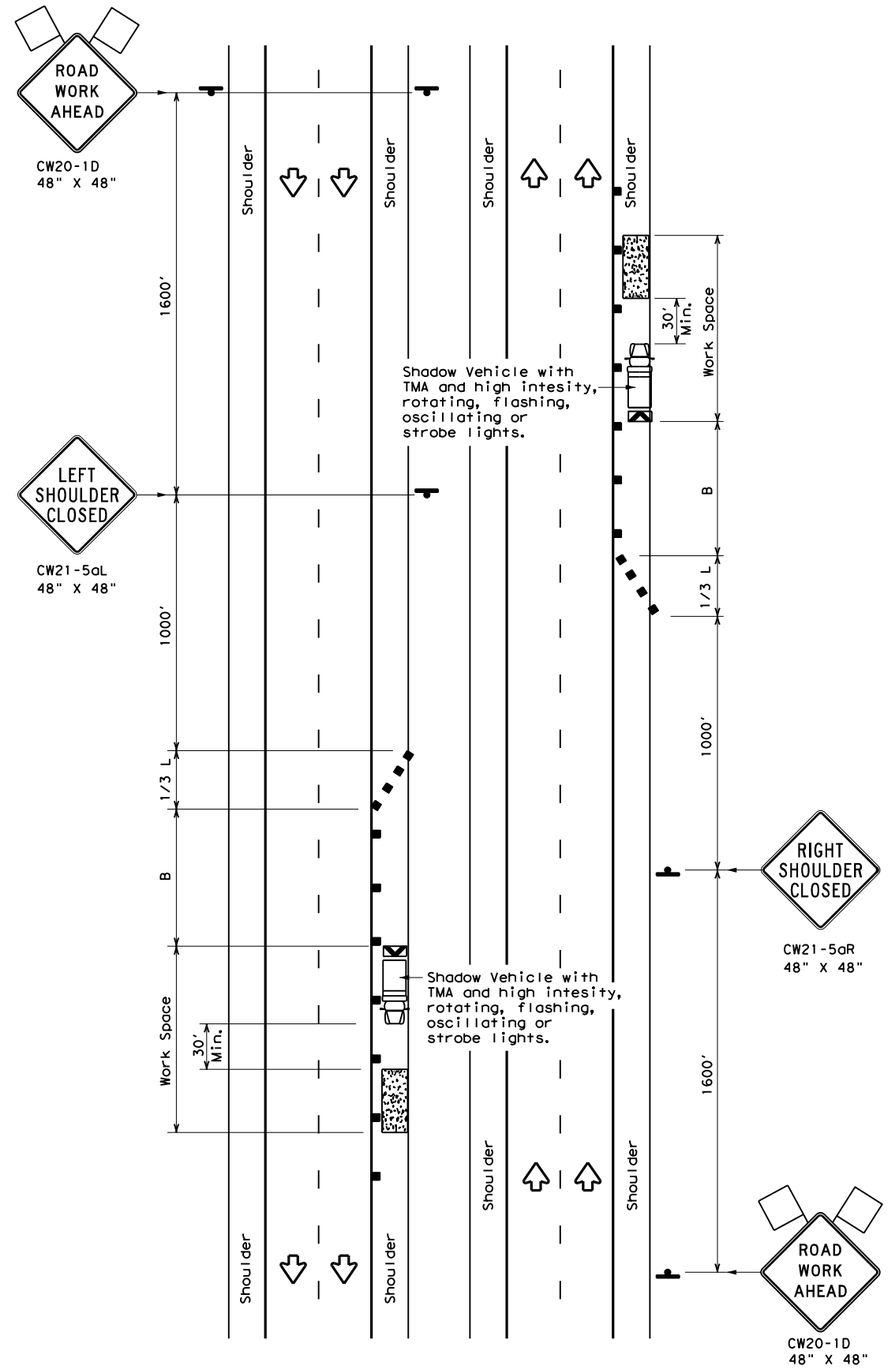
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS FOR ISOLATED WORK AREAS UNDIVIDED HIGHWAYS

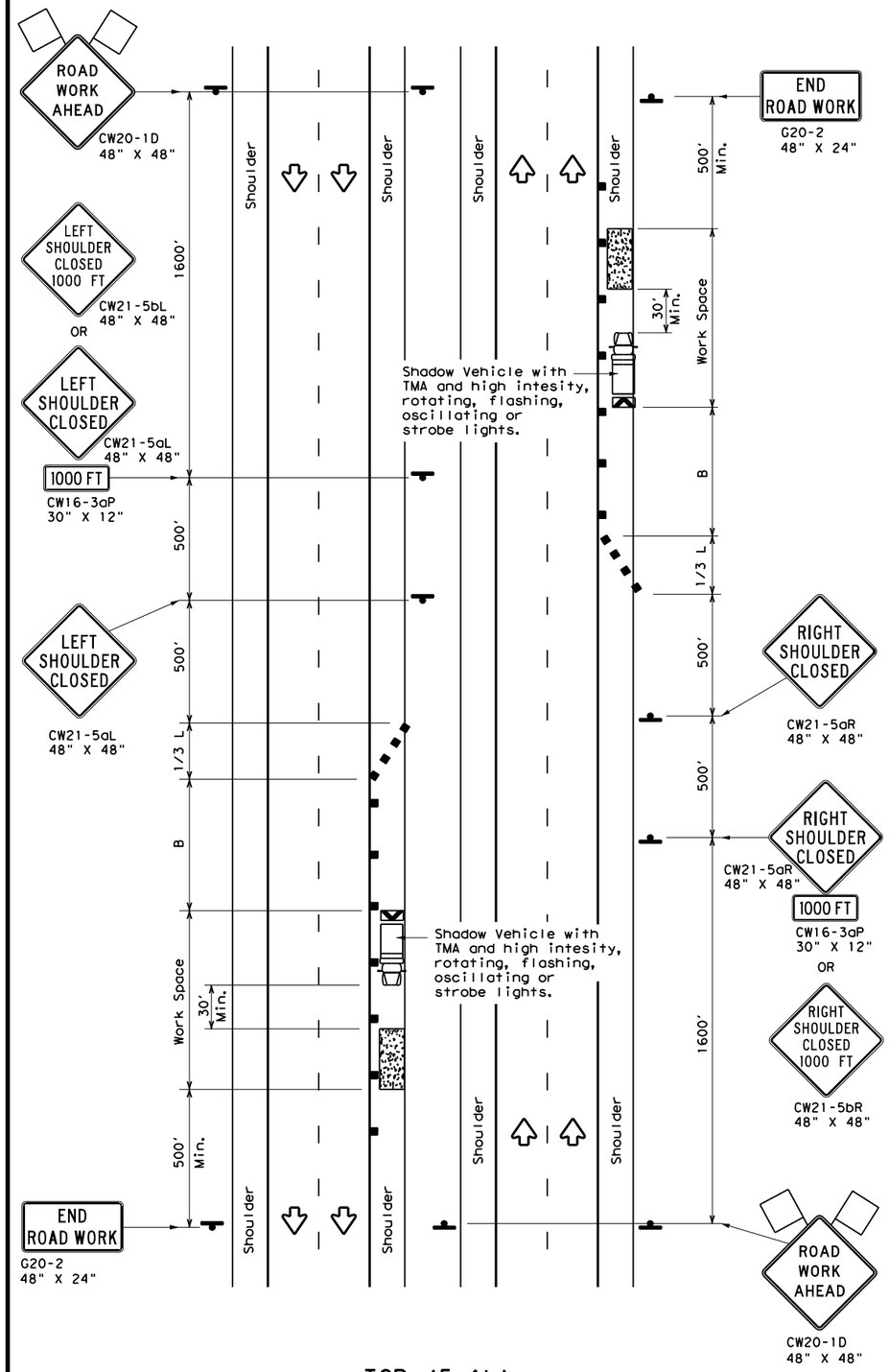
TCP(3-4)-13

FILE: tcp3-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT July, 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC.	IH 37, ETC.
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		73



TCP (5-1a)

WORK AREA ON SHOULDER



TCP (5-1b)

WORK AREA ON SHOULDER

LEGEND

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	90'
35		205'	225'	245'	35'	70'	120'
40		265'	295'	320'	40'	80'	155'
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

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

TYPICAL USAGE

MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	TCP(5-1a)	TCP(5-1b)	TCP(5-1b)	

GENERAL NOTES

1. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30' to 100' in advance of the area of crew exposure without adversely effecting the performance or quality of the work. Type 3 barricades or drums may be substituted when workers on foot are no longer present when approved by the Engineer.
2. 28" tall or taller one-piece cones will be allowed only for Short Duration or Short Term stationary operations when workers are present to maintain the devices upright and in proper location. Intermediate Term stationary work areas should use Drums, Vertical Panels or 42" tall two-piece cones.

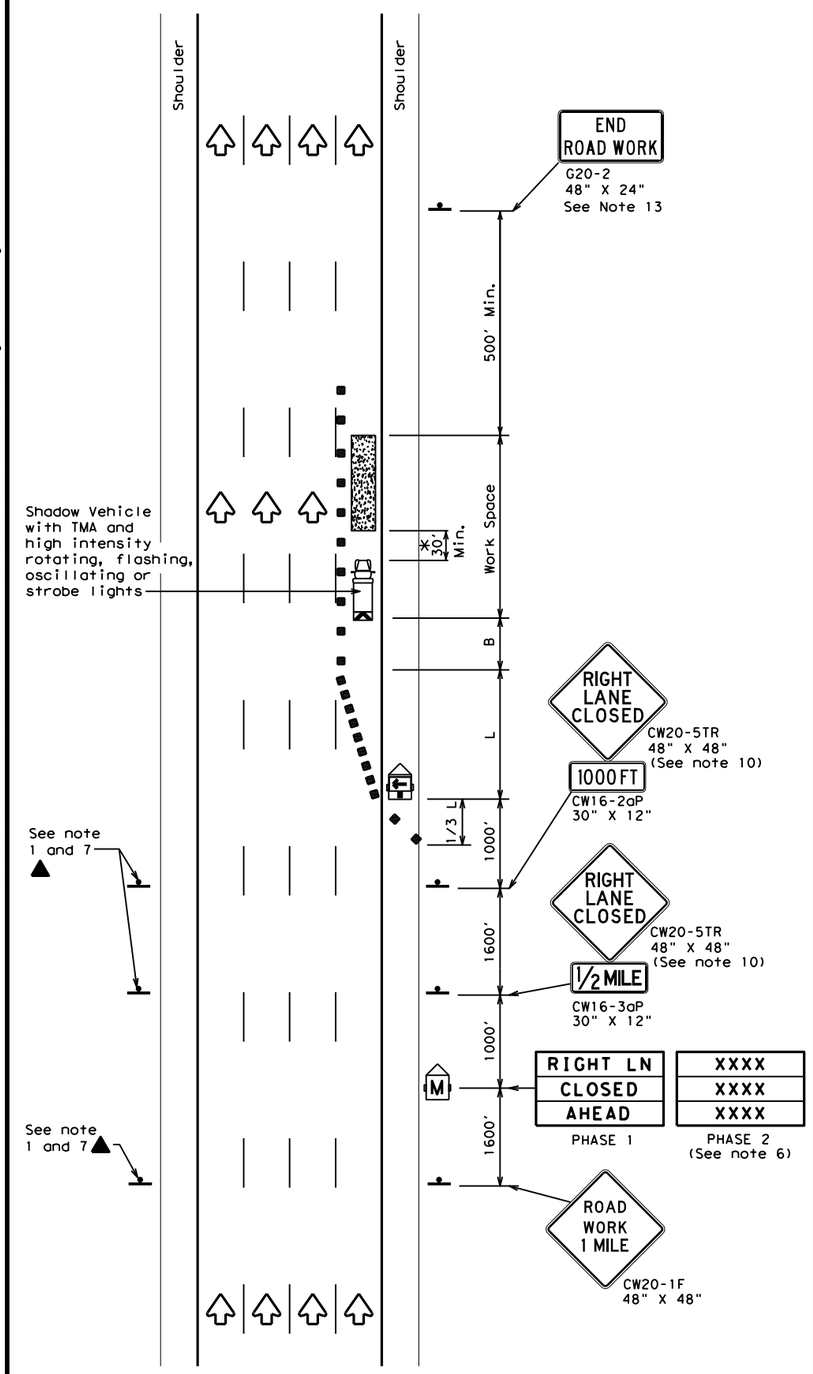
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN SHOULDER WORK FOR FREEWAYS / EXPRESSWAYS

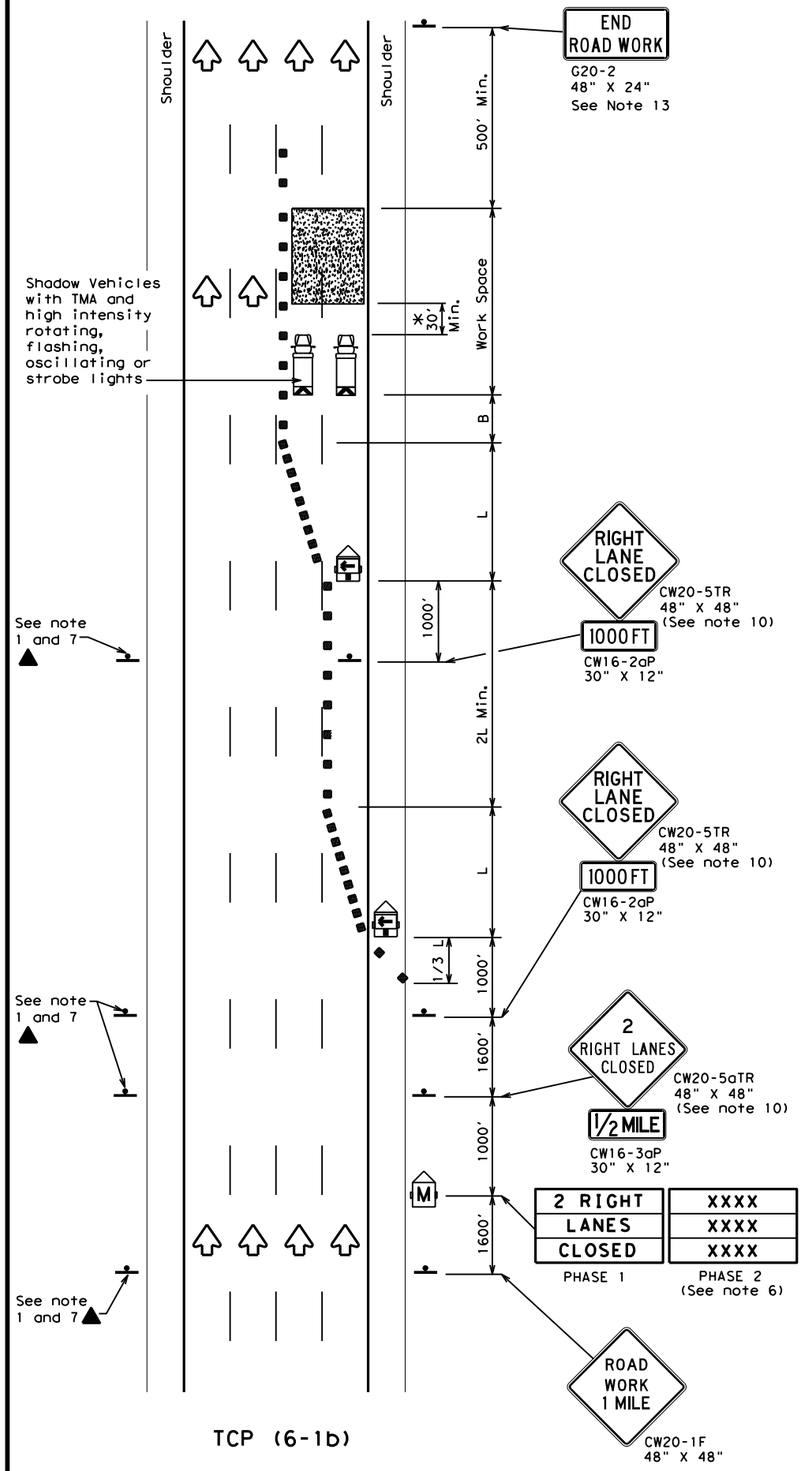
TCP(5-1)-18

FILE: tcp5-1-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-18	0074	06	254, ETC.	IH 37, ETC.
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		74



TCP (6-1a)

TYPICAL FREEWAY ONE LANE CLOSURE



TCP (6-1b)

TYPICAL FREEWAY TWO LANE CLOSURE

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

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

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

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

GENERAL NOTES

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. Drums or 42"cones are the typical channelizing devices. For Intermediate Term Stationary work, drums shall be used on tapers with drums or 42" cones used on tangent sections. Other channelizing devices may be used as directed by the Engineer.
3. All construction signs and barricades placed during any phase of work shall remain in place until removal is approved by the Engineer.
4. The Engineer may direct the Contractor to furnish additional signs and barricades as required to maintain traffic flow, detours and motorist safety during construction.
5. Static message boards or changeable message signs stating the date and duration of ramp or freeway lane closures shall be placed a minimum of seven (7) calendar days in advance of the actual closure.
6. Phase 2 of the PCMS message should include appropriate information formatted as shown on BC(6), such as "MERGE LEFT," recommended advisory speed, delay information, or other specific warnings.
7. Duplicate construction warning signs should be erected on the medians side of freeways where median width will permit and traffic volume justifies the signing.
8. The number of closed lanes may be increased provided the spacing of traffic control devices, taper lengths and tangent lengths meet the requirements of the TMUTCD.
9. Warning signs for intermediate term stationary work should be mounted at 7' to the bottom of the sign.
10. Warning signs shown shall be appropriately altered for left lane closures. When signs are mounted at 1' height for short term stationary or short duration work, sign versions shown in the SHSD for Texas with distances on the sign face rather than mounted on a plaque below the sign may be used.
11. When possible, PCMS units should be located in advance of the last available exit ramp prior to the lane closure to allow motorists an alternate route. They may also be relocated to improve advance warning in case of unanticipated queuing or congestion.
12. For Intermediate Term Stationary work at night, floodlights should be used to illuminate the work area and equipment crossings. Floodlights shall not produce a disabling glare condition for road users or workers.
13. The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.

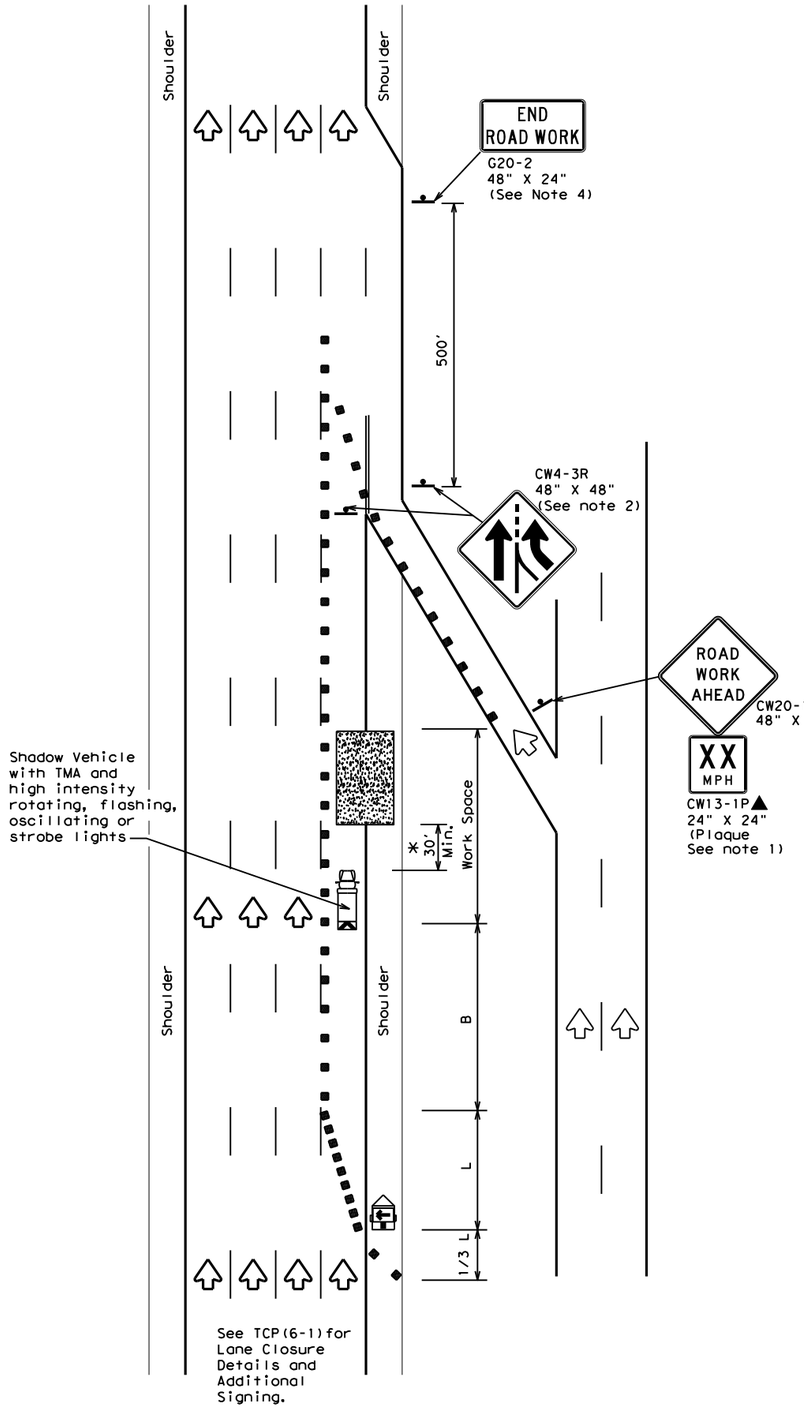
* A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN FREEWAY LANE CLOSURES

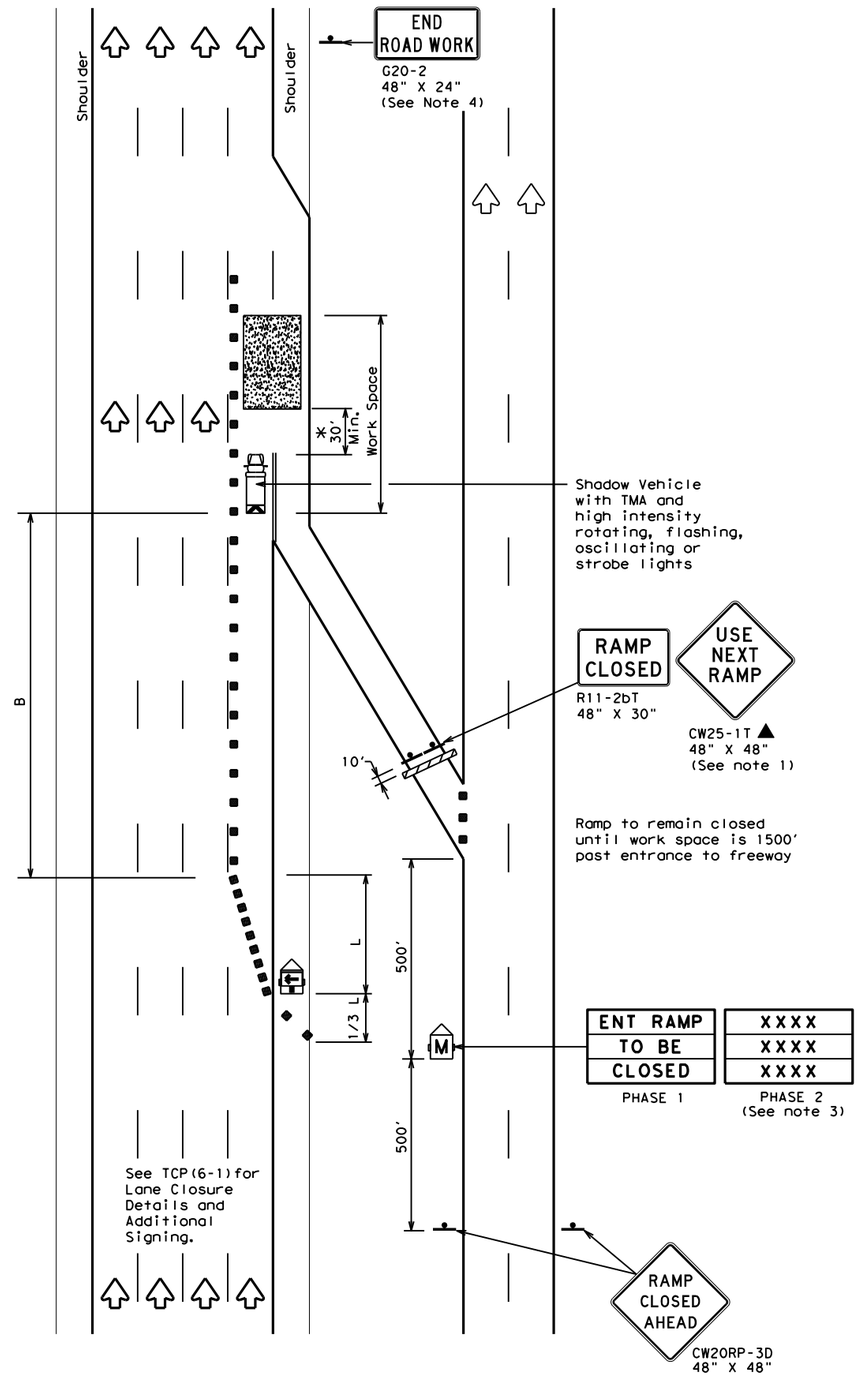
TCP(6-1)-12

FILE: tcp6-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-12	0074	06	254, ETC.	IH 37, ETC.
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		75



TCP (6-2a)

ENTRANCE RAMP OPEN
WORK WITHIN 500' OF RAMP



TCP (6-2b)

ENTRANCE RAMP CLOSED

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

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

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

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

GENERAL NOTES

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. ADDED LANE Symbol (CW4-3) sign may be omitted when sign between ramp and mainlane can be seen from both roadways.
3. See "Advance Notice List" on BC(6) for recommended date and time formatting options for PCMS Phase 2 message.
4. The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.

*A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

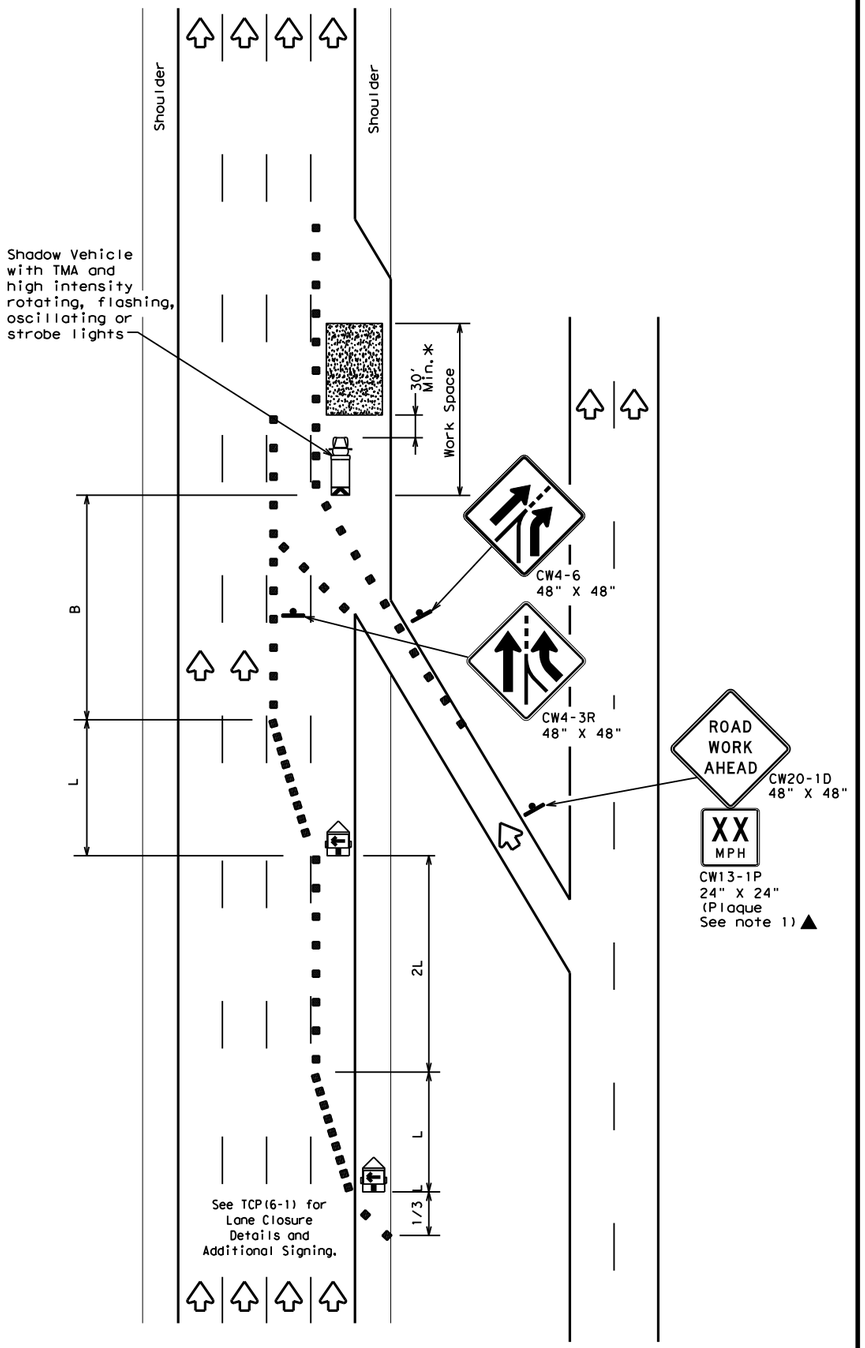
Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA NEAR RAMP

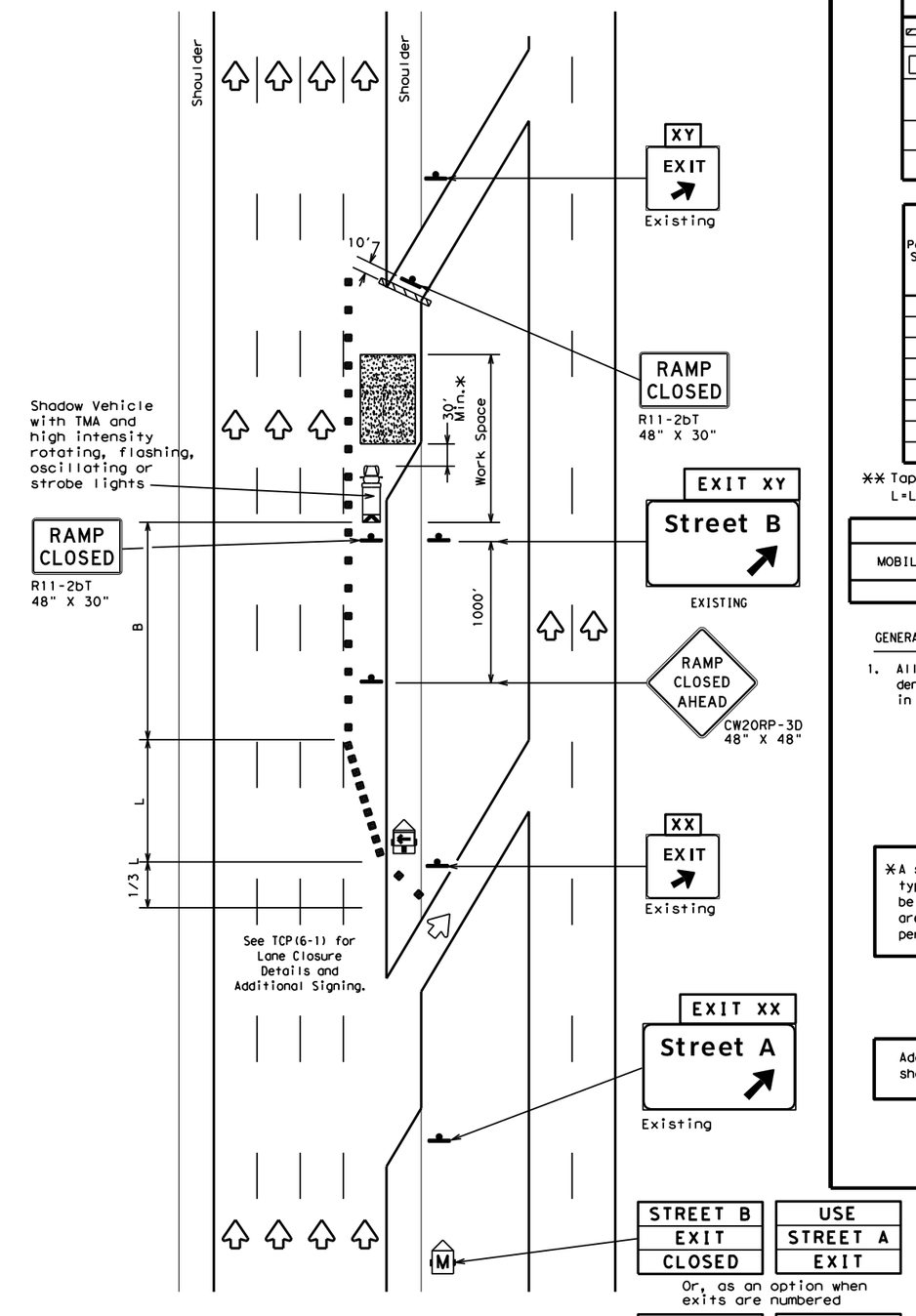
TCP(6-2)-12

FILE: tcp6-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC.	IH 37, ETC.
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	CRP	NUECES		76



TCP (6-3a)

ENTRANCE RAMP OPEN



TCP (6-3b)

EXIT RAMP CLOSED

TRAFFIC EXITS PRIOR TO CLOSED RAMP

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

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

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

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

GENERAL NOTES:

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.

*A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

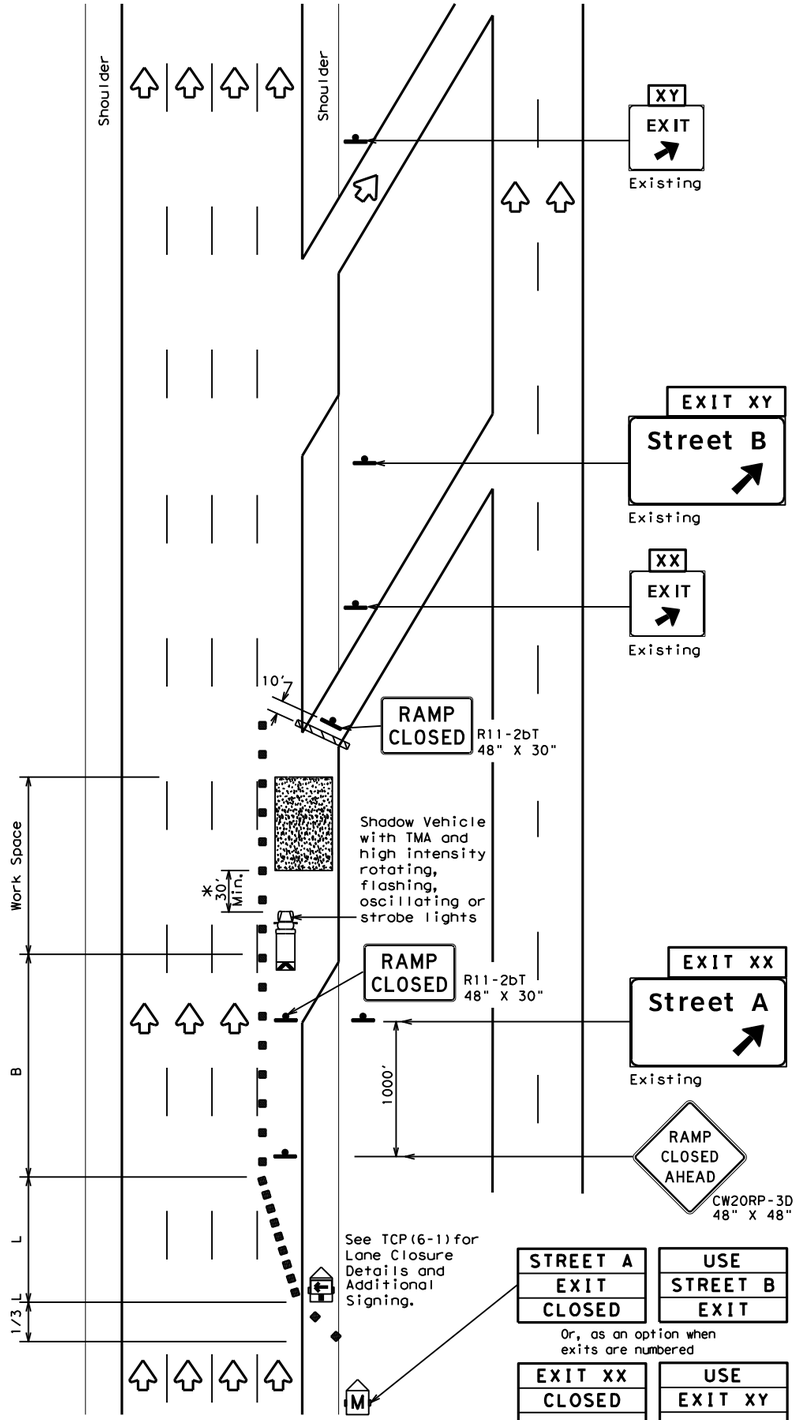
Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA BEYOND RAMP

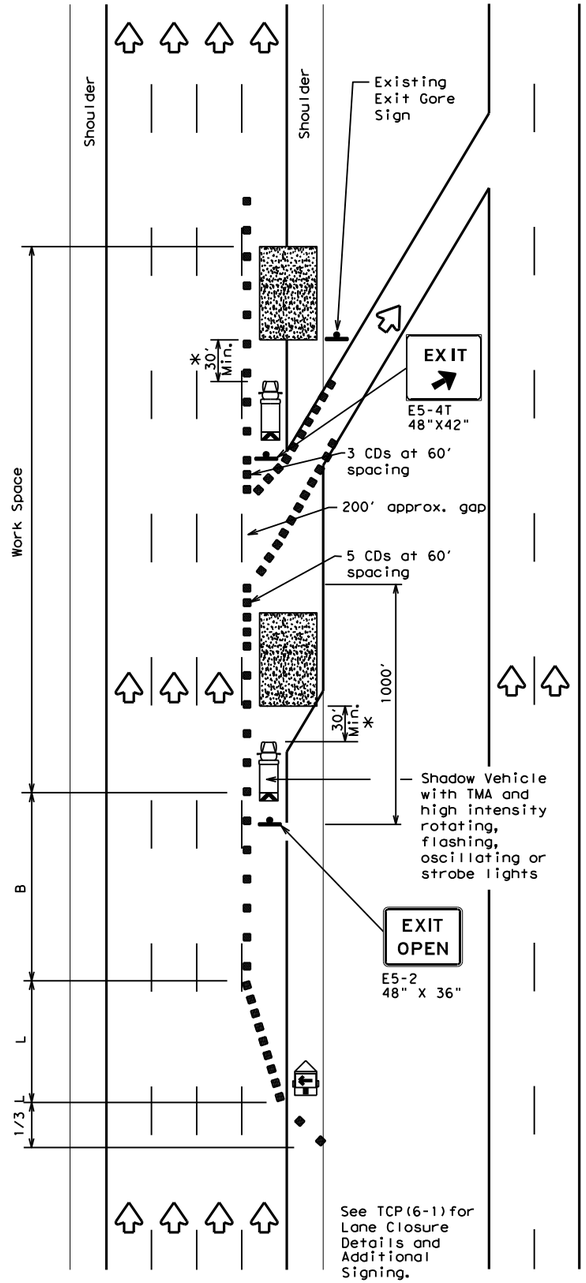
TCP(6-3)-12

FILE: tcp6-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC.	IH 37, ETC.
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	CRP	NUECES		77



TCP (6-4a)

EXIT RAMP CLOSED
TRAFFIC EXITS PAST CLOSED RAMP



TCP (6-4b)

EXIT RAMP OPEN

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. See BC Standards for sign details.

*A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

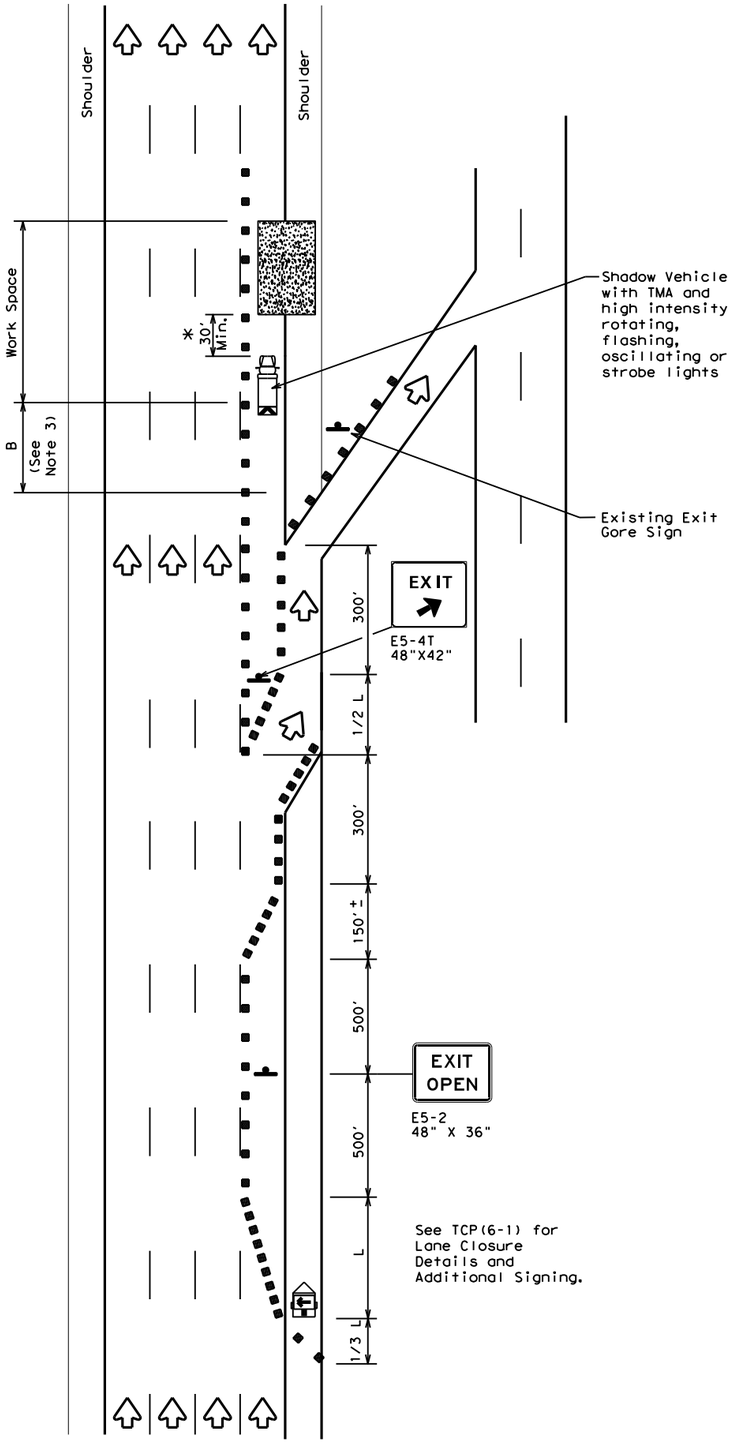
Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA AT EXIT RAMP

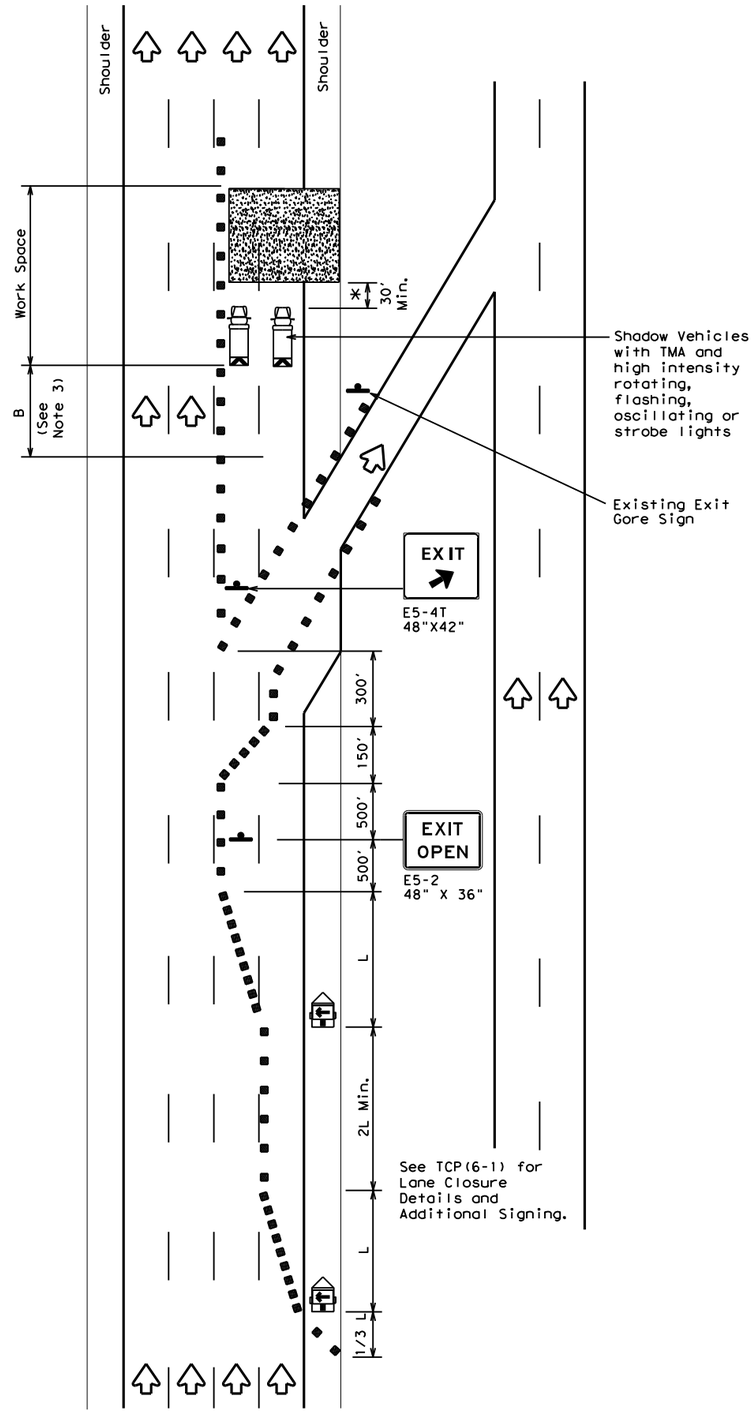
TCP(6-4)-12

FILE: tcp6-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT Feburary 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC.	IH 37, ETC.
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	CRP	NUECES		78



TCP (6-5a)

EXIT RAMP OPEN



TCP (6-5b)

EXIT RAMP OPEN
TWO LANE CLOSURE WITHIN 1500' PAST EXIT RAMP

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

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

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

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

GENERAL NOTES

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. See BC standards for sign details.
3. If adequate longitudinal buffer length "B" does not exist between the work space and the exit ramp, consideration should be given to closing the ramp.

* A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

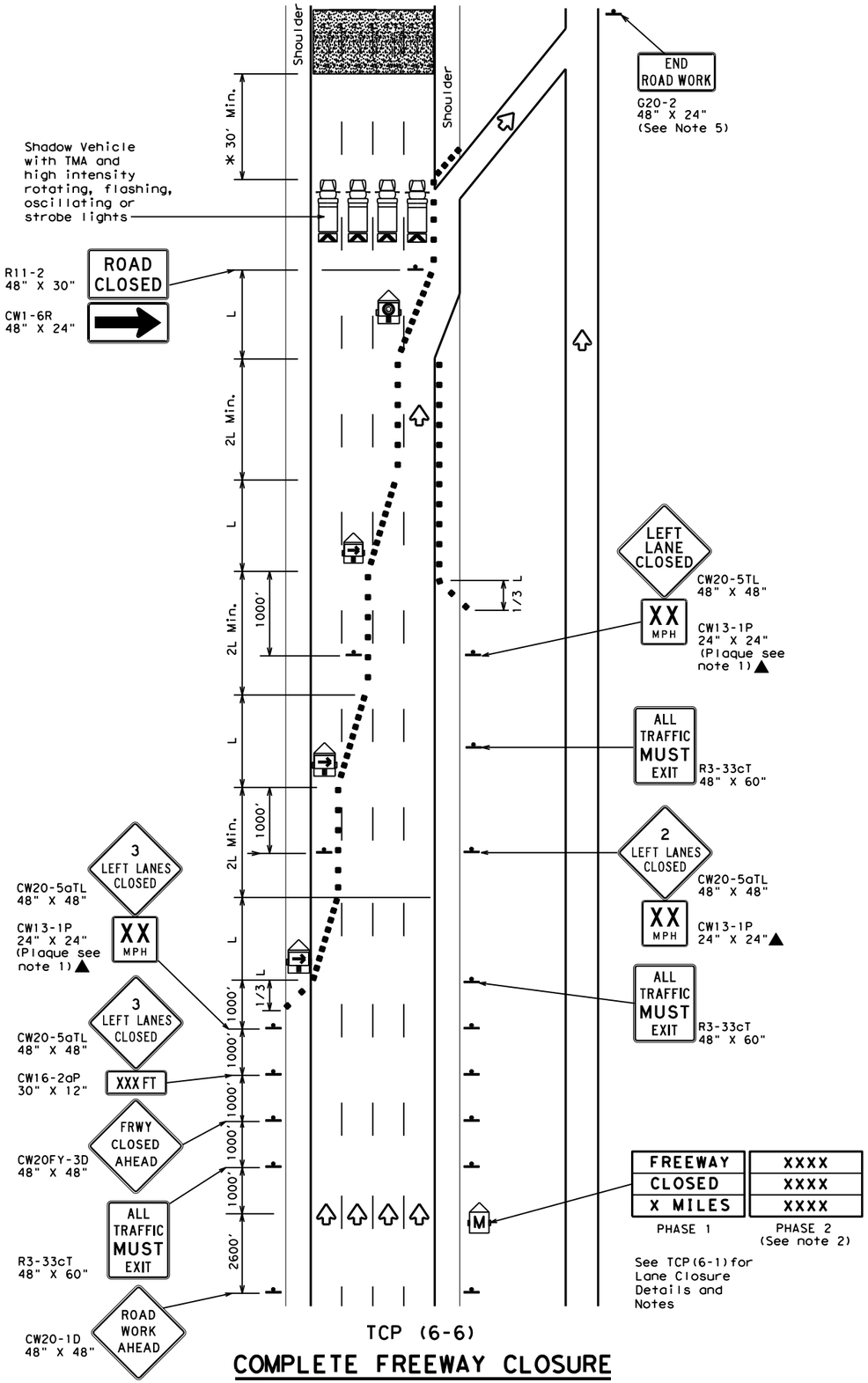
Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA BEYOND EXIT RAMP

TCP(6-5)-12

FILE: tcp6-5.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT Feburary 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC.	IH 37, ETC.
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	CRP	NUECES		79

DATE:
FILE:



TCP (6-6)

COMPLETE FREEWAY CLOSURE

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

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

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

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

GENERAL NOTES

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. Phase 2 of the PCMS message should include appropriate information formatted as shown on BC(6), such as "MERGE RIGHT," recommended speed, delay, exit information, or other specific warnings.
3. Where queuing is anticipated beyond signing shown, additional PCMS signs, other warning signs, devices or Law Enforcement Officers should be available to warn approaching high speed traffic of the end of the queue, as directed by the Engineer.
4. Entrance ramps located from the advance warning area to the exit ramp should be closed whenever possible.
5. The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.

* A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

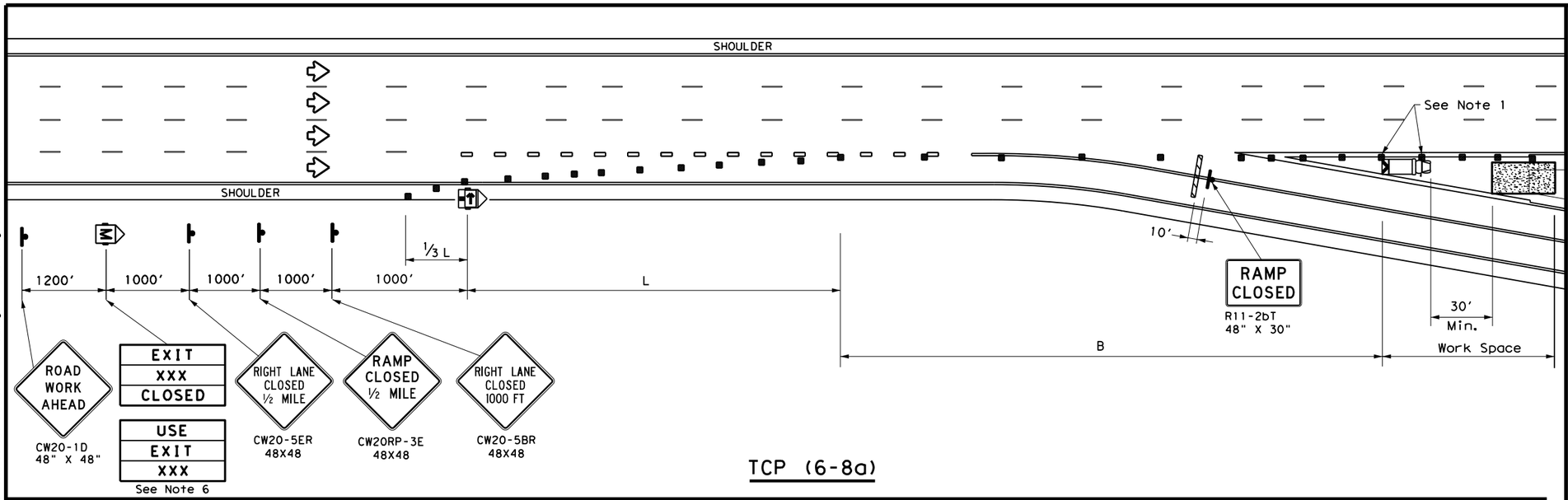
Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
FREEWAY CLOSURE

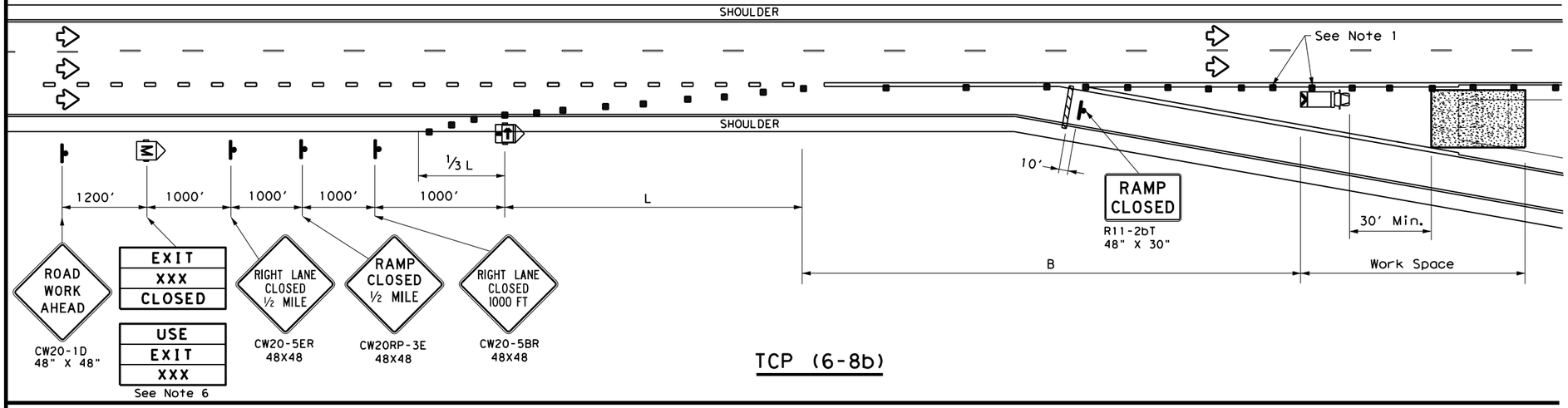
TCP(6-6)-12

FILE: tcp6-6.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC.	IH 37, ETC.
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	CRP	NUECES		80

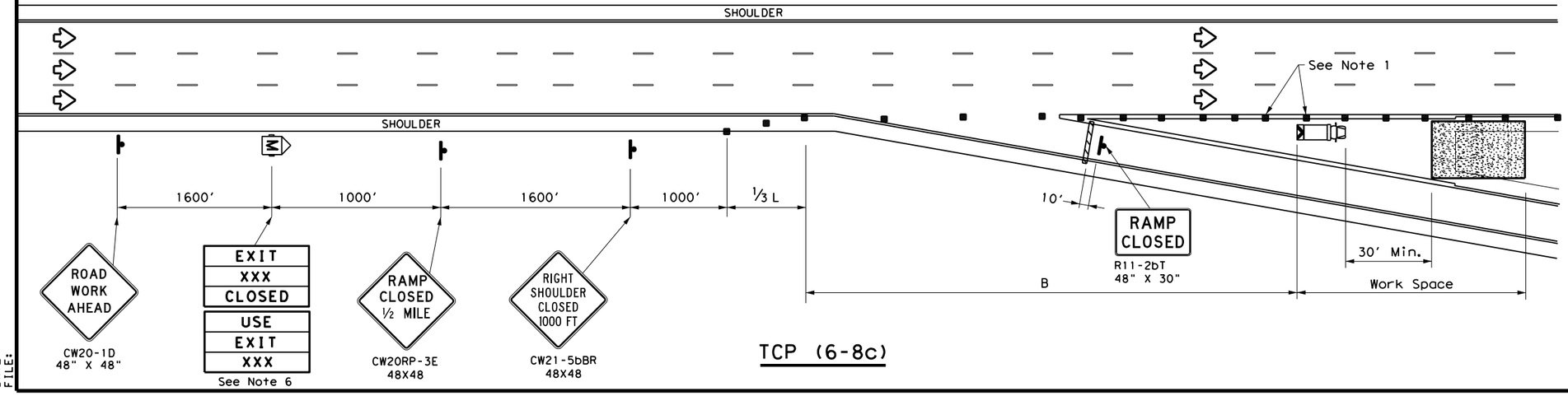
DATE:
FILE:



TCP (6-8a)



TCP (6-8b)



TCP (6-8c)

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

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

Texas Department of Transportation

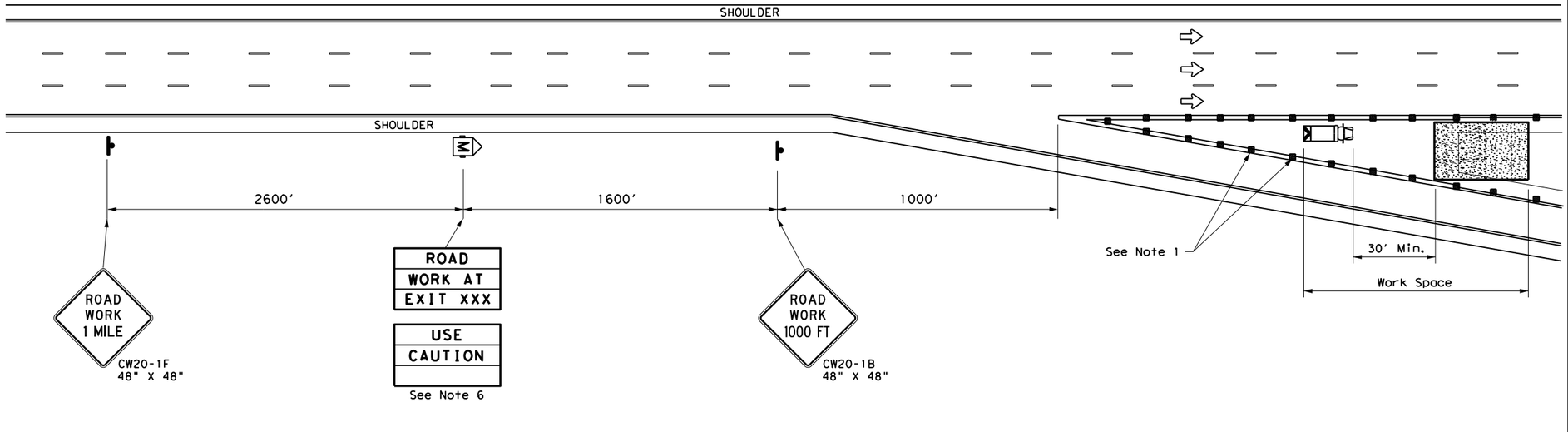
Traffic Operations Division Standard

WORK IN EXIT GORE FOR ADT GREATER THAN 10,000

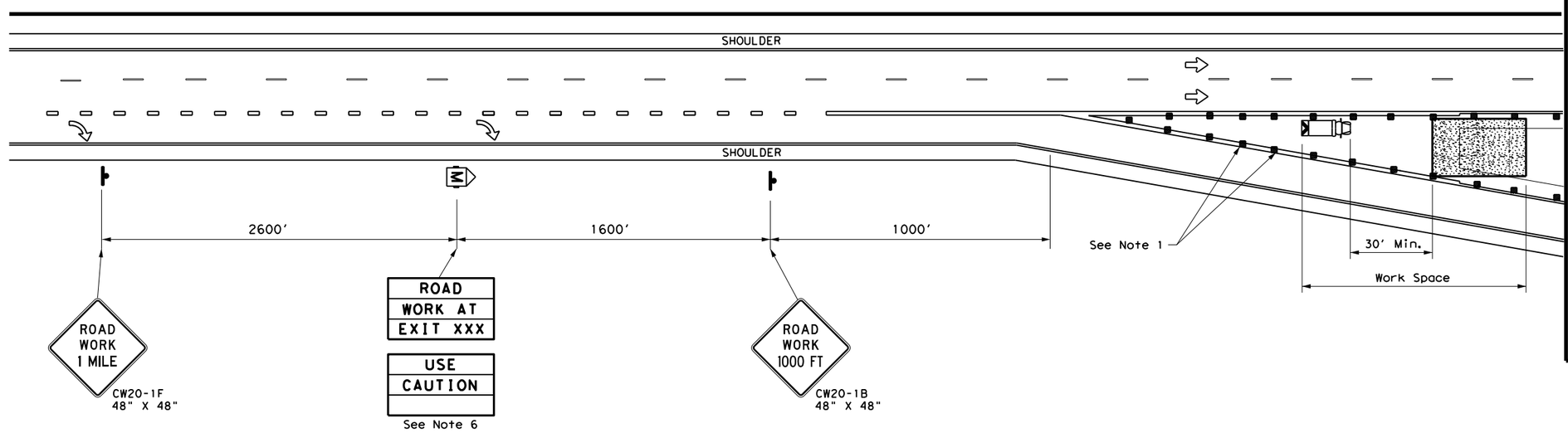
TCP(6-8)-14

FILE: tcp6-8.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC.	IH 37, ETC.
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		81

DATE:
FILE:



TCP (6-9a)



TCP (6-9b)

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

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

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

WORK IN EXIT GORE FOR ADT LESS THAN 10,000

TCP(6-9)-14

FILE: tcp6-9.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2014	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	CRP	NUECES		82

DATE:
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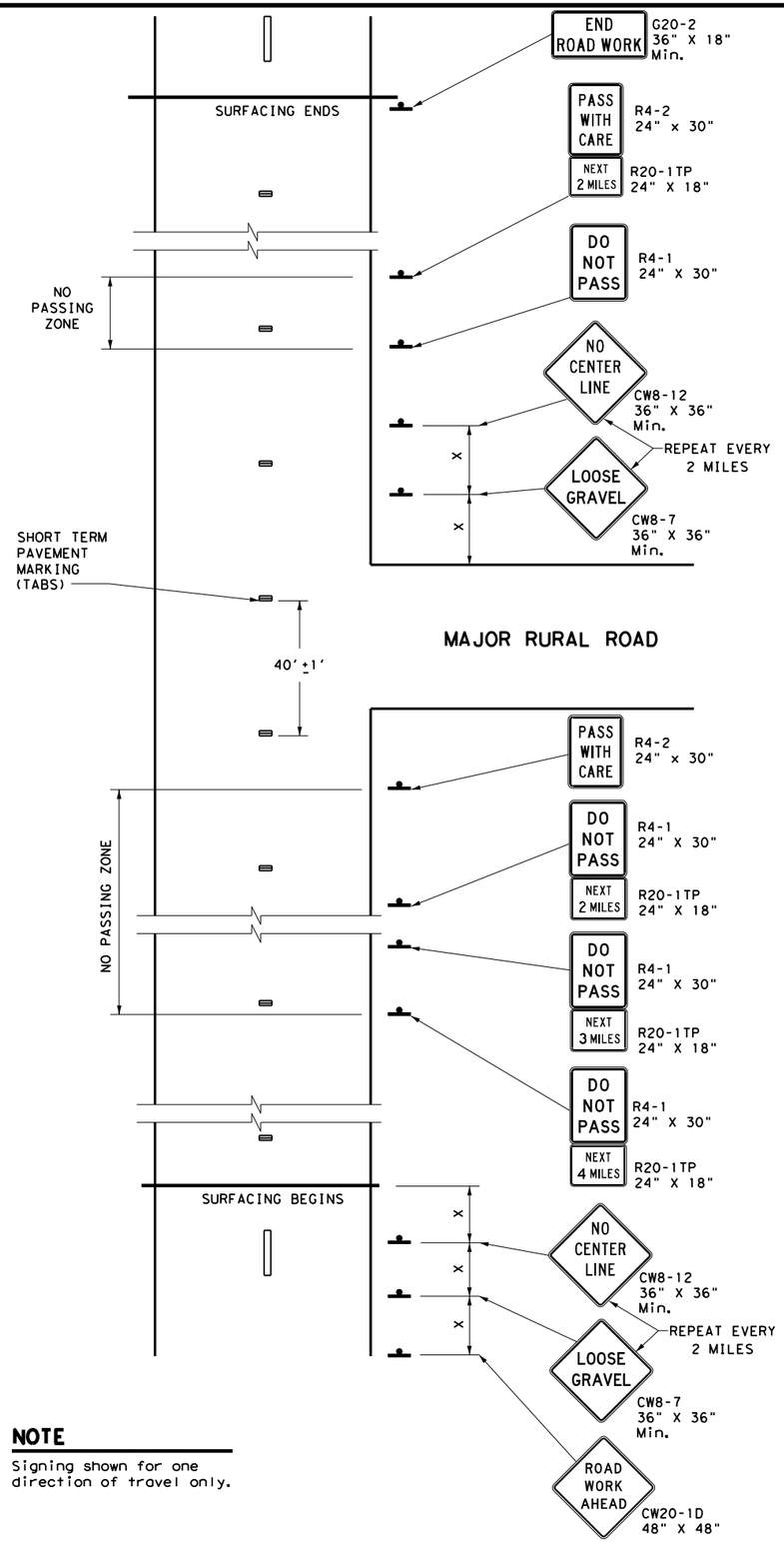
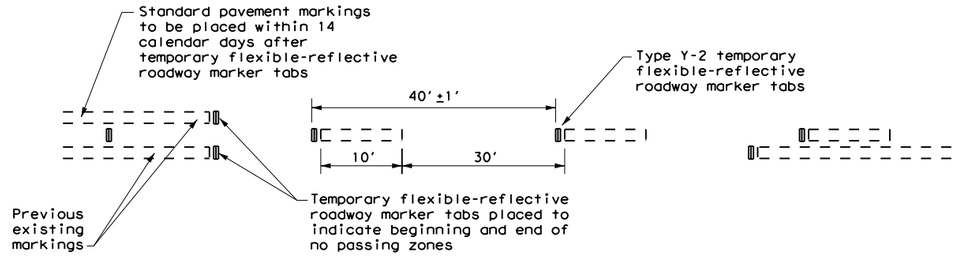


NOTE

Signing shown for one direction of travel only.

NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS



TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS

For seal coat, micro-surface or similar operations

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

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

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

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

D. R4-1 and R4-2 are to remain in place until standard pavement markings are installed.

"NO CENTER LINE" SIGN (CW8-12)

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

B. At the time construction activity obliterates the existing center line markings(low volume roads may not have an existing centerline), a NO CENTER LINE (CW8-12) sign should be erected at the beginning of the work area, at approximately 2 mile intervals within the work area, beyond major intersections and other locations deemed necessary by the Engineer.

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

"LOOSE GRAVEL" SIGN (CW8-7)

A. When construction begins, a LOOSE GRAVEL (CW8-7) sign should be erected at each end of the work area and repeated at intervals of approximately 2 miles in rural areas and closer in urban areas.

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

PAVEMENT MARKINGS

A. Temporary markings for surfacing projects shall be Temporary Flexible-reflective Roadway Marker Tabs unless otherwise approved by the Engineer. Tabs are to be installed to provide true alignment for striping crews or as directed by the Engineer. Tabs will be placed at the spacing indicated. Tabs should be applied to the pavement
no more than two (2) days before the surfacing is applied. After the surfacing is rolled and swept, the cover over the reflective strip shall be removed.

B. Tabs shall not be used to simulate edge lines.

C. Tab placement for overlay/inlay operations shall be as shown on the WZ(STPM) standard sheet.

COORDINATION OF SIGN LOCATIONS

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

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

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

* Conventional Roads Only

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

GENERAL NOTES

1. The traffic control devices detailed on this sheet will be furnished and erected as directed by the Engineer on sections of roadway where tabs must be placed prior to the surfacing operation which will cover or obliterate the existing pavement markings.
2. The devices shown on this sheet are to be used to supplement those required by the BC Standards or others required elsewhere in the plans.
3. Signs shall be erected as detailed on the BC Standards or the Compliant Work Zone Traffic Control Devices List (CWZTCD) on supports approved for Long-Term / Intermediate-Term Work Zone Sign Supports.
4. When surfacing operations take place on divided highways, freeways or expressways, the size of diamond shaped construction warning signs shall be 48" x 48".
5. Signs on divided highways, freeways and expressways will be placed on both right and left sides of the roadway based on roadway conditions as directed by the Engineer.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS

TCP(7-1)-13

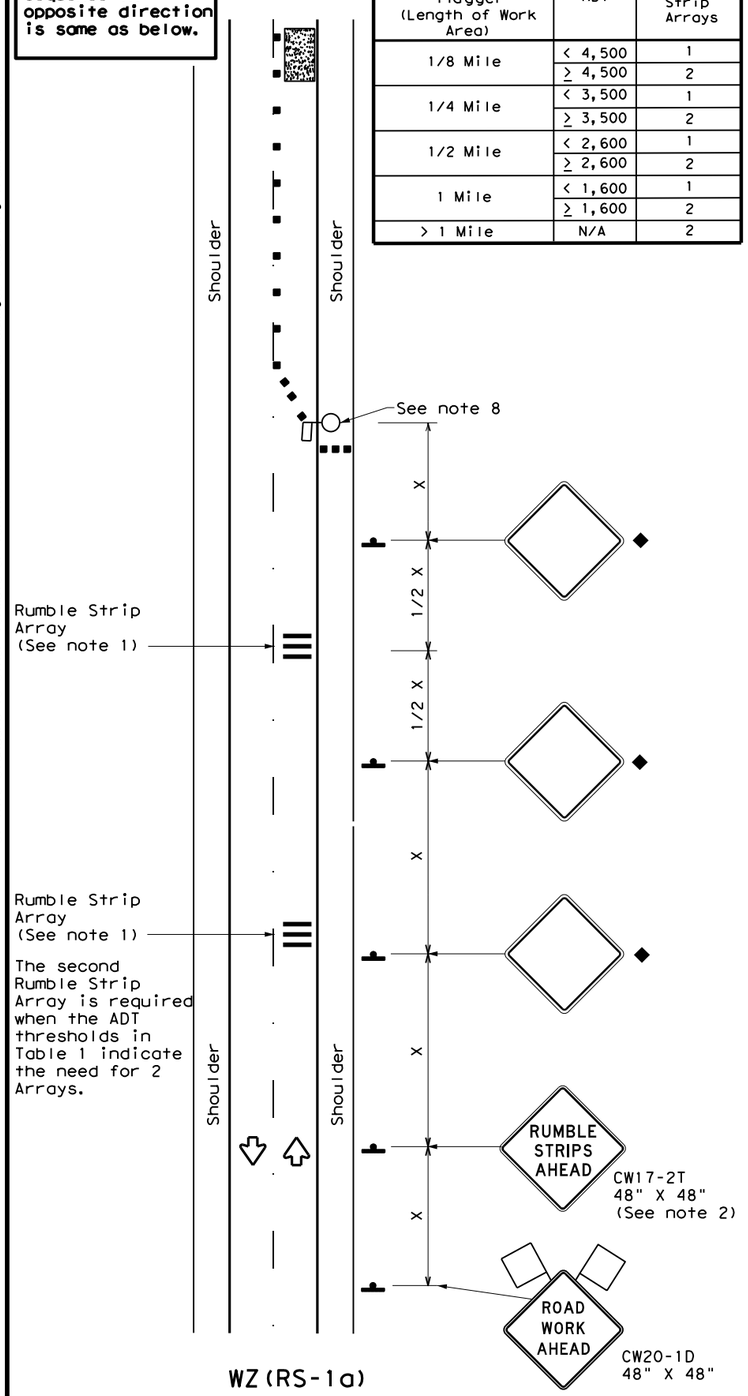
FILE: tcp7-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT March 1991	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC.	IH 37, ETC.
4-92 4-98	DIST	COUNTY		SHEET NO.
1-97 7-13	CRP	NUECES		83

210

DATE:
FILE:

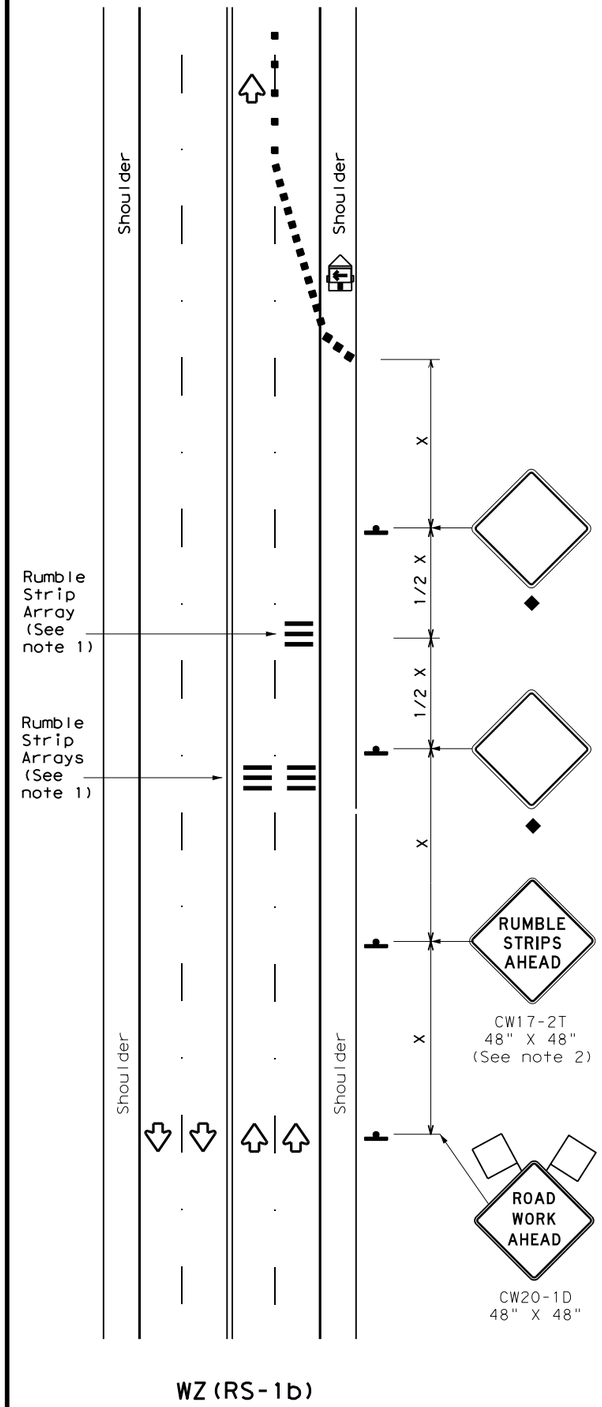
Warning sign and rumble strip sequence in opposite direction is same as below.

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



WZ(RS-1a)

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

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

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

* Conventional Roads Only

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

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

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

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

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

Texas Department of Transportation

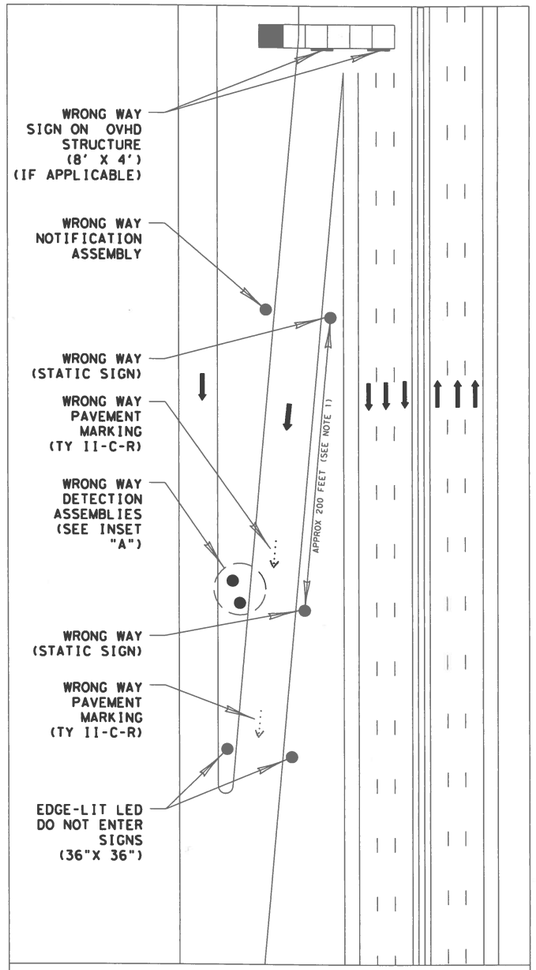
Traffic Safety Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-22

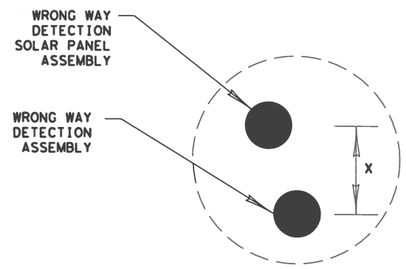
FILE: wzrs22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-14 1-22 4-16	0074	06	254, ETC.	IH 37, ETC.
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		84

117



TYPICAL LAYOUT
(EXIT RAMP)

INSET "A"



X = APPROXIMATELY 10 FEET OR PER MANUFACTURER'S RECOMMENDATIONS (SEE NOTE 2)

LEGEND

- DIRECTION OF TRAVEL
- PAVEMENT MARKERS TY II-C-R
- WWDS ASSEMBLY

NOTES

1. THE WRONG WAY DETECTION ASSEMBLY AND NOTIFICATION ASSEMBLY SHALL BE PLACED PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR SHALL MARK LOCATIONS APPROXIMATELY 200 FEET APART FROM EACH OTHER AS SHOWN IN THE DIAGRAM AND THEN COORDINATE WITH THE ENGINEER FOR APPROVAL OF THESE MARKED LOCATIONS BEFORE FOUNDATIONS ARE TO BE DRILLED.

2. THE CONTRACTOR SHALL MARK THE PROPOSED LOCATIONS OF THE WRONG WAY DETECTION ASSEMBLY AND ITS CORRESPONDING SOLAR PANEL ASSEMBLY AND THEN COORDINATE WITH THE ENGINEER FOR APPROVAL OF THESE LOCATIONS BEFORE THE FOUNDATIONS ARE DRILLED.

3. REFER TO SHEET 2 OF 2 FOR DETAILS OF EQUIPMENT MOUNTED ON THE SYSTEM POLES AND OF THE POLE FOUNDATIONS.

STATE OF TEXAS
KASSONDRA FIORA MUNOZ
104720
LICENSED
PROFESSIONAL ENGINEER

Kassondra Fiora Munoz
1-30-23

WRONG WAY DETECTION SYSTEM LAYOUT AND DETAILS

SHEET 1 OF 2

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		85

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DATE: $DATE$ $TIME$
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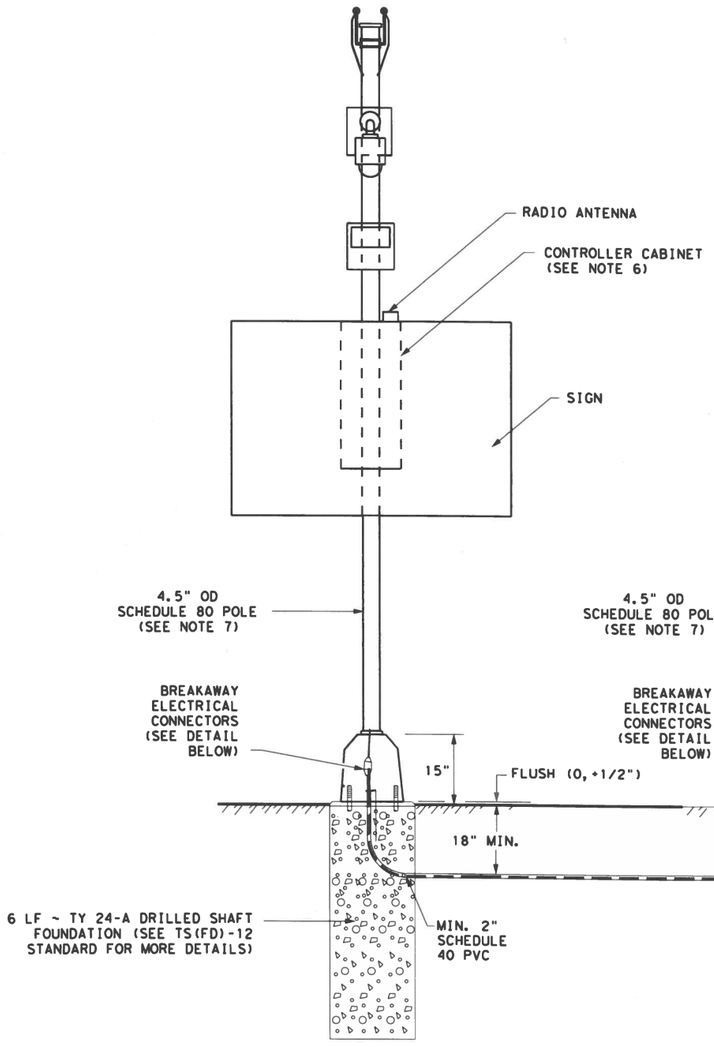
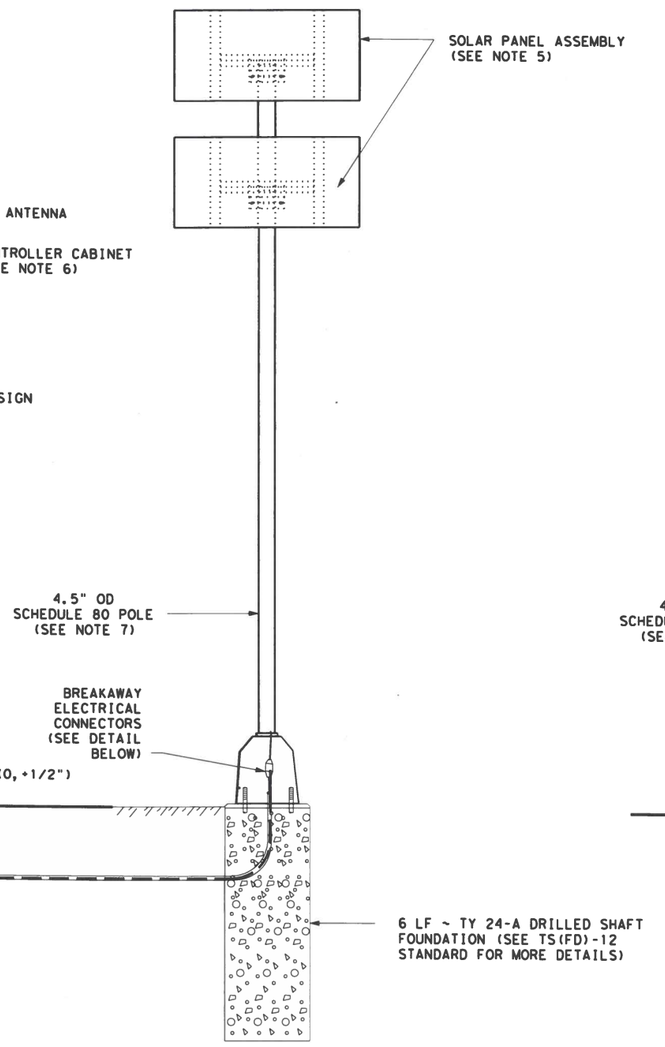
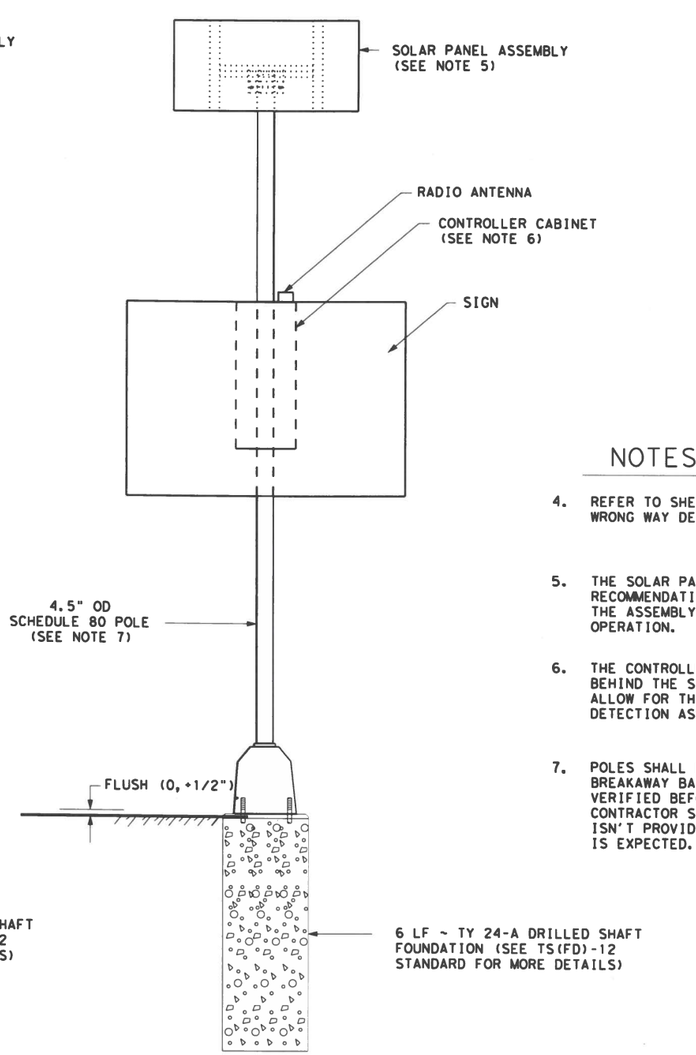


WRONG WAY DETECTION ASSEMBLY



WRONG WAY SOLAR PANEL ASSEMBLY FOR DETECTION ASSEMBLY



WRONG WAY NOTIFICATION ASSEMBLY

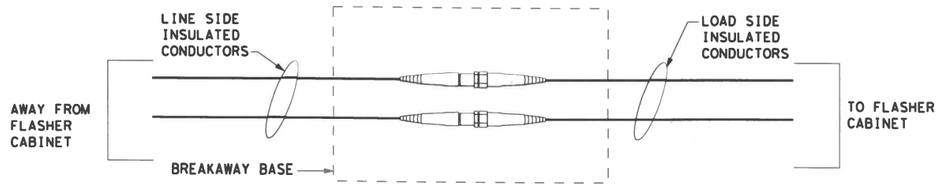
NOTES

4. REFER TO SHEET 1 OF 2 FOR TYPICAL LAYOUT OF POLES FOR WRONG WAY DETECTION SYSTEMS AT A TYPICAL RAMP.

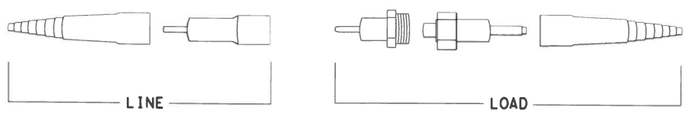
5. THE SOLAR PANELS ARE TO BE INSTALLED PER MANUFACTURER RECOMMENDATIONS. THE CONTRACTOR SHALL INSTALL SO THAT THE ASSEMBLY MAY RECEIVE OPTIMAL SUNLIGHT FOR ASSEMBLY OPERATION.

6. THE CONTROLLER CABINET SHALL BE INSTALLED SO THAT IT IS BEHIND THE SIGN AS IS SHOWN IN THE DETAILS HERE AND TO ALLOW FOR THE RADIO ANTENNAS FOR THE NOTIFICATION AND DETECTION ASSEMBLY TO BE ABLE TO COMMUNICATE OPTIMALLY.

7. POLES SHALL BE SUPPLIED FROM THE SAME SUPPLIER AS THE BREAKAWAY BASES TO PROVIDE OPTIMAL FIT. THIS FIT SHALL BE VERIFIED BEFORE EQUIPMENT IS INSTALLED ON THE POLES. THE CONTRACTOR SHALL CONSULT WITH THE ENGINEER IF OPTIMAL FIT ISN'T PROVIDED TO ENSURE THAT THE ASSEMBLY WILL PERFORM AS IS EXPECTED.



NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS



NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS EXPLODED VIEW

STATE OF TEXAS
KASSONDRA FIORA MUNOZ
104720
LICENSED
PROFESSIONAL ENGINEER

Kassondra Fiora Munoz
1-3-23

WRONG WAY DETECTION SYSTEM LAYOUT AND DETAILS

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		86

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

CK:
DW:
CK:
DN:

MODIFIED R5-1a SIGNS

Identifier : R5-1 SPL_96x48;
1.000" Border, White on Red;
[WRONG] D; [WAY] D;

NOTES

1. THE CONTRACTOR SHALL SUBMIT THE DESIGNS FOR ALL SIGNS ON THIS SHEET TO THE TXDOT AREA ENGINEER AND TXDOT DISTRICT TRAFFIC ENGINEERING OFFICE PRIOR TO SIGN FABRICATION FOR APPROVAL.
2. SHOW ALL DIMENSIONS TO 3 DECIMAL PLACES AND ROUND DIMENSIONS TO 1/8 TH OF AN INCH.
3. ALL SIGNS ON THIS SHEET ARE TO BE FABRICATED WITH RED RETROREFLECTIVE SHEETING AND WHITE RETROREFLECTIVE LEGEND.
4. REFER TO TSR STANDARDS FOR MORE SHEETING INFORMATION.
5. REFER TO THE LARGE SIGN SUMMARIES FOR LOCATIONS OF THESE SIGNS. LOCATIONS MAY BE ADJUSTED BY THE ENGINEER.

STATE OF TEXAS
KASSONDRA FIORA MUNOZ
104720
LICENSED
PROFESSIONAL ENGINEER

Kassondra Fiora Muñoz
1-3-23

LARGE SIGN DETAILS

NOTE: ALL DIMENSIONS ARE IN INCHES.

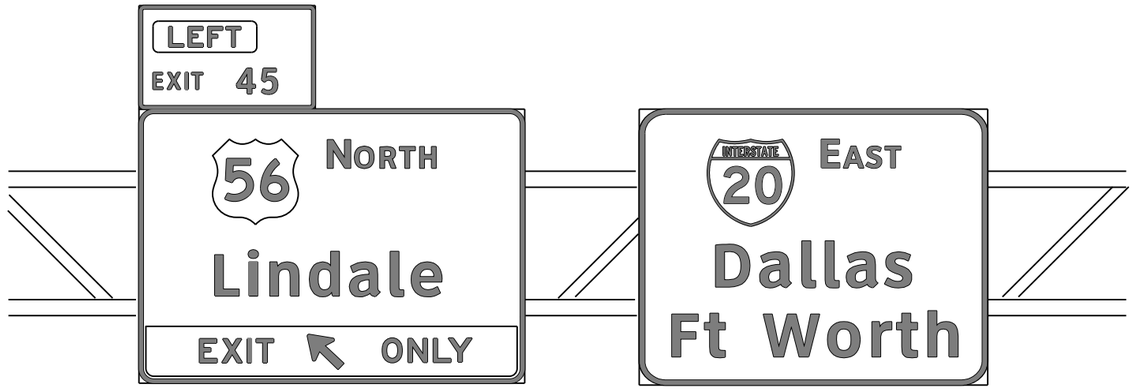
LEGEND
WHITE - RETROFLECTIVE
RED - RETROFLECTIVE

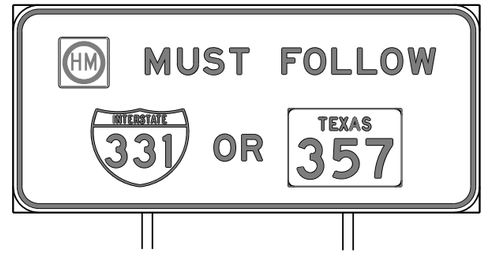
Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		87

REQUIREMENTS FOR OVERHEAD AND LARGE GROUND-MOUNTED SIGNS

TYPICAL EXAMPLES





GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign summary sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Black legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod, or F).
   White legend shall use the Clearview Alphabet.
   The following Clearview fonts shall be used to replace the existing white FHWA lettering, when not specified in the SHSD or in the plans.

B	CV-1W
C	CV-2W
D	CV-3W
E	CV-4W
Emod	CV-5WR
F	CV-6W

3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
5. White legend and borders shall be cut-out white sheeting applied to colored background sheeting.
6. Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius need not be trimmed or rounded if fabricated from an extruded material.
7. Sign substrate for ground-mounted signs shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative. Sign substrate for overhead signs shall be any material that meets DMS-7110. Exit Number Panels attached above the parent sign shall be made with the same substrate and sheeting as the parent sign.
8. Mounting details of attachments to parent sign face are shown on Standard Plan Sheet TSR(5). Mounting details of exit number panels above parent sign are shown in the "SMD series" Standard Plan Sheets.
9. Background sheeting shall be applied to the substrate per sheeting manufacturer's recommendations. Sheeting will not be allowed to bridge the horizontal gap between panels.
10. Cut all legend, symbols, borders, and direct applied sign attachments at panel joints.

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

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE B OR C SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE D SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM

Texas Department of Transportation

Traffic Operations Division Standard

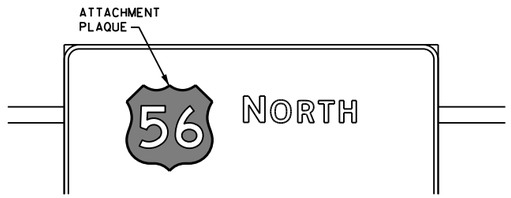
TYPICAL SIGN REQUIREMENTS

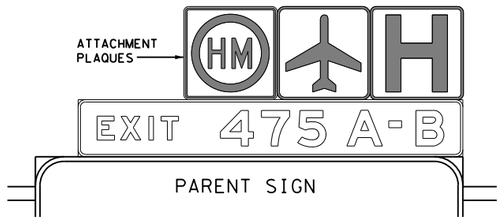
TSR(1)-13

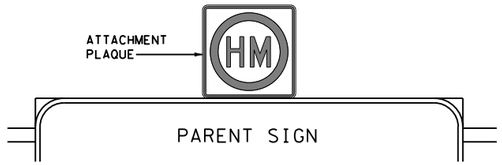
FILE:	tsr1-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS		0074	06	254, ETC.	IH 37, ETC.
12-03 7-13		DIST	COUNTY		SHEET NO.
9-08		CRP	NUECES		88

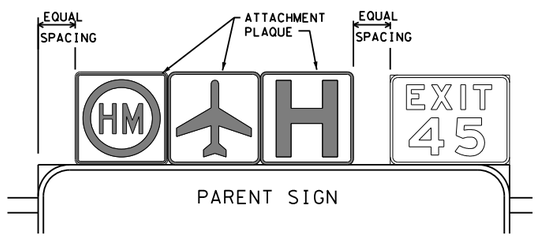
DATE:
FILE:

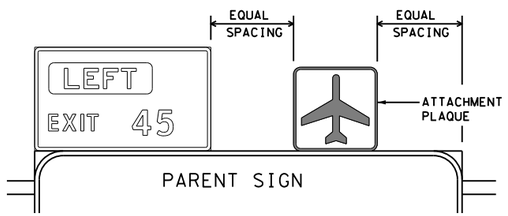
REQUIREMENTS FOR ATTACHMENTS TO OVERHEAD AND LARGE GROUND MOUNTED SIGNS











TYPICAL EXAMPLES

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

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE B OR C SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B OR C SHEETING

GENERAL NOTES

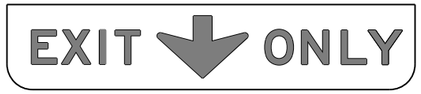
1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Route Marker legends (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod, or F).
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
5. White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
6. Colored legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to white background sheeting, or combination thereof.
7. Route markers and other attachments within the parent sign face shall be direct applied unless otherwise specified in the plans. Attachments not direct applied shall use 0.063 inch thick one piece sheet aluminum signs (Type A).
8. General Service Plaques shall be 0.080 inch thick and Routing Plaques shall be 0.100 inch thick.
9. The priority for Routing Plaques shall be (left to right) Hazardous Material, Airport then Hospital. See examples for mounting location.
10. Mounting details of attachments to parent signs face are shown on Standard Plan Sheet TSR(5). Mounting details of sign plaque attachments above and below parent sign are shown in the "SMD series" Standard Plan Sheets.
11. Plaques shall be horizontally centered at the top of the parent sign. If an exit number panel exists, the plaque shall be centered between the edge of the parent sign and the edge of the exit number panel. The plaque may be placed above the exit number panel when there is insufficient space.

TYPICAL EXAMPLES

REQUIREMENTS FOR EXIT ONLY AND LEFT EXIT PANELS

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

SHEETING REQUIREMENTS FOR OVERHEAD EXIT PANELS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	FLUORESCENT YELLOW	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND	BLACK	ACRYLIC NON-REFLECTIVE FILM



TYPICAL EXAMPLES

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD). Individual panel sizes shown in the plans may be adjusted to fit actual parent sign sizes if necessary.
2. Exit Panel legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets E Series.
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend shall be applied by screening process or cut-out acrylic non-reflective black film to yellow background sheeting, or combination thereof.
5. Exit Only and Left Exit panels within the parent sign face shall be direct applied unless otherwise specified in the plans. Panels not direct applied shall use 0.063 inch thick one piece sheet aluminum signs (Type A).
6. Mounting details of Exit Only and Left Exit panel attachments to parent signs face are shown on Standard Plan Sheet TSR(5).

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

DATE:
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Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(2)-13

FILE: tsr2-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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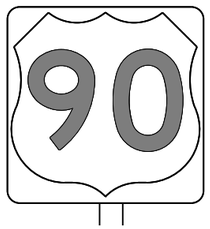
REVISIONS	0074	06	254, ETC.	IH 37, ETC.
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	CRP	NUECES		89

2

DATE:
FILE:

REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

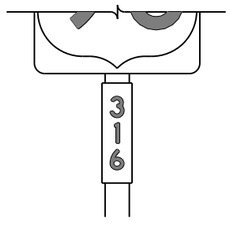
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING

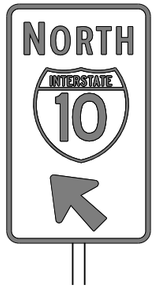


TYPICAL EXAMPLES

REQUIREMENTS FOR BLUE, BROWN & GREEN D AND I SERIES GUIDE SIGNS

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE D SHEETING
LEGEND, SYMBOLS & BORDERS	ALL OTHERS	TYPE B OR C SHEETING





TYPICAL EXAMPLES

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).

2. White legend shall use the Clearview Alphabet. The following Clearview fonts shall be used to replace the existing white Federal Highway Administration (FHWA) Standard Highway Alphabets, when not specified in the SHSD, or in the plans.

B	CV-1W
C	CV-2W
D	CV-3W
E	CV-4W
Emod	CV-5WR
F	CV-6W

3. Route sign legend (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets B, C, D, E, Emod or F).

4. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.

5. Independent mounted route sign with white or colored legend and borders shall be applied by screening process with transparent color ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof. White legend, symbols and borders on all other signs shall be cut-out white sheeting applied to colored background sheeting.

6. Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius should be trimmed or rounded.

7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.

8. Mounting details of roadside signs are shown in the "SMD series" Standard Plan Sheets.

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

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(3)-13

FILE: tsr3-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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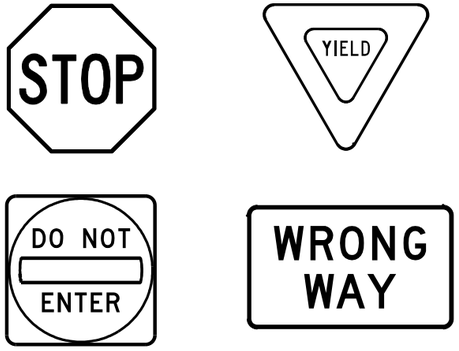
REVISIONS	0074	06	254, ETC.	IH 37, ETC.
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	CRP	NUECES		90

DATE:
FILE:

REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS

(STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	WHITE	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE B OR C SHEETING
LEGEND	RED	TYPE B OR C SHEETING

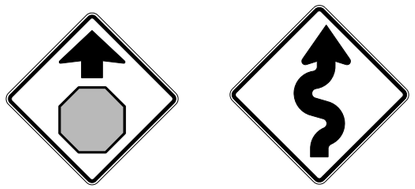
REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)

TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND, BORDERS AND SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	FLOURESCENT YELLOW	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR SCHOOL SIGNS

TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	FLOURESCENT YELLOW GREEN	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
SYMBOLS	RED	TYPE B OR C SHEETING

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod or F).
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
5. White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
6. Colored legend shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to background sheeting, or combination thereof.
7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
8. Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

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

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(4)-13

FILE: tsr4-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS 12-03 7-13 9-08	0074	06	254, ETC.	IH 37, ETC.
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		91

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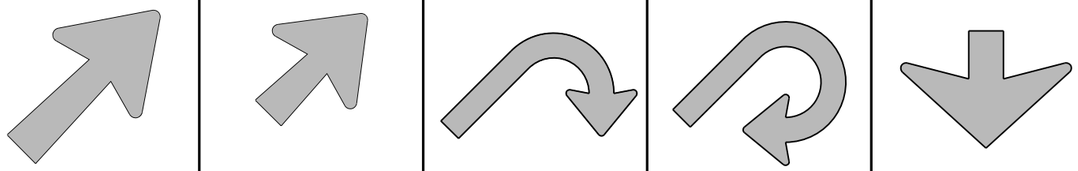
ARROW DETAILS

for Large Ground-Mounted and Overhead Guide Signs



TYPE	LETTER SIZE	USE
A-1	10.67" U/L and 10" Caps	Single Lane Exits
A-2	13.33" U/L and 12" Caps	
A-3	16" & 20" U/L	
B-1	10.67" U/L and 10" Caps	Multiple Lane Exits
B-2	13.33" U/L and 12" Caps	
B-3	16" & 20" U/L	

CODE	USED ON SIGN NO.
E-3	E5-1aT
E-4	E5-1bT

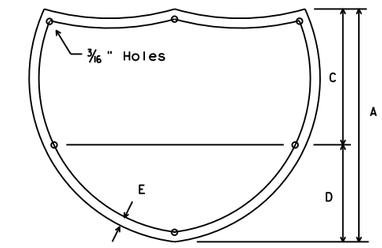
NOTE

Arrow dimensions are shown in the "Standard Highway Sign Designs for Texas" manual.

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

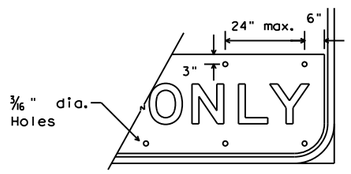
http://www.txdot.gov/

SIGN BLANK PUNCHING DETAILS FOR ATTACHMENTS WHEN SPECIFIED TO BE TYPE A ALUMINUM SIGNS (FOR MOUNTING TO GUIDE SIGN FACE)

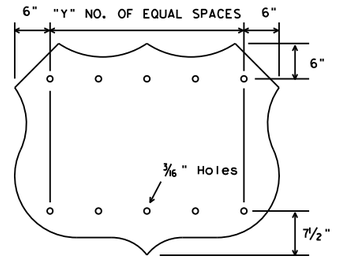


INTERSTATE ROUTE MARKERS

A	C	D	E
36	21	15	1 1/2
48	28	20	1 3/4

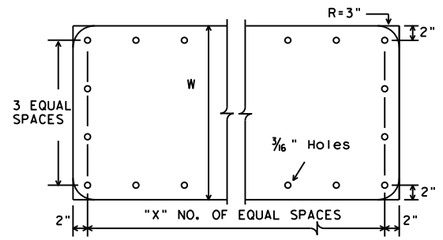


EXIT ONLY PANEL



U.S. ROUTE MARKERS

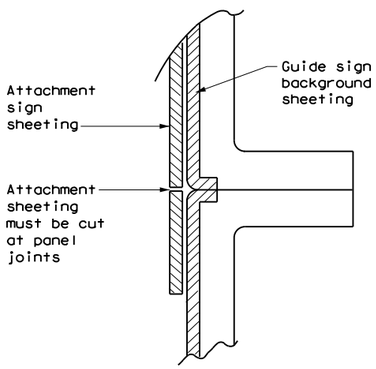
Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



STATE ROUTE MARKERS

No. of Digits	W	X
4	24	4
4	36	5
4	48	6
3	24	3
3	36	4
3	48	5

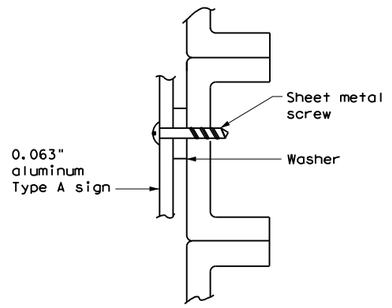
MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



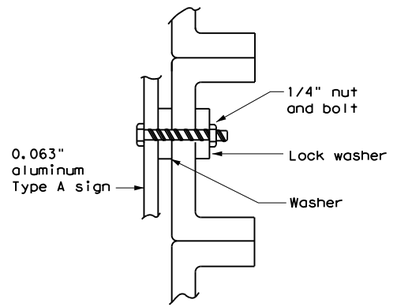
DIRECT APPLIED ATTACHMENT

NOTE:

1. Sheeting for legend, symbols, and borders must be cut at panel joints.
2. Direct applied attachment signs will be subsidiary to "Aluminum Signs" or "Fiberglass Signs".



SCREW ATTACHMENT



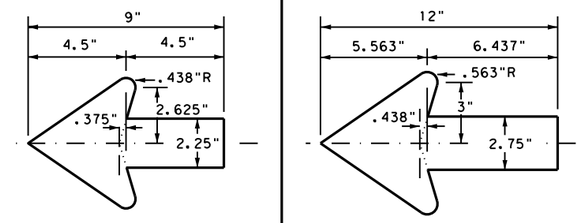
NUT/BOLT ATTACHMENT

NOTE:

Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

ARROW DETAILS

for Destination Signs (Type D)



Standard arrow to be used with 6 inch letters.

Standard arrow to be used with 8 inch letters.

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(5)-13

FILE: tsr5-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
TWT = Thin-Walled Tubing (see SMD(TWT))
10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

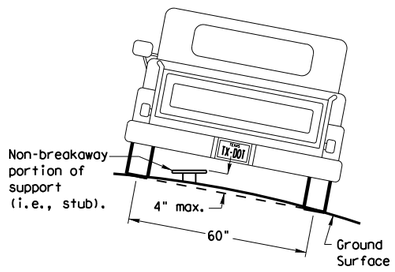
Anchor Type

UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
WS = Wedge Anchor Steel - (see SMD(TWT))
WP = Wedge Anchor Plastic (see SMD(TWT))
SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation

P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-1) to (SLIP-3))

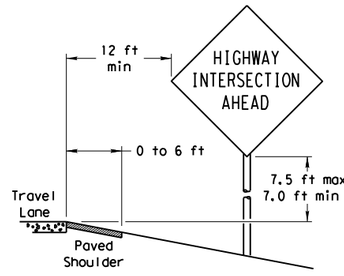
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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

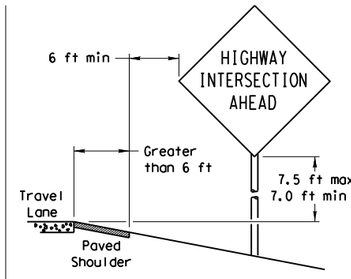
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

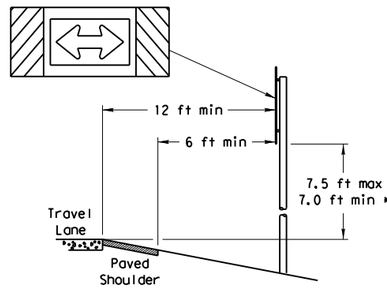
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



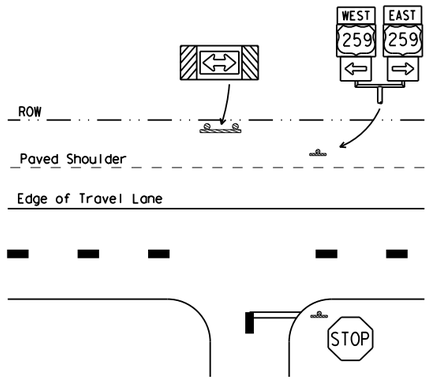
GREATER THAN 6 FT. WIDE

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

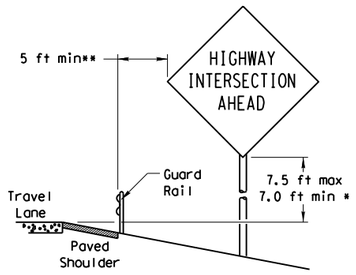
T-INTERSECTION



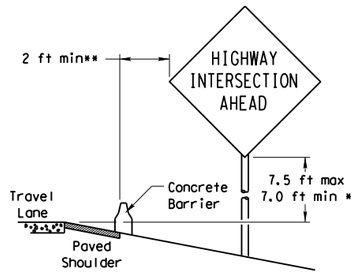
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

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

* Signs shall be mounted using the following condition that results in the greatest sign elevation:

(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

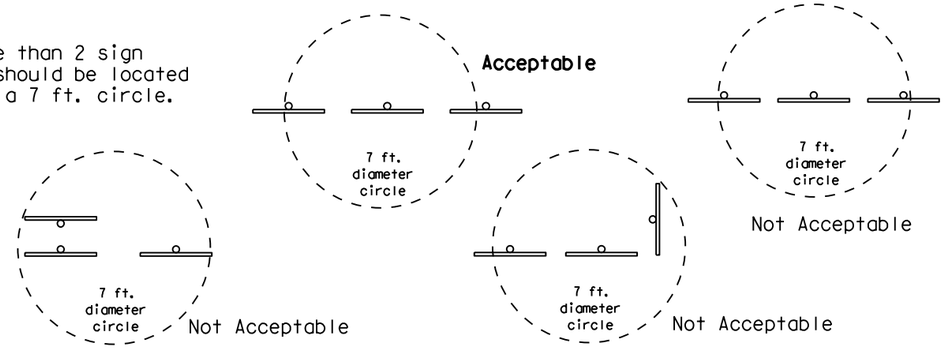
(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

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

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

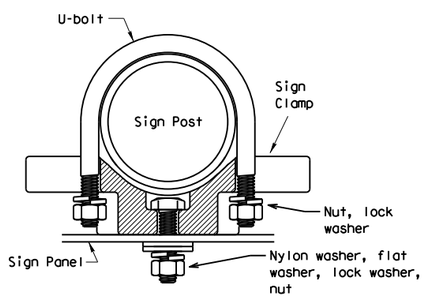
The website address is:
http://www.txdot.gov/publications/traffic.htm

No more than 2 sign posts should be located within a 7 ft. circle.



TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

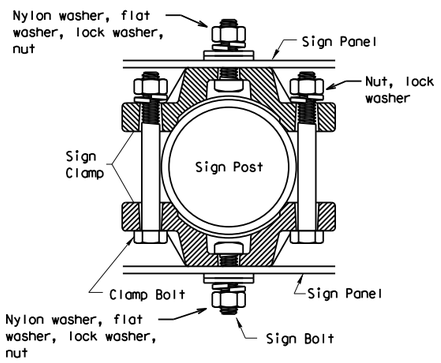


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

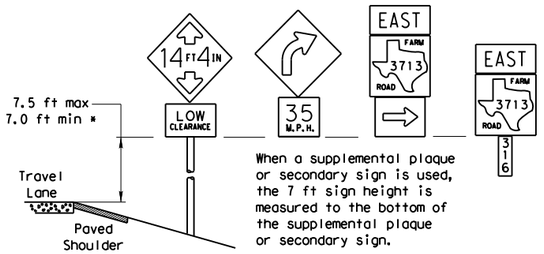
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



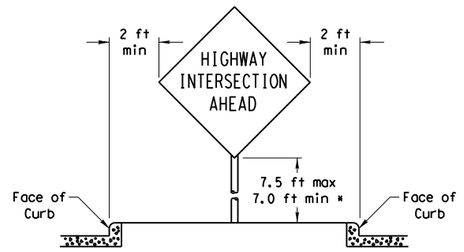
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



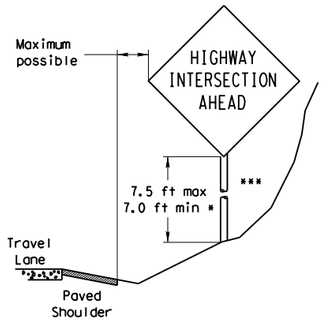
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

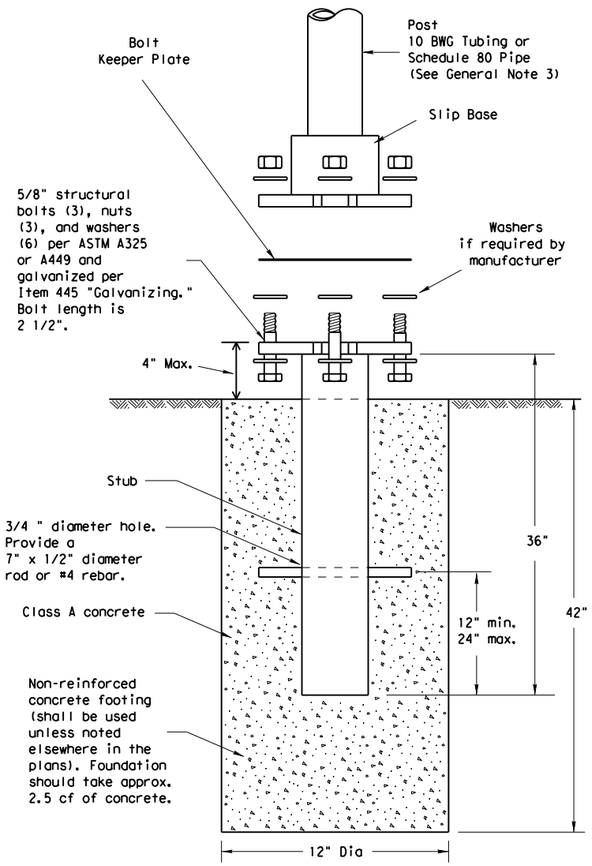
9-08 REVISIONS

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.

DIST	COUNTY	SHEET NO.
CRP	NUECES	93

DATE:
FILE:

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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

NOTE

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

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   - 0.134" nominal wall thickness
   - Seamless or electric-resistance welded steel tubing or pipe
   - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   - Other steels may be used if they meet the following:
     - 55,000 PSI minimum yield strength
     - 70,000 PSI minimum tensile strength
     - 20% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.

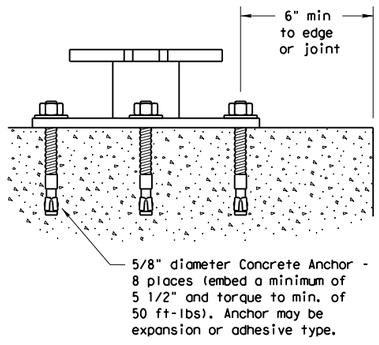
   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum yield strength
     - 62,000 PSI minimum tensile strength
     - 21% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   - Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

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

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

CONCRETE ANCHOR



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

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

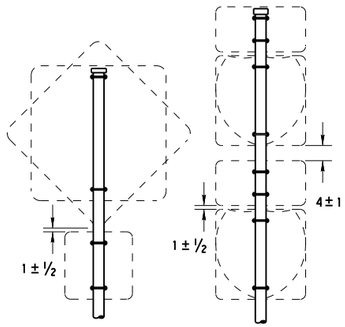
REVISIONS 9-08

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.

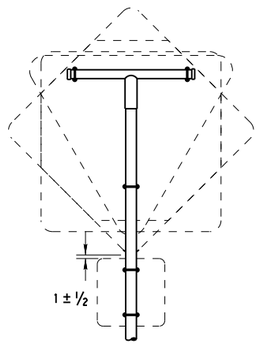
DIST	COUNTY	SHEET NO.
CRP	NUECES	94

DATE:
FILE:

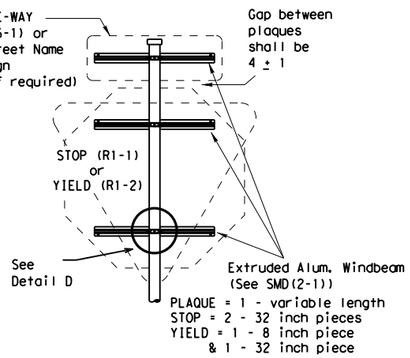
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



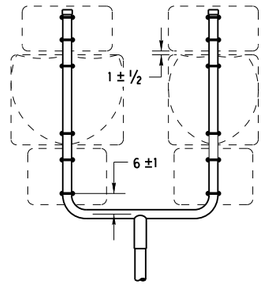
SM RD SGN ASSM TY XXXXX(1)XX(P)



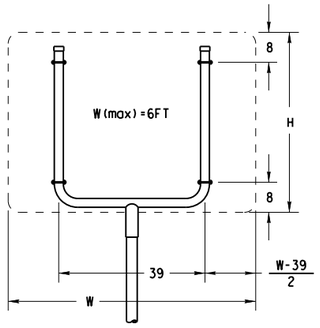
SM RD SGN ASSM TY XXXXX(1)XX(T)



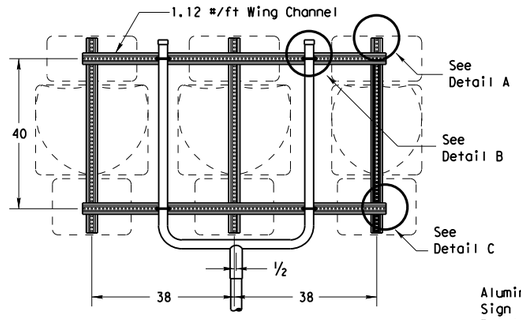
SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



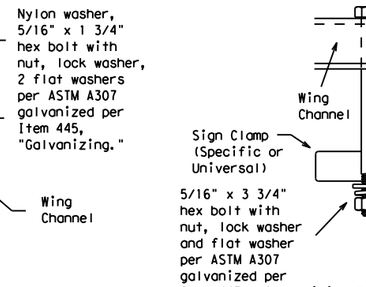
SM RD SGN ASSM TY XXXXX(1)XX(U)



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

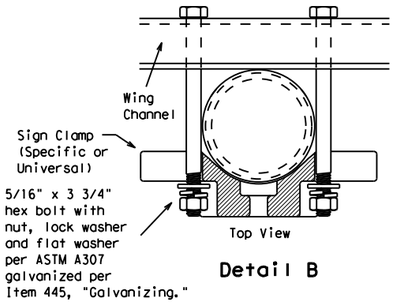


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)



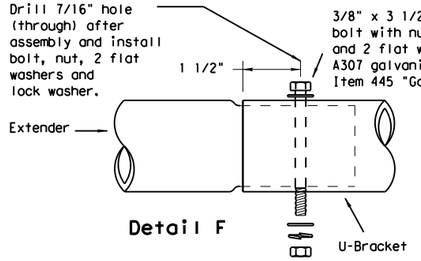
Top View

Detail A



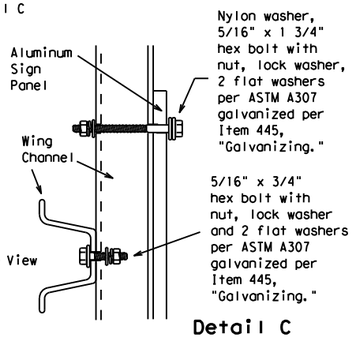
Top View

Detail B

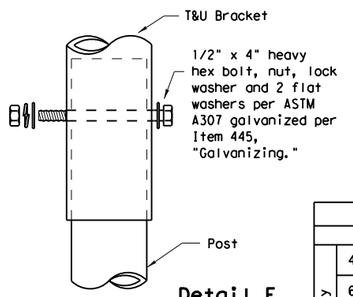


Detail F

Splices shall only be allowed behind the sign substrate.



Detail C



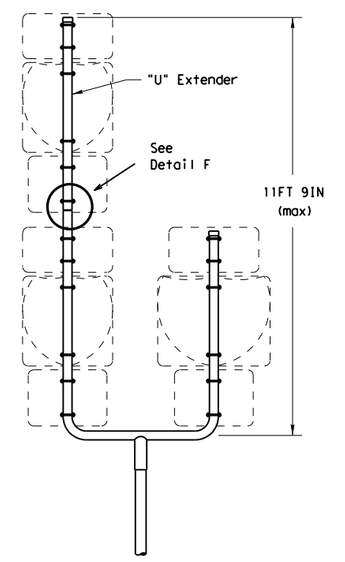
Detail E

GENERAL NOTES:

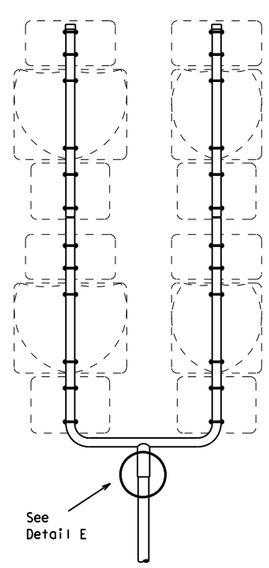
1.

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

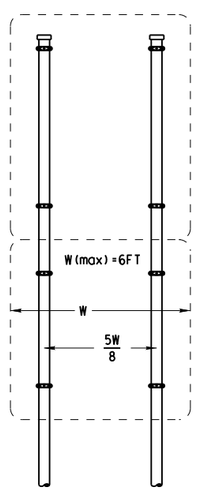
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.



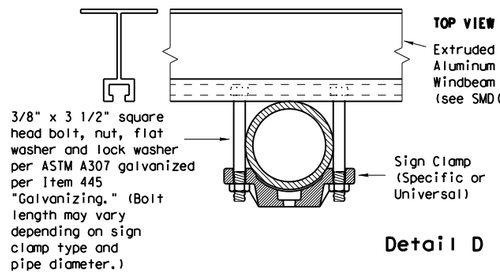
SM RD SGN ASSM TY S80(1)XX(U-1EXT)



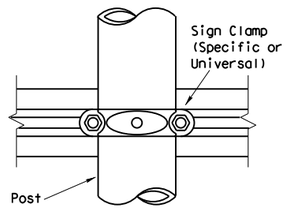
SM RD SGN ASSM TY S80(1)XX(U-2EXT)



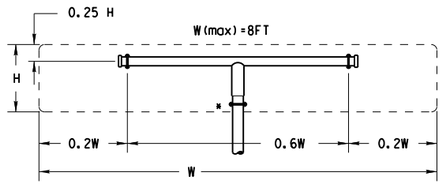
SM RD SGN ASSYM TY XXXXX(2)XX(P)



Detail D



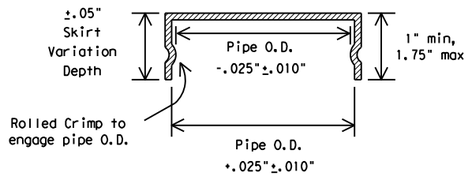
REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)



All dimensions are in english unless detailed otherwise.

SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

FRICTION CAP DETAIL



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

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

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

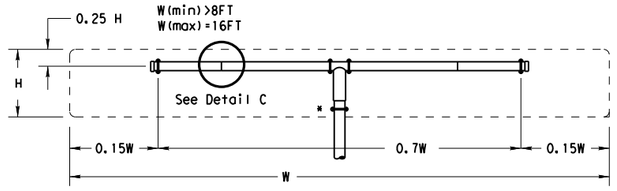
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

9-08 REVISIONS

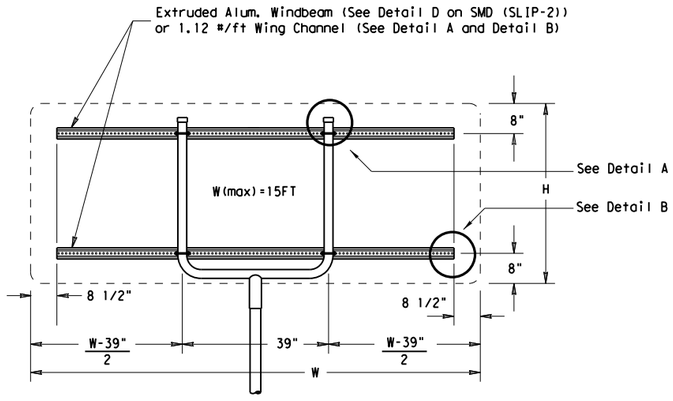
CONT	SECT	JOB	HIGHWAY
0074	06	254,ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		95

DATE:
FILE:

DATE:
FILE:



SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)



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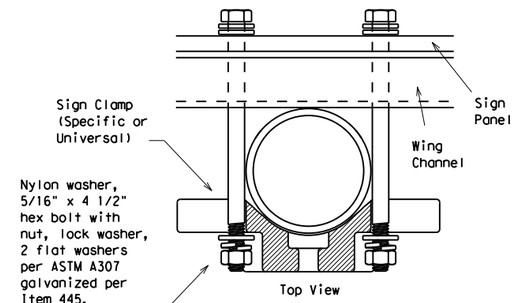
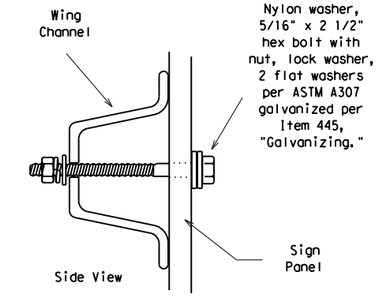
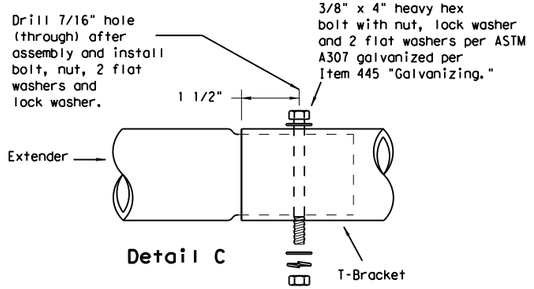


Top View

Detail A

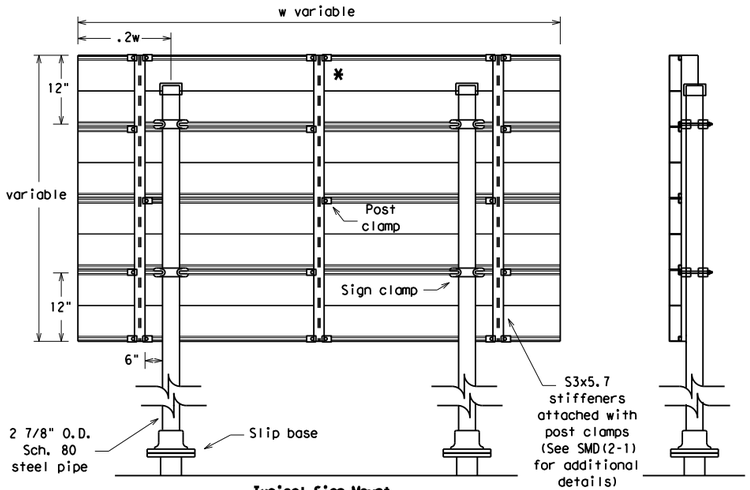


Detail B



Detail C

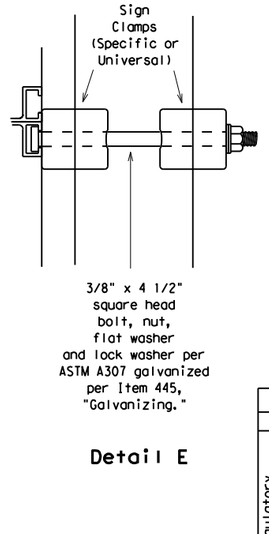
Splices shall only be allowed behind the sign substrate.



Typical Sign Mount

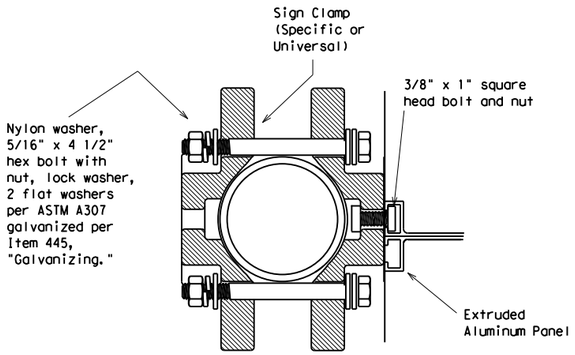
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

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

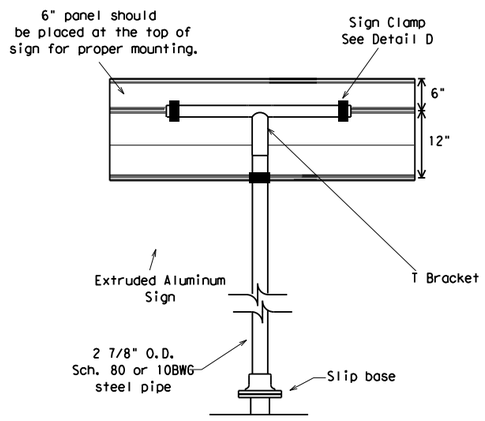


Detail E

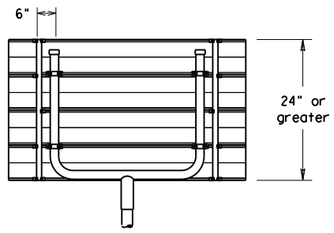
See Detail E
for clamp installation



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET



Extruded Aluminum Sign
With T Bracket



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

See Detail E
for clamp installation

GENERAL NOTES:

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

1. See table above.
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Sign blanks shall be the sizes and shapes shown on the plans.
11. Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.

REQUIRED SUPPORT

	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

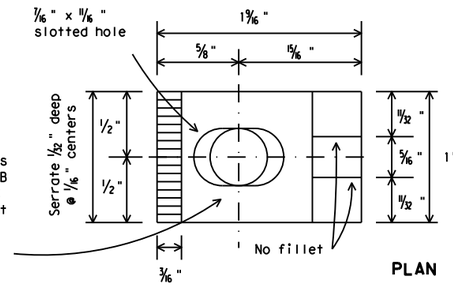
REVISIONS
9-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

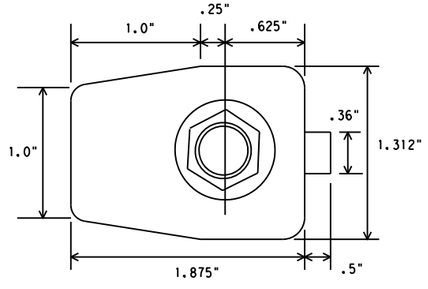
CONT	SECT	JOB	HIGHWAY
0326	01	066, ETC.	SH286, ETC.

DIST	COUNTY	SHEET NO.
CRP	NUECES	96

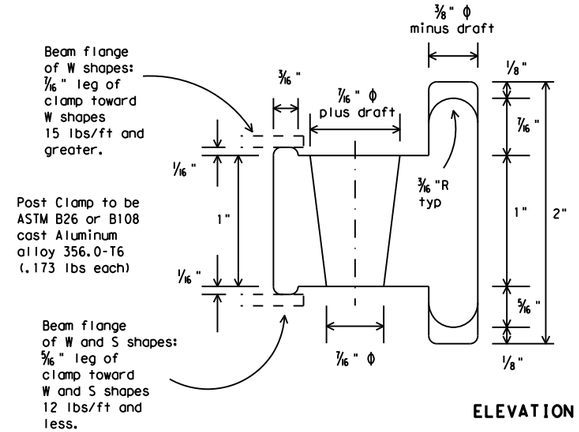
NOTE: centerline of hole for 3/8" diameter squarehead bolt x 2 1/4" long with a flat washer and self-locking nut, or lock washer and hex. nut. Bolt head dimensions shall be in accordance with ANSI B 18.2.1 as referred to in the AISC Manual of steel construction. Bolt assembly shall be galvanized.



PLAN

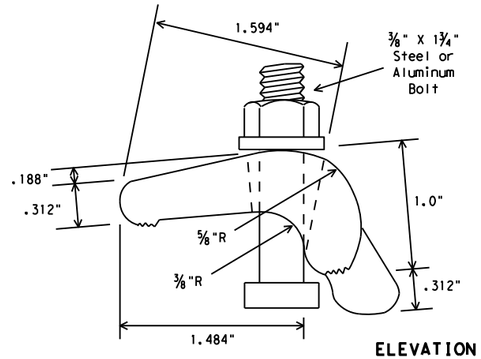


PLAN



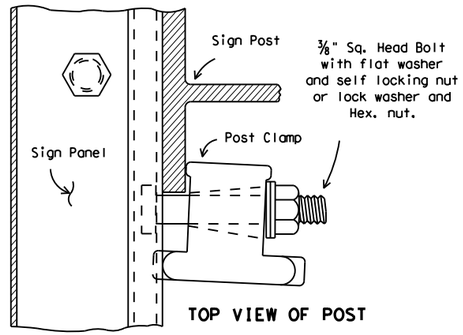
ELEVATION

POST CLAMP DETAIL

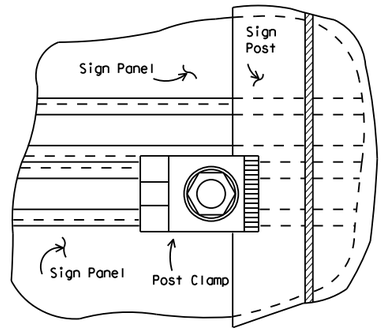


ELEVATION

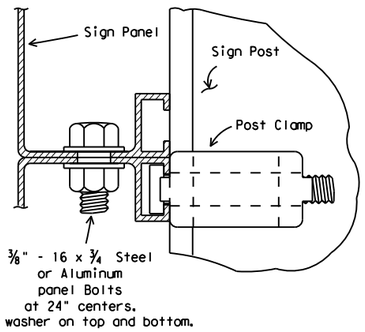
ALTERNATE POST CLAMP DETAIL



TOP VIEW OF POST



TOP VIEW OF CLAMP



SIDE VIEW OF PANELS

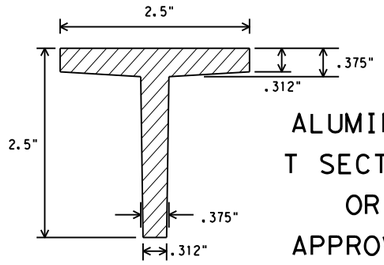
CONNECTION DETAILS

DEPARTMENTAL MATERIAL SPECIFICATIONS

SIGN HARDWARE DMS-7120

GENERAL NOTES:

1. Design conforms with AASHTO Specifications for the design and construction of structural supports for highway signs.
2. Materials and fabrication shall conform to the requirements of the Department material specifications.
3. Structural steel shall be "low-alloy steel" for non-bridge structures per Item 442, "Metal For Structures."
4. For fiberglass substrate connection details, see manufacturer's recommendations.

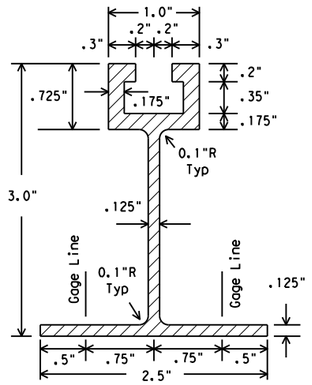


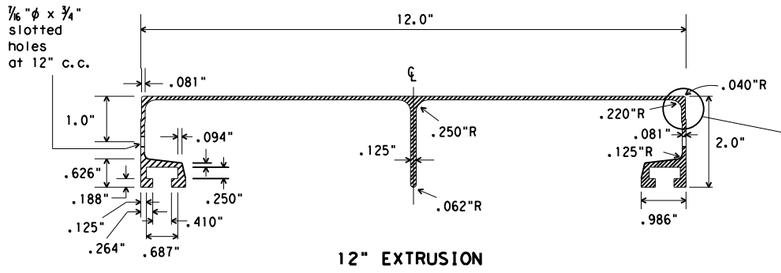
1.912 lbs/ft

ALUMINUM T SECTION OR APPROVED ALTERNATIVE

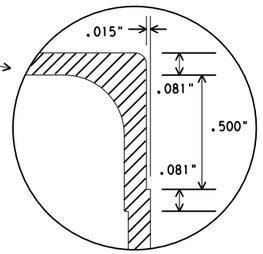
WINDBEAM CROSS SECTION

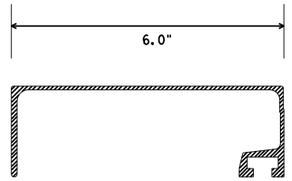
Windbeam to be extruded aluminum (1.175 lbs/ft) or approved alternative



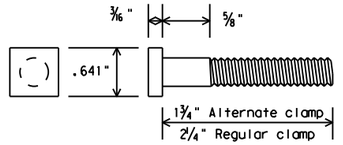


12" EXTRUSION





6" EXTRUSION



POST CLAMP BOLT DETAIL

ALUMINUM SIGN PANEL EXTRUSION DETAILS

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS- EXTRUDED ALUMINUM SIGN PANELS & HARDWARE

SMD(2-1)-08

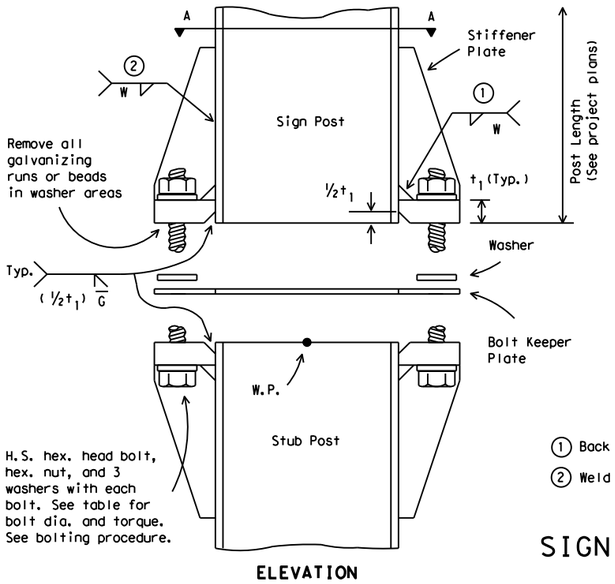
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS	CONT	SECT	JOB	HIGHWAY
9-08	0074	06	254, ETC.	IH 37, ETC.

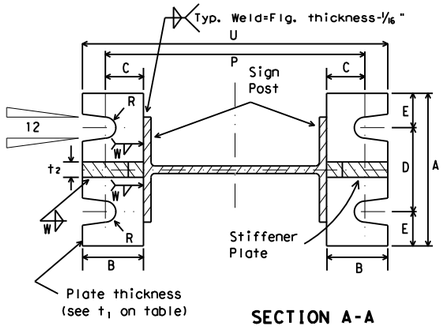
DIST	COUNTY	SHEET NO.
CRP	NUECES	97

DATE:
FILE:

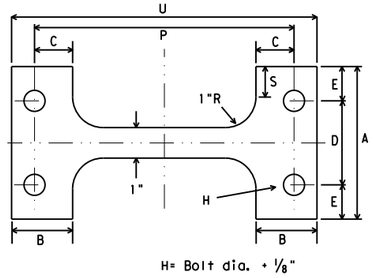
DATE:
FILE:



ELEVATION

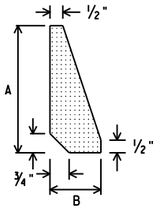


SECTION A-A



H= Bolt dia. + ⅛"

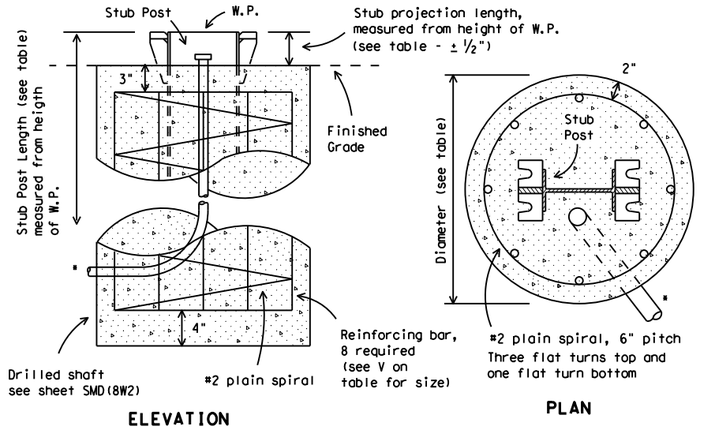
BOLT KEEPER PLATE
30 Ga galv. sheet steel



STIFFENER PLATE DETAIL

Steel Plate (thickness = t_2)

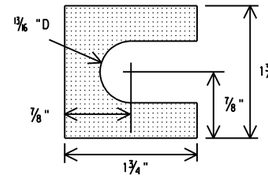
(See table for dimensions)



ELEVATION PLAN

FOUNDATION DETAIL

*Note: For signs with electrical apparatus, see ED(10) for conduit required in founation.



SHIM DETAIL

Furnish two .012"± thick and two .032"± thick shims per post. Shims shall be fabricated from brass shim stock or strip conforming to ASTM B36.

BOLTING PROCEDURE FOR ASSEMBLY OF BASE CONNECTION:

1. Assemble sign post, BOLT KEEPER PLATE and stub post with bolts and three flat washers per bolt as shown.
2. Shim as required to plumb post.
3. Tighten all bolts the maximum possible with a 12 to 15 inch wrench to clean bolt threads and to bed washers and shims.
4. Loosen each bolt in sequence and retighten bolts in a systematic order to the prescribed torque. Do not overtighten.
5. To prevent nut loosening, burr threads of bolt at junction with nut using a center punch.

Dimensions / Post Size	Base Connection Data Table: Bolt Size & Torque	A	B	C	D	E	t_1	t_2	W	R
W6x9	⅝"ϕ x 2¾" 440-450 inch pounds 36-38 foot pounds	5"	2"	1¼"	2¾"	1⅛"	¾"	½"	¼"	11/32"
W6x12										
W6x15										
W8x18										
W8x21	¾"ϕ x 3½" 740-750 inch pounds 62-63 foot pounds	6"	2¼"	1⅜"	3½"	1¼"	1"	¾"	5/16"	13/32"
W10x22										
W10x26										
W12x26										
S3x5.7	½"ϕ x 2½" 440-450 inch pounds 36-38 foot pounds	See Detail Below								
S4x7.7										

Perforated Fuse Plate Data Table												Bolt Keeper Data			Foundation Data			
F	G	J	K	M	d_1	d_2	t_3	Bolt Dia.	Wt. (ea.) (lbs.)	Bolt length	P	S	U	Stub length	Stub projection	Dr. Shaft diameter	Bar V Size
4¼"	2"	4"	2¼"	1"	9/16"	¾"	¼"	½"	1.01	1½"	8⅜"	1"	9⅞"	2'-0"	3"	24"	#5
											8½"		10"	2'-0"	3"		#5
5"	2½"	6"	3½"	1½"	11/16"	1¼"	⅜"	⅝"	2.51	2¼"	8½"		10"	2'-6"	3"		#6
5"	2½"	5¼"	2¾"	1¼"	11/16"	1 1/16"	⅜"	⅝"	2.26	2¼"	10⅝"		12⅛"	2'-6"	3"		#7
5½"	2½"	5¼"	2¾"	1¼"	13/16"	1"	½"	¾"	3.35	2¼"	11"	1½"	12¾"	3'-0"	2½"		#8
6"	3"	5¾"	2¾"	1⅜"	13/16"	1⅛"	½"	¾"	4.03	2¼"	12⅞"		14⅝"	3'-0"	2½"		#9
											13⅛"		14⅞"	3'-0"	2½"		#10
6"	3"	6½"	3½"	1⅝"	13/16"	1 5/16"	½"	¾"	4.47	2¼"	15"		16¾"	3'-0"	2½"		#11
3¾"	1½"	2⅝"	1½"	⅝"	9/16"	⅜"	¼"	½"	0.60	1½"	See Detail Below			3'-3½"	3½"	12"	Non-reinforced ③

③ Foundation design shall be Type G Mount, see SMD (TY G).

PERFORATED FUSE PLATE DETAIL

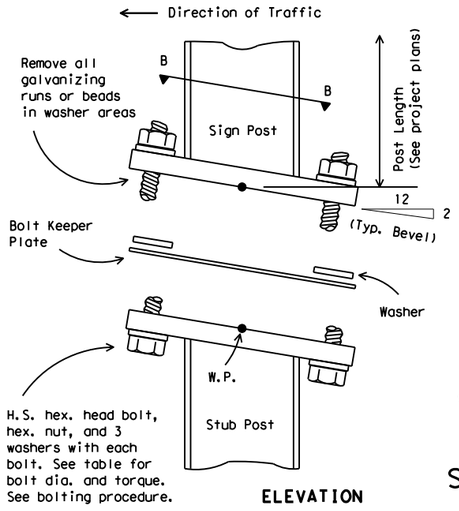
Use H.S. hex head bolts, hex head nut and bevel or flat washer (where req'd) under nut. All holes shall be drilled, sub-punched and reamed. All plate cuts shall preferably be saw cuts. However, flame cutting will be permitted provided all edges are ground. Metal projecting beyond the plane of the plate face will not be permitted. Steel fuse plates shall conform to the requirements of ASTM A36. ASTM A572 Grade 50 or ASTM A588 may be substituted for A36 at the option of the fabricator. Mill test reports shall be submitted for Fuse Plates. Steel used shall have an ultimate tensile strength not to exceed 80 KSI. For alternative Fuse Plate contact Traffic Operations Division.

SIGN POST AND STUB POST

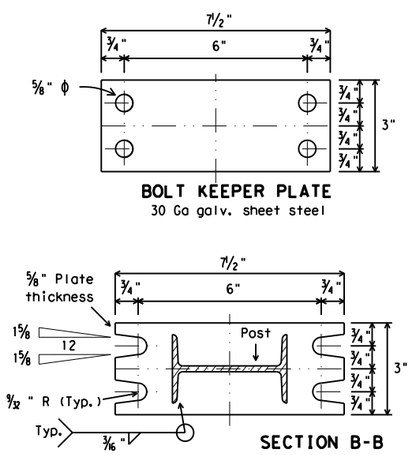
(For W Shapes)

① Back up weld to be made before installing stiffener plate

② Weld W may be continued across clips to seal joint

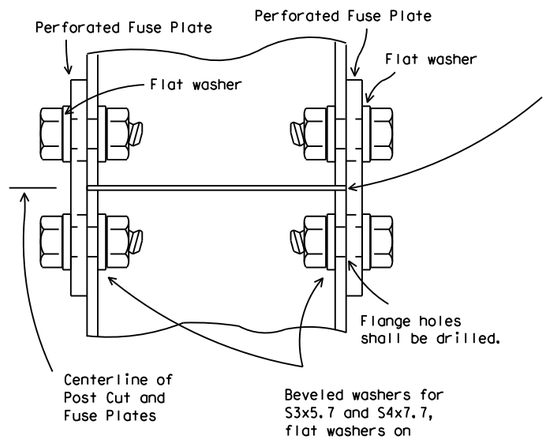


ELEVATION



SIGN POST AND STUB POST

(For S4x7.7 and S3x5.7)



DETAIL "A"

Parts shall be saw cut either before galvanizing and the galvanized cut cleaned of zinc build-up, or saw cut after galvanizing and the cut surface repaired per Item 445, "Galvanizing."

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS- LARGE ROADSIDE SIGNS FOUNDATION & STUB

SMD(2-2)-08

REVISIONS
4-98
9-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		98

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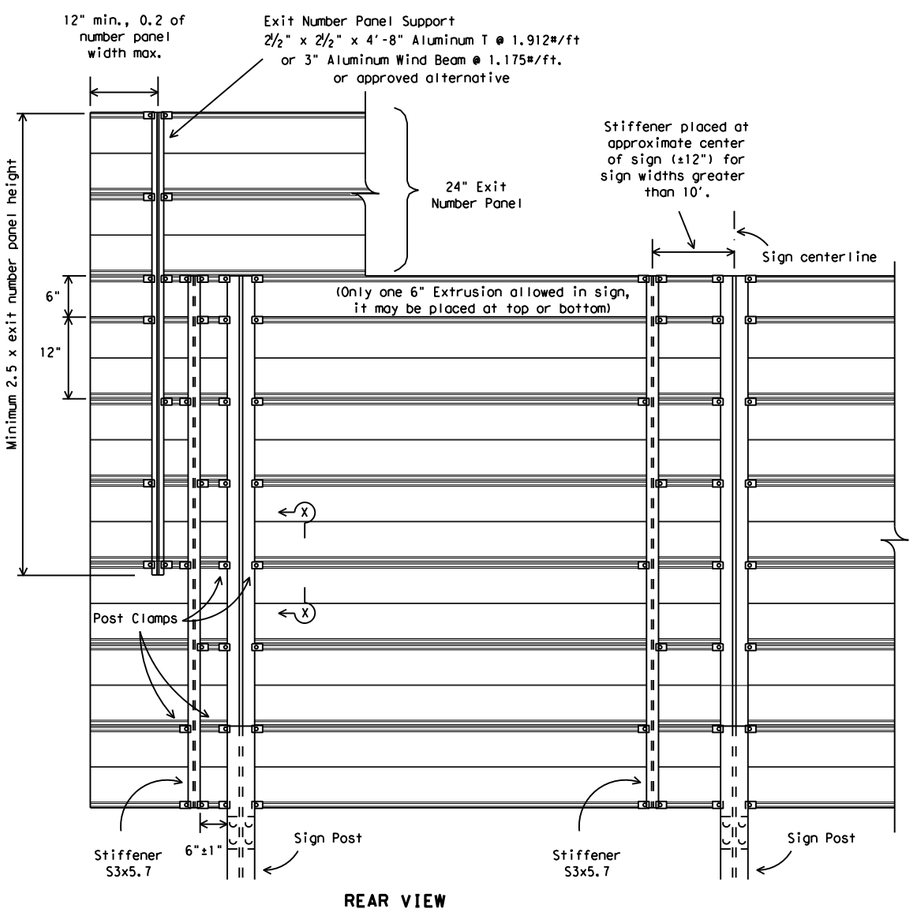
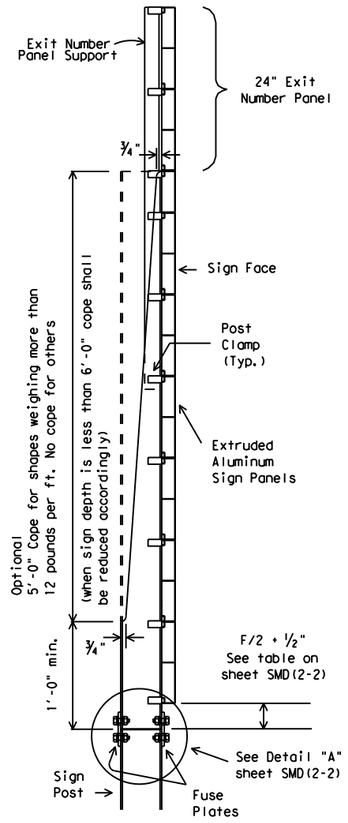
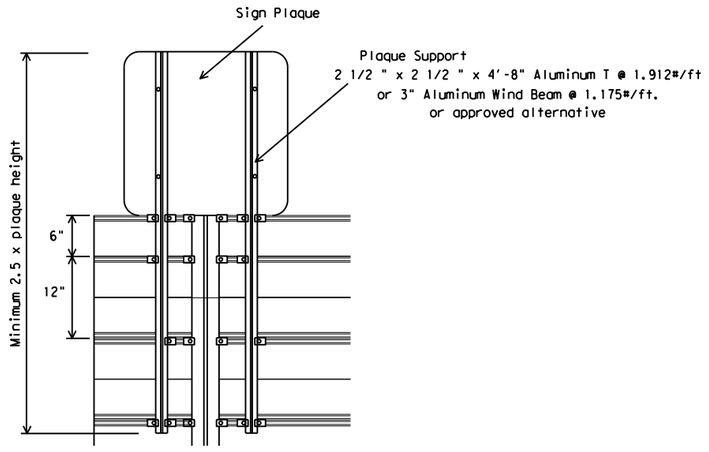


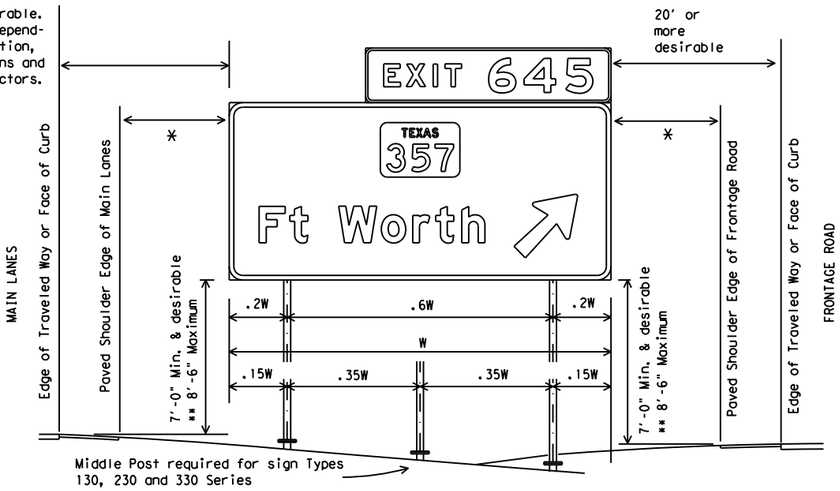


ALUMINUM PARENT SIGN & EXIT NUMBER PANEL MOUNTING DETAILS



SIGN PLAQUE MOUNTING DETAIL TO ALUMINUM PARENT SIGN

30' or more desirable. May be reduced depending on cross section, viewing conditions and other related factors.



TYPICAL SIGN INSTALLATION AND LOCATION

LATERAL CLEARANCE NOTES:

Lateral clearances of signs mounted on median side of main lanes are the same as shown above where space will permit.

Where a sign is to be located behind guardrail, an allowable minimum clearance of five feet may be used, measured from the face of the guardrail to the near edge of sign.

⁎ - 6' minimum and desirable may be used only in areas of limited lateral clearance and when approved by the Engineer.

POST SPACING NOTES:

Post spacing on a two post sign may vary a maximum of plus or minus 10% of total sign width to fit field conditions.

Post spacing on a three post sign may vary a maximum of plus or minus 5% of total sign width to fit field conditions.

SIGN HEIGHT NOTES:

** The 8' 6" maximum may be exceeded when placing signs on extreme slopes. In these conditions, a 7' minimum from natural ground to bottom of sign must be maintained.

DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN HARDWARE	DMS-7120

GENERAL NOTES:

1. Exit number panel shall be mounted to the right hand side of the parent sign for right exits and to the left hand side for left exits. The number panel shall be mounted with two uprights so its right edge is even with the right edge of the parent sign or vice-versa for left hand exits.
2. Exit number panel support shall be symmetrical about number panel centerline.
3. Exit number panel support shall be ASTM A36 structural steel galvanized after fabrication, or ASTM B221 aluminum alloy 6061-T6 or approved alternative.
4. All bolts, nuts and washers shall be galvanized per ASTM Designation: B695 Class 50, or A153 Class C or D.
5. Posts, parent sign panels, and exit number panels shall comply with notes on sheets SMD(2-1) and SMD(2-2).
6. Signs (such as exit number panels) attached above a parent sign shall be made of the same type material as the parent sign. General Service and Routing signs may be fabricated from flat sheet aluminum.
7. Exit number panel support and other connection hardware required to fasten exit number panel to parent sign shall be subsidiary to "Aluminum Signs" or "Fiberglass Signs."
8. For fiberglass sign installation details, see manufacturer's recommendations.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS-LARGE ROADSIDE SIGNS

SMD(2-3)-08

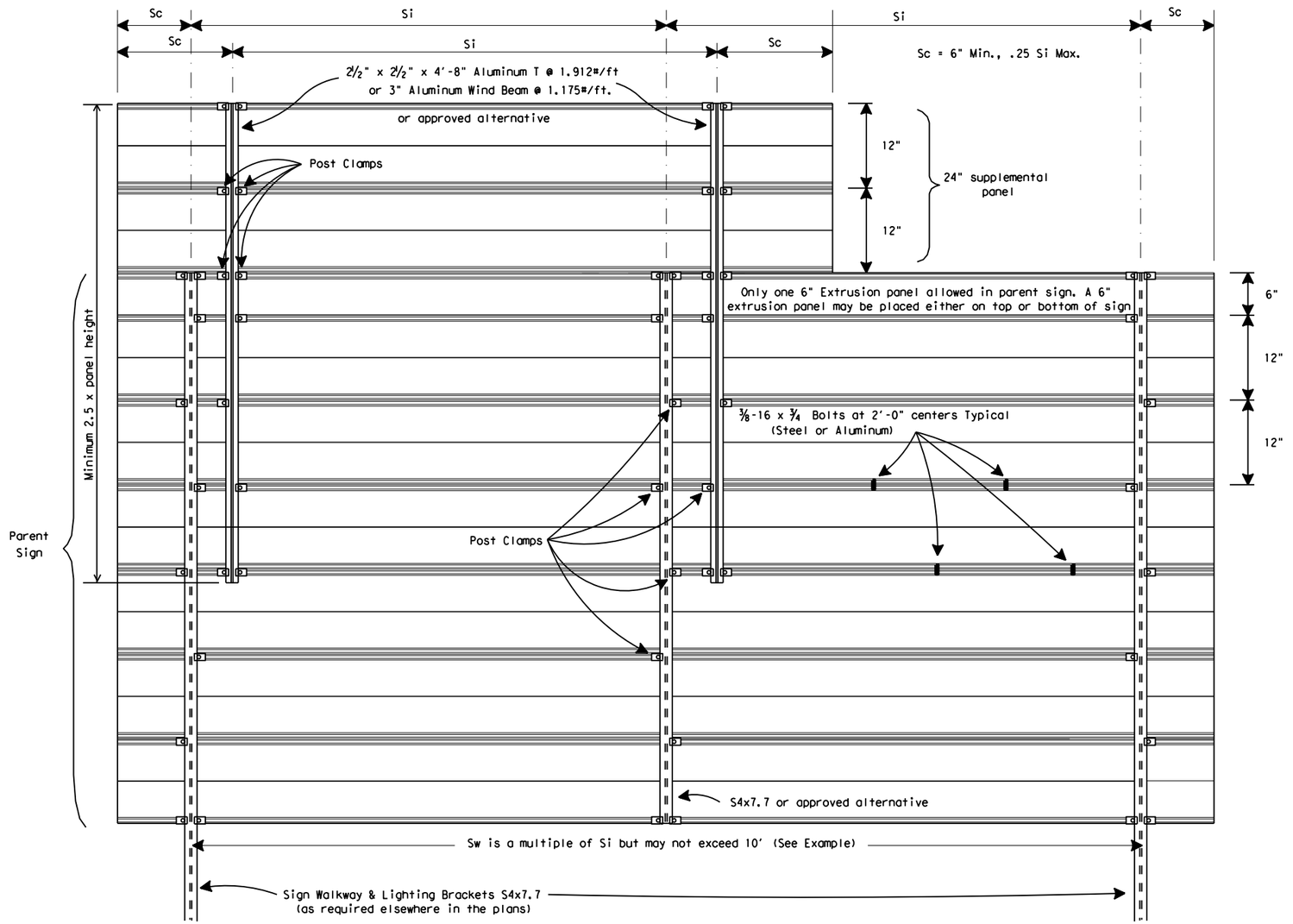
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
9-08

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		99

DATE:
FILE:

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

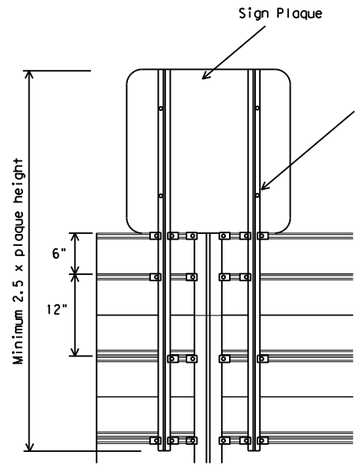


REAR VIEW

EXAMPLES (FOR DETERMINING Si and Sw)

NO.	ZONE	"d"	EXIT PANEL	WALKWAY	Si	Sw	COMMENT
1	1	15.0	YES	YES	4.5	9.0	Sw=2x(Si)
2	2	14.0	YES	NO	7.5	7.5	Sw = Si
3	1	15.0	NO	NO	8.5	8.5	Sw = Si
4	3	14.0	NO	YES	10.0	10.0	Sw = Si

Values shown for Si are maximum values. Si may be varied for different sign lengths and Truss mounting conditions. Sw should not exceed two times Si(Max.) or 10 feet.



SIGN PLAQUE MOUNTING DETAIL

MAXIMUM SIGN SUPPORT SPACING "Si" (FEET)

"d" Deepest Sign in Group (Ft.)	EXTRUDED ALUMINUM SIGN PANELS															
	WITH EXIT NUMBER PANELS								WITHOUT EXIT NUMBER PANELS							
	WITH WALKWAYS				WITHOUT WALKWAYS				WITH WALKWAYS				WITHOUT WALKWAYS			
	WIND ZONE				WIND ZONE				WIND ZONE				WIND ZONE			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
15	4.5	7	8	10	5	7	8	10	7	8	9	10	8.5	10	10	10
14	6	7.5	9.5	10	6	7.5	9.5	10	8	9	10	10	10	10	10	10
13	7.5	9	10	10	7.5	9	10	10	9	10	10	10	10	10	10	10
12	8.5	10	10	10	8.5	10	10	10	10	10	10	10	10	10	10	10
11 or less	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

For fiberglass sign installations, see manufacturer's recommendations.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS- OVERHEAD SIGNS EXTRUDED ALUMINUM

SMD(2-4)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

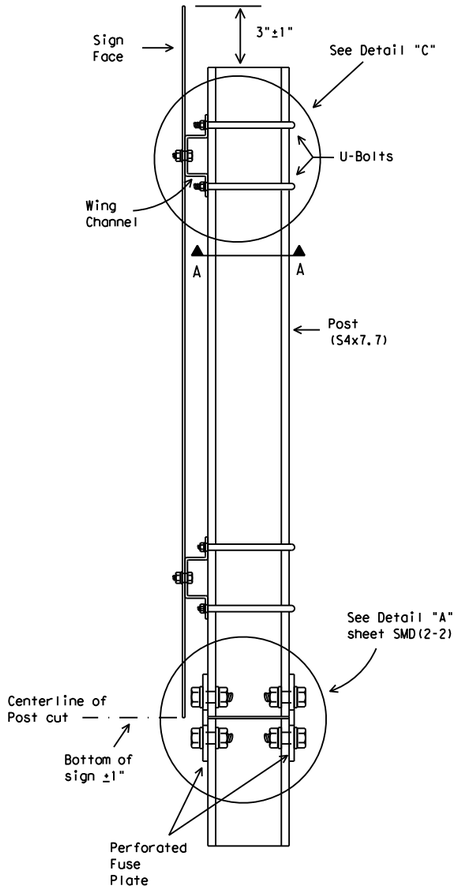
REVISIONS
9-08

CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.

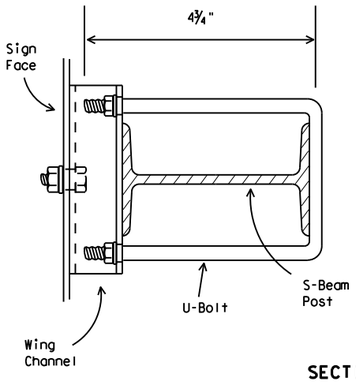
DIST	COUNTY	SHEET NO.
CRP	NUECES	100

DATE:
FILE:

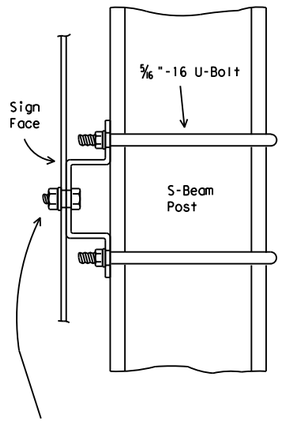
WING CHANNEL CLAMP DETAIL FOR TYPE G MOUNT



SIDE VIEW

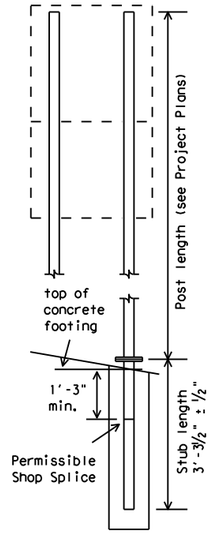


SECTION A-A

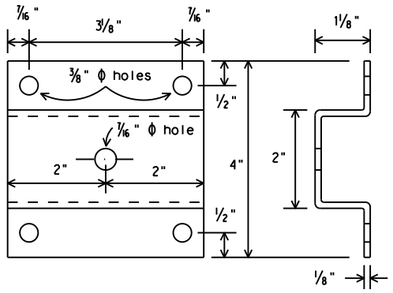


Galvanized steel or aluminum self-locking hex. head nut. 3/8 " - 16 x 3/4 " hex. head bolt for sheet metal. 3/8 " - 16 x 1 1/4 " hex. head bolt for plywood. 3/8 " galvanized medium washer.

DETAIL "C"



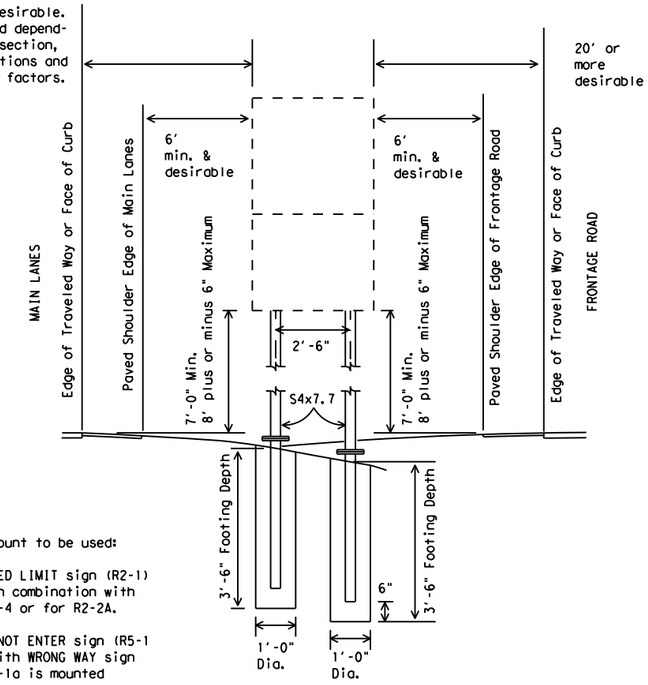
The weight of one S4x7.7 post is equal to 112.2 lbs. plus 7.7 lbs./ft x (post length in feet minus 10 ft). The weight of 112.2 lbs. includes 10 feet of post length, post foundation stub, related connection plates, friction fuse plate, and all high strength bolts, nuts and washers.



WING CHANNEL

Wing channel, 4" width x 1⅛" depth x ⅛" thickness, shall be aluminum (ASTM B221 6061-T6 or B308 6061-T6), galvanized steel (ASTM A36) or stainless steel (ASTM A167 type 304, No. 2B finish).

30' or more desirable. May be reduced depending on cross section, viewing conditions and other related factors.



This type mount to be used:

(1) For SPEED LIMIT sign (R2-1) when used in combination with R2-2 and R2-4 or for R2-2A.

(2) For DO NOT ENTER sign (R5-1 when used with WRONG WAY sign (R5-1a). R5-1a is mounted above R5-1.

DEPARTMENTAL MATERIAL SPECIFICATIONS
SIGN HARDWARE DMS-7120

GENERAL NOTES:

1. Design conforms with AASHTO Specifications for the design and construction of structural supports for highway signs.
2. Materials and fabrication shall conform to the requirements of the Department material specifications.
3. Structural steel shall be "Low-Alloy Steel" for non-bridge structures per Item 442, "Metal For Structures."
4. Parts shall be saw cut either before galvanizing and the galvanized cut cleaned of zinc build-up, or saw cut after galvanizing and the cut surface repaired per Item 445, "Galvanizing." (Cut surface will not be treated until plate is installed and all bolts fully tightened.)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS, TYPE G SUPPORT

SMD(TY G)-08

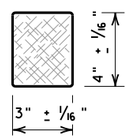
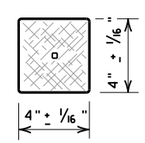
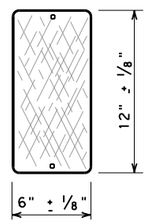
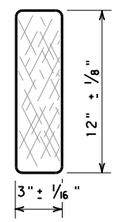
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
1-97
9-08

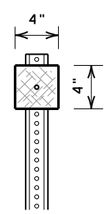
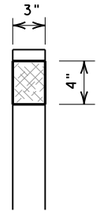
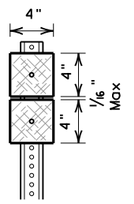
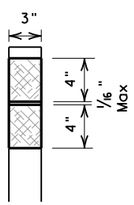
CONT	SECT	JOB	HIGHWAY
0074	06	254, ETC.	IH 37, ETC.
DIST	COUNTY		SHEET NO.
CRP	NUECES		101

DATE:
FILE:

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

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

DELINEATORS

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

D & OM DESCRIPTIVE CODES

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

NUMBER OF REFLECTORS
S = Single
D = Double

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

REFLECTOR UNIT SIZE
1 or 2

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

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

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

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

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

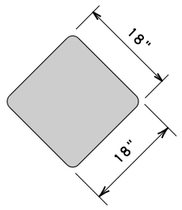
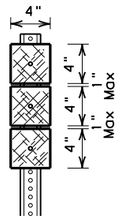
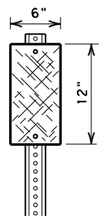
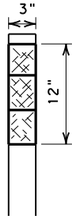
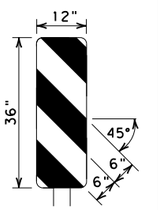
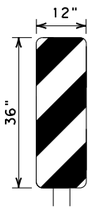
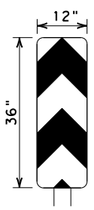
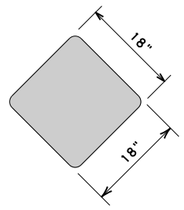
NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

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

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

DIRECTION
If Required
BI = Bi-Directional

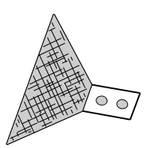
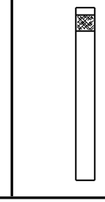
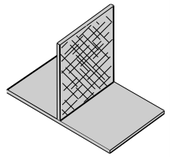
OBJECT MARKERS

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

DEPARTMENTAL MATERIAL SPECIFICATIONS

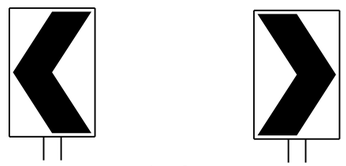
FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

BARRIER REFLECTORS (BRF)

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

CHEVRONS

DEVICE



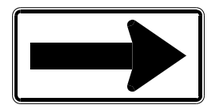
W1-8

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

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

ONE DIRECTION LARGE ARROW

DEVICE



W1-6

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

NOTE:

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC.	IH 37, ETC.
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	CRP	NUECES		102

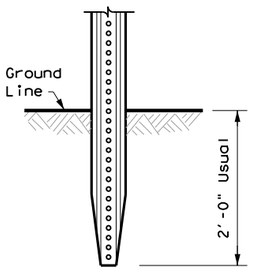
20A

DATE:
FILE:

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

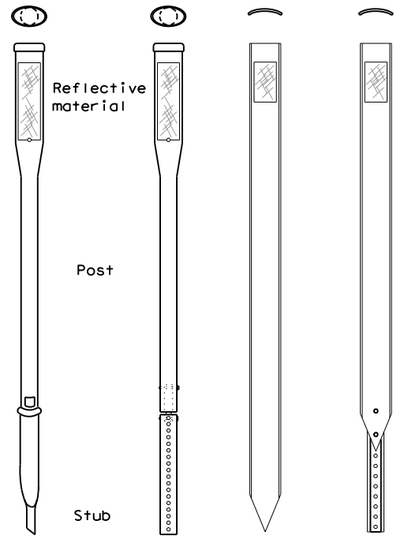


NOTES

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

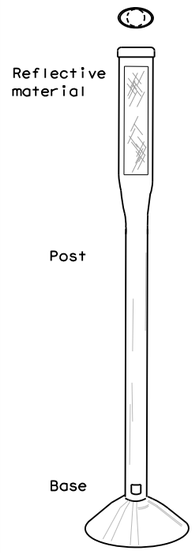
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



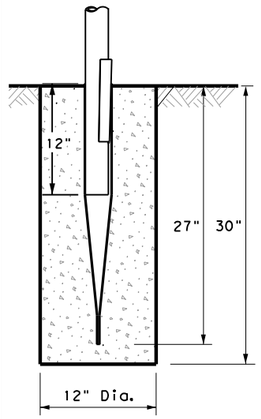
SURFACE MOUNT

NOTES

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

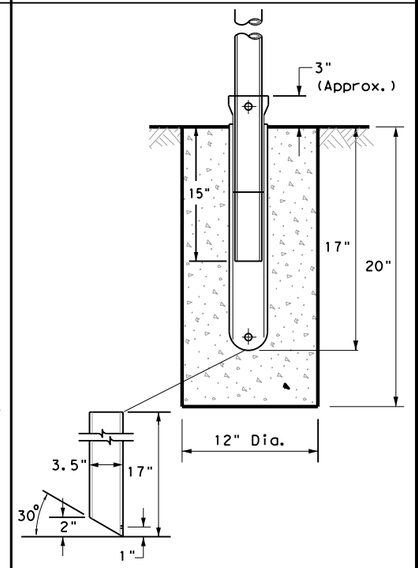
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

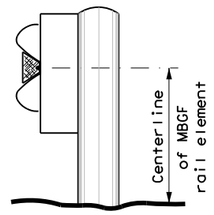
NOTE

1. Install per manufacturer's recommendations.

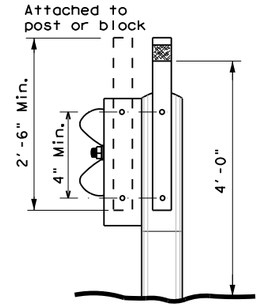
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

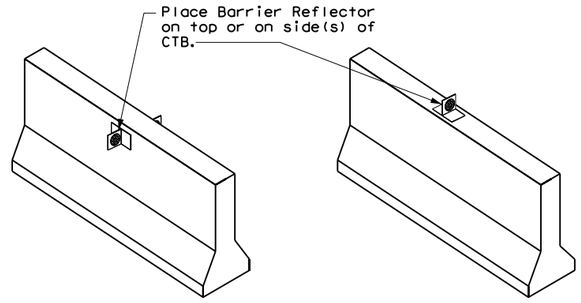
GF1



GF2



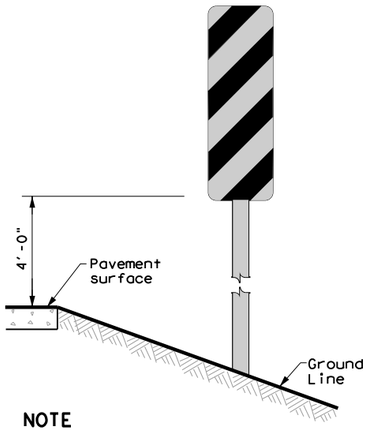
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

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

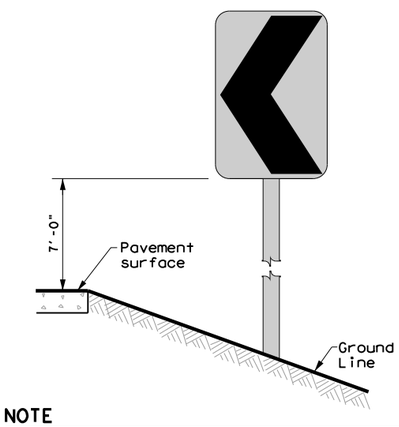
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

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

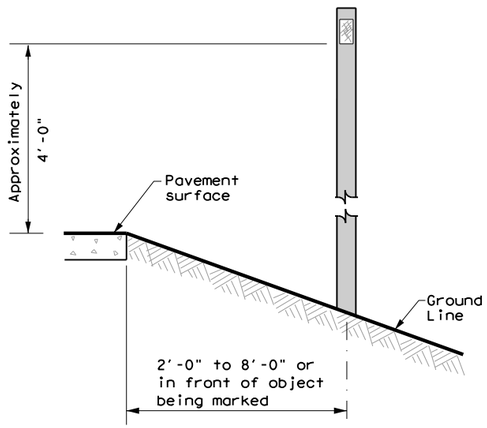
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

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

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

FILE: dom2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC.	IH 37, ETC.
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	CRP	NUECES		103

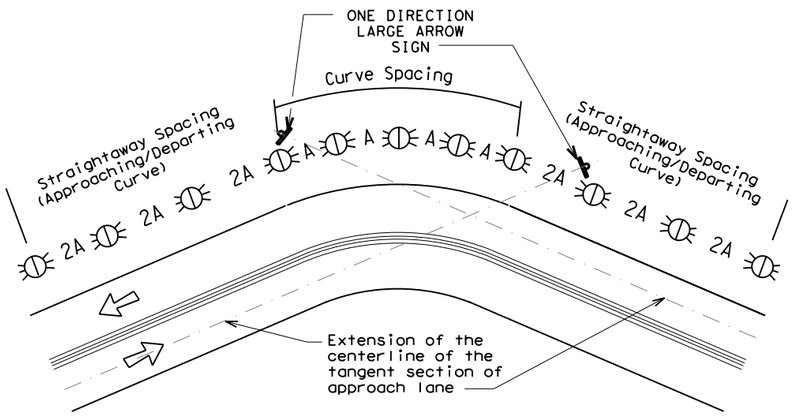
20B

DATE:
FILE:

MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

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

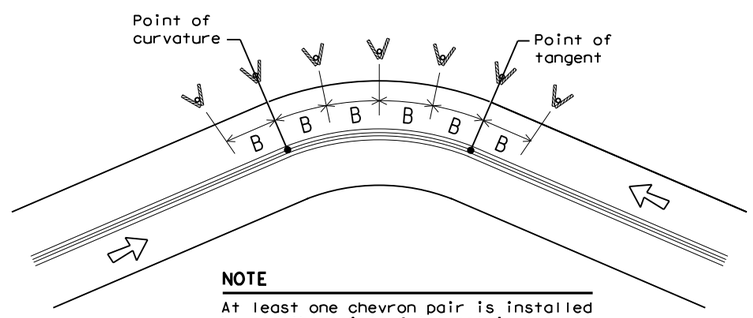
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



NOTE

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

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



NOTE

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

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN

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

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

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS NOT KNOWN

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

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

DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

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

NOTES

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

LEGEND

	Bi-directional Delineator
	Delineator
	Sign

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

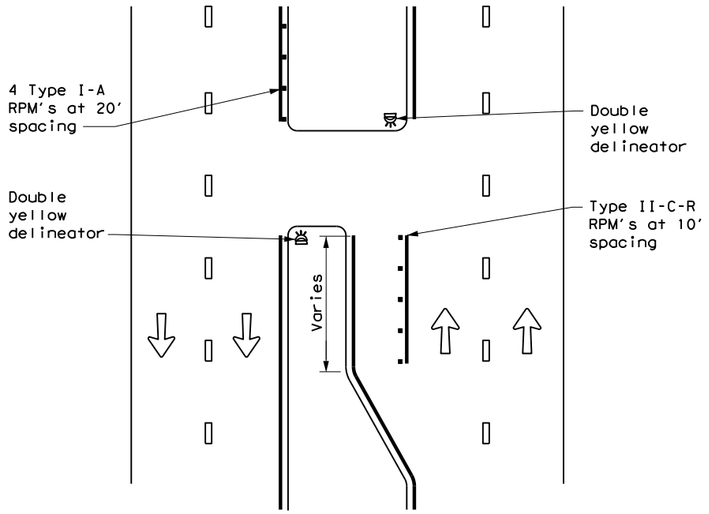
D & OM(3)-20

FILE: dom3-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC.	IH 37, ETC.
3-15 8-15	DIST	COUNTY		SHEET NO.
8-15 7-20	CRP	NUECES		104

20C

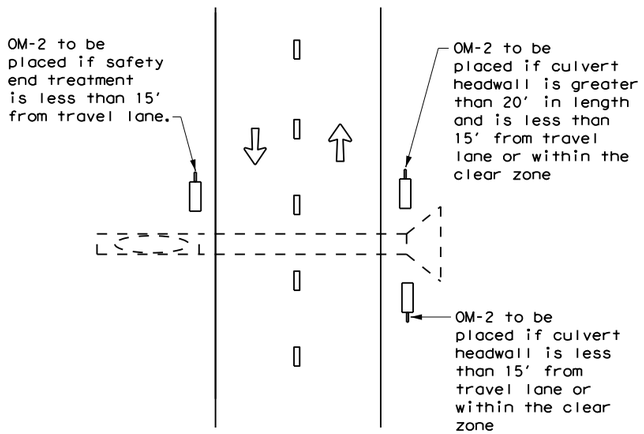
DATE:
FILE:

CROSSOVERS



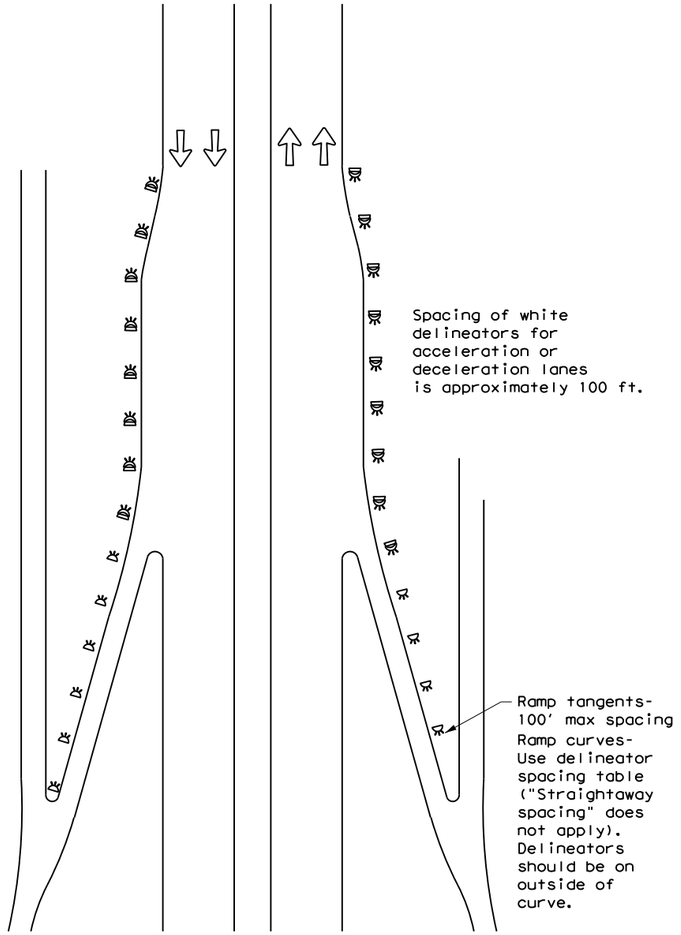
DETAIL 1

FOR CULVERTS WITHOUT MBGF



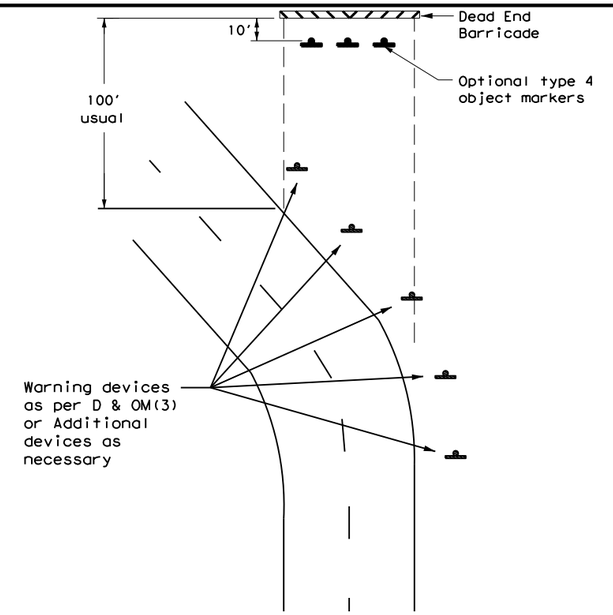
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



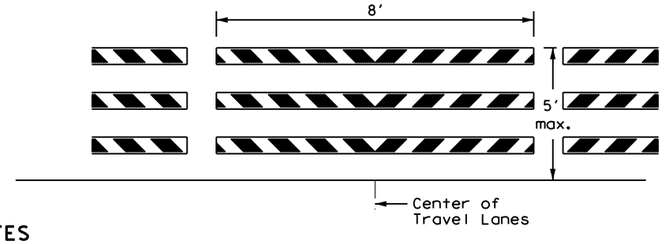
DETAIL 3

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 4

TYPICAL DEAD END BARRICADE INSTALLATION



NOTES

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

DETAIL 5

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

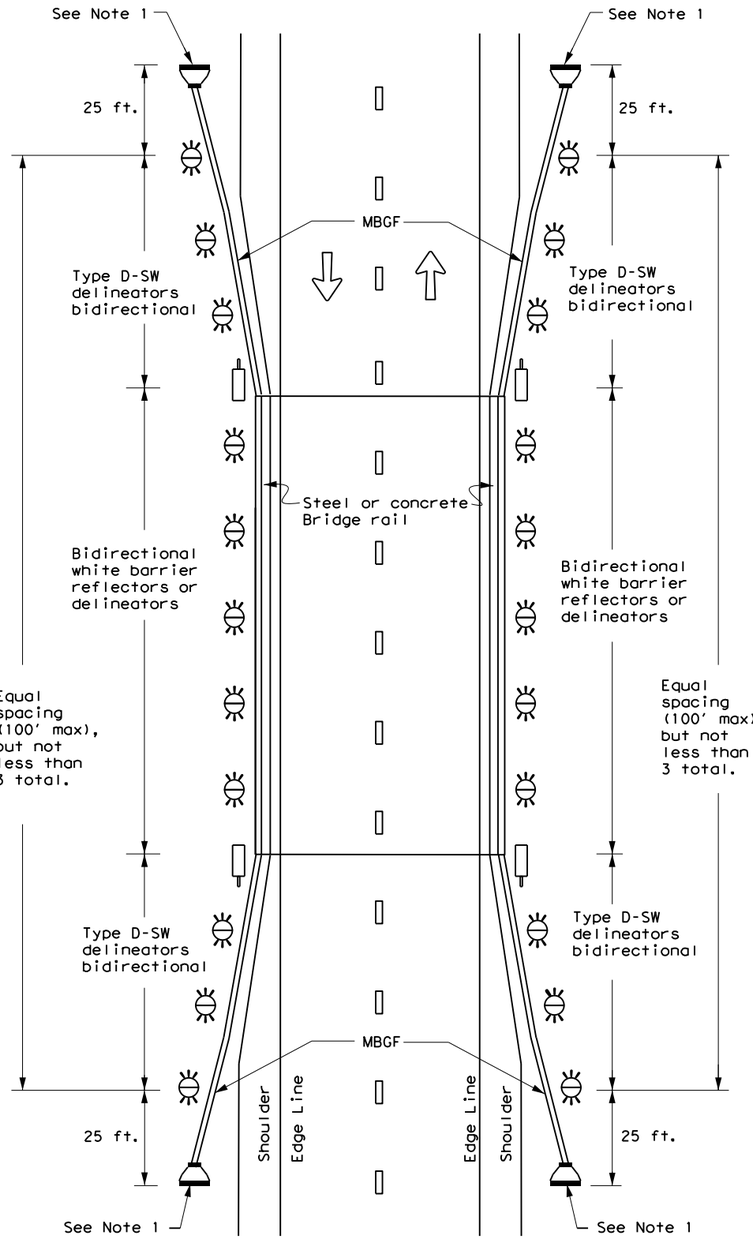
D & OM(4)-20

FILE: dom4-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC.	IH 37, ETC.
3-15	DIST	COUNTY		SHEET NO.
7-20	CRP	NUECES		105

DATE:
FILE:

20D

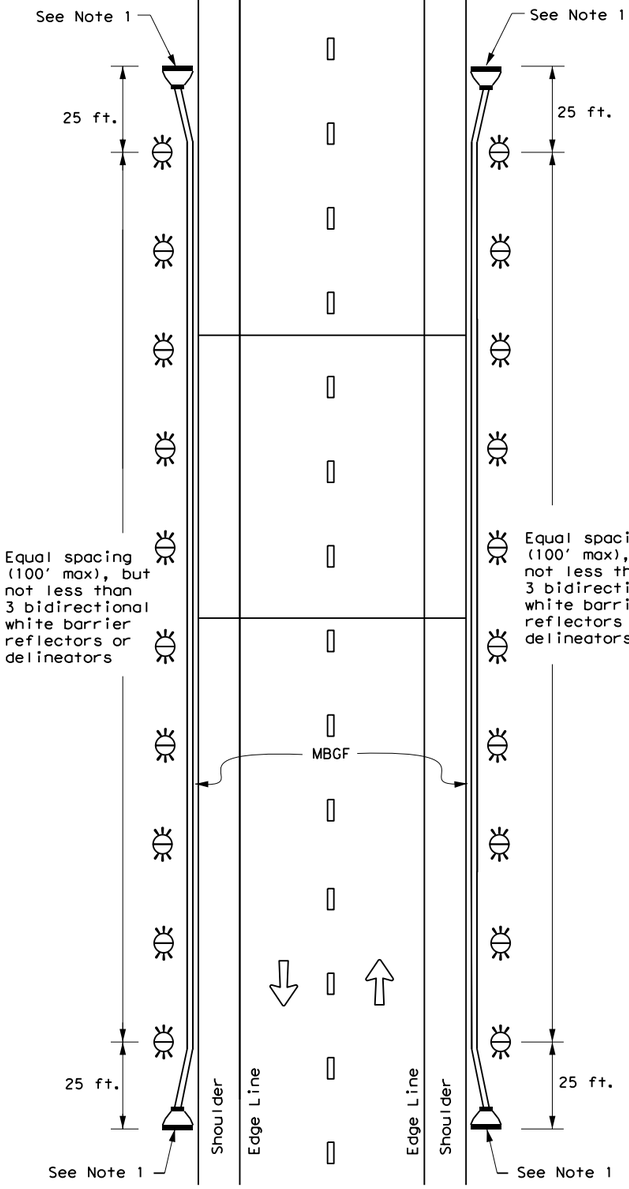
TWO-WAY, TWO LANE ROADWAY WITH REDUCED WIDTH APPROACH RAIL



NOTE:

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

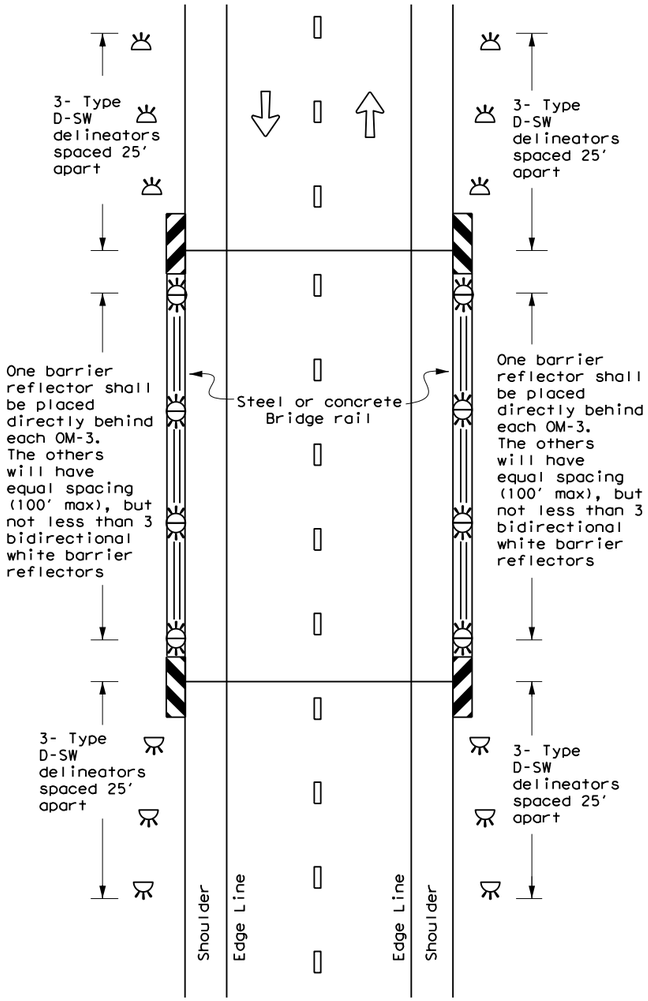
TWO-WAY, TWO LANE ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



NOTE:

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

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



LEGEND

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(5)-20

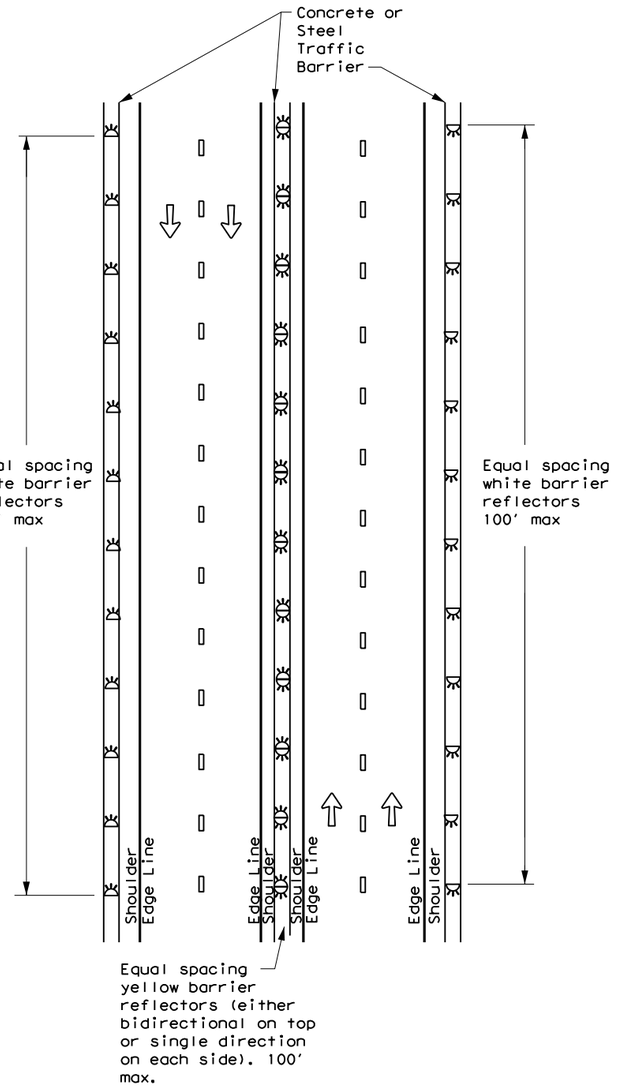
FILE: dom5-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC.	IH 37, ETC.
7-20	DIST	COUNTY		SHEET NO.
	CRP	NUECES		106

DATE:
FILE:

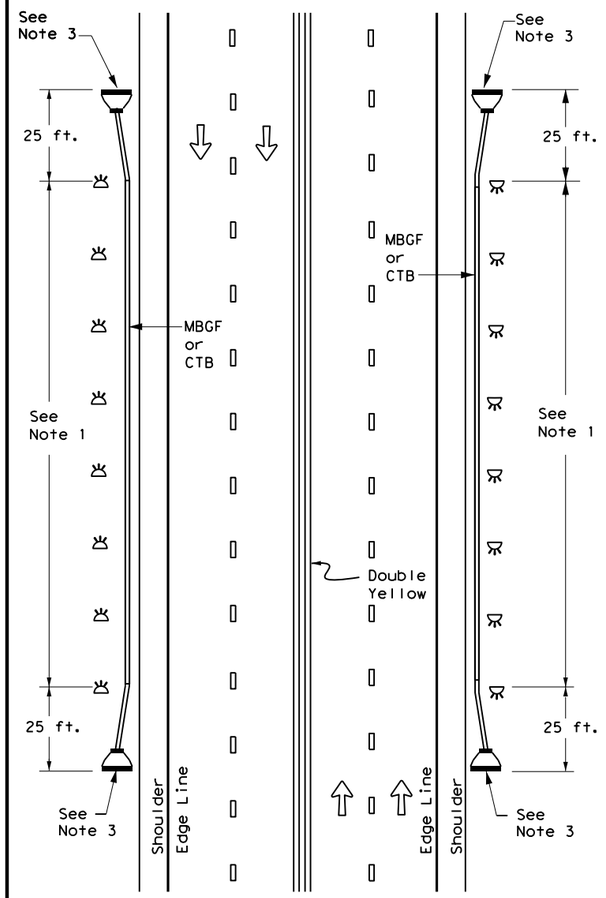
20E

DATE:
FILE:

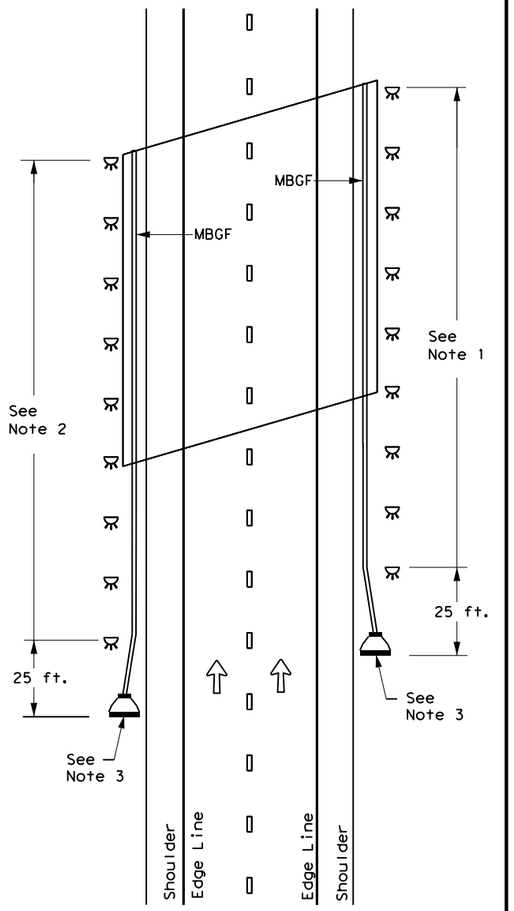
CONTINUOUS CONCRETE OR STEEL BARRIER



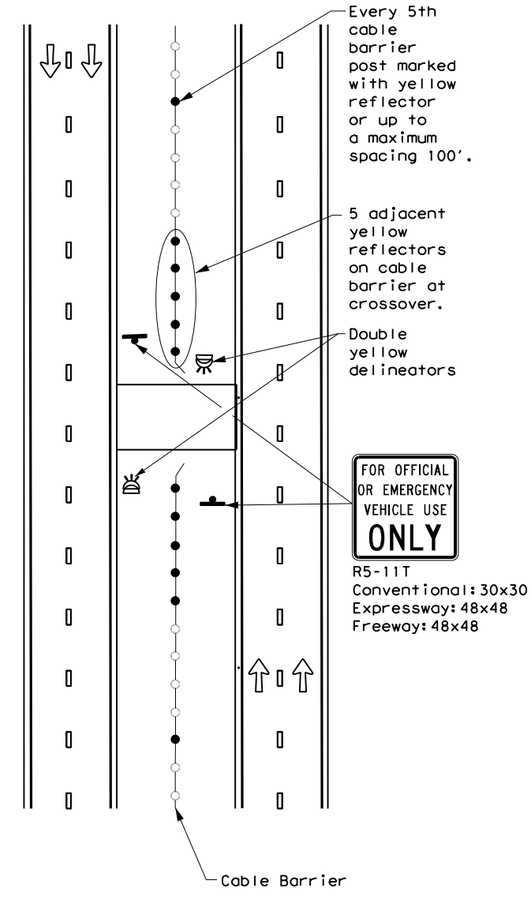
MULTI-LANE UNDIVIDED, TWO-WAY ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



DIVIDED ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



EMERGENCY CROSSOVER



NOTES

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

LEGEND

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(6)-20

FILE: dom6-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0074	06	254, ETC.	IH 37, ETC.
7-20	DIST	COUNTY		SHEET NO.
	CRP	NUECES		107

GENERAL NOTES:

1. Details show a typical warning sign with two flashing beacon heads, other arrangements are possible. When only one beacon is required, install the upper beacon.

2. See Item 685, "Roadside Flashing Beacon Assemblies" for further requirements.

3. See SMD standard sheets for lateral and vertical clearances and sign mounting details. Install signs as shown on the sign layout sheets.

4. Use either a Screw-In Type Anchor Foundation or a Drilled Shaft Foundation as shown elsewhere in the plans. When plans require a Drilled Shaft Foundation, see standard sheet TS-FD. Install the Screw-In Type Anchor Foundation as per manufacturer's recommendations. On a slope, install one edge at ground level. Screw-In/Drilled Shaft Foundation is subsidiary to Item 685. Installation of a ground rod is not required for solar powered flashing beacon assemblies.

5. When used, provide Screw-In Type Anchor Foundations as shown on TxDOT's Material Producer List (MPL) in the file "Highway Traffic Signals".

6. Install beacon heads as shown here, as shown elsewhere on the plans, or as directed. Use hardware specifically designed for mounting beacon heads on poles.

7. Conduit in foundation and within 6 in. of foundation is subsidiary to the Item 685, "Roadside Flashing Beacon Assemblies."

8. Unless otherwise shown on the plans, pole shaft shall be one piece, Schedule 40 Aluminum pipe, ASTM B429 or B221 (Alloy 6061-T6 only). Aluminum conduit will not develop the necessary strength and will not be allowed.

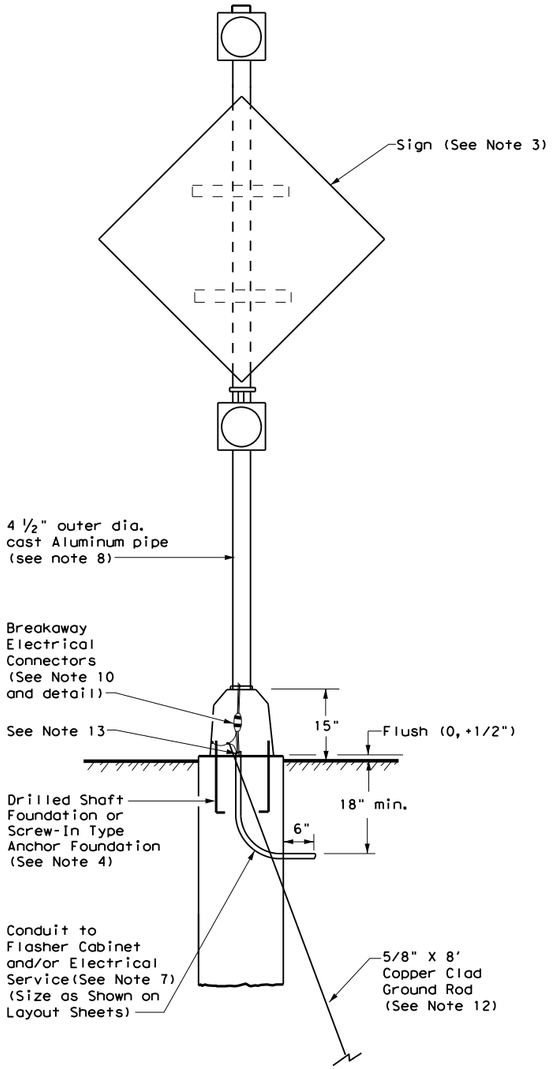
9. Per manufacturer's recommendations, engage all threads on the pedestal pole base and pipe unless the pipe is fully seated into base. In high winds, use a pole and base collar assembly to add strength and prevent loosening of connection.

10. Provide single pole non-fused watertight breakaway electrical connectors for frangible pedestal pole bases, as shown on TxDOT's MPL in the file "Roadway Illumination and Electrical Supplies." Approved models are listed under Item 685. For ungrounded (hot) conductors, install a breakaway connector with a dummy fuse slug). For grounded (neutral) conductors, install a breakaway connector with a white colored marking and a permanently installed dummy fuse (slug).

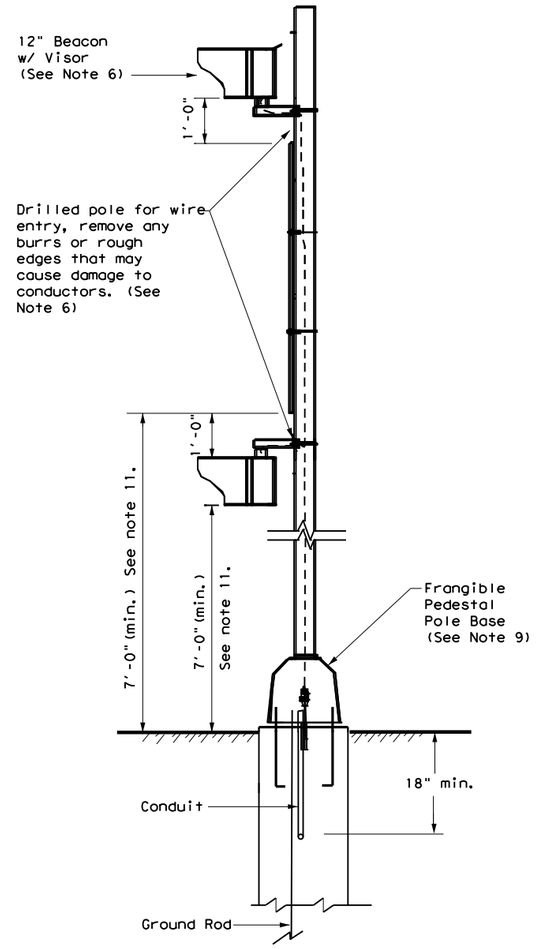
11. Provide clearance as shown above the sidewalk or pavement grade at the edge of the road. When a bottom beacon is not used, mount the bottom of the sign at least 7 ft. above the sidewalk or pavement grade at the edge of the road.

12. Make connections to ground rods according to NEC. Ground rod clamps shall be listed for their intended purpose.

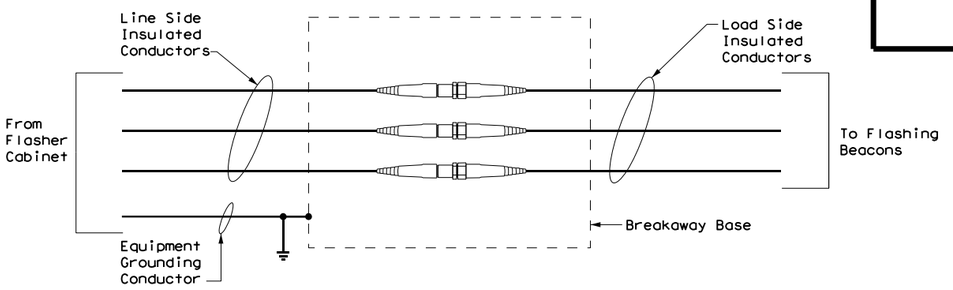
13. Ensure height of conduit and ground rod is below top of anchor bolts.



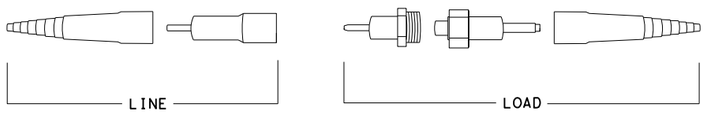
FRONT



SIDE



NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS



NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS
EXPLODED VIEW

Texas Department of Transportation

Traffic Operations Division Standard

ROADSIDE FLASHING BEACON ASSEMBLY

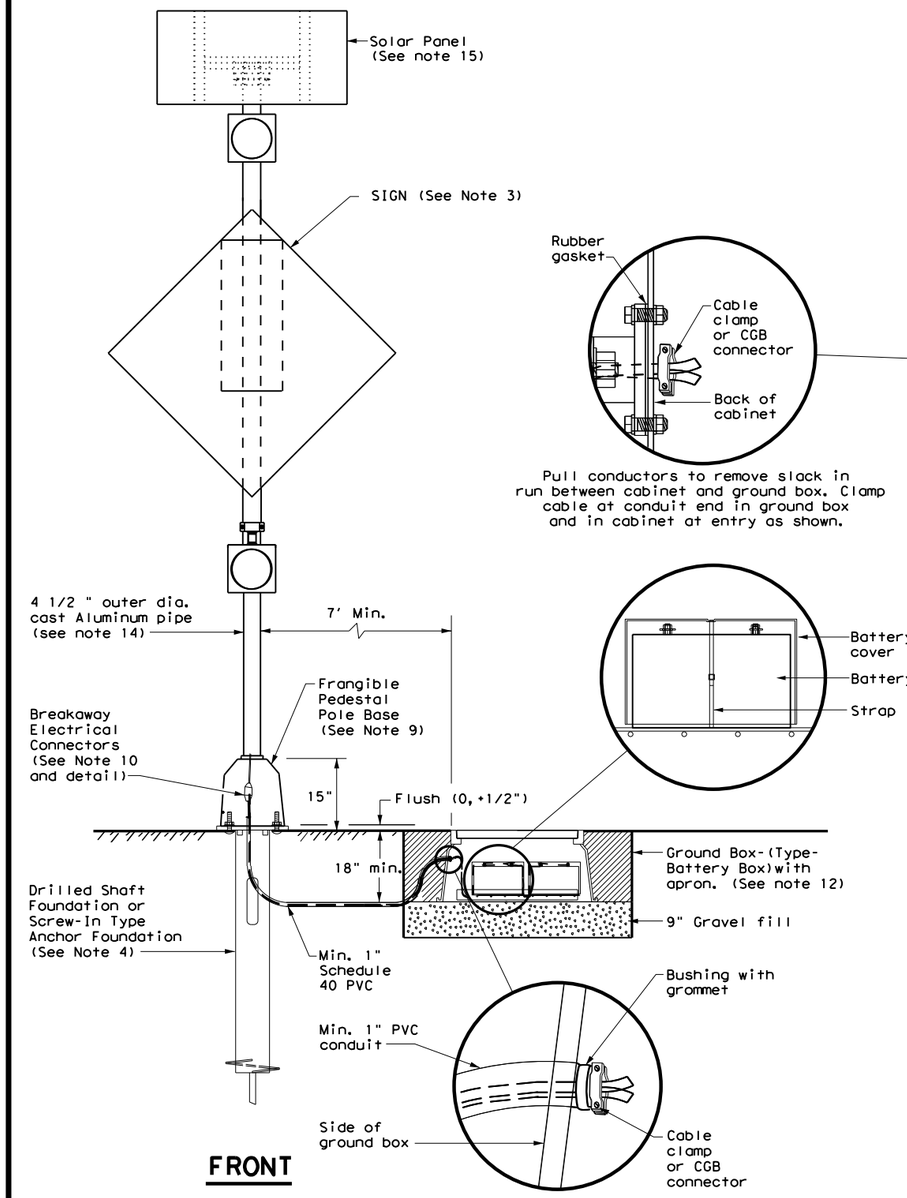
RFBA-13

FILE: rfba-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS 5-93 12-04 10-93 3-13 4-98	0074	06	254, ETC.	IH 37, ETC.
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		108

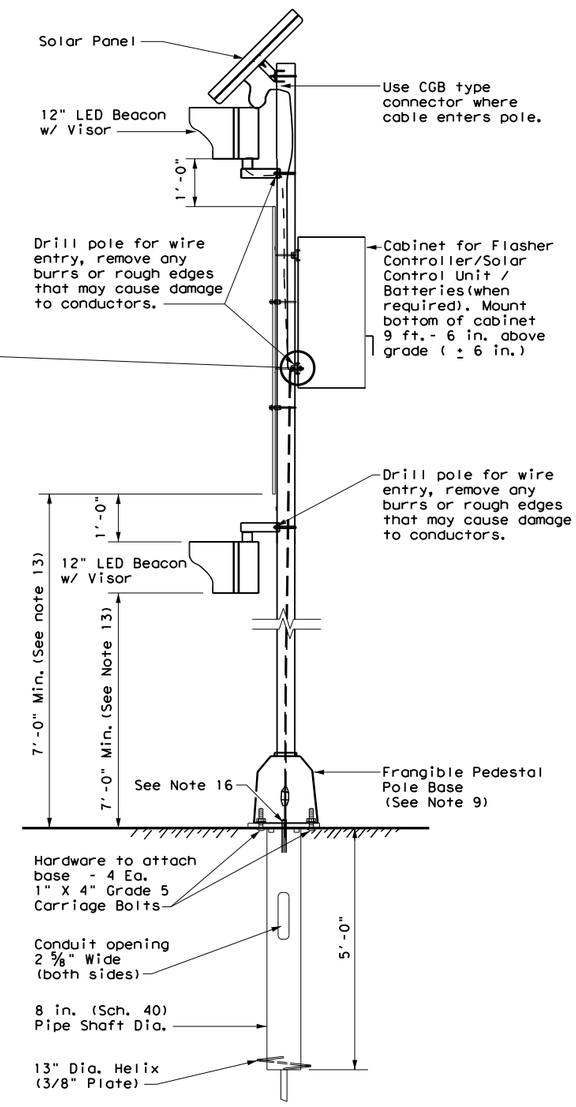
DATE:
FILE:

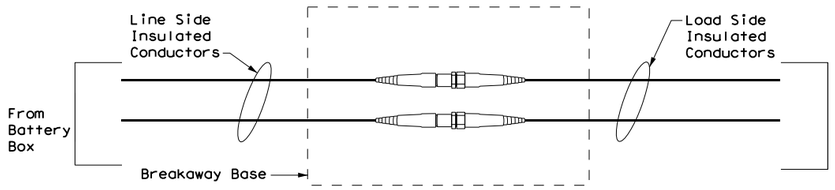
GENERAL NOTES:

1. Details show a typical warning sign with two flashing beacon heads, other arrangements are possible. When only one beacon is required, install the upper beacon.
2. See Item 685, "Roadside Flashing Beacon Assemblies" for further requirements.
3. See SMD standard sheets for lateral and vertical clearances and sign mounting details. Install signs as shown on the sign layout sheets.
4. Use either a Screw-In Type Anchor Foundation or a Drilled Shaft Foundation as shown elsewhere in the plans. When plans require a Drilled Shaft Foundation, see standard sheet TS-FD. Install the Screw-In Type Anchor Foundation as per manufacturer's recommendations. On a slope, install one edge at ground level. Screw-In/Drilled Shaft Foundation is subsidiary to Item 685. Installation of a ground rod is not required for solar powered flashing beacon assemblies.
5. When used, provide Screw-In Type Anchor Foundations as shown on TxDOT's Material Producer List (MPL) in the file "Highway Traffic Signals".
6. Use materials specifically designed for attaching cabinets, beacon heads, solar panels, etc., to poles.
7. Install beacon heads as shown here, as shown elsewhere on the plans, or as directed. Use hardware specifically designed for mounting beacon heads on poles.
8. Conduit in foundation and within 6 in. of foundation is subsidiary to the Item 685, "Roadside Flashing Beacon Assemblies."
9. Per manufacturer's recommendations, engage all threads on the pedestal pole base and pipe unless the pipe is fully seated into base. In high winds, use a pole and base collar assembly to add strength and prevent loosening on connection.
10. Provide single pole non-fused watertight breakaway electrical connectors for frangible pedestal pole bases, as shown on TxDOT's MPL in the file "Roadway Illumination and Electrical Supplies." Approved models are listed under Item 685. For ungrounded (hot) conductors, install a breakaway connector with a dummy fuse slug). For grounded (neutral) conductors, install a breakaway connector with a white colored marking and a permanently installed dummy fuse (slug).
11. Install the batteries in a battery box. Place the batteries on a 3/16" thick plastic sheet and connect together. Place a plastic cover (battery bell jar) over the top of each battery and secure the battery bell jar to the battery with a strap. The batteries, bell jars, straps and 3/16" plastic sheet are subsidiary to the Item 685, "Roadside Flashing Beacon Assemblies." When required, install batteries in the flasher cabinet. Wire batteries according to manufacturers recommendations. Provide the number of batteries as required by the manufacturer.
12. See standard sheet Electrical Details (ED) for additional requirements regarding the installation of ground boxes/battery boxes, conduit, and cabinets.
13. Provide clearance as shown above the sidewalk or pavement grade at the edge of the road. When a bottom beacon is not used, mount the bottom of the sign at least 7 ft. above the sidewalk or pavement grade at the edge of the road.
14. Unless otherwise shown on the plans, pole shaft shall be one piece, Schedule 40 Aluminum pipe, ASTM B429 or B221 (Alloy 6061-T6 only). Aluminum conduit will not develop the necessary strength and will not be allowed.
15. Orient solar panel for optimum exposure to sunlight (face to the south). Prior to installation, check the location to ensure there is no overhead obstruction that would block the solar panel from receiving full sunlight. Unless specified elsewhere, mount a minimum of 14' above grade.
16. Ensure height of conduit is below top of anchor bolts.

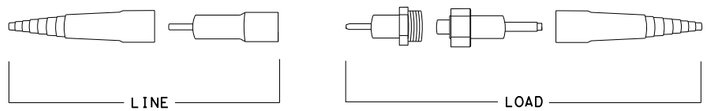


Pull conductors to remove slack in run between cabinet and ground box. Clamp cable at conduit end in ground box and in cabinet at entry as shown.





NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS



NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS EXPLODED VIEW

Texas Department of Transportation

Traffic Operations Division Standard

SOLAR POWERED ROADSIDE FLASHING BEACON ASSEMBLY DETAILS

SPRFBA(1)-13

FILE: spb1-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC.	IH 37, ETC.
12-04	DIST	COUNTY		SHEET NO.
3-13	CRP	NUECES		109

DATE:
FILE:

75A

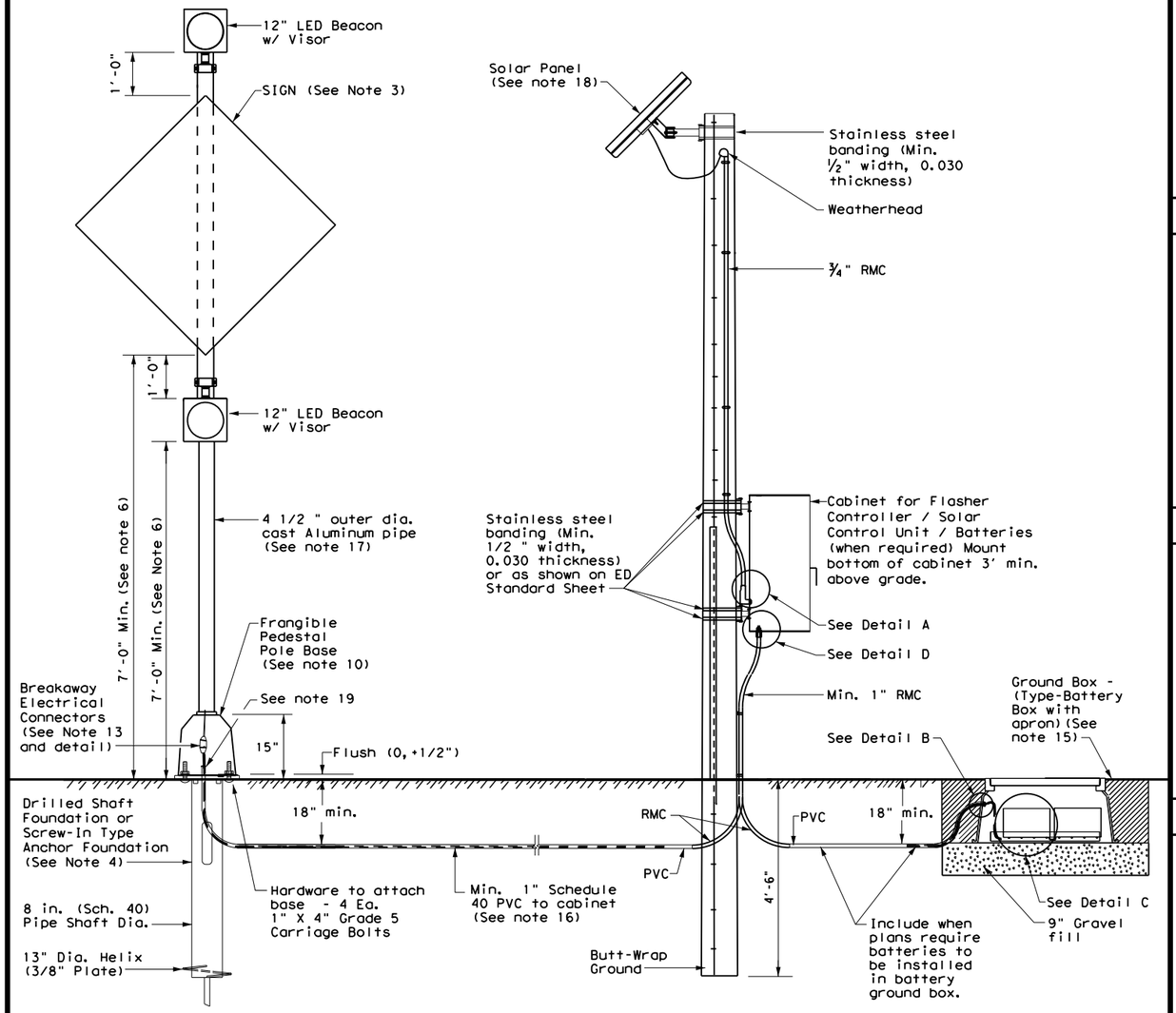
GENERAL NOTES:

1. Details show a typical warning sign with two flashing beacon heads, other arrangements are possible. When only one beacon is required, install the upper beacon.
2. See Item 685, "Roadside Flashing Beacon Assemblies" for further requirements.
3. See SMD standard sheets for lateral and vertical clearances and sign mounting details. Install signs as shown on the sign layout sheets.
4. Use either a Screw-In Type Anchor Foundation or a Drilled Shaft Foundation as shown elsewhere in the plans. When plans require a Drilled Shaft Foundation, see standard sheet TS-FD. Install the Screw-In Type Anchor Foundation as per manufacturer's recommendations. On a slope, install one edge at ground level. Screw-In/Drilled Shaft Foundation is subsidiary to Item 685. Installation of a ground rod is not required for solar powered flashing beacon assemblies.
5. When used, provide Screw-In Type Anchor Foundations as shown on TxDOT's Material Producer List (MPL) in the file "Highway Traffic Signals".
6. Provide clearance as shown above the sidewalk or pavement grade at the edge of the road. When a bottom beacon is not used, mount the bottom of the sign at least 7 ft. above the sidewalk or pavement grade at the edge of the road.
7. Provide 20' in length ANSI class 5 timber poles. Install pole as shown or at the edge of the right of way. The timber pole is subsidiary to the Item 685, "Roadside Flashing Beacon Assemblies."
8. Use materials specifically designed for attaching cabinets, beacon heads, solar panels, etc., to poles.
9. Conduit in foundation and within 6 in. of foundation is subsidiary to the Item 685, "Roadside Flashing Beacon Assemblies."
10. Per manufacturer's recommendations, engage all threads on the pedestal pole base and pipe unless the pipe is fully seated into base. In high winds, use a pole and base collar assembly to add strength and prevent loosening on connection.
11. Install beacon heads as shown here, as shown elsewhere on the plans, or as directed. Use hardware specifically designed for mounting beacon heads on poles.
12. Install the Type LB conduit body attachment in the bottom third of the back of the cabinet. See Detail A.
13. Provide single pole non-fused watertight breakaway electrical connectors for frangible pedestal pole bases, as shown on TxDOT's MPL in the file "Roadway Illumination and Electrical Supplies". Approved models are listed under Item 685. For ungrounded (hot) conductors, install a breakaway connector with a dummy fuse (slug). For grounded (neutral) conductors, install a breakaway connector with a white colored marking and a permanently installed dummy fuse (slug).
14. Install the batteries in a battery box. Place the batteries on a 3/16" thick plastic sheet and connect together. Place a plastic cover (battery bell jar) over the top of each battery and secure the battery bell jar to the battery with a strap. The batteries, bell jars, straps and 3/16 " plastic sheet are subsidiary to the Item 685, "Roadside Flashing Beacon Assemblies." When required, install batteries in the flasher cabinet. Wire batteries according to manufacturers recommendations. Provide the number of batteries as required by the manufacturer.
15. See standard sheet Electrical Details (ED) for additional requirements regarding the installation of ground boxes/battery boxes, conduit, and cabinets.
16. Unless otherwise shown on the plans or recommended by the manufacturer, use the following table to determine the wire size from cabinet to beacons.

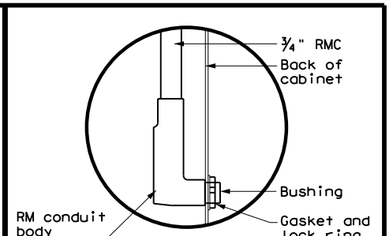
Distance from Cabinet to Beacons (ft.)	Minimum Required Wire Size (AWG)
0 - 35	#14
35 - 60	#12
60 - 100	#10
> 100	#8

17. Unless otherwise shown on the plans, pole shaft shall be one piece, Schedule 40 Aluminum pipe, ASTM B429 or B221 (Alloy 6061-T6 only). Aluminum conduit will not develop the necessary strength and will not be allowed.
18. Orient solar panel for optimum exposure to sunlight (face to the south). Prior to installation, check the location to ensure there is no overhead obstruction that would block the solar panel from receiving full sunlight. Unless specified elsewhere, mount a minimum of 14' above grade.
19. Ensure height of conduit is below top of anchor bolts.

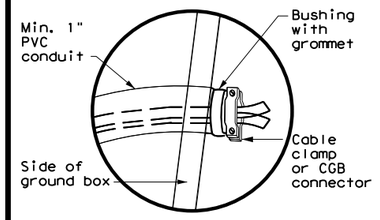
DATE:
FILE:



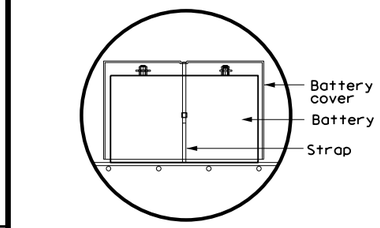
DETAIL FOR SOLAR PANEL, CABINET, AND BATTERIES LOCATED OUT OF CLEAR ZONE ON TIMBER POLE



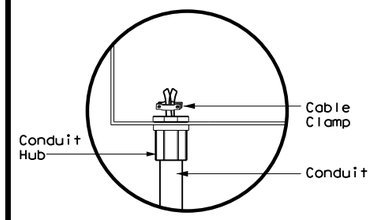
DETAIL A



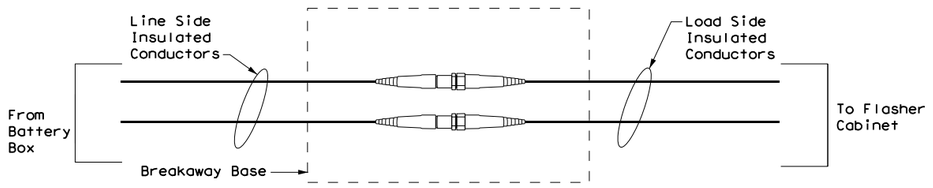
DETAIL B



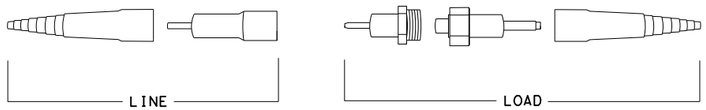
DETAIL C



DETAIL D



NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS



NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS EXPLODED VIEW

Texas Department of Transportation

Traffic Operations Division Standard

SOLAR POWERED ROADSIDE FLASHING BEACON ASSEMBLY DETAILS (TIMBER)

SPRFBA(2)-13

FILE: spb2-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-04 3-13	0074	06	254, ETC.	IH 37, ETC.
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		110

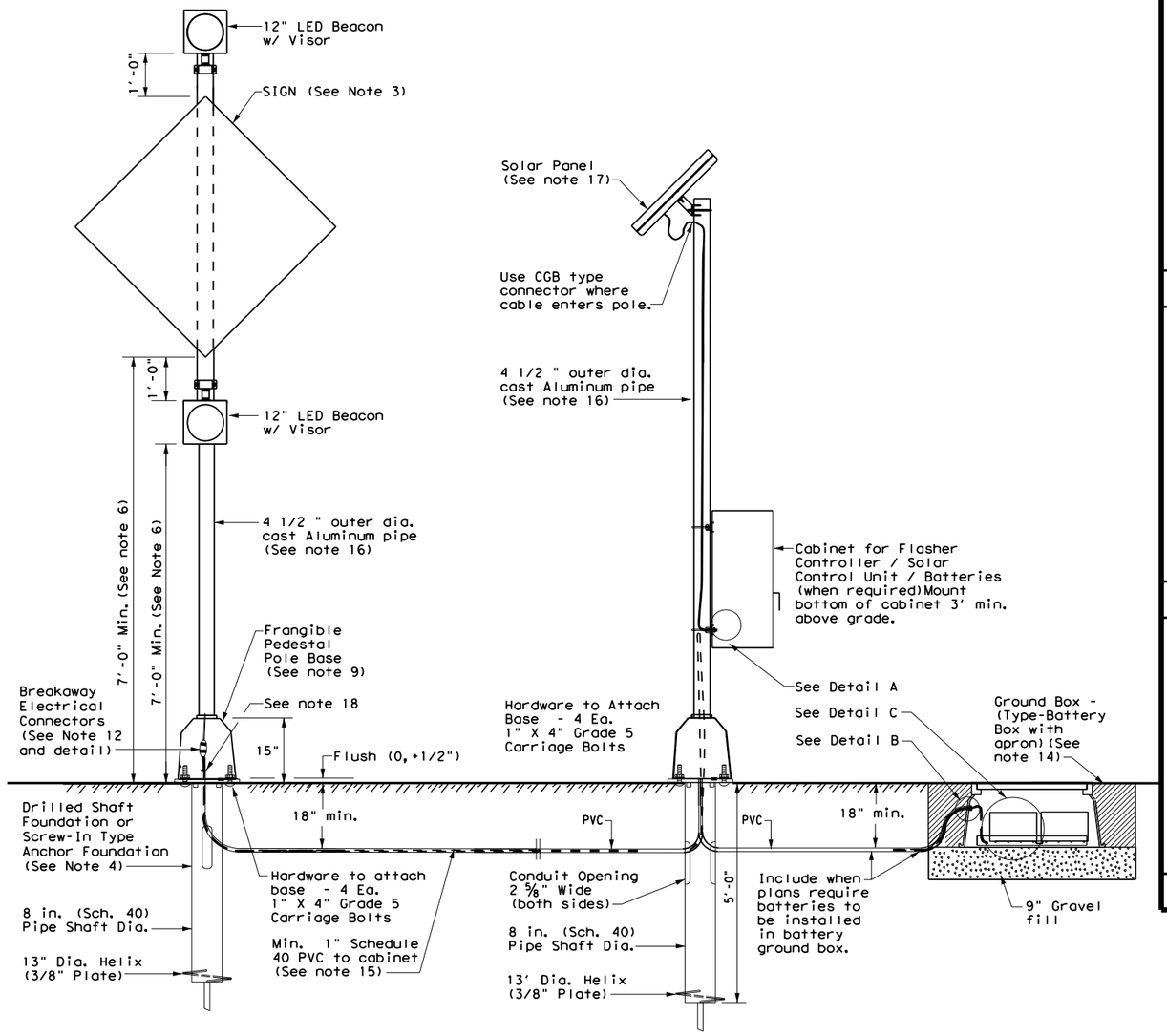
75B

GENERAL NOTES:

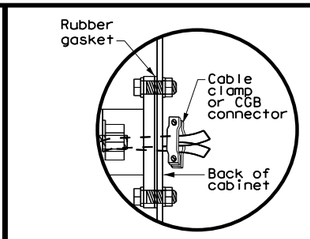
1. Details show a typical warning sign with two flashing beacon heads, other arrangements are possible. When only one beacon is required, install the upper beacon.
2. See Item 685, "Roadside Flashing Beacon Assemblies" for further requirements.
3. See SMD standard sheets for lateral and vertical clearances and sign mounting details. Install signs as shown on the sign layout sheets.
4. Use either a Screw-In Type Anchor Foundation or a Drilled Shaft Foundation as shown elsewhere in the plans. When plans require a Drilled Shaft Foundation, see standard sheet TS-FD. Install the Screw-In Type Anchor Foundation as per manufacturer's recommendations. On a slope, install one edge at ground level. Screw-In/Drilled Shaft Foundation is subsidiary to Item 685. Installation of a ground rod is not required for solar powered flashing beacon assemblies.
5. When used, provide Screw-In Type Anchor Foundations as shown on TxDOT's Material Producer List (MPL) in the file "Highway Traffic Signals".
6. Provide clearance as shown above the sidewalk or pavement grade at the edge of the road. When a bottom beacon is not used, mount the bottom of the sign at least 7 ft. above the sidewalk or pavement grade at the edge of the road.
7. Use materials specifically designed for attaching cabinets, beacon heads, solar panels, etc., to poles.
8. Conduit in foundation and within 6 in. of foundation is subsidiary to the Item 685, "Roadside Flashing Beacon Assemblies."
9. Per manufacturer's recommendations, engage all threads on the pedestal pole base and pipe unless the pipe is fully seated into base. In high winds, use a pole and base collar assembly to add strength and prevent loosening on connection.
10. Install beacon heads as shown here, as shown elsewhere on the plans, or as directed. Use hardware specifically designed for mounting beacon heads on poles.
11. Install the cable clamp in the bottom third of the back of the cabinet. See Detail A.
12. Provide single pole non-fused watertight breakaway electrical connectors for frangible pedestal pole bases, as shown on TxDOT's MPL in the file "Roadway Illumination and Electrical Supplies". Approved models are listed under Item 685. For ungrounded (hot) conductors, install a breakaway connector with a dummy fuse (slug). For grounded (neutral) conductors, install a breakaway connector with a white colored marking and a permanently installed dummy fuse (slug).
13. Install the batteries in a battery box. Place the batteries on a 3/16" thick plastic sheet and connect together. Place a plastic cover (battery bell jar) over the top of each battery and secure the battery bell jar to the battery with a strap. The batteries, bell jars, straps and 3/16 " plastic sheet are subsidiary to the Item 685, "Roadside Flashing Beacon Assemblies." When required, install batteries in the flasher cabinet. Wire batteries according to manufacturers recommendations. Provide the number of batteries as required by the manufacturer.
14. See standard sheet Electrical Details (ED) for additional requirements regarding the installation of ground boxes/battery boxes, conduit, and cabinets.
15. Unless otherwise shown on the plans or recommended by the manufacturer, use the following table to determine the wire size from cabinet to beacons.

Distance from Cabinet to Beacons (ft.)	Minimum Required Wire Size (AWG)
0 - 35	#14
35 - 60	#12
60 - 100	#10
> 100	#8

16. Unless otherwise shown on the plans, pole shaft shall be one piece, Schedule 40 Aluminum pipe, ASTM B429 or B221 (Alloy 6061-T6 only). Aluminum conduit will not develop the necessary strength and will not be allowed.
17. Orient solar panel for optimum exposure to sunlight (face to the south). Prior to installation, check the location to ensure there is no overhead obstruction that would block the solar panel from receiving full sunlight. Unless specified elsewhere, mount a minimum of 14' above grade.
18. Ensure height of conduit is below top of anchor bolts.

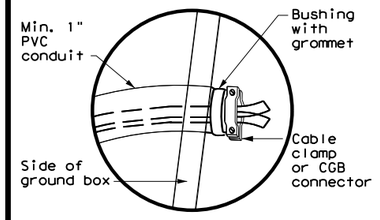


DETAIL FOR SOLAR PANEL, CABINET, AND BATTERIES LOCATED OUT OF CLEAR ZONE ON SEPARATE ALUMINUM POLE ASSEMBLY

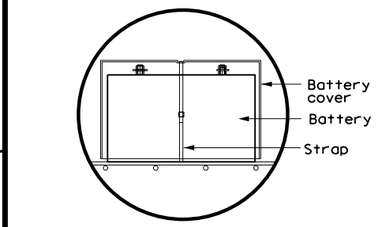


Pull conductors to remove slack in run between cabinet and ground box. Clamp cable at conduit end in ground box and in cabinet at entry as shown.

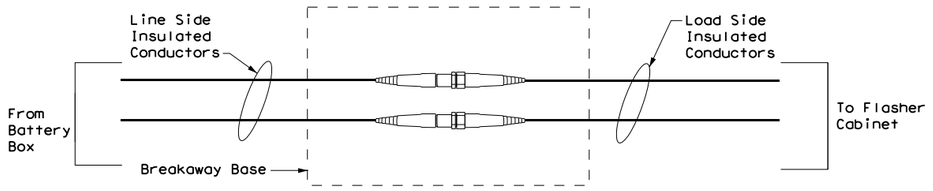
DETAIL A



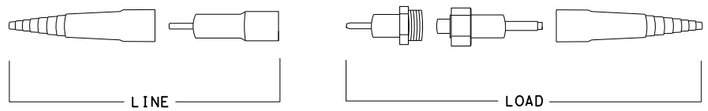
DETAIL B



DETAIL C



NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS



NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS EXPLODED VIEW

Texas Department of Transportation — Traffic Operations Division Standard

SOLAR POWERED ROADSIDE FLASHING BEACON ASSEMBLY DETAILS (ALUMINUM)

SPRFBA(3)-13

FILE: spb3-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0326	01	066	SH 286
12-04	DIST	COUNTY		SHEET NO.
3-13	CRP	NUECES		111

DATE:
FILE:

75C

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DATE:
FILE:

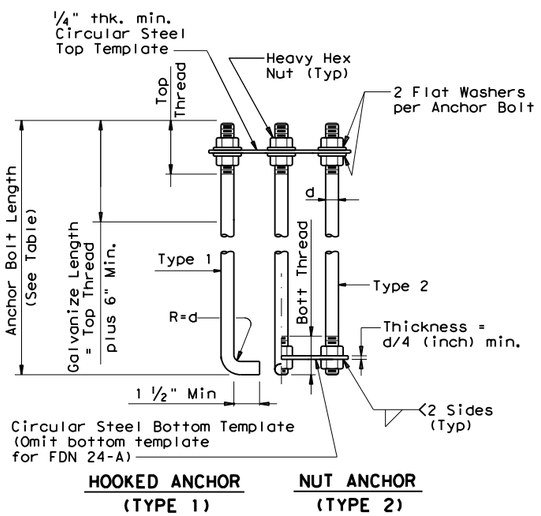
FOUNDATION DESIGN TABLE

FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		EMBEDDED DRILLED SHAFT LENGTH-ft ④, ⑤, ⑥			ANCHOR BOLT DESIGN ①				FOUNDATION DESIGN LOAD ②		TYPICAL APPLICATION
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N blows/ft 10	15	40	ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips	
24-A	24"	4- #5	#2 at 12"	5.7	5.3	4.5	¾"	36	12 ¾"	1	10	1	Pedestal pole, pedestal mounted controller.
30-A	30"	8- #9	#3 at 6"	11.3	10.3	8.0	1 ½"	55	17"	2	87	3	Mast arm assembly. (see Selection Table)
36-A	36"	10- #9	#3 at 6"	13.2	12.0	9.4	1 ¾"	55	19"	2	131	5	Mast arm assembly. (see Selection Table) 30' strain pole with or without luminaire.
36-B	36"	12- #9	#3 at 6"	15.2	13.6	10.4	2"	55	21"	2	190	7	Mast arm assembly. (see Selection Table) Strain pole taller than 30' & strain pole with mast arm
42-A	42"	14- #9	#3 at 6"	17.4	15.6	11.9	2 ¼"	55	23"	2	271	9	Mast arm assembly. (see Selection Table)

FOUNDATION SELECTION TABLE FOR STANDARD MAST ARM PLUS ILSN SUPPORT ASSEMBLIES (ft)

		FDN 30-A	FDN 36-A	FDN 36-B	FDN 42-A
80 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH	32'	48'		
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	24' X 24'			
		28' X 28'			
		32' X 28'	32' X 32'		
			36' X 36'		
			40' X 36'		
			44' X 28'	44' X 36'	
100 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH		36'	44'	
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS		24' X 24'		
			28' X 28'		
			32' X 24'	32' X 32'	
				36' X 36'	
				40' x24'	40' X 36'
					44' x 36'

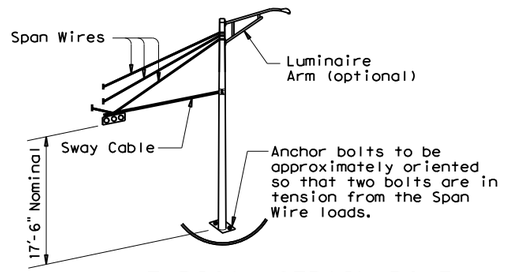
EXAMPLE:
1. For 80mph design wind speed, foundation 30-A can support up to a 32' arm with another arm up to 28'
2. For 100mph design wind speed, foundation 36-A can support a single 36' mast arm.



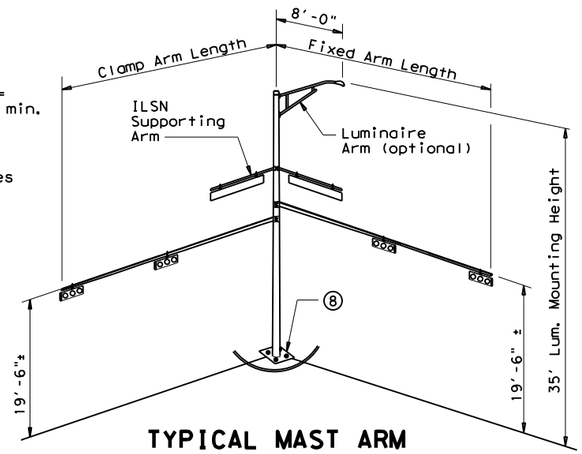
HOOKED ANCHOR (TYPE 1) NUT ANCHOR (TYPE 2)

ANCHOR BOLT ASSEMBLY

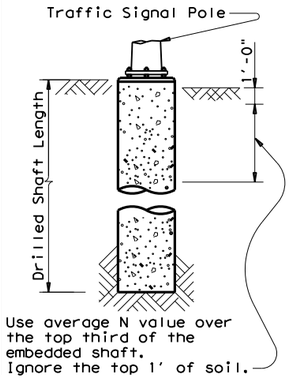
⑧ Orient anchor bolts orthogonal with the fixed arm direction to ensure that two bolts are in tension under dead load.



TYPICAL STRAIN POLE ASSEMBLY



TYPICAL MAST ARM ASSEMBLY



Use average N value over the top third of the embedded shaft. Ignore the top 1' of soil.

NOTES:

① Anchor bolt design develops the foundation capacity given under Foundation Design Loads.

② Foundation Design Loads are the allowable moments and shears at the base of the structure.

③ Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.

④ Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.

⑤ If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.

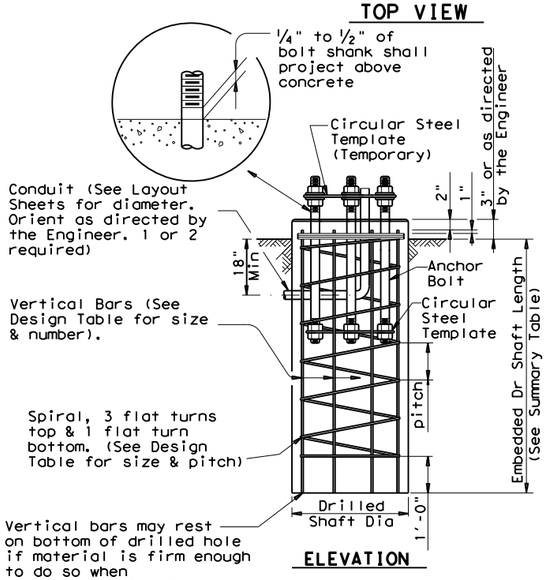
⑥ Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

ANCHOR BOLT & TEMPLATE SIZES

BOLT DIA IN.	⑦ BOLT LENGTH	TOP THREAD	BOTTOM THREAD	BOLT CIRCLE	R2	R1
¾"	1'-6"	3"	—	12 ¾"	7 ⅛"	5 ⅝"
1 ½"	3'-4"	6"	4"	17"	10"	7"
1 ¾"	3'-10"	7"	4 ½"	19"	11 ¼"	7 ¾"
2"	4'-3"	8"	5"	21"	12 ½"	8 ½"
2 ¼"	4'-9"	9"	5 ½"	23"	13 ¾"	9 ¼"

⑦ Min dimensions given, longer bolts are acceptable.

TOP VIEW



ELEVATION

FOUNDATION DETAILS

* DRILLED SHAFT LF QUANTITY IS FOR CONTRACTOR'S INFORMATION ONLY. THIS IS SUBSIDIARY TO ITEM 0687-6001.

FOUNDATION SUMMARY TABLE ③

LOCATION IDENTIFICATION	AVG. N BLOW /ft.	FDN TYPE	NO. EA	DRILLED SHAFT LENGTH ⑥ (FEET) 24-A	30-A	36-A	36-B	42-A
CORRIDOR A: SH 358 (EVERHART RD EXIT EB)								
SIGN 293,294,295	10	24-A	1	6 EACH SIGN				
CORRIDOR A: SH 358 (NAS DR EB)								
SIGN 382,383,384	10	24-A	1	6 EACH SIGN				
CORRIDOR A: SH 358 (ENNIS JOSLIN RD WB)								
SIGN 416,417,418	10	24-A	1	6 EACH SIGN				
CORRIDOR A: SH 358 (WEBER RD WB)								
SIGN 466,467,468	10	24-A	1	6 EACH SIGN				
CORRIDOR B: IH 37 (LANTANA RD SB)								
SIGN 547,548,549	10	24-A	1	6 EACH SIGN				
CORRIDOR B: IH 37 (TULOSO RD SB)								
SIGN 517,518,519	10	24-A	1	6 EACH SIGN				
CORRIDOR B: IH 37 (VALERO WAY NB)								
SIGN 481,482,483	10	24-A	1	6 EACH SIGN				
CORRIDOR B: IH 37 (RAND MORGAN RD NB)								
SIGN 503,504,505	10	24-A	1	6 EACH SIGN				
CORRIDOR C: SH 286 (MORGAN AVE SB)								
SIGN 283,284,285	10	24-A	1	6 EACH SIGN				
CORRIDOR C: SH 286 (GREENWOOD DR SB)								
SIGN 503,504,505	10	24-A	1	6 EACH SIGN				
CORRIDOR C: SH 286 (GOLLIHAR RD NB)								
SIGN 270,271,272	10	24-A	1	6 EACH SIGN				
CORRIDOR C: SH 286 (AGNES ST NB)								
SIGN 278,279,280	10	24-A	1	6 EACH SIGN				
CORRIDOR D: SH 286 (HOLLY RD SB)								
SIGN 259,260,261	10	24-A	1	6 EACH SIGN				
CORRIDOR D: SH 286 (DIVIDED HIGHWAY SB)								
SIGN 266,267,268	10	24-A	1	6 EACH SIGN				
TOTAL DRILLED SHAFT LENGTHS				252*				

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and interim revisions thereto.

Reinforcing steel shall conform to Item 440, "Reinforcing Steel".

Concrete shall be Class "C".

Threads for anchor bolts and nuts shall be rolled or cut threads of 8UN series up to 2" in diameter or UNC series for all sizes. Bolts and nuts shall have Class 2A and 2B fit tolerances. Galvanized nuts shall be tapped after galvanizing.

Anchor bolts that are larger than 1" in diameter shall conform to "alloy steel" or "medium-strength mild steel" per Item 449, "Anchor Bolts". Anchor bolts that are 1" in diameter or less shall conform to ASTM A36. Galvanize a minimum of the top end thread length plus 6" for all anchor bolts unless otherwise noted. Exposed washers and exposed nuts shall be galvanized. All galvanizing shall be in accordance with Item 445, "Galvanizing".

Templates and embedded nuts need not be galvanized. Lubricate and tighten anchor bolts when erecting the structure in accordance with Item 449, "Anchor Bolts".

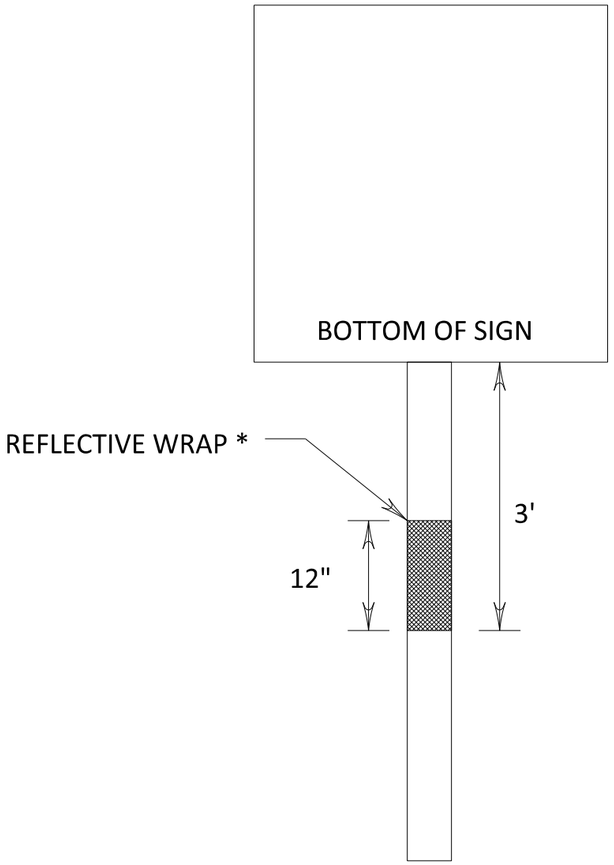
Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL POLE FOUNDATION

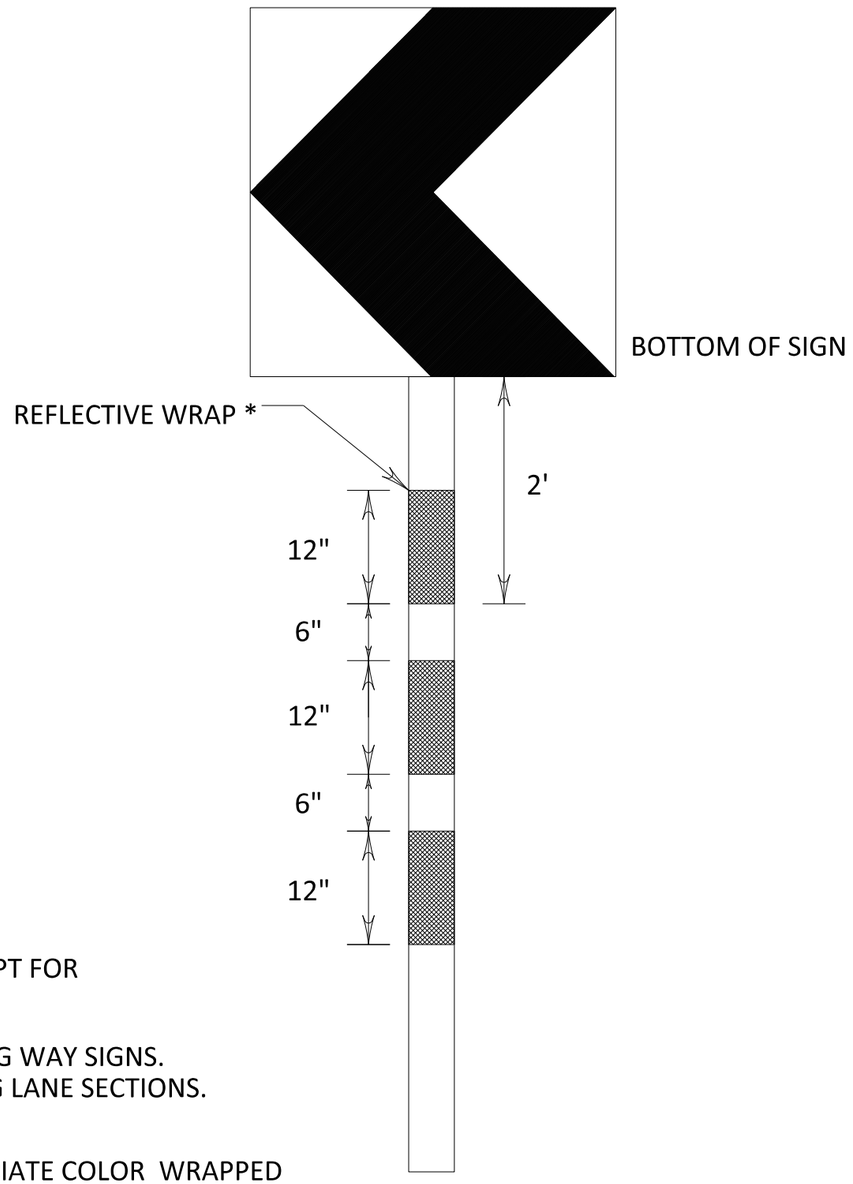
TS-FD-12

REVISIONS	DN: MS	CK: JSY	DW: MAO/MMF	CK: JSY/TEB
5-96 11-98 1-12	CONT	SECT	JOB	HIGHWAY
	0074	06	254, ETC.	IH 37, ETC.
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		112

DATE:
FILE:



W1-8



REFLECTIVE WRAP COLOR SHALL MATCH THE BACKGROUND OF THE SIGN, EXCEPT FOR STOP AND YIELD SIGNS, WHICH WILL BE RED.

APPLY WRAP TO ALL WARNING SIGNS, STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS. ADDITIONALLY, APPLY WRAP TO THE W9-1R AND W9-2TL SIGNS IN THE PASSING LANE SECTIONS. PLEASE DIRECT ANY QUESTIONS REGARDING THE WRAPS TO THE ENGINEER.

WRAP WILL CONSIST OF A 12" STRIP OF REFLECTIVE MATERIAL OF THE APPROPRIATE COLOR WRAPPED AROUND THE SIGN POST SO THAT THE BOTTOM OF THE STRIP IS POSITIONED 3 FEET FROM THE BOTTOM OF THE SIGN. THE BOTTOM OF THE STRIP WILL BE POSITION 2 FEET FROM THE BOTTOM OF THE SIGN FOR CHEVRON SIGNS (W1-8 SIGNS)

WRAPS WILL BE FURNISHED BY THE CONTRACTOR AND SHALL BE SUBSIDIARY TO ITEM 644.

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

CORPUS CHRISTI DISTRICT REFLECTIVE WRAP DETAIL

FILE:	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT July 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC.	IH 37, ETC.
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		113

DATE:
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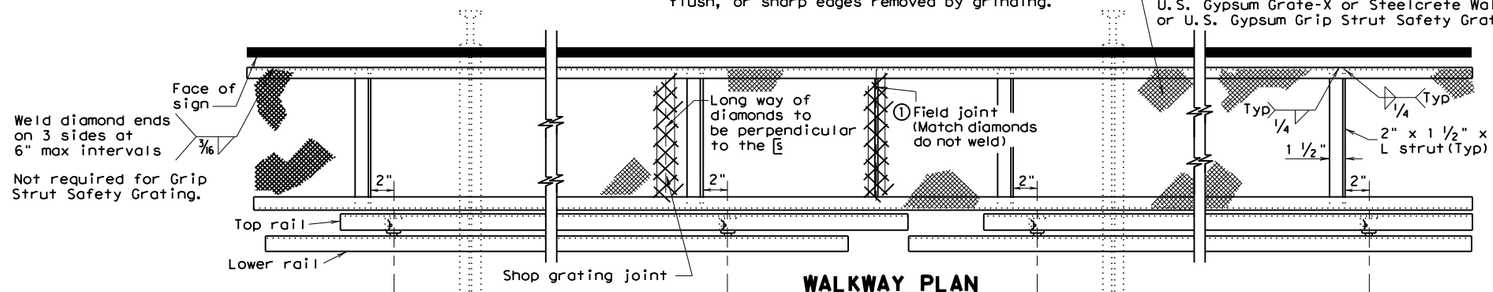
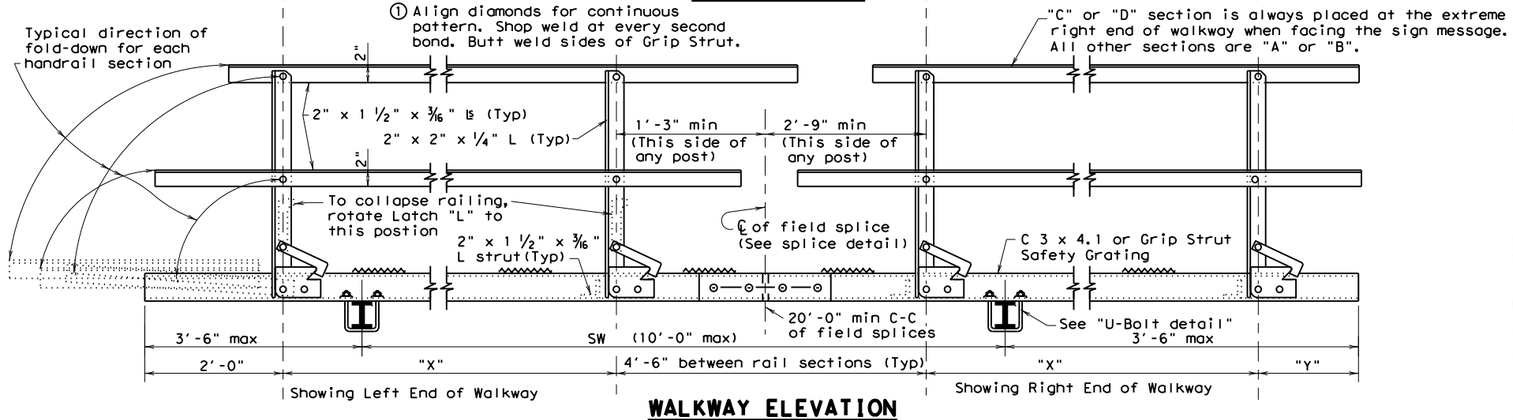


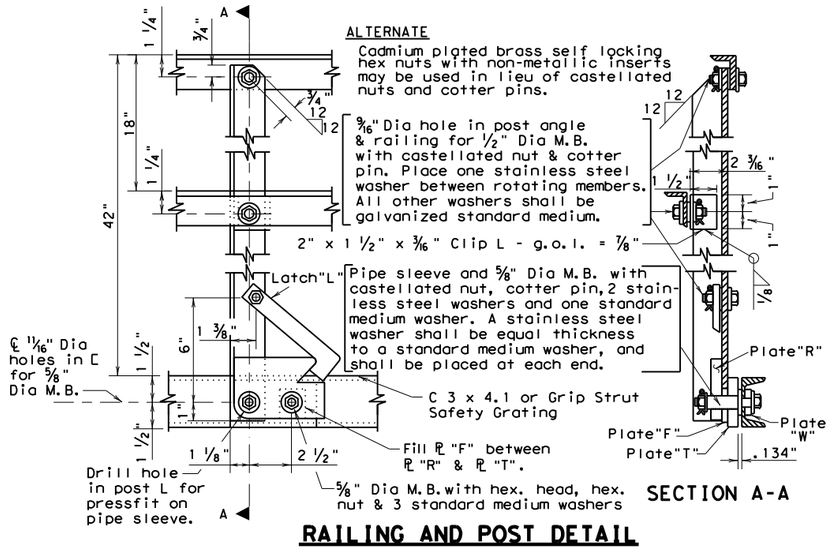
WALKWAY PLAN



WALKWAY ELEVATION

10'-0" Maximum spacing for Walkway, Lights and Sign Support Bracket spacing, see sheets SL(MV), and SMD(2-4)EXTRUDED ALUMINUM for other limitations to spacing.

Note: Eliminate C 3 x 4.1 when Grip Strut Safety Grating is used. All other details and materials apply unless otherwise noted.



RAILING AND POST DETAIL

After erection, adjust all castellated nuts to remove only excess play in rotation parts then lock in position with cotter pins. Adjust nut on latch "L" for free latch operation.

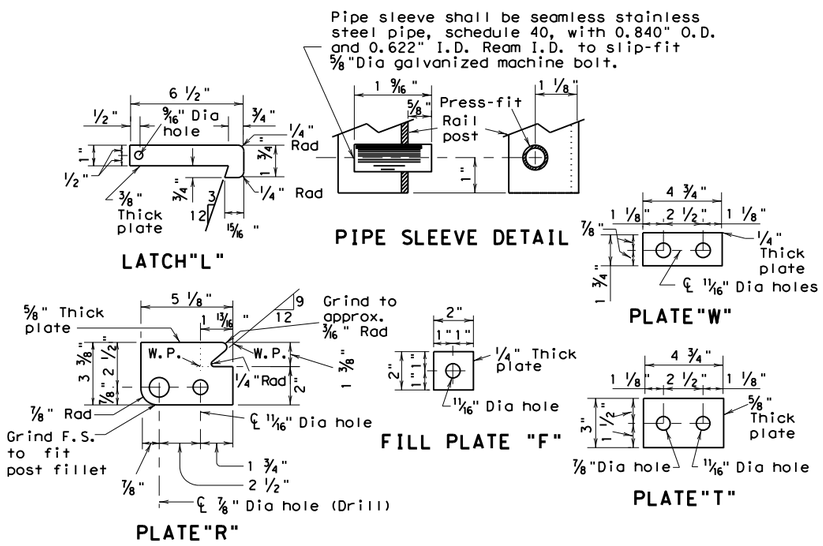


PLATE AND MISCELLANEOUS DETAILS

GENERAL NOTES

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and Interim revisions thereto.

Materials, fabrication, construction and erection shall conform to Item 654, "Sign Walkways" and with details, dimensions, and weld procedures shown herein.

Structural steel shall conform with ASTM A36. Bolts shall have hexagon heads and nuts and conform with ASTM A307. Stainless steel pipe bushings shall conform with ASTM A312 Grade TP304. Stainless steel washers shall conform with ASTM A167 Type 302B. All parts, except stainless steel shall be galvanized after fabrication per Item 445, "Galvanizing".

The stainless steel bushings shall be pressed in the rail posts after posts are galvanized.

The walkway and railing shall be shop assembled to check fabrication.

SHEET 1 OF 2

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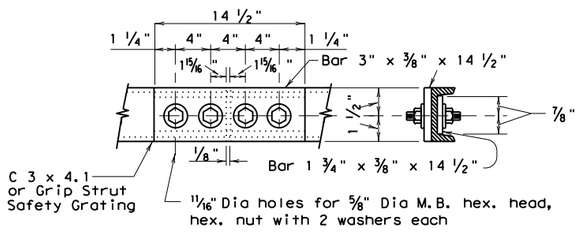
SIGN WALKWAY AND HANDRAIL

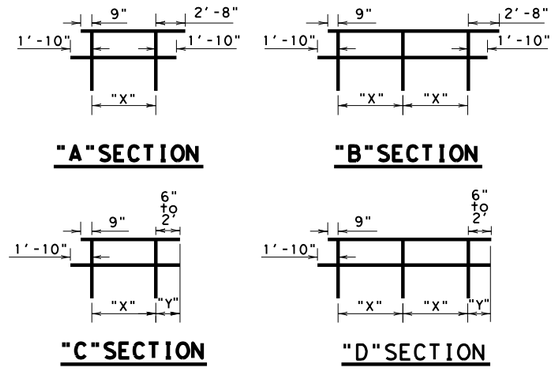
SWW(1)-14

FILE: sww1-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254,ETC.	IH 37, ETC.
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		114



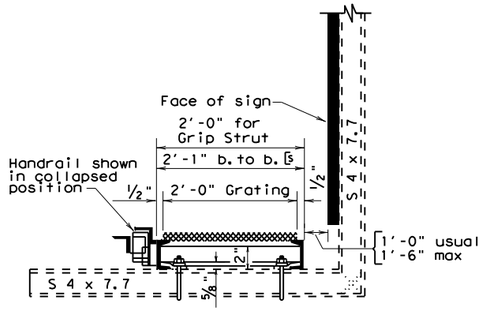
FIELD SPLICE DETAIL

(See WALKWAY ELEVATION for location; sheet 1 of 2)

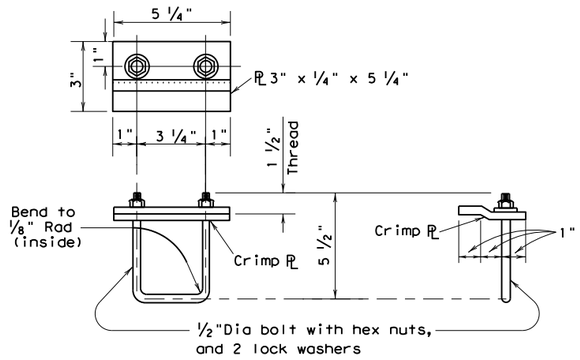


"X"dimension = 8'-0" max. See table for min dimension "X".
"X"shall be the same for all sections in any one walkway.
"Y"dimension = 6" usual,but variable between 6" and 2'-0" to obtain maximum dimension for "X" in even inches.

TYPES OF HANDRAIL SECTION



END VIEW OF WALKWAY



U-BOLT AND CLAMP DETAIL

WALKWAY LENGTH	MINIMUM "X" DIMENSION	REQUIRED NO. OF SECTIONS			
		"A"	"B"	"C"	"D"
7'-6" to 12'-0"	1 at 5'-0"	~	~	1	~
12'-6" to 20'-0"	2 at 5'-0"	~	~	~	1
20'-6" to 24'-6"	2 at 6'-9"	1	~	1	~
25'-0" to 32'-6"	3 at 6'-0"	~	1	1	~
33'-0" to 40'-6"	4 at 6'-6"	~	1	~	1
41'-0" to 45'-0"	4 at 7'-4 ½"	1	1	1	~
45'-6" to 53'-0"	5 at 6'-9"	~	2	1	~
53'-6" to 61'-0"	6 at 7'-0"	~	2	~	1
61'-6" to 73'-6"	7 at 6'-6"	~	3	1	~
74'-0" to 81'-6"	8 at 7'-3"	~	3	~	1
82'-0" to 94'-0"	9 at 6'-10"	~	4	1	~
94'-6" to 102'-0"	10 at 7'-4"	~	4	~	1
102'-6" to 114'-6"	11 at 7'-0"	~	5	1	~
115'-0" to 122'-6"	12 at 7'-6"	~	5	~	1

Texas Department of Transportation

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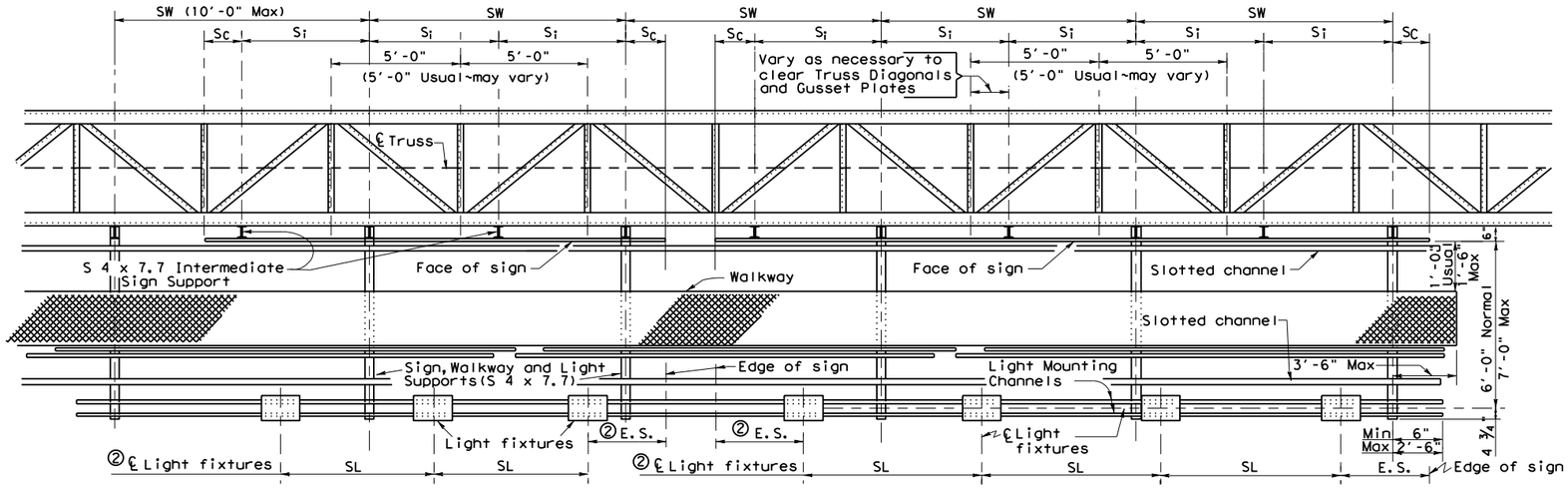
SIGN WALKWAY AND HANDRAIL

SWW(1)-14

FILE: sww1-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC.	IH 37, ETC.
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		115

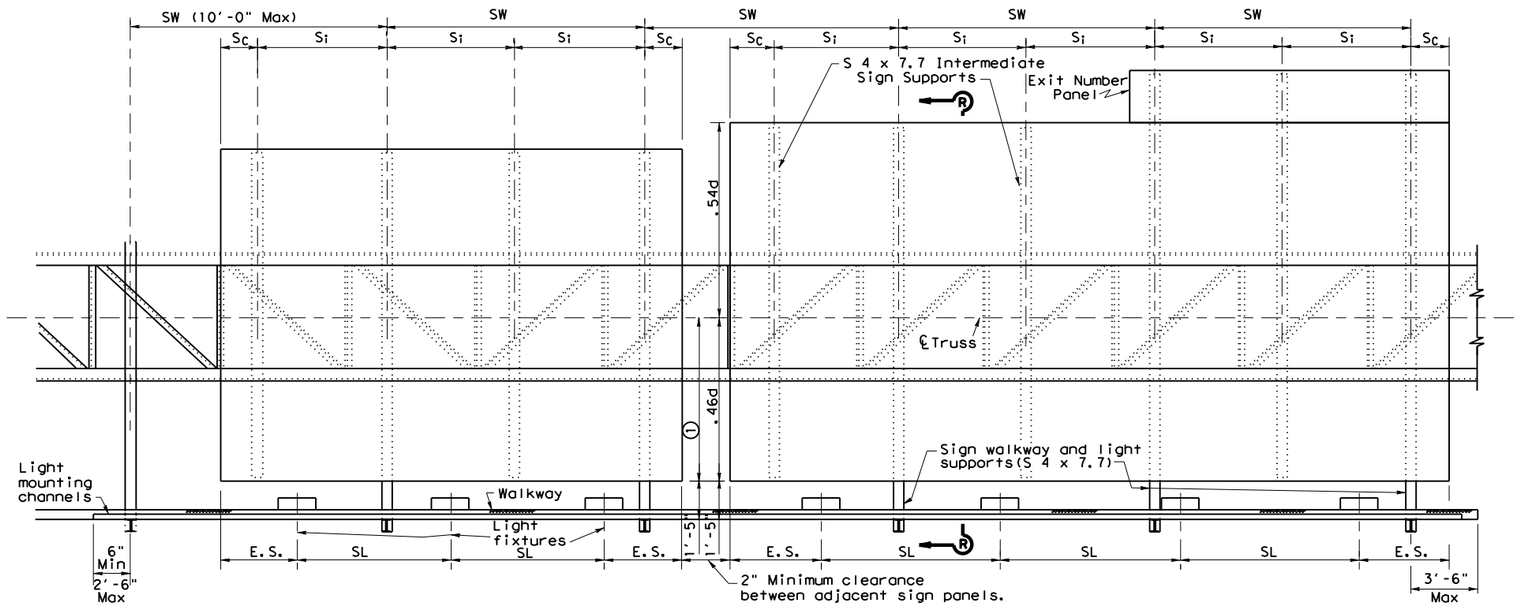
DATE:
FILE:

DATE:
FILE:



Sc=6" Min and .25 Si Max
② See SL(MV) for light fixture spacing.

PART PLAN
(Showing Truss, Signs, Walkways and Lights)

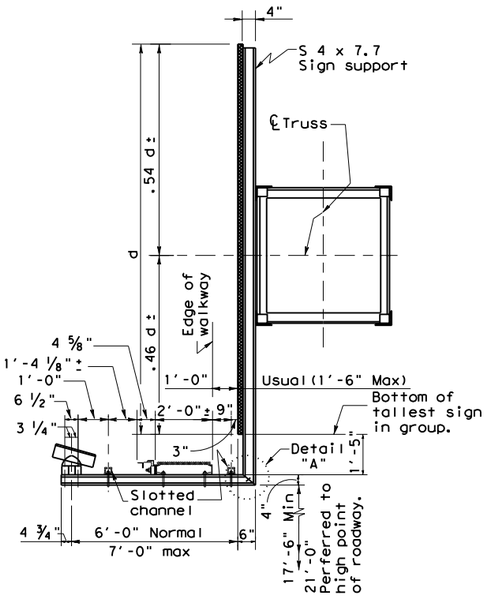


PART ELEVATION

① Where signs of different depths are used, the bottom edge of all signs may be placed in line. Where this is done, all signs should be so positioned that the bottom edges are approximately 0.46 of the depth of the deepest sign below the ℄ of the truss. When signs are spaced thus, Si is determined by the deepest sign.

See sheet SL(MV) for Lighting Details & Spa. S.L. & E.S.
See sheet SWW(1) for Walkway Details.
See sheet SMD(2-4) for Extruded Aluminum Sign Details & Max. Spa. for Si.
Sc = 6" min, .25 Si max.

Note: Exit Number Panel may be supported by sign support brackets as shown hereon, or may be supported as shown on sheet SMD(2-4). Regardless of method used spacing of supports shall not exceed Si.



SECTION R-R

SHEET 1 OF 2

Texas Department of Transportation

Traffic Operations Division Standard

SUPPORT BRACKETS FOR SIGNS, WALKWAYS & LIGHTS

SB(SWL-1)-14

FILE: swl-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2014	CONT	SECT	JOB	HIGHWAY
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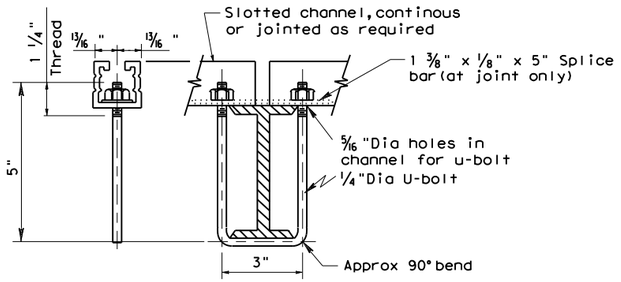
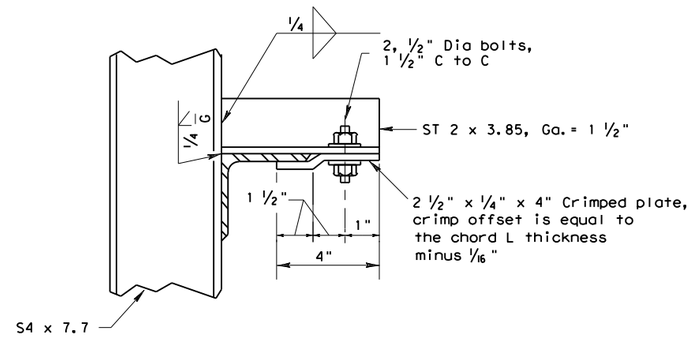
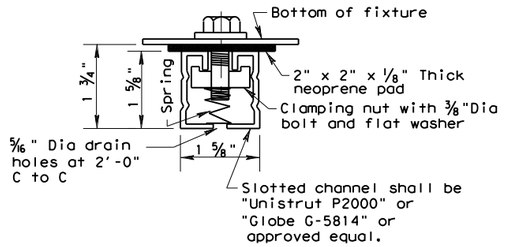


SECTION A-A

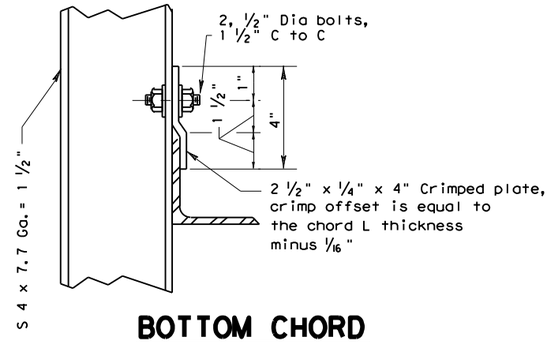


TOP CHORD



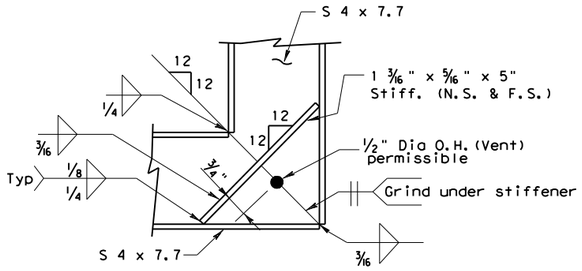
TYPICAL SLOTTED CHANNEL

CONNECTED TO
LIGHTING FIXTURE



BOTTOM CHORD

SUPPORT TO TRUSS CONNECTION



DETAIL "A"

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and Interim revisions thereto.

Materials, fabrication, construction and erection shall conform to Item 654, "Sign Walkways" and with details, dimensions, and weld procedures shown herein. Structural steel shall conform with ASTM A36 unless noted otherwise.

Bolts shall have hexagon heads and nuts and conform with ASTM A307.

All parts shall be galvanized after fabrication per Item 445, "Galvanizing".

Texas Department of Transportation

Traffic Operations Division Standard

SUPPORT BRACKETS FOR SIGNS, WALKWAYS & LIGHTS

SB(SWL-1)-14

FILE: swl-14.DGN	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC.	IH 37, ETC.
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		117

DATE:
FILE:

GENERAL NOTES FOR ALL ELECTRICAL WORK

1. The location of all conduits, junction boxes, ground boxes, and electrical services is diagrammatic and may be shifted to accommodate field conditions.

2. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC), TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA), and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association (CSA), Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Where reference is made to NEMA listed devices, International Electrotechnical Commission (IEC) listed devices will not be considered an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection. Replace or reinstall rejected material or equipment at no additional cost to the Department.

3. Miscellaneous nuts, bolts and hardware, except for high strength bolts, may be stainless steel when plans specify galvanized, provided the bolt size is ½ in. or less in diameter.

4. Provide the following test equipment as required by the Engineer to confirm compliance with the contract and the NEC: voltmeter, ammeter, megohm meter (1000 volt DC), ground resistance tester, torque wrenches, and torque screwdrivers. Ensure all equipment has been properly calibrated within the last year. Provide calibration certification to the Engineer upon request. Operate test equipment during inspection as requested by the Engineer.

5. Install grounding as shown on the plans and in accordance with the NEC. Ensure all metallic conduits; metal poles; luminaires; and metal enclosures are bonded to the equipment grounding conductor. Provide stranded bare copper or green insulated grounding conductors. Ground rods, connectors, and bonding jumpers are subsidiary to the various bid items.

6. When required by the Engineer, notify the Department in writing of materials from the Material Producers List (MPL) intended for use on each project. Prequalified materials are listed on the MPL on TxDOT's website under "Roadway Illumination and Electrical Supplies." No substitutions will be allowed for materials on this list.

CONDUIT

A. MATERIALS

1. Provide conduit, junction boxes, fittings, and hardware as per TxDOT Departmental Material Specification (DMS) 11030 "Conduit" and Item 618 "Conduit" of TxDOT's "Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges," latest edition. Provide conduits listed under Item 618 on the MPL under "Roadway Illumination and Electrical Supplies." Provide conduit types according to the descriptive code or as shown on the plans. Do not substitute other types of conduits for those shown. Provide liquidtight flexible metal conduit (LFMC) when flexible conduit is called for on galvanized steel rigid metallic conduit (RMC) systems. Provide liquidtight flexible nonmetallic conduit (LFNC) when flexible conduit is called for on polyvinyl chloride (PVC) systems.

2. Provide galvanized steel RMC for all exposed conduits, unless otherwise shown on the plans. Properly bond all metal conduits.

3. Unless otherwise shown on the plans, provide junction boxes with a minimum size as shown in the following table, which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes is present, count the conductors as if all are of the larger size. For situations not applicable to the table, size junction boxes in accordance with NEC.

AWG	3 CONDUCTORS	5 CONDUCTORS	7 CONDUCTORS
#1	10" x 10" x 4"	12" x 12" x 4"	16" x 16" x 4"
#2	8" x 8" x 4"	10" x 10" x 4"	12" x 12" x 4"
#4	8" x 8" x 4"	10" x 10" x 4"	10" x 10" x 4"
#6	8" x 8" x 4"	8" x 8" x 4"	10" x 10" x 4"
#8	8" x 8" x 4"	8" x 8" x 4"	8" x 8" x 4"

4. Junction boxes with an internal volume of less than 100 cu. in. and supported by entering raceways must have threaded entries or hubs identified for the intended purpose and supported by connection of two or more rigid metal conduits. Secure conduit within 3 ft. of the enclosure or within 18 in. of the enclosure if all conduit entries are on the same side. Mechanically secure all junction boxes with an internal volume greater than 100 cu. inches.

5. Provide hot dipped galvanized cast iron or sand cast aluminum outlet boxes for junction boxes containing only 10 AWG or 12 AWG conductors. Do not use die cast aluminum boxes. Size outlet boxes according to the NEC.

6. Do not use intermediate metal conduit (IMC) or electrical metallic tubing (EMT) unless specifically required by the plan sheets. When EMT is called for, provide junction boxes made from galvanized steel sheeting, listed and approved for outdoor use, unless otherwise noted on the plans. Size all galvanized steel junction boxes in accordance with the NEC. Provide junction boxes for IMC conduit systems that meet the same requirements for junction boxes used with RMC systems.

7. Provide PVC junction boxes intended for outdoor use on PVC conduit systems, unless otherwise noted on the plans.

8. Provide PVC elbows in PVC conduit systems, unless otherwise shown on the plans. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the PVC conduit system. When galvanized steel RMC elbows are specifically called for in the plans and any portion of the RMC elbow is buried less than 18 in., ground the RMC elbow by means of a grounding bushing on a rigid metal extension. Grounding of the rigid metal elbow is not required if the entire RMC elbow is encased in a minimum of 2 in. of concrete. PVC extensions are allowed on these concrete encased rigid metal elbows. RMC or PVC elbows are subsidiary to various bid items.

9. When required, provide High-Density Polyethylene (HDPE) conduit with factory installed internal conductors according to Item 622 "Duct Cable." At the Contractor's request and with approval by the Engineer, substitute HDPE conduit with no conductors for bored schedule 40 or schedule 80 PVC conduit bid under Item 618. Ensure bored HDPE substituted for PVC is schedule 40 and of the same size PVC called for in the plans. Ensure the substituted HDPE meets the requirements of Item 622, except that the conduit is supplied without factory-installed conductors. Make the transition of the HDPE conduit to PVC (or RMC elbow when required) at the bore pit. Provide conduit of the size and schedule as shown on the plans. Do not extend substituted conduit into ground boxes or foundations. Provide PVC or galvanized steel RMC elbows as called for at all ground boxes and foundations.

10. Use two-hole straps when supporting 2 in. and larger conduits. On electrical service poles, properly sized stainless steel or hot dipped galvanized one-hole standoff straps are allowed on the service riser conduit.

B. CONSTRUCTION METHODS

1. Provide and install expansion joint conduit fittings on all structure-mounted conduits at the structure's expansion joints to allow for movement of the conduit. In addition, provide and install expansion joint fittings on all continuous runs of galvanized steel RMC conduit externally exposed on structures such as bridges at maximum intervals of 150 ft. When requested by the project Engineer, supply manufacturer's specification sheet for expansion joint conduit fittings. Repair or replace expansion joint fittings that do not allow for movement at no additional cost to the Department. Provide the method of determining the amount of expansion to the Engineer upon request. Do not use LFMC or LFNC as a substitute for the required expansion conduit fittings.

2. Space all conduit supports at maximum intervals of 5 ft. Install conduit spacers when attaching metal conduit to surface of concrete structures. See "Conduit Mounting Options" on ED(2). Install conduit support within 3 ft. of all enclosures and conduit terminations.

3. Do not attach conduit supports directly to pre-stressed concrete beams except as shown specifically in the plans or as approved by the Engineer.

4. Unless otherwise shown on the plans, jack or bore conduit placed beneath existing roadways, driveways, sidewalks, or after the base or surfacing operation has begun. Backfill and compact the bore pits below the conduit per Item 476 "Jacking, Boring, or Tunneling Pipe or Box" prior to installing conduit or duct cable to prevent bending of the connections.

5. When placing conduit in the sub-grade of new roadways, backfill all trenches with excavated material unless otherwise noted on the plans. When placing conduit in the sub-base of new roadways, backfill all trenches with cement-stabilized base as per requirements of Items 110 "Excavation", 400 "Excavation and Backfill for Structures", 401 "Flowable Backfill", 402 "Trench Excavation Protection", and 403 "Temporary Special Shoring."

6. Provide and place warning tape approximately 10 in. above all trenched conduit as per Item 618.

7. During construction, temporarily cap or plug open ends of all conduit and raceways immediately after installation to prevent entry of dirt, debris and animals. Temporary caps constructed of durable duct tape are allowed. Tightly fix the tape to the conduit opening. Clean out the conduit and prove it clear in accordance with Item 618 prior to installing any conductors.

8. Ensure conduit entry into the top of any enclosure is waterproof by installing conduit sealing hubs or using boxes with threaded bosses. This includes surface mounted safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes. Grounding bushings on water tight sealing hubs are not required.

9. Fit the ends of all PVC conduit terminations with bushings or bell end fittings. Provide and install a grounding type bushing on all metal conduit terminations.

10. Install a bonding jumper from each grounding bushing to the nearest ground rod, grounding lug, or equipment grounding conductor. Ensure all bonding jumpers are the same size as the equipment grounding conductor. Bonding of conduit used as a casing under roadways for duct cable is not required, if the duct extends the full length through the casing.

11. At all electrical services, install a 6 AWG solid copper grounding electrode conductor.

12. Place conduits entering ground boxes so that the conduit openings are between 3 in. and 6 in. from the bottom of the box. See the ground box detail on sheet ED(4).

13. Seal ends of all conduits with duct seal, expandable foam, or by other methods approved by the Engineer. Seal conduit immediately after completion of conductor installation and pull tests. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a conduit sealant.

14. File smooth the cut ends of all mounting strut and conduit. Before installing, paint the field cut ends of all mounting strut and RMC (threaded or non-threaded) with zinc rich paint (94% or more zinc content) to alleviate overspray. Use zinc rich paint to touch up galvanized material as allowed under Item 445 "Galvanizing." Do not paint non-galvanized material with a zinc rich paint as an alternative for materials required to be galvanized.

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Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUITS & NOTES

ED(1)-14

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71A

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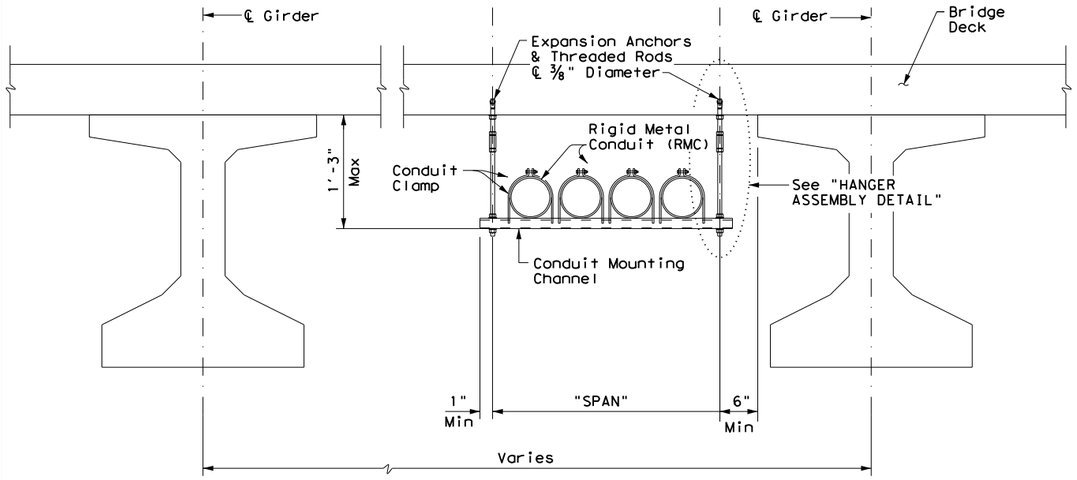
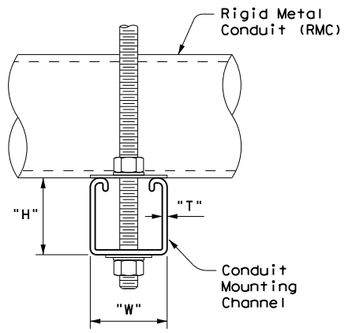
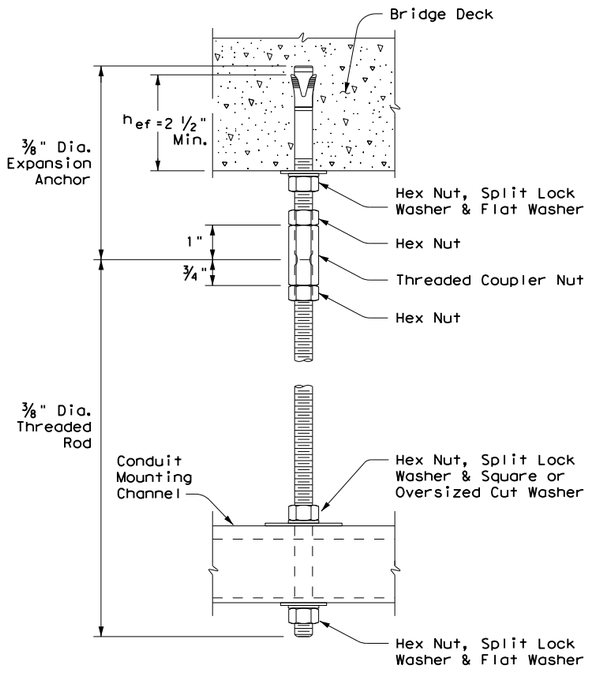


CONDUIT HANGING DETAIL

CONDUIT MOUNTING CHANNEL		
"SPAN"	"W" x "H"	"T"
less than 2'	1 5/8" x 1 3/8"	12 Ga.
2'-0" to 2'-6"	1 5/8" x 1 5/8"	12 Ga.
>2'-6" to 3'-0"	1 5/8" x 2 7/16"	12 Ga.

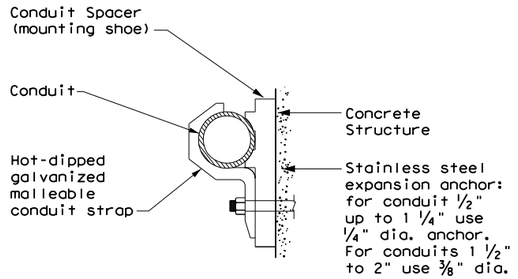
Channels with round or short slotted hole patterns are allowed, if the load carrying capacity is not reduced by more than 15%.

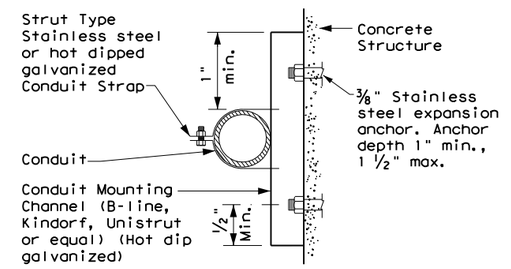




HANGER ASSEMBLY DETAIL

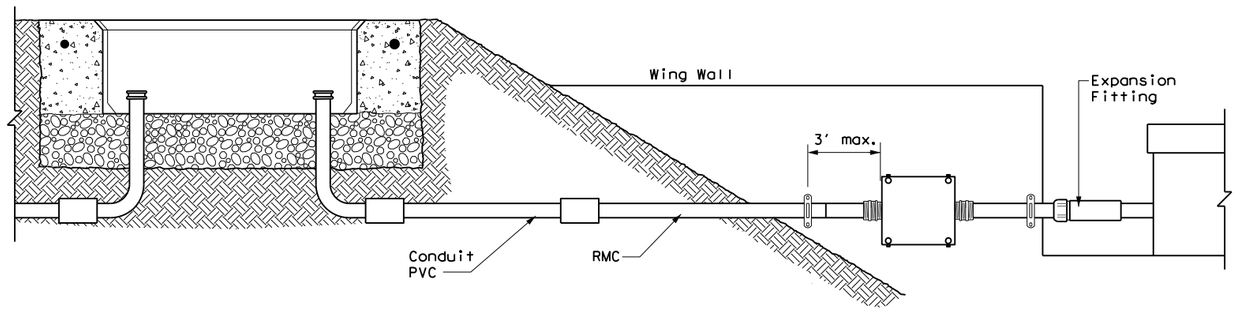
ELECTRIC CONDUIT TO BRIDGE DECK ATTACHMENT





CONDUIT MOUNTING OPTIONS

Attachment to concrete surfaces
See ED(1)B.2



TYPICAL CONDUIT ENTRY TO BRIDGE STRUCTURE DETAIL

EXPANSION ANCHOR NOTES FOR BRIDGE DECK ATTACHMENT

1. Use torque controlled mechanical expansion anchors that are approved for use in cracked concrete by the International Code Council, Evaluation Service (ICC-ES). The chosen anchor product shall have a designated ICC-ES Evaluation Report number, and its approval status shall be maintained on the ICC-ES website under Division 031600 for Concrete Anchors.

2. Unless otherwise approved by the Engineer: do not use adhesive anchors; do not use expansion anchors that are not included in the ICC-ES approval list; and do not use expansion anchors that are only approved for use in uncracked concrete.

3. Use anchors manufactured with stainless steel expansion wedges. Anchors manufactured with carbon steel expansion wedges are not allowed. Anchor bodies can be either zinc-plated carbon steel or stainless steel. For application in marine environment, both the anchor body and expansion wedge shall be stainless steel.

4. Install anchors as shown on the plans and in accordance with the anchor manufacturer's published installation instructions. Arrange a field demonstration test to evaluate the procedures and tools. The test shall be witnessed and approved by the Engineer prior to furnishing anchors on the structure.

5. Prior to hole drilling, use rebar locator to ensure clearing of existing deck strands or reinforcement. Install anchors to ensure a minimum effective embedment depth, (h_{ef}), as shown. Increase (h_{ef})as needed to ensure sufficient thread length for proper torqueing and tightening of anchors.

6. Use anchors of minimum 1600 Lbs tensile capacity (minimum of steel, concrete breakout, and concrete pullout strengths as determined by ACI 318 Appendix D) at the required minimum embedment depth (h_{ef}). No lateral loads shall be introduced after conduit installation.

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Traffic Operations Division Standard

ELECTRICAL DETAILS
CONDUIT SUPPORTS

ED(2)-14

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ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

1. Provide Type XHHW insulated conductors in accordance with Departmental Material Specification (DMS)11040 "Conductors" and Item 620 "Electrical Conductors." Provide conductors as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 620. Color code insulated conductors in conformance with the NEC. Identify grounded (neutral) conductors with white insulation. Identify grounding conductors (ground wires) with green insulation or bare conductors. Identify ungrounded (hot) conductors with any color insulation except green, white, or gray. Keep color scheme consistent throughout the wiring system. Identify conductors 6 American Wire Gauge (AWG) and smaller by continuous color jacket. Identify electrical conductors 4 AWG and larger by continuous color jacket or by colored tape. When identifying conductors with colored tape, mark at least 6 in. of the conductor's insulation with half laps of tape.

2. Provide a solid copper 6 AWG grounding electrode conductor to bond the electrical service equipment to the concrete encased grounding electrode or the ground rod at the service location. Connect the grounding electrode conductor to the ground rod with a UL listed connector in accordance with DMS 11040. Connect the grounding electrode conductor to the concrete encased grounding electrode as shown in the plans.

3. Where two or more circuits are present in one conduit or enclosure, permanently identify the conductors of each branch circuit by attaching a non-metallic tag around both circuit conductors at each accessible location. Provide tags with two straps, large enough to indicate circuit number, letter, or other identification as shown in the plans. Print circuit identification on the tag with a permanent marker.

4. Use listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors for splicing as specified in DMS 11040. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Provide UL listed gel-filled insulating splice covers. Splicing materials, insulating materials, breakaway disconnects, splice covers, and fuse holders are subsidiary to various bid items.

B. CONSTRUCTION METHODS

1. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the conduit system. After installing conductors in conduit, perform conductor pull test. If a conductor cannot be freely pulled, make any needed alterations or repairs at no additional cost to the department. Perform insulation resistance tests in accordance with Item 620. Coordinate with the Engineer to witness the tests.

2. Leave 2 ft. minimum, 3 ft. maximum length for each conductor up to the splice in ground boxes. Leave 3 ft. minimum, 4 ft. maximum length of conductor in ground boxes when pulled through with no splice. Leave 1 ft. minimum, 1.5 ft. maximum length of conductor at enclosures, weatherheads and pole bases.

3. Make splices only in junction boxes, ground boxes, pole bases, or electrical enclosures and use only listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors. Insulate splices with heavy wall heat shrink tubing or gel-filled insulating splice covers to provide a watertight splice. Overlap conductor insulation with heat shrink tubing a minimum of 2 in. past both sides of the splice. Where heat shrink tubing may not shrink sufficiently to provide a watertight seal around the individual conductors, prior to heating the tubing, increase the diameter of the conductor insulation using hot melt adhesive tape to provide a watertight seal between the individual conductors and the heat shrink tubing. Ensure the tape extends past the heat shrink tubing. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Heat shrink tubing that appears to have been burned, or overheated, is considered defective and must be replaced.

4. Size and install gel-filled insulating splice covers according to manufacturer's specifications when used in place of heat shrink tubing.

5. Wire nuts with factory applied waterproof sealant may be used for 8 AWG or smaller conductors in above ground junction boxes, but not in pole bases or ground boxes. Install wire nuts in an upright position to prevent the accumulation of water.

6. Support conductors in illumination poles with a J-hook at the top of the pole.

7. When terminating conductors, remove the insulation and jacketing material without nicking the individual strands of the conductor. Conductors with nicked individual conductor strands or removed strands will be considered damaged.

8. Replace conductors and cables that are damaged beyond repair or that fail an insulation resistance test at no additional cost to the department.

9. Do not repair damaged conductors with duct tape, electrical tape, or wire nuts. Use only approved splicing methods.

10. Do not terminate more than one conductor under a single connector, unless the connector is rated for multiple conductors. Do not exceed the pressure connector's listing for maximum number and size of conductors allowed.

11. Install breakaway connectors on conductors bid under Item 620 whenever those conductors pass through a breakaway support device. Follow manufacturer's instructions when terminating conductors to breakaway connectors. Properly torque threaded connections. Proper terminations are critical to the safe operation of breakaway devices. Trim waterproofing boots on breakaway connectors to fit snugly around the conductor to ensure waterproof connection. Only one conductor may enter a single opening in a boot. Provide waterproof boots with the correct number of openings. Leave unused openings factory sealed. Use prequalified breakaway connectors as shown on the MPL.

12. Provide and install a separate stranded equipment grounding conductor (EGC) in all conduits that contain circuit wiring of 50 volts or more. Unless shown elsewhere, size the EGC to be the same size as the largest current carrying conductor contained in the conduit. Ensure all EGCs are bonded together at every accessible location. For traffic signal installations, provide a minimum size 8 AWG EGC. The EGC is paid for under Item 620.

C. TEMPORARY WIRING

1. Install temporary conductors and electrical equipment in accordance with the NEC article "Temporary Installations" and Department standard sheets.

2. Provide a ground fault circuit interrupter (GFCI) for power outlets for portable electrical equipment, power tools, ice machines, ice storage bins and refrigerators located outdoors at grade. GFCI may be any one of the following: molded cord and plug set, receptacle, or circuit breaker type.

3. Use listed wire nuts with factory applied sealant for temporary wiring where approved.

4. Enclose conductor splices within a listed enclosure or ground box, or ensure the splices are more than 10 ft. above grade vertically and more than 5 ft. horizontally from any metal structure. Where installing temporary conductors in areas subject to vehicle traffic or mobile construction equipment, ensure the vertical clearance to ground is at least 18 ft. when measured at the lowest point. Ground messenger wires that support power conductors in conformance with the NEC.

5. Protect and when necessary repair any existing electrical conduits uncovered during the construction process in a timely manner and in conformance with the NEC.

GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

1. Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS 11040 and the plans. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets. Concrete encased grounding electrodes may be called for in specific locations including electrical service, see individual plan sheets.

B. CONSTRUCTION METHODS

1. Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil, ensure that the upper end is between 2 to 4 in. below finished grade.

2. Do not place ground rods in the same drilled hole as a timber pole.

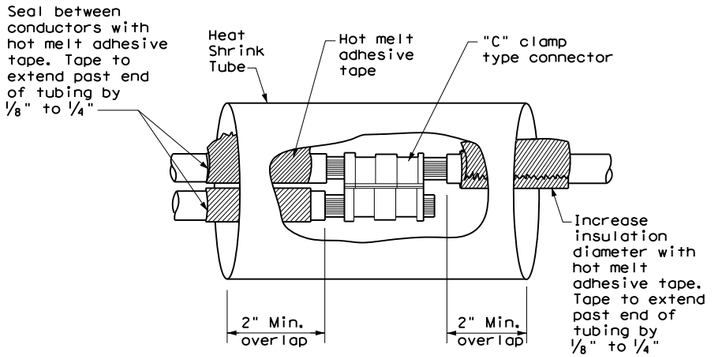
3. Install ground rods so the imprinted part number is at the upper end of the rod.

4. Remove all non-conductive coatings such as concrete splatter from the rod at the clamp location.

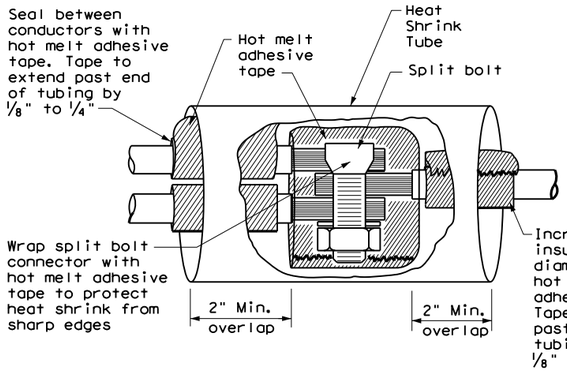
5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.

6. Unless otherwise called for in the plans, protect grounding electrode conductors with non-metallic conduit. When protecting grounding electrode conductors with metal conduit, provide and install a grounding type bushing and properly sized bonding jumper on each end of the metal conduit.

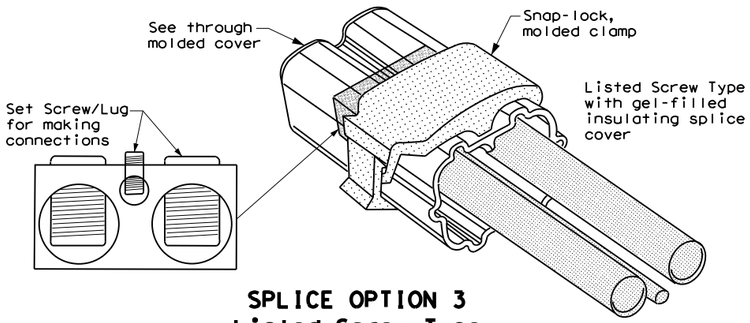
7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



SPLICE OPTION 1
Compression Type



SPLICE OPTION 2
Split Bolt Type



SPLICE OPTION 3
Listed Screw Type

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Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUCTORS

ED(3)-14

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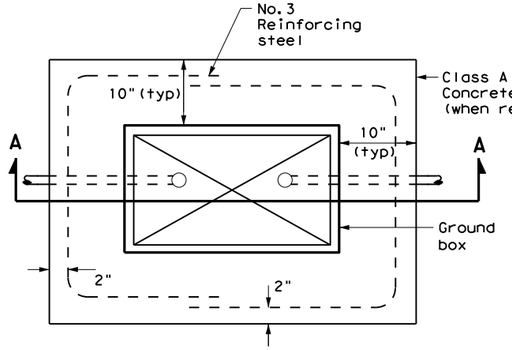
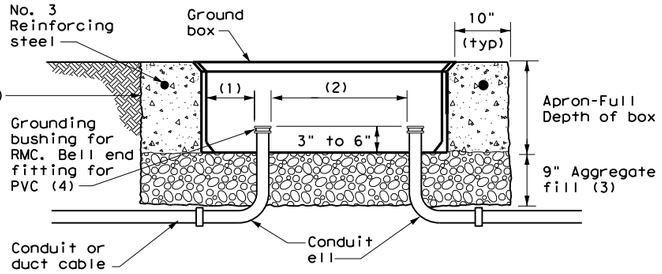


PLAN VIEW



SECTION A - A

APRON FOR GROUND BOX

(1) Uniformly space ends of conduits within the ground box. Position ends of conduits so that ground box walls do not interfere with the installation of grounding bushings or bell end fittings.

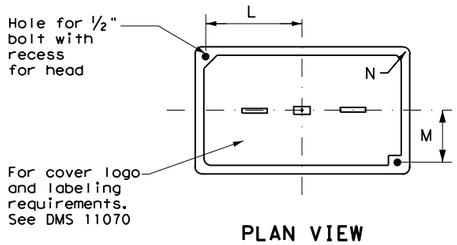
(2) Maintain sufficient space between conduits to allow for proper installation of bushing.

(3) Place aggregate under the box, not in the box. Aggregate should not encroach on the interior volume of the box.

(4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

GROUND BOX DIMENSIONS	
TYPE	OUTSIDE DIMENSIONS (INCHES) (Width x Length X Depth)
A	12 X 23 X 11
B	12 X 23 X 22
C	16 X 29 X 11
D	16 X 29 X 22
E	12 X 23 X 17

GROUND BOX COVER DIMENSIONS								
TYPE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2



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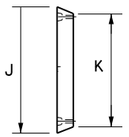

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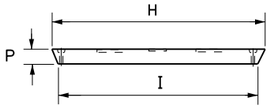

SIDE

GROUND BOX COVER

GROUND BOXES

A. MATERIALS

1. Provide polymer concrete ground boxes measuring 16x30x24 in. (WxLxD) or smaller in accordance with Departmental Material Specification (DMS) 11070 "Ground Boxes" and Item 624 "Ground Boxes."

2. Provide Type A, B, C, D, and E ground boxes as shown in the plans, and as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 624.

3. Ensure ground box cover is correctly labeled in accordance with DMS 11070.

4. Provide larger ground boxes in accordance with Item 624 and as shown in the plans.

B. CONSTRUCTION METHODS

1. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure aggregate bed is in place and at least 9 inches deep, prior to setting the ground box. Install ground box on top of aggregate.

2. Cast ground box aprons in place. Reinforcing steel may be field bent. Ensure the depth of concrete for the apron extends from finished grade to the top of the aggregate bed under the box. Ground box aprons, including concrete and reinforcing steel, are subsidiary to ground boxes when called for by descriptive code.

3. Keep bolt holes in the box clear of dirt. Bolt covers down when not working in ground boxes.

4. Install all conduits and ells in a neat and workmanlike manner. Uniformly space conduits so grounding bushings and bell end fittings can easily be installed.

5. Temporarily seal all conduits in the ground box until conductors are installed.

6. Permanently seal conduits immediately after the completion of conductor installation and pull tests. Permanently seal the ends of all conduits with duct seal, expandable foam, or other method as approved. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a sealant.

7. When a ground rod is present in a ground box, bond all equipment grounding conductors together and to the ground rod with listed connectors.

8. When a type B or D ground box is stacked to meet volume requirements, it is allowable to cut an appropriately sized hole for conduit entry in the side wall at least 18 inches below grade.

9. If an existing ground box in the contract has a metal cover, bond the cover to the equipment grounding conductor with a 3 ft. long stranded bonding jumper the same size as the grounding conductor. The bonding jumper is subsidiary to various bid items. Verify existing ground boxes with metal covers are shown on the plans, with notes fully describing the work required.

10. If other ground boxes with metal covers are within the project limits but are not part of the contract, the Engineer may direct the Contractor to bond the metal covers, identifying the specific boxes in writing. This work will be paid for separately.

11. Bond metal ground box covers to the grounding conductor with a tank ground type lug.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
GROUND BOXES

ED(4)-14

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DUCT CABLE & HDPE CONDUIT NOTES

1. Provide duct cable in accordance with Departmental Material Specification (DMS) 11060 "Duct Cable" and Item 622 "Duct Cable." Provide duct cable as listed on the Material Producer List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 622.

2. Provide High-Density Polyethylene (HDPE) conduit in accordance with DMS 11060 and Item 618, "Conduit." Provide HDPE as listed on the MPL on the Department web site under "Roadway Illumination and Electrical Supplies," Item 618.

3. Supply duct cable with a minimum 2 in. diameter, unless otherwise shown in the plans. Provide duct cable and HDPE conduit as shown by descriptive code or on the plans. Bend duct cable and HDPE conduit as recommended by the manufacturer, with a minimum bending radius of 26 in. for 2 in. duct. Follow manufacturers' recommendations when handling duct cable and HDPE conduit reels and during installation of duct cable and HDPE conduit.

4. Do not splice conductors within duct cable or HDPE conduit. Couple duct cable and HDPE entering a ground box or foundation to a PVC elbow. When galvanized steel RMC elbows are called for in the plans and any portion of the RMC elbow is buried less than 18" from possible contact, ground the RMC elbow.

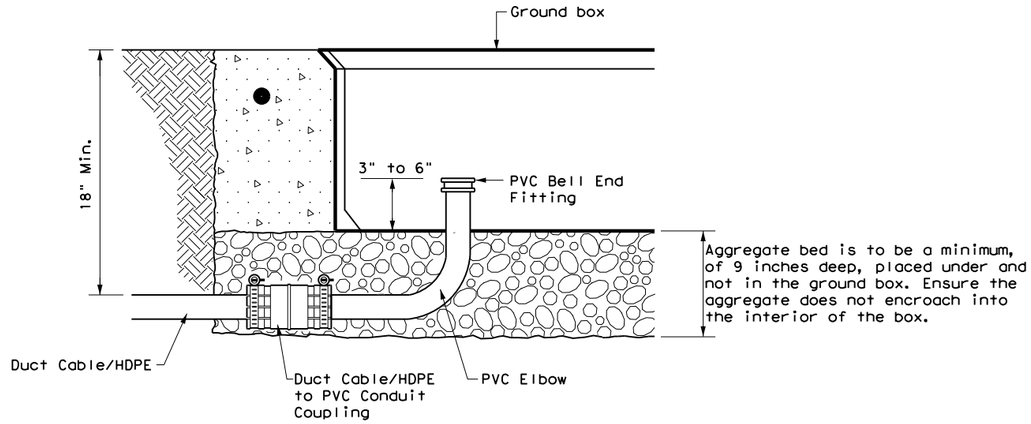
5. Furnish and install duct cable with factory installed conductors, sized as shown in the plans and as required by the National Electrical Code (NEC). The NEC contains specific requirements for duct cable in Article, "Nonmetallic Underground Conduit with Conductors: Type NUCC."

6. When conduit casing is called for in the plans, extend duct cable or HDPE conduit through the conduit casing in one continuous length without connection to the casing.

7. Seal the ends of duct cable or HDPE conduit with duct seal, expandable foam, or other approved method after completing the pull tests required by Item 622.

8. Provide minimum cover of 24 in. under roadways, 18 in. in other locations, or as shown on the plans.

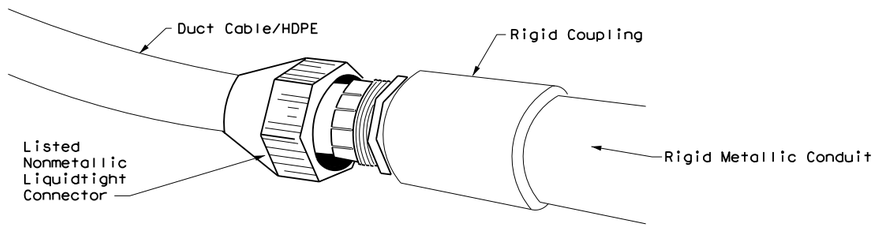
9. Furnish and install listed fittings to couple duct cable or HDPE conduit to other types of conduit. Duct cable and HDPE conduit may be field-threaded and spliced with PVC or RMC threaded couplings; connected with listed tie-wrap fittings; connected using listed coupling made of HDPE with stainless steel external banding clamps and locking rings; connected with approved electrofusion conduit couplings; or connected using an approved chemical fusion method using an epoxy or adhesive specifically designed for HDPE couplings and connectors all installed in accordance with their manufacturer's instructions. Do not use PVC glue on HDPE. Do not use water pipe fittings, or connect conduit with heat shrink tubing.



DUCT CABLE/HDPE AT GROUND BOX

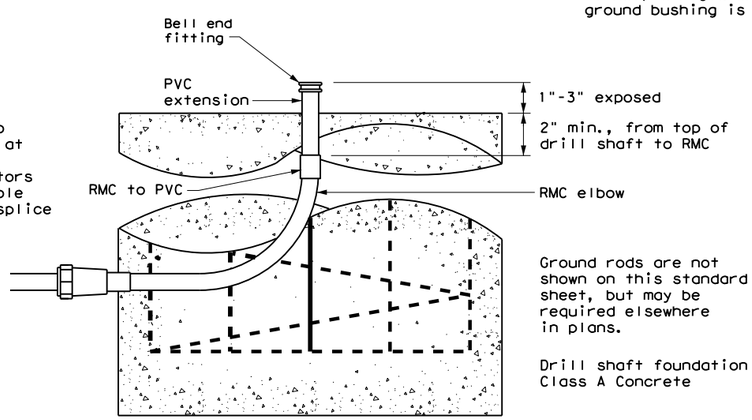
When the upper end of an RMC Ell does not enter the ground box, it may be extended with a SCH-40 PVC conduit nipple and bell end, provided there is a minimum of 18" of cover over all parts of the elbow. If not, a rigid extension and ground bushing is required.

DUCT CABLE/HDPE TO PVC

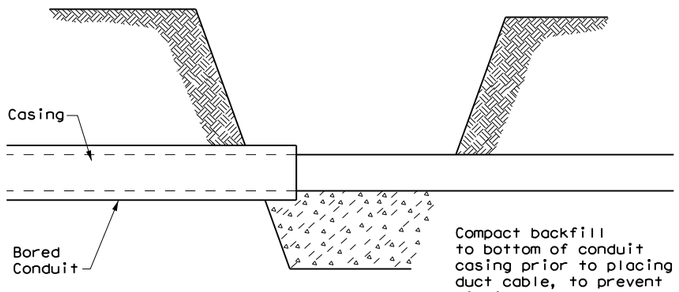


DUCT CABLE/HDPE TO RMC

Couple duct to conduit elbow at foundations. Ensure conductors extend into pole base. Do not splice conductors in conduit.



DUCT CABLE / HDPE AT FOUNDATION



BORE PIT DETAIL

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
DUCT CABLE/ HDPE CONDUIT

ED(11)-14

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REVISIONS	0074	06	254, ETC.	IH 37, ETC.
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		122

DATE:
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71L

DATE:
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BATTERY BOX GROUND BOXES NOTES

A. MATERIALS

1. Provide polymer concrete or fiberglass reinforced plastic (FRP) battery box ground box and cover in accordance with Departmental Material Specification (DMS) 11071 "Battery Box Ground Boxes." Battery box will accommodate up to 4 batteries, each measuring 8 in. x 13.5 in. x 10 in. (W x L x D). Label battery box ground box cover in accordance with DMS 11071.

2. Supply a marine grade batteries with covers. Secure the marine grade batteries with covers to the stainless steel rack in the bottom of the ground box with tie down straps.

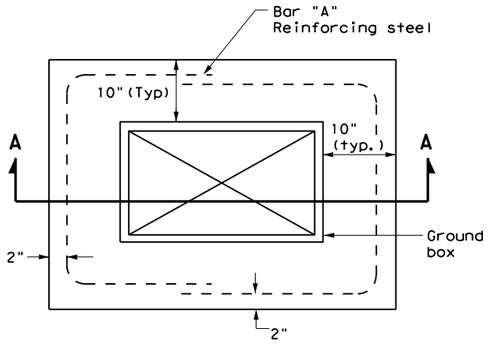
B. CONSTRUCTION METHODS

1. Ensure conduit entry will not interfere with placement of the batteries in the battery box ground box.

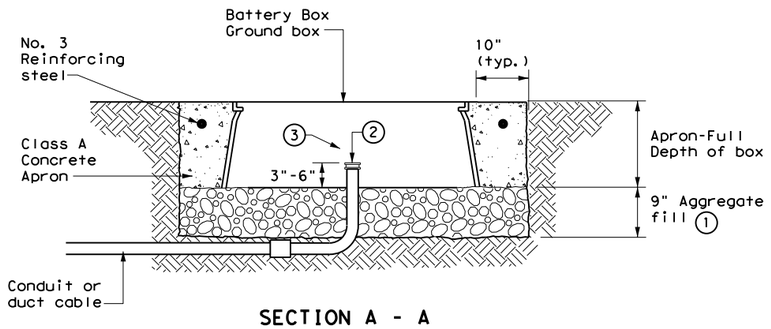
2. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting battery box ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure the aggregate bed is in place and is a minimum of 9 in. deep prior to setting the box. Install battery box ground box on top of aggregate.

3. Cast battery box aprons in place. Reinforcing steel may be field bent. Ensure the depth of concrete for the apron extends from finished grade to the top of the aggregate bed under the box. Battery box ground box aprons, including concrete and reinforcing steel, are subsidiary to battery box ground boxes when called for by descriptive code.

4. Bolt covers down when not working in battery box ground boxes. Keep bolt holes in the box clear of dirt.



PLAN VIEW



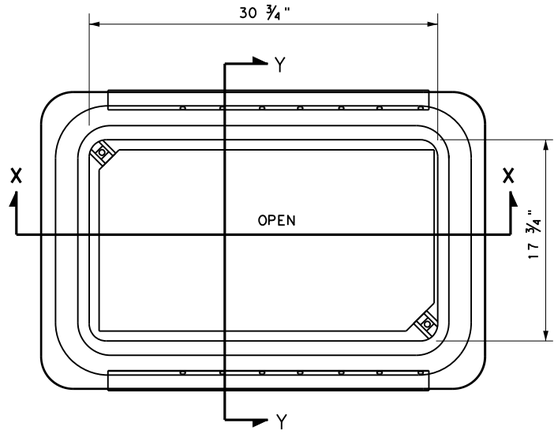
SECTION A - A

APRON FOR BATTERY BOX GROUND BOXES

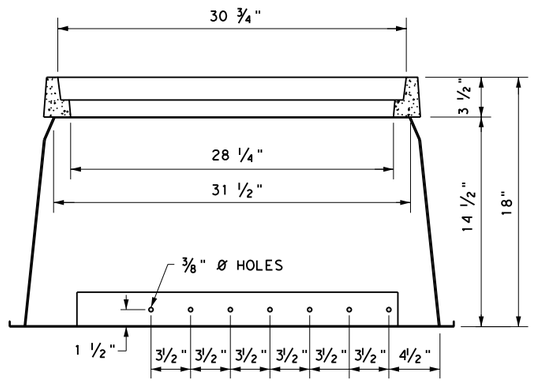
(1) Place aggregate under the box and not in the box. Aggregate should not encroach on the interior volume of the box.

(2) Install bushing or bell end fitting on the upper end of all ells.

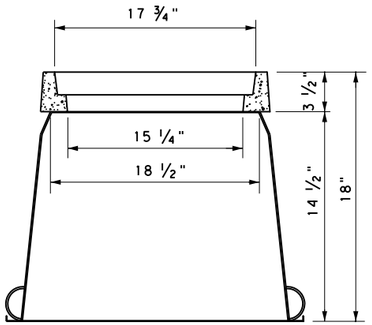
(3) Install all conduits in a neat and workmanlike manner.



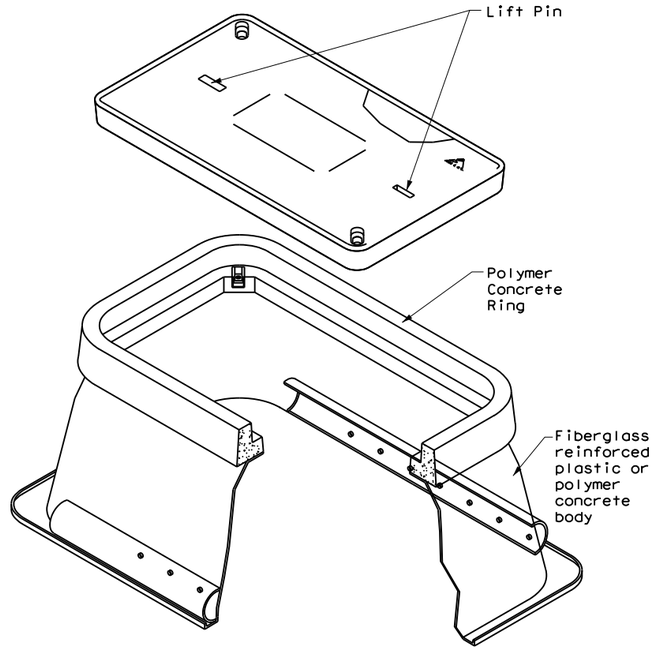
BATTERY BOX TOP VIEW



SECTION X-X



SECTION Y-Y



Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS BATTERY BOX GROUND BOXES

ED(12)-14

FILE: ed12-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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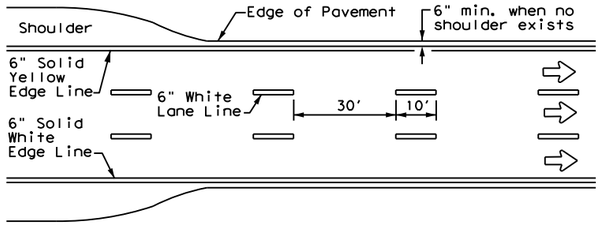
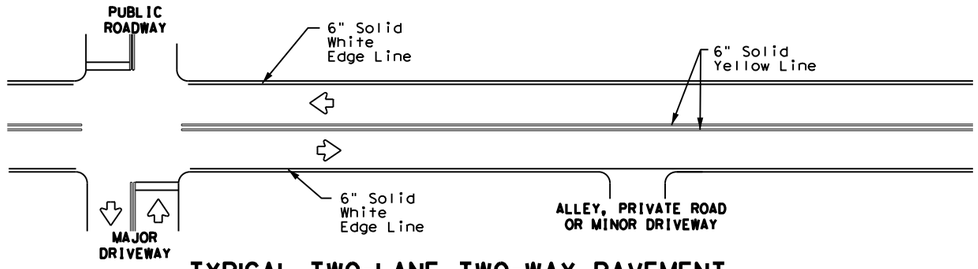
REVISIONS	0074	06	254,ETC.	IH 37, ETC.
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		123

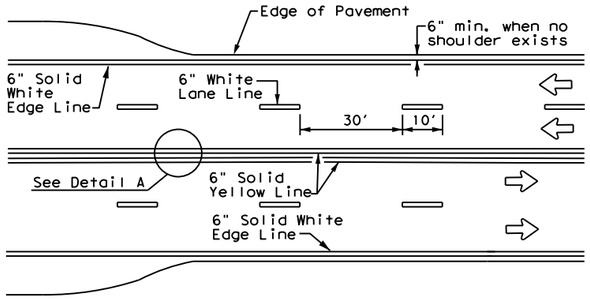
71M

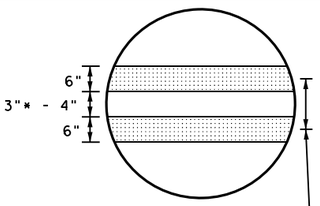


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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





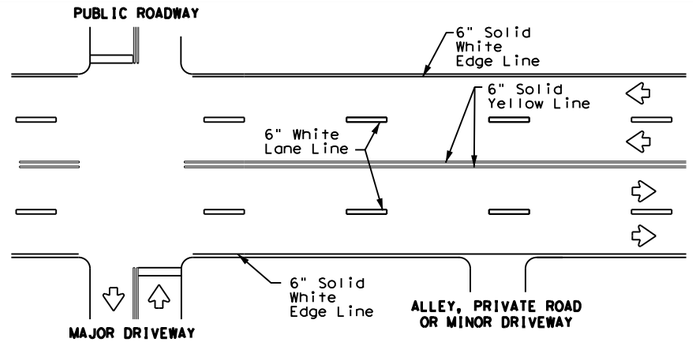
DETAIL "A"

9"** min. - 10" typ.
(18" max. for traveled way greater than 48' only)

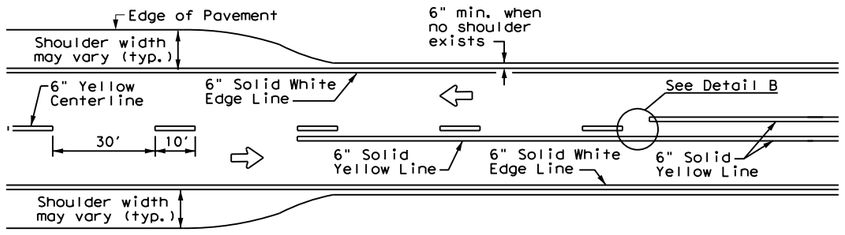
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

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

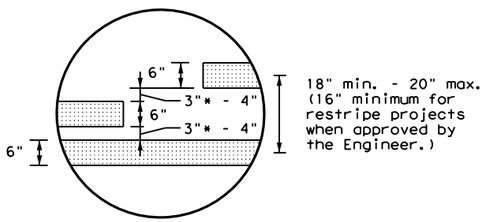
** 8" minimum for restripe projects when approved by the Engineer.



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

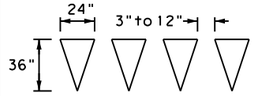


TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



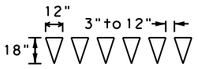
DETAIL "B"

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

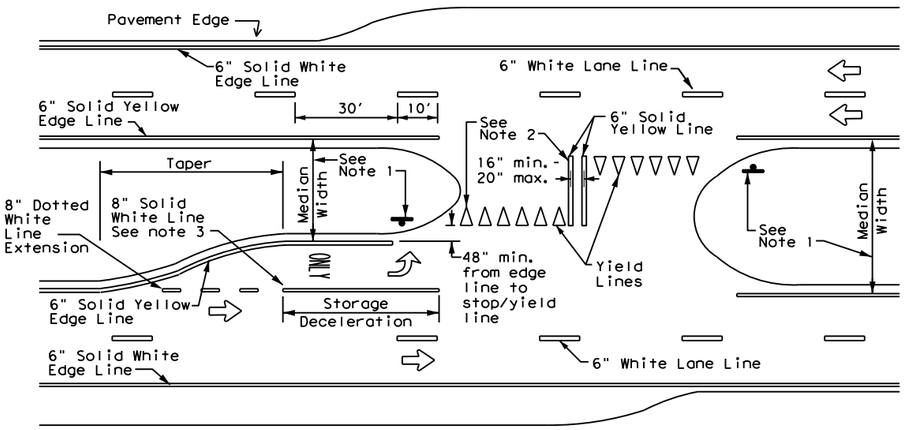


For posted speed on road being marked equal to or greater than 45 MPH.

YIELD LINES



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



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

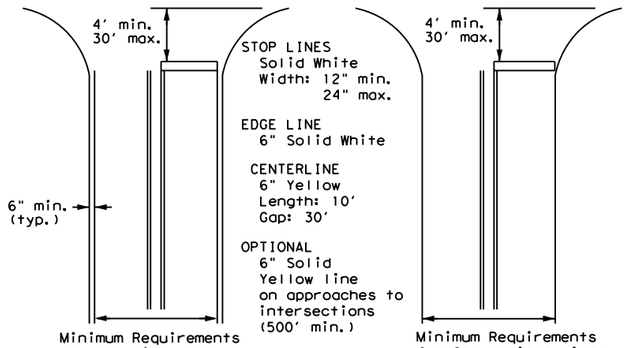
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections.
   Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling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

GENERAL NOTES

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

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

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



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

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-22

FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
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REVISIONS 11-78 8-00 6-20	0074	06	254, ETC.	IH 37, ETC.
8-95 3-03 12-22	DIST	COUNTY		SHEET NO.
5-00 2-12	CRP	NUECES		124

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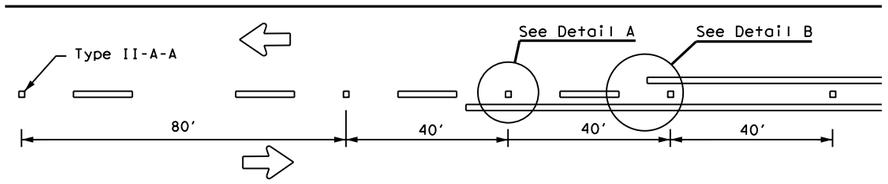
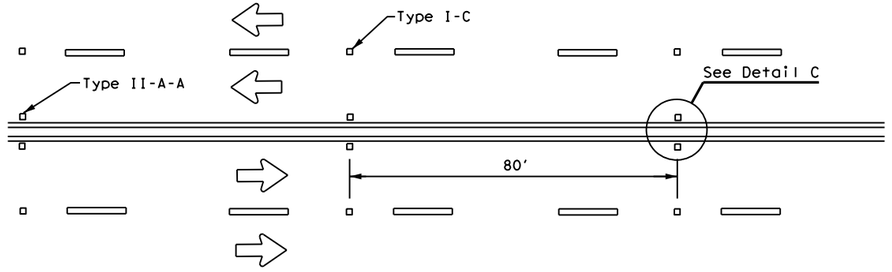
DATE:
FILE:

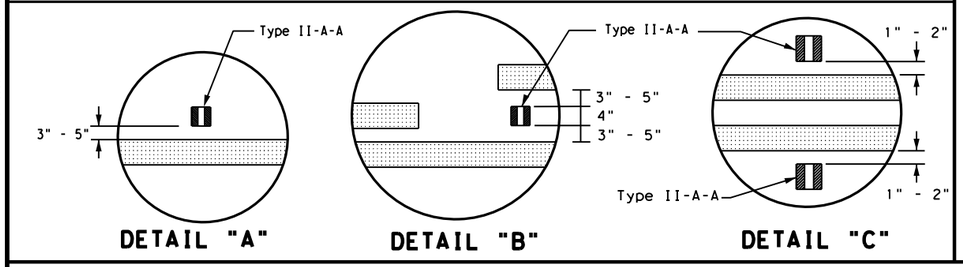
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

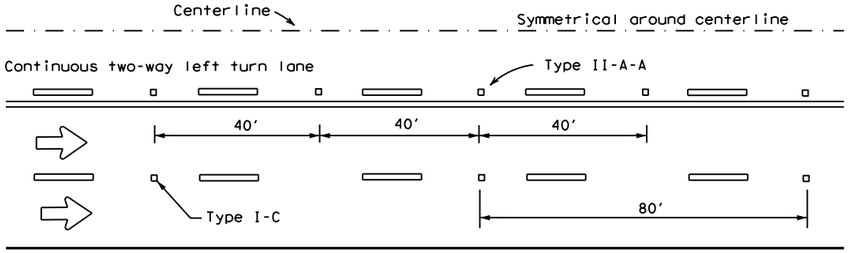


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

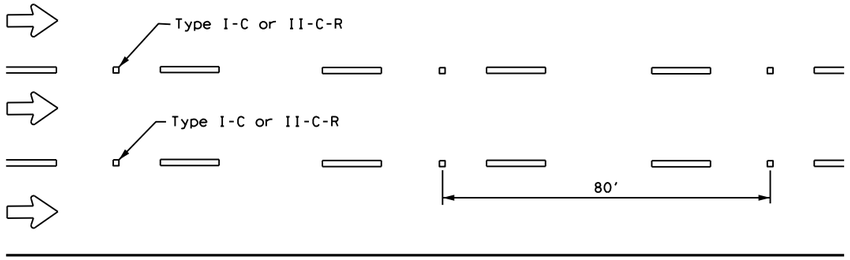


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS





CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



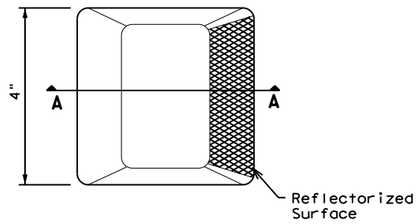
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

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

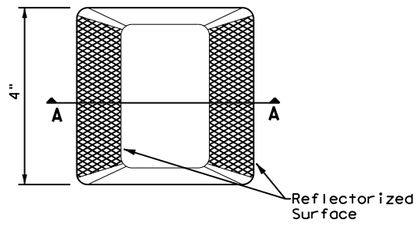
See Note 3.

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

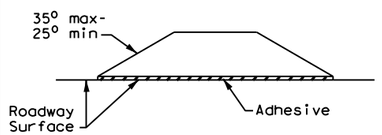
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

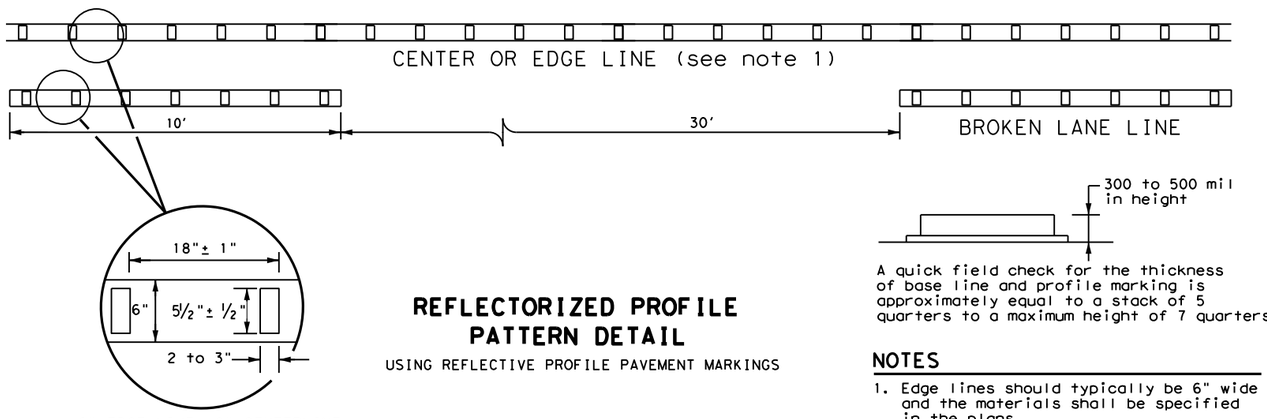


Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



6" EDGE LINE, 6" CENTERLINE OR 6" LANE LINE

REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters.

NOTES

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Safety Division Standard

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

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
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	DIST	COUNTY		SHEET NO.
	CRP	NUECES		125

22B

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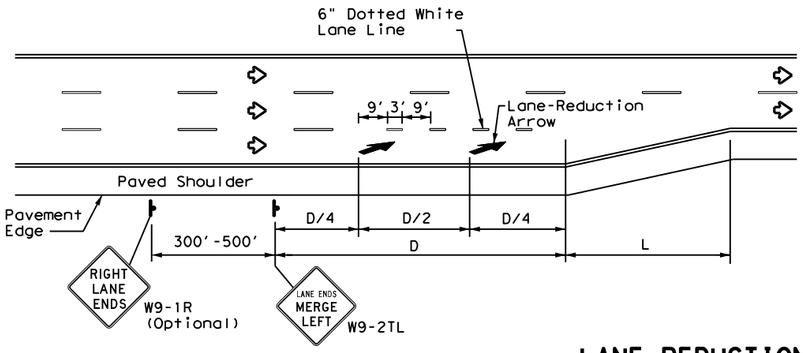
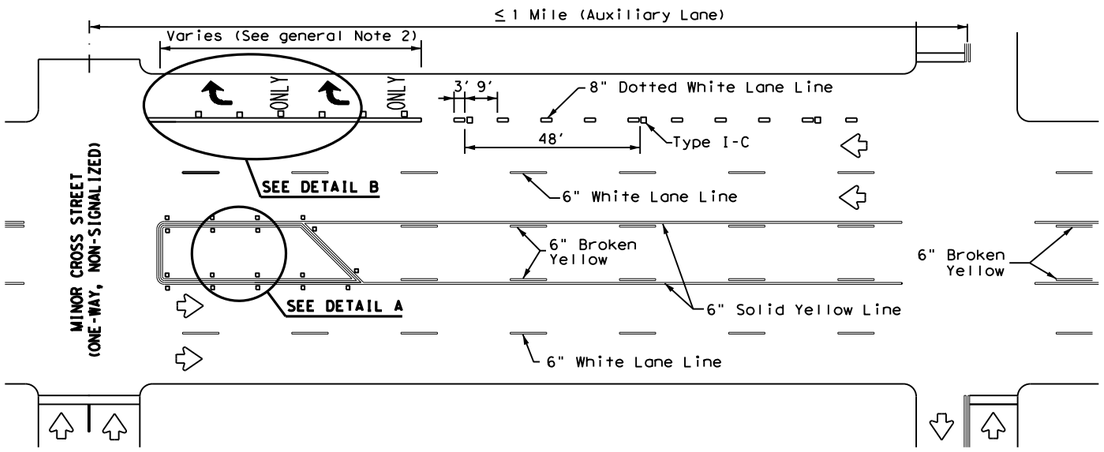


LANE REDUCTION

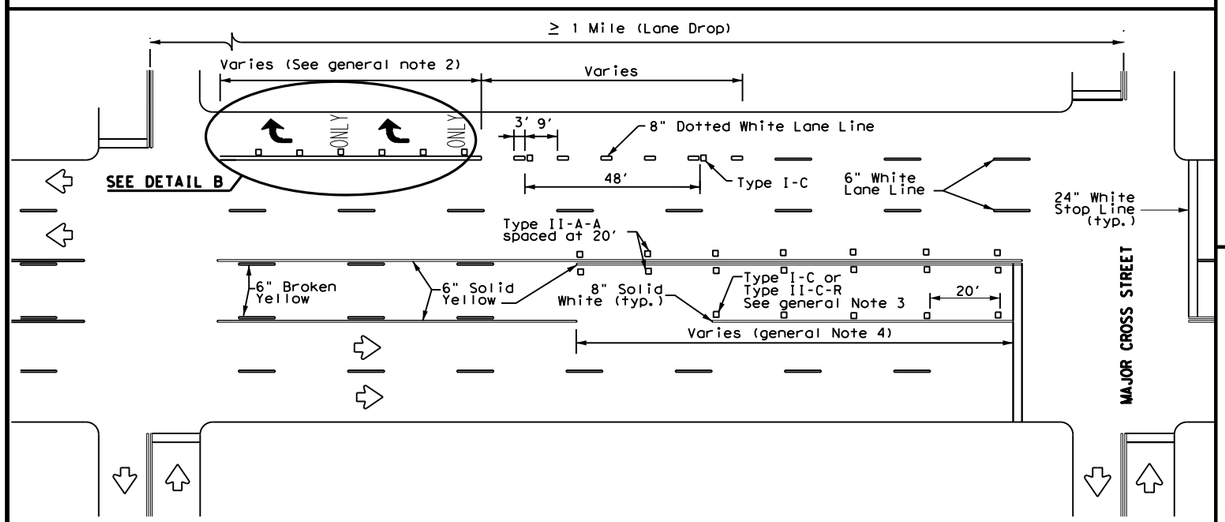
NOTES

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

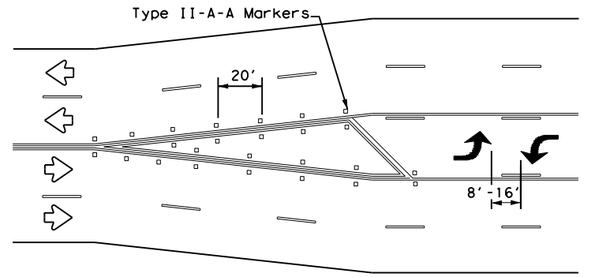
ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
30 MPH	460	$L=\frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	



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

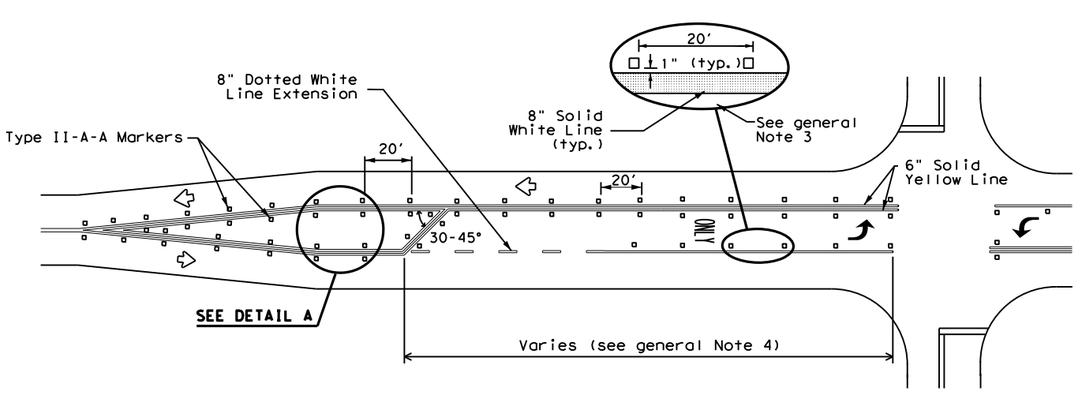


TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP

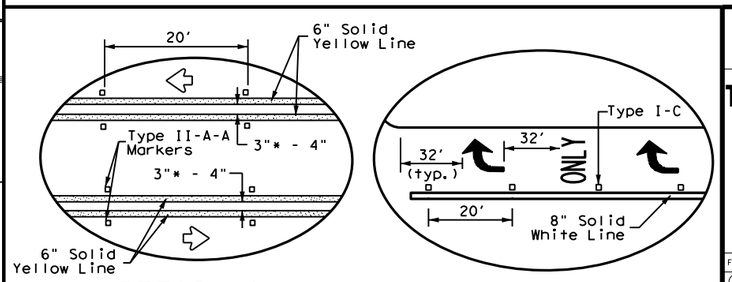


A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



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

GENERAL NOTES

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

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

PM(3)-22

FILE: pm3-22.dgn	DN:	CK:	DW:	CK:
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REVISIONS 4-98 3-03 6-20 5-00 2-10 12-22 8-00 2-12	0074	06	254, ETC.	IH 37, ETC.
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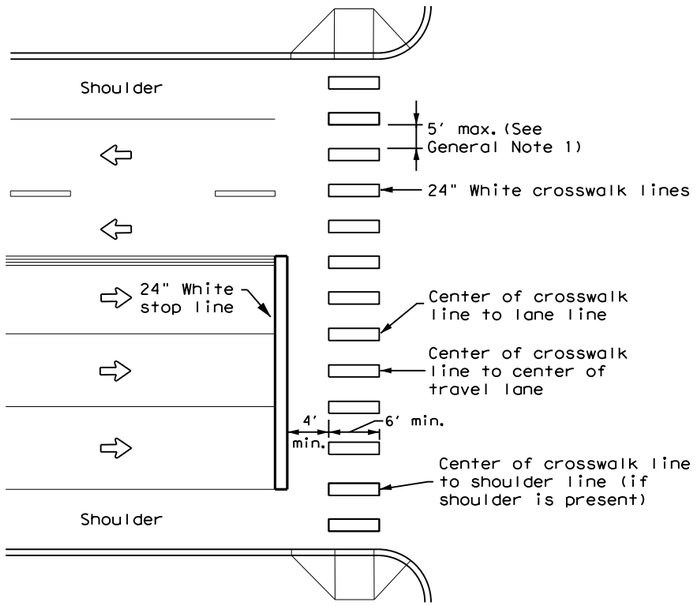


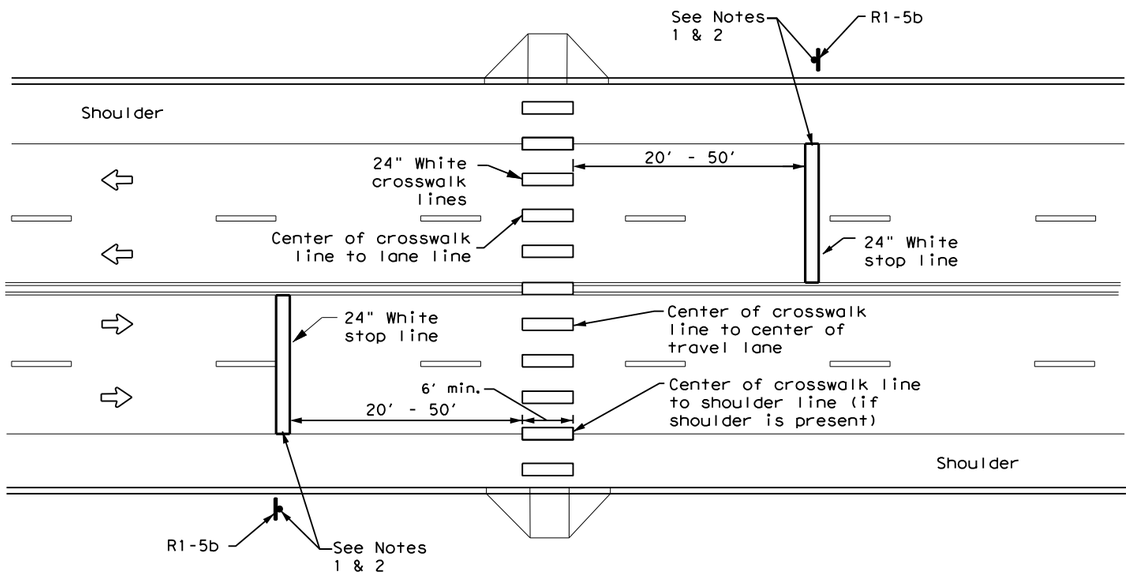
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

GENERAL NOTES

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

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

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



UNSIGNALIZED MIDBLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

NOTES:

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

Texas Department of Transportation

Traffic Safety Division Standard

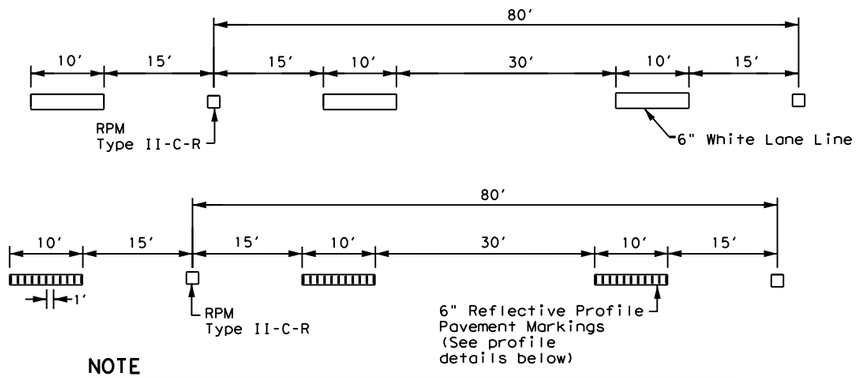
CROSSWALK PAVEMENT MARKINGS

PM(4)-22A

FILE: pm4-22a.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC.	IH 37, ETC.
6-20	DIST	COUNTY		SHEET NO.
6-22	CRP	NUECES		127
12-22				

22D

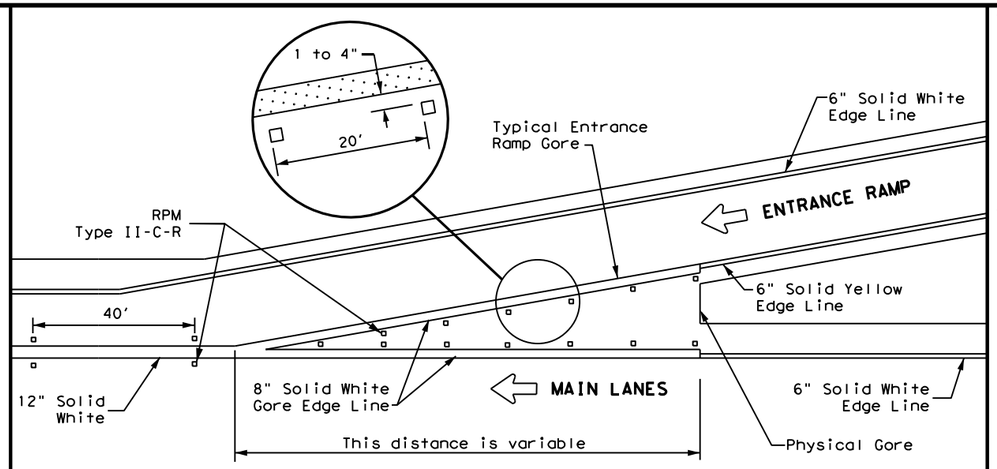
DATE:
FILE:



NOTE

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

TRAFFIC LANE LINES PAVEMENT MARKING



TYPICAL ENTRANCE RAMP GORE MARKING

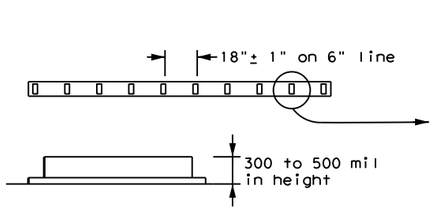
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

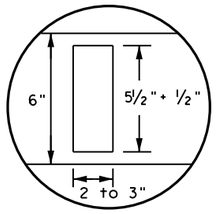
LEGEND	
⇦	Traffic flow
↱	Pavement marking arrows (white)
▫	Reflectorized Raised Markers (RPM) Type II-C-R

GENERAL NOTE

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



Reflective Profile Pavement Markings

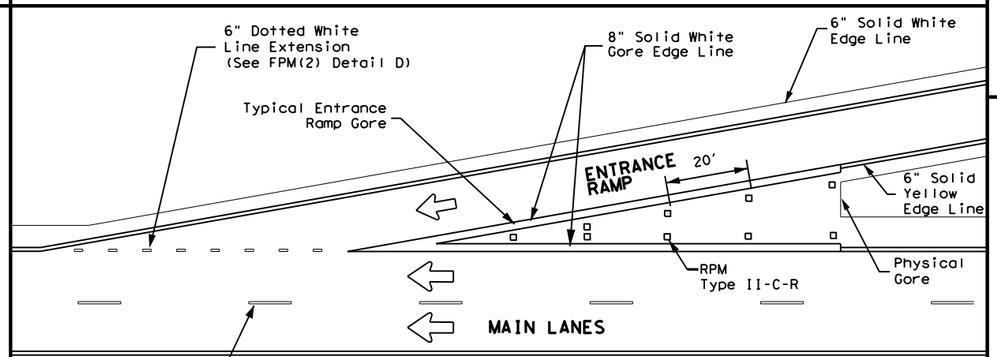


Standard 6" Profile Detail

NOTE

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

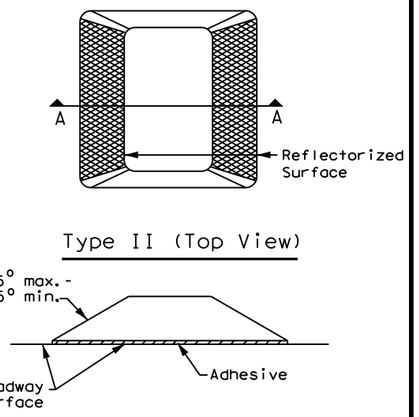
EDGE LINE PAVEMENT MARKINGS



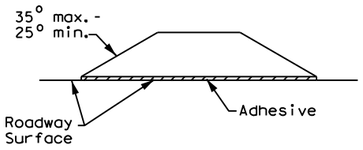
NOTE

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

TAPERED ACCELERATION LANE

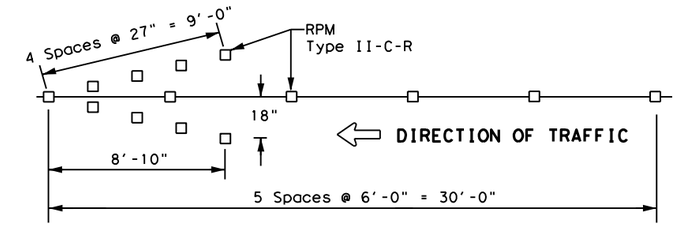


Type II (Top View)



SECTION A

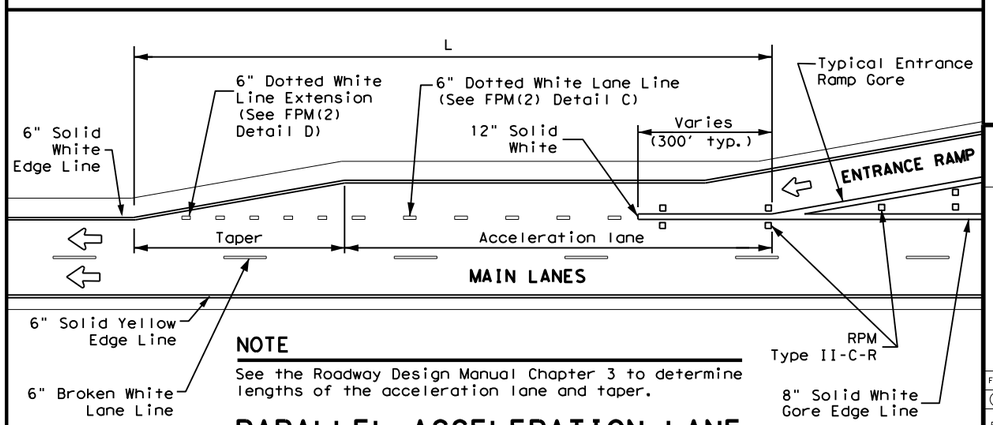
REFLECTORIZED RAISED PAVEMENT MARKER (RPM)



NOTES

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

WRONG WAY ARROW



NOTE

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

PARALLEL ACCELERATION LANE

Texas Department of Transportation

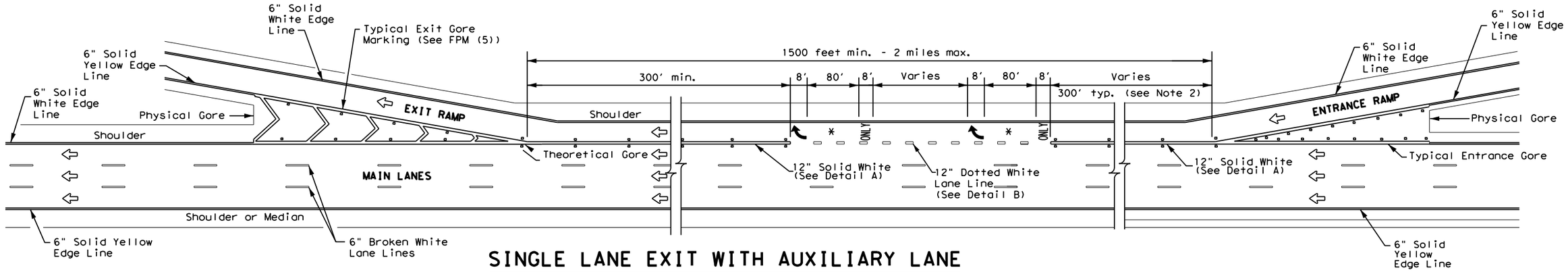
Traffic Safety Division Standard

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS WITH RAISED PAVEMENT MARKERS

FPM(1)-22

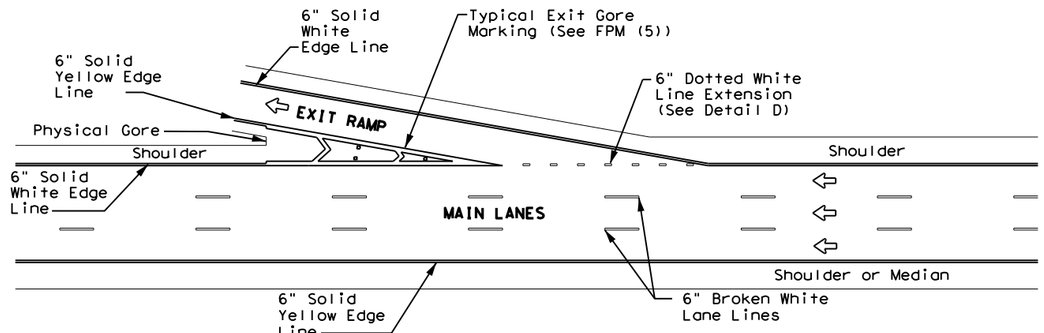
FILE: fpm(1)-22.dgn	DN:	CK:	DW:	CK:
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254,ETC.	IH 37,ETC.
5-74 8-00 2-12	DIST	COUNTY		SHEET NO.
4-92 2-08 10-22	CRP	NUECES		128
5-00 2-10				

23A



SINGLE LANE EXIT WITH AUXILIARY LANE

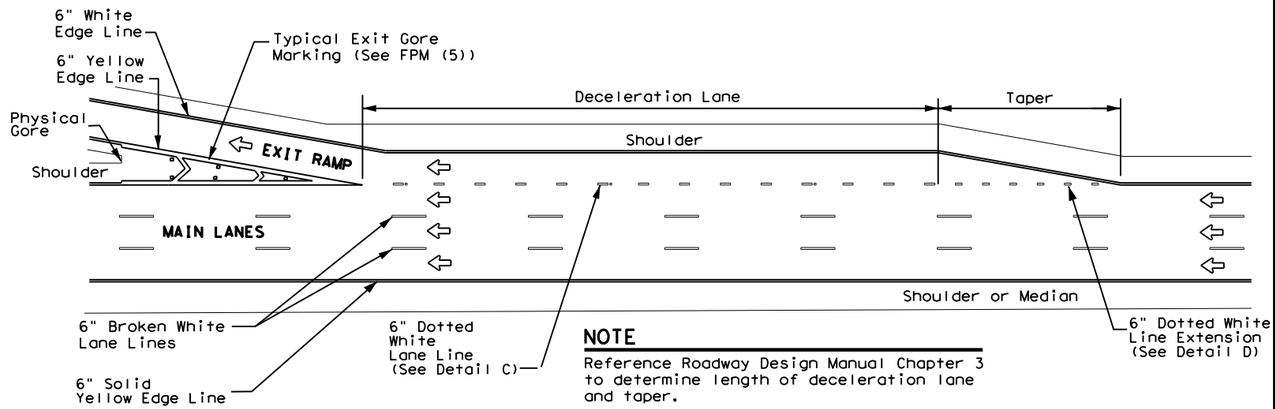
(See Note 2)



NOTE

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

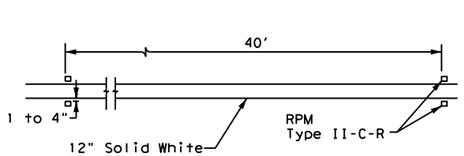
TAPERED DECELERATION LANE



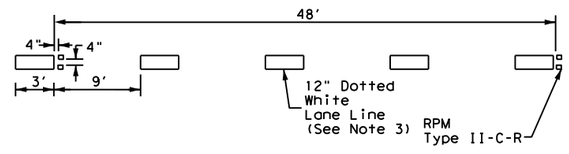
NOTE

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

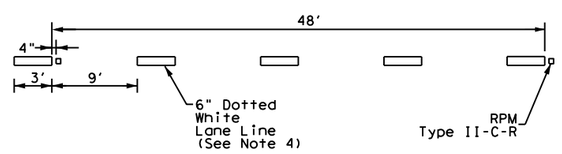
PARALLEL DECELERATION LANE



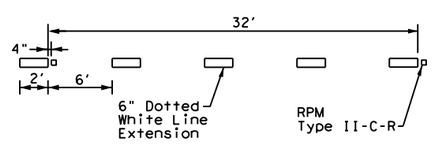
DETAIL A



DETAIL B



DETAIL C



DETAIL D

GENERAL NOTES

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

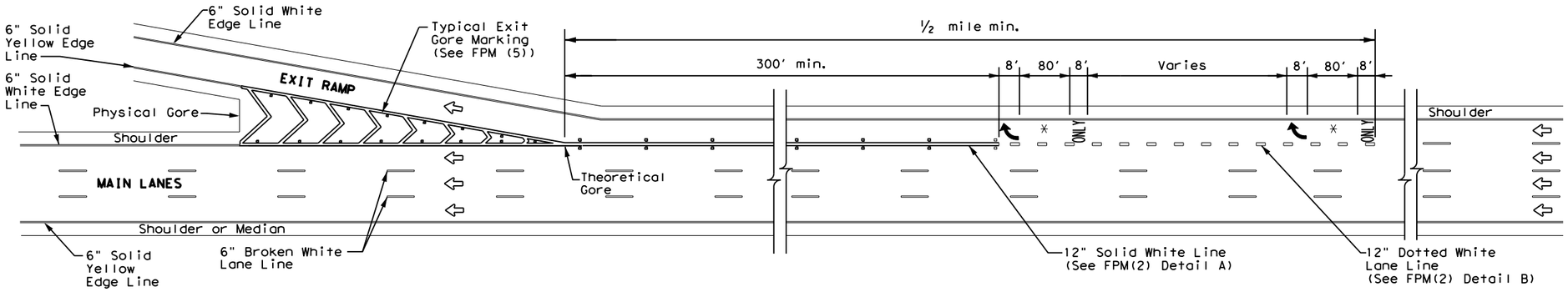
TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS ENTRANCE AND EXIT RAMPS

FPM(2)-22

FILE: fpm(2)-22.dgn	DN:	CK:	DW:	CK:
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-77 5-00 2-12 4-92 8-00 10-22 8-95 2-10	0074	06	254, ETC.	IH 37, ETC.
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		129

23B

DATE:
FILE:

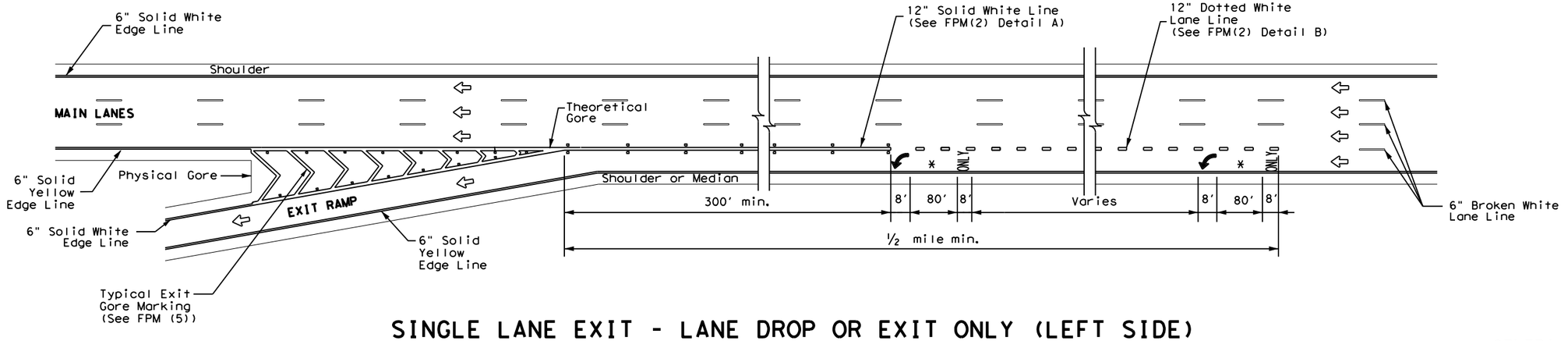


SINGLE LANE EXIT - LANE DROP OR EXIT ONLY

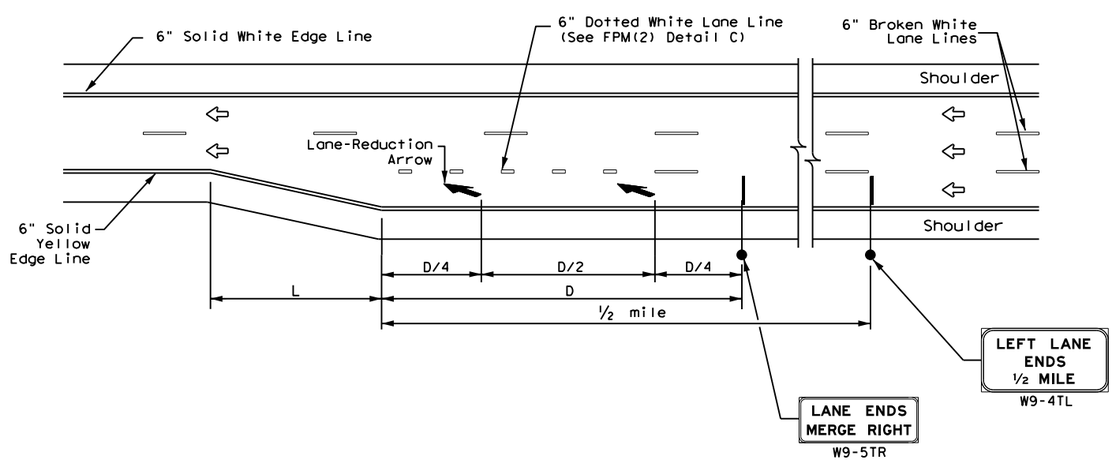
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

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



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



FREEWAY LANE REDUCTION

NOTES

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Safety Division Standard

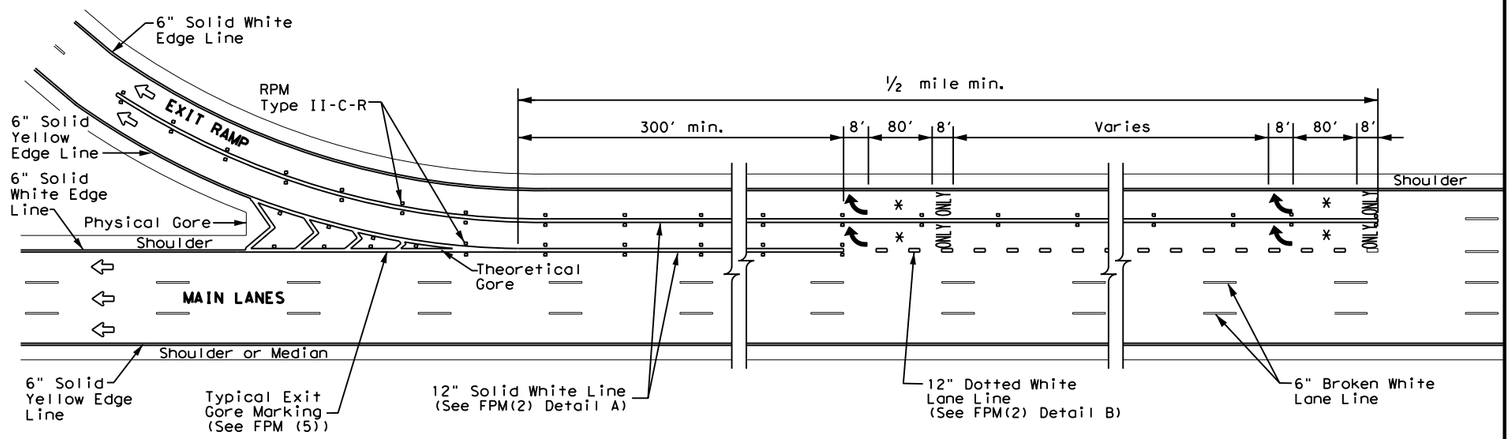
TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS SINGLE LANE DROP (EXIT ONLY) AND LANE REDUCTION DETAILS

FPM(3)-22

FILE: fpm(3)-22.dgn	DN:	CK:	DW:	CK:
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254,ETC.	IH37,ETC.
4-92 2-10	DIST	COUNTY		SHEET NO.
5-00 2-12	CRP	NUECES		130
8-00 10-22				

DATE:
FILE:

23C



MULTIPLE LANE EXIT ONLY

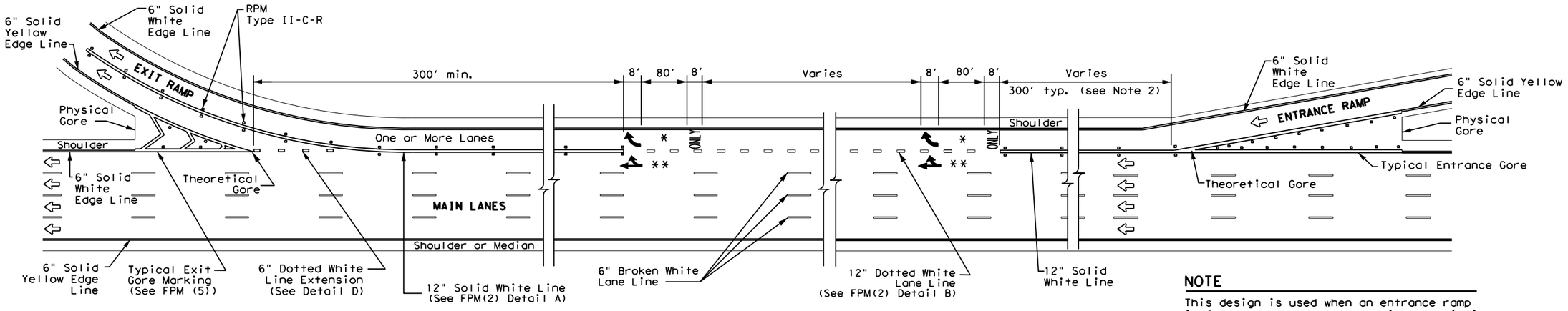
LEGEND	
⇦	Traffic Flow
▫	Reflectorized Raised Markers (RPM) Type II-C-R
↱	Pavement marking arrow (white)
*	Arrow markings are optional, however "ONLY" is required if arrow is used
**	Arrow markings are optional

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

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

GENERAL NOTES

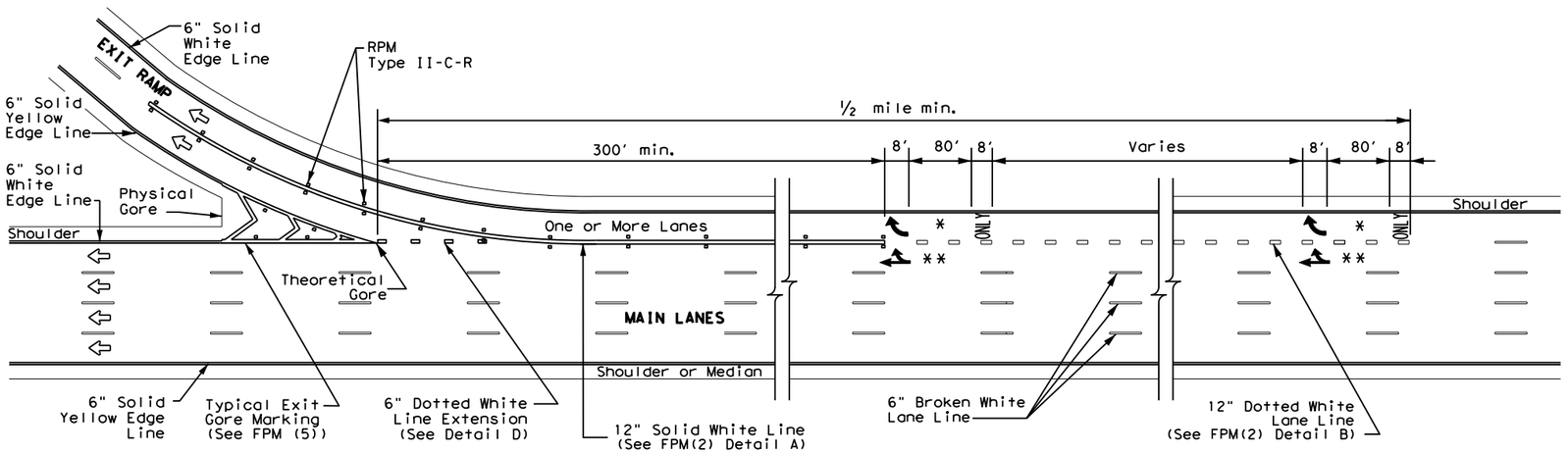
1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Wide (12") dotted lane line (see FPM(2) Detail B) is used to separate a through lane that continues beyond the interchange from an adjacent mandatory exit lane.
4. Edge lines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



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

NOTE

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



MULTIPLE LANE EXIT - EXIT ONLY WITH OPTION LANE

DATE:
FILE:

Texas Department of Transportation — Traffic Safety Division Standard

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

FPM(4)-22

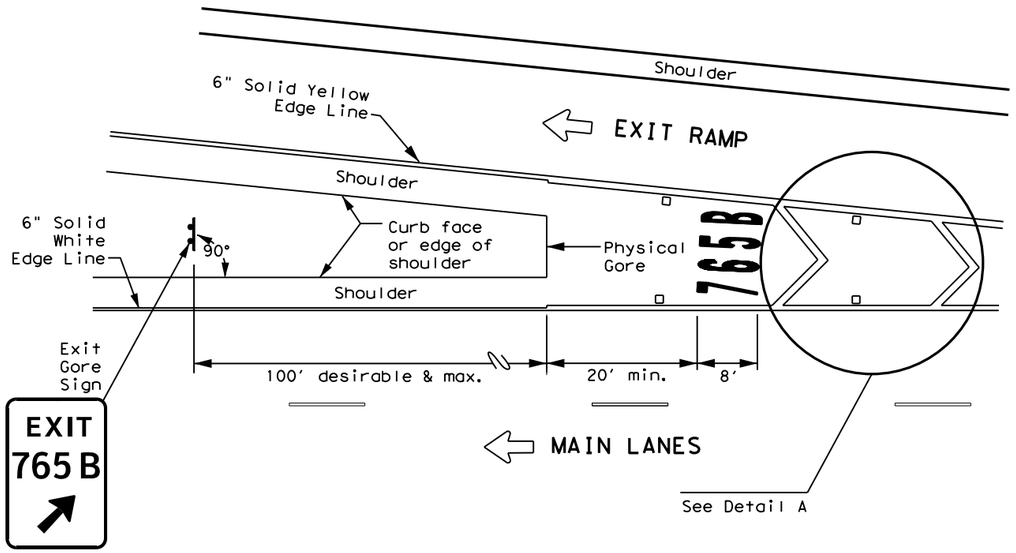
FILE: fpm(4)-22.dgn	DN:	CK:	DW:	CK:
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254,ETC.	IH37,ETC.
2-77 2-10	DIST	COUNTY		SHEET NO.
5-00 2-12	CRP	NUECES		131
8-00 10-22				

230

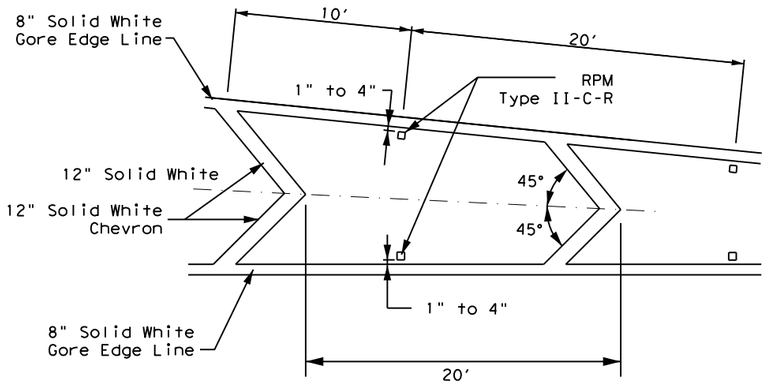
DATE:
FILE:

EXIT NUMBER PAVEMENT MARKING NOTES

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



MARKINGS WITH EXIT NUMBER



NOTES

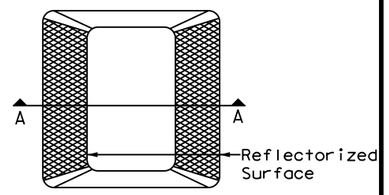
1. Raised pavement markers shall be centered between each chevron or neutral area line.
2. For more information, see Reflectorized Raised Pavement Marker Detail.

DETAIL A

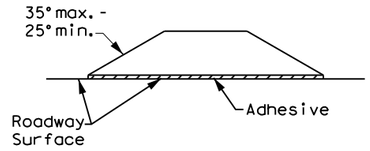
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

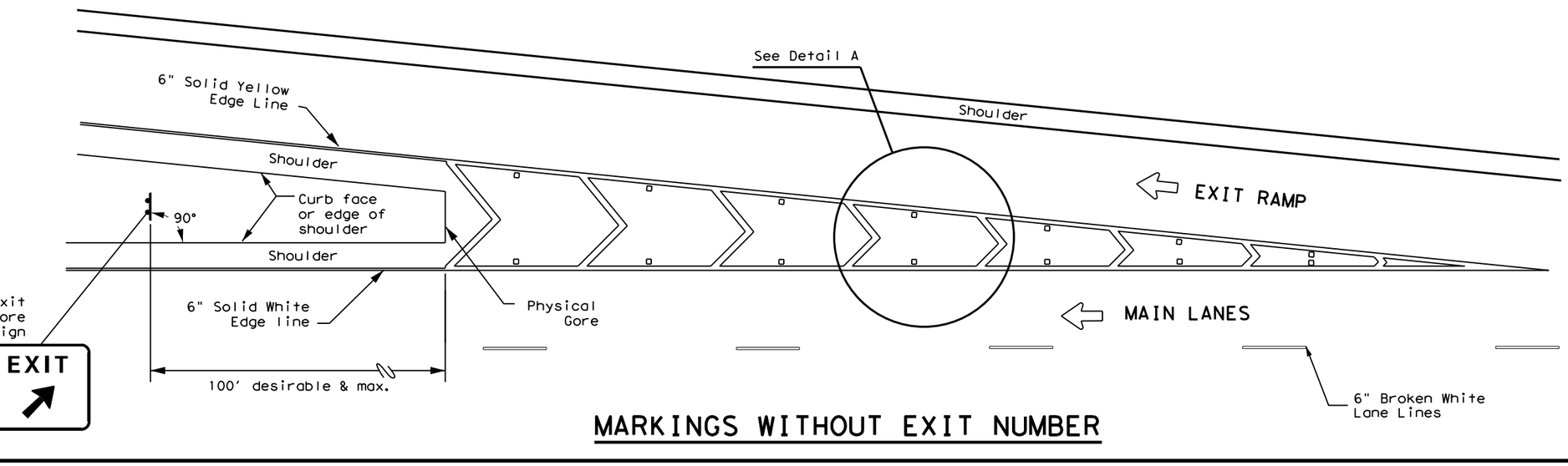
LEGEND	
⇦	Traffic flow
▫	Reflectorized Raised Markers (RPM) Type II-C-R



Type II (Top View)



SECTION A



MARKINGS WITHOUT EXIT NUMBER

REFLECTORIZED RAISED PAVEMENT MARKER (RPM)

Texas Department of Transportation

Traffic Safety Division Standard

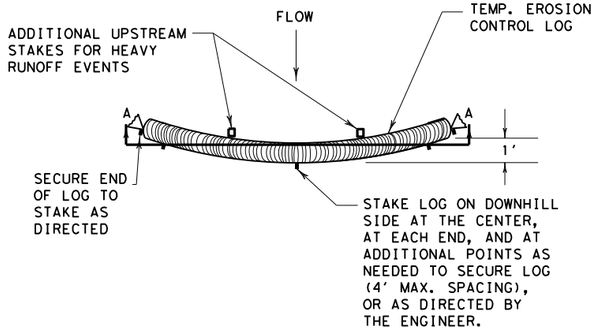
EXIT GORE PAVEMENT MARKINGS

FPM(5)-22

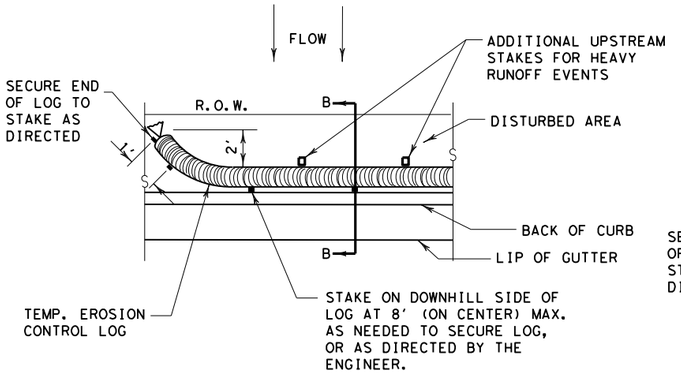
FILE: fpm(5)-22.dgn	DN:	CK:	DW:	CK:
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-19 10-22	0074	06	254, ETC.	IH37, ETC.
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		132

23E

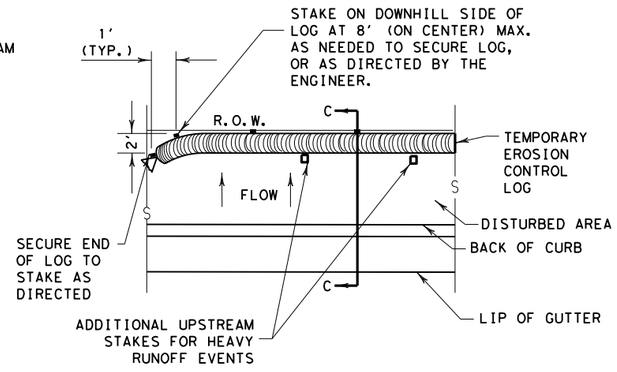
DATE:
FILE:



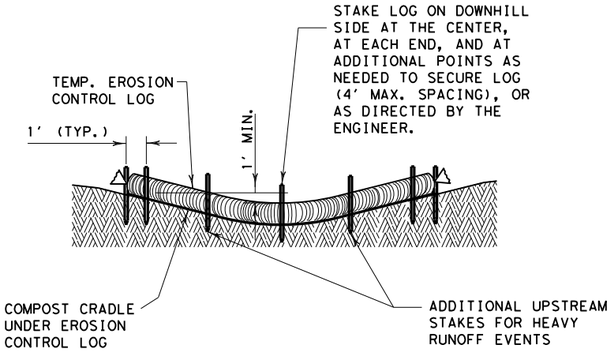
PLAN VIEW



PLAN VIEW



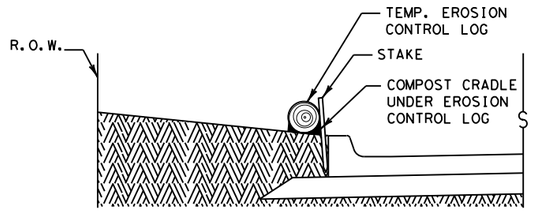
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

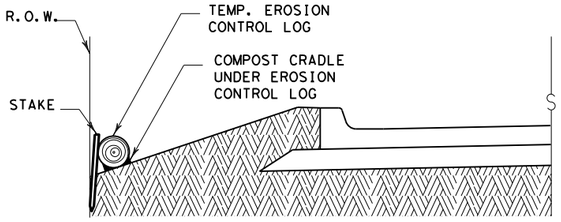
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

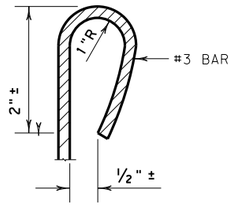
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



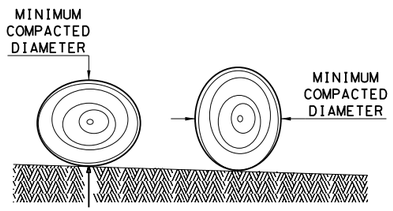
REBAR STAKE DETAIL

LEGEND

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

GENERAL NOTES:

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



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

SEDIMENT BASIN & TRAP USAGE GUIDELINES

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

Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

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

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

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

Texas Department of Transportation

Design Division Standard

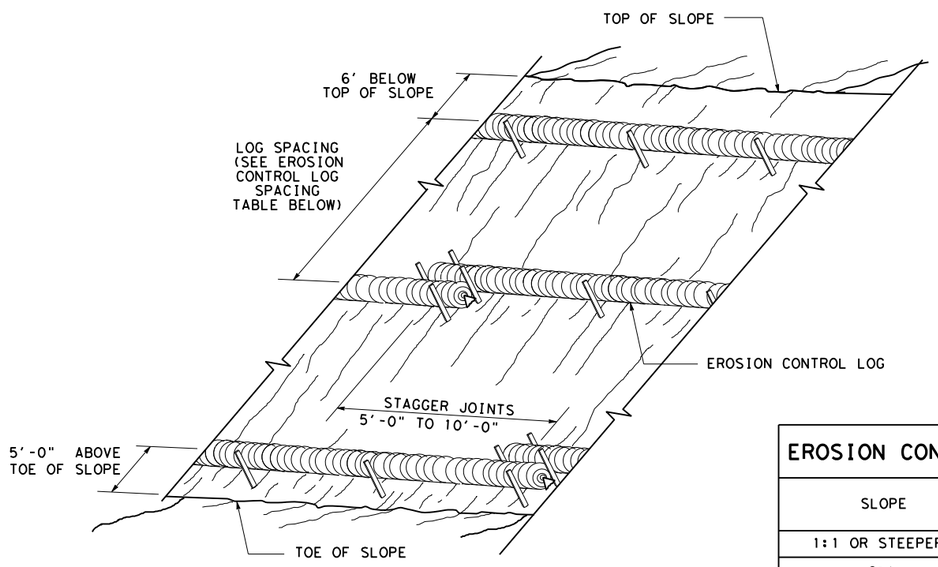
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

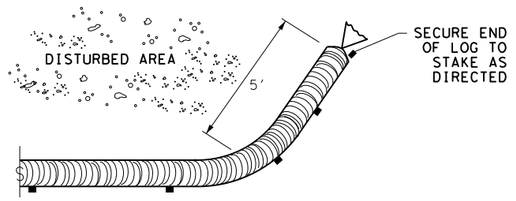
FILE: ec916	DN: TxDOT		CK: KM	DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0074	06	254, ETC.		IH 37, ETC.	
	DIST	COUNTY				SHEET NO.
	CRP	NUECES				133

DATE:
FILE:



EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

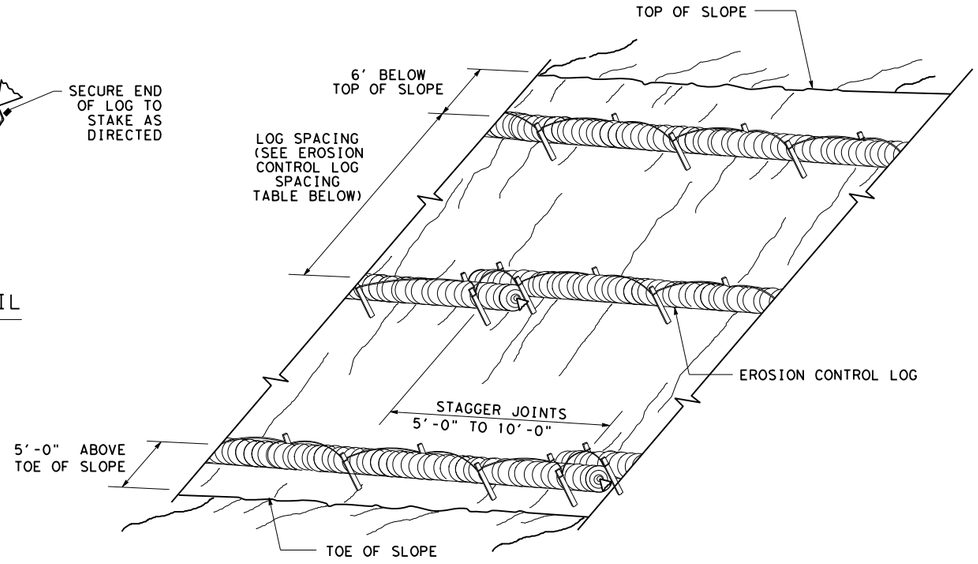
CL-SST



END SECTION RAP DETAIL

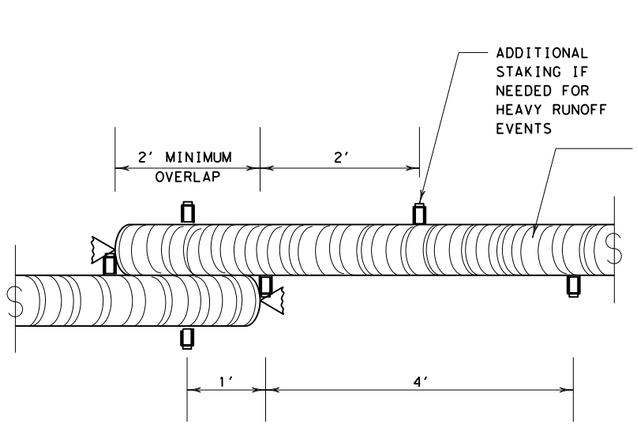
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

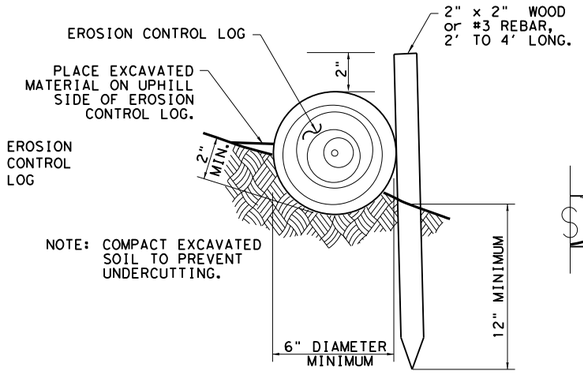
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

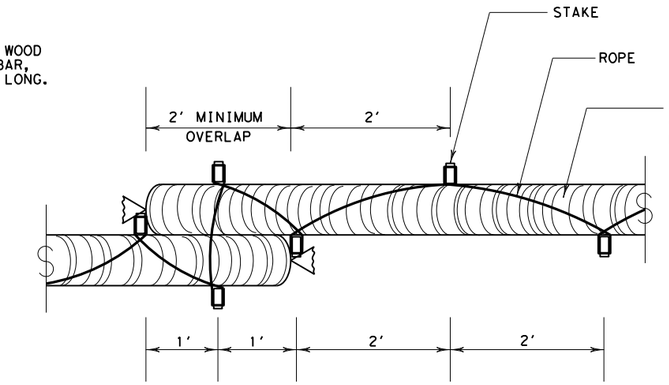


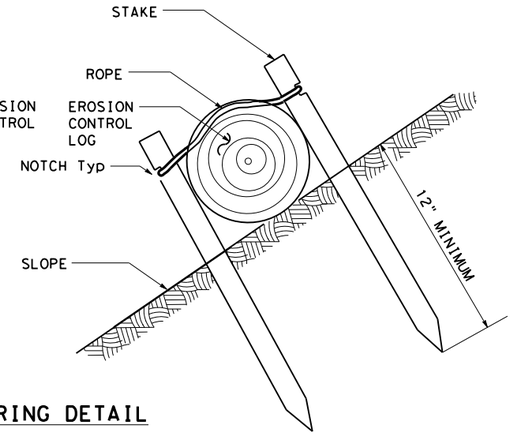


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

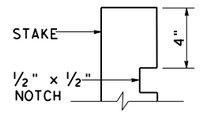
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

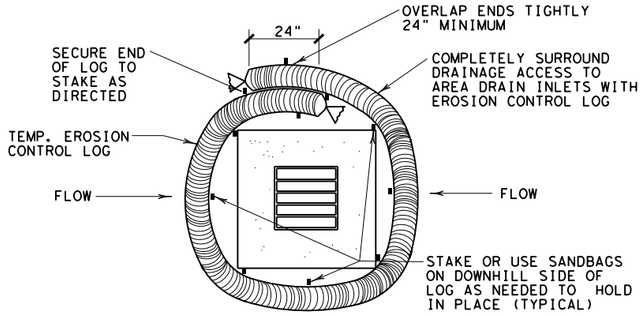
Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
EROSION CONTROL LOG
EC(9)-16

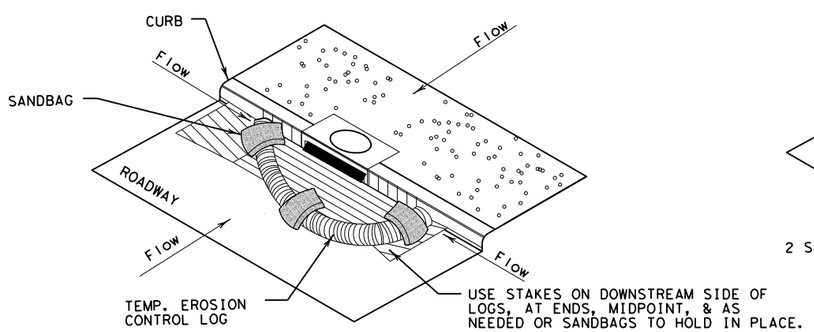
FILE: ec116	DN: TxDOT		CK: KM		DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0074	06	254, ETC.		IH 37, ETC.	
	DIST	COUNTY			SHEET NO.	
	CRP	NUECES			134	

DATE:
FILE:



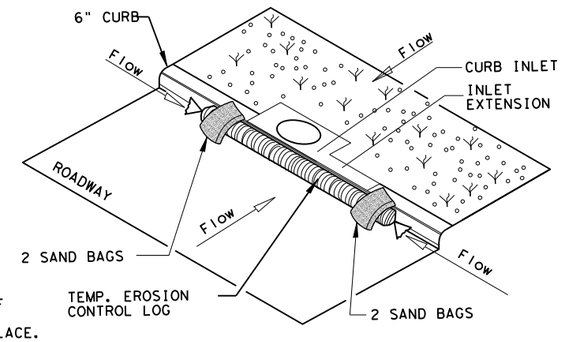
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

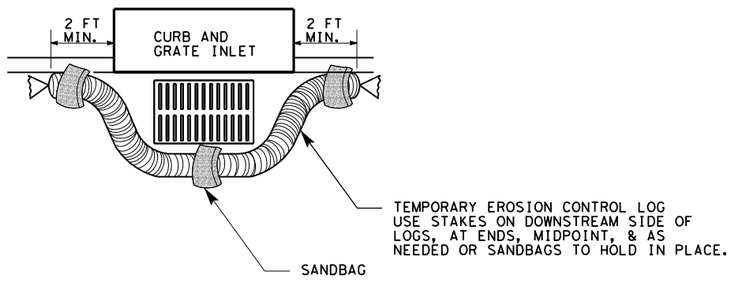
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

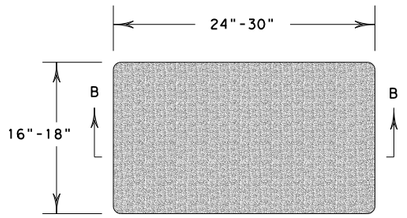
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT		CK: KM	DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0074	06	254, ETC.		IH 37, ETC.	
	DIST	COUNTY				SHEET NO.
	CRP	NUECES				135

DATE:
FILE:

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

1.

2.

☒ No Action Required ☐ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

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

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

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

☒ No Permit Required

☐ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)

☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)

☐ Individual 404 Permit Required

☐ Other Nationwide Permit Required: NWP# _____

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

1.

2.

3.

4.

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

Best Management Practices:

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

III. CULTURAL RESOURCES

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

☒ No Action Required ☐ Required Action

IV. VEGETATION RESOURCES

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

☐ No Action Required ☒ Required Action

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

☐ No Action Required ☒ Required Action

Action No.

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediate area, and contact the Engineer immediately.

LIST OF ABBREVIATIONS

BMP:	Best Management Practice	SPCC:	Spill Prevention Control and Countermeasure
CGP:	Construction General Permit	SW3P:	Storm Water Pollution Prevention Plan
DSHS:	Texas Department of State Health Services	PCN:	Pre-Construction Notification
FHWA:	Federal Highway Administration	PSL:	Project Specific Location
MOA:	Memorandum of Agreement	TCEQ:	Texas Commission on Environmental Quality
MOU:	Memorandum of Understanding	TPDES:	Texas Pollutant Discharge Elimination System
MS4:	Municipal Separate Stormwater Sewer System	TPWD:	Texas Parks and Wildlife Department
MBTA:	Migratory Bird Treaty Act	TxDOT:	Texas Department of Transportation
NOT:	Notice of Termination	T&E:	Threatened and Endangered Species
NWP:	Nationwide Permit	USACE:	U.S. Army Corps of Engineers
NOI:	Notice of Intent	USFWS:	U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

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

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

☐ Yes ☒ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

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

☐ Yes ☒ No

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

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

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

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

☐ No Action Required ☒ Required Action

Action No.

1.

2.

3.

Texas Department of Transportation

Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR	
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY	
REVISIONS 12-12-2011 (DS) 05-07-14 ADDED NOTE SECTION IV. 01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	0074	06	254, ETC.	IH 37, ETC.	
	DIST	COUNTY		SHEET NO.	
	CRP	NUECES		136	

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

DOT #: 435536J
Crossing Type: **RR Over
RR Company Owning Track at Crossing: Union Pacific Railroad Company
Operating RR Company at Track: Union Pacific Railroad Company
RR MP: 143.300
RR Subdivision: Corpus Christi
City: Corpus Christi
County: Nueces
CSJ at this Crossing: 0074-06-254
Highway/Roadway name crossing the railroad: IH 37
# of regularly scheduled trains per day at this crossing: 0
# of switching movements per day at this crossing: 0
% of estimated contract cost of work within railroad ROW: 0.10%

Scope of Work at this Crossing to Be Performed by State Contractor:
The State's Contractor will be installing wrong way driver signs, pavement markings and detectiong systems on the roadway beneath Railroad Right of Way. Traffic control will be implemented through UPRR ROW; however, no TCP signs or channelizers will be within railroad ROW. RR (flagging) to be provided for entire duration of TCP through UPRR ROW.

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

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

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

Installation of traffic control channelizing devices

DATE:
FILE:

III. FLAGGING & INSPECTION

of Days of Railroad Flagging Expected: 1

On this project, night or weekend flagging is:

☐ Expected
☒ Not Expected

Flagging services will be provided by:

☐ Railroad Company: TxDOT will pay flagging invoices
☒ Outside Party: Contractor will pay flagging invoices, to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30 day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

☒ UPRR - UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
- UP.request@nrssinc.net
Call Center 877-984-6777

☐ BNSF - BNSF.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging

☐ KCS - KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
- Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS _____

Contractor must incorporate Construction Inspection into anticipated construction schedule.

☒ Not Required

☐ Required: Contact Information for Construction Inspection:

_____

IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

On this project, construction work to be performed by a railroad company is:

☐ Required
☒ Not Required

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

V. RAILROAD INSURANCE REQUIREMENTS

Railroad reference number shall be provided by TxDOT CST or DO.

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies must be issued for and on behalf of the Railroad. Where more than one Railroad Company is operating on the same right of way or where several Railroad Companies are involved and operate on their own separate rights of way, provide separate insurance policies in the name of each Railroad Company.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000 combined single limit

Railroad Protective Liability		
☐	Not Required	
☒	Non - Bridge Projects	$2,000,000 / $6,000,000
☐	Bridge Projects	$5,000,000 / $10,000,000
☐	Other	

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

On this project, an ROE agreement is:

☐ Not Required

☐ Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)

☒ Required: UPRR Maintenance Consent Letter. TxDOT CST to assist.

☐ Required: Contractor to obtain (see Item 5, Article 8.4)
With the following railroad companies: _____

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

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

Approved ROE Agreement templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed ROE agreement between the Contractor and the Railroad if required on project.

VII. RAILROAD COORDINATION MEETING

On this project, a Railroad Coordination Meeting is:

☐ Not Required
☒ Required

See Item 5, Article 8.1 for more details.

VIII. SUBCONTRACTORS

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

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call Union Pacific
Railroad Emergency Line at 800-848-8715

Location: DOT 435536J
RR Milepost 143.300
Subdivision Corpus Christi

Texas Department of Transportation | Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:
© TxDOT June 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS 9/2021	0074	06	254,ETC.	IH 37,ETC.
	DIST	COUNTY		SHEET NO.
	CRP			137

DATE:
FILE:

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

DOT #: 435537R
Crossing Type: ** At Grade
RR Company Owning Track at Crossing: Union Pacific Railroad Company
Operating RR Company at Track: Union Pacific Railroad Company
RR MP: 143.300
RR Subdivision: Corpus Christi
City: Corpus Christi
County: Nueces
CSJ at this Crossing: 0074-06-254
Highway/Roadway name crossing the railroad: IH 37 Southbound Frontage Road
# of regularly scheduled trains per day at this crossing: 0
# of switching movements per day at this crossing: 0
% of estimated contract cost of work within railroad ROW: 0.10%

DOT #: 435535C
Crossing Type: ** At Grade
RR Company Owning Track at Crossing: Union Pacific Railroad Company
Operating RR Company at Track: Union Pacific Railroad Company
RR MP: 143.300
RR Subdivision: Corpus Christi
City: Corpus Christi
County: Nueces
CSJ at this Crossing: 0074-06-254
Highway/Roadway name crossing the railroad: IH 37 Northbound Frontage Road
# of regularly scheduled trains per day at this crossing: 0
# of switching movements per day at this crossing: 0
% of estimated contract cost of work within railroad ROW: 0.10%

Scope of Work at this Crossing to Be Performed by State Contractor:
The State's Contractor will be installing wrong way driver signs, pavement markings and detectiong systems within 300 feet of Railroad Right of Way. Traffic control will be implemented through UPRR ROW; however, no TCP signs or channelizers will be within railroad ROW. RR (flagging) to be provided for entire duration of TCP through UPRR ROW.

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

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

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

Installation of traffic control channelizing devices

III. FLAGGING & INSPECTION

of Days of Railroad Flagging Expected: 1

On this project, night or weekend flagging is:

☐ Expected
☒ Not Expected

Flagging services will be provided by:

☐ Railroad Company: TxDOT will pay flagging invoices
☒ Outside Party: Contractor will pay flagging invoices, to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30 day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

☒ UPRR - UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
- UP.request@nrssinc.net
Call Center 877-984-6777

☐ BNSF - BNSF.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging

☐ KCS - KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
- Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS _____

Contractor must incorporate Construction Inspection into anticipated construction schedule.

☒ Not Required

☐ Required: Contact Information for Construction Inspection:

IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

On this project, construction work to be performed by a railroad company is:

☐ Required
☒ Not Required

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

V. RAILROAD INSURANCE REQUIREMENTS

Railroad reference number shall be provided by TxDOT CST or DO.

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies must be issued for and on behalf of the Railroad. Where more than one Railroad Company is operating on the same right of way or where several Railroad Companies are involved and operate on their own separate rights of way, provide separate insurance policies in the name of each Railroad Company.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000 combined single limit

Railroad Protective Liability		
☐	Not Required	
☒	Non - Bridge Projects	$2,000,000 / $6,000,000
☐	Bridge Projects	$5,000,000 / $10,000,000
☐	Other	

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

On this project, an ROE agreement is:

☐ Not Required

☐ Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)

☒ Required: UPRR Maintenance Consent Letter. TxDOT CST to assist.

☐ Required: Contractor to obtain (see Item 5, Article 8.4)
With the following railroad companies: _____

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

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

Approved ROE Agreement templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed ROE agreement between the Contractor and the Railroad if required on project.

VII. RAILROAD COORDINATION MEETING

On this project, a Railroad Coordination Meeting is:

☐ Not Required
☒ Required

See Item 5, Article 8.1 for more details.

VIII. SUBCONTRACTORS

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

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call Union Pacific
Railroad Emergency Line at 800-848-8715

Location: DOT 435537R
RR Milepost 143.300
Subdivision Corpus Christi

Location: DOT 435535C
RR Milepost 143.300
Subdivision Corpus Christi

Texas Department of Transportation | Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:
© TxDOT June 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS 9/2021	0074	06	254,ETC.	IH 37,ETC.
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		138

PART 1 - GENERAL

1.01 DESCRIPTION

This project includes construction work within the right of way and/or properties of the Railroad and adjacent to its tracks, wire lines and other facilities. These sheets describe the minimum special requirements for coordination with the Railroad when working upon, over or under Railroad Right of Way or when impacting current or future Railroad operations. Coordinate with the Railroad while performing the work outlined herein, and afford the same cooperation with the Railroad as with TxDOT. Complete all submittals and work in accordance with TxDOT Standard Specifications, Railroad Guidelines and AREMA recommendations as modified by these minimum special requirements or as directed in writing by the Railroad Designated Representative.

For purposes of this project, the Railroad Designated Representative is the person or persons designated by the Railroad Manager of Industry and Public Projects to handle specific tasks related to the project.

1.02 REQUEST FOR INFORMATION / CLARIFICATION

Submit Requests for Information ("RFI") involving work within any Railroad Right of Way to the TxDOT Engineer. The TxDOT Engineer will submit the RFI to the Railroad Designated Representative for review and approval for RFI's corresponding to work within Railroad Right of Way. Allow six (6) weeks total time for review and approval, which includes four (4) weeks for review and approval by the Railroad.

1.03 PLANS / SPECIFICATIONS

TxDOT has received written Railroad approval of the plans and specifications for this project. Any revisions or changes in the plans after award of the Contract must have the approval of TxDOT and the Railroad.

PART 2 - UTILITIES AND FIBER OPTIC

Construct all utility installations in accordance with current AREMA recommendations, Railroad, TxDOT and owning utility specifications and requirements. Railroad general guidelines can be found on the Railroad website or by contacting the Railroad Designated Representative.

PART 3 - CONSTRUCTION

3.01 GENERAL

A. Perform all work in compliance with all applicable Railroad, Federal Railroad Administration (FRA), and TxDOT rules and regulations. Arrange and conduct work in a manner that does not endanger or interfere with the safe operation of the tracks and property of the Railroad and the traffic moving on such tracks, or the wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the Work. The safe operation of railroad train movements takes precedence over any work to be performed by the Contractor. The Contractor is responsible for train delay cost and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction or other activities.

B. Construction activities within 15 feet of the operational tracks will only be allowed if absolutely necessary and the Railroad's Designated Representative grants approval. Construction activities within 15 feet of the operational track(s) preferably allow the tracks to stay operational. In such cases, coordination and approval by the Railroad Track Manager is required with regard to schedule, flagging, and slow orders. See Sections 3.07 and 3.08 for additional information.

C. Provide track protection for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail. When not in use, keep Contractor machinery and materials at least 50 feet from the Railroad's nearest track.

D. Vehicular crossings of railroad track are allowed only at existing crossings, or haul road crossings developed with Railroad approval.

E. The Contractor is also advised that new railroad facilities within the project may be built by the Railroad. If applicable, these facilities are delineated in the plans. Be aware of the limits of responsibilities and coordinate efforts with the Railroad and TxDOT.

F. Railroad requirements do not allow work within 50 feet of track centers when a train passes the work site and all personnel must clear the area within 50 feet of the track centerline and secure all equipment. Additional allowances may be pursued as outlined in 3.02 and 3.03.

G. All permanent clearances shall be verified before project closing.

3.02 RAILROAD OPERATIONS

A. Trains and/or equipment are expected on any track, at any time, in either direction. Become familiar with the train schedules in this location and structure bid assuming intermittent track windows in this period, as defined in Paragraph B that follows.

B. All railroad tracks within and adjacent to the contract site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. Coordinate and schedule the work so that construction activities do not interfere with railroad operations.

C. Coordinate work windows with TxDOT and the Railroad's Designated Representative. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:

1. Conditional Work Window: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and/or adjacent to the railroad tracks within 25 feet of the nearest track, a railroad flag person will be required. At the direction of the railroad flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the Railroad Designated Representative, from the tracks). Conditional Work Windows are available for the Project.

2. Absolute Work Window: An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame, the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window, the railroad tracks and/or signals must be completely operational for train operations and all Railroad, Public Utilities Commission (PUC) and FRA requirements, codes and regulations for operational tracks must be satisfied. In the situation where the operating tracks and/or signals have been affected, the Railroad will perform inspections of the work prior to placing that track back into service. Railroad flag persons will be required for construction activities requiring an Absolute Work Window. Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for Railroad review.

3.03 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES

A. Do not perform any work within Railroad Right of Way without a valid executed Right of Entry Agreement if required on this project.

B. Give advance notice to the Railroad as required in the "Contractor's Right of Entry Agreement" before commencing work in connection with construction upon or over Railroad Right of Way and observe the Railroad's rules and regulations with respect thereto.

C. Perform all work upon Railroad Right of Way in a manner to avoid interference with or endanger the operations of the Railroad. Whenever work may affect the operations or safety of trains, submit the work method to the Railroad Designated Representative for approval. Approval does not relieve the Contractor from liability. Do not commence any work which requires flagging service or inspection service until the flagging protection required by the Railroad is available at the job site. See Section 3.15 for railroad flagging requirements.

D. Make requests in writing for both Absolute and Conditional Work Windows, at least 30 days in advance of any work. Include in the written request:
1. Exactly what the work entails.
2. The days and hours that work will be performed.
3. The exact location of work, and proximity to the tracks.
4. The type of window requested and the amount of time requested.
5. The designated contact person.

Provide a written confirmation notice to the Railroad at least 48 hours before commencing work in connection with approved work windows when work is within 25 feet of nearest rail. Perform all work in accordance with previously approved work plans.

E. Make provisions to protect operations and property of the Railroad should a condition arising from, or in connection with the work, require immediate and unusual action. If in the judgment of the Railroad Designated Representative such provisions are insufficient, the Railroad Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the Railroad or TxDOT. The Railroad or TxDOT shall have the right to order the Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the Railroad Designated Representative, the Contractor's operations could endanger railroad operations. In the event of such an order, immediately notify TxDOT of the order.

3.04 INSURANCE

Do not begin work upon or over Railroad Right of Way until furnishing the Railroad with the insurance policies, binders, certificates and endorsements required by the "Contractor's Right of Entry Agreement", and until the Railroad Designated Representative has advised TxDOT that such insurance is in accordance with the Agreement.

3.05 RAILROAD SAFETY ORIENTATION

A. Complete the railroad course "Orientation for Contractor's Safety", and maintain current registration prior to working on railroad property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

"UPRR, BNSF, KCS/TEXMEX will not accept on-track safety training certificates from other railroads. Refer to Railroad specific contractor right of entry for training information."

B. Know and follow the "Contractor's Right of Entry Agreement" EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

3.06 COOPERATION

The Railroad will cooperate with Contractor so that work may be conducted in an efficient manner, and will cooperate with Contractor in enabling use of Railroad Right of Way in performing the work.

3.07 MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES

Abide by the following minimum temporary clearances during the course of construction:
A. 15' - 0" (BNSF)(UPRR)and 14'-0" (KCS) horizontal from centerline of track
B. 22' (KCS) and 21' - 6" (UPRR & BNSF) vertically above top of rail.

For construction clearance less than listed above, obtain local Railroad Operating Unit review and approval.

3.08 APPROVAL OF REDUCED CLEARANCES

A. Maintain minimum track clearances during construction as specified in Section 3.07.

B. Submit any proposed infringement on the specified minimum clearances to the Railroad Designated Representative through TxDOT at least 30 days in advance of the work. Do not proceed with such infringement without written approval by the Railroad Designated Representative.

C. Do not commence work involving an approved infringement without receiving written assurance from the Railroad Designated Representative that arrangements have been made for any necessary flagging service.

Texas Department of Transportation | Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	0074	06	254,ETC.	IH 37,ETC.
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		139

DATE:
FILE:

3.09 MAINTENANCE OF RAILROAD FACILITIES

A. Maintain all ditches and drainage structures free of silt or other obstructions resulting from Contractor's operations. Repair eroded areas and any other damage within Railroad Right of Way and repair any other damage to the property of the Railroad, or its tenants.

B. Perform all such maintenance and repair of damages due to the Contractors's operations at Contractor's expense.

C. Submit a proposed method of erosion control for review by the Railroad prior to beginning any grading on the project site. Comply with all applicable local, state and federal regulations when developing and implementing such erosion control.

3.10 SITE INSPECTIONS BY RAILROAD's DESIGNATED REPRESENTATIVE

A. In addition to the office reviews of construction submittals, site inspections may be performed by the Railroad Designated Representative at significant points during construction, including the following if applicable:
   1. Pre-construction meetings.
   2. Pile driving/drilling of caissons or drilled shafts.
   3. Reinforcement and concrete placement for railroad bridge substructure and/or superstructure.
   4. Erection of precast concrete or steel bridge superstructure.
   5. Placement of waterproofing (prior to placing ballast on bridge deck).
   6. Completion of the bridge structure.

B. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by the Railroad.

C. Provide a detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to TxDOT for submittal to the Railroad Designated Representative for review prior to commencement of work. Include the anticipated dates when the above listed events will occur. Update this schedule for the above listed events as necessary and each month at a minimum to allow the Railroad to schedule site inspections.

3.11 RAILROAD REPRESENTATIVES

Railroad representatives, conductors, flag person or watch person will be provided by the Railroad at expense of TxDOT to protect Railroad facilities, property and movements of its trains or engines. In general, the Railroad will furnish such personnel or other protective services as follows:

A. When any part of any equipment is standing or being operated within 25 feet, measured horizontally, from nearest rail of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25 foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.

B. For any excavation below elevation of track subgrade if, in the opinion of the Railroad Designated Representative, track or other railroad facilities may be subject to settlement or movement.

C. During any clearing, grubbing, excavation or grading in proximity to railroad facilities, which, in the opinion of the Railroad Designated Representative, may endanger railroad facilities or operations.

D. During any Contractor's operations when, in the opinion of the Railroad Designated Representative, railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.

E. Arrange with the Railroad Designated Representative to provide the adequate number of flag persons to accomplish the work.

3.12 COMMUNICATIONS AND SIGNAL LINES

If required, the Railroad will rearrange its communications and signal lines, its grade crossing warning devices, train signals and tracks, and facilities that are in use and maintained by the Railroad's forces in connection with its operation at expense of TxDOT. This work by the Railroad will be done by its own forces and it is not a part of the Work under this Contract.

3.13 TRAFFIC CONTROL

Coordinate any operations that control traffic across or around railroad facilities with the Railroad Designated Representative.

3.14 CONSTRUCTION EXCAVATIONS AND BORING ACTIVITIES UNDER TRACK

A. Take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of TxDOT, OSHA, AREMA and Railroad "Guidelines for Temporary Shoring".

B. The project plans indicate whether there are fiber optic lines or other such telecommunications systems that require consideration. Regardless, contact the necessary call center to determine if such cable systems are present:

   UPRR 1-800-336-9193
   7:00 AM to 9:00 PM CST Monday-Friday except holidays,
   staffed 24 hrs/day for emergencies
   48 hrs notice required

   BNSF 1-800-533-2891
   24 hour number
   5 working days notice required

   KCS 1-800-344-8377
   Texas One Call, a 24 hour number
   48 hrs notice required, excluding weekends and holidays

   If a telecommunications system is buried anywhere on or near railroad property, coordinate with TxDOT, the Railroad and the Telecommunication Company(ies) to arrange for relocation or protective measures prior to beginning work on or near railroad property. Refer to the project General Notes for additional information.

C. Projects involving a boring or jack and bore operation under track such as drainage pipes or culverts and utilities require an installation plan reviewed and approved by the Railroad and TxDOT prior to proceeding with such construction. A railroad inspector and contractor assisted monitoring of ground and track movement is required to maintain safe passage of rail traffic. Stop installation and do not allow passage of trains if movements in excess of $\frac{1}{4}$ inch vertical or horizontal is detected in the tracks. Immediately repair the damage to the satisfaction of TxDOT and the Railroad before proceeding.

3.15 RAILROAD FLAGGING

Per the Right of Entry Agreement for flagging, notify the Railroad Representative at least 10 working days in advance of Contractor's work and at least 30 working days in advance of any Contractor's work in which any person or equipment will be within 25 feet of nearest rail or as specified in the Contractor Right of Entry (CROE).

3.16 CLEANING OF RIGHT-OF-WAY

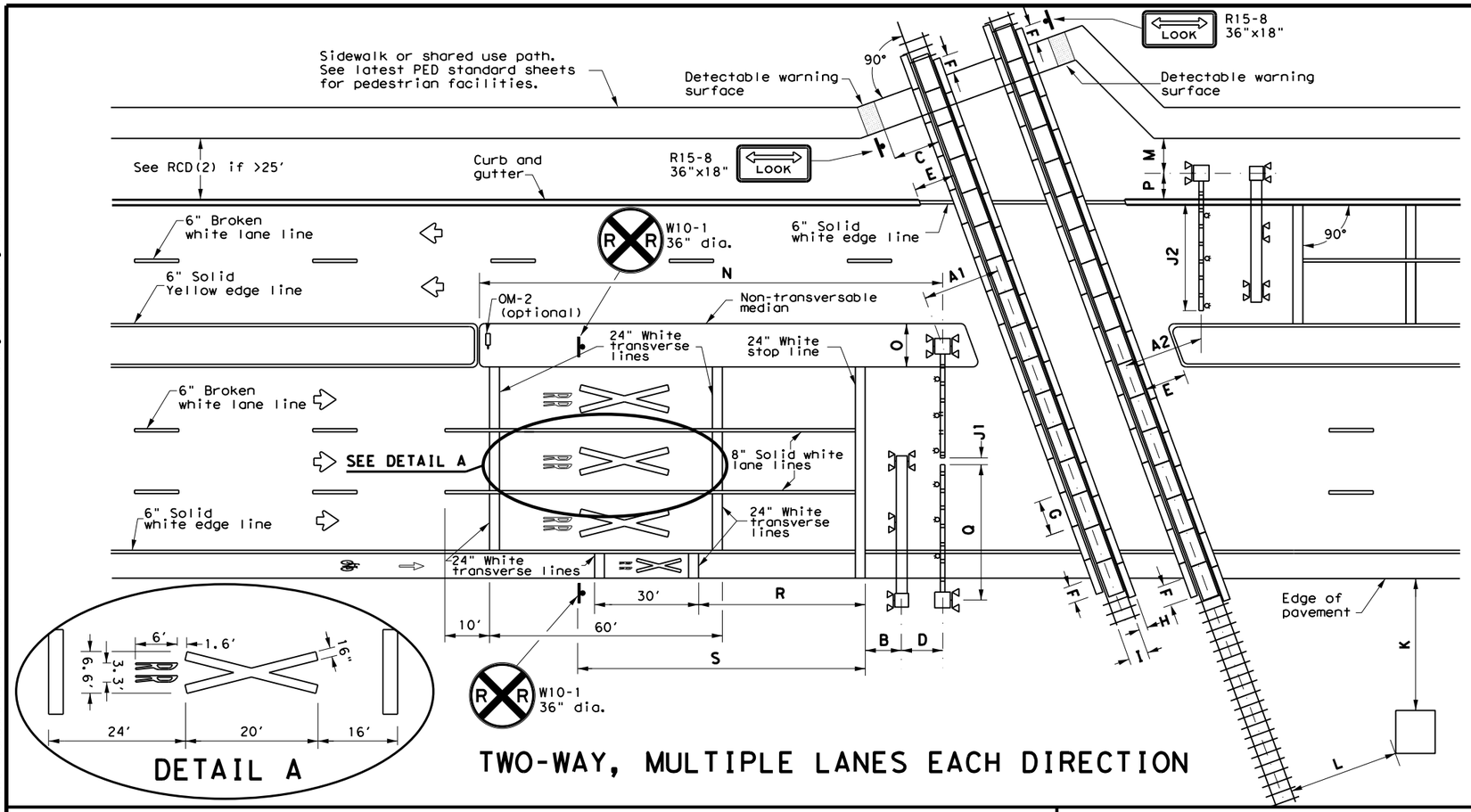
When work is complete, remove all tools, implements, and other materials brought into Railroad Right of Way and leave the right of Way in a clean and presentable condition to the satisfaction of TxDOT and the Railroad.

DATE:
FILE:

Texas Department of Transportation | Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	0074	06	254, ETC.	IH 37, ETC.
	DIST	COUNTY		SHEET NO.
	CRP	NUECES		140



NOTES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

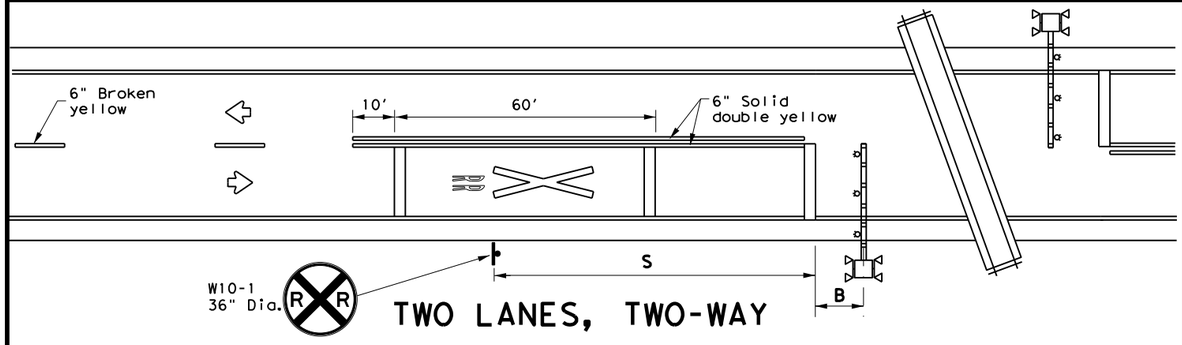
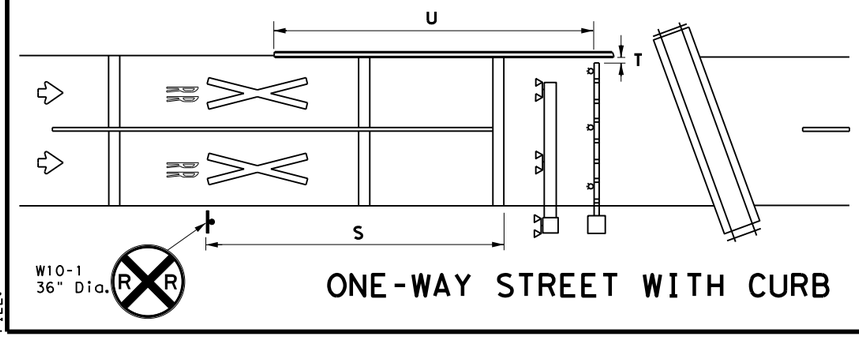


TABLE 1	
Approach Speed (mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

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

GENERAL NOTES

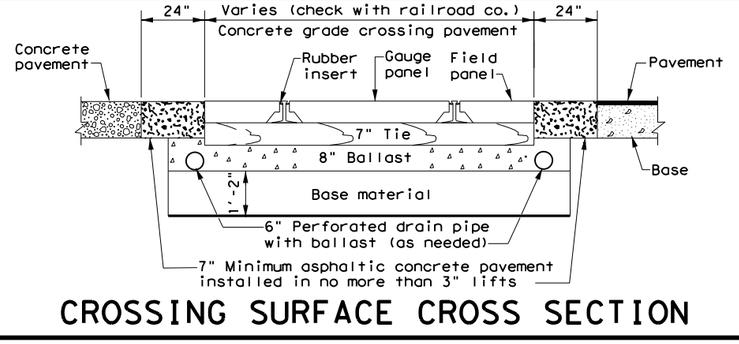
1. Medians and curbs must be non-traversable to qualify as a Quiet Zone Supplementary Safety Measure (SSM). Non-traversable curbs in Quiet Zones are 6" tall minimum and used on roadways where speed does not exceed 40 mph.
2. Raised pavement markers may be used to supplement striping. See PM(2) and PM(3)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



NOTES

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

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



Texas Department of Transportation

Traffic Safety Division Standard

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

FILE: rcd1-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC.	IH 37, ETC.
2-16	DIST	COUNTY		SHEET NO.
11-22	CRP	NUECES		141

DATE:
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DATE:
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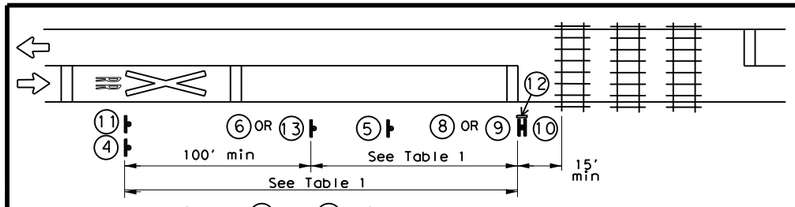
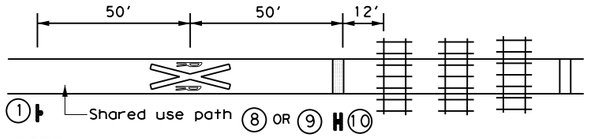


(if no ⑥ or ⑬ sign used)

PASSIVE CROSSING

NOTES

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



NOTES

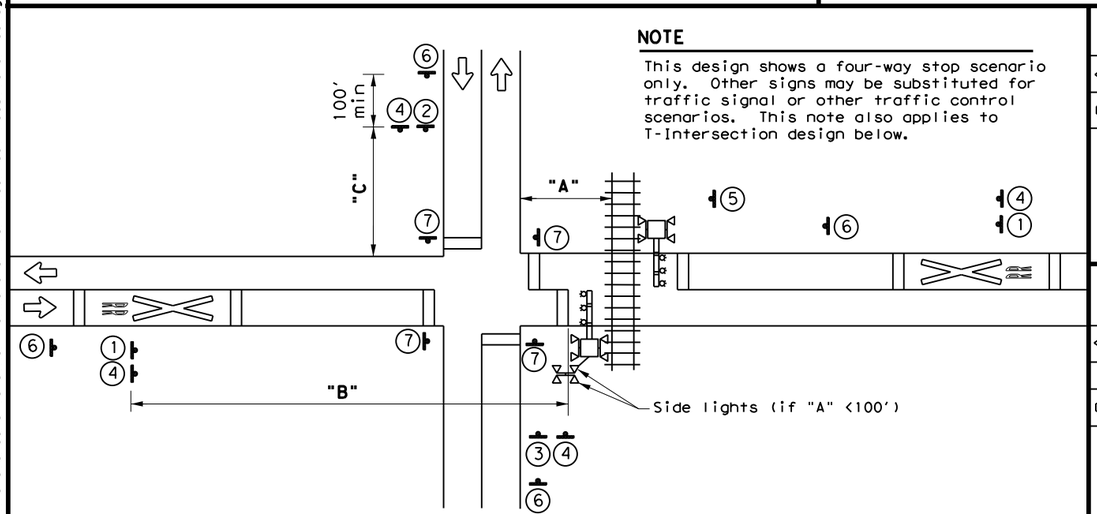
1. A shared use path is considered a separate pathway crossing when more than 25' from traveled way of adjacent roadway.
2. Detectable warning used at stop bar.
3. Smaller signs preferred. See the Design of Bicycle Signs section within the TMUTCD for sizing details.

PATHWAY CROSSING

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

GENERAL NOTES

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

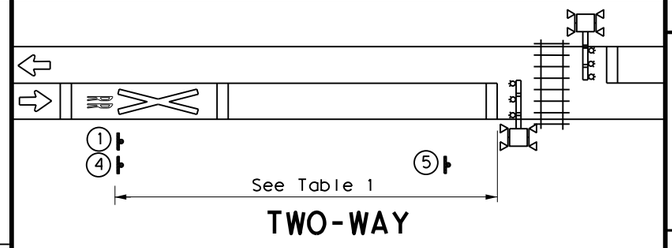


NOTE

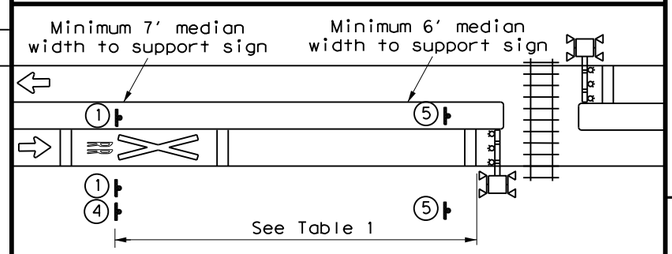
This design shows a four-way stop scenario only. Other signs may be substituted for traffic signal or other traffic control scenarios. This note also applies to T-Intersection design below.

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

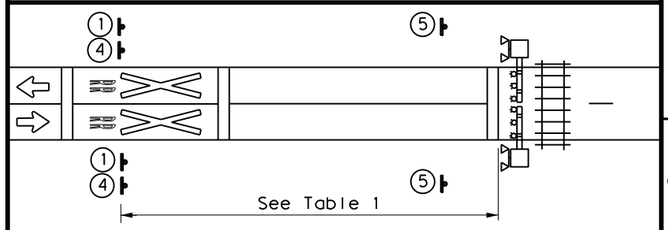
GRADE CROSSING NEAR A PARALLEL STREET



TWO-WAY

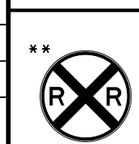


TWO-WAY WITH MEDIAN



ONE-WAY

SIGNS



1 W10-1 36" Dia.

2 W10-2L 36" X 36"

3 W10-2R 36" X 36"

IF NEEDED

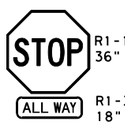
4 W10-5 36" X 36"
W10-5P 30" X 24"

IF NEEDED

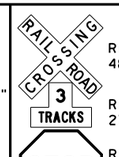
5 R8-8 24" X 30"

IF NEEDED

6 W3-1 30" X 30"



R1-1 36" X 36"
R1-3P 18" X 6"
7



R15-1 48" X 9"
R15-2P 27" X 18"
R1-1 36" X 36"
8

R15-1 48" X 9"
R15-2P 27" X 18"

9 R1-2 48" X 48" X 48"

R15-1 48" X 9"
R15-2P 27" X 18"
10

W10-1 36" Dia.
W10-13P 30" X 24"
11 **

REPORT EMERGENCY OR PROBLEM 1-800-555-5555 CROSSING 836 597 H

Sign may be placed perpend. to travel lanes.

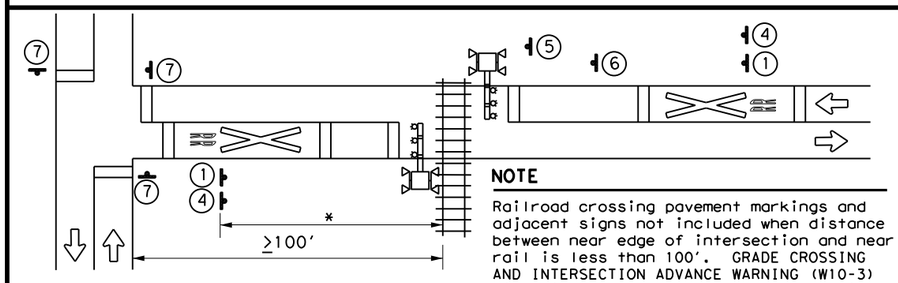
12 I-13 15" X 9"

IF NEEDED

13 W3-2 30" X 30"

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

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

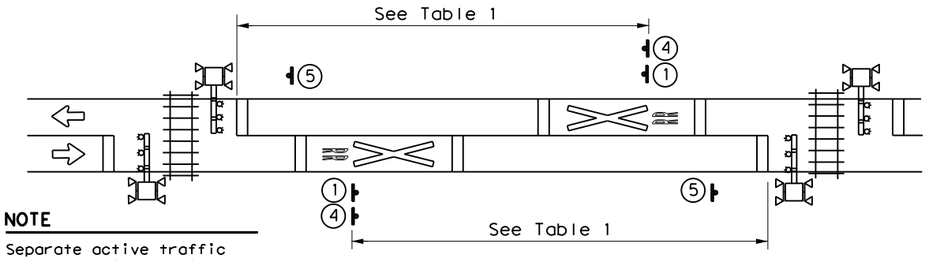


*Use Table 1 if sufficient space exists.

NOTE

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

T-INTERSECTION



NOTE

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

TWO ADJACENT CROSSINGS

Texas Department of Transportation

Traffic Safety Division Standard

RAILROAD CROSSING DETAILS SIGNING & STRIPING

RCD(2)-22

FILE: rcd2-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0074	06	254, ETC.	IH 37, ETC.
2-16 11-22	DIST	COUNTY		SHEET NO.
	CRP	NUECES		142