Docusign Envelope ID: 0EF43CE8-E7CC-4DDE-8F3D-E61CD318FEB9

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6	C 204-7-56	US 79	
STATE	DISTRICT	COUNTY	
TEXAS	BRY	MILAM	
CONTROL	SECTION	JOB	SHEET NO.
0204	07	056	1

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

SEE SHEET 2
FOR INDEX OF SHEETS
AND SHEET 3 FOR
PROJECT LOCATION MAP

DESIGN SPEED: 55 MPH (US 79)

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

STATE PROJECT NUMBER: C 204-7-56

US 79
MILAM COUNTY

US 79 = 2,500.00 FT = 0.473 MILES

FINAL PLANS

CONTRACTOR:

LETTING DATE:

DATE CONTRACTOR BEGAN WORK:

DATE WORK WAS COMPLETED:

DATE WORK WAS ACCEPTED:

FINAL CONTRACT COST: $

FOR THE CONSTRUCTION OF INTERSECTION IMPROVEMENTS
CONSISTING OF RIGHT AND LEFT TURN LANES

LOCATION NO.	HIGHWAY	CONTROL NO.	LIMITS	2022 / 2042 ADT	STATION		REFERENCE MARKERS		TOTAL LENGTH (FT)	BRIDGE LENGTH (FT)	RDWY LENGTH (FT)
					FROM	TO	BEGIN	END			
1	US 79	0204-07-056	AT US 190	6,650 / 9,310	40+00.00	65+00.00	RM 512+0.726 MI (0.726 MI)	RM 512+0.253 MI (0.253 MI)	2,500.00	0.0	2,500.00

NO EXCEPTIONS
NO EQUATIONS
NO RAILROAD CROSSINGS

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, SEPTEMBER 1, 2024, AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT:
SPECIAL LABOR PROVISIONS FOR STATE PROJECTS (000--005)

Lochner
TBPE Firm Reg. No. 10488

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TEXAS DEPARTMENT OF TRANSPORTATION®

SUBMITTED FOR LETTING: 7/30/2024
DocuSigned by: Jeff Miles 589D3E0B31FA414...
DISTRICT DESIGN ENGINEER

RECOMMENDED FOR LETTING: 7/30/2024
DocuSigned by: 1E2F3895183F4F3...
AREA ENGINEER

APPROVED FOR LETTING: 7/31/2024
DocuSigned by: Chad Bohne 60E5537715D24EA...
DISTRICT ENGINEER

REV DATE: 2-12-2015
CSJ: 2447-01-033
FILENAME: c:\pw_working\lochner-pw-01\dms92627\US79_US190_AA01.dgn

SHEET NO.	DESCRIPTION

GENERAL

1	TITLE SHEET
2	INDEX OF SHEETS
3	PROJECT LOCATION MAP (MILAM COUNTY)
4	EXISTING TYPICAL SECTIONS
5 - 8	PROPOSED TYPICAL SECTIONS
9, 9A - 9E	GENERAL NOTES
10, 10A	ESTIMATE AND QUANTITY
11, 12	SUMMARY OF QUANTITIES

TRAFFIC CONTROL PLAN

13	TRAFFIC CONTROL PLAN SEQUENCE OF CONSTRUCTION
14	TRAFFIC CONTROL SECTIONS
15, 16	TRAFFIC CONTROL PLAN PHASE 1
17 - 19	TRAFFIC CONTROL PLAN PHASE 2
20	TREATMENT FOR VARIOUS EDGE CONDITIONS

TRAFFIC CONTROL PLAN STANDARDS

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33	## TCP(2-1)-18
34	## TCP(2-2)-18
35	## TCP(2-3)-23
36	## TCP(2-4)-18
37	## TCP(3-1)-13
38	## TCP(3-3)-14
39	## TCP(3-4)-13
40	## TCP(S-1)-08A
41	## TCP(S-2)-08A
42	## TCP(S-2C)-10
43	## WZ(RS)-22
44	## WZ(STPM)-23
45	## WZ(UL)-13

ROADWAY

46	SURVEY CONTROL INDEX SHEET
47	HORIZONTAL & VERTICAL CONTROL SHEET
48	ALIGNMENT DATA
49 - 56	PLAN AND PROFILE
57	DRIVEWAY DETAILS

ROADWAY STANDARDS

58	## CCCG-22
59	## TE(HMAC)-11
60	## HMA LONGITUDINAL JOINT DETAIL SHEET

SHEET NO.	DESCRIPTION

TRAFFIC

61 - 68	SIGNING & STRIPING LAYOUT
69	SMALL SIGN DETAILS
70 - 74	SUMMARY OF SMALL SIGNS SOSS

DELINEATION & PAVEMENT MARKING STANDARDS

75 - 79	## D & OM(1)-20 THRU D & OM(5)-20
80 - 82	## PM(1)-22 THRU PM(3)-22
83	## RS(2)-23
84	## RS(3)-23
85	## RS(4)-23

SIGNING STANDARDS

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87	## SMD(GEN)-08
88 - 90	## SMD(SLIP-1)-08 THRU SMD(SLIP-3)-08
91, 92	## TSR(3)-13, TSR(4)-13

ENVIRONMENTAL

93, 94	STORMWATER POLLUTION PREVENTION PLAN (SWP3)
95	ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)
96 - 101	ENVIRONMENTAL LAYOUTS

ENVIRONMENTAL STANDARDS

102, 103	## TREE PRUNING & TREE AND BRUSH REMOVAL
104	## EC(1)-16
105	## EC(2)-16
106 - 108	## EC(9)-16

UTILITIES

109 - 112	EXISTING UTILITY PLAN

THIS STANDARD SHEETS SPECIFICALLY IDENTIFIED WITH A "##" HAVE BEEN ISSUED BY ME AND ARE APPLICABLE TO THIS PROJECT.

David P. Neumann, P.E.

DAVID P. NEUMANN, P.E. 6/3/2024

2024.06.04 12:59:51-05'00'

STATE OF TEXAS
DAVID P. NEUMANN
83345
LICENSED
PROFESSIONAL ENGINEER

Lochner
TBPE Firm Reg. No. 10488

PRINT DATE	REVISION DATE
6/3/2024	

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Bryan District

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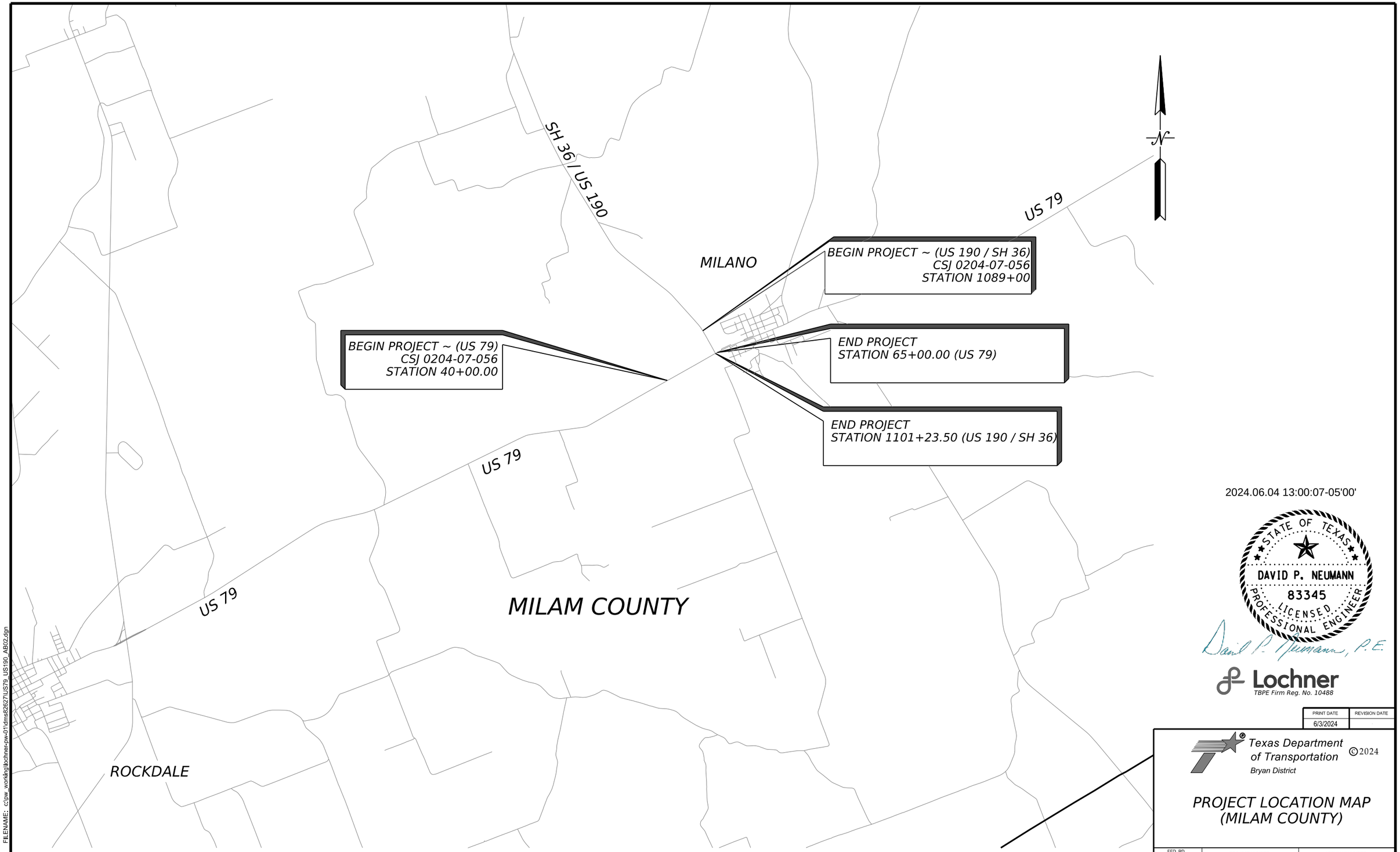
INDEX OF SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79
STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM
CONTROL	SECTION	JOB / SHEET NO.
0204	07	056 / 002

REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
FILENAME: c:\pw_working\lochner-pw-01\dms82627\US79_SH36_AB01.dgn



VICINITY MAP

N.T.S

REV DATE: 1-31-2023
CSJ: 0167-01-052, ETC
FILENAME: c:\pw_working\lochner-pw-01\dms826270\US79_US190_ABOZ.dgn

2024.06.04 13:00:07-05'00'

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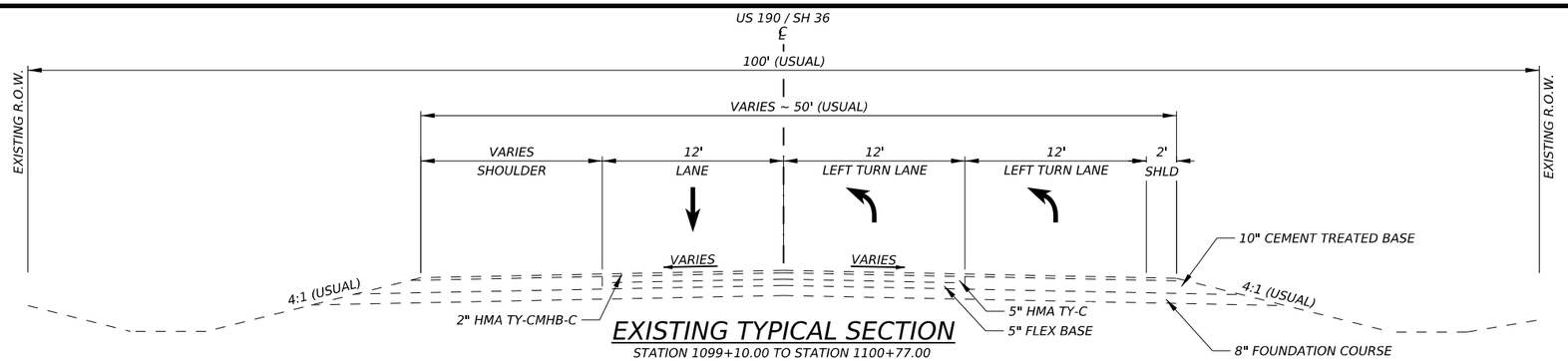
PROJECT LOCATION MAP (MILAM COUNTY)

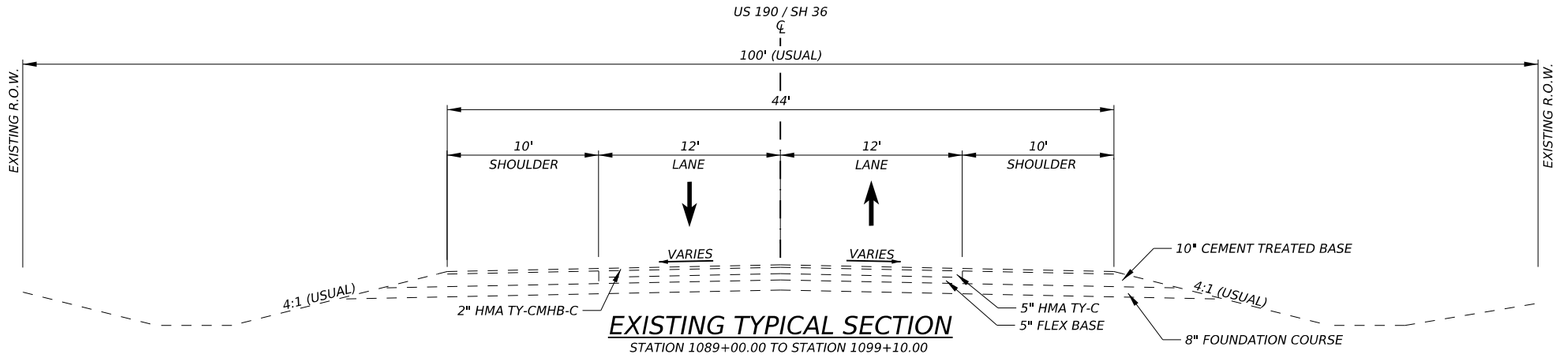
FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79
STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM
CONTROL	SECTION	JOB / SHEET NO.
0204	07	056 / 003

US 190 / SH 36



EXISTING TYPICAL SECTION

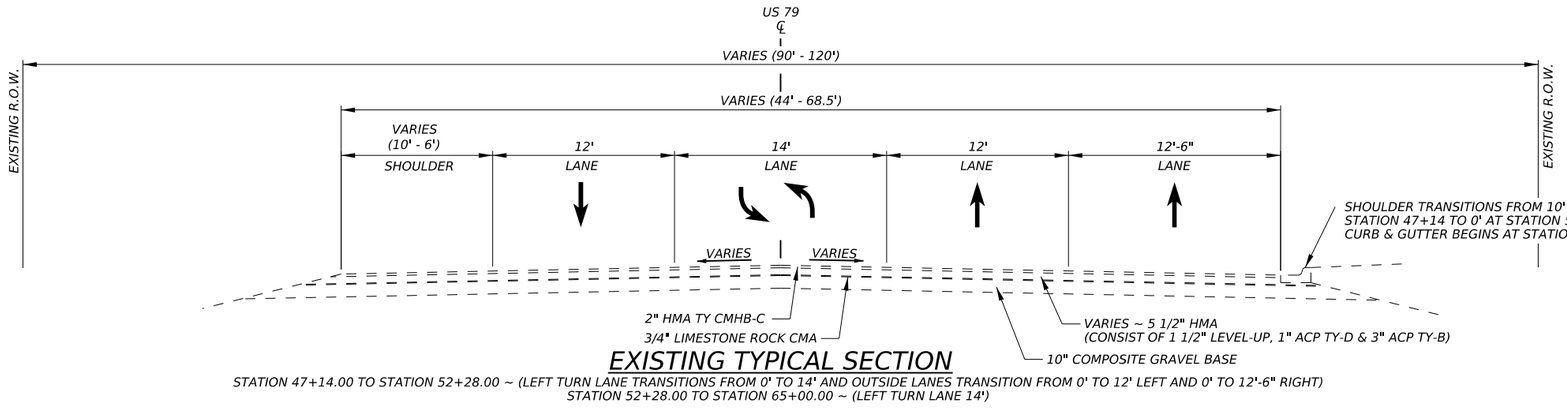
STATION 1099+10.00 TO STATION 1100+77.00



EXISTING TYPICAL SECTION

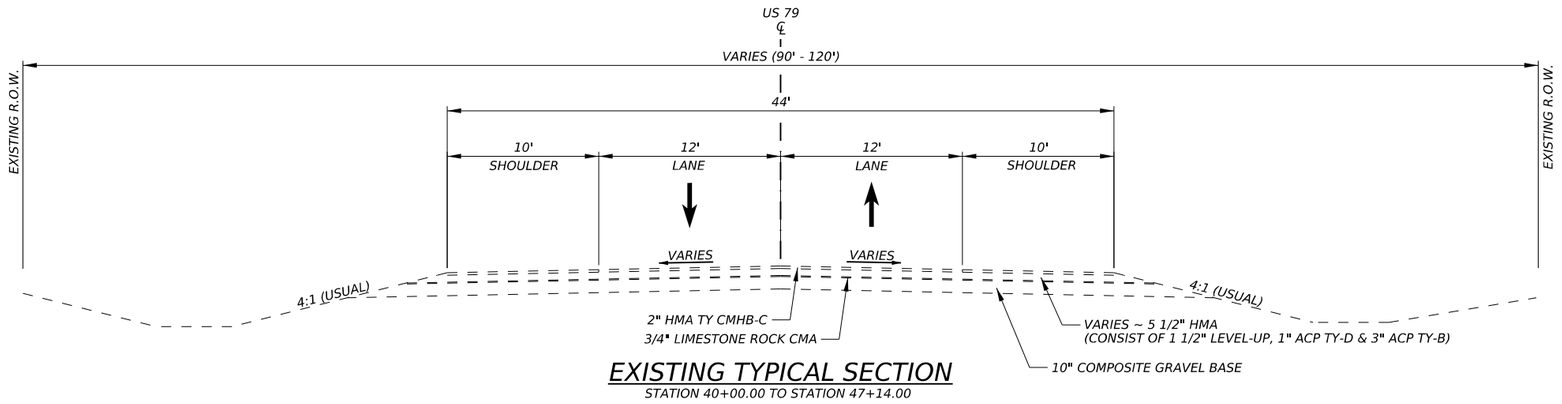
STATION 1089+00.00 TO STATION 1099+10.00

US 79



EXISTING TYPICAL SECTION

STATION 47+14.00 TO STATION 52+28.00 ~ (LEFT TURN LANE TRANSITIONS FROM 0' TO 14' AND OUTSIDE LANES TRANSITION FROM 0' TO 12' LEFT AND 0' TO 12'-6" RIGHT)
STATION 52+28.00 TO STATION 65+00.00 ~ (LEFT TURN LANE 14')



EXISTING TYPICAL SECTION

STATION 40+00.00 TO STATION 47+14.00

2024.06.04 13:00:22-05'00'

STATE OF TEXAS
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EXISTING TYPICAL SECTIONS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79
STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM
CONTROL	SECTION	JOB / SHEET NO.
0204	07	056 / 004

REV DATE: 1-31-2023
CSJ: 0167-01-052, ETC
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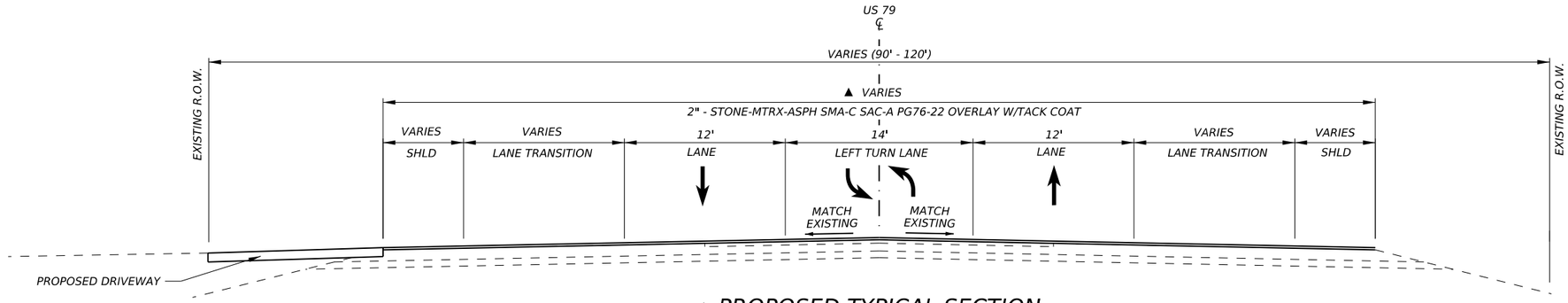
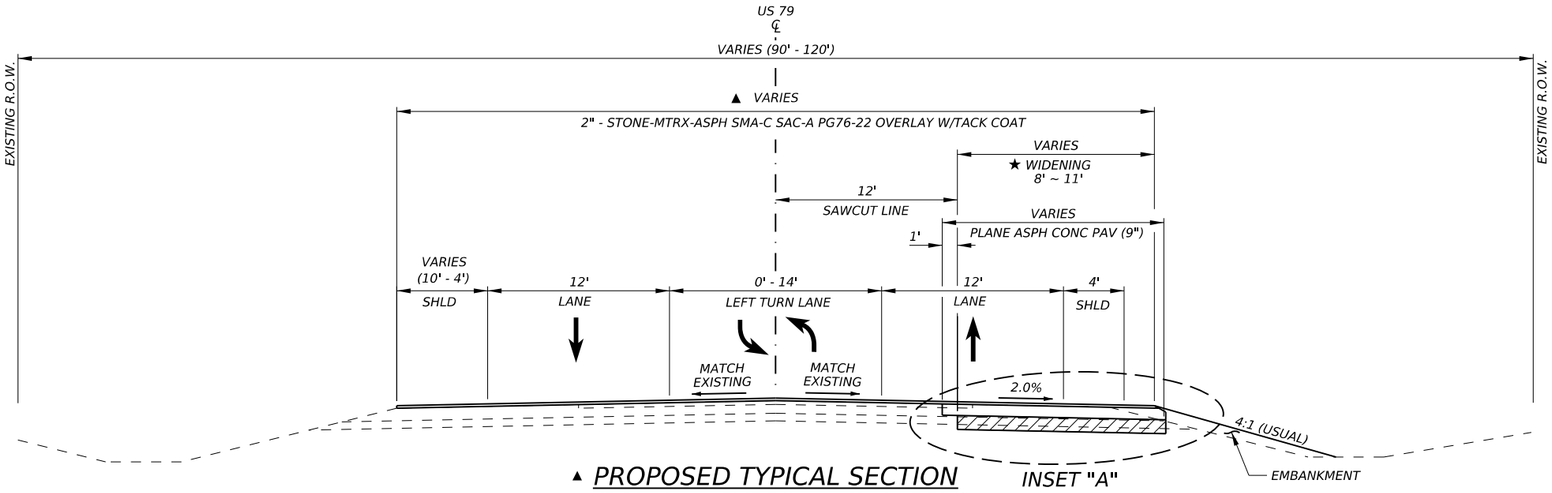


▲ PROPOSED TYPICAL SECTION

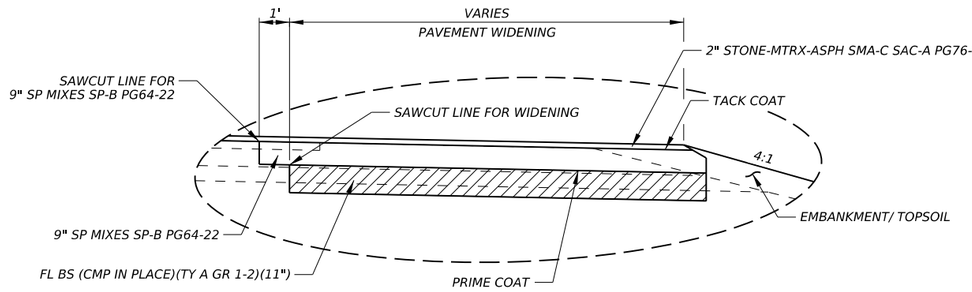
STATION 49+03.32 TO STATION 51+63.28



▲ PROPOSED TYPICAL SECTION

STATION 40+00.00 TO STATION 40+19.00 ~ (44' TYPICAL)
STATION 40+19 TO STATION 42+12.00 ~ (GORE AREA)(OVERALL WIDTH VARIES 44' - 46')
STATION 42+12.00 TO STATION 49+03.32 ~ (LEFT TURN LANE ~ 46' TYPICAL)

INSET "A"



INSET "A"

(INSET ILLUSTRATES WIDENING ON RIGHT (EAST BOUND) SIDE)

WIDENING RIGHT

★ (WIDENING RT. BEGINS AT STATION 40+18.98)
STATION 40+18.98 TO STATION 41+29.20 ~ (SAWCUT LINE 12' RT.) - WIDENING 8'
STATION 41+29.20 TO STATION 42+11.91 ~ (SAWCUT LINE 12' RT.) - WIDENING TRANSITIONS FROM 8' TO 11'
STATION 42+11.91 TO STATION 49+03.32 ~ (SAWCUT LINE 12' RT.) - WIDENING 11'

2024.06.04 13:01:04-05'00'

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$DATE$	

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Bryan District

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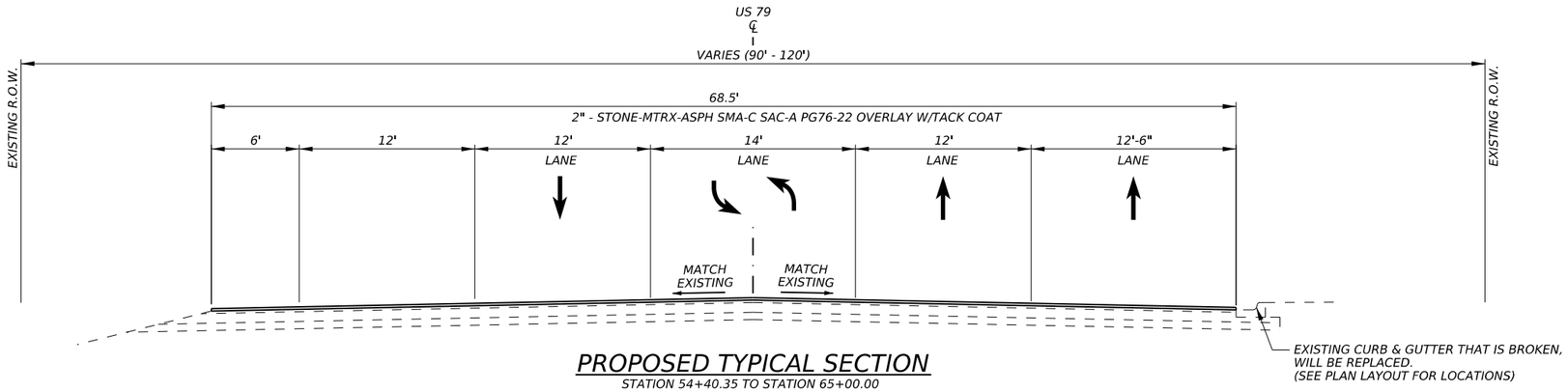
PROPOSED TYPICAL SECTIONS (US 79)

SHEET 1 OF 4

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79

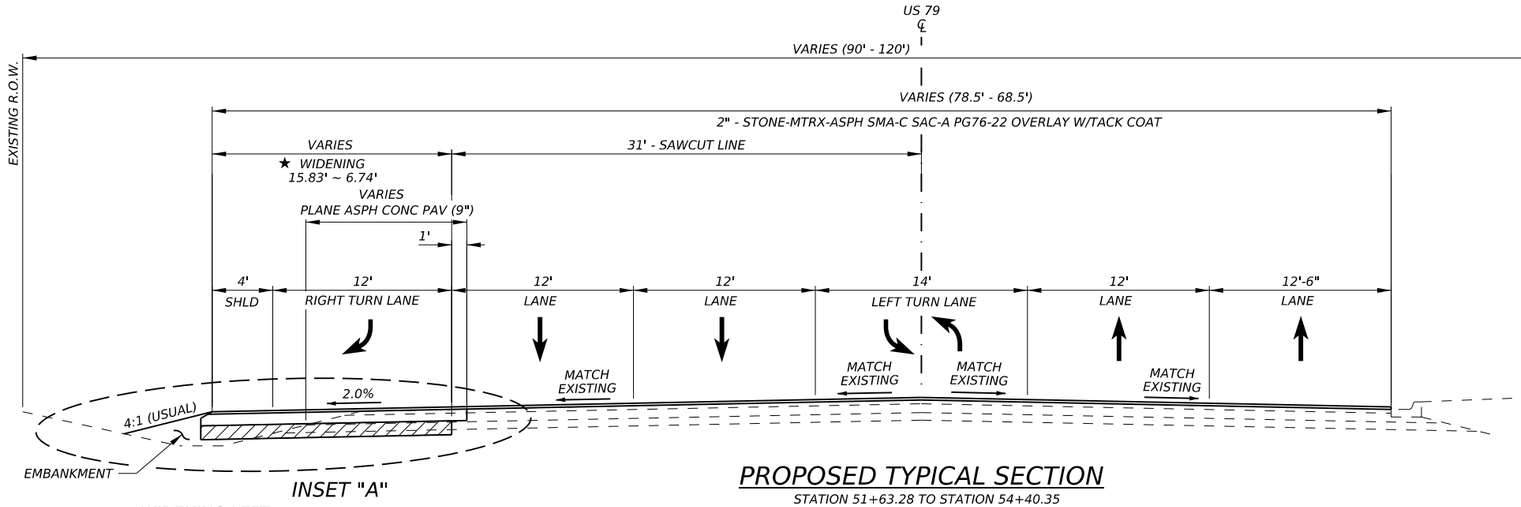
STATE	DISTRICT	COUNTY	
TEXAS	BRY	MILAM	
CONTROL	SECTION	JOB	SHEET NO.
0204	07	056	005

REV DATE: 1-31-2023
CSJ: 0187-01-052; ETC
FILENAME: $FILE$



PROPOSED TYPICAL SECTION

STATION 54+40.35 TO STATION 65+00.00



INSET "A"

WIDENING LEFT

★ STATION 51+63.28 TO STATION 54+40.35 ~ (SAWCUT LINE 31' LT.)
(15.83' WIDENING FROM STATION 51+63.51 TO STATION 53+63.52.
TRANSITION WIDENING FROM 15.83' TO 6.74' FROM STATION 53+63.52 TO STATION 54+40.35)

PROPOSED TYPICAL SECTION

STATION 51+63.28 TO STATION 54+40.35

2024.06.04 13:01:35-05'00'

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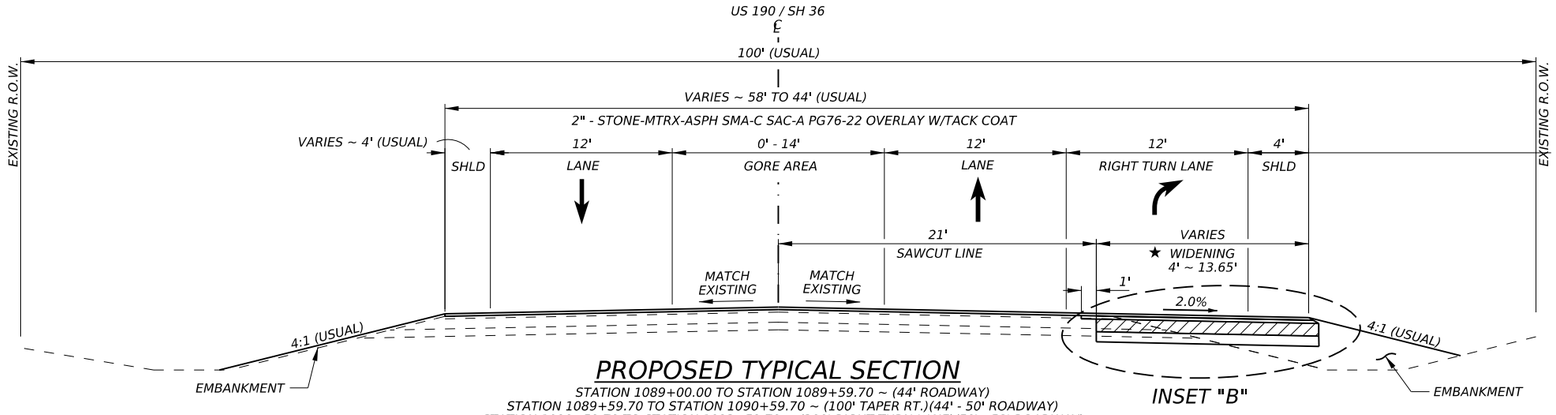
PROPOSED TYPICAL SECTIONS (US 79)

SHEET 2 OF 4

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79

STATE	DISTRICT	COUNTY	
TEXAS	BRY	MILAM	
CONTROL	SECTION	JOB	SHEET NO.
0204	07	056	006

REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
FILENAME: c:\pw_working\lochner-pw-01\dms82627\US79_SH36_ACD1.dgn



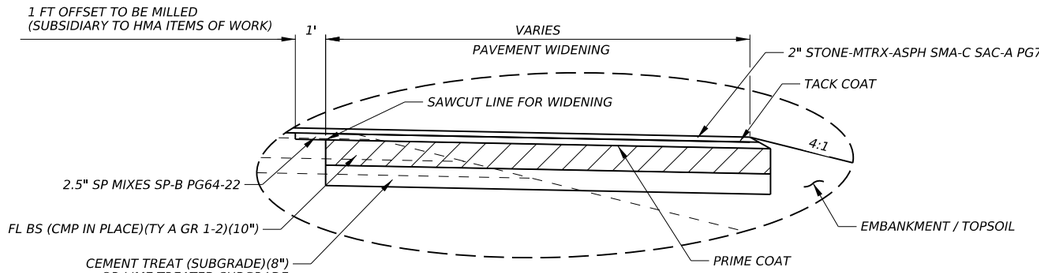
PROPOSED TYPICAL SECTION

STATION 1089+00.00 TO STATION 1089+59.70 ~ (44' ROADWAY)
STATION 1089+59.70 TO STATION 1090+59.70 ~ (100' TAPER RT.)(44' - 50' ROADWAY)
STATION 1090+59.70 TO STATION 1092+59.70 ~ (200' RIGHT TURN LANE)(50' - 58' ROADWAY)

INSET "B"

WIDENING RIGHT

★ (WIDENING RT. BEGINS AT STATION 1089+49.31)
STATION 1089+49.31 TO STATION 1090+49.02 ~ (SAWCUT LINE 21' RT.) - WIDENING TRANSITIONS FROM 4' TO 6.64'
STATION 1090+49.02 TO STATION 1092+49.31 ~ (SAWCUT LINE 21' RT.) - WIDENING TRANSITIONS FROM 6.64' TO 13.65'



INSET "B"

NOTES:

LIME TREATMENT IS IN THE EVENT THE SUBGRADE PI IS HIGHER THAN EXPECTED. THIS WOULD BE USED IN LIEU OF THE CEMENT TREATED SUBGRADE. TREATMENT TO BE CONFIRMED WITH THE ENGINEER PRIOR TO CONSTRUCTION.

2024.06.04 13:02:05-05'00'

STATE OF TEXAS
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PROPOSED TYPICAL SECTIONS (US 190 / SH 36)

SHEET 3 OF 4

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79
STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM
CONTROL	SECTION	JOB / SHEET NO.
0204	07	056 / 007

REV DATE: 1-31-2023
CSJ: 0167-01-052, ETC
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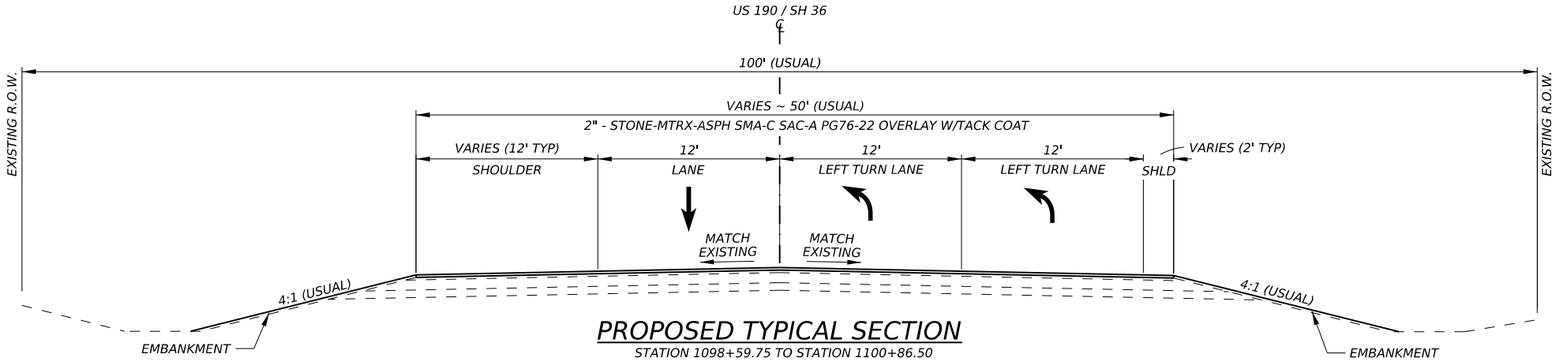
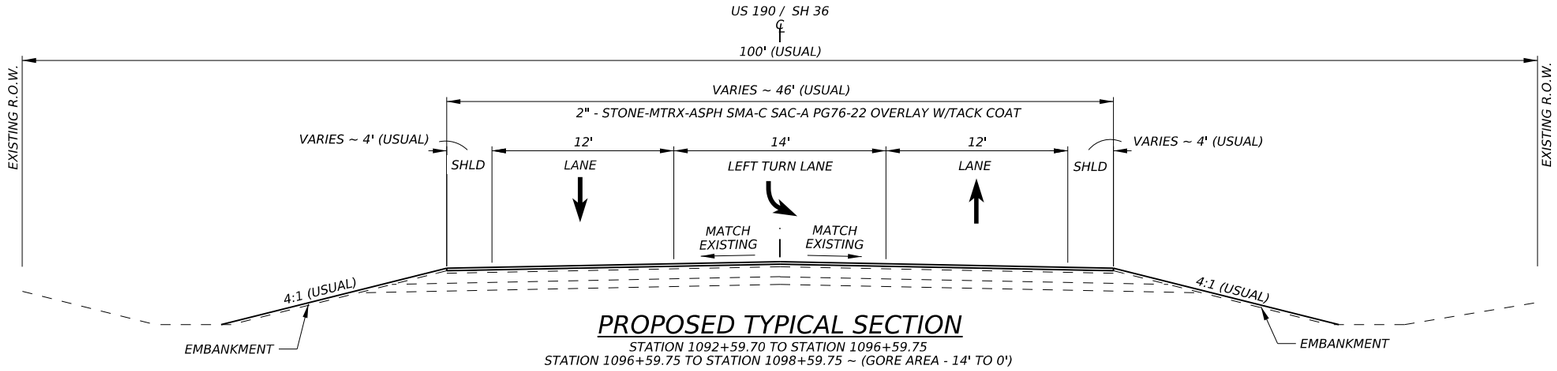


PROPOSED TYPICAL SECTION

STATION 1098+59.75 TO STATION 1100+86.50



PROPOSED TYPICAL SECTION

STATION 1092+59.70 TO STATION 1096+59.75
STATION 1096+59.75 TO STATION 1098+59.75 ~ (GORE AREA - 14' TO 0')

2024.06.04 13:02:29-05'00'

STATE OF TEXAS
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PROPOSED TYPICAL SECTIONS (US 190 / SH 36)

SHEET 4 OF 4

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79
STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM
CONTROL	SECTION	JOB / SHEET NO.
0204	07	056 / 008

REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
FILENAME: c:\pw_working\lochner-pw-01\dms02627\US79_SH36_ACD1.dgn

BASIS OF ESTIMATE					
ITEM	DESCRIPTION	COURSE	RATE	AMOUNT	QUANTITY
168	Vegetative Watering		10 GAL/SY	5,790 SY	57.9 TGL
275	Cement Treat (Subgrade)(8”)	N/A	3% BY WEIGHT	274 SY	3.2 TON
310	Asphalt (MC-30 OR EC-30)	Prime	0.20 GAL/SY	1,855 SY	371 GAL
344	SP MIXES SP-B PG64-22	2.5”	275 LB/SY	335 SY	46 TON
344	SP MIXES SP-B PG64-22	9”	990 LB/SY	1,567 SY	776 TON
346	STONE-MTRX-ASPH SMA-C SAC-A PG76-22	2”	220 LB/SY	24,840 SY	2,733 TON
346	TACK COAT	Tack	0.10 GAL/SY	24,840 SY	2,484 GAL

BASIS OF ESTIMATE * for contractor's information only					
ITEM	DESCRIPTION	COURSE	RATE	AMOUNT	QUANTITY
166*	FERTILIZER **	N/A	60 LB/AC	1.20 AC	0.03 TON

Note: Rates are for estimating purposes only. Actual Rates will be determined in the field.
** Tonnage represents Nitrogen content only.

GENERAL:

Contractor questions on this project are to be addressed to the following individual(s):
James Kreamer, P.E., A.E., James.Kreamer@txdot.gov
Rene Pequeno, P.E., A.A.E., Rene.Pequeno@txdot.gov

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

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

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

Sheet: 9
Highway: US 79 Control: 0204-07-056
County: Milam

ITEM 5 “CONTROL OF THE WORK”

Prior to letting, earthwork construction cross-section data is available at the Area Engineer’s office in ***Brenham*** for inspection by prospective bidders. In addition, bidders may request electronic earthwork construction cross-section data by sending an email to: James.Kreamer@txdot.gov.

Earthwork files will be provided by email or by using TxDOT’s FTP Service. These cross-sections are for non-construction purposes only, and it is the responsibility of the prospective bidder to validate the data for this project.

After letting, the Engineer will provide final earthwork construction cross-section data necessary for the contractor to establish and control the work.

When a precast or cast-in-place concrete element is included in the plans, a precast concrete alternate may be submitted in accordance with “Standard Operating Procedure for Alternate Precast Proposal Submission” found online at https://www.txdot.gov/business/resources/highway/bridge/bridge-publications.html#design.. Acceptance or denial of an alternate is at the sole discretion of the Engineer. Impacts to the project schedule and any additional costs resulting from the use of alternates are the sole responsibility of the Contractor.

ITEM 7 “LEGAL RELATIONS AND RESPONSIBILITIES”

State contract mowers will mow the right of way during the growing season. The Contractor will be notified by the Engineer one week in advance of the anticipated time when mowers will be in the limits of the project. Clean the right of way to such a condition that allows the mowing contractors to safely mow.

In accordance with Item 7.2.5, Contractor equipment equipped with blue warning lights shall be wired so that operation of blue lights is independent of any other lights.

This project is on a hurricane evacuation route. Furnish at the pre-construction meeting a written plan outlining procedures to suspend work, secure the job site and safely handle traffic through and across the project in the event of a hurricane evacuation.

During the hurricane season (June 1 through November 30), do not close any travel lanes except when the Contractor can demonstrate that he can provide labor, equipment, material, work plan, and quality of work to satisfactorily return all lanes to an open, all-weather travel surface within three days of receiving written or verbal notice but no later than 3 days prior to hurricane landfall. Construction of temporary lanes to an all-weather surface will be paid in accordance with Article 9.7, “Payment for Extra Work and Force Account Method”.

In addition to lane closures, cease work 3 days prior to hurricane landfall on or near the roadway that adversely impacts the flow of traffic and reduces the capacity of the highway during an evacuation. Prohibit the Contractor's, sub-contractors' or material suppliers' vehicles from entering or exiting the stream of traffic including material hauling and delivery, and mobilization or demobilization of equipment. When directed, this prohibition will include a reasonable time period for the evacuees to return to their point of origin.

In the event of the declaration of a hurricane watch, warning, other severe weather warning or national or state emergency that requires the roadways in the vicinity be used as evacuation routes, cease all work that requires the Contractor's, sub-contractors' or material suppliers' vehicles to enter the stream of traffic on these primary or secondary evacuation routes. This work includes material hauling and delivery, and mobilization or demobilization of equipment.

The following roadways are recognized evacuation routes in the Bryan District:

Primary Evacuation Routes: IH 45, US 290, SH 6, SH 36.

Secondary Evacuation Routes: US 79, US 84, SH 7, SH 30, SH 21, SH 105.

Other routes may be designated.

Roadway closures during the following key dates and/or special events are prohibited:

- Day before and day of Texas A&M home football games
- Texas A&M graduation
- Texas A&M Family Weekend

The Engineer may decide to restrict construction operations or lane closures on these key dates and/or special events.

ITEM 8 "PROSECUTION AND PROGRESS"

At the end of each work day, remove all grade differentials transverse to centerline.

At the end of each work day, provide 100 foot minimum grade tapers longitudinal to the centerline to transition differences in the profile grade line or roadway grade.

By noon of each Wednesday, provide the Engineer a written outline of the daily work schedule for the following week. Include in the outline the times and places for proposed traffic control changes, lane and shoulder closures, and moving operations or other operations that affect traffic on the roadway. Unless otherwise authorized by the Engineer, prosecute the work on this project in accordance with the following sequence of work:

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Highway: US 79 **Control: 0204-07-056**

County: Milam

1) Set advance signing and barricades. The use of TMAs are required when the Contractor is operating equipment within the roadway and out to the clear zone. The Contractor may use lay enforcement through a force account when necessary.
2) Move traffic according to TCP Phases
3) Construct widening as shown and install required drainage items as shown in the plans.
4) Overlay project as shown.
   The Contractor will ensure that all soil disturbed during the construction is returned to its original grading and excess materials are removed, such as concrete items, etc.
5) Final cleanup.

Some of these operations may be performed simultaneously.

Prepare Progress Schedule Bar Chart.

Work is allowed to be performed during the nighttime.

Equipment and material may be pre-staged at approved locations.

The 90 day convenience delayed start allowed after authorization under SP008-005 is for Contractor mobilization.

ITEM 100 "PREPARING RIGHT OF WAY"

During burn bans obtain written approval from the Commissioners Court prior to burning brush.

Prevent ashes from burned vegetation to be transported into any stream.

If burning is not allowed, all trees and brush will be disposed of by shredding, logging or other methods approved by the Engineer. Create a windrow, stockpile, or topdress biomass on disturbed areas along the project at locations approved by necessary permits and the Engineer.

ITEM 132 "EMBANKMENT"

Provide Embankment material for areas within the limits of the Pavement Structure that meet one of the following requirements:

- Sources outside the ROW provide material with a plasticity index between 10 and 25 and with less than 30% silt.
- Sources within the ROW provide material with a plasticity index between 10 and 25 and with less than 30% silt.

Provide Embankment material for areas outside the limits of the Pavement Structure with a plasticity index between 10 and 35.

ITEM 134 "BACKFILLING PAVEMENT EDGES"

Furnish Type A or B material meeting one of the following requirements:
Item 247, Type D Grade 3;
Reclaimed Asphalt Pavement (RAP) with 95% of the RAP passing the 2 inch sieve.

Place emulsified asphalt (SS-1, CSS-1, or as approved by the Engineer) at an application rate of 0.15 gal/SY.

ITEM 160 "TOPSOIL"

All slopes requiring topsoil will be tracked immediately upon final grading to prevent erosion per standard sheet EC(1)-16. Tracking slopes to prevent erosion will not be measured or paid for directly but will be subsidiary to pertinent Items.

Topsoil may be obtained from the right of way at sites of proposed excavation and embankment.

ITEM 166 "FERTILIZER"

Fertilize all areas of project that are being seeded or sodded.

ITEM 168 "VEGETATIVE WATERING"

Vegetative watering is required for all areas of the project that are being seeded or sodded.

ITEM 216 "PROOF ROLLING"

Proof rolling is shown in the plans for use by the Engineer at their discretion to direct contractor to test areas of possible soft subgrade.

ITEM 247 "FLEXIBLE BASE"

Place flexible base in equal lifts of 4 to 8 in. in depth unless otherwise approved by the Engineer.

ITEM 301 "ASPHALT ANTISTRIPPING AGENT"

When the Contractor adds lime as an anti-stripping agent (or an equivalent anti-stripping agent) the lime or equivalent shall be added to the asphaltic concrete in the methods specified in this

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item unless otherwise approved by the Engineer. If an alternate method is proposed, the Engineer's approval will be based on test method Tex-242-F performed on the asphaltic concrete produced through the plant.

ITEM 310 "PRIME COAT"

Cure MC 30 for 7 days before placing subsequent surface courses unless otherwise directed by the engineer. EC-30 may be used in place of MC-30 with approval from the Engineer.

ITEM 316 "SEAL COAT"

When placing surface treatment on base material, prepare surface by sweeping or other approved methods. Before applying bituminous material, lightly sprinkle the surface with water. When directed, sweep the surface after sprinkling with water. Do not apply bituminous material when water is puddling on the surface.

Sweep excess aggregate no sooner than 2 hours after rolling or as directed.

Vehicles used to haul aggregate from the stockpile to the chip spreader will not be overloaded. Any damage to the roadway caused by the vehicles will be repaired by the Contractor at his expense and subsequent loads will be reduced so as not to cause further damage.

Transverse variance rates shall be used as directed. The nozzles outside the wheel paths will output up to 20% more asphalt by volume than the nozzles over the wheel paths.

The Contractor may be required to furnish and set string line to insure straight and uniform alignment as directed by the Engineer. The Contractor may use other methods subject to approval of the Engineer.

Cure surface treatments placed with a cutback asphalt binder for 21 days before placing subsequent surface courses unless otherwise directed by the engineer.

Air and surface temperature for asphalt material application will be in accordance with the specification and the manufacturer's recommendation. However, the engineer may limit the use of an asphalt material due to the time of year.

ITEM 320 "EQUIPMENT FOR ASPHALT CONCRETE PAVEMENT"

Unless otherwise approved by the Engineer, provide a Material Transfer Device with remixing capabilities as specified in Item 320.2.3.3 Placement and Compaction Equipment for all asphaltic concrete pavement.

ITEM 344 “SUPERPAVE MIXTURES”

Hydrated lime, commercial lime slurry or an equivalent anti-stripping agent may be used. If hydrated lime or commercial lime slurry is used up to 1.0 percent may be added. If an equivalent anti-stripping agent is used, add according to manufacturers recommendations. Provide hydrated lime or commercial lime slurry in accordance with DMS-6350, “Lime and Lime Slurry”. Add hydrated lime, commercial lime slurry, or an equivalent anti-stripping agent in accordance with Section 301.4.2.

Apply tack coat through a distributor spray bar in accordance with Section 316.3.1. Distributor. If residual from emulsion tack is not tacky, then the Engineer can require the use of PG binder.

RAS is not permitted.

ITEM 346 “STONE MATRIX ASPHALT”

Use aggregate that meets the SAC requirement of class A.

Hydrated lime, commercial lime slurry or an equivalent anti-stripping agent may be used. If hydrated lime or commercial lime slurry is used up to 1.0 percent may be added. If an equivalent anti-stripping agent is used, add according to manufacturer’s recommendations. Provide hydrated lime or commercial lime slurry in accordance with DMS-6350, “Lime and Lime Slurry”. Add hydrated lime, commercial lime slurry, or an equivalent anti-stripping agent in accordance with Section 301.4.2.

Apply tack coat through a distributor spray bar in accordance with Section 316.3.1. Distributor. If residual from emulsion tack is not tacky, then the Engineer can require the use of PG binder.

No RAS allowed in surface courses or thin level-up courses.

Blending will not be permitted.

ITEM 354 “PLANING AND TEXTURING PAVEMENT”

Existing raised pavement markers in the proposed work area are to be removed prior to planing operations. This item will be considered subsidiary.

Construct a fine milling pattern by adjusting the speed of the drum and the machine, as approved by the Engineer.

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TxDOT will retain all RAP except what is needed in the hot mix and for backfilling pavement edges in the project. Use for backfilling pavement edges on projects when approved by the Engineer. Reclaimed asphalt material to be stockpiled at the Cameron Maintenance Office.

ITEM 464 “REINFORCED CONCRETE PIPE”

Seal joints using cold applied plastic asphalt sewer compound or cold applied preformed plastic gaskets. When cohesionless material is used for backfill, wrap the joints prior to backfilling with sand proof tape following the manufacturer's recommendations or with an equivalent material and method.

ITEM 467 “SAFETY END TREATMENTS”

All Type II SET’s shall have riprap aprons as shown on the plans. Riprap aprons are considered subsidiary to Type II SET’s.

ITEM 502 “BARRICADES, SIGNS AND TRAFFIC HANDLING”

Where shown on applicable TCP standards, channelizing devices on the centerline are required at all times; including when a pilot vehicle is used to lead traffic. Mount a G20-4 sign at a conspicuous location on the rear of the vehicle. Traffic delays caused by one-lane, two-way traffic control, will not be allowed to exceed 5 minutes unless approved by the Engineer.

One way traffic control operations are required when placing centerline profile markings on all two-lane roadways, unless otherwise approved by the Engineer. Work area is limited to a maximum of 2 miles for this work.

During one-way operations, station flaggers at all county roads and any other locations, such as private businesses, that may have traffic entering the work area.

Prior to beginning pulverization operations, place an approved channelizing device along both sides of the travelway the entire length of the operation in accordance with the BC standards. Do not remove the channelizing devices until permanent edge striping is placed.

Place "Pavement Ends" (CW8-3), "Slow Down On Wet Road" (CW8-5a), “No Centerline Stripe”, and “Loose Gravel” signs before pulverization of the existing pavement.

Removal of ground mounted temporary signs and supports as specified on standard sheet BC(5), shall include the immediate backfilling of support holes with Type B embankment material and the compaction of the backfill material.

The Contractor Force Account “Safety Contingency” that has been established for this project is intended to be utilized for work zone enhancements, to improve the effectiveness of the Traffic

Control Plan, that could not be foreseen in the project planning and design stage. These enhancements will be mutually agreed upon by the Engineer and the Contractor's Responsible Person based on weekly or more frequent traffic management reviews on the project. The Engineer may choose to use existing bid items if it does not slow the implementation of enhancement.

Law enforcement assistance will be required for this project and is expected to be required for major traffic control changes and lane closures. Coordinate with local law enforcement and arrange for law enforcement as directed or agreed by the Engineer. Complete the weekly 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.
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.

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

Provide construction fencing as approved at all work locations to protect pedestrian or bicycle traffic. This material and its placement will be considered subsidiary to Item 502.

ITEM 503 "PORTABLE CHANGEABLE MESSAGE SIGN"

Furnish, install, and operate up to 3 Portable Changeable Message Signs (PCMS) for this project. The signs can be used both on the project and within a ten (10) mile radius of the project. Locations, messages, and durations of use will be specified by the Engineer. The primary uses will be to inform the public of special events, lane and road closures, and changes in traffic control. Signs will be paid for only when used as directed by the Engineer.

ITEM 504 "FIELD OFFICE AND LABORATORY"

Furnish a Type D Structure (Asphalt Mix Control Laboratory).

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ITEM 505 "TRUCK MOUNTED ATTENUATOR (TMA) AND TRAILER ATTENUATOR (TA)"

In addition to the shadow vehicles with truck mounted attenuator (TMA) that are specified as being required on the traffic control plan (TCP) for this project,

provide one (1) shadow vehicle(s) with TMA for TCP(2-1)-18 as detailed on General Note 4 of this standard sheet.

provide one (1) shadow vehicle(s) with TMA for TCP(2-2)-18 as detailed on General Note 6 of this standard sheet.

provide one (1) shadow vehicle(s) with TMA for TCP(2-3)-23 as detailed on General Note 7 of this standard sheet.

provide one (1) shadow vehicle(s) with TMA for TCP(2-4)-18 as detailed on General Note 5 of this standard sheet.

provide two (2) (shadow and trail) vehicle(s) with TMA for TCP(3-1)-13 as detailed on General Note 3 of this standard sheet.

provide two (2) (shadow and trail) vehicle(s) with TMA for TCP(3-3)-14 as detailed on General Note 3 of this standard sheet.

provide two (2) shadow vehicle(s) with TMA for TCP(3-4)-13 as detailed on General Note 2 of this standard sheet.

Therefore, 10 total shadow vehicles with TMA will be required for this type of work. 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.

Forty-eight (48) TMA days are provided in the project estimate for stationary operations. Thirty (30) TMA hours are provided in the project estimate for mobile operations.

ITEM 529 "CONCRETE CURB, GUTTER, AND COMBINED CURB AND GUTTER"

Provide steel reinforcement in all concrete curb, gutter, and combined curb and gutter in accordance with the plans and specifications. Use synthetic fiber in lieu of steel reinforcing when approved in writing by the Engineer.

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ITEM 585 “RIDE QUALITY FOR PAVEMENT SURFACES”

Pay adjustment schedule 2 will be used to evaluate ride quality of the travel lanes in accordance with Item 585, “Ride Quality for Pavement Surfaces.”

ITEM 644 “SMALL ROADSIDE SIGN ASSEMBLIES”

Salvage and deliver all aluminum sign faces to the local TxDOT maintenance office.

ITEM 662 “WORK ZONE PAVEMENT MARKINGS”

Paint and beads may be used for non-removable work zone pavement markings.

All striping limits must be approved by the Engineer before striping operations may begin.

ITEM 666 “REFLECTORIZED PAVEMENT MARKINGS”

Unless authorized by the Engineer, the Contractor will not place the pavement markings on the resurfaced roadway until it has cured for 3 days.

All striping limits must be approved by the Engineer before striping operations may begin.

ITEM 672 “RAISED PAVEMENT MARKERS”

Use flexible bituminous adhesive for applications on all pavement types.

ITEM 678 “PAVEMENT SURFACE PREPARATION FOR MARKINGS”

It is not anticipated that pavement surface preparation for markings will be needed. If the Engineer determines that it is needed, payment for work will be determined in accordance with Article 9.7 “Payment for Extra Work and Force Account Method”.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0204-07-056 **DISTRICT** Bryan **COUNTY** Milam
HIGHWAY US 79

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0204-07-056**			
		PROJECT ID		**A00187468**			
		COUNTY		**Milam**			
		HIGHWAY		**US 79**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	100-7002	PREPARING ROW	STA	6.000		6.000	
	100-7003	PREP ROW (TREE REMOVE) (0"-12" DIA)	EA	6.000		6.000	
	104-7017	REMOV CONC (CURB & GUTTER)	LF	30.000		30.000	
	110-7001	EXCAV (ROADWAY)	CY	976.000		976.000	
	132-7006	EMBANK (FNL)(DC)(TY C)	CY	96.000		96.000	
	134-7004	BACKFILL (TY A OR B)	STA	27.300		27.300	
	160-7002	FURN & PLACE TOPSOIL (4")	SY	5,790.000		5,790.000	
	164-7001	BROADCAST SEED (PERM_RURAL_SAND)	SY	5,790.000		5,790.000	
	164-7013	DRILL SEED (TEMP_WARM)	SY	2,895.000		2,895.000	
	164-7014	DRILL SEED (TEMP_COOL)	SY	2,895.000		2,895.000	
	168-7001	VEGETATIVE WATERING	TGL	57.900		57.900	
	216-7001	PROOF ROLLING	HR	2.000		2.000	
	247-7090	FL BS (CMP IN PLC)(TY A GR 1-2) (10")	SY	274.000		274.000	
	247-7339	FL BS (CMP IN PLC)(TY A GR 1-2) (11")	SY	1,578.000		1,578.000	
	260-7001	LIME (COM OR QK)(SLURRY) OR QK(DRY)	TON	4.900		4.900	
	260-7007	LIME TRT (EXIST MATL)(8")	SY	274.000		274.000	
	275-7001	CEMENT	TON	3.200		3.200	
	275-7003	CEMENT TRT (EXIST MATL)(8")	SY	274.000		274.000	
	310-7004	PRIME COAT (MC-30)	GAL	371.000		371.000	
	344-7001	SP MIXES SP-B PG64-22	TON	822.000		822.000	
	346-7001	STONE-MTRX-ASPH SMA-C SAC-A PG76-22	TON	2,733.000		2,733.000	
	346-7028	TACK COAT	GAL	2,484.000		2,484.000	
	354-7032	PLANE ASPH CONC PAV(0" TO 2")	SY	852.000		852.000	
	354-7058	PLANE ASPH CONC PAV(9")	SY	4,006.000		4,006.000	
	480-7001	CLEAN EXIST CULVERTS	EA	4.000		4.000	
	500-7001	MOBILIZATION	LS	1.000		1.000	
	502-7001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	4.000		4.000	
	503-7002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	3.000		3.000	
	505-7001	TMA (STATIONARY)	DAY	48.000		48.000	
	505-7002	TMA (MOBILE OPERATION)	HR	30.000		30.000	
	506-7002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	88.000		88.000	
	506-7011	ROCK FILTER DAMS (REMOVE)	LF	88.000		88.000	
	506-7039	TEMP SEDMT CONT FENCE (INSTALL)	LF	463.000		463.000	
	506-7041	TEMP SEDMT CONT FENCE (REMOVE)	LF	463.000		463.000	
	529-7009	CONC CURB & GUTTER (TY II)	LF	30.000		30.000	
	530-7006	DRIVEWAYS (CONC)	SY	728.000		728.000	
	533-7001	MILL RUMBLE STRIPS (ASPHALT) (SHLDR)	LF	3,916.000		3,916.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0204-07-056 **DISTRICT** Bryan **COUNTY** Milam
HIGHWAY US 79

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0204-07-056**			
		PROJECT ID		**A00187468**			
		COUNTY		**Milam**			
		HIGHWAY		**US 79**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	533-7002	MILL RUMBLE STRIPS (ASPH) (CENTERLINE)	LF	1,123.000		1,123.000	
	644-7001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	20.000		20.000	
	644-7004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	2.000		2.000	
	644-7028	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	2.000		2.000	
	644-7073	REMOVE SM RD SN SUP&AM	EA	23.000		23.000	
	658-7058	INSTL OM ASSM (OM-2Z)(WFLX)GND	EA	12.000		12.000	
	662-7068	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	3,718.000		3,718.000	
	662-7072	WK ZN PAV MRK REMOV (W)8"(SLD)	LF	200.000		200.000	
	662-7082	WK ZN PAV MRK REMOV (W)(ARROW)	EA	2.000		2.000	
	662-7092	WK ZN PAV MRK REMOV (W)(WORD)	EA	2.000		2.000	
	662-7109	WK ZN PAV MRK REMOV (Y)6"(SLD W/MRKR)	LF	4,410.000		4,410.000	
	662-7112	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	303.000		303.000	
	662-7114	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	699.000		699.000	
	666-7017	REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	79.000		79.000	
	666-7023	REFL PAV MRK TY I (W)8"(SLD)(090MIL)	LF	996.000		996.000	
	666-7035	REFL PAV MRK TY I (W)24"(SLD)(090MIL)	LF	106.000		106.000	
	666-7089	REF PAV MRK TY I(W)36"(YLD TRI)(090MIL)	EA	14.000		14.000	
	666-7289	TY I HIGH PERF PM (W)6"(BRK)(090MIL)	LF	570.000		570.000	
	666-7292	TY I HIGH PERF PM (W)6"(SLD)(090MIL)	LF	6,536.000		6,536.000	
	666-7301	TY I HIGH PERF PM (Y)6"(BRK)(090MIL)	LF	910.000		910.000	
	666-7304	TY I HIGH PERF PM (Y)6"(SLD)(090MIL)	LF	8,518.000		8,518.000	
	668-7091	PREFAB PM TY C (W)(ARROW)	EA	12.000		12.000	
	668-7100	PREFAB PM TY C (W)(LN REDUCT ARROW)	EA	1.000		1.000	
	668-7103	PREFAB PM TY C (W)(WORD)	EA	12.000		12.000	
	672-7002	REFL PAV MRKR TY I-C	EA	86.000		86.000	
	672-7004	REFL PAV MRKR TY II-A-A	EA	350.000		350.000	
	677-7001	ELIM EXT PM & MRKS (4")	LF	4,753.000		4,753.000	
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	

SUMMARY OF TRAFFIC CONTROL

LOCATION	0662-7068 WK ZN PAV MRK REMOV (W)6"(SLD)	0662-7072 WK ZN PAV MRK REMOV (W)8"(SLD)	0662-7082 WK ZN PAV MRK REMOV (W)(ARROW)	0662-7092 WK ZN PAV MRK REMOV (W)(WORD)	0662-7109 WK ZN PAV MRK REMOV (Y)6" (SLD W/MRKR)	0662-7112 WK ZN PAV MRK SHT TERM (TAB)TY W	0662-7114 WK ZN PAV MRK SHT TERM (TAB)TY Y-2	0677-7001 ELIM EXT PAV MRK & MRKS (4") ◒	0503-7002 PORTABLE CHANGEABLE MESSAGE SIGN	0505-7001 TMA (STATIONARY)	0505-7002 TMA (MOBILE OPERATION)
	LF	LF	LF	LF	LF	EA	EA	LF	EA	DAY	HR
US 79	3718	200	2	2	4410	249	539	4753	2	24	15
US 190 / SH 36	0	0	0	0	0	54	160	0	1	24	15
PROJECT TOTALS:	3718	200	2	2	4410	303	699	4753	3	48	30

◒ NOTE: ELIM EXT PAV MRK & MRKS ARE FOR PHASE 2 CONSTRUCTION.

SUMMARY OF ROADWAY

SEE NOTE (1) — SEE NOTE (2)

LOCATION	0100-7002 PREPARING ROW	0100-7003 PREP ROW (TREE REMOVE) (0"-12" DIA)	0104-7017 REMOVING CONC (CURB & GUTTER)	0110-7001 EXCAV (ROADWAY)	0132-7006 EMBANK (FNL)(DC) (TY C)	0134-7004 BACKFILL (TY A OR B)	0216-7001 PROOF ROLLING	0247-7090 FL BS (CMP IN PLC) (TY A GR1-2) (10")	0247-7339 FL BS (CMP IN PLC) (TY A GR1-2) (11")	0260-7001 LIME (COM OR QK) (SLURRY) OR QK(DRY)	0260-7007 LIME TRT (EXIST MATL) (8")	0275-7001 CEMENT
	STA	EA	LF	CY	CY	STA	HR	SY	SY	TON	SY	TON
US 79	6	6	30	788	68	10.8	1	0	1578	0	0	0
US 190 / SH 36	0	0	0	188	28	16.5	1	274	0	4.9	274	3.2
PROJECT TOTALS:	6	6	30	976	96	27.3	2	274	1578	4.9	274	3.2

NOTES:

(1) PROOF ROLLING ITEM OF WORK ADDED FOR USE BY ENGINEER AT THEIR DISCRETION TO DIRECT CONTRACTOR TO TEST AREAS OF POSSIBLE SOFT SUBGRADE.

(2) LIME TREATMENT IS IN THE EVENT THE SUBGRADE PI IS HIGHER THAN EXPECTED. THIS WOULD BE USED IN LIEU OF THE CEMENT TREATED SUBGRADE. TREATMENT TO BE CONFIRMED WITH THE ENGINEER PRIOR TO CONSTRUCTION.

SUMMARY OF ROADWAY (CONTINUED)

LOCATION	0275-7003 CEMENT TRT (EXIST MATL)(8")	0310-7004 PRIME COAT (MC-30)	0344-7001 SP MIXES SP-B PG64-22	0346-7001 STONE-MTRX-ASPH SMA-C SAC-A PG76-22	0346-7028 TACK COAT	0354-7032 PLANE ASPH CONC PAV(0" TO 2")	0354-7058 PLANE ASPH CONC PAV(9")	0529-7009 CONC CURB & GUTTER (TY II)
	SY	GAL	TON	TON	GAL	SY	SY	LF
US 79	0	316	776	1786	1623	607	4006	30
US 190 / SH 36	274	55	46	947	861	245	0	0
PROJECT TOTALS:	274	371	822	2733	2484	852	4006	30

SUMMARY OF DRAINAGE

LOCATION	0480-7001 CLEAN EXIST CULVERTS
	EA
US 79	2
US 190 / SH 36	2
PROJECT TOTALS:	4

Lochner
TBPE Firm Reg. No. 10488

PRINT DATE	REVISION DATE
$DATE$	

Texas Department of Transportation
Bryan District

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SUMMARY OF QUANTITIES

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79
STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM
CONTROL	SECTION	JOB / SHEET NO.
0204	07	056 / 011

REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
FILENAME: $FILES

SUMMARY OF DRIVEWAY ITEMS

LOCATION	STATION	DRV #	WIDTH FT	LENGTH FT	RADIUS R1	RADIUS R2	0530-7006 DRIVEWAYS (CONC) SY	RESIDENTIAL / COMMERCIAL	COMMENTS
US 79									
PLAN & PROFILE NO. 3	50+81.17, LT.	DRV-3-1	45	20.9	100	60	421	COMMERCIAL	
US 190 / SH 36									
PLAN & PROFILE NO. 7	1093+06.29, RT.	DRV-7-1	45	37.8	35	35	307	COMMERCIAL	
						PROJECT TOTALS:	728		

NOTE: DRIVEWAYS WILL BE CONSTRUCTED TO THE R.O.W. TO TIE-IN AS DIRECTED.
REFER TO DRIVEWAY DETAILS FOR ADDITIONAL INFORMATION.

SUMMARY OF SIGNS

LOCATION	0644-7001 IN SM RD SN SUP & AM TY10BWG(1)SA(P)	0644-7004 IN SM RD SN SUP & AM TY10BWG(1)SA(T)	0644-7028 IN SM RD SN SUP & AM TYS80(1)SA(T)	0644-7073 REMOVE SM RD SN SUP&AM
	EA	EA	EA	EA
US 79				
SHEET 1 OF 8	2	0	0	1
SHEET 2 OF 8	4	1	0	3
SHEET 3 OF 8	3	0	0	5
SHEET 4 OF 8	4	0	1	5
SHEET 5 OF 8	1	0	0	1
US 190 / SH 36				
SHEET 6 OF 8	0	1	0	1
SHEET 7 OF 8	1	0	1	2
SHEET 8 OF 8	5	0	0	5
PROJECT TOTALS:	20	2	2	23

SUMMARY OF EROSION CONTROL (SW3P)

LOCATION	0160-7002 FURN & PLACE TOPSOIL (4")	0164-7001 BROADCAST SEED (PERM_RURAL_SAND)	0164-7013 BROADCAST SEED (TEMP_WARM)	0164-7014 BROADCAST SEED (TEMP_COOL)	0168-7001 VEGETATIVE WATERING	0506-7002 ROCK FILTER DAMS (INSTALL)(TY 2)	0506-7011 ROCK FILTER DAMS (REMOVE)	0506-7039 TEMP SEDMT CONT FENCE (INSTALL)	0506-7041 TEMP SEDMT CONT FENCE (REMOVE)
	SY	SY	SY	SY	TGL	LF	LF	LF	LF
US 79									
SHEET 1 OF 6	482	482	241	241	4.8				
SHEET 2 OF 6	2606	2606	1303	1303	26.0	16	16	82	82
SHEET 3 OF 6	1296	1296	648	648	12.9	56	56	190	190
SHEET 4 OF 6	246	246	123	123	2.6			145	145
US 190 / SH 36									
SHEET 5 OF 6	530	530	265	265	5.3			46	46
SHEET 6 OF 6	630	630	315	315	6.3	16	16		
PROJECT TOTALS:	5790	5790	2895	2895	57.9	88	88	463	463

SUMMARY OF DELINEATOR AND PAVEMENT MARKERS / RUMBLE STRIPS

LOCATION	▲ 0533-7001 MILL RUMBLE STRIPS (ASPHALT) (SHOULDER)	▮ 0533-7002 MILL RUMBLE STRIPS (ASPHALT) (CENTERLINE)	0658-7058 INSTL OM ASSM (OM-2Z)(WFLX) GND	0666-7017 REFL PAV MRK TY I (W) 8"(DOT)(090MIL)	0666-7023 REFL PAV MRK TY I (W) 8"(SLD)(090MIL)	0666-7035 REFL PAV MRK TY I (W) 24"(SLD)(090MIL)	0666-7089 REFL PAV MRK TY I(W)36" (YLD TRI)(090MIL)	0666-7289 TY I HIGH PERF PM (W)6"(BRK)(090MIL)
	LF	LF	EA	LF	LF	LF	EA	LF
US 79								
SHEET 1 OF 8	200	181						
SHEET 2 OF 8	1200	424	2	13				
SHEET 3 OF 8	830		4		136			110
SHEET 4 OF 8	163			36	312	82		160
SHEET 5 OF 8								300
US 190 / SH 36								
SHEET 6 OF 8	400	200	2		50			
SHEET 7 OF 8	986	318	2	30	350			
SHEET 8 OF 8	137		2		148	24	14	
PROJECT TOTALS:	3916	1123	12	79	996	106	14	570

▮ OPTION 3 RUMBLE STRIPS WILL BE USED OR AS DIRECTED

▲ OPTION 7 RUMBLE STRIPS WILL BE USED OR AS DIRECTED

SUMMARY OF DELINEATOR AND PAVEMENT MARKERS / RUMBLE STRIPS

LOCATION	0666-7292 TY I HIGH PERF PM (W)6"(SLD)(090MIL)	0666-7301 TY I HIGH PERF PM (Y)6"(BRK)(090MIL)	0666-7304 TY I HIGH PERF PM (Y)6"(SLD)(090MIL)	668-7091 PREFAB PAV MRK TY C (W)(ARROW)	668-7100 PREFAB PAV MRK TY C (W) (LN REDUCT ARROW)	668-7103 PREFAB PAV MRK TY C (W)(WORD)	0672-7002 REFL PAV MRKR TY I-C	0672-7004 REFL PAV MRKR TY II-A-A
	LF	LF	LF	EA	EA	EA	EA	EA
US 79								
SHEET 1 OF 8	200		400					17
SHEET 2 OF 8	1200	200	1626	2				62
SHEET 3 OF 8	929	300	1200	2	1	1	12	30
SHEET 4 OF 8	298	110	894	2		5	30	37
SHEET 5 OF 8	500	300	1200				16	60
US 190 / SH 36								
SHEET 6 OF 8	400		480			1	3	24
SHEET 7 OF 8	1086		1644	4		3	18	82
SHEET 8 OF 8	1923		1074	2		2	7	38
PROJECT TOTALS:	6536	910	8518	12	1	12	86	350

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SUMMARY OF QUANTITIES

SHEET 2 OF 2

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79
STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM
CONTROL	SECTION	JOB / SHEET NO.
0204	07	056 / 012

REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
FILENAME: $FILE$

GENERAL

A. ALL TRAFFIC CONTROL DEVICES WILL CONFORM WITH THE TEXAS "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" (TMUTCD), AND WILL BE MAINTAINED AS DIRECTED. ADDITIONAL GUIDELINES FOR TRAFFIC CONTROL DEVICES MAY BE FOUND IN THE TMUTCD.

B. TRUCK MOUNTED ATTENUATOR (TMA'S) WILL BE REQUIRED AT ALL APPROACH WORK AREAS.

C. INSTALL ALL SIGNS, BARRICADES AND TRAFFIC CONTROL DEVICES AS SHOWN AND IN ACCORDANCE WITHE THE STANDARD BC SHEETS AND AS DIRECTED.

D. ADDITIONAL SIGNS, BARRICADES OR TRAFFIC CONTROL DEVICES OTHER THAN THOSE SPECIFIED MAY BE REQUIRED FOR THE SAFE MOVEMENT OF TRAFFIC THROUGHOUT THE PROJECT. SEE GENERAL NOTES FOR ADDITIONAL DETAILS.

E. WORK SITES SHOULD BE CAREFULLY MONITORED TO ENSURE THAT TRAFFIC CONTROL MEASURES ARE OPERATING EFFECTIVELY AND THAT ALL DEVICES USED ARE CLEARLY VISIBLE, CLEAN AND IN GOOD REPAIR.

F. THE ENGINEER MAY DIRECT THE CONTRACTOR TO VARY THE NUMBER AND LOCATION OF SIGNS, BARRICADES AND CHANNELIZING DEVICES FROM THOSE INDICATED ON THE PLANS IN ORDER TO MAINTAIN SAFE AND UNINTERRUPTED FLOW OF TRAFFIC, PARTICULARLY IN THOSE AREAS OF IMMEDIATE WORK.

G. NO EQUIPMENT WILL REMAIN IN A POSITION OVERNIGHT OR ANY OTHER NON-WORK PERIODS THAT WILL ENDANGER THE TRAVELING PUBLIC.

H. THE CONTRACTOR WILL BE REQUIRED TO PROVIDE ACCESS TO PRIVATE PROPERTY AT ALL TIMES AND IN ALL WEATHER CONDITIONS. DRIVEWAYS WILL BE PLACED ACCORDING TO THE PLANS AND AS DIRECTED. TEMPORARY DRIVEWAYS WILL BE CONSTRUCTED IMMEDIATELY AFTER THE CONTRACTOR HAS DISTURBED OR ALTERED THE EXISTING DRIVEWAYS.

I. ANY REQUEST TO ALTER THE SEQUENCE OF OPERATION OF TRAFFIC CONTROL PLAN WILL BE SUBMITTED TO THE ENGINEER FOR WRITTEN APPROVAL.

J. THE ENGINEER WILL BE NOTIFIED PRIOR TO ANY LANE CLOSURE. PROVIDE TWO (2) WEEK NOTICE TO THE ENGINEER OF ANY PLANNED LANE CLOSURES TO ALLOW COORDINATION. THE PROJECT ENGINEER MUST APPROVE ALL CLOSURES PRIOR TO IMPLEMENTATION.

K. THE CONTRACTOR WILL MAINTAIN PERMANENT SIGNS WITHIN PROJECT LIMITS AND COVER SIGNS NOT IN USE. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO THE ITEM 502 "BARRICADES, SIGNS AND TRAFFIC HANDLING".

SEQUENCE OF CONSTRUCTION:

THE CONTRACTORS OPERATION WILL BE SUCH THAT THE SAFETY OF THE TRAVELING PUBLIC WILL BE OF PRIME IMPORTANCE.
THE SEQUENCES AS SHOWN CAN OVERLAP, AS NECESSARY, AND WHEN APPROVED BY THE ENGINEER.

THE SEQUENCE OF CONSTRUCTION WILL GENERALLY CONFORM TO THE FOLLOWING SEQUENCE:

PHASE 1

1) SET PROJECT BARRICADES, TRAFFIC CONTROL DEVICES AND SIGNS IN ACCORDANCE WITH TRAFFIC CONTROL STANDARDS SHOWN IN THE PLANS, TMUTCD AND GENERAL NOTES.

2) INSTALL BEST MANAGEMENT PRACTICES (BMP) AND EROSION CONTROL DEVICES AS SHOWN OR AS DIRECTED.

3) EXISTING SIGNS THAT CONFLICT WITH THE PAVEMENT WIDENING WILL BE MOVED AND PLACED ON SKIDS FOR TEMPORARY USE AS DIRECTED.

4) CONSTRUCT WIDENING ON US 190 / SH 36 FROM STATION 1089+49.31 TO STATION 1092+49.31, RIGHT.
CONSTRUCT WIDENING ON US 79 FROM STATION 51+63.28 TO STATION 54+40.34, LEFT.

- ELIMINATE EXISTING PAVEMENT MARKINGS AS NEEDED AND PLACE WORK ZONE PAVEMENT MARKINGS AND SHIFT TRAFFIC AS SHOWN IN THE TRAFFIC CONTROL PLAN.
- AT THE END OF EACH DAY'S OPERATION, PLACE ALL WEATHER MATERIAL ALONG PAVEMENT EDGE DROP-OFF AS SHOWN IN THE DETAIL ON THIS SHEET.

5) ONCE PHASE 1 WORK IS COMPLETE ADJUST WORK ZONE PAVEMENT MARKINGS AND SWITCH TRAFFIC FOR PHASE 2 CONSTRUCTION.

PHASE 2

1) CONSTRUCT PAVEMENT WIDENING ON US 79 FROM STATION 40+18.98 TO STATION 49+03.32, RIGHT.

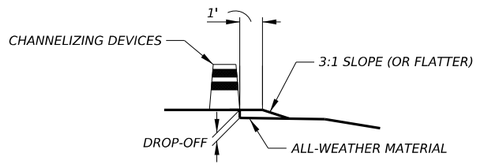
- AT THE END OF EACH DAY'S OPERATION, PLACE ALL WEATHER MATERIAL ALONG PAVEMENT EDGE DROP-OFF AS SHOWN IN THE DETAIL ON THIS SHEET.

2) ONCE PAVEMENT WIDENING IS COMPLETE, PERFORM HMA OVERLAY AS SHOWN IN THE PLANS. REFER TO TCP(2-2) FOR DAILY LANE CLOSURES.

- PAVING OPERATIONS WILL END SO THAT THE DISTANCE OF UNEVEN LANES IS MINIMAL PRIOR TO THE END OF EACH DAYS WORK.
- WORK ZONE TABS WILL BE USED ON FINAL PAVING OPERATIONS UNTIL PERMANENT STRIPING CAN BE PLACED, AS DIRECTED.

3) COMPLETE FINAL PAVEMENT MARKINGS AND SIGNS.

4) COMPLETE ALL OTHER WORK AS SHOWN ON THE PLANS AND AS DIRECTED. UPON COMPLETION, PERFORM FINAL PROJECT CLEAN-UP. REMOVE EROSION CONTROLS (BMP) WHEN DIRECTED.



PAVEMENT EDGE DROP-OFF DETAIL

1. LESS THAN 2 INCHES: CW 8-11 SIGNS ARE REQUIRED.
2. GREATER THAN 2 INCHES: CHANNELIZATION DEVICES AND EITHER CW 8-9a OR CW 8-11 SIGNS ARE REQUIRED.
3. THE SAFETY SLOPE WILL BE CONSTRUCTED WITH AN ALL-WEATHER MATERIAL SUCH AS RAP, WHICH IS CLEAN AND FREE OF DEBRIS AND LARGE ROCKS.
4. FOR CHANNELING DEVICE PLACEMENT AND SPACING FOR ALL PHASES, REFER TO THE TCP STANDARDS.

2024.06.04 13:02:44-05'00'

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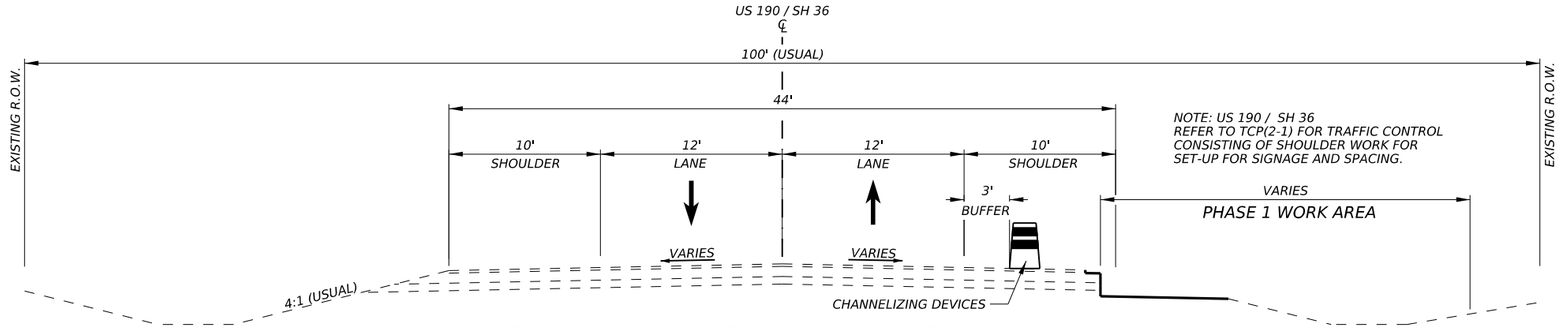
TRAFFIC CONTROL PLAN SEQUENCE OF CONSTRUCTION

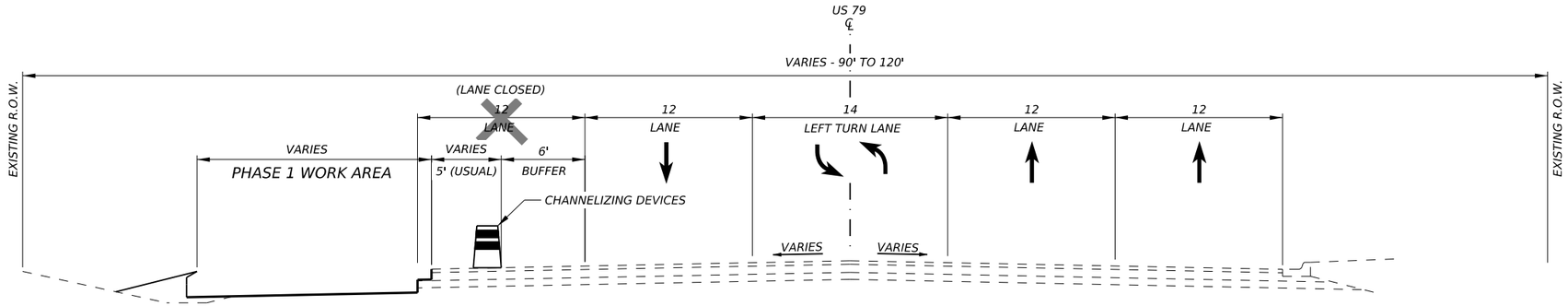
FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79
STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM
CONTROL	SECTION	JOB / SHEET NO.
0204	07	056 / 013

REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
FILENAME: c:\pw_working\lochner-pw-01\dms82631\US79_US190_BB01.dgn



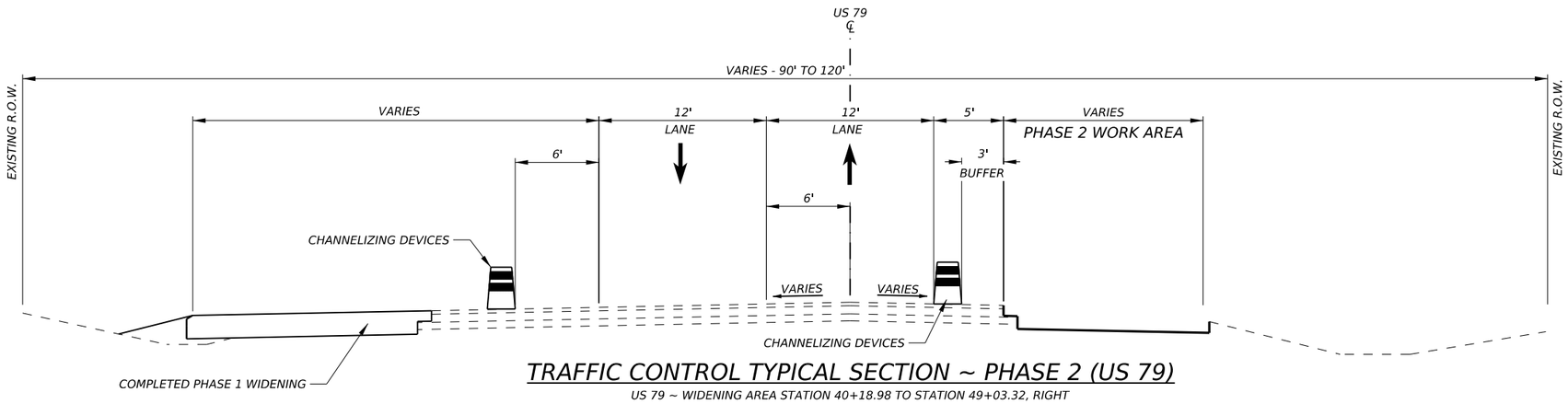
TRAFFIC CONTROL TYPICAL SECTION ~ PHASE 1 (US 190 / SH 36)

US 190 / SH 36 ~ WIDENING AREA STATION 1089+49.31 TO STATION 1092+49.31, RIGHT



TRAFFIC CONTROL TYPICAL SECTION ~ PHASE 1 (US 79)

US 79 ~ WIDENING AREA STATION 51+63.28 TO STATION 54+40.35, LEFT



TRAFFIC CONTROL TYPICAL SECTION ~ PHASE 2 (US 79)

US 79 ~ WIDENING AREA STATION 40+18.98 TO STATION 49+03.32, RIGHT

2024.06.04 13:03:04-05'00'

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TRAFFIC CONTROL SECTIONS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79
STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM
CONTROL	SECTION	JOB / SHEET NO.
0204	07	056 / 014

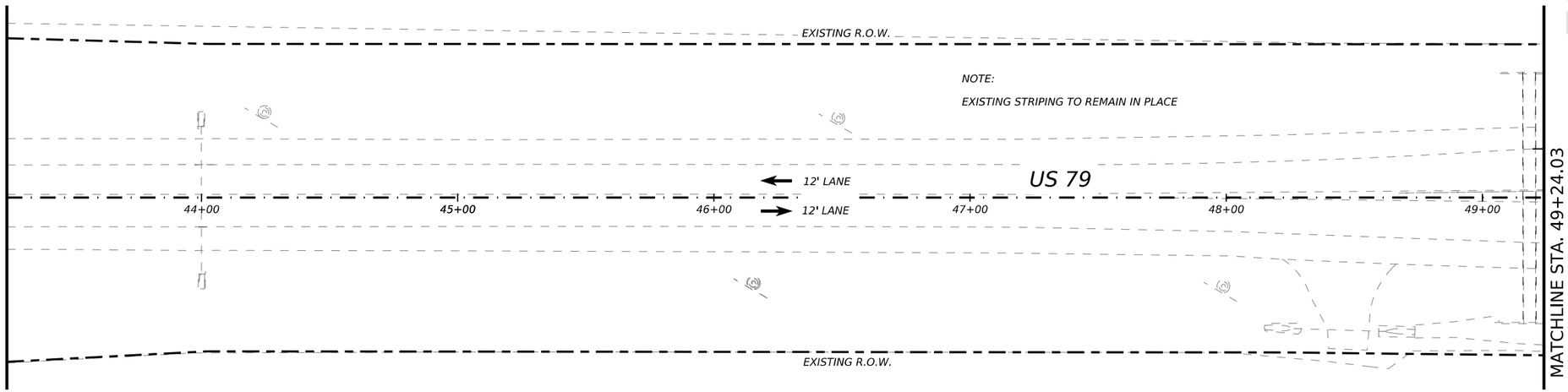
REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
FILENAME: c:\pw_working\lochner-pw-01\dms92631\US79_US190_BA01.dgn

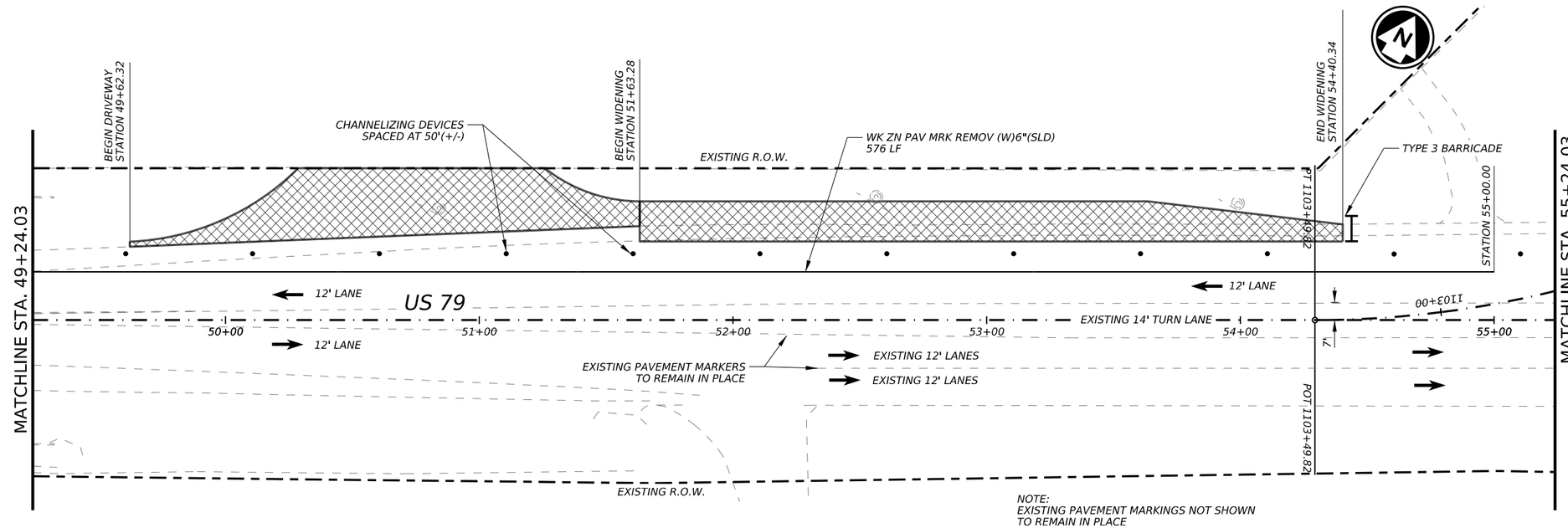
NOTES:

1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- WORK AREA
- COMPLETED WORK AREA
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING R.O.W.
- CHANNELIZING DEVICES





2024.06.04 13:03:31-05'00'

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TRAFFIC CONTROL PLAN PHASE 1

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79

STATE	DISTRICT	COUNTY	
TEXAS	BRY	MILAM	
CONTROL	SECTION	JOB	SHEET NO.
0204	07	056	015

REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
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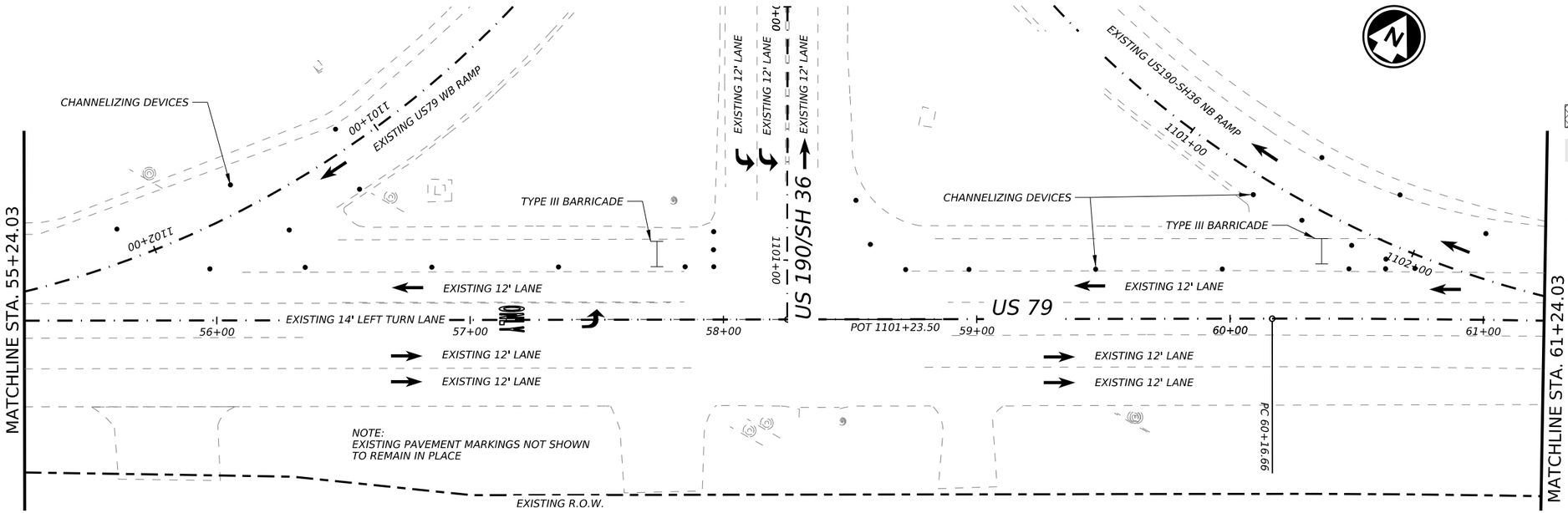
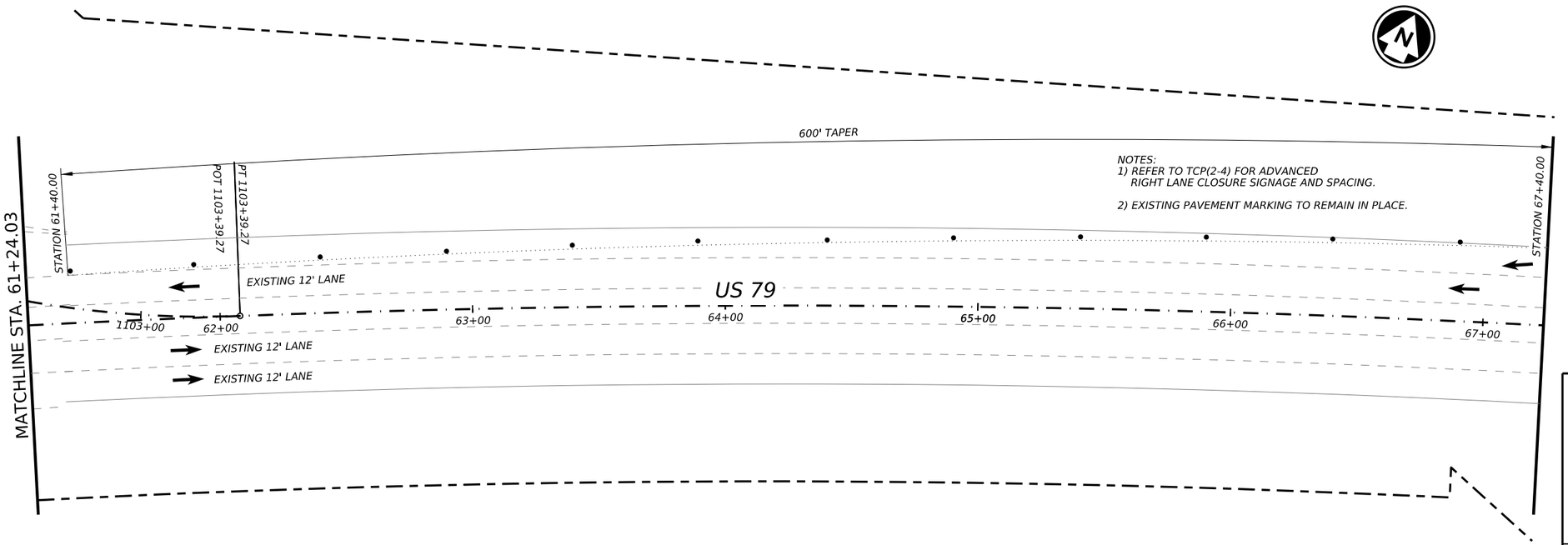


NOTES:

1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- WORK AREA
- COMPLETED WORK AREA
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING R.O.W.
- CHANNELIZING DEVICES



NOTES:
1) REFER TO TCP(2-4) FOR ADVANCED RIGHT LANE CLOSURE SIGNAGE AND SPACING.

2) EXISTING PAVEMENT MARKING TO REMAIN IN PLACE.

2024.06.04 13:03:48-05'00'

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TRAFFIC CONTROL PLAN PHASE 1

SHEET 2 OF 2

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79

STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM

CONTROL	SECTION	JOB	SHEET NO.
0204	07	056	016

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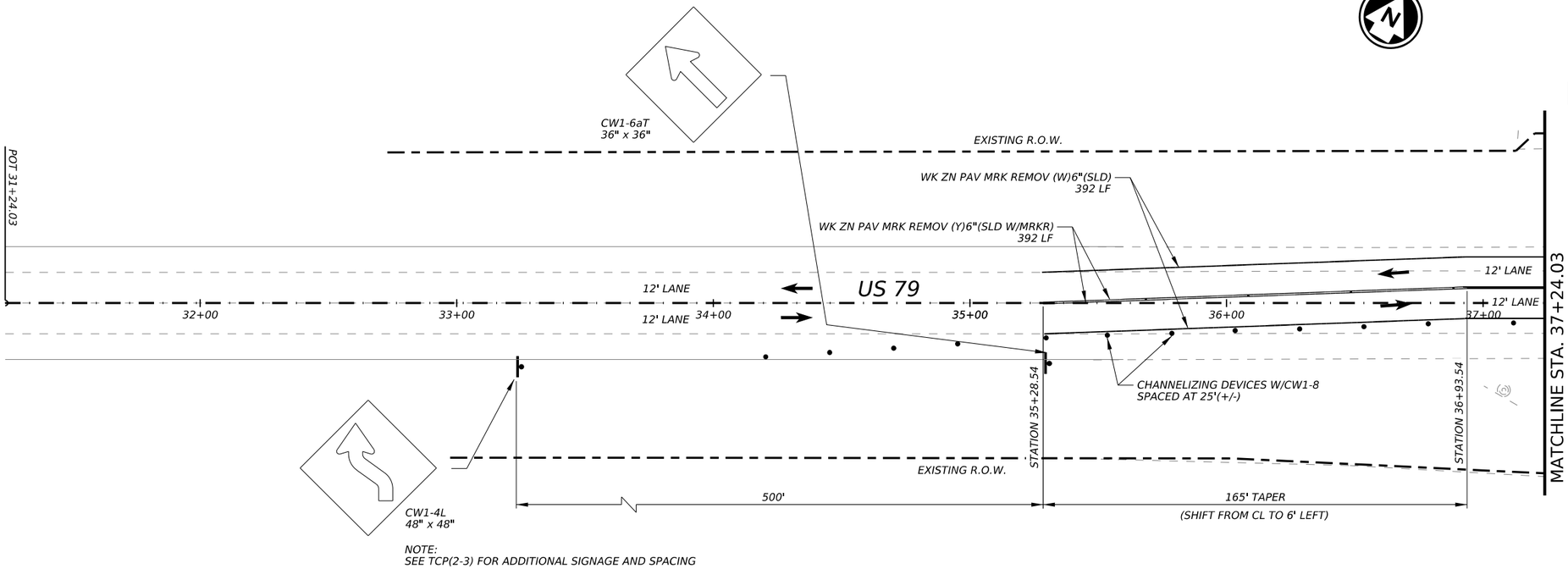
FILENAME: c:\pw_working\lochner-pw-01\dms82831\TCP_PHASE1_PLANS.dgn

NOTES:

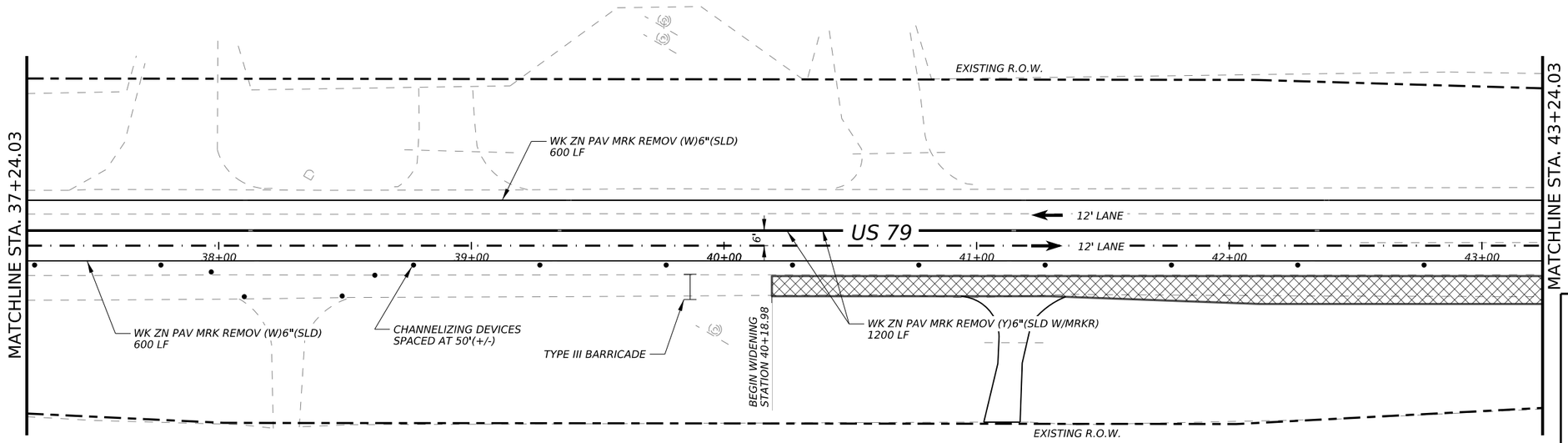
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- WORK AREA
- COMPLETED WORK AREA
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING R.O.W.
- CHANNELIZING DEVICES



NOTE:
SEE TCP(2-3) FOR ADDITIONAL SIGNAGE AND SPACING



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TRAFFIC CONTROL PLAN PHASE 2

SHEET 1 OF 3

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79

STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM

CONTROL	SECTION	JOB	SHEET NO.
0204	07	056	017

REV DATE: 1-31-2023
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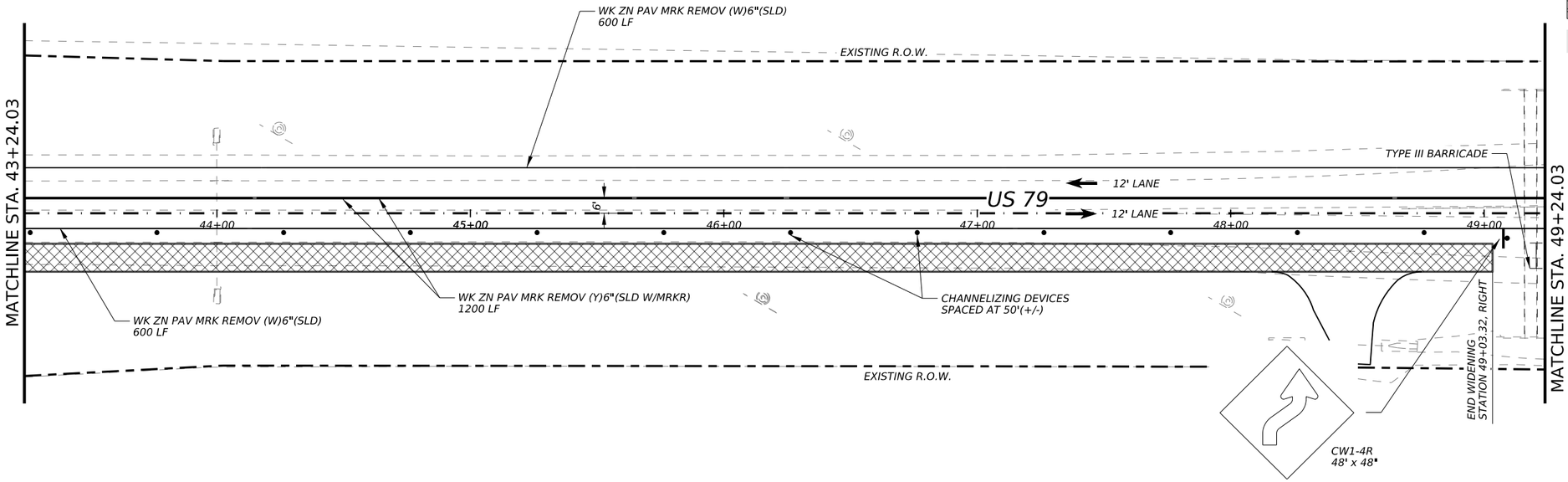
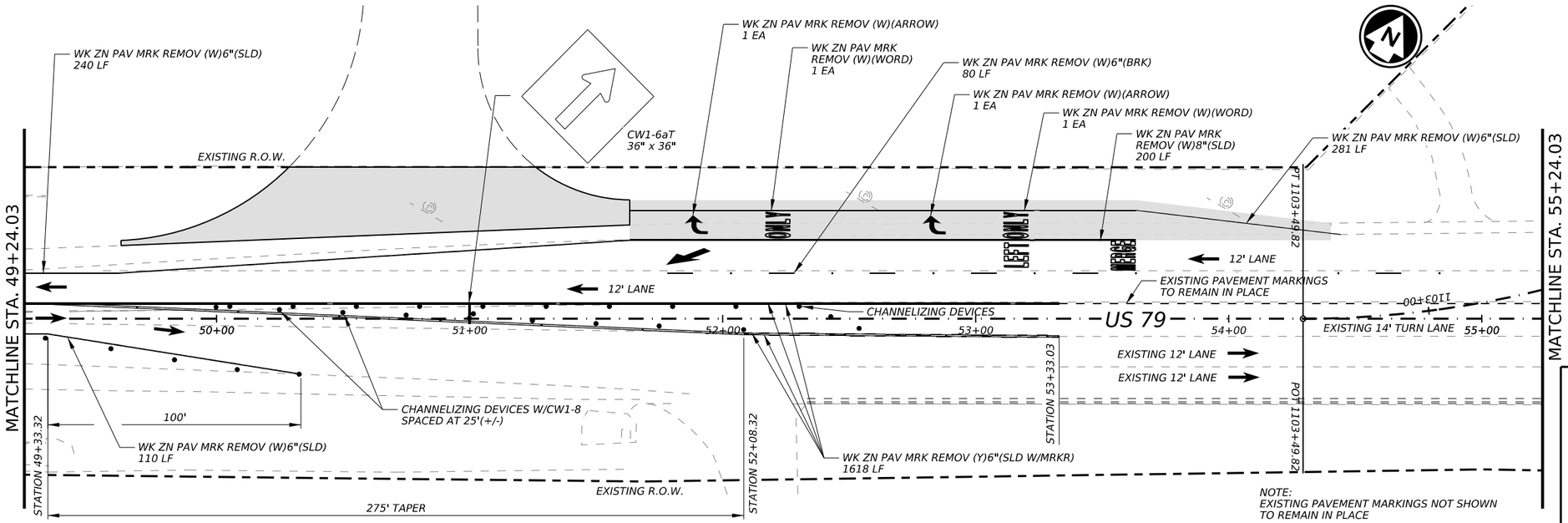
NOTES:

1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- WORK AREA
- COMPLETED WORK AREA
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING R.O.W.
- CHANNELIZING DEVICES





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TRAFFIC CONTROL PLAN PHASE 2

SHEET 2 OF 3

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79

STATE	DISTRICT	COUNTY	
TEXAS	BRY	MILAM	
CONTROL	SECTION	JOB	SHEET NO.
0204	07	056	018

REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
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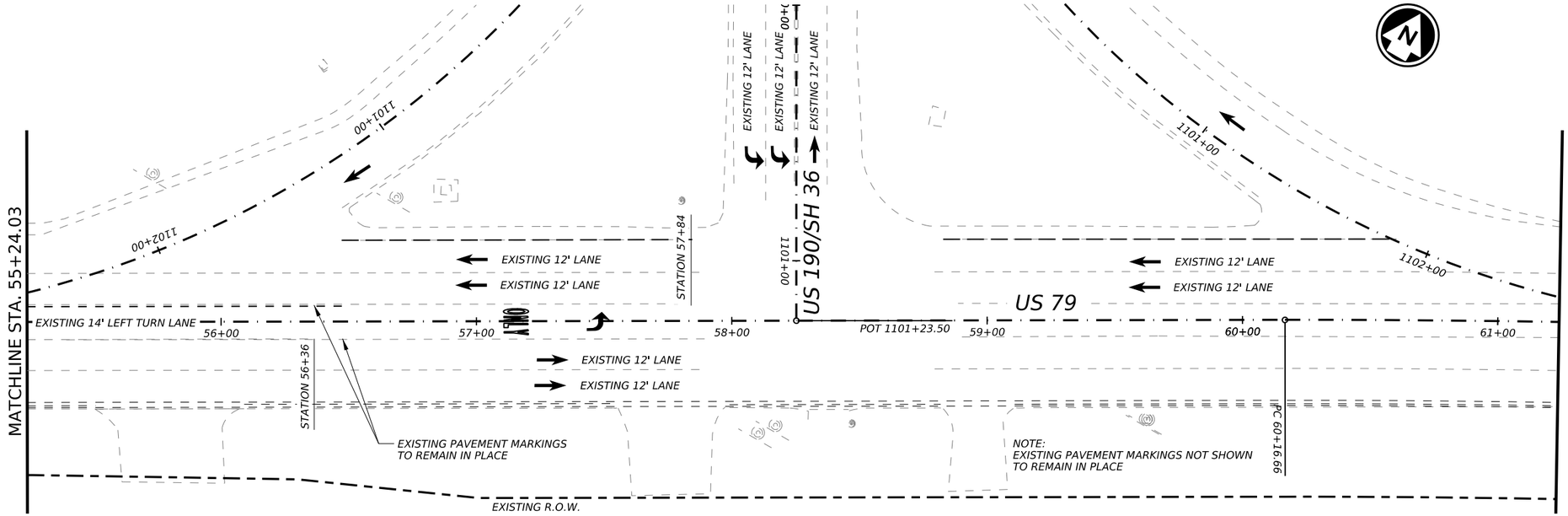

NOTES:

1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- WORK AREA
- COMPLETED WORK AREA
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING R.O.W.
- CHANNELIZING DEVICES

2024.06.04 13:04:46-05'00'

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TRAFFIC CONTROL PLAN PHASE 2

SHEET 3 OF 3

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79
STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM
CONTROL	SECTION	JOB / SHEET NO.
0204	07	056 / 019

REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
FILENAME: c:\pw_working\lochner-pw-01\dms826311\TCP_PHASE2_PLANS.dgn

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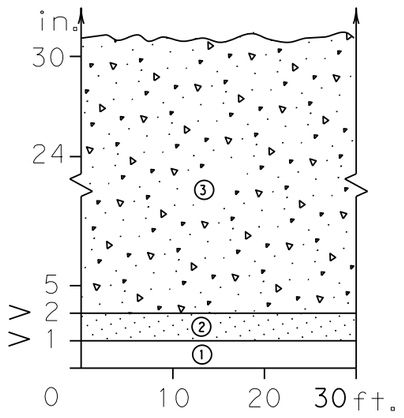
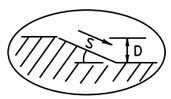
DATE:
FILE:

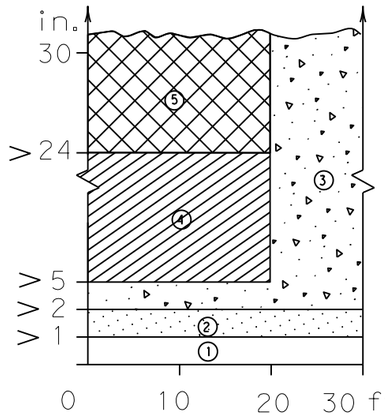
DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

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

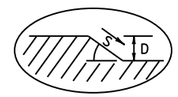


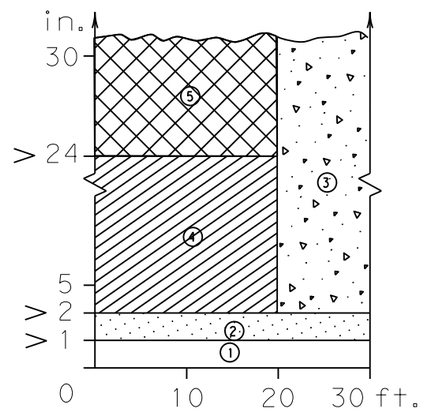
Edge Condition I
S = (3:1) (or flatter)



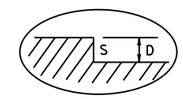


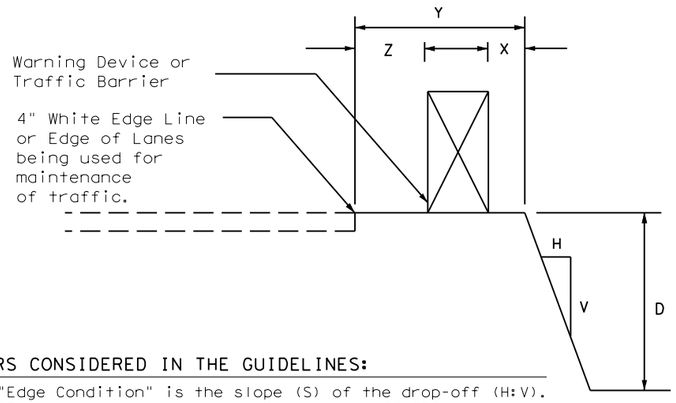
Edge Condition II
S = ((2.99):1) to (1:1)





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	CW8-9a or CW 8-11, signs plus drums. Where restricted space precludes the use of drums, use vertical panels. An edge slope to that of the profered Edge Condition I.
⑤	Check indications (Figure-1) for possitive 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:

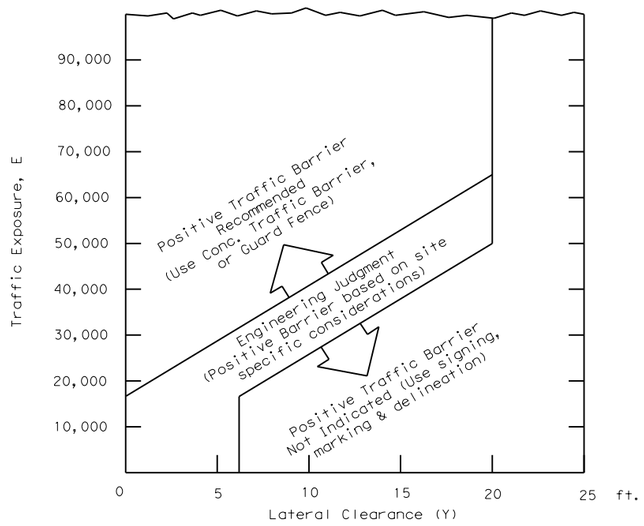
1. Edge Condition I: Most vehicles are able to traverse an edge condition with a slope rate of (3 to 1) or flatter. The slope must be constructed with a compacted material capable of supporting vehicles.

2. Edge Condition II: Most vehicles are able to traverse an edge condition with a slope between (2.99 to 1) and (1 to 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 the clear zone.

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
DAVID P. NEUMANN
83345
LICENSED
PROFESSIONAL ENGINEER

2024.06.04 13:11:01-05'00'

Date

David P. Neumann, P.E.

Texas Department of Transportation

Traffic Safety Division Standard

TREATMENT FOR VARIOUS EDGE CONDITIONS

FILE: edgecon.dgn	DN:	CK:	DW:	CK:
©TxDOT August 2000	CONT	SECT	JOB	HIGHWAY
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03-01 08-01 9-21	DIST	COUNTY		SHEET NO.
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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-03 7-13 9-07 8-14 5-10 5-21	0204	07	056	US 79
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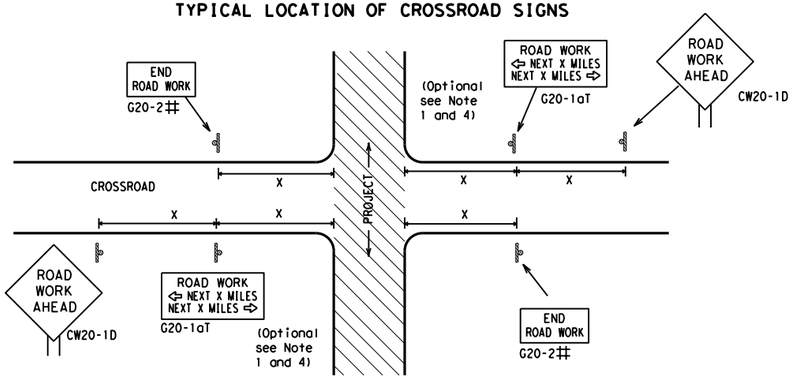
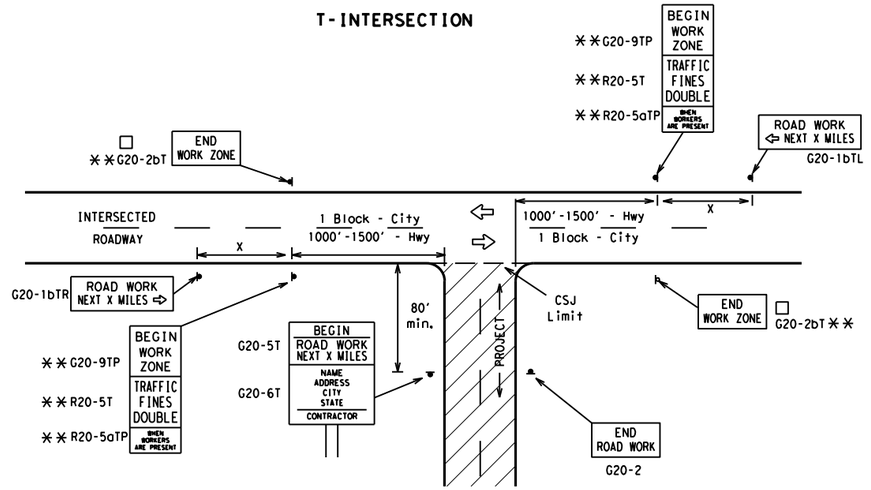
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

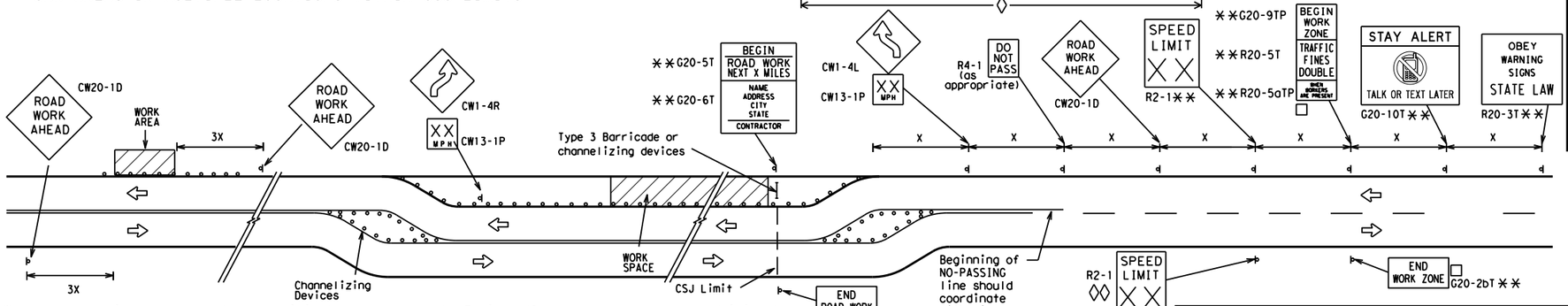
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

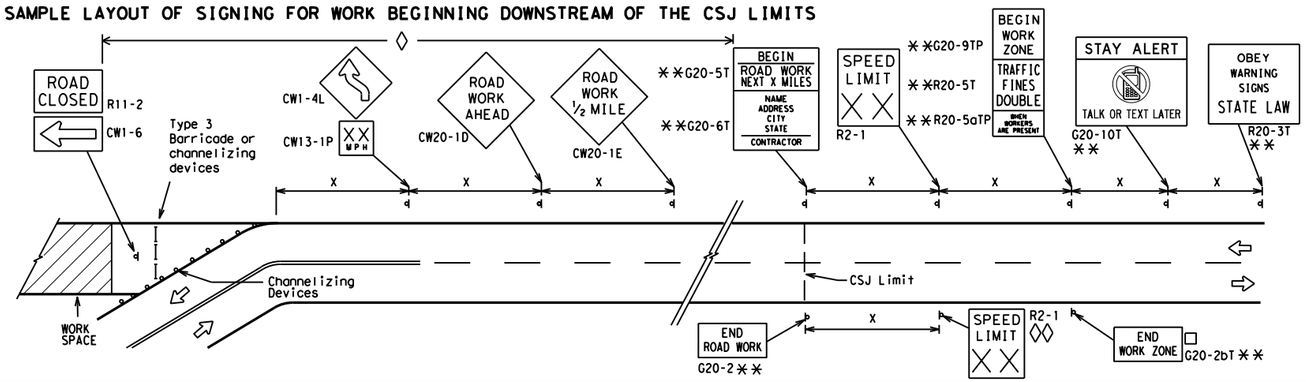
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

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



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

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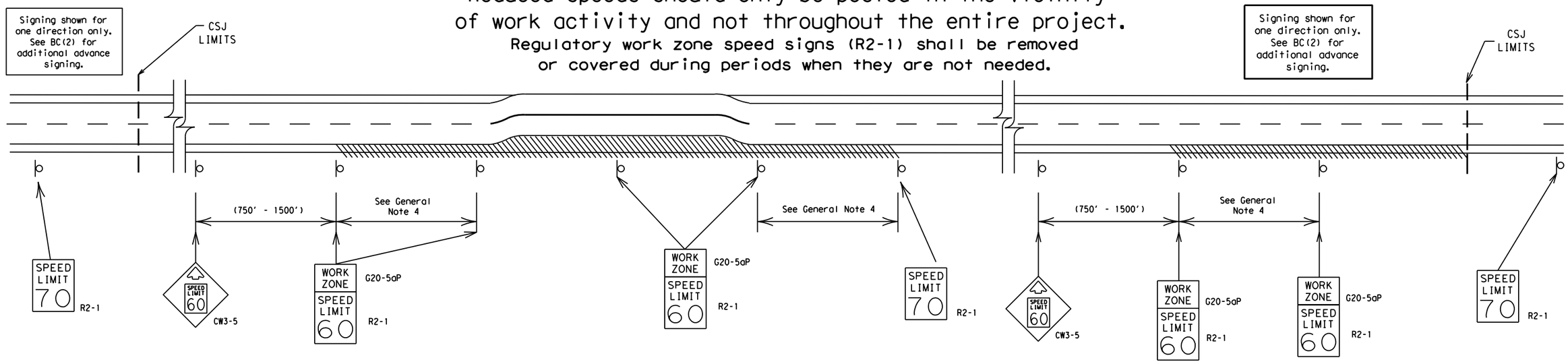
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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 traveled way.

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

GENERAL NOTES

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

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Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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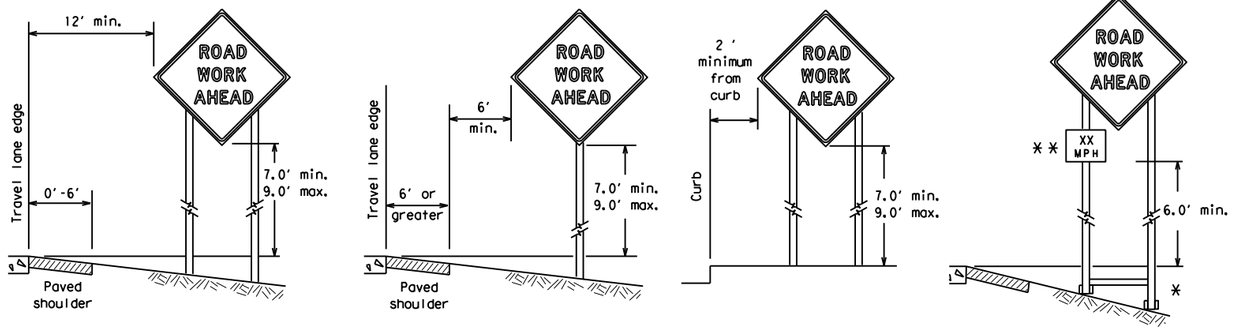
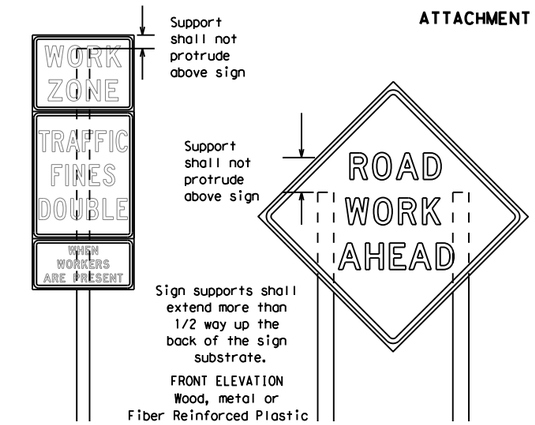
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

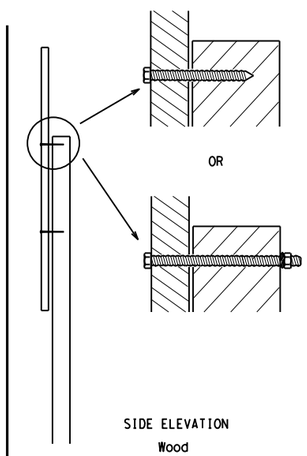


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** 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





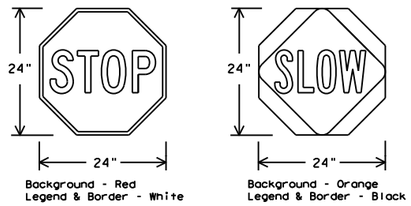
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



Background - Red
Legend & Border - White

Background - Orange
Legend & Border - Black

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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

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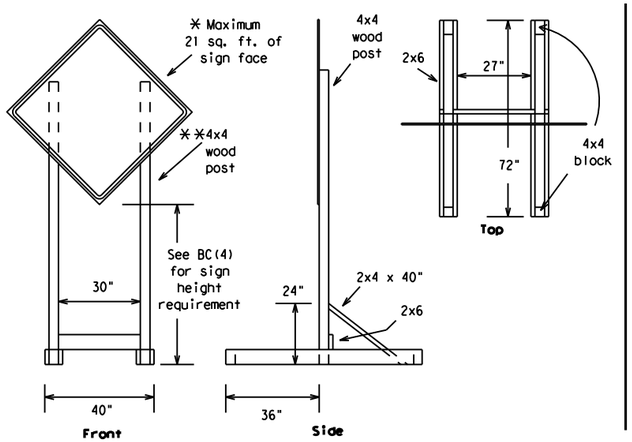
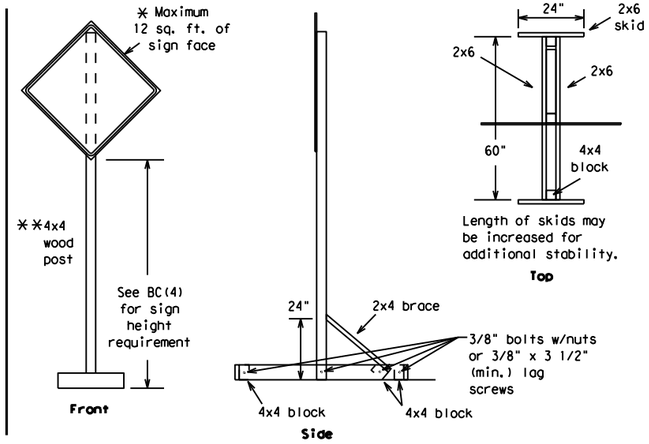
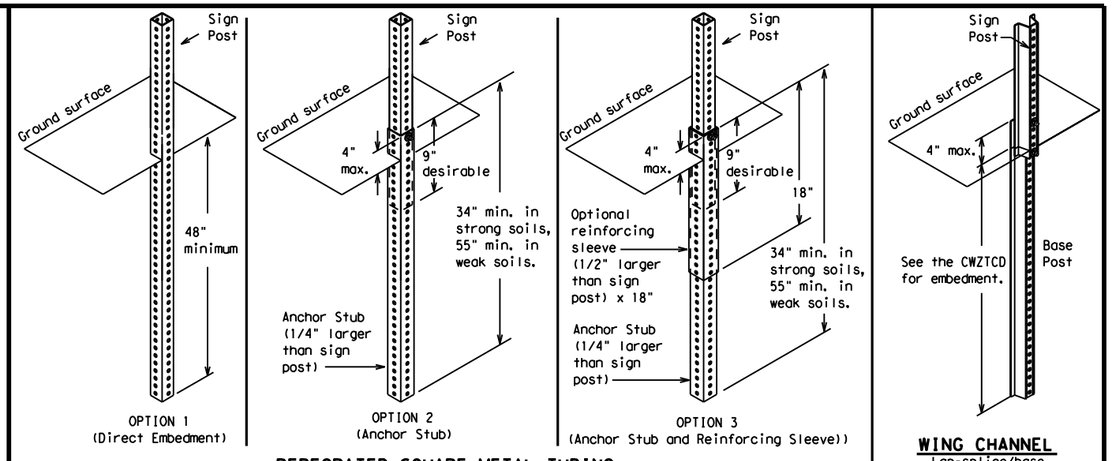




SKID MOUNTED WOOD SIGN SUPPORTS

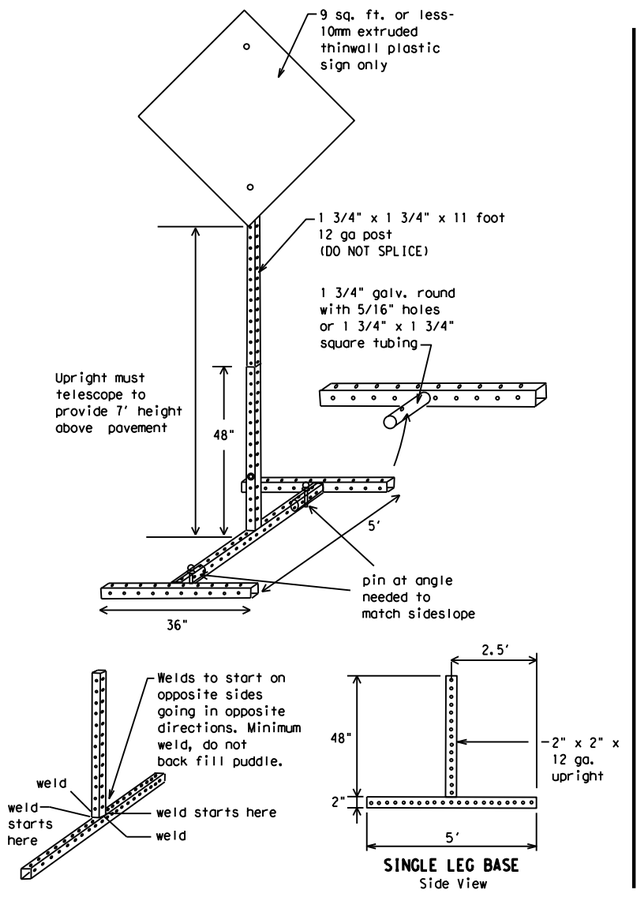
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

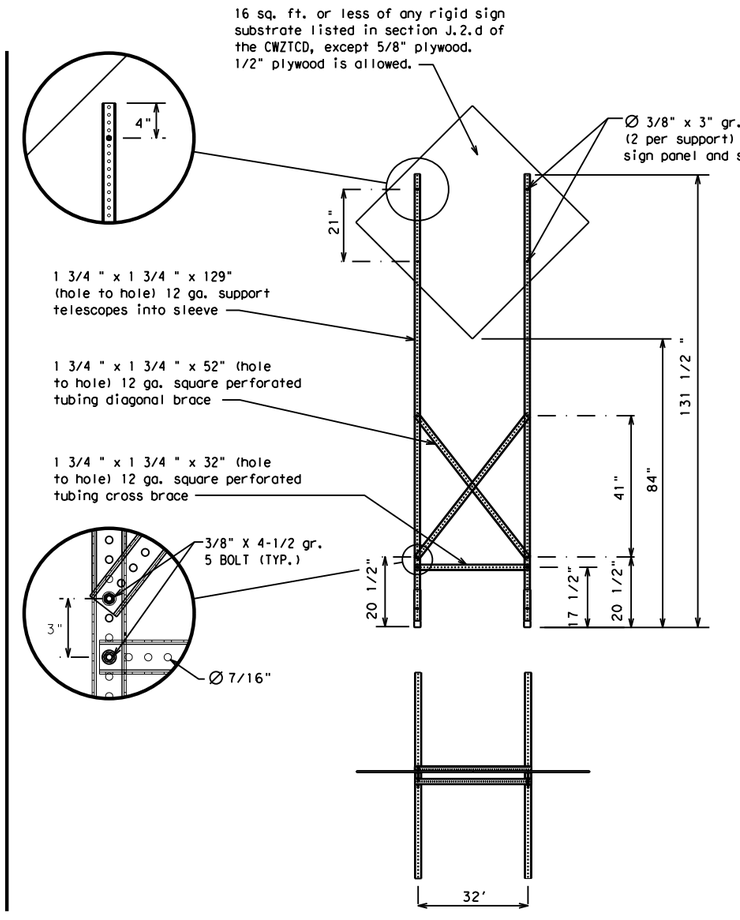


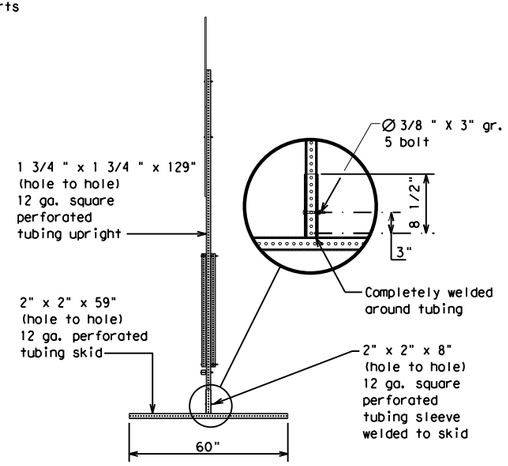
PERFORATED SQUARE METAL TUBING

GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

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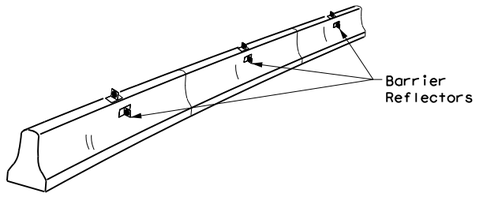
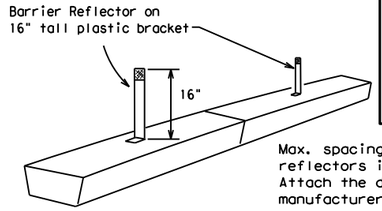
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



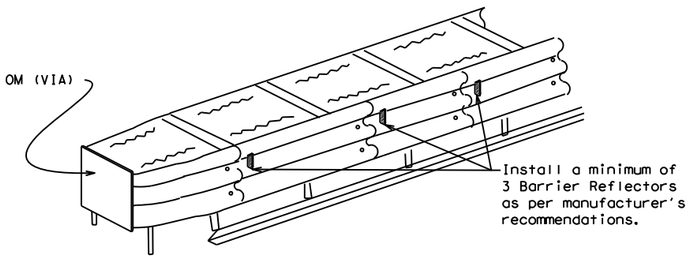
CONCRETE TRAFFIC BARRIER (CTB)

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



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

LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

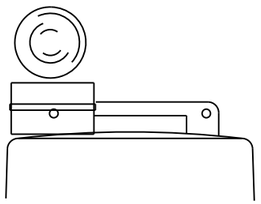
LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

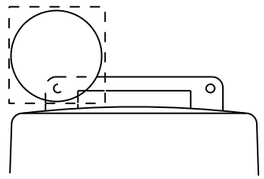
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

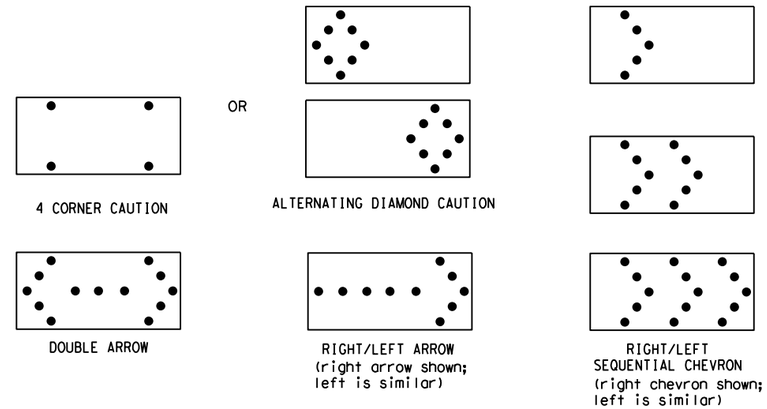
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0204	07	056	US 79
9-07 8-14	DIST	COUNTY		SHEET NO.
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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

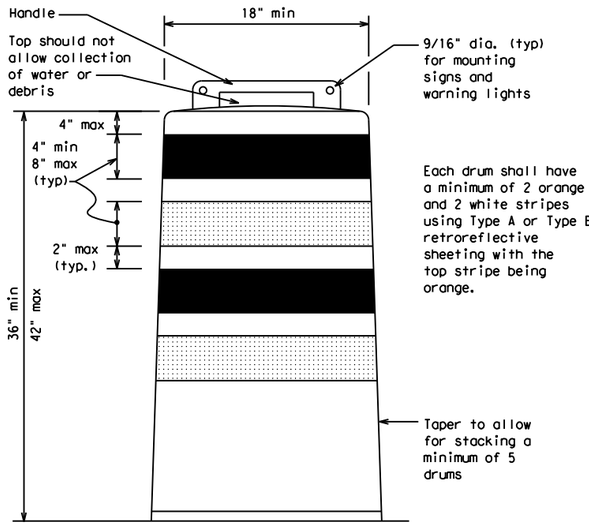
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

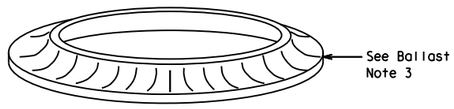
RETROREFLECTIVE SHEETING

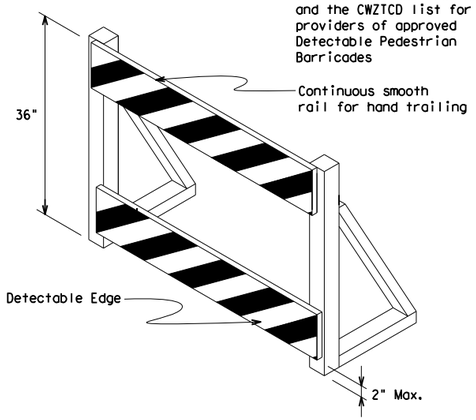
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

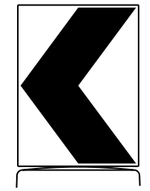




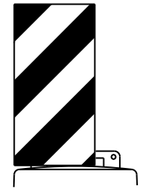


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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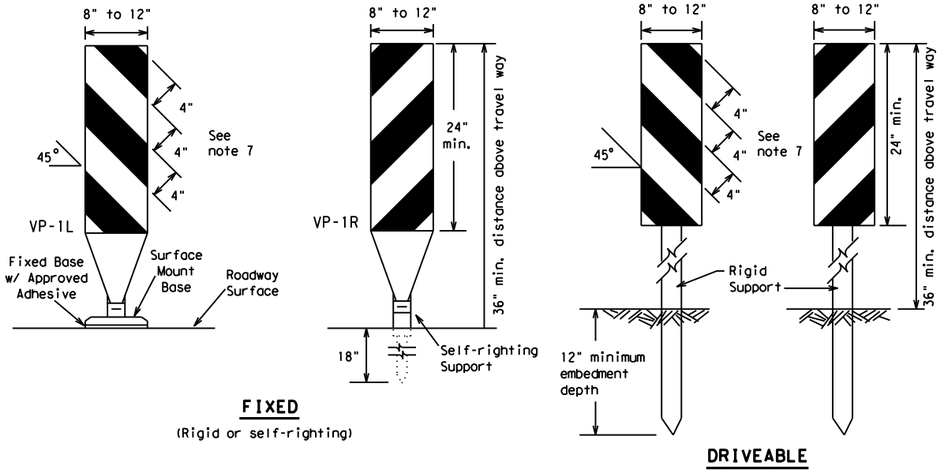
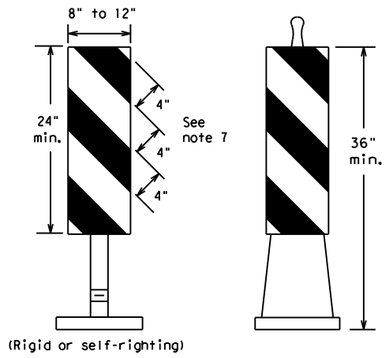


FIXED
(Rigid or self-righting)

DRIVEABLE

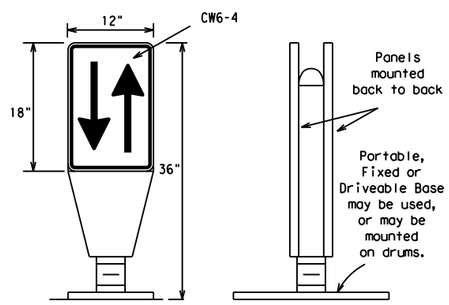


(Rigid or self-righting)

PORTABLE

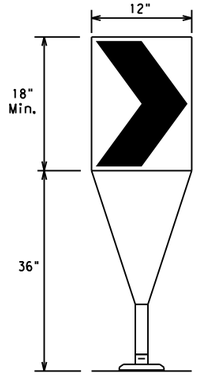
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



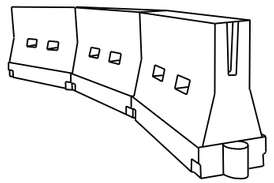
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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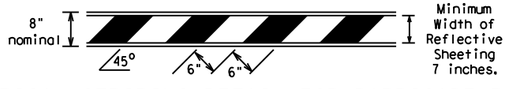
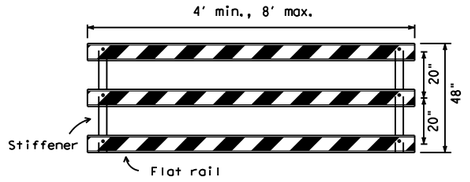
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



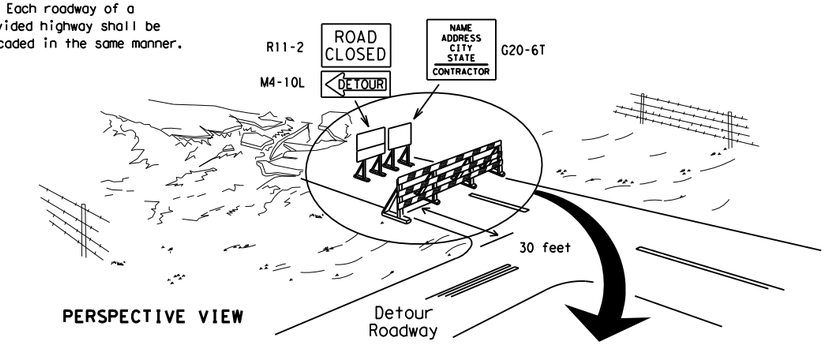
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

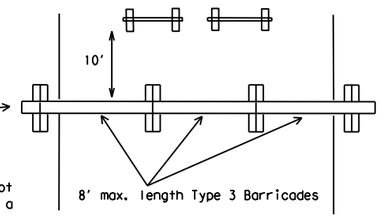
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.

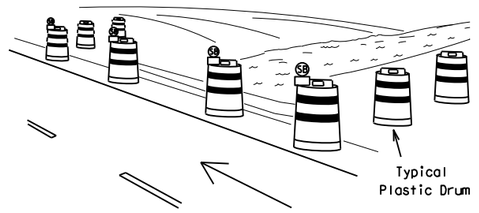
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

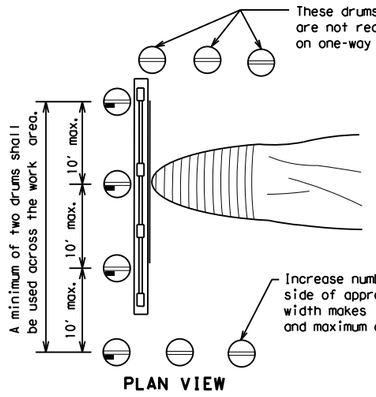
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

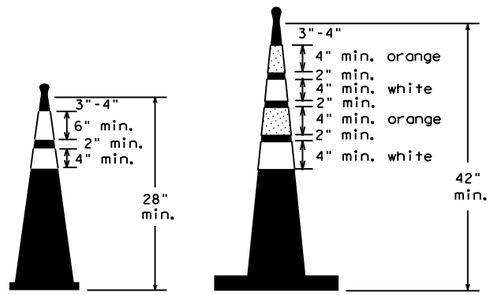
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



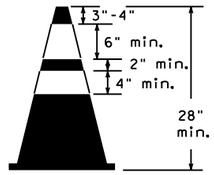
PLAN VIEW

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

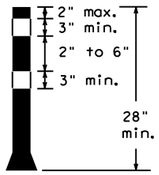
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

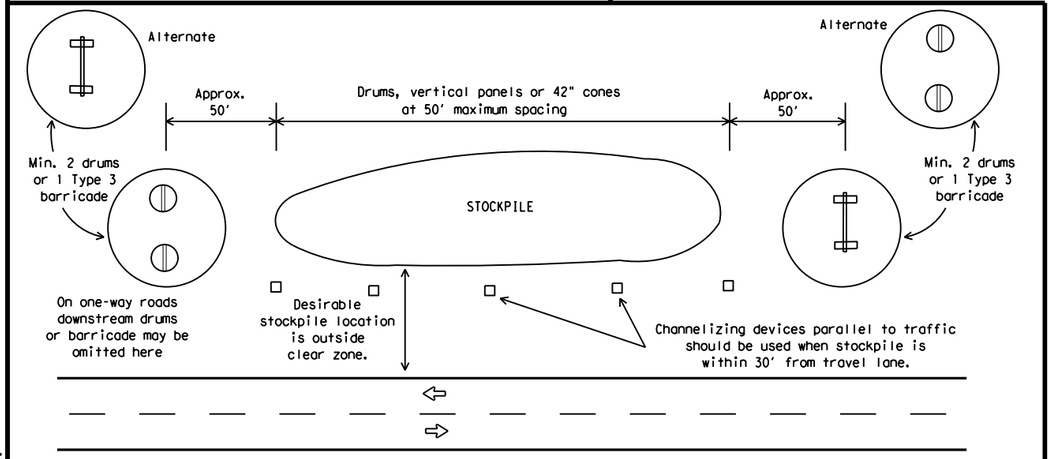


Tubular Marker

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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

SHEET 10 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

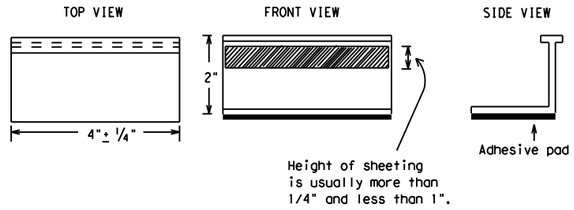
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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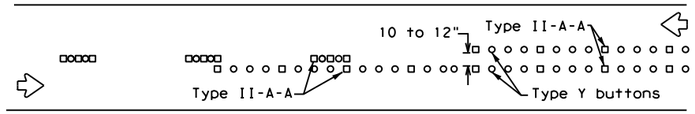
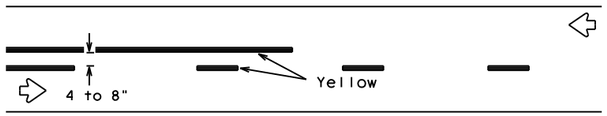
PAVEMENT MARKING PATTERNS

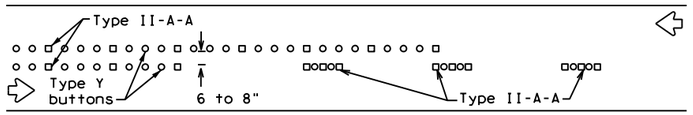
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



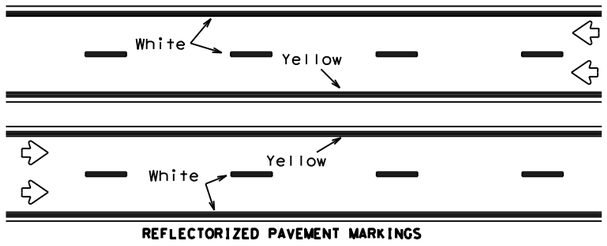
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



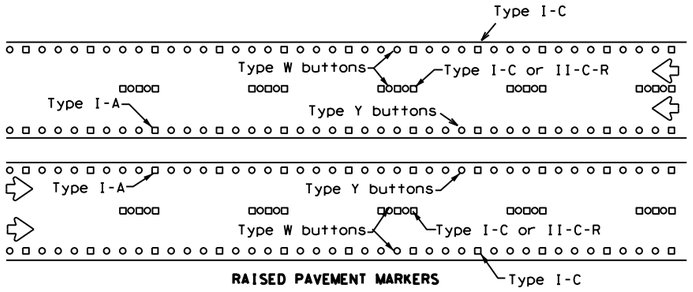
RAISED PAVEMENT MARKERS - PATTERN B

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

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



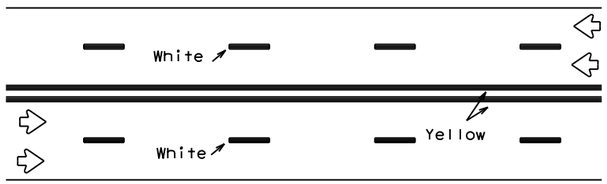
REFLECTORIZED PAVEMENT MARKINGS



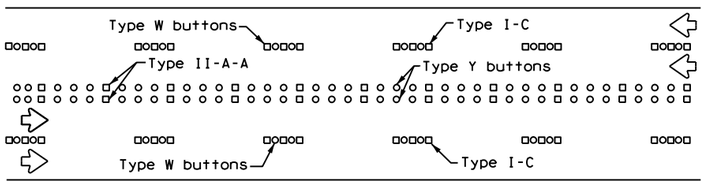
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



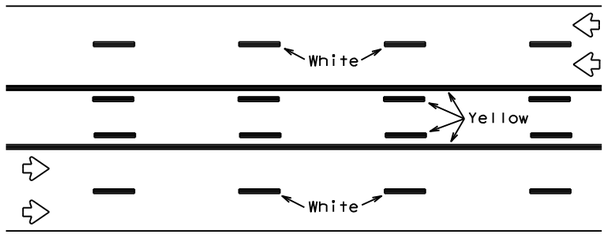
REFLECTORIZED PAVEMENT MARKINGS



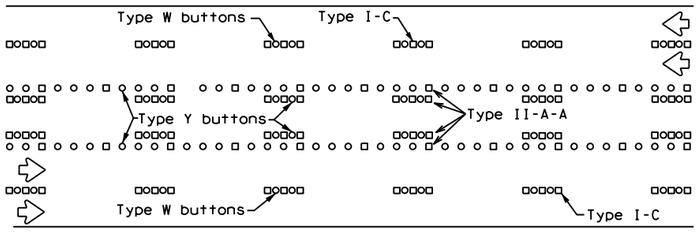
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

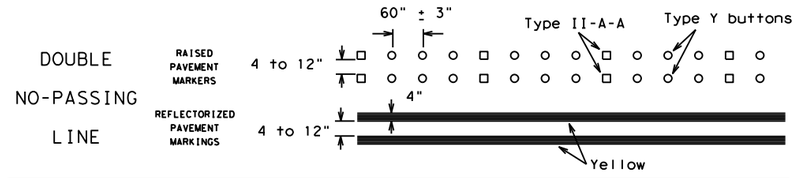
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

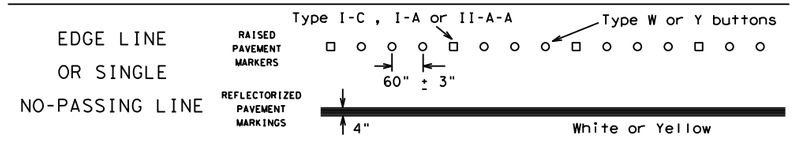
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

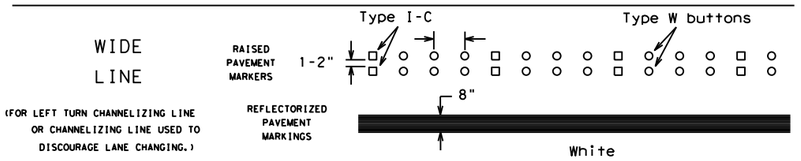


EDGE LINE OR SINGLE NO-PASSING LINE



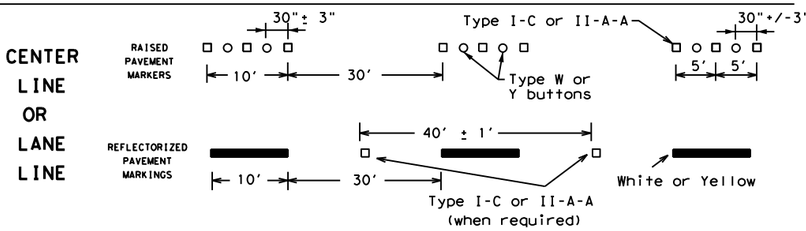
WIDE LINE

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

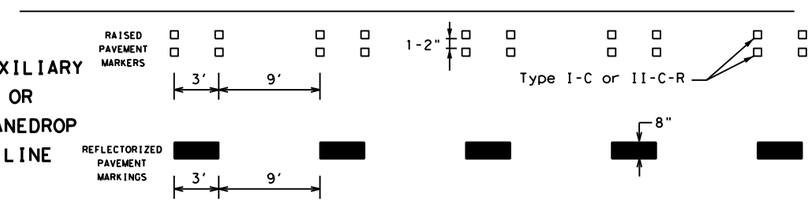


BROKEN LINES

CENTER LINE OR LANE LINE

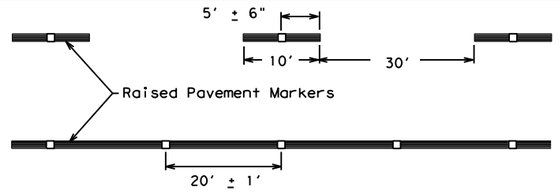


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

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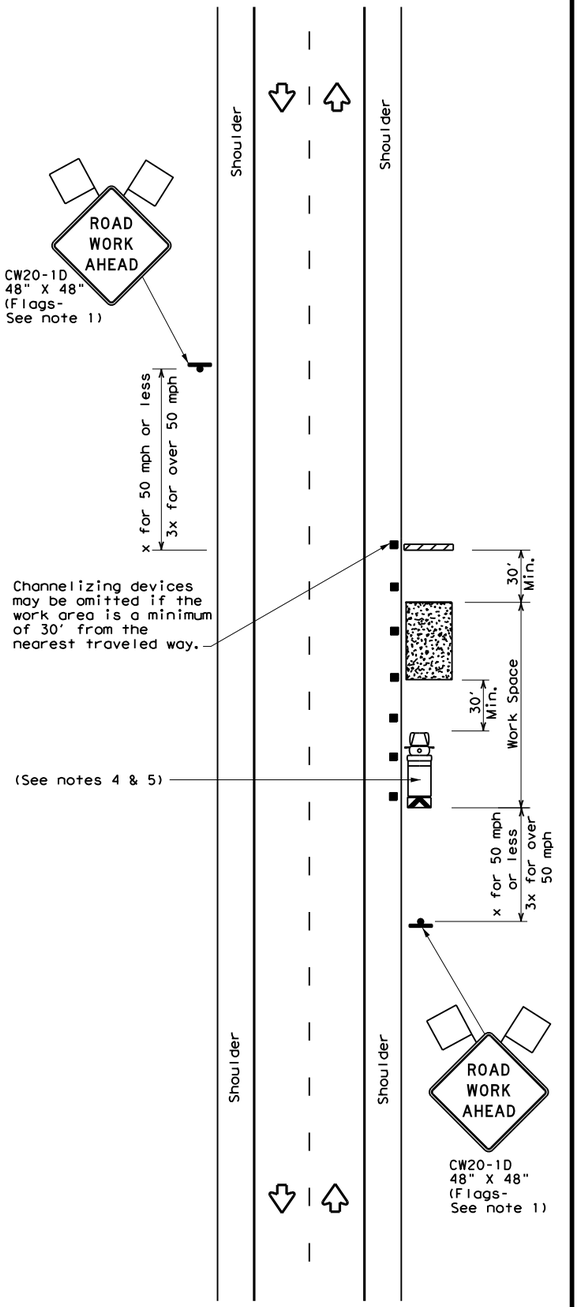
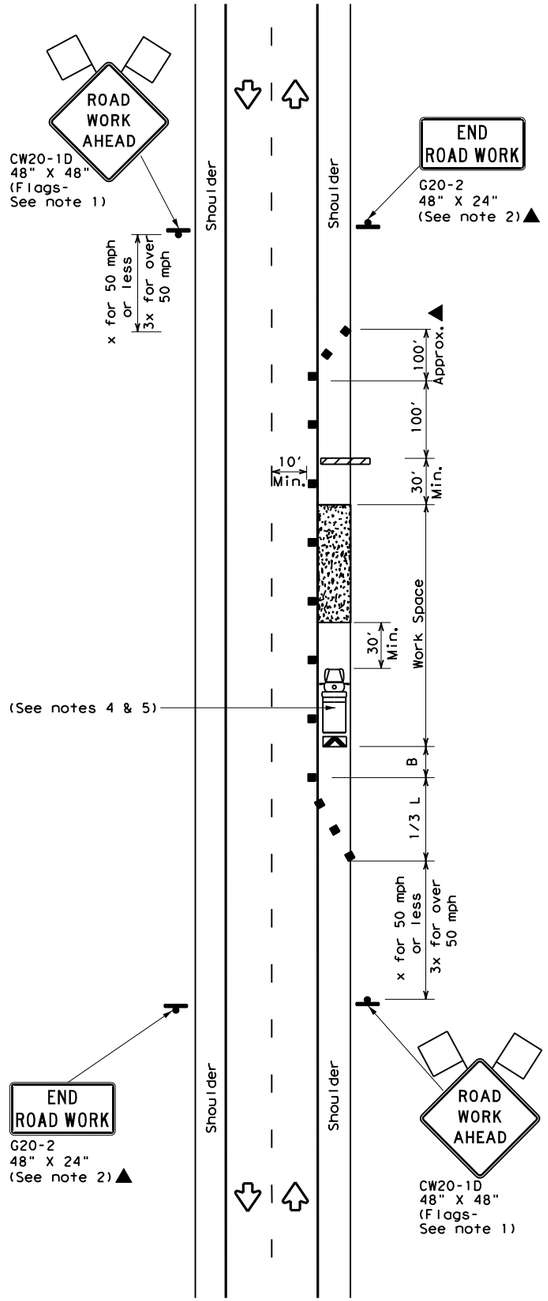


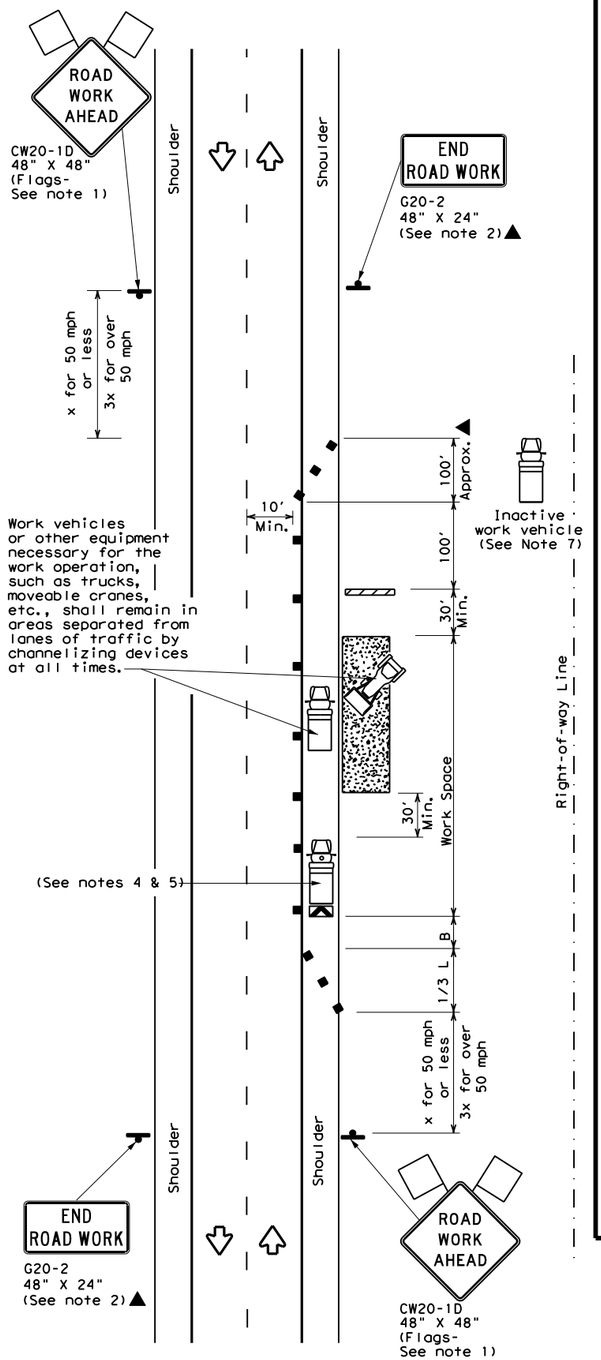
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0204	07	056	US 79
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	BRY	MILAM		033
1-97 2-18				

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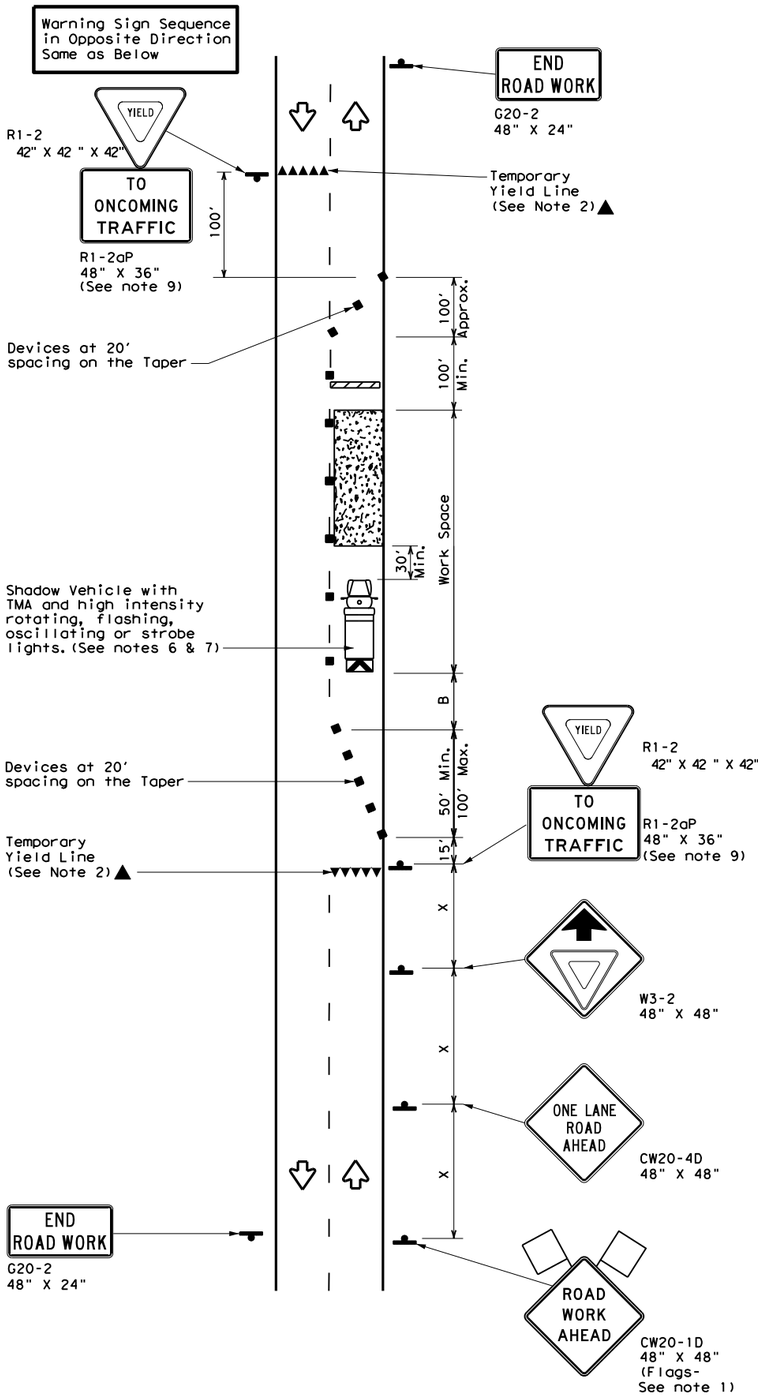
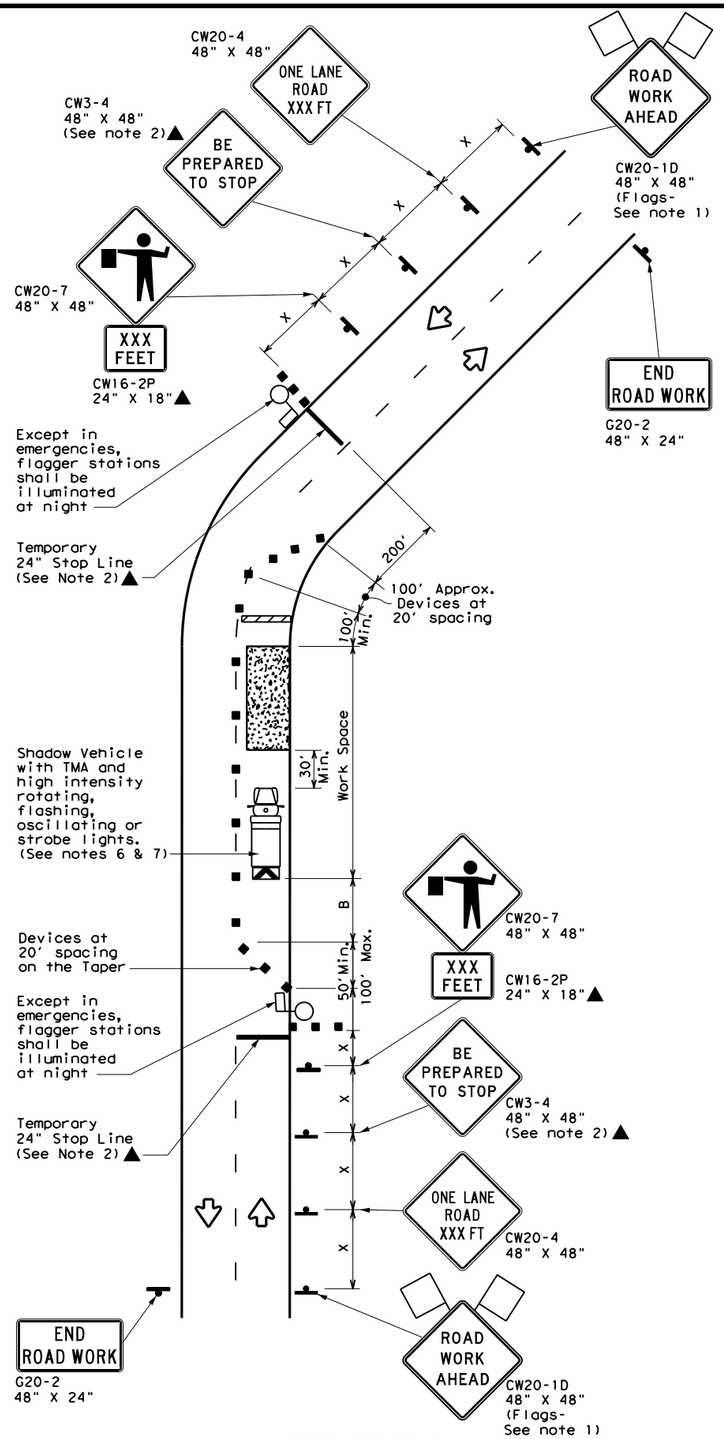


TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



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

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

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

TCP (2-2a)

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

TCP (2-2b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

TCP(2-2)-18

FILE: tcp2-2-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	0204	07	056	US 79
	DIST	COUNTY		SHEET NO.
	BRY	MILAM		034

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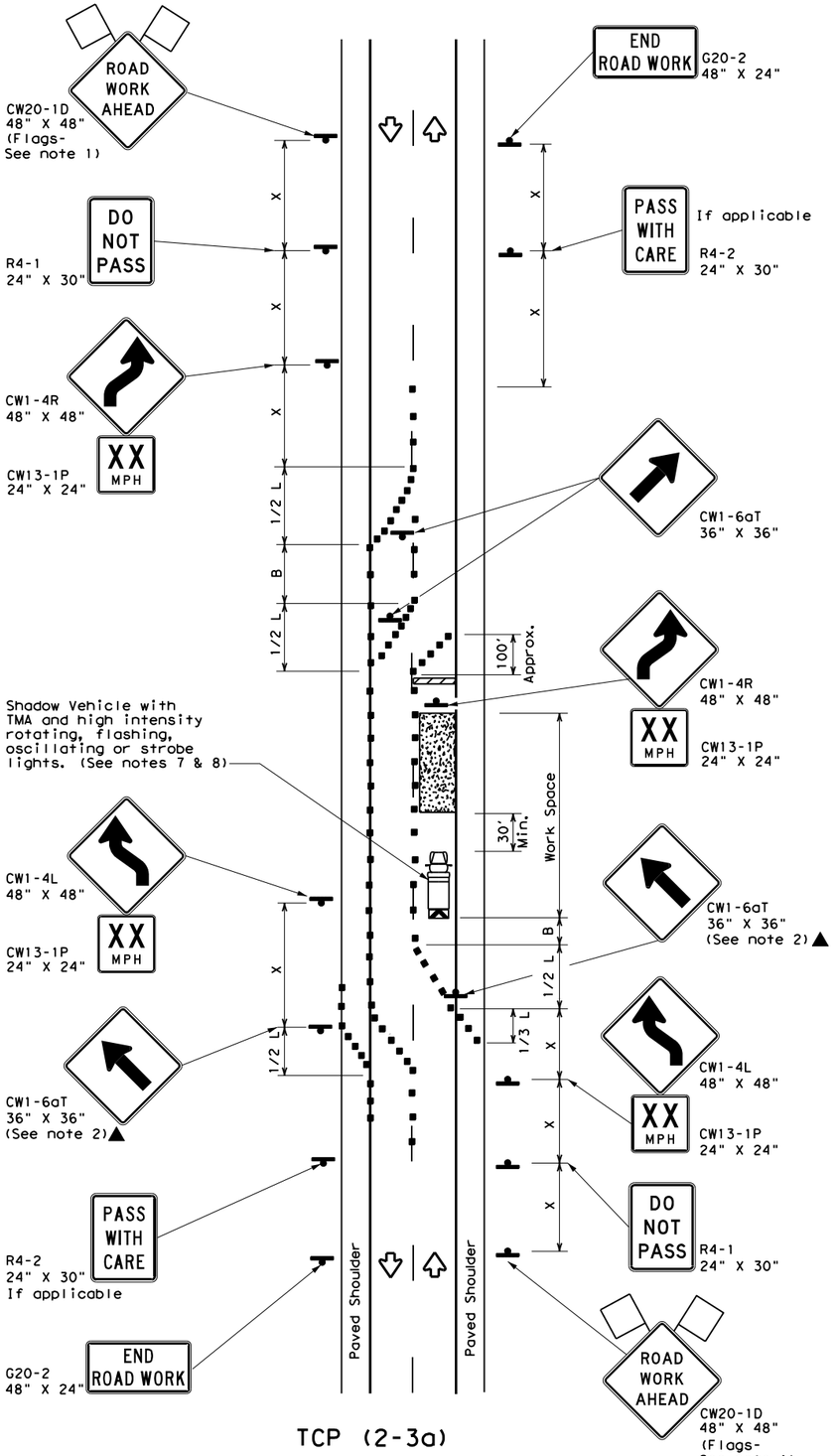
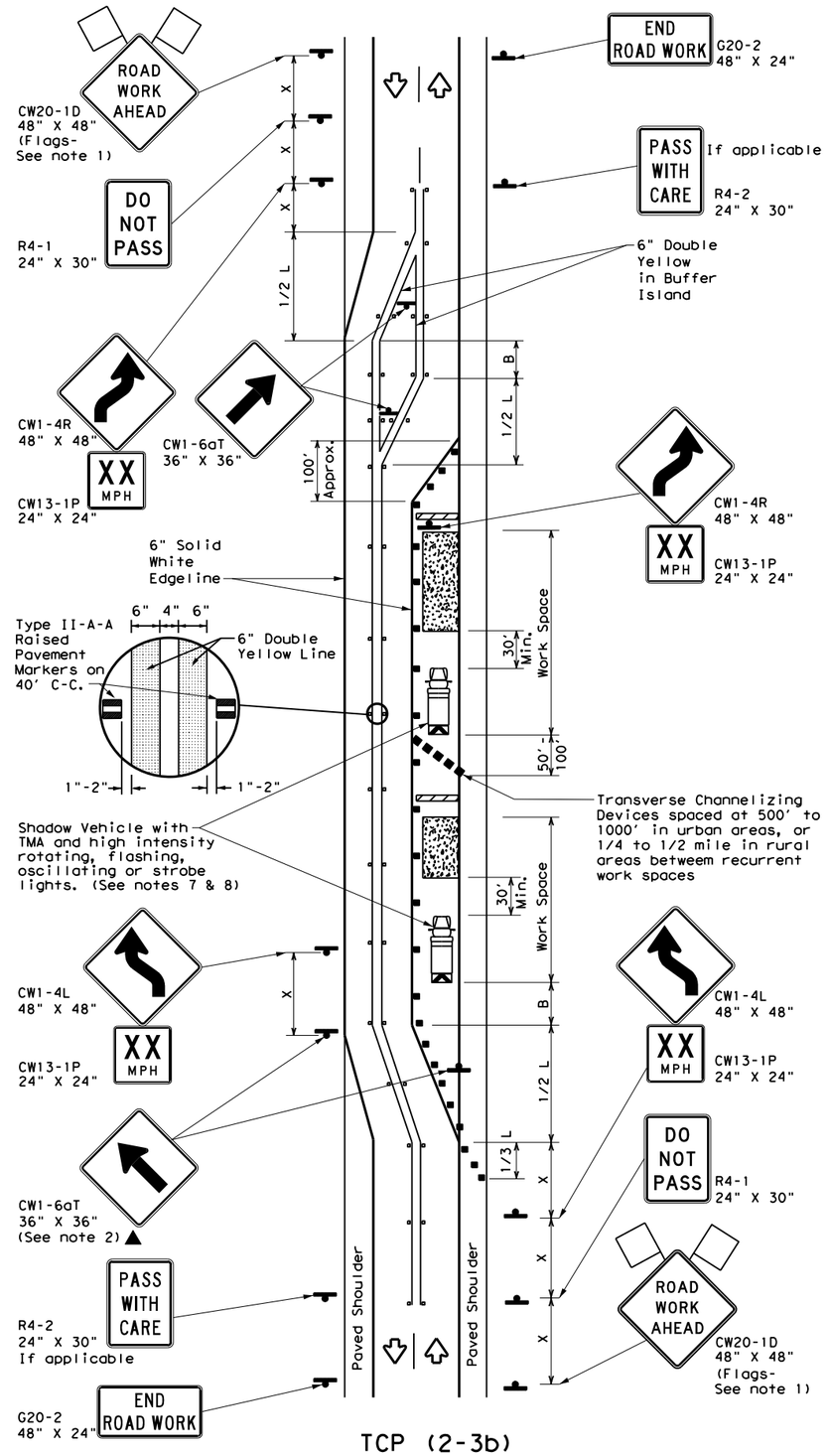


TCP (2-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



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

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

LEGEND

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

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

* Conventional Roads Only

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

TYPICAL USAGE

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

GENERAL NOTES

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

TCP (2-3a)

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

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO-LANE ROADS

TCP(2-3)-23

FILE: tcp(2-3)-23.dgn	DN:	CK:	DW:	CK:
© TxDOT April 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-85 4-98 2-18	0204	07	056	US 79
8-95 3-03 4-23	DIST	COUNTY		SHEET NO.
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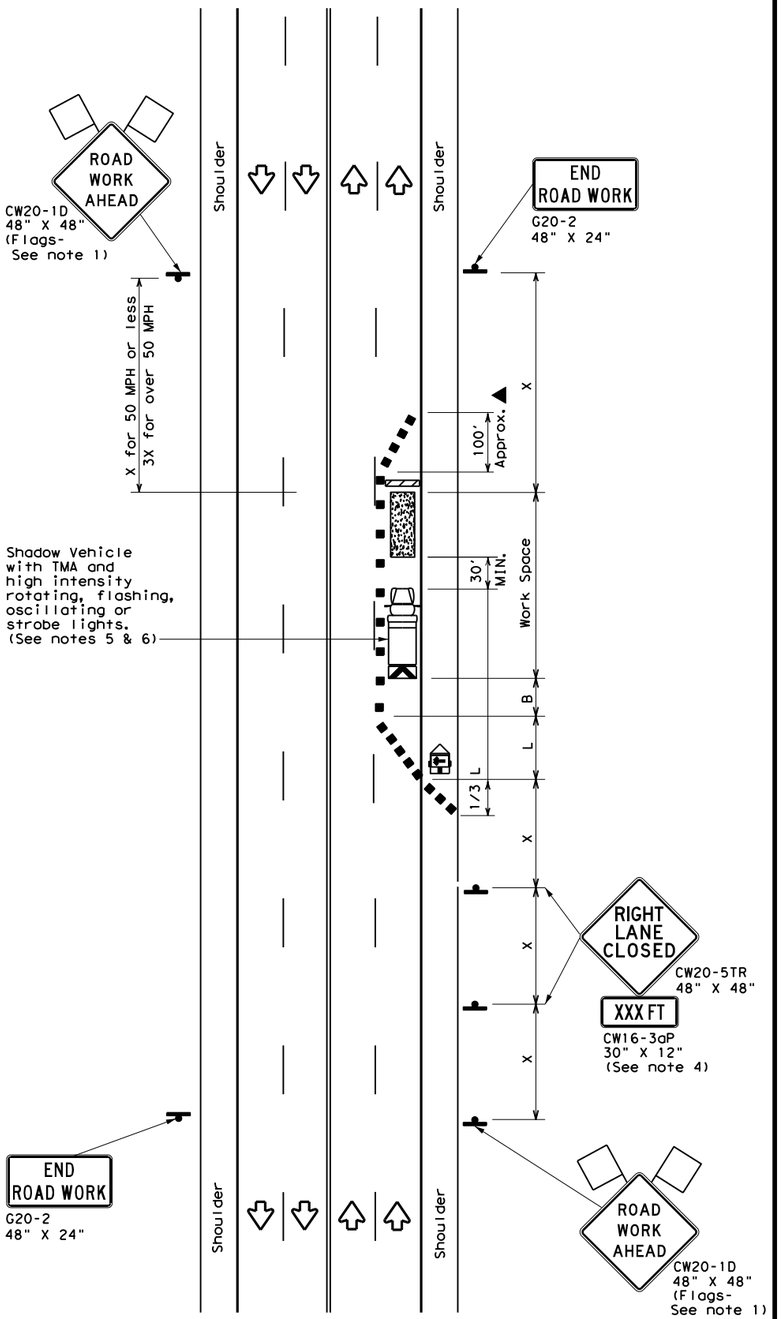
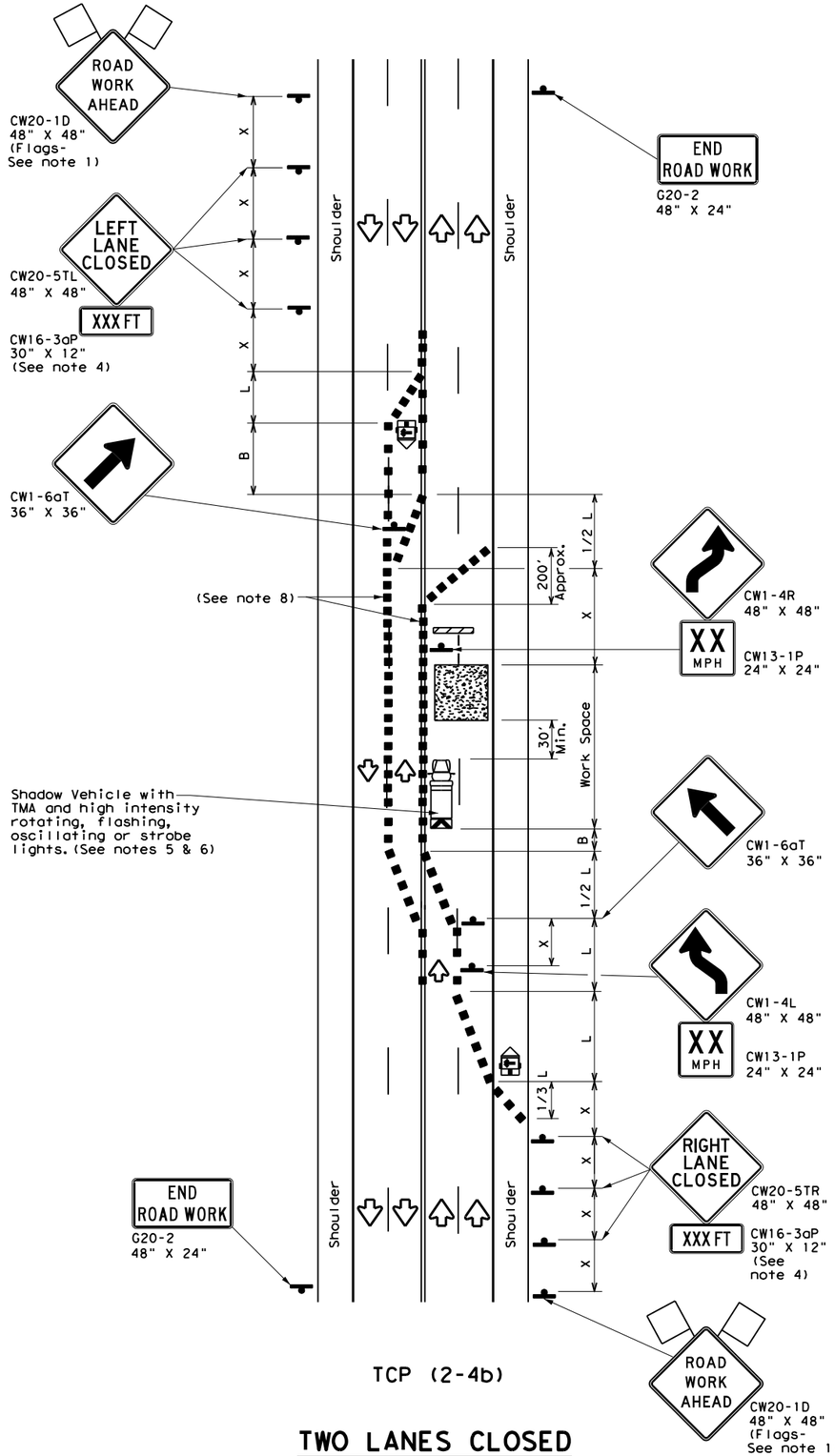


TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

TCP (2-4a)

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

TCP (2-4b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

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8-95 3-03	DIST	COUNTY		SHEET NO.
1-97 2-12	BRY	MILAM		036
4-98 2-18				

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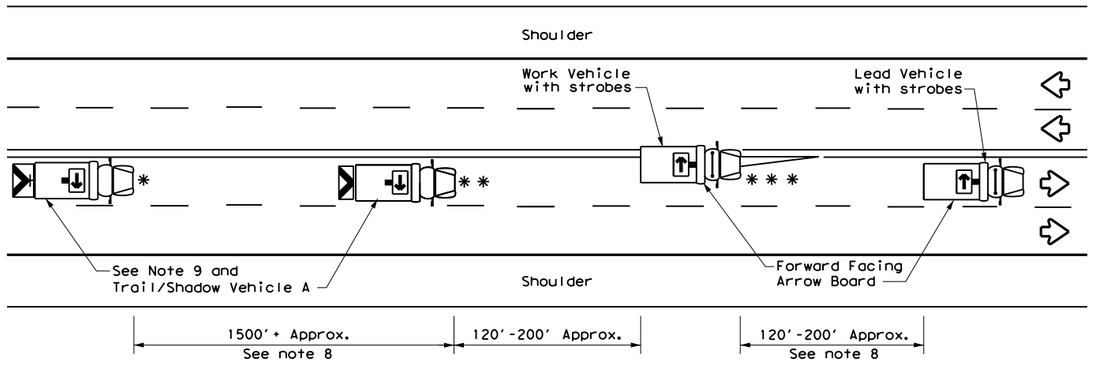
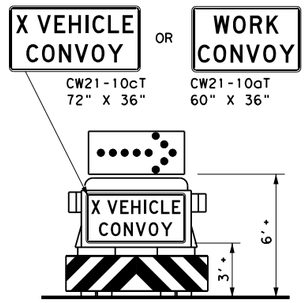


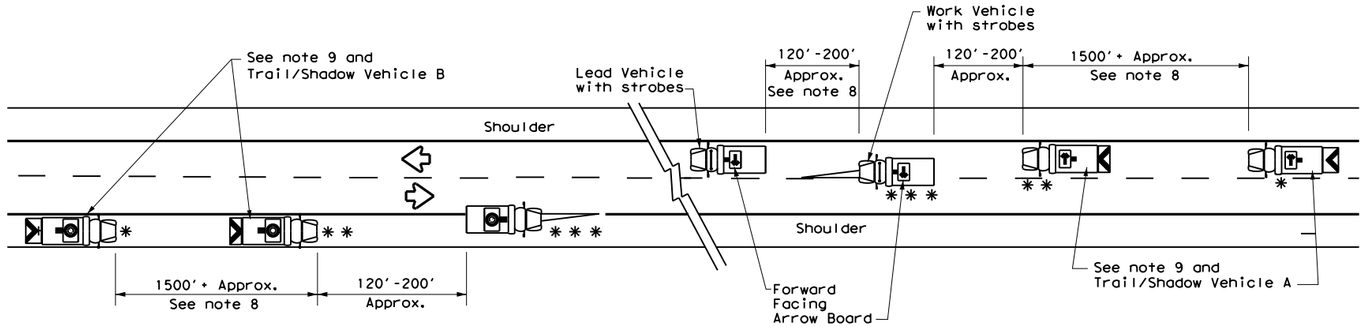
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

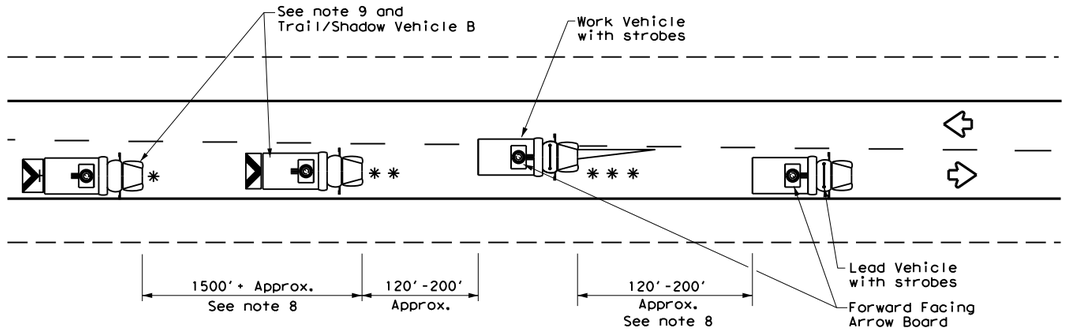


WORK ON SHOULDER

WORK ON TRAVEL LANE

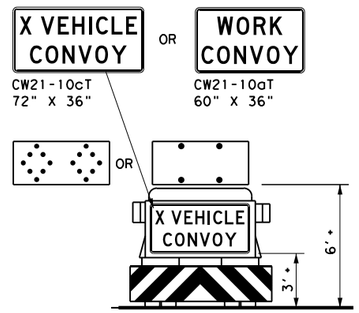
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

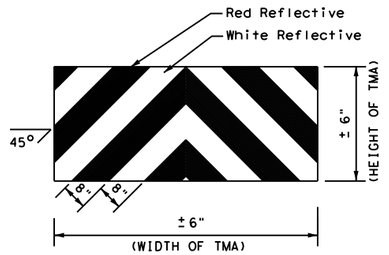
with Flashing Arrow Board in CAUTION display

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

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0204	07	056	US 79
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	BRY	MILAM		037

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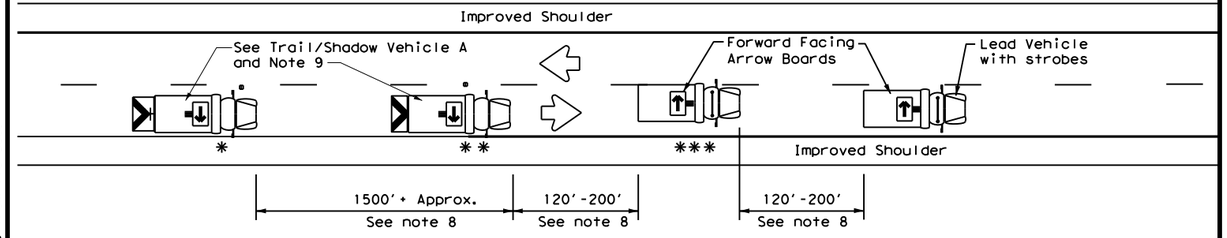
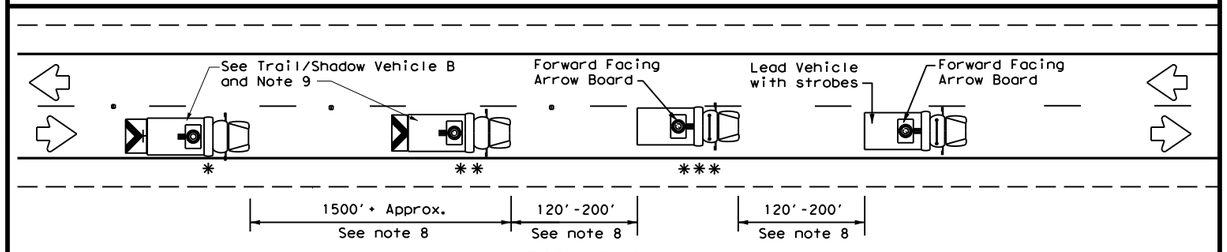


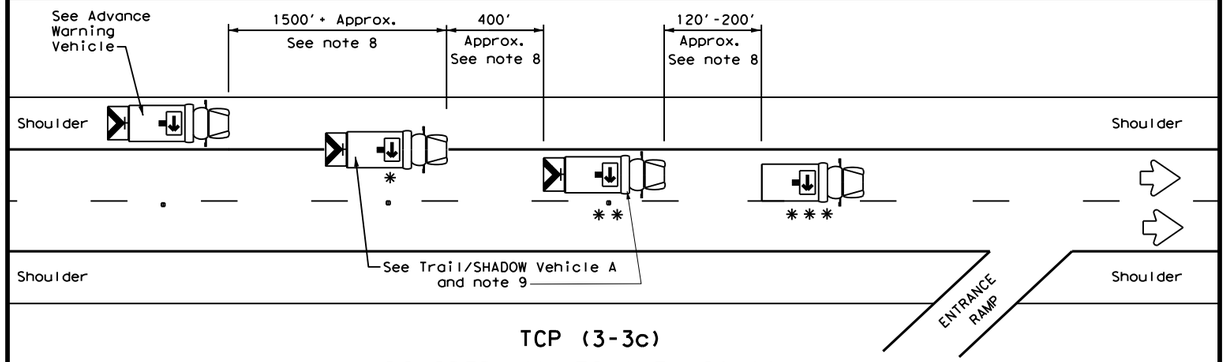
TCP (3-3a)

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



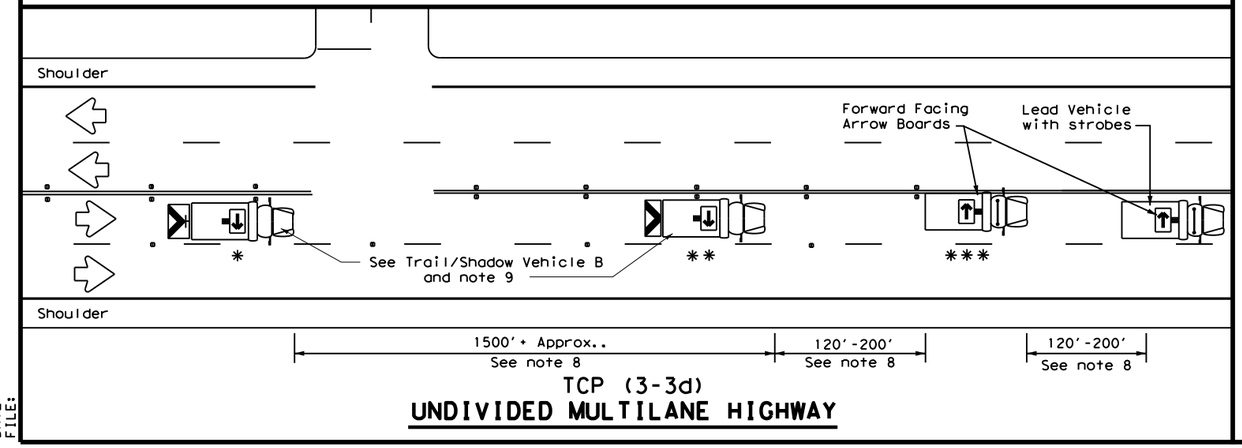
TCP (3-3b)

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



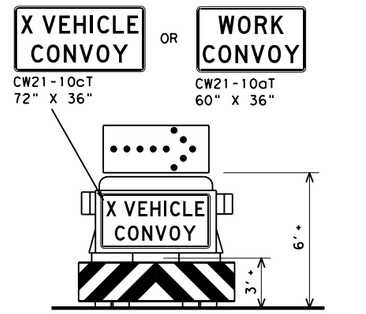
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



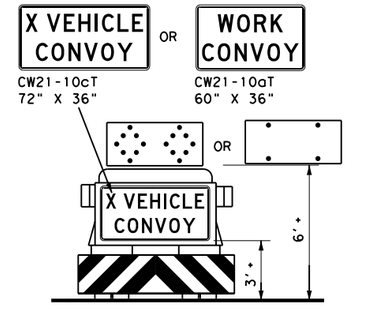
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



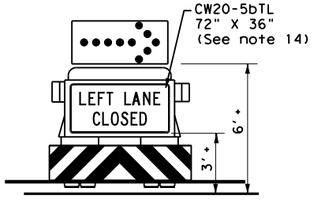
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

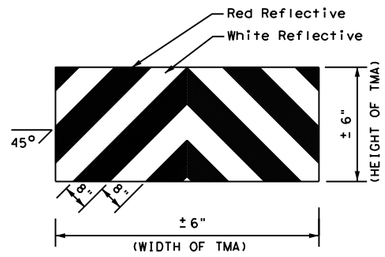


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

LEGEND

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL

TCP(3-3)-14

FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0204	07	056	US 79
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	BRY	MILAM		038
1-97 7-14				

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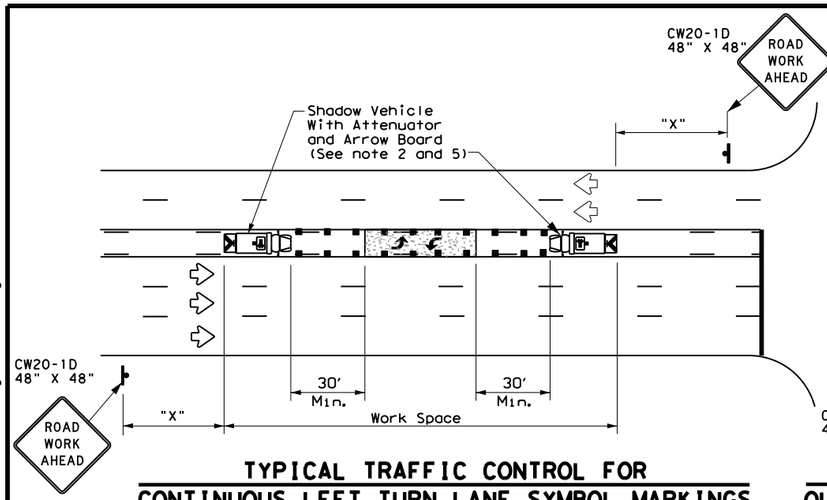
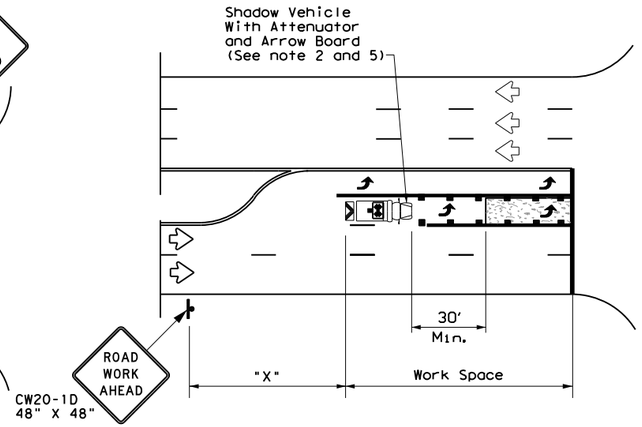
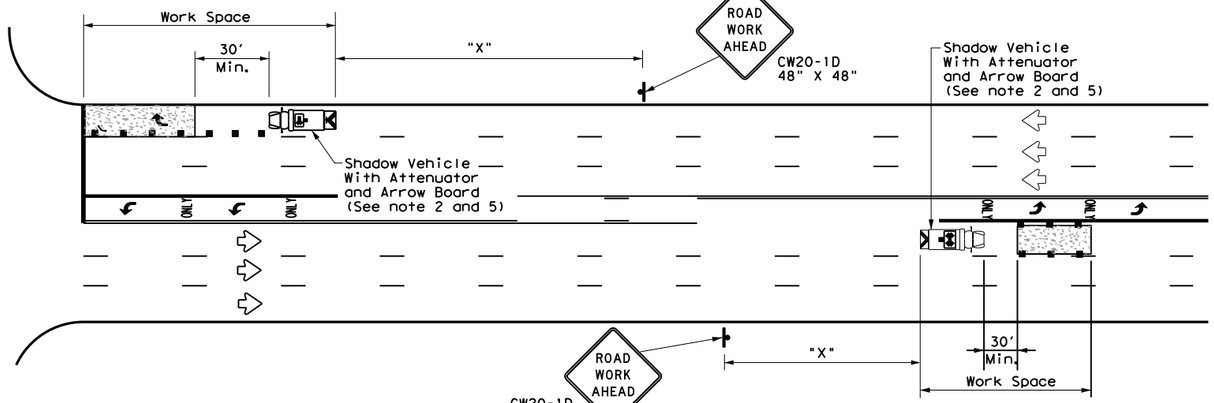


TYPICAL TRAFFIC CONTROL FOR
CONTINUOUS LEFT TURN LANE SYMBOL MARKINGS

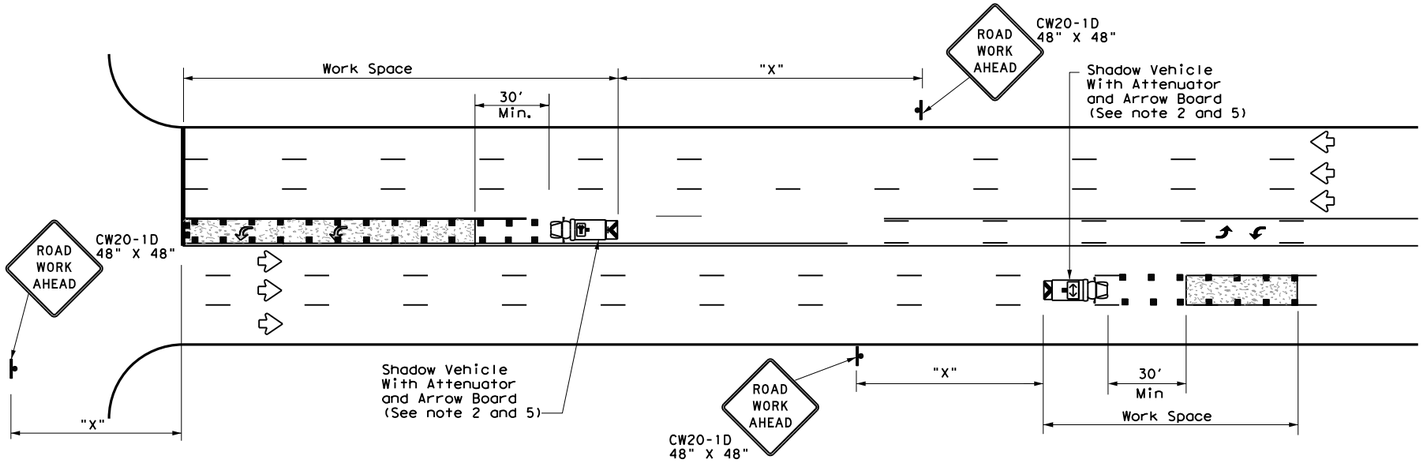


TYPICAL TRAFFIC CONTROL FOR
OUTSIDE DUAL LEFT TURN LANE SYMBOL MARKINGS



TYPICAL TRAFFIC CONTROL FOR
OUTSIDE LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR
INSIDE LANE MARKINGS



TYPICAL TRAFFIC CONTROL FOR
LEFT TURN LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR
CENTER LANE MARKINGS

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

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

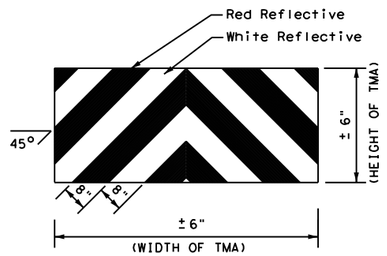
✱ Conventional Roads Only

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

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS FOR ISOLATED WORK AREAS UNDIVIDED HIGHWAYS

TCP(3-4)-13

FILE: tcp3-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT July, 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	0204	07	056	US 79
	DIST	COUNTY		SHEET NO.
	BRY	MILAM		039

DATE:
FILE:

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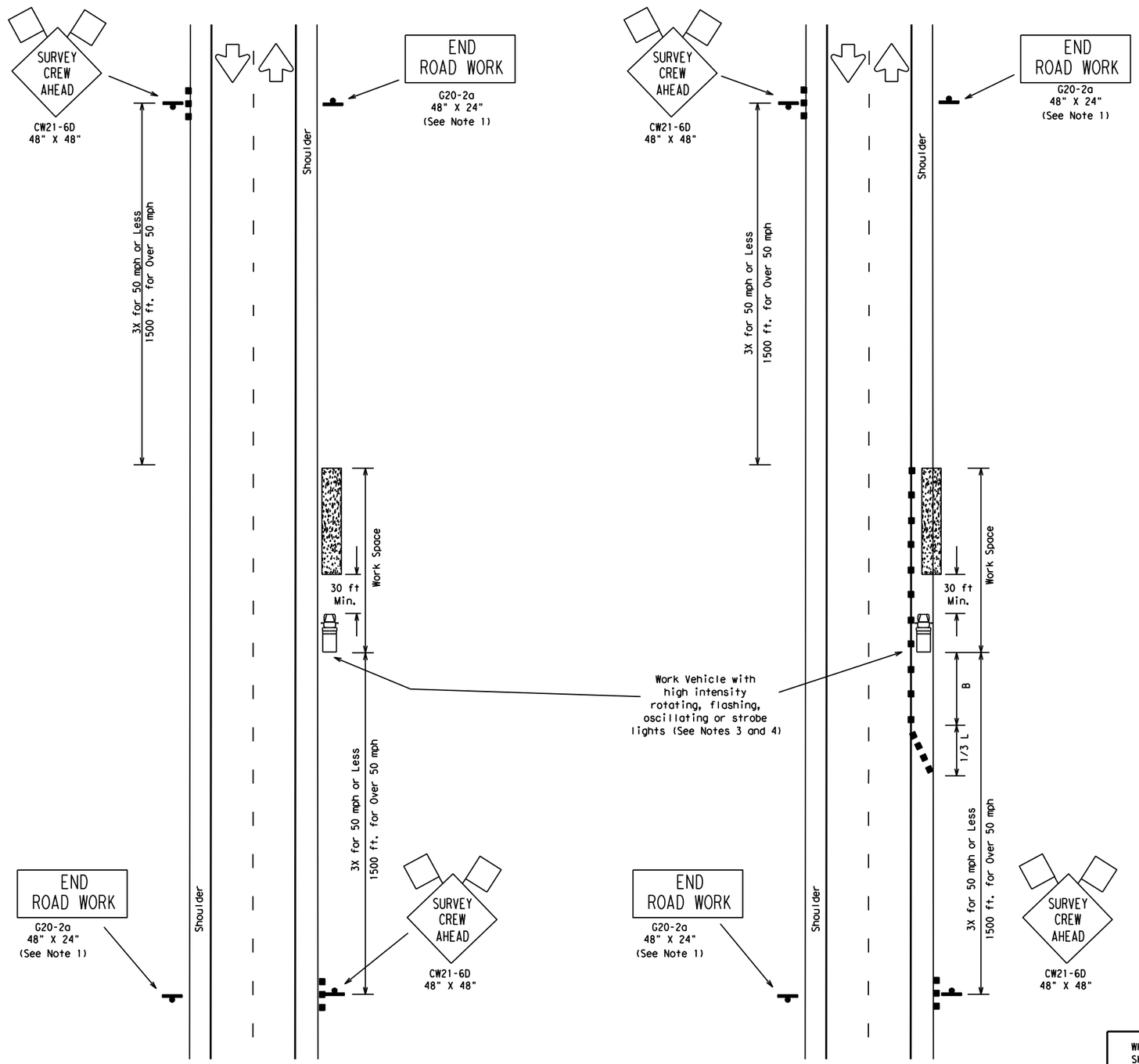

TCP (S-1a)
WORK OFF SHOULDER OR PAVED SURFACE

TCP (S-1b)
WORK ON SHOULDER

LEGEND

Type III Barricade ■ ■ Channelizing Devices Flag
Heavy Work Vehicle Truck Mounted Attenuator (TMA)
Trailer Mounted Flashing Arrow Panel (M) Portable Changeable Message Sign (PCMS)
Flagger Sign Post

Posted Speed ✳	Formula	Minimum Desirable Taper Lengths ✳✳ 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Device On a Taper	On a Tangent	Min. Sign Spacing "X" Distance	Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'-75'	120'	90'
35		205'	225'	245'	35'	70'-90'	160'	120'
40		265'	295'	320'	40'	80'-100'	240'	155'
45	L=WS	450'	495'	540'	45'	90'-110'	320'	195'
50		500'	550'	600'	50'	100'-125'	400'	240'
55		550'	605'	660'	55'	110'-140'	500'	295'
60		600'	660'	720'	60'	120'-150'	600'	350'
65		650'	715'	780'	65'	130'-165'	700'	410'
70		700'	770'	840'	70'	140'-175'	800'	475'
75		750'	825'	900'	75'	150'-185'	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
	✓	✓		

DEFINITIONS:
SHORT DURATION - work that occupies a location up to 1 hour.
SHORT TERM STATIONARY - daytime work that occupies a location for more than 1 hour within a single daylight period.

GENERAL NOTES:

1. The G20-2a "END ROAD WORK" sign may be placed on the back of the CW21-6D "SURVEY CREW AHEAD" sign or may be omitted for short duration (less than 1 hour) work.
2. Channelizing devices on the shoulder taper and tangent section may be omitted for short duration (less than 1 hour) work.
3. If line-of-sight requirements for surveying operations will preclude the placement of the Work Vehicle to protect workers, the channelizing devices mentioned in Note 2 are required.
4. ⚠1 A Shadow Vehicle with a Truck Mounted Attenuator and flashing warning lights/arrow panel in caution mode may be used in lieu of the Work Vehicle to protect the work space.
5. The CW20-1D "ROAD WORK AHEAD" sign may be substituted for the CW21-6D "SURVEY CREW AHEAD" sign.
6. This plan may also be used for shoulder work or off shoulder work for multilane undivided roadways.
7. The CW21-6D "SURVEY CREW AHEAD" sign for low volume intersecting side roads is desirable, but is not required when working less than 15 minutes in area of the side road, as determined by the Engineer.

TCP(S-1a)

8. Cones may be placed at edge of pavement adjacent to the work space to enhance safety.

WHENEVER POSSIBLE, SURVEY PARTIES SHOULD AVOID, BY THE USE OF OFFSET LINES, ANY UNNECCESSARY PERIODS OF TIME ON THE ROAD SURFACE.

8-18-08 Revision
⚠1 Corrected misspelling.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN FOR SURVEYING OPERATIONS

TCP(S-1)-08A

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

REVISIONS
8-08

CONT	SECT	JOB	HIGHWAY
0204	07	056	US 79
DIST	COUNTY		SHEET NO.
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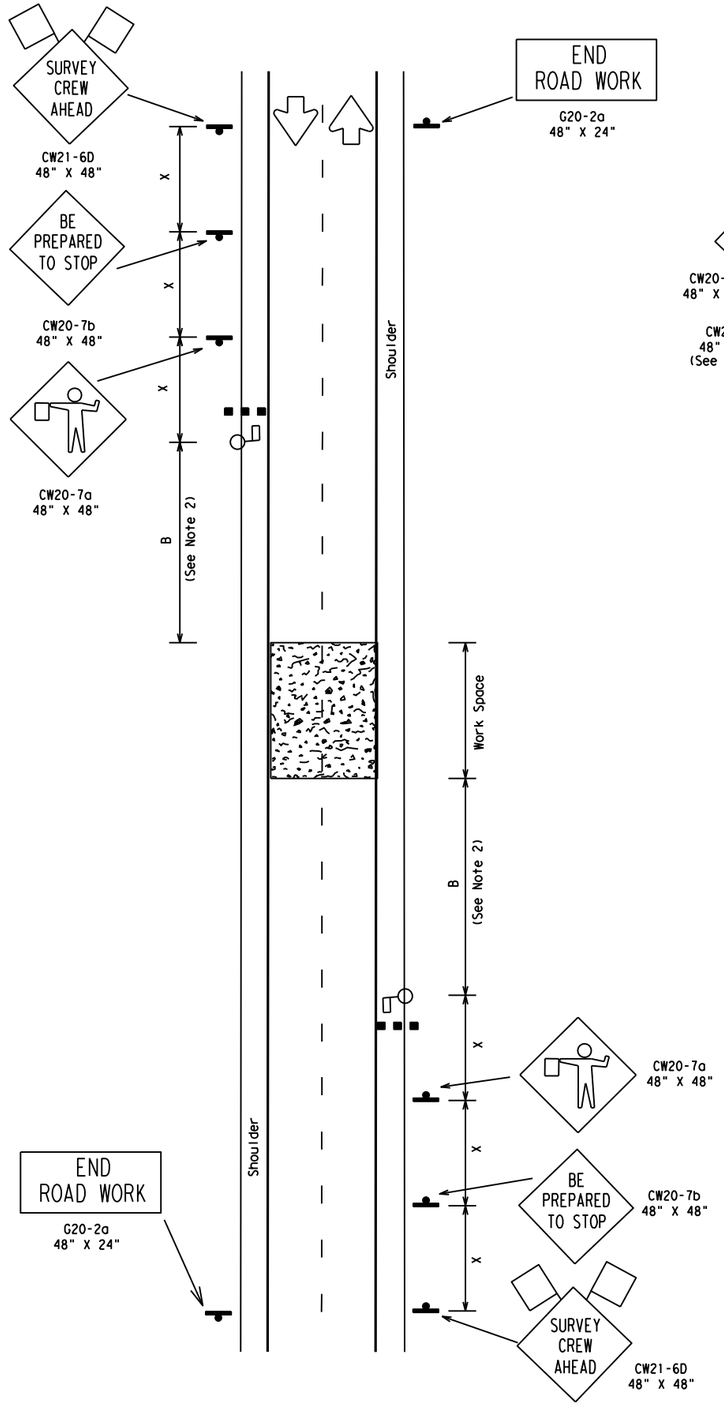
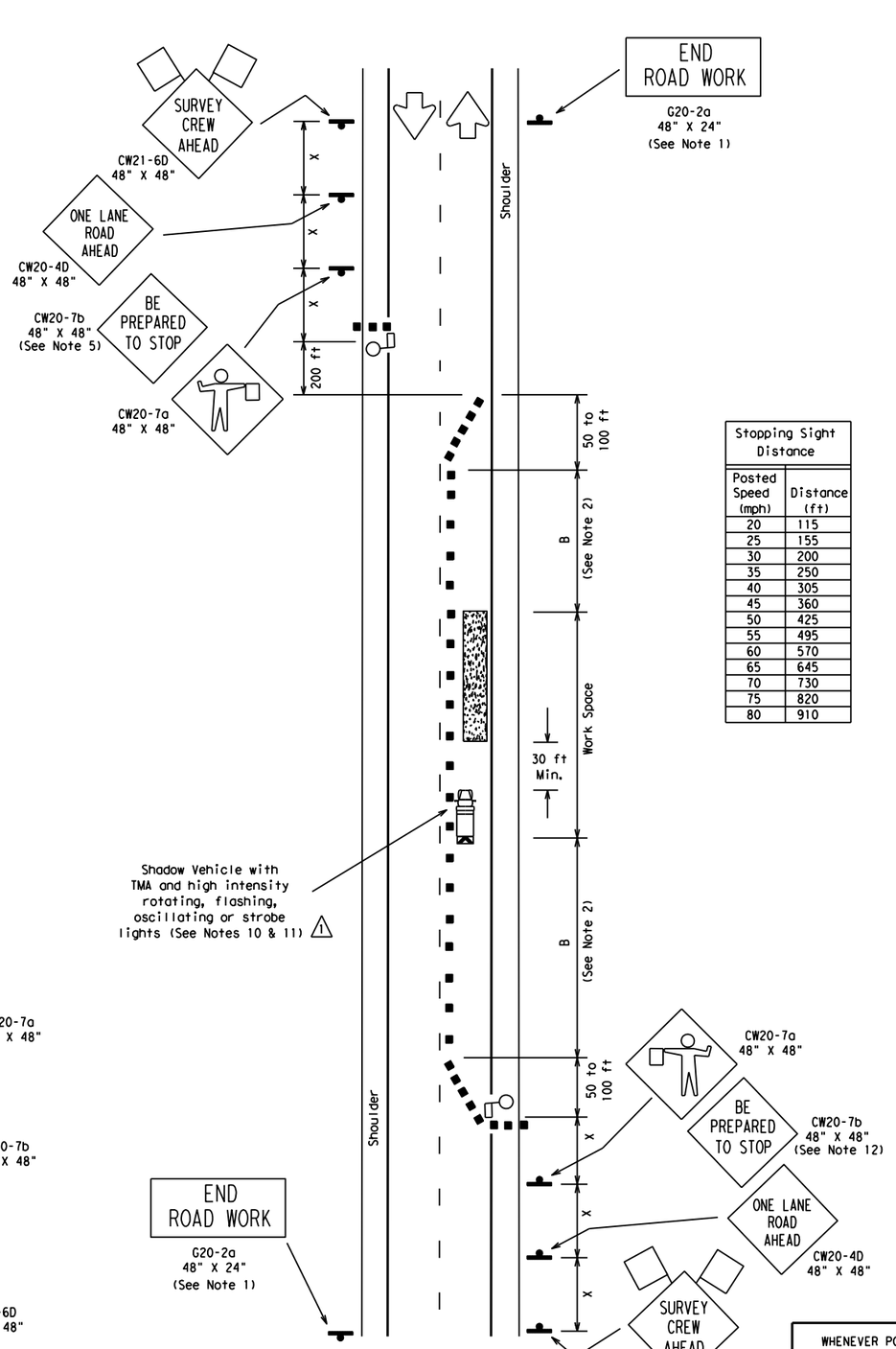


TCP (S-2a)
ROAD CLOSED FOR LESS THAN 20 MINUTES -
OFF PEAK TRAFFIC HOURS
WITH OR WITHOUT SHOULDERS



TCP (S-2b)
WORK IN ROADWAY
OFF PEAK TRAFFIC HOURS
WITH OR WITHOUT SHOULDERS

Stopping Sight Distance	
Posted Speed (mph)	Distance (ft)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820
80	910

LEGEND

Type III Barricade ■ ■ Channelizing Devices Flag
Heavy Work Vehicle Truck Mounted Attenuator (TMA)
Trailer Mounted Flashing Arrow Panel Portable Changeable Message Sign (PCMS)
Flagger Sign Post

Posted Speed ✳	Formula	Minimum Desirable Taper Lengths ✳✳ 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Device On a Taper	On a Tangent	Min. Sign Spacing "X" Distance	Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'-75'	120'	90'
35		205'	225'	245'	35'	70'-90'	160'	120'
40		265'	295'	320'	40'	80'-100'	240'	155'
45	L=WS	450'	495'	540'	45'	90'-110'	320'	195'
50		500'	550'	600'	50'	100'-125'	400'	240'
55		550'	605'	660'	55'	110'-140'	500'	295'
60		600'	660'	720'	60'	120'-150'	600'	350'
65		650'	715'	780'	65'	130'-165'	700'	410'
70		700'	770'	840'	70'	140'-175'	800'	475'
75		750'	825'	900'	75'	150'-185'	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
	✓	✓		

DEFINITIONS:
SHORT DURATION - work that occupies a location up to 1 hour.
SHORT TERM STATIONARY - daytime work that occupies a location for more than 1 hour within a single daylight period.

GENERAL NOTES:
1. The G20-2a "END ROAD WORK" sign may be placed on the back of the CW21-6D "SURVEY CREW AHEAD" sign or may be omitted for short duration (less than 1 hour) work.
2. Adequate Stopping Sight Distance (see Stopping Sight Distance table) should be maintained from approaching traffic to the flagger or a queue of stopped vehicles. The Buffer Space "B" should be extended around curves or other obstacles, when necessary, to have adequate Stopping Sight Distance to the flagger station.
3. Flaggers should use two-way radios or other means of communication while flagging.
4. The length of the work space should be based on the ability of the flaggers to communicate.
5. CW20-1D "ROAD WORK AHEAD" signs may be substituted for CW21-6D "SURVEY CREW AHEAD" signs.
6. The CW21-6D "SURVEY CREW AHEAD" sign for low volume intersecting side roads is desirable, but is not required when working less than 15 minutes in area of the side road, as determined by the Engineer.

TCP(S-2a)

7. Road closures shall be less than 20 minutes. Closures less than 5 minutes are desirable.
8. Sign spacing should be increased if traffic repeatedly queues past the CW20-7b "BE PREPARED TO STOP" sign.
9. The surveying instrument should not be located on the paved surface.

TCP (S-2B)

10. For short duration work the Shadow Vehicle with a TMA may be replaced by another Work Vehicle with high intensity rotating, flashing or strobe lights.
11. Shadow Vehicles with a TMA are desirable when workers or equipment are in the work space. When approved by the engineer, Type III barricades or other channelizing devices may be substituted for the Shadow Vehicle.
12. The CW20-7b "BE PREPARED TO STOP" sign is optional. When used, it should be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign.

WHENEVER POSSIBLE, SURVEY PARTIES SHOULD AVOID, BY THE USE OF OFFSET LINES, ANY UNNECCESSARY PERIODS OF TIME ON THE ROAD SURFACE.

8-18-08 Revision
1 Corrected referrence to notes.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN FOR SURVEYING OPERATIONS

TCP(S-2)-08A

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REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
8-08	CONT	SECT	JOB	HIGHWAY
	0204	07	056	US 79
	DIST	COUNTY		SHEET NO.
	BRY	MILAM		041

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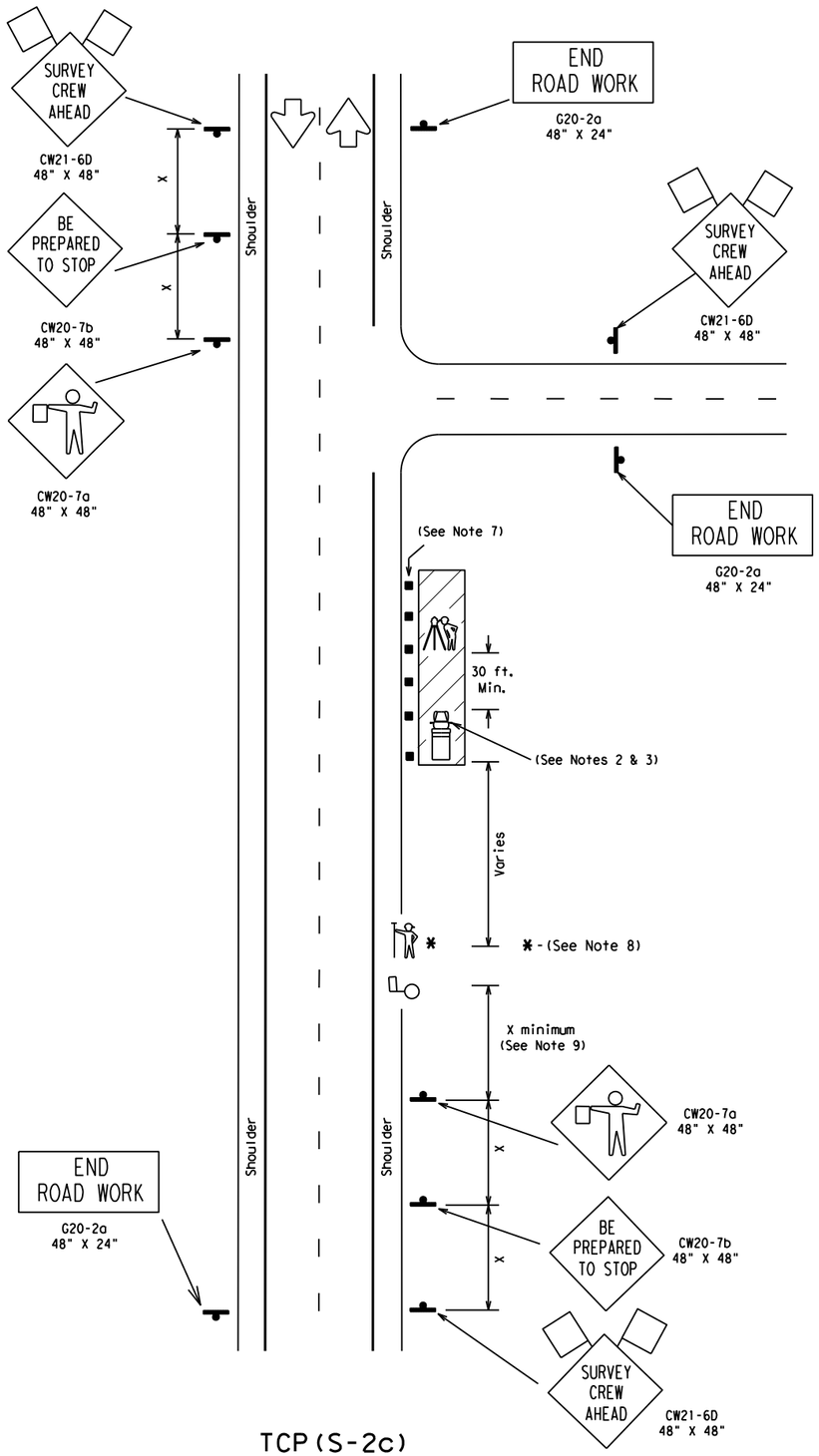

TCP(S-2c)

Stopping Sight Distance	
Posted Speed (mph)	Distance (ft)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820
80	910

LEGEND

Type III Barricade ■ ■ Channelizing Devices Flag

Work Vehicle Truck Mounted Attenuator (TMA)

Flagger Sign Post Survey Rodman Instrument Person

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Device On a Taper	On a Tangent	Min. Sign Spacing "X" Distance	Longitudinal Buffer Space "B"
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'-75'	120'	90'
35		205'	225'	245'	35'	70'-90'	160'	120'
40		265'	295'	320'	40'	80'-100'	240'	155'
45	L=WS	450'	495'	540'	45'	90'-110'	320'	195'
50		500'	550'	600'	50'	100'-125'	400'	240'
55		550'	605'	660'	55'	110'-140'	500'	295'
60		600'	660'	720'	60'	120'-150'	600'	350'
65		650'	715'	780'	65'	130'-165'	700'	410'
70		700'	770'	840'	70'	140'-175'	800'	475'
75		750'	825'	900'	75'	150'-185'	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
	✓	✓		

DEFINITIONS:

MOBILE - work that moves continously or intermittently (stopping up to approximately 15 minutes).

SHORT DURATION - work that occupies a location up to 1 hour.

SHORT TERM STATIONARY - daytime work that occupies a location for more than 1 hour within a single daylight period.

GENERAL NOTES:

1. The G20-2a "END ROAD WORK" sign may be placed on the back of the CW21-6D "SURVEY CREW AHEAD" sign or may be omitted for short duration (less than 1 hour) work.
2. Work Vehicle with high intensity rotating, flashing, oscillating or strobe lights should be used to protect work space.
3. When approved by the engineer, Type III barricades or other channelizing devices may be substituted for the Heavy Work Vehicle.
4. CW20-1D "ROAD WORK AHEAD" signs may be substituted for CW21-6D "SURVEY CREW AHEAD" SIGNS.
5. The CW21-6D "SURVEY CREW AHEAD" sign for low volume intersecting side roads may be omitted when approved by the Engineer.
6. The Surveying Instrument shall not be located on the paved surface.
7. Cones at edge of pavement adjacent to instrument person may be omitted when approved by the Engineer.
8. Rodman may only enter roadway when accompanied by flagger and as traffic allows.
9. The distance between the advance warning signs and the work should not exceed a two mile maximum.
10. Flaggers and Survey Crew should use two-way radios or other means of communication.
11. Survey Crew and Flaggers shall wear high-visibility apparel meeting the ANSI 107-2007 standard performance for Class 2 or Class 3 risk exposure.
12. Additional traffic control devices may be required to address local site conditions.
13. Stopping Sight Distance shall be maintained from approaching traffic to the flagger. See "Stopping Sight Distance" table.

SURVEY PARTIES SHOULD AVOID ANY UNNECCESSARY PERIODS OF TIME ON THE ROAD SURFACE.

This TCP is to cover two lane rural type roadways as determined by the Engineer. All other type roadways will be covered by other established Survey TCP'S.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN FOR SURVEYING OPERATIONS

TCP(S-2c)-10

©TxDOT January 2010

REVISIONS

DATE:
FILE:

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

CONT	SECT	JOB	HIGHWAY
0204	07	056	US 79

DIST	COUNTY	SHEET NO.
BRY	MILAM	042

212A

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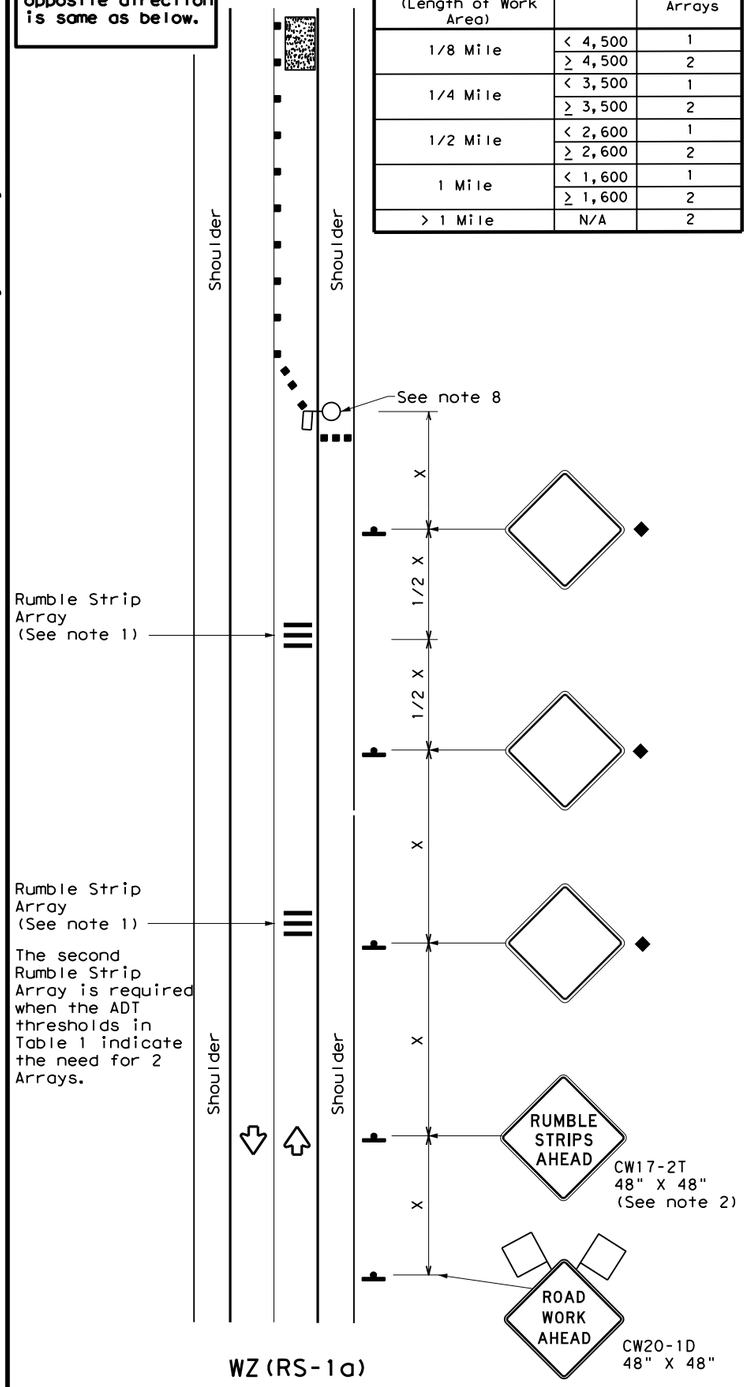
DATE:
FILE:

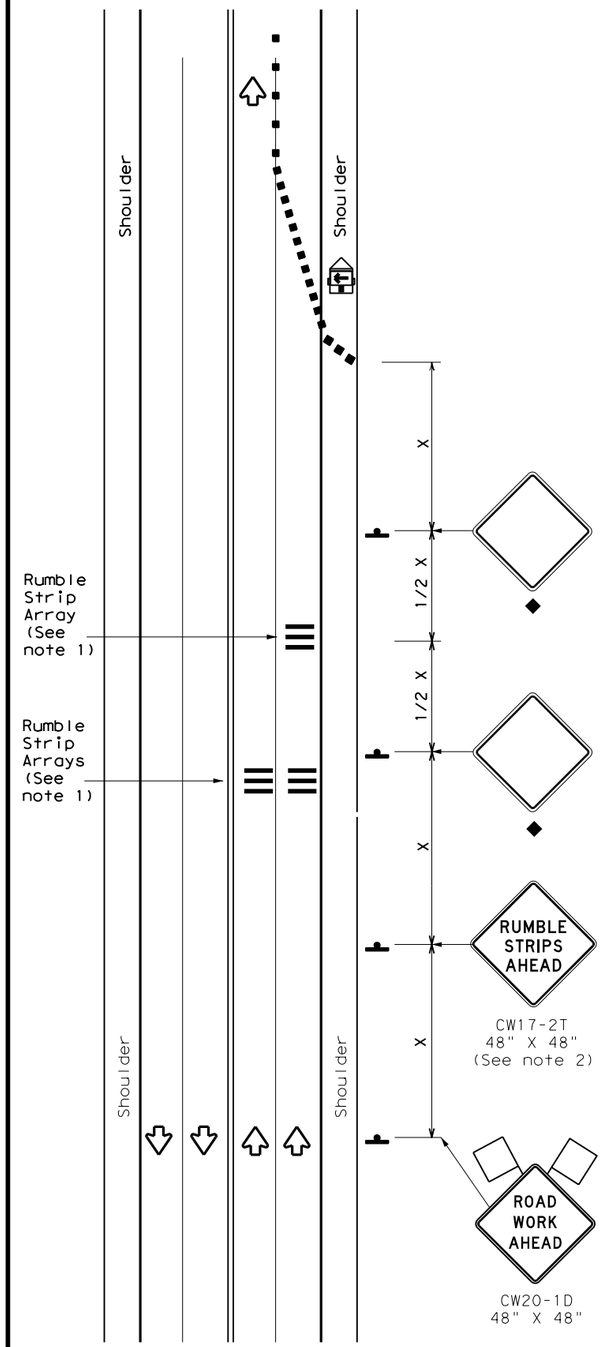
Warning sign and rumble strip sequence in opposite direction is same as below.

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



WZ(RS-1a)

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

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

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

* Conventional Roads Only

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-22

FILE: wzrs22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-14 1-22 4-16	0204	07	056	US 79
	DIST	COUNTY		SHEET NO.
	BRY	MILAM		043

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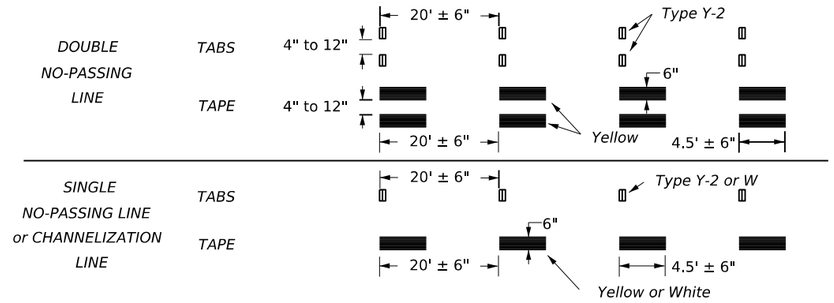
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



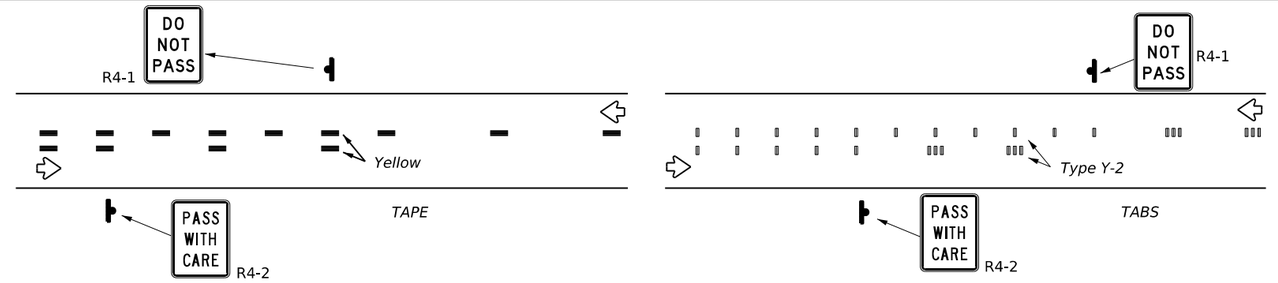
NOTES:

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.

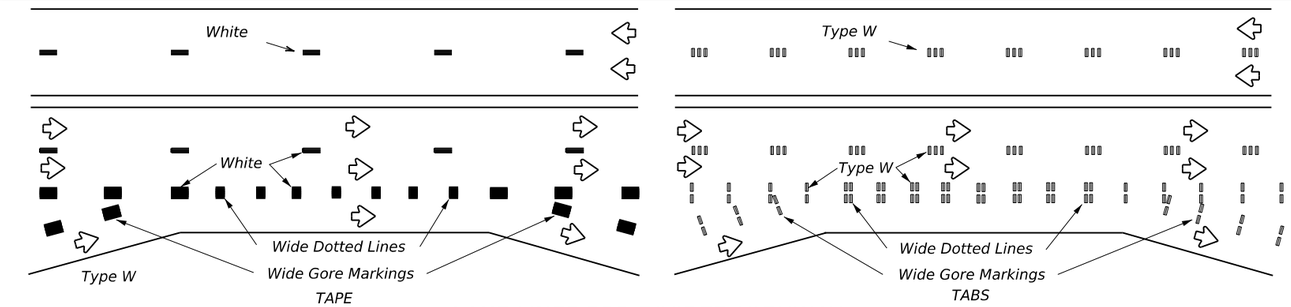
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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.

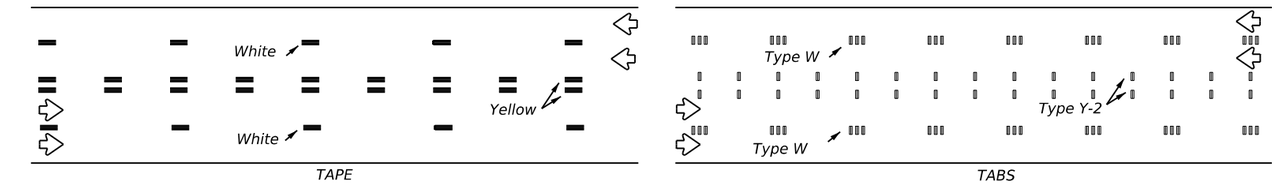
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



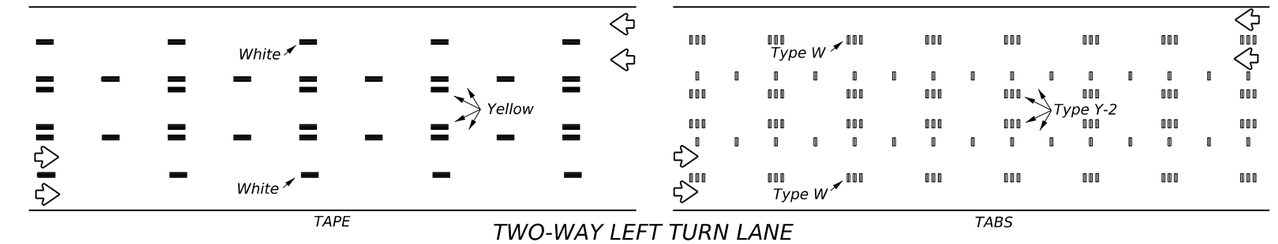
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



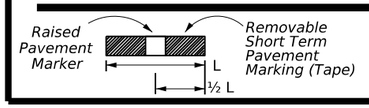
LANE LINES FOR DIVIDED HIGHWAY



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 Safety Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-23

FILE: wzstpm-23.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0204	07	056	US 79
4-92 7-13	DIST	COUNTY		SHEET NO.
1-97 2-23	BRY	MILAM		044
3-03				

DATE:
FILE:

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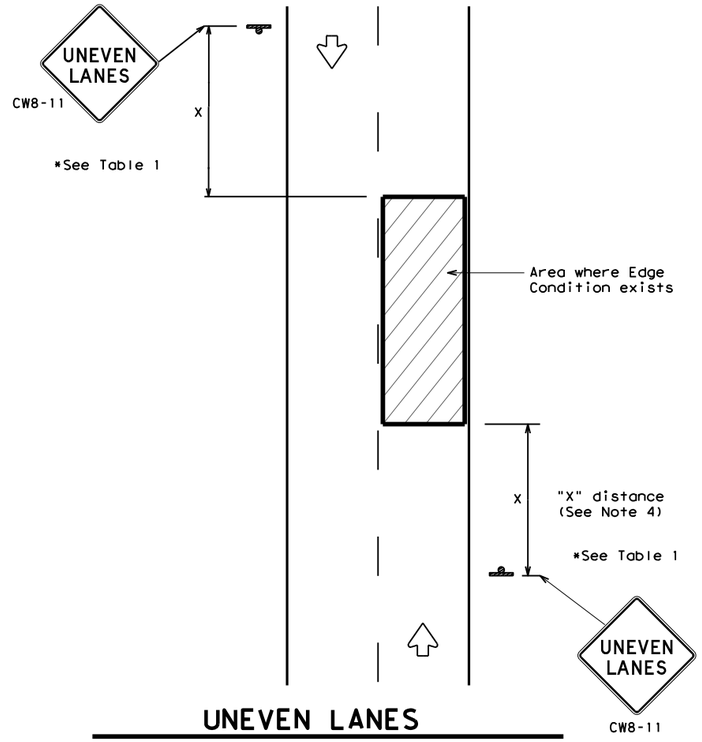
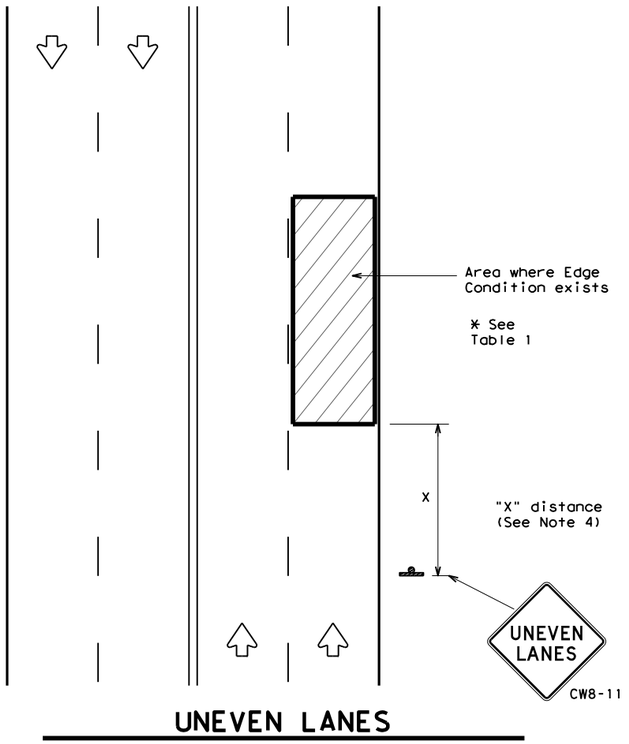
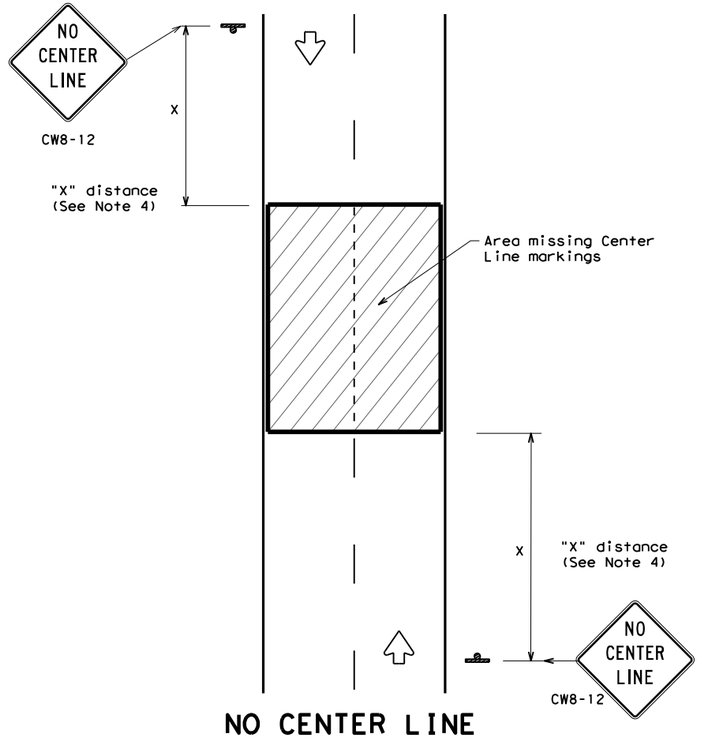
DATE:
FILE:



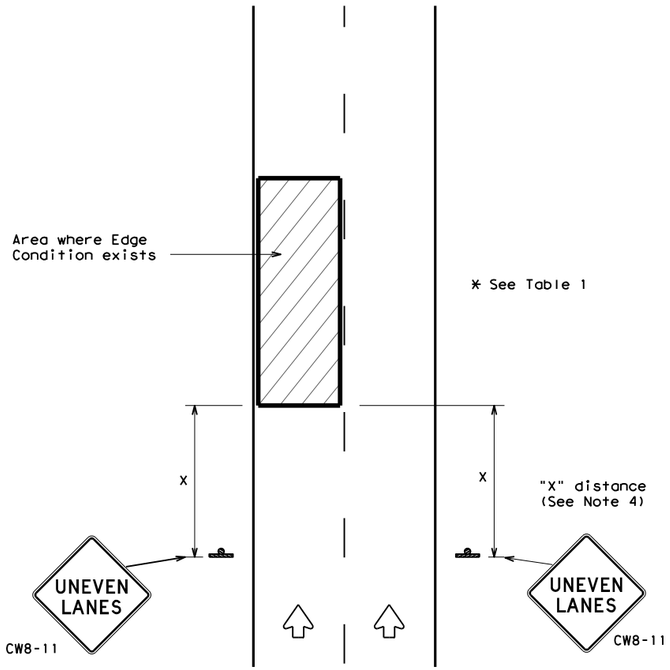
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

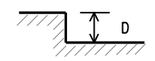
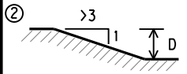
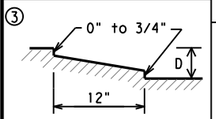
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

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"

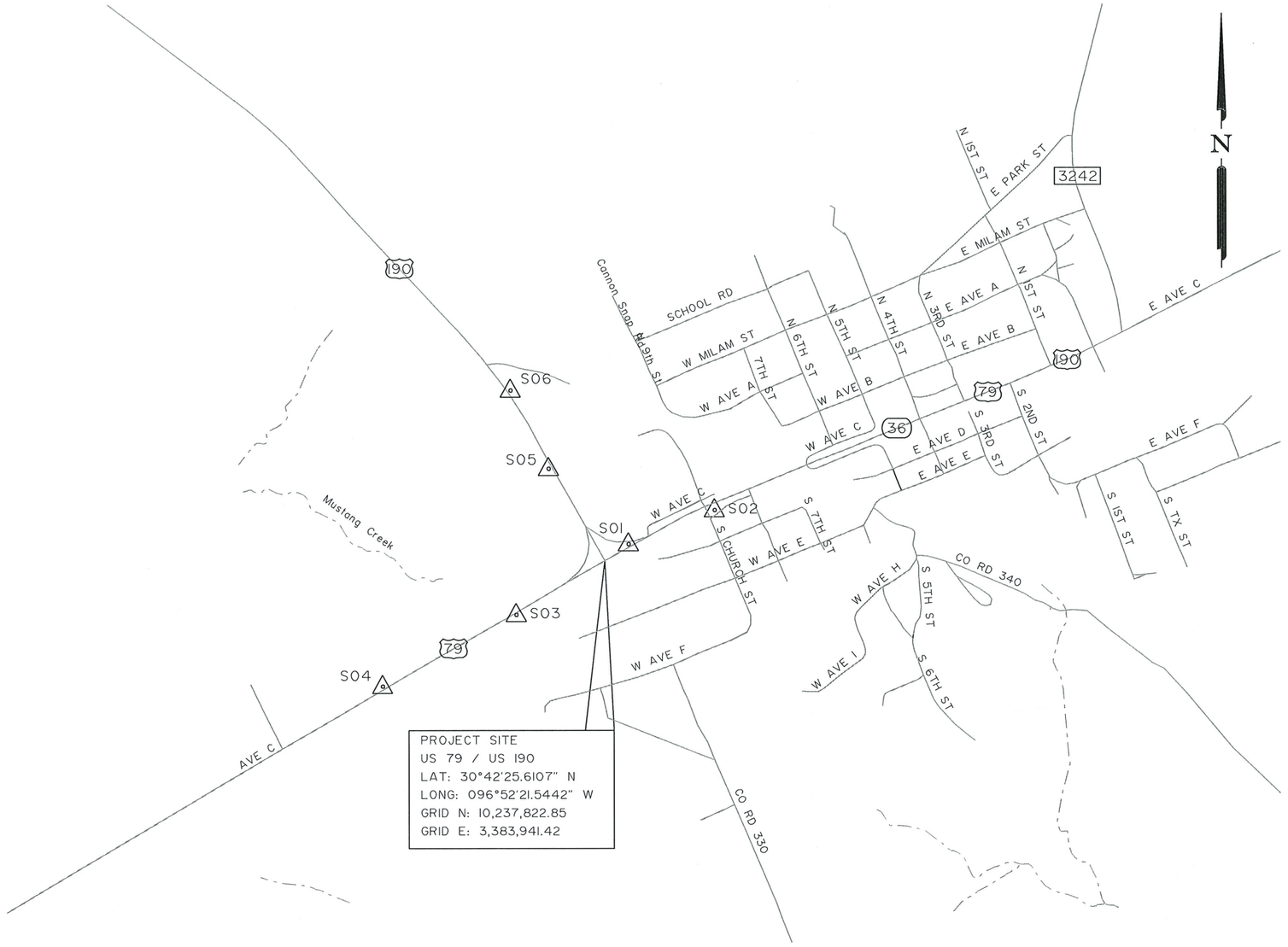
Texas Department of Transportation

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		0204	07	056	US 79
8-95 2-98 7-13		DIST	COUNTY		SHEET NO.
1-97 3-03		BRY	MILAM		045



NOTES:

1. ALL BEARINGS ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, NORTH CENTRAL ZONE (NAD83, 2011 ADJUSTMENT, EPOCH 2010.00). ESTABLISHED BY TXDOT RTN, HELD HORIZONTAL MONUMENT "CAMERON BASE STATION".

2. ALL DISTANCES AND COORDINATES ARE IN US SURVEY FEET DISPLAYED IN SURFACE VALUES WITH THE TxDOT SURFACE ADJUSTMENT FACTOR OF 1.000120.

3. ALL ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) USING GEOID12B. ESTABLISHED BY TXDOT RTN, HELD VERTICAL MONUMENT "CAMERON BASE STATION".

THE SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E

STATE OF TEXAS
REGISTERED
DAVID H. SPRADLEY
6035
PROFESSIONAL
LAND SURVEYOR

3/30/23
David H. Spradley

THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION IN MARCH 2023.

TRAVERSE TABLE

FROM	TO	BEARING	DISTANCE
S01	S02	N 69°53'25" E	787.00'
S01	S03	S 55°21'12" W	1,257.62'
S03	S04	S 66°14'06" W	1,064.20'
S01	S05	N 45°01'51" W	846.50'
S05	S06	N 22°06'09" W	730.15'

POINT INFO TABLE

POINT No.	LATITUDE (N)	LONGITUDE (W)	GRID NORTHING	GRID EASTING	SURFACE NORTHING	SURFACE EASTING	ELEVATION	DESCRIPTION
S01	30°42'26.5889"	096°52'20.2446"	10,237,925.15	3,384,051.73	10,239,153.70	3,384,457.82	499.69'	CP 3.25" TACC IN DIRT
S02	30°42'29.0381"	096°52'11.6872"	10,238,195.71	3,384,790.67	10,239,424.29	3,385,196.84	518.11'	CP 3.25" TACC IN PAVEMENT
S03	30°42'19.8343"	096°52'32.3442"	10,237,210.26	3,383,017.24	10,238,438.73	3,383,423.21	477.40'	CP 3.25" TACC IN DIRT
S04	30°42'15.8912"	096°52'43.6473"	10,236,781.45	3,382,043.39	10,238,009.87	3,382,449.24	482.69'	CP 3.25" TACC IN DIRT
S05	30°42'32.6914"	096°52'26.8881"	10,238,523.33	3,383,452.92	10,239,751.95	3,383,858.93	490.39'	CP 3.25" TACC IN DIRT
S06	30°42'39.4683"	096°52'29.7926"	10,239,199.74	3,383,178.22	10,240,428.45	3,383,584.20	497.03'	CP 3.25" TACC IN DIRT

11x17 - SCALE: 1" = NOT TO SCALE
22x34 - SCALE: 1" = NOT TO SCALE

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. 10046100
2322 W. Grand Parkway North, Suite 150 • Katy, Texas 77449 • 832.913.4000

SURVEY
CONTROL INDEX SHEET
US 79 / US 190

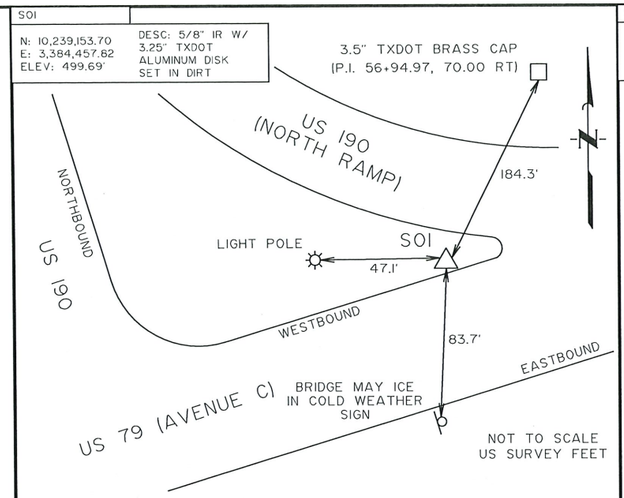
PAGE 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
06			46
STATE	DIST.	COUNTY	
TEXAS	17	MILAM	
CONT.	SECT.	JOB	HIGHWAY
0204	07	056	US 79 / US 190

S01

N: 10,239,153.70
E: 3,384,457.62
ELEV: 499.69'

DESC: 5/8" IR W/ 3.25" TXDOT ALUMINUM DISK SET IN DIRT

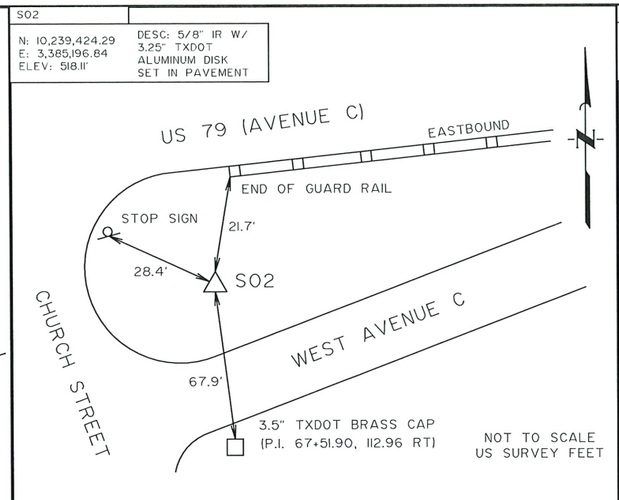


CONTROL POINT S01 IS A 3.25" TXDOT ALUMINUM DISK SET IN DIRT, ON THE NORTHWEST SIDE OF US 79 (AVENUE C), LOCATED APPROXIMATELY 145' NORTHEAST OF US 190.

S02

N: 10,239,424.29
E: 3,385,196.84
ELEV: 518.11'

DESC: 5/8" IR W/ 3.25" TXDOT ALUMINUM DISK SET IN PAVEMENT

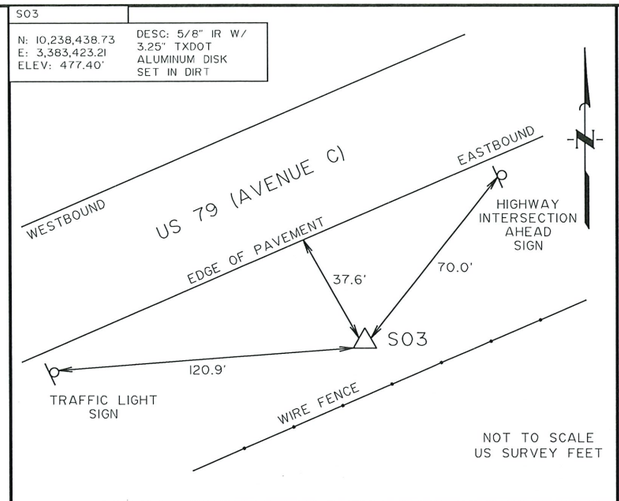


CONTROL POINT S02 IS A 3.25" TXDOT ALUMINUM DISK SET IN PAVEMENT, ON THE SOUTHEAST SIDE OF US 79 (AVENUE C), LOCATED APPROXIMATELY 930' NORTHEAST OF US 190.

S03

N: 10,238,438.73
E: 3,383,423.21
ELEV: 477.40'

DESC: 5/8" IR W/ 3.25" TXDOT ALUMINUM DISK SET IN DIRT

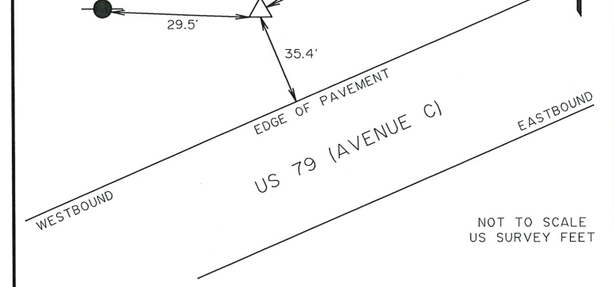


CONTROL POINT S03 IS A 3.25" TXDOT ALUMINUM DISK SET IN DIRT, ON THE SOUTHEAST SIDE OF US 79 (AVENUE C), LOCATED APPROXIMATELY 1,050' SOUTHWEST OF US 190.

S04

N: 10,238,009.87
E: 3,382,449.24
ELEV: 482.69'

DESC: 5/8" IR W/ 3.25" TXDOT ALUMINUM DISK SET IN DIRT

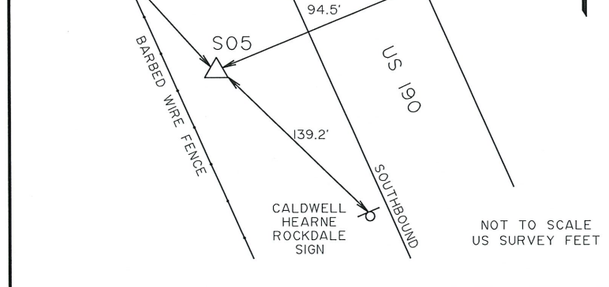


CONTROL POINT S04 IS A 3.25" TXDOT ALUMINUM DISK SET IN DIRT, ON THE NORTHWEST SIDE OF US 79 (AVENUE C), LOCATED APPROXIMATELY 2,120' SOUTHWEST OF US 190.

S05

N: 10,239,751.95
E: 3,383,858.93
ELEV: 490.39'

DESC: 5/8" IR W/ 3.25" TXDOT ALUMINUM DISK SET IN DIRT

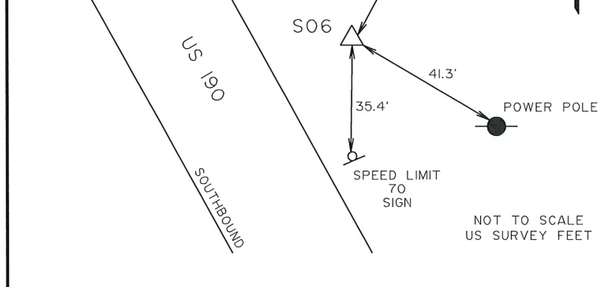


CONTROL POINT S05 IS A 3.25" TXDOT ALUMINUM DISK SET IN DIRT, ON THE SOUTHWEST SIDE OF US 190, LOCATED APPROXIMATELY 820' NORTHWEST OF US 79 (AVENUE C).

S06

N: 10,240,428.45
E: 3,383,584.20
ELEV: 497.03'

DESC: 5/8" IR W/ 3.25" TXDOT ALUMINUM DISK SET IN DIRT



CONTROL POINT S06 IS A 3.25" TXDOT ALUMINUM DISK SET IN DIRT, ON THE NORTHEAST SIDE OF US 190, LOCATED APPROXIMATELY 1,550' NORTHWEST OF US 79 (AVENUE C).

NOTES:

1. ALL BEARINGS ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, NORTH CENTRAL ZONE (NAD83, 2011 ADJUSTMENT, EPOCH 2010.00). ESTABLISHED BY TXDOT RTN, HELD HORIZONTAL MONUMENT "CAMERON BASE STATION".

2. ALL DISTANCES AND COORDINATES ARE IN US SURVEY FEET DISPLAYED IN SURFACE VALUES WITH THE TxDOT SURFACE ADJUSTMENT FACTOR OF 1.000120.

3. ALL ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) USING GEOID12B. ESTABLISHED BY TXDOT RTN, HELD VERTICAL MONUMENT "CAMERON BASE STATION".

THE SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PSBE.

STATE OF TEXAS
REGISTERED
DAVID H. SPRADLEY
6035
PROFESSIONAL
LAND SURVEYOR

3/30/23

THE CONTROL POINTS HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION IN MARCH 2023.

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. 10016100
2322 W. Grand Parkway North, Suite 150 • Katy, Texas 77449 • 832.913.4000

HORIZONTAL & VERTICAL CONTROL SHEET US 79 / US 190

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
06			47
STATE	DIST.	COUNTY	
TEXAS	17	MILAM	
CONT.	SECT.	JOB	HIGHWAY
0204	07	056	US 79 / US 190

US 79
HORIZONTAL ALIGNMENT DATA

Alignment Name: BL CL-US79
Alignment Description:
Alignment Style: Alignment\Baseline

	Station	Northing	Easting
Element: Linear			
POT ( )	31+24.033 R1	10237684.112	3382000.480
PC ( )	60+16.660 R1	10239132.721	3384504.242

Tangential Direction: N59.947°E
Tangential Length: 2892.627

Element: Circular			
PC ( )	60+16.660 R1	10239132.721	3384504.242
PI ( )	64+10.629 R1	10239330.018	3384845.248
CC ( )		10234173.387	3387373.579
PT ( )	68+03.360 R1	10239478.783	3385210.051

Radius: 5729.580
Delta: 7.867° Right
Degree of Curvature (Arc): 1.000°
Length: 786.700

Tangent: 393.969
Chord: 786.082
Middle Ordinate: 13.497
External: 13.529
Back Tangent Direction: N59.947°E
Back Radial Direction: S30.053°E
Chord Direction: N63.881°E
Ahead Radial Direction: S22.186°E
Ahead Tangent Direction: N67.814°E

Element: Linear			
PT ( )	68+03.360 R1	10239478.783	3385210.051
POT ( )	70+66.796 R1	10239578.259	3385453.983

Tangential Direction: N67.814°E
Tangential Length: 263.436

US 190 / SH 36
HORIZONTAL ALIGNMENT DATA

Alignment Name: IR CL-SH36/US191
Alignment Description:
Alignment Style: Alignment\Intersecting Road

	Station	Northing	Easting
Element: Linear			
POT ( )	1077+22.060 R1	10241023.991	3383007.827
PC ( )	1081+30.214 R1	10240724.027	3383284.614

Tangential Direction: S42.699°E
Tangential Length: 408.154

Element: Circular			
PC ( )	1081+30.214 R1	10240724.027	3383284.614
PI ( )	1084+49.907 R1	10240489.074	3383501.412
CC ( )		10238781.286	3381179.197
PT ( )	1087+66.967 R1	10240212.110	3383661.084

Radius: 2864.790
Delta: 12.735° Right
Degree of Curvature (Arc): 2.000°
Length: 636.753

Tangent: 319.694
Chord: 635.443
Middle Ordinate: 17.673
External: 17.783
Back Tangent Direction: S42.699°E
Back Radial Direction: S47.301°W
Chord Direction: S36.331°E
Ahead Radial Direction: S60.036°W
Ahead Tangent Direction: S29.964°E

Element: Linear			
PT ( )	1087+66.967 R1	10240212.110	3383661.084
POT ( )	1101+23.500 R1	10239036.889	3384338.607

Tangential Direction: S29.964°E
Tangential Length: 1356.533

US 79 / US 190 (SH 36)
WEST RAMP HORIZONTAL ALIGNMENT DATA

Alignment Name: RAMP CL-WEST
Alignment Description:
Alignment Style: Alignment\Ramp

	Station
Element: Circular	
PC ( )	1097+27.600 R1
PI ( )	1101+23.497 R1
CC ( )	
PT ( )	1103+49.823 R1

Radius: 396.511
Delta: 89.911°
Degree of Curvature (Arc): 14.450°
Length: 622.223

Tangent: 395.897
Chord: 560.316
Middle Ordinate: 115.918
External: 163.806
Back Tangent Direction: S29.964°E
Back Radial Direction: S60.036°W
Chord Direction: S14.992°W
Ahead Radial Direction: N30.053°W
Ahead Tangent Direction: S59.947°W

US 79 / US 190 (SH 36)
EAST RAMP HORIZONTAL ALIGNMENT DATA

Alignment Name: RAMP CL-EAST
Alignment Description:
Alignment Style: Alignment\Ramp

	Station
Element: Circular	
PC ( )	1097+31.160 R1
PI ( )	1101+13.923 R1
CC ( )	
PT ( )	1103+39.273 R1

Radius: 395.143
Delta: 88.176°
Degree of Curvature (Arc): 14.500°
Length: 608.113

Tangent: 382.763
Chord: 549.854
Middle Ordinate: 111.324
External: 154.989
Back Tangent Direction: S29.964°E
Back Radial Direction: S60.036°W
Chord Direction: S74.052°E
Ahead Radial Direction: S28.140°E
Ahead Tangent Direction: N61.860°E

2024.06.04 13:05:02-05'00'

STATE OF TEXAS
DAVID P. NEUMANN
83345
LICENSED
PROFESSIONAL ENGINEER

David P. Neumann, P.E.

Lochner
TBPE Firm Reg. No. 10488

PRINT DATE	REVISION DATE
6/3/2024	

Texas Department of Transportation
Bryan District

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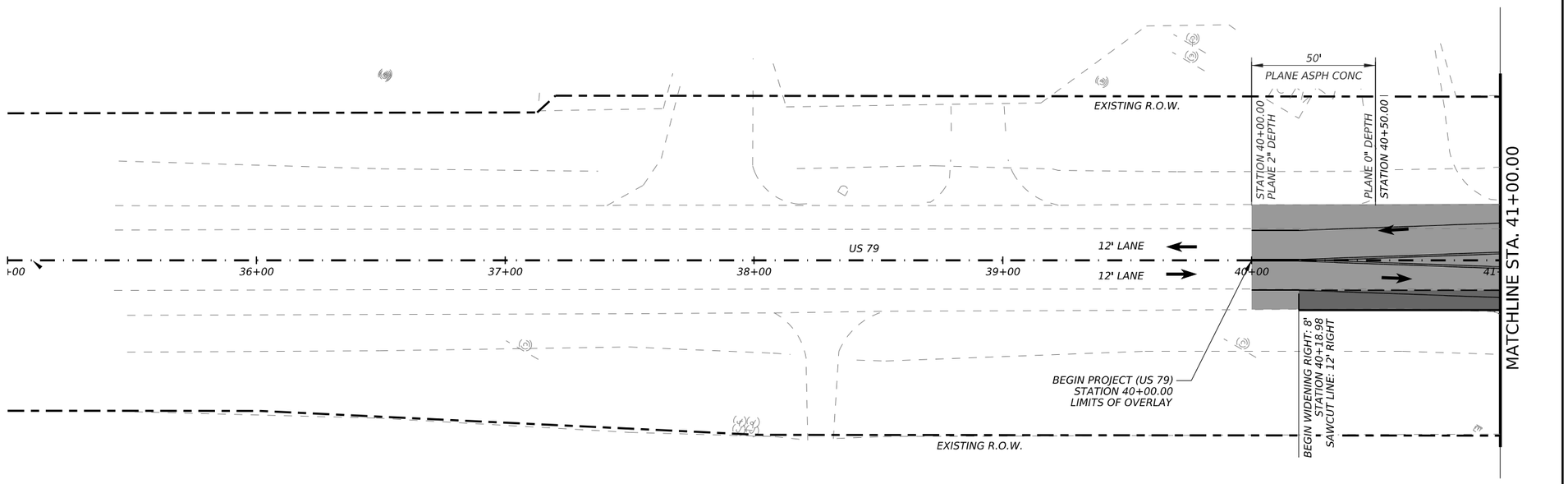
ALIGNMENT DATA

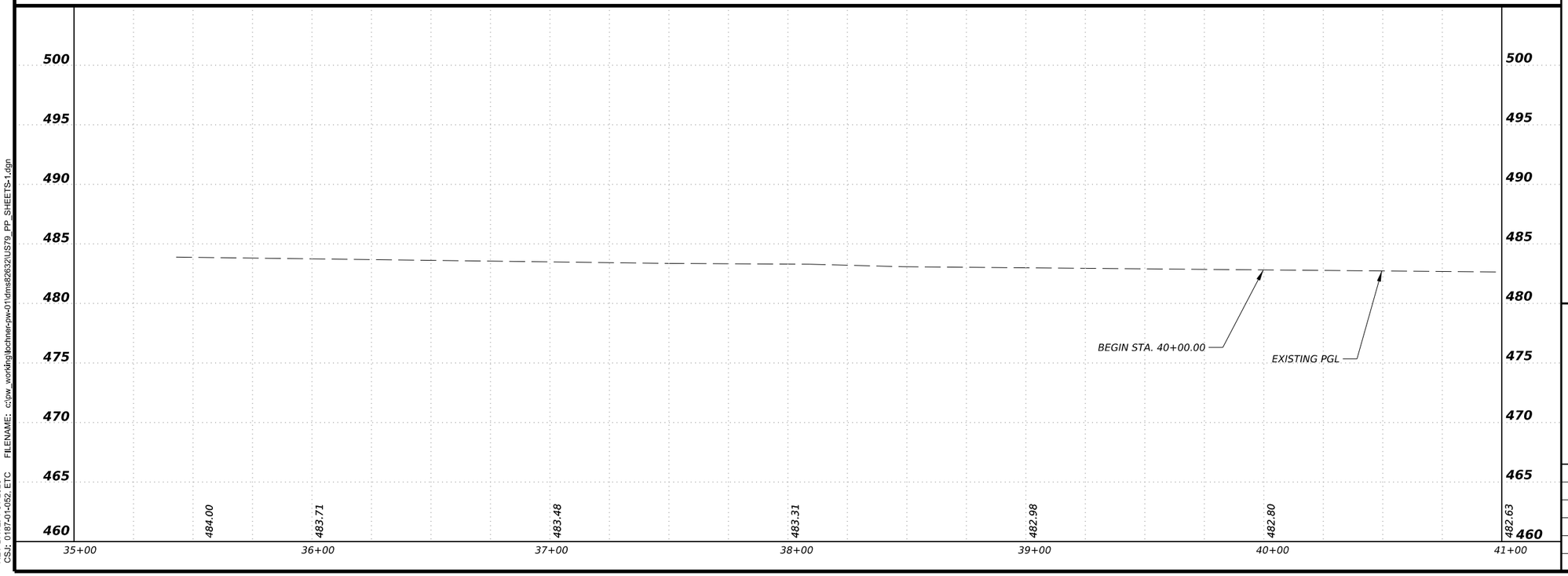
FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79

STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM

CONTROL	SECTION	JOB	SHEET NO.
0204	07	056	048

REV DATE: 1-31-2023
CSJ#: 0187-01-052, ETC
FILENAME: c:\pw_working\lochner-pw-01\dms82832\US79_CC01.dgn





NOTES:

1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- AREA OF OVERLAY
- AREA OF WIDENING / OVERLAY
- DRIVEWAY WORK
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING R.O.W.
- SAWCUT LINE
- DRV-X-X — DRIVEWAY X-X

0 25 50
HORIZONTAL & VERTICAL

2024.06.04 13:05:17-05'00'

STATE OF TEXAS
DAVID P. NEUMANN
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PLAN & PROFILE (US 79)

SHEET 1 OF 8

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79
STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM
CONTROL	SECTION	JOB / SHEET NO.
0204	07	056 / 049

REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
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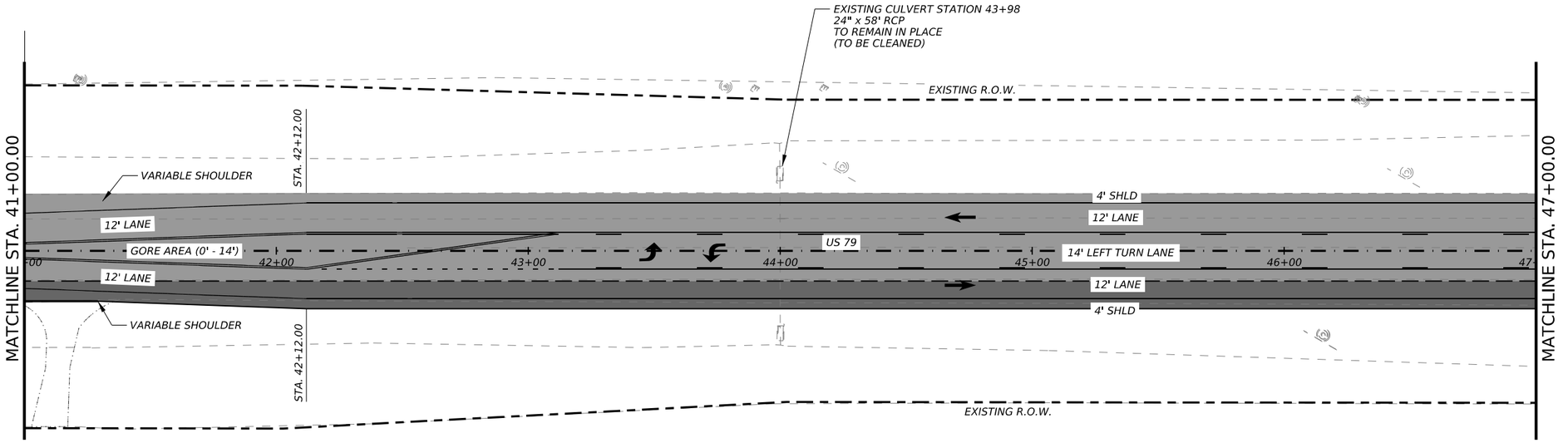

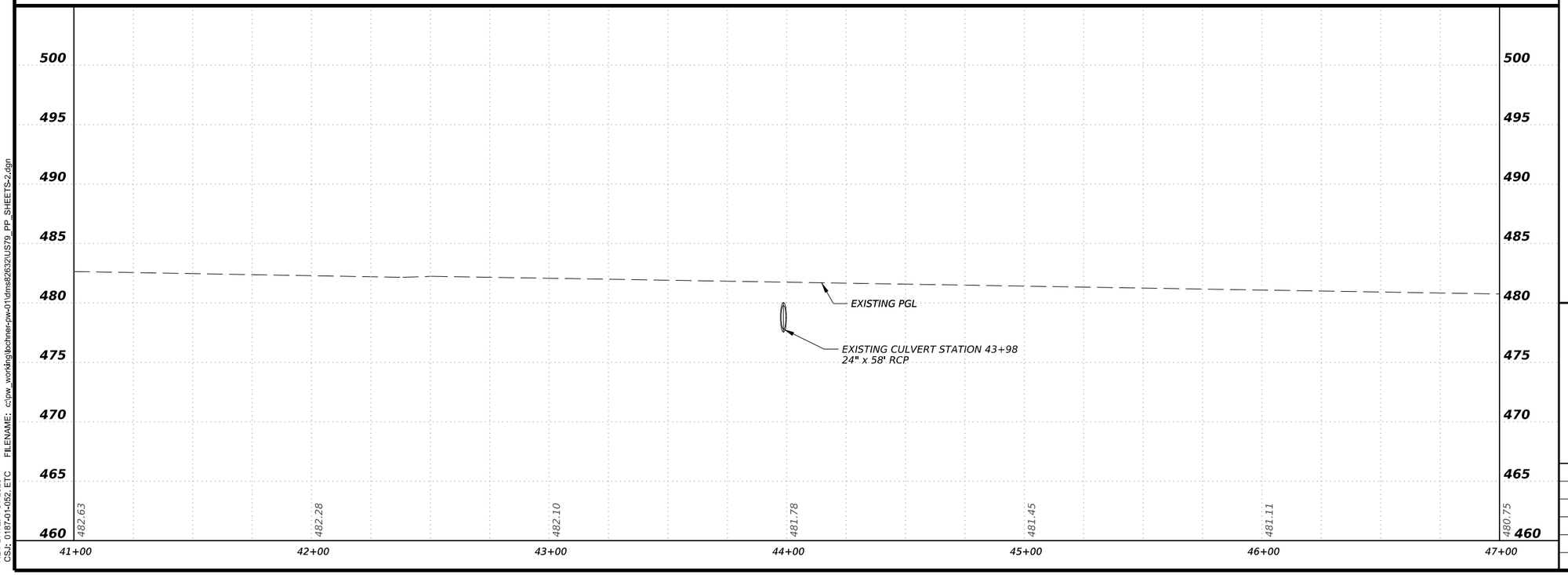

NOTES:

1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- AREA OF OVERLAY
- AREA OF WIDENING / OVERLAY
- DRIVEWAY WORK
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING R.O.W.
- SAWCUT LINE
- DRV-X-X — DRIVEWAY X-X

0 25 50
HORIZONTAL & VERTICAL

2024.06.04 13:05:42-05'00'

STATE OF TEXAS
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PLAN & PROFILE
(US 79)

SHEET 2 OF 8

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79

STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM

CONTROL	SECTION	JOB	SHEET NO.
0204	07	056	050

REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
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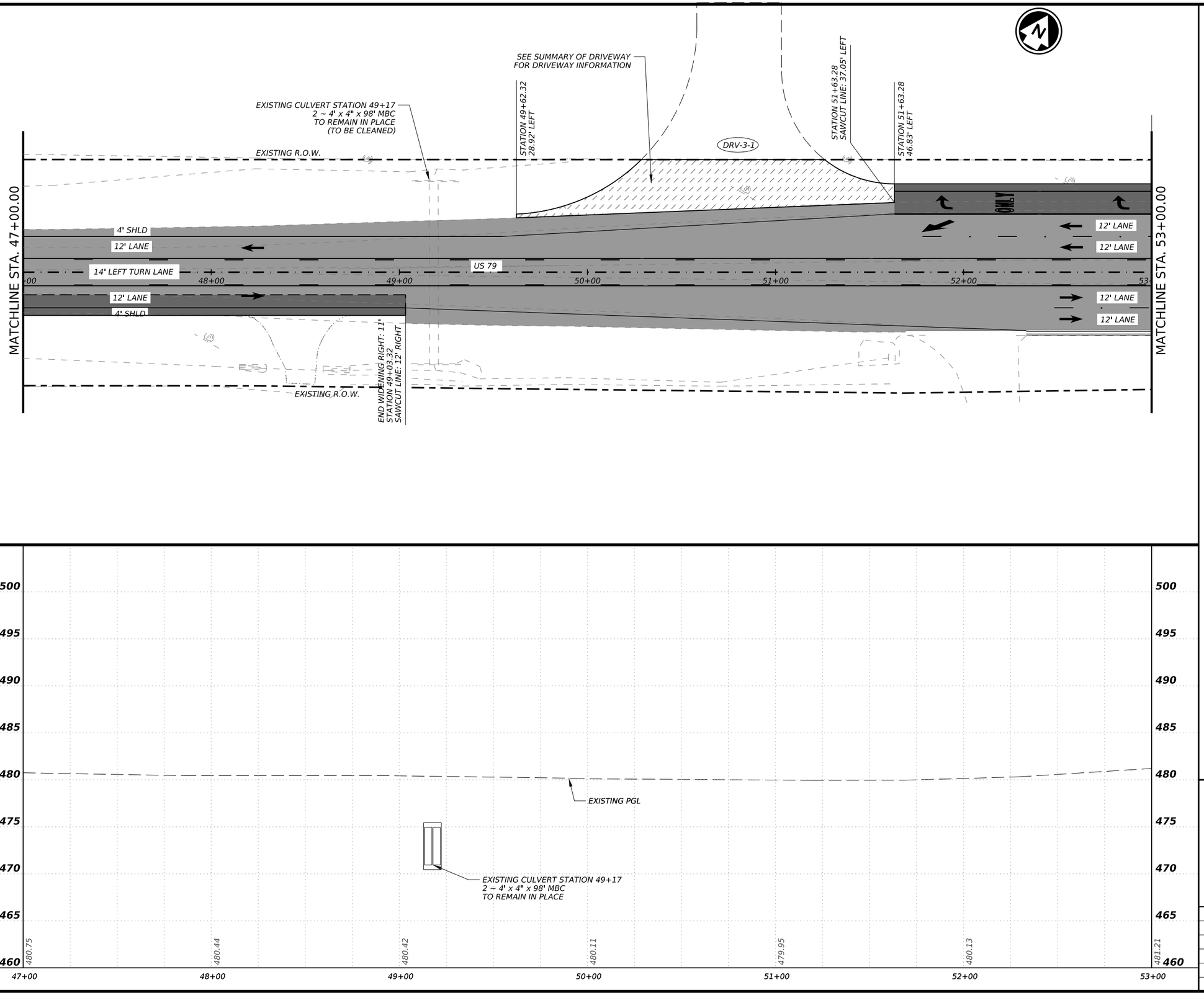

NOTES:

1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- AREA OF OVERLAY
- AREA OF WIDENING / OVERLAY
- DRIVEWAY WORK
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING R.O.W.
- SAWCUT LINE
- DRV-X-X — DRIVEWAY X-X

0 25 50
HORIZONTAL & VERTICAL

REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
FILENAME: c:\pw_working\lochner-pw-01\dms82632\US79_PP_SHEETS-3.dgn

2024.06.04 13:06:33-05'00'

STATE OF TEXAS
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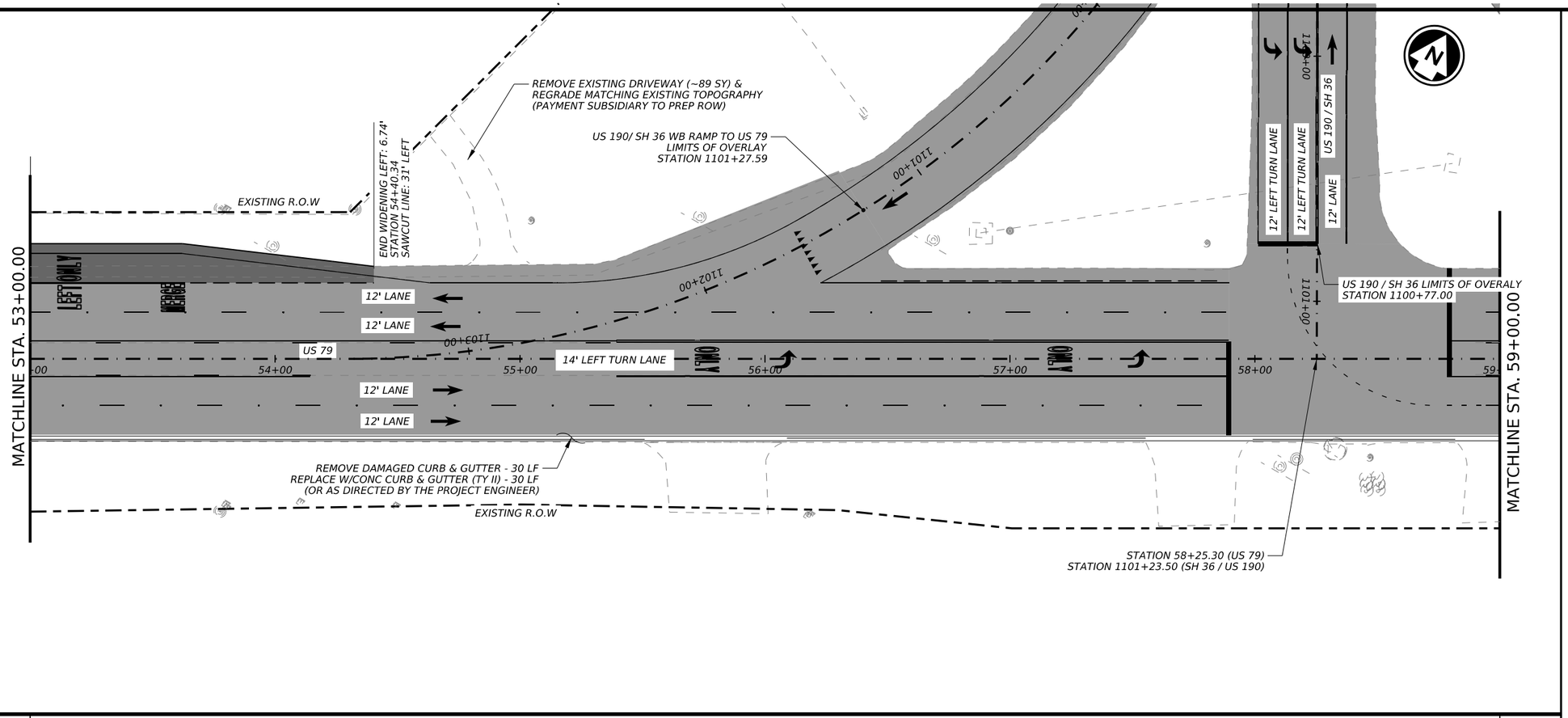
PLAN & PROFILE (US 79)

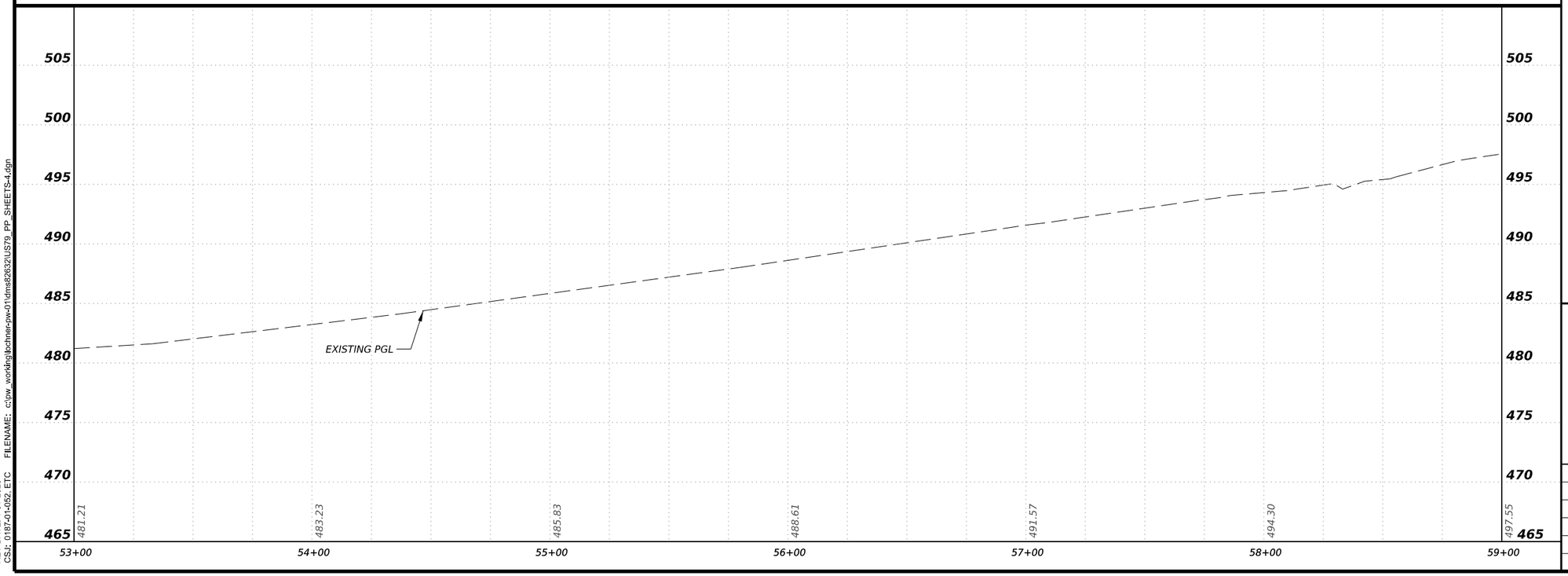
SHEET 3 OF 8

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79

STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM

CONTROL	SECTION	JOB	SHEET NO.
0204	07	056	051





NOTES:

1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- AREA OF OVERLAY
- AREA OF WIDENING / OVERLAY
- DRIVEWAY WORK
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING R.O.W.
- SAWCUT LINE
- DRV-X-X — DRIVEWAY X-X

0 25 50
HORIZONTAL & VERTICAL

2024.06.04 13:07:03-05'00'

STATE OF TEXAS
DAVID P. NEUMANN
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PLAN & PROFILE (US 79)

SHEET 4 OF 8

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79
STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM
CONTROL	SECTION	JOB / SHEET NO.
0204	07	056 / 052

REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
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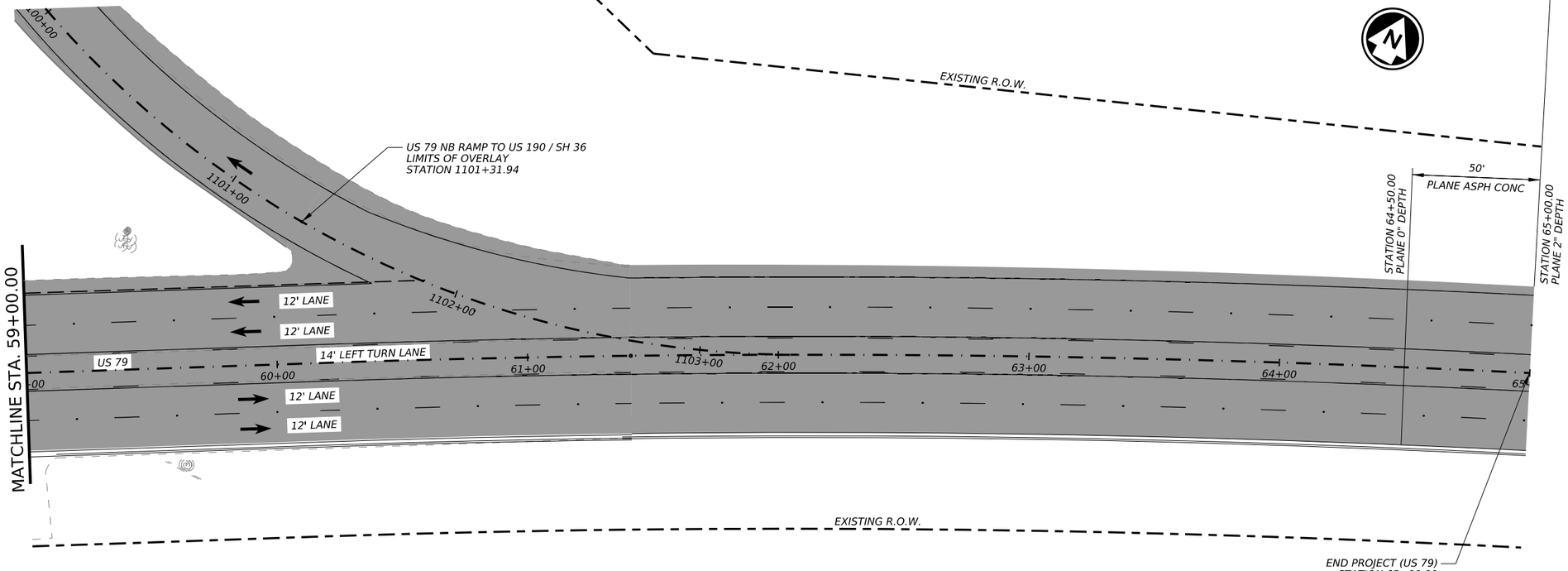


PI	64+10.63
Δ	07°52'01.2" (RT)
D	01°00'00.0"
T	393.97'
L	786.70'
R	5729.58'
PC	60+16.66
PT	68+03.36

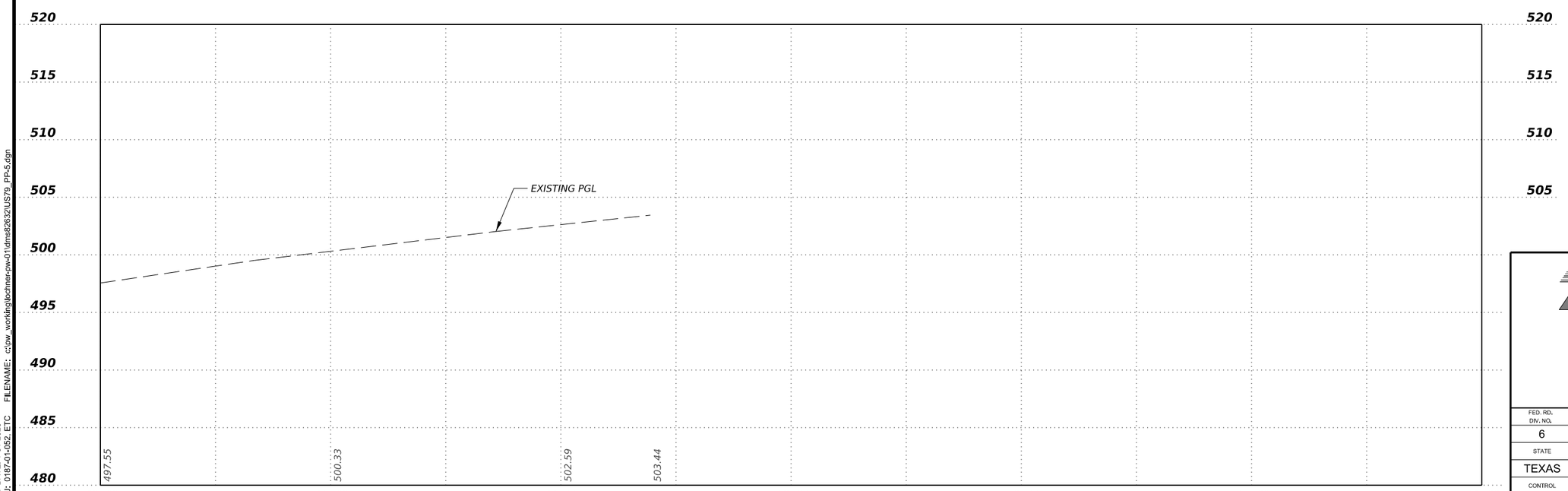
NOTES:

1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- AREA OF OVERLAY
- AREA OF WIDENING / OVERLAY
- DRIVEWAY WORK
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING R.O.W.
- SAWCUT LINE
- DRV-X-X — DRIVEWAY X-X

0 25 50
HORIZONTAL & VERTICAL



2024.06.04 13:07:19-05'00'

STATE OF TEXAS
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PLAN & PROFILE (US 79)

SHEET 5 OF 8

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79

STATE	DISTRICT	COUNTY	
TEXAS	BRY	MILAM	
CONTROL	SECTION	JOB	SHEET NO.
0204	07	056	053

REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
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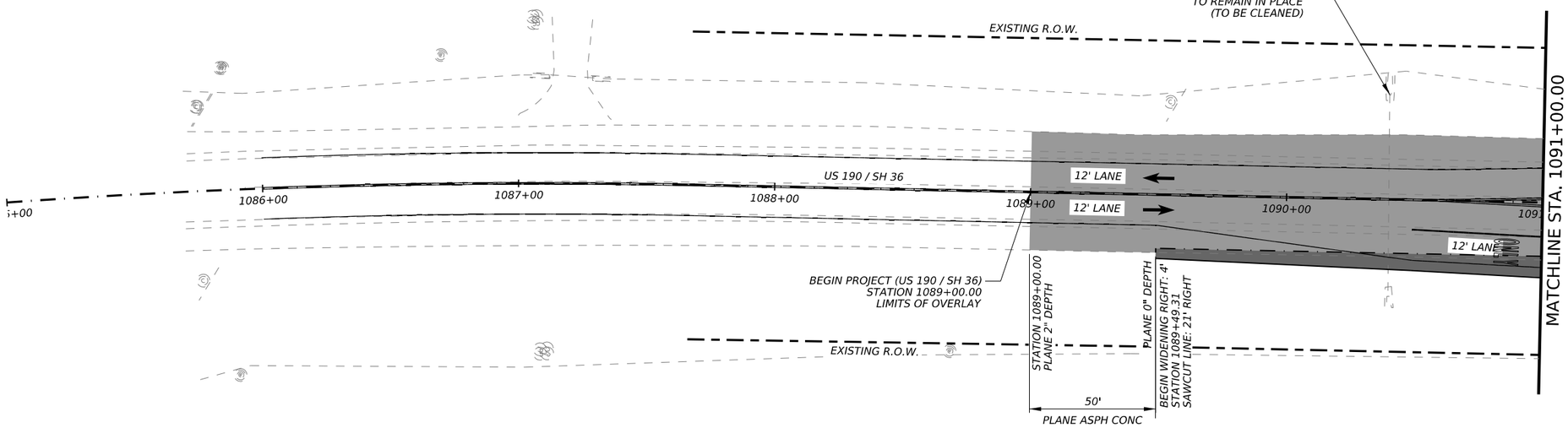

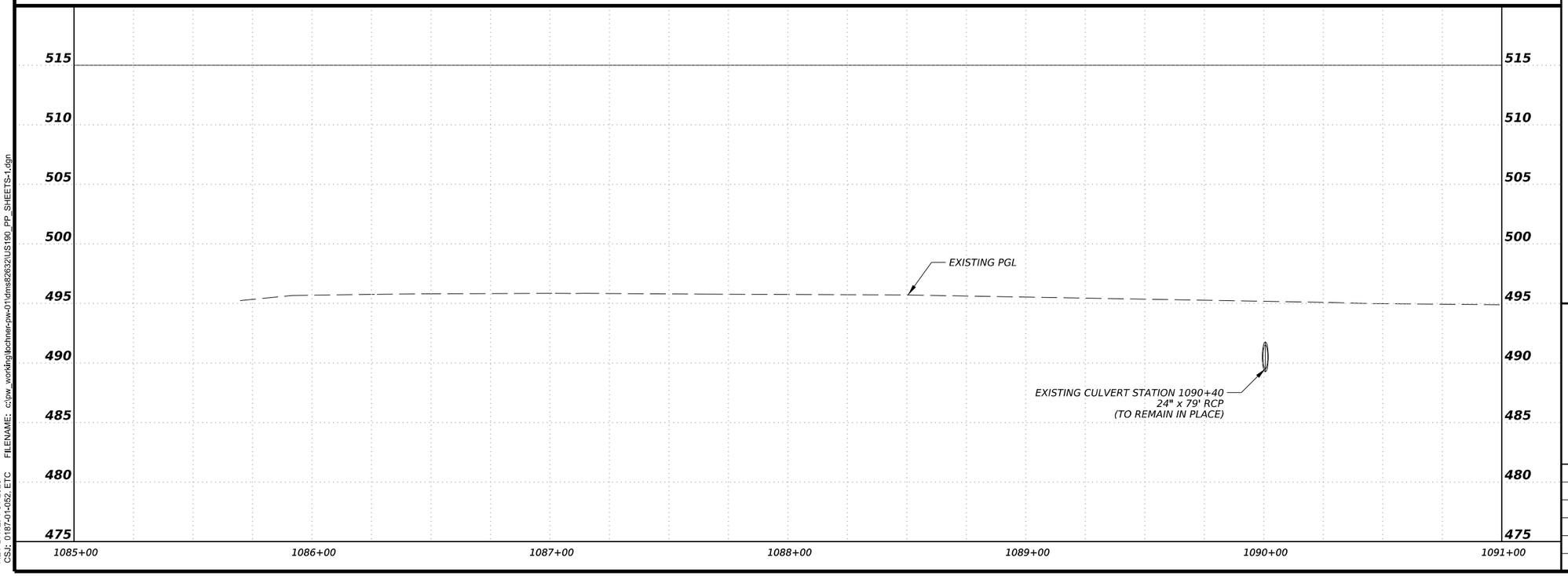

NOTES:

1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- AREA OF OVERLAY
- AREA OF WIDENING / OVERLAY
- DRIVEWAY WORK
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING R.O.W.
- SAWCUT LINE
- DRV-X-X — DRIVEWAY X-X

0 25 50
HORIZONTAL & VERTICAL

2024.06.04 13:07:37-05'00'

STATE OF TEXAS
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PLAN & PROFILE (US 190 / SH 36)

SHEET 6 OF 8

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79

STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM

CONTROL	SECTION	JOB	SHEET NO.
0204	07	056	054

REV DATE: I-31-2023
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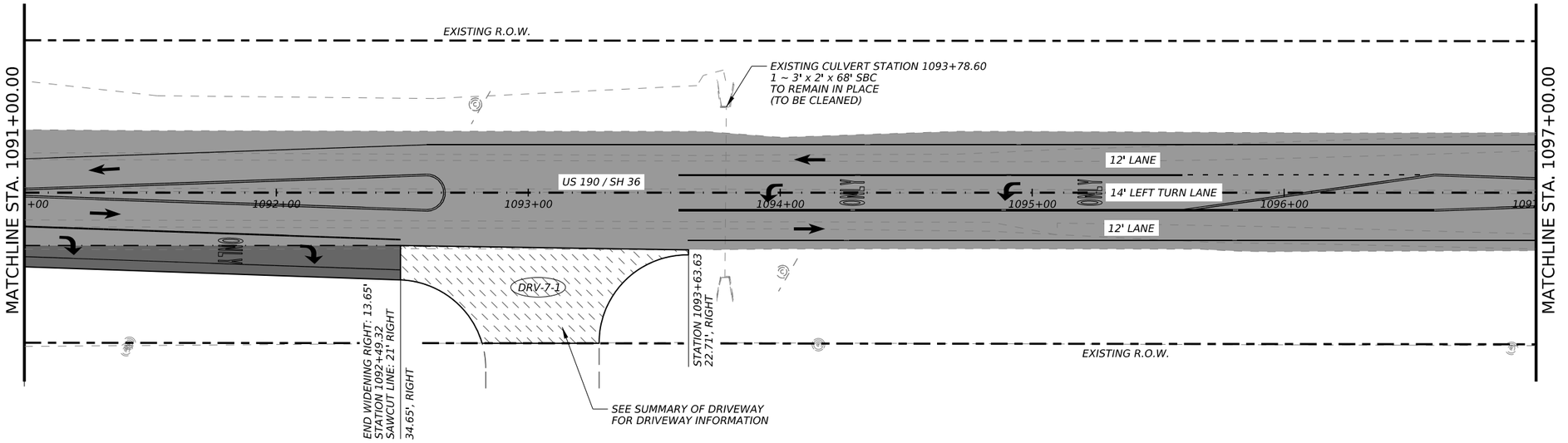

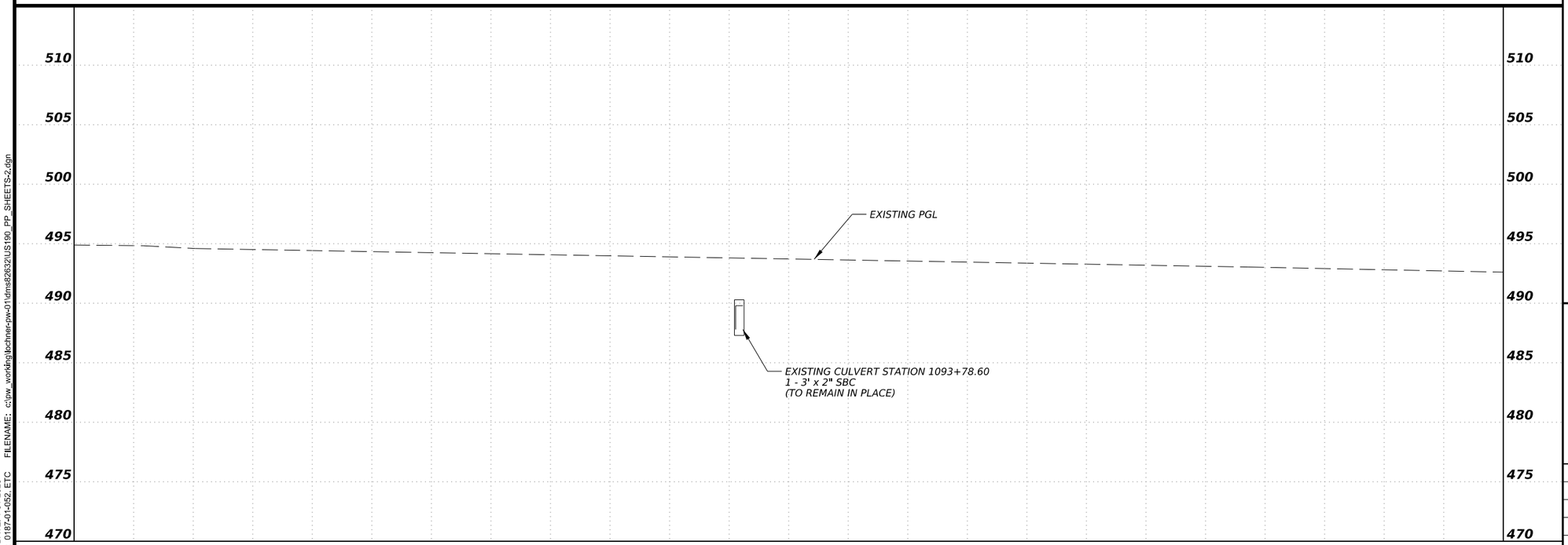

NOTES:

1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- AREA OF OVERLAY
- AREA OF WIDENING / OVERLAY
- DRIVEWAY WORK
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING R.O.W.
- SAWCUT LINE
- DRV-X-X — DRIVEWAY X-X

0 25 50
HORIZONTAL & VERTICAL

2024.06.04 13:07:49-05'00'

STATE OF TEXAS
DAVID P. NEUMANN
83345
LICENSED
PROFESSIONAL ENGINEER

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PRINT DATE	REVISION DATE
6/3/2024	

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PLAN & PROFILE
(US 190 / SH 36)

SHEET 7 OF 8

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79

STATE	DISTRICT	COUNTY	
TEXAS	BRY	MILAM	
CONTROL	SECTION	JOB	SHEET NO.
0204	07	056	055

REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
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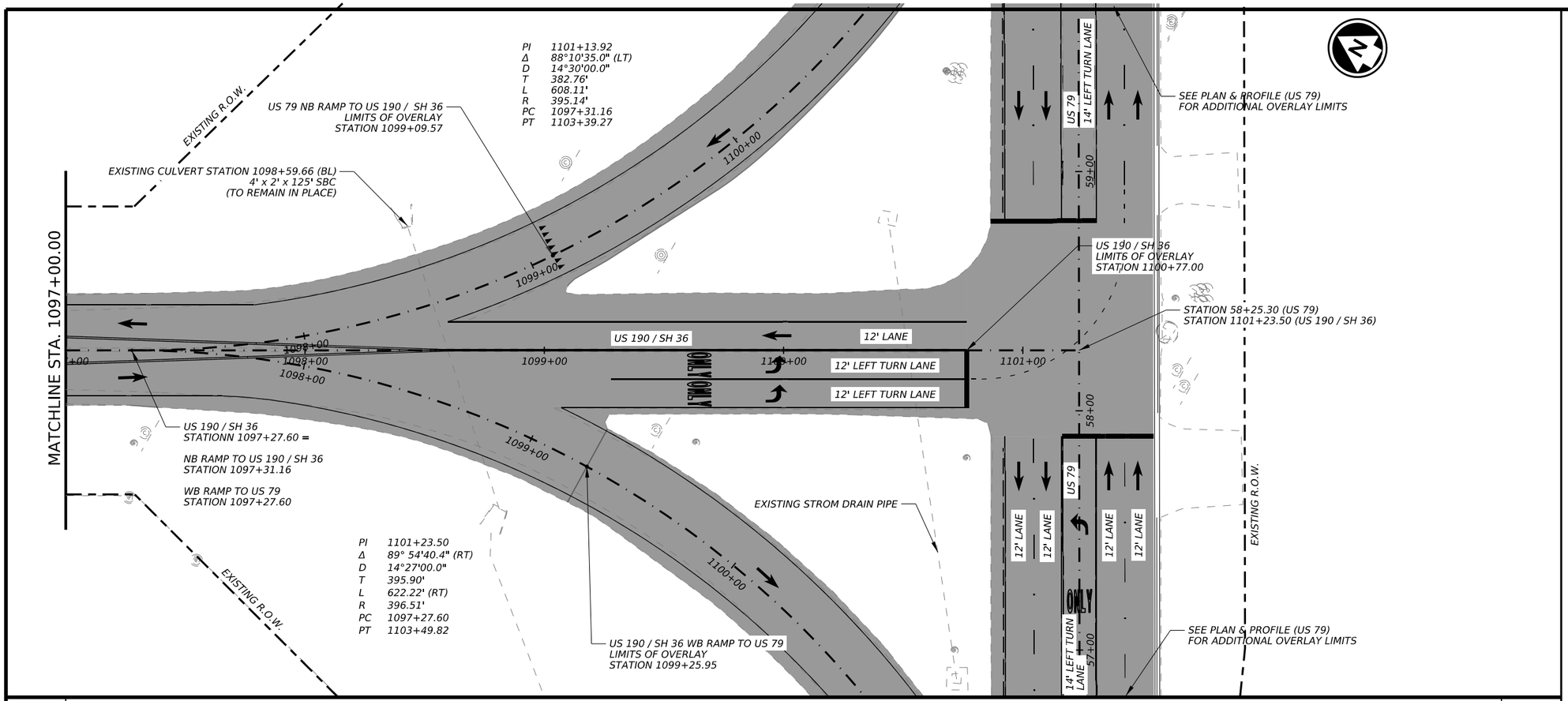

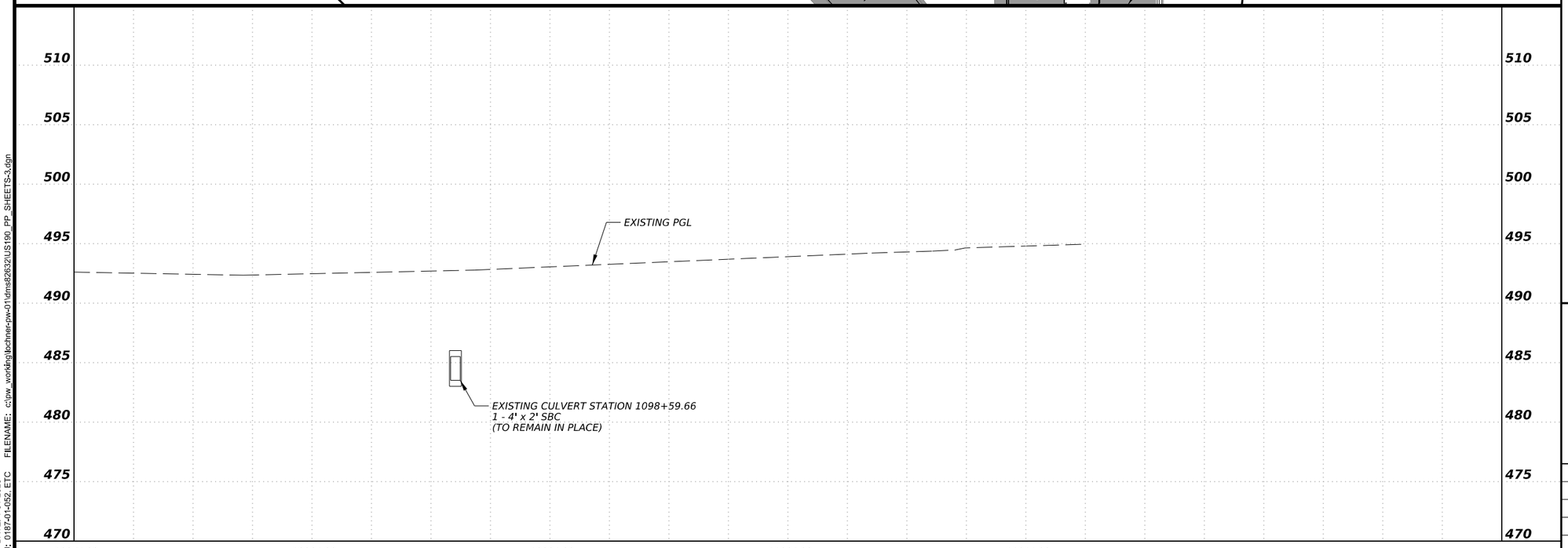

NOTES:

1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- AREA OF OVERLAY
- AREA OF WIDENING / OVERLAY
- DRIVEWAY WORK
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING R.O.W.
- SAWCUT LINE
- DRV-X-X — DRIVEWAY X-X

0 25 50
HORIZONTAL & VERTICAL

2024.06.04 13:08:08-05'00'

STATE OF TEXAS
DAVID P. NEUMANN
83345
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PROFESSIONAL ENGINEER

David P. Neumann, P.E.

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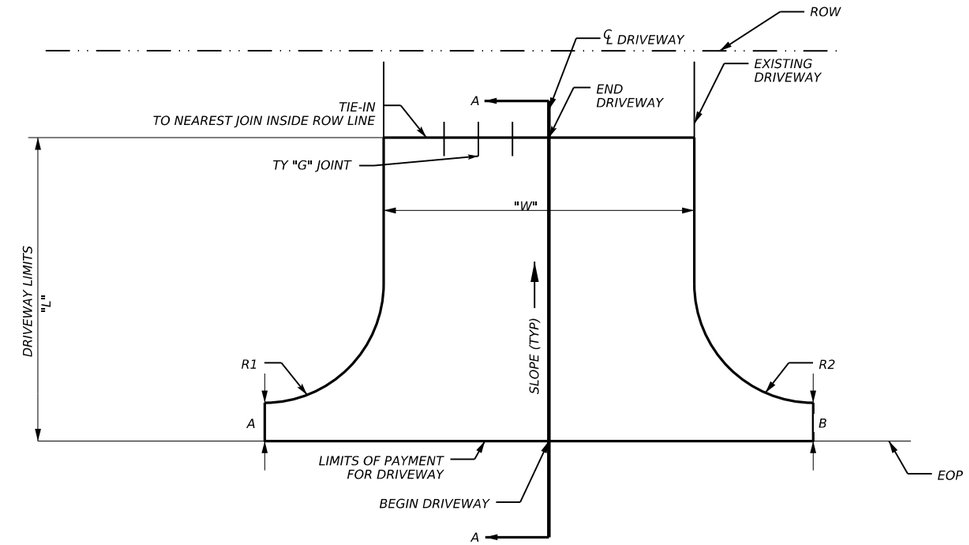
PLAN & PROFILE (US 190 / SH 36)

SHEET 8 OF 8

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79
STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM
CONTROL	SECTION	JOB / SHEET NO.
0204	07	056 / 056

REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
FILENAME: c:\pw_working\lochner-pw-01\dms82832\US190_PP_SHEETS-2.dgn

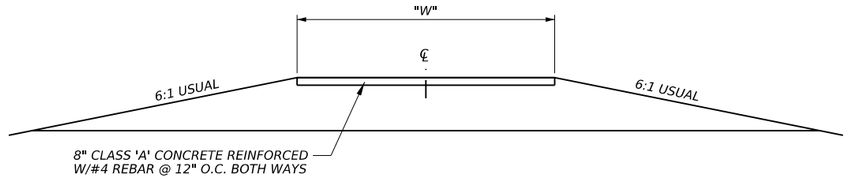
PLAN LOCATION	RESIDENTIAL / COMMERCIAL			WIDTH "W"	LENGTH "L"	"A"	"B"	RADIUS		SURFACE AREA SY	CONCRETE SURFACE
		STATION	DRV #	FT	FT	FT	FT	R1	R2	SY	
RDWY PLAN & PROFILE NO. 3 OF 8	COMMERCIAL	50+81.17, LT.	DRV-3-1	45	20.9	2	9.78	100	60	421	8" REINFORCED CONCRETE
RDWY PLAN & PROFILE NO. 7 OF 8	COMMERCIAL	1093+06.29, RT.	DRV-7-1	45	37.8	2	13.65	35	35	307	8" REINFORCED CONCRETE



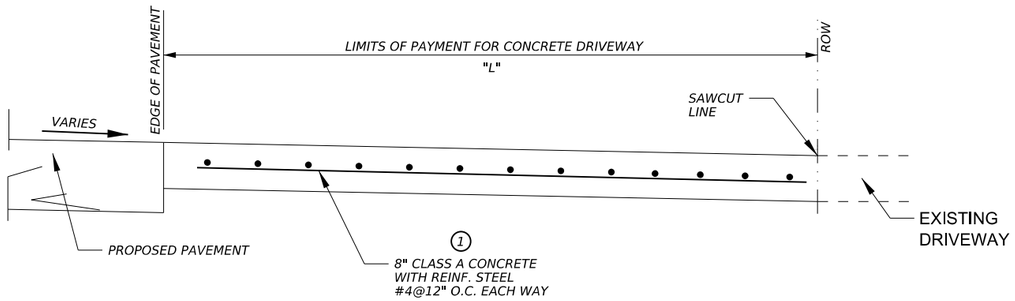
DRIVEWAYS (CONC)

DRIVEWAYS (CONC) WILL CONSIST OF: BLADING AND RESHAPING THE SUBGRADE, ANY EXTRA EMBANKMENT MATERIAL NECESSARY TO ACHIEVE THE PROPER SUBGRADE WIDTH, THE PLACEMENT OF CLASS 'A' CONCRETE AND REMOVAL OF ANY EXISTING CONCRETE AND/OR CONC CURB AND GUTTER.

DRIVEWAY TYPE	DESIGN
RESIDENTIAL	6" CONCRETE
COMMERCIAL	8" CONCRETE



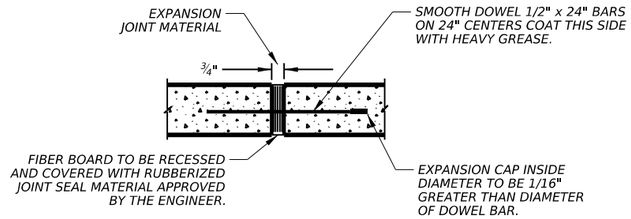
DRIVEWAY TYPICAL SECTION



NOTES:
1. BARS WILL BE TRIMMED IN THE FIELD TO FIT INTO DRIVEWAY RADIUS.

SECTION A-A

NTS



TY "G" JOINT

NOTE: USE JOINT WHEN CONCRETE DRIVEWAYS MUST BE PLACED IN HALF WIDTHS.

2024.06.04 13:08:47-05'00'

STATE OF TEXAS
DAVID P. NEUMANN
83345
LICENSED
PROFESSIONAL ENGINEER

David P. Neumann, P.E.

Lochner
TBPE Firm Reg. No. 10488

PRINT DATE	REVISION DATE
6/3/2024	

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DRIVEWAY DETAILS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79
STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM
CONTROL	SECTION	JOB / SHEET NO.
0204	07	056 / 057

REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
FILENAME: c:\pw_working\lochner-pw-01\dms82632\DRIVEWAY_DETAILS.dgn

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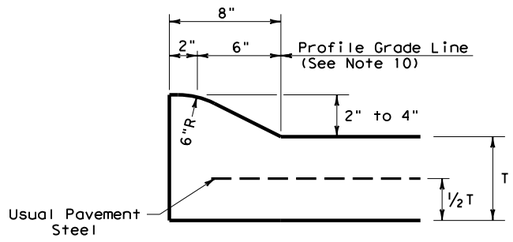
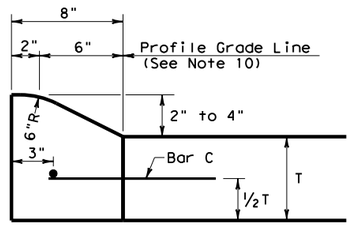
DATE:
FILE:



TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



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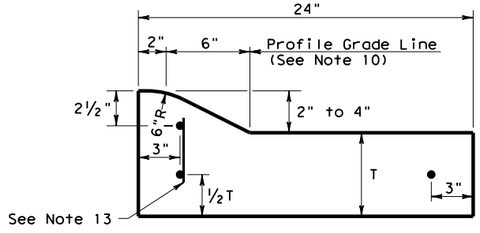
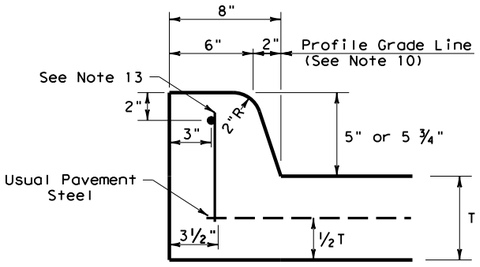
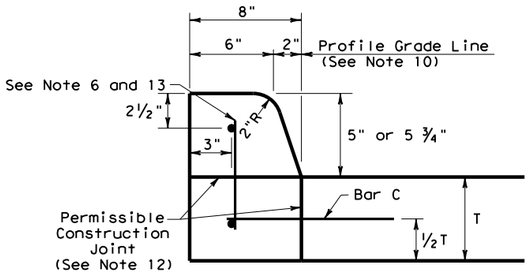
2" - 4" HEIGHT



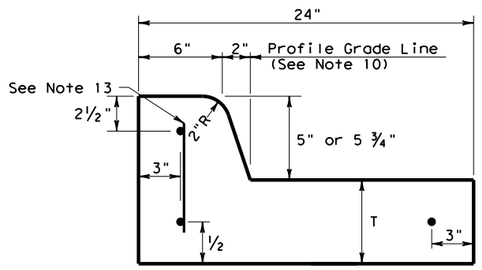
TYPE I CURB AND GUTTER
2" - 4" HEIGHT



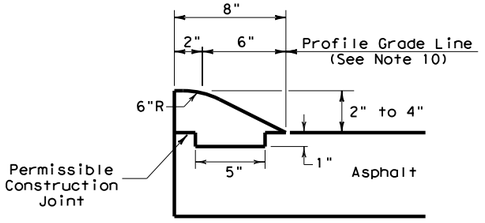
TYPE II CURB (MONOLITHIC)
5" - 5 ¾" HEIGHT



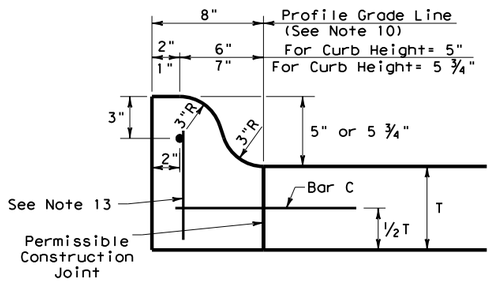
TYPE II CURB
5" - 5 ¾" HEIGHT



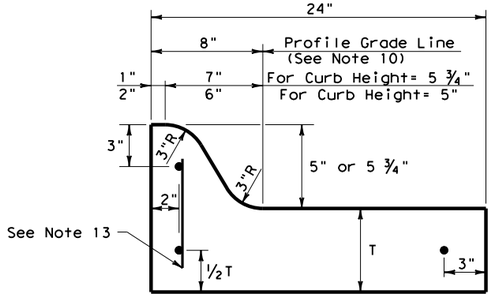
TYPE II CURB AND GUTTER
5" - 5 ¾" HEIGHT



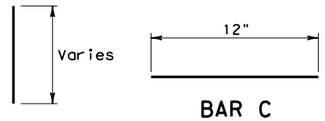
TYPE III CURB (KEYED)
2" - 4" HEIGHT



TYPE IIa CURB
5" - 5 ¾" HEIGHT

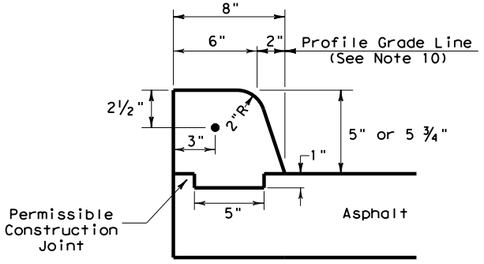


TYPE IIa CURB AND GUTTER
5" - 5 ¾" HEIGHT

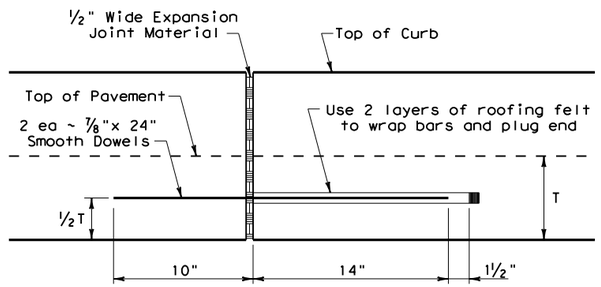


BAR B

BAR C

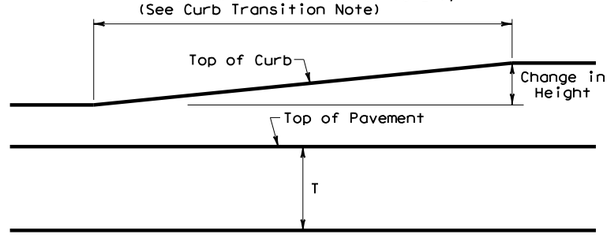


TYPE IV CURB (KEYED)
5" - 5 ¾" HEIGHT



EXPANSION JOINT DETAIL

CURB TRANSITION NOTE:
Field conditions may require a longer or shorter transition, and shall be shown elsewhere in the plans, or as directed by the Engineer.



CURB TRANSITION
Note: To be paid for as Highest Curb

GENERAL NOTES

1. All materials and construction shall be in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
2. Concrete shall be Class A.
3. When reinforcing bars are used, they shall be No.4 unless otherwise shown. The use of fiber reinforced concrete in lieu of reinforcing steel is acceptable. Use fibers meeting the requirements of DMS 4550, "Fibers for Concrete," and dose fibers in accordance with Material Producers List (MPL) "Fibers for Class A and B Concrete Applications."
4. Round exposed sharp edges with a rounding tool, to a minimum radius of ¼ inch.
5. All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
6. Where concrete curb is to be placed on existing concrete pavement, Bar B may be drilled and grouted in place, or may be inserted into fresh concrete.
7. Expansion and contraction joints shall be constructed to match pavement joints in all curbs and curb and gutter adjacent to jointed concrete pavement. Where placement of curb or curb and gutter is not adjacent to concrete pavement, expansion joints shall be provided at structures, curb returns at streets, and at locations directed by The Engineer.
8. Vertical and horizontal dowel bars and transverse reinforcing bars shall be placed at four feet C~C.
9. Dimension 'T' shown is the thickness of concrete pavement. When curb is installed adjacent to flexible pavement dimension 'T' is 8" maximum.
10. Usual profile grade line. Refer to typical sections and plan-profile sheets for exact locations.
11. One-half inch expansion joint material shall be provided where curb or curb and gutter is adjacent to sidewalk or riprap.
12. When horizontal permissible construction joints are used, the longitudinal pavement steel shall be placed in accordance with pavement details shown elsewhere in the plans. Reinforcing steel for curb section shall then conform to that required for concrete curb.
13. Bar B placement as needed (typically at four ft. C-C) to support curb reinforcing steel during concrete placement.

Texas Department of Transportation

Design Division Standard

CONCRETE CURB AND CURB AND GUTTER

CCCG-22

FILE: cccg21.dgn	DN: TXDOT	CK: AN	DW: CS	CK: KM
© TxDOT: JUNE 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0204	07	056	US 79
	DIST	COUNTY		SHEET NO.
	BRY	MILAM		058

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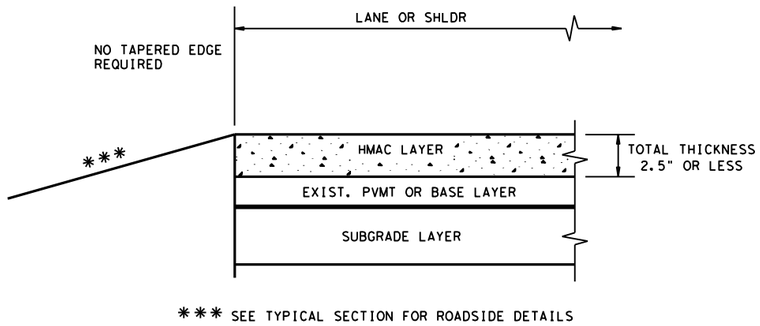
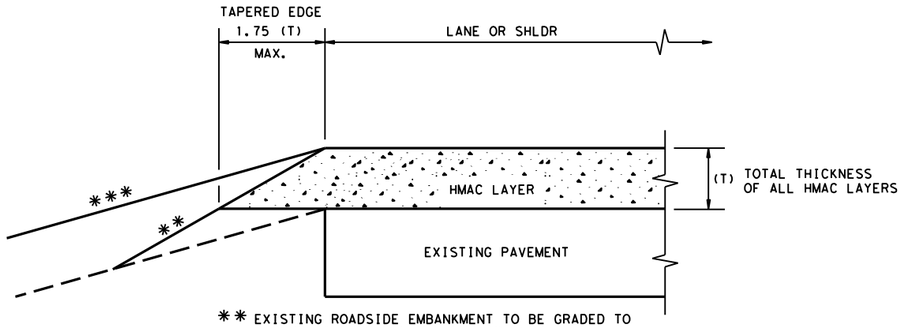
FILE:



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

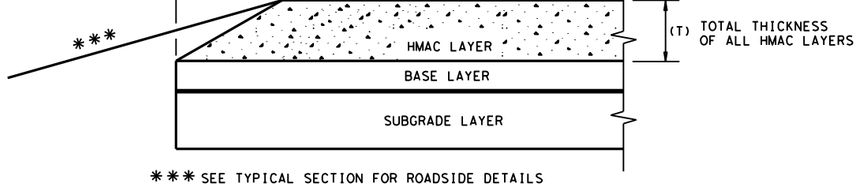
CONDITION - 1
THIN HMAC SURFACES OR HMAC OVERLAY WITH THICKNESS OF 2.5" OR LESS



** EXISTING ROADSIDE EMBANKMENT TO BE GRADED TO PRODUCE A SMOOTH LEVEL SURFACE FOR PLACEMENT OF TAPERED EDGE. THIS WORK IS SUBSIDIARY TO THE VARIOUS BID ITEMS.

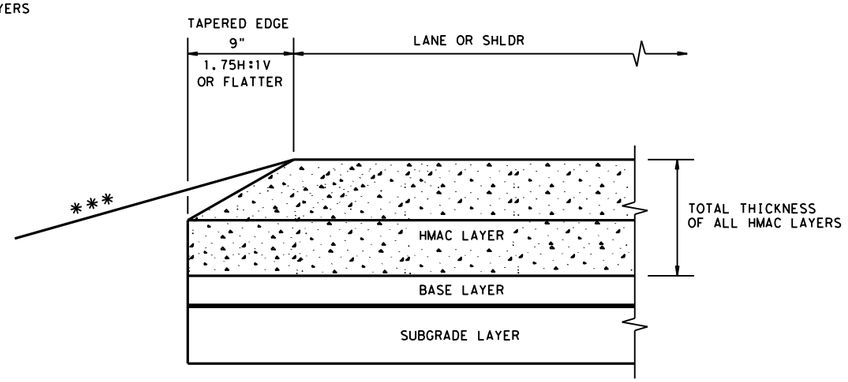
*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 2
OVERLAY OF EXISTING PAVEMENT HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 3
NEW OR RECONSTRUCTED PAVEMENT HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 4
NEW OR RECONSTRUCTED PAVEMENT HMAC THICKNESS 5" OR GREATER

(NOT TO SCALE)

GENERAL NOTES

1. UNLESS OTHERWISE SHOWN IN THE PLANS, A VERTICAL EDGE IS PERMISSIBLE FOR HMAC PLACED GREATER THAN 5" BELOW THE EDGE OF PAVEMENT AND FOR THICKNESS OF HMAC LESS THAN 2.5".
2. FOR FURTHER INFORMATION REGARDING THE ROADSIDE AND PAVEMENT DETAILS, SEE TYPICAL SECTIONS.
3. PAYMENT FOR TAPERED EDGE WILL BE IN ACCORDANCE WITH APPLICABLE ITEMS IN THE CONTRACT.
4. THE SLOPE OF THE TAPERED EDGE SHALL BE 1.75H:1V OR FLATTER.
5. THE TAPERED EDGE SHALL BE PRODUCED BY USE OF A SCREED ATTACHMENT CAPABLE OF PRODUCING A SMOOTH COMPACTED SURFACE. ADDITIONAL COMPACTING EFFORT BEHIND THE SCREED IS NOT REQUIRED.

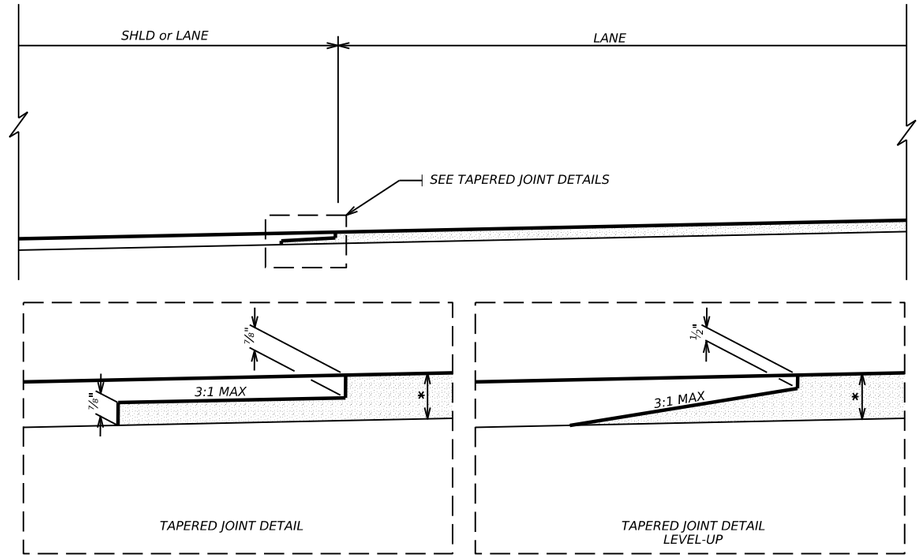
Texas Department of Transportation

Design Division Standard

TAPERED EDGE DETAILS HMAC PAVEMENT

TE(HMAC)-11

FILE: tehmac11.dgn	DN: TxDOT	CK: RL	DW: KB	CK:
© TxDOT January 2011	CONT	SECT	JOB	HIGHWAY
REVISIONS	0204	07	056	US 79
	DIST	COUNTY		SHEET NO.
	BRY	MILAM		059



* SEE TYPICAL SECTION FOR DEPTH AND TYPE OF HMA.

NOTES:

LONGITUDINAL JOINTS SHALL BE CONSTRUCTED BY TAPERING THE BITUMINOUS MAT. THE TAPERED PORTION SHALL EXTEND BEYOND THE NORMAL LANE WIDTH. THE TAPERED PORTION OF THE MAT SHALL BE CONSTRUCTED BY THE USE OF AN APPROVED STRIKE-OFF DEVICE THAT WILL PROVIDE A UNIFORM SLOPE AND WILL NOT RESTRICT THE MAIN SCREED. TACK COAT SHALL BE APPLIED TO THE IN-PLACE TAPER BEFORE THE ADJACENT MAT IS PLACED. FINAL DENSITY REQUIREMENTS FOR THE ENTIRE PAVEMENT, INCLUDING THE TAPER AREA, WILL REMAIN UNCHANGED. COMPACTION OF THE INITIAL TAPER SECTION WILL BE REQUIRED AS NEAR TO FINAL DENSITY AS POSSIBLE.

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Bryan District

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HMA LONGITUDINAL JOINT DETAIL SHEET

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6	SEE TITLE SHEET	US 79

STATE	DISTRICT	COUNTY	
TEXAS	BRY	MILAM	
CONTROL	SECTION	JOB	SHEET NO.
0204	07	056	060

REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
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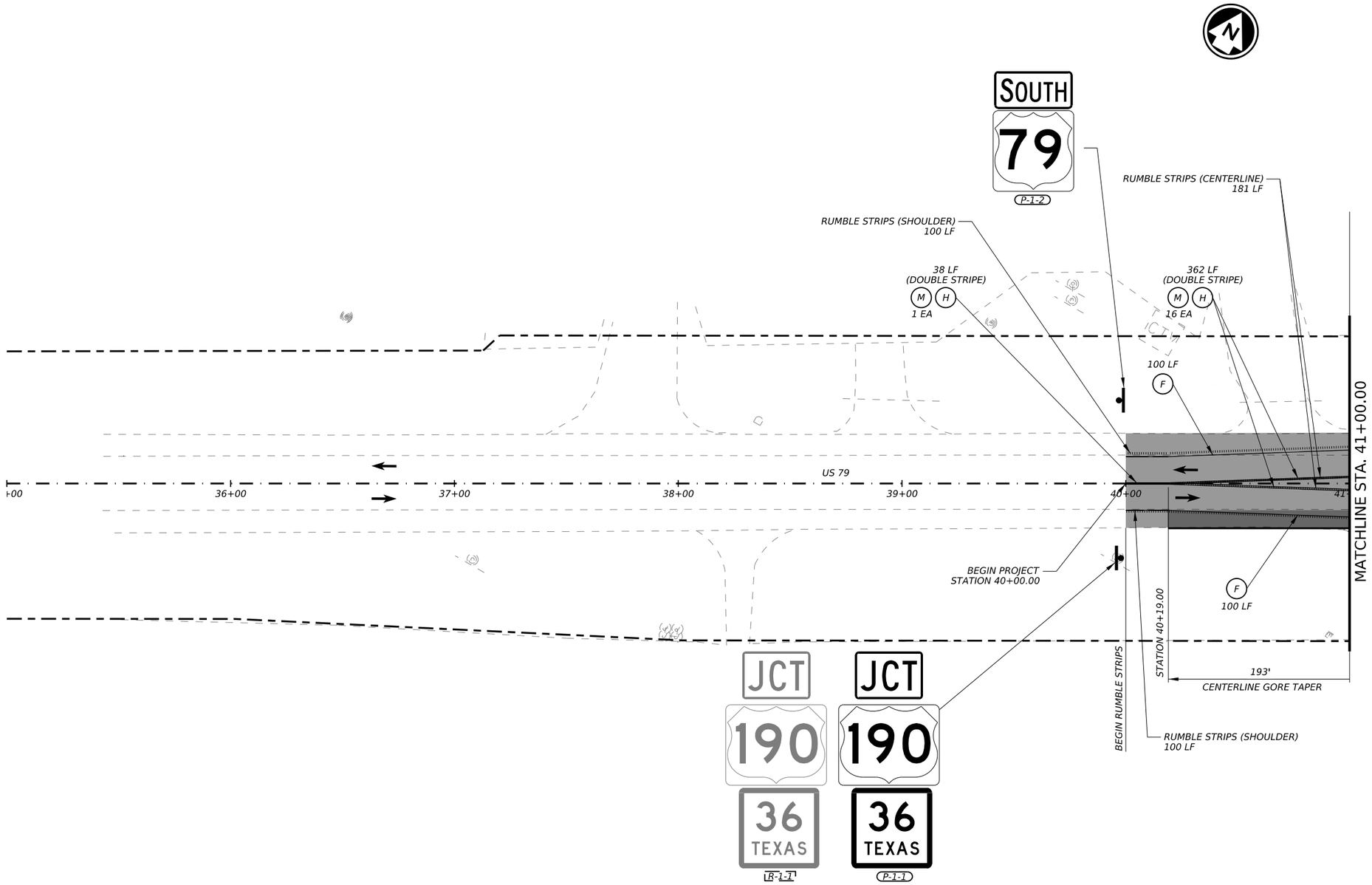

TRAFFIC LEGEND

- (A) REFL PAV MRK TY I(W)6"(LNDP)(90MIL)
- (B) REFL PAV MRK TY I(W)8"(DOT)(90MIL)
- (C) REFL PAV MRK TY I(W)8"(SLD)(90MIL)
- (D) REFL PAV MRK TY I(W)24"(SLD)(90MIL)
- (E) RE PM W/RET REQ TY 1 (W)6"(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6"(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6"(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6"(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (K) PREFAB PAV MRK TY C (W)(WORD)
- (L) REFL PAV MRKR TY I-C
- (M) REFL PAV MRKR TY II-A-A
- (N) PREFAB PAV MRK TY C (W) (YIELD)
- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)
- R-1-1 REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- E-1-2 EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- RR-1-2 EXISTING SMALL SIGN RELOCATE - SHEET # - SIGN #
- P-1-2 PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS

0 25 50

2024.06.04 13:20:14-05'00'

STATE OF TEXAS
DAVID P. NEUMANN
83345
LICENSED
PROFESSIONAL ENGINEER

David P. Neumann, P.E.

Lochner
TBPE Firm Reg. No. 10488

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SIGNING & STRIPING LAYOUT (US 79)

SHEET 1 OF 8

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79
STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM
CONTROL	SECTION	JOB / SHEET NO.
0204	07	056 / 061

REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
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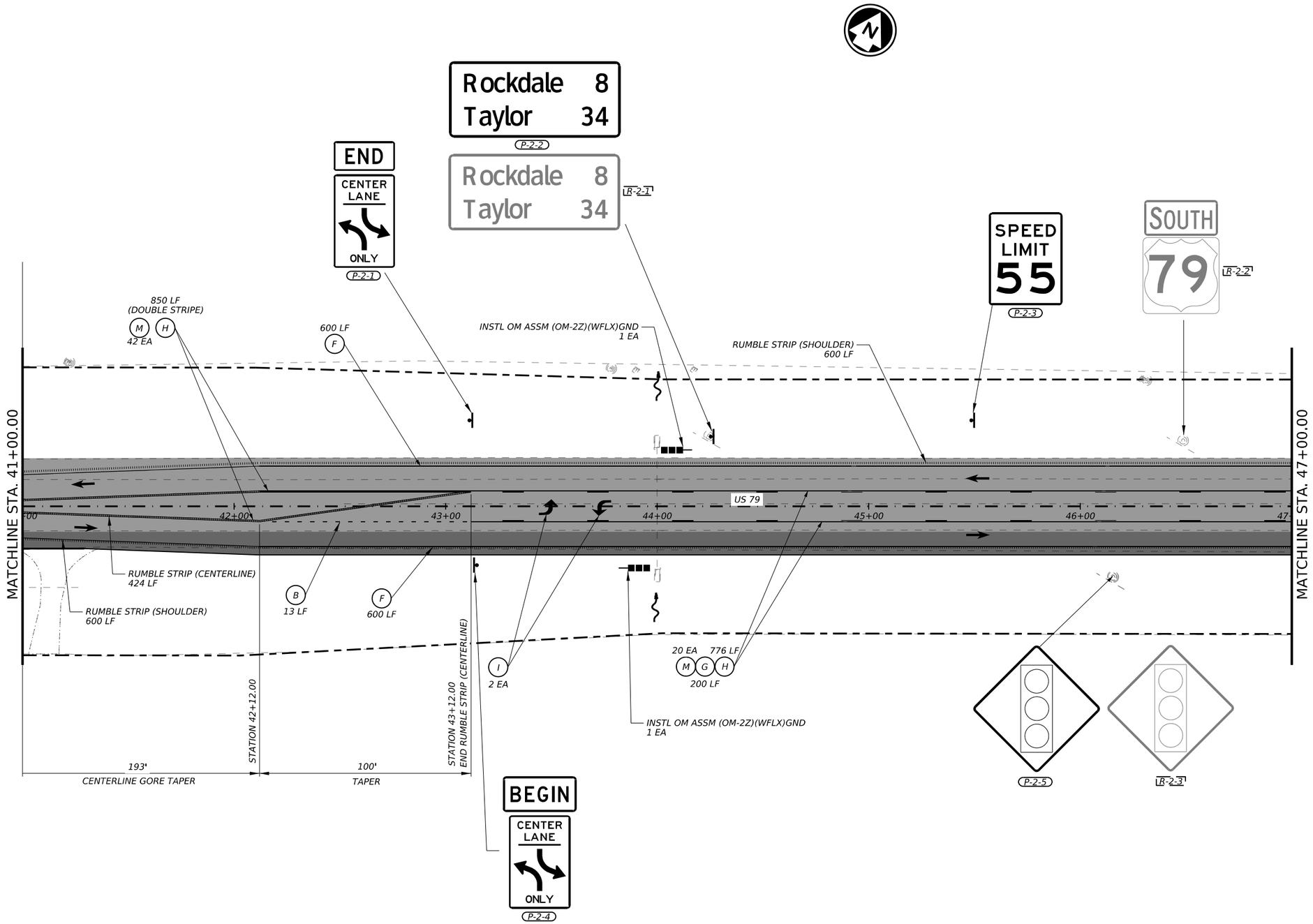

TRAFFIC LEGEND

- A — REFL PAV MRK TY I(W)6"(LNDP)(90MIL)
- B — REFL PAV MRK TY I(W)8"(DOT)(90MIL)
- C — REFL PAV MRK TY I(W)8"(SLD)(90MIL)
- D — REFL PAV MRK TY I(W)24"(SLD)(90MIL)
- E — RE PM W/RET REQ TY 1 (W)6"(BRK)(090MIL)
- F — RE PM W/RET REQ TY 1 (W)6"(SLD)(090MIL)
- G — RE PM W/RET REQ TY 1 (Y)6"(BRK)(090MIL)
- H — RE PM W/RET REQ TY 1 (Y)6"(SLD)(090MIL)
- I — PREFAB PAV MRK TY C (W)(ARROW)
- J — PREFAB PAV MRK TY C (W)(LNDP ARROW)
- K — PREFAB PAV MRK TY C (W)(WORD)
- L — REFL PAV MRKR TY I-C
- M — REFL PAV MRKR TY II-A-A
- N — PREFAB PAV MRK TY C (W) (YIELD)
- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)
- LR-1-1 — REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- E-1-2 — EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- RR-1-2 — EXISTING SMALL SIGN RELOCATE - SHEET # - SIGN #
- P-1-2 — PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS

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2024.06.04 13:19:57-05'00'

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SHEET 2 OF 8

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6	SEE TITLE SHEET	US 79
STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM
CONTROL	SECTION	JOB / SHEET NO.
0204	07	056 / 062

REV DATE: 1-31-2023
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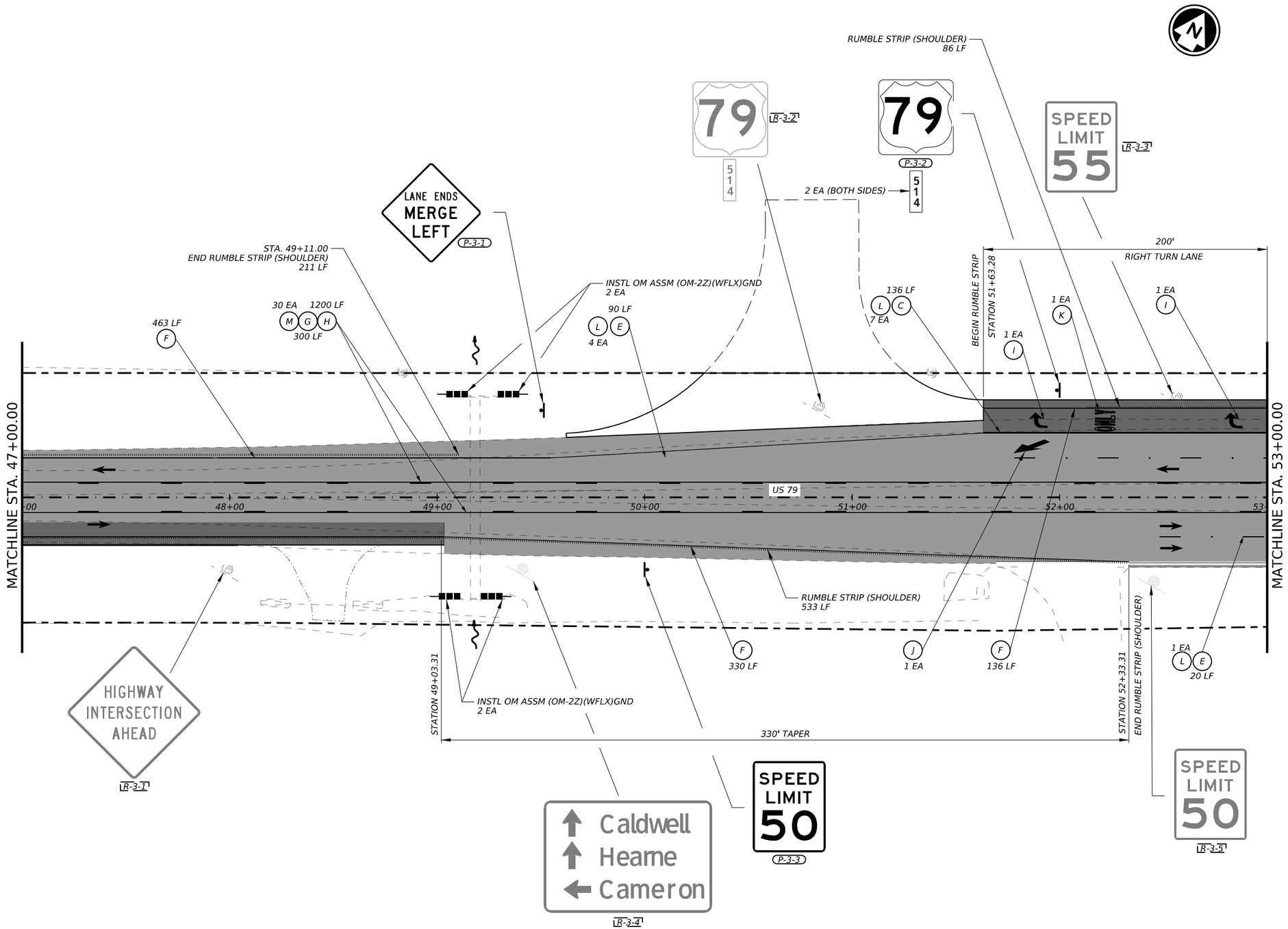

TRAFFIC LEGEND

- (A) REFL PAV MRK TY I(W)6"(LNDP)(90MIL)
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- (C) REFL PAV MRK TY I(W)8"(SLD)(90MIL)
- (D) REFL PAV MRK TY I(W)24"(SLD)(90MIL)
- (E) RE PM W/RET REQ TY 1 (W)6"(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6"(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6"(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6"(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (K) PREFAB PAV MRK TY C (W)(WORD)
- (L) REFL PAV MRKR TY I-C
- (M) REFL PAV MRKR TY II-A-A
- (N) PREFAB PAV MRK TY C (W) (YIELD)
- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)
- R-1-1 REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- E-1-2 EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- RR-1-2 EXISTING SMALL SIGN RELOCATE - SHEET # - SIGN #
- P-1-2 PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS

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2024.06.04 13:19:42-05'00'

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SIGNING & STRIPING LAYOUT (US 79)

SHEET 3 OF 8

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79

STATE	DISTRICT	COUNTY	
TEXAS	BRY	MILAM	
CONTROL	SECTION	JOB	SHEET NO.
0204	07	056	063

REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
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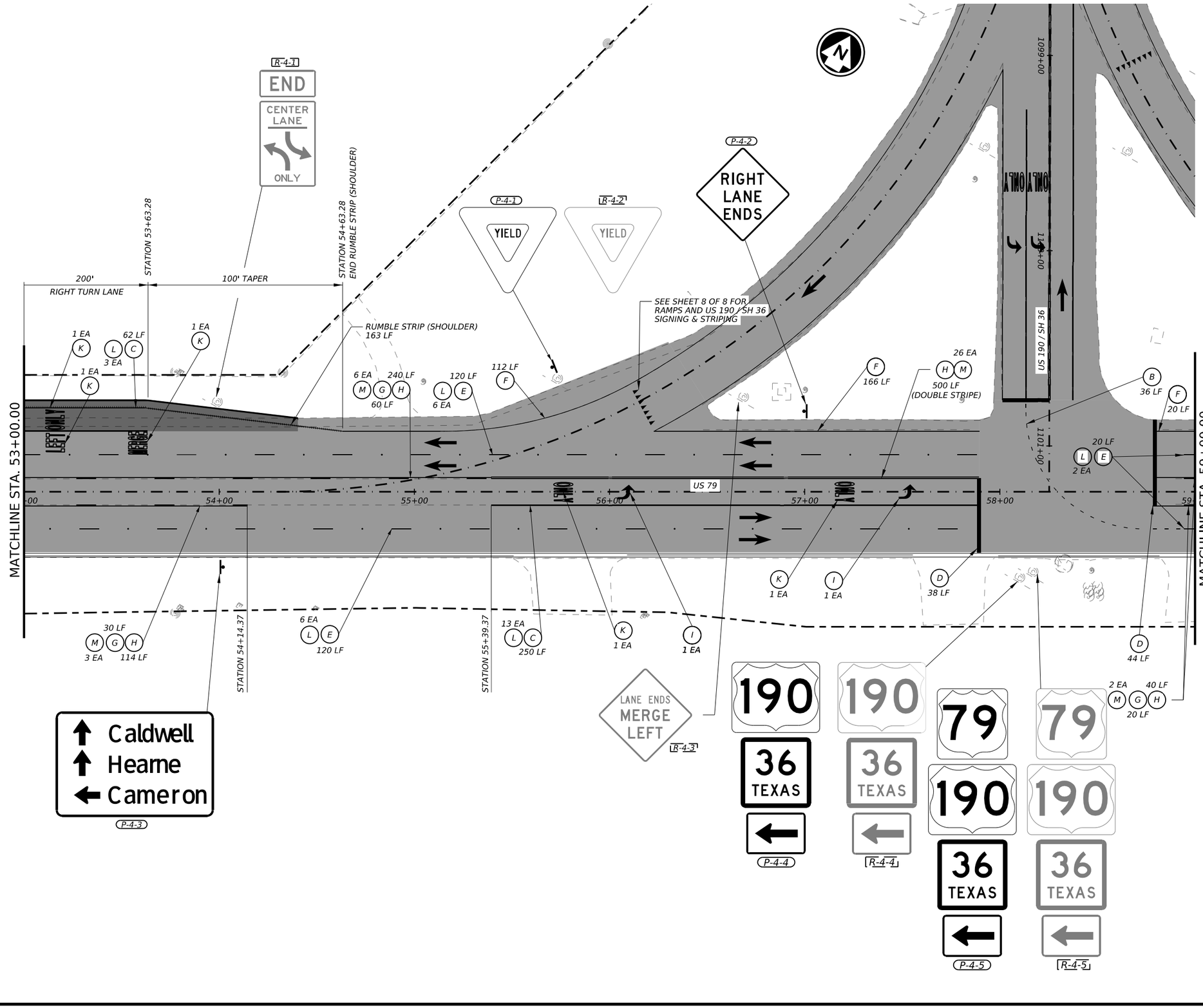

TRAFFIC LEGEND

- (A) REFL PAV MRK TY I(W)6"(LNDP)(90MIL)
- (B) REFL PAV MRK TY I(W)8"(DOT)(90MIL)
- (C) REFL PAV MRK TY I(W)8"(SLD)(90MIL)
- (D) REFL PAV MRK TY I(W)24"(SLD)(90MIL)
- (E) RE PM W/RET REQ TY 1 (W)6"(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6"(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6"(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6"(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (K) PREFAB PAV MRK TY C (W)(WORD)
- (L) REFL PAV MRKR TY I-C
- (M) REFL PAV MRKR TY II-A-A
- (N) PREFAB PAV MRK TY C (W) (YIELD)
- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)
- R-1-1 REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- E-1-2 EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- RR-1-2 EXISTING SMALL SIGN RELOCATE - SHEET # - SIGN #
- P-1-2 PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS

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STATE OF TEXAS
DAVID P. NEUMANN
83345
LICENSED
PROFESSIONAL ENGINEER

David P. Neumann, P.E.

Lochner
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SIGNING & STRIPING LAYOUT (US 79)

SHEET 4 OF 8

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79

STATE	DISTRICT	COUNTY	
TEXAS	BRY	MILAM	
CONTROL	SECTION	JOB	SHEET NO.
0204	07	056	064

REV DATE: 1-31-2023
CSJ: 0167-01-052, ETC
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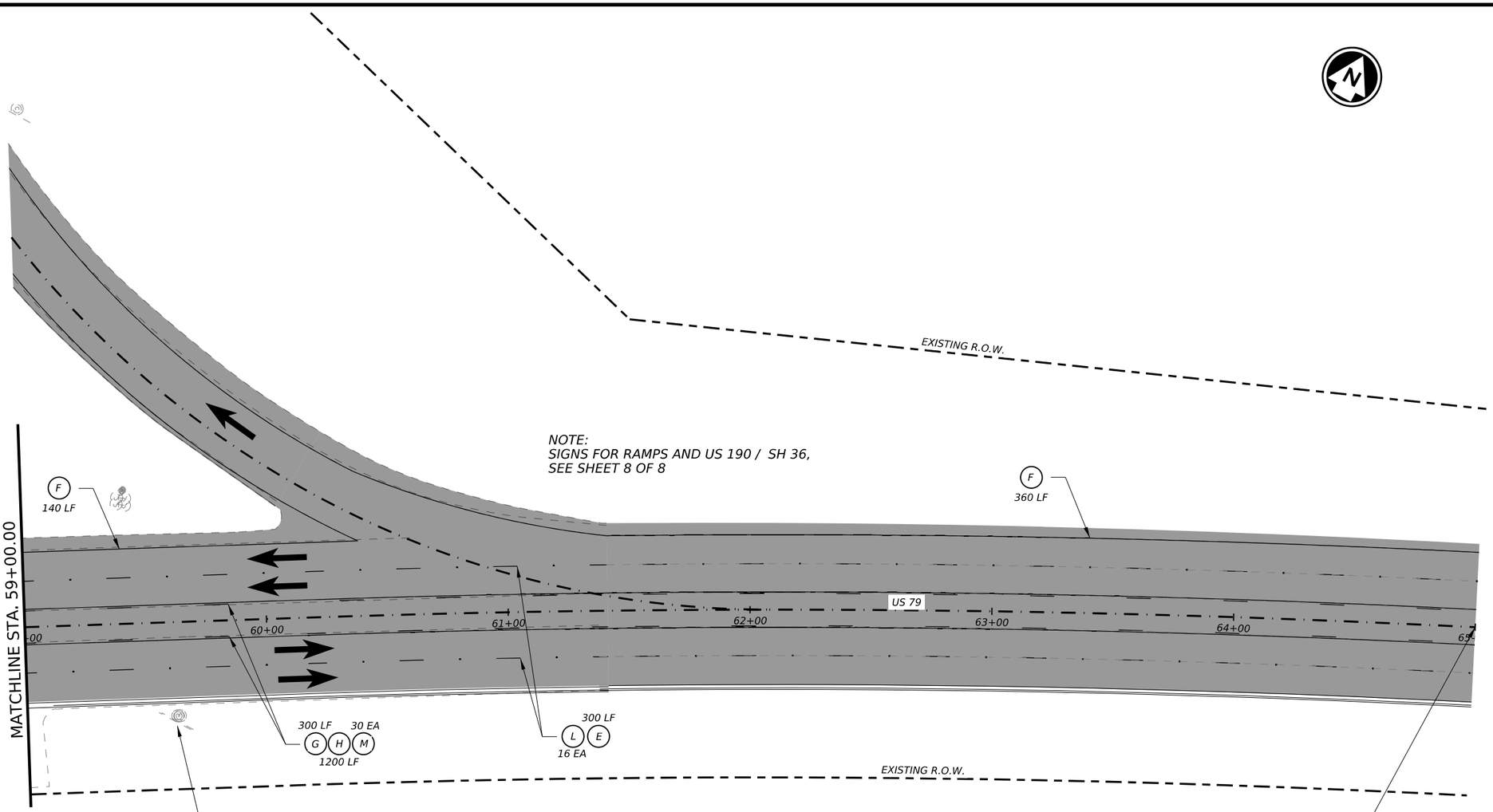

P-5-1

R-5-1

TRAFFIC LEGEND

- A REFL PAV MRK TY I(W)6"(LNDP)(90MIL)
- B REFL PAV MRK TY I(W)8"(DOT)(90MIL)
- C REFL PAV MRK TY I(W)8"(SLD)(90MIL)
- D REFL PAV MRK TY I(W)24"(SLD)(90MIL)
- E RE PM W/RET REQ TY 1 (W)6"(BRK)(090MIL)
- F RE PM W/RET REQ TY 1 (W)6"(SLD)(090MIL)
- G RE PM W/RET REQ TY 1 (Y)6"(BRK)(090MIL)
- H RE PM W/RET REQ TY 1 (Y)6"(SLD)(090MIL)
- I PREFAB PAV MRK TY C (W)(ARROW)
- J PREFAB PAV MRK TY C (W)(LNDP ARROW)
- K PREFAB PAV MRK TY C (W)(WORD)
- L REFL PAV MRKR TY I-C
- M REFL PAV MRKR TY II-A-A
- N PREFAB PAV MRK TY C (W) (YIELD)

SIGN POST

BI-DIRECTIONAL DELINEATOR ASSM

OBJECT MARKER TY 2 (OM-2)

R-1-1 REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #

E-1-2 EXISTING SIGN TO REMAIN - SHEET # - SIGN #

RR-1-2 EXISTING SMALL SIGN RELOCATE - SHEET # - SIGN #

P-1-2 PROPOSED SMALL SIGN - SHEET # - SIGN #

DIRECTIONAL TRAFFIC FLOW ARROWS

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SIGNING & STRIPING LAYOUT (US 79)

SHEET 5 OF 8

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79

STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM

CONTROL	SECTION	JOB	SHEET NO.
0204	07	056	065

REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
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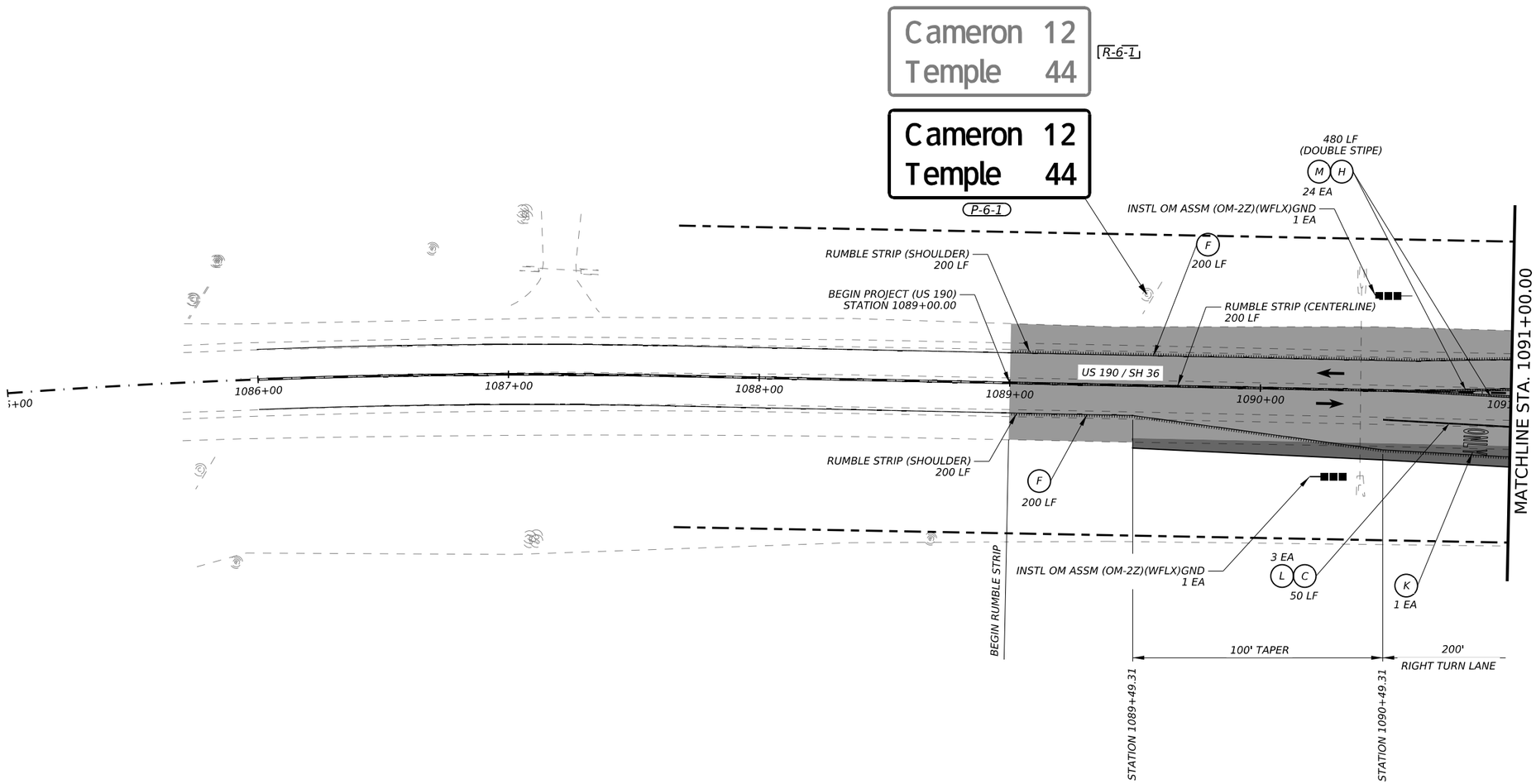

TRAFFIC LEGEND

- (A) REFL PAV MRK TY I(W)6"(LNDP)(90MIL)
- (B) REFL PAV MRK TY I(W)8"(DOT)(90MIL)
- (C) REFL PAV MRK TY I(W)8"(SLD)(90MIL)
- (D) REFL PAV MRK TY I(W)24"(SLD)(90MIL)
- (E) RE PM W/RET REQ TY 1 (W)6"(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6"(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6"(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6"(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (K) PREFAB PAV MRK TY C (W)(WORD)
- (L) REFL PAV MRKR TY I-C
- (M) REFL PAV MRKR TY II-A-A
- (N) PREFAB PAV MRK TY C (W) (YIELD)
- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)
- R-1-1 REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- E-1-2 EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- RR-1-2 EXISTING SMALL SIGN RELOCATE - SHEET # - SIGN #
- P-1-2 PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS

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SIGNING & STRIPING LAYOUT (US 190 / SH 36)

SHEET 6 OF 8

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79

STATE	DISTRICT	COUNTY	
TEXAS	BRY	MILAM	
CONTROL	SECTION	JOB	SHEET NO.
0204	07	056	066

REV DATE: 1-31-2023
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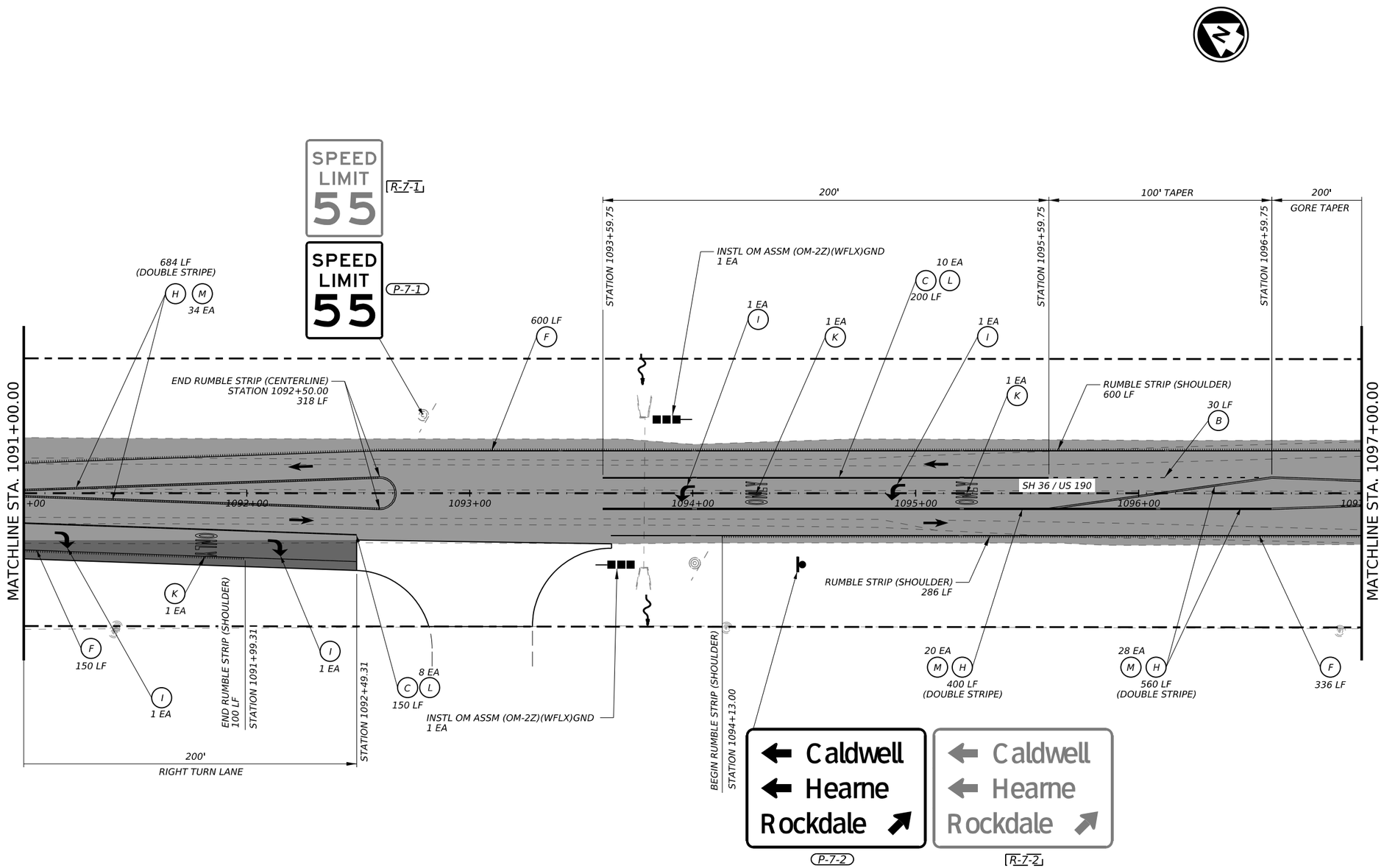

TRAFFIC LEGEND

- (A) REFL PAV MRK TY I(W)6"(LNDP)(90MIL)
- (B) REFL PAV MRK TY I(W)8"(DOT)(90MIL)
- (C) REFL PAV MRK TY I(W)8"(SLD)(90MIL)
- (D) REFL PAV MRK TY I(W)24"(SLD)(90MIL)
- (E) RE PM W/RET REQ TY 1 (W)6"(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6"(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6"(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6"(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (K) PREFAB PAV MRK TY C (W)(WORD)
- (L) REFL PAV MRKR TY I-C
- (M) REFL PAV MRKR TY II-A-A
- (N) PREFAB PAV MRK TY C (W) (YIELD)
- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)
- R-1-1 REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- E-1-2 EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- RR-1-2 EXISTING SMALL SIGN RELOCATE - SHEET # - SIGN #
- P-1-2 PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS

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SIGNING & STRIPING LAYOUT (US 190 / SH 36)

SHEET 7 OF 8

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79

STATE	DISTRICT	COUNTY	
TEXAS	BRY	MILAM	
CONTROL	SECTION	JOB	SHEET NO.
0204	07	056	067

REV DATE: 1-31-2023
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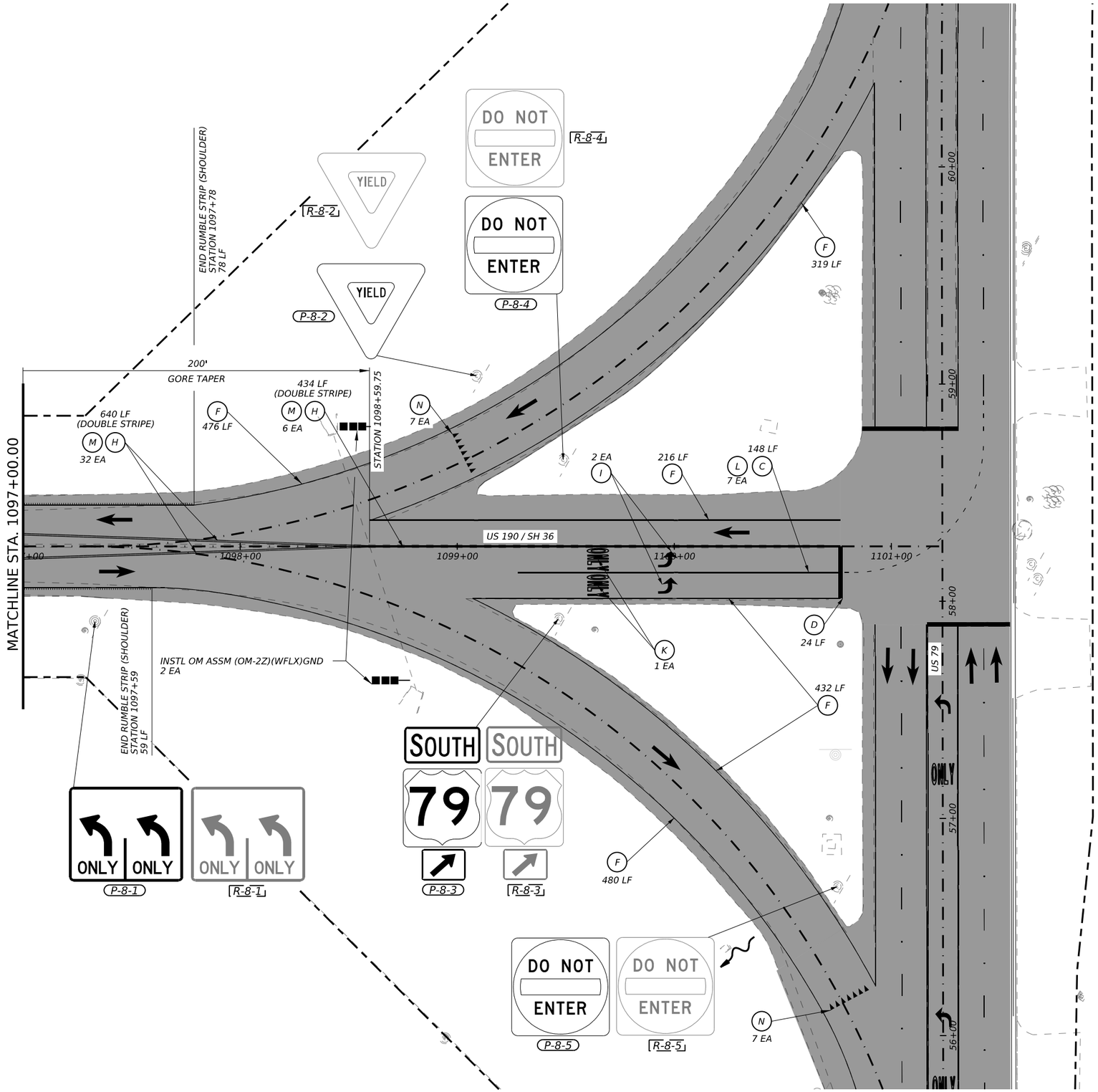

TRAFFIC LEGEND

- (A) REFL PAV MRK TY I(W)6"(LNDP)(90MIL)
- (B) REFL PAV MRK TY I(W)8"(DOT)(90MIL)
- (C) REFL PAV MRK TY I(W)8"(SLD)(90MIL)
- (D) REFL PAV MRK TY I(W)24"(SLD)(90MIL)
- (E) RE PM W/RET REQ TY 1 (W)6"(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6"(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6"(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6"(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (K) PREFAB PAV MRK TY C (W)(WORD)
- (L) REFL PAV MRKR TY I-C
- (M) REFL PAV MRKR TY II-A-A
- (N) PREFAB PAV MRK TY C (W) (YIELD)

SIGN POST

BI-DIRECTIONAL DELINEATOR ASSM

OBJECT MARKER TY 2 (OM-2)

R-1-1 REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #

E-1-2 EXISTING SIGN TO REMAIN - SHEET # - SIGN #

RR-1-2 EXISTING SMALL SIGN RELOCATE - SHEET # - SIGN #

P-1-2 PROPOSED SMALL SIGN - SHEET # - SIGN #

DIRECTIONAL TRAFFIC FLOW ARROWS

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SIGNING & STRIPING LAYOUT (US 190 / SH 36)

SHEET 8 OF 8

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79
STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM
CONTROL	SECTION	JOB / SHEET NO.
0204	07	056 / 068

REV DATE: 1-31-2023
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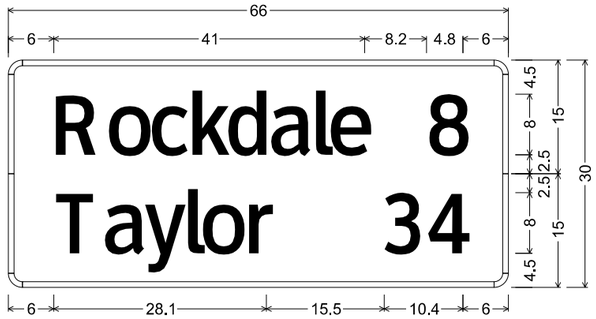
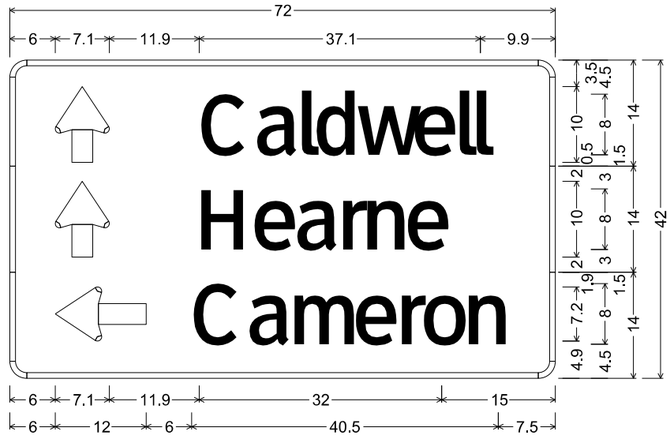


P-2-2
D2-2 8in;

1.9" Radius, 0.8" Border, White on Green;
"Rockdale", ClearviewHwy-3-W; "8", ClearviewHwy-3-W;

1.9" Radius, 0.8" Border, White on Green;
"Taylor", ClearviewHwy-3-W; "34", ClearviewHwy-3-W;

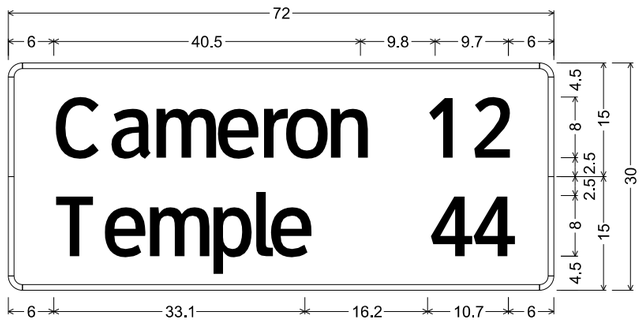


P-4-3
D1-3 8in UP-UP-LT;

2.3" Radius, 0.8" Border, White on Green;
Standard Arrow Custom 10.0" X 7.1" 90°;
"Caldwell", ClearviewHwy-3-W;

2.3" Radius, 0.8" Border, White on Green;
Standard Arrow Custom 10.0" X 7.1" 90°;
"Hearne", ClearviewHwy-3-W;

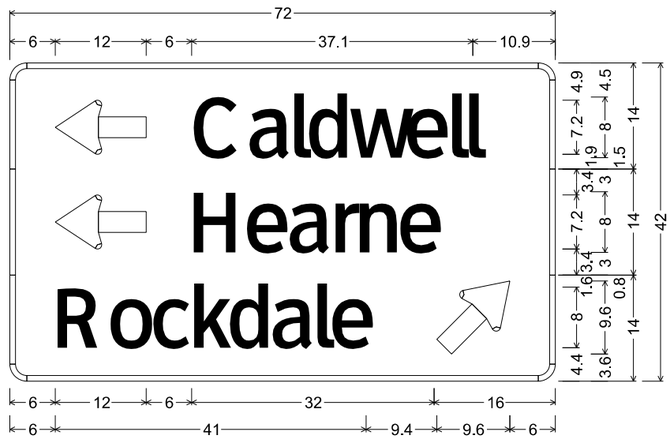
2.3" Radius, 0.8" Border, White on Green;
Standard Arrow Custom 12.0" X 7.1" 180°;
"Cameron", ClearviewHwy-3-W;



P-6-1
D2-2 8in;

1.9" Radius, 0.8" Border, White on Green;
"Cameron", ClearviewHwy-3-W; "12", ClearviewHwy-3-W;

1.9" Radius, 0.8" Border, White on Green;
"Temple", ClearviewHwy-3-W; "44", ClearviewHwy-3-W;

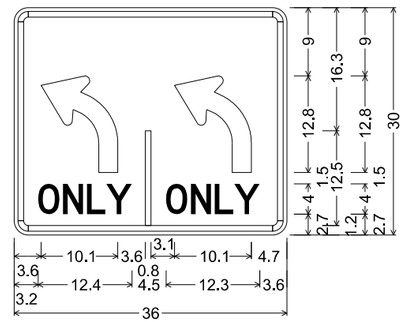


P-7-2
D1-3 8in LT-LT-45RT;

2.3" Radius, 0.8" Border, White on Green;
Standard Arrow Custom 12.0" X 7.1" 180°;
"Caldwell", ClearviewHwy-3-W;

2.3" Radius, 0.8" Border, White on Green;
Standard Arrow Custom 12.0" X 7.1" 180°;
"Hearne", ClearviewHwy-3-W;

2.3" Radius, 0.8" Border, White on Green;
"Rockdale", ClearviewHwy-3-W;
Standard Arrow Custom 12.3" X 7.1" 45°;



P-8-1
R3-8LL_36x30;
1.9" Radius, 0.8" Border, 0.5" Indent, Black on White;
L ir=4.5, s=2.5;
"ONLY", D 50% spacing;
L ir=4.5, s=2.5;
"ONLY", D 50% spacing;

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STATE OF TEXAS
DAVID P. NEUMANN
83345
LICENSED
PROFESSIONAL ENGINEER

David P. Neumann, P.E.

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SMALL SIGN DETAILS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79

STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM

CONTROL	SECTION	JOB	SHEET NO.
0204	07	056	069

REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
FILENAME: c:\pw_working\lochner-pw-01\dms82637\US79_SIGN DETAILS.dgn

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
			JCT 190 36 TEXAS									
		M2-1		21 X 15	X							
1 OF 8	P-1-1						10BWG	1	SA	P		
		M1-4		30 X 24	X							
		M1-6T		24 X 24	X							
			SOUTH 79									
		M3-3		24 X 12	X							
1 OF 8	P-1-2						10BWG	1	SA	P		
		M1-4		24 X 24	X							
			END CENTER LANE ONLY									
		M4-6		24 X 12	X							
2 OF 8	P-2-1						10BWG	1	SA	P		
		R3-9b		24 X 36	X							
			Rockdale 8 Taylor 34									
2 OF 8	P-2-2	I-2aT		66 X 30	X		10BWG	1	SA	T		
			SPEED LIMIT 55									
2 OF 8	P-2-3	R2-1		30 X 36	X		10BWG	1	SA	P		
			BEGIN CENTER LANE ONLY									
		M4-14		24 X 12	X							
2 OF 8	P-2-4						10BWG	1	SA	P		
		R3-9b		24 X 36	X							

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, 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).

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FILE:

Texas Department of Transportation

Traffic Operations Division Standard

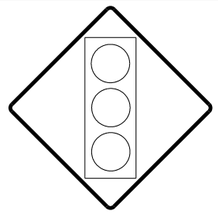
SUMMARY OF SMALL SIGNS

SOSS

SHEET 1 OF 55

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0204	07	056	US 79
4-16 8-16	DIST	COUNTY		SHEET NO.
	BRY	MILAM		070

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"	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
2 OF 8	P-2-5	W3-3		36 X 36	X		10BWG	1	SA	P		
3 OF 8	P-3-1	W9-2TL		36 X 36	X		10BWG	1	SA	P		
3 OF 8	P-3-2	M1-4		24 X 24	X		10BWG	1	SA	P		
		D10-7aT		3 X 10								
		D10-7aT		3 X 10								
3 OF 8	P-3-3	R2-1		30 X 36	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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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, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.
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DATE:
FILE:

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

SHEET 2 OF 5

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0204	07	056	US 79
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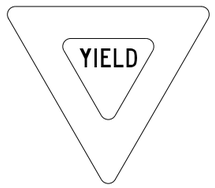
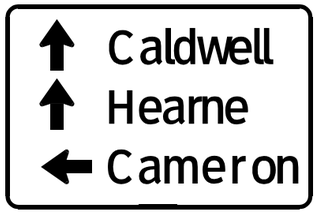
SUMMARY OF SMALL SIGNS

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
4 OF 8	P-4-1	R1-2		36 X 36 X 36	X		10BWG	1	SA	P		
4 OF 8	P-4-2	W9-1R		36 X 36	X		10BWG	1	SA	P		
4 OF 8	P-4-3	I-2aT		72 X 42	X		S80	1	SA	T		
		M1-4		30 X 24	X							
4 OF 8	P-4-4	M1-6T		24 X 24	X		10BWG	1	SA	P		
		M6-1		21 X 15	X							
		M1-4		24 X 24	X							
		M1-4		30 X 24	X							
4 OF 8	P-4-5						10BWG	1	SA	P		
		M1-6T		24 X 24	X							
		M6-1		21 X 15	X							
5 OF 8	P-5-1	W8-13aT		36 X 36	X		10BWG	1	SA	P		

DATE:
FILE:

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, 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

SHEET 8 OF 55

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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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	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	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
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		TY N TY S
6 OF 8	P-6-1	D2-2	Cameron 12 Temple 44	72 X 30	X		10BWG	1	SA	T		
7 OF 8	P-7-1	R2-1	SPEED LIMIT 55	30 X 36	X		10BWG	1	SA	P		
7 OF 8	P-7-2	D1-3	← Caldwell ← Hearne Rockdale ↗	72 X 42	X		S80	1	SA	T		
8 OF 8	P-8-1	R3-8LL	ONLY ONLY	36 X 30	X		10BWG	1	SA	P		
8 OF 8	P-8-2	R1-2	YIELD	36 X 36	X		10BWG	1	SA	P		
		M3-3	SOUTH	24 X 12	X							
8 OF 8	P-8-3	M1-4	79				10BWG	1	SA	P		
		M6-2		24 X 24	X							
			↗	21 X 15	X							

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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SUMMARY OF SMALL SIGNS

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SHEET 1 OF 55

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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
8 OF 8	P-8-4	R5-1		36 X 36	X		10BWG	1	SA	P		
8 OF 8	P-8-5	R5-1		36 X 36	X		10BWG	1	SA	P		

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FILE:

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
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7.5 to 15	0.100"
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NOTE:

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SUMMARY OF SMALL SIGNS

SOSS

SHEET 5 OF 5

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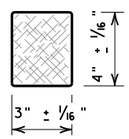
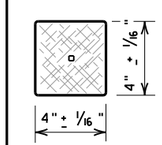
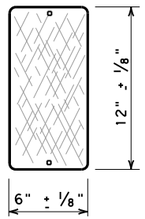
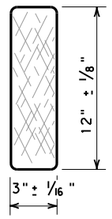
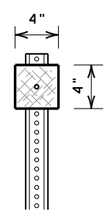
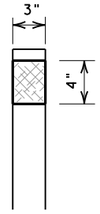
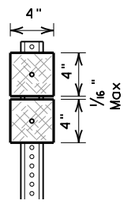
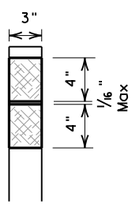
REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

	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

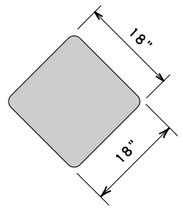
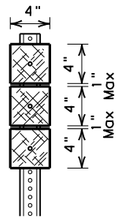
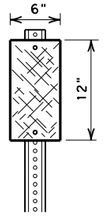
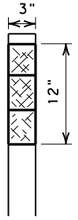
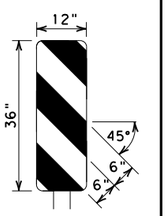
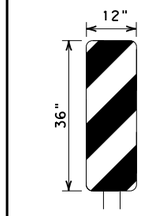
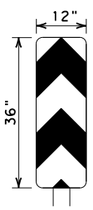
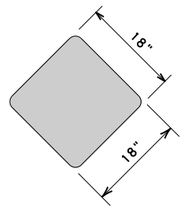
NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s) (Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

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

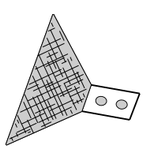
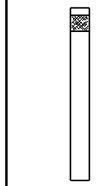
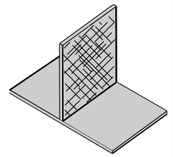
OBJECT MARKERS

	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

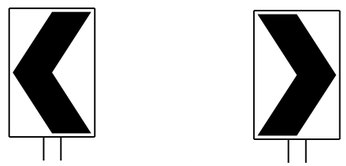
FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

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



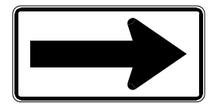
W1-8

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.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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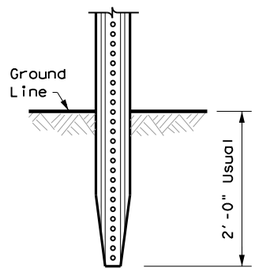
POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

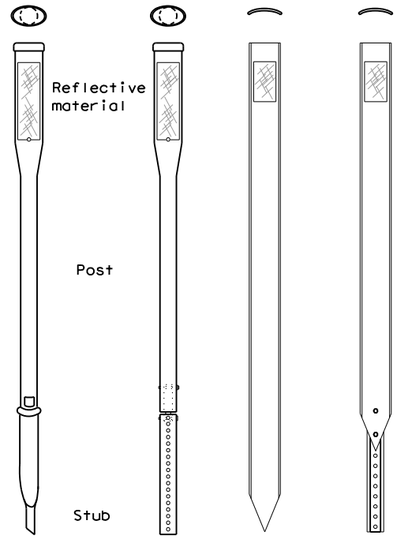


NOTES

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

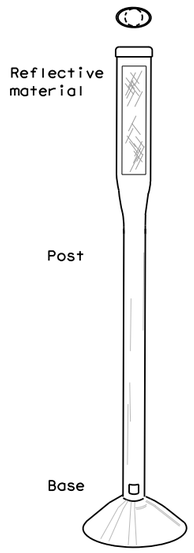
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



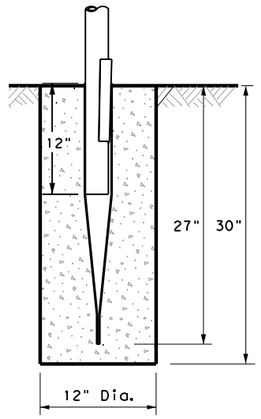
SURFACE MOUNT

NOTES

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

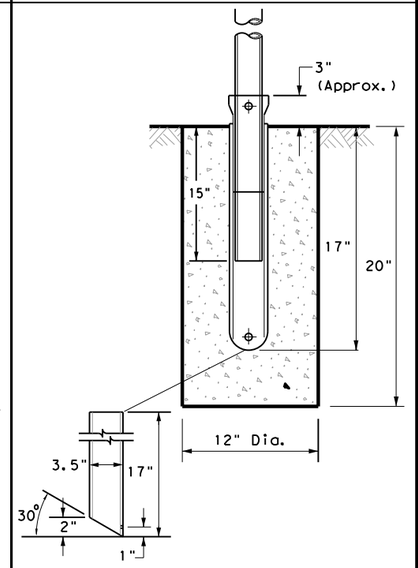
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

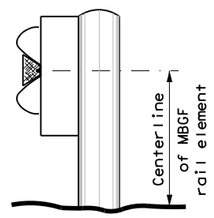
NOTE

1. Install per manufacturer's recommendations.

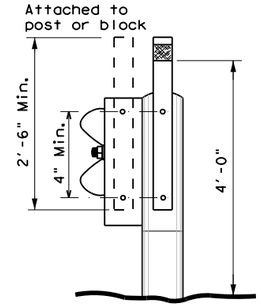
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

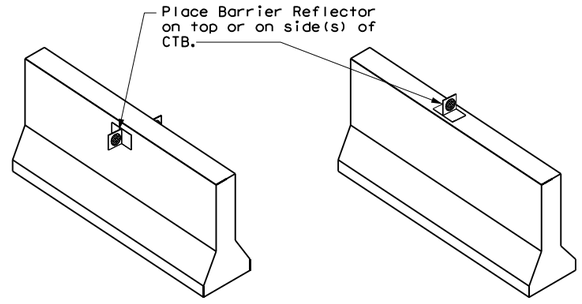
GF1



GF2



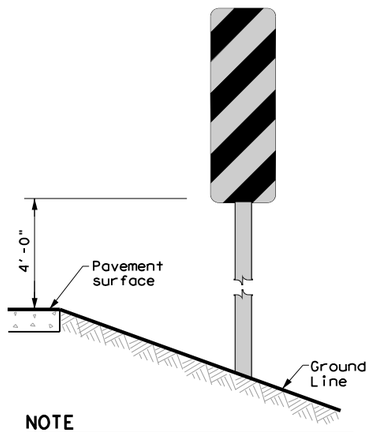
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

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

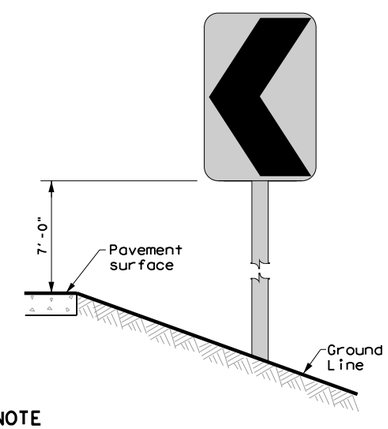
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

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

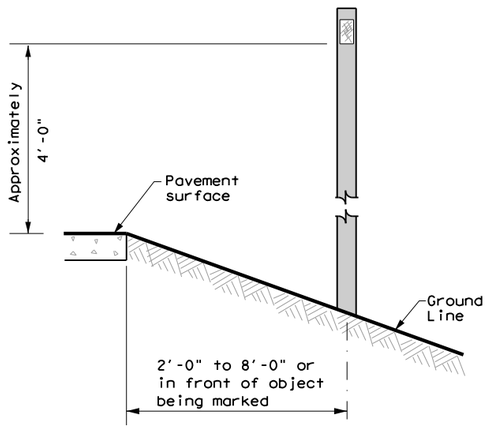
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

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

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

FILE: dom2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
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20B

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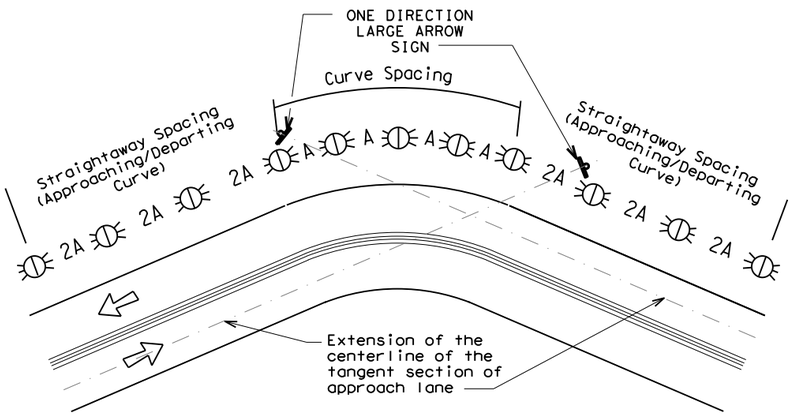
MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

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

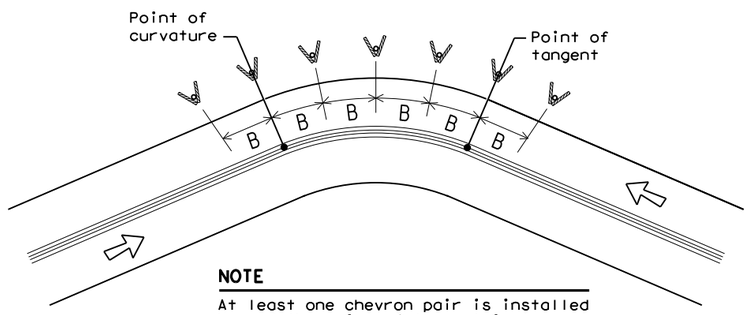
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



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.

DATE:
FILE:

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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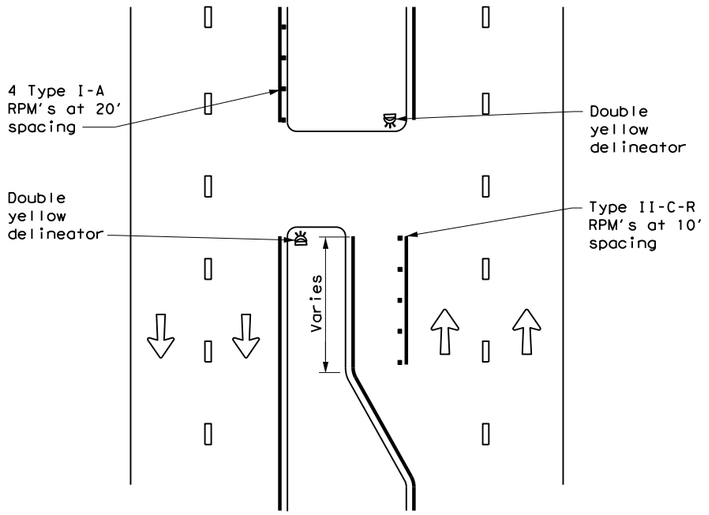
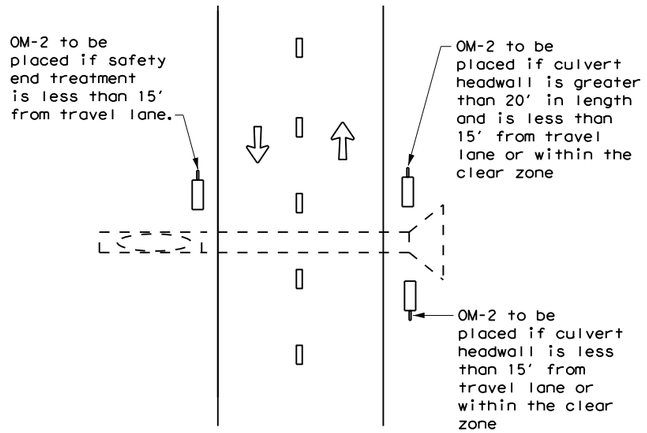
CROSSOVERS



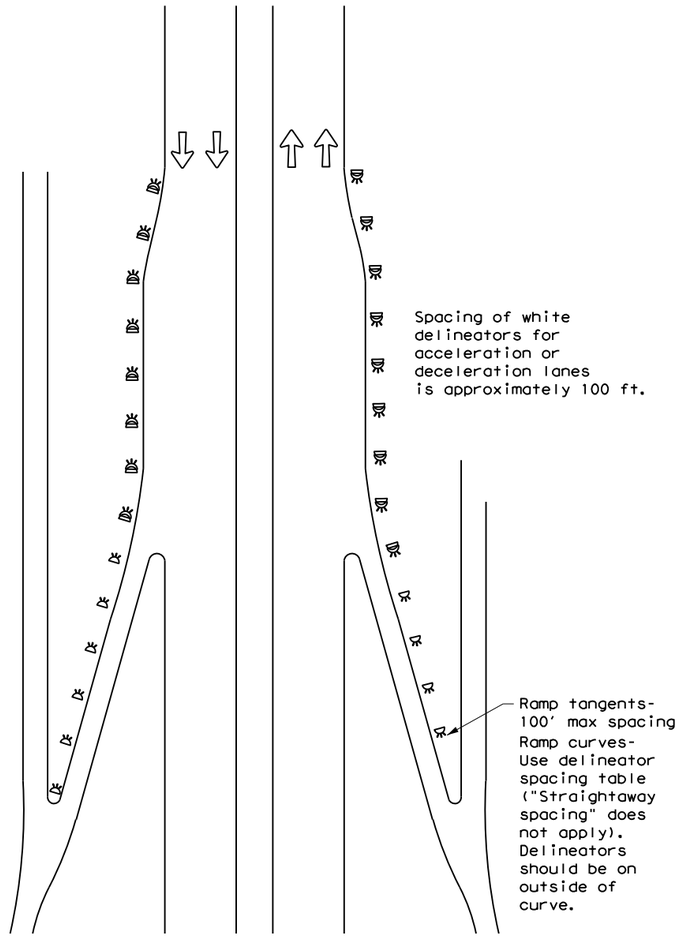
DETAIL 1

FOR CULVERTS WITHOUT MBGF



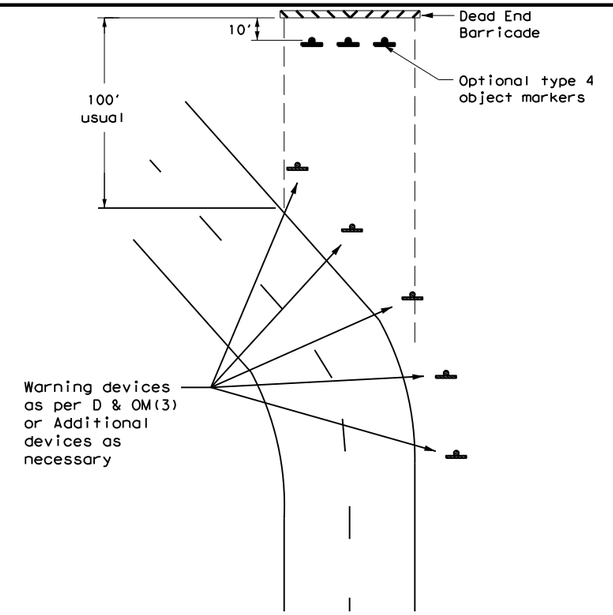
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



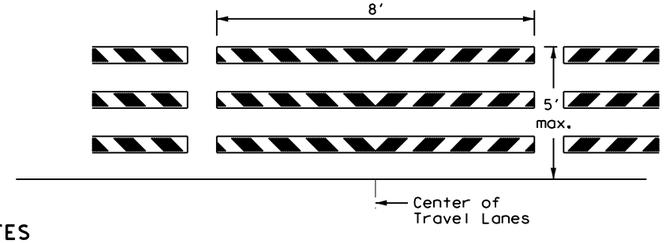
DETAIL 3

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 4

TYPICAL DEAD END BARRICADE INSTALLATION



NOTES

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

DETAIL 5

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(4)-20

FILE: dom4-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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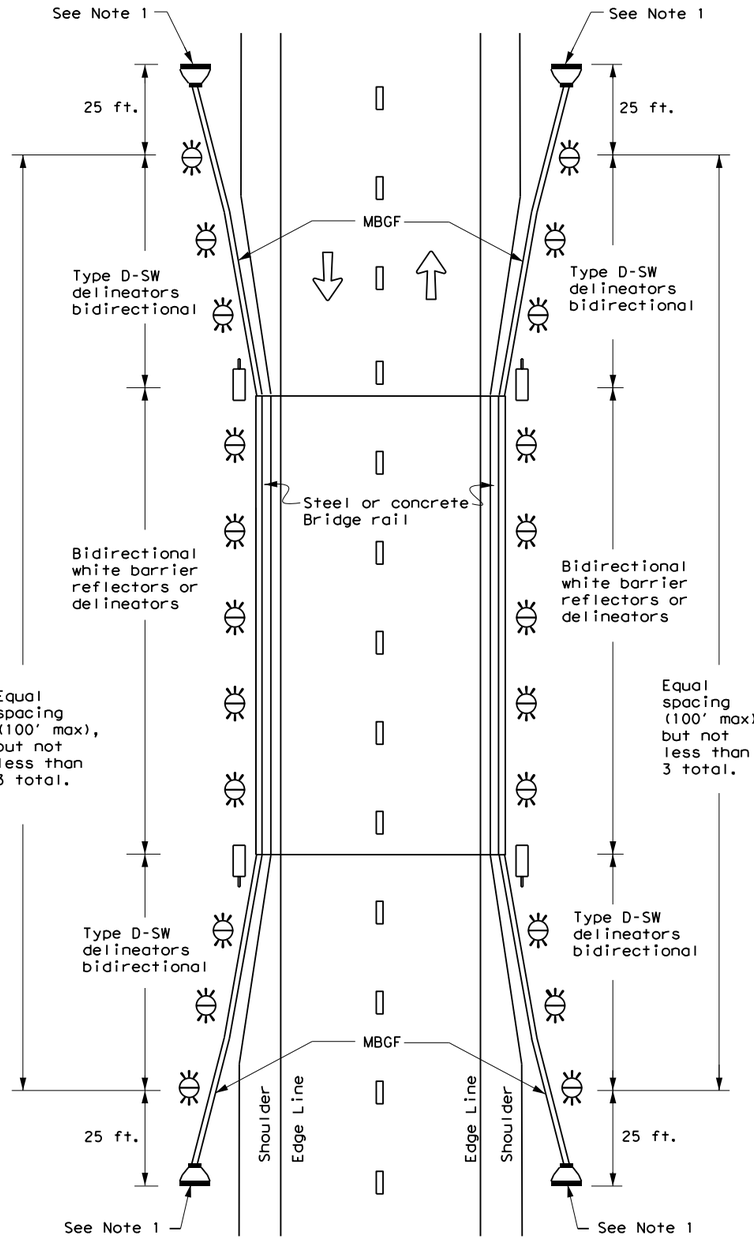
FILE:

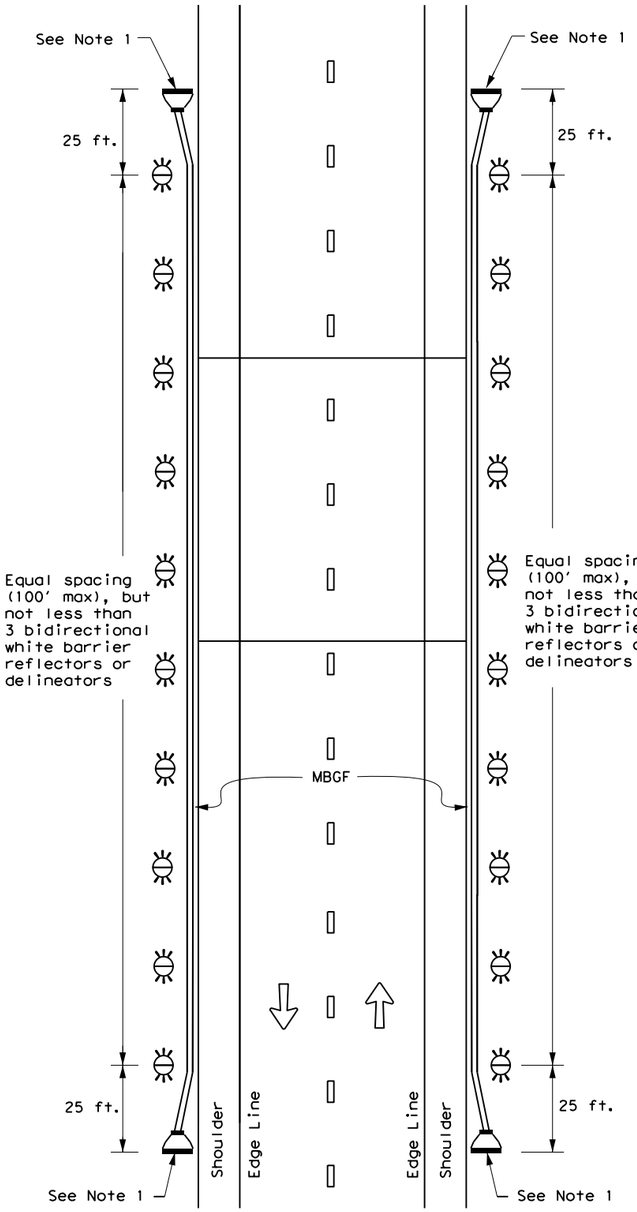
TWO-WAY, TWO LANE ROADWAY WITH REDUCED WIDTH APPROACH RAIL



NOTE:

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

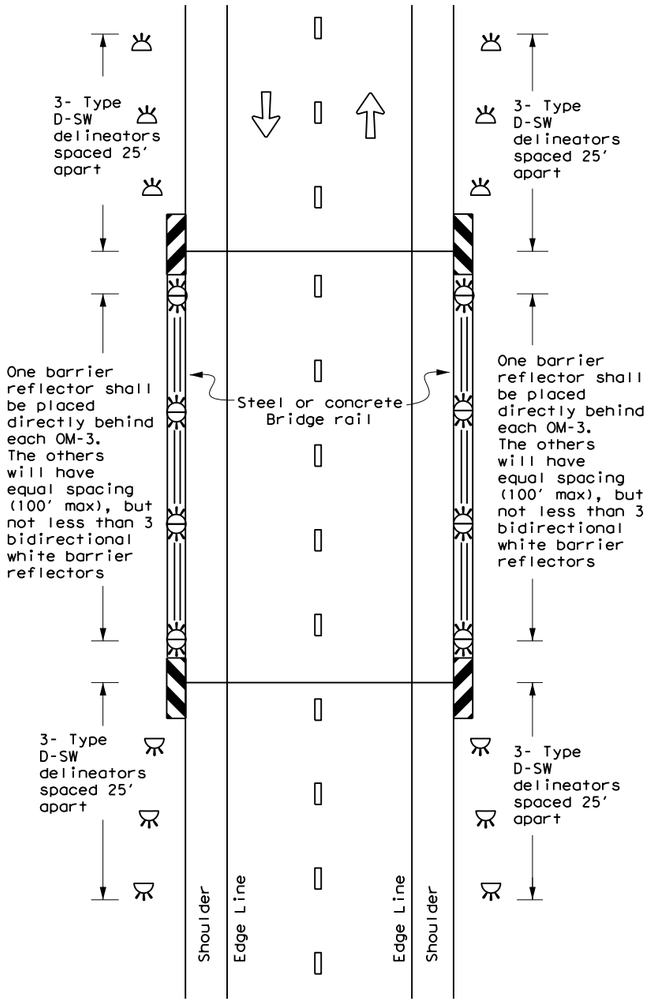
TWO-WAY, TWO LANE ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



NOTE:

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

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



LEGEND

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(5)-20

FILE: dom5-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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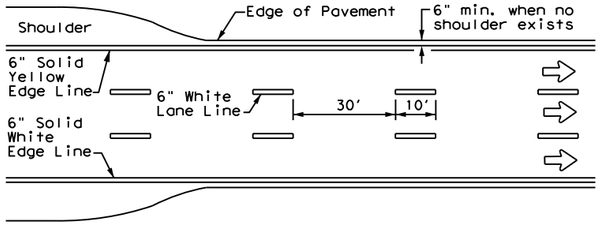
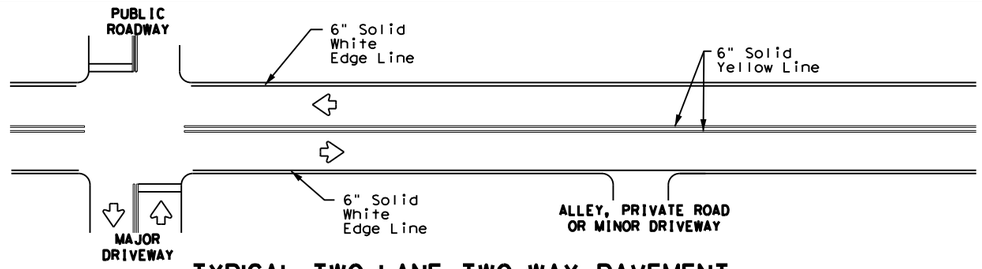
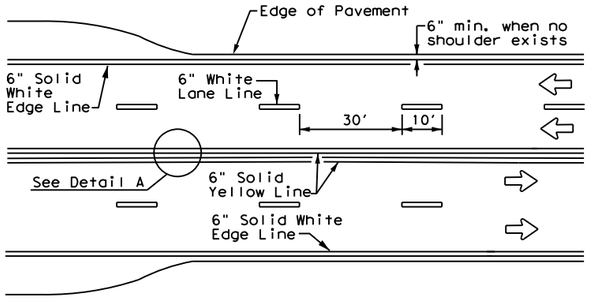
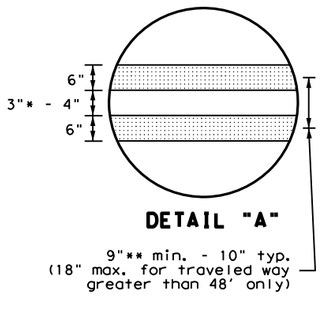


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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

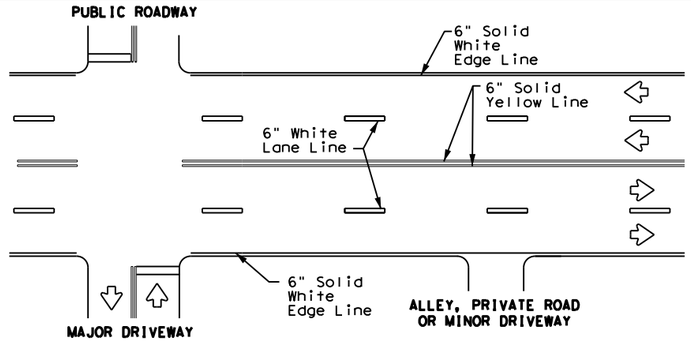




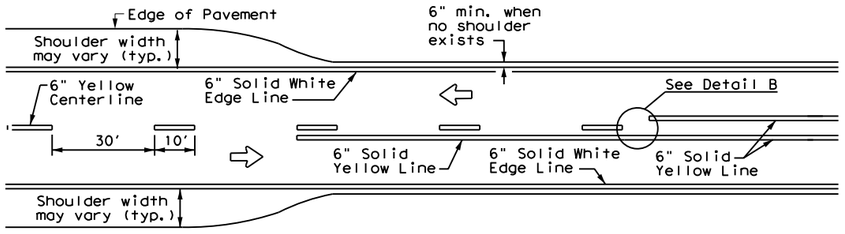
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

* 2" minimum for restripe projects when approved by the Engineer.

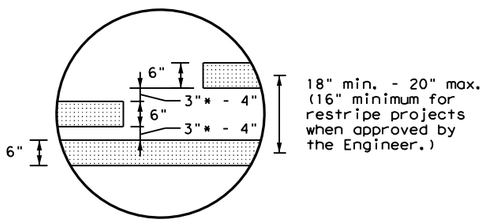
** 8" minimum for restripe projects when approved by the Engineer.



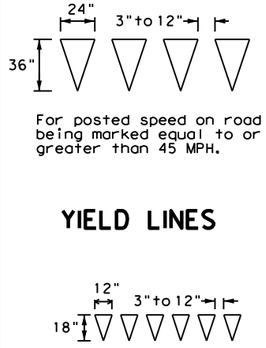
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS

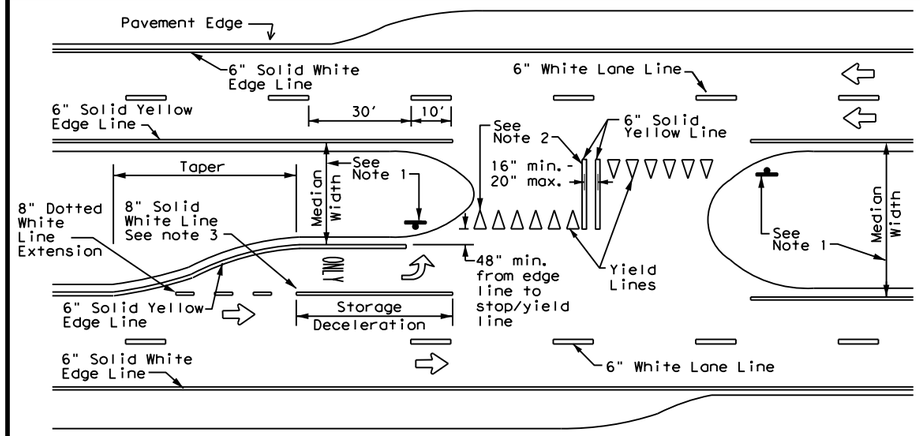


TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



* 2" minimum for restripe projects when approved by the Engineer.





FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

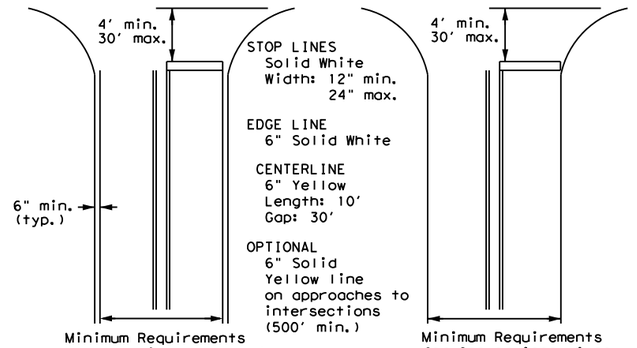
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections.
   Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs and stop bars are optional as determined by the Engineer.
2. Install median striping (double yellow centerlines and stop lines/yield lines) when a 50' or greater median centerline can be placed. Stop lines shall only be used with stop signs. Yield lines shall only be used with yield signs.
3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

GENERAL NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edge lines are not required in curb and gutter sections of roadways.
2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the center of edge line to the center of edge line of a two lane roadway.

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

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



NOTE: Traveled way is exclusive of shoulder widths. Refer to General Note 2 for additional details.

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-22

FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
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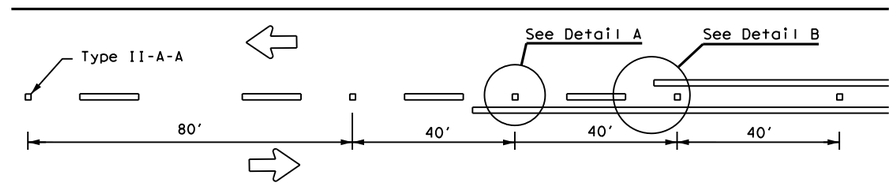
REVISIONS	0204	07	056	US 79
11-78 8-00 6-20	DIST	COUNTY		SHEET NO.
8-95 3-03 12-22	BRY	MILAM		080
5-00 2-12				

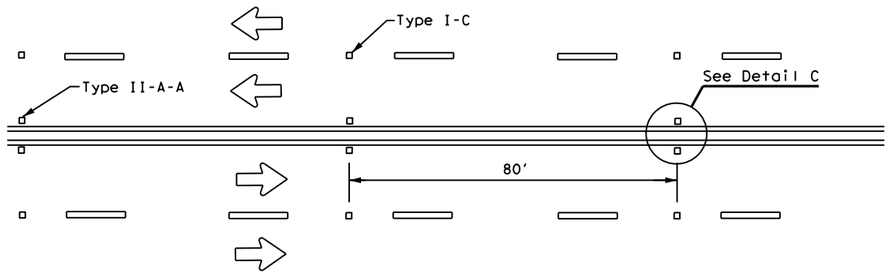
22A

DATE:
FILE:

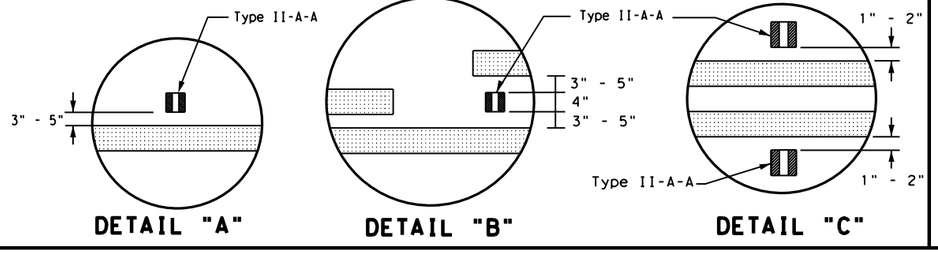
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

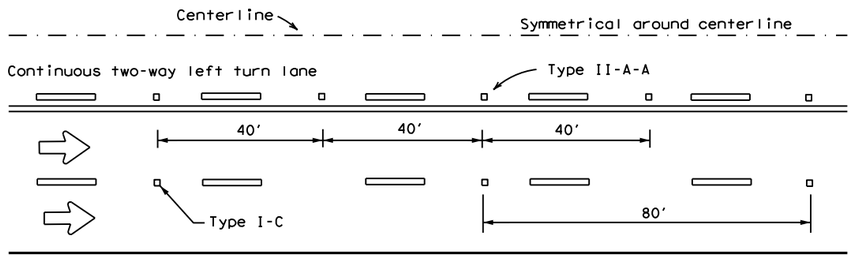


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

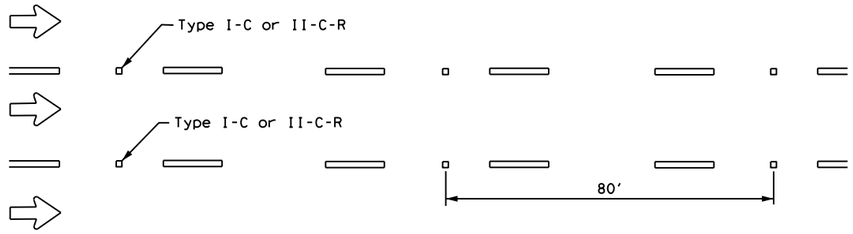


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS





CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



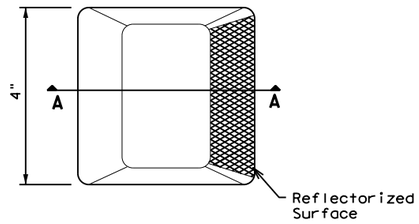
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

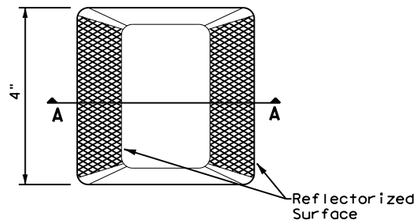
See Note 3.

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

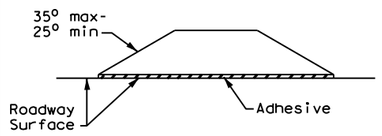
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

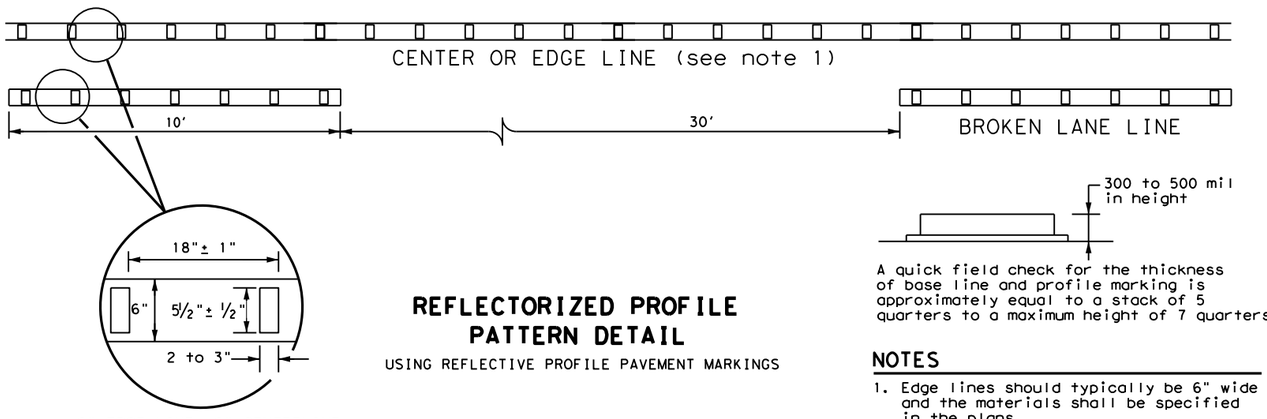


Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



6" EDGE LINE, 6" CENTERLINE OR 6" LANE LINE

REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters.

NOTES

1. Edge lines should typically be 6" wide and the materials shall be specified in the plans.
2. Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

1. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.
3. Use raised pavement marker Type I-C with undivided roadways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.

Texas Department of Transportation

Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-22

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0204	07	056	US 79
4-77 8-00 6-20	DIST	COUNTY		SHEET NO.
4-92 2-10 12-22	BRY	MILAM		081
5-00 2-12				

22B

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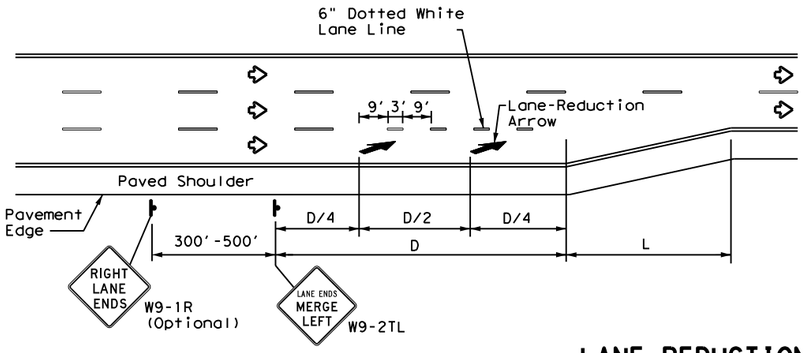
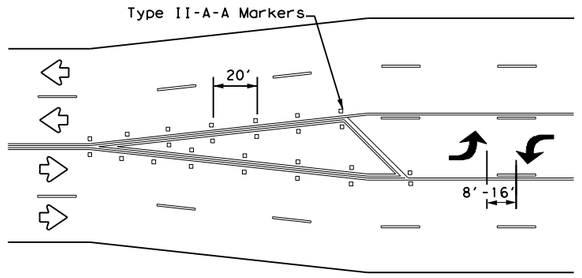


LANE REDUCTION

NOTES

1. Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
2. On divided highways, an additional RIGHT LANE ENDS (W9-1R) sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
3. Lane reduction arrows are required for speeds of 45 mph or greater. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
4. For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.

ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
30 MPH	460	$L = \frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	



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.

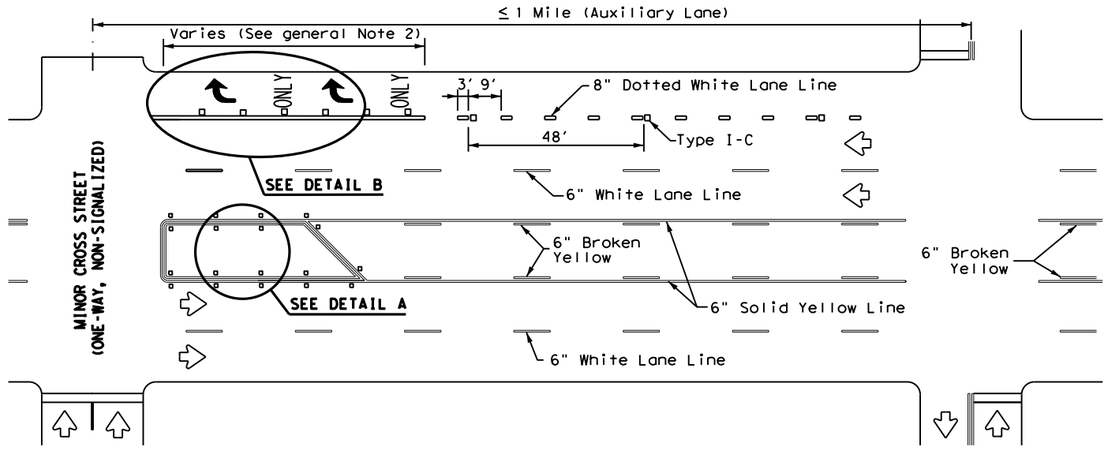
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

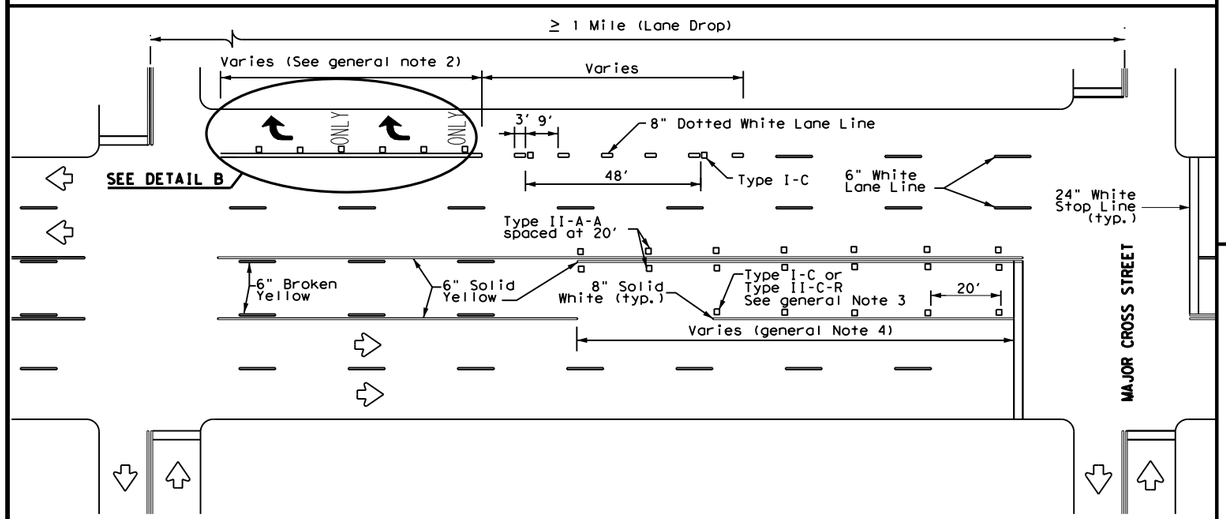
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn 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. See Chapter 3 of the Roadway Design Manual for additional information on turning lanes or storage lengths.

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

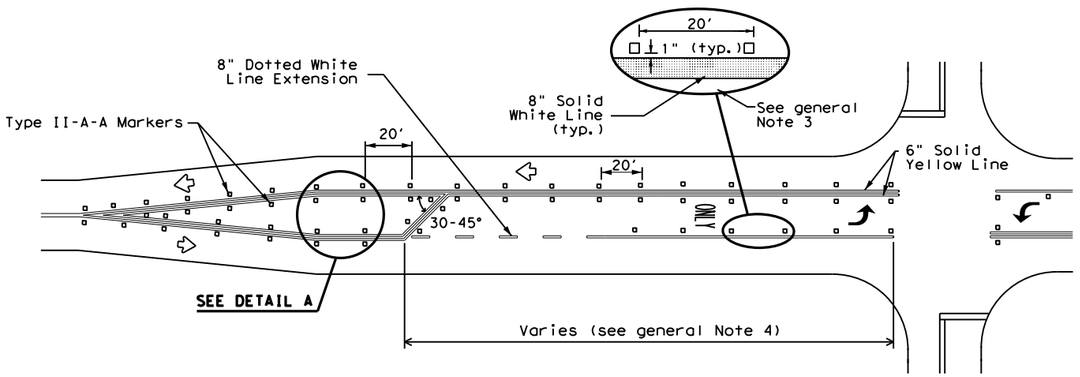
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



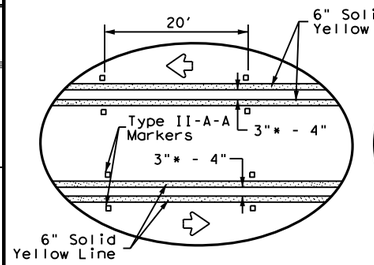
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



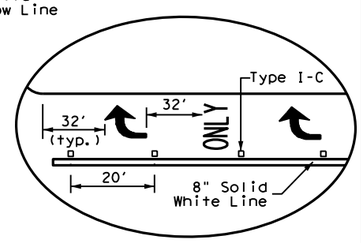
TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



DETAIL A



DETAIL B

* 2" minimum allowed for restripe projects when approved by the Engineer.

Texas Department of Transportation

Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS

PM(3)-22

FILE: pm3-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 3-03 6-20 5-00 2-10 12-22 8-00 2-12	0204	07	056	US 79
	DIST	COUNTY		SHEET NO.
	BRY	MILAM		082

22C

DATE:
FILE:

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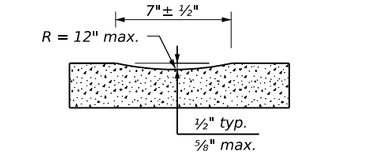
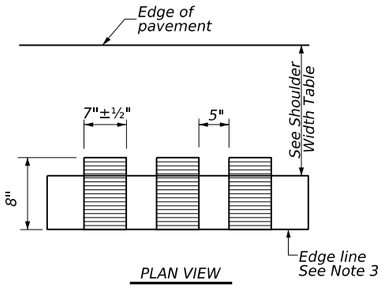
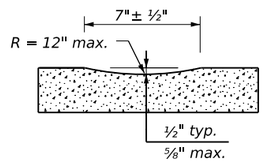


PROFILE VIEW
OPTION 1

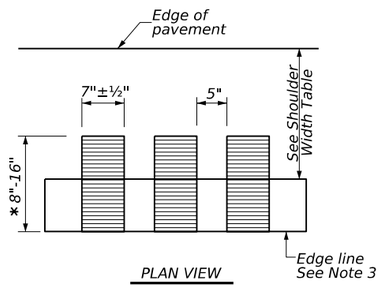


PLAN VIEW

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)



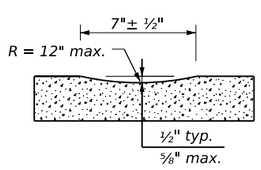
PROFILE VIEW
OPTION 2



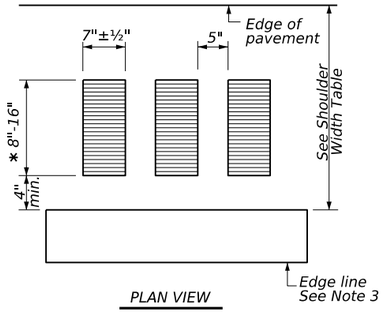
PLAN VIEW

∗ This distance may vary based on width of shoulder

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)



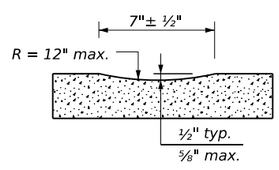
PROFILE VIEW
OPTION 3



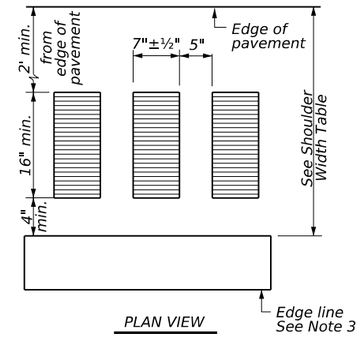
PLAN VIEW

∗ This distance may vary based on width of shoulder

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)

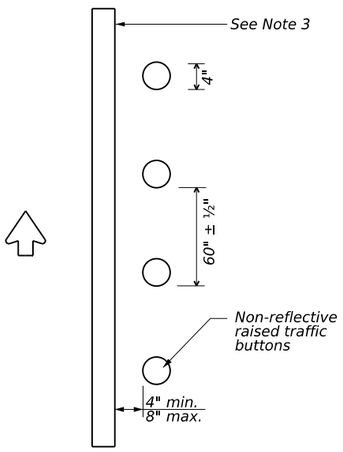


PROFILE VIEW
OPTION 4



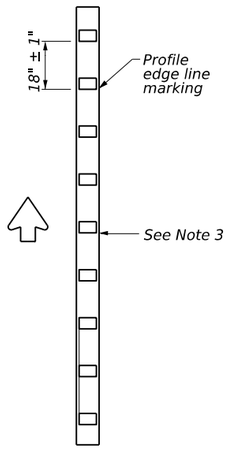
PLAN VIEW

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)



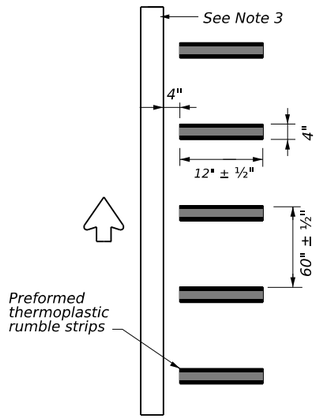
PLAN VIEW
OPTION 5

RAISED EDGE LINE (Rumble Strips)



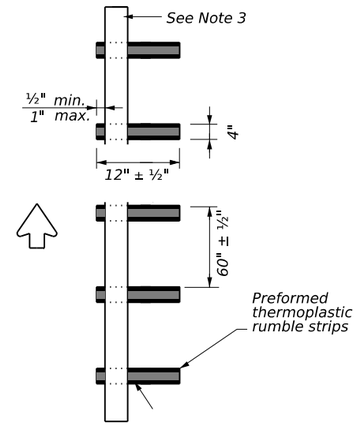
PLAN VIEW
OPTION 6

PROFILE EDGE LINE MARKINGS (Rumble Strips)



PLAN VIEW
OPTION 7

PREFORMED THERMOPLASTIC EDGE LINE (Rumble Strips)



PLAN VIEW
OPTION 8

PREFORMED THERMOPLASTIC EDGE LINE (Rumble Strips)

SHOULDER WIDTH TABLE		
EQUAL TO OR LESS THAN 2 FEET	GREATER THAN 2 FEET LESS THAN 4 FEET	EQUAL TO OR GREATER THAN 4 FEET
Option 1, 5, 6 or 8	Option 1, 2, 3 5, 6 or 7	Option 2, 4, 5 6 or 7

GENERAL NOTES

1. Rumble strips and profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
2. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
3. Use Standard Sheet PM(2) and FPM(1) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings, and profile markings.
4. See the Shoulder Width Table below for determining what options may be used for edge line rumble strips.
5. Breaks in edge line rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections, or driveways with high usage of large trucks when installed on conventional highways.
6. Rumble strips shall not be placed across exit or entrance ramps, acceleration or deceleration lanes, crossovers, gore areas, or intersections with other roadways.
7. Consideration should be given to noise levels when edgeline rumble strips are to be installed near residential areas, schools, churches, etc. A 3/8 inch deep (minimum) milled rumble strip may be considered in these areas.
8. Consideration shall be given to bicyclists. See RS(6).

WHEN INSTALLING MILLED DEPRESSION EDGE LINE RUMBLE STRIPS:

9. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Safety Division.
10. Pavement markings can be applied over milled shoulder rumble strips to create an edge line rumble strip.

WHEN INSTALLING RAISED OR PROFILE EDGE LINE RUMBLE STRIPS:

11. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per the manufacturer's recommendations.
12. Non-reflective traffic buttons shall be placed adjacent to the pavement marking delineating the edge line when used as a rumble strip. The color of the button should match the color of the adjacent edge line marking (white or yellow). The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
13. Non-reflective traffic buttons shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
14. The minimum distance between the edge line and the buttons should be used if the shoulder is less than 8 feet in width.
15. Raised profile thermoplastic markings used as edge lines may substitute for buttons.

Texas Department of Transportation

Traffic Safety Division Standard

EDGE LINE RUMBLE STRIPS ON UNDIVIDED OR TWO LANE HIGHWAYS RS(2)-23

FILE: rs(2)-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0204	07	056	US 79
10-13	DIST	COUNTY		SHEET NO.
1-23	BRY	MILAM		083

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DATE:
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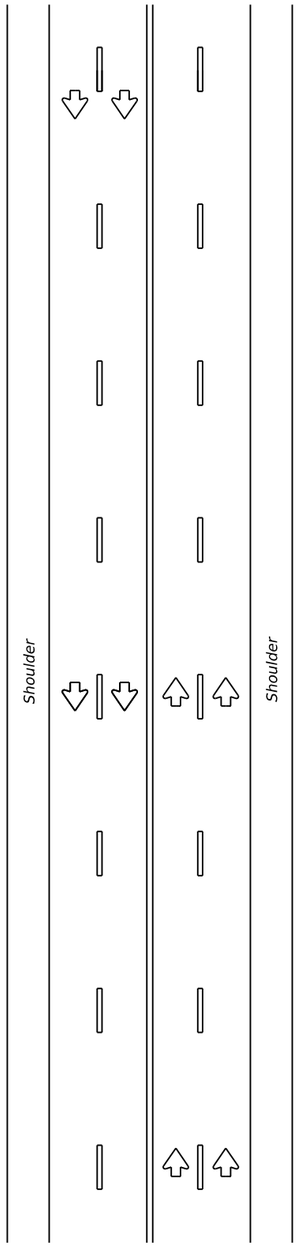
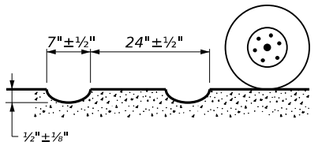
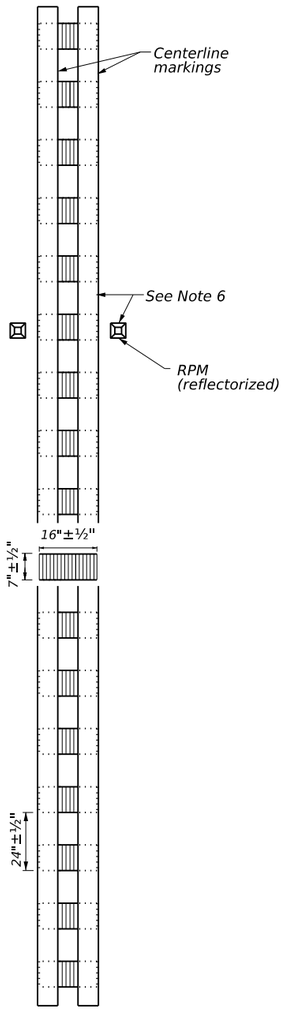
CENTERLINE RUMBLE STRIPS



MULTILANE UNDIVIDED HIGHWAY WITH SHOULDER

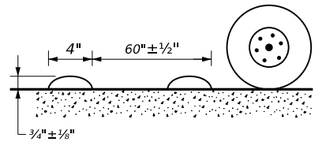


PROFILE VIEW

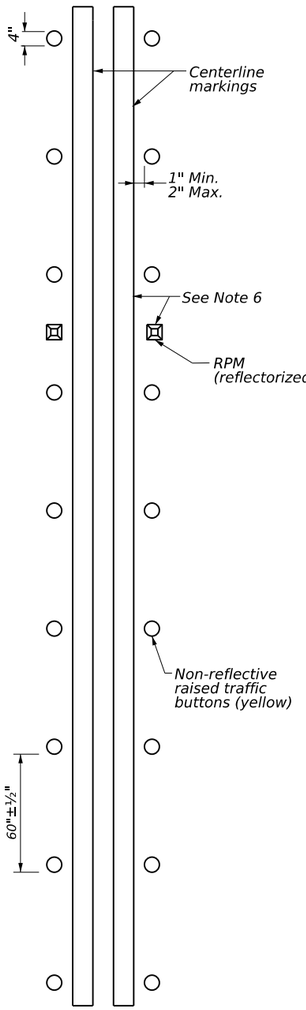


PLAN VIEW
OPTION 1

MILLED CENTERLINE RUMBLE STRIPS

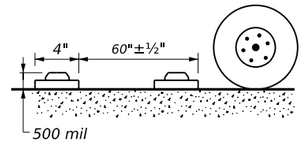


PROFILE VIEW

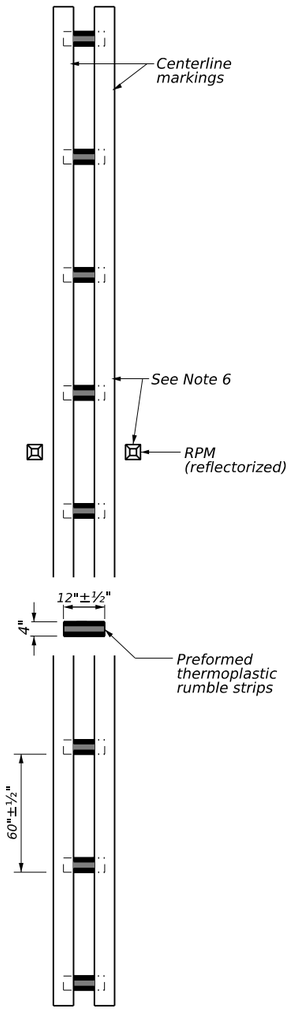


PLAN VIEW
OPTION 2

RAISED CENTERLINE RUMBLE STRIPS

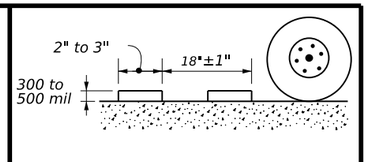


PROFILE VIEW

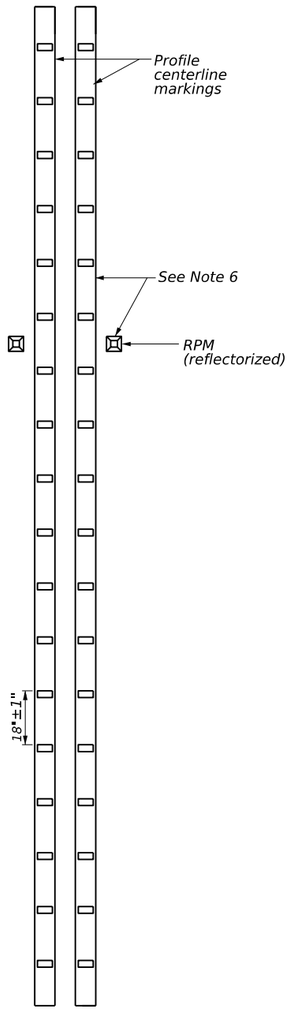


PLAN VIEW
OPTION 3

PREFORMED THERMOPLASTIC RUMBLE STRIPS



PROFILE VIEW



PLAN VIEW
OPTION 4

PROFILE CENTERLINE MARKINGS

GENERAL NOTES

1. *This standard sheet provides guidelines for installing centerline rumble strips on multilane undivided highways.*
2. *Centerline and edge line rumble strips or profile markings shall not be placedon roadways with a posted speed limit of 45 MPH or less.*
3. *Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.*
4. *See dimensions for milled rumble strips. Other shapes and dimensions may beused if approved by the Traffic Safety Division.*
5. *Breaks in milled centerline rumble strips shall occur at least 50 feet and nomore than 150 feet in advance of bridges, railroad crossing, intersections ordriveways with high usage of large trucks.*
6. *Use standard sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings and profile markings.*
7. *Consideration should be given to noise levels when centerline rumble strips are to be installed near residential areas, schools, churches, etc. A 3/8 inch deep (minimum) milled rumble strip may be considered in these areas.*
8. *Pavement markings must be applied over milled centerline rumble strips for normal centerline spacing. For wider medians, specify in the plans the exact placement of the rumble strips. Place the rumble strips under each centerline marking or centered in the middle of the median.*

WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

9. *Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per manufacturer's recommendations.*
10. *When using non-reflective raised traffic buttons as a centerline rumble strip, the button shall be placed adjacent to the pavement marking delineating the centerline. The color of the button should be yellow for a continuous no passing roadway. The button will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.*
11. *Consideration shall be given to bicyclists. See RS(6).*

WHEN INSTALLING EDGE LINE RUMBLE STRIPS WITH OR WITHOUT CENTERLINE RUMBLE STRIPS ON UNDIVIDED HIGHWAYS:

12. *See standard sheet RS(2).*

Texas Department of Transportation

Traffic Safety Division Standard

CENTERLINE RUMBLE STRIPS ON MULTILANE UNDIVIDED HIGHWAYS RS(3)-23

FILE: rs(3)-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0204	07	056	US 79
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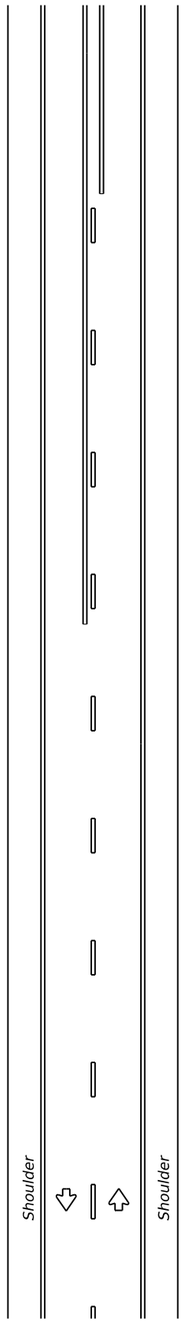
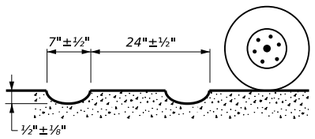
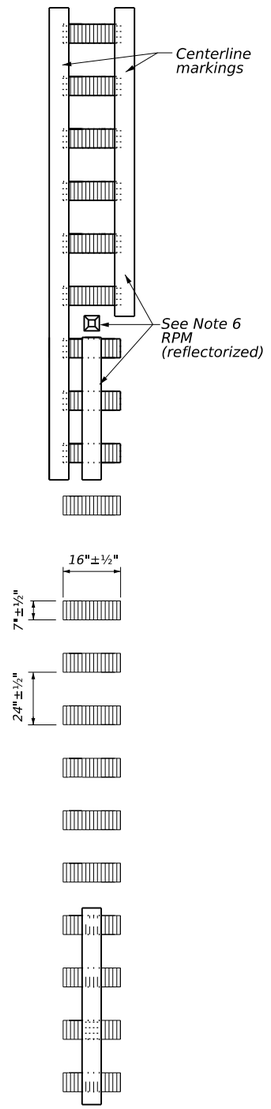
CENTERLINE RUMBLE STRIPS



TWO LANE TWO-WAY HIGHWAYS

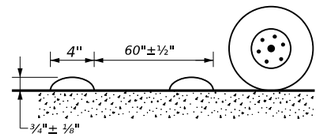


PROFILE VIEW

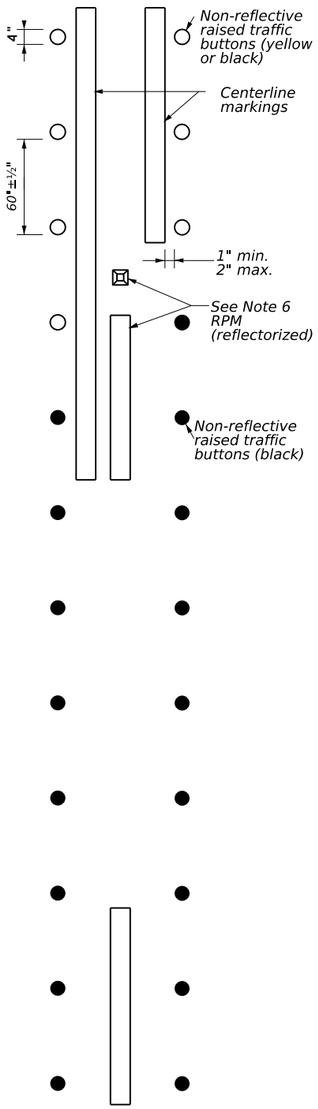


PLAN VIEW
OPTION 1

MILLED CENTERLINE RUMBLE STRIPS

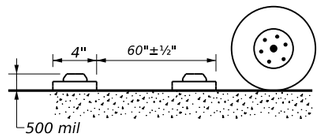


PROFILE VIEW

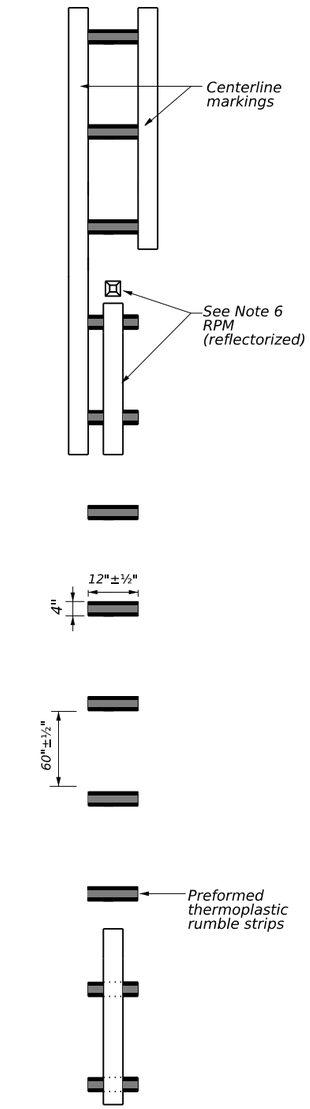


PLAN VIEW
OPTION 2

RAISED CENTERLINE RUMBLE STRIPS

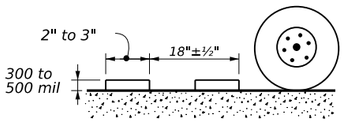


PROFILE VIEW

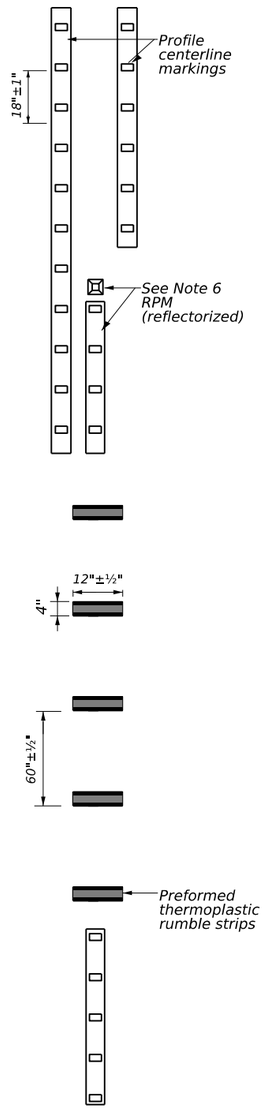


PLAN VIEW
OPTION 3

PREFORMED THERMOPLASTIC RUMBLE STRIPS



PROFILE VIEW



PLAN VIEW
OPTION 4

PROFILE CENTERLINE MARKINGS AND PREFORMED THERMOPLASTIC RUMBLE STRIPS

GENERAL NOTES

1. This standard sheet provides guidelines for installing centerline rumble strips on two-lane highways with or without shoulders.
2. Centerline and edge line rumble strips or profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
3. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
4. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Safety Division.
5. Breaks in milled centerline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections or driveways with high usage of large trucks.
6. Use standard sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings and profile markings.
7. Consideration should be given to noise levels when centerline rumble strips are to be installed near residential areas, schools, churches, etc. A 3/8 inch deep (minimum) milled rumble strip may be considered in these areas.
8. Pavement markings must be applied over milled centerline rumble strips.

WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

9. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per manufacturer's recommendations.
10. When using non-reflective raised traffic buttons as a centerline rumble strip, the button shall be placed adjacent to the pavement marking delineating the centerline. The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
11. The color of the button should be yellow for a continuous no passing roadway. Black buttons should be used in areas where passing is allowed.
12. Consideration shall be given to bicyclists. See RS(6).

WHEN INSTALLING EDGE LINE RUMBLE STRIPS WITH OR WITHOUT CENTERLINE RUMBLE STRIPS ON UNDIVIDED HIGHWAYS:

13. See standard sheet RS(2).

Texas Department of Transportation

Traffic Safety Division Standard

CENTERLINE RUMBLE STRIPS ON TWO LANE TWO-WAY HIGHWAYS RS(4)-23

FILE: rs(4)-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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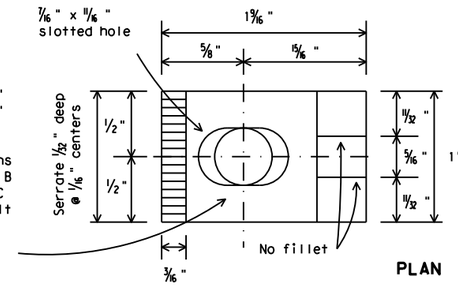
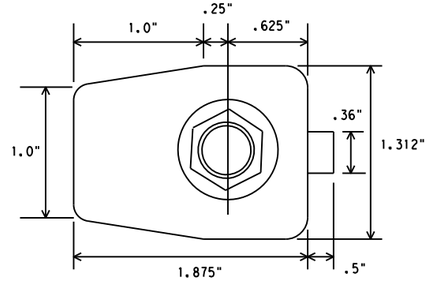
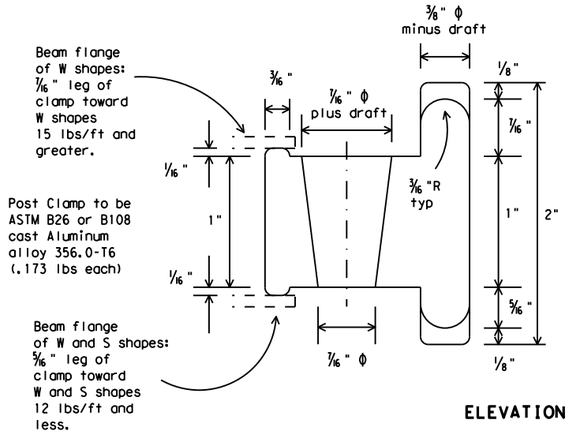


NOTE: centerline of hole for 3/8" diameter squarehead bolt x 2 1/4" long with a flat washer and self-locking nut, or lock washer and hex. nut. Bolt head dimensions shall be in accordance with ANSI B 18.2.1 as referred to in the AISC Manual of steel construction. Bolt assembly shall be galvanized.

PLAN

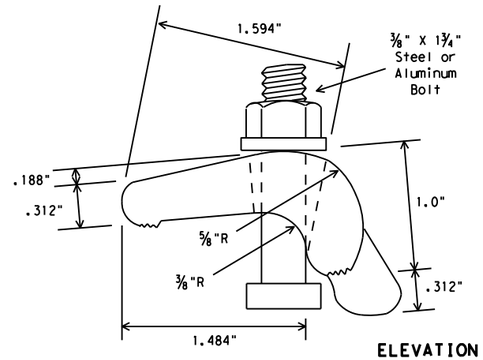


PLAN



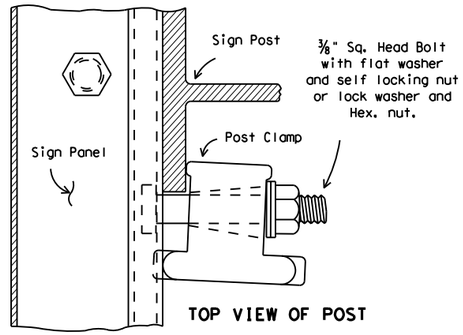
ELEVATION

POST CLAMP DETAIL

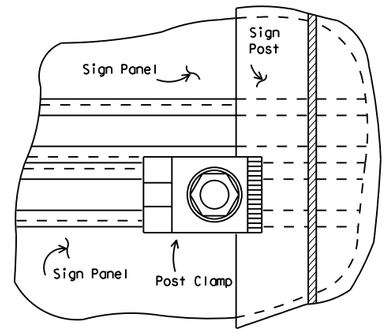


ELEVATION

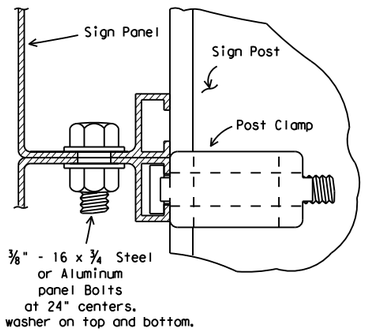
ALTERNATE POST CLAMP DETAIL



TOP VIEW OF POST



TOP VIEW OF CLAMP



SIDE VIEW OF PANELS

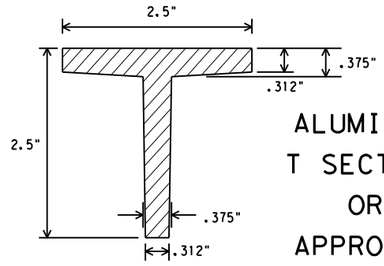
CONNECTION DETAILS

DEPARTMENTAL MATERIAL SPECIFICATIONS

SIGN HARDWARE	DMS-7120

GENERAL NOTES:

1. Design conforms with AASHTO Specifications for the design and construction of structural supports for highway signs.
2. Materials and fabrication shall conform to the requirements of the Department material specifications.
3. Structural steel shall be "low-alloy steel" for non-bridge structures per Item 442, "Metal For Structures."
4. For fiberglass substrate connection details, see manufacturer's recommendations.

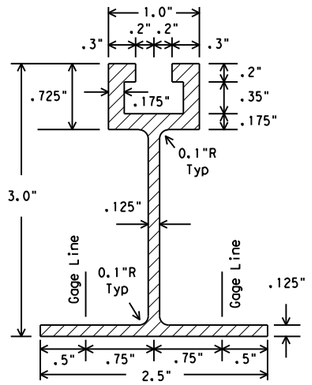


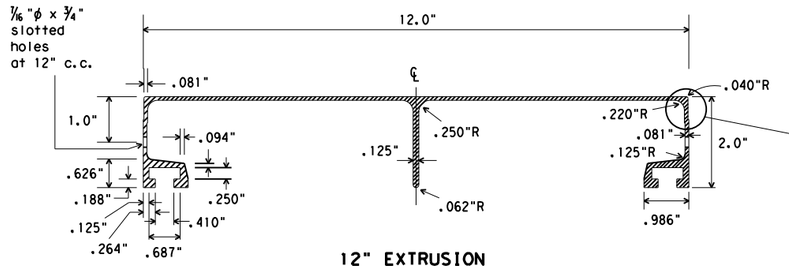
1.912 lbs/ft

ALUMINUM T SECTION OR APPROVED ALTERNATIVE

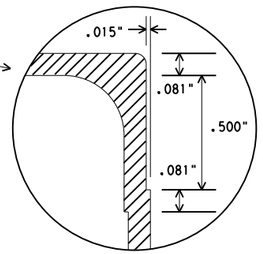
WINDBEAM CROSS SECTION

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

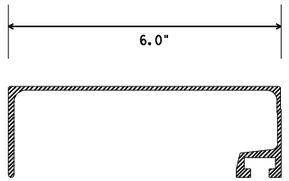




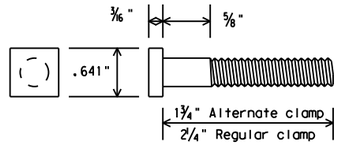
12" EXTRUSION



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

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	BRY	MILAM		086

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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)

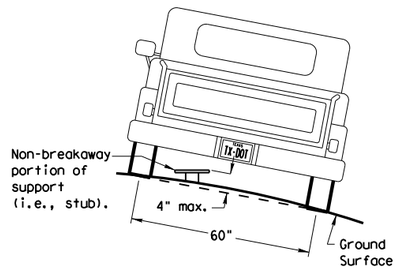
Anchor Type

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))

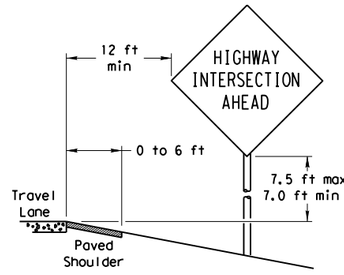
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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).

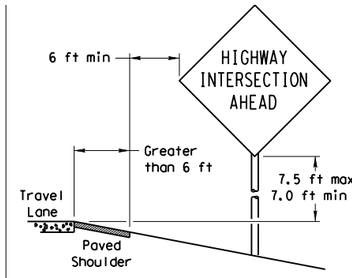
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

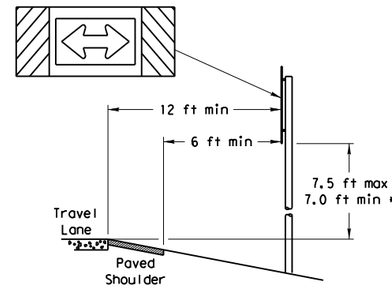
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



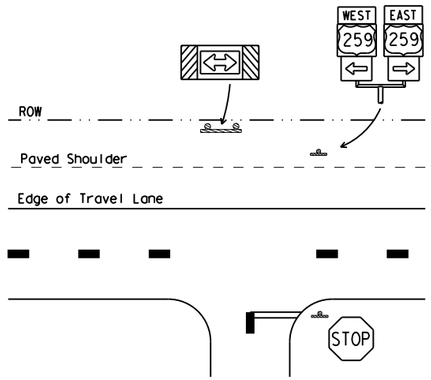
GREATER THAN 6 FT. WIDE

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.

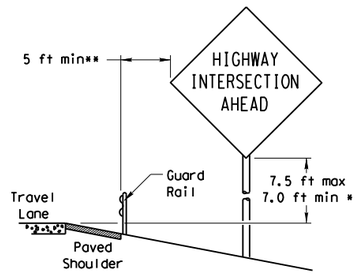
T-INTERSECTION



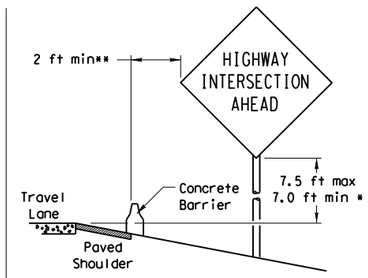
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



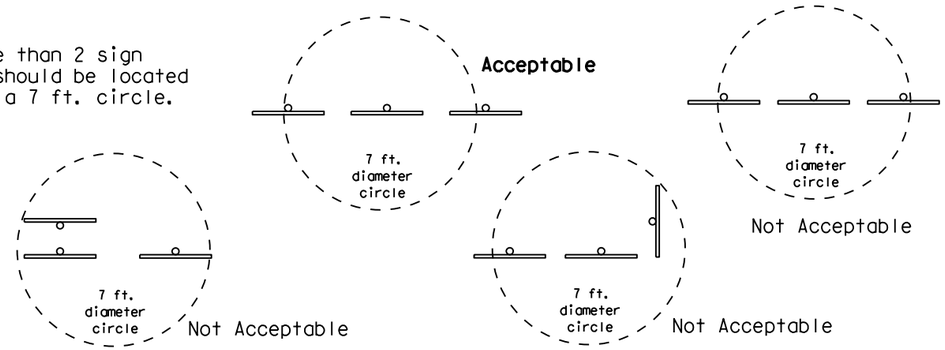
BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

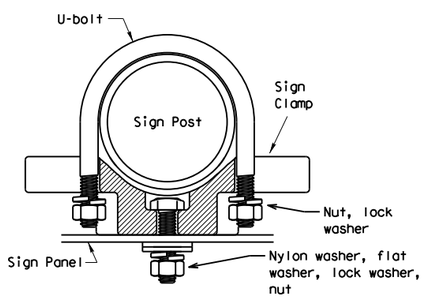
****Sign clearance based on distance required for proper guard rail or concrete barrier performance.**

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



TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

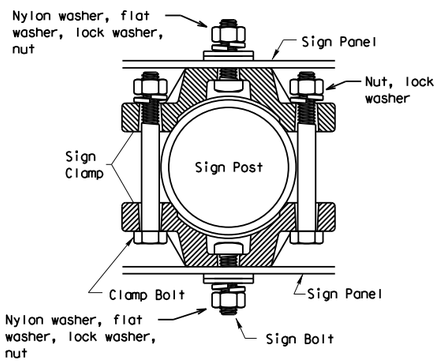


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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.

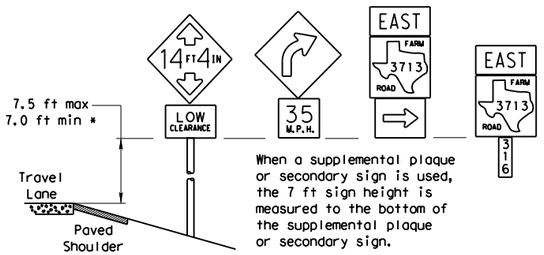
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



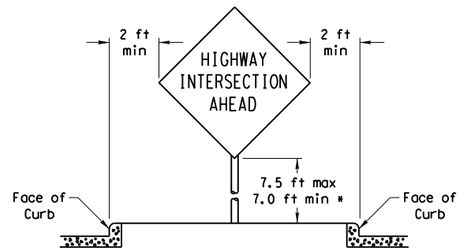
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



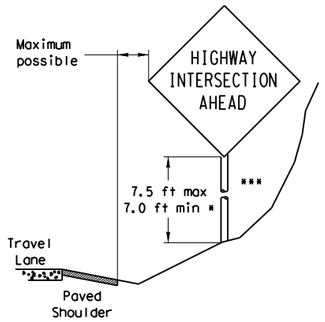
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

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

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REVISIONS
9-08

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BRY	MILAM		087

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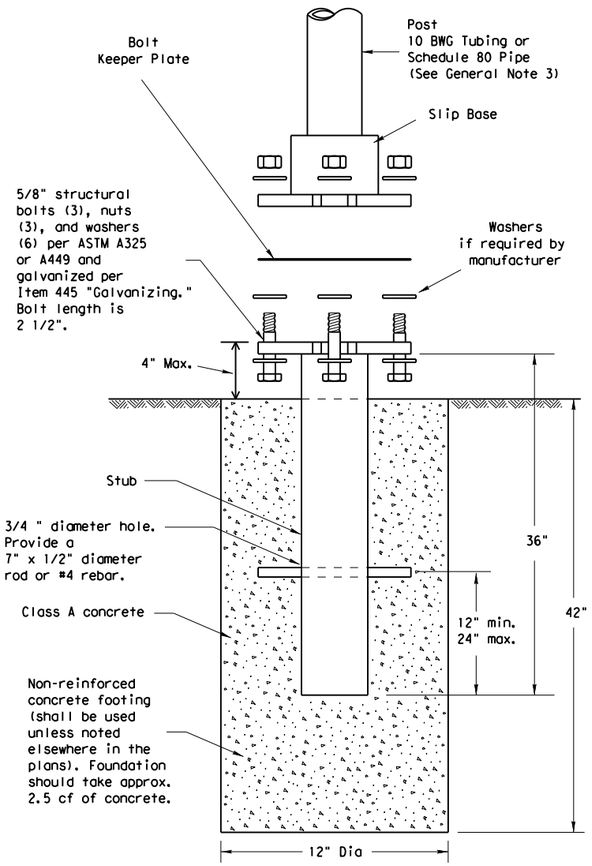
TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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.

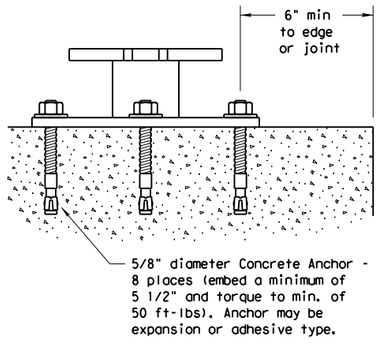
   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum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

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	DIST	COUNTY		SHEET NO.
	BRY	MILAM		088

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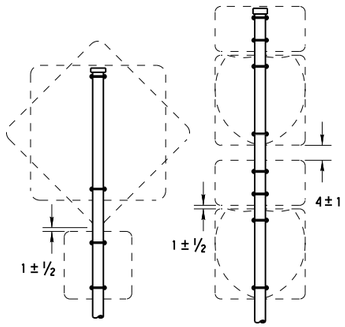
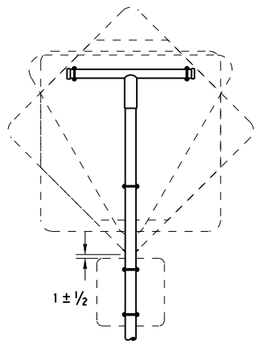


SM RD SGN ASSM TY XXXXX(1)XX(P)



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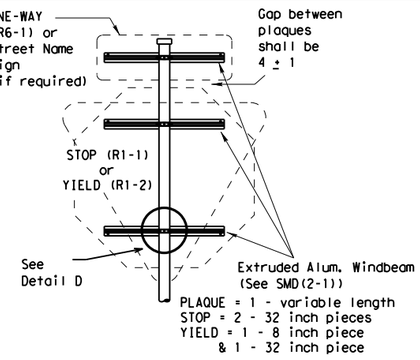

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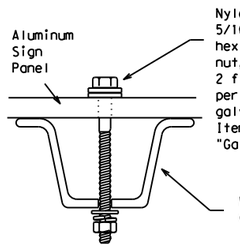
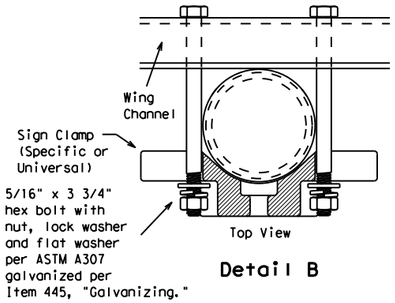
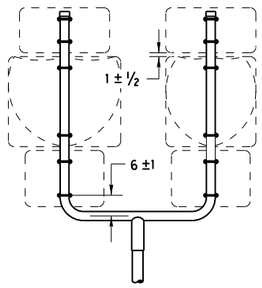


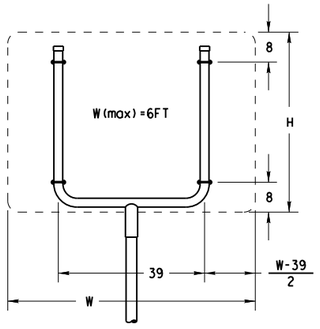
Detail A



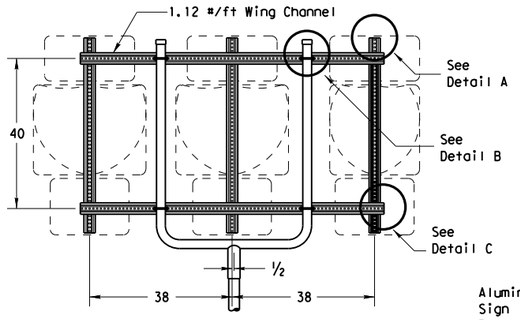
Detail B



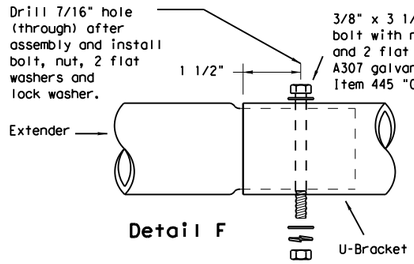
SM RD SGN ASSM TY XXXXX(1)XX(U)



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

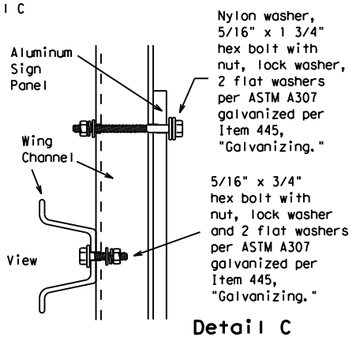


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

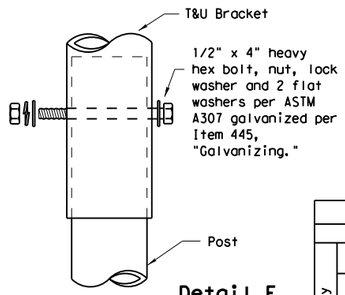


Detail F

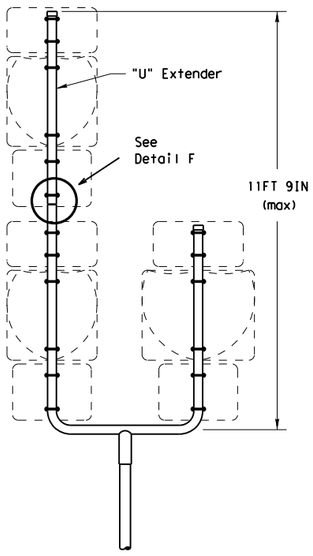
Splices shall only be allowed behind the sign substrate.



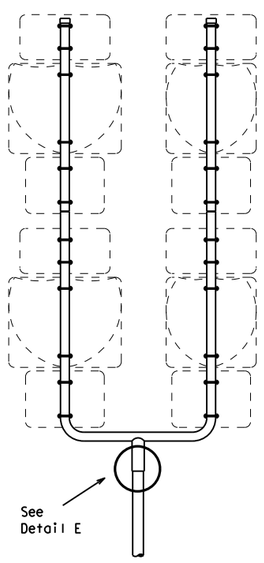
Detail C



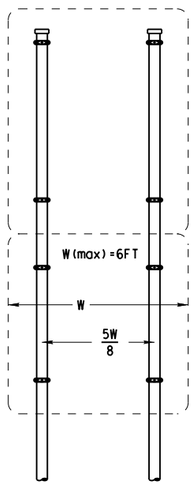
Detail E



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

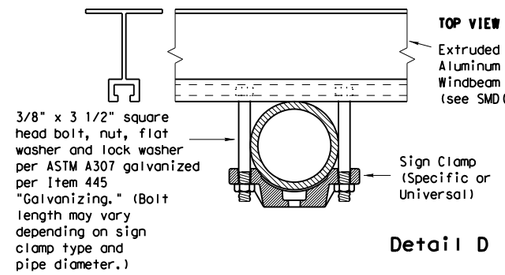


SM RD SGN ASSM TY S80(1)XX(U-2EXT)

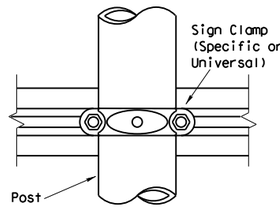


SM RD SGN ASSYM TY XXXXX(2)XX(P)

SIDE VIEW



Detail D



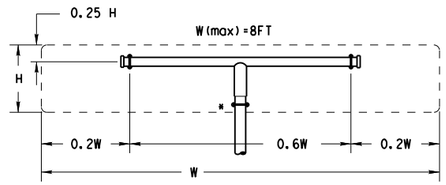
GENERAL NOTES:

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.

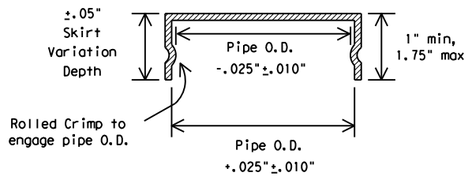
REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)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

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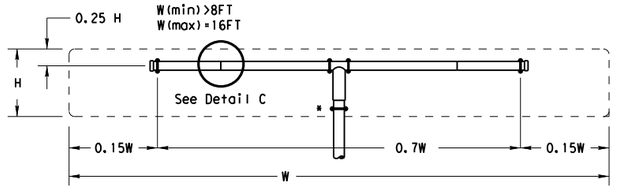
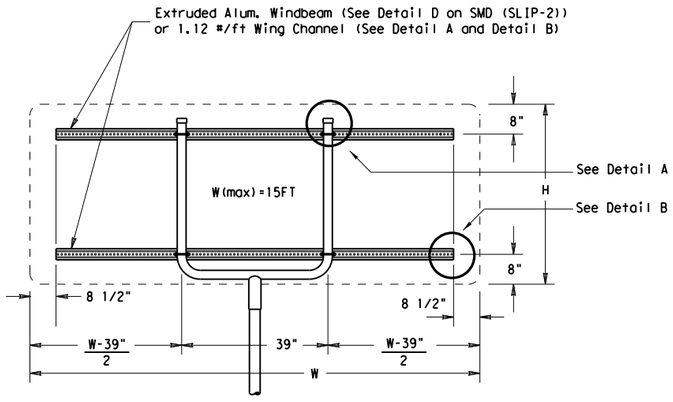
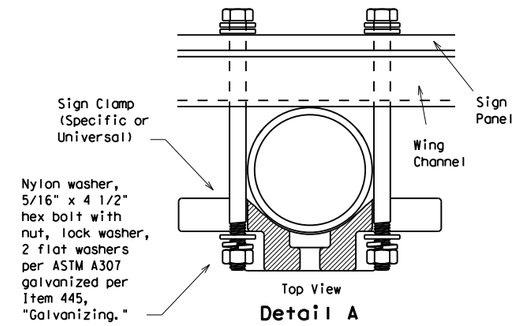


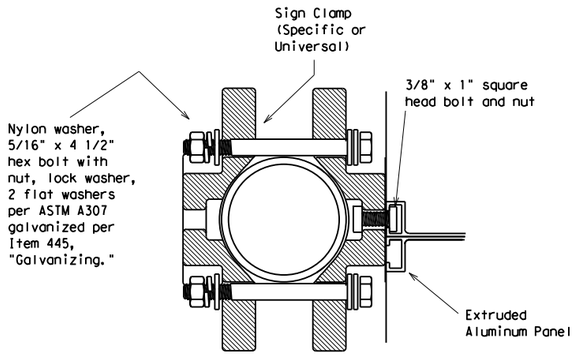
SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)



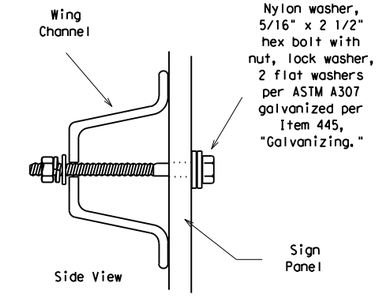
SM RD SGN ASSM TY XXXXX(1)XX(U-XX)



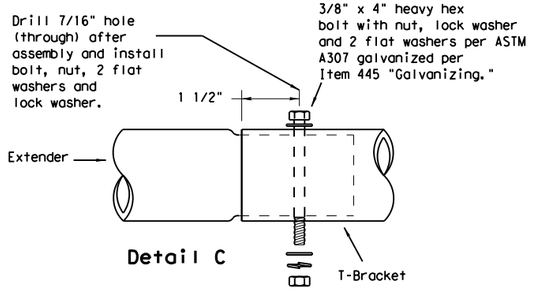
Detail A



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET

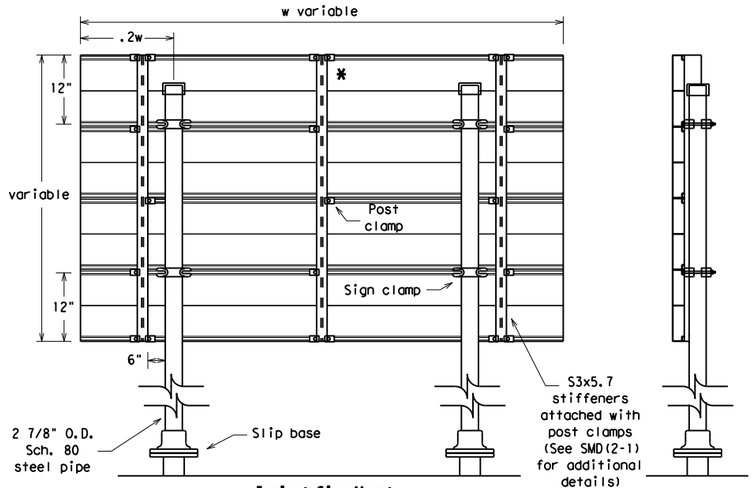


Detail B



Detail C

Splices shall only be allowed behind the sign substrate.

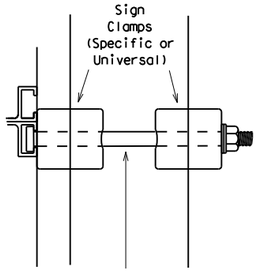


Typical Sign Mount

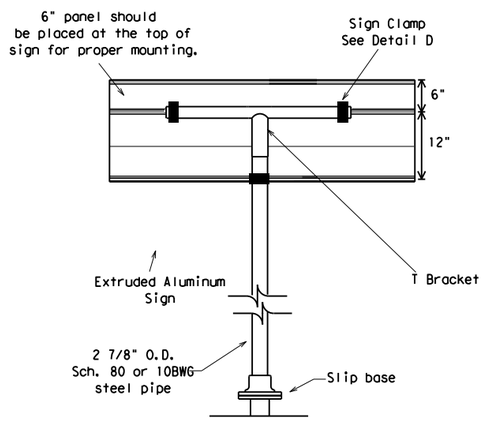
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

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

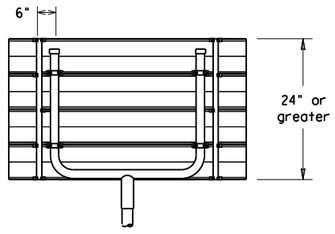
See Detail E
for clamp installation



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

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

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CONT	SECT	JOB	HIGHWAY
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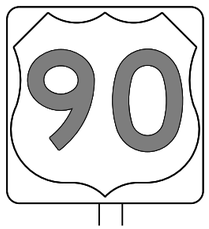
REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

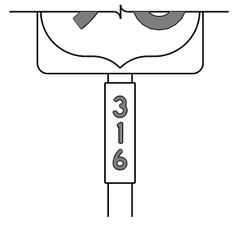
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING

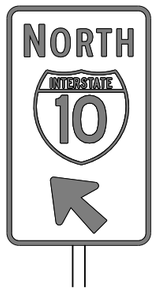


TYPICAL EXAMPLES

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

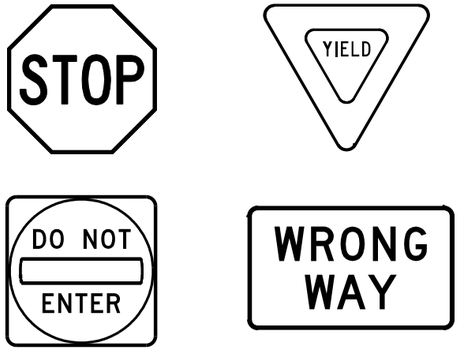
FILE: tsr3-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0204	07	056	US 79
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	BRY	MILAM		091

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:

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

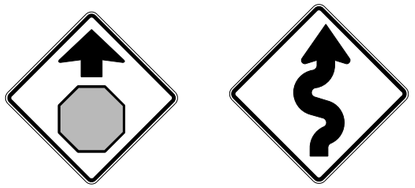
REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

(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	0204	07	056	US 79
12-03 7-13 9-08	DIST	COUNTY		SHEET NO.
	BRY	MILAM		092

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with the TPDES Construction General Permit TXR150000 (CGP). The Texas Department of Transportation (TxDOT) ensures that project specifications include adequate best management practices (BMPs) for this project.

This SWP3 is consistent with requirements specified in applicable stormwater plans and the projects environmental permits, issues, and commitments (EPICs). A copy of the CGP is included in Attachment 2.12 of the SWP3 binder.

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):
0204-07-056

1.2 PROJECT LIMITS:
From: US 79 at SH 36

To: N/A

1.3 PROJECT COORDINATES:
BEGIN: (Lat) 30.70710561 ,(Long) -96.87272698

END: (Lat) N/A ,(Long) N/A

1.4 TOTAL PROJECT AREA (Acres): 13.2

1.5 TOTAL AREA TO BE DISTURBED (Acres): 1.2

1.6 NATURE OF CONSTRUCTION ACTIVITY:
Project consist of constructing pavement widening, which consist of Excavation, Embankment, Grading along with Temporary and Permanent Seeding.

1.7 MAJOR SOIL TYPES:

Soil Type	Description
Uhland Loam	0 to 1 percent slopes Vegetative cover is in good condition with 90% coverage.

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):
PSLs must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. PSLs may be identified during preconstruction meetings or during the construction process. Please choose from the options below:

☐ PSLs determined during preconstruction meeting
☒ PSLs determined during construction
☐ No PSLs planned for construction

Type	Sheet #s

All off-ROW PSLs required by the Contractor are the Contractor's responsibility. The Contractor shall secure all permits required by local, state, federal laws for off-ROW PSLs. The contractor shall provide diagrams, areas of disturbance, acreage, and BMPs for all off-ROW PSLs within one mile of the project.

1.9 CONSTRUCTION ACTIVITIES:
(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.5.)

☒ Mobilization
☒ Install sediment and erosion controls
☒ Blade existing topsoil into windrows, prep ROW, clear and grub
☒ Remove existing pavement
☒ Grading operations, excavation, and embankment
☒ Excavate and prepare subgrade for proposed pavement widening
☒ Remove existing culverts, safety end treatments (SETs)
☐ Remove existing metal beam guard fence (MBGF), bridge rail
☒ Install proposed pavement per plans
☒ Install culverts, culvert extensions, SETs
☐ Install mow strip, MBGF, bridge rail
☒ Place flex base
☒ Rework slopes, grade ditches
☒ Blade windrowed material back across slopes
☒ Revegetation of unpaved areas
☒ Achieve site stabilization and remove sediment and erosion control measures
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

☒ Sediment laden stormwater from stormwater conveyance over disturbed area
☒ Fuels, oils, and lubricants from construction vehicles, equipment, and storage
☐ Solvents, paints, adhesives, etc. from various construction activities
☒ Transported soils from offsite vehicle tracking
☒ Construction debris and waste from various construction activities
☐ Contaminated water from excavation or dewatering pump-out water
☒ Sanitary waste from onsite restroom facilities
☒ Trash from various construction activities/receptacles
☐ Long-term stockpiles of material and waste
☒
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.11 RECEIVING WATERS:
Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody
Mustang Creek to Sandy Creek	Stream Segment No. 1213 of the Little River Basin

* Add (*) for impaired waterbodies with pollutant in ().

1.12 ROLES AND RESPONSIBILITIES: TxDOT

☒ Development of plans and specifications
☐ Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
☒ Post Construction Site Notice
☐ Submit NOI/CSN to local MS4
☒ Perform SWP3 inspections
☒ Maintain SWP3 records and update to reflect daily operations
☐ Complete and submit Notice of Termination to TCEQ
☒ Maintain SWP3 records for 3 years
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

☒ Day To Day Operational Control
☐ Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
☒ Post Construction Site Notice
☐ Submit NOI/CSN to local MS4
☒ Maintain schedule of major construction activities
☒ Install, maintain and modify BMPs
☐ Complete and submit Notice of Termination to TCEQ
☒ Maintain SWP3 records for 3 years
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.14 LOCAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) OPERATOR COORDINATION:

MS4 Entity
N/A

David P. Neumann, P.E.

STATE OF TEXAS
DAVID P. NEUMANN
83345
LICENSED PROFESSIONAL ENGINEER

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STORMWATER POLLUTION PREVENTION PLAN (SWP3)

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Sheet 1 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			093
STATE	STATE DIST.	COUNTY	
TEXAS	BRY	MILAM	
CONT.	SECT.	JOB	HIGHWAY NO.
0204	07	056	US 79

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

2.0 BEST MANAGEMENT PRACTICES (BMPs) AND CONTROLS, INSPECTION, AND MAINTENANCE

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

- ☐ ☒ Protection of Existing Vegetation
- ☐ ☒ Vegetated Buffer Zones
- ☐ ☐ Soil Retention Blankets
- ☐ ☐ Geotextiles
- ☐ ☐ Mulching/ Hydromulching
- ☐ ☐ Soil Surface Treatments
- ☒ ☐ Temporary Seeding
- ☐ ☒ Permanent Planting, Sodding or Seeding
- ☐ ☐ Biodegradable Erosion Control Logs
- ☐ ☐ Rock Filter Dams/ Rock Check Dams
- ☒ ☐ Vertical Tracking
- ☐ ☐ Interceptor Swale
- ☐ ☐ Riprap
- ☐ ☐ Diversion Dike
- ☐ ☐ Temporary Pipe Slope Drain
- ☐ ☐ Embankment for Erosion Control
- ☐ ☐ Paved Flumes
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____

2.2 SEDIMENT CONTROL BMPs:

T / P

- ☐ ☐ Biodegradable Erosion Control Logs
- ☐ ☐ Dewatering Controls
- ☐ ☐ Inlet Protection
- ☐ ☐ Rock Filter Dams/ Rock Check Dams
- ☐ ☐ Sandbag Berms
- ☒ ☐ Sediment Control Fence
- ☐ ☐ Stabilized Construction Exit
- ☐ ☐ Floating Turbidity Barrier
- ☐ ☒ Vegetated Buffer Zones
- ☐ ☐ Vegetated Filter Strips
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

Sediment control BMPs requiring design capacity calculations (See SWP3 Attachment 1.3.):

T / P

- ☐ ☐ Sediment Trap
  - ☐ Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
  - ☐ 3,600 cubic feet of storage per acre drained
- ☐ ☐ Sedimentation Basin
  - ☒ Not required (<10 acres disturbed)
  - ☐ Required (>10 acres) and implemented.
    - ☐ Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
    - ☐ 3,600 cubic feet of storage per acre drained
  - ☐ Required (>10 acres), but not feasible due to:
    - ☐ Available area/Site geometry
    - ☐ Site slope/Drainage patterns
    - ☐ Site soils/Geotechnical factors
    - ☐ Public safety
    - ☐ Other: _____

2.3 PERMANENT CONTROLS:

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

- ☒ Excess dirt/mud on road removed daily
- ☐ Haul roads dampened for dust control
- ☒ Loaded haul trucks to be covered with tarpaulin
- ☐ Stabilized construction exit
- ☒ Daily street sweeping
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

2.5 POLLUTION PREVENTION MEASURES:

- ☒ Chemical Management
- ☒ Concrete and Materials Waste Management
- ☒ Debris and Trash Management
- ☒ Dust Control
- ☒ Sanitary Facilities
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

2.6 VEGETATED BUFFER ZONES:

Natural vegetated buffers shall be maintained as feasible to protect adjacent surface waters. If vegetated natural buffer zones are not feasible due to site geometry, the appropriate additional sediment control measures have been incorporated into this SWP3.

Type	Stationing	
	From	To

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

- ☒ Fire hydrant flushings
- ☒ Irrigation drainage
- ☒ Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- ☒ Potable water sources
- ☒ Springs
- ☒ Uncontaminated groundwater
- ☒ Water used to wash vehicles or control dust
- ☒ Other allowable non-stormwater discharges as allowed by TPDES GP TXR150000.

2.8 DEWATERING:

Dewatering discharges of accumulated stormwater, groundwater, and surface water including discharges from dewatering of trenches, excavations, foundations, vaults, and other points of accumulation are prohibited unless managed by appropriate controls to prevent and minimize the offsite discharge of sediment and other pollutants.

2.9 INSPECTIONS:

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3.

When dewatering activities are present, a daily inspection will be conducted once per day during those activities and documented in accordance with CGP and TxDOT requirements.

2.10 MAINTENANCE:

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3.

David P. Neumann, P.E.

STATE OF TEXAS
DAVID P. NEUMANN
83345
LICENSED
PROFESSIONAL ENGINEER

2024.06.04
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STORMWATER POLLUTION PREVENTION PLAN (SWP3)

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Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			094
STATE	STATE DIST.	COUNTY	
TEXAS	BRY	MILAM	
CONT.	SECT.	JOB	HIGHWAY NO.
0204	07	056	US 79

During the planning phase of project development the following environmental permits, issues and commitments have been developed during coordination with resource agencies, local governmental entities and the general public. Any change orders and/or deviations from the final design must be reported to the Engineer prior to the commencement of construction activities. As additional environmental clearances may be required.

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.

☐ Required Action ☒ No Action Required

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.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction

1.

2.

Refer to 2014 TxDOT Standard Specification Items:
7.7.2 Texas Pollutant Discharge Elimination System (TPDES) Permits and Storm Water Pollution Prevention PLans (SWP3)
506 Temporary Erosion, Sedimentation and Environmental Controls
734 Litter Removal
735 Debris Removal
738 Cleaning and Sweeping Highways

II. WORK IN OR NEAR STREAMS, WATER BODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas.
The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

☒ No Permit Required

☐ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)

☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)

☐ Individual 404 Permit Required

☐ Other Nationwide Permit Required: NWP#

Required Actions: List locations of waters of the US.

1.

Information regarding the USACE Nationwide Permit Program can be found at:
http://www.swf.usace.army.mil/Missions/Regulatory/Permitting/GeneralPermits.aspx

Refer to 2014 TxDOT Standard Specification Items:
7.7.3 Work in Waters of the United States
7.7.6 Project Specific Locations
496 Removing Structures
506 Temporary Erosion, Sedimentation and Environmental Controls
506.4.3.4 Restricted Activities and Required Precautions

III. CULTURAL RESOURCES

Refer to 2014 TxDOT Standard Specification Item 7.7.1 Cultural Resources, in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) immediately cease work in the vicinity and contact the Engineer.

☐ Required Action ☒ No Action Required

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.

☒ Required Action ☐ No Action Required

Action No.

1) Tree removal to be done in accordance with the Migratory Bird Treaty Act.

Refer to 2014 TxDOT Standard Specification Items:
160 Topsoil
161 Compost
162 Sodding for Erosion Control
164 Seeding for Erosion Control
166 Fertilizer
168 Vegetative Watering
169 Soil Retention Blankets
170 Irrigation System
180 Wildflower Seeding
192 Landscape Planting
193 Landscape Establishment
506 Temporary Erosion, Sedimentation, and Environmental Controls
730 Roadside Mowing
751 Landscape Maintenance
752 Tree and Brush Removal

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

☒ Required Action ☐ No Action Required

Action No.

1. Do not kill snakes or other animals!
2. Do not destroy nests on structures within the project limits.

   Temporarily prevent the building of nests on any structures that require work within the project limits during the construction timeframe.

   This can be accomplished by application of bird repellant gel, netting, or removal by hand every 3-4 days.

   The nesting/breeding season for migratory birds is March 1 - September 1.

Under the Migratory Bird Treaty Act (MBTA), it is unlawful by any means or manner, to pursue, hunt, take, capture, [or] kill any migratory birds except as permitted by regulation (16 U.S.C. 703-704). Neither the statute nor its implementing regulations (Title 50, Code of Federal Regulations, Parts 10, 13, 21) exempt unintentional take of migratory birds. The unauthorized take (e.g. killing, capturing, or collecting) of migratory birds is a strict liability criminal offense that does not require knowledge or specific intent on the part of the offender. Even when engaged in an otherwise lawful activity for which the intent is not the killing of migratory birds, a violation may be committed.

3. If caves or sinkholes are discovered, cease work in the immediate area to verify the presence or absence of wildlife.
4. BMPs for T and E species will be discussed at the preconstruction meeting.

The Bryan District Environmental Section can be contacted at (979) 778-9766 to assist with the removal of wildlife that will not leave on their own with gentle persuasion.

Refer to 2014 TxDOT Standard Specification Item:
7.7.6 Project Specific Locations

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 appropiate 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 Engineerimmediately. The Contractor shall be responsiblefor the proper containment and cleanup of all product spills.

Contact the Engineer if any of the follwing are detected:
* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

Does the project involve any bridge class structure rehabilitation or replacements (bridge class structures not including box culverts)?

☐ Yes ☒ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

☐ Yes ☒ No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notifiy 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 discoverd on site. Hazardous Materials or Contamination Issues Specific to this Project:

☒ Required Action ☐ No Action Required

Action No.

1. The Clean Water Act, in part, requires that any spill of oil that could enter a waterway, as defined by the Act, and that violates applicable water quality standards or causes a film or sheen on water require reporting to the TCEQ and local authorities.
   Contact the Bryan District Enviromental Section at 979-778-9766.

   If potentially hazardous material and/or contaminated media (i.e. soil, groudwater, surface water, sediment, building materials) are unexpectedly encountered during construction, immediately cease work in the vicinity and contact the Engineer.

   Refer to 2014 TxDOT Standard Specification Items:
   6.10 Hazardous Materials
   7.12 Responsibility for Hazardous Materials

VII. OTHER ENVIRONMENTAL ISSUES

☐ Required Action ☒ No Action Required

Action No.

1.

Refer to 2014 TxDOT Standard Specification Items:
7.7.6 Project Specific Locations
751 Landscape Maintenance

Contacts:

Mr. John D. Moravec
Environmental Coordinator
Texas Department of Transportation
Bryan District
2591 N. Earl Rudder Freeway
Bryan, TX 77803
Phone: (979) 778-9766
Fax: (979) 778-9702
e-mail: John.Moravec@txdot.gov

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ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79
STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM
CONTROL	SECTION	JOB / SHEET NO.
0204	07	056 / 095

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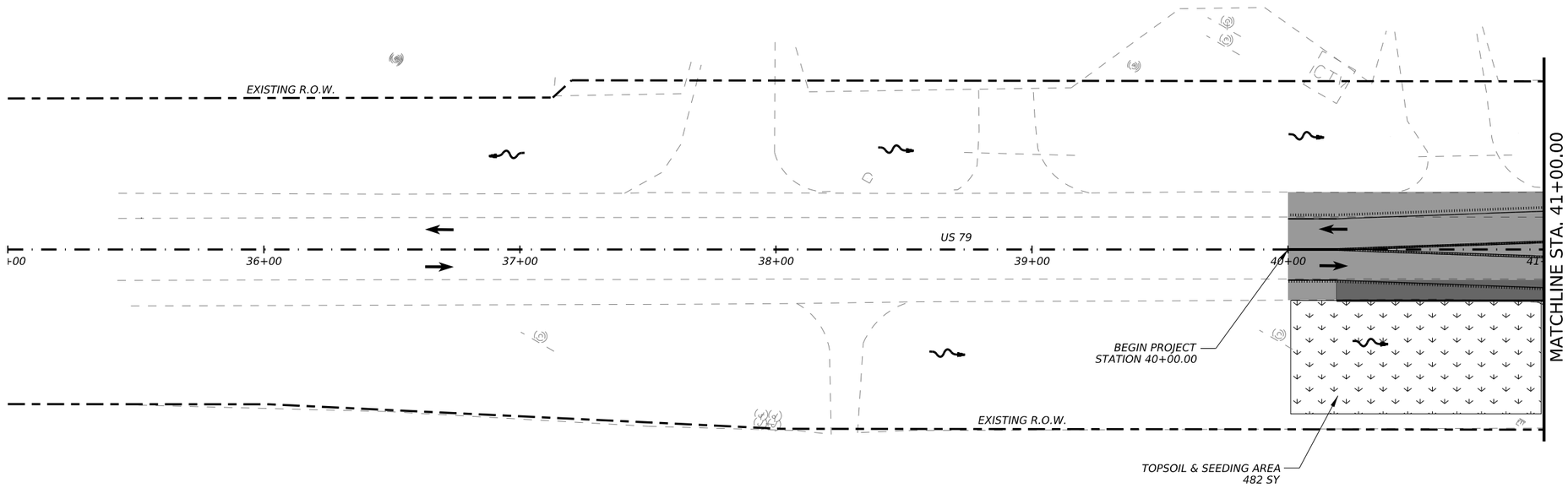

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   EROSION CONTROL QUANTITIES LISTED ARE APPROXIMATE AND MAY NEED TO BE VARIED TO MEET FIELD CONDITIONS.

ENV LEGEND

- SEEDING AREA
- AREA OF OVERLAY
- AREA OF WIDENING / OVERLAY
- SCF — SEDIMENT CONTROL FENCE
- CL-D — EROSION CONTROL LOGS AT DROP INLET
- CL-C — EROSION CONTROL LOGS AT CURB INLET
- RFD2 — ROCK FILTER DAM TYPE 2
- DRAINAGE FLOW ARROWS

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STATE OF TEXAS
DAVID P. NEUMANN
83345
LICENSED
PROFESSIONAL ENGINEER

David P. Neumann, P.E.

Lochner
TBPE Firm Reg. No. 10488

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ENVIRONMENTAL LAYOUT (US 79)

SHEET 1 OF 6

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79

STATE	DISTRICT	COUNTY	
TEXAS	BRY	MILAM	
CONTROL	SECTION	JOB	SHEET NO.
0204	07	056	096

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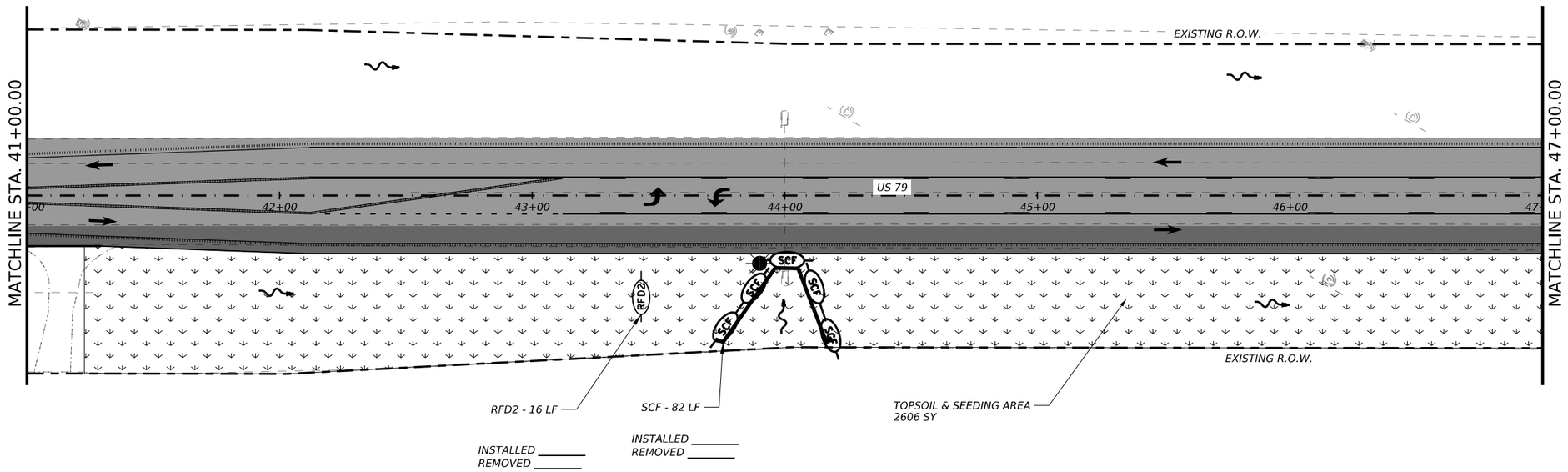

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ENVIRONMENTAL LAYOUT (US 79)

SHEET 2 OF 6

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79
STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM
CONTROL	SECTION	JOB / SHEET NO.
0204	07	056 / 097

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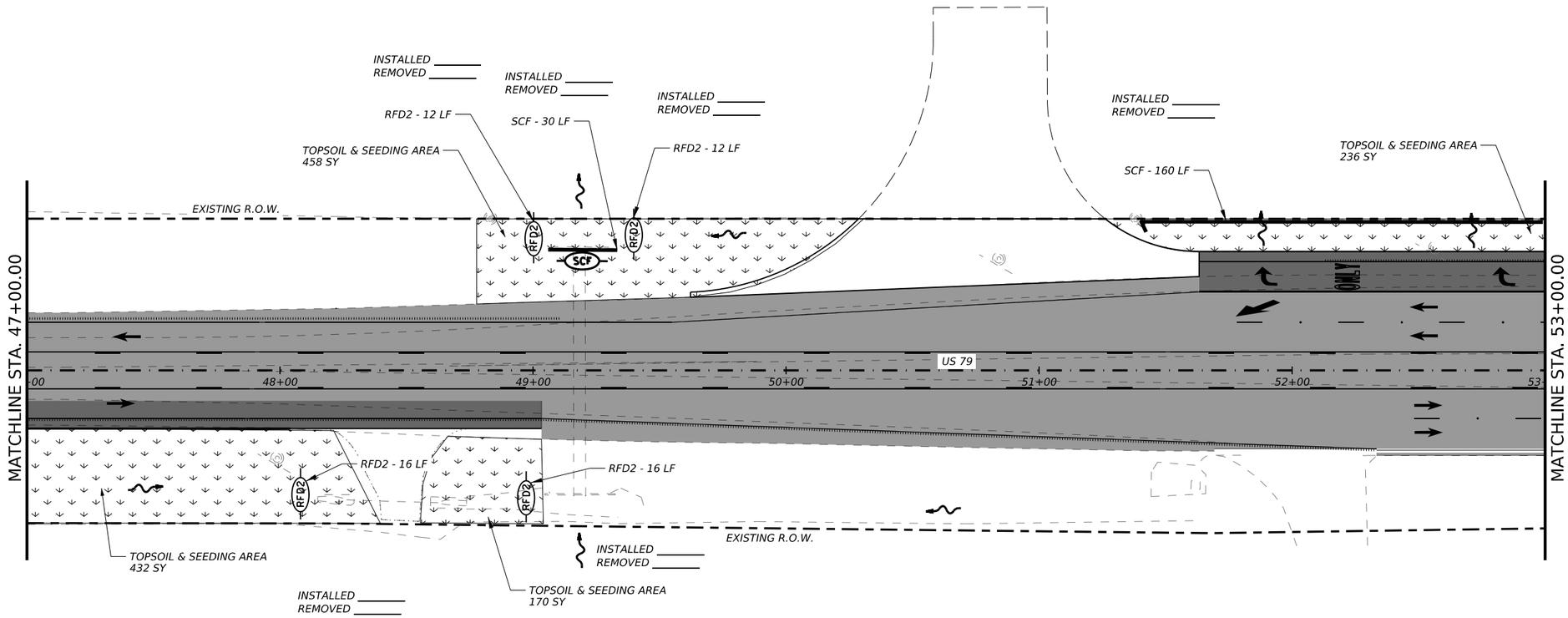

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ENVIRONMENTAL LAYOUT (US 79)

SHEET 3 OF 6

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79

STATE	DISTRICT	COUNTY	
TEXAS	BRY	MILAM	
CONTROL	SECTION	JOB	SHEET NO.
0204	07	056	098

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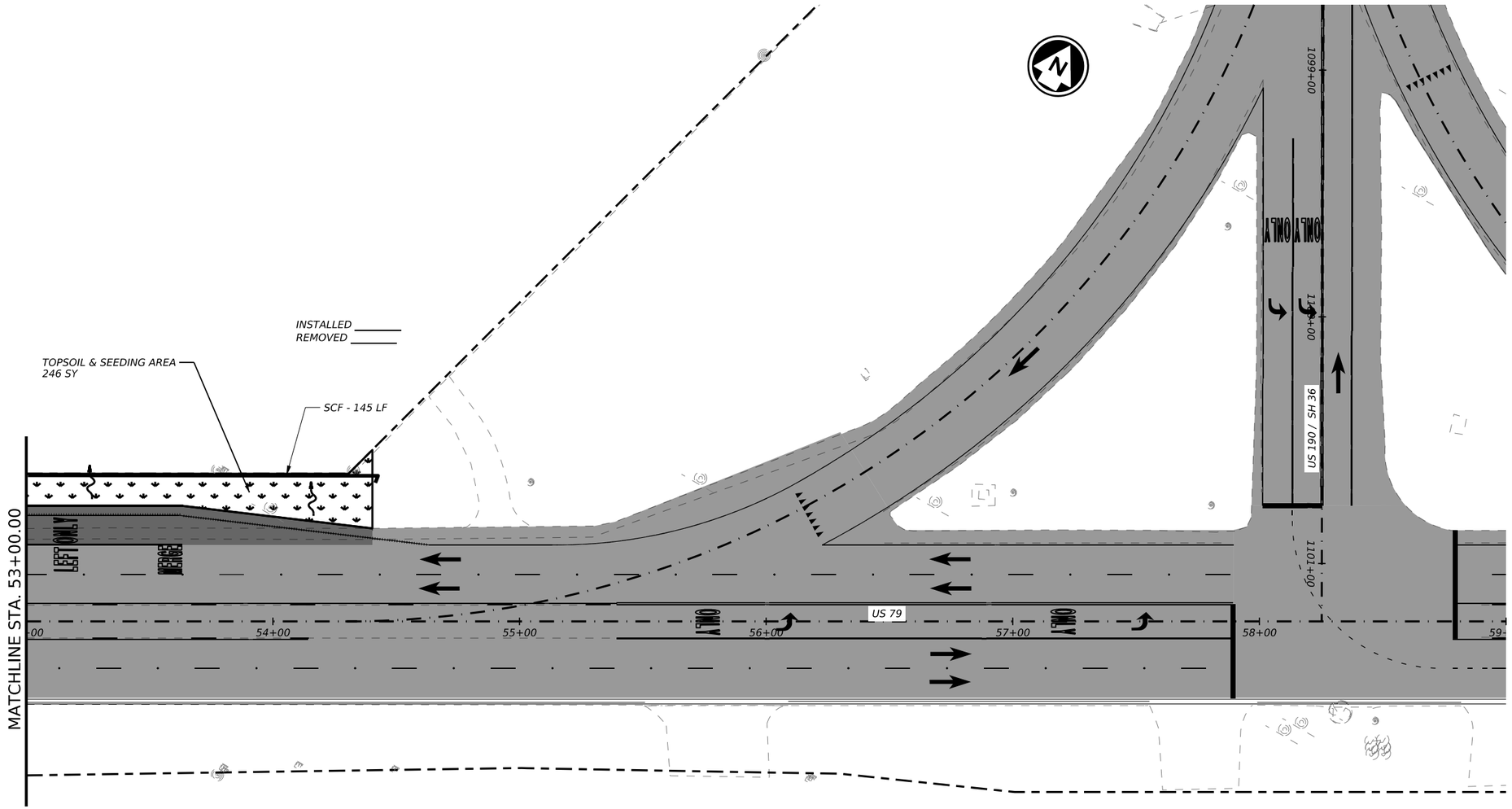

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- DRAINAGE FLOW ARROWS

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ENVIRONMENTAL LAYOUT (US 79)

SHEET 4 OF 6

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79

STATE	DISTRICT	COUNTY	
TEXAS	BRY	MILAM	
CONTROL	SECTION	JOB	SHEET NO.
0204	07	056	099

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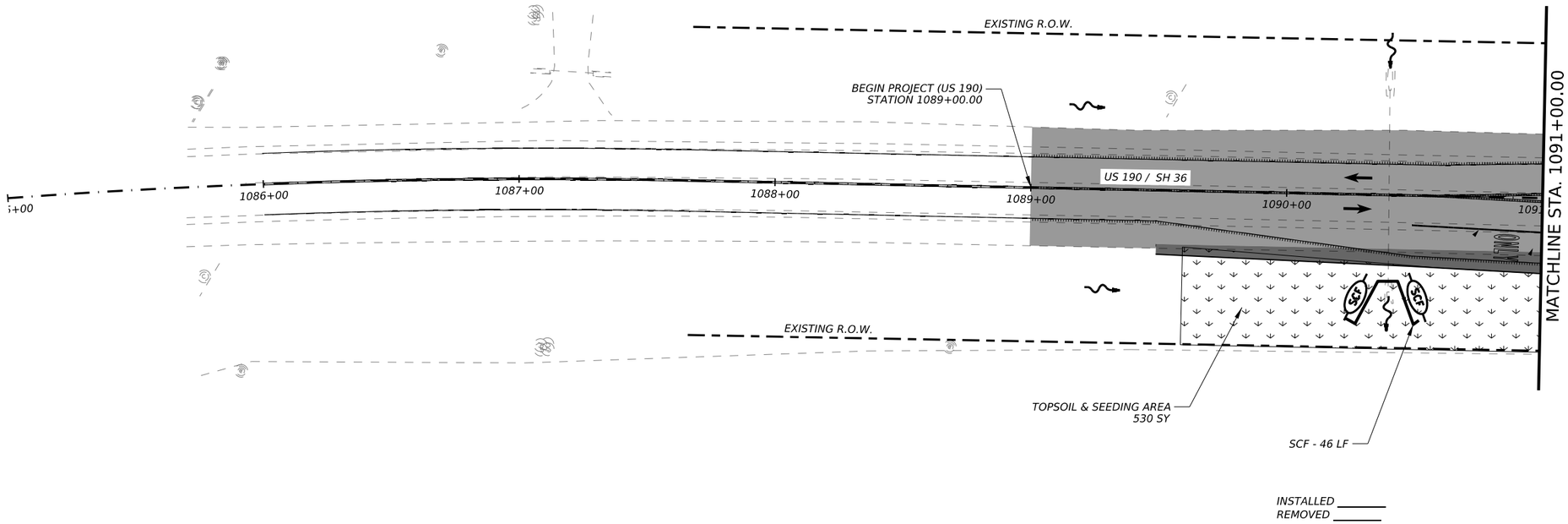

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ENVIRONMENTAL LAYOUT (US 190 / SH 36)

SHEET 5 OF 6

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79

STATE	DISTRICT	COUNTY	
TEXAS	BRY	MILAM	
CONTROL	SECTION	JOB	SHEET NO.
0204	07	056	100

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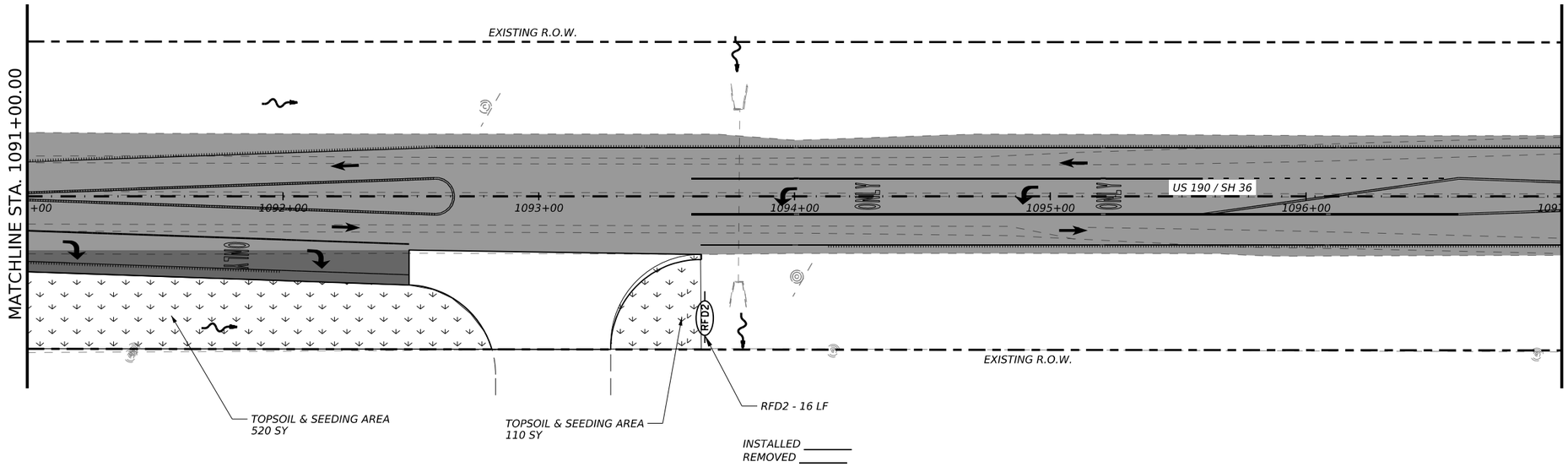

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ENVIRONMENTAL LAYOUT (US 190 / SH 36)

SHEET 6 OF 6

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79

STATE	DISTRICT	COUNTY	
TEXAS	BRY	MILAM	
CONTROL	SECTION	JOB	SHEET NO.
0204	07	056	101

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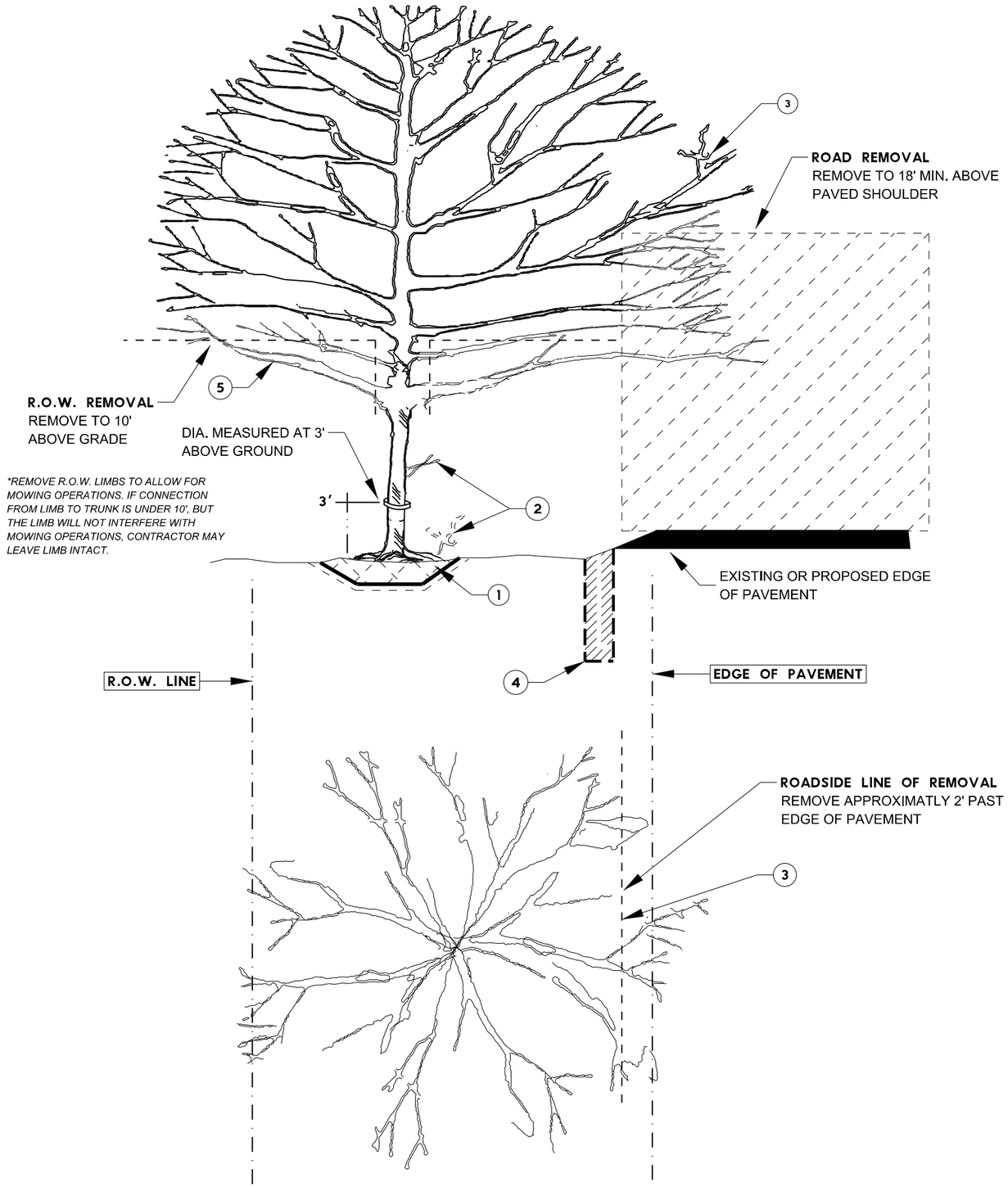

TYPICAL TREE PRUNING

SHEET LEGEND

1. When tree is to be removed, remove stump to 12" below grade, for an area 9 time the size of the trunk at grade
2. Remove suckers and water sprouts as directed in the plans or by the Engineer
3. Only clean limbs that extend past the line of removal. Remove dead limbs to nearest live branch. Prune according to these plans or as directed by the Engineer. **Cut back any limbs that overhang the roadway, that appear to have weak or damaged joint connections.**
4. New road locations and widenings may require root prune trenching prior to beginning major earthwork operations. see root pruning for details. Locations will be marked elswhere in the plans and paid subsidary to Item 100, including trench backfilling.
5. Where large limbs (6" and greater) are removed, over roads, prune opposing side of tree in order balance the tree.

ROOT PRUNING

1. Root pruning shall be completed after the installation of tree protection but prior to any earthwork operation in the vicinity or protected trees.

2. Flag/Mark area of pruning operation prior to beginning work. Allow for inspection and approval by the Engineer prior to beginning work.

3. When tree protection devices interfere with pruning operation, remove the minimum amount devices necessary, immediately prior to pruning and replace devices immediately after operation. No vehicles are allowed in the protection areas even when protection devices are temporarily removed.

4. Appropriate application(s) shall be selected by the Engineer. Applications may consist of Air-Blast Trenching with manual pruning, Earth-Saw Trenching, conventional Chain Trenching. Root pruning shall be accomplished using only the application(s) stated in the General Notes for Item 100.

5. When Earth-Saw Trenching and conventional Chain Trenching are used, a cutting width of no more than 6" may be performed.

6. When conventional Chain Trenching is used, all roots, with a diameter, over 1-1/2" shall be manually pruned back, after trenching operation, to the nearest undamaged section of root.

7. Root pruning is to done to a depth of 12", unless otherwise shown in the plans.

TABLE 1

TREE AND BRUSH REMOVAL/PRUNING PAYMENT ITEMS

PAY ITEM	UNIT	DESCRIPTION
100 6001	AC	PREPARING ROW
100 6002	STA	PREPARING ROW

TABLE 2

TREE TRUNK SIZE FOR TREE REMOVAL PAYMENT

		RANGE FOR PAY ITEMS	
		TRUNK DIAMETER (CIRCUMFERENCE) IN INCHES	
PAY ITEM	UNIT	LOWER LIMIT IS GREATER THAN	UPPER LIMIT IS LESS THAN OR EQUAL TO
100 6003	EA	4 (12-1/2)	12 (37-1/2)
100 6004	EA	12 (37-1/2)	24 (75-1/2)
100 6005	EA	24 (75-1/2)	30 (94)
100 6006	EA	4 (12-1/2)	24 (75-1/2)
100 6007	EA	24 (75-1/2)	84 (264)

*SEE SHEET NOTE 4

SHEET NOTES

TREE PRUNING:

1. Prune and remove all tree limbs, that are directly above and extending over pavement or bridge surface 18' above pavement surface or bridge deck elevation.

2. Prune and remove all tree limbs, above the Right of Way, to a minimum height of 10' above natural grade or other structure elevation, unless otherwise shown in the plans.

TREE AND BRUSH REMOVAL:

3. For trees marked for removal, the diameter of the tree is determined by measurement of the trunk circumfrence at 3' above grade. Trees with trunk diameters of less than 4" are considered Brush. Trees with multiple trunks at the point of measurment are paid for seperatly, except when individual trunk diameters are less than 4" each. Multi-trunk trees with indivual trunk diameters less than 4" each will be paid as Brush.

4. Remove all brush to within 1" of ground surface.

5. Measuement ranges for Tree Removal are shown in Table 2.

6. Pay Items by the centerline mile, include all Tree Trimming and/or Brush Removal in the right of way on both sides of the road. For divided highways, the median is included. For highways with frontage roads, the areas between the frontage roads and main lanes, and the areas outside of the frontage roads are included.

7. Perform Tree Pruning and Brush Removal operations in Non-Mowing areas only when directed to do so in the plans.

TREE AND BRUSH REMOVAL (CHANNEL):

8. Brush Removal and Tree Trimming, in and along channels and easements are paid for by the acre, as Item 100-6001 for areas designated on the plans.

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TREE PRUNING & TREE AND BRUSH REMOVAL (For Design)

SHEET 1 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79
STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM
CONTROL	SECTION	JOB / SHEET NO.
0204	07	056 / 102

REV DATE: 1-31-2023
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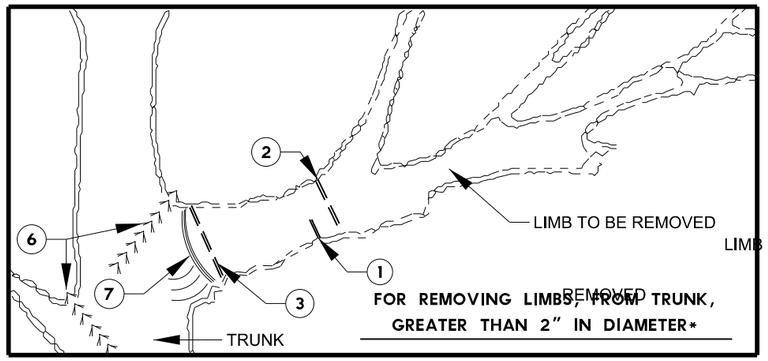
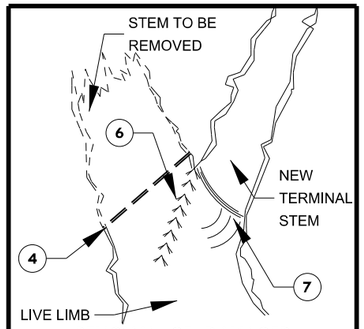
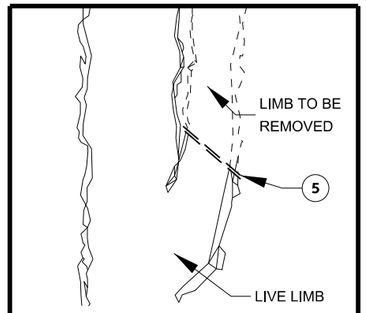


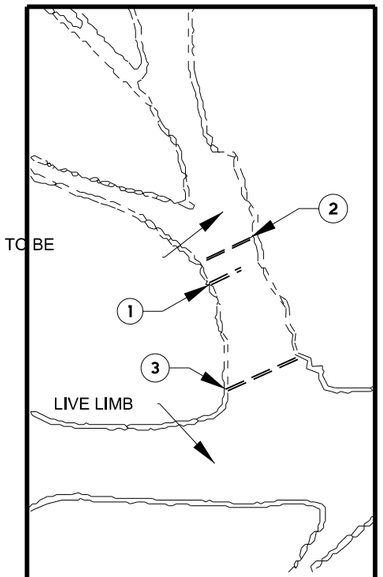
FOR REMOVING LIMBS, FROM TRUNK, GREATER THAN 2" IN DIAMETER*



REMOVAL OF DAMAGED PARENT STEM

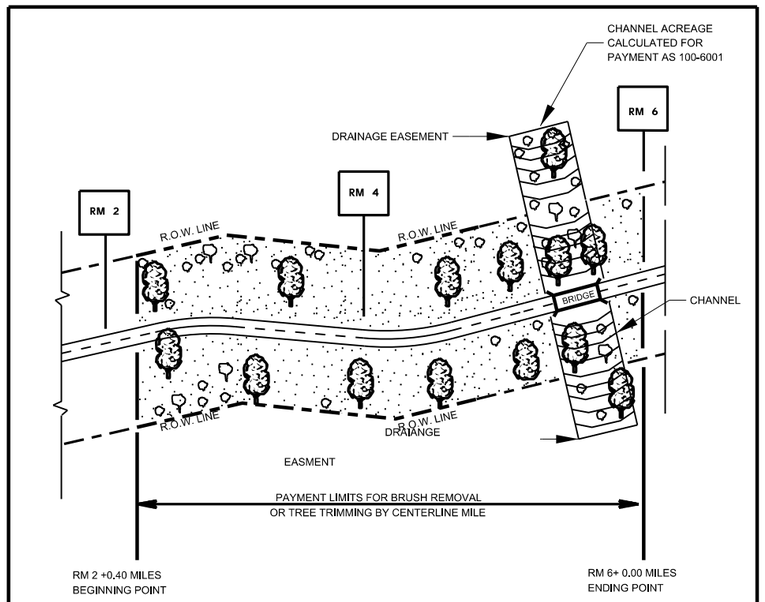


REMOVAL OF BRANCH WITH NARROW ANGLE OF ATTACHMENT



FOR REMOVING LIMBS, FROM LIVE LIMB, GREATER THAN 2" IN DIAMETER*

*Limbs under 2" diameter may be cut with single pass 1/2" beyond branch bark collar



NOTE:
BRUSH REMOVAL AND TREE TRIMMING UNDER BRIDGES, IN AND ALONG CHANNELS AND EASEMENTS ARE PAID FOR BY THE ACRE FOR AREAS DESIGNATED ON THE PLANS.

EXAMPLE: UNDIVIDED HIGHWAY

SHEET LEGEND

1. FIRST CUT-12" FROM TRUNK OR LIVE LIMB. CUT FROM BOTTOM OF LIMB UP 2/3 LIMB DIAMETER.
2. SECOND CUT-2" OR MORE AWAY FROM FIRST CUT. CUT FROM TOP OF LIMB DOWN FULLY THROUGH LIMB.
3. FINAL CUT-1/2" FROM BRANCH COLLAR AND BARK RIDGE OR LIVE LIMB. DO NOT FLUSH CUT. IF BRANCH COLLAR OR BARK RIDGE ARE NOT DISCERNABLE AT TRUNK CONNECTIONS, CUT LIMB 1" AWAY FROM TRUNK DOWNWARDS AT 90° FROM THE TOP ANGLE OF LIMB
4. CUT TO REDUCE LENGTH OF A PARENT STEM OR BRANCH. MAKE CUT JUST BEYOND NEAREST CONNECTING LIMB. MAKE CUT ANGLE BETWEEN BRANCH BARK RIDGE AND PERPINDICULAR TO REMOVED LIMB.
5. NARROW ATTACHMENT ANGLE LIMB REMOVAL. MAKE CUT FROM OUTSIDE OF THE BRANCH TO PREVENT DAMAGE TO THE PARENT BRANCH. THIS CUT SHOULD BE MADE AFTER THE REMOVAL OF MAJORITY OF REMOVED LIMB WEIGHT.
6. BRANCH BARK RIDGE
7. BRANCH COLLAR

SHEET NOTES

PREVENTING SPREAD OF DISEASE:

1. All care should be taken to prevent the spread of disease and disease carrying vectors for trees and brush.

2. Special instructions for disease prevention shall be outlined in the General Notes for Item 100.

3. Contractor shall alert the Engineer in the event that diseased material is found on the project site. Additional information and requirements for removal will be given to the Contractor after evaluation by the Engineer.

4. Do not use cutting equipment, on healthy trees, that had been previously used on diseased trees and brush, without first properly sanitizing cutting equipment. Sanitizing information will be given in the General Notes or by the Engineer.

PRUNING STANDARDS:

5. Standards developed using ***ANSI A300*** *(PART 1)-2008.* Review **ANSI** document for pruning practices not covered in these sheets.

SAFETY STANDARDS:

6. Contractor shall follow ***ANSI*** Document ***Z133.1 2012****: Safety Requirement for Arboriculture Operations*.

7. Contractor shall comply with related ***OSHA*** Standards of the Tree Care Industry ***Section 1910*** *Subparts D,H,I,K,R,S, and Z*

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TREE PRUNING & TREE AND BRUSH REMOVAL (For Design)

SHEET 2 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79
STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM
CONTROL	SECTION	JOB / SHEET NO.
0204	07	056 / 103

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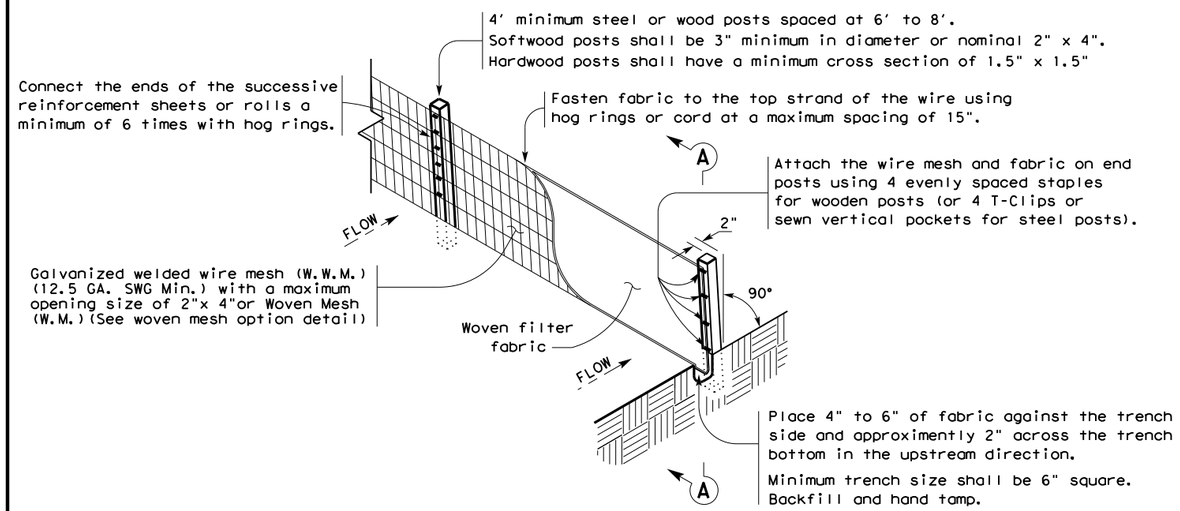
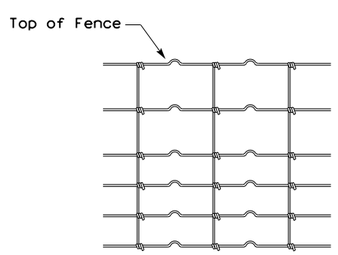
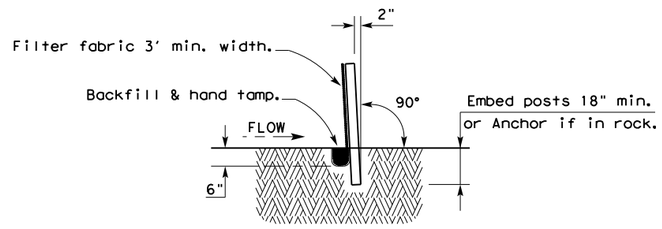


TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA.SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

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

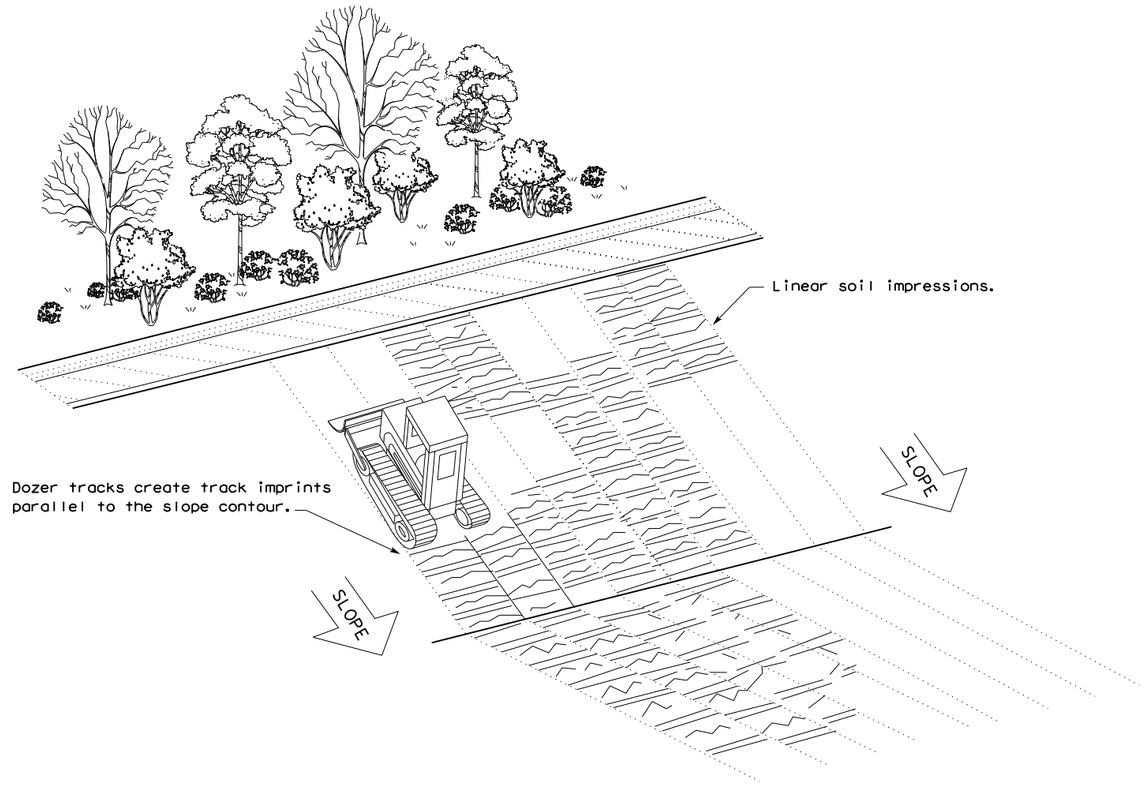
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



VERTICAL TRACKING

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

EC(1)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS	
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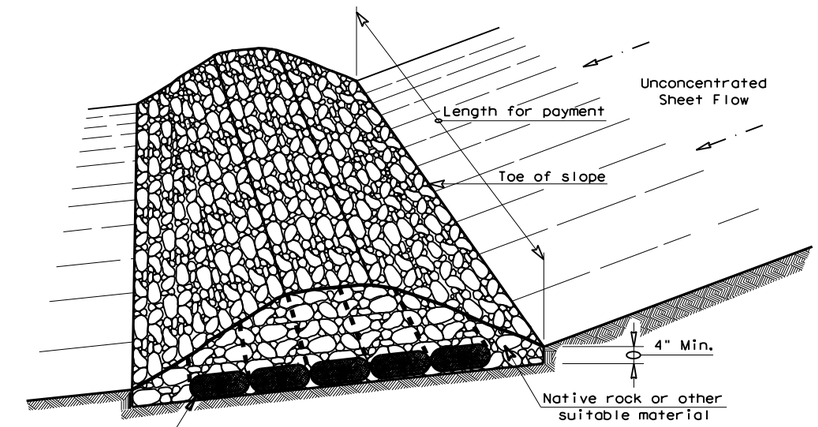
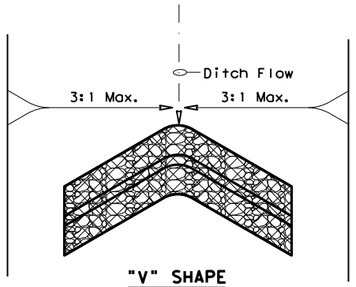


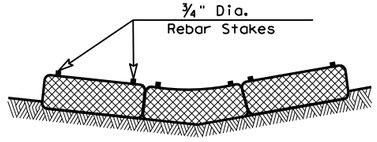
FILTER DAM AT TOE OF SLOPE

RFD1

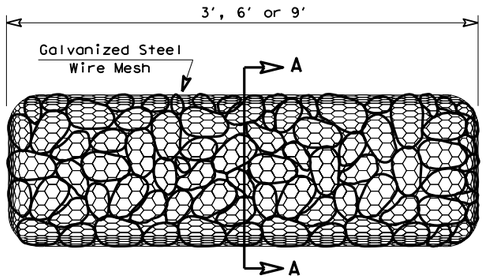


"V" SHAPE PLAN VIEW

PLAN VIEW

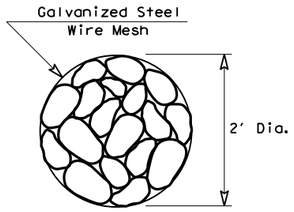


SECTION B-B

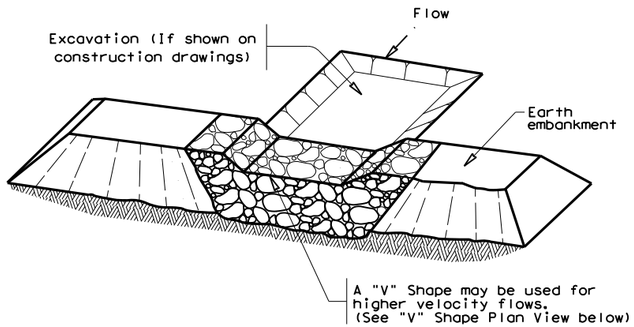


TYPE 4 (SACK GABIONS)

RFD4

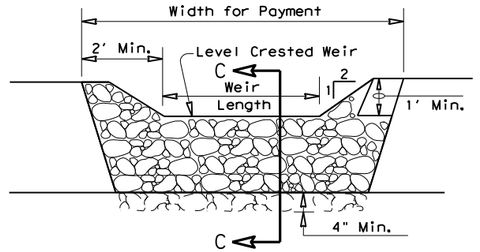


SECTION A-A

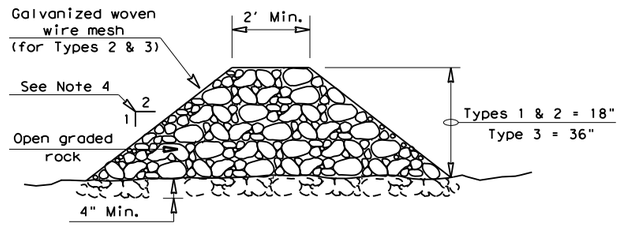


FILTER DAM AT SEDIMENT TRAP

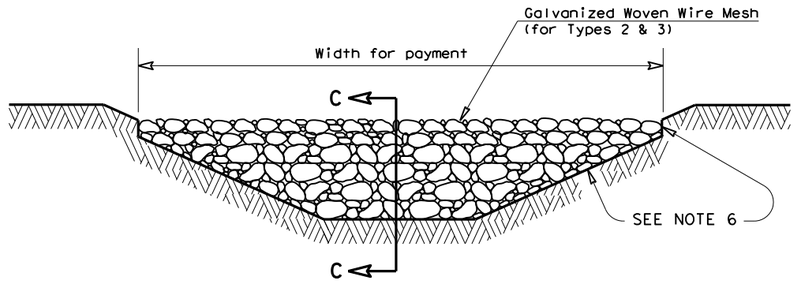
RFD1 — OR — RFD2



PROFILE



SECTION C-C



FILTER DAM AT CHANNEL SECTIONS

RFD1 — OR — RFD2 — OR — RFD3

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with ¾" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 ½" x 3 ¼"
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT^2 of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximently 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh) (3" to 6" aggregate): Type 2 may be used in ditches and at dike or swale outlets.

Type 3 (36" high with wire mesh) (4" to 8" aggregate): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions) (3" to 6" aggregate): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

Type 5: Provide rock filter dams as shown on plans.

PLAN SHEET LEGEND

Type 1 Rock Filter Dam	RFD1
Type 2 Rock Filter Dam	RFD2
Type 3 Rock Filter Dam	RFD3
Type 4 Rock Filter Dam	RFD4

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

ROCK FILTER DAMS

EC(2)-16

FILE: ec216	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
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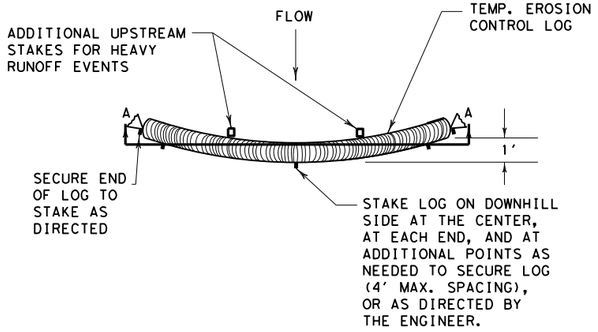
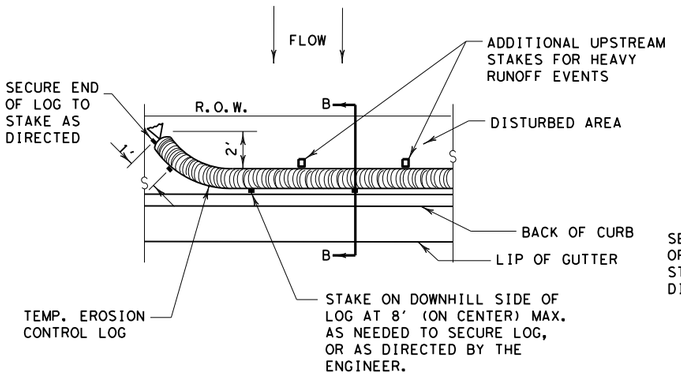


PLAN VIEW



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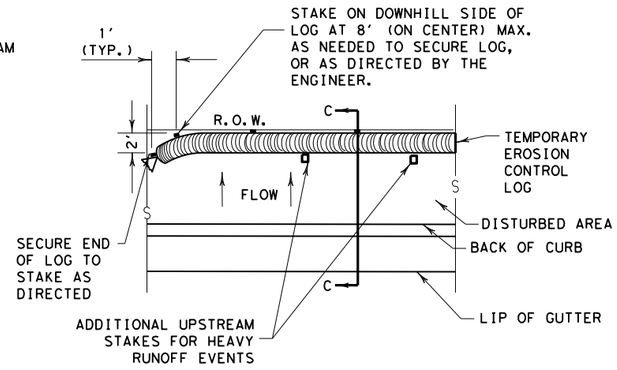
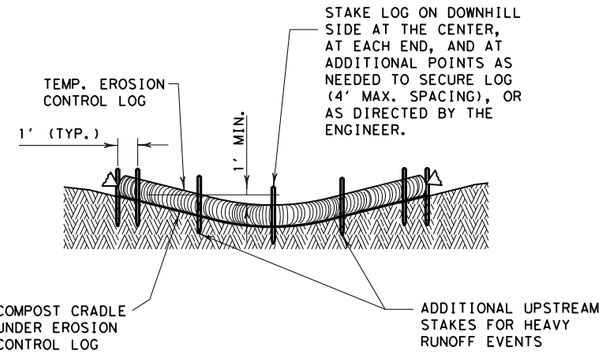


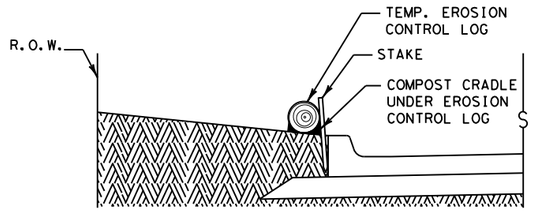
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

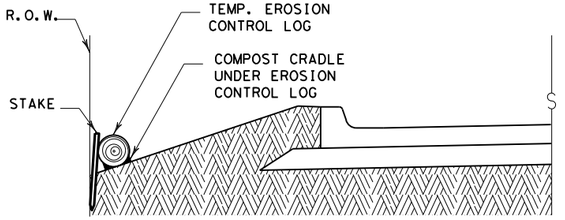
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

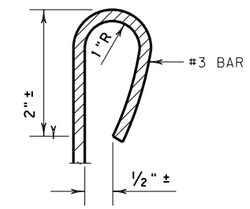
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



REBAR STAKE DETAIL

LEGEND

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

GENERAL NOTES:

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

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.

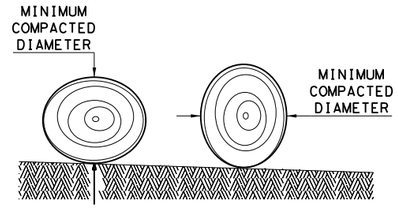
Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

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

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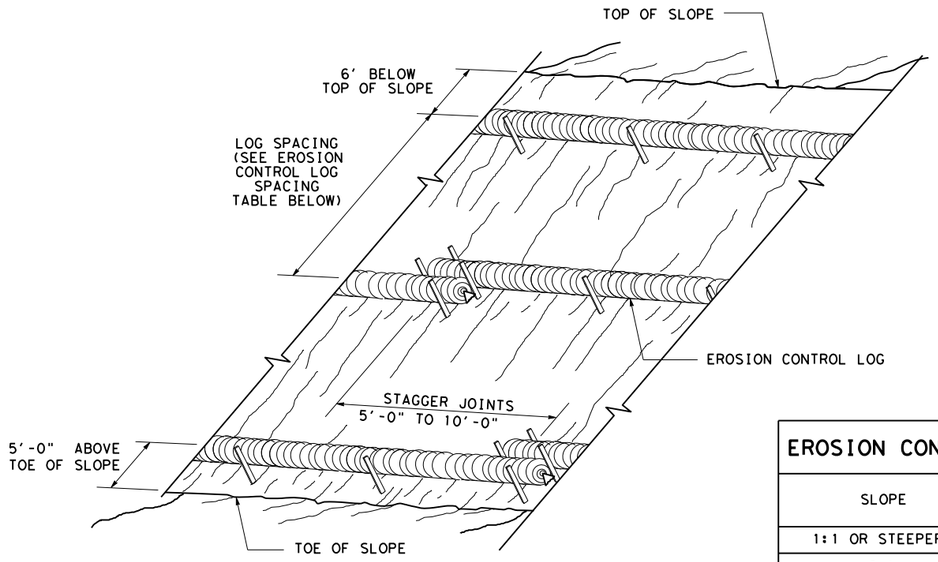
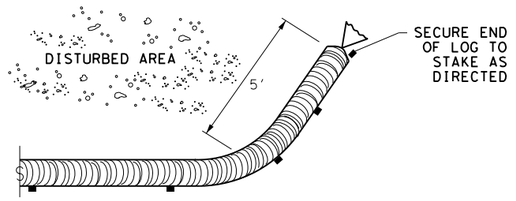


EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

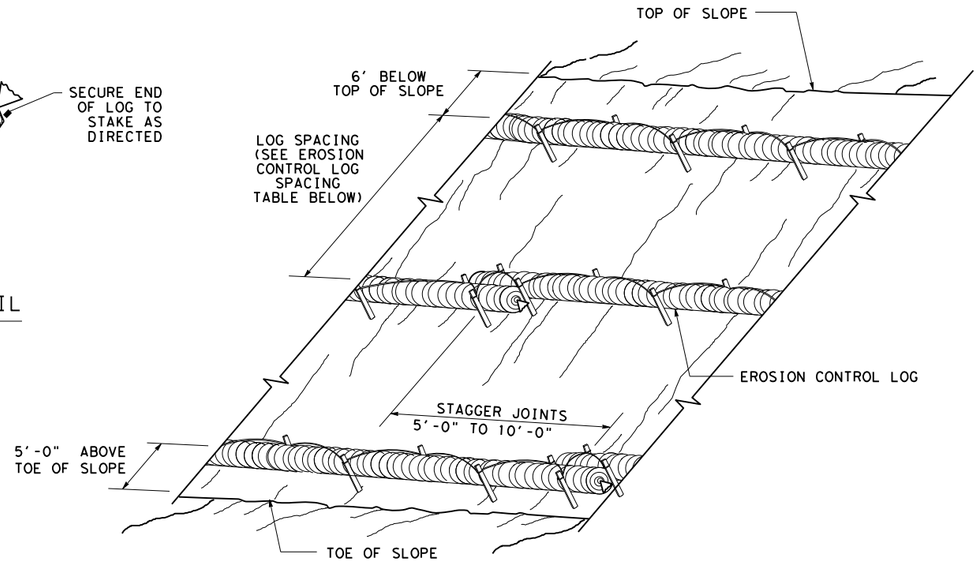
CL-SST



END SECTION RAP DETAIL

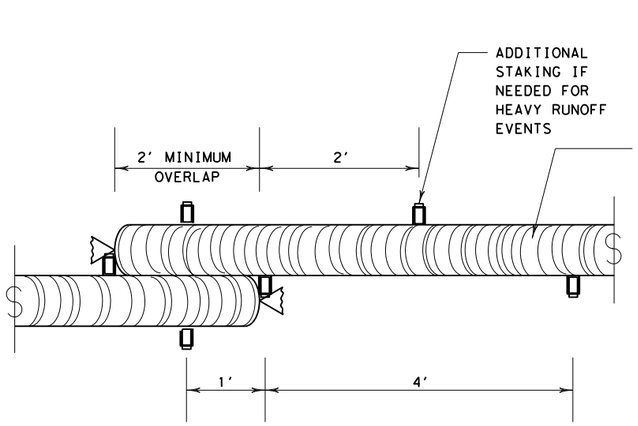
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

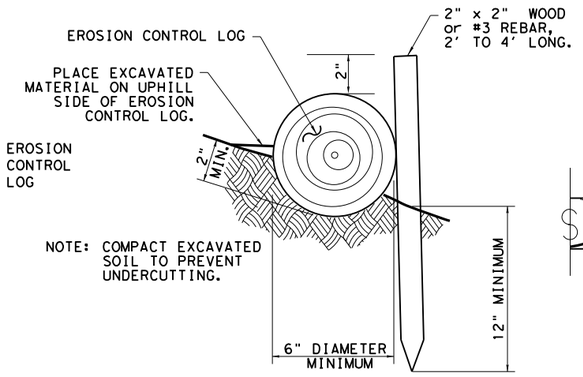
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

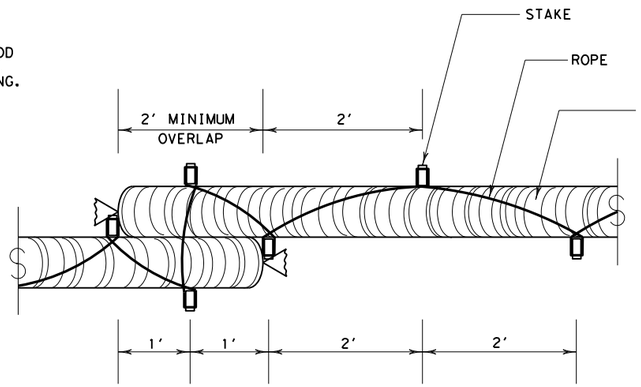


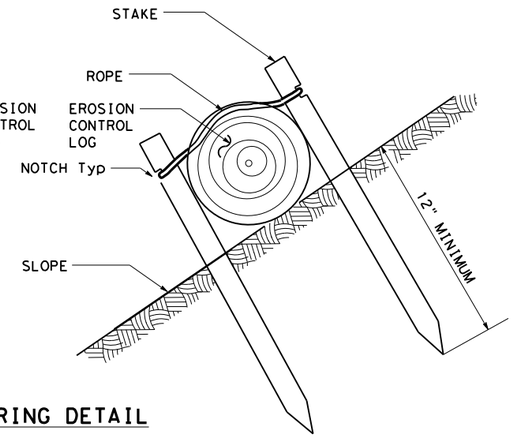


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

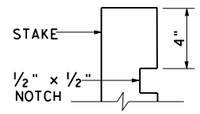
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

Texas Department of Transportation

Design Division Standard

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

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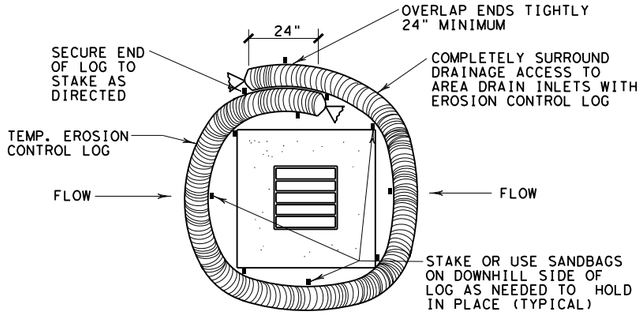
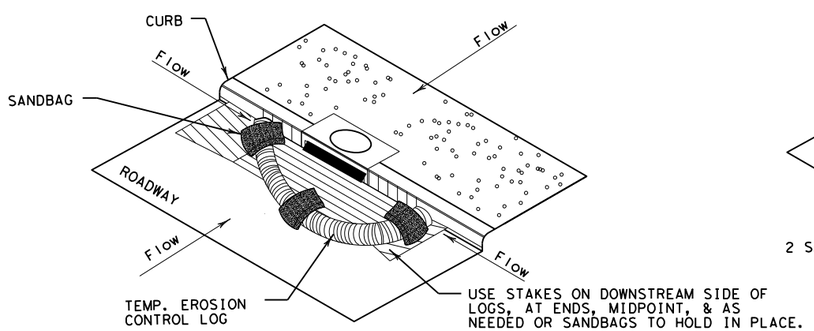


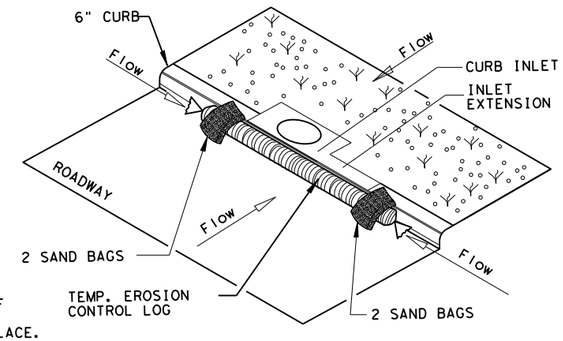
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

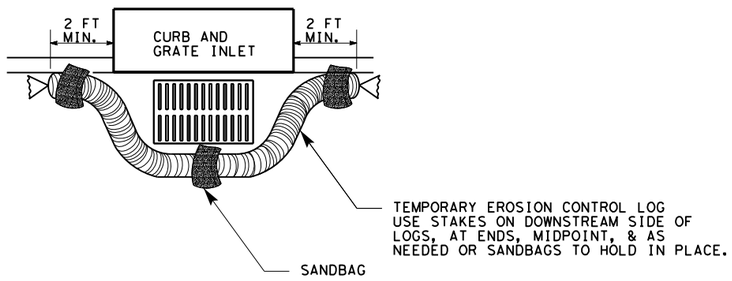
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

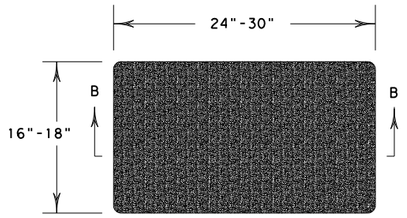
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



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

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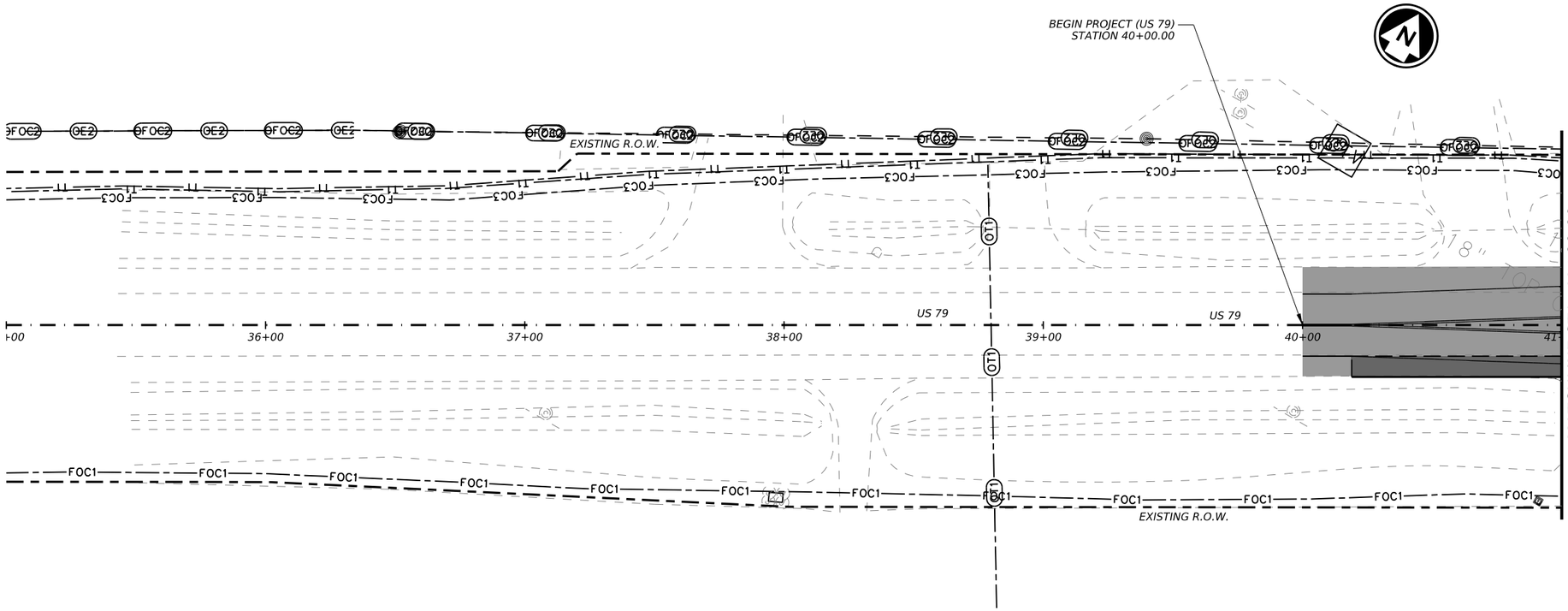

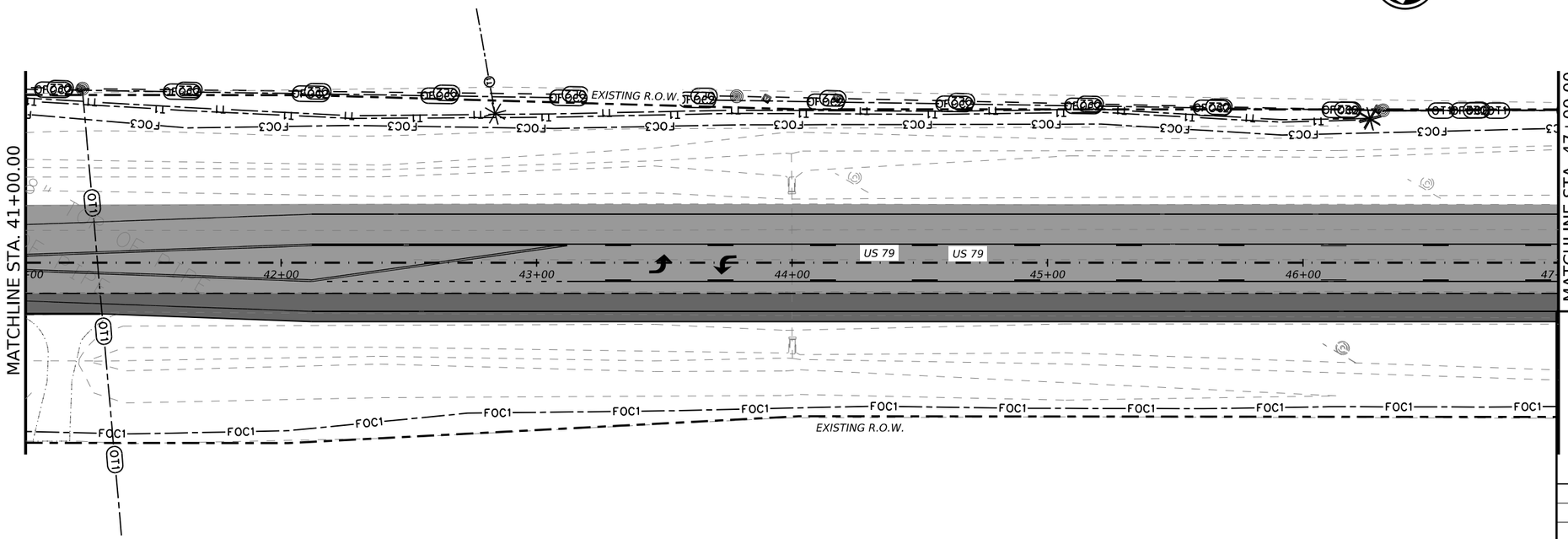

LEGEND OF UTILITY TYPES

COMMUNICATIONS	QL "B"
BRIGHTSPEED (UG)	T1
BRIGHTSPEED (FOC)	FOC1
SUDDENLINK (FOC)	FOC2
AT&T (FOC)	FOC3
	QL "D"
BRIGHTSPEED (UG)	T1
BRIGHTSPEED (OVH)	OT1
BRIGHTSPEED (FOC)	FOC1
SUDDENLINK (FOC OV)	OFOC2
AT&T (FOC)	FOC3
ELECTRIC/POWER	QL "D"
BARTLETT ELECTRIC COOP (OVH)	OE1
	QL "C/D"
ONCOR DISTRIBUTION (OVH)	OE2

LEGEND OF UTILITY SYMBOLS

- LEVEL STATUS CHANGE
- TELEPHONE PEDESTAL
- CABLE TV PEDESTAL
- GENERIC JUNCTION BOX
- STORM SEWER MANHOLE
- POWER POLE
- *AREA OF OVERLAY*
- *AREA OF WIDENING / OVERLAY*

2024.06.04 13:14:43-05'00'

STATE OF TEXAS
DAVID P. NEUMANN
83345
LICENSED
PROFESSIONAL ENGINEER

David P. Neumann, P.E.

Lochner
TBPE Firm Reg. No. 10488

0 25 50

PRINT DATE	REVISION DATE
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EXISTING UTILITY LAYOUT (US 79)

SHEET 1 OF 4

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79
STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM
CONTROL	SECTION	JOB / SHEET NO.
0204	07	056 / 109

REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
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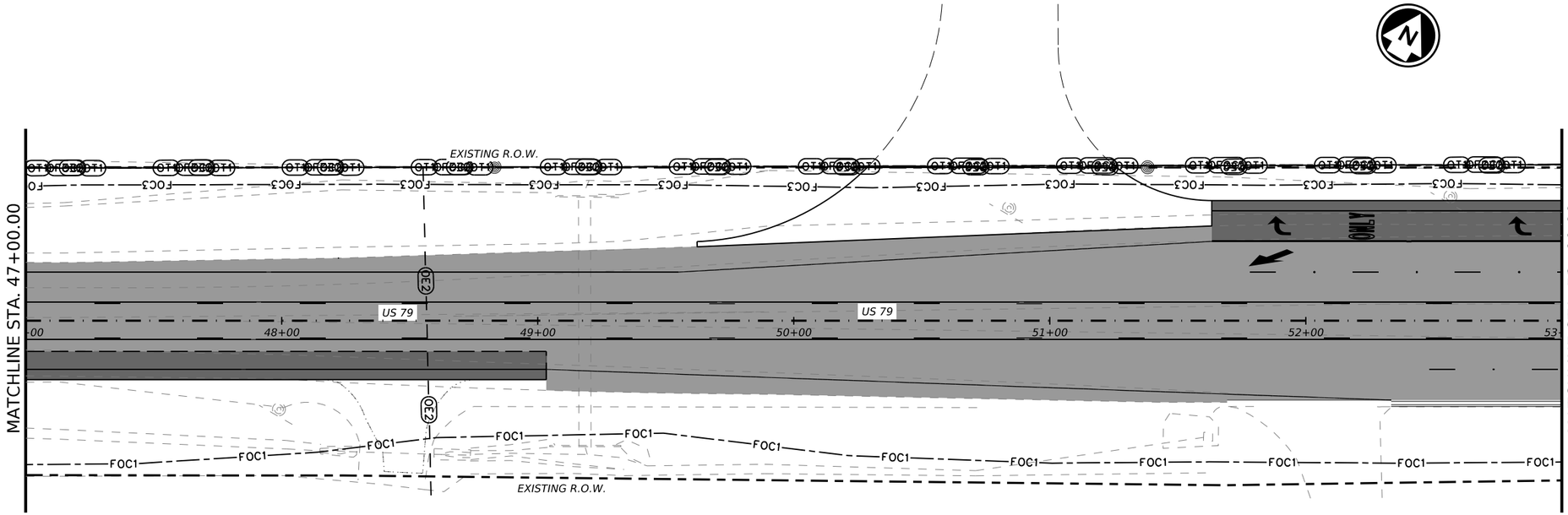
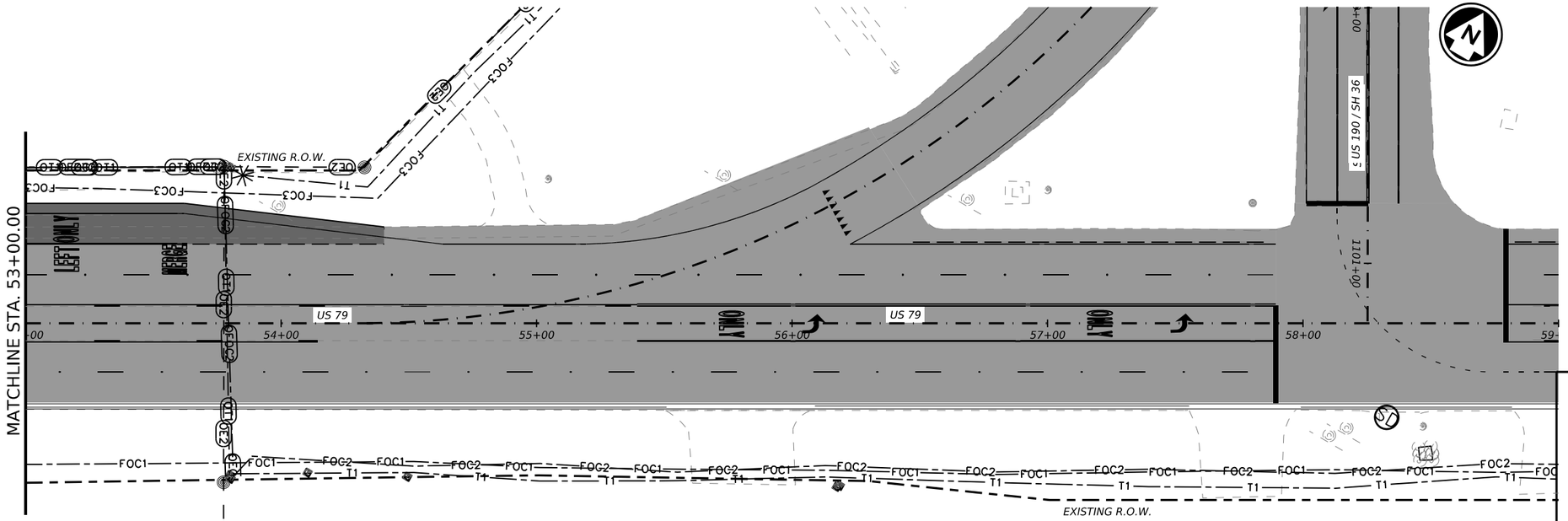


LEGEND OF UTILITY TYPES

COMMUNICATIONS		QL "B"
	BRIGHTSPEED (UG)	T1
	BRIGHTSPEED (FOC)	FOC1
	SUDDENLINK (FOC)	FOC2
	AT&T (FOC)	FOC3
		QL "D"
	BRIGHTSPEED (UG)	T1
	BRIGHTSPEED (OVH)	OT1
	BRIGHTSPEED (FOC)	FOC1
	SUDDENLINK (FOC OV)	OFOC2
	AT&T (FOC)	FOC3
ELECTRIC/POWER		QL "D"
	BARTLETT ELECTRIC COOP (OVH)	OE1
		QL "C/D"
	ONCOR DISTRIBUTION (OVH)	OE2

LEGEND OF UTILITY SYMBOLS

- LEVEL STATUS CHANGE
- TELEPHONE PEDESTAL
- CABLE TV PEDESTAL
- GENERIC JUNCTION BOX
- STORM SEWER MANHOLE
- POWER POLE
- *AREA OF OVERLAY*
- *AREA OF WIDENING / OVERLAY*



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EXISTING UTILITY LAYOUT (US 79)

SHEET 2 OF 4

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79
STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM
CONTROL	SECTION	JOB / SHEET NO.
0204	07	056 / 110

REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
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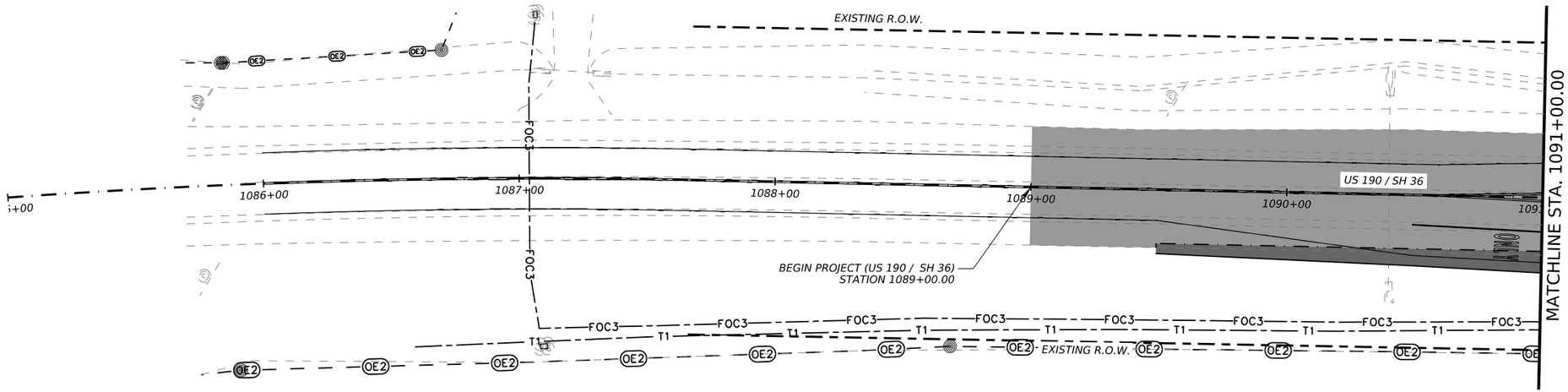

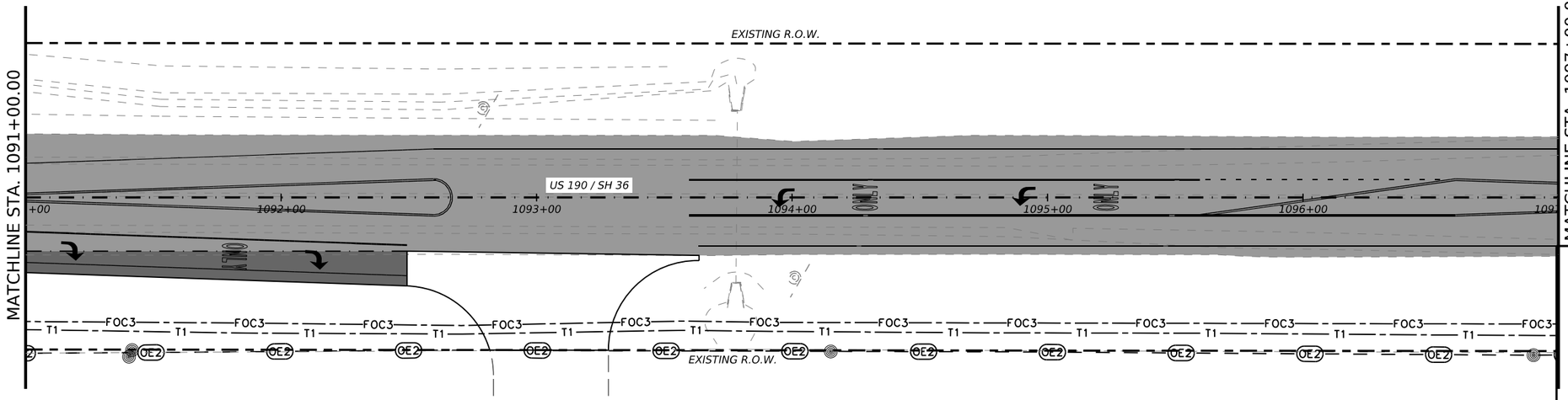

LEGEND OF UTILITY TYPES

COMMUNICATIONS	QL "B"
BRIGHTSPEED (UG)	T1
BRIGHTSPEED (FOC)	FOC1
SUDDENLINK (FOC)	FOC2
AT&T (FOC)	FOC3
	QL "D"
BRIGHTSPEED (UG)	T1
BRIGHTSPEED (OVH)	OT1
BRIGHTSPEED (FOC)	FOC1
SUDDENLINK (FOC OV)	OFOC2
AT&T (FOC)	FOC3
ELECTRIC/POWER	QL "D"
BARTLETT ELECTRIC COOP (OVH)	OE1
	QL "C/D"
ONCOR DISTRIBUTION (OVH)	OE2

LEGEND OF UTILITY SYMBOLS

- LEVEL STATUS CHANGE
- TELEPHONE PEDESTAL
- CABLE TV PEDESTAL
- GENERIC JUNCTION BOX
- STORM SEWER MANHOLE
- POWER POLE
- *AREA OF OVERLAY*
- *AREA OF WIDENING / OVERLAY*

2024.06.04 13:14:10-05'00'

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EXISTING UTILITY LAYOUT (US 190 / SH 36)

SHEET 3 OF 4

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79
STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM
CONTROL	SECTION	JOB / SHEET NO.
0204	07	056 / 111

REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
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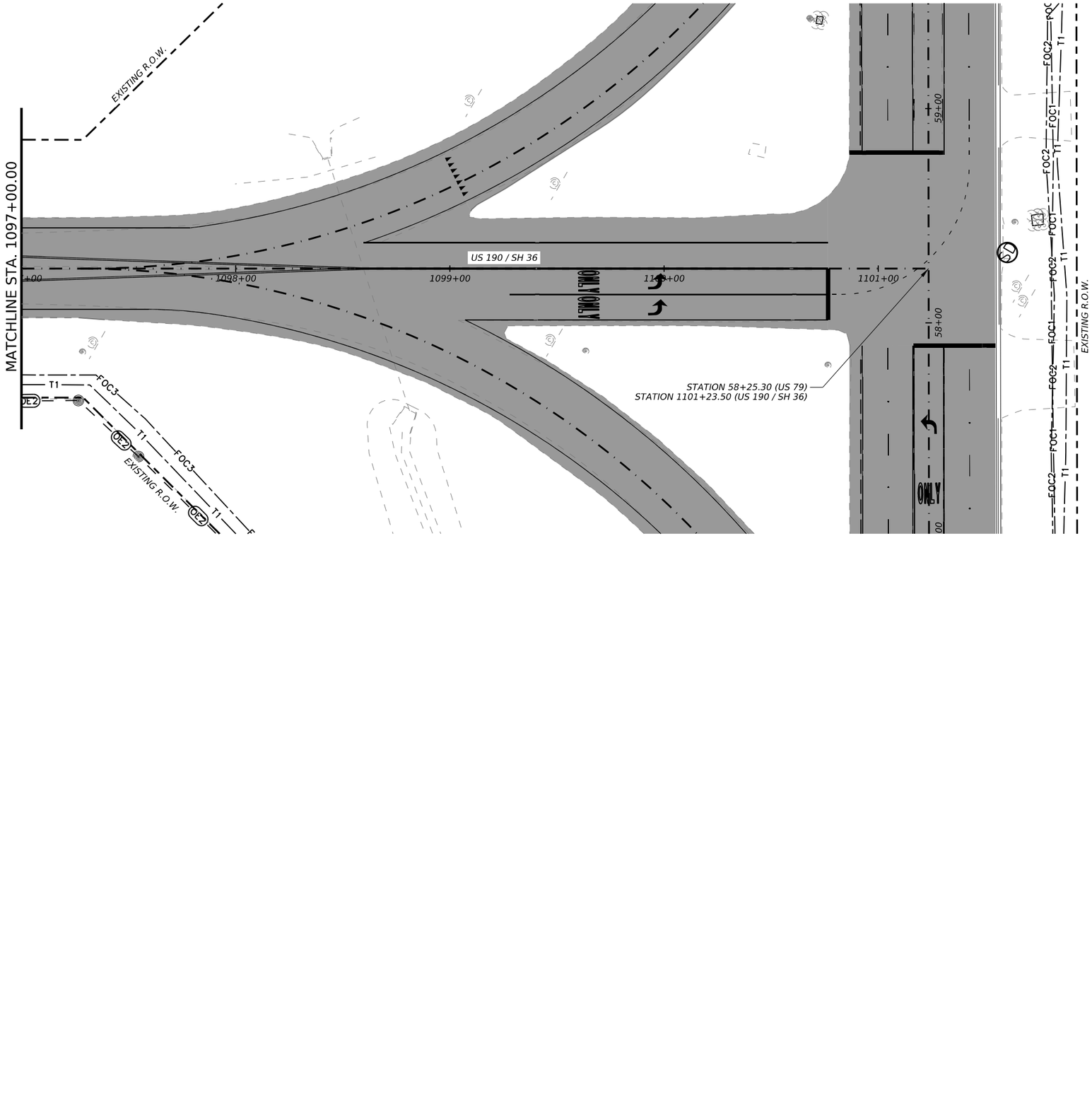

LEGEND OF UTILITY TYPES

COMMUNICATIONS	QL "B"
BRIGHTSPEED (UG)	T1
BRIGHTSPEED (FOC)	FOC1
SUDDENLINK (FOC)	FOC2
AT&T (FOC)	FOC3
	QL "D"
BRIGHTSPEED (UG)	(T1)
BRIGHTSPEED (OVH)	(OT1)
BRIGHTSPEED (FOC)	(FOC1)
SUDDENLINK (FOC OV)	(OFOC2)
AT&T (FOC)	(FOC3)
ELECTRIC/POWER	QL "D"
BARTLETT ELECTRIC COOP (OVH)	(OE1)
	QL "C/D"
ONCOR DISTRIBUTION (OVH)	(OE2)

LEGEND OF UTILITY SYMBOLS

- LEVEL STATUS CHANGE
- TELEPHONE PEDESTAL
- CABLE TV PEDESTAL
- GENERIC JUNCTION BOX
- STORM SEWER MANHOLE
- POWER POLE
- *AREA OF OVERLAY*
- *AREA OF WIDENING / OVERLAY*

2024.06.04 13:13:55-05'00'

STATE OF TEXAS
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EXISTING UTILITY LAYOUT (US 190 / SH 36)

SHEET 4 OF 4

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	SEE TITLE SHEET	US 79
STATE	DISTRICT	COUNTY
TEXAS	BRY	MILAM
CONTROL	SECTION	JOB / SHEET NO.
0204	07	056 / *112*

REV DATE: 1-31-2023
CSJ: 0187-01-052, ETC
FILENAME: c:\pw_working\lochner-pw-01\dms82633\US190_UTILITY_SHEETS-2.dgn