SEE SHEET 2 FOR INDEX OF SHEETS

DESIGN SPEED = 60 MPH
A.D.T. (2018)= 45,705
A.D.T. (2038)= 63,987

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
ELP	EL PASO		1

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED STATE HIGHWAY IMPROVEMENT

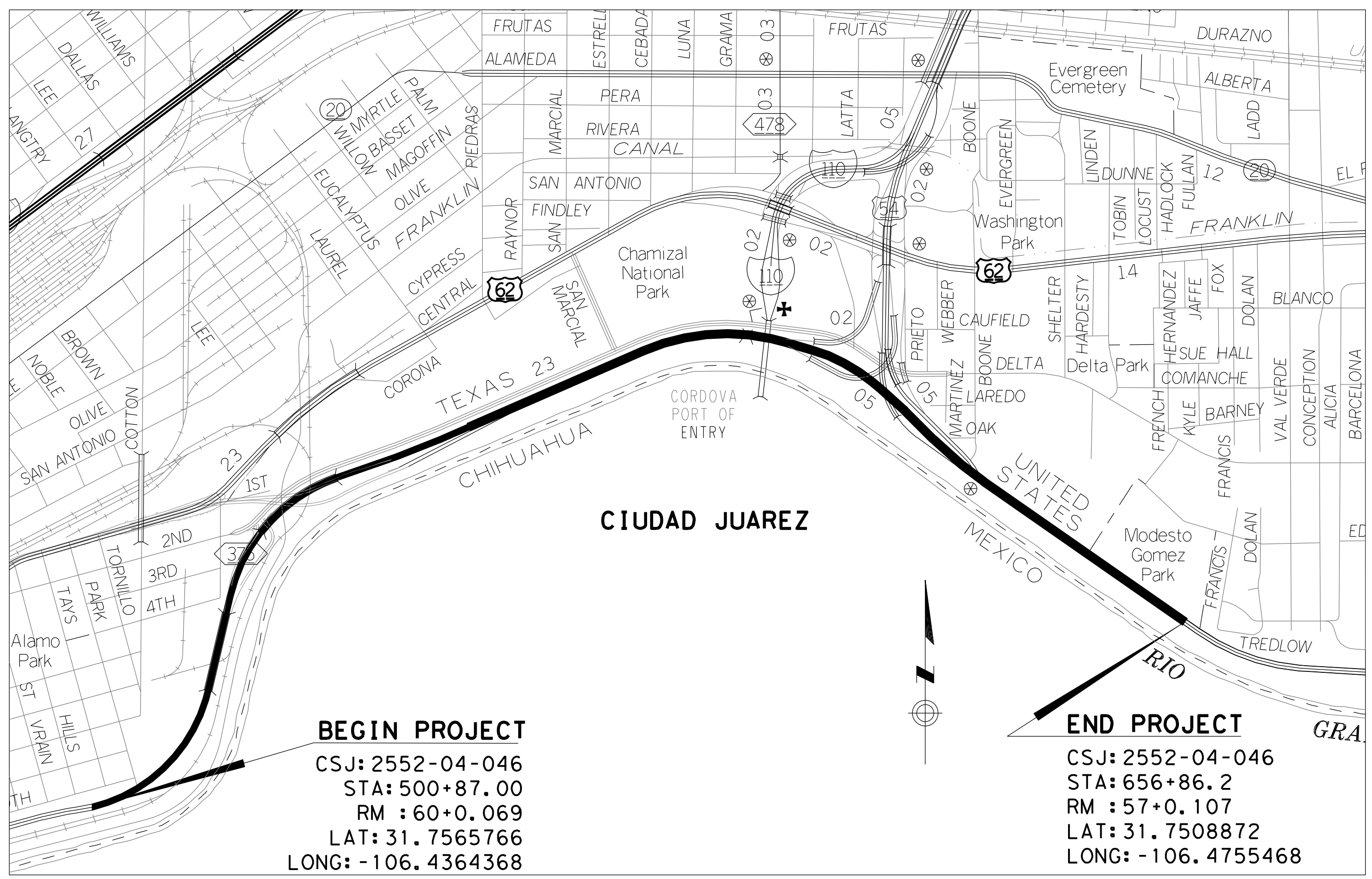
STATE PROJECT: C2552-4-46

EL PASO COUNTY
SL375 CESAR CHAVEZ BORDER HIGHWAY

NET LENGTH OF ROADWAY= 15,686.88FT.= 2.971 MI.
NET LENGTH OF BRIDGE = 2,020.00FT.= 0.383 MI. (NO WORK PROPOSED)
NET LENGTH OF PROJECT= 13,666.88FT.= 2.588 MI.

LIMITS: 0.87 MI E OF US 54 TO 0.11 MI W OF PARK STREET

FOR THE REHABILITATION OF SL375 MAIN LANES & SHOULDERS CONSISTING OF: BASE REPAIR, UNDERSEAL, MILL, INLAY PAVEMENT MARKINGS AND SIGNS



EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: NONE

TDLR INSPECTION NOT REQUIRED

REQUIRED SIGNS SHALL BE IN ACCORDANCE WITH BC (1)- 14 THRU BC (12)- 14 AND THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

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 SPECIAL LABOR PROVISIONS FOR ALL STATE CONSTRUCTION PROJECTS. (SP000-008)

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

Monica Ruiz, P.E.
05/04/2021

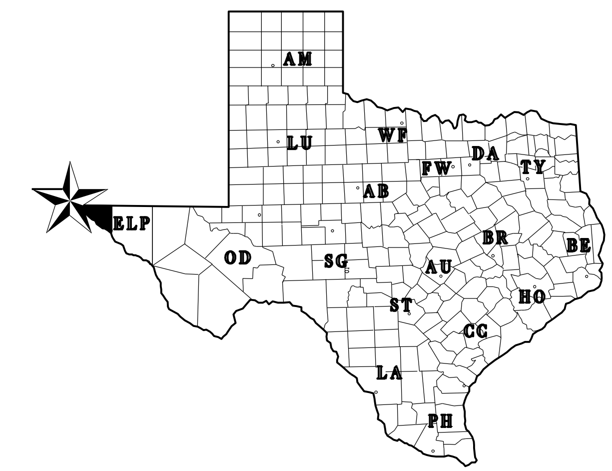
DATE: 05/04/2021 05:39 PM
FILE: TxDOT_Sheets_XM.cel

FINAL PLANS

CONTRACTOR: ____
TIME CHARGES BEGAN: ____
DATE CONTRACTOR BEGAN WORK: ____
DATE WORK WAS COMPLETED: ____
DATE WORK WAS ACCEPTED: ____
TOTAL DAYS CHARGED: ____
ORIGINAL CONTRACT AMOUNT: $ ____
AMOUNT OF CONTRACT AMENDMENTS: $ ____
FINAL CONTRACT COST: $ ____
LETTING DATE: ____

____ 20 ____

____
AREA ENGINEER



KEY TO COUNTIES

Texas Department of Transportation

RECOMMENDED FOR LETTING: 5/5/2021
DocuSigned by:
Eduardo Perales, P.E.
2778C60AB5F7426...
SAFETY REVIEW COMMITTEE CHAIRMAN

RECOMMENDED FOR LETTING: 5/5/2021
DocuSigned by:
L. Raul Ortega Jr., P.E.
0F17...
DISTRICT DIRECTOR OF TRANSPORTATION PLANNING AND DEVELOPMENT

APPROVED FOR LETTING: 5/5/2021
DocuSigned by:
7A68C5EA0D94490...
DISTRICT ENGINEER

CK:
DW:
CK:
DN:

INDEX OF SHEETS

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ON THIS SHEET WITH THE SYMBOL # HAVE BEEN ISSUED BY ME AND ARE APPLICABLE TO THIS PROJECT.

Monica Ruiz, P.E.
NAME

05/26/2021
DATE

GENERAL

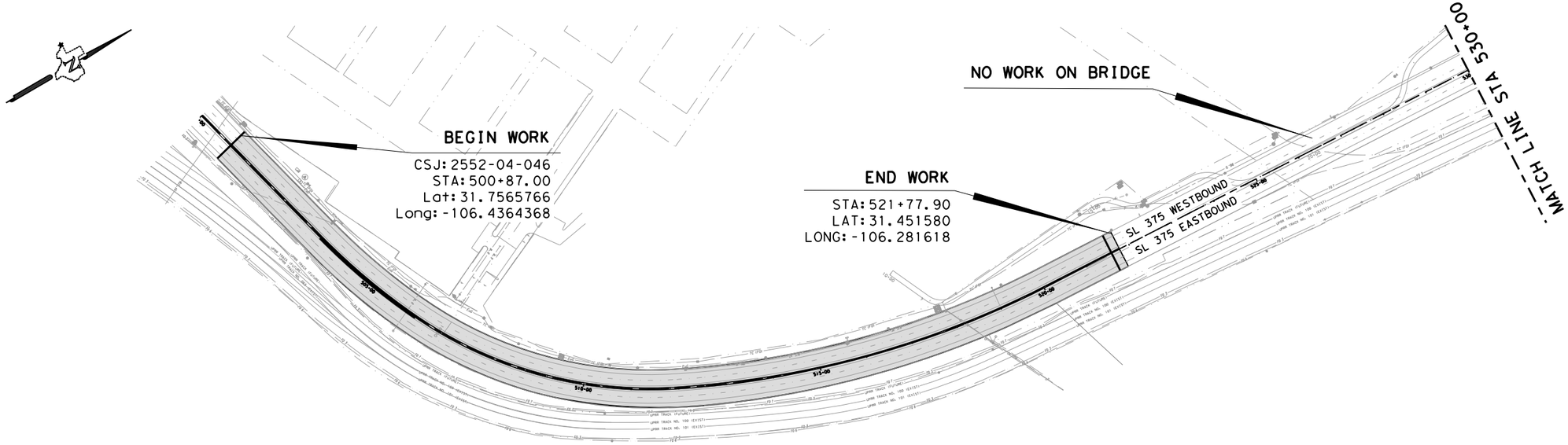
INDEX OF SHEETS

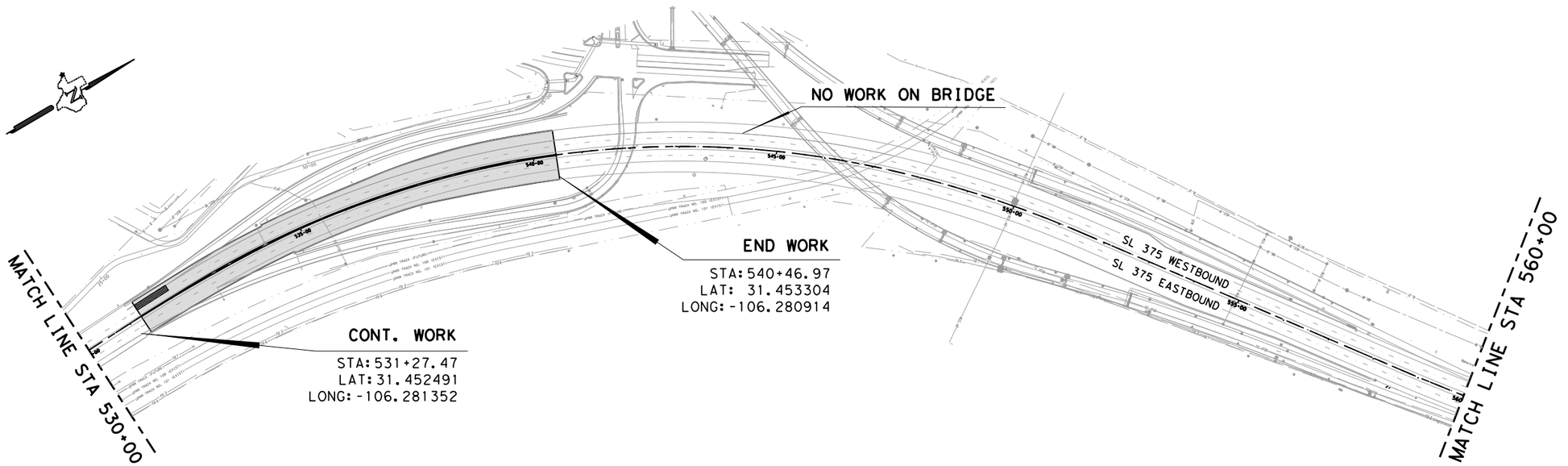
SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL375
DIST	COUNTY		SHEET NO.
ELP	EL PASO		2

DATE:
FILE:





STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

0 125 250

SCALE IN FEET

PROJECT LAYOUT

SHEET 1 OF 3

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		3

DATE: 5/3/2021 10:49:36 PM
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CK:
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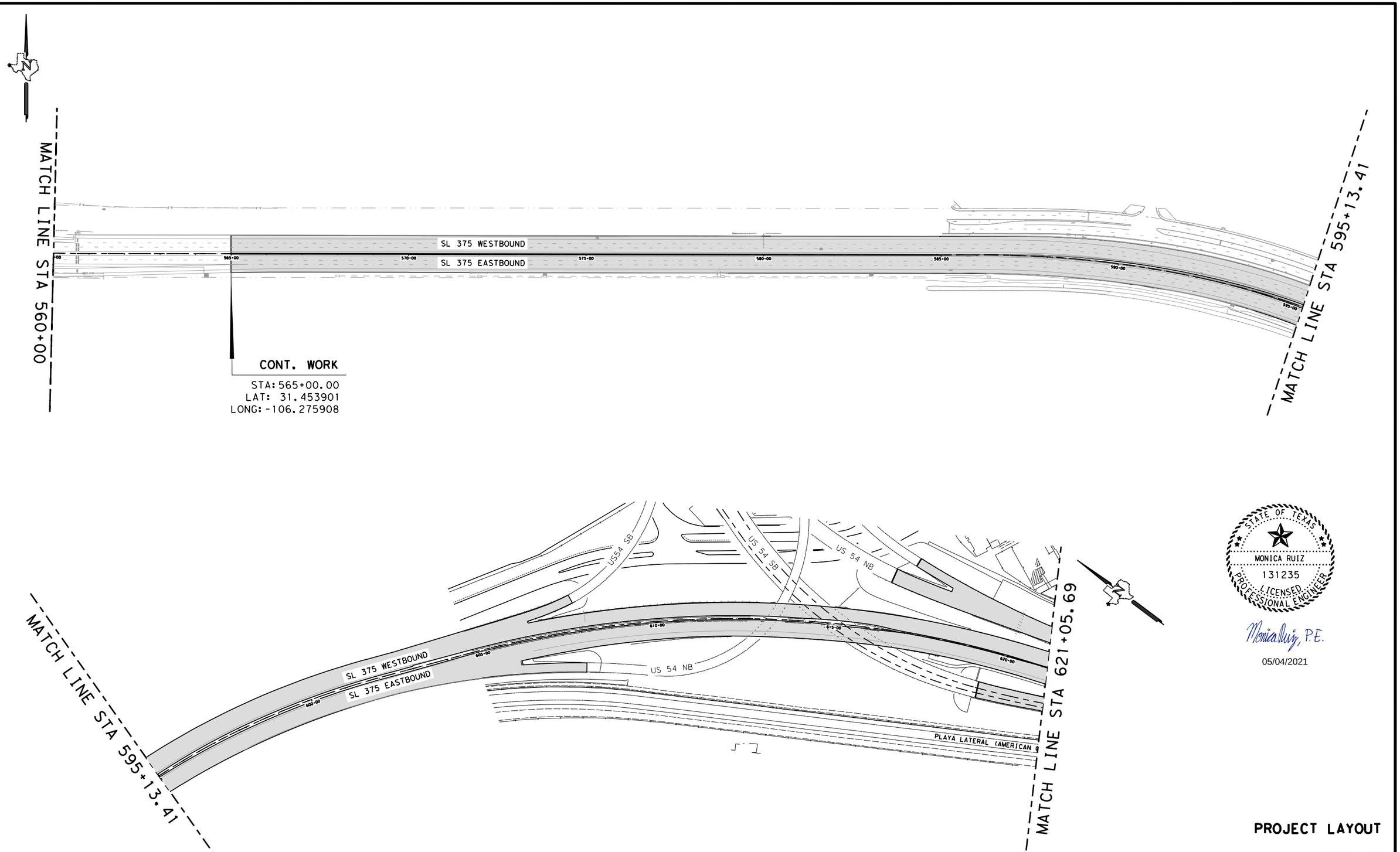

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED
PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

DATE:
FILE:

PROJECT LAYOUT

SHEET 2 OF 3

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL375
DIST	COUNTY		SHEET NO.
ELP	EL PASO		4

CK:
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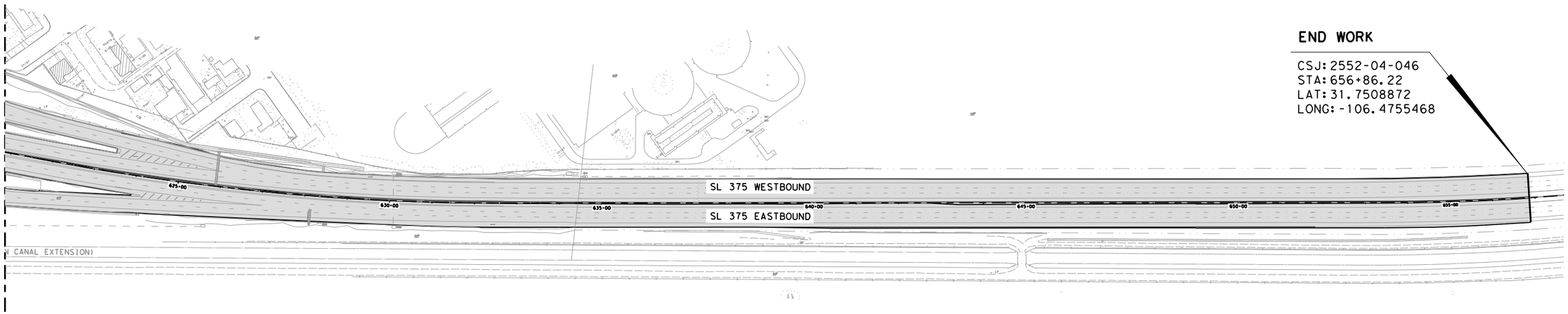
MATCH LINE STA 621+05.69



END WORK

CSJ: 2552-04-046
STA: 656+86.22
LAT: 31.7508872
LONG: -106.4755468

0 125 250

SCALE IN FEET

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED
PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

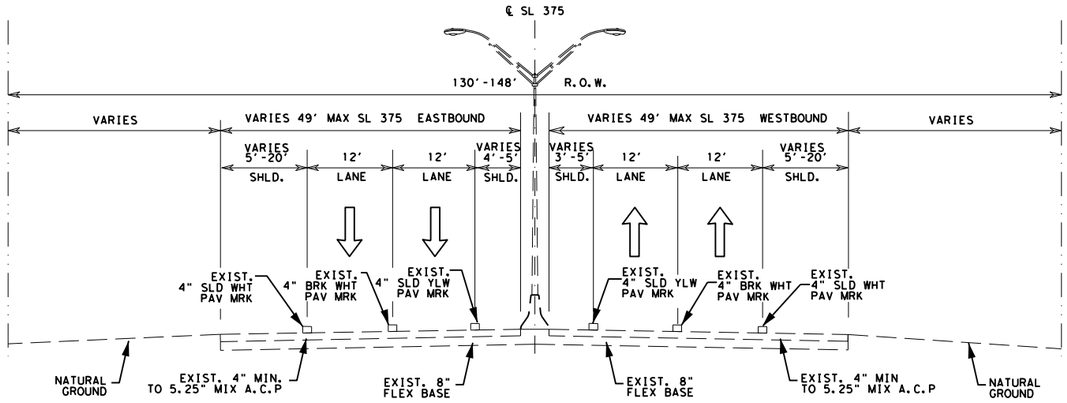
PROJECT LAYOUT

SHEET 3 OF 3

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL375
DIST	COUNTY		SHEET NO.
ELP	EL PASO		5

DATE:
FILE:



SL 375 EB EXISTING TYPICAL SECTION

STA: 500+87.00 TO 521+77.89
STA: 531+27.44 TO 540+47.06

SL 375 WB EXISTING TYPICAL SECTION

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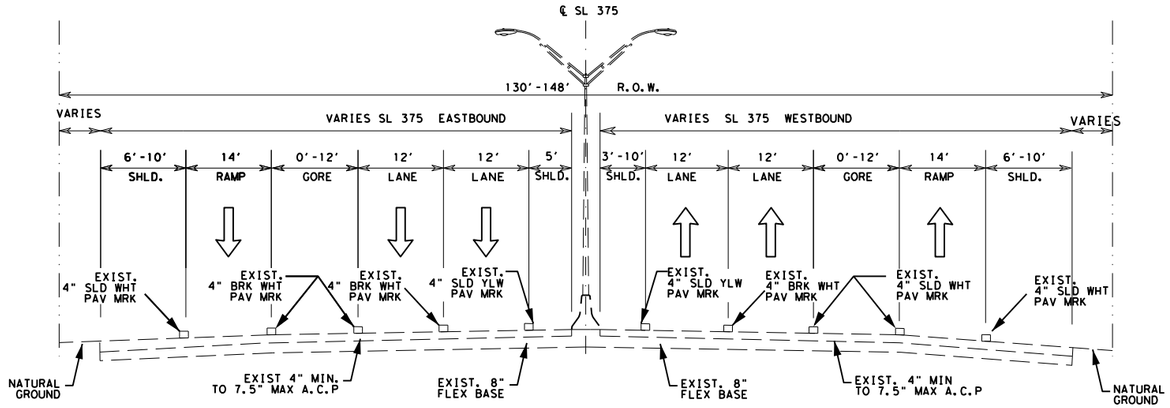
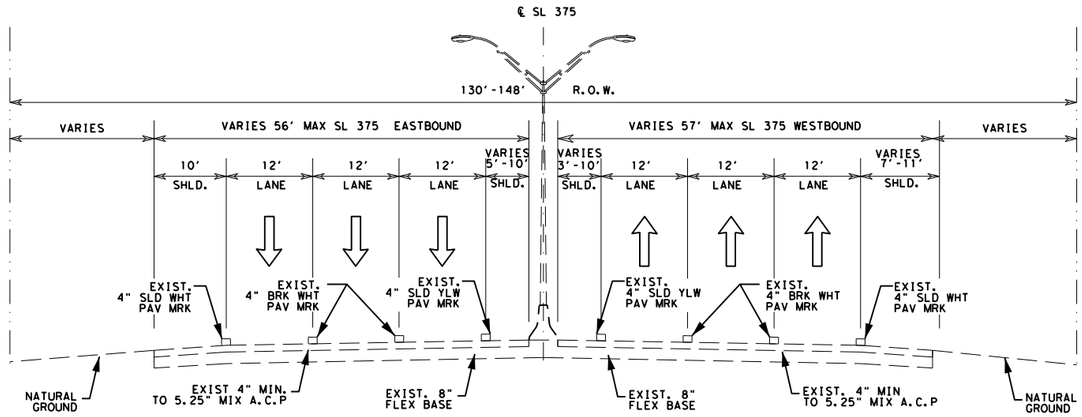


SL 375 EB EXISTING TYPICAL SECTION

STA: 551+32.59 TO 565+36.96
STA: 603+06.58 TO 627+01.34

SL 375 WB EXISTING TYPICAL SECTION

STA: 532+16.12 TO 540+47.06
STA: 551+32.53 TO 560+55.99
STA: 603+18.94 TO 626+01.79



SL 375 EB EXISTING TYPICAL SECTION

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STA: 627+01.34 TO 656+86.20

SL 375 WB EXISTING TYPICAL SECTION

STA: 560+55.99 TO 603+18.94
STA: 626+01.79 TO 656+86.20

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED
PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375
MILL & INLAY
GENERAL

EXISTING TYPICAL SECTIONS

SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL375
DIST	COUNTY		SHEET NO.
ELP	EL PASO		6

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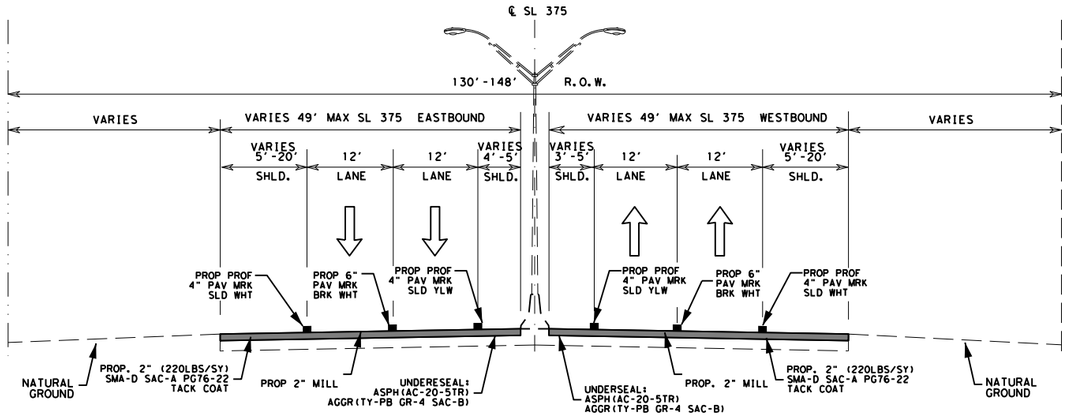
DW:
CK:
DN:

DATE:
FILE:

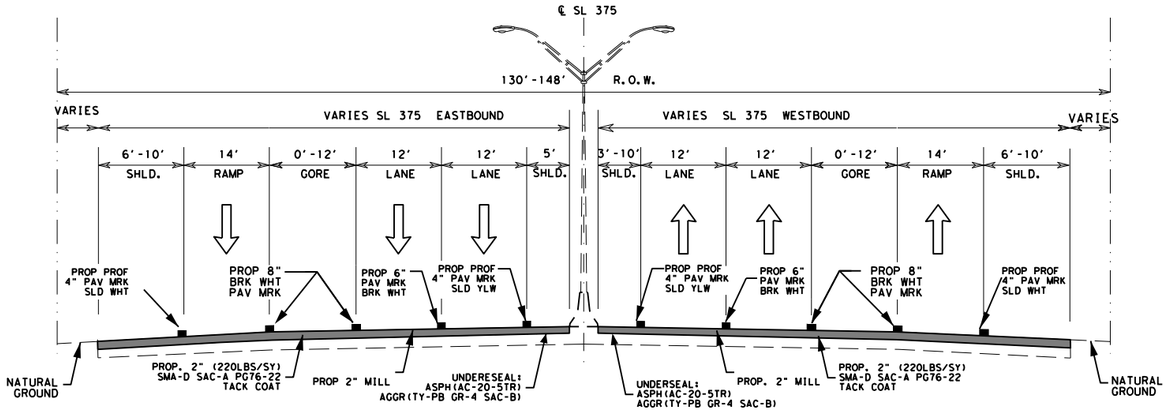


SL 375 EB PROPOSED TYPICAL SECTION

STA: 500+87.00 TO 521+77.89
STA: 531+27.44 TO 540+47.06

SL 375 WB PROPOSED TYPICAL SECTION

STA: 500+87.00 TO 521+77.89
STA: 531+27.44 TO 532+16.12

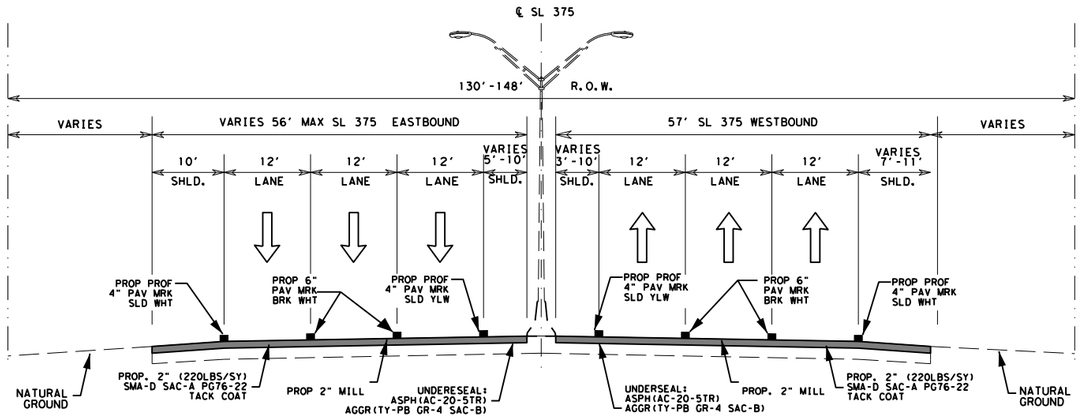


SL 375 EB PROPOSED TYPICAL SECTION

STA: 551+32.59 TO 565+36.96
STA: 603+06.58 TO 629+29.66

SL 375 WB PROPOSED TYPICAL SECTION

STA: 532+16.12 TO 540+47.06
STA: 551+32.53 TO 560+55.99
STA: 603+18.94 TO 626+01.79



SL 375 EB PROPOSED TYPICAL SECTION

STA: 565+36.96 TO 603+06.58
STA: 629+29.66 TO 656+86.20

SL 375 WB PROPOSED TYPICAL SECTION

STA: 560+55.99 TO 603+18.94
STA: 626+01.79 TO 656+86.20

NOTES:

1. REFER TO ROADWAY MISCELLANEOUS DETAILS FOR FLEXIBLE PAVEMENT STRUCTURE REPAIR LOCATIONS.
2. REFER TO PLAN LAYOUT SHEETS FOR MILL AND INLAY LIMITS.

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375
MILL & INLAY
GENERAL

PROPOSED TYPICAL SECTIONS

SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL375
DIST	COUNTY		SHEET NO.
ELP	EL PASO		7

CK:
DW:
CK:
DN:

DATE:
FILE:

********** GENERAL NOTES **********
2014 Specification Book

Specification Data

Table 1
Basis of Estimate

Item	Description	Rate
316	Asph (AC-20-5TR) Aggr (Ty-PB Gr-4 SAC-B)	0.40 gal./sq yd. 110 sq.yd/cu yd.
340	Dense-Graded Hot-Mix Asphalt Ty B(Small Quantity) (Flexible Pavement Structure Repair) Tack Coat (TRAIL)[2]	1 in. = 110 lb./sq.yd. 0.15 gal./sq.yd.
346	Stone-Matrix Asphalt SMA-D SAC-A PG 76-22 Tack Coat (TRAIL)[2]	1 in. = 110 lb./sq.yd. 0.15 gal/sq.yd.

1. Deviation from the rates shown will require approval.
2. Tack Coat to be applied to each layer as directed by the Engineer. Rate shown is based on the desired residual application of 0.10 gal./sq.yd.

GENERAL REQUIREMENTS

Maintain the entire project area in a neat and orderly manner throughout the duration of the work. Remove all construction litter and undesirable vegetation within the right of way inside the project limits. This work will be subsidiary to the various bid items.

General Project Description -This project consists of mil and inlay operations on SL 375, with flexible pavement base repairs, metal beam guard fence, pavement markings and signs.

TRAFFIC

Inform the Engineer and the respective utility companies, when it becomes apparent that the utility lines will interfere with the work in progress.

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

Mohammad Moabed, P.E.
West El Paso Area Engineer
Mohammad.Moabed@txdot.gov

Aldo Madrid, P.E.
Director of Construction
Aldo.Madrid@txdot.gov

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

All contractor questions will be reviewed by the Engineer. Once a response is developed, it will be posted to TxDOT's Public FTP at the following Address:

https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/

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

ITEM 4 – SCOPE OF WORK

Schedule and perform all work to assure proper drainage during the course of construction or maintenance operations. All labor, tools, equipment and supervision required, to ensure drainage, removal, and handling of water shall be considered incidental work.

ITEM 5 – CONTROL OF WORK

Keep traveled surfaces used in hauling operations clear and free of dirt or other material.

Existing pavement, utilities, structures, etc. damaged as a result of the operations will be repaired at no additional cost to the Department.

Protect from damage and destruction all areas of the right of way, which are not included in the actual limits of the proposed construction areas. Exercise care to prevent damage to trees, vegetation, and other natural features. Protect trees, shrubs, and other landscape features from abuse, marring, or damage within the actual construction and/or fenced protection areas designated for preservation. Restore any area disturbed or damaged to a condition "as good as" or "better than" prior to start of construction operation. This work will be at the Contractor's expense.

ITEM 7 – LEGAL RELATIONS AND RESPOSIBILITIES

Comply with all requirements of the Environmental Permits Issues and Commitments (EPIC) Sheet.

Do not discharge any liquid pollutant from vehicles onto the roadside. Immediately clean spills and dispose in compliance with local, state, and federal regulations to the satisfaction of the Engineer at no additional cost to the Department.

Occupational Safety & Health Administration (OSHA) regulations prohibit operations that bring people or equipment within 10 ft. of an energized electrical line. Where workers and/or equipment may be close to an energized electrical line, notify the electrical power company and make all necessary adjustments to ensure the safety of workers near the energized line.

Obtain any required traffic control permits from the City of El Paso when traffic control devices encroach City ROW or traffic control setup impacts City streets. The contractor shall be responsible for submitting a traffic control plan to the City of El Paso – Streets and Maintenance Department at tcp@elpasotexas.gov for review no later than two weeks prior to beginning of construction.

No significant traffic generator events identified.

LAW ENFORCEMENT PERSONNEL
Submit charge summary and invoices 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.

ITEM 8 – PROSECUTION AND PROGRESS

Working days will be calculated in accordance with Section 8.3.1., "Standard Workweek."

Contractor work activities will be limited to the allowed lane closure times defined as daytime hours of 9 A.M. to 4 P.M. Monday through Friday or nighttime hours of 9 P.M. to 5 A.M. Sunday through Thursday, unless otherwise directed by the Engineer.

SL375 work activities are required to be performed during nighttime hours or as directed by the Engineer.

Create and maintain a CPM schedule.

Submit baseline schedule and obtain approval prior to beginning construction. The monthly progress payment will be held if the monthly update is not submitted.

Provide a Project Schedule Summary Report on a monthly basis along with the monthly progress schedule.

ITEM 9 – MEASUREMENT AND PAYMENT

Monthly progress payments will be made for items of work completed by the 27th day of each month. Any work completed after the 27th will be included for payment in the subsequent monthly progress payment.

Submit Material on Hand (MOH) payment requests at least three (3) working days before the end of the month for payment consideration on that month's estimate.

When approved, provide uniformed, off-duty law enforcement officers with marked vehicles during work that requires a lane closure. The officer in marked vehicles shall be located as approved to monitor or direct traffic during the closure. The method used to direct traffic at signalized intersections shall be as approved. Additional officers and vehicles may be provided when approved or directed.

Complete the daily tracking form provided by the department and submit invoices that agree with the tracking form for payment at the end of each month approved services were provided.

Show proof of certification by the Texas Commission on Law Enforcement Standards.

All law enforcement personnel used in Work Zone Traffic Control shall be trained for performing duties in work zones and are required to take "Safe and Effective Use of Law Enforcement Personnel in Work Zones" (Course #133119) which can be found online at the following site: www.nhi.fhwa.dot.gov

Certificates of completion should be available to all who finish the course. These should be kept by the officers in order to substantiate completion when reporting to the work site.

Minimums, scheduling fees, etc. will not be paid; TxDOT will consider paying cancellation fees on a case by case basis.

ITEM 316 – SEAL COAT

Before applying the seal coat, protect all bridge armor and expansion joints, manhole and valve covers with paper or other suitable materials as directed by the Engineer.

Protect all existing bridges, curbs, and other exposed concrete surfaces within the limits of the project from asphalt materials by any method that is approved. Remove any excessive asphalt materials deposited on these surfaces at the Contractor's expense. During the application of the surface treatment, if existing conditions warrant, the lane widths, transitions, and intersection areas may be varied as directed.

The Engineer will approve asphalt and aggregate rates prior to application.

Prepare the roadway surface prior to placing asphalt to the satisfaction of the Engineer. Some areas may require more extensive cleaning than other areas. This work will not be paid for directly, but will be subsidiary to pertinent items.

Do not apply asphalt cement from September 16th to April 30th unless authorized in writing.

Surface treat existing intersections, curb widenings, and widened dipped sections plus any additional areas encountered during construction to conform to the existing surface. The limits are the right-of-way line or as directed.

Use AC-10 or PG 64-22 asphalt for pre-coating aggregate. The stripping characteristics of pre-coated aggregate must not exceed 10% when tested in accordance with Tex-530-C. Add asphalt antistripping agent (Liquid) only to the asphalt pre-coating the aggregate.

ITEM 340 – DENSE-GRADED HOT-MIX ASPHALT (SMALL QUANTITY)

Provide aggregates with a Surface Aggregate Classification (SAC) of "A" for all surface mixes. Provide aggregates with a minimum SAC of B for all other layers unless otherwise shown on the plans.

In place of typical tack materials shown in Table 18 under Item 300, use a tracking resistant asphalt interlayer (TRAIL) material as a tack coat. Approved TRAIL products are found on TxDOT's Material Producer List under Asphalt Interlayer (Tracking Resistant) through http://www.txdot.gov/business/resources/materials.html.

Do not dilute the tack coat.
Tack coat shall be applied to each layer as directed by the Engineer.

Hydrated Lime shall be added as an additive as per Item 301 “Asphalt Antistripping Agents” between the rates of 1% minimum and 2.0% maximum by weight. If the Hamburg Wheel Test cannot be met within these limits, Liquid Antistripping agents as approved by the Engineer may be used in conjunction with lime.

Supply Warm-Mix Asphalt (WMA) under this Item.

When Reclaimed Asphalt Pavement (RAP) is used in the production of hot-mix asphaltic concrete, use fractionated RAP. Do not exceed 10.0% of Fractionated RAP on surface mixtures.

Use of RAS is not allowed for any mixtures.

Substitute PG Binders (grade dumping) will not be allowed for any mixtures.

Obtain the current version of the templates at http://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/forms/site-manager.html. Submit electronically to the Engineer.

Design the mixture at 50 gyrations (Ndesign).

Do not cover with asphaltic material, any existing survey monuments, manholes, or valve covers, etc. Adjustments will be done in coordination with the respective utility owners.

Place a string line or other suitable marking to ensure smooth, neat lines, or as directed. Provide smooth transitions to existing driveways and intersections.
Place longitudinal joints approximately 6 in. from the broken striping, or as directed. Avoid placing joint under the wheel path.

Operate the spreading and finishing machine at a uniform forward speed consistent with the plant production rate, hauling capability, and roller train capacity to result in a continuous operation. The speed will be slow enough, so that stopping between trucks is not ordinarily required. If the Engineer determines non-uniform delivery of material is affecting the HMA placement, the Engineer may require the paving operations to cease until acceptable methods are employed to minimize starting and stopping of the paver.

Post vertical clearance signs and advanced warning clearance signs for structures at 3” below the measured minimum vertical clearance for each structure. Payment for this work, signs, and incidentals will be subsidiary to the pertinent bid items within this contract.

ITEM 346-STONE MATRIX ASPAHLT

Use Surface Aggregate Classification “A” material for all surface mixes.

In place of typical tack materials shown in Table 18 under Item 300, use a tracking resistant asphalt interlayer (TRAIL) material as a tack coat. Approved TRAIL products are found on TxDOT’s Material Producer List under Asphalt Interlayer (Tracking Resistant) through http://www.txdot.gov/business/resources/materials.html.

Do not dilute the tack coat.

Tack coat shall be applied to each layer as directed by the Engineer.

CONTROL: 2552-04-046

COUNTY: EL PASO

HIGHWAY: SL 375

Hydrated Lime shall be added as an additive as per Item 301 “Asphalt Antistripping Agents” between the rates of 1.0% minimum and 2.0% maximum by weight. If the Hamburg Wheel Test cannot be met within these limits, Liquid Antistripping agents as approved by the Engineer may be used in conjunction with lime.

Supply Warm-Mix Asphalt (WMA) under this Item.

When Reclaimed Asphalt Pavement (RAP) is used in the production of hot-mix asphaltic concrete, use fractionated RAP. Do not exceed 10.0% of Fractionated RAP on surface mixtures.

Use of RAS is not allowed for any mixtures.

Substitute PG Binders (grade dumping) will not be allowed for any mixtures.
Obtain the current version of the templates at http://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/forms/site-manager.html. Submit electronically to the Engineer.

Design the mixture at 50 gyrations (Ndesign).

Do not cover with asphaltic material, any existing survey monuments, manholes, or valve covers, etc. Adjustments shall be done in coordination with the respective utility owners.

Adjust or construct all manholes and valves to final pavement elevations prior to the final mat of ACP. If, between the final elevation adjustment and the final mat of ACP, the manholes and valves are going to be exposed to traffic, place temporary asphalt around the manhole and valve to provide a +/- 50:1 taper. The cost of elevation adjustment and the concrete apron around the manhole and valve will be part of the manhole and valve work. The asphalt tapers are part of the ACP work.

Place a string line or other suitable marking to ensure smooth neat lines, or as directed. Provide smooth transitions to existing driveways and intersections.

Provide a minimum of 40 ft skis during paving operations to ensure smooth final surface.

Place longitudinal joints approximately 6 in. from the broken striping, or as directed. Avoid placing under the wheel path.

Operate the spreading and finishing machine at a uniform forward speed consistent with the plant production rate, hauling capability, and roller train capacity to result in a continuous operation. The speed will be slow enough, so that stopping between trucks is not ordinarily required. If the Engineer determines non-uniform delivery of material is affecting the HMA placement, the Engineer may require the paving operations to cease until acceptable methods are employed to minimize starting and stopping of the paver.

Taper ACP placed at curb inlets, traffic inlets, and slotted drains as shown on plans.

Post vertical clearance signs and advanced warning clearance signs for structures at 3” below the measured minimum vertical clearance for each structure. Payment for this work, signs, and incidentals will be subsidiary to the pertinent bid items within this contract.

ITEM 351 – FLEXIBLE PAVEMENT STRUCTURE REPAIR

Provide eight (8) inches of D-GR HMA TY B PG 64-22 for all repairs. D-GR HMA TY B PG 64-22 will not be measured but will be subsidiary to Item 351, Flexible Pavement Structure Repair".

Field verify locations and quantities, These locations may vary as shown on the plans or as directed by the Engineer.

Square the sides of the repair area saw-cutting or other approved methods. Remove loose and foreign material. Clean and dry the repair area. Apply SS-1H as a prime coat at 0.15 gal/sy to surfaces of the repair area, unless otherwise directed.

Apply Tack coat (TRAIL) to all surfaces that will come in contact with the subsequent HMA placement at 0.10 gal/sy of residual asphalt, unless otherwise directed.

Use of a motor grader will not be permitted unless otherwise directed by the Engineer.
Place repair material in horizontal lifts no more than four (4) inches deep. Finish to grade and compact to conform to roadway surface. Compact with hand tamp, mechanical tampers, or rollers as directed or approved. Compact to achieve full consolidation.

Repair pavement edges to the line and grade of original pavement. Clean roadway surface after repair operations. Dispose of materials removed as directed or approved.

ITEM 354 – PLANE ASPH CONC PAVEMENT

The Department will retain ownership of planed materials. Coordinate with El Paso West Area Maintenance Office for the delivery and stockpiling of the milled materials.

ITEM 432 – RIPRAP

Wire mesh and fibers for concrete will not be allowed on this project for this Item. Reinforce all concrete riprap using bar reinforcement conforming to Item 440, "Reinforcement for Concrete," as shown on the plans, or as directed.
Finish concrete riprap with a smooth (wood float) finish, unless otherwise directed.
Obtain approval for all stone riprap material sources.

ITEM 500 – MOBILIZATION

The Contractor will be paid in accordance with the associated Item based work performed. This will fully compensate the Contractor for all associated activities.

ITEM 502 – BARRICADES, SIGNS, AND TRAFFIC HANDLING

Prior to beginning construction, the Engineer will approve the routing of traffic and sequence of work.

Additional signs and barricades, placed as directed, will be considered subsidiary to this Item.

In accordance with Section 7.2.6.1, designate, in writing, a Contractor Responsible Person (CRP) and a CRP alternate to take full responsibility for the set-up, maintenance, and necessary corrective measures of the traffic control plan. The CRP or CRP alternate must be present at site and implement the initial set up of every traffic control phase/stage, at each location, and/or each call out, for the entire duration of the project.

At the written request of the Engineer, immediately remove the CRP or CRP alternate from the project if, in the opinion of the Engineer, is not competent, not present at initial TCP set-ups, or does not perform in a proper, skillful, or safe manner. These individuals shall not be reinstated without written consent of the Engineer.

CRP and CRP alternate must be trained using Department approved training. Provide a copy of the certificate of completion to the Engineer for project records. Refer to Table 1 or Department approved Training.

Table 1
Contractor Responsible Person and Alternate

Provider	Course Number	Course Title	Duration	Notes
American Traffic Safety Services Association	TCS	Traffic Control Supervisor	2 days	
National Highway Institute	133112 133113	Design and Operation of Work Zone Traffic Control Work Zone Traffic Control for Maintenance Operations	1 day 1 day	Both courses are required to meet minimum required training.
Texas Engineering Extension Services	133112A	Design and Operation of Work Zone Traffic Control	3 days	
University of Texas Arlington Division for Enterprise Development	WKZ421	Traffic Control Supervisor	16 hours	Contact UTA for training needs.

All contractor workers involved with the traffic control implementation and maintenance must participate and complete a Department approved training course. Provide a copy of the certificate of completion to the Engineer for project records. Refer to Table 2 for Department approved training.

Table 2
Other Work Zone Personnel

Provider	Course Number	Course Title	Duration	Notes
American Traffic Safety Services Association	TCT	Traffic Control Technician	1 day	
Texas Engineering Extension Services	HWS002	Work Zone Traffic Control	16 hours	Identical to HWS-410. Counts for 3 year CRP requirement.
National Highway Institute	133116	Maintenance of Traffic for Technicians	5 hours	Web based
National Highway Institute	134109-I	Maintenance Training Series: Basics of Work Zone Traffic Control	1 hour	Free, Web based
University of Texas at Arlington, Division for Enterprise Development	WKZ100	Work Zone Safety: Temporary Traffic Control	4 hours	Note name change. Free, Web based
TxDOT/AGC Joint Development	N/A	Safe Workers Awareness Highway Construction Work Zone Hazards	16 minutes 18 minutes	Videos available through AGC of Texas offices. English & Spanish
AGC America	N/A	Highway Work Zone Safety Training	1 day	
Texas Engineering Extension Service	HWS400	Temporary Traffic Control Worker	4 hours	Contact TEEX, if interested in course
TxDOT/AGC Joint Development	N/A	Work Zone Fundamentals	10 minutes	Videos available through ACT of Texas offices. English & Spanish

Contractor may choose to train workers involved with the traffic control implementation and maintenance with a contractor developed training in lieu of Department approved training. Contractor developed training must be equivalent to the Department approved training shown in Table 2. Provide the Engineer a copy of the course curriculum for pre-approval, prior to conducting the contractor developed training. Provide the Engineer a copy of the log of attendees after training completion for project records.

Existing regulatory signs, route marker auxiliaries, guide signs, and warning signs that must be removed due to widening shall be relocated temporarily and erected on approved supports at locations shown in the plans, or as directed. This work will not be paid for directly, but considered subsidiary to this Item.

Notify the Department officials when major traffic changes are to be made, such as detours. Coordinate with the Department on all traffic changes. Advance notification for the following week's work must be made by 5 P.M. on Wednesdays. Coordinate with the District Public Information Officer as well as emergency services for mainlane and ramp closures to provide advance notice to public.

If Law Enforcement Personnel is required by the Engineer, coordinate with local law enforcement as directed or agreed. Complete the weekly tracking form provided by the Department and submit invoices with 5% allowance for Law Enforcement payments by Contractor that agree with the tracking form for payment at the end of each month where approved services were provided.

Provide access to intersecting side roads and driveways at all times, unless otherwise directed.
Any approved change to the sequence of work or TCP, must be signed and sealed by a Contractor's Licensed Professional Engineer assuming full responsibility for any additional barricade signs and devices needed.

Use striping operations to channelize traffic into the newly completed roadway, as directed. Maintain shoulders and median areas in a condition capable of serving as emergency paths, as approved. This work will be subsidiary to this Item.

Use portable changeable message signs (PCMS) to alert public of construction two weeks prior to construction.
Place and maintain sufficient additional warning signs, beacons, delineators, and barricades to warn and guide the public of all hazards through the construction zone at all times, and as directed.

Use flashing arrow boards on all tapers for each lane closure.

Some signs, barricades, and channelization devices may not be shown at the precise or measured position. Place the barricades, devices, or signs, with approval, in positions to meet field conditions.
Fill any holes left by barricade or sign supports and restore the area to its original condition.

Use Type A flashing warning lights or delineators to mark open excavation, footings, foundations, or other obstructions near lanes that may be open to traffic, as directed.

For additional information pertaining to channelization, signing, spacing details, and flagging procedures required to regulate, warn, and guide traffic through project, refer to the "Barricade and Construction Standards," BC(1)-14 and to the current *Texas Manual on Uniform Traffic Control Devices(TMUTCD).*

Remove or cover signs that do not apply to current conditions at the end of each day's work.
Repair and/or replace all signs damaged by the public or due to weather events.

SAFETY CONTINGENCY

The contractor Force Account "Safety Contingency" that has been established for this project is intended to be utilized for work zone enhancement, to improve the effectiveness of the TCP 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.

ITEM 506 – TEMPORARY EROSION, SEDIMENTATION, AND ENVIRONMENTAL CONTROLS

Place Best Method Practices (BMP's) in locations as designated in the plans or as directed to meet field conditions.
Place rain gauge(s) at locations as designated.

The total disturbed area for this project is 0 acres. Establish the authorization requirements for Storm Water Discharges for soil disturbed area in this project, all project locations in the Contract, and Contractor Project Specific Locations

Locations (PSLs), within one mile of the project limits. Both the Department and the Contractor shall obtain an authorization to discharge storm water from TCEQ for the construction activities shown on the plans. Obtain required authorization from the TCEQ for any Contractor PSLs for construction support activities on or off right of way.

Best Method Practices (BMP's) may be adjusted to meet field conditions, or as directed. The Engineer will verify all locations prior to placement of BMPs. Maintain and properly place the erosion control measures to prevent storm water pollution to the Waters of the United States, as directed. Within the project limits, keep all inlets functional as long as possible to accept storm water as part of the Storm Water Pollution Prevention Plan (SWP3), as directed.
Grading operations will be limited to the catch point of the proposed cross-section.

Preserve any vegetation outside these limits.

ITEM 540 – METAL BEAM GUARD FENCE

Provide composite blockouts for all Metal Beam Guard Fence (MBGF) posts.
Install guardrails in the direction of traffic flow.

Stake the locations for approval prior to beginning the installation of the proposed MBGF.
Remove all delineators and object markers associated with the MBGF. This work will be subsidiary to the various bid items.

Verify MBGF post lengths and heights prior to ordering materials.
Place reflectors, as per Delineator and Pavement Marker Standard sheet D&OM (1)-20 on the metal beam rail element or as directed. This work will not be paid for directly but will be considered subsidiary to pertinent items.

At the end of each work day, protect all untreated, incomplete, MBGF/Rail blunt ends exposed to traffic flow during construction until the permanent end treatment is in place. All work and incidentals are considered subsidiary to this Item.

MBGF not used will become the property of the Contractor.

ITEM 544 –GUARDRAIL END TREATMENTS

Provide certifications from the approved manufacturer's online training for all personnel installing end treatments prior to beginning work.

ITEM 585 – RIDE QUALITY FOR PAVEMENT SURFACES

RIDE QUALITY FOR EXISTING SURFACE:
Measure the ride quality on the existing riding surface, after the flexible pavement base repairs have been performed Use a certified profiler operator from the Department's MPL. When requested, furnish the Engineer documentation for the person certified to operate the profiler. Provide all profile data to the Engineer in electronic data files within 24 hours of the ride quality using the format specified in Tex-1001-S. The Engineer will use Department software to evaluate longitudinal profiles to determine areas requiring corrective action. Correct any 0.1-mi. section with an average IRI over 95.0 in. per mile. Correct the deficient section to an IRI of 65 in. per mile or less.

Use item 354-6134 PLANE ASPH CONC (0" TO ½" MICRO) to correct bumps. Use item 340-6242 D-GR HMA (SQ) TY-D LEVEL UP to correct dips identified with the Ride Quality. These operations shall be performed after milling the top 2 inches of existing surface and prior to the placement of the underseal and the final 2" of SMA. The work performed, materials furnished, certification and recertification, traffic control for all testing, and materials will not be measured or paid for directly but will be subsidiary to pertinent items.

Reprofile the corrected area, and provide results that show the corrective action was successful. If the corrective action is not successful, the Engineer will require continued corrective action.

The contractor shall take care to ensure satisfactory profile results in the intermediate paving layers (mixture) to eliminate corrective action for excessive deviations in the final surface layers.

RIDE QUALITY FOR FINAL RIDING SURFACE SMA TY-D
Use Surface Test Type B to evaluate ride quality for the final riding surface. Notify the District Laboratory 48 hours prior to conducting Surface Test Type B. Properly mark all starting/ending points, and leave-out sections prior to testing. Deliver test results within 24 hours of testing. Provide all profile measurements in electronic data to ELP-LAB@txdot.gov using the format specified in Tex-1001-S.

"Payment Adjustment, Schedule 1" will be used for the travel lanes.
An IRI > 95 will require corrective action.

Use diamond grinding or equivalent to correct areas of localized roughness. For flexible pavements, use CSS-1H emulsion to fog seal the corrected areas. This work will not be compensated directly, but will be subsidiary to the SMA item.

Milling will not be allowed as a corrective action for excessive deviations in the surface layer of hot mix.

ITEM 644 – SMALL ROADSIDE SIGN ASSEMBLIES

Stake all sign locations and receive approval prior to sign placement.
The 2-1/2 inch, Schedule 10 post will meet the following requirements:

- 0.120 in. nominal wall thickness
- Seamless or electric-resistance welded steel tubing or pipe
- Steel will be HSLAS Grade 55 per ASTM A1011 or ASTM A1008

Other steel may be used, if it meets the following:

- 55,000 psi minimum yield strength
- 70,000 psi minimum tensile strength
- 20% minimum elongation in 2 in.
- Wall thickness (uncoated) to be within the range of 0.108 in. to 0.132 in. galvanization per ASTM A123 or ASTM A653 G90

For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metalizing with zinc wire per ASTM B833.

Verify all post lengths to ensure the proper sign height. Remove and replace any sign installed incorrectly. This work will be done at no expense to the Department.

Provide Texas Universal Triangular Slip Base Bolt clamp type for all signs as shown on SMD (Slip-1)-08.
As directed, some regulatory and guide signs will be relocated before construction begins. Mark and locate each reference marker perpendicular to the road and along the right of way, or as directed, prior to removal. Re-erect reference markers at their original location upon completion of construction.

All signs removed will remain property of the Department.

ITEM 658 – DELINEATOR AND OBJECT MARKER ASSEMBLIES

Verify all locations with the Engineer prior to installation.

Removal and proper disposal of all existing delineators, object markers, and any non-standard hardware assemblies are not paid directly, but will be considered subsidiary to pertinent items for payment.

ITEM 662 – WORK ZONE PAVEMENT MARKINGS

In those areas where existing pavement markings are to be covered or removed, field locate and record the existing pavement markings by survey or other approved method by the Engineer as directed. Place final striping on these locations.

Remove and properly dispose of tabs upon completion of the final striping. This work is considered subsidiary to various bid items.

Place tabs as per the Department's Standard sheet TCP (7-1)-13. Place raised pavement markers in accordance with applicable standards and as directed.

ITEM 672 – RAISED PAVEMENT MARKERS

Use a pilot line for final striping and remove pilot line after all striping is complete. Removal will be in accordance with the methods specified in Item 677, "Eliminating Existing Pavement Markings and Markers," and will be subsidiary to this Item.

Air blasting is required for pavement surface preparation.

Furnish adhesives that conform to DMS-6100, "Epoxies and Adhesives," and DMS-6130, "Bituminous Adhesive for Pavement Markers," for this Item.

Do not place raised pavement markers when the pavement surface temperature is below 60°F.
Removal of all existing raised pavement markers will be considered subsidiary to the various bid items.

ITEM 6001-"PORTABLE CHANGEABLE MESSAGE SIGN"

Provide six Portable Message Signs (PMS). Use PMS as advanced notification for two weeks prior to beginning project and throughout duration of project as directed.

ITEM 6185 – TRUCK MOUNTED ATTENUATOR (TMA) AND TRAILER ATTENUATOR (TA)

All TMA Operators must participate in a TMA workshop to be conducted by the El Paso District Safety Office, on the proper use of TMAs, prior to working on Department Right of Way (ROW). A certificate of completion will be issued to TMA Operators that successfully complete the TMA workshop. The certificate of completion must be carried by TMA Operators at all times while working on Department right of way.
Acquire the TCP and TMA Operator's certificates of completion prior to the authorization to begin work. No time suspension will be granted and no traffic control work will be allowed without certificates of completion.
Up to (3) total shadow vehicles with TMA will be required for this type of work. Refer to Table 4A and Table 4B for basis of estimate for Stationary TMAs and Mobile TMAs. The contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMAs needed for the project.
The supporting vehicle for the TMA shall have a minimum gross (i.e., ballasted) vehicular weight of 19,000 pounds.

Basis of Estimate for Stationary TMAs				
		TMA(Stationary)		
Work	Standard	Required	Additional	TOTAL
Flexible Pavement Base Repairs	TCP (1-5)-18	1	0	1
Mill, Underseal, Overlay	TCP (1-5)-18	1	0	1
MBGF and Signs	TCP (6-1)-18	1	0	1

	Basis of Estimate for Mobile TMAs			
		TMA(Mobile)		
Work	Standard	Required	Additional	TOTAL
Striping	TCP (3-2)-13	3	0	3
RPM	TCP (3-2)-13	3	0	3

QUANTITY SHEET

CONTROLLING PROJECT ID 2552-04-046 **DISTRICT** El Paso **COUNTY** El Paso
HIGHWAY SL 375

		CONTROL SECTION JOB		**2552-04-046**		TOTAL EST.	TOTAL FINAL
		PROJECT ID		**A00059433**			
		COUNTY		**El Paso**			
		HIGHWAY		**SL 375**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	104-6009	REMOVING CONC (RIPRAP)	SY	1,175.000		1,175.000	
	316-6017	ASPH (AC-20-5TR)	GAL	56,481.000		56,481.000	
	316-6224	AGGR(TY-PB GR-4 SAC-B)	CY	1,290.000		1,290.000	
	340-6246	D-GR HMA (SQ) TY-D PG64_22(LEVEL-UP)	TON	481.000		481.000	
	340-6272	TACK COAT	GAL	1,311.000		1,311.000	
	346-6014	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	TON	15,536.000		15,536.000	
	346-6058	TACK COAT	GAL	21,182.000		21,182.000	
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY	15,560.000		15,560.000	
	354-6045	PLANE ASPH CONC PAV (2")	SY	141,191.000		141,191.000	
	354-6134	PLANE ASPH CONC PAV (0" TO 1/2" MICRO)	SY	2,595.000		2,595.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	135.000		135.000	
	500-6001	MOBILIZATION	LS	100.00%		100.00%	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	6.000		6.000	
	506-6040	BIODEG EROSN CONT LOGS (INSTL) (8")	LF	4,120.000		4,120.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	4,120.000		4,120.000	
	540-6002	MTL W-BEAM GD FEN (STEEL POST)	LF	6,866.000		6,866.000	
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	23.000		23.000	
	540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	15.000		15.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF	7,371.000		7,371.000	
	542-6002	REMOVE TERMINAL ANCHOR SECTION	EA	9.000		9.000	
	542-6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA	17.000		17.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	10.000		10.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA	10.000		10.000	
	636-6007	REPLACE EXISTING ALUMINUM SIGNS(TY A)	SF	112.000		112.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	11.000		11.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	28.000		28.000	
	644-6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	10.000		10.000	
	644-6050	IN SM RD SN SUP&AM TYS80(2)SA(P)	EA	6.000		6.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	65.000		65.000	
	658-6013	INSTL DEL ASSM (D-SW)SZ (BRF)CTB	EA	306.000		306.000	
	658-6026	INSTL DEL ASSM (D-SY)SZ (BRF)CTB	EA	781.000		781.000	
	658-6027	INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI)	EA	434.000		434.000	
	658-6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	376.000		376.000	
	658-6064	INSTL DEL ASSM (D-SY)SZ 1(BRF)GF2	EA	34.000		34.000	
	662-6060	WK ZN PAV MRK REMOV (W)4"(BRK)	LF	8,623.000		8,623.000	
	662-6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	33,427.000		33,427.000	
	662-6072	WK ZN PAV MRK REMOV (W)12"(LNDP)	LF	2,390.000		2,390.000	

QUANTITY SHEET

CONTROLLING PROJECT ID 2552-04-046 **DISTRICT** El Paso **COUNTY** El Paso
HIGHWAY SL 375

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**2552-04-046**			
		PROJECT ID		**A00059433**			
		COUNTY		**El Paso**			
		HIGHWAY		**SL 375**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	662-6073	WK ZN PAV MRK REMOV (W)12"(SLD)	LF	2,558.000		2,558.000	
	662-6082	WK ZN PAV MRK REMOV (W)(ENTR GORE)	EA	2.000		2.000	
	662-6083	WK ZN PAV MRK REMOV (W)(EXIT GORE)	EA	4.000		4.000	
	662-6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	33,518.000		33,518.000	
	666-6006	REFL PAV MRK TY I (W)4"(DOT)(100MIL)	LF	208.000		208.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	7,585.000		7,585.000	
	666-6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	2,390.000		2,390.000	
	666-6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	2,558.000		2,558.000	
	666-6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	6.000		6.000	
	666-6057	REFL PAV MRK TY I(W)(DBL ARROW)(100MIL)	EA	3.000		3.000	
	666-6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	6.000		6.000	
	666-6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	2.000		2.000	
	666-6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	3.000		3.000	
	666-6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	8,623.000		8,623.000	
	666-6342	REF PROF PAV MRK TY I(W)4"(SLD)(100MIL)	LF	34,549.000		34,549.000	
	666-6345	REF PROF PAV MRK TY I(Y)4"(SLD)(100MIL)	LF	34,661.000		34,661.000	
	668-6115	PREFAB PAV MRK TY C (MULTI) (SHIELD)	EA	13.000		13.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	1,252.000		1,252.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	28,090.000		28,090.000	
	678-6001	PAV SURF PREP FOR MRK (4")	LF	69,417.000		69,417.000	
	678-6002	PAV SURF PREP FOR MRK (6")	LF	8,628.000		8,628.000	
	678-6004	PAV SURF PREP FOR MRK (8")	LF	7,585.000		7,585.000	
	678-6006	PAV SURF PREP FOR MRK (12")	LF	4,746.000		4,746.000	
	678-6009	PAV SURF PREP FOR MRK (ARROW)	EA	6.000		6.000	
	678-6010	PAV SURF PREP FOR MRK (DBL ARROW)	EA	3.000		3.000	
	678-6016	PAV SURF PREP FOR MRK (WORD)	EA	6.000		6.000	
	678-6017	PAV SURF PREP FOR MRK (ENTR GORE)	EA	3.000		3.000	
	678-6018	PAV SURF PREP FOR MRK (EXIT GORE)	EA	4.000		4.000	
	678-6025	PAV SURF PREP FOR MRKS (SHIELD)	EA	13.000		13.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	56.000		56.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	6.000		6.000	
	6185-6002	TMA (STATIONARY)	DAY	138.000		138.000	
	6185-6003	TMA (MOBILE OPERATION)	HR	480.000		480.000	
	08	LAW ENFORCEMENT	LS	1.000		1.000	
		SAFETY CONTINGENCY (NON-PART)	LS	1.000		1.000	
		EROSION CONTROL MAINTENANCE (NON-PART)	LS	1.000		1.000	

GRADING SUMMARY												
	104-6009	316-6017	316-6224	340-6246	340-6272	346-6014	346-6058	351-6004	354-6045	354-6134	432-6045	540-6002
SHEET NO.	REMOVING CONC (RIPRAP)	ASPH (AC-20-5TR)	AGGR(TY-PB GR-4 SAC-B)	D-GR HMA (SQ) TY-D PG64-22(LEVEL-UP)	TACK COAT	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	TACK COAT	FLEXIBLE PAVEMENT STRUCTURE REPAIR(87)	PLANE ASPH CONC PAV (2")	PLANE ASPH CONC PAV (0" TO 1/2" MICRO)	RIPRAP (MOW STRIP)(4 IN)	MTL W-BEAM GD FEN (STEEL POST)
CSJ: 2552-04-046	SY	GAL	CY	TON	GAL	TON	GAL	SY	SY	SY	CY	LF
SL 375												
PLAN LAYOUT 01	0	3,087	71	0	0	849	1,158	0	7,717	0	0	0
PLAN LAYOUT 02	222	3,803	87	0	0	1,046	1,426	0	9,506	51	25	947
PLAN LAYOUT 03	33	827	19	0	0	228	310	211	2,066	0	4	66
PLAN LAYOUT 04	18	2,838	65	0	0	781	1,064	109	7,093	0	2	13
PLAN LAYOUT 05	0	0	0	0	0	0	0	0	0	0	0	0
PLAN LAYOUT 06	18	2,267	52	0	0	624	850	1,320	5,667	0	2	38
PLAN LAYOUT 07	0	6,778	155	0	0	1,864	2,542	3,273	16,945	0	0	663
PLAN LAYOUT 08	0	4,712	108	0	0	1,296	1,767	2,695	11,779	0	0	813
PLAN LAYOUT 09	47	6,115	139	0	0	1,682	2,293	2,812	15,286	0	6	58
PLAN LAYOUT 10	494	6,178	141	0	0	1,699	2,317	2,031	15,445	0	57	1,805
PLAN LAYOUT 11	284	8,572	195	0	0	2,358	3,215	3,109	21,429	0	32	2,037
PLAN LAYOUT 12	0	7,396	169	0	0	2,034	2,774	0	18,489	0	0	426
PLAN LAYOUT 13		3,908	89	481	1,311	1,075	1,466	0	9,769	2,544	0	0
US 54												
PLAN LAYOUT 01	59	0	0	0	0	0	0	0	0	0	7	0
TOTAL	1,175	56,481	1,290	481	1,311	15,536	21,182	15,560	141,191	2,595	135	6,866

GRADING SUMMARY												
	540-6006	540-6016	542-6001	542-6002	542-6004	544-6001	544-6003	658-6013	658-6026	658-6027	658-6061	658-6064
SHEET NO.	MTL BEAM GD FEN TRANS (THRIE-BEAM)	DOWNSTREAM ANCHOR TERMINAL SECTION	REMOVE METAL BEAM GUARD FENCE	REMOVE TERMINAL ANCHOR SECTION	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	GUARDRAIL END TREATMENT (INSTALL)	GUARDRAIL END TREATMENT (REMOVE)	INSTL DEL ASSM (D-SW)SZ (BRF)CTB	INSTL DEL ASSM (D-SY)SZ (BRF)CTB	INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI)	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	INSTL DEL ASSM (D-SY)SZ 1(BRF)GF2
CSJ: 2552-04-046	EA	EA	LF	EA	EA	EA	EA	EA	EA	EA	EA	EA
SL 375												
PLAN LAYOUT 01	0	0	0	0	0	0	0	92	46	23	0	0
PLAN LAYOUT 02	1	0	967	0	1	0	0	61	55	28	24	0
PLAN LAYOUT 03	1	0	80	0	1	0	0	51	60	30	12	0
PLAN LAYOUT 04	1	1	0	0	0	0	0	18	55	28	39	1
PLAN LAYOUT 05	0	0	0	0	0	0	0	53	55	28	12	0
PLAN LAYOUT 06	3	3	0	0	0	0	0	16	75	38	34	0
PLAN LAYOUT 07	0	1	663	1	0	1	1	0	75	38	55	0
PLAN LAYOUT 08	0	0	813	0	0	1	1	0	50	25	46	0
PLAN LAYOUT 09	1	4	66	3	0	1	1	12	60	47	44	4
PLAN LAYOUT 10	6	2	1,979	2	5	4	4	3	65	56	45	29
PLAN LAYOUT 11	2	3	2,256	3	2	2	2	0	70	35	54	0
PLAN LAYOUT 12	0	0	547	0	0	1	1	0	75	38	11	0
PLAN LAYOUT 13	0	0	0	0	0	0	0	0	40	20	0	0
US 54												
PLAN LAYOUT 01	8	1	0	0	8	0	0	0	0	0	0	0
TOTAL	23	15	7,371	9	17	10	10	306	781	434	376	34

GRADING SUMMARY

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		10

DATE: 5/3/2021 9:00:07 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT5\Documents\24 - ELP\Design Projects\255204046\4 - Design\Plan Set\1. General\010 SL375 Quantity Sheet.dgn

TRAFFIC CONTROL SUMMARY												
	502-6001	662-6060	662-6063	662-6072	662-6073	662-6082	662-6083	662-6095	6001-6001	6001-6002	6185-6002	6185-6003
SHEET NO.	BARRICADES, SIGNS AND TRAFFIC HANDLING	WK ZN PAV MRK REMOV (W14"(BRK)	WK ZN PAV MRK REMOV (W14"(SLD)	WK ZN PAV MRK REMOV (W12"(LNDP)	WK ZN PAV MRK REMOV (W12"(SLD)	WK ZN PAV MRK REMOV (W(ENTR GORE)	WK ZN PAV MRK REMOV (W(EXIT GORE)	WK ZN PAV MRK REMOV (Y14"(SLD)	PORTABLE CHANGEABLE MESSAGE SIGN	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)	TMA (MOBILE OPERATION)
CSJ: 2552-04-046	MO	LF	LF	LF	LF	EA	EA	LF	DAY	EA	DAY	HR
SL 375												
PLAN LAYOUT 01	0	455	1,826	0	0	0	0	1,826	0	0	0	0
PLAN LAYOUT 02	0	550	2,200	0	0	0	0	2,200	0	0	0	0
PLAN LAYOUT 03	0	596	2,384	0	151	0	0	2,381	0	0	0	0
PLAN LAYOUT 04	0	550	2,192	0	0	0	0	2,200	0	0	0	0
PLAN LAYOUT 05	0	550	2,199	0	0	0	1	2,199	0	0	0	0
PLAN LAYOUT 06	0	750	2,958	202	600	0	0	3,001	0	0	0	0
PLAN LAYOUT 07	0	750	3,000	750	0	0	0	3,000	0	0	0	0
PLAN LAYOUT 08	0	501	2,002	523	0	0	0	2,002	0	0	0	0
PLAN LAYOUT 09	0	600	2,404	256	600	1	1	2,542	0	0	0	0
PLAN LAYOUT 10	0	743	4,037	0	353	0	1	4,052	0	0	0	0
PLAN LAYOUT 11	0	829	3,656	123	854	1	1	3,546	0	0	0	0
PLAN LAYOUT 12	0	1,125	3,000	375	0	0	0	3,000	0	0	0	0
PLAN LAYOUT 13	6	624	1,569	161	0	0	0	1,569	56	6	138	480
TOTAL	6	8,623	33,427	2,390	2,558	2	4	33,518	56	6	138	480

DATE: 5/25/2021 11:23:04 AM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT5\Documents\24 - ELP\Design Projects\255204046\4 - Design\Plan Set\1. General\010 SL375 Quantity Sheet.dgn

TRAFFIC CONTROL SUMMARY

SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		11

SUMMARY OF SIGNING, PAVEMENT MARKING & SWP3							
	506	506	636	644	644	644	644
	6040	6043	6007	6001	6004	6030	6050
	BILOGOS INSTALL	BIOLOG REMOV	REPLACE EXISTING ALUMINUM SIGNS(TY A)	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	IN SM RD SN SUP&AM TYS80(1)SA(T)	IN SM RD SN SUP&AM TYS80(2)SA(P)
	LF	LF	SF	EA	EA	EA	EA
SL375							
PAVEMENT MARKING LAYOUT 1 OF 13	360	360	0	2	0	1	0
PAVEMENT MARKING LAYOUT 2 OF 13	390	390	0	1	1	0	0
PAVEMENT MARKING LAYOUT 3 OF 13	0	0	0	0	3	2	0
PAVEMENT MARKING LAYOUT 4 OF 13	970	970	14	5	6	0	1
PAVEMENT MARKING LAYOUT 5 OF 13	0	0	28	1	1	0	0
PAVEMENT MARKING LAYOUT 6 OF 13	180	180	0	0	2	1	1
PAVEMENT MARKING LAYOUT 7 OF 13	480	480	0	0	1	2	0
PAVEMENT MARKING LAYOUT 8 OF 13	160	160	0	0	2	0	0
PAVEMENT MARKING LAYOUT 9 OF 13	0	0	28	0	3	1	1
PAVEMENT MARKING LAYOUT 10 OF 13	1,160	1,160	42	0	1	1	1
PAVEMENT MARKING LAYOUT 11 OF 13	420	420	0	1	4	1	1
PAVEMENT MARKING LAYOUT 12 OF 13	0	0	0	1	1	1	0
PAVEMENT MARKING LAYOUT 13 OF 13	0	0	0	0	0	0	0
US 54							
PAVEMENT MARKING LAYOUT 1 OF 2	0	0	0	0	2	0	1
PAVEMENT MARKING LAYOUT 2 OF 2	0	0	0	0	1	0	0
TOTAL	4,120	4,120	112	11	28	10	6

SUMMARY OF SIGNING, PAVEMENT MARKING & SWP3					
	644	666	666	666	666
	6076	6006	6036	6039	6042
	REMOVE SM RD SN SUP&AM	REFL PAV MRK TY1 (W)4"(DOT)(100MIL)	REFL PAV MRK TY1 (W)8"(SLD)(100MIL)	REFL PAV MRK TY1 (W)12"(LNDP)(100MIL)	REFL PAV MRK TY1 (W)12"(SLD)(100MIL)
	EA	LF	LF	LF	LF
SL375					
PAVEMENT MARKING LAYOUT 1 OF 13	3	0	0	0	0
PAVEMENT MARKING LAYOUT 2 OF 13	2	0	0	0	0
PAVEMENT MARKING LAYOUT 3 OF 13	4	0	157	0	151
PAVEMENT MARKING LAYOUT 4 OF 13	13	0	601	0	0
PAVEMENT MARKING LAYOUT 5 OF 13	4	0	0	0	0
PAVEMENT MARKING LAYOUT 6 OF 13	6	0	2,126	202	600
PAVEMENT MARKING LAYOUT 7 OF 13	2	0	0	750	0
PAVEMENT MARKING LAYOUT 8 OF 13	2	0	0	523	0
PAVEMENT MARKING LAYOUT 9 OF 13	7	0	1,236	256	600
PAVEMENT MARKING LAYOUT 10 OF 13	8	0	1,296	0	353
PAVEMENT MARKING LAYOUT 11 OF 13	7	0	1,693	123	854
PAVEMENT MARKING LAYOUT 12 OF 13	3	0	0	375	0
PAVEMENT MARKING LAYOUT 13 OF 13	0	0	0	161	0
US 54					
PAVEMENT MARKING LAYOUT 1 OF 2	4	59	476	0	0
PAVEMENT MARKING LAYOUT 2 OF 2	0	149	0	0	0
TOTAL	65	208	7,585	2,390	2,558

PAVEMENT MARKINGS, SIGNS & SWP3 SUMMARY

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		12

SUMMARY OF SIGNING, PAVEMENT MARKING & SWP3

	666	666	666	666	666	666	666
	6054	6057	6078	6081	6084	6306	6342
	REFL PAV MRK TY1 (W)(ARROW)(100MIL)	REFL PAV MRK TY1 (W)(DBL ARROW)(100MIL)	REFL PAV MRK TY1 (W)(WORD)(100MIL)	REFL PAV MRK TY1 (W)(ENTR GORE)(100MIL)	REFL PAV MRK TY1 (W)(EXIT GORE)(100MIL)	RE PM W/RET REQ TY 1 (W) 6" (BRK)(100MIL)	RE PM W/RET REQ TY 1 (W) 4" (SLD)(100MIL)
	EA	EA	EA	EA	EA	LF	LF
SL375							
PAVEMENT MARKING LAYOUT 1 OF 13	0	0	0	0	0	455	1,826
PAVEMENT MARKING LAYOUT 2 OF 13	0	0	0	0	0	550	2,200
PAVEMENT MARKING LAYOUT 3 OF 13	0	1	0	0	0	596	2,384
PAVEMENT MARKING LAYOUT 4 OF 13	0	0	0	0	0	550	2,192
PAVEMENT MARKING LAYOUT 5 OF 13	0	0	0	0	0	550	2,199
PAVEMENT MARKING LAYOUT 6 OF 13	2	0	2	0	0	750	2,958
PAVEMENT MARKING LAYOUT 7 OF 13	0	0	0	0	0	750	3,000
PAVEMENT MARKING LAYOUT 8 OF 13	0	0	0	0	0	501	2,002
PAVEMENT MARKING LAYOUT 9 OF 13	2	0	2	0	1	600	2,404
PAVEMENT MARKING LAYOUT 10 OF 13	0	0	0	0	1	743	4,037
PAVEMENT MARKING LAYOUT 11 OF 13	1	1	1	1	1	829	3,656
PAVEMENT MARKING LAYOUT 12 OF 13	0	0	0	0	0	1,125	3,000
PAVEMENT MARKING LAYOUT 13 OF 13	1	1	1	0	0	624	1,569
US 54							
PAVEMENT MARKING LAYOUT 1 OF 2	0	0	0	1	0	0	1,122
PAVEMENT MARKING LAYOUT 2 OF 2	0	0	0	0	0	0	0
TOTAL	6	3	6	2	3	8,623	34,549

SUMMARY OF SIGNING, PAVEMENT MARKING & SWP3

	666	668	672	677	678
	6345	6115	6010	6001	6001
	REF PROF PAV MRK TY1 (Y) 4"(SLD)(100MIL)	PREFAB PAV MRK TY C (MULTI) (SHIELD)	REFL PAV MRKR TY II-C-R	ELIM EXIST PAVEM MRK & MRKS (4")	PAV SURF PREP FOR MRK (4")
	LF	EA	EA	LF	LF
SL375					
PAVEMENT MARKING LAYOUT 1 OF 13	1,826	0	23	0	3,652
PAVEMENT MARKING LAYOUT 2 OF 13	2,200	0	28	0	4,400
PAVEMENT MARKING LAYOUT 3 OF 13	2,381	1	30	5,886	4,765
PAVEMENT MARKING LAYOUT 4 OF 13	2,200	0	58	2,526	4,391
PAVEMENT MARKING LAYOUT 5 OF 13	2,199	0	27	6,598	4,398
PAVEMENT MARKING LAYOUT 6 OF 13	3,001	1	195	8,492	5,959
PAVEMENT MARKING LAYOUT 7 OF 13	3,000	0	164	0	6,000
PAVEMENT MARKING LAYOUT 8 OF 13	2,002	0	112	0	4,004
PAVEMENT MARKING LAYOUT 9 OF 13	2,542	3	143	0	4,946
PAVEMENT MARKING LAYOUT 10 OF 13	4,052	0	111	0	8,089
PAVEMENT MARKING LAYOUT 11 OF 13	3,546	4	178	0	7,202
PAVEMENT MARKING LAYOUT 12 OF 13	3,000	0	94	0	6,000
PAVEMENT MARKING LAYOUT 13 OF 13	1,569	4	48	0	3,138
US 54					
PAVEMENT MARKING LAYOUT 1 OF 2	1,143	0	29	3,913	2,324
PAVEMENT MARKING LAYOUT 2 OF 2	0	0	12	675	149
TOTAL	34,661	13	1,252	28,090	69,417

PAVEMENT MARKINGS, SIGNS & SWP3 SUMMARY

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		13

SUMMARY OF SIGNING, PAVEMENT MARKING & SWP3					
	678	678	678	678	678
	6002	6004	6006	6009	6010
	PAV SURF PREP FOR MRK (6")	PAV SURF PREP FOR MRK (8")	PAV SURF PREP FOR MRK (12")	PAV SURF PREP FOR MRK (ARROW)	PAV SURF PREP FOR MRK (DBL ARROW)
	LF	LF	LF	EA	EA
SL375					
PAVEMENT MARKING LAYOUT 1 OF 13	457	0	0	0	0
PAVEMENT MARKING LAYOUT 2 OF 13	550	0	0	0	0
PAVEMENT MARKING LAYOUT 3 OF 13	596	157	151	0	1
PAVEMENT MARKING LAYOUT 4 OF 13	550	601	0	0	0
PAVEMENT MARKING LAYOUT 5 OF 13	550	0	0	0	0
PAVEMENT MARKING LAYOUT 6 OF 13	750	2,126	600	2	0
PAVEMENT MARKING LAYOUT 7 OF 13	750	0	750	0	0
PAVEMENT MARKING LAYOUT 8 OF 13	504	0	523	0	0
PAVEMENT MARKING LAYOUT 9 OF 13	600	1,236	856	2	0
PAVEMENT MARKING LAYOUT 10 OF 13	743	1,296	353	0	0
PAVEMENT MARKING LAYOUT 11 OF 13	829	1,693	977	1	1
PAVEMENT MARKING LAYOUT 12 OF 13	1125	0	375	0	0
PAVEMENT MARKING LAYOUT 13 OF 13	624	0	161	1	1
US 54					
PAVEMENT MARKING LAYOUT 1 OF 2	0	476	0	0	0
PAVEMENT MARKING LAYOUT 2 OF 2	0	0	0	0	0
TOTAL	8,628	7,585	4,746	6	3

SUMMARY OF SIGNING, PAVEMENT MARKING & SWP3				
	678	678	678	678
	6016	6017	6018	6025
	PAV SURF PREP FOR MRK (WORD)	PAV SURF PREP FOR MRK (ENTR GORE)	PAV SURF PREP FOR MRK (EXIT GORE)	PAV SURF PREP FOR MRKS (SHIELD)
	EA	EA	EA	EA
SL375				
PAVEMENT MARKING LAYOUT 1 OF 13	0	0	0	0
PAVEMENT MARKING LAYOUT 2 OF 13	0	0	0	0
PAVEMENT MARKING LAYOUT 3 OF 13	0	0	0	1
PAVEMENT MARKING LAYOUT 4 OF 13	0	1	1	0
PAVEMENT MARKING LAYOUT 5 OF 13	0	0	0	0
PAVEMENT MARKING LAYOUT 6 OF 13	2	0	0	1
PAVEMENT MARKING LAYOUT 7 OF 13	0	0	0	0
PAVEMENT MARKING LAYOUT 8 OF 13	0	0	0	0
PAVEMENT MARKING LAYOUT 9 OF 13	2	0	1	3
PAVEMENT MARKING LAYOUT 10 OF 13	0	0	1	0
PAVEMENT MARKING LAYOUT 11 OF 13	1	1	1	4
PAVEMENT MARKING LAYOUT 12 OF 13	0	0	0	0
PAVEMENT MARKING LAYOUT 13 OF 13	1	0	0	4
US 54				
PAVEMENT MARKING LAYOUT 1 OF 2	0	1	0	0
PAVEMENT MARKING LAYOUT 2 OF 2	0	0	0	0
TOTAL	6	3	4	13

PAVEMENT MARKINGS, SIGNS & SWP3 SUMMARY

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		14

DATE:
FILE:

SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
SL375												
1/13												
	1	M3-2	EAST	36X18	X		10BWG	1	SA	P		
		M1-6L	LOOP 375	36X36	X							
	2	M1-6L	LOOP 375	36X36	X		10BWG	1	SA	P		
		D10-7aT	060	3X10	X							
	3	R2-1	SPEED LIMIT 45	48X60	X		S80	1	SA	T		
2/13												
	4	W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	48X48	X		10BWG	1	SA	T		
	5	M3-2	EAST	36X18	X		10BWG	1	SA	P		
		M1-6L	LOOP 375	36X36	X							
3/13												
	6	W12-2	16'-11"	48X48	X		10BWG	1	SA	T		
	7	R2-1	SPEED LIMIT 60	48X60	X		S80	1	SA	T		
	8	W1-2R		48X48	X		10BWG	1	SA	T		
	9	R2-1	SPEED LIMIT 45	48X60	X		S80	1	SA	T		

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/

NOTE:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
2. For installation of bridge mount clearance signs, Contractor shall verify bridge clearance after overlay. See Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.
3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		2552	04	046	SL375
4-16		DIST	COUNTY		SHEET NO.
8-16		ELP	EL PASO		15

SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
SL375												
	10	W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	48X48	X		10BWG	1	SA	T		
4/13	11	W12-2	19'-0"	48X48	X		10BWG	1	SA	T		
	12	E5-1c	EXIT 59	60X90	X		S80	2	SA	P		
	13	W1-2L		48X48	X		10BWG	1	SA	T		
		W13-1P	25 MPH	30X30	X							
	14	W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	48X48	X		10BWG	1	SA	T		
	15	W3-3		48X48	X		10BWG	1	SA	T		
	16	W12-2a	19 FT 0 IN	84x24	X							N
	17	WI-18		30X36	X		10BWG	1	SA	P		
	18	WI-18		30X36	X		10BWG	1	SA	P		

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"

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3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		2552	04	046	SL375
4-16		DIST	COUNTY		SHEET NO.
8-16		ELP	EL PASO		16

60X90

SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
SL375							10BWG		SA	P		
	19	WI-18		30X36	X							
	20	WI-18		30X36	X		10BWG		SA	P		
	21	WI-18		30X36	X		10BWG		SA	P		
	22	W4-1R		48X48	X		10BWG		SA	T		
	23	W3-5		48X48	X		10BWG		SA	T		
5/13	24	W12-2a		84X24	X							
	25	W12-2a		84X24	X							
	26	W12-2a		36X12	X		10BWG	1	SA	P		
	27	W8-13aT		48X48	X		10BWG	1	SA	T		
6/13	28	W4-3R		48X48	X		10BWG	1	SA	T		

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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"

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http://www.txdot.gov/

NOTE:

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2. For installation of bridge mount clearance signs, Contractor shall verify bridge clearance after overlay. See Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.
3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	2552	04	046	SL375
4-16	DIST	COUNTY		SHEET NO.
8-16	ELP	EL PASO		17

18

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SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
SL375												
	29	M3-2	EAST	36X18	X		10BWG	1	SA	P		
		M1-6L	LOOP 375	36X36	X							
	30	E5-1c	EXIT 59 ↗	60X90	X		S80	2	SA	P		
	31	W12-2a		36X12	X		10BWG	1	SA	P		
	32	M3-2	WEST	36X18	X		10BWG	1	SA	P		
		M1-6L		36X36	X							
		D10-7aT	LOOP 375 05 9	3X10	X							
	33	WI2-2	18'-10"	48X48	X		10BWG	1	SA	T		
	34	WI3-2	EXIT 45 MPH	48X60	X		S80	1	SA	T		
	35	M1-4	62	36X36	X		10BWG	1	SA	P		
7/13												
	36	R2-1	SPEED LIMIT 60	48X60	X		S80	1	SA	P		
	37	R2-1	16'-2"	48x48	X		10BWG	1	SA	T		

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.

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Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	2552	04	046	SL375
4-16	DIST	COUNTY		SHEET NO.
8-16	ELP	EL PASO		18

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SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE: FRP = Fiberglass, TWT = Thin-Wall, 10BWG = 10 BWG, S80 = Sch 80	POSTS: 1 or 2	ANCHOR TYPE: UA=Universal Conc, UB=Universal Bolt, SA=Slipbase-Conc, SB=Slipbase-Bolt, WS=Wedge Steel, WP=Wedge Plastic	MOUNTING DESIGNATION: PREFABRICATED: P = "Plain", T = "T", U = "U"	MOUNTING DESIGNATION: 1EXT or 2EXT = # of Ext, BM = Extruded Wind Beam, WC = 1.12 #/ft Wing Channel, EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE: TY N, TY S
SL375												
	38	R2-1	SPEED LIMIT 60	48X60	X		S80	1	SA	T		
8/13												
	39	R3-33T	RIGHT LANE MUST EXIT	48X48	X		10BWG	1	SA	T		
	40	W12-2	16'-1"	48X48	X		10BWG	1	SA	T		
9/13												
	41	R3-33T	RIGHT LANE MUST EXIT	48X48	X		10BWG	1	SA	T		
	42	W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	48X48	X		10BWG	1	SA	T		
	43	W12-2a	17 FT 7 IN	84X24	X							
	44	w13-2	EXIT 30 MPH	48x60	X		S80	1	SA	T		
	45	W1-2L		48X48	X		10BWG	1	SA	T		
		W13-1P	35 MPH	30X30	X		10BWG	1	SA	T		
	46	E5-1a	EXIT 58	78X60		X	S80	2	SA	P		

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Traffic Operations Division Standard

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© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
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4-16	DIST	COUNTY		SHEET NO.
8-16	ELP	EL PASO		19

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SUMMARY OF SMALL SIGNS

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

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SL375												
	47	W12-2a	17 FT 2 IN	84X24	X							
10/13												
	48	M3-2	EAST	36X18	X		10BWG	1	SA	P		
		MI-6L	LOOP 375	36X36	X							
		D10-7aT	058	3X10	X							
	49	W12-2a	16 FT 1 IN	84X24	X							
	50	M3-2	WEST	36X18	X		10BWG	1	SA	P		
		MI-6L	LOOP 375	36X36	X							
		D10-7aT	058	3X10	X							
	51	W4-3R		48X48	X		10BWG	1	SA	T		
	52	W12-2a	16 FT 6 IN	84X24	X							
	53	W12-2a	15 FT 9 IN	84X24	X							
	54	E5-1c	EXIT 20	60X90	X		S80	2	SA	P		
	55	W13-2	EXIT 40 MPH	48X60	X		S80	1	SA	T		

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Greater than 15	0.125"

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© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	2552	04	046	SL375
4-16	DIST	COUNTY		SHEET NO.
8-16	ELP	EL PASO		20

SUMMARY OF SMALL SIGNS

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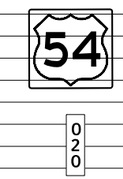
SL375												
11/13												
	56	W4-3R		48X48	X		10BWG	1	SA	T		
	57	W8-15		48X48	X		10BWG	1	SA	T		
	58	W8-13aT		48X48	X		10BWG	1	SA	T		
	59	E5-1c		60X90	X		S80	2	SA	P		
	60	W13-2		48X60	X		S80	1	SA	T		
	61	M1-4 D10-7aT		36X36 3X10	X		10BWG	1	SA	P		
	62	W12-2		48X48	X		10BWG	1	SA	T		
12/13												
	63	R2-1		48X60	X		S80	1	SA	T		

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REVISIONS		2552	04	046	SL375
4-16		DIST	COUNTY		SHEET NO.
8-16		ELP	EL PASO		21

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SL375												
	64	R14-2	HM	36X36	X		10BWG	1	SA	P		
		M6-2R		30X21								
	65	R5-11T	FOR OFFICIAL OR EMERGENCY VEHICLE USE ONLY	48X48	X		10BWG	1	SA	T		
US54												
1/2	66	W4-1R		48X48	X		10BWG	1	SA	T		
	67	W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	48X48	X		10BWG	1	SA	T		
	68	E5-1c	EXIT 20	60X90	X		S80	2	SA	P		
2/2	69	W9-2TR	LANE ENDS MERGE RIGHT	48X48	X		10BWG	1	SA	T		

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
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4-16 8-16	DIST	COUNTY		SHEET NO.
	ELP	EL PASO		22

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.

[X] 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):

[X] 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	[X] BIODEG ERSN CTLR LOGS	[ ] 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.

[X] No Action Required [ ] Required Action

Action No.

1.

2.

3.

4.

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.

[X] No Action Required [ ] Required Action

Action No.

1.

2.

3.

4.

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

[X] No Action Required [ ] Required Action

Action No.

1.

2.

3.

4.

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 [X] 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 [X] 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:

[X] No Action Required [ ] Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

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

[X] No Action Required [ ] Required Action

Action No.

1.

2.

3.

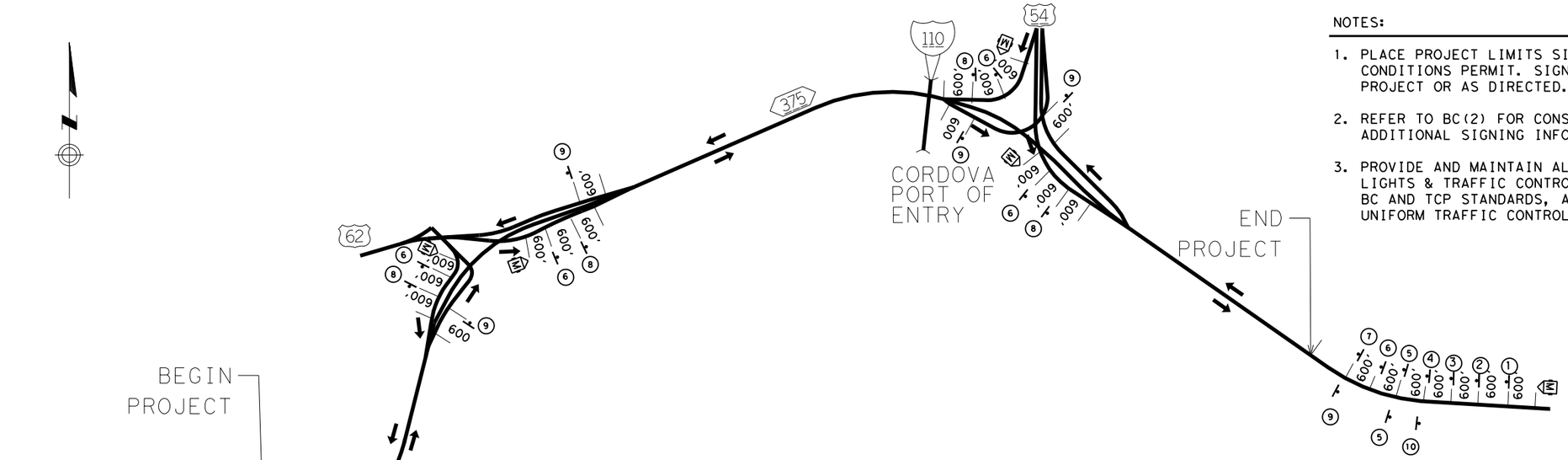
Texas Department of Transportation

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)	2552	04	046	SL375
05-07-14 ADDED NOTE SECTION IV.	DIST	COUNTY		SHEET NO.
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	ELP	EL PASO		023



NOTES:

1. PLACE PROJECT LIMITS SIGNS AT LOCATIONS SHOWN AS FIELD CONDITIONS PERMIT. SIGNS TO REMAIN FOR THE DURATION OF THE PROJECT OR AS DIRECTED.
2. REFER TO BC(2) FOR CONSTRUCTION WARNING SIGNS SPACING AND ADDITIONAL SIGNING INFORMATION.
3. PROVIDE AND MAINTAIN ALL BARRICADES, WARNING SIGNS, FLASHING LIGHTS & TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH TXDOT BC AND TCP STANDARDS, AND PART VI OF THE "TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES."

LEGEND

- CONSTRUCTION WARNING SIGN
- WORK AREA
- TRAFFIC FLOW
- (M) PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

LP 375 POSTED SPEED LIMIT = 60 MPH

TCP SELECTION TABLE

TYPE OF WORK	SHEET	TRAFFIC CONTROL PLAN SHEET DESCRIPTION	COMMENTS
FLEXIBLE PAVEMENT BASE REPAIR ON MAINLANES	TCP (1-5)-18 TCP (6-1)-12	LANE CLOSURE FOR DIVIDED HIGHWAYS FREEWAY LANE CLOSURES	PERFORM DURING NIGHTLY LANE CLOSURES SUNDAY TO THURSDAY (9 PM TO 5 AM)
FLEXIBLE PAVEMENT BASE REPAIR ON ENTRANCE AND EXIT RAMPS	TCP (6-2)-12 TCP (6-3)-12 TCP (6-4)-12 TCP (6-5)-12	WORK AREA NEAR RAMP WORK AREA BEYOND RAMP WORK AREA AT EXIT RAMP WORK AREA BEYOND EXIT RAMP	PERFORM DURING NIGHTLY LANE CLOSURES SUNDAY TO THURSDAY (9 PM TO 5 AM) WORK AREAS AT OR NEAR ENTRANCE/EXIT RAMPS WILL REQUIRE RAMP CLOSURE.
MILL, UNDERSEAL AND OVERLAY ON MAINLANES	TCP (1-5)-18 TCP (6-1)-12 TCP (7-1)-13	LANE CLOSURE FOR DIVIDED HIGHWAYS FREEWAY LANE CLOSURES DETAILS FOR SURFACING OPERATIONS	PERFORM DURING NIGHTLY LANE CLOSURES SUNDAY TO THURSDAY (9 PM TO 5 AM)
MILL, UNDERSAL AND OVERLAY ON SHOULDERS	TCP (5-1)-18	SHOULDER WORK FOR FREEWAYS/EXPRESSWAYS	PERFORM DURING NIGHTLY LANE CLOSURES SUNDAY TO THURSDAY (9 PM TO 5 AM)
MILL, UNDERSEAL AND OVERLAY ON ENTRANCE AND EXIT RAMPS	TCP (6-2)-12 TCP (6-3)-12 TCP (6-4)-12 TCP (6-5)-12 TCP (6-8)-14 TCP (6-9)-14	WORK AREA NEAR RAMP WORK AREA BEYOND RAMP WORK AREA AT EXIT RAMP WORK AREA BEYOND EXIT RAMP WORK IN EXIT GORE FOR ADT GREATER THAN 10,000 WORK IN EXIT GORE FOR ADT LESS THAN 10,000	PERFORM DURING NIGHTLY LANE CLOSURES SUNDAY TO THURSDAY (9 PM TO 5 AM) WORK AREAS AT OR NEAR ENTRANCE/EXIT RAMPS WILL REQUIRE RAMP CLOSURE.
STRIPING	TCP (3-2)-13	MOBILE OPERATIONS DIVIDED HIGHWAY	PERFORM DURING NIGHTLY LANE CLOSURES SUNDAY TO THURSDAY (9 PM TO 5 AM)
RAISED PAVEMENT MARKERS	TCP (3-3)-14	MOBILE OPERATIONS RPM INSTALLATION/REMOVAL	PERFORM DURING NIGHTLY LANE CLOSURES SUNDAY TO THURSDAY (9 PM TO 5 AM)
MBGF REMOVAL/INSTALLATION	TCP (6-1)-12	FREEWAY LANE CLOSURES	WORK PERMITTED DURING DAILY CLOURES MONDAY TO FRIDAY (9 AM TO 4 PM)
SIGNS REMOVAL/INTALLATION	TCP (6-1)-12	FREEWAY LANE CLOSURES	WORK PERMITTED DURING DAILY CLOURES MONDAY TO FRIDAY (9 AM TO 4 PM)

① Give Us A BRAKE — CW21-1T 48" X 48"

② OBEY WARNING SIGNS STATE LAW — R20-3T 48" X 42"

③ STAY ALERT / TALK OR TEXT LATER — G20-10T 48" X 60"

④ BEGIN WORK ZONE / TRAFFIC FINES DOUBLE / WHEN WORKERS ARE PRESENT — G20-9TP 36" X 30"; R20-5T 36" X 36"; R20-5aTP 36" X 18"

⑤ SPEED LIMIT 60 — R2-1 36" X 48"

⑥ ROAD WORK AHEAD — CW20-1D 48" X 48"

⑦ BEGIN ROAD WORK NEXT 2 MILES / NAME ADDRESS CITY STATE / CONTRACTOR — G20-5T 48"X24"; G20-6T 48"X30"

⑧ ROAD WORK ⇦ NEXT 1 MILES NEXT 1 MILES ⇨ — G20-1aT 72"x 36"

⑨ END ROAD WORK — G20-2 48" X 24"

⑩ END WORK ZONE — G20-2bT 48" X 24"

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375
MILL & INLAY
TRAFFIC CONTROL PLAN

LINE DIAGRAM

SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL375
DIST	COUNTY		SHEET NO.
ELP	EL PASO		24

DATE:
FILE:

TCP GENERAL NOTES:

1. THE CONTRACTOR SHALL FOLLOW ALL TXDOT STANDARDS FOR TRAFFIC CONTROL AND FOLLOW THE TRAFFIC CONTROL PLAN (TCP) AT ALL TIMES. ANY DEVIATION FROM THE ADOPTED TCP SHALL BE REVIEWED AND APPROVED BY THE ENGINEER.
2. THE CONTRACTOR SHALL MAINTAIN ACCESS TO EXISTING DRIVEWAYS AT ALL TIMES UNLESS WRITTEN APPROVAL IS GIVEN BY THE ENGINEER.
3. ALL MILLING AND PAVING OPERATIONS SHALL BE CONDUCTED DURING NIGHT HOURS.
4. ALL INTERSECTIONS TO REMAIN OPEN AT ALL TIMES. UNLESS NOTED PER TCP.
5. 3:1 SAFETY WEDGE IS REQUIRED AT THE END OF EACH WORKDAY WHEN ANY DROP-OFF IS GREATER THAN 2 INCHES.
6. NOTIFY THE ENGINEER DURING THE WORK WEEK AT LEAST 24 HOURS IN ADVANCE OF ANY ADDITIONAL LANE CLOSURES. ADDITIONAL LANE CLOSURES SHALL BE MINIMIZED AND WILL BE LIMITED TO OFF PEAK HOURS 9:00 PM TO 5:00 AM.

PHASE 1- EASTBOUND SL 375

THE INTENT OF THIS PHASE IS TO CONSTRUCT PAVEMENT REPAIR SECTIONS, MILL, SEAL, OVERLAY, REMOVAL AND INSTALLATION OF MBGF AND SIGNS ON THE EASTBOUND DIRECTION OF SL 375.

1. INSTALL SW3P, TRAFFIC CONTROL WARNING DEVICES AND/OR DETOUR SIGNS.

THE FOLLOWING OPERATIONS MUST BE LIMITED TO ONLY WHAT CAN BE COMPLETED DURING ONE NIGHTLY LANE CLOSURE. THE LIMITS OF OPERATIONS MUST BE COMPLETED WITH ALL LANES OPENED TO TRAFFIC BY 5:00 AM

2. PERFORM 8 IN OF HMA TY-B BASE REPAIRS AT THE LOCATIONS SPECIFIED ON THE PLANS.
3. MILL 2 IN, LEVEL UP AND MICROMILL AS NEEDED, UNDERSEAL AND INLAY 2 IN OF SMA TY-D
4. INSTALL WORK ZONE PAVEMENT MARKINGS
5. INSTALL PERMANENT PAVEMENT MARKINGS AFTER COMPLETION OF MILL AND INLAY
6. THE FOLLOWING OPERATIONS MAY BE COMPLETED WITH DAILY LANE CLOSURES FROM 9:00 AM TO 4:00 PM
7. REMOVAL AND INSTALLATION OF MBGF
8. REMOVAL AND INSTALLATION OF SIGNS.

PHASE 2- WESTBOUND SL 375

THE INTENT OF THIS PHASE IS TO CONSTRUCT PAVEMENT REPAIR SECTIONS, MILL, SEAL, OVERLAY, REMOVAL AND INSTALLATION OF MBGF AND SIGNS ON THE WESTBOUND DIRECTION OF SL 375.

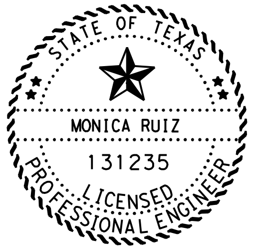
1. INSTALL SW3P, TRAFFIC CONTROL WARNING DEVICES AND/OR DETOUR SIGNS.

THE FOLLOWING OPERATIONS MUST BE LIMITED TO ONLY WHAT CAN BE COMPLETED DURING ONE NIGHTLY LANE CLOSURE. THE LIMITS OF OPERATIONS MUST BE COMPLETED WITH ALL LANES OPENED TO TRAFFIC BY 5:00 AM

2. PERFORM 8 IN OF HMA TY-B BASE REPAIRS AT THE LOCATIONS SPECIFIED ON THE PLANS.
3. MILL 2 IN, LEVEL UP AND MICROMILL AS NEEDED, UNDERSEAL AND INLAY 2 IN OF SMA TY-D
4. INSTALL WORK ZONE PAVEMENT MARKINGS
5. INSTALL PERMANENT PAVEMENT MARKINGS AFTER COMPLETION OF MILL AND INLAY
6. THE FOLLOWING OPERATIONS MAY BE COMPLETED WITH DAILY LANE CLOSURES FROM 9:00 AM TO 4:00 PM
7. REMOVAL AND INSTALLATION OF MBGF
8. REMOVAL AND INSTALLATION OF SIGNS.

SL 375 PROJECT LIMITS

1. PERFORM FINAL CLEAN-UP
2. REMOVE TEMPORARY SW3P DEVICES
3. REMOVE BARRICADES



Monica Ruiz, P.E.

05/04/2021

SL 375
MILL & INLAY

TRAFFIC CONTROL

TCP SEQUENCE
OF WORK

SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL0375
DIST	COUNTY		SHEET NO.
ELP	EL PASO		25

FILE: pw:\\txdot5.projectwiseonline.com:TXDOT5\Documents\24 - ELP\Design Projects\255204046\4 - Design\Plan Set\2. TCP\025 TCP SEQUENCE OF WORK.dgn
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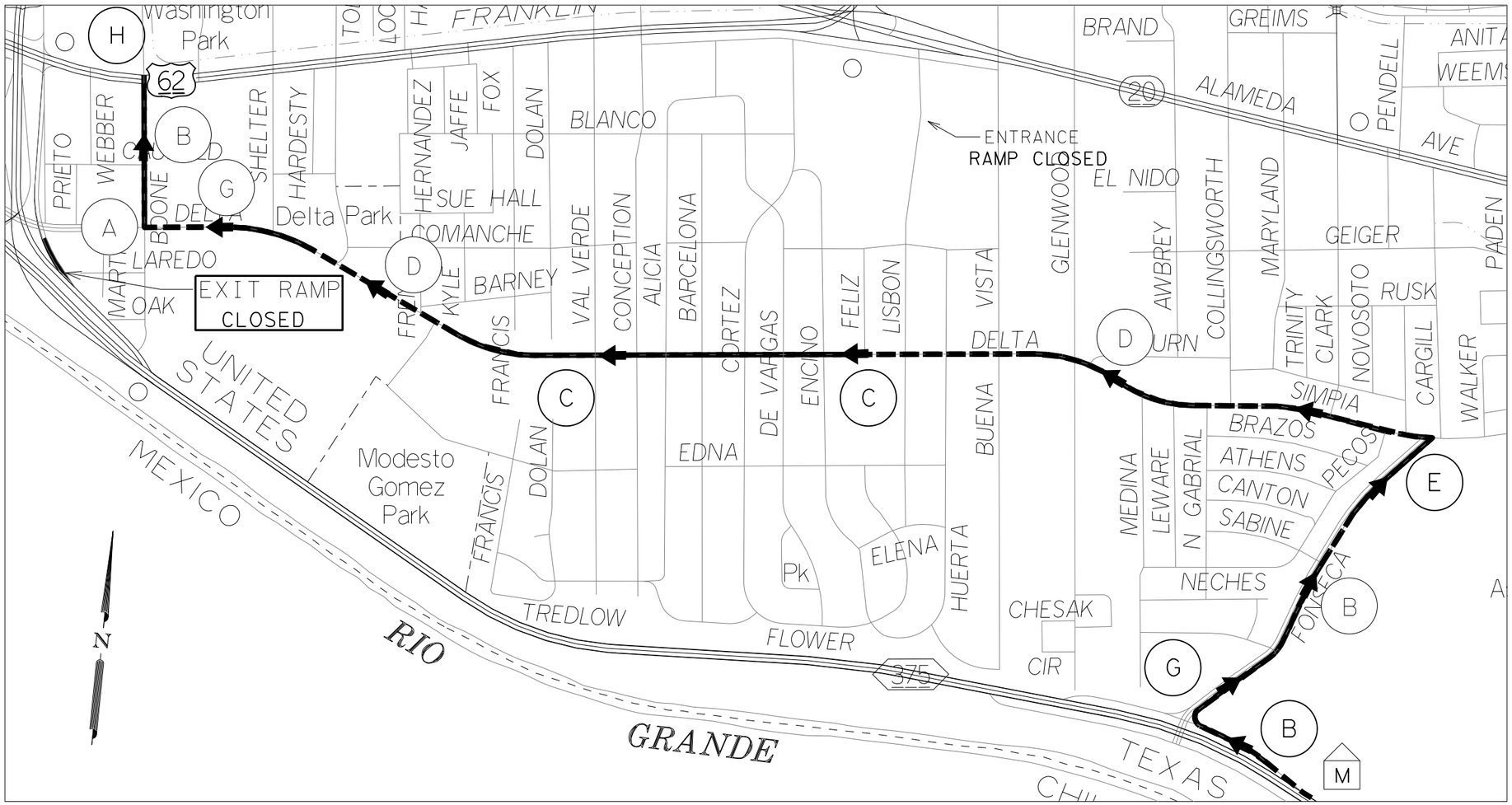

LEGEND

- M — PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
- DETOUR ROUTE
- CLOSED RAMP
- (X) — SIGN (NOTE)

PORTABLE CHANGEABLE MESSAGE BOARD PHASE 1 AND PHASE 2

EXIT XXX
CLOSED
X MILE

A — RAMP CLOSED — R11-2R

B — DETOUR — M4-9S

C — DETOUR — M4-9S

D — DETOUR — M4-9S

E — DETOUR — M4-9TL

F — DETOUR — M4-9S

G — DETOUR — M4-9TR

H — END DETOUR — M4-8A

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

5/04/2021

DETOUR LAYOUT

SL375 WB TO US54 NB

SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		26

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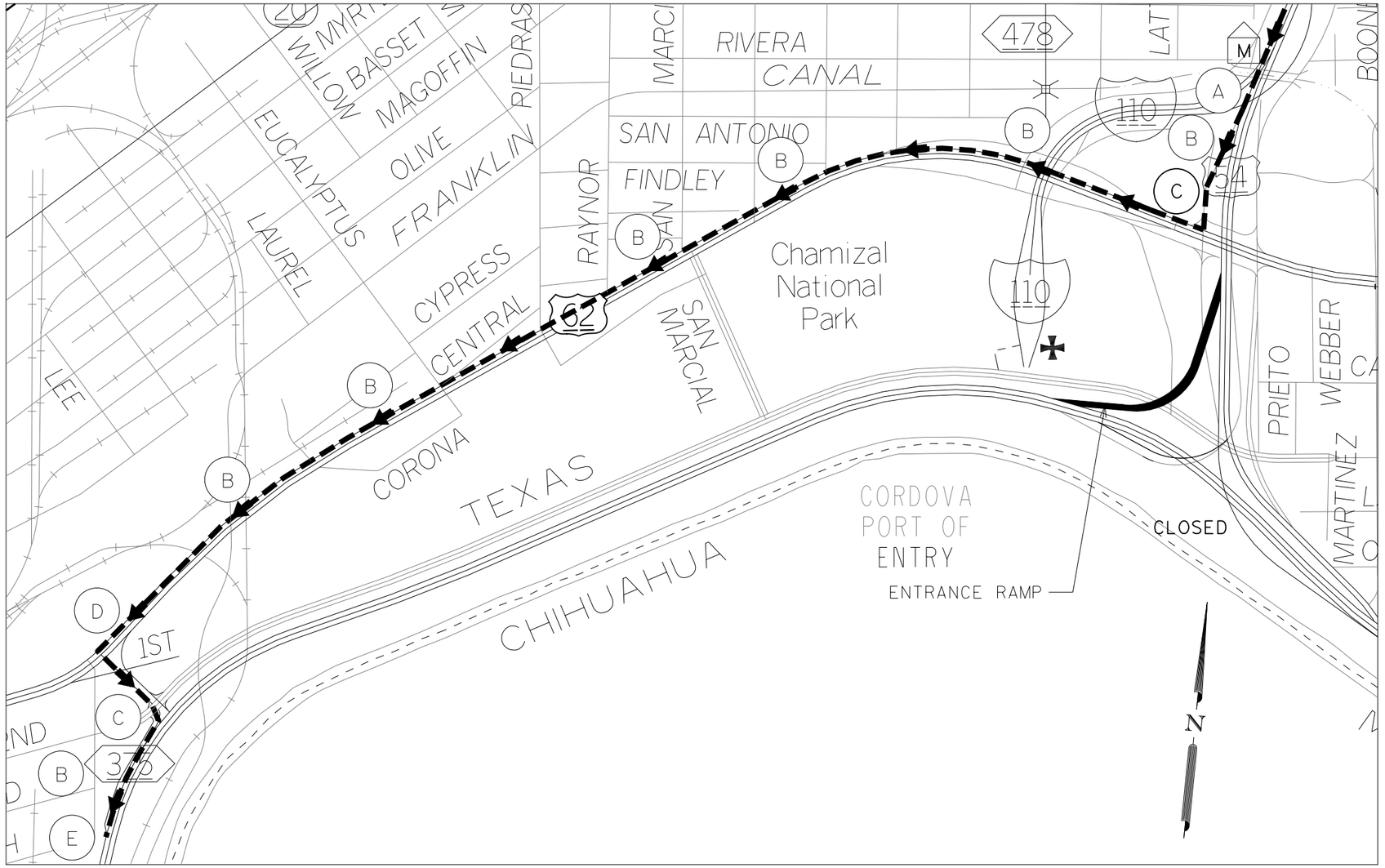

LEGEND

- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
- DETOUR ROUTE
- CLOSED RAMP
- SIGN (NOTE)

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

5/04/2021

PORTABLE CHANGEABLE MESSAGE BOARD PHASE 1 AND PHASE 2

ENTRANCE XXX
CLOSED
X MILE

A

RAMP CLOSED — R11-2R

DETOUR ← — M4-9S

B

DETOUR ↑ — M4-9S

C

DETOUR → — M4-9TL

D

DETOUR ← — M4-9TL

E

END DETOUR — M4-8A

DETOUR LAYOUT
US54 SB TO SL375 WB

SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		27

M4-9S

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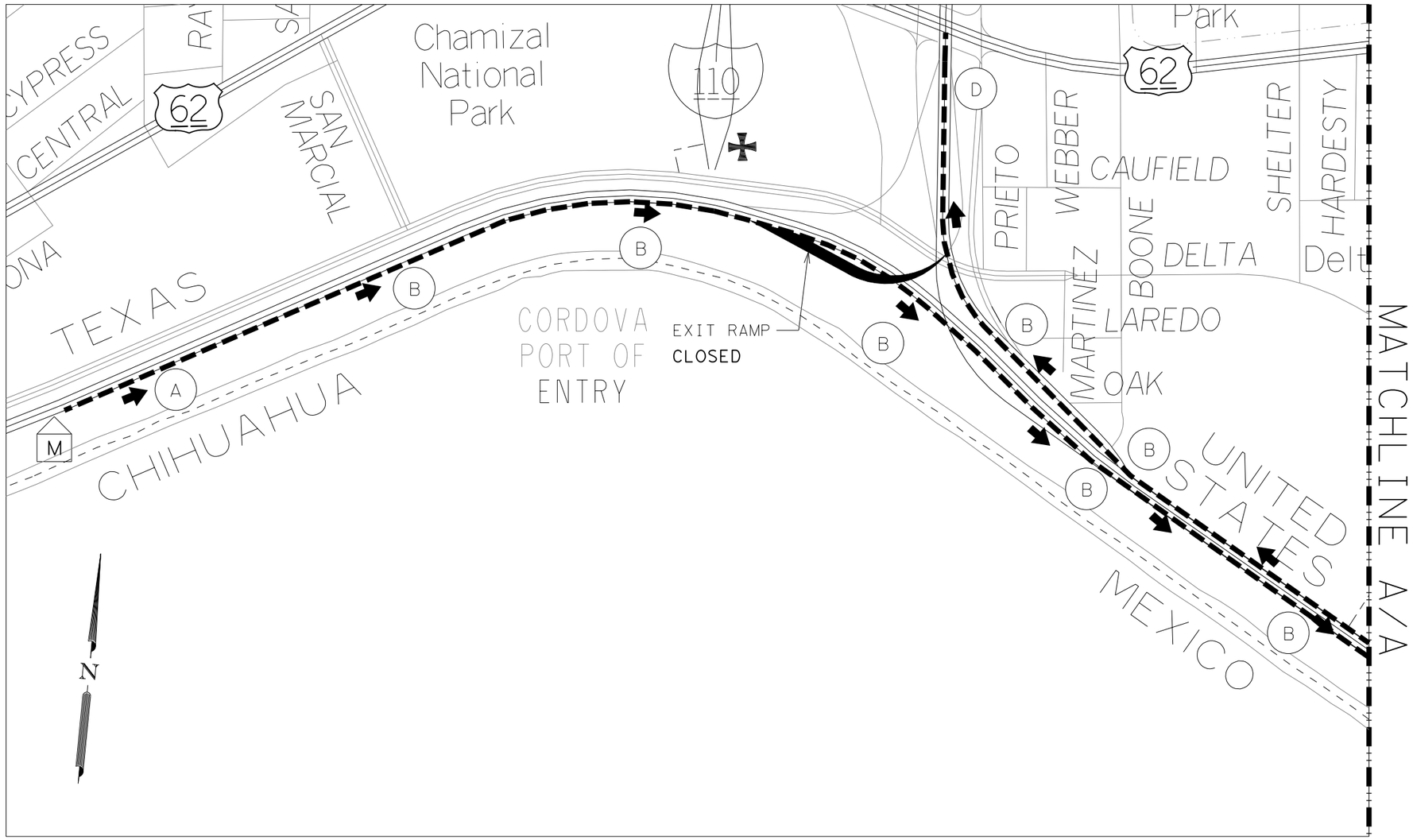

LEGEND

- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
- DETOUR ROUTE
- CLOSED RAMP
- SIGN (NOTE)

PORTABLE CHANGEABLE MESSAGE BOARD PHASE 1 AND PHASE 2

EXIT XXX
CLOSED
X MILE

A

RAMP CLOSED — R11-2R

DETOUR — M4-9S

B

DETOUR — M4-9S

C

DETOUR — M4-9TR

D

END DETOUR — M4-8A

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

5/04/2021

DETOUR LAYOUT

SL375 EB TO US54 NB

SHEET 1 OF 2

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		28

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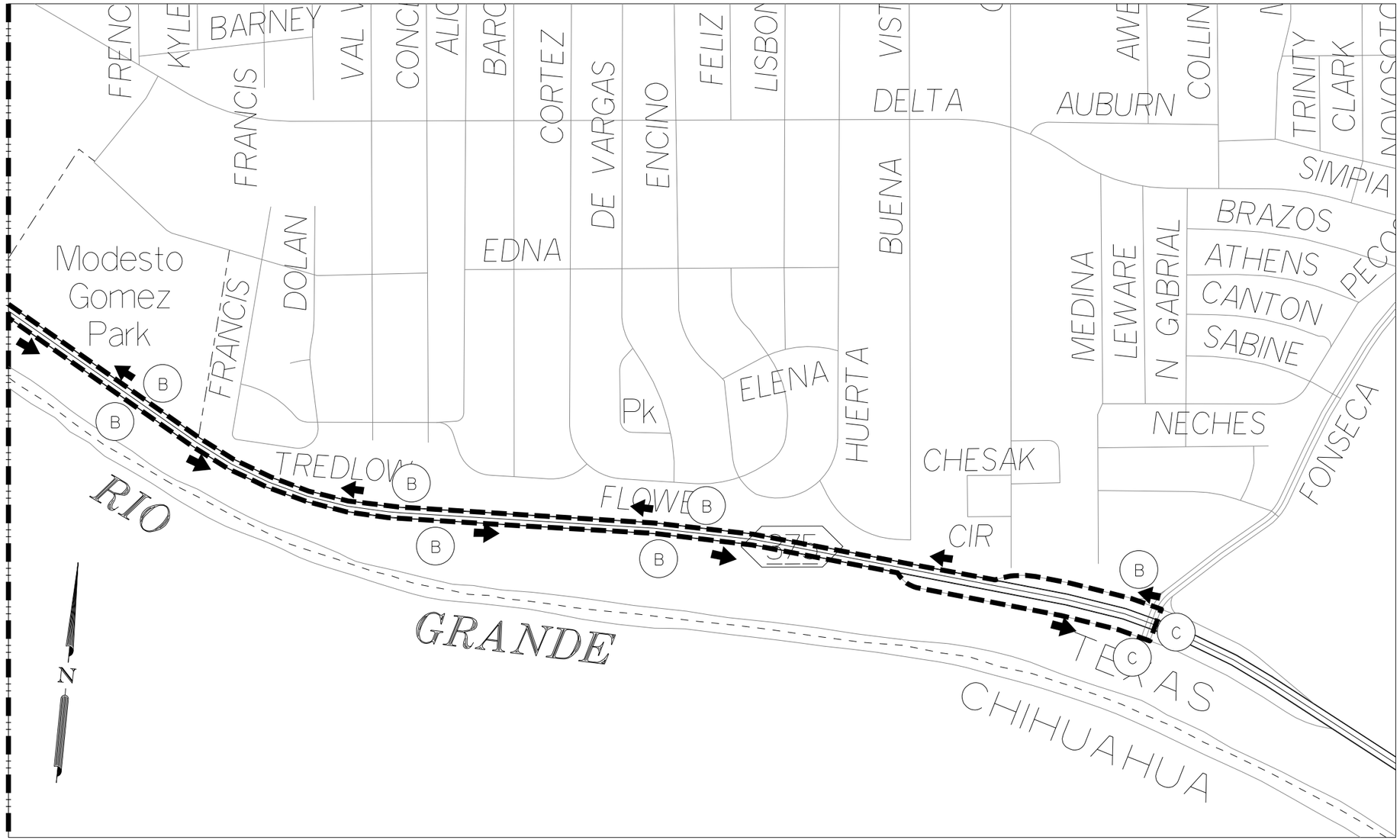

LEGEND

DETOUR ROUTE

(X) SIGN (NOTE)

B

DETOUR

M4-9S

C

DETOUR

M4-9TL

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED
PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

5/04/2021

DETOUR LAYOUT
SL375 EB TO US54 NB

SHEET 2 OF 2

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		29

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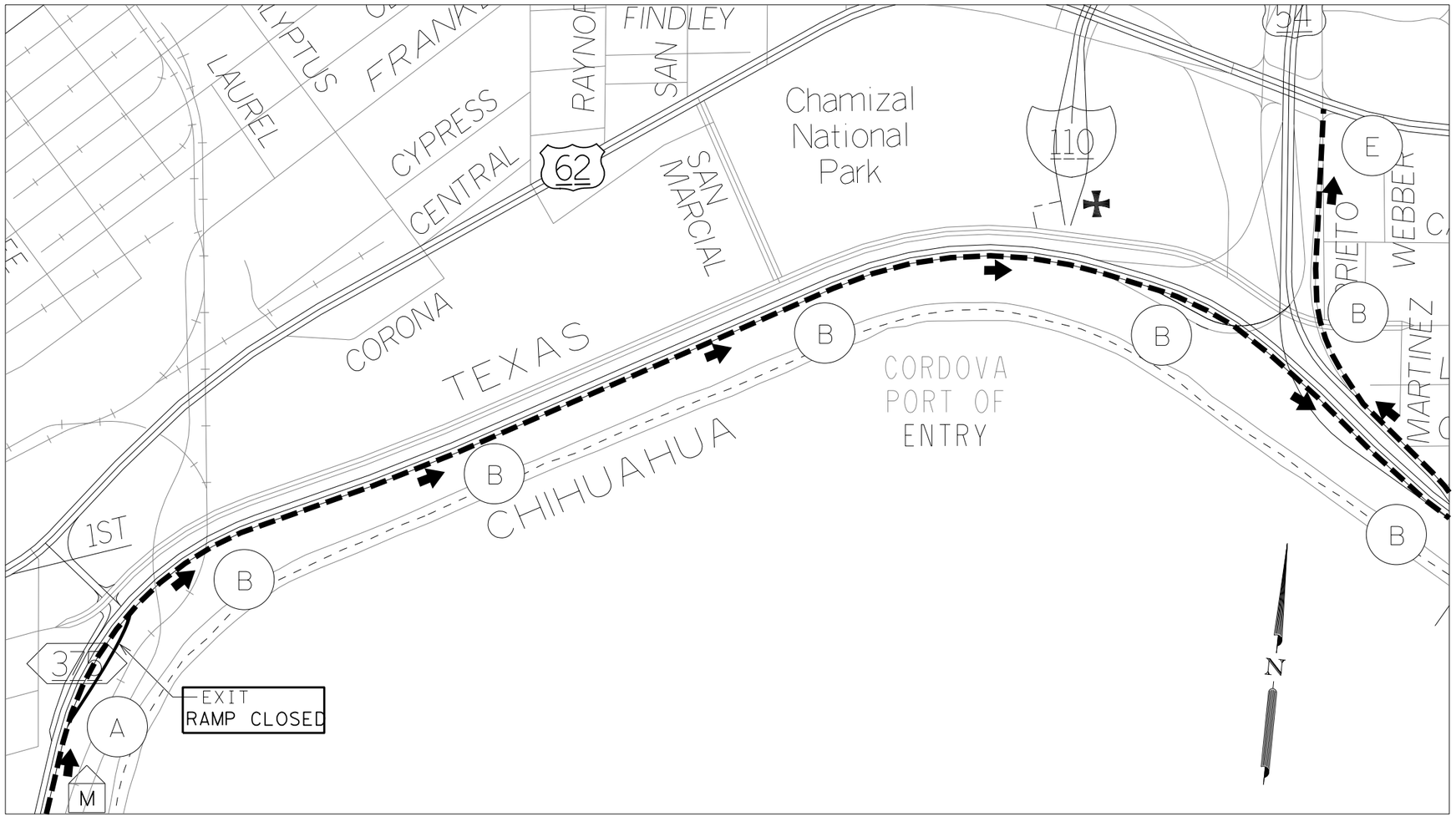

LEGEND

- M — PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
- DETOUR ROUTE
- CLOSED RAMP
- (X) — SIGN (NOTE)

PORTABLE CHANGEABLE MESSAGE BOARD PHASE 1 AND PHASE 2

EXIT XXX
CLOSED
X MILE

A

RAMP CLOSED — R11-2R

B

DETOUR — M4-9S

C

DETOUR — M4-9S

D

DETOUR — M4-9S

E

END DETOUR — M4-8A

STATE OF TEXAS
MONICA RUIZ
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Monica Ruiz, P.E.

5/04/2021

DETOUR LAYOUT

SL375 EB TO US62

SHEET 1 OF 2

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		30

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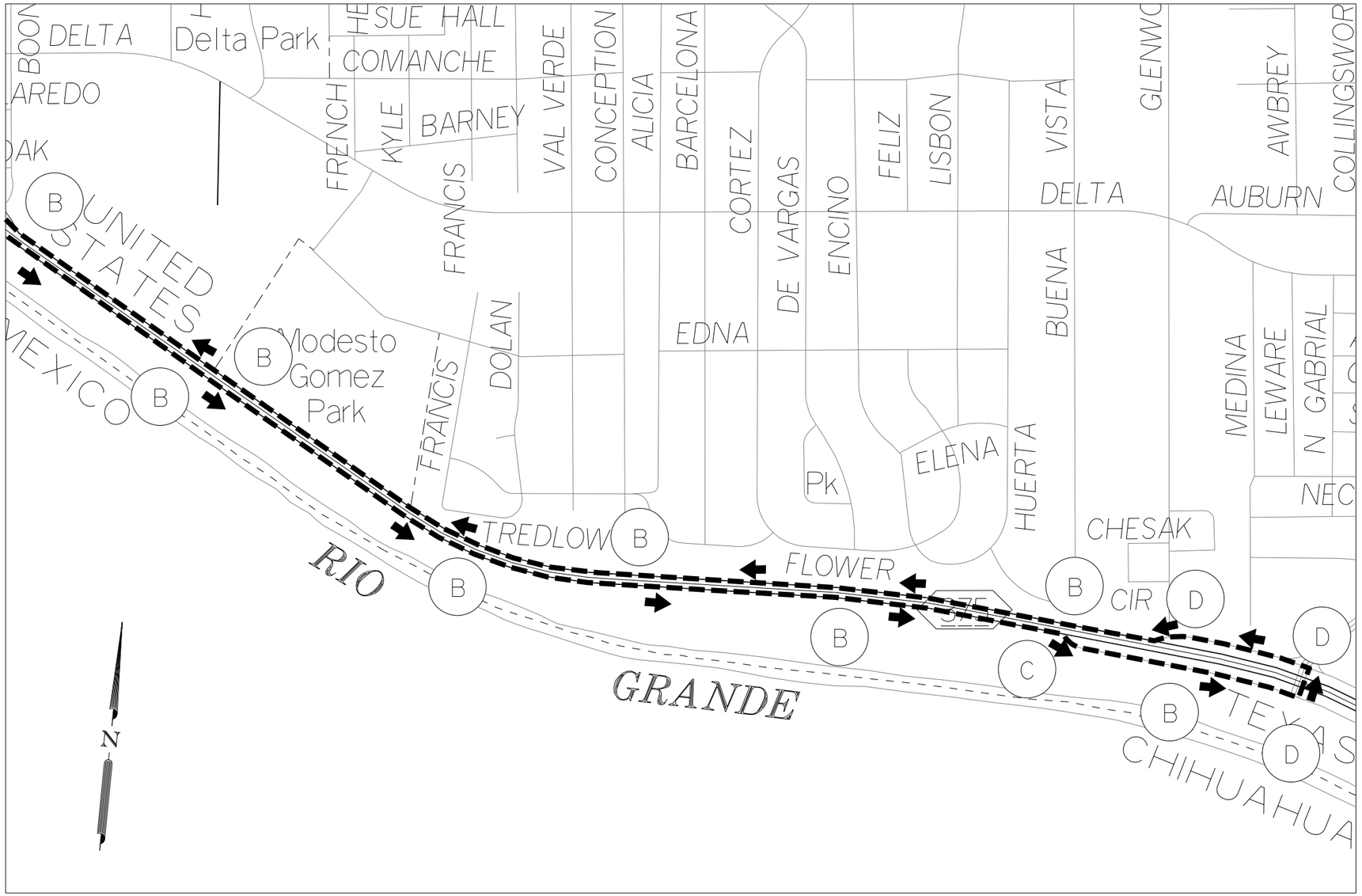

LEGEND

- DETOUR ROUTE
- CLOSED RAMP
- (X) SIGN (NOTE)

A
RAMP CLOSED
R11-2R

B
DETOUR
M4-9S

C
DETOUR
M4-9S

D
DETOUR
M4-9S

E
END DETOUR
M4-8A

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

5/04/2021

DETOUR LAYOUT
SL375 EB TO US62

SHEET 2 OF 2

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		31

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DES:	CK:	DW:	CK:

DATE:
FILE:

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. As shown on BC(2), the OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER (see Sign Detail G20-10T) and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. However, the TRAFFIC FINES DOUBLE sign will not be required on projects consisting solely of mobile operation work, such as striping or milling edgeline rumble strips. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits.

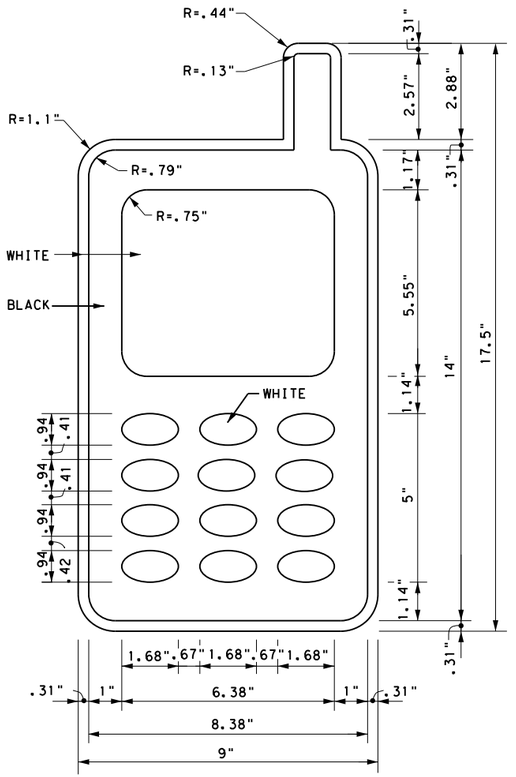
11. Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.

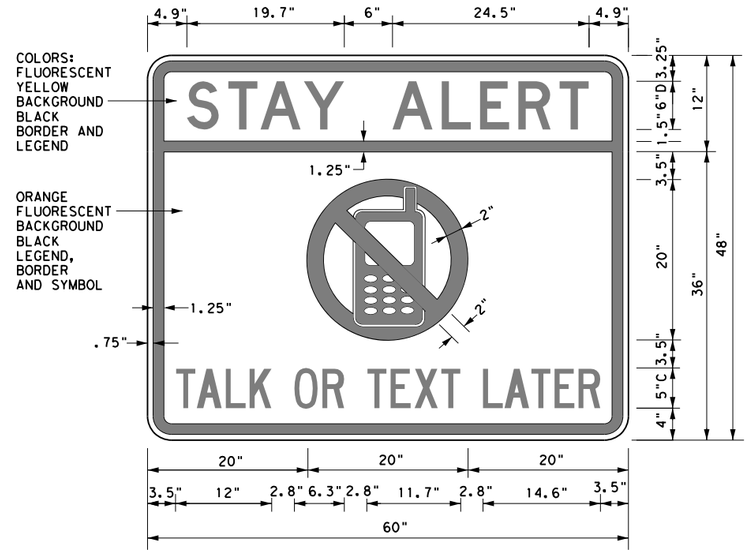
12. The Engineer has the final decision on the location of all traffic control devices.

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 APPAREL 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.





3.0" Radius, 1.25" Border, 0.75" Indent, Black on Yellow;
[STAY ALERT] Font: D
3.0" Radius, 1.25" Border, 0.75" Indent, Black on Orange;
[TALK OR TEXT LATER] Font: C specified length;

SIGN DETAIL (G20-10T)

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

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

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 Operations Division Standard

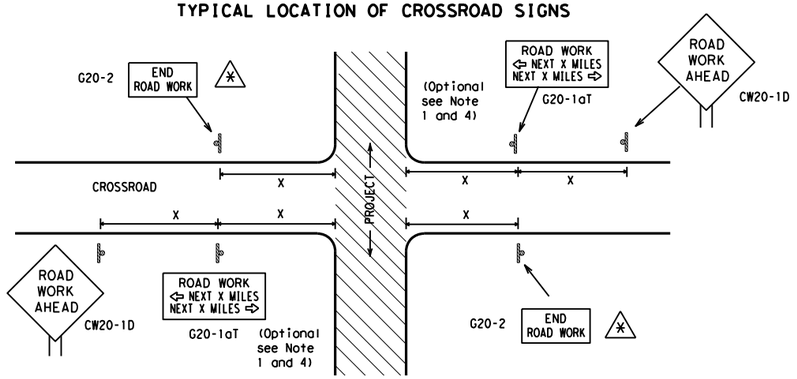
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-03 5-10 8-14 9-07 7-13	2552	04	046	SL375
	DIST	COUNTY		SHEET NO.
	ELP	EL PASO		32

DATE:
FILE:

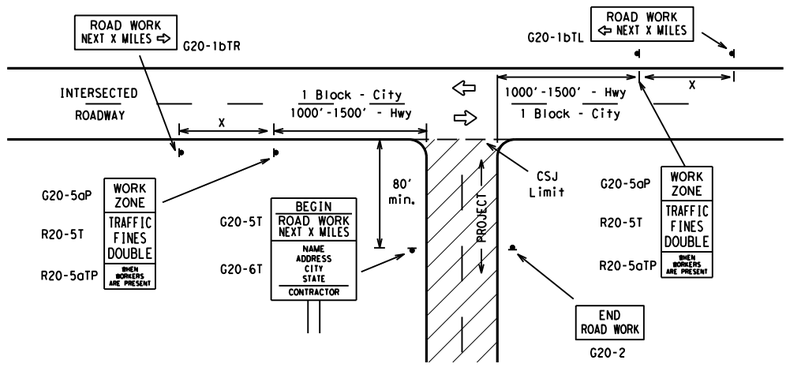
TYPICAL LOCATION OF CROSSROAD SIGNS



✱ 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. 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]

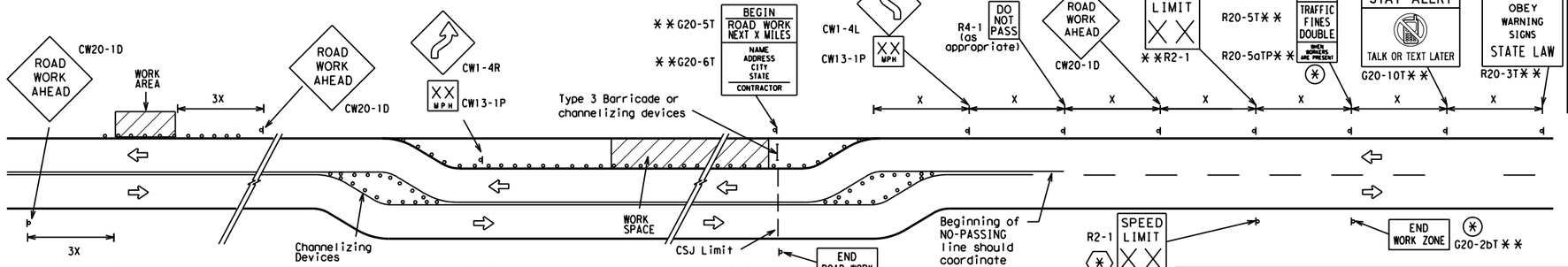
✱ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

△ 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. 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.

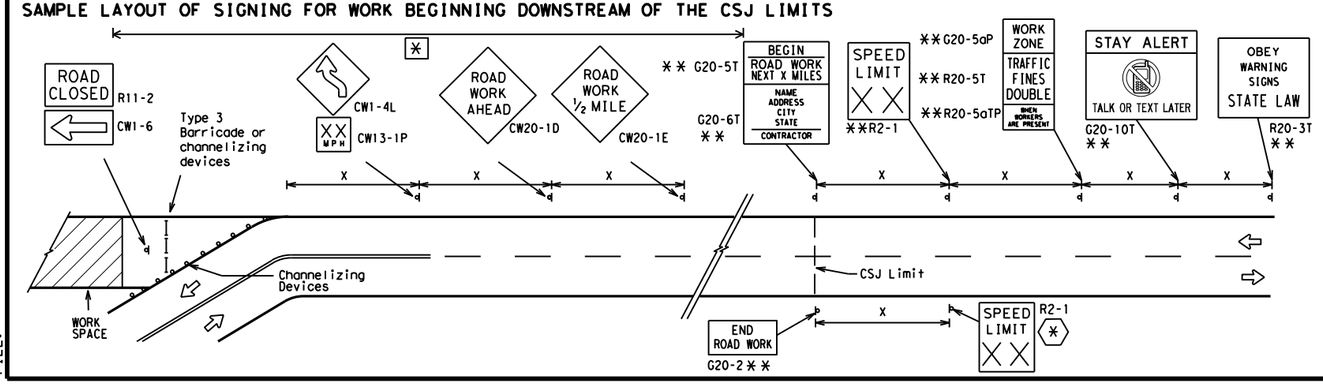
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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.

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

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

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

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 Operations Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-14

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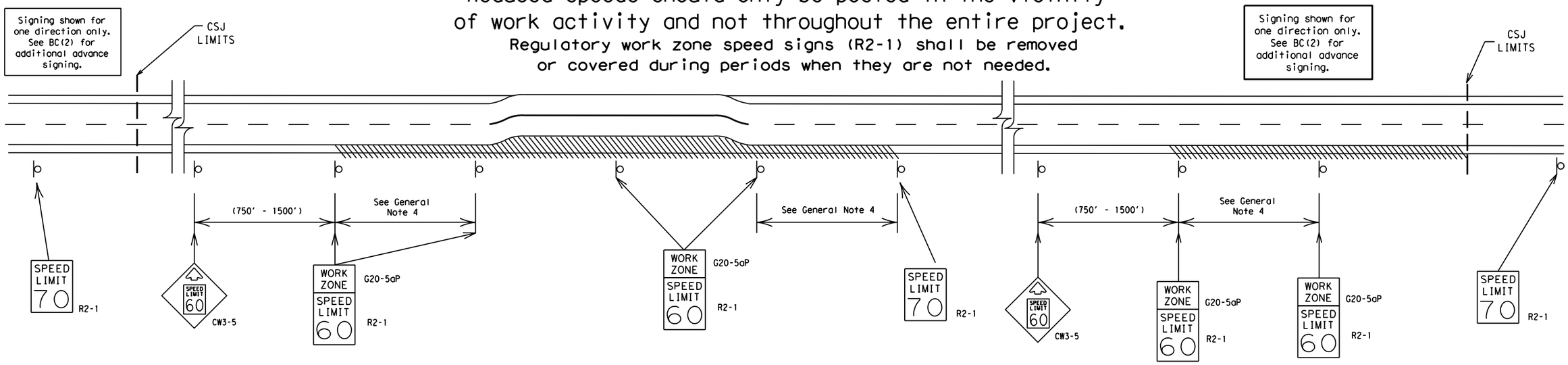
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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 travelled 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 Operations Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-14

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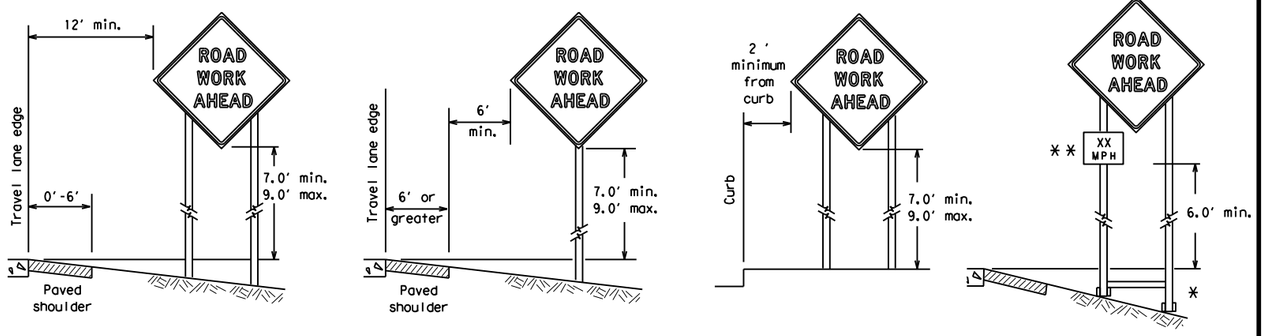
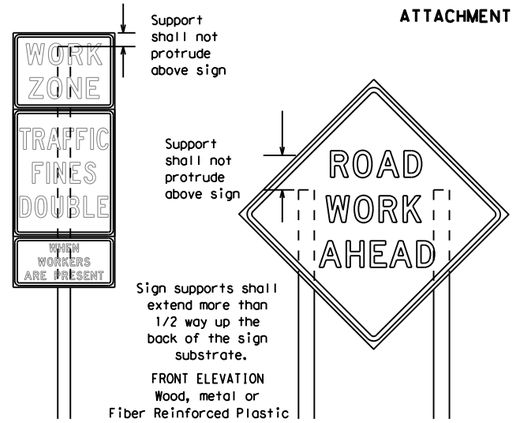
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



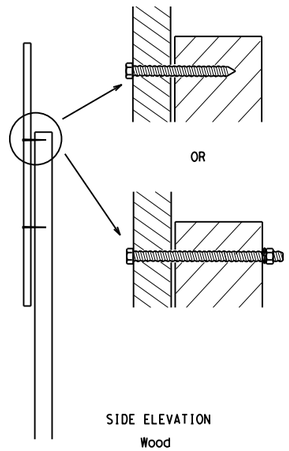
* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** 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



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.

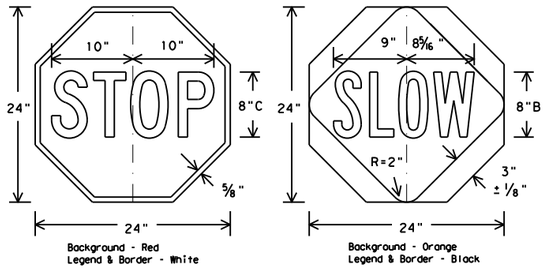


Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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.

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" as detailed below.
2. When used at night, the STOP/SLOW paddle shall be retroreflectorized.
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.



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, 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.
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 sheets or the CWZTCD. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
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). 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 Operations Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-14

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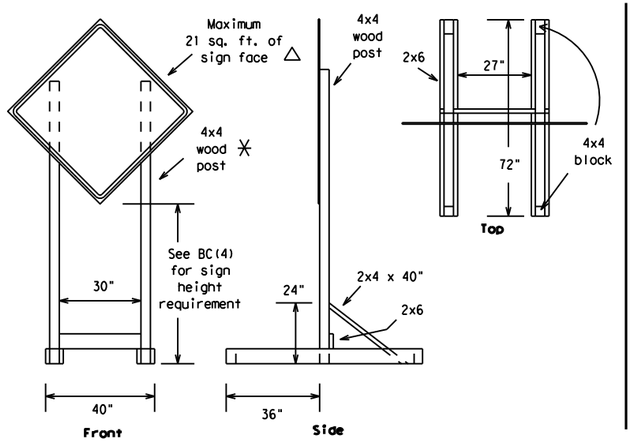
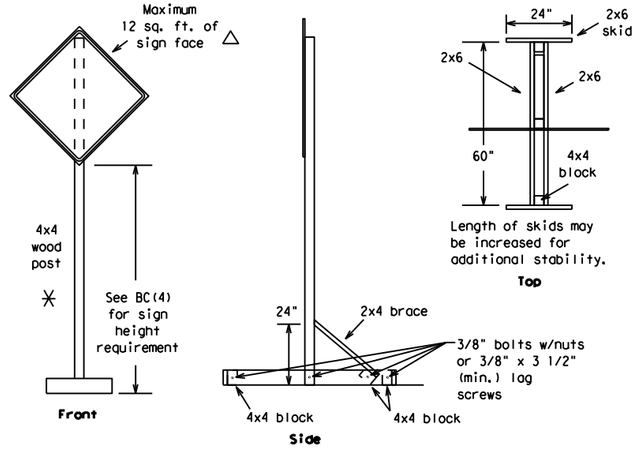
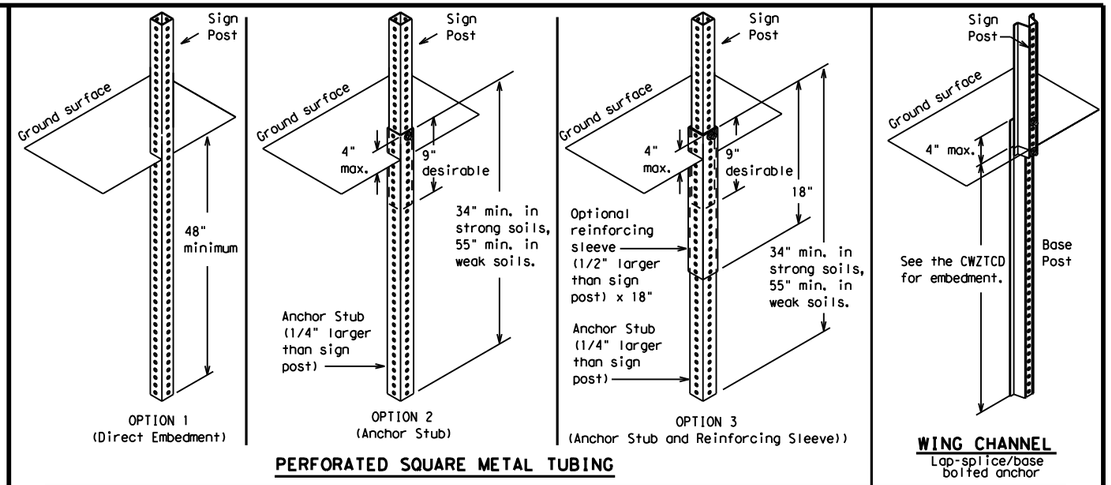




SKID MOUNTED WOOD SIGN SUPPORTS

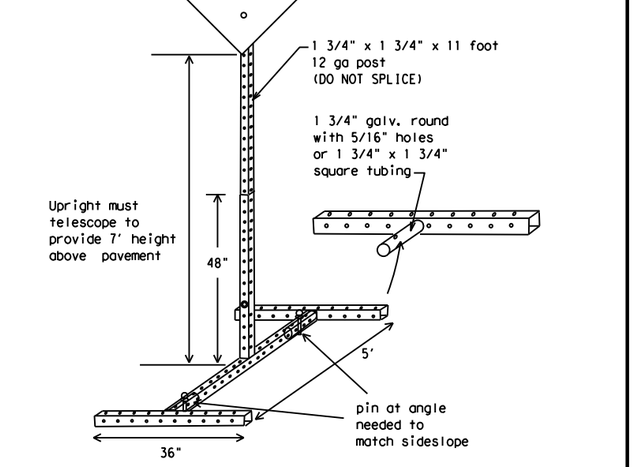
LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS □

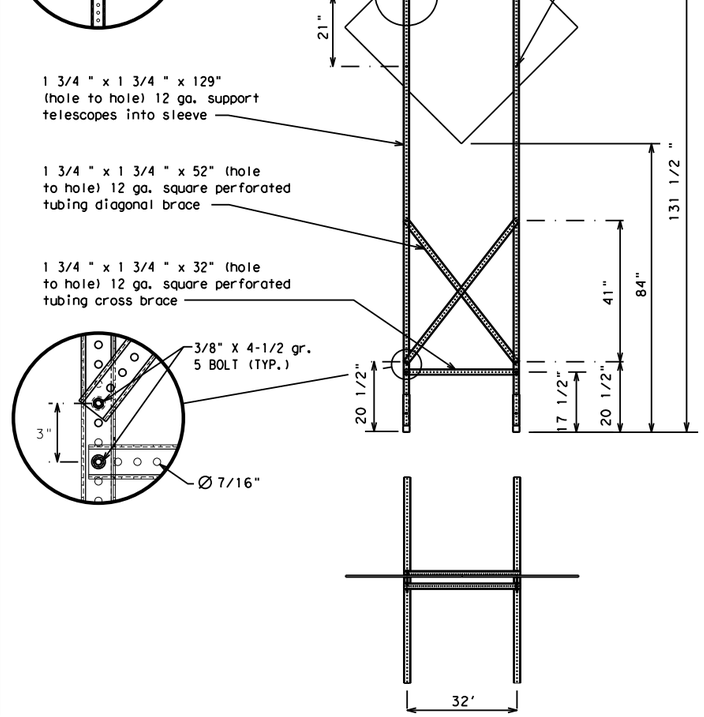


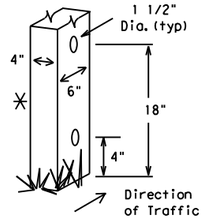
PERFORATED SQUARE METAL TUBING

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.

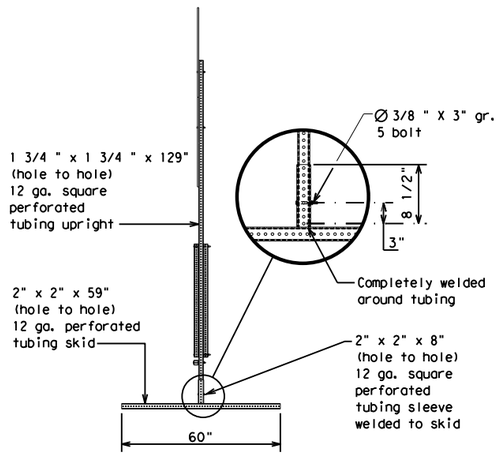






Nominal Post Size	Number of Posts	Maximum Sq. feet of Sign Face	Minimum Soil Embedment	Drilled Hole(s) Required
4 x 4	1	12	36"	NO
4 x 4	2	21	36"	NO
4 x 6	1	21	36"	YES
4 x 6	2	36	36"	YES

WOOD POST SYSTEM FOR GROUND 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 Operations Division Standard

SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-14

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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

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

** 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 Operations Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	2552	04	046	SL375
9-07 8-14	DIST	COUNTY		SHEET NO.
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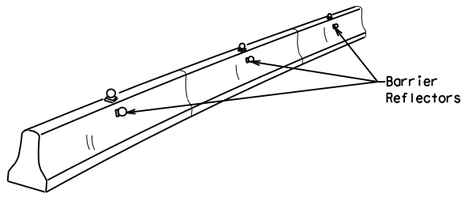
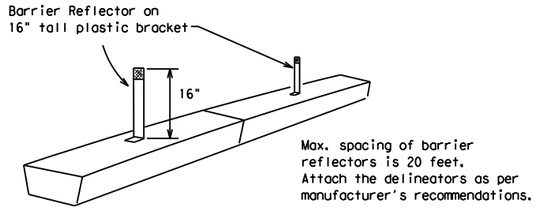
DATE:
FILE:

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.

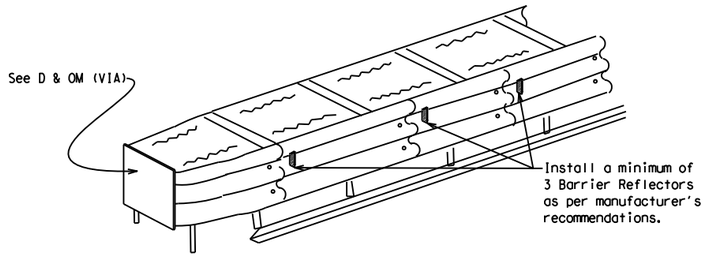


CONCRETE TRAFFIC BARRIER (CTB)

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.



LOW PROFILE CONCRETE BARRIER (LPCB)

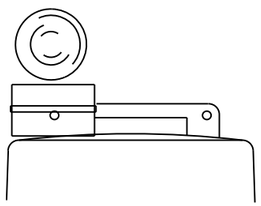


DELINEATION OF END TREATMENTS

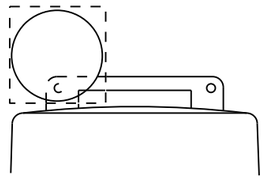
END TREATMENTS FOR CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones shall meet crashworthy standards as defined in the National Cooperative Highway Research Report 350. Refer to the CWZTCD List for approved end treatments and manufacturers.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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

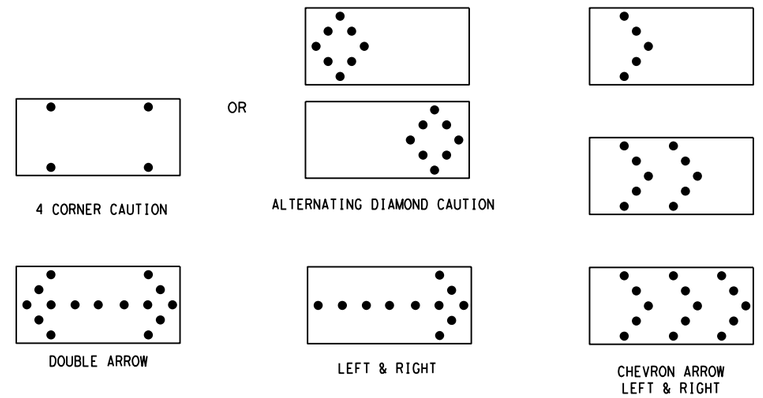
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing 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 National Cooperative Highway Research Report No. 350 (NCHRP 350) or 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 Operations Division Standard

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

BC(7)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	2552	04	046	SL375
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	ELP	EL PASO		38

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DATE:
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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

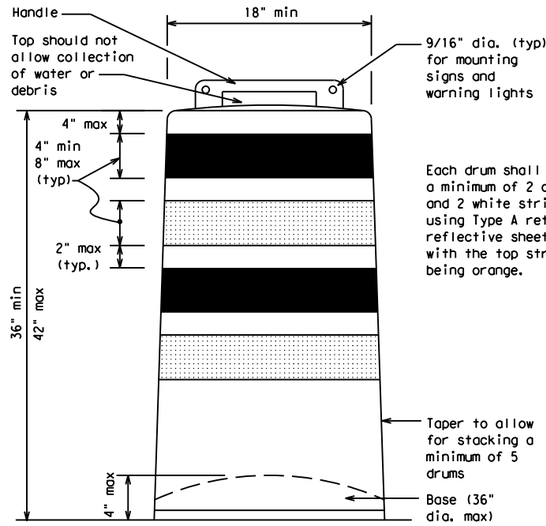
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

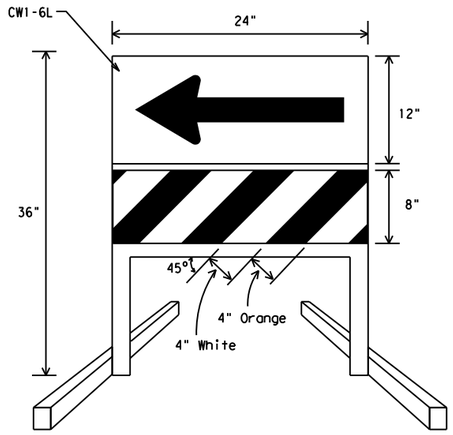
RETROREFLECTIVE SHEETING

1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A 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

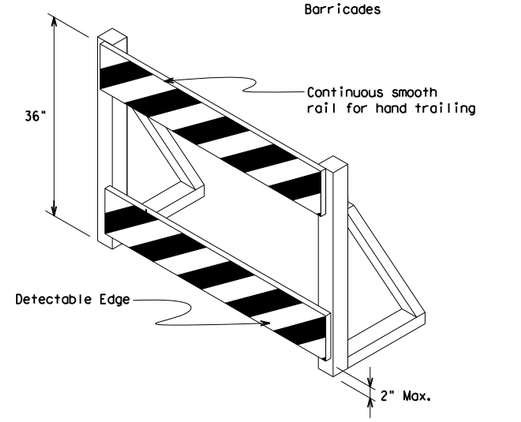
1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other 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.





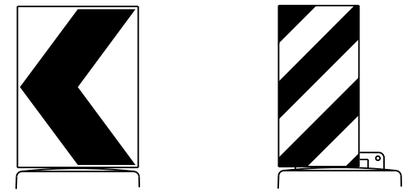
DIRECTION INDICATOR BARRICADE

1. The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
2. If used, the Direction Indicator Barricade should be used in series to direct the driver through the transition and into the intended travel lane.
3. The Direction Indicator Barricade shall consist of One-Direction Large Arrow (CW1-6) sign in the size shown with a black arrow on a background of Type B_{FL} or Type C_{FL} Orange retroreflective sheeting above a rail with Type A retroreflective sheeting in alternating 4" white and orange stripes sloping downward at an angle of 45 degrees in the direction road users are to pass. Sheeting types shall be as per DMS 8300.
4. Double arrows on the Direction Indicator Barricade will not be allowed.
5. Approved manufacturers are shown on the CWZTCD List. Ballast shall be as approved by the manufacturers instructions.



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.
2. Where pedestrians with visual disabilities normally use the closed sidewalk, a device that is detectable by a person with a visual disability traveling with the aid of a long cane shall be placed across the full width of the closed sidewalk.
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 for Buildings and Facilities (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 may use 8" nominal barricade rails as shown on BC(10) provided that the top rail provides a smooth continuous rail suitable for hand trailing with no splinters, burrs, or sharp edges.



18" x 24" Sign
(Maximum Sign Dimension)
Chevron 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 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 Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	2552	04	046	SL375
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	ELP	EL PASO		39

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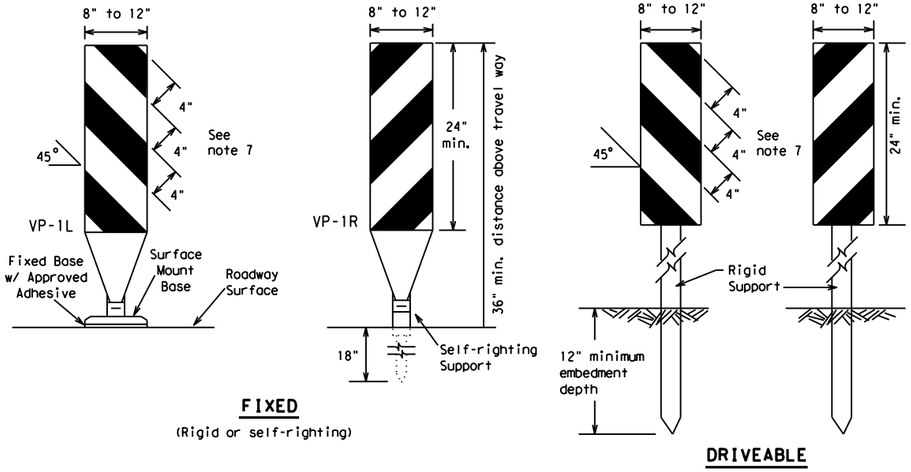
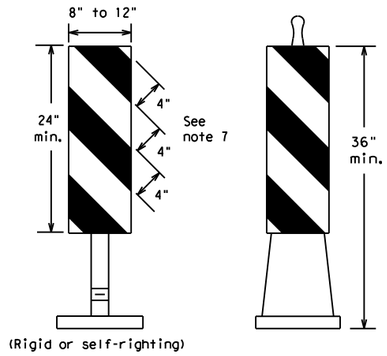


FIXED
(Rigid or self-righting)

DRIVEABLE

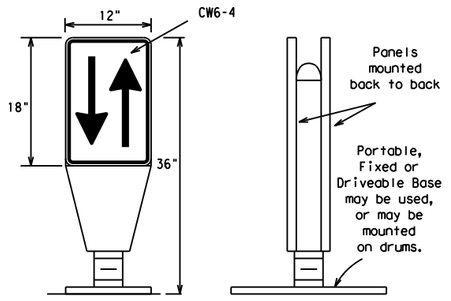


(Rigid or self-righting)

PORTABLE

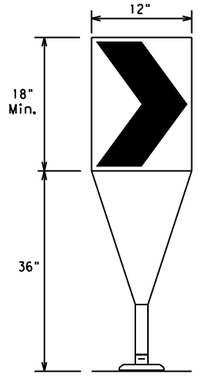
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual Appendix B "Treatment of Pavement Drop-offs in Work Zones" for additional guidelines on the use of 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 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)



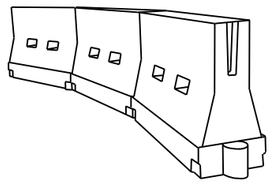
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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) placed 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 NCHRP 350 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

Texas Department of Transportation | Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-14

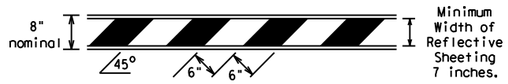
FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	2552	04	046	SL375
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	ELP	EL PASO		40

DATE:
FILE:

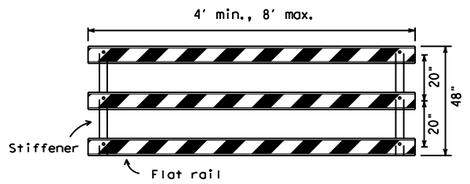
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



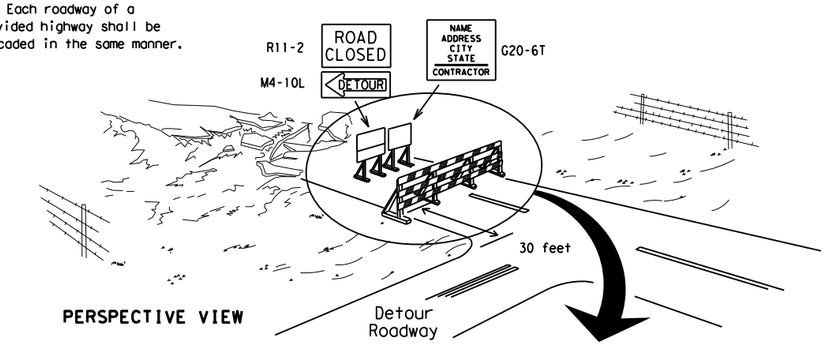
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

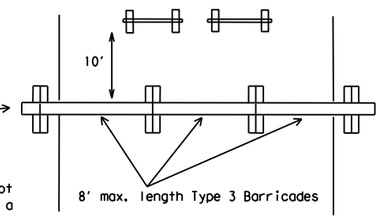
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

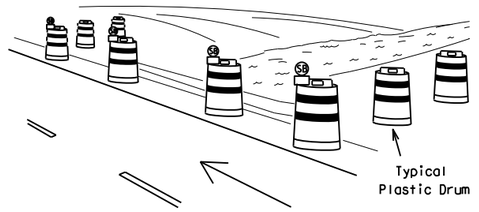
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

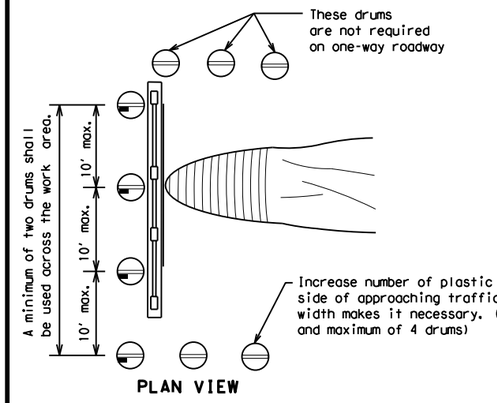
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

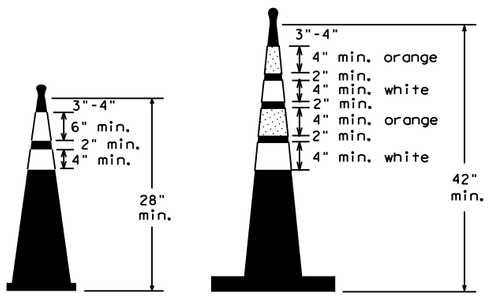
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder 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

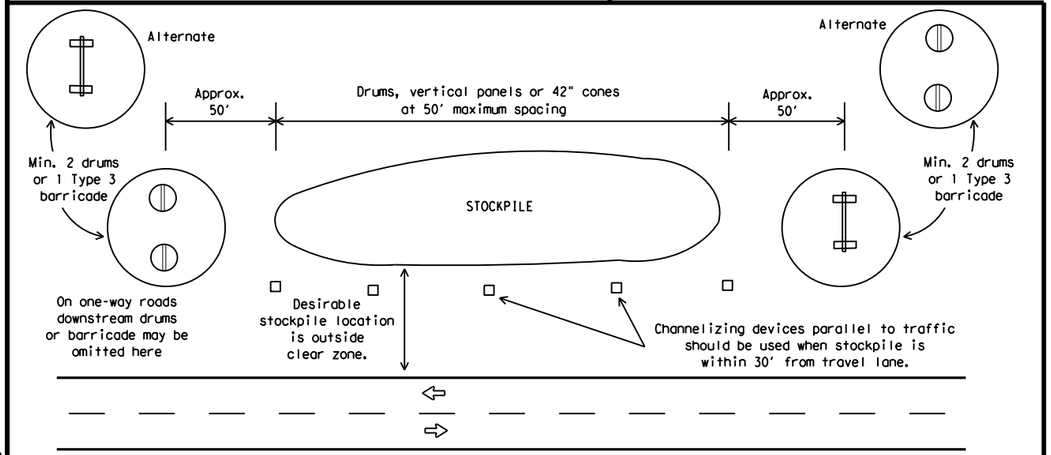
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

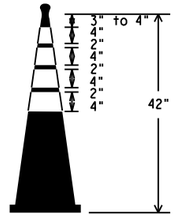
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

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 used at night shall have white or white and orange reflective bands as shown above. The reflective bands shall have a smooth, sealed outer surface and meet the requirements of Departmental Material Specification DMS-8300 Type A.
5. 28" cones and tubular markers are generally suitable for short duration and short-term stationary work as defined on BC(4). These should not be used for intermediate-term or long-term stationary work unless personnel is on-site to maintain them in their proper upright position.
6. 42" two-piece cones, vertical panels or drums are suitable for all work zone durations.
7. Cones or tubular markers used on each project should be of the same size and shape.



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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



EDGELINE CHANNELIZER

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

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Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-14

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REVISIONS 9-07 8-14 7-13	2552	04	046	SL375
	DIST	COUNTY		SHEET NO.
	ELP	EL PASO		41

DATE:
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DATE:
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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.

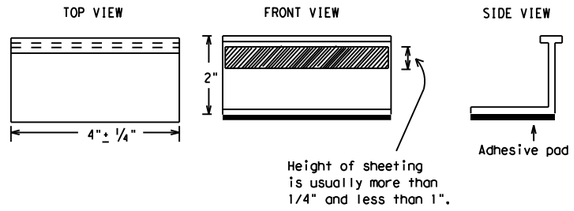
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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 Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	2552	04	046	SL375
2-98 9-07	DIST	COUNTY		SHEET NO.
1-02 7-13	ELP	EL PASO		42
11-02 8-14				

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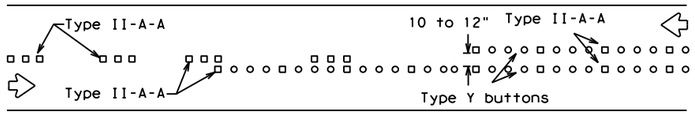
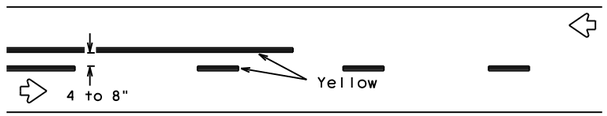
PAVEMENT MARKING PATTERNS

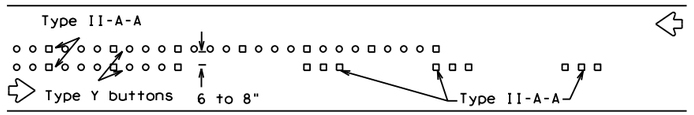
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



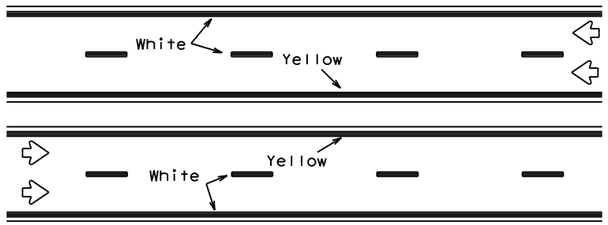
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



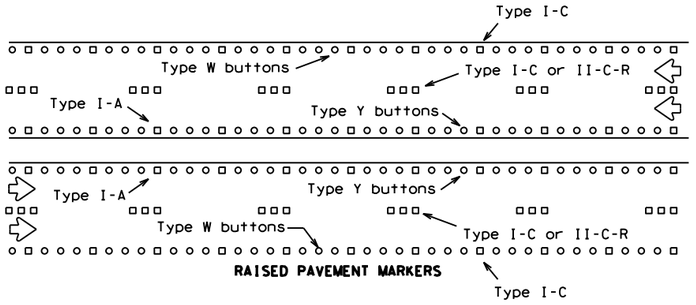
RAISED PAVEMENT MARKERS - PATTERN B

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



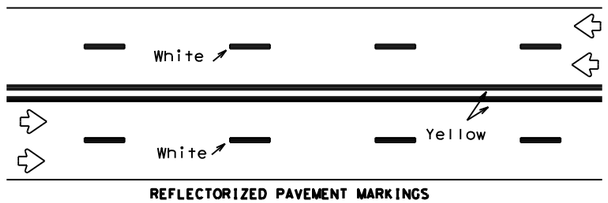
REFLECTORIZED PAVEMENT MARKINGS



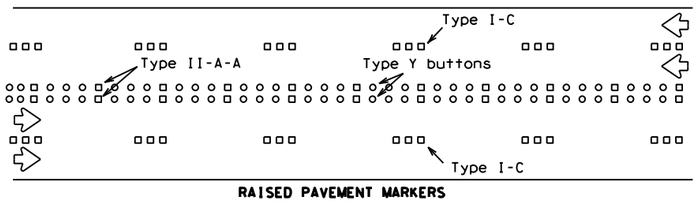
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



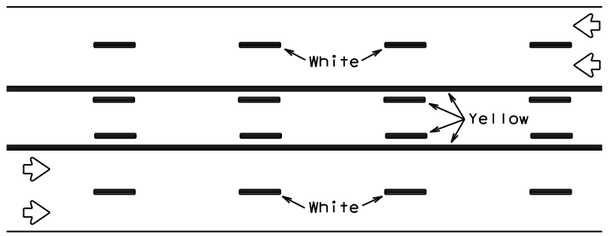
REFLECTORIZED PAVEMENT MARKINGS



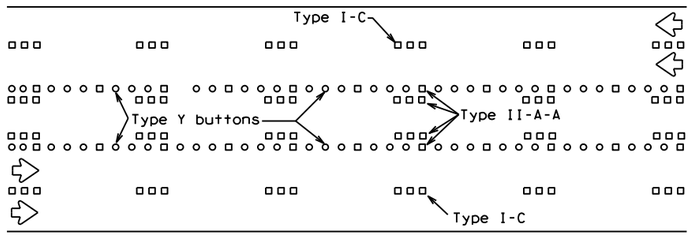
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

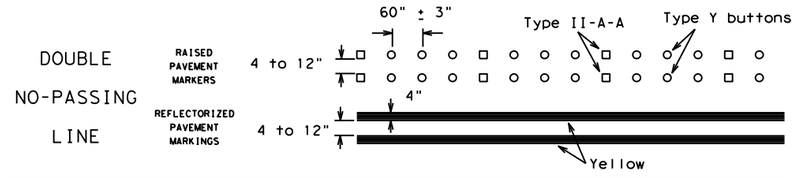
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

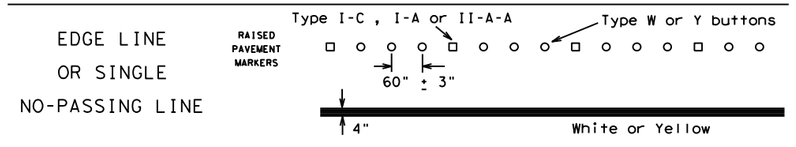
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

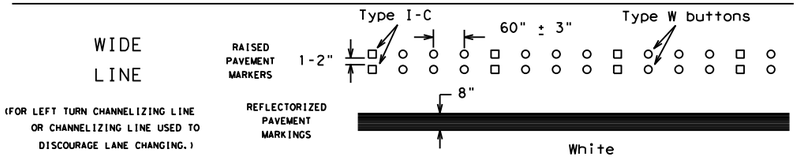


EDGE LINE OR SINGLE NO-PASSING LINE



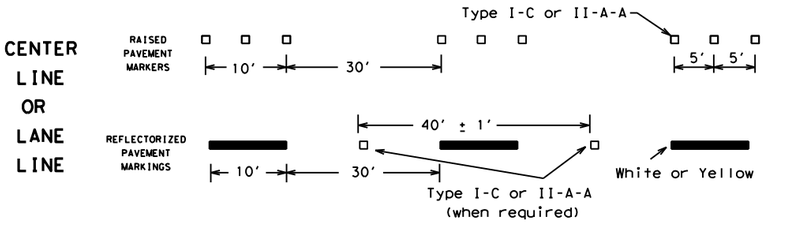
WIDE LINE

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

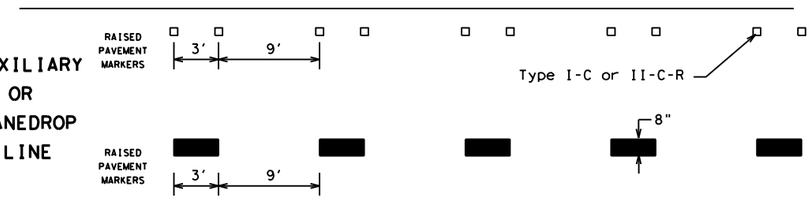


BROKEN LINES

CENTER LINE OR LANE LINE

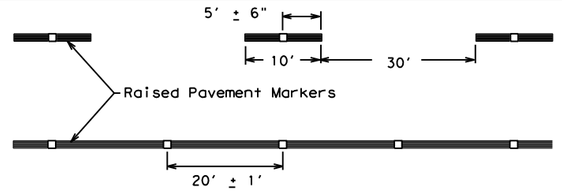


AUXILIARY OR LANEDROP LINE



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."

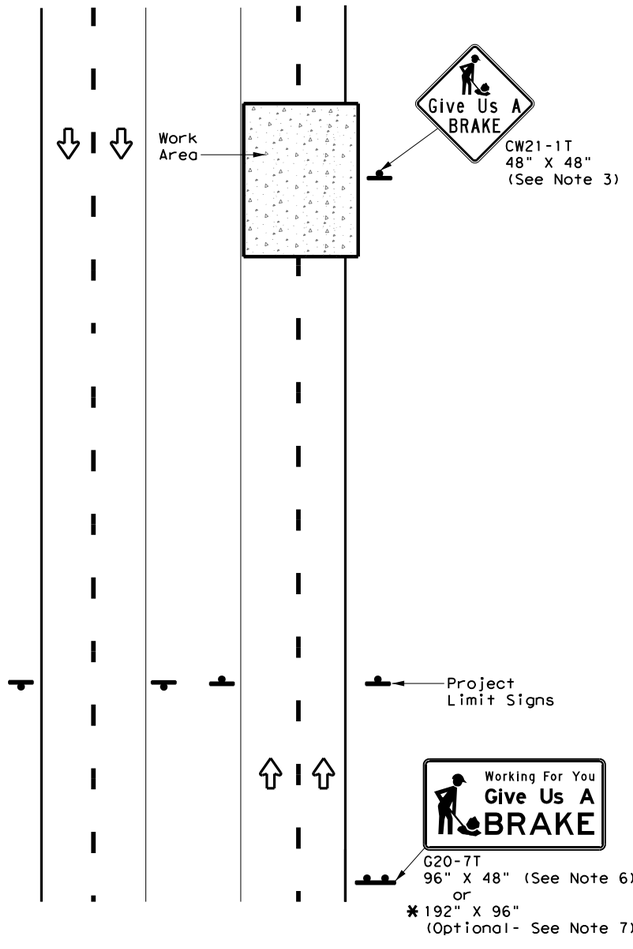
Texas Department of Transportation

Traffic Operations Division Standard

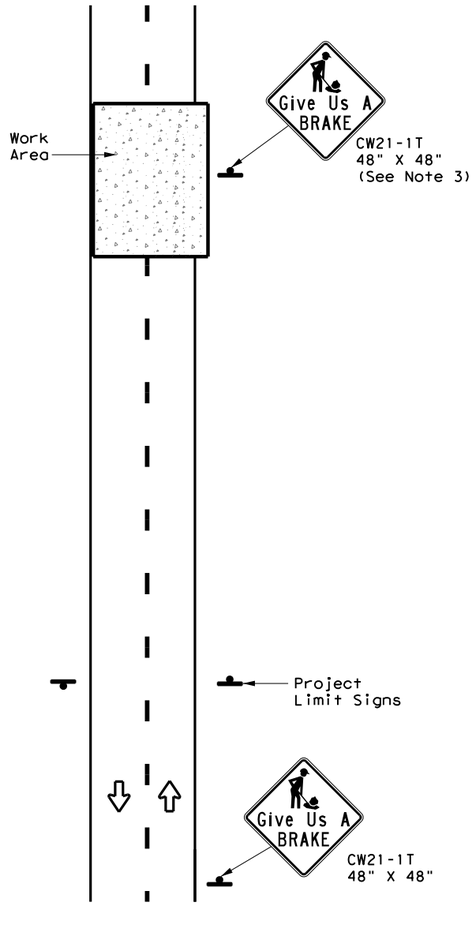
BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	2552	04	046	SL375
1-97 9-07	DIST	COUNTY		SHEET NO.
2-98 7-13	ELP	EL PASO		43
11-02 8-14				



DIVIDED HIGHWAY



UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

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

DATE:
FILE:

SUMMARY OF LARGE SIGNS

BACKGROUND COLOR	SIGN DESIGNATION	SIGN	SIGN DIMENSIONS	REFLECTIVE SHEETING	SQ FT	GALVANIZED STRUCTURAL STEEL			DRILLED SHAFT 24" DIA. (LF)
						Size	(LF) ①	(LF) ②	
Orange	G20-7T	Working For You Give Us A BRAKE	96" X 48"	Type B_{FL} or C_{FL}	32	▲	▲	▲	▲
Orange	G20-7T	Working For You Give Us A BRAKE	192" X 96"	Type B_{FL} or C_{FL}	128	W8x18	16	17	12

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

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

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B_{FL} OR TYPE C_{FL}
BLACK	LEGEND & BORDERS	NON-REFLECTIVE ACRYLIC FILM

GENERAL NOTES

1. See BC and SMD sheets for additional sign support details.
2. Sign locations shall be approved by the Engineer.
3. For projects more than two miles in length, Give Us a BRAKE signs should be repeated halfway through the project. The Give Us a Brake (CW21-1T) may be used for this purpose.
4. Work zone speed limits are sometimes used in conjunction with GIVE US A BRAKE signing. See BC(3) for location and spacing of construction speed zone signing when required.
5. Give Us a Brake (CW21-1T) signs and supports shall be considered subsidiary to Item 502, "Barricades, Signs and Traffic Handling."
6. The 96" X 48" Working For You Give Us A BRAKE (G20-7T) may use a 1/2" or 5/8" plywood substrate or 0.125" aluminum sheeting substrate and may be supported by two 4" x 6" wood posts with drilled holes for breakaway as per BC(5) and will be subsidiary to Item 502.
7. The Working For You Give Us A BRAKE (G20-7T) 192" X 96" sign shall be paid for under the following specification items:
   Item 636 - Aluminum Signs
   Item 647 - Large Roadside Sign Supports and Assemblies.
   Item 416 - Drilled Shaft Foundations
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	2552	04	046	SL375
6-96 5-98 7-13	DIST	COUNTY		SHEET NO.
8-96 3-03	ELP	EL PASO		44

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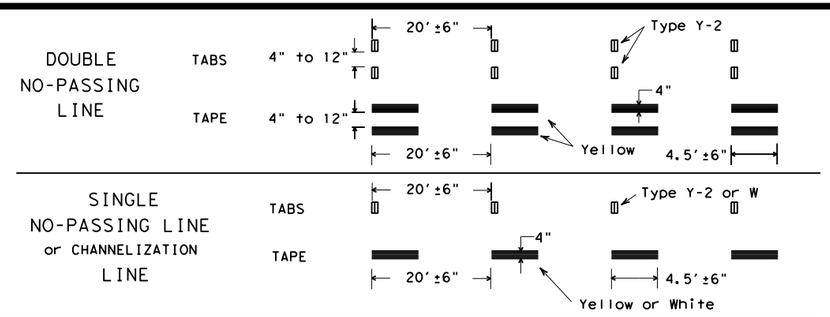
DATE:
FILE:

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



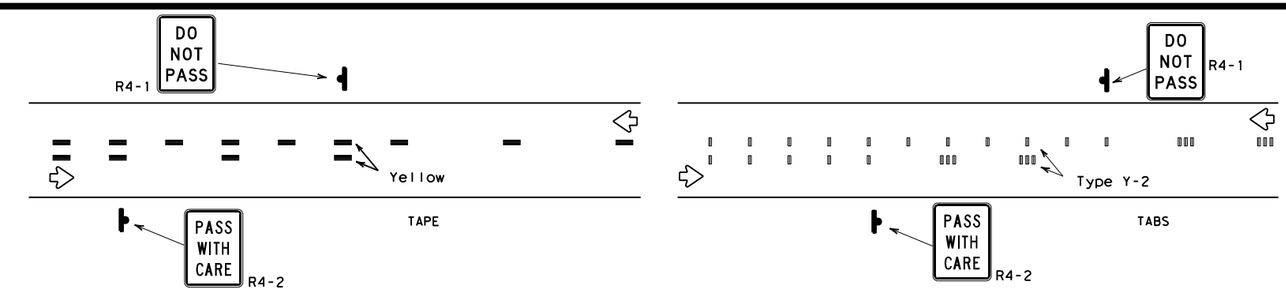
NOTES:

1. Short term pavement markings may be prefabricated markings (stick down tape) or temporary flexible-reflective roadway marker tabs unless otherwise specified elsewhere in plans.
2. Short term pavement markings shall NOT be used to simulate edge lines.
3. Dimensions indicated on this sheet are typical and approximate. Variations in size and height may occur between markers or devices made by manufacturers, by as much as 1/4 inch, unless otherwise noted.
4. Temporary flexible-reflective roadway marker tabs will require normal maintenance replacement when used on roadways with an ADT per lane of up to 7500 vehicles with no more than 10% truck mix. When roadways exceed these values, additional maintenance replacement of devices should be planned.
5. No segment of roadway open to traffic shall remain without permanent pavement markings for a period greater than 14 calendar days. The Contractor will be responsible for maintaining short term pavement markings until permanent pavement markings are in place. When the Contractor is responsible for placement of permanent pavement markings, no segment of roadway shall remain without permanent pavement markings for a period greater than 14 calendar days unless weather conditions prohibit placement. Permanent pavement markings shall be placed as soon as weather permits.
6. For two lane, two-way roadways, DO NOT PASS signs shall be erected to mark the beginning of sections where passing is prohibited and PASS WITH CARE signs shall be erected to mark the beginning of sections where passing is permitted. Signs shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and may be used to indicate the limits of no-passing zones for up to 14 calendar days. Permanent pavement markings should then be placed.
7. For low volume two lane, two-way roadways of 4000 ADT or less, no-passing lines may be omitted when approved by the Engineer. DO NOT PASS and PASS WITH CARE signs shall be erected (see note 6).
8. For exit gores where a lane is being dropped place wide gore markings or retroreflective channelizing devices to guide motorist through the exit. If channelizing devices are to be used it should be noted elsewhere in the plans. One piece cones are not allowed for this purpose.

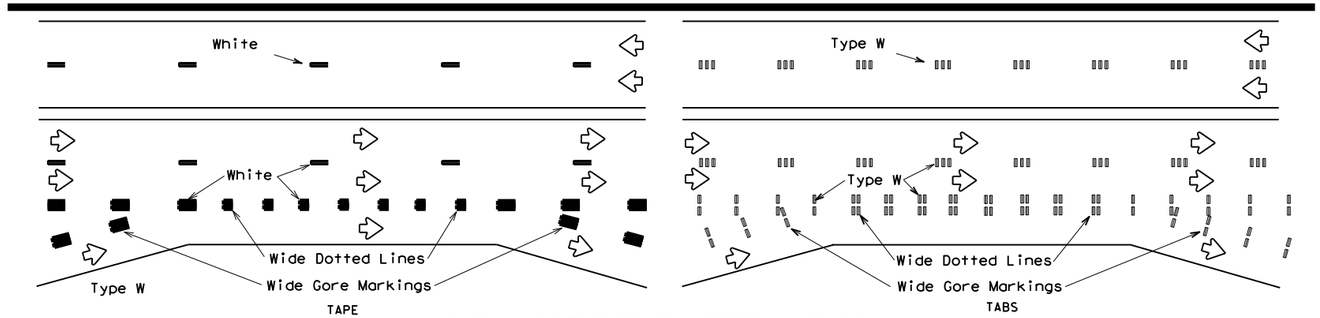
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

1. Temporary flexible-reflective roadway marker tabs detailed on this sheet will be designated Type Y-2 (two amber reflective surfaces with yellow body); Type Y (one amber reflective surface with yellow body); and Type W (one white or silver reflective surface with white body). Additional details may be found on BC(11).
2. Tabs shall meet requirements of Departmental Material Specification DMS-8242.
3. When dry, tabs shall be visible for a minimum distance of 200 feet during normal daylight hours and when illuminated by automobile low-beam head light at night, unless sight distance is restricted by roadway geometrics.
4. No two consecutive tabs nor four tabs per 1000 feet of line shall be missing or fail to meet the visual performance requirements of Note 3.

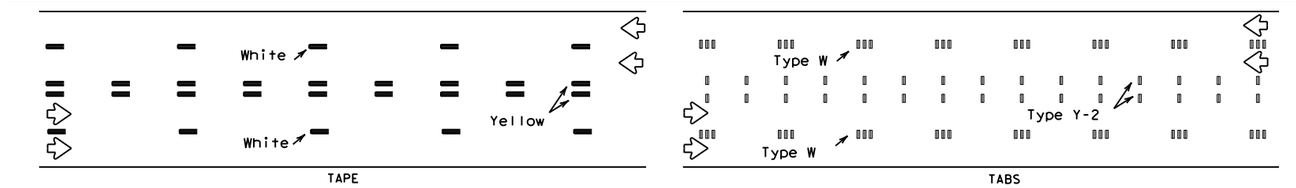
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



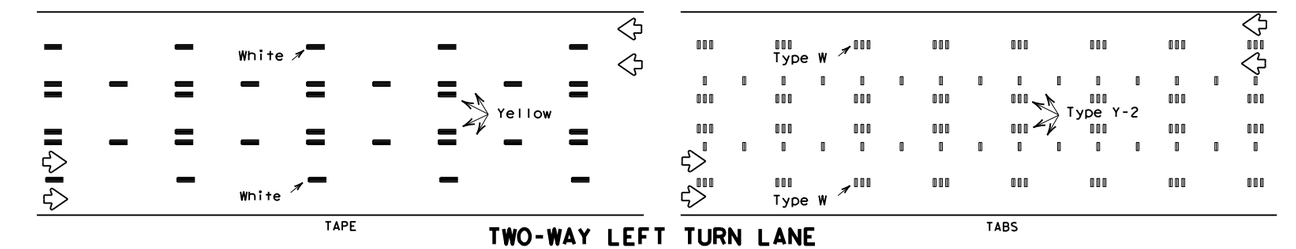
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



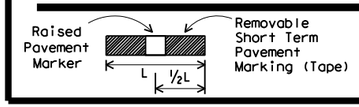
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

1. DMSs referenced above can be found along with embedded links to their respective MPLs at the following website:
   http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm

Texas Department of Transportation

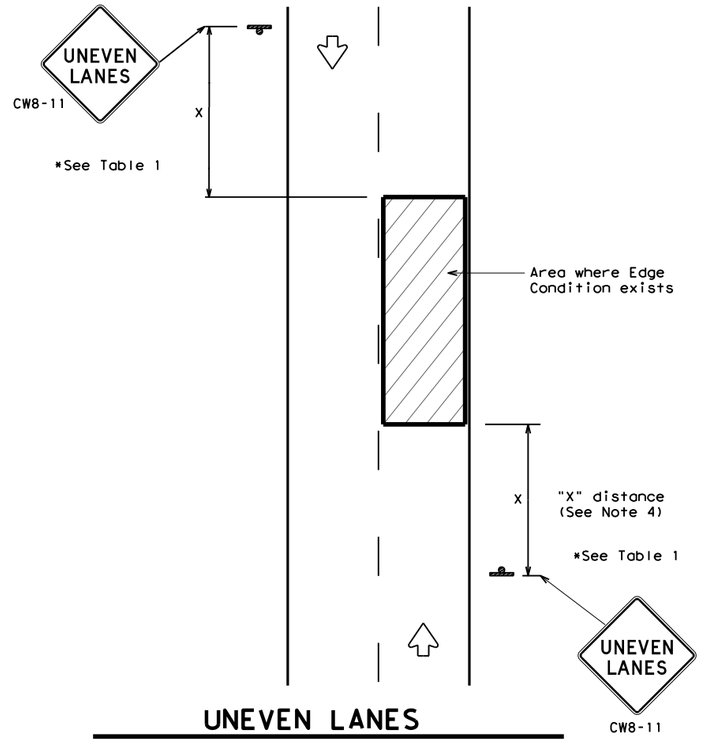
Traffic Operations Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

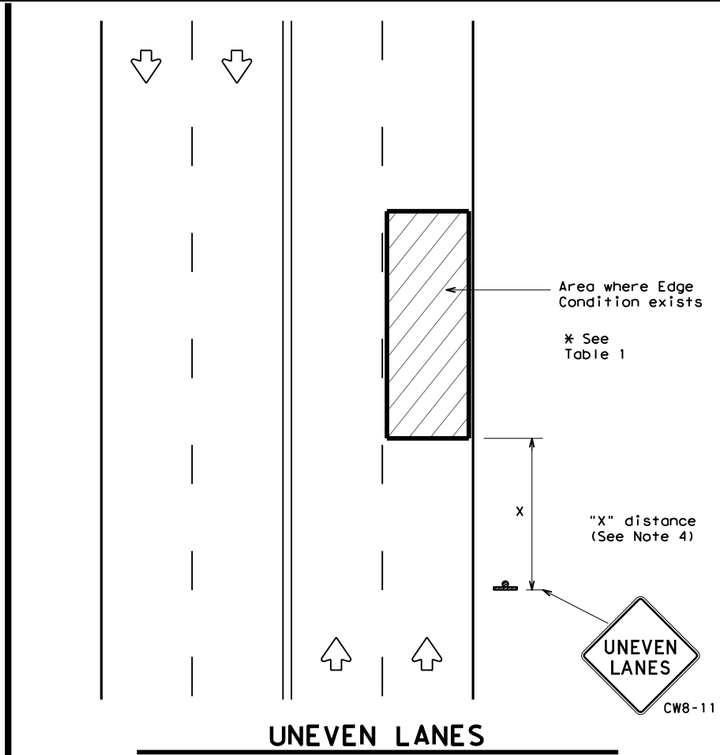
WZ(STPM)-13

FILE:	wzstpm-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS		2552	04	046	SL375
1-97		DIST	COUNTY		SHEET NO.
3-03		ELP	EL PASO		45
7-13					

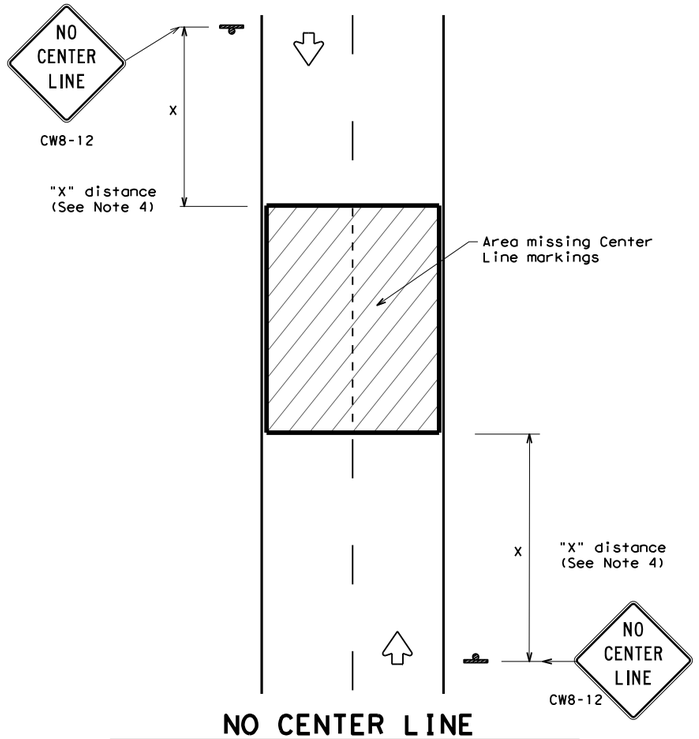
DATE:
FILE:



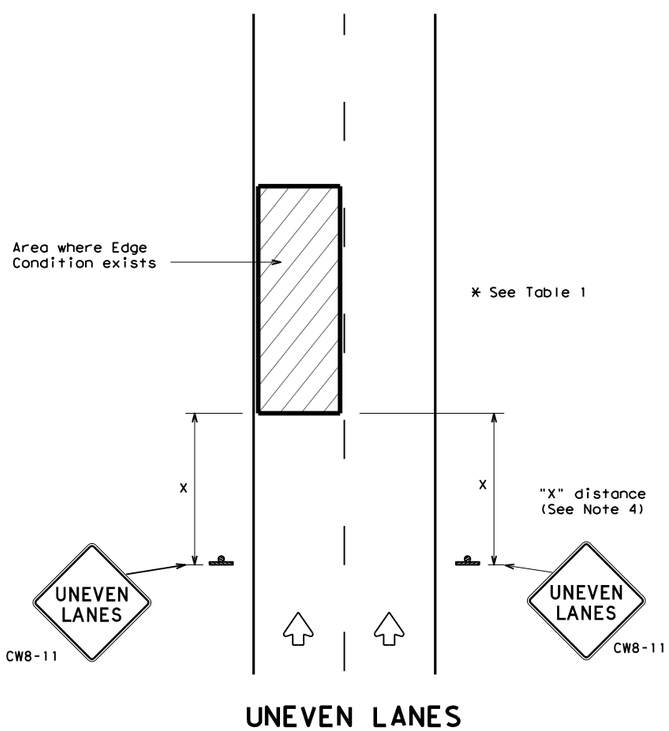
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

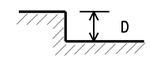
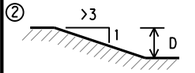
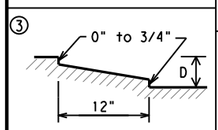
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B_{FL} OR TYPE C_{FL} SHEETING
BLACK	LEGEND & BORDERS	ACRYLIC NON-REFLECTIVE SHEETING

GENERAL NOTES

1. If spalling or holes occur, ROUGH ROAD (CW8-8) signs should be placed in advance of the condition and be repeated every two miles where the condition persists.
2. UNEVEN LANES (CW8-11) signs shall be installed in advance of the condition and repeated every mile. Signs installed along the uneven lane condition may be supplemented with the NEXT XX MILES (CW7-3aP) plaque or Advisory Speed (CW13-1P) plaque.
3. NO CENTER LINE (CW8-12) signs and temporary pavement markings as per the WZ(STPM) standard shall be installed if yellow centerlines separating two way traffic are obscured or obliterated. Repeat NO CENTER LINE signs every two miles where the center line markings are not in place. The signs and markings shall remain in place until permanent pavement markings are installed.
4. Signs shall be spaced at the distances recommended as per BC standards.
5. Additional signs may be required as directed by the Engineer. Signs shall remain in place until final surface is applied. Signs shall be considered subsidiary to Item 502 "BARRICADES, SIGNS AND TRAFFIC HANDLING."
6. Signs shall be fabricated and mounted on supports as shown on the BC standards and/or listed on the "Compliant Work Zone Traffic Control Devices" list.
7. Short term markings shall not be used to simulate edge lines.
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition.

TABLE 1

Edge Condition	Edge Height (D)	* Warning Devices
① 	Less than or equal to: 1¼" (maximum-planing) 1½" (typical-overlay)	Sign: CW8-11
	Distance "D" may be a maximum of 1 1/4 " for planing operations and 2" for overlay operations if uneven lanes with edge condition 1 are open to traffic after work operations cease.	
② 	Less than or equal to 3"	Sign: CW8-11
③  Notched Wedge Joint	Distance "D" may be a maximum of 3" if uneven lanes with edge condition 2 or 3 are open to traffic after work operations cease. Uneven lanes should not be open to traffic when "D" is greater than 3".	

TRAFFIC CONTROL DURING PLANING, OVERLAY AND LEVELING OPERATIONS ARE SHOWN ELSEWHERE IN THE PLANS.

MINIMUM WARNING SIGN SIZE	
Conventional roads	36" x 36"
Freeways/expressways, divided roadways	48" x 48"

Texas Department of Transportation

Traffic Operations Division Standard

SIGNING FOR UNEVEN LANES

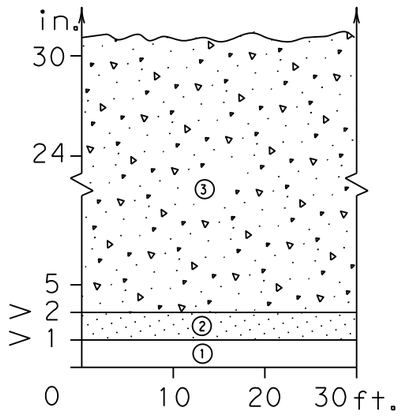
WZ(UL)-13

FILE: wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	2552	04	046	SL375
8-95 2-98 7-13	DIST	COUNTY		SHEET NO.
1-97 3-03	ELP	EL PASO		46

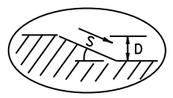
DATE:
FILE:

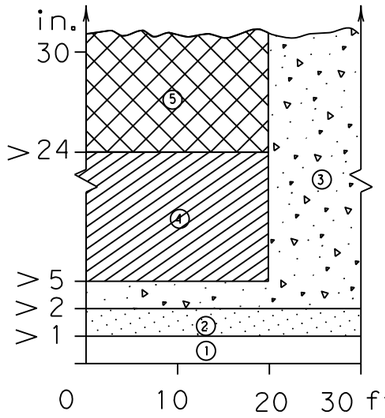
DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

Edge Height (D) in Inches versus Lateral Clearance (Y) in Feet

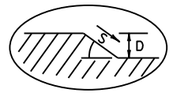


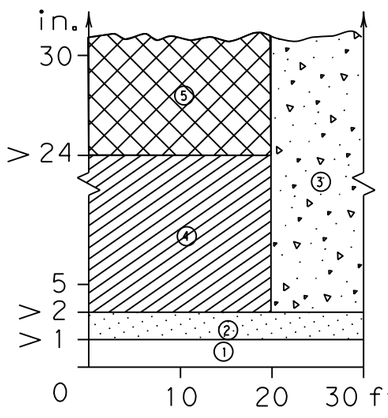
Edge Condition I
S = (3:1) (or flatter)



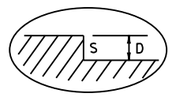


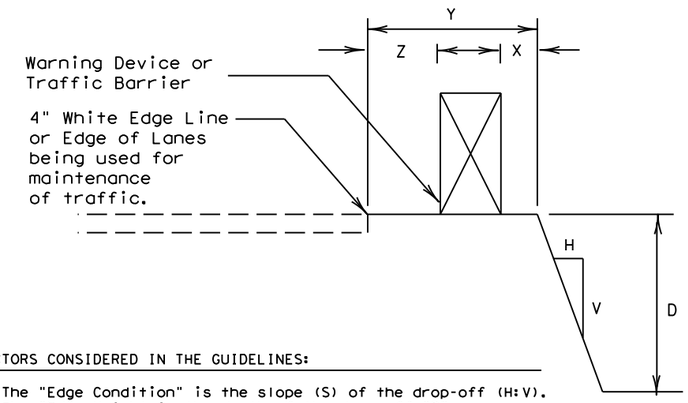
Edge Condition II
S = ((2.99):1) to (1:1)





Edge Condition III
S is steeper than (1:1)





FACTORS CONSIDERED IN THE GUIDELINES:

1. The "Edge Condition" is the slope (S) of the drop-off (H:V). The "Edge Height is the depth of the drop-off "D".

2. Distance "X" is to be the maximum practical under job conditions. Two feet minimum for high speed conditions. Distance "Y" is the lateral clearance from edge of travel lane to edge of dropoff. Distance "Z" does not have a minimum.

3. In addition to the factors considered in the guidelines, each construction zone drop-off situation should be analyzed individually, taking into account other variables, such as: traffic mix, posted speed in the construction zone, horizontal curvature, and the practicality of the treatment options.

4. The conditions for indicating the use of positive or protective barriers are given by Zone-5 and Figure-1. Traffic barriers are primarily applicable for high speed conditions. Urban areas with speeds of 30 mph or less may have a lesser need for signing, delineation, and barriers. Right-angled edges, however, with "D" greater than 2 inches and located within a lateral offset of 6 feet, may indicate a higher level of treatment.

5. If the distance "Y" must be less than 3 feet, the use of a positive barrier may not be feasible. In such a case, consider either: 1) narrowing the lanes to a desired 11 to 12 feet or 10 foot minimum (see CW20-8 sign), or 2) provide an edge slope such as Edge Condition I.

Zone	Treatment Types Guidelines:
①	No treatment.
②	CW 8-11 "Uneven Lanes" signs.
③	CW 8-9a "Shoulder Drop-Off" or CW 8-11 signs plus vertical panels.
④	CW 8-9a or CW 8-11, signs plus drums. Where restricted space precludes the use of drums, use vertical panels. An edge fill may be provided to change the edge slope to that of the preferable Edge Condition I.
⑤	Check indications (Figure-1) for positive barrier. Where positive barrier is not indicated, the treatment shown above for Zone- 4 may be used after consideration of other applicable factors.

Edge Condition Notes:

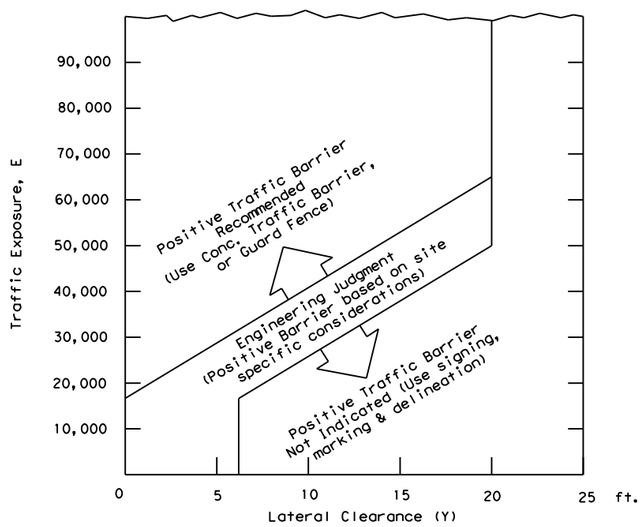
1. Edge Condition I: Most vehicles are able to traverse an edge condition with a slope rate of (3 to 1) or flatter. The slope must be constructed with a compacted material capable of supporting vehicles.

2. Edge Condition II: Most vehicles are able to traverse an edge condition with a slope between (2.99 to 1) and (1to 1) so long as "D" does not exceed 5 inches. Under-carriage drag on most automobiles will occur when "D" exceeds 6 inches. As "D" exeeds 24 inches, the possibility for rollover is greater in most vehicles.

3. Edge Condition III: When slopes are greater than (1 to 1) and where "D" is greater than 2 inches, a more difficult control factor may exist for some vehicles, if not properly treated. For example, where "D" is greater than 2 inches and up to 24 inches different types of vehicles may experience different steering control at different edge heights. Automobiles might experience more steering control differential when "D" is greater than 2 inches and up to 5 inches. Trucks, particularly those with high loads, have more steering control differential when "D" is greater than 5 inches and up to 24 inches. When "D" exceeds 24 inches, the possibility of rollover is greater for most vehicles.

4. Milling or overlay operations that result in Edge Condition III should not be in place without appropriate warning treatments, and these conditions should not be left in place for extended periods of time.

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



1 E = ADT x T
Where ADT is that portion of the average daily traffic volume traveling within 20 feet (generally two adjacent lanes) of the edge dropoff condition; and, T is the duration time in years of the dropoff condition.

2 Figure-1 provides a practical approach to the use of positive barriers for the protection of vehicles from pavement drop-offs. Other factors, such as the presence of heavy machinery, construction workers, or the mix and volume of traffic may make the use of positive barriers appropriate, even when the edge condition alone may not justify the use of a barrier.

3 An approved end treatment should be provided for any positive barrier end located within a lateral offset of 20 feet from the edge of the travel lane.

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

Engineer's Seal

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED
PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

Date 5/04/2021

Texas Department of Transportation
Traffic Operations Division

TREATMENT FOR VARIOUS EDGE CONDITIONS

REVISIONS
03-01
08-01 correct typos

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

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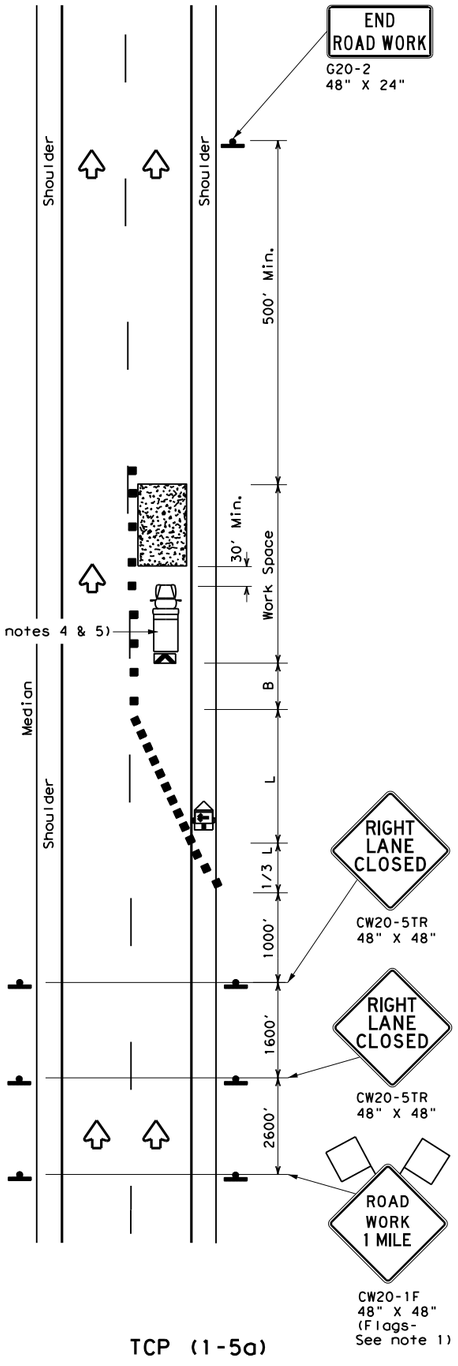
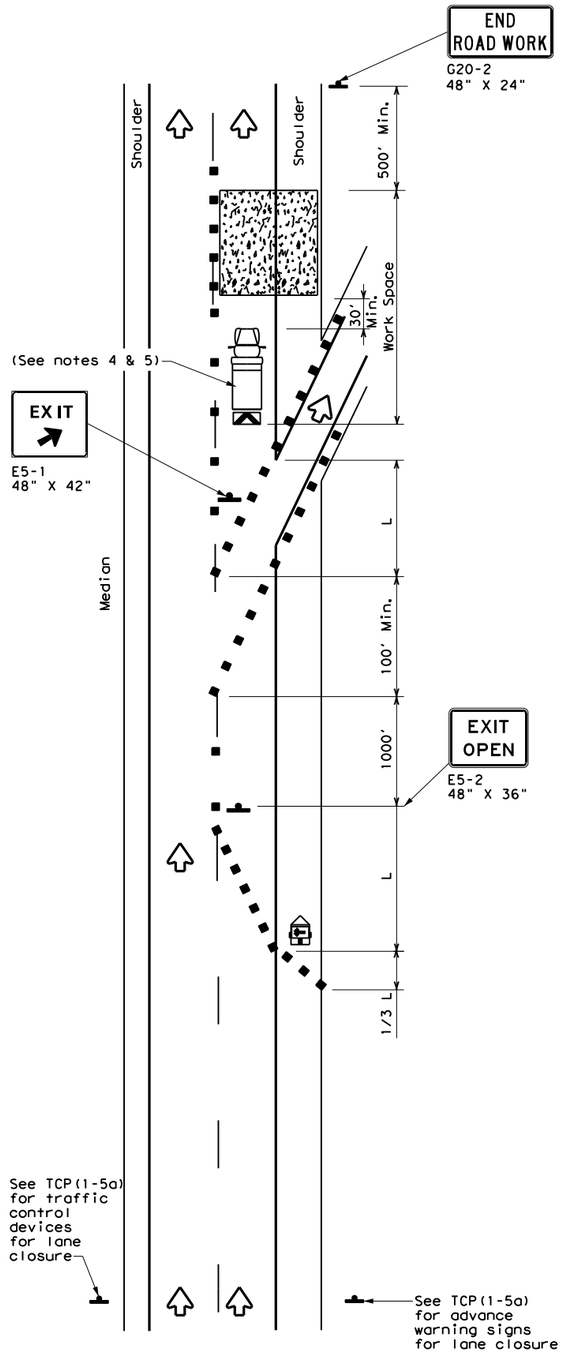
2552	04	046	SL375
DIST	COUNTY		SHEET NO.
ELP	EL PASO		47

DATE:
FILE:



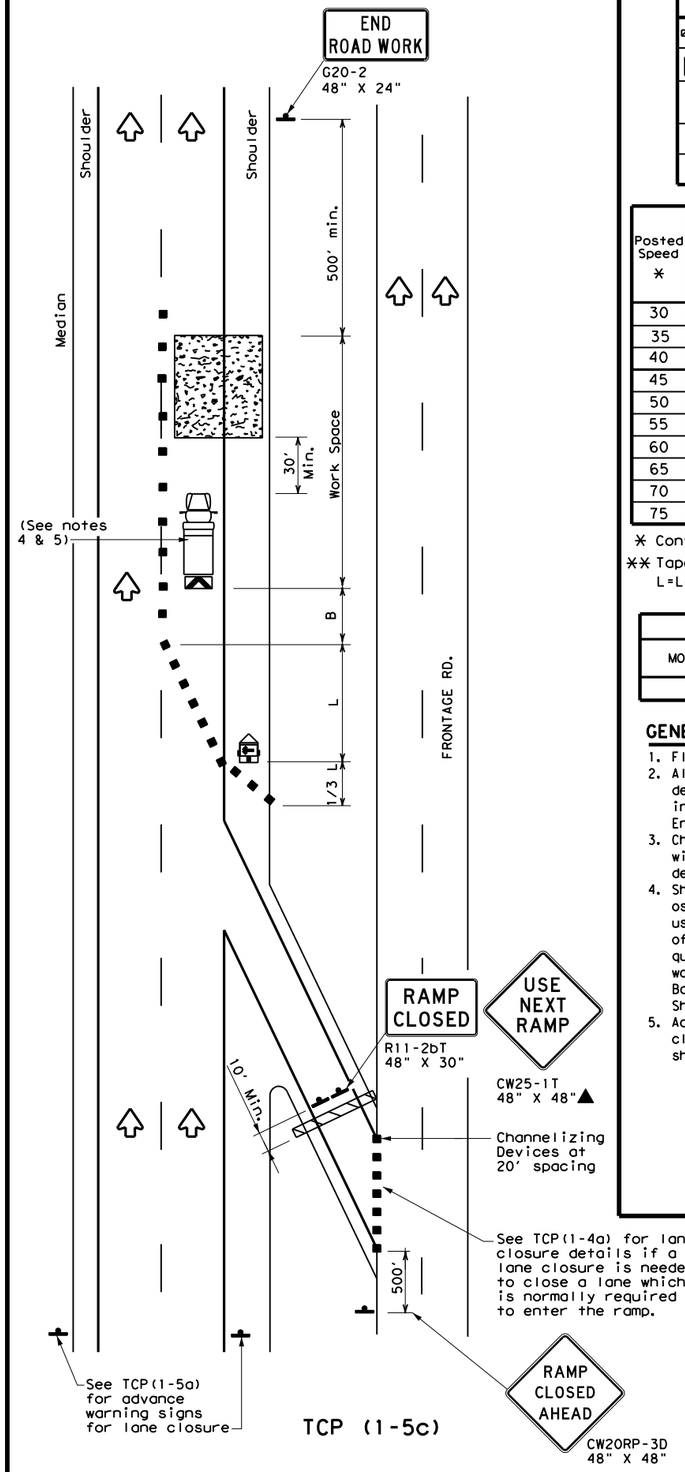
TCP (1-5a)

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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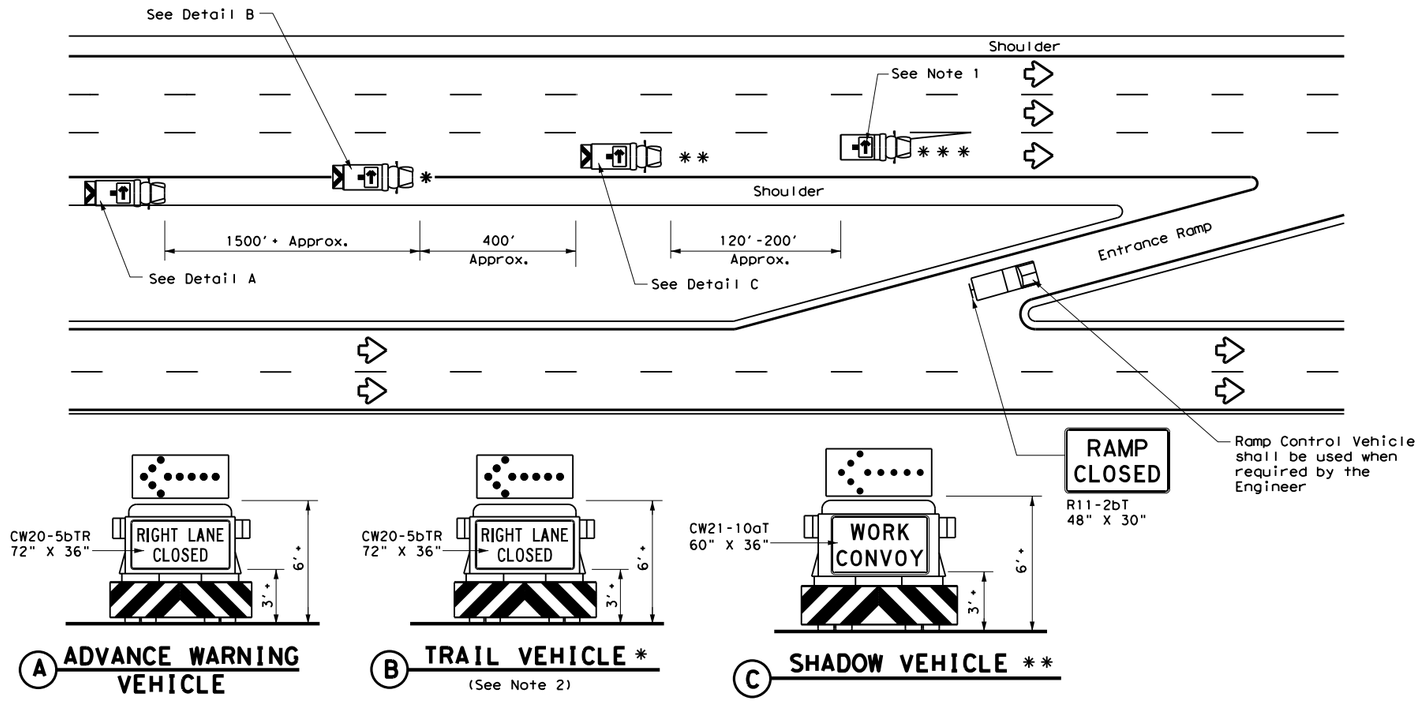
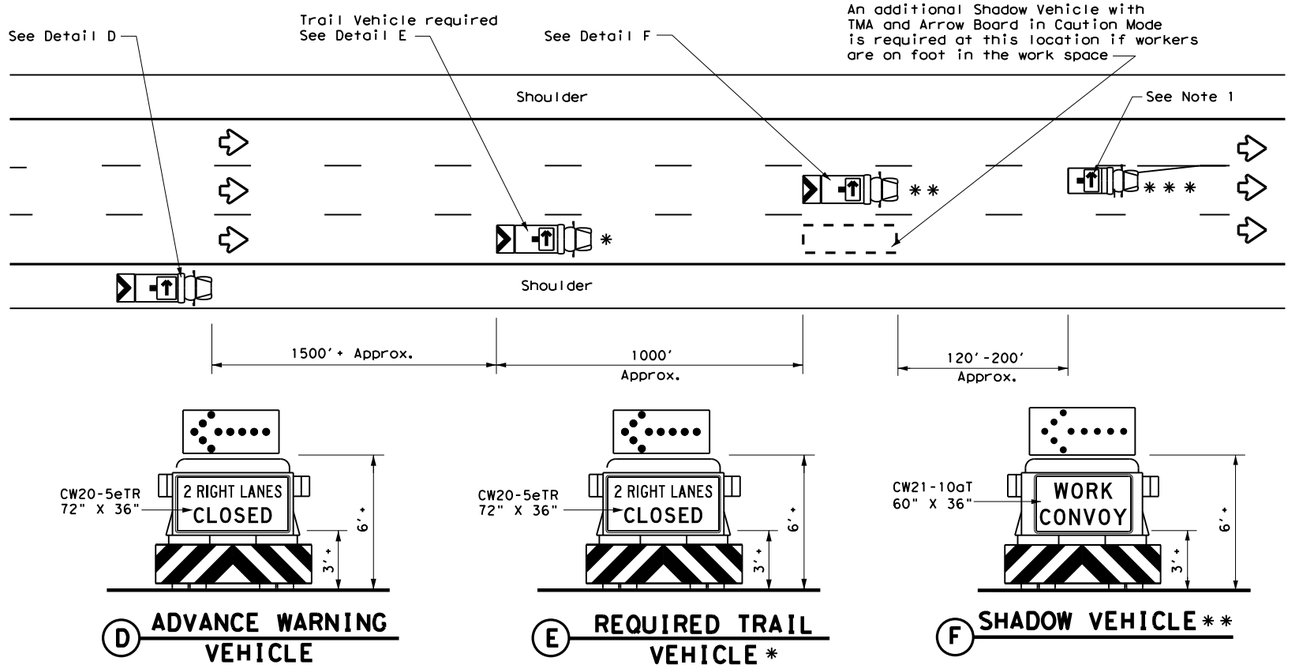
	DIST	COUNTY		SHEET NO.
	ELP	EL PASO		48

DATE:
FILE:



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



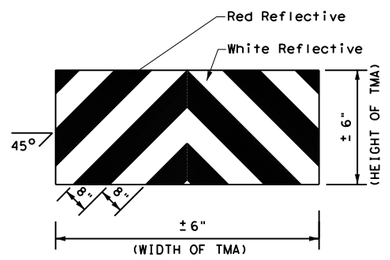
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

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

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

GENERAL NOTES

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	2552	04	046	SL375
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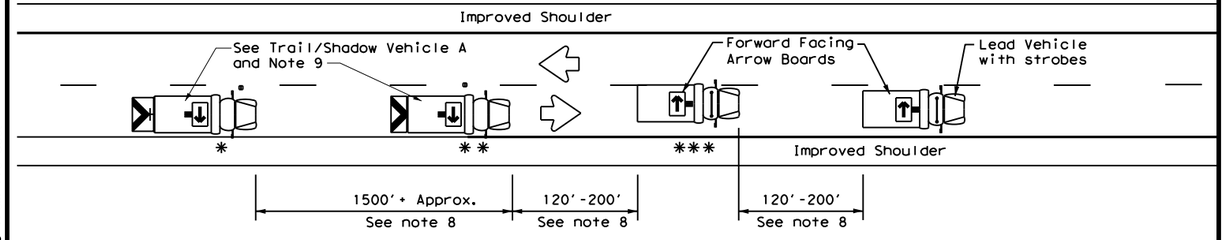
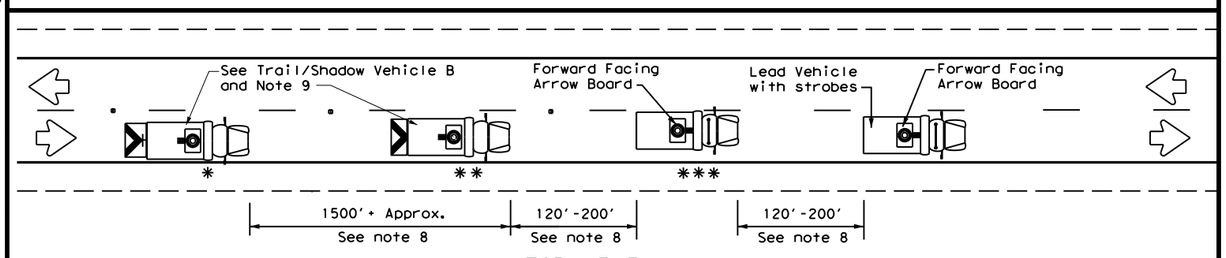
	ELP	EL PASO		49

176



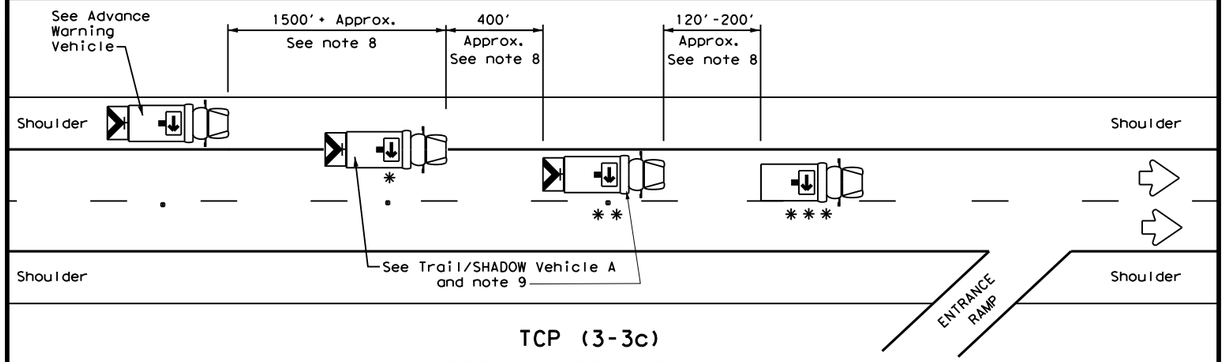
TCP (3-3a)

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



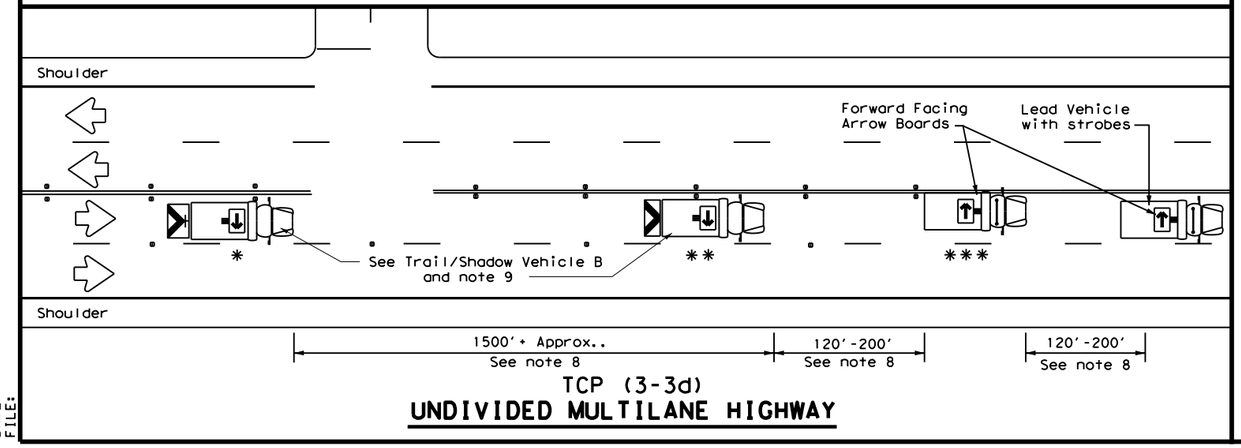
TCP (3-3b)

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



TCP (3-3c)

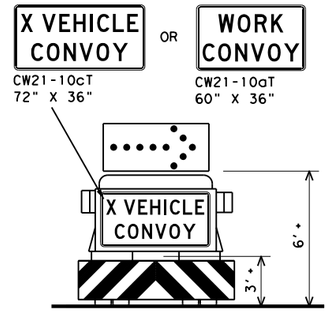
DIVIDED MULTILANE HIGHWAY



TCP (3-3d)

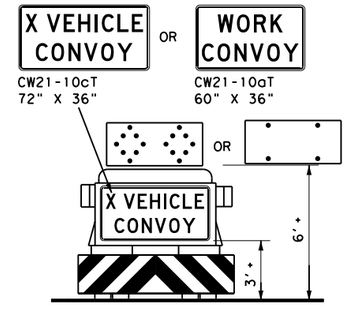
UNDIVIDED MULTILANE HIGHWAY

DATE:
FILE:



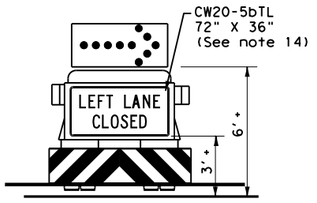
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

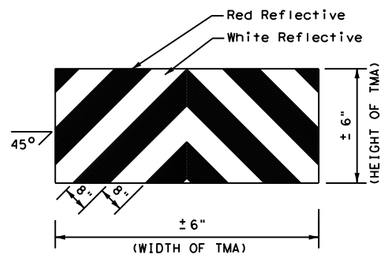


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL

TCP(3-3)-14

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©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
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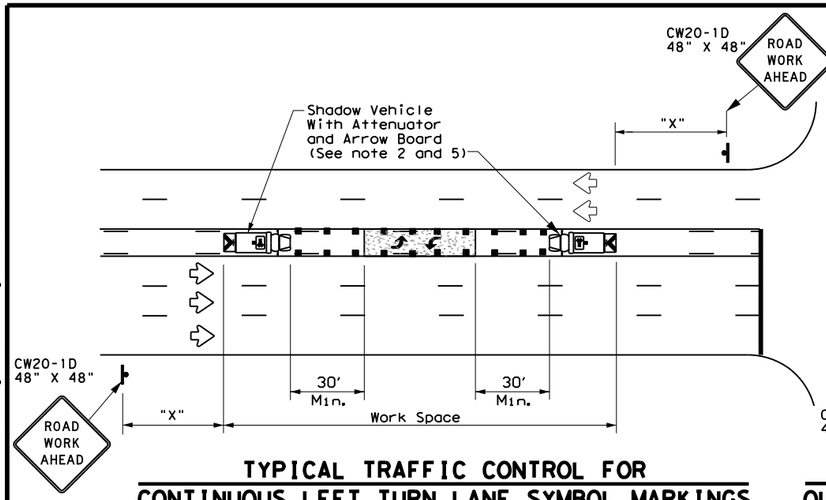
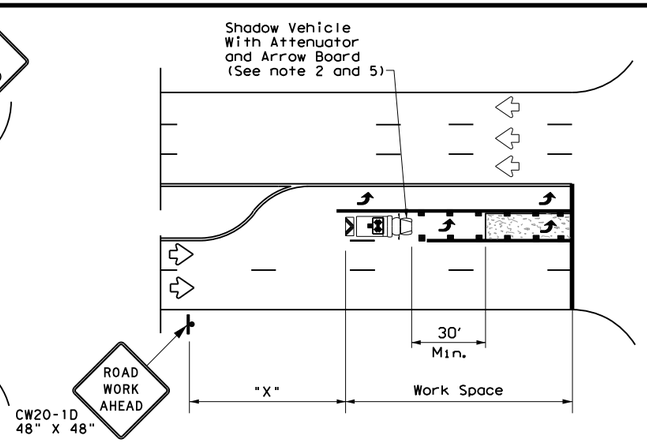
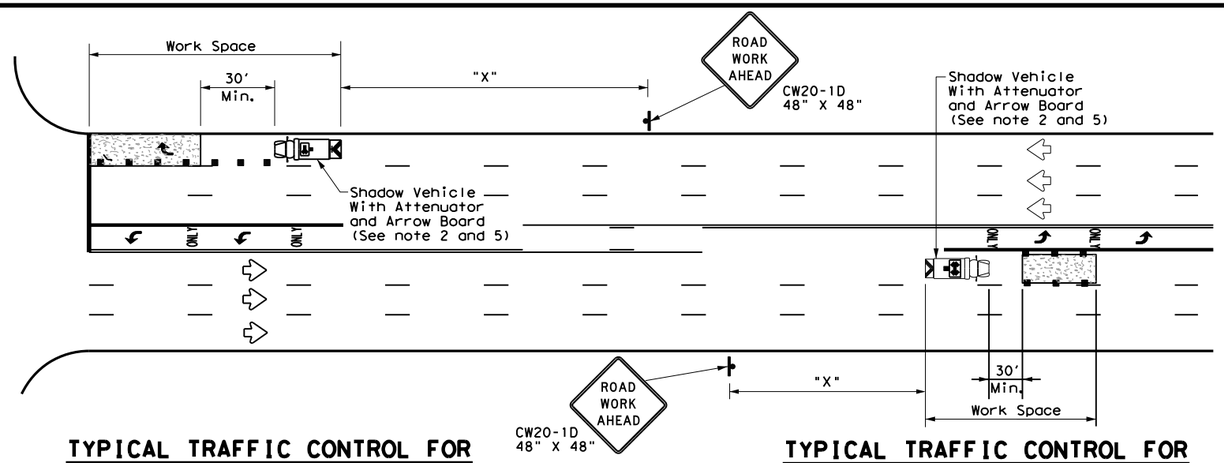
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	ELP	EL PASO		50
1-97 7-14				



TYPICAL TRAFFIC CONTROL FOR
CONTINUOUS LEFT TURN LANE SYMBOL MARKINGS

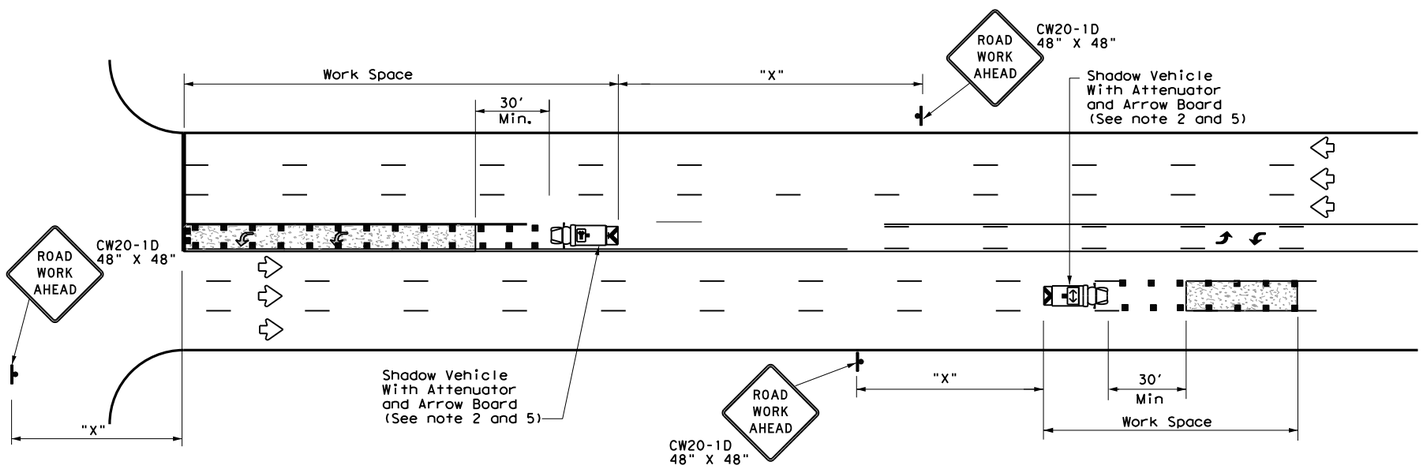


TYPICAL TRAFFIC CONTROL FOR
OUTSIDE DUAL LEFT TURN LANE SYMBOL MARKINGS



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

DATE:
FILE:

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

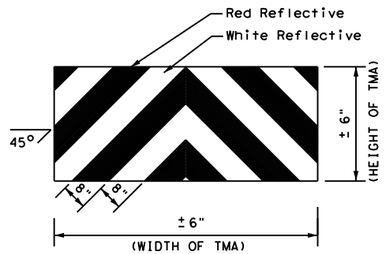
* Conventional Roads Only

** 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

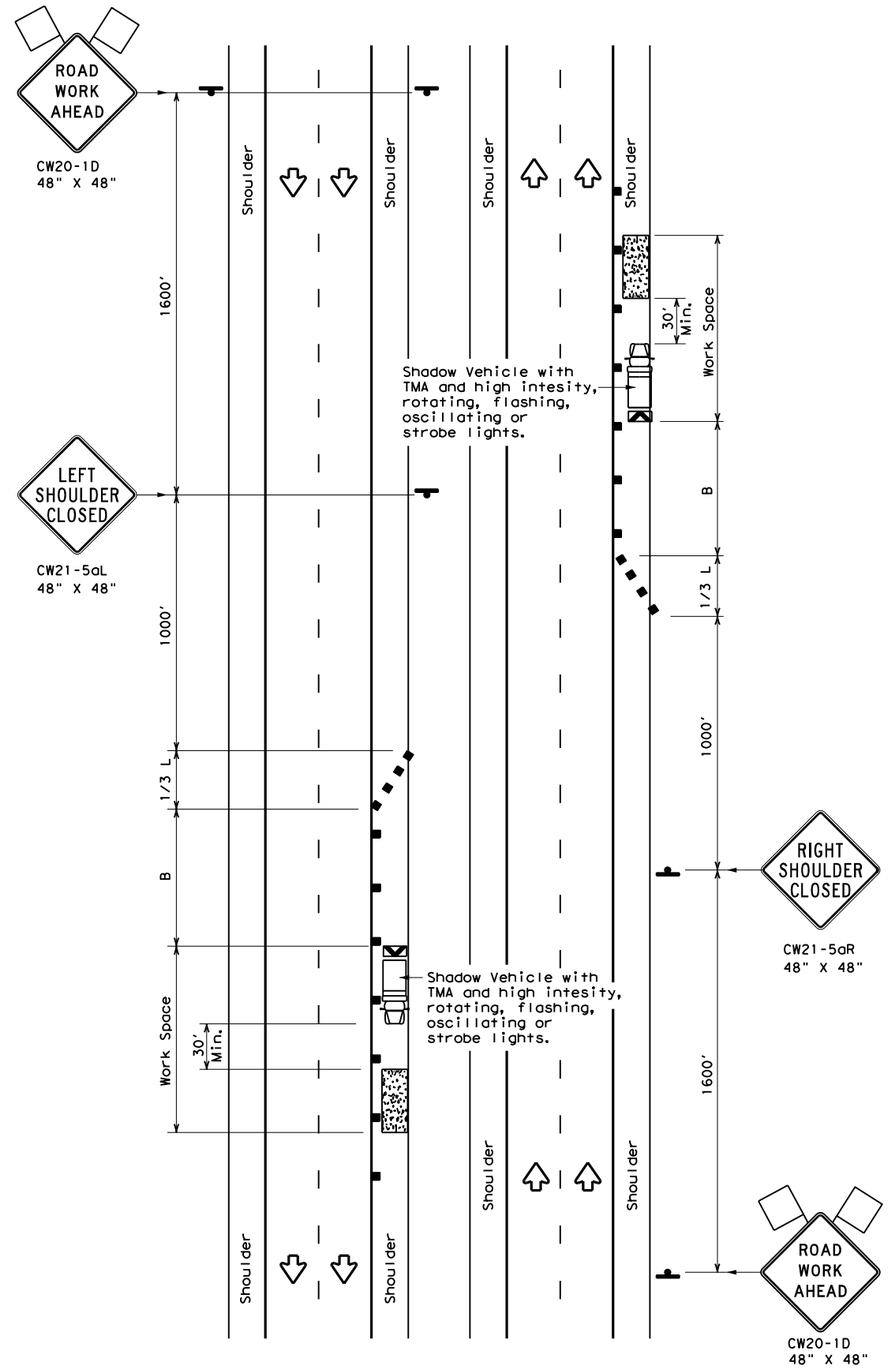
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS FOR ISOLATED WORK AREAS UNDIVIDED HIGHWAYS

TCP(3-4)-13

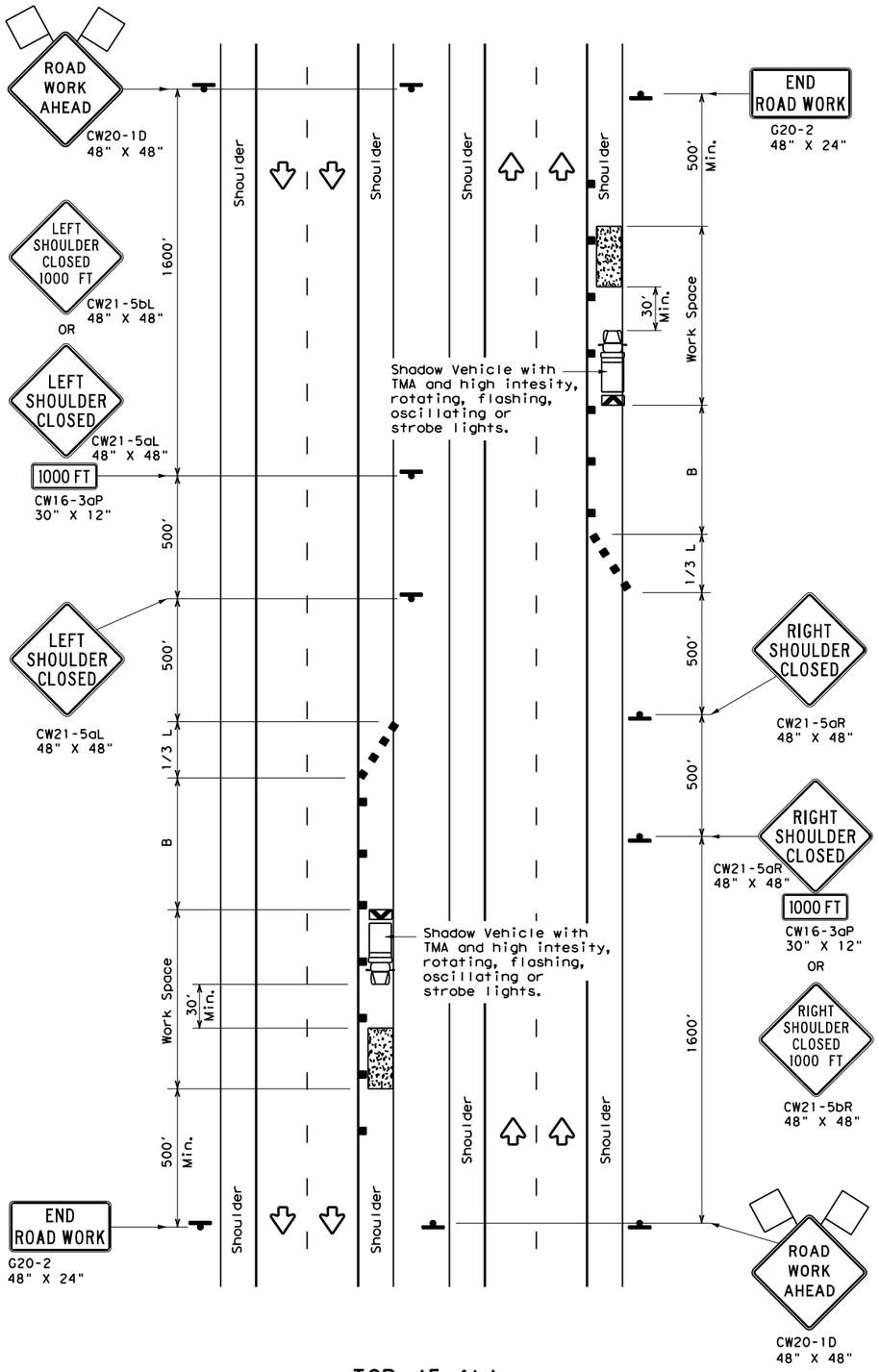
FILE: tcp3-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT July, 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	2552	04	046	SL375
	DIST	COUNTY		SHEET NO.
	ELP	EL PASO		51

DATE:
FILE:



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.

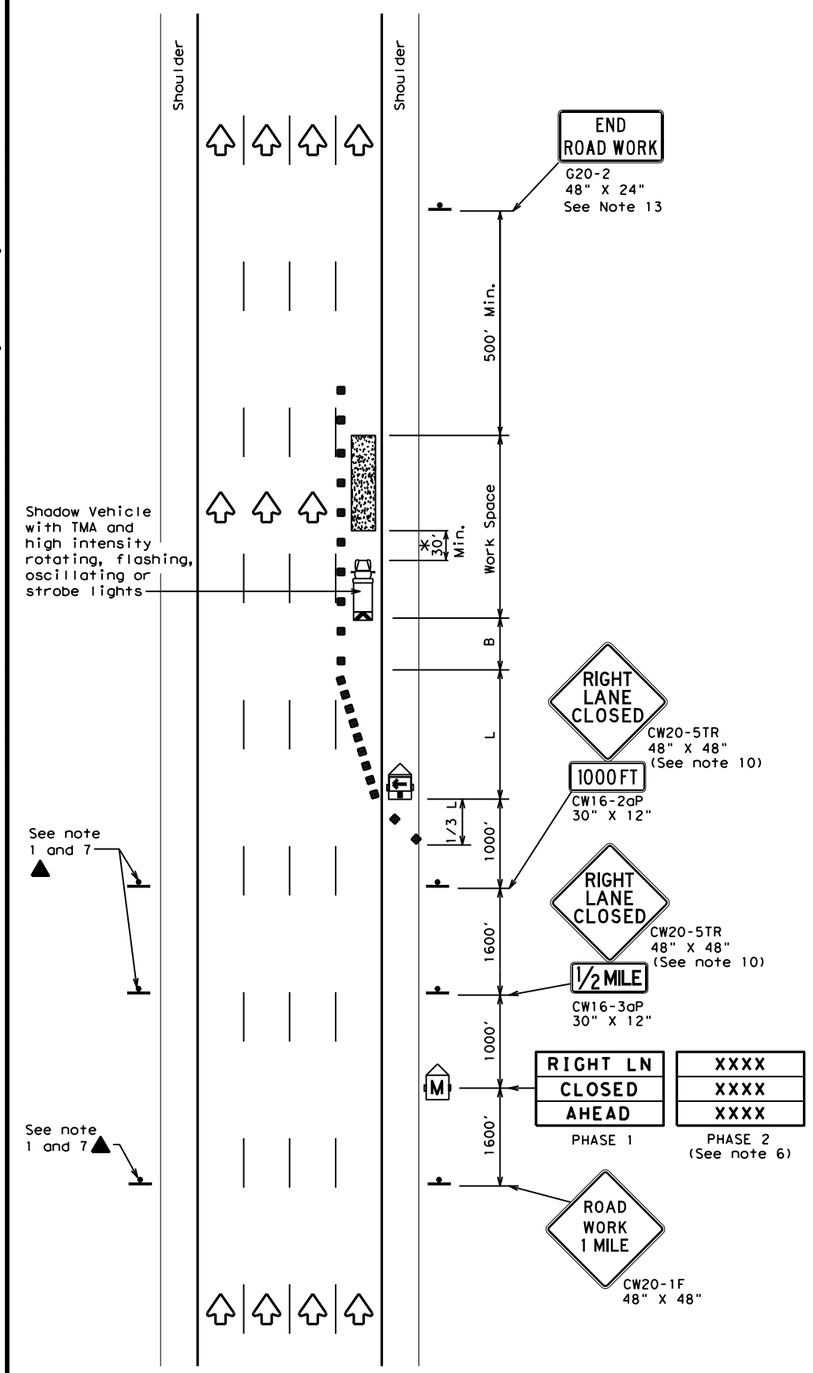
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN SHOULDER WORK FOR FREEWAYS / EXPRESSWAYS

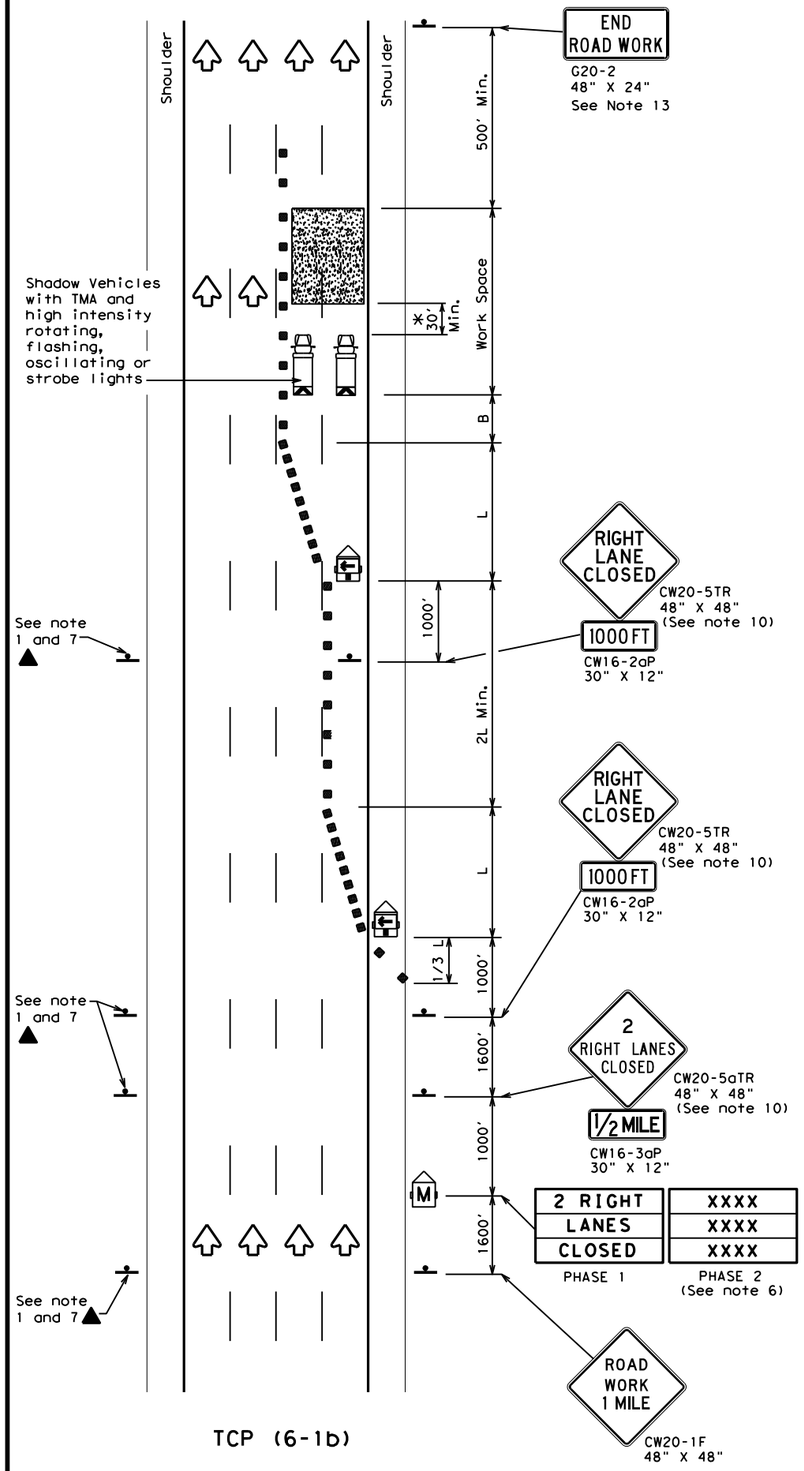
TCP(5-1)-18

FILE: tcp5-1-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-18	2552	04	046	SL375
	DIST	COUNTY		SHEET NO.
	ELP	EL PASO		52



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

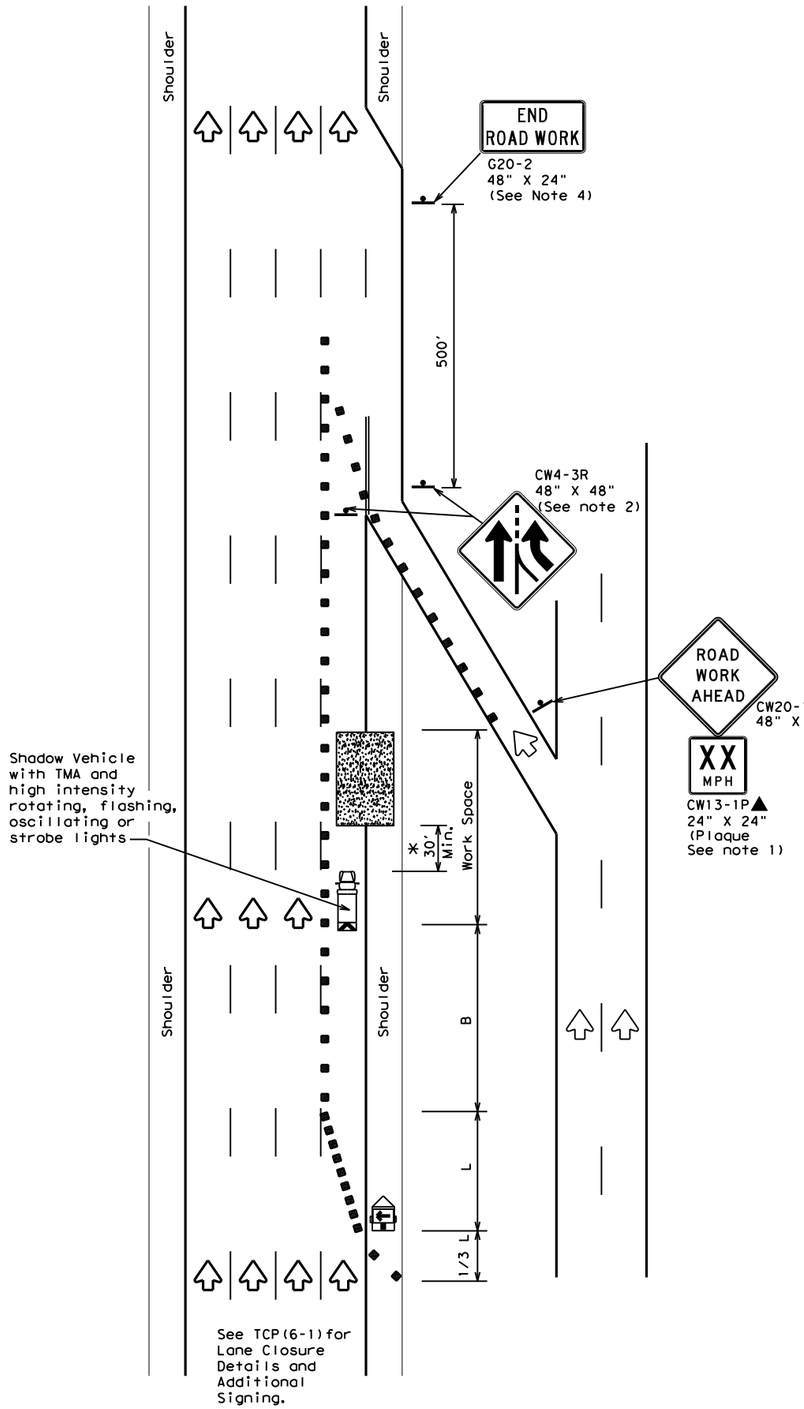
TRAFFIC CONTROL PLAN FREEWAY LANE CLOSURES

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	2552	04	046	SL375
	DIST	COUNTY		SHEET NO.
	ELP	EL PASO		53

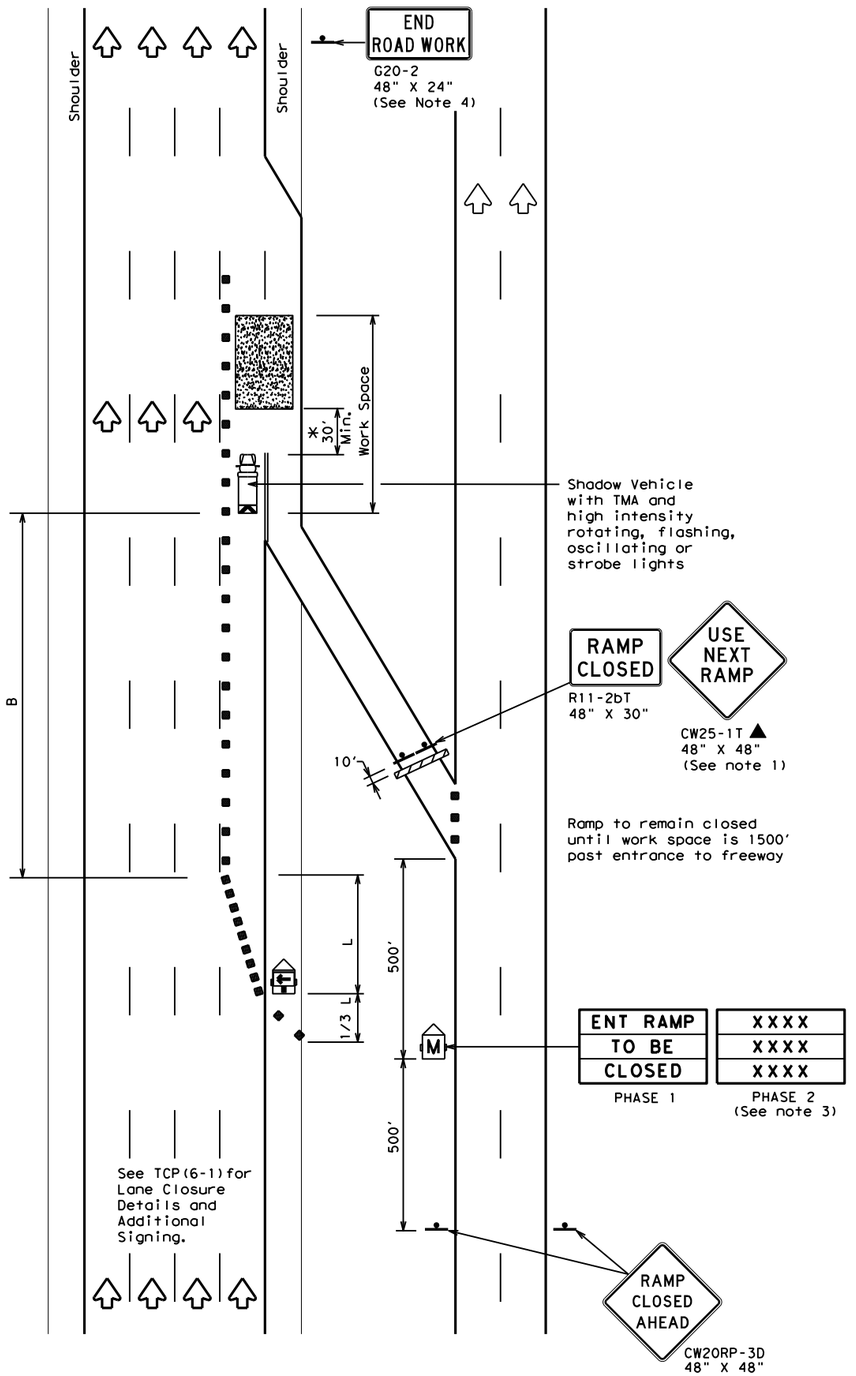
DATE:
FILE:

DATE:
FILE:



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" ** 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. 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.

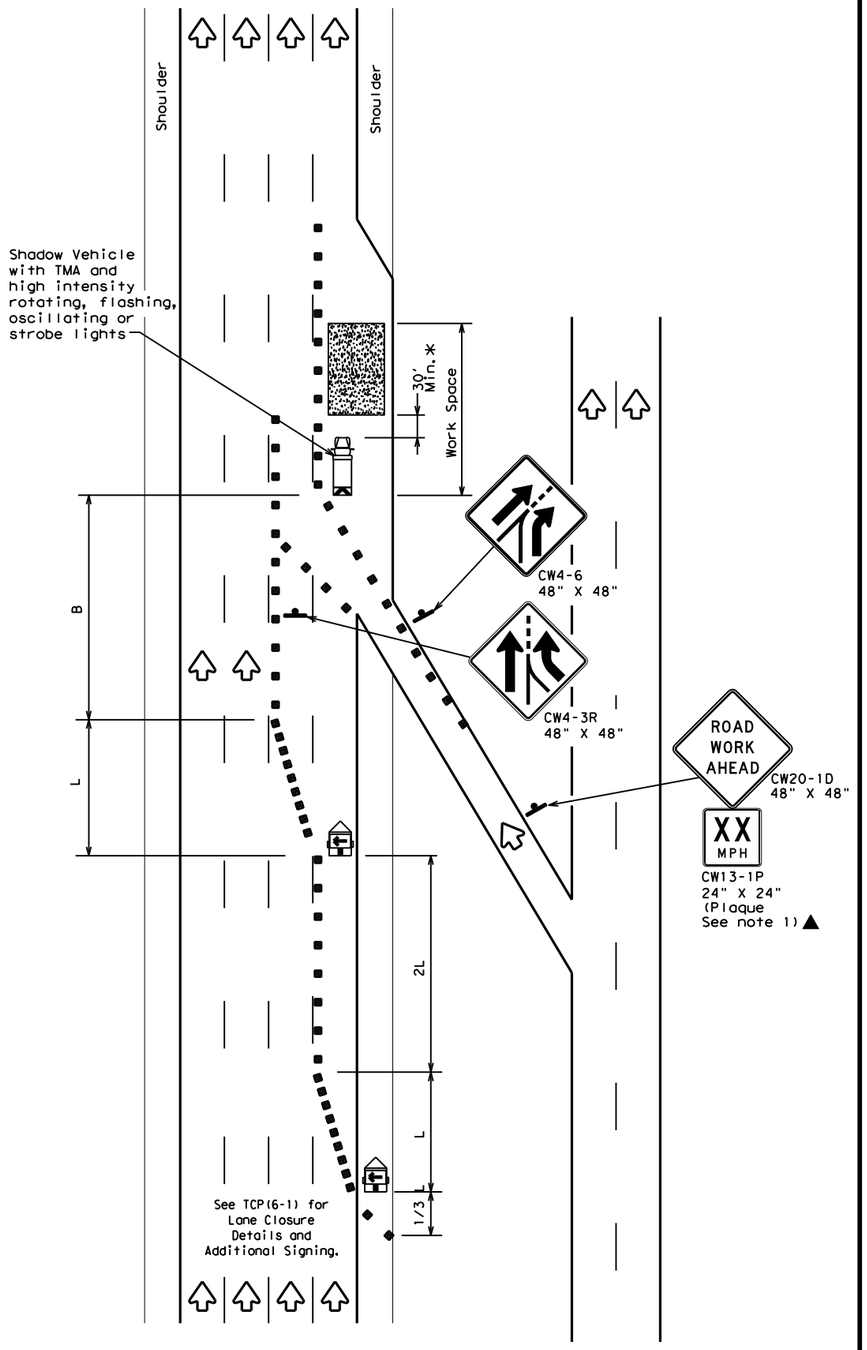
Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA NEAR RAMP

TCP(6-2)-12

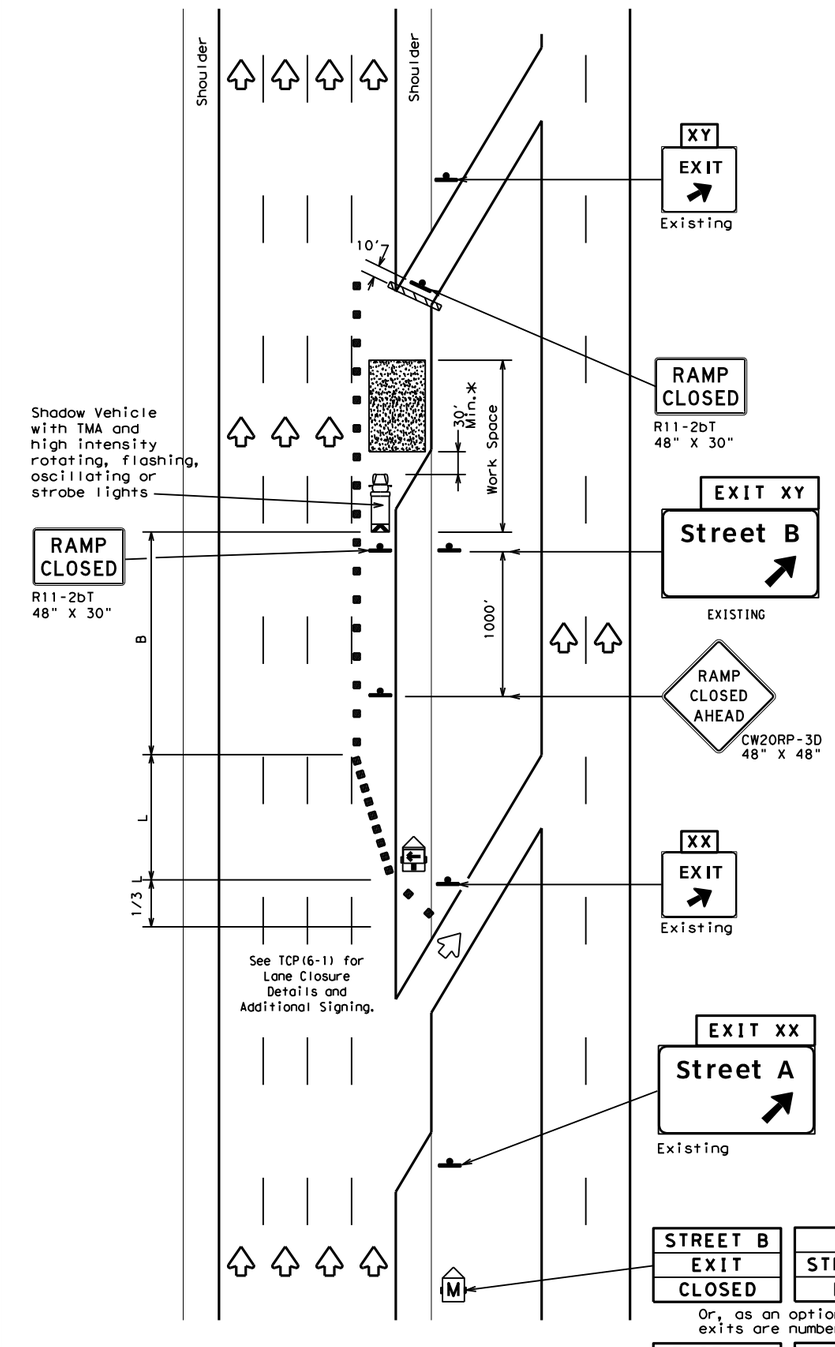
FILE: tcp6-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	2552	04	046	SL375
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	ELP	EL PASO		54

202



TCP (6-3a)

ENTRANCE RAMP OPEN



STREET B EXIT CLOSED	USE STREET A EXIT

Or, as an option when exits are numbered

EXIT XY CLOSED	USE EXIT XX

Place 1 mile (approx.) in advance of Street A exit.

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

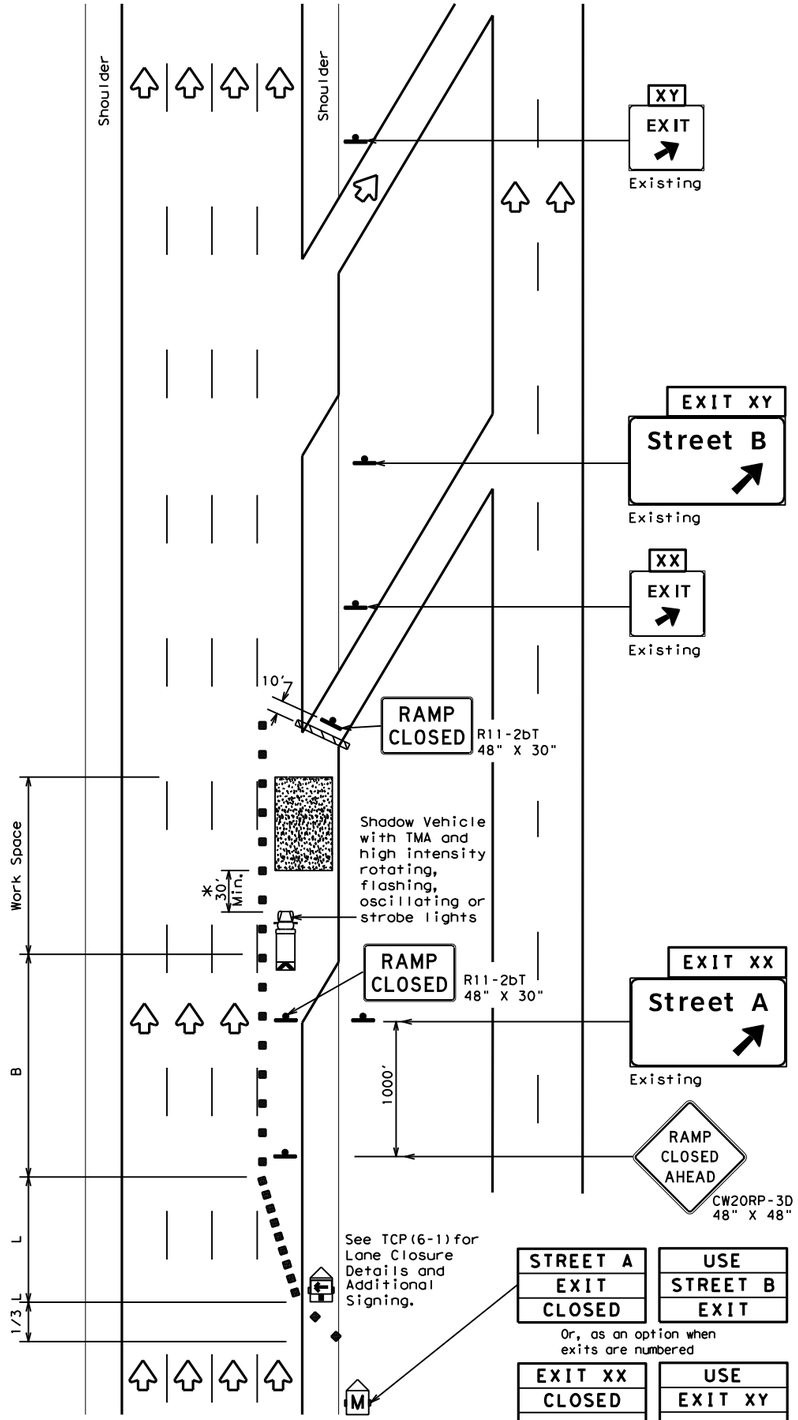
TRAFFIC CONTROL PLAN
WORK AREA BEYOND RAMP

TCP(6-3)-12

FILE: tcp6-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	2552	04	046	SL375
1-97 8-98 4-98 8-12	DIST	COUNTY		SHEET NO.
	ELP	EL PASO		55

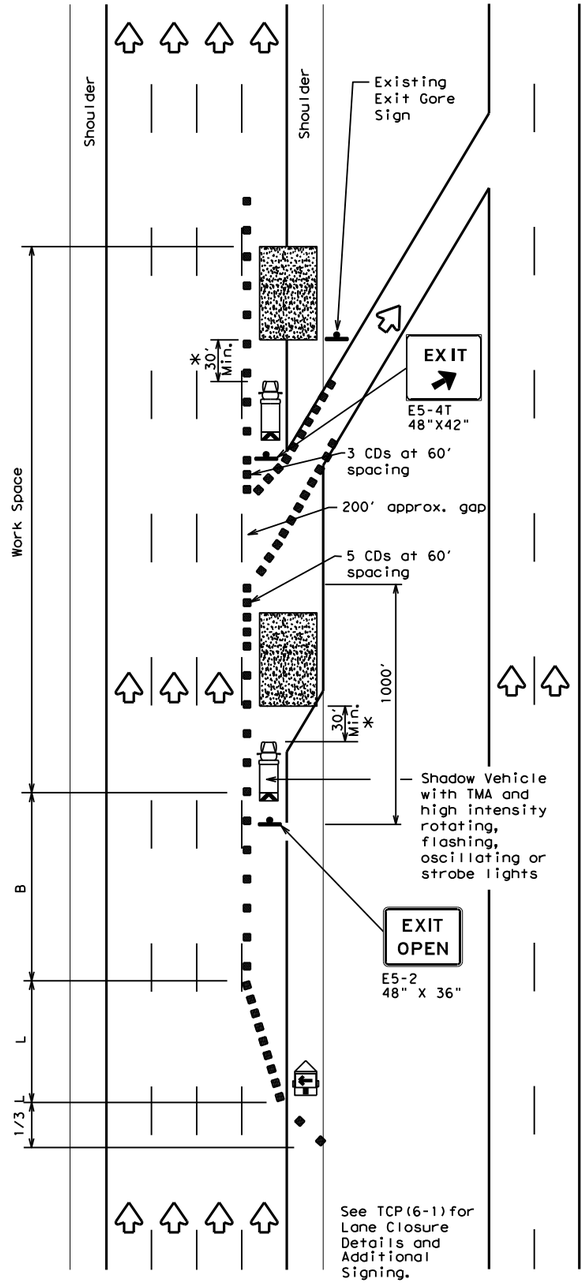
DATE:
FILE:

DATE:
FILE:



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.

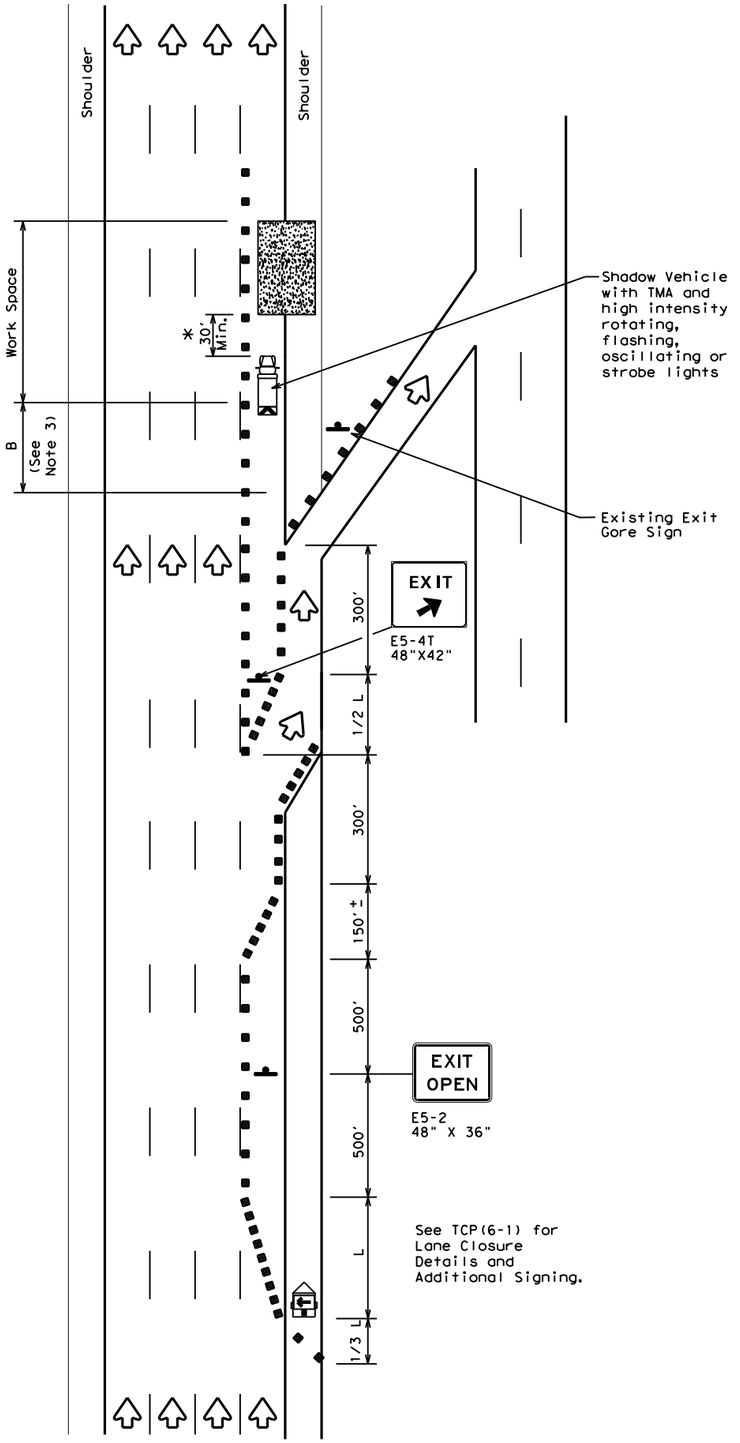
Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA AT EXIT RAMP

TCP(6-4)-12

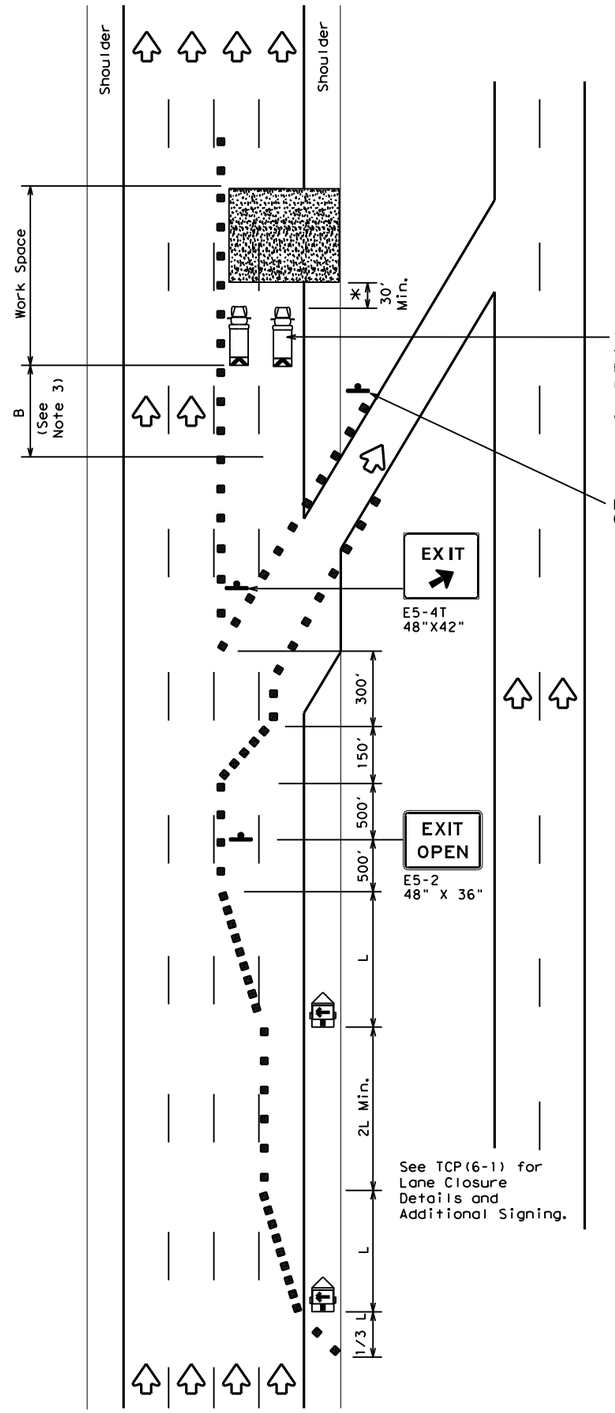
FILE: tcp6-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT Feburary 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	2552	04	046	SL375
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	ELP	EL PASO		56

DATE:
FILE:



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	2552	04	046	SL375
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	ELP	EL PASO		57

DATE:
FILE:

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) 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

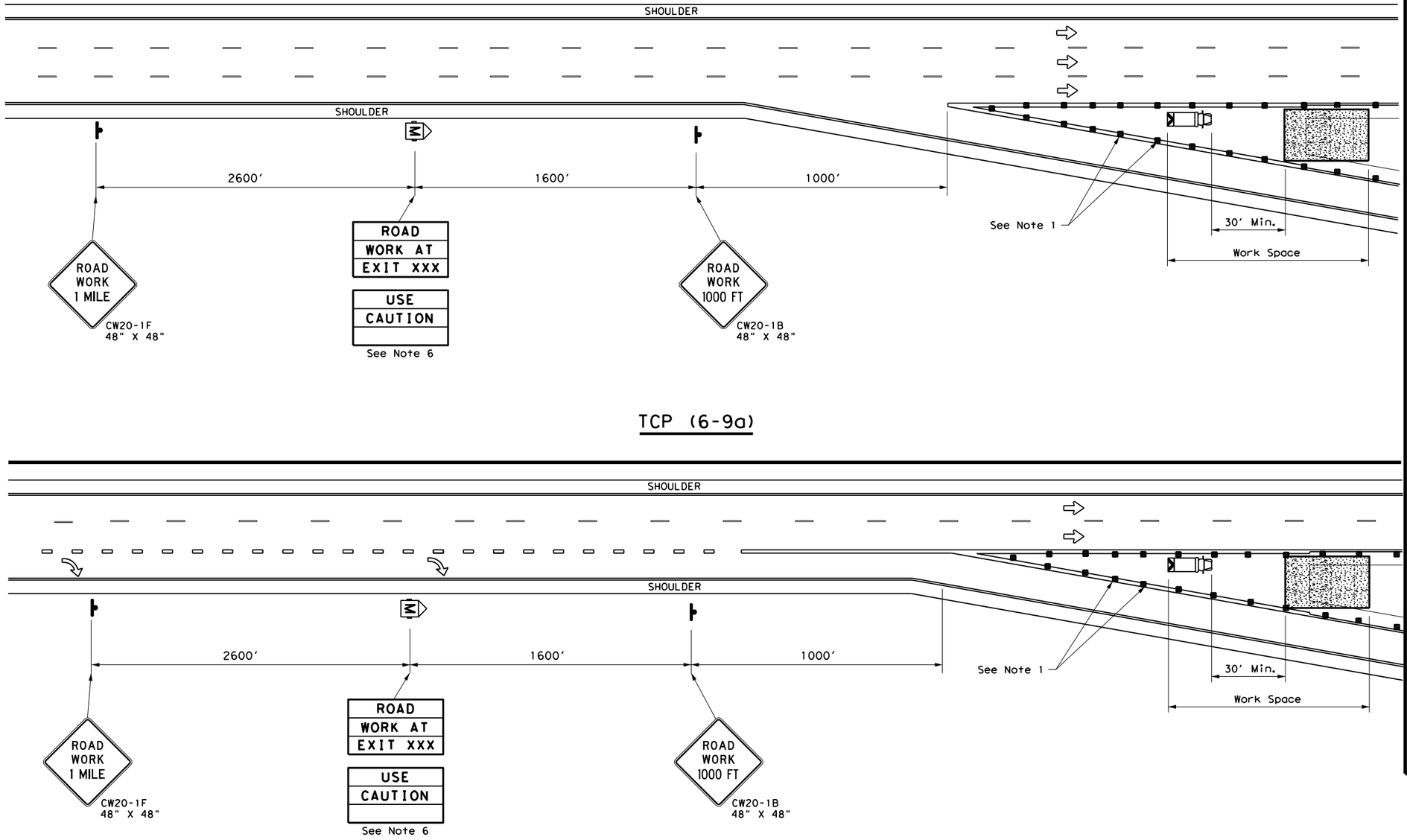
Traffic Operations Division Standard

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	2552	04	046	SL375
	DIST	COUNTY		SHEET NO.
	ELP	EL PASO		58

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

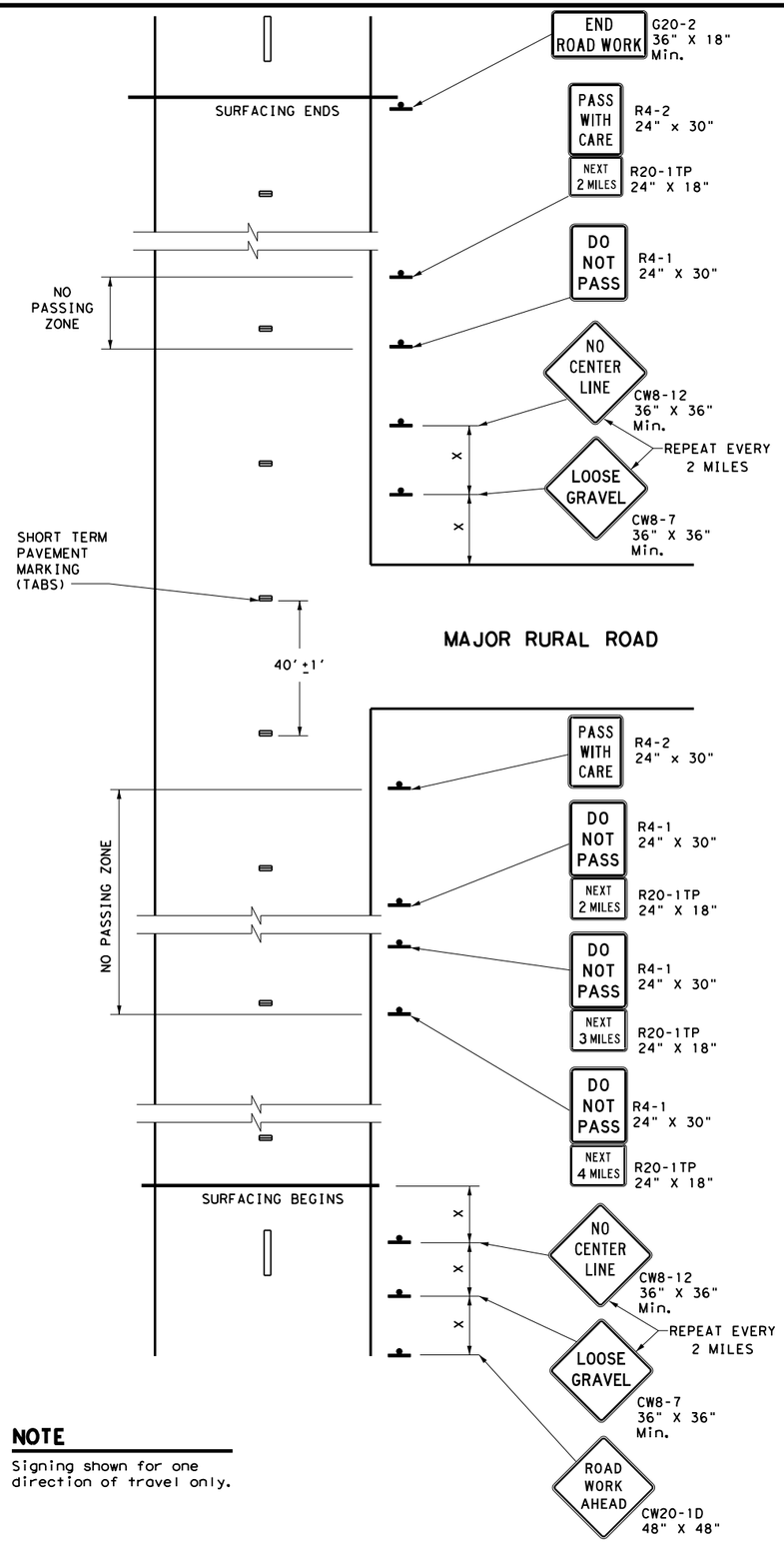
Traffic Operations Division Standard

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
REVISIONS	CONT	SECT	JOB	HIGHWAY
	2552	04	046	SL375
	DIST	COUNTY		SHEET NO.
	ELP	EL PASO		59

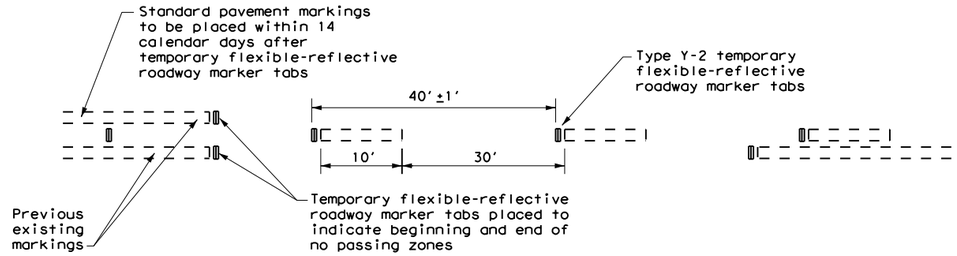
DATE:
FILE:



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.

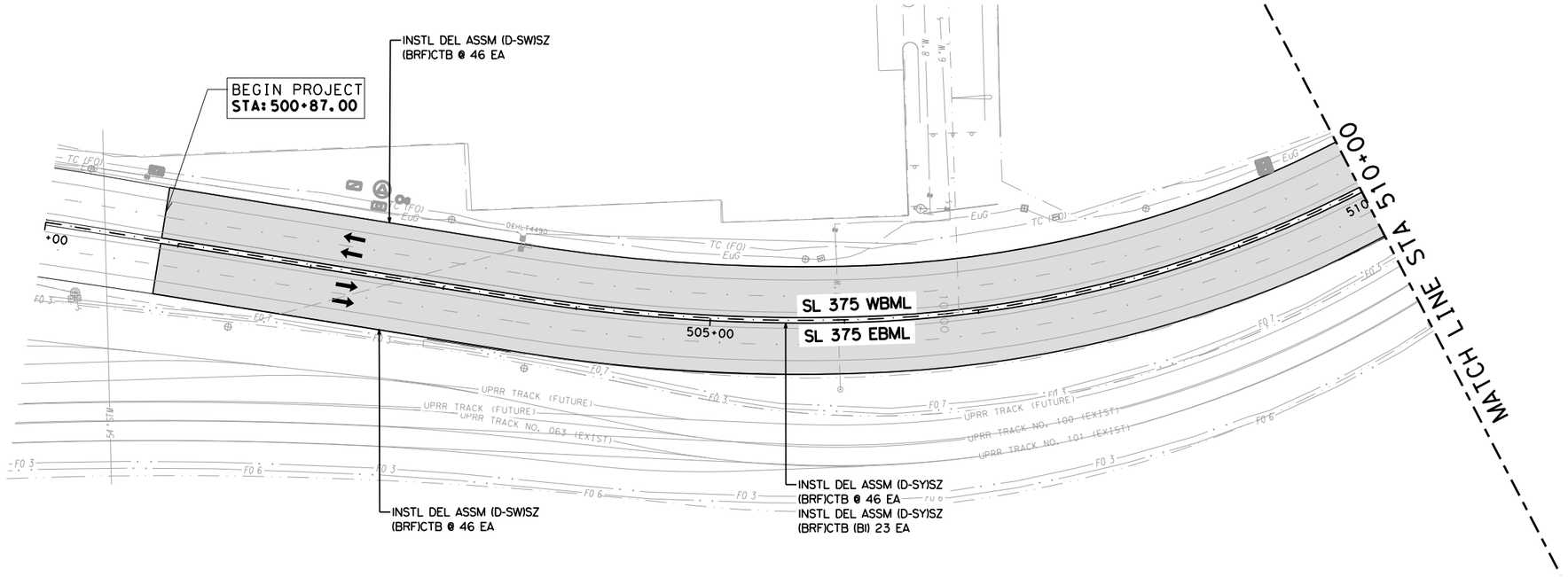
Texas Department of Transportation

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		2552	04	046	SL375
4-92 4-98		DIST	COUNTY		SHEET NO.
1-97 7-13		ELP	EL PASO		60



QUANTITY SUMMARY CSJ: 2552-04-046			
ITEM NO.	ITEM	UNIT	QUANTITY
0316-6017	ASPH (AC-20-5TR)	GAL	3087
0316-6224	AGGRITY-PB GR-4 SAC-B)	CY	71
0346-6014	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	TON	849
0346-6058	TACK COAT	GAL	1158
0354-6045	PLANE ASPH CONC PAV (2")	SY	7717
0658-6013	INSTL DEL ASSM (D-SW)SZ (BRF)CTB	EA	92
0658-6026	INSTL DEL ASSM (D-SY)SZ (BRF)CTB	EA	46
0658-6027	INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI)	EA	23

LEGEND

PROPOSED PAVEMENT

TRAFFIC FLOW ARROW

GENERAL NOTES:

1. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS.
2. SEE PLANSHEET "FLEXIBLE PAVEMENT STRUCTURE REPAIR" FOR ADDITIONAL BASE AND PAVEMENT REPAIR INFORMATION.
3. ONE GUARD FENCE REFLECTORS TO BE INSTALLED ON TOP AND SIDE OF PROPOSED AND EXISTING MBGF SPACED AT 40'.
3. TWO CTB REFLECTORS TO BE INSTALLED ON TOP AND SIDE OF EXISTING CTB SPACED AT 40' WHERE TRAFFIC IS LOCATED ON ONE SIDE OF CTB
4. THREE CTB REFLECTORS TO BE INSTALLED ON TOP AND SIDES OF EXISTING CTB SPACED AT 40' WHERE TRAFFIC IS LOCATED ON BOTH SIDES OF CTB.

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED
PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375 MILL AND INLAY
ROADWAY

SL 375
PLAN LAYOUT

BEGIN TO STA 510+00

SHEET 1 OF 13

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		61

DATE: 5/3/2021 12:48:38 AM
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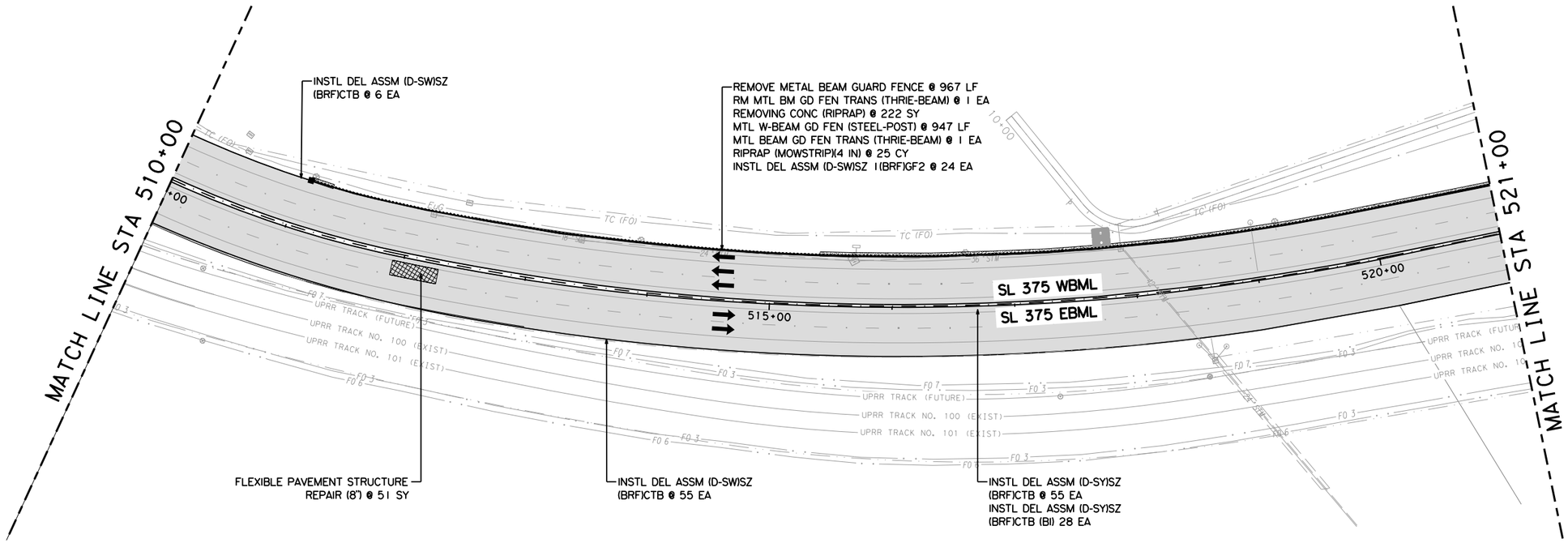

GENERAL NOTES:

1. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS.
2. SEE PLANSHEET "FLEXIBLE PAVEMENT STRUCTURE REPAIR" FOR ADDITIONAL BASE AND PAVEMENT REPAIR INFORMATION.
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4. THREE CTB REFLECTORS TO BE INSTALLED ON TOP AND SIDES OF EXISTING CTB SPACED AT 40' WHERE TRAFFIC IS LOCATED ON BOTH SIDES OF CTB.

QUANTITY SUMMARY CSJ: 2552-04-046			
ITEM NO.	ITEM	UNIT	QUANTITY
0104-6009	REMOVING CONC (RIPRAP)	SY	222
0316-6017	ASPH (AC-20-5TR)	GAL	3803
0316-6224	AGGR(TY-PB GR-4 SAC-B)	CY	87
0346-6014	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	TON	1046
0346-6058	TACK COAT	GAL	1426
0354-6045	PLANE ASPH CONC PAV (2")	SY	9506
0354-6134	PLANE ASPH CONC PAV (0" TO 1/2" MICRO)	SY	51
0432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	25
0540-6002	MTL W-BEAM GD FEN (STEEL POST)	LF	947
0540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	1
0542-6001	REMOVE METAL BEAM GUARD FENCE	LF	967
0542-6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA	1
0658-6013	INSTL DEL ASSM (D-SW)SZ (BRF)CTB	EA	61
0658-6026	INSTL DEL ASSM (D-SY)SZ (BRF)CTB	EA	55
0658-6027	INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI)	EA	28
0658-6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	24

LEGEND

ASHPALT PAVEMENT TO BE REMOVED

TRAFFIC FLOW ARROW

BASE REPAIR

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375 MILL AND INLAY ROADWAY

SL 375 PLAN LAYOUT

STA 510+00 TO STA 521+00

SHEET 2 OF 13

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		62

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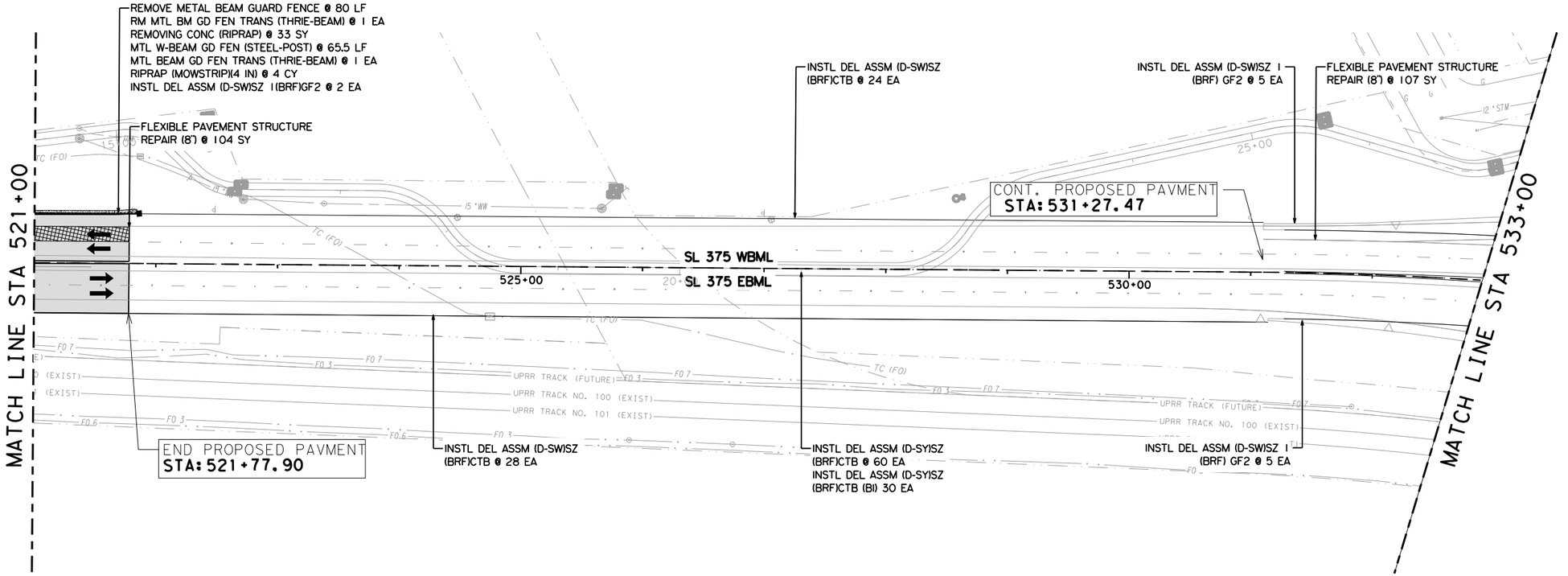

GENERAL NOTES:

1. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS.
2. SEE PLANSHEET "FLEXIBLE PAVEMENT STRUCTURE REPAIR" FOR ADDITIONAL BASE AND PAVEMENT REPAIR INFORMATION.
3. ONE GUARD FENCE REFLECTORS TO BE INSTALLED ON TOP AND SIDE OF PROPOSED AND EXISTING MBGF SPACED AT 40'.
3. TWO CTB REFLECTORS TO BE INSTALLED ON TOP AND SIDE OF EXISTING CTB SPACED AT 40' WHERE TRAFFIC IS LOCATED ON ONE SIDE OF CTB
4. THREE CTB REFLECTORS TO BE INSTALLED ON TOP AND SIDES OF EXISTING CTB SPACED AT 40' WHERE TRAFFIC IS LOCATED ON BOTH SIDES OF CTB.

QUANTITY SUMMARY CSJ: 2552-04-046

ITEM NO.	ITEM	UNIT	QUANTITY
0104-6009	REMOVING CONC (RIPRAP)	SY	33
0316-6017	ASPH (AC-20-5TR)	GAL	827
0316-6224	AGGR(TY-PB GR-4 SAC-B)	CY	19
0346-6014	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	TON	228
0346-6058	TACK COAT	GAL	310
0351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY	211
0354-6045	PLANE ASPH CONC PAV (2")	SY	2066
0432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	4
0540-6002	MTL W-BEAM GD FEN (STEEL POST)	LF	66
0540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	1
0542-6001	REMOVE METAL BEAM GUARD FENCE	LF	80
0542-6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA	1
0658-6013	INSTL DEL ASSM (D-SW)SZ (BRF)CTB	EA	51
0658-6026	INSTL DEL ASSM (D-SY)SZ (BRF)CTB	EA	60
0658-6027	INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI)	EA	30
0658-6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	12

LEGEND

PROPOSED PAVMENT

TRAFFIC FLOW ARROW

BASE REPAIR

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED
PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375 MILL AND INLAY
ROADWAY

SL 375
PLAN LAYOUT
STA 521+00 TO STA 533+00

SHEET 3 OF 13

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		63

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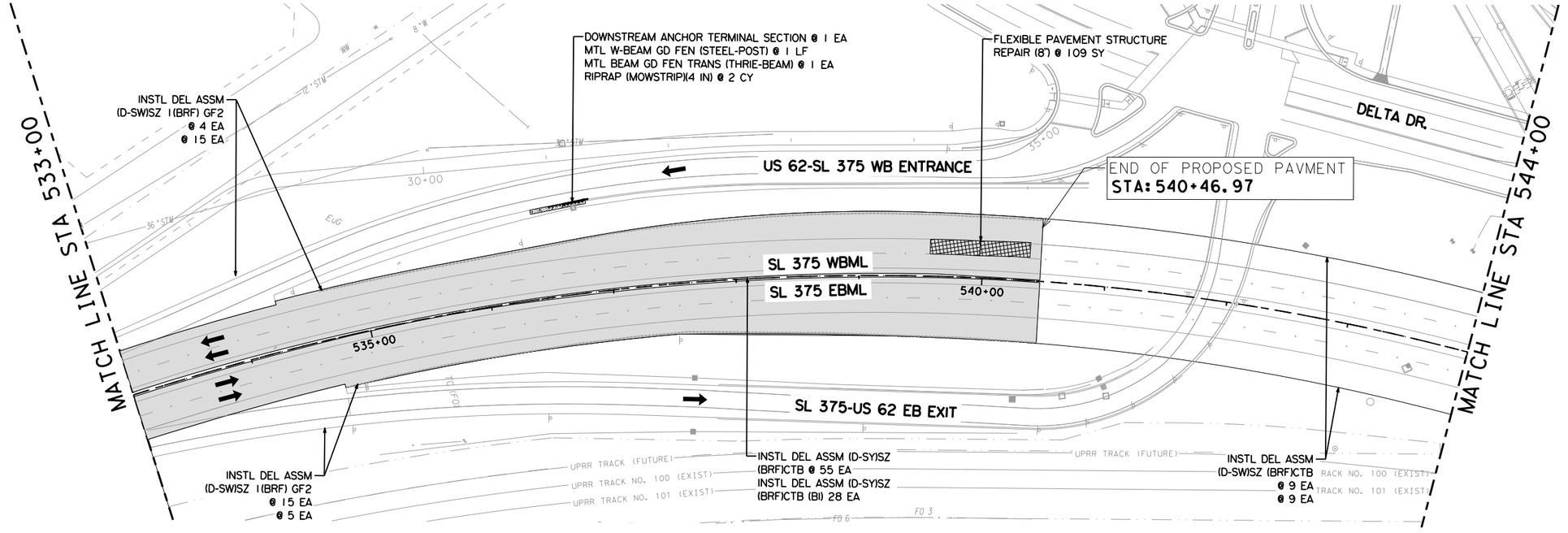

QUANTITY SUMMARY CSJ: 2552-04-046			
ITEM NO.	ITEM	UNIT	QUANTITY
0104-6009	REMOVING CONC (RIPRAP)	SY	18
0316-6017	ASPH (AC-20-5TR)	GAL	2838
0316-6224	AGGR(TY-PB GR-4 SAC-B)	CY	65
0346-6014	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	TON	781
0346-6058	TACK COAT	GAL	1064
0351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY	109
0354-6045	PLANE ASPH CONC PAV (2")	SY	7093
0432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	2
0540-6002	MTL W-BEAM GD FEN (STEEL POST)	LF	13
0540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	1
0540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	1
0658-6013	INSTL DEL ASSM (D-SW)SZ (BRF)CTB	EA	18
0658-6026	INSTL DEL ASSM (D-SY)SZ (BRF)CTB	EA	55
0658-6027	INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI)	EA	28
0658-6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	39
0658-6064	INSTL DEL ASSM (D-SY)SZ 1(BRF)GF2	EA	1

GENERAL NOTES:

1. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS.
2. SEE PLANSHEET "FLEXIBLE PAVEMENT STRUCTURE REPAIR" FOR ADDITIONAL BASE AND PAVEMENT REPAIR INFORMATION.
3. ONE GUARD FENCE REFLECTORS TO BE INSTALLED ON TOP AND SIDE OF PROPOSED AND EXISTING MBGF SPACED AT 40'.
3. TWO CTB REFLECTORS TO BE INSTALLED ON TOP AND SIDE OF EXISTING CTB SPACED AT 40' WHERE TRAFFIC IS LOCATED ON ONE SIDE OF CTB
4. THREE CTB REFLECTORS TO BE INSTALLED ON TOP AND SIDES OF EXISTING CTB SPACED AT 40' WHERE TRAFFIC IS LOCATED ON BOTH SIDES OF CTB.

LEGEND

- PROPOSED PAVMENT
- TRAFFIC FLOW ARROW
- BASE REPAIR

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375 MILL AND INLAY
ROADWAY

SL 375
PLAN LAYOUT

STA 533+00 TO STA 544+00

SHEET 4 OF 13

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		64

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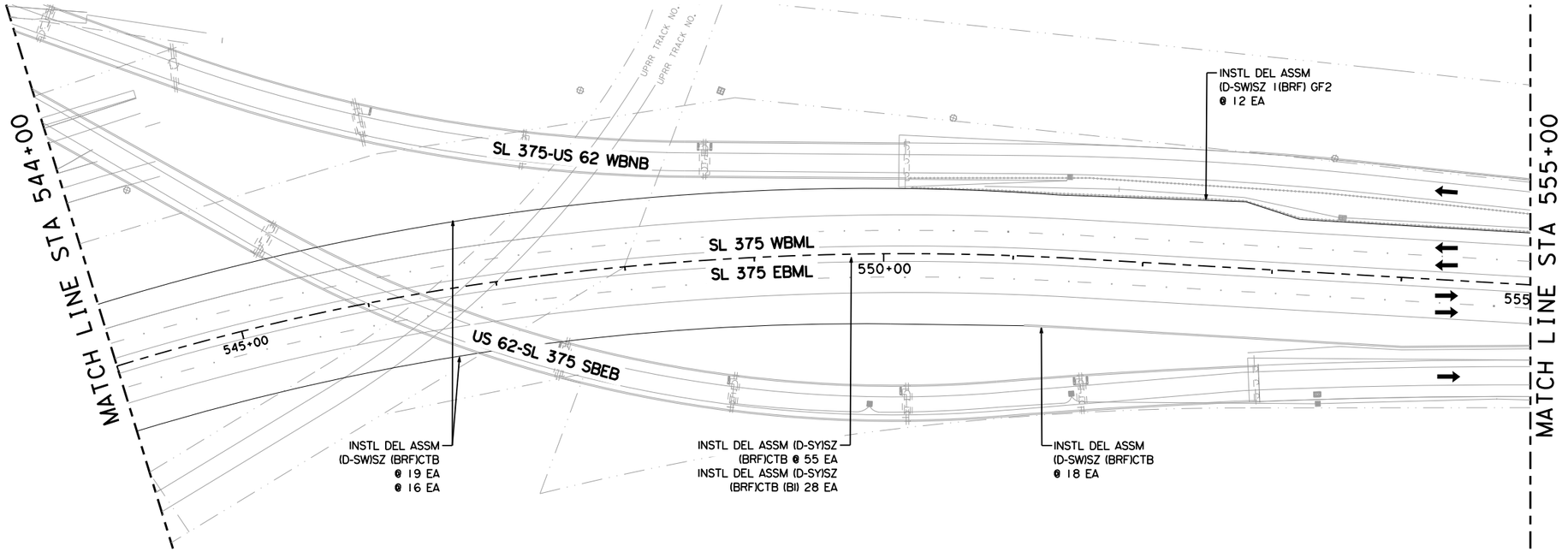

	QUANTITY SUMMARY CSJ: 2552-04-046		
ITEM NO.	ITEM	UNIT	QUANTITY
0658-6013	INSTL DEL ASSM (D-SW)SZ (BRF)CTB	EA	53
0658-6026	INSTL DEL ASSM (D-SY)SZ (BRF)CTB	EA	55
0658-6027	INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI)	EA	28
0658-6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	12

LEGEND

TRAFFIC FLOW ARROW

GENERAL NOTES:

1. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS.
2. SEE PLANSHEET "FLEXIBLE PAVEMENT STRUCTURE REPAIR" FOR ADDITIONAL BASE AND PAVEMENT REPAIR INFORMATION.
3. ONE GUARD FENCE REFLECTORS TO BE INSTALLED ON TOP AND SIDE OF PROPOSED AND EXISTING MBGF SPACED AT 40'.
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STATE OF TEXAS
MONICA RUIZ
131235
LICENSED
PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375 MILL AND INLAY
ROADWAY

SL 375
PLAN LAYOUT
544+00 TO STA 555+00

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		65

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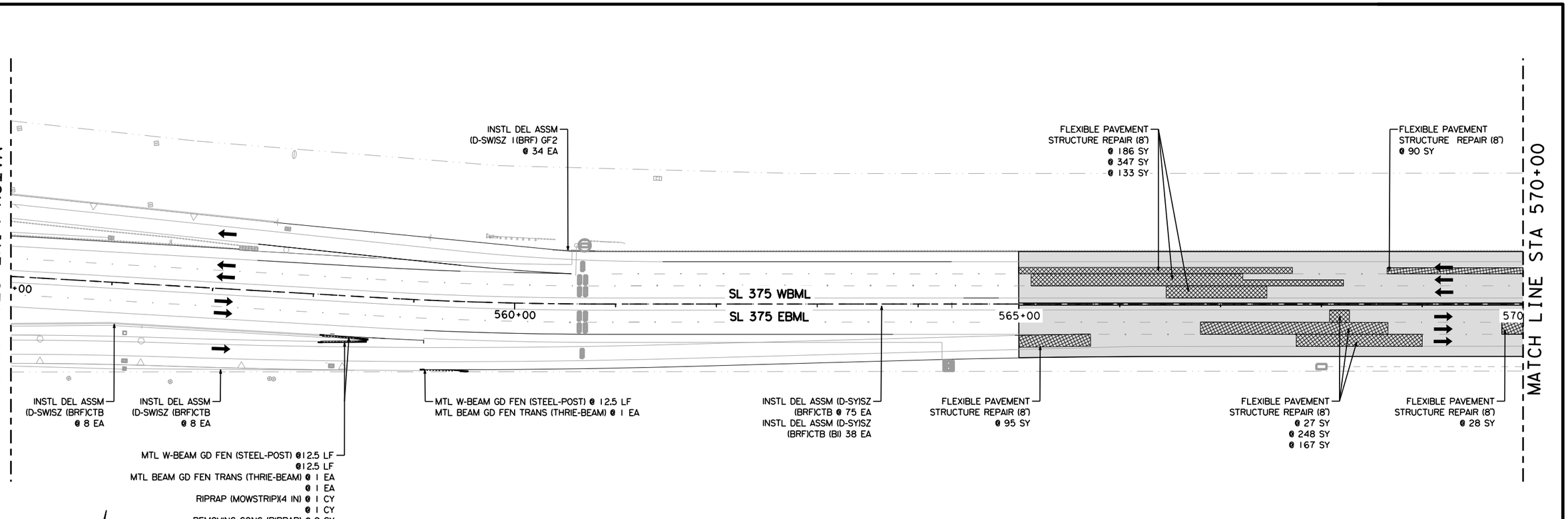

QUANTITY SUMMARY CSJ: 2552-04-046			
ITEM NO.	ITEM	UNIT	QUANTITY
0104-6009	REMOVING CONC (RIPRAP)	SY	18
0316-6017	ASPH (AC-20-5TR)	GAL	2267
0316-6224	AGGR(TY-PB GR-4 SAC-B)	CY	52
0346-6014	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	TON	624
0346-6058	TACK COAT	GAL	850
0351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY	1320
0354-6045	PLANE ASPH CONC PAV (2")	SY	5667
0432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	2
0540-6002	MTL W-BEAM GD FEN (STEEL POST)	LF	38
0540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	3
0540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	3
0658-6013	INSTL DEL ASSM (D-SWISZ (BRF)CTB	EA	16
0658-6026	INSTL DEL ASSM (D-SY)SZ (BRF)CTB	EA	75
0658-6027	INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI)	EA	38
0658-6061	INSTL DEL ASSM (D-SWISZ 1(BRF)GF2	EA	34

LEGEND

PROPOSED PAVEMENT

TRAFFIC FLOW ARROW

BASE REPAIRS

GENERAL NOTES:

1. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS.
2. SEE PLANSHEET "FLEXIBLE PAVEMENT STRUCTURE REPAIR" FOR ADDITIONAL BASE AND PAVEMENT REPAIR INFORMATION.
3. ONE GUARD FENCE REFLECTORS TO BE INSTALLED ON TOP AND SIDE OF PROPOSED AND EXISTING MBGF SPACED AT 40'.
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STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375 MILL AND INLAY
ROADWAY
SL 375
PLAN LAYOUT

555+00 TO STA 570+00

SHEET 6 OF 13

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		66

DATE: 5/3/2021 1:09:55 AM
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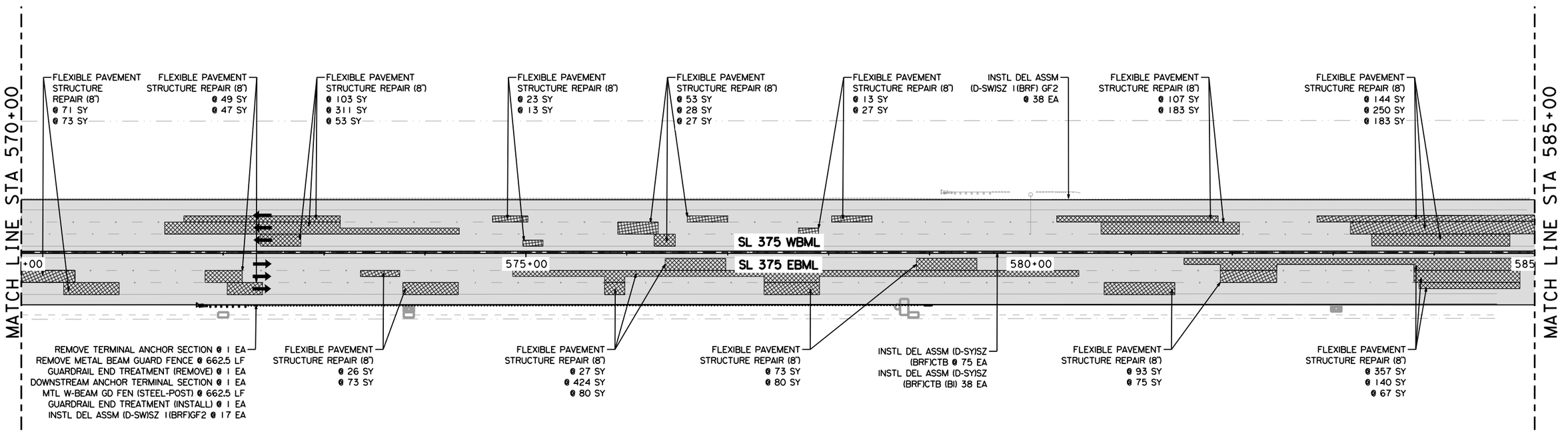

QUANTITY SUMMARY CSJ: 2552-04-046			
ITEM NO.	ITEM	UNIT	QUANTITY
0316-6017	ASPH (AC-20-5TR)	GAL	6778
0316-6224	AGGRITY-PB GR-4 SAC-B)	CY	155
0346-6014	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	TON	1864
0346-6058	TACK COAT	GAL	2542
0351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY	3273
0354-6045	PLANE ASPH CONC PAV (2")	SY	16945
0540-6002	MTL W-BEAM GD FEN (STEEL POST)	LF	663
0540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	1
0542-6001	REMOVE METAL BEAM GUARD FENCE	LF	663
0542-6002	REMOVE TERMINAL ANCHOR SECTION	EA	1
0544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
0544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA	1
0658-6026	INSTL DEL ASSM (D-SY)SZ (BRF)CTB	EA	75
0658-6027	INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI)	EA	38
0658-6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	55

LEGEND

PROPOSED PAVEMENT

TRAFFIC FLOW ARROW

BASE REPAIRS

GENERAL NOTES:

1. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS.
2. SEE PLANSHEET "FLEXIBLE PAVEMENT STRUCTURE REPAIR" FOR ADDITIONAL BASE AND PAVEMENT REPAIR INFORMATION.
3. ONE GUARD FENCE REFLECTORS TO BE INSTALLED ON TOP AND SIDE OF PROPOSED AND EXISTING MBGF SPACED AT 40'.
3. TWO CTB REFLECTORS TO BE INSTALLED ON TOP AND SIDE OF EXISTING CTB SPACED AT 40' WHERE TRAFFIC IS LOCATED ON ONE SIDE OF CTB
4. THREE CTB REFLECTORS TO BE INSTALLED ON TOP AND SIDES OF EXISTING CTB SPACED AT 40' WHERE TRAFFIC IS LOCATED ON BOTH SIDES OF CTB.

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375 MILL AND INLAY
ROADWAY
SL 375
PLAN LAYOUT

STA 570+00 TO 585+00

SHEET 7 OF 13

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		67

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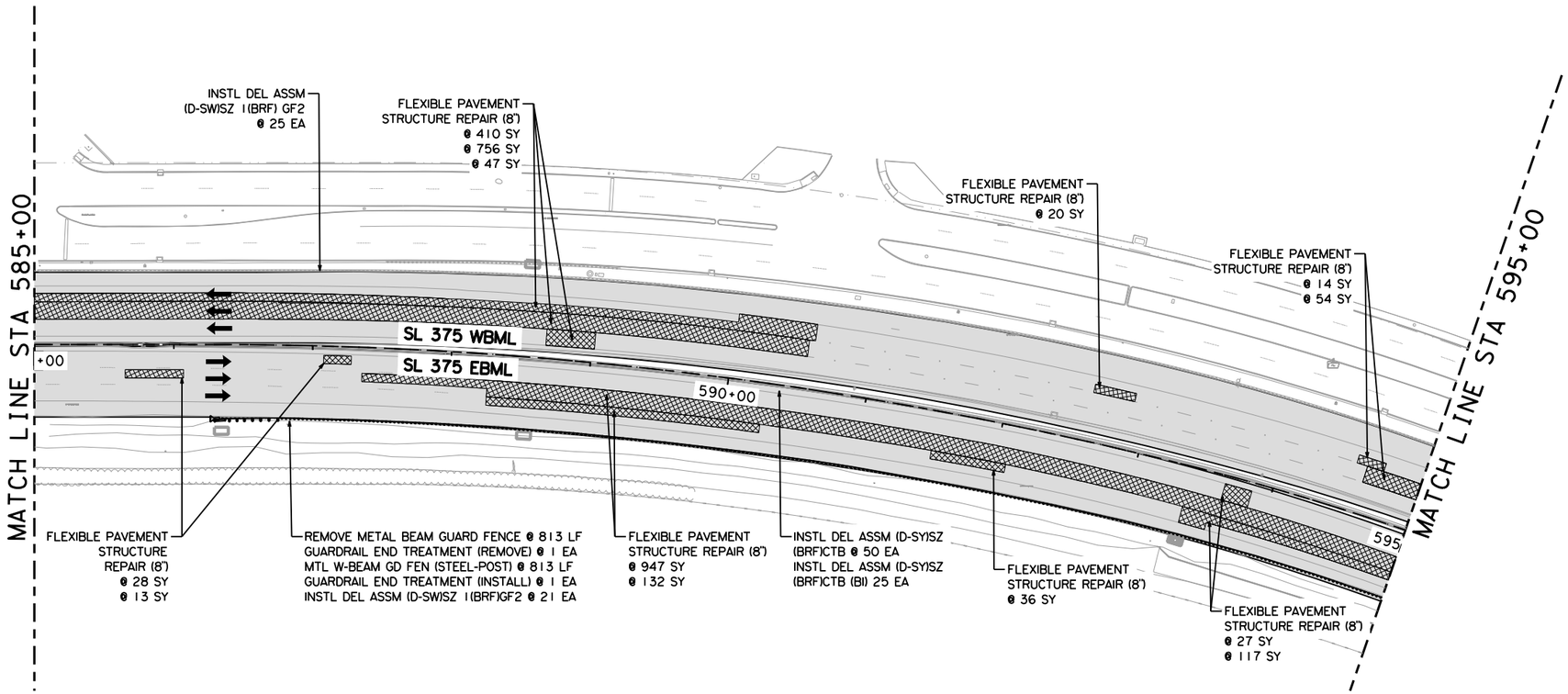

QUANTITY SUMMARY CSJ: 2552-04-046			
ITEM NO.	ITEM	UNIT	QUANTITY
0316-6017	ASPH (AC-20-5TR)	GAL	4712
0316-6224	AGGR(TY-PB GR-4 SAC-B)	CY	108
0346-6014	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	TON	1296
0346-6058	TACK COAT	GAL	1767
0351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY	2695
0354-6045	PLANE ASPH CONC PAV (2")	SY	11779
0540-6002	MTL W-BEAM GD FEN (STEEL POST)	LF	813
0542-6001	REMOVE METAL BEAM GUARD FENCE	LF	813
0544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
0544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA	1
0658-6026	INSTL DEL ASSM (D-SY)SZ (BRF)CTB	EA	50
0658-6027	INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI)	EA	25
0658-6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	46

GENERAL NOTES:

1. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS.
2. SEE PLANSHEET "FLEXIBLE PAVEMENT STRUCTURE REPAIR" FOR ADDITIONAL BASE AND PAVEMENT REPAIR INFORMATION.
3. ONE GUARD FENCE REFLECTORS TO BE INSTALLED ON TOP AND SIDE OF PROPOSED AND EXISTING MBGF SPACED AT 40'.
3. TWO CTB REFLECTORS TO BE INSTALLED ON TOP AND SIDE OF EXISTING CTB SPACED AT 40' WHERE TRAFFIC IS LOCATED ON ONE SIDE OF CTB
4. THREE CTB REFLECTORS TO BE INSTALLED ON TOP AND SIDES OF EXISTING CTB SPACED AT 40' WHERE TRAFFIC IS LOCATED ON BOTH SIDES OF CTB.

LEGEND

PROPOSED PAVEMENT

TRAFFIC FLOW ARROW

BASE REPAIRS

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED
PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375 MILL AND INLAY
ROADWAY
SL 375
PLAN LAYOUT

STA 585+00 TO STA 595+00

SHEET 8 OF 13

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		68

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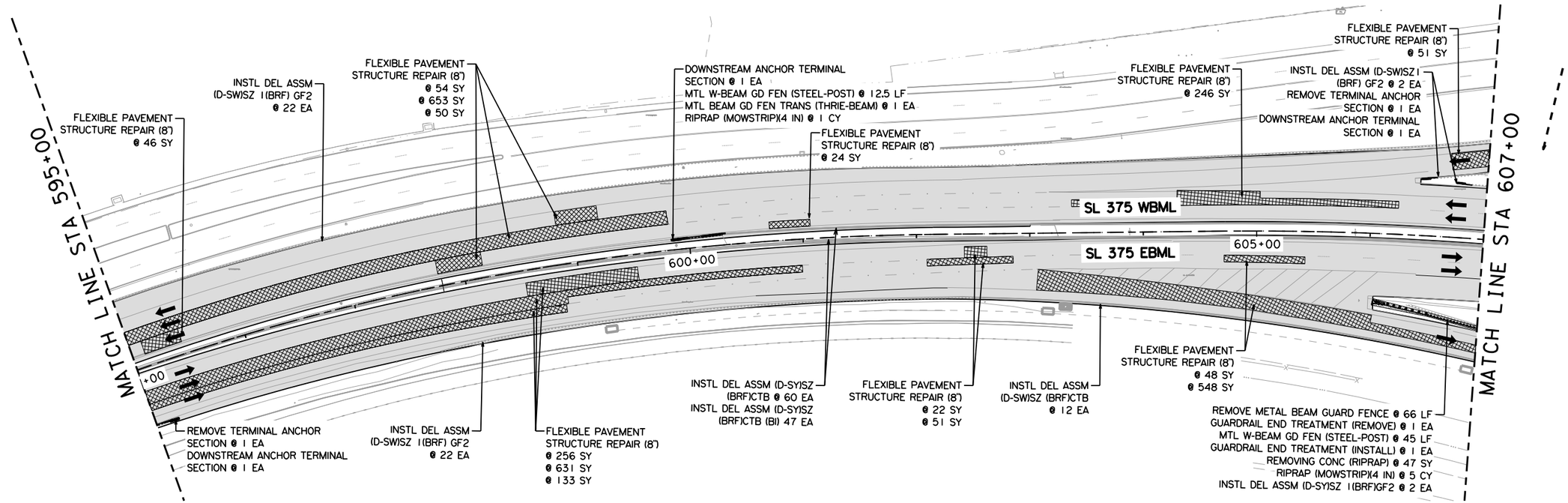

GENERAL NOTES:

1. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS.
2. SEE PLANSHEET "FLEXIBLE PAVEMENT STRUCTURE REPAIR" FOR ADDITIONAL BASE AND PAVEMENT REPAIR INFORMATION.
3. ONE GUARD FENCE REFLECTORS TO BE INSTALLED ON TOP AND SIDE OF PROPOSED AND EXISTING MBGF SPACED AT 40'.
3. TWO CTB REFLECTORS TO BE INSTALLED ON TOP AND SIDE OF EXISTING CTB SPACED AT 40' WHERE TRAFFIC IS LOCATED ON ONE SIDE OF CTB
4. THREE CTB REFLECTORS TO BE INSTALLED ON TOP AND SIDES OF EXISTING CTB SPACED AT 40' WHERE TRAFFIC IS LOCATED ON BOTH SIDES OF CTB.

QUANTITY SUMMARY CSJ: 2552-04-046			
ITEM NO.	ITEM	UNIT	QUANTITY
0104-6009	REMOVING CONC (RIPRAP)	SY	47
0316-6017	ASPH (AC-20-5TR)	GAL	6115
0316-6224	AGGR(TY-PB GR-4 SAC-B)	CY	139
0346-6014	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	TON	1682
0346-6058	TACK COAT	GAL	2293
0351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY	2812
0354-6045	PLANE ASPH CONC PAV (2")	SY	15286
0432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	6
0540-6002	MTL W-BEAM GD FEN (STEEL POST)	LF	58
0540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	1
0540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	4
0542-6001	REMOVE METAL BEAM GUARD FENCE	LF	66
0542-6002	REMOVE TERMINAL ANCHOR SECTION	EA	3
0544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
0544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA	1
0658-6013	INSTL DEL ASSM (D-SW)SZ (BRF)CTB	EA	12
0658-6026	INSTL DEL ASSM (D-SY)SZ (BRF)CTB	EA	60
0658-6027	INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI)	EA	47
0658-6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	44
0658-6064	INSTL DEL ASSM (D-SY)SZ 1(BRF)GF2	EA	4

LEGEND

PROPOSED PAVEMENT

TRAFFIC FLOW ARROW

BASE REPAIRS

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED
PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375 MILL AND INLAY
ROADWAY
SL 375
PLAN LAYOUT

STA 595+00 TO STA 607+00

SHEET 9 OF 13

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		69

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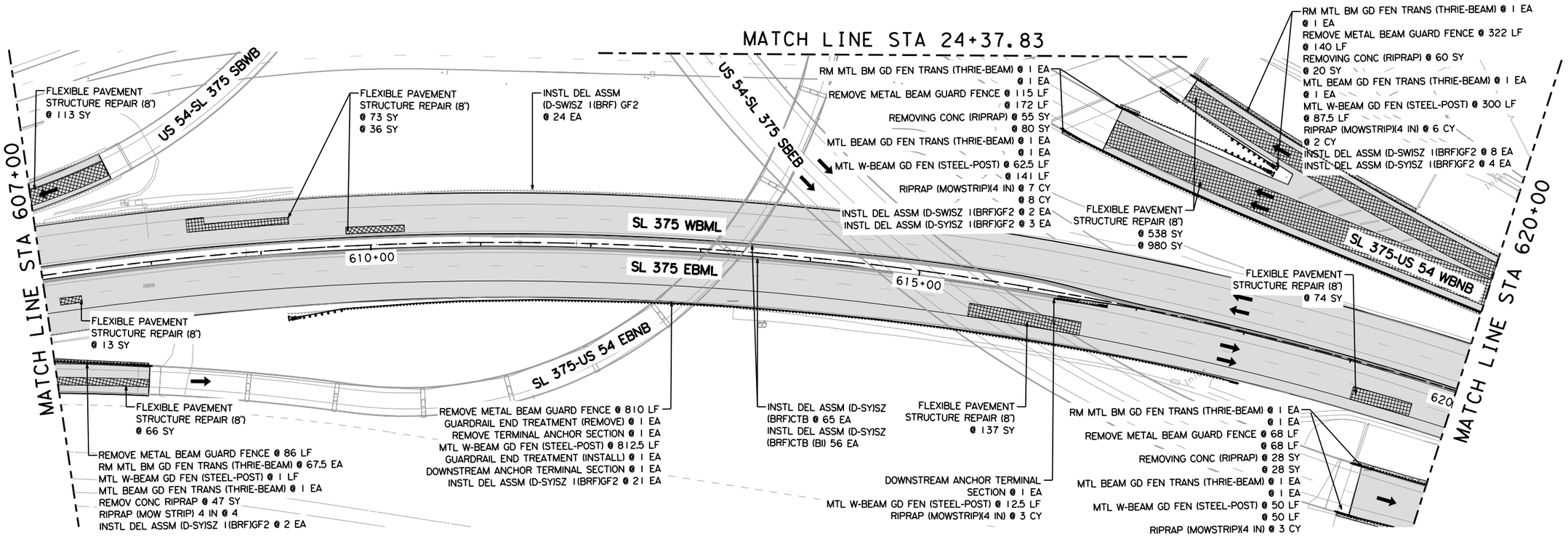

QUANTITY SUMMARY CSJ: 2552-04-046			
ITEM NO.	ITEM	UNIT	QUANTITY
0104-6009	REMOVING CONC (RIPRAP)	SY	494
0316-6017	ASPH (AC-20-5TR)	GAL	6178
0316-6224	AGGR(TY-PB GR-4 SAC-B)	CY	141
0346-6014	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	TON	1699
0346-6058	TACK COAT	GAL	2317
0351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY	2031
0354-6045	PLANE ASPH CONC PAV (2")	SY	15445
0432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	57
0540-6002	MTL W-BEAM GD FEN (STEEL POST)	LF	1805
0540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	6
0540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	2
0542-6001	REMOVE METAL BEAM GUARD FENCE	LF	1979
0542-6002	REMOVE TERMINAL ANCHOR SECTION	EA	2
0542-6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA	5
0544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	4
0544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA	4
0658-6013	INSTL DEL ASSM (D-SW)SZ (BRF)CTB	EA	3
0658-6026	INSTL DEL ASSM (D-SY)SZ (BRF)CTB	EA	65
0658-6027	INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI)	EA	56
0658-6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	45
0658-6064	INSTL DEL ASSM (D-SY)SZ 1(BRF)GF2	EA	29

GENERAL NOTES:

1. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS.
2. SEE PLANSHEET "FLEXIBLE PAVEMENT STRUCTURE REPAIR" FOR ADDITIONAL BASE AND PAVEMENT REPAIR INFORMATION.
3. ONE GUARD FENCE REFLECTORS TO BE INSTALLED ON TOP AND SIDE OF PROPOSED AND EXISTING MBGF SPACED AT 40'.
3. TWO CTB REFLECTORS TO BE INSTALLED ON TOP AND SIDE OF EXISTING CTB SPACED AT 40' WHERE TRAFFIC IS LOCATED ON ONE SIDE OF CTB
4. THREE CTB REFLECTORS TO BE INSTALLED ON TOP AND SIDES OF EXISTING CTB SPACED AT 40' WHERE TRAFFIC IS LOCATED ON BOTH SIDES OF CTB.

LEGEND

PROPOSED PAVEMENT

TRAFFIC FLOW ARROW

BASE REPAIRS

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375 MILL AND INLAY
ROADWAY
SL 375
PLAN LAYOUT

STA 607+00 TO STA 620+00

SHEET 10 OF 13

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		70

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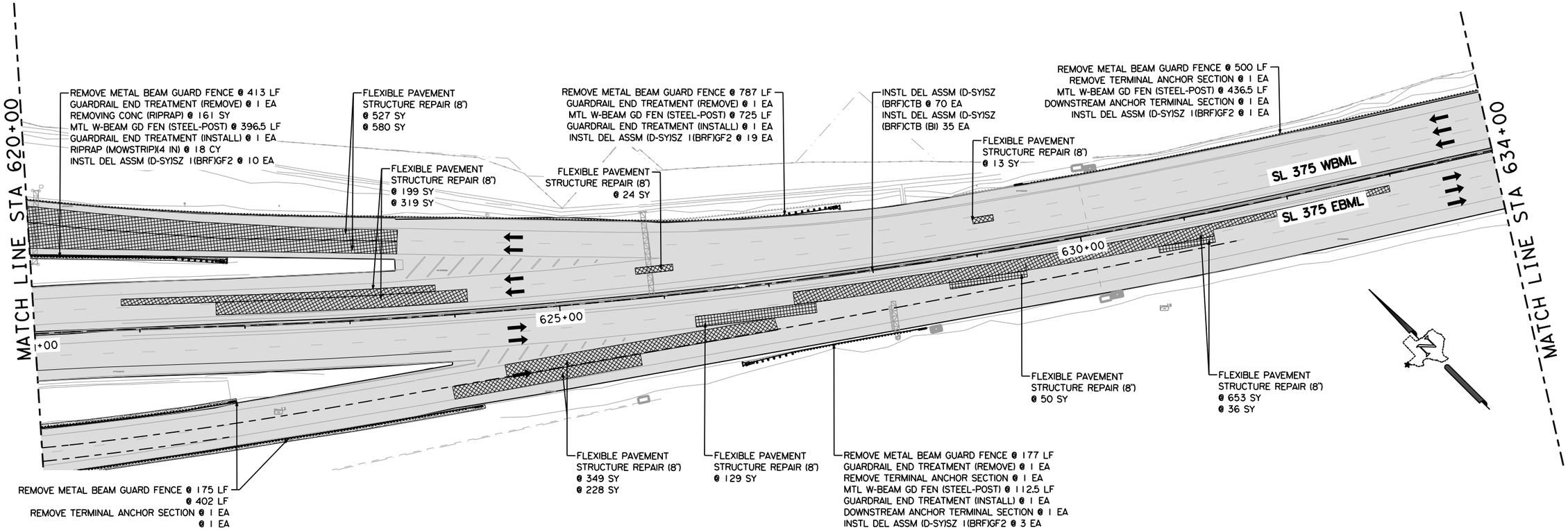

GENERAL NOTES:

1. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS.
2. SEE PLANSHEET "FLEXIBLE PAVEMENT STRUCTURE REPAIR" FOR ADDITIONAL BASE AND PAVEMENT REPAIR INFORMATION.
3. ONE GUARD FENCE REFLECTORS TO BE INSTALLED ON TOP AND SIDE OF PROPOSED AND EXISTING MBGF SPACED AT 40'.
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4. THREE CTB REFLECTORS TO BE INSTALLED ON TOP AND SIDES OF EXISTING CTB SPACED AT 40' WHERE TRAFFIC IS LOCATED ON BOTH SIDES OF CTB.

QUANTITY SUMMARY CSJ: 2552-04-046

ITEM NO.	ITEM	UNIT	QUANTITY
0104-6009	REMOVING CONC (RIPRAP)	SY	284
0316-6017	ASPH (AC-20-5TR)	GAL	8572
0316-6224	AGGR(TY-PB GR-4 SAC-B)	CY	195
0346-6014	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	TON	2358
0346-6058	TACK COAT	GAL	3215
0351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY	3109
0354-6045	PLANE ASPH CONC PAV (2")	SY	21429
0432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	32
0540-6002	MTL W-BEAM GD FEN (STEEL POST)	LF	2037
0540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	2
0540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	3
0542-6001	REMOVE METAL BEAM GUARD FENCE	LF	2256
0542-6002	REMOVE TERMINAL ANCHOR SECTION	EA	3
0542-6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA	2
0544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	2
0544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA	2
0658-6026	INSTL DEL ASSM (D-SY)SZ (BRF)CTB	EA	70
0658-6027	INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI)	EA	35
0658-6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	54

LEGEND

PROPOSED PAVEMENT

TRAFFIC FLOW ARROW

BASE REPAIR

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375 MILL AND INLAY
ROADWAY
SL 375
PLAN LAYOUT

STA 620+00 TO STA 634+00

SHEET 11 OF 13

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		71

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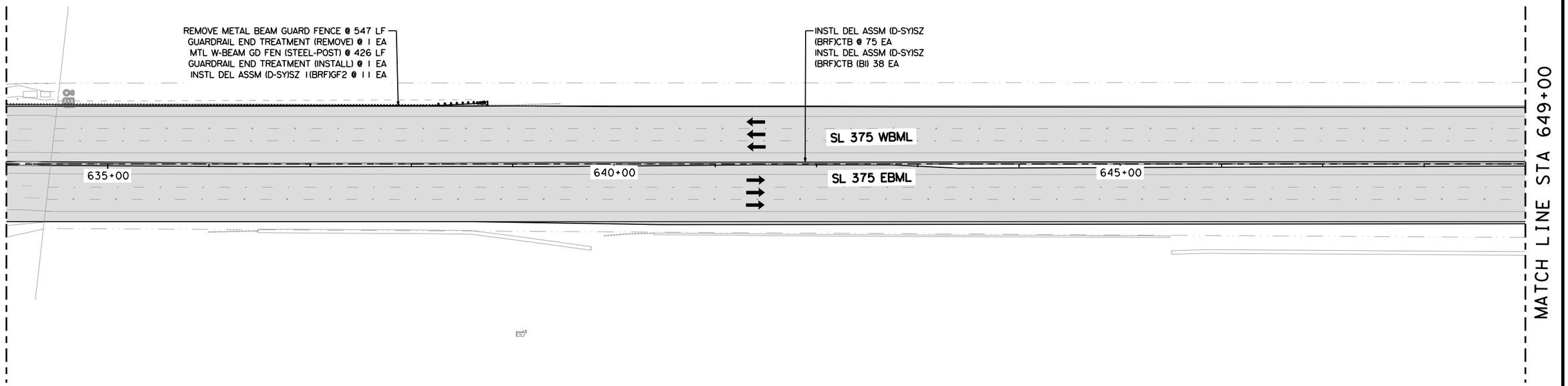

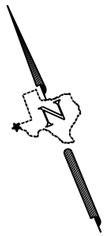

QUANTITY SUMMARY CSJ: 2552-04-046			
ITEM NO.	ITEM	UNIT	QUANTITY
0316-6017	ASPH (AC-20-5TR)	GAL	7396
0316-6224	AGGRITY-PB GR-4 SAC-B)	CY	169
0346-6014	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	TON	2034
0346-6058	TACK COAT	GAL	2774
0354-6045	PLANE ASPH CONC PAV (2")	SY	18489
0540-6002	MTL W-BEAM GD FEN (STEEL POST)	LF	426
0542-6001	REMOVE METAL BEAM GUARD FENCE	LF	547
0544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
0544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA	1
0658-6026	INSTL DEL ASSM (D-SY)SZ (BRF)CTB	EA	75
0658-6027	INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI)	EA	38
0658-6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	11

LEGEND

PROPOSED PAVEMENT

TRAFFIC FLOW ARROW

GENERAL NOTES:

1. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS.
2. SEE PLANSHEET "FLEXIBLE PAVEMENT STRUCTURE REPAIR" FOR ADDITIONAL BASE AND PAVEMENT REPAIR INFORMATION.
3. ONE GUARD FENCE REFLECTORS TO BE INSTALLED ON TOP AND SIDE OF PROPOSED AND EXISTING MBGF SPACED AT 40'.
3. TWO CTB REFLECTORS TO BE INSTALLED ON TOP AND SIDE OF EXISTING CTB SPACED AT 40' WHERE TRAFFIC IS LOCATED ON ONE SIDE OF CTB
4. THREE CTB REFLECTORS TO BE INSTALLED ON TOP AND SIDES OF EXISTING CTB SPACED AT 40' WHERE TRAFFIC IS LOCATED ON BOTH SIDES OF CTB.

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED
PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375 MILL AND INLAY
ROADWAY
SL 375
PLAN LAYOUT

STA 634+00 TO 649+00

SHEET 12 OF 13

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		72

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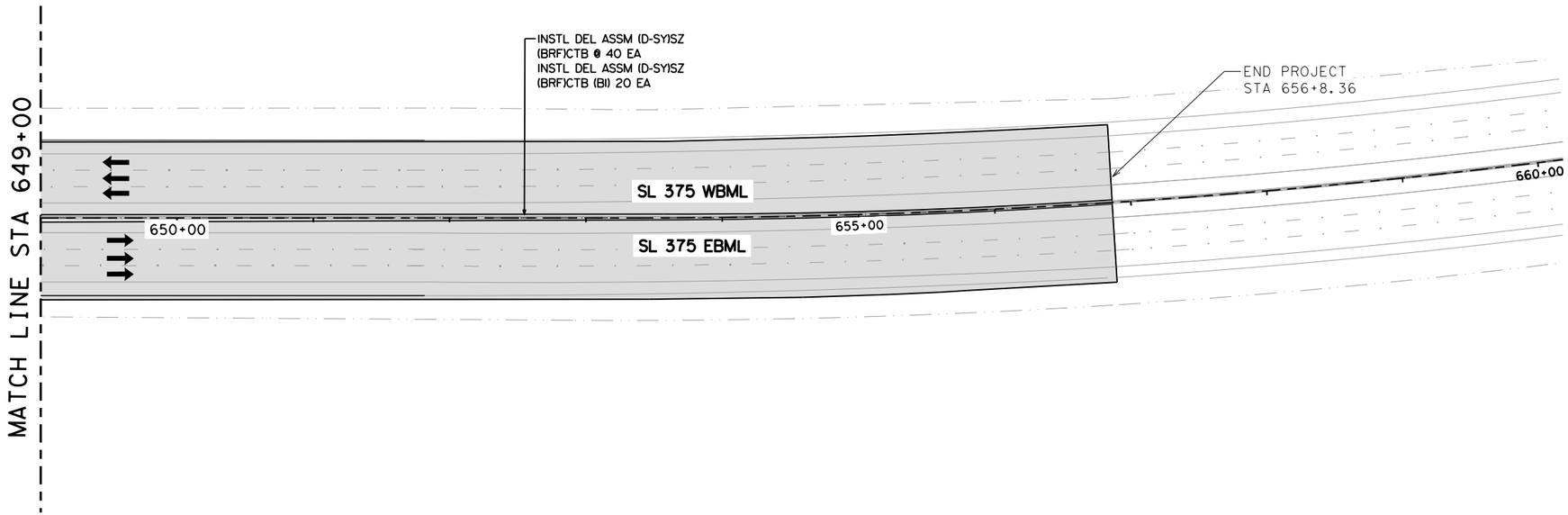

QUANTITY SUMMARY CSJ: 2552-04-046			
ITEM NO.	ITEM	UNIT	QUANTITY
0316-6017	ASPH (AC-20-5TR)	GAL	3908
0316-6224	AGGR(TY-PB GR-4 SAC-B)	CY	89
0340-6246	D-GR HMA (SQ) TY-D PG64-22(LEVEL-UP)	TON	481
0340-6272	TACK COAT	GAL	1311
0346-6014	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	TON	1075
0346-6058	TACK COAT	GAL	1466
0354-6045	PLANE ASPH CONC PAV (2")	SY	9769
0354-6134	PLANE ASPH CONC PAV (0" TO 1/2" MICRO)	SY	2544
0658-6026	INSTL DEL ASSM (D-SY)SZ (BRF)CTB	EA	40
0658-6027	INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI)	EA	20

LEGEND

PROPOSED PAVMENT

TRAFFIC FLOW ARROW

GENERAL NOTES:

1. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS.
2. SEE PLANSHEET "FLEXIBLE PAVEMENT STRUCTURE REPAIR" FOR ADDITIONAL BASE AND PAVEMENT REPAIR INFORMATION.
3. ONE GUARD FENCE REFLECTORS TO BE INSTALLED ON TOP AND SIDE OF PROPOSED AND EXISTING MBGF SPACED AT 40'.
3. TWO CTB REFLECTORS TO BE INSTALLED ON TOP AND SIDE OF EXISTING CTB SPACED AT 40' WHERE TRAFFIC IS LOCATED ON ONE SIDE OF CTB
4. THREE CTB REFLECTORS TO BE INSTALLED ON TOP AND SIDES OF EXISTING CTB SPACED AT 40' WHERE TRAFFIC IS LOCATED ON BOTH SIDES OF CTB.

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375 MILL AND INLAY
ROADWAY
SL 375
PLAN LAYOUT

STA 649+00 TO END

SHEET 13 OF 13

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		73

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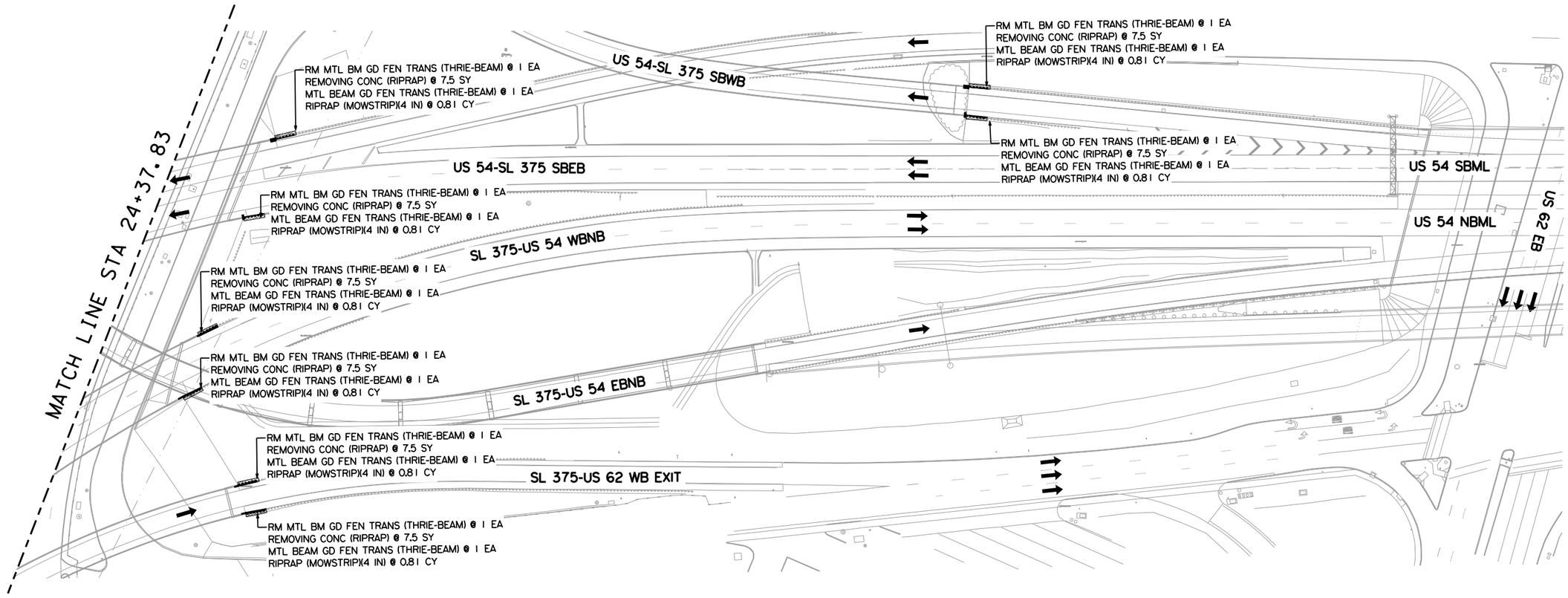

QUANTITY SUMMARY CSJ: 2552-04-046			
ITEM NO.	ITEM	UNIT	QUANTITY
0104-6009	REMOVING CONC (RIPRAP)	SY	59
0432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	7
0540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	8
0540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	1
0542-6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA	8

LEGEND

TRAFFIC FLOW ARROW

GENERAL NOTES:

1. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS.
2. SEE PLANSHEET "FLEXIBLE PAVEMENT STRUCTURE REPAIR" FOR ADDITIONAL BASE AND PAVEMENT REPAIR INFORMATION.
3. ONE GUARD FENCE REFLECTORS TO BE INSTALLED ON TOP AND SIDE OF PROPOSED AND EXISTING MBGF SPACED AT 40'.
3. TWO CTB REFLECTORS TO BE INSTALLED ON TOP AND SIDE OF EXISTING CTB SPACED AT 40' WHERE TRAFFIC IS LOCATED ON ONE SIDE OF CTB
4. THREE CTB REFLECTORS TO BE INSTALLED ON TOP AND SIDES OF EXISTING CTB SPACED AT 40' WHERE TRAFFIC IS LOCATED ON BOTH SIDES OF CTB.

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED
PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375 MILL AND INLAY
ROADWAY
US 54
PLAN LAYOUT

STA 24+37.83 TO END

SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		74

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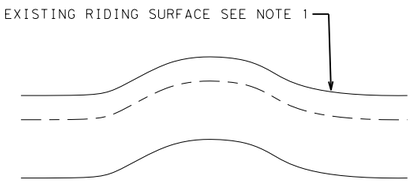
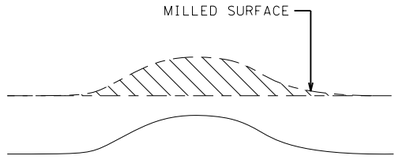
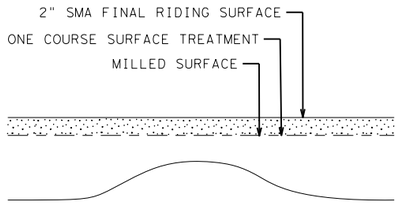


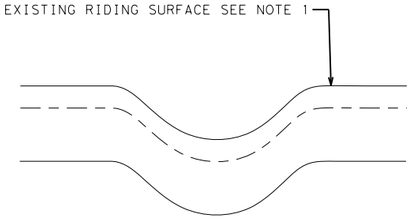
EXISTING BUMP



MICRO-MILLING AREA



PROPOSED SURFACE



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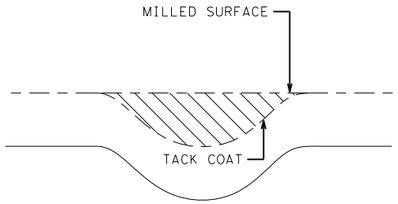
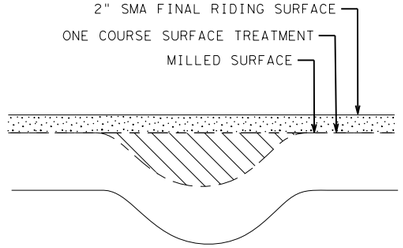


LEVEL UP AREA



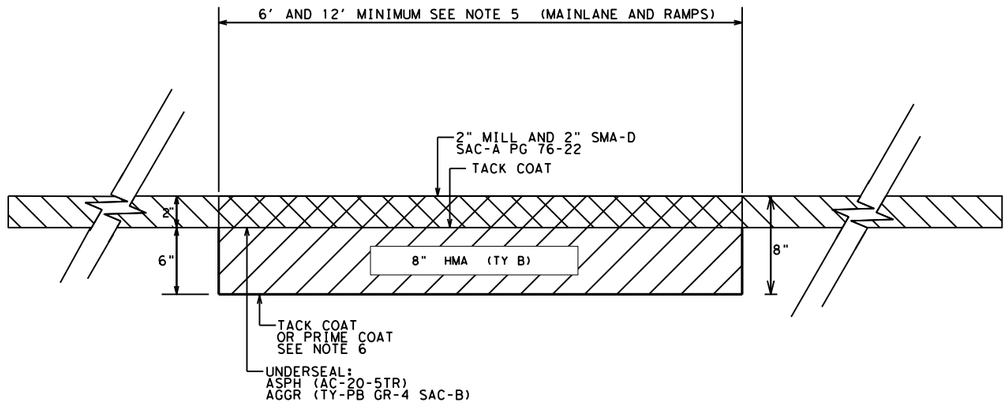
PROPOSED SURFACE

NOTES:
1. RIDE QUALITY SHALL BE MEASURED ON THE RIDING SURFACE, AFTER BASE REPAIRS HAVE BEEN COMPLETED AND ON THE FINAL RIDING SURFACE AFTER SMA HAS BEEN PLACED. SEE GENERAL NOTE 585 FOR ADDITIONAL INFORMATION.
2. MICROMILLING AND LEVEL UP WILL BE PERFORMED OVER THE MILLED SURFACE. AFTER THE TOP 2 INCHES HAVE BEEN MILLED.
3. MICRO MILLING SHALL BE PAID UNDER ITEM 354-6134 "PLANE ASPH CONC PAV (0" TO 1/2" MICRO)"
4. LEVEL UP SHALL BE PAID UNDER ITEM 340-6246 "D-GR HMA (SQ) TY-D PG64_22(LEVEL UP)"
5. FOR MAINLANE AND RAMP BASE REPAIRS, THE TYPICAL REPAIR WIDTHS ARE 6' AND 12' AND MINIMUM LENGTH AS SHOWN THE PLANS THESE DIMENSIONS MAY DIFFER BASED UPON THE AREA THAT IS IN NEED OF REPAIR. FOR PAVEMENT REPAIR LOCATIONS AND DESCRIPTION SEE "PLAN" LAYOUTS. REMOVAL OF EXISTING PAVEMENT STRUCTURE WILL BE SUBSIDIARY TO ITEM 351,"FLEXIBLE PAVEMENT STRUCTURE REPAIR".

   HMA (TY B) SHALL NOT BE PAID FOR DIRECTLY, BUT SHALL BE SUBSIDIARY TO ITEM 351.

   THE REPAIR LOCATIONS AND THE SIZE OF EACH LOCATION IS SUBJECT TO CHANGE AS DIRECTED BY THE ENGINEER.

6. APPLY TACK COAT UNDER FLEXIBLE PAVEMENT BASE REPAIRS. IN THE EVENT FLEX BASE IS EXPOSED, APPLY PRIME COAT. PRIME COAT AND TACK COAT FOR BASE REPAIRS SHALL NOT BE PAID FOR DIRECTLY, BUT SHALL BE SUBSIDIATY TO ITEM 351



FLEXIBLE PAVEMENT STRUCTURE REPAIR 8"
TYPICAL SECTION
⊛TO BE PLACED IN TWO EQUAL LIFTS

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED
PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/26/2021

SL 375 MILL AND INLAY
ROADWAY

FLEXIBLE PAVEMENT REPAIR AND REMEDIATION DETAILS

SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		75

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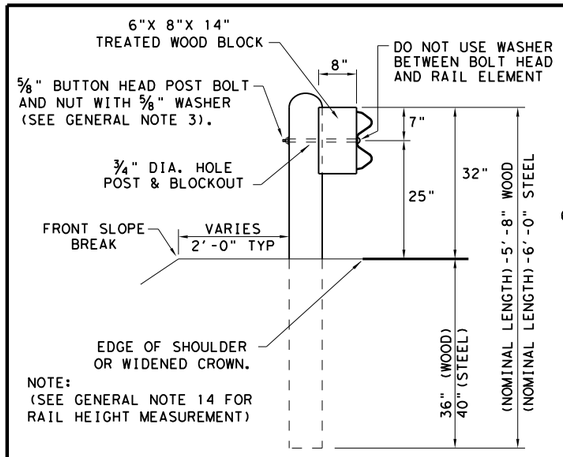
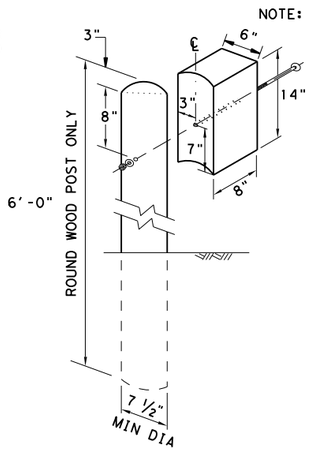
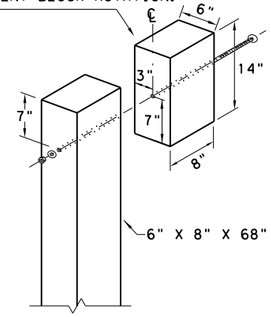


TYPICAL POST PLACEMENT

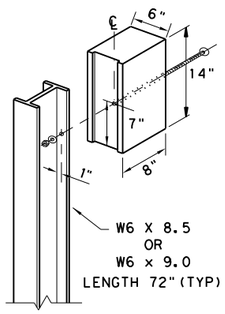


WOOD BLOCK TO ROUND WOOD POST

NOTE: TOENAIL WITH ONE 16D GALV. NAIL TO PREVENT BLOCK ROTATION.

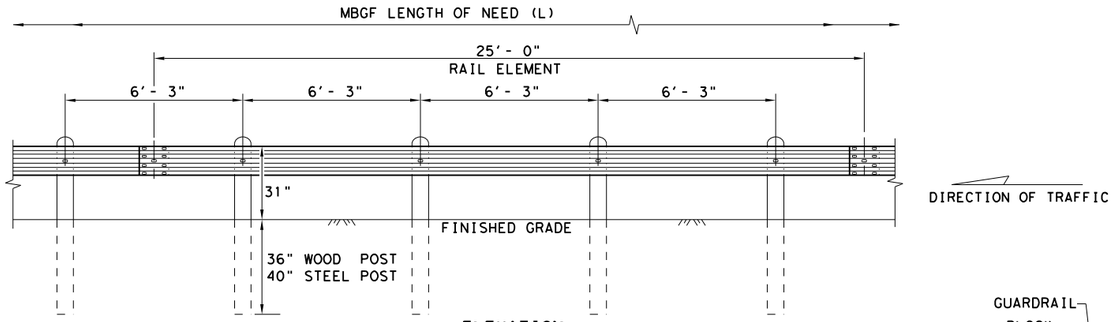


WOOD BLOCK TO RECTANGULAR WOOD POST



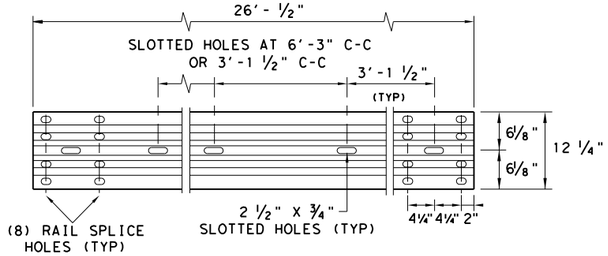
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

NOTE: ** "WOOD" INDICATES DIMENSIONS FOR BOTH ROUND AND RECTANGULAR WOOD POST SYSTEMS.



ELEVATION
MID-SPAN RAIL SPLICE

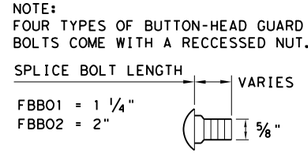
SHOWING A 25'- 0" SECTION OF W-BEAM RAIL. (SEE GENERAL NOTE 2)



ELEVATION 25'- 0" (NOM.) W-BEAM SECTION

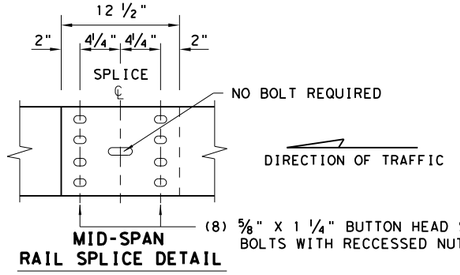
NOTES: SEE GENERAL NOTE 2 FOR ALLOWABLE RAIL TYPES.
SEE RAIL SPLICE DETAIL FOR REQUIRED HARDWARE.

NOTE:
FOUR TYPES OF BUTTON-HEAD GUARD RAIL BOLTS COME WITH A RECCESSED NUT.



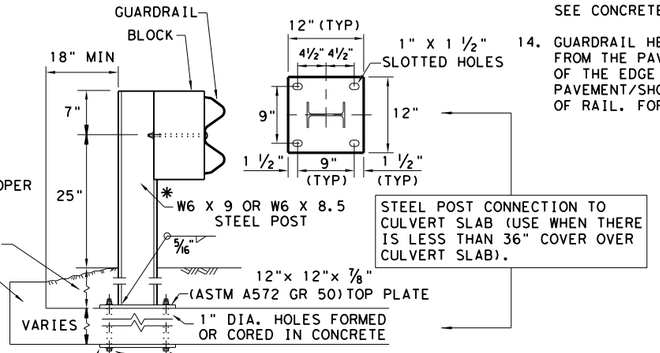
BUTTON HEAD BOLT

NOTE: SEE GENERAL NOTE 3 FOR SPLICE & POST BOLT DETAILS.



MID-SPAN RAIL SPLICE DETAIL

NOTE: GF(31), MID-SPAN RAIL SPLICES ARE REQUIRED WITH 6'-3" POST SPACINGS.



* POST(S) MAY REQUIRE FIELD MODIFICATION TO ENSURE PROPER GUARDRAIL HEIGHT.

STEEL POST CONNECTION TO CULVERT SLAB (USE WHEN THERE IS LESS THAN 36" COVER OVER CULVERT SLAB).

LOW FILL CULVERT POST

NOTE: TWO INSTALLATION OPTIONS.

1. BOLT-THROUGH OPTION: REQUIRES A 6" MIN. SLAB THICKNESS. ⅞" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS.
   NOTE: BOLT LENGTH = SLAB PLUS 2 ¼" MIN.

2. EPOXY ANCHOR OPTION: THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE ⅞" DIA. ASTM A449 OR A193 GRADE B7 WITH HEAVY HEX NUT, AND ONE HARDENED WASHER EACH. EMBED ANCHOR RODS 6" WITH HILTI HIT RE 500 EPOXY ADHESIVE. OTHER TYPE III CLASS C EPOXY ADHESIVES MEETING THE REQUIREMENTS OF DMS-6100, "EPOXIES AND ADHESIVES", MAY BE USED IF IT CAN BE DEMONSTRATED THAT THEY MEET OR EXCEED THE STRENGTH OF HILTI HIT RE 500 WITH THE SAME EMBEDMENT DEPTH AND THREADED ROD DIA. FOLLOW THE MANUFACTURER'S REQUIREMENTS FOR INSTALLING EPOXIED THREADED RODS. EXTEND RODS ¼" MIN. BEYOND NUT.

NOTE: CULVERTS OF 25 FT. OR LESS, SEE GF(31)LS STANDARD FOR "LONG SPAN" OPTION.

NOTE: TRANSISTIONS TO BRIDGE RAILS OR TRAFFIC BARRIERS.
SEE GF(31)TL3 TR STANDARD FOR HIGH-SPEED TL-3 TRANSITIONS.
SEE GF(31)TL2 TR STANDARD FOR LOW-SPEED TL-2 TRANSITIONS.

GENERAL NOTES

1. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF MBGF SHALL BE SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. STEEL POSTS TO BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING."
2. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540,"METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS. THE CONTRACTOR MAY FURNISH RAIL ELEMENTS OF 25'- 0", OR 12'- 6" (NOM.) LENGTHS. RAIL ELEMENTS MAY HAVE SLOTTED HOLES AT 3'-1 ½" C-C OR 6'-3" C-C. A SPECIAL LENGTH OF RAIL MAY BE MANUFACTURED TO ACCOMMODATE THE DOWNSTREAM ANCHOR TERMINAL (DAT) AND THE TRANSITION SECTIONS OF GUARDRAIL.
3. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND ⅝" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
4. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445,"GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
5. CROWN SHALL BE WIDENED TO ACCOMMODATE THE METAL BEAM GUARD FENCE.
6. THE LATERAL APPROACH TO THE GUARD FENCE, SHALL HAVE A MAXIMUM SLOPE OF 1V:10H.
7. IF SHOWN ELSEWHERE IN THE PLANS OR AS DIRECTED BY THE ENGINEER, THE GUARD FENCE MAY BE FLARED AT A RATE OF 25:1 OR FLATTER.
8. UNLESS OTHERWISE SHOWN IN THE PLANS, GUARD FENCE PLACED IN THE VICINITY OF CURBS SHALL BE POSITIONED SO THAT THE FACE OF CURB IS LOCATED DIRECTLY BELOW OR BEHIND THE FACE OF THE RAIL. RAIL PLACED OVER CURBS SHALL BE INSTALLED SO THAT THE POST BOLT IS LOCATED APPROXIMATELY 25 INCHES ABOVE THE GUTTER PAN OR EDGE OF SHOULDER.
9. APPLICATIONS IN SOLID ROCK ARE ONLY ALLOWED WITH STEEL POSTS. IF SOLID ROCK IS ENCOUNTERED WITHIN 0 TO 18" OF THE FINISHED GRADE, DRILL A 24" DIA. HOLE, 24" INTO THE ROCK. IF SOLID ROCK IS ENCOUNTERED BELOW 18", DRILL A 12" DIA. HOLE, 12" INTO THE ROCK OR TO THE STANDARD EMBEDMENT DEPTH, WHICHEVER MAYBE LESS. ANY EXCESS POST LENGTH, AFTER MEETING THESE DEPTHS, MAY BE FIELD CUT TO ENSURE PROPER GUARDRAIL MOUNTING HEIGHT. BACKFILL WITH COARSE AGGREGATE MATERIAL.
10. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
11. SPECIAL FABRICATION WILL BE REQUIRED AT INSTALLATION LOCATIONS HAVING A CURVATURE OF LESS THAN 150 FT. RADIUS.
12. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210,"COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. THE CONSTRUCTION DIVISION, TXDOT MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210 ONLY PRODUCERS ON THE MPL MAY FURNISH COMPOSITE MATERIAL BLOCKS.
13. FOR THE LOW FILL CULVERT OPTION, POSTS LOCATED PARTIALLY OR WHOLLY BETWEEN PRECAST BOX CULVERT UNITS, THE USE OF A CAST-IN-PLACE CONCRETE CLOSURE BETWEEN BOXES IS REQUIRED. THE LENGTH OF THE CAST-IN-PLACE CONCRETE CLOSURE SHALL ACCOMMODATE THE PLACEMENT OF THE LOW FILL CULVERT OPTION. SEE CONCRETE CLOSURE DETAILS ON BRIDGE STANDARD SCP-MD.
14. GUARDRAIL HEIGHT MEASUREMENT: WHEN THE GUARDRAIL IS LOCATED ABOVE PAVEMENT, MEASURE THE HEIGHT FROM THE PAVEMENT TO THE TOP OF THE W-BEAM RAIL. WHEN THE GUARDRAIL IS LOCATED UP TO 2 FT. OFF OF THE EDGE OF PAVEMENT OR FOR A PAVEMENT OVERLAY, USE A 10-FOOT STRAIGHTEDGE TO EXTEND THE PAVEMENT/SHOULDER SLOPE TO THE BACK OF RAIL, MEASURE FROM THE BOTTOM OF STRAIGHTEDGE TO THE TOP OF RAIL. FOR GUARDRAIL LOCATED DOWN A 10:1 SLOPE, MEASURE FROM THE NOMINAL TERRAIN.

Texas Department of Transportation

Design Division Standard

METAL BEAM GUARD FENCE
TL-3 MASH COMPLIANT
GF(31)-19

FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	2552	04	046	SL 375
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	24	EL PASO		76

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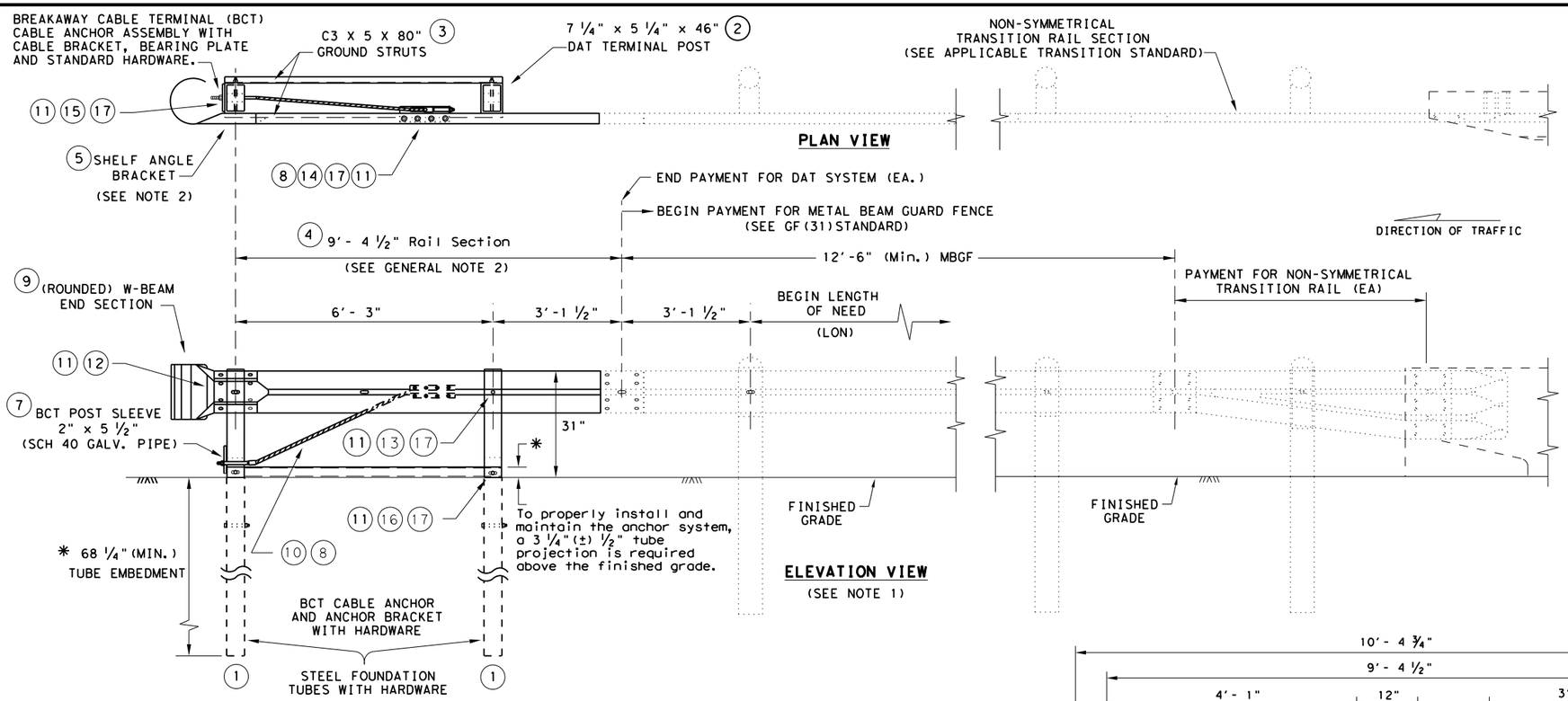


DOWNSTREAM ANCHOR TERMINAL (DAT)

NOTE: ONLY FOR DOWNSTREAM USE, WHEN LOCATED OUTSIDE THE HORIZONTAL CLEARANCE AREA OF OPPOSING TRAFFIC.

GENERAL NOTES

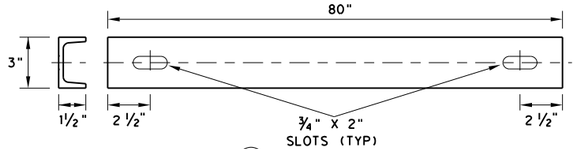
1. THE DETAIL SHOWN IS THE MINIMUM LENGTH OF NEED (LON) FOR A DOWNSTREAM ANCHOR TERMINAL (DAT) CONNECTED TO A CONCRETE RAIL.
2. THE RAIL SECTION AT THE END POST IS SUPPORTED BY THE SHELF ANGLE BRACKET. THE RAIL ELEMENT IS NOT ATTACHED TO THE END POST.
3. THE FOUNDATION TUBES SHALL NOT PROJECT MORE THAN 3 3/4" ABOVE THE FINISHED GRADE.
4. ALL HARDWARE FOR DAT SHALL BE ASTM A307 UNLESS OTHERWISE SHOWN.
5. REFER TO GF(31) SHEET FOR TERMINAL CONNECTION DETAILS.

MOW STRIP INSTALLATION

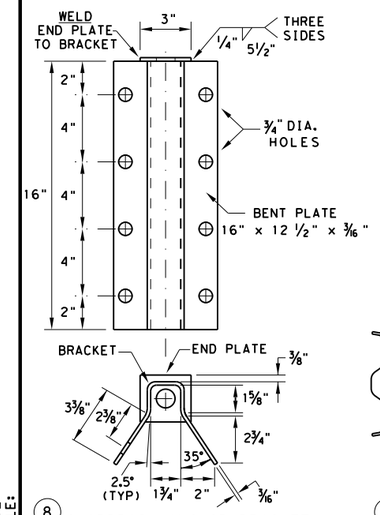
IF A MOW STRIP IS REQUIRED WITH THE DAT INSTALLATION THE LEAVE-OUT AREA AROUND THE STEEL FOUNDATION TUBES AND THE TWO CHANNEL STRUTS MAY BE OMITTED. THIS WILL REQUIRE A FULL POUR AT THE FOUNDATION TUBES.

#	(DAT) PARTS LIST	QTY
(1)	STEEL FOUNDATION TUBE	2
(2)	DAT TERMINAL POST	2
(3)	CHANNEL STRUT	2
(4)	TERMINAL RAIL ELEMENT	1
(5)	SHELF ANGLE BRACKET	1
(6)	BCT BEARING PLATE	1
(7)	BCT POST SLEEVE	1
(8)	GUARDRAIL ANCHOR BRACKET	1
(9)	(ROUNDED) W-BEAM END SECTION	1
(10)	BCT CABLE ANCHOR	1
(11)	RECESSED NUT, GUARDRAIL	20
(12)	1 1/4" BUTTON HEAD BOLT	4
(13)	10" BUTTON HEAD BOLT	2
(14)	5/8" X 2" HEX HEAD BOLT	8
(15)	5/8" X 8" HEX HEAD BOLT	4
(16)	5/8" X 10" HEX HEAD BOLT	2
(17)	5/8" FLAT WASHER	18

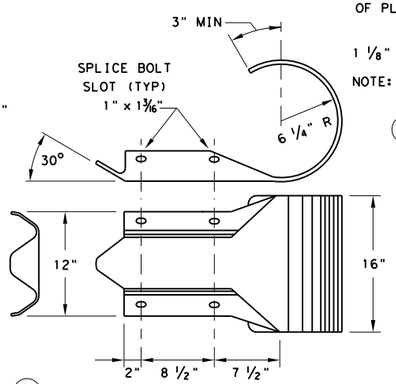
(4) **TERMINAL RAIL ELEMENT FOR DAT**



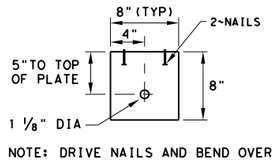
(3) **CHANNEL STRUT**
C3 X 5 X 80", GRADE A36



(8) **GUARDRAIL ANCHOR BRACKET**

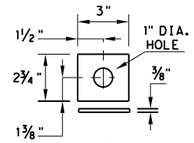


(9) **W-BEAM END SECTION (ROUNDED) (12 GA.)**

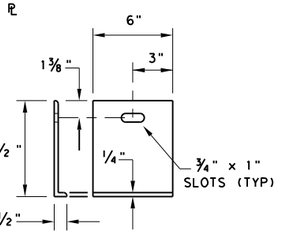


NOTE: DRIVE NAILS AND BEND OVER TO PREVENT PLATE ROTATION

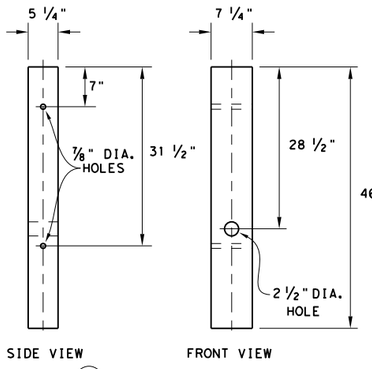
(6) **BEARING PLATE**
8"x 8"x 5/8" R



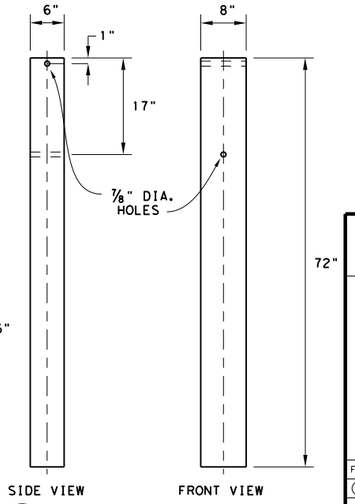
END PLATE



(5) **SHELF ANGLE BRACKET**



(2) **TERMINAL POST**
7 1/4"x 5 1/4"x 46" WOOD POST



(1) **STEEL FOUNDATION TUBE**
6"x 8"x 1/8" x 72" STEEL TUBE

Texas Department of Transportation — Design Division Standard

METAL BEAM GUARD FENCE
(DOWNSTREAM ANCHOR TERMINAL)
TL-3 MASH COMPLIANT

GF(31)DAT-19

FILE: gf31dat19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
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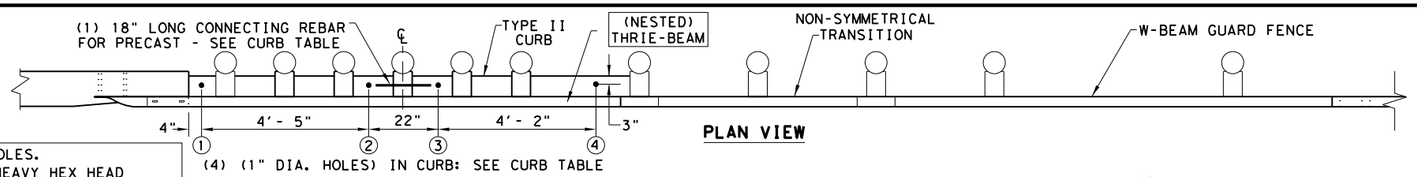


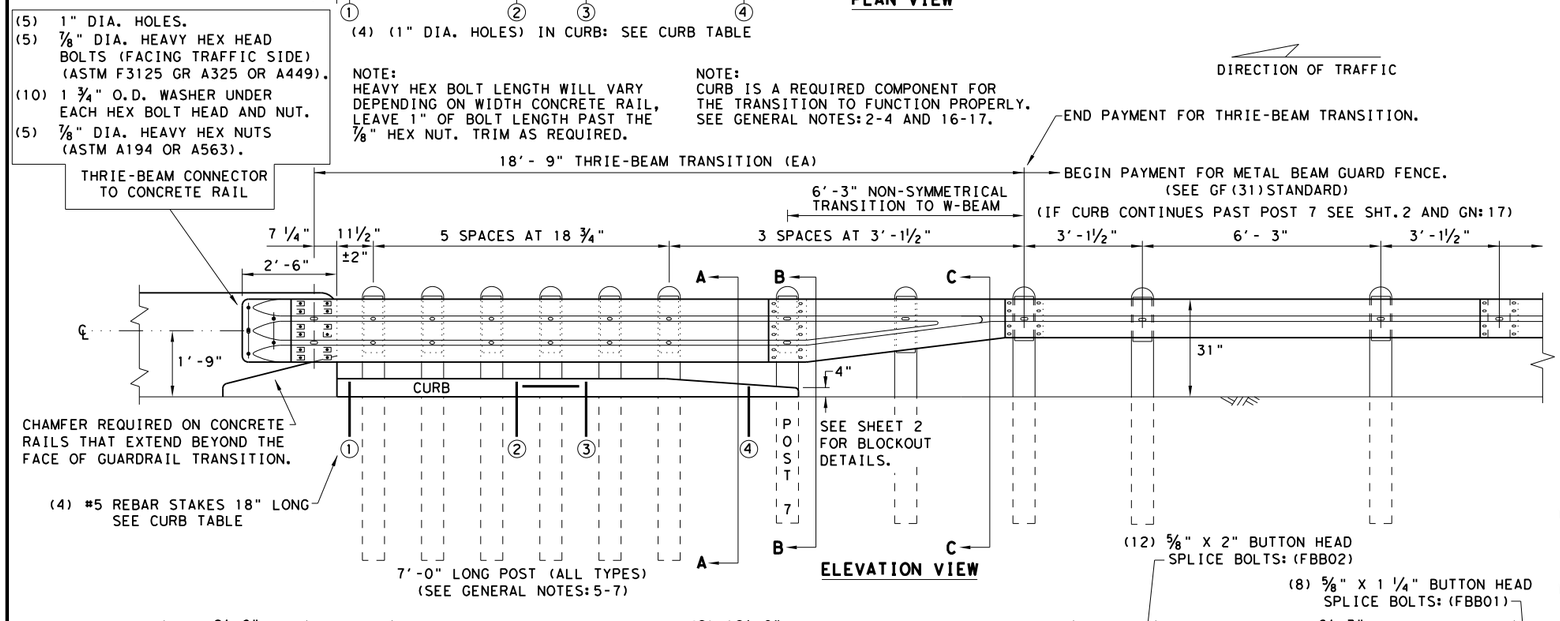
PLAN VIEW

(5) 1" DIA. HOLES.
(5) ⅞" DIA. HEAVY HEX HEAD BOLTS (FACING TRAFFIC SIDE) (ASTM F3125 GR A325 OR A449).
(10) 1 ¾" O.D. WASHER UNDER EACH HEX BOLT HEAD AND NUT.
(5) ⅞" DIA. HEAVY HEX NUTS (ASTM A194 OR A563).

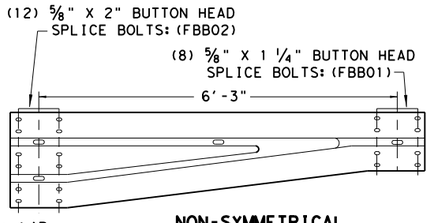
NOTE:
HEAVY HEX BOLT LENGTH WILL VARY DEPENDING ON WIDTH CONCRETE RAIL, LEAVE 1" OF BOLT LENGTH PAST THE ⅞" HEX NUT. TRIM AS REQUIRED.

NOTE:
CURB IS A REQUIRED COMPONENT FOR THE TRANSITION TO FUNCTION PROPERLY. SEE GENERAL NOTES: 2-4 AND 16-17.

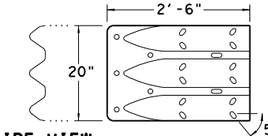
DIRECTION OF TRAFFIC



ELEVATION VIEW

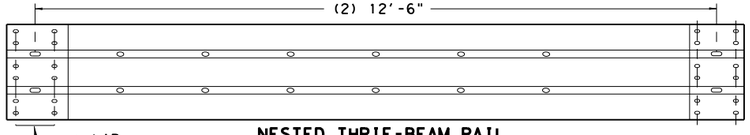


NON-SYMMETRICAL W-BEAM TO THRIE-BEAM TRANSITION 10GA.
PART DESIGNATOR RWT02a OR RWT02b



SIDE-VIEW

THRIE-BEAM TERMINAL CONNECTOR 10GA.
PART DESIGNATOR RTE01b
NOTE: SEE GENERAL NOTE: 9

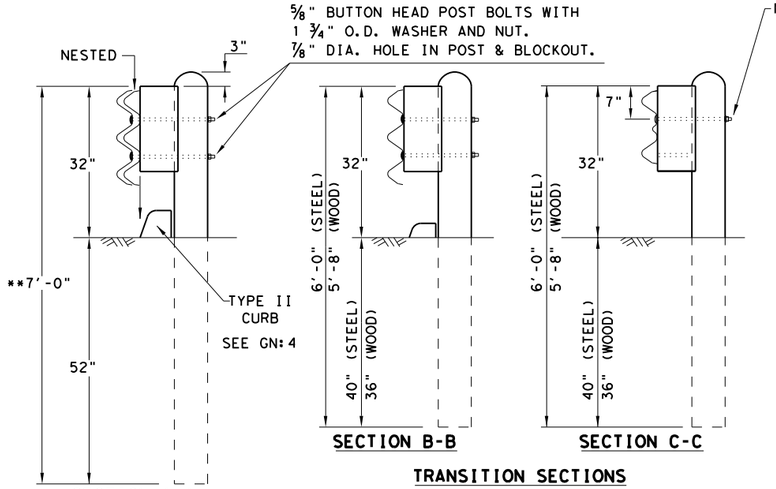


NESTED THRIE-BEAM RAIL
PART DESIGNATOR RTM10a

(12) ⅝" X 2" BUTTON HEAD SPLICE BOLTS WITH RECESSED NUTS: (FBB02)
(12) RECTANGULAR GUARDRAIL PLATE WASHERS: (FWR03)

PLATE WASHER INSTRUCTIONS

BRIDGE APPROACH - UPSTREAM: THE NESTED RAIL LAPS OVER THE TERMINAL CONNECTOR. PLATE WASHERS ARE INSTALLED UNDER THE SPLICE NUTS AGAINST INSIDE OF CONNECTOR.
BRIDGE EXIT - DOWNSTREAM: THE TERMINAL CONNECTOR LAPS OVER THE NESTED RAIL. PLATE WASHERS ARE INSTALLED UNDER THE BOLT HEAD AGAINST OUTSIDE OF CONNECTOR.



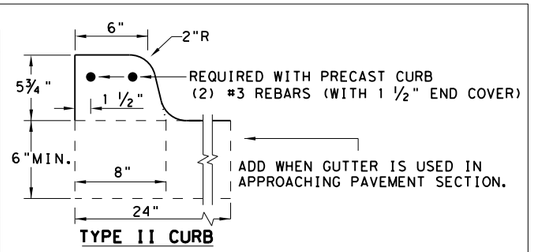
SECTION A-A
SECTION B-B
SECTION C-C

TRANSITION SECTIONS
NOTE: ALL POST TYPES, SEE GENERAL NOTE: 5 & 6

NOTE: ** "WOOD" INDICATES DIMENSIONS FOR BOTH ROUND AND RECTANGULAR WOOD POST SYSTEMS.

THRIE-BEAM TERMINAL - CURB TABLE

PRECAST CURB FULL LENGTH EQUALS 12'- 2" THE PRECAST CURB MAY BE FORMED INTO TWO SECTIONS.
CURB (1) LENGTH 5'- 8"
CURB (2) LENGTH 6'- 6"
TAPER CURB (2) TO A HEIGHT OF 4" AT POST 7
CONNECTING PRECAST CURB SECTIONS (1) & (2):
FORM OR CORE 1" DIA. HOLE 9" LONG INTO EACH CURB END. USE (1) #5 GR.60 REBAR 18" LONG TO CONNECT BOTH CURBS.
SECURING PRECAST OR CAST-IN-PLACE TO FINISHED GRADE *:
FORM OR CORE (4) 1" DIA. HOLES, SEE PLAN AND ELEVATION VIEWS FOR HOLE LOCATIONS. DRIVE (4) #5 GR.60 REBAR STAKES 18" LONG INTO THE GROUND AND ½" BELOW TOP OF CURB. FILL HOLES WITH APPROVED GROUT MIXTURE.



TYPE II CURB

NOTE: OPTIONS FOR TYPE II CURB:
1. PRECAST
2. CAST-IN-PLACE

* NOTES: NOT NEEDED FOR CAST-IN-PLACE.
SEE TYPE II CURB DETAIL FOR REBAR AND COVER REQUIREMENTS.
PERCUSSION DRILLING IS NOT PERMITTED WITH:
TYPE II CURB, BRIDGE RAIL OR CONCRETE TRAFFIC RAIL.

TYPE II CURB DETAILS

GENERAL NOTES

1. CONTACT THE DESIGN DIVISION FOR DRAINAGE CUT OUT OPTIONS NEEDED WITHIN THE CURB SECTION OF THE THRIE-BEAM TRANSITION. (512) 416-2678
2. CONCRETE CURB MAY BE CAST-IN-PLACE OR PRECAST AS SHOWN ON THIS SHEET. WHEN USED IN CONJUNCTION WITH THE THRIE-BEAM TRANSITIONS, CURB SHALL BE TYPE II (5- ¾" HEIGHT); SEE CURRENT CCCG STANDARD SHEET FOR FURTHER DETAILS. IF OTHER CURB HEIGHTS ARE SHOWN IN THE PLANS IN CONJUNCTION WITH THE TRANSITION, THE CURB HEIGHT MAY BE FROM 4" TO 8" WITH A RELATIVELY VERTICAL FACE. CONCRETE CURB SHALL BE CONTINUOUS TO THE SEVENTH POST UNLESS OTHERWISE SHOWN IN THE PLANS. SEE GENERAL NOTE: 17 FOR CIRCUMSTANCES WHERE CURB CONTINUES PAST POST 7.
3. CONCRETE CURB TYPE II SUBSIDIARY TO "METAL BEAM GUARD FENCE TRANSITION". IF NO ADDITIONAL CURB IS INDICATED BEYOND THE TRANSITION, THEN ANY CURB HEIGHT GREATER THAN 4" WILL BE TAPERED DOWN BEGINNING AT THE LAST 7 FT. POST TO A MAXIMUM HEIGHT OF 4" AT POST 7. IF SHOWN ELSEWHERE IN THE PLANS, ADDITIONAL CURB UNDERNEATH GUARDRAIL WILL BE PAID FOR BY THE LINEAR FOOT.
4. UNLESS OTHERWISE SHOWN IN THE PLANS, TRANSITIONS SHALL BE PLACED WITH THE BLOCKOUT FACE IN FRONT OF OR DIRECTLY ABOVE THE CURB FACE. SEE SECTION A-A.
5. FOR ROUND WOOD POST SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 ½" DIA. MINIMUM THROUGHOUT THE THRIE-BEAM TRANSITION.
6. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. REFER TO GF(31) STANDARD SHEET.
7. THE POST LENGTH SHALL BE MARKED ON ALL 7'- 0" LONG POSTS BY THE MANUFACTURER. THE MARK SHALL BE LOCATED WITHIN THE TOP 1 FT. REGION OF THE POST, AT LEAST ⅝" IN HEIGHT, AND VISIBLE AFTER INSTALLATION. WOODEN POSTS SHALL BE MARKED WITH A BRAND, AND STEEL POSTS WITH A STENCIL BEFORE GALVANIZING.
8. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
9. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED ON THE PLANS. THE THRIE-BEAM TERMINAL CONNECTOR AND THE THRIE-BEAM TRANSITION TO W-BEAM SHALL BE OF THE SAME MATERIAL, BUT SHALL NOT BE LESS THAN 10 GAUGE. CONTRACTOR SHALL VERIFY THAT THE LOCATIONS OF BOLT HOLES MATCH THOSE IN THE THRIE-BEAM TERMINAL CONNECTOR PRIOR TO ORDERING MATERIALS.
10. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND ⅝" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
11. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
12. CROWN SHALL BE WIDENED TO ACCOMMODATE TRANSITIONS.
13. WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
14. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. TXDOT'S MATERIALS AND TESTS DIVISION MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210. ONLY PRODUCERS ON THE MPL CAN FURNISH COMPOSITE MATERIAL BLOCKS.
15. REFER TO GF(31) STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
16. THE INSTALLATION OF THE TYPE II CURB IS CRITICAL FOR THE PERFORMANCE OF THE THRIE-BEAM TRANSITION SYSTEM. THE CURB PREVENTS (VEHICLE WHEEL SNAGGING) AT THE CONCRETE RAIL AND IS REQUIRED TO MEET MASH CRASH TEST CRITERIA.
17. IF CURB EXTENDS BEYOND POST 7, 25' OF NESTED W-BEAM GUARDRAIL SHALL BE INSTALLED BEYOND THE PAY LIMITS OF THRIE-BEAM TRANSITION SECTION, (SEE SHT.2). PAYMENT FOR THIS 25' SECTION WILL BE BY LINEAR FOOT, PAY ITEM "0540 6XXX MTL W-BEAM GD FEN (NESTED)(TIM POST)" OR "540 6XXX MTL W-BEAM GD FEN (NESTED)(STEEL POST)" AS APPLICABLE FOR POST TYPE. SEE SHT.2 FOR ADDITIONAL INFORMATION.

HIGH-SPEED TRANSITION

Texas Department of Transportation
Design Division Standard

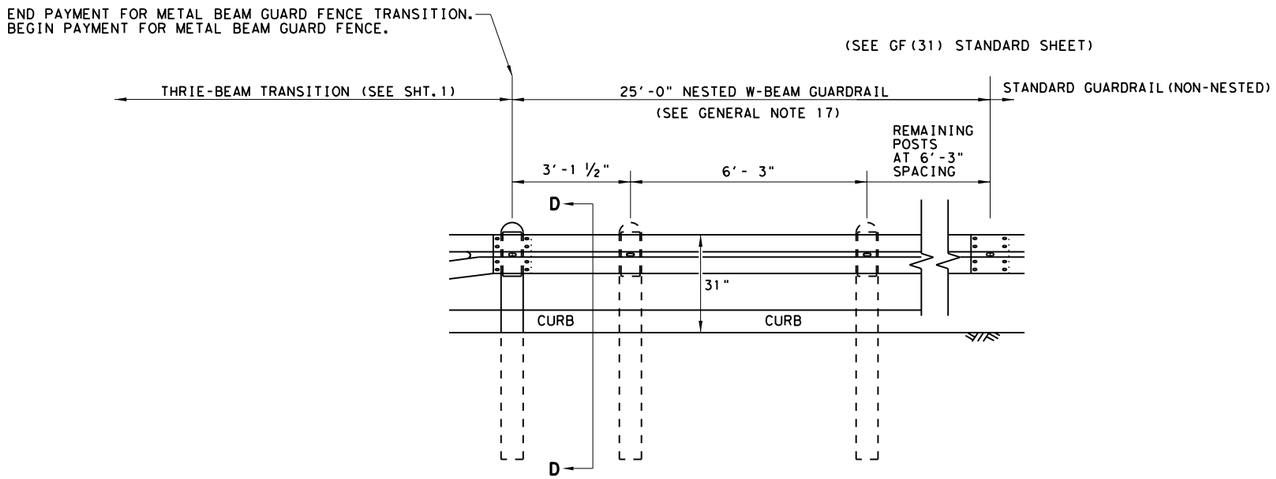
METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-3 MASH COMPLIANT

GF(31)TR TL3-20

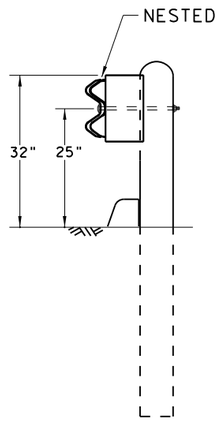
FILE: gf31trtl320.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	2552	04	046	SL 375
	DIST	COUNTY		SHEET NO.
	24	EL PASO		78

DATE:
FILE:

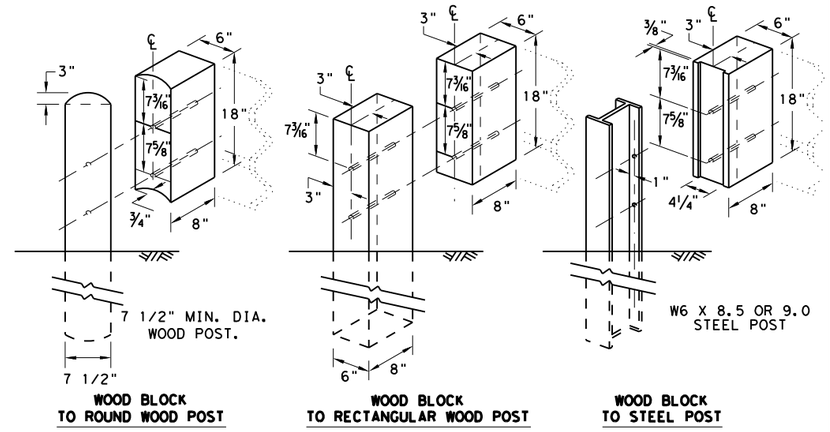
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



ELEVATION VIEW



SECTION D-D



THRIE BEAM TRANSITION BLOCKOUT DETAILS

HIGH-SPEED TRANSITION

SHEET 2 OF 2

Texas Department of Transportation | Design Division Standard

METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-3 MASH COMPLIANT

GF(31)TR TL3-20

FILE: gf31tr1320.dgn	DN: TxDOT	CK: KM	DW: KM	CK: CGL/AG	
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY	
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DATE:
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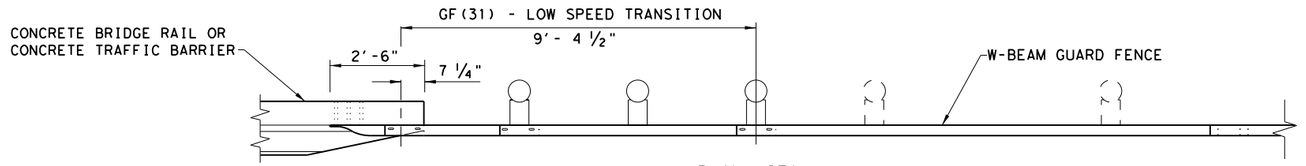
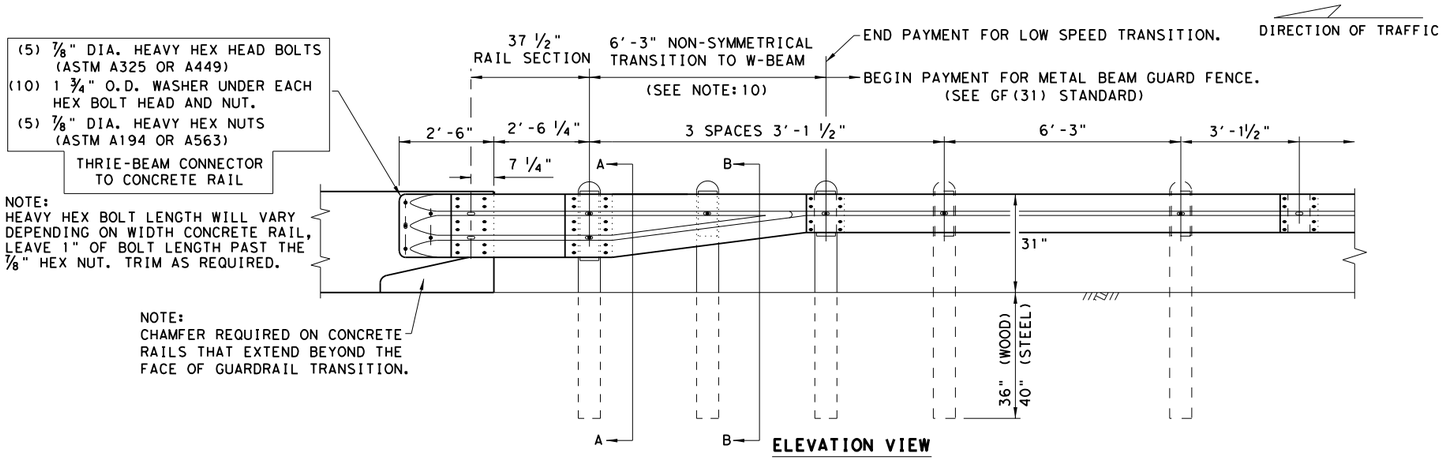


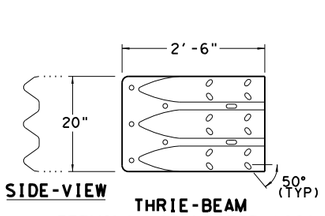
PLAN VIEW



ELEVATION VIEW

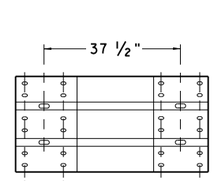
GENERAL NOTES

1. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF TRANSITIONS SHALL BE AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. REFER TO GF(31)STANDARD SHEET.
2. RAIL ELEMENT SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS.
3. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM REQUIRING CONSTRUCTION OF THE TRANSITION.
4. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND ⅝" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM BOLT LENGTH TO MEET REQUIRED LENGTH.
5. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
6. CROWN SHALL BE WIDENED TO ACCOMMODATE TRANSITIONS.
7. WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
8. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. THE CONSTRUCTION DIVISION, TXDOT, MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210. ONLY PRODUCERS ON THE MPL CAN FURNISH COMPOSITE MATERIAL BLOCKS.
9. REFER TO GF(31)STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
10. FOR ROUND WOOD POSTS SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 ½" DIA. MINIMUM THROUGHOUT THE TRANSITION.

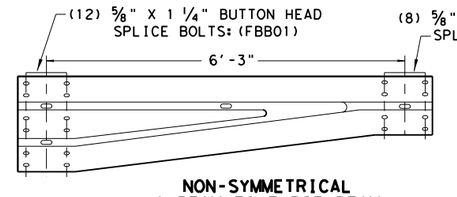


SIDE-VIEW

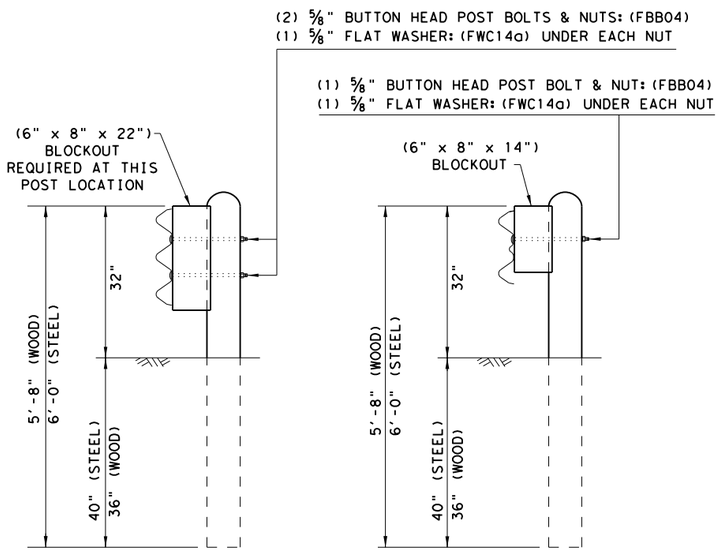
THRIE-BEAM TERMINAL CONNECTOR 10GA.
PART DESIGNATOR RTE01b



THRIE-BEAM RAIL SHORT SECTION 10GA.
PART DESIGNATOR RTM01a



NON-SYMMETRICAL W-BEAM TO THRIE-BEAM TRANSISTION 10GA.
PART DESIGNATOR RWT02a OR RWT02b

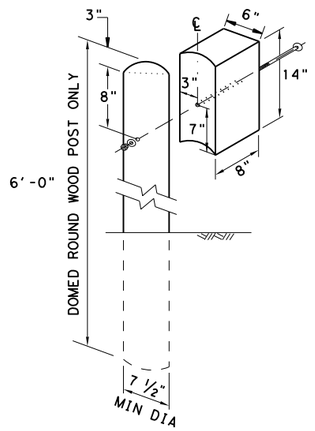


SECTION A-A

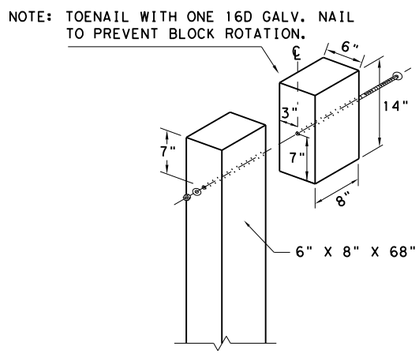
SECTION B-B

PLATE WASHER INSTRUCTIONS

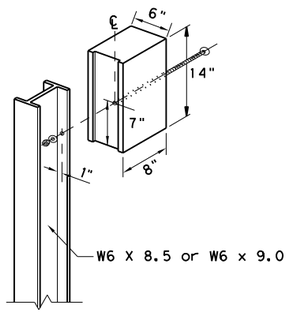
BRIDGE APPROACH - UPSTREAM: THE SHORT RAIL LAPS OVER THE TERMINAL CONNECTOR. PLATE WASHERS ARE INSTALLED UNDER THE SPLICE NUTS AGAINST INSIDE OF CONNECTOR.
BRIDGE EXIT - DOWNSTREAM: THE TERMINAL CONNECTOR LAPS OVER THE NESTED RAIL. PLATE WASHERS ARE INSTALLED UNDER THE BOLT HEAD AGAINST OUTSIDE OF CONNECTOR.



WOOD BLOCK TO ROUND WOOD POST



WOOD BLOCK TO RECTANGULAR WOOD POST



ROUTED WOOD BLOCK TO I-BEAM STEEL POST

NOTE: * "WOOD" INDICATES DIMENSIONS FOR BOTH ROUND AND RECTANGULAR WOOD POST SYSTEMS.

LOW-SPEED TRANSITION

Texas Department of Transportation

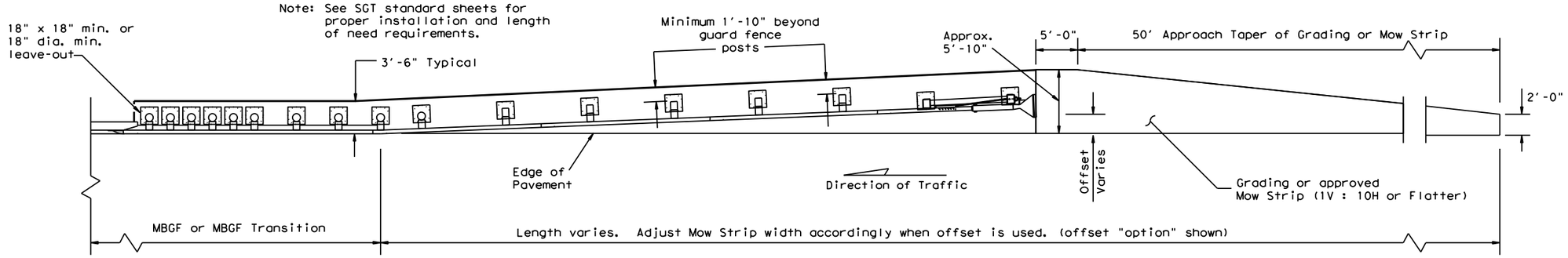
Design Division Standard

METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-2 MASH COMPLIANT

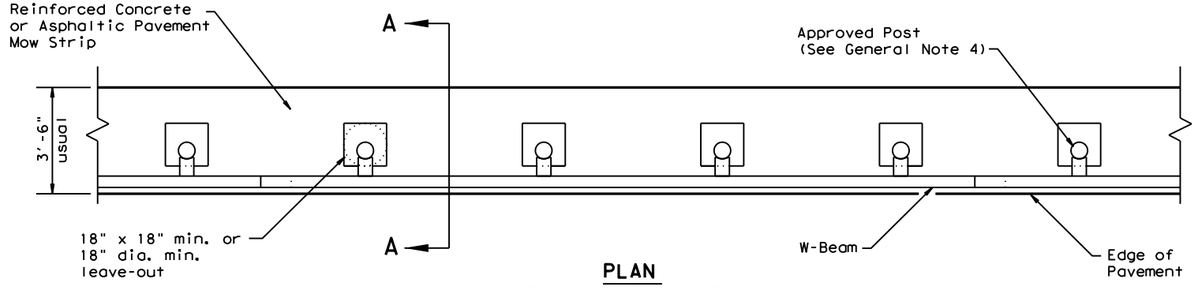
GF(31)TR TL2-19

FILE: gf31tr1219.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	2552	04	046	SL 375
	DIST	COUNTY		SHEET NO.
	24	EL PASO		80

DATE:
FILE:

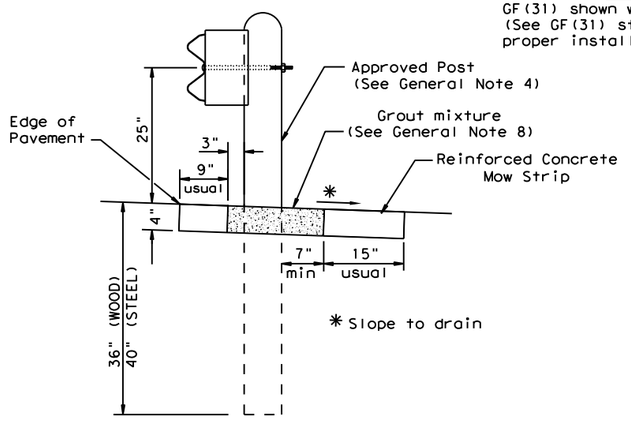


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



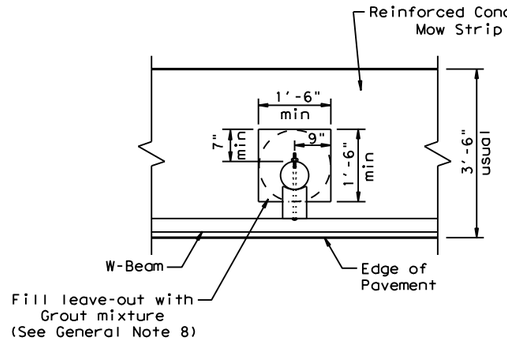
PLAN

GF(31) shown with Mow Strip
(See GF(31) standard sheet for proper installation)



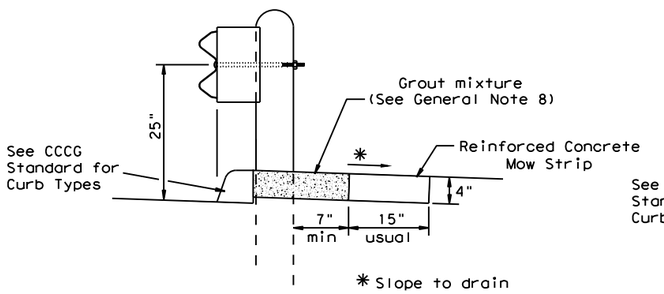
SECTION A-A

Typical



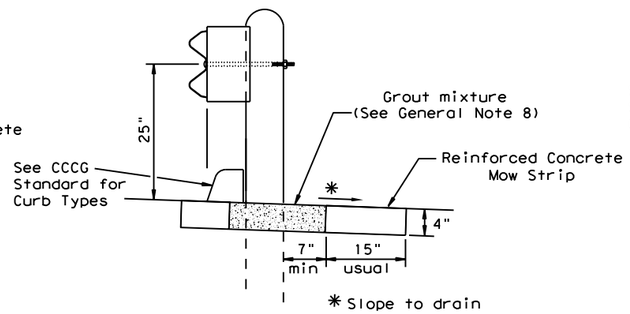
MOW STRIP DETAIL

Reinforced Concrete Mow Strip
with 18" x 18" Square or
18" Dia. minimum leave-out.



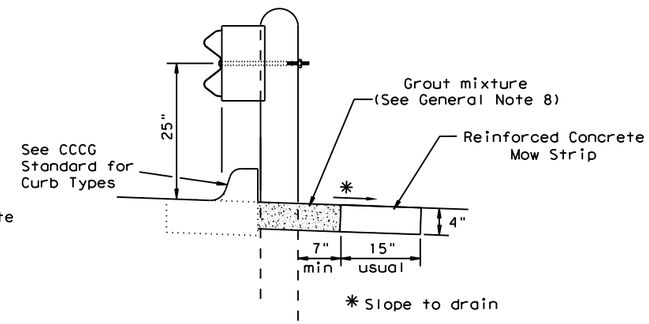
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

Note: Site Condition(s)

Site conditions may exist where grading is required for the proper installation of metal guard fence and end treatments.

Approach grading or mow strip may be decreased or eliminated, as directed by the Engineer.

GENERAL NOTES

1. This mow strip design is for use with metal beam guard fence, guard fence transitions, and guard fence end treatments. See applicable GF(31) MBGF or GF(31) Transition Standard sheet for additional information.
2. Mow strips shall be reinforced concrete with (wire mesh or synthetic fiber), as shown on the plans and will be paid for under the pertinent bid item. Reinforced concrete shall be placed in accordance with Item 432, "Riprap." The use of the synthetic fiber in lieu of steel reinforcing is acceptable, provided the fiber producer is on the Department Material Producer List (MPL), maintained by TxDOT, Construction Division.
3. The leave-out behind the post shall be a minimum of 7".
4. Only steel (W6 x 8.5 or W6 x 9.0), or 7 ½" Dia. round wood posts are acceptable for use in the mow strip. See GF(31) Standard for additional details.
5. Other curb placement options may be used. Curbs are not considered part of the mow strip and will be paid for under other pertinent bid item.
6. Thickness of the mow strip will be 4".
7. The limits of payment for reinforced concrete will include leave-outs for the posts.
8. The leave-outs shall be filled with a Grout mixture consisting of: 2719 pounds sand, 188 pounds Type 1 or II cement, and 550 pounds of water per cubic yard, with a 28-day compressive strength of approximately 230 psi or less. Provide grout with a consistency that will flow into and completely fill all voids. Due to auger size, larger leave-out dimensions are acceptable from both an impact performance and maintenance repair standpoint (Suggested Maximum leave-out of 20"). Payment for furnishing and placing the grout mixture will be subsidiary to the pay item of riprap mow strip.

Texas Department of Transportation

Design Division Standard

METAL BEAM GUARD FENCE (MOW STRIP) TL-3 MASH COMPLIANT

GF(31)MS-19

FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
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	24	EL PASO		81

DATE:
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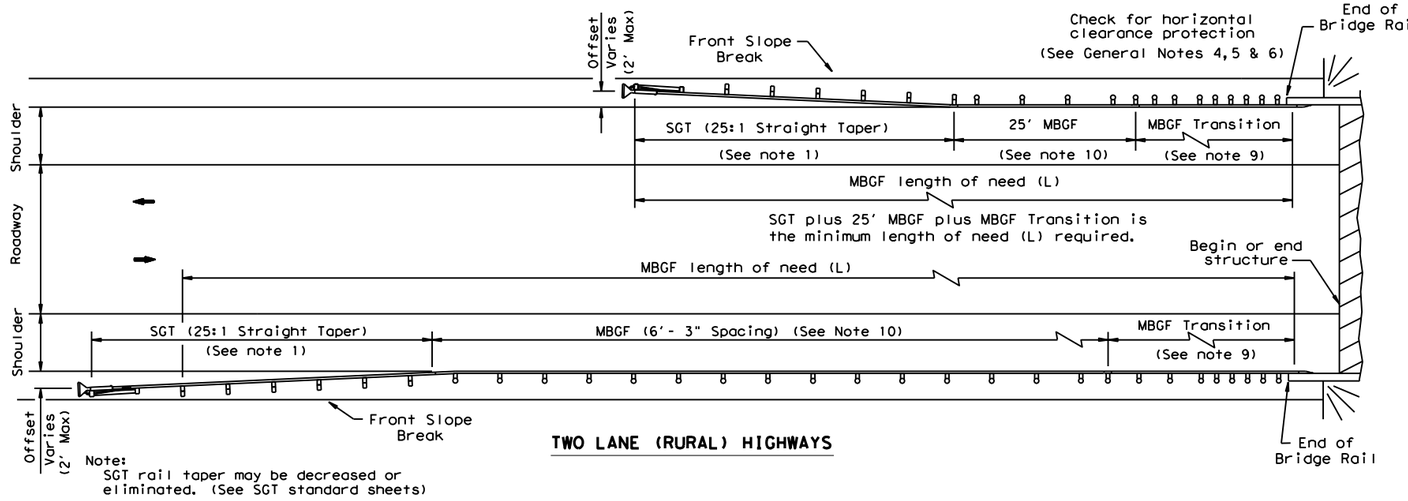
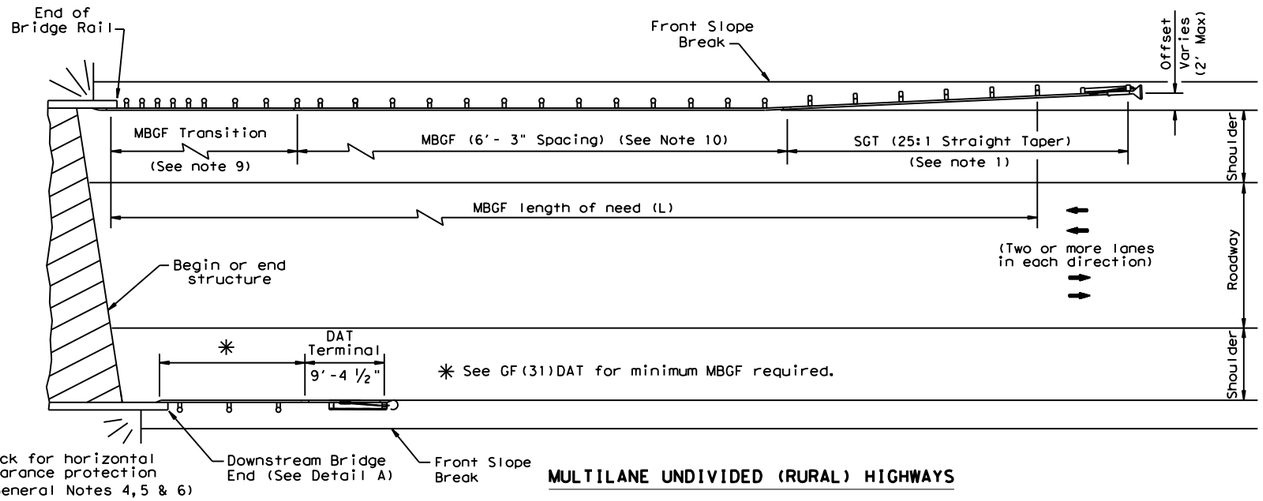
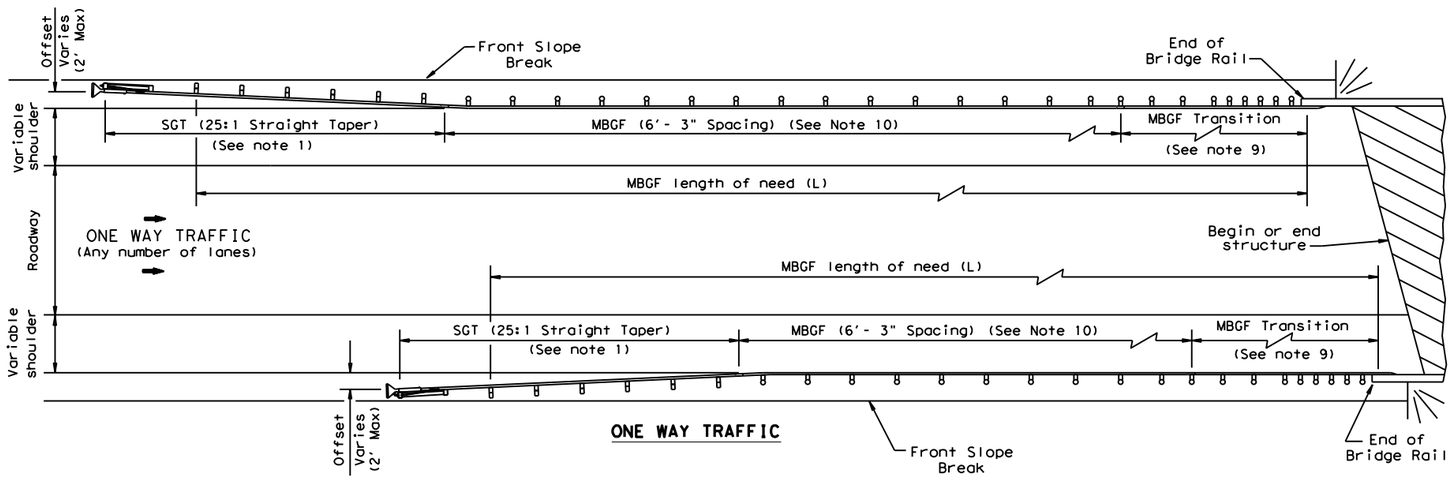


TWO LANE (RURAL) HIGHWAYS

Note:
SGT rail taper may be decreased or eliminated. (See SGT standard sheets)



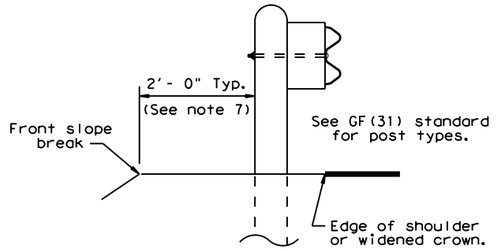
MULTILANE UNDIVIDED (RURAL) HIGHWAYS



ONE WAY TRAFFIC

GENERAL NOTES

1. For more detail: See GF(31), SGT( )31, GF(31)TR, and GF(31)TL2 standard sheets.
2. Quantities of metal beam guard fence (MBGF) at individual bridge ends are as shown in the plans.
3. Use average daily traffic (ADT) for the current year to determine MBGF length of need in accordance with the Roadway Design Manual unless otherwise specified. Where significant traffic volume growth is anticipated on low volume (0-750 ADT) highways, use length determinations for the higher volume category.
4. MBGF may not be required to shield departure end of bridge unless other obstacles within the horizontal clearance limits or opposing traffic indicate a MBGF consideration.
5. Downstream anchor terminals (DAT) are only for downstream end anchorage use, outside the horizontal clearance area of opposing traffic.
6. Direct connection of MBGF to concrete rails are only for downstream rail connections outside the horizontal clearance area of opposing traffic. (This requires a minimum of three standard line posts plus the DAT terminal, See Detail A)
7. The crown shall be widened to accommodate MBGF. Typically the "front slope" break should be 2'- 0" from the back of the MBGF post. This applies to new construction on new alignment or where existing roadway cross section is to be widened to increase roadway width. This does not apply to rehabilitation work where existing roadway crown width is to be retained (See Typical Cross Section at MBGF).
8. For restrictive bridge widths: The MBGF should be properly transitioned from the existing bridge rail to the adjoining MBGF (See MBGF Transition Standards). Metal beam guard fence at these bridge location(s) shall be flared at the rate of 25:1 or flatter, and be of the length necessary to locate the terminal end at the 2 ft. "maximum" offset from the shoulder edge in the approach direction.
9. Transition length and post spacing will vary depending on the transition type. Transition type will be shown elsewhere in the plans.
10. A minimum 25' length of MBGF will be required.



TYPICAL CROSS SECTION AT MBGF

Note:
All rail elements shall be lapped in the direction of adjacent traffic.

DETAIL A

Showing Downstream Rail Attachment

Texas Department of Transportation

Design Division Standard

BRIDGE END DETAILS

(METAL BEAM GUARD FENCE APPLICATIONS TO RIGID RAILS)

BED-14

FILE: bed14.dgn	DN: TxDOT	CK: AM	DW: BD/VP	CK: CGL
© TxDOT: December 2011	CONT	SECT	JOB	HIGHWAY
REVISIONS	2552	04	046	SL 375
REVISED APRIL 2014 SEE (MEMO 0414)	DIST	COUNTY		SHEET NO.
	24	EL PASO		82

DATE:
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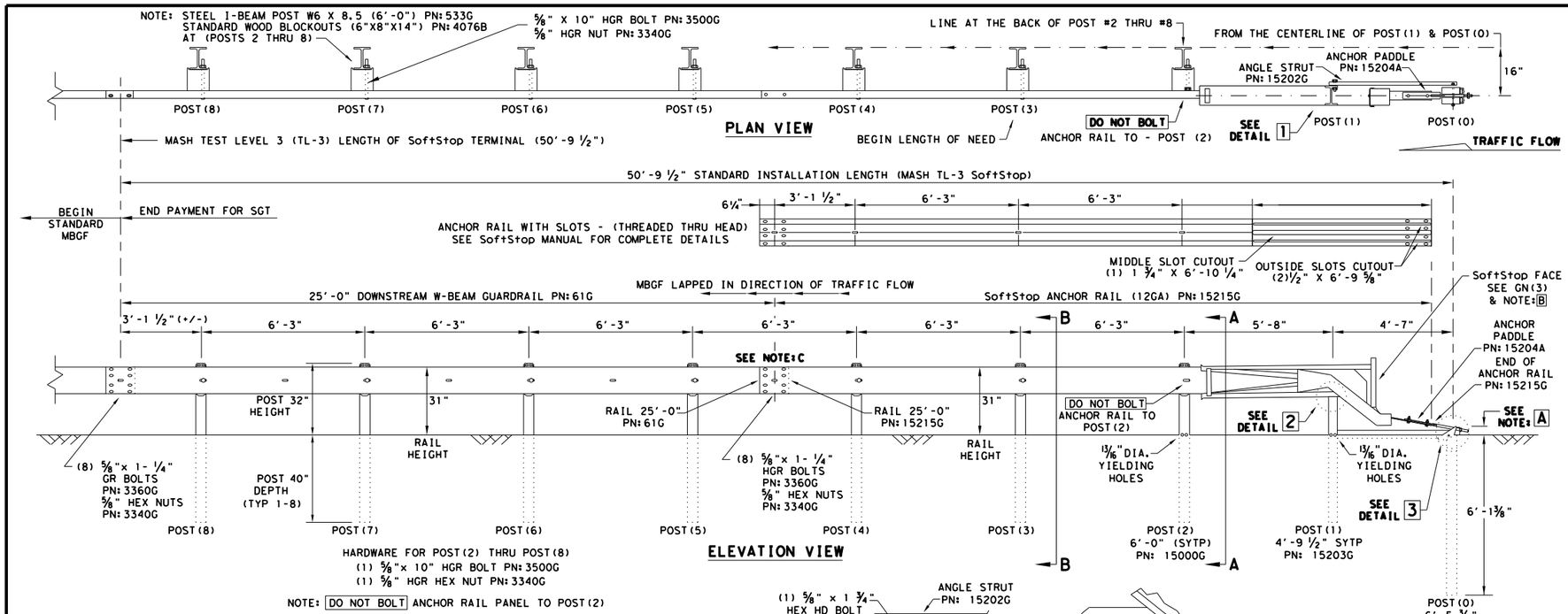

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: TRINITY HIGHWAY AT 1(888)323-6374. 2525 N. STEMMONS FREEWAY, DALLAS, TX 75207
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE; SoftStop END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL. PN: 620237B
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. A COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
7. IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL AND REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
8. POSTS SHALL NOT BE SET IN CONCRETE.
9. IT IS ACCEPTABLE TO INSTALL THE SoftStop IMPACT HEAD PARALLEL TO THE GRADE LINE OR WITH AN UPWARD TILT.
10. DO NOT ATTACH THE SoftStop SYSTEM DIRECTLY TO A RIGID BARRIER.
11. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE SoftStop SYSTEM BE CURVED.
12. A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.

NOTE:A	THE INSTALLATION HEIGHT OF FULLY ASSEMBLED ANCHOR POST WILL VARY FROM 3-3/4" MIN. TO 4" MAX. ABOVE FINISHED GRADE.
NOTE:B	PART PN: 5852B RIGHT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING) PART PN: 5851B LEFT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING)
NOTE:C	W-BEAM SPLICE LOCATED BETWEEN LINE POST(4) AND LINE POST(5) GUARDRAIL PANEL 25'-0" PN: 61G ANCHOR RAIL 25'-0" PN: 15215G LAP GUARDRAIL IN DIRECTION OF TRAFFIC FLOW.

PART	QTY	MAIN SYSTEM COMPONENTS
620237B	1	PRODUCT DESCRIPTION ASSEMBLY MANUAL (LATEST REV.)
15208A	1	SoftStop HEAD (SEE MANUAL FOR RIGHT-LEFT APPROACH)
15215G	1	SoftStop ANCHOR RAIL (12GA) WITH CUTOUT SLOTS
61G	1	SoftStop DOWNSTREAM W-BEAM RAIL (12GA) (25'- 0")
15205A	1	POST #0 - ANCHOR POST (6'- 5 7/8")
15203G	1	POST #1 - (SYTP) (4'- 9 1/2")
15000G	1	POST #2 - (SYTP) (6'- 0")
533G	6	POST #3 THRU #8 - I-BEAM (W6 x 8.5) (6'- 0")
4076B	7	BLOCKOUT - WOOD (ROUTED) (6" x 8" x 14")
6777B	7	BLOCKOUT - COMPOSITE (4" x 7 1/2" x 14")
15204A	1	ANCHOR PADDLE
15207G	1	ANCHOR KEEPER PLATE (24 GA)
15206G	1	ANCHOR PLATE WASHER (1/2" THICK)
15201G	2	ANCHOR POST ANGLE (10" LONG)
15202G	1	ANGLE STRUT
		HARDWARE
4902G	1	1" ROUND WASHER F436
3908G	1	1" HEAVY HEX NUT A563 GR.DH
3717G	2	3/4" x 2 1/2" HEX BOLT A325
3701G	4	3/4" ROUND WASHER F436
3704G	2	3/4" HEAVY HEX NUT A563 GR.DH
3360G	16	5/8" x 1 1/4" W-BEAM RAIL SPLICE BOLTS HGR
3340G	25	5/8" W-BEAM RAIL SPLICE NUTS HGR
3500G	7	5/8" x 10" HGR POST BOLT A307
3391G	1	5/8" x 1 3/4" HEX HD BOLT A325
4489G	1	5/8" x 9" HEX HD BOLT A325
4372G	4	5/8" WASHER F436
105285G	2	5/8" x 2 1/2" HEX HD BOLT GR-5
105286G	1	5/8" x 1 1/2" HEX HD BOLT GR-5
3240G	6	5/8" ROUND WASHER (WIDE)
3245G	3	5/8" HEX NUT A563 GR.DH
5852B	1	HIGH INTENSITY REFLECTIVE SHEETING - SEE NOTE:B

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SoftStop END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

Texas Department of Transportation

Design Division Standard

TRINITY HIGHWAY
SOFTSTOP END TERMINAL
MASH - TL-3
SGT(10S)31-16

FILE: sgt10s3116	DN: TxDOT	CK: KM	DW: VP	CK: MB/VP
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REVISIONS	2552	04	046	SL 375
	DIST	COUNTY		SHEET NO.
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DATE:
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(SEE GN NOTE 15)
STANDARD 31" MBGF

ITEM (6)
INNER SIDE SLIDER
(ISS) PANEL FOR RAIL 3

FIELD-SIDE
(RAIL 3)

NOTE:
RECESSED HEX NUTS FACING
TRAFFIC-SIDE **SEE DETAIL (C)**

REFERENCE LINE USED TO INSTALL
LINE POST(9) THRU POST(2)

POST 1 OFFSET DISTANCE MEASURED
7-⅝" FROM REFERENCE LINE

POST 9 | POST 8 | POST 7 | POST 6 | POST 5 | POST 4 | POST 3 | POST 2

RAIL 4 | RAIL 3 | RAIL 2 | RAIL 1

ITEM (10)
CABLE ASSEMBLY

ITEM (2)
GROUNDSTRUT

NO BLOCKOUT
AT (POST 1)

CABLES

ITEM (5)
TRAFFIC SIDE SLIDER
(TSS) PANEL FOR RAIL 2

NOTE: SECURE THE (TSS) PANEL TO OUTSIDE
OF RAIL 2 WITH THE PANEL ARROWS
POINTING TOWARDS THE HEAD.

NOTES:
1. ITEM (12) COMPOSITE BLOCKOUTS INSTALLED AT LINE POST(9) THRU LINE POST(2).
2. DO NOT INSTALL A BLOCKOUT AT LINE POST(1).

PLAN VIEW

MBGF
RAIL 2

INSTALL GUARD FENCE RECESSED
HEX NUTS ON TRAFFIC-SIDE

MBGF
RAIL 1

DETAIL (C)

TRAFFIC FLOW

ITEM (25)
MAX-TENSION HEAD
SEE DETAIL (A)

END PAYMENT (SGT) BY EACH

DO NOT BOLT
RAIL TO POST 6

BEGIN LENGTH OF NEED

INSTALLATION LENGTH 55'- ½"

49'-8 9/16"

6'-3" | 6'-3" | 6'-3" | 6'- ¾" | 6'-3" | 6'-3" | 6'-3" | 37 ½" | 5'-3 11/16"

RAIL
HEIGHT
31"

ARROWS

DETAIL (D)

ITEM (13) RAIL 4 | ITEM (13) RAIL 3 | ITEM (13) RAIL 2 | ITEM (13) RAIL 1

RAIL
HEIGHT
31"

HEAD
HEIGHT

DETAIL (B)

A

32-¼"

FINISHED
GRADE

CABLES

FINISHED
GRADE

ITEM (10)
CABLE
ASSEMBLY

ITEM (2)
GROUNDSTRUT

68-⅛"

POST 9 | POST 8 | POST 7 | POST 6 | POST 5 | POST 4 | POST 3 | POST 2 | POST 1
ITEM (4)
I-BEAM
W6 X 9
NO BLOCKOUT
AT (POST 1)

(8) X-LITE LINE POST - ITEM (11)

ELEVATION VIEW

**SOIL
ANCHOR POST**
ITEM (1)

A

TSS PANEL
GALVANIZED
ITEM (5)

RSS PLATE
GALVANIZED
ITEM (8)

INSTALL THE TSS AND RSS
WITH THE ARROWS POINTING
TOWARDS THE MAX-HEAD

TSS PANEL AND RSS PLATE
DETAIL (D)

HEAD
HEIGHT
32-¼"

TOP OF POST

31-⅞"

FINISHED
GRADE

40-⅛"

68-⅛"
ANCHOR POST
DEPTH

ITEM (1)
ANCHOR

ITEM (11)
LINE POSTS
2 THRU 9
(NOTE: ITEM (4) POST 1 (NOT SHOWN),
TO BE INSTALLED AT SAME DEPTH
AS LINE POSTS.)

**SOIL ANCHOR, POST 1
& LINE POST 2 THRU 9**

SECTION VIEW A-A

NOTE:
USE THE MASH APPROVED
X-TENSION CABLE ASSEMBLY.

7 5/16"

2 ⅛"

UPPER CABLE
(BACK SIDE)

LOWER CABLE
(TRAFFIC SIDE)

DETAIL (B)

CABLE
FRICTION PLATE
HEAD UNIT
ITEM (9)

NOTE:
INSTALL ⅝" RECESSED HEX
NUTS ON TRAFFIC SIDE.

ITEM (24)
ITEM (21)

ITEM (20)
8X

ITEM (17)
8X

ITEM (23)
6X
3 SCREWS
EACH SIDE

(RAIL 1)

ITEM (22)
BRACKET
SHIPPED FLAT

ITEM (3)

ITEM (16)
4X

* ITEM (25)
HIGH INTENSITY
REFLECTIVE SHEETING

NOTE: DELINEATION MARKER IN
ACCORDANCE WITH TEXAS MUTCD.

SPLICE FOR IMPACT-HEAD
TO GUARD FENCE (RAIL1)

DETAIL (A)

APPROX 5'-10"

5'-0"

50' APPROACH GRADING

STANDARD
MBGF

2'-0"

EDGE OF PAVEMENT

NOTE: ADJUST WIDTH ACCORDINGLY WHEN OFFSET IS USED. (OFFSET "OPTION" SHOWN)

2'-0" MAX.
RAIL OFFSET

APPROACH GRADING
(1V:10H OR FLATTER)
SEE PRODUCT ASSEMBLY MANUAL
FOR ADDITIONAL GUIDANCE.

NOTE: TXDOT GENERIC APPROACH GRADING LAYOUT
USED FOR ALL TANGENT TYPE END TREATMENTS.

APPROACH GRADING AT GUARDRAIL END TREATMENTS

TRAFFIC FLOW

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800
2. FOR INSTALLATION, REPAIR, & MAINTENANCE REFER TO THE; MAX-TENSION INSTALLATION INSTRUCTION MANUAL. P/N MANMAX REV D (ECN 3516).
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURE'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. ALL STEEL COMPONENTS ARE GALVANIZED PER ASTM A123 OR EQUIVALENT UNLESS OTHERWISE STATED.
6. SYSTEM SHOWN USING STEEL WIDE FLANGE POST WITH COMPOSITE BLOCKOUTS.
7. COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST(MPL)FOR CERTIFIED PRODUCERS.
8. REFER TO INSTALLATION MANUAL FOR SPECIFIC PANEL LAPPING GUIDANCE.
9. IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL FOR INSTALLATION GUIDANCE.
10. POSTS SHALL NOT BE SET IN CONCRETE.
11. A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POST TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST.
12. MAX-TENSION SYSTEM SHALL NEVER BE INSTALLED WITHIN A CURVED SECTION OF GUARDRAIL.
13. IF A DELINEATION MARKER IS REQUIRED, MARKER SHALL BE IN ACCORDANCE WITH TEXAS MUTCD.
14. THE SYSTEM IS SHOWN WITH 12'-6" MBGF PANELS, 25'-0" MBGF PANELS ARE ALSO ALLOWED.
15. A MINIMUM OF 12'-6" OF 12GA. MBGF IS REQUIRED IMMEDIATELY DOWNSTREAM OF THE MAX-TENSION SYSTEM.

ITEM #	PART NUMBER	DESCRIPTION	QTY
1	BSI-1610060-00	SOIL ANCHOR - GALVANIZED	1
2	BSI-1610061-00	GROUND STRUT - GALVANIZED	1
3	BSI-1610062-00	MAX-TENSION IMPACT HEAD	1
4	BSI-1610063-00	W6x9 I-BEAM POST 6FT.-GALVANIZED	1
5	BSI-1610064-00	TSS PANEL - TRAFFIC SIDE SLIDER	1
6	BSI-1610065-00	ISS PANEL - INNER SIDE SLIDER	1
7	BSI-1610066-00	TOOTH - GEOMET	1
8	BSI-1610067-00	RSS PLATE - REAR SIDE SLIDER	1
9	B061058	CABLE FRICTION PLATE - HEAD UNIT	1
10	BSI-1610069-00	CABLE ASSEMBLY - MASH X-TENSION	2
11	BSI-1012078-00	X-LITE LINE POST-GALVANIZED	8
12	B090534	8" W-BEAM COMPOSITE-BLOCKOUT XT110	8
13	BSI-4004386	12'-6" W-BEAM GUARD FENCE PANELS 12GA.	4
14	BSI-1102027-00	X-LITE SQUARE WASHER	1
15	BSI-2001886	⅝" X 7" THREAD BOLT HH (GR.5)GEOMET	1
16	BSI-2001885	¾" X 3" ALL-THREAD BOLT HH (GR.5)GEOMET	4
17	4001115	⅝" X 1 ¼" GUARD FENCE BOLTS (GR.2)MGAL	48
18	2001840	⅝" X 10" GUARD FENCE BOLTS MGAL	8
19	2001636	⅝" WASHER F436 STRUCTURAL MGAL	2
20	4001116	⅝" RECESSED GUARD FENCE NUT (GR.2)MGAL	59
21	BSI-2001888	⅝" X 2" ALL THREAD BOLT (GR.5)GEOMET	1
22	BSI-1701063-00	DELINEATION MOUNTING (BRACKET)	1
23	BSI-2001887	¼" X ¾" SCREW SD HH 410SS	7
24	4002051	GUARDRAIL WASHER RECT AASHTO FWR03	1
* 25	SEE NOTE BELOW	HIGH INTENSITY REFLECTIVE SHEETING	1
** 26	4002337	8" W-BEAM TIMBER-BLOCKOUT, PDB01B	8
** 27	BSI-4004431	25' W-BEAM GUARDRAIL PANEL,8-SPACE,12GA.	2
28	MANMAX Rev-(D)	MAX-TENSION INSTALLATION INSTRUCTIONS	1

* TO BE PROVIDED BY DISTRIBUTOR OR CONTRACTOR.

** ALTERNATIVE ITEMS NOT SHOWN.
ITEM(26) 8" WOOD-BLOCKOUTS
ITEM(27) 25'GUARD FENCE PANELS

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE MAX-TENSION END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

Texas Department of Transportation

Design Division Standard

MAX-TENSION END TERMINAL
MASH - TL-3
SGT(11S)31-18

FILE: sgt11s3118.dgn	DN: TxDOT	CK: KM	DW: TxDOT	CK: CL
© TxDOT: FEBRUARY 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	2552	04	046	SL 375
	DIST	COUNTY		SHEET NO.
	24	EL PASO		84

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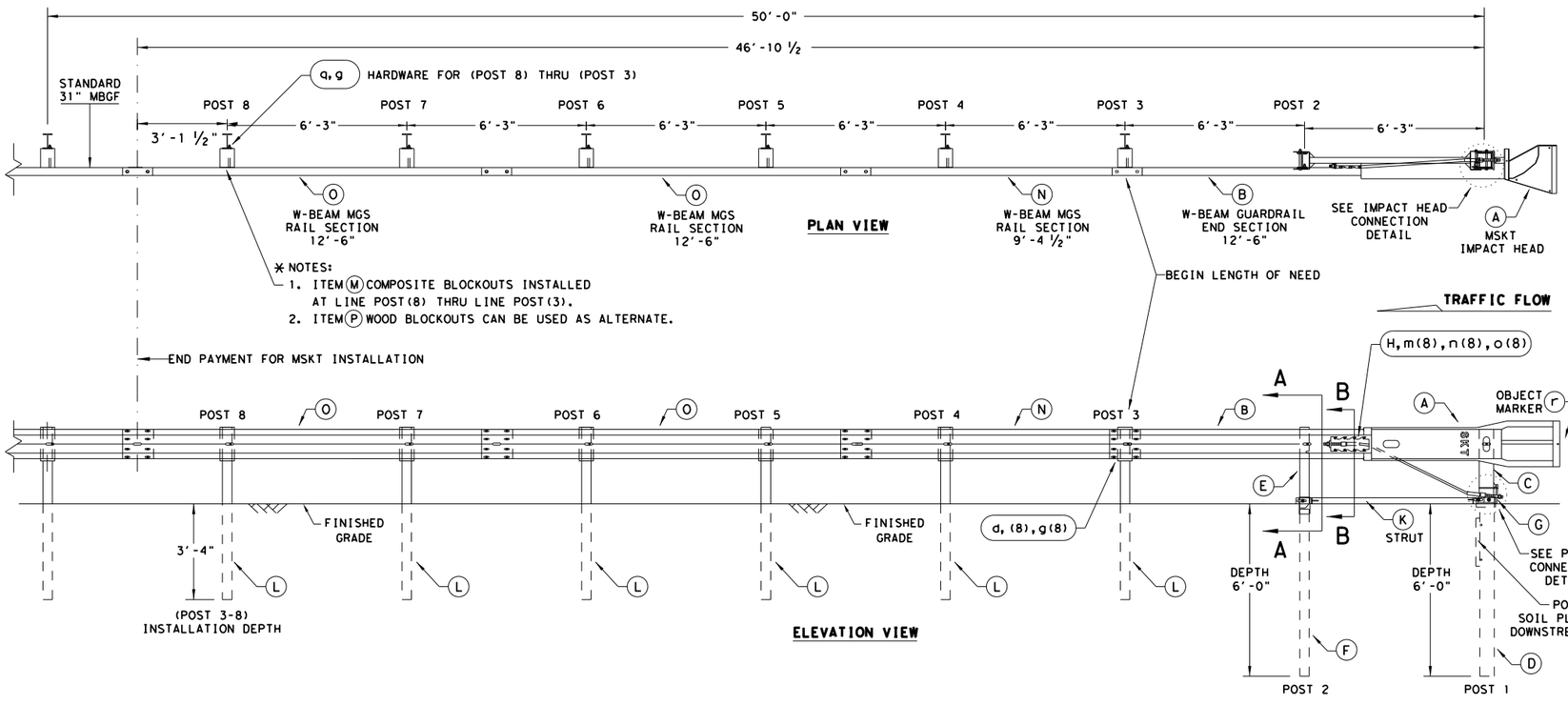
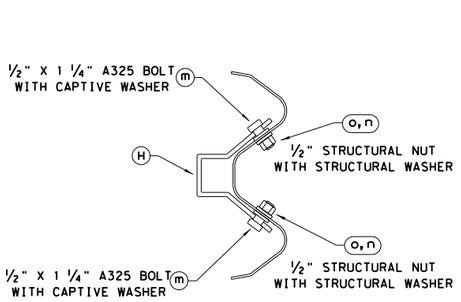
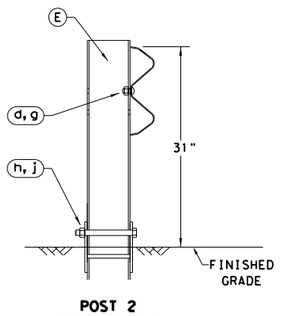


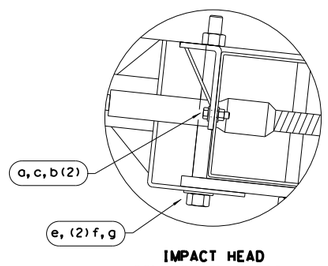
NOTE: SEE (GENERAL NOTE 14) FOR DRIVING CAP INFORMATION.



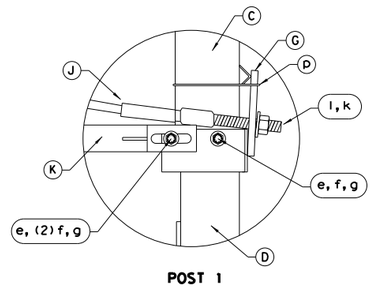
SECTION B-B
ANCHOR BRACKET



POST 2
SECTION A-A



IMPACT HEAD
CONNECTION DETAIL



POST 1
CONNECTION DETAIL

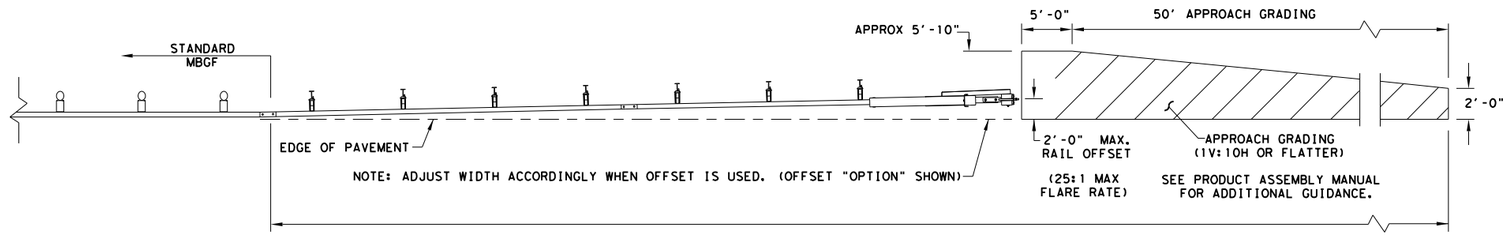
GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: ROAD SYSTEMS, INC. (432)263-2435. 3616 OLD HOWARD COUNTY AIRPORT, BIG SPRING, TX 79720
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE; MSKT END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL (PUBLICATION~062717).
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. SYSTEM SHOWN USING STEEL WIDE FLANGE POSTS WITH COMPOSITE BLOCKOUTS.
7. A COMPOSITE MATERIAL BLOCKOUTS THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
8. IF SOLID ROCK IS ENCOUNTERED IN THE AREA OF (POST 1) AND / OR (POST 2) CONTACT THE MANUFACTURER, & REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
9. POSTS SHALL NOT BE SET IN CONCRETE.
10. SYSTEM MUST BE ATTACHED TO STANDARD 31" MBGF.
11. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE MSKT SYSTEM BE CURVED.
12. A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.
13. THE SYSTEM IS SHOWN WITH TWO 12'-6" MBGF PANELS, ONE 25'-0" MBGF PANEL IS ALSO ALLOWED IN THEIR PLACE.
14. A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POSTS 3-8 TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST. SPECIAL DRIVING CAP TO BE USED ON LOWER POSTS 1 & 2 TO PREVENT DAMAGE TO THE WELDED PLATES.

SEE NOTES: *

ALTERNATIVE ITEMS NOT SHOWN. **
* ITEM(P) 8" WOOD-BLOCKOUT
** ITEM(Q) 25'GUARD FENCE PANEL

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM NUMBERS
A	1	MSKT IMPACT HEAD	MS3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 Ga.	SF1303
C	1	POST 1 - TOP (6" X 6" X 1/8" TUBE)	MTPHP1A
D	1	POST 1 - BOTTOM (6' W6X15)	MTPHP1B
E	1	POST 2 - ASSEMBLY TOP	UHP2A
F	1	POST 2 - ASSEMBLY BOTTOM (6' W6X9)	HP2B
G	1	BEARING PLATE	E750
H	1	CABLE ANCHOR BOX	S760
J	1	BCT CABLE ANCHOR ASSEMBLY	E770
K	1	GROUND STRUT	MS785
L	6	W6x9 OR W6x8.5 STEEL POST	P621
M	6	COMPOSITE BLOCKOUTS	CBSP-14
N	1	W-BEAM MGS RAIL SECTION (9'-4 1/2")	G12025
O	2	W-BEAM MGS RAIL SECTION (12'-6")	G1203A
P	6	WOOD BLOCKOUT 6" X 8" X 14"	P675
Q	1	W-BEAM MGS RAIL SECTION (25'-0")	G1209
		SMALL HARDWARE	
a	2	5/16" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	5/16" WASHER	W0516
c	2	5/16" HEX NUT	N0516
d	25	5/8" Dia. x 1 1/4" SPLICE BOLT (POST 2)	B580122
e	2	5/8" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	5/8" WASHER	W050
g	33	5/8" Dia. H.G.R NUT	N050
h	1	3/4" Dia. x 8 1/2" HEX BOLT (GRD A449)	B340854A
j	1	3/4" Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	1/2" x 1 1/4" A325 BOLT WITH CAPTIVE WASHER	SB12A
n	8	1/2" STRUCTURAL NUTS	N012A
o	8	1 1/16" O.D. x 9/16" I.D. STRUCTURAL WASHERS	W012A
p	1	BEARING PLATE RETAINER TIE	CT-100ST
q	6	5/8" x 10" H.G.R. BOLT	B581002
r	1	OBJECT MARKER 18" X 18"	E3151



APPROACH GRADING AT GUARDRAIL END TREATMENTS

NOTE: TXDOT GENERIC APPROACH GRADING LAYOUT USED FOR ALL TANGENT TYPE END TREATMENTS.

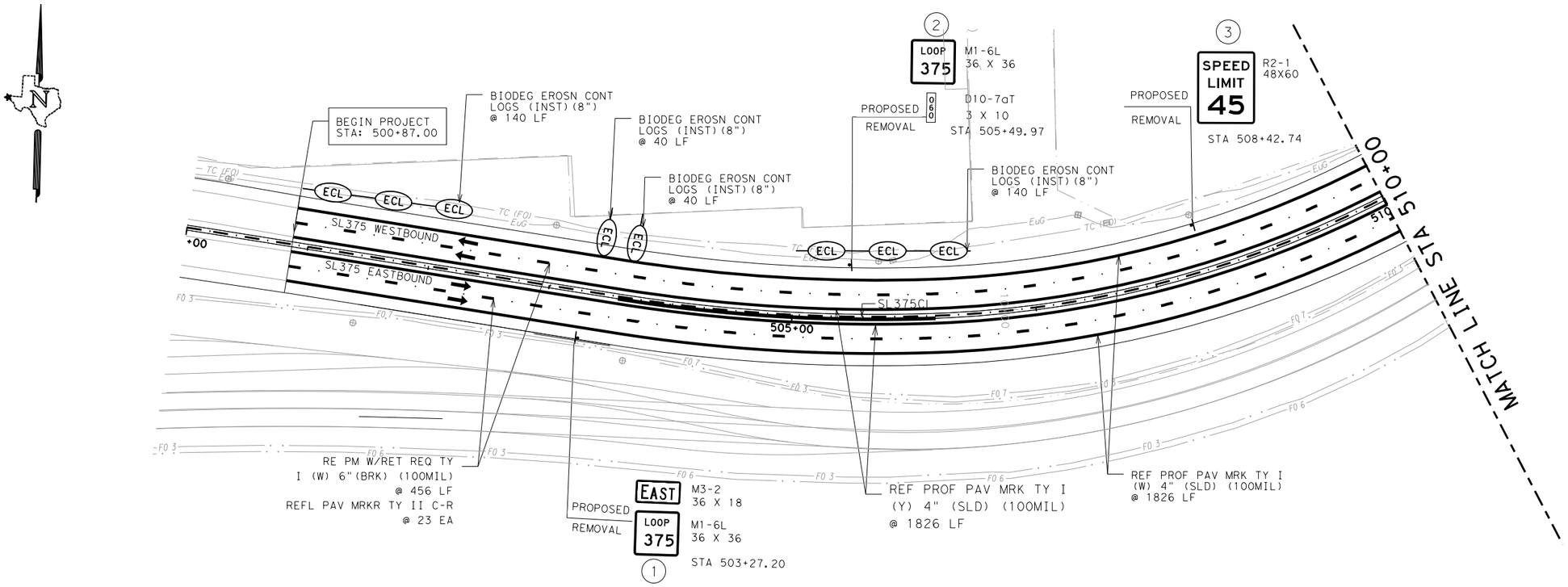
NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE MSKT END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

Texas Department of Transportation

Design Division Standard

SINGLE GUARDRAIL TERMINAL
MSKT-MASH-TL-3
SGT(12S)31-18

FILE: sgt12s3118.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CL		
© TxDOT: APRIL 2018	CONT	SECT	JOB	HIGHWAY		
REVISIONS	2552	04	046	SL 375		
	DIST	COUNTY		SHEET NO.		
	24	EL PASO		85		



PAVEMENT MARKING				
ITEM	CODE	DESCRIPTION	UNIT	QTY
506	6040	BIOLOGS INSTALL	LF	360
506	6043	BIOLOGS REMOV	LF	360
644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	2
644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	1
644	6076	REMOVE SM RD SN SUP&AM	EA	3
666	6306	RE PM W/RET REQ TY I (W) 6" (BRK)(100MIL)	LF	456
666	6342	REF PROF PAV MRK TYI (W) 4"(SLD)(100MIL)	LF	1,826
666	6345	REF PROF PAV MRK TYI (Y) 4"(SLD)(100MIL)	LF	1,826
672	6010	REFL PAV MRKR TY II-C-R	EA	23
678	6001	PAV SURF PREP FOR MRK (4")	LF	3,652
678	6002	PAV SURF PREP FOR MRK (6")	LF	456

LEGEND

TRAFFIC FLOW ARROW

GENERAL NOTES:

1. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375
SIGNING, PAVEMENT MARKING & SWP3 LAYOUT
BEGIN TO STA 510+00

SHEET 1 OF 13

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		86

DATE: 5/4/2021 02:22:10 AM
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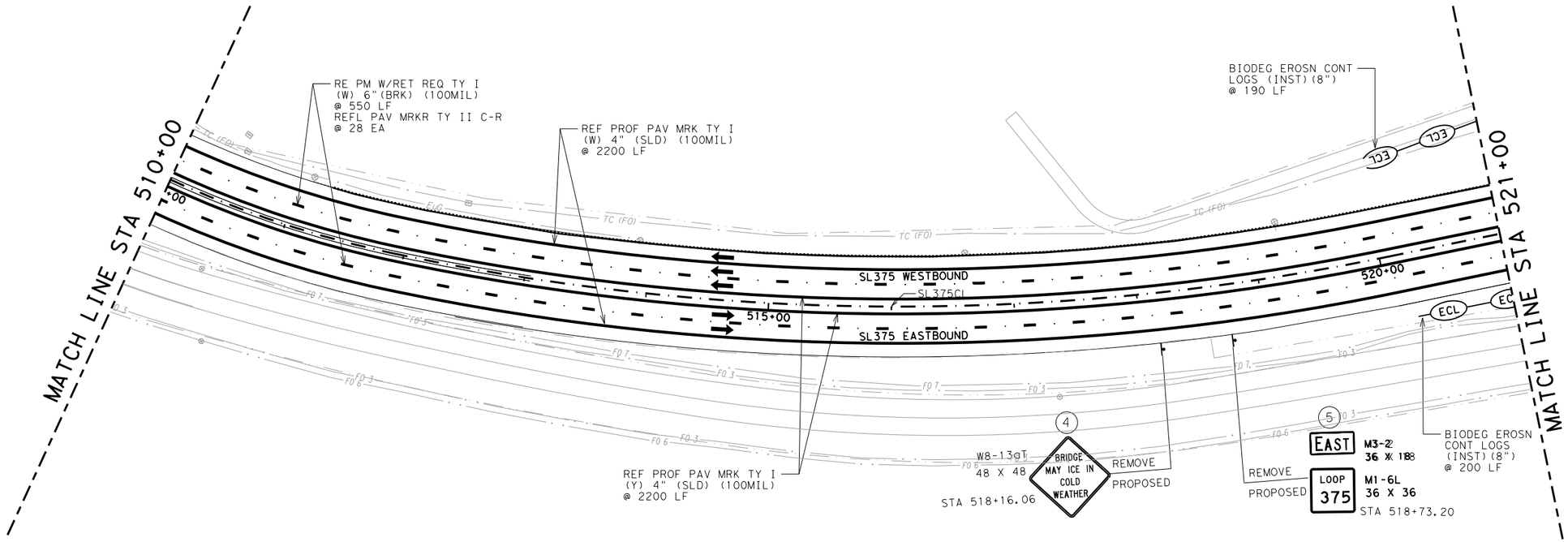

PAVEMENT MARKING				
ITEM	CODE	DESCRIPTION	UNIT	QTY
506	6040	BIOLOGS INSTALL	LF	390
506	6043	BIOLOGS REMOV	LF	390
644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	1
644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	1
644	6076	REMOVE SM RD SN SUP&AM	EA	2
666	6306	RE PM W/RET REQ TY I (W) 6" (BRK)(100MIL)	LF	550
666	6342	REF PROF PAV MRK TYI (W) 4"(SLD)(100MIL)	LF	2,200
666	6345	REF PROF PAV MRK TYI (Y) 4"(SLD)(100MIL)	LF	2,200
672	6010	REFL PAV MRKR TY II-C-R	EA	28
678	6001	PAV SURF PREP FOR MRK (4")	LF	4,400
678	6002	PAV SURF PREP FOR MRK (6")	LF	550

LEGEND

TRAFFIC FLOW ARROW

GENERAL NOTES:

1. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375
SIGNING, PAVEMENT MARKING & SWP3 LAYOUT
STA 510+00 TO STA 521+00

SHEET 2 OF 13

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		87

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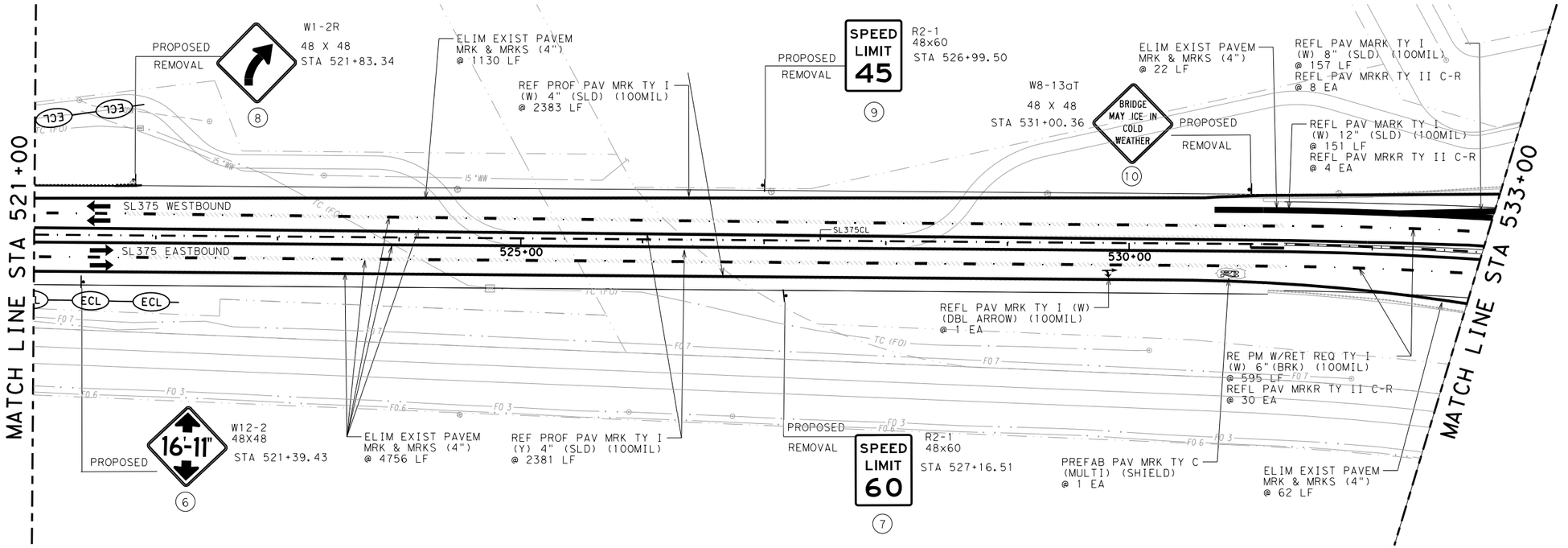

PAVEMENT MARKING				
ITEM	CODE	DESCRIPTION	UNIT	QTY
644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	3
644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	2
644	6076	REMOVE SM RD SN SUP&AM	EA	4
666	6036	REFL PAV MRK TYI (W)8"(SLD)(100MIL)	LF	157
666	6042	REFL PAV MRK TYI (W)12"(SLD)(100MIL)	LF	151
666	6057	REFL PAV MRK TYI (W)(DBL ARROW)(100MIL)	EA	1
666	6306	RE PM W/RET REQ TY I (W) 6" (BRK)(100MIL)	LF	595
666	6342	REF PROF PAV MRK TYI (W) 4"(SLD)(100MIL)	LF	2,383
666	6345	REF PROF PAV MRK TYI (Y) 4"(SLD)(100MIL)	LF	2,381
668	6115	PREFAB PAV MRK TY C (MULTI) (SHIELD)	EA	1
672	6010	REFL PAV MRKR TY II-C-R	EA	42
677	6001	ELIM EXIST PAVEM MRK & MRKS (4")	LF	5,970
678	6001	PAV SURF PREP FOR MRK (4")	LF	4,764
678	6002	PAV SURF PREP FOR MRK (6")	LF	595
678	6004	PAV SURF PREP FOR MRK (8")	LF	157
678	6006	PAV SURF PREP FOR MRK (12")	LF	151
678	6010	PAV SURF PREP FOR MR (DBL ARROW)	EA	1
678	6025	PAV SURF PREP FOR MRKS (SHIELD)	EA	1

LEGEND

TRAFFIC FLOW ARROW

GENERAL NOTES:

1. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED
PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375
SIGNING, PAVEMENT MARKING & SWP3 LAYOUT
STA 521+00 TO STA 533+00

SHEET 3 OF 13

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		88

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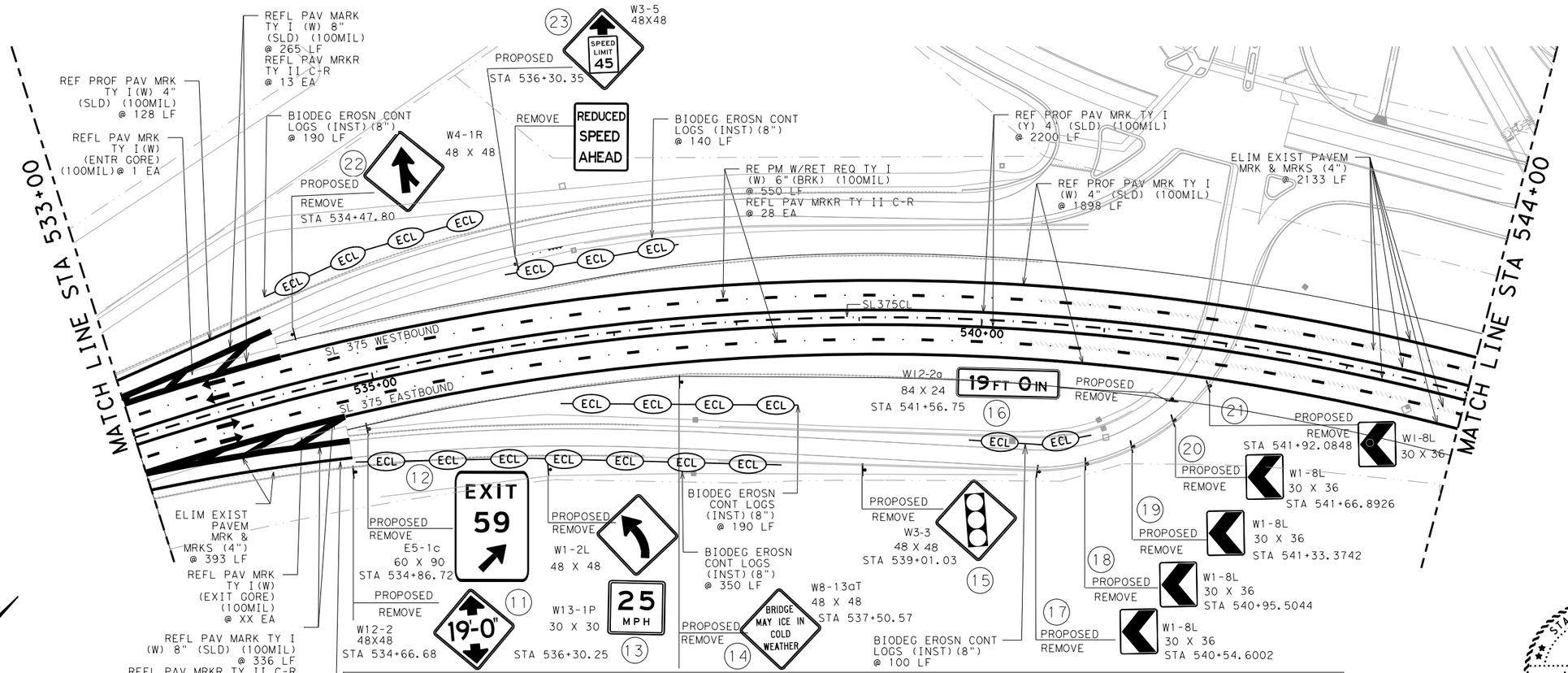

LEGEND

TRAFFIC FLOW ARROW

GENERAL NOTES:

1. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS

PAVEMENT MARKING

ITEM	CODE	DESCRIPTION	UNIT	QTY
506	6040	BIOLOGS INSTALL	LF	970
506	6043	BIOLOGS REMOV	LF	970
636	6007	REPLACE EXISTING ALUMINUM SIGNS(TY A)	SF	14
644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	5
644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	6
644	6050	IN SM RD SN SUP&AM TYS80(2)SA(P)	EA	1
666	6036	REFL PAV MRK TY I (W) 8" (SLD)(100MIL)	LF	601
644	6076	REMOVE SM RD SN SUP&AM	EA	13
666	6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	1
666	6084	REFL PAV MRK TY I (W) (EXIT GORE) (100MIL)	LF	1
666	6306	RE PM W/RET REQ TY I (W) 6" (BRK)(100MIL)	LF	550
666	6342	REF PROF PAV MRK TYI (W) 4"(SLD)(100MIL)	LF	2,192
666	6345	REF PROF PAV MRK TYI (Y) 4"(SLD)(100MIL)	LF	2,200
672	6010	REFL PAV MRKR TY II-C-R	EA	58
677	6001	ELIM EXIST PAVEM MRK & MRKS (4")	LF	2,526
678	6001	PAV SURF PREP FOR MRK (4")	LF	4,391
678	6002	PAV SURF PREP FOR MRK (6")	LF	550
678	6004	PAV SURF PREP FOR MRK (8")	LF	601
678	6017	PAV SURF PREP FOR MRK (ENTR GORE)	EA	1
678	6018	PAV SURF PREP FOR MRK (EXIT GORE)	EA	1

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375
SIGNING, PAVEMENT MARKING & SWP3 LAYOUT
STA 533+00 TO STA 544+00

SHEET 4 OF 13

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		89

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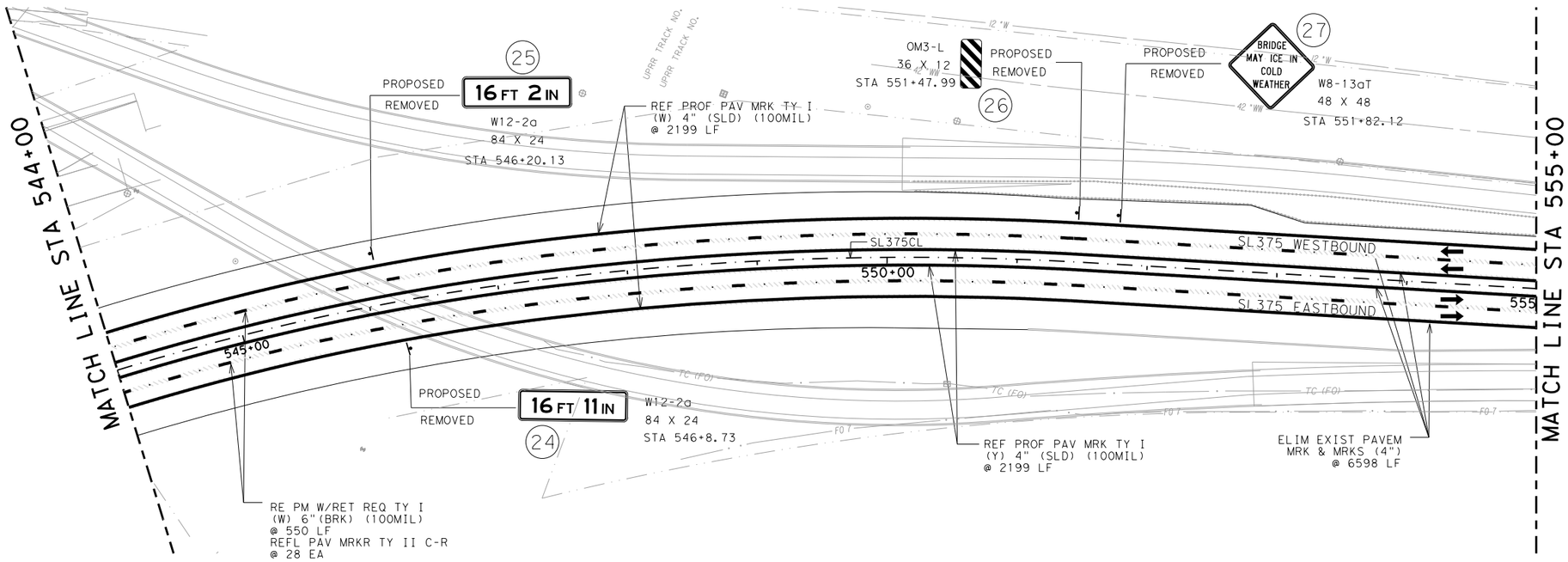

PAVEMENT MARKING				
ITEM	CODE	DESCRIPTION	UNIT	QTY
636	6007	REPLACE EXISTING ALUMINUM SIGNS(TY A)	SF	28
644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	1
644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	1
644	6076	REMOVE SM RD SN SUP&AM	EA	4
666	6306	RE PM W/RET REQ TY I (W) 6" (BRK)(100MIL)	LF	550
666	6342	REF PROF PAV MRK TYI (W) 4"(SLD)(100MIL)	LF	2,199
666	6345	REF PROF PAV MRK TYI (Y) 4"(SLD)(100MIL)	LF	2,199
672	6010	REFL PAV MRKR TY II-C-R	EA	27
677	6001	ELIM EXIST PAVEM MRK & MRKS (4")	LF	6,598
678	6001	PAV SURF PREP FOR MRK (4")	LF	4,398
678	6002	PAV SURF PREP FOR MRK (6")	LF	550

LEGEND

TRAFFIC FLOW ARROW

GENERAL NOTES:

1. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED
PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375
SIGNING, PAVEMENT MARKING & SWP3 LAYOUT
544+00 TO STA 555+00

SHEET 5 OF 13

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		90

DATE: 5/4/2021 02:22:48 AM
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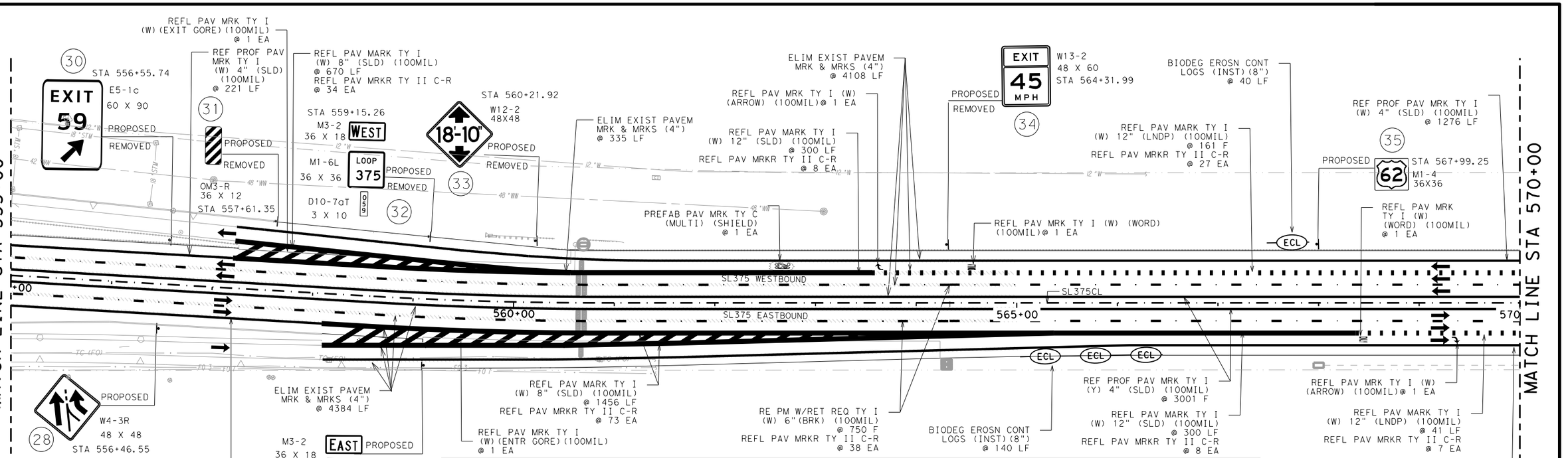

LEGEND

TRAFFIC FLOW ARROW

GENERAL NOTES:

1. FOR PROPOSED PAVEMENT STRUCTURE SEE TYPICAL SECTION
2. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS

PAVEMENT MARKING

ITEM	CODE	DESCRIPTION	UNIT	QTY
506	6040	BIOLOGS INSTALL	LF	180
506	6043	BIOLOGS REMOV	LF	180
644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	2
644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	4
644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	1
644	6050	IN SM RD SN SUP&AM TYS80(2)SA(P)	EA	1
644	6076	REMOVE SM RD SN SUP&AM	EA	6
666	6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	2,126
666	6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	202
666	6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	600
666	6054	REFL PAV MRK TYI (W)(ARROW)(100 MIL)	EA	2
666	6078	REFL PAV MRK TYI (W)(WORD)(100 MIL)	EA	2
666	6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	1
666	6084	REFL PAV MRK TY I (W) (EXIT GORE) (100MIL)	LF	1
666	6306	RE PM W/RET REQ TY I (W) 6" (BRK)(100MIL)	LF	750
666	6342	REF PROF PAV MRK TYI (W) 4"(SLD)(100MIL)	LF	2,958
666	6345	REF PROF PAV MRK TYI (Y) 4"(SLD)(100MIL)	LF	3,001
668	6115	PREFAB PAV MRK TY C (MULTI) (SHIELD)	EA	1
672	6010	REFL PAV MRKR TY II-C-R	EA	195
677	6001	ELIM EXIST PAVEM MRK & MRKS (4")	LF	8,492
678	6001	PAV SURF PREP FOR MRK (4")	LF	5,959
678	6002	PAV SURF PREP FOR MRK (6")	LF	750
678	6004	PAV SURF PREP FOR MRK (8")	LF	2,126
678	6006	PAV SURF PREP FOR MRK (12")	LF	600
678	6009	PAV SURF PREP FOR MRK (ARROW)	EA	2
678	6016	PAV SURF PREP FOR MRK (WORD)	EA	2
678	6025	PAV SURF PREP FOR MRKS (SHIELD)	EA	1
678	6017	PAV SURF PREP FOR MRK (ENTR GORE)	EA	1
678	6018	PAV SURF PREP FOR MRK (EXIT GORE)	EA	1

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED
PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375
SIGNING, PAVEMENT MARKING & SWP3 LAYOUT
555+00 TO STA 570+00

SHEET 6 OF 13

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		91

DATE: 5/4/2021 02:22:57 AM
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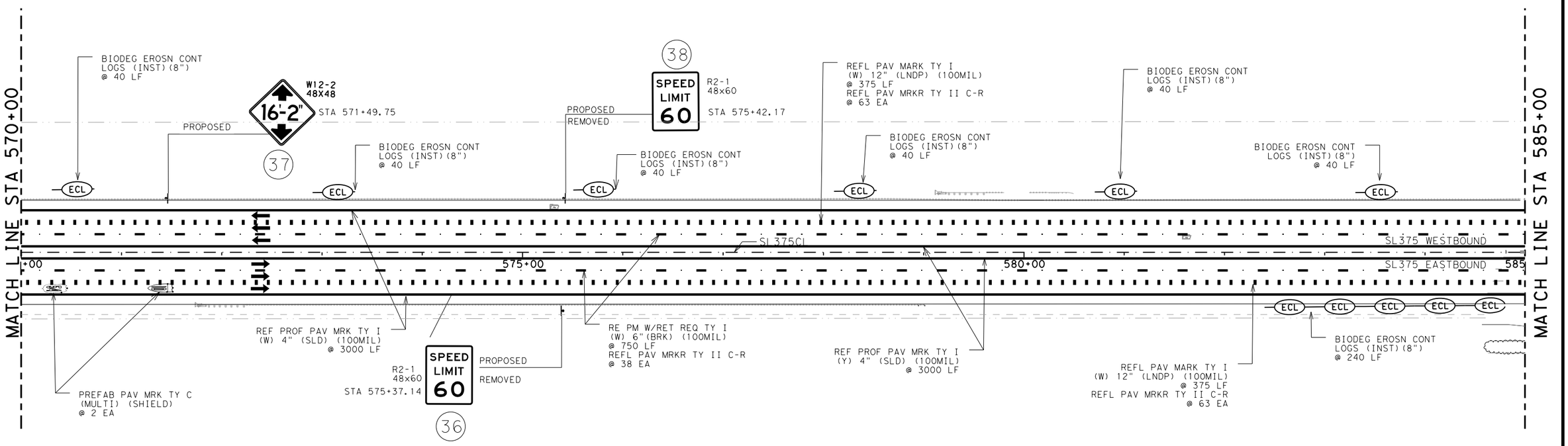

PAVEMENT MARKING				
ITEM	CODE	DESCRIPTION	UNIT	QTY
506	6040	BIOLOGS INSTALL	LF	480
506	6043	BIOLOGS REMOV	LF	480
644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	1
644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	2
644	6076	REMOVE SM RD SN SUP&AM	EA	2
666	6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	750
666	6306	RE PM W/RET REQ TY I (W) 6" (BRK)(100MIL)	LF	750
666	6342	REF PROF PAV MRK TYI (W) 4"(SLD)(100MIL)	LF	3,000
666	6345	REF PROF PAV MRK TYI (Y) 4"(SLD)(100MIL)	LF	3,000
672	6010	REFL PAV MRKR TY II-C-R	EA	164
678	6001	PAV SURF PREP FOR MRK (4")	LF	6,000
678	6002	PAV SURF PREP FOR MRK (6")	LF	750
678	6006	PAV SURF PREP FOR MRK (12")	LF	750

LEGEND

TRAFFIC FLOW ARROW

GENERAL NOTES:

1. FOR PROPOSED PAVEMENT STRUCTURE SEE TYPICAL SECTION
2. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375

SIGNING, PAVEMENT MARKING & SWP3 LAYOUT

STA 570+00 TO 585+00

SHEET 7 OF 13

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		92

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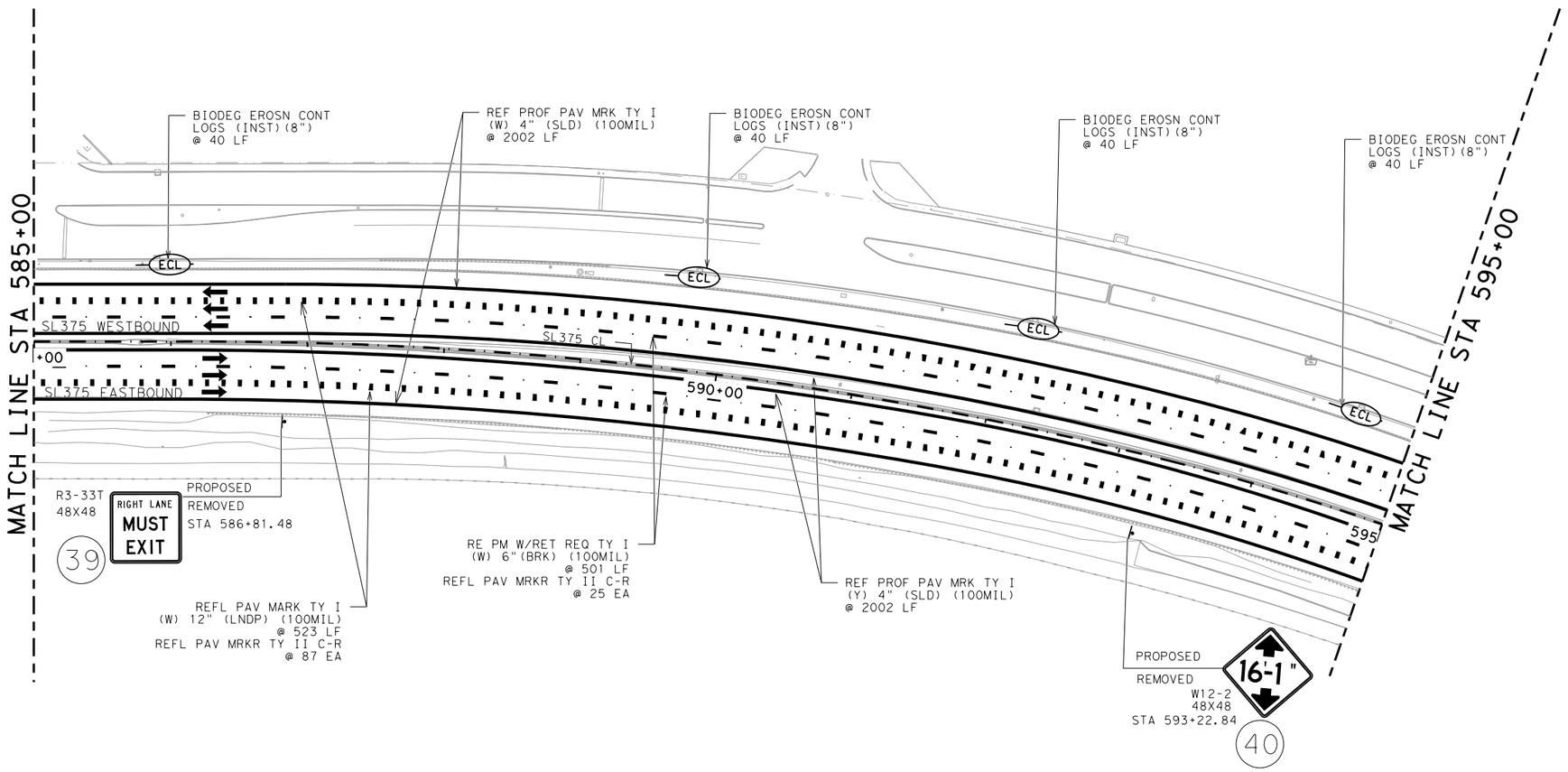

PAVEMENT MARKING				
ITEM	CODE	DESCRIPTION	UNIT	QTY
506	6040	BIOLOGS INSTALL	LF	160
506	6043	BIOLOGS REMOV	LF	160
644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	2
644	6076	REMOVE SM RD SN SUP&AM	EA	2
666	6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	523
666	6306	RE PM W/RET REQ TY I (W) 6" (BRK)(100MIL)	LF	501
666	6342	REF PROF PAV MRK TYI (W) 4"(SLD)(100MIL)	LF	2,002
666	6345	REF PROF PAV MRK TYI (Y) 4"(SLD)(100MIL)	LF	2,002
672	6010	REFL PAV MRKR TY II-C-R	EA	112
678	6001	PAV SURF PREP FOR MRK (4")	LF	4,004
678	6002	PAV SURF PREP FOR MRK (6")	LF	504
678	6006	PAV SURF PREP FOR MRK (12")	LF	523

LEGEND

TRAFFIC FLOW ARROW

GENERAL NOTES:

1. FOR PROPOSED PAVEMENT STRUCTURE SEE TYPICAL SECTION
2. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED
PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375

SIGNING, PAVEMENT MARKING & SWP3 LAYOUT

STA 585+00 TO STA 595+00

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		93

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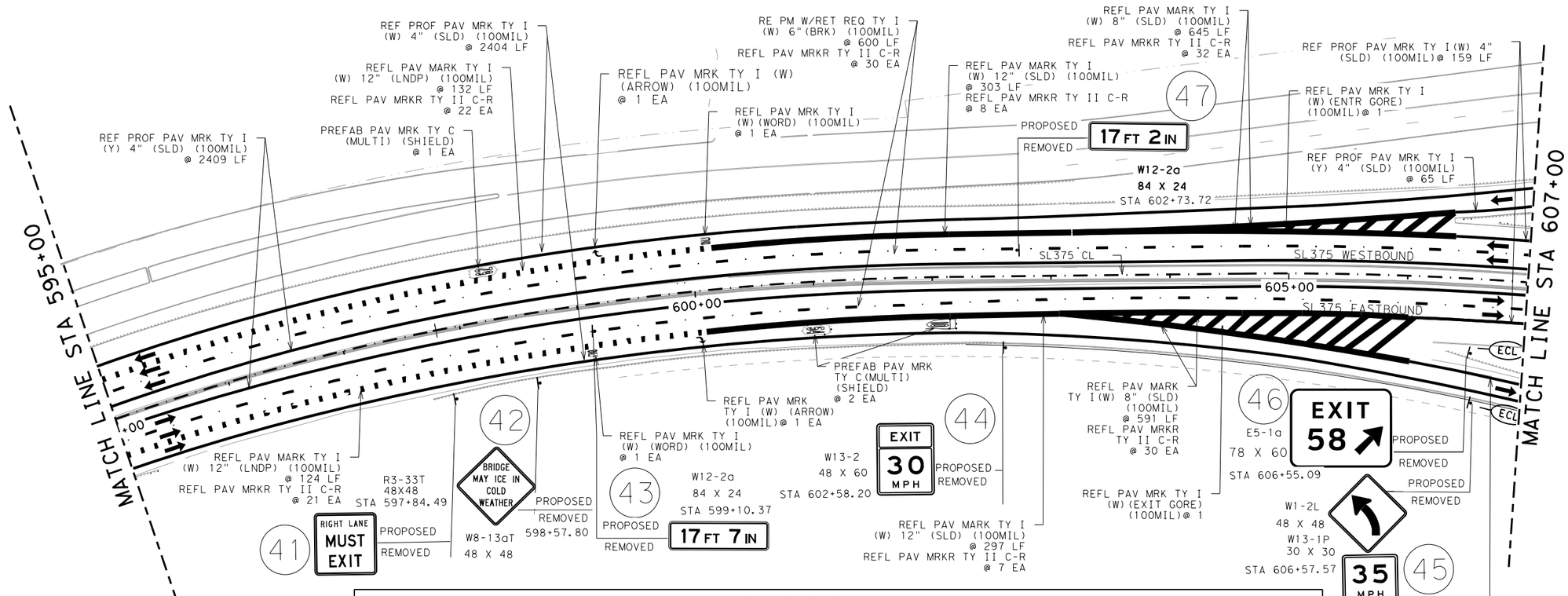

PAVEMENT MARKING

ITEM	CODE	DESCRIPTION	UNIT	QTY
636	6007	REPLACE EXISTING ALUMINUM SIGNS(TY A)	SF	28
644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	3
644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	1
644	6050	IN SM RD SN SUP&AM TYS80(2)SA(P)	EA	1
644	6076	REMOVE SM RD SN SUP&AM	EA	7
666	6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	1,236
666	6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	256
666	6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	600
666	6054	REFL PAV MRK TYI (W)(ARROW)(100MIL)	EA	2
666	6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	2
666	6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	1
666	6084	REFL PAV MRK TY I (W) (EXIT GORE) (100MIL)	LF	1
666	6306	RE PM W/RET REQ TY I (W) 6" (BRK)(100MIL)	LF	600
666	6342	REF PROF PAV MRK TYI (W) 4"(SLD)(100MIL)	LF	2,404
666	6345	REF PROF PAV MRK TYI (Y) 4"(SLD)(100MIL)	LF	2,542
668	6115	PREFAB PAV MRK TY C (MULTI) (SHIELD	EA	3
672	6010	REFL PAV MRKR TY II-C-R	EA	143
678	6001	PAV SURF PREP FOR MRK (4")	LF	4,946
678	6002	PAV SURF PREP FOR MRK (6")	LF	600
678	6004	PAV SURF PREP FOR MRK (8")	LF	1,236
678	6006	PAV SURF PREP FOR MRK (12")	LF	856
678	6009	PAV SURF PREP FOR MRK (ARROW)	EA	2
678	6016	PAV SURF PREP FOR MRK (WORD)	EA	2
678	6017	PAV SURF PREP FOR MRK (ENTR GORE)	EA	1
678	6018	PAV SURF PREP FOR MRK (EXIT GORE)	LF	1
678	6025	PAV SURF PREP FOR MRK (SHIELD)	EA	3

LEGEND

TRAFFIC FLOW ARROW

GENERAL NOTES:

1. FOR PROPOSED PAVEMENT STRUCTURE SEE TYPICAL SECTION
2. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375
SIGNING, PAVEMENT MARKING & SWP3 LAYOUT
STA 595+00 TO STA 607+00

SHEET 9 OF 13

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		94

DATE: 5/4/2021 7:15:56 AM
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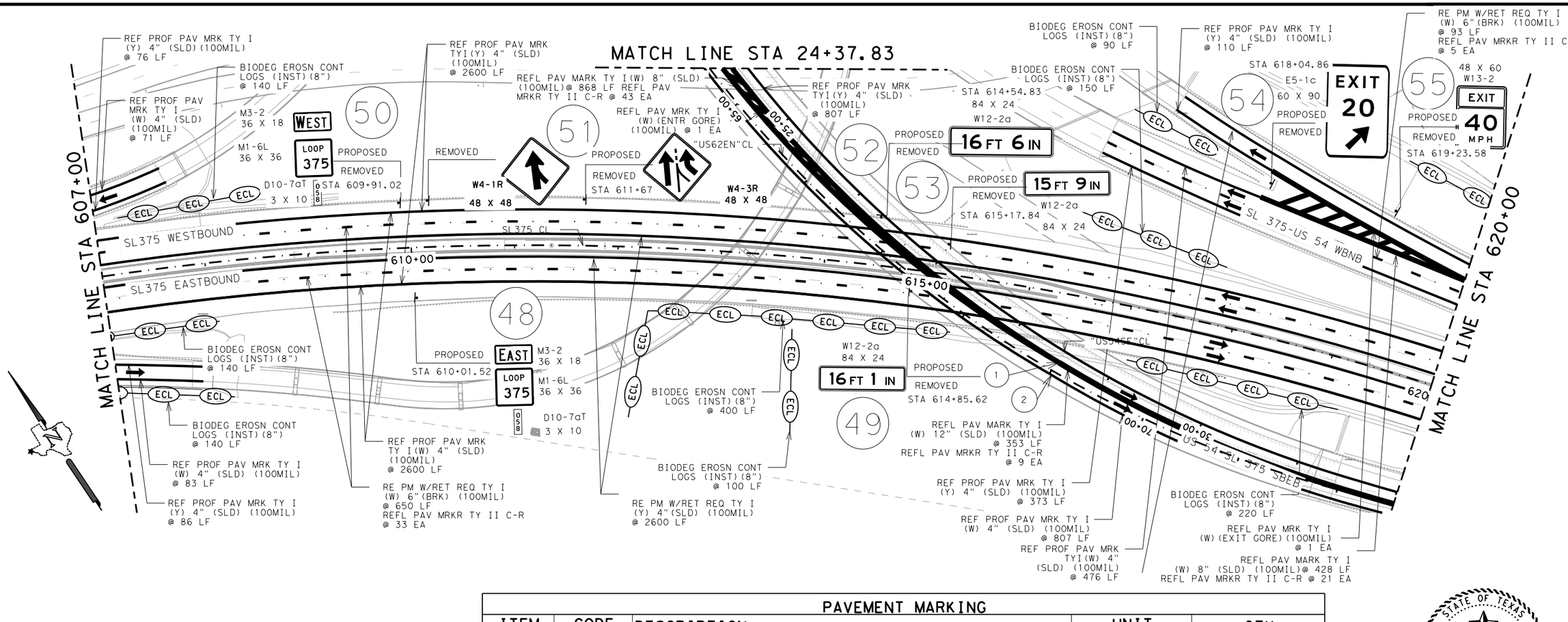


STRIPING CALLOUTS				
ID	CHAIN	STATION	OFFSET	COMMENT
1	US62EN	69+02.8	10' LT	EQ: US54SE 28+51.59 12'RT
2	US62EN	69+02.8	4' RT	EQ: US54SEL 28+51.59 26'RT

LEGEND

TRAFFIC FLOW ARROW

GENERAL NOTES:

1. FOR PROPOSED PAVEMENT STRUCTURE SEE TYPICAL SECTION
2. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS

PAVEMENT MARKING				
ITEM	CODE	DESCRIPTION	UNIT	QTY
506	6040	BIOLOGS INSTALL	LF	1,160
506	6043	BIOLOGS REMOV	LF	1,160
636	6007	REPLACE EXISTING ALUMINUM SIGNS(TY A)	SF	42
644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	1
644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	2
644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	1
644	6050	IN SM RD SN SUP&AM TYS80(2)SA(P)	EA	1
644	6076	REMOVE SM RD SN SUP&AM	EA	8
666	6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	1,296
666	6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	353
666	6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	1
666	6084	REFL PAV MRK TY I (W) (EXIT GORE) (100MIL)	EA	1
666	6306	RE PM W/RET REQ TY I (W) 6" (BRK)(100MIL)	LF	743
666	6342	REF PROF PAV MRK TYI (W) 4"(SLD)(100MIL)	LF	4,037
666	6345	REF PROF PAV MRK TYI (Y) 4"(SLD)(100MIL)	LF	4,052
672	6010	REFL PAV MRKR TY II-C-R	EA	111
677	6001	ELIM EXIST PAVEM MRK & MRKS (4")	LF	2,726
678	6001	PAV SURF PREP FOR MRK (4")	LF	8,089
678	6002	PAV SURF PREP FOR MRK (6")	LF	743
678	6004	PAV SURF PREP FOR MRK (8")	LF	1,296
678	6006	PAV SURF PREP FOR MRK (12")	LF	353
678	6017	PAV SURF PREP FOR MRK (ENTR GORE)	EA	1
678	6018	PAV SURF PREP FOR MRK (EXIT GORE)	EA	1

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/26/2021

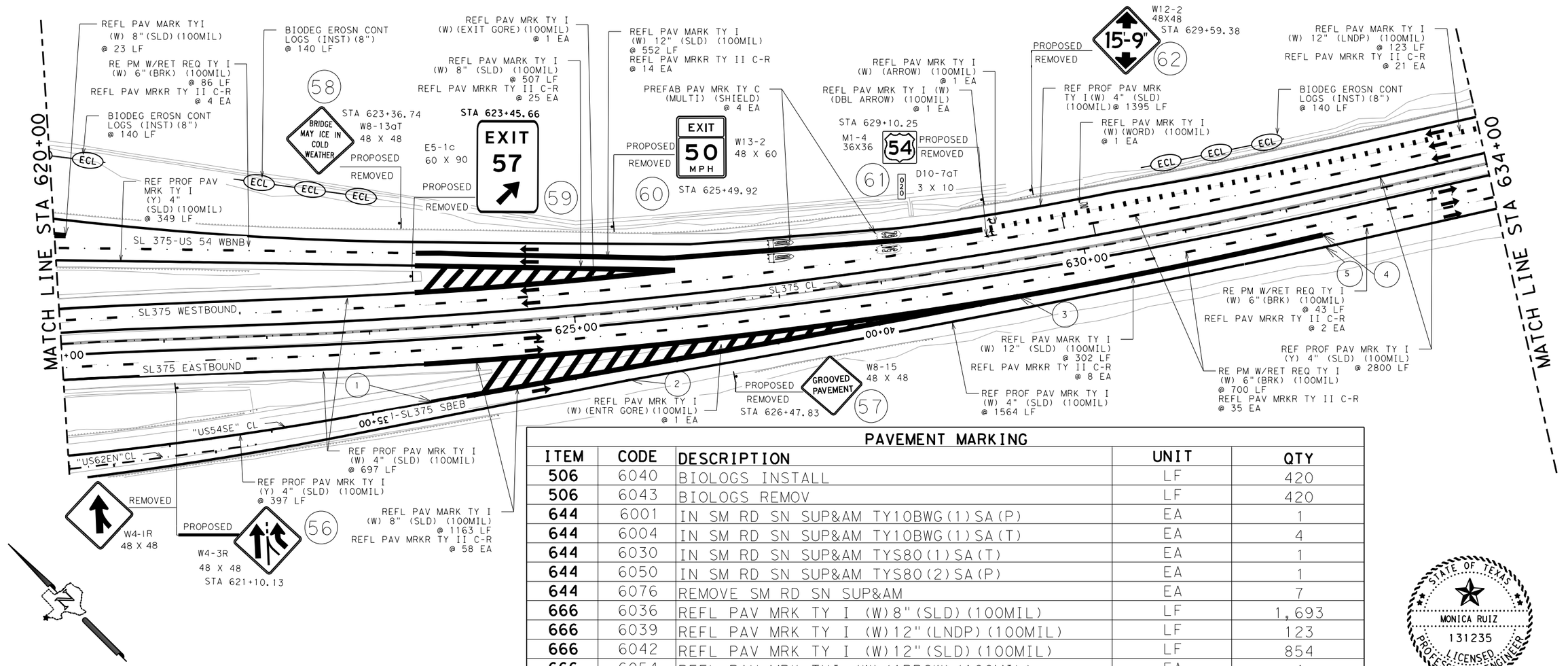
SL 375
SIGNING, PAVEMENT MARKING & SWP3 LAYOUT
STA 607+00 TO STA 620+00

SHEET 10 OF 13

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		95

DATE: 5/26/2021 1:40:48 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT5\Documents\24 - ELP\Design Projects\255204046\4 - Design\Plan Set\8. Traffic\095 SIGNING, PAVEMENT MARKING & SWP3 LAYOUT



STRIPING CALLOUTS

ID	CHAIN	STATION	OFFSET	COMMENT
1	US54SE	35+557.58	0'	MATCH EXISTING BROKEN
2	US54SE	37+47.47	12' RT	MATCH EXISTING WHT SLD
3	US54SE	41+38.10	0'	MATCH EXISTING BROKEN
4	SL375	632+29.66	32' RT	MATCH EXISTING BROKEN
5	SL375	632+29.67	44' RT	MATCH EXISTING WHT SLD

LEGEND

TRAFFIC FLOW ARROW

GENERAL NOTES:

1. FOR PROPOSED PAVEMENT STRUCTURE SEE TYPICAL SECTION
2. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS

PAVEMENT MARKING

ITEM	CODE	DESCRIPTION	UNIT	QTY
506	6040	BIOLOGS INSTALL	LF	420
506	6043	BIOLOGS REMOV	LF	420
644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	1
644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	4
644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	1
644	6050	IN SM RD SN SUP&AM TYS80(2)SA(P)	EA	1
644	6076	REMOVE SM RD SN SUP&AM	EA	7
666	6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	1,693
666	6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	123
666	6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	854
666	6054	REFL PAV MRK TYI (W)(ARROW)(100MIL)	EA	1
666	6057	REFL PAV MRK TY I (W)(DBL ARROW)(100MIL)	EA	1
666	6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	1
666	6081	REFL PAV MRK TY I (W) (ENTR GORE) (100MIL)	EA	1
666	6084	REFL PAV MRK TY I (W) (EXIT GORE) (100MIL)	EA	1
666	6306	RE PM W/RET REQ TY I (W) 6" (BRK)(100MIL)	LF	829
666	6342	REF PROF PAV MRK TYI (W) 4"(SLD)(100MIL)	LF	3,656
666	6345	REF PROF PAV MRK TYI (Y) 4"(SLD)(100MIL)	LF	3,546
668	6115	PREFAB PAV MRK TY C (MULTI) (SHIELD)	EA	4
672	6010	REFL PAV MRKR TY II-C-R	EA	178
678	6001	PAV SURF PREP FOR MRK (4")	LF	7,202
678	6002	PAV SURF PREP FOR MRK (6")	LF	829
678	6004	PAV SURF PREP FOR MRK (8")	LF	1,693
678	6006	PAV SURF PREP FOR MRK (12")	LF	977
678	6009	PAV SURF PREP FOR MRK (ARROW)	EA	1
678	6010	PAV SURF PREP FOR MRK (DBL ARROW)	EA	1
678	6016	PAV SURF PREP FOR MRK (WORD)	EA	1
678	6017	PAV SURF PREP FOR MRK (ENTR GORE)	EA	1
678	6018	PAV SURF PREP FOR MRK (EXIT GORE)	EA	1
678	6025	PAV SURF PREP FOR MRKS (SHIELD)	EA	4

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/26/2021

SL 375
SIGNING, PAVEMENT MARKING & SWP3 LAYOUT
STA 620+00 TO STA 634+00

SHEET 11 OF 13

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		96

DATE: 5/26/2021 1:34:50 PM
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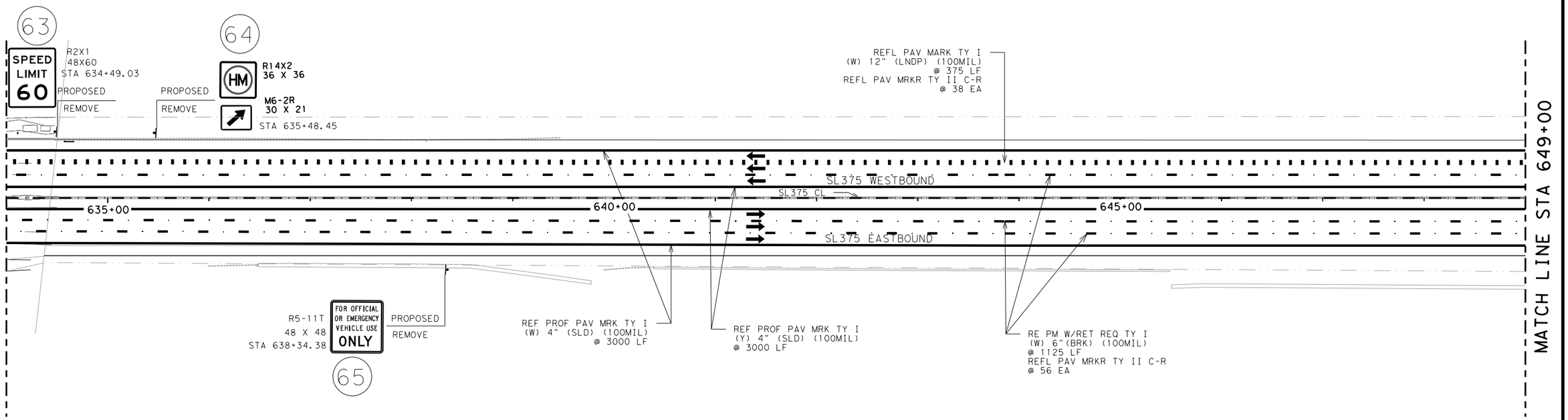

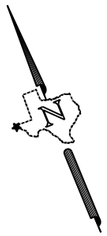

LEGEND

TRAFFIC FLOW ARROW

GENERAL NOTES:

1. FOR PROPOSED PAVEMENT STRUCTURE SEE TYPICAL SECTION
2. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS

PAVEMENT MARKING

ITEM	CODE	DESCRIPTION	UNIT	QTY
644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	1
644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	1
644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	1
644	6076	REMOVE SM RD SN SUP&AM	EA	3
666	6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	375
666	6306	RE PM W/RET REQ TY I (W) 6" (BRK)(100MIL)	LF	1,125
666	6342	REF PROF PAV MRK TYI (W) 4"(SLD)(100MIL)	LF	3,000
666	6345	REF PROF PAV MRK TYI (Y) 4"(SLD)(100MIL)	LF	3,000
672	6010	REFL PAV MRKR TY II-C-R	EA	94
678	6001	PAV SURF PREP FOR MRK (4")	LF	6,000
678	6002	PAV SURF PREP FOR MRK (6")	LF	1,125
678	6006	PAV SURF PREP FOR MRK (12")	LF	375

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375
SIGNING, PAVEMENT MARKING & SWP3 LAYOUT
STA 634+00 TO 649+00

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		97

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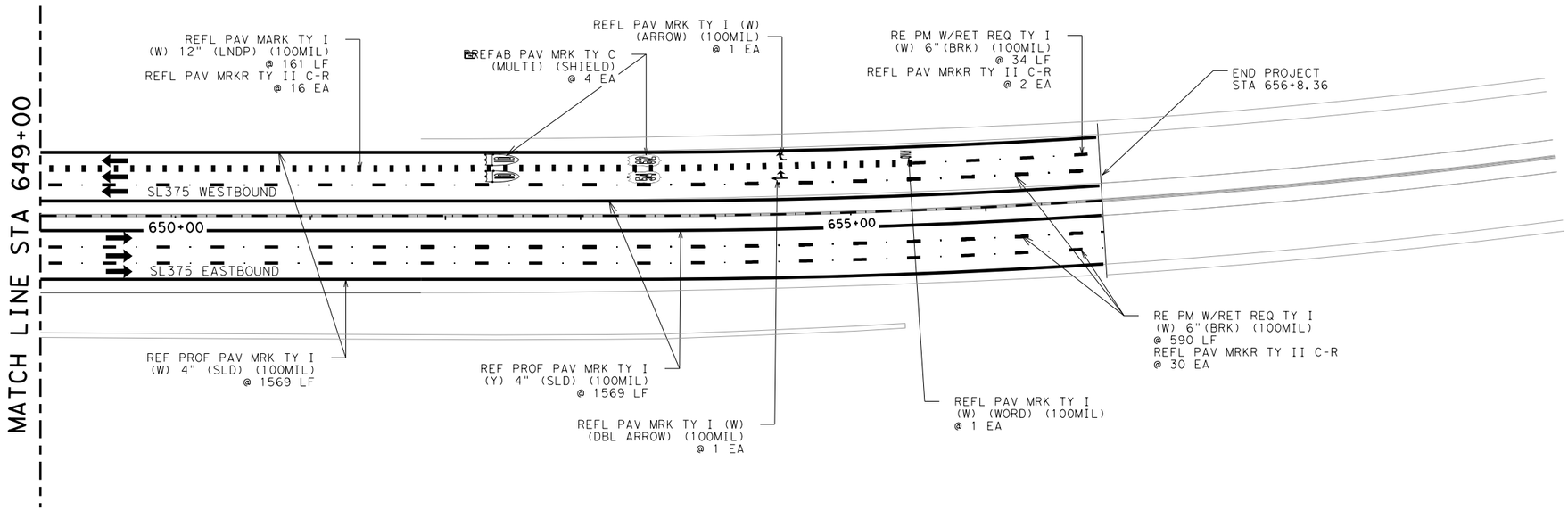

LEGEND

TRAFFIC FLOW ARROW

GENERAL NOTES:

1. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS

±

ITEM	CODE	DESCRIPTION	UNIT	QTY
666	6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	161
666	6054	REFL PAV MRK TYI (W)(ARROW)(100MIL)	EA	1
666	6057	REFL PAV MRK TY I (W)(DBL ARROW)(100MIL)	EA	1
666	6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	1
666	6306	RE PM W/RET REQ TY I (W) 6" (BRK)(100MIL)	LF	624
666	6342	REF PROF PAV MRK TYI (W) 4"(SLD)(100MIL)	LF	1,569
666	6345	REF PROF PAV MRK TYI (Y) 4"(SLD)(100MIL)	LF	1,569
668	6115	PREFAB PAV MRK TY C (MULTI) (SHIELD)	EA	4
672	6010	REFL PAV MRKR TY II-C-R	EA	48
678	6001	PAV SURF PREP FOR MRK (4")	LF	3,138
678	6002	PAV SURF PREP FOR MRK (6")	LF	624
678	6006	PAV SURF PREP FOR MRK (12")	LF	161
678	6009	PAV SURF PREP FOR MRK (ARROW)	EA	1
678	6010	PAV SURF PREP FOR MRK (DBL ARROW)	EA	1
678	6016	PAV SURF PREP FOR MRK (WORD)	EA	1
678	6025	PAV SURF PREP FOR MRKS (SHIELD)	EA	4

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/04/2021

SL 375

SIGNING, PAVEMENT MARKING & SWP3 LAYOUT

STA 649+00 TO END

SHEET 13 OF 13

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		98

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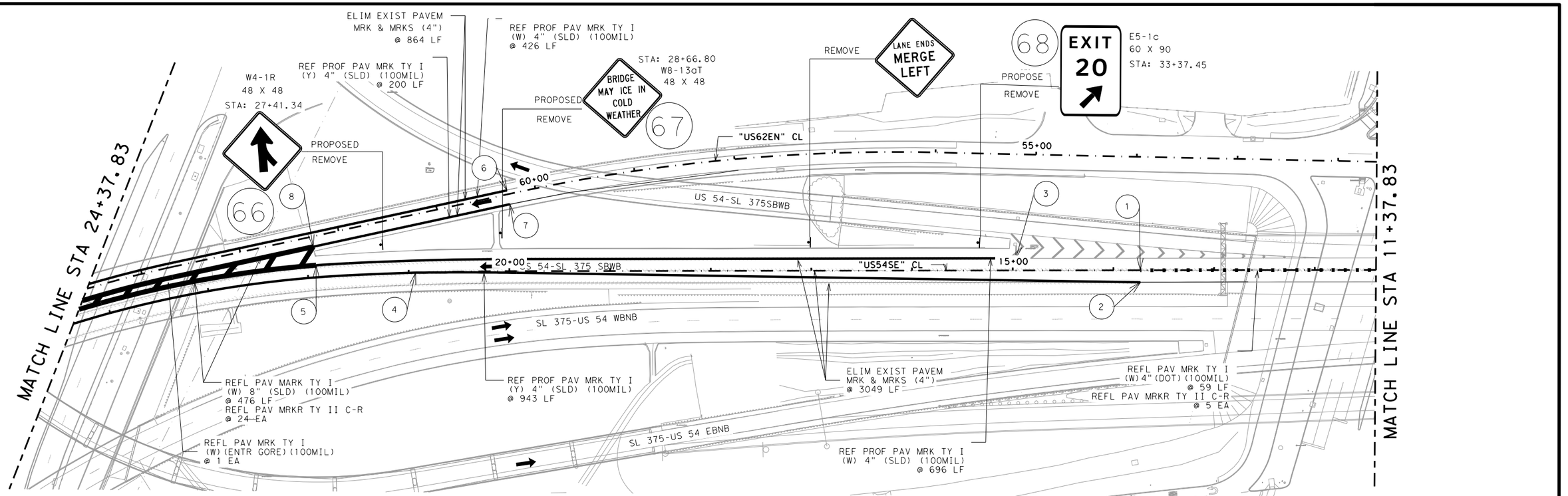

PAVEMENT MARKING

ITEM	CODE	DESCRIPTION	UNIT	QTY
644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	2
644	6050	IN SM RD SN SUP&AM TYS80(2)SA(P)	EA	1
644	6076	REMOVE SM RD SN SUP&AM	EA	4
666	6006	REFL PAV MRK TY I (W)4"(DOT)(100MIL)	LF	59
666	6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	476
666	6081	REFL PAV MRK TY I (W) (ENTR GORE) (100MIL)	EA	1
666	6342	REF PROF PAV MRK TYI (W) 4"(SLD)(100MIL)	LF	1,122
666	6345	REF PROF PAV MRK TYI (Y) 4"(SLD)(100MIL)	LF	1,143
672	6010	REFL PAV MRKR TY II-C-R	EA	29
677	6001	ELIM EXIST PAVEM MRK & MRKS (4")	LF	3,913
678	6001	PAV SURF PREP FOR MRK (4")	LF	2,324
678	6004	PAV SURF PREP FOR MRK (8")	LF	476
678	6017	PAV SURF PREP FOR MRK (ENTR GORE)	EA	1

STRIPING CALLOUTS

ID	CHAIN	STATION	OFFSET	COMMENT
1	US54SE	13+73.23	0'	MATCH EXISTING BROKEN
2	US54SE	13+73.23	12' LT	MATCH EXISTING YLW SLD
3	US54SE	14+97	12' RT	MATCH EXISTING WHT SLD
4	US54SE	20+93.23	0'	MATCH EXISTING BROKEN
5	US54SE	21+91.15	12' RT	MATCH EXISTING WHT SLD
6	US62EN	60+28	4' RT	MATCH EXISTING WHT SLD
7	US62EN	60+28	10' LT	MATCH EXISTING YLW SLD
8	US62EN	62+28	10 'LT	MATCH EXISTING YLW SLD

LEGEND

TRAFFIC FLOW ARROW

GENERAL NOTES:

1. FOR PROPOSED PAVEMENT STRUCTURE SEE TYPICAL SECTION
2. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/26/2021

US 54
SIGNING, PAVEMENT MARKING & SWP3 LAYOUT

STA 24+37.83 TO STA 11+37.83

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		99

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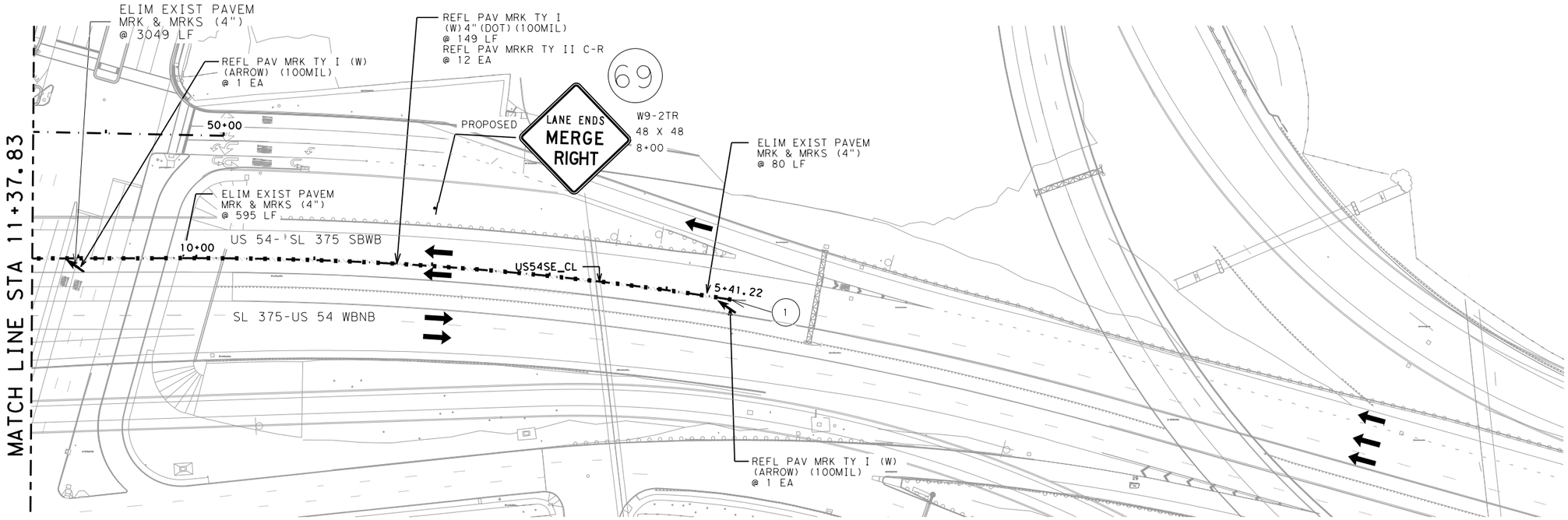

PAVEMENT MARKING				
ITEM	CODE	DESCRIPTION	UNIT	QTY
644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	1
666	6006	REFL PAV MRK TY I (W)4"(DOT)(100MIL)	LF	149
672	6010	REFL PAV MRKR TY II-C-R	EA	12
677	6001	ELIM EXIST PAVEM MRK & MRKS (4")	LF	675
678	6001	PAV SURF PREP FOR MRK (4")	LF	149

LEGEND

TRAFFIC FLOW ARROW

STRIPING CALLOUTS				
ID	CHAIN	STATION	OFFSET	COMMENT
1	US54SE+CL	5+41.22	0'	MATCH EXISTING BROKEN

GENERAL NOTES:

1. FOR PROPOSED PAVEMENT STRUCTURE SEE TYPICAL SECTION
2. FOR ROADWAY WIDTHS SEE TYPICAL SECTIONS

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED
PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/26/2021

US 54
SIGNING, PAVEMENT MARKING & SWP3 LAYOUT

STA 11+37.83 TO END OF PROJECT

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL 375
DIST	COUNTY		SHEET NO.
24	EL PASO		100

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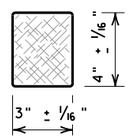
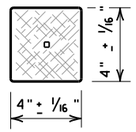
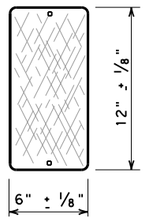
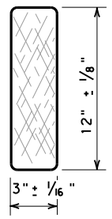
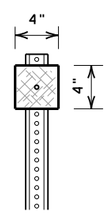
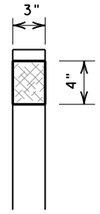
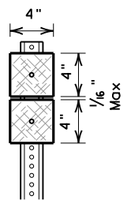
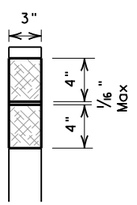
REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

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

DELINEATORS

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

D & OM DESCRIPTIVE CODES

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

NUMBER OF REFLECTORS
S = Single
D = Double

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

REFLECTOR UNIT SIZE
1 or 2

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

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

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

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

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

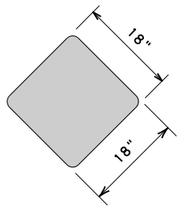
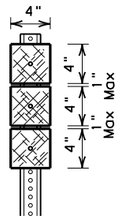
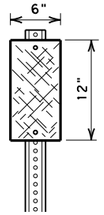
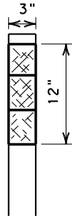
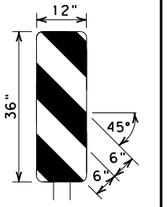
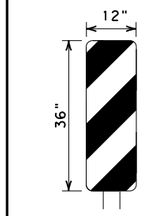
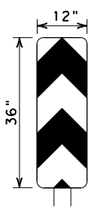
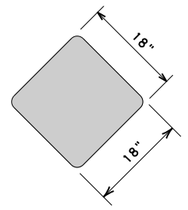
NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

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

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

DIRECTION
If Required
BI = Bi-Directional

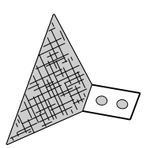
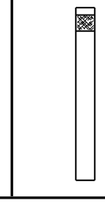
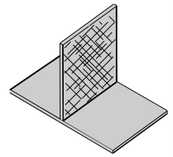
OBJECT MARKERS

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

DEPARTMENTAL MATERIAL SPECIFICATIONS

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

BARRIER REFLECTORS (BRF)

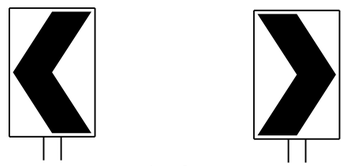
	GF1	GF2	CTB
DEVICE			

1. Barrier reflectors shall meet the requirements of DMS 8600.
2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.

SHEETING: Yellow, White, Red

NOTE: 1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.

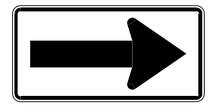
CHEVRONS

DEVICE:  W1-8

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

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

ONE DIRECTION LARGE ARROW

DEVICE:  W1-6

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

NOTE:

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

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DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	2552	04	046	SL375
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	ELP	EL PASO		101

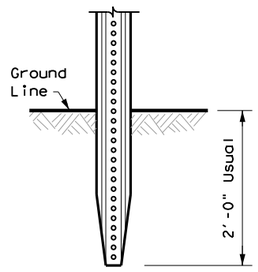
20A

DATE:
FILE:

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

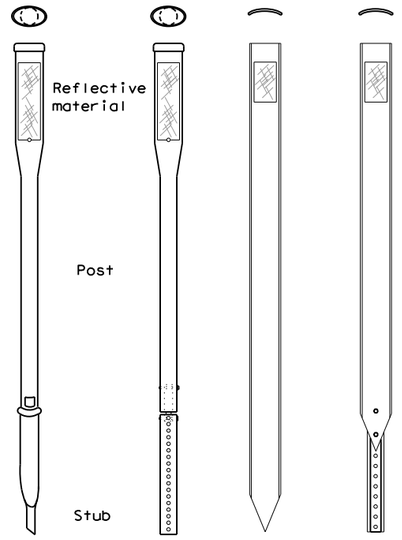


NOTES

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.

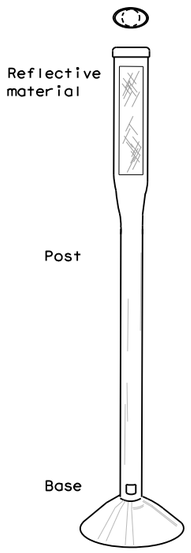
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



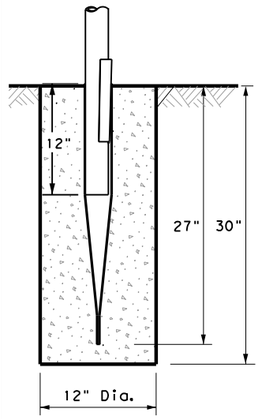
SURFACE MOUNT

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.

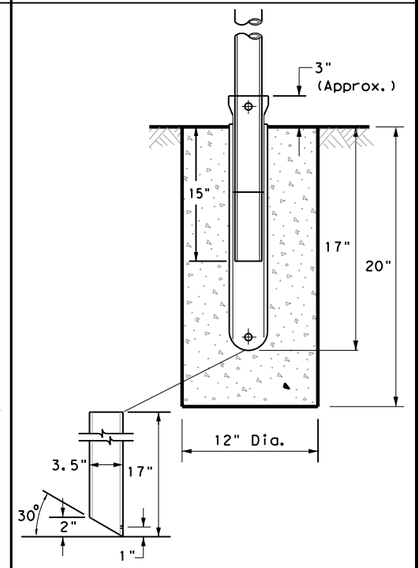
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

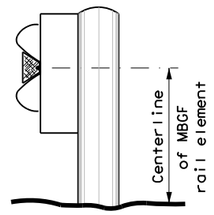
NOTE

1. Install per manufacturer's recommendations.

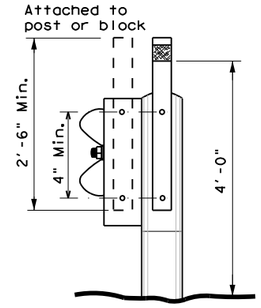
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

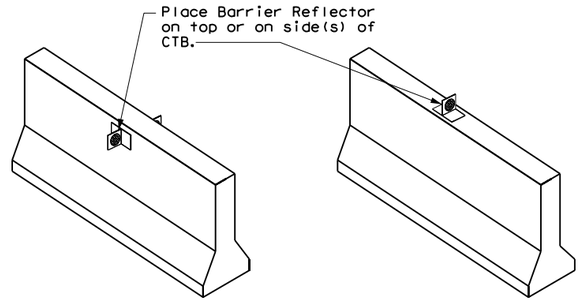
GF1



GF2



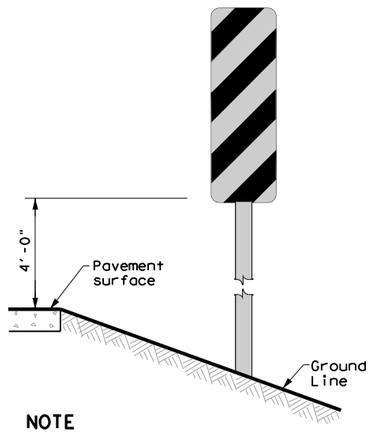
CONCRETE TRAFFIC BARRIER (CTB)



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.

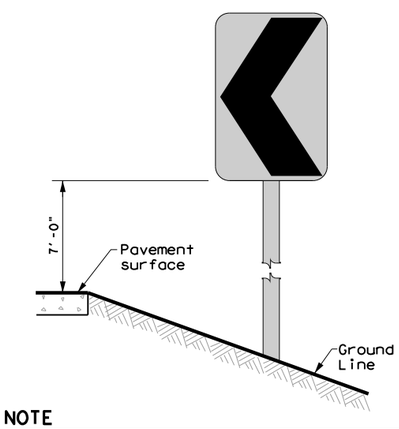
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



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)

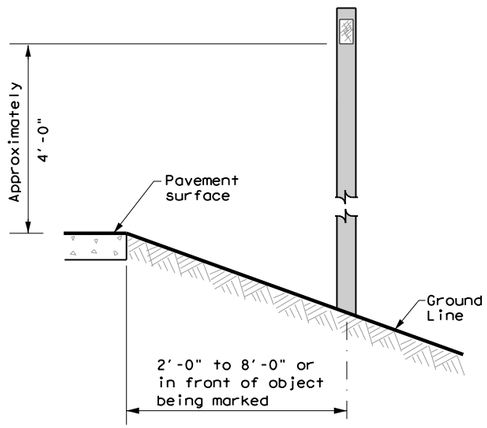
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



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

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DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

FILE: dom2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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REVISIONS	2552	04	046	SL375
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DATE:
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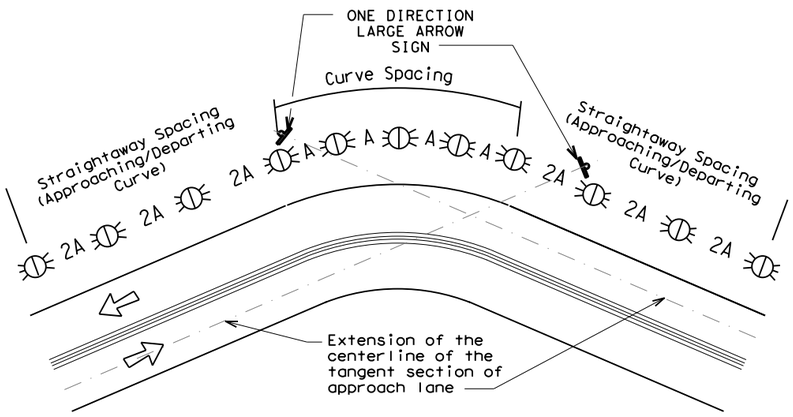
MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

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

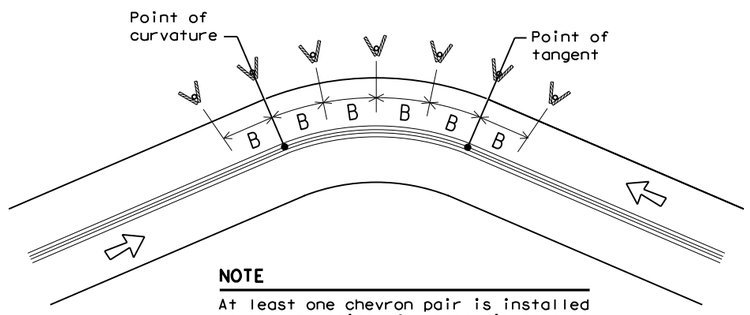
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



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
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8-15 7-20	ELP	EL PASO		103

20C

DATE:
FILE:

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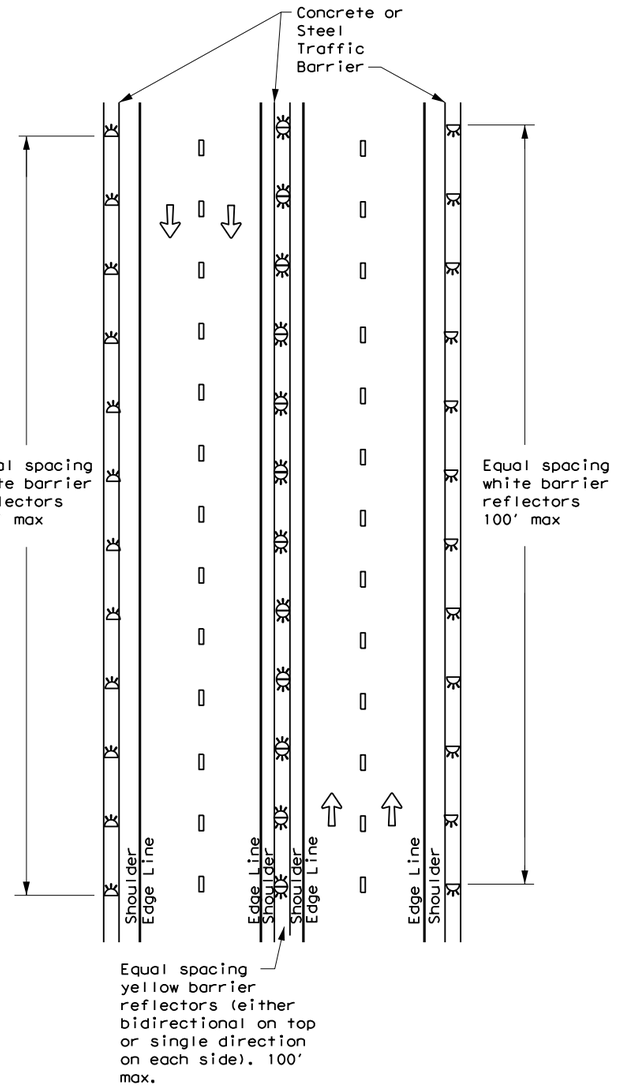
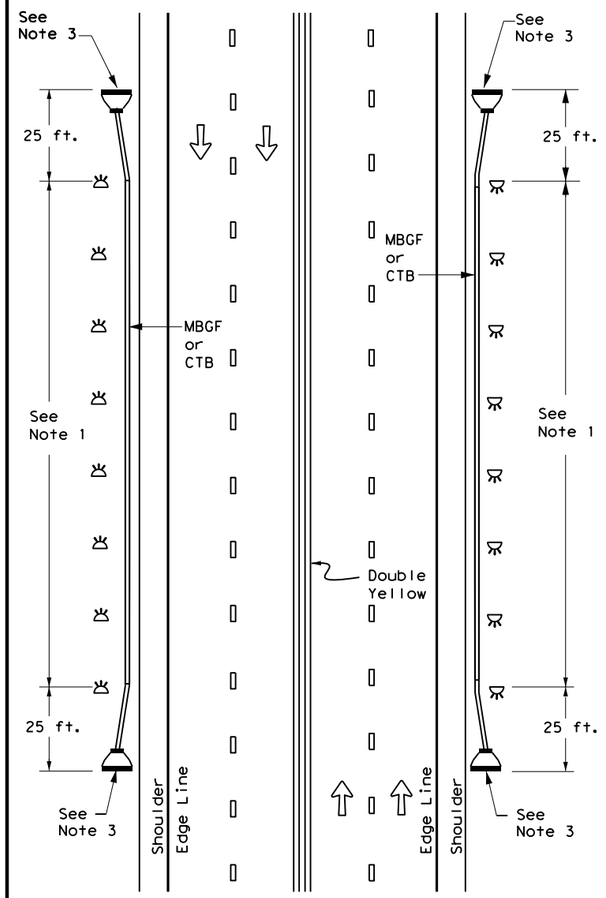
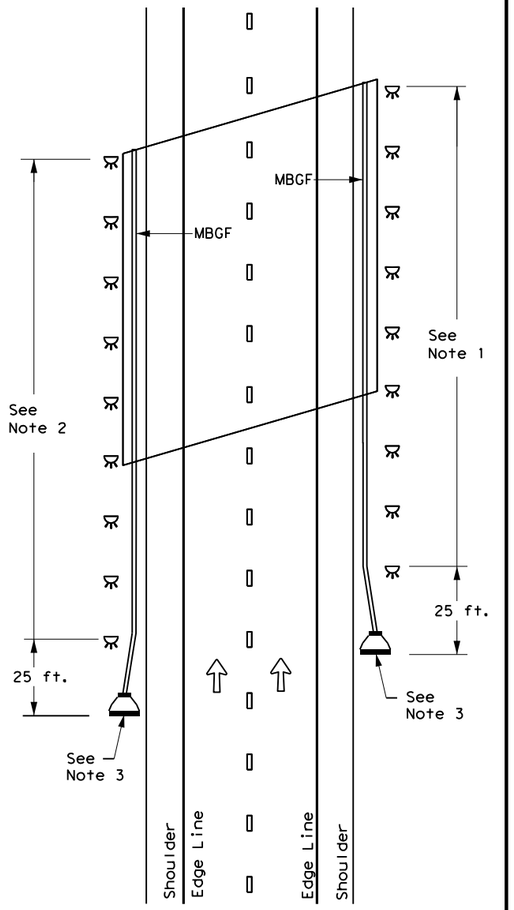
CONTINUOUS CONCRETE OR STEEL BARRIER



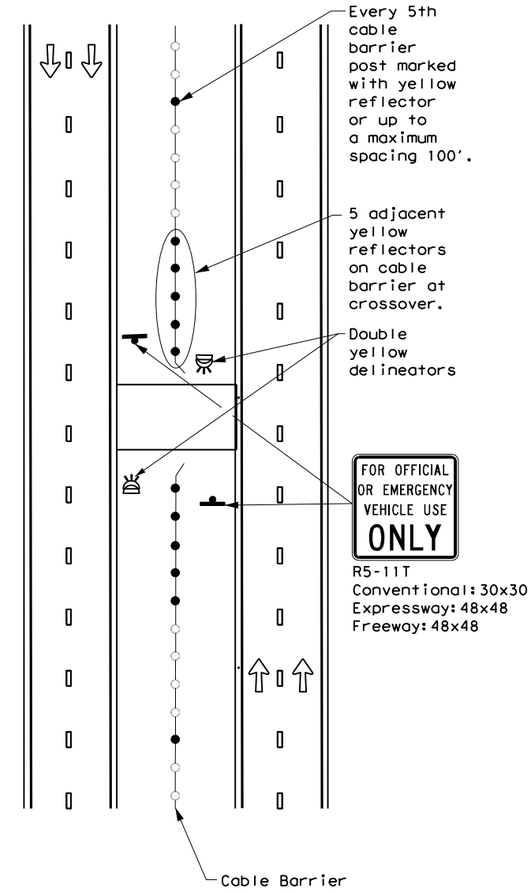
MULTI-LANE UNDIVIDED, TWO-WAY ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



DIVIDED ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



EMERGENCY CROSSOVER



NOTES

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

LEGEND

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(6)-20

FILE: dom6-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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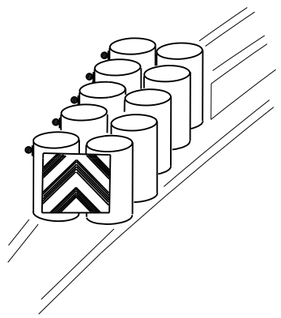
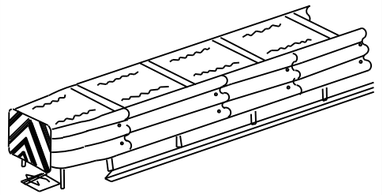
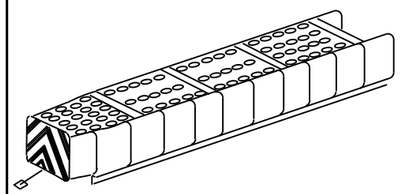
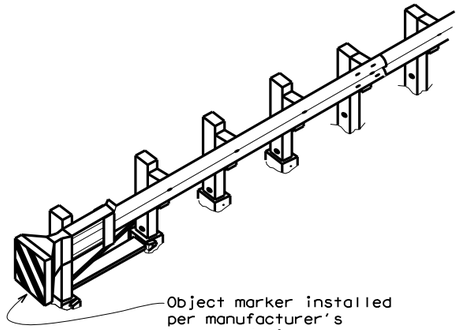
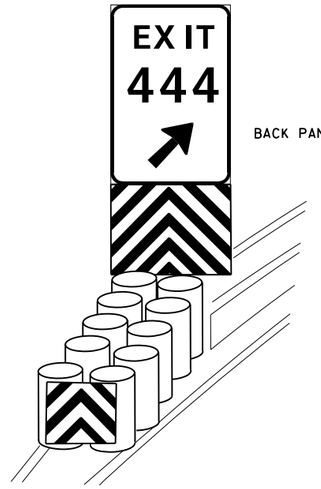
7-20	DIST	COUNTY		SHEET NO.
	ELP	EL PASO		104

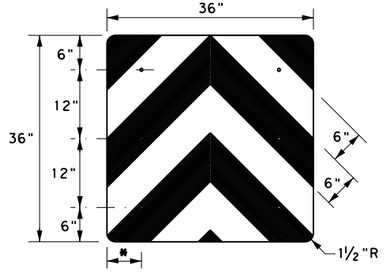


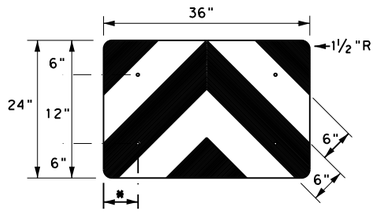




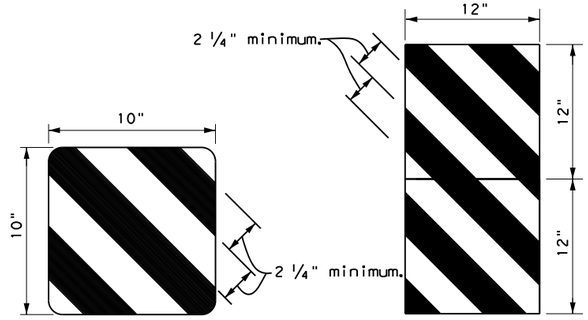




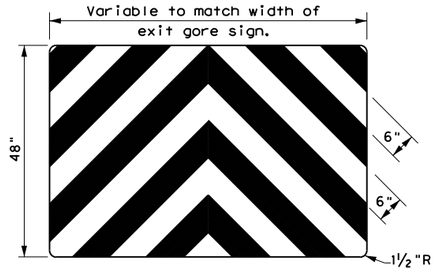


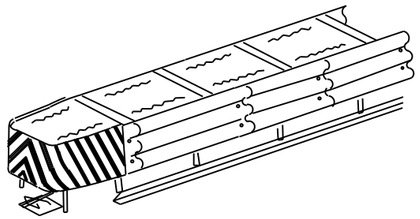


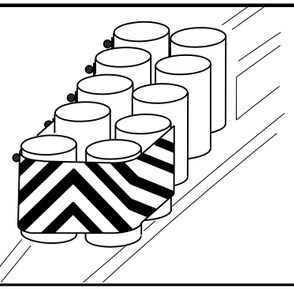
* Adjust to fit attenuator per manufacturer's recommendation, or as directed by the Engineer

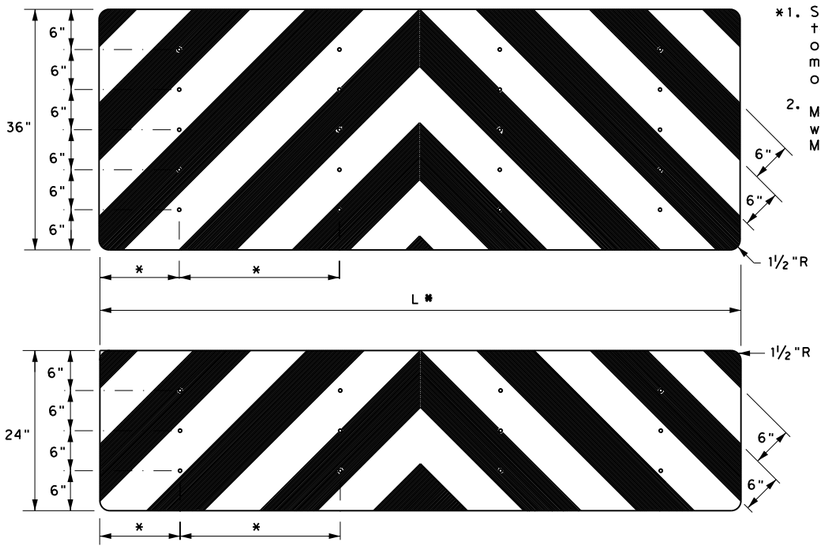


OBJECT MARKERS SMALLER THAN 3 FT^2









NOTES

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

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

NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

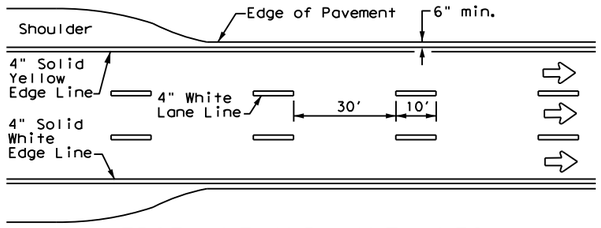
DELINEATOR & OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS

D & OM(VIA)-20

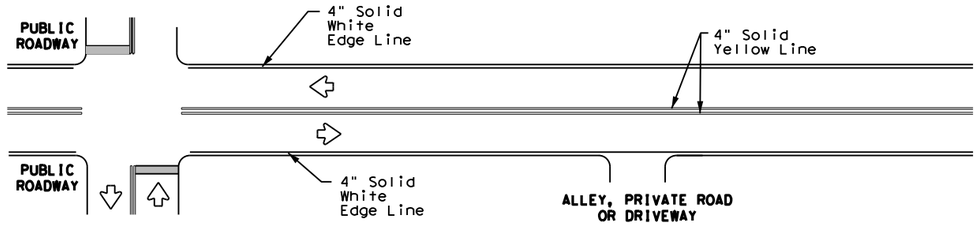
FILE: domvia20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT December 1989	CONT	SECT	JOB	HIGHWAY
REVISIONS	2552	04	046	SL375
4-92 8-04	DIST	COUNTY		SHEET NO.
8-95 3-15	ELP	EL PASO		105
4-98 7-20				

20G

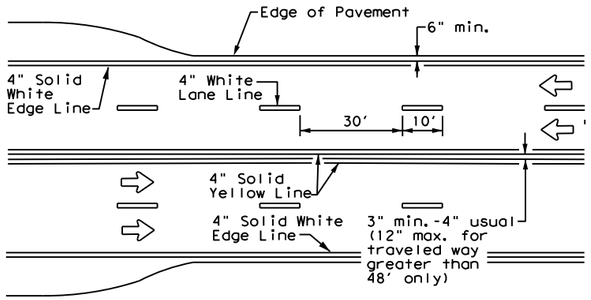
DATE:
FILE:



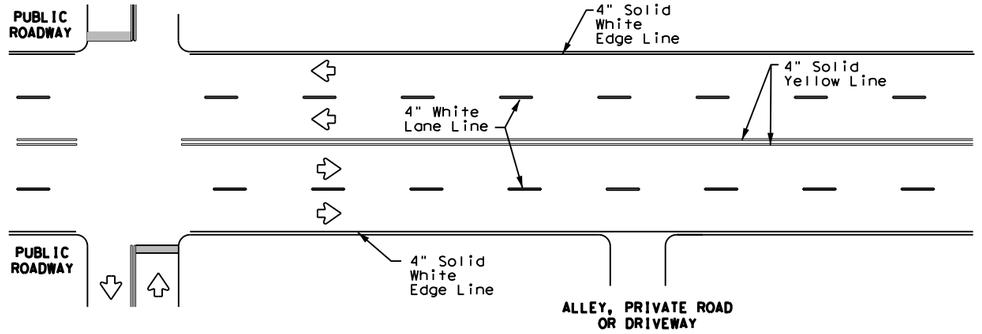
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



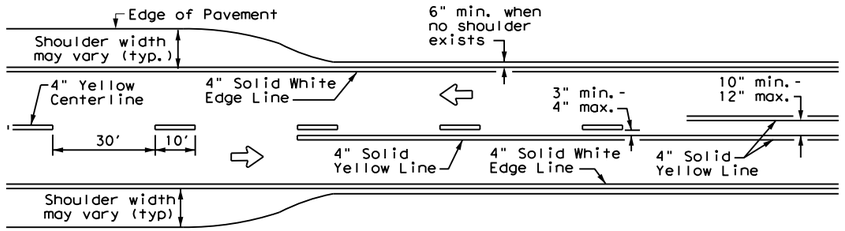
TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



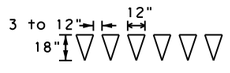
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



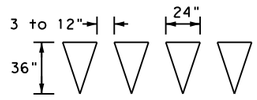
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

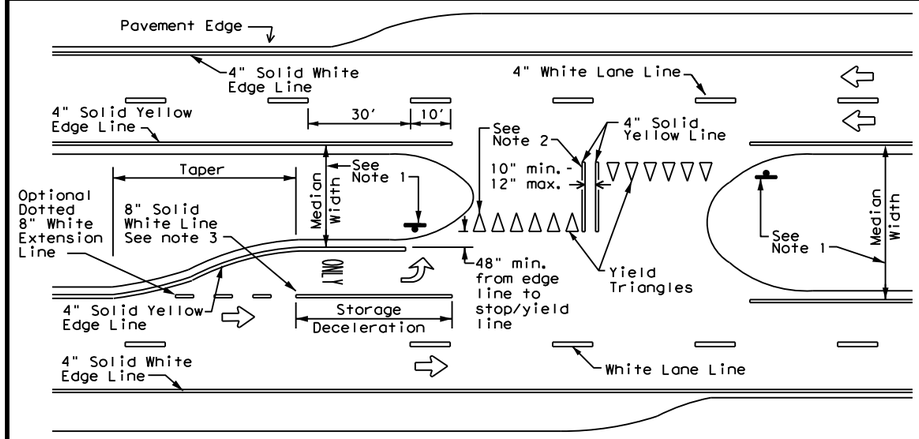


For posted speed on road being marked equal to or less than 40 MPH.



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

YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

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 are optional as determined by the Engineer.

2. Install median striping (double yellow centerlines and stop bars/yield triangles) when a 50' or greater median centerline can be placed. Stop bars shall only be used with stop signs. Yield traingles 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.

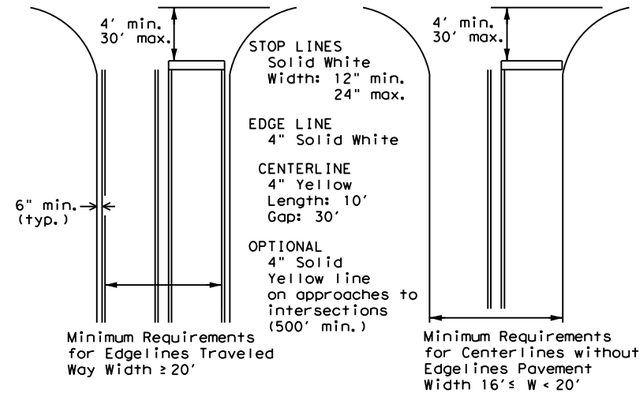
GENERAL NOTES

1. Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should not be placed less less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edgelines are not required in curb and 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 inside of edgeline to the inside of edgeline of a two lane roadway.

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

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



GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Highways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-20

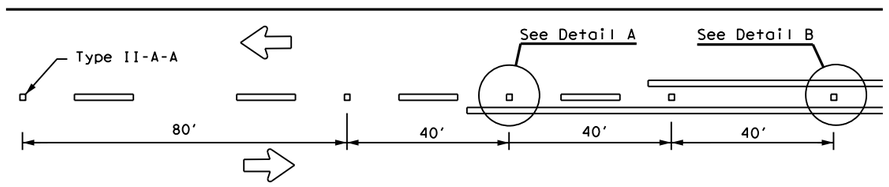
FILE: pm1-20.dgn	DN:	CK:	DW:	CK:
© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	2552	04	046	SL375
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	ELP	EL PASO		106

DATE:
FILE:

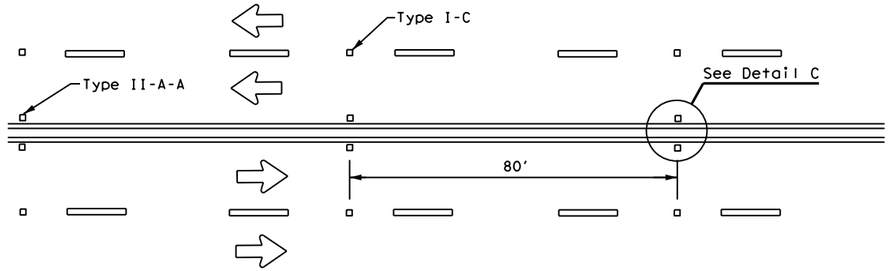
22A

REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

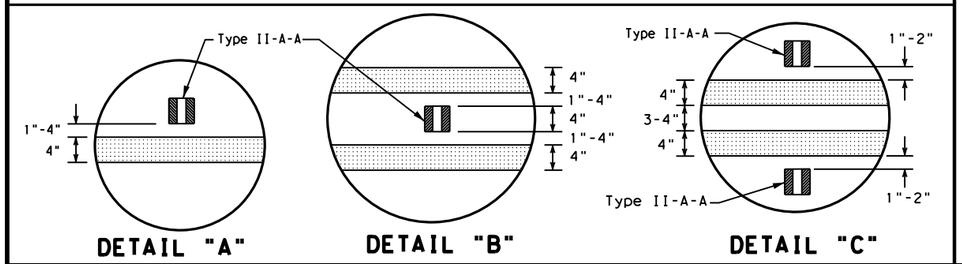
DATE:
FILE:



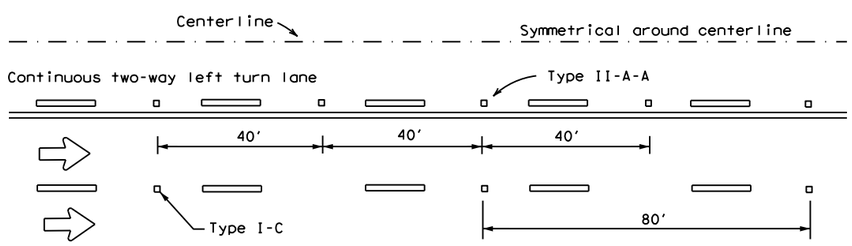
CENTERLINE FOR ALL TWO LANE ROADWAYS



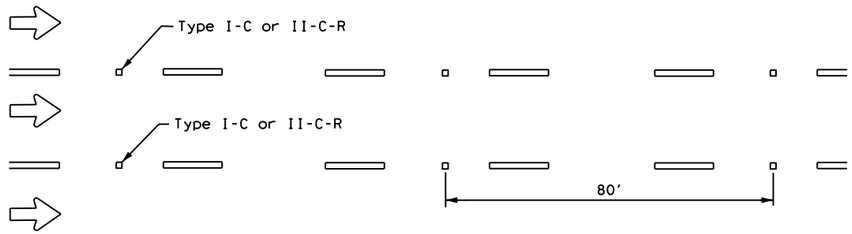
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



DETAIL "A" DETAIL "B" DETAIL "C"

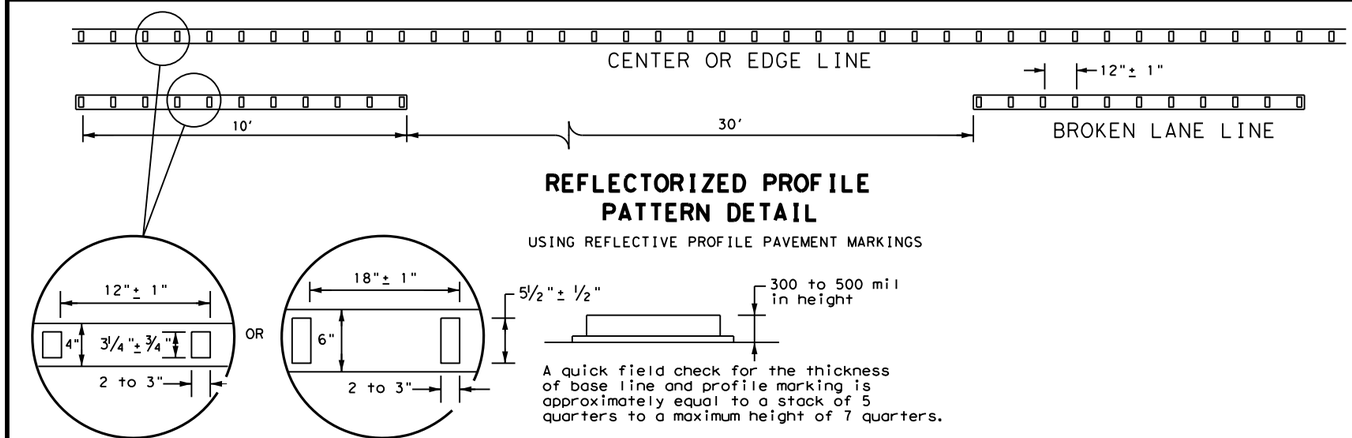


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



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.



4" EDGE LINE, CENTER LINE OR LANE LINE

OPTIONAL 6" EDGE LINE, CENTER LINE OR 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.

NOTE

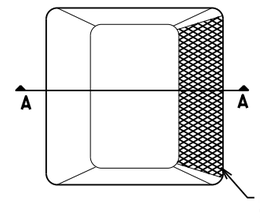
Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

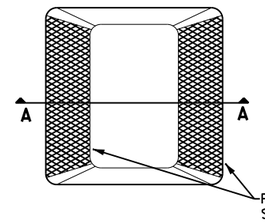
1. All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

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

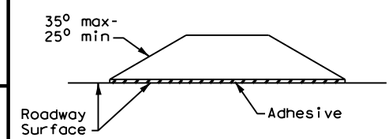
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

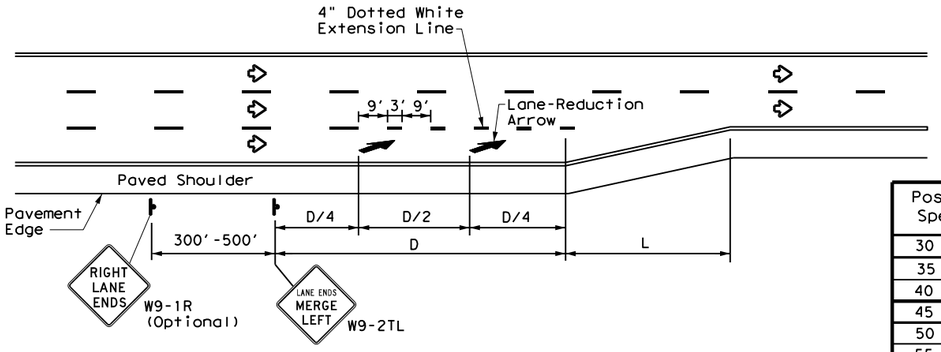
Texas Department of Transportation

Traffic Safety Division Standard

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

FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-92 2-10 5-00 2-12 8-00 6-20	2552	04	046	SL375
	DIST	COUNTY		SHEET NO.
	ELP	EL PASO		107

22B

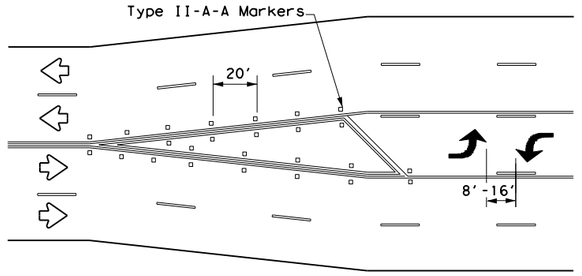


LANE REDUCTION

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	

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 W9-1R "RIGHT LANE ENDS" sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
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.



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.

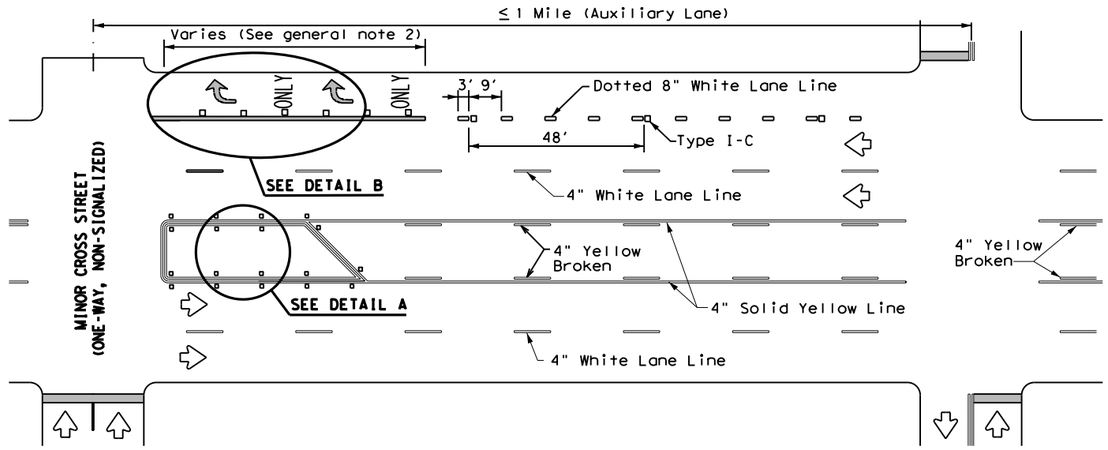
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

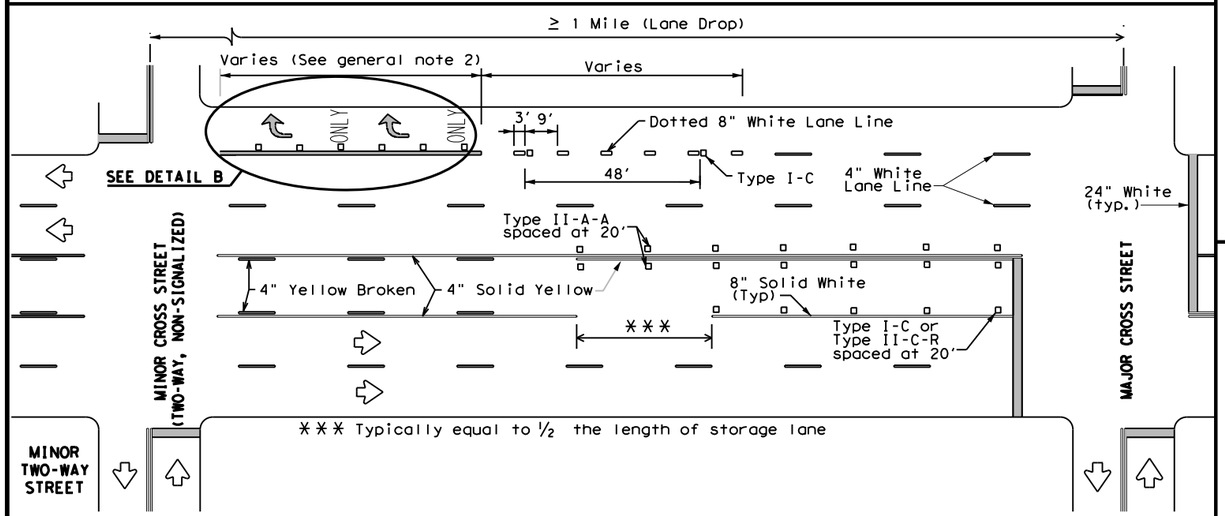
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn 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.

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

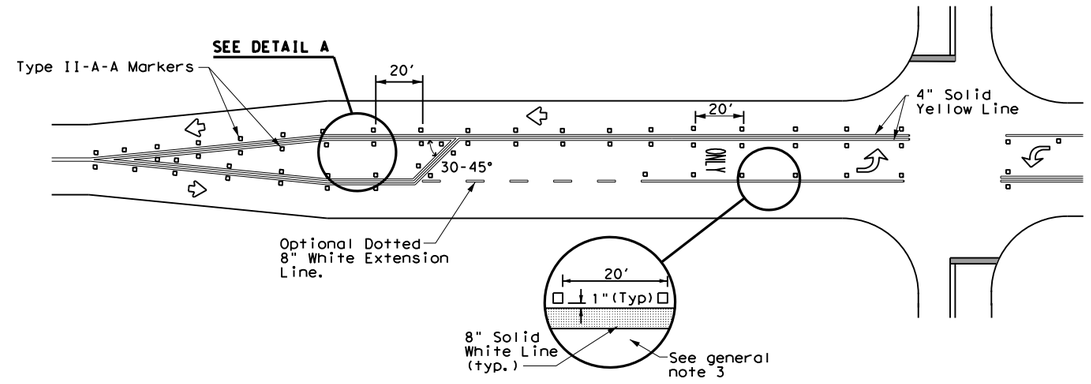
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



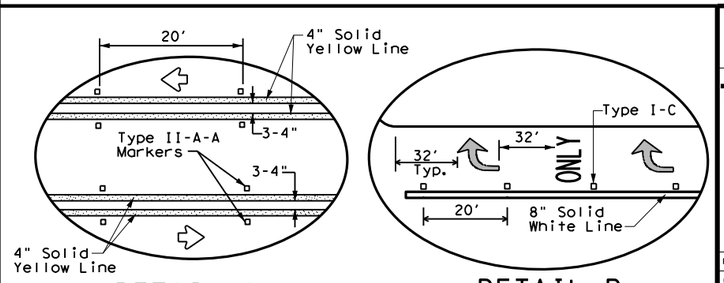
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



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



TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



Texas Department of Transportation

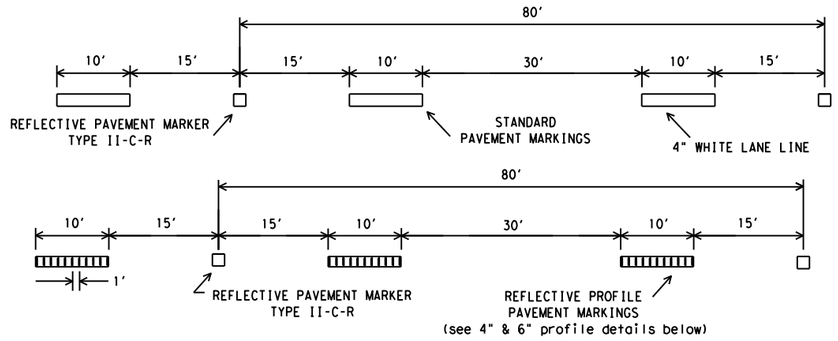
Traffic Safety Division Standard

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

FILE: pm3-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 5-00 2-10 8-00 2-12 3-03 6-20	2552	04	046	SL375
	DIST	COUNTY		SHEET NO.
	ELP	EL PASO		108

220

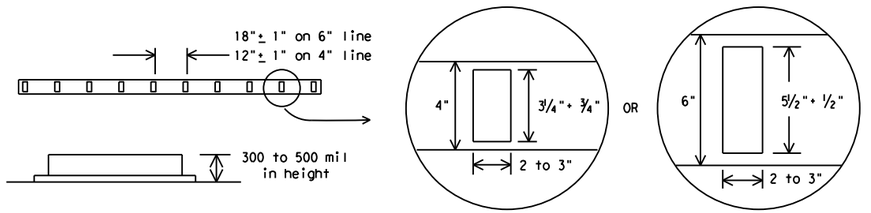
DATE:
FILE:



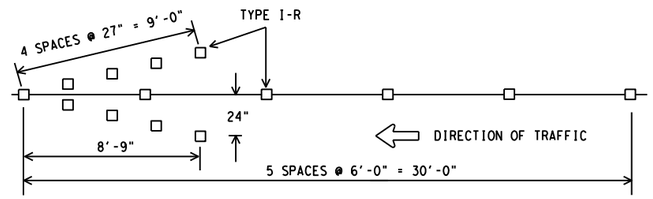
PAVEMENT MARKERS (REFL) TYPE II-C-R SHALL BE SPACED ON 80' CENTERS WITH THE CLEAR FACE TOWARD NORMAL TRAFFIC AND THE RED FACE TOWARD WRONG WAY TRAFFIC.

TRAFFIC LANE LINES PAVEMENT MARKING DETAILS

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



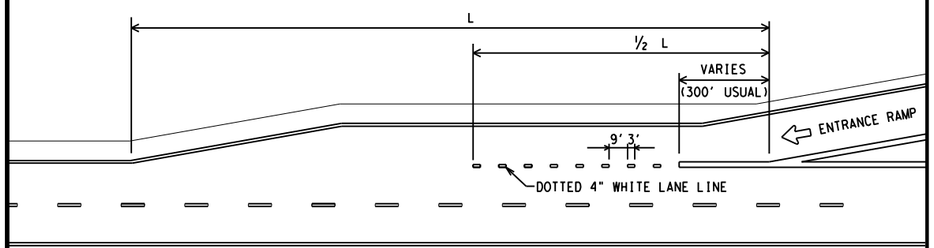
EDGELINE PAVEMENT MARKINGS



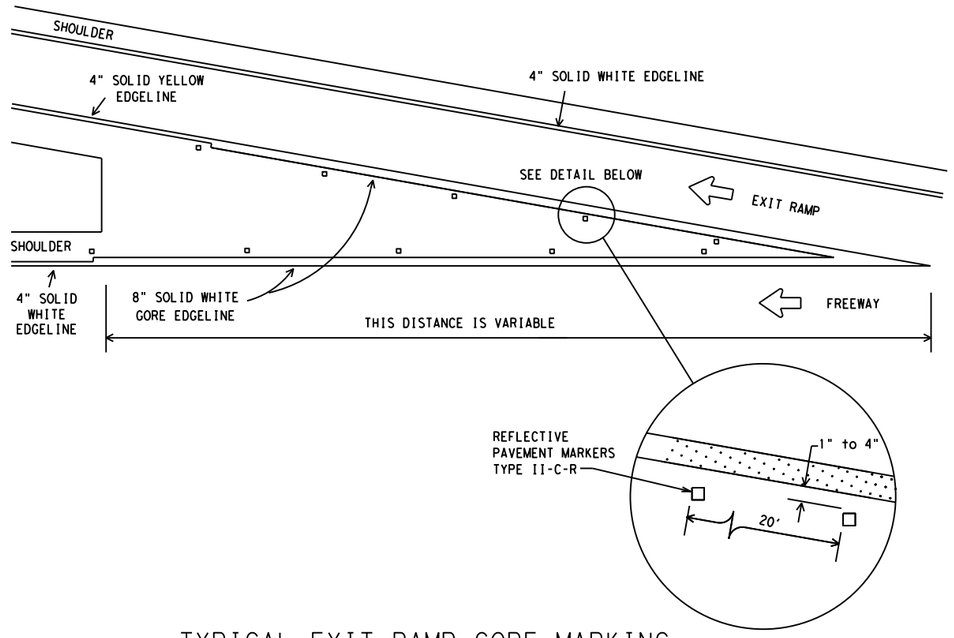
ALL RAISED MARKERS IN THE WRONG WAY ARROW SHALL BE TYPE I-R REFLECTORIZED PAVEMENT MARKERS WITH THE REFLECTORIZED SURFACE FACING THE WRONG WAY TRAFFIC. TYPE II-C-R SHALL NOT BE USED.

REFLECTORIZED WRONG WAY ARROWS, NOT TO EXCEED TWO, MAY BE PLACED ON EXIT RAMPS.
LOCATION OF THE ARROWS SHALL BE AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER.

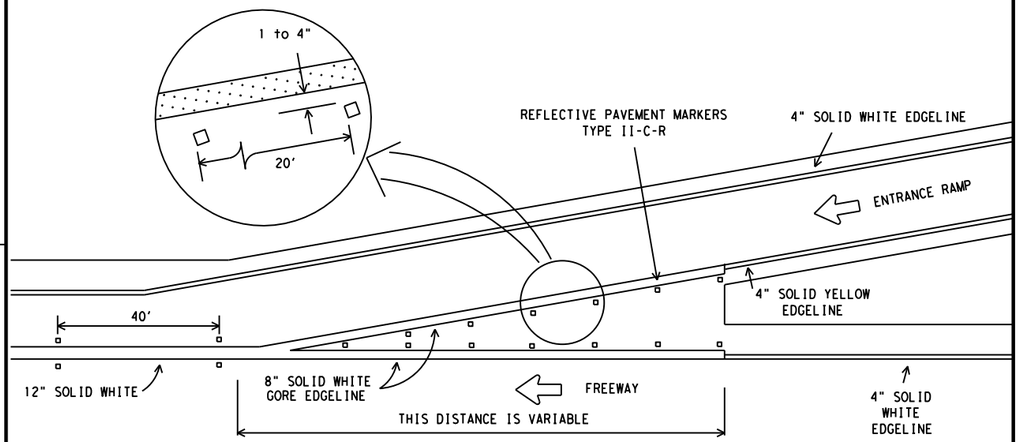
WRONG WAY ARROW DETAIL



PARALLEL ACCELERATION LANE

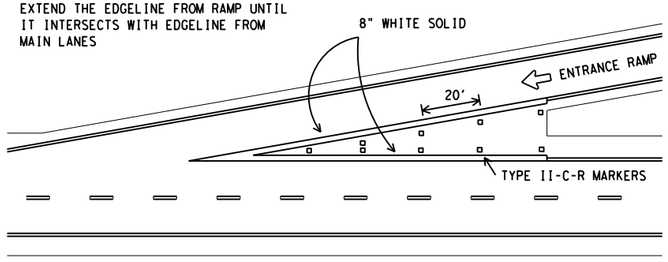


TYPICAL EXIT RAMP GORE MARKING



TYPICAL ENTRANCE RAMP GORE MARKING

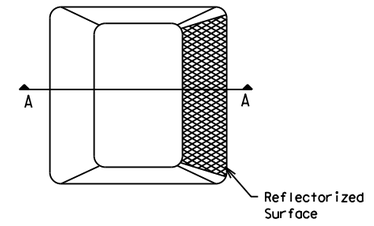
EXTEND THE EDGELINE FROM RAMP UNTIL IT INTERSECTS WITH EDGELINE FROM MAIN LANES



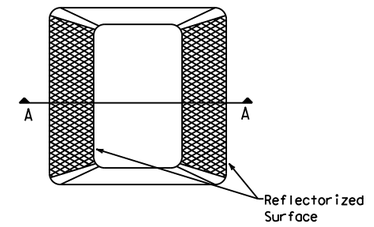
TAPERED ACCELERATION LANE

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

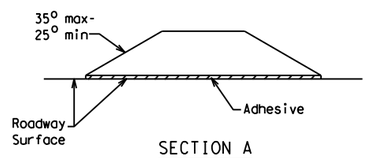
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

Texas Department of Transportation
Traffic Operations Division

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS WITH RAISED PAVEMENT MARKERS

FPM(1)-12

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

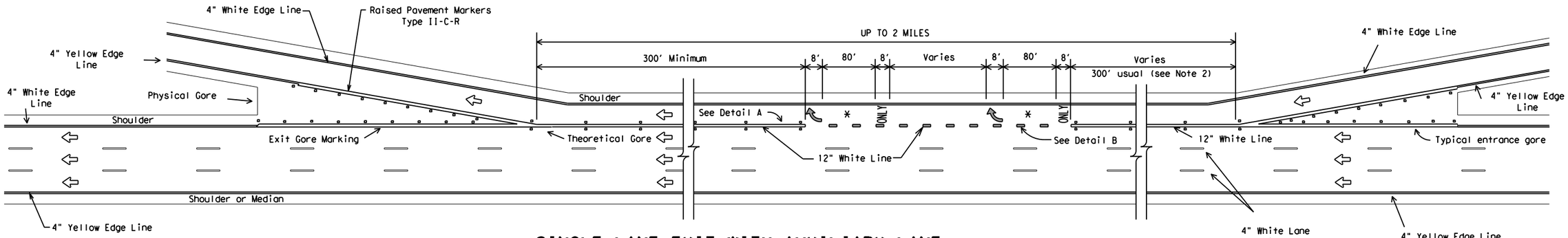
REVISIONS
4-92 2-10
5-00 2-12
8-00
2-08

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL375
DIST	COUNTY		SHEET NO.
ELP	EL PASO		109

23A

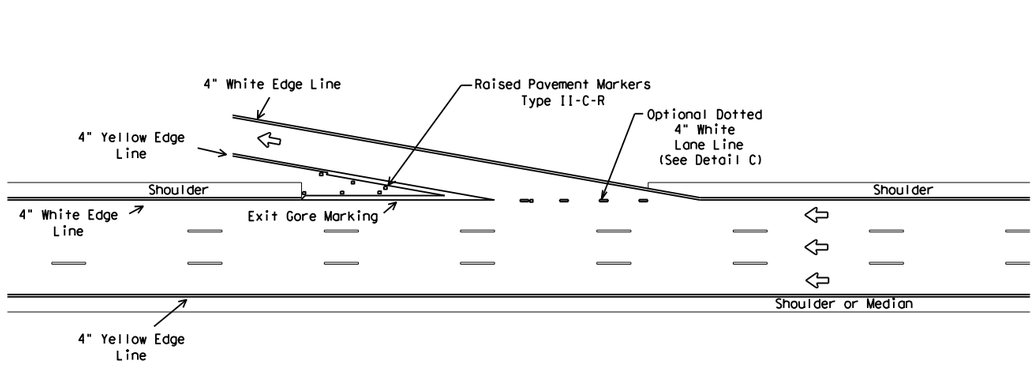
DATE:
FILE:

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.

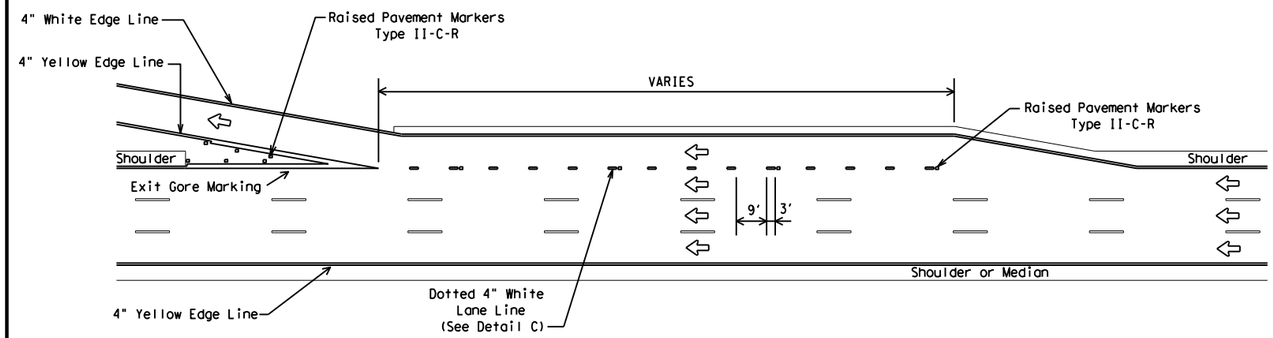


SINGLE LANE EXIT WITH AUXILIARY LANE

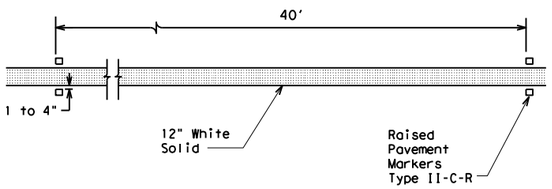
(See Note 2)



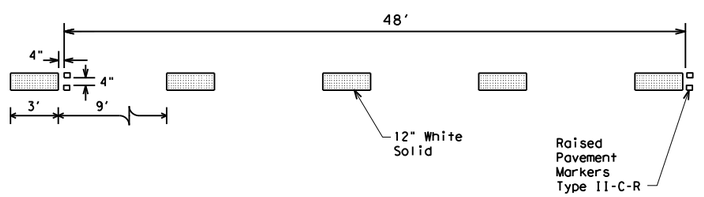
TAPERED DECELERATION LANE



PARALLEL DECELERATION LANE

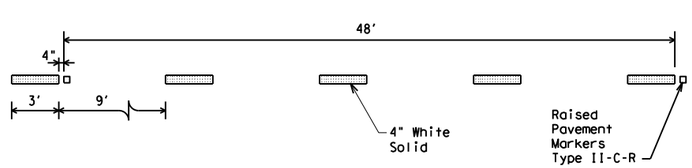


DETAIL A



DETAIL B

Wide (12") Dotted Lane Line (See Note 3)



DETAIL C

Normal (4") Dotted Lane Line (See Note 4)

GENERAL NOTES

1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Wide (12") Dotted Lane Line (See Detail B) is used to separate a through lane from a lane drop at normal exit ramp and from an auxiliary lane between an entrance and exit ramp.
4. Normal (4") Dotted Lane Line (See Detail C) is used at parallel acceleration and deceleration lanes.

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

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

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

Texas Department of Transportation
Traffic Operations Division

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS ENTRANCE AND EXIT RAMPS

FPM(2)-12

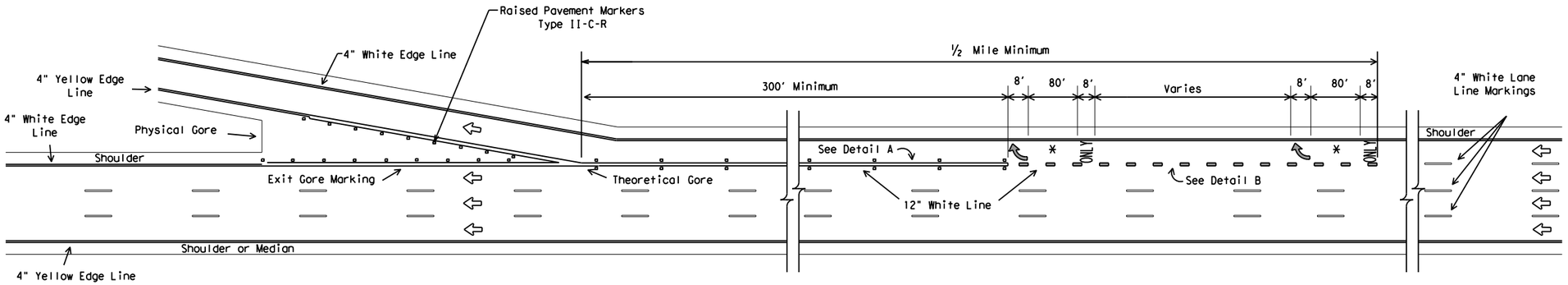
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
4-92 2-10
8-95 2-12
5-00
8-00

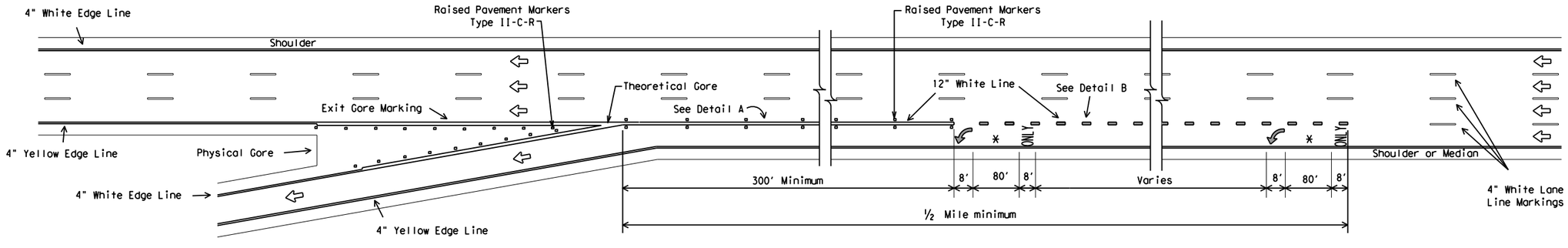
CONT	SECT	JOB	HIGHWAY
2552	04	046	SL375
DIST	COUNTY		SHEET NO.
ELP	EL PASO		110

23B

DATE:
FILE:



SINGLE LANE EXIT - LANE DROP OR EXIT ONLY

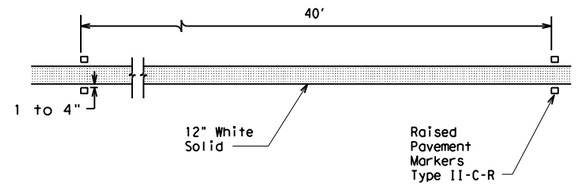


SINGLE LANE EXIT - LANE DROP OR EXIT ONLY (LEFTHAND)

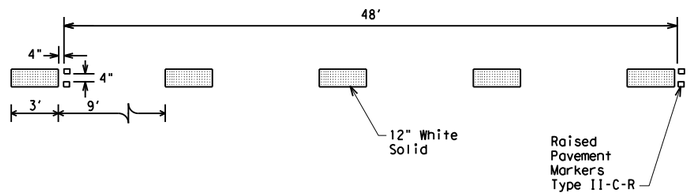
LEGEND	
⇦	Denotes direction of traffic.
↱	Pavement marking arrows (white)
*	Arrow markings are optional, however "ONLY" is required if arrow is used

GENERAL NOTES

1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Wide (12") Dotted Lane Line (See Detail B) is used to separate a through lane from a lane drop at normal exit ramp and from an auxiliary lane between an entrance and exit ramp.



DETAIL A



DETAIL B

Wide (12") Dotted Lane Line (See Note 3)

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

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

Texas Department of Transportation
Traffic Operations Division

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS LANE DROP (EXIT ONLY) EXIT RAMPS

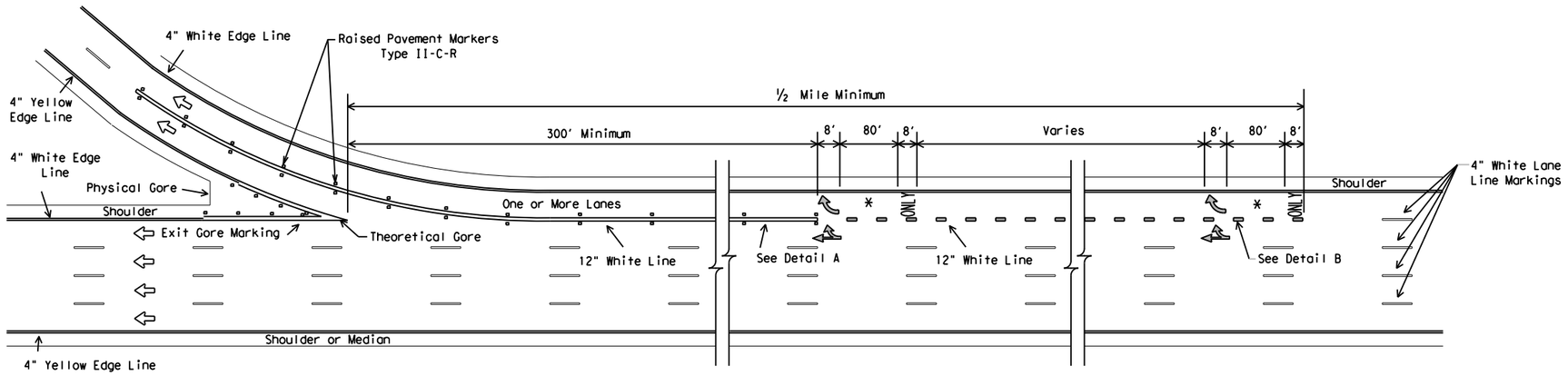
FPM(3)-12

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

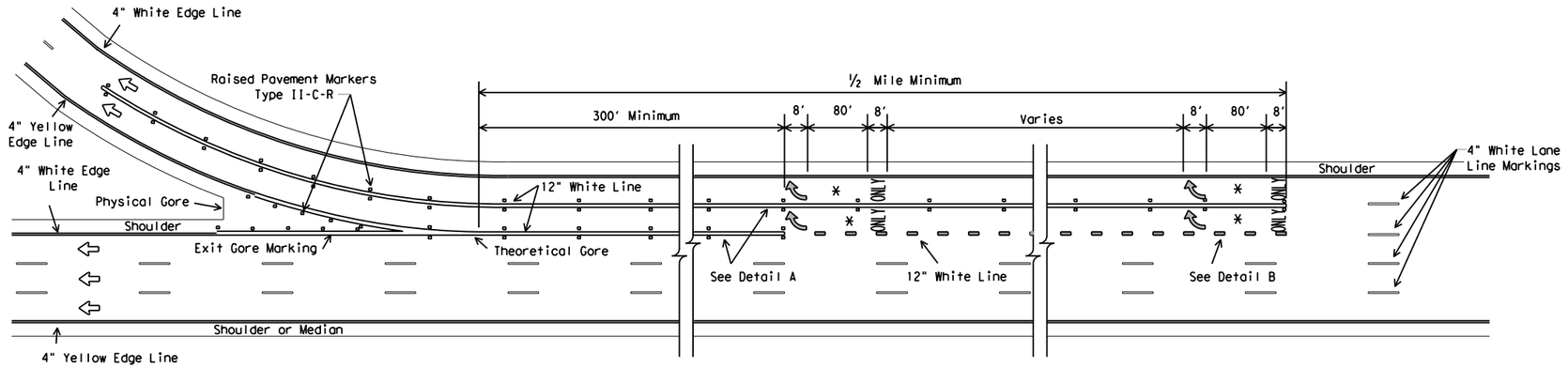
REVISIONS
5-00
8-00
2-10
2-12

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL375
DIST	COUNTY		SHEET NO.
ELP	EL PASO		111

DATE:
FILE:



MULTIPLE LANE EXIT - EXIT ONLY WITH OPTION LANE

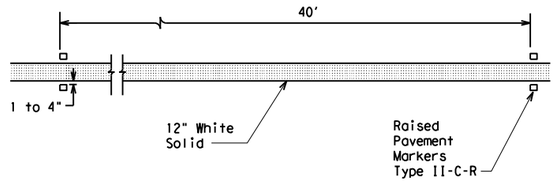


MULTIPLE LANE EXIT ONLY

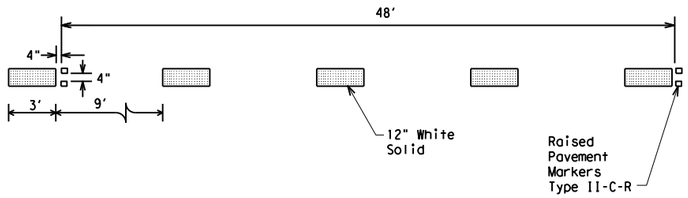
LEGEND	
⇦	Denotes direction of traffic
	Pavement marking arrow (white)
	Optional Pavement Marking Arrows (white)
✳	Arrow markings are optional, however "ONLY" is required if arrow is used

GENERAL NOTES

1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Wide (12") Dotted Lane Line (See Detail B) is used to separate a through lane from a lane drop at normal exit ramp and from an auxiliary lane between an entrance and exit ramp.



DETAIL A



DETAIL B

Wide (12") Dotted Lane Line (See Note 3)

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

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

Texas Department of Transportation
Traffic Operations Division

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

FPM(4)-12

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
5-00
8-00
2-10
2-12

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL375
DIST	COUNTY		SHEET NO.
ELP	EL PASO		112

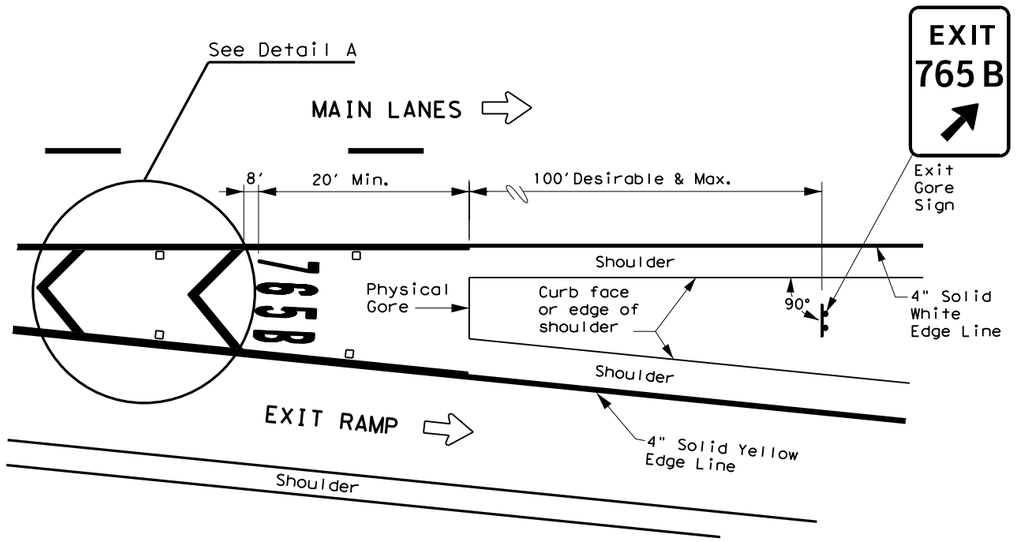
23D

DATE:
FILE:

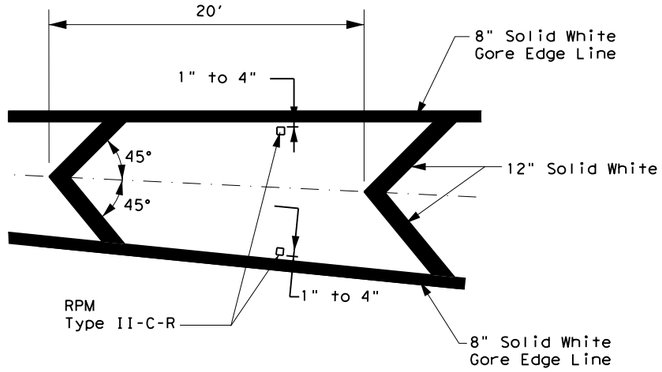
DATE:
FILE:

EXIT NUMBER PAVEMENT MARKING NOTES

1. Minimum 8 foot white 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. All pavement marking materials shall meet the required Departmental Material Specifications or as specified in these plans.
5. Numbers and Letters details can be found in the Standard Highway Design for Texas (SHSD) Chapter 12 at http://www.txdot.gov



MARKINGS WITH EXIT NUMBER



NOTES

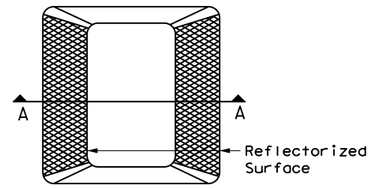
1. Raised pavement markers shall be centered between chevron or gore lines.
2. For more information, see Reflectorized Raised Pavement Marker Detail.

DETAIL A

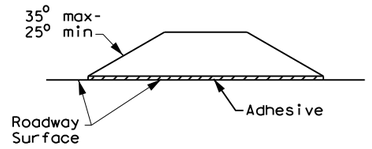
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

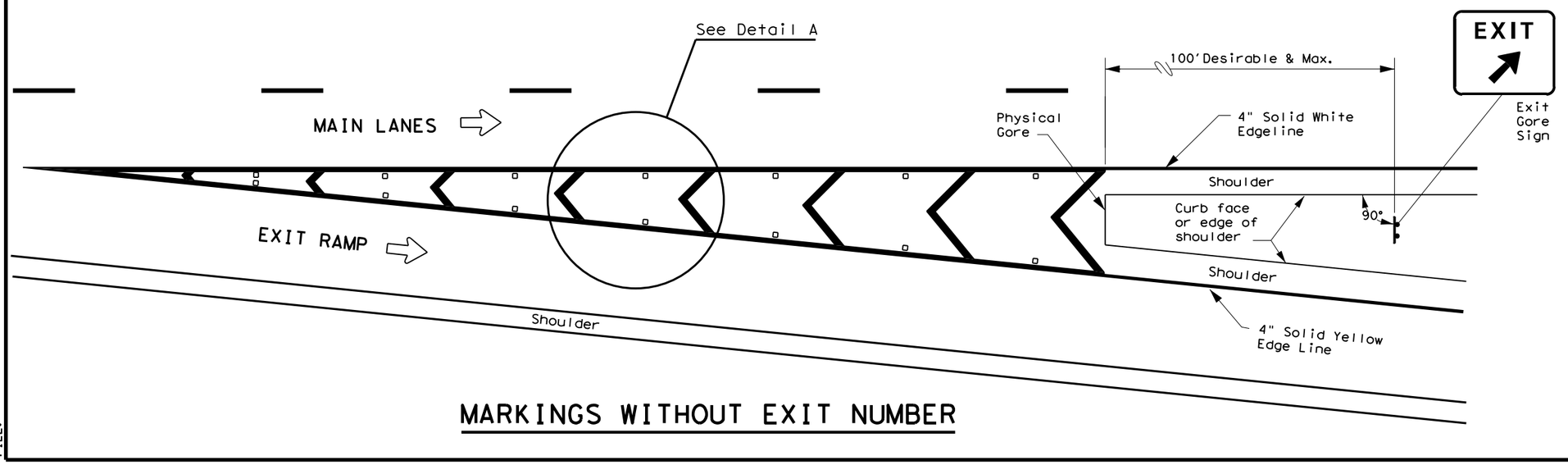
LEGEND	
⇦	Traffic flow
▫	Reflectorized Raised Markers (RPM) Type II-C-R



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

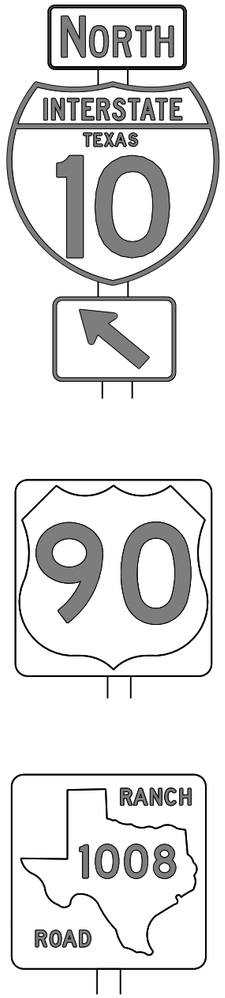
FPM(5)-19

FILE: fpm(5)-19.dgn	DN:	CK:	DW:	CK:
© TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	2552	04	046	SL375
	DIST	COUNTY		SHEET NO.
	ELP	EL PASO		113

DATE:
FILE:

REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

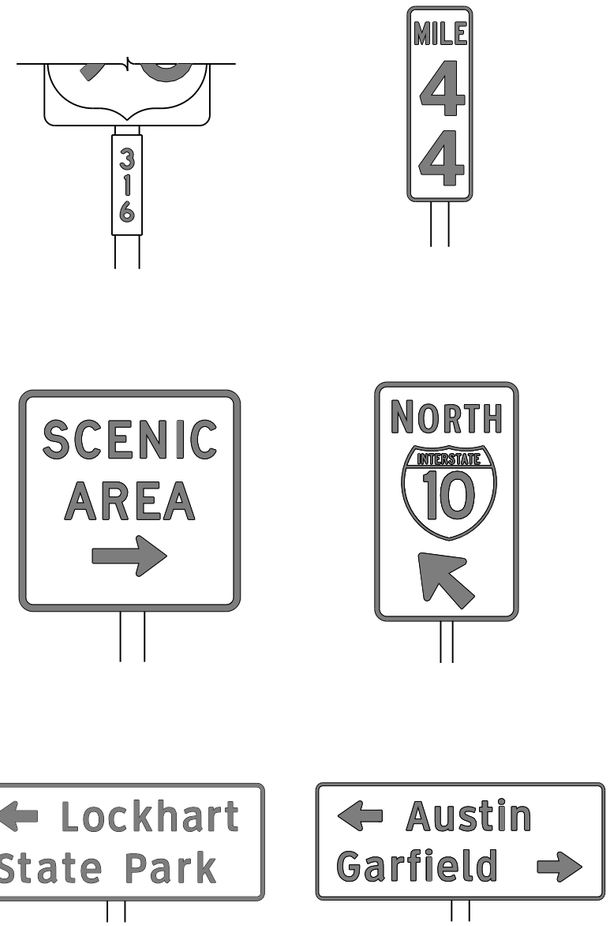
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



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

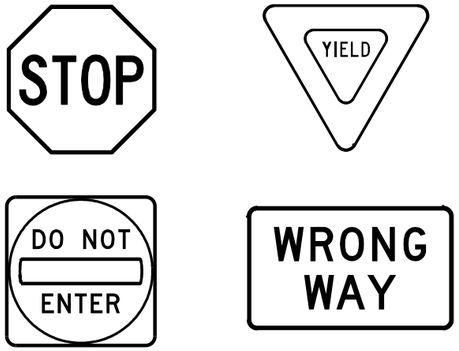
TYPICAL SIGN REQUIREMENTS

TSR(3)-13

FILE:	tsr3-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS		2552	04	046	SL375
12-03 7-13		DIST	COUNTY		SHEET NO.
9-08		ELP	EL PASO		114

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

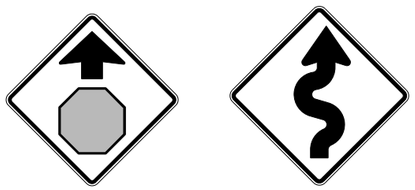
REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

(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
© TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	2552	04	046	SL375
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	ELP	EL PASO		115

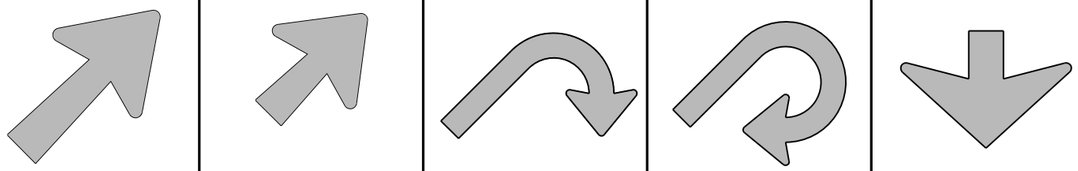
DATE:
FILE:

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.

DATE:
FILE:

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

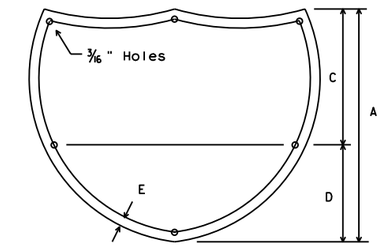
NOTE

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.

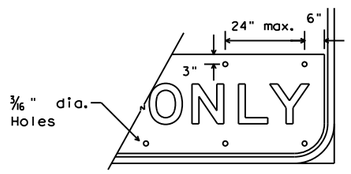
http://www.txdot.gov/

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

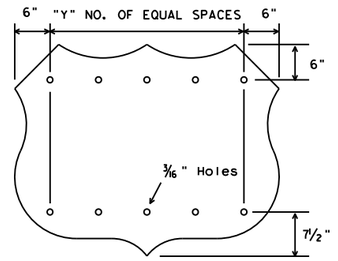


INTERSTATE ROUTE MARKERS

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

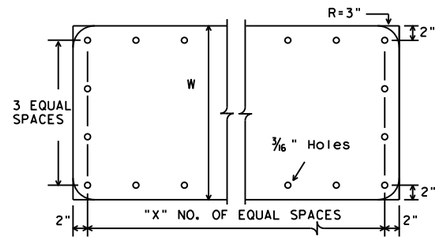


EXIT ONLY PANEL



U.S. ROUTE MARKERS

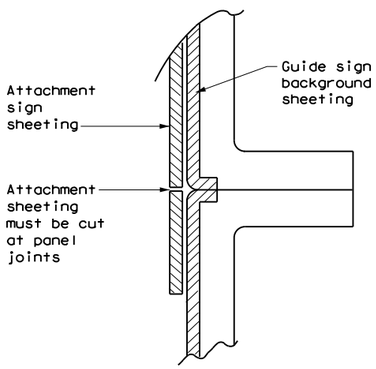
Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



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

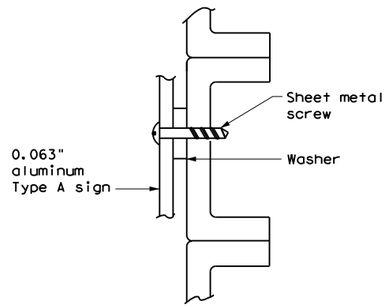
MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



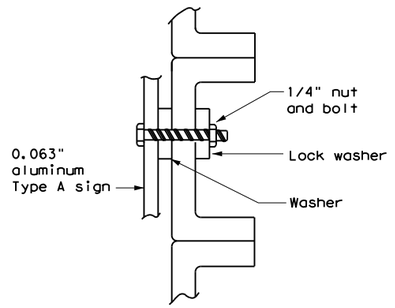
DIRECT APPLIED ATTACHMENT

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



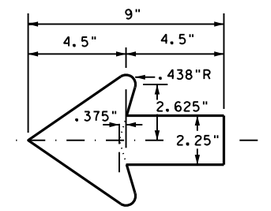
NUT/BOLT ATTACHMENT

NOTE:

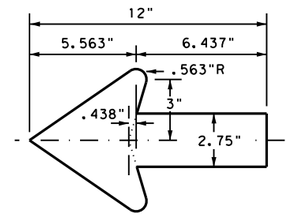
Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

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)

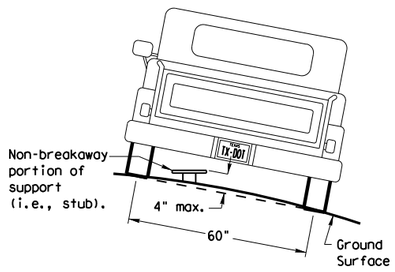
Anchor Type

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))

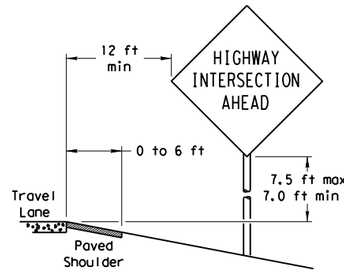
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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).

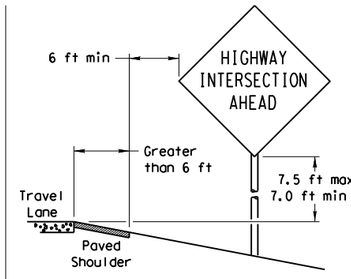
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

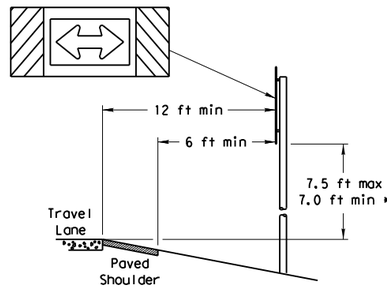
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



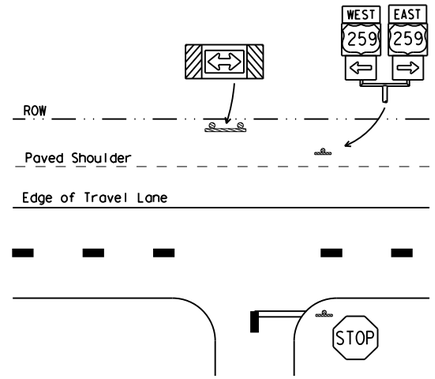
GREATER THAN 6 FT. WIDE

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.

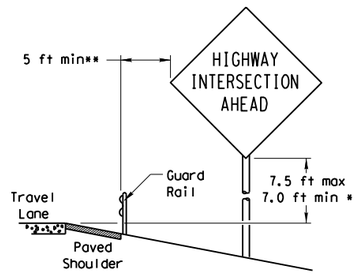
T-INTERSECTION



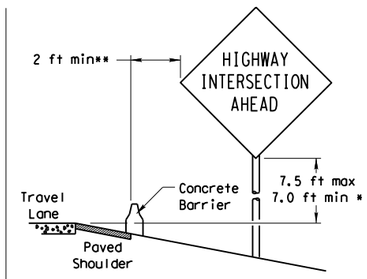
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



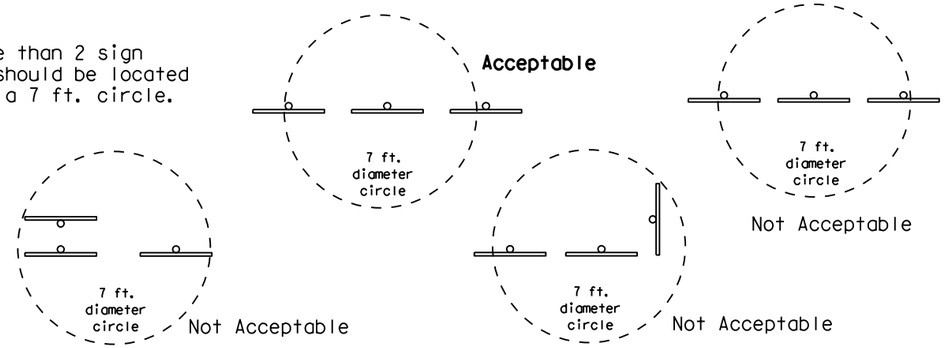
BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

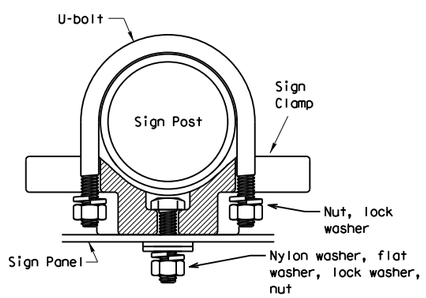
****Sign clearance based on distance required for proper guard rail or concrete barrier performance.**

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



TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

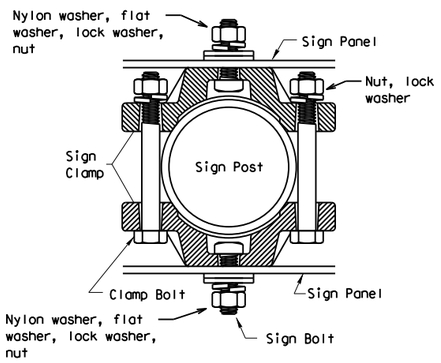


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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.

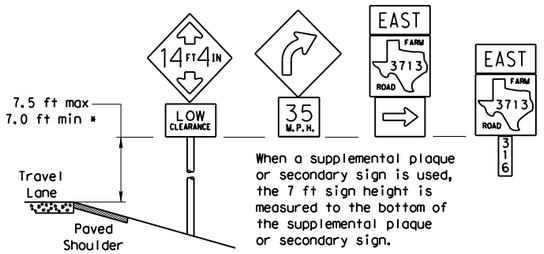
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



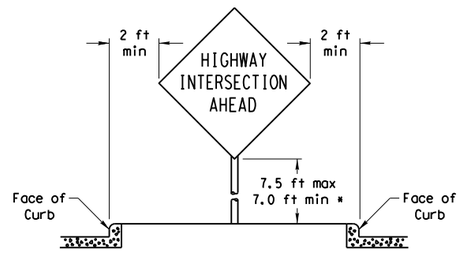
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



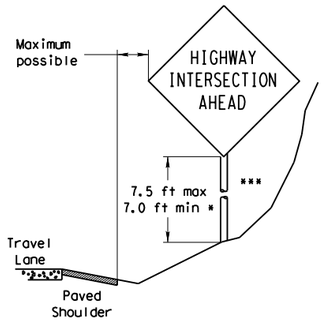
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

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.

* 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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

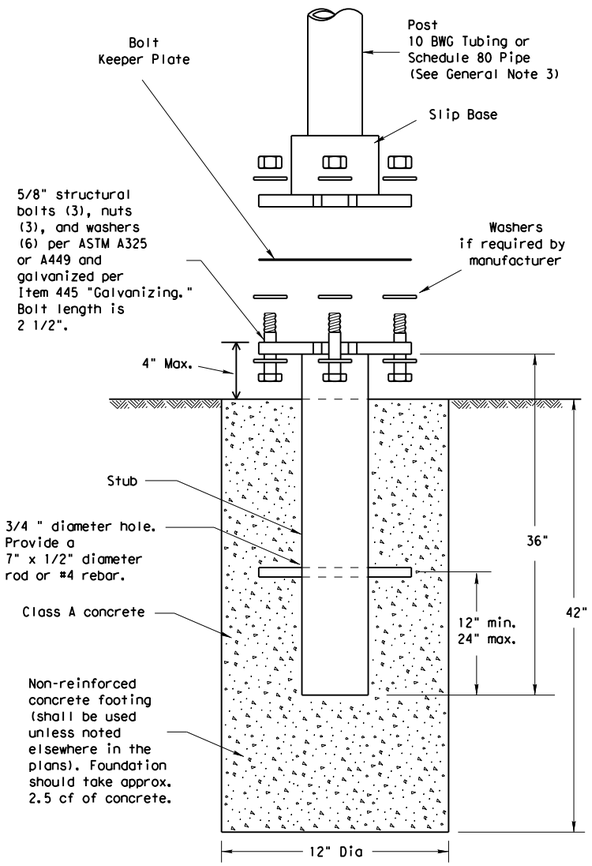
SMD(GEN)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS	CONT	SECT	JOB	HIGHWAY
9-08	2552	04	046	SL375
	DIST	COUNTY		SHEET NO.
	ELP	EL PASO		117

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.

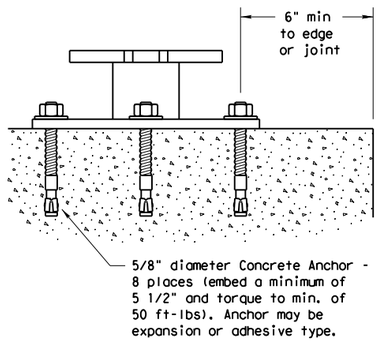
   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum 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

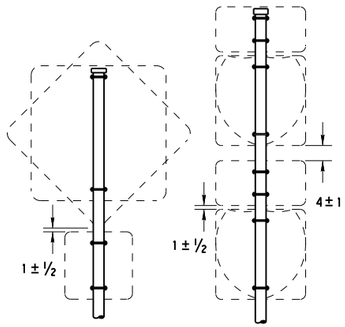
SMD(SLIP-1)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

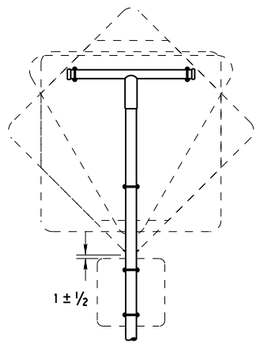
REVISIONS
9-08

CONT	SECT	JOB	HIGHWAY
2552	04	046	SL375
DIST	COUNTY		SHEET NO.
ELP	EL PASO		118

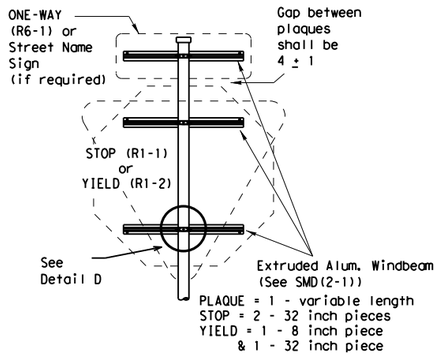
DATE:
FILE:



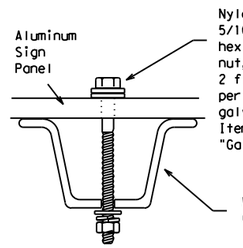
SM RD SGN ASSM TY XXXXX(1)XX(P)



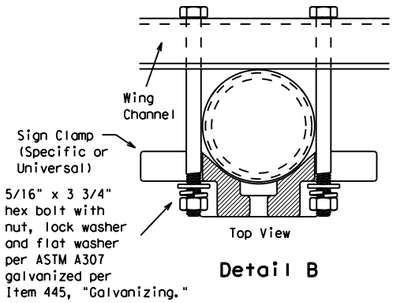
SM RD SGN ASSM TY XXXXX(1)XX(T)



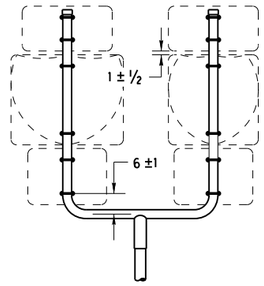
SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



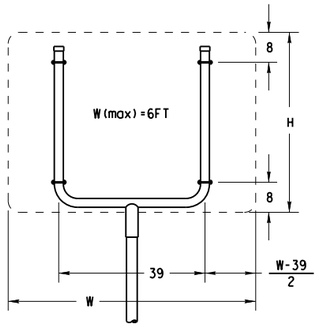
Detail A



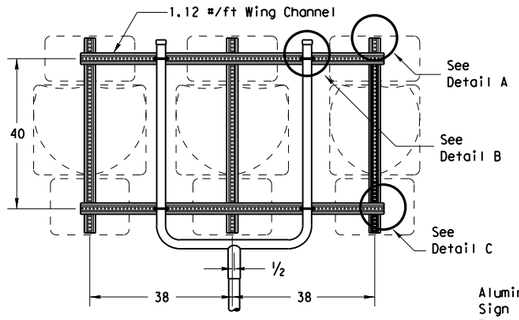
Detail B



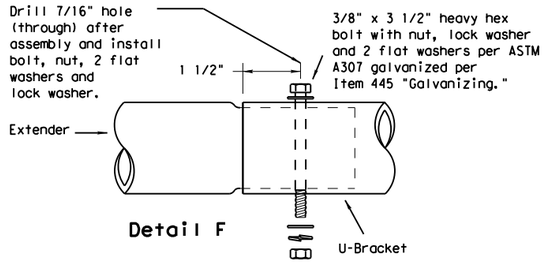
SM RD SGN ASSM TY XXXXX(1)XX(U)



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

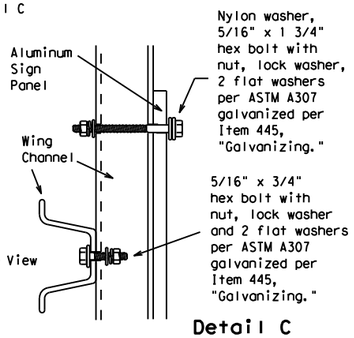


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

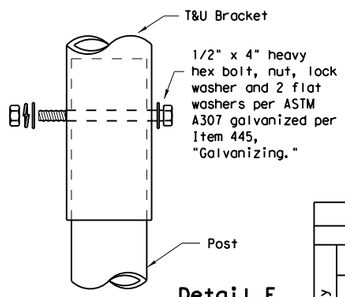


Detail F

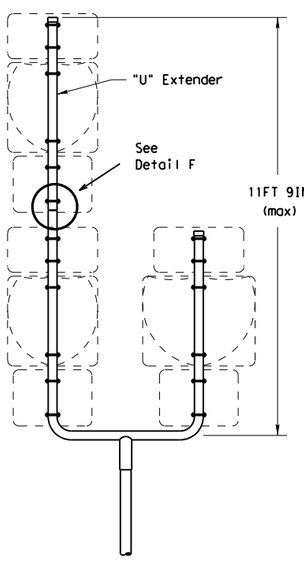
Splices shall only be allowed behind the sign substrate.



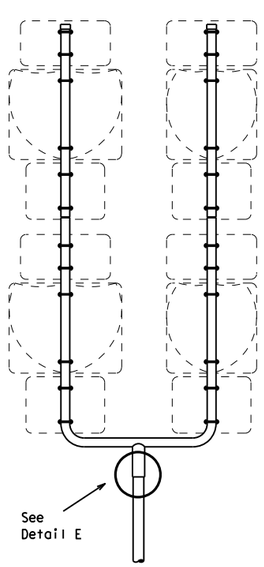
Detail C



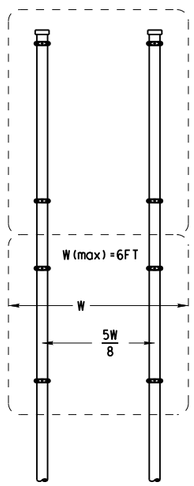
Detail E



SM RD SGN ASSM TY S80(1)XX(U-1EXT)

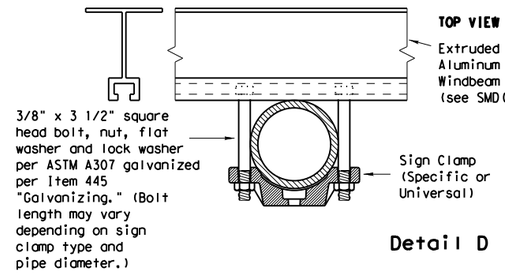


SM RD SGN ASSM TY S80(1)XX(U-2EXT)

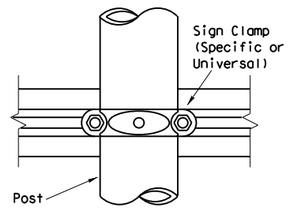


SM RD SGN ASSYM TY XXXXX(2)XX(P)

SIDE VIEW



Detail D



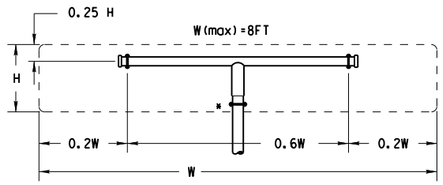
GENERAL NOTES:

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.

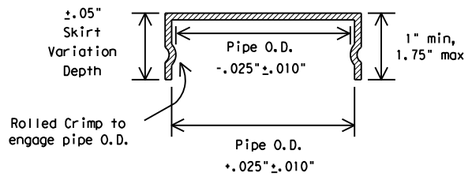
REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	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

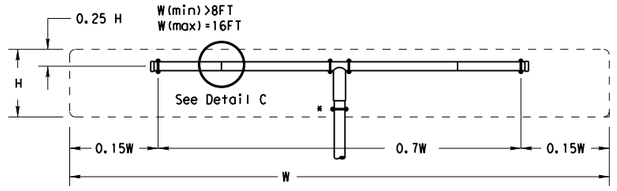
SMD(SLIP-2)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CONT	SECT	JOB	HIGHWAY
2552	04	046	SL375
DIST	COUNTY		SHEET NO.
ELP	EL PASO		119

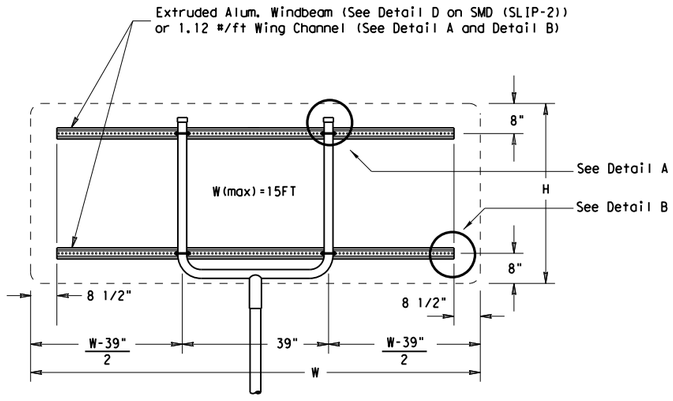
9-08 REVISIONS

DATE:
FILE:

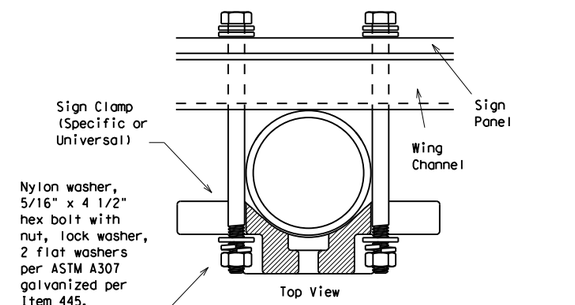
DATE:
FILE:



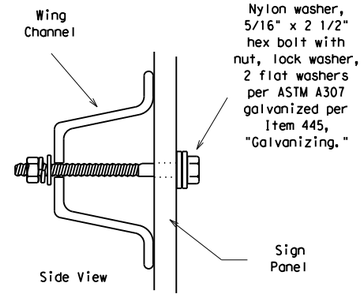
SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)



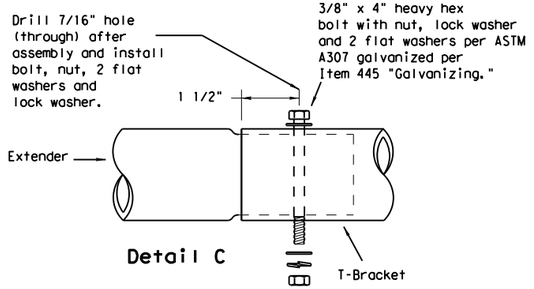
SM RD SGN ASSM TY XXXXX(1)XX(U-XX)



Detail A

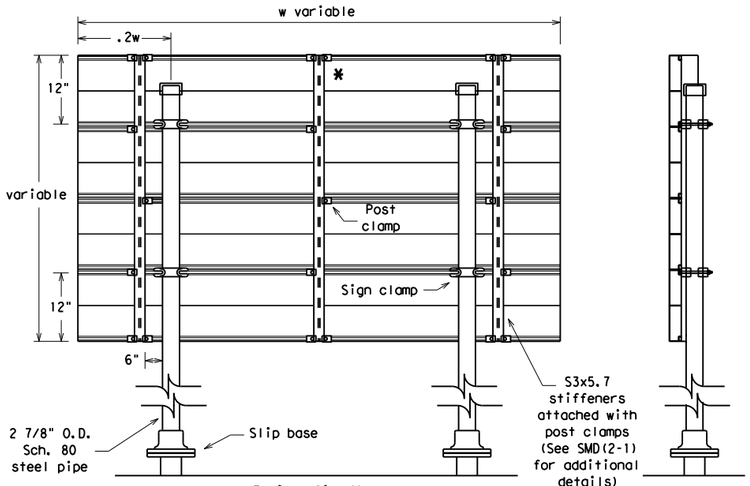


Detail B



Detail C

Splices shall only be allowed behind the sign substrate.

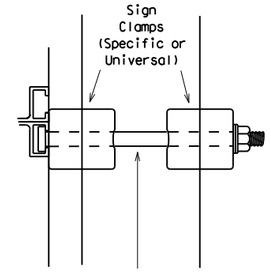


Typical Sign Mount

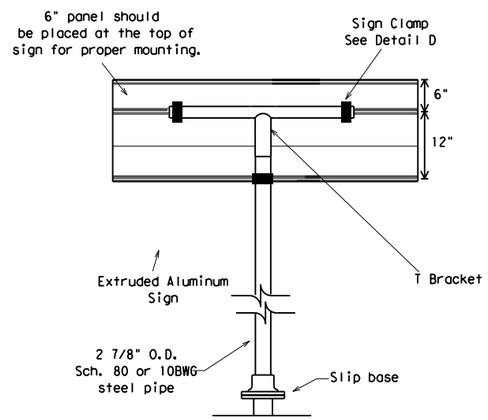
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

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

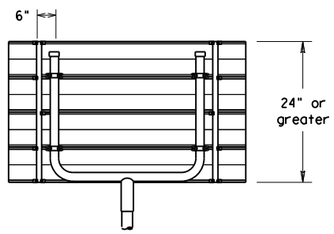
See Detail E
for clamp installation



Detail E



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

Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET

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. 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.
2. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
3. 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.
4. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
5. 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.
6. 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.
7. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
8. 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."
9. Sign blanks shall be the sizes and shapes shown on the plans.
10. 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.
11. 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)

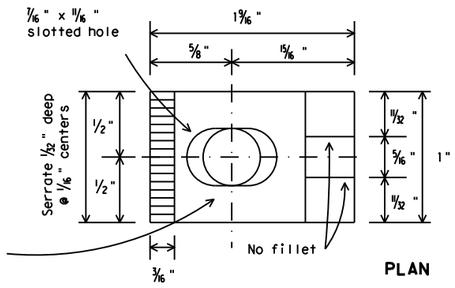
Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

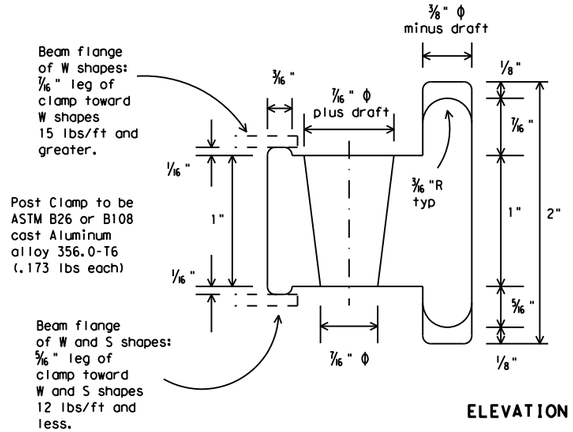
REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	2552	04	046	SL375
	DIST	COUNTY		SHEET NO.
	ELP	EL PASO		120

DATE:
FILE:



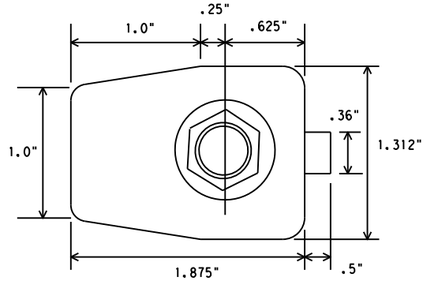
NOTE: centerline of hole for 3/8" diameter squarehead bolt x 2 1/4" long with a flat washer and self-locking nut, or lock washer and hex. nut. Bolt head dimensions shall be in accordance with ANSI B 18.2.1 as referred to in the AISC Manual of steel construction. Bolt assembly shall be galvanized.

PLAN

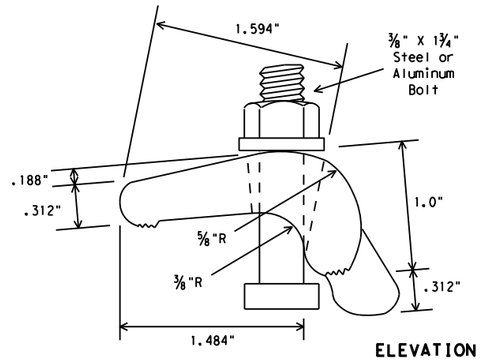


ELEVATION

POST CLAMP DETAIL

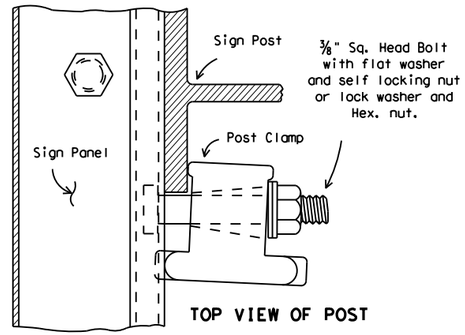


PLAN

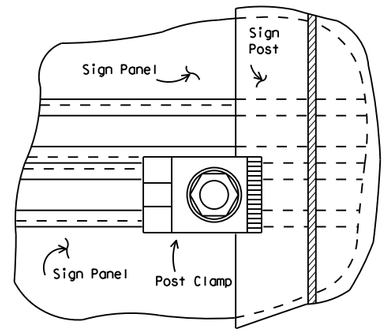


ELEVATION

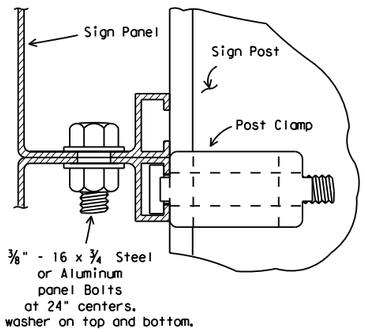
ALTERNATE POST CLAMP DETAIL



TOP VIEW OF POST



TOP VIEW OF CLAMP



SIDE VIEW OF PANELS

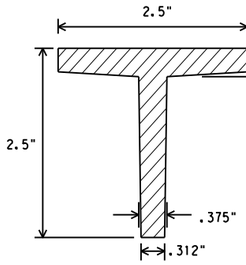
CONNECTION DETAILS

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.

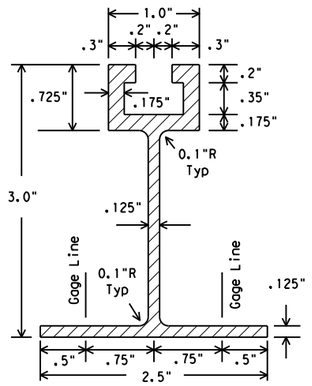


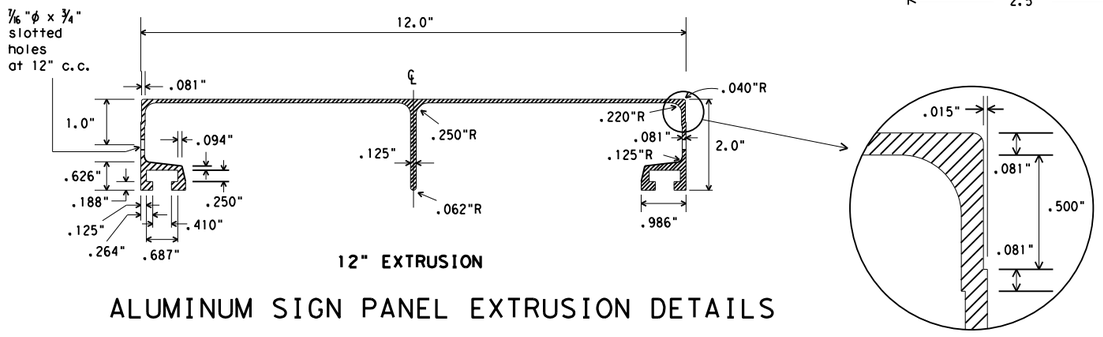
1.912 lbs/ft

ALUMINUM T SECTION OR APPROVED ALTERNATIVE

WINDBEAM CROSS SECTION

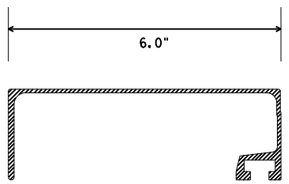
Windbeam to be extruded aluminum (1.175 lbs/ft) or approved alternative



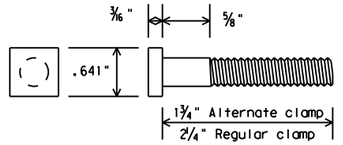


12" EXTRUSION

ALUMINUM SIGN PANEL EXTRUSION DETAILS



6" EXTRUSION



POST CLAMP BOLT DETAIL

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS- EXTRUDED ALUMINUM SIGN PANELS & HARDWARE

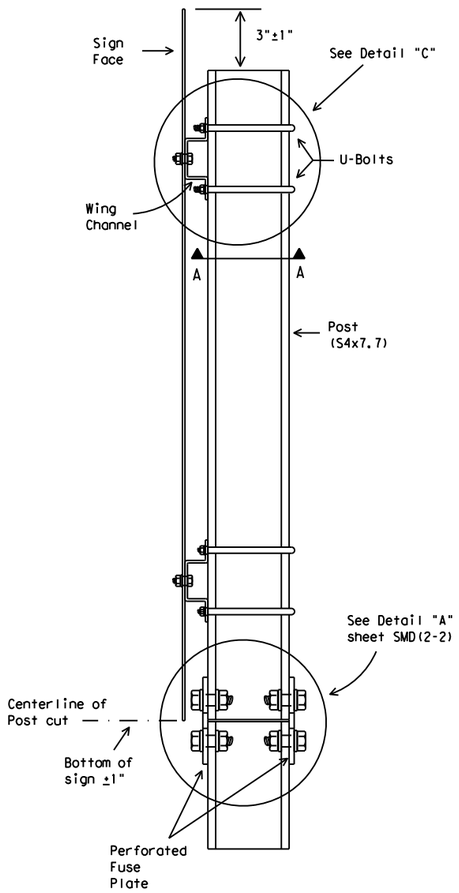
SMD(2-1)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

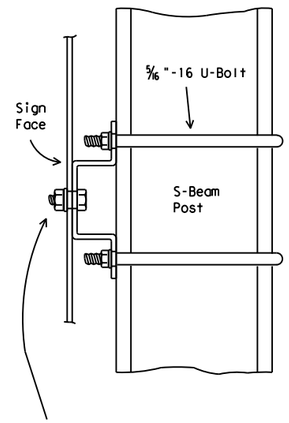
REVISIONS	CONT	SECT	JOB	HIGHWAY
9-08	2552	04	046	SL375
	DIST	COUNTY		SHEET NO.
	ELP	EL PASO		121

DATE:
FILE:

WING CHANNEL CLAMP DETAIL FOR TYPE G MOUNT

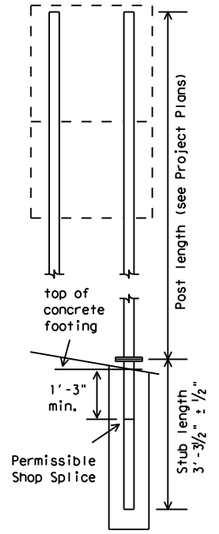


SIDE VIEW



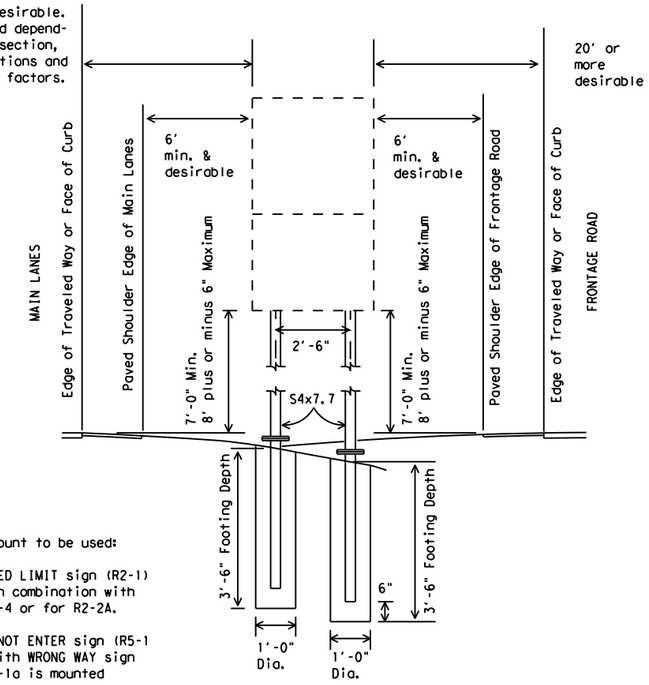
Galvanized steel or aluminum self-locking hex. head nut. 3/8 " - 16 x 3/4 " hex. head bolt for sheet metal. 3/8 " - 16 x 1 1/4 " hex. head bolt for plywood. 3/8 " galvanized medium washer.

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.

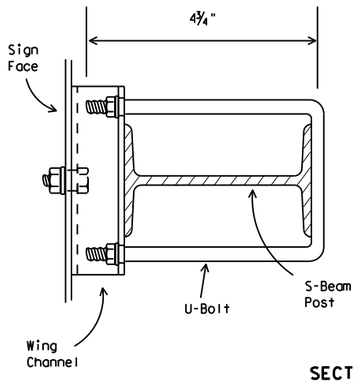
30' or more desirable. May be reduced depending on cross section, viewing conditions and other related factors.



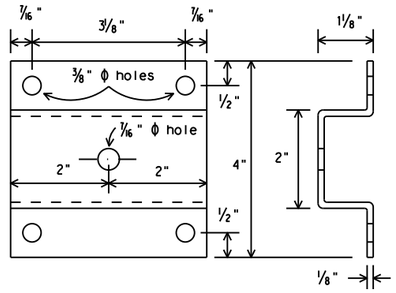
This type mount to be used:

(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.



SECTION A-A



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).

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
2552	04	046	SL375
DIST	COUNTY		SHEET NO.
ELP	EL PASO		122

1. SITE OR PROJECT DESCRIPTION:

NATURE OF THE CONSTRUCTION ACTIVITY: SEE TITLE SHEET

POTENTIAL POLLUTANTS AND SOURCES:

Sediment laden storm water	*Construction vehicles and storage areas*
Fuels, oils, and lubricants	*Various construction activities*
Construction debris and waste	*Restroom facilities*
Sanitary waste	*Construction site and Receptacles*
Trash	

SEQUENCE OF ACTIVITIES THAT WILL DISTURB SOILS:

1. *Removal and replacement of Metal Beam Guard Fence.*
2. *Removal and replacement of concrete riprap.*
3. *Removal and replacement of sign supports.*
4.
5.
6.
7.

AREAS:

TOTAL AREA OF PROJECT: 29.17 ACRES

TOTAL AREA OF SOIL DISTURBANCE: 0.59 ACRES

TOTAL AREA OFF-SITE:

WEIGHTED RUNOFF COEFFICIENT (BEFORE AND AFTER CONSTRUCTION): *N/A*

GENERAL LOCATION MAP: SEE TITLE SHEET

THE LOCATION AND DESCRIPTION OF CONCRETE AND ASPHALT PLANTS:

Supporting Concrete Plant Facilities shall be located off site.

Supporting Asphalt Plant Facilities shall be located off site.

NAME OF RECEIVING WATERS: *N/A*

401 WATER QUALITY CERTIFICATION: YES____ NO__X__

2. BEST MANAGEMENT PRACTICES (BMPs):

EROSION AND SEDIMENT CONTROLS: Erosion and sediment controls have been designed to retain sediment on-site. Controls shall be utilized to reduce off site transport of suspended sediments and pollutants if it is necessary to pump water from the site. Control measures shall be installed per specifications or as directed. Sediment must be removed from controls per manufacturers recommendations, but no later than the time that design capacity has been reduced by 50%. If sediment escapes the site, accumulations will be removed to minimize further negative effects. Controls will be developed to limit the off site transportation of litter, construction debris, and construction materials.

INTERIM(INT), PERMANENT(PER), AND 401 CERTIFICATION BMP'S:

EROSION CONTROLS:	401	INT	PER
☒ *Compaction & Tracking of slopes*			
☒ *Diversion Dike*			
☒ *Preserve Existing Vegetation*			
☒ *Soil Stabilization*			
☒ *Permanent Vegetation*			
☒ *No Erosion Controls are Required.*			

SEDIMENT CONTROLS:	401	INT	PER
☒ *Silt Fence*			
☐ *Rock Berm*			
☐ *Buffer Zones*			
☒ *Erosion Control Logs*			
☒ *Ditch Block*			
☐ *No Sediment Controls are Required.*			

POST CONSTRUCTION TSS CONTROL (401 CERTIFICATION ONLY):

☐ *Vegetation Lined Drainage Ditch*	☐ *Grassy Swales*
☐ *Retention/Irrigation*	☐ *Vegetative Filter Strips*
☐ *Erosion Control Compost*	☒ *No Post Construction TSS Control Required.*

The El Paso District of the Texas Department of Transportation uses Site-Manager, a computer based construction record-keeping system. Documentation describing grading activities, temporary or permanent cessation of construction, and stabilization measures is a part of this system and is incorporated by reference into this SWPPP.

5. OTHER CONTROLS:

OFF-SITE VEHICLE TRACKING OF SEDIMENTS AND THE GENERATION OF DUST: The off site vehicle tracking of sediments shall be minimized by removal of excess dirt from the road and at entrances to the work site. The generation of dust will be minimized as directed by the Project Engineer by dampening haul roads and covering haul trucks with a tarpaulin.

CONSTRUCTION AND WASTE MATERIALS: The contractor will maintain a clean, orderly construction site. Construction waste including trash, rubble, scrap and vegetation shall be disposed of in lidded dumpsters or in a manner approved by the Project Engineer. Disposal methods must meet Federal, State, and Local waste management guidelines. No construction waste will be buried or burned on site. Spoils disposal, material storage, and materials resulting from the destruction of existing roads and structures shall be stored in areas designated by the Project Engineer and protected from run-off. All waterways shall be cleared of temporary embankment, temporary bridges, matting, false work, piling, debris, or other obstructions placed during construction operations, that are not part of the finished work, as soon as practicable. All excess soil generated by the construction will be collected and disposed of by the contractor. Disposal areas, stockpiles, and haul roads shall be constructed in a manner that will minimize and control the amount of sediment that may enter receiving waters. Disposal areas shall not be located in any wetland, water body, or stream bed.

POLLUTANT SOURCES FROM AREAS OTHER THAN CONSTRUCTION: Staging areas and vehicle maintenance areas shall be located and constructed in a manner to minimize the runoff of pollutants. If potential pollutant sources are identified after the start of construction, controls and measures shall be implemented as directed by the Project Engineer.

5. OTHER CONTROLS (CONT):

DEDICATED ASPHALT PLANTS: Asphalt or asphaltic material for this project will be produced off site. If the project requires a dedicated asphalt plant and the plant within 1 mile of the project limits it will be considered an off site PSL. Consideration shall be given to on site plant and storage facilities and measures implemented as directed by the Project Engineer.

DEDICATED CONCRETE PLANTS: Cement or Concrete material for this project will be produced off site. If the project requires a dedicated concrete plant and the plant is within 1 mile of the project limits it will be considered an off site PSL. Consideration shall be given to on site plant and storage facilities and measures implemented as directed by the Project Engineer. Concrete trucks shall be wasted or washed out in locations designated by the Project Engineer. The locations shall be protected by a berm sufficient to contain all waste and wash water. Wash water shall not be allowed to enter any storm drainage system or waterway. The residual material and contaminated soil shall be collected and disposed of in accordance with Federal, State, and Local guidelines. Staging areas and vehicle maintenance areas shall be located and constructed in a manner to minimize the runoff of pollutants.

HAZARDOUS MATERIALS AND SPILL REPORTING: The contractor shall take appropriate measures to prevent, minimize, and control the spillage or leakage of hazardous materials and any associated wastes on site and in maintenance and staging areas. hazardous materials shall include but are not limited to paints, acids, solvents, asphalt products, chemical additives, curing compounds, oils, fuels, and lubricants. Hazardous materials shall not be stored, accumulated, or transported in open containers subject to precipitation or spillage, but shall be stored, accumulated, or transported in closed containers of the type recommended by the manufacturer. In the event of a spill the Project Engineer should be contacted immediately. All spills shall be immediately cleaned and any contaminated soil removed and disposed of in accordance with Local, State, and Federal laws. Fuel tanks shall be protected by a secondary containment, such as a lined berm, capable of containing 1.5 times the capacity of the tank, or as approved by the Project Engineer.

OFF SITE PSLs: All off site project specific locations including dedicated asphalt plants, concrete plants, or utility installations, required by the contractor, are the contractor's responsibility. The contractor shall secure all permits required by local, state, or federal laws for off site PSLs. The contractor shall provide diagrams and areas of disturbance for all PSL's within 1 mile of the project.

SANITARY FACILITIES: All sanitary or septic wastes that are generated onsite shall be treated and disposed of in accordance with state and local regulations. Raw sewage or septage shall not be discharged or buried on site. Precaution shall be taken to prevent illicit discharges to storm water. Licensed waste management contractors shall be required to dispose of sanitary waste. Porta johns will be required for the construction site or as directed by the Project Engineer.

VELOCITY DISSIPATION DEVICES: Velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel as shown in the plans or as directed by the Project Engineer to provide a non-erosive flow velocity from the structure to a watercourse so that the natural physical and biological characteristics and functions are maintained and protected.

7. MAINTENANCE:

Control measures shall be properly installed according to specifications. If inspections or other information indicates a control has been installed, used, or is performing inadequately, the contractor must replace or modify the control as soon as practicable after discovery. Control measures shall be maintained in effective operating condition. If inspections determine that BMPs are not operating effectively maintenance will be performed as necessary to continue the effectiveness of the controls. Maintenance must be accomplished as soon as practicable. Controls adjacent to creeks, culverts, bridges, and water crossings shall have priority. Controls that have been disabled, run over, removed, or otherwise rendered ineffective must be corrected immediately upon discovery.

8. INSPECTION OF CONTROLS:

A TxDOT inspector will inspect disturbed areas of the site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, and structural controls for evidence of, or the potential for, pollutants entering the drainage system. Sediment and erosion controls measures identified in the SWP3 will be inspected to ensure that they are operating correctly. Locations where vehicles enter or exit the site will be inspected for evidence of off-site vehicle tracking.

9. NON-STORM WATER COMPONENTS:

The contractor shall be required to implement appropriate pollution prevention controls and measures for all eligible non-storm water components of the discharge as approved and directed by the Project Engineer.

STATE OF TEXAS
MONICA RUIZ
131235
LICENSED PROFESSIONAL ENGINEER

Monica Ruiz, P.E.

05/05/2021

TxDOT STORM WATER POLLUTION PREVENTION PLAN (SWP3)

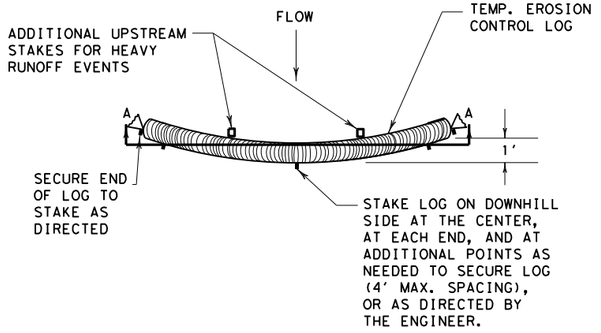
(SOIL DISTURBANCE LESS THAN 1 ACRE)

Texas Department of Transportation

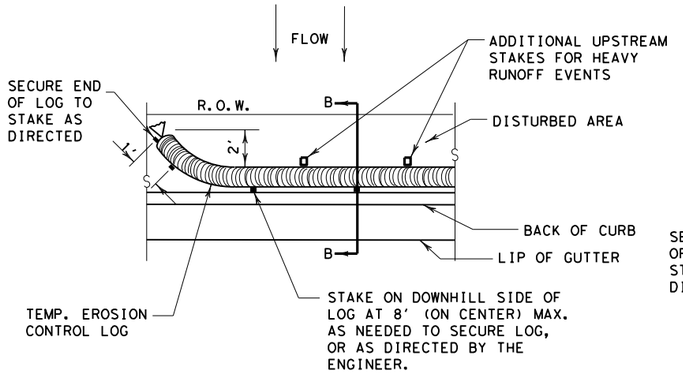
FED. RD. DIV. NO.			SHEET NO.
6			123
STATE	STATE DIST.	COUNTY	
TEXAS	ELP	EL PASO	
CONT.	SECT.	JOB	HIGHWAY NO.
2552	04	046	SL 375

REV: 07-2014

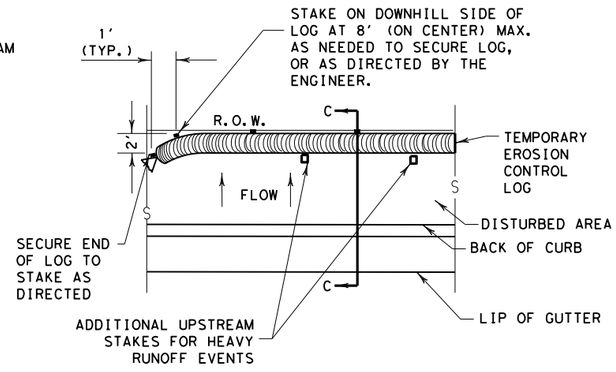
DATE:
FILE:



PLAN VIEW



PLAN VIEW



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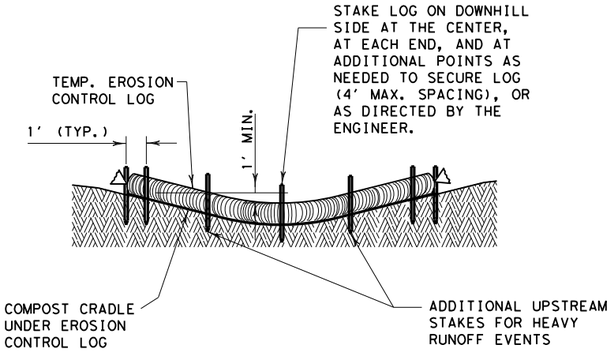
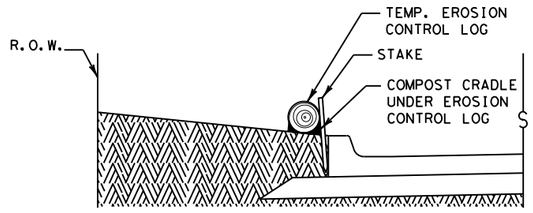


SECTION A-A

EROSION CONTROL LOG DAM

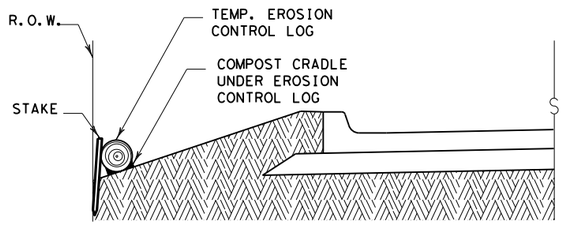
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

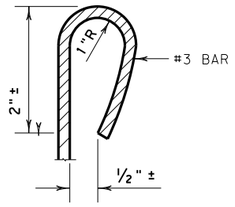
CL-BOC



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.

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.

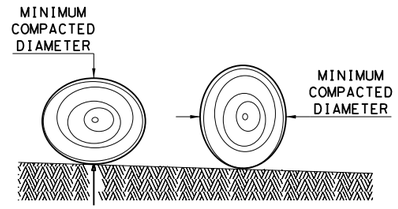
Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

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.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

Texas Department of Transportation

Design Division Standard

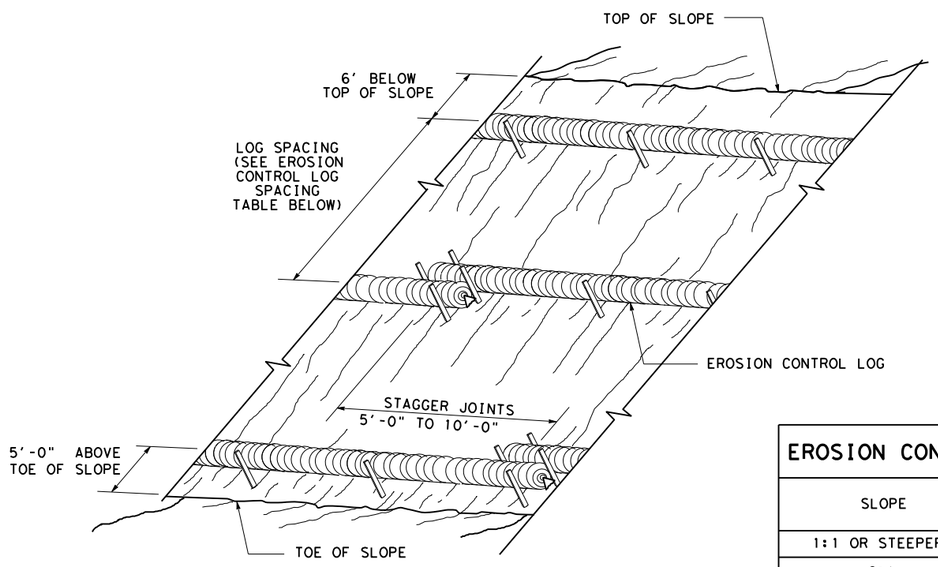
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

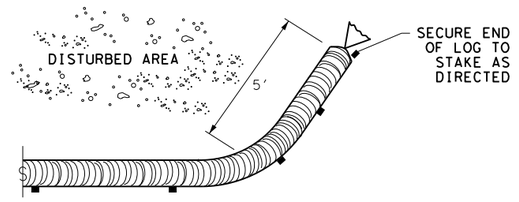
FILE: ec916		DN: TxDOT	CK: KM	DW: LS/PT	CK: LS		
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY			
REVISIONS	2552	04	046	SL 375			
	DIST	COUNTY		SHEET NO.			
	24	EL PASO		124			

DATE:
FILE:



EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

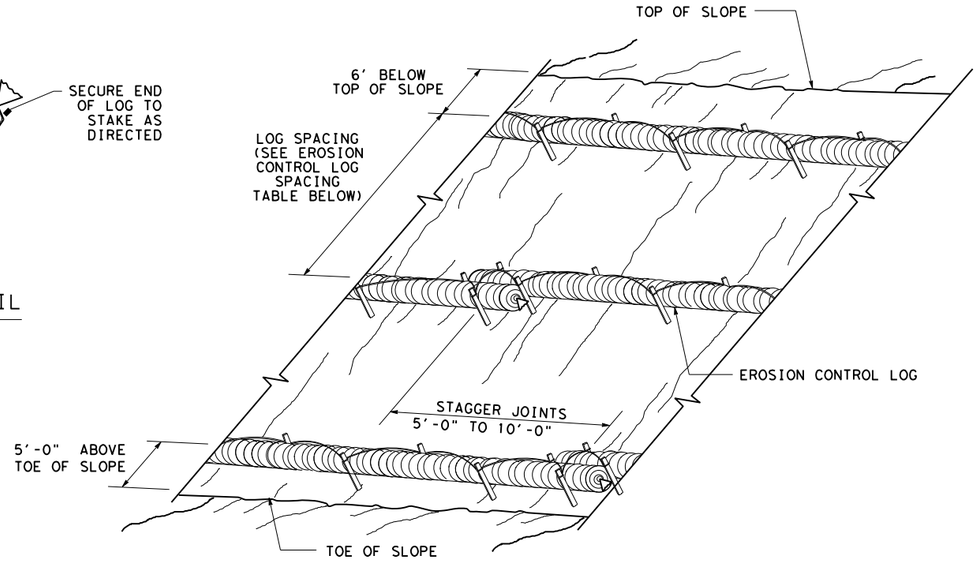
CL-SST



END SECTION RAP DETAIL

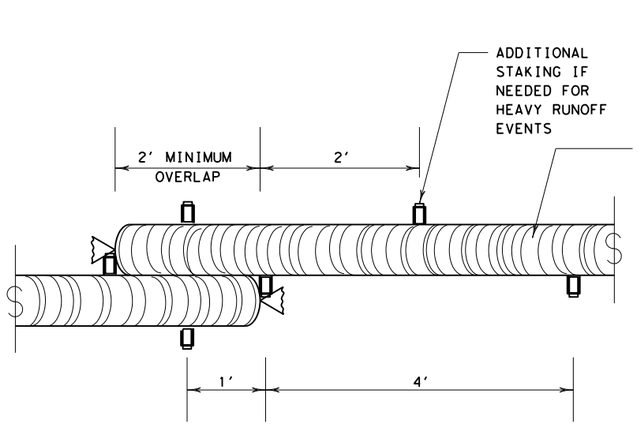
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

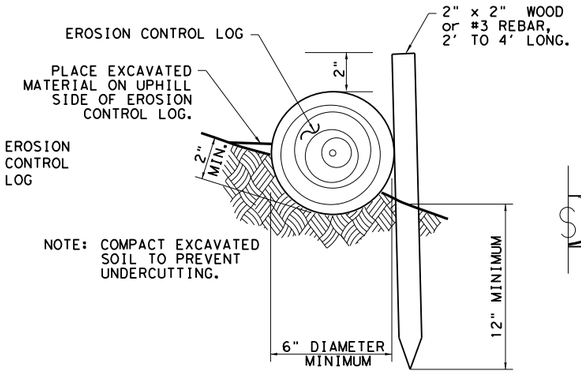
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

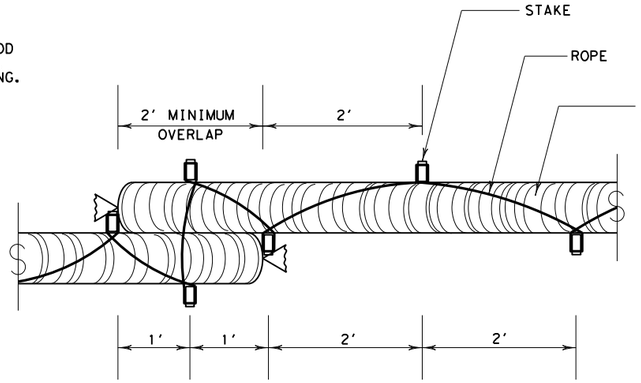


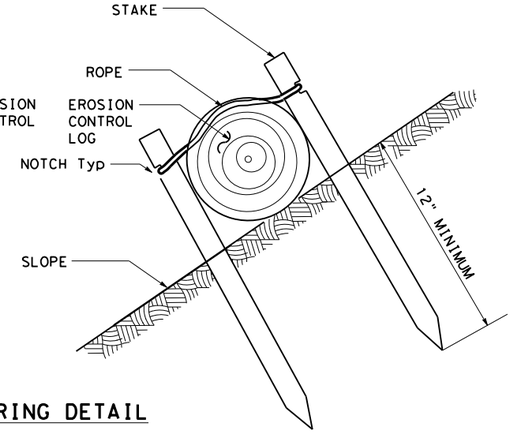


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

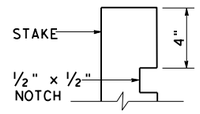
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

SHEET 2 OF 3

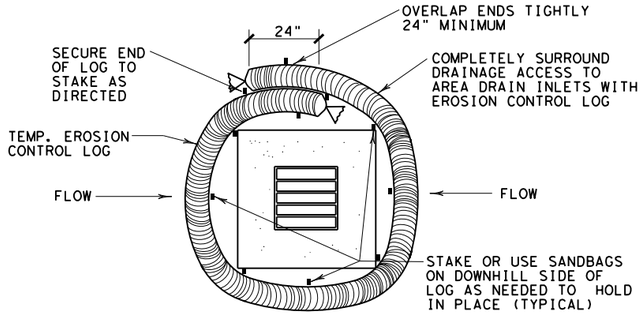
Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
EROSION CONTROL LOG
EC(9)-16

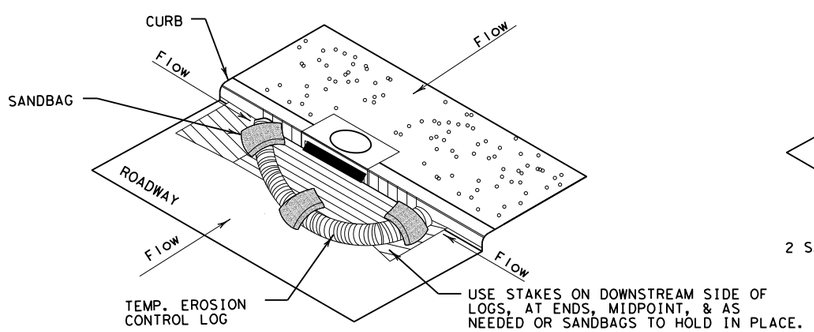
FILE: ec116	DN: TxDOT		CK: KM		DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	2552	04	046		SL 375	
	DIST	COUNTY			SHEET NO.	
	24	EL PASO			125	

DATE:
FILE:



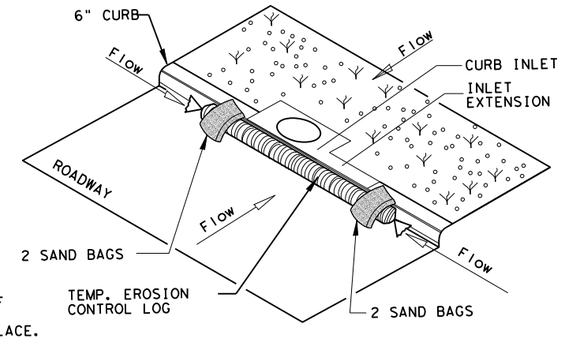
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

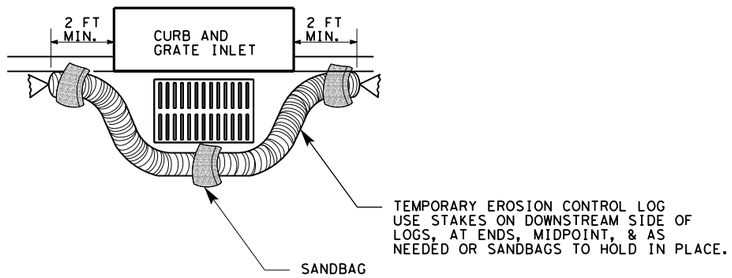
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

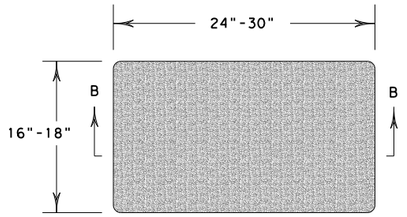
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



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	2552	04	046		SL 375		
	DIST	COUNTY			SHEET NO.		
	24	EL PASO			126		