CONT	SECT	JOB	HIGHWAY
0039	07	257	I69E
DIST	COUNTY		SHEET NO.
PHR	CAMERON		1

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT NUMBER

F 2023(418)

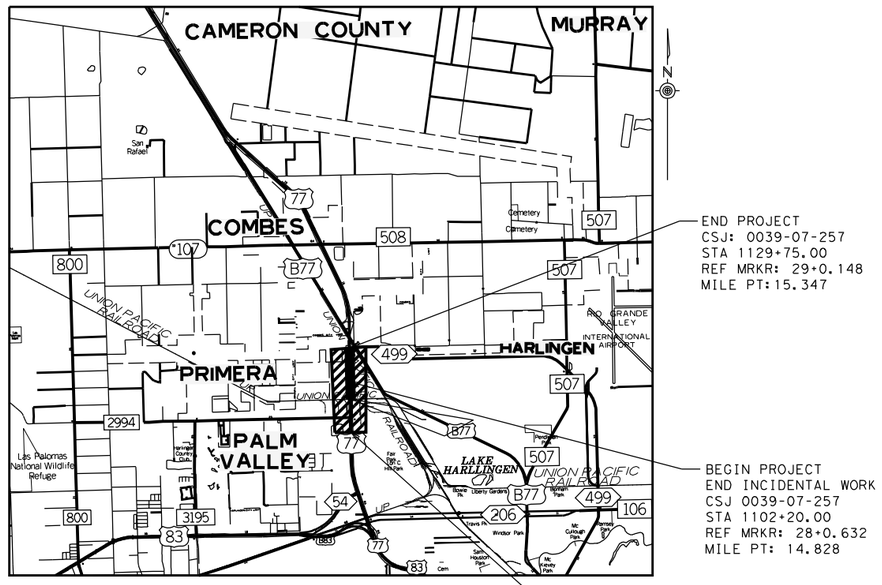
CSJ: 0039-07-257

NET LENGTH OF PROJECT = 2,735.04 FEET = 0.518 MILES
- ROADWAY = 2,735.04 FEET = 0.518 MILES
- BRIDGE = 0.000 FEET = 0.000 MILES

CAMERON COUNTY
I-69E

FROM: INDUSTRIAL BLVD.
TO: LOOP 499 (PRIMERA RD.)

FOR THE CONSTRUCTION OF FREEWAY OPERATIONAL IMPROVEMENTS: CONSISTING OF GRADING, DRAINAGE, ASPHALT CONCRETE PAVEMENT, TREATED FLEXBASE AND SUBGRADE, SIGNING, PAVEMENT MARKINGS



LOCATION MAP NOT TO SCALE

EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: RIO VALLEY SWITCHING COMPANY
FUNCTIONAL CLASSIFICATION: INTERSTATE HIGHWAY

DESIGN SPEED

MAIN LANES: 70 MPH
FRONTAGE ROADS: 45 MPH
RAMPS: 50 MPH

A.D.T.

2025: 36,200 VPD
2045: 50,680 VPD

100% SUBMITTAL

INDEX OF SHEETS

FINAL PLANS

DATE OF LETTING: _____

DATE WORK BEGAN: _____

DATE WORK COMPLETED: _____

DATE WORK ACCEPTED: _____

FINAL CONTRACT COST: $ _____

CONTRACTOR: _____

LIST OF APPROVED FIELD CHANGES, CHANGE ORDERS & SUPPLEMENTAL AGREEMENTS:

THIS IS TO CERTIFY THAT ALL CONSTRUCTION SUBSTANTIAL WORK WAS PERFORMED IN ACCORDANCE WITH THE PLANS SPECIFICATIONS AND CONTRACT. ALL PROPOSED CONSTRUCTION WAS COMPLETED UNLESS OTHERWISE NOTED.

_____ _____
ANDRES ESPINOZA, P.E. DATE
SAN BENITO AREA ENGINEER

TDLR INSPECTION NOT REQUIRED

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

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
4350 Lockhill Selma Road, Suite 100 • San Antonio, Texas 78249 • 210.494.5511

RECOMMENDED FOR LETTING: DATE: 12/2/2022

DocuSigned by: Pedro R. Alvarez
EABA335C2DAA48C...
DISTRICT ENGINEER

SUBMITTED FOR LETTING: DATE: 12/1/2022

DocuSigned by: Romualdo Mena Jr
8D395A956F70440...
DISTRICT CENTRAL DESIGN SUPERVISOR

FILE: c:\bms\pwe101-01\daniel.ontiveros\dms24511\I69E-RAMPS*TITLESHEET.dgn
DATE: 11/28/2022 4:25:49 PM

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6-7	PROPOSED TYPICAL SECTIONS
8	SEAL COAT MATERIAL SELECTION TABLE "UNDERSEAL"
9, 9A-9H	GENERAL NOTES
10, 10A-10B	ESTIMATES & QUANTITY SHEETS
11-18	SUMMARY OF QUANTITIES

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21	TRAFFIC CONTROL PLAN TYPICAL SECTION PHASE 1 STEP 1
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STATE OF TEXAS
NICOLAS C. GARCIA
99410
LICENSED
PROFESSIONAL ENGINEER
Nicolas C. Garcia
12/14/2022

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

STATE OF TEXAS
MARK D. CORBITT
PE 101980
LICENSED
PROFESSIONAL ENGINEER
Mark D. Corbitt
12/13/2022

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

STATE OF TEXAS
GIOVANNI PUCCINI
90714
LICENSED
PROFESSIONAL ENGINEER
12/13/2022

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

STATE OF TEXAS
GREGORIO GARCIA, P.E.
PE 101077
LICENSED
PROFESSIONAL ENGINEER
12/13/2022

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

Pharr District Central Design

Texas Department of Transportation

I-69E
INDEX OF SHEETS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0039	07	257	I69E

DIST	COUNTY	SHEET NO.
PHR	CAMERON	2

DS: CK:
DW: CK:

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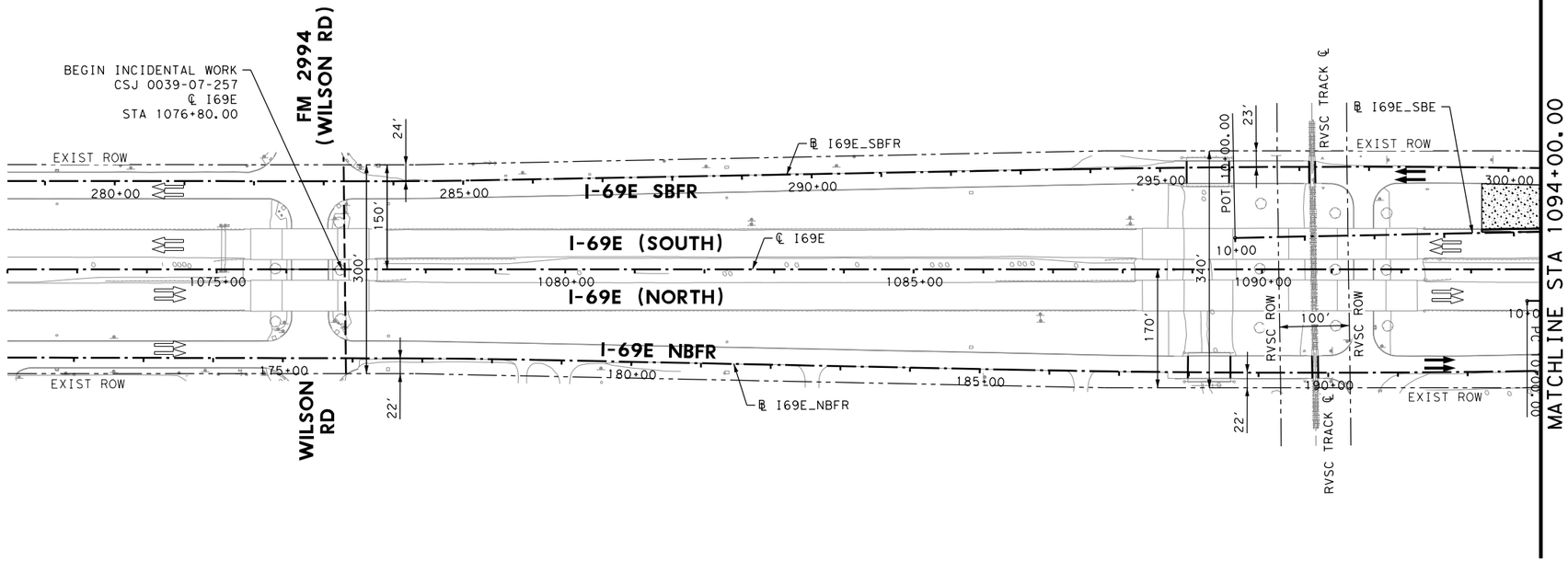
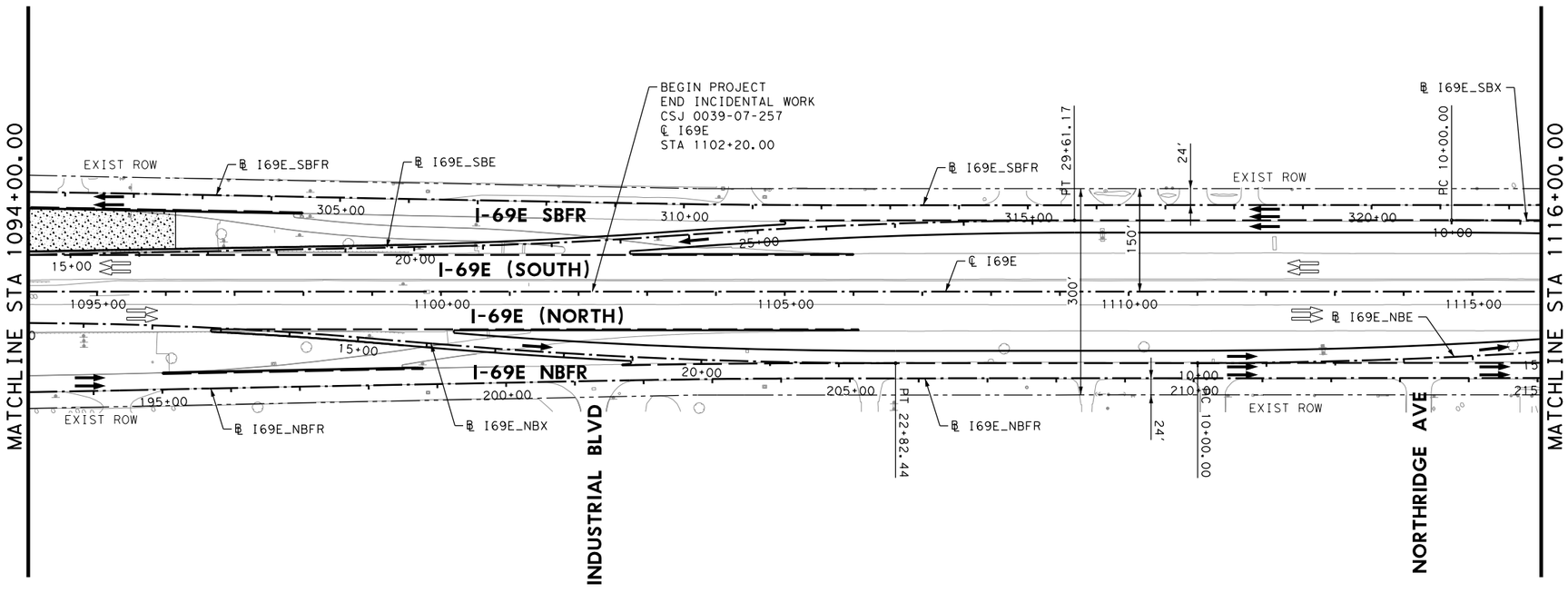
LEGEND:

DIRECTION OF TRAVEL

EXISTING ROW





NO.	DATE	REVISION	APPROVED

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PROFESSIONAL ENGINEER

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12/15/2022

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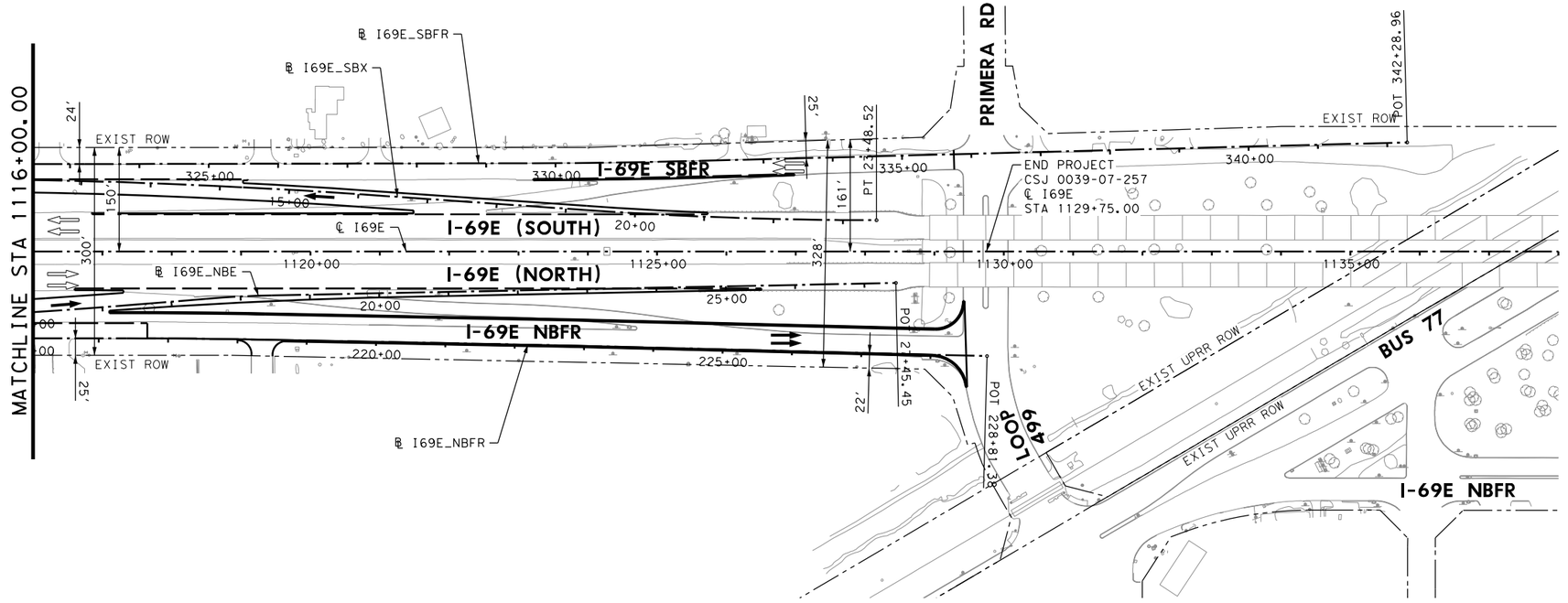
I-69E
PROJECT LAYOUT
BEG TO STA 1116+00

SHEET 01 OF 02

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	3
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				



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I-69E
PROJECT LAYOUT
STA 1116+00 TO END

SHEET 02 OF 02

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	4
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

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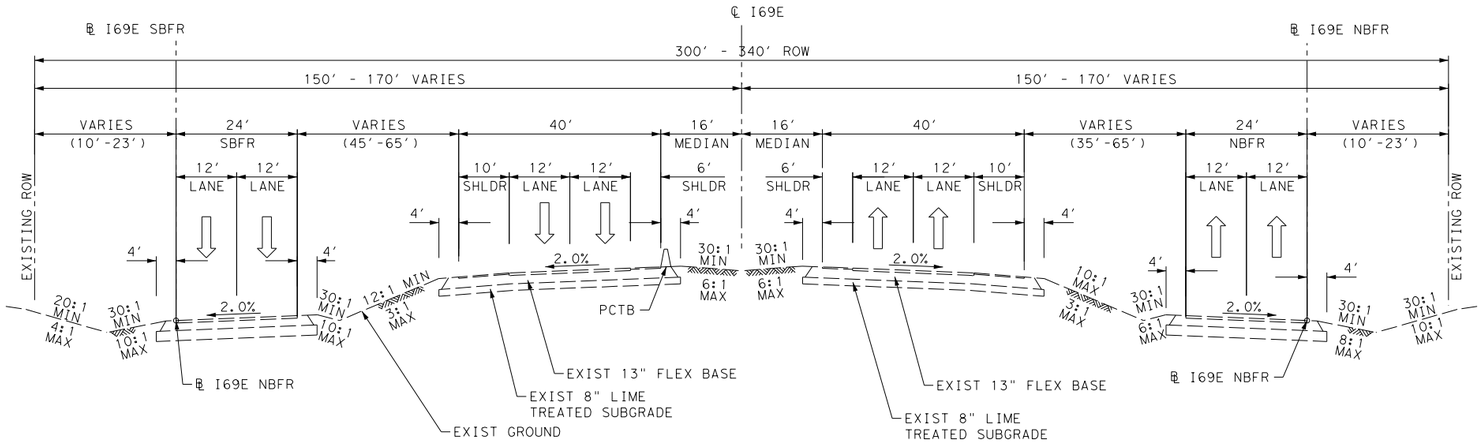
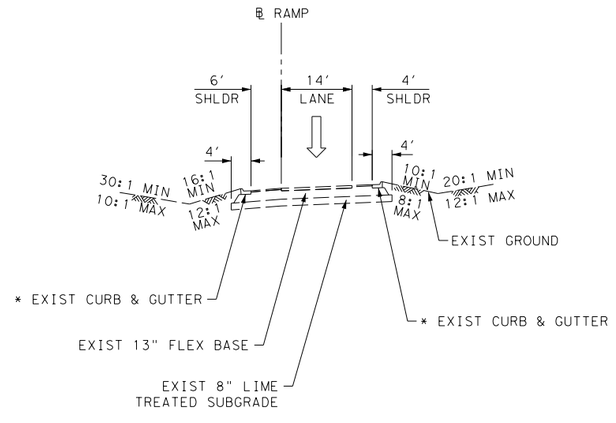


SOUTHBOUND FRONTAGE RD
STA 283+26 TO STA 336+22

EXISTING I69E TYPICAL SECTION
STA 1076+80 TO STA 1129+75

NORTHBOUND FRONTAGE RD
STA 175+85 TO STA 228+80

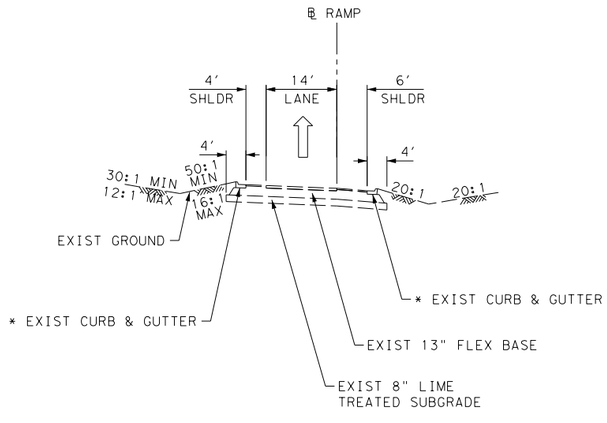
LEGEND:
⇨ EXIST LANE
➡ PROP LANE



EXISTING I-69E SOUTHBOUND RAMP TYPICAL SECTION
I-69E SBX RAMP: STA 1094+00 TO STA 1106+00
I-69E SBE RAMP: STA 1117+00 TO STA 1127+00

* LT CURB & GUTTER SB
STA 1096+90 TO STA 1104+40
STA 1124+00 TO STA 1124+15

RT CURB & GUTTER SB
STA 1094+00 TO STA 1101+90
STA 1122+60 TO STA 1127+00



EXISTING I-69E NORTHBOUND RAMP TYPICAL SECTION
I-69E NBE RAMP: STA 1096+00 TO STA 1105+00
I-69E NBX RAMP: STA 1115+50 TO STA 1127+50

* LT CURB & GUTTER NB
STA 1096+00 TO STA 1100+00
STA 1120+75 TO STA 1127+50

RT CURB & GUTTER NB
STA 1099+50 TO STA 1100+50
STA 1116+50 TO STA 1124+50

NO.	DATE	REVISION	APPROVED

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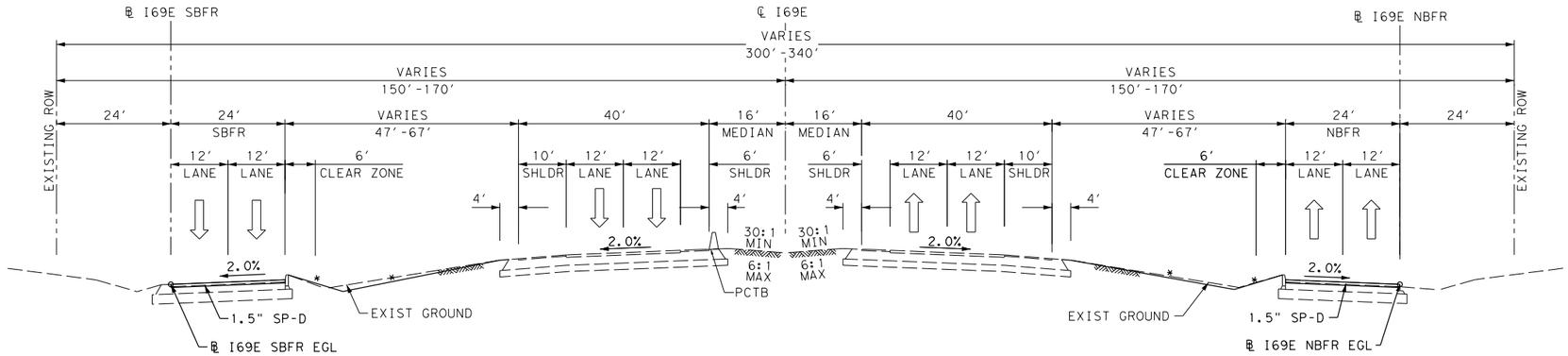
I-69E EXISTING TYPICAL SECTIONS

SHEET 1 OF 1

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	5
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				



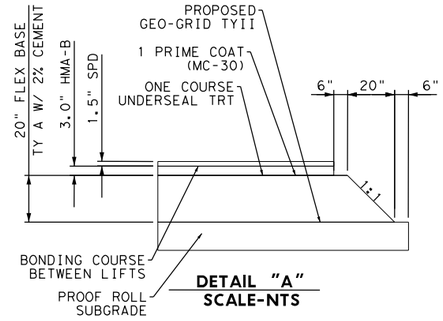
PROPOSED SOUTHBOUND FRONTAGE RD
STA 283+26 TO STA 309+22

I69E TYPICAL SECTION
STA 1076+80 TO STA 1102+75

PROPOSED NORTHBOUND FRONTAGE RD
STA 175+85 TO STA 201+80

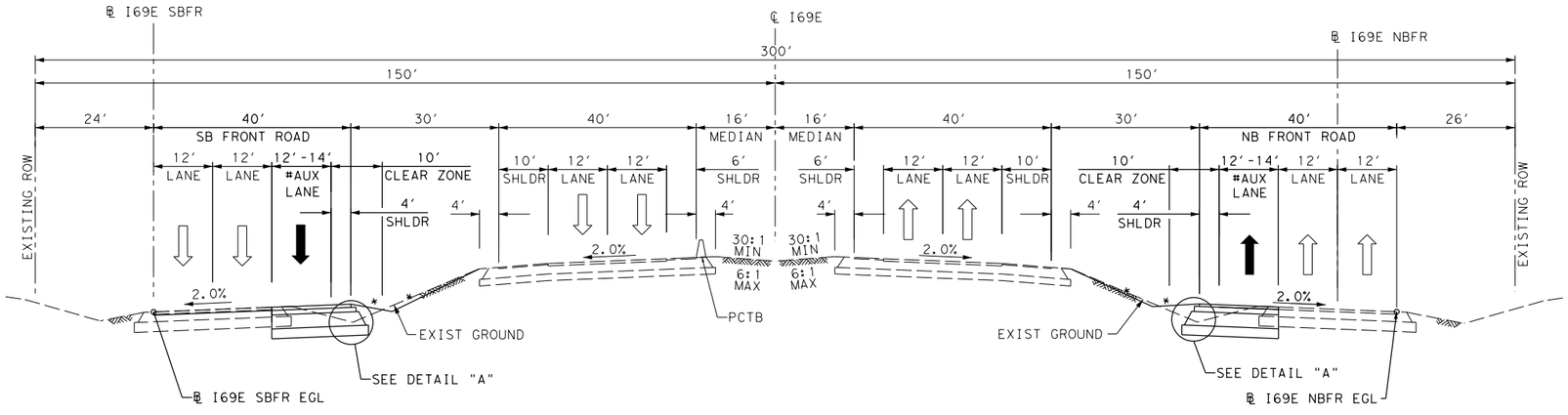
*** PROPOSED GRADING: STA 299+61 TO STA 309+22**
10:1 3:1: STA 299+61 TO STA 302+69
4:1 4:1 : STA 302+61 TO STA 309+22

*** PROPOSED GRADING: STA 195+70 TO STA 3201+80**
4:1 4:1 : STA 195+70 TO STA 197+00
6:1 6:1 : STA 197+00 TO STA 199+50
4:1 4:1 : STA 199+50 TO STA 200+90



DETAIL "A"
SCALE-NTS

LEGEND:
⇨ EXIST LANE
➡ PROP LANE



PROPOSED SOUTHBOUND FRONTAGE RD
STA 309+22 TO STA 324+12

I69E TYPICAL SECTION
STA 1102+75 TO STA 1117+65

PROPOSED NORTHBOUND FRONTAGE RD
STA 201+80 TO STA 216+70

 # AUXILIARY LANE
STA 314+06 TO STA 315+68 (162′ TRANS FROM 14′ TO 12′)
STA 321+16 TO STA 322+95 (179′ TRANS FROM 12′ TO 14′)

*** PROPOSED GRADING: STA 309+22 TO STA 324+12**
4:1 4:1 : STA 309+22 TO STA 312+47
6:1 : STA 302+61 TO STA 323+30 (TIE INTO EXISTING)
6:1 6:1 : STA 323+30 TO STA 324+12

 # AUXILIARY LANE
STA 203+96 TO STA 205+66 (170′ TRANS FROM 14′ TO 12′)
STA 210+06 TO STA 211+67 (161′ TRANS FROM 12′ TO 14′)

*** PROPOSED GRADING: STA 201+80 TO STA 216+70**
4:1 4:1 : STA 201+80 TO STA 216+70
6:1 6:1 : STA 202+75 TO STA 205+10
6:1 : STA 205+10 TO STA 215+65 (TIE INTO EXISTING)

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
NICOLAS C. GARCIA
99410
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PROFESSIONAL ENGINEER

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12/15/2022

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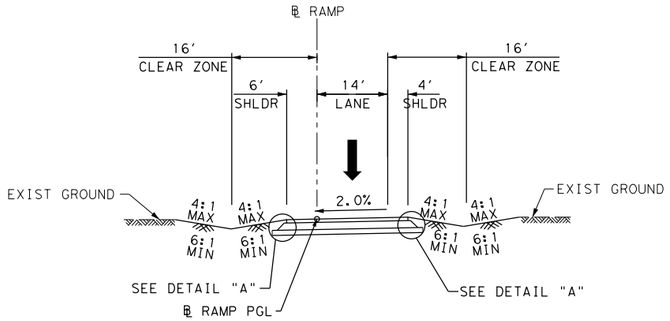
I-69E
PROPOSED
TYPICAL SECTIONS

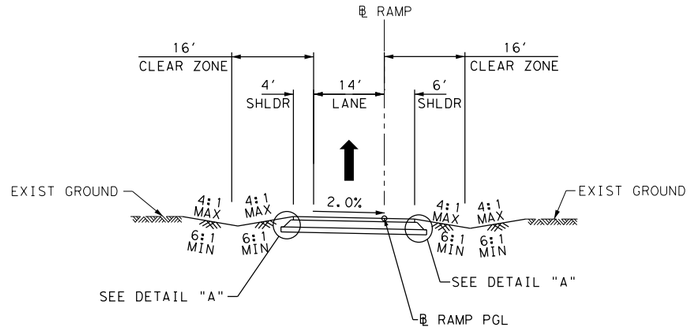
SHEET 1 OF 2

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	6
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				



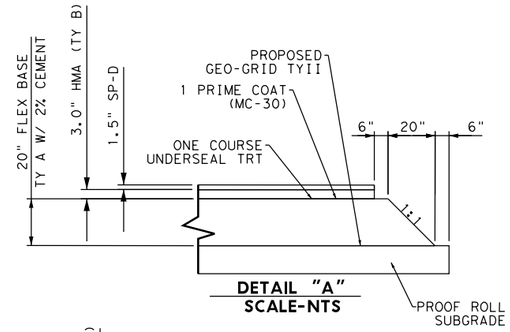
PROPOSED I-69E SOUTHBOUND RAMP TYPICAL SECTION

I-69E SBE RAMP: STA 1105+00 TO STA 1102+75
I-69E SBX RAMP: STA 1119+03 TO STA 1121+49



PROPOSED I-69E NORTHBOUND RAMP TYPICAL SECTION

I-69E NBX RAMP: STA 1100+19 TO STA 1102+77
I-69E NBE RAMP: STA 1117+10 TO STA 1117+30



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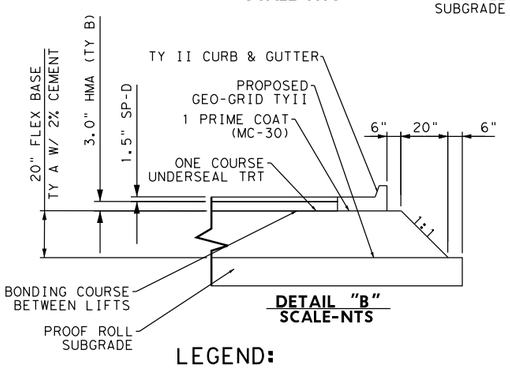
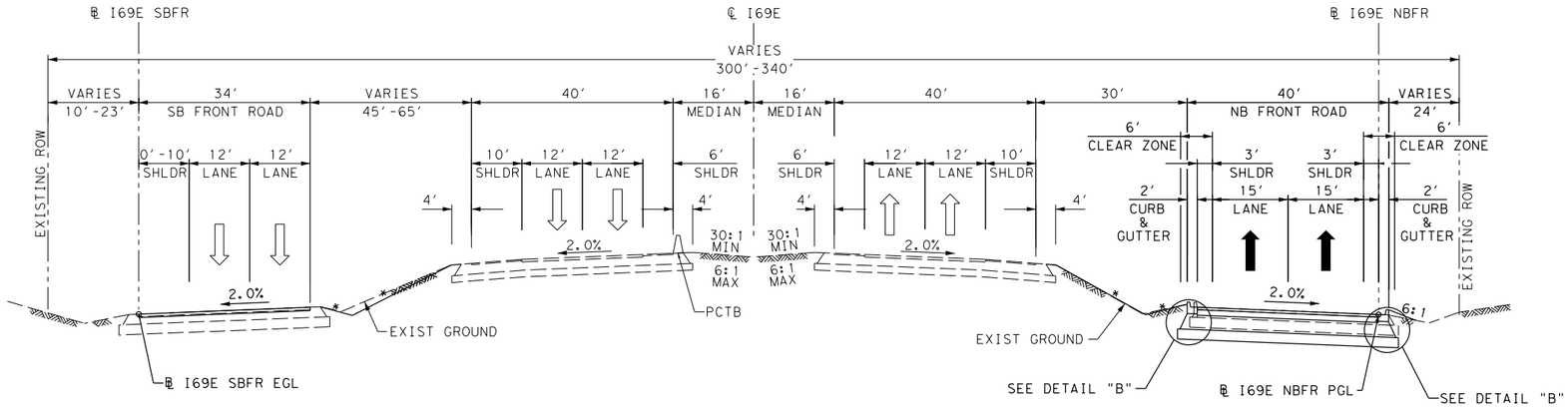
SCALE-NTS



DETAIL "B"
SCALE-NTS

LEGEND:

⇨ EXIST LANE
➡ PROP LANE



PROPOSED SOUTHBOUND FRONTAGE RD
STA 324+12 TO STA 335+93

I69E TYPICAL SECTION
STA 1117+65 TO STA 1129+46

PROPOSED NORTHBOUND FRONTAGE RD
STA 216+70 TO STA 228+52

*** PROPOSED GRADING: STA 324+12 TO STA 333+45**
6:1 6:1 : STA 324+12 TO STA 322+20
6:1 : STA 322+20 TO STA 333+45 (TIE INTO EXISTING)

*** PROPOSED GRADING: STA 216+70 TO STA 228+52**
4:1 4:1 : STA 217+45 TO STA 218+50
6:1 6:1 : STA 218+50 TO STA 225+50
6:1 : STA 225+50 TO STA 228+52 (TIE INTO EXISTING)

NO.	DATE	REVISION	APPROVED

NICOLAS C. GARCIA
99410
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

Nicolas C. Garcia, P.E.

12/15/2022

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I-69E
PROPOSED
TYPICAL SECTIONS

SHEET 2 OF 2

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED XX	STATE	DIST.	COUNTY	SHEET NO.
CHECKED XX	TEXAS	PHR	CAMERON	7
APPROVED XX	CONT.	SECT.	JOB	
	0039	07	257	

SEAL COAT MATERIAL SELECTION TABLE

Contractor:

1) Provide materials according to the alternates selected for the roadway tier designations specified at various roadway locations shown on the plans;
2) Alternately supply selected binders from a higher tier, but only if the type of material is allowed for the designated tier; payment will only be made for the tier designated for the pavement;
3) Supply the aggregate type, grade and surface aggregate class that is shown to be allowed with the binder used; and
4) Adhere to the application season selected.

[ ] Tier 1: Heavy Use (>5,000 ADT) Use only the selected materials.

Type	Asphalt Rubber (A-R) [ ] A-R Only	Asphalt Cement (A-C) [ ] A-C Only
Asphalt	[ ] A-R Ty II [ ] SP 300-016&039 [ ] A-R Ty III	[ ] AC-20-5TR [ ] AC-20XP [ ] AC-15P
Aggregate Type	[ ] Ty PA [ ] Ty PB [ ] Ty PC [ ] Ty PD [ ] Ty PE [ ] Ty PL	[ ] Ty PA [ ] Ty PB [ ] Ty PC [ ] Ty PD [ ] Ty PE [ ] Ty PL
Aggregate Grade	[ ] 3S [ ] 3non-lw [ ] 3 lw [ ] 4S [ ] 4P [ ] SP 302-013	[ ] 3S [ ] 4S [ ] 5 [ ] 3non-lw [ ] 4P [ ] 5S [ ] 3 lw [ ] SP 302-1
Aggregate SAC	[ ] A [ ] B	[ ] A [ ] B

[X] Tier 2: Moderate Use (500-5,000 ADT)

Use this materials or any selected Tier 1 materials combinations of the allowed types

Type	Asphalt Cement (A-C) [X] A-C Only	Asphalt Emulsion [ ] Emulsion Only
Asphalt	[X] AC-10-2TR [X] AC-5 W/2% SBR [X] AC-10 [X] AC-10 W/2% SBR [ ] AC-15P	[ ] CHFRS-2P [ ] CRS-2P [ ] HFRS-2P [ ] SP 300-016&039
Aggregate Type	[ ] Ty PA [ ] Ty PB [ ] Ty PC [ ] Ty PD [ ] Ty PE [ ] Ty PL [X] Allow uncoated aggregate	[ ] Ty A [ ] Ty B [ ] Ty C [ ] Ty D [ ] Ty E [ ] Ty L
Aggregate Grade	[ ] 3S [ ] 4S [ ] 5 [ ] 3non-lw [X] 4P [ ] 5S [ ] 3 lw [X] SP 302-008	[ ] 3S [ ] 4S [ ] 5S [ ] 3non-lw [ ] 4P [ ] 5 [ ] 3 lw [ ] SP 302-013
Aggregate SAC	[ ] A [X] B	[ ] A [ ] B

[ ] Tier 3: Moderate Use (<500 ADT) Use this materials or any selected Tier 1 or Tier 2 materials combinations of the allowed types

Type	Asphalt Cement (A-C) [ ] A-C Only	Asphalt Emulsion [ ] Emulsion Only
Asphalt	[ ] AC-10-2TR [ ] AC-5 W/2% SBR [ ] AC-20XP [ ] SP 300-016&039 [ ] AC-10 W/2% SBR [ ] AC-15P	[ ] CRS-2 [ ] CRS-2H [ ] HFRS-2 [ ] SP 300-016&039
Aggregate Type	[ ] Ty PA [ ] Ty PB [ ] Ty PC [ ] Ty PD [ ] Ty PE [ ] Ty PL	[ ] Ty A [ ] Ty B [ ] Ty C [ ] Ty D [ ] Ty E [ ] Ty L
Aggregate Grade	[ ] 3S [ ] 4S [ ] 5 [ ] 3non-lw [ ] 4P [ ] 5S [ ] 3 lw [ ] SP 302-013	[ ] 3S [ ] 4S [ ] [ ] 3non-lw [ ] 4P [ ] 5 [ ] 3 lw [ ] SP 302-013
Aggregate SAC	[ ] A [ ] B	[ ] A [ ] B

Seasonal Alternates: Use these materials for work in cooler conditions as directed.

[X] CRS-2 [X] HFRS-2 [ ] CRS-1P [ ] RS-1P [ ] RC-250 [ ] MC-800 [ ] AC-12-5-TR [ ] SP 300-016&032

Seal Coat Seasons: Refer to Item 316 for temperature and weather restrictions.

[X] Season 4: CRP, LRD, PHR	Apr 1 to Sept 30

Texas Department of Transportation
Design Division (Roadway)

SEAL COAT MATERIAL SELECTION TABLE "UNDERSEAL"

FILE: sctable.dgn	DN: TxDOT	CK: AM	DW: BGD	CK:		
©TxDOT June 2011	DIST	FEDERAL AID PROJECT				SHEET
REVISIONS September 2020	PHARR					8
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	CAMERON		0039	07	257	I 69E

Project Number:

County: Cameron **Control:** 0039-07-257

Highway: IH-69E

2014 SPECS GENERAL NOTES:

****

General Requirements and Covenants to ITEMS 1 thru 9:

For all pits or quarries, comply with the "Texas Aggregate Quarry and Pit Safety Act."

Provide on a weekly basis a list of equipment, including idle equipment, utilized on the project that week.

The 1-800 call services for utility locations do not include TxDOT facilities. Contact the Pharr District Signal Section (956-702-6225) for coordination regarding TxDOT underground lines.

ITEM 2: Instructions to Bidders

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

Andres Espinoza, P.E., San Benito Area Engineer; Andres.Espinoza@txdot.gov
Hector Siller, P.E., Assist. Area Engineer; Hector.Siller@txdot.gov

Contractor questions will be accepted through email, phone, and in person by the above individuals. Questions may also be submitted via the Letting Pre-Bid Q&A web page. This webpage can be accessed from the Notice to Contractors dashboard located at the following Address:

https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors

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

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

ITEM 5: Control of the Work

The responsibility for the construction surveying on this contract will be in accordance with Article 5.9.1., "Method A."

Prior to contract letting, bidders may obtain a free computerized transfer of files (from the Engineer's office) that contains the earthwork information. If copies of the actual cross-sections in additional to, or instead of the electronic files are requested, they will be available at the Engineer's office for borrowing by copying companies for the purpose of making copies for the bidder at the bidder's expense.

Work in this contract is required to be done on railroad property. Cooperate with the railroad companies and comply with all their requirements including obtaining any training they require before performing work on railroad property.

ITEM 6: Control of Materials

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

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

The Buy America Material Classification Sheet is located at the below link.

https://www.txdot.gov/business/resources/materials/buy-america-material-classification-sheet.html for clarification on material categorization.

ITEM 7: Legal Relations and Responsibilities

No significant traffic generator events identified.

ITEM 8: Prosecution and Progress

Working days will be computed and charged in accordance with Article 8.3.1.4. Standard Workweek.

The road user cost liquidated damages is $270.00 per day for the work performed on IH- 69E.

Where road closures or detours around structures are necessary to accomplish proposed work, the removal of existing structures and/or cutting of existing pavement will not be permitted until all precast members for the proposed structure have been cast, tested, and approved for use.

Project Number:

County: Cameron **Control:** 0039-07-257

Highway: IH-69E

Prepare progress schedules using the Critical Path Method (CPM).

The State Contractor shall not perform any work operations within the railroad right of way at Locations 1 (CSJ 0039-07-257), IH-69E NB and SB Frontage Rd., until the railroad agreements have been executed.

ITEM 132: Embankment

Embankment (DENS CONT) shall be Type C with a max. PI of 40. Material used as embankment material in the top two feet below the bottom of Flexible Base shall meet the following requirements based on preliminary tests and such other tests found necessary by the Engineer.

1. The material shall be such as to produce a well-bonded embankment and shall have a minimum PI of 8 and a maximum PI of 30.

It is the Contractor's responsibility to advise the Engineer of the location of the source sufficiently in advance to avoid delay.

ITEM 160: Topsoil

Use topsoil as needed and directed by the Project Engineer for select problem areas. Unless otherwise approved by the Project Engineer, use topsoil from approved sources outside the right of way as per standard specifications. Existing topsoil is to be salvaged and retained for re-use on the project as topsoil.

ITEM 164: Seeding for Erosion Control

During drill seeding operations, application methods shall be in accordance with the method shown in the Standard Specification Book.

SS-1 Tacking Agent shall be a ratio of 2:1, two (Emulsion) to one (water) and applied at a rate of 0.05 gallons per square yard. The SS-1 Tacking Agent required for Drill Seed operations, will not be paid for directly, but will be subsidiary to Item 164 “Drill Seeding.” Watering shall not be used with the Drill Seed Method. A biodegradable tacking agent may be used in lieu of the SS-1 tacking agent in accordance with the manufacturer’s recommendations when approved by the Engineer.

Cool Season or Warm Season Grasses shall be included as part of Item 164 (See Table 3 and/or Table 4 in the Standard Specification Book or dates and seed type).

Seed mixture shall be as specified under Item 164.

ITEM 166: Fertilizer

Fertilizer rate is based on a rate of 100 Lbs. of Nitrogen per acre. The Nitrogen-Phosphorous Potassium (NPK) ratio shall include a minimum of 5% Phosphorous and 5% Potassium.

Fertilizer shall be homogenized.

ITEM 247: Flexible Base

Flexible Base Type E will be composed of caliche (argillaceous Limestone, calcareous or calcareous clay particles) and may contain stone, conglomerate, gravel, sand, or granular materials when these materials are in situ with the caliche.

Flexible Base (TY E GR 4) caliche shall conform to the following requirements:

The Wet Ball Test (Tex-116-E) shall be run and the Plasticity Index of the material passing the No.40 sieve shall be determined (Wet Ball PI).

The percent of density as determined by Compaction Ratio (Tex-113-E) for the new Flexible Base shall be a minimum of 98%.

The Contractor's attention is called to the fact that certain existing and/or proposed structures may be within the limits of the Flexible Base. It shall be the Contractor's responsibility to perform construction operations without damage to these structures.

For water added under Item 247, the sulfate content will not exceed 3000-ppm and the chloride content will not exceed 3000-ppm.

Proof roll constructed flexible base in accordance with Item 216, “Proof Rolling.” Correct soft spots as directed.

ITEM 275: Cement Treatment (Road-Mixed)

The percent of density as determined by Tex-120-E for the new and salvage Flexible Base shall be a minimum of 98% for all courses.

Proof roll all constructed cement treated subgrade and bases courses in accordance with Item 216, “Proof Rolling.” Correct soft spots as directed. Correction of soft spots in the subgrade or base courses will be at the Contractor’s expense.

Project Number:

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In order to avoid damaging the Geogrid, add cement to the first lift of new base and/or salvage base at a central mixing site or mixing plant away from the construction area. The Engineer shall approve the site or plant location and method of mixing.

Contractor is to place an underseal and/or pavement course as indicated on plans within 14 calendar days of initial prime coat application. Otherwise, reapply prime coat as directed by the Engineer. Reapplication of the prime coat will be at the Contractor's expense.

ITEM 3096: Asphalts, Oils, and Emulsions

Temporary ramps/detours and driveways may use Performance Grade Binder 64-22.

ITEM 301: Asphalt Antistripping Agents

Hydrated Lime shall be added as an Antistripping additive between the rates of 1% minimum and 2.0% maximum by weight for Items 292, 3076, 3077, and 3080. If the Hamburg Wheel Test cannot be met within these limits, Liquid Antistripping agents as approved by the Engineer may be used in conjunction with lime for Items 3076, 3077, and 3080.

ITEM 302: Aggregates for Surface Treatments

Loc.	County	CSJ	Highway	Binder	SAC
1	Cameron	0039-07-257	IH-69E	PG 76-22	A

The aggregate for the surface treatment shall be surface dry before application unless otherwise directed by the Engineer.

ITEM 310: Prime Coat

The Contractor shall exercise diligence in the application of asphalt by the use of flagging and rolling procedures to keep from spraying or splattering the traveling public with asphaltic material.

All existing Flexible Base, which may become exposed by the milling operation, shall be primed at the rate of 0.2 Gal/SY.

Do not apply subsequent courses over the initial prime coat no earlier than 12 hours after the prime coat was applied, unless otherwise authorized or directed by the Engineer.

ITEM 316: Seal Coat

In addition to cleaning by brooming of paved surfaces to be sealed as required by this Item, blading may also be necessary to clean dirt and grass from edges of the pavement and/or turnout areas. The cost of this blading will not be paid for directly but will be considered subsidiary to the various bid Items of the project.

When applying surface treatment at railroad crossings, a strip of paper shall be placed over the rail and flange areas across the pavement.

The type and grade of asphalt as shown on the plans and/or as directed by the Engineer, shall be used on these projects. Asphalt cement will be used during the warm season. An emulsified asphalt will be used during the cooler season if permitted in writing by the Engineer. The emulsified asphalt, if used, shall be HFRS 2P. Estimated quantities shown for the bid Item is based on an average of the estimated rates of application for asphaltic cement and emulsified asphalt. These rates should be used for estimating and comparison purposes only.

The one or two-course surface treatment shall be in place for a sufficient period of time in the opinion of the Engineer, for the surface treatment to properly dry and cure before placing the Asphaltic Concrete Pavement.

Traffic will not be permitted on the surface treatment unless authorized by the Engineer.

When emulsified asphalt is used, do not apply subsequent courses over the surface treatment any earlier than the day after the surface treatment was applied, unless otherwise authorized or directed by the Engineer.

Contractor is to place ACP layer(s) as indicated on plans within 14-calendar days of seal coat placement unless otherwise directed by the Engineer.

ITEM 3076: Dense-Graded Hot-Mix Asphalt

The Contractor shall exercise diligence in the application of "Bonding Course" by the use of flagging and rolling procedures to keep from spraying or splattering the traveling public with asphaltic material.

Blading (not to exceed more than 3-ft from the pavement edge) may also be necessary to clean dirt and grass from pavement edges and turnout areas as work under this bid Item. The cost of this blading will not be paid for directly but shall be considered subsidiary to this bid Item.

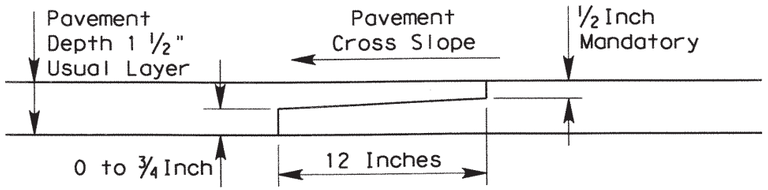
Project Number:

County: Cameron **Control:** 0039-07-257

Highway: IH-69E

Level-up will be placed before the surface course. An asphaltic concrete spreading and finishing machine and/or motor graders; when approved by the Engineer may be used to place the ACP level-up.

All unconfined longitudinal joints shall be constructed with a joint maker providing a maximum ½-inch vertical edge and a minimum 6:1 edge taper or as approved by the Engineer. The Engineer may waive this requirement when no impacts to the traveling public are foreseen.



NOTCHED WEDGE JOINT

The engineer may allow for variances to the dimensions shown.

The Hamburg Wheel Test requirement for PG 64 binder will be 5,000 passes @ 0.5-inch rut depth. Design mixture using a Superpave Gyratory Compactor.

Public and private driveways need to have a smooth vertical transition between the edge of pavement and the existing driveways. The Contractor is to add a vertical taper if needed which will be subsidiary to Item 3076.

The use of RAP and RAS (recycled asphalt shingles) will not be allowed as part of the mix design for the final riding surface.

Use a release agent from the Department's MPL to clean and to coat the inside of truck beds for hauling equipment. Hauling equipment shall be cleaned prior to hauling material to job site. Submit a copy of the bill of lading to the Engineer as part of the QCP. Ensure the pavement is free from any spillage of hydraulic oil or diesel from construction equipment. The Department may reject trucks that contain any foreign material and suspend production if the pavement is contaminated by any pollutants mentioned above.

When SAC B aggregate is used, material properties are required to be 10 or less on the magnesium sulfate soundness test and 20 or less on the Micro-Deval test.

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County: Cameron **Control:** 0039-07-257

Highway: IH-69E

ITEM 3077: Superpave Mixtures

The Contractor shall exercise diligence in the application of "Bonding Course" by the use of flagging and rolling procedures to keep from spraying or splattering the traveling public with asphaltic material.

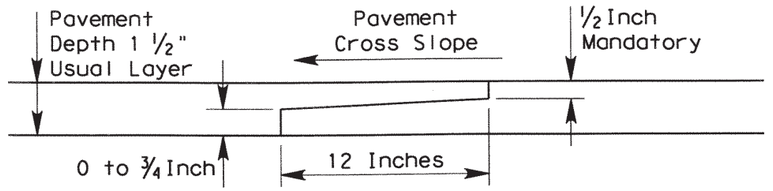
Blading (not to exceed more than 3-ft from the pavement edge) may also be necessary to clean dirt and grass from pavement edges and turnout areas as work under this bid Item. The cost of this blading will not be paid for directly but shall be considered subsidiary to this bid Item.

All surplus RAP from this project will remain the property of the Contractor.

Level-up will be placed before the surface course. An asphaltic concrete spreading and finishing machine and/or motor graders; when approved by the Engineer may be used to place the ACP level-up.

Aggregates used on shoulders and ramps are required to meet SAC requirements.

All unconfined longitudinal joints shall be constructed with a joint maker providing a maximum ½-inch vertical edge and a minimum 6:1 edge taper or as approved by the Engineer. The Engineer may waive this requirement when no impacts to the traveling public are foreseen.



NOTCHED WEDGE JOINT

The engineer may allow for variances to the dimensions shown.

Public and private driveways need to have a smooth vertical transition between the edge of pavement and the existing driveways. The Contractor is to add a vertical taper if needed which will be subsidiary to Item 3077.

The use of RAP and RAS (recycled asphalt shingles) will not be allowed as part of the mix design for the final riding surface.

Use a release agent from the Department's MPL to clean and to coat the inside of truck beds for hauling equipment. Hauling equipment shall be cleaned prior to hauling material to job site.

Submit a copy of the bill of lading to the Engineer as part of the QCP. Ensure the pavement is free from any spillage of hydraulic oil or diesel from construction equipment. The Department may reject trucks that contain any foreign material and suspend production if the pavement is contaminated by any pollutants mentioned above.

ITEM 3084 – Bonding Course

The minimum application rates are listed in Table BC.

The target shear bond strengths are listed in Table BCS. The informational test cores shall be taken once a shift for first 5 lots of placement or a change to placement method of bonding course, bonding material, or hot mix material. The remaining informational test cores shall be taken once every 3 lots for surface mix. Informational tests are not required for non-surface mix beyond the first 5 lots unless there is a change to placement method of bonding course, bonding material, or hot mix material. Results from these informational tests will not be used for specification compliance.

Table BC

Material	Minimum Application Rate (gal. per square yard)
TRAIL – Emulsified Asphalt	0.06
TRAIL – Hot Asphalt	0.12
Spray Applied Underseal Membrane	0.10

Table BCS (For Informational Tests)

Material	Target Shear Bond Strength (Tex-249-F psi)
SMA – Stone-Matrix Asphalt	60.0
All Other Materials	40.0

ITEM 354: Planing and Texturing Pavement

Contractor is to place seal coat or ACP layer(s) as indicated on plans within 14-calendar days of planing/milling operation unless otherwise directed by the Engineer.

All planing/milling operation drop offs greater than 1-inch need to have a 3:1 slope taper unless otherwise directed by the Engineer. The cost of the 3:1 slope taper is subsidiary to Item 354.

For full width planing/milling locations, Contractor is to place seal coat or ACP layer(s) as indicated on the plans within 2-calendar days of the planing/milling operation unless otherwise directed by the Engineer. Contractor will not be allowed to move onto the next planing/milling

location or seal coat/ACP overlay location until the exposed area is covered as per above. Contractor cannot get paid for the planing/milling operation until exposed area is covered as per above.

ITEM 400: Excavation and Backfill for Structures

If the Contractor elects to cut pavement (existing/detour) for structural work beyond that required by the construction phasing shown in the plans and approved by the Engineer, it shall be restored at his expense and backfilled to its original condition or better in accordance with Item 400.

Unless shown otherwise in the plans, use a 1-ft depth for Item 400 Structural Excavation (Special) for gravel bedding needed below drainage structures with unstable material.

Structural Excavation Special (Gravel):

Use durable natural stone when tested in accordance with Tex-411-A, has weight loss of no more than 18% after 5 cycles of magnesium sulfate solution. Provide gravel conforming to an aggregate Grade No. 1 as shown on Table 4 of Article 421.2.

ITEM 416: Drilled Shaft Foundations

Payment for furnishing and installing anchor bolts mounted in drill shafts will be included in the unit price bid for the various diameter drill shafts.

The Contractor shall coordinate with the utility companies to verify utility locations before drilling foundations.

The Contractor shall form, or provide a smooth finish, the portions of drilled shaft that project above the ground line. Place a ¾ inch chamfer on the top edge of each pole foundation. This work will not be paid for directly but will be considered subsidiary to this bid Item.

All drilled shaft foundations will be based on the lengths shown on the plans or those established in writing. Adequate calculations for measurements of foundations have been made in accordance with Article 9.1. of the Standard Specifications. Increases or decreases in the quantities required by change in design will be measured as specified and the revised quantities will be the basis for payment.

In the presence of excess ground water and/or unstable conditions in sub-grade soils prevents excavation to the line and depths indicated on the plans for “Drilled Shaft Foundation”, other

proposed methods of foundation installation such as casing, etc. shall be submitted for review and approved by the Engineer.

ITEM 421: Hydraulic Cement Concrete

Provide equipment at the batch plant for determining the free moisture and/or absorption of aggregates in accordance with applicable TXDOT Test.

Provide the following items for concrete batch inspection in accordance with specifications outlined in DMS-10101, "Computer Equipment":

(1) One Desktop Microcomputer or One Laptop Microcomputer
(2) One Integrated Printer/Scanner/Copier/Fax Unit
(3) Contractor-Furnished Software
(4) Hardware

Submit to the Engineer for approval the project locations for all Portland Cement concrete washout areas prior to starting any concrete work.

Fiber Reinforced Concrete is not permitted.

ITEM 432: Riprap

Provide Class "A" concrete minimum for riprap aprons placed around all box culvert and pipe safety end treatments. Provide ¼-inch thick dummy joints at least every 15-ft for riprap aprons placed around box and pipe culverts.

Do not use fiber reinforced concrete RIPRAP on side slopes equal to or steeper than 6:1 unless approved by the Engineer.

ITEM 464: Reinforced Concrete Pipe

Use tongue and groove pipe where the RCP extends into the lime treated subgrade. The 4-foot depth restriction for heavy equipment passage over pipe structures is voided. The Contractor will be responsible for any construction damage to these facilities.

Do not use mortar joints.

All reinforced concrete pipe shall include rubber gaskets unless shown otherwise on the plans or directed by the Engineer.

ITEM 465: Junction Boxes, Manholes, and Inlets

For TY PSL with RG, FG, or SFG lid inlets, provide Class B concrete riprap with (6"x6" W3xW3 (No. 6 gauge) welded wire fabric) for any side that is touching the natural ground. The riprap will be 4-in thick and 3-ft wide with an 8-in deep by 6-in wide toe unless otherwise shown in the plans. The cost will be subsidiary to Item 465, unless otherwise shown in the plans.

For all inlet extensions, provide a temporary circular curb/inlet extension opening for drainage during construction. The circular opening will be a 4-in Diameter by 2-in deep slot that matches the statewide PCO standard. Fill curb circular curb/inlet extension opening with epoxy and mortar as per Item 429 Concrete Structure Repair specifications. Epoxy and mortar are subsidiary to Item 465.

ITEM 496: Removing Structures

Store the following items to be salvaged at a location designated by the Engineer.

ITEM 502: Barricades, Signs, and Traffic Handling

Shadow vehicles equipped with Truck-Mounted Attenuators are required for traffic handling. See notes for Item 6185: Truck Mounted Attenuator/Trailer Attenuator, for additional references pertaining to the TMAs.

A pilot car and radio equipped flaggers shall be required for all undivided roadway locations as directed by the Engineer. The pilot car with necessary flaggers and/or radio equipped flaggers and all signs, equipment, labor, and incidentals required for this method of traffic control will not be paid for directly but shall be considered subsidiary to Item 502.

Replace/relocate all regulatory signs removed due to construction operations with the same sign on fixed support(s) immediately upon its removal. First obtain Project Engineer approval before removing any regulatory roadway sign. Required flaggers are to be available to direct traffic during sign intermediate down time.

Relocate any Directional Sign Assemblies removed during construction operations immediately upon their removal.

These signs shall be relocated to a location in accordance with the Latest Version of the "Texas Manual on Uniform Traffic Control Devices". In no case will a sign be removed without a replacement sign and support(s) being readily available and a location established. Removal and relocation of these signs required for traffic control will not be paid for directly but shall be considered subsidiary to Item 502.

From the beginning to the end of the project, all traffic control devices need to be in acceptable condition as per the Texas Quality Guidelines for Work Zone Traffic Control Devices.

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 "Safety Contingency" is not intended to be used in lieu of bid Items established by the contract.

Remove and dispose of all litter, debris, objectionable material, excess materials that accumulate at the base of all traffic control devices as directed by the Engineer.

ITEM 504: Field Office and Laboratory

Furnish (1) Field Office (Type C).

The Contractor will furnish a Type D Structure (Asphalt Mix Laboratory) modified by the following.

Laboratory room:

The other room of this building will be used as a laboratory and will include access to a bathroom facility from the interior. The laboratory and bathroom facility will have the walls, ceiling and floor insulated such that the air temperature can always be maintained at 76 degrees Fahrenheit.

Furnish for the Department's use in the asphalt laboratory one (1) desktop computer.

ITEM 506: Temporary Erosion, Sedimentation, and Environmental Controls

Before starting each phase of construction, review with the Engineer the SW3P used for temporary erosion control as outlined on the plans. Before construction, place the temporary erosion and sedimentation control features as shown on the SW3P. Location of Construction Exits are to be approved by the Engineer. After completing earthwork operations, restore and reseed the disturbed areas in accordance with the Department's specifications for permanent or temporary erosion control. Before starting grading operations and during the project duration, place the temporary or permanent erosion control measures to prevent sediment from leaving the right of way.

The Contractor Force Account "Erosion Control Maintenance" that has been established for this project is intended to be utilized for work zone Best Management Practice (BMP) maintenance, to improve the effectiveness of the Environmental Controls that may need maintenance attention

and/or require replacement while the project is still under the construction stage. These procedures will be mutually agreed upon by the Engineer and the Contractor's Responsible Person based on weekly or more frequent BMP management reviews on the project. The "Erosion Control Maintenance" is not intended to be used in lieu of bid Items established by the contract.

ITEM 508: Constructing Detours

Flexible Base, prime coat, and Asphaltic Concrete Pavement used for detours shall meet the requirements of Items 247, 310 and 3076 respectively, except for measurement and payment.

ITEM 512: Portable Traffic Barrier

During the various construction phases, provide drainage slots in every temporary concrete traffic barrier used for traffic control in order to handle temporary drainage. Provide any additional drainage measures needed as directed by the Engineer.

ITEM 529: Concrete Curb, Gutter, and Combined Curb and Gutter

Before final acceptance of the project, remove discoloration caused by tire marks, mud, asphalt, paint, or other similar material by any method satisfactory to the Engineer to achieve a uniform color and texture of the finished surface exposed to view.

Curb attached to the MBGF thrie-beam transition section will be subsidiary to the MBGF transition.

ITEM 530: Intersections, Driveways, and Turnouts

Prime coat shall meet the requirements of Item 310.

Public and private driveways need to have a smooth vertical transition tie-in between the proposed driveway and the existing driveway. The Contractor is to add a vertical taper if needed which will be subsidiary to Item 530.

ITEM 540: Metal Beam Guard Fence

The optional terminal anchor post with the terminal connector will be required as shown on the Metal Beam Guard Fence Standard.

Galvanize the rail elements supplied for this project using a Type II Zinc Coating.

ITEM 542: Removing Metal Beam Guard Fence

Dispose all metal beam guard fence materials unless shown otherwise in the plans.

ITEM 544: Guardrail End Treatments

Label “end treatment type” on backside of unit at time of installation.

ITEM 585: Ride Quality for Pavement Surfaces

Use Surface Test Type "B" for service roads and ramps.

Quality control results shall be submitted to TxDOT the next working day after each day’s paving.

Pavement areas with public turnout intersections that carry major traffic volumes will not be subjected to inertial profiler testing. These areas shall be evaluated using the 10-ft. straightedge.

Diamond grinding shall be used to remove localized roughness.

Use Surface Test Type B pay adjustment schedule 1 to evaluate ride quality of the travel lanes in accordance with Item 585, “Ride Quality for Pavement Surfaces.” This includes ramps and service road travel lanes.

ITEMS 636: Signs

Complete sign blanks and panels shall be handled and stored at the job site in such a manner that corners, edges and faces are not damaged. Finished sign blanks shall be stored in either a weatherproof warehouse or outside and off the ground in a vertical position. All paper, cardboard and chemically treated separators and packaging shall be removed prior to outside storage.

ITEM 644: Small Roadside Sign Assemblies

All signs shall be installed as shown in the plans and in accordance with the current edition of the "Texas Manual on Uniform Traffic Control Devices" and the “Sign Crew Field Book” (SCFB).

All signs shall be erected according to the locations shown on the signing layout sheets except that a sign may be shifted in order to secure a more desirable location. All sign locations will be staked as shown in the plans and as approved. It is the intent of the plans to erect all roadside traffic signs with the sign edge a minimum of 6 feet from the edge of the shoulder, or if none, 12 feet from the edge of the travel lane. In curb and gutter sections, the sign edge shall be a minimum of 2 feet from the face of the curb.

For this project, aluminum type sign blanks as provided for under Item 636 will be required for all proposed signing installed under Item 644. Aluminum sign blanks less than 7.5 square feet shall be 0.08-inch-thick, sign blanks 7.5 to 15 square feet shall be 0.100-inch-thick and sign blanks greater than 15 square feet shall be 0.125 inch thick.

All excess excavation shall be spread uniformly inside the right of way as directed and shall be included in the price of these Items.

Sign types which design details are not shown on the plans shall conform with the latest edition of the Department's "Standard Highway Sign Design for Texas" Manual.

Signs shown to be removed shall include the complete sign installation and separate the sign post at the concrete foundation. The concrete foundation shall be disposed in accordance with this bid Item. Except for concrete foundations, all removed sign panels, sign posts, and hardware shall remain then property of the Department. All removed sign installations shall be completely disassembled. All salvageable sections of sign panels shall be recycled by TxDOT. The removed sign material will be required to be hauled to the maintenance yard closest to the project. No signs shall be removed without prior approval.

ITEM 647: Large Roadside Sign Supports and Assemblies

New sign foundation stubs, when left overnight without installing signs and posts, shall be protected with flashing electric lights.

ITEMS 662 and 666: Work Zone Pavement Markings and Retroreflectorized Pavement Markings

For expressway projects, provide channelizing devices at the ramp connections when temporary pavement marking tabs are placed. These channelizing devices will be subsidiary to Item 502.

All permanent pavement markings and work zone pavement markings for this project under these Items shall be 0.100 inches (100 mil) thick thermoplastic.

Any permanent pavement markings or non-removal work zone pavement markings lacking reflectivity in accordance with the requirements of Tex 828-B, or that fail to meet minimum retro

reflectivity requirements for longitudinal pavement markings when required, will be addressed per the requirements of the specification. The roadway will be re-striped at no additional compensation.

Pavement surface preparation for markings and markers will not be paid for directly but shall be considered subsidiary to Item 666.

Prior to any striping operations, an on-site coordination meeting between all the parties involved will be required to review striping details and requirements to ensure quality work.

The beads used on this project shall meet the requirements of Departmental Materials Specification DMS-8290, Glass Traffic Beads Texas Type II & III. Use a 50% Type II/ 50% Type III mix utilizing a double drop system with Type III beads dropped first.

For expressway projects, provide channelizing devices at the ramp connections when temporary pavement marking tabs are placed. These channelizing devices will be subsidiary to Item 502.

ITEM 5001: Geogrid Base Reinforcement

Provide a construction plan to the Engineer detailing how the base will be lime treated without damaging the Geogrid Base Reinforcement placed on top of the subgrade.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0039-07-257 **DISTRICT** Pharr **COUNTY** Cameron
HIGHWAY IH 69E

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0039-07-257**			
		PROJECT ID		**A00132971**			
		COUNTY		**Cameron**			
		HIGHWAY		**IH 69E**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	104-6017	REMOVING CONC (DRIVEWAYS)	SY	99.000		99.000	
	104-6021	REMOVING CONC (CURB)	LF	3,918.000		3,918.000	
	105-6049	REMOVING STAB BASE & ASPH PAV (4"-22")	SY	10,645.000		10,645.000	
	110-6001	EXCAVATION (ROADWAY)	CY	21,325.000		21,325.000	
	132-6006	EMBANKMENT (FINAL)(DENS CONT)(TY C)	CY	2,377.000		2,377.000	
	160-6003	FURNISHING AND PLACING TOPSOIL (4")	SY	24,999.000		24,999.000	
	164-6023	CELL FBR MLCH SEED(PERM)(RURAL)(CLAY)	SY	24,999.000		24,999.000	
	164-6029	CELL FBR MLCH SEED(TEMP)(WARM)	SY	24,999.000		24,999.000	
	168-6001	VEGETATIVE WATERING	MG	790.000		790.000	
	247-6236	FL BS (RDWY DEL)(TY A GR 1-2)(FNAL POS)	CY	11,411.000		11,411.000	
	275-6001	CEMENT	TON	455.000		455.000	
	275-6083	CEMENT TREAT (NEW BASE)(20")	SY	20,544.000		20,544.000	
	310-6009	PRIME COAT (MC-30)	GAL	3,615.000		3,615.000	
	316-6005	ASPH (TIER II)	GAL	5,421.000		5,421.000	
	316-6426	AGGR (GR 4P)	CY	153.000		153.000	
	354-6041	PLANE ASPH CONC PAV (1.5")	SY	24,175.000		24,175.000	
	400-6005	CEM STABIL BKFL	CY	116.000		116.000	
	402-6001	TRENCH EXCAVATION PROTECTION	LF	1,668.000		1,668.000	
	416-6015	DRILL SHAFT (NON - REINFORCED) (12 IN)	LF	14.000		14.000	
	416-6018	DRILL SHAFT (SIGN MTS) (24 IN)	LF	169.000		169.000	
	432-6001	RIPRAP (CONC)(4 IN)	CY	223.000		223.000	
	432-6043	RIPRAP(CONC)(SIGN MOUNTS)(CL B)	CY	18.900		18.900	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	37.000		37.000	
	464-6003	RC PIPE (CL III)(18 IN)	LF	1,274.000		1,274.000	
	464-6005	RC PIPE (CL III)(24 IN)	LF	139.000		139.000	
	464-6007	RC PIPE (CL III)(30 IN)	LF	313.000		313.000	
	464-6008	RC PIPE (CL III)(36 IN)	LF	12.000		12.000	
	465-6006	JCTBOX(COMPL)(PJB)(4FTX4FT)	EA	9.000		9.000	
	465-6020	INLET (COMPL)(PCO)(4FT)(BOTH)	EA	1.000		1.000	
	465-6128	INLET (COMPL)(PSL)(FG)(4FTX4FT-4FTX4FT)	EA	7.000		7.000	
	496-6002	REMOV STR (INLET)	EA	7.000		7.000	
	496-6007	REMOV STR (PIPE)	LF	871.000		871.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	11.000		11.000	
	506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	702.000		702.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY	702.000		702.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	1,600.000		1,600.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0039-07-257 **DISTRICT** Pharr **COUNTY** Cameron
HIGHWAY IH 69E

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0039-07-257**			
		PROJECT ID		**A00132971**			
		COUNTY		**Cameron**			
		HIGHWAY		**IH 69E**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	1,600.000		1,600.000	
	506-6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	380.000		380.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	380.000		380.000	
	508-6001	CONSTRUCTING DETOURS	SY	2,844.000		2,844.000	
	512-6001	PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	LF	6,100.000		6,100.000	
	512-6009	PORT CTB (FUR & INST)(LOW PROF)(TY 1)	LF	3,020.000		3,020.000	
	512-6010	PORT CTB (FUR & INST)(LOW PROF)(TY 2)	LF	80.000		80.000	
	512-6025	PORT CTB (MOVE)(SGL SLP)(TY 1)	LF	3,000.000		3,000.000	
	512-6033	PORT CTB (MOVE)(LOW PROF)(TY 1)	LF	4,160.000		4,160.000	
	512-6034	PORT CTB (MOVE)(LOW PROF)(TY 2)	LF	80.000		80.000	
	512-6049	PORT CTB (REMOVE)(SGL SLP)(TY 1)	LF	6,100.000		6,100.000	
	512-6057	PORT CTB (REMOVE)(LOW PROF)(TY 1)	LF	3,020.000		3,020.000	
	512-6058	PORT CTB (REMOVE)(LOW PROF)(TY 2)	LF	80.000		80.000	
	529-6008	CONC CURB & GUTTER (TY II)	LF	3,678.000		3,678.000	
	530-6004	DRIVEWAYS (CONC)	SY	92.000		92.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	1,045.000		1,045.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF	1,055.000		1,055.000	
	542-6003	REMOVE DOWNSTREAM ANCHOR TERMINAL	EA	1.000		1.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	2.000		2.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA	2.000		2.000	
	545-6003	CRASH CUSH ATTEN (MOVE & RESET)	EA	2.000		2.000	
	545-6005	CRASH CUSH ATTEN (REMOVE)	EA	4.000		4.000	
	545-6019	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	EA	4.000		4.000	
	636-6001	ALUMINUM SIGNS (TY A)	SF	280.400		280.400	
	636-6002	ALUMINUM SIGNS (TY G)	SF	195.000		195.000	
	636-6007	REPLACE EXISTING ALUMINUM SIGNS(TY A)	SF	1.000		1.000	
	644-6027	IN SM RD SN SUP&AM TYS80(1)SA(P)	EA	4.000		4.000	
	644-6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	7.000		7.000	
	644-6070	RELOCATE SM RD SN SUP&AM TY S80	EA	12.000		12.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	4.000		4.000	
	647-6001	INSTALL LRSS (STRUCT STEEL)	LB	900.900		900.900	
	647-6002	RELOCATE LRSA	EA	7.000		7.000	
	647-6003	REMOVE LRSA	EA	1.000		1.000	
	658-6083	INSTL DEL ASSM (D-SW)SZ 1(WFLX)SRF	EA	70.000		70.000	
	662-6060	WK ZN PAV MRK REMOV (W)4"(BRK)	LF	9,242.000		9,242.000	
	662-6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	23,425.000		23,425.000	
	662-6071	WK ZN PAV MRK REMOV (W)8"(SLD)	LF	57.000		57.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0039-07-257 **DISTRICT** Pharr **COUNTY** Cameron
HIGHWAY IH 69E

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0039-07-257**			
		PROJECT ID		**A00132971**			
		COUNTY		**Cameron**			
		HIGHWAY		**IH 69E**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	662-6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	14,706.000		14,706.000	
	666-6006	REFL PAV MRK TY I (W)4"(DOT)(100MIL)	LF	35.000		35.000	
	666-6018	REFL PAV MRK TY I (W)6"(DOT)(100MIL)	LF	158.000		158.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	5,334.000		5,334.000	
	666-6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	855.000		855.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	335.000		335.000	
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	2,311.000		2,311.000	
	666-6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	14,656.000		14,656.000	
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	320.000		320.000	
	666-6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	4,136.000		4,136.000	
	666-6350	REFL PAV MRK TY I (W)12"(DOT)(100MIL)	LF	1,093.000		1,093.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	7.000		7.000	
	668-6078	PREFAB PAV MRK TY C (W) (DBL ARROW)	EA	2.000		2.000	
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA	9.000		9.000	
	668-6089	PREFAB PAV MRK TY C (W) (RR XING)	EA	7.000		7.000	
	672-6007	REFL PAV MRKR TY I-C	EA	6.000		6.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	477.000		477.000	
	680-6011	INSTALL HWY TRF SIG (UPGRADE)	EA	1.000		1.000	
	3076-6001	D-GR HMA TY-B PG64-22	TON	3,084.000		3,084.000	
	3077-6065	SP MIXESSP-DSAC-A PG76-22	TON	3,616.000		3,616.000	
	3084-6001	BONDING COURSE	GAL	3,608.000		3,608.000	
	5001-6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	22,344.000		22,344.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	3.000		3.000	
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	
		RAILROAD FLAGGING: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	

I69E CORRIDOR

Baseline Station	Station Quantities								Mass Ordinate (cu. yd)
	Cut				Fill				
	Factor	Area (sq. ft)	Volume (cu. yd)	Adjusted (cu. yd)	Factor	Area (sq. ft)	Volume (cu. yd)	Adjusted (cu. yd)	
1093+00.0	1				1				0.00
1094+00.0	1	22.47	41.61	41.61	1	26.34	48.77	48.77	-7.16
1095+00.0	1	34.64	105.76	105.76	1	48.58	138.74	138.74	-40.14
1096+00.0	1	59.62	174.55	174.55	1	65.44	211.15	211.15	-76.74
1097+00.0	1	75.22	249.70	249.70	1	205.16	501.11	501.11	-328.15
1098+00.0	1	104.53	332.86	332.86	1	87.97	542.84	542.84	-538.13
1099+00.0	1	160.75	491.25	491.25	1	18.5	197.18	197.18	-244.06
1099+36.2	1				1				0.00
1100+00.0	1	223.78	712.08	712.08	1	2.01	37.98	37.98	430.04
1101+00.0	1	234.67	848.98	848.98	1	0.49	4.62	4.62	1274.40
1102+00.0	1	220.88	843.62	843.62	1	2.29	5.15	5.15	2112.87
1103+00.0	1	218.31	813.30	813.30	1	6.75	16.74	16.74	2909.43
1104+00.0	1	167.58	714.59	714.59	1	5.5	22.68	22.68	3601.35
1105+00.0	1	195.99	673.26	673.26	1	1.62	13.17	13.17	4261.44
1106+00.0	1	160.84	660.79	660.79	1	0.96	4.77	4.77	4917.46
1107+00.0	1	129.55	537.75	537.75	1	0.0000	1.77	1.77	5453.44
1108+00.0	1	120.16	462.41	462.41	1	0.0000	0.00	0.00	5915.86
1109+00.0	1	108.54	423.52	423.52	1	1.25	2.31	2.31	6337.07
1110+00.0	1	110.39	405.44	405.44	1	1.26	4.64	4.64	6737.86
1111+00.0	1	103.2	395.55	395.55	1	3.28	8.41	8.41	7125.00
1112+00.0	1	106.1	387.60	387.60	1	2.91	11.48	11.48	7501.12
1113+00.0	1	105.22	391.32	391.32	1	3.81	12.46	12.46	7879.98
1114+00.0	1	108.49	395.76	395.76	1	3.39	13.35	13.35	8262.39
1115+00.0	1	126.37	434.94	434.94	1	2	9.98	9.98	8687.35
1116+00.0	1	152.44	516.31	516.31	1	2.79	8.87	8.87	9194.79
1117+00.0	1	212.07	675.02	675.02	1	2.46	9.73	9.73	9860.07
1118+00.0	1	289.56	928.94	928.94	1	11.44	25.75	25.75	10763.26
1119+00.0	1	265.23	1027.39	1027.39	1	15.89	50.62	50.62	11740.03
1120+00.0	1	204.07	869.08	869.08	1	28.38	82.00	82.00	12527.11
1121+00.0	1	224.64	793.90	793.90	1	17.71	85.36	85.36	13235.65
1122+00.0	1	243.01	866.02	866.02	1	12.6	56.13	56.13	14045.54
1123+00.0	1	256.28	924.62	924.62	1	11.73	45.04	45.04	14925.12
1124+00.0	1	257.36	951.18	951.18	1	11.05	42.18	42.18	15834.12
1125+00.0	1	232.9	907.88	907.88	1	14.99	48.22	48.22	16693.79
1126+00.0	1	165.67	738.09	738.09	1	20.33	65.40	65.40	17366.48
1127+00.0	1	144.8	574.94	574.94	1	0	37.65	37.65	17903.77
1128+00.0	1	146.75	539.91	539.91	1	1.53	2.83	2.83	18440.85
1129+00.0	1	131.33	514.96	514.96	1	2.89	8.19	8.19	18947.62
Grand Total:		21324.89	21324.89			2377.27	2377.27		

SUMMARY OF EARTHWORK

	110 6001	132 6006
	EXCAVATION (ROADWAY)	EMBANKMENT (FINAL) (DENS CONT) (TY C)
	CY	CY
PROJECT TOTALS	21325	2377

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
NICOLAS C. GARCIA
99410
LICENSED
PROFESSIONAL ENGINEER

Nicolas C. Garcia, P.E.

12/15/2022

Texas Department of Transportation
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QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
4350 Lockhill Selma Road, Suite 100•San Antonio, Texas 78249•210.494.5511

I-69E
SUMMARY OF QUANTITIES
EARTHWORK

SHEET 01 OF 01

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	11
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS (1 OF 2)										
LOCATION	508 6001	512 6001	512 6009	512 6010	512 6025	512 6033	512 6034	512 6049	512 6057	512 6058
	CONSTRUCTING DETOURS	PORT CTB (FUR & INST) (SGL SLOPE) (TY 1)	PORT CTB (FUR & INST) (LOW PROF) (TY 1)	PORT CTB (FUR & INST) (LOW PROF) (TY 2)	PORT CTB (MOVE) (SGL SLP) (TY 1)	PORT CTB (MOVE) (LOW PROF) (TY 1)	PORT CTB (MOVE) (LOW PROF) (TY 2)	PORT CTB (REMOVE) (SGL SLP) (TY 1)	PORT CTB (REMOVE) (LOW PROF) (TY 1)	PORT CTB (REMOVE) (LOW PROF) (TY 2)
	SY	LF	LF	LF	LF	LF	LF	LF	LF	LF
PHASE 1										
PHASE 1 -STEP 1	2844	0	1480	80	0	0	0	0	0	0
PHASE 1 -STEP 2	0	6100	1540	0	0	1480	0	3100	340	0
PHASE 1 -STEP 3	0	0	0	0	3000	2680	80	3000	2680	80
PROJECT TOTALS	2844	6100	3020	80	3000	4160	80	6100	3020	80

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS (2 OF 2)								
LOCATION	545 6003	545 6005	545 6019	662 6060	662 6063	662 6071	662 6095	6001 6002
	CRASH CUSH ATTEN (MOVE & RESET)	CRASH CUSH ATTEN (REMOVE)	CRASH CUSH ATTEN (INSTL) (S) (N) (TL3)	WK ZN PAV MRK REMOV (W) 4" (BRK)	WK ZN PAV MRK REMOV (W) 4" (SLD)	WK ZN PAV MRK REMOV (W) 8" (SLD)	WK ZN PAV MRK REMOV (Y) 4" (SLD)	PORTABLE CHANGEABLE MESSAGE SIGN
	EA	EA	EA	LF	LF	LF	LF	EA
PHASE 1								
PHASE 1 -STEP 1	0	0	0	0	0	0	0	0
PHASE 1 -STEP 2	0	0	4	3154	7622	33	7621	2
PHASE 1 -STEP 3	2	4	0	6088	15803	24	7085	1
PROJECT TOTALS	2	4	4	9242	23425	57	14706	3

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
4350 Lockhill Selma Road, Suite 100 • San Antonio, Texas 78249 • 210.494.5511

I-69E
SUMMARY OF QUANTITIES
TRAFFIC CONTROL PLAN

SHEET 1 OF 2

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	12
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

PENTABLE: I69E-RAMPS.tbl
PLOTDRIVER: BW_HALF_PDF.pltcfg
DATE: 12/6/2022 6:19:12 PM USER:
FILE: c:\bms\pwe101-01\daniel.ontiveros\dms24517\I69E-RAMPS_SUM_TCP_01.dgn

SUMMARY OF REMOVAL ITEMS							
LOCATION	104 6017	104 6021	105 6049	354 6041	542 6001	542 6003	544 6003
	REMOVING CONC (DRIVEWAYS)	REMOVING CONC (CURB)	REMOVING STAB BASE & ASPH PAV (4"-22")	PLANE ASPH CONC PAV (1.5")	REMOVE METAL BEAM GUARD FENCE	REMOVE DOWNSTREAM ANCHOR TERMINAL	GUARDRAIL END TREATMENT (REMOVE)
	SY	SY	SY	SY	LF	EA	EA
REMOVAL SHEET 1 OF 3	0	0	48	9238	129	0	0
REMOVAL SHEET 2 OF 3	0	1874	3901	11100	835	1	1
REMOVAL SHEET 3 OF 3	99	2044	6696	3837	91	0	1
PROJECT TOTALS	99	3918	10645	24175	1055	1	2

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
4350 Lockhill Selma Road, Suite 100•San Antonio, Texas 78249•210.494.5511

I-69E
SUMMARY OF QUANTITIES
REMOVALS

SHEET 1 OF 1

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	13
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

PLOTDRIVER: BW_HALF_PDF.pltcfg
PENTABLE: I69E-RAMPS.tbl
DATE: 11/22/2022 4:37:26 PM USER:
FILE: c:\bms\pwe101-01\matt.becket\dms245117\I69E-RAMPS_SUM_REM.dgn

SUMMARY OF ROADWAY ITEMS (1 OF 2)

LOCATION	247 6236	275 6001	275 6083	310 6009	316 6005	316 6426	432 6001	432 6045
	FL BS (RDWY DEL)(TY A GR 1-2)(FNAL POS)	CEMENT	CEMENT TREAT (NEW BASE)(20")	PRIME COAT (MC-30)	ASPH (TIER II)	AGGR (GR 4P)	RIPRAP (CONC)(4 IN)	RIPRAP (MOW STRIP)(4 IN)
	CY	TON	SY	GAL	GAL	CY	CY	CY
PLAN & PROFILE: NBE RAMP SHEET 1 OF 2	544	22	979	182	273	8	0	0
PLAN & PROFILE: NBE RAMP SHEET 2 OF 2	297	12	534	91	136	4	0	10
PLAN & PROFILE: NBX RAMP SHEET 1 OF 2	855	34	1540	272	408	11	0	13
PLAN & PROFILE: NBX RAMP SHEET 2 OF 2	40	2	72	8	12	1	0	0
PLAN & PROFILE: SBE RAMP SHEET 1 OF 2	418	17	753	132	198	5	0	8
PLAN & PROFILE: SBE RAMP SHEET 2 OF 2	867	34	1561	280	420	12	0	6
PLAN & PROFILE: SBX RAMP SHEET 1 OF 2	341	14	613	102	153	4	0	0
PLAN & PROFILE: SBX RAMP SHEET 2 OF 2	576	23	1038	188	282	8	0	0
PLAN & PROFILE: NBFR SHEET 1 OF 6	0	0	0	0	0	0	0	0
PLAN & PROFILE: NBFR SHEET 2 OF 6	0	0	0	0	0	0	0	0
PLAN & PROFILE: NBFR SHEET 3 OF 6	424	17	763	131	196	5	0	0
PLAN & PROFILE: NBFR SHEET 4 OF 6	1489	59	2681	504	756	21	0	0
PLAN & PROFILE: NBFR SHEET 5 OF 6	2790	110	5023	860	1289	36	0	0
PLAN & PROFILE: NBFR SHEET 6 OF 6	725	29	1306	221	333	9	0	0
PLAN & PROFILE: SBFR SHEET 1 OF 6	0	0	0	0	0	0	0	0
PLAN & PROFILE: SBFR SHEET 2 OF 6	31	2	56	5	8	1	180	0
PLAN & PROFILE: SBFR SHEET 3 OF 6	311	13	560	90	134	4	43	0
PLAN & PROFILE: SBFR SHEET 4 OF 6	1371	54	2468	461	692	19	0	0
PLAN & PROFILE: SBFR SHEET 5 OF 6	332	13	597	88	131	4	0	0
PLAN & PROFILE: SBFR SHEET 6 OF 6	0	0	0	0	0	0	0	0
PROJECT TOTALS	11411	455	20544	3615	5421	153	223	37

RATES:
ASPH TIER II 0.30 GAL./SY
AGGR (GR-4P) 1 CY/20 SY
PRIME COAT (MC-30) 0.20 GAL/SY

EST. WT. OF FLEXIBLE BASE = 1305 LB./SY

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I-69E
SUMMARY OF QUANTITIES
ROADWAY

SHEET 1 OF 2

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	14
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

PLOTDRIVER: BW_HALF_PDF.pltcfg PENTABLE: I69E-RAMPS.tbl
DATE:11/28/2022 8:37:01 PM USER:
FILE:c:\bms\pwe101-01\jason.kane\dms245177\I69E-RAMPS_SUM_RDWY_01.dgn

SUMMARY OF ROADWAY ITEMS (2 OF 2)								
LOCATION	529 6008	530 6004	540 6001	544 6001	3076 6001	3077 6065	3084 6001	5001 6002
	CONC CURB & GUTTER (TY II)	DRIVEWAYS (CONC)	MTL W-BEAM GD FEN (TIM POST)	GUARDRAIL END TREATMENT (INSTALL)	D-GR HMA TY-B PG64-22	SP MIXES SP-D SAC-A PG76-22	BONDING COURSE	GEOGRID BASE REINFORCEMENT (TY II)
	LF	SY	LF	EA	TON	TON	GAL	SY
PLAN & PROFILE: NBX RAMP SHEET 1 OF 2	0	0	272	0	232	116	272	1720
PLAN & PROFILE: NBX RAMP SHEET 2 OF 2	0	0	0	0	6	4	8	106
PLAN & PROFILE: NBE RAMP SHEET 1 OF 2	0	0	0	0	155	78	182	1029
PLAN & PROFILE: NBE RAMP SHEET 2 OF 2	0	0	91	1	77	39	91	618
PLAN & PROFILE: SBE RAMP SHEET 1 OF 2	0	0	682	1	112	56	131	849
PLAN & PROFILE: SBE RAMP SHEET 2 OF 2	0	0	0	0	239	120	280	1721
PLAN & PROFILE: SBX RAMP SHEET 1 OF 2	0	0	0	0	87	44	101	719
PLAN & PROFILE: SBX RAMP SHEET 2 OF 2	0	0	0	0	160	80	188	1135
PLAN & PROFILE: NBFR SHEET 1 OF 6	0	0	0	0	0	145	0	0
PLAN & PROFILE: NBFR SHEET 2 OF 6	0	0	0	0	0	250	0	0
PLAN & PROFILE: NBFR SHEET 3 OF 6	582	0	0	0	112	297	130	851
PLAN & PROFILE: NBFR SHEET 4 OF 6	0	0	0	0	430	457	503	2844
PLAN & PROFILE: NBFR SHEET 5 OF 6	427	92	0	0	735	404	859	5323
PLAN & PROFILE: NBFR SHEET 6 OF 6	1896	0	0	0	189	94	221	1426
PLAN & PROFILE: SBFR SHEET 1 OF 6	0	0	0	0	0	183	0	0
PLAN & PROFILE: SBFR SHEET 2 OF 6	150	0	0	0	4	247	5	78
PLAN & PROFILE: SBFR SHEET 3 OF 6	246	0	0	0	76	280	89	619
PLAN & PROFILE: SBFR SHEET 4 OF 6	0	0	0	0	394	426	461	2631
PLAN & PROFILE: SBFR SHEET 5 OF 6	377	0	0	0	74	255	87	675
PLAN & PROFILE: SBFR SHEET 6 OF 6	0	0	0	0	0	41	0	0
PROJECT TOTALS	3678	92	1045	2	3084	3616	3608	22344

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I-69E
SUMMARY OF QUANTITIES
ROADWAY

SHEET 2 OF 2

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	15
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

PLOTDRIVER: BW_HALF_PDF.pltcfg PENTABLE: I69E-RAMPS.tbl
DATE: 11/28/2022 8:37:05 PM USER:
FILE: c:\bms\pwe101-01\jason.kane\dms24517\I69E-RAMPS_SUM_RDWY_02.dgn

SUMMARY OF SIGNING ITEMS

LOCATION	416 6015	416 6018	432 6043	636 6001	636 6002	636 6007	644 6027	644 6030	644 6070	644 6076	647 6001	647 6002	647 6003	658 6083
	DRILL SHAFT (NON - REINFORCED) (12 IN)	DRILL SHAFT (SIGN MTS) (24 IN)	RIPRAP(CONC)(SIGN MOUNTS)(CL B)	ALUMINUM SIGNS (TY A)	ALUMINUM SIGNS (TY G)	REPLACE EXISTING ALUMINUM SIGNS(TY A)	IN SM RD SN SUP&AM TYS80(1)SA(P)	IN SM RD SN SUP&AM TYS80(1)SA(T)	RELOCATE SM RD SN SUP&AM TY S80	REMOVE SM RD SN SUP&AM	INSTALL LRSS (STRUCT STEEL)	RELOCATE LRSA	REMOVE LRSA	INSTL DEL ASSM (D-SW)SZ 1(WFLX)SRF
	LF	LF	CY	SF	SF	SF	EA	EA	EA	EA	LB	EA	EA	EA
IH69E SIGNING AND PAVEMENT MARKINGS SHEET 01 OF 07	0	44	3.8	0	0	0	0	0	0	0	0	2	0	0
IH69E SIGNING AND PAVEMENT MARKINGS SHEET 02 OF 07	0	27	2.3	0	0	0	0	0	0	0	0	1	0	0
IH69E SIGNING AND PAVEMENT MARKINGS SHEET 03 OF 07	0	18	1.9	205.1	0	1	4	1	0	0	0	1	0	0
IH69E SIGNING AND PAVEMENT MARKINGS SHEET 04 OF 07	7	24	3.5	28.3	37.5	0	0	2	4	2	298.3	1	0	11
IH69E SIGNING AND PAVEMENT MARKINGS SHEET 05 OF 07	0	0	0	32	0	0	0	2	0	0	0	0	0	38
IH69E SIGNING AND PAVEMENT MARKINGS SHEET 06 OF 07	7	0	1.2	0	0	0	0	0	5	2	0	0	1	21
IH69E SIGNING AND PAVEMENT MARKINGS SHEET 07 OF 07	0	56	6.2	15	157.5	0	0	2	3	0	602.6	2	0	0
PROJECT TOTALS	14	169	18.9	280.4	195	1	4	7	12	4	900.9	7	1	70

SUMMARY OF PAVEMENT MARKING ITEMS (1 OF 2)

LOCATION	666 6006	666 6018	666 6036	666 6042	666 6048	666 6300	666 6309	666 6315	666 6321	666 6350	668 6077
	REFL PAV MRK TY I (W)4"(DOT)(100MIL)	REFL PAV MRK TY I (W)6"(DOT)(100MIL)	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	REFL PAV MRK TY I (W)12"(DOT)(100MIL)	PREFAB PAV MRK TY C (W) (ARROW)
	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	EA
IH69E SIGNING AND PAVEMENT MARKINGS SHEET 01 OF 07	0	0	0	0	0	0	0	0	0	0	0
IH69E SIGNING AND PAVEMENT MARKINGS SHEET 02 OF 07	0	0	0	0	0	304	1119	0	0	0	0
IH69E SIGNING AND PAVEMENT MARKINGS SHEET 03 OF 07	0	0	672	0	161	310	2069	0	0	0	0
IH69E SIGNING AND PAVEMENT MARKINGS SHEET 04 OF 07	0	79	1050	122	48	506	4385	0	937	0	0
IH69E SIGNING AND PAVEMENT MARKINGS SHEET 05 OF 07	0	0	1179	513	0	550	3032	0	1215	1093	4
IH69E SIGNING AND PAVEMENT MARKINGS SHEET 06 OF 07	0	79	1691	188	0	552	3558	0	1677	0	0
IH69E SIGNING AND PAVEMENT MARKINGS SHEET 07 OF 07	35	0	742	32	126	89	493	320	307	0	3
PROJECT TOTALS	35	158	5334	855	335	2311	14656	320	4136	1093	7

SUMMARY OF PAVEMENT MARKING ITEMS (2 OF 2)

LOCATION	668 6078	668 6085	668 6089	672 6007	672 6010
	PREFAB PAV MRK TY C (W) (DBL ARROW)	PREFAB PAV MRK TY C (W) (WORD)	PREFAB PAV MRK TY C (W) (RR XING)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-C-R
	EA	EA	EA	EA	EA
IH69E SIGNING AND PAVEMENT MARKINGS SHEET 01 OF 08	0	0	0	0	0
IH69E SIGNING AND PAVEMENT MARKINGS SHEET 02 OF 07	0	0	0	0	16
IH69E SIGNING AND PAVEMENT MARKINGS SHEET 03 OF 07	0	0	2	0	84
IH69E SIGNING AND PAVEMENT MARKINGS SHEET 04 OF 07	0	1	2	0	111
IH69E SIGNING AND PAVEMENT MARKINGS SHEET 05 OF 07	0	4	0	0	134
IH69E SIGNING AND PAVEMENT MARKINGS SHEET 06 OF 07	0	1	0	0	114
IH69E SIGNING AND PAVEMENT MARKINGS SHEET 07 OF 07	2	3	3	6	18
PROJECT TOTALS	2	9	7	6	477

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I-69E
SUMMARY OF QUANTITIES
SIGNING & PAVEMENT MARKINGS

SHEET 1 OF 1

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	16
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

PLOTDRIVER: BW_HALF_PDF.pltcfg PENTABLE: I69E-RAMPS.tbl
DATE:12/15/2022 3:35:06 AM USER:
FILE:c:\bms\pwe101-01\jason.kane\dms24517\I69E-RAMPS_SUM_SPM.dgn

DRAINAGE SUMMARY													
SHEET NO.	STATION LIMITS	0400-6001* STRUCT EXCAV	0400-6005 CEM STABIL BKFL	0402-6001 TRENCH EXCAVATION PROTECTION	0464-6003 RC PIPE (CL III) (18 IN)	0464-6005 RC PIPE (CL III) (24 IN)	0464-6007 RC PIPE (CL III) (30 IN)	0464-6008 RC PIPE (CL III) (36 IN)	0465-6006 JCTBOX (COMPL) (PJB) (4FTX4FT)	0465-6020 INLET (COMPL) (PCO) (4FT) (BOTH)	0465-6128 INLET (COMPL) (PSL)(FG) (4FTX4FT -4FTX4FT)	0496-6002 REMOV STR (INLET)	0496-6007 REMOV STR (PIPE)
		CY	CY	LF	LF	LF	LF	LF	EA	EA	EA	EA	LF
	SYS A	618	11	523	223		300	12	4		3	3	311
	SYS B	773	89	1061	1028	33			3		4	2	97
	SYS C	121	16	84	23	106	13		2	1		2	463
PROJECT TOTAL		1512	116	1668	1274	139	313	12	9	1	7	7	871

* FOR CONTRACTOR INFORMATION ONLY

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SANCHEZ-SALAZAR & ASSOCIATES, LLC

12770 Cimarron Path, Ste. 118
San Antonio, TX 78249
Phone: (210) 314-5458
TBPELS Registration No. 15685

I69E
SUMMARY OF QUANTITIES
DRAINAGE

SHEET 1 OF 1

DRAWN	FED.RD. DIV.NO.	STATE PROJECT NUMBER		HIGHWAY NO.
RO	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
RO	TEXAS	PHARR	CAMERON	17
CHECKED	CONT.	SECT.	JOB	
GG	0039	07	257	
APPROVED				
GG				

PLOTDRIVER: V8i_BAKER_WIN_BW_PDF.plt CENTABLE: I69E-RAMPS.tbl
DATE:12/14/2022 11:56:02 AM USER:
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	SW3P SUMMARY												
			0160-6003	0164-6023	0164-6029	0166-6002*	0168-6001	0506-6020	0506-6024	0506-6038	0506-6039	0506-6041	0506-6043
PHASE	SHEET NO.	STATION LIMITS	FURNISHING AND PLACING TOPSOIL (4")	CELL FBR MLCH SEED (PERM) (RURAL) (CLAY)	CELL FBR MLCH SEED (TEMP) (WARM)	FERTILIZER	VEGETATIVE WATERING	CONSTRUCTION EXITS (INSTALL) (TY 1)	CONSTRUCTION EXITS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	BIODEG EROSN CONT LOGS (INSTL) (12")	BIODEG EROSN CONT LOGS (REMOVE)
			SY	SY	SY	TON	MG	SY	SY	LF	LF	LF	LF
1	1 OF 3	BEGIN TO STA 1094+00											
	2 OF 3	STA 1094+00 TO STA 1116+00	13694	13694	13694	0.14	433	468	468	395	395	200	200
	3 OF 3	STA 1116+00 TO END	11305	11305	11305	0.12	357	234	234	1205	1205	180	180
PROJECT TOTAL			24999	24999	24999	0.26	790	702	702	1600	1600	380	380

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12770 Cimarron Path, Ste. 118
San Antonio, TX 78249
Phone: (210) 314-5458
TBPELS Registration No. 15685

I69E
SUMMARY OF QUANTITIES
SW3P

SHEET 1 OF 1

DRAWN	FED.RD. DIV.NO.	STATE PROJECT NUMBER		HIGHWAY NO.
RO	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
RO	TEXAS	PHARR	CAMERON	18
CHECKED	CONT.	SECT.	JOB	
GG	0039	07	257	
APPROVED				
GG				

PLOTDRIVER: cpypdf_ANSIB.pltcfg PENTABLE: I69E-RAMPS.tbl
DATE: 12/5/2022 9:21:27 AM USER:
FILE: c:\bms\pwe101-01\uvaldo.valdez\dms24518\I69E-SW3P-SUMMARY.dgn

GENERAL NOTES AND SPECIFICATIONS DATA:

USE A POWER-BROOM WHEN CLEANING THE ROADWAY AS NEEDED.

REMOVE & DISPOSE OF ALL MATERIAL NOT DEEMED SALVAGEABLE BY THE ENGINEER, UNLESS OTHERWISE SHOWN ON THE PLANS.

ON EXISTING PAVEMENT THAT WILL REMAIN IN PLACE, SAND BLAST OR SURFACE TREAT IN ORDER TO REMOVE EXISTING STRIPING.

DO NOT BLOCK DRAINAGE WHEN HANDLING & STOCKPILING EXCAVATED MATERIAL.

MAINTAIN ALL WEATHER ACCESS TO DRIVEWAYS AND INTERSECTIONS THROUGH ALL PHASES OF CONSTRUCTION.

CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE DURING ALL PHASES OF CONSTRUCTION.

ALWAYS COMPLETE THE PROPOSED DRIVEWAYS DURING THEIR TCP PHASE BEFORE SWITCHING TRAFFIC TO A NEW PHASE UNLESS DIRECTED BY THE ENGINEER.

TRAFFIC CONTROL DEVICES:

AT THE COMMENCEMENT OF THE PROJECT, ALL TRAFFIC CONTROL DEVICES SHALL BE IN ACCEPTABLE CONDITION, AND MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT, AS PER GUIDELINES FOR TEMPORARY TRAFFIC CONTROL DEVICES AND FEATURES.

NOTIFY THE AREA ENGINEER<AE> IN WRITING<E-MAIL IS ACCEPTABLE) ONCE THE TRAFFIC CONTROL PLAN (TCP) AND ALL TRAFFIC CONTROL DEVICES HAVE BEEN INSTALLED AS PER PLANS ON THE PROJECT SO THAT THE DEPARTMENT'S RESPONSIBLE PERSON ACCOMPANIED BY THE CONTRACTOR'S RESPONSIBLE PERSON CAN CONDUCT A NIGHT INSPECTION ON THE SAID TCP AND TRAFFIC CONTROL DEVICES. COMMENCEMENT OF WORK WILL NOT BE AUTHORIZED NOR ALLOWED UNTIL THE AREA ENGINEER NOTIFIES THE CONTRACTOR IN WRITING (E-MAIL IS ACCEPTABLE) TO PROCEED WITH THE WORK.

CONTRACTOR SHALL HAVE A SUFFICIENT AMOUNT OF TRAFFIC CONTROL DEVICES IN ACCEPTABLE CONDITION TO REPLACE ANY DAMAGED TRAFFIC CONTROL DEVICES WITHIN 24 HOURS OF NOTIFICATION.

PROVIDE ADDITIONAL SIGNS AND BARRICADES AS NECESSARY TO ADDRESS FIELD CONSTRUCTABILITY & VISIBILITY. THESE ADDITIONAL SIGNS WILL BE CONSIDERED SUBSIDIARY TO ITEM 502.

REMOVE OR COMPLETELY COVER ALL EXISTING SIGNS WHICH ARE IN CONFLICT WITH THE TRAFFIC CONTROL PLAN.

ADJUST STOP SIGNS AS NEEDED ON INTERSECTING STREETS DURING THE VARIOUS CONSTRUCTION PHASES. DO NOT REMOVE ANY EXISTING STOP SIGNS UNTIL TEMPORARY STOP SIGNS ARE IN PLACE.

COORDINATE THE TRAFFIC CONTROL PLAN AND THE VARIOUS SEQUENCES OF CONSTRUCTION WITH ADJACENT CONSTRUCTION PROJECTS IF APPLICABLE, TO ENSURE THE UNINTERRUPTED AND SAFE FLOW OF TRAFFIC.

NOTIFY THE ENGINEER IN WRITING WHEN MAJOR TRAFFIC CHANGES ARE TO BE MADE. NOTIFICATIONS MUST BE GIVEN A MINIMUM OF THREE WORKING DAYS PRIOR TO THE CHANGE.

ALL WORK ZONE PAVEMENT MARKINGS FO THIS PROJECT SHAL BE 0.100 INCHES (100 MIL) THICK THERMOPLASTIC.

SAFETY:

PROTECT EXPOSED PITS THAT MUST REMAIN OPEN DURING NON-WORKING HOURS AS PER OSHA REQUIREMENTS.

DROP OFFS GREATER THAN OR EQUAL TO 2'' MUST BE PROTECTED BY A 3: 1 OR FLATTER SLOPE WHEN NO ROAD WORK IS BEING DONE IN THE IMMEDIATE AREA

PROJECT SPECIFIC NOTES:

THE TRAFFIC CONTROL PLAN AND VARIOUS PHASES AND SEQUENCES OF CONSTRUCTION SERVE AS A GUIDE FOR THE SAFE HANDLING OF TRAFFIC DURING CONSTRUCTION OF THE PROJECT ROADWAYS,
UTILITIES, AND OTHER RELATED ITEMS. THE TCP DOES NOT ATTEMPT TO ADDRESS EVERY ASPECT OF CONSTRUCTION THAT IS REQUIRED DURING EACH PHASE OF CONSTRUCTION. THE TCP DOES NOT
RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF CONSTRUCTING THE COMPLETE ROADWAYS, UTILITIES AND OTHER RELATED ITEMS, AS NOTED ON THE PLANS AND SPECIFICATIONS.

THE CONTRACTOR SHALL NOTIFY THE PROPER CITY, COUNTY, E.M.S.,
FIRE DEPARTMENT, POLICE DEPARTMENT, TEXAS DEP'T. OF PUBLIC SAFETY AND TEXAS DEP'T OF TRANSPORTATION OFFICIALS WHEN MAJOR
TRAFFIC CHANGES ARE TO BE MADE. THE NOTIFICATION MUST BE MADE THREE DAYS PRIOR TO THE CHANGE.

THE CONTRACTOR SHALL FURNISH AND INSTALL FOUR (4I PORTABLE CHANGEABLE MESSAGE SIGNS CPCMSI, TO INFORM THE PUBLIC OF ANY CHANGES IN TRAFFIC PATTERNS. THESE SIGNS SHALL BE USED AS DIRECTED
BY THE ENGINEER. UPON COMPLETION OF THE PROJECT THE PCMS SHALL REMAIN THE PROPERTY OF THE CONTRACTOR. THE PCMS AND ALL RELATED COSTS FOR SETUP, RELOCATION, MAINTENANCE, REMOVAL, AND INCIDENTALS SHALL BE PAID UNDER ITEM 6001 "PORTABLE CHANGEABLE MESSAGE SIGN". THE CONTRACTOR SHALL BE RESPONSIBLE FOR UPDATING MESSAGES.

WORK ZONE PAVEMENT MARKINGS ON-BRIDGES AND THOSE INSTALLED AFTER THE COMPLETION OF WORK ON A CERTAIN PHASE SEQUENCE, AND WHICH ARE TO BE REMOVED ON A SUBSEQUENT
SEQUENCE OF WORK, SHALL BE OF THE REMOVABLE TYPE. ALL NON $^{27}/_{64}$ REMOVABLE WORK ZONE PAVEMENT MARKINGS SHALL BE THERMOPLASTIC (100 MIL THICKNESS).

IF NECESSARY, TEMPORARY LANE CLOSURES SHALL BE DONE DURING OFF-PEAK HOURS, BETWEEN 7:00P.M. TO 6:00A.M. AT NIGHTTIME, OR AS DIRECTED BY THE ENGINEER. DURING THE PEAK HOURS OF 6:00 A.M. TO 7:00 P.M., THE CONTRACTOR SHALL MAINTAIN
THE NUMBER OF LANES OPEN TO TRAFFIC AS SHOWN ON THE TRAFFIC CONTROL PLANS.

THE CONTRACTOR SHALL PROTECT THE PAVEMENT FROM ALL DAMAGE AS DIRECTED BY THE ENGINEER WHEN MOVING ANY EQUIPMENT, NOT LICENSED FOR OPERATION ON PUBLIC HIGHWAYS, ON OR ACROSS ANY PAVEMENT.

THE CONTRACTOR SHALL KEEP TRAVELED SURFACES USED IN HAULING OPERATIONS CLEAR AND FREE OF DIRT AND OTHER MATERIAL.

WHEN APPLICABLE, DETOURS MUST BE CONSTRUCTED TO MATCH THE EXISTING ROADWAY CROSS SLOPE AND TO PROVIDE POSITIVE DRAINAGE AT THE POINT OF INTERSECTION BETWEEN PROPOSED DETOUR AND EXISTING ROADWAY.

ALL SIGNS, BARRICADES, BARRIERS, AND CHANNELIZING DEVICES NEEDED TO CONSTRUCT THE DETOUR WILL NOT BE PAID FOR DIRECTLY, BUT WILL BE SUBSIDIARY TO ITEM 502

SEQUENCE OF WORK

CONTRACTOR MUST MAINTAIN ACCESS TO ALL RESIDENCES AND BUSINESSES THROUGHOUT THE CONSTRUCTION OF IMPROVEMENTS.

CONTRACTOR MUST MAINTAIN POSITIVE DRAINAGE PATTERNS THROUGHOUT THE CONSTRUCTION OF IMPROVEMENTS.

INSTALL AND MAINTAIN TEMPORARY EROSION CONTROL MEASURES AS INDICATED ON PLANS.

INSTALL CONSTRUCTION BARRICADES AND TRAFFIC CONTROL DEVICES 48 HOURS PRIOR TO CONSTRUCTION PER BARRICADE AND CONSTRUCTION STANDARDS BC1-12(21).

PHASE 1: BEGIN RAMP CONSTRUCTION

STEP 1: TEMPORARY PAVEMENT

1. PRIOR TO BEGINNING PHASE 1, INSTALL PROJECT LIMIT, ADVANCE WARNING SIGNS, TRAFFIC CONTROL DEVICES AND SW3P ITEMS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. CONSTRUCTION WILL NOT BEGIN UNTIL THE ENGINEER GIVES APPROVAL.

2. PLACE CHANNELIZING DEVICES, AND STRIPING AS SHOWN ON THE TCP PLANS FOR THIS STEP.

3. SHIFT TRAFFIC AS SHOWN ON TCP TYPICALS AND LAYOUTS FOR THIS STEP.

4. CONSTRUCT TEMPORARY PAVEMENT ALONG NORTHBOUND FRONTAGE ROAD FROM STA. 1111+62.77 TO STA. 1129+45.12

STEP 2: BEGIN CONSTRUCTION OF NORTHBOUND ENTRANCE
STA. 1116+60.01 SOUTHBOUND EXIT RAMPS
STA. 1104+93.24, AND HALF OF NORTHBOUND FRONTAGE ROAD
STA. 1102+63.27.

1. PLACE CHANNELIZING DEVICES, AND STRIPING AS SHOWN ON THE TCP PLANS FOR THIS STEP.

2. DETOUR NORTHBOUND TRAFFIC ON MAINLANES TO USE PRIOR EXIT RAMP TO FM 2994 (WILSON RD) TO CONTINUE TO ACCESS LP 499. USE DETOUR LAYOUT PHASE 1 STEP 2.

3. CLOSE EXISTING NB EXIT RAMP. MAINTAINING EXISTING NB ENTRANCE RAMP OPEN DURING THIS STEP.

4. DETOUR SOUTHBOUND TRAFFIC ON SOUTHBOUND FRONTAGE ROAD TO USE NEXT ENTRANCE RAMP AFTER FM 2994 (WILSON RD) TO CONTINUE TO ACCESS SOUTHBOUND I-69E MAINLANES. USE DETOUR LAYOUT PHASE 1 STEP 2.

5. CLOSE EXISTING SB ENTRANCE RAMP. MAINTAINING EXISTING SOUTHBOUND EXIT RAMP OPEN DURING THIS STEP.

6. TEMPORARILY REDUCE TO ONE LANE OF TRAFFIC ON NORTHBOUND FRONTAGE ROAD FROM STA. 1098+50 TO STA. 1117+50 SHIFT TWO LANES OF TRAFFIC OF NORTHBOUND FRONTAGE ROAD TO TEMPORARY PAVEMENT AREA.

7. TEMPORARILY REDUCE TO ONE LANE OF TRAFFIC ON SOUTHBOUND FRONTAGE ROAD FROM STA. 1103+25 TO STA. 1128+25.

8. DEMOLISH EXISTING NORTHBOUND EXIT RAMP AND EXISTING SOUTHBOUND ENTRANCE RAMP.

9. CONSTRUCT PROPOSED PAVEMENT STRUCTURE (EXCEPT FOR FINAL 1.5" FINAL TY D LIFT) OF PROPOSED NORTHBOUND ENTRANCE RAMP AND PROPOSED SOUTHBOUND EXIT RAMP.

10. CONSTRUCT PROPOSED PAVEMENT STRUCTURE (EXCEPT FOR FINAL 1.5" FINAL TY D LIFT) OF PROPOSED NORTHBOUND FRONTAGE ROAD AUXILIARY LANE FROM STA. 1102+63.27 TO STA. 1129+44.97 AND PROPOSED SOUTHBUND FRONTAGE ROAD AUXILIARY LANE FROM STA. 1104+93.25 TO STA. 1119+44.73.

11. CONSTRUCT HALF OF THE PROPOSED PAVEMENT STRUCTURE (EXCEPT FOR FINAL 1.5" FINAL TY D LIFT) FOR NORTHBOUND FRONTAGE ROAD FROM STA. 1117+50 TO LP 499 INTERSECTION.

12. COMPLETION OF ROADWAY INCLUDES DRAINAGE IMPROVEMENTS, RESHAPING OF DITCHES, TEMPORARY SEEDING AND SIGNS.

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
NICOLAS C. GARCIA
99410
LICENSED
PROFESSIONAL ENGINEER

Nicolas C. Garcia, P.E.

12/14/2022

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Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
4350 Lockhill Selma Road, Suite 100•San Antonio, Texas 78249•210.494.5511

I-69E
TRAFFIC CONTROL PLAN NARRATIVE

SHEET 01 OF 02

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	19
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

STEP 3: BEGIN CONSTRUCTION OF NB EXIT AND SOUTHBOUND ENTRANCE RAMPS AND HALF OF NORTHBOUND FRONTAGE ROAD

1. PLACE CHANNELIZING DEVICES, AND STRIPING AS SHOWN ON THE TCP PLANS FOR THIS STEP.

2. SHIFT TRAFFIC AS SHOWN ON TCP TYPICALS AND LAYOUTS FOR THIS STEP. OPEN NEWLY CONSTRUCTED NB ENTRANCE RAMP AND SB EXIT RAMP TO TRAFFIC.

3. DETOUR NORTHBOUND TRAFFIC ON MAINLANES TO USE PRIOR EXIT RAMP TO FM 2994 (WILSON RD) TO CONTINUE TO ACCESS LP 499. USE DETOUR LAYOUT PHASE 1 STEP 3. CLOSE EXISTING NB ENTRANCE RAMP.

4. DETOUR SOUTHBOUND TRAFFIC ON SOUTHBOUND FRONTAGE ROAD TO USE NEXT ENTRANCE RAMP AFTER FM 2994 (WILSON RD) TO CONTINUE TO ACCESS SOUTHBOUND I-69E MAINLANES. USE DETOUR LAYOUT PHASE 1 STEP 3. CLOSE EXISTING SB EXIT RAMP.
SHIFT TWO LANES OF TRAFFIC LEFT ALONG PORTION OF NB FR

5. CONSTRUCT PROPOSED PAVEMENT STRUCTURE (EXCEPT FOR FINAL 1.5" FINAL TY D LIFT) OF PROPOSED NB EXIT RAMP FROM STA. 1096+50 TO 1102+50 AND PROPOSED SB ENTRANCE RAMP FROM STA. 1092+50 TO1105+00. COMPLETE CONSTRUCITON OF PROPOSED NB AND SB AUXILIARY LANES.

6. COMPLETE CONSTRUCTION PROPOSED PAVEMENT STRUCTURE (EXCEPT FOR FINAL 1.5" FINAL TY D LIFT) OF REMAINING HALF OF THE PROPOSED NBFR FROM STA. 1117+50 TO LP 499 INTERSECTION.

7. CONSTRUCT DRIVEWAY AT STA. 1119+25

8. COMPLETION OF THE ROADWAY INCLUDES DRAINAGE IMPROVEMENTS, RESHAPING OF DITCHES, TEMPORARY SEEDING AND SIGNS

PHASE 2: CONSTRUCTION COMPLETED

1. CONSTRUCT FINAL SURFACE COURSE OF 1.5" FOR THE FULL WIDTH OF THE ROADWAY.

2. INSTALL PERMANENT PAVEMENT MARKINGS & MARKERS AND SIGNS.

3. OPEN ALL RAMPS AND LANES TO TRAFFIC AND REMOVE ALL TRAFFIC CONTROL DEVICES AND DETOUR SIGNING.

4. REMOVE SW3P ITEMS AND PERFORM FINAL CLEAN UP.

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
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12/14/2022

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I-69E
TRAFFIC CONTROL PLAN NARRATIVE

SHEET 02 OF 02

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED XX	STATE	DIST.	COUNTY	SHEET NO.
CHECKED XX	TEXAS	PHR	CAMERON	20
APPROVED XX	CONT.	SECT.	JOB	
	0039	07	257	

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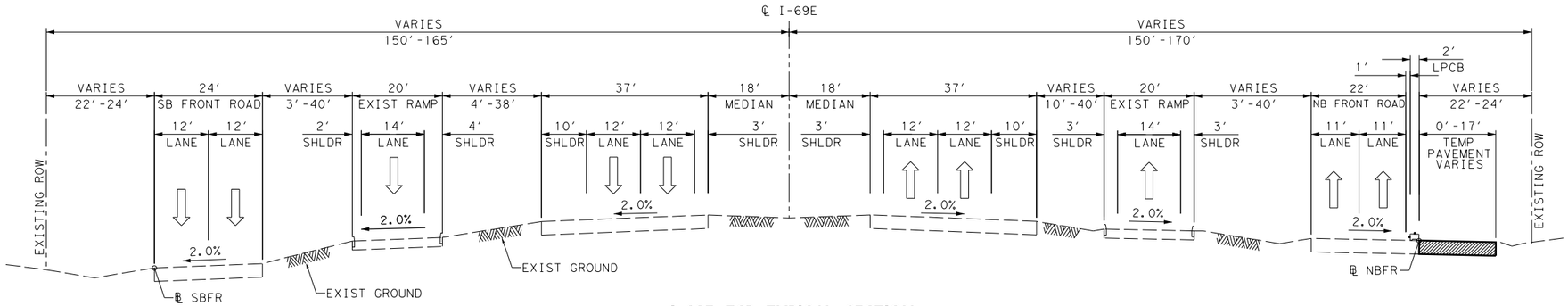

I-69E TCP TYPICAL SECTION
PHASE 1 STEP 1

℄ I-69E STA. 1111+50.00 TO STA. 1129+50.00

LEGEND:

- WORK ZONE
- WORK COMPLETED PREVIOUS STEP
- LOW PROFILE CONCRETE BARRIER W/ REFLECTORS
- SINGLE SLOPE CONCRETE BARRIER W/ REFLECTORS
- DRUMS W/ REFLECTORS

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
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PROFESSIONAL ENGINEER

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I-69E
TRAFFIC CONTROL PLAN
TYPICAL SECTION
PHASE 1 STEP 1

Scale: 1"= 30' **SHEET 1 OF 1**

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED XX	STATE	DIST.	COUNTY	SHEET NO.
CHECKED XX	TEXAS	PHR	CAMERON	21
APPROVED XX	CONT.	SECT.	JOB	
	0039	07	257	

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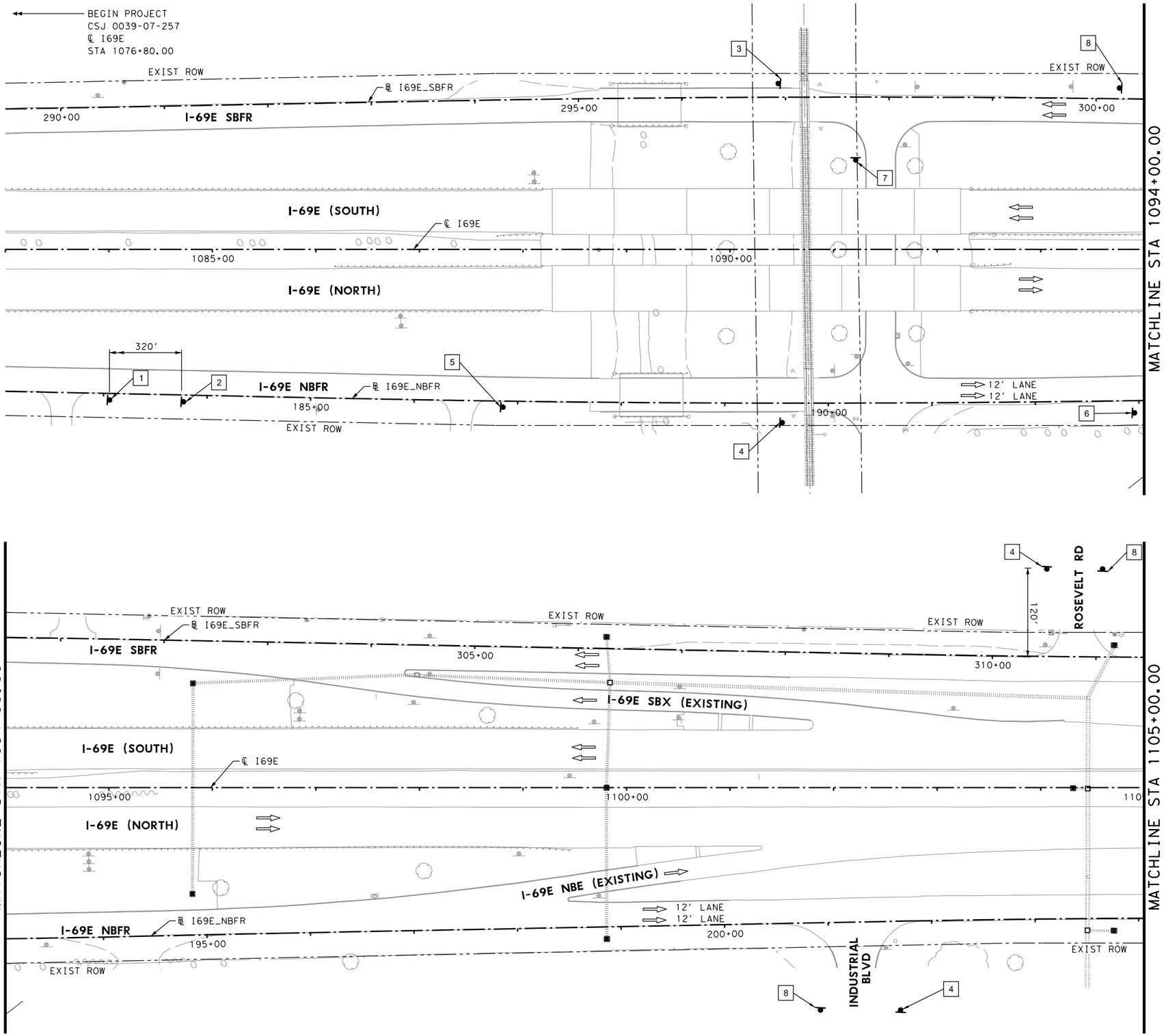

0' 25' 50' 100'

N

LEGEND:

- TCP TRAFFIC THIS PHASE
- TYPE III BARRICADE
- SIGN
- DRUMS
- CRASH CUSHION ATTENUATOR (CCA)
- EXIST ROW
- PERM CONST THIS PHASE
- PERM CONST IN PREV PHASE
- TEMP CONST THIS PHASE
- TEMP CONST IN PREV PHASE
- PERMANENT REMOVAL
- PORTABLE CONCRETE TRAFFIC BARRIER
- LOW PROFILE CONCRETE BARRIER
- (M) PORTABLE MOVABLE MESSAGE SIGN
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (C) WK ZN PAV MRK REMOV (W) 8" (SLD)
- (D) WK ZN PAV MRK REMOV (W) 4" (BRN)
- (E) WK ZN PAV MRK REMOV (W) (ARROW)
- (F) WK ZN PAV MRK REMOV (W) (WORD)
- (G) REFL PAV MRKR TY II-A-A

SIGN LEGEND:

1. OBEY WARNING SIGNS STATE LAW — R20-3T 48"X42"
2. STAY ALERT / TALK OR TEXT LATER — G20-10T 60"x48"
3. END WORK ZONE — G20-2bT 48" X 24"
4. ROAD WORK AHEAD — CW20-1D 48"x48"
5. BEGIN WORK ZONE / TRAFFIC FINES DOUBLE WHEN WORKERS ARE PRESENT — G20-9TP 36"x30"; R20-5T 36"x36"; R20-5aTP 36"x18"
6. BEGIN ROAD WORK NEXT 2 MILES / NAME ADDRESS CITY STATE CONTRACTOR — G20-5T 48"x24"; G20-6T 48"x30"
7. ROAD WORK ← NEXT 1 MILES — G20-1bTL 72"X24"
8. END ROAD WORK — G20-2 48"X24"
9. ROAD WORK NEXT 1 MILES → — G20-1bTR 72"X24"

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
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99410
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PROFESSIONAL ENGINEER

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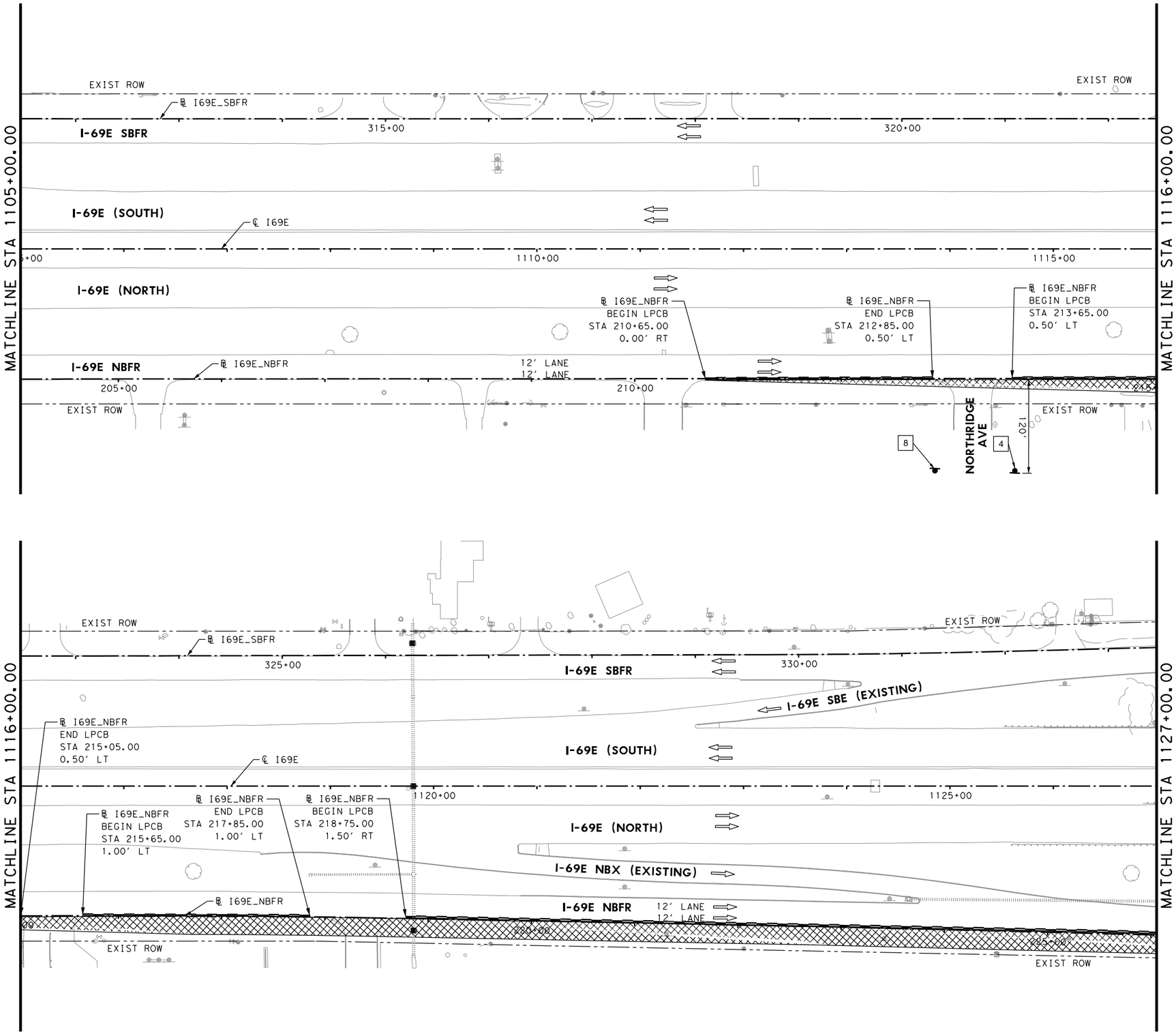
I-69E
TRAFFIC CONTROL PLAN
PHASE 1 STEP 1
BEG TO 1105+00

SHEET 01 OF 03

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	22
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				



0' 25' 50' 100'

N

LEGEND:

- TCP TRAFFIC THIS PHASE
- TYPE III BARRICADE
- SIGN
- DRUMS
- CRASH CUSHION ATTENUATOR (CCA)
- EXIST ROW
- PERM CONST THIS PHASE
- PERM CONST IN PREV PHASE
- TEMP CONST THIS PHASE
- TEMP CONST IN PREV PHASE
- PERMANENT REMOVAL
- PORTABLE CONCRETE TRAFFIC BARRIER
- LOW PROFILE CONCRETE BARRIER
- M PORTABLE MOVABLE MESSAGE SIGN
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (C) WK ZN PAV MRK REMOV (W) 8" (SLD)
- (D) WK ZN PAV MRK REMOV (W) 4" (BRN)
- (E) WK ZN PAV MRK REMOV (W) (ARROW)
- (F) WK ZN PAV MRK REMOV (W) (WORD)
- (G) REFL PAV MRKR TY II-A-A

SIGN LEGEND:

1. OBEY WARNING SIGNS / STATE LAW — R20-3T 48"X42"
2. STAY ALERT / TALK OR TEXT LATER — G20-10T 60"x48"
3. END WORK ZONE — G20-2bT 48" X 24"
4. ROAD WORK AHEAD — CW20-1D 48"x48"
5. BEGIN WORK ZONE — G20-9TP 36"x30"; TRAFFIC FINES DOUBLE WHEN WORKERS ARE PRESENT — R20-5T 36"x36", R20-5aTP 36"x18"
6. BEGIN ROAD WORK NEXT 2 MILES — G20-5T 48"x24"; NAME ADDRESS CITY STATE CONTRACTOR — G20-6T 48"x30"
7. ROAD WORK ← NEXT 1 MILES — G20-1bTL 72"X24"
8. END ROAD WORK — G20-2 48"X24"
9. ROAD WORK NEXT 1 MILES → — G20-1bTR 72"X24"

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
NICOLAS C. GARCIA
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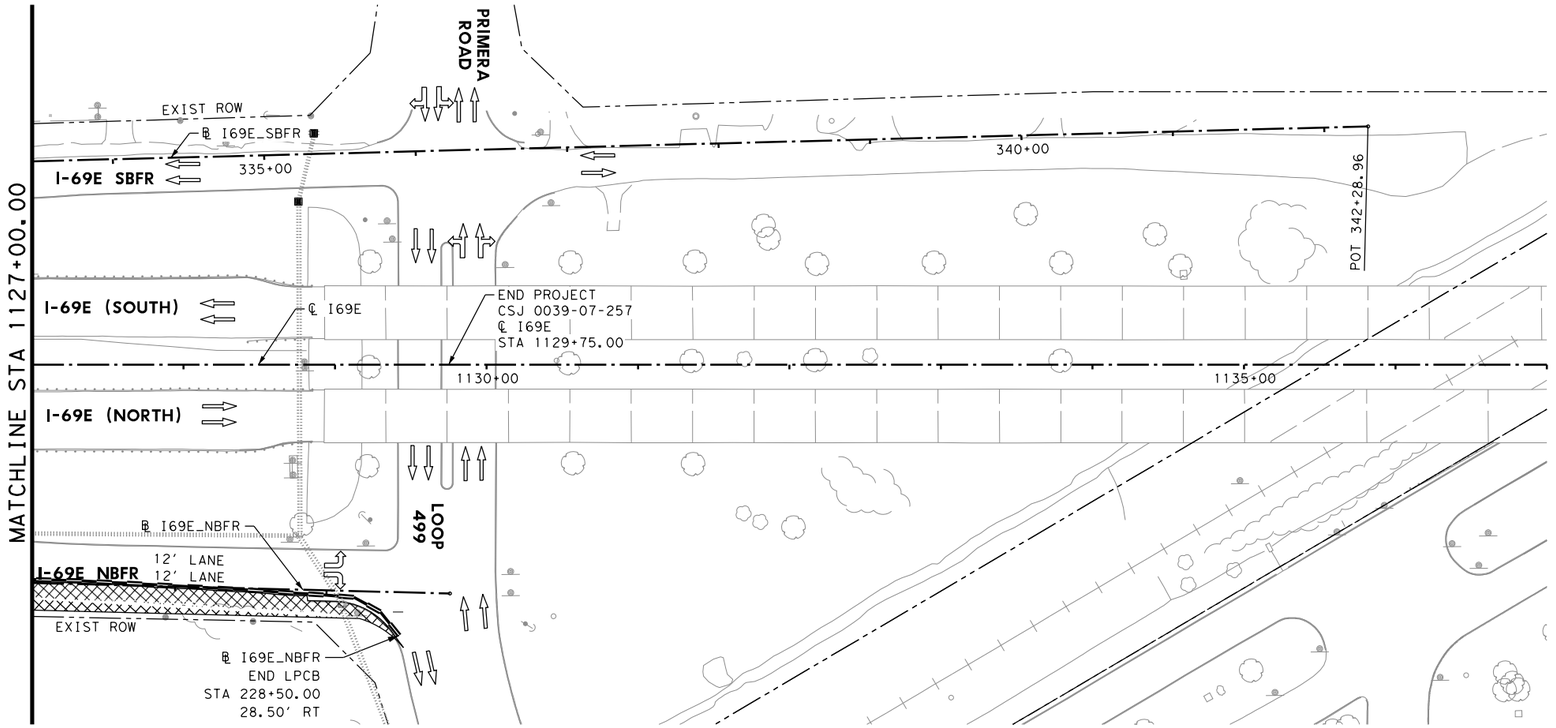
I-69E
TRAFFIC CONTROL PLAN
PHASE 1 STEP 1
1105+00 TO 1127+00

SHEET 02 OF 03

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	23
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				



0' 25' 50' 100'

N

LEGEND:

- TCP TRAFFIC THIS PHASE
- TYPE III BARRICADE
- SIGN
- DRUMS
- CRASH CUSHION ATTENUATOR (CCA)
- EXIST ROW
- PERM CONST THIS PHASE
- PERM CONST IN PREV PHASE
- TEMP CONST THIS PHASE
- TEMP CONST IN PREV PHASE
- PERMANENT REMOVAL
- PORTABLE CONCRETE TRAFFIC BARRIER
- LOW PROFILE CONCRETE BARRIER
- M PORTABLE MOVABLE MESSAGE SIGN
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (C) WK ZN PAV MRK REMOV (W) 8" (SLD)
- (D) WK ZN PAV MRK REMOV (W) 4" (BRN)
- (E) WK ZN PAV MRK REMOV (W) (ARROW)
- (F) WK ZN PAV MRK REMOV (W) (WORD)
- (G) REFL PAV MRKR TY II-A-A

SIGN LEGEND:

OBEY WARNING SIGNS STATE LAW	R20-3T 48"X42"	1
STAY ALERT TALK OR TEXT LATER	G20-10T 60"x48"	2
END WORK ZONE	G20-2bT 48" X 24"	3
ROAD WORK AHEAD	CW20-1D 48"x48"	4
BEGIN WORK ZONE / TRAFFIC FINES DOUBLE WHEN WORKERS ARE PRESENT	G20-9TP 36"x30" / R20-5T 36"x36" / R20-5aTP 36"x18"	5
BEGIN ROAD WORK NEXT 2 MILES / NAME ADDRESS CITY STATE CONTRACTOR	G20-5T 48"x24" / G20-6T 48"x30"	6
ROAD WORK ← NEXT 1 MILES	G20-1bTL 72"X24"	7
END ROAD WORK	G20-2 48"X24"	8
ROAD WORK NEXT 1 MILES →	G20-1bTR 72"X24"	9

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
NICOLAS C. GARCIA
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12/14/2022

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I-69E
TRAFFIC CONTROL PLAN
PHASE 1 STEP 1

1127+00 TO END

SHEET 03 OF 03

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	24
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

TCP PHASE 1 STEP 1 QUANTITIES

ITEM	DESCRIPTION	UNI	EST.	FIN.
508	CONSTRUCTING DETOURS	SY	2844	
512	PORT CTB (FUR & INST) (LOW PROF) (TYP 1)	LF	1480	
512	PORT CTB (FUR & INST) (LOW PROF) (TYP 2)	LF	80	

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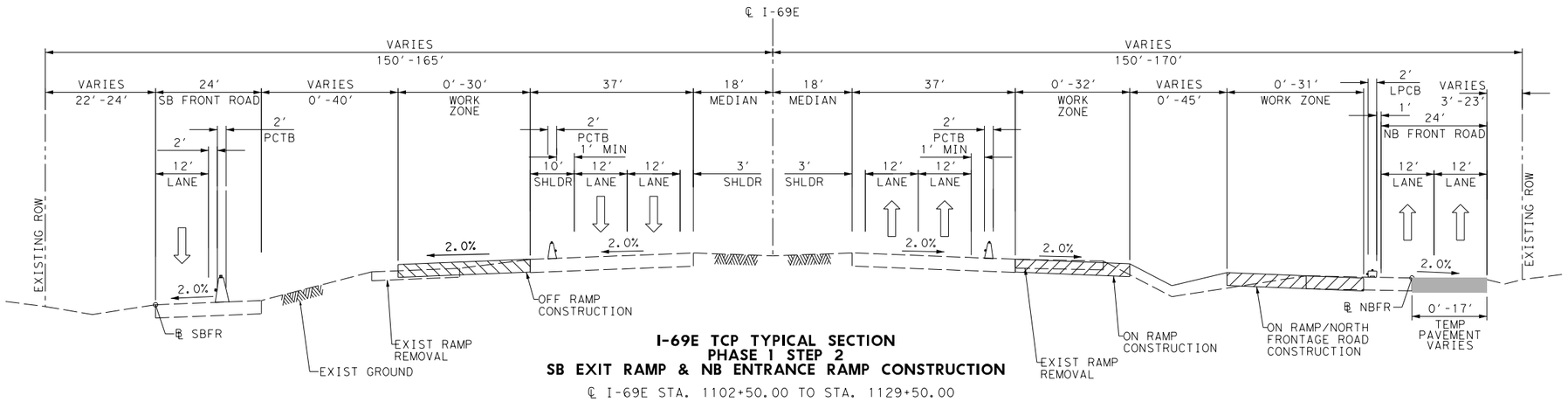

I-69E TCP TYPICAL SECTION
PHASE 1 STEP 2
SB EXIT RAMP & NB ENTRANCE RAMP CONSTRUCTION

℄ I-69E STA. 1102+50.00 TO STA. 1129+50.00

LEGEND:

- WORK ZONE
- WORK COMPLETED PREVIOUS STEP
- LOW PROFILE CONCRETE BARRIER W/ REFLECTORS
- SINGLE SLOPE CONCRETE BARRIER W/ REFLECTORS
- DRUMS W/ REFLECTORS

NOTE:
CONTRACTOR TO REFER TO THE PROPOSED TYPICAL SECTION FOR PROPOSED PAVEMENT DESIGN AND GRADING DETAILS

NO.	DATE	REVISION	APPROVED

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I-69E
TRAFFIC CONTROL PLAN
TYPICAL SECTION
PHASE 1 STEP 2

SCALE: 1"=30' **SHEET 1 OF 1**

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	25
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

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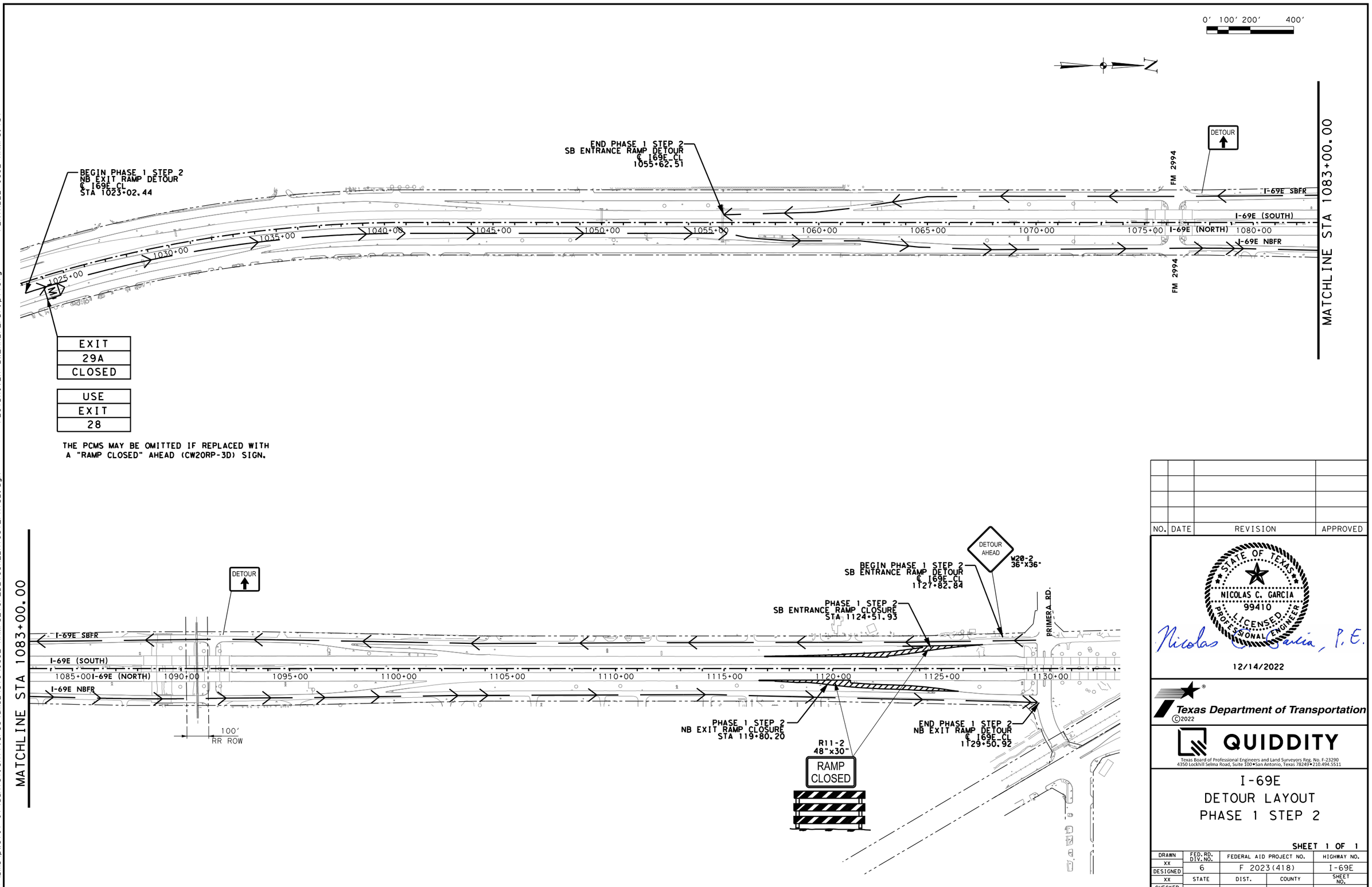

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
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Nicolas C. Garcia, P.E.

12/14/2022

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I-69E
DETOUR LAYOUT
PHASE 1 STEP 2

SHEET 1 OF 1

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED XX	STATE	DIST.	COUNTY	SHEET NO.
CHECKED XX	TEXAS	PHR	CAMERON	26
APPROVED XX	CONT.	SECT.	JOB	
	0039	07	257	

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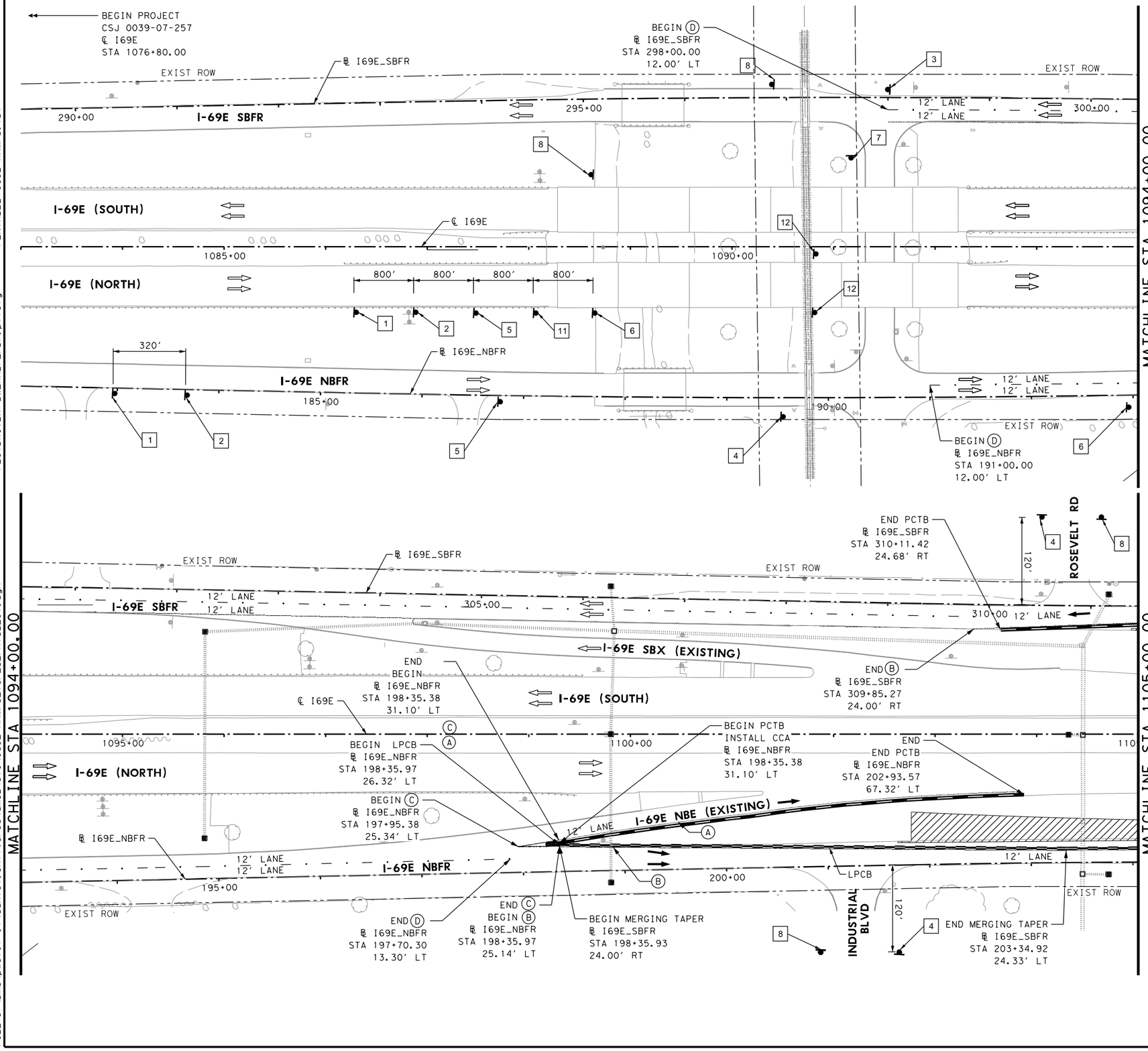

0' 25' 50' 100'

N

LEGEND:

- TCP TRAFFIC THIS PHASE
- TYPE III BARRICADE
- SIGN
- DRUMS
- CRASH CUSHION ATTENUATOR (CCA)
- EXIST ROW
- PERM CONST THIS PHASE
- PERM CONST IN PREV PHASE
- TEMP CONST THIS PHASE
- TEMP CONST IN PREV PHASE
- PERMANENT REMOVAL
- PORTABLE CONCRETE TRAFFIC BARRIER
- LOW PROFILE CONCRETE BARRIER
- (M) PORTABLE MOVABLE MESSAGE SIGN
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (C) WK ZN PAV MRK REMOV (W) 8" (SLD)
- (D) WK ZN PAV MRK REMOV (W) 4" (BRN)
- (E) WK ZN PAV MRK REMOV (W) (ARROW)
- (F) WK ZN PAV MRK REMOV (W) (WORD)
- (G) REFL PAV MRKR TY II-A-A

SIGN LEGEND:

1	OBEY WARNING SIGNS STATE LAW R20-3T 48"X42"	11	CW20-1D 48"x48" ROAD WORK AHEAD; CW13-1P 30"X30" 70 MPH
2	STAY ALERT TALK OR TEXT LATER R20-3 60"x48"	12	RAMP CLOSED 1/2 MILE CW20-3E 48"X48"
3	END WORK ZONE G20-2bT 48" X 24"	13	RAMP CLOSED AHEAD CW20RP-3D 48"x48"
4	CW20-1D 48"x48" ROAD WORK AHEAD	14	RAMP CLOSED R11-2bT 48"x30"
5	G20-9TP 36"x30" BEGIN WORK ZONE; R20-5T 36"x36" TRAFFIC FINES DOUBLE; R20-5aTP 36"x18" WHEN WORKERS ARE PRESENT	15	USE NEXT RAMP CW25-1T 48"X48"
6	G20-5T 48"x24" BEGIN ROAD WORK NEXT 2 MILES; G20-6T 48"x30" NAME ADDRESS CITY STATE CONTRACTOR	16	R4-7B 48" x 60" KEEP RIGHT
7	ROAD WORK NEXT 2 MILES G20-1bL	17	LEFT LANE ENDS CW9-1L 48"X48"
8	END ROAD WORK G20-2	18	LANE ENDS MERGE RIGHT CW9-2TR 48"X48"
9	ROAD WORK NEXT 2 MILES G20-1bR	19	R3-8LR 48"x48" ONLY ONLY
10	STREET A EXIT CLOSED "M-1" STREET A EXIT CLOSED		M PLACE 1 MILE TO EXIT
10 A	USE ALTERNATE EXIT "M-2" USE ALTERNATE EXIT		

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
NICOLAS C. GARCIA
99410
LICENSED
PROFESSIONAL ENGINEER

Nicolas C. Garcia, P.E.

12/14/2022

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Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
4350 Lockhill Selma Road, Suite 100 • San Antonio, Texas 78249 • 210.494.5511

I-69E
TRAFFIC CONTROL PLAN
PHASE 1 STEP 2

BEG TO 1105+00

SHEET 01 OF 03

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	27
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

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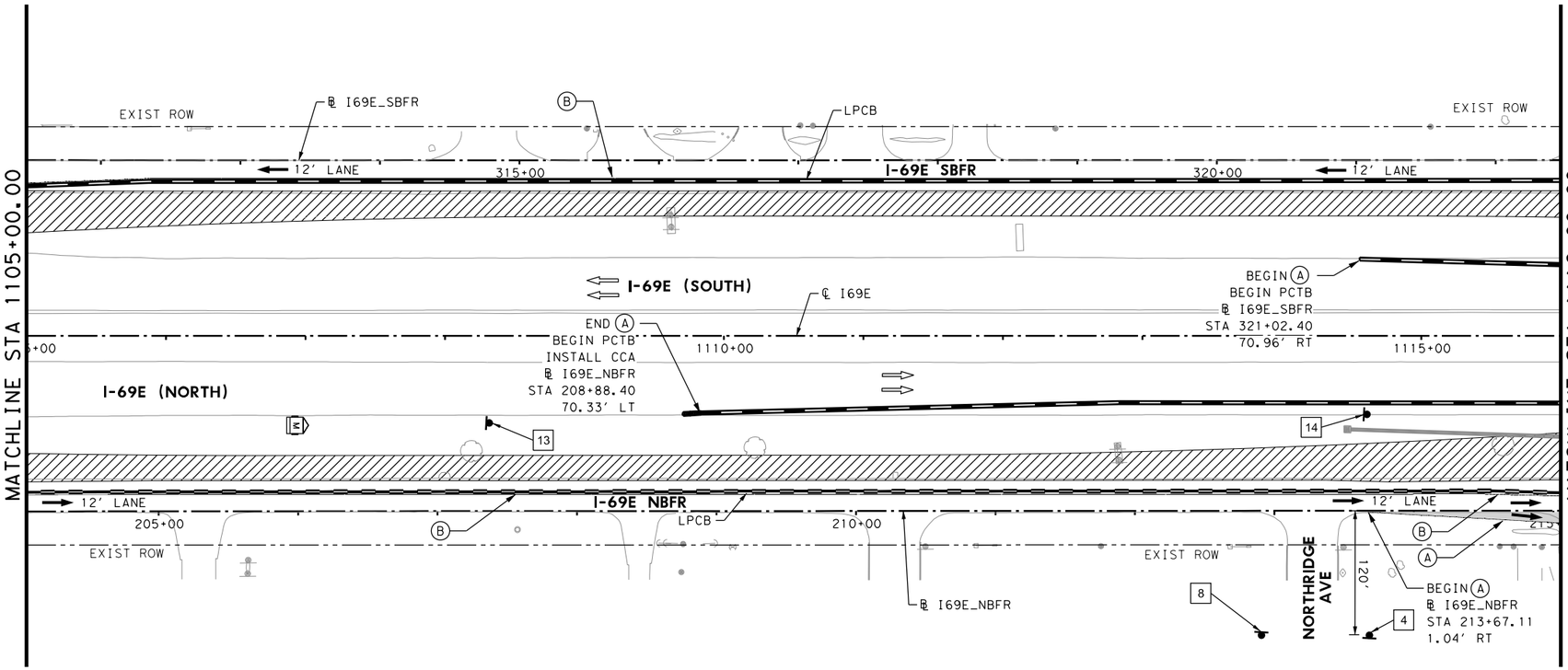

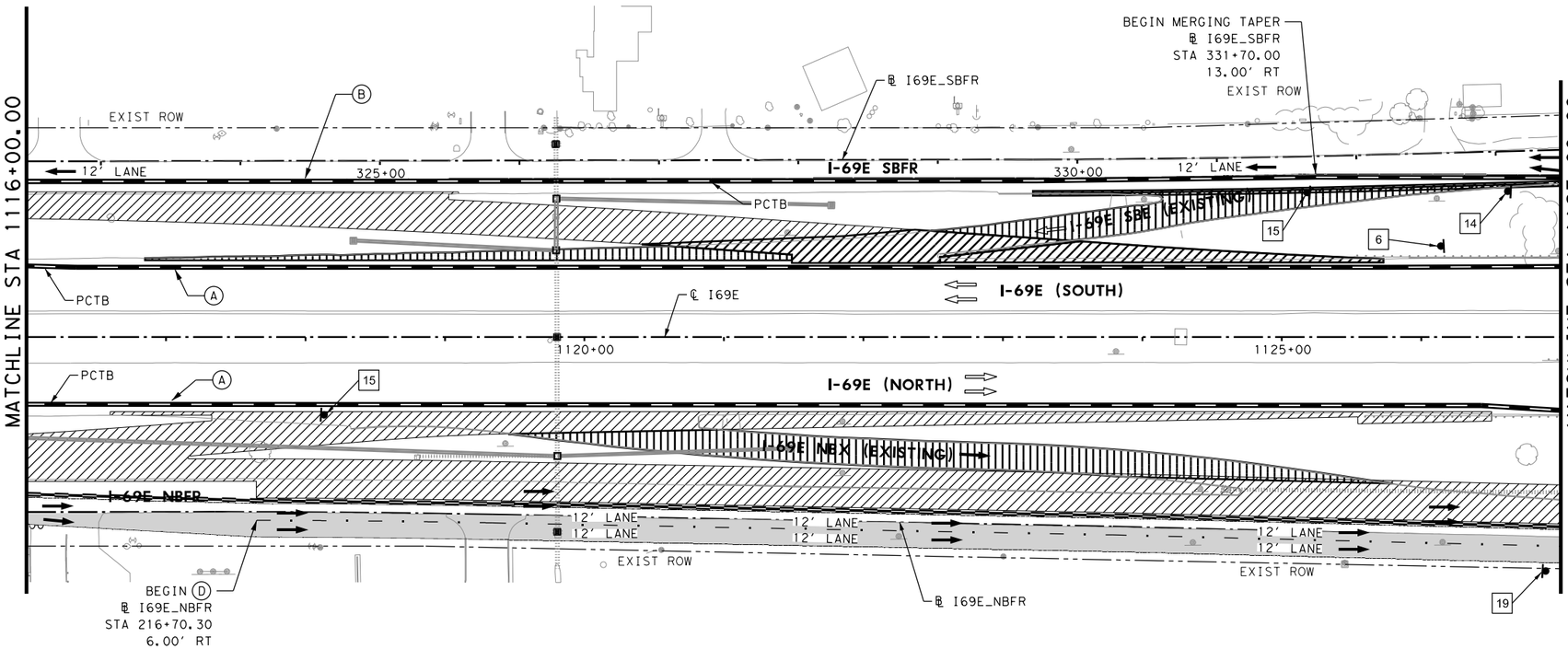

0' 25' 50' 100'

N

LEGEND:

- TCP TRAFFIC THIS PHASE
- TYPE III BARRICADE
- SIGN
- DRUMS
- CRASH CUSHION ATTENUATOR (CCA)
- EXIST ROW
- PERM CONST THIS PHASE
- PERM CONST IN PREV PHASE
- TEMP CONST THIS PHASE
- TEMP CONST IN PREV PHASE
- PERMANENT REMOVAL
- PORTABLE CONCRETE TRAFFIC BARRIER
- LOW PROFILE CONCRETE BARRIER
- M PORTABLE MOVABLE MESSAGE SIGN
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (C) WK ZN PAV MRK REMOV (W) 8" (SLD)
- (D) WK ZN PAV MRK REMOV (W) 4" (BRN)
- (E) WK ZN PAV MRK REMOV (W) (ARROW)
- (F) WK ZN PAV MRK REMOV (W) (WORD)
- (G) REFL PAV MRKR TY II-A-A

SIGN LEGEND:

1. OBEY WARNING SIGNS / STATE LAW — R20-3T 48"X42"
2. STAY ALERT / TALK OR TEXT LATER — R20-3 60"x48"
3. END WORK ZONE — G20-2bT 48" X 24"
4. CW20-1D 48"x48" ROAD WORK AHEAD
5. G20-9TP 36"x30" BEGIN WORK ZONE; R20-5T 36"x36" TRAFFIC FINES DOUBLE; R20-5aTP 36"x18" WHEN WORKERS ARE PRESENT
6. G20-5T 48"x24" BEGIN ROAD WORK NEXT 2 MILES; G20-6T 48"x30" NAME ADDRESS CITY STATE CONTRACTOR
7. ROAD WORK ← NEXT 2 MILES — G20-1bL
8. END ROAD WORK — G20-2
9. ROAD WORK NEXT 2 MILES → — G20-1bR
10. STREET A EXIT CLOSED — "M-1" STREET A EXIST CLOSED
10A. USE ALTERNATE EXIT — "M-2" USE ALTERNATE EXIT
11. CW20-1D 48"x48" ROAD WORK AHEAD; CW13-1P 30"X30" 70 MPH
12. RAMP CLOSED 1/2 MILE — CW20-3E 48"x48"
13. RAMP CLOSED AHEAD — CW20RP-3D 48"x48"
14. RAMP CLOSED — R11-2bT 48"x30"
15. USE NEXT RAMP — CW25-1T 48"X48"
16. R4-7B 48" x 60" KEEP RIGHT
17. LEFT LANE ENDS — CW9-1L 48"X48"
18. LANE ENDS MERGE RIGHT — CW9-2TR 48"X48"
19. R3-8LR 48"x48" ONLY ONLY; M PLACE 1 MILE TO EXIT

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS — NICOLAS C. GARCIA — 99410 — LICENSED PROFESSIONAL ENGINEER

Nicolas C. Garcia, P.E.

12/14/2022

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I-69E
TRAFFIC CONTROL PLAN
PHASE 1 STEP 2
1105+00 TO 1127+00

SHEET 02 OF 03

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	28
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

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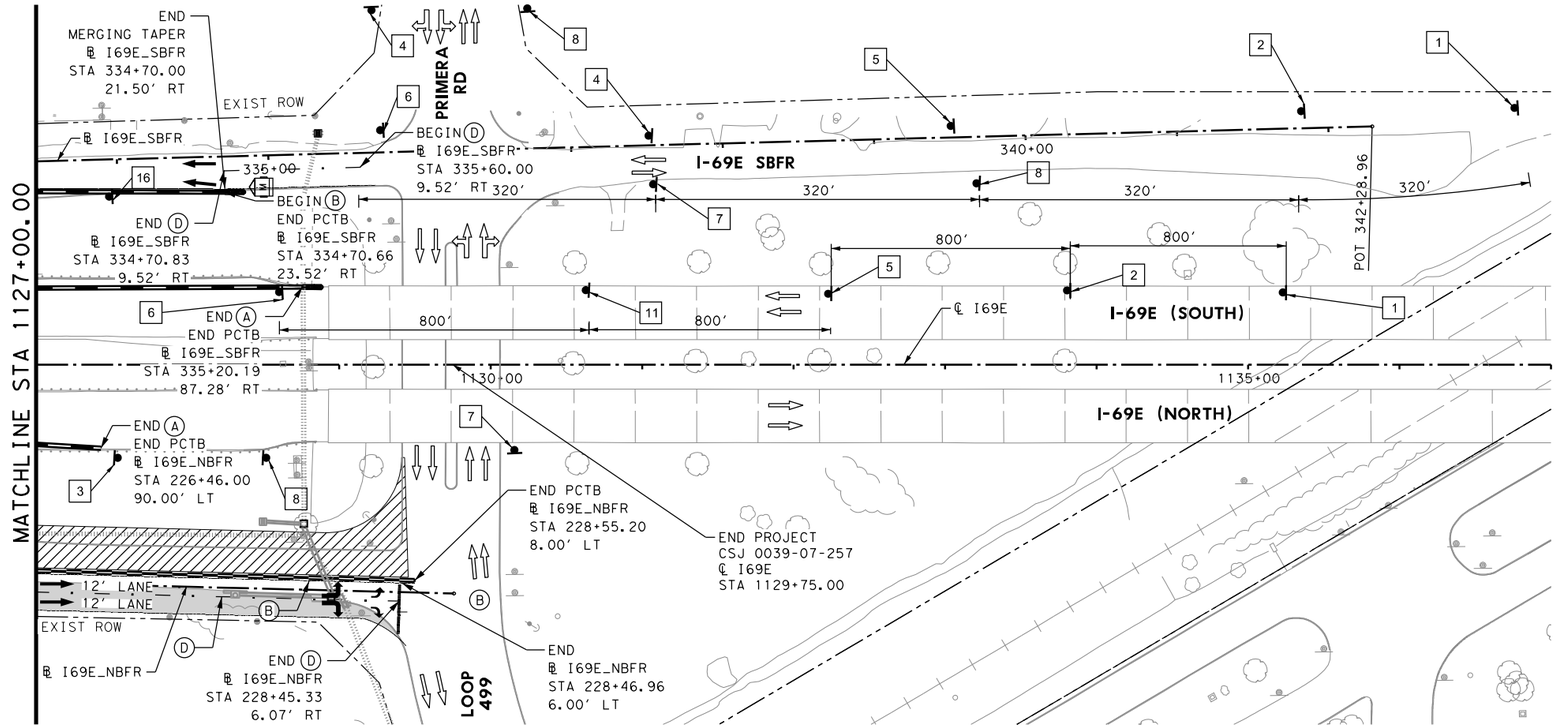

TCP PHASE 1 STEP 2 QUANTATIES				
ITEM	DESCRIPTION	UNI	EST.	FIN.
512	PORT CTB (FUR & INST) (SGL SLOPE) (TYP I)	LF	6100	
512	PORT CTB (FUR & INST) (LOW PROF) (TYP I)	LF	1540	
512	PORT CTB (MOVE) (SGL SLP) (TYP 1)	LF	1480	
512	PORT CTB (MOVE) (LOW PROF) (TYP 2)	LF	3100	
512	PORT CTB (MOVE) (LOW PROF) (TYP 2)	LF	340	
545	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	EA	4	
662	WK ZONE PAV MRK REMOV (W)4"(BRK)	LF	3154	
662	WK ZONE PAV MRK REMOV (W)4"(SLD)	LF	7622	
662	WK ZONE PAV MRK REMOV (W)8"(SLD)	LF	33	
662	WK ZONE PAV MRK REMOV (Y)4"(SLD)	LF	7621	

0' 25' 50' 100'

LEGEND:

- TCP TRAFFIC THIS PHASE
- TYPE III BARRICADE
- SIGN
- DRUMS
- CRASH CUSHION ATTENUATOR (CCA)
- EXIST ROW
- PERM CONST THIS PHASE
- PERM CONST IN PREV PHASE
- TEMP CONST THIS PHASE
- TEMP CONST IN PREV PHASE
- PERMANENT REMOVAL
- PORTABLE CONCRETE TRAFFIC BARRIER
- LOW PROFILE CONCRETE BARRIER
- (M) PORTABLE MOVABLE MESSAGE SIGN
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (C) WK ZN PAV MRK REMOV (W) 8" (SLD)
- (D) WK ZN PAV MRK REMOV (W) 4" (BRN)
- (E) WK ZN PAV MRK REMOV (W) (ARROW)
- (F) WK ZN PAV MRK REMOV (W) (WORD)
- (G) REFL PAV MRKR TY II-A-A

SIGN LEGEND:

1 OBEY WARNING SIGNS / STATE LAW — R20-3T 48"X42"
2 STAY ALERT / TALK OR TEXT LATER — R20-3 60"x48"
3 END WORK ZONE — G20-2bT 48" X 24"
4 CW20-1D 48"x48" ROAD WORK AHEAD
5 G20-9TP 36"x30" BEGIN WORK ZONE; R20-5T 36"x36" TRAFFIC FINES DOUBLE; R20-5aTP 36"x18" WHEN WORKERS ARE PRESENT
6 G20-5T 48"x24" BEGIN ROAD WORK NEXT 2 MILES; G20-6T 48"x30" NAME ADDRESS CITY STATE CONTRACTOR
7 ROAD WORK ← NEXT 2 MILES — G20-1bL
8 END ROAD WORK — G20-2
9 ROAD WORK NEXT 2 MILES → — G20-1bR
10 STREET A EXIT CLOSED — "M-1" STREET A EXIST CLOSED
10 A USE ALTERNATE EXIT — "M-2" USE ALTERNATE EXIT
11 CW20-1D 48"x48" ROAD WORK AHEAD; CW13-1P 30"X30" 70 MPH
12 RAMP CLOSED 1/2 MILE — CW20-3E 48"X48"
13 RAMP CLOSED AHEAD — CW20RP-3D 48"x48"
14 RAMP CLOSED — R11-2bT 48"x30"
15 USE NEXT RAMP — CW25-1T 48"X48"
16 R4-7B 48" x 60" KEEP RIGHT
17 LEFT LANE ENDS — CW9-1L 48"X48"
18 LANE ENDS MERGE RIGHT — CW9-2TR 48"X48"
19 R3-8LR 48"x48" ONLY ONLY
PLACE 1 MILE TO EXIT

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS — NICOLAS C. GARCIA — 99410 — LICENSED PROFESSIONAL ENGINEER

Nicolas C. Garcia, P.E.

12/14/2022

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I-69E
TRAFFIC CONTROL PLAN
PHASE 1 STEP 2
1127+00 TO END

SHEET 03 OF 03

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	29
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

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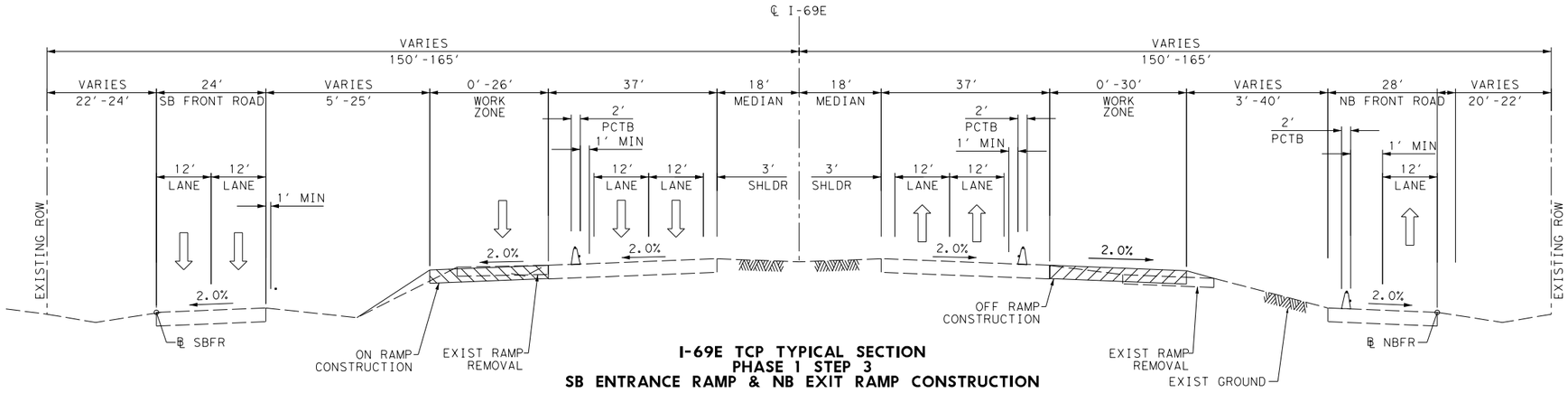
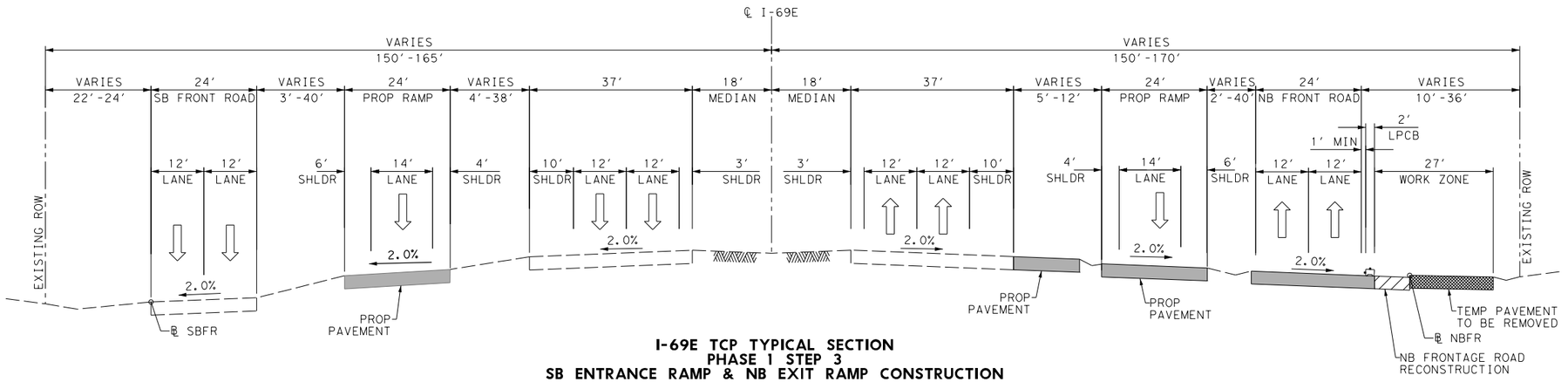


I-69E TCP TYPICAL SECTION
PHASE 1 STEP 3
SB ENTRANCE RAMP & NB EXIT RAMP CONSTRUCTION

℄ I-69E STA. 1092+50.00 TO STA. 1105+00.00



I-69E TCP TYPICAL SECTION
PHASE 1 STEP 3
SB ENTRANCE RAMP & NB EXIT RAMP CONSTRUCTION

℄ I-69E STA. 1117+50.00 TO STA. 1129+50.00

LEGEND:

- WORK ZONE
- WORK COMPLETED PREVIOUS STEP
- LOW PROFILE CONCRETE BARRIER W/ REFLECTORS
- SINGLE SLOPE CONCRETE BARRIER W/ REFLECTORS
- DRUMS W/ REFLECTORS

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
NICOLAS C. GARCIA
99410
LICENSED
PROFESSIONAL ENGINEER

Nicolas C. Garcia, P.E.

12/14/2022

Texas Department of Transportation

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I-69E
TRAFFIC CONTROL PLAN
TYPICAL SECTION
PHASE 1 STEP 3

SCALE: 1"=30′ **SHEET 1 OF 1**

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	30
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

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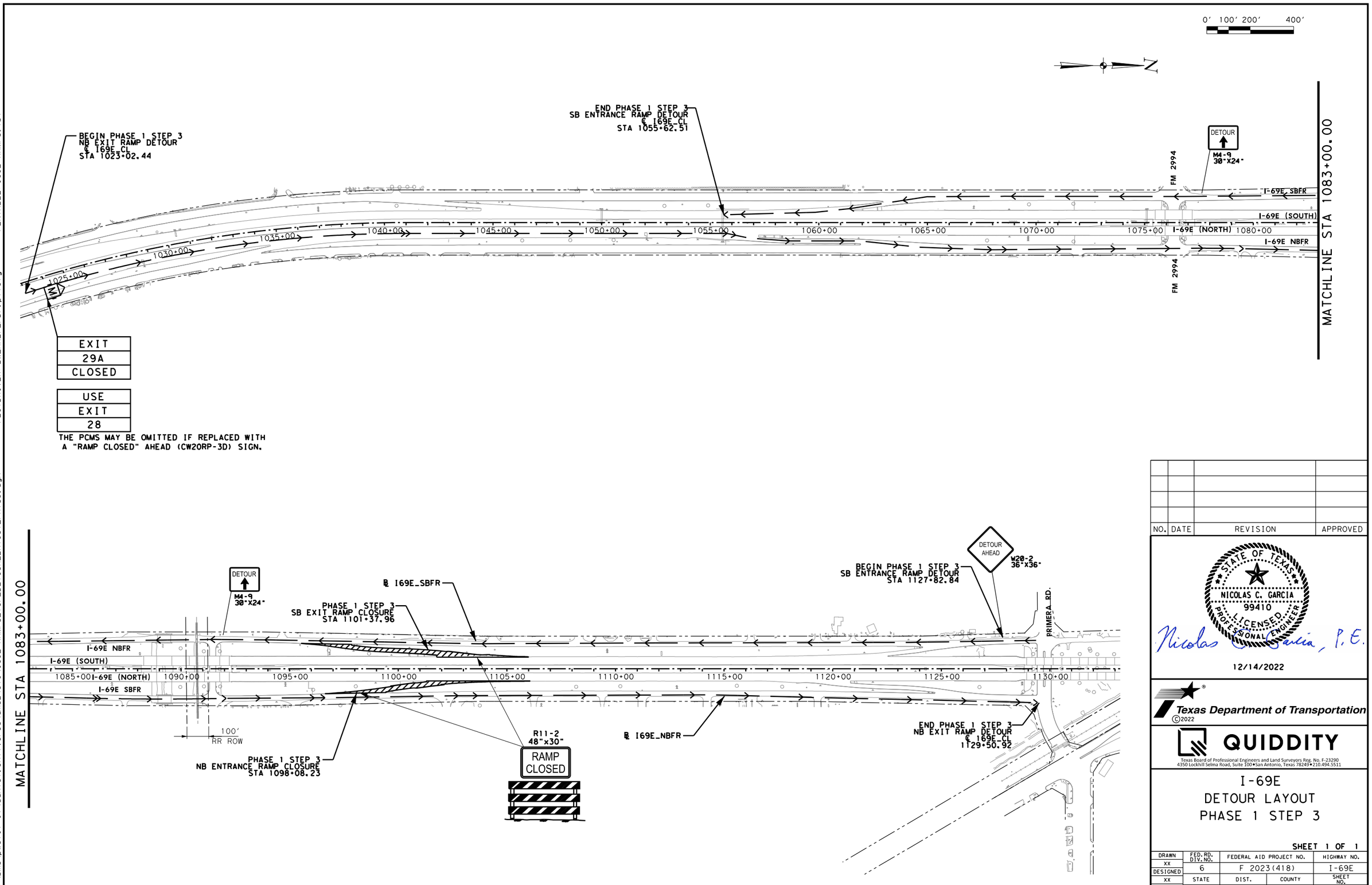

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
NICOLAS C. GARCIA
99410
LICENSED
PROFESSIONAL ENGINEER

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12/14/2022

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I-69E
DETOUR LAYOUT
PHASE 1 STEP 3

SHEET 1 OF 1

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	31
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

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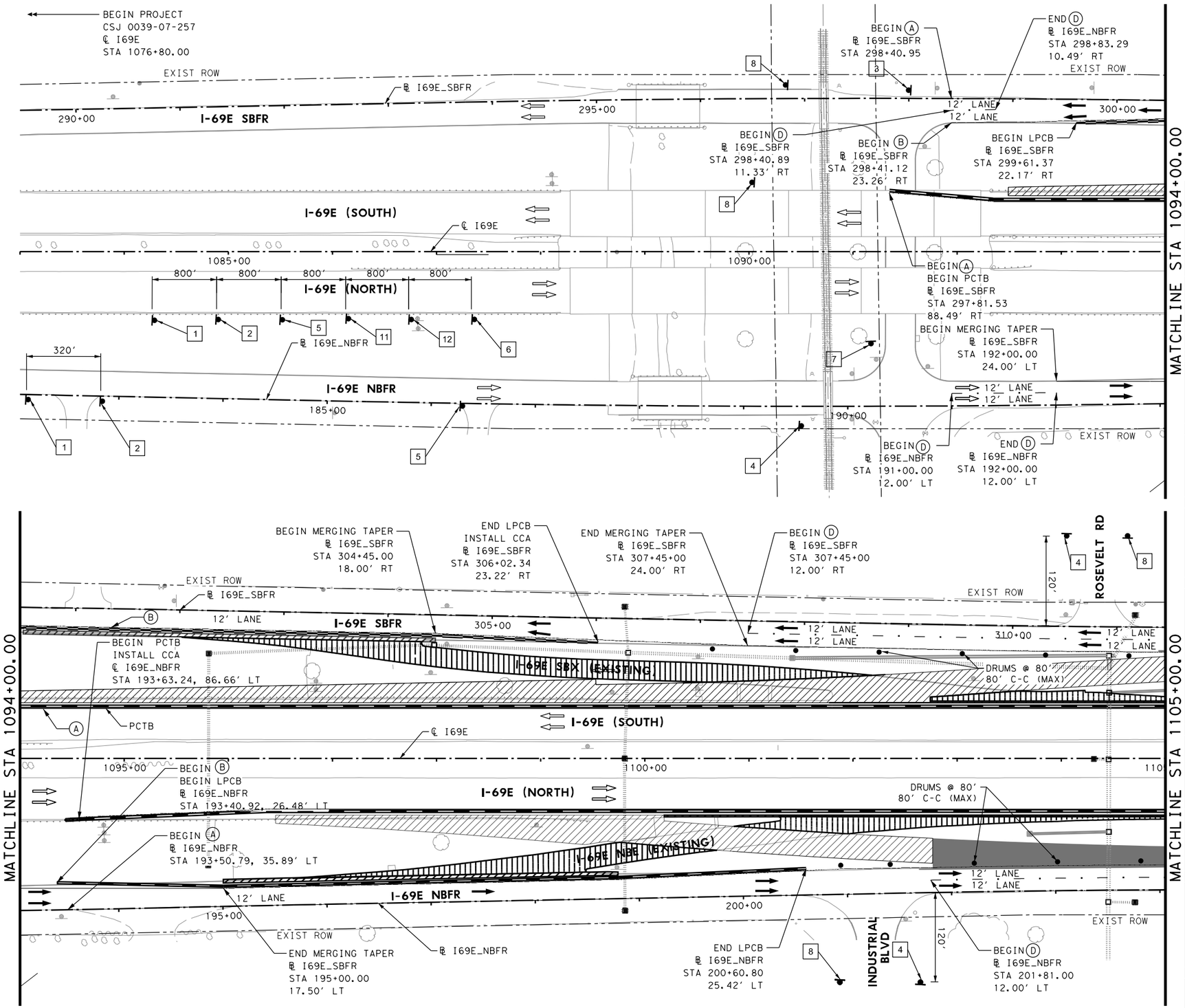

0' 25' 50' 100'

N

LEGEND:

- TCP TRAFFIC THIS PHASE
- TYPE III BARRICADE
- SIGN
- DRUMS
- CRASH CUSHION ATTENUATOR (CCA)
- EXIST ROW
- PERM CONST THIS PHASE
- PERM CONST IN PREV PHASE
- TEMP CONST THIS PHASE
- TEMP CONST IN PREV PHASE
- PERMANENT REMOVAL
- PORTABLE CONCRETE TRAFFIC BARRIER
- LOW PROFILE CONCRETE BARRIER
- M PORTABLE MOVABLE MESSAGE SIGN
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (C) WK ZN PAV MRK REMOV (W) 8" (SLD)
- (D) WK ZN PAV MRK REMOV (W) 4" (BRN)
- (E) WK ZN PAV MRK REMOV (W) (ARROW)
- (F) WK ZN PAV MRK REMOV (W) (WORD)
- (G) REFL PAV MRKR TY II-A-A

SIGN LEGEND:

1	OBEY WARNING SIGNS STATE LAW R20-3T 48"X42"	11	CW20-1D 48"x48" ROAD WORK AHEAD; CW13-1P 30"X30" 70 MPH
2	STAY ALERT TALK OR TEXT LATER R20-3 60"x48"	12	RAMP CLOSED 1/2 MILE CW20-3E 48"X48"
3	END WORK ZONE G20-2bT 48" X 24"	13	RAMP CLOSED AHEAD CW20RP-3D 48"x48"
4	CW20-1D 48"x48" ROAD WORK AHEAD	14	RAMP CLOSED R11-2bT 48"x30"
5	G20-9TP 36"x30" BEGIN WORK ZONE; R20-5T 36"x36" TRAFFIC FINES DOUBLE; R20-5aTP 36"x18" WHEN WORKERS ARE PRESENT	15	USE NEXT RAMP CW25-1T 48"X48"
6	G20-5T 48"x24" BEGIN ROAD WORK NEXT 2 MILES; G20-6T 48"x30" NAME ADDRESS CITY STATE CONTRACTOR	16	R4-7B 48" x 60" KEEP RIGHT
7	ROAD WORK NEXT 2 MILES G20-1bL	17	LEFT LANE ENDS CW9-1L 48"X48"
8	END ROAD WORK G20-2	18	LANE ENDS MERGE RIGHT CW9-2TR 48"X48"
9	ROAD WORK NEXT 2 MILES G20-1bR	19	R3-8LR 48"x48" ONLY ONLY
10	STREET A EXIT CLOSED "M-1" STREET A EXIST CLOSED		M PLACE 1 MILE TO EXIT
10 A	USE ALTERNATE EXIT "M-2" USE ALTERNATE EXIT		

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
NICOLAS C. GARCIA
99410
LICENSED
PROFESSIONAL ENGINEER

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12/14/2022

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I-69E
TRAFFIC CONTROL PLAN
PHASE 1 STEP 3

BEG TO 1105+00

SHEET 01 OF 03

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	32
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

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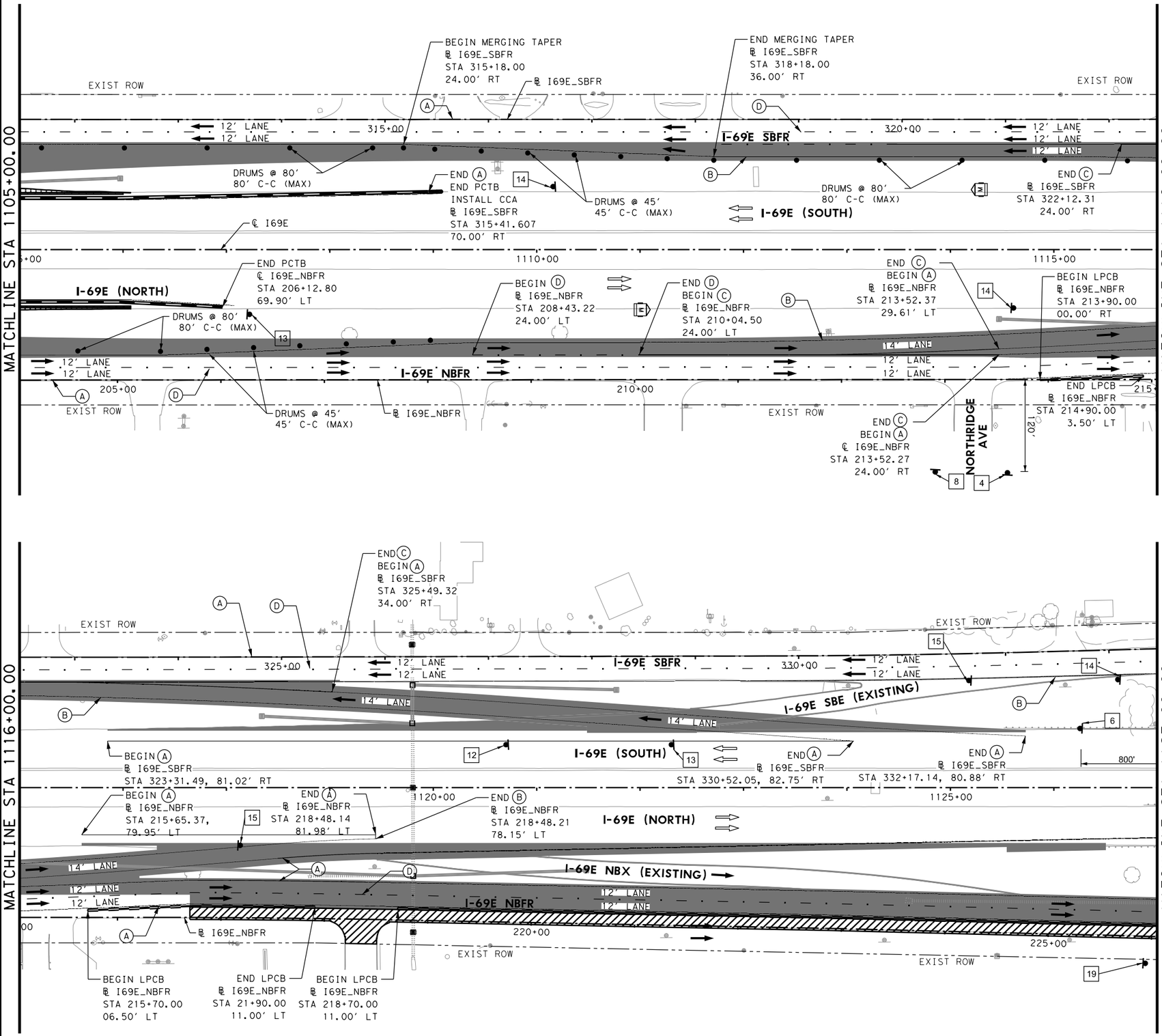

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0' 25' 50' 100'

N

LEGEND:

- TCP TRAFFIC THIS PHASE
- TYPE III BARRICADE
- SIGN
- DRUMS
- CRASH CUSHION ATTENUATOR (CCA)
- EXIST ROW
- PERM CONST THIS PHASE
- PERM CONST IN PREV PHASE
- TEMP CONST THIS PHASE
- TEMP CONST IN PREV PHASE
- PERMANENT REMOVAL
- PORTABLE CONCRETE TRAFFIC BARRIER
- LOW PROFILE CONCRETE BARRIER
- M PORTABLE MOVABLE MESSAGE SIGN
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (C) WK ZN PAV MRK REMOV (W) 8" (SLD)
- (D) WK ZN PAV MRK REMOV (W) 4" (BRN)
- (E) WK ZN PAV MRK REMOV (W) (ARROW)
- (F) WK ZN PAV MRK REMOV (W) (WORD)
- (G) REFL PAV MRKR TY II-A-A

SIGN LEGEND:

1 OBEY WARNING SIGNS / STATE LAW — R20-3T 48"X42"
2 STAY ALERT / TALK OR TEXT LATER — R20-3 60"x48"
3 END WORK ZONE — G20-2bT 48" X 24"
4 CW20-1D 48"x48" ROAD WORK AHEAD
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8 END ROAD WORK — G20-2
9 ROAD WORK NEXT 2 MILES — G20-1bR
10 STREET A EXIT CLOSED — "M-1" STREET A EXIST CLOSED
10A USE ALTERNATE EXIT — "M-2" USE ALTERNATE EXIT
11 CW20-1D 48"x48" ROAD WORK AHEAD; CW13-1P 30"X30" 70 MPH
12 RAMP CLOSED 1/2 MILE — CW20-3E 48"X48"
13 RAMP CLOSED AHEAD — CW20RP-3D 48"x48"
14 RAMP CLOSED — R11-2bT 48"x30"
15 USE NEXT RAMP — CW25-1T 48"X48"
16 R4-7B 48" x 60" KEEP RIGHT
17 LEFT LANE ENDS — CW9-1L 48"X48"
18 LANE ENDS MERGE RIGHT — CW9-2TR 48"X48"
19 R3-8LR 48"x48" ONLY ONLY
M PLACE 1 MILE TO EXIT

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
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99410
LICENSED
PROFESSIONAL ENGINEER

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12/14/2022

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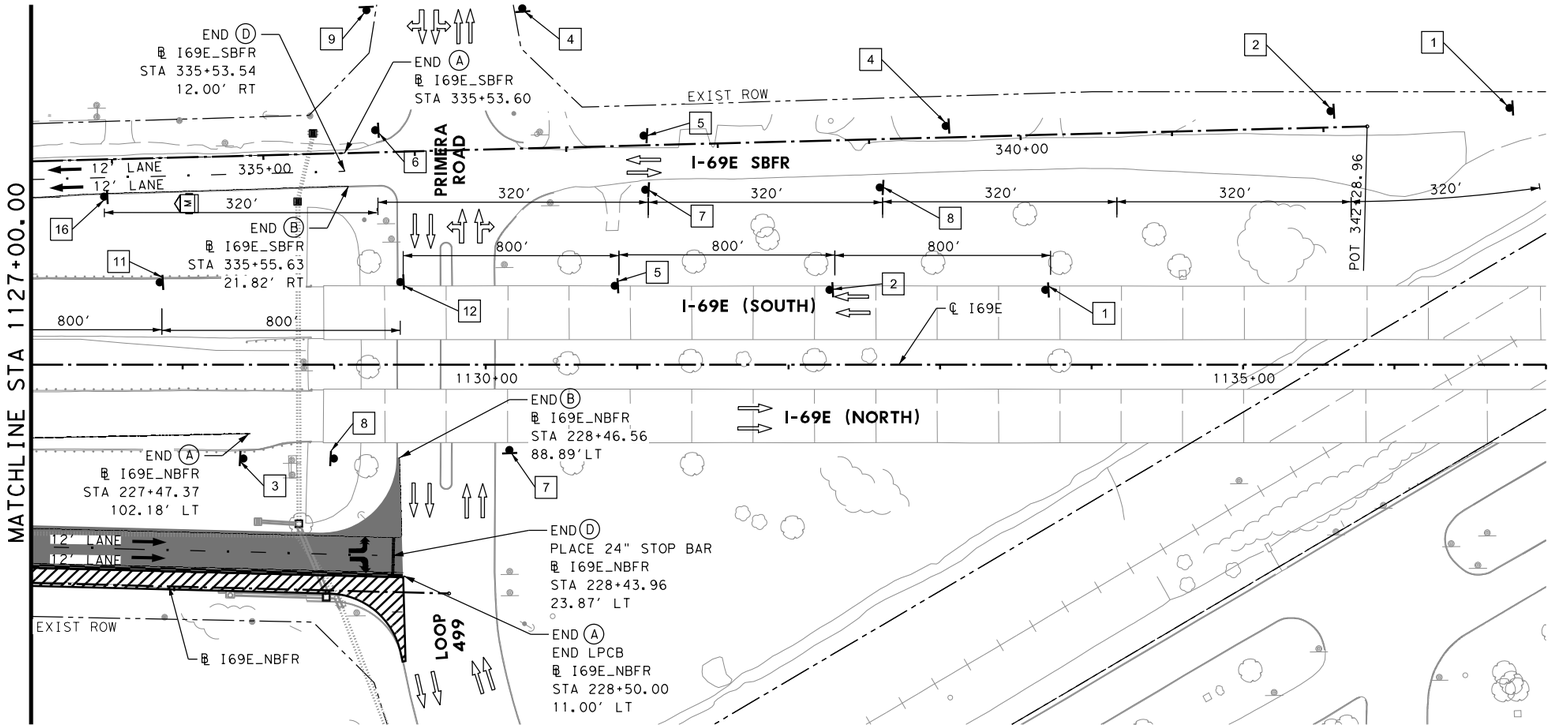
I-69E
TRAFFIC CONTROL PLAN
PHASE 1 STEP 3
1105+00 TO 1127+00

SHEET 02 OF 03

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	33
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				



TCP PHASE 1 STEP 3 QUANTITIES				
ITEM	TCP PHASE 1 STEP 1 QUANTITIES	UNI	EST.	FIN.
512	PORT CTB (MOVE) (SGL SLP) (TYP 1)	LF	3000	
512	PORT CTB (MOVE) (SGL SLP) (TYP 1)	LF	2680	
512	PORT CTB (MOVE) (LOW PROF) (TYP 1)	LF	80	
512	PORT CTB (MOVE) (LOW PROF) (TYP 2)	LF	3000	
512	PORT CTB (MOVE) (LOW PROF) (TYP 2)	LF	2680	
512	PORT CTB (REMOVE) (SGL SLP) (TYP 1)	LF	80	
545	CRASH CUSH ATTEN (MOVE & RESET)	EA	2	
545	CRASH CUSH ATTEN (REMOVE)	EA	4	
662	WK ZONE PAV MRK REMOV (W)4"(BRK)	LF	6088	
662	WK ZONE PAV MRK REMOV (W)4"(SLD)	LF	15803	
662	WK ZONE PAV MRK REMOV (W)8"(SLD)	LF	24	
662	WK ZONE PAV MRK REMOV (Y)4"(SLD)	LF	7085	

0' 25' 50' 100'

LEGEND:

- TCP TRAFFIC THIS PHASE
- TYPE III BARRICADE
- SIGN
- DRUMS
- CRASH CUSHION ATTENUATOR (CCA)
- EXIST ROW
- PERM CONST THIS PHASE
- PERM CONST IN PREV PHASE
- TEMP CONST THIS PHASE
- TEMP CONST IN PREV PHASE
- PERMANENT REMOVAL
- PORTABLE CONCRETE TRAFFIC BARRIER
- LOW PROFILE CONCRETE BARRIER
- M PORTABLE MOVABLE MESSAGE SIGN
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (C) WK ZN PAV MRK REMOV (W) 8" (SLD)
- (D) WK ZN PAV MRK REMOV (W) 4" (BRN)
- (E) WK ZN PAV MRK REMOV (W) (ARROW)
- (F) WK ZN PAV MRK REMOV (W) (WORD)
- (G) REFL PAV MRKR TY II-A-A

SIGN LEGEND:

1 OBEY WARNING SIGNS STATE LAW — R20-3T 48"X42"
2 STAY ALERT TALK OR TEXT LATER — R20-3 60"x48"
3 END WORK ZONE — G20-2bT 48" X 24"
4 CW20-1D 48"x48" ROAD WORK AHEAD
5 G20-9TP 36"x30" BEGIN WORK ZONE; R20-5T 36"x36" TRAFFIC FINES DOUBLE; R20-5aTP 36"x18" WHEN WORKERS ARE PRESENT
6 G20-5T 48"x24" BEGIN ROAD WORK NEXT 2 MILES; G20-6T 48"x30" NAME ADDRESS CITY STATE CONTRACTOR
7 ROAD WORK ← NEXT 2 MILES — G20-1bL
8 END ROAD WORK — G20-2
9 ROAD WORK NEXT 2 MILES → — G20-1bR
10 STREET A EXIT CLOSED — "M-1" STREET A EXIST CLOSED
10A USE ALTERNATE EXIT — "M-2" USE ALTERNATE EXIT
11 CW20-1D 48"x48" ROAD WORK AHEAD; CW13-1P 30"X30" 70 MPH
12 RAMP CLOSED 1/2 MILE — CW20-3E 48"X48"
13 RAMP CLOSED AHEAD — CW20RP-3D 48"x48"
14 RAMP CLOSED — R11-2bT 48"x30"
15 USE NEXT RAMP — CW25-1T 48"X48"
16 R4-7B 48" x 60" KEEP RIGHT
17 LEFT LANE ENDS — CW9-1L 48"X48"
18 LANE ENDS MERGE RIGHT — CW9-2TR 48"X48"
19 R3-8LR 48"x48" ONLY ONLY
M PLACE 1 MILE TO EXIT

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS — NICOLAS C. GARCIA — 99410 — LICENSED PROFESSIONAL ENGINEER

Nicolas C. Garcia, P.E.

12/14/2022

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QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
4350 Lockhill Selma Road, Suite 100•San Antonio, Texas 78249•210.494.5511

I-69E
TRAFFIC CONTROL PLAN
PHASE 1 STEP 3
1127+00 TO END

SHEET 03 OF 03

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	34
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

PLOTDRIVER: BW_HALF_PDF.pltcfg PENTABLE: I69E-RAMPS.tbl
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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	0039	07	257	I69E
9-07 8-14	DIST	COUNTY		SHEET NO.
5-10 5-21	PHR	CAMERON		35

DATE: 11/22/2022 4:54:21 PM
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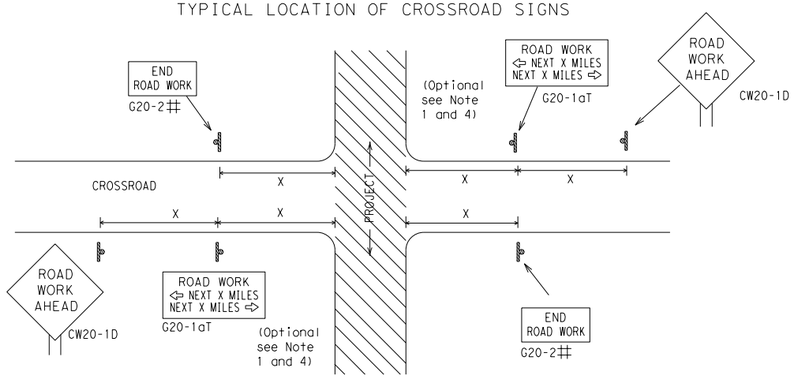
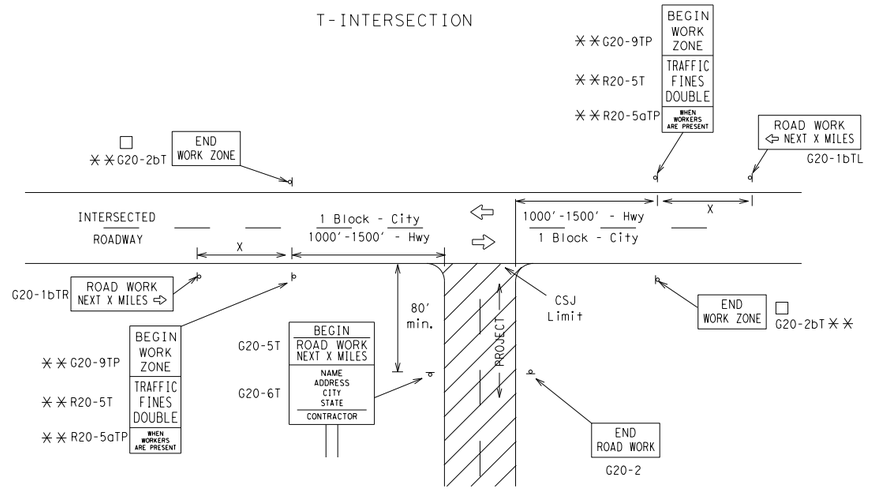
TYPICAL LOCATION OF CROSSROAD SIGNS



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.

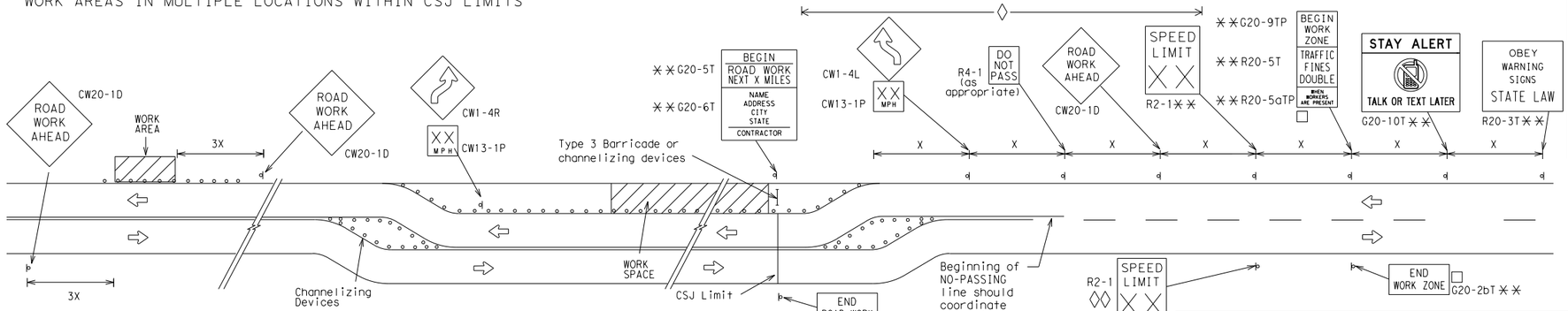
△ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

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.

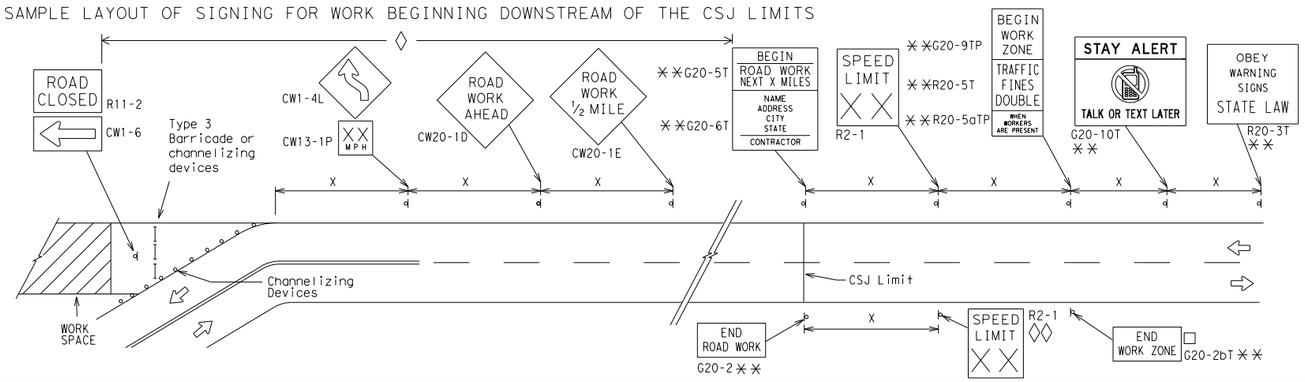
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE 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



NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	CAMERON		36

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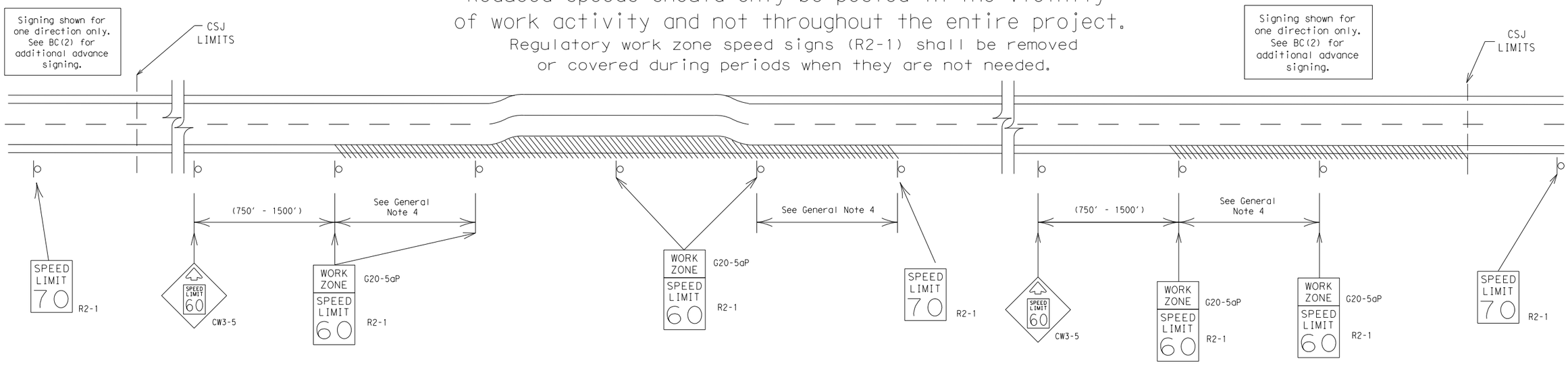
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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.

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13 5-21	0039	07	257	I69E
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		37

97

DATE: 11/22/2022 4:54:22 PM
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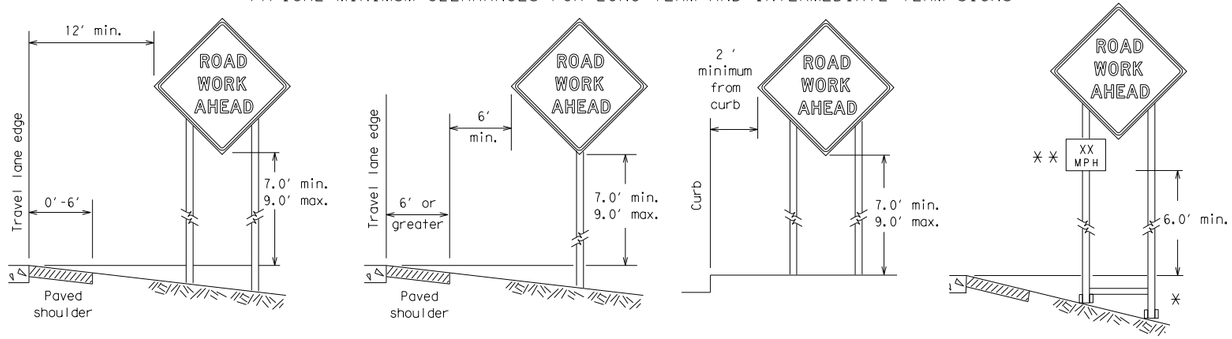
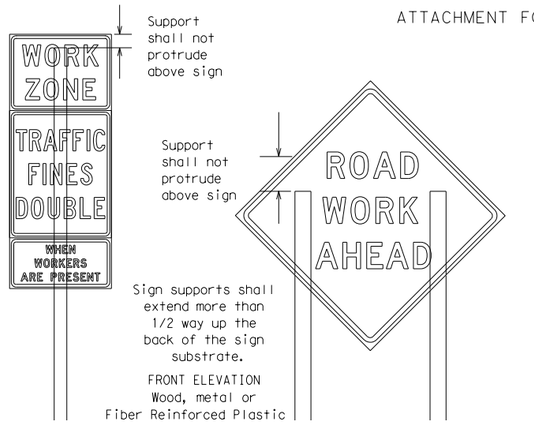
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

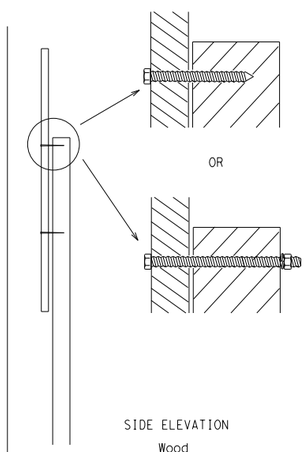


⁎ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

⁎⁎ 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





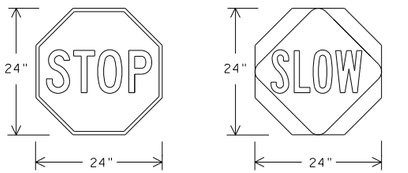
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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.

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BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	CAMERON		38

DATE: 11/22/2022 4:54:22 PM
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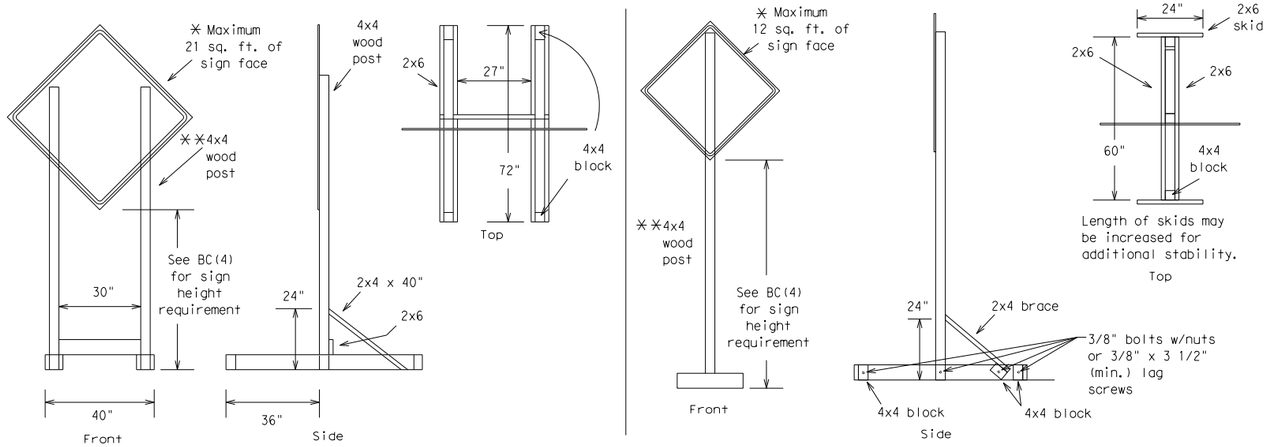
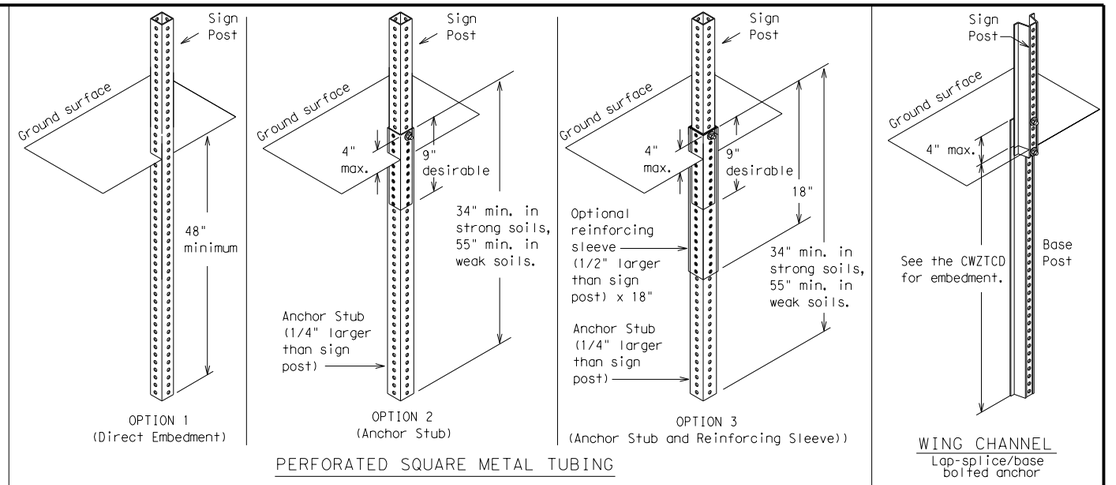


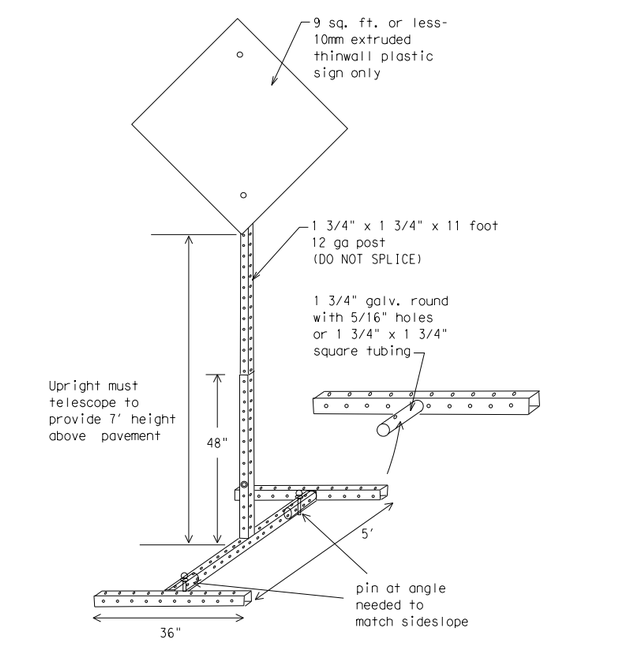
SKID MOUNTED WOOD SIGN SUPPORTS

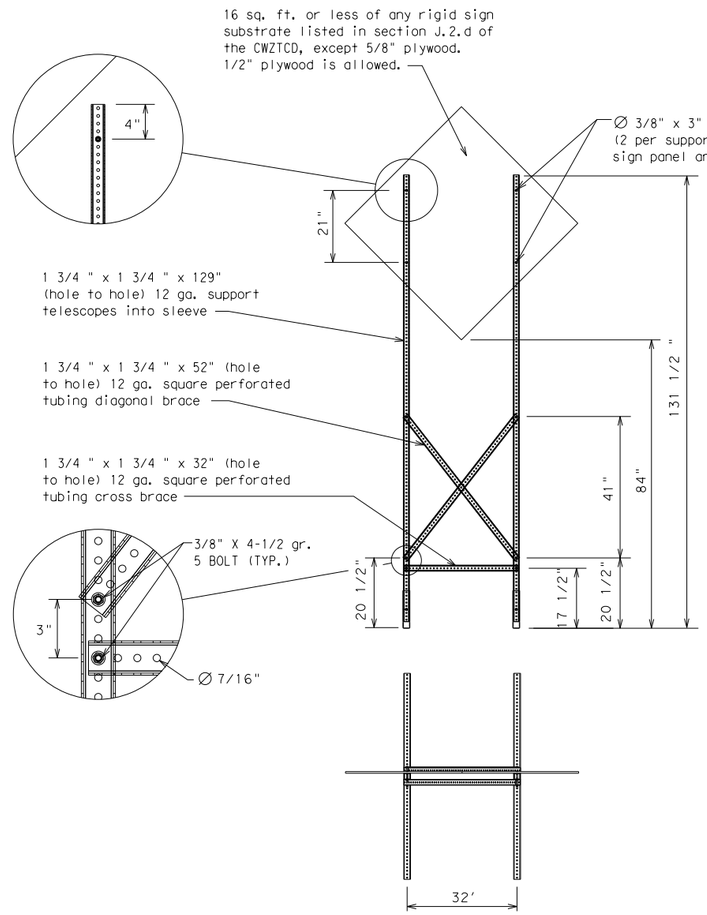
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

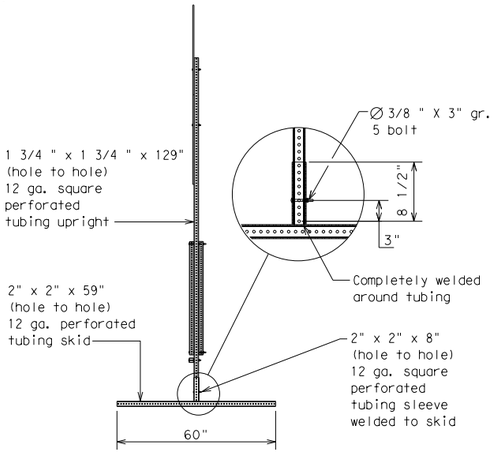


GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

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BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	CAMERON		39

DATE: 11/22/2022 4:54:22 PM
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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 ⁂

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

⁑⁑ Advance Notice List

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

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

⁑⁑ See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	CAMERON		40

100

DATE: 11/22/2022 4:54:23 PM
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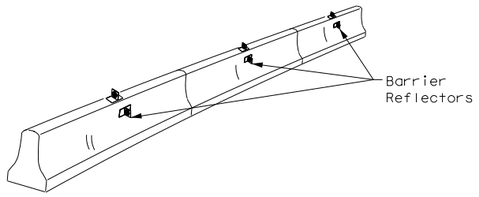
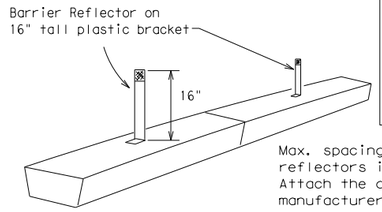
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost 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.

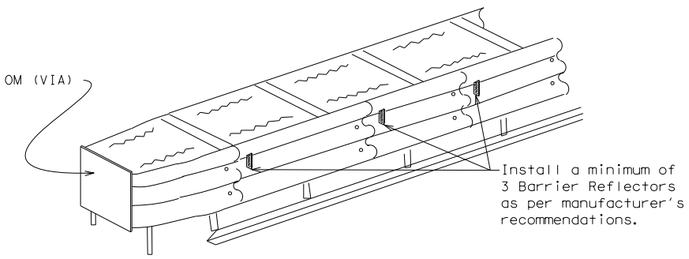


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB)

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.

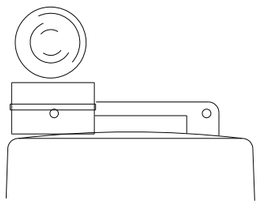


DELINEATION OF END TREATMENTS

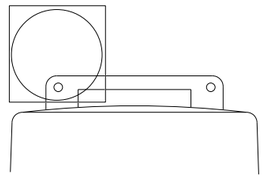
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

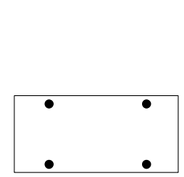
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

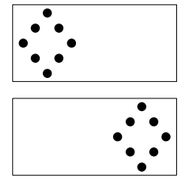
Arrow Boards may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

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

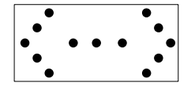


4 CORNER CAUTION

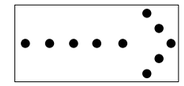
OR



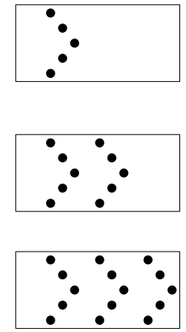
ALTERNATING DIAMOND CAUTION



DOUBLE ARROW



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



RIGHT/LEFT SEQUENTIAL CHEVRON
(right chevron shown; left is similar)

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.

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Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	CAMERON		41

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

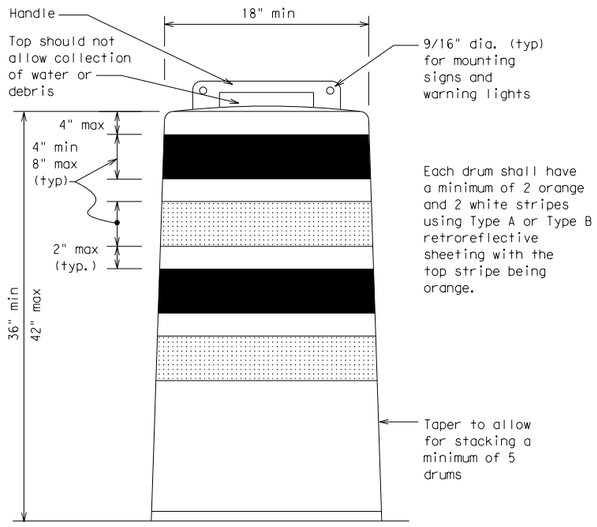
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

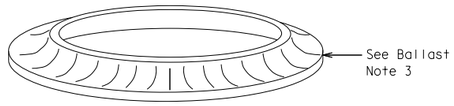
RETROREFLECTIVE SHEETING

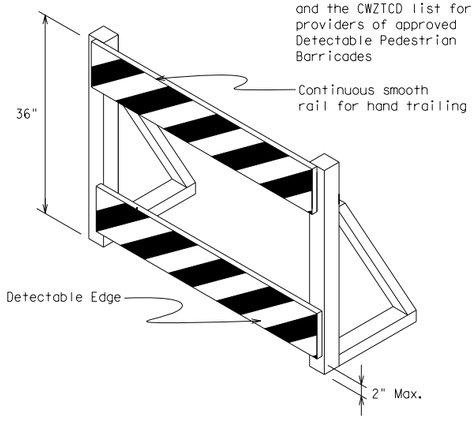
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

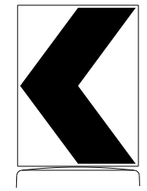




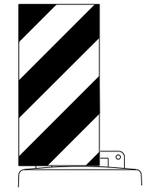


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	PHR	CAMERON		42
7-13				

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DATE: 11/22/2022 4:54:23 PM
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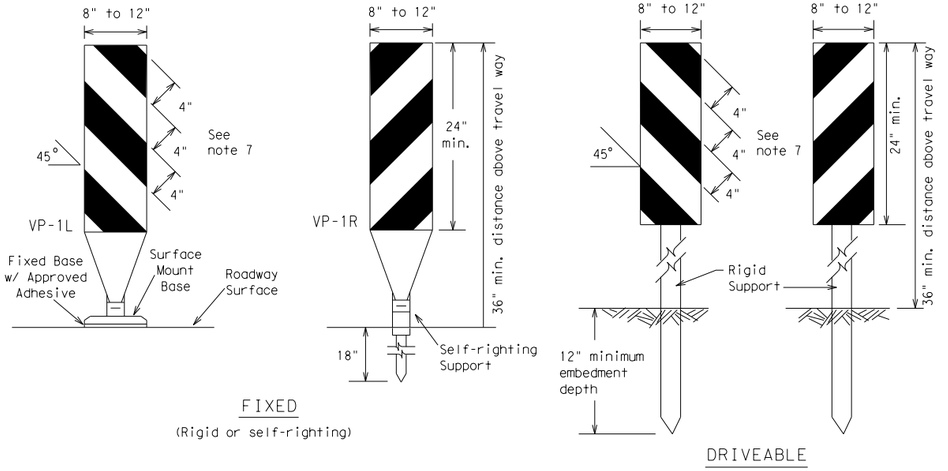
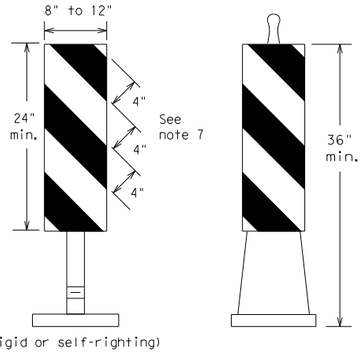


FIXED

(Rigid or self-righting)

DRIVEABLE

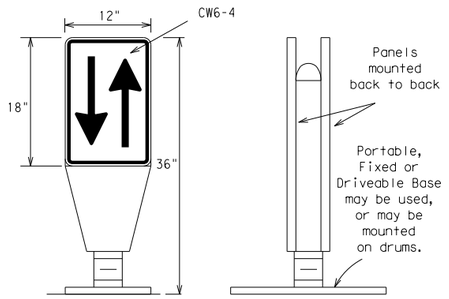


(Rigid or self-righting)

PORTABLE

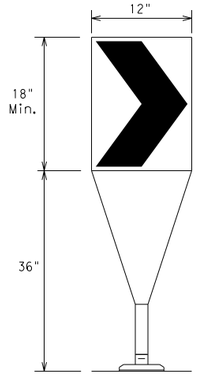
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is 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)



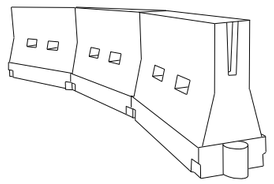
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
9-07 8-14	DIST	COUNTY		SHEET NO.
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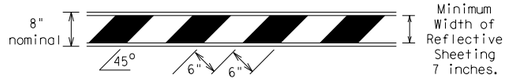
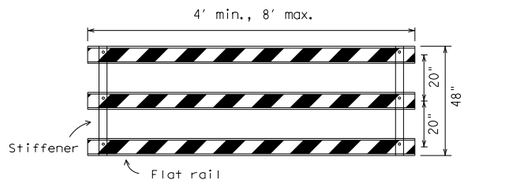
TYPE 3 BARRICADES

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.



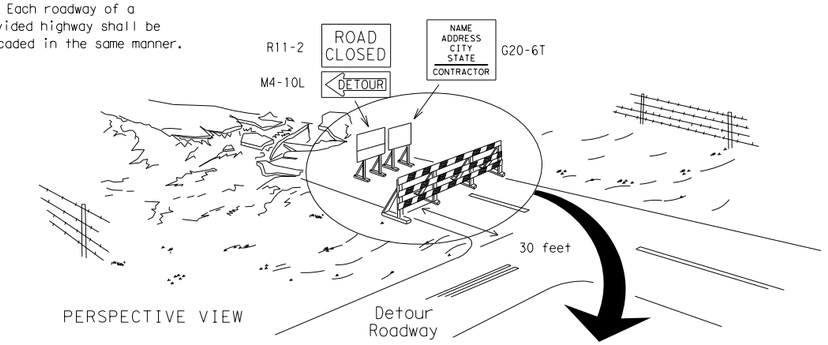
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

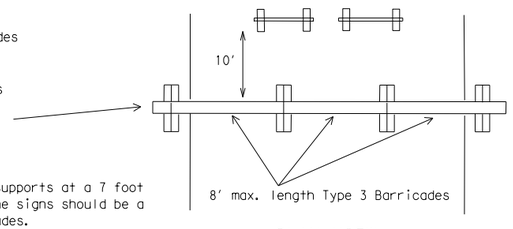
TYPICAL PANEL DETAIL
FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

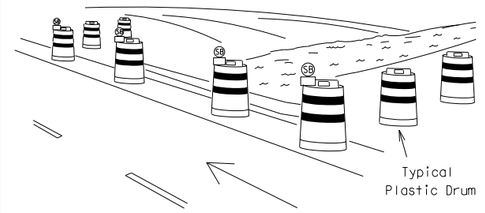
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

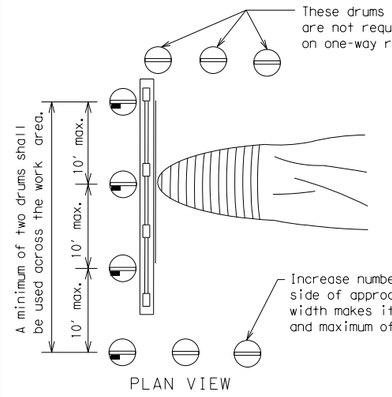
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

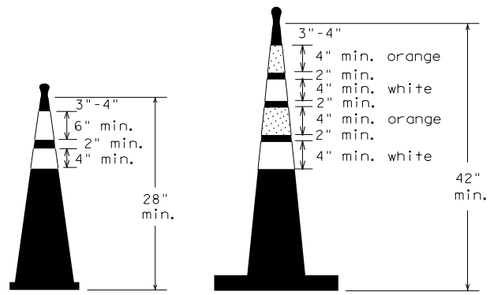
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



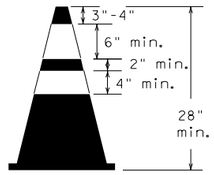
PLAN VIEW

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

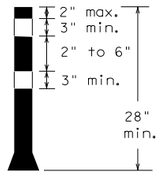
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

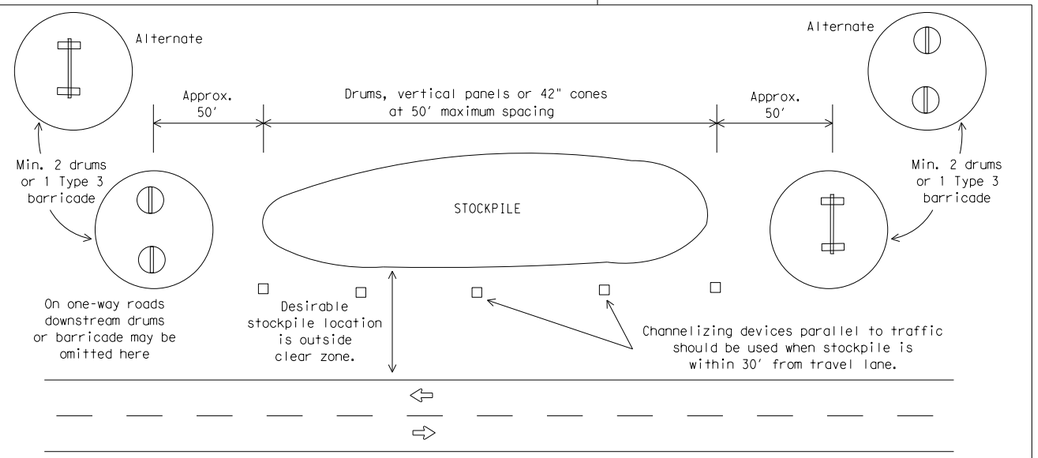


Tubular Marker

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

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Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	CAMERON		44

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.

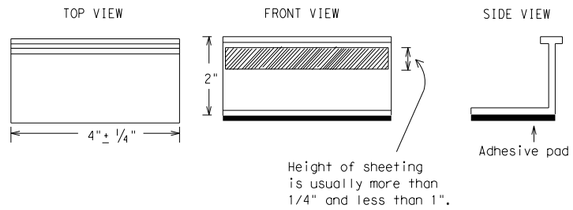
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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11-02 8-14				

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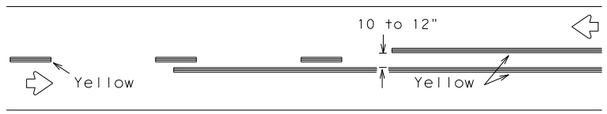
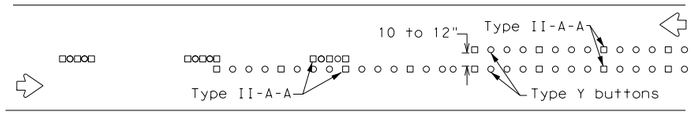
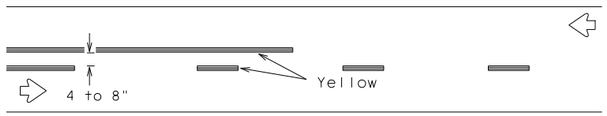
PAVEMENT MARKING PATTERNS



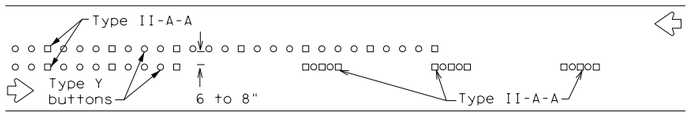
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



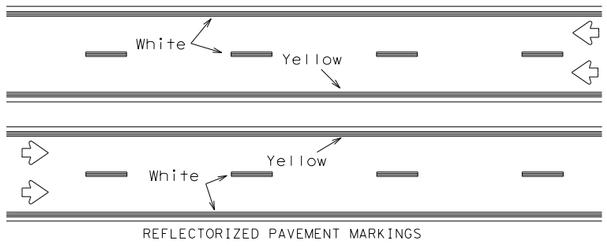
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



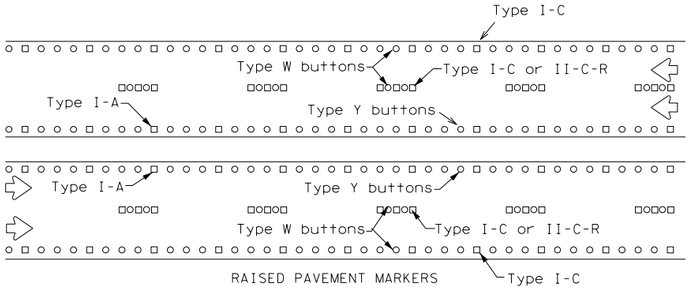
RAISED PAVEMENT MARKERS - PATTERN B

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

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



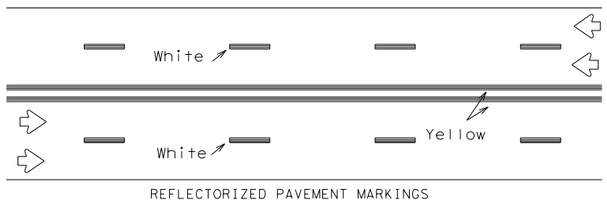
REFLECTORIZED PAVEMENT MARKINGS



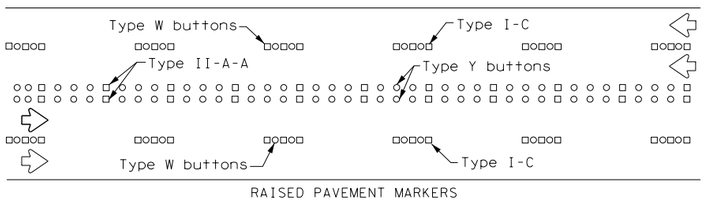
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



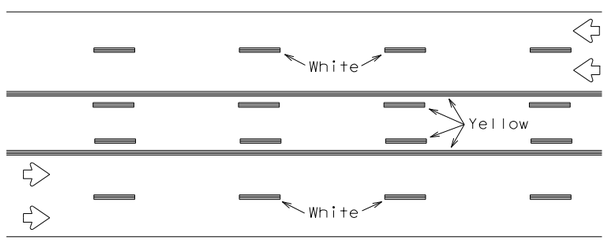
REFLECTORIZED PAVEMENT MARKINGS



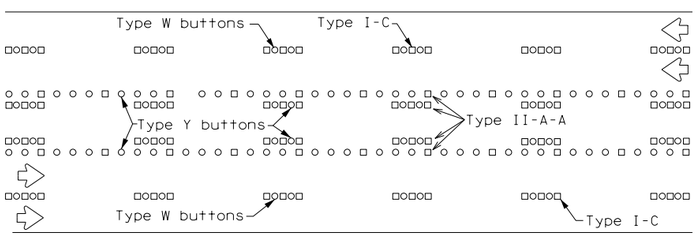
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

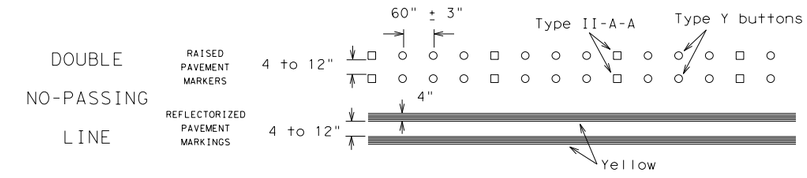
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

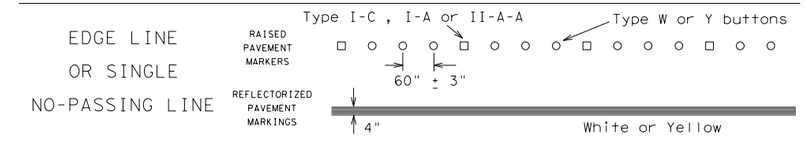
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

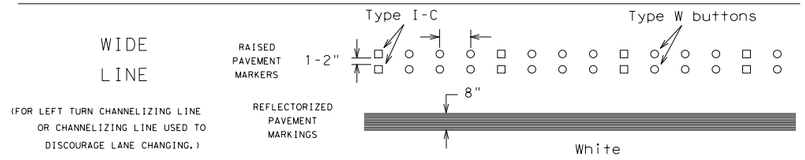


EDGE LINE OR SINGLE NO-PASSING LINE



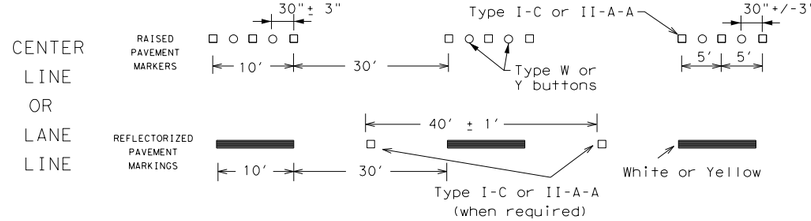
WIDE LINE

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

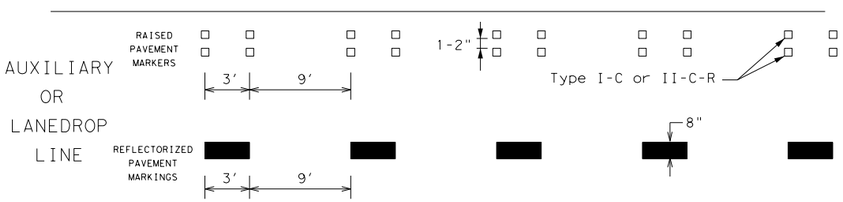


BROKEN LINES

CENTER LINE OR LANE LINE

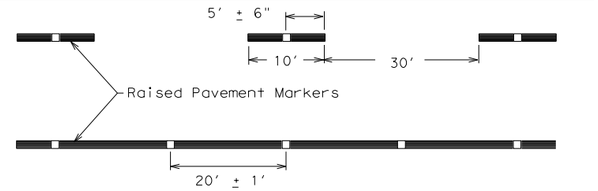


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

SHEET 12 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

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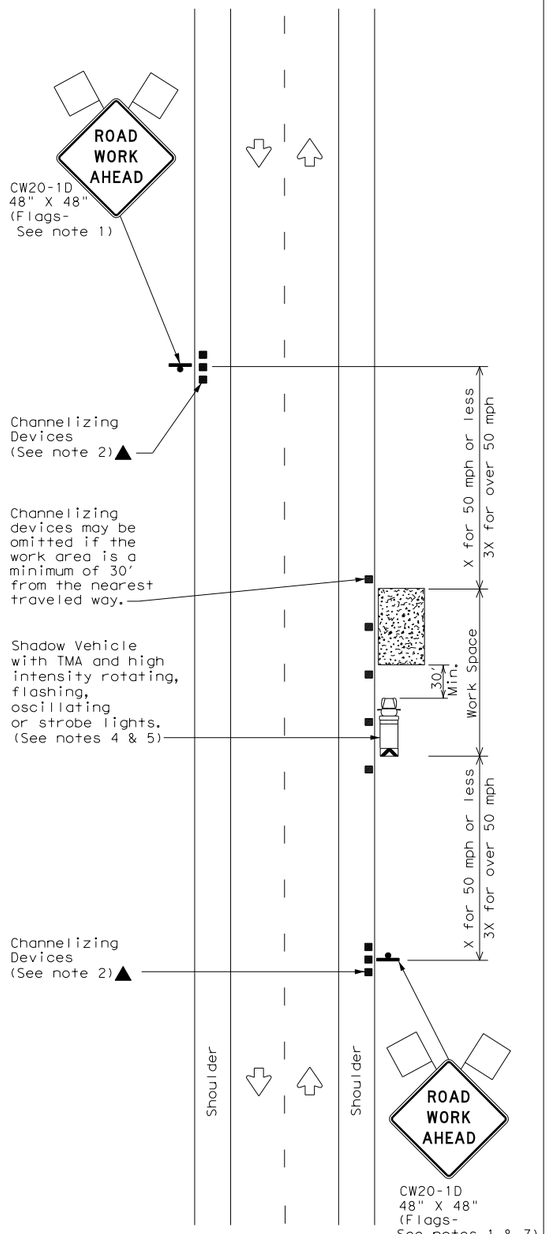
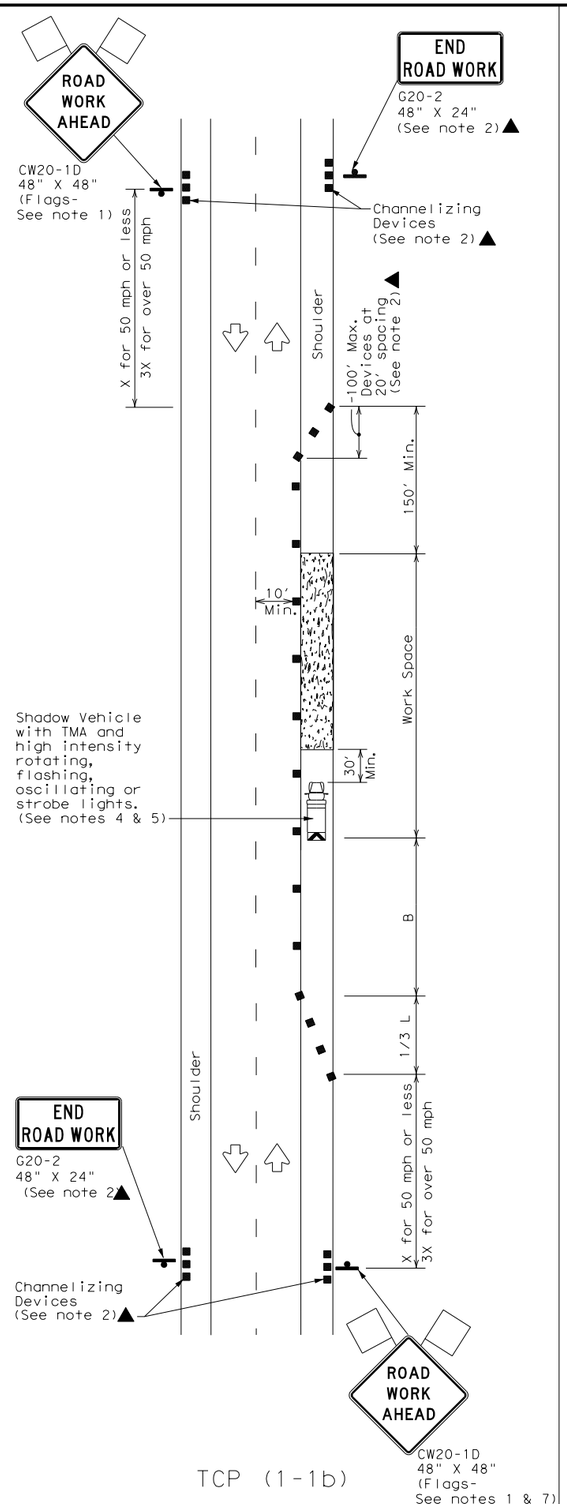


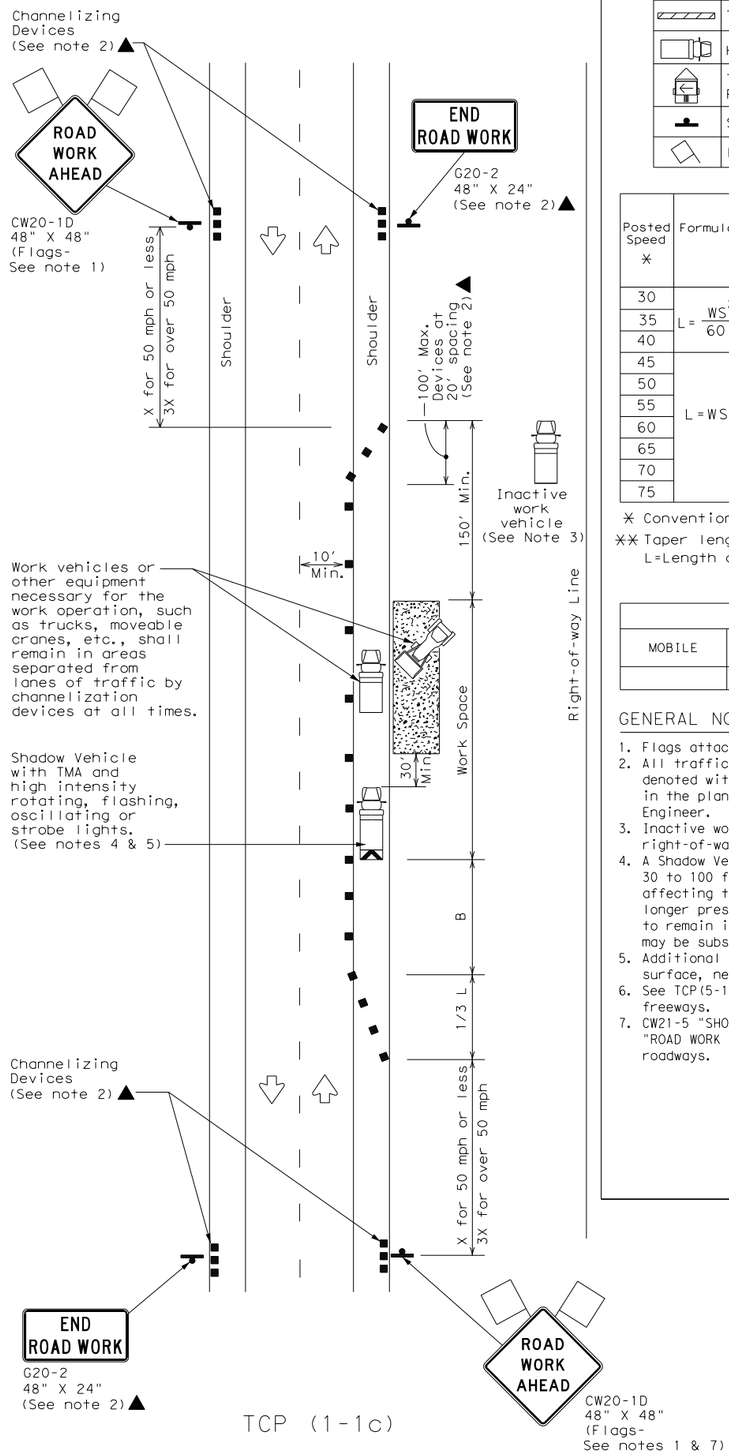
TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(1-1)-18

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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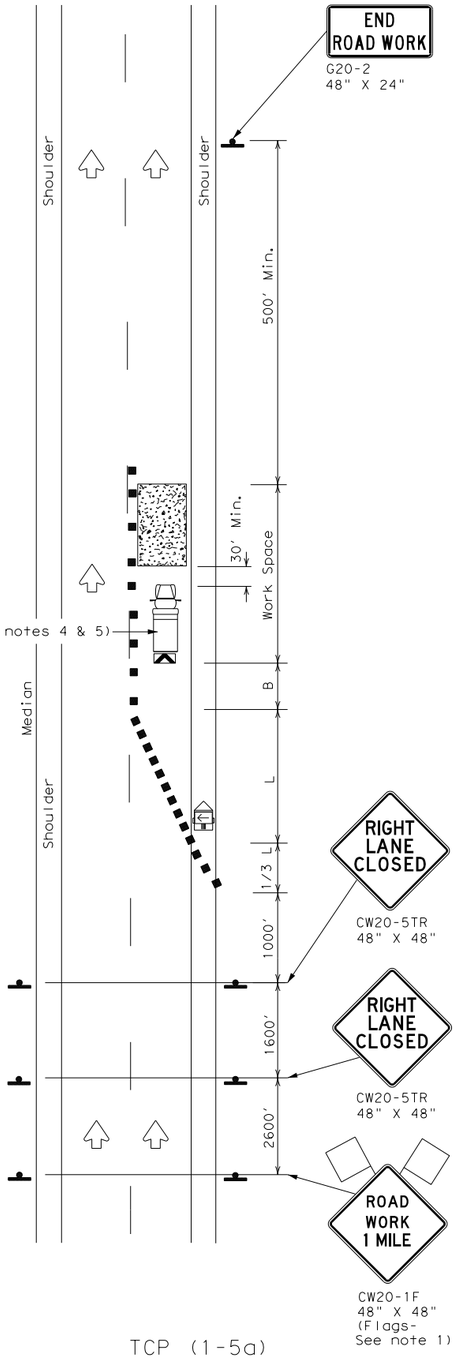
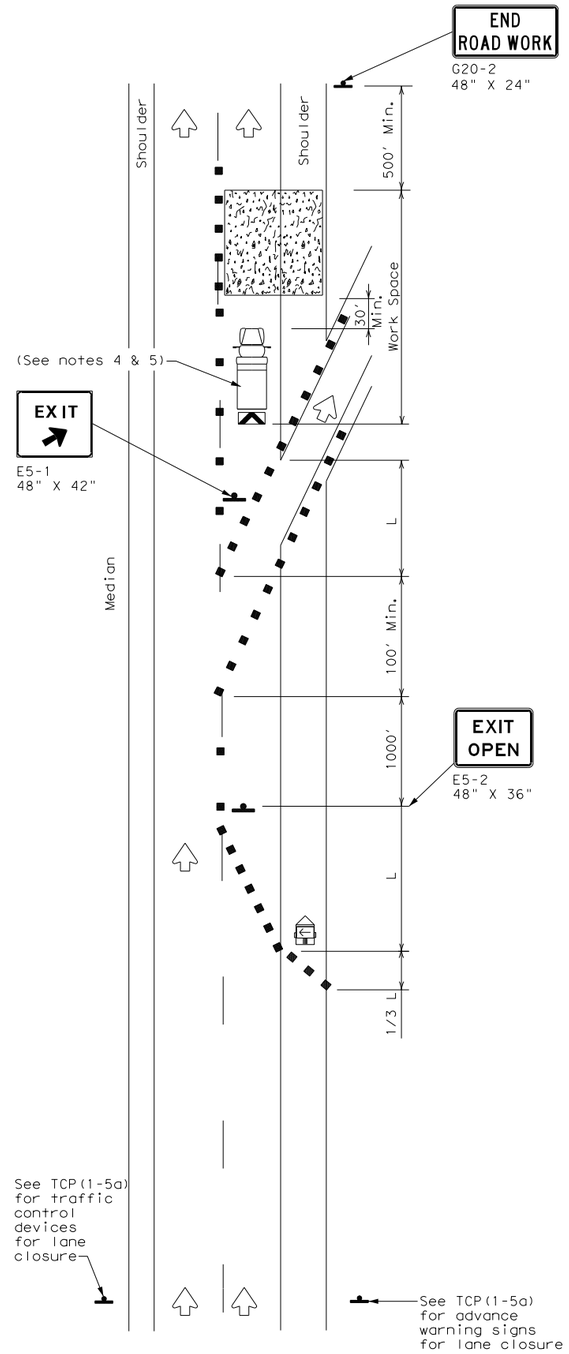


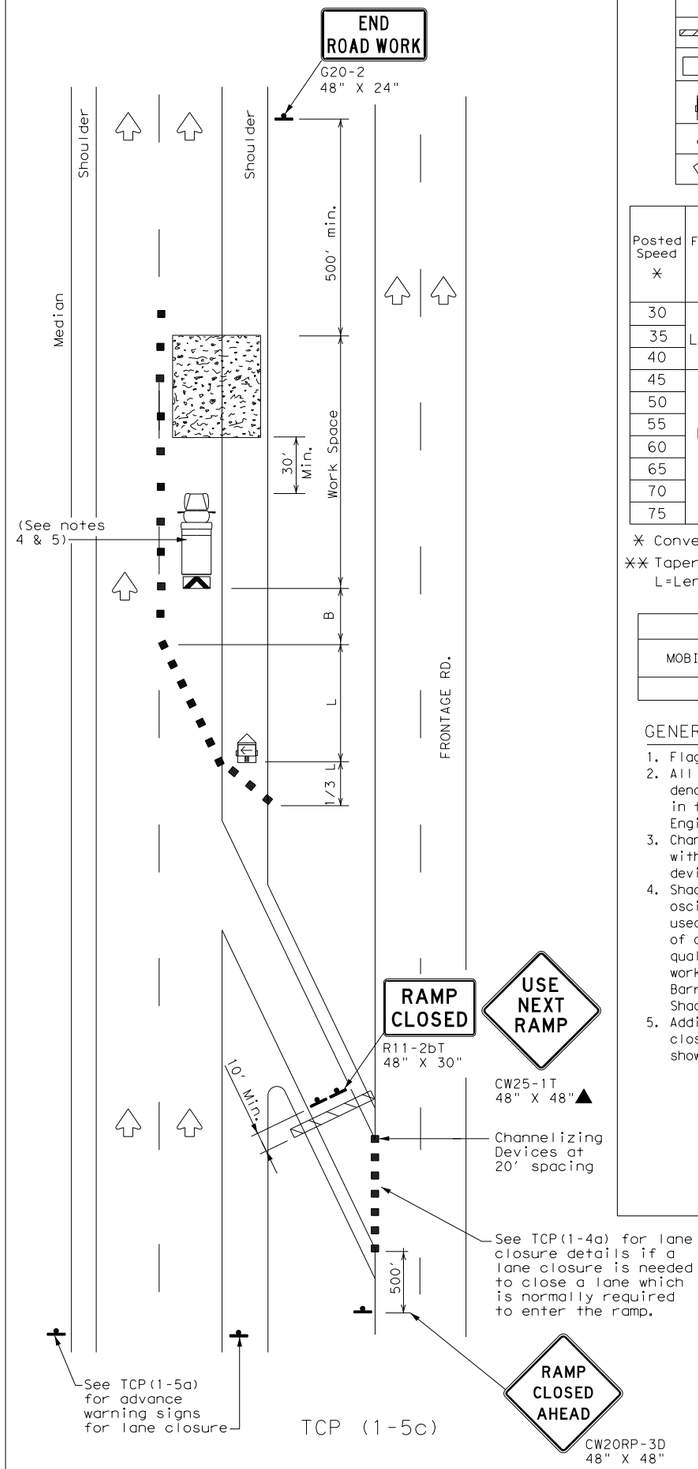
TCP (1-5a)

ONE LANE CLOSURE



TCP (1-5b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (1-5c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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

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

✳ Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES FOR DIVIDED HIGHWAYS

TCP(1-5)-18

FILE: tcp1-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-18	0039	07	257	I69E
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		48

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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: 11/22/2022 4:54:41 PM
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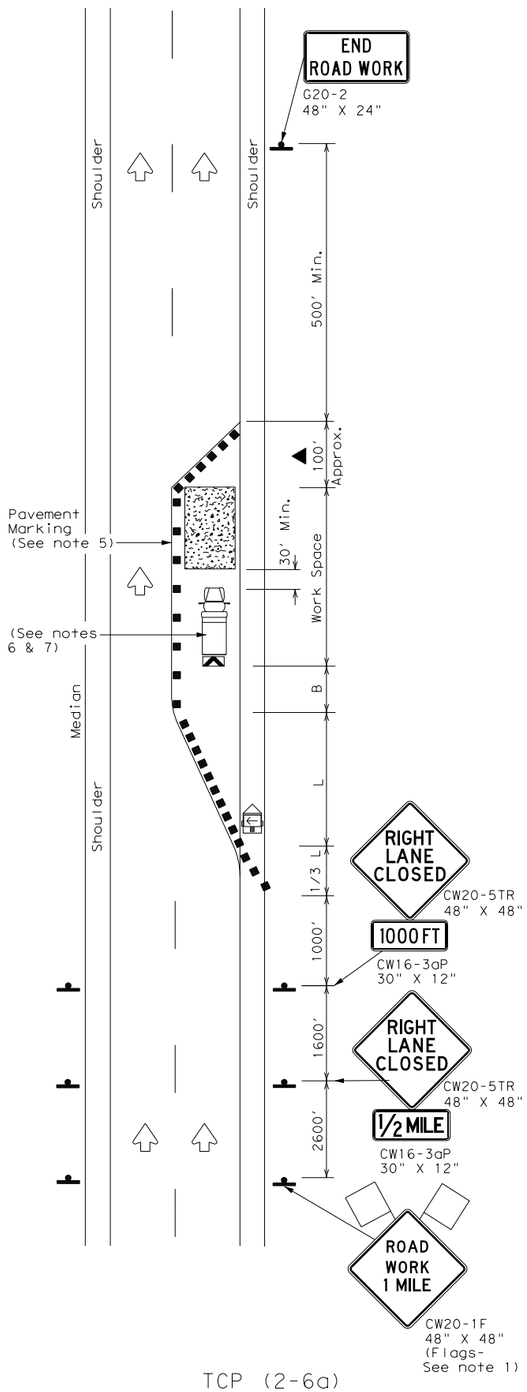
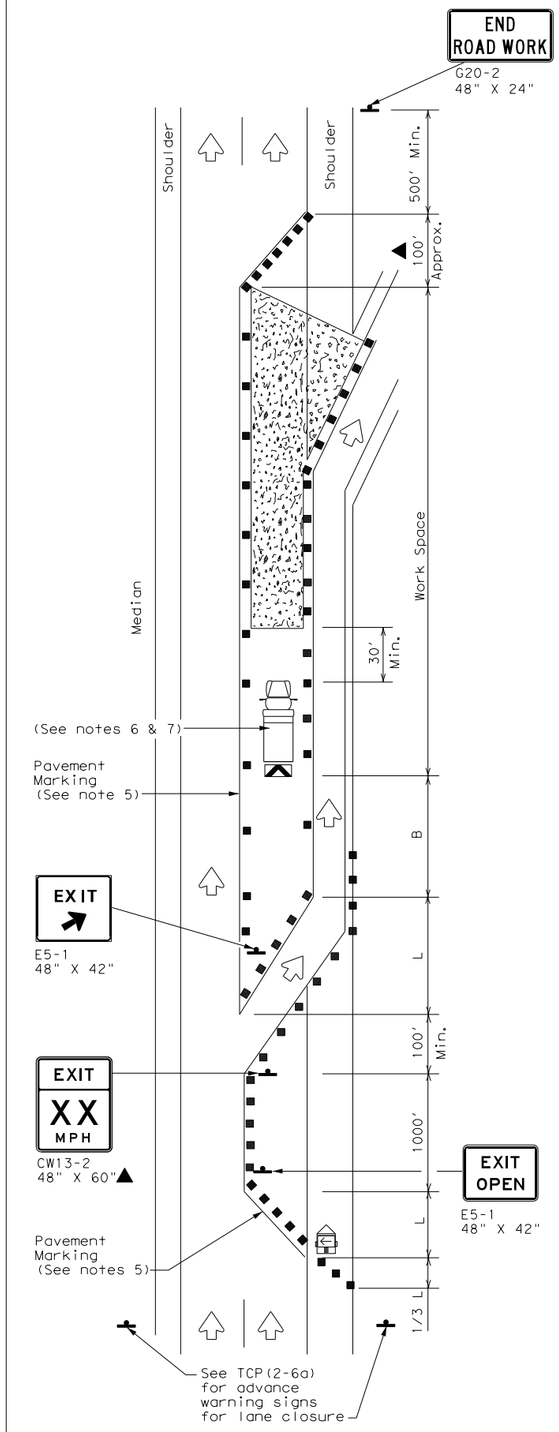


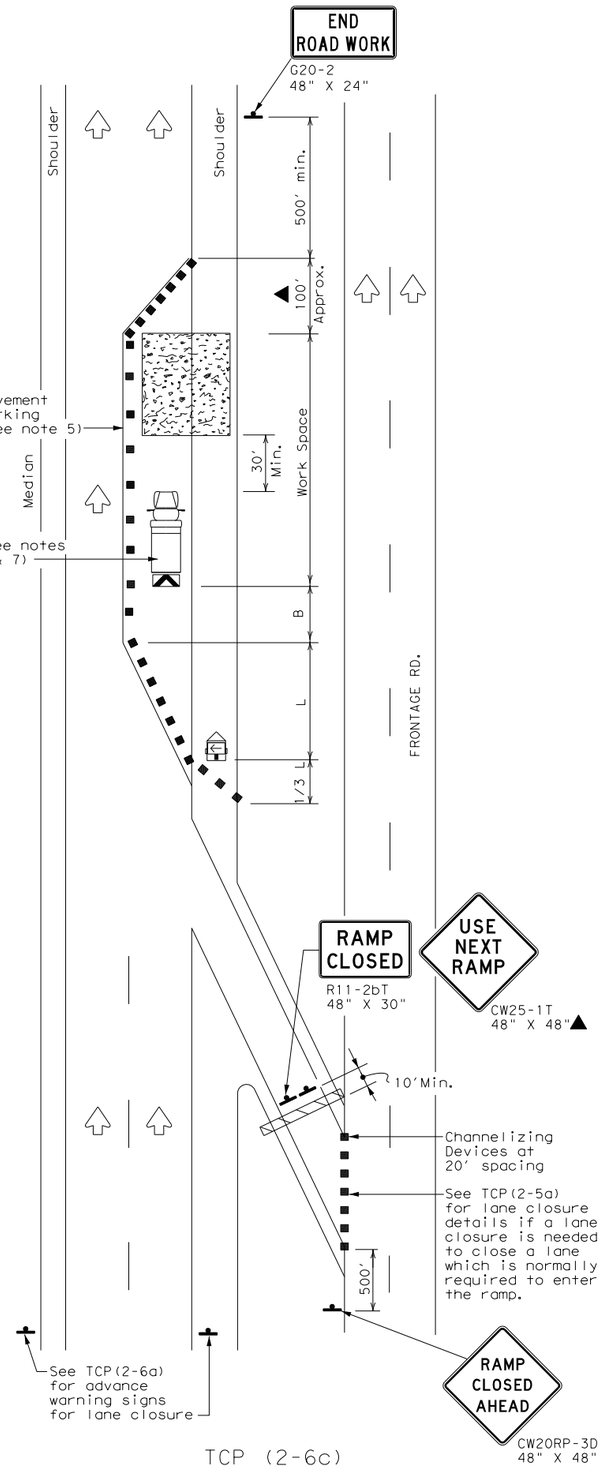
TCP (2-6a)

ONE LANE CLOSURE



TCP (2-6b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (2-6c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

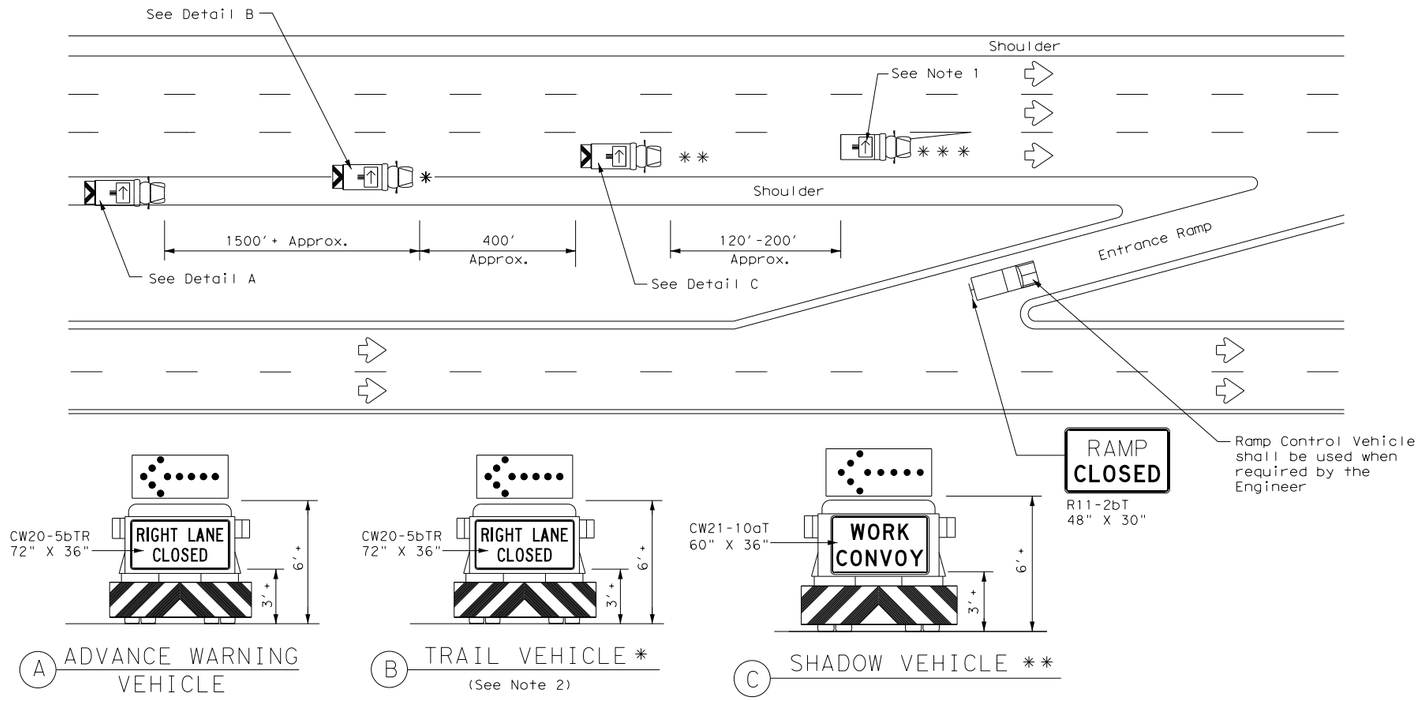
Texas Department of Transportation

Traffic Operations Division Standard

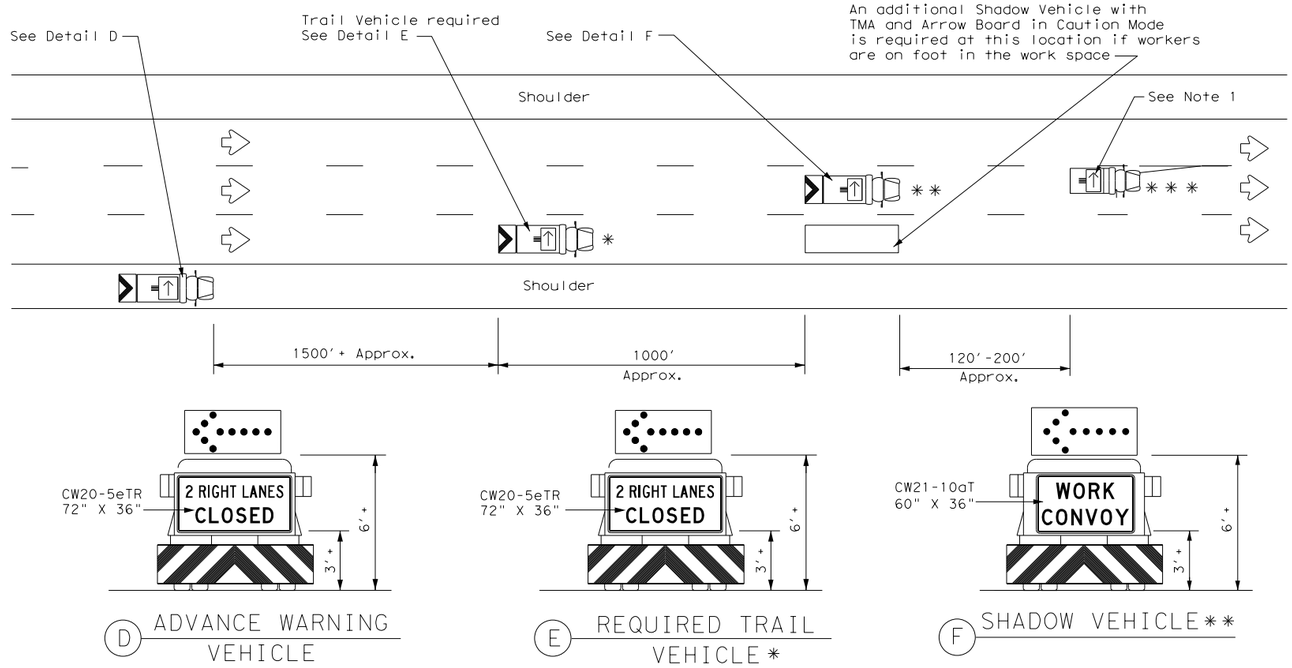
TRAFFIC CONTROL PLAN LANE CLOSURES ON DIVIDED HIGHWAYS

TCP(2-6)-18

FILE: tcp2-6-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	0039	07	257	I69E
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		49



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



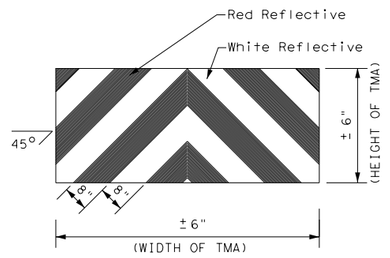
INTERMEDIATE LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

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

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

TCP(3-2)-13

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©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	PHR	CAMERON		50
1-97				

176

DATE: 11/22/2022 4:54:47 PM
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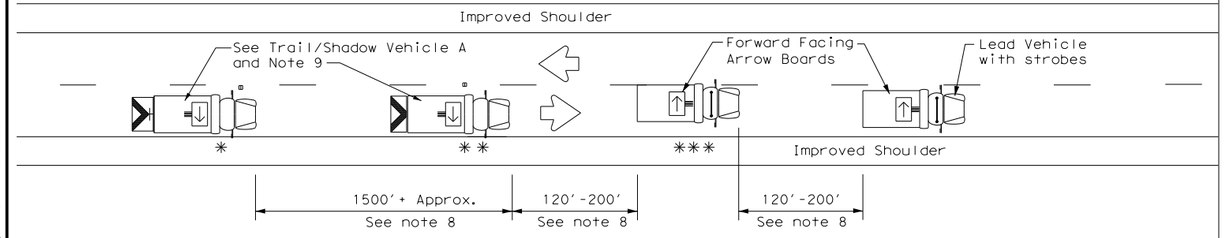
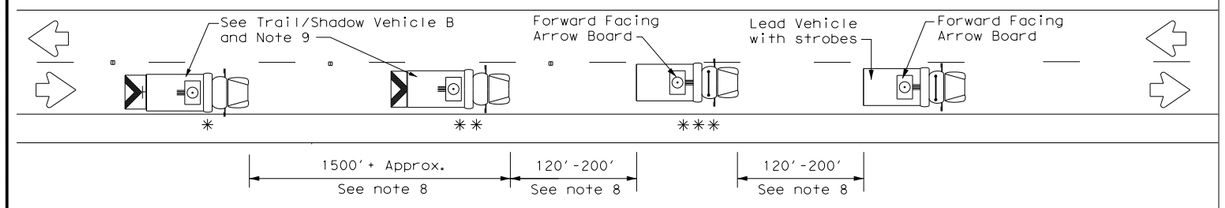


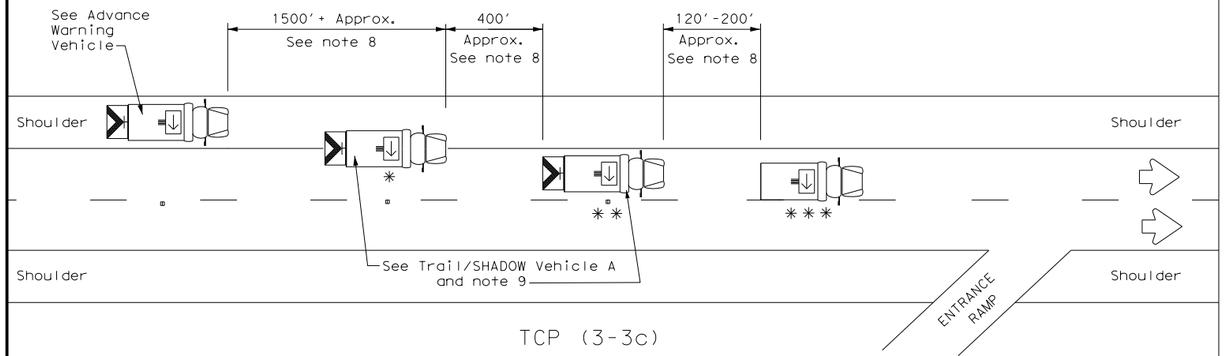
TCP (3-3a)

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



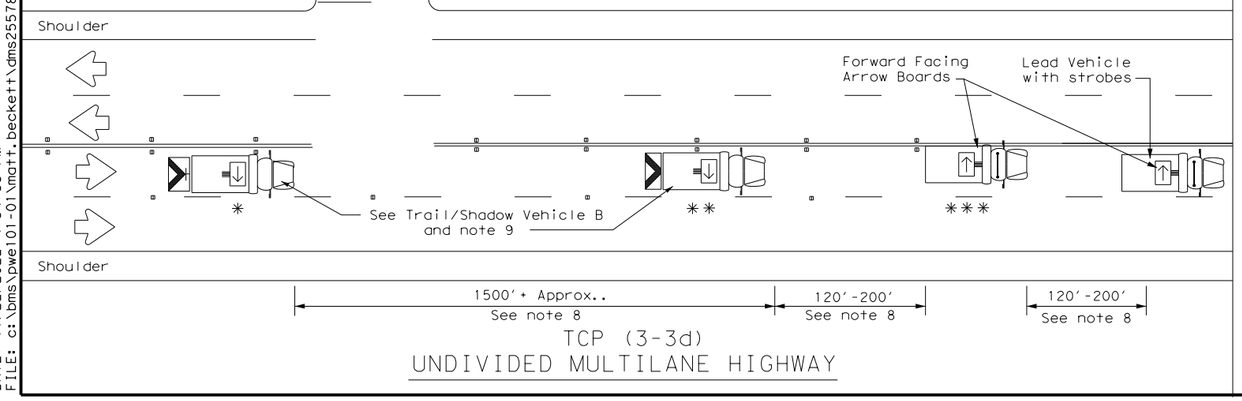
TCP (3-3b)

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



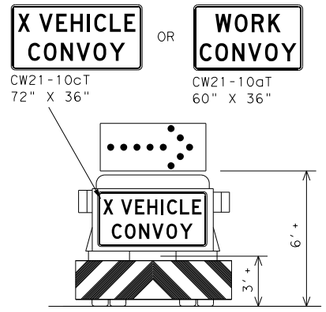
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



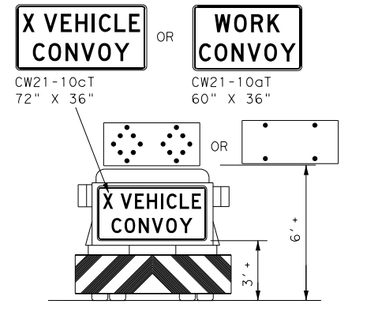
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



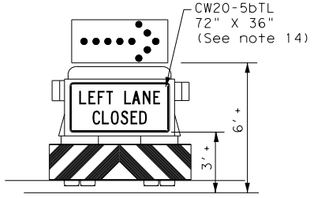
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

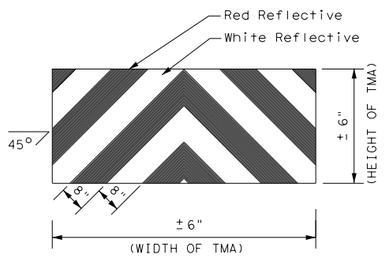


TRAIL/SHADOW VEHICLE B

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	0039	07	257	I69E
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	PHR	CAMERON		51
1-97 7-14				

177

DATE: 11/22/2022 4:54:53 PM
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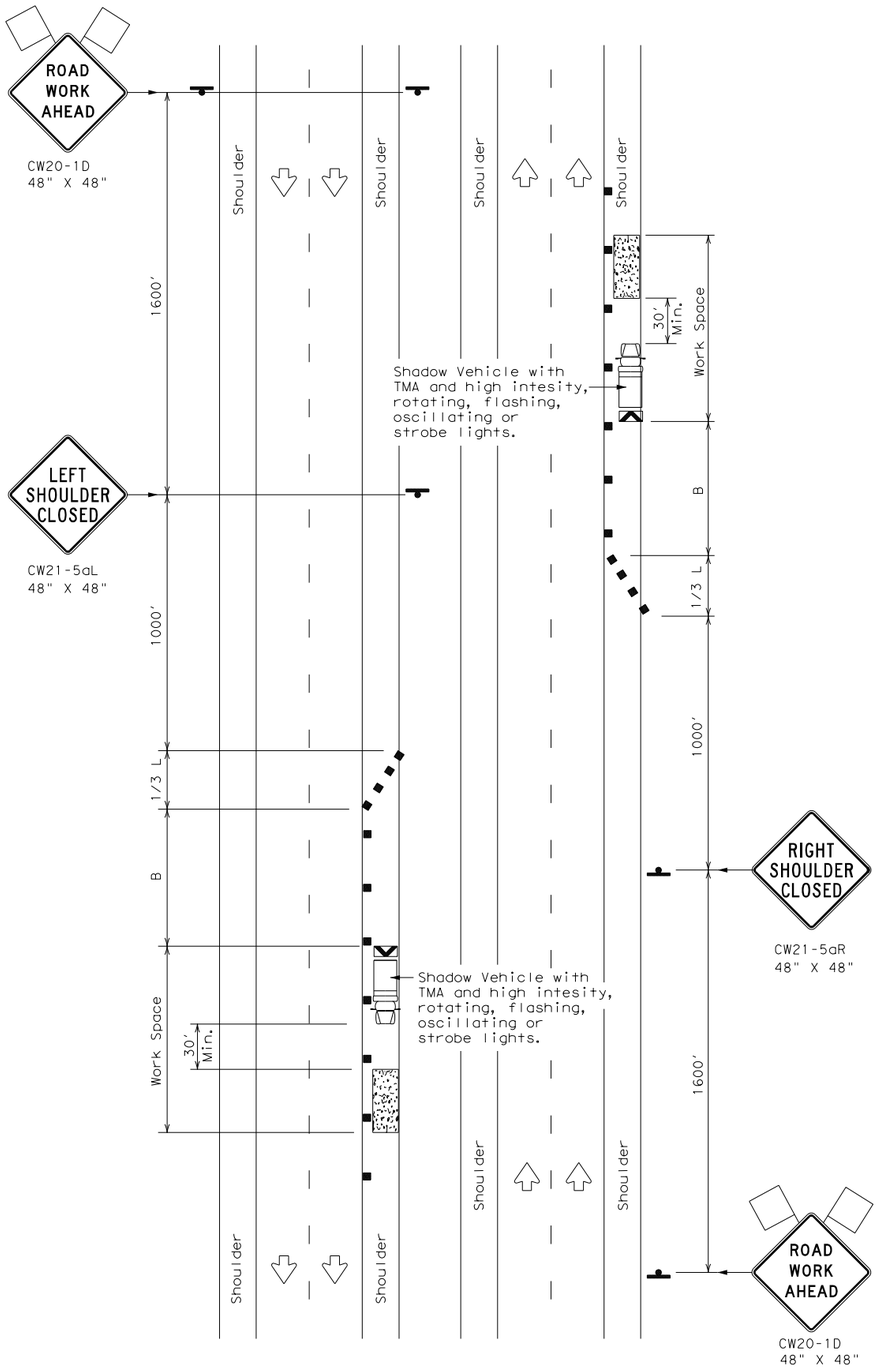
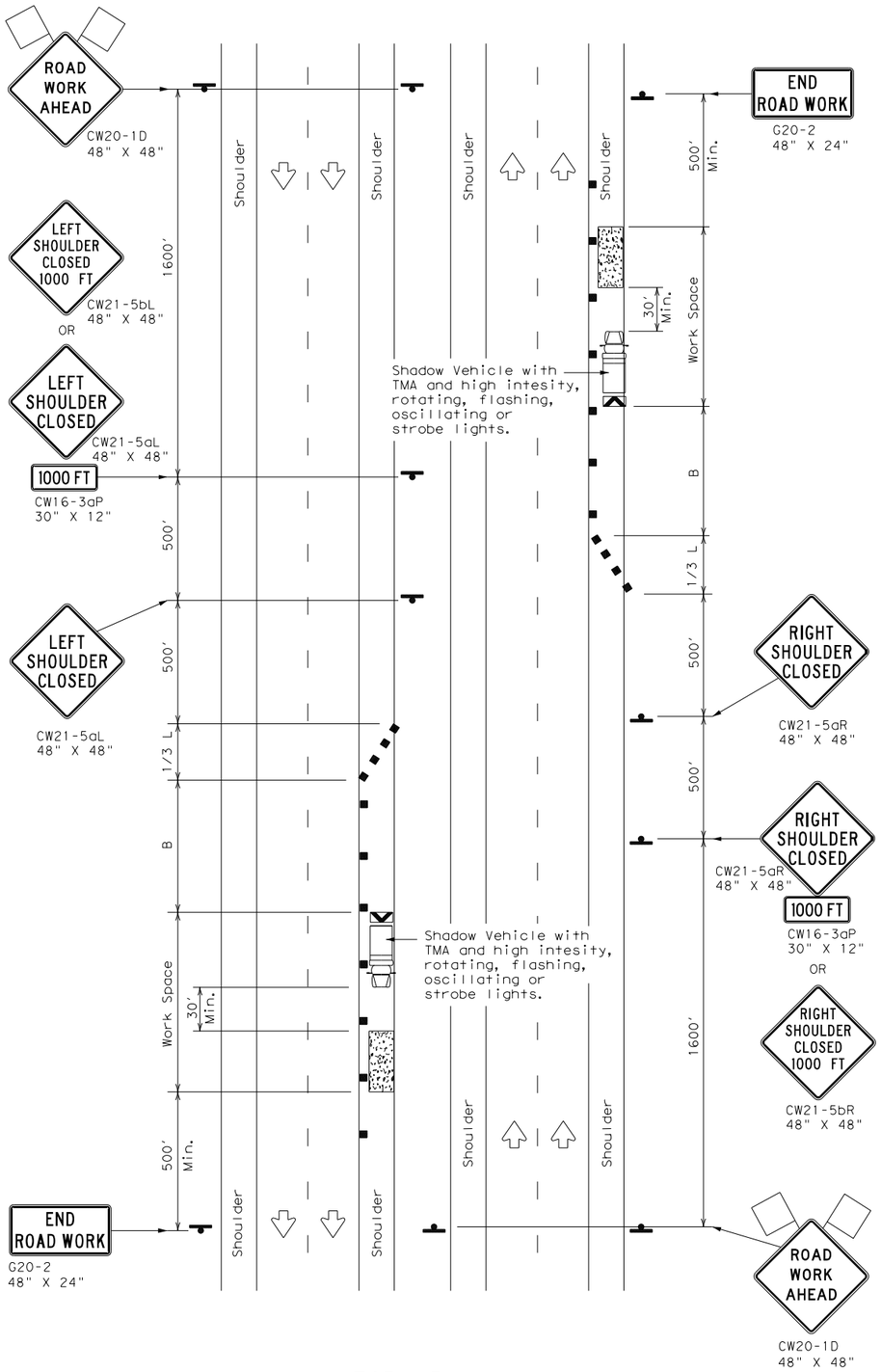


TCP (5-1a)

WORK AREA ON SHOULDER



TCP (5-1b)

WORK AREA ON SHOULDER

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

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

* Conventional Roads Only

** Taper lengths have been rounded off.

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN SHOULDER WORK FOR FREEWAYS / EXPRESSWAYS

TCP(5-1)-18

FILE: tcp5-1-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
2-18	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		52

DATE: 11/22/2022 4:54:59 PM
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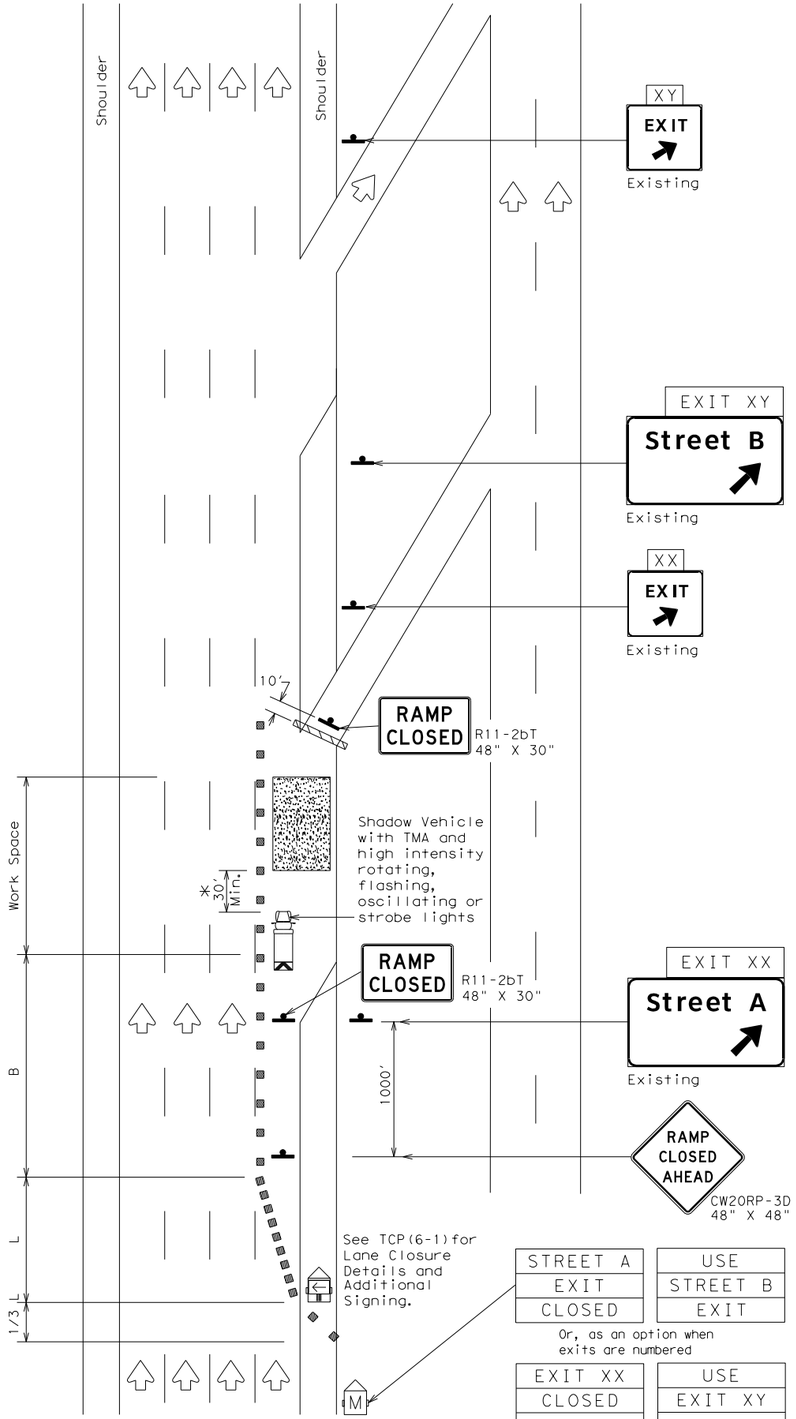
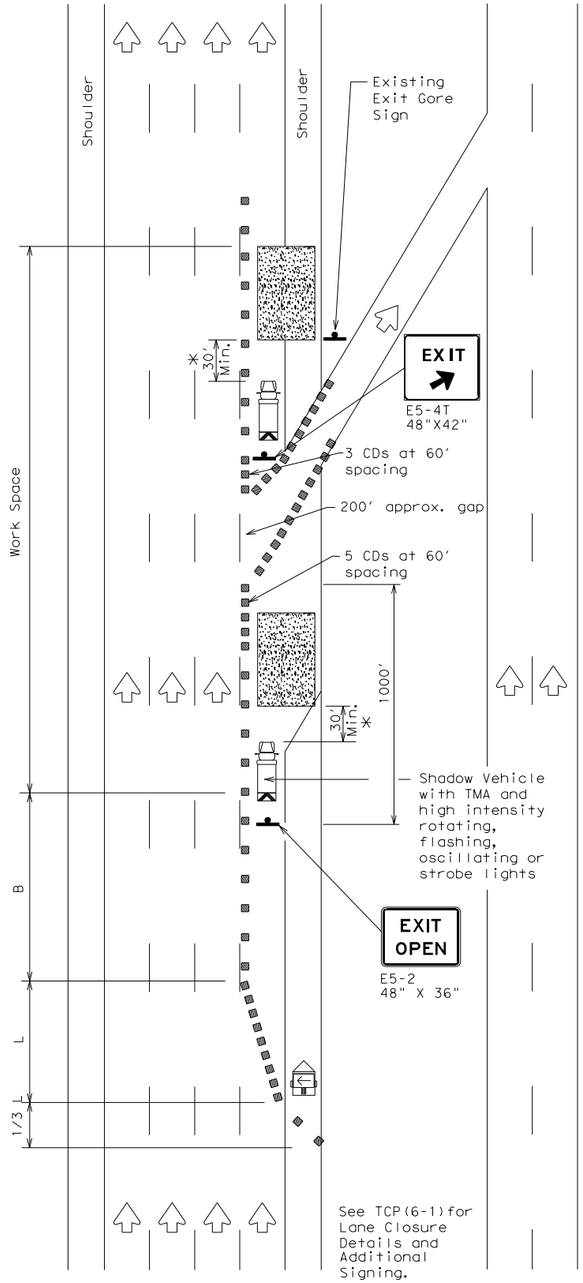


TCP (6-4a)

EXIT RAMP CLOSED

TRAFFIC EXITS PAST CLOSED RAMP



TCP (6-4b)

EXIT RAMP OPEN

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

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

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

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

GENERAL NOTES

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

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

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA AT EXIT RAMP

TCP(6-4)-12

FILE: tcp6-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT Feburary 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	PHR	CAMERON		53

DATE: 11/22/2022 4:55:05 PM
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LEGEND			
	Type 3 Barricade		Channelizing Devices (CDs)
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

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

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

WORK IN EXIT GORE FOR ADT GREATER THAN 10,000

TCP(6-8)-14

FILE: tcp6-8.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2014	CONT	SECT	JOB	HIGHWAY
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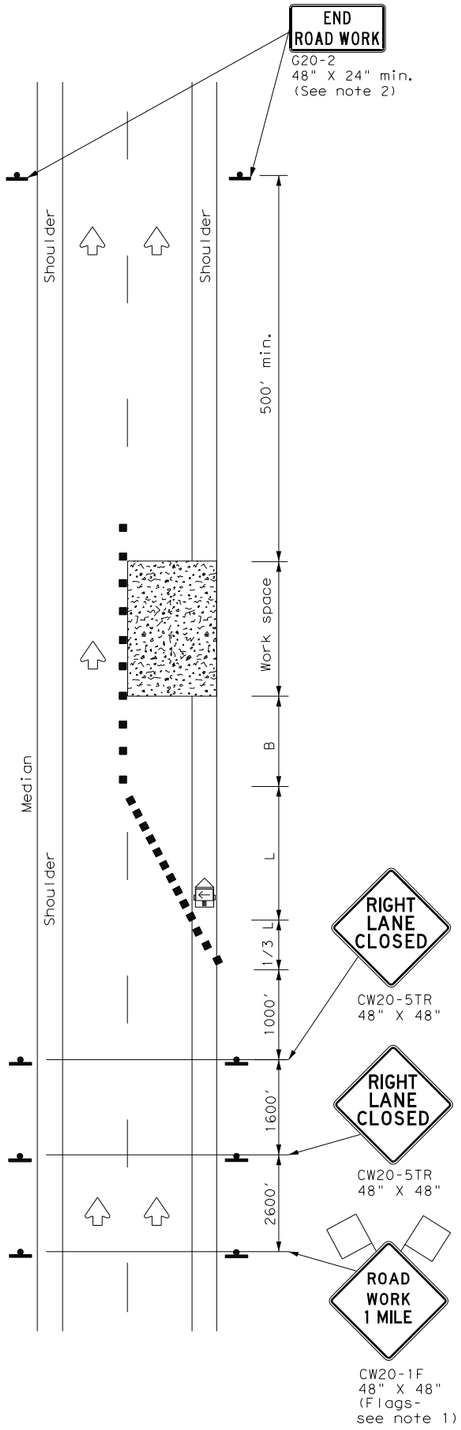
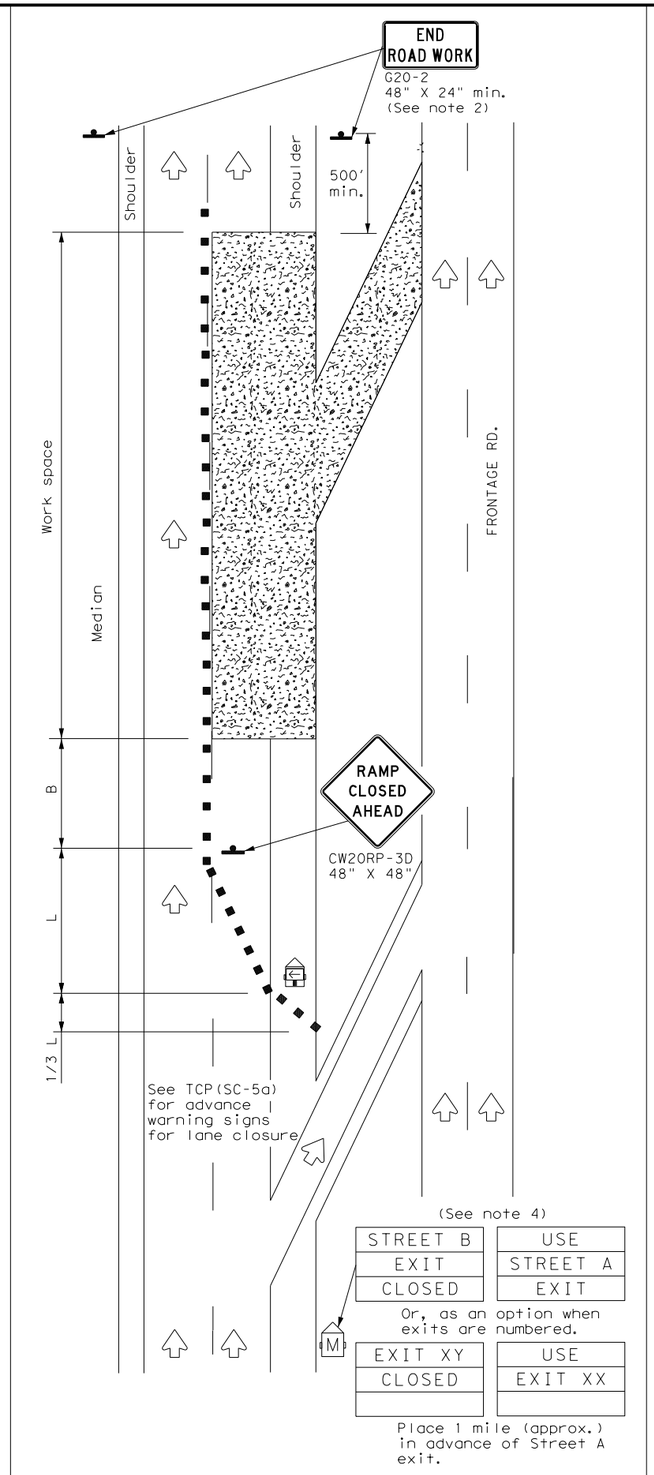


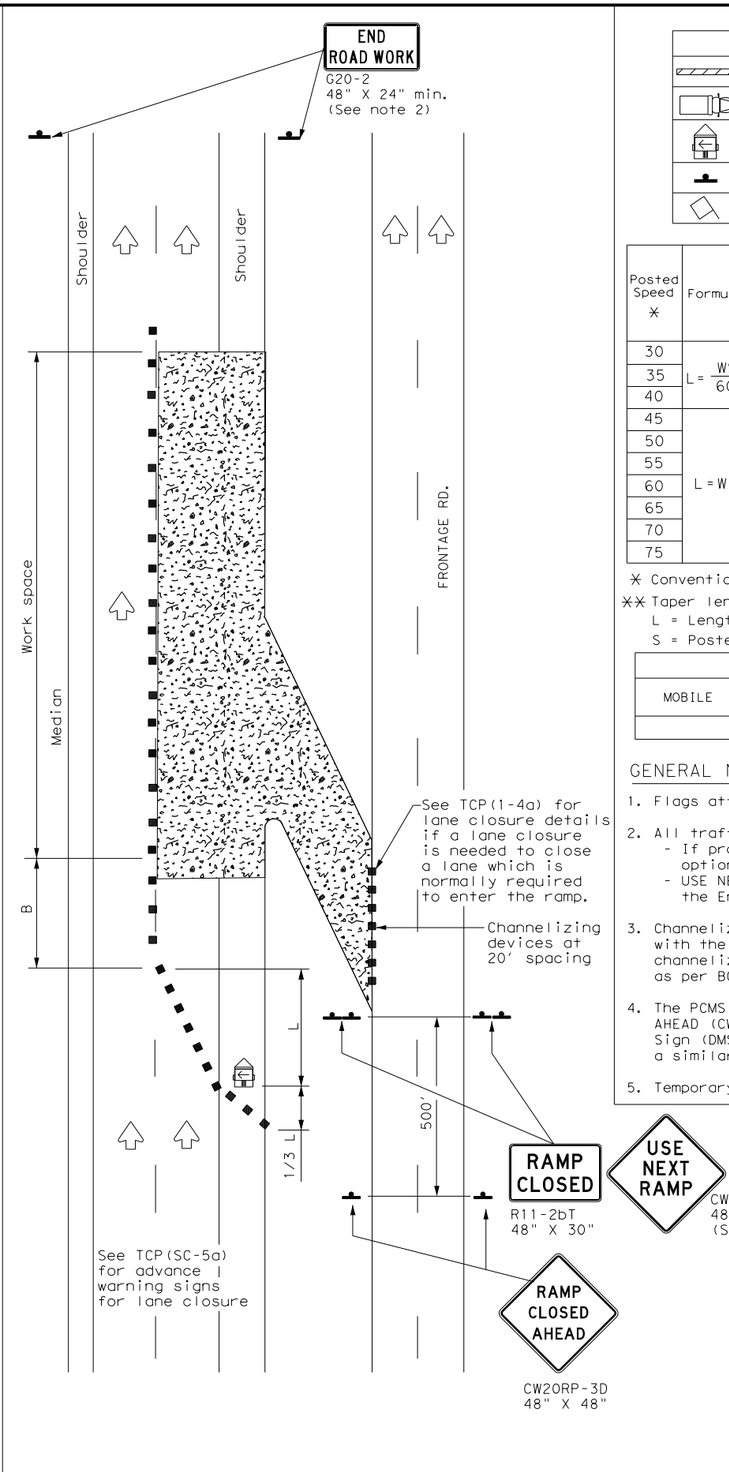
TCP (SC-5a)

ONE LANE CLOSURE



TCP (SC-5b)

LANE AND RAMP CLOSURE AT EXIT RAMPS



TCP (SC-5c)

LANE AND RAMP CLOSURE AT ENTRANCE RAMPS

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing Distance "X"	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:
   - If project signing is present, END ROAD WORK (G20-2) sign is optional with approval by the Engineer.
   - USE NEXT RAMP (CW25-1T) sign is optional with approval by the Engineer.
3. Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
4. The PCMS may be omitted if: it is replaced with a RAMP CLOSED AHEAD (CW20RP-3D) sign or when a permanent Dynamic Message Sign (DMS) is available in the appropriate location to display a similar message as called for on the PCMS.
5. Temporary rumble strips are not required on seal coat operations.

SHEET 5 OF 8

Texas Department of Transportation — Traffic Safety Division Standard

TRAFFIC CONTROL PLAN SEAL COAT OPERATIONS DIVIDED HIGHWAYS

TCP(SC-5)-22

FILE: tcpsc-5-22.dgn	DN:	CK:	DW:	CK:
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
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	PHR	CAMERON		55

221

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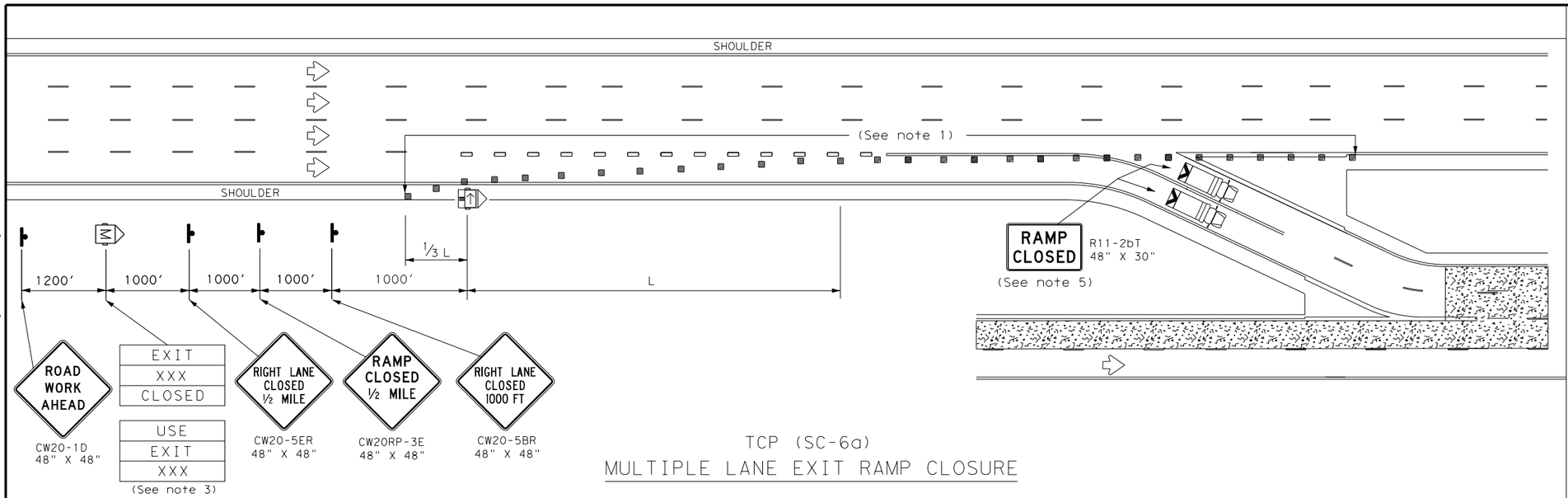
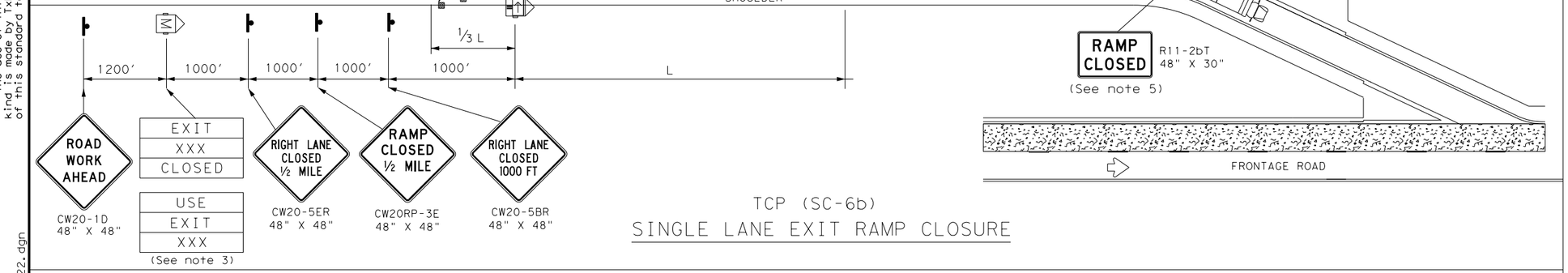
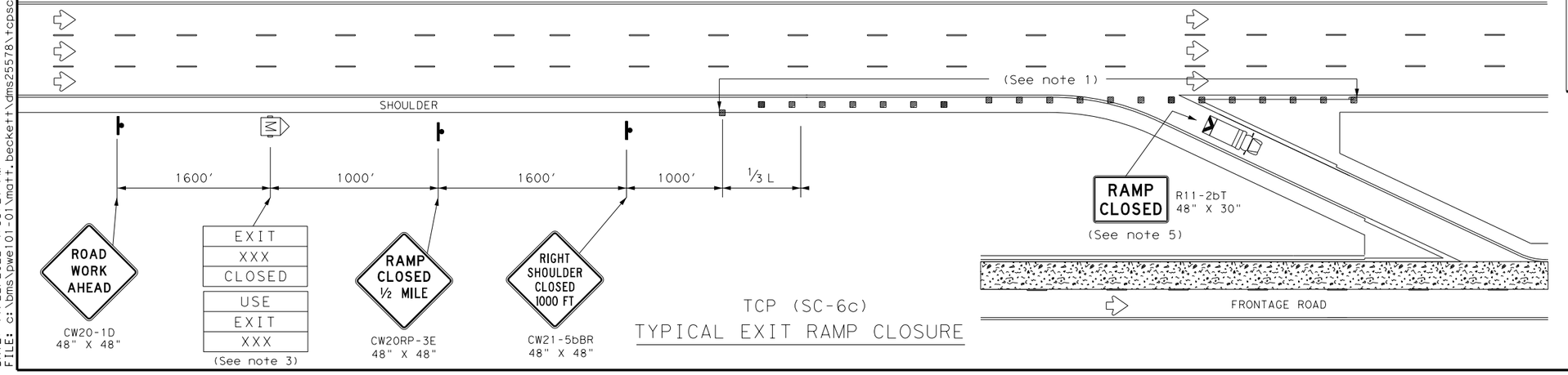


TCP (SC-6a)
MULTIPLE LANE EXIT RAMP CLOSURE



TCP (SC-6b)
SINGLE LANE EXIT RAMP CLOSURE



TCP (SC-6c)
TYPICAL EXIT RAMP CLOSURE

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

Posted Speed	Formula	Minimum Desirable Taper Lengths "L" ✻✻ 10′ Offset	11′ Offset	12′ Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450′	495′	540′	45′	90′	195′
50		500′	550′	600′	50′	100′	240′
55		550′	605′	660′	55′	110′	295′
60		600′	660′	720′	60′	120′	350′
65		650′	715′	780′	65′	130′	410′
70		700′	770′	840′	70′	140′	475′
75		750′	825′	900′	75′	150′	540′
80		800′	880′	960′	80′	160′	615′
85		850′	935′	1020′	85′	170′	695′

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

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

GENERAL NOTES

1. Place channelizing devices at 20′ spacings. Tighter spacing allowed as necessary to address field conditions or observed driver behavior.
2. See the Standard Highway Sign Design for Texas (SHSD) for sign details.
3. The PCMS may be omitted if replaced with a RAMP CLOSED AHEAD (CW20RP-3D) sign or when a permanent Dynamic Message Sign (DMS) is available in an appropriate location to display a similar message as called for on the PCMS.
4. When it is determined that a through lane should be closed in addition to the exit ramp, refer to TCP(6-4) for traffic control details.
5. A Truck Mounted Attenuator (TMA), where shown, is REQUIRED and shall have a RAMP CLOSED (R11-2bT) sign mounted on the rear of the truck.

Texas Department of Transportation
Traffic Safety Division Standard

TRAFFIC CONTROL PLAN SEAL COAT OPERATIONS DIVIDED HIGHWAYS

TCP(SC-6)-22

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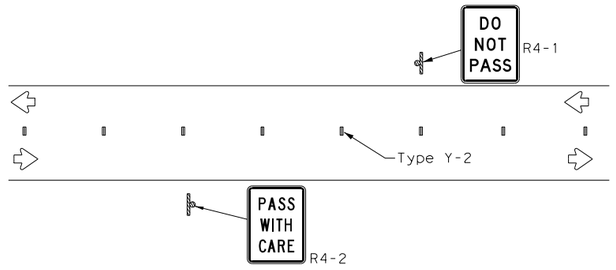
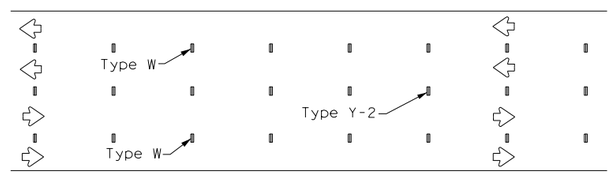
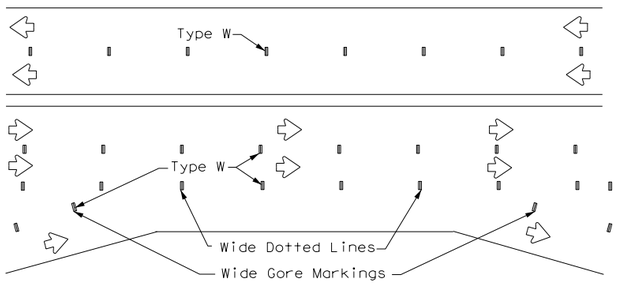
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS (TABS)



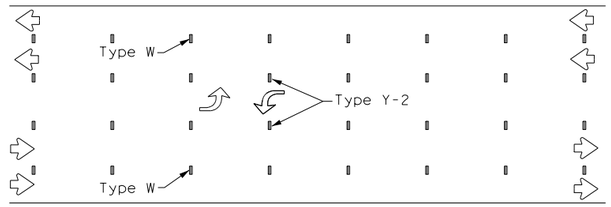
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS

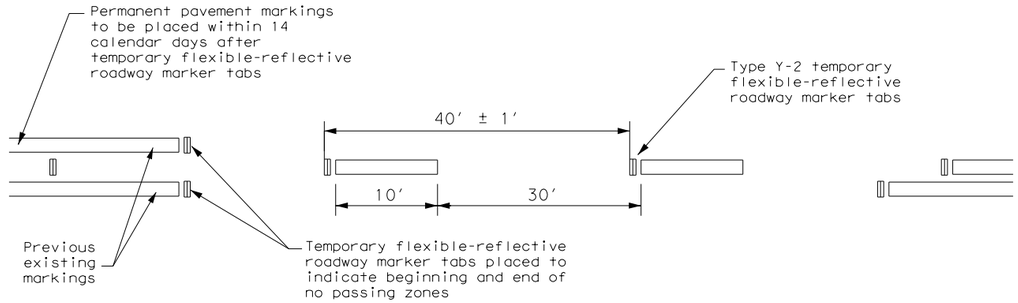


LANE LINES FOR DIVIDED HIGHWAY



TWO-WAY LEFT TURN LANE

TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS



TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS

1. Temporary markings for surfacing projects shall be Temporary Flexible-Reflective Roadway Marker Tabs with protective cover unless otherwise approved by the Engineer. Tabs are to be installed to provide true alignment for striping crews or as directed by the Engineer. Tabs will be placed at the spacing indicated. Tabs should be applied to the pavement no more than two days before the surfacing is applied. After the surfacing is rolled and swept, the protective cover over the reflective strip shall be removed.
2. Temporary Flexible-Reflective Roadway Marker Tabs detailed on this sheet will be designated Type Y-2 (two amber reflective surfaces with a 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).
3. Temporary Flexible-Reflective Roadway Marker Tabs will require normal maintenance replacement when used on roadways with an Average Daily Traffic (ADT) per lane of up to 7500 vehicles with no more than 10% truck mix. When roadway volumes exceed these values, additional maintenance replacement of these devices should be planned for.
4. 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.
5. 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 4.
6. Tabs shall meet requirements of Departmental Material Specification DMS-8242.
7. Tabs shall NOT be used to simulate edge lines.

NOTES:

1. 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.
2. 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 acceptable.
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.

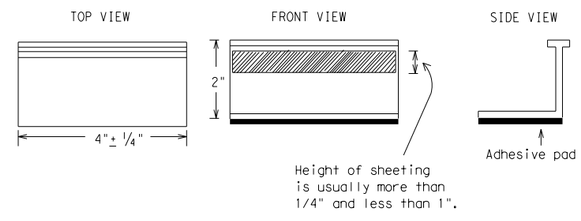
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS) & MATERIAL PRODUCER LISTS (MPL)

1. DMSs referenced above may be found along with embedded links to their respective MPLs at the following website: http://www.txdot.gov

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS (TABS)

SOLID LINES	DOUBLE NO-PASSING LINE	40′ ± 1′, Type Y-2
	SINGLE NO-PASSING LINE or CHANNELIZATION LINE	40′ ± 1′, Type Y-2 or W
	8" WIDE SOLID LINE	20′ ± 1′, Type Y-2 or W
BROKEN LINES (FOR CENTER LINE OR LANE LINE)		40′ ± 1′, Type Y-2 or W
WIDE DOTTED LINES (FOR LANE DROP LINES)		12′ ± 1′, Type W
WIDE GORE MARKINGS		20′ ± 1′, Type W

TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS



Texas Department of Transportation

Traffic Safety Division Standard

TEMPORARY PAVEMENT MARKINGS FOR SEAL COAT OPERATIONS

TCP(SC-7)-22

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REVISIONS		0039	07	257	I69E
4-21		DIST	COUNTY		SHEET NO.
10-22		PHR	CAMERON		57

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METHOD 1: WOOD EMBEDMENT

STEPS:

Step 1. Determine sign height (Hs), width (Ws), average mounting height from bottom of sign to ground (Hbs), and temporary guide sign wind zone. Temporary guide sign wind zone is determined from Wind Velocity Worksheet. (Page 30A on the Traffic Standards web page) and Table 1.

TABLE 1

Wind Zone on Wind Velocity Worksheet	Temporary Guide Sign Wind Zone
90 mph	70 mph
80 mph	70 mph
70 mph	60 mph

Step 2. Determine number of posts and post size from temporary guide sign wind zone using Hs, Ws, Hbs below (Figure 1: 60 mph and Figure 2: 70 mph). Determine spacing of posts (A) and distance from edge of sign to outside posts (0.5A) from 'Post Spacing and Sign Placement' detail on TLRS(2).

Step 3. Determine minimum post embedment depth from Table 2. For cohesionless soils, another method should be used to determine embedment depth.

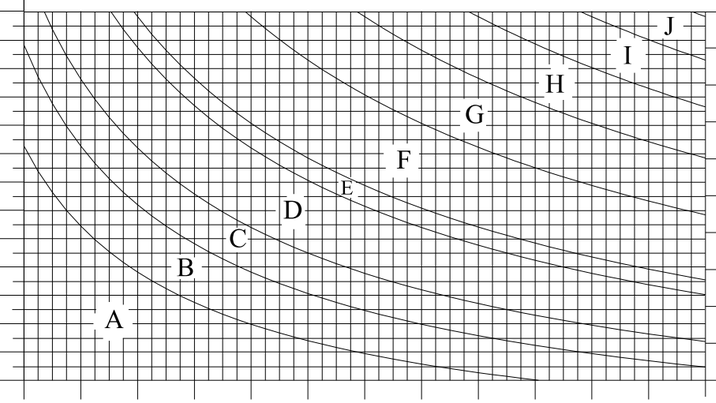
TABLE 2

Wooden Post Size	Embedment Depth (ft)
4x6	3
6x8	4
6x10	5

Step 4. Fabricate posts using 'Wood Post' detail on TLRS(2). Attach sign (plywood or extruded aluminum) using a method on TLRS(3). Wooden parts are not required to be painted.

FIGURE 1

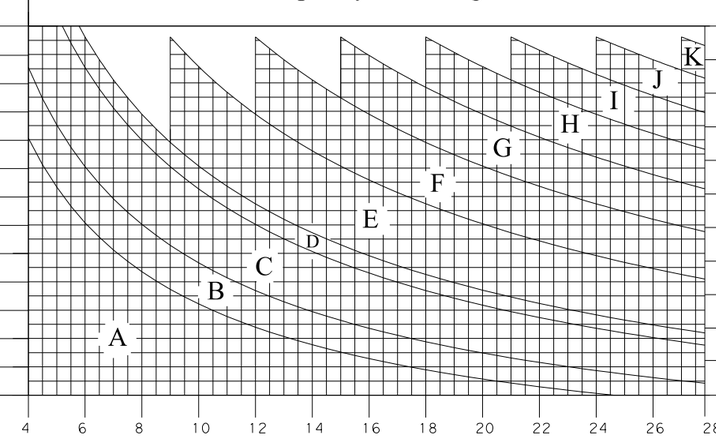
Average Height Above Ground (Hbs)(ft)	13-16	10-13	7-10	60 MPH Temporary Guide Sign Wind Zone	Post Qty	Post Size
Sign Face Height (Hs) (ft)	13	14	15	J	7	6" x 10"
	12	13	14	I	6	6" x 10"
	11	12	13	H	5	6" x 10"
	10	11	12	G	4	6" x 10"
	9	10	11	F	3	6" x 10"
	8	9	10	E	2	6" x 10"
	7	8	9	D	3	6" x 8"
	6	7	8	C	2	6" x 8"
	5	6	7	B	3	4" x 6"
	4	5	6	A	2	4" x 6"
	3	4	5			
	2	3	4			
	1	2	3			



Width of Sign Face (Ws) (ft)

FIGURE 2

Average Height Above Ground (Hbs)(ft)	13-16	10-13	7-10	70 MPH Temporary Guide Sign Wind Zone	Post Qty	Post Size
Sign Face Height (Hs) (ft)	13	14	15	K	9	6" x 10"
	12	13	14	J	8	6" x 10"
	11	12	13	I	7	6" x 10"
	10	11	12	H	6	6" x 10"
	9	10	11	G	5	6" x 10"
	8	9	10	F	4	6" x 10"
	7	8	9	E	3	6" x 10"
	6	7	8	D	2	6" x 10"
	5	6	7	C	3	6" x 8"
	4	5	6	B	2	6" x 8"
	3	4	5	A	3	4" x 6"
	2	3	4			
	1	2	3			



Width of Sign Face (Ws) (ft)

GENERAL NOTES

1. See plans for specifications and pay item information. Temporary guide signs required for contractor changes to traffic control plan are subsidiary to item 502.
2. Contractor may use any of the 3 methods (Wood Embedment, Steel Embedment or Wood Skid) as long as sign height requirements are met and approved by the Engineer.
3. See SMD (2-3) for details on attaching panels and plaques to parent signs.
4. Nails are not allowed in temporary sign support structures.

METHOD 2: STEEL EMBEDMENT

STEPS:

Step 1. Determine sign height (Hs), width (Ws), average mounting height from bottom of sign to ground (Hbs), and wind zone from Wind Velocity Worksheet.

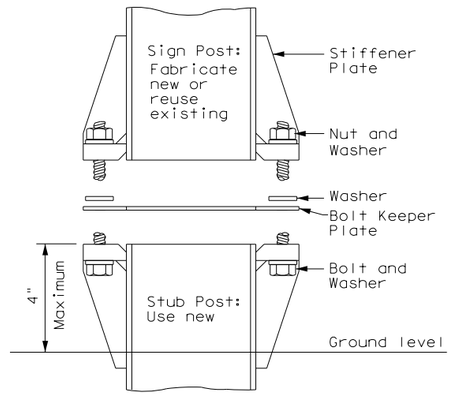
Step 2. Determine number of posts, post size, and post spacing from SMD(2-3) and SMD(8W1). Alternatively, the sign posts from an existing sign may be used if 7' minimum height from pavement to bottom of sign can be maintained at new location. In this case, only a new stub post without concrete foundation is required. See Detail A and SMD(2-2) for more information.

Step 3. Determine minimum stub post embedment depth from Table 3. No concrete foundation is required. For cohesionless soils, another method should be used to determine embedment depth.

TABLE 3

Steel Support Post Size	Embedment Depth (ft)
W6x9	4
W6x12	4.5
W6x15	5
W8x18	6
W8x21	6.5
W10x22	7.5
W10x26	8
W12x26	8.5
S3x5.7	3
S4x7.7	3.5

Step 4. Attach sign using SMD(2-3) for an extruded aluminum sign or using TLRS(3) for a plywood sign.



DETAIL A

SHEET 1 OF 4

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TEMPORARY LARGE ROADSIDE SIGNS

TLRS(1)-17

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	PHR	CAMERON		58

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METHOD 3: WOOD SKID

STEPS:

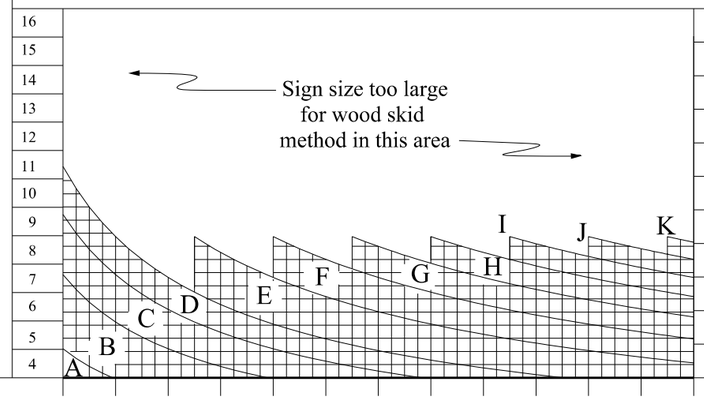
Step 1. Determine sign height (Hs) and width (Ws). Note that the wood skid method is only intended for use on level terrain. The skid height from ground to bottom of sign is 7'6". If this causes the distance from edge of pavement to the bottom of the sign to be less than 7', the wood skid method is not to be used.

Step 2. Determine number of 4"x6" (nominal 3.5"x 5.5") posts from Figure 3 below. Determine spacing of posts (A) and distance from edge of sign to outside posts (0.5A) from 'Post Spacing and Sign Placement' detail.

Step 3. Determine number of 40 pound sandbags from Figure 4.

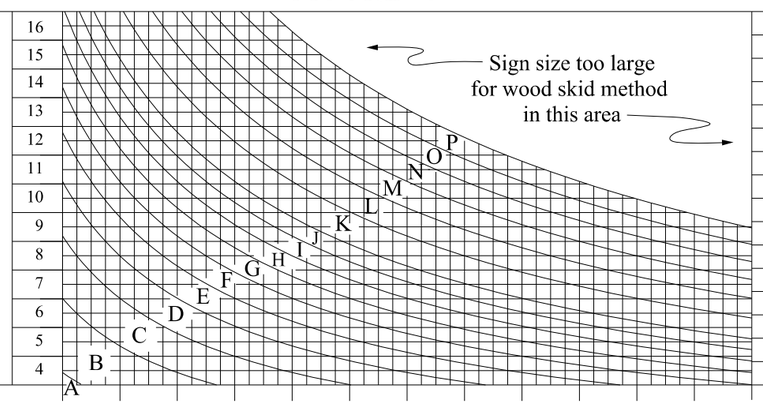
Step 4. Assemble skid as shown on TLRS(4) standard. Attach sign (plywood or extruded aluminum) using a method on TLRS(3). Wooden parts are not required to be painted.

FIGURE 3

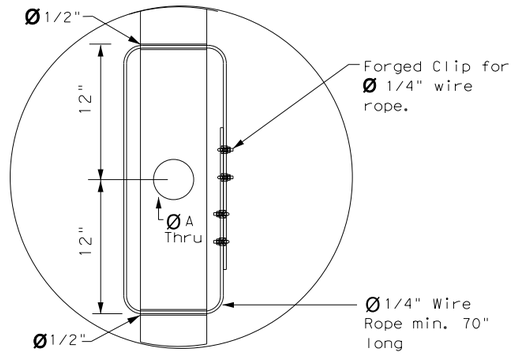


	Post Qty	Post Size
K	9	3.5" x 5.5"
J	8	3.5" x 5.5"
I	7	3.5" x 5.5"
H	6	3.5" x 5.5"
G	5	3.5" x 5.5"
F	4	3.5" x 5.5"
E	3	3.5" x 5.5"
D	2	3.5" x 5.5"
C	3	3.5" x 3.5"
B	2	3.5" x 3.5"
A	1	3.5" x 3.5"

FIGURE 4



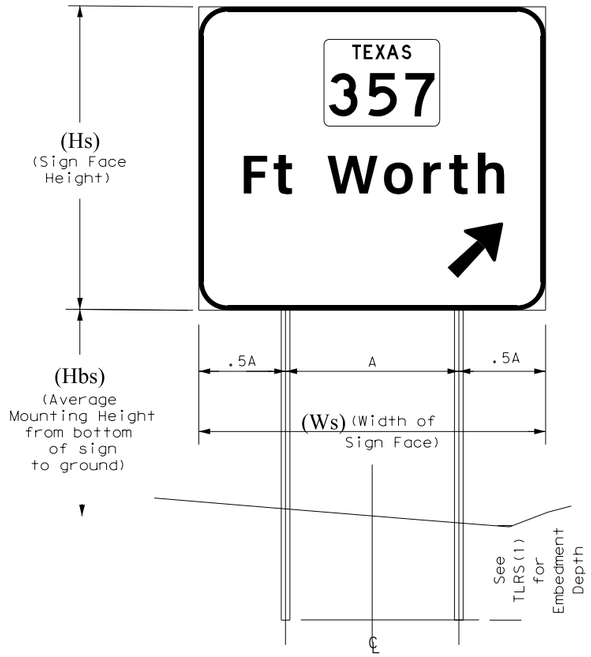
	Bags
P	110
O	100
N	090
M	080
L	070
K	060
J	050
I	045
H	040
G	035
F	030
E	025
D	020
C	015
B	010
A	005



DETAIL B

NOTES:

1. Wire rope breakaway feature required on all wooden posts. This breakaway feature includes the clamped cable with 2 holes to mount the cable, 4 cable clips, and hole A which the cable surrounds.
2. Breakaway feature is designed so wooden post fractures at hole A, with post staying attached to sign structure via the clamped cable.



WOODEN POST SPACING NOTES:

1. Spacing between posts: A = Ws / # of posts required
2. Spacing between edge of sign and outside posts: 0.5A

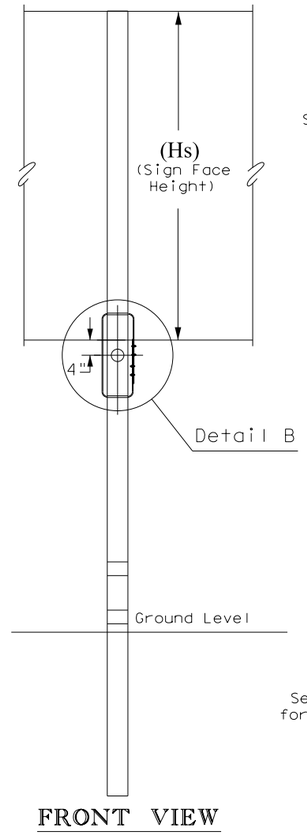
STEEL POST SPACING NOTE:

See SMD(2-3) for post spacing unless reusing existing sign posts.

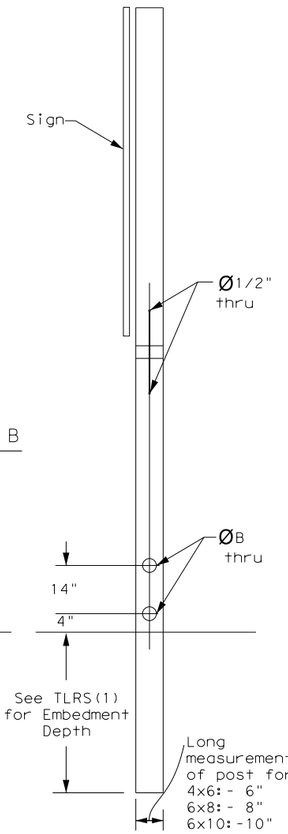
SIGN PLACEMENT NOTE:

See SMD(2-3) for sign placement details.

TABLE 4		
Support Size	ØA	ØB
4x6	1 1/2"	2"
6x8	3 5/8"	4"
6x10	3 5/8"	4"



FRONT VIEW



SIDE VIEW

NOTE:

All holes shown here are required for breakaway features to function properly.

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TEMPORARY LARGE ROADSIDE SIGNS

TLRS(2)-17

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REVISIONS	0039	07	257	I69E
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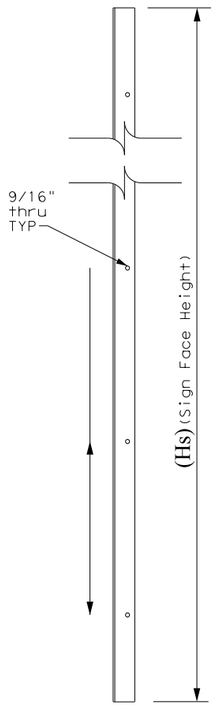
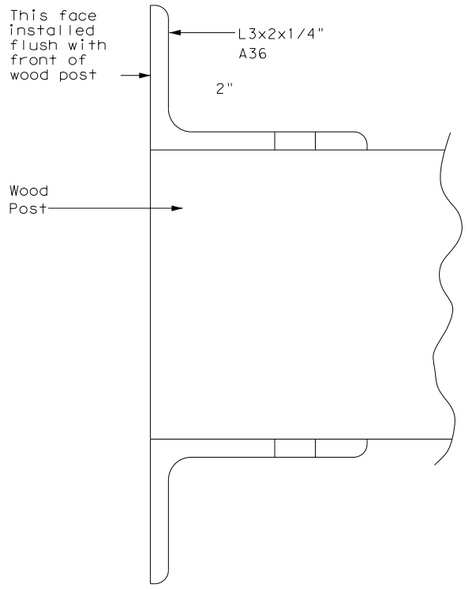
	PHR	CAMERON		59

117B

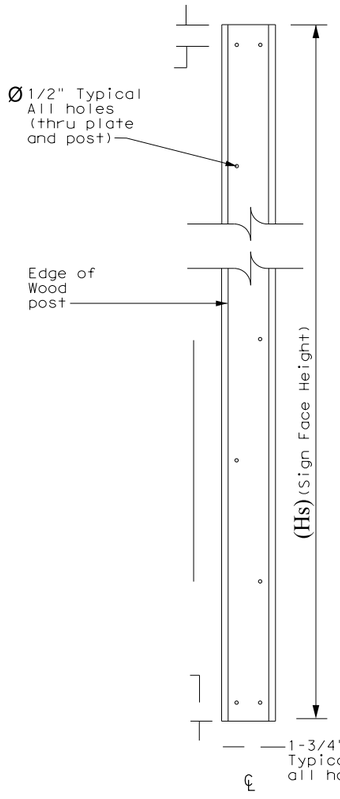


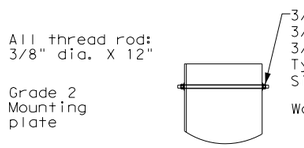


NOTES:

1. Drill holes evenly spaced from each edge of angle stiffener, with 2' between holes.

2. Attach 2 angle stiffeners to each post using A307 1/2" dia. x 2" long lag screws for 4x6 post, or A307 1/2" dia. x 3" long lag screws for 6x8 or 6x10 post.





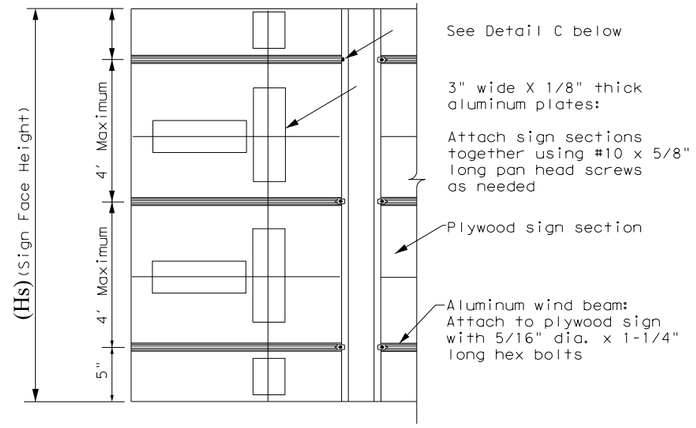
NOTES:

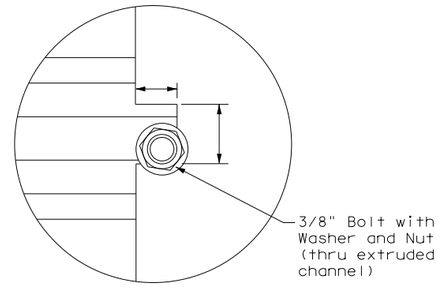
1. Drill holes evenly spaced from each edge of mounting plate, with 1'6" between holes.

2. Two holes drilled 3" from each end of mounting plate.

3. Steel mounting plate 6" wide x 1/4" thick for 4x6 post, or 8" wide x 1/4" thick for 6x8 or 6x10 post.

4. Install mounting plate so plate overhang is the same on both sides of wood post. Drill 1/2" dia. holes thru wood post before attaching mounting plate using 3/8" threaded rod.





NOTES:

1. Recommended sign thickness 5/8".

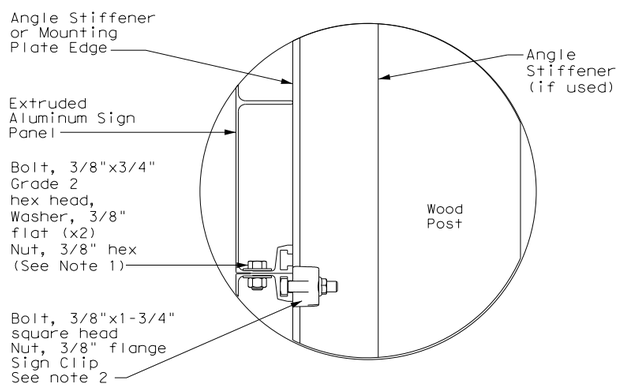
2. Attach an aluminum wind beam approx. 5" from the top and bottom of sign thru the width of the sign and then as needed so there is a maximum 4' spacing between beams.

3. Attach sign sections with aluminum plates as needed.

4. Attach sign to post using bolts with sign clips as shown in 'Mounting Plate and Angle Stiffener Attachment to Extruded Aluminum Sign' detail. On the top bolt, cut out a 1/2" wide x 3/4" tall notch and tighten the bolt in the notch with a nut and washer. A sign clip is not used here. See Detail C.

5. This option works for the angle stiffener or mounting plate methods. Clamp plate method not recommended with aluminum wind beams.

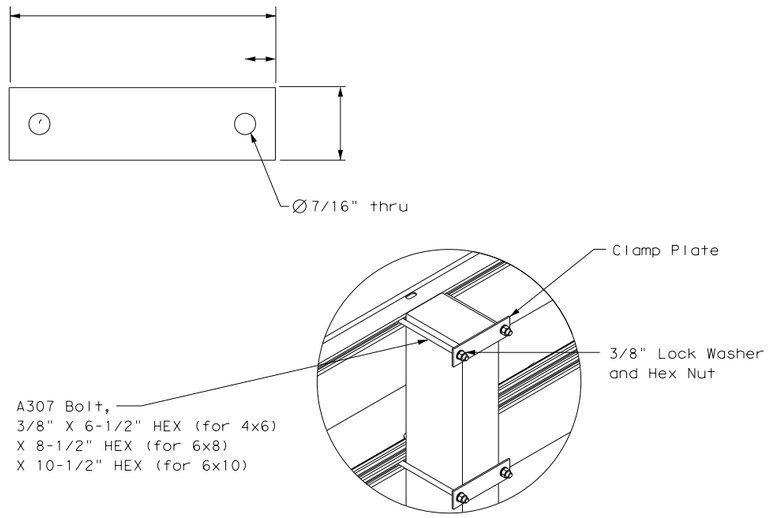
6. Alternatively, contractor may drill holes thru plywood sign and attach to post using angle stiffener, mounting plate, or clamp plate method. Vertical bolt spacing should not be greater than 12" with 3/8" bolts.



NOTES:

1. Space this hardware at 24" at each joint between panels.

2. Install this hardware on both sides of the wood post for proper attachment.



SHEET 3 OF 4

Texas Department of Transportation

Traffic Operations Division Standard

TEMPORARY LARGE ROADSIDE SIGNS: MOUNTING DETAILS

TLRS(3)-17

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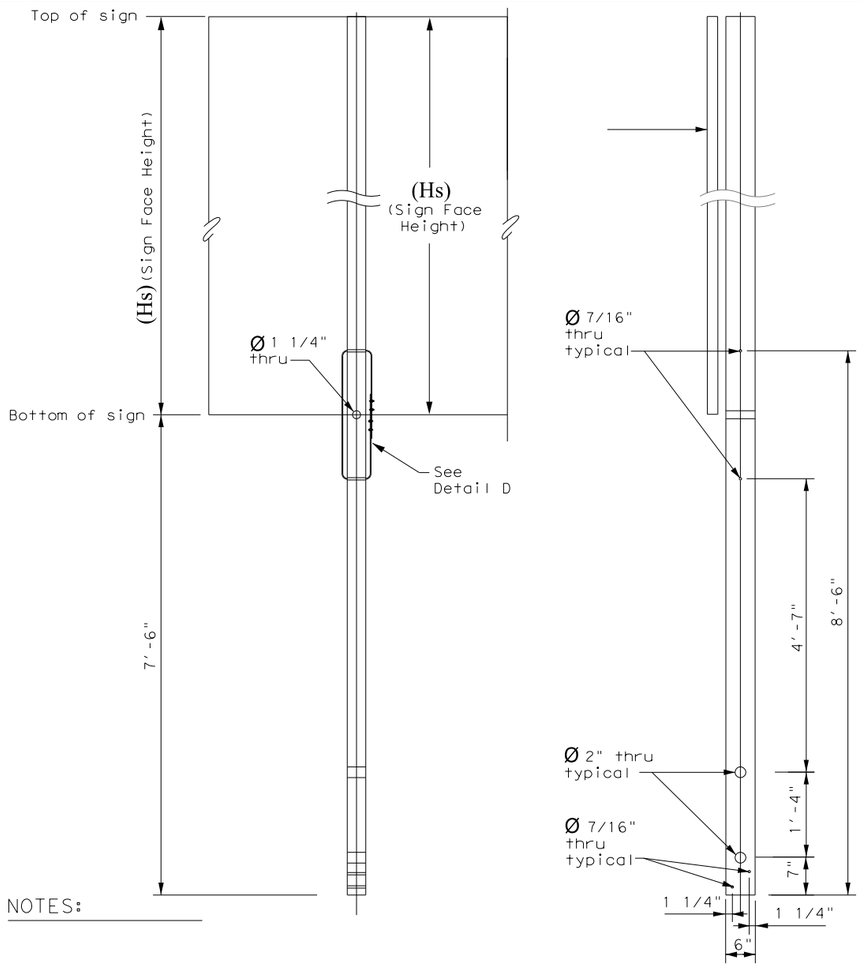
(4 x 6)



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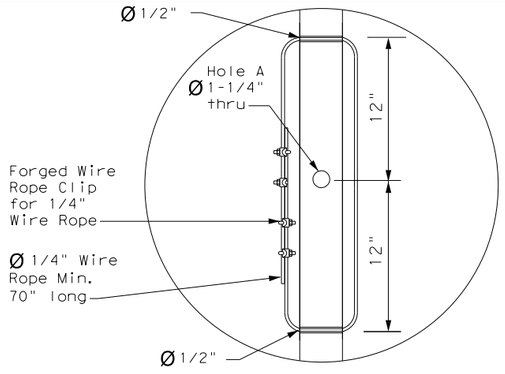
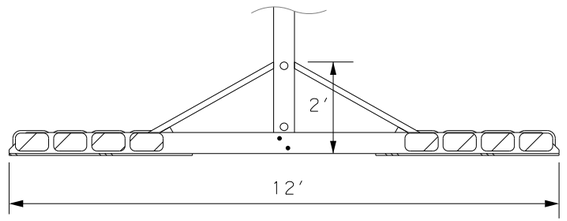


DETAIL D

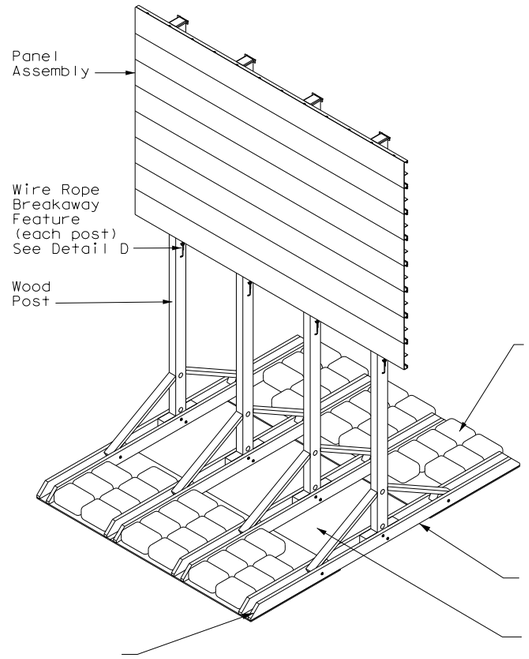
NOTES:

1. Wire rope breakaway feature required on all wooden posts. This breakaway feature includes the clamped cable with 2 holes to mount the cable, 4 cable clips, and hole A which the cable surrounds.

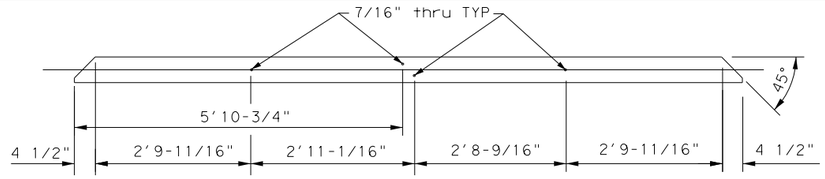
2. Breakaway feature is designed so wood post fractures at hole A, with post staying attached to sign structure via the clamped cable.



DETAIL E

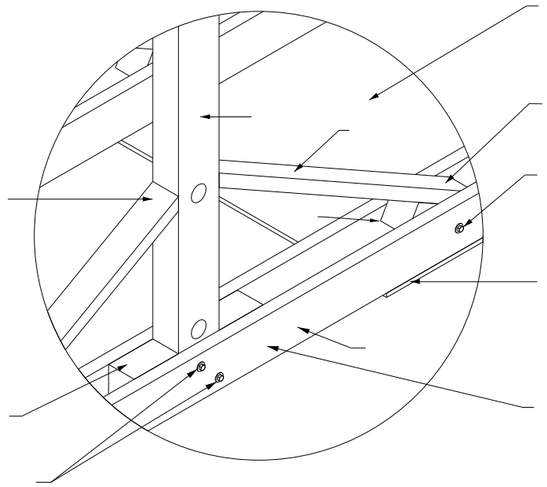


(2 x 6)



NOTES:

The 2 center holes are drilled 1-1/4" above and below skid centerline for attachment to post.

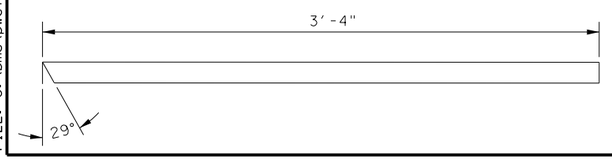


DETAIL F

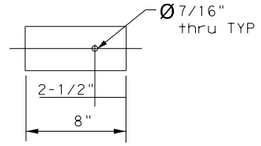
NOTE:

Contractor shall have the option to use another method to support the sandbags, provided the material under the sandbags does not exceed 0.75" in height. Examples include use of marine grade plywood or composite decking. Contractor may drill holes in plywood as needed for drainage.

(2 x 4)



(4 x 4)



SHEET 4 OF 4

Texas Department of Transportation

Traffic Operations Division Standard

TEMPORARY LARGE ROADSIDE SIGNS: WOOD SKID

TLRS(4)-17

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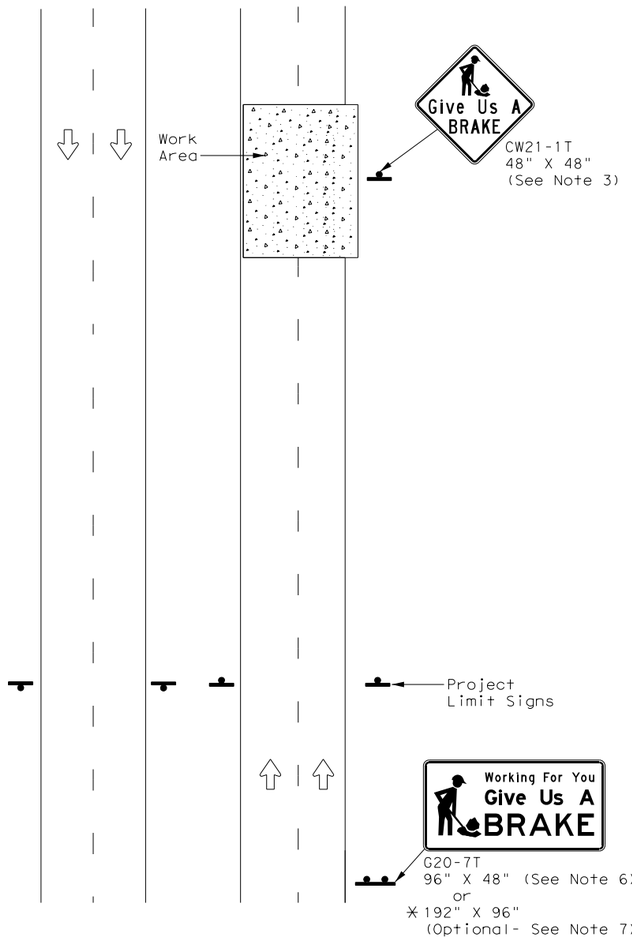
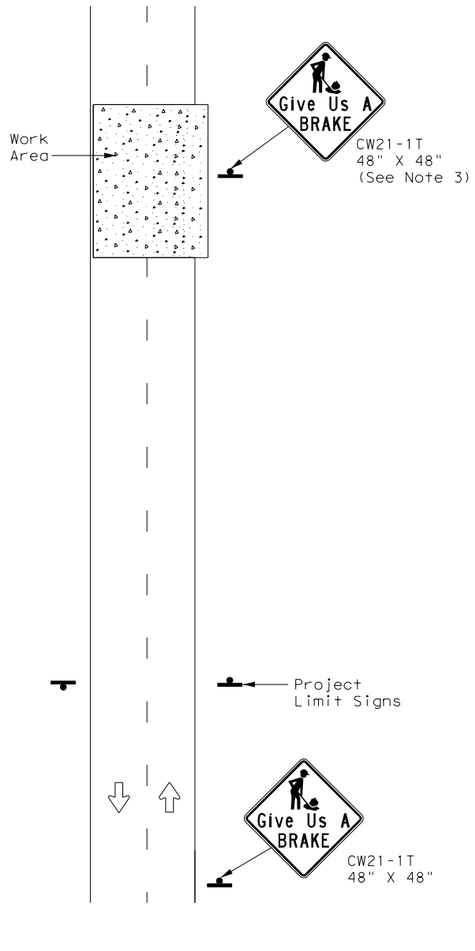


DIVIDED HIGHWAY



UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

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

SUMMARY OF LARGE SIGNS

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

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

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

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

GENERAL NOTES

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

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Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

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©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
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8-96 3-03	PHR	CAMERON		62

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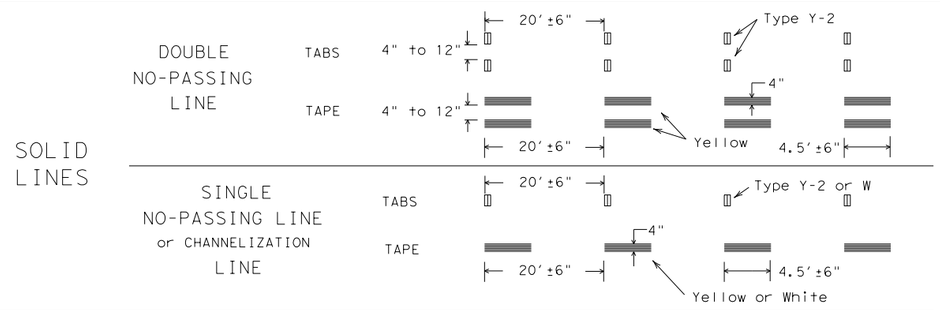
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



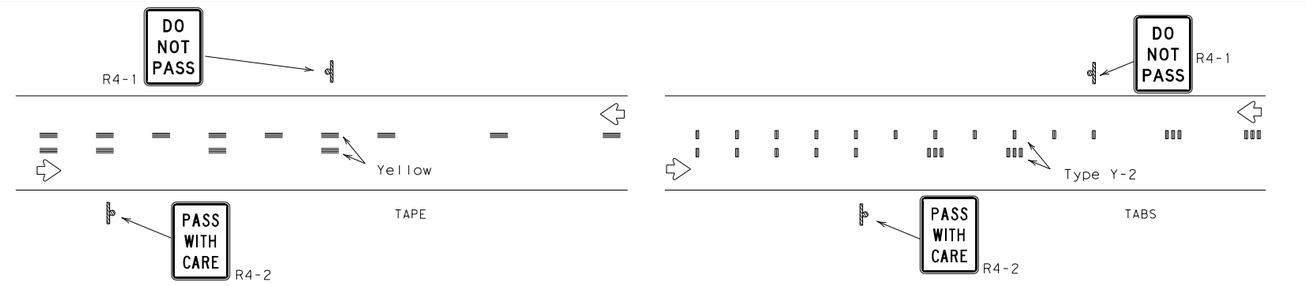
NOTES:

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.

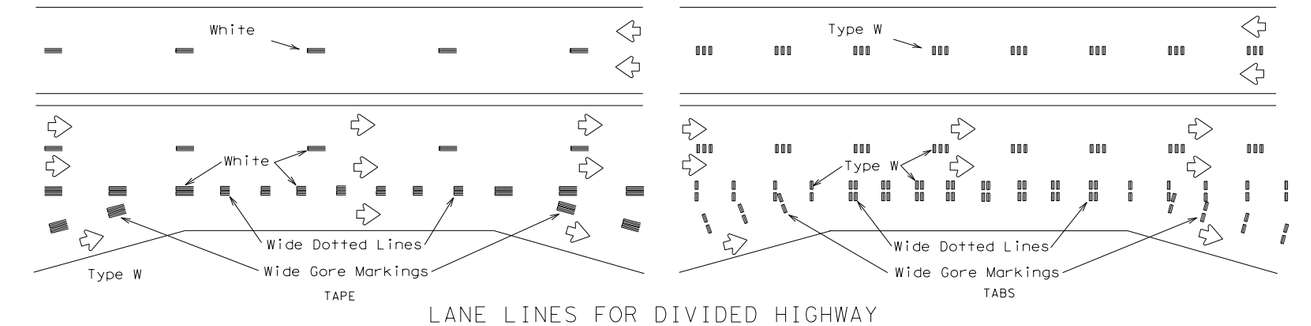
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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.

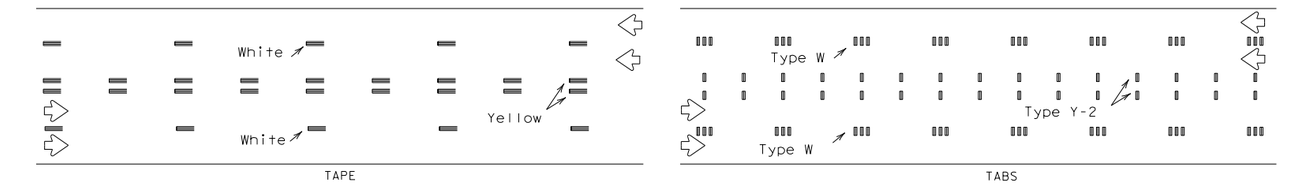
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



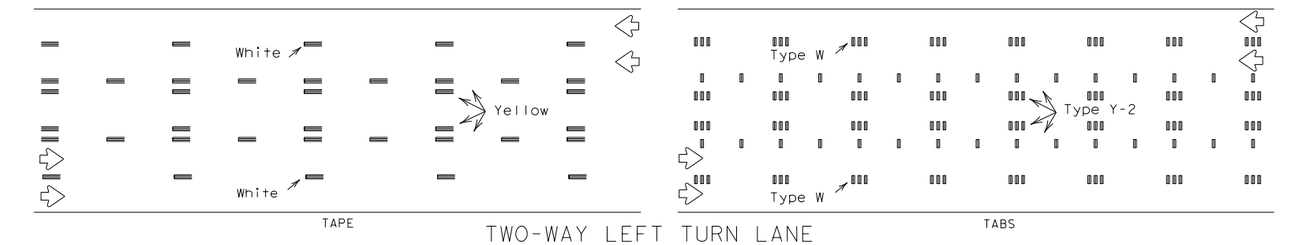
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



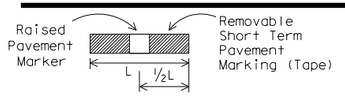
LANE LINES FOR DIVIDED HIGHWAY



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

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WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-13

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3-03		PHR	CAMERON		63
7-13					

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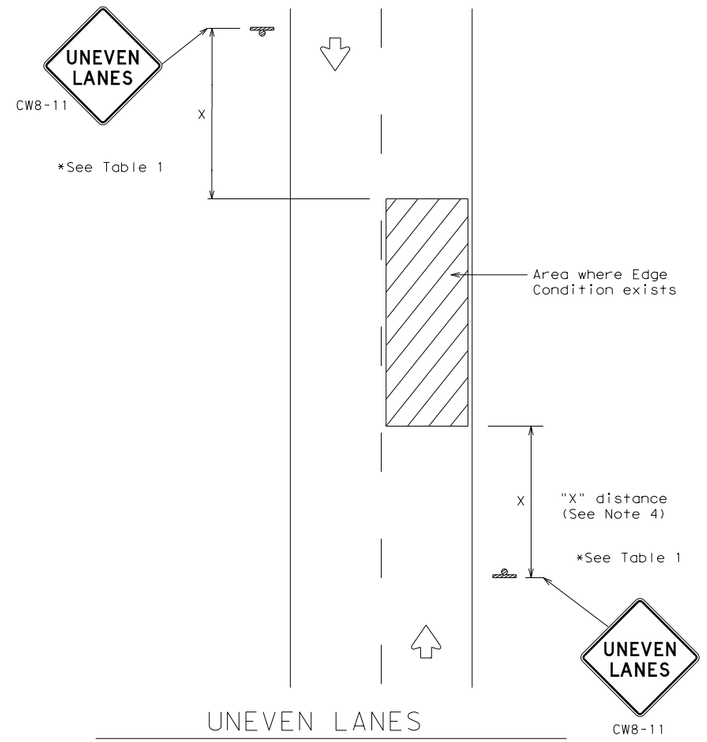
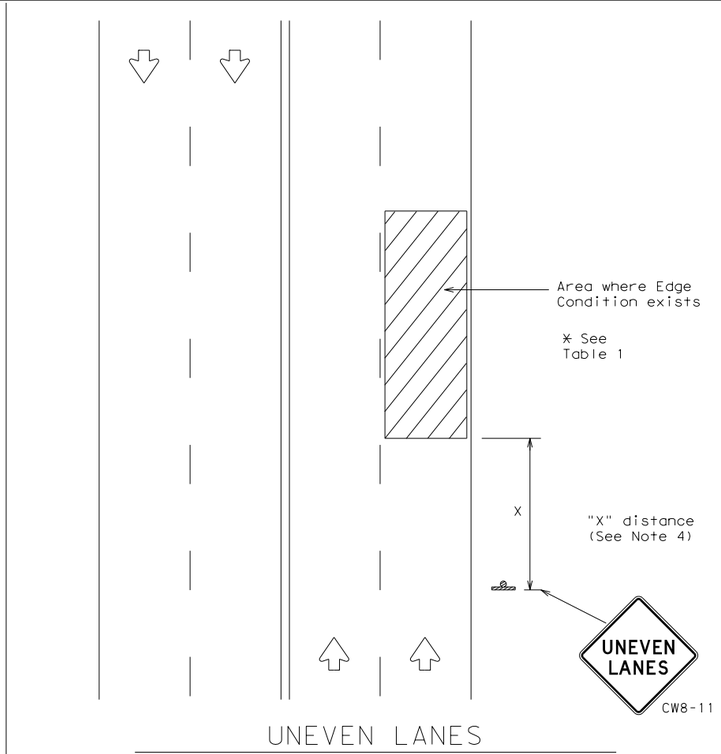
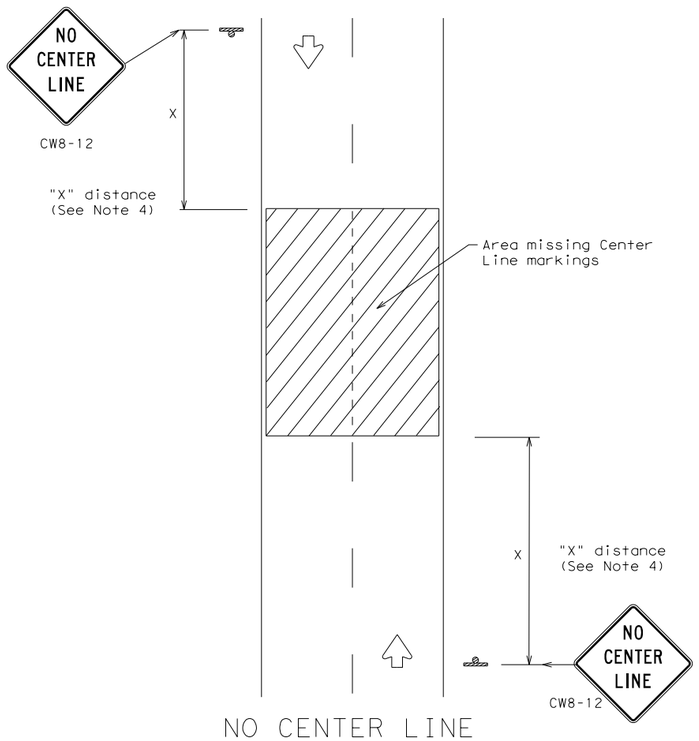


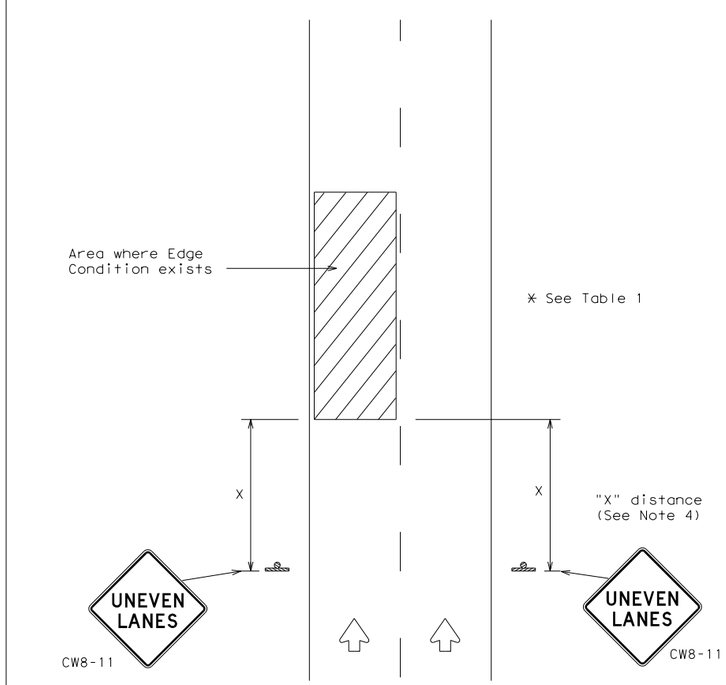
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

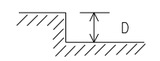
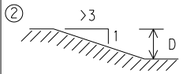
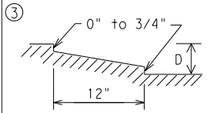
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

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

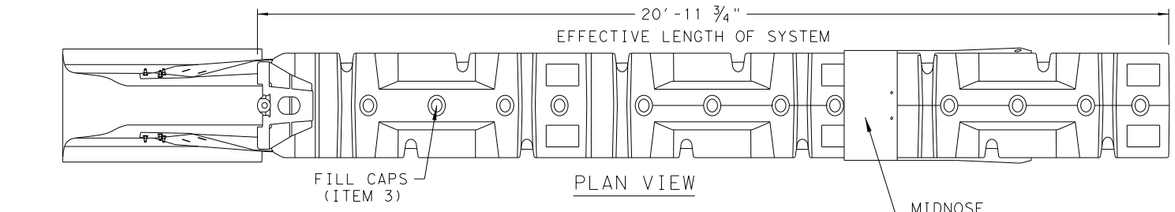
WZ(UL)-13

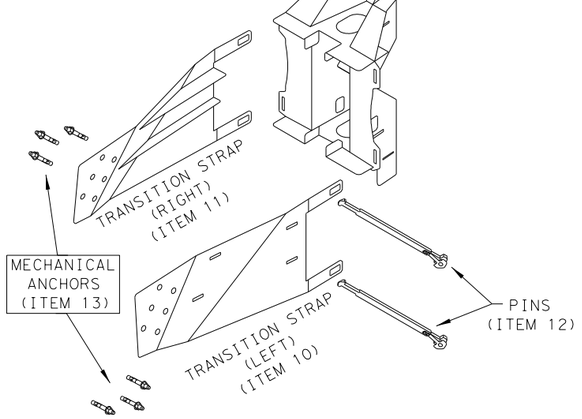
FILE: wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
8-95 2-98 7-13	DIST	COUNTY		SHEET NO.
1-97 3-03	PHR	CAMERON		64

112

DATE: 11/22/2022
FILE: c:\bms\pwe101-01\matt.beckett\dms25578\absorbm19.dgn

SYSTEM SHOWN - ABSORB-M TL-3





THE ABSORB-M IS A NON-REDIRECTIVE, GATING, CRASH CUSHION DESIGNED TO MEET THE LATEST TL-3 & TL-2 MASH REQUIREMENTS.

THE SYSTEM IS DESIGNED TO ACCOMMODATE A VARIETY OF F-SHAPE AND SINGLE SLOPE CONCRETE BARRIERS. CONTACT THE MANUFACTURER FOR GUIDANCE REGARDING OTHER ALLOWABLE SHAPES.

TEST LEVEL	NUMBER OF ELEMENTS	EFFECTIVE LENGTH	MAXIMUM LENGTH
TL-2	2	14'- 7 3/4"	17'- 4"
TL-3	3	20'- 11 3/4"	23'- 8"

NOTE:
CROSS SLOPES OF UP TO 8% (OR 1:12 SLOPE) CAN BE ACCOMMODATED WITH STANDARD HARDWARE SHOWN WITHIN THE INSTRUCTIONS MANUAL. FOR SLOPES WITH EXCESS OF 8% (OR 1:12) CONTACT, LINDSAY TRANSPORTATION SOLUTIONS.

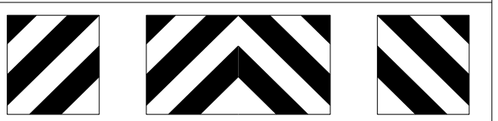
GENERAL NOTES

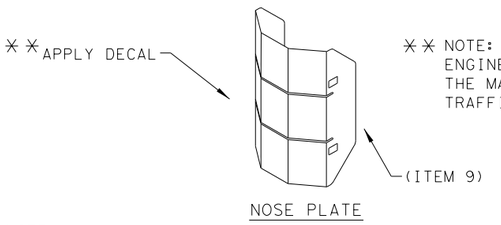
1. FOR SPECIFIC INFORMATION REGARDING THE INSTALLATION AND TECHNICAL GUIDANCE, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800. 180 RIVER ROAD, RIO VISTA, CA 94571
2. THE ABSORB-M SYSTEM IS ONLY APPROVED FOR USE IN (TEMPORARY WORK ZONE) LOCATIONS.
3. THE ABSORB-M IS A WATER FILLED NON-REDIRECTIVE, GATING CRASH CUSHION THAT DOES NOT NEED TO BE ATTACHED TO A FOUNDATION AND CAN BE INSTALLED ON TOP OF CONCRETE, ASPHALT, OR ANY SURFACE CAPABLE OF BEARING THE WEIGHT OF THE SYSTEM.
4. MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%.
5. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
6. THE ABSORB-M SHOULD BE LOCATED APPROXIMATELY PARALLEL WITH THE BARRIER.
7. THE USE OF THE ABSORB-M IS RESTRICTED TO A BARRIER HEIGHT OF UP TO 42 INCHES.
8. DO NOT ADD WATER TO FRONT ELEMENT (TL-2 OR TL-3 UNIT).

BILL OF MATERIALS (BOM) ABSORB-M TL-3 & TL-2 SYSTEMS			QTY	QTY
ITEM #	PART NUMBER	PART DESCRIPTION	TL-2 SYSTEM	TL-3 SYSTEM
1	BSI-1809036-00	TRANSITION-(GALV)	1	1
* 2	BSI-1808002-00	PRE-ASSEMBLED ABSORBING (ELEMENTS)	2	3
* 3	BSI-4004598	FILL CAPS	8	12
* 4	BSI-4004599	DRAIN PLUGS	2	3
* 5	BSI-1809053-00	TENSION STRAP-(GALV)	8	12
* 6	BSI-2001998	C-SCR FH 3/8-16 X 1 1/2 GR5 PLT	8	12
* 7	BSI-2001999	C-SCR FH 3/8-16 X 1 GR5 PLT	8	12
8	BSI-1809035-00	MIDNOSE-(GALV)	1	1
9	BSI-1808014-00	NOSE PLATE	1	1
10	BSI-1809037-00	TRANSITION STRAP (LEFT-HAND)-(GALV)	1	1
11	BSI-1809038-00	TRANSITION STRAP (RIGHT-HAND)-(GALV)	1	1
12	BSI-1808005-00	PIN ASSEMBLY	8	10
13	BSI-2002001	ANC MECH 5/8-11X5 (GALV)	6	6
14	ABSORB-M	INSTALLATION AND INSTRUCTIONS MANUAL	1	1

*COMPONENTS PRE-ASSEMBLED WITH ELEMENT ASSEMBLY

DELINEATION DECAL PLACEMENT GUIDE





** NOTE: (PROVIDED BY OTHERS)
ENGINEER OR CONTRACTOR SHALL COORDINATE WITH THE MANUFACTURER FOR THE CORRECT DECAL PER TRAFFIC FLOW, LEFT, RIGHT OR BOTH-SIDES.

NOTE:
APPLY A HIGH REFLECTIVE DECAL TO THE NOSE PLATE. DELINEATION DECAL ORIENTATION IS SHOWN ON THE CONSTRUCTION PLAN SET AND SHALL BE IN ACCORDANCE WITH THE TEXAS MUTCD FOR (TRAFFIC CONTROL DEVICES). DECALs ARE AVAILABLE FOR TRAFFIC FLOW ON THE LEFT-SIDE, BOTH -SIDES AND RIGHT-SIDE.

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE ABSORB-M, IT IS NOT INTENDED TO REPLACE THE INSTALLATION INSTRUCTIONS MANUAL.

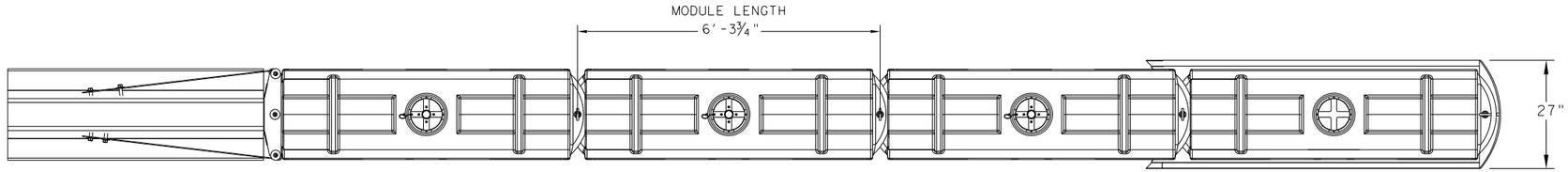
SACRIFICIAL

Texas Department of Transportation — Design Division Standard

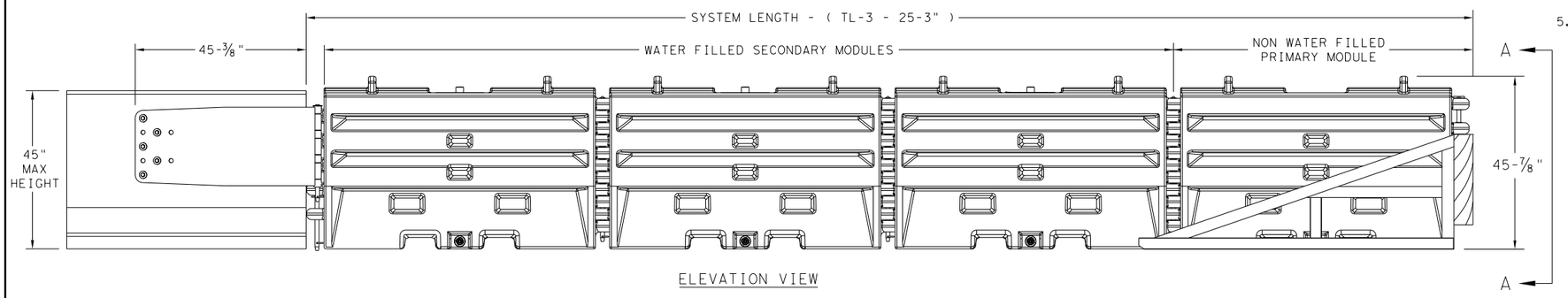
LINDSAY TRANSPORTATION SOLUTIONS
CRASH CUSHION
(MASH TL-3 & TL-2)
TEMPORARY - WORK ZONE
ABSORB(M)-19

FILE: absorbm19	DN: TxDOT	CK: KM	DW: VP	CK:
REVISIONS	CONT	SECT	JOB	HIGHWAY
	0039	07	257	I69E
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		65

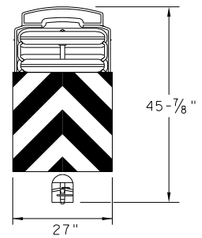
DATE: 11/22/2022
FILE: c:\dms\pwe101-01\matt.beckett\dms25578\sled19.dgn



PLAN VIEW



ELEVATION VIEW



SECTION A-A

NOSE SHEETING PANEL DELINEATION

NOTE:
SEE INSTALLATION MANUAL FOR CUSTOMIZED DELINEATION NOSE SHEETING FOR DECAL PLACEMENT.

TEST LEVEL	NUMBER OF SECONDARY MODULES	SYSTEM LENGTH
TL-3	3	25′ 3"

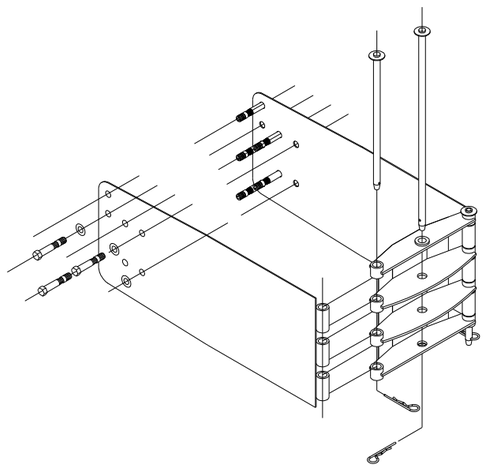
GENERAL NOTES

1. REFER TO THE INSTALLATION MANUAL FOR SPECIFIC SYSTEM ASSEMBLY AND MODULE ORIENTATION. FOR ADDITIONAL INFORMATION, CONTACT TRAFFIX, INC. AT (949) 361-5663.
2. THE SLED SYSTEM IS A MASH APPROVED TEST LEVEL 3 (TL-3) CRASH CUSHION APPROVED FOR USE IN TEMPORARY WORK ZONES. THE SLED SYSTEM IS A NON-REDIRECTIVE, GATING CRASH CUSHION THAT DOES NOT NEED TO BE ATTACHED TO THE GROUND AND CAN BE INSTALLED ON CONCRETE, ASPHALT, GRAVEL OR COMPACTED SOIL.
3. MAXIMUM PERMISSIBLE CROSS SLOPE IS 8° (DEGREES) (14%).
4. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
5. THE SLED SYSTEM CAN BE ATTACHED TO:

- CONCRETE BARRIER, TEMPORARY OR PERMANENT, 45" MAXIMUM HEIGHT
- STEEL BARRIER
- PLASTIC BARRIER
- CONCRETE BRIDGE ABUTMENTS
- W-BEAM GUARD RAIL
- THRIE BEAM GUARD RAIL

BILL OF MATERIAL

PART NUMBER	DESCRIPTION	QTY: TL-3
45131	TRANSITION FRAME, GALVANIZED	1
45150	TRANSITION PANEL, GALVANIZED	2
45147-CP	TRANSITION SHORT DROP PIN W/ KEEPER PIN, GALVANIZED	2
45148-CP	TRANSITION LONG DROP PIN W/ KEEPER PIN, GALVANIZED	1
45050	ANCHOR BOLTS	9
12060	WASHER, 3/4" ID X 2" OD	9
45044-Y	SLED YELLOW WATER FILLED MODULE	3
45044-YH	SLED YELLOW "NO FILL" MODULE	1
45044-S	CIS (CONTAINMENT IMPACT SLED), GALVANIZED	1
45043-CP	T-PIN W/ KEEPER PIN	4
18009-B-I	FILL CAP W/ "DRIVE BY" FLOAT INDICATOR	3
45033-RC-B	DRAIN PLUG	3
45032-DPT	DRAIN PLUG REMOVAL TOOL	1



SLED TRANSITION COMPONENTS FOR ATTACHMENT TO CMB

NOTE:
SEE MANUFACTURER'S INSTALLATION MANUAL FOR FURTHER DETAILS.

TRANSITION OPTIONS
SLED TRANSITION TO CONCRETE TRAFFIC BARRIER (TEMPORARY OR PERMANENT)
SLED TRANSITION TO STEEL TRAFFIC BARRIER (CONTACT MFGR FOR PROPER TRANSITION)
SLED TRANSITION TO PLASTIC TRAFFIC BARRIER (CONTACT MFGR FOR PROPER TRANSITION)
SLED TRANSITION TO W-BEAM OR THRIE BEAM GUARD RAIL (CONTACT MFGR FOR PROPER TRANSITION)
SLED TRANSITION TO CONCRETE BRIDGE ABUTMENT

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SLED, IT IS NOT INTENDED TO REPLACE THE INSTALLATION INSTRUCTIONS MANUAL.

SACRIFICIAL

Texas Department of Transportation

Design Division Standard

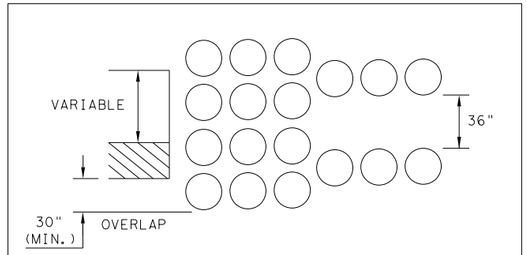
SLED
CRASH CUSHION
TL-3 MASH COMPLIANT
(TEMPORARY, WORK ZONE)
SLED-19

FILE: sled19.dgn	DN: TxDOT	CK: KM	DW: VP	CK:
©TxDOT: DECEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		66

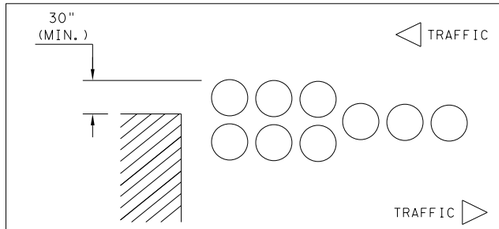
DATE: 11/22/2022
FILE: c:\bms\pwe101-01\matt.becket\dms25578\viasfpm19.dgn

SITE CONDITIONS AND PLACEMENT GUIDELINES

CONDITION	RECOMMENDATION	ILLUSTRATION
1. ANGLE OF ARRAY IN RELATION TO CENTER LINE OF OBSTACLE	NOT RECOMMENDED FOR MORE THAN 10°	EDGE OF PAVEMENT; 10° MAX.
2. MODULE SPACING: MODULE TO FIXED OBJECT MODULE TO MODULE	 12" TO 24" SEE DIAGRAM	12" TO 24"; MODULE TO FIXED OBJECT; 6" MAX.; FIXED OBJECT; 6" MIN.; MODULE TO MODULE
3. BI-DIRECTIONAL TRAFFIC	OFFSET ARRAY TO AVOID REAR CORNER MODULE SNAGGING, POTENTIAL BY TRAFFIC IN THE UPSTREAM DIRECTION OF FLOW.	SEE (DETAIL B) SHOWING BI-DIRECTIONAL TRAFFIC
4. "COFFIN" CORNER	SHIELD 30" MINIMUM OUTSIDE OF FIXED OBJECT	FIXED OBJECT; 30" MIN.
5. SLOPING SITES: LATERAL AND LONGITUDINAL FOR MORE INFORMATION READ GENERAL NOTE: 7	1:10 MAXIMUM (V: H:)	SLOPE
6. CURB: RAISED ISLAND:	NO MORE THAN 4" HIGH (REMOVE IF POSSIBLE)	CURB; RAISED ISLAND
7. FOUNDATION PADS:	FLAT SURFACE: CONCRETE OR ASPHALT	FOUNDATION PAD
8. MAINTENANCE:	KEEP SITE CLEAR OF TRASH, ROAD DEBRIS, ETC	REMOVE DEBRIS
9. SAND DENSITIES	100 LBS / CF	SCALE
10. VANDALISM	CHECK PERIODICALLY FOR DAMAGES, GRAFFITI.	DAMAGED MODULE



MODULE PLACEMENT FOR FIXED OBJECT OF VARIABLE WIDTH
DETAIL A
SEE GENERAL NOTE 2



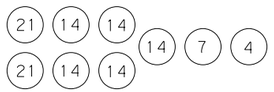
MODULE PLACEMENT FOR BI-DIRECTIONAL TRAFFIC
DETAIL B
SEE GENERAL NOTE 2

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE AVAILABLE MASH COMPLIANT SYSTEMS, CONTACT: TrafFix DEVICES, INC. AT (949) 361-5663 OR PSS INNOVATIONS, INC. AT (800) 662-6338.
2. REAR MODULES SHOULD OVERLAP THE HAZARDOUS FIXED OBJECT IN WIDTH ON EACH SIDE BY A MINIMUM OF 30 INCHES. SEE DETAILS A, B.
3. BARRIERS CAN BE INSTALLED AT ANY DISTANCE FROM THE SHOULDER, AT ROADSIDE AND MEDIAN LOCATIONS FROM ZERO FT UP TO 30 FT, DEPENDING UPON THE LOCATION OF THE HAZARDOUS FIXED OBJECT.
4. ANGLING THE BARRIER TOWARDS ON-COMING TRAFFIC IS SUGGESTED, 3-DEGREES UP TO 10-DEGREES DEPENDING ON SPACE AVAILABLE.
5. WHENEVER POSSIBLE, CURBS 4 INCHES AND HIGHER SHOULD BE REMOVED FROM THE HAZARDOUS SITES. HOWEVER, WHEN REMOVAL IS NOT POSSIBLE, MODULES CAN BE SEPARATED ALONG THE BARRIER AXIS TO FIT THE SITUATION.
6. LONGITUDINAL SPACING OF MODULES MAY BE INCREASED WHERE SPACE PERMITS, E.G., 2 FT UP TO 3 FT SPACING OF SELECTED MODULES MAY PERMIT THE DESIGNER TO USE ALL THE SPACE ALLOCATED FOR AN ENERGY-ABSORBING BARRIER.
7. THE ENTIRE AREA OF THE CRASH CUSHION INSTALLATION AND APPROACHES SHALL BE GRADED SO THAT THE MAXIMUM SLOPE DOES NOT EXCEED 1V:10H VERTICALLY OR HORIZONTALLY IN ANY DIRECTION.
8. WHERE REQUIRED, SUPPORT PADS, CONCRETE, ASPHALT, ETC, WILL BE MEASURED AND PAID FOR IN ACCORDANCE WITH PERTINENT BID ITEMS.
9. TrafFIX DEVICES AND PSS INNOVATIONS SAND BARREL SYSTEMS HAVE BEEN ASSESSED AS MASH COMPLIANT.

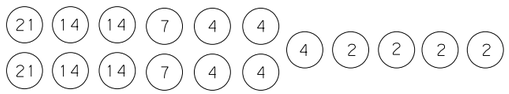
TYPICAL MODULE ARRAYS WITH CORRESPONDING DESIGN SPEED AND SAND WEIGHT (X 100 LB) SHOWN IN CIRCLES.

CONFIGURATION = 12,300 LB



TL-2
TL-2 = 45 MPH OR LOWER

CONFIGURATION = 14,000 LB



TL-3
TL-3 = 50 MPH OR GREATER

TYPICAL MODULE ARRAY

NOTE: MODULE ARRAYS SHOWN ARE THE MINIMUM DESIGNS REQUIRED. SITE SPECIFIC VARIATIONS OF THESE DESIGNS WILL REQUIRE ADDITIONAL DETAILS WITH AN ENGINEER'S SEAL.

SACRIFICIAL

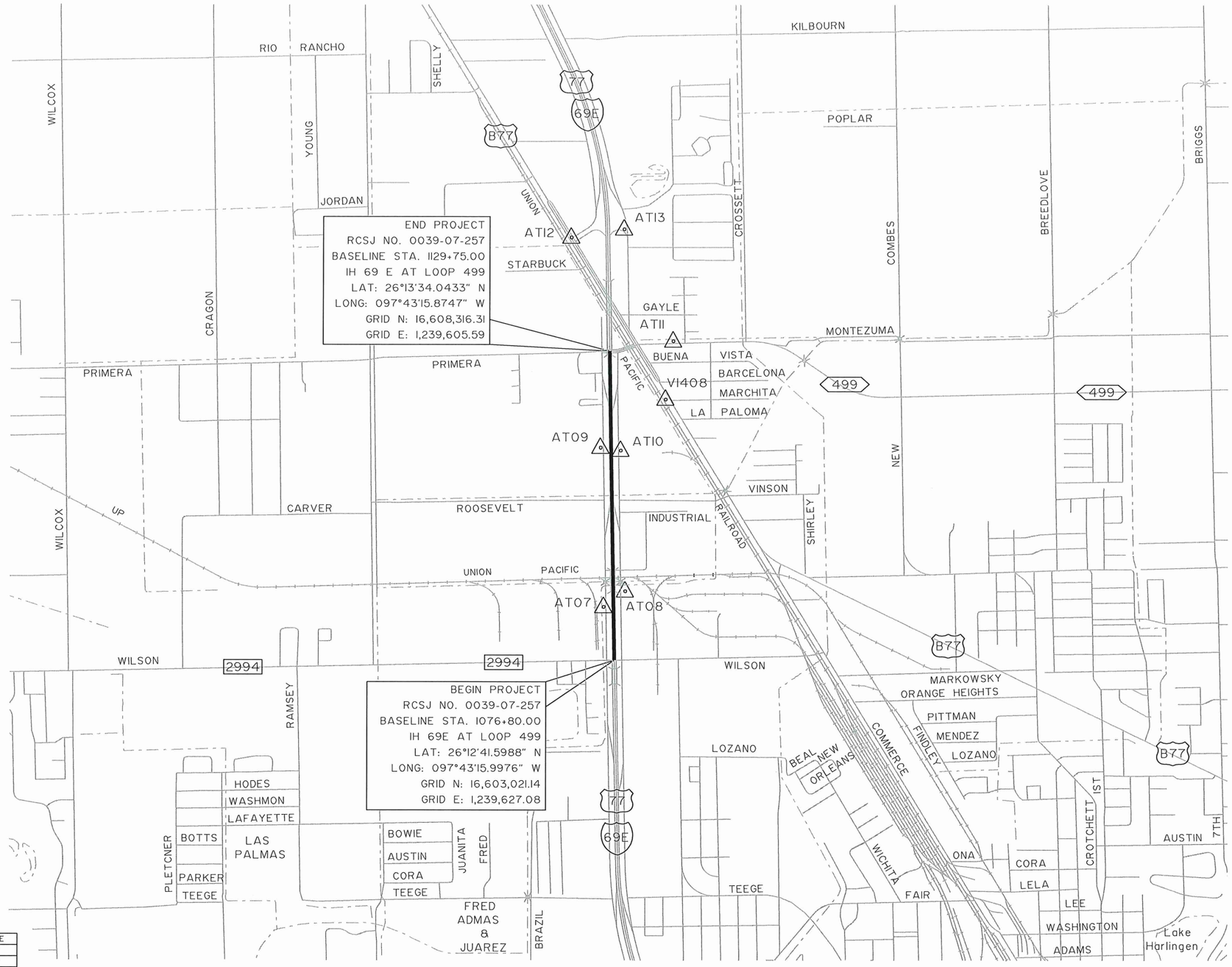
Texas Department of Transportation

Design Division Standard

VEHICLE IMPACT ATTENUATOR SAND FILLED PLASTIC MODULES MASH TL-3 & TL-2

VIA(SFPM)-19

FILE: viasfpm19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CL
©TxDOT: DECEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		67



NOTES:

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

2. ALL DISTANCES AND COORDINATES ARE IN US SURVEY FEET DISPLAYED IN SURFACE VALUES WITH THE TxDOT SURFACE ADJUSTMENT FACTOR OF 0.999960.

3. ALL ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) USING GEOID12A. ESTABLISHED BY TXDOT RTN, HELD VERTICAL MONUMENT "RAYMONDVILLE BASE STATION".

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

STATE OF TEXAS
REGISTERED
JIBRAEL K. AHMAD
6183
PROFESSIONAL
LAND SURVEYOR
04/29/22

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

TRAVERSE TABLE

FROM	TO	BEARING	DISTANCE
AT07	AT08	N 61°28'32" E	327.66'
AT08	AT09	N 05°14'57" W	3,113.75'
AT09	AT10	S 84°05'29" E	283.75'
AT10	V1408	N 76°11'45" E	805.43'
V1408	AT11	N 04°09'32" E	1,054.60'
AT11	AT12	N 43°44'40" W	2,408.78'
AT12	AT13	N 80°28'51" E	913.97'

POINT INFO TABLE

POINT No.	LATITUDE (N)	LONGITUDE (W)	GRID NORTHING	GRID EASTING	SURFACE NORTHING	SURFACE EASTING	ELEVATION	DESCRIPTION
AT07	26°12'51.8388"	097°43'17.4927"	16,604,054.19	1,239,484.53	16,603,390.03	1,239,434.95	36.61'	AT-MAG W/ JC SHINER
AT08	26°12'53.3710"	097°43'14.3210"	16,604,210.67	1,239,772.43	16,603,546.50	1,239,722.84	37.50'	AT-MAG W/ JC SHINER
AT09	26°13'24.0988"	097°43'17.2389"	16,607,311.48	1,239,487.55	16,606,647.19	1,239,437.97	36.48'	AT-MAG W/ JC SHINER
AT10	26°13'23.7923"	097°43'14.1416"	16,607,282.28	1,239,769.80	16,606,617.98	1,239,720.21	36.12'	AT-MAG W/ JC SHINER
AT11	26°13'36.0606"	097°43'04.6280"	16,608,526.32	1,240,628.48	16,607,861.98	1,240,578.86	35.12'	AT-MAG W/ JC SHINER
AT12	26°13'53.3980"	097°43'22.8003"	16,610,266.57	1,238,962.89	16,609,602.16	1,238,913.33	37.71'	AT-MAG W/ JC SHINER
AT13	26°13'54.8400"	097°43'12.8912"	16,610,417.73	1,239,864.30	16,609,753.31	1,239,814.71	36.79'	AT-MAG W/ JC SHINER
V1408	26°13'25.6477"	097°43'05.5394"	16,607,474.46	1,240,552.00	16,606,810.16	1,240,502.38	36.23'	NGS-FLANGE-ENCASED ROD

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

QUIDDITY
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2322 W. Grand Parkway North, Suite 150 • Katy, Texas 77449 • 832.913.4000

SURVEY CONTROL INDEX SHEET
INTERSTATE HIGHWAY 69 E AT LOOP 499

1 OF 2

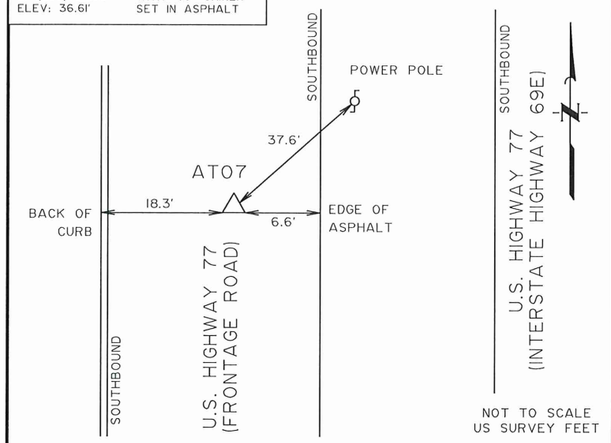
FED. RD. DIV. NO.	FEDERAL AID PROJECT	SHEET NO.
06		68

STATE	DIST.	COUNTY	
TEXAS	21	CAMERON	
CONT.	SECT.	JOB	HIGHWAY
0039	07	257	IH 69 E

AT07

N: 16,603,390.03
E: 1,239,434.95
ELEV: 36.61'

DESC: MAG NAIL WITH "JC" SHINER SET IN ASPHALT

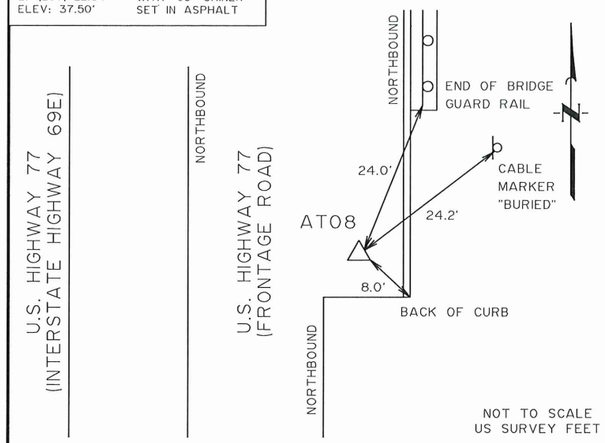


CONTROL POINT AT07 IS A MAG NAIL WITH "JC" SHINER SET IN ASPHALT, ON THE WEST SIDE OF U.S. HIGHWAY 77 (FRONTAGE ROAD), LOCATED APPROXIMATELY 1,000' NORTH OF WILSON ROAD.

AT08

N: 16,603,546.50
E: 1,239,722.84
ELEV: 37.50'

DESC: MAG NAIL WITH "JC" SHINER SET IN ASPHALT

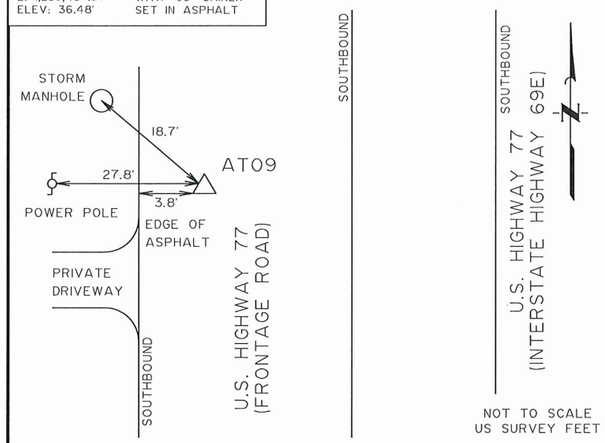


CONTROL POINT AT08 IS A MAG NAIL WITH "JC" SHINER SET IN ASPHALT, ON THE EAST SIDE OF U.S. HIGHWAY 77 (FRONTAGE ROAD), LOCATED APPROXIMATELY 1,200' NORTH OF WILSON ROAD.

AT09

N: 16,606,647.19
E: 1,239,437.97
ELEV: 36.48'

DESC: MAG NAIL WITH "JC" SHINER SET IN ASPHALT



CONTROL POINT AT09 IS A MAG NAIL WITH "JC" SHINER SET IN ASPHALT, ON THE WEST SIDE OF U.S. HIGHWAY 77 (FRONTAGE ROAD), LOCATED APPROXIMATELY 1,000' SOUTH OF PRIMERA ROAD.

NOTES:

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

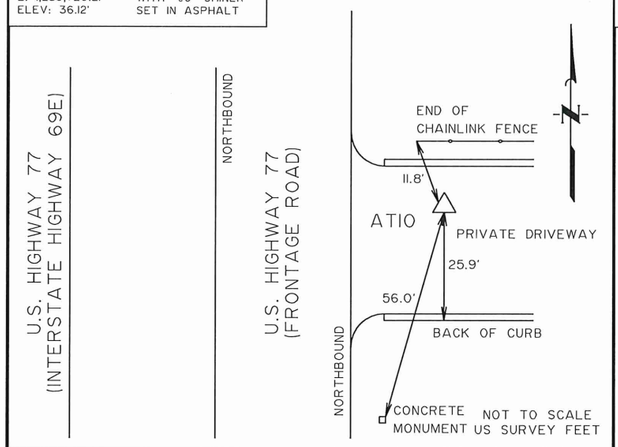
2. ALL DISTANCES AND COORDINATES ARE IN US SURVEY FEET DISPLAYED IN SURFACE VALUES WITH THE TxDOT SURFACE ADJUSTMENT FACTOR OF 0.999960.

3. ALL ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) USING GEOID12A. ESTABLISHED BY TXDOT RTN, HELD VERTICAL MONUMENT "RAYMONDVILLE BASE STATION".

AT10

N: 16,606,617.98
E: 1,239,720.21
ELEV: 36.12'

DESC: MAG NAIL WITH "JC" SHINER SET IN ASPHALT

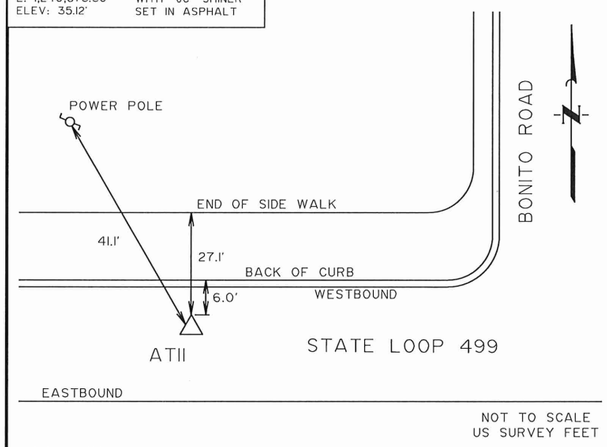


CONTROL POINT AT10 IS A MAG NAIL WITH "JC" SHINER SET IN ASPHALT, ON THE EAST SIDE OF U.S. HIGHWAY 77 (FRONTAGE ROAD), LOCATED APPROXIMATELY 1,100' SOUTH OF STATE LOOP 499.

AT11

N: 16,607,861.98
E: 1,240,578.86
ELEV: 35.12'

DESC: MAG NAIL WITH "JC" SHINER SET IN ASPHALT

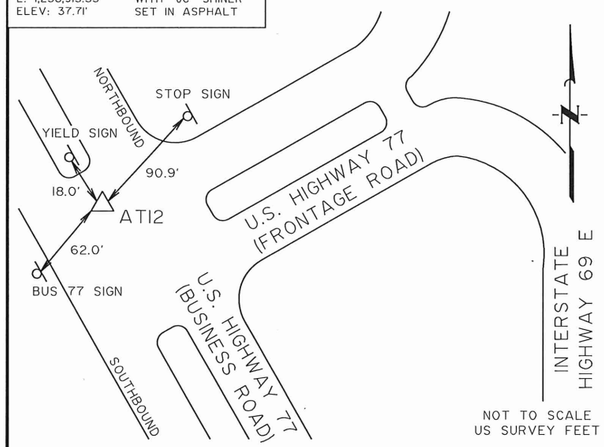


CONTROL POINT AT11 IS A MAG NAIL WITH "JC" SHINER SET IN ASPHALT, ON THE NORTH SIDE OF STATE LOOP 499, LOCATED APPROXIMATELY 250' WEST OF BONITO ROAD.

AT12

N: 16,609,602.16
E: 1,238,913.33
ELEV: 37.71'

DESC: MAG NAIL WITH "JC" SHINER SET IN ASPHALT

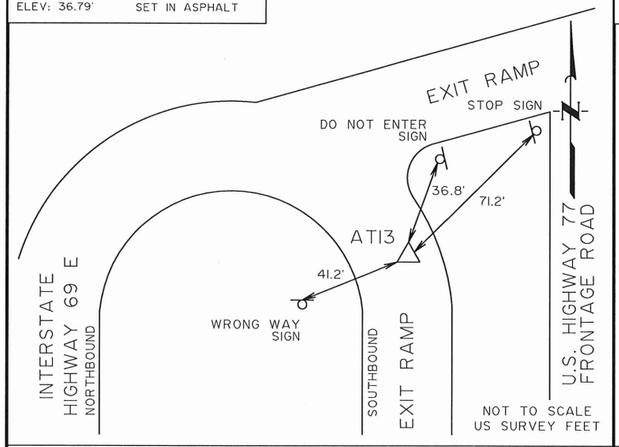


CONTROL POINT AT12 IS A MAG NAIL WITH "JC" SHINER SET IN ASPHALT, AT THE INTERSECTION OF U.S. HIGHWAY 77 (BUSINESS ROAD) AND U.S. HIGHWAY 77 (FRONTAGE ROAD).

AT13

N: 16,609,753.31
E: 1,239,814.71
ELEV: 36.79'

DESC: MAG NAIL WITH "JC" SHINER SET IN ASPHALT

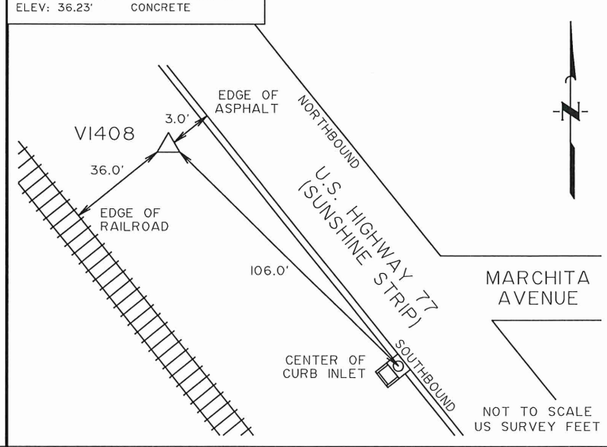


CONTROL POINT AT07 IS A MAG NAIL WITH "JC" SHINER SET IN ASPHALT, ON THE WEST SIDE OF U.S. HIGHWAY 77 (FRONTAGE ROAD), LOCATED APPROXIMATELY 300' NORTH OF GRACE AVENUE.

VI408

N: 16,606,810.16
E: 1,240,502.38
ELEV: 36.23'

DESC: NGS MONUMENT IN CAN FOUND IN CONCRETE



CONTROL POINT VI408 IS A NGS MONUMENT IN CAN FOUND IN CONCRETE, ON THE WEST SIDE OF U.S. HIGHWAY 77 (SUNSHINE STRIP), LOCATED APPROXIMATELY 50' NORTHWEST OF MARCHITA AVENUE.

THE SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS8E.

STATE OF TEXAS
REGISTERED
JIBRAEL K. AHMAD
6183
PROFESSIONAL
LAND SURVEYOR

9/29/22

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

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. 10046100
2323 W. Grand Parkway North, Suite 150 • Katy, Texas 77449 • 832.913.4000

HORIZONTAL & VERTICAL CONTROL SHEET INTERSTATE HIGHWAY 69 E AT LOOP 499

2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
06			69
STATE	DIST.	COUNTY	
TEXAS	21	CAMERON	
CONT.	SECT.	JOB	HIGHWAY
0039	07	257	IH 69 E

I-69E HORIZONTAL ALIGNMENT DATA

<* 1 DESCRIBE CHAIN I69E_CL

Chain I69E_CL contains:
CL001 CUR I69E_CL1 CUR I69E_CL2 CUR I69E_CL3 CUR I69E_CL4 CUR I69E_CL5 CUR I69-E_CL6 CUR I69E_CL7 CUR I69E_CL8 CUR I69E_CL9 CUR I69E_CL10 CUR I69E_CL11 CUR I6-9E_CL12 CUR I69E_CL13 CUR I69E_CL14 CUR I69E_CL15 CL002

Beginning chain I69E_CL description

Point CL001 N 16,594,823.5688 E 1,240,599.9409 Sta 1000+00.00

Course from CL001 to PC I69E_CL1 N 18° 16′ 58.21" W Dist 2,290.9742

Curve Data

Curve I69E_CL1					
P.I. Station	1032+01.10	N	16,597,863.0719	E	1,239,595.7314
Delta =	18° 03′ 01.12"	(RT)			
Degree =	0° 59′ 59.73"				
Tangent =	910.1218				
Length =	1,805.1640				
Radius =	5,730.0000				
External =	71.8292				
Long Chord =	1,797.7082				
Mid. Ord. =	70.9399				
P.C. Station	1022+90.97	N	16,596,998.8935	E	1,239,881.2439
P.T. Station	1040+96.14	N	16,598,773.1862	E	1,239,592.0378
C.C.		N	16,598,796.4405	E	1,245,321.9906
Back = N	18° 16′ 58.21" W				
Ahead = N	0° 13′ 57.09" W				
Chord Bear = N	9° 15′ 27.65" W				

Course from PT I69E_CL1 to PC I69E_CL2 N 0° 13′ 57.09" W Dist 11,165.1804

Curve Data

Curve I69E_CL2					
P.I. Station	1165+27.95	N	16,611,204.8981	E	1,239,541.5853
Delta =	24° 55′ 47.67"	(LT)			
Degree =	0° 59′ 59.73"				
Tangent =	1,266.6339				
Length =	2,493.1746				
Radius =	5,730.0000				
External =	138.3270				
Long Chord =	2,473.5541				
Mid. Ord. =	135.0664				
P.C. Station	1152+61.32	N	16,609,938.2746	E	1,239,546.7258
P.T. Station	1177+54.49	N	16,612,351.3360	E	1,239,003.0304
C.C.		N	16,609,915.0204	E	1,233,816.7729
Back = N	0° 13′ 57.09" W				
Ahead = N	25° 09′ 44.77" W				
Chord Bear = N	12° 41′ 50.93" W				

Course from PT I69E_CL2 to PC I69E_CL3 N 25° 09′ 44.77" W Dist 6,525.3878

Curve Data

Curve I69E_CL3					
P.I. Station	1254+14.67	N	16,619,284.6094	E	1,235,746.0300
Delta =	22° 24′ 15.24"	(LT)			
Degree =	0° 59′ 59.73"				
Tangent =	1,134.7905				
Length =	2,240.5883				
Radius =	5,730.0000				
External =	111.2883				
Long Chord =	2,226.3409				
Mid. Ord. =	109.1681				
P.C. Station	1242+79.88	N	16,618,257.5037	E	1,236,228.5270
P.T. Station	1265+20.47	N	16,620,050.2887	E	1,234,908.4832
C.C.		N	16,615,821.1881	E	1,231,042.2696
Back = N	25° 09′ 44.77" W				
Ahead = N	47° 34′ 00.01" W				
Chord Bear = N	36° 21′ 52.39" W				

Course from PT I69E_CL3 to PC I69E_CL4 N 47° 34′ 00.01" W Dist 2,226.8513

Curve Data

Curve I69E_CL4					
P.I. Station	1290+07.48	N	16,621,728.3542	E	1,233,072.9126
Delta =	0° 29′ 28.09"	(RT)			
Degree =	0° 05′ 39.81"				
Tangent =	260.1596				
Length =	520.3159				
Radius =	60,700.0000				
External =	0.5575				
Long Chord =	520.3143				
Mid. Ord. =	0.5575				
P.C. Station	1287+47.32	N	16,621,552.8163	E	1,233,264.9268
P.T. Station	1292+67.64	N	16,621,905.5316	E	1,232,882.4102
C.C.		N	16,666,353.2367	E	1,274,221.1513
Back = N	47° 34′ 00.01" W				
Ahead = N	47° 04′ 31.92" W				
Chord Bear = N	47° 19′ 15.96" W				

Course from PT I69E_CL4 to PC I69E_CL5 N 47° 04′ 31.92" W Dist 2,839.9802

Curve Data

Curve I69E_CL5					
P.I. Station	1329+25.52	N	16,624,396.6766	E	1,230,203.9136
Delta =	16° 14′ 49.94"	(RT)			
Degree =	0° 59′ 59.73"				
Tangent =	817.9082				
Length =	1,624.8403				
Radius =	5,730.0000				
External =	58.0803				
Long Chord =	1,619.4018				
Mid. Ord. =	57.4975				
P.C. Station	1321+07.62	N	16,623,839.6536	E	1,230,802.8286
P.T. Station	1337+32.46	N	16,625,099.0198	E	1,229,784.7623
C.C.		N	16,628,035.4584	E	1,234,705.1513
Back = N	47° 04′ 31.92" W				
Ahead = N	30° 49′ 41.98" W				
Chord Bear = N	38° 57′ 06.95" W				

Course from PT I69E_CL5 to PC I69E_CL6 N 30° 49′ 41.98" W Dist 6,597.2499

Curve Data

Curve I69E_CL6					
P.I. Station	1406+35.57	N	16,631,026.7670	E	1,226,247.1425
Delta =	2° 13′ 04.87"	(RT)			
Degree =	0° 21′ 45.47"				
Tangent =	305.8611				
Length =	611.6457				
Radius =	15,800.0000				
External =	2.9602				
Long Chord =	611.6075				
Mid. Ord. =	2.9596				
P.C. Station	1403+29.71	N	16,630,764.1220	E	1,226,403.8863
P.T. Station	1409+41.35	N	16,631,295.2814	E	1,226,100.6810
C.C.		N	16,638,861.1081	E	1,239,971.4512
Back = N	30° 49′ 41.98" W				
Ahead = N	28° 36′ 37.10" W				
Chord Bear = N	29° 43′ 09.54" W				

Course from PT I69E_CL6 to PC I69E_CL7 N 28° 36′ 37.10" W Dist 963.9889

Curve Data

Curve I69E_CL7					
P.I. Station	1422+12.44	N	16,632,411.1668	E	1,225,492.0201
Delta =	2° 13′ 37.22"	(LT)			
Degree =	0° 21′ 45.47"				
Tangent =	307.1004				
Length =	614.1235				
Radius =	15,800.0000				
External =	2.9842				
Long Chord =	614.0849				
Mid. Ord. =	2.9837				
P.C. Station	1419+05.34	N	16,632,141.5643	E	1,225,639.0751
P.T. Station	1425+19.46	N	16,632,674.8513	E	1,225,334.5998
C.C.		N	16,624,575.7376	E	1,211,768.3048
Back = N	28° 36′ 37.10" W				
Ahead = N	30° 50′ 14.32" W				
Chord Bear = N	29° 43′ 25.71" W				

Course from PT I69E_CL7 to PC I69E_CL8 N 30° 50′ 14.32" W Dist 843.1260

Curve Data

Curve I69E_CL8					
P.I. Station	1436+34.39	N	16,633,632.1531	E	1,224,763.0880
Delta =	1° 58′ 15.77"	(LT)			
Degree =	0° 21′ 45.47"				
Tangent =	271.7967				
Length =	543.5397				
Radius =	15,800.0000				
External =	2.3376				
Long Chord =	543.5129				
Mid. Ord. =	2.3372				
P.C. Station	1433+62.59	N	16,633,398.7814	E	1,224,902.4116
P.T. Station	1439+06.13	N	16,633,860.5949	E	1,224,615.8202
C.C.		N	16,625,299.6677	E	1,211,336.1167
Back = N	30° 50′ 14.32" W				
Ahead = N	32° 48′ 30.09" W				
Chord Bear = N	31° 49′ 22.21" W				

Course from PT I69E_CL8 to PC I69E_CL9 N 32° 48′ 30.09" W Dist 1,277.9454

Curve Data

Curve I69E_CL9					
P.I. Station	1454+55.73	N	16,635,163.0109	E	1,223,776.2014
Delta =	1° 58′ 11.95"	(RT)			
Degree =	0° 21′ 45.47"				
Tangent =	271.6504				
Length =	543.2473				
Radius =	15,800.0000				
External =	2.3351				
Long Chord =	543.2206				
Mid. Ord. =	2.3347				
P.C. Station	1451+84.08	N	16,634,934.6921	E	1,223,923.3900
P.T. Station	1457+27.32	N	16,635,396.2545	E	1,223,636.9485
C.C.		N	16,643,495.6192	E	1,237,203.0936
Back = N	32° 48′ 30.09" W				
Ahead = N	30° 50′ 18.14" W				
Chord Bear = N	31° 49′ 24.12" W				

Course from PT I69E_CL9 to PC I69E_CL10 N 30° 50′ 18.14" W Dist 3,331.6597

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
NICOLAS C. GARCIA
99410
LICENSED
PROFESSIONAL ENGINEER

Nicolas C. Garcia, P.E.

11/22/2022

Texas Department of Transportation
©2022

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
4350 Lockhill Selma Road, Suite 100 • San Antonio, Texas 78249 • 210.494.5511

I-69E
HORIZONTAL
ALIGNMENT DATA

SHEET 01 OF 05

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	70
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

PLOTDRIVER: BW_HALF_PDF.plt cfg PENTABLE: I69E-RAMPS.tbl
DATE:11/22/2022 4:56:10 PM USER:
FILE:c:\bms\pwe101-01\matt.beckett\dms24514\I69E-RAMPS_HAD_01.dgn

I-69E HORIZONTAL ALIGNMENT DATA (CONT)

		Curve Data				
Curve I69E_CL10						
P.I. Station		1491+91.41	N	16,638,370.5775	E	1,221,861.1952
Delta	=	0° 15′ 00.00"	(LT)			
Degree	=	0° 05′ 39.81"				
Tangent	=	132.4271				
Length	=	264.8537				
Radius	=	60,700.0000				
External	=	0.1445				
Long Chord	=	264.8535				
Mid. Ord.	=	0.1445				
P.C. Station		1490+58.98	N	16,638,256.8734	E	1,221,929.0797
P.T. Station		1493+23.84	N	16,638,483.9843	E	1,221,792.8152
C.C.			N	16,607,140.9594	E	1,169,811.0416
Back	= N	30° 50′ 18.14" W				
Ahead	= N	31° 05′ 18.14" W				
Chord Bear	= N	30° 57′ 48.14" W				

Course from PT I69E_CL10 to PC I69E_CL11 N 31° 05′ 18.14" W Dist 3,078.1870

		Curve Data				
Curve I69E_CL11						
P.I. Station		1531+66.59	N	16,641,774.8099	E	1,219,808.5731
Delta	=	22° 38′ 10.27"	(RT)			
Degree	=	1° 29′ 59.60"				
Tangent	=	764.5659				
Length	=	1,509.1902				
Radius	=	3,820.0000				
External	=	75.7619				
Long Chord	=	1,499.3943				
Mid. Ord.	=	74.2886				
P.C. Station		1524+02.02	N	16,641,120.0572	E	1,220,203.3640
P.T. Station		1539+11.21	N	16,642,531.0717	E	1,219,696.1941
C.C.			N	16,643,092.5506	E	1,223,474.7046
Back	= N	31° 05′ 18.14" W				
Ahead	= N	8° 27′ 07.87" W				
Chord Bear	= N	19° 46′ 13.01" W				

Course from PT I69E_CL11 to PC I69E_CL12 N 8° 27′ 07.87" W Dist 604.1754

		Curve Data				
Curve I69E_CL12						
P.I. Station		1552+52.39	N	16,643,857.6792	E	1,219,499.0629
Delta	=	5° 20′ 28.71"	(LT)			
Degree	=	0° 21′ 45.47"				
Tangent	=	736.9989				
Length	=	1,472.9301				
Radius	=	15,800.0000				
External	=	17.1795				
Long Chord	=	1,472.3968				
Mid. Ord.	=	17.1608				
P.C. Station		1545+15.39	N	16,643,128.6850	E	1,219,607.3900
P.T. Station		1559+88.32	N	16,644,573.4241	E	1,219,323.3453
C.C.			N	16,640,806.3374	E	1,203,978.9959
Back	= N	8° 27′ 07.87" W				
Ahead	= N	13° 47′ 36.58" W				
Chord Bear	= N	11° 07′ 22.23" W				

Course from PT I69E_CL12 to PC I69E_CL13 N 13° 47′ 36.58" W Dist 2,240.1596

		Curve Data				
Curve I69E_CL13						
P.I. Station		1586+63.08	N	16,647,171.0494	E	1,218,685.6200
Delta	=	12° 58′ 52.65"	(RT)			
Degree	=	1° 29′ 59.60"				
Tangent	=	434.6023				
Length	=	865.4832				
Radius	=	3,820.0000				
External	=	24.6429				
Long Chord	=	863.6333				
Mid. Ord.	=	24.4850				
P.C. Station		1582+28.48	N	16,646,748.9805	E	1,218,789.2392
P.T. Station		1590+93.96	N	16,647,605.6080	E	1,218,679.4594
C.C.			N	16,647,659.7571	E	1,222,499.0756
Back	= N	13° 47′ 36.58" W				
Ahead	= N	0° 48′ 43.93" W				
Chord Bear	= N	7° 18′ 10.26" W				

Course from PT I69E_CL13 to PC I69E_CL14 N 0° 48′ 43.93" W Dist 2,748.6221

		Curve Data				
Curve I69E_CL14						
P.I. Station		1619+89.17	N	16,650,500.5218	E	1,218,638.4195
Delta	=	1° 03′ 47.08"	(LT)			
Degree	=	0° 21′ 45.47"				
Tangent	=	146.5825				
Length	=	293.1567				
Radius	=	15,800.0000				
External	=	0.6799				
Long Chord	=	293.1525				
Mid. Ord.	=	0.6799				
P.C. Station		1618+42.58	N	16,650,353.9540	E	1,218,640.4973
P.T. Station		1621+35.74	N	16,650,647.0259	E	1,218,633.6227
C.C.			N	16,650,129.9866	E	1,202,842.0848
Back	= N	0° 48′ 43.93" W				
Ahead	= N	1° 52′ 31.02" W				
Chord Bear	= N	1° 20′ 37.47" W				

Course from PT I69E_CL14 to PC I69E_CL15 N 1° 52′ 31.02" W Dist 818.3894

		Curve Data				
Curve I69E_CL15		(Chord Definition)				
P.I. Station		1630+97.79	N	16,651,608.5636	E	1,218,602.1405
Delta	=	1° 02′ 30.88"	(RT)			
Degree	=	0° 21′ 45.48"				
Tangent	=	143.6636				
Length	=	287.3187				
Radius	=	15,800.0000				
External	=	0.6531				
Long Chord	=	287.3152				
Mid. Ord.	=	0.6531				
P.C. Station		1629+54.13	N	16,651,464.9770	E	1,218,606.8417
P.T. Station		1632+41.45	N	16,651,752.2120	E	1,218,600.0509
C.C.			N	16,651,982.0163	E	1,234,398.3796
Back	= N	1° 52′ 31.02" W				
Ahead	= N	0° 50′ 00.14" W				
Chord Bear	= N	1° 21′ 15.58" W				

Course from PT I69E_CL15 to CL002 N 0° 50′ 00.14" W Dist 1,055.3618

Point CL002 N 16,652,807.4621 E 1,218,584.7012 Sta 1642+96.81

==========

Ending chain I69E_CL description

I-69E NBX RAMP HORIZONTAL ALIGNMENT DATA

<* 2 DESCRIBE CHAIN I69E_NBX

Chain I69E_NBX contains:
CUR I69E_NBX_1 CUR I69E_NBX_4

Beginning chain I69E_NBX description
Feature: Road_Centerline

==========

		Curve Data				
Curve I69E_NBX_1						
P.I. Station		12+54.55	N	16,604,312.1298	E	1,239,615.0591
Delta	=	4° 51′ 31.26"	(RT)			
Degree	=	0° 57′ 17.75"				
Tangent	=	254.5527				
Length	=	508.8002				
Radius	=	6,000.0000				
External	=	5.3973				
Long Chord	=	508.6478				
Mid. Ord.	=	5.3925				
P.C. Station		10+00.00	N	16,604,057.5792	E	1,239,616.0922
P.T. Station		15+08.80	N	16,604,565.8532	E	1,239,635.5898
C.C.			N	16,604,081.9292	E	1,245,616.0427
Back	= N	0° 13′ 57.09" W				
Ahead	= N	4° 37′ 34.17" E				
Chord Bear	= N	2° 11′ 48.54" E				

Course from PT I69E_NBX_1 to PC I69E_NBX_4 N 4° 37′ 34.17" E Dist 100.0000

		Curve Data				
Curve I69E_NBX_4						
P.I. Station		19+45.83	N	16,605,001.4552	E	1,239,670.8377
Delta	=	4° 53′ 08.46"	(LT)			
Degree	=	0° 43′ 30.95"				
Tangent	=	337.0258				
Length	=	673.6431				
Radius	=	7,900.0000				
External	=	7.1857				
Long Chord	=	673.4390				
Mid. Ord.	=	7.1792				
P.C. Station		16+08.80	N	16,604,665.5274	E	1,239,643.6552
P.T. Station		22+82.44	N	16,605,338.4775	E	1,239,669.3111
C.C.			N	16,605,302.6939	E	1,231,769.3921
Back	= N	4° 37′ 34.17" E				
Ahead	= N	0° 15′ 34.29" W				
Chord Bear	= N	2° 10′ 59.94" E				

==========

Ending chain I69E_NBX description

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
NICOLAS C. GARCIA
99410
LICENSED
PROFESSIONAL ENGINEER

Nicolas C. Garcia, P.E.

11/22/2022

Texas Department of Transportation

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
4350 Lockhill Selma Road, Suite 100 • San Antonio, Texas 78249 • 210.494.5511

I-69E
HORIZONTAL
ALIGNMENT DATA

SHEET 02 OF 05

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	71
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

I-69E NBE RAMP ALIGNMENT DATA

```
<*       1    Describe Chain I69E_NBE

Chain I69E_NBE contains:
 CUR I69E_NBE_1 CUR I69E_NBE_4 28

Beginning chain I69E_NBE description
Feature: Road_Centerline
================================================================================

                                        Curve Data
                                       *----------*
Curve I69E_NBE_1
P.I.  Station                 12+59.50  N      16,606,037.2643  E       1,239,665.7267
Delta         =        3° 45′ 45.88" (LT)
Degree        =        0° 43′ 30.95"
Tangent       =              259.4987
Length        =              518.8109
Radius        =            7,900.0000
External      =                4.2609
Long Chord    =              518.7177
Mid. Ord.     =                4.2586
P.C.  Station                 10+00.00  N      16,605,777.7705  E       1,239,667.3212
P.T.  Station                 15+18.81  N      16,606,296.0941  E       1,239,647.1063
C.C.                                    N      16,605,729.2276  E       1,231,767.4704
Back          = N    0° 21′ 07.44" W
Ahead         = N    4° 06′ 53.31" W
Chord Bear    = N    2° 14′ 00.38" W

Course from PT I69E_NBE_1 to PC I69E_NBE_4 N 4° 06′ 53.31" W Dist 137.6929

                                        Curve Data
                                       *----------*
Curve I69E_NBE_4
P.I.  Station                 18+45.20  N      16,606,621.6387  E       1,239,623.6864
Delta         =        2° 44′ 11.47" (RT)
Degree        =        0° 43′ 30.95"
Tangent       =              188.6930
Length        =              377.3142
Radius        =            7,900.0000
External      =                2.2532
Long Chord    =              377.2784
Mid. Ord.     =                2.2525
P.C.  Station                 16+56.50  N      16,606,433.4321  E       1,239,637.2261
P.T.  Station                 20+33.82  N      16,606,810.2771  E       1,239,619.1477
C.C.                                    N      16,607,000.2987  E       1,247,516.8620
Back          = N    4° 06′ 53.31" W
Ahead         = N    1° 22′ 41.84" W
Chord Bear    = N    2° 44′ 47.58" W

Course from PT I69E_NBE_4 to 28 N 1° 22′ 41.84" W Dist 711.4870

Point 28                N  16,607,521.5583 E    1,239,602.0341 Sta       27+45.31

================================================================================
Ending chain I69E_NBE description
```

I-69E SBE RAMP ALIGNMENT DATA

```
<*       1    Describe Chain I69E_SBE

Chain I69E_SBE contains:
 27 CUR I69E_SBE_3 CUR I69E_SBE_6

Beginning chain I69E_SBE description
Feature: Road_Centerline
================================================================================

Point 27                N  16,603,638.1267 E    1,239,527.2937 Sta       10+00.00

Course from 27 to PC I69E_SBE_3 N 1° 13′ 03.75" W Dist 925.3592

                                        Curve Data
                                       *----------*
Curve I69E_SBE_3
P.I.  Station                 21+41.58  N      16,604,779.4475  E       1,239,503.0335
Delta         =        3° 05′ 46.90" (LT)
Degree        =        0° 42′ 58.31"
Tangent       =              216.2195
Length        =              432.3337
Radius        =            8,000.0000
External      =                2.9214
Long Chord    =              432.2811
Mid. Ord.     =                2.9203
P.C.  Station                 19+25.36  N      16,604,563.2769  E       1,239,507.6285
P.T.  Station                 23+57.69  N      16,604,995.0544  E       1,239,486.7687
C.C.                                    N      16,604,393.2654  E       1,231,509.4352
Back          = N    1° 13′ 03.75" W
Ahead         = N    4° 18′ 50.66" W
Chord Bear    = N    2° 45′ 57.20" W

Course from PT I69E_SBE_3 to PC I69E_SBE_6 N 4° 18′ 50.66" W Dist 50.0000

                                        Curve Data
                                       *----------*
Curve I69E_SBE_6
P.I.  Station                 26+84.57  N      16,605,321.0025  E       1,239,462.1800
Delta         =        3° 57′ 51.66" (RT)
Degree        =        0° 42′ 58.31"
Tangent       =              276.8743
Length        =              553.5276
Radius        =            8,000.0000
External      =                4.7898
Long Chord    =              553.4172
Mid. Ord.     =                4.7869
P.C.  Station                 24+07.69  N      16,605,044.9127  E       1,239,483.0075
P.T.  Station                 29+61.22  N      16,605,597.8717  E       1,239,460.4901
C.C.                                    N      16,605,646.7017  E       1,247,460.3410
Back          = N    4° 18′ 50.66" W
Ahead         = N    0° 20′ 59.00" W
Chord Bear    = N    2° 19′ 54.83" W

================================================================================
Ending chain I69E_SBE description
```

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
NICOLAS C. GARCIA
99410
LICENSED
PROFESSIONAL ENGINEER

Nicolas C. Garcia, P.E.

11/22/2022

Texas Department of Transportation

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
4350 Lockhill Selma Road, Suite 100•San Antonio, Texas 78249•210.494.5511

I-69E HORIZONTAL ALIGNMENT DATA

SHEET 03 OF 05

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	72
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

I-69E SBX RAMP ALIGNMENT DATA

<* 4 DESCRIBE CHAIN I69E_SBX

Chain I69E_SBX contains:
CUR I69E_SBX_1 CUR I69E_SBX_4 CUR I69E_SBX_7

Beginning chain I69E_SBX description
Feature: Road_Centerline

			Curve Data			

Curve I69E_SBX_1						
P.I. Station		11+94.96	N	16,606,341.1253	E	1,239,457.3265
Delta	=	2° 47′ 31.55" (RT)				
Degree	=	0° 42′ 58.31"				
Tangent	=	194.9637				
Length	=	389.8502				
Radius	=	8,000.0000				
External	=	2.3753				
Long Chord	=	389.8116				
Mid. Ord.	=	2.3746				
P.C. Station		10+00.00	N	16,606,146.1633	E	1,239,458.1561
P.T. Station		13+89.85	N	16,606,535.8961	E	1,239,465.9949
C.C.			N	16,606,180.2033	E	1,247,458.0837
Back	= N	0° 14′ 37.66" W				
Ahead	= N	2° 32′ 53.89" E				
Chord Bear	= N	1° 09′ 08.12" E				

Course from PT I69E_SBX_1 to PC I69E_SBX_4 N 2° 32′ 53.89" E Dist 43.5009

			Curve Data			

Curve I69E_SBX_4						
P.I. Station		15+18.47	N	16,606,664.3873	E	1,239,471.7135
Delta	=	1° 13′ 09.02" (RT)				
Degree	=	0° 42′ 58.31"				
Tangent	=	85.1174				
Length	=	170.2284				
Radius	=	8,000.0000				
External	=	0.4528				
Long Chord	=	170.2252				
Mid. Ord.	=	0.4528				
P.C. Station		14+33.35	N	16,606,579.3540	E	1,239,467.9290
P.T. Station		16+03.58	N	16,606,749.3208	E	1,239,477.3063
C.C.			N	16,606,223.6612	E	1,247,460.0178
Back	= N	2° 32′ 53.89" E				
Ahead	= N	3° 46′ 02.91" E				
Chord Bear	= N	3° 09′ 28.40" E				

Course from PT I69E_SBX_4 to PC I69E_SBX_7 N 3° 46′ 02.91" E Dist 326.0627

			Curve Data			

Curve I69E_SBX_7						
P.I. Station		21+39.17	N	16,607,283.7506	E	1,239,512.4984
Delta	=	4° 00′ 00.00" (LT)				
Degree	=	0° 57′ 17.75"				
Tangent	=	209.5246				
Length	=	418.8790				
Radius	=	6,000.0000				
External	=	3.6573				
Long Chord	=	418.7940				
Mid. Ord.	=	3.6550				
P.C. Station		19+29.64	N	16,607,074.6788	E	1,239,498.7311
P.T. Station		23+48.52	N	16,607,493.2735	E	1,239,511.6481
C.C.			N	16,607,468.9235	E	1,233,511.6975
Back	= N	3° 46′ 02.91" E				
Ahead	= N	0° 13′ 57.09" W				
Chord Bear	= N	1° 46′ 02.91" E				

Ending chain I69E_SBX description

I-69E NBFR ALIGNMENT DATA

<* 6 DESCRIBE CHAIN I69E_NBFR

Chain I69E_NBFR contains:
12 CUR I69E_NBFR_3 CUR I69E_NBFR_6 13 CUR I69E_NBFR_11 CUR I69E_NBFR_14 14 15

Beginning chain I69E_NBFR description
Feature: Road_Frontage Road_BL

Point 12 N 16,601,472.6169 E 1,239,707.0804 Sta 167+00.00

Course from 12 to PC I69E_NBFR_3 N 0° 07′ 10.64" W Dist 974.5987

			Curve Data			

Curve I69E_NBFR_3						
P.I. Station		177+68.67	N	16,602,541.2830	E	1,239,704.8492
Delta	=	1° 04′ 40.54" (RT)				
Degree	=	0° 34′ 22.65"				
Tangent	=	94.0697				
Length	=	188.1338				
Radius	=	10,000.0000				
External	=	0.4424				
Long Chord	=	188.1310				
Mid. Ord.	=	0.4424				
P.C. Station		176+74.60	N	16,602,447.2135	E	1,239,705.0456
P.T. Station		178+62.73	N	16,602,635.3395	E	1,239,706.4225
C.C.			N	16,602,468.0916	E	1,249,705.0238
Back	= N	0° 07′ 10.64" W				
Ahead	= N	0° 57′ 29.90" E				
Chord Bear	= N	0° 25′ 09.63" E				

Course from PT I69E_NBFR_3 to PC I69E_NBFR_6 N 0° 57′ 29.90" E Dist 675.1583

			Curve Data			

Curve I69E_NBFR_6						
P.I. Station		189+87.74	N	16,603,760.1922	E	1,239,725.2381
Delta	=	2° 27′ 15.66" (LT)				
Degree	=	0° 16′ 22.21"				
Tangent	=	449.8518				
Length	=	899.5660				
Radius	=	21,000.0000				
External	=	4.8177				
Long Chord	=	899.4972				
Mid. Ord.	=	4.8166				
P.C. Station		185+37.89	N	16,603,310.4033	E	1,239,717.7144
P.T. Station		194+37.46	N	16,604,209.8907	E	1,239,713.4934
C.C.			N	16,603,661.6239	E	1,218,720.6516
Back	= N	0° 57′ 29.90" E				
Ahead	= N	1° 29′ 45.76" W				
Chord Bear	= N	0° 16′ 07.93" W				

Course from PT I69E_NBFR_6 to 13 N 1° 29′ 45.76" W Dist 130.7174

Point 13 N 16,604,340.5635 E 1,239,710.0806 Sta 195+68.17

Course from 13 to PC I69E_NBFR_11 N 1° 20′ 34.23" W Dist 611.8519

			Curve Data			

Curve I69E_NBFR_11						
P.I. Station		203+21.84	N	16,605,094.0185	E	1,239,692.4186
Delta	=	1° 04′ 59.94" (RT)				
Degree	=	0° 22′ 55.10"				
Tangent	=	141.8101				
Length	=	283.6117				
Radius	=	15,000.0000				
External	=	0.6703				
Long Chord	=	283.6075				
Mid. Ord.	=	0.6703				
P.C. Station		201+80.03	N	16,604,952.2474	E	1,239,695.7419
P.T. Station		204+63.64	N	16,605,235.8271	E	1,239,691.7763
C.C.			N	16,605,303.7706	E	1,254,691.6224
Back	= N	1° 20′ 34.23" W				
Ahead	= N	0° 15′ 34.29" W				
Chord Bear	= N	0° 48′ 04.26" W				

Course from PT I69E_NBFR_11 to PC I69E_NBFR_14 N 0° 15′ 34.29" W Dist 1,176.7159

			Curve Data			

Curve I69E_NBFR_14						
P.I. Station		217+39.78	N	16,606,511.9522	E	1,239,685.9959
Delta	=	1° 08′ 21.33" (RT)				
Degree	=	0° 34′ 22.65"				
Tangent	=	99.4223				
Length	=	198.8381				
Radius	=	10,000.0000				
External	=	0.4942				
Long Chord	=	198.8348				
Mid. Ord.	=	0.4942				
P.C. Station		216+40.35	N	16,606,412.5309	E	1,239,686.4463
P.T. Station		218+39.19	N	16,606,611.3628	E	1,239,687.5224
C.C.			N	16,606,457.8266	E	1,249,686.3437
Back	= N	0° 15′ 34.29" W				
Ahead	= N	0° 52′ 47.04" E				
Chord Bear	= N	0° 18′ 36.37" E				

Course from PT I69E_NBFR_14 to 14 N 0° 52′ 47.04" E Dist 445.0394

Point 14 N 16,607,056.3497 E 1,239,694.3554 Sta 222+84.23

Course from 14 to 15 N 1° 13′ 01.05" E Dist 597.1488

Point 15 N 16,607,653.3638 E 1,239,707.0378 Sta 228+81.38

Ending chain I69E_NBFR description

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
NICOLAS C. GARCIA
99410
LICENSED
PROFESSIONAL ENGINEER

Nicolas C. Garcia, P.E.

11/22/2022

Texas Department of Transportation
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QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
4350 Lockhill Selma Road, Suite 100•San Antonio, Texas 78249•210.494.5511

I-69E
HORIZONTAL
ALIGNMENT DATA

SHEET 04 OF 05

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	73
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

PLOTDRIVER: BW_HALF_PDF.pltcfg PENTABLE: I69E-RAMPS.tbl
DATE:11/22/2022 4:56:25 PM USER:
FILE:c:\bms\pwe101-01\matt.beckett\dms24514\I69E-RAMPS_HAD_04.dgn

I69E_SBFR ALIGNMENT DATA

```
<*       7   DESCRIBE CHAIN I69E_SBFR

Chain I69E_SBFR contains:
 9 CUR I69E_SBFR_3 CUR I69E_SBFR_6 CUR I69E_SBFR_9 10 CUR I69E_SBFR_14 11

Beginning chain I69E_SBFR description
Feature: Road_Frontage Road_BL
================================================================================

Point 9                N  16,601,530.2307 E    1,239,454.0479 Sta     275+00.00

Course from 9 to PC I69E_SBFR_3 N 0° 12' 08.94" W Dist 895.7753

                                    Curve Data
                                   *----------*
Curve I69E_SBFR_3
P.I.  Station            284+53.13  N      16,602,483.3513  E       1,239,450.6796
Delta          =       1° 05' 43.06" (LT)
Degree         =       0° 57' 17.75"
Tangent        =             57.3513
Length         =            114.6991
Radius         =          6,000.0000
External       =              0.2741
Long Chord     =            114.6973
Mid. Ord.      =              0.2741
P.C.  Station            283+95.78  N      16,602,426.0004  E       1,239,450.8823
P.T.  Station            285+10.47  N      16,602,540.6879  E       1,239,449.3807
C.C.                                N      16,602,404.7965  E       1,233,450.9197
Back         = N   0° 12' 08.94" W
Ahead        = N   1° 17' 52.00" W
Chord Bear   = N   0° 45' 00.47" W

Course from PT I69E_SBFR_3 to PC I69E_SBFR_6 N 1° 17' 52.00" W Dist 863.7156

                                    Curve Data
                                   *----------*
Curve I69E_SBFR_6
P.I.  Station            297+70.30  N      16,603,800.1907  E       1,239,420.8474
Delta          =       2° 09' 40.38" (RT)
Degree         =       0° 16' 22.21"
Tangent        =            396.1104
Length         =            792.1268
Radius         =         21,000.0000
External       =              3.7355
Long Chord     =            792.0799
Mid. Ord.      =              3.7348
P.C.  Station            293+74.19  N      16,603,404.1819  E       1,239,429.8187
P.T.  Station            301+66.32  N      16,604,196.2561  E       1,239,426.8165
C.C.                                N      16,603,879.8017  E       1,260,424.4320
Back         = N   1° 17' 52.00" W
Ahead        = N   0° 51' 48.38" E
Chord Bear   = N   0° 13' 01.81" W

Course from PT I69E_SBFR_6 to PC I69E_SBFR_9 N 0° 51' 48.38" E Dist 767.8985

                                    Curve Data
                                   *----------*
Curve I69E_SBFR_9
P.I.  Station            310+79.04  N      16,605,108.8758  E       1,239,440.5706
Delta          =       1° 06' 26.03" (LT)
Degree         =       0° 22' 56.20"
Tangent        =            144.8248
Length         =            289.6406
Radius         =         14,988.0000
External       =              0.6997
Long Chord     =            289.6361
Mid. Ord.      =              0.6997
P.C.  Station            309+34.22  N      16,604,964.0674  E       1,239,438.3882
P.T.  Station            312+23.86  N      16,605,253.6993  E       1,239,439.9543
C.C.                                N      16,605,189.9254  E       1,224,452.0900
Back         = N   0° 51' 48.38" E
Ahead        = N   0° 14' 37.66" W
Chord Bear   = N   0° 18' 35.36" E

Course from PT I69E_SBFR_9 to 10 N 0° 14' 37.66" W Dist 1,096.7997

Point 10               N  16,606,350.4891 E    1,239,435.2875 Sta     323+20.66

Course from 10 to PC I69E_SBFR_14 N 0° 20' 31.70" W Dist 647.5302

                                    Curve Data
                                   *----------*
Curve I69E_SBFR_14
P.I.  Station            330+89.36  N      16,607,119.1838  E       1,239,430.6972
Delta          =       1° 23' 18.72" (LT)
Degree         =       0° 34' 22.65"
Tangent        =            121.1783
Length         =            242.3447
Radius         =         10,000.0000
External       =              0.7342
Long Chord     =            242.3388
Mid. Ord.      =              0.7341
P.C.  Station            329+68.19  N      16,606,998.0077  E       1,239,431.4208
P.T.  Station            332+10.53  N      16,607,240.3068  E       1,239,427.0374
C.C.                                N      16,606,938.2936  E       1,229,431.5991
Back         = N   0° 20' 31.70" W
Ahead        = N   1° 43' 50.42" W
Chord Bear   = N   1° 02' 11.06" W

Course from PT I69E_SBFR_14 to 11 N 1° 43' 50.42" W Dist 1,018.4292

Point 11               N  16,608,258.2714 E    1,239,396.2795 Sta     342+28.96

================================================================================
Ending chain I69E_SBFR description
```

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I-69E
HORIZONTAL
ALIGNMENT DATA

SHEET 05 OF 05

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	74
CHECKED	CONT.	SECT.	JOB	
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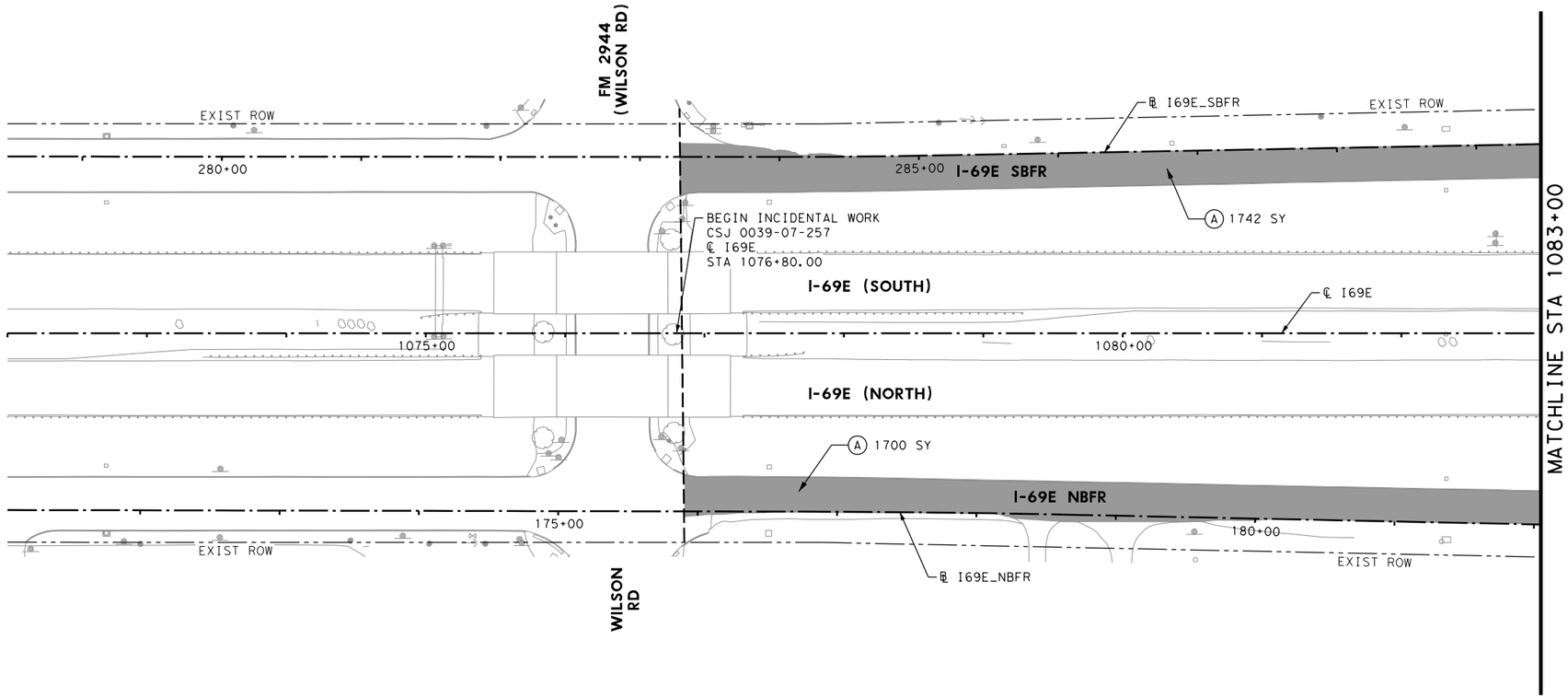
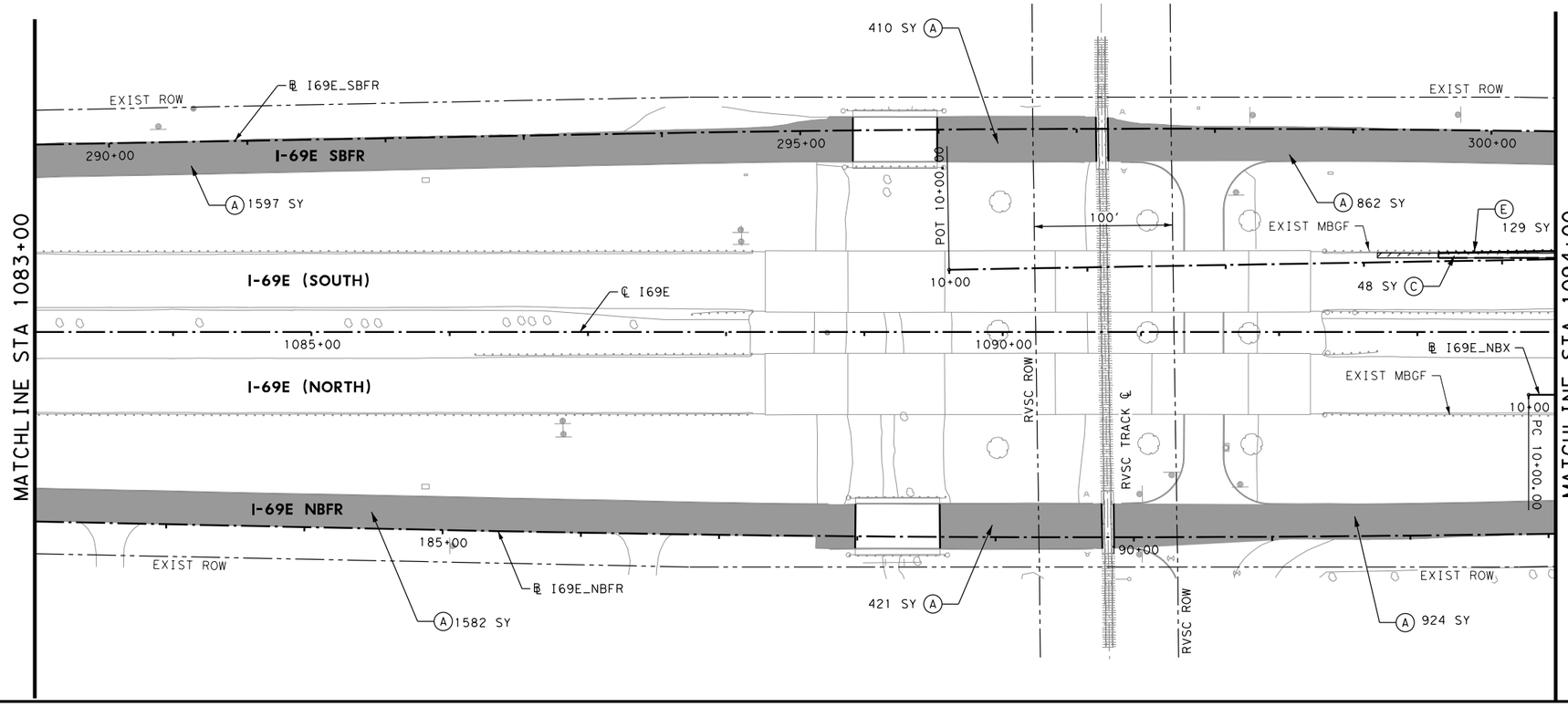
APPROVED				
XX				





0' 25' 50' 100'

N

LEGEND:

- DIRECTION OF TRAVEL
- EXISTING ROW
- (A) PLANE ASPHALT CONC PAV (1.5")
- (B) REMOVE CONC (DRVWY)
- (C) REMOVE STAB BASE AND ASPHALT PAV (4"-22")
- (D) REMOVE CONC CURB
- (E) REMOVE METAL BEAM GAURD FENCE
- (F) REMOVE TERMINAL ANCHOR SECTION
- (G) REMOVE GUARDRAIL END TREATMENT

NO.	DATE	REVISION	APPROVED

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I-69E
REMOVAL SHEETS

BEGIN TO STA 1094+00

SHEET 01 OF 03

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	75
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

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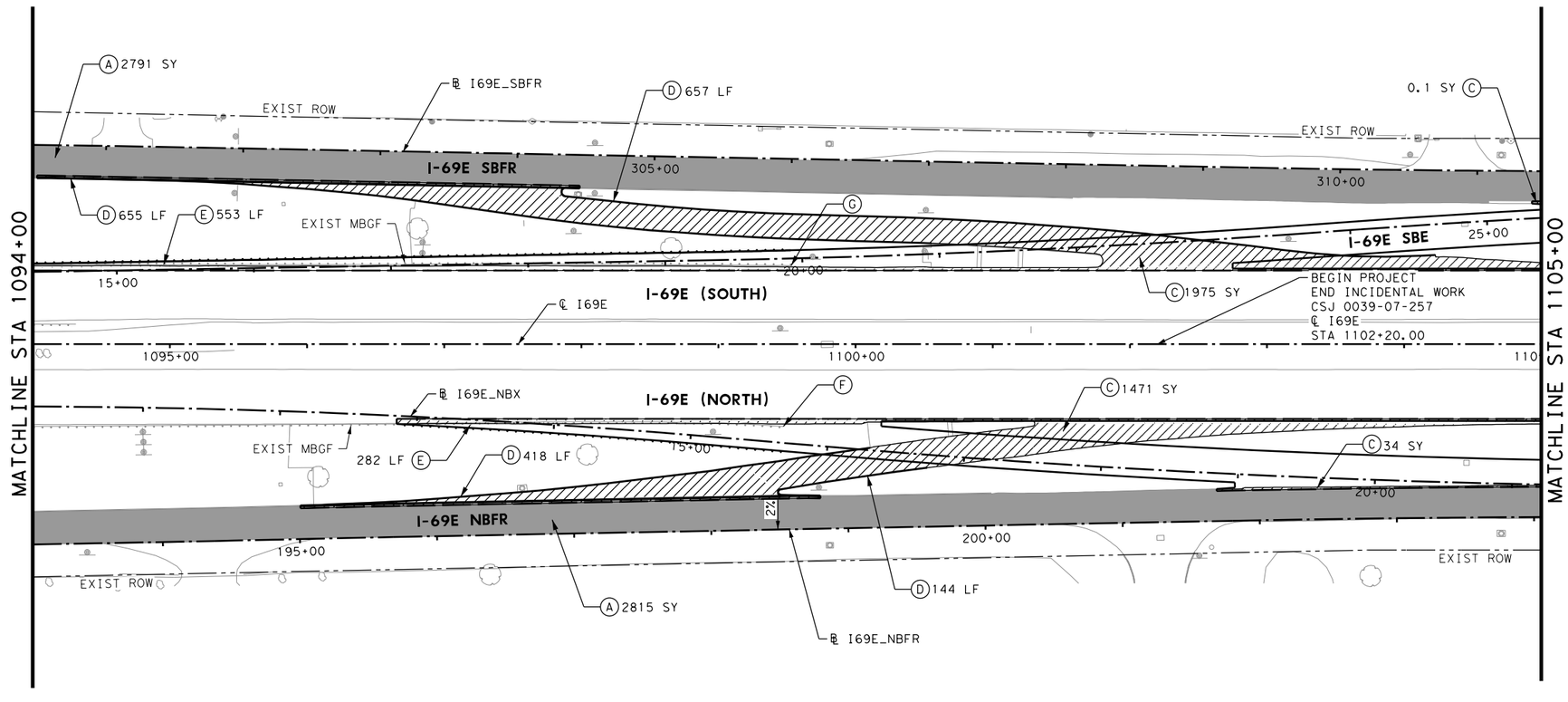

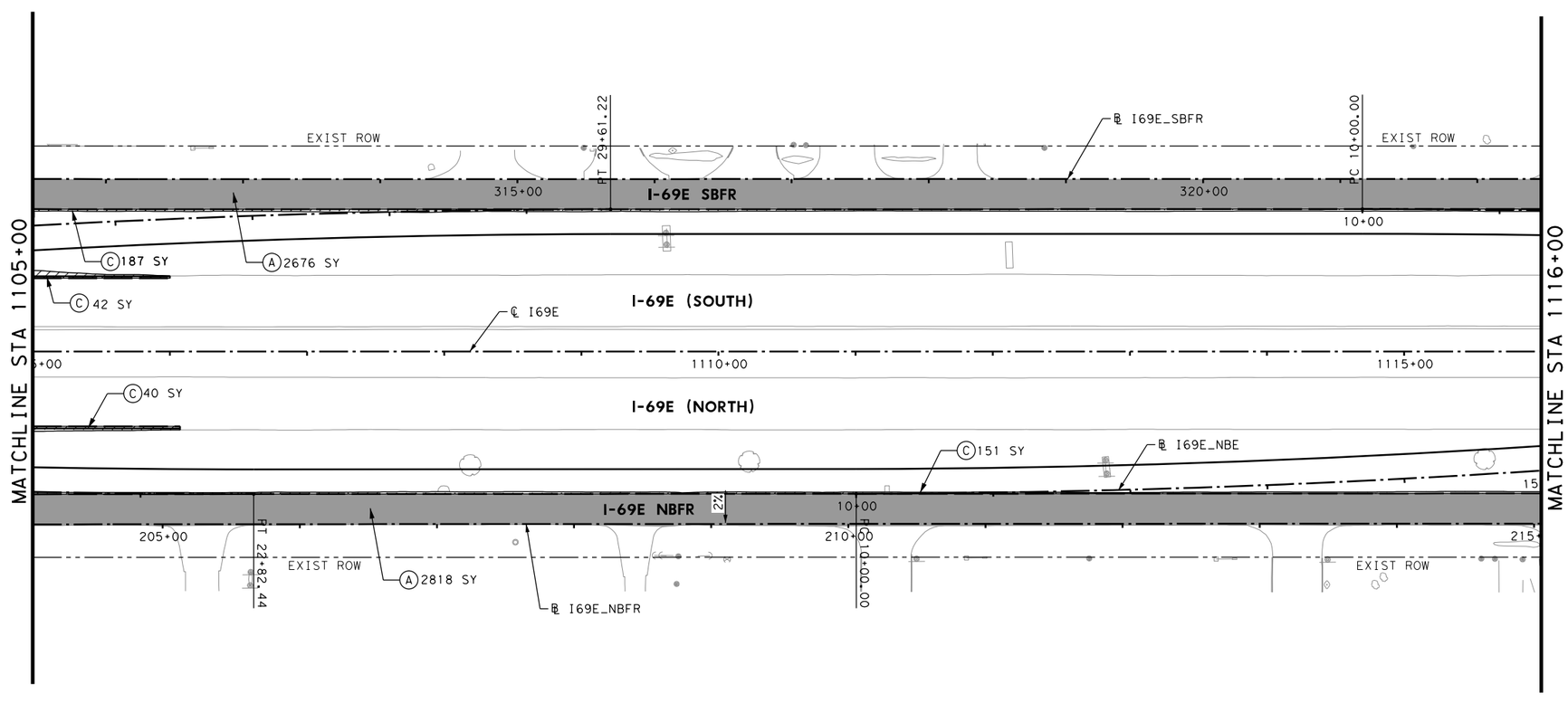

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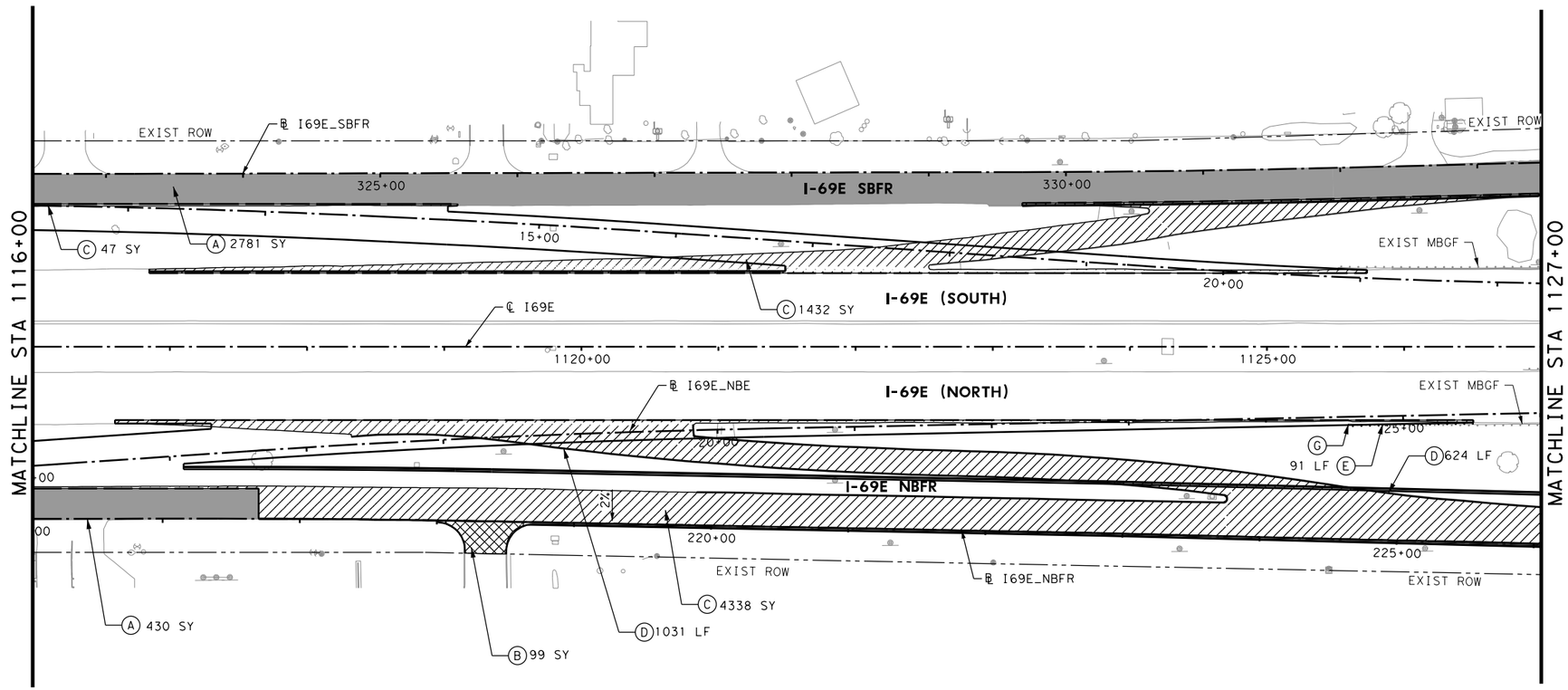
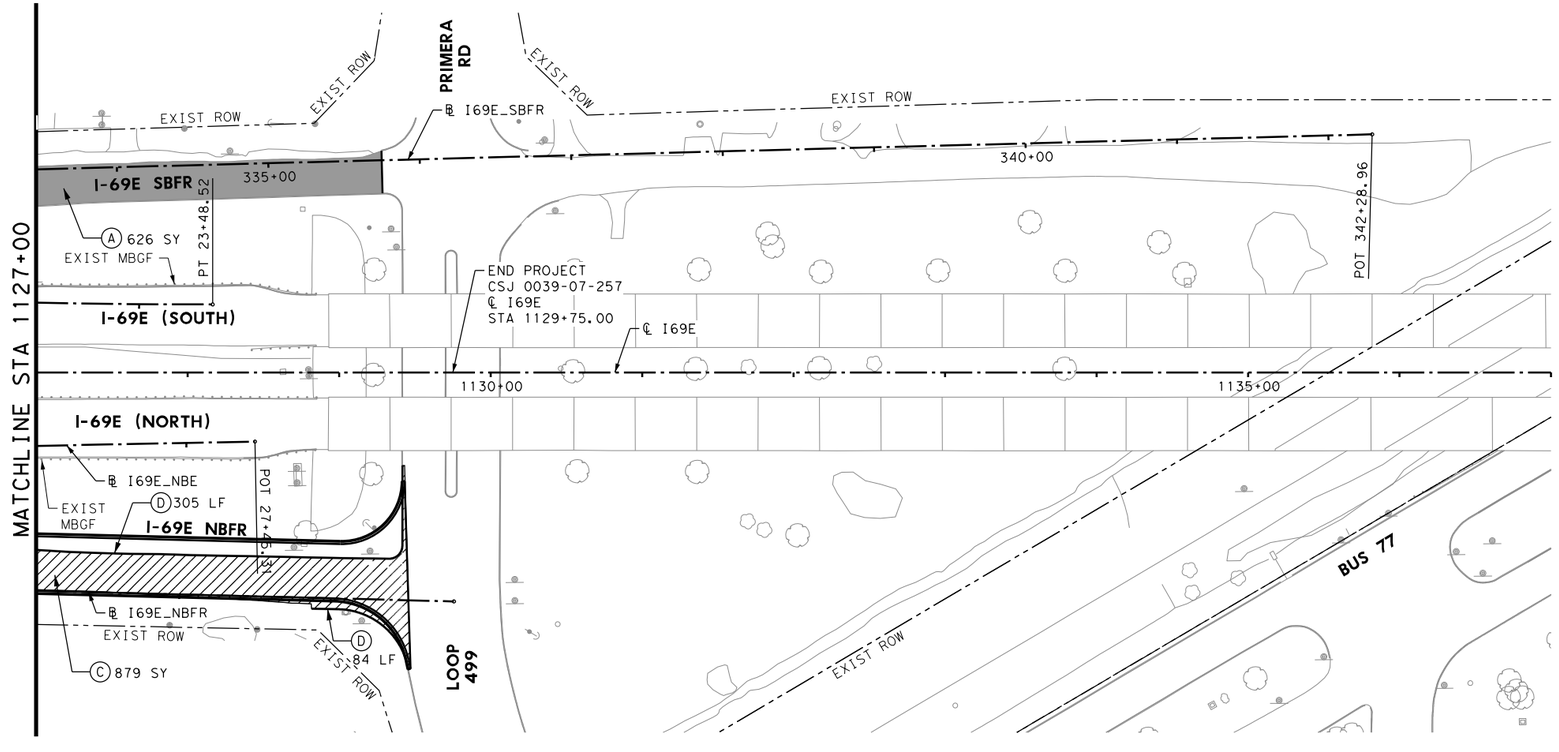
I-69E
REMOVAL SHEETS

STA 1094+00 TO STA 1116+00

SHEET 02 OF 03

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	76
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				





0' 25' 50' 100'

N

LEGEND:

- DIRECTION OF TRAVEL
- EXISTING ROW
- (A) PLANE ASPHALT CONC PAV (1.5")
- (B) REMOVE CONC (DRVWY)
- (C) REMOVE STAB BASE AND ASPHALT PAV (4"-22")
- (D) REMOVE CONC CURB
- (E) REMOVE METAL BEAM GAURD FENCE
- (F) REMOVE TERMINAL ANCHOR SECTION
- (G) REMOVE GUARDRAIL END TREATMENT

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I-69E
REMOVAL SHEETS

STA 1116+00 TO END

SHEET 03 OF 03

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	77
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

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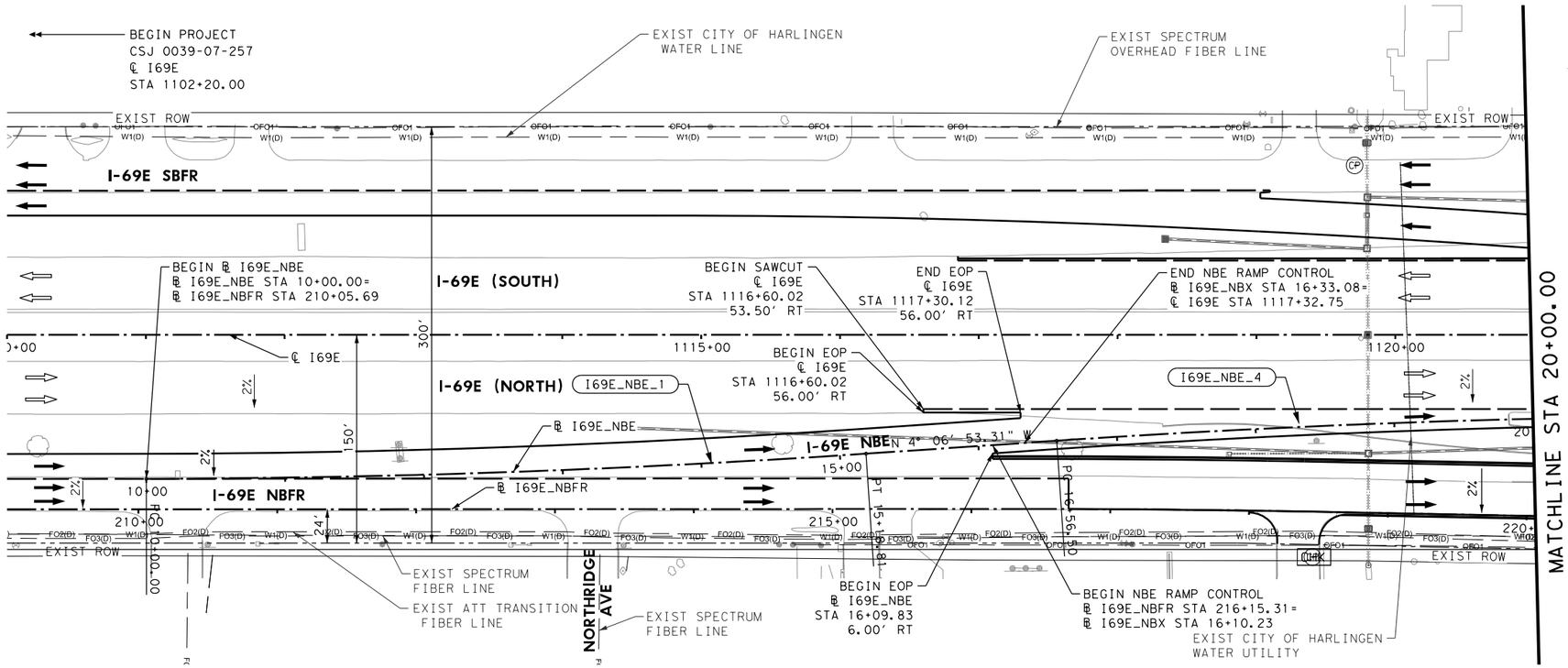
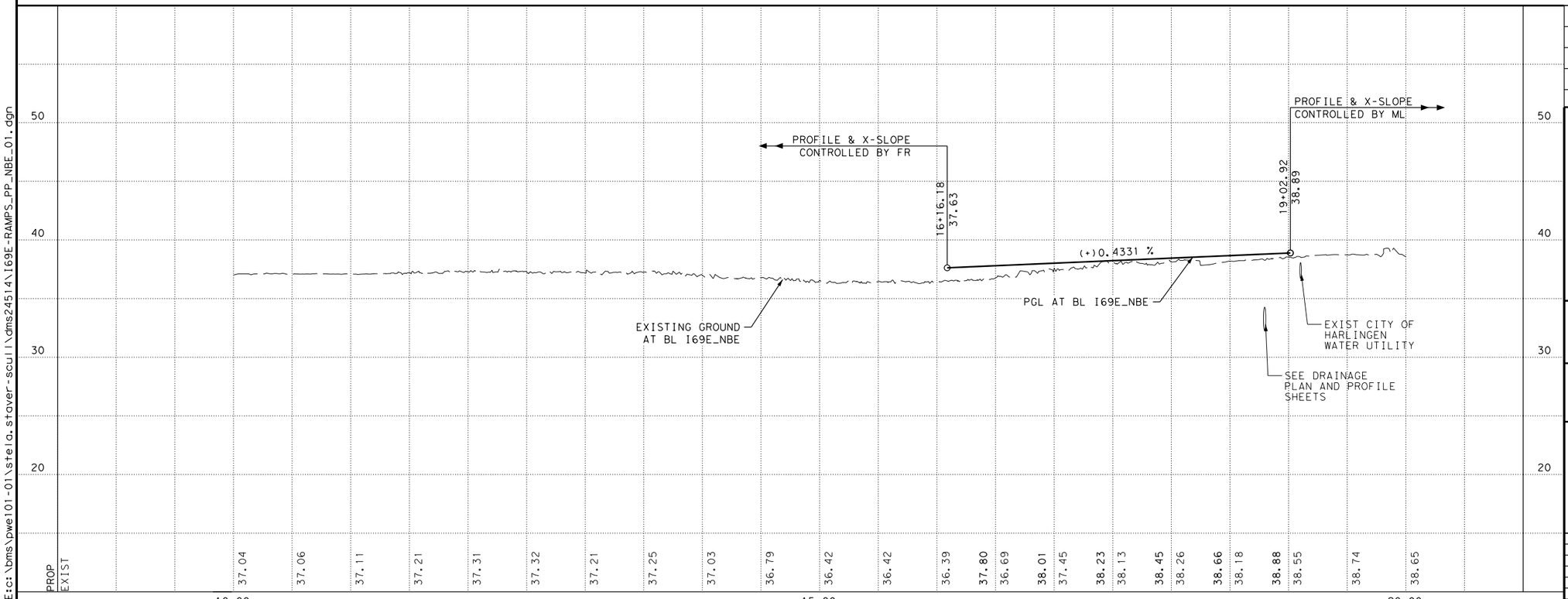


HORZ 0' 25' 50' 100'
VERT 0' 5' 10'

LEGEND:

- PROPOSED LANE
- EXISTING LANE
- PROPOSED SAWCUT
- PROPOSED MBGF
- XXXXX ALIGNMENT DATA
- EXISTING ROW

ITEM	DESCRIPTION	UNIT	EST.	FIN.
247	FL BS (RDWY DEL) (TYP. A GR 1-2)	CY	544	
275	CEMENT	TON	22	
275	CEMENT TREATED (NEW BASE) (20")	SY	979	
310	PRIME COAT (MC-30)	GAL	182	
316	ASPHALT (TIER II)	GAL	273	
316	ASPHALT (GR 4P)	CY	8	
3076	3.0" HMA TYPE "B" PG64-22	TON	155	
3077	1.5" SP-D SMA SAC-A PG76-22	TON	78	
3084	BONDING COURSE	GAL	182	
5001	GEOGRID BASE REINFORCEMENT (TY II)	SY	1029	



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I-69E
PLAN & PROFILE
NBE RAMP
STA 10+00 TO STA 20+00

SHEET 01 OF 02

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	78
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

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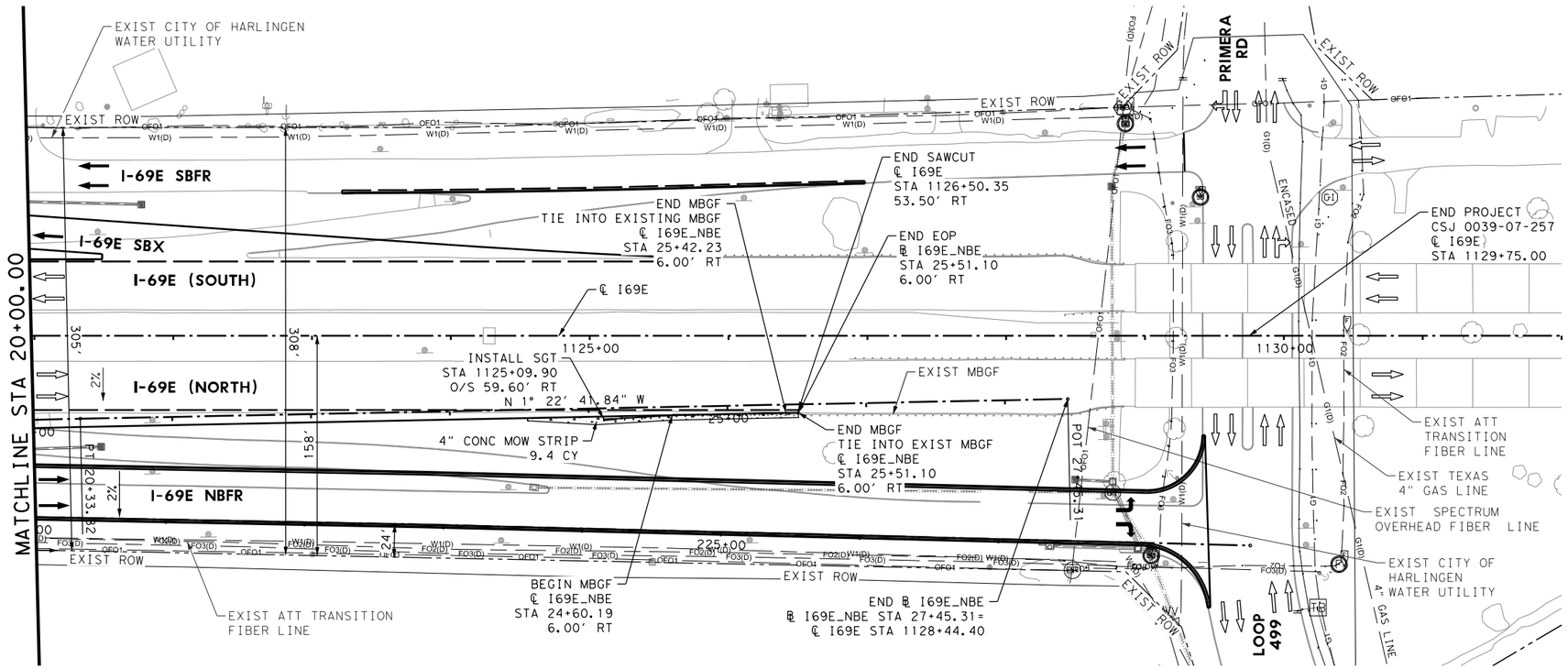


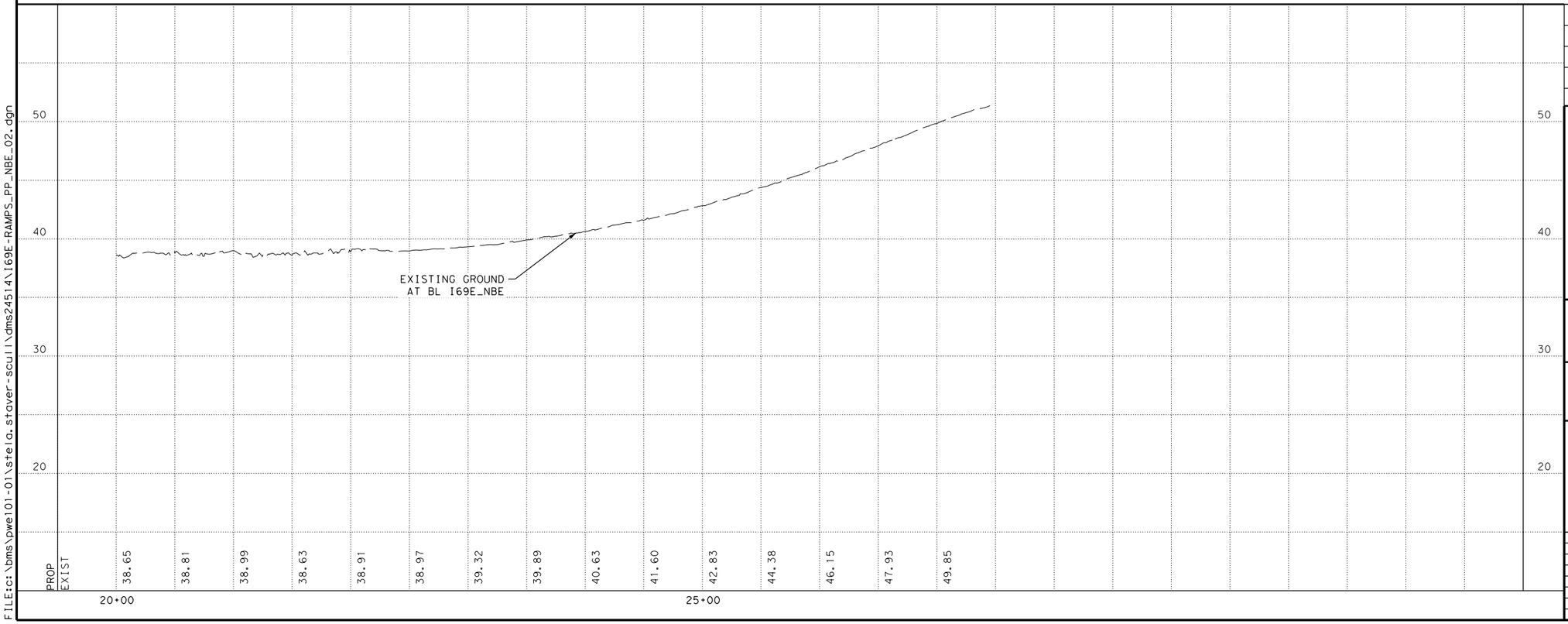
HORZ 0' 25' 50' 100'
VERT 0' 5' 10'

N

LEGEND:

- PROPOSED LANE
- EXISTING LANE
- PROPOSED SAWCUT
- PROPOSED MBGF
- XXXXX ALIGNMENT DATA
- EXISTING ROW

ITEM	DESCRIPTION	UNIT	EST.	FIN.
247	FL BS (RDWY DEL) (TYP. A GR 1-2)	CY	297	
275	CEMENT	TON	12	
275	CEMENT TREATED (NEW BASE) (20")	SY	534	
310	PRIME COAT (MC-30)	GAL	91	
316	ASPHALT (TIER II)	GAL	136	
316	ASPHALT (GR 4P)	CY	4	
432	RIPRAP (MOW STRIP) (4 IN)	CY	10	
540	MTL W-BEA, GD FEN (TIM POST)	LF	91	
544	GUARDRAIL END TREATMENT (INSTALL)	EA	1	
3076	3.0" HMA TYPE "B" PG64-22	TON	77	
3077	1.5" SP-D SMA SAC-A PG76-22	TON	39	
3084	BONDING COURSE	GAL	91	
5001	GEOGRID BASE REINFORCEMENT (TY II)	SY	618	



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12/21/2022

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I-69E
PLAN & PROFILE
NBE RAMP
STA 20+00 TO STA 27+45.31

SHEET 02 OF 02

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	79
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

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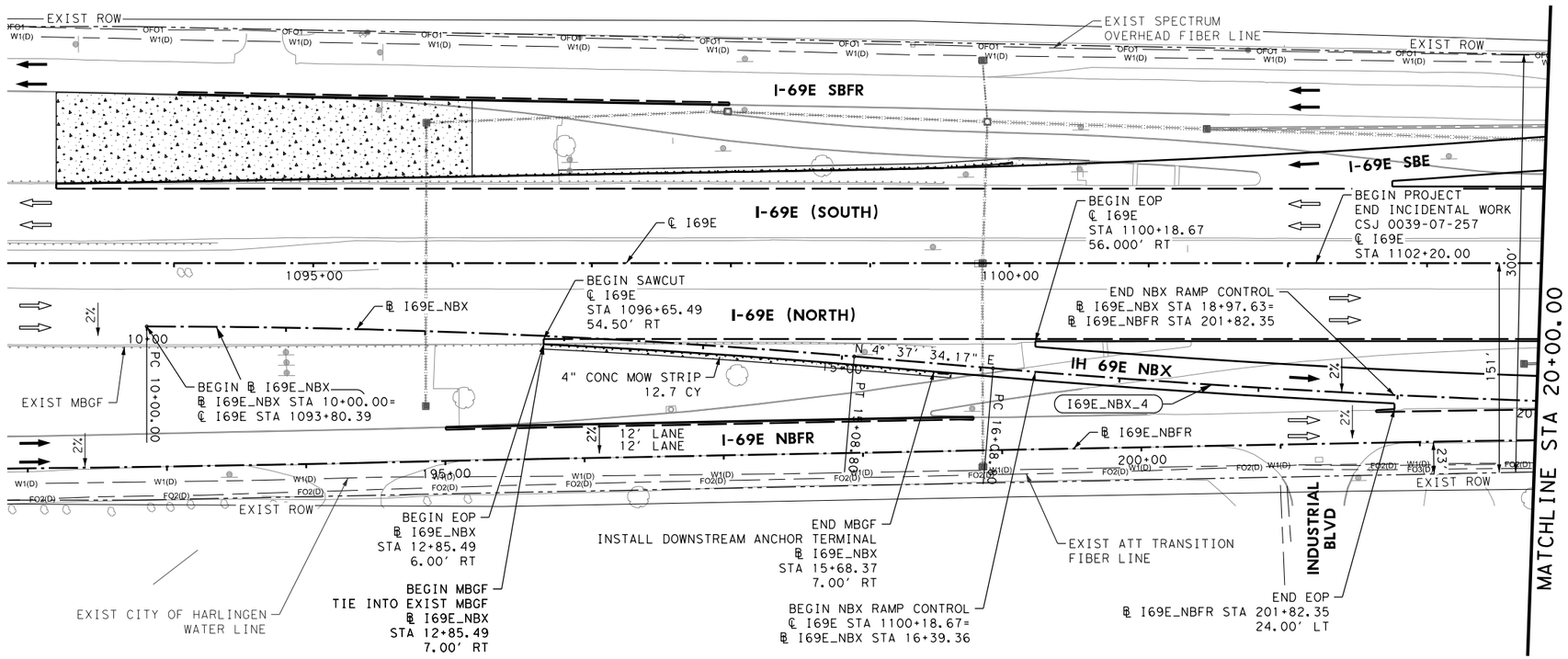
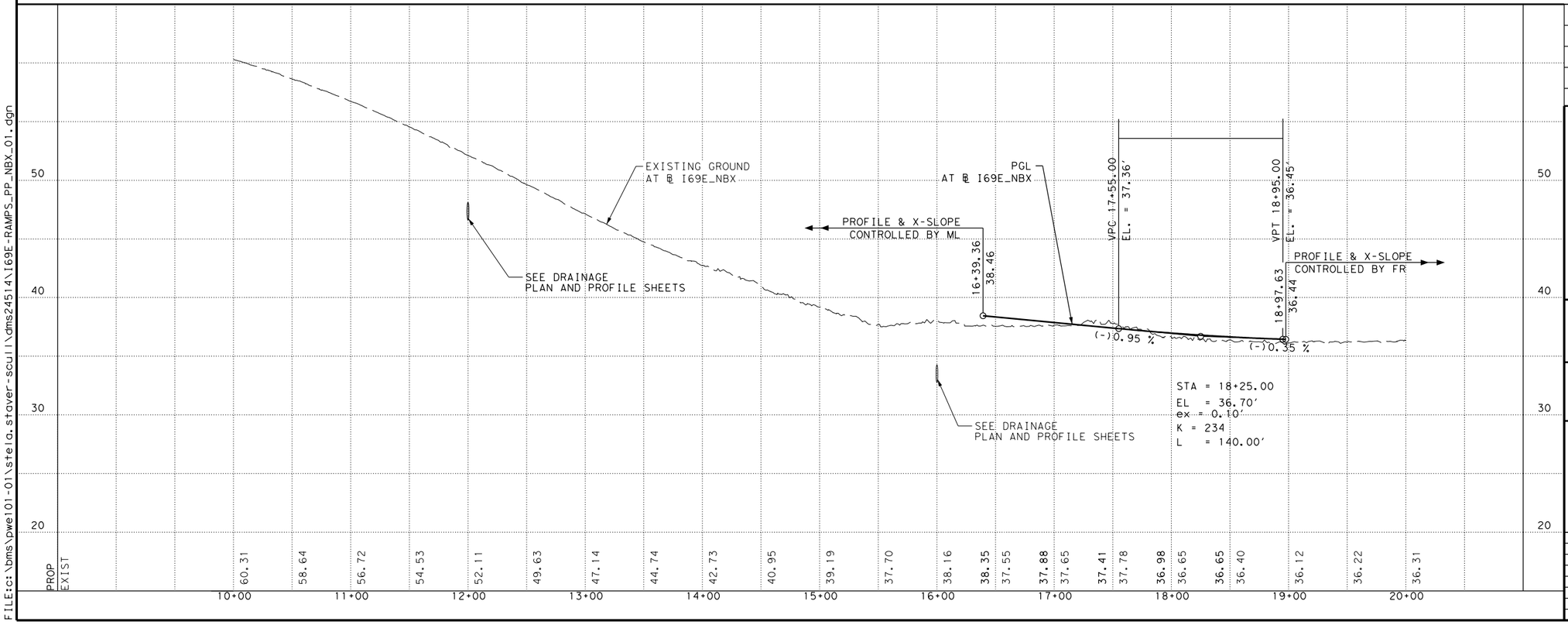


LEGEND:

- PROPOSED LANE
- EXISTING LANE
- PROPOSED SAWCUT
- PROPOSED MBGF
- XXXXX ALIGNMENT DATA
- EXISTING ROW

ITEM	DESCRIPTION	UNIT	EST.	FIN.
247	FL BS (RDWY DEL) (TYP. A GR 1-2)	TON	855	
275	CEMENT	TON	34	
275	CEMENT TREATED (NEW BASE) (20")	SY	1540	
310	PRIME COAT (MC-30)	GAL	272	
316	ASPHALT (TIER II)	GAL	408	
316	ASPHALT (GR 4P)	CY	11	
432	RIPRAP (MOW STRIP) (4 IN)	CY	13	
540	MTL W-BEAM GD FEN (TIM POST)	LF	272	
3076	3.0" HMA TYPE "B" PG64-22	TON	232	
3077	1.5" SP-D SMA SAC-A PG76-22	TON	116	
3084	BONDING COURSE	GAL	272	
5001	GEOGRID BASE REINFORCEMENT (TY II)	SY	1720	



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I-69E
PLAN & PROFILE
NBX RAMP
STA 10+00 TO STA 20+00

SHEET 01 OF 02

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	80
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

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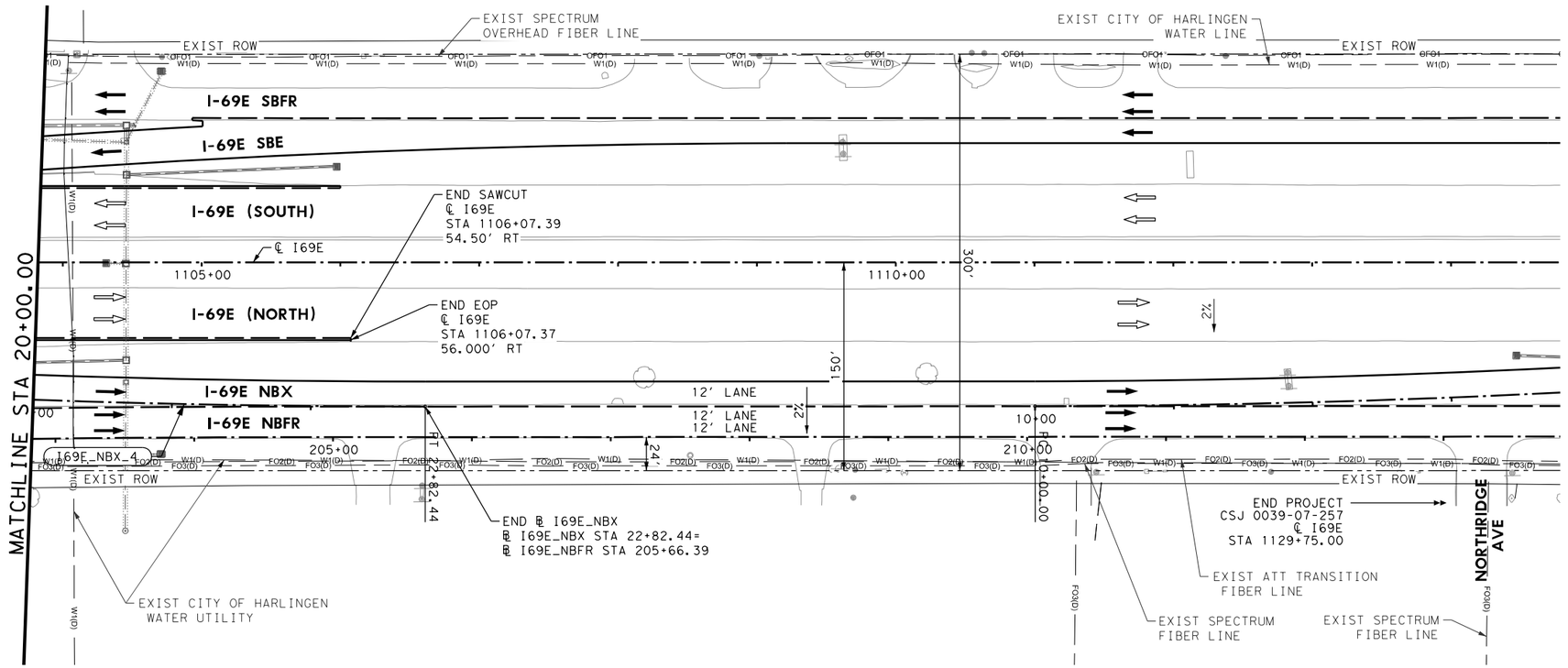


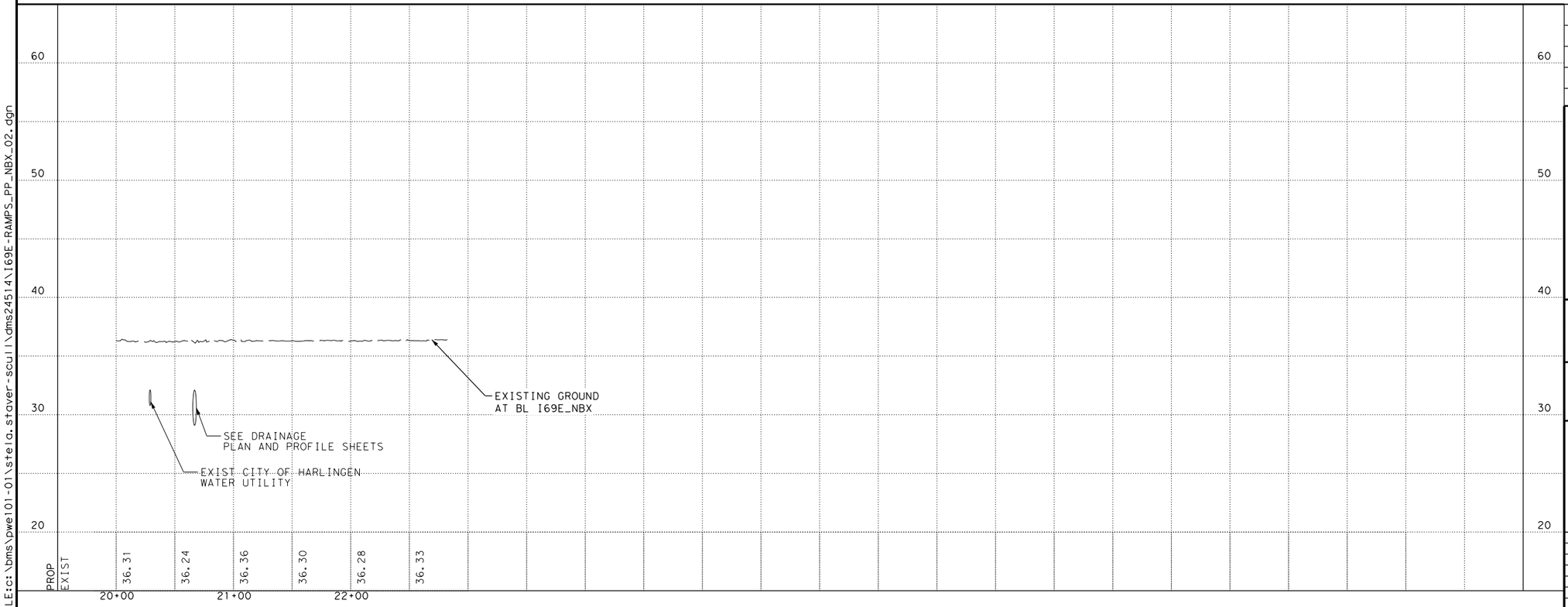
HORZ 0' 25' 50' 100'
VERT 0' 5' 10'

N

LEGEND:

- PROPOSED LANE
- EXISTING LANE
- PROPOSED SAWCUT
- PROPOSED MBGF
- XXXXX ALIGNMENT DATA
- EXISTING ROW

ITEM	DESCRIPTION	UNIT	EST.	FIN.
247	FL BS (RDWY DEL) (TYP. A GR 1-2)	TON	40	
275	CEMENT	TON	2	
275	CEMENT TREATED (NEW BASE) (20")	SY	72	
310	PRIME COAT (MC-30)	GAL	8	
316	ASPHALT (TIER II)	GAL	12	
316	ASPHALT (GR 4P)	CY	1	
3076	3.0" HMA TYPE "B" PG64-22	TON	6	
3077	1.5" SP-D SMA SAC-A PG76-22	TON	4	
3084	BONDING COURSE	GAL	8	
5001	GEOGRID BASE REINFORCEMENT (TY II)	SY	106	



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I-69E
PLAN & PROFILE
NBX RAMP
STA 20+00 TO END

SHEET 02 OF 02

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED XX	STATE	DIST.	COUNTY	SHEET NO.
CHECKED XX	TEXAS	PHR	CAMERON	81
APPROVED XX	CONT.	SECT.	JOB	
	0039	07	257	

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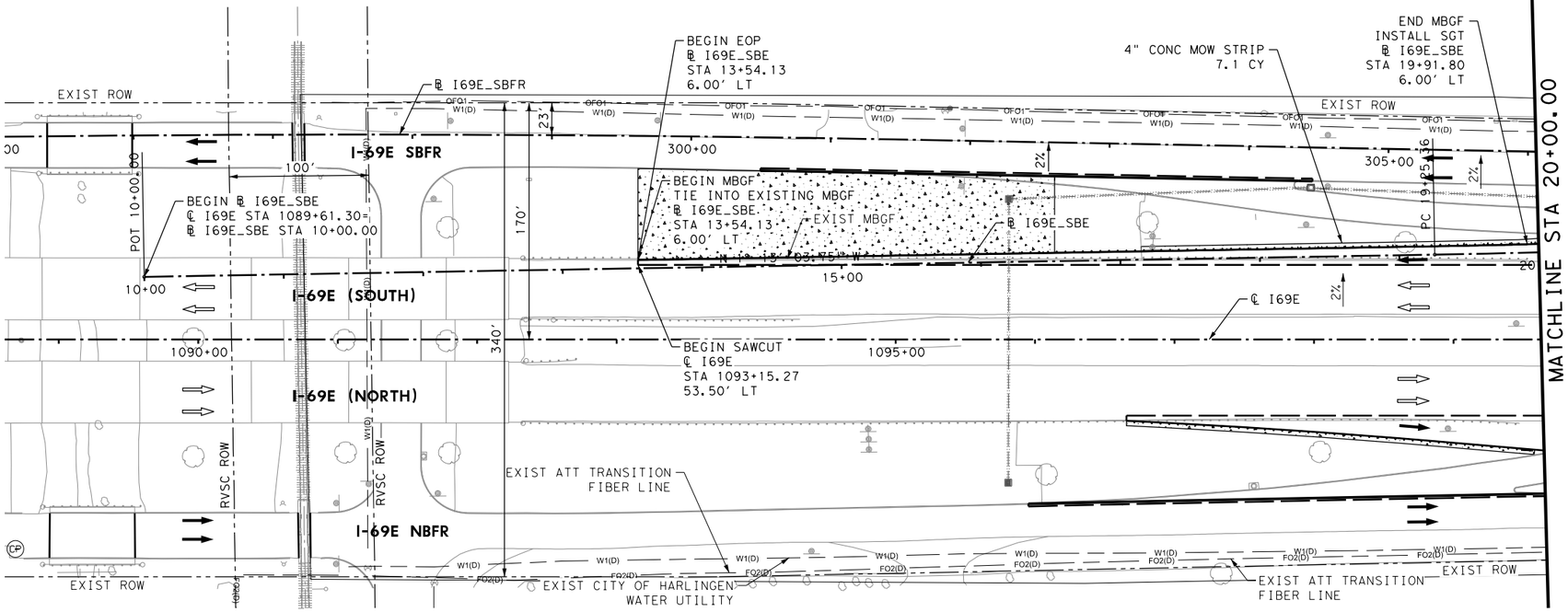


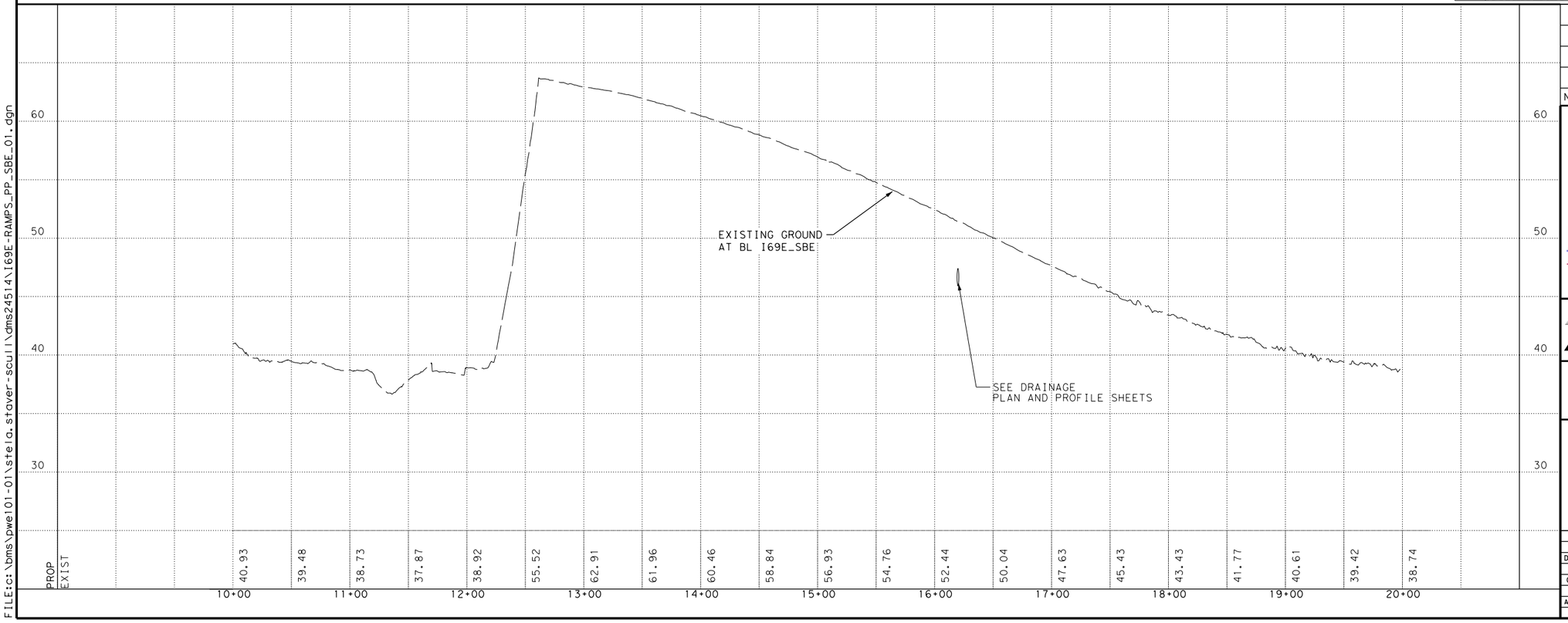
HORZ 0' 25' 50' 100'
VERT 0' 5' 10'

N

LEGEND:

- PROPOSED LANE
- EXISTING LANE
- PROPOSED SAWCUT
- PROPOSED MBGF
- XXXXX ALIGNMENT DATA
- EXISTING ROW

ITEM	DESCRIPTION	UNIT	EST.	FIN.
247	FL BS (RDWY DEL) (TYP. A GR 1-2)	TON	418	
275	CEMENT	TON	17	
275	CEMENT TREATED (NEW BASE) (20")	SY	753	
310	PRIME COAT (MC-30)	GAL	132	
316	ASPHALT (TIER II)	GAL	198	
316	ASPHALT (GR 4P)	CY	5	
432	RIPRAP (MOW STRIP) (4 IN)	CY	8	
540	MTL W-BEA, GD FEN (TIM POST)	LF	682	
544	GUARDRAIL END TREATMENT (INSTALL)	EA	1	
3076	3.0" HMA TYPE "B" PG64-22	TON	112	
3077	1.5" SP-D SMA SAC-A PG76-22	TON	56	
3084	BONDING COURSE	GAL	131	
5001	GEOGRID BASE REINFORCEMENT (TY II)	SY	849	



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I-69E
PLAN & PROFILE
SBE RAMP
BEGIN TO STA 20+00

SHEET 01 OF 02

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	
CHECKED	CONT.	SECT.	JOB	82
XX	0039	07	257	
APPROVED				
XX				

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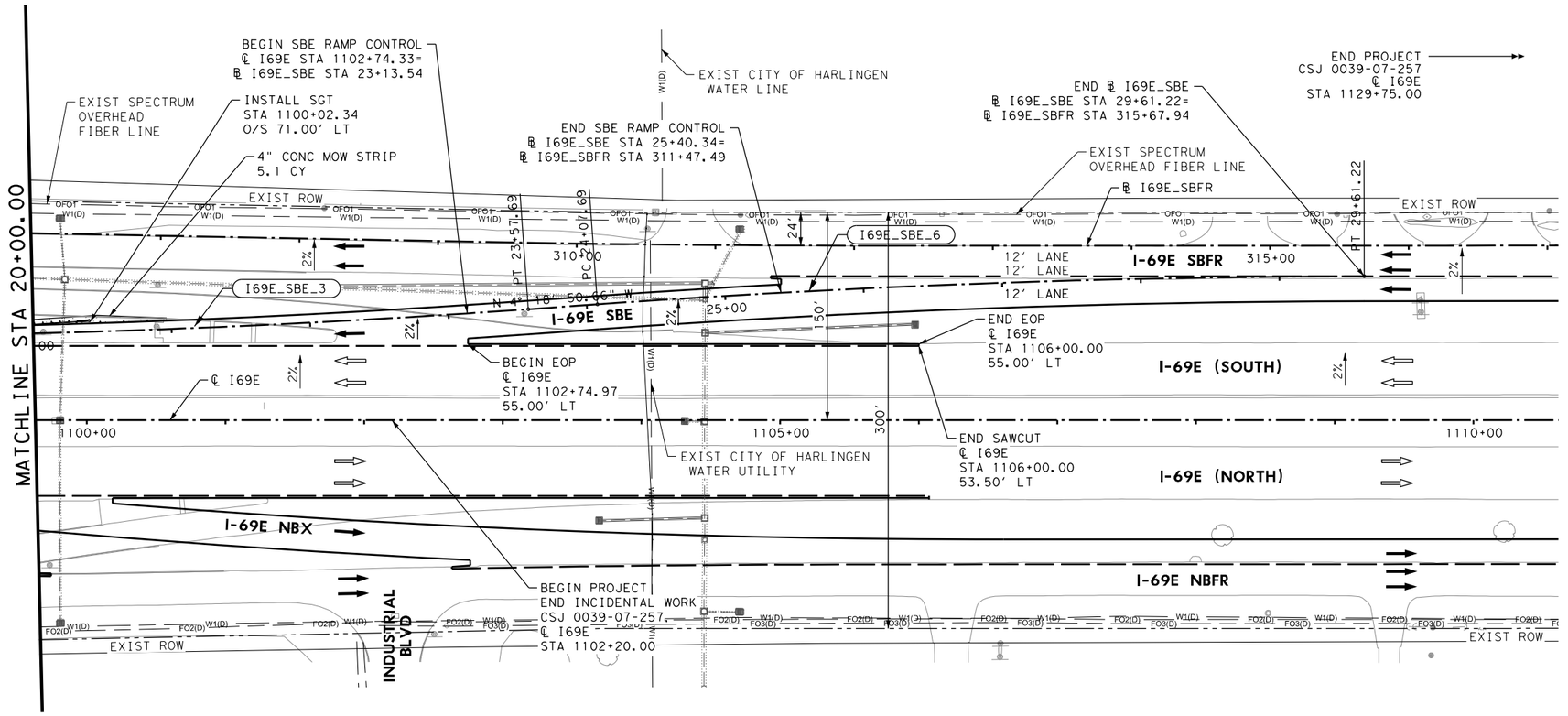
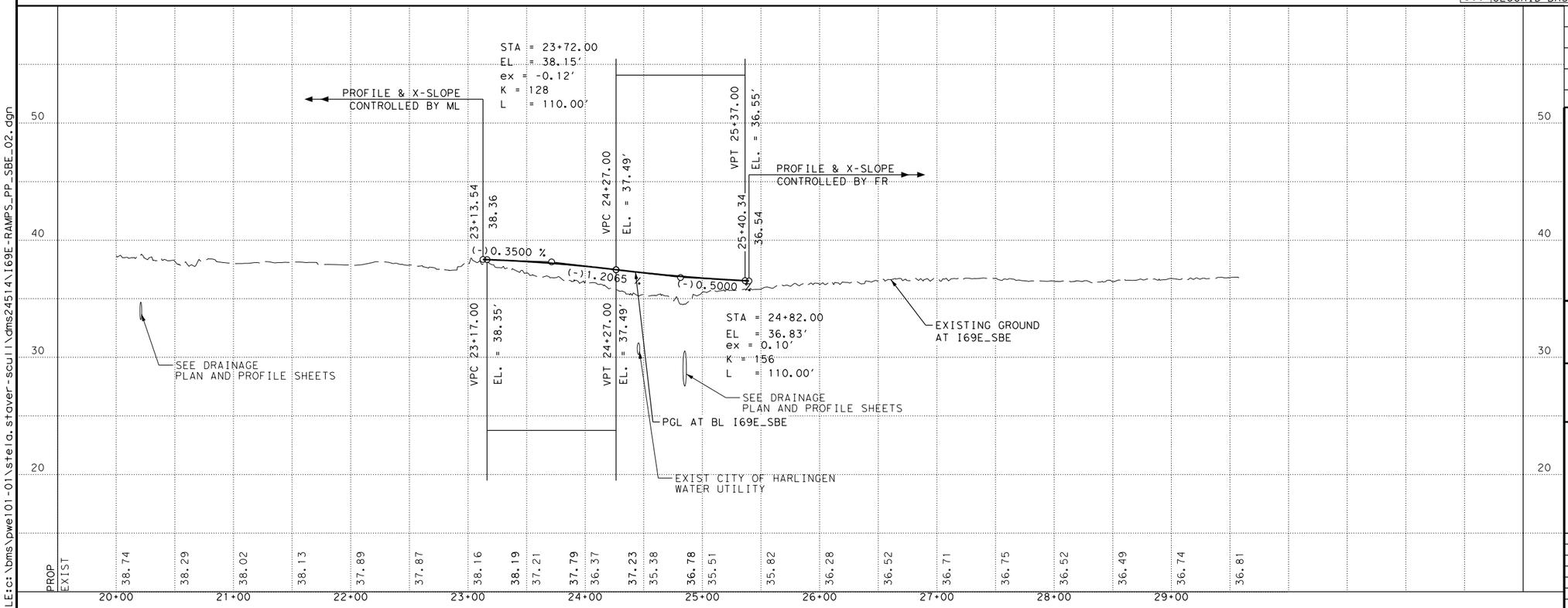


ITEM	DESCRIPTION	UNIT	EST.	FIN.
247	FL BS (RDWY DEL) (TYP. A GR 1-2)	TON	867	
275	CEMENT	TON	34	
275	CEMENT TREATED (NEW BASE) (20")	SY	1561	
310	PRIME COAT (MC-30)	GAL	280	
316	ASPHALT (TIER II)	GAL	420	
316	ASPHALT (GR 4P)	CY	12	
432	RIPRAP (MOW STRIP) (4 IN)	CY	6	
3076	3.0" HMA TYPE "B" PG64-22	TON	239	
3077	1.5" SP-D SMA SAC-A PG76-22	TON	120	
3084	BONDING COURSE	GAL	280	
5001	GEOGRID BASE REINFORCEMENT (TY II)	SY	1721	



NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
NICOLAS C. GARCIA
99410
LICENSED
PROFESSIONAL ENGINEER

Nicolas C. Garcia, P.E.

12/21/2022

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I-69E
PLAN & PROFILE
SBE RAMP
STA 20+00 TO END

SHEET 02 OF 02

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	83
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

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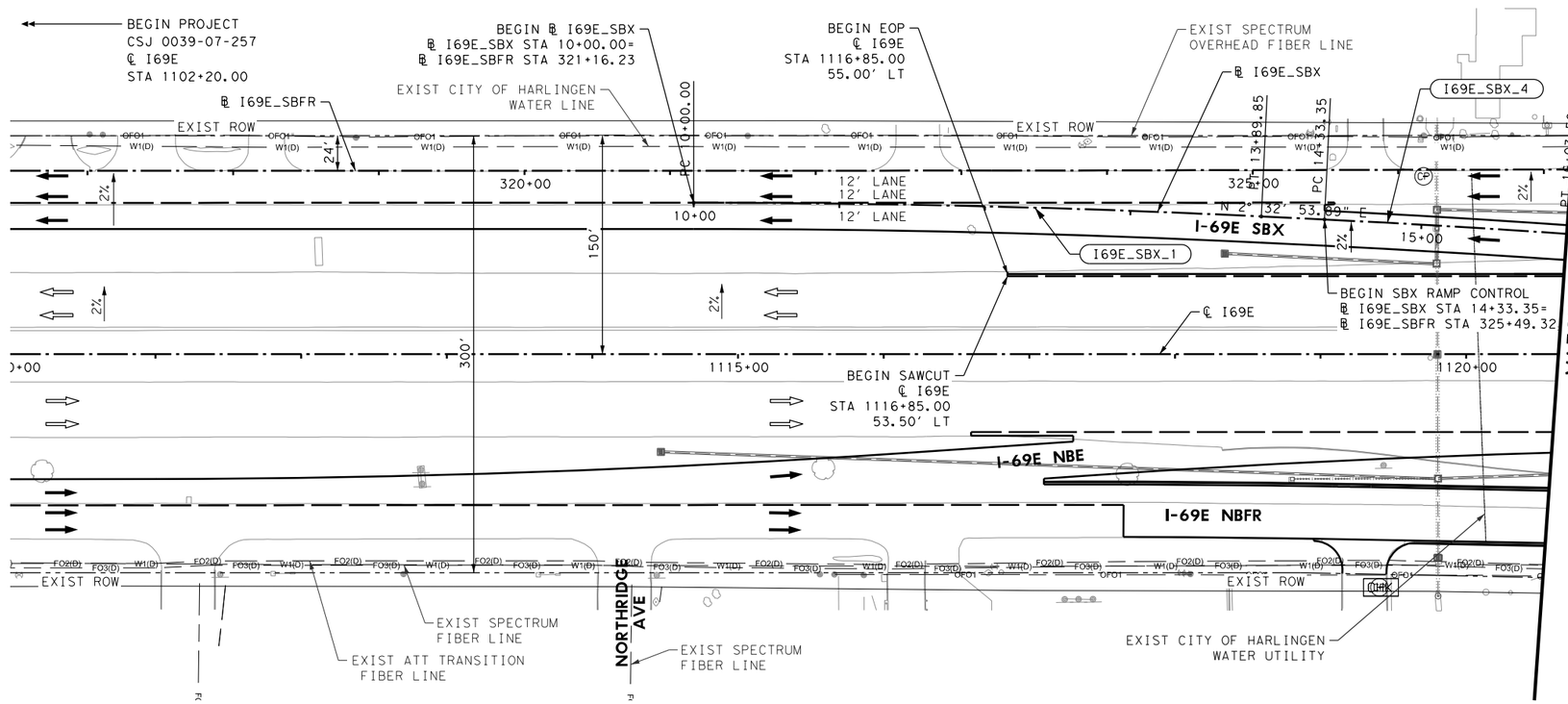
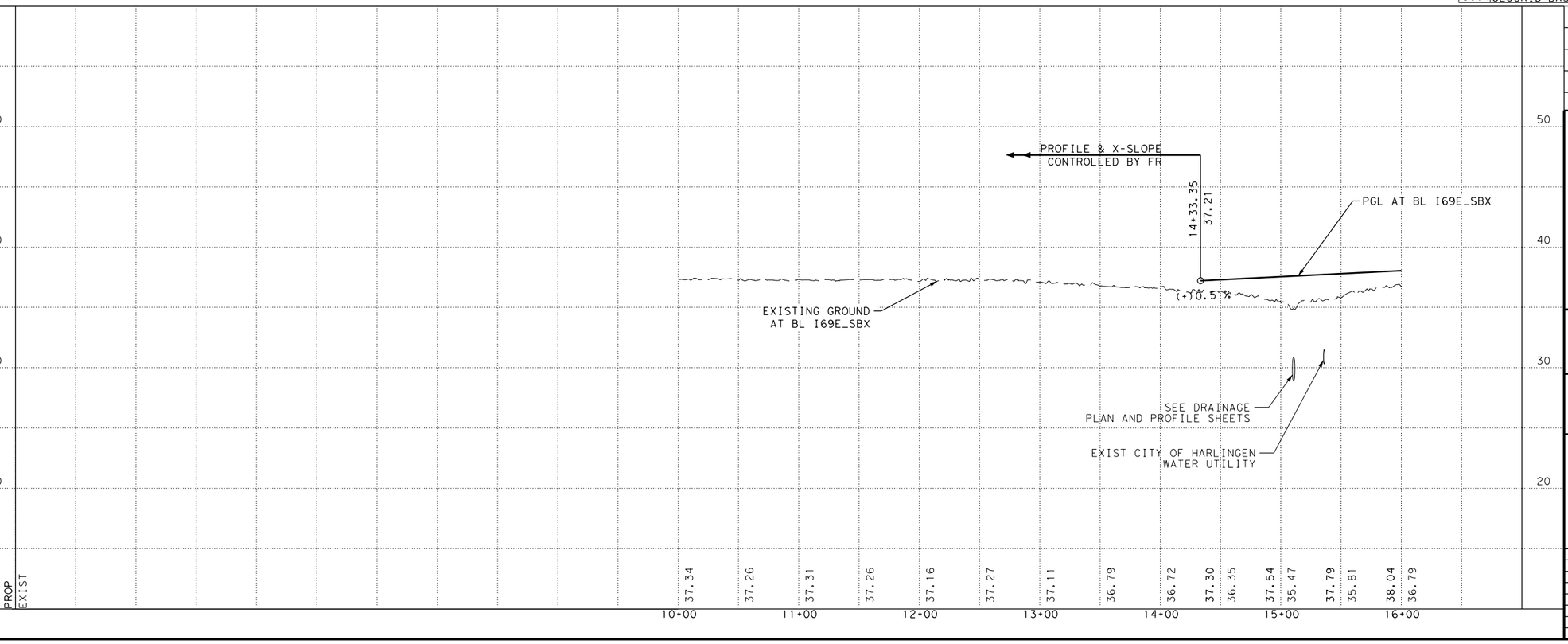


ITEM	DESCRIPTION	UNIT	EST.	FIN.
247	FL BS (RDWY DEL) (TYP. A GR 1-2)	TON	341	
275	CEMENT	TON	14	
275	CEMENT TREATED (NEW BASE) (20")	SY	613	
310	PRIME COAT (MC-30)	GAL	102	
316	ASPHALT (TIER II)	GAL	153	
316	ASPHALT (GR 4P)	CY	4	
3076	3.0" HMA TYPE "B" PG64-22	TON	87	
3077	1.5" SP-D SMA SAC-A PG76-22	TON	44	
3084	BONDING COURSE	GAL	101	
5001	GEOGRID BASE REINFORCEMENT (TY II)	SY	719	



NO.	DATE	REVISION	APPROVED

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PLAN & PROFILE
SBX RAMP
BEGIN TO STA 16 + 00

SHEET 01 OF 02

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	84
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

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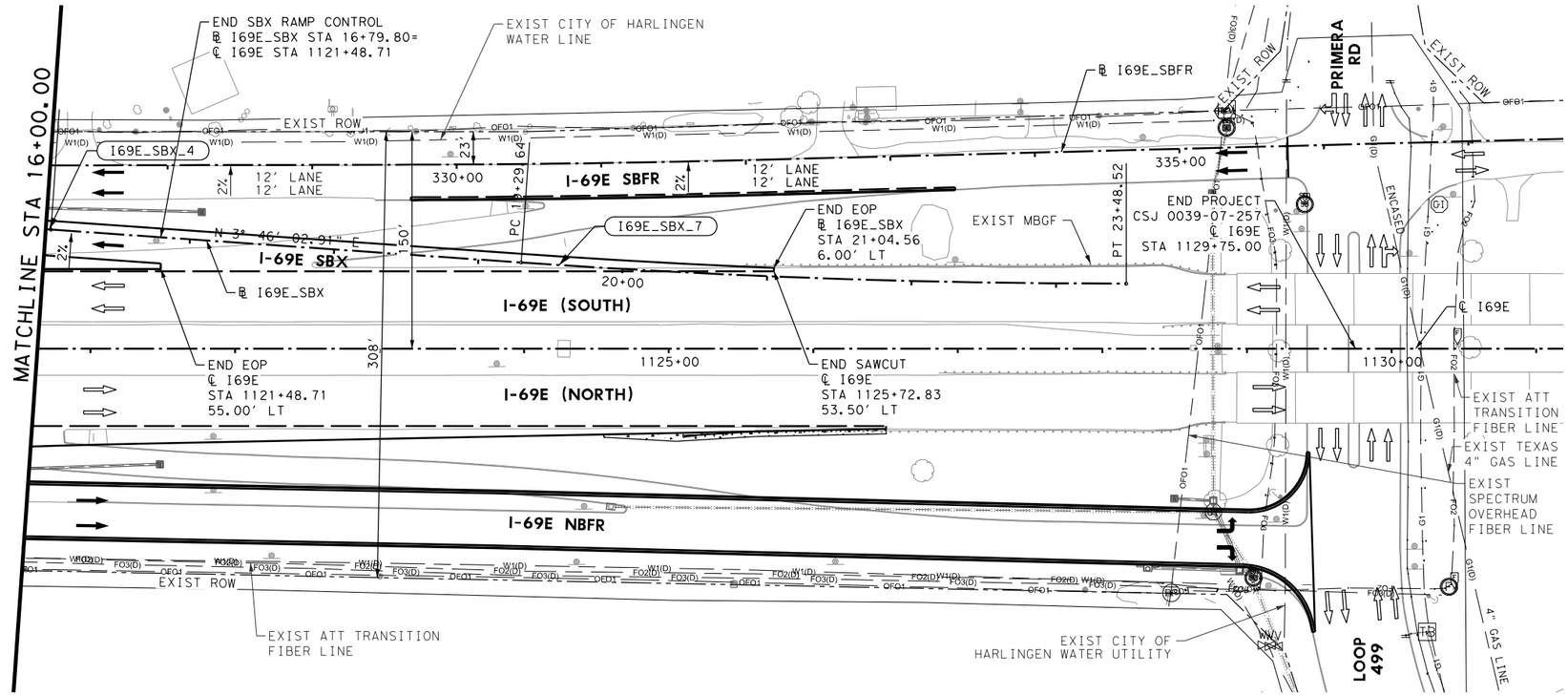
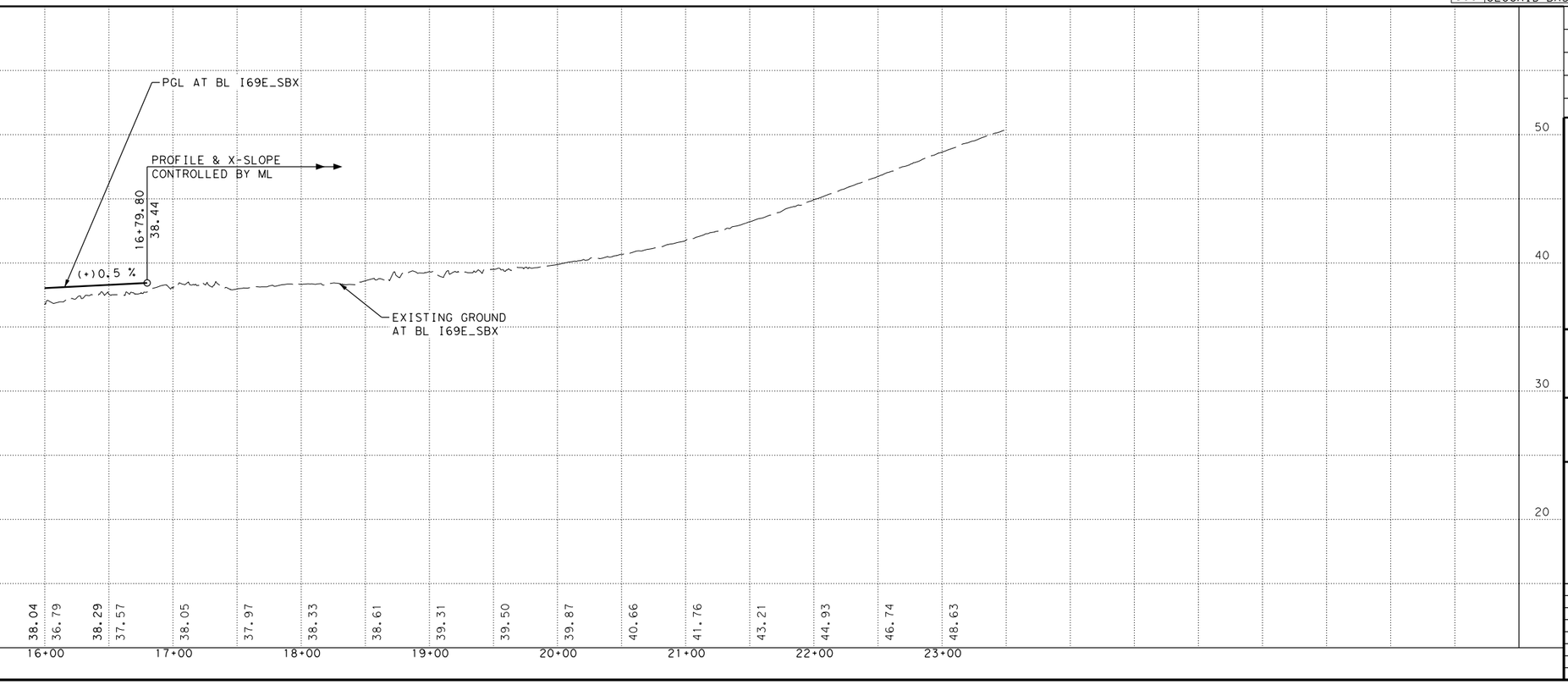


ITEM	DESCRIPTION	UNIT	EST.	FIN.
247	FL BS (RDWY DEL) (TYP. A GR 1-2)	TON	576	
275	CEMENT	TON	23	
275	CEMENT TREATED (NEW BASE) (20")	SY	1038	
310	PRIME COAT (MC-30)	GAL	188	
316	ASPHALT (TIER II)	GAL	282	
316	ASPHALT (GR 4P)	CY	8	
3076	3.0" HMA TYPE "B" PG64-22	TON	160	
3077	1.5" SP-D SMA SAC-A PG76-22	TON	80	
3084	BONDING COURSE	GAL	188	
5001	GEOGRID BASE REINFORCEMENT (TY II)	SY	1135	



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I-69E
PLAN & PROFILE
SBX RAMP
STA 16+00 TO END

SHEET 02 OF 02

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	85
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

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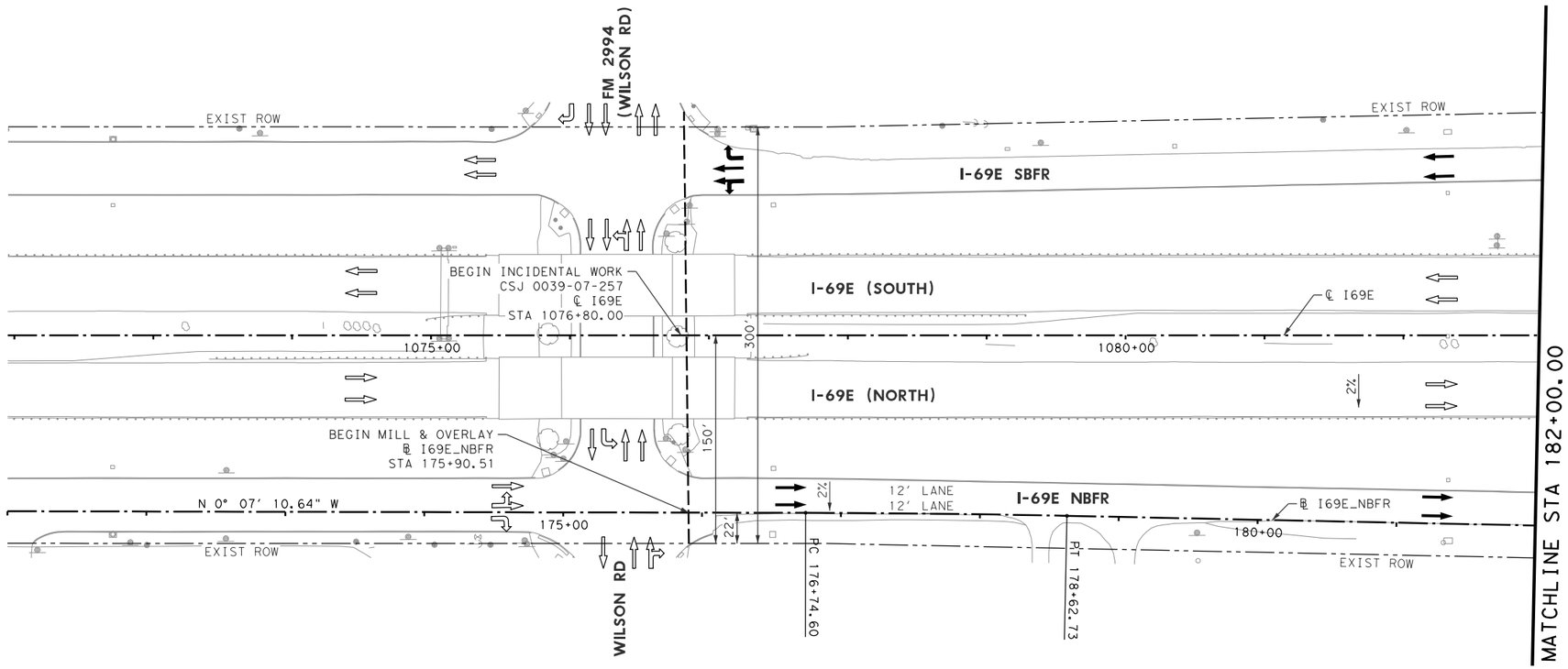


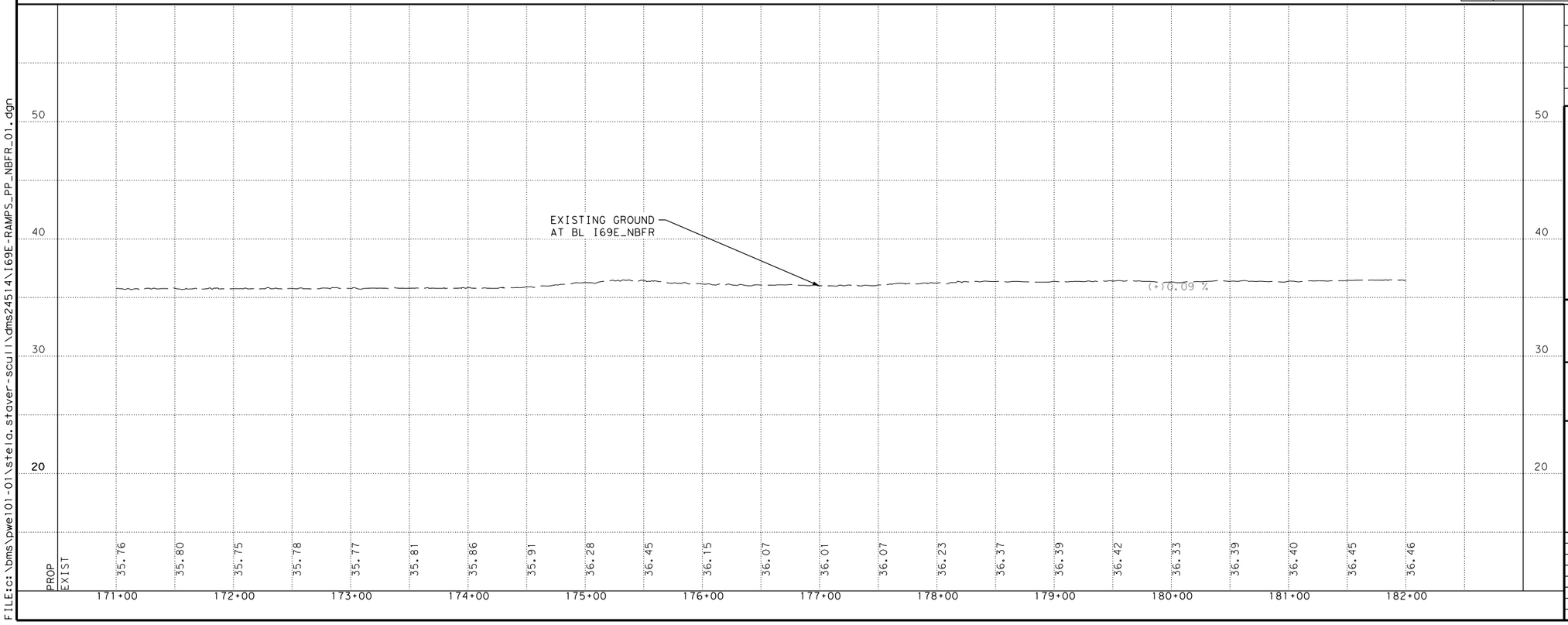
HORZ 0' 25' 50' 100'
VERT 0' 5' 10'

N

LEGEND:

- PROPOSED LANE
- EXISTING LANE
- PROPOSED SAWCUT
- PROPOSED MBGF
- XXXXX ALIGNMENT DATA
- EXISTING ROW

ITEM	DESCRIPTION	UNIT	EST.	FIN.
3077	1.5" SP-D SMA SAC-A PG76-22	TON	145	



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PLAN & PROFILE
NORTHBOUND FRONTAGE ROAD
STA 171+00 TO STA 182+00

SHEET 01 OF 06

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED XX	STATE	DIST.	COUNTY	SHEET NO.
CHECKED XX	TEXAS	PHR	CAMERON	86
APPROVED XX	CONT.	SECT.	JOB	
	0039	07	257	

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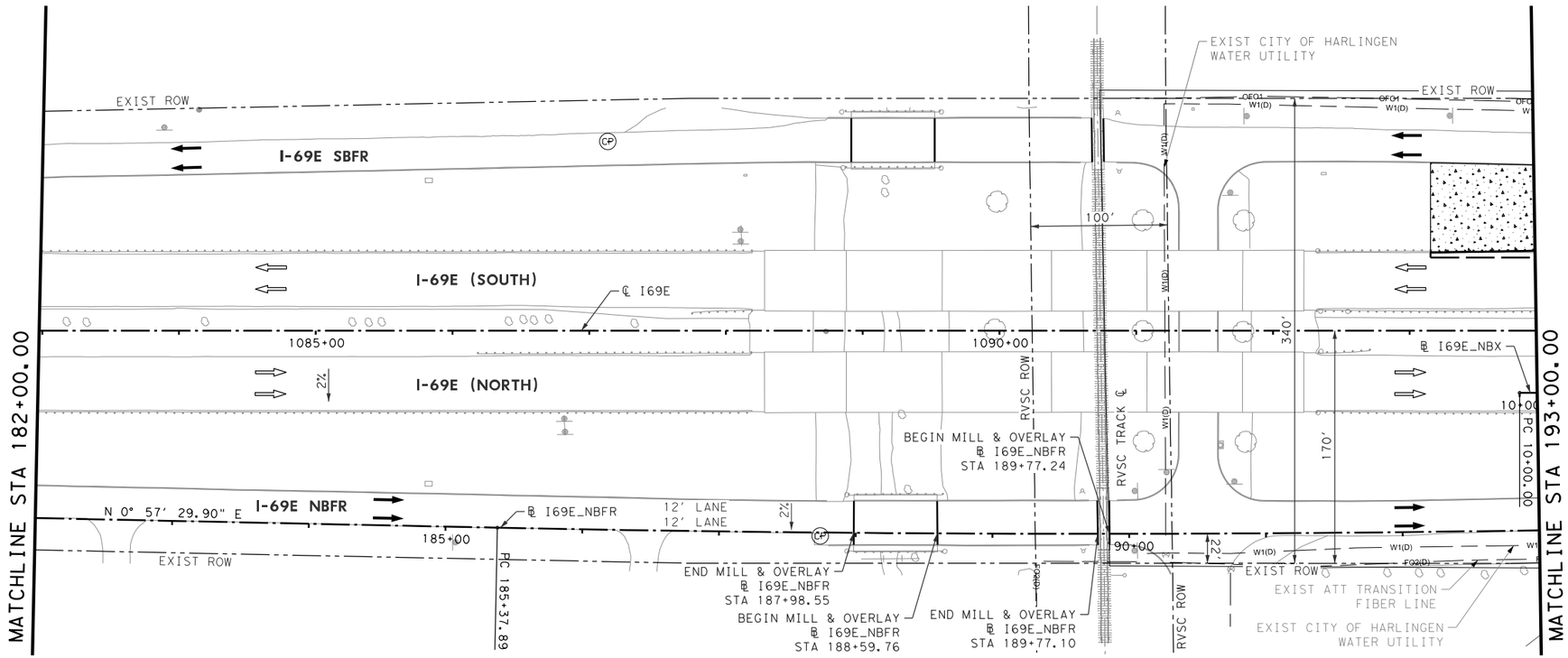


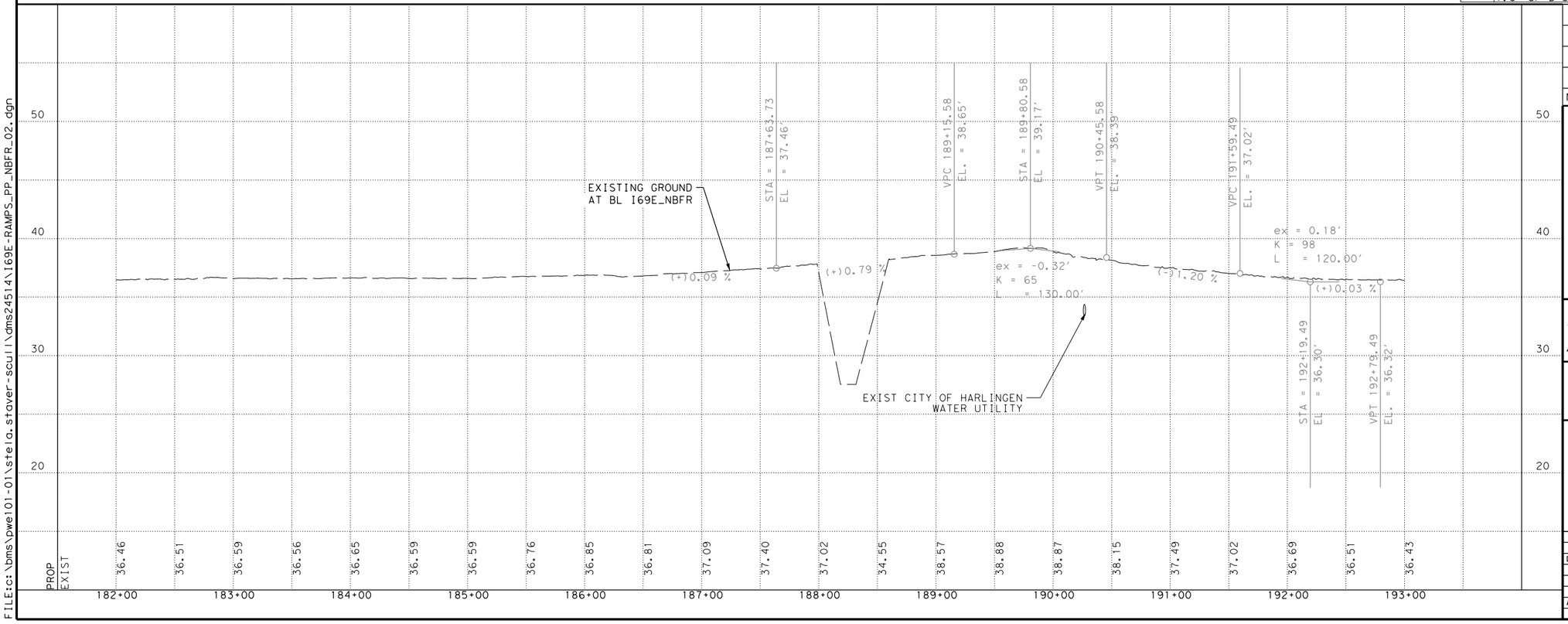
HORZ 0' 25' 50' 100'
VERT 0' 5' 10'

N

LEGEND:

- PROPOSED LANE
- EXISTING LANE
- PROPOSED SAWCUT
- PROPOSED MBGF
- XXXXX ALIGNMENT DATA
- EXISTING ROW

ITEM	DESCRIPTION	UNIT	EST.	FIN.
3077	1.5" SP-D SMA SAC-A PG76-22	TON	250	



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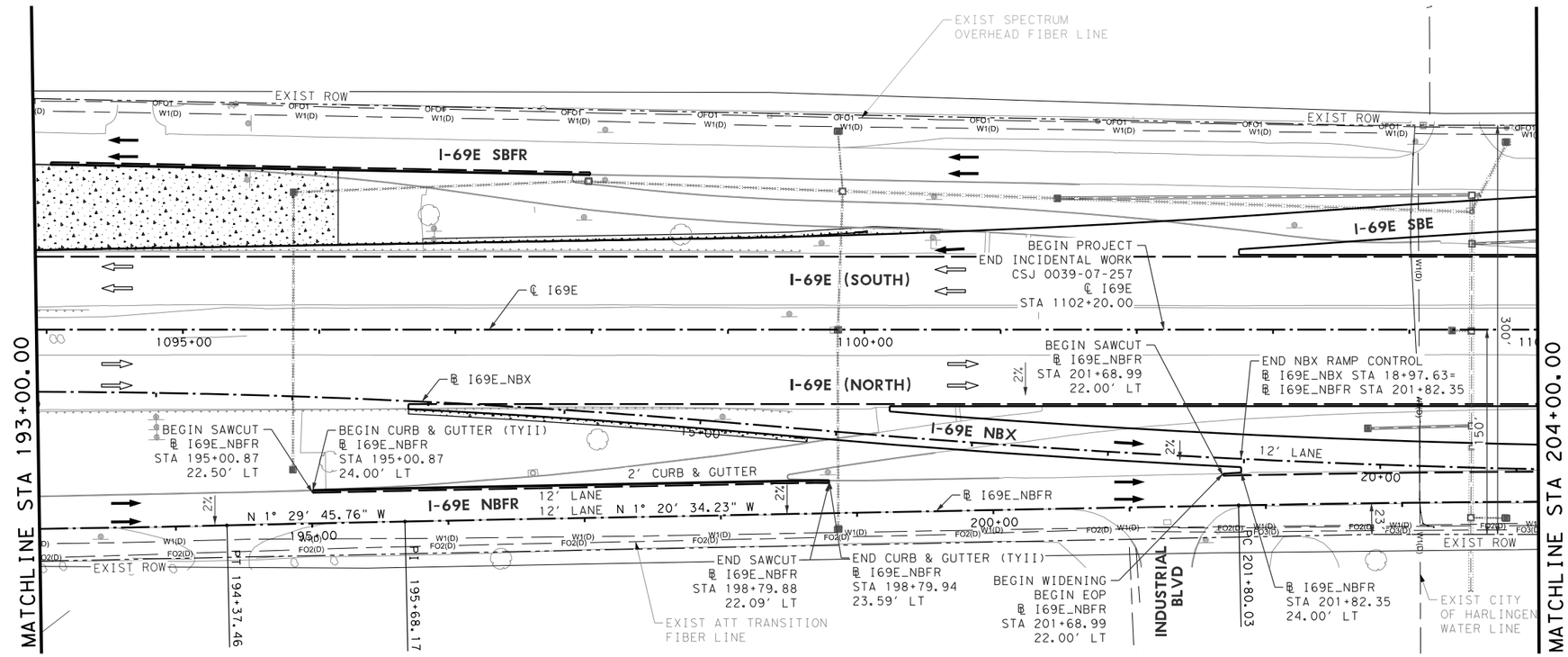
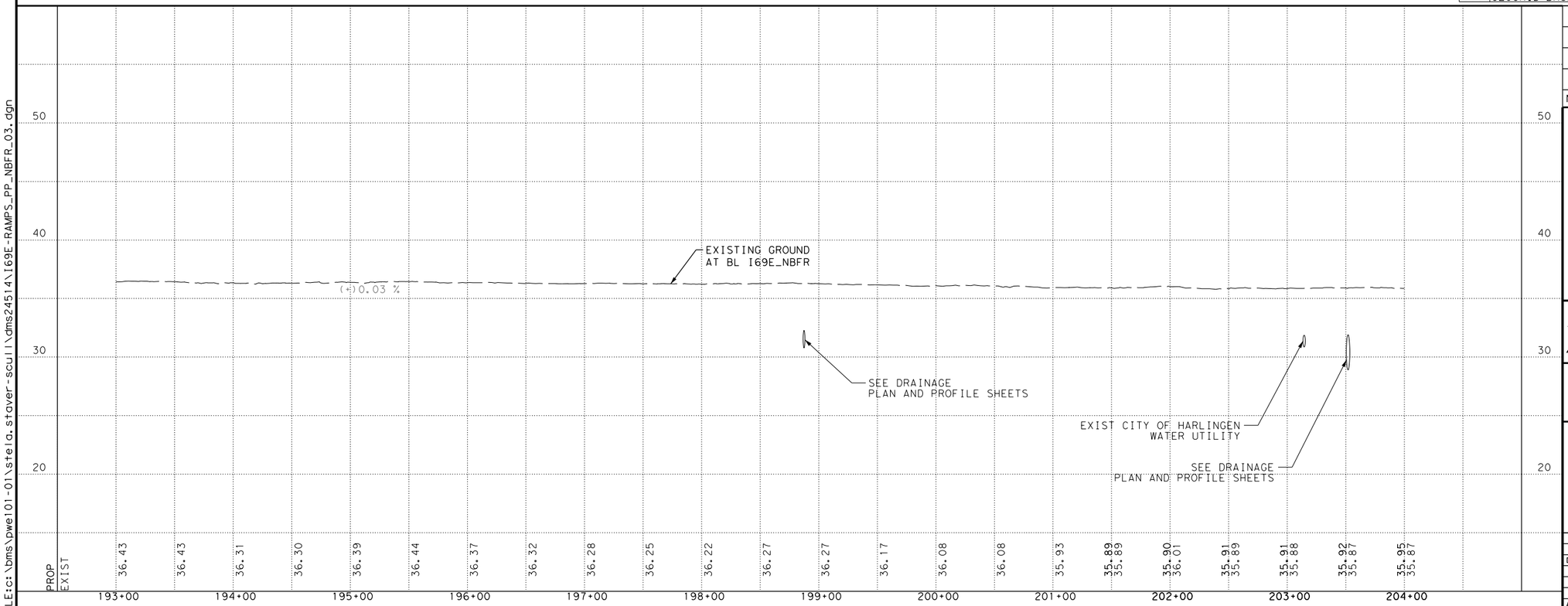
I-69E
PLAN & PROFILE
NORTHBOUND FRONTAGE ROAD
STA 182+00 TO STA 193+00

SHEET 02 OF 06

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	87
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				



ITEM	DESCRIPTION	UNIT	EST.	FIN.
247	FL BS (RDWY DEL) (TYP. A GR 1-2)	TON	424	
275	CEMENT	TON	17	
275	CEMENT TREATED (NEW BASE) (20")	SY	763	
310	PRIME COAT (MC-30)	GAL	131	
316	ASPHALT (TIER II)	GAL	196	
316	ASPHALT (GR 4P)	CY	5	
529	CONC CURB & GUTTER (TY II)	LF	582	
3076	3.0" HMA TYPE "B" PG64-22	TON	112	
3077	1.5" SP-D SMA SAC-A PG76-22	TON	297	
3084	BONDING COURSE	GAL	130	
5001	GEOGRID BASE REINFORCEMENT (TY II)	SY	851	



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PLAN & PROFILE
NORTHBOUND FRONTAGE ROAD
STA 193+00 TO STA 204+00

SHEET 03 OF 06

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	88
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

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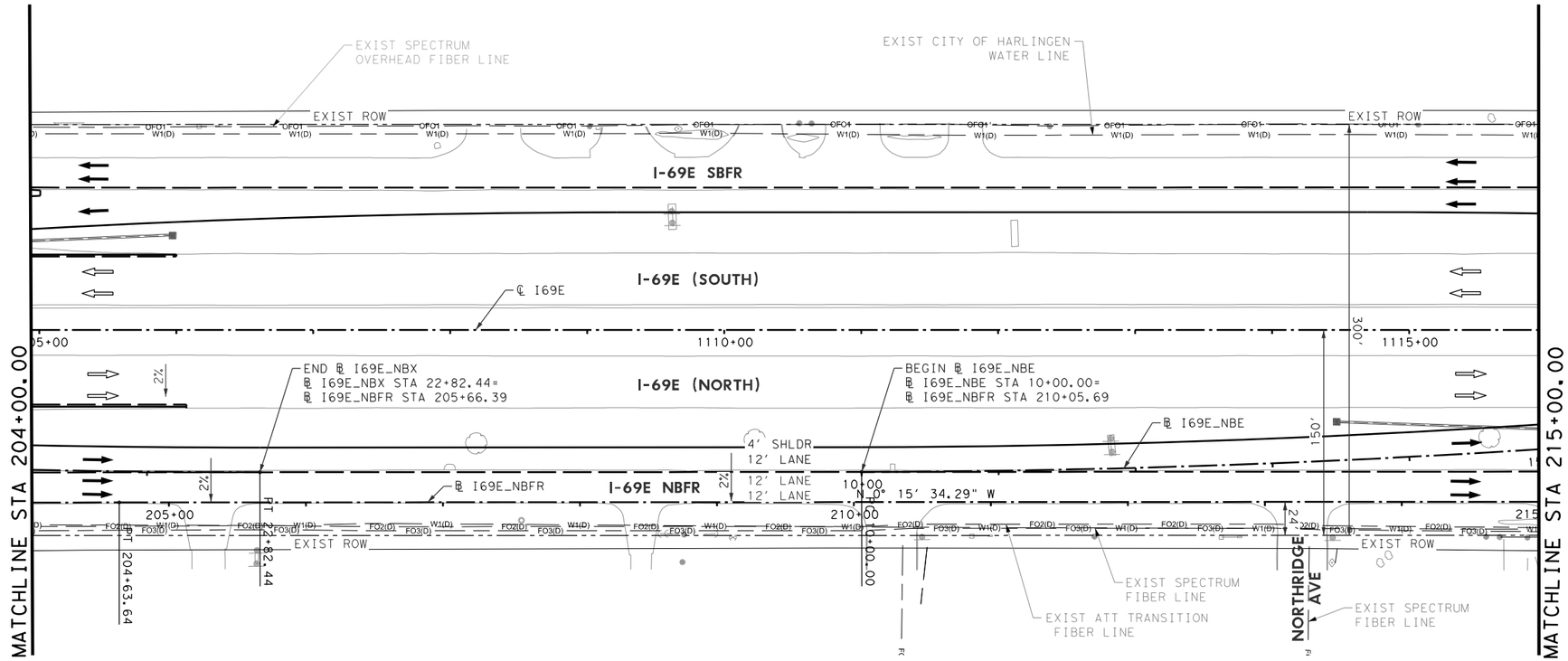


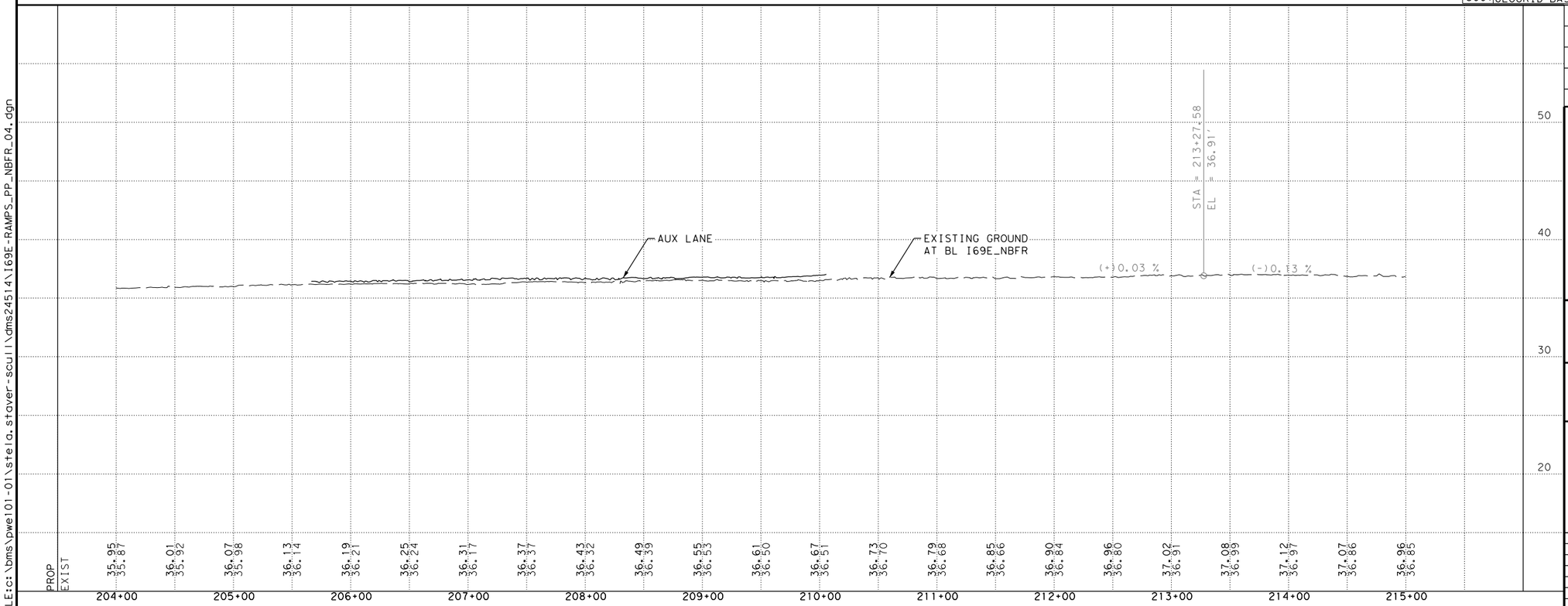
HORZ 0' 25' 50' 100'
VERT 0' 5' 10'

N

LEGEND:

- PROPOSED LANE
- EXISTING LANE
- PROPOSED SAWCUT
- PROPOSED MBGF
- XXXXX ALIGNMENT DATA
- EXISTING ROW

ITEM	DESCRIPTION	UNIT	EST.	FIN.
247	FL BS (RDWY DEL) (TYP. A GR 1-2)	TON	1489	
275	CEMENT	TON	59	
275	CEMENT TREATED (NEW BASE) (20")	SY	2681	
310	PRIME COAT (MC-30)	GAL	504	
316	ASPHALT (TIER II)	GAL	756	
316	ASPHALT (GR 4P)	CY	21	
3076	3.0" HMA TYPE "B" PG64-22	TON	430	
3077	1.5" SP-D SMA SAC-A PG76-22	TON	457	
3084	BONDING COURSE	GAL	503	
5001	GEOGRID BASE REINFORCEMENT (TY II)	SY	2844	



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I-69E
PLAN & PROFILE
NORTHBOUND FRONTAGE ROAD
SAT 204+00 TO STA 215+00

SHEET 04 OF 06

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	
CHECKED	CONT.	SECT.	JOB	89
XX	0039	07	257	
APPROVED				
XX				

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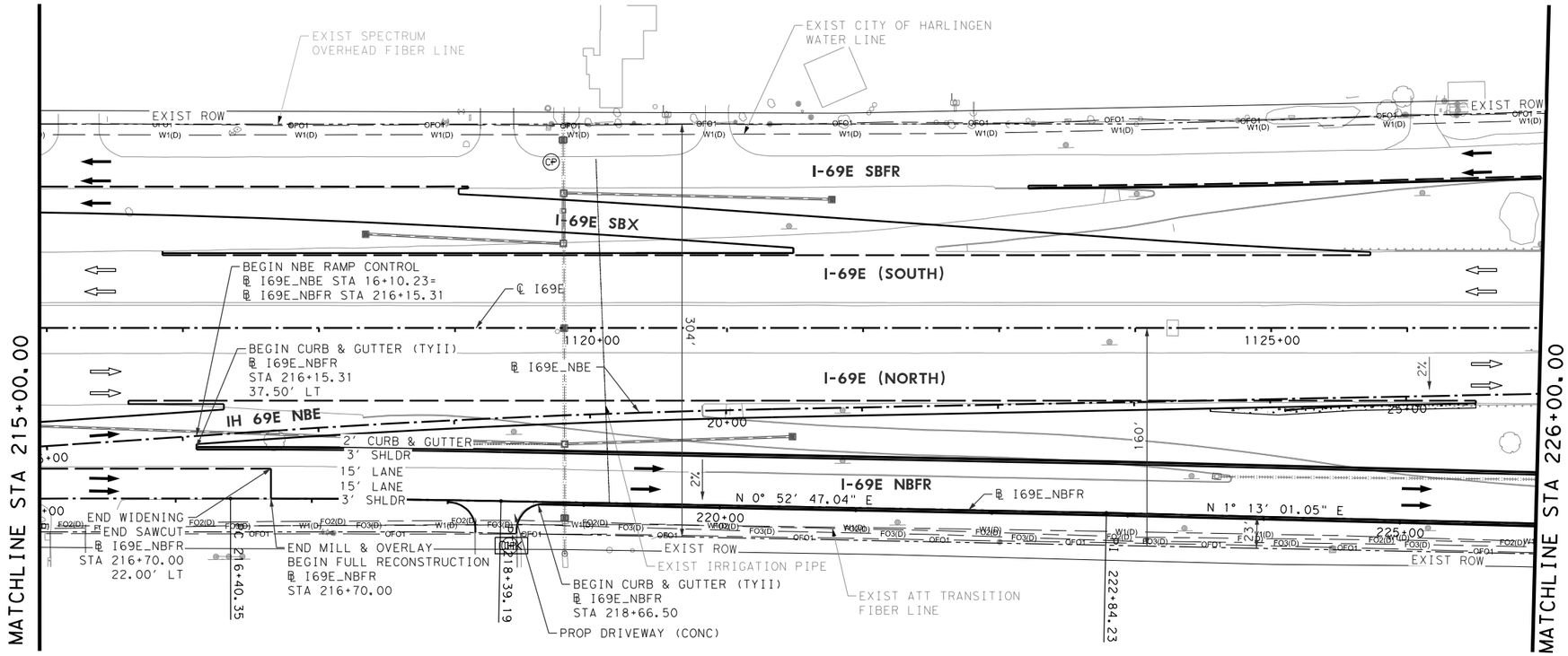


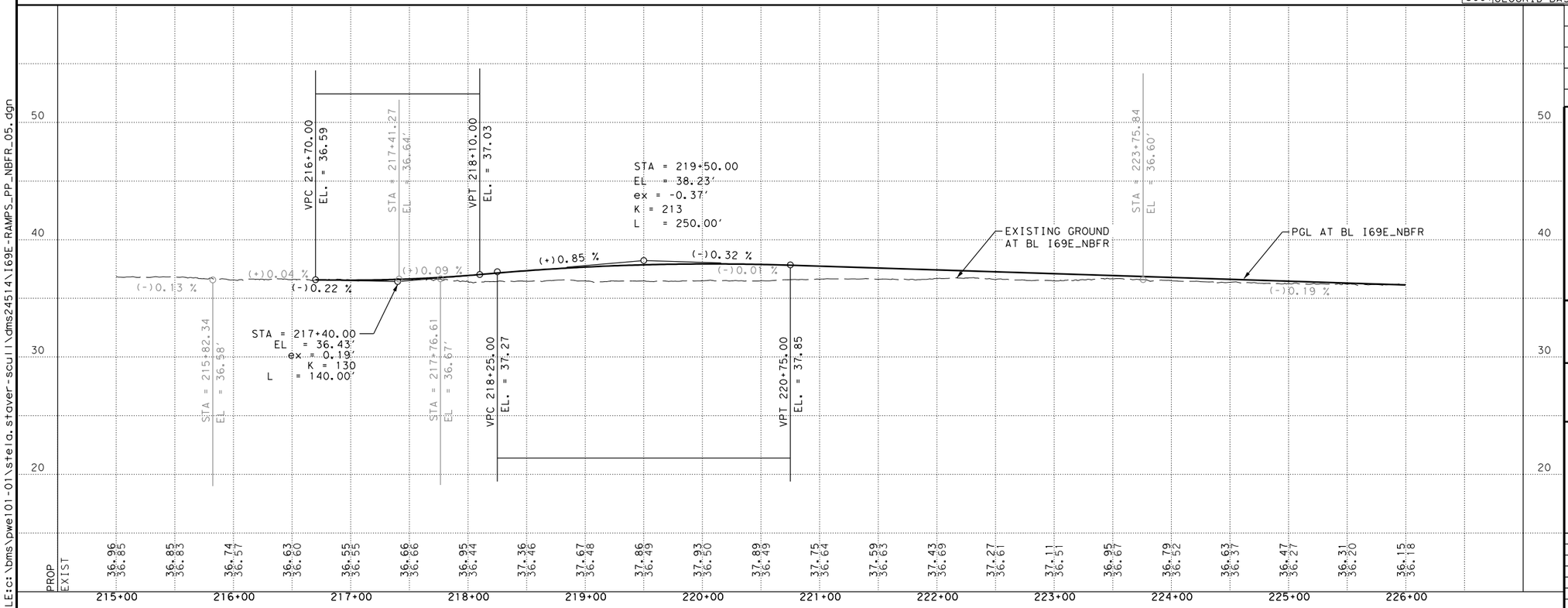
HORZ 0' 25' 50' 100'
VERT 0' 5' 10'

N

LEGEND:

- PROPOSED LANE
- EXISTING LANE
- PROPOSED SAWCUT
- PROPOSED MBGF
- XXXXX ALIGNMENT DATA
- EXISTING ROW

ITEM	DESCRIPTION	UNIT	EST.	FIN.
247	FL BS (RDWY DEL) (TYP. A GR 1-2)	TON	2790	
275	CEMENT	TON	110	
275	CEMENT TREATED (NEW BASE) (20")	SY	5023	
310	PRIME COAT (MC-30)	GAL	860	
316	ASPHALT (TIER II)	GAL	1289	
316	ASPHALT (GR 4P)	CY	36	
529	CONC CURB & GUTTER (TY II)	LF	427	
530	DRIVEWAYS CONCRETE	SY	92	
3076	3.0" HMA TYPE "B" PG64-22	TON	735	
3077	1.5" SP-D SMA SAC-A PG76-22	TON	404	
3084	BONDING COURSE	GAL	859	
5001	GEOGRID BASE REINFORCEMENT (TY II)	SY	5323	



NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
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I-69E
PLAN & PROFILE
NORTHBOUND FRONTAGE ROAD
SAT 215+00 TO 226+00

SHEET 05 OF 06

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	90
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

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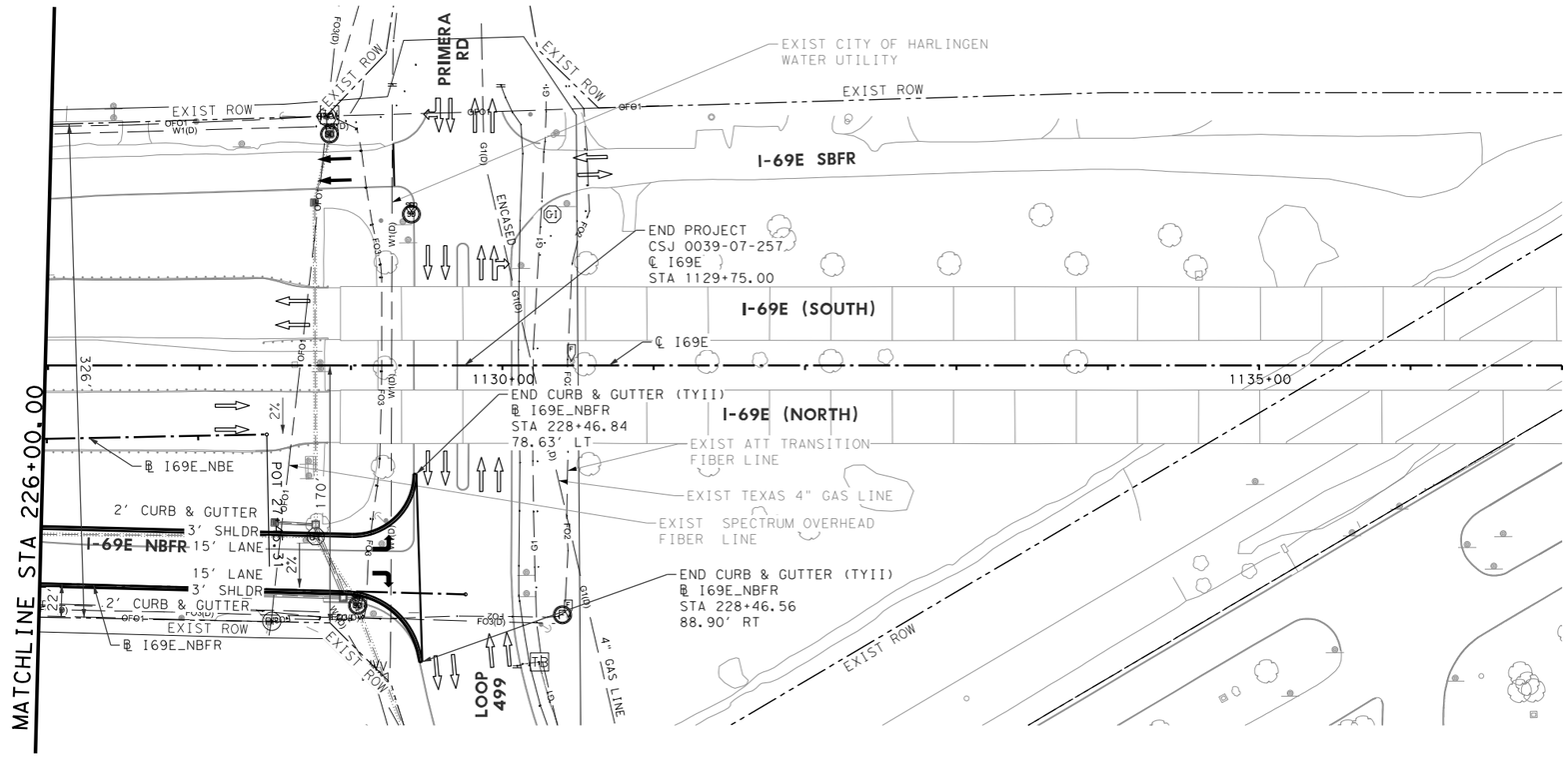


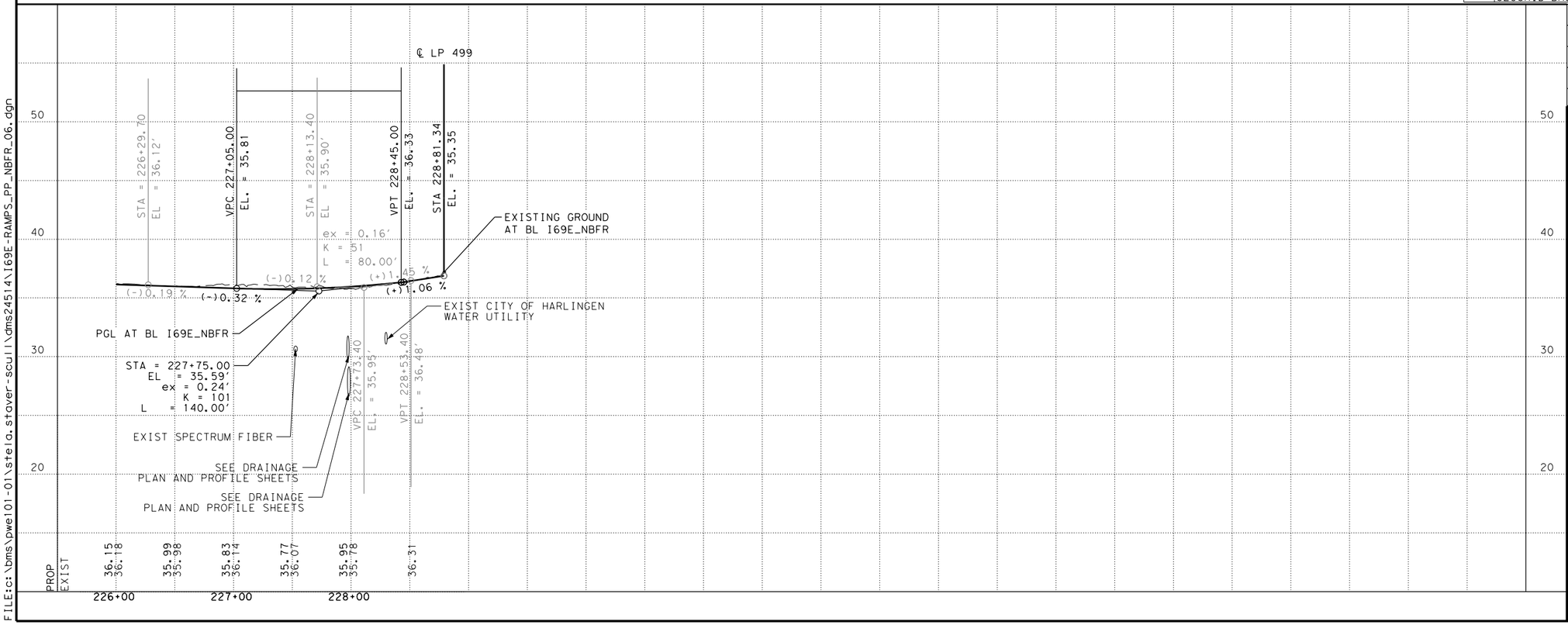
HORZ 0' 25' 50' 100'
VERT 0' 5' 10'

N

LEGEND:

- PROPOSED LANE
- EXISTING LANE
- PROPOSED SAWCUT
- PROPOSED MBGF
- XXXXX ALIGNMENT DATA
- EXISTING ROW

ITEM	DESCRIPTION	UNIT	EST.	FIN.
247	FL BS (RDWY DEL) (TYP. A GR 1-2)	TON	725	
275	CEMENT	TON	29	
275	CEMENT TREATED (NEW BASE) (20")	SY	1306	
310	PRIME COAT (MC-30)	GAL	221	
316	ASPHALT (TIER II)	GAL	333	
316	ASPHALT (GR 4P)	CY	9	
529	CONC CURB & GUTTER (TY II)	LF	1896	
3076	3.0" HMA TYPE "B" PG64-22	TON	189	
3077	1.5" SP-D SMA SAC-A PG76-22	TON	94	
3084	BONDING COURSE	GAL	221	
5001	GEOGRID BASE REINFORCEMENT (TY II)	SY	1426	



NO.	DATE	REVISION	APPROVED

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PLAN & PROFILE
NORTHBOUND FRONTAGE ROAD
SAT 226+00 TO STA 228+81.38

SHEET 06 OF 06

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	91
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

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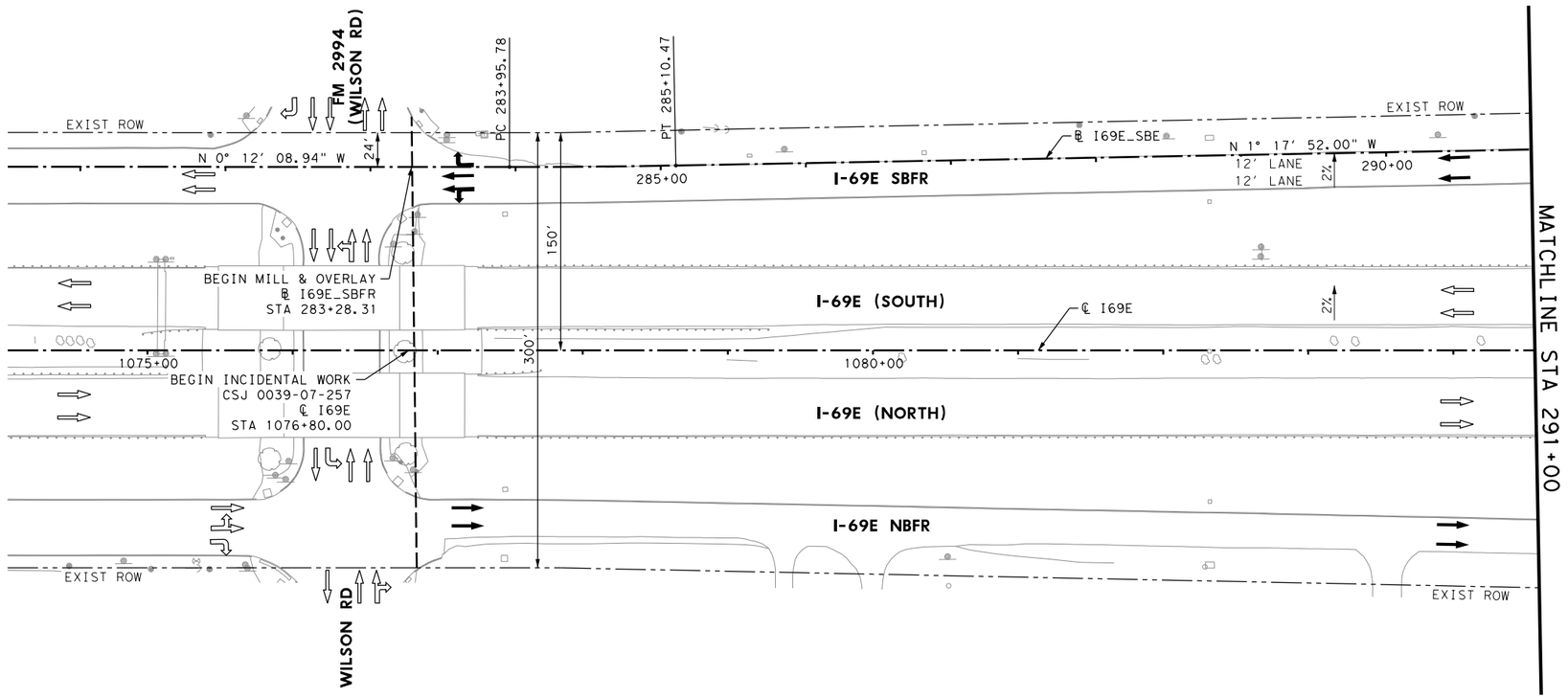


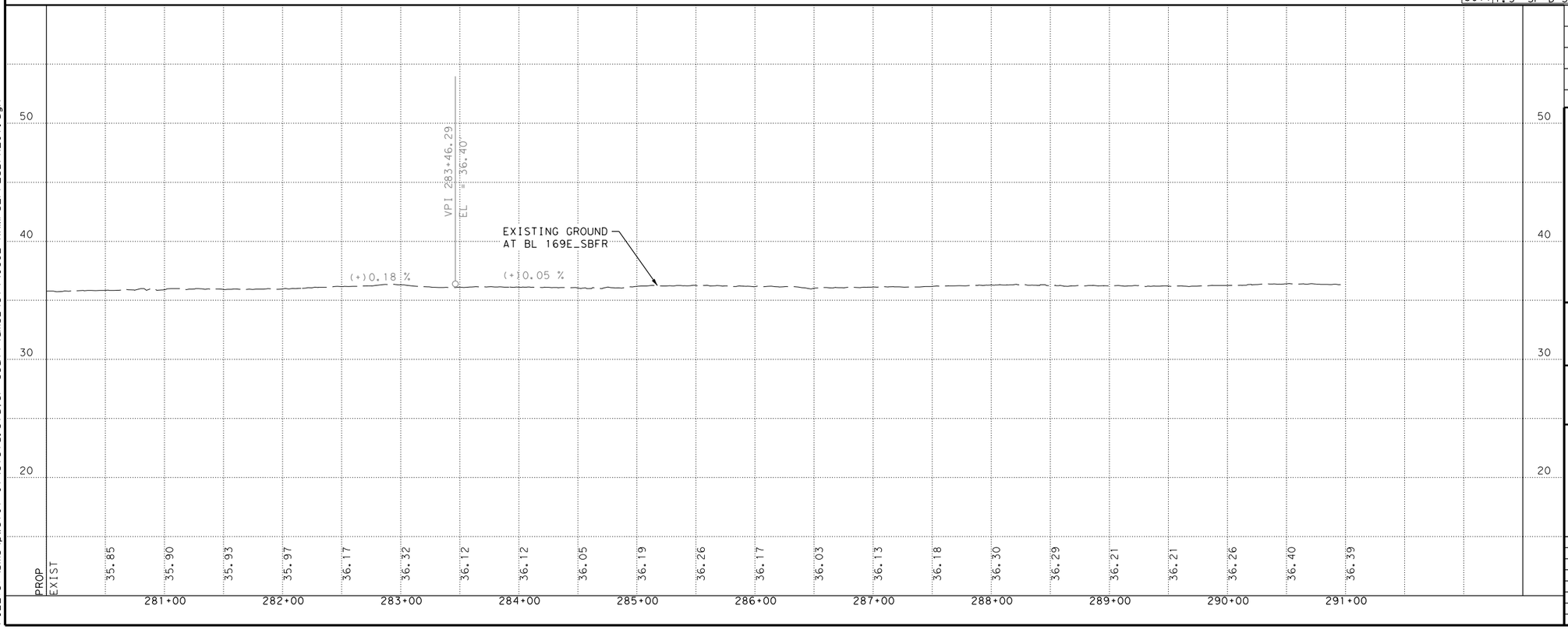
HORZ 0' 25' 50' 100'
VERT 0' 5' 10'

N

LEGEND:

- PROPOSED LANE
- EXISTING LANE
- PROPOSED SAWCUT
- PROPOSED MBGF
- XXXXX — ALIGNMENT DATA
- EXISTING ROW

ITEM	DESCRIPTION	UNIT	EST.	FIN.
3077	1.5" SP-D SMA SAC-A PG76-22	TON	183	



NO.	DATE	REVISION	APPROVED

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I-69E
PLAN & PROFILE
SOUTHBOUND FRONTAGE ROAD
BEG TO STA 291+00

SHEET 01 OF 06

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	92
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

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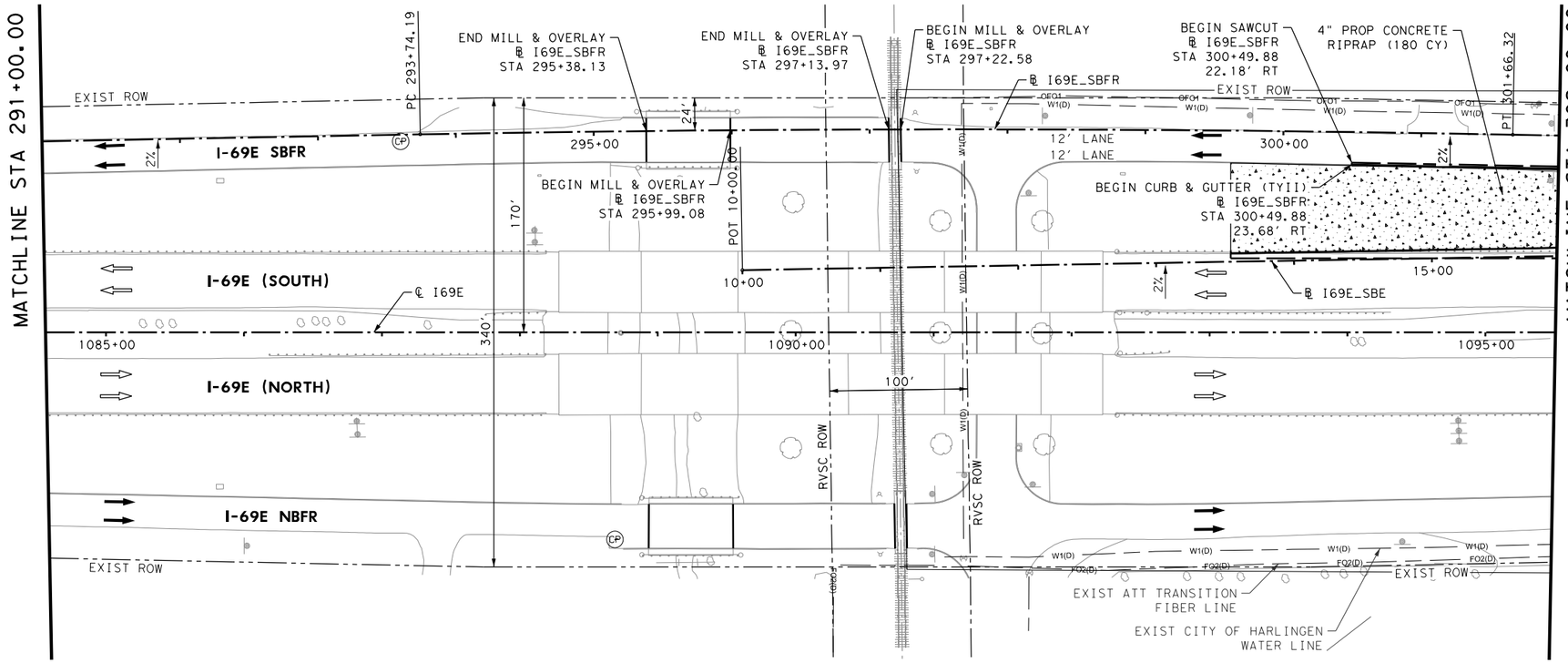
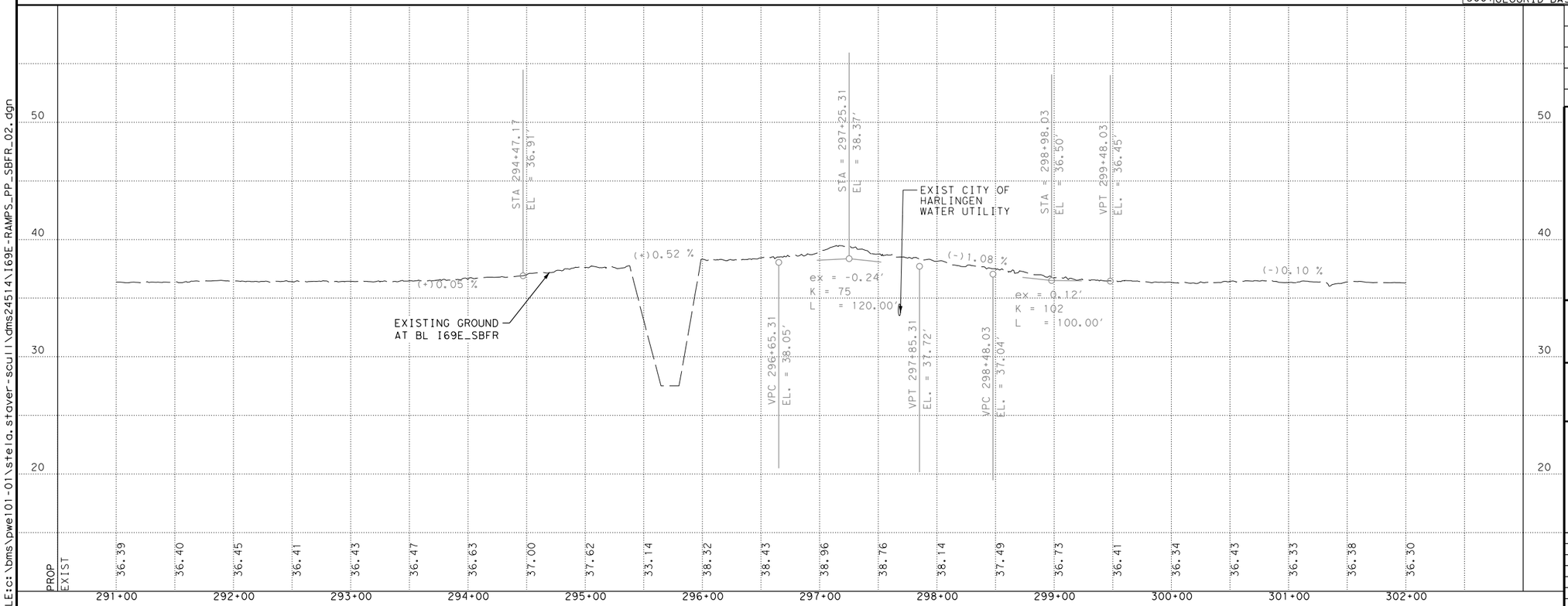


ITEM	DESCRIPTION	UNIT	EST.	FIN.
247	FL BS (RDWY DEL) (TYP. A GR 1-2)	TON	31	
275	CEMENT	TON	2	
275	CEMENT TREATED (NEW BASE) (20")	SY	56	
310	PRIME COAT (MC-30)	GAL	5	
316	ASPHALT (TIER II)	GAL	8	
316	ASPHALT (GR 4P)	CY	1	
432	RIPRAP (CONC) (4 IN)	CY	180	
529	CONC CURB & GUTTER (TY II)	LF	150	
3076	3.0" HMA TYPE "B" PG64-22	TON	4	
3077	1.5" SP-D SMA SAC-A PG76-22	TON	247	
3084	BONDING COURSE	GAL	5	
5001	GEOGRID BASE REINFORCEMENT (TY II)	SY	78	



NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
NICOLAS C. GARCIA
99410
LICENSED
PROFESSIONAL ENGINEER

Nicolas C. Garcia, P.E.

12/21/2022

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I-69E
PLAN & PROFILE
SOUTHBOUND FRONTAGE ROAD
STA 291+00 TO STA 302+00

SHEET 02 OF 06

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	93
APPROVED				
XX				

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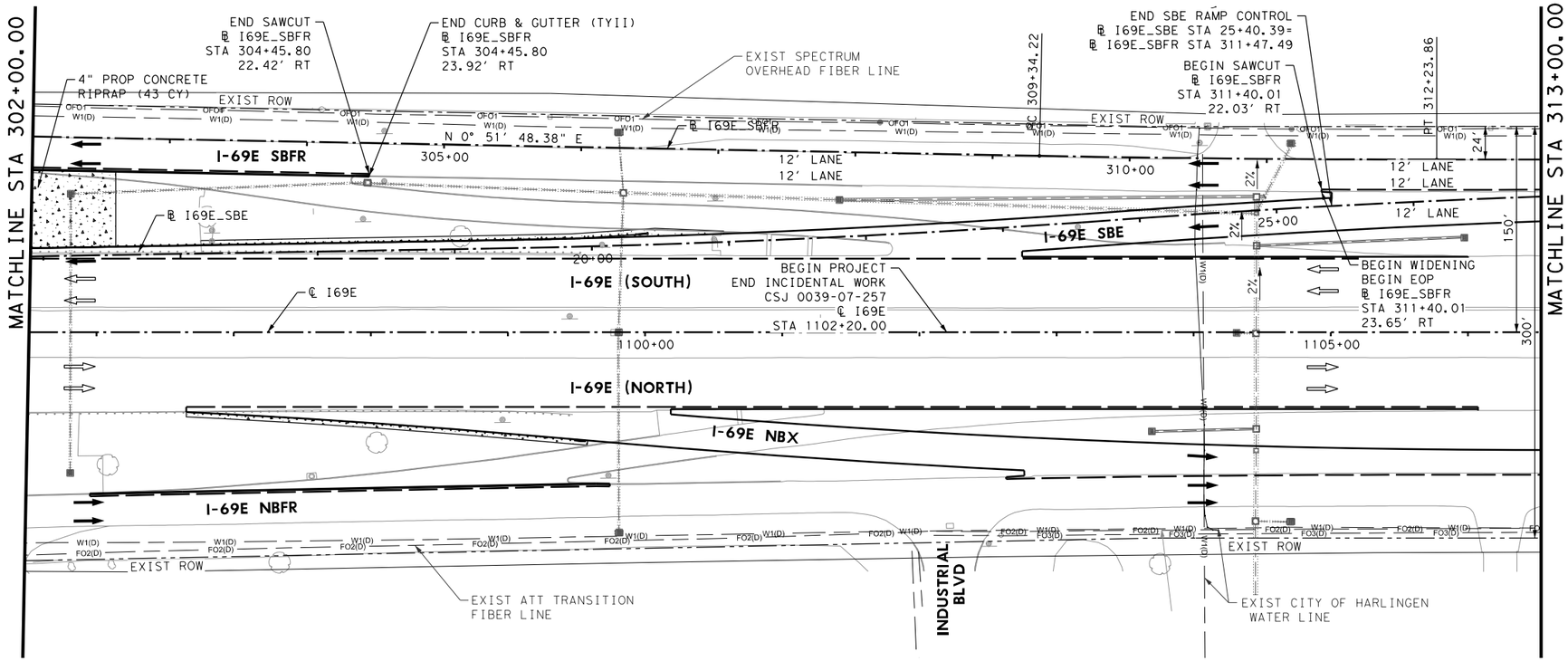
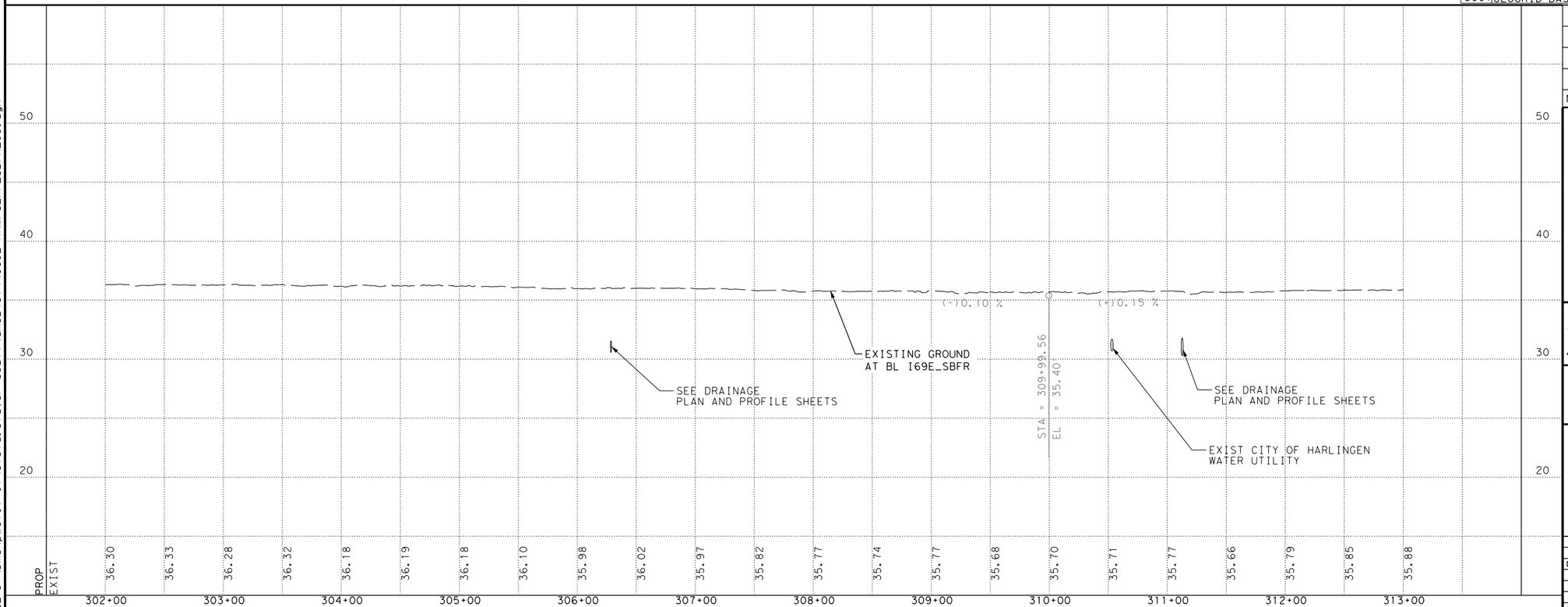


ITEM	DESCRIPTION	UNIT	EST.	FIN.
247	FL BS (RDWY DEL) (TYP. A GR 1-2)	TON	311	
275	CEMENT	TON	13	
275	CEMENT TREATED (NEW BASE) (20")	SY	560	
310	PRIME COAT (MC-30)	GAL	90	
316	ASPHALT (TIER II)	GAL	134	
316	ASPHALT (GR 4P)	CY	4	
432	RIPRAP (CONC) (4 IN)	CY	43	
529	CONC CURB & GUTTER (TY II)	LF	246	
3076	3.0" HMA TYPE "B" PG64-22	TON	76	
3077	1.5" SP-D SMA SAC-A PG76-22	TON	280	
3084	BONDING COURSE	GAL	89	
5001	GEOGRID BASE REINFORCEMENT (TY II)	SY	619	



NO.	DATE	REVISION	APPROVED

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I-69E
PLAN & PROFILE
SOUTHBOUND FRONTAGE ROAD
STA 302+00 TO STA 313+00

SHEET 03 OF 06

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	94
APPROVED				
XX				

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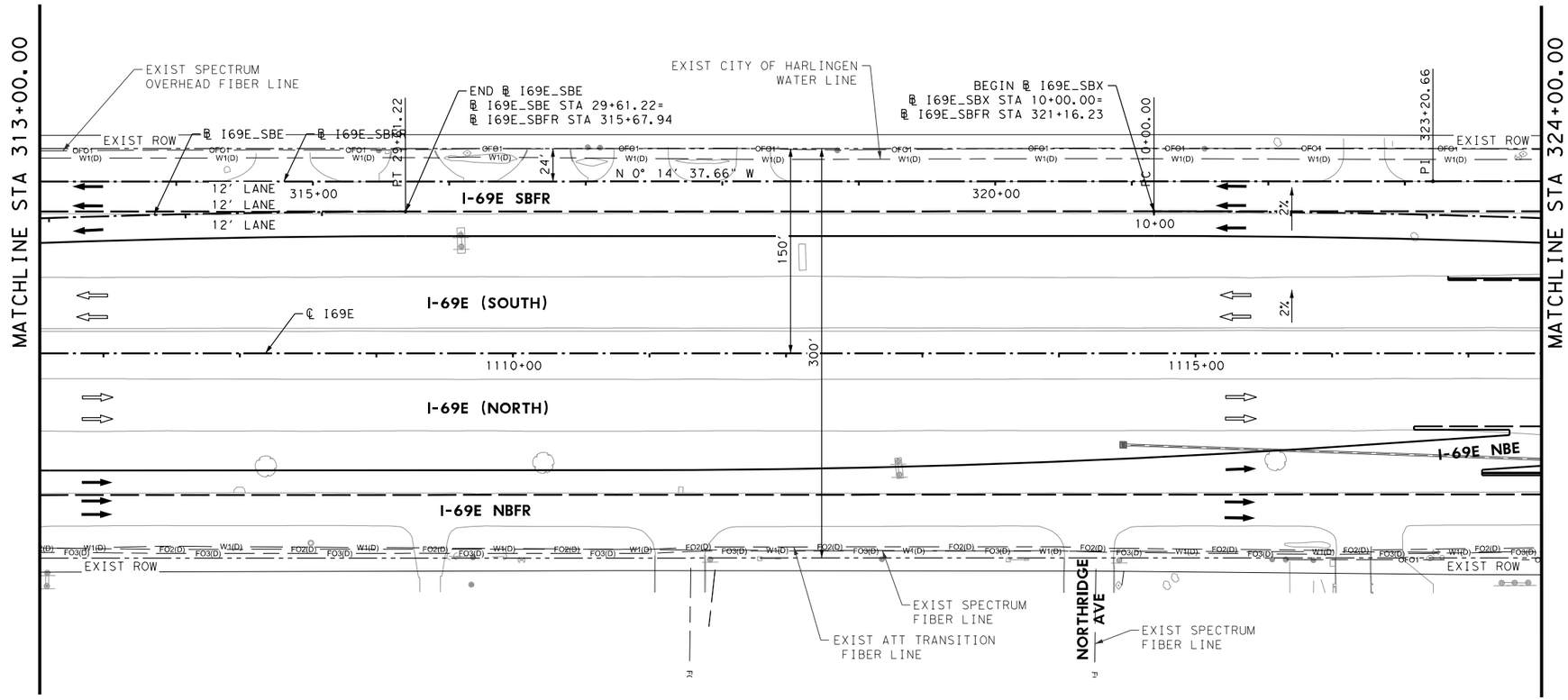
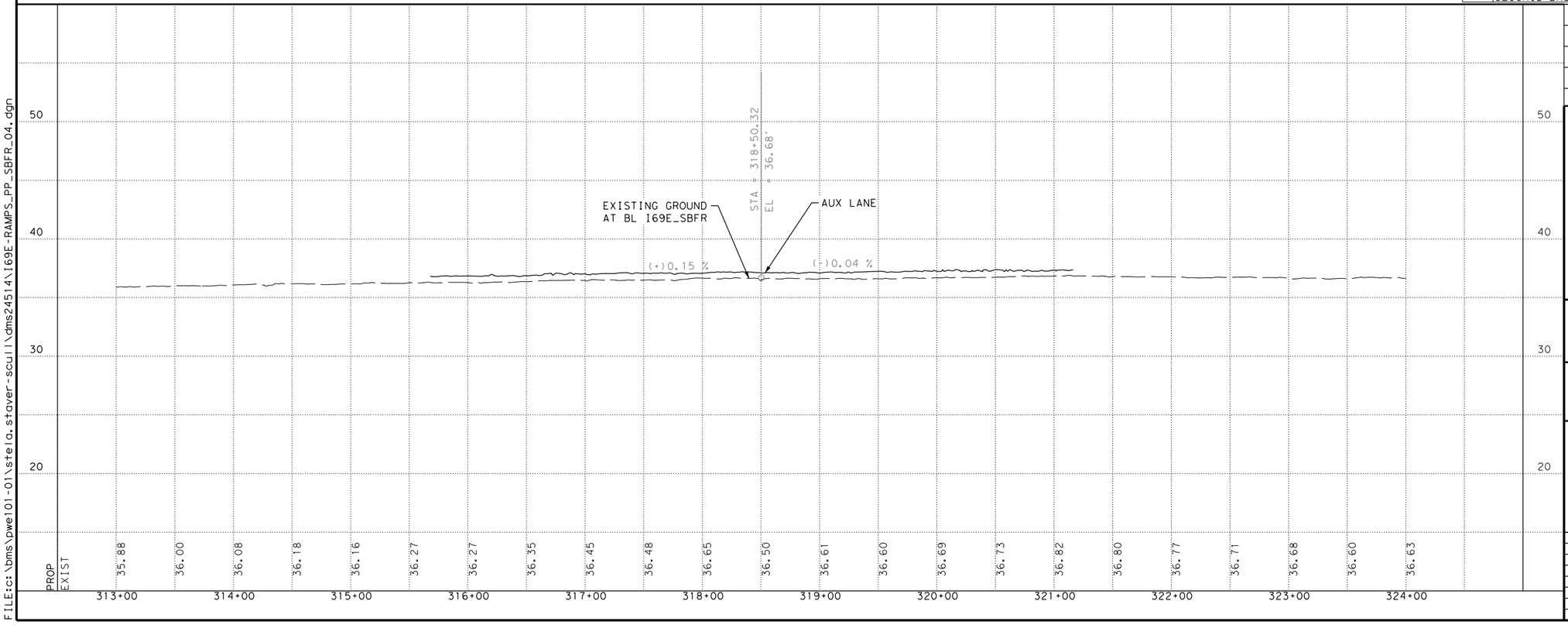


ITEM	DESCRIPTION	UNIT	EST.	FIN.
247	FL BS (RDWY DEL) (TYP. A GR 1-2)	TON	1371	
275	CEMENT	TON	54	
275	CEMENT TREATED (NEW BASE) (20")	SY	2468	
310	PRIME COAT (MC-30)	GAL	461	
316	ASPHALT (TIER II)	GAL	692	
316	ASPHALT (GR 4P)	CY	19	
3076	3.0" HMA TYPE "B" PG64-22	TON	394	
3077	1.5" SP-D SMA SAC-A PG76-22	TON	426	
3084	BONDING COURSE	GAL	461	
5001	GEOGRID BASE REINFORCEMENT (TY II)	SY	2631	



NO.	DATE	REVISION	APPROVED

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I-69E
PLAN & PROFILE
SOUTHBOUND FRONTAGE ROAD
STA 313+00 TO STA 324+00

SHEET 04 OF 06

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	95
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

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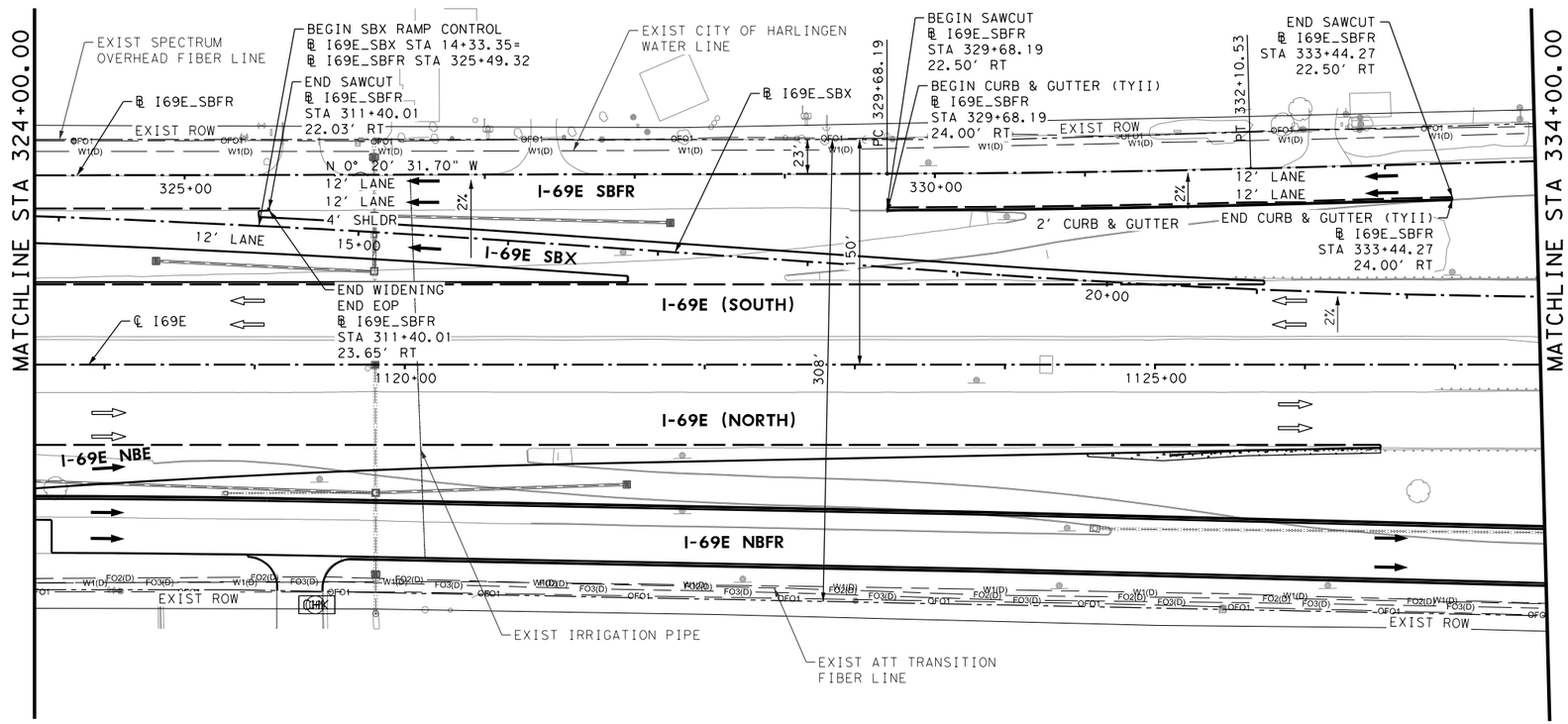


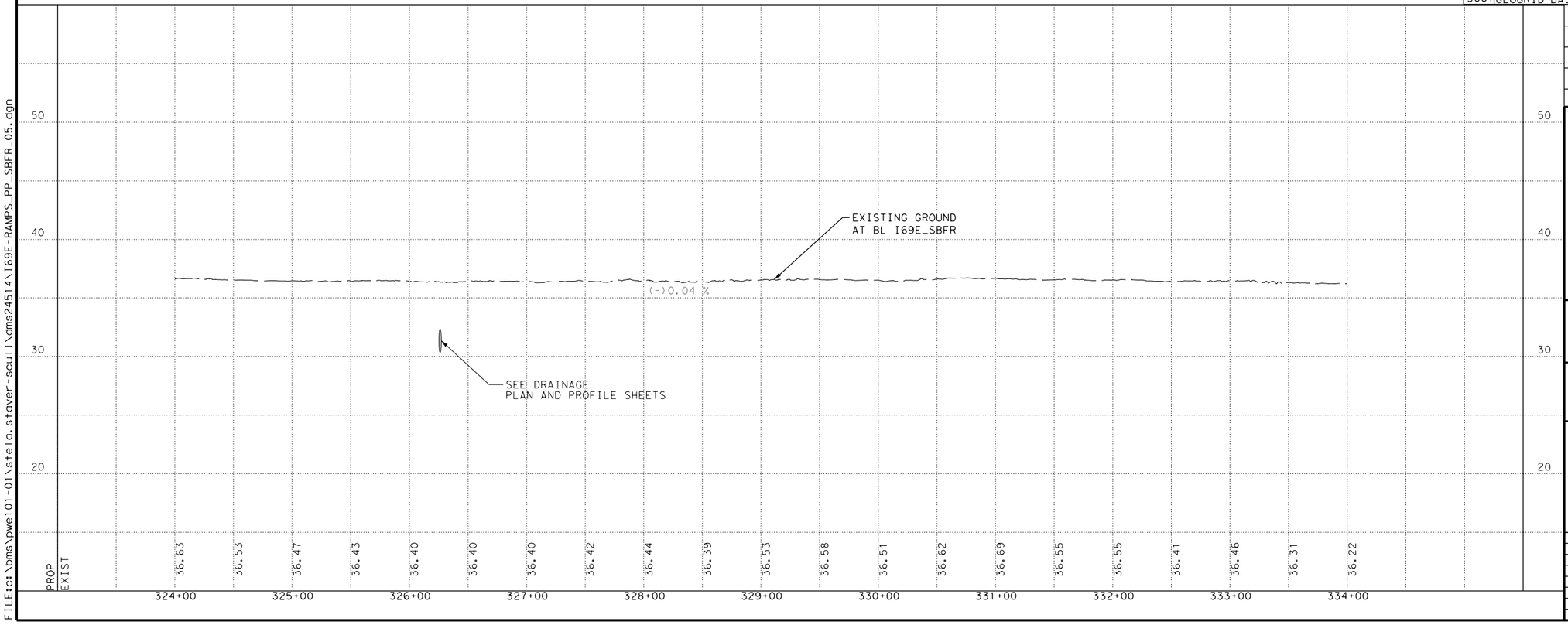
HORZ 0' 25' 50' 100'
VERT 0' 5' 10'

N

LEGEND:

- PROPOSED LANE
- EXISTING LANE
- PROPOSED SAWCUT
- PROPOSED MBGF
- XXXXX ALIGNMENT DATA
- EXISTING ROW

ITEM	DESCRIPTION	UNIT	EST.	FIN.
247	FL BS (RDWY DEL) (TYP. A GR 1-2)	TON	332	
275	CEMENT	TON	13	
275	CEMENT TREATED (NEW BASE) (20")	SY	2468	
310	PRIME COAT (MC-30)	GAL	88	
316	ASPHALT (TIER II)	GAL	131	
316	ASPHALT (GR 4P)	CY	4	
529	CONC CURB & GUTTER (TY II)	LF	377	
3076	3.0" HMA TYPE "B" PG64-22	TON	74	
3077	1.5" SP-D SMA SAC-A PG76-22	TON	255	
3084	BONDING COURSE	GAL	87	
5001	GEOGRID BASE REINFORCEMENT (TY II)	SY	675	



NO.	DATE	REVISION	APPROVED

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I-69E
PLAN & PROFILE
SOUTHBOUND FRONTAGE ROAD
324+00 TO 334+00

SHEET 05 OF 06

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	96
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

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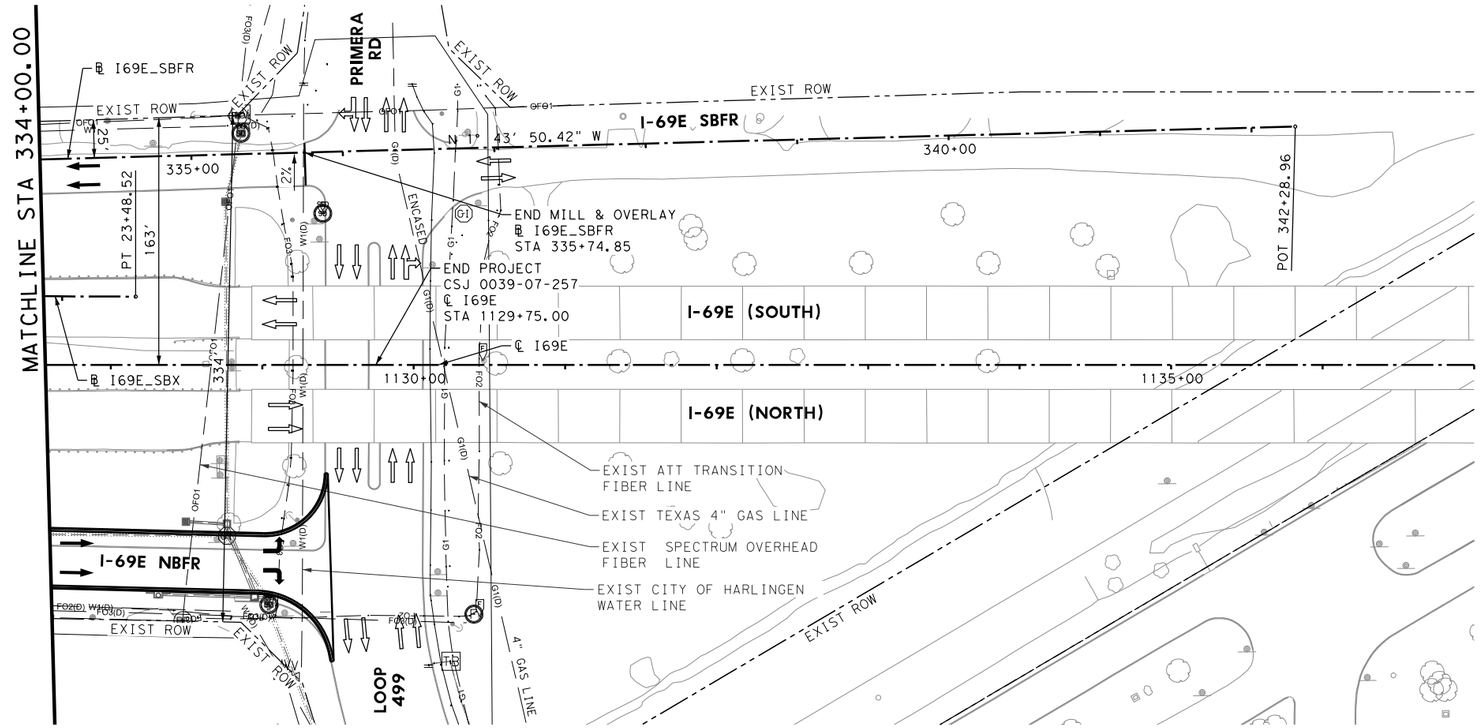


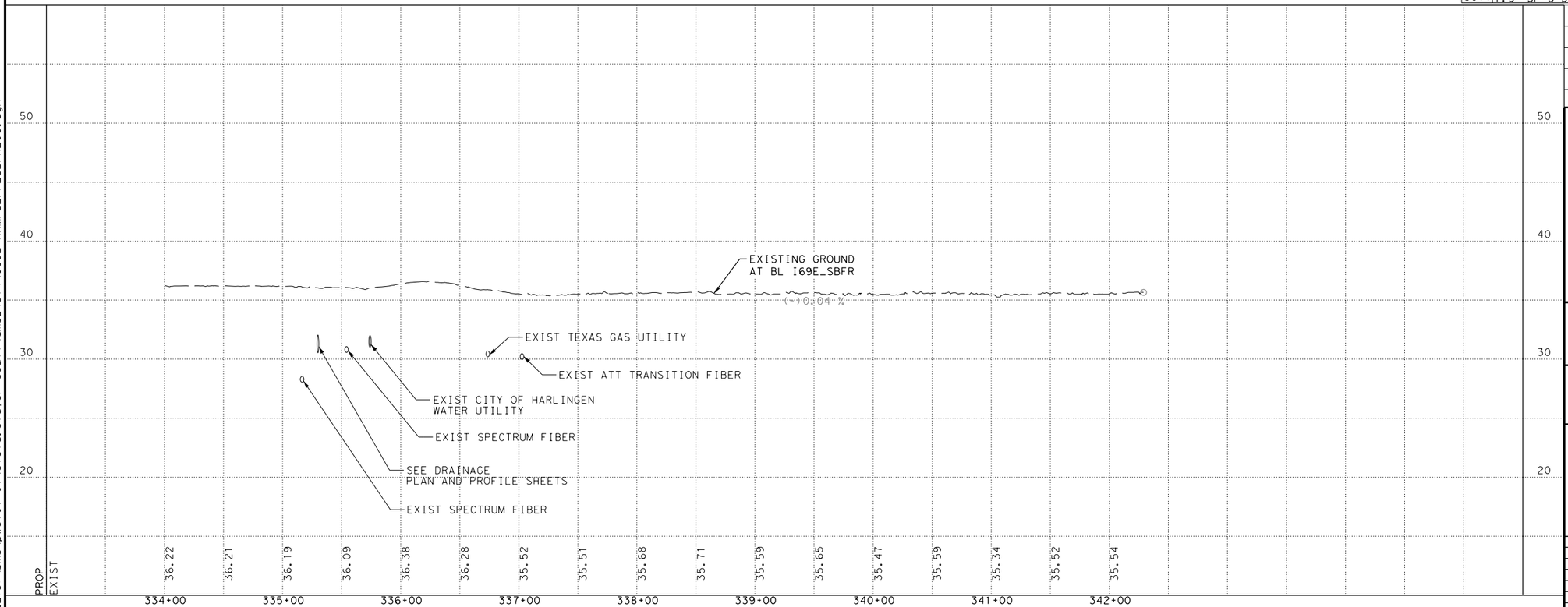
HORZ 0' 25' 50' 100'
VERT 0' 5' 10'

N

LEGEND:

- PROPOSED LANE
- EXISTING LANE
- PROPOSED SAWCUT
- PROPOSED MBGF
- XXXXX ALIGNMENT DATA
- EXISTING ROW

ITEM	DESCRIPTION	UNIT	EST.	FIN.
3077	1.5" SP-D SMA SAC-A PG76-22	TON	41	



NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
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I-69E
PLAN & PROFILE
SOUTHBOUND FRONTAGE ROAD
334+00 TO END

SHEET 06 OF 06

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	97
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

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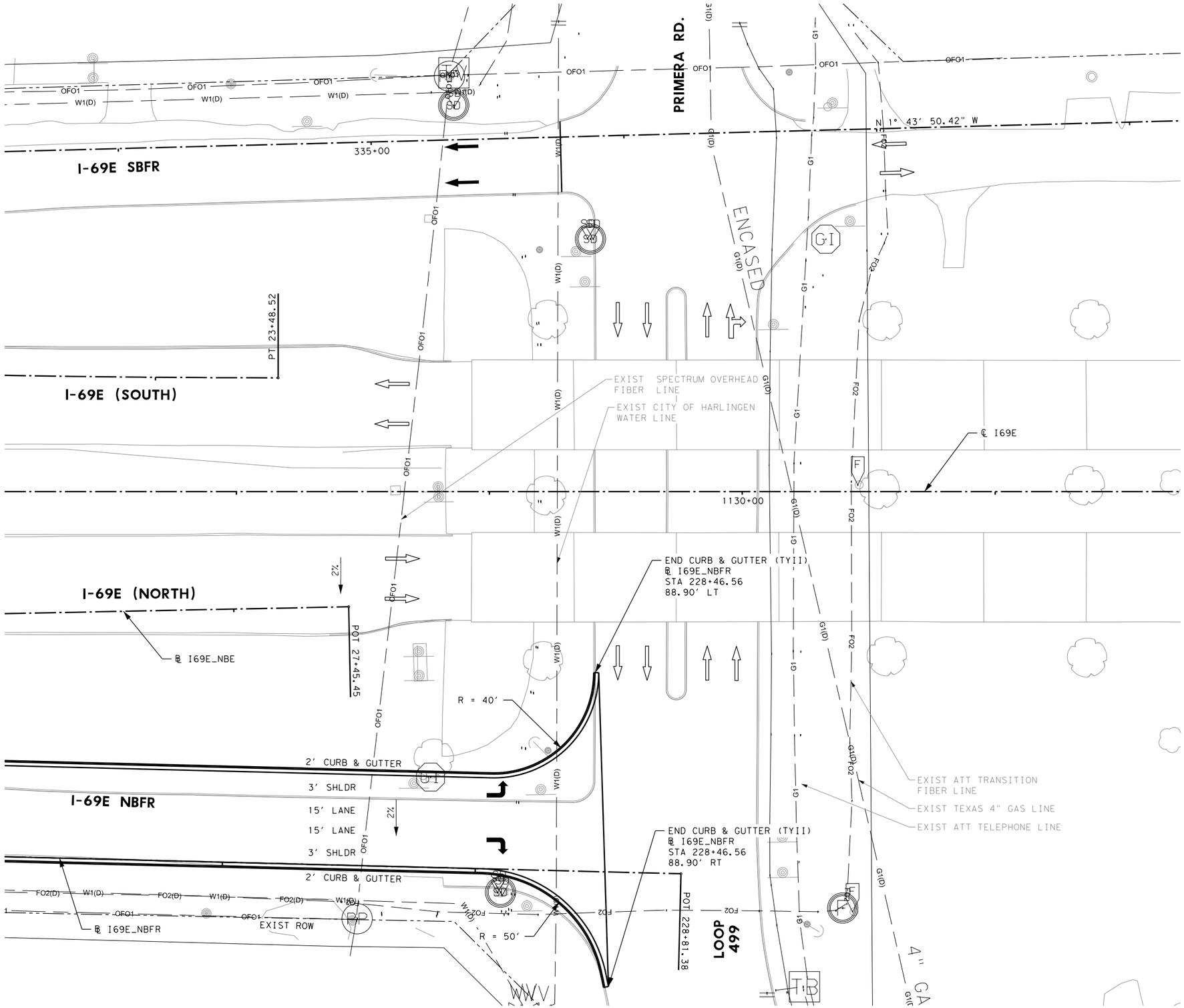

LEGEND:

- DIRECTION OF TRAVEL
- PROPOSED SAWCUT
- EXISTING ROW
- CONCRETE PAVEMENT

NO.	DATE	REVISION	APPROVED

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I-69E
INTERSECTION LAYOUT
LOOP 499

SHEET 01 OF 01

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	98
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

(ALIGNMENT) STATION	EXIST. DRVWY. WIDTH	PROP WIDTH @ EDGE OF PAVEMENT	PROP WIDTH @ ROW LINE	PROP. DRVWY WIDTH	PRIVATE & PUBLIC DRIVEWAY AREA (SY)				PROP. RADIUS (FT)		RCP CL 111 (LF)			ITEM 467 PROP. S.E.T. TY II (6:1) (EA)			ITEM 496 REMOVE OLD STR. (SET) (LF)		ITEM 496 REMOVE OLD STR. (SET) (LF)		ITEM 104 REMOVE 4" CONC. DRVWY (SY)	ITEM 104 REMOVE CONC. C&G (LF)
	(FT)	(FT)	(FT)	(FT)	PB-1	P	PBSI	CONC.	LEFT	RIGHT	18"	24"	30"	18"	24"	30"	18"	24"	18"	24"		
218+34.71	56.84	56.84	30.13	30.13	822	822	822	822	20	20											99	0

NO.	DATE	REVISION	APPROVED

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I-69E
PUBLIC DRIVEWAY TABLE

SHEET 01 OF 01

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	99
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

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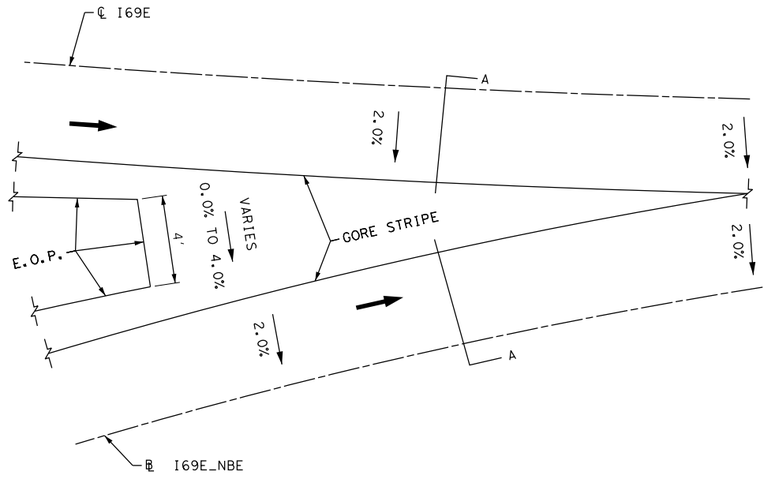
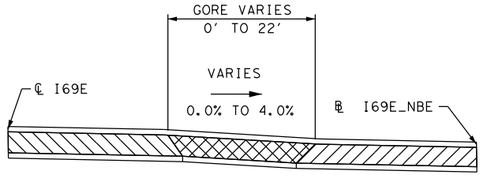


GORE NOSE DETAIL
N.T.S.



SECTION A-A
N.T.S.

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
NICOLAS C. GARCIA
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PROFESSIONAL ENGINEER

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12/15/2022

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I-69E
GORE NOSE DETAIL

SHEET 01 OF 01

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	100
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

DATE: 11/22/2022
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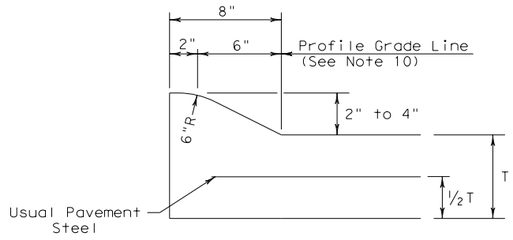
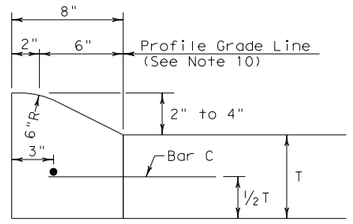
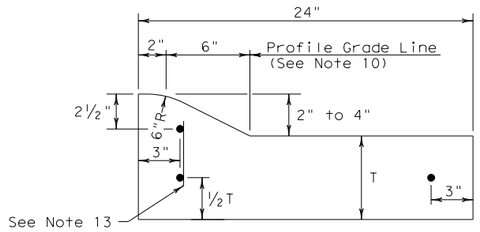


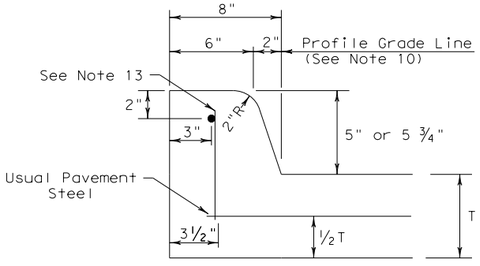
TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



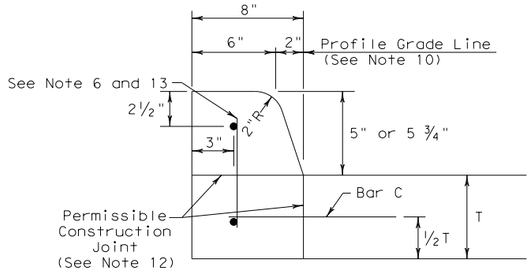
TYPE I CURB
2" - 4" HEIGHT



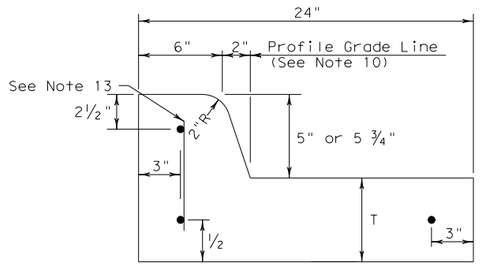
TYPE I CURB AND GUTTER
2" - 4" HEIGHT



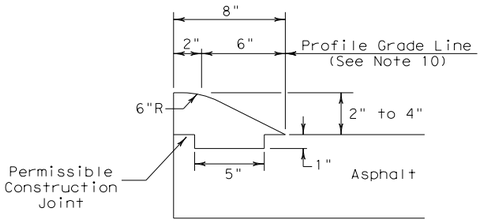
TYPE II CURB (MONOLITHIC)
5" - 5 ¾" HEIGHT



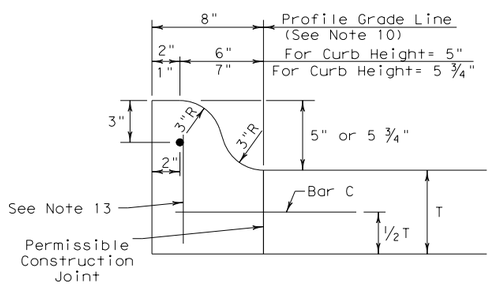
TYPE II CURB
5" - 5 ¾" HEIGHT



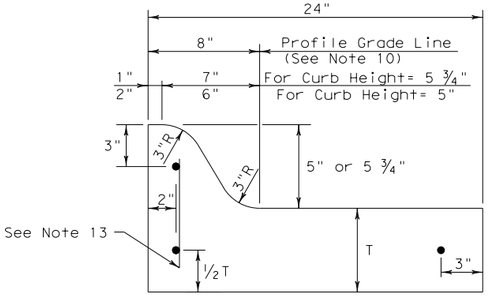
TYPE II CURB AND GUTTER
5" - 5 ¾" HEIGHT



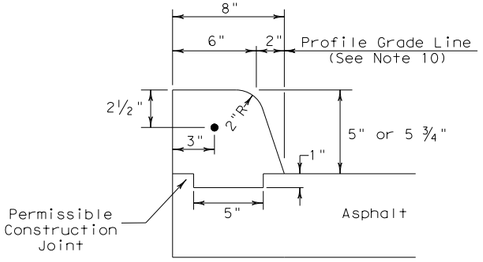
TYPE III CURB (KEYED)
2" - 4" HEIGHT



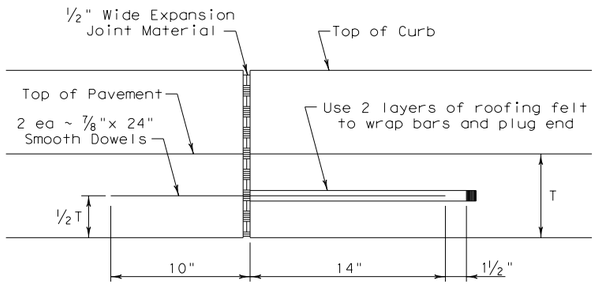
TYPE IIa CURB
5" - 5 ¾" HEIGHT



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

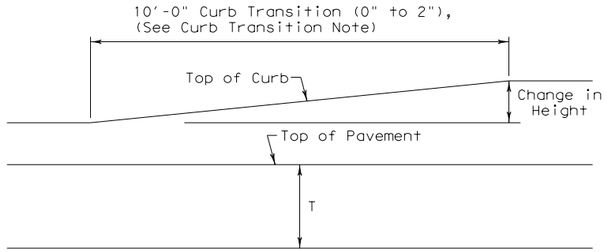


TYPE IV CURB (KEYED)
5" - 5 ¾" HEIGHT



EXPANSION JOINT DETAIL

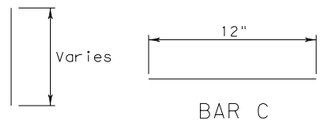
CURB TRANSITION NOTE:
Field conditions may require a longer or shorter transition, and shall be shown elsewhere in the plans, or as directed by the Engineer.



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.



BAR B

BAR C

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	0039	07	257	I69E
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		101

DATE: 11/22/2022
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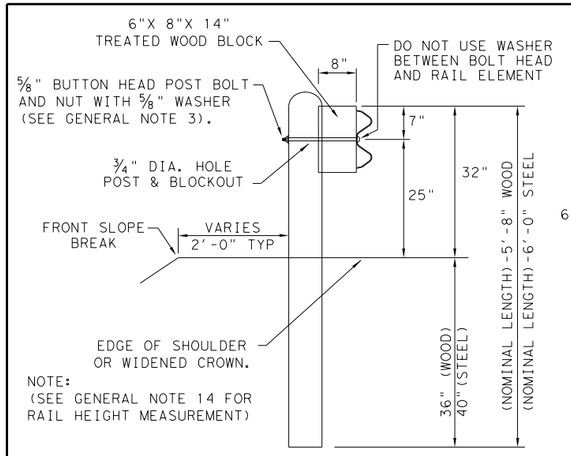
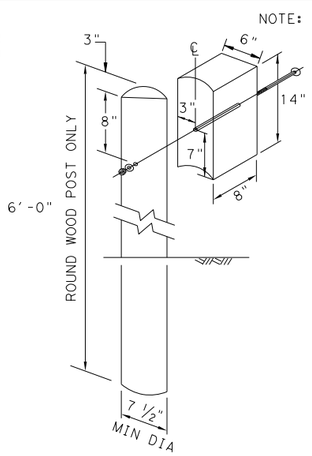
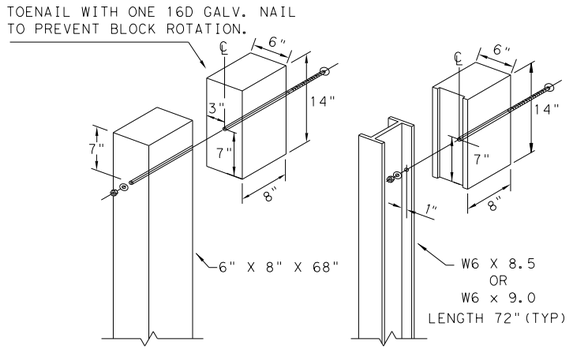


TYPICAL POST PLACEMENT



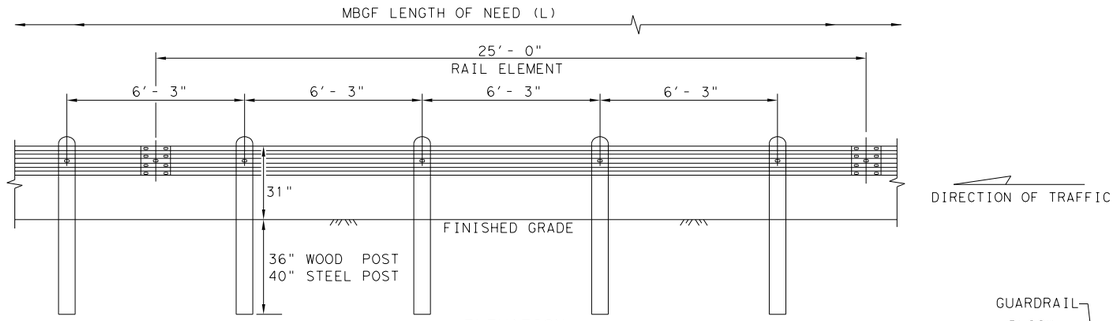
WOOD BLOCK TO
ROUND WOOD POST



WOOD BLOCK TO
RECTANGULAR WOOD POST

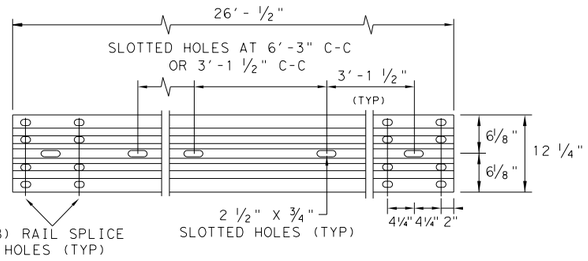
ROUTED WOOD BLOCK
TO I-BEAM STEEL POST

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



ELEVATION
MID-SPAN RAIL SPLICE

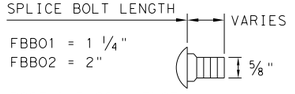
SHOWING A 25'- 0" SECTION OF W-BEAM RAIL. (SEE GENERAL NOTE 2)



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

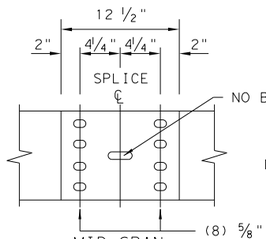
NOTES: SEE GENERAL NOTE 2 FOR ALLOWABLE RAIL TYPES.
SEE RAIL SPLICE DETAIL FOR REQUIRED HARDWARE.

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



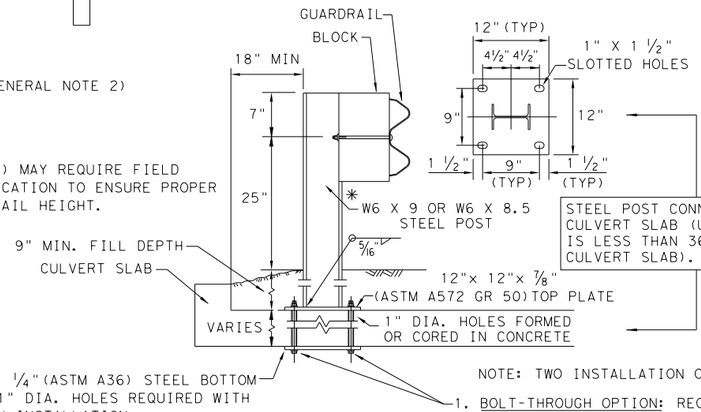
BUTTON HEAD BOLT

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



MID-SPAN
RAIL SPLICE DETAIL

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



LOW FILL CULVERT POST

NOTE: TWO INSTALLATION OPTIONS.

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

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

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

GENERAL NOTES

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

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

Texas Department of Transportation | Design Division Standard

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

FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG	
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0039	07	257	I69E	
	DIST	COUNTY		SHEET NO.	
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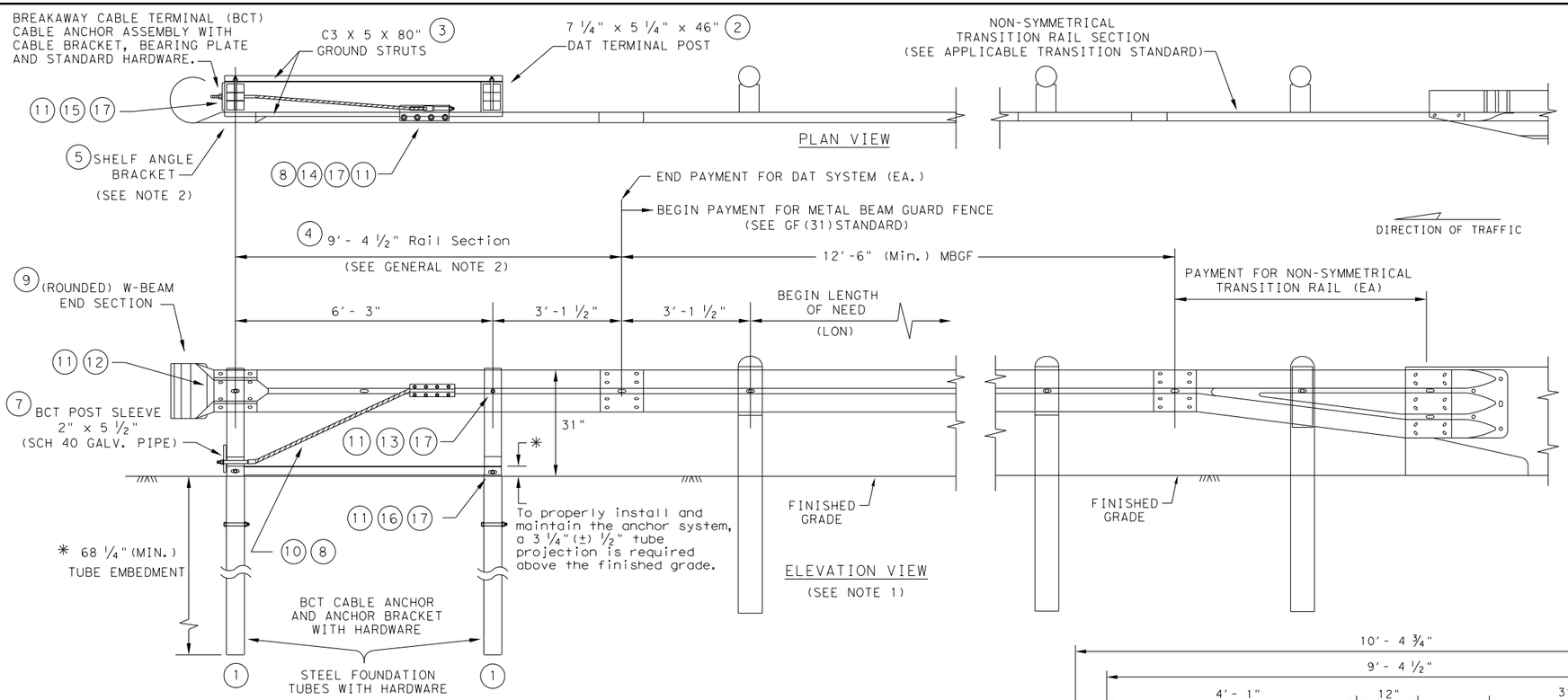


DOWNSTREAM ANCHOR TERMINAL (DAT)

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

GENERAL NOTES

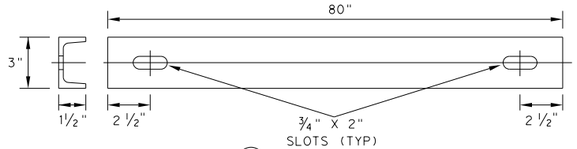
1. THE DETAIL SHOWN IS THE MINIMUM LENGTH OF NEED (LON) FOR A DOWNSTREAM ANCHOR TERMINAL (DAT) CONNECTED TO A CONCRETE RAIL.
2. THE RAIL SECTION AT THE END POST IS SUPPORTED BY THE SHELF ANGLE BRACKET. THE RAIL ELEMENT IS NOT ATTACHED TO THE END POST.
3. THE FOUNDATION TUBES SHALL NOT PROJECT MORE THAN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

MOW STRIP INSTALLATION

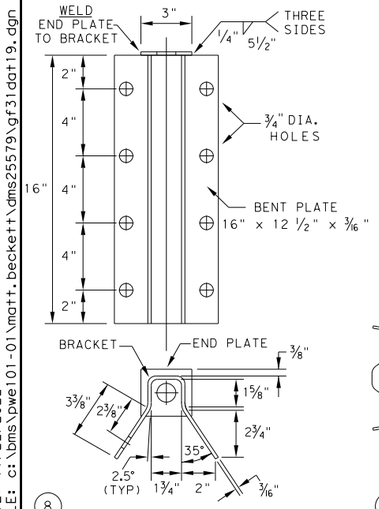
IF A MOW STRIP IS REQUIRED WITH THE DAT INSTALLATION THE LEAVE-OUT AREA AROUND THE STEEL FOUNDATION TUBES AND THE TWO CHANNEL STRUTS MAY BE OMITTED. THIS WILL REQUIRE A FULL POUR AT THE FOUNDATION TUBES.

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

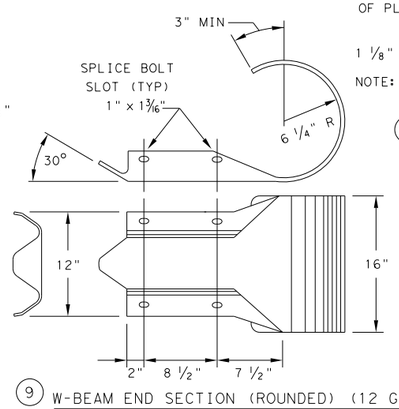
(4) TERMINAL RAIL ELEMENT FOR DAT



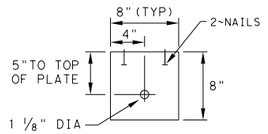
(3) CHANNEL STRUT
C3 X 5 X 80", GRADE A36



(8) GUARDRAIL ANCHOR BRACKET

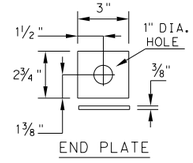


(9) W-BEAM END SECTION (ROUNDED) (12 GA.)

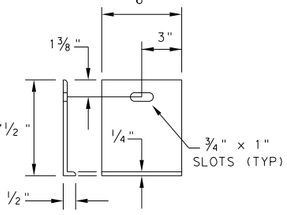


NOTE: DRIVE NAILS AND BEND OVER TO PREVENT PLATE ROTATION

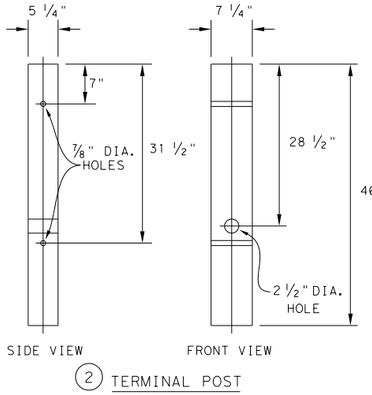
(6) BEARING PLATE
8"x 8"x 5/8" R



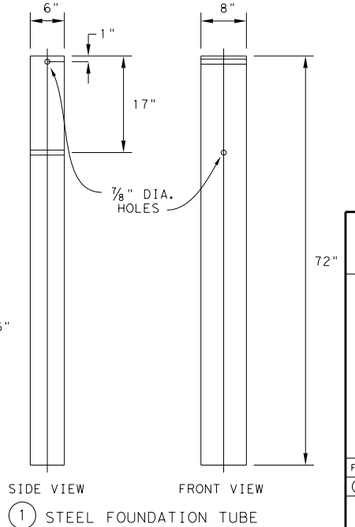
END PLATE



(5) SHELF ANGLE BRACKET



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



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

Texas Department of Transportation

Design Division Standard

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

GF(31)DAT-19

FILE: gf31dat19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		103

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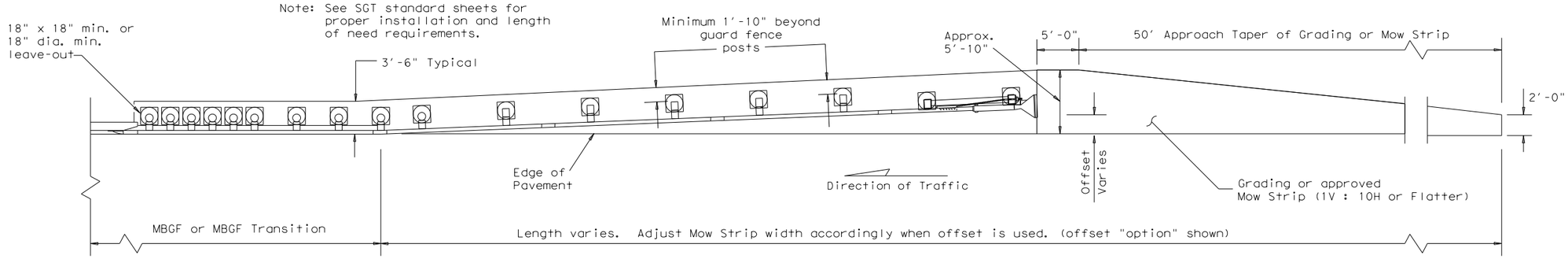
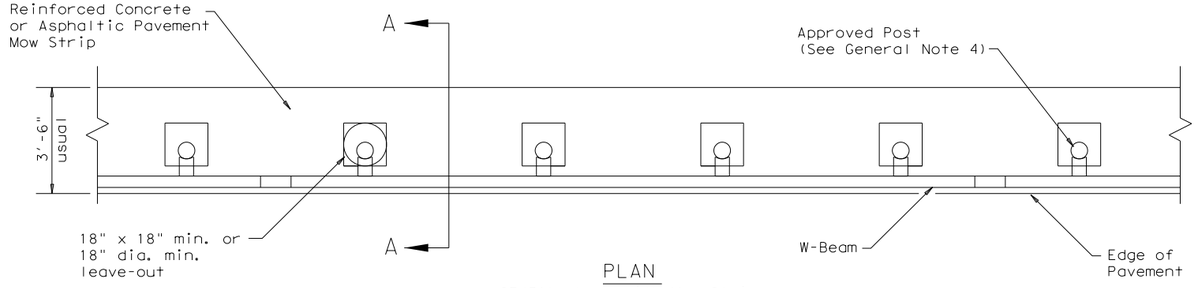
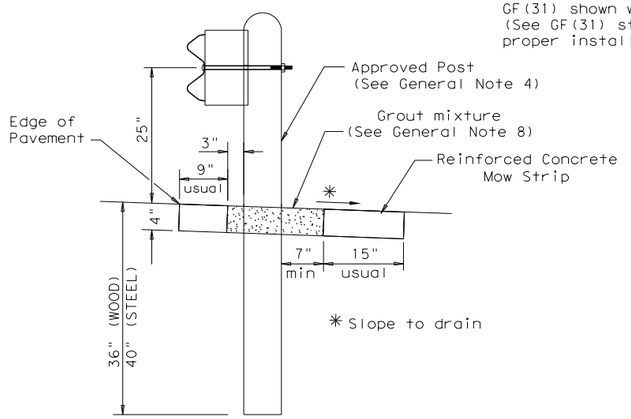


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



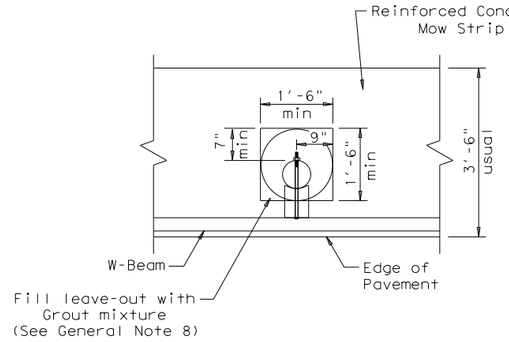
PLAN

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



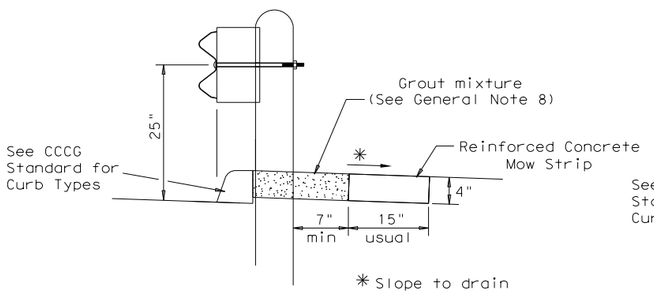
SECTION A-A

Typical



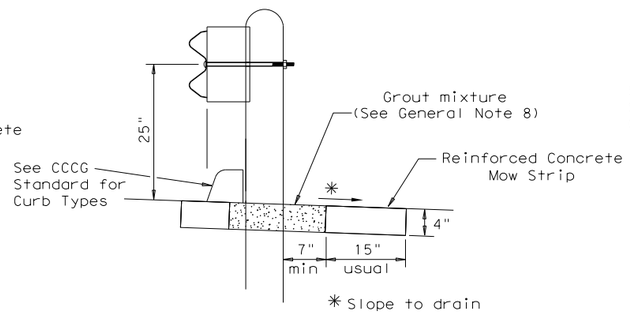
MOW STRIP DETAIL

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



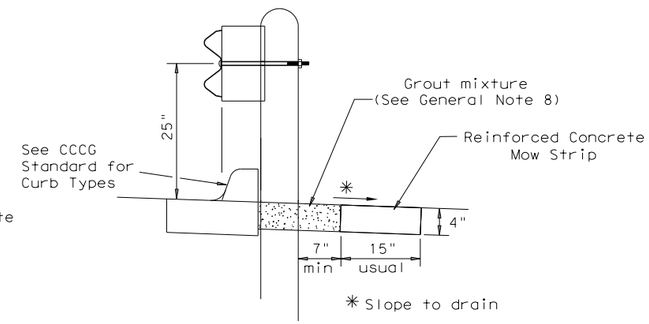
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

Note: Site Condition(s)

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

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

GENERAL NOTES

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

Texas Department of Transportation

Design Division Standard

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

GF(31)MS-19

FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG		
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB		HIGHWAY	
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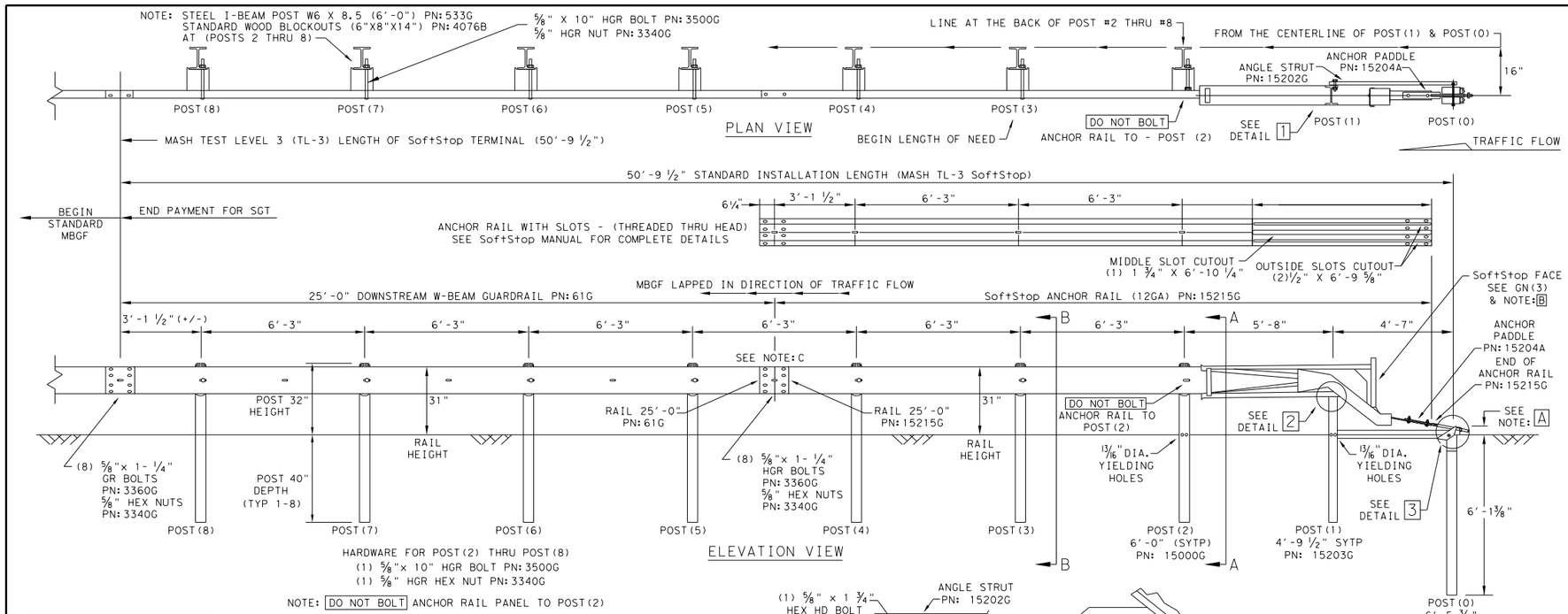
	DIST	COUNTY			SHEET NO.	
	PHR	CAMERON			104	



GENERAL NOTES

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

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

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

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

Texas Department of Transportation

Design Division Standard

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

FILE: sgt10s3116	DN: TxDOT	CK: KM	DW: VP	CK: MB/VP
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
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	PHR	CAMERON		105

DATE: 11/22/2022
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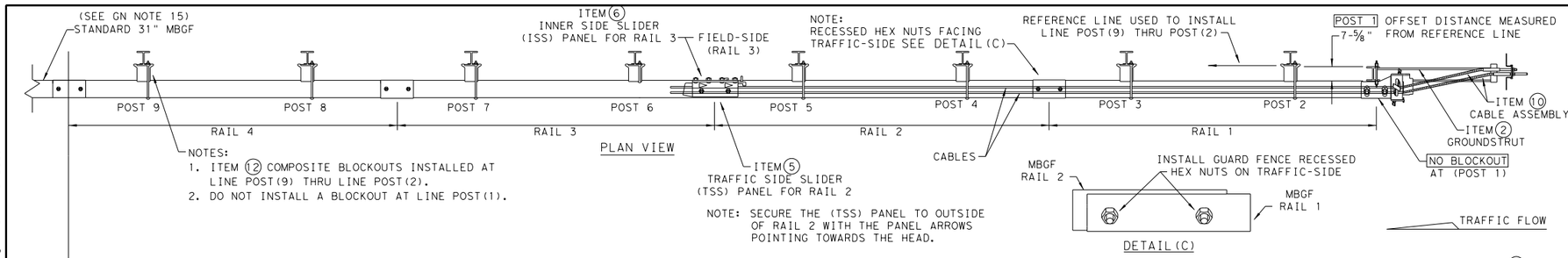

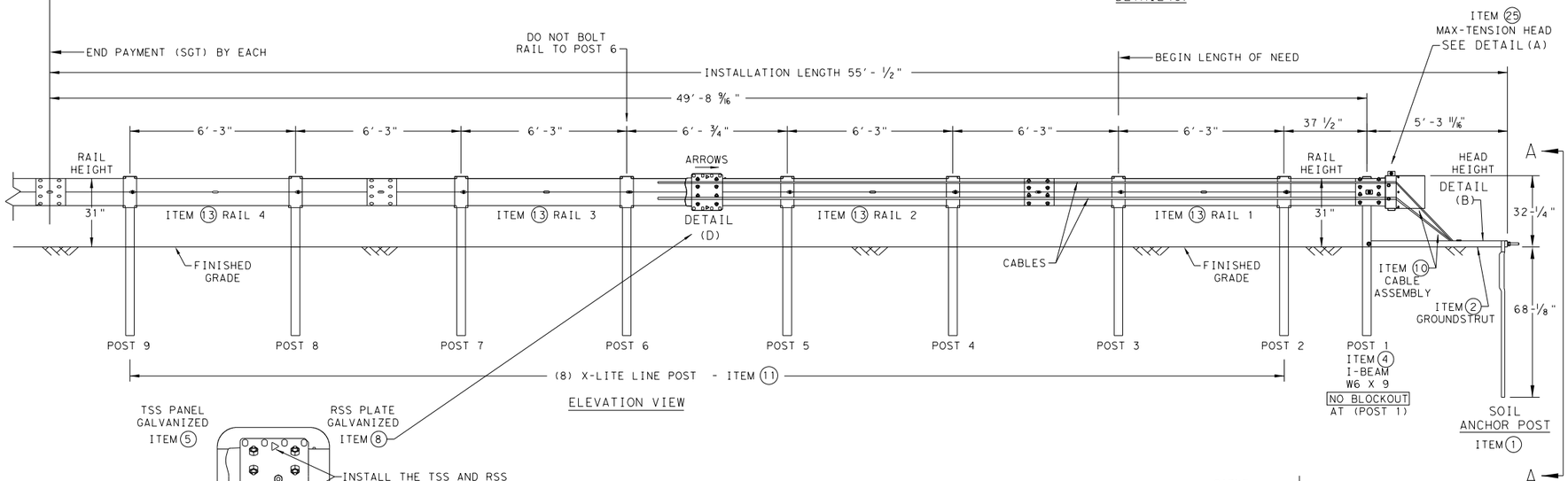

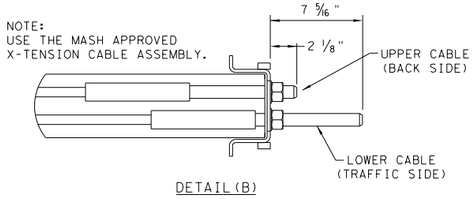

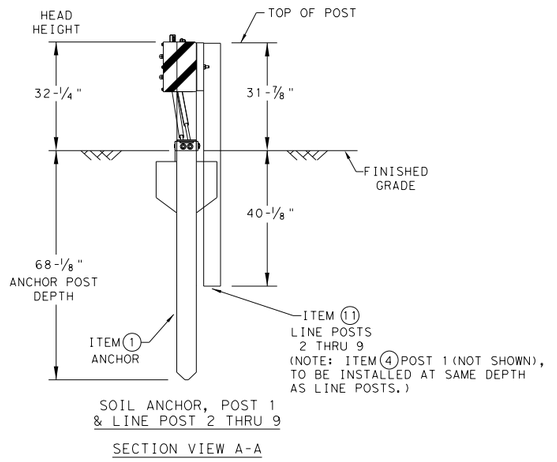

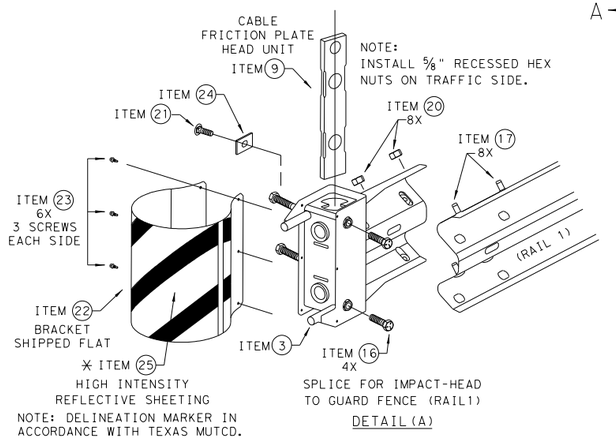

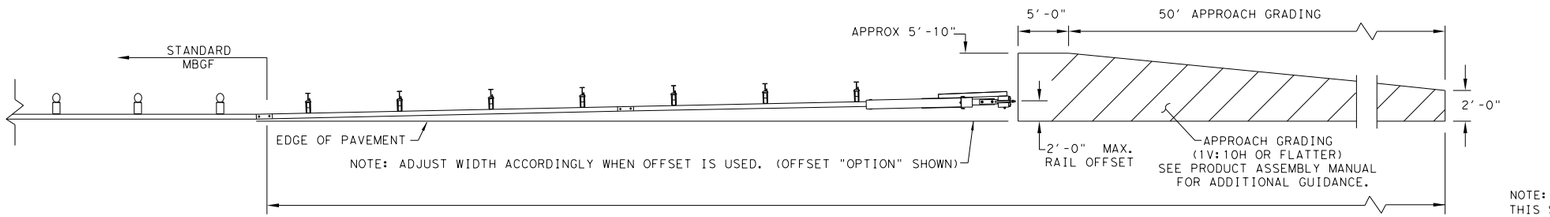

GENERAL NOTES

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

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

* TO BE PROVIDED BY DISTRIBUTOR OR CONTRACTOR.

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

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

Texas Department of Transportation

Design Division Standard

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

FILE: sgt11s3118.dgn	DN: TxDOT	CK: KM	DW: TxDOT	CK: CL
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	PHR	CAMERON		106

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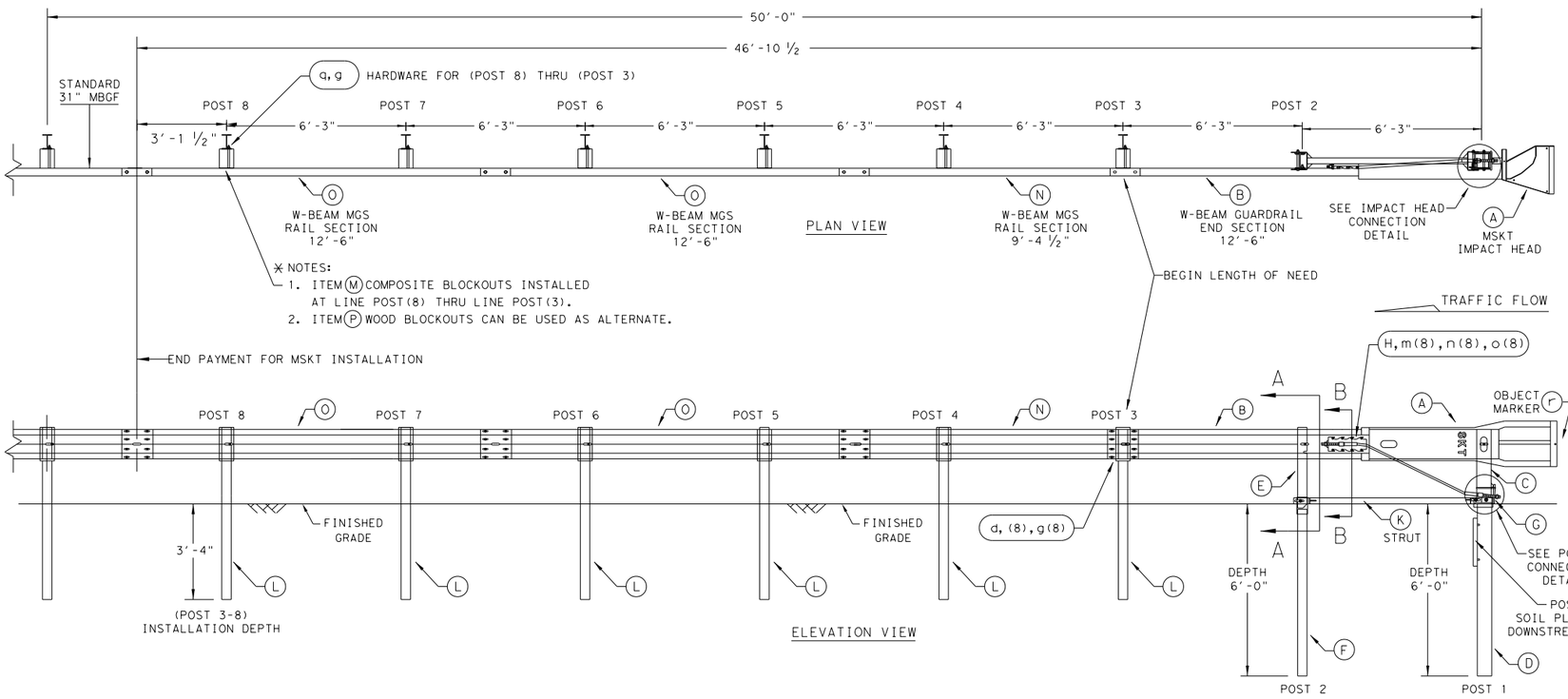


NOTE: SEE (GENERAL NOTE 14) FOR DRIVING CAP INFORMATION.

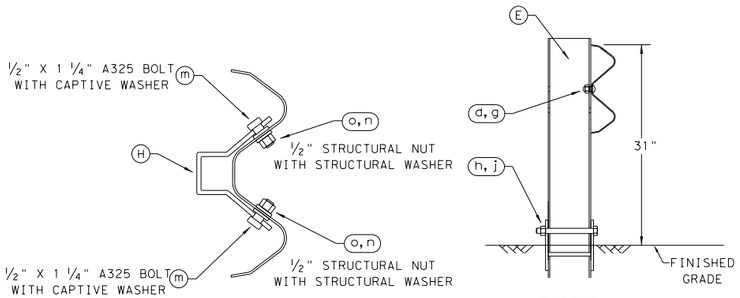
GENERAL NOTES

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

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

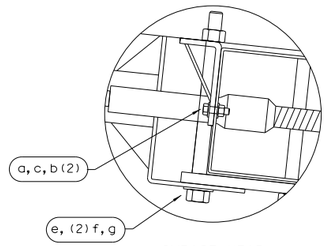
SEE NOTES: ✳

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



SECTION B-B
ANCHOR BRACKET

POST 2
SECTION A-A



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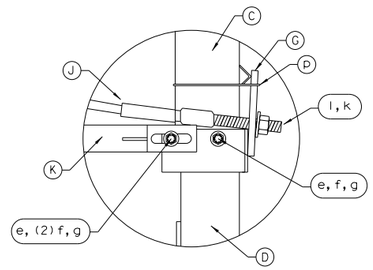
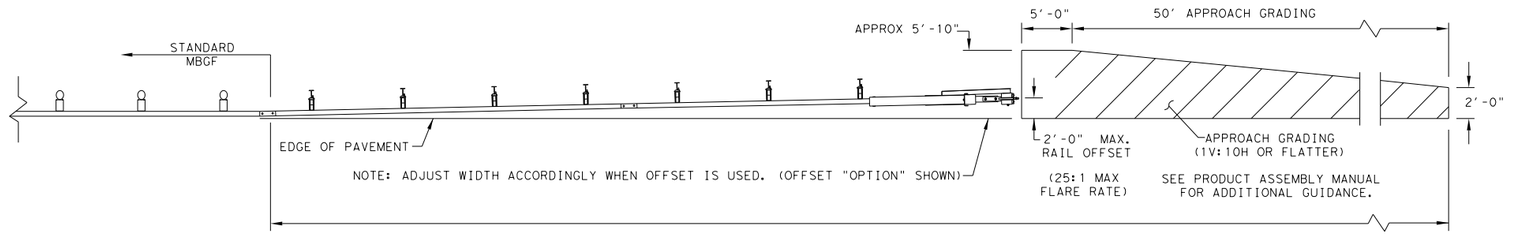


POST 1
CONNECTION DETAIL



TRAFFIC FLOW

APPROACH GRADING AT GUARDRAIL END TREATMENTS

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

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

Texas Department of Transportation

Design Division Standard

SINGLE GUARDRAIL TERMINAL

MSKT-MASH-TL-3

SGT(12S)31-18

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	DIST	COUNTY		SHEET NO.	
	PHR	CAMERON		107	

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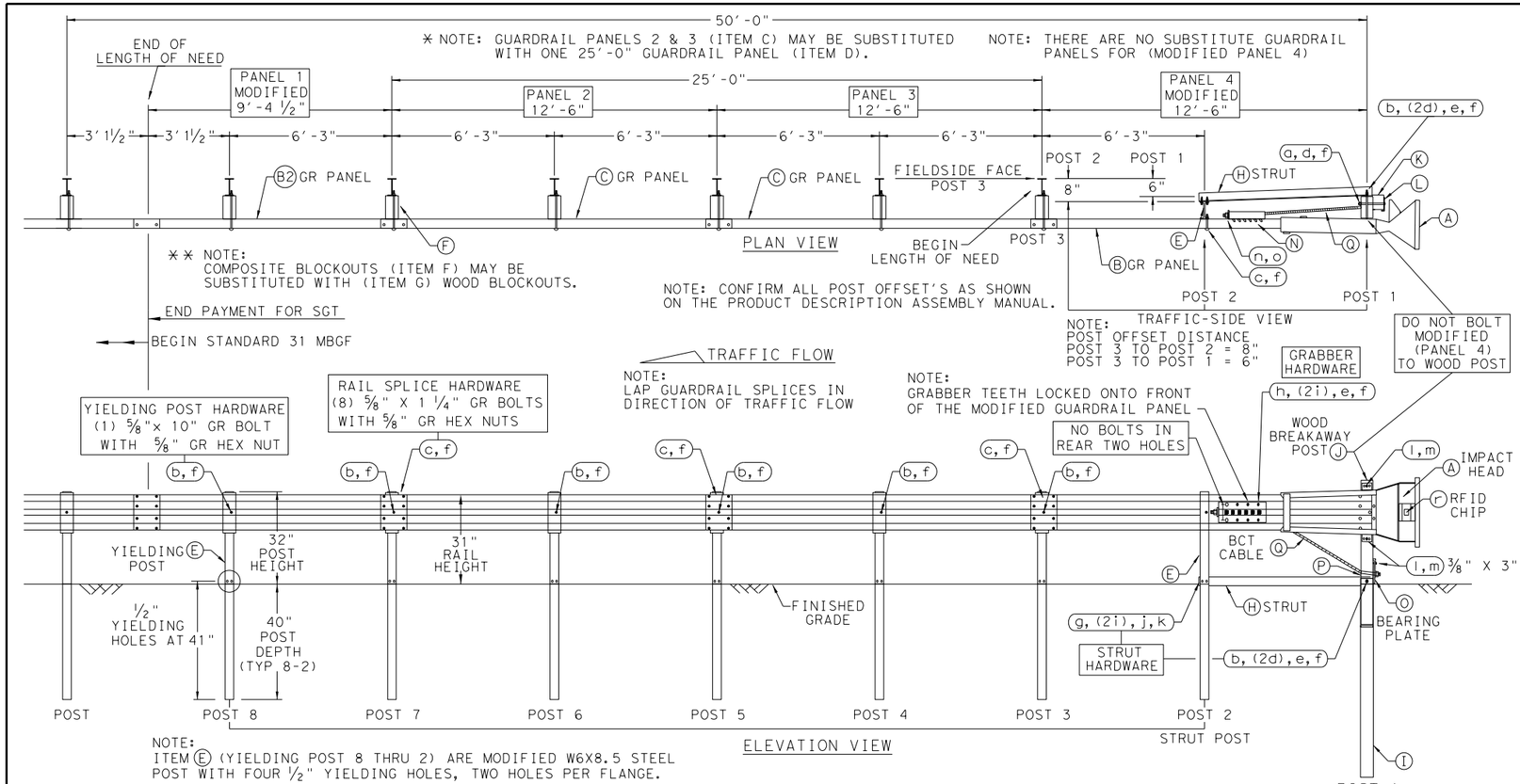
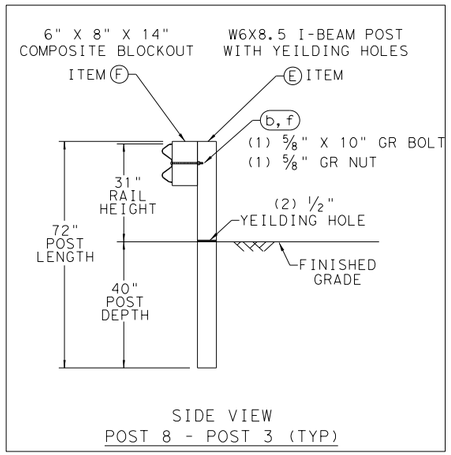


GENERAL NOTES

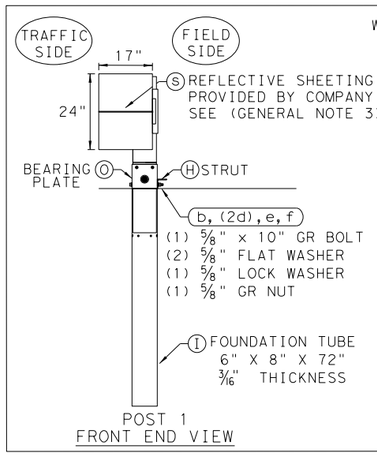
1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: SPIG INDUSTRY, INC. AT 1(267) 644-9510. 14675 INDUSTRIAL PARK RD; BRISTOL, VA 24202
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE MANUFACTURER'S; SGET END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL.
3. MANUFACTURER WILL APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" TO THE FACE PLATE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. THE OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. THE NOMINAL HEIGHT OF THE GUARDRAIL BEAM IS 31 INCHES WITH A TOLERANCE OF +/- ONE INCH.
5. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
6. (POST 2 THROUGH POST 8) ARE MODIFIED STEEL-YIELDING POSTS WITH YIELDING HOLES AT GROUND LEVEL. THERE ARE NO SUBSTITUTE POSTS.
7. POSTS SHALL NOT BE SET IN CONCRETE.
8. IF SOLID ROCK IS ENCOUNTERED FOR ANY OF THE POSTS IN THE SYSTEM, CONTACT THE MANUFACTURER FOR SPECIFIC INSTALLATION GUIDANCE.
9. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445,"GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
10. A COMPOSITE MATERIAL BLOCKOUT THAT MEETS DMS-7210 REQUIREMENTS MAY BE SUBSTITUTED FOR AN APPROVED WOOD BLOCKOUT. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
11. THE ENTIRE SYSTEM MUST BE INSTALLED IN A STRAIGHT LINE WITHOUT ANY CURVE. HOWEVER, THE SYSTEM CAN BE OFFSET BY TWO FEET AS SHOWN ON THE APPROACH GRADING DETAIL TO HELP OFF-SET THE IMPACT HEAD FROM SHOULDER OF THE ROAD.

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM #
A	1	SGET IMPACT HEAD	SIH1A
B	1	MODIFIED GUARDRAIL PANEL 12'-6" 12GA	126SPZGP
B2	1	MODIFIED GUARDRAIL PANEL 9'-4 1/2" 12GA	GP94
C	2	STANDARD GUARDRAIL PANEL 12'-6" 12GA	GP126
D *	1	STANDARD GUARDRAIL PANEL 25'-0" 12GA	GP25
E	7	MODIFIED YIELDING I-BEAM POST W6x8.5	YP6MOD
F	6	COMPOSITE BLOCKOUT 6" X 8" X 14"	CBO8
G **	6	WOOD BLOCKOUT 6" X 8" X 14"	WBO8
H	1	STRUT 3" X 3" X 80" x 1/4" A36 ANGLE	STR80
I	1	FOUNDATION TUBE 6" X 8" X 72" x 3/16"	FNDT6
J	1	WOOD BREAKAWAY POST 5 1/2" x 7 1/2" x 50"	WBRK50
K	1	WOOD STRIKE BLOCK	WSBLK14
L	1	STRIKE PLATE 1/4" A36 BENT PLATE	SPLT8
M	1	REINFORCEMENT PLATE 12 GA. GR55	REPLT17
N	1	GUARDRAIL GRABBER 2 1/2" X 2 1/2" X 16 1/2"	GGR17
O	1	BEARING PLATE 8" X 8 5/8" X 5/8" A36	BPLT8
P	1	PIPE SLEEVE 4 1/4" X 2 3/8" O.D. (2 1/8" I.D.)	PSLV4
Q	1	BCT CABLE 3/4" X 81" LENGTH	CBL81
		SMALL HARDWARE	
a	1	5/8" X 12" GUARDRAIL BOLT 307A HDG	12GRBLT
b	7	5/8" X 10" GUARDRAIL BOLT 307A HDG	10GRBLT
c	33	5/8" X 1 1/4" GR SPLICE BOLTS 307A HDG	1GRBLT
d	3	5/8" FLAT WASHER F436 A325 HDG	58FW436
e	1	5/8" LOCK WASHER HDG	58LW
f	39	5/8" GUARDRAIL HEX NUT HDG	58HN563
g	2	1/2" X 2" STRUT BOLT A325 HDG	2BLT
h	6	1/2" X 1 1/4" PLATE BOLT A325 HDG	125BLT
i	16	1/2" FLAT WASHER F436 A325 HDG	12FWF436
j	8	1/2" LOCK WASHER HDG	12LW
k	8	1/2" HEX NUT A563 HDG	12HN563
l	4	3/8" X 3" HEX LAG SCREW GR5 HDG	38LS
m	4	3/8" FLAT WASHER F436 A325 HDG	38FW844
n	2	1" FLAT WASHER F436 A325 HDG	1FWF436
o	2	1" HEX NUT A563DH HDG	1HN563
p	1	18" TO 24" LONG ZIP TIE RATED 175-200LB	ZPT18
q	1	1 1/2" X 4" SCH-40 PVC PIPE	PSPCR4
r	1	RFID CHIP RATED MIL-STD-810F	RFID810F
s	1	IMPACT HEAD REFLECTIVE SHEETING	RS30M

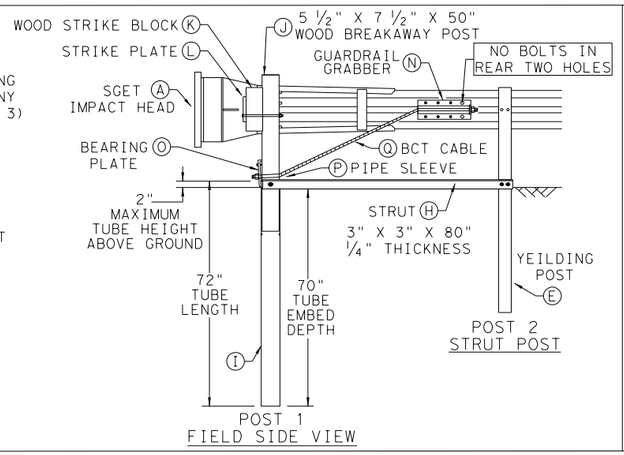
* ALTERNATIVE ITEMS
** NOTE: SEE PLAN VIEW



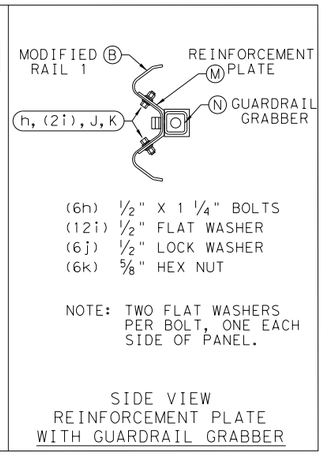
SIDE VIEW
POST 8 - POST 3 (TYP)



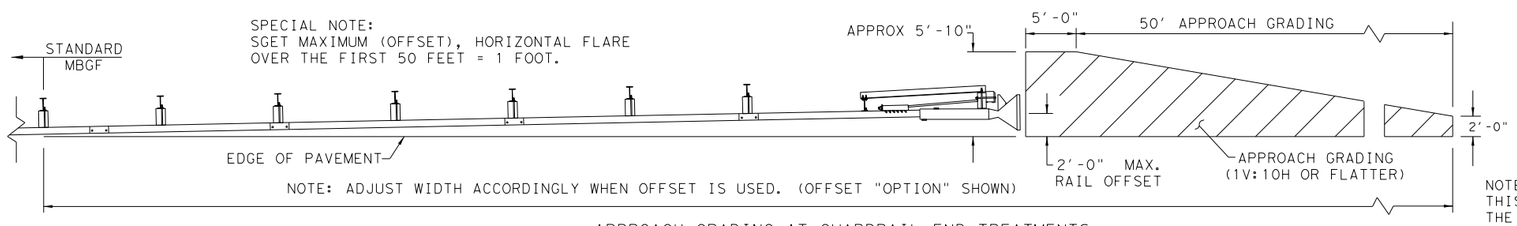
POST 1
FRONT END VIEW



POST 1
FIELD SIDE VIEW



SIDE VIEW
REINFORCEMENT PLATE
WITH GUARDRAIL GRABBER



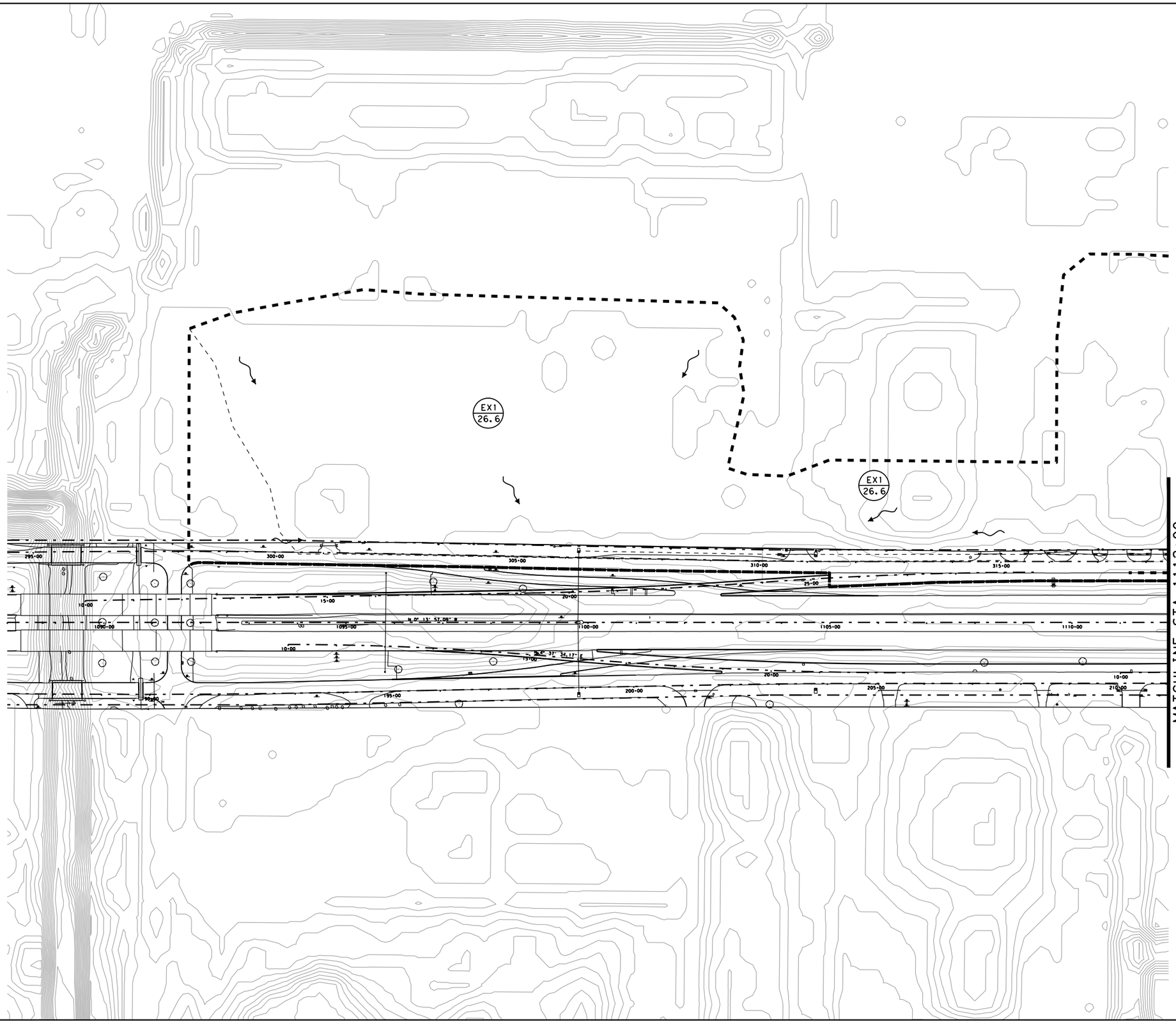
APPROACH GRADING AT GUARDRAIL END TREATMENTS

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SGET TERMINAL SYSTEM AND IS NOT INTENDED TO REPLACE THE MANUFACTURER'S ASSEMBLY MANUAL.

Texas Department of Transportation — Design Division Standard

SPIG INDUSTRY, LLC
SINGLE GUARDRAIL TERMINAL
SGET - TL-3 - MASH
SGT(15)31-20

FILE: sgt153120.dgn	DN: TxDOT	CK: KM	DW: VP	CK: VP
© TxDOT: APRIL 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		108



0' 50' 100' 200'

N

LEGEND:

- PROP MANHOLE
- PROP GRATE INLET
- PROP CURB INLET
- EXIST DRAINAGE BOUNDARY
- PROP DRAINAGE BOUNDARY
- PROP DITCH OR SWALE
- FLOW DIRECTION
- X99 / X.XX — DRAINAGE AREA NUMBER / AREA IN ACRES

NOTES:

1. CONTOURS SHOWN WERE DERIVED FROM USGS DEM DATA FOR CAMERON COUNTY 2012
2. SEE HYDROLOGIC & HYDRAULIC DATA SHEETS FOR ASSOCIATED DRAINAGE AREA CALCULATIONS

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
MARK CORBITT
101980
LICENSED
PROFESSIONAL ENGINEER
Mark D. Corbitt
11/22/2022

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
4350 Lockhill Selma Road, Suite 100 • San Antonio, Texas 78249 • 210.494.5511

SANCHEZ-SALAZAR & ASSOCIATES, LLC
12770 Cimarron Path, Ste. 118
San Antonio, TX 78249
Phone: (210) 314-5458
TBPELS Registration No. 15685

I69E
EXTERNAL DRAINAGE AREA MAP

SHEET 1 OF 2

DRAWN	FED. RD. DIV. NO.	STATE PROJECT NUMBER		HIGHWAY NO.
MC	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
MC	TEXAS	PHARR	CAMERON	109
CHECKED	CONT.	SECT.	JOB	
MC	0039	07	257	
APPROVED				
MC				

PLOTDRIVER: sso_pdf_co.pltcfg PENTABLE: I69E-RAMPS.tbl
DATE:11/22/2022 5:23:05 PM USER:
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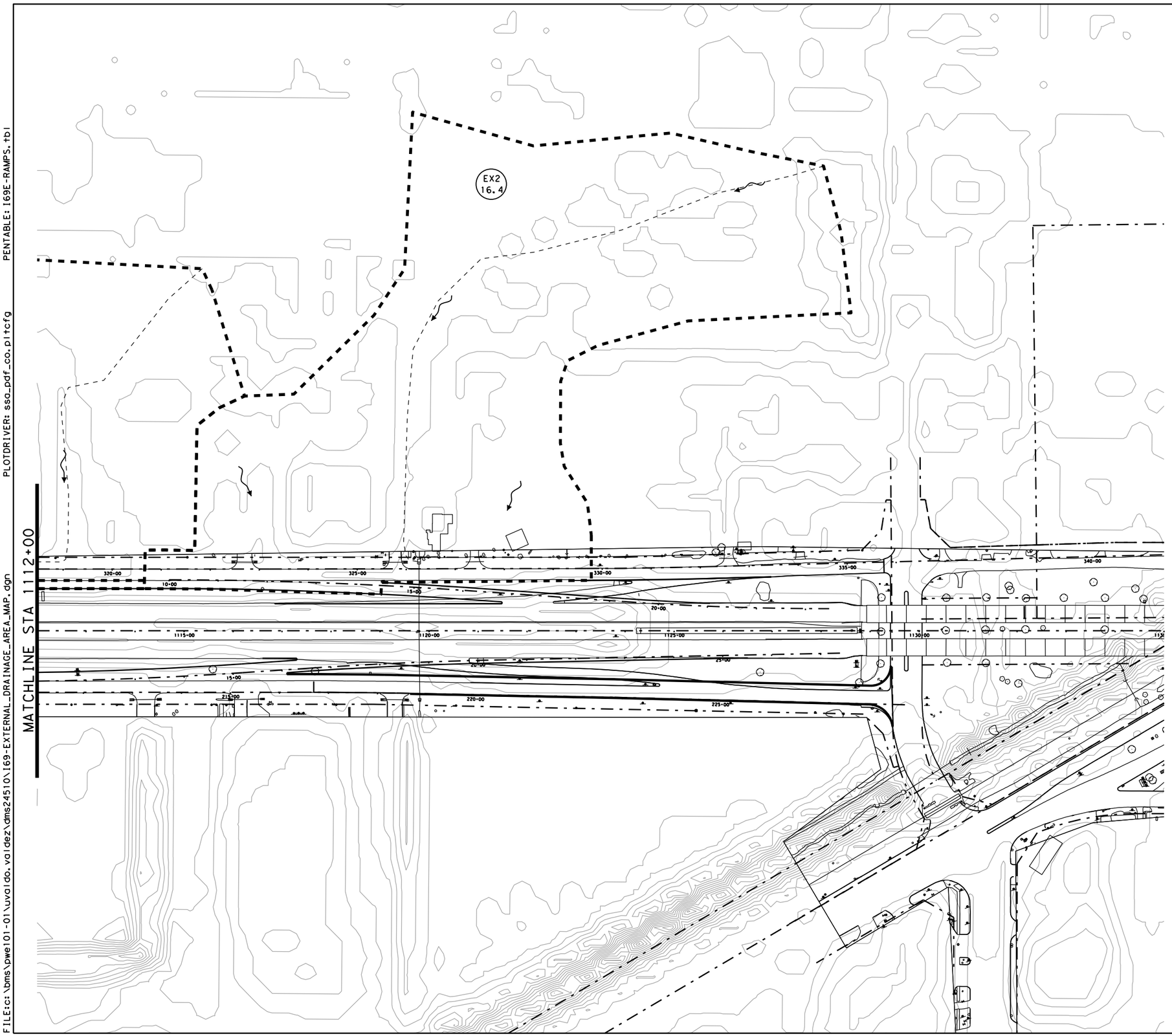

0' 50' 100' 200'

N

LEGEND:

- PROP MANHOLE
- PROP GRATE INLET
- PROP CURB INLET
- EXIST DRAINAGE BOUNDARY
- PROP DRAINAGE BOUNDARY
- PROP DITCH OR SWALE
- FLOW DIRECTION
- X99 / X.XX — DRAINAGE AREA NUMBER / AREA IN ACRES

NOTES:

1. CONTOURS SHOWN WERE DERIVED FROM USGS DEM DATA FOR CAMERON COUNTY 2012
2. SEE HYDROLOGIC & HYDRAULIC DATA SHEETS FOR ASSOCIATED DRAINAGE AREA CALCULATIONS

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
MARK CORBITT
101980
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Mark D. Corbitt
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Texas Department of Transportation

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I69E
EXTERNAL DRAINAGE AREA MAP

SHEET 2 OF 2

DRAWN	FED. RD. DIV. NO.	STATE PROJECT NUMBER		HIGHWAY NO.
MC	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
MC	TEXAS	PHARR	CAMERON	110
CHECKED	CONT.	SECT.	JOB	
MC	0039	07	257	
APPROVED				
MC				

I69E - Drainage Area Calculations					INTENSITY	INTENSITY	INTENSITY	INTENSITY	INTENSITY	INTENSITY	PEAK FLOWS	PEAK FLOWS	PEAK FLOWS	PEAK FLOWS	PEAK FLOWS	PEAK FLOWS
AREA ID	AREA	METHOD	C / CN	Tc	2 year	5 year	10 year	25 year	50 year	100 year	2 year	5 year	10 year	25 year	50 year	100 year
	(ac)			(min)	(in/hr)	(in/hr)	(in/hr)	(in/hr)	(in/hr)	(in/hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
EX 1	26.62	RATIONAL	0.58	79	1.79	2.28	2.69	3.24	3.67	4.10	27.65	35.21	41.47	50.07	56.69	63.36
EX 2	16.41	RATIONAL	0.43	49	1.65	2.10	2.47	2.98	3.38	3.77	11.67	14.83	17.43	21.06	23.83	26.60

I69E - Internal Drainage Area Calculations					INTENSITY	PEAK FLOWS
AREA ID	AREA	METHOD	C / CN	Tc	5 year	5 year
	(ac)			(min)	(in/hr)	(cfs)
DA-A-01	2.05	RATIONAL	0.48	14	5.60	5.50
DA-A-02	1.61	RATIONAL	0.52	10	6.40	5.36
DA-A-03	0.64	RATIONAL	0.20	15	5.40	0.69
DA-A-04	1.08	RATIONAL	0.55	15	5.40	3.21
DA-A-05	1.33	RATIONAL	0.55	16	5.30	3.88
DA-A-06	0.92	RATIONAL	0.52	10	6.40	3.06
DA-A-07	1.04	RATIONAL	0.20	15	5.40	1.12
DA-A-08	1.19	RATIONAL	0.62	12	6.00	4.42
DA-A-09	1.20	RATIONAL	0.60	10	6.40	4.60
DA-A-10	1.31	RATIONAL	0.64	12	6.00	5.03
DA-A-11	1.15	RATIONAL	0.57	15	5.40	3.55
DA-B-01	1.18	RATIONAL	0.55	11	6.20	4.04
DA-B-02	1.55	RATIONAL	0.53	20	4.88	4.01
DA-B-03	1.31	RATIONAL	0.56	14	5.60	4.11
DA-B-04	1.83	RATIONAL	0.51	16	5.30	4.95
DA-B-05	1.26	RATIONAL	0.62	10	6.40	4.98
DA-B-06	1.13	RATIONAL	0.57	10	6.40	4.11
DA-B-07	1.41	RATIONAL	0.20	19	4.99	1.41
DA-C-01	1.24	RATIONAL	0.55	20	4.88	3.32
DA-C-02	0.87	RATIONAL	0.47	10	6.40	2.61
DA-C-03	0.60	RATIONAL	0.44	10	6.40	1.69
DA-C-04	0.35	RATIONAL	0.48	10	6.40	1.07

NOTES:

1. INTENSITIES ARE DERIVED FROM NOAA ATLAS 14 DATA. 2-YEAR, 24-HOUR PRECEIPITATION OBTAINED FROM NOAA ATLAS 14 DATA.
2. INTENSITIES BASED ON ANNUAL MAX DURATION.

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
MARK CORBITT
101980
LICENSED
PROFESSIONAL ENGINEER
Mark D. Corbitt
11/22/2022

Texas Department of Transportation

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TBPELS Registration No. 15685

I69E
HYDROLOGIC & HYDRAULIC DATA SHEETS

SHEET 1 OF 3

DRAWN	FED.RD. DIV.NO.	STATE PROJECT NUMBER		HIGHWAY NO.
MC	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
MC	TEXAS	PHARR	CAMERON	
CHECKED	CONT.	SECT.	JOB	111
MC	0039	07	257	
APPROVED				
MC				

CONVEYANCE CONFIGURATION DATA

Link ID	Upstream Node	Downstream Node	Number of Barrels	Rise	Span	Actual Length	Hydraulic Length	Slope	Invert Upstream	Invert Downstream	Discharge	Capacity	Soffit Upstream	HGL Upstream
				(ft.)	(ft.)	(ft.)	(ft.)	(ft./ft.)	(ft.)	(ft.)	(cfs)	(cfs)	(ft.)	(ft.)
L-A-01	A-01	A-02	1	1.50	N/A'	199.40	203.40	0.2310	31.93	31.46	5.50	5.88	33.43	40.65
L-A-02	A-02	JCT-A-01	1	1.50	N/A'	212.63	216.63	0.0920	31.46	31.26	10.86	3.72	32.96	40.02
L-A-03	JCT-A-01	JCT-A-02	1	1.50	N/A'	182.52	186.52	0.2470	31.26	30.80	10.86	6.08	32.76	37.24
L-A-04	A-05	JCT-A-02	1	1.00	N/A'	40.25	44.25	2.1010	31.73	30.80	3.88	5.97	32.73	35.60
L-A-05	A-04	A-03	1	1.50	N/A'	144.02	146.02	0.8900	31.51	30.21	3.21	11.55	33.01	35.06
L-A-06	A-03	JCT-A-02	1	1.50	N/A'	97.58	101.58	0.2070	30.21	30.00	3.90	5.57	31.71	34.89
L-A-07	JCT-A-02	A-06	1	2.00	N/A'	153.70	157.70	0.5520	30.00	29.13	18.64	19.58	32.00	34.77
L-A-08	A-06	JCT-A-03	1	2.50	N/A'	300.14	304.14	0.3260	29.13	28.14	21.70	27.27	31.63	32.84
L-A-09	A-11	JCT-A-03	1	1.50	N/A'	43.11	47.11	1.8260	29.00	28.14	3.55	16.54	30.50	31.82
L-A-10	JCT-A-03	JCT-A-04	1	3.00	N/A'	31.49	35.49	0.1130	28.14	28.10	25.25	26.10	31.14	31.71
L-A-11	A-10	JCT-A-04	1	1.50	N/A'	147.46	151.46	0.6540	29.00	28.01	5.03	9.90	30.50	31.58
L-A-12	JCT-A-04	JCT-A-05	1	3.00	N/A'	59.99	63.99	0.3750	28.01	27.77	30.28	47.60	31.01	31.16
L-A-13	A-07	JCT-A-05	1	1.50	N/A'	10.14	14.14	4.6670	33.66	33.00	1.12	26.45	35.16	34.20
L-A-14	JCT-A-05	JCT-A-06	1	3.00	N/A'	65.58	69.58	0.3740	27.77	27.51	31.40	47.51	30.77	30.82
L-A-15	A-08	JCT-A-06	1	1.50	N/A'	76.16	80.16	1.2480	29.00	28.00	4.42	13.67	30.50	30.75
L-A-16	JCT-A-06	JCT-A-07	1	3.00	N/A'	63.27	67.27	0.3720	27.51	27.26	35.82	47.39	30.51	30.53
L-A-17	A-09	JCT-A-07	1	1.00	N/A'	21.59	25.60	3.9070	29.00	28.00	4.60	8.14	30.00	31.02
L-A-18	JCT-A-07	OUT-A	1	3.00	N/A'	53.65	55.65	0.4670	27.26	27.00	40.42	53.13	30.26	30.01
L-B-01	B-04	JCT-B-01	1	2.00	N/A'	35.03	39.03	0.0510	29.33	29.31	4.95	5.97	31.33	34.08
L-B-02	B-06	JCT-B-01	1	1.50	N/A'	193.09	197.10	0.2500	32.33	31.84	4.11	6.12	33.83	34.37
L-B-03	JCT-B-01	JCT-B-02	1	2.00	N/A'	32.94	36.94	0.0540	29.31	29.29	9.06	6.13	31.31	34.03
L-B-04	JCT-B-02	B-07	1	2.00	N/A'	58.24	62.24	0.0480	29.29	29.26	13.17	5.79	31.29	33.64
L-B-05	B-07	JCT-B-03	1	2.00	N/A'	81.35	85.35	0.0590	29.26	29.21	14.58	6.38	31.26	33.06
L-B-06	B-05	JCT-B-03	1	1.50	N/A'	163.43	167.43	0.2930	32.63	32.14	4.98	6.62	34.13	33.93
L-B-07	JCT-B-03	B-02	1	2.00	N/A'	50.30	54.30	0.0550	29.21	29.18	23.60	6.20	31.21	32.74
L-B-08	B-02	OUT-B	1	2.00	N/A'	24.31	26.31	0.6840	29.18	29.00	27.61	21.81	31.18	31.33
L-C-04	C-04	C-03	1	1.50	N/A'	42.32	46.32	0.8420	31.00	30.61	1.07	11.23	32.50	31.52
L-C-05	C-03	JCT-C-02	1	2.00	N/A'	208.64	212.64	0.3200	30.61	29.93	2.76	14.91	32.61	31.44
L-C-06	C-02	JCT-C-02	1	1.50	N/A'	23.09	27.09	2.1040	30.50	29.93	2.69	17.76	32.00	31.44
L-C-07	JCT-C-02	C-01	1	2.00	N/A'	47.53	51.53	0.2910	29.93	29.78	5.45	14.22	31.93	31.38
L-C-08	C-01	OUT-C	1	2.00	N/A'	183.57	185.57	0.9430	29.78	28.03	8.77	25.60	31.78	30.94
L-C-09	C-01A	C-01	1	2.00	N/A'	58.85	63.35	0.3470	30.00	29.78	3.32	15.536	32.00	32.01
L-B-03A	B-03	JCT-B-02	1	1.50	N/A'	141.56	145.56	0.4880	30.00	29.29	4.11	8.55	31.50	33.91
L-B-06A	B-01	JCT-B-03	1	1.50	N/A'	529.92	533.92	0.2420	30.50	29.21	4.04	6.02	32.00	33.50

CONVEYANCE CONFIGURATION DATA

Link ID	EGL Upstream	Soffit Downstream	HGL Downstream	EGL Downstream	Manning's N Value	Actual Velocity Upstream	Actual Velocity Downstream	Uniform Velocity	Critical Velocity	Actual Depth Upstream	Actual Depth Downstream	Uniform Depth	Critical Depth	Friction Slope	Critical Slope
	(ft.)	(ft.)	(ft.)	(ft.)		(fps)	(fps)	(fps)	(fps)	(ft.)	(ft.)	(ft.)	(ft.)		
L-A-01	40.80	32.96	40.02	40.61	0.012	3.11	3.11	3.54	4.94	1.50	1.50	1.232	0.904	0.0020	0.0050
L-A-02	40.61	32.76	37.24	37.83	0.012	6.15	6.15	6.31	6.84	1.50	1.50	1.5	1.263	0.0080	0.0090
L-A-03	37.83	32.30	34.77	35.31	0.012	6.15	6.15	6.31	6.84	1.50	1.50	1.5	1.263	0.0080	0.0090
L-A-04	35.98	31.80	34.77	35.31	0.012	4.94	4.94	7.64	5.53	1.00	1.00	0.616	0.837	0.0210	0.0100
L-A-05	35.11	31.71	34.89	34.97	0.012	1.82	1.82	5.32	4.10	1.50	1.50	0.561	0.682	0.0090	0.0040
L-A-06	34.97	31.50	34.77	35.31	0.012	2.21	2.21	3.23	4.38	1.50	1.50	0.968	0.755	0.0020	0.0050
L-A-07	35.31	31.13	32.84	33.15	0.012	5.93	5.93	6.55	7.12	2.00	2.00	1.701	1.554	0.0050	0.0060
L-A-08	33.15	30.64	31.71	31.90	0.012	4.42	4.42	5.88	6.62	2.50	2.50	1.76	1.584	0.0030	0.0040
L-A-09	31.88	29.64	31.71	31.90	0.012	2.01	2.01	7.06	4.24	1.50	1.50	0.491	0.719	0.0180	0.0050
L-A-10	31.90	31.10	31.16	31.45	0.012	3.57	3.57	3.67	6.48	3.00	3.00	2.816	1.622	0.0010	0.0040
L-A-11	31.71	29.51	31.16	31.45	0.012	2.85	2.85	5.31	4.78	1.50	1.50	0.792	0.863	0.0070	0.0050
L-A-12	31.45	30.77	30.82	31.13	0.012	4.28	4.28	6.72	6.92	3.00	3.00	1.826	1.783	0.0040	0.0040
L-A-13	34.34	34.50	33.24	33.87	0.012	1.98	6.34	7.06	3.01	0.54	0.24	0.218	0.396	0.0470	0.0040
L-A-14	31.13	30.51	30.53	30.99	0.012	4.44	4.44	6.78	7.01	3.00	3.00	1.87	1.817	0.0040	0.0040
L-A-15	30.84	29.50	30.53	30.99	0.012	2.50	2.50	6.54	4.56	1.50	1.50	0.611	0.807	0.0120	0.0050
L-A-16	30.99	30.26	30.01	30.95	0.012	5.07	5.27	6.89	7.38	3.00	2.75	2.068	1.946	0.0040	0.0040
L-A-17	31.45	29.00	30.01	30.95	0.012	5.86	5.86	10.10	6.21	1.00	1.00	0.563	0.893	0.0390	0.0130
L-A-18	30.95	30.00	29.07	30.01	0.012	5.95	7.78	7.78	7.77	2.75	2.07	2.068	2.07	0.0050	0.0050
L-B-01	34.12	31.31	34.03	34.15	0.012	1.58	1.58	2.09	4.34	2.00	2.00	1.408	0.784	0.0010	0.0040
L-B-02	34.45	33.34	34.03	34.15	0.012	2.33	2.33	3.50	4.45	1.50	1.50	0.946	0.776	0.0020	0.0050
L-B-03	34.15	31.29	33.64	33.91	0.012	2.88	2.88	2.96	5.27	2.00	2.00	2	1.075	0.0010	0.0040
L-B-04	33.91	31.26	33.06	33.40	0.012	4.19	4.19	4.30	6.06	2.00	2.00	2	1.306	0.0020	0.0050
L-B-05	33.40	31.21	32.74	33.62	0.012	4.64	4.64	4.76	6.33	2.00	2.00	2	1.376	0.0030	0.0050
L-B-06	34.12	33.64	33.00	33.62	0.012	3.07	4.76	3.93	4.76	1.30	0.86	1.012	0.858	0.0030	0.0050
L-B-07	33.62	31.18	31.33	32.53	0.012	7.51	7.51	7.71	8.20	2.00	2.00	2	1.724	0.0080	0.0090
L-B-08	32.53	31.00	30.82	32.14	0.012	8.79	9.20	9.02	9.20	2.00	1.82	2	1.821	0.0110	0.0110
L-C-04	31.66	32.11	30.94	31.16	0.012	1.95	3.79	3.80	2.99	0.52	0.33	0.325	0.384	0.0080	0.0040
L-C-05	31.52	31.93	31.38	31.55	0.012	2.25	1.13	3.47	3.66	0.83	1.45	0.601	0.579	0.0030	0.0040
L-C-06	31.55	31.43	31.38	31.55	0.012	2.31	1.54	6.87	3.88	0.94	1.45	0.41	0.623	0.0210	0.0040
L-C-07	31.55	31.78	30.94	31.36	0.012	2.23	2.90	4.01	4.47	1.45	1.16	0.895	0.824	0.0030	0.0040
L-C-08	31.36	30.03	28.87	29.63	0.012	4.66	6.99	7.01	5.21	1.16	0.84	0.84	1.056	0.0090	0.0040
L-C-09	32.02	31.78	31.98	32.51	0.012	1.06	1.06	3.73	3.85	2.00	2.00	0.65	0.64	0.0030	0.0040
L-B-03A	33.99	30.79	33.64	33.91	0.012	2.33	2.33	4.54	4.45	1.50	1.50	0.765	0.776	0.0050	0.0050
L-B-06A	33.58	30.71	32.74	33.62	0.012	2.29	2.29	3.44	4.42	1.50	1.50	0.946	0.77	0.0020	0.0050

NOTES:

1. INTENSITIES ARE DERIVED FROM NOAA ATLAS 14 DATA.
2. STORM DRAIN ANALYSIS WAS PERFORMED USING GEOPAK DRAINAGE.

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
MARK CORBITT
101980
LICENSED
PROFESSIONAL ENGINEER

Mark D. Corbitt, P.E.
11/22/2022

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TBPELS Registration No. 15685

I69E
HYDROLOGIC & HYDRAULIC DATA SHEETS

SHEET 2 OF 3

DRAWN	FED. RD. DIV. NO.	STATE PROJECT NUMBER		HIGHWAY NO.
MC	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
MC	TEXAS	PHARR	CAMERON	
CHECKED	CONT.	SECT.	JOB	112
MC	0039	07	257	
APPROVED				
MC				

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Inlet Hydraulics

Inlet ID	Discharge	Supplied Discharge	By Pass Flow Into	By Pass Flow	Capacity	Type	Profile Type	Station	Offset	Elevation	Longitudinal Slope	Computed Ponded Width	Max Ponded Width	Computed Ponded Depth
	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)				(feet)		(ft./ft.)	(feet)	(feet)	(feet)
A-01	5.5	5.50	0.00	0.00	5.50	Grate	On Grade	1095+80.78	102.66	36.40	0.2000	4.27	15.00	1.42
A-02	5.36	5.36	0.00	0.00	5.36	Grate	On Grade	1095+81.26	-100.75	36.65	0.2000	4.23	15.00	1.41
A-03	0.69	0.69	0.00	0.00	0.69	Grate	On Grade	1099+80.73	0.04	37.61	0.2000	1.96	15.00	0.65
A-04	3.21	3.21	0.00	0.00	3.21	Grate	On Grade	1099+81.07	146.06	35.36	0.2000	3.49	15.00	1.16
A-05	3.88	3.88	0.00	0.00	3.88	Grate	On Grade	1099+80.65	-145.59	35.37	0.2000	3.75	15.00	1.25
A-06	3.06	3.06	0.00	0.00	3.06	Grate	On Grade	1101+41.71	-96.40	34.80	0.2000	3.43	15.00	1.14
A-07	1.12	1.12	0.00	0.00	1.12	Grate	On Grade	1104+31.32	0.55	36.73	0.2000	2.35	15.00	0.78
A-08	4.42	4.42	0.00	0.00	4.42	Grate	On Grade	1103+69.55	72.35	35.00	0.2000	3.93	15.00	1.31
A-09	4.6	4.60	0.00	0.00	4.60	Grate	On Grade	1104+70.73	138.10	34.96	0.2000	3.99	15.00	1.33
A-10	5.03	5.03	0.00	0.00	5.03	Grate	On Grade	1105+97.33	-68.84	35.00	0.2000	4.13	15.00	1.38
A-11	3.55	3.55	0.00	0.00	3.55	Grate	On Grade	1104+70.96	-137.60	34.73	0.2000	3.62	15.00	1.21
B-01	4.04	4.04	0.00	0.00	4.04	Grate	On Grade	1114+47.06	67.09	36.80	0.2000	3.80	15.00	1.27
B-02	4.01	4.01	0.00	0.00	4.01	Grate	On Grade	1119+80.52	139.69	35.25	0.2000	3.79	15.00	1.26
B-03	4.11	4.11	0.00	0.00	4.11	Grate	On Grade	1118+34.30	-69.02	35.60	0.2000	3.83	15.00	1.28
B-04	4.95	4.95	0.00	0.00	4.95	Grate	On Grade	1119+79.40	-138.17	35.20	0.2000	4.11	15.00	1.37
B-05	4.98	4.98	0.00	0.00	4.98	Grate	On Grade	1121+48.00	79.91	35.80	0.2000	4.11	15.00	1.37
B-06	4.11	4.11	0.00	0.00	4.11	Grate	On Grade	1121+77.00	-94.46	36.50	0.2000	3.83	15.00	1.28
B-07	1.41	1.41	0.00	0.00	1.41	Grate	On Grade	1119+80.30	0.04	36.62	0.2000	2.57	15.00	0.85
C-01A	3.32	3.32	0.00	0.00	3.32	Curb	On Grade	1128+31.45	149.50	36.31	0.2000	13.31	15.00	0.27
C-02	2.69	2.69	0.00	0.00	2.69	Grate	On Grade	1128+49.67	103.60	35.10	0.2000	3.27	15.00	1.09
C-03	1.69	1.69	0.00	0.00	1.69	Grate	On Grade	1128+75.79	-107.61	35.98	0.2000	2.75	15.00	0.91
C-04	1.07	1.07	0.00	0.00	1.07	Grate	On Grade	1128+85.93	-152.71	35.18	0.2000	2.31	15.00	0.77

Inlet Hydraulics

Inlet ID	Max Ponded Depth	Length Required	Curb Length	Curb Depression	Curb Height	Curb Depression Width	Grate Type	Grate Length	Grate Width	Grate Area	Grate Perimeter	Grate Clog Area	Grate Clog Per	Spread N	Composite Spread Slope	Inlet to Gutter Offset
	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)		(feet)	(feet)	(sq.	(feet)	(sq.				(feet)
A-01	2.00	N/A'	N/A'	N/A'	N/A'	N/A'	Parallel 1 1/8	4	4	11.73	15	0.5	0.5	0.035	0.3330	0
A-02	2.00	N/A'	N/A'	N/A'	N/A'	N/A'	Parallel 1 1/8	4	4	11.73	15	0.5	0.5	0.035	0.3330	0
A-03	2.00	N/A'	N/A'	N/A'	N/A'	N/A'	Parallel 1 1/8	4	4	11.73	15	0.5	0.5	0.035	0.3330	0
A-04	2.00	N/A'	N/A'	N/A'	N/A'	N/A'	Parallel 1 1/8	4	4	11.73	15	0.5	0.5	0.035	0.3330	0
A-05	2.00	N/A'	N/A'	N/A'	N/A'	N/A'	Parallel 1 1/8	4	4	11.73	15	0.5	0.5	0.035	0.3330	0
A-06	2.00	N/A'	N/A'	N/A'	N/A'	N/A'	Parallel 1 1/8	4	4	11.73	15	0.5	0.5	0.035	0.3330	0
A-07	2.00	N/A'	N/A'	N/A'	N/A'	N/A'	Parallel 1 1/8	4	4	11.73	15	0.5	0.5	0.035	0.3330	0
A-08	2.00	N/A'	N/A'	N/A'	N/A'	N/A'	Parallel 1 1/8	4	4	11.73	15	0.5	0.5	0.035	0.3330	0
A-09	2.00	N/A'	N/A'	N/A'	N/A'	N/A'	Parallel 1 1/8	4	4	11.73	15	0.5	0.5	0.035	0.3330	0
A-10	2.00	N/A'	N/A'	N/A'	N/A'	N/A'	Parallel 1 1/8	4	4	11.73	15	0.5	0.5	0.035	0.3330	0
A-11	2.00	N/A'	N/A'	N/A'	N/A'	N/A'	Parallel 1 1/8	4	4	11.73	15	0.5	0.5	0.035	0.3330	0
B-01	2.00	N/A'	N/A'	N/A'	N/A'	N/A'	Parallel 1 1/8	4	4	11.73	15	0.5	0.5	0.035	0.3330	0
B-02	2.00	N/A'	N/A'	N/A'	N/A'	N/A'	Parallel 1 1/8	4	4	11.73	15	0.5	0.5	0.035	0.3330	0
B-03	2.00	N/A'	N/A'	N/A'	N/A'	N/A'	Parallel 1 1/8	4	4	11.73	15	0.5	0.5	0.035	0.3330	0
B-04	2.00	N/A'	N/A'	N/A'	N/A'	N/A'	Parallel 1 1/8	4	4	11.73	15	0.5	0.5	0.035	0.3330	0
B-05	2.00	N/A'	N/A'	N/A'	N/A'	N/A'	Parallel 1 1/8	4	4	11.73	15	0.5	0.5	0.035	0.3330	0
B-06	2.00	N/A'	N/A'	N/A'	N/A'	N/A'	Parallel 1 1/8	4	4	11.73	15	0.5	0.5	0.035	0.3330	0
B-07	2.00	N/A'	N/A'	N/A'	N/A'	N/A'	Parallel 1 1/8	4	4	11.73	15	0.5	0.5	0.035	0.3330	0
C-01	2.00	11.817	14	0.25	0.5	1.5	N/A'	N/A'	N/A'	N/A'	N/A'	N/A'	N/A'	0.011	0.0200	0
C-02	2.00	N/A'	N/A'	N/A'	N/A'	N/A'	Parallel 1 1/8	4	4	11.73	15	0.5	0.5	0.035	0.3330	0
C-03	2.00	N/A'	N/A'	N/A'	N/A'	N/A'	Parallel 1 1/8	4	4	11.73	15	0.5	0.5	0.035	0.3330	0
C-04	2.00	N/A'	N/A'	N/A'	N/A'	N/A'	Parallel 1 1/8	4	4	11.73	15	0.5	0.5	0.035	0.3330	0

NOTES:

1. INTENSITIES ARE DERIVED FROM NOAA ATLAS 14 DATA.
2. STORM DRAIN ANALYSIS WAS PERFORMED USING GEOPAK DRAINAGE.
3. REFER TO STORM DRAIN PLAN AND PROFILE SHEETS FOR INLET TYPES.

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
MARK CORBITT
101980
LICENSED
PROFESSIONAL ENGINEER
Mark D. Corbitt, P.E.
11/22/2022

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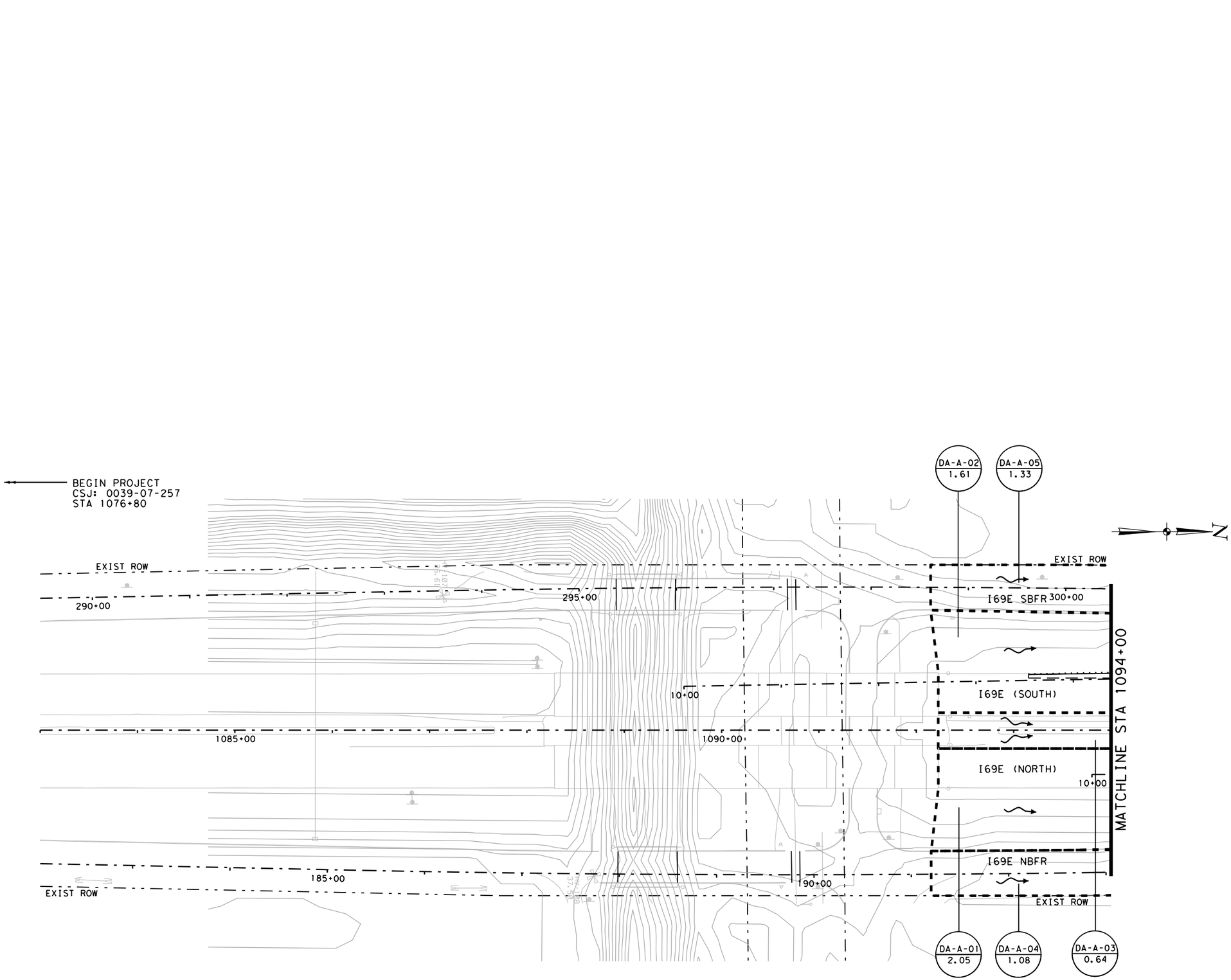
I69E
HYDROLOGIC & HYDRAULIC DATA SHEETS

SHEET 3 OF 3

DRAWN	FED. RD. DIV. NO.	STATE PROJECT NUMBER		HIGHWAY NO.
MC	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
MC	TEXAS	PHARR	CAMERON	113
CHECKED	CONT.	SECT.	JOB	
MC	0039	07	257	
APPROVED				
MC				



0' 25' 50' 100'

LEGEND:

- PROP MANHOLE
- PROP GRATE INLET
- PROP CURB INLET
- PROP DRAINAGE BOUNDARY
- PROP DITCH OR SWALE
- FLOW DIRECTION
- X99 / X.XX — DRAINAGE AREA NUMBER / AREA IN ACRES

NOTES:

1. CONTOURS SHOWN WERE DERIVED FROM USGS DEM DATA FOR CAMERON COUNTY 2012
2. SEE HYDROLOGIC & HYDRAULIC DATA SHEETS FOR ASSOCIATED DRAINAGE AREA CALCULATIONS

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
MARK CORBITT
101980
LICENSED
PROFESSIONAL ENGINEER
Mark D. Corbitt
11/22/2022

Texas Department of Transportation

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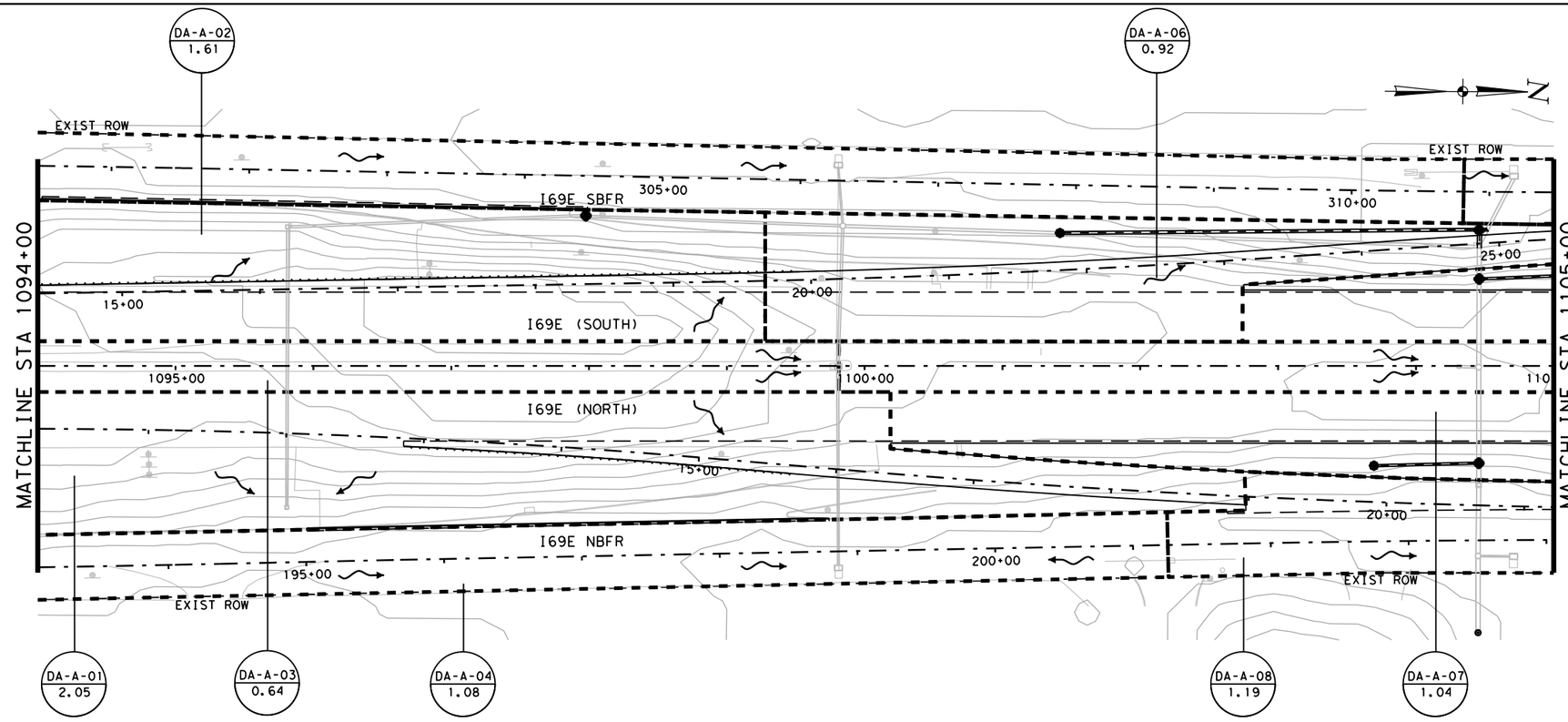
TBPELS Registration No. 15685

I69E
INTERNAL
DRAINAGE AREA
BEGIN PROJECT TO STA 1094+00

SHEET 1 OF 3

DRAWN	FED. RD. DIV. NO.	STATE PROJECT NUMBER		HIGHWAY NO.
MC	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
MC	TEXAS	PHARR	CAMERON	114
CHECKED	CONT.	SECT.	JOB	
MC	0039	07	257	
APPROVED				
MC				



0' 25' 50' 100'

LEGEND:

- PROP MANHOLE
- PROP GRATE INLET
- PROP CURB INLET
- PROP DRAINAGE BOUNDARY
- PROP DITCH OR SWALE
- FLOW DIRECTION
- X99 / X.XX — DRAINAGE AREA NUMBER / AREA IN ACRES

NOTES:

1. CONTOURS SHOWN WERE DERIVED FROM USGS DEM DATA FOR CAMERON COUNTY 2012
2. SEE HYDROLOGIC & HYDRAULIC DATA SHEETS FOR ASSOCIATED DRAINAGE AREA CALCULATIONS

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
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101980
LICENSED
PROFESSIONAL ENGINEER
Mark D. Corbitt
11/22/2022

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TBPELS Registration No. 15685

I69E INTERNAL DRAINAGE AREA

STA 1094+00 TO STA 1116+00

SHEET 2 OF 3

DRAWN	FED. RD. DIV. NO.	STATE PROJECT NUMBER		HIGHWAY NO.
MC	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
MC	TEXAS	PHARR	CAMERON	115
CHECKED	CONT.	SECT.	JOB	
MC	0039	07	257	
APPROVED				
MC				

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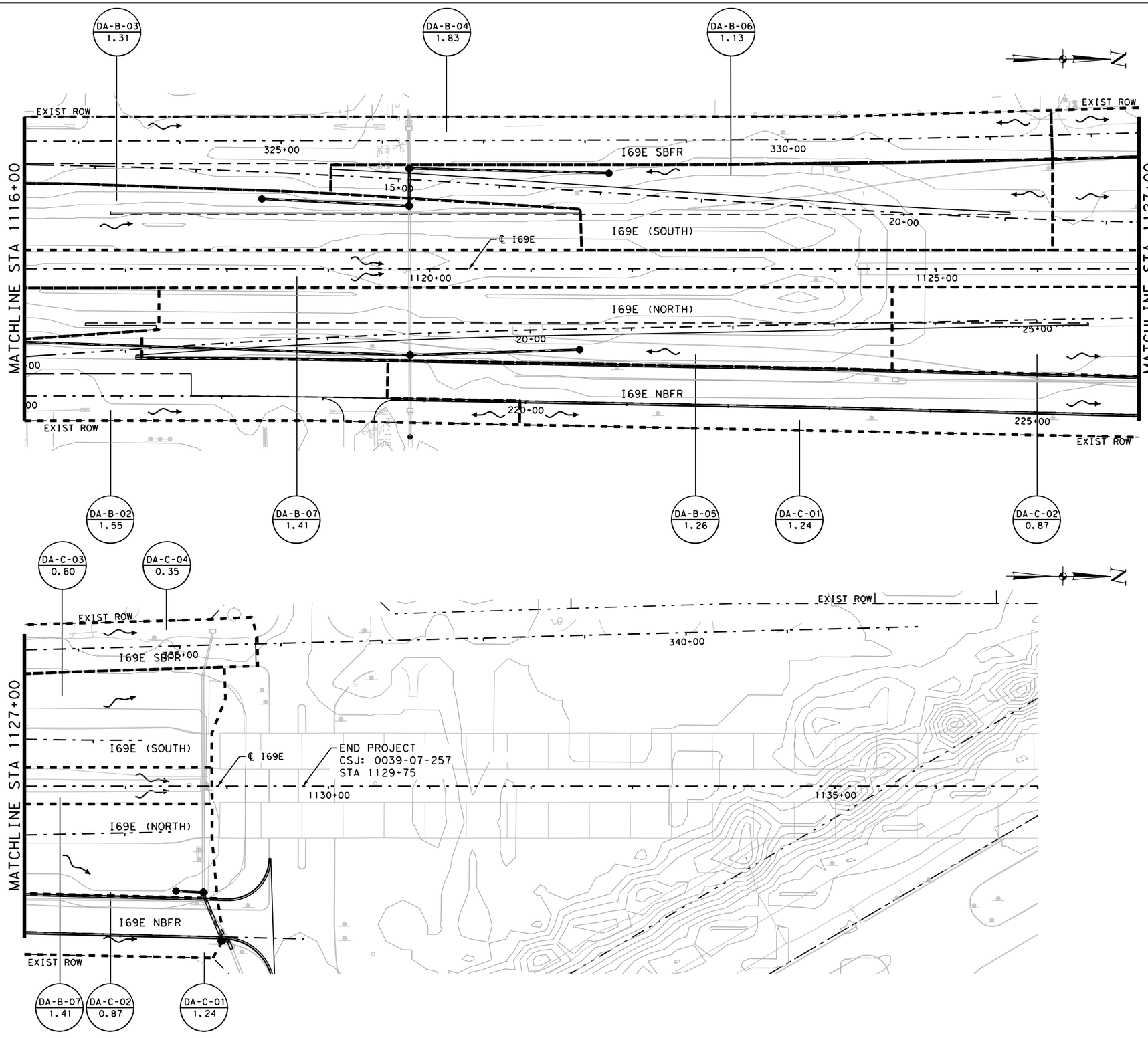

0' 25' 50' 100'

LEGEND:

- PROP MANHOLE
- PROP GRATE INLET
- PROP CURB INLET
- PROP DRAINAGE BOUNDARY
- PROP DITCH OR SWALE
- FLOW DIRECTION
- X99 / X.XX — DRAINAGE AREA NUMBER / AREA IN ACRES

NOTES:

1. CONTOURS SHOWN WERE DERIVED FROM USGS DEM DATA FOR CAMERON COUNTY 2012
2. SEE HYDROLOGIC & HYDRAULIC DATA SHEETS FOR ASSOCIATED DRAINAGE AREA CALCULATIONS

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
MARK CORBITT
101980
LICENSED PROFESSIONAL ENGINEER
Mark D. Corbitt
11/22/2022

Texas Department of Transportation

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San Antonio, TX 78249
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TBPELS Registration No. 15685

I69E
INTERNAL
DRAINAGE AREA
STA 1116+00 TO END PROJECT

SHEET 3 OF 3

DRAWN	FED.RD. DIV.NO.	STATE PROJECT NUMBER		HIGHWAY NO.
MC	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
MC	TEXAS	PHARR	CAMERON	
CHECKED	CONT.	SECT.	JOB	116
MC	0039	07	257	
APPROVED				
MC				

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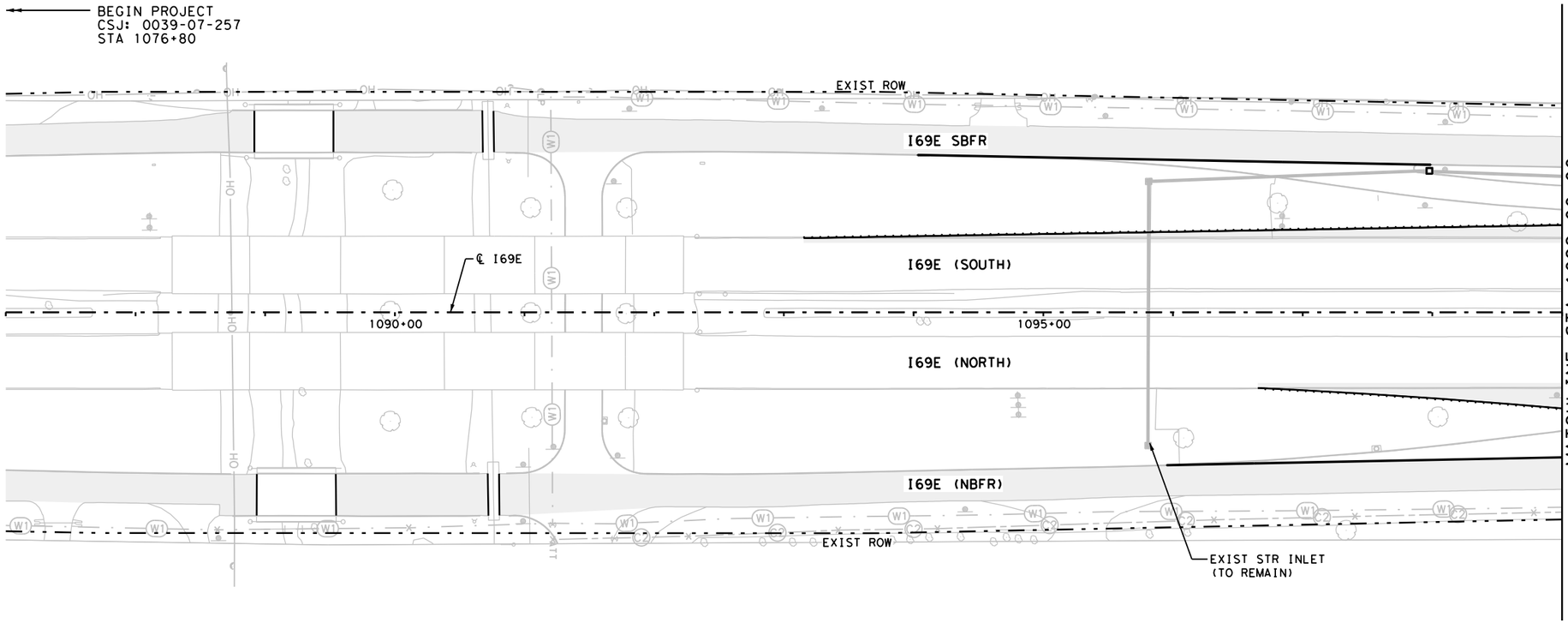

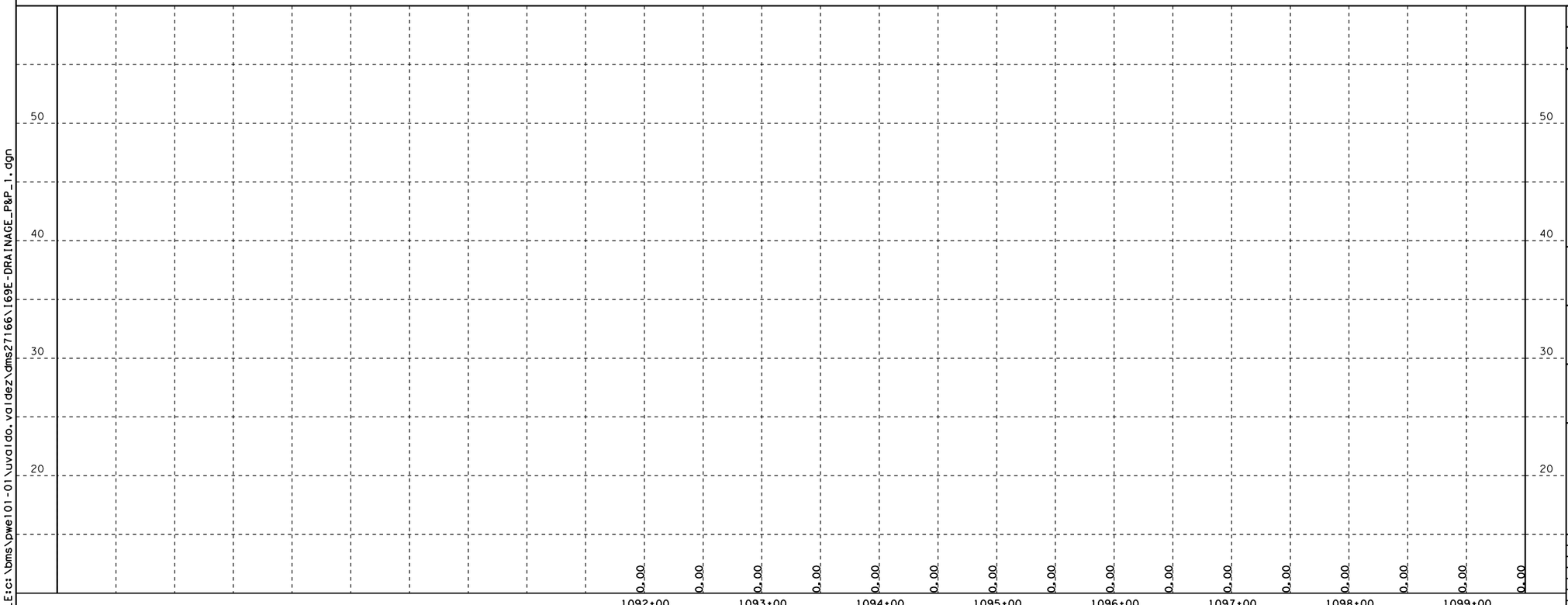

NO.	DATE	REVISION	APPROVED

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I69E
DRAINAGE PLAN & PROFILE
NORTHBOUND FRONTAGE ROAD
BEGIN PROJECT TO STA 1099+00

SHEET 01 OF 04

DRAWN	FED. RD. DIV. NO.	STATE PROJECT NUMBER		HIGHWAY NO.
MC	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
MC	TEXAS	PHARR	CAMERON	117
CHECKED	CONT.	SECT.	JOB	
MC	0039	07	257	
APPROVED				
MC				

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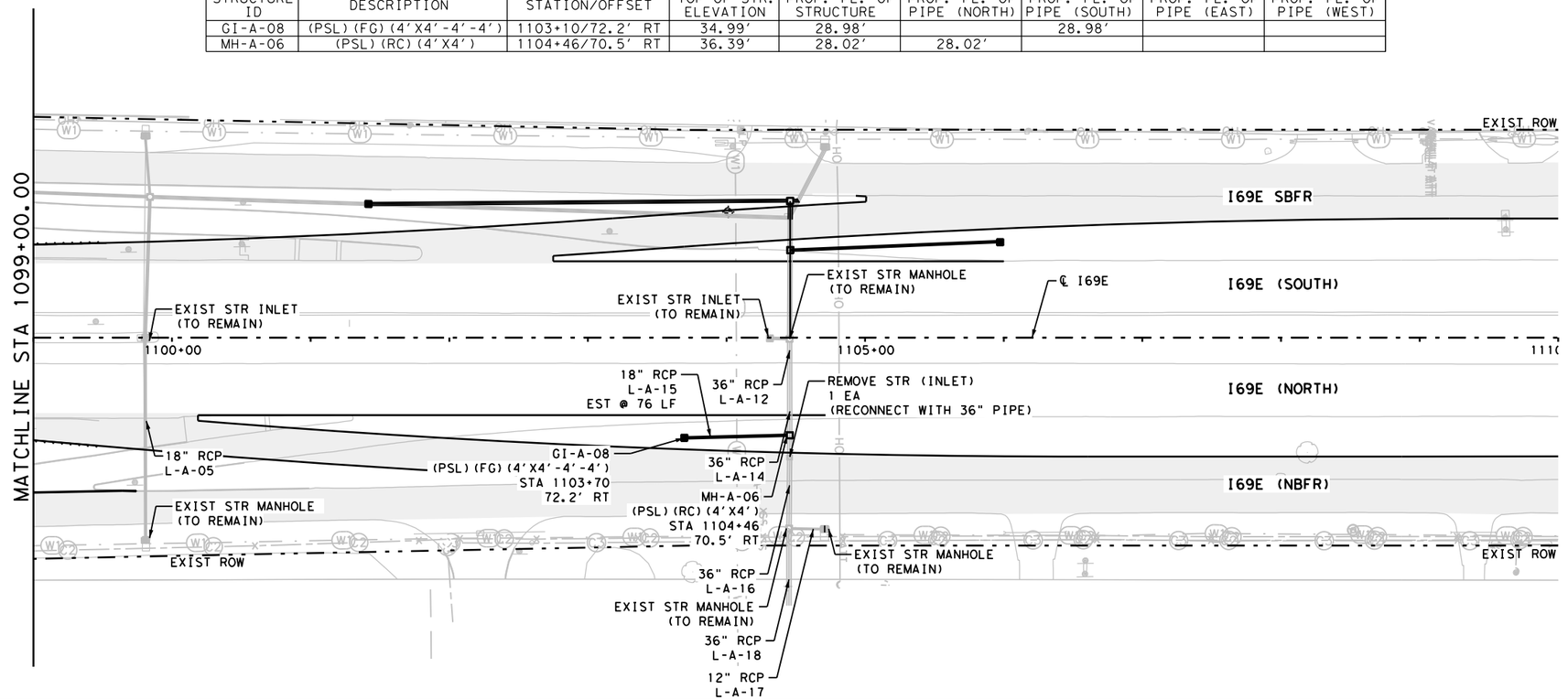
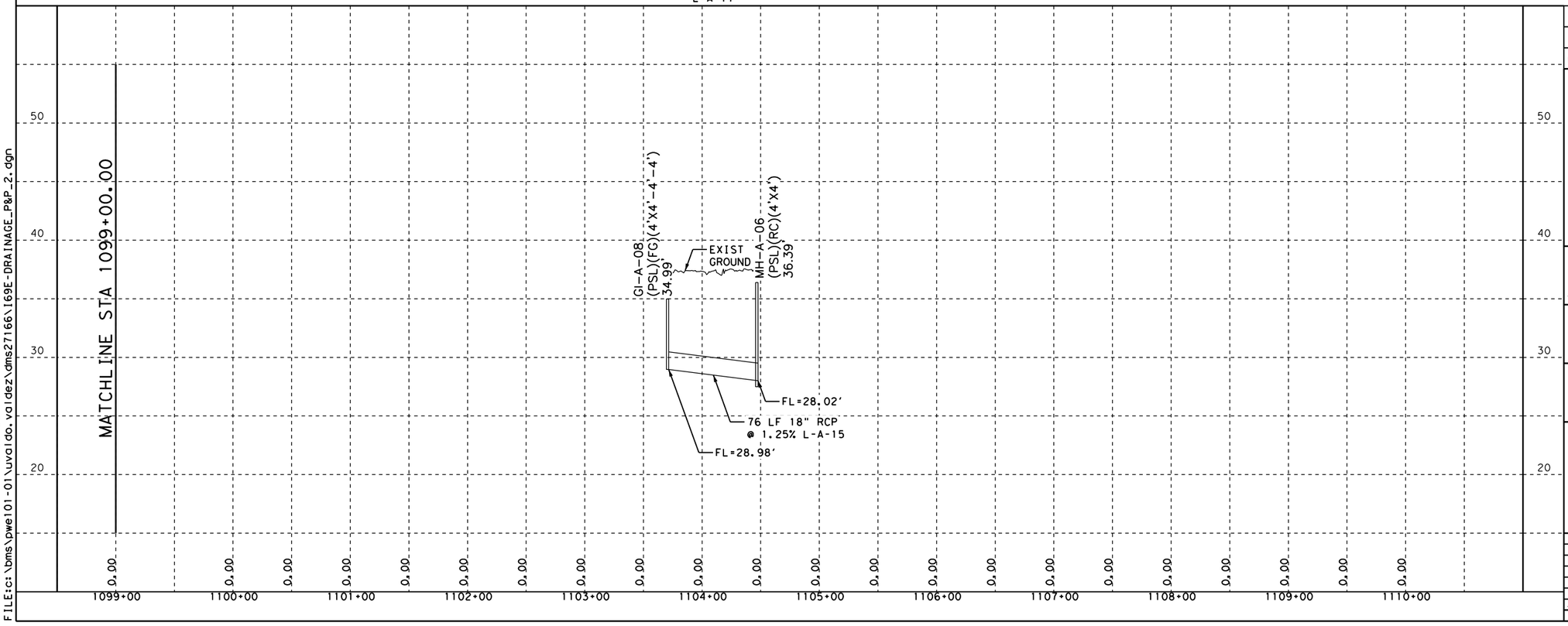
STORM DRAIN TABLE								
STRUCTURE ID	DESCRIPTION	STATION/OFFSET	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
GI-A-08	(PSL)(FG)(4'X4'-4'-4')	1103+10/72.2' RT	34.99'	28.98'		28.98'		
MH-A-06	(PSL)(RC)(4'X4')	1104+46/70.5' RT	36.39'	28.02'	28.02'			





LEGEND:

- PROPOSED PAVEMENT
- CURB INLET (TY PCO)
- GRATE INLET (TY PSL FG)
- JCTBOX (TY PJB)

CI-A-01
NODE TYPE ┘ └ NODE ID

NODE TYPE LEGEND
CI = CURB INLET
GI = GRATE INLET
MH = JUNCTION BOX

NOTES:

1. ALL DIMENSIONS ARE MEASURED NORMAL TO THE ℄ UNLESS OTHERWISE NOTED.
2. THE INFORMATION SHOWN CONCERNING TYPE AND LOCATION OF UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING DETERMINATIONS AS TO THE TYPE AND LOCATION OF ALL UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THEIR TO.
3. LENGTHS PROVIDED FOR PROPOSED RCP PIPES ONLY.

HORZ 0' 25' 50' 100'
VERT 0' 5' 10'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
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12770 Cimarron Path, Ste. 118
San Antonio, TX 78249
Phone: (210) 314-5458
TBPELS Registration No. 15685

I69E
DRAINAGE PLAN & PROFILE
NORTHBOUND FRONTAGE ROAD
STA 1099+00 TO STA 1110+00

SHEET 02 OF 04

DRAWN	FED. RD. DIV. NO.	STATE PROJECT NUMBER		HIGHWAY NO.
MC	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
MC	TEXAS	PHARR	CAMERON	118
CHECKED	CONT.	SECT.	JOB	
MC	0039	07	257	
APPROVED				
MC				

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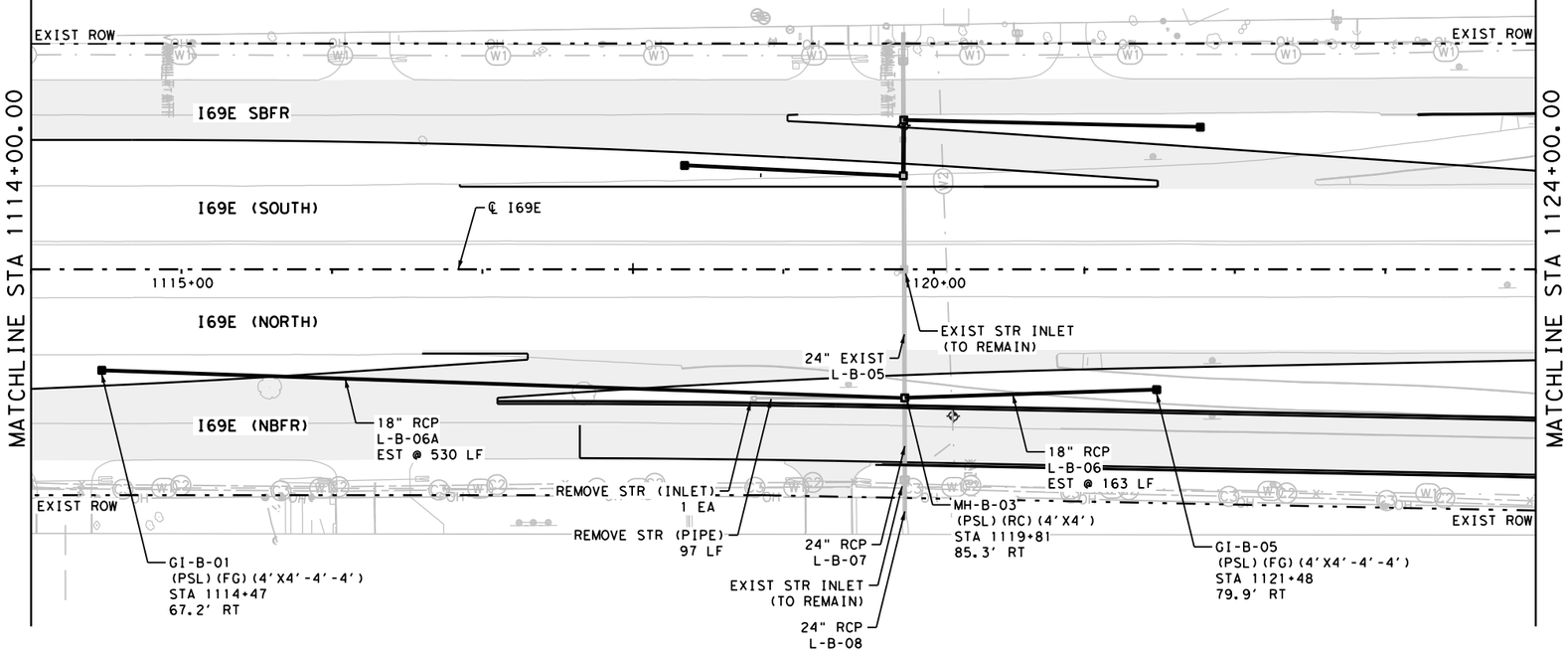
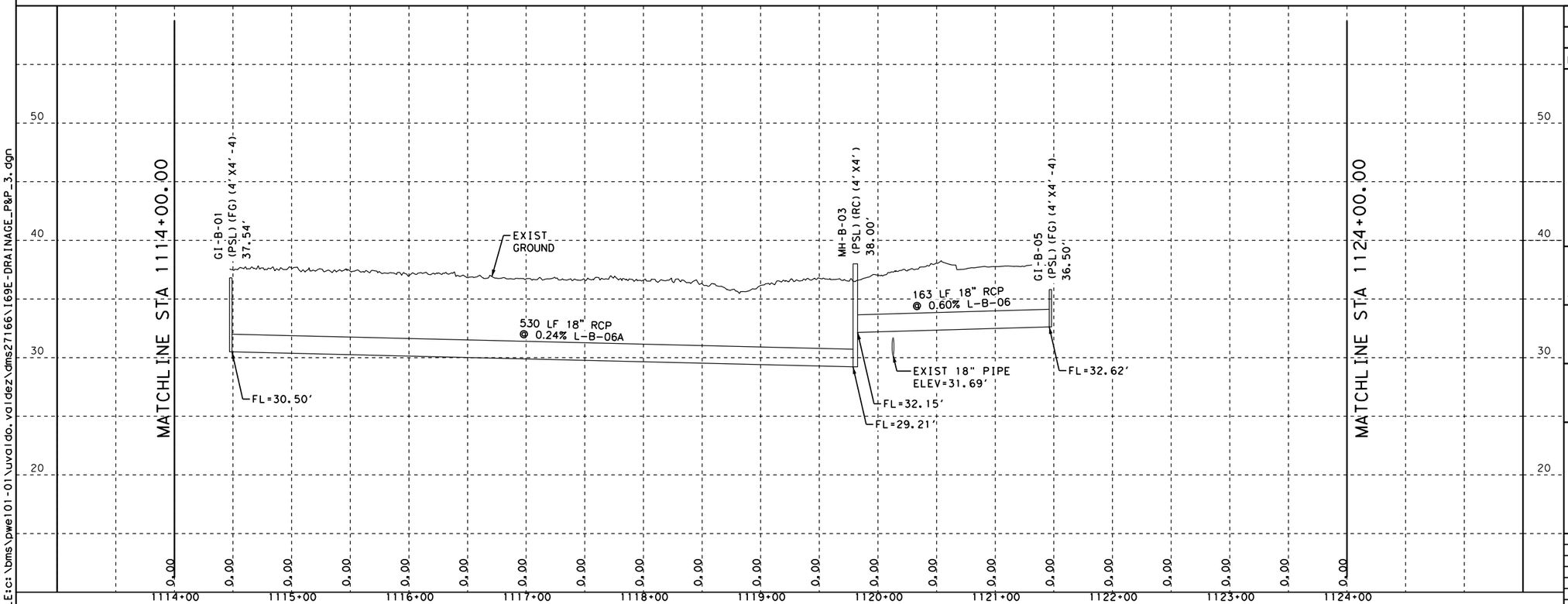
STORM DRAIN TABLE								
STRUCTURE ID	DESCRIPTION	STATION / OFFSET	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
GI-B-01	(PSL)(FG)(4'X4'-4'-4')	1114+47/67.2' RT	37.54'	30.50'	29.21'	30.50'		
MH-B-03	(PSL)(RC)(4'X4')	1119+81/85.3' RT	38.00'	29.21'	32.15'	29.21'		
GI-B-05	(PSL)(FG)(4'X4'-4'-4')	1121+48/79.9' RT	36.50'	32.62'	32.62'	32.15'		





N

LEGEND:

- PROPOSED PAVEMENT
- CURB INLET (TY PCO)
- GRATE INLET (TY PSL FG)
- JCTBOX (TY PJB)

CI-A-01
NODE TYPE — NODE ID

NODE TYPE LEGEND
CI = CURB INLET
GI = GRATE INLET
MH = JUNCTION BOX

NOTES:

1. ALL DIMENSIONS ARE MEASURED NORMAL TO THE ℄ UNLESS OTHERWISE NOTED.
2. THE INFORMATION SHOWN CONCERNING TYPE AND LOCATION OF UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING DETERMINATIONS AS TO THE TYPE AND LOCATION OF ALL UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THEIR TO.
3. LENGTHS PROVIDED FOR PROPOSED RCP PIPES ONLY.

HORZ 0' 25' 50' 100'
VERT 0' 5' 10'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
MARK CORBITT
101980
LICENSED
PROFESSIONAL ENGINEER
Mark D Corbitt
11/22/2022

Texas Department of Transportation
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San Antonio, TX 78249
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I69E
DRAINAGE PLAN & PROFILE
NORTHBOUND FRONTAGE ROAD
STA 1114 TO STA 1124+00

SHEET 03 OF 04

DRAWN	FED. RD. DIV. NO.	STATE PROJECT NUMBER		HIGHWAY NO.
MC	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
MC	TEXAS	PHARR	CAMERON	119
CHECKED	CONT.	SECT.	JOB	
MC	0039	07	257	
APPROVED				
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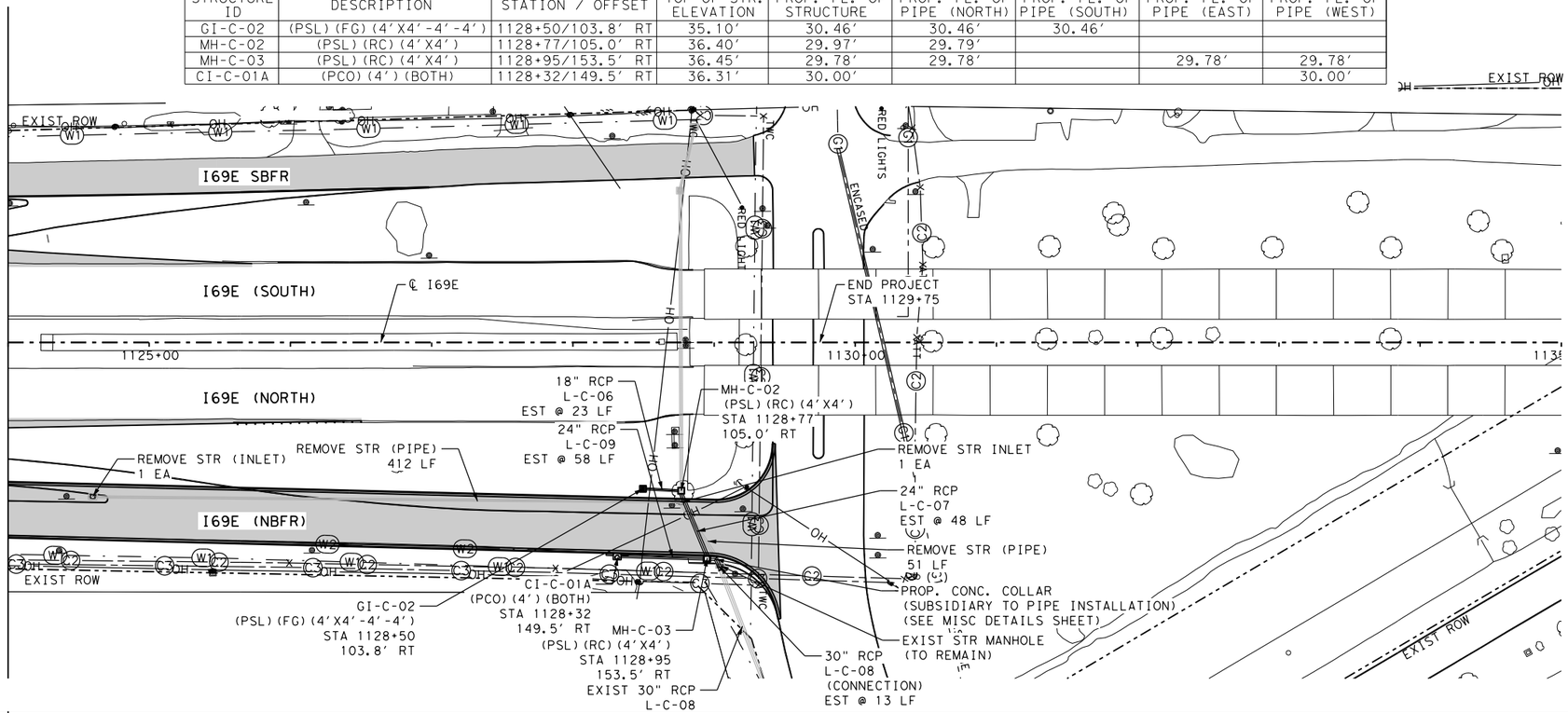
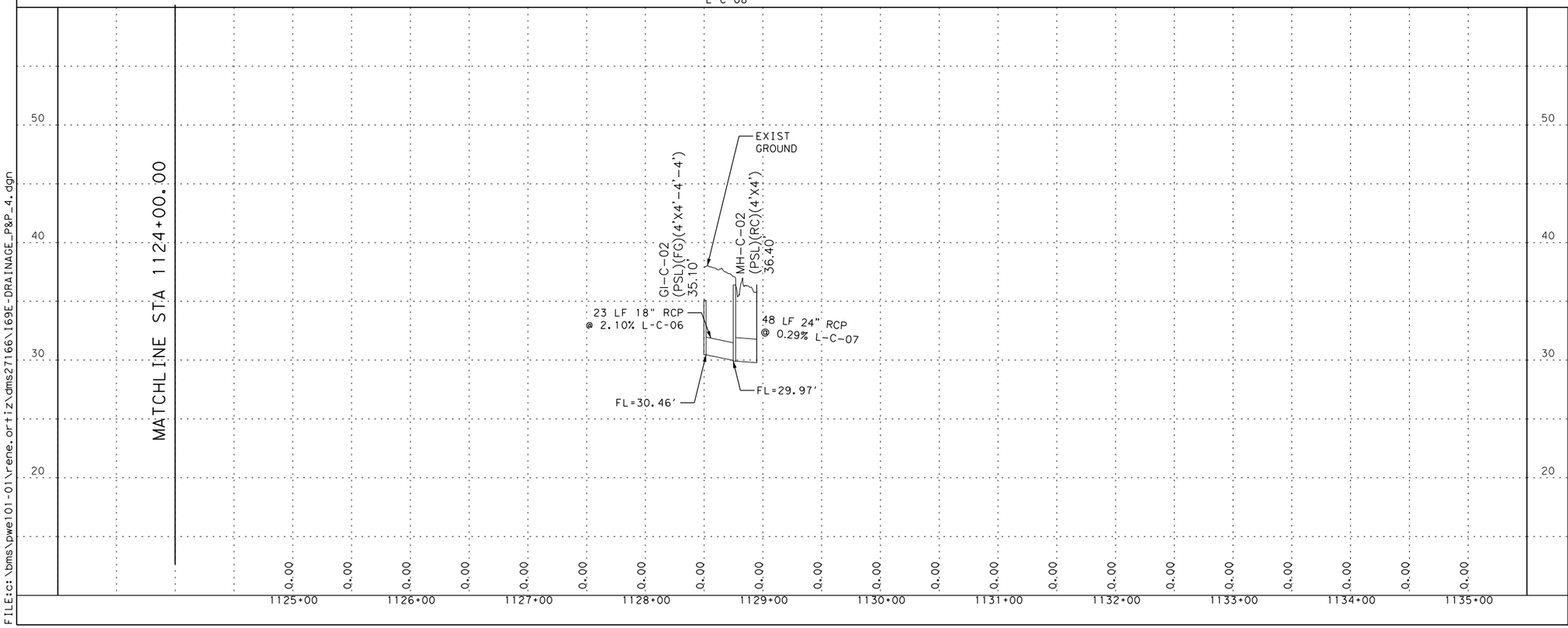
STORM DRAIN TABLE								
STRUCTURE ID	DESCRIPTION	STATION / OFFSET	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
GI-C-02	(PSL)(FG)(4'X4'-4'-4')	1128+50/103.8' RT	35.10'	30.46'	30.46'	30.46'		
MH-C-02	(PSL)(RC)(4'X4')	1128+77/105.0' RT	36.40'	29.97'	29.79'			
MH-C-03	(PSL)(RC)(4'X4')	1128+95/153.5' RT	36.45'	29.78'	29.78'		29.78'	29.78'
CI-C-01A	(PCO)(4')(BOTH)	1128+32/149.5' RT	36.31'	30.00'				30.00'





LEGEND:

- PROPOSED PAVEMENT
- CURB INLET (TY PCO)
- GRATE INLET (TY PSL FG)
- JCTBOX (TY PJB)

CI-A-01
NODE TYPE — NODE ID

NODE TYPE LEGEND
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3. LENGTHS PROVIDED FOR PROPOSED RCP PIPES ONLY.

HORZ 0' 25' 50' 100'
VERT 0' 5' 10'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
MARK CORBITT
101980
LICENSED
PROFESSIONAL ENGINEER
Mark D. Corbitt, P.E.
11/22/2022

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I69E
DRAINAGE PLAN & PROFILE
NORTHBOUND FRONTAGE ROAD
SAT 1124+00 TO END PROJECT

SHEET 04 OF 04

DRAWN	FED. RD. DIV. NO.	STATE PROJECT NUMBER		HIGHWAY NO.
MC	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
MC	TEXAS	PHARR	CAMERON	120
CHECKED	CONT.	SECT.	JOB	
MC	0039	07	257	
APPROVED				
MC				

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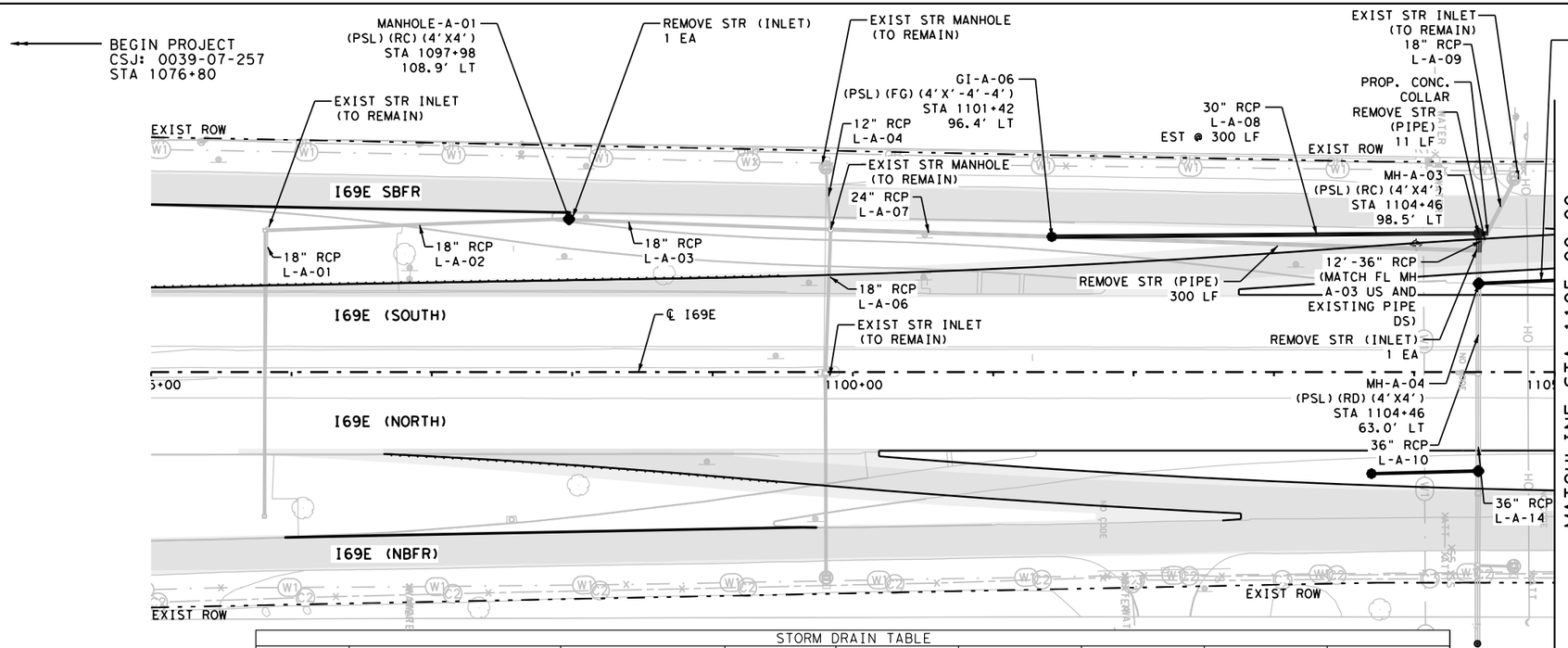

STORM DRAIN TABLE								
STRUCTURE ID	DESCRIPTION	STATION/OFFSET	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
MH-A-01	(PSL)(RC)(4'X4')	1097+98/108.9' LT	36.80'	31.26'	30.80'	31.46'		
GI-A-06	(PSL)(FG)(4'X4'-4'-4')	1101+42/96.4' LT	34.80'	29.14'	28.15'	29.99'		
MH-A-03	(PSL)(RC)(4'X4')	1104+46/98.5' LT	37.61'	28.15'	28.15'	29.14'		
MH-A-04	(PSL)(RC)(4'X4')	1104+46/63.0' LT	35.36'	28.02'		28.02'		

LEGEND:

- PROPOSED PAVEMENT
- CURB INLET (TY PCO)
- GRATE INLET (TY PSL FG)
- JCTBOX (TY PJB)

CI-A-01
NODE TYPE — NODE ID

NODE TYPE LEGEND
CI = CURB INLET
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NOTES:

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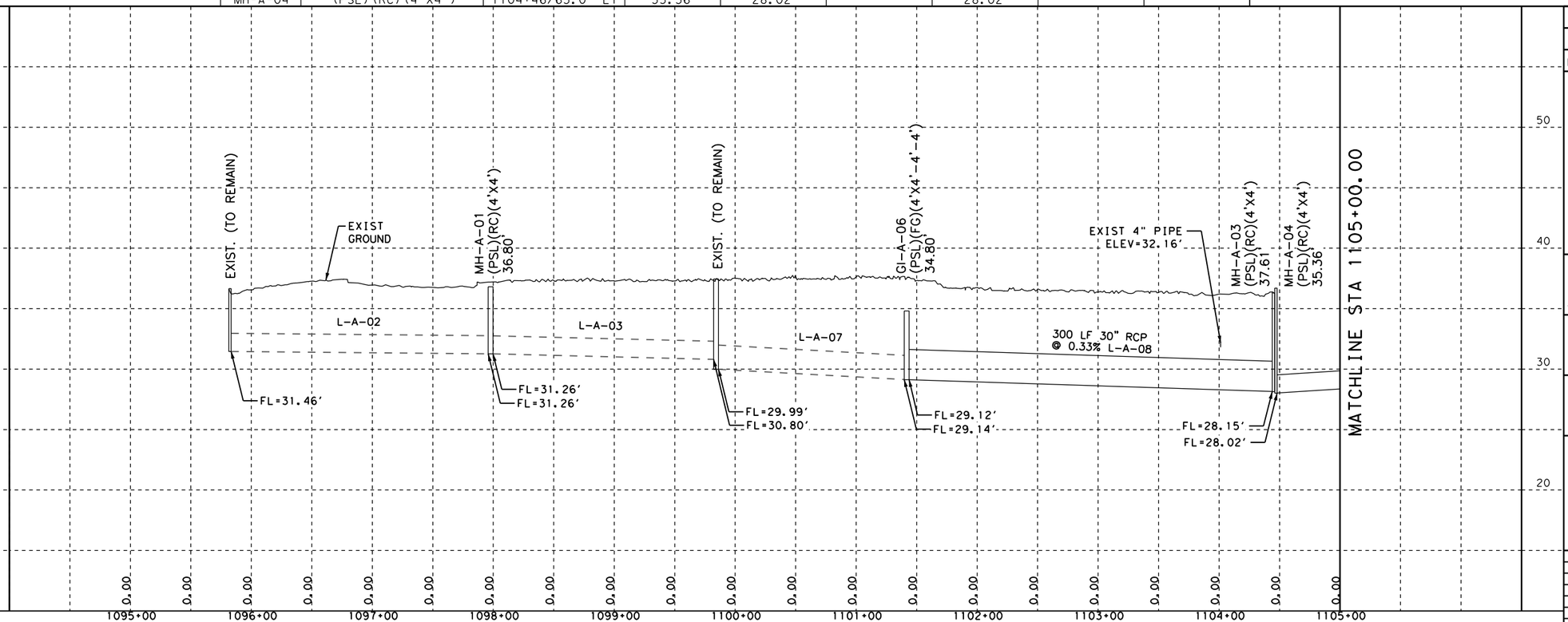
3. LENGTHS PROVIDED FOR PROPOSED RCP PIPES ONLY.

HORZ 0' 25' 50' 100'
VERT 0' 5' 10'



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STATE OF TEXAS
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San Antonio, TX 78249
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TBPELS Registration No. 15685

I69E
DRAINAGE PLAN & PROFILE
SOUTHBOUND FRONTAGE ROAD
BEGIN PROJECT TO STA 1105+00

SHEET 01 OF 03

DRAWN	FED. RD. DIV. NO.	STATE PROJECT NUMBER		HIGHWAY NO.
MC	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
MC	TEXAS	PHARR	CAMERON	121
CHECKED	CONT.	SECT.	JOB	
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APPROVED				
MC				

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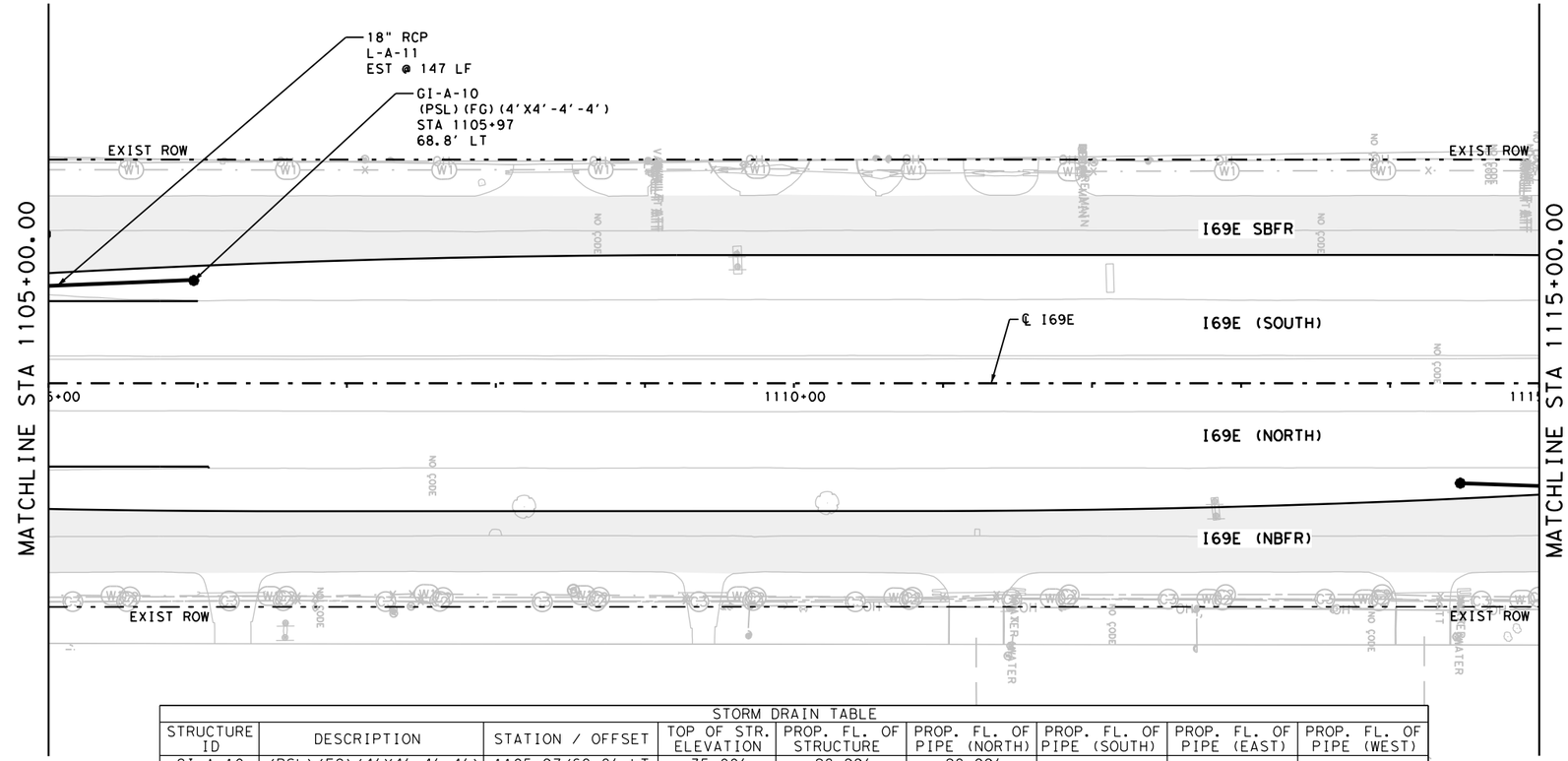

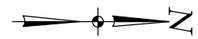

LEGEND:

- PROPOSED PAVEMENT
- CURB INLET (TY PCO)
- GRATE INLET (TY PSL FG)
- JCTBOX (TY PJB)

CI-A-01
NODE TYPE — NODE ID

NODE TYPE LEGEND
CI = CURB INLET
GI = GRATE INLET
MH = JUNCTION BOX

NOTES:

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HORZ 0' 25' 50' 100'
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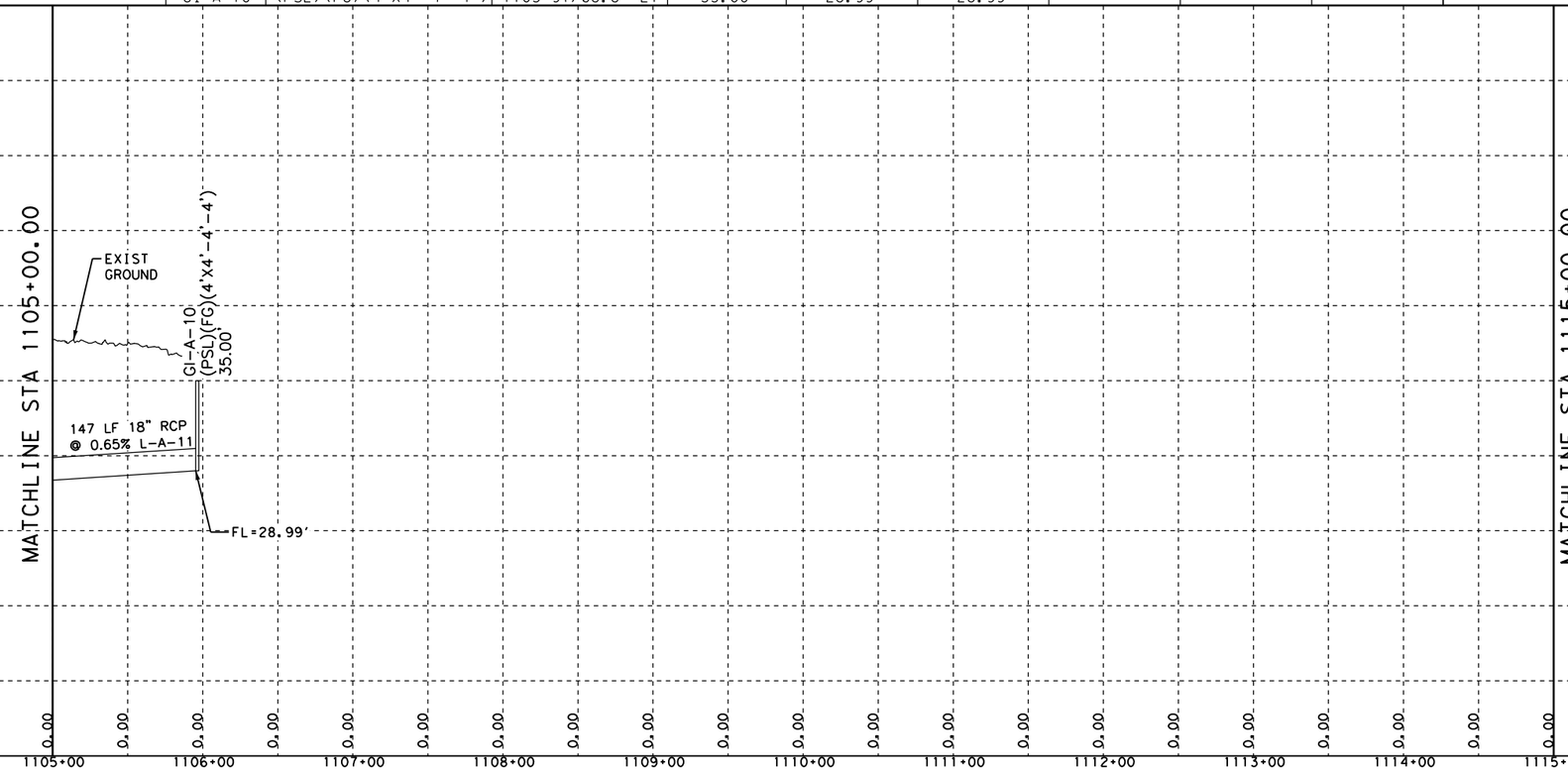
STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
GI-A-10	(PSL)(FG)(4'X4'-4'-4')	1105+97/68.8' LT	35.00'	28.99'	28.99'			



NO.	DATE	REVISION	APPROVED

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Mark D. Corbitt
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San Antonio, TX 78249
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I69E
DRAINAGE PLAN & PROFILE
SOUTHBOUND FRONTAGE ROAD
STA 1105+00 TO STA 1115+00

SHEET 02 OF 03

DRAWN	FED. RD. DIV. NO.	STATE PROJECT NUMBER		HIGHWAY NO.
MC	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
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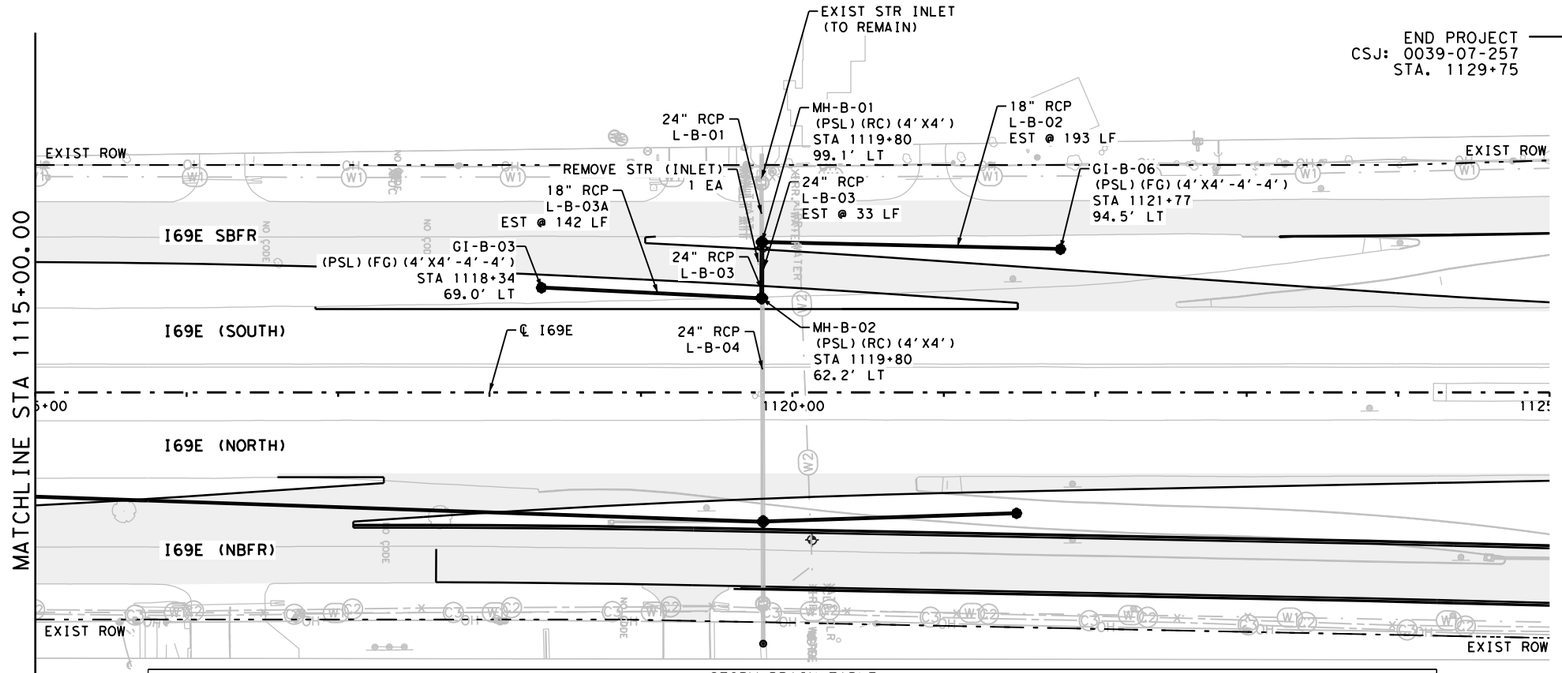

STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
GI-B-03	(PSL)(FG)(4'X4'-4'-4')	1118+84/69.0' LT	35.60'	29.99'	29.30'	29.99'		
MH-B-01	(PSL)(RC)(4'X4')	1119+80/99.1' LT	36.80'	29.30'	32.32'	31.84'		
MH-B-02	(PSL)(RC)(4'X4')	1119+80/62.2' LT	35.25'	29.30'	29.30'	29.99'		
GI-B-06	(PSL)(FG)(4'X4'-4'-4')	1121+77/94.5' LT	35.50'	32.32'	32.32'	31.84'		

LEGEND:

- PROPOSED PAVEMENT
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- GRATE INLET (TY PSL FG)
- JCTBOX (TY PJB)

CI-A-01
NODE TYPE — NODE ID

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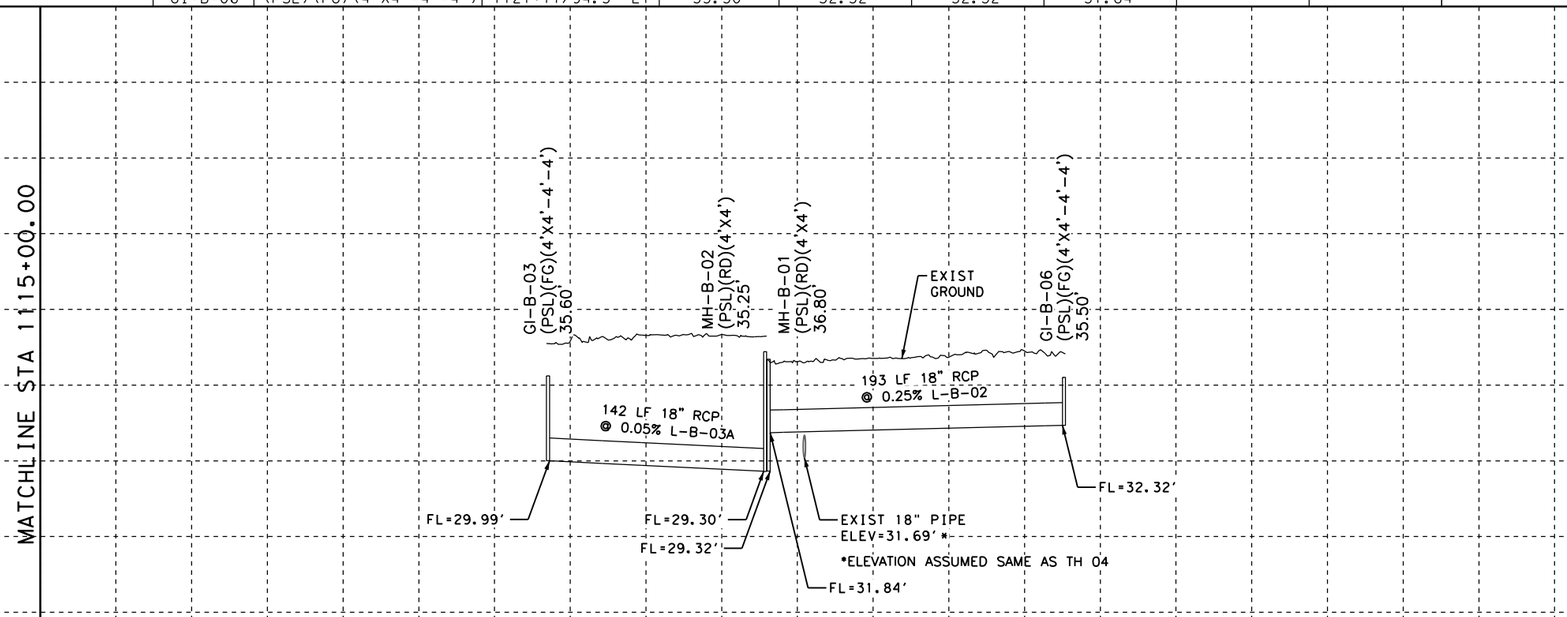
HORZ 0' 25' 50' 100'
VERT 0' 5' 10'



NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
MARK CORBITT
101980
LICENSED
PROFESSIONAL ENGINEER
Mark D. Corbitt
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San Antonio, TX 78249
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I69E
DRAINAGE PLAN & PROFILE
SOUTHBOUND FRONTAGE ROAD
1115+00 TO END PROJECT

SHEET 03 OF 03

DRAWN	FED. RD. DIV. NO.	STATE PROJECT NUMBER		HIGHWAY NO.
MC	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
MC	TEXAS	PHARR	CAMERON	123
CHECKED	CONT.	SECT.	JOB	
MC	0039	07	257	
APPROVED				
MC				

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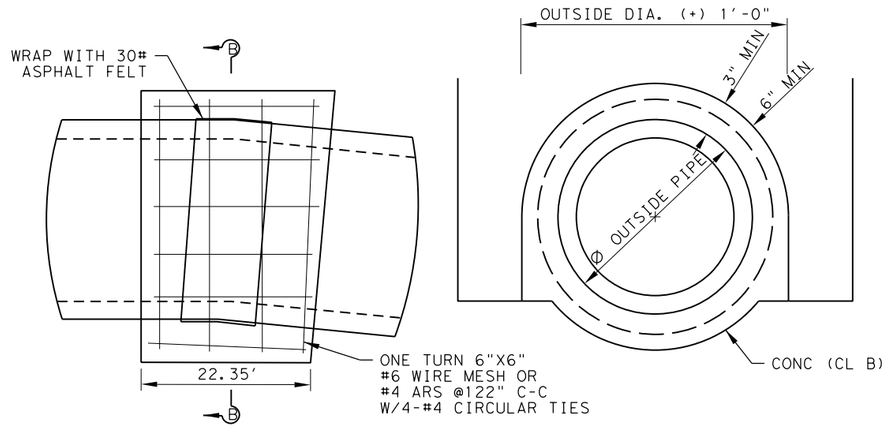
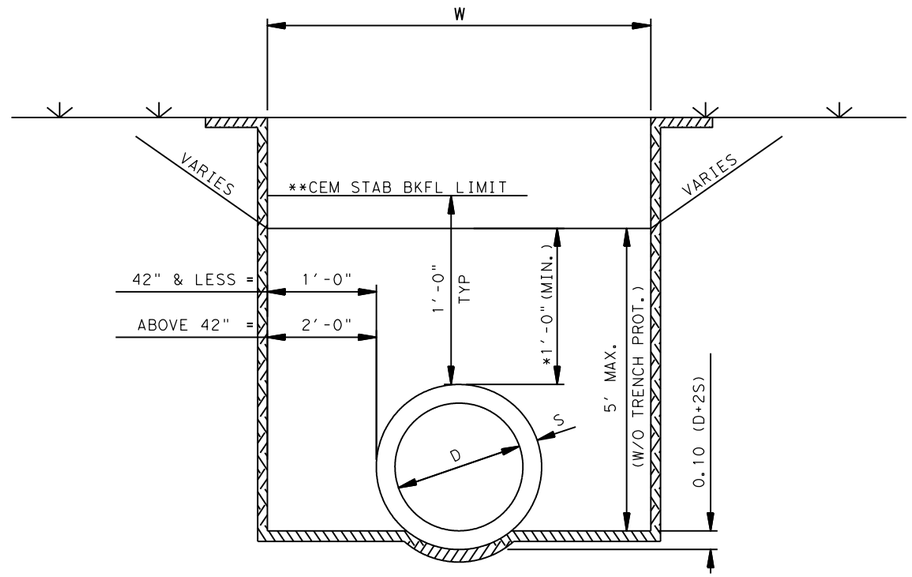


ELEVATION SECTION B-B

PIPE COLLAR DETAIL (NTS)

NOTE:

1. CONCRETE COLLARS ARE SUBSIDIARY TO PERTINENT BID ITEMS



CLASS "C" BEDDING EXCEPT AS NOTED
*SEE STANDARD SPECIFICATION ITEM 400.
EXCEPT WHERE NEGATIVE PROJECTION IS USED.

**CEMENT STABILIZED BACKFILL (CSB) SHALL BE USED
FOR ALL PIPES/BOXES THAT CROSS EXISTING AND/OR PROPOSED PAVEMENT.

THE LIMITS OF CEMENT STABILIZED BACKFILL SHALL TYPICALLY
BE 1' ABOVE THE TOP OF PIPE/BOX. THE TRENCH SHALL BE
UNDERCUT BY 4" AS SPECIFIED IN ITEM 400.

TRENCH BACKFILL DETAIL (STORM DRAIN)

WITH LIMITS OF CEMENT STABILIZED BACKFILL (AS SPECIFIED)

STATE OF TEXAS
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101980
LICENSED
PROFESSIONAL ENGINEER
Mark L. Corbitt
11/22/2022

Texas Department of Transportation

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San Antonio, TX 78249
Phone: (210) 314-5458
TBPELS Registration No. 15685

I69E
MISCELLANEOUS DETAILS
DRAINAGE

SHEET 1 OF 1

DRAWN	FED.RD. DIV.NO.	STATE PROJECT NUMBER		HIGHWAY NO.
MC	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
MC	TEXAS	PHARR	CAMERON	124
CHECKED	CONT.	SECT.	JOB	
MC	0039	07	257	
APPROVED				
MC				

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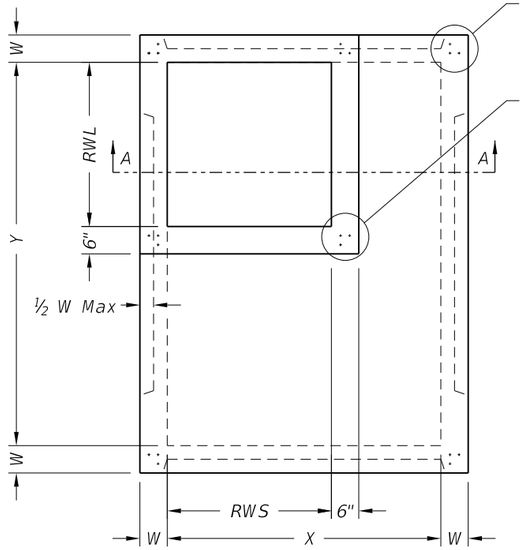
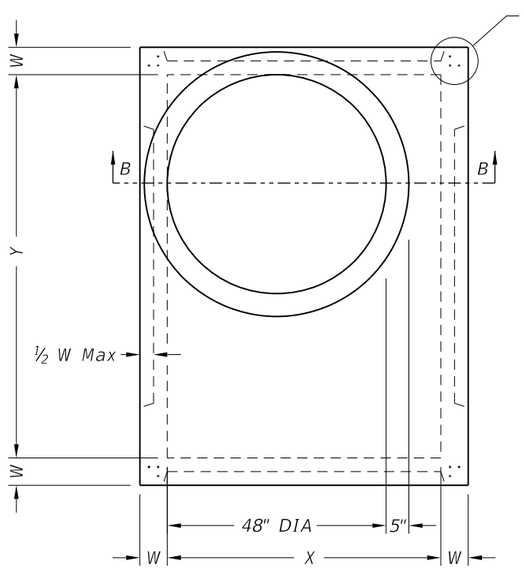


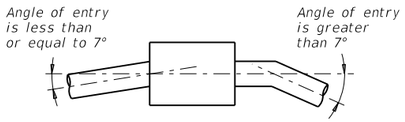
PLAN VIEW "A"

SQUARE REDUCED RISER OPTION



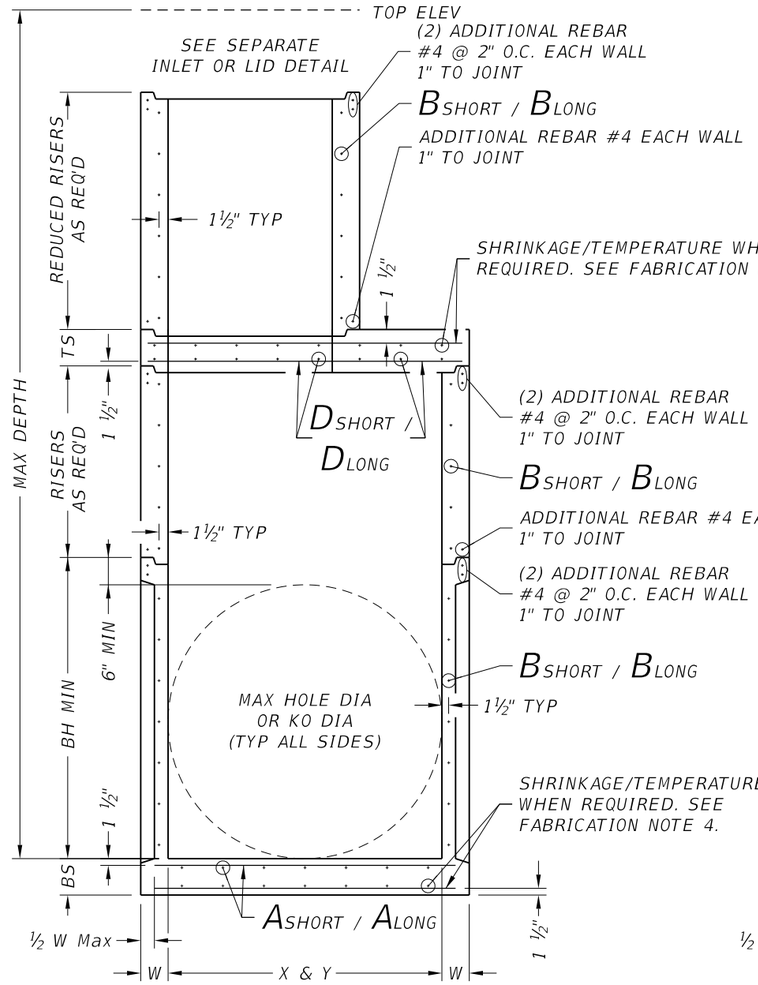
PLAN VIEW "B"

ROUND REDUCED RISER OPTION



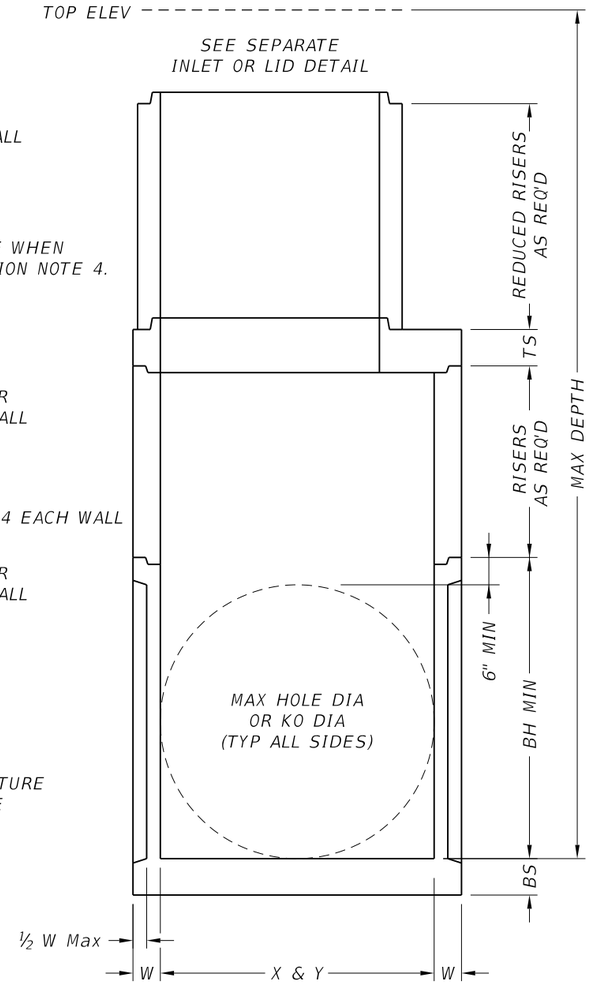
PIPE CONNECTION DETAIL

Connect pipes within 7° of normal to PB wall.
If necessary, use pipe elbow or curved
approach alignment to stay within this limit.



SECTION A-A

SQUARE REDUCED RISER OPTION



SECTION B-B

ROUND REDUCED RISER OPTION

FABRICATION NOTES:

1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Provide typical clear cover of 1 ½" to reinforcing steel at interior or exterior walls.
4. Walls or slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing steel. Provide steel area = 0.11 in^2/ft each way.
5. No substitution is allowed for vertical and horizontal #4 bars in corners.
6. Manufacture base and risers to nearest 3" increment.
7. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
8. Provide lifting devices in conformance with Manufacturer's recommendations.
9. See sheet PDD for sizes, dimensions, and reinforcing steel not shown.

INSTALLATION NOTES:

1. If required elsewhere. Inverts (benching) to be provided by Contractor. Concrete or mortar used for invert is subsidiary to specified inlet or manhole.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. For rigid pipe, cut hole in thin wall panel (KO) 4" Max, 2" Min larger than pipe OD.
5. For flexible pipe, consult boot/seal Manufacturer's specification for placement tolerance and hole size. Center pipe in hole and install boot/seal per Manufacturer's specification.

GENERAL NOTES:

1. Precast Base consists of base slab, base unit, risers (as required), reducing slab (as required), and reduced risers (as required). See sheet PDD for sizes.
2. Designed according to ASTM C913.
3. Payment for precast base is subsidiary to the specified inlet, per Item 465, "Junction Boxes, Manholes, and Inlets."

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

PRECAST BASE

PB

FILE: prestd01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		125

DATE:
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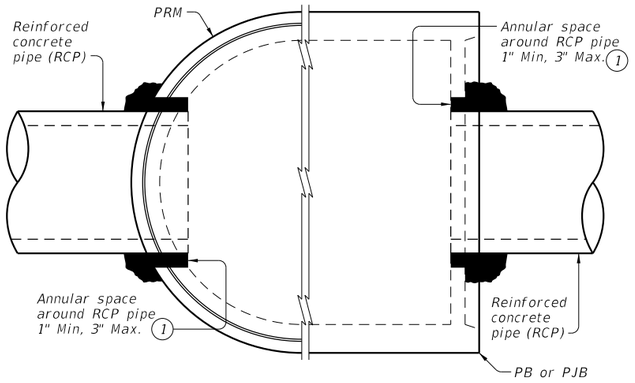
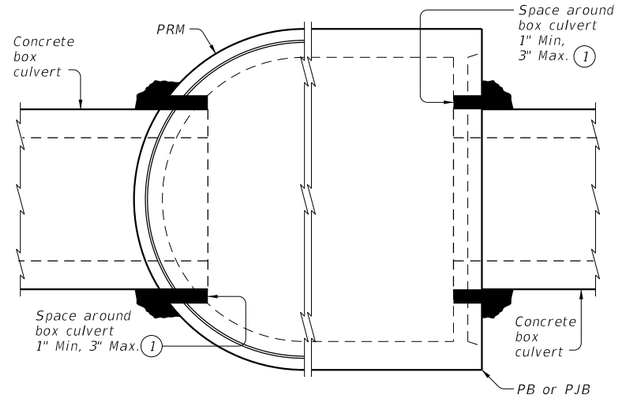


PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

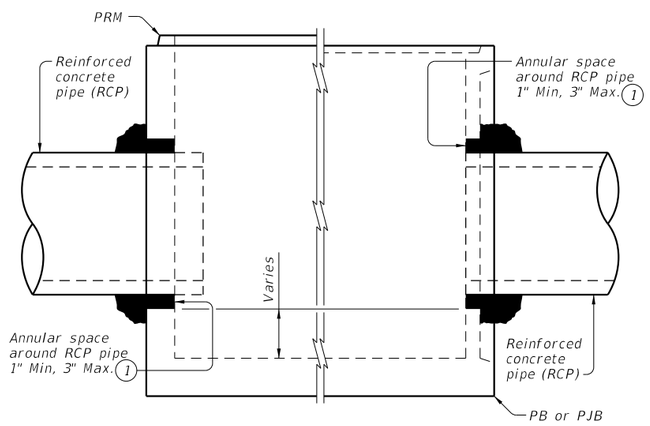
TYPICAL HALF PLAN



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

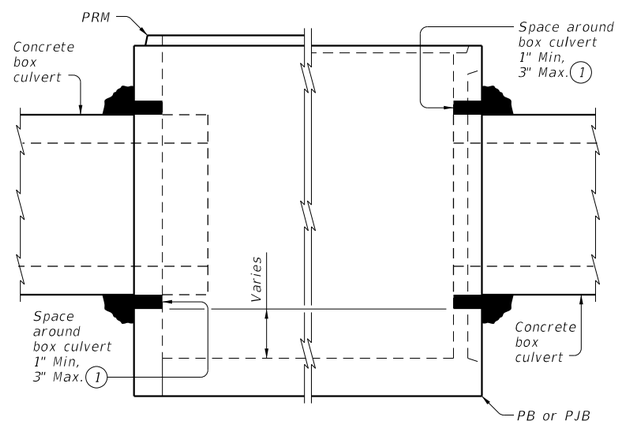
TYPICAL HALF PLAN



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

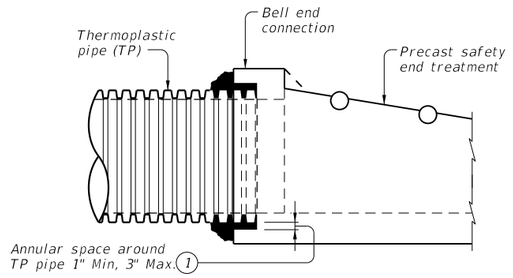
TYPICAL HALF ELEVATION



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

TYPICAL HALF ELEVATION



TYPICAL PARTIAL ELEVATION OF PRECAST SAFETY END TREATMENTS

Showing square PSET for parallel drainage, cross drainage shown similar.

(1) Completely fill the void between the precast structure and the connecting pipe or box with cementitious grouts and mortars in accordance with DMS-4675 "Cementitious Grouts and Mortars for Miscellaneous Application".

CONSTRUCTION NOTES:

Do not grout rubber gasket joints without Manufacturer's recommendations.

Do not use bricks, masonry blocks, native stone, or similar materials in conjunction with grouted connections when filling void spaces around pipes or box culverts.

MATERIAL NOTES:

Provide grouted connections in accordance with DMS-4675 "Cementitious Grouts and Mortars for Miscellaneous Application".

GENERAL NOTES:

See applicable standards for notes and details not shown:
- Precast Base (PB)
- Precast Junction Box (PJB)
- Precast Round Manhole (PRM)
- Precast Safety End Treatments C/D Square (PSET-SC)
- Precast Safety End Treatments P/D Square (PSET-SP)

Provide Concrete Box Culverts in accordance with Item 462 "Concrete Box Culverts and Drains".

Provide Reinforced Concrete Pipe (RCP) in accordance with Item 464 "Reinforced Concrete Pipe".

Provide Thermoplastic Pipe (TP) in accordance with Special Specification Thermoplastic Pipe.

Payment for grouted connections is considered subsidiary to other bid Items.

Texas Department of Transportation

Bridge Division Standard

PIPE AND BOX GROUTED CONNECTIONS FOR PRECAST STRUCTURES

PBGC

FILE: pbgcstd1-20.dgn	DN: TxDOT	CK: TAR	DW: JTR	CK: TAR
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
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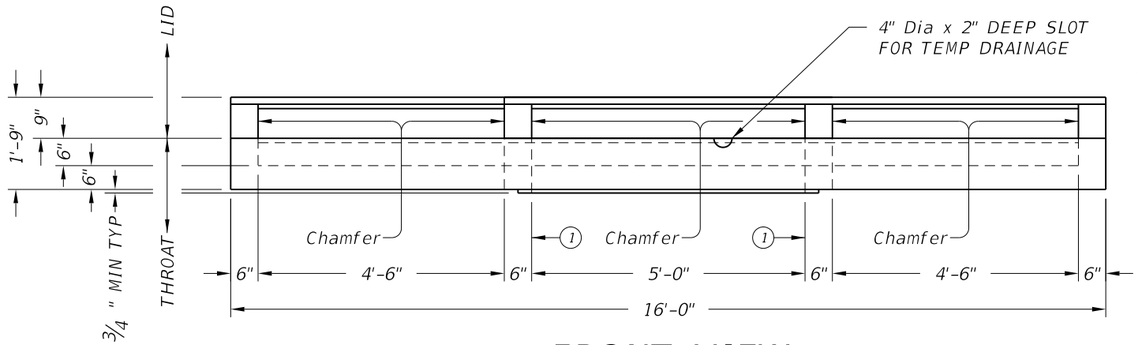
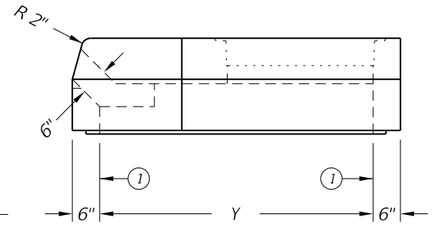
	PHR	CAMERON		126

DATE:
FILE:



FRONT VIEW

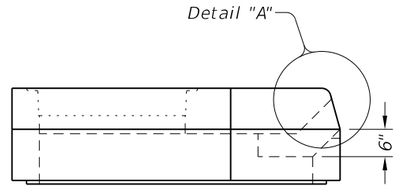
(SHOWING LEFT AND RIGHT EXTENSIONS)



RIGHT VIEW

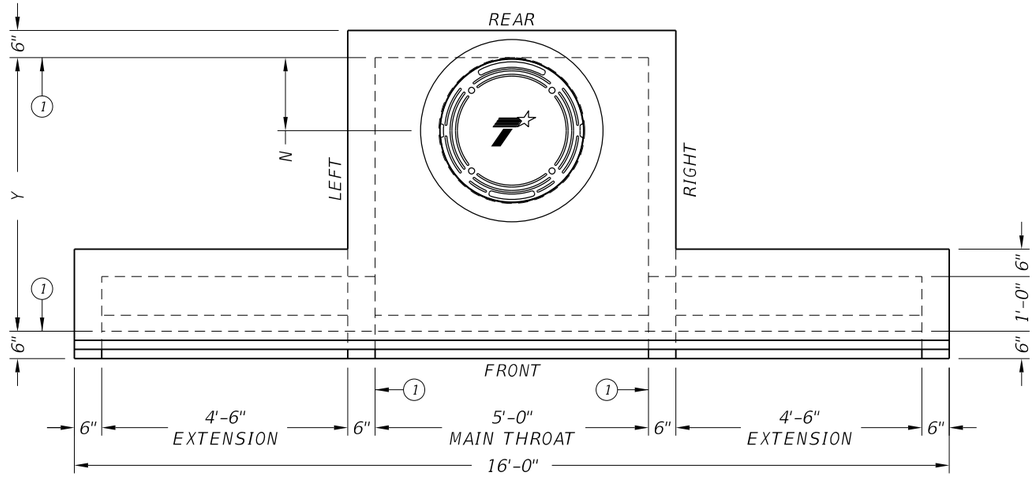
REAR VIEW

(EXTENSIONS NOT SHOWN)



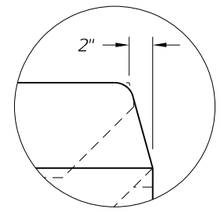
LEFT VIEW

(1) Matches inside face of wall of precast base or riser below inlet.



PLAN VIEW

(SHOWING LEFT AND RIGHT EXTENSIONS)



DETAIL "A"

HS20 LOADING

Texas Department of Transportation

Bridge Division Standard

PRECAST CURB INLET OUTSIDE ROADWAY

PCO

FILE: prestd03-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT			
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY			
REVISIONS	0039	07	257	I69E			
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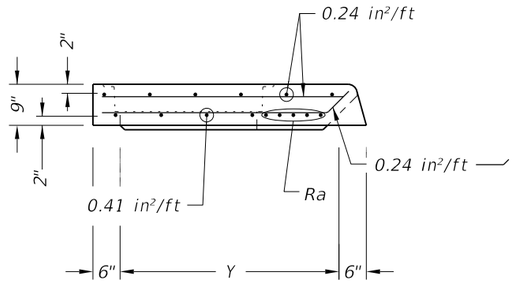
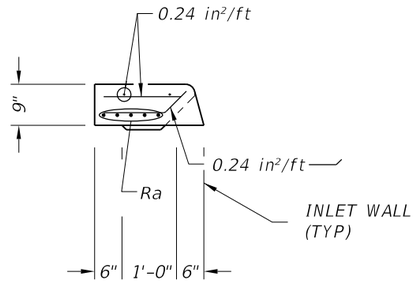
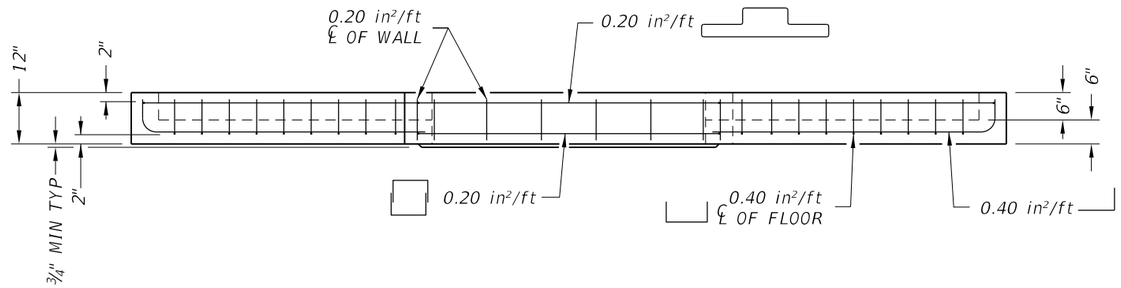


LID SECTION A-A

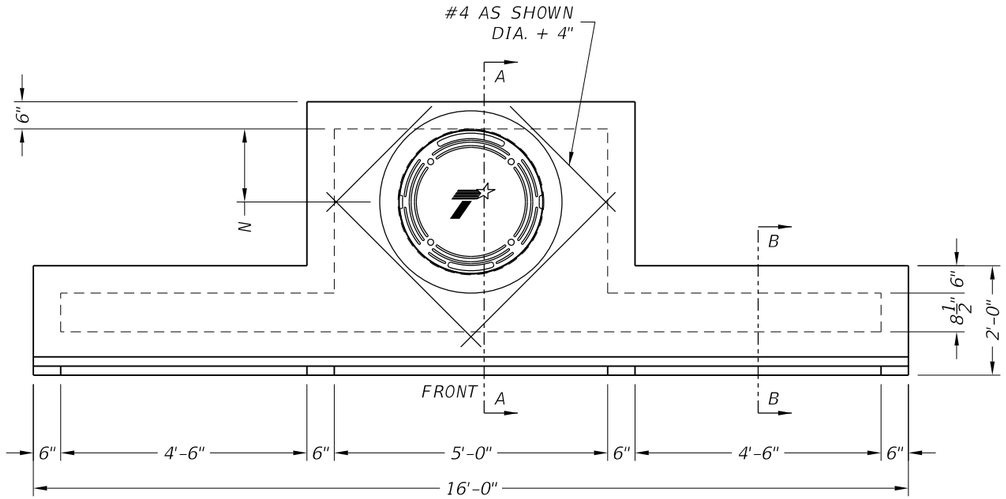


LID SECTION B-B



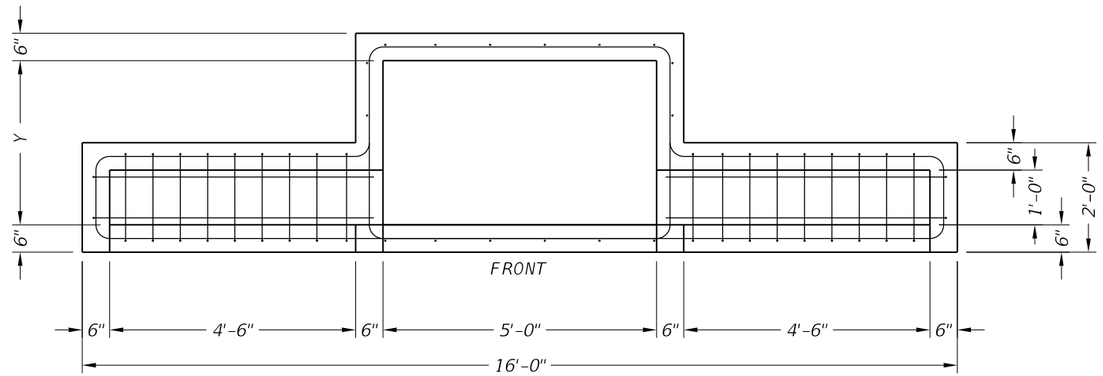
THROAT ELEVATION VIEW

(SHOWING LEFT AND RIGHT EXTENSIONS)



LID PLAN VIEW

(SHOWING LEFT AND RIGHT EXTENSIONS)



THROAT PLAN VIEW

(SHOWING LEFT AND RIGHT EXTENSIONS)

SIZE(Y)	N	MH DIA*	Ra
3'	9"	18"	(4) #5 Additional
4'	16"	32"	(4) #5 Additional
5'	16"	32"	(4) #5 Additional
6'	16"	32"	(4) #5 Additional

* Nominal ring and cover size.

FABRICATION NOTES:

1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Extensions may be right, left, both or none. Provide extensions as specified elsewhere in the plans.
4. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾". Lid may employ a butt joint with dowels at the Contractor's option.
5. Provide lifting devices in conformance with Manufacturer's recommendations.
6. Provide cast iron solid cover, unless noted otherwise elsewhere in the plans.
7. Chamfer vertical edges of inlet lid ¾" as shown in Front View, sheet 1.

INSTALLATION NOTES:

1. Inlet throat and lid are not intended for direct traffic. Do not place in roadway.
2. Seal tongue and groove joints and butt joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.

GENERAL NOTES:

1. Designed according to ASTM C913.
2. Open area of main throat = 360 sq in. Open area of one extension throat = 324 sq in.
3. Payment for inlet is per Item 465, "Junction Boxes, Manholes, and Inlets" by type, size, and extension placement. Extensions are subsidiary to inlet.

Cover dimensions are clear dimensions, unless noted otherwise.

HS20 LOADING SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

PRECAST CURB INLET OUTSIDE ROADWAY

PCO

FILE: prestd03-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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	PHR	CAMERON		128

DATE:
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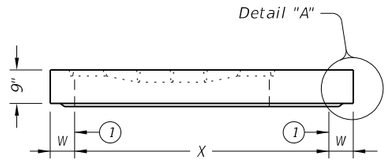
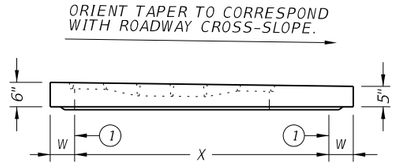
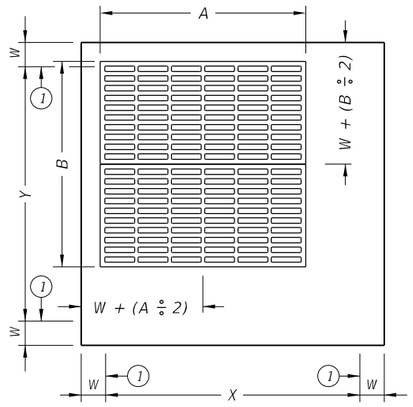


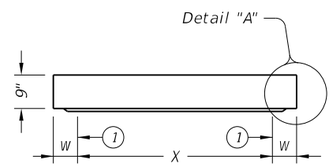
STYLE 'FG'



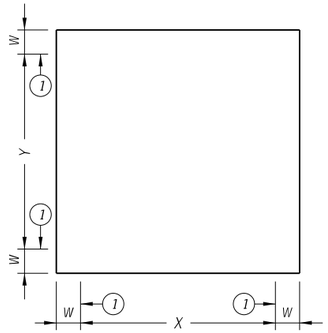
STYLE 'SFG'
ELEVATION VIEW



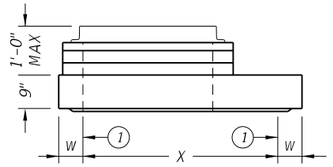
PLAN VIEW
CAST-IN FRAME & GRATE
STYLES 'FG' & 'SFG'



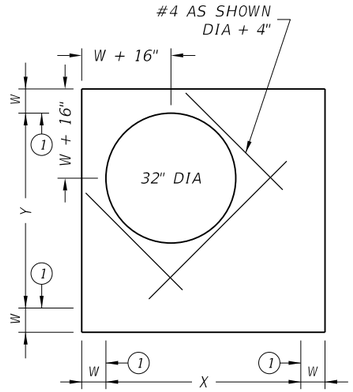
ELEVATION VIEW



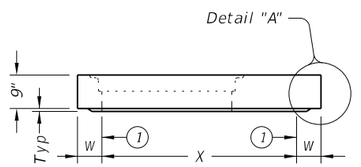
PLAN VIEW
NO OPENINGS
STYLE 'SL'



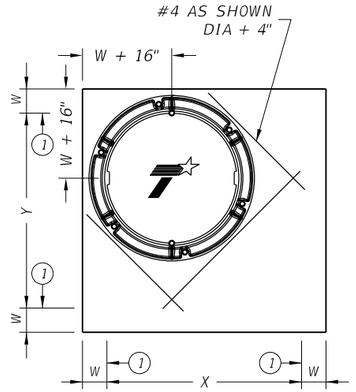
ELEVATION VIEW



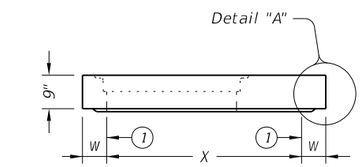
PLAN VIEW
SHIP LOOSE RING & COVER
STYLE 'RH'



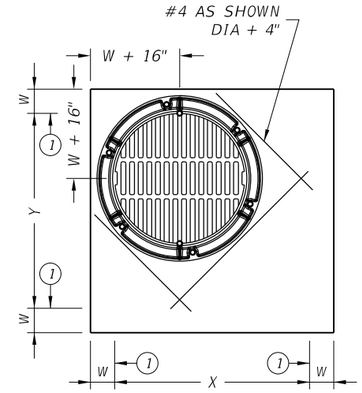
ELEVATION VIEW



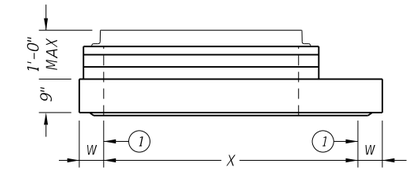
PLAN VIEW
32" DIA CAST-IN RING & COVER
STYLE 'RC'



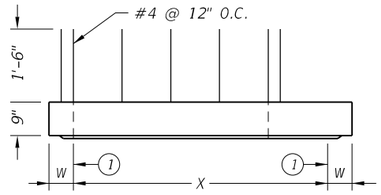
ELEVATION VIEW



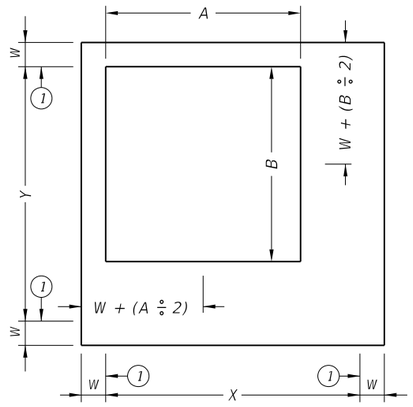
PLAN VIEW
32" DIA CAST-IN RING & GRATE
STYLE 'RG'



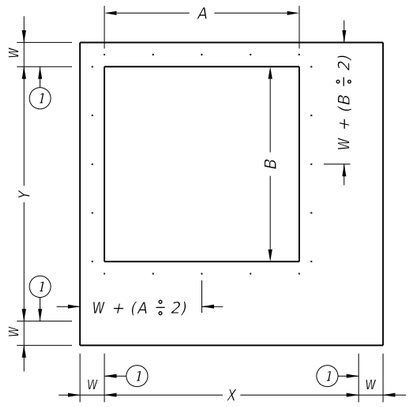
ELEVATION VIEW



ELEVATION VIEW



PLAN VIEW
SHIP LOOSE FRAME & GRATE
STYLE 'SH'



PLAN VIEW
EXPOSED REBAR
STYLE 'S1'

(1) Matches inside face of wall of precast base or riser below inlet.

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

PRECAST SLAB LID

PSL

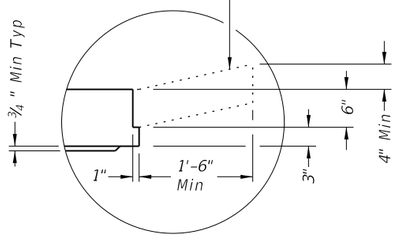
FILE: prestd05-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		129

DATE:
FILE:

Style	Size (X x Y)	W (2)	A x B (nominal)	Short Span Reinf Steel Area	Long Span Reinf Steel Area
SL	3'x3'	6"	n/a	0.37 in²/ft	0.37 in²/ft
RH,RC,RG,SH,S1,FG	3'x3'	6"	3'x3' or 32" Dia	0.37 in²/ft	0.37 in²/ft
SFG	3'x3'	6"	3'x3'	0.32 in²/ft	0.32 in²/ft
SL	4'x4'	6"	n/a	0.34 in²/ft	0.34 in²/ft
RH,RC,RG,SH,S1,FG	4'x4'	6"	3'x3' or 32" Dia	0.41 in²/ft	0.41 in²/ft
SH,S1,FG	4'x4'	6"	4'x4'	0.41 in²/ft	0.41 in²/ft
SFG	4'x4'	6"	4'x4'	0.32 in²/ft	0.32 in²/ft
SL	3'x5'	6"	n/a	0.39 in²/ft	0.39 in²/ft
RH,RC,RG,SH,S1,FG	3'x5'	6"	3'x3' or 32" Dia	0.48 in²/ft	0.48 in²/ft
SH,S1,FG	3'x5'	6"	3'x5'	0.48 in²/ft	0.48 in²/ft
SFG	3'x5'	6"	3'x5'	0.32 in²/ft	0.32 in²/ft
SL	4'x5'	6"	n/a	0.42 in²/ft	0.42 in²/ft
RH,RC,RG,SH,S1,FG	4'x5'	6"	3'x3' or 32" Dia	0.42 in²/ft	0.42 in²/ft
SH,S1,FG	4'x5'	6"	4'x4'	0.63 in²/ft	0.63 in²/ft
SH,S1,FG	4'x5'	6"	3'x5'	0.66 in²/ft	0.66 in²/ft
SL	5'x5'	6"	n/a	0.36 in²/ft	0.36 in²/ft
RH,RC,RG,SH,S1,FG	5'x5'	6"	3'x3' or 32" Dia	0.43 in²/ft	0.43 in²/ft
SH,S1,FG	5'x5'	6"	4'x4'	0.63 in²/ft	0.63 in²/ft
SH,S1,FG	5'x5'	6"	3'x5'	0.63 in²/ft	0.63 in²/ft
SL	5'x6'	6"/8"	n/a	0.48 in²/ft	0.48 in²/ft
RH,RC,RG,SH,S1,FG	5'x6'	6"/8"	3'x3' or 32" Dia	0.48 in²/ft	0.48 in²/ft
SH,S1,FG	5'x6'	6"/8"	4'x4'	0.60 in²/ft	0.60 in²/ft
SH,S1,FG	5'x6'	6"/8"	3'x5'	0.60 in²/ft	0.60 in²/ft
SL	6'x6'	6"/8"	n/a	0.43 in²/ft	0.43 in²/ft
RH,RC,RG,SH,S1,FG	6'x6'	6"/8"	3'x3' or 32" Dia	0.56 in²/ft	0.56 in²/ft
SH,S1,FG	6'x6'	6"/8"	4'x4'	0.56 in²/ft	0.56 in²/ft
SH,S1,FG	6'x6'	6"/8"	3'x5'	0.59 in²/ft	0.59 in²/ft
SL	8'x8'	8"/10"	n/a	0.45 in²/ft	0.45 in²/ft
RH,RC,RG,SH,S1,FG	8'x8'	8"/10"	3'x3' or 32" Dia	0.45 in²/ft	0.45 in²/ft
SH,S1,FG	8'x8'	8"/10"	4'x4'	0.45 in²/ft	0.45 in²/ft
SH,S1,FG	8'x8'	8"/10"	3'x5'	0.45 in²/ft	0.45 in²/ft

(2) See sheet PDD for corresponding wall thickness (W) of base unit or riser.

Construct cast-in-place reinforced concrete apron, when shown elsewhere in plans. Use Class "A" concrete. Apron is subsidiary to PSL. Apron is 1'-6" Min width around precast zone drain.



DETAIL "A"

(Reinforcing not shown for clarity)

When an apron is to be cast around PSL, use detail above to create an apron ledge on all 4 sides.

FABRICATION NOTES:

1. Locate penetration (Style 'RH'), ring and cover (Style 'RC'), ring and grate (Style 'RG'), and frame and grate (Style 'FG') in a corner. Only one penetration is allowed per slab lid.
2. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
3. Provide Grade 60 reinforcing steel or equivalent area of WWR.
4. Provide clear cover of ¾" to reinforcing from lower outside shoulder of slab for structural reinforcement, and 2" from top of slab for shrinkage and temperature reinforcement. Place short span reinforcing closest to surface.
5. Slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing. Provide steel area = 0.11 in²/ft each way.
6. No substitution is allowed for diagonal #4 bars around openings.
7. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
8. Provide lifting devices in conformance with Manufacturer's recommendations.

INSTALLATION NOTES:

1. Precast slab lids are intended for direct traffic and may be placed in roadway.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. Initial installation of grade adjustment rings for Styles 'RH' and 'SH' is limited to 1'-0" Max as shown.
5. Grade adjustment rings for Styles 'RH' and 'SH' may be increased to 2'-0" Max when future construction affects final grade of structure. Make adjustments greater than 2'-0" with additional risers. Adjustments can be made up to Max depth shown on sheet PDD. Structure must be evaluated if Max depth will be exceeded.
6. Orient long dimension of grate slots perpendicular to traffic, unless noted otherwise on plans

GENERAL NOTES:

1. Designed according to ASTM C913.
2. Payment for lid is per Item 465, "Junction Boxes, Manholes, and Inlets" by type, style, size, and opening size (when applicable).

Cover dimensions are clear dimensions, unless noted otherwise.

Texas Department of Transportation

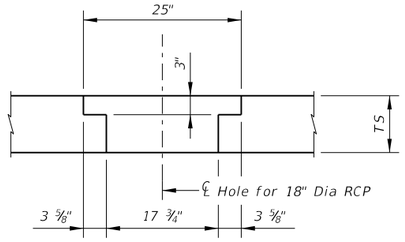
Bridge Division Standard

PRECAST SLAB LID

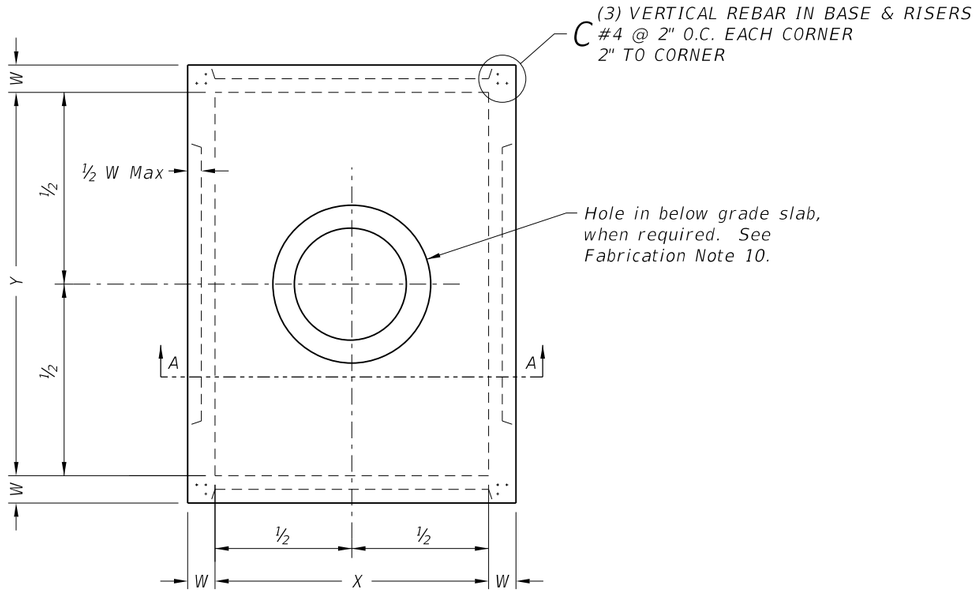
PSL

FILE: prestd05-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		130

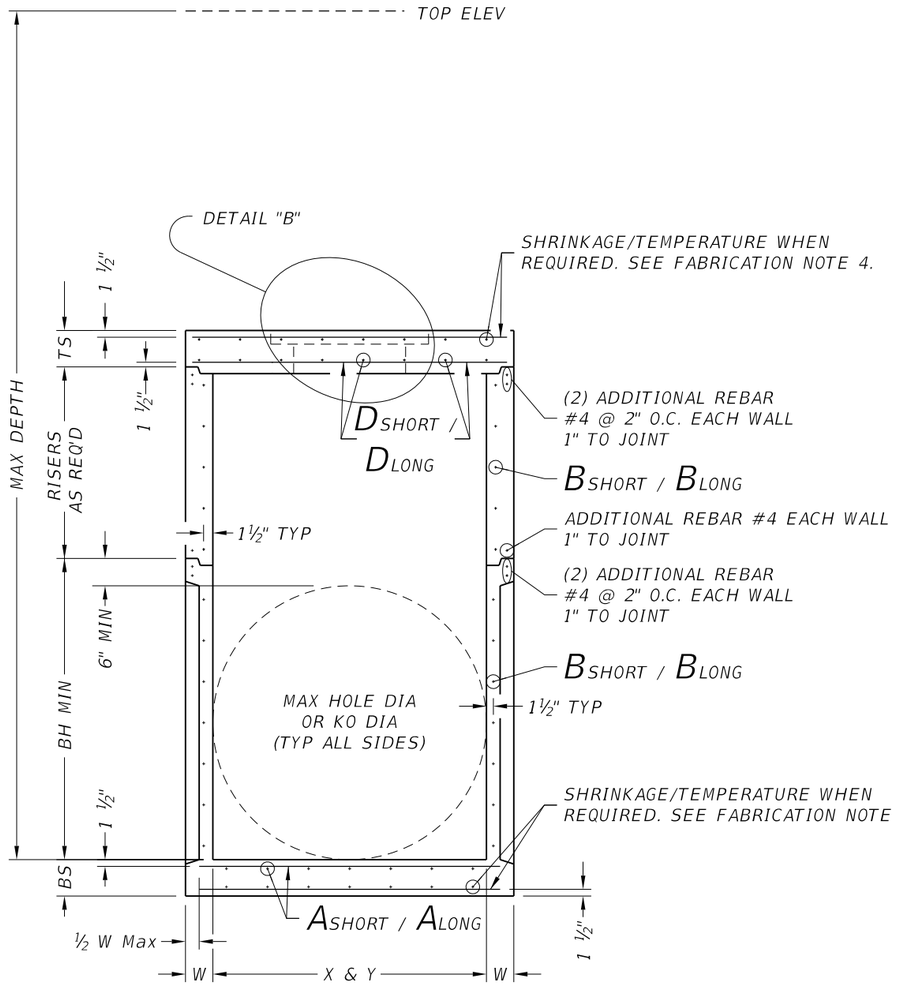
DATE:
FILE:



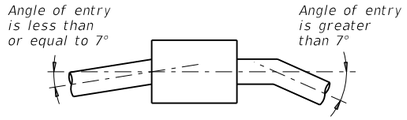
DETAIL "B"



PLAN VIEW



SECTION A-A



PIPE CONNECTION DETAIL

Connect pipes within 7° of normal to PJB wall.
If necessary, use pipe elbow or curved approach
alignment to stay within this limit.

FABRICATION NOTES:

1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Provide typical clear cover of 1 ½" to reinforcing steel at interior or exterior walls.
4. Walls or slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing steel. Provide steel area = 0.11 in²/ft each way.
5. No substitution is allowed for vertical and horizontal #4 bars in corners.
6. Manufacture base and risers to nearest 3" increment.
7. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
8. Provide lifting devices in conformance with Manufacturer's recommendations.
9. See sheet PDD for sizes, dimensions, and reinforcing steel not shown.
10. Provide hole in below grade slab only when PJB is installed with inlet type POD.

INSTALLATION NOTES:

1. Inverts (benching) to be provided by Contractor. Concrete or mortar used for invert is subsidiary to junction box.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. For rigid pipe, cut hole in thin wall panel (KO) 4" Max, 2" Min larger than pipe OD.
5. For flexible pipe, consult boot/seal Manufacturer's specification for placement tolerance and hole size. Center pipe in hole and install boot/seal per Manufacturer's specification.

GENERAL NOTES:

1. Precast Junction Box consists of base slab, base unit, risers (as required), and below grade slab. See sheet PDD for sizes.
2. Designed according to ASTM C913.
3. Payment for junction box is per Item 465 "Junction Boxes, Manholes, and Inlets" by type and size.

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

PRECAST JUNCTION BOX

PJB

FILE: prestd09-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		131

DISCLAIMER:
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DATE:
FILE:

		MAX DEPTH = 15 ft. to top of BASE SLAB										MAX DEPTH = 25 ft. to top of BASE SLAB												
		Base Slab			Base Unit or Riser Walls			Below Grade Slab (w/PJB) Reducing Slab (w/PB)				Base Slab			Base Unit or Riser Walls			Below Grade Slab (w/PJB) Reducing Slab (w/PB)				Min Height (See Gen Note 3)	Max HOLE DIA (See Fab Note 2)	Max KO DIA (See Fab Note 2)
	Size	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Reduced Riser Size	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Reduced Riser Size	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness			
	X x Y	Ashort	Along	BS	Bshort	Blong	W	RWSxRWL or ID	Dshort	Dlong	TS	Ashort	Along	BS	Bshort	Blong	W	RWSxRWL or ID	Dshort	Dlong	TS	BH MIN	HOLE DIA	KO DIA
	ft.	in^2/ft	in^2/ft	in.	in^2/ft	in^2/ft	in.	ft. **	in^2/ft	in^2/ft	in.	in^2/ft	in^2/ft	in.	in^2/ft	in^2/ft	in.	ft. **	in^2/ft	in^2/ft	in.	ft.	in.	in.
Precast Junction Box (PJB)	3x3	0.23	0.23	6	0.19	0.19	6	N/A	0.37	0.37	9	0.29	0.29	6	0.24	0.24	6	N/A	0.37	0.37	9	3.5	36	36
	4x4	0.29	0.29	6	0.24	0.24	6	N/A	0.41	0.41	9	0.47	0.47	6	0.38	0.38	6	N/A	0.41	0.41	9	4.5	48	48
	3x5	0.29	0.18	6	0.19	0.35	6	N/A	0.48	0.48	9	0.39	0.18	6	0.23	0.59	6	N/A	0.48	0.48	9	3.5	36/60	36/60
	4x5	0.36	0.18	6	0.22	0.34	6	N/A	0.42	0.42	9	0.53	0.26	6	0.39	0.59	6	N/A	0.42	0.42	9	4.5	48/60	48/60
	5x5	0.36	0.36	6	0.34	0.34	6	N/A	0.43	0.43	9	0.62	0.62	6	0.59	0.59	6	N/A	0.43	0.43	9	5.5	60	60
	5x6	0.27	0.27	9	0.34	0.45	6	N/A	0.48	0.48	9	0.47	0.45	9	0.38	0.54	8	N/A	0.48	0.48	9	5.5	60/72	60/72
	6x6	0.27	0.27	9	0.45	0.45	6	N/A	0.56	0.56	9	0.52	0.52	9	0.54	0.54	8	N/A	0.56	0.56	9	6.5	72	72
	8x8	0.46	0.46	9	0.51	0.51	8	N/A	0.45	0.45	12	0.87	0.87	9	0.59	0.59	10	N/A	0.45	0.45	12	8.5	96	72
Precast Base (PB)	3x3	0.23	0.23	6	0.19	0.19	6	N/A	N/A	N/A	N/A	0.29	0.29	6	0.24	0.24	6	N/A	N/A	N/A	N/A	3.5	36	36
	4x4	0.29	0.29	6	0.24	0.24	6	N/A	N/A	N/A	N/A	0.47	0.47	6	0.38	0.38	6	N/A	N/A	N/A	N/A	4.5	48	48
	3x5	0.29	0.18	6	0.19	0.35	6	3x3	0.30	0.34	9	0.39	0.18	6	0.23	0.59	6	3x3	0.40	0.40	9	3.5	36/60	36/60
	4x5	0.36	0.18	6	0.22	0.34	6	3x3	0.30	0.30	9	0.53	0.26	6	0.39	0.59	6	3x3	0.46	0.37	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	4x4	0.30	0.30	9	0.53	0.26	6	0.39	0.59	6	4x4	0.39	0.39	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	48"	0.39	0.39	9	0.53	0.26	6	0.39	0.59	6	48"	0.47	0.47	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	3x5	0.33	0.40	9	0.53	0.26	6	0.39	0.59	6	3x5	0.48	0.48	9	4.5	48/60	48/60
	5x5	0.36	0.36	6	0.34	0.34	6	3x3	0.34	0.34	9	0.62	0.62	6	0.59	0.59	6	3x3	0.53	0.53	9	5.5	60	60
	5x5	0.36	0.36	6	0.34	0.34	6	4x4	0.36	0.36	9	0.62	0.62	6	0.59	0.59	6	4x4	0.64	0.64	9	5.5	60	60
	5x5	0.38	0.38	6	0.34	0.34	6	48"	0.36	0.36	9	0.62	0.62	6	0.59	0.59	6	48"	0.64	0.64	9	5.5	60	60
	5x5	0.36	0.36	6	0.34	0.34	6	3x5	0.34	0.40	9	0.62	0.62	6	0.59	0.59	6	3x5	0.53	0.53	9	5.5	60	60
	5x6	0.31	0.31	9	0.34	0.45	6	3x3	0.34	0.34	9	0.47	0.45	9	0.38	0.54	8	3x3	0.61	0.50	9	5.5	60/72	60/72
	5x6	0.27	0.27	9	0.34	0.45	6	4x4	0.36	0.45	9	0.47	0.45	9	0.38	0.54	8	4x4	0.74	0.57	9	5.5	60/72	60/72
	5x6	0.29	0.29	9	0.34	0.45	6	48"	0.36	0.45	9	0.47	0.45	9	0.38	0.54	8	48"	0.74	0.57	9	5.5	60/72	60/72
	5x6	0.29	0.29	9	0.34	0.45	6	3x5	0.45	0.45	9	0.47	0.45	9	0.38	0.54	8	3x5	0.61	0.61	9	5.5	60/72	60/72
	6x6	0.29	0.29	9	0.45	0.45	6	3x3	0.41	0.41	9	0.52	0.52	9	0.54	0.54	8	3x3	0.74	0.74	9	6.5	72	72
	6x6	0.27	0.27	9	0.45	0.45	6	4x4	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	4x4	0.87	0.87	9	6.5	72	72
	6x6	0.29	0.29	9	0.45	0.45	6	48"	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	48"	0.87	0.87	9	6.5	72	72
	6x6	0.29	0.29	9	0.45	0.45	6	3x5	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	3x5	0.87	0.87	9	6.5	72	72
	8x8	0.52	0.52	9	0.51	0.51	8	3x3	0.61	0.61	12	0.91	0.91	9	0.70	0.70	10	3x3	0.85	0.85	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	4x4	0.70	0.70	12	0.87	0.87	9	0.70	0.70	10	4x4	1.01	1.01	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	48"	0.70	0.70	12	0.87	0.87	9	0.70	0.70	10	48"	1.01	1.01	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	3x5	0.70	0.85	12	0.87	0.87	9	0.70	0.70	10	3x5	1.01	1.01	12	8.5	96	72

** Unless otherwise indicated.

FABRICATION NOTES:
1. Maximum spacing of reinforcement is 8".
2. At manufacturer's option, provide cast or cored holes or thin wall panels (KO) to the maximum diameter shown for each. When no penetration is required, it is acceptable to provide a wall with no sectional reduction.

GENERAL NOTES:
1. Precast Junction Box consists of base slab, base unit, risers (as required), and below grade slab. See sheet PJB for details.
2. Precast Base consists of base slab, base unit, risers (as required), reducing slab (as required), and reduced risers (as required). See sheet PB for details.
3. Min Height shown is for stock base units. Use stock base units whenever practical. Smaller height base units can be used in special installation circumstances, when noted elsewhere in the plans. Absolute minimum height of base units is 2'-6".

HL93 LOADING

Texas Department of Transportation | Bridge Division Standard

DESIGN DATA FOR PRECAST BASE AND JUNCTION BOX

PDD

FILE: prestd10-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		132

DATE:
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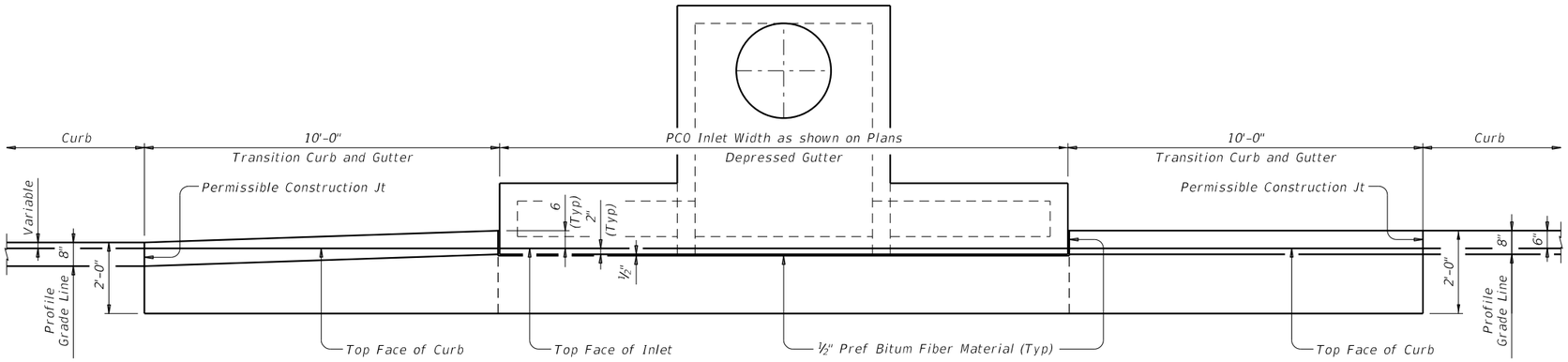
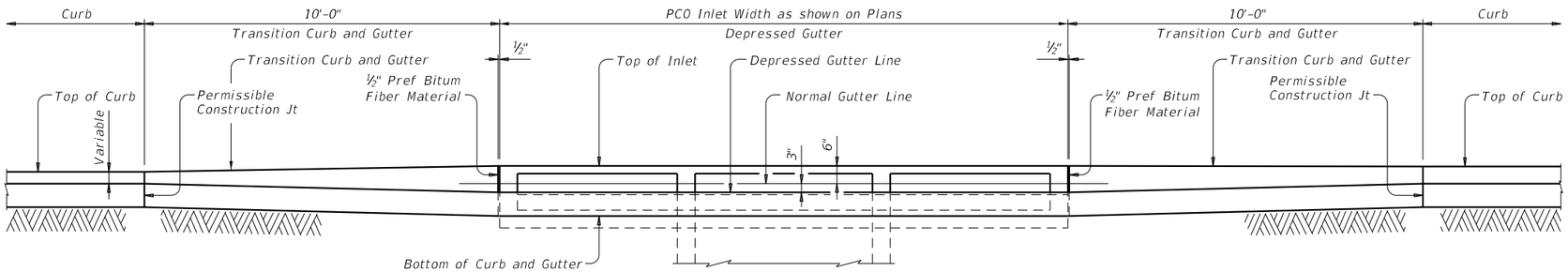


SHOWING TYPE I, IIa & III Curb and Gutter

PLAN

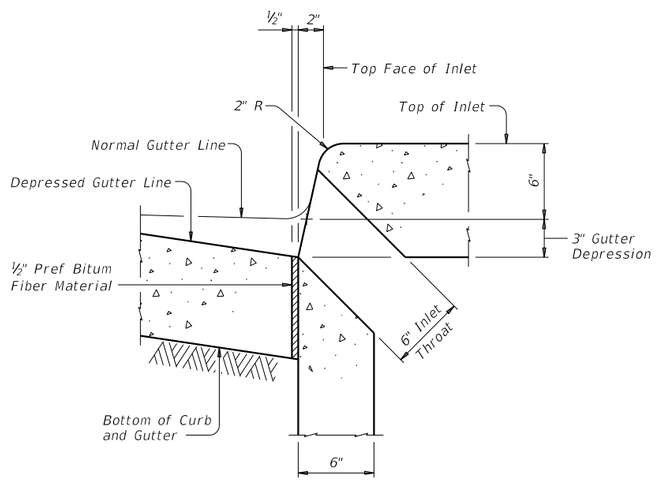
SHOWING TYPE II & IV Curb and Gutter



SHOWING TYPE I, IIa & III Curb and Gutter

ELEVATION

SHOWING TYPE II & IV Curb and Gutter



SECTION AT GUTTER AND INLET

Reinforcing steel not shown for clarity.

CONSTRUCTION NOTES:
Align top face of curb with PCO Inlet as shown.

MATERIAL NOTES:
Provide ½" Preformed Bituminous Fiber Material.

GENERAL NOTES:
See Precast Curb Inlet Outside Roadway (PCO) standard for details and notes not shown.
See Concrete Curb and Curb and Gutter (CCCG-12) standard for details and notes not shown.
Curb and Gutter Transitions is paid for and in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
Preformed Bituminous Fiber Material is subsidiary to PCO Inlet.

Texas Department of Transportation

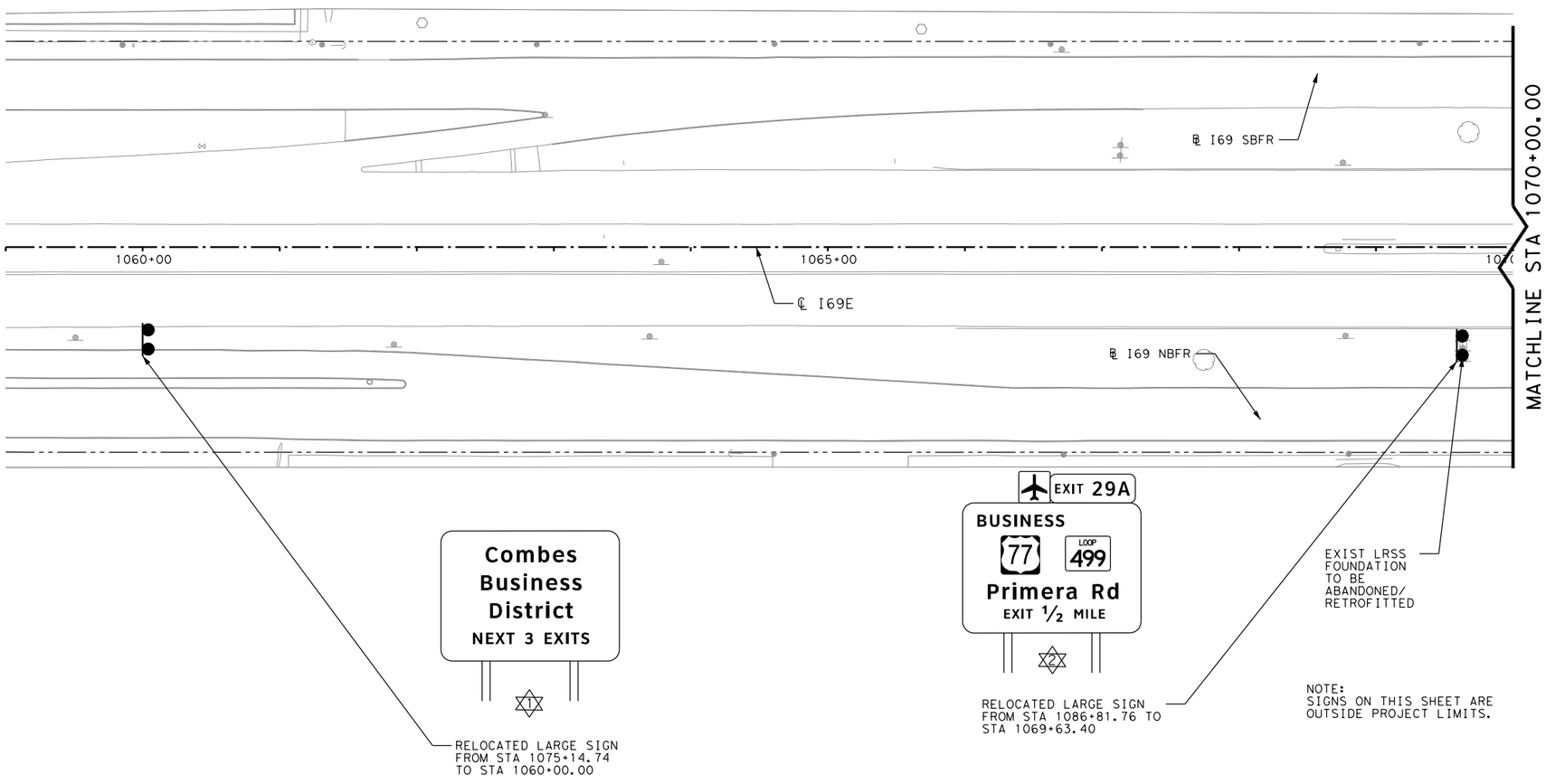
Bridge Division Standard

CURB AND GUTTER TRANSITION DETAILS FOR PCO INLET

CGT-PCO

FILE: prestd13-20.dgn	DN: TxDOT	CK: AES	DW: JTR	CK: AES
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		133

ITEM	DESCRIPTION	UNIT	EST.	FIN.
416 6018	DRILL SHAFT (SIGN MTS)(24 IN)	LF	44	
432 6043	RIPRAP(CONC)(SIGN MOUNTS)(CL B)	CY	3.8	
647 6002	RELOCATE LRSA	EA	2	



NOTE:
SIGNS ON THIS SHEET ARE OUTSIDE PROJECT LIMITS.

0' 25' 50' 100'

N

PAVEMENT LEGEND:

BK-BK BACK TO BACK
PROPOSED LANE
EXISTING LANE
EXISTING SIGN POST
PROPOSED SIGN POST
(A) REFL PAV MRK TY I (W)4"(DOT)(100MIL)
(B) REFL PM W/RET REQ TY I (W)4"(BRK)(100MIL)
(C) REFL PAV MRK TY I (W)6"(DOT)(100MIL)
(D) REFL PAV MRK TY I (Y)4"(SLD)(100MIL)
(E) REFL PM W/RET REQ TY I (W)6"(SLD)(100MIL)
(F) REFL PAV MRK TY I (W)8"(SLD)(100MIL)
(G) REFL PAV MRK TY I (W)12"(SLD)(100MIL)
(H) REFL PAV MRK TY I (W)24"(SLD)(100MIL)
(I) REFL PAV MRKR TY I-C
(J) REFL PAV MRKR TY II-C-R
(K) PREFAB PAV MRK TY C (W)ARROW)
(L) PREFAB PAV MRK TY C (W)(DBL ARROW)
(M) PREFAB PAV MRK TY C (W)(WORD)
(N) PREFAB PAV MRK TY C (W)(RR XING)
(P) REFL PM W/RET REQ TY 1(Y) 6"(SLD) 100 MIL
(Q) REFL PAV MRK TY 1(W) 12"(DOT) 100 MIL

SIGNING LEGEND:

(#) PROPOSED SIGN (SMALL)
EXISTING SIGN TO BE REMOVED (SMALL)
EXISTING SIGN TO BE RELOCATED (SMALL)
EXISTING SIGN TO REMAIN (SMALL)
PROPOSED SIGN (LARGE)
EXISTING SIGN TO BE REMOVED (LARGE)
EXISTING SIGN TO BE RELOCATED (LARGE)
EXISTING SIGN TO REMAIN (LARGE)

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
GIOVANNI PUCCINI
90714
LICENSED
PROFESSIONAL ENGINEER
11/22/2022

Texas Department of Transportation

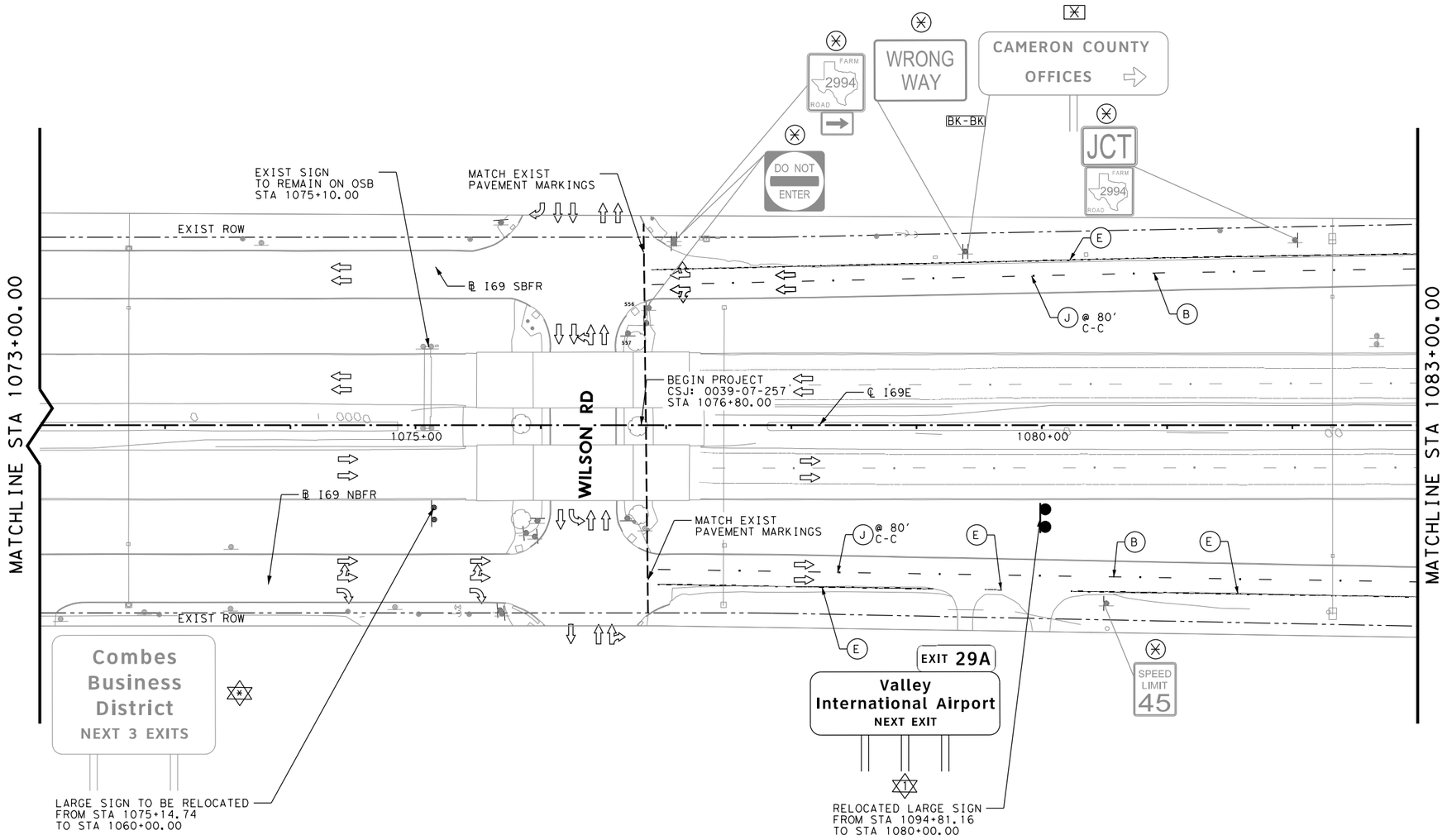
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
4350 Lockhill Selma Road, Suite 100•San Antonio, Texas 78249•210.494.5511

I-69E
SIGNING AND PAVEMENT MARKINGS
BEGIN TO STA 1083+00

SHEET 01 OF 08

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	134
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

ITEM	DESCRIPTION	UNIT	EST.	FIN.
416 6018	DRILL SHAFT (SIGN MTS) (24 IN)	LF	27	
432 6043	RIPRAP (CONC) (SIGN MOUNTS) (CL B)	CY	2.3	
647 6002	RELOCATE LRSA	EA	1	
666 6300	RE PM W/RET REQ TY I (W)4" (BRK) (100MIL)	LF	304	
666 6309	RE PM W/RET REQ TY I (W)6" (SLD) (100MIL)	LF	1119	
672 6010	REFL PAV MRKR TY II-C-R	EA	16	



0' 25' 50' 100'

N

PAVEMENT LEGEND:

BK-BK BACK TO BACK
PROPOSED LANE
EXISTING LANE
EXISTING SIGN POST
PROPOSED SIGN POST
(A) REFL PAV MRK TY I (W)4" (DOT) (100MIL)
(B) REFL PM W/RET REQ TY I (W)4" (BRK) (100MIL)
(C) REFL PAV MRK TY I (W)6" (DOT) (100MIL)
(D) REFL PAV MRK TY I (Y)4" (SLD) (100MIL)
(E) REFL PM W/RET REQ TY I (W)6" (SLD) (100MIL)
(F) REFL PAV MRK TY I (W)8" (SLD) (100MIL)
(G) REFL PAV MRK TY I (W)12" (SLD) (100MIL)
(H) REFL PAV MRK TY I (W)24" (SLD) (100MIL)
(I) REFL PAV MRKR TY I-C
(J) REFL PAV MRKR TY II-C-R
(K) PREFAB PAV MRK TY C (W)ARROW)
(L) PREFAB PAV MRK TY C (W)(DBL ARROW)
(M) PREFAB PAV MRK TY C (W)(WORD)
(N) PREFAB PAV MRK TY C (W)(RR XING)
(P) REFL PM W/RET REQ TY 1(Y) 6"(SLD) 100 MIL
(Q) REFL PAV MRK TY 1(W) 12"(DOT) 100 MIL

SIGNING LEGEND:

(#) PROPOSED SIGN (SMALL)
EXISTING SIGN TO BE REMOVED (SMALL)
EXISTING SIGN TO BE RELOCATED (SMALL)
EXISTING SIGN TO REMAIN (SMALL)
PROPOSED SIGN (LARGE)
EXISTING SIGN TO BE REMOVED (LARGE)
EXISTING SIGN TO BE RELOCATED (LARGE)
EXISTING SIGN TO REMAIN (LARGE)

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
GIOVANNI PUCCINI
90714
LICENSED
PROFESSIONAL ENGINEER
11/22/2022

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I-69E
SIGNING AND PAVEMENT MARKINGS
BEGIN TO STA 1083+00

SHEET 02 OF 08

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	
CHECKED	CONT.	SECT.	JOB	135
XX	0039	07	257	
APPROVED				
XX				

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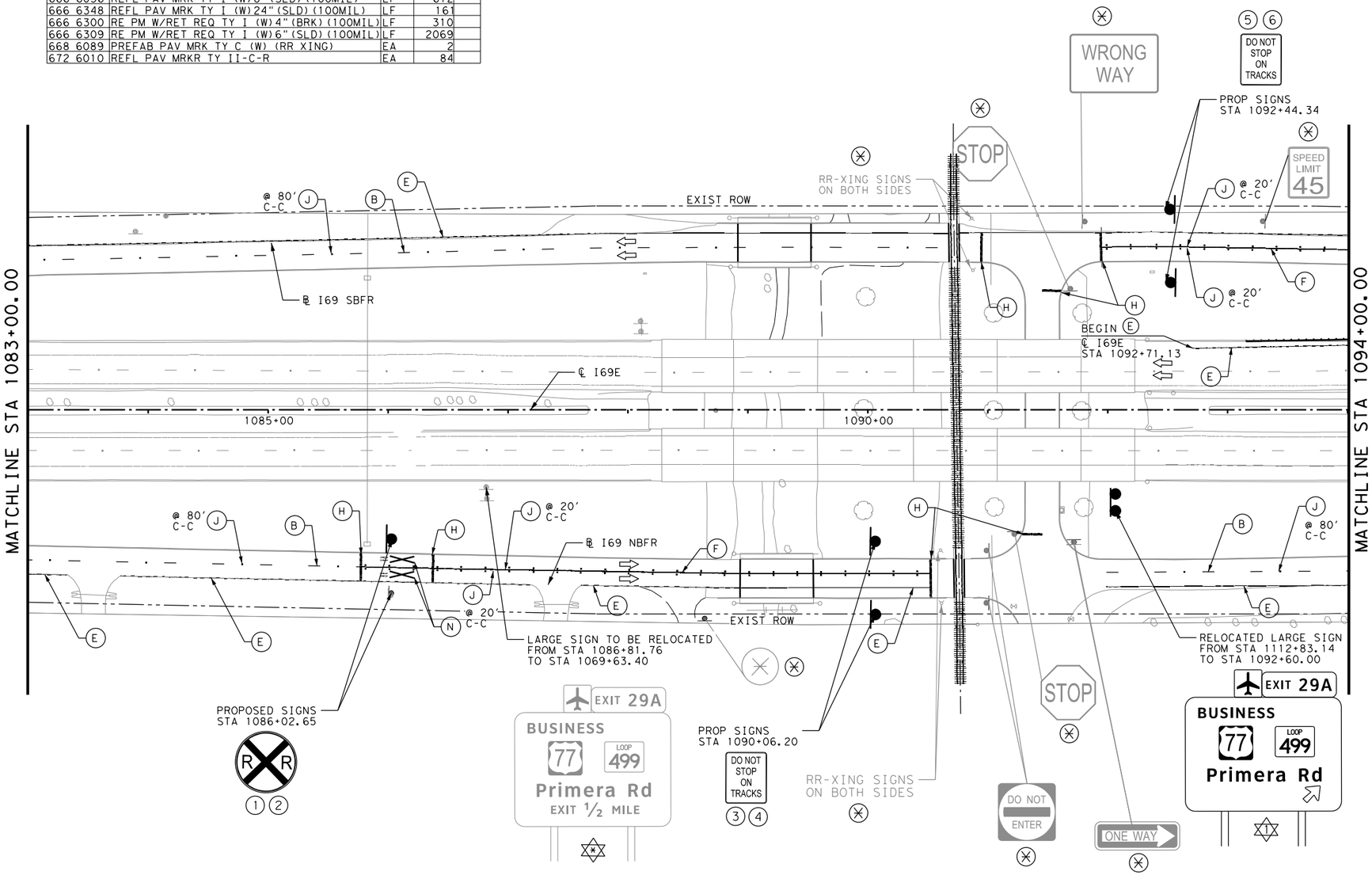
ITEM	DESCRIPTION	UNIT	EST.	FIN.
416 6018	DRILL SHAFT (SIGN MTS)(24 IN)	LF	18	
432 6043	RIPRAP(CONC)(SIGN MOUNTS)(CL B)	CY	1.9	
636 6001	ALUMINUM SIGN (TY A)	SF	205.1	
636 6007	REPLACE EXISTING ALUMINUM SIGN (TY A)	SF	1	
644 6027	IN SM RD SN SUP&AM TYS80(1)SA(P)	EA	4	
644 6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	1	
647 6002	RELOCATE LRSA	EA	1	
666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	672	
666 6348	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	161	
666 6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	310	
666 6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	2069	
668 6089	PREFAB PAV MRK TY C (W) (RR XING)	EA	2	
672 6010	REFL PAV MRKR TY II-C-R	EA	84	



0' 25' 50' 100'

N

PAVEMENT LEGEND:

BK-BK BACK TO BACK
PROPOSED LANE
EXISTING LANE
EXISTING SIGN POST
PROPOSED SIGN POST
(A) REFL PAV MRK TY I (W)4"(DOT)(100MIL)
(B) REFL PM W/RET REQ TY I (W)4"(BRK)(100MIL)
(C) REFL PAV MRK TY I (W)6"(DOT)(100MIL)
(D) REFL PAV MRK TY I (Y)4"(SLD)(100MIL)
(E) REFL PM W/RET REQ TY I (W)6"(SLD)(100MIL)
(F) REFL PAV MRK TY I (W)8"(SLD)(100MIL)
(G) REFL PAV MRK TY I (W)12"(SLD)(100MIL)
(H) REFL PAV MRK TY I (W)24"(SLD)(100MIL)
(I) REFL PAV MRKR TY I-C
(J) REFL PAV MRKR TY II-C-R
(K) PREFAB PAV MRK TY C (W)ARROW)
(L) PREFAB PAV MRK TY C (W)(DBL ARROW)
(M) PREFAB PAV MRK TY C (W)(WORD)
(N) PREFAB PAV MRK TY C (W)(RR XING)
(P) REFL PM W/RET REQ TY 1(Y) 6"(SLD) 100 MIL
(Q) REFL PAV MRK TY 1(W) 12"(DOT) 100 MIL

SIGNING LEGEND:

(#) PROPOSED SIGN (SMALL)
EXISTING SIGN TO BE REMOVED (SMALL)
EXISTING SIGN TO BE RELOCATED (SMALL)
EXISTING SIGN TO REMAIN (SMALL)
PROPOSED SIGN (LARGE)
EXISTING SIGN TO BE REMOVED (LARGE)
EXISTING SIGN TO BE RELOCATED (LARGE)
EXISTING SIGN TO REMAIN (LARGE)

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
GIOVANNI PUCCINI
90714
LICENSED
PROFESSIONAL ENGINEER

11/22/2022

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I-69E
SIGNING AND PAVEMENT MARKINGS
STA 1083+00 TO STA 1094+00

SHEET 03 OF 08

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	136
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

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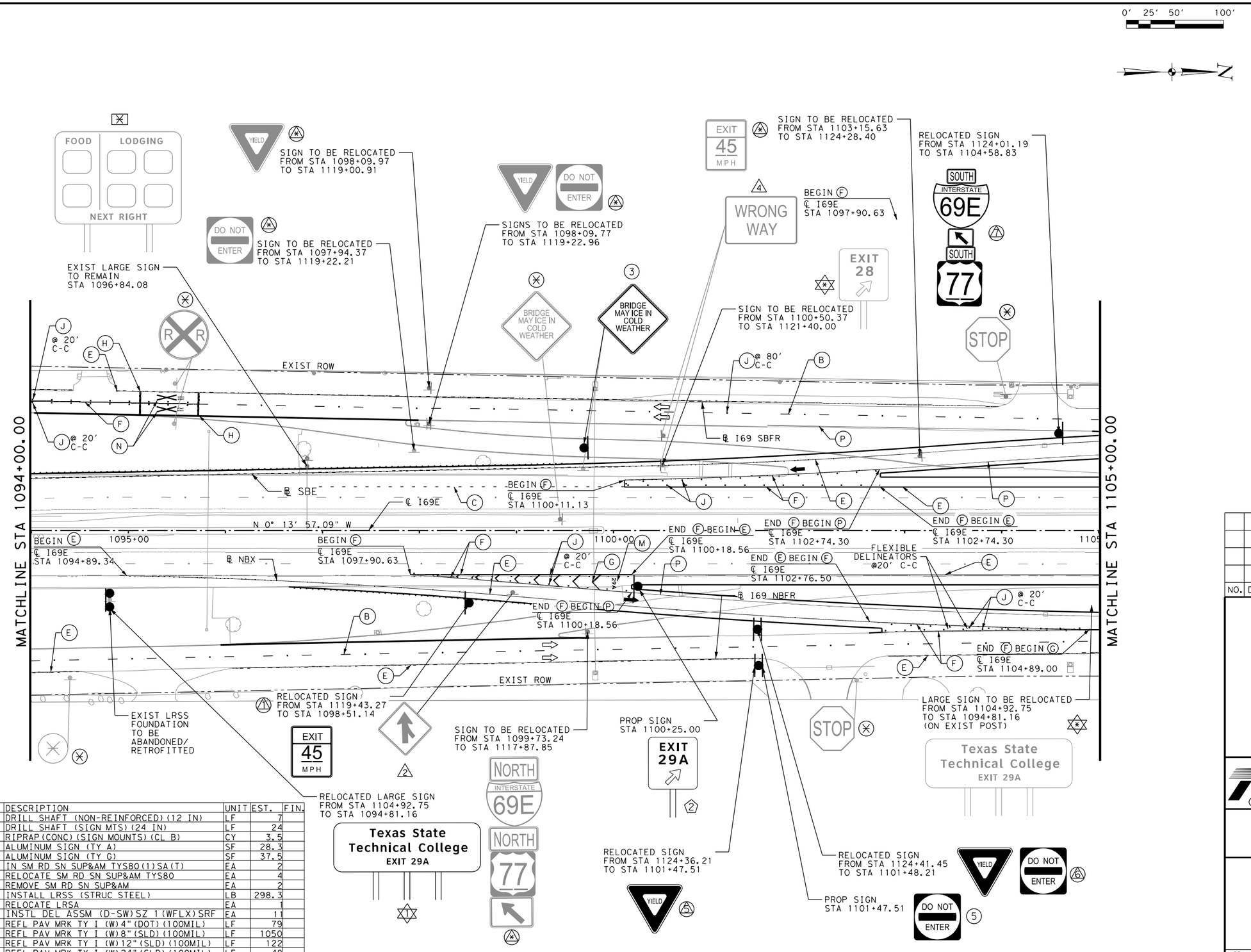

ITEM	DESCRIPTION	UNIT	EST.	FIN.
416 6015	DRILL SHAFT (NON-REINFORCED) (12 IN)	LF	7	
416 6018	DRILL SHAFT (SIGN MTS) (24 IN)	LF	24	
432 6043	RIPRAP (CONC) (SIGN MOUNTS) (CL B)	CY	3.5	
636 6001	ALUMINUM SIGN (TY A)	SF	28.3	
636 6002	ALUMINUM SIGN (TY G)	SF	37.5	
644 6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	2	
644 6070	RELOCATE SM RD SN SUP&AM TYS80	EA	4	
644 6076	REMOVE SM RD SN SUP&AM	EA	2	
647 6001	INSTALL LRSS (STRUC STEEL)	LB	298.3	
647 6002	RELOCATE LRSA	EA	1	
658 6083	INSTL DEL ASSM (D-SW)SZ 1(WFLX)SRF	EA	11	
666 6018	REFL PAV MRK TY I (W)4"(DOT)(100MIL)	LF	79	
666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	1050	
666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	122	
666 6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	48	
666 6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	506	
666 6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	4385	
666 6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	937	
668 6085	PREFAB PAV MRK TY C (W) (WORD)	EA	1	
672 6089	PREFAB PAV MRK TY C (W) (RR XING)	EA	2	
672 6010	REFL PAV MRKR TY II-C-R	EA	111	

PAVEMENT LEGEND:

BK-BK BACK TO BACK
PROPOSED LANE
EXISTING LANE
EXISTING SIGN POST
PROPOSED SIGN POST
(A) REFL PAV MRK TY I (W)4"(DOT)(100MIL)
(B) REFL PM W/RET REQ TY I (W)4"(BRK)(100MIL)
(C) REFL PAV MRK TY I (W)6"(DOT)(100MIL)
(D) REFL PAV MRK TY I (Y)4"(SLD)(100MIL)
(E) REFL PM W/RET REQ TY I (W)6"(SLD)(100MIL)
(F) REFL PAV MRK TY I (W)8"(SLD)(100MIL)
(G) REFL PAV MRK TY I (W)12"(SLD)(100MIL)
(H) REFL PAV MRK TY I (W)24"(SLD)(100MIL)
(I) REFL PAV MRKR TY I-C
(J) REFL PAV MRKR TY II-C-R
(K) PREFAB PAV MRK TY C (W)ARROW)
(L) PREFAB PAV MRK TY C (W)(DBL ARROW)
(M) PREFAB PAV MRK TY C (W)(WORD)
(N) PREFAB PAV MRK TY C (W)(RR XING)
(P) REFL PM W/RET REQ TY 1(Y) 6"(SLD) 100 MIL
(Q) REFL PAV MRK TY 1(W) 12"(DOT) 100 MIL

SIGNING LEGEND:

(#) PROPOSED SIGN (SMALL)
EXISTING SIGN TO BE REMOVED (SMALL)
EXISTING SIGN TO BE RELOCATED (SMALL)
EXISTING SIGN TO REMAIN (SMALL)
PROPOSED SIGN (LARGE)
EXISTING SIGN TO BE REMOVED (LARGE)
EXISTING SIGN TO BE RELOCATED (LARGE)
EXISTING SIGN TO REMAIN (LARGE)

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
GIOVANNI PUCCINI
90714
LICENSED
PROFESSIONAL ENGINEER

11/22/2022

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I-69E
SIGNING AND PAVEMENT MARKINGS
STA 1094+00 TO STA 1105+00

SHEET 04 OF 08

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	137
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

DATE:12/15/2022 2:44:10 AM USER:
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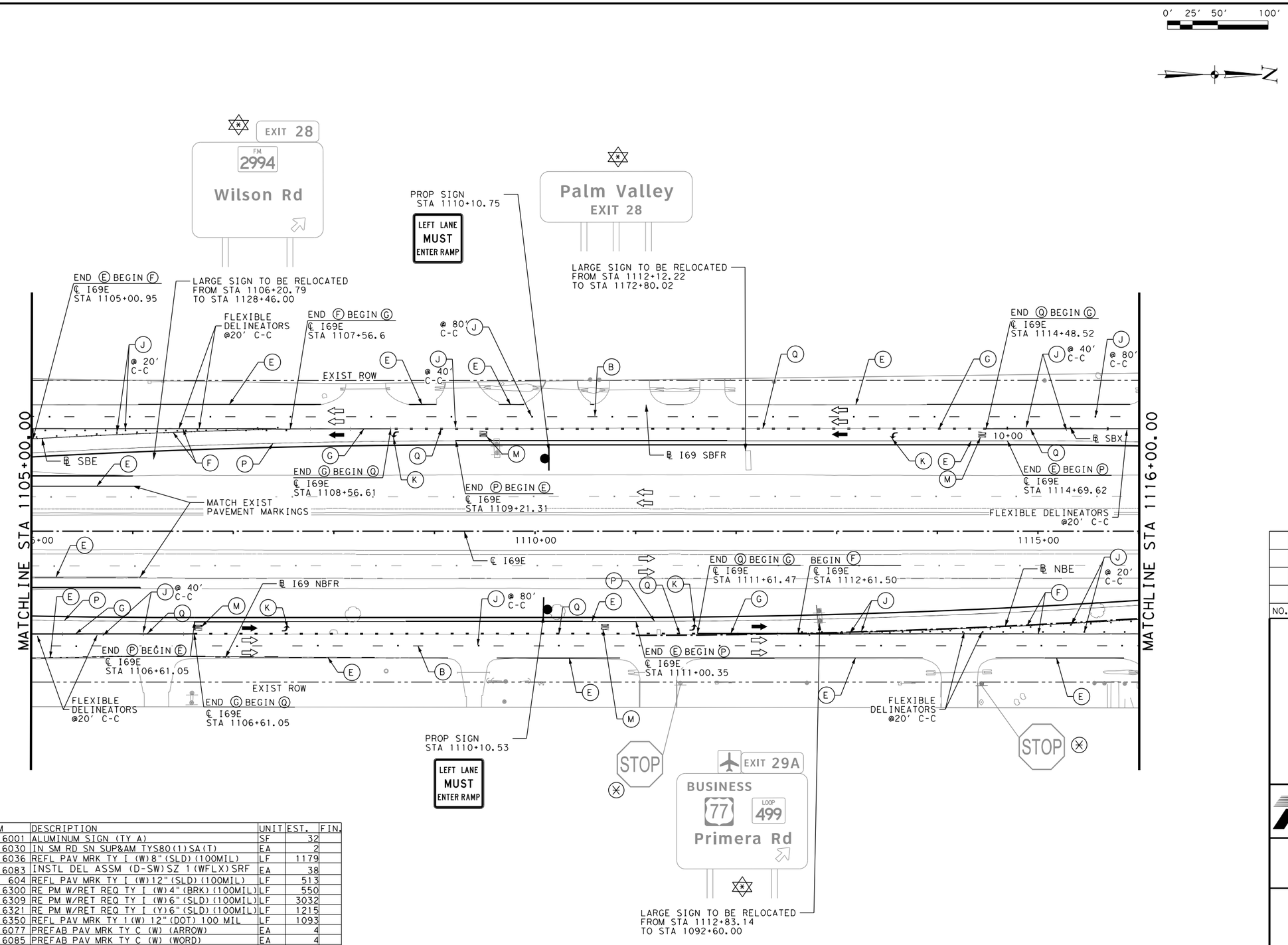

0' 25' 50' 100'

N

PAVEMENT LEGEND:

BK-BK BACK TO BACK
PROPOSED LANE
EXISTING LANE
EXISTING SIGN POST
PROPOSED SIGN POST
(A) REFL PAV MRK TY I (W)4"(DOT)(100MIL)
(B) REFL PM W/RET REQ TY I (W)4"(BRK)(100MIL)
(C) REFL PAV MRK TY I (W)6"(DOT)(100MIL)
(D) REFL PAV MRK TY I (Y)4"(SLD)(100MIL)
(E) REFL PM W/RET REQ TY I (W)6"(SLD)(100MIL)
(F) REFL PAV MRK TY I (W)8"(SLD)(100MIL)
(G) REFL PAV MRK TY I (W)12"(SLD)(100MIL)
(H) REFL PAV MRK TY I (W)24"(SLD)(100MIL)
(I) REFL PAV MRKR TY I-C
(J) REFL PAV MRKR TY II-C-R
(K) PREFAB PAV MRK TY C (W)ARROW)
(L) PREFAB PAV MRK TY C (W)(DBL ARROW)
(M) PREFAB PAV MRK TY C (W)(WORD)
(N) PREFAB PAV MRK TY C (W)(RR XING)
(P) REFL PM W/RET REQ TY 1(Y) 6"(SLD) 100 MIL
(Q) REFL PAV MRK TY 1(W) 12"(DOT) 100 MIL

SIGNING LEGEND:

(#) PROPOSED SIGN (SMALL)
EXISTING SIGN TO BE REMOVED (SMALL)
EXISTING SIGN TO BE RELOCATED (SMALL)
EXISTING SIGN TO REMAIN (SMALL)
PROPOSED SIGN (LARGE)
EXISTING SIGN TO BE REMOVED (LARGE)
EXISTING SIGN TO BE RELOCATED (LARGE)
EXISTING SIGN TO REMAIN (LARGE)

ITEM	DESCRIPTION	UNIT	EST.	FIN.
636 6001	ALUMINUM SIGN (TY A)	SF	32	
644 6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	2	
666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	1179	
658 6083	INSTL DEL ASSM (D-SW)SZ 1(WFLX)SRF	EA	38	
666 604	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	513	
666 6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	550	
666 6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	3032	
666 6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	1215	
666 6350	REFL PAV MRK TY 1(W) 12"(DOT) 100 MIL	LF	1093	
668 6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	4	
668 6085	PREFAB PAV MRK TY C (W) (WORD)	EA	4	
672 6010	REFL PAV MRKR TY II-C-R	EA	134	

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
GIOVANNI PUCCINI
90714
LICENSED
PROFESSIONAL ENGINEER
11/22/2022

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I-69E
SIGNING AND PAVEMENT MARKINGS
STA 1105+00 TO STA 1116+00

SHEET 05 OF 08

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	
CHECKED	CONT.	SECT.	JOB	138
XX	0039	07	257	
APPROVED				
XX				

DATE:12/15/2022 2:44:16 AM USER:
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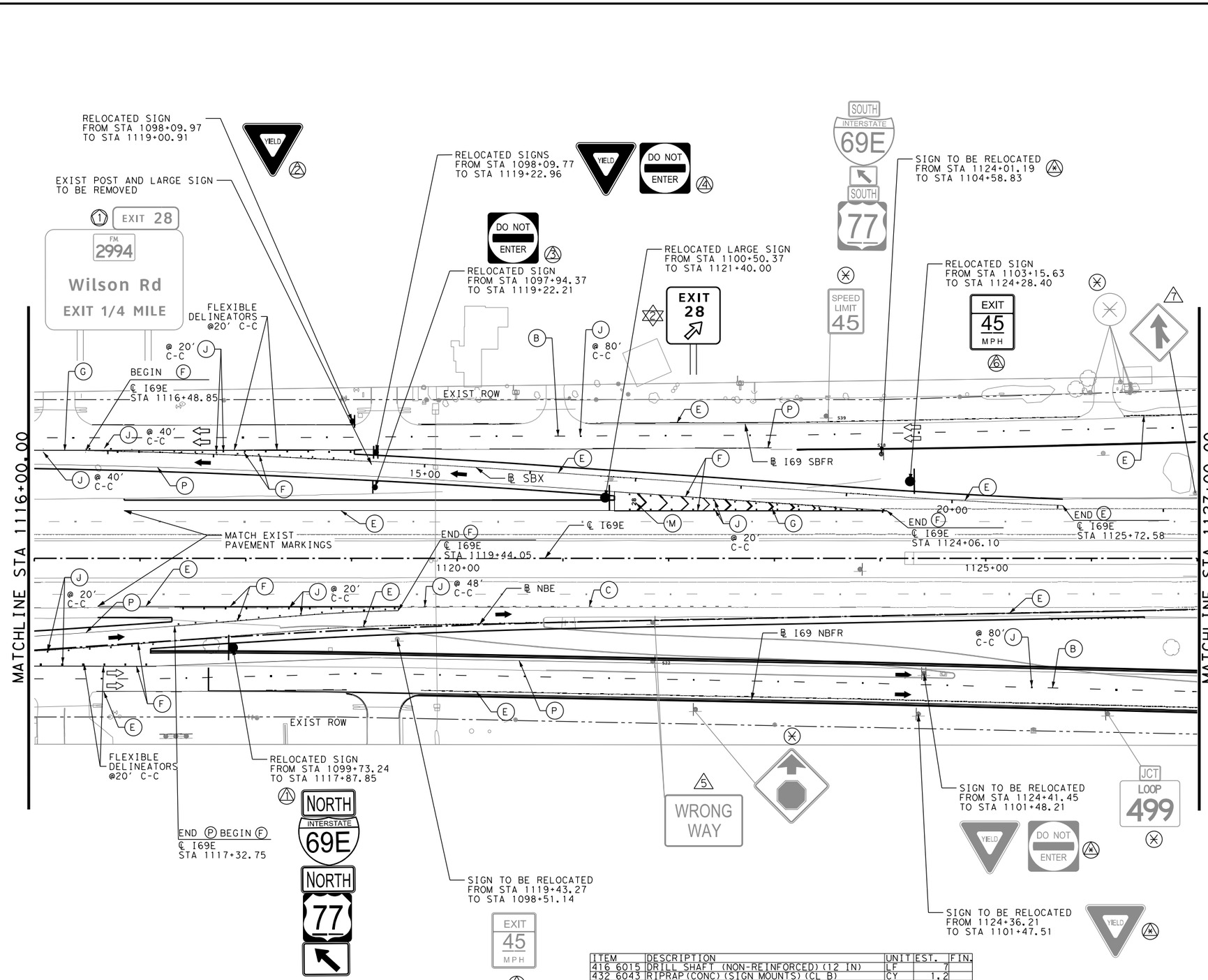

ITEM	DESCRIPTION	UNIT	EST.	FIN.
416 6015	DRILL SHAFT (NON-REINFORCED) (12 IN)	LF	7	
432 6043	RIPRAP (CONC) (SIGN MOUNTS) (CL B)	CY	1.2	
644 6070	RELOCATE SM RD SN SUP&AM TYS80	EA	5	
644 6076	REMOVE SM RD SN SUP&AM	EA	2	
647 6003	RELOCATE LRSA	EA	1	
658 6083	INSTL DEL ASSM (D-SW) SZ 1 (WFLX) SRF	EA	21	
666 6018	REFL PAV MRK TY I (W)6" (DOT) (100MIL)	LF	79	
666 6036	REFL PAV MRK TY I (W)8" (SLD) (100MIL)	LF	1691	
666 6042	REFL PAV MRK TY I (W)12" (SLD) (100MIL)	LF	188	
666 6300	RE PM W/RET REQ TY I (W)4" (BRK) (100MIL)	LF	552	
666 6309	RE PM W/RET REQ TY I (W)6" (SLD) (100MIL)	LF	3558	
666 6321	RE PM W/RET REQ TY I (Y)6" (SLD) (100MIL)	LF	1677	
666 6350	REFL PAV MRK TY I (W) 12" (DOT) 100 MIL	LF	0	
668 6685	PREFAB PAV MRK TY C (W) (WORD)	EA	1	
672 6010	REFL PAV MRKR TY II-C-R	EA	114	

PAVEMENT LEGEND:

BK-BK BACK TO BACK
PROPOSED LANE
EXISTING LANE
EXISTING SIGN POST
PROPOSED SIGN POST
(A) REFL PAV MRK TY I (W)4" (DOT) (100MIL)
(B) REFL PM W/RET REQ TY I (W)4" (BRK) (100MIL)
(C) REFL PAV MRK TY I (W)6" (DOT) (100MIL)
(D) REFL PAV MRK TY I (Y)4" (SLD) (100MIL)
(E) REFL PM W/RET REQ TY I (W)6" (SLD) (100MIL)
(F) REFL PAV MRK TY I (W)8" (SLD) (100MIL)
(G) REFL PAV MRK TY I (W)12" (SLD) (100MIL)
(H) REFL PAV MRK TY I (W)24" (SLD) (100MIL)
(I) REFL PAV MRKR TY I-C
(J) REFL PAV MRKR TY II-C-R
(K) PREFAB PAV MRK TY C (W) ARROW)
(L) PREFAB PAV MRK TY C (W) (DBL ARROW)
(M) PREFAB PAV MRK TY C (W) (WORD)
(N) PREFAB PAV MRK TY C (W) (RR XING)
(P) REFL PM W/RET REQ TY 1 (Y) 6" (SLD) 100 MIL
(Q) REFL PAV MRK TY 1 (W) 12" (DOT) 100 MIL

SIGNING LEGEND:

(#) PROPOSED SIGN (SMALL)
EXISTING SIGN TO BE REMOVED (SMALL)
EXISTING SIGN TO BE RELOCATED (SMALL)
EXISTING SIGN TO REMAIN (SMALL)
PROPOSED SIGN (LARGE)
EXISTING SIGN TO BE REMOVED (LARGE)
EXISTING SIGN TO BE RELOCATED (LARGE)
EXISTING SIGN TO REMAIN (LARGE)

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
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90714
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PROFESSIONAL ENGINEER
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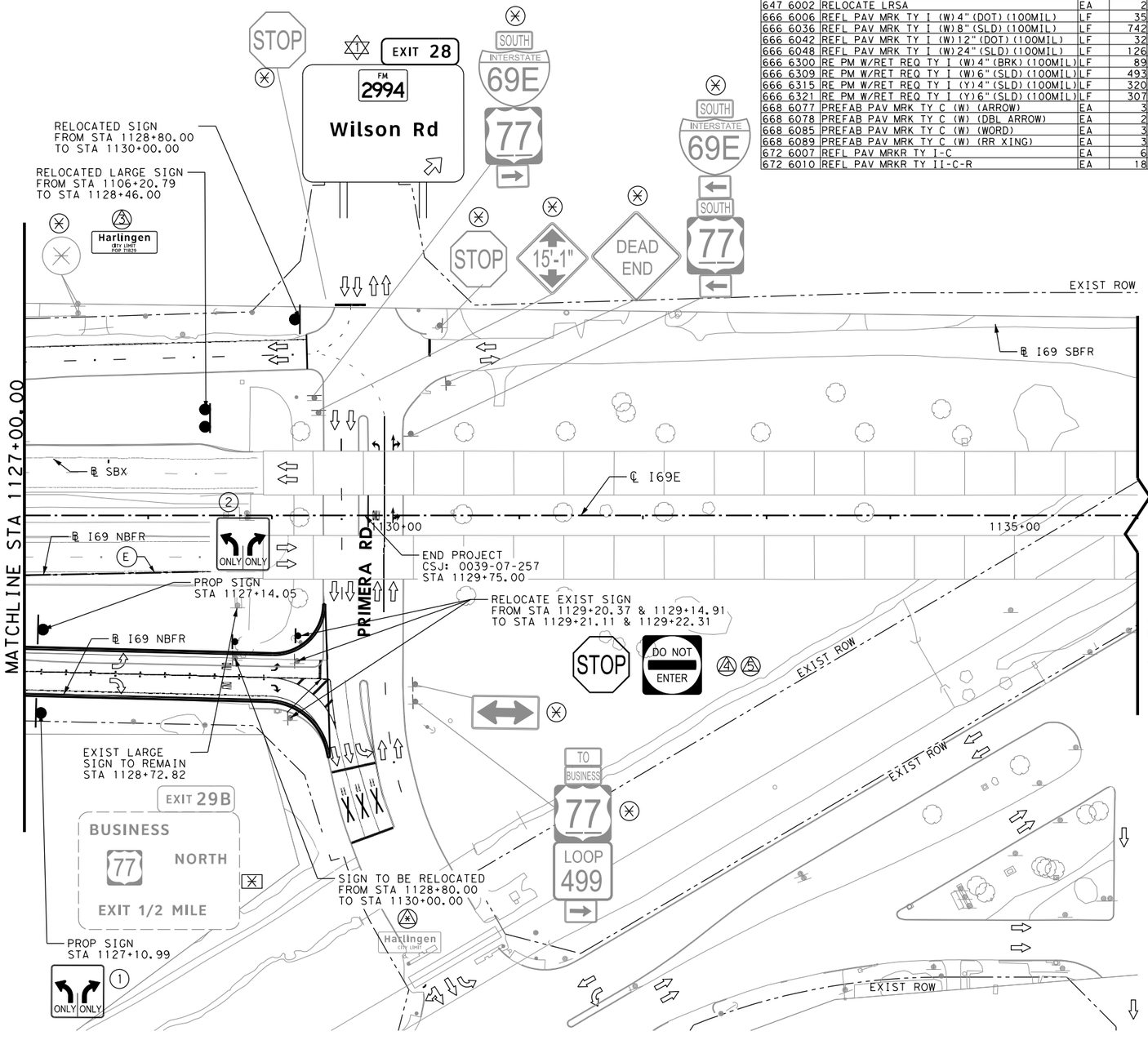
I-69E
SIGNING AND PAVEMENT MARKINGS
STA 1116+00 TO STA 1127+00

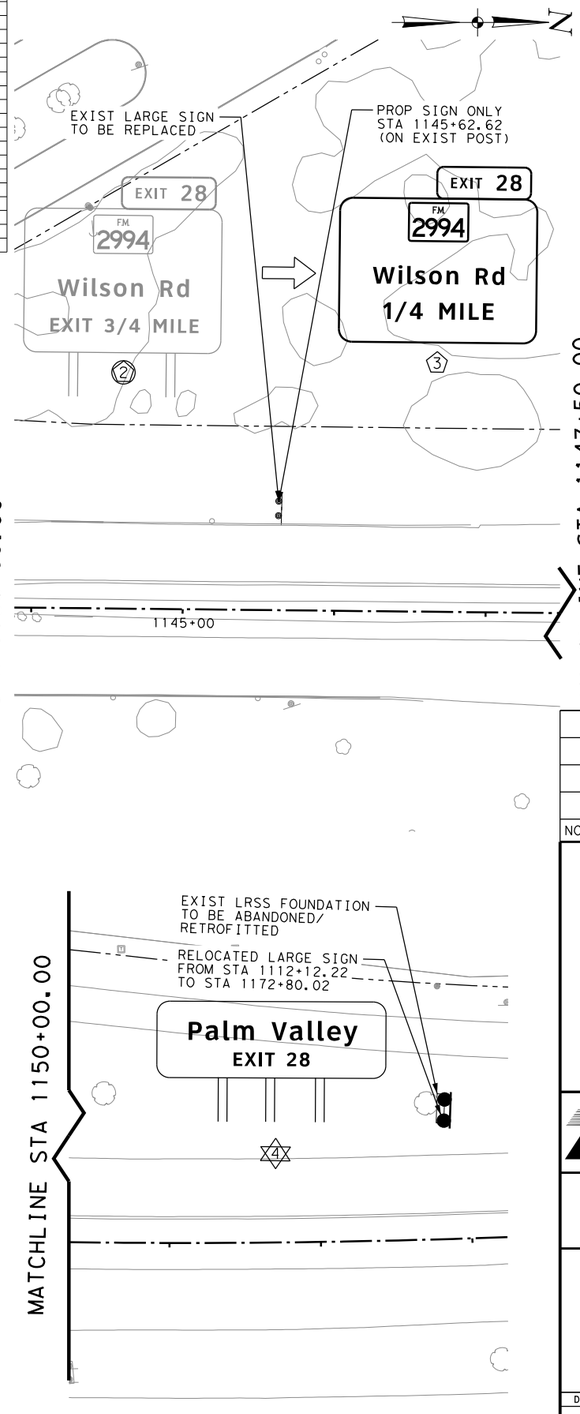
SHEET 06 OF 08

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	139
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

ITEM	DESCRIPTION	UNIT	EST.	FIN.
416 6018	DRILL SHAFT (SIGN MTS)(24 IN)	LF	56	
432 6043	RIPRAP(CONC)(SIGN MOUNTS)(CL B)	CY	6.2	
636 6001	ALUMINUM SIGN (TY A)	SF	15	
636 6002	ALUMINUM SIGN (TY G)	SF	157.5	
644 6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	2	
644 6070	RELOCATE SM RD SN SUP&AM TYS80	EA	3	
647 6001	INSTALL LRSS (STRUC STEEL)	LB	602.6	
647 6002	RELOCATE LRSA	EA	2	
666 6006	REFL PAV MRK TY I (W)4"(DOT)(100MIL)	LF	35	
666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	742	
666 6042	REFL PAV MRK TY I (W)12"(DOT)(100MIL)	LF	32	
666 6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	126	
666 6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	89	
666 6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	493	
666 6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	320	
666 6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	307	
668 6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	3	
668 6078	PREFAB PAV MRK TY C (W) (DBL ARROW)	EA	2	
668 6085	PREFAB PAV MRK TY C (W) (WORD)	EA	3	
668 6089	PREFAB PAV MRK TY C (W) (RR XING)	EA	3	
672 6007	REFL PAV MRKR TY I-C	EA	6	
672 6010	REFL PAV MRKR TY II-C-R	EA	18	



NOTE 1:
REFER TO INTERSECTION LAYOUT (SHEET 8 OF 8 FOR DETAILS ON INTERSECTION MARKINGS)



PAVEMENT LEGEND:

BK-BK BACK TO BACK
PROPOSED LANE
EXISTING LANE
EXISTING SIGN POST
PROPOSED SIGN POST
(A) REFL PAV MRK TY I (W)4"(DOT)(100MIL)
(B) REFL PM W/RET REQ TY I (W)4"(BRK)(100MIL)
(C) REFL PAV MRK TY I (W)6"(DOT)(100MIL)
(D) REFL PAV MRK TY I (Y)4"(SLD)(100MIL)
(E) REFL PM W/RET REQ TY I (W)6"(SLD)(100MIL)
(F) REFL PAV MRK TY I (W)8"(SLD)(100MIL)
(G) REFL PAV MRK TY I (W)12"(SLD)(100MIL)
(H) REFL PAV MRK TY I (W)24"(SLD)(100MIL)
(I) REFL PAV MRKR TY I-C
(J) REFL PAV MRKR TY II-C-R
(K) PREFAB PAV MRK TY C (W)ARROW)
(L) PREFAB PAV MRK TY C (W)(DBL ARROW)
(M) PREFAB PAV MRK TY C (W)(WORD)
(N) PREFAB PAV MRK TY C (W)(RR XING)
(P) REFL PM W/RET REQ TY 1(Y) 6"(SLD) 100 MIL
(Q) REFL PAV MRK TY 1(W) 12"(DOT) 100 MIL

SIGNING LEGEND:

(#) PROPOSED SIGN (SMALL)
EXISTING SIGN TO BE REMOVED (SMALL)
EXISTING SIGN TO BE RELOCATED (SMALL)
EXISTING SIGN TO REMAIN (SMALL)
(#) PROPOSED SIGN (LARGE)
EXISTING SIGN TO BE REMOVED (LARGE)
EXISTING SIGN TO BE RELOCATED (LARGE)
EXISTING SIGN TO REMAIN (LARGE)

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
GIOVANNI PUCCINI
90714
LICENSED
PROFESSIONAL ENGINEER
11/22/2022

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I-69E
SIGNING AND PAVEMENT MARKINGS
STA 1127+00 TO END

SHEET 07 OF 08

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	
CHECKED	CONT.	SECT.	JOB	140
XX	0039	07	257	
APPROVED				
XX				

PLOTDRIVER: BW_HALF_PDF.pltcfg PENTABLE: I69E-RAMPS.tbl
DATE:12/16/2022 12:44:27 PM USER:
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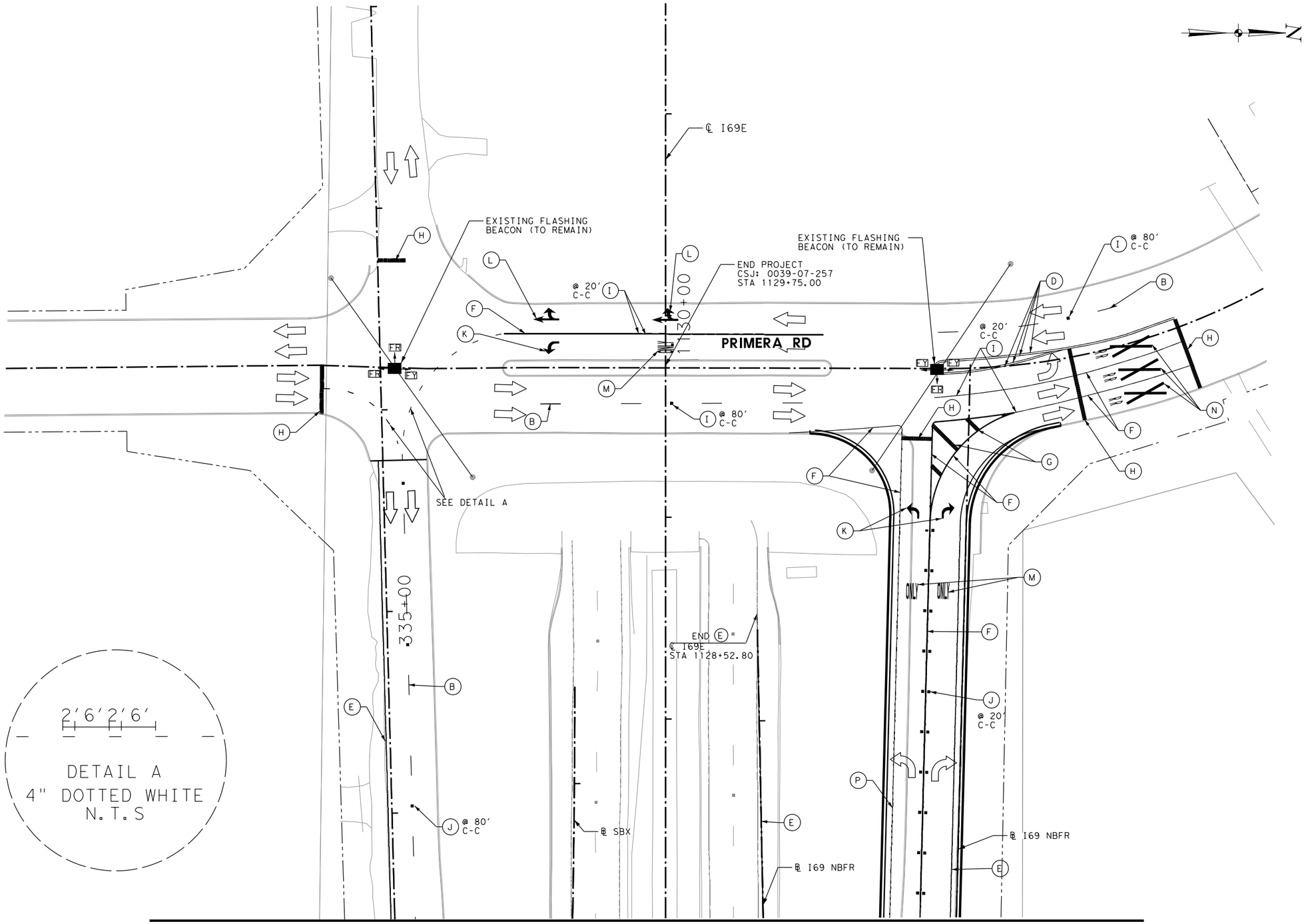

NOTE 1:
REFER TO SHEET 7 OF 8 FOR QUANTITIES DETAILED ON THIS SHEET

0' 25' 50'

PAVEMENT LEGEND:

BK-BK BACK TO BACK
PROPOSED LANE
EXISTING LANE
EXISTING SIGN POST
PROPOSED SIGN POST

- (A) REFL PAV MRK TY I (W)4"(DOT)(100MIL)
- (B) REFL PM W/RET REQ TY I (W)4"(BRK)(100MIL)
- (C) REFL PAV MRK TY I (W)6"(DOT)(100MIL)
- (D) REFL PAV MRK TY I (Y)4"(SLD)(100MIL)
- (E) REFL PM W/RET REQ TY I (W)6"(SLD)(100MIL)
- (F) REFL PAV MRK TY I (W)8"(SLD)(100MIL)
- (G) REFL PAV MRK TY I (W)12"(SLD)(100MIL)
- (H) REFL PAV MRK TY I (W)24"(SLD)(100MIL)
- (I) REFL PAV MRKR TY I-C
- (J) REFL PAV MRKR TY II-C-R
- (K) PREFAB PAV MRK TY C (W)ARROW)
- (L) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (M) PREFAB PAV MRK TY C (W)(WORD)
- (N) PREFAB PAV MRK TY C (W)(RR XING)
- (P) REFL PM W/RET REQ TY 1(Y) 6"(SLD) 100 MIL
- (Q) REFL PAV MRK TY 1(W) 12"(DOT) 100 MIL

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
GIOVANNI PUCCINI
90714
LICENSED
PROFESSIONAL ENGINEER
11/22/2022

Texas Department of Transportation
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Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
4350 Lockhill Selma Road, Suite 100•San Antonio, Texas 78249•210.494.5511

I-69E
SIGNING AND PAVEMENT MARKINGS
SL 499 INTERSECTION PM LAYOUT

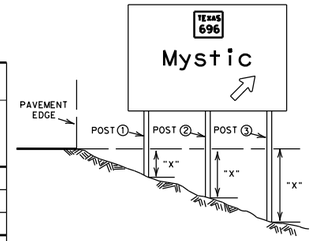
SHEET 8 OF 8

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED XX	STATE	DIST.	COUNTY	SHEET NO.
CHECKED XX	TEXAS	PHR	CAMERON	141
APPROVED XX	CONT.	SECT.	JOB	
	0039	07	257	

PENTABLE: I69E-RAMPS.tbl
PLOTDRIVER: BW_HALF_PDF.plt
DATE:12/16/2022 11:08:16 AM USER:
FILE:c:\bms\pwe101-01\jose.teran\dms28291\I69E-RAMPS_SPM_08.dgn

SUMMARY OF LARGE SIGNS TO BE INSTALLED

PLAN SHEET NO.	SIGN NO.	SIGN BACK-GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS (W X H) IN	PLAQUES, & OTHER ATTACHMENTS		BACKGROUND SUBSTRATE (SQ FT)		TYPE OF MOUNT	"X" DIMENSION ◒			GALVANIZED STRUCTURAL STEEL						DRILLED SHAFT					RIP RAP
					DIRECT APPLY	✳ ALUMINUM (TYPE A)	GROUND MOUNT (TYPE G)	OVERHEAD (TYPE O)		post ①	post ②	post ③	SIZE	LINEAR FEET post ①	post ②	post ③	post ④	TOTAL WEIGHT LBS.	NON-REINF 12"ϕ	LINEAR FEET REINFORCED 24"ϕ	30"ϕ	48"ϕ	54"ϕ	CY
4	②	GREEN	EXIT 29A	60 X 90			37.5		220	0.25′		0.25′	S4 X 7.7	14.8		14.8		298.3	7					1.2
7	③	GREEN	EXIT 28 FM 2994 Wilson Rd 1/4 MILE	84 X 30			17.5		220	1.11′		2.71′	W6 X 15	18.1		19.7		602.6		22				1.9
				64 X 36	16																			
				168 X 120			140																	
			PAGE TOTALS		16	0	195	0						**PAGE TOTALS**				900.9	7	22	0	0	0	3.1



◒ The "X" dimension is the elevation difference at the post between the ground and the edge of pavement or top of curb.

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.

The post lengths listed here are approximations, The corrected post lengths will be furnished by the Contractor after the stud posts are placed.

Tower heights shall be verified with the Engineer before fabrication.

✳ This column is for aluminum Type A and not direct apply. Direct apply is subsidiary to the sign.

SIGN TYPE

SIGN TYPE 1 3 0

- 1 — Wind Design Zone
- 3 — No. of Posts
- 0 — Series No.
  - 0 Aluminum/Fiberglass
  - 1 Aluminum
  - 2 Fiberglass

See sheet SMD(8W1)

SUMMARY OF LARGE SIGNS

SOLS

		REVISIONS	
DN.↑-TxDOT			
CK.↑-TxDOT	11-93		1-04
DW.↑-TxDOT	8-95		9-08
CK.↑-TxDOT	5-01		

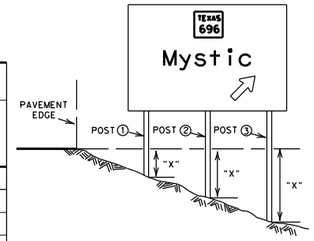
CONT	SECT	JOB	HIGHWAY
0039	07	257	I69E
DIST	COUNTY		SHEET NO.
PHR	CAMERON		142

DATE: 12/14/2022 10:08:04 PM

SUMMARY OF LARGE SIGNS TO BE RELOCATED OR REMOVED

PLAN SHEET NO.	SIGN NO.	SIGN BACK-GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS (W X H) IN	PLAQUES, & OTHER ATTACHMENTS: DIRECT APPLY	PLAQUES, & OTHER ATTACHMENTS: ✳ ALUMINUM (TYPE A)	BACKGROUND SUBSTRATE (SQ FT): GROUND MOUNT (TYPE G)	BACKGROUND SUBSTRATE (SQ FT): OVERHEAD (TYPE O)	TYPE OF MOUNT	"X" DIMENSION ◒: post ①	post ②	post ③	GALVANIZED STRUCTURAL STEEL: SIZE	LINEAR FEET: post ①	post ②	post ③	post ④	TOTAL WEIGHT LBS.	DRILLED SHAFT: NON-REINF 12"ϕ	LINEAR FEET REINFORCED: 24"ϕ	30"ϕ	48"ϕ	54"ϕ	RIP RAP CY
1	1	GREEN	Combes Business District NEXT 3 EXITS	144 X 120			120		220	0.63′		0.58′	W6 X 15	17.6		17.6		563.6		22				1.9
				(ESTIMATED)						2.94′		8.01′	→	[X DIMS FOR CONTRACTOR INFO ONLY]				[SEE NOTE 1]						
1	2	GREEN	EXIT 29A BUSINESS 77 499 Primera Rd EXIT ½ MILE	36 X 36		9			220	0.99′		2.96′	W6 X 15	18		20		605.6		22				1.9
				102 X 30			21.25			1.69′		6.09′	→	[X DIMS FOR CONTRACTOR INFO ONLY]				[SEE NOTE 1]						
				36 X 36	9																			
				48 X 36	12																			
				144 X 120			120																	
				(ESTIMATED)																				
2	1	GREEN	EXIT 29A Valley International Airport NEXT EXIT	102 X 30			21.25		230	3.21′	5.67′	8.30′	W6 X 12	17.2	19.7	22.3		831.3		27				2.3
				198 X 84			115.5			1.50′	4.33′	7.19′	→	[X DIMS FOR CONTRACTOR INFO ONLY]				[SEE NOTE 1]						
				(ESTIMATED)																				
3	1	GREEN	EXIT 29A BUSINESS 77 499 Primera Rd	36 X 36		9			220	2.87′	5.15′	7.31′	W6 X 15	19.9		24.3		698.6		18				1.9
				102 X 30			21.25			2.26′		2.25′	→	[X DIMS FOR CONTRACTOR INFO ONLY]				[SEE NOTE 1]						
				36 X 36	9																			
				48 X 36	12																			
				144 X 120			120																	
				(ESTIMATED)																				
4	1	GREEN	Texas State Technical College EXIT 29A	198 X 84			115.5		230	2.67′	4.95′	7.11′	W6 X 12	16.7	19	21.1		802.5		24				2.3
				(ESTIMATED)						.60′	1.49′	2.20′	→	[X DIMS FOR CONTRACTOR INFO ONLY]				[SEE NOTE 1]						
6	2	GREEN	EXIT 28	60 X 90			37.5		220	0.00′			S4 X 7.7	17		17		332.2	7					1.2
				(ESTIMATED)						.06′														
7	1	GREEN	EXIT 28 FM 2994 Wilson Rd	102 X 30			21.25		220	3.17′		6.24′	W6 X 15	20.7		23.7		701.6		16				2.0
				64 X 36	16					.99′		1.90′	→	[X DIMS FOR CONTRACTOR INFO ONLY]				[SEE NOTE 1]						
				162 X 126			141.75																	
				(ESTIMATED)																				
7	4	GREEN	Palm Valley EXIT 28	198 X 84			115.5		220	.35′	.48′	.87′	W6 X 12	14.4		15.2		435.8		18				2.3
				(ESTIMATED)						.74′	1.29′	1.58′	→	[X DIMS FOR CONTRACTOR INFO ONLY]				[SEE NOTE 1]						
			PAGE TOTALS		58	18	970.75	0					PAGE TOTALS					0 [SEE NOTE 1]	7	147	0	0	0	15.8

PLAN SHEET NO.	SIGN NO.	TYPE OF MOUNT	SIGN TEXT	REMOVE LARGE RDSD ASSMS
6	1	GROUND MOUNT	EXIT 28 FM 2994 Wilson Rd EXIT 1/4 MILE	SIGN AND ASSEMBLY



◒ The "X" dimension is the elevation difference at the post between the ground and the edge of pavement or top of curb.

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.

The post lengths listed here are approximations, The corrected post lengths will be furnished by the Contractor after the stud posts are placed.

Tower heights shall be verified with the Engineer before fabrication.

✳ This column is for aluminum Type A and not direct apply. Direct apply is subsidiary to the sign.

Note 1:
Existing support structure to be relocated with sign. Contractor shall shorten/lengthen exist supportsin accordance to specs. This work is subsidiary to item 647-6002 and notto be paid separately.

SIGN TYPE

SIGN TYPE 1 3 0
- 1 — Wind Design Zone
- 3 — Series No.
- 0 — No. of Posts

Series No.: 0 Aluminum/Fiberglass; 1 Aluminum; 2 Fiberglass

See sheet SMD(8W1)

SUMMARY OF LARGE SIGNS

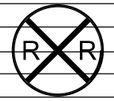
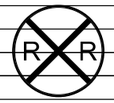
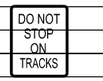
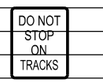
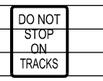
SOLS

DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	REVISIONS
				11-93 1-04 8-95 9-08 5-01

CONT	SECT	JOB	HIGHWAY
0039	07	257	I69E

DIST	COUNTY	SHEET NO.
PHR	CAMERON	143

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS (See above Note)	ALUMINUM TYPE A	ALUMINUM TYPE G	SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX) Post Type: FRP = Fiberglass, TWT = Thin-wall 10BWG = 10 BWG, S80 = Sched 80	Posts (1 or 2)	Anchor Type: UA = Univer-Conc, UB = Univer-Bolt, SA = Slip-Conc, SB = Slip-Bolt, WS = Wedge Steel, WP = Wedge Pistic	Mounting Designation: P = Prefb. "Plain" T = Prefab. "T" U = Prefab. "U"	Mounting Designation: 1EXT or 2EXT = # of Ext. BM = Extruded Beam, WC = 1.12 #/ft Wing Chan., EXAL = Extruded Alum. Signs	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2): TY N = Type N, TY S = Type S
3 OF 7												
	1	W10-01		36 DIA	X		ON EXISTING POST			T		
	2	W10-01		36 DIA	X		S80	1	SA			
	3	R8-8		24 X 30	X		S80	1	SA	P		
	4	R8-8		24 X 30	X		S80	1	SA	P		
	5	R8-8		24 X 30	X		S80	1	SA	P		
	6	R8-8		24 X 30	X		S80	1	SA	P		
4 OF 7												
	3	W8-13aT		36 X 36	X		S80	1	SA	T		
	5	R5-1		36 X 36	X		S80	1	SA	T		
5 OF 7												
	1	R3-33aTL		48 X 48	X		S80	1	SA	T		
	2	R3-33aTL		48 X 48	X		S80	1	SA	T		

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

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
4-16	DIST	COUNTY		SHEET NO.
8-16	PHR	CAMERON		144

18

DATE: 12/14/2022 10:07:59 PM
FILE: c:\bms\pwe101-01\daniel.ontiveros\dms28291\I69E-RAMPS_SOSS_02.dgn

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS (See above Note)	ALUMINUM TYPE A	ALUMINUM TYPE G	SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX) Post Type: FRP = Fiberglass TWT = Thin-wall 10BWG = 10 BWG S80 = Sched 80	Posts (1 or 2)	Anchor Type: UA = Univer-Conc UB = Univer-Bolt SA = Slip-Conc SB = Slip-Bolt WS = Wedge Steel WP = Wedge Pistic	Mounting Designation: P = Prefb. "Plain" T = Prefab. "T" U = Prefab. "U"	Mounting Designation: 1EXT or 2EXT = # of Ext. BM = Extruded Beam WC = 1.12 #/ft Wing Chan. EXAL = Extruded Alum. Signs	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2): TY N = Type N TY S = Type S
7 OF 7												
	(1)	R3-8		36 X 30	X		S80	1	SA	T		
	(2)	R3-8		36 X 30	X		S80	1	SA	T		

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
	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.
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3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		0039	07	257	I69E
4-16		DIST	COUNTY		SHEET NO.
8-16		PHR	CAMERON		145

18

DATE: 12/14/2022 10:07:59 PM
FILE: c:\bms\pwe101-01\daniel.antiveros\dms28291\I69E-RAMPS_SOSS_02.dgn

SUMMARY OF SMALL SIGNS TO BE REMOVED/RELOCATED

PLAN SHEET NO.	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS (INCHES)	REMOVE SMALL SIGN ASSM. (EA)	RELOCATE SMALL SIGN ASSM. (EA)
4 OF 5						
	1	W13-2	EXIT 45 MPH	36 X 48		X
	2	W4-1L	MERGE AHEAD LEFT	48 X 48	X	
	4	R5-1a	WRONG WAY	42 X 30	X	
	5	R1-2	YIELD	36 X 36		X
	6	R1-2	YIELD	36 X 36		X
		R5-1	DO NO ENTER	36 X 36		X
	1	M3-3B	SOUTH	24 X 12		X
		M1-1T	INTERSTATE 69E	24 X 24		X
		M6-2B	DIAGONAL ARROW (LEFT)	21 X 15		X
		M3-3	SOUTH	24 X 12		X
		M1-4	77	24 X 24		X
6 OF 7						
	1	M3-1B	NORTH	24 X 12		X
		M1-1T	INTERSTATE 69E	24 X 24		X
		M3-1	NORTH	24 X 12		X
		M1-4	77	24 X 24		X
		M6-2B	DIAGONAL ARROW (LEFT)	21 X 15		X
	2	R1-2	YIELD	36 X 36		X
	3	R1-2	DO NOT ENTER	36 X 36		X
	4	R1-2	YIELD	36 X 36		X
		R5-1	DO NOT ENTER	36 X 36		X
	5	R5-1a	WRONG WAY	42 X 30	X	
	6	W13-2	EXIT 45 MPH	36 X 48		X
	7	W4-1L	MERGE AHEAD LEFT	48 X 48	X	
7 OF 7						
	3	I-2aT	HARLINGEN CITY LIMIT POP 71829	72 X 24		X
	4	R1-1	STOP	36 X 36		X
		R5-1	DO NOT ENTER	36 X 36		X
	5	R1-1	STOP	36 X 36		X
		R5-1	DO NOT ENTER	36 X 36		X

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
	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).

TABULATION OF
SIGNS TO BE REMOVED
OR RELOCATED
UNDER ITEM 644
(WITHOUT REMOVABLE COPY)

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

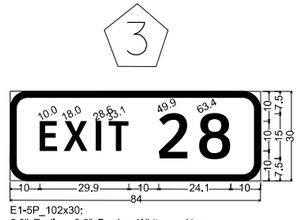
FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		0039	07	257	I69E
4-16		DIST	COUNTY		SHEET NO.
8-16		PHR	CAMERON		146

18

DATE: 12/14/2022 10:07:59 PM
FILE: c:\bms\pwe101-01\daniel.ontiveros\dms28291\I69E-RAMPS_SOSS_02.dgn

E5-1c_60x90;
6.0" Radius, 1.5" Border, White on None;
"EXIT", ClearviewHwy-6-W;
"29A", ClearviewHwy-4-W specified length;
Arrow A-2 - 29.3" 45°;

E1-2_VARx120;
12.0" Radius, 2.0" Border, White on None;
State Highway 2994 M1-6F4; "Wilson Rd", ClearviewHwy-5-W; " 1/4 MILE", ClearviewHwy-5-W;



E1-5P_102x30;
6.0" Radius, 2.0" Border, White on None;
"EXIT 28", ClearviewHwy-4-W;

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
GIOVANNI PUCCINI
90714
LICENSED
PROFESSIONAL ENGINEER

11/22/2022

Texas Department of Transportation
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QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
4350 Lockhill Selma Road, Suite 100 • San Antonio, Texas 78249 • 210.494.5511

I-69E SIGN DETAILS

SHEET 01 OF 01

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHR	CAMERON	147
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

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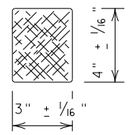
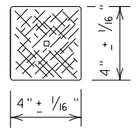
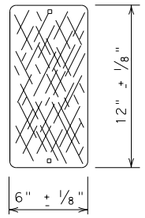
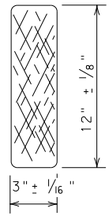
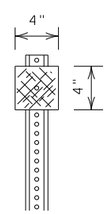
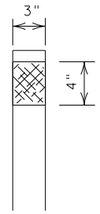
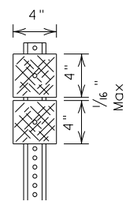
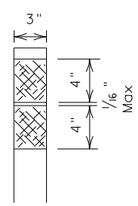
DEVICE				
SHEETING	Yellow, White or Red Type B or C reflective sheeting			
NOTE	1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (flx). 2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.			

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

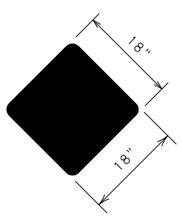
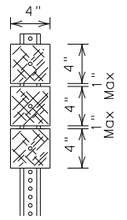
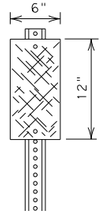
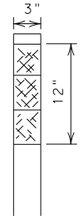
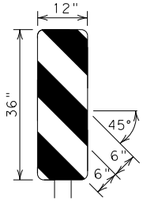
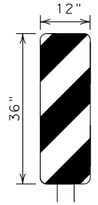
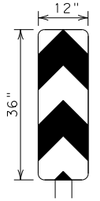
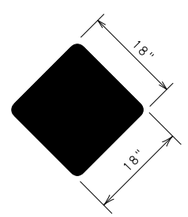
NUMBER OF REFLECTORS OR DIRECTION
- X = 3-Size 2 reflector units (Type 2 only)
- Y = 1-Size 3 reflector unit (Type 2 only)
- Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
- L = Left Side (Type 3 Object Marker only)
- R = Right Side (Type 3 Object Marker only)
- C = Center (Type 3 Object Marker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

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

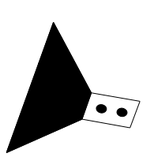
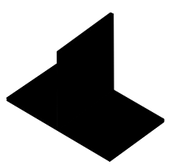
TYPE OF MOUNT
- GND = Embedded (drivable)
- SRF = Surface Mount
- WAS = Wedge Anchor Steel
- WAP = Wedge Anchor Plastic

DIRECTION
- If Required
- BI = Bi-Directional

OBJECT MARKERS

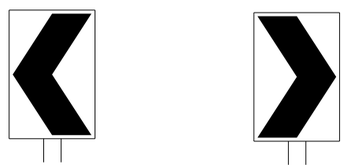
	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4
DEVICE								
		3-Size 2 reflector units	1-Size 3 reflector unit	3-Size 1 reflector units or 1-Size 4 reflector unit				
SHEETING	Yellow-Type B_{FL} or C_{FL} Sheeting	Yellow - Type B or C Sheeting			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

BARRIER REFLECTORS (BRF)

	GF1	GF2	CTB
DEVICE			
NOTE	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



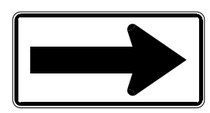
W1-8

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"	

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

NOTE:

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	PHR	CAMERON		148

20A

DATE: 12/15/2022 2:53:07 AM
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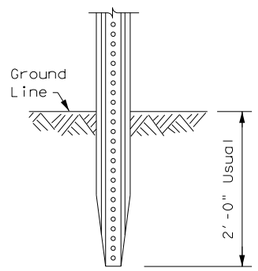
POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

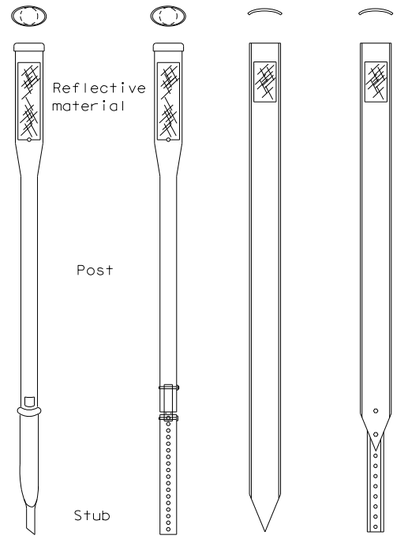


NOTES

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.

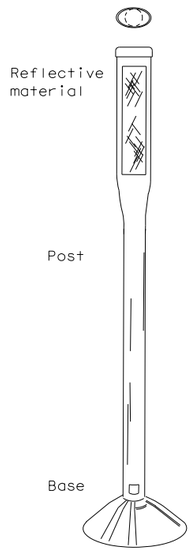
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



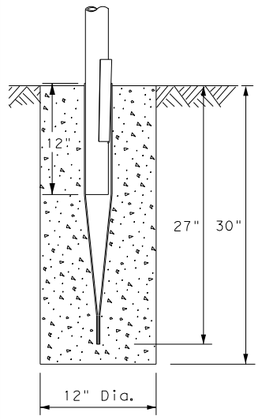
SURFACE MOUNT

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.

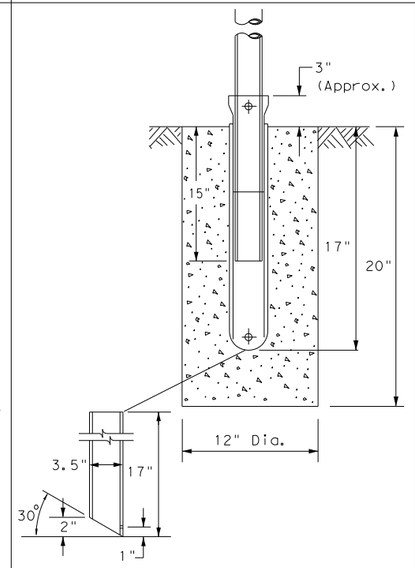
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

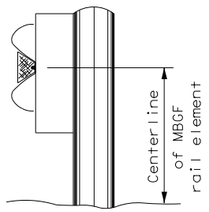
NOTE

1. Install per manufacturer's recommendations.

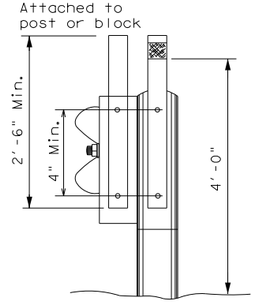
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

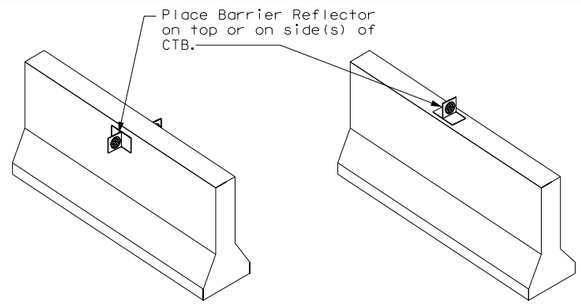
GF1



GF2



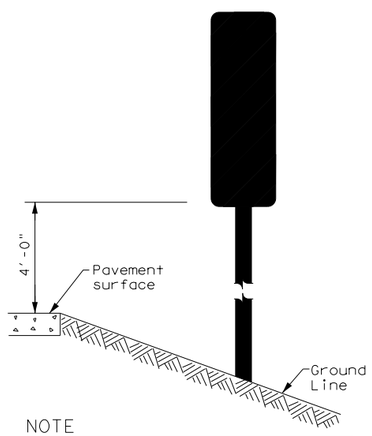
CONCRETE TRAFFIC BARRIER (CTB)



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.

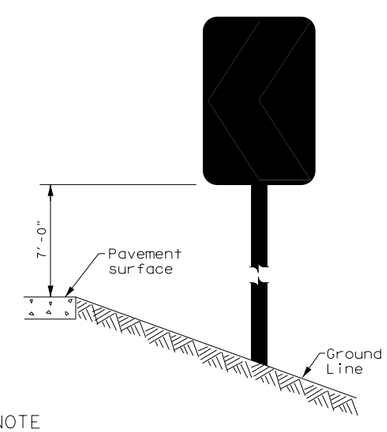
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



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)

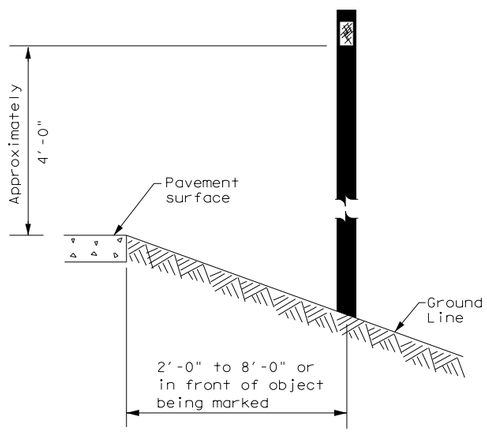
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



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

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© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
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10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	PHR	CAMERON		149

20B

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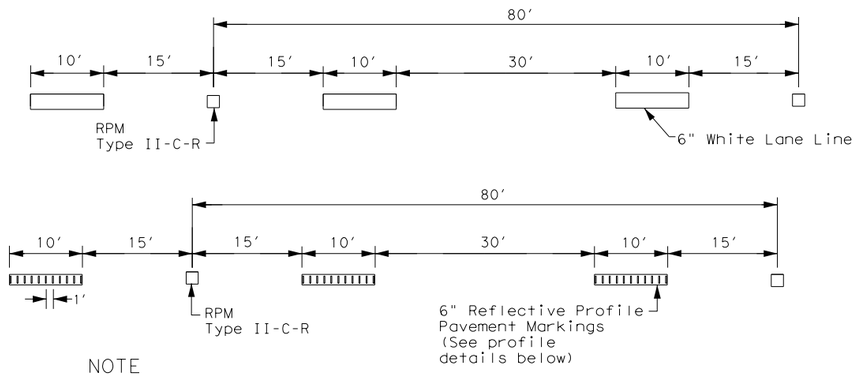
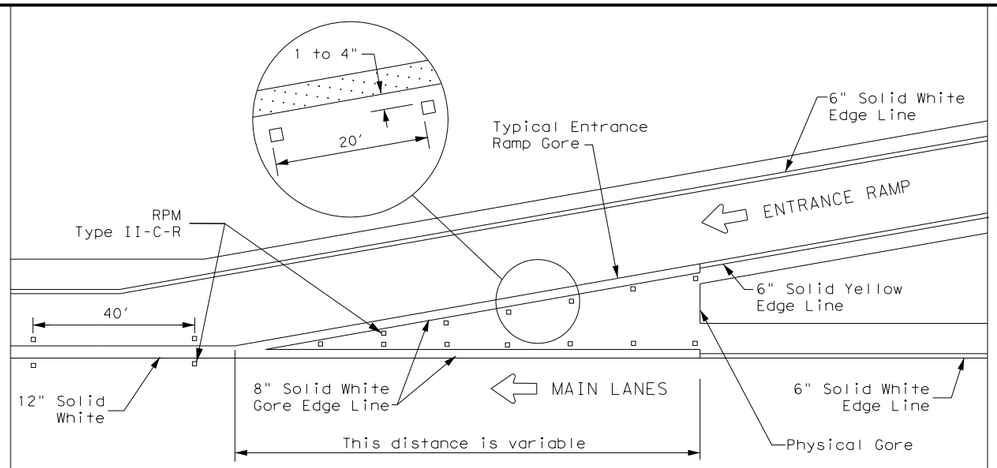


NOTE

Reflectorized raised pavement markers Type II-C-R shall be spaced on 80'centers with the clear face toward normal traffic and the red face toward wrong way traffic. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.

TRAFFIC LANE LINES PAVEMENT MARKING

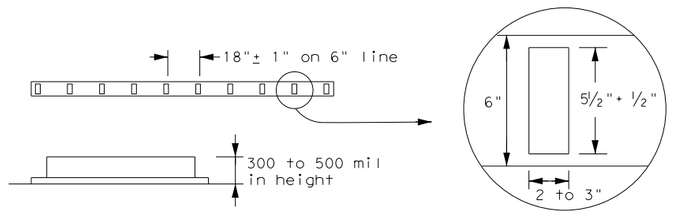


TYPICAL ENTRANCE RAMP GORE MARKING

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

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

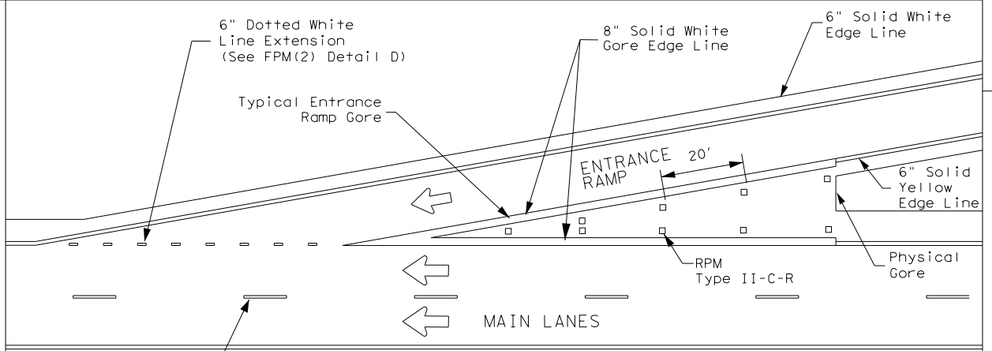
LEGEND	
⇦	Traffic flow
↱	Pavement marking arrows (white)
▫	Reflectorized Raised Markers (RPM) Type II-C-R



NOTE

Edge lines should typically be 6" wide and the materials shall be as specified in the plans. See details above if reflective profile pavement markings are to be used.

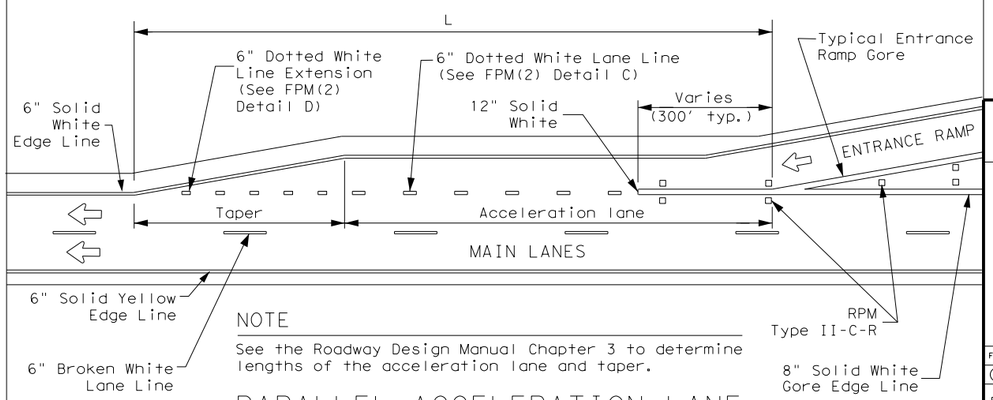
EDGE LINE PAVEMENT MARKINGS



NOTE

See the Roadway Design Manual Chapter 3 to determine if a tapered acceleration lane may be used.

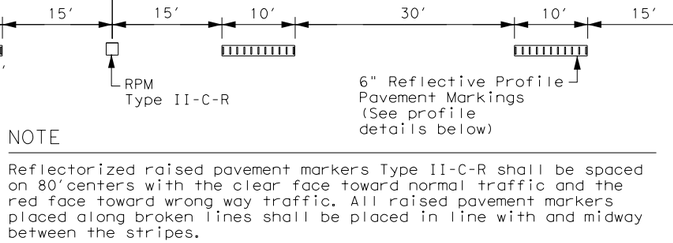
TAPERED ACCELERATION LANE



NOTE

See the Roadway Design Manual Chapter 3 to determine lengths of the acceleration lane and taper.

PARALLEL ACCELERATION LANE



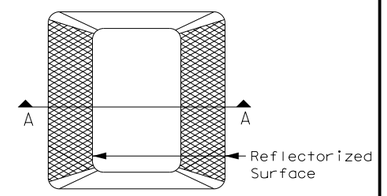
NOTES

1. Reflectorized raised pavement markers Type-II-C-R in the wrong way arrow shall have the clear face toward normal traffic and the red face toward the wrong way traffic.
2. Red reflectorized wrong way arrows, not to exceed two, may be placed on exit ramps. Locations of the arrows shall be as shown in the plans or as directed by the engineer.

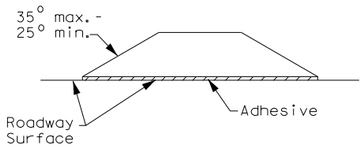
WRONG WAY ARROW

GENERAL NOTE

On concrete pavements the raised pavement markers shall be placed to one side of the longitudinal joints.



Type II (Top View)



SECTION A

REFLECTORIZED RAISED PAVEMENT MARKER (RPM)

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS WITH RAISED PAVEMENT MARKERS

FPM(1)-22

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5-74 8-00 2-12	DIST	COUNTY		SHEET NO.
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5-00 2-10				
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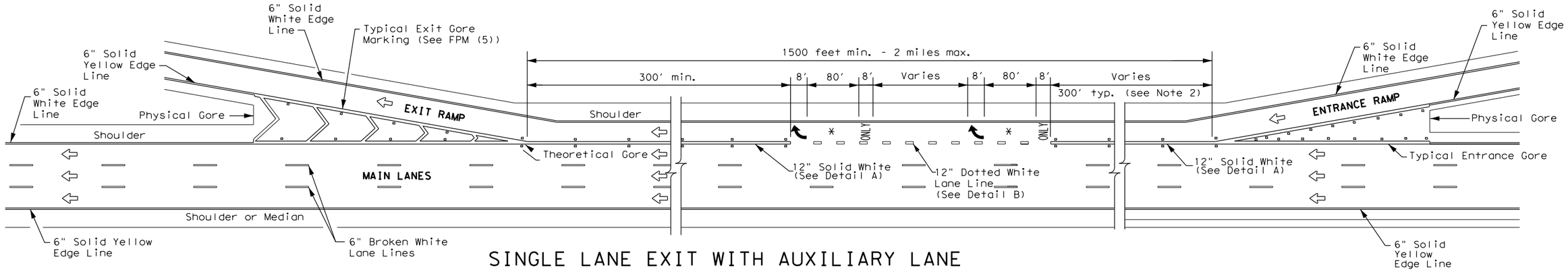
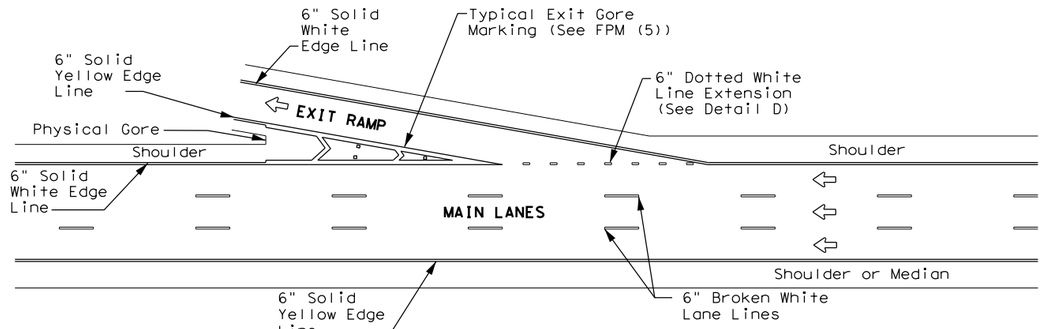


SINGLE LANE EXIT WITH AUXILIARY LANE

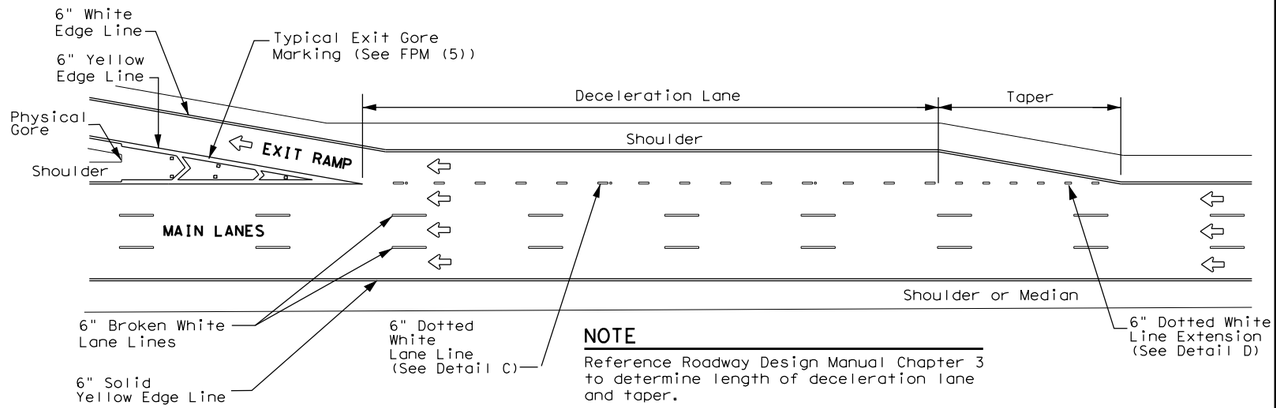
(See Note 2)



NOTE

Reference Roadway Design Manual Chapter 3 to determine if tapered deceleration lane may be used.

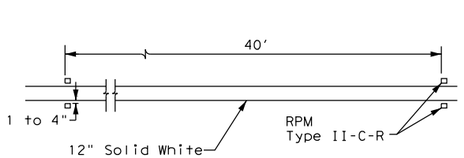
TAPERED DECELERATION LANE



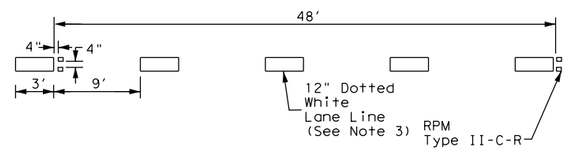
NOTE

Reference Roadway Design Manual Chapter 3 to determine length of deceleration lane and taper.

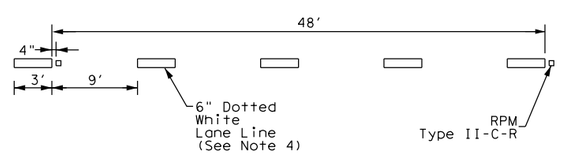
PARALLEL DECELERATION LANE



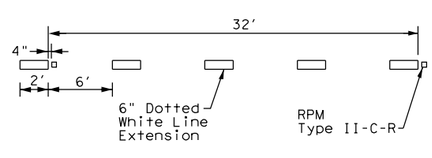
DETAIL A



DETAIL B



DETAIL C



DETAIL D

GENERAL NOTES

1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Wide (12") dotted lane line (see Detail B) is used to separate a through lane that continues beyond the interchange from an adjacent mandatory exit lane.
4. Normal (6") dotted lane line (see Detail C) is used at parallel acceleration and deceleration lanes.
5. See FPM(1) for traffic lane line pavement marking details.

LEGEND	
⇦	Traffic flow
↱	Pavement marking arrows (white)
▫	Reflectorized Raised Markers (RPM) Type II-C-R
✳	Arrow markings are optional, however "ONLY" is required if arrow is used

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

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

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS ENTRANCE AND EXIT RAMPS

FPM(2)-22

FILE: fpm(2)-22.dgn	DN:	CK:	DW:	CK:
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-77 5-00 2-12 4-92 8-00 10-22 8-95 2-10	0039	07	257	I69E
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		151

23B

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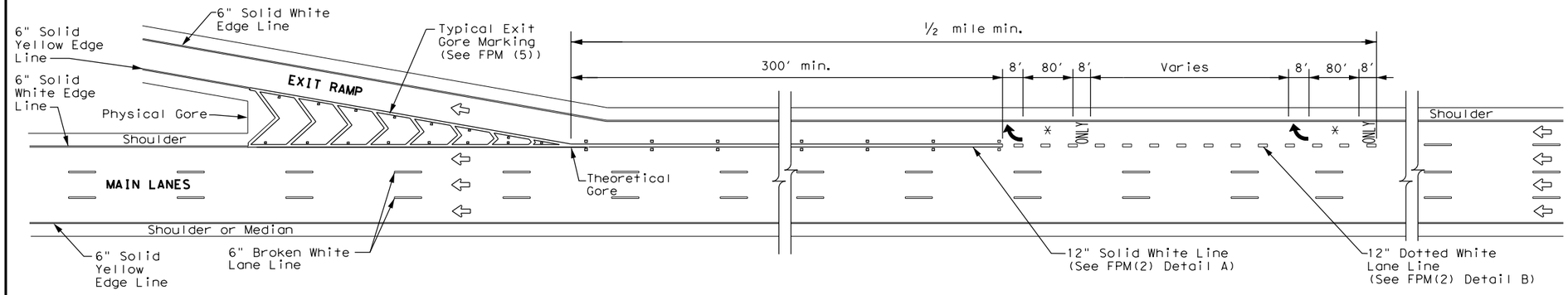
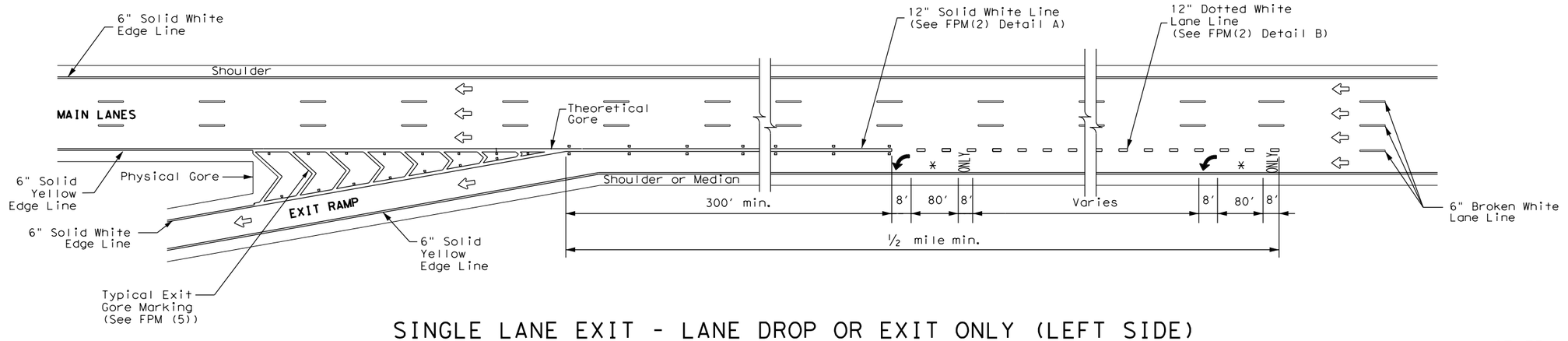


SINGLE LANE EXIT - LANE DROP OR EXIT ONLY

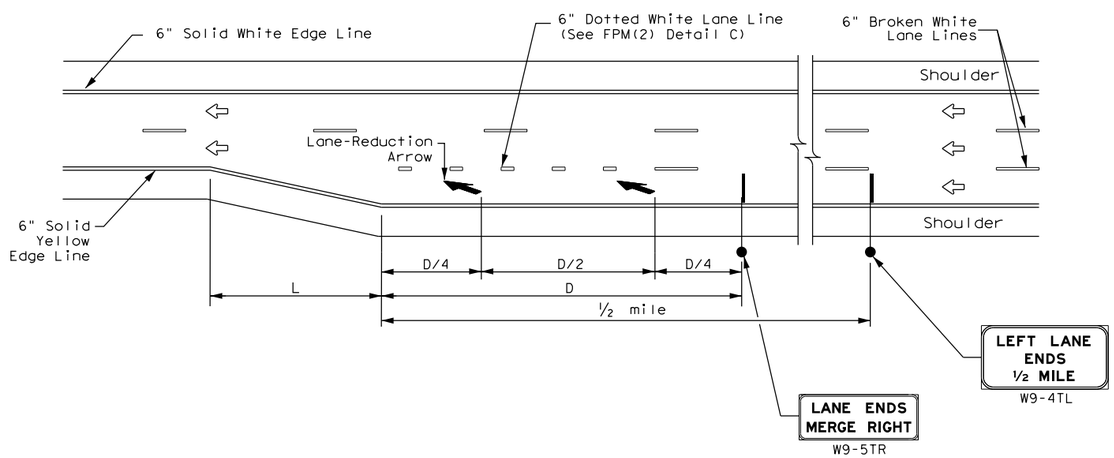
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

LEGEND	
⇦	Traffic flow
↱	Pavement marking arrows (white)
▫	Reflectorized Raised Markers (RPM) Type II-C-R
⚹	Arrow markings are optional, however "ONLY" is required if arrow is used



SINGLE LANE EXIT - LANE DROP OR EXIT ONLY (LEFT SIDE)



FREEWAY LANE REDUCTION

NOTES

1. Large Guide signs shall conform to the TxDOT Freeway Signing Handbook.
2. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
3. Arrows and sign details can be found in the Standard Highway Sign Designs for Texas (SHSD) at http://www.txdot.gov.
4. These guidelines may also be applied to the design of a right side lane reduction. Use LANE ENDS MERGE LEFT (W9-5TL) and RIGHT LANE ENDS 1/2 MILE (W9-4TR) signs in lieu of what is shown on drawing.

ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	
80 MPH	1,500	
85 MPH	1,625	

GENERAL NOTES

1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Wide (12") dotted lane line (see FPM(2) Detail B) is used to separate a through lane that continues beyond the interchange from an adjacent mandatory exit lane.
4. Edge lines are not required in curb and gutter sections of frontage roads.
5. See FPM(1) for traffic lane line pavement marking details.

Texas Department of Transportation

Traffic Safety Division Standard

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

FPM(3)-22

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© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
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4-92 2-10	DIST	COUNTY		SHEET NO.
5-00 2-12	PHR	CAMERON		152
8-00 10-22				

23C

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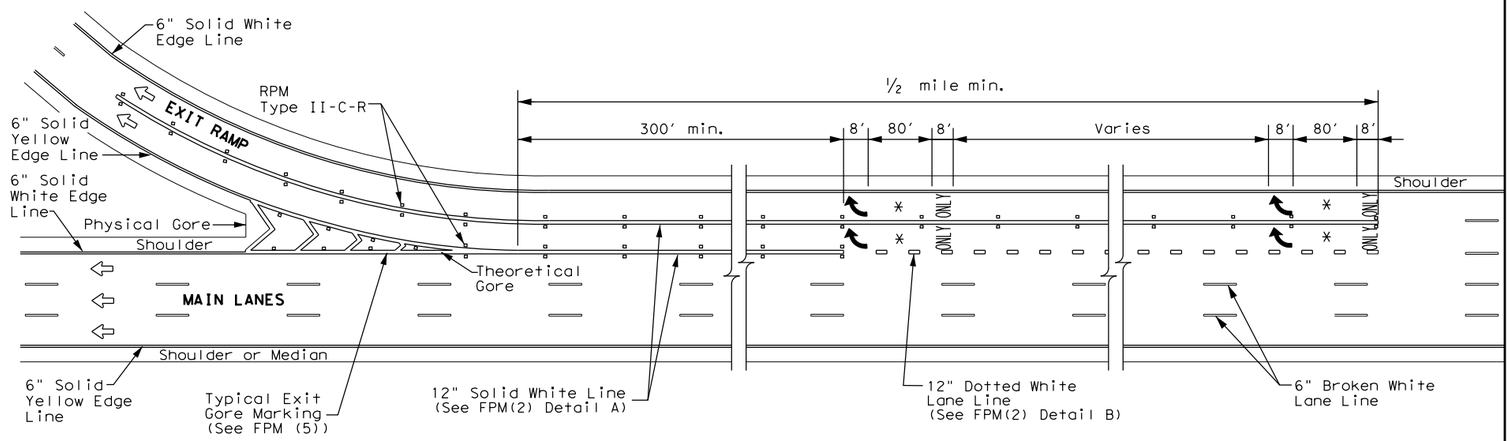


MULTIPLE LANE EXIT ONLY

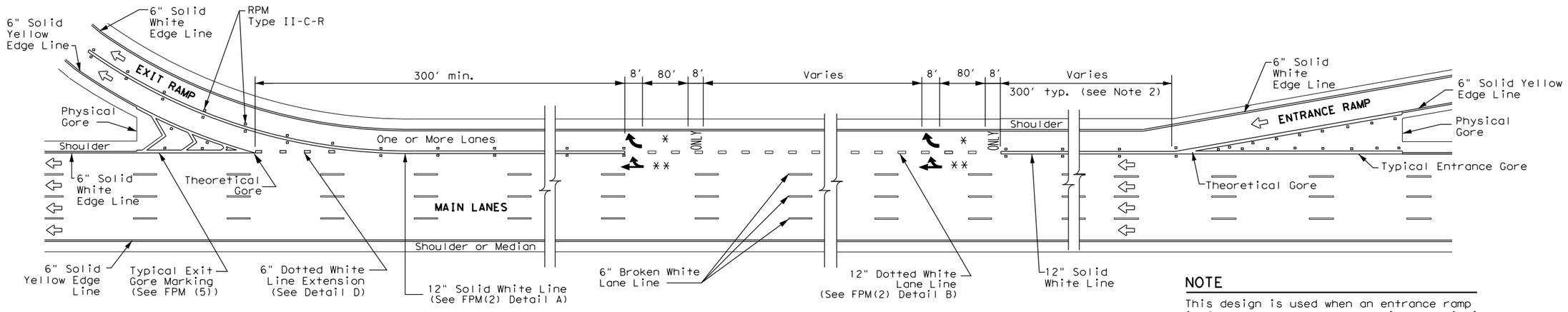
LEGEND	
⇦	Traffic Flow
▫	Reflectorized Raised Markers (RPM) Type II-C-R
↱	Pavement marking arrow (white)
*	Arrow markings are optional, however "ONLY" is required if arrow is used
**	Arrow markings are optional

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

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

GENERAL NOTES

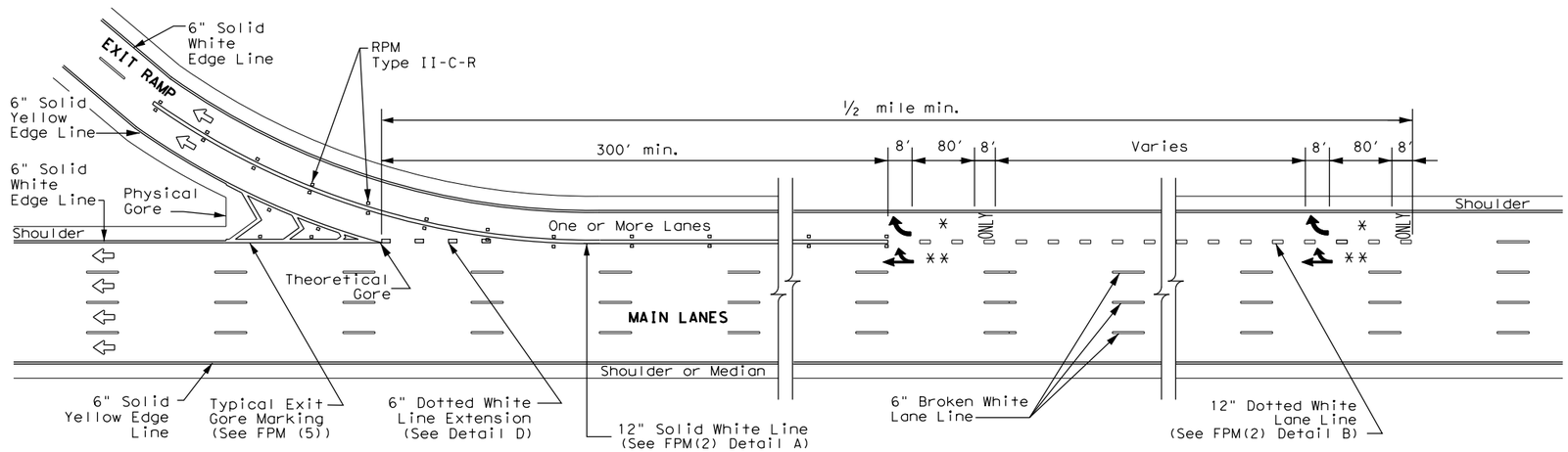
1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Wide (12") dotted lane line (see FPM(2) Detail B) is used to separate a through lane that continues beyond the interchange from an adjacent mandatory exit lane.
4. Edge lines are not required in curb and gutter sections of frontage roads.
5. See FPM(1) for traffic lane line pavement marking details.



SINGLE LANE ENTRANCE WITH MULTIPLE LANE EXIT - EXIT ONLY WITH OPTION LANE

NOTE

This design is used when an entrance ramp is followed by a dual lane exit ramp within 2400' downstream (theoretical gore to theoretical gore).



MULTIPLE LANE EXIT - EXIT ONLY WITH OPTION LANE

Texas Department of Transportation — Traffic Safety Division Standard

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

FPM(4)-22

FILE: fpm(4)-22.dgn	DN:	CK:	DW:	CK:
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
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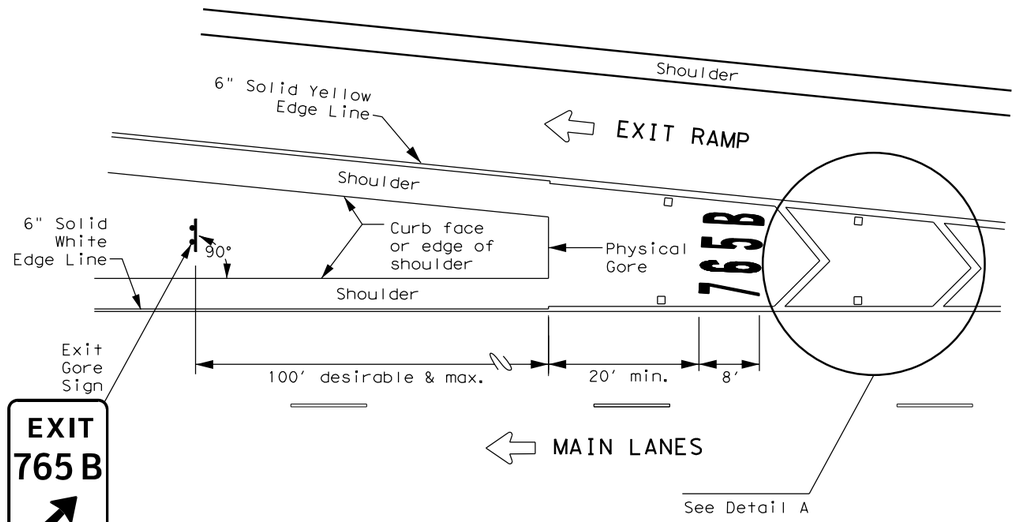
2-77 2-10	DIST	COUNTY		SHEET NO.
5-00 2-12	PHR	CAMERON		153
8-00 10-22				

230

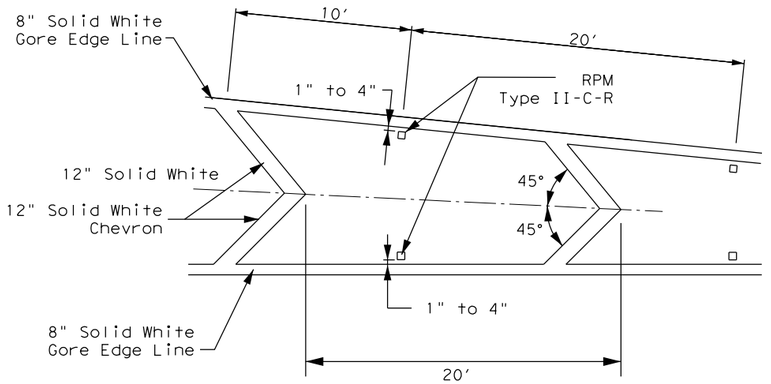
DATE: 12/15/2022 2:59:20 AM
FILE: c:\dms\pwe101-01\jason.kane\dms25583\fpm(4)-22.dgn

EXIT NUMBER PAVEMENT MARKING NOTES

1. Minimum 8 foot white exit number pavement markings should be used, unless otherwise noted.
2. Spacing between letters and numbers should be approximately 4 inches.
3. Pavement markings are to be located as specified elsewhere in the plans.
4. Numbers and Letters details can be found in the Standard Highway Design for Texas (SHSD) Section 12 at http://www.txdot.gov



MARKINGS WITH EXIT NUMBER



NOTES

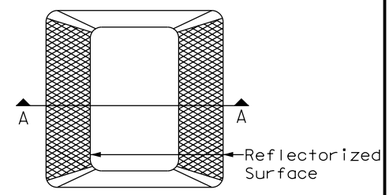
1. Raised pavement markers shall be centered between each chevron or neutral area line.
2. For more information, see Reflectorized Raised Pavement Marker Detail.

DETAIL A

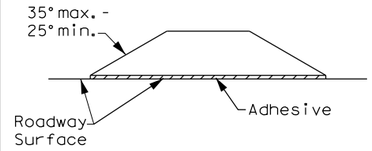
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

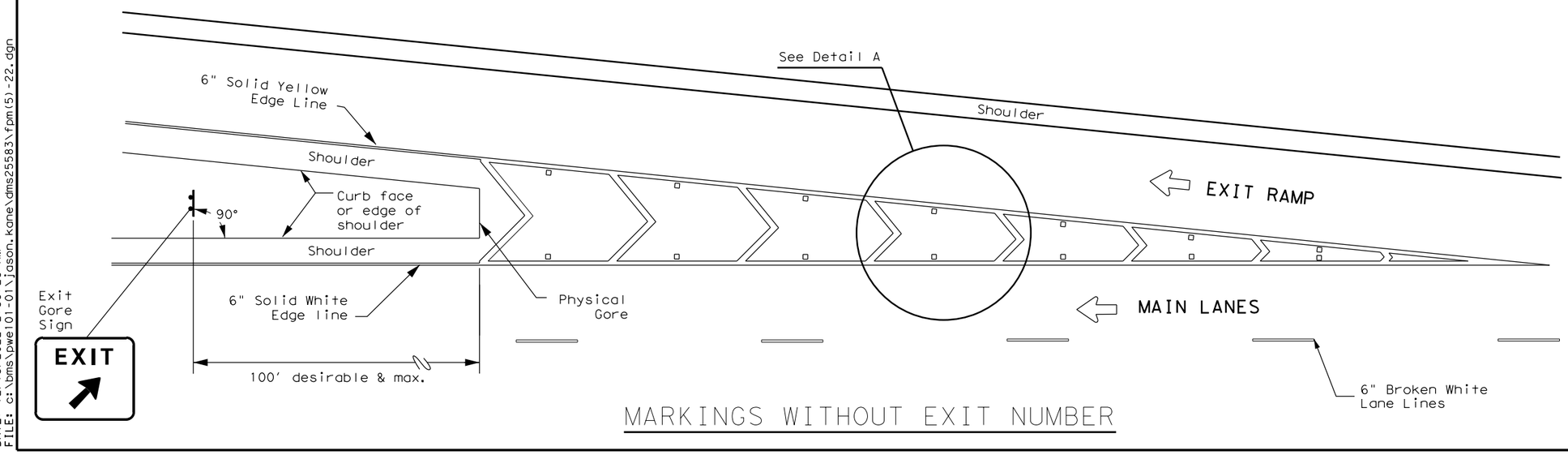
LEGEND	
⇦	Traffic flow
□	Reflectorized Raised Markers (RPM) Type II-C-R



Type II (Top View)



SECTION A



MARKINGS WITHOUT EXIT NUMBER

REFLECTORIZED RAISED PAVEMENT MARKER (RPM)

Texas Department of Transportation — Traffic Safety Division Standard

EXIT GORE PAVEMENT MARKINGS

FPM(5)-22

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©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
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	PHR	CAMERON		154

23E

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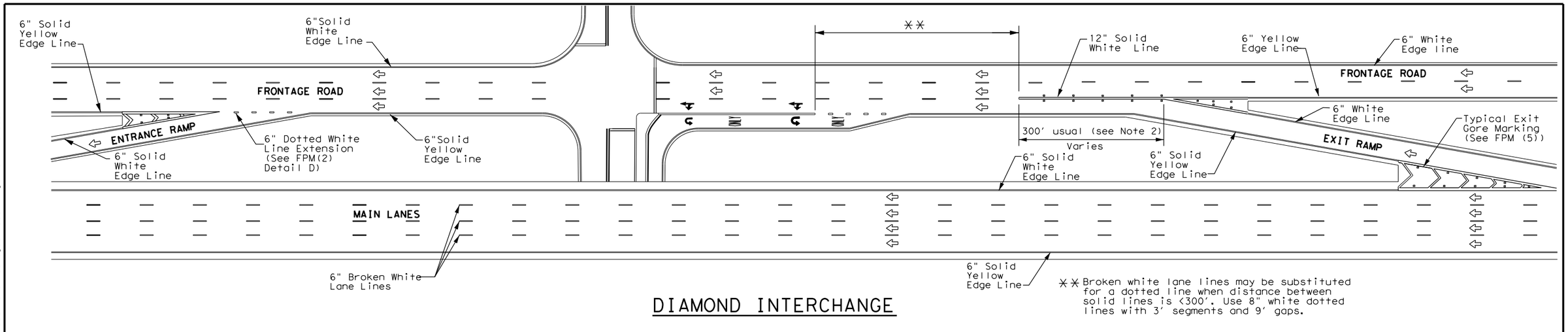
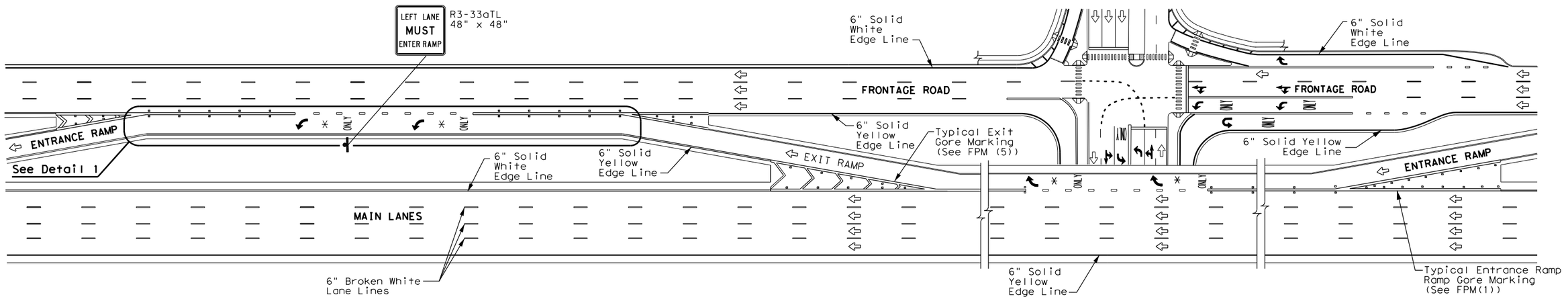
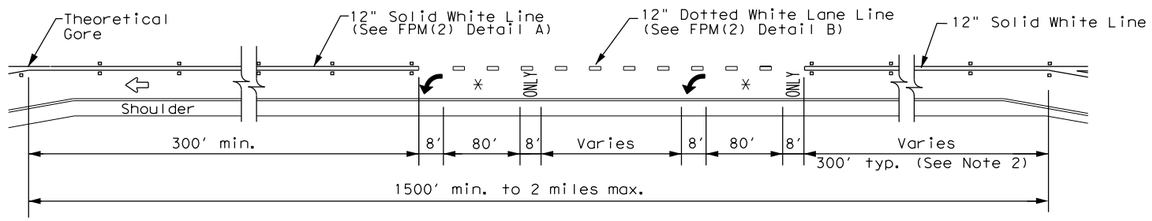


DIAMOND INTERCHANGE



URBAN X-RAMP WITH FRONTAGE ROAD AUXILIARY LANE



DETAIL 1

(Frontage Road Auxiliary Lane for X-Ramps)

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

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

GENERAL NOTES

1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Wide (12") dotted lane line (see FPM(2) Detail B) is used to separate a through lane that continues beyond the interchange from an adjacent mandatory exit lane.
4. Edge lines are not required in curb and gutter sections of frontage roads.
5. See FPM(1) for traffic lane line pavement marking details.

LEGEND	
⇦	Traffic flow
↱	Pavement marking arrows (white)
▫	Reflectorized Raised Markers (RPM) Type II-C-R
*	Arrow markings are optional, however "ONLY" is required if arrow is used

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD FREEWAY AND FRONTAGE ROAD PAVEMENT MARKINGS

FPM(6)-22

FILE: fpm(6)-22.dgn	DN:	CK:	DW:	CK:
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
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	PHR	CAMERON		155

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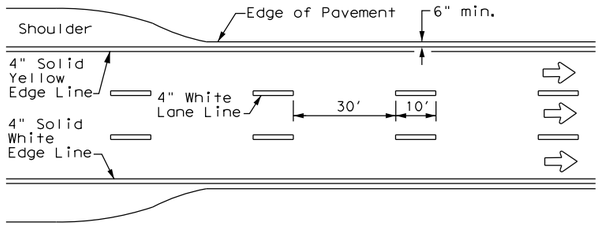
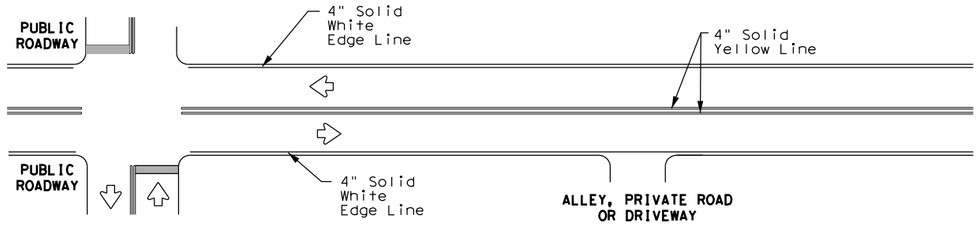
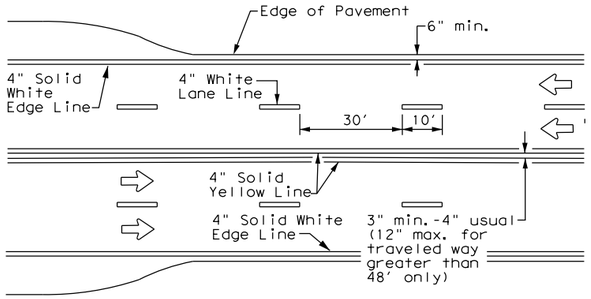


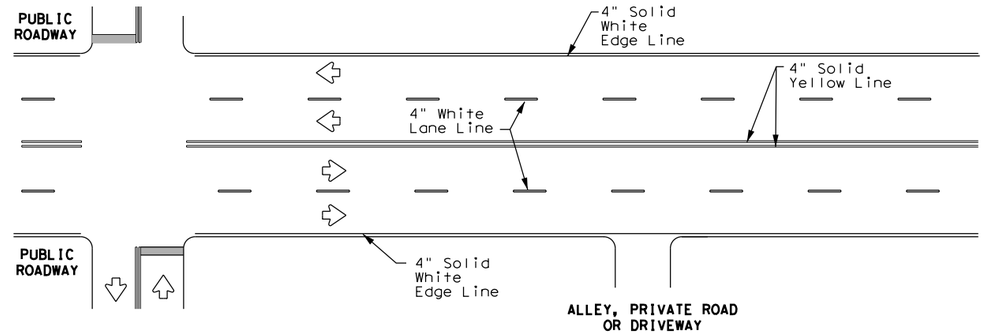
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



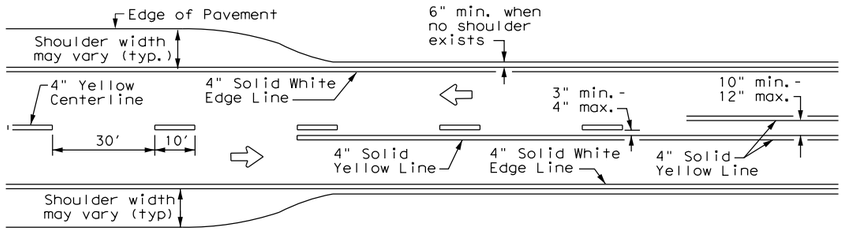
TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



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

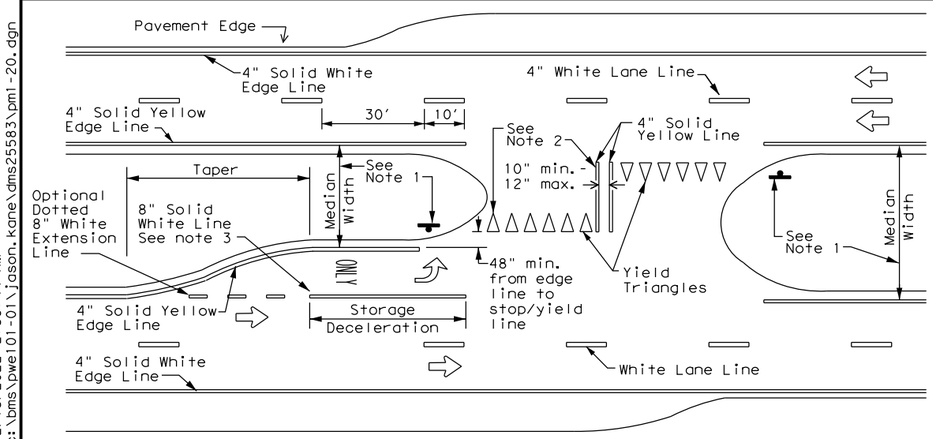


TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs are optional as determined by the Engineer.

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

3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

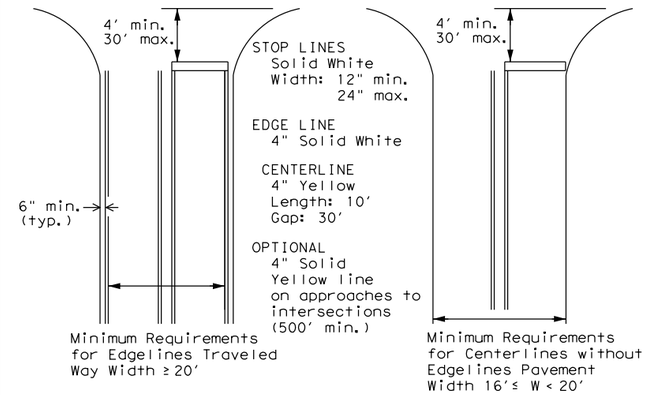
GENERAL NOTES

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

2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the inside of edgeline to the inside of edgeline of a two lane roadway.

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

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



GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Highways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-20

FILE: pm1-20.dgn	DN:	CK:	DW:	CK:
© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0039	07	257	I69E
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	PHR	CAMERON		156

22A

DATE: 12/15/2022 2:59:44 AM
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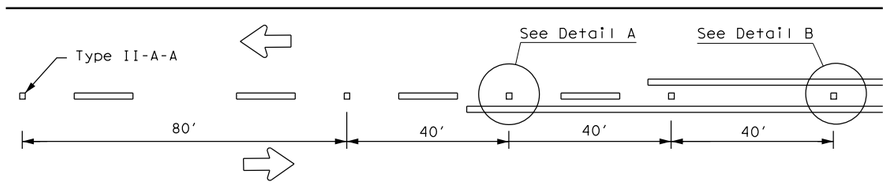
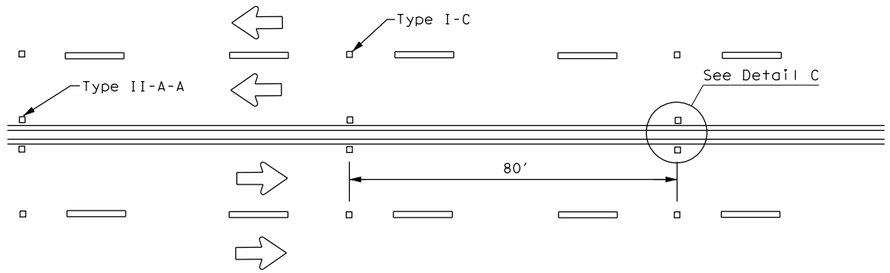
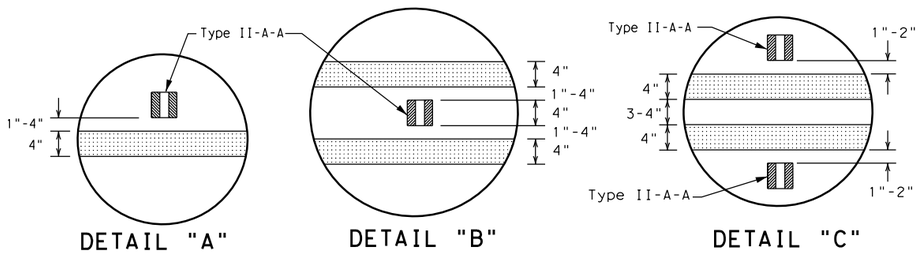
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



CENTERLINE FOR ALL TWO LANE ROADWAYS



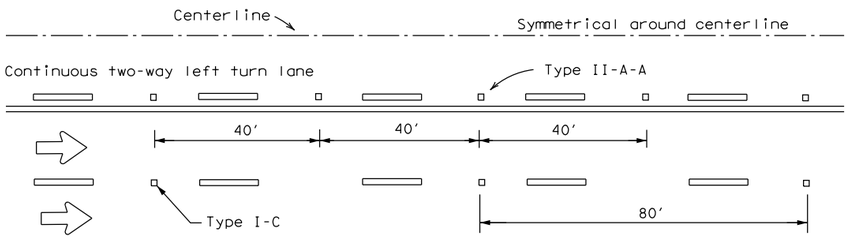
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



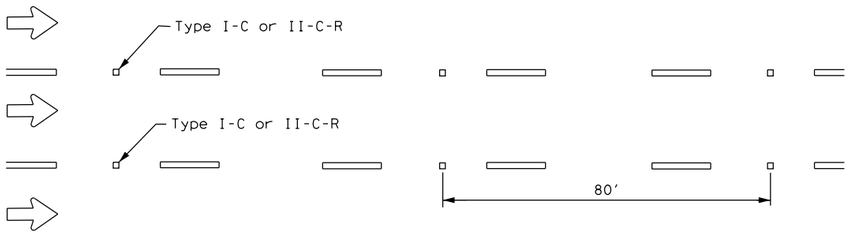
DETAIL "A"

DETAIL "B"

DETAIL "C"



CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE

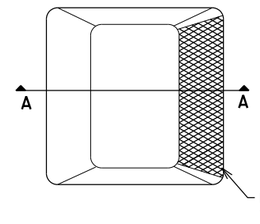


LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

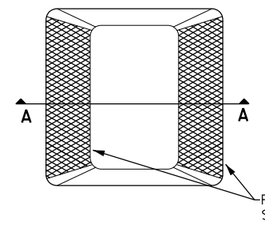
Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

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

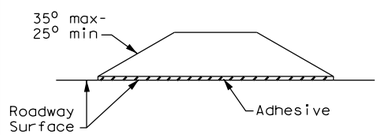
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

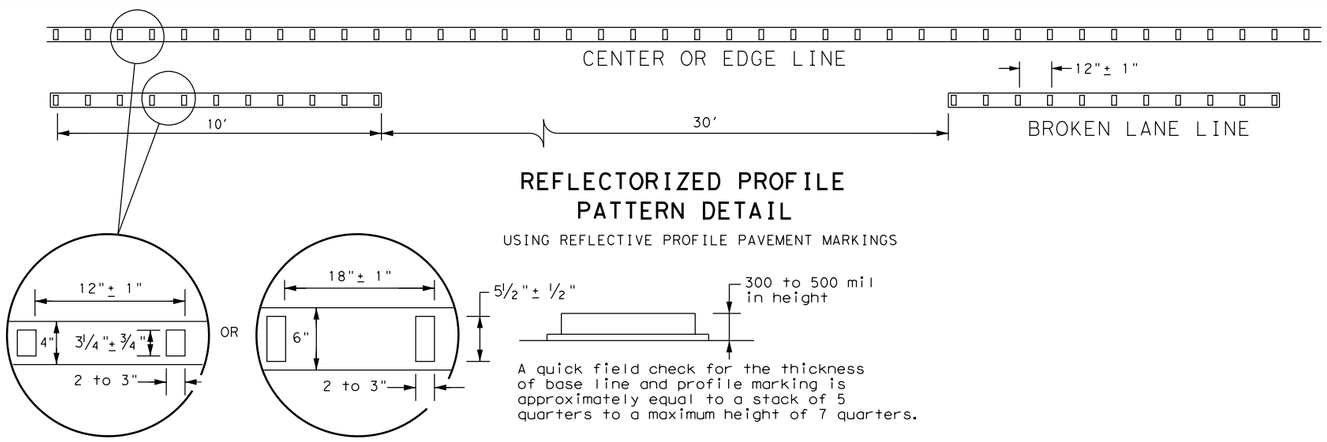


Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

4" EDGE LINE, CENTER LINE OR LANE LINE

OPTIONAL 6" EDGE LINE, CENTER LINE OR LANE LINE

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

NOTE

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

GENERAL NOTES

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

Texas Department of Transportation

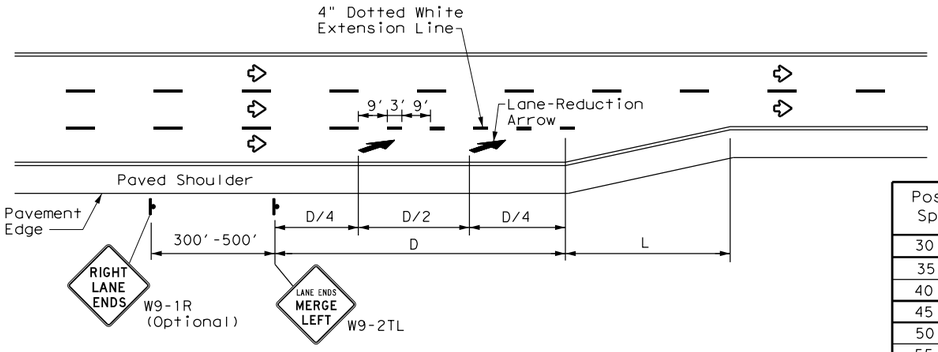
Traffic Safety Division Standard

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

FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-92 2-10	0039	07	257	I69E
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	PHR	CAMERON		157

22B

DATE: 12/15/2022, 2:59:50 AM
FILE: c:\dms\pwe101-01\jason.kane\dms25583\pm2-20.dgn

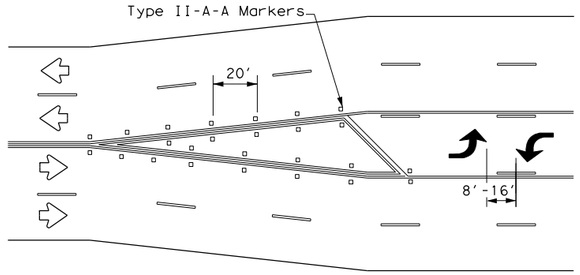


LANE REDUCTION

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

NOTES

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



A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

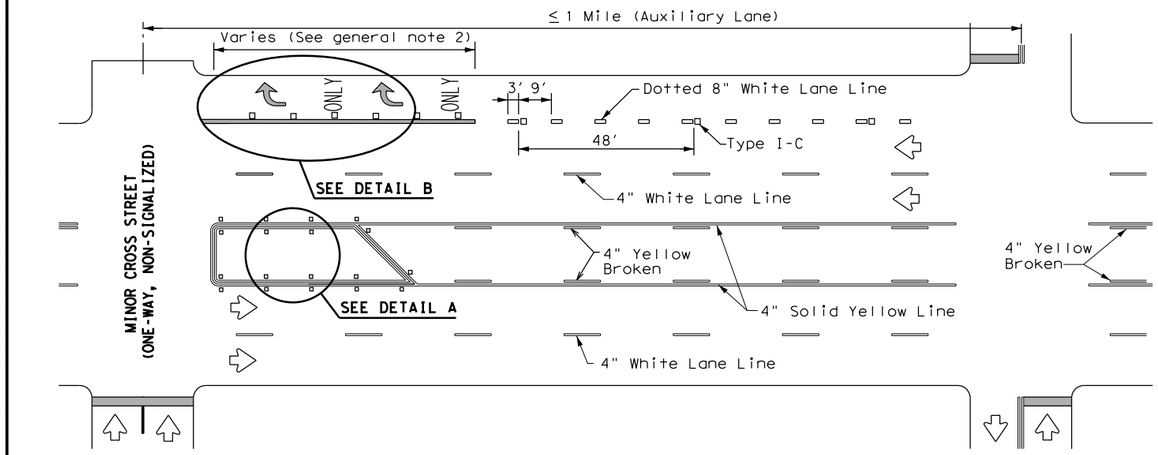
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

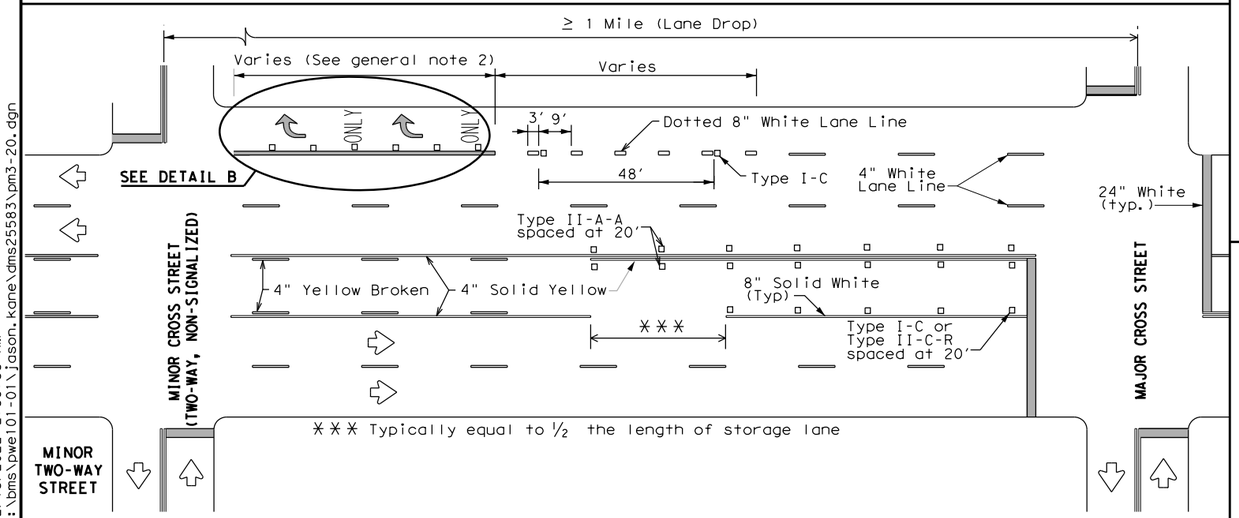
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
2. When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
3. Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
4. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

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

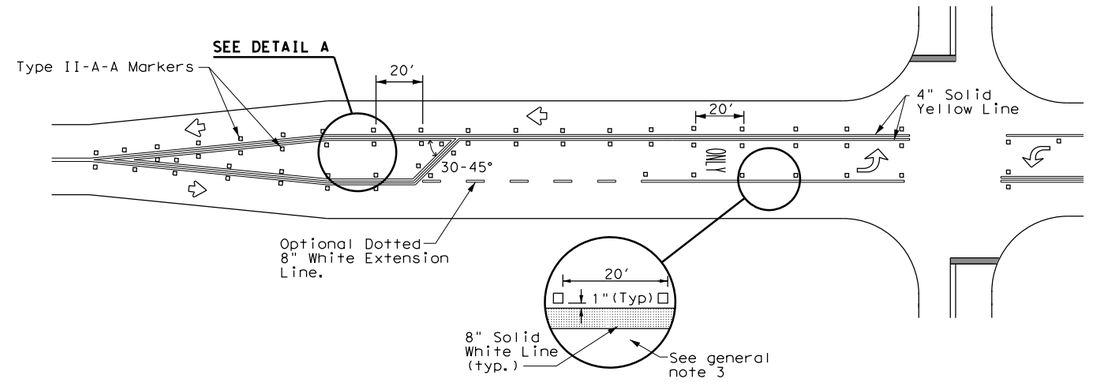
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



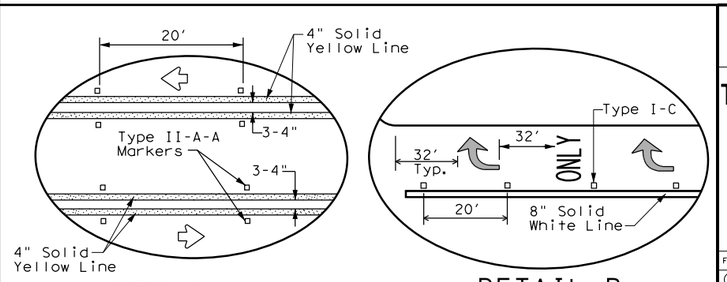
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



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



TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



Texas Department of Transportation

Traffic Safety Division Standard

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

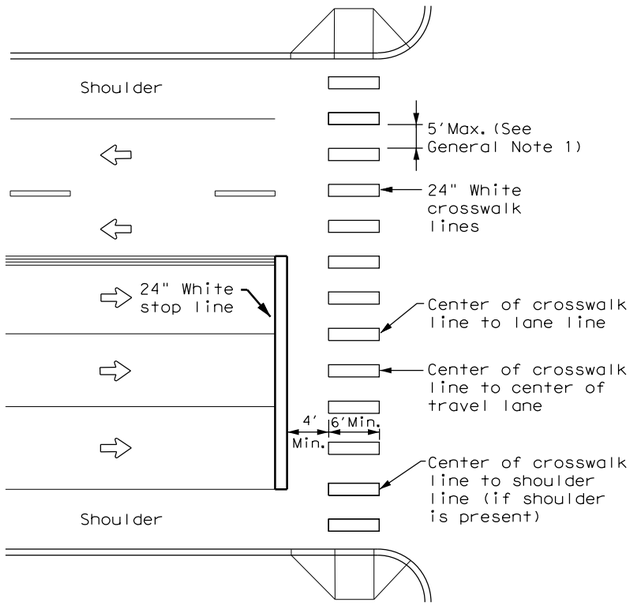
PM(3)-20

FILE: pm3-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
5-00 2-10	DIST	COUNTY		SHEET NO.
8-00 2-12	PHR	CAMERON		158
3-03 6-20				

22C

DATE: 12/15/2022 2:59:55 AM
FILE: c:\bms\pwe101-01\jason.kane\dms25583\pm3-20.dgn

DATE:
FILE:



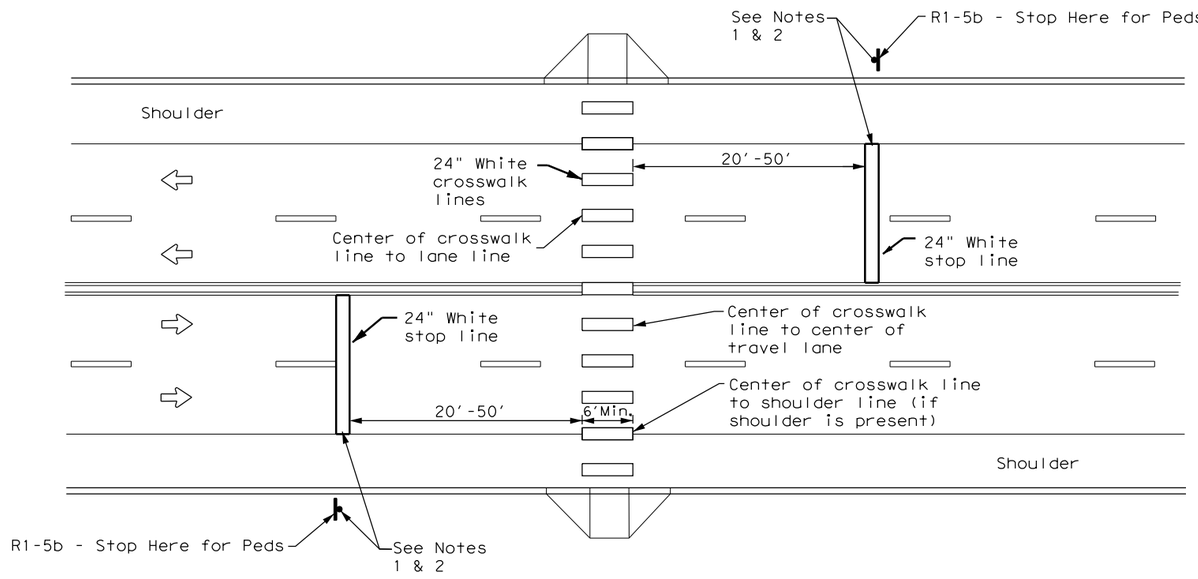
HIGH-VISIBILITY LONGITUDINAL CROSSWALK
AT CONTROLLED APPROACH

GENERAL NOTES

1. Longitudinal crosswalk lines should not be placed in the wheel path of vehicles. Center the crosswalk lines on travel lanes, lane lines, and shoulder lines (if present).
2. A minimum 6" clear distance shall be provided to the curb face. If the last crosswalk line falls into this distance it must be omitted.
3. For divided roadways, adjustments in spacing of the crosswalk lines should be made in the median so that the crosswalk lines are maintained in their proper location across the travel portion of the roadway.
4. At skewed crosswalks, the crosswalk lines are to remain parallel to the lane lines.
5. Each crosswalk shall be a minimum of 6' wide.
6. The High-Visibility Longitudinal Crosswalk is the preferred crosswalk pattern on State Highways. Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used. All crosswalk designs and dimension shall comply with the "Texas Manual on Uniform Traffic Control Devices."
7. Final placement of Stop Bar and Crosswalk shall be approved by the Engineer in the field.

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

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



UNSIGNALIZED MID BLOCK HIGH-VISIBILITY
LONGITUDINAL CROSSWALK

NOTES:

1. Use stop bars with "Stop Here for Pedestrians" signs at unsignalized mid block cross walks.
2. Use stop bars with "Stop Here on Red" signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

Texas Department of Transportation

Traffic Safety Division Standard

CROSSWALK PAVEMENT MARKINGS

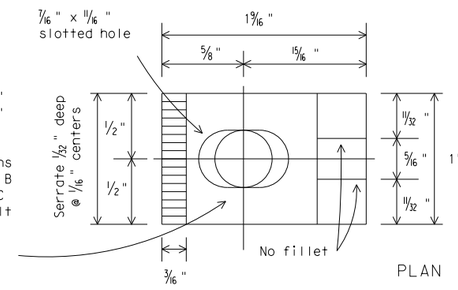
PM(4)-22

FILE: pm4-22.dgn	DN:	CK:	DW:	CK:
© TxDOT	CONT	SECT	JOB	HIGHWAY
REVISIONS 3-22	0039	07	257	169E
	DIST	COUNTY		SHEET NO.
	PHARR	CAMERON		159

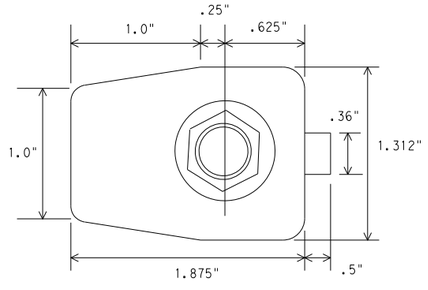
22D

DATE: 12/15/2022, 3:00:07 AM
FILE: c:\bms\pwe101-01\jason.kane\dms25583\smd21-08.dgn

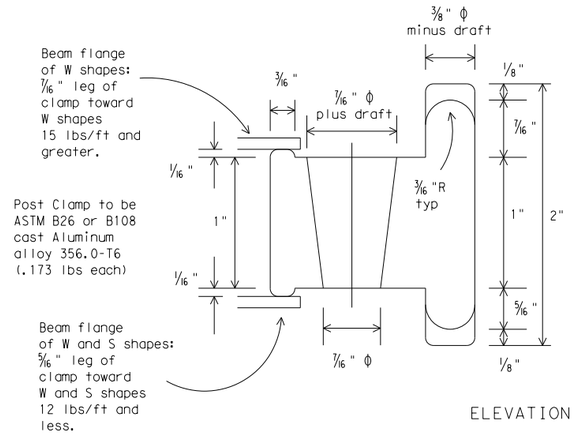
NOTE: centerline of hole for 3/8" diameter squarehead bolt x 2 1/4" long with a flat washer and self-locking nut, or lock washer and hex. nut. Bolt head dimensions shall be in accordance with ANSI B 18.2.1 as referred to in the AISC Manual of steel construction. Bolt assembly shall be galvanized.



PLAN

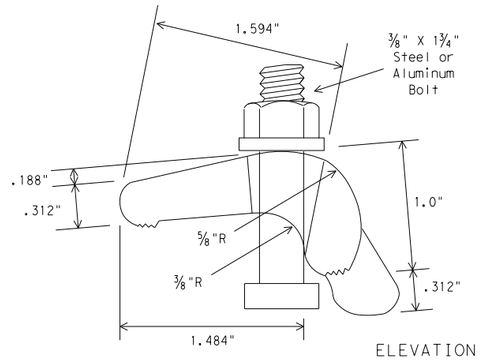


PLAN



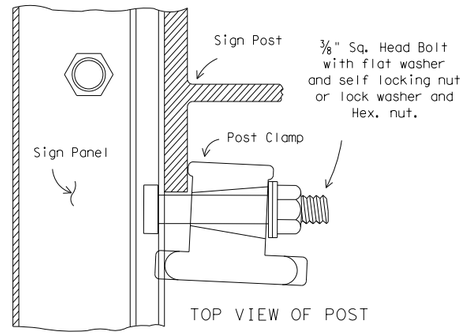
ELEVATION

POST CLAMP DETAIL

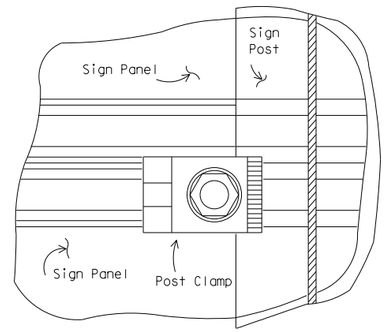


ELEVATION

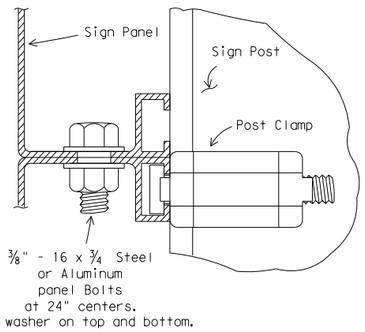
ALTERNATE POST CLAMP DETAIL



TOP VIEW OF POST



TOP VIEW OF CLAMP



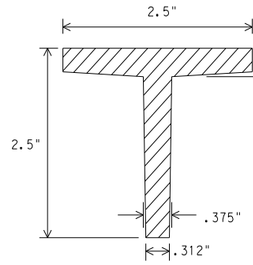
SIDE VIEW OF PANELS

CONNECTION DETAILS

DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN HARDWARE	DMS-7120

GENERAL NOTES:

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

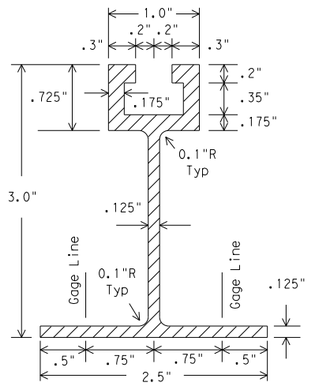


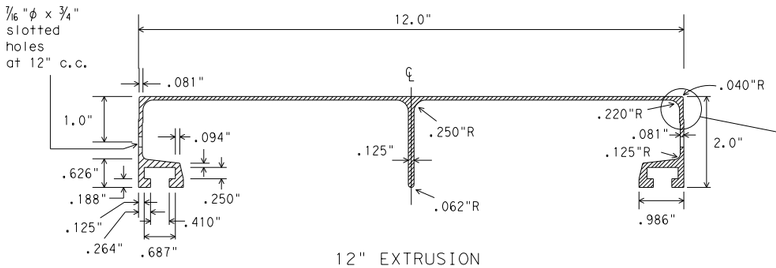
1.912 lbs/ft

ALUMINUM T SECTION OR APPROVED ALTERNATIVE

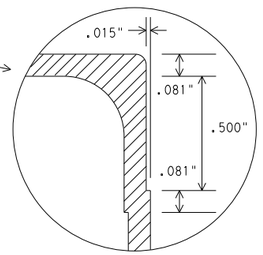
WINDBEAM CROSS SECTION

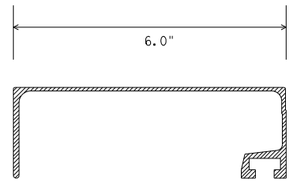
Windbeam to be extruded aluminum (1.175 lbs/ft) or approved alternative





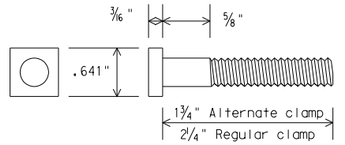
12" EXTRUSION





6" EXTRUSION

ALUMINUM SIGN PANEL EXTRUSION DETAILS



POST CLAMP BOLT DETAIL

Texas Department of Transportation
Traffic Operations Division

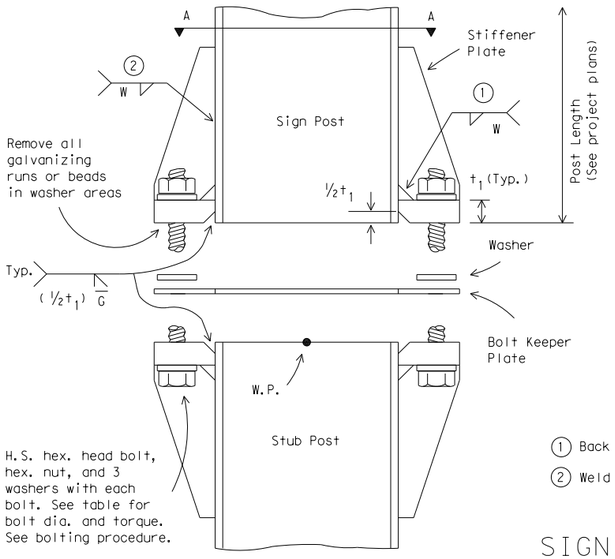
SIGN MOUNTING DETAILS- EXTRUDED ALUMINUM SIGN PANELS & HARDWARE

SMD(2-1)-08

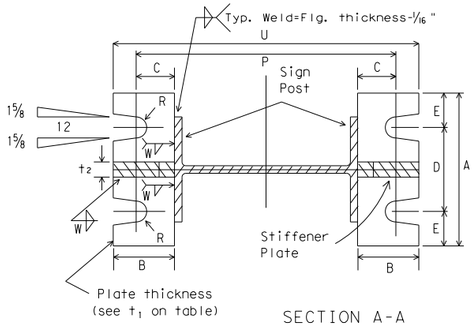
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS	CONT	SECT	JOB	HIGHWAY
9-08	0039	07	257	I69E
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		160

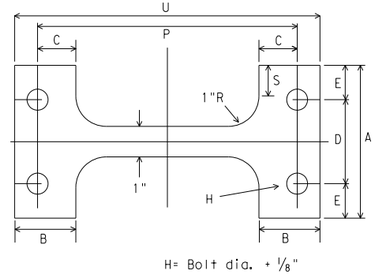
27A



ELEVATION

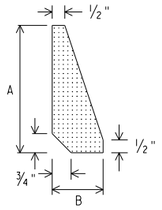


SECTION A-A



H= Bolt dia. + ⅛"

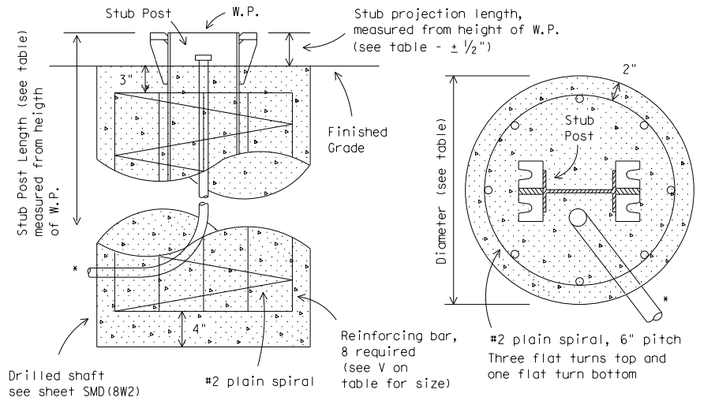
BOLT KEEPER PLATE
30 Ga galv. sheet steel



STIFFENER PLATE DETAIL

Steel Plate (thickness = t_2)

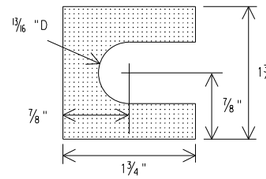
(See table for dimensions)



ELEVATION PLAN

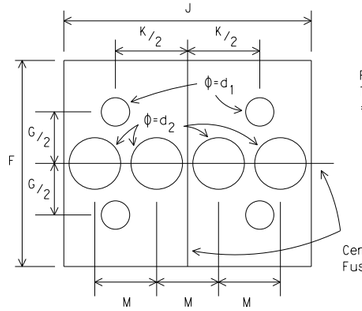
FOUNDATION DETAIL

*Note: For signs with electrical apparatus, see ED(10) for conduit required in founation.



SHIM DETAIL

Furnish two .012"+ thick and two .032"+ thick shims per post. Shims shall be fabricated from brass shim stock or strip conforming to ASTM B36.



PERFORATED FUSE PLATE DETAIL

Use H.S. hex head bolts, hex head nut and bevel or flat washer (where req'd) under nut. All holes shall be drilled, sub-punched and reamed. All plate cuts shall preferably be saw cuts. However, flame cutting will be permitted provided all edges are ground. Metal projecting beyond the plane of the plate face will not be permitted. Steel fuse plates shall conform to the requirements of ASTM A36. ASTM A572 Grade 50 or ASTM A588 may be substituted for A36 at the option of the fabricator. Mill test reports shall be submitted for Fuse Plates. Steel used shall have an ultimate tensile strength not to exceed 80 KSI. For alternative Fuse Plate contact Traffic Operations Division.

① Back up weld to be made before installing stiffener plate

② Weld W may be continued across clips to seal joint

SIGN POST AND STUB POST

(For W Shapes)

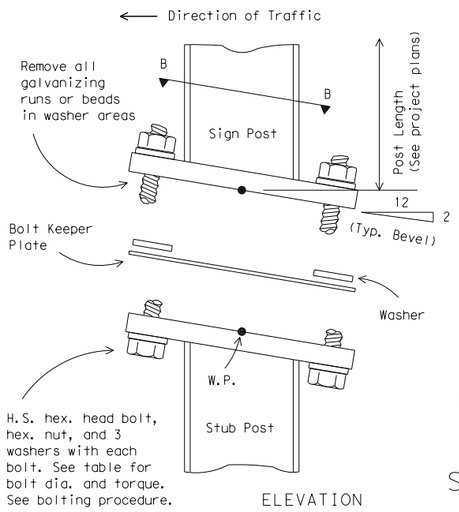
BOLTING PROCEDURE FOR ASSEMBLY OF BASE CONNECTION:

1. Assemble sign post, BOLT KEEPER PLATE and stub post with bolts and three flat washers per bolt as shown.
2. Shim as required to plumb post.
3. Tighten all bolts the maximum possible with a 12 to 15 inch wrench to clean bolt threads and to bed washers and shims.
4. Loosen each bolt in sequence and retighten bolts in a systematic order to the prescribed torque. Do not overtighten.
5. To prevent nut loosening, burr threads of bolt at junction with nut using a center punch.

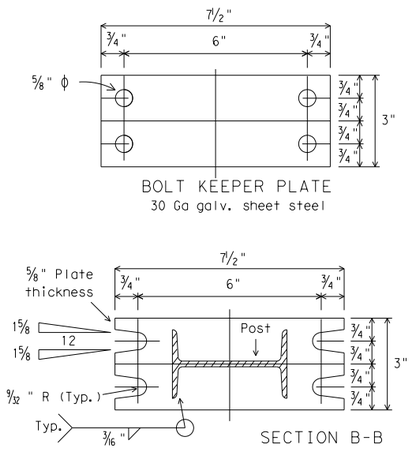
Dimensions / Post Size	Base Connection Data Table: Bolt Size & Torque	A	B	C	D	E	t_1	t_2	W	R
W6x9	⅝"ϕ x 2¾" 440-450 inch pounds 36-38 foot pounds	5"	2"	1¼"	2¾"	1⅛"	¾"	½"	¼"	11/32"
W6x12										
W6x15										
W8x18										
W8x21	¾"ϕ x 3½" 740-750 inch pounds 62-63 foot pounds	6"	2¼"	1⅜"	3½"	1¼"	1"	¾"	5/16"	13/32"
W10x22										
W10x26										
W12x26										
S3x5.7	½"ϕ x 2½" 440-450 inch pounds 36-38 foot pounds	See Detail Below								
S4x7.7										

Perforated Fuse Plate Data Table												Bolt Keeper Data			Foundation Data			
F	G	J	K	M	d_1	d_2	t_3	Bolt Dia.	Wt. (ea.) (lbs.)	Bolt length	P	S	U	Stub length	Stub projection	Dr. Shaft diameter	Bar V Size
4¼"	2"	4"	2¼"	1"	9/16"	¾"	¼"	½"	1.01	1½"	8⅜"	1"	9⅞"	2'-0"	3"	24"	#5
											8½"		10"				#5
5"	2½"	6"	3½"	1½"	11/16"	1¼"	⅜"	⅝"	2.51	2¼"	8½"		10"	2'-6"	3"		#6
5"	2½"	5¼"	2¾"	1¼"	11/16"	1 1/16"	⅜"	⅝"	2.26	2¼"	10⅝"		12⅛"	2'-6"	3"		#7
5½"	2½"	5¼"	2¾"	1¼"	13/16"	1"	½"	¾"	3.35	2¼"	11"	1½"	12¾"	3'-0"	2½"		#8
6"	3"	5¾"	2¾"	1⅜"	13/16"	1⅛"	½"	¾"	4.03	2¼"	12⅞"		14⅝"	3'-0"	2½"		#9
											13⅜"		14⅞"	3'-0"	2½"		#10
6"	3"	6½"	3½"	1⅝"	13/16"	1 5/16"	½"	¾"	4.47	2¼"	15"		16¾"	3'-0"	2½"		#11
3¾"	1½"	2⅝"	1½"	⅝"	9/16"	⅜"	¼"	½"	0.60	1½"	See Detail Below			3'-3½"	3½"	12"	Non-reinforced ③

③ Foundation design shall be Type G Mount, see SMD (TY G).



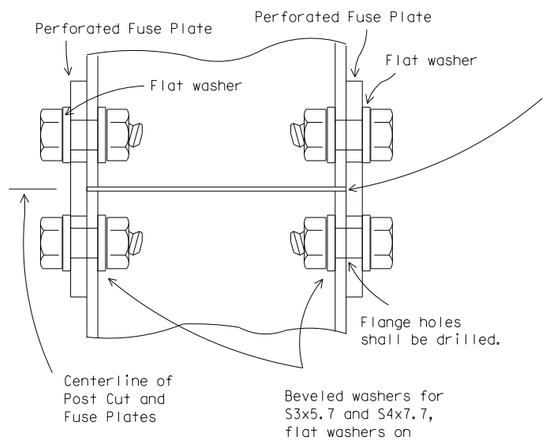
ELEVATION



BOLT KEEPER PLATE
30 Ga galv. sheet steel

SIGN POST AND STUB POST

(For S4x7.7 and S3x5.7)



DETAIL "A"

Parts shall be saw cut either before galvanizing and the galvanized cut cleaned of zinc build-up, or saw cut after galvanizing and the cut surface repaired per Item 445, "Galvanizing."

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS- LARGE ROADSIDE SIGNS FOUNDATION & STUB

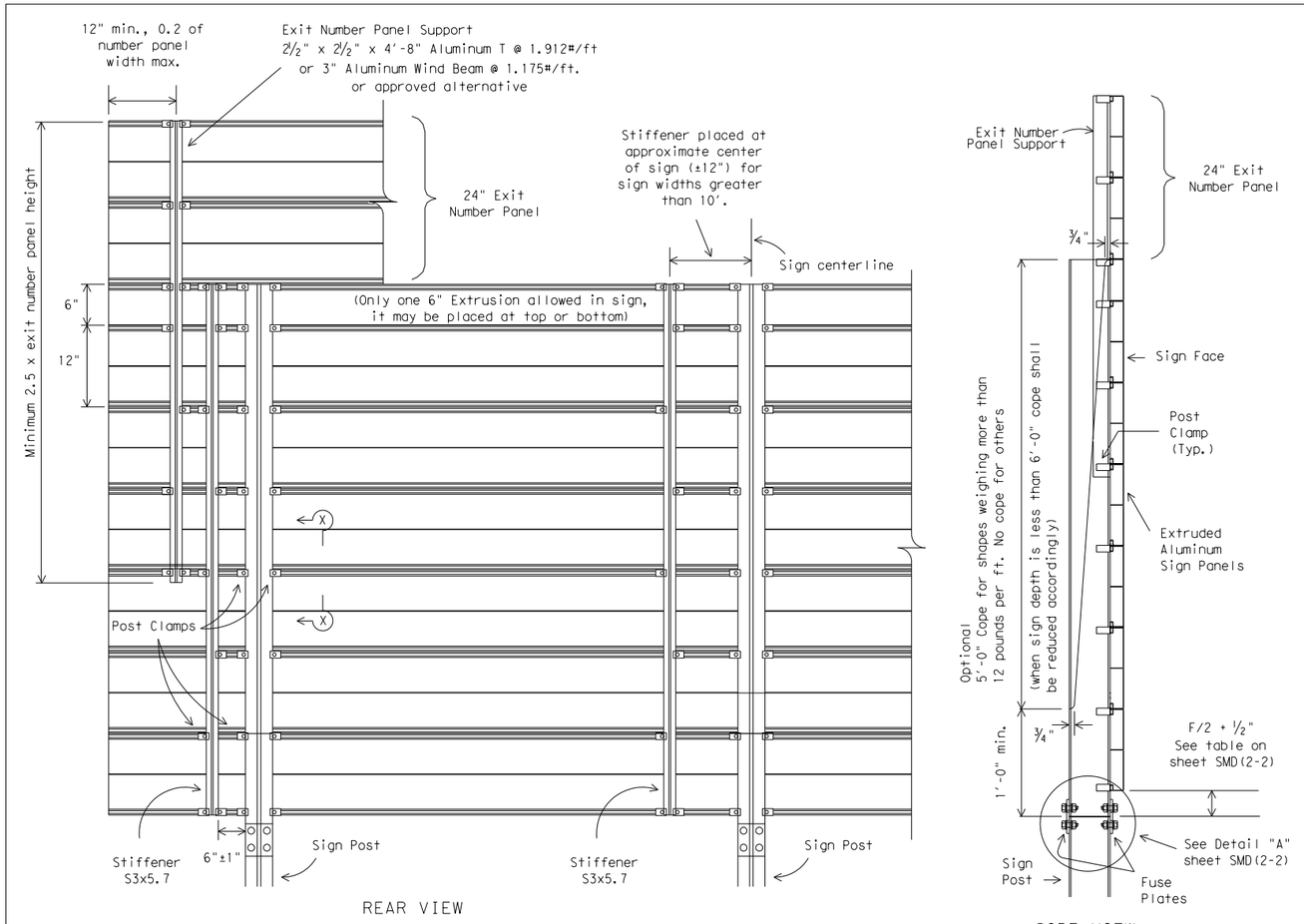
SMD(2-2)-08

REVISIONS
4-98
9-08

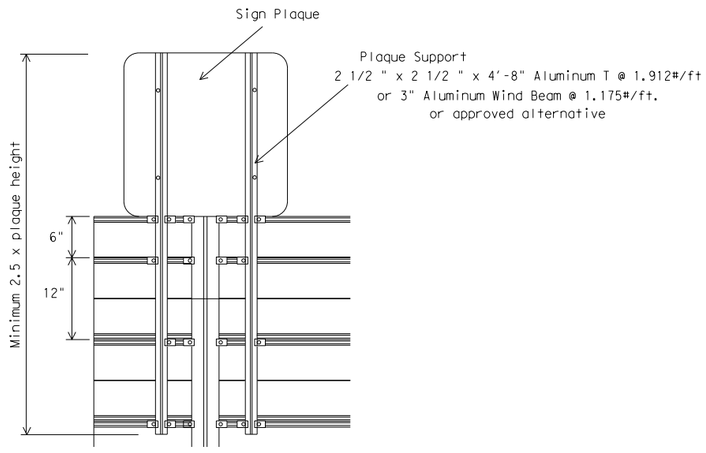
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CONT	SECT	JOB	HIGHWAY
0039	07	257	I69E
DIST	COUNTY		SHEET NO.
PHR	CAMERON		161

27B

DATE: 12/15/2022 3:00:13 AM
FILE: c:\bms\pwe101-01\jason.kane\dms25583\smd22-08.dgn

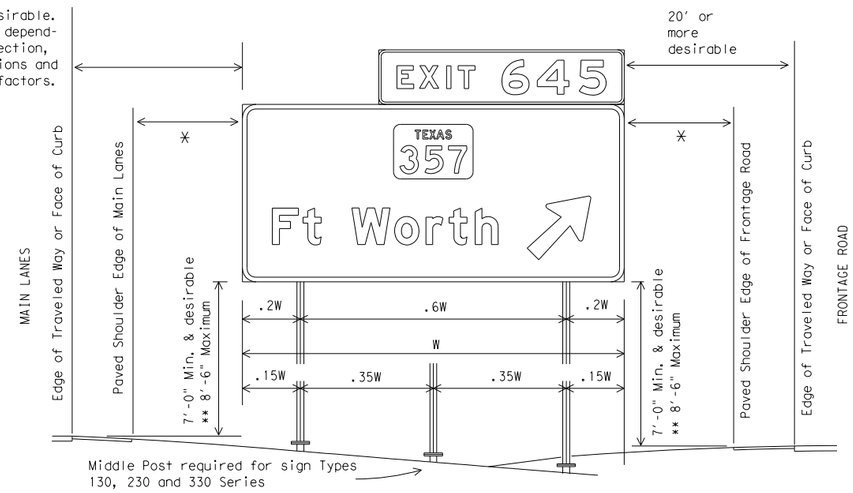


ALUMINUM PARENT SIGN & EXIT NUMBER PANEL MOUNTING DETAILS



SIGN PLAQUE MOUNTING DETAIL TO ALUMINUM PARENT SIGN

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



TYPICAL SIGN INSTALLATION AND LOCATION

LATERAL CLEARANCE NOTES:

Lateral clearances of signs mounted on median side of main lanes are the same as shown above where space will permit.

Where a sign is to be located behind guardrail, an allowable minimum clearance of five feet may be used, measured from the face of the guardrail to the near edge of sign.

✳ - 6' minimum and desirable may be used only in areas of limited lateral clearance and when approved by the Engineer.

POST SPACING NOTES:

Post spacing on a two post sign may vary a maximum of plus or minus 10% of total sign width to fit field conditions.

Post spacing on a three post sign may vary a maximum of plus or minus 5% of total sign width to fit field conditions.

SIGN HEIGHT NOTES:

** The 8' 6" maximum may be exceeded when placing signs on extreme slopes. In these conditions, a 7' minimum from natural ground to bottom of sign must be maintained.

DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN HARDWARE	DMS-7120

GENERAL NOTES:

1. Exit number panel shall be mounted to the right hand side of the parent sign for right exits and to the left hand side for left exits. The number panel shall be mounted with two uprights so its right edge is even with the right edge of the parent sign or vice-versa for left hand exits.
2. Exit number panel support shall be symmetrical about number panel centerline.
3. Exit number panel support shall be ASTM A36 structural steel galvanized after fabrication, or ASTM B221 aluminum alloy 6061-T6 or approved alternative.
4. All bolts, nuts and washers shall be galvanized per ASTM Designation: B695 Class 50, or A153 Class C or D.
5. Posts, parent sign panels, and exit number panels shall comply with notes on sheets SMD(2-1) and SMD(2-2).
6. Signs (such as exit number panels) attached above a parent sign shall be made of the same type material as the parent sign. General Service and Routing signs may be fabricated from flat sheet aluminum.
7. Exit number panel support and other connection hardware required to fasten exit number panel to parent sign shall be subsidiary to "Aluminum Signs" or "Fiberglass Signs."
8. For fiberglass sign installation details, see manufacturer's recommendations.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS-LARGE ROADSIDE SIGNS

SMD(2-3)-08

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

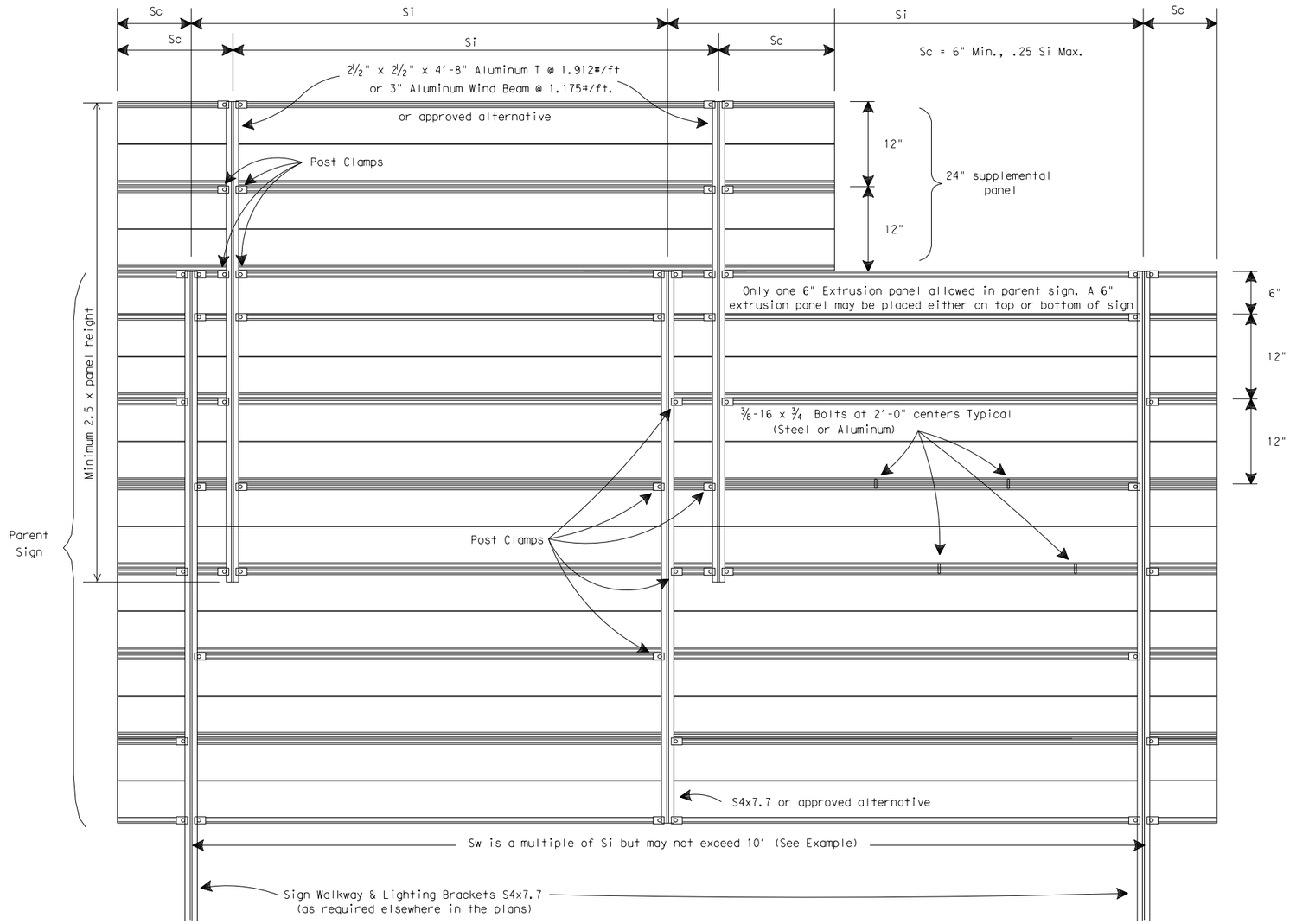
REVISIONS
9-08

CONT	SECT	JOB	HIGHWAY
0039	07	257	I69E

DIST	COUNTY	SHEET NO.
PHR	CAMERON	162

27C

DATE: 12/15/2022 3:00:18 AM
FILE: c:\bms\pwe101-01\jason.kane\dms25583\smd23-08.dgn

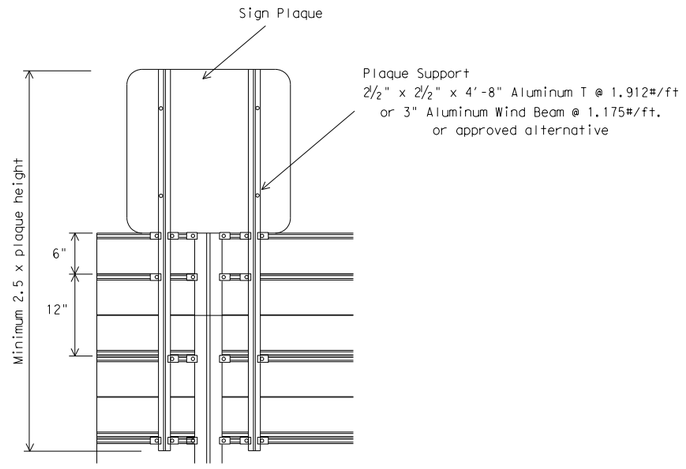


REAR VIEW

EXAMPLES (FOR DETERMINING Si and Sw)

NO.	ZONE	"d"	EXIT PANEL	WALKWAY	Si	Sw	COMMENT
1	1	15.0	YES	YES	4.5	9.0	Sw=2x(Si)
2	2	14.0	YES	NO	7.5	7.5	Sw = Si
3	1	15.0	NO	NO	8.5	8.5	Sw = Si
4	3	14.0	NO	YES	10.0	10.0	Sw = Si

Values shown for Si are maximum values. Si may be varied for different sign lengths and Truss mounting conditions. Sw should not exceed two times Si(Max.) or 10 feet.



SIGN PLAQUE MOUNTING DETAIL

MAXIMUM SIGN SUPPORT SPACING "Si" (FEET)

"d" Deepest Sign in Group (Ft.)	EXTRUDED ALUMINUM SIGN PANELS															
	WITH EXIT NUMBER PANELS								WITHOUT EXIT NUMBER PANELS							
	WITH WALKWAYS				WITHOUT WALKWAYS				WITH WALKWAYS				WITHOUT WALKWAYS			
	WIND ZONE				WIND ZONE				WIND ZONE				WIND ZONE			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
15	4.5	7	8	10	5	7	8	10	7	8	9	10	8.5	10	10	10
14	6	7.5	9.5	10	6	7.5	9.5	10	8	9	10	10	10	10	10	10
13	7.5	9	10	10	7.5	9	10	10	9	10	10	10	10	10	10	10
12	8.5	10	10	10	8.5	10	10	10	10	10	10	10	10	10	10	10
11 or less	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

For fiberglass sign installations, see manufacturer's recommendations.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS- OVERHEAD SIGNS EXTRUDED ALUMINUM

SMD(2-4)-08

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

REVISIONS
9-08

CONT	SECT	JOB	HIGHWAY
0039	07	257	I69E

DIST	COUNTY	SHEET NO.
PHR	CAMERON	163

27D

DATE: 12/15/2022 3:00:24 AM
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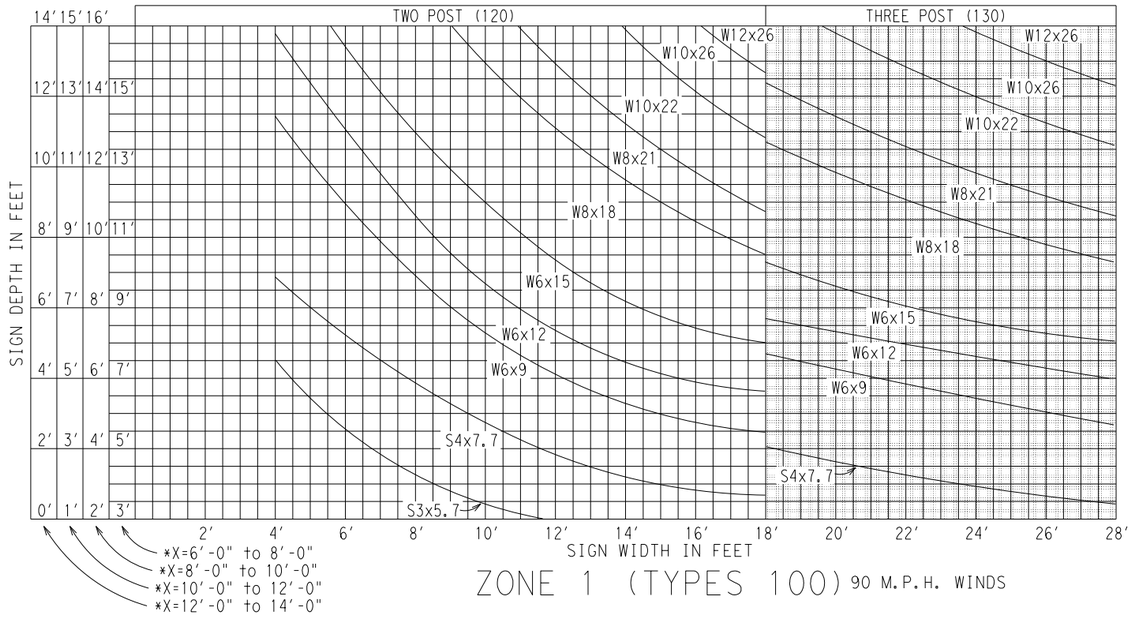
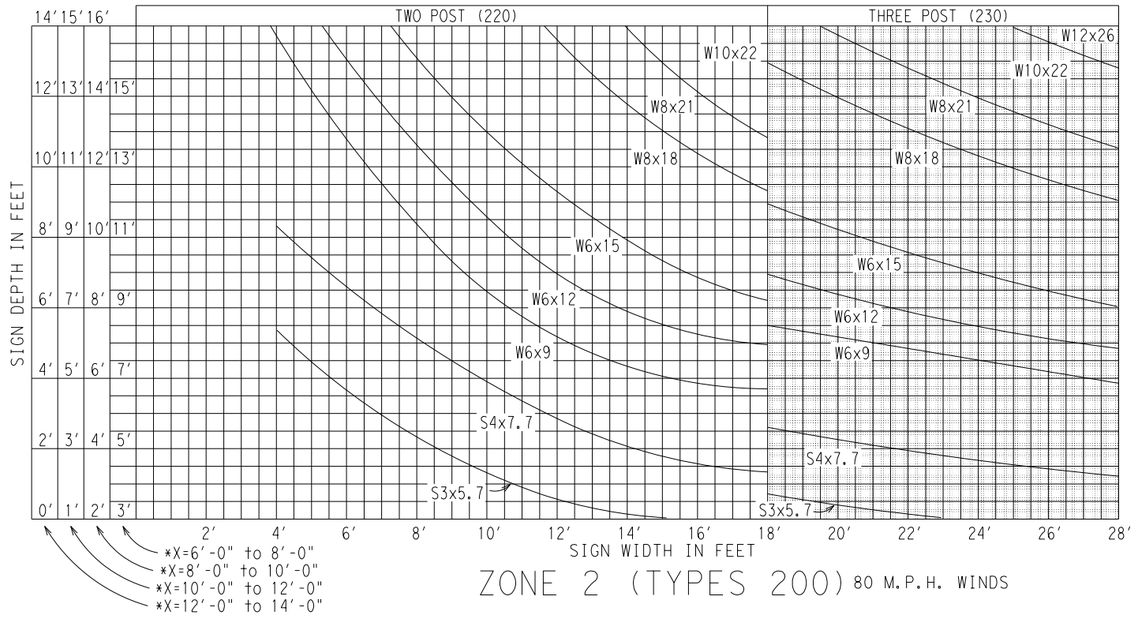
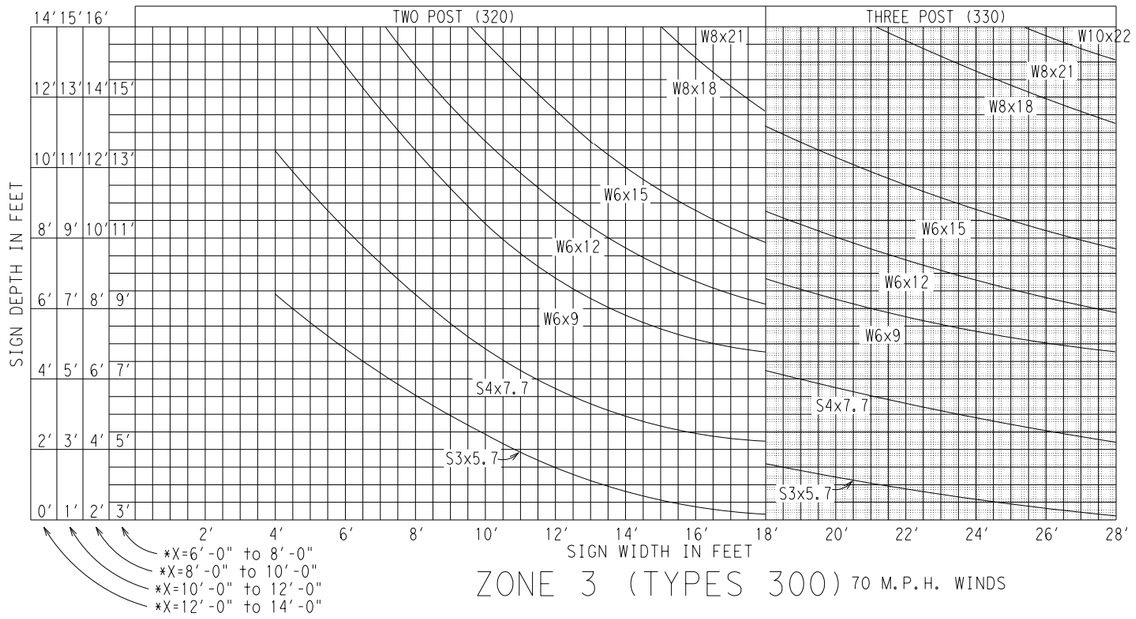


ZONE 1 (TYPES 100) 90 M.P.H. WINDS



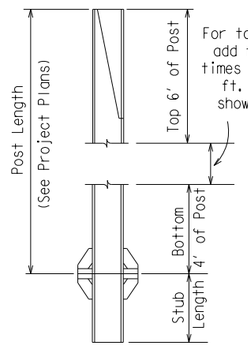
ZONE 2 (TYPES 200) 80 M.P.H. WINDS



ZONE 3 (TYPES 300) 70 M.P.H. WINDS

* NOTE: "X" EQUALS THE AVERAGE HEIGHT FROM THE GROUND LINE TO THE BOTTOM EDGE OF THE SIGN.

SHADED AREA DENOTES 3 POST SUPPORTS



POST WEIGHT DATA

POST SIZE	WEIGHT OF ONE POST (#)	WEIGHT OF TWO POSTS (#)	WEIGHT OF THREE POSTS (#)
W6x9*	123.2	246.4	369.6
W6x12*	160.3	320.6	480.9
W6x15*	167.8	335.6	503.4
W8x18*	201.8	403.6	605.4
W8x21*	254.7	509.4	764.1
W10x22*	266.0	532.0	798.0
W10x26*	308.0	616.0	924.0
W12x26*	308.6	617.2	925.8
S3x5.7*	85.9	171.8	257.7
S4x7.7*	112.2	224.4	336.6

*LAST FIGURES=POST WT. PER FT.

Weight Data is the weight of items shown for one, two or three posts - (includes top 6' of post, bottom 4' of post, post foundation stub, related base connection plates and stiffeners, friction fuse plate and all high strength bolts, nuts and washers).

SIGN TYPE

SIGN TYPE 1 3 0

- 1 — Wind Design Zone
- 3 — Series No.
- 0 — 0 Aluminum/Fiberglass, 1 Aluminum, 2 Fiberglass
- 0 — No. of Posts

Note: Footings for S3x5.7 and S4x7.7 post sizes shall be non-reinforced with Class A concrete, while footing for all other post sizes shall be reinforced with Class C concrete.

Texas Department of Transportation
Traffic Operations Division

LARGE ROADSIDE SIGN SUPPORTS
POST SELECTION
WORKSHEET
SMD(8W1)-08

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

REVISIONS
1-82
5-01
9-08

CONT	SECT	JOB	HIGHWAY
0039	07	257	I69E

DIST	COUNTY	SHEET NO.
PHR	CAMERON	164

29A

DATE: 12/15/2022 3:00:30 AM
FILE: c:\bms\pwe101-01\jason.kane\dms25583\smd8-08.dgn

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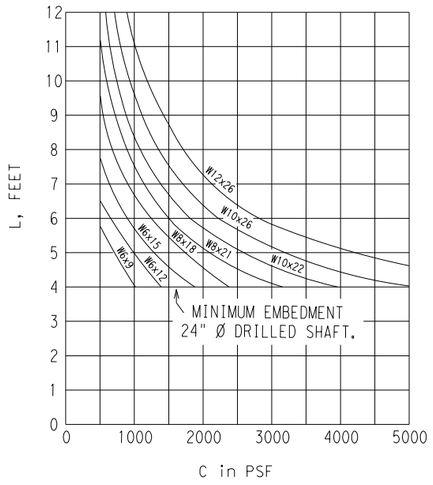
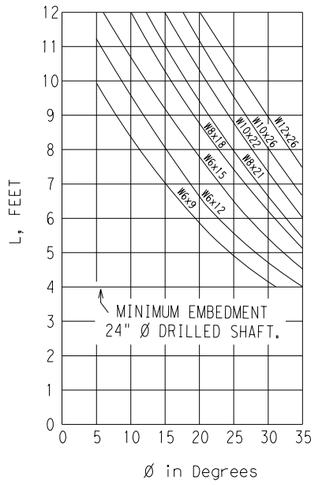
I



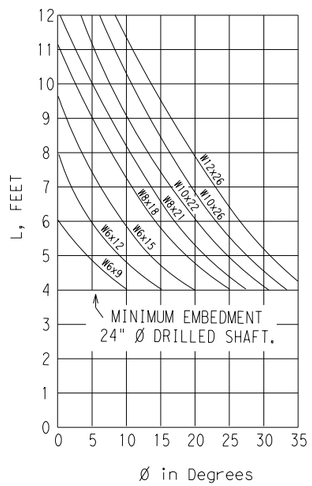
Ø = 0 Degrees

II



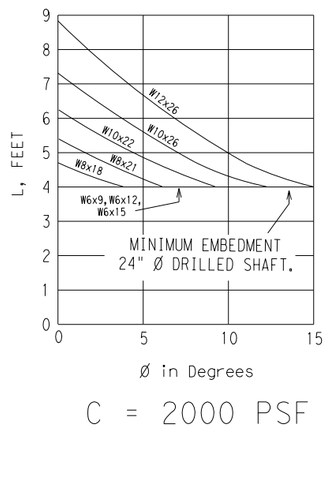
C = 0 PSF

III



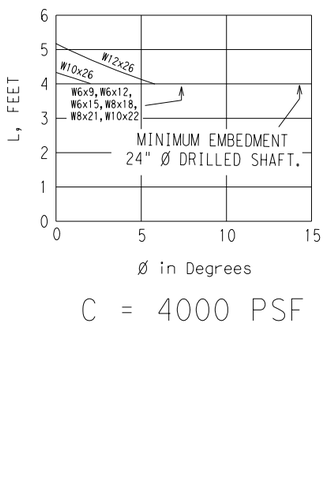
C = 500 PSF

IV



C = 2000 PSF

V



C = 4000 PSF

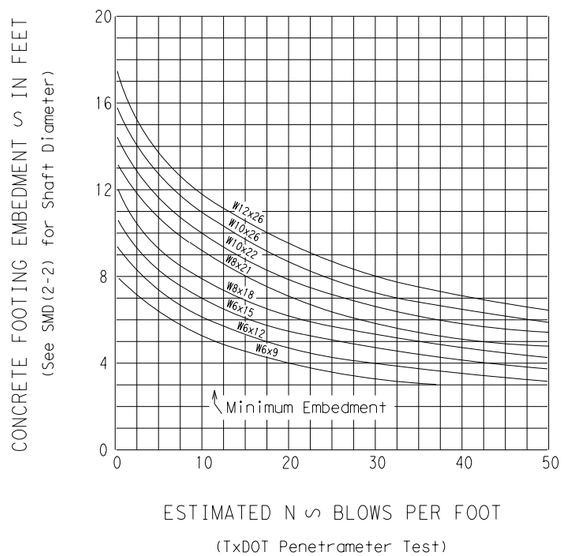
DRILLED CONCRETE FOOTING DEPTH CHART
(COHFRIC DESIGN)

NOTE: THESE CHARTS MAY BE USED AS AN ALTERNATE TO THE CHART BELOW, PROVIDED THAT SOIL COHESION AND INTERNAL FRICTION (COHFRIC) DATA ARE AVAILABLE.

LEGEND:

L = Required embedment of concrete drilled shaft, in feet
C = Cohesive shear strength of soil, in psf
Ø = Angle of internal friction of soil, in degrees

For values of C and Ø which are intermediate to those on the charts, embedments may be determined by straight - line interpolation.



DRILLED CONCRETE FOOTING DEPTH CHART
(TxDOT PENETROMETER DESIGN)

NOTE: ESTIMATED N SHOULD BE BASED AT APPROXIMATELY THE UPPER ONE-THIRD POINT OF THE DRILLED CONCRETE FOOTING BELOW THE GROUND LINE

Note:
1. Curves shown on this sheet are applicable for reinforced concrete footings only.

Texas Department of Transportation
Traffic Operations Division

LARGE ROADSIDE SIGN SUPPORTS
FOUNDATION
WORKSHEET
SMD(8W2)-08

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

REVISIONS
5-74
4-78
9-08

CONT	SECT	JOB	HIGHWAY
0039	07	257	I69E

DIST	COUNTY	SHEET NO.
PHR	CAMERON	165

29B

DATE: 12/15/2022 3:00:32 AM
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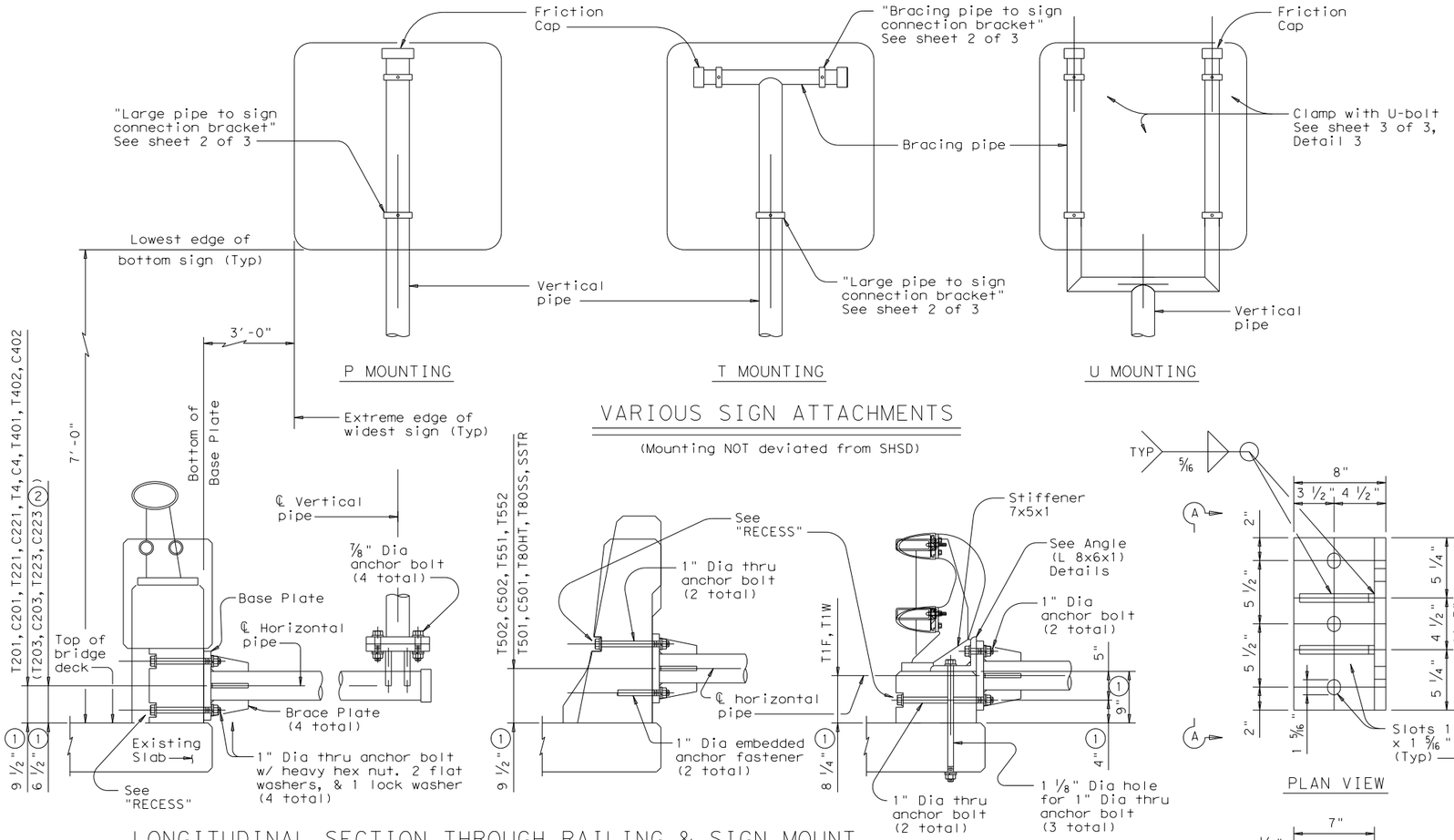
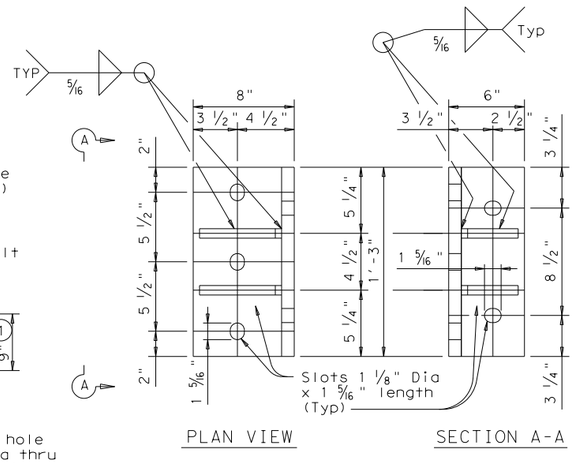
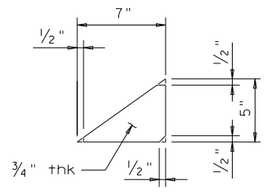


VARIOUS SIGN ATTACHMENTS

(Mounting NOT deviated from SHSD)

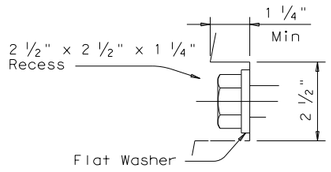
LONGITUDINAL SECTION THROUGH RAILING & SIGN MOUNT





STIFFENER

ANGLE (L 8x6x1) DETAILS



RECESS

① Increase 2" for structure with overlay.

② Attached at ℄ post.

PIPE SIZE AND THICKNESS			
Pipe Placement / Design Wind Speed	Horizontal	Vertical	Bracing
90 mph	5" X-Strong (.375")	4" X-Strong (.337")	2 ½" Standard (.203")
130 mph	6" X-Strong (.432")	5" X-Strong (.375")	3" X-Strong (.300")

GENERAL NOTES:

Design conforms to 2013 AASHTO Standard Specifications for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design 3-second gust wind speeds of 90 mph and 130 mph with a 1.14 gust factor, and a wind importance factor of 1.0 (50-year mean recurrence interval) for the supporting structures. For mounting connection between sign panel and pipe, wind importance factors of 0.71 and 0.54, for 90 mph and 130 mph winds, respectively, are applied to adjust the wind speeds to a 10-year mean recurrence interval.

See standard sheet WV & IZ(LTS2013) for the boundaries of each design wind zone. All mounting shall be based on 130 mph wind speed design except when located in 90 mph wind zone. Maximum panel area is 30 sq. ft. Maximum design height is 50 ft, with design height defined as the distance between natural ground (average elevation of surrounding terrain) and the center of sign(s) at the mounting location.

Material for pipe shall be ASTM A53 Grade B, or A501. Structural steel plates shall be ASTM A36, A572 Grade 50, or A588. Bolts used to connect pipe and mounting bracket, and wind beam to sign panel shall be ASTM A307. Anchor bolts shall be ASTM A325 or A193 B7. Each anchor bolt shall be provided with 2 flat washers, 1 lock washer, and 1 heavy hex nut. All parts shall be galvanized in accordance with Standard Specifications Item 445, "Galvanizing".

Attach horizontal pipe at least 2'-0" from the edge of any nearby drain slot.

Contractor shall verify applicable field dimensions before fabrication. Holes drilled through the railing parapet wall shall be drilled with rotary (coring or masonry drill) type equipment. Percussion (star) drilling shall not be allowed. Anchorage for pipe attached to rail shall be placed using an anchoring system approved by the engineer. Installation of anchor fasteners including hole depth, diameter and material shall be in accordance with the manufacturers' recommendation.

Each embedded anchor fastener shall resist an allowable design loading (after applying the reduction factors of bolt spacing and bolt edge distance) of:

	130 mph	90 mph
Tension	12.5 kips	7.5 kips
Shear	9.0 kips	5.0 kips

Each anchoring system shall provide a capacity to resist the required tension and shear acting simultaneously.

For sign connection to mounting, shop drill holes on sign blank in accordance with the current Standard Highway Sign Designs for Texas (SHSD). Additional hole(s) needed to meet a stipulated-type mounting may be field drilled. For multi-sign or back-to-back signs mounting, the engineer shall determine the proper type which ensures each individual mounting meets requirements.

Refer to Standard sheets SMD(GEN), SMD(SLIP-2 and SMD(2-1) for details not covered here.

Texas Department of Transportation

Traffic Operations Division Standard

BRIDGE RAILING SIGN MOUNT DETAILS

SMD(BR)-14

FILE: smdbr-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		166A

DATE: 12/15/2022 3:00:37 AM
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DATE: 12/15/2022 3:00:38 AM
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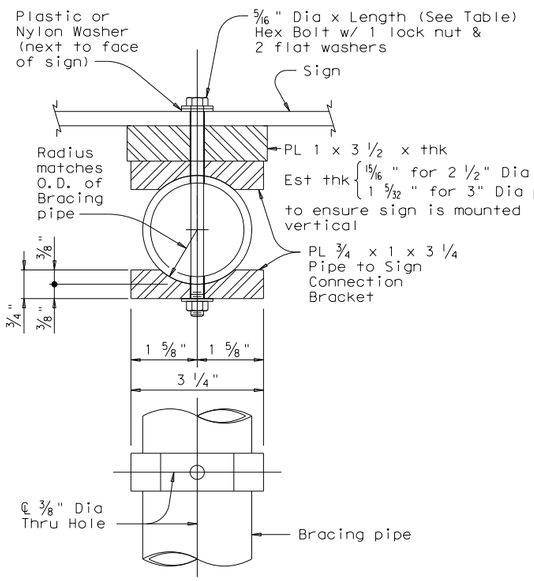
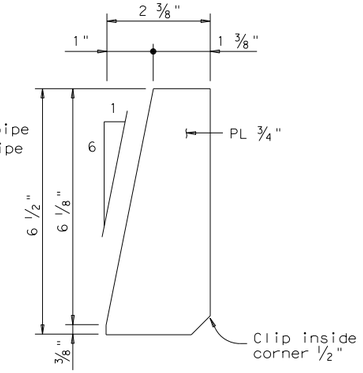
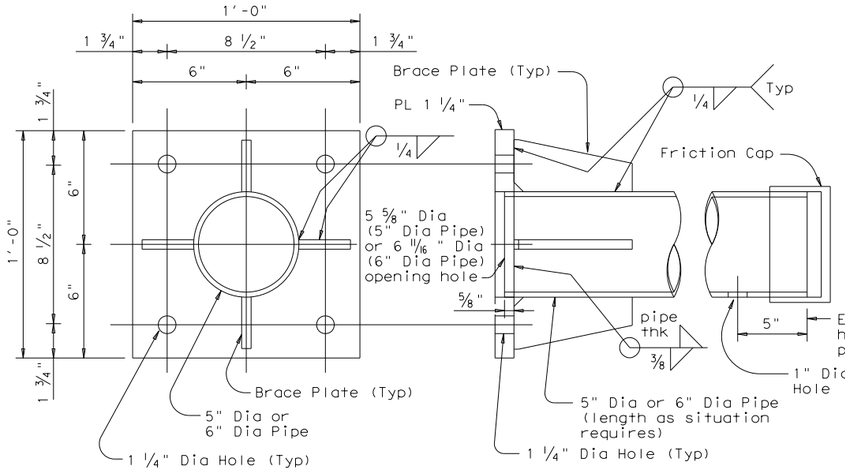


BRACING PIPE TO SIGN CONNECTION BRACKET DETAILS

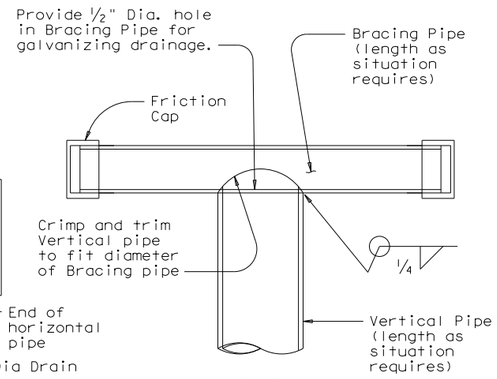
(Showing T Mounting)

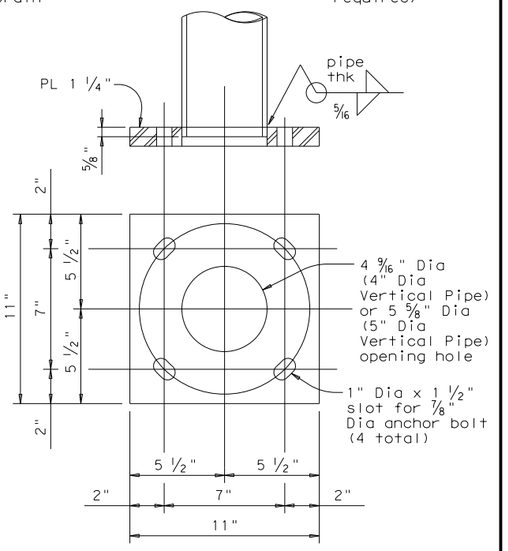


BRACE PLATE DETAILS



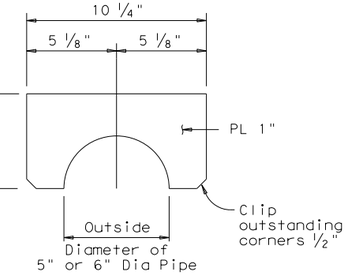
BASE PLATE DETAILS



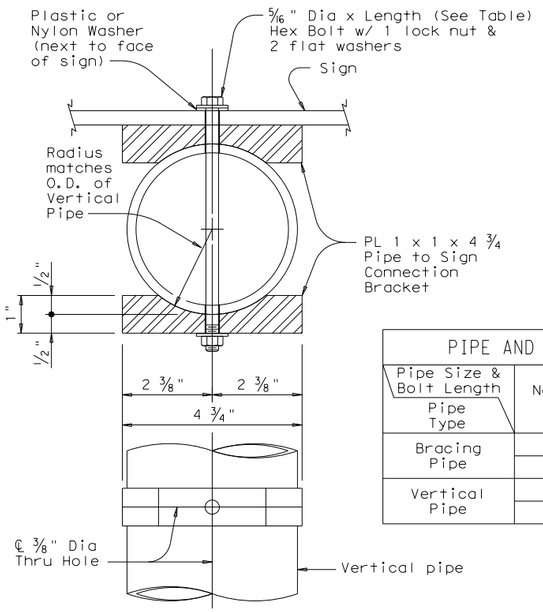


SIGN POLE & POLE BASE PLATE DETAILS

(Showing only T Mounting)



SIGN POLE SUPPORT PLATE BRACKET DETAILS



LARGE PIPE TO SIGN CONNECTION BRACKET DETAILS

(Showing P or T Mounting)

PIPE AND BOLT SPECIFICATIONS		
Pipe Size & Bolt Length / Pipe Type	Nominal Pipe Dia (in.)	Bolt Length (in.)
Bracing Pipe	2 1/2	6
	3	7
Vertical Pipe	4	7
	5	8

SIGN POLE SUPPORT PLATE DETAILS

SHEET 2 OF 3

Texas Department of Transportation

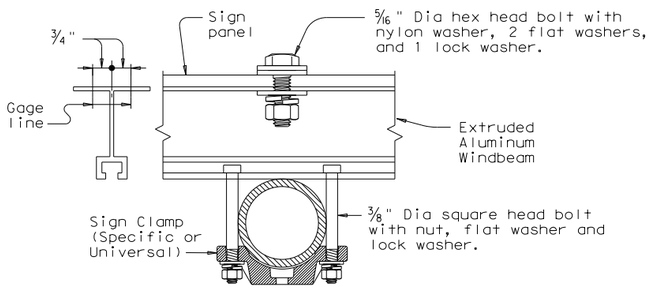
Traffic Operations Division Standard

BRIDGE RAILING SIGN MOUNT DETAILS

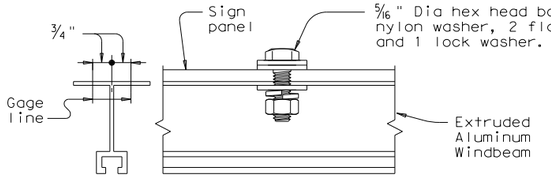
SMD(BR)-14

FILE: smdbr-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		166B

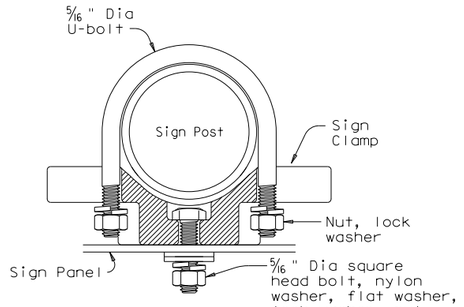
26H



DETAIL 1



DETAIL 2

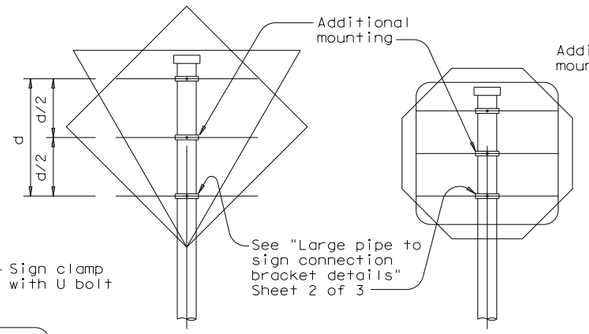


DETAIL 3

SIGN SHAPE	SQUARE			HORIZONTAL RECTANGLE			VERTICAL RECTANGLE			DIAMOND			OCTAGON			EQUILATERAL TRIANGLE			INTERSTATE SHIELD	PENTAGON (SCHOOL)	
Type of Sign Mounting on SHSD / Design Wind Speed	P	T	U	P	T	U	P	T	U	P	T	U	P	T	U	P	T	U	P	P	T
90 mph					(Type 23) 60"x48"	(Type 3) 72"x36" 78"x36"		(Type 2) 36"x48"			(Type 3) 60"x60"								(Type Special) 45"x36"		
						(Type 23) 72"x30" 84"x24"		(Type 32) 36"x60" 36"x72" 42"x60" 48"x54" 48"x60" 48"x72"													
								(Type 3) 48"x84"													
130 mph	(Type 1) 30"x30" 36"x36"	(Type 3) 48"x48"		(Type 1) 36"x24" 36"x30"	(Type 23) 48"x42" 54"x42" 60"x30" 66"x36" 84"x24"	(Type 3) 72"x36" 78"x36"	(Type 1) 30"x36" 30"x42"	(Type 3) 36"x48" 36"x60" 36"x72" 42"x60" 48"x54" 48"x60"	(Type 3) 48"x60"	(Type 1) 36"x36"	(Type 3) 48"x48" 60"x60"					(Type 1) 48"x48"			(Type Special) 36"x36" 45"x36"		
					(Type 3) 60"x48"	(Type 23) 72"x30" 84"x24"		(Type 4) 48"x72" 48"x84"													

Notes:
1. Drill holes in addition to the hole pattern of the Standard Highway Sign Designs for Texas (SHSD) at specified locations to meet a stipulated-type mounting indicated in the parenthesis ( ).
2. "Blank" in the above table indicates all other signs excluded from stipulated mounting shall be mounted in accordance with SHSD.

(1) In lieu of welding, the Fabricator may bend bracing pipe elbows if the following conditions are met:
a. Spacing between vertical bracing pipes is equal to or greater than 2'-6".
b. Bending radius is 12".
c. The distance between the lowest clamp and centerline of horizontal bent pipe is 13" max.



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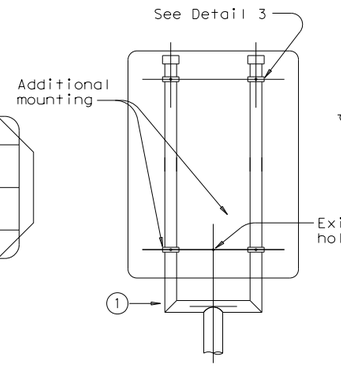
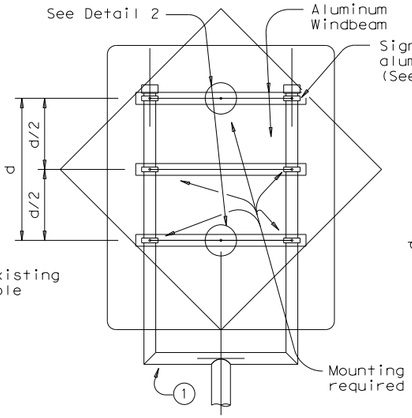
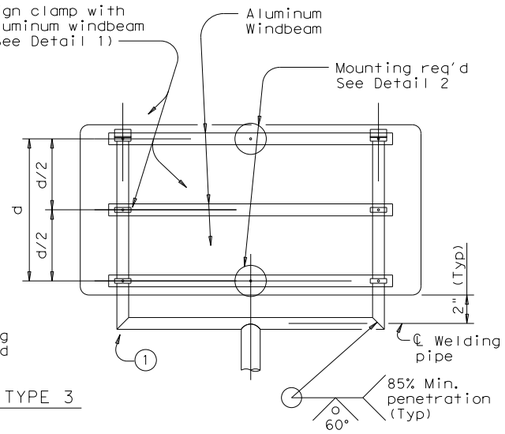
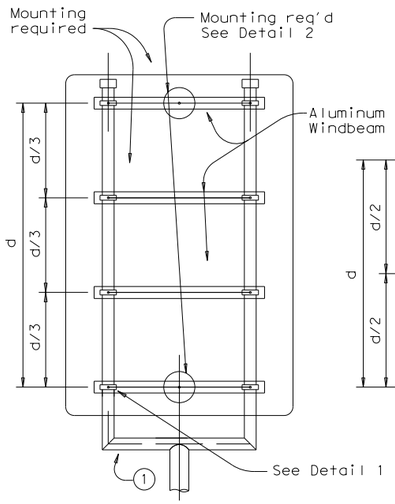


TYPE 2

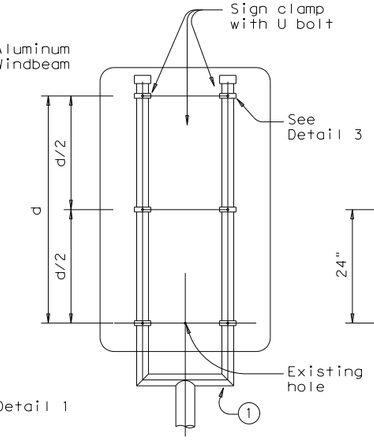


TYPE 3

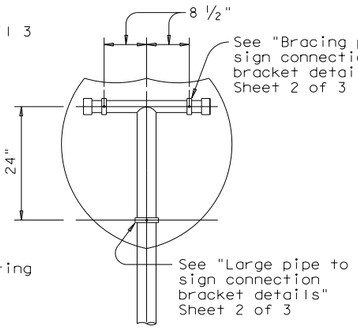




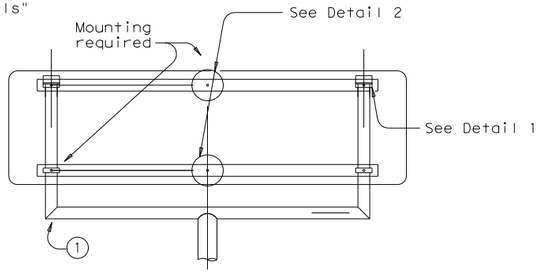
TYPE 4



TYPE 32



TYPE SPECIAL



TYPE 23

SHEET 3 OF 3

Texas Department of Transportation

Traffic Operations Division Standard

BRIDGE RAILING SIGN MOUNT DETAILS

SMD(BR)-14

FILE: smdbr-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		166C

DATE: 12/15/2022 3:00:38 AM
FILE: c:\pwe\01-01\jason.kane\dms25583\smdbr-14.dgn

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)

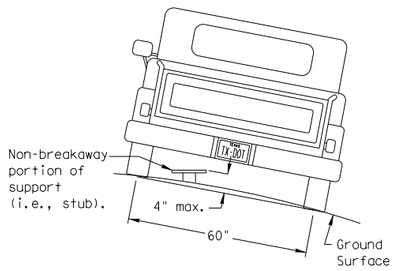
Anchor Type

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

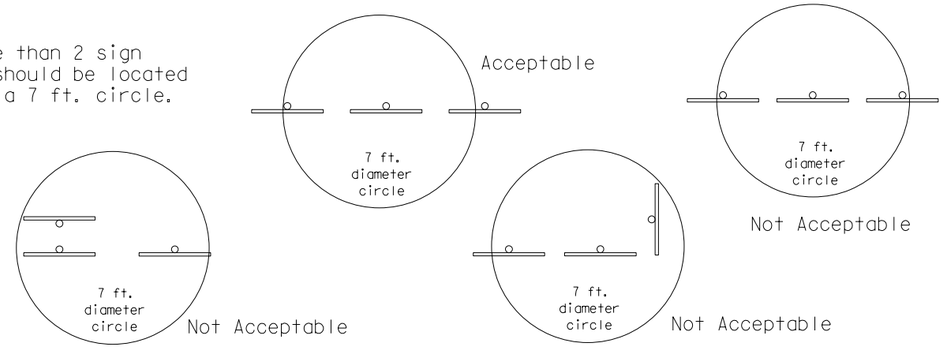
P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
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



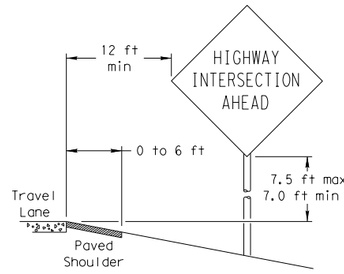
To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

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



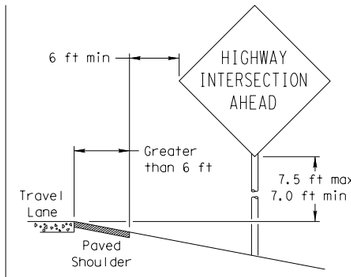
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

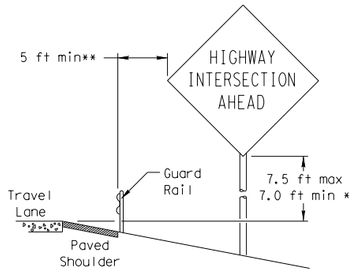
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



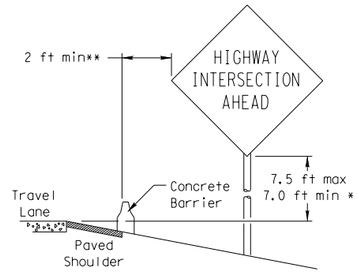
GREATER THAN 6 FT. WIDE

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.

BEHIND BARRIER



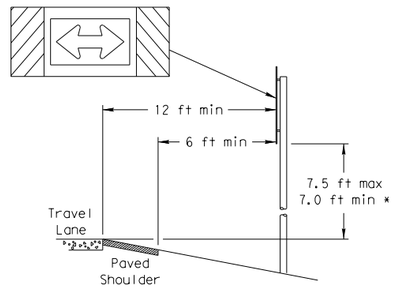
BEHIND GUARDRAIL



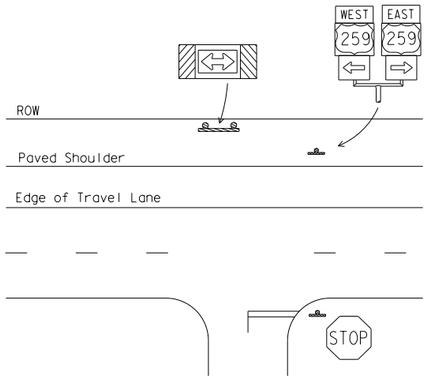
BEHIND CONCRETE BARRIER

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

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.



* 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.

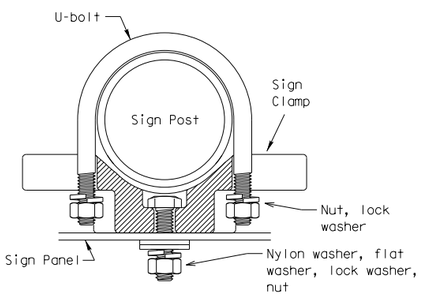
The maximum values may be increased when directed by the Engineer.

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

TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

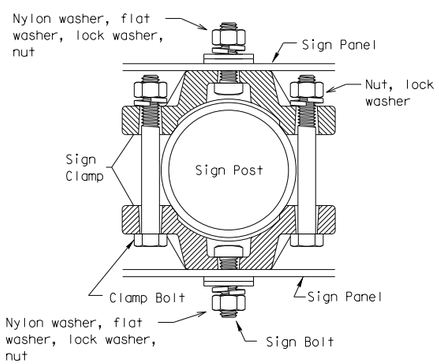


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

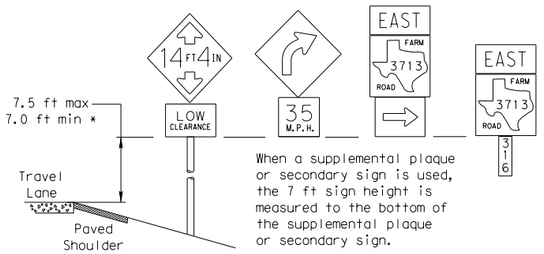
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



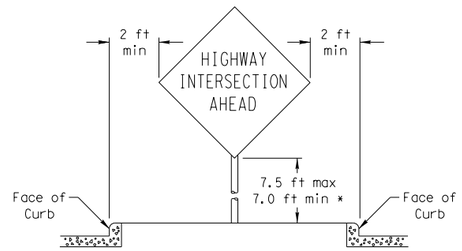
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



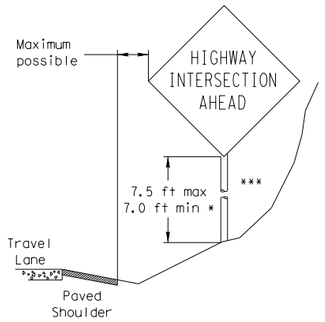
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



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

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

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

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

9-08 REVISIONS

CONT	SECT	JOB	HIGHWAY
0039	07	257	I69E
DIST	COUNTY		SHEET NO.
PHR	CAMERON		167

26A

DATE: 12/14/2022 8:46:50 AM
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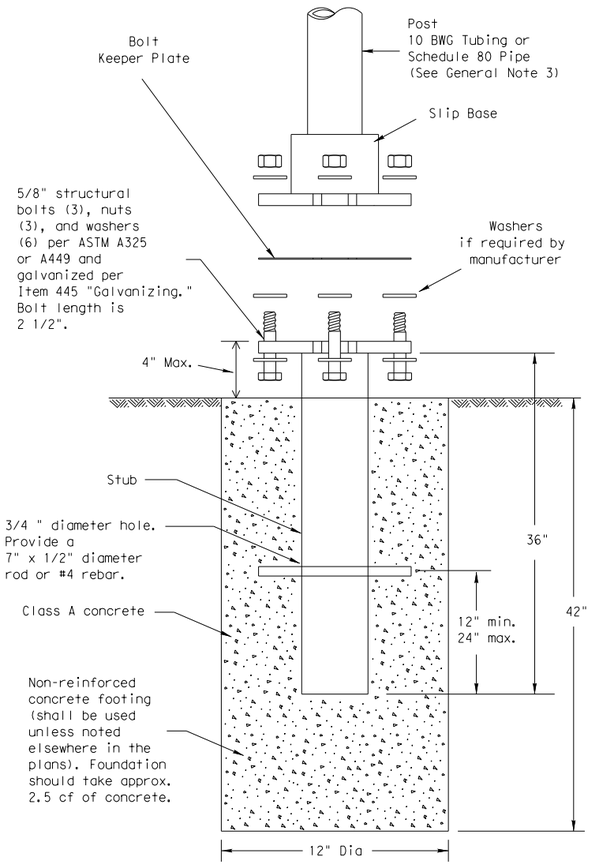
TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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:

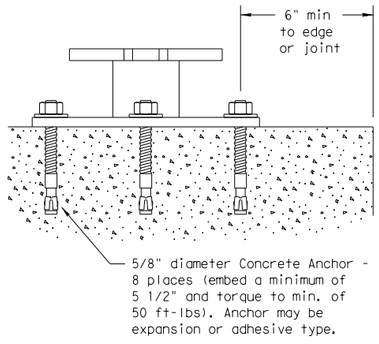
1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   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

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

REVISIONS
9-08

CONT	SECT	JOB	HIGHWAY
0039	07	257	I69E

DIST	COUNTY	SHEET NO.
PHR	CAMERON	168

26B

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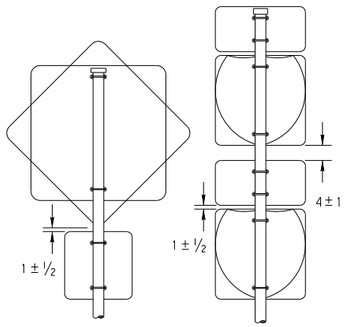
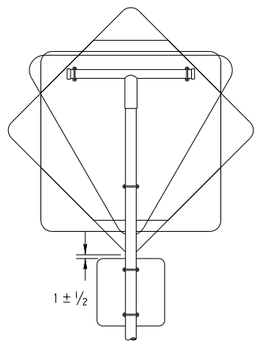


SM RD SGN ASSM TY XXXXX(1)XX(P)



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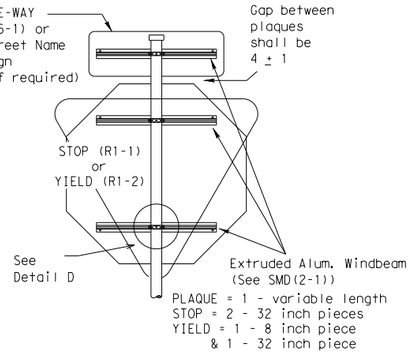
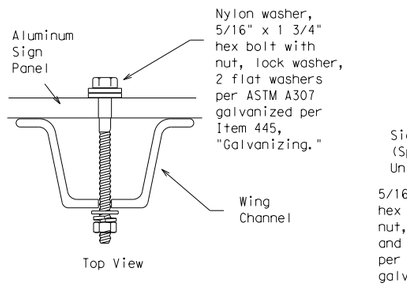
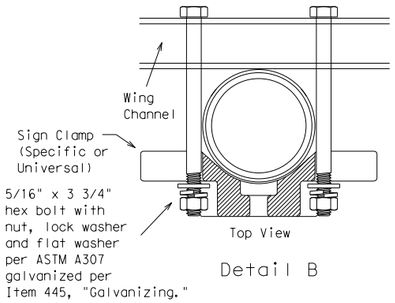


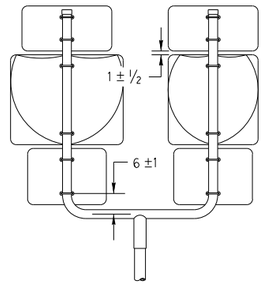
SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



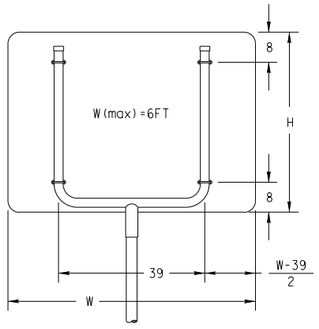
Detail A



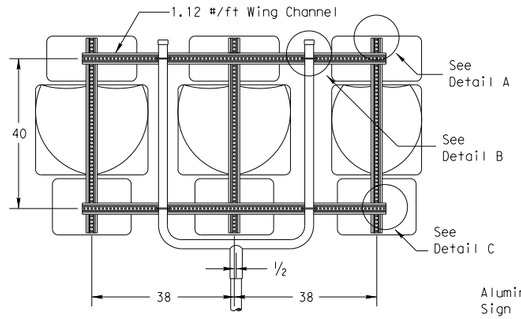
Detail B



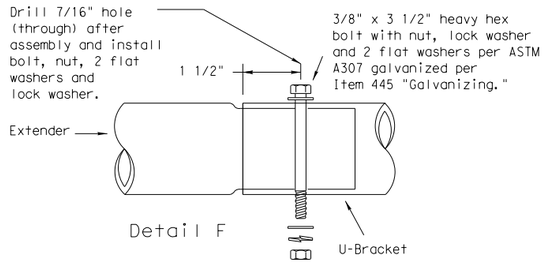
SM RD SGN ASSM TY XXXXX(1)XX(U)



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

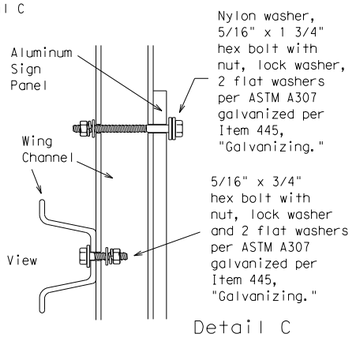


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

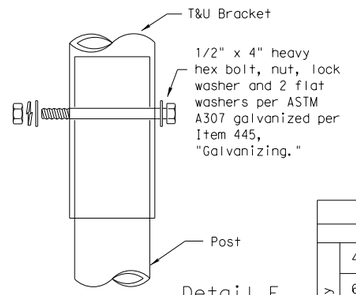


Detail F

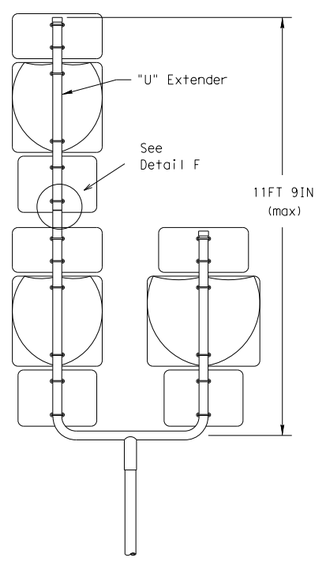
Splices shall only be allowed behind the sign substrate.



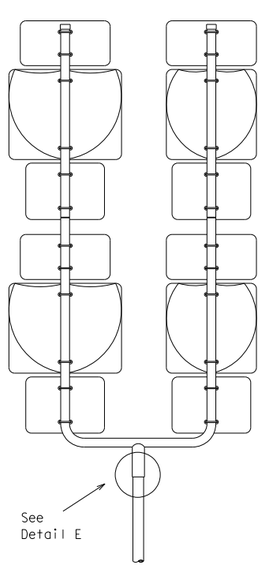
Detail C



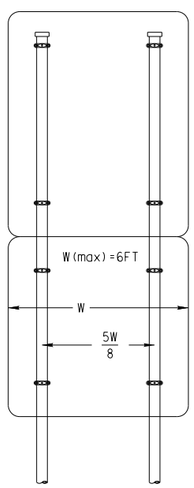
Detail E



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

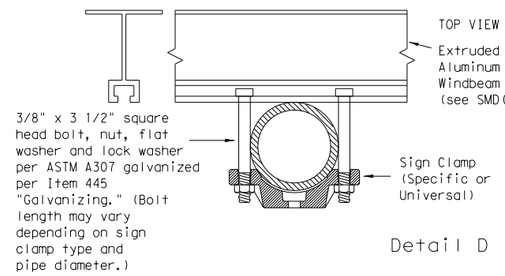


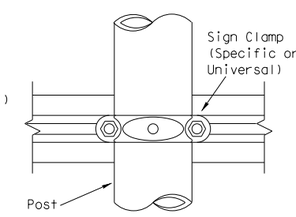
SM RD SGN ASSM TY S80(1)XX(U-2EXT)



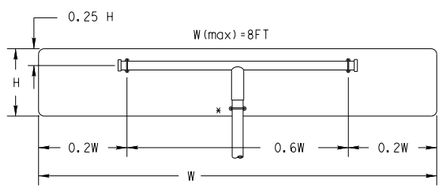
SM RD SGN ASSYM TY XXXXX(2)XX(P)

SIDE VIEW





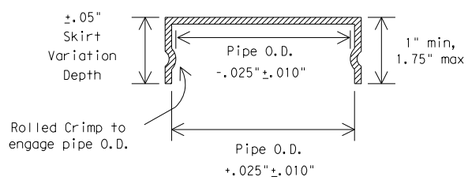
Detail D



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

All dimensions are in english unless detailed otherwise.

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.

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)

Texas Department of Transportation
Traffic Operations Division

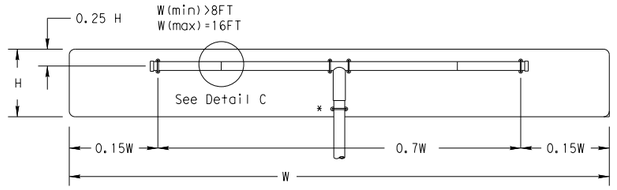
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0039	07	257	I69E
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		169

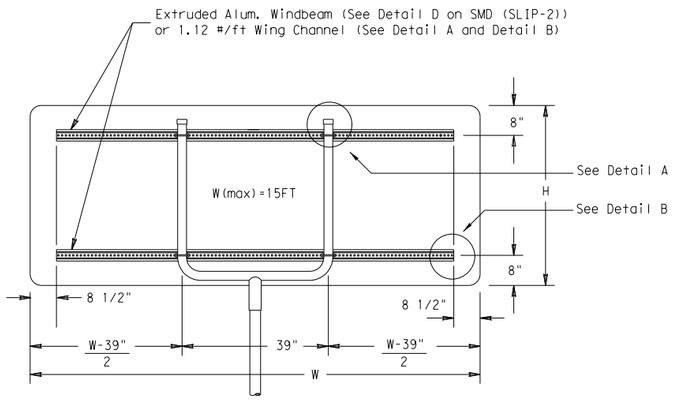
26C

DATE: 12/14/2022 8:46:59 AM
FILE: c:\bms\pwe101-01\stefa.staver-scul\dms25583\smds2.dgn

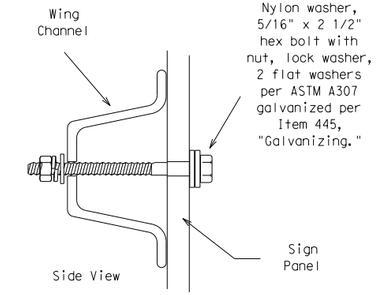


SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)

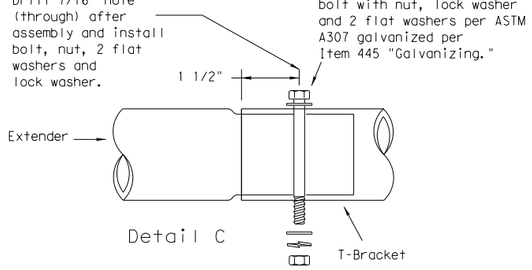
(* - See Note 12)



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

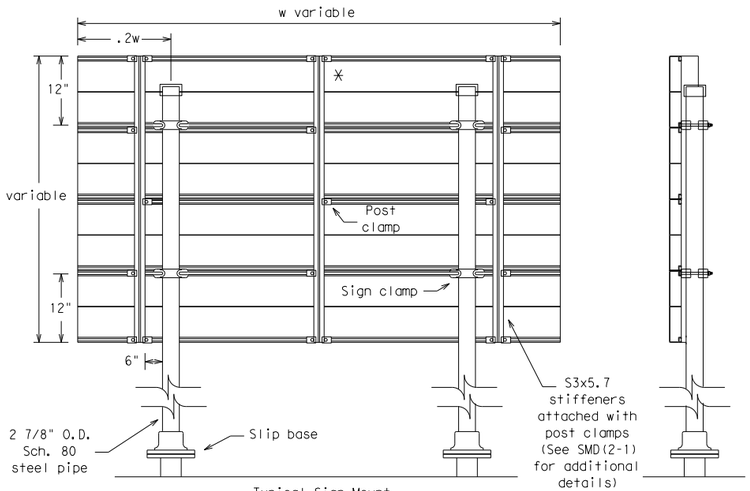


Detail B



Detail C

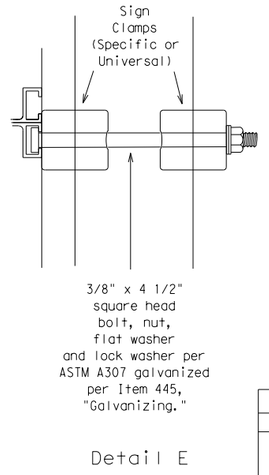
Splices shall only be allowed behind the sign substrate.



Typical Sign Mount

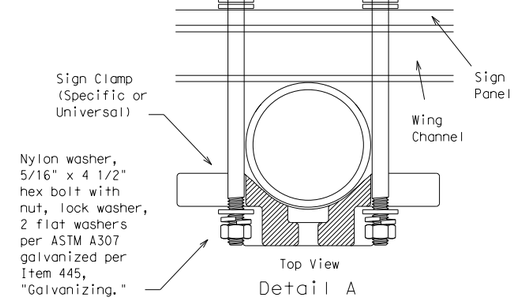
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

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

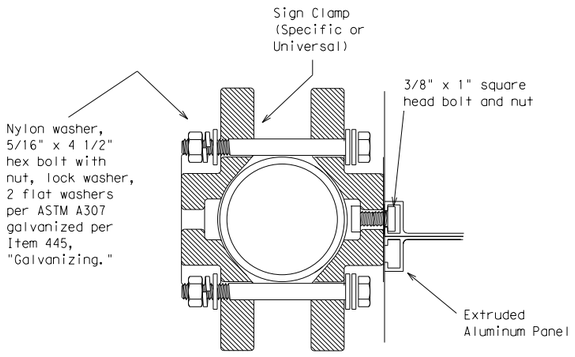


Detail E

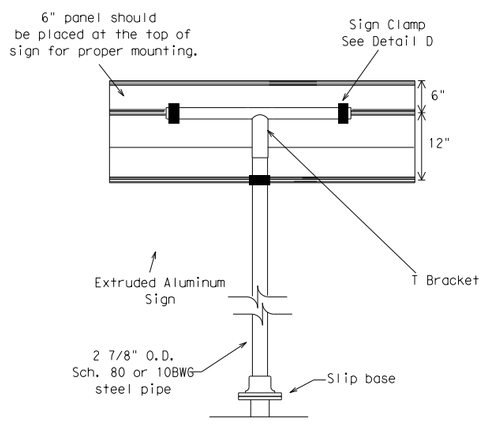
See Detail E for clamp installation



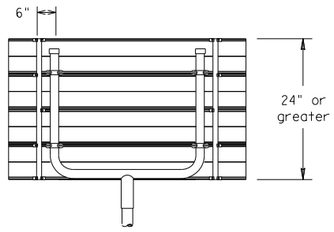
Detail A



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET



Extruded Aluminum Sign
With T Bracket



Use Extruded Alum. Windbeam as stiffeners
See SMD (2-1) for additional details

See Detail E
for clamp installation

GENERAL NOTES:

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Sign blanks shall be the sizes and shapes shown on the plans.
11. Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.

REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

REVISIONS
9-08

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

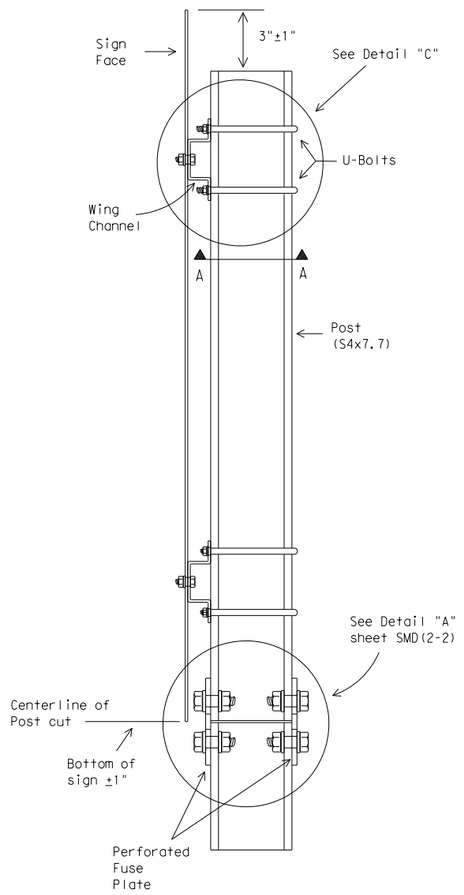
CONT	SECT	JOB	HIGHWAY
0039	07	257	I69E

DIST	COUNTY	SHEET NO.
PHR	CAMERON	170

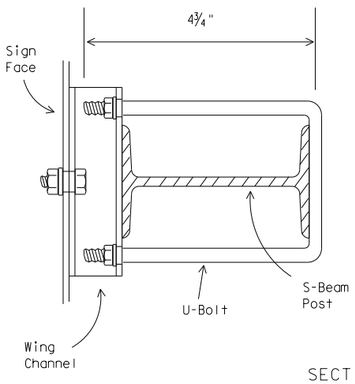
26D

DATE: 12/14/2022 8:47:03 AM
FILE: c:\bms\pwe101-01\stela.staver-scul1\dms25583\smds3.dgn

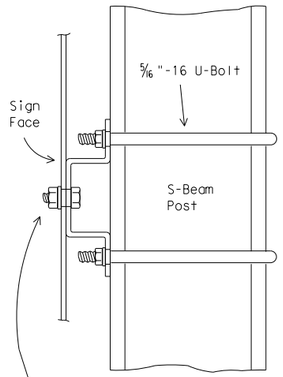
WING CHANNEL CLAMP DETAIL FOR TYPE G MOUNT



SIDE VIEW

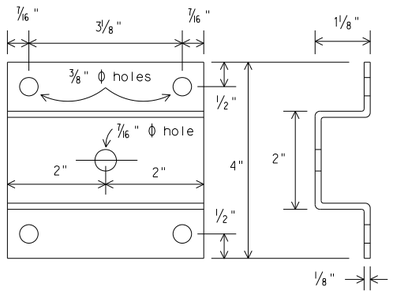


SECTION A-A



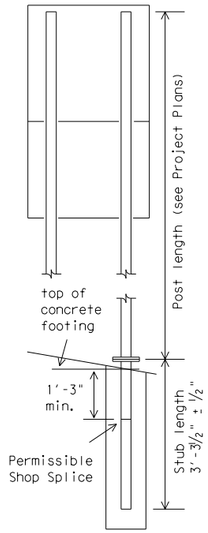
Galvanized steel or aluminum self-locking hex. head nut. 3/8 " - 16 x 3/4 " hex. head bolt for sheet metal. 3/8 " - 16 x 1 1/4 " hex. head bolt for plywood. 3/8 " galvanized medium washer.

DETAIL "C"

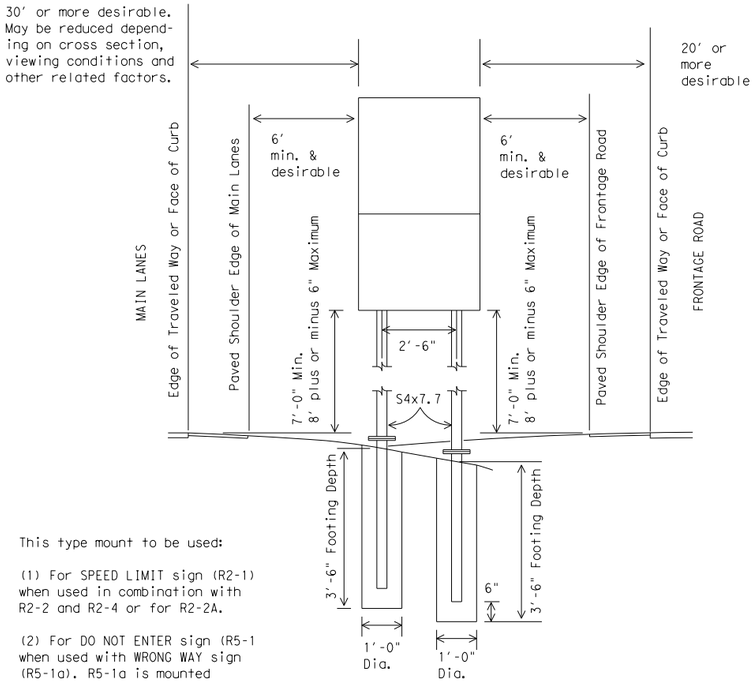


WING CHANNEL

Wing channel, 4" width x 1⅛" depth x ⅛" thickness, shall be aluminum (ASTM B221 6061-T6 or B308 6061-T6), galvanized steel (ASTM A36) or stainless steel (ASTM A167 type 304, No. 2B finish).



The weight of one S4x7.7 post is equal to 112.2 lbs. plus 7.7 lbs./ft x (post length in feet minus 10 ft). The weight of 112.2 lbs. includes 10 feet of post length, post foundation stub, related connection plates, friction fuse plate, and all high strength bolts, nuts and washers.



This type mount to be used:

(1) For SPEED LIMIT sign (R2-1) when used in combination with R2-2 and R2-4 or for R2-2A.

(2) For DO NOT ENTER sign (R5-1 when used with WRONG WAY sign (R5-1a). R5-1a is mounted above R5-1.

DEPARTMENTAL MATERIAL SPECIFICATIONS
SIGN HARDWARE — DMS-7120

GENERAL NOTES:

1. Design conforms with AASHTO Specifications for the design and construction of structural supports for highway signs.
2. Materials and fabrication shall conform to the requirements of the Department material specifications.
3. Structural steel shall be "Low-Alloy Steel" for non-bridge structures per Item 442, "Metal For Structures."
4. Parts shall be saw cut either before galvanizing and the galvanized cut cleaned of zinc build-up, or saw cut after galvanizing and the cut surface repaired per Item 445, "Galvanizing." (Cut surface will not be treated until plate is installed and all bolts fully tightened.)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS, TYPE G SUPPORT

SMD(TY G)-08

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

REVISIONS
1-97
9-08

CONT	SECT	JOB	HIGHWAY
0039	07	257	I69E

DIST	COUNTY	SHEET NO.
PHR	CAMERON	171

DATE: 12/14/2022 8:47:08 AM
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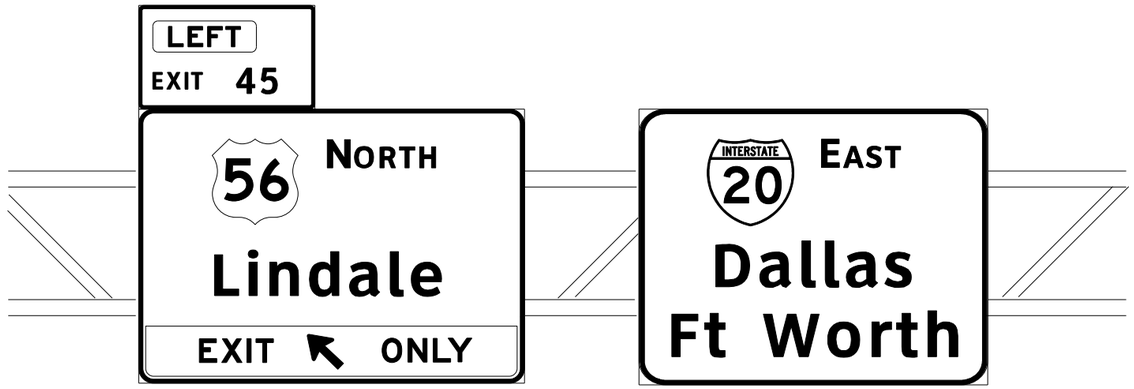
DATE: 12/14/2022 8:47:12 AM
FILE: c:\dms\pwe101-01\stella.stover-scull\dms25583\tsr1-13.dgn

REQUIREMENTS FOR OVERHEAD AND LARGE GROUND-MOUNTED SIGNS

TYPICAL EXAMPLES



GENERAL NOTES

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

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

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

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

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

http://www.txdot.gov/

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

Texas Department of Transportation

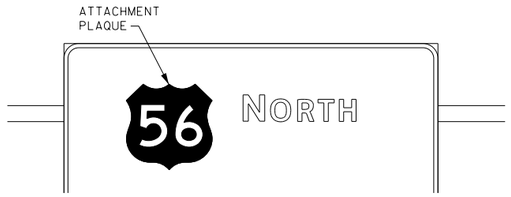
Traffic Operations Division Standard

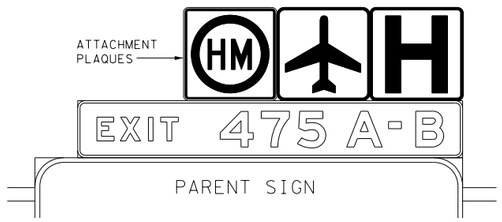
TYPICAL SIGN REQUIREMENTS

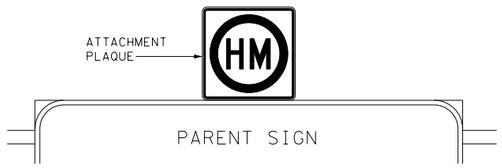
TSR(1)-13

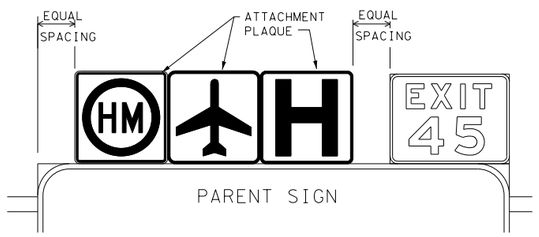
FILE: tsr1-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	PHR	CAMERON		172

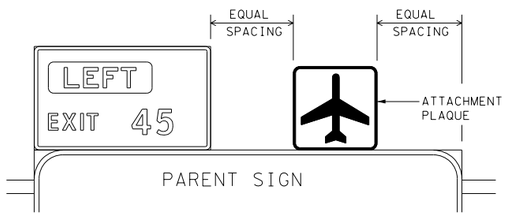
REQUIREMENTS FOR ATTACHMENTS TO OVERHEAD AND LARGE GROUND MOUNTED SIGNS









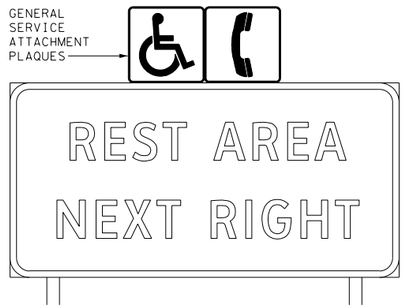


DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

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

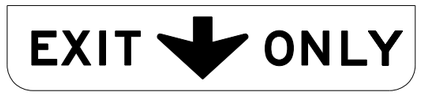


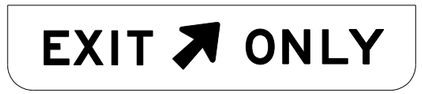
TYPICAL EXAMPLES

REQUIREMENTS FOR EXIT ONLY AND LEFT EXIT PANELS

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

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





TYPICAL EXAMPLES

GENERAL NOTES

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

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

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(2)-13

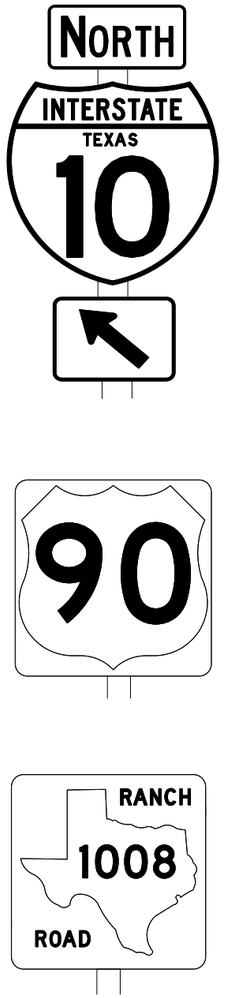
FILE: tsr2-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	PHR	CAMERON		173
2				

DATE: 12/14/2022 8:47:17 AM
FILE: c:\bms\pwe101-01\strela.staver-scull\dms25583\tsr2-13.dgn

DATE: 12/14/2022 8:47:22 AM
FILE: c:\bms\pwe101-01\stefa.staver-scull\dms25583\tsr3-13.dgn

REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

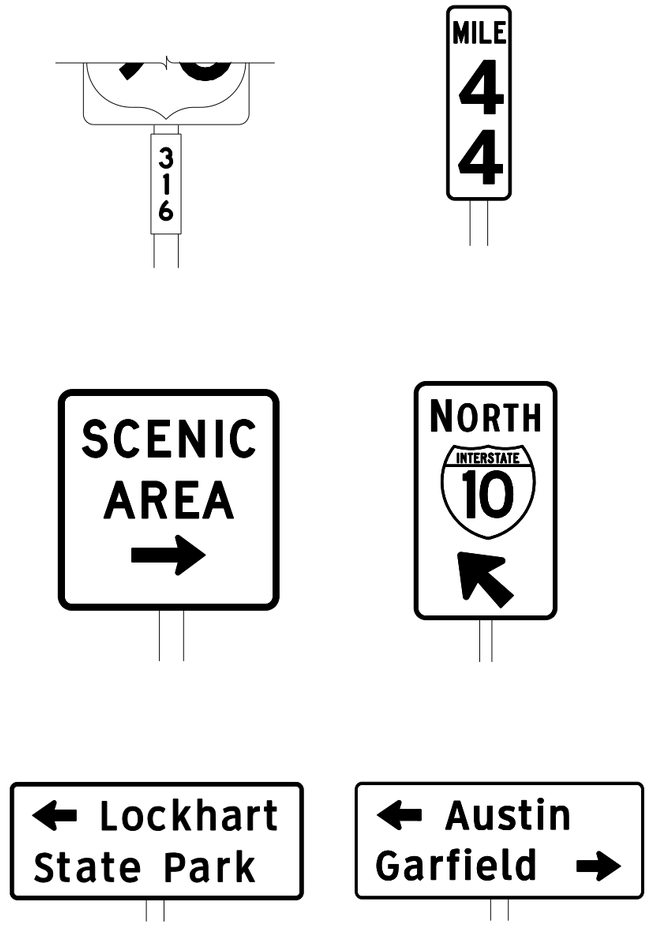
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



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

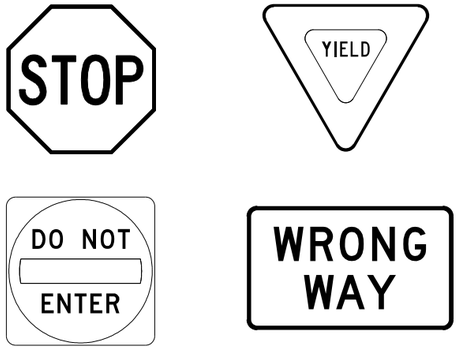
FILE: tsr3-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	PHR	CAMERON		174

3

DATE: 12/14/2022 8:47:26 AM
FILE: c:\bms\pwe101-01\strla.staver-scull\dms25583\tsr4-13.dgn

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

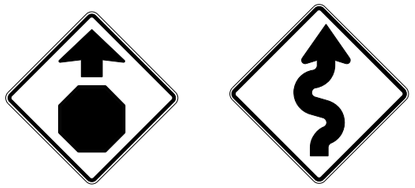
REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

(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

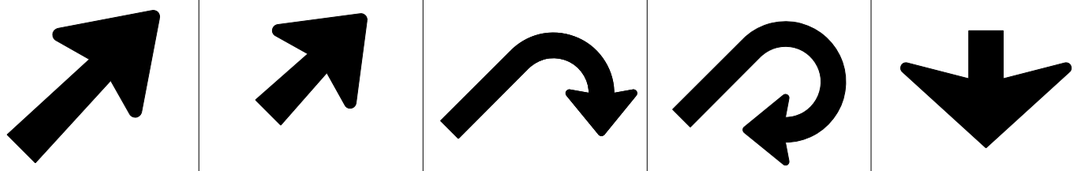
TSR(4)-13

FILE: tsr4-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
12-03 7-13 9-08	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		175

DATE: 12/14/2022 8:47:31 AM
FILE: c:\bms\pwe101-01\stella.stover-scull\dms25583\tsr5-13.dgn

ARROW DETAILS

for Large Ground-Mounted and Overhead Guide Signs



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

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

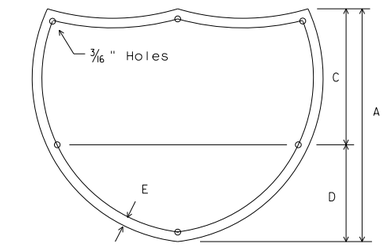
NOTE

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

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

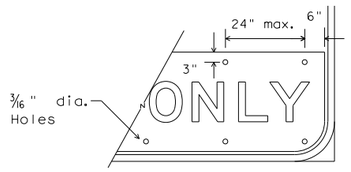
http://www.txdot.gov/

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

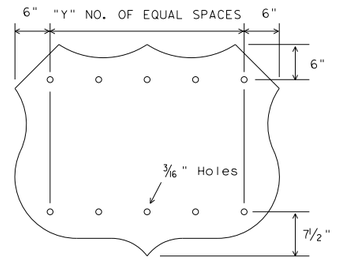


INTERSTATE ROUTE MARKERS

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

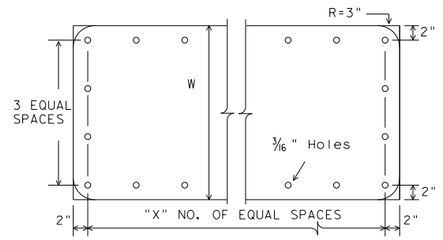


EXIT ONLY PANEL



U.S. ROUTE MARKERS

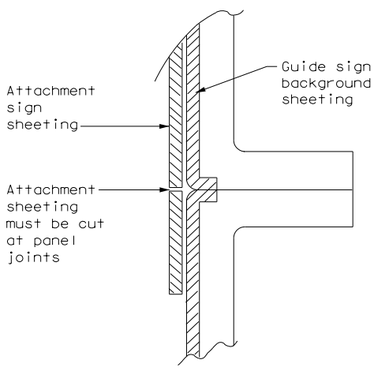
Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



STATE ROUTE MARKERS

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

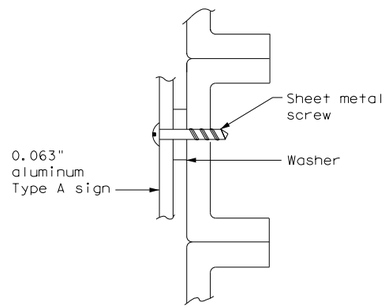
MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



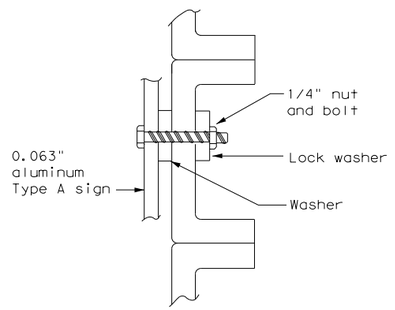
DIRECT APPLIED ATTACHMENT

NOTE:

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



SCREW ATTACHMENT



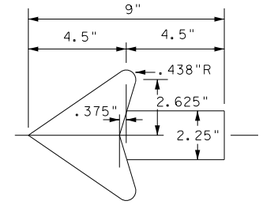
NUT/BOLT ATTACHMENT

NOTE:

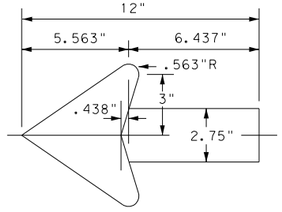
Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

ARROW DETAILS

for Destination Signs (Type D)



Standard arrow to be used with 6 inch letters.



Standard arrow to be used with 8 inch letters.

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(5)-13

FILE: tsr5-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	PHR	CAMERON		176

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DATE: 12/14/2022 8:47:36 AM
FILE: c:\bms\pwe101-01\stela.staver-scull\dms25583\windice.dgn

NOTE: Structures north of ice line to be designed for ice.

ICE LINE

ZONE 2
(90 MPH WIND)

ZONE 3
(80 MPH WIND)

ZONE 4
(70 MPH WIND)

ZONE 4
(70 MPH WIND)

ICE LINE

ZONE 3
(80 MPH WIND)

ZONE 1
(100 MPH WIND)

LEGEND

ZONE 1 - = (100 MPH WIND)
ZONE 2 - = (90 MPH WIND)
ZONE 3 - = (80 MPH WIND)
ZONE 4 - = (70 MPH WIND)
= (ICE LINE)
= (DISTRICT LINES)

WIND VELOCITY & ICE ZONES FOR APPLICABLE OVERHEAD SIGN SUPPORTS, HIGH MAST POLES, AND TRAFFIC SIGNAL POLES

Based on 50 Year Mean Recurrence Interval of Fastest Mile Wind Velocity at 33 feet height.

THIS SHEET TO BE INCLUDED IN ALL P.S.&E. PACKAGES CONTAINING ONE OR MORE OF THE APPLICABLE STANDARD SHEETS LISTED HEREON

APPLICABLE STANDARDS SHEETS

OVERHEAD SIGN BRIDGE STANDARDS:

OSB-SE
OSB-Z#
OSB-Z#1
HOSB-Z#
HOSB-Z1L
HOSB-Z#1
OSBT
OSBC
OSBC-SC-Z#
OSBS-SC
OSB-FD
OSB-FD-SC

CANTILEVER OVERHEAD SIGN SUPPORT STANDARDS:

COSS-SE
COSS-Z#-10
HCOSS-Z#-10
COSS-Z21-10
COSS-Z#&Z#1-10
COSSD
COSSF
COSS-FD

Note: # = Wind Zone number 1, 2, 3 or 4

HIGH MAST ILLUMINATION POLE STANDARDS:

HMIP-98
HMIF-98

WALKWAYS AND BRACKETS STANDARDS:

SWW
SB(SWL-1)

TRAFFIC SIGNAL POLE STANDARDS:

SP-80
SP-100
SMA-80
SMA-100
DMA-80
DMA-100
MA-C
MAC(ILSN)
MAD-D
TS-FD
LUM-A
CFA
LMA
TS-C
MA-DPD

FOR HARRIS CO. ONLY
Zone line is just North of US 90, around on the North, West and South sides of IH 610 and down the West side of SH 288.

FOR JACKSON CO. ONLY
Zone line is just North of SH 616.

Texas Department of Transportation

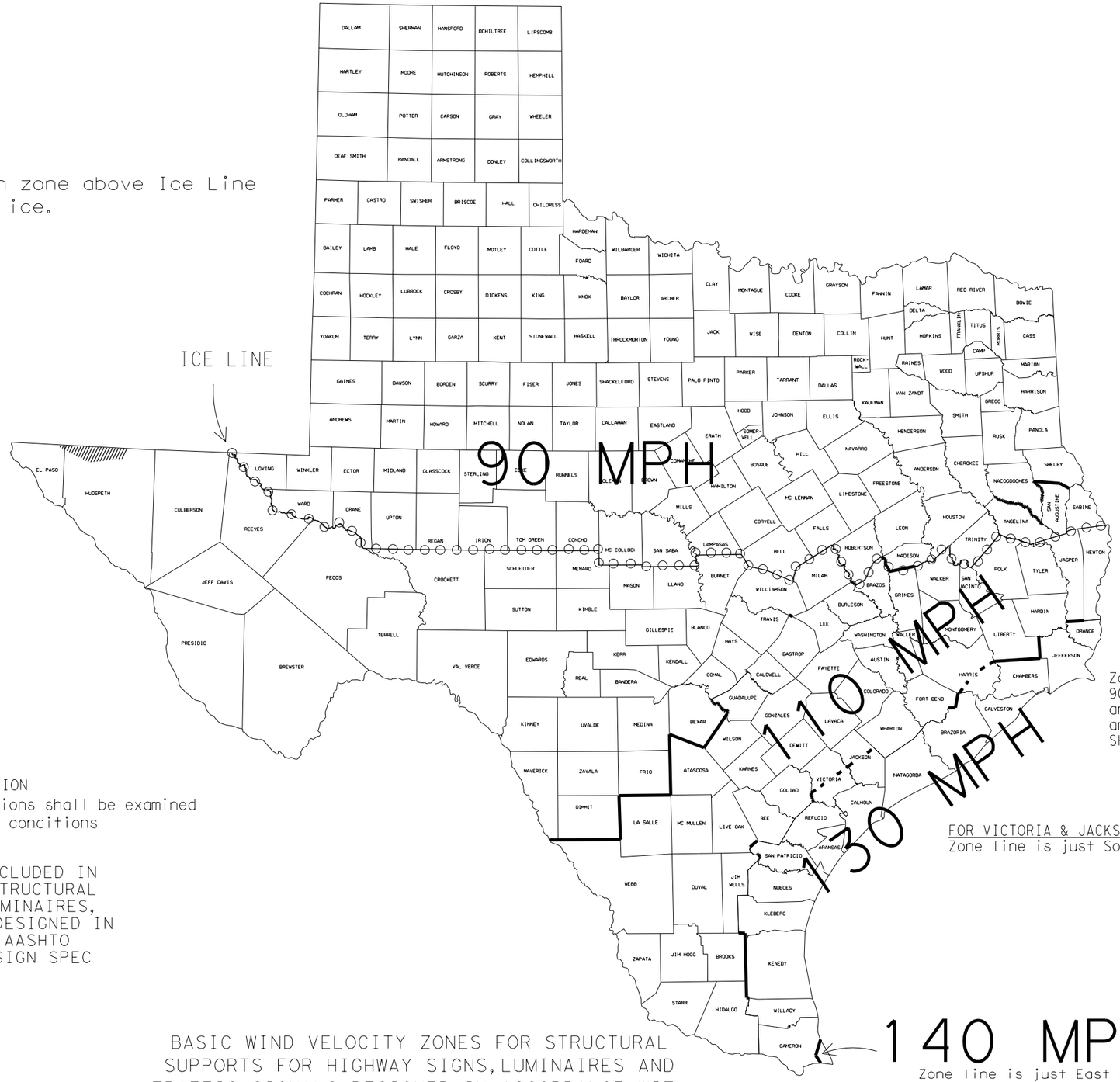
Traffic Operations Division Standard

WIND VELOCITY AND ICE ZONES

WV & IZ-14

FILE: windice.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 1996	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
8-14-Added list of applicable standards, restricting use to structures designed for Fastest Mile wind speeds.	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		177

NOTE: Structures in zone above Ice Line to be designed for ice.



SPECIAL WIND REGION
Special wind regions shall be examined for unusual wind conditions

THIS SHEET IS TO BE INCLUDED IN ALL P.S.&E.'s HAVING STRUCTURAL SUPPORTS FOR SIGNS, LUMINAIRES, AND/OR TRAFFIC SIGNALS DESIGNED IN ACCORDANCE WITH THE AASHTO 2001 THRU 2013 LTS DESIGN SPEC

FOR HARRIS CO. ONLY
Zone line is just North of US 90, around on the North, West and South sides of IH 610 and down the West side of SH 288.

FOR VICTORIA & JACKSON COUNTIES ONLY
Zone line is just South of US 59.

140 MPH
Zone line is just East of both CO 1847 & FM 511

BASIC WIND VELOCITY ZONES FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS DESIGNED IN ACCORDANCE WITH THE AASHTO 2001 THRU 2013 LTS DESIGN SPEC

Values are nominal design 3-sec gust wind speeds in mph at 33 ft above ground for Exposure C category. (50-year mean recurrence interval)

NOTE: AASHTO 2001 THRU 2013 LTS DESIGN SPEC =AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 4th thru 6th Edition

Texas Department of Transportation

Traffic Operations Division Standard

WIND VELOCITY AND ICE ZONES (AASHTO 2001-2013 LTS DESIGN SPEC)

WV & IZ(LTS2013)-14

FILE:	lts2013.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	August 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS		0039	07	257	I69E
		DIST	COUNTY		SHEET NO.
		PHR	CAMERON		178

30B

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GENERAL NOTES:

1. PURPOSE: TO INVESTIGATE, INTERPRET, AND DEPICT EXISTING UTILITIES AS PER THE SCOPE OF WORK NEGOTIATED BETWEEN LAMB-STAR ENGINEERING, LLC. AND THE CLIENT, WITHIN CLIENT SPECIFIC CORRIDORS.

2. THE UTILITIES DEPICTED ARE THE RESULTS OF THE UTILITY INVESTIGATION AS IDENTIFIED USING APPROPRIATE INDUSTRY STANDARD DETECTION METHODOLOGIES IN ACCORDANCE WITH THE AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE) STANDARD GUIDELINE FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA. QUALITY LEVELS AND DEFINITIONS PER CI/ASCE STANDARD NO. 38-02.

3. RELIANCE UPON THIS DATA FOR RISK MANAGEMENT PURPOSES DOES NOT RELIEVE ANYONE FROM FOLLOWING ALL APPLICABLE UTILITY DAMAGE PREVENTION STATUTES, POLICIES, AND/OR PROCEDURES DURING DESIGN OR CONSTRUCTION.

4. UTILITY LOCATIONS ON THESE DRAWINGS ARE INTENDED FOR DESIGN PURPOSES AND NOT CONSTRUCTION. THEY REFLECT SUBSURFACE UTILITIES BASED ON INFORMATION PROVIDED BY OTHERS.

5. QUALITY LEVEL "D" - QL-D - DEPICTED ACCORDING TO UTILITY RECORD INFORMATION AND IN-FIELD VISUAL INSPECTION. NO ELECTRONIC DESIGNATING INFORMATION WAS OBTAINED. UTILITIES WITH A QL-D LABEL ARE DEPICTED ON THE PLANS USING PROFESSIONAL JUDGMENT IN INTERPRETING THIRD-PARTY RECORDS OR OTHER INFORMATION.

6. QUALITY LEVEL "C" - QL-C - EXISTING UTILITY SURFACE FEATURES HAVE BEEN FIELD LOCATED AND SURVEYED TO ASSIST IN THE DEPICTING OF THE UTILITIES SHOWN ON THE RECORDS. NO ELECTRONIC DESIGNATING INFORMATION WAS OBTAINED. UTILITIES WITH A QL-C LABEL ARE DEPICTED BASED ON PROFESSIONAL JUDGMENT OF THE CORRELATION OF THE SURVEYED SURFACE FEATURES AND THE UTILITY RECORDS RECEIVED.

7. QUALITY LEVEL "B" - QL-B - INFORMATION WAS OBTAINED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF THE SUBSURFACE UTILITIES. QL-B DATA SHOULD BE REPRODUCIBLE BY SURFACE GEOPHYSICS AT ANY POINT OF THEIR DEPICTION. UTILITIES WITH A QL-B LABEL ARE DEPICTED ON THE PLANS USING PROFESSIONAL JUDGMENT IN SELECTING AND INTERPRETING APPROPRIATE GEOPHYSICAL DATA, SURVEYING TO APPROPRIATE PROJECT ACCURACIES, AND USING PROFESSIONAL JUDGMENT TO CORRELATE THIRD-PARTY RECORDS OR OTHER INFORMATION, IF AVAILABLE, TO THESE QL-B DEPICTIONS.

8. QUALITY LEVEL "A" - QL-A - OBTAIN PRECISE HORIZONTAL AND VERTICAL POSITION OF THE UTILITY LINE BY EXCAVATING A TEST HOLE. THE TEST HOLE SHALL BE DONE USING VACUUM EXCAVATION OR COMPARABLE NON-DESTRUCTIVE EQUIPMENT IN A MANNER AS TO CAUSE NO DAMAGE TO UTILITY LINE. UNLESS OTHERWISE NOTED, ALL SIZES OF QL-A PIPES AND CONDUITS WILL BE PROVIDED AS OUTER DIAMETER (O.D.) RATHER THAN NOMINAL SIZE OR INSIDE DIAMETER.

9. UTILITIES SHOWN OUTSIDE OF LIMITS OF INVESTIGATION ARE FOR REFERENCE ONLY. THESE UTILITIES ARE SHOWN FOR GENERAL INFORMATION USE DURING UTILITY COORDINATION, BUT THEY HAVE NOT BEEN VERIFIED AS BEING COMPLETE OR ACCURATE.

10. UTILITY SIZE AND TYPE ARE DETERMINED THROUGH AVAILABLE UTILITY OWNER INFORMATION OR FIELD OBSERVATIONS; UTILITIES LABELED AS UNKNOWN HAVE NO CORRELATED RECORDS OR VISIBLE APPURTENANCES TO DETERMINE FUNCTION OR TYPE.

11. IT IS IMPORTANT THAT THE CONTRACTOR INVESTIGATES AND UNDERSTANDS THE SCOPE OF WORK BETWEEN THE PROJECT OWNER AND THEIR ENGINEER REGARDING THE SCOPE AND LIMITS OF THE UTILITY INVESTIGATIONS LEADING TO THESE UTILITY DEPICTIONS.

12. "END OF INFORMATION" (EOI) SIGNIFIES GEOPHYSICAL EQUIPMENT LOST THE SIGNAL OF THE TARGET UTILITY AND THE LINE WAS UNABLE TO BE DESIGNATED ANY FURTHER. LINES SHOWING AN EOI SYMBOL CONTINUE ON OR MAY STOP. POSITIVE VERIFICATION BY EXCAVATION IS REQUIRED TO CONFIRM PRESENCE BEYOND END OF SIGNAL.

13. STORM SEWER EXCLUDED FROM SCOPE OF INVESTIGATION.

14. UTILITY MAPPING WAS COMPLETED IN THE FIELD 03/25/2022. UTILITIES MAY HAVE BEEN CHANGED OR ADDED AFTER THIS DATE.

15. HORIZONTAL DATUM: TEXAS SOUTH 4205

16. VERTICAL DATUM: NAD 1983 (CONUS)

17. SURFACE ADJUSTMENT FACTOR: 0.999960

18. SIZE AND MATERIAL OF UTILITIES ARE UNKNOWN UNLESS OTHERWISE SPECIFIED.

LEGEND OF UTILITY TYPES

GENERAL
- LIMITS OF INVESTIGATION
- UTILITY CONTINUES
- UTILITY TERMINATES
- QL-B SIGNAL LOST

COMMUNICATIONS
- SPECTRUM CATV (QL-B) — TV1
- SPECTRUM OH FIBER — OFO1
- SPECTRUM FIBER (QL-B) — FO3
- SPECTRUM FIBER (QL-D) — FO3(D)
- ATT TRANSISION FIBER (QL-B) — FO2
- ATT TRANSISION FIBER (QL-D) — FO2(D)
- ATT TELEPHONE (QL-B) — T1
- ATT TELEPHONE (QL-D) — T1(D)

GAS
- TEXAS GAS SERVICE (QL-B) — G1
- TEXAS GAS SERVICE (QL-D) — G1(D)

ELECTRIC
- TXDOT TRAFFIC SIGNAL (QL-B) — TS1

WATER/SANITARY SEWER
- HARLINGEN WATER WORKS (QL-B) — W1
- HARLINGEN WATER WORKS (QL-D) — W1(D)
- POWER POLE (PP)
- TRAFFIC PULL BOX (TB)
- GAS VALVE (GV)
- FIRE HYDRANT
- WATER METER (WM)
- WATER VALVE (WV)
- GRATE INLET (GI)
- MANHOLE-STORM (SD)
- UNDERGROUND FIBER MARKER (F)
- MANHOLE-FIBER (F)
- MANHOLE-TELEPHONE (T)

NO.	DATE	REVISION	APPROVED
1	12/22	REVISED SHEET NUMBERS	DWS

STATE OF TEXAS
DAKOTA W. SMITH
133272
LICENSED PROFESSIONAL ENGINEER
12/14/2022

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Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
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3801 PARKWOOD BOULEVARD, SUITE 550
FRISCO, TEXAS 75034 (214) 440-3600
TEXAS REGISTERED ENGINEERING FIRM F-9073

IH 69E
NOTES/LEGEND
LAYOUT

BEGIN TO STA 1094+00

SHEET 1 OF 1

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
BWG	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
--	TEXAS	PHARR	CAMERON	179
CHECKED	CONT.	SECT.	JOB	
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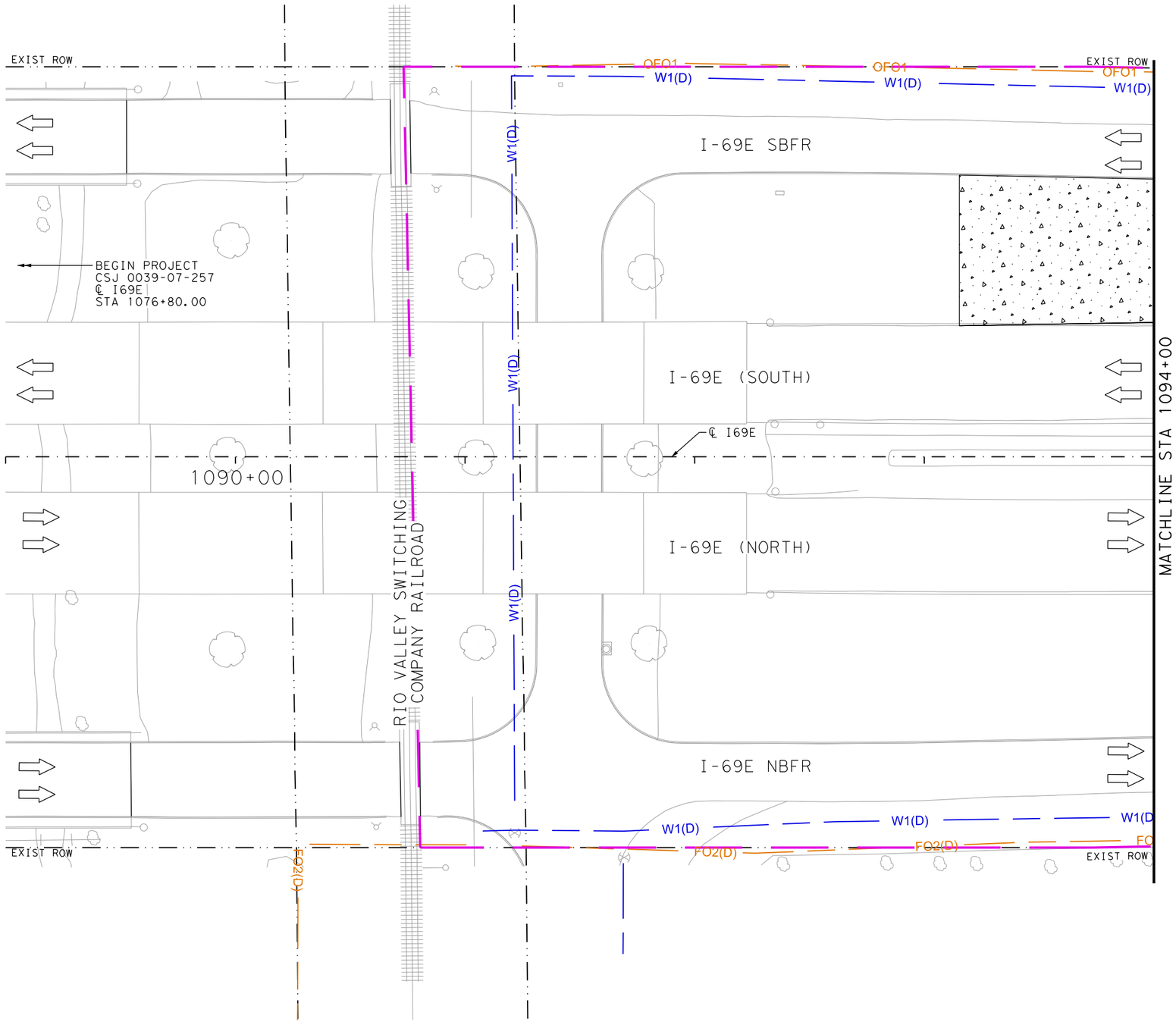
APPROVED				
DWS				



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HORIZ. SCALE IN FEET

LEGEND OF UTILITY TYPES

GENERAL
- LIMITS OF INVESTIGATION
- UTILITY CONTINUES
- UTILITY TERMINATES
- QL-B SIGNAL LOST

COMMUNICATIONS
- SPECTRUM CATV (QL-B) — TV1
- SPECTRUM OH FIBER — OFO1
- SPECTRUM FIBER (QL-B) — FO3
- SPECTRUM FIBER (QL-D) — FO3(D)
- ATT TRANSISION FIBER (QL-B) — FO2
- ATT TRANSISION FIBER (QL-D) — FO2(D)
- ATT TELEPHONE (QL-B) — T1
- ATT TELEPHONE (QL-D) — T1(D)

GAS
- TEXAS GAS SERVICE (QL-B) — G1
- TEXAS GAS SERVICE (QL-D) — G1(D)

ELECTRIC
- TXDOT TRAFFIC SIGNAL (QL-B) — TS1

WATER/SANITARY SEWER
- HARLINGEN WATER WORKS (QL-B) — W1
- HARLINGEN WATER WORKS (QL-D) — W1(D)
- POWER POLE
- TRAFFIC PULL BOX
- GAS VALVE
- FIRE HYDRANT
- WATER METER
- WATER VALVE
- GRATE INLET
- MANHOLE-STORM
- UNDERGROUND FIBER MARKER
- MANHOLE-FIBER
- MANHOLE-TELEPHONE

NO.	DATE	REVISION	APPROVED
1	12/22	REVISED SHEET NUMBERS	DWS

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TEXAS REGISTERED ENGINEERING FIRM F-9073

IH 69E
EXISTING UTILITIES LAYOUT
BEGIN TO STA 1094+00

SHEET 1 OF 9

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
BWG	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
--	TEXAS	PHARR	CAMERON	180
CHECKED	CONT.	SECT.	JOB	
CC	0039	07	257	
APPROVED				
DWS				

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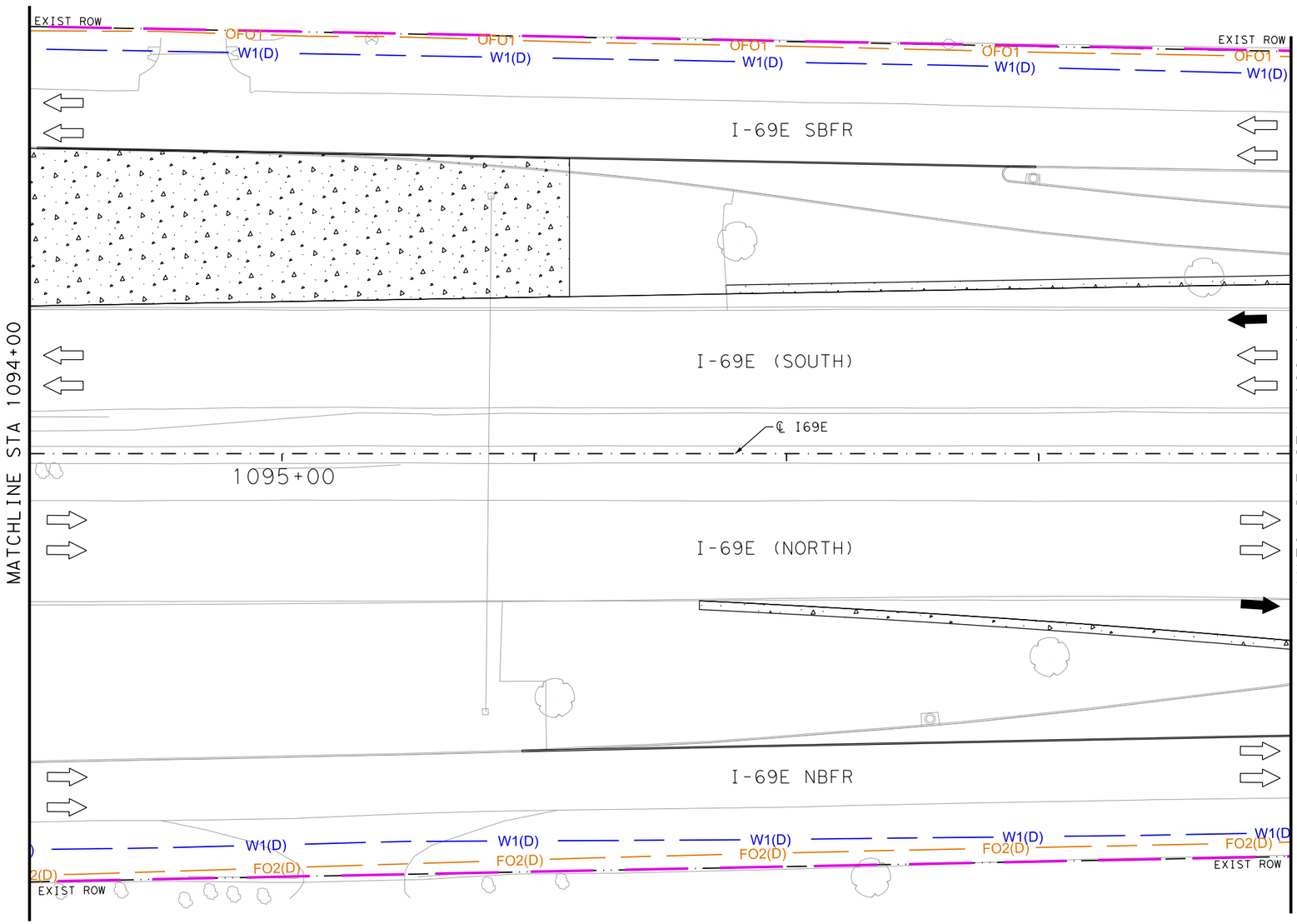

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HORIZ. SCALE IN FEET

LEGEND OF UTILITY TYPES

GENERAL
- LIMITS OF INVESTIGATION
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COMMUNICATIONS
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- ATT TRANSISION FIBER (QL-B) — FO2
- ATT TRANSISION FIBER (QL-D) — FO2(D)
- ATT TELEPHONE (QL-B) — T1
- ATT TELEPHONE (QL-D) — T1(D)

GAS
- TEXAS GAS SERVICE (QL-B) — G1
- TEXAS GAS SERVICE (QL-D) — G1(D)

ELECTRIC
- TXDOT TRAFFIC SIGNAL (QL-B) — TS1

WATER/SANITARY SEWER
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1	12/22	REVISED SHEET NUMBERS	DWS

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12/14/2022

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IH 69E
EXISTING UTILITIES LAYOUT
STA 1094+00 TO STA 1099+00

SHEET 2 OF 9

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
BWG	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
--	TEXAS	PHARR	CAMERON	181
CHECKED	CONT.	SECT.	JOB	
CC	0039	07	257	
APPROVED				
DWS				

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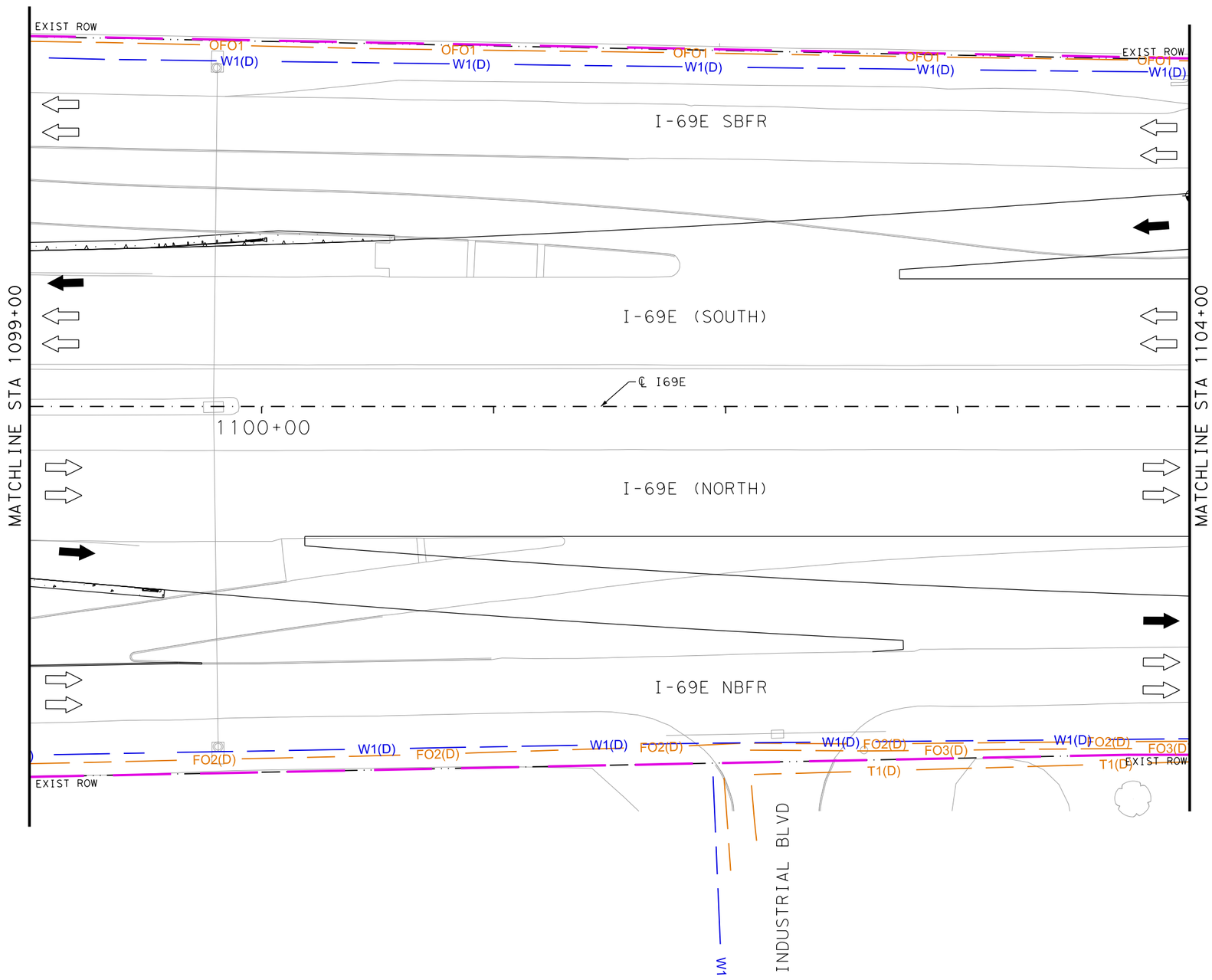

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HORIZ. SCALE IN FEET

LEGEND OF UTILITY TYPES

GENERAL

- LIMITS OF INVESTIGATION
- UTILITY CONTINUES
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- QL-B SIGNAL LOST

COMMUNICATIONS

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GAS

- TEXAS GAS SERVICE (QL-B) — G1
- TEXAS GAS SERVICE (QL-D) — G1(D)

ELECTRIC

- TXDOT TRAFFIC SIGNAL (QL-B) — TS1

WATER/SANITARY SEWER

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NO.	DATE	REVISION	APPROVED
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12/14/2022

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TEXAS REGISTERED ENGINEERING FIRM F-9073

IH 69E
EXISTING UTILITIES LAYOUT
STA 1099+00 TO STA 1104+00

SHEET 3 OF 9

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
BWG	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
--	TEXAS	PHARR	CAMERON	182
CHECKED	CONT.	SECT.	JOB	
CC	0039	07	257	
APPROVED				
DWS				

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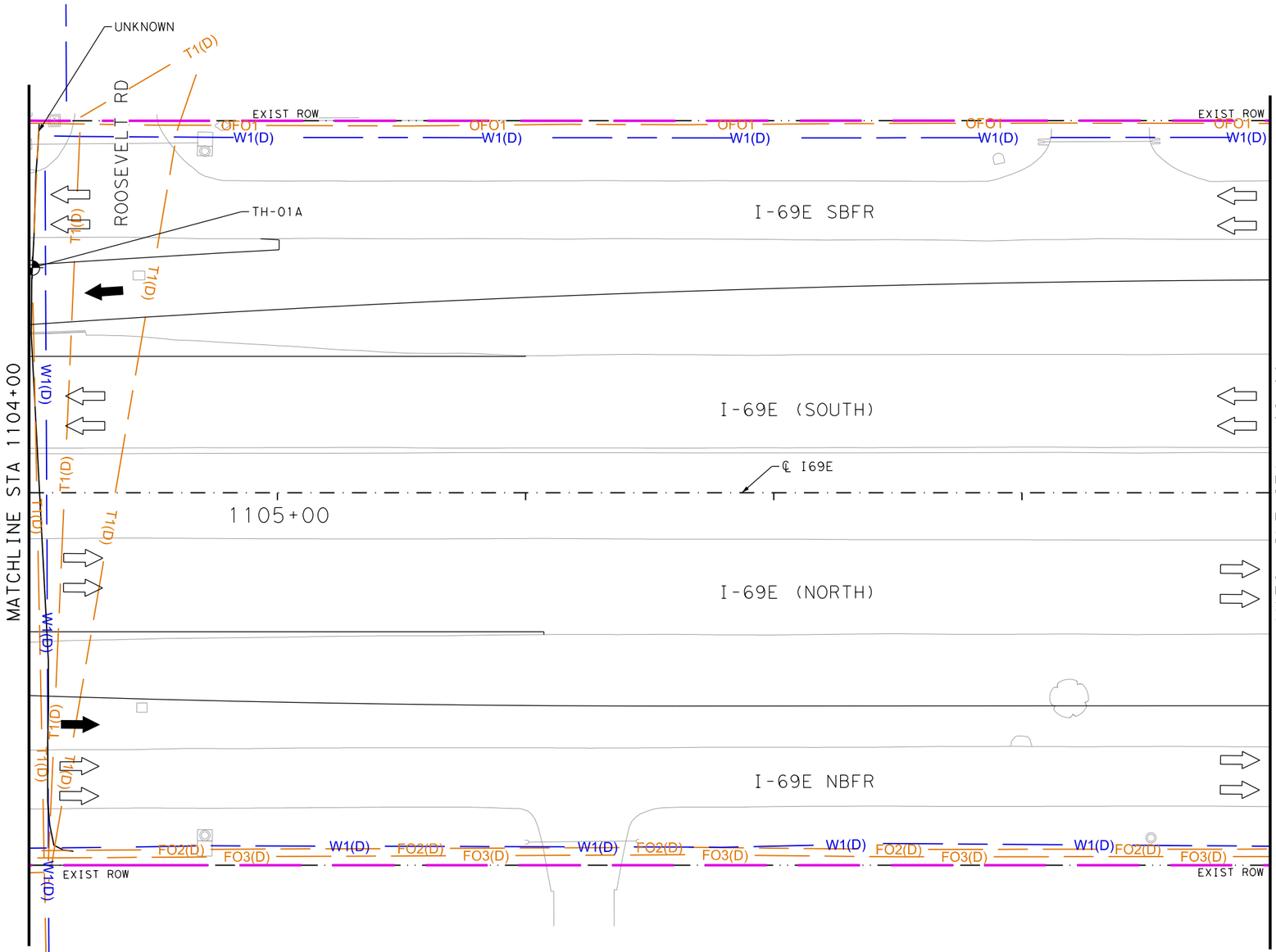

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HORIZ. SCALE IN FEET

LEGEND OF UTILITY TYPES

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NO.	DATE	REVISION	APPROVED
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12/14/2022

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TEXAS REGISTERED ENGINEERING FIRM F-9073

IH 69E
EXISTING UTILITIES LAYOUT
STA 1104+00 TO STA 1109+00

SHEET 4 OF 9

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
BWG	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
--	TEXAS	PHARR	CAMERON	183
CHECKED	CONT.	SECT.	JOB	
CC	0039	07	257	
APPROVED				
DWS				

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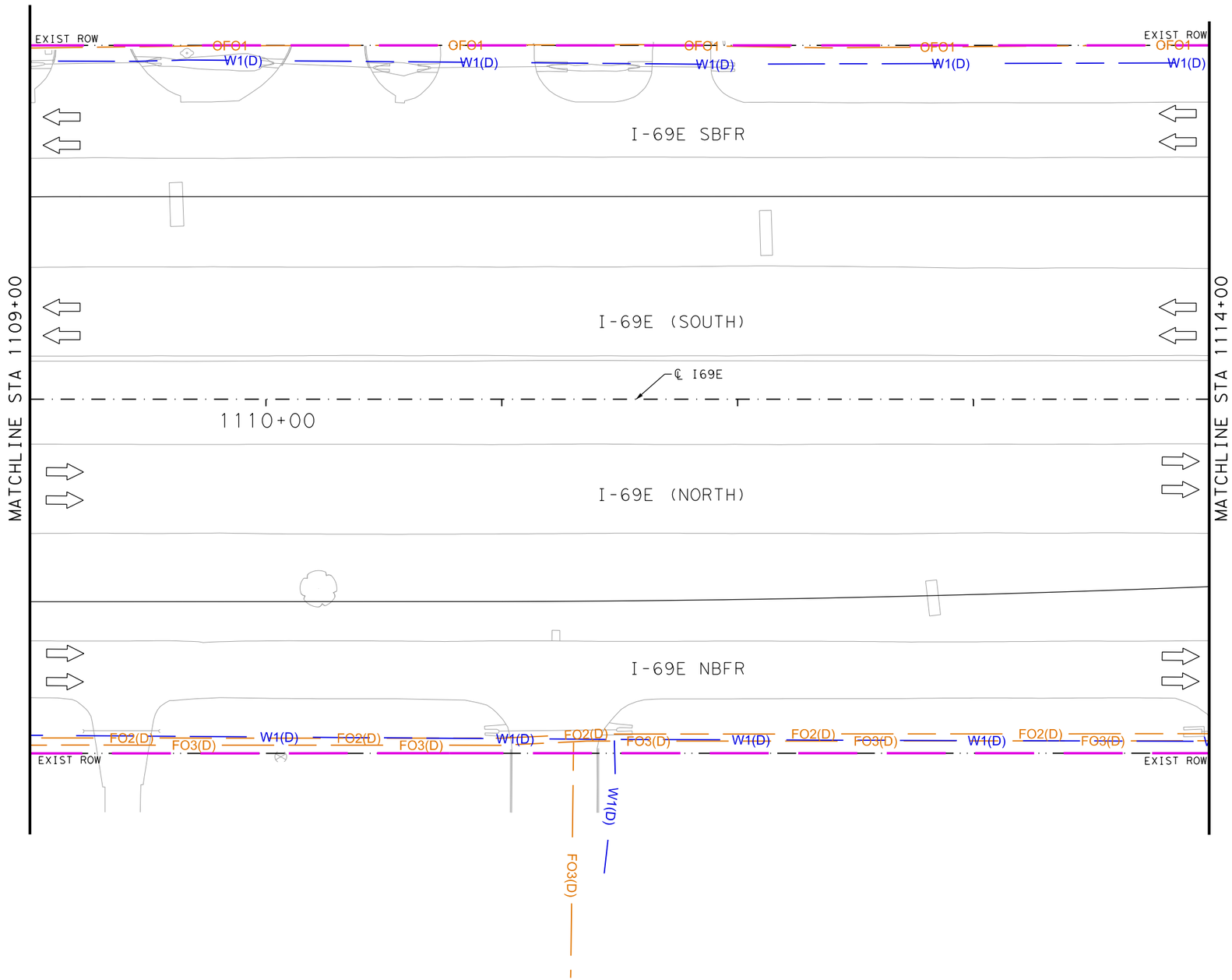

0 25 50
HORIZ. SCALE IN FEET

LEGEND OF UTILITY TYPES

GENERAL
- LIMITS OF INVESTIGATION
- UTILITY CONTINUES
- UTILITY TERMINATES
- QL-B SIGNAL LOST

COMMUNICATIONS
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- ATT TELEPHONE (QL-B) — T1
- ATT TELEPHONE (QL-D) — T1(D)

GAS
- TEXAS GAS SERVICE (QL-B) — G1
- TEXAS GAS SERVICE (QL-D) — G1(D)

ELECTRIC
- TXDOT TRAFFIC SIGNAL (QL-B) — TS1

WATER/SANITARY SEWER
- HARLINGEN WATER WORKS (QL-B) — W1
- HARLINGEN WATER WORKS (QL-D) — W1(D)

- POWER POLE (PP)
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- WATER VALVE (WV)
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- MANHOLE-STORM (SD)
- UNDERGROUND FIBER MARKER (F)
- MANHOLE-FIBER (F)
- MANHOLE-TELEPHONE (T)

NO.	DATE	REVISION	APPROVED
1	12/22	REVISED SHEET NUMBERS	DWS

STATE OF TEXAS
DAKOTA W. SMITH
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12/14/2022

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FRISCO, TEXAS 75034 (214) 440-3600
TEXAS REGISTERED ENGINEERING FIRM F-9073

IH 69E
EXISTING UTILITIES LAYOUT
STA 1109+00 TO STA 1114+00

SHEET 5 OF 9

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
BWG	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
--	TEXAS	PHARR	CAMERON	184
CHECKED	CONT.	SECT.	JOB	
CC	0039	07	257	
APPROVED				
DWS				

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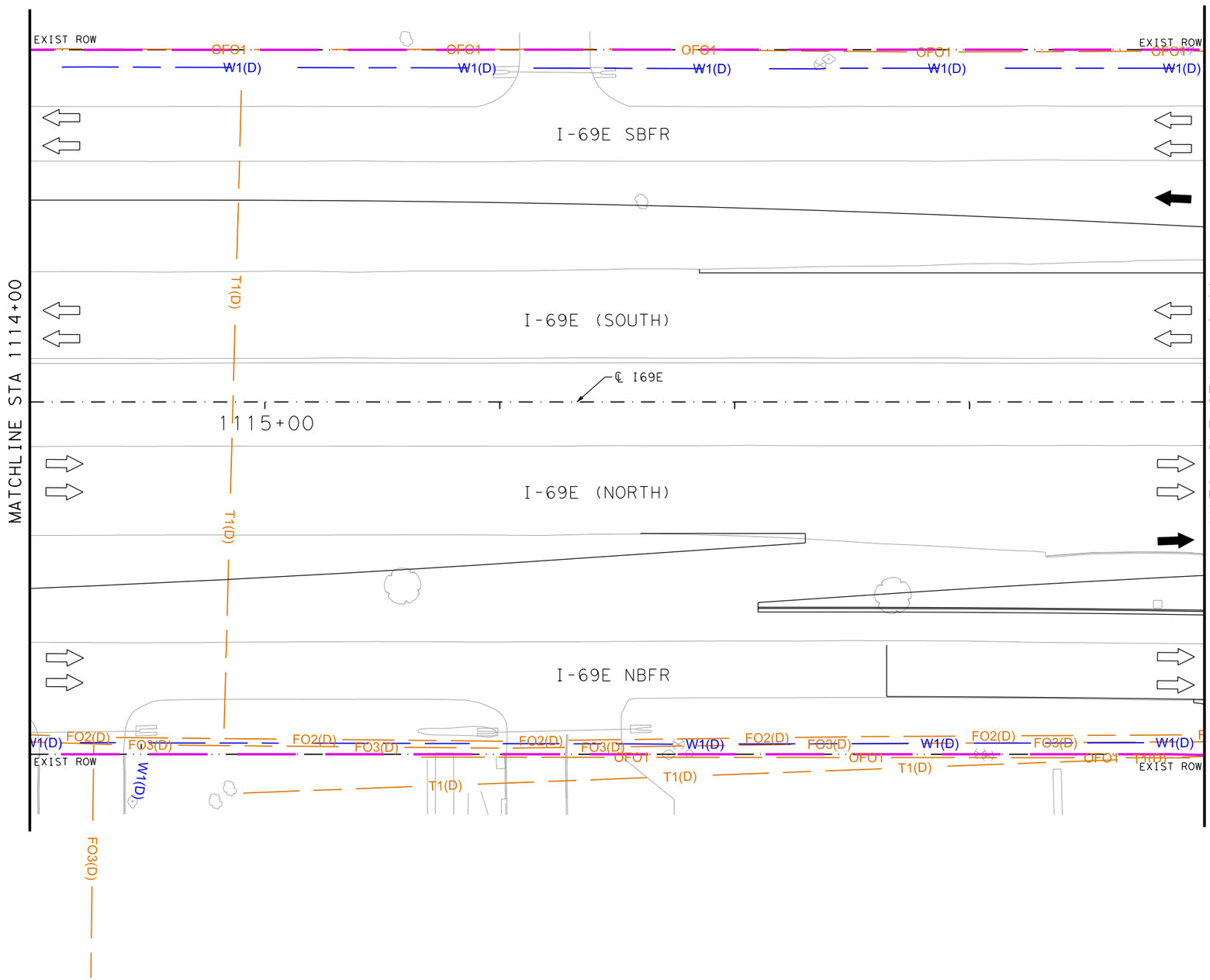

0 25 50
HORIZ. SCALE IN FEET

LEGEND OF UTILITY TYPES

GENERAL
- LIMITS OF INVESTIGATION
- UTILITY CONTINUES
- UTILITY TERMINATES
- QL-B SIGNAL LOST

COMMUNICATIONS
- SPECTRUM CATV (QL-B) — TV1
- SPECTRUM OH FIBER — OFO1
- SPECTRUM FIBER (QL-B) — FO3
- SPECTRUM FIBER (QL-D) — FO3(D)
- ATT TRANSISION FIBER (QL-B) — FO2
- ATT TRANSISION FIBER (QL-D) — FO2(D)
- ATT TELEPHONE (QL-B) — T1
- ATT TELEPHONE (QL-D) — T1(D)

GAS
- TEXAS GAS SERVICE (QL-B) — G1
- TEXAS GAS SERVICE (QL-D) — G1(D)

ELECTRIC
- TXDOT TRAFFIC SIGNAL (QL-B) — TS1

WATER/SANITARY SEWER
- HARLINGEN WATER WORKS (QL-B) — W1
- HARLINGEN WATER WORKS (QL-D) — W1(D)
- POWER POLE (PP)
- TRAFFIC PULL BOX (TB)
- GAS VALVE (GV)
- FIRE HYDRANT
- WATER METER (WM)
- WATER VALVE (WV)
- GRATE INLET (GI)
- MANHOLE-STORM (SD)
- UNDERGROUND FIBER MARKER (F)
- MANHOLE-FIBER (F)
- MANHOLE-TELEPHONE (T)

NO.	DATE	REVISION	APPROVED
1	12/22	REVISED SHEET NUMBERS	DWS

STATE OF TEXAS
DAKOTA W. SMITH
133272
LICENSED PROFESSIONAL ENGINEER
12/14/2022

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FRISCO, TEXAS 75034 (214) 440-3600
TEXAS REGISTERED ENGINEERING FIRM F-9073

IH 69E
EXISTING UTILITIES LAYOUT
STA 1114+00 TO STA 1119+00

SHEET 6 OF 9

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
BWG	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
--	TEXAS	PHARR	CAMERON	185
CHECKED	CONT.	SECT.	JOB	
CC	0039	07	257	
APPROVED				
DWS				

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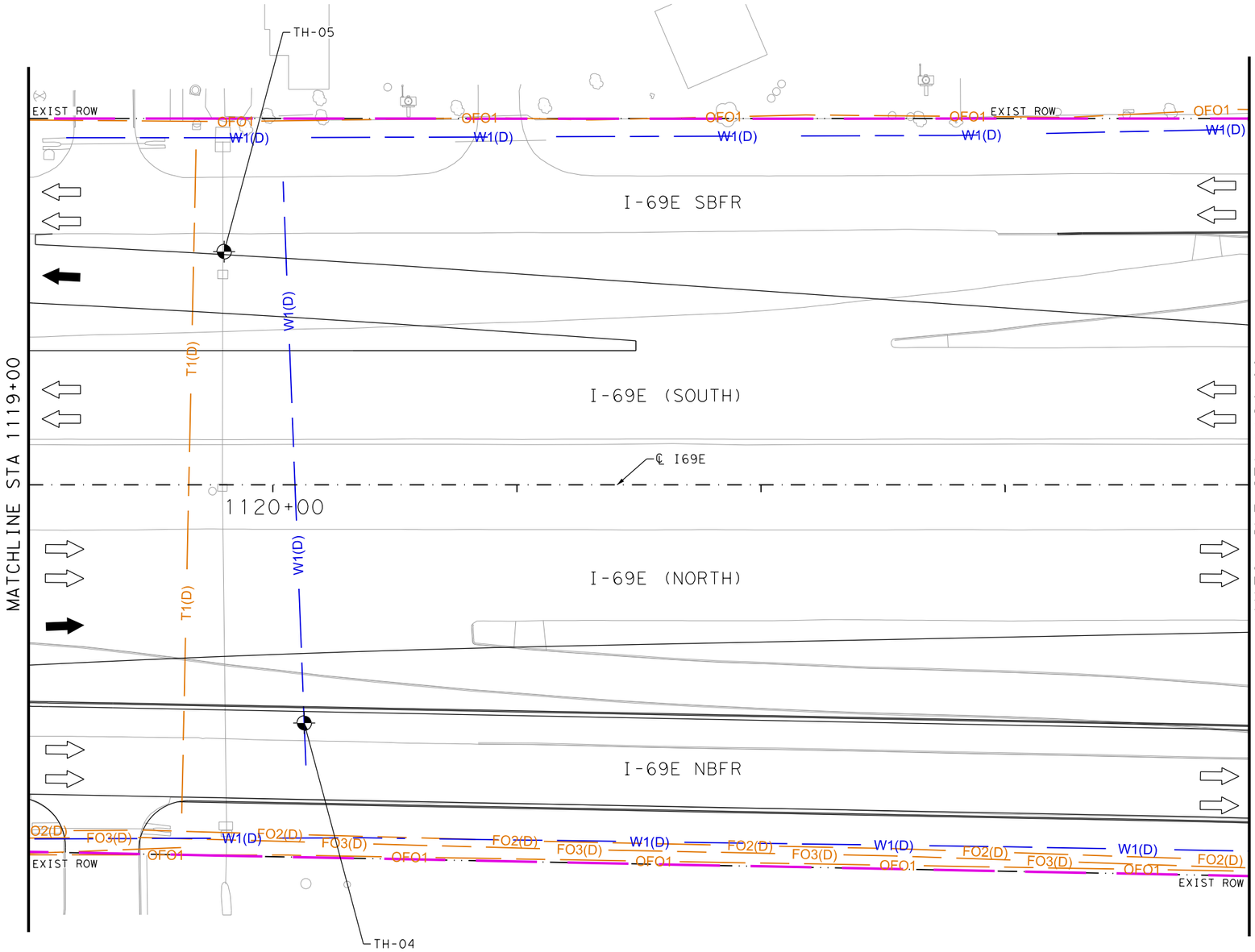

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HORIZ. SCALE IN FEET

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IH 69E
EXISTING UTILITIES LAYOUT
STA 1119+00 TO STA 1124+00

SHEET 7 OF 9

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
BWG	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
--	TEXAS	PHARR	CAMERON	186
CHECKED	CONT.	SECT.	JOB	
CC	0039	07	257	
APPROVED				
DWS				

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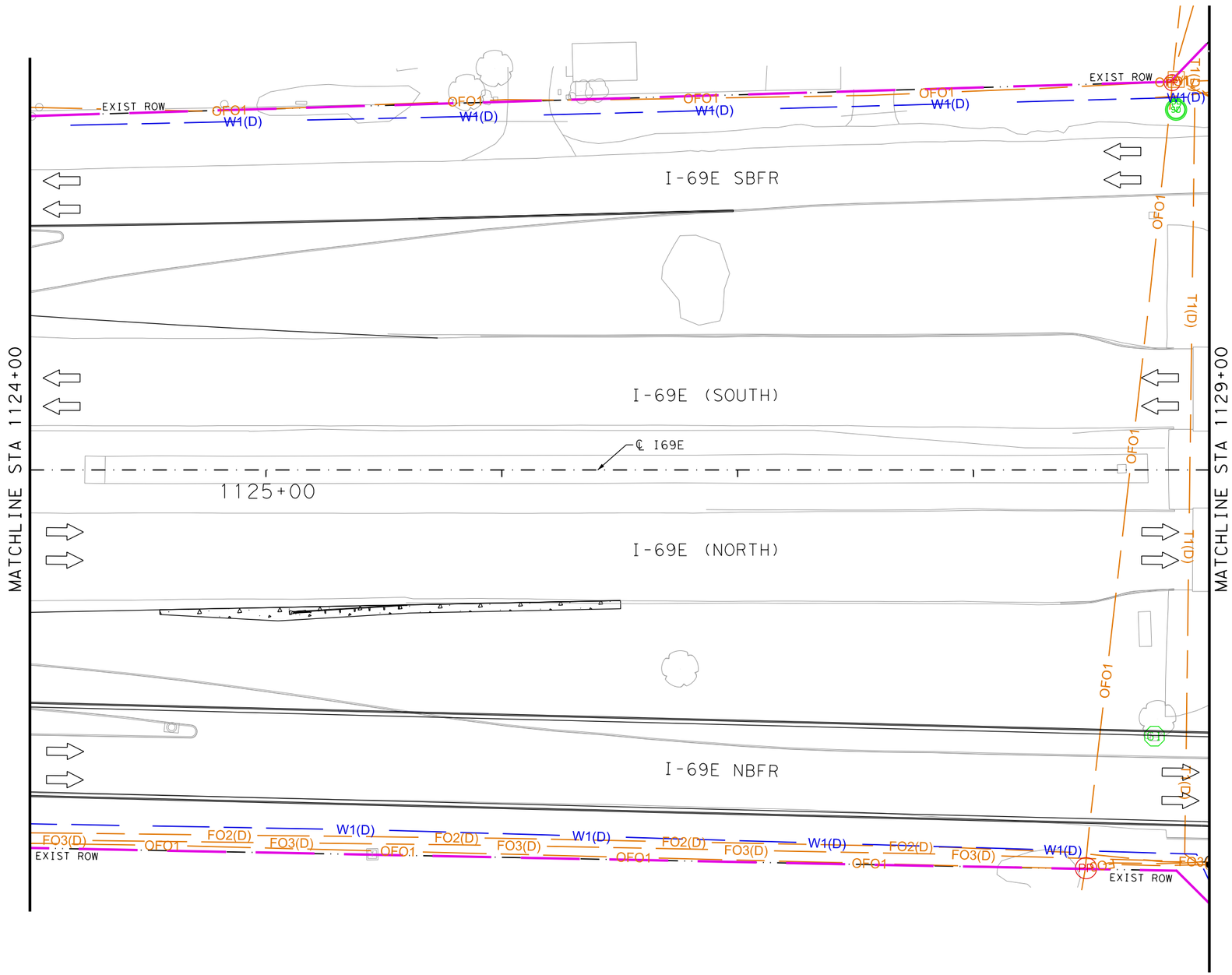

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HORIZ. SCALE IN FEET

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NO.	DATE	REVISION	APPROVED
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STATE OF TEXAS
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IH 69E
EXISTING UTILITIES LAYOUT
STA 1124+00 TO STA 1129+00

SHEET 8 OF 9

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
BWG	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
--	TEXAS	PHARR	CAMERON	187
CHECKED	CONT.	SECT.	JOB	
CC	0039	07	257	
APPROVED				
DWS				

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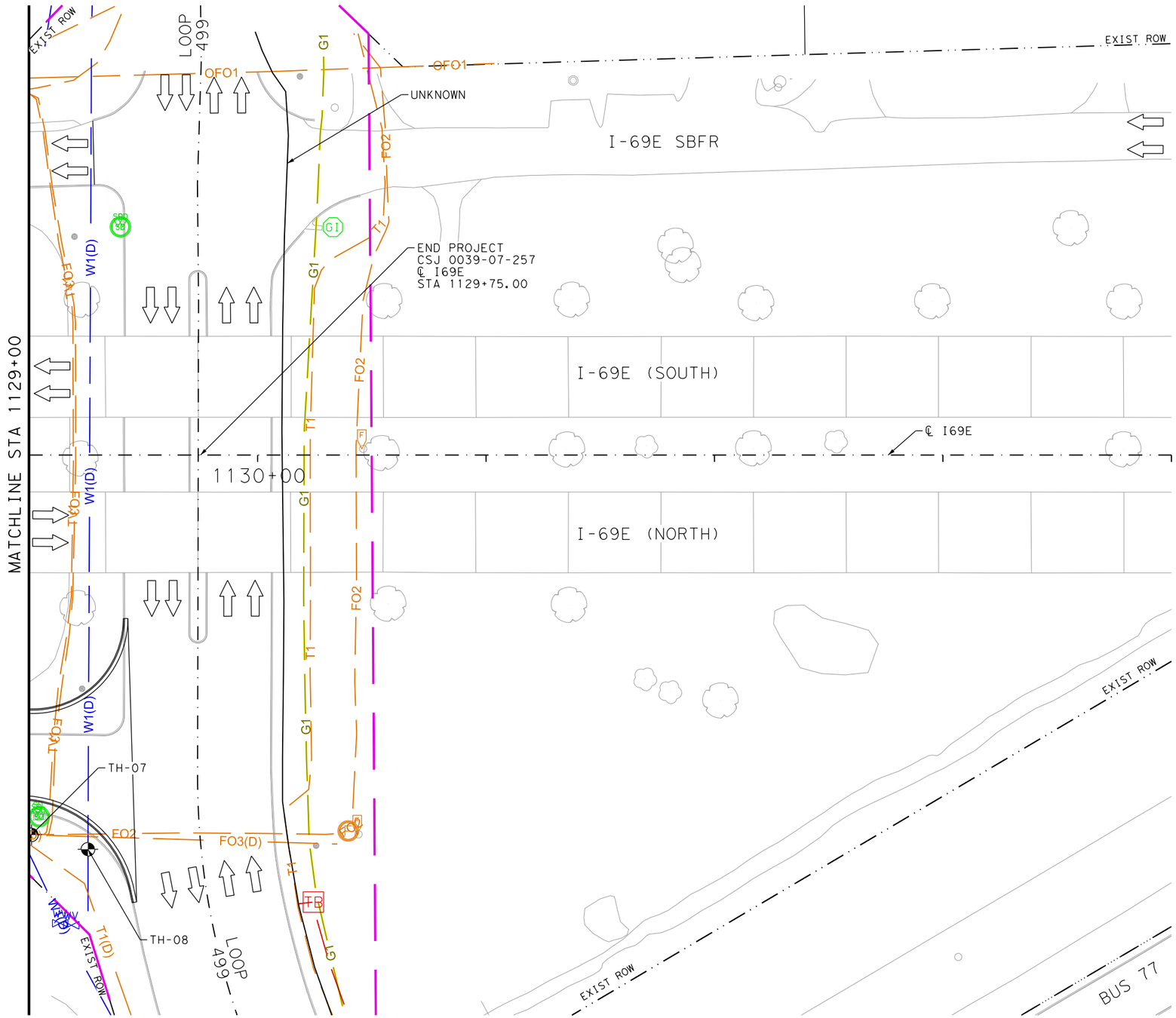

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NO.	DATE	REVISION	APPROVED
1	12/22	REVISED SHEET NUMBERS	DWS

STATE OF TEXAS
DAKOTA W. SMITH
133272
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PROFESSIONAL ENGINEER
12/14/2022

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TEXAS REGISTERED ENGINEERING FIRM F-9073

IH 69E
EXISTING UTILITIES LAYOUT
STA 1129+00 TO END

SHEET 9 OF 9

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
BWG	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
- -	TEXAS	PHARR	CAMERON	188
CHECKED	CONT.	SECT.	JOB	
CC	0039	07	257	
APPROVED				
DWS				

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. Clean Water Act, Section 402; Stormwater Pollution Prevention

Action Items Required : ☐ No Action Required

1. ☒ The contractor must implement the SW3P by installing Best Management Practices (BMPs) as indicated in the construction plans and maintained appropriately throughout construction. BMPs must be in place prior to the start of construction. The SW3P may need to be revised as necessary as construction progresses.

2. ☒ For all construction PSL's off the ROW, the contractor must certify compliance with all applicable laws, rules and regulations pertaining to the preservation of cultural resources, natural resources and the environment.

3. ☒ Based on the acreage of impact, select the appropriate box below:

   ☐ This project will disturb less than 1 acre of soil and is not part of a larger common plan of development; therefore, a NOI and TPDES Site Notice are not required for this project.

   or

   ☐ This project will disturb equal to or more than 1 acre of soil but less than 5 acres; therefore a NOI is not required but a TPDES Site Notice is required. The Construction Site Notice (CSN) is required to be posted at the construction site in a publicly accessible location for review by the public, TCEQ, EPA and other Inspectors.

   or

   ☒ This project will disturb equal to or more than 5 acres of soil and will require a NOI and TPDES Site Notice. The NOI and Site Notice are required to be posted at the construction site in a publicly accessible location.

4. ☒ Need to address MS4 requirements (Cameron & Hidalgo Counties only) ☐ MS4 requirements not needed

II. Clean Water Act, Sections 401 and 404 Compliance

Action Items Rquired : ☐ No Action Required

1. ☒ Filling, dredging or excavating in any water bodies, rivers, creeks, streams, wetlands or wet areas is prohibited unless specified in the USACE permit and approved by the Engineer. The contractor shall adhere to all agreements, mitigation plans, and BMPs required by the NWP as regulated by the USACE.

   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 (1/10th to <1/2 acre, 1/3 in tidal waters)

   ☐ Individual 404 Permit Required

   ☐ Other Nationwide Permit Required: NWP#_____

2. ☒ The contractor is responsible for obtaining new or revised Section 404 permit(s) for Contractor initiated changes in construction methods that change Impacts To Waters Of The U.S., including wetlands. The Contractor will ensure that the water quality of the State will be maintained and not degraded.

3. ☒ Best Management Practices for applicable Section 401 General Conditions:

General Condition 12 - Categories I and II BMPs required

Category I (Erosion Control)

☐ Temporary Vegetation	☐ Interceptor Swale	☒ Mulch Filter Berms and/or Socks
☐ Blankets, Matting	☐ Diversion Dike	☐ Compost Filter Berms and/or Socks
☐ Mulch	☐ Erosion Control Compost	☐ Compost Blankets
☐ Sodding		

Category II (Sedimentation Control)

☒ Silt Fence	☐ Hay (Straw) Bale Dike	☒ Mulch Filter Berms and/or Socks
☐ Rock Berm	☐ Brush Berms	☐ Compost Filter Berms and/or Socks
☐ Triangular Filter Dike	☐ Sediment Basins	☐ Stone Outlet Sediment Traps
☐ Sand Bag Berm	☐ Erosion Control Compost	

General Condition 21 - Category III BMPs required

Category III (Post-Construction TSS Control)

☐ Vegetative Filter Strips	☐ Wet Basins	☒ Mulch Filter Berms and/or Socks
☐ Retention/Irrigation	☐ Grassy Swales	☐ Compost Filter Berms and/or Socks
☐ Extended Detention Basin	☐ Vegetation-Lined Ditches	☐ Sand Filter Systems
☐ Constructed Wetlands	☐ Erosion Control Compost	☐ Sedimentation Chambers

II. Clean Water Act, Sections 401 and 404 Compliance - Continued:

4. ☐ The Contractor's designated and qualified Contractor Responsible Person Environmental (CRPe) will monitor the project site daily to ensue compliance with SW3P and TPDES General Permit TXR 150000. Daily Monitoring Reports shall be provided to TxDOT within 48 hours, in accordance with Item 506.3.1.

5. ☐ Other Project Specific Actions:

III. Cultural Resources

Action Items Required : ☒ No Action Required

1. ☒ Refer to the 2014 TxDOT Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges, Item 7.7.1., in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

2. ☐ Other Project Specific Actions:

IV. Vegetation Resources

Action Items Required : ☐ No Action Required

1. ☒ In accordance with the 2014 TxDOT Standard Specifications; Item 164 - Seeding For Erosion Control; provide and install temporary or permanent seeding for erosion control as shown on the plans or as directed by the Engineer for all seeding and replanting of right of way where possible. (Required for Urban Settings)

2. ☒ In accordance with Executive Order 13112 on invasive species and the Executive Memorandum on Beneficial Landscaping, native species of plants shall be used for all seeding and replanting of right of way where possible for rural roadways. (Required for Rural Settings)

3. ☒ Preserve vegetation where possible throughout the project and minimize clearing, grubbing and excavation within stream banks, bed and approach sections.

4. ☐ Other Project Specific Actions:

Pharr District Contact No. 956-702-6100 Revised 01/30/2017

List of Abbreviations

BMP: Best Management Practice	NWP: Nationwide Permit
CGP: Construction General Permit	PCN: Pre-Construction Notification
CRPe: Contractor Responsible Person Environmental	PSL: Project Specific Location
DSHS: Texas Department of State Health Services	SPCC: Spill Prevention Control and Countermeasure
FEMA: Federal Emergency Management Agency	SW3P: Storm Water Pollution Prevention Plan
FHWA: Federal Highway Administration	TCEQ: Texas Commission on Environmental Quality
MOA: Memorandum of Agreement	THC: Texas Historical Commission
MOU: Memorandum of Understanding	TPDES: Texas Pollutant Discharge Elimination System
MS4: Municipal Separate Stormwater Sewer System	TPWD: Texas Parks and Wildlife Department
MSAT: Mobile Source Air Toxic	TxDOT: Texas Department of Transportation
MBTA: Migratory Bird Treaty Act	T&E: Threatened and Endangered Species
NOI: Notice of Intent	USACE: U.S. Army Corp of Engineers
NOT: Notice of Termination	USFWS: U.S. Fish and Wildlife Service

Texas Department of Transportation

PHARR DISTRICT

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	F 2023(418)		I-69E
STATE	DISTRICT	COUNTY	
TEXAS	PHR	CAMERON	
CONTROL	SECTION	JOB	SHEET NO.
0039	07	257	189

Date Printed: $DATE$

V. Federal Listed, and Proposed Threatened and Endangered Species, Critical Habitat, State Listed Species, Candidate Species and Migratory Birds

Action Items Required : ☐ No Action Required

1. ☒ Under the Migratory Bird Treaty Act (MBTA) of 1918, codified at 16 U.S.C. §703-712 and as enforced by the USFWS, the proposed construction work will not remove active nests from bridges, trees, ground and other structures during migratory bird nesting season, (February 1st. through October ist.). If the Contractor needs to perform work within the right of way during nesting season, a qualified Biologist shall conduct a survey to determine if active nests are present. If present, the Contractor shall maintain a buffer zone around the nest(s) as directed by the Biologist. The buffer zone will be protected from clearing and disturbance until such time as the Biologist has determined that the nest(s) is no longer active. Prior to the nesting season, existing bridges and culverts should be treated against migratory bird nesting by utilizing Bird Exclusion Methods. Bird Exclusion Methods should be monitored and maintained throughout the nesting season. Refer to Standard Bird Exclusion Details.

2. ☒ There is the potential for the presence of state-listed species & species of concern in the project area and state law prohibits the taking (incidental or otherwise) of state-listed species. Taking is defined as the collection, hooking, hunting, netting, shooting, or share by any means or devices. If any listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately.

3. ☒ Other Project Specific Actions:

VI. Hazardous Materials on Contamination Issues

Action Items Required : ☐ No Action Required

General (applies to all projects):

Comply with the Hazard Communication Act (HCA) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the HCA.

Maintain an adequate supply of on-site spill response materials as indicated in the MSDS. In the event of a spill, take immediate action to mitigate the spill as indicated in the MSDS and in accordance with safe work practices. Contact the TxDOT Pharr District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

- Dead or distressed vegetation (identified as not normal)
- Trash piles, drums, canisters, barrels, etc.
- Undesirable smells or odors
- Evidence of leaching or seepage of contaminant substances

Any other evidence indicating possible hazardous materials or contamination discovered on site.

1. ☒ If potentially hazardous material and/or contaminated media (i.e.: soil, groundwater, surface water, sediment, building materials) are unexpectedly encountered during construction, assure that such materials and contamination are handled according to applicable federal and state regulations, cease work in the immediate area and contact the Engineer immediately.

VI. Hazardous Materials on Contamination Issues - Continued:

2. 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 required.
If "Yes", then TxDOT is responsible for completing an asbestos assessment/inspection.

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

☐ Yes ☐ No

If "Yes", then TxDOT must retain a Texas Department of State Health Services (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 abatement activities and/or demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

4. ☐ The Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and an Asbestos Consultant in order to minimize construction delays and subsequent claims.

VII. Other Environmental Issues

Action Items Required : ☐ No Action Required

1. ☒ Noise

Contractor shall make every reasonable effort to minimize construction noise through abatement measures such as work hour controls and proper maintenance of equipment mufflers.

2. ☒ Air

Contractor shall practice common dust control techniques such as surface chemical treatment or watering of unpaved road surfaces and vehicle speed reduction shall be implemented to minimize and prevent airborne dust during construction.

Contractor should minimize MSAT by utilizing measures to encourage use of EPA required cleaner diesel fuels, limits on idling, increase use of cleaner burning diesel engines, and other emission limitation techniques, as appropriate.

Pharr District Contact No. 956-702-6100 Revised 01/30/2017

List of Abbreviations

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Texas Department of Transportation
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PHARR DISTRICT

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

SHEET 2 OF 2

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	F 2023(418)		I-69E
STATE	DISTRICT	COUNTY	
TEXAS	PHR	CAMERON	SHEET NO.
CONTROL	SECTION	JOB	
0039	07	257	190

Date Printed: $DATE$

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.

For all projects with any soil disturbing activities, TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office. If no field office is available, then this SWP3 shall be kept in the appropriate TxDOT Area Office.

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):
0039-07-257

1.2 PROJECT LIMITS:
From: FM 2994 (WILSON RD)

To: LOOP 499 (PRIMERA RD)

1.3 PROJECT COORDINATES:
BEGIN: (Lat) 26° 12' 58.54" N ,(Long) 97° 43' 15.93" W

END: (Lat) 26° 13' 34.03" N ,(Long) 97° 43' 15.88" W

1.4 TOTAL PROJECT AREA (Acres): 53.34 AC

1.5 TOTAL AREA TO BE DISTURBED (Acres): 5.17 AC

1.6 NATURE OF CONSTRUCTION ACTIVITY:
FOR THE REHABILITATION OF FREEWAY FACILITIES CONSISTING OF RAMPS, FRONTAGE ROADS, GRADING, LIME TREATMENT SUBGRADE, FLEXIBLE BASE, ASPHALTIC CONCRETE, SIGNING, STRIPING AND SIGNALS.

1.7 MAJOR SOIL TYPES:

Soil Type	Description
	12/14/2022

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:

- [X] PSLs determined during preconstruction meeting
- [ ] PSLs determined during construction
- [ ] No PSLs planned for construction

Type	Sheet #s
SEDIMENT CONTROL FENCE	193-195
EROSION CONTROL LOG	193-195
SEEDING	193-195

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.)

- [X] Mobilization
- [X] Install sediment and erosion controls
- [ ] Blade existing topsoil into windrows, prep ROW, clear and grub
- [X] Remove existing pavement
- [X] Grading operations, excavation, and embankment
- [X] Excavate and prepare subgrade for proposed pavement widening
- [ ] Remove existing culverts, safety end treatments (SETs)
- [X] Remove existing metal beam guard fence (MBGF), bridge rail
- [ ] Install proposed pavement per plans
- [ ] Install culverts, culvert extensions, SETs
- [X] Install mow strip, MBGF, bridge rail
- [X] Place flex base
- [X] 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:

- [X] Sediment laden stormwater from stormwater conveyance over disturbed area
- [X] Fuels, oils, and lubricants from construction vehicles, equipment, and storage
- [ ] Solvents, paints, adhesives, etc. from various construction activities
- [X] Transported soils from offsite vehicle tracking
- [X] 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
	LOWER LAGUNA MADRE

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

1.12 ROLES AND RESPONSIBILITIES: TxDOT

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

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

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

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

MS4 Entity

STATE OF TEXAS
GREGORIO GARCIA
101077
LICENSED
PROFESSIONAL ENGINEER

STORMWATER POLLUTION PREVENTION PLAN (SWP3)

Sheet 1 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	F 2023(418)		191
STATE	STATE DIST.	COUNTY	
TEXAS	PHARR	CAMERON	
CONT.	SECT.	JOB	HIGHWAY NO.
0039	07	257	I69E

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
- ☐ X Permanent Planting, Sodding or Seeding
- X ☐ 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

- X ☐ Biodegradable Erosion Control Logs
- ☐ ☐ Dewatering Controls
- ☐ ☐ Inlet Protection
- ☐ ☐ Rock Filter Dams/ Rock Check Dams
- ☐ ☐ Sandbag Berms
- X ☐ Sediment Control Fence
- X ☐ 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
  - X 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
- ☐ Other: _____
- ☐ Other: _____
- ☐ 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:

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

2.8 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 .

2.9 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.

STATE OF TEXAS
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12/14/2022

STORMWATER POLLUTION PREVENTION PLAN (SWP3)

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	F 2023(418)		192
STATE	STATE DIST.	COUNTY	
TEXAS	PHARR	CAMERON	
CONT.	SECT.	JOB	HIGHWAY NO.
0039	07	257	I69E

ITEM	DESCRIPTION	UNIT	QTY
0160-6003	FURNISHING AND PLACING TOPSOIL (4")	SY	
0164-6023	CELL FBR MLCH SEED(PERM)(RURAL)(CLAY)	SY	
0164-6029	CELL FBR MLCH SEED(TEMP)(WARM)	SY	
0166-6001	FERTILIZER	TON	
0168-6001	VEGETATIVE WATERING	MG	
0506-6020	CONSTRUCTION EXITS (INSTALL)(TY 1)	SY	
0506-6024	CONSTRUCTION EXITS (REMOVE)	SY	
0506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	
0506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	
0506-6041	BIODEG EROSN CONT LOGS (INSTL)(12")	LF	
0506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	

0′ 25′ 50′ 100′

LEGEND:

- CONSTRUCTION EXIT (TY 1)
- CONSTRUCTION THIS PHASE
- SEEDING
- SCF — SEDIMENT CONTROL FENCE
- EROSION CONTROL LOG
- TRAFFIC FLOW
- DRAINAGE FLOW

NOTES:

1. REFER TO SW3P STANDARD SHEETS FOR DETAILS.
2. INSTALLED MEASURES SHALL REMAIN IN PLACE AND SHALL BE MAINTAINED THROUGHOUT DURATION OF PROJECT OR AS DIRECTED BY THE ENGINEER.
3. SW3P MEASURES SHOWN ARE MINIMUM REQUIREMENTS BASED UPON PROJECT DESIGN. INSTALLATION OF SW3P MEASURES WILL BE AS SHOWN AND MODIFIED TO ACCOMMODATE ACTUAL FIELD CONDITIONS.
4. CONSTRUCTION EXITS TO BE LOCATED IN THE FIELD AND APPROVED BY THE ENGINEER. THE SIZE OF THE CONSTRUCTION EXIT WILL BE 78 SY (50′X14′). REFER TO STANDARD EC(3) FOR DETAILS.

BEGIN PROJECT
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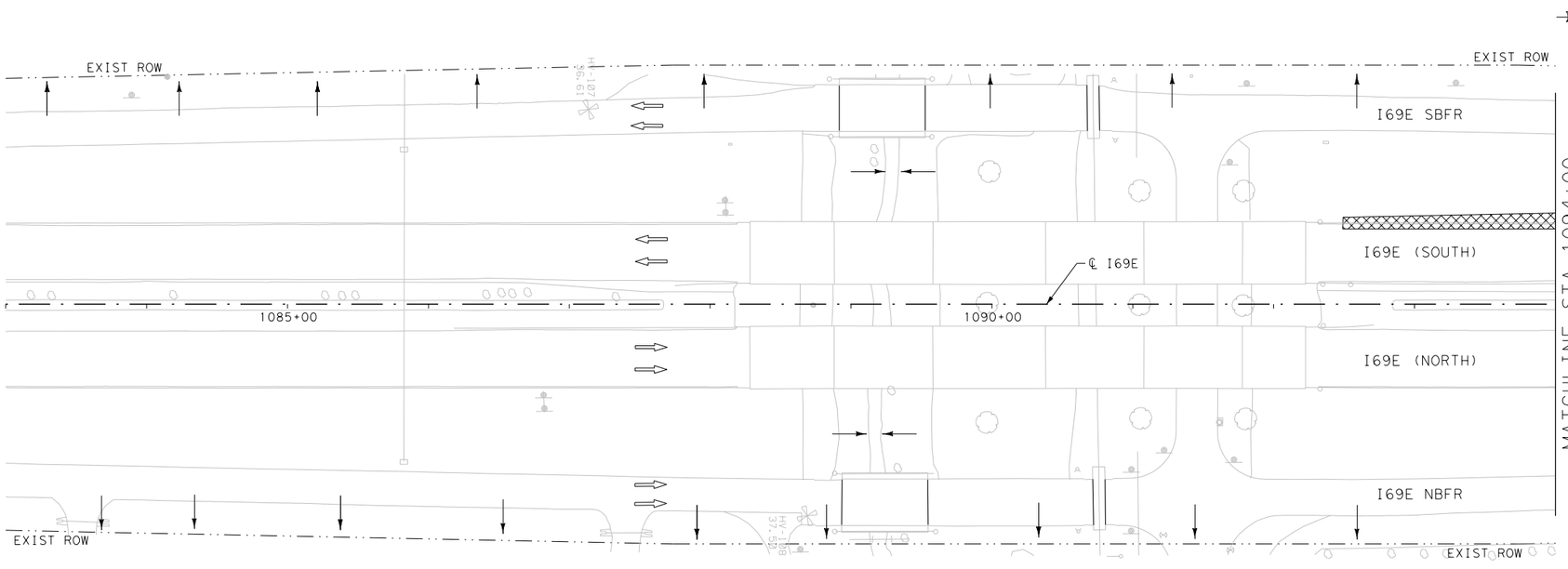
STA 1076+80



NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
GREGORIO GARCIA
101077
LICENSED
PROFESSIONAL ENGINEER

12/14/2022

Texas Department of Transportation

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
4350 Lockhill Selma Road, Suite 100•San Antonio, Texas 78249•210.454.5511

SANCHEZ-SALAZAR & ASSOCIATES, LLC
12770 Cimarron Path, Ste. 118
San Antonio, TX 78249
Phone: (210) 314-5458
TBPELS Registration No. 15685

I69E
SW3P LAYOUT
PHASE 1

BEGIN PROJECT TO STA 1094+00

SHEET 1 OF 3

DRAWN	FED.RD. DIV.NO.	STATE PROJECT NUMBER		HIGHWAY NO.
RO	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
RO	TEXAS	PHARR	CAMERON	193
CHECKED	CONT.	SECT.	JOB	
GG	0039	07	257	
APPROVED				
GG				

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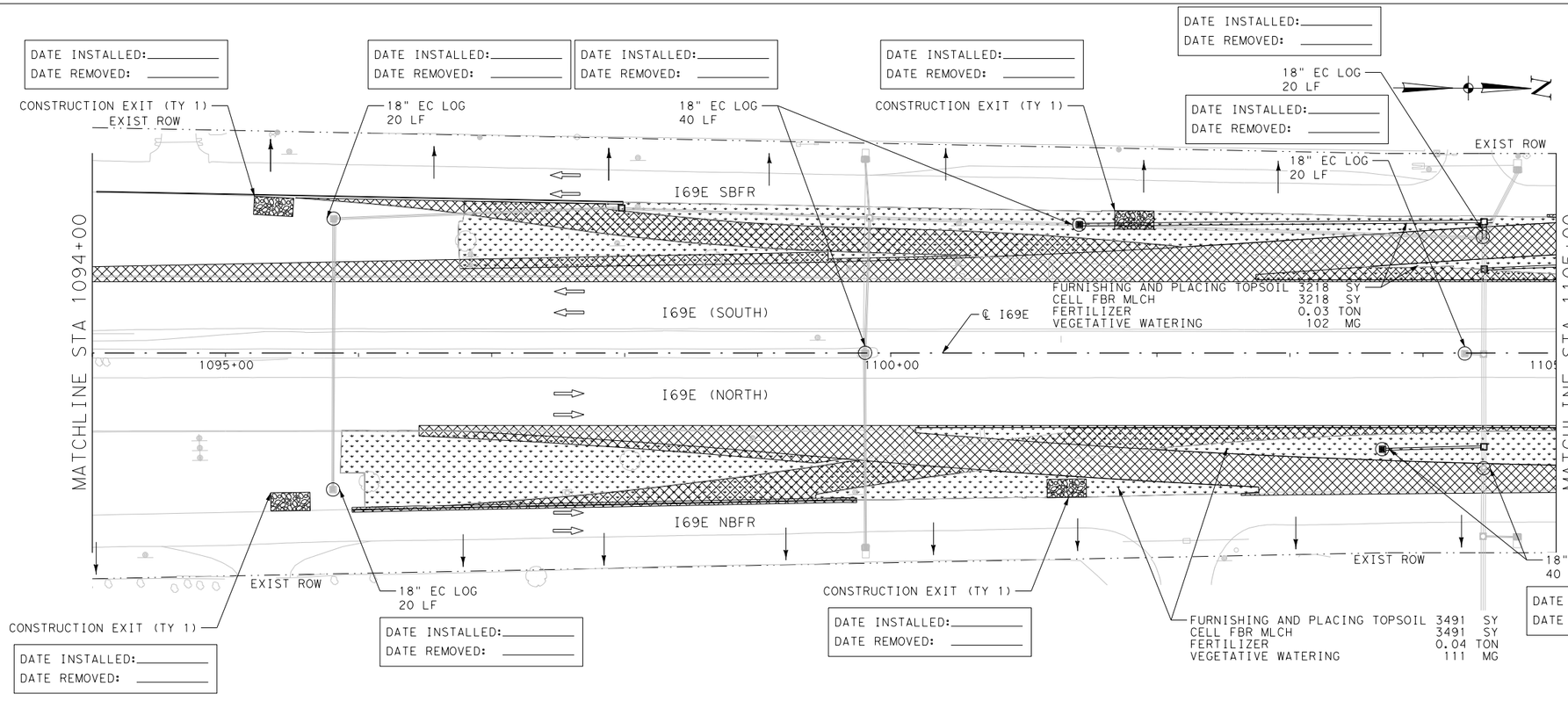

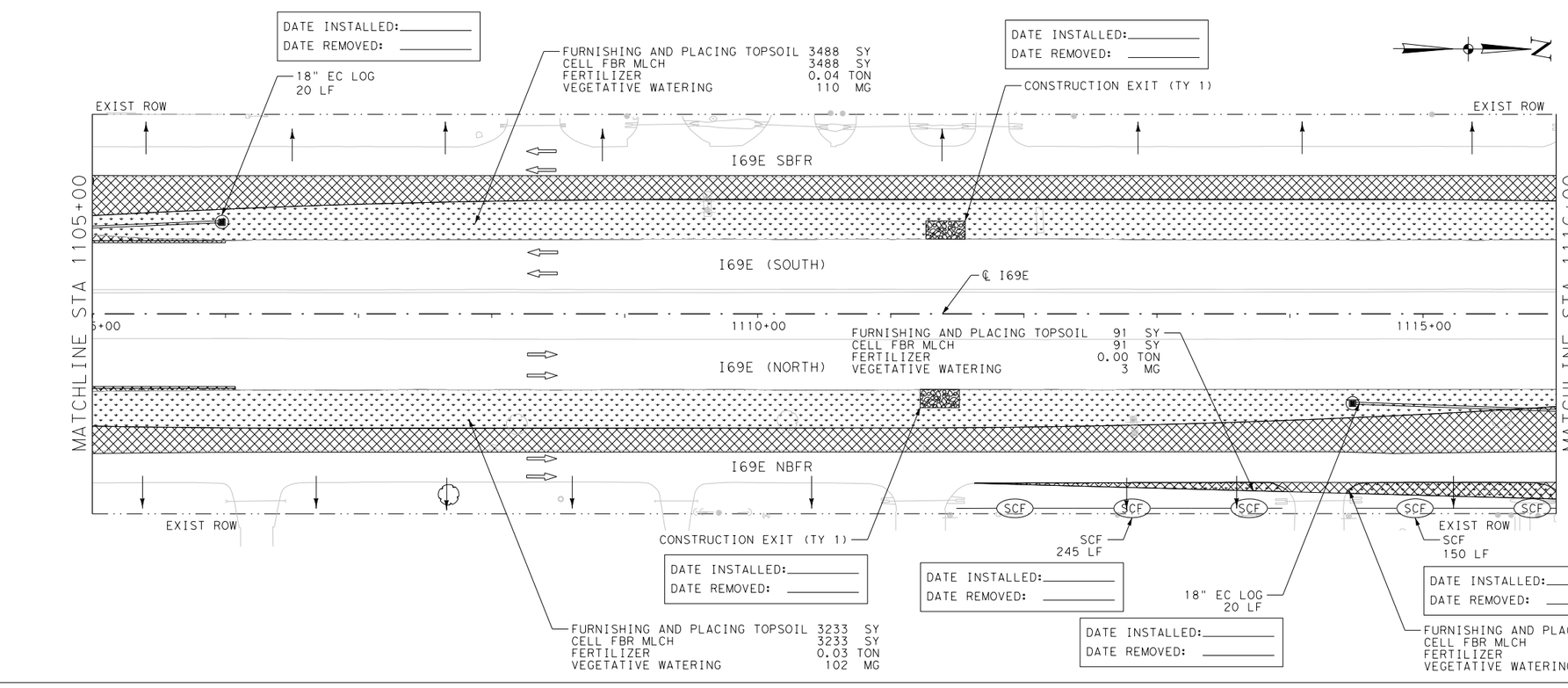

ITEM	DESCRIPTION	UNIT	QTY
0160-6003	FURNISHING AND PLACING TOPSOIL (4")	SY	13694
0164-6023	CELL FBR MLCH SEED(PERM)(RURAL)(CLAY)	SY	13694
0164-6029	CELL FBR MLCH SEED(TEMP)(WARM)	SY	13694
0166-6001	FERTILIZER	TON	0.14
0168-6001	VEGETATIVE WATERING	MG	433
0506-6020	CONSTRUCTION EXITS (INSTALL)(TY 1)	SY	468
0506-6024	CONSTRUCTION EXITS (REMOVE)	SY	468
0506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	395
0506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	395
0506-6041	BIODEG EROSN CONT LOGS (INSTL)(12")	LF	200
0506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	200

0′ 25′ 50′ 100′

LEGEND:

- CONSTRUCTION EXIT (TY 1)
- CONSTRUCTION THIS PHASE
- SEEDING
- SCF — SEDIMENT CONTROL FENCE
- EROSION CONTROL LOG
- TRAFFIC FLOW
- DRAINAGE FLOW

NOTES:

1. REFER TO SW3P STANDARD SHEETS FOR DETAILS.
2. INSTALLED MEASURES SHALL REMAIN IN PLACE AND SHALL BE MAINTAINED THROUGHOUT DURATION OF PROJECT OR AS DIRECTED BY THE ENGINEER.
3. SW3P MEASURES SHOWN ARE MINIMUM REQUIREMENTS BASED UPON PROJECT DESIGN. INSTALLATION OF SW3P MEASURES WILL BE AS SHOWN AND MODIFIED TO ACCOMMODATE ACTUAL FIELD CONDITIONS.
4. CONSTRUCTION EXITS TO BE LOCATED IN THE FIELD AND APPROVED BY THE ENGINEER. THE SIZE OF THE CONSTRUCTION EXIT WILL BE 78 SY (50′X14′). REFER TO STANDARD EC(3) FOR DETAILS.

NO.	DATE	REVISION	APPROVED

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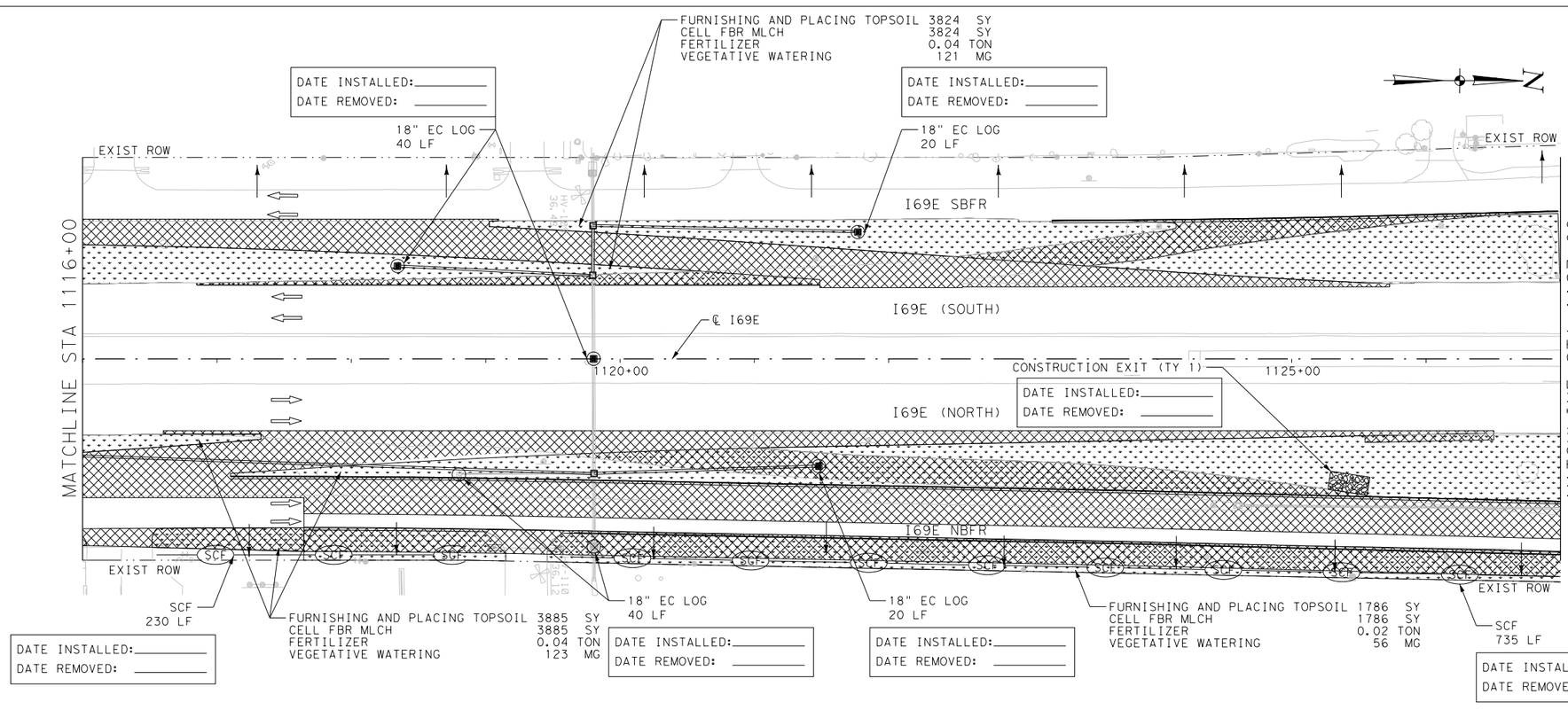
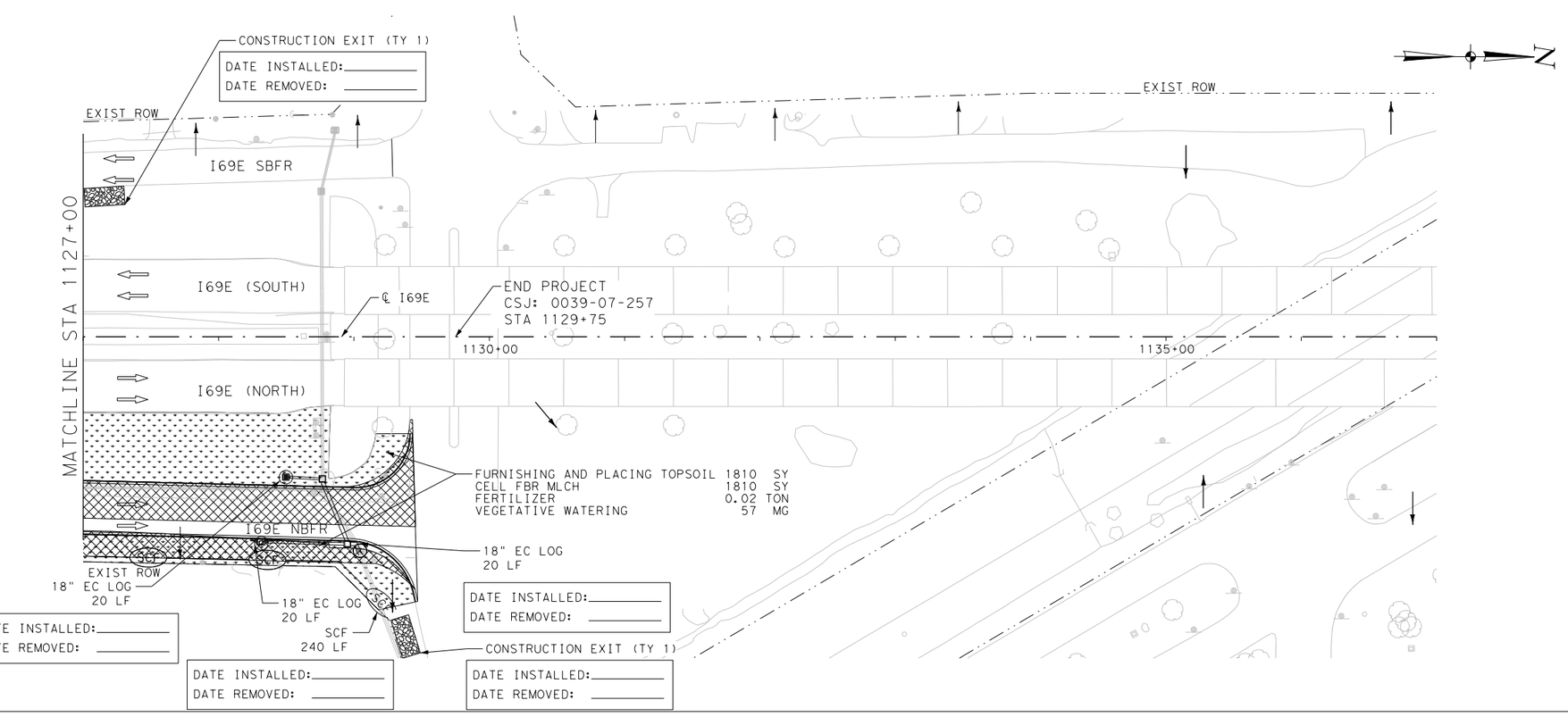
TBPELS Registration No. 15685

I69E
SW3P LAYOUT
PHASE 1
STA 1094+00 TO STA 1116+00

SHEET 2 OF 3

DRAWN	FED.RD. DIV.NO.	STATE PROJECT NUMBER		HIGHWAY NO.
RO	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
RO	TEXAS	PHARR	CAMERON	194
CHECKED	CONT.	SECT.	JOB	
GG	0039	07	257	
APPROVED				
GG				





ITEM	DESCRIPTION	UNIT	QTY
0160-6003	FURNISHING AND PLACING TOPSOIL (4")	SY	11305
0164-6023	CELL FBR MLCH SEED(PERM)(RURAL)(CLAY)	SY	11305
0164-6029	CELL FBR MLCH SEED(TEMP)(WARM)	SY	11305
0166-6001	FERTILIZER	TON	0.12
0168-6001	VEGETATIVE WATERING	MG	357
0506-6020	CONSTRUCTION EXITS (INSTALL)(TY 1)	SY	234
0506-6024	CONSTRUCTION EXITS (REMOVE)	SY	234
0506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	1205
0506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	1205
0506-6041	BIODEG EROSN CONT LOGS (INSTL)(12")	LF	180
0506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	180

0′ 25′ 50′ 100′

LEGEND:

- CONSTRUCTION EXIT (TY 1)
- CONSTRUCTION THIS PHASE
- SEEDING
- SCF — SEDIMENT CONTROL FENCE
- EROSION CONTROL LOG
- TRAFFIC FLOW
- DRAINAGE FLOW

NOTES:

1. REFER TO SW3P STANDARD SHEETS FOR DETAILS.
2. INSTALLED MEASURES SHALL REMAIN IN PLACE AND SHALL BE MAINTAINED THROUGHOUT DURATION OF PROJECT OR AS DIRECTED BY THE ENGINEER.
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NO.	DATE	REVISION	APPROVED

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Phone: (210) 314-5458
TBPELS Registration No. 15685

I69E
SW3P LAYOUT
PHASE 1
STA 1116+00 TO END PROJECT

SHEET 3 OF 3

DRAWN	FED.RD. DIV.NO.	STATE PROJECT NUMBER		HIGHWAY NO.
RO	6	F 2023(418)		I69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
RO	TEXAS	PHARR	CAMERON	195
CHECKED	CONT.	SECT.	JOB	
GG	0039	07	257	
APPROVED				
GG				

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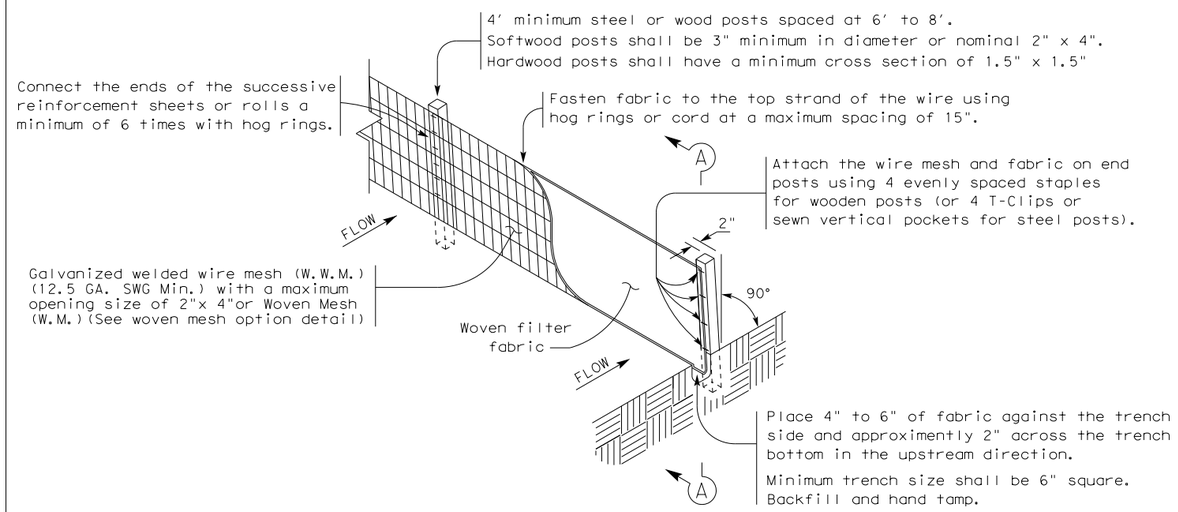
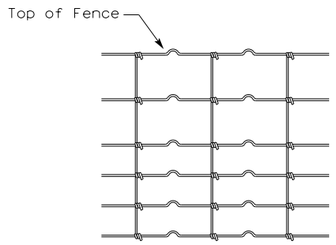
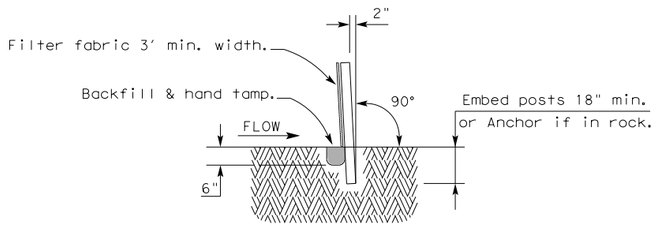


TEMPORARY SEDIMENT CONTROL FENCE

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.

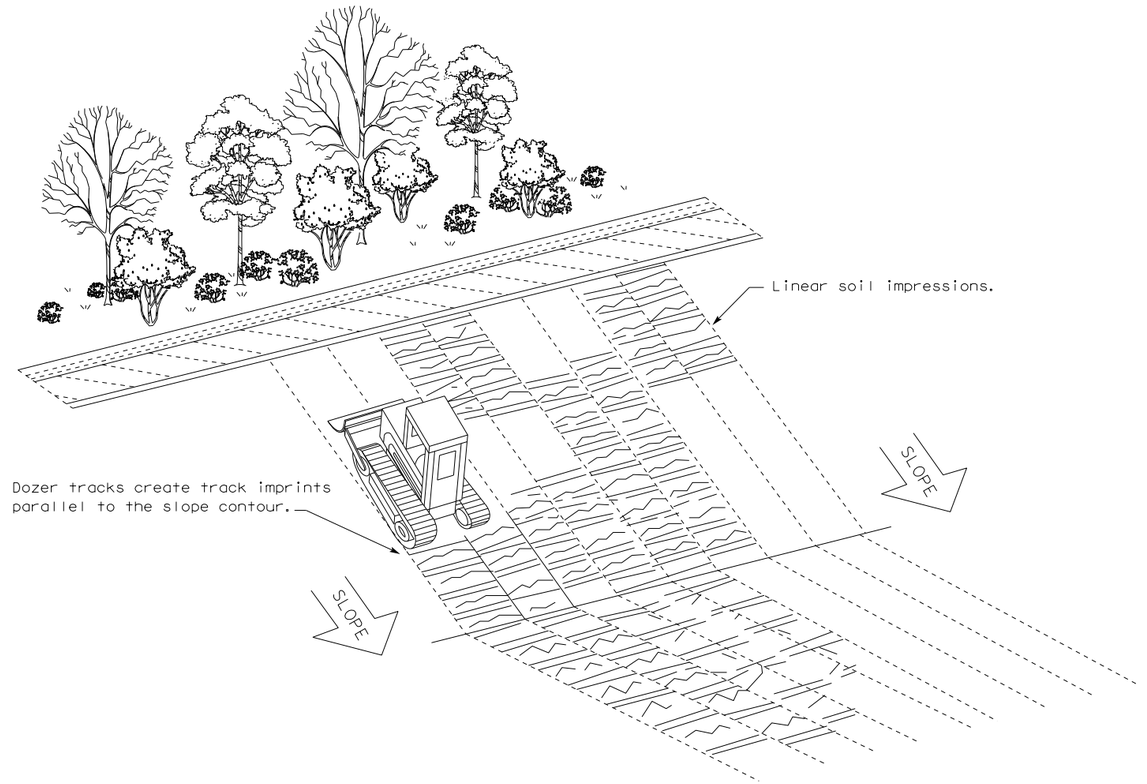
LEGEND

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
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0039	07	257		I69E	
	DIST	COUNTY			SHEET NO.	
	PHR	CAMERON			196	

DATE
FILE

DATE:
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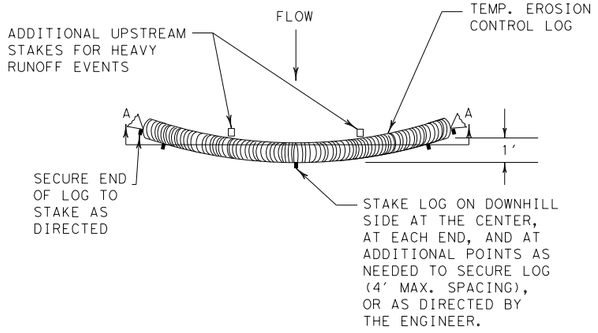

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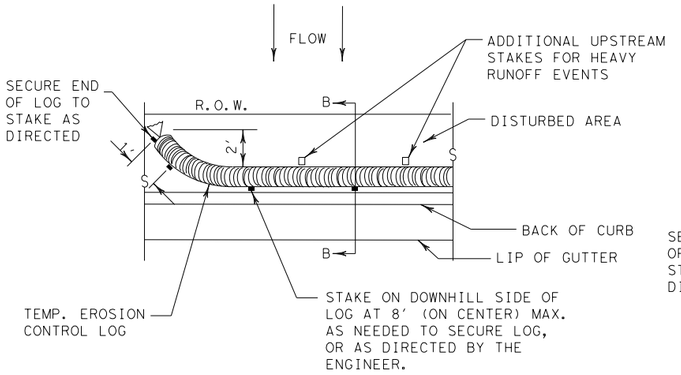

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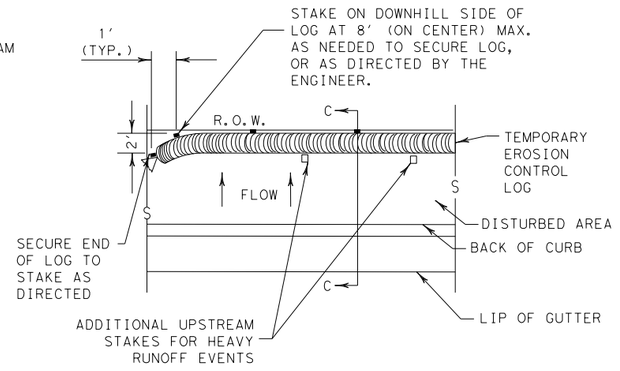
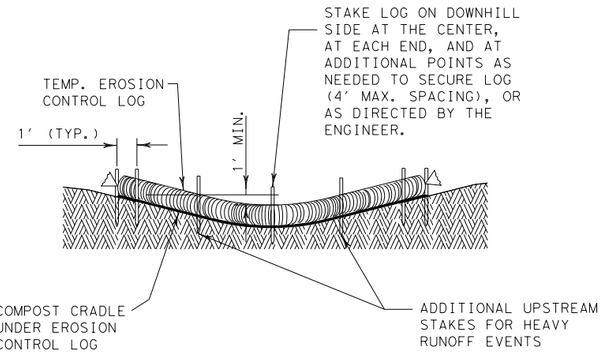


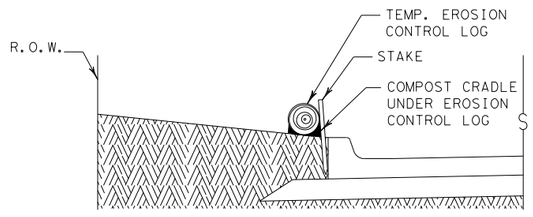
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

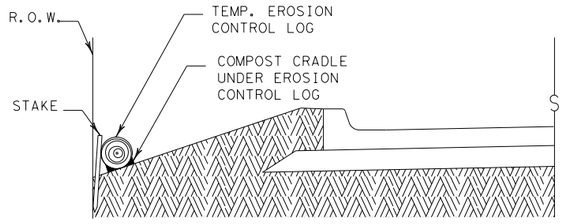
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

CL-BOC



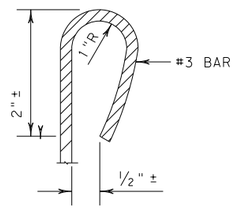
SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW

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



REBAR STAKE DETAIL

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

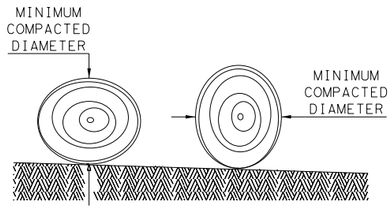
Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

Texas Department of Transportation — Design Division Standard

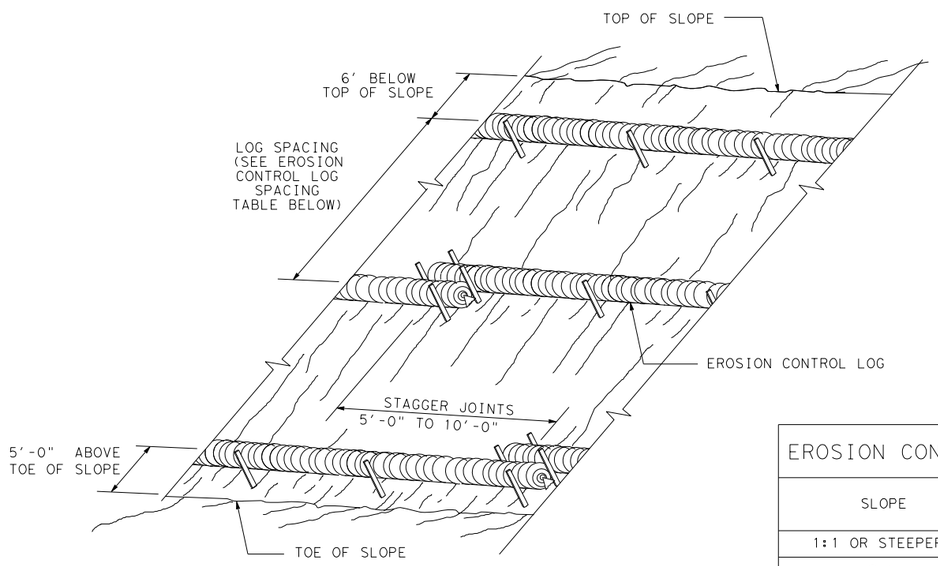
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

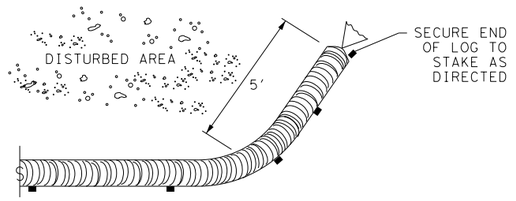
FILE: ec916		DN: TxDOT		CK: KM	DW: LS/PT		CK: LS
© TxDOT: JULY 2016		CONT	SECT	JOB		HIGHWAY	
REVISIONS		0039	07	257		I69E	
		DIST		COUNTY			SHEET NO.
		PHR		CAMERON			197

DATE:
FILE:



EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

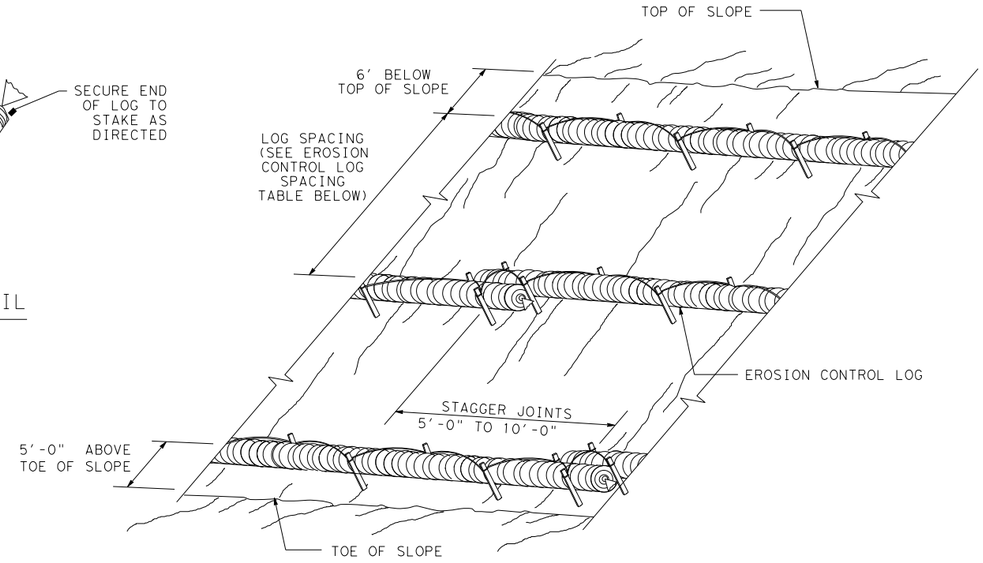
CL-SST



END SECTION RAP DETAIL

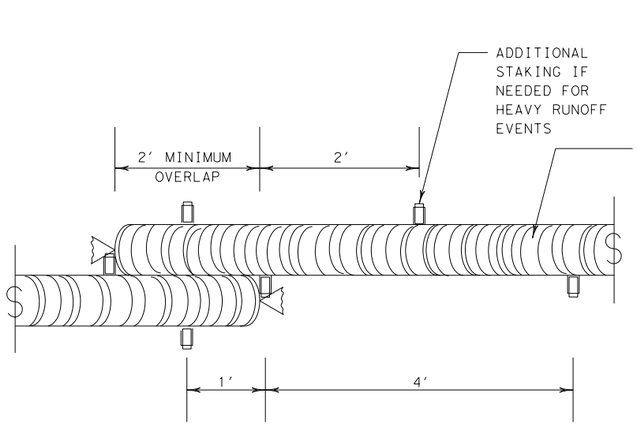
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5′	10′	15′	20′
2:1	10′	20′	30′	40′
3:1	15′	30′	45′	60′
4:1 OR FLATTER	20′	40′	60′	80′

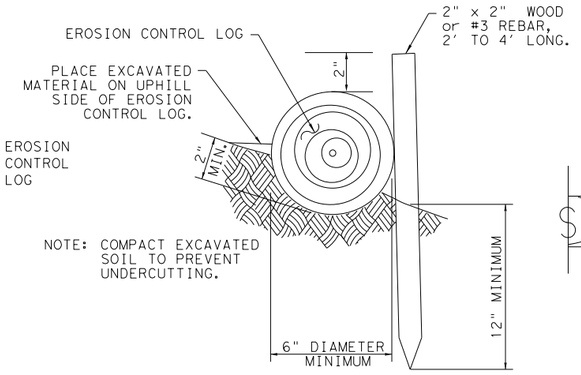
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

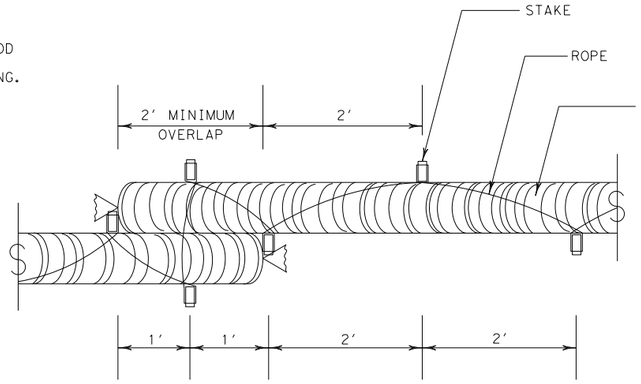


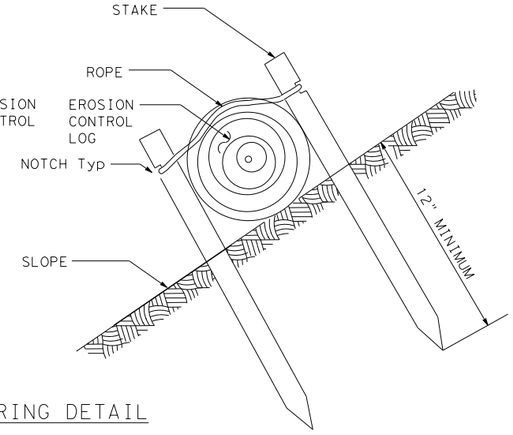


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

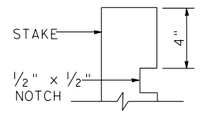
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

Texas Department of Transportation

Design Division Standard

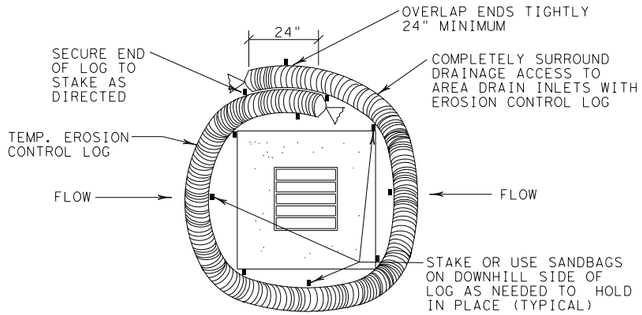
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

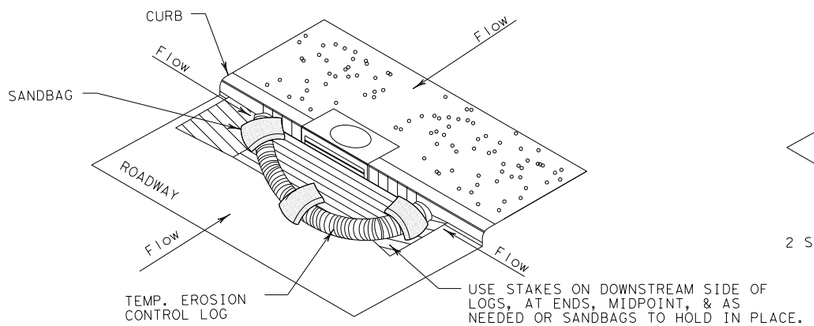
FILE: ec116	DN: TxDOT		CK: KM		DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0039	07	257		I69E	
	DIST	COUNTY			SHEET NO.	
	PHR	CAMERON			198	

DATE:
FILE:



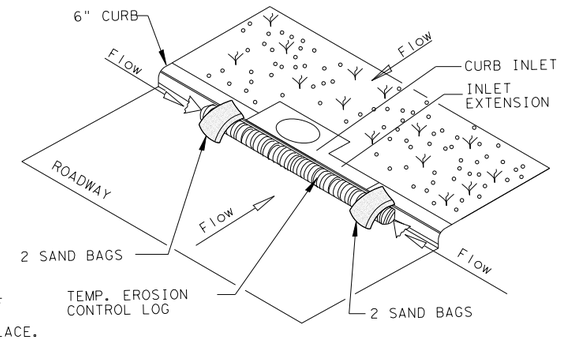
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

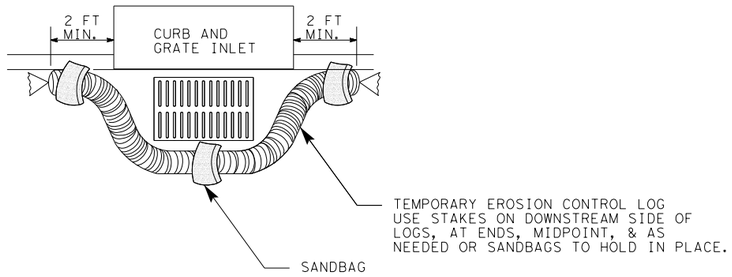
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

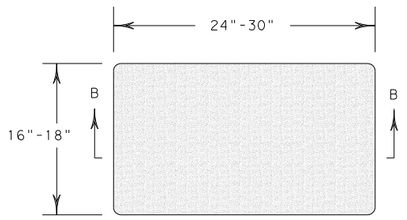
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

SECTION B-B



SANDBAG DETAIL

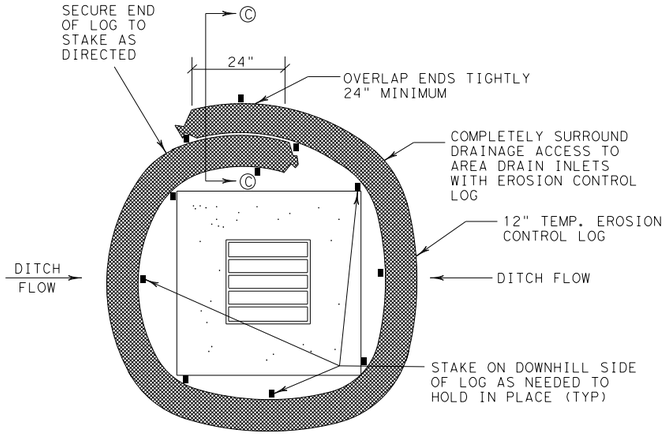
Texas Department of Transportation | Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

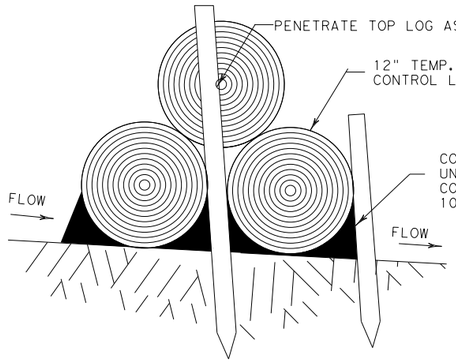
FILE: ec916	DN: TxDOT		CK: KM		DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0039	07	257		I69E		
	DIST	COUNTY			SHEET NO.		
	PHR	CAMERON			199		



DROP INLET SEDIMENT TRAP

NTS

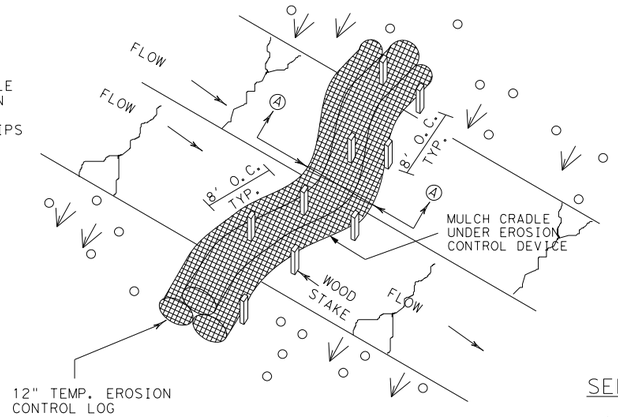
DI-ST



SECTION A-A

DITCH LINE SEDIMENT TRAP A-A

DL-ST



DITCH LINE SEDIMENT TRAP

DL-ST

PLANS SHEET LEGEND

DI-ST — DROP INLET SEDIMENT TRAP

DL-ST — DITCH LINE SEDIMENT TRAP

BOCI-ST — BACK OF CURB INLET SEDIMENT TRAP

ROW-ST — RIGHT OF WAY SEDIMENT TRAP

CI-ST — CURB INLET SEDIMENT TRAP

SEDIMENT BASIN & TRAP USAGE GUIDELINES

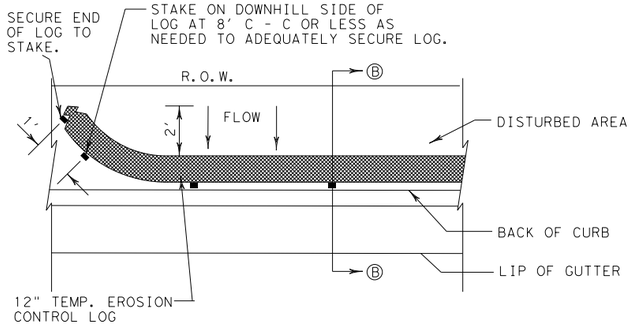
A sediment trap may be used to precipitate sediment out of runoff draining from an unstabilized area.

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).

Sediment traps should be placed in the following locations:

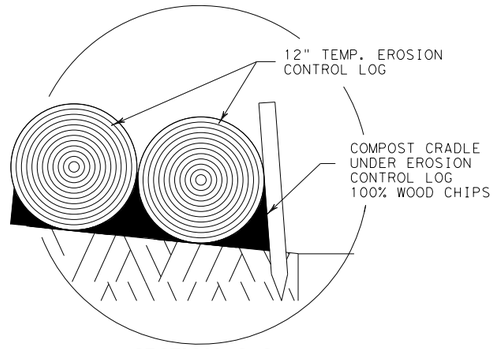
1. Immediately preceding drain inlets
2. Just before the drainage enters a water course
3. Just before the drainage leaves the right of way
4. Just before the drainage leaves the construction limits where drainage flows away from the project

The trap should be cleaned when the capacity has been reduced by ½ or the sediment has accumulated to a depth of 1', whichever is less. Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for seperately.



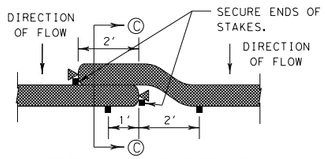
PLAN VIEW

NTS



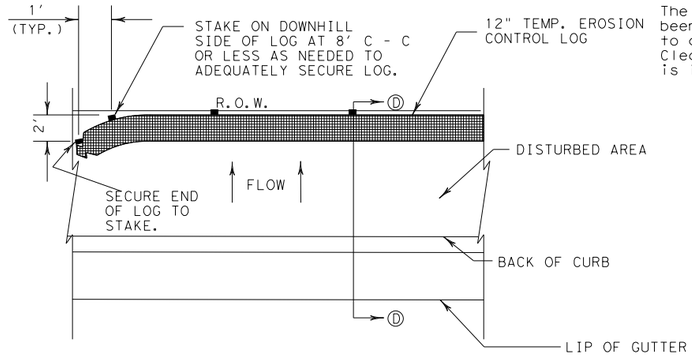
SECTION C-C

OVERLAP WITH COMPOST CRADLE



OVERLAP DETAIL PLAN VIEW

NTS

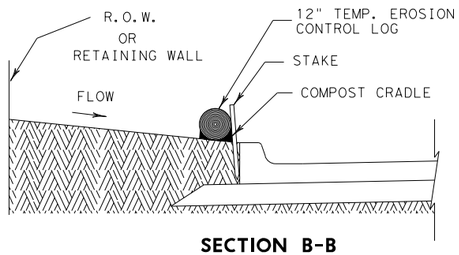


PLAN VIEW

NTS

GENERAL NOTES

1. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED. MAXIMUM LENGTH OF LOGS SHALL BE 30' FOR 12" DIAMETER LOGS.
2. 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.
3. STUFF LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE DENSITY THAT WILL HOLD SHAPE WITHOUT EXCESSIVE DEFORMATION.
4. STAKES SHALL BE 2" X 2" WOOD 4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG.
5. COMPOST CRADLE MATERIAL IS INCIDENTAL AND WILL NOT BE PAID FOR SEPARATELY.

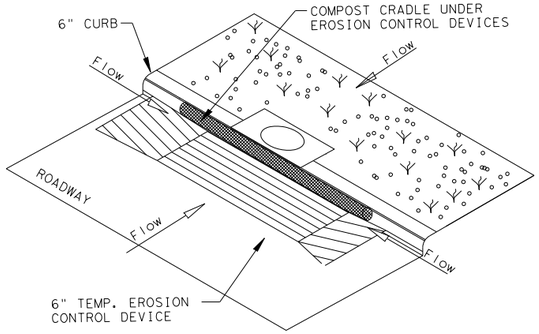


SECTION B-B

BACK OF CURB INLET SEDIMENT TRAP

NTS

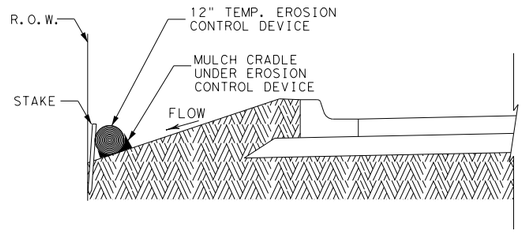
BOCI-ST



CURB INLET SEDIMENT TRAP

NTS

CI-ST



SECTION D-D

RIGHT-OF-WAY SEDIMENT TRAP

NTS

ROW-ST

PHARR DISTRICT STANDARD

Texas Department of Transportation

TEMPORARY EROSION CONTROL LOGS

TECL-17 (PHR)

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	F 2023(418)		I69E
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	PHARR	CAMERON	200
CONTROL	SECTION	JOB	
0039	07	257	

LEVELS DISPLAYED

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

TPWD BMPs

The Programmatic Agreement defines Best Management Practices (BMPs) to be implemented by Texas Department of Transportation (TxDOT) per §2.213 (Programmatic Agreements) of the 2017 Memorandum of Understanding (MOU) between TxDOT and Texas Parks and Wildlife Department (TPWD). These BMPs are measures that TxDOT and TPWD agree will result in avoidance and minimization of potential impacts to natural resources and in some cases apply to particular types of TxDOT projects.

The purpose of this section is to provide BMPs to minimize impacts to species or groups of species. Implementation of these BMPs by TxDOT eliminates the need for coordination under §2.206(1)of the MOU, except as noted.

Due diligence should be used to avoid killing or harming any wildlife species in the implementation of TxDOT projects.

☒ Bird BMPs (Required)

In addition to complying with the Migratory Bird Treaty Act (MBTA) perform the following BMPs:

- ☒ Prior to construction, perform daytime surveys for nests including under bridges and in culverts to determine if they are active before removal. Nests that are active should not be disturbed.
- ☒ Do not disturb, destroy, or remove active nests, including ground nesting birds, during the nesting season.
- ☒ Avoid the removal of unoccupied, inactive nests, as practicable.
- ☐ Prevent the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair.
- ☒ Do not collect, capture, relocate, or transport birds, eggs, young, or active nests without a permit.

☐ Bald Eagle *(Haliaeetus leucocephalus)*

- ☐ Bird BMPs and Bald and Golden Eagle Protection Act compliance

☐ Reddish Egret *(Egretta rufescens)* or
☐ White-faced Ibis *(Plegadis chihi)*

- ☐ Bird BMPs unless project is within 300 meters (984 feet)of a known colonial water bird rookery then coordinate with TPWD.

☐ Rookeries (Recommendations)

In general, nesting dates for herons and egrets range from early February to late August in Texas, depending on the species. Great Blue Herons (GBHE) are usually the first to nest. When GBHE get disrupted from the nest and abandon nesting, then the other species of herons and egrets may not attempt to nest at the colony that year. Breeding dates for rookery species are approximately as follows:

Species	Dates
Cattle Egret	Early April to late October
Little Blue Heron	Late March to late July
Snowy Egret	Late March to early August
Great Egret	Early March to early August
Black-crowned Night Heron	Early February to late July
Great Blue Heron	February to late August

☐ Rookeries (Recommendations) (Continued)

- ☐ Vegetation clearing in a primary buffer area of 300 meters (984 feet) from a heronry periphery should be avoided. Utilizing areas that have already been cleared within this buffer area may be acceptable depending on site-specific characteristics. Additionally, human foot-traffic or machinery use should not occur within this buffer area during the nesting season.
- ☐ Clearing activities or construction using heavy machinery in a secondary buffer area of 1,000 meters (3,281 feet) from the heronry periphery should be avoided during the breeding season (courting and nesting).

☐ Bat BMPs (Required)

To determine the appropriate BMP to avoid or minimize impacts to bats, review the habitat description for the species of interest on the TPWD Rare, Threatened, and Endangered Species of Texas by County List or other trusted resources. All bat surveys and other activities that include direct contact with bats shall comply with TPWD' recommended white-nose syndrome protocols located on the TPWD Wildlife Habitat Assessment Program website under "Project Design and Construction".

The following survey and exclusion protocols should be followed prior to commencement of construction activities. For the purposes of this document, structures are defined as bridges, culverts (concrete or metal), wells, and buildings.

- ☐ For activities that have the potential to impact structures, cliffs or caves, or trees; a qualified biologist will perform a habitat assessment and occupancy survey of the feature(s) with roost potential as early in the planning process as possible or within one year before project letting.
- ☐ For roosts where occupancy is strongly suspected but unconfirmed during the initial survey, revisit feature(s) at most four weeks prior to scheduled disturbance to confirm absence of bats.
- ☐ If bats are present or recent signs of occupation (i.e., piles of guano, distinct musky odor, or staining and rub marks at potential entry points) are observed, take appropriate measures to ensure that bats are not harmed, such as implementing non-lethal exclusion activities or timing or phasing of construction.
- ☐ Exclusion devices can be installed by a qualified individual between September 1 and March 31. Exclusion devices should be used for a minimum of seven days when minimum nighttime temperatures are above 50°F and minimum daytime temperatures are above 70°F. Prior to exclusion, ensure that alternate roosting habitat is available in the immediate area. If no suitable roosting habitat is available, installation of alternate roosts is recommended to replace the loss of an occupied roost. If alternate roost sites are not provided, bats may seek shelter in other inappropriate sites, such as buildings, in the surrounding area. See Additional Bat BMPs (Recommendations) for recommended acceptable methods for excluding bats from structures.
- ☐ If feature(s) used by bats are removed as a result of construction, replacement structures should incorporate bat-friendly design or artificial roosts should be constructed to replace these features, as practicable.
- ☐ Conversion of property containing cave or cliff features to transportation purposes should be avoided where feasible.

☐ Bat BMPs (Required)(Continued)

- ☐ Avoid unnecessary removal of dead fronds on native and ornamental palm trees in south Texas (Cameron, Hidalgo, Willacy, Kenedy, Brooks, Kleberg, Nueces, and San Patricio counties) from April 1st through October 31st. If removal of dead fronds is necessary at other times of the year, limit frond removal to extended warm periods (nighttime temperatures: 55°F for at least two consecutive nights), so bats can move away from the disturbance and find new roosts.
- ☐ Large hollow trees, snags (dead standing trees), and trees with shaggy bark should be surveyed for colonies and, if found, should not be disturbed until the bats are no longer occupying these features. Post-occupancy surveys should be conducted by a qualified biologist prior to tree removal from the landscape.
- ☐ Retain mature, large diameter hardwood forest species and native/ornamental palm trees where feasible.
- ☐ In all instances, avoid harm or death to bats. Bats should only be handled as a last resort and after communication with TPWD.

☐ Mexican Long-tongues Bat *(Choeronycteris mexicana)*

- ☐ Avoid unnecessary impacts to cacti and agave species.
- ☐ Bat BMPs.

☐ Additional Bat BMPs (Recommendations)

- ☐ Bat surveys of structures should include visual inspections of structural fissures (cracked or spalled concrete, damaged or split beams, split or damaged timber railings), crevices (expansion joints, space between parallel beams, spaces above supports piers), and alternative structures (drainage pipes, bolt cavities, open sections between support beams, swallow nests) for the presence of bats.
- ☐ Before excluding bats from any occupied structure, bat species, weather, temperature, season, and geographic location must be incorporated into any exclusion plans to avoid unnecessary harm or death to bats. Winter exclusion must entail a survey to confirm either, 1) bats are absent or 2) present but active (i.e. continuously active - not intermittently active due to arousals from hibernation).
- ☐ Avoid using materials that degrade quickly, like paper, steel wool or rags, to close holes.
- ☐ Avoid using products or making structural modifications that may block natural ventilation, like hanging plastic sheeting over an active roost entrance, thereby altering roost microclimate.
- ☐ Avoid using chemical and ultrasonic repellents.
- ☐ Avoid use of silicone, polyurethane or similar non-water-based caulk products.
- ☐ Avoid use of expandable foam products at occupied sites.
- ☐ Avoid the use of flexible netting attached with duct tape.

Pharr District Contact No. 956-702-6100

Revised 07/12/2017

List of Abbreviations

BMP: Best Management Practice
CGP: Construction General Permit
CRPe: Contractor Responsible Person Environmental
DSHS: Texas Department of State Health Services
FEMA: Federal Emergency Management Agency
FHWA: Federal Highway Administration
MOA: Memorandum of Agreement
MOU: Memorandum of Understanding
MS4: Municipal Separate Stormwater Sewer System
MSAT: Mobile Source Air Toxic
MBTA: Migratory Bird Treaty Act
NOI: Notice of Intent
NOT: Notice of Termination
NWP: Nationwide Permit
PCN: Pre-Construction Notification
PSL: Project Specific Location
SPCC: Spill Prevention Control and Countermeasure
SW3P: Storm Water Pollution Prevention Plan
TCEQ: Texas Commission on Environmental Quality
THC: Texas Historical Commission
TPDES: Texas Pollutant Discharge Elimination System
TPWD: Texas Parks and Wildlife Department
TxDOT: Texas Department of Transportation
T&E: Threatened and Endangered Species
USACE: U.S. Army Corp of Engineers
USFWS: U.S. Fish and Wildlife Service

Texas Department of Transportation
PHARR DISTRICT

EPIC SHEET SUPPLEMENTALS

TPWD BMPs

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	F 2023(418)		I-69E
STATE	DISTRICT	COUNTY	
TEXAS	PHR	CAMERON	SHEET NO.
CONTROL	SECTION	JOB	
0039	07	257	201

Date Printed: $DATE$

☐ Additional Bat BMPs (Recommendations) (Continued)

- ☐ In order to avoid entombing bats, exclusion activities should be only implemented by a qualified individual. A qualified individual or company should possess at least the following minimum qualifications:
  - Experience in bat exclusion (the individual, not just the company).
  - Proof of rabies pre-exposure vaccinations.
  - Demonstrated knowledge of the relevant bat species, including maternity season date range and habitat requirements.
  - Demonstrated knowledge of rabies and histoplasmosis in relation to bat roosts.
- ☐ Contact TPWD for additional resources and information to assist in executing successful bat exclusions that will avoid unnecessary harm or death in bats.

☐ Fossorial Mammal BMPs (Required)

- ☐ If black-tailed prairie dog (BTPD) burrows or pocket gopher mounds are to be excavated/directly impacted coordinate with TPWD WHAB.
- ☐ When a construction zone is adjacent to active BTPD burrows or pocket gopher mounds, erect barriers to discourage individuals moving through or into the construction area.
- ☐ When seeding or revegetation is planned in an area adjacent to BTPD burrows or pocket gopher mounds, a vegetative barrier should be considered in the planting to discourage dispersal into the ROW.

☐ Coues' Rice Rat *(Oryzomys couesi)*

- ☐ Minimize impacts to wetland, Resaca, oxbow lakes, and marsh habitats.
- ☐ Contractors will be advised of potential occurrence in the project area and to avoid harming the species if encountered.
- ☐ Water Quality BMPs.

☒ Plains Spotted Skunk *(Spilogale putorius interrupta)* or
☐ Swift Fox *(Vulpes velox)*

- ☒ Contractor will be advised of potential occurrence in the project area and to avoid harming the species if encountered and to avoid unnecessary impacts to dens.

☐ White nosed Coati *(Nasua narica)*/
☐ Yellow nosed Cotton Rat *(Sigmodon ochrognathus)*

- ☐ Contractors will be advised of potential occurrence in the project area and to avoid harming the species if encountered.

☐ Terrestrial Reptile BMPs (Required)

- ☐ Apply hydro mulching and/or hydro seeding in areas for soil stabilization and/or revegetation of disturbed areas where feasible. If hydro mulching and/or hydro seeding are not feasible due to site conditions, utilize erosion control blankets or mats that contain no netting or contain loosely woven, natural fiber netting is preferred. Plastic netting should be avoided to the extent practicable.
- ☐ For open trenches and excavated pits, install escape ramps at an angle of less than 45 degrees (1 :1) in areas left uncovered. Visually inspect excavation areas for trapped wildlife prior to backfilling.
- ☐ Inform contractors that if reptiles are found on project site allow species to safely leave the project area.
- ☐ Avoid or minimize disturbing or removing downed trees, rotting stumps, and leaf litter where feasible.
- ☐ Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered.

☒ Texas Tortoise *(Gopherus berlandieri)*

- ☒ Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered.
- ☒ Utility trenches should be covered overnight or visually inspected before filling to avoid burial of the species.
- ☒ Terrestrial Reptile BMPs.

☒ Texas Horned Lizard *(Phrynosoma cornutum)*

- ☒ Avoid harvester ant mounds in the selection of Project Specific Locations (PSLs) where feasible.
- ☒ Terrestrial Reptile BMPs.

☐ Additional Reptile BMPs (Recommendations)

- ☐ Due to increased activity (mating) of reptiles during the spring, construction activities like clearing or grading should attempt to be scheduled outside of the spring (April-May) season. Also, timing ground disturbing activities before October when reptiles become less active and may be using burrows in the project area is also encouraged.
- ☐ When designing roadways with curbs, consider using Type I or Type III curbs to provide a gentle slope to enable turtles and small animals to get out of roadways.
- ☐ If Texas Tortoises are present in a project area, they should be removed from the area. After removal of the tortoises, the area that will be disturbed during active construction and project specific locations should be fenced off to exclude tortoises and other reptiles. The exclusion fence should be constructed and maintained as follows:
  - a. The exclusion fence should be constructed with metal flashing or drift fence material.
  - b. Rolled erosion control mesh material should not be used.
  - c. The exclusion fence should be buried at least 6 inches deep and be at least 24 inches high.
  - d. The exclusion fence should be maintained for the life of the project and only removed after the construction is completed and the disturbed site has been revegetated.

☐ Amphibian and Aquatic Reptile BMPs (Required)

Unless absence of the species can be demonstrated, assume presence in suitable habitat and implement the following BMPs. Absence can only be demonstrated using TPWD-approved survey efforts (contact TPWD for minimum survey protocols for species and project site conditions).

- ☐ For projects within one mile of a known occupied location or observation of the species recorded from 1980 until the current year and suitable habitat is present, coordinate with TPWD.
- ☐ For new location roadway projects, coordinate with TPWD.
- ☐ For projects within existing right-of-way (ROW) when work is in water or will permanently impact a water feature and potential habitat exists for the target species complete the following:
  - a) Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered.
  - b) Minimize impacts to wetland, temporary and permanent open water features, including depressions, and riverine habitats.
  - c) Maintain hydrologic regime and connections between wetlands and other aquatic features.

Pharr District Contact No. 956-702-6100

☐ Amphibian and Aquatic Reptile BMPs (Continued)

- d) Use barrier fencing to direct animal movements away from construction activities and areas of potential wildlife-vehicle collisions in construction areas directly adjacent, or that may directly impact, potential habitat for the target species.
- e) Apply hydromulching and/or hydroseeding in areas for soil stabilization and/or revegetation of disturbed areas where feasible. If hydromulching and/or hydroseeding are not feasible due to site conditions, using erosion control blankets or mats that contain no netting, or only contain loosely woven natural fiber netting is preferred. Plastic netting should be avoided to the extent practicable.
- f) Project specific locations (PSLs) proposed within state-owned ROW should be located in uplands away from aquatic features.
- g) When work is directly adjacent to the water, minimize impacts to shoreline basking sites (e.g., downed trees, sand bars, exposed bedrock) and overwinter sites (e.g., brush and debris piles, crayfish burrows) where feasible.
- h) Avoid or minimize disturbing or removing downed trees, rotting stumps, and leaf litter, which may be refugia for terrestrial amphibians, where feasible.
- i) If gutters and curbs are part of the roadway design, where feasible install gutters that do not include the side box inlet and include sloped (i.e. mountable) curbs to allow small animals to leave roadway. If this modification to the entire curb system is not possible, install sections of sloped curb on either side of the storm water drain for several feet to allow small animals to leave the roadway. Priority areas for these design recommendations are those with nearby wetlands or other aquatic features.

☐ For projects that require acquisition of additional ROW and work within that new ROW is in water or will permanently impact a water feature, implement a) - i) above plus j) -l) below, where applicable:

- j) For sections of roadway adjacent to wetlands or other aquatic features, install wildlife barriers that prevent climbing. Barriers should terminate at culvert openings in order to funnel animals under the road. The barriers should be of the same length as the adjacent feature or 80 feet long in each direction, or whichever is the lesser of the two.
- k) For culvert extensions and culvert replacement/installation, incorporate measures to funnel animals toward culverts such as concrete wingwalls and barrier walls with overhangs.
- l) When riprap or other bank stabilization devices are necessary, their placement should not impede the movement of terrestrial or aquatic wildlife through the water feature. Where feasible, biotechnical streambank stabilization methods using live native vegetation or a combination of vegetative and structural materials should be used.

Revised 07/12/2017

List of Abbreviations

BMP: Best Management Practice	MSAT: Mobile Source Air Toxic	TCEQ: Texas Commission on Environmental Quality
CGP: Construction General Permit	MBTA: Migratory Bird Treaty Act	THC: Texas Historical Commission
CRPe: Contractor Responsible Person Environmental	NOI: Notice of Intent	TPDES: Texas Pollutant Discharge Elimination System
DSHS: Texas Department of State Health Services	NOT: Notice of Termination	TPWD: Texas Parks and Wildlife Department
FEMA: Federal Emergency Management Agency	NWP: Nationwide Permit	TxDOT: Texas Department of Transportation
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MOU: Memorandum of Understanding	SPCC: Spill Prevention Control and Countermeasure	USFWS: U.S. Fish and Wildlife Service
MS4: Municipal Separate Stormwater Sewer System	SW3P: Storm Water Pollution Prevention Plan	

Texas Department of Transportation

PHARR DISTRICT

EPIC SHEET SUPPLEMENTALS

TPWD BMPs

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	F 2023(418)		I-69E
STATE	DISTRICT	COUNTY	
TEXAS	PHR	CAMERON	SHEET NO.
CONTROL	SECTION	JOB	
0039	07	257	202

Date Printed: $DATE$

☒ Sheep Frog *(Hypopachus variolosus)*

- ☒ Minimize disturbance to burrows or downed woody debris.
- ☒ Water Quality BMPs.
- ☒ Amphibian BMPs.

☒ South Texas Siren (Large Form) *(Siren sp 1)*

- ☒ Minimize impacts to warm, shallow waters with vegetative cover such as ponds and ditches.
- ☒ Water Quality BMPs.
- ☒ Amphibian BMPs.

☐ Freshwater Mussel BMPs (Required)

- ☐ When work is in the water; survey project footprints for state listed species where appropriate habitat exists.
- ☐ When work is in the water and mussels are discovered during surveys; relocate state listed and SGCN mussels under TPWD authorization and implement Water Quality BMPs.
- ☐ When work is adjacent to the water; Water Quality BMPs implemented as part of the SWPPP for a construction general permit or any conditions of the Section 401 water quality certification for the project will be implemented.

☐ Fish BMPs (Required)

- ☐ For projects within the range of a SGCN or State-Listed fish and work is adjacent to water: Use Water Quality BMPs. No TPWD Coordination required.
- ☐ For projects within the range of a SGCN or State-Listed fish, and work is in the water: TPWD coordination is required.

☒ Water Quality BMPs (Required)

In addition to BMPs required for a TCEQ Storm Water Pollution Prevention Plan and/or Section 401 water quality permit:

- ☒ Minimize the use of equipment in streams and riparian areas during construction. When possible, equipment access should be from banks, bridge decks, or barges.
- ☐ When temporary stream crossings are unavoidable, remove stream crossings once they are no longer needed and stabilize banks and soils around the crossing.

☒ Additional Water Quality BMPs (Recommendations)

- ☐ Wet-Bottomed detention ponds are recommended to benefit wildlife and downstream water quality. Consider potential wildlife-vehicle interactions when siting detention ponds.
- ☒ Rubbish found near bridges on TxDOT ROW should be removed and disposed of properly to minimize the risk of pollution. Rubbish does not include brush piles or snags.

☐ Aquatic Mitigation (Recommendations)

- ☐ In-kind compensatory mitigation should be considered for all unavoidable impacts to aquatic resources including, but not limited to streams, wetlands, oysters, seagrass and mudflats, regardless of their jurisdictional status.
- ☐ Compensatory mitigation plans should be developed in consultation with TPWD Transportation Conservation Coordinator.

☒ Stream Crossings (Recommendations)

- ☐ Use spanning bridges rather than culverts when feasible.
- ☐ If using a culvert, staggered culverts that concentrate low flows but provide conveyance of higher flows through staggered culverts placed at higher elevations is recommended.
- ☐ Bottomless culverts are recommended to allow for fish and other aquatic wildlife passage in the low flow channel. If bottomless culverts are not feasible, making a low flow channel for fish passage is recommended.
- ☐ Avoid placing riprap across stream channels and instead use alternative stabilization such as biotechnical stream bank stabilization methods including live native vegetation or a combination of vegetative and structural materials. When riprap or other bank stabilization devices are necessary, their placement should not impede the movement of aquatic and terrestrial wildlife underneath the bridge. In some instances, riprap may be buried, back-filled with topsoil and planted with native vegetation.
- ☐ Incorporate bat-friendly design into bridges and culverts.
- ☐ Design bridges for adequate vertical and horizontal clearances under the roadway to allow for terrestrial wildlife to safely pass under the road.
- ☒ A span wide enough to cross the stream and allow for dry ground and a natural surface path under the roadway is encouraged. For culverts, incorporation of an artificial ledge inside the culvert on one or both sides for use by terrestrial wildlife is recommended.
- ☒ Riparian buffer zones should remain undisturbed where possible.

☒ Vegetation BMPs (Recommendations)

- ☒ Minimize the amount of vegetation cleared. Removal of native vegetation, particularly mature native trees and shrubs should be avoided to the greatest extent practicable. Wherever practicable, impacted vegetation should be replaced with in-kind on-site replacement/restoration of native vegetation.
- ☐ To minimize adverse effects, activities should be planned to preserve mature trees, particularly acorn, nut or berry producing varieties. These types of vegetation have high value to wildlife as food and cover.
- ☐ It is strongly recommended that trees greater than 12 inches in diameter at breast height (dbh) that are removed be replaced. TPWD's experience indicates that for ecologically effective replacement, a ratio of three trees for every one (3:1) lost should be provided to the extent practicable either on-site or off-site. Trees less than 12 inches dbh should be replaced at a 1:1 ratio.
- ☐ Replacement trees should be of equal or better wildlife quality than those removed and be regionally adapted native species.
- ☐ When trees are planted, a maintenance plan that ensures at least an 85 percent survival rate after three (3) years should be developed for the replacement trees.
- ☒ The use of any non-native vegetation in landscaping and revegetation is discouraged. Locally adapted native species should be used.
- ☒ The use of seed mix that contains seeds from only locally adapted native species is recommended.
- ☒ Avoid vegetation clearing activities during the general bird nesting season, March through August, to minimize adverse impacts to birds.

☐ Invasive Species BMPs (Recommendations)

- ☐ For all work in waters listed in the distribution of Zebra mussels on http://texasinvasives .org/ as well as those waters specified in 31 TAC §57.972 and any TPWD emergency orders regarding prevention of the spread of Zebra mussels all machinery, equipment, or vehicles coming in contact with such waters should follow clean/drain/dry protocols to prevent the potential spread of invasive Zebra mussels.
- ☐ Care should be taken to avoid the spread of aquatic invasive plants (such as Giant Salvinia, Hydrilla, Hyacinth, Watermilfoil, Water Lettuce, and Alligatorweed) from infested water bodies into areas not currently infested. All machinery/equipment/vehicles coming in contact with waters containing aquatic invasive plant species should follow clean/drain/dry protocols to prevent the potential spread of invasive plants.
- ☐ Colonization by invasive plants should be actively prevented on disturbed sites in terrestrial habitats. Vegetation management should include removing invasive species as soon as practical while allowing the existing native plants to revegetate the disturbed areas. If using hay bales for sediment control, use locally grown weed-free hay to prevent the spread of invasive species. Leave the hay bales in place and allow them to break down, as this acts as mulch assisting in revegetation.

☐ Wildlife Crossings (Recommendations)

- ☐ Design roadways on new location to incorporate wildlife crossings, particularly in areas that bisect wildlife travel corridors or seasonal movement routes.
- ☐ Consider using cable median barrier instead of concrete traffic barrier when feasible to increase permeability for animals encountering barriers.

Pharr District Contact No. 956-702-6100

Revised 07/12/2017

List of Abbreviations

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Texas Department of Transportation

PHARR DISTRICT

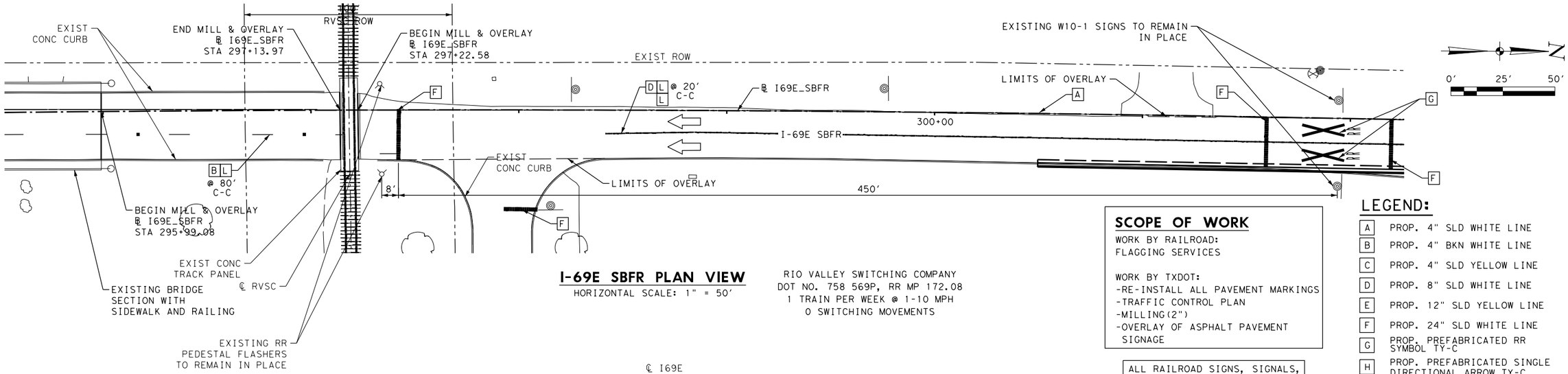
EPIC SHEET SUPPLEMENTALS

TPWD BMPs

SHEET 3 OF 3

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	F 2023(418)		I-69E
STATE	DISTRICT	COUNTY	
TEXAS	PHR	CAMERON	SHEET NO.
CONTROL	SECTION	JOB	
0039	07	257	203

Date Printed: $DATE$



I-69E SBFR PLAN VIEW

HORIZONTAL SCALE: 1" = 50'

RIO VALLEY SWITCHING COMPANY
DOT NO. 758 569P, RR MP 172.08
1 TRAIN PER WEEK @ 1-10 MPH
0 SWITCHING MOVEMENTS

SCOPE OF WORK

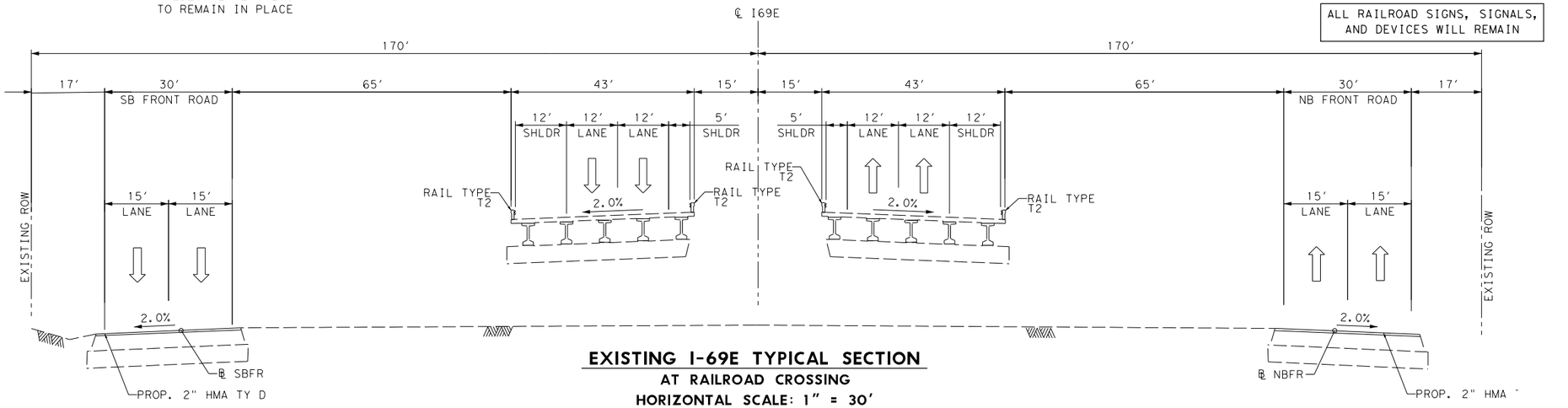
WORK BY RAILROAD:
FLAGGING SERVICES

WORK BY TXDOT:
-RE-INSTALL ALL PAVEMENT MARKINGS
-TRAFFIC CONTROL PLAN
-MILLING(2")
-OVERLAY OF ASPHALT PAVEMENT
SIGNAGE

ALL RAILROAD SIGNS, SIGNALS, AND DEVICES WILL REMAIN

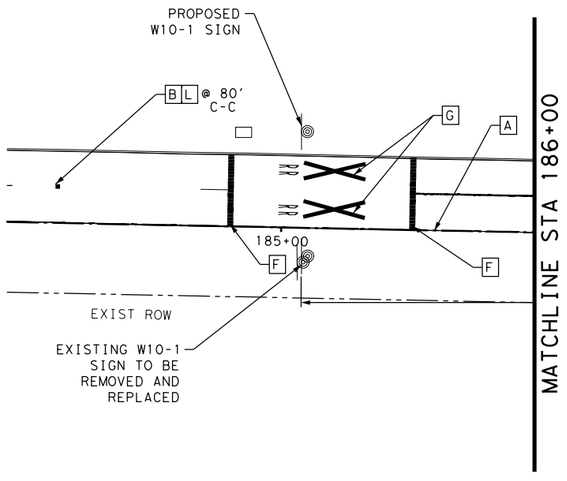
LEGEND:

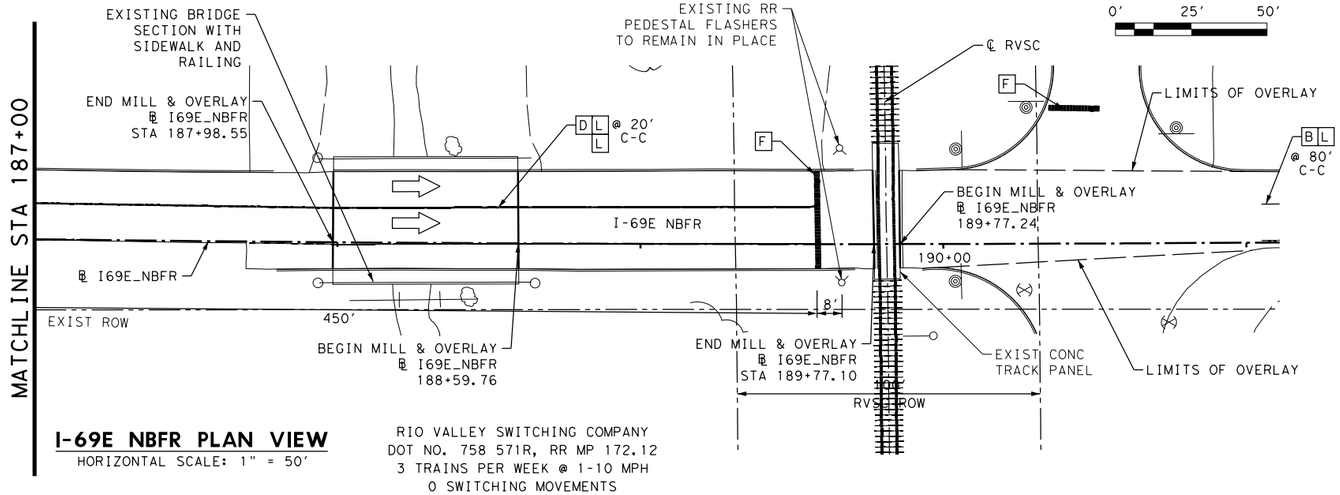
A	PROP. 4" SLD WHITE LINE
B	PROP. 4" BKN WHITE LINE
C	PROP. 4" SLD YELLOW LINE
D	PROP. 8" SLD WHITE LINE
E	PROP. 12" SLD YELLOW LINE
F	PROP. 24" SLD WHITE LINE
G	PROP. PREFABRICATED RR SYMBOL TY-C
H	PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
I	PROP. PREFABRICATED WORD TY-C
J	PROP. PAV MRKR II-A-A
K	PROP. PAV MRKR TY I-C
L	PROP. PAV MRKR TY II-C-R
M	PROP. 4" BRK WHITE CONTRAST LINE
N	PROP. 12" SLD WHITE LINE
*	REMOVE EXIST. 12" CROSSWALK



EXISTING I-69E TYPICAL SECTION

AT RAILROAD CROSSING
HORIZONTAL SCALE: 1" = 30'
VERTICAL SCALE: NTS





I-69E NBFR PLAN VIEW

HORIZONTAL SCALE: 1" = 50'

RIO VALLEY SWITCHING COMPANY
DOT NO. 758 571R, RR MP 172.12
3 TRAINS PER WEEK @ 1-10 MPH
0 SWITCHING MOVEMENTS

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
NICOLAS C. GARCIA
99410
LICENSED
PROFESSIONAL ENGINEER

Nicolas C. Garcia, P.E.

2/10/2023

Texas Department of Transportation
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QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
4350 Lockhill Selma Road, Suite 100 • San Antonio, Texas 78249 • 210.494.5511

I69E
GRADE CROSSING EXHIBIT A
RIO VALLEY SWITCHING COMPANY

SHEET 01 OF 01

DRAWN	FED.RD. DIV.NO.	STATE PROJECT NUMBER		HIGHWAY NO.
XX	6	F 2023(418)		I-69E
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
XX	TEXAS	PHARR	CAMERON	204
CHECKED	CONT.	SECT.	JOB	
XX	0039	07	257	
APPROVED				
XX				

PLOTDRIVER: BW_HALF_PDF.PLTCFG PENTABLE: I69E-RAMPS.tbl
DATE:2/10/2023 6:00:32 PM USER:
FILE:c:\bms\pwe101-01\jason.kane\dms26471\I69E-RAMPS_RR EXH_S.dgn

DATE: 12/14/2022
FILE: c:\dms\pwe101-01\stela.stover-scull\dms26471\RR Scope of Work.dgn

I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

DOT #: 758 569P
Crossing Type: AT GRADE
RR Company Owning Track at Crossing: UNION PACIFIC RAILROAD COMPANY
Operating RR Company at Track: RIO VALLEY SWITCHING COMPANY
RR MP: 172.08
RR Subdivision: SANTA ROSA
City: HARLINGEN
County: CAMERON
CSJ at this Crossing: 0039-07-257
Highway/Roadway name crossing the railroad: I-69E SB FR
# of regularly scheduled trains per week at this crossing: 1
# of switching movements per day at this crossing: 0
% of estimated contract cost of work within railroad ROW: < 1%

DOT #: 758 571R
Crossing Type: AT GRADE
RR Company Owning Track at Crossing: UNION PACIFIC RAILROAD COMPANY
Operating RR Company at Track: RIO VALLEY SWITCHING COMPANY
RR MP: 172.12
RR Subdivision: SANTA ROSA
City: HARLINGEN
County: CAMERON
CSJ at this Crossing: 0039-07-257
Highway/Roadway name crossing the railroad: I-69E NB FR
# of regularly scheduled trains per week at this crossing: 3
# of switching movements per day at this crossing: 0
% of estimated contract cost of work within railroad ROW: < 1%

Scope of Work at this Crossing to Be Performed by State Contractor:
Mill and overlay the existing road, without disturbing the existing railroad concrete planking. Overlay shall consist of hot mix asphalt. Includes pavement markings and signage.

Scope of Work at this Crossing to Be Performed by Railroad Company:
Flagging Services

** Choose: Highway Overpass, Highway Underpass, At Grade, Pedestrian, or Closed/Abandoned

II. OTHER PROJECT WORK WITHIN RAILROAD RIGHTS-OF-WAY (ROW)

None

III. FLAGGING & INSPECTION

of Days of Railroad Flagging Expected: 6

On this project, night or weekend flagging is:

[X] Expected
[ ] Not Expected

Flagging services will be provided by:

[X] Railroad Company: TxDOT will pay flagging invoices
[ ] Outside Party: Contractor will pay flagging invoices, to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30 day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

[ ] UPRR - UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
- UP.request@nrssinc.net
Call Center 877-984-6777

[ ] BNSF - BNSF.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging

[ ] KCS - KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
- Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

[X] OTHERS PATRICK JOHNSON, MANAGER OF OPERATIONS
PHONE NUMBER: (956) 971-9111, EXT. 117
PATRICK@RIOVALLEYSWITCHING.COM

Contractor must incorporate Construction Inspection into anticipated construction schedule.

[X] Not Required

[ ] Required: Contact Information for Construction Inspection:

IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

On this project, construction work to be performed by a railroad company is:

[ ] Required
[X] Not Required

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

V. RAILROAD INSURANCE REQUIREMENTS

Railroad reference number shall be provided by TxDOT CST or DO.

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies must be issued for and on behalf of the Railroad. Where more than one Railroad Company is operating on the same right of way or where several Railroad Companies are involved and operate on their own separate rights of way, provide separate insurance policies in the name of each Railroad Company.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000 combined single limit

Railroad Protective Liability		
[ ]	Not Required	
[X]	Non - Bridge Projects	$2,000,000 / $6,000,000
[ ]	Bridge Projects	$5,000,000 / $10,000,000
[ ]	Other	

VI. CONTRACTOR'S RIGHT OF ENTRY (ROE) AGREEMENT

On this project, an ROE agreement is:

[ ] Not Required

[ ] Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)

[ ] Required: UPRR Maintenance Consent Letter. TxDOT CST to assist.

[X] Required: Contractor to obtain (see Item 5, Article 8.4)
With the following railroad companies: RIO VALLEY SWITCHING COMPANY

To view previously approved ROE Agreement templates agreed upon between the State and Railroad, see:

http://www.txdot.gov/inside-txdot/division/rail/samples.html

Approved ROE Agreement templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed ROE agreement between the Contractor and the Railroad if required on project.

VII. RAILROAD COORDINATION MEETING

On this project, a Railroad Coordination Meeting is:

[X] Not Required
[ ] Required

See Item 5, Article 8.1 for more details.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are required to maintain the same insurance coverage as required of the Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call RIO VALLEY SWITCHING COMPANY
Railroad Emergency Line: (956) 971-9111, EXT. 117
Location: DOT 758 569P
RR Milepost: 172.08
Subdivision: SANTA ROSA

In Case of Railroad Emergency
Call RIO VALLEY SWITCHING COMPANY
Railroad Emergency Line: (956) 971-9111, EXT. 117
Location: DOT 758 571R
RR Milepost: 172.12
Subdivision: SANTA ROSA

Texas Department of Transportation | Rail Division

RAILROAD SCOPE OF WORK

PROJECT SPECIFIC DETAILS

RIO VALLEY SWITCHING COMPANY

FILE: RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:
© TxDOT June 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I-69E
9/2021	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		205

PART 1 - GENERAL

1.01 DESCRIPTION

This project includes construction work within the right of way and/or properties of the Railroad and adjacent to its tracks, wire lines and other facilities. These sheets describe the minimum special requirements for coordination with the Railroad when working upon, over or under Railroad Right of Way or when impacting current or future Railroad operations. Coordinate with the Railroad while performing the work outlined herein, and afford the same cooperation with the Railroad as with TxDOT. Complete all submittals and work in accordance with TxDOT Standard Specifications, Railroad Guidelines and AREMA recommendations as modified by these minimum special requirements or as directed in writing by the Railroad Designated Representative.

For purposes of this project, the Railroad Designated Representative is the person or persons designated by the Railroad Manager of Industry and Public Projects to handle specific tasks related to the project.

1.02 REQUEST FOR INFORMATION / CLARIFICATION

Submit Requests for Information ("RFI") involving work within any Railroad Right of Way to the TxDOT Engineer. The TxDOT Engineer will submit the RFI to the Railroad Designated Representative for review and approval for RFI's corresponding to work within Railroad Right of Way. Allow six (6) weeks total time for review and approval, which includes four (4) weeks for review and approval by the Railroad.

1.03 PLANS / SPECIFICATIONS

TxDOT has received written Railroad approval of the plans and specifications for this project. Any revisions or changes in the plans after award of the Contract must have the approval of TxDOT and the Railroad.

PART 2 - UTILITIES AND FIBER OPTIC

Construct all utility installations in accordance with current AREMA recommendations, Railroad, TxDOT and owning utility specifications and requirements. Railroad general guidelines can be found on the Railroad website or by contacting the Railroad Designated Representative.

PART 3 - CONSTRUCTION

3.01 GENERAL

A. Perform all work in compliance with all applicable Railroad, Federal Railroad Administration (FRA), and TxDOT rules and regulations. Arrange and conduct work in a manner that does not endanger or interfere with the safe operation of the tracks and property of the Railroad and the traffic moving on such tracks, or the wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the Work. The safe operation of railroad train movements takes precedence over any work to be performed by the Contractor. The Contractor is responsible for train delay cost and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction or other activities.

B. Construction activities within 15 feet of the operational tracks will only be allowed if absolutely necessary and the Railroad's Designated Representative grants approval. Construction activities within 15 feet of the operational track(s) preferably allow the tracks to stay operational. In such cases, coordination and approval by the Railroad Track Manager is required with regard to schedule, flagging, and slow orders. See Sections 3.07 and 3.08 for additional information.

C. Provide track protection for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail. When not in use, keep Contractor machinery and materials at least 50 feet from the Railroad's nearest track.

D. Vehicular crossings of railroad track are allowed only at existing crossings, or haul road crossings developed with Railroad approval.

E. The Contractor is also advised that new railroad facilities within the project may be built by the Railroad. If applicable, these facilities are delineated in the plans. Be aware of the limits of responsibilities and coordinate efforts with the Railroad and TxDOT.

F. Railroad requirements do not allow work within 50 feet of track centers when a train passes the work site and all personnel must clear the area within 50 feet of the track centerline and secure all equipment. Additional allowances may be pursued as outlined in 3.02 and 3.03.

G. All permanent clearances shall be verified before project closing.

3.02 RAILROAD OPERATIONS

A. Trains and/or equipment are expected on any track, at any time, in either direction. Become familiar with the train schedules in this location and structure bid assuming intermittent track windows in this period, as defined in Paragraph B that follows.

B. All railroad tracks within and adjacent to the contract site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. Coordinate and schedule the work so that construction activities do not interfere with railroad operations.

C. Coordinate work windows with TxDOT and the Railroad's Designated Representative. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:

1. Conditional Work Window: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and/or adjacent to the railroad tracks within 25 feet of the nearest track, a railroad flag person will be required. At the direction of the railroad flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the Railroad Designated Representative, from the tracks). Conditional Work Windows are available for the Project.

2. Absolute Work Window: An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame, the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window, the railroad tracks and/or signals must be completely operational for train operations and all Railroad, Public Utilities Commission (PUC) and FRA requirements, codes and regulations for operational tracks must be satisfied. In the situation where the operating tracks and/or signals have been affected, the Railroad will perform inspections of the work prior to placing that track back into service. Railroad flag persons will be required for construction activities requiring an Absolute Work Window. Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for Railroad review.

3.03 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES

A. Do not perform any work within Railroad Right of Way without a valid executed Right of Entry Agreement if required on this project.

B. Give advance notice to the Railroad as required in the "Contractor's Right of Entry Agreement" before commencing work in connection with construction upon or over Railroad Right of Way and observe the Railroad's rules and regulations with respect thereto.

C. Perform all work upon Railroad Right of Way in a manner to avoid interference with or endanger the operations of the Railroad. Whenever work may affect the operations or safety of trains, submit the work method to the Railroad Designated Representative for approval. Approval does not relieve the Contractor from liability. Do not commence any work which requires flagging service or inspection service until the flagging protection required by the Railroad is available at the job site. See Section 3.15 for railroad flagging requirements.

D. Make requests in writing for both Absolute and Conditional Work Windows, at least 30 days in advance of any work. Include in the written request:
1. Exactly what the work entails.
2. The days and hours that work will be performed.
3. The exact location of work, and proximity to the tracks.
4. The type of window requested and the amount of time requested.
5. The designated contact person.

Provide a written confirmation notice to the Railroad at least 48 hours before commencing work in connection with approved work windows when work is within 25 feet of nearest rail. Perform all work in accordance with previously approved work plans.

E. Make provisions to protect operations and property of the Railroad should a condition arising from, or in connection with the work, require immediate and unusual action. If in the judgment of the Railroad Designated Representative such provisions are insufficient, the Railroad Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the Railroad or TxDOT. The Railroad or TxDOT shall have the right to order the Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the Railroad Designated Representative, the Contractor's operations could endanger railroad operations. In the event of such an order, immediately notify TxDOT of the order.

3.04 INSURANCE

Do not begin work upon or over Railroad Right of Way until furnishing the Railroad with the insurance policies, binders, certificates and endorsements required by the "Contractor's Right of Entry Agreement", and until the Railroad Designated Representative has advised TxDOT that such insurance is in accordance with the Agreement.

3.05 RAILROAD SAFETY ORIENTATION

A. Complete the railroad course "Orientation for Contractor's Safety", and maintain current registration prior to working on railroad property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

"UPRR, BNSF, KCS/TEXMEX will not accept on-track safety training certificates from other railroads. Refer to Railroad specific contractor right of entry for training information."

B. Know and follow the "Contractor's Right of Entry Agreement" EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

3.06 COOPERATION

The Railroad will cooperate with Contractor so that work may be conducted in an efficient manner, and will cooperate with Contractor in enabling use of Railroad Right of Way in performing the work.

3.07 MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES

Abide by the following minimum temporary clearances during the course of construction:
A. 15' - 0" (BNSF)(UPRR)and 14'-0" (KCS) horizontal from centerline of track
B. 22' (KCS) and 21' - 6" (UPRR & BNSF) vertically above top of rail.

For construction clearance less than listed above, obtain local Railroad Operating Unit review and approval.

3.08 APPROVAL OF REDUCED CLEARANCES

A. Maintain minimum track clearances during construction as specified in Section 3.07.

B. Submit any proposed infringement on the specified minimum clearances to the Railroad Designated Representative through TxDOT at least 30 days in advance of the work. Do not proceed with such infringement without written approval by the Railroad Designated Representative.

C. Do not commence work involving an approved infringement without receiving written assurance from the Railroad Designated Representative that arrangements have been made for any necessary flagging service.

SHEET 1 OF 2

Texas Department of Transportation | Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	0039	07	257	I-69E
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		206

3.09 MAINTENANCE OF RAILROAD FACILITIES

A. Maintain all ditches and drainage structures free of silt or other obstructions resulting from Contractor's operations. Repair eroded areas and any other damage within Railroad Right of Way and repair any other damage to the property of the Railroad, or its tenants.

B. Perform all such maintenance and repair of damages due to the Contractors's operations at Contractor's expense.

C. Submit a proposed method of erosion control for review by the Railroad prior to beginning any grading on the project site. Comply with all applicable local, state and federal regulations when developing and implementing such erosion control.

3.10 SITE INSPECTIONS BY RAILROAD's DESIGNATED REPRESENTATIVE

A. In addition to the office reviews of construction submittals, site inspections may be performed by the Railroad Designated Representative at significant points during construction, including the following if applicable:
   1. Pre-construction meetings.
   2. Pile driving/drilling of caissons or drilled shafts.
   3. Reinforcement and concrete placement for railroad bridge substructure and/or superstructure.
   4. Erection of precast concrete or steel bridge superstructure.
   5. Placement of waterproofing (prior to placing ballast on bridge deck).
   6. Completion of the bridge structure.

B. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by the Railroad.

C. Provide a detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to TxDOT for submittal to the Railroad Designated Representative for review prior to commencement of work. Include the anticipated dates when the above listed events will occur. Update this schedule for the above listed events as necessary and each month at a minimum to allow the Railroad to schedule site inspections.

3.11 RAILROAD REPRESENTATIVES

Railroad representatives, conductors, flag person or watch person will be provided by the Railroad at expense of TxDOT to protect Railroad facilities, property and movements of its trains or engines. In general, the Railroad will furnish such personnel or other protective services as follows:

A. When any part of any equipment is standing or being operated within 25 feet, measured horizontally, from nearest rail of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25 foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.

B. For any excavation below elevation of track subgrade if, in the opinion of the Railroad Designated Representative, track or other railroad facilities may be subject to settlement or movement.

C. During any clearing, grubbing, excavation or grading in proximity to railroad facilities, which, in the opinion of the Railroad Designated Representative, may endanger railroad facilities or operations.

D. During any Contractor's operations when, in the opinion of the Railroad Designated Representative, railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.

E. Arrange with the Railroad Designated Representative to provide the adequate number of flag persons to accomplish the work.

3.12 COMMUNICATIONS AND SIGNAL LINES

If required, the Railroad will rearrange its communications and signal lines, its grade crossing warning devices, train signals and tracks, and facilities that are in use and maintained by the Railroad's forces in connection with its operation at expense of TxDOT. This work by the Railroad will be done by its own forces and it is not a part of the Work under this Contract.

3.13 TRAFFIC CONTROL

Coordinate any operations that control traffic across or around railroad facilities with the Railroad Designated Representative.

3.14 CONSTRUCTION EXCAVATIONS AND BORING ACTIVITIES UNDER TRACK

A. Take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of TxDOT, OSHA, AREMA and Railroad "Guidelines for Temporary Shoring".

B. The project plans indicate whether there are fiber optic lines or other such telecommunications systems that require consideration. Regardless, contact the necessary call center to determine if such cable systems are present:

   UPRR 1-800-336-9193
   7:00 AM to 9:00 PM CST Monday-Friday except holidays,
   staffed 24 hrs/day for emergencies
   48 hrs notice required

   BNSF 1-800-533-2891
   24 hour number
   5 working days notice required

   KCS 1-800-344-8377
   Texas One Call, a 24 hour number
   48 hrs notice required, excluding weekends and holidays

   If a telecommunications system is buried anywhere on or near railroad property, coordinate with TxDOT, the Railroad and the Telecommunication Company(ies) to arrange for relocation or protective measures prior to beginning work on or near railroad property. Refer to the project General Notes for additional information.

C. Projects involving a boring or jack and bore operation under track such as drainage pipes or culverts and utilities require an installation plan reviewed and approved by the Railroad and TxDOT prior to proceeding with such construction. A railroad inspector and contractor assisted monitoring of ground and track movement is required to maintain safe passage of rail traffic. Stop installation and do not allow passage of trains if movements in excess of 1/4 inch vertical or horizontal is detected in the tracks. Immediately repair the damage to the satisfaction of TxDOT and the Railroad before proceeding.

3.15 RAILROAD FLAGGING

Per the Right of Entry Agreement for flagging, notify the Railroad Representative at least 10 working days in advance of Contractor's work and at least 30 working days in advance of any Contractor's work in which any person or equipment will be within 25 feet of nearest rail or as specified in the Contractor Right of Entry (CROE).

3.16 CLEANING OF RIGHT-OF-WAY

When work is complete, remove all tools, implements, and other materials brought into Railroad Right of Way and leave the right of Way in a clean and presentable condition to the satisfaction of TxDOT and the Railroad.

Texas Department of Transportation | Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
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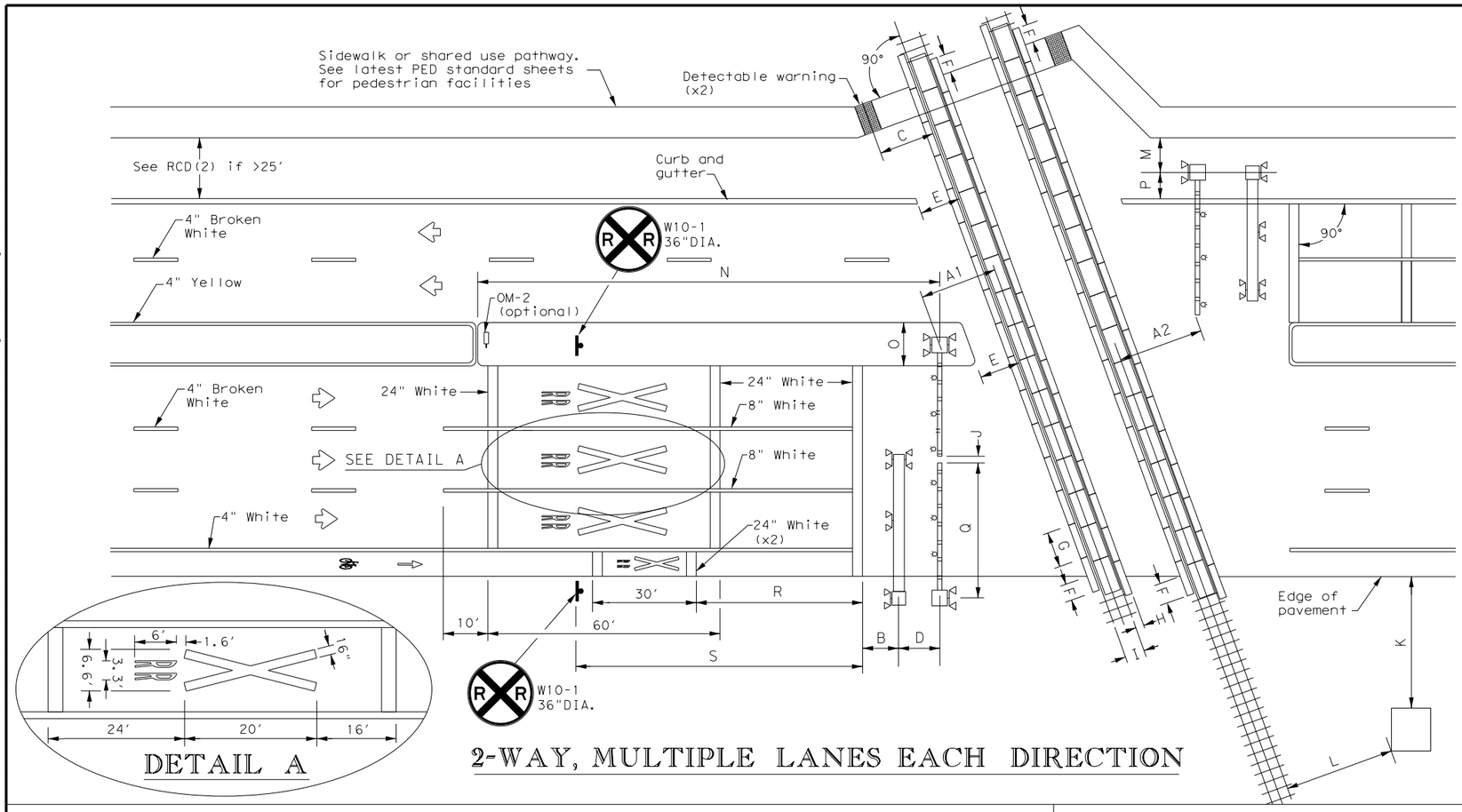
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		207



DETAIL A

2-WAY, MULTIPLE LANES EACH DIRECTION

NOTES

A1: Center of RR mast to center of rail: 12' minimum, 15' typical.

A2: Tip of gate to center of rail: 12' minimum, 15' typical.

B: Center of mast (cantilever, gate, or mast flasher) of nearest active traffic control device to stop line: 8' (NOTE: Stop line may be moved as needed, but should be at least 8' back from gates, if present).

C: Center of detectable warning device to nearest rail: 6' minimum

D: Center of gate mast to center of cantilever mast: 6' typical. NOTE: Cantilever may be located in front or behind gates.

E: Edge of median or curb to nearest rail: 10' typical. NOTE: Design median edge to be parallel with rail.

F: Edge of planking panel from edge of pavement or sidewalk: 3' minimum. NOTE: Field panels need not be in line with gauge panels.

G: Length of panels along rail: 8' typical.

H: Width of field panel: 2' typical (check with railroad company).

I: Distance between rails: 4'-8.5".

J: Tip of gate to tip of gate: 2' maximum for Quiet Zone SSM or 90% of traveled way covered by gates for all other locations.

K: Nearest edge of RR cabin from edge of pavement: 30' typical. NOTE: Cabinet not required to be parallel to edge of pavement.

L: Nearest edge of RR cabin from nearest rail: 25' typical.

M: Center of RR mast to edge of sidewalk: 6' minimum.

N: Center of gate mast to leading edge of non-traversable median: 100' minimum to qualify as a Quiet Zone SSM. NOTE: 60'will suffice if there is a street intersection within the 100' and all street intersections within 60' are closed.

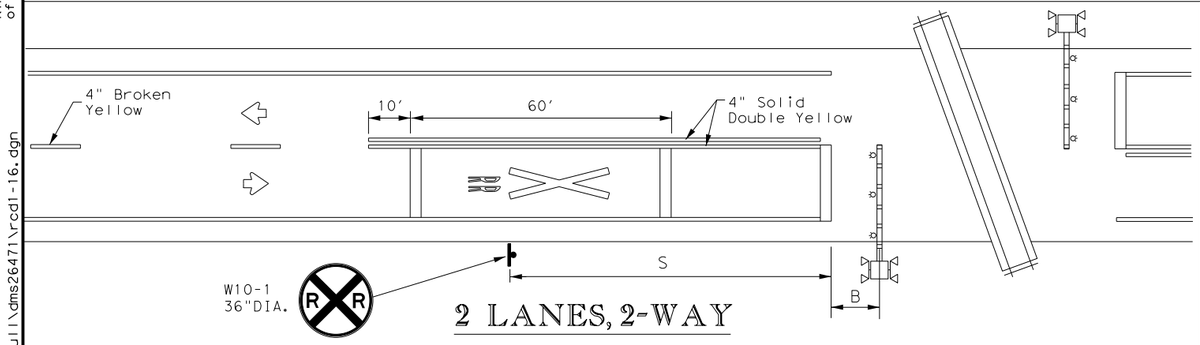
O: Width of median: 8'-6" minimum, 10' typical when using median gates. NOTE: Center of gate mast minimum 4'-3" from face of curb.

P: Center of RR mast to face of curb: 4'-3" minimum.
Center of RR mast to edge of pavement (with shoulder): 6' minimum
Center of RR mast to edge of pavement (no shoulder): 8'-3" minimum
NOTE: BNSF prefers 5'-3", 7', and 9'-3" minimums, respectively.

Q: Gate length: 28' or less typical, but railroad company may allow up to 32'under special circumstances.

R: Stop line to first RR Crossing transverse line (bike lane): 50' typical.

S: Stop line to GRADE CROSSING ADVANCE WARNING (W10-1) sign and adjacent RR Crossing pavement markings. See Table 1. See RCD(2) for other signs.



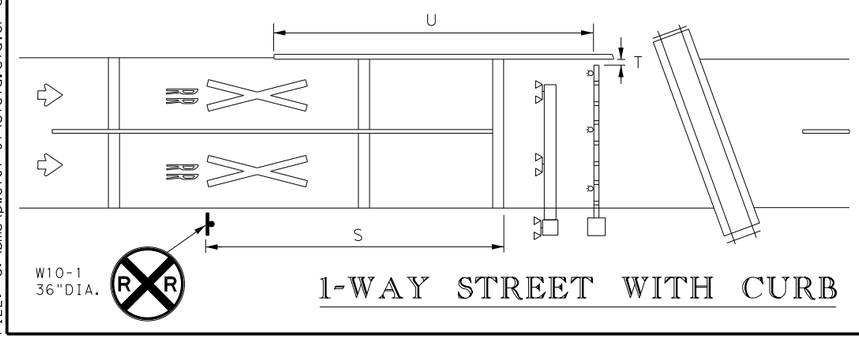
2 LANES, 2-WAY

TABLE 1	
Approach Speed(mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

LEGEND	
	Sign
	Object Marker
	Traffic Flow
	Cantilever
	Gate Assembly
	Mast Flasher Pair

GENERAL NOTES

1. Medians and curbs must be non-traversable to qualify as a Quiet Zone Supplementary Safety Measure (SSM). Non-traversable curbs in Quiet Zones are 6" tall minimum and used on roadways where speed does not exceed 40 mph.
2. Raised pavement markers may be used to supplement striping. See PM(2) and PM(3) standard sheets.
3. Medians preferred whenever possible to prevent vehicles from driving around gates.
4. Longitudinal edge striping may be continued thru crossing as needed. Illumination may also be considered for nighttime visibility.
5. See SMD standard sheets for sign mounting details.
6. See the Standard Highway Sign Design for Texas (SHSD) manual for sign and pavement marking details.

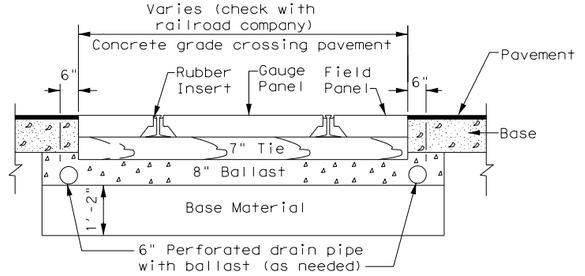


1-WAY STREET WITH CURB

NOTES

T: Tip of gate to edge of curb: 1' max for Quiet Zone SSM, 90% of traveled way covered by gates for all other locations

U: Non-traversable curb length from gate: 100' min. for a Quiet Zone SSM, 10' min for all other locations.



CROSSING SURFACE CROSS SECTION

Texas Department of Transportation

Traffic Operations Division Standard

RAILROAD CROSSING DETAILS SIGNING, STRIPING, AND DEVICE PLACEMENT RCD(1)-16

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©TxDOT FEBRUARY 2016	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		208

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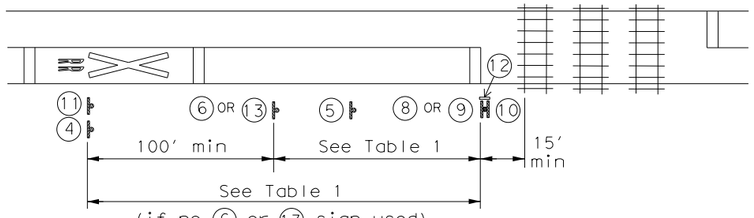
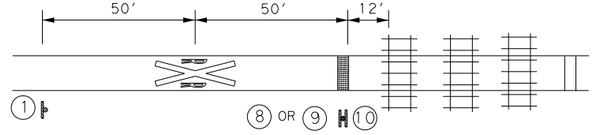


NOTES

1. Stop or yield sign may also be installed to the left of the crossbuck sign, rather than below it.
2. A 2" white retroreflective strip shall be installed on front and back of crossbuck sign post.

PASSIVE CROSSING



NOTES

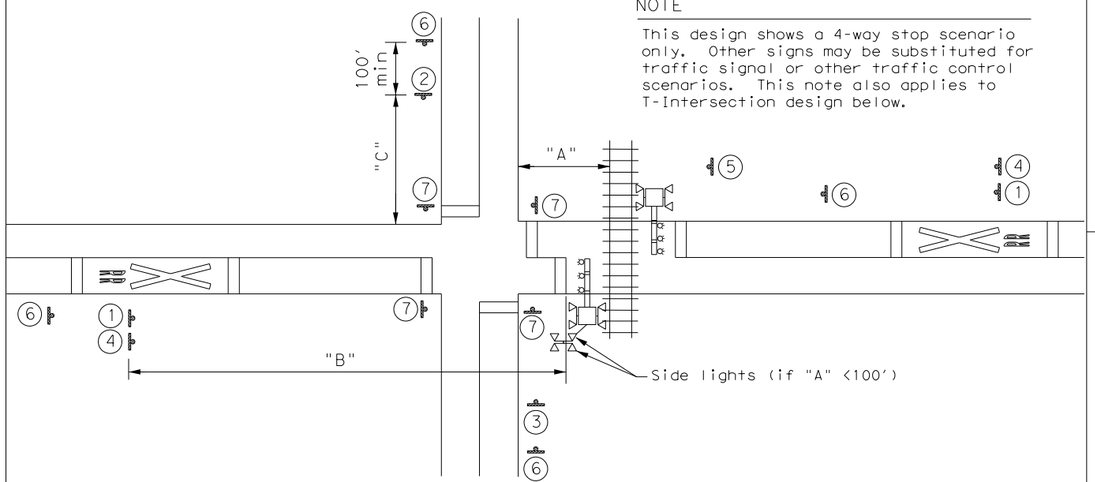
1. A shared use pathway is considered a separate pathway crossing when more than 25′ from traveled way of adjacent roadway.
2. Detectable warning used at stop bar.
3. Smaller sign sizes preferred than shown to the right on this sheet.

PATHWAY CROSSING

TABLE 1	
Approach Speed (mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

GENERAL NOTES

1. Railroad company to provide active traffic control devices, CROSSBUCK (R15-1), NUMBER OF TRACKS Plaque (R15-2P) (if more than 1 track), and EMERGENCY NOTIFICATION (I-13) signs.
2. LOW GROUND CLEARANCE (W10-5) signs may be relocated further upstream of crossing to provide advance warning of alternate route.
3. GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-2) signs may be modified as needed to fit roadway geometry.
4. Table 1 placement distances may vary per Sect. 2C.05 of the TMUTCD.
5. See Table 1 to determine placement of STOP AHEAD (W3-1) and YIELD AHEAD (W3-2) signs unless shown otherwise.
6. DO NOT STOP ON TRACKS (R8-8) signs installed when potential for vehicles stopping on tracks is significant as determined by sealing engineer. Install so sign does not block view of RR mast.
7. See the Standard Highway Sign Design for Texas (SHSD) manual for sign and pavement marking details.



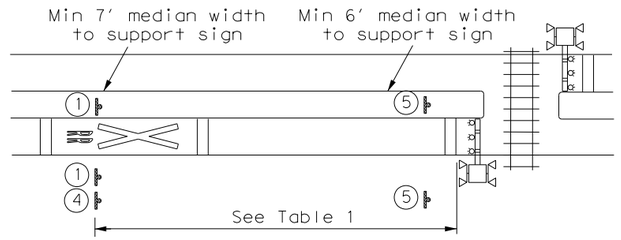
NOTE

This design shows a 4-way stop scenario only. Other signs may be substituted for traffic signal or other traffic control scenarios. This note also applies to T-Intersection design below.

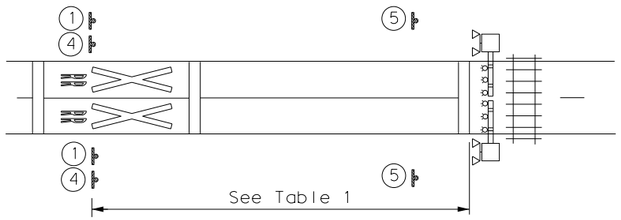
	"A" <100′	"A" ≥100′
"B"	See Table 1. Place pavement markings and signs on opposite side of intersection from rail if spacing from Table 1 would put markings within intersection.	See Table 1. Place pavement markings and signs between rail and intersection if spacing from Table 1 would put markings within intersection.
"C"	See Table 1.	GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-2, W10-3, W10-4) signs should only be installed if W10-1 sign is not between intersection and railroad crossing. If needed, see Table 1.

GRADE CROSSING NEAR A PARALLEL STREET

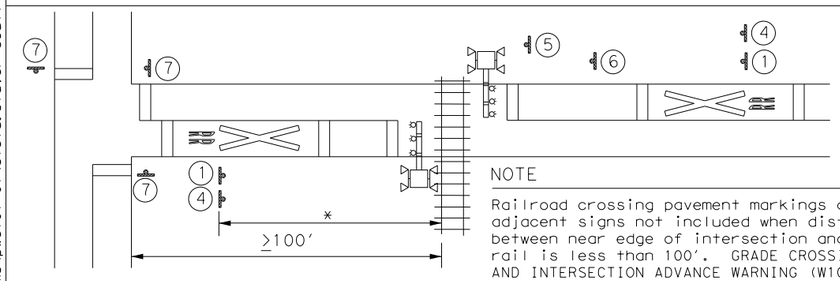
2-WAY



2-WAY WITH MEDIAN



1-WAY

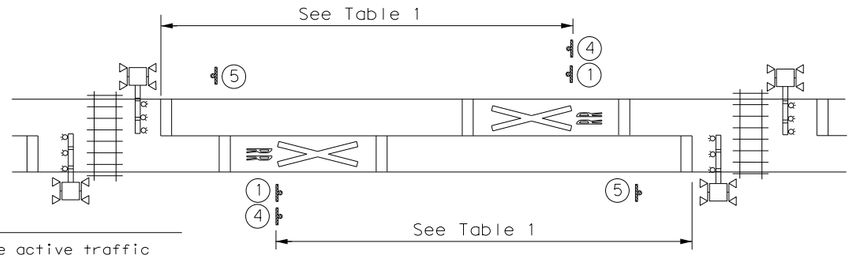


*Use Table 1 if sufficient space exists.

NOTE

Railroad crossing pavement markings and adjacent signs not included when distance between near edge of intersection and near rail is less than 100′. GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-3) signs installed on roadway parallel with rail in this case.

T-INTERSECTION



NOTE

Separate active traffic control devices, railroad crossing pavement markings, and adjacent signs required when tracks are more than 100′ apart.

2 ADJACENT CROSSINGS

SIGNS

**	**	**	IF NEEDED
1 W10-1 36"DIA.	2 W10-2L 36"X36"	3 W10-2R 36"X36"	4 W10-5 36"X36" / W10-5P 30"x24" (LOW GROUND CLEARANCE)
IF NEEDED	IF NEEDED		
5 R8-8 24"X30" (DO NOT STOP ON TRACKS)	6 W3-1 30"X30"	7 R1-1 36"X36" (STOP) / R1-3P 18"X6" (ALL WAY)	R15-1 48"X9" (RAIL CROSSING ROAD) / R15-2P 27"X18" (3 TRACKS) / 8 R1-1 36"X36" (STOP)
9 R15-1 48"X9" (RAIL CROSSING ROAD) / R15-2P 27"X18" (3 TRACKS) / R1-2 48"X48"X48" (YIELD)	10 R15-1 48"X9" (RAIL CROSSING ROAD) / R15-2P 27"X18" (3 TRACKS)	11 W10-1 36"DIA. (R R) / W10-13P 30"X24" (NO GATES OR LIGHTS) / **	12 REPORT EMERGENCY OR PROBLEM 1-800-555-5555 CROSSING 836 597 H — Sign may be placed perpend. to travel lanes. / I-13 15"X9"
IF NEEDED			
13 W3-2 30"X30"			

** Includes a NO TRAIN HORN Plaque (W10-9P) if crossing is in a Quiet Zone. LOW GROUND CLEARANCE Plaque (W10-5P) if needed is mounted below W10-2/W10-3/W10-4 signs.

NO TRAIN HORN W10-9P 30"X24"

LOW GROUND CLEARANCE W10-5P 30"X24"

Texas Department of Transportation

Traffic Operations Division Standard

RAILROAD CROSSING DETAILS SIGNING & STRIPING

RCD(2)-16

FILE: rcd2-16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT FEBRUARY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0039	07	257	I69E
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		209