PROJECT NO.			SHEET NO.
F 2023(909)			1
STATE	DISTRICT	COUNTY	
TX	PHR	HIDALGO	
CONTROL	SECTION	JOB	HIGHWAY NO.
1804	01	082,ETC.	SS 115,ETC.

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT
FEDERAL-AID PROJECT NUMBER : F 2023(909)
CSJ: 1804-01-082, ETC.

NET LENGTH OF PROJECT = 9.170 MILES

HIDALGO COUNTY
SS 115, ETC.

LIMITS: VARIOUS LOCATIONS

FOR THE CONSTRUCTION OF:
PREVENTATIVE MAINTENANCE
CONSISTING OF MILLING, OVERLAY, & PAVEMENT MARKINGS

FINAL PLANS

DATE OF LETTING: _____

DATE WORK BEGAN: _____

DATE WORK COMPLETED: _____

DATE WORK ACCEPTED: _____

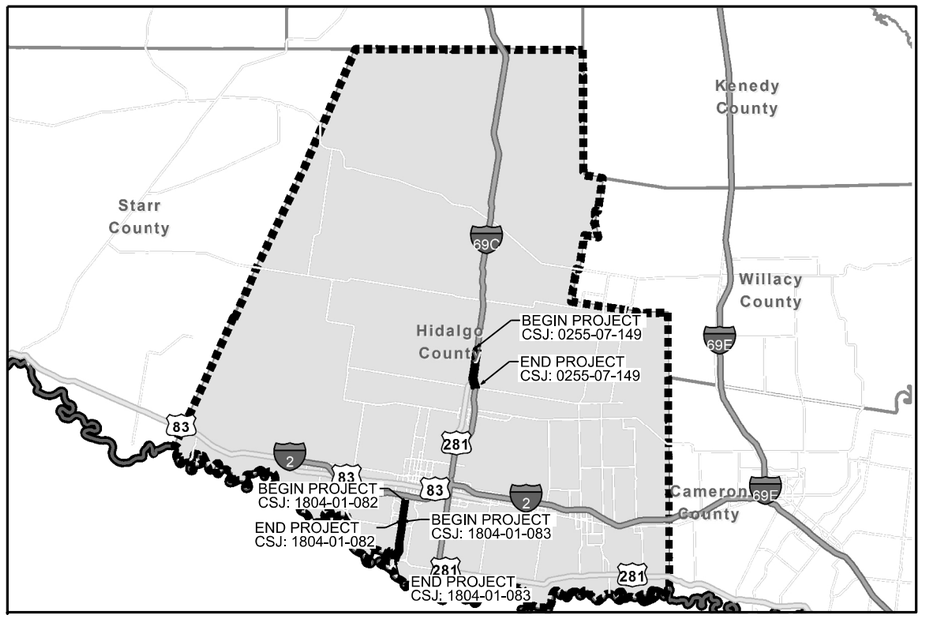
FINAL CONTRACT COST: _____

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.

_____ _____
HECTOR SILLER, P.E. DATE
PHARR AREA ENGINEER



LOCATION MAP NOT TO SCALE

INDEX OF SHEETS
SEE SHEET No. 2

LOCATION #1
ADT: 20,049 (2021)
29,224 (2041)
FUNCTION CLASSIFICATION: PRINCIPAL ARTERIAL

LOCATION #2
ADT: 18,914 (2021)
26,480 (2041)
FUNCTION CLASSIFICATION: PRINCIPAL ARTERIAL

LOCATION #3
ADT: 2,607 (2021)
3,181 (2041)
FUNCTION CLASSIFICATION: MAJOR COLLECTOR

EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: NONE

APPROVED FOR LETTING: DATE: 4/28/2023

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

SUBMITTED FOR LETTING: DATE: 4/28/2023

DocuSigned by:
Eugene Palacios
8325CC1071A9427...
PROJECT ENGINEER

RECOMMENDED FOR LETTING: DATE: 4/28/2023

DocuSigned by:
Juan A. Sustaita Jr
E353D62C01B2433...
DIRECTOR OF MAINTENANCE

NO TDLR INSPECTION REQUIRED

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

	SHEET NO.	DESCRIPTION
		GENERAL
	1	TITLE SHEET
	2	INDEX OF SHEETS
	3	DISTRICT LAYOUT
	4-5	LOCATION MAPS
	6	SS 115 LOCATION #1 TYPICAL SECTIONS
	7	SS 115 LOCATION #2 TYPICAL SECTIONS
	8	IH 69C FR. LOCATION #3 TYPICAL SECTIONS
	9, 9A-9D	GENERAL NOTES
	10-11	ESTIMATE & QUANTITY SHEET
	12-16	BASIS OF ESTIMATE
	17	PAVEMENT STRUCTURE REPAIR SUMMARY
		TRAFFIC CONTROL PLAN STANDARDS
*	18-29	[S] BC (1)-21 THRU BC (12)-21
*	30	[S] TCP (1-1)-18
*	31	[S] TCP (1-3)-18
*	32	[S] TCP (1-4)-18
*	33	[S] TCP (1-5)-18
*	34	[S] TCP (2-1)-18
*	35	[S] TCP (2-3)-18
*	36	[S] TCP (2-4)-18
*	37	[S] TCP (2-6)-18
*	38	[S] TCP (3-1)-13
*	39	[S] TCP (3-2)-13
*	40	[S] TCP (3-3)-14
*	41	[S] TCP (3-4)-13
*	42	[S] TCP (6-2)-12
*	43	[S] TCP (6-4)-12
*	44	[S] TCP (6-8)-14
*	45	[S] WZ (STPM)-13
		ROADWAY DETAILS
	46-53	SS 115 LOCATION #1 PAVING PLAN LAYOUT
	54	SS 115 LOCATION #1 & #2 PAVING PLAN LAYOUT
	55-67	SS 115 LOCATION #2 PAVING PLAN LAYOUT
	68-74	IH 69C FR. LOCATION #3 PAVING PLAN LAYOUT
	75	IH 69C FR. LOCATION #3 MBGF REMOVAL PLAN
		ROADWAY STANDARDS
*	76	[S] GF(31)-19
*	77	[S] GF(31)MS-19
*	78-79	[S] GF(3)TR TL3-20
*	80	[S] SGT(12S)31-18
*	81	[S] SGT(15)31-20
		TRAFFIC ITEMS
	82-89	SS 115 LOCATION #1 PAVEMENT MARKING LAYOUT
	90	SS 115 LOCATION #1 & #2 PAVEMENT MARKING LAYOUT
	91-103	SS 115 LOCATION #2 PAVEMENT MARKING LAYOUT
	104-119	IH 69C FR. LOCATION #3 PAVEMENT MARKING LAYOUT

	SHEET NO.	DESCRIPTION
		TRAFFIC ITEMS STANDARDS
*	120	[S] PM(1)-22
*	121	[S] PM(2)-22
*	122	[S] PM(3)-22
*	123	[S] PM(4)-22A
*	124	[S] D & OM(1)-20
*	125	[S] D & OM(2)-20
*	126	[S] D & OM(4)-20
*	127	[S] D & OM(6)-20
*	128	[S] LD (1)-03
*	129	[S] LD (2)-03
		ENVIRONMENTAL ISSUES
	130-131	ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)
	132-134	TWPD BMPS
	135	TXDOT STORMWATER POLLUTION PREVENTION PLAN (SW3P)
		ENVIRONMENTAL ISSUES STANDARDS
*	136	[D] TECL-17 (PHR)

LEGEND

[D] DISTRICT STANDARDS
[S] STATE STANDARDS

STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

Eugene Palacios

*THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

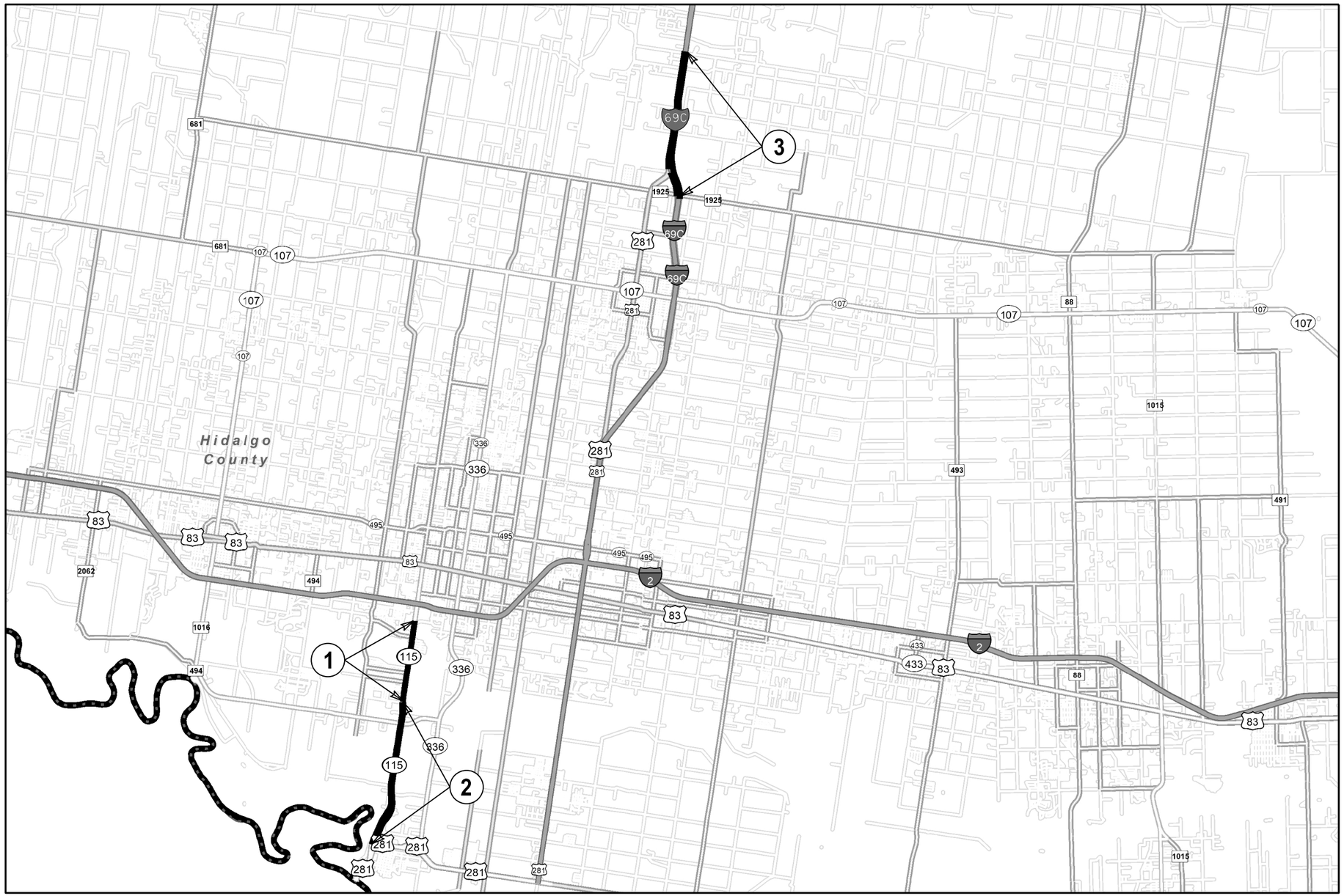
REQUIRED SIGNS SHALL BE IN ACCORDANCE WITH BC (1)-21 THRU BC (12)-21 AND THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

INDEX OF SHEETS

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		2
STATE	STATE DIST.NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

OVERLAY LOCATIONS

LOC. NO.	LENGTH	
	ROADWAY	MILES
1	SS 115	2.00
2	SS 115	3.58
3	IH-69C FR.	3.59



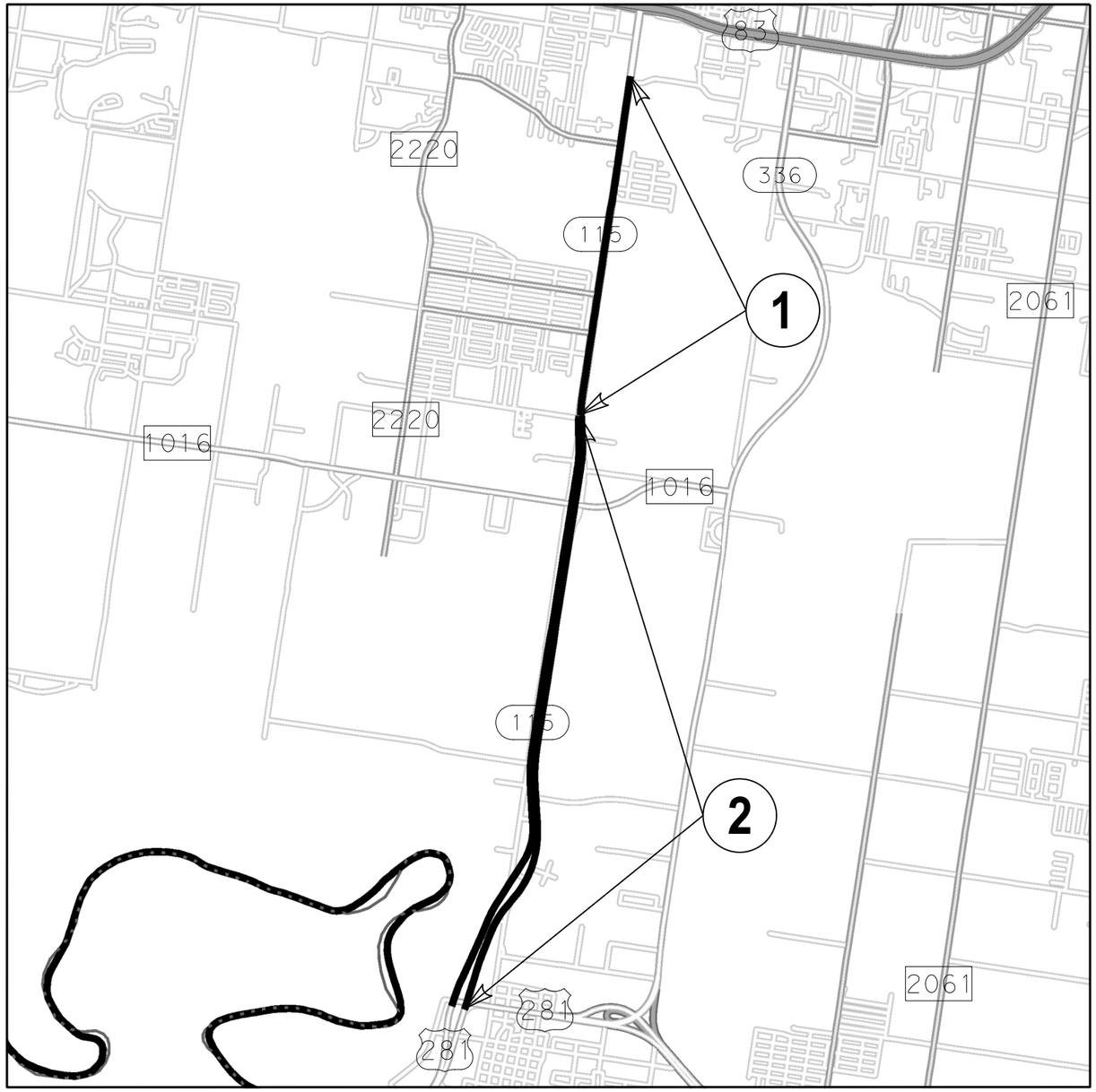
TEXAS DEPARTMENT OF TRANSPORTATION

DISTRICT LAYOUT

N.T.S.

FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET NO.
6	F 2023(909)		HIDALGO		3
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LOCATION MAPS



N

LOC. NO.	CSJ	ROADWAY	FROM	TO	LENGTH (MI)
1	1804-01-082	SS 115	Uvalde Rd.	Sarah Ave.	2.00
2	1804-01-083	SS 115	Sarah Ave.	UP 281	3.58

TEXAS DEPARTMENT OF TRANSPORTATION

LOCATION MAPS-
SS 115

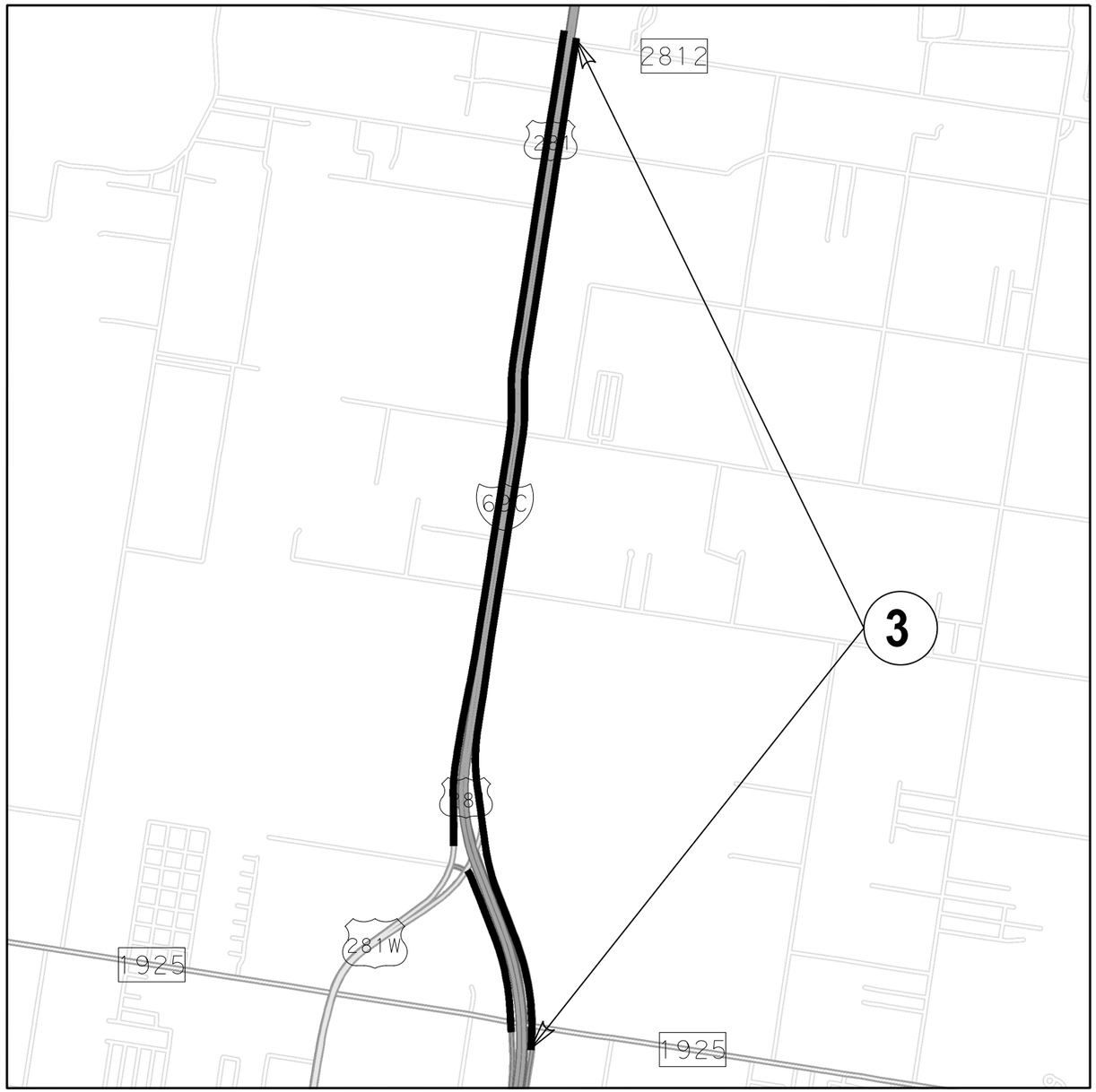
N.T.S.

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET NO.
6	F 2023(909)		HIDALGO		4
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LOCATION MAPS

LOC. NO.	CSJ	ROADWAY	FROM	TO	LENGTH (MI)
3	0255-07-149	IH-69C FR	FM 1925	FM 2812	3.59



N

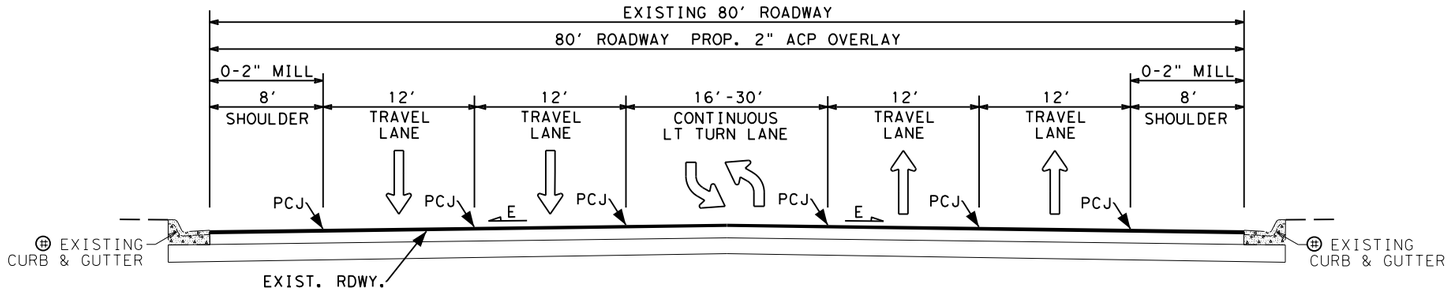
TEXAS DEPARTMENT OF TRANSPORTATION

LOCATION MAPS-
IH-69C FR.

N.T.S.

SHEET 2 OF 2

FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		5
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.



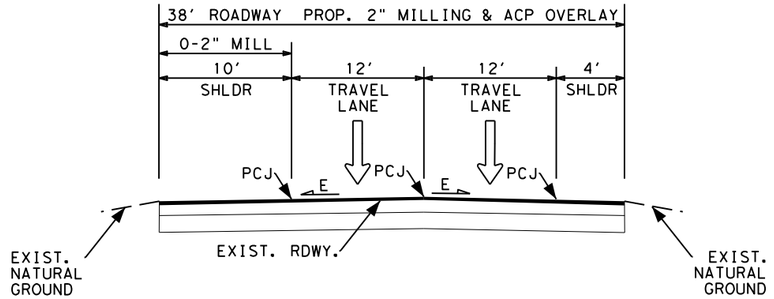
SS 115 PROPOSED TYPICAL SECTION

STA. 100+00 TO STA. 137+41
STA. 137+41 TO STA. 142+75 (TRANSITION)
STA. 151+33 TO STA. 152+00 (CROSS-OVER)
STA. 159+27 TO STA. 187+09 (TRANSITION)
STA. 193+70 TO STA. 194+35 (CROSS-OVER)
STA. 199+92 TO STA. 200+48 (CROSS-OVER)

LEGEND

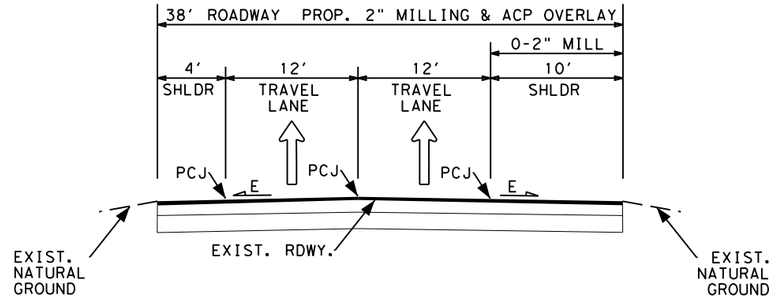
EXIST. - EXISTING
RDWY. - ROADWAY
PROP. - PROPOSED
SHLDR - SHOULDER
ACP - ASPHALT CONCRETE PAVEMENT
WB - WEST BOUND
EB - EAST BOUND
N.T.S - NOT TO SCALE
F-F - FACE TO FACE
PCJ - PERMISSIBLE CONSTRUCTION JOINT
E - EXISTING CROSS SLOPE

⊕ EXISTING CURB & GUTTER LOCATIONS SHALL BE IDENTIFIED BY CONTRACTOR PRIOR TO CONSTRUCTION.



SB SS 115 PROPOSED TYPICAL SECTION

STA. 142+75 TO STA. 147+97
STA. 147+97 TO STA. 149+07 (OMITTED BRIDGE)
STA. 149+07 TO STA. 151+33
STA. 152+00 TO STA. 159+27
STA. 187+09 TO STA. 193+70
STA. 194+35 TO STA. 199+82
STA. 200+48 TO STA. 205+62



NB SS 115 PROPOSED TYPICAL SECTION

STA. 142+75 TO STA. 147+97
STA. 147+97 TO STA. 149+07 (OMITTED BRIDGE)
STA. 149+07 TO STA. 151+33
STA. 152+00 TO STA. 159+27
STA. 187+09 TO STA. 193+70
STA. 194+35 TO STA. 199+82
STA. 200+48 TO STA. 205+62

NOTES

1. WHERE PERMISSIBLE, OR UNLESS DIRECTED BY THE ENGINEER, PERMISSIBLE CONSTRUCTION JOINTS SHALL FALL ON STRIPING LINES AS SHOWN.
2. FOR STRIPING CONFIGURATION SEE PAVEMENT MARKING DETAILS.
3. PROPOSED BONDING COURSE RATE 0.07 GAL/SY IS FOR ESTIMATING PURPOSES ONLY. RATE TO BE ADJUSTED IN THE FIELD AS PER SPEC AND THE ENGINEER.
4. SEE BASIS OF ESTIMATE PLAN SHEETS FOR TRANSITION AREA QUANTITIES.

STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

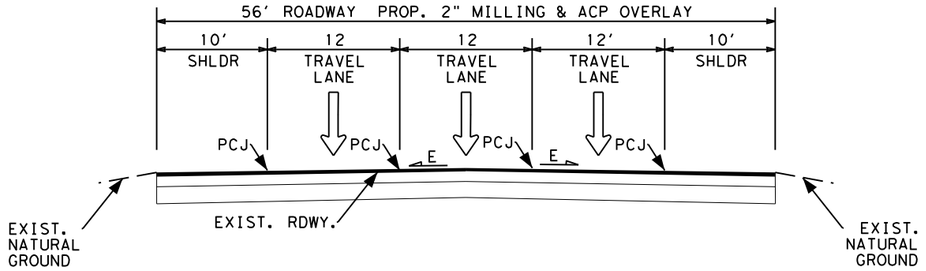
Eugene Palacios

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #1
TYPICAL SECTIONS

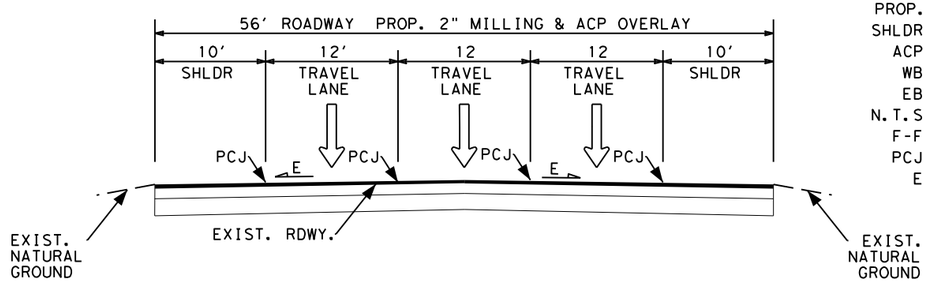
N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		6
STATE	STATE DIST.NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082.ETC.	SS 115,ETC.



SB SS 115 PROPOSED TYPICAL SECTION

STA. 100+00 TO STA. 101+10 (INTERSECTION)
STA. 101+10 TO STA. 106+27 (TRANSITION)
STA. 106+27 TO STA. 125+78
STA. 125+78 TO STA. 128+82 (CONCRETE BRIDGE)
STA. 128+82 TO STA. 135+09
STA. 135+09 TO STA. 142+02 (TRANSITION)
STA. 142+02 TO STA. 163+13 (CONCRETE BRIDGE)
STA. 163+13 TO STA. 170+60
STA. 170+60 TO STA. 171+60 (CROSS-OVER)
STA. 171+60 TO STA. 183+40
STA. 183+40 TO STA. 184+60 (CROSS-OVER)
STA. 184+60 TO STA. 189+40
STA. 189+40 TO STA. 193+17 (TRANSITION)
STA. 193+17 TO STA. 194+77 (CROSS-OVER)
STA. 194+77 TO STA. 207+84
STA. 207+84 TO STA. 208+84 (CROSS-OVER)
STA. 208+84 TO STA. 215+20
STA. 215+20 TO STA. 220+20 (CROSS-OVER)
STA. 220+20 TO STA. 231+00
STA. 231+00 TO STA. 233+20 (TRANSITION)
STA. 233+20 TO STA. 234+00 (CROSS-OVER)
STA. 234+00 TO STA. 242+80
STA. 242+80 TO STA. 243+80 (CROSS-OVER)
STA. 243+80 TO STA. 258+20
STA. 258+20 TO STA. 259+00 (CROSS-OVER)
STA. 259+00 TO STA. 265+00
STA. 265+00 TO STA. 270+20 (TRANSITION)
STA. 270+20 TO STA. 271+14 (CROSS-OVER)
STA. 271+14 TO STA. 282+20
STA. 282+20 TO STA. 285+00 (TRANSITION)



NB SS 115 PROPOSED TYPICAL SECTION

STA. 100+00 TO STA. 101+10 (INTERSECTION)
STA. 101+10 TO STA. 112+14 (TRANSITION)
STA. 112+14 TO STA. 125+88
STA. 125+88 TO STA. 128+92 (CONCRETE BRIDGE)
STA. 128+92 TO STA. 136+48
STA. 136+48 TO STA. 142+16 (TRANSITION)
STA. 142+16 TO STA. 162+69 (CONCRETE BRIDGE)
STA. 162+69 TO STA. 170+75
STA. 170+75 TO STA. 171+72 (CROSS-OVER)
STA. 171+72 TO STA. 183+40
STA. 183+40 TO STA. 184+60 (CROSS-OVER)
STA. 184+60 TO STA. 193+20
STA. 193+20 TO STA. 194+80 (CROSS-OVER)
STA. 194+80 TO STA. 207+80
STA. 207+80 TO STA. 208+80 (CROSS-OVER)
STA. 208+80 TO STA. 211+00 (TRANSITION)
STA. 211+00 TO STA. 215+00
STA. 215+00 TO STA. 220+00 (CROSS-OVER)
STA. 220+00 TO STA. 222+20 (TRANSITION)
STA. 222+20 TO STA. 233+47
STA. 233+47 TO STA. 234+40 (CROSS-OVER)
STA. 234+40 TO STA. 240+00 (TRANSITION)
STA. 240+00 TO STA. 244+00
STA. 244+00 TO STA. 245+00 (CROSS-OVER)
STA. 245+00 TO STA. 259+20
STA. 259+20 TO STA. 260+20 (CROSS-OVER)
STA. 260+20 TO STA. 270+40 (TRANSITION)
STA. 270+40 TO STA. 271+40 (CROSS-OVER)
STA. 271+40 TO STA. 283+06
STA. 283+06 TO STA. 285+00 (TRANSITION)

LEGEND

EXIST. - EXISTING
RDWY. - ROADWAY
PROP. - PROPOSED
SHLDR - SHOULDER
ACP - ASPHALT CONCRETE PAVEMENT
WB - WEST BOUND
EB - EAST BOUND
N.T.S - NOT TO SCALE
F-F - FACE TO FACE
PCJ - PERMISSIBLE CONSTRUCTION JOINT
E - EXISTING CROSS SLOPE

NOTES

1. WHERE PERMISSIBLE, OR UNLESS DIRECTED BY THE ENGINEER, PERMISSIBLE CONSTRUCTION JOINTS SHALL FALL ON STRIPING LINES AS SHOWN.
2. FOR STRIPING CONFIGURATION SEE PAVEMENT MARKING DETAILS.
3. PROPOSED BONDING COURSE RATE 0.07 GAL/SY IS FOR ESTIMATING PURPOSES ONLY. RATE TO BE ADJUSTED IN THE FIELD AS PER SPEC AND THE ENGINEER.
4. SEE BASIS OF ESTIMATE PLAN SHEETS FOR TRANSITION AREA QUANTITIES.

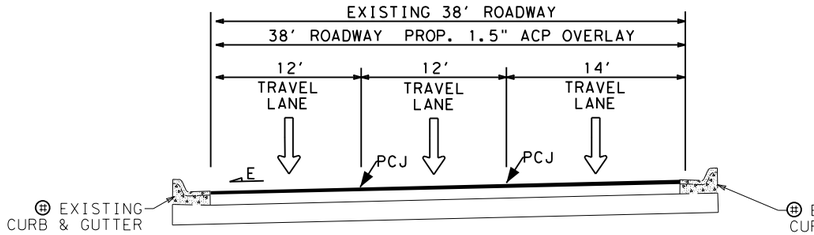
STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER
5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #2
TYPICAL SECTIONS

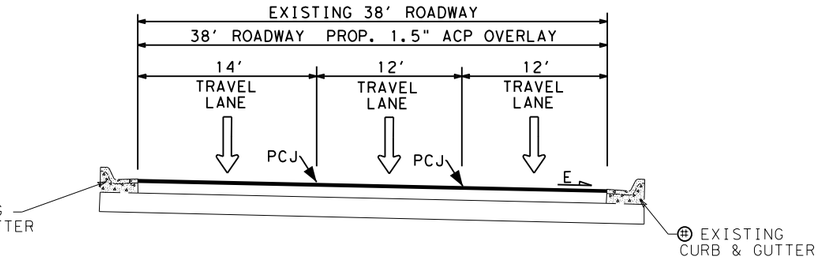
N. T. S.

FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		7
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.



NB IH 69C FR. PROPOSED TYPICAL SECTION

STA. 100+00 TO STA. 103+16 (CONCRETE INTERSECTION)
STA. 103+16 TO STA. 104+77 (TRANSITION)
STA. 104+77 TO STA. 117+54
STA. 117+54 TO STA. 126+08 (TRANSITION)
STA. 126+08 TO STA. 151+53
STA. 151+53 TO STA. 159+05 (TRANSITION)
STA. 159+05 TO STA. 169+83
STA. 169+83 TO STA. 171+22 (TRANSITION)
STA. 171+22 TO STA. 177+29 (CONCRETE INTERSECTION)
STA. 177+29 TO STA. 178+91 (TRANSITION)
STA. 178+91 TO STA. 200+45
STA. 200+45 TO STA. 201+27 (TRANSITION)
STA. 201+27 TO STA. 207+83 (TRANSITION)
STA. 207+83 TO STA. 218+73
STA. 218+73 TO STA. 224+70 (TRANSITION)
STA. 224+70 TO STA. 225+70 (TRANSITION)
STA. 225+70 TO STA. 244+78
STA. 246+90 TO STA. 252+15 (TRANSITION)
STA. 252+15 TO STA. 254+72 (TURNAROUND)
STA. 254+72 TO STA. 259+36
STA. 259+36 TO STA. 271+00 (TRANSITION)
STA. 271+00 TO STA. 275+60 (TRANSITION)
STA. 275+60 TO STA. 279+64
STA. 279+64 TO STA. 280+49 (TRANSITION)
STA. 280+49 TO STA. 283+36
STA. 283+36 TO STA. 289+58 (CONCRETE INTERSECTION)



SB IH 69C FR. #1 PROPOSED TYPICAL SECTION

STA. 100+00 TO. STA. 103+18 (CONCRETE INTERSECTION)
STA. 103+18 TO. STA. 104+20 (TRANSITION)
STA. 104+20 TO. STA. 122+03
STA. 122+03 TO. STA. 126+00 (TRANSITION)
STA. 126+00 TO. STA. 145+00
STA. 145+00 TO. STA. 150+76 (TRANSITION)
STA. 150+76 TO. STA. 167+12
STA. 167+12 TO. STA. 169+05 (TRANSITION)
STA. 169+05 TO. STA. 175+27 (CONCRETE INTERSECTION)
STA. 175+27 TO. STA. 182+20
STA. 182+20 TO. STA. 191+80 (TRANSITION)
STA. 191+80 TO. STA. 225+69
STA. 225+69 TO. STA. 233+00 (TRANSITION)
STA. 233+00 TO. STA. 250+20
STA. 250+20 TO. STA. 252+20 (TRANSITION)

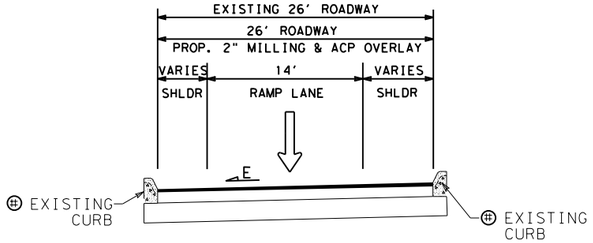
SB IH 69C FR. #2 PROPOSED TYPICAL SECTION

STA. 100+00 TO. STA. 107+20 (TRANSITION)
STA. 107+20 TO. STA. 113+80
STA. 113+80 TO. STA. 120+00 (TRANSITION)
STA. 120+00 TO. STA. 123+00
STA. 123+00 TO. STA. 124+95 (TRANSITION)
STA. 124+95 TO. STA. 131+14 (CONCRETE INTERSECTION)

LEGEND

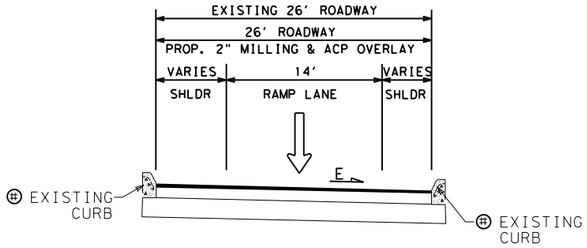
EXIST. - EXISTING
RDWY. - ROADWAY
PROP. - PROPOSED
SHLDR - SHOULDER
ACP - ASPHALT CONCRETE PAVEMENT
NB - NORTH BOUND
WB - WEST BOUND
EB - EAST BOUND
SB - SOUTH BOUND
N.T.S - NOT TO SCALE
F-F - FACE TO FACE
PCJ - PERMISSIBLE CONSTRUCTION JOINT
E - EXISTING CROSS SLOPE

⊕ EXISTING CURB & GUTTER LOCATIONS SHALL BE IDENTIFIED BY CONTRACTOR PRIOR TO CONSTRUCTION.



NORTHBOUND RAMP TYPICAL SECTION

* PROPOSED WIDTH OF OVERLAY & MILLING VARIES ON RAMPS, SEE BASIS OF ESTIMATE FOR OVERALL ESTIMATED AREAS.



SOUTHBOUND RAMP TYPICAL SECTION

* PROPOSED WIDTH OF OVERLAY & MILLING VARIES ON RAMPS, SEE BASIS OF ESTIMATE FOR OVERALL ESTIMATED AREAS.

NOTES

1. WHERE PERMISSIBLE, OR UNLESS DIRECTED BY THE ENGINEER, PERMISSIBLE CONSTRUCTION JOINTS SHALL FALL ON STRIPING LINES AS SHOWN.
2. FOR STRIPING CONFIGURATION SEE PAVEMENT MARKING DETAILS.
3. PROPOSED BONDING COURSE RATE 0.07 GAL/SY IS FOR ESTIMATING PURPOSES ONLY. RATE TO BE ADJUSTED IN THE FIELD AS PER SPEC AND THE ENGINEER.
4. SEE BASIS OF ESTIMATE PLAN SHEETS FOR TRANSITION AREA QUANTITIES.

STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

Eugene Palacios

TEXAS DEPARTMENT OF TRANSPORTATION

IH 69C FR.
LOCATION #3
TYPICAL SECTIONS

N. T. S.

FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET NO.
6	F 2023(909)		HIDALGO		8
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

Project Number:

County: Hidalgo **Control:** 1804-01-082, Etc.

Highway: SS 115, Etc.

2014 SPECS GENERAL NOTES:

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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):

Hector Siller, P.E., Pharr Area Engineer; Hector.Siller@txdot.gov
Jesus Noriega, P.E., Assist. Area Engineer; Jesus.Noriega@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 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.

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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.

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

- National Holidays
- The day before a National Holiday
- During emergency events such as natural disasters or as directed by the Engineer
- Local Special Event

ITEM 8: Prosecution and Progress
A total of 140 working days will be allowed for this project. Working days will be computed and charged in accordance with Article 8.3.1.4 Standard Workweek. Nighttime work for all locations shall be done in accordance with Article 8.3.3.2.1.

Prepare progress schedules as a Bar Chart.

ITEM 134: Backfilling Pavement Edges
Areas to be backfilled shall extend approximately 3-ft out from the edges of the proposed overlay. Final slopes shall be uniform and smooth. The 100-foot station payment includes backfilling of both sides.

Backfill Ty A shall not contain particles more than two inches in size and shall have a minimum PI of 10 and a maximum PI of 20.

Any additional backfill material necessary due to pre-existing edge conditions or to replace existing fill removed during blading operations will not be paid for directly. It will be considered subsidiary to this bid Item.

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 351: Flexible Pavement Structure Repair
Repair pavement structure for areas identified in the plans.

Notify the Engineer when differing site conditions are encountered that require structural repair. The contractor shall utilize Item 351 to repair pavement structure as approved by the Engineer.

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ITEM 354: Planing and Texturing Pavement

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.

Manholes in roadway shall be identified by contractor prior to milling operations.

RAP generated from this project will become the property of the Contractor.

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 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.

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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

For this project a field office will not be required at the project site.

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 be maintained at 76 degrees Fahrenheit at all times.

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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 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. The removal of delineators mounted to the metal beam guard fence or posts will be subsidiary to Item 542.

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 10 ft. straightedge.

Diamond grinding shall be used to remove localized roughness.

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Use surface test Type B pay adjustment schedule 3 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.

ITEM 658: Delineator and Object Marker Assemblies
Delineator assemblies shall be installed 8 feet from the edge of the shoulder unless restricted by some obstruction, in which case, the delineator assembly shall be placed between 2 and 8 feet from the edge of the shoulder.

Bi-directional object markers shall be in accordance with the D&OM standard sheets. The Contractor is directed to the standards when instructed where and how to install the object markers.

ITEMS 662 and 666: Work Zone Pavement Markings and Reflectorized Pavement Markings
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 677: Eliminating Existing Pavement Markings and Markers
Asphalt and aggregate types and grades shall be as approved in writing when a surface treatment is used to eliminate existing pavement markings.

ITEM 688: Pedestrian Detectors and Vehicle Loop Detectors
Loop detectors shall be installed to replace those damaged or destroyed due to construction operations. Before milling operations begin, all existing loop detector locations shall be marked, and their configuration and orientation obtained for replacement with same size loop detectors.

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After milling operations and before final overlay lift placement, all loop detectors shall be installed into existing flexible pavement structure.

Any deviation of location for proposed loop detector work shall be as approved. Install loop vehicle detectors in accordance with plan Standard Sheet LD1-03 (Loop Detector Installation Details). All loop detectors shall be rectangular.

Use 2/c #14 AWG shielded for loop lead-ins and #14 AWG for loop wire in pavement.

Splices for loop wire will be permitted only at ground boxes or pole base with approved weatherproof splice kits.

A minimum length of 2 feet for each cable shall be left in each ground box.

All wiring not covered by the plans and specifications shall be in accordance with the latest edition of the National Electrical Code.

Handling of traffic

Roads and streets shall always be kept open to traffic. The setting of loop detectors shall be arranged so as to close only one lane of a roadway at a time and to permit the continuous movement of traffic in both directions at all times. All traffic control devices used for this operation will be subsidiary to Item 688.

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.

A portion of RAP generated from this project will remain the property of the State. This quantity can be found on the Estimate and Quantity Tables under Item 354.

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.

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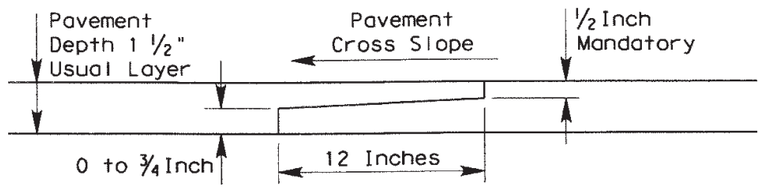
All unconfined longitudinal joints shall be constructed with a joint maker providing a maximum ½-inch vertical edge and a minimum 6:1 edge taper or as approved by the Engineer. The Engineer may waive this requirement when no impacts to the traveling public are foreseen.



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.

SAC B aggregate must have material properties that require 10 or less on the magnesium sulfate soundness test and 20 or less on the Micro-Deval test.

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.

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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 6185: Truck Mounted Attenuator/Trailer Attenuator

In addition to the shadow vehicles with truck mounted attenuator (TMA) that are specified as being required on the traffic control plan for the project, provide 1 additional shadow vehicle(s) with TMA as per TCP (1-1) -18 as detailed on General Note 5 of this standard sheet;
or as per TCP (1-3) -18 as detailed on General Note 7 of this standard sheet;
or as per TCP (1-4) -18 as detailed on General Note 5 of this standard sheet;
or as per TCP (2-1) -18 as detailed on General Note 5 of this standard sheet;
or as per TCP (2-3) -18 as detailed on General Note 8 of this standard sheet.
or as per TCP (2-4) -18 as detailed on General Note 6 of this standard sheet.

Therefore, 2 total shadow vehicles with TMA will be required on this project for the type of work as shown on the plans. The Contractor will be responsible for determining if one or more of his construction operations will be ongoing at the same time and thus determine the total number of TMAs needed for the project.

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Estimate & Quantity Sheet

CONTROLLING PROJECT ID 1804-01-082 **DISTRICT** Pharr **COUNTY** Hidalgo
HIGHWAY IH 69C, SS 115

				0255-07-149		1804-01-082		1804-01-083		TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB									
		PROJECT ID		**A00189377**		**A00129661**		**A00189376**			
		COUNTY		**Hidalgo**		**Hidalgo**		**Hidalgo**			
		HIGHWAY		**IH 69C**		**SS 115**		**SS 115**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	134-6001	BACKFILL (TY A)	STA	5.000		68.000				73.000	
	351-6008	FLEXIBLE PAVEMENT STRUCTURE REPAIR(12")	SY	21,027.000				8,266.000		29,293.000	
	354-6021	PLANE ASPH CONC PAV(0" TO 2")	SY			24,366.000		1,301.000		25,667.000	
	354-6045	PLANE ASPH CONC PAV (2")	SY	150,182.000				254,709.000		404,891.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	24.000						24.000	
	500-6001	MOBILIZATION	LS			1.000				1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO			7.000				7.000	
	506-6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	116.000		11.000		20.000		147.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	116.000		11.000		20.000		147.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	298.000						298.000	
	540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	1.000						1.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF	321.000						321.000	
	542-6002	REMOVE TERMINAL ANCHOR SECTION	EA	1.000						1.000	
	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	3.000						3.000	
	658-6015	INSTL DEL ASSM (D-SW)SZ (BRF)GF1	EA	9.000						9.000	
	658-6060	REMOVE DELIN & OBJECT MARKER ASSMS	EA	9.000						9.000	
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	5,146.000		1,565.000		6,456.000		13,167.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	178.000		1,512.000		401.000		2,091.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	7,756.000		868.000		6,951.000		15,575.000	
	666-6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	2,107.000				845.000		2,952.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF			1,315.000		1,127.000		2,442.000	
	666-6141	REFL PAV MRK TY I (Y)12"(SLD)(100MIL)	LF	465.000		2,010.000		1,382.000		3,857.000	
	666-6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	13,852.000		5,070.000		17,269.000		36,191.000	
	666-6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	4,277.000		22,445.000		39,545.000		66,267.000	
	666-6318	RE PM W/RET REQ TY I (Y)6"(BRK)(100MIL)	LF			2,365.000		77.000		2,442.000	
	666-6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	8,639.000		22,863.000		37,066.000		68,568.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA			7.000		53.000		60.000	
	668-6078	PREFAB PAV MRK TY C (W) (DBL ARROW)	EA					5.000		5.000	
	668-6080	PREFAB PAV MRK TY C (W) (UTURN ARROW)	EA					4.000		4.000	
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA			7.000		56.000		63.000	
	672-6007	REFL PAV MRKR TY I-C	EA	138.000		233.000		98.000		469.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	160.000		550.000		264.000		974.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	1,234.000		88.000		1,280.000		2,602.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	6,356.000		495.000		15,994.000		22,845.000	
	677-6003	ELIM EXT PAV MRK & MRKS (8")	LF	4,950.000				1,233.000		6,183.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 1804-01-082 **DISTRICT** Pharr **COUNTY** Hidalgo
HIGHWAY IH 69C, SS 115

			CONTROL SECTION JOB	**0255-07-149**		**1804-01-082**		**1804-01-083**		TOTAL EST.	TOTAL FINAL
			PROJECT ID	**A00189377**		**A00129661**		**A00189376**			
			COUNTY	**Hidalgo**		**Hidalgo**		**Hidalgo**			
			HIGHWAY	**IH 69C**		**SS 115**		**SS 115**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	677-6005	ELIM EXT PAV MRK & MRKS (12")	LF	669.000				222.000		891.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	1,594.000				1,140.000		2,734.000	
	677-6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	27.000						27.000	
	677-6009	ELIM EXT PAV MRK & MRKS (DBL ARROW)	EA	11.000						11.000	
	677-6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	37.000						37.000	
	688-6004	VEH LP DETECT (SAWCUT)	LF	319.000		3,476.000		1,664.000		5,459.000	
	3080-6013	STONE-MTRX-ASPH SMA-F SAC-A PG76-22	TON	17,121.000		11,245.000		29,037.000		57,403.000	
	3084-6001	BONDING COURSE	GAL	10,513.000		6,905.000		17,830.000		35,248.000	
	6038-6004	MULTIPOLYMER PAV MRK (W)(6")(SLD)	LF	1,633.000				6,024.000		7,657.000	
	6038-6005	MULTIPOLYMER PAV MRK (W)(6")(BRK)	LF	1,179.000				2,707.000		3,886.000	
	6038-6007	MULTIPOLYMER PAV MRK (W)(8")(SLD)	LF	4,950.000				1,233.000		6,183.000	
	6038-6013	MULTIPOLYMER PAV MRK (W)(24")(SLD)	LF	1,594.000				836.000		2,430.000	
	6038-6017	MULTIPOLYMER PAV MRK (Y)(6")(SLD)	LF	3,544.000						3,544.000	
	6038-6018	MULTIPOLYMER PAV MRK (Y)(6")(BRK)	LF					7,263.000		7,263.000	
	6038-6025	MULTIYPOLYMER PAV MRK (W) (ARROW)	EA	27.000						27.000	
	6038-6026	MULTIPOLYMER PAV MRK (W) (DBL ARROW)	EA	11.000						11.000	
	6038-6027	MULTIPOLYMER PAV MRK (W) (WORD)	EA	37.000						37.000	
	6038-6029	MULTIPOLYMER PAV MRK (W)(U-TURN ARROW)	EA	10.000						10.000	
	6038-6031	MULTIPOLYMER PAV MRK (W)(18")(YLD TRI)	EA	28.000						28.000	
	6185-6002	TMA (STATIONARY)	DAY			60.000				60.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY			90.000				90.000	
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS			1.000				1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS			1.000				1.000	

BASIS OF ESTIMATE
LOCATION 1

CONTROL: 1804-01-082 COUNTY: HIDALGO
PROJECT: HIGHWAY: SS 115

TYPE: OVERLAY
LIMITS: FROM: Uvalde Rd.
TO: Sarah Ave.

STATION LIMITS: 100+00. TO 205+62. = 10,562.00 Ft. = 2.000 Mi.

EXCEPTIONS: NONE
EQUATIONS: NONE

SS 115

STA	TO	STA	WIDTH(FT)	LENGTH	AREA(SY)*
100+00		137+41	80	3,741	33,253
137+41	†	142+75	89.1	534	5,287
151+33	Crossover	152+00	102.7	67	765
159+27	†	187+09	99.7	2,782	30,818
193+70	Crossover	194+35	104.8	65	757
199+92	Crossover	200+48	122.1	56	760
	† AVG WIDTH		TOTAL =	7,245	71,640

SOUTHBOUND

STA	TO	STA	WIDTH(FT)	LENGTH	AREA(SY)*
142+75		147+97	38	52	2,204
147+97	Omitted Bridge	149+07		110	
149+07		151+33	38	22	954
152+00		159+27	38	72	3,070
187+09		193+70	38	66	2,791
194+35		199+82	38	54	2,310
200+48		205+62	38	51	2,170
	† AVG WIDTH		TOTAL =	3,30	13,499

NORTHBOUND

STA	TO	STA	WIDTH(FT)	LENGTH	AREA(SY)*
142+75		147+97	38	522	2,204
147+97	Omitted Bridge	149+07		110	
149+07		151+33	38	226	954
152+00		159+27	38	727	3,070
187+09		193+70	38	661	2,791
194+35		199+82	38	547	2,310
200+48		205+62	38	514	2,170
	AVG WIDTH		TOTAL =	3,307	13,499

134	6001	BACKFILL (TY A)	=	68	STA
354	6021	PLANE ASPH CONC PAV (0" TO 2")	=	24,366	SY
500	6001	MOBILIZATION	=	1	LS
502	6001	BARRICADES, SIGNS, AND TRAFF HANDLE	=	7	MO
506	6041	BIODEG EROSN CONT LOGS(INSTL)(12")	=	11	LF
506	6043	BIODEG EROSN CONT LOGS(REMOVE)	=	11	LF
662	6109	WK ZN PAV MRK SHT TERM (TAB) TY W	=	1,565	EA
662	6111	WK ZN PAV MRK SHT TERM (TAB) TY Y-2	=	1,512	EA
666	6036	REFL PAV MRK TY I (W) 8" (SLD)(100MIL)	=	868	LF
666	6048	REFL PAV MRK TY I (W) 24"(SLD)(100MIL)	=	1,315	LF
666	6141	REFL PAV MRK TY I (Y) 12"(SLD)(100MIL)	=	2,010	LF
666	6306	RE PM W/RET REQ TY I (W) 6" (BRK)(100MIL)	=	5,070	LF
666	6309	RE PM W/RET REQ TY I (W) 6" (SLD)(100MIL)	=	22,445	LF
666	6318	RE PM W/RET REQ TY I (Y) 6" (BRK)(100MIL)	=	2,365	LF
666	6321	RE PM W/RET REQ TY I (Y) 6" (SLD)(100MIL)	=	22,863	LF
668	6077	PREFAB PAV MRK TY C (W) (ARROW)	=	7	LF
668	6085	PREFAB PAV MRK TY C (W) (WORD)	=	7	EA
672	6007	REFL PAV MRKR TY I-C	=	233	EA
672	6009	REFL PAV MRKR TY II A-A	=	550	EA
* 672	6010	REFL PAV MRKR TY II C-R	=	88	EA
* 677	6001	ELIM EXT PAV MRK & MRKS(4")	=	495	LF
684		1/C #14 AWG LOOP WIRE (XHHW)	=	6,952	LF
688	6004	VEH LP DETECT (SAWCUT)	=	3,476	LF
3080	6013	STONE-MTRX-ASPH SMA-F SAC-A PG76-22	=	11,245	TON
3084	6001	BONDING COURSE	=	6,905	GAL
6185	6002	TMA (STATIONARY)	=	60	DAY
6185	6005	TMA (MOBILE OPERATION)	=	90	DAY

LOCATION 1

TEXAS DEPARTMENT OF TRANSPORTATION

BASIS OF ESTIMATE

FED. RD. DIV.NO.	PROJECT NO.	COUNTY			SHEET No.
6	F 2023(909)	HIDALGO			12
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

BASIS OF ESTIMATE
LOCATION 2

CONTROL: 1804-01-083
PROJECT:

COUNTY: HIDALGO
HIGHWAY: SS 115

TYPE: OVERLAY
LIMITS: FROM: Sarah Ave.
TO: UP 281

STATION LIMITS: 100+00. TO 289+13. = 18,913.00 Ft. = 3.582 Mi.

EXCEPTIONS: NONE
EQUATIONS: NONE

SOUTHBOUND

STA	TO	STA	WIDTH(FT)	LENGTH	AREA(SY)*
100+00	Intersection	101+10	51.3	110	627
101+10	†	106+27	64.4	517	3,699
106+27		125+78	56	1,951	12,140
125+78	Concrete Bridge	128+82		304	
128+82		135+09	56	627	3,901
135+09	†	142+02	73.3	693	5,644
142+02	Concrete Bridge	163+13		2,111	
163+13		170+60	56	747	4,648
170+60	Crossover	171+60	75.5	100	839
171+60		183+40	56	1,180	7,342
183+40	Crossover	184+60	76.4	120	1,019
184+60		189+40	56	480	2,987
189+40	†	193+17	64.3	377	2,693
193+17	Crossover	194+77	73.1	160	1,300
194+77		207+84	56	1,307	8,132
207+84	Crossover	208+84	73.3	100	814
208+84		215+20	56	636	3,957
215+20	Crossover	220+20	88.9	500	4,939
220+20		231+00	56	1,080	6,720
231+00	†	233+20	58	220	1,418
233+20	Crossover	234+00	92.4	80	821
234+00		242+80	56	880	5,476
242+80	Crossover	243+80	119.9	100	1,332
243+80		258+20	56	1,440	8,960
258+20	Crossover	259+00	109.5	80	973
259+00		265+00	56	600	3,733
265+00	†	270+20	60.4	520	3,490
270+20	Crossover	271+14	98.9	94	1,033
271+14		282+20	56	1,106	6,882
282+20	†	285+00	64.8	280	2,016
	† AVG WIDTH		TOTAL =	18,500	107,535

NORTHBOUND

STA	TO	STA	WIDTH(FT)	LENGTH	AREA(SY)*
100+00	Intersection	101+10	55.3	110	676
101+10	†	112+14	68	1,104	8,341
112+14		125+88	56	1,374	8,549
125+88	Concrete Bridge	128+92		304	
128+92		136+48	56	756	4,704
136+48	†	142+16	65.2	568	4,115
142+16	Concrete Bridge	162+69		2,053	
162+69		170+75	56	806	5,015
170+75	Crossover	171+72	79.4	97	856
171+72		183+40	56	1,168	7,268
183+40	Crossover	184+60	73.1	120	975
184+60		193+20	56	860	5,351
193+20	Crossover	194+80	71.5	160	1,271
194+80		207+80	56	1,300	8,089
207+80	Crossover	208+80	76.2	100	847
208+80	†	211+00	60.8	220	1,486
211+00		215+00	56	400	2,489
215+00	Crossover	220+00	88.4	500	4,911
220+00	†	222+20	67.8	220	1,657
222+20		233+47	56	1,127	7,012
233+47	Crossover	234+40	91.9	93	950
234+40	†	240+00	60.2	560	3,746
240+00		244+00	56	400	2,489
244+00	Crossover	245+00	135.2	100	1,502
245+00		259+20	56	1,420	8,836
259+20	Crossover	260+20	100.25	100	1,114
260+20	†	270+40	58.9	1,020	6,675
270+40	Crossover	271+40	104.3	100	1,159
271+40		283+06	56	1,166	7,255
283+06	†	285+00	51.8	194	1,117
	AVG WIDTH		TOTAL =	18,500	108,455

SOUTHBOUND FRONTAGE

STA	TO	STA	WIDTH(FT)	LENGTH	AREA(SY)*
106+27.	†	123+93.	40	1,766	7,849
123+93.	Concrete Intersection	128+70.		477	
128+70.	†	135+02.	29.4	632	2,065
	† AVG WIDTH		TOTAL =	2,875	9,914

NORTHBOUND FRONTAGE

STA	TO	STA	WIDTH(FT)	LENGTH	AREA(SY)*
112+14.	†	126+20.	35	1,406	5,468
126+20.	Concrete Intersection	130+01.		381	
130+01.	†	139+73.	69.35	972	7,490
	† AVG WIDTH		TOTAL =	2,759	12,958

Depot Rd.

STA	TO	STA	WIDTH(FT)	LENGTH	AREA(SY)*
100+00.	†	115+63.	24	1,563	4,168
	† AVG WIDTH		TOTAL =	1,563	4,168

UP 281

STA	TO	STA	WIDTH(FT)	LENGTH	AREA(SY)*
285+00.	†	289+13.	254.5	413	11,679
	† AVG WIDTH		TOTAL =	413	11,679

LOCATION 2

BASIS OF ESTIMATE

FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		13
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082.ETC.	SS 115,ETC.

BASIS OF ESTIMATE
LOCATION 2

CONTROL: 1804-01-083 COUNTY: HIDALGO
PROJECT: HIGHWAY: SS 115

TYPE: OVERLAY
LIMITS: FROM: Sarah Ave.
TO: UP 281

STATION LIMITS: 100+00. TO 289+13. = 18,913.00 Ft. = 3.582 Mi.

EXCEPTIONS: NONE
EQUATIONS: NONE

351	6008	FLEXIBLE PAVEMENT STRUCTURE REPAIR(12")	=	8,266	SY
354	6021	PLANE ASPH CONC PAV (0" TO 2")	=	1,301	SY
354	6045	PLANE ASPH CONC PAV (2")	=	254,709	SY
506	6041	BIODEG EROSN CONT LOGS(INSTL)(12")	=	20	LF
506	6043	BIODEG EROSN CONT LOGS(REMOVE)	=	20	LF
662	6109	WK ZN PAV MRK SHT TERM (TAB) TY W	=	6,456	EA
662	6111	WK ZN PAV MRK SHT TERM (TAB) TY Y-2	=	401	EA
666	6036	REFL PAV MRK TY I (W) 8" (SLD)(100MIL)	=	6,951	LF
666	6042	REFL PAV MRK TY I (W) 12"(SLD)(100MIL)	=	845	LF
666	6048	REFL PAV MRK TY I (W) 24"(SLD)(100MIL)	=	1,127	LF
666	6141	REFL PAV MRK TY I (Y) 12"(SLD)(100MIL)	=	1,382	LF
666	6306	RE PM W/RET REQ TY I (W) 6" (BRK)(100MIL)	=	17,269	LF
666	6309	RE PM W/RET REQ TY I (W) 6" (SLD)(100MIL)	=	39,545	LF
666	6318	RE PM W/RET REQ TY I (Y) 6" (BRK)(100MIL)	=	77	LF
666	6321	RE PM W/RET REQ TY I (Y) 6" (SLD)(100MIL)	=	37,066	LF
668	6077	PREFAB PAV MRK TY C (W) (ARROW)	=	53	LF
668	6078	PREFAB PAV MRK TY C (W) (DBL ARROW)	=	5	EA
668	6080	PREFAB PAV MRK TY C (W) (UTURN ARROW)	=	4	EA
668	6085	PREFAB PAV MRK TY C (W) (WORD)	=	56	EA
672	6007	REFL PAV MRKR TY I-C	=	98	EA
672	6009	REFL PAV MRKR TY II A-A	=	264	EA
672	6010	REFL PAV MRKR TY II C-R	=	1,280	EA
677	6001	ELIM EXT PAV MRK & MRKS(4")	=	15,994	LF
677	6003	ELIM EXT PAV MRK & MRKS(8")	=	1,233	LF
677	6005	ELIM EXT PAV MRK & MRKS(12")	=	222	LF
677	6007	ELIM EXT PAV MRK & MRKS(24")	=	1,140	LF
* 684		1/C #14 AWG LOOP WIRE (XHHW)	=	3,328	LF
* 688	6004	VEH LP DETECT (SAWCUT)	=	1,664	LF
3080	6013	STONE-MTRX-ASPH SMA-F SAC-A PG76-22	=	29,037	TON
3084	6001	BONDING COURSE	=	17,830	GAL
6038	6004	MULTIPOLYMER PAV MRK (W)(6")(SLD)	=	6,024	LF
6038	6005	MULTIPOLYMER PAV MRK (W)(6")(BRK)	=	2,707	LF
6038	6007	MULTIPOLYMER PAV MRK (W)(24")(SLD)	=	836	LF
6038	6013	MULTIPOLYMER PAV MRK (W)(8")(SLD)	=	1,233	LF
6038	6017	MULTIPOLYMER PAV MRK (Y)(6")(SLD)	=	7,263	LF

LOCATION 2

BASIS OF ESTIMATE

FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		14
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

BASIS OF ESTIMATE
LOCATION 3

CONTROL: 0255-07-149
PROJECT:

COUNTY: HIDALGO
HIGHWAY: IH 69C FR

TYPE: OVERLAY
LIMITS: FROM: FM 1925
TO: FM 2812

STATION LIMITS: 100+00. TO 289+53. = 18,953.00Ft. 3.590 Mi.

EXCEPTIONS: NONE
EQUATIONS: NONE

NORTHBOUND

STA	TO	STA	WIDTH(FT)	LENGTH	AREA(SY)*
100+00	**Concrete Intersection**	103+16		316	
103+16	†	104+77	41.1	161	735
104+77		117+54	38	1,277	5,392
117+54	†	126+08	46	854	4,365
126+08		151+53	38	2,545	10,746
151+53	†	159+05	52.7	752	4,403
159+05		169+83	38	1,078	4,552
169+83	†	171+22	26.4	139	408
171+22	**Concrete Intersection**	177+29		607	
177+29	†	178+91	45.1	162	812
178+91		200+45	38	2,154	9,095
200+45	†	201+27	37.2	82	339
201+27	†	207+83	50	656	3,644
207+83		218+73	38	1,090	4,602
218+73	†	224+70	47	597	3,118
224+70	†	225+70	38.2	100	424
225+70		244+78	39	1,908	8,268
246+90	†	252+15	14.3	525	834
252+15	† **Turnaround**	254+72	75.6	257	2,159
254+72		259+36	26	464	1,340
259+36	†	271+00	35.8	1,164	4,630
271+00	†	275+60	45.7	460	2,336
275+60		279+64	36	404	1,616
279+64	†	280+49	31.2	85	295
280+49		283+36	34	287	1,084
283+36	**Concrete Intersection**	289+58		622	
	† **AVG WIDTH**		**TOTAL =**	18,746	75,197

SOUTHBOUND #1

STA	TO	STA	WIDTH(FT)	LENGTH	AREA(SY)*
100+00	**rete Intersec**	103+18		318	
103+18	†	104+20	67.9	102	770
104+20		122+03	38	1,783	7,528
122+03	†	126+00	50	397	2,206
126+00		145+00	38	1,900	8,022
145+00	†	150+76	51.7	576	3,309
150+76		167+12	38	1,636	6,908
167+12	†	169+05	45.2	193	969
169+05	**rete Intersec**	175+27		622	
175+27		182+20	38	693	2,926
182+20	†	191+80	50	960	5,333
191+80		225+69	38	3,389	14,309
225+69	†	233+00	48.4	731	3,931
233+00		250+20	38	1,720	7,262
250+20	†	252+20	39	200	867
	† **AVG WIDTH**		**TOTAL =**	15,220	64,340

SOUTHBOUND #2

STA	TO	STA	WIDTH(FT)	LENGTH	AREA(SY)*
100+00	†	107+20	33.3	720	2,664
107+20		113+80	38	660	2,787
113+80	†	120+00	43.8	620	3,017
120+00		123+00	38	300	1,267
123+00	†	124+95	42	195	910
124+95	**rete Intersec**	131+14		619	
	† **AVG WIDTH**		**TOTAL =**	3,114	10,645

LOCATION 3

TEXAS DEPARTMENT OF TRANSPORTATION

BASIS OF ESTIMATE

FED. RD. DIV. NO.	PROJECT NO.		COUNTY			SHEET No.
6	F 2023(909)		HIDALGO			15
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB		HIGHWAY No.
TX	PHR	1804	01	082,ETC.		SS 115,ETC.

BASIS OF ESTIMATE
LOCATION 3

CONTROL: 0255-07-149 COUNTY: HIDALGO
PROJECT: HIGHWAY: IH 69C FR

TYPE: OVERLAY
LIMITS: FROM: FM 1925
TO: FM 2812

STATION LIMITS: 100+00. TO 289+53. = 18,953.00Ft. 3.590 Mi.

EXCEPTIONS: NONE
EQUATIONS: NONE

134	6001	BACKFILL (TY A)	=	5	STA
351	6008	FLEXIBLE PAVEMENT STRUCTURE REPAIR(12")	=	21,027	SY
354	6045	PLANE ASPH CONC PAV (2")	=	150,182	SY
432	6045	RIPRAP (MOW STRIP) (4 IN)	=	24	CY
506	6041	BIODEG EROSN CONT LOGS(INSTL)(12")	=	116	LF
506	6043	BIODEG EROSN CONT LOGS(REMOVE)	=	116	LF
540	6001	MTL W-BEAM GD FEN TIM POST	=	298	LF
540	6016	DOWNSTREAM ANCHOR TERMINCAL SECTION	=	1	EA
542	6001	REMOVE METAL BEAM GUARD FENCE	=	321	LF
542	6002	REMOVE TERMINAL ANCHOR SECTION	=	1	EA
542	6003	REMOVE DOWNSTREAM ANCHOR TERMINAL	=	1	EA
544	6001	GUARDRAIL END TREATMENT (INSTALL)	=	2	EA
544	6003	GUARDRAIL END TREATMENT (REMOVE)	=	3	EA
658	6015	INSTL DEL ASSM (D-SW) SZ (BRF) GF1	=	9	EA
658	6060	REMOVE DELIN & OBJECT MARKER ASSMS	=	9	EA
662	6109	WK ZN PAV MRK SHT TERM (TAB) TY W	=	5,146	EA
662	6111	WK ZN PAV MRK SHT TERM (TAB) TY Y-2	=	178	EA
666	6036	REFL PAV MRK TY I (W) 8" (SLD)(100MIL)	=	7,756	LF
666	6042	REFL PAV MRK TY I (W) 12"(SLD)(100MIL)	=	2,107	LF
666	6141	REFL PAV MRK TY I (Y) 12"(SLD)(100MIL)	=	465	LF
666	6306	RE PM W/RET REQ TY I (W) 6" (BRK)(100MIL)	=	13,852	LF
666	6309	RE PM W/RET REQ TY I (W) 6" (SLD)(100MIL)	=	4,277	LF
666	6321	RE PM W/RET REQ TY I (Y) 6" (SLD)(100MIL)	=	8,639	LF
672	6007	REFL PAV MRKR TY I-C	=	138	EA
672	6009	REFL PAV MRKR TY II A-A	=	160	EA
672	6010	REFL PAV MRKR TY II C-R	=	1,234	EA
677	6001	ELIM EXT PAV MRK & MRKS(4")	=	6,356	LF
677	6003	ELIM EXT PAV MRK & MRKS(8")	=	4,950	LF
677	6005	ELIM EXT PAV MRK & MRKS(12")	=	669	LF
677	6007	ELIM EXT PAV MRK & MRKS(24")	=	1,594	LF
677	6008	ELIM EXT PAV MRK & MRKS(ARROW)	=	27	EA
677	6009	ELIM EXT PAV MRK & MRKS(DBL ARROW)	=	11	EA
677	6012	ELIM EXT PAV MRK & MRKS(WORD)	=	37	EA
* 684		1/C #14 AWG LOOP WIRE (XHHW)	=	638	LF
* 688	6004	VEH LP DETECT (SAWCUT)	=	319	LF
3080	6013	STONE-MTRX-ASPH SMA-F SAC-A PG76-22	=	17,121	TON
3084	6001	BONDING COURSE	=	10,513	GAL
6038	6004	MULTIPOLYMER PAV MRK (W)(6")(SLD)	=	1,633	LF
6038	6005	MULTIPOLYMER PAV MRK (W)(6")(BRK)	=	1,179	LF
6038	6007	MULTIPOLYMER PAV MRK (W)(24")(SLD)	=	1,594	LF
6038	6013	MULTIPOLYMER PAV MRK (W)(8")(SLD)	=	4,950	LF
6038	6017	MULTIPOLYMER PAV MRK (Y)(6")(SLD)	=	3,544	LF
6038	6025	MULTIPOLYMER PAV MRK (W)(ARROW)	=	27	EA
6038	6026	MULTIPOLYMER PAV MRK (W)(DBL ARROW)	=	11	EA
6038	6027	MULTIPOLYMER PAV MRK (W)(WORD)	=	37	EA
6038	6029	MULTIPOLYMER PAV MRK (W)(U-TURN ARROW)	=	10	EA
6038	6031	MULTIPOLYMER PAV MRK (W)(18")(YLD TRI)		28	EA

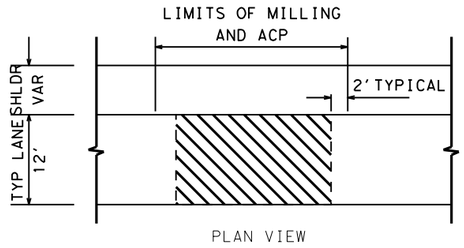
*ELEC. CONDR. (NO. 14) INSULATED WIRE TO BE INSTALLED. SUBSIDIARY TO ITEM 688.
*FOR CONTRACTOR'S INFORMATION ONLY

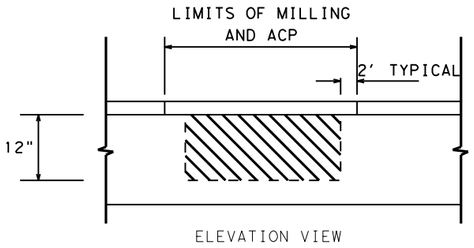
LOCATION 3

BASIS OF ESTIMATE

FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		16
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

PROJECT LOCATION	MNT SECTION	HIGHWAY	Limits		RM	LANE	ITEM 351-6008		
							FLEXIBLE PAVEMENT STRUCTURE REPAIR (12")		
			From	To			WIDTH (FT)	LENGTH (FT)	AREA (SY)
#2	Mission	Spur115 S.B. Left/Center Lane	1,800 Ft. South of Las Milpas Rd.	3,800 Ft. South of Las Milpas Rd.	728-730	Left/Center	24	2,000	5,333
	Mission	Spur115 S.B. Left Lane	150 Ft. South Of Bridge St.	1,160 Ft. South of Produce Rd.	728-730	Left Lane	12	2,200	2,933
#3	Mission	I69C Frontage N.B. On Ramp	1,050 Ft North of Intersection of I69C/FM1925 (Concrete Edge)	1,620 Ft. N. of Intersection of I69C/FM1925 (Concrete Edge)	009-010	On Ramp	12	570	760
	Mission	I69C Frontage N.B. Right Lane	1,475 Ft. South of Davis Rd.	440Ft. South of Intersection of I69C/Ramseyer Rd.(Concrete Edge)	010-011	Right Lane	12	4,050	5,400
	Mission	I69C Frontage N.B Center Lane	3,850 Ft. North of Intersection of I69C/FM1925 (Concrete Edge)	6,800 Ft. North of Intersection of I69C/FM1925 (Concrete Edge)	010-011	Center Lane	12	2,950	3,933
	Mission	I69C Frontage N.B. Center Lane	2,200Ft North of Intersection of I69C/Ramseyer Rd.(Concrete Edge)	4,900Ft North of Intersection of I69C/Ramseyer Rd.(Concrete Edge)	011-012	Right Lane	12	2,700	3,600
	Mission	I69C Frontage N.B. Right Lane	1,000Ft. South of Intersection of I69C/FM2812(Concrete Edge)	180Ft.South of Intersection of I69C/FM2812 (Concrete Edge)	012-013	Right Lane	12	1,000	1,333
	Mission	I69C Frontage N.B. Center Lane	200Ft. South of Intersection of I69C/FM2812 (Concrete Edge)	180Ft South of Intersection of I69C/FM2812 (Concrete Edge)	012-013	Center Lane	12	200	267
	Mission	I69C Frontage N.B. Off Ramp	2,000Ft. South of Intersection of I69C/FM2812 (Concrete Edge)	1,450Ft. South of Intersection of I69C/FM2812 (Concrete Edge)	012-013	Off Ramp	12	550	733
	Mission	I69C Frontage N.B. Center Lane	50 Ft.South of Davis Rd.	1,800 Ft. North of Davis Rd.	010-011	Center Lane	12	1,850	2,467
	Mission	I69C Frontage S.B.Full Width	50 Ft. North of Ingle Rd.	100 Ft. South of Ingle Rd.	012-013	Full Width	40	150	667
	Mission	I69C Frontage S.B. Left Lane	850 Ft. South of Ingle Rd.	2,250 Ft. South of Ingle Rd.	012-013	Left Lane	12	1,400	1,867
								TOTAL	29,293





LIMITS OF ITEM 351

NOTES:
1. ADDITIONAL REPAIR AREAS SHALL BE APPROVED BY THE ENGINEER.
2. SURFACE LAYER OF ACP SHALL BE REMOVED USING ITEM 354 AND REPLACED WITH ITEM 3080.
3. REMAINING 12" OF EXISTING PAVEMENT STRUCTURE SHALL BE SCARIFIED, PULVERIZED, MIXED, AND TREATED WITH CEMENT (3% BY WEIGHT) (FLEX BASE UNIT WEIGHT, 3375 LB/CY) UNDER ITEM 351.
4. MATCH EXISTING ACP DEPTH, ROADWAY ELEVATION, AND CROSS SLOPE. ACP NEEDED TO MATCH EXISTING DEPTH SHALL BE SUBSIDIARY TO ITEM 351.
5. APPLY PRIMECOAT AT A RATE OF 0.20 GAL/SY TO RESHAPED BASE MATERIAL PRIOR TO ITEM 3080 PLACEMENT.
6. EXCESS MATERIAL SHALL BECOME PROPERTY OF THE CONTRACTOR.

FLEXIBLE PAVEMENT STRUCTURE REPAIR TYPICAL DETAIL

STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER
5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

PAVEMENT STRUCTURE REPAIR SUMMARY

FED. RD. DIV. NO.	PROJECT NO.	COUNTY	SHEET No.
6	F 2023(909)	HIDALGO	17

STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

DATE:
FILE:

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

10. 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

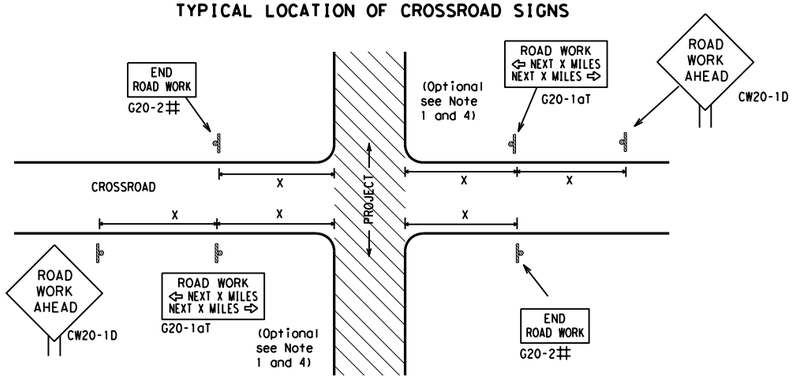
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1804	01	082,ETC.	SS 115,ETC.
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	PHR	HIDALGO		18
5-10 5-21				

DATE:
FILE:

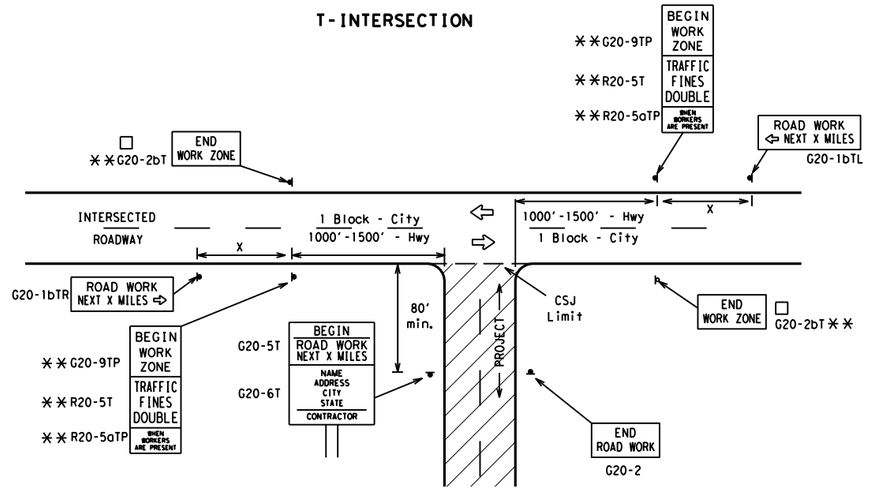
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

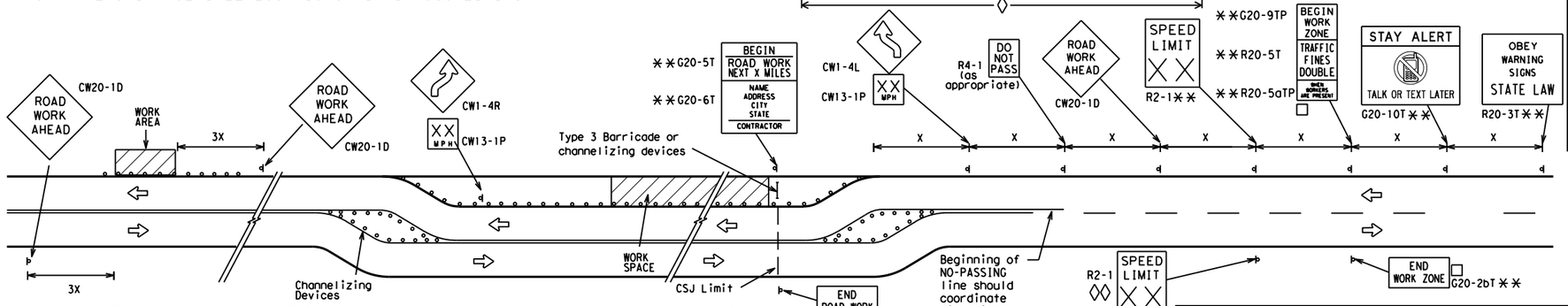
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

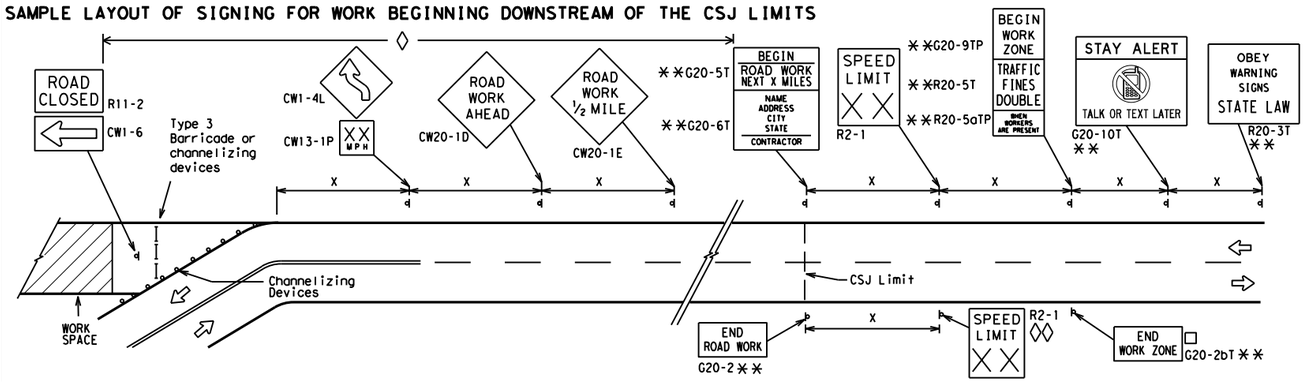
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

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



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1804	01	082,ETC.	SS 115,ETC.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	HIDALGO		19

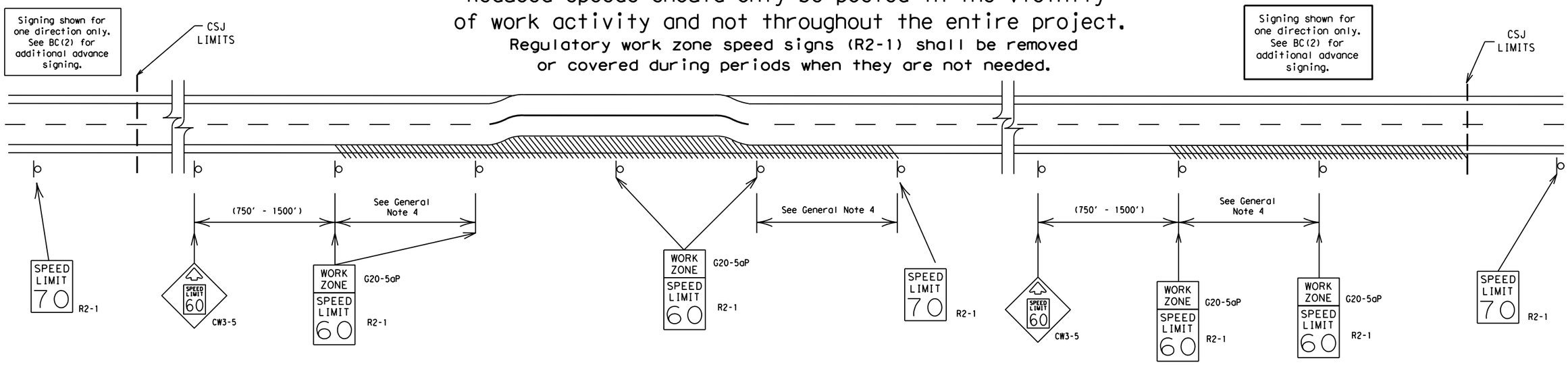
DATE:
FILE:

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	1804	01	082,ETC.	SS 115,ETC.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	HIDALGO		20

DATE:
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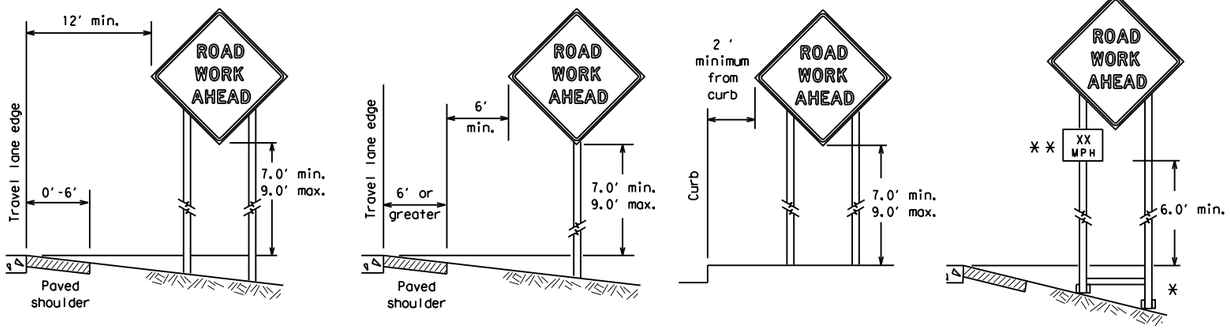
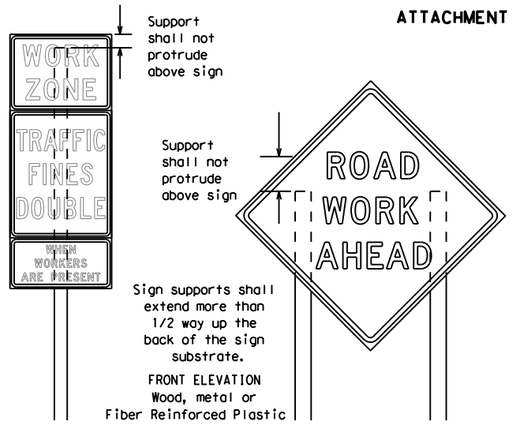
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

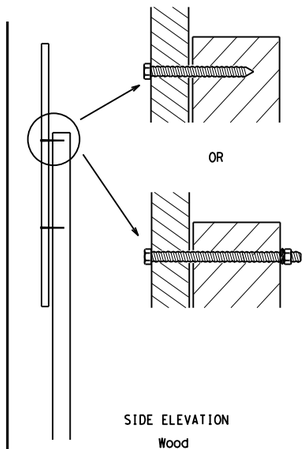


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** 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





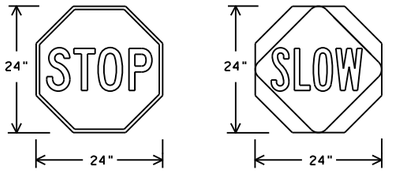
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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.



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1804	01	082,ETC.	SS 115,ETC.
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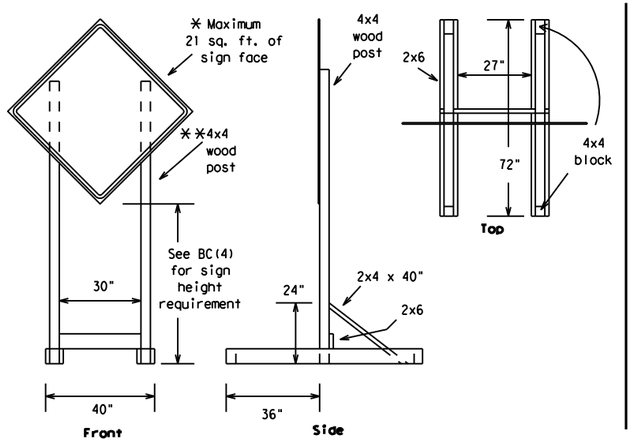
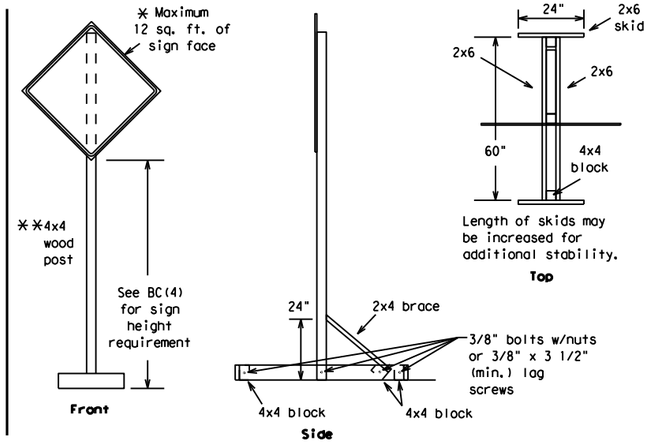
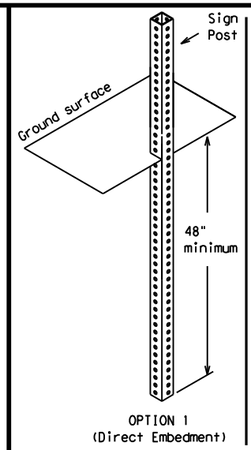
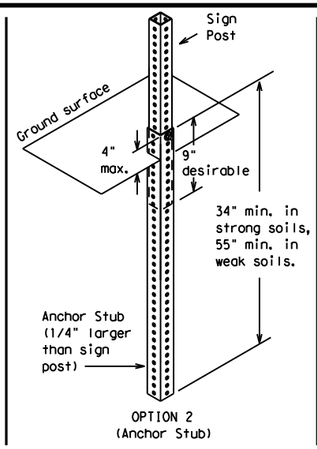


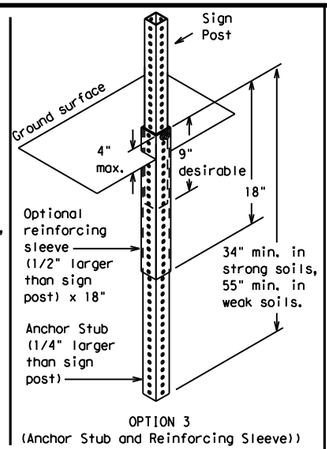


SKID MOUNTED WOOD SIGN SUPPORTS

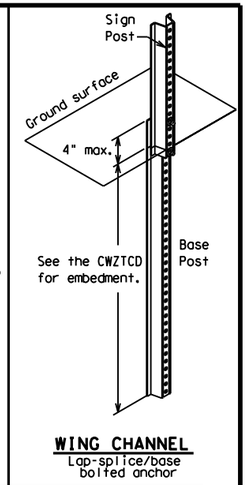
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS







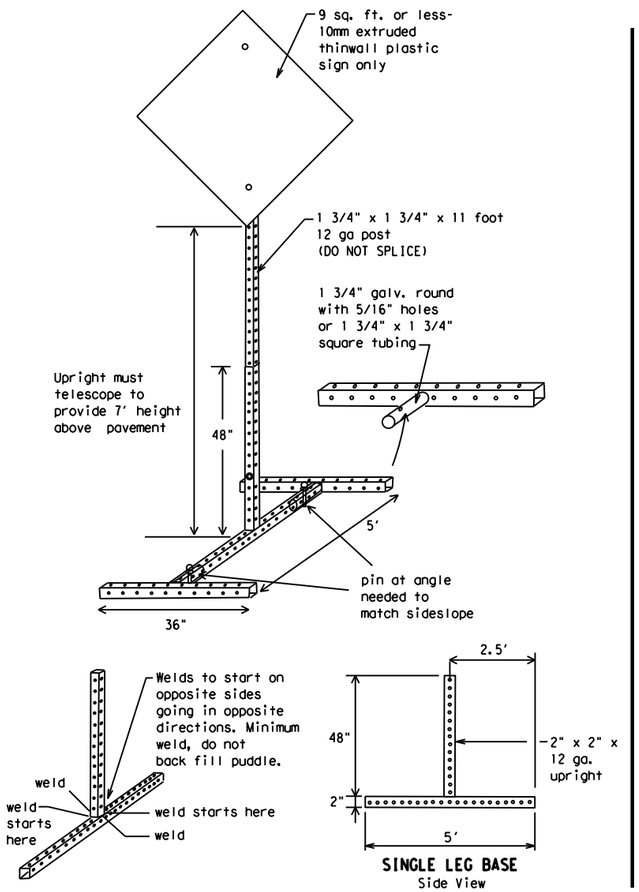
PERFORATED SQUARE METAL TUBING

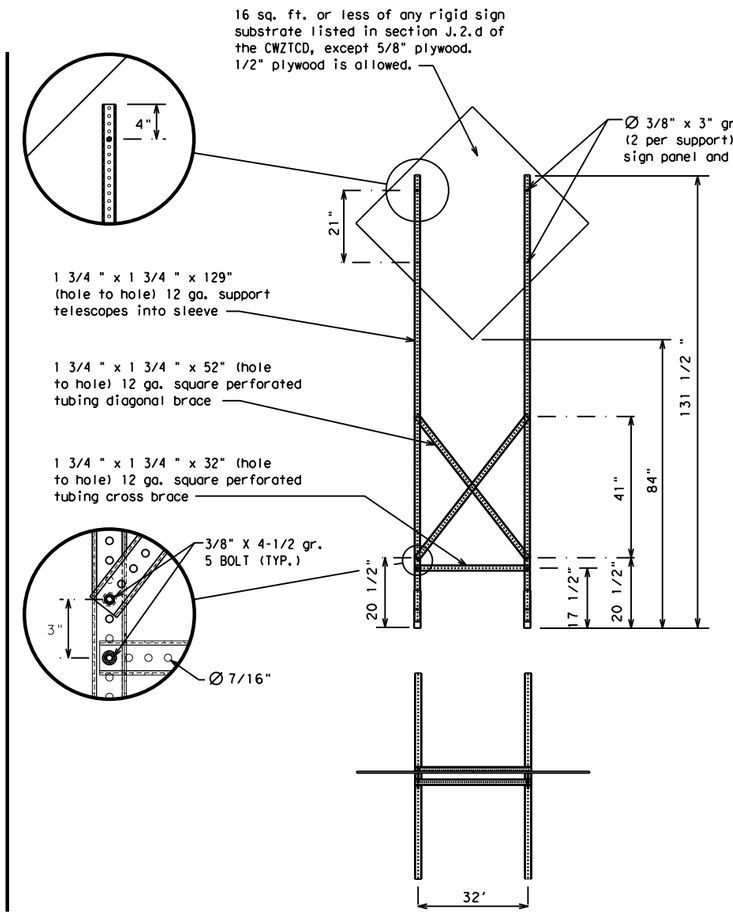


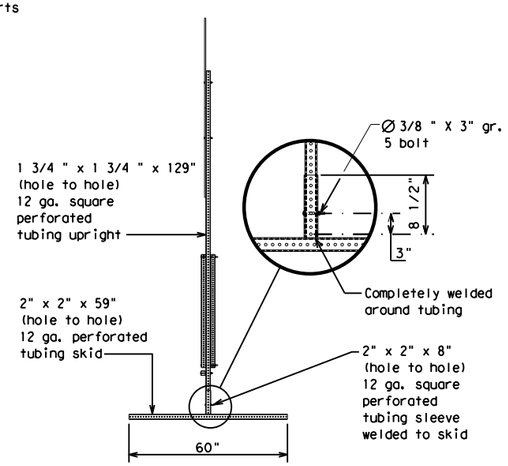
WING CHANNEL
Lap-splice/base bolted anchor

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

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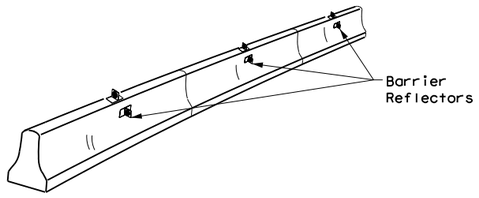
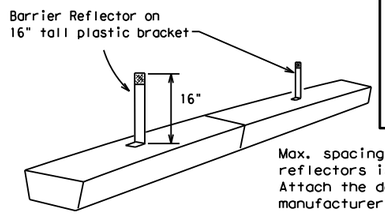
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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

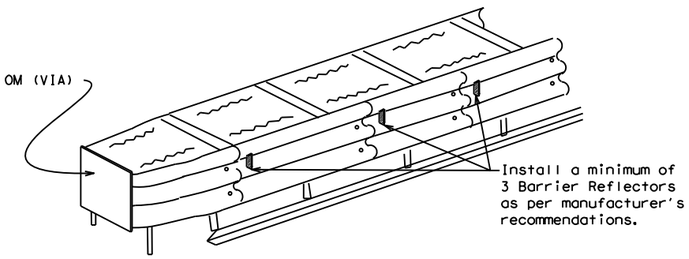


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

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.

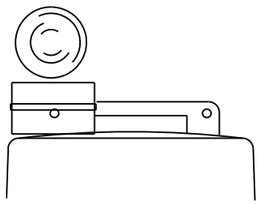


DELINEATION OF END TREATMENTS

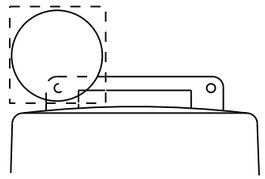
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

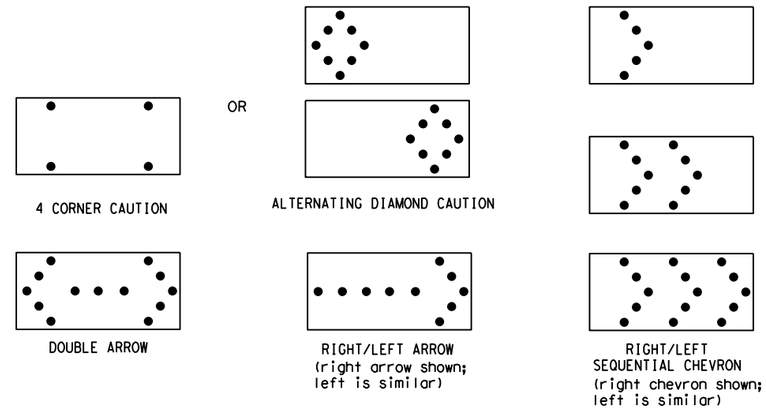
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing 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:



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1804	01	082,ETC.	SS 115,ETC.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	HIDALGO		24

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DATE:
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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

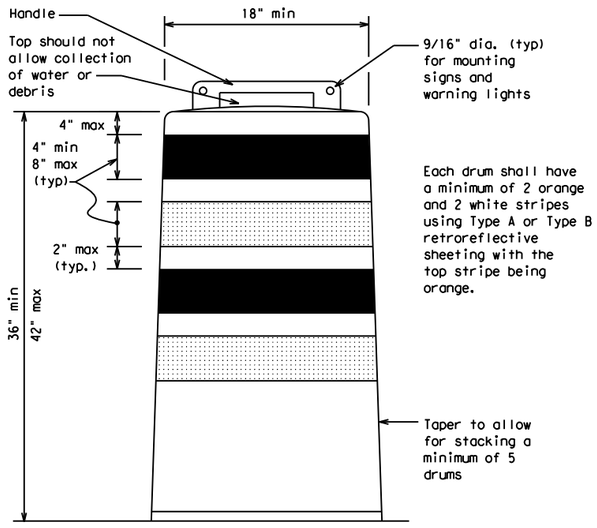
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

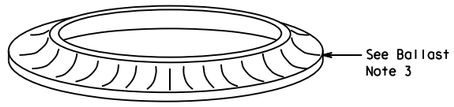
RETROREFLECTIVE SHEETING

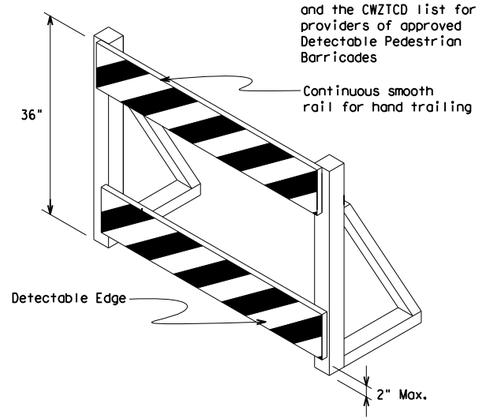
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall 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.

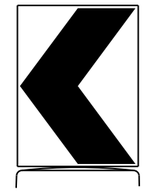




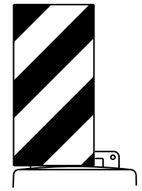


DETECTABLE PEDESTRIAN BARRICADES

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	1804	01	082,ETC.	SS 115,ETC.
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	PHR	HIDALGO		25
7-13				

DATE:
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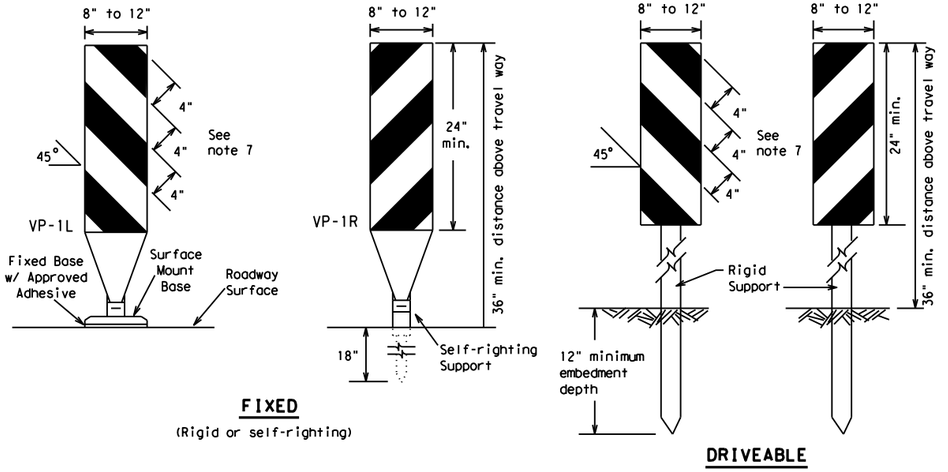
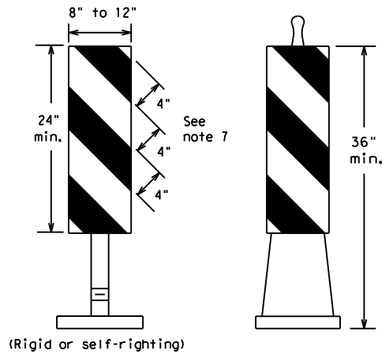


FIXED
(Rigid or self-righting)

DRIVEABLE

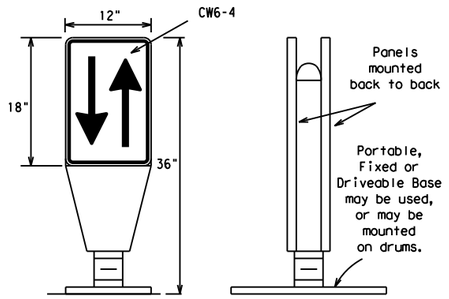


(Rigid or self-righting)

PORTABLE

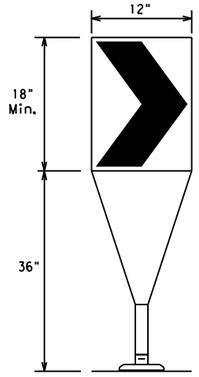
VERTICAL PANELS (VPs)

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.



OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

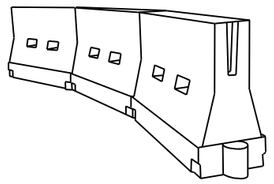
1. Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The 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.



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



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

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.

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1804	01	082,ETC.	SS 115,ETC.
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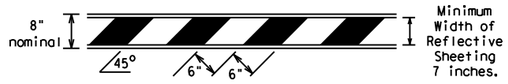
7-13 5-21	PHR	HIDALGO		26

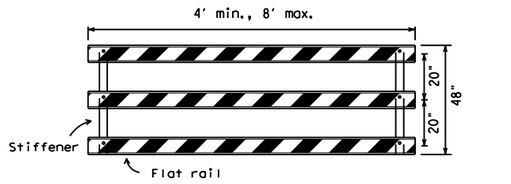
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



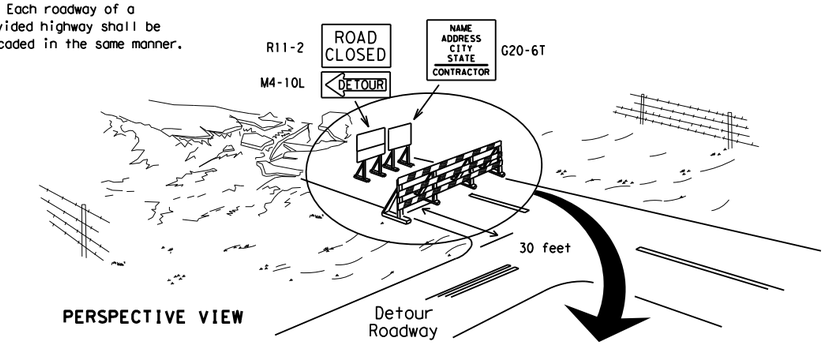
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

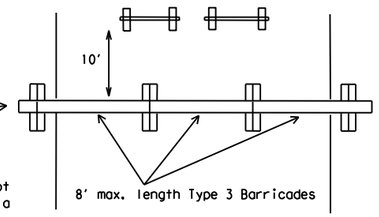
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

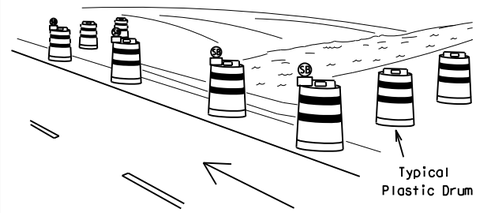
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

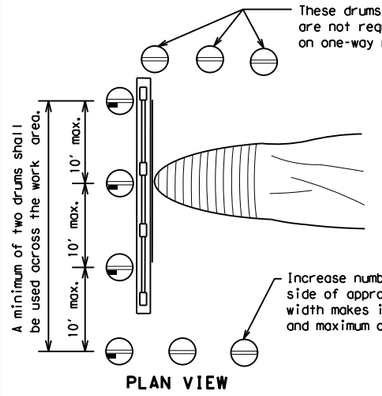
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

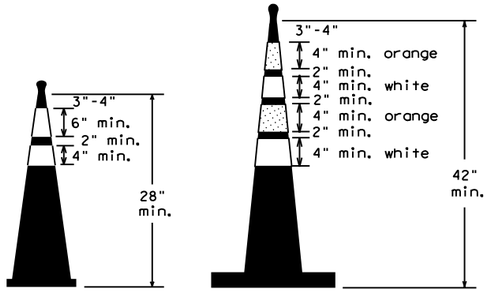
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



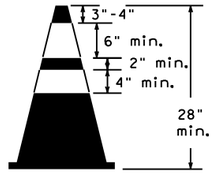
LEGEND	
	Plastic drum
	Plastic drum with steady burn light or yellow warning reflector
SB	Steady burn warning light or yellow warning reflector

PLAN VIEW

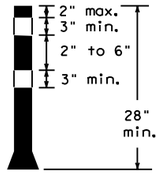
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

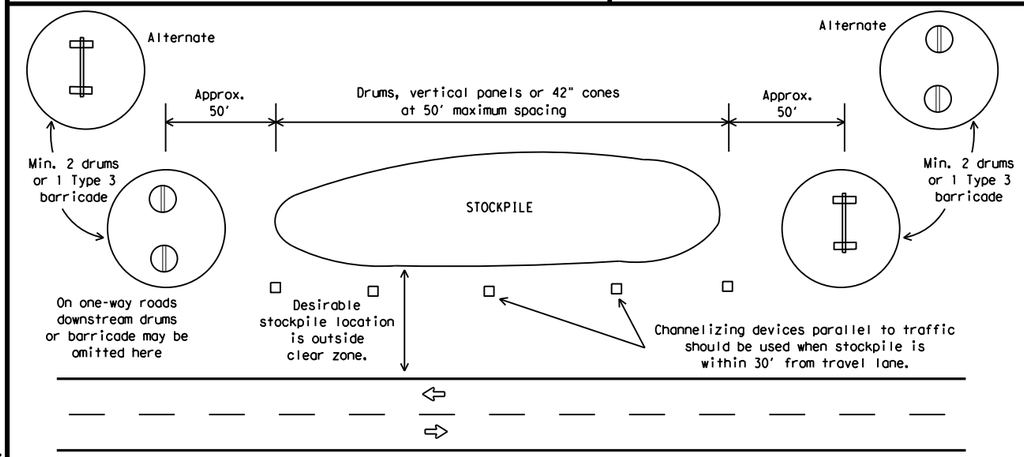


Tubular Marker

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

DATE:
FILE:

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	1804	01	082,ETC.	SS 115,ETC.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	HIDALGO		27

DATE:
FILE:

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.

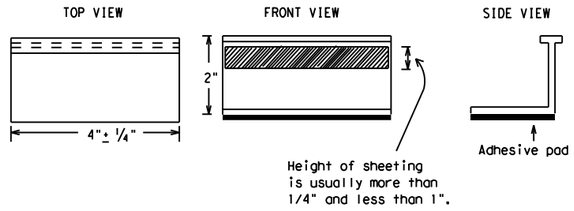
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

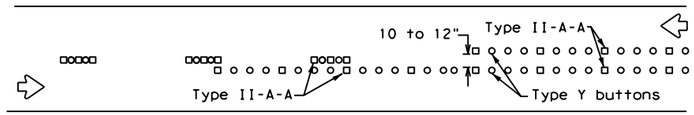
BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	1804	01	082,ETC.	SS 115,ETC.
2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	PHR	HIDALGO		28
11-02 8-14				

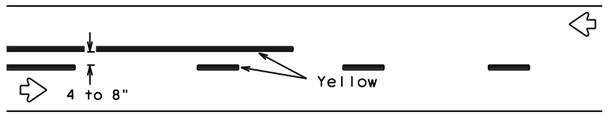
DATE:
FILE:

PAVEMENT MARKING PATTERNS

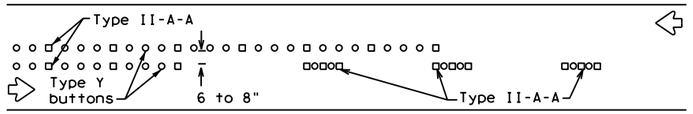
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



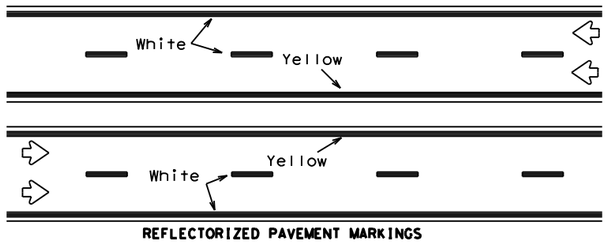
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



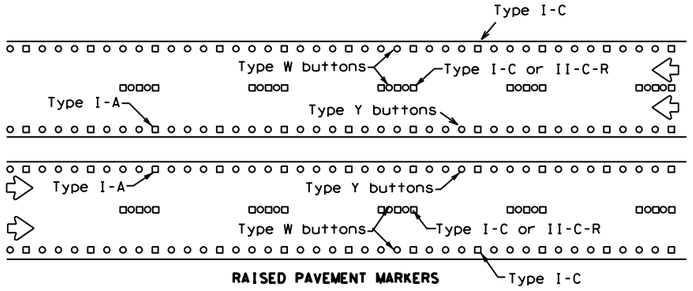
RAISED PAVEMENT MARKERS - PATTERN B

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



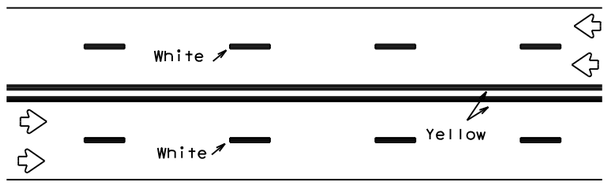
REFLECTORIZED PAVEMENT MARKINGS



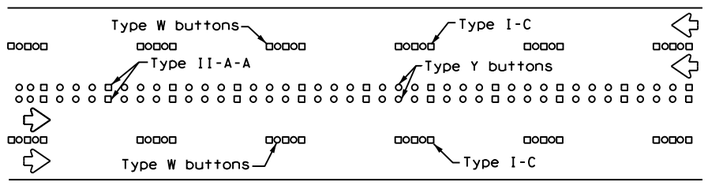
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



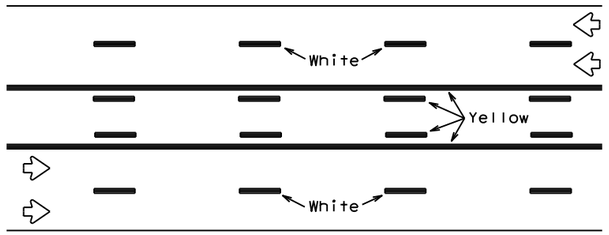
REFLECTORIZED PAVEMENT MARKINGS



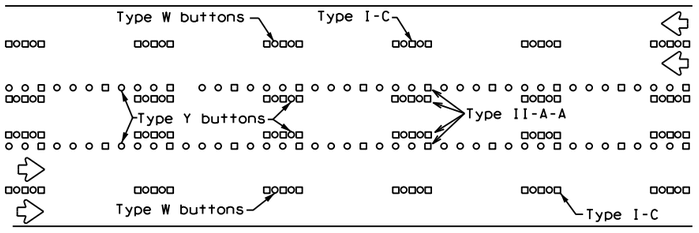
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

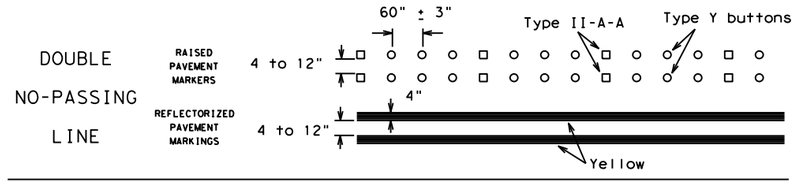
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

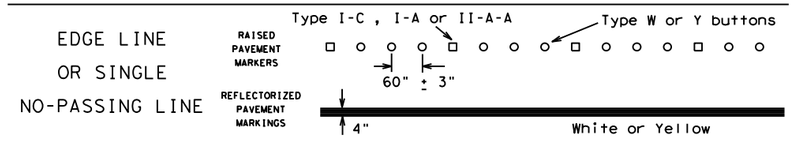
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

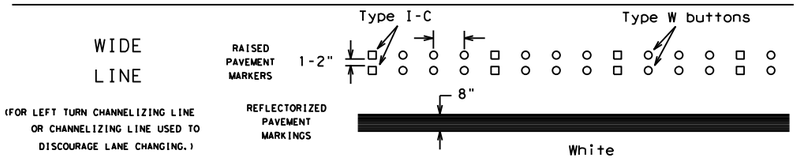


EDGE LINE OR SINGLE NO-PASSING LINE



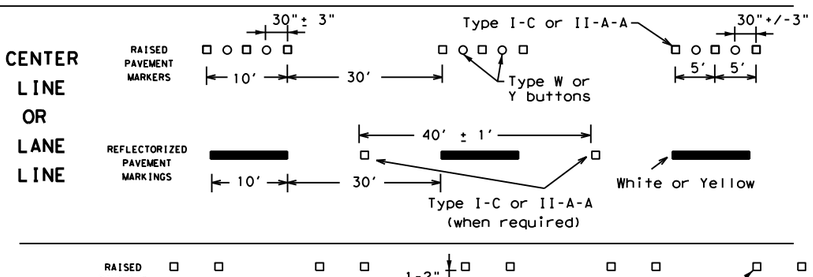
WIDE LINE

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

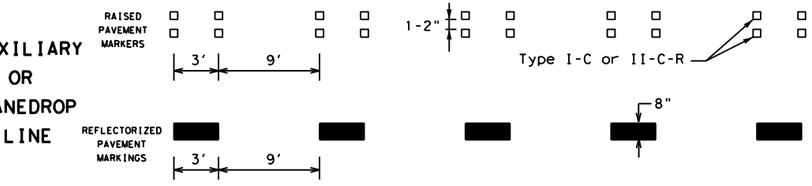


BROKEN LINES

CENTER LINE OR LANE LINE

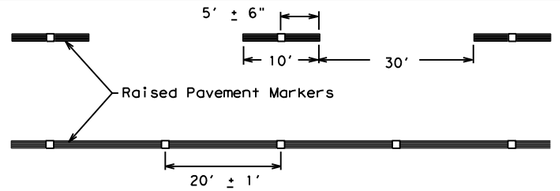


AUXILIARY OR LANEDROP LINE



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

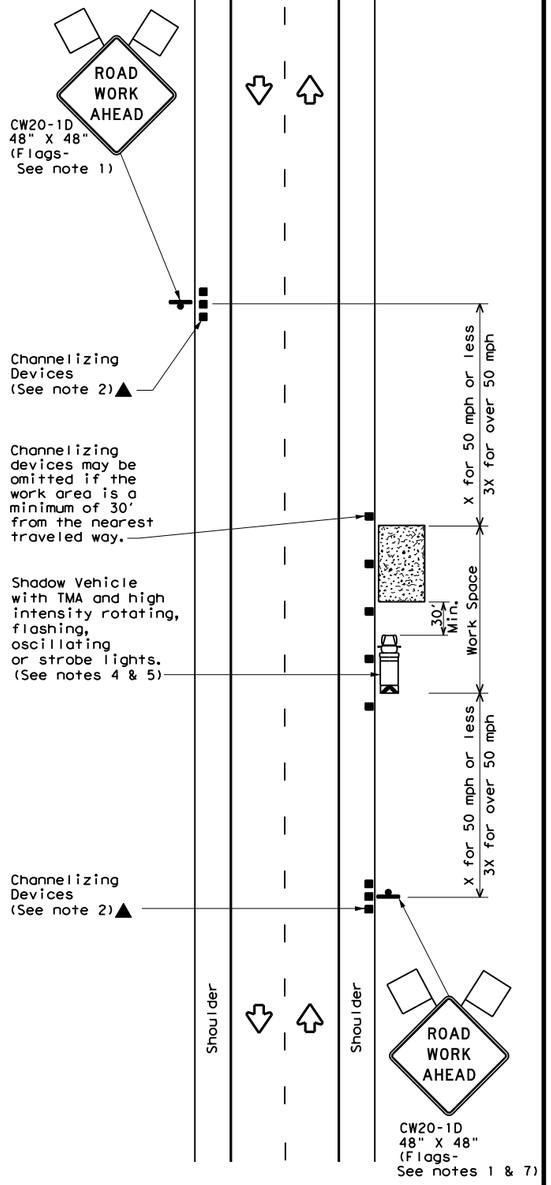
BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	1804	01	082,ETC.	SS 115,ETC.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		29

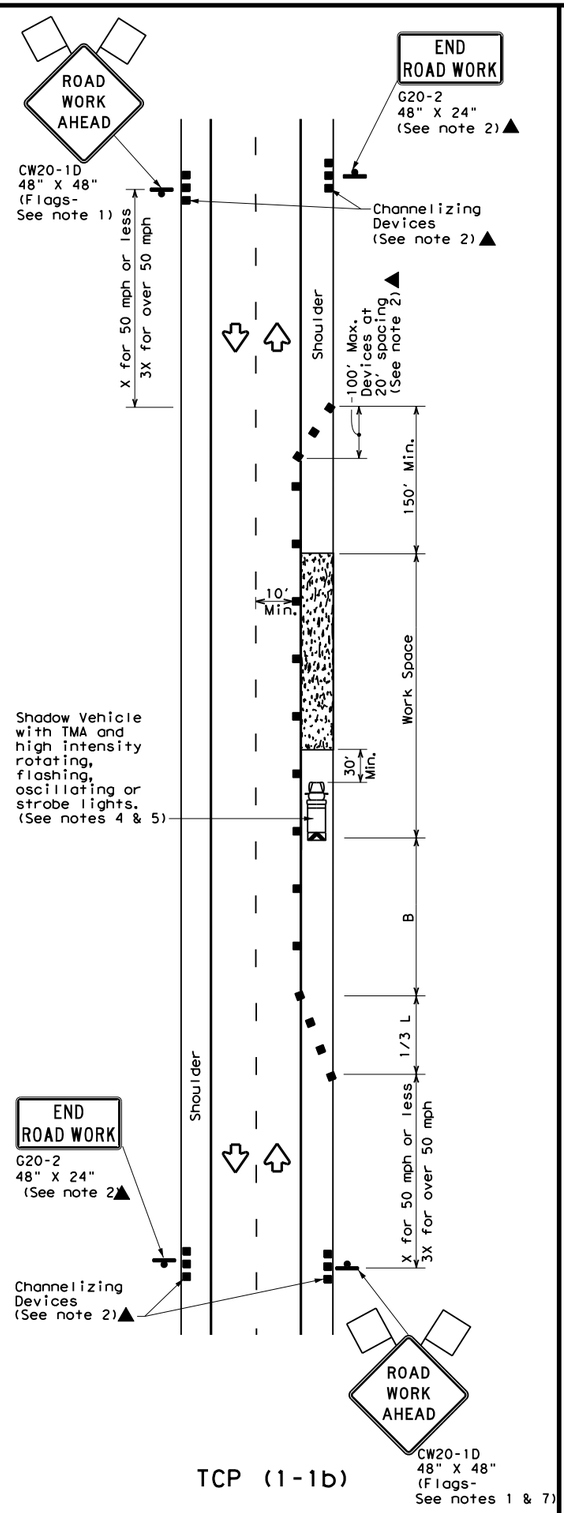
106

DATE:
FILE:



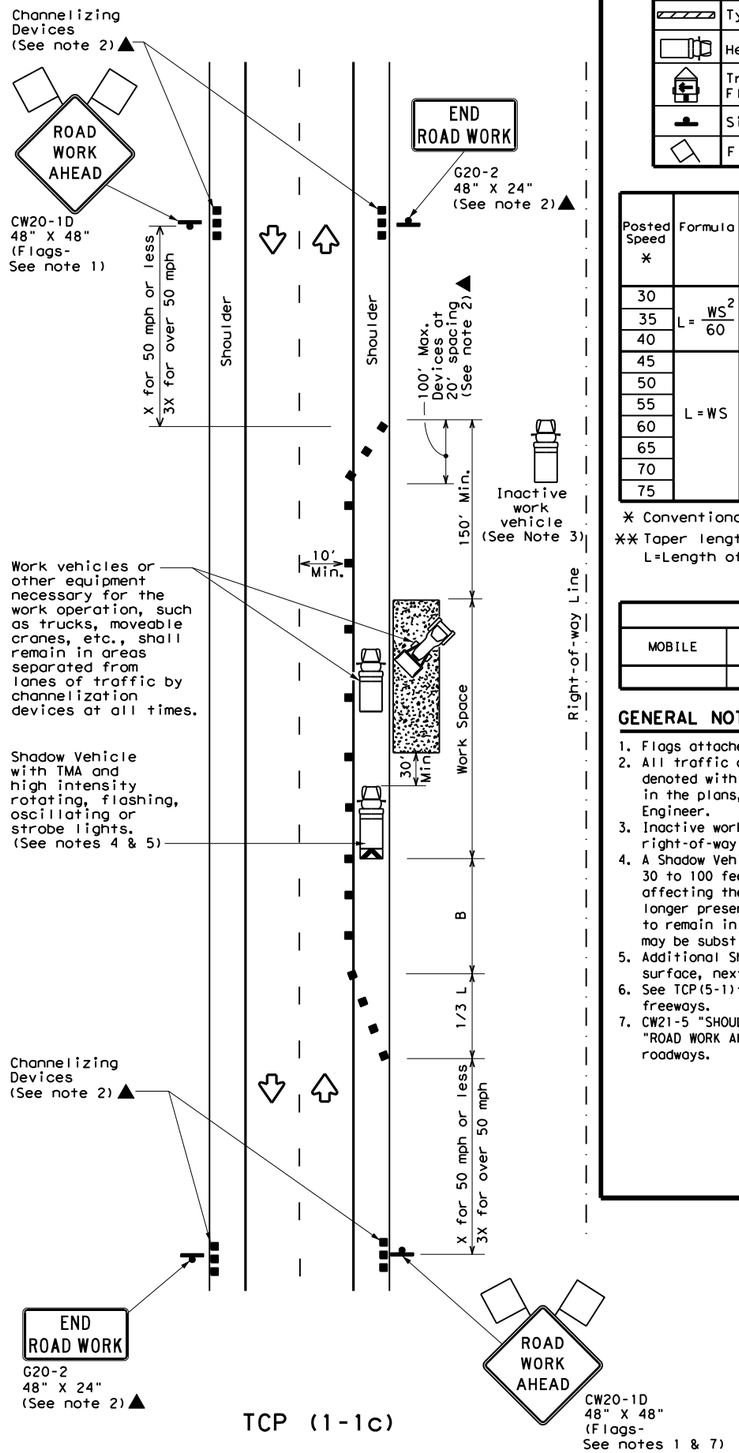
TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(1-1)-18

FILE: tcp1-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	1804	01	082,ETC.	SS 115,ETC.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		30

DATE:
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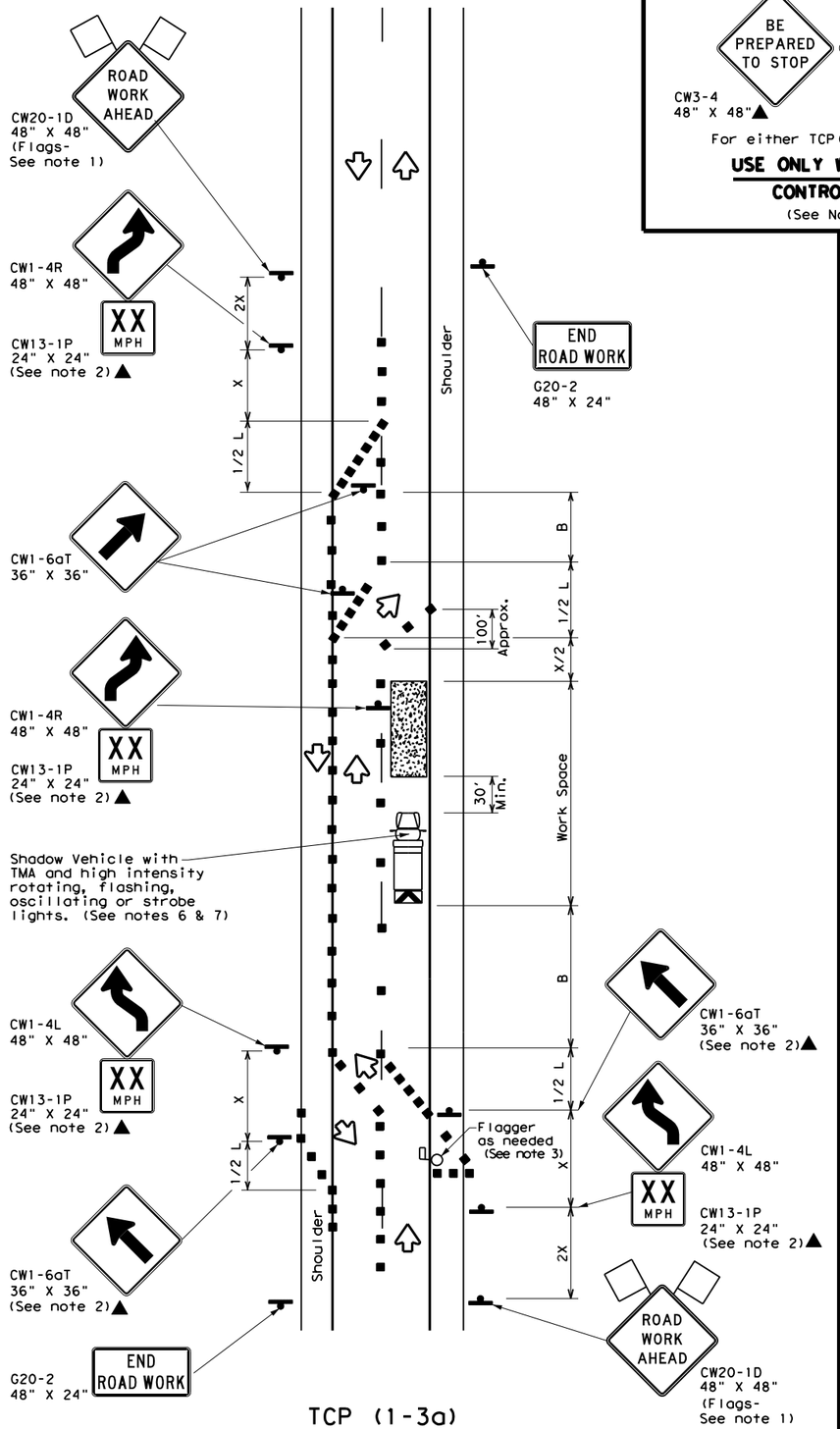


TCP (1-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

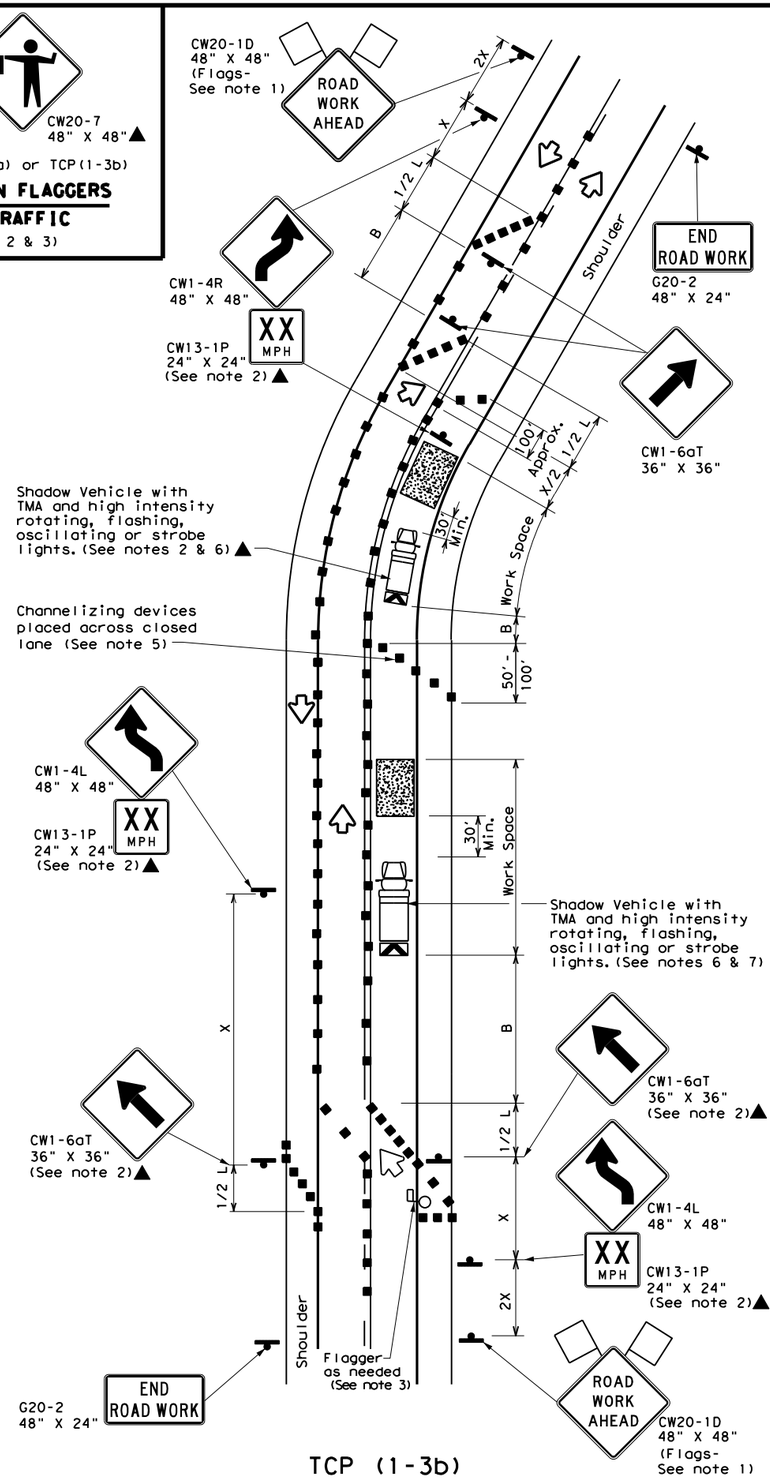
ONE LANE CLOSED
ADEQUATE FIELD OF VIEW

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

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

USE ONLY WHEN FLAGGERS CONTROL TRAFFIC

(See Notes 2 & 3)



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

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

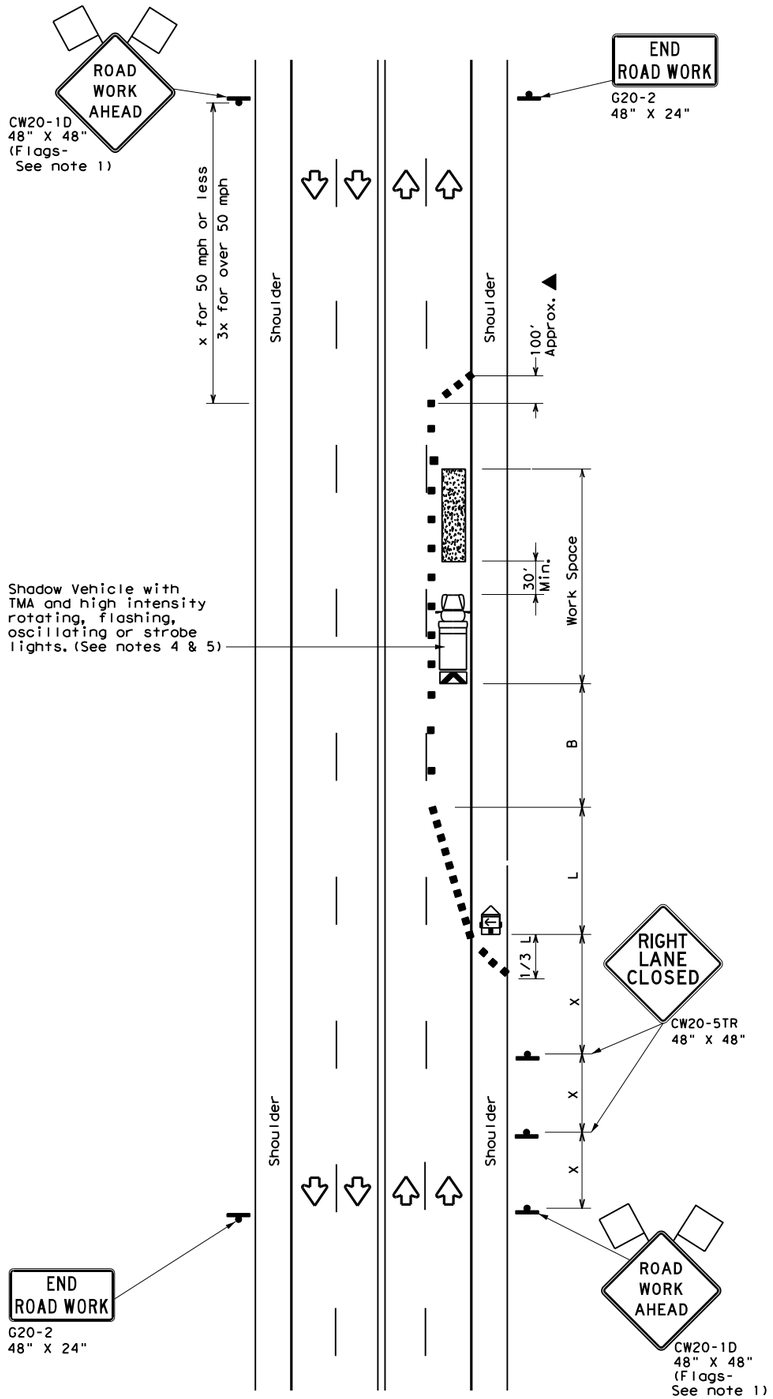
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
TRAFFIC SHIFTS ON TWO LANE ROADS

TCP(1-3)-18

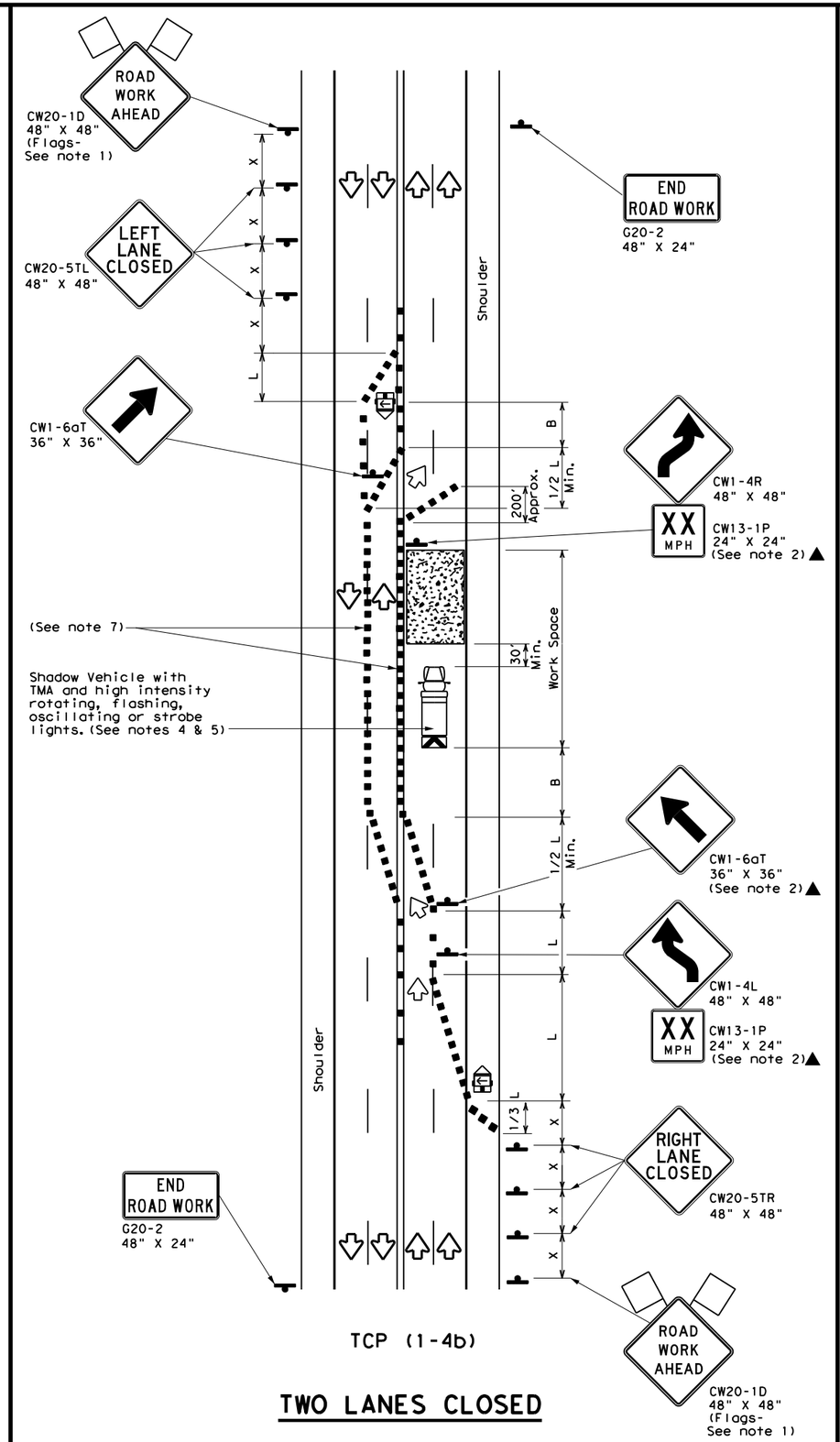
FILE: tcp1-3-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	1804	01	082, ETC.	SS 115, ETC.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	PHR	HIDALGO		31
1-97 2-18				

DATE:
FILE:



TCP (1-4a)

ONE LANE CLOSED



TCP (1-4b)

TWO LANES CLOSED

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

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

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

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

GENERAL NOTES

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

TCP (1-4a)

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

TCP (1-4b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(1-4)-18

FILE: tcp1-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	1804	01	082,ETC.	SS 115,ETC.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	PHR	HIDALGO		32
1-97 2-18				

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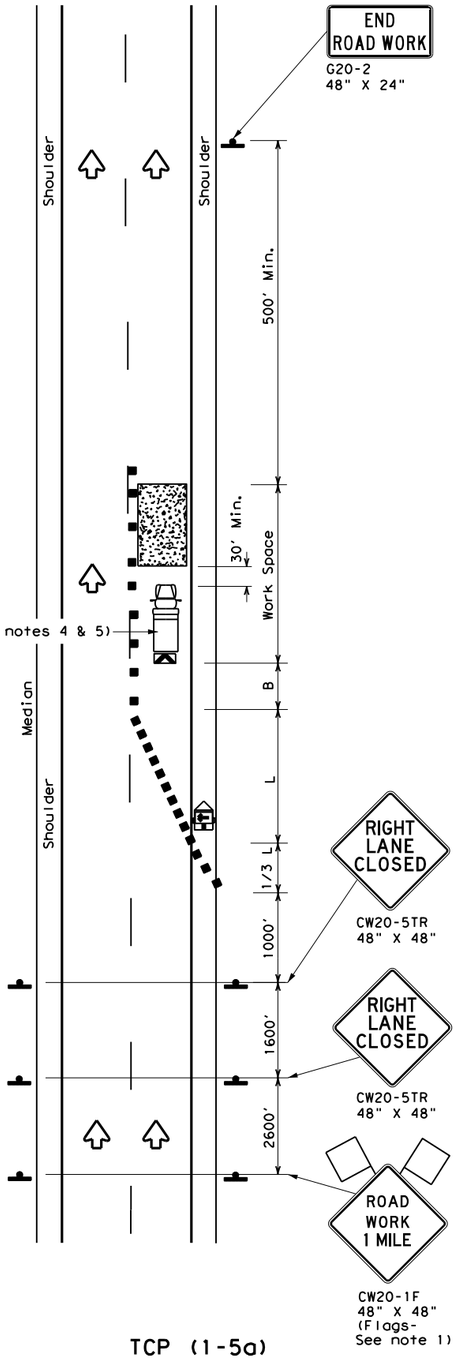
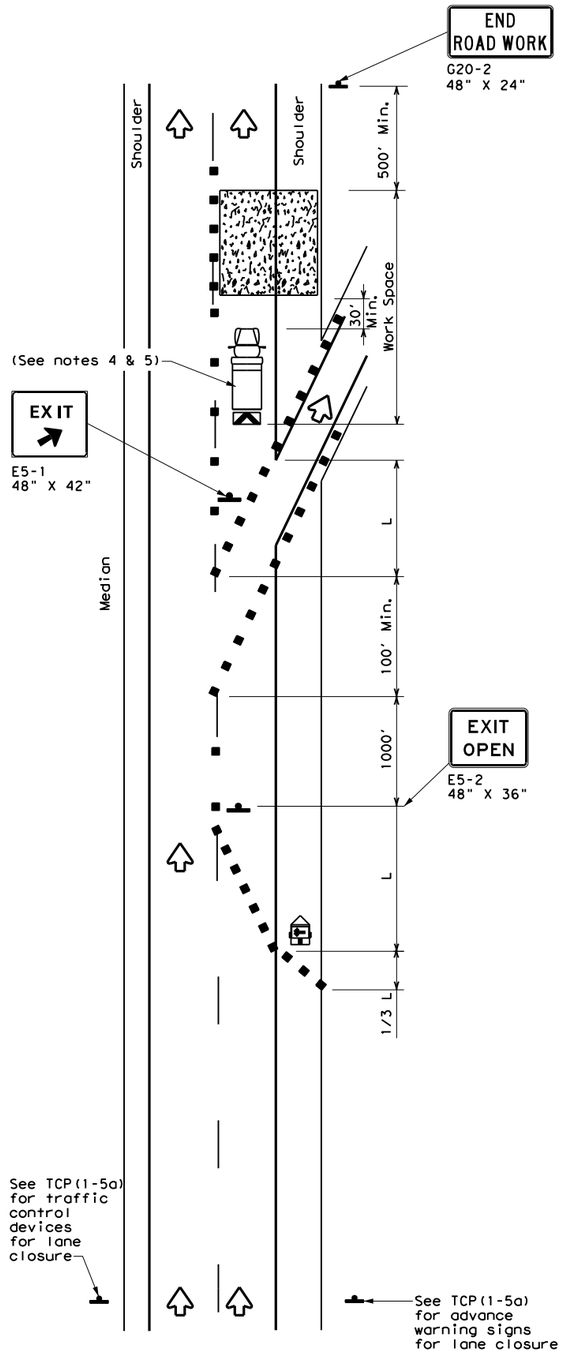
DATE:
FILE:



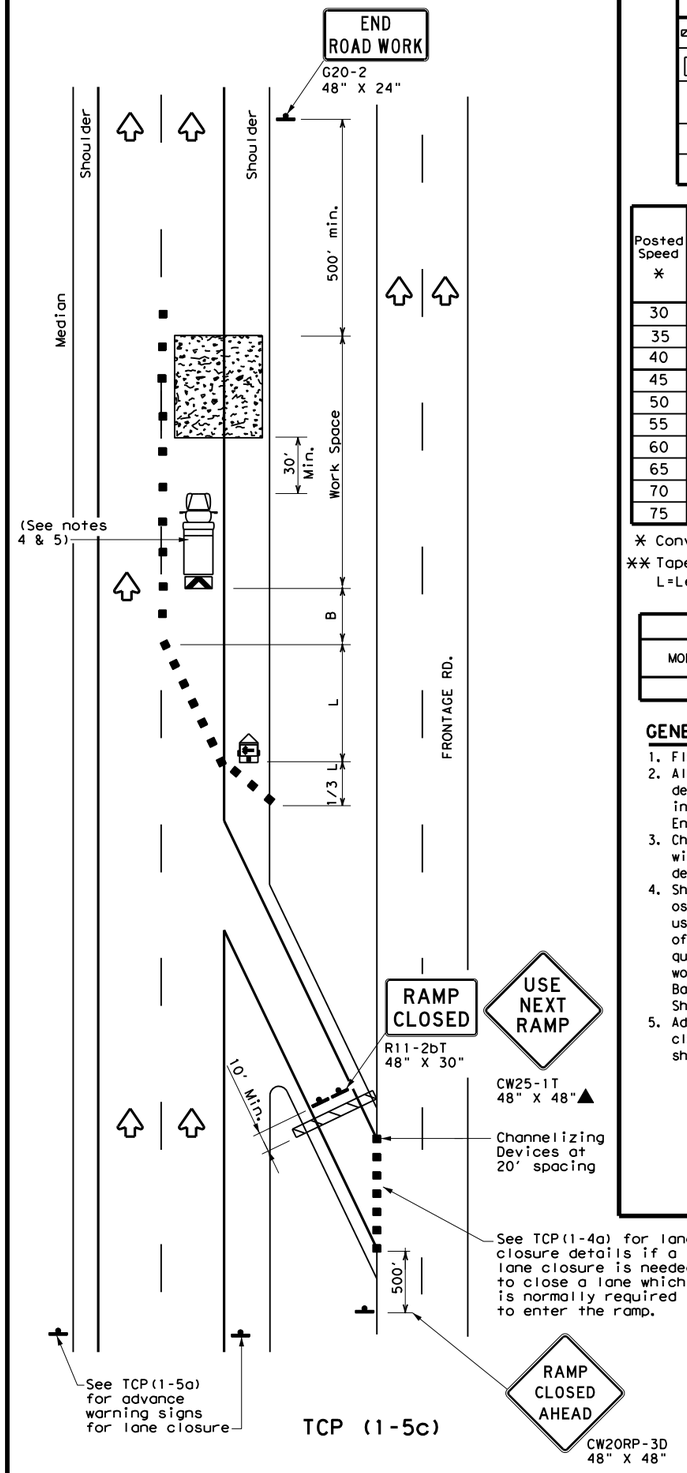
TCP (1-5a)

ONE LANE CLOSURE



TCP (1-5b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (1-5c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES FOR DIVIDED HIGHWAYS

TCP(1-5)-18

FILE: tcp1-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-18	1804	01	082,ETC.	SS 115,ETC.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		33

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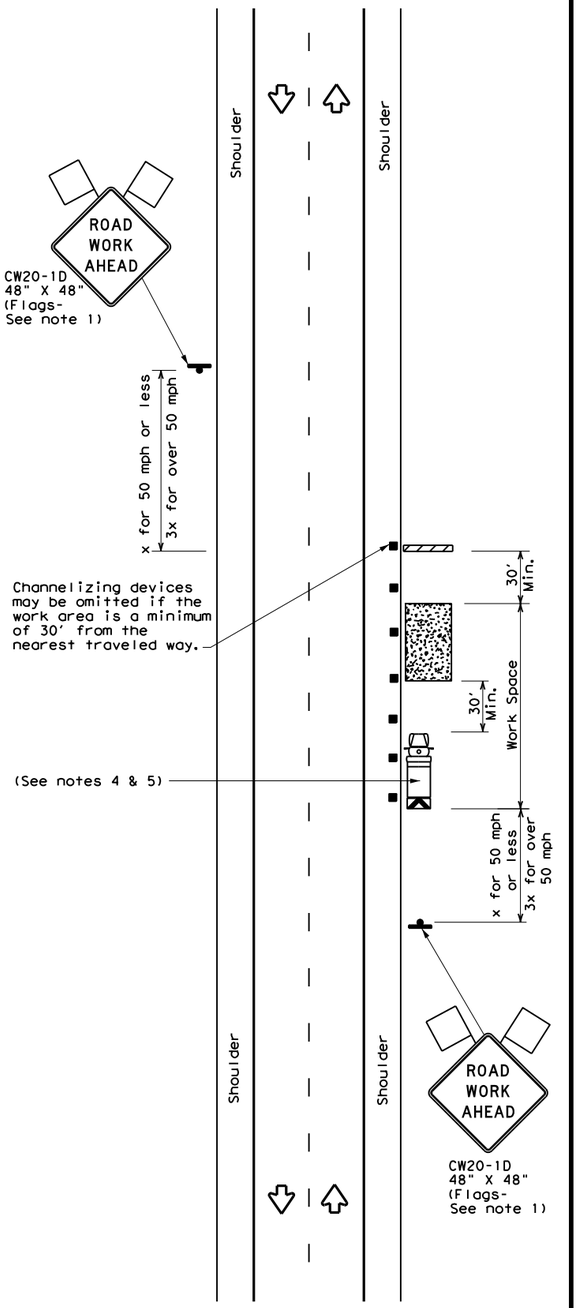
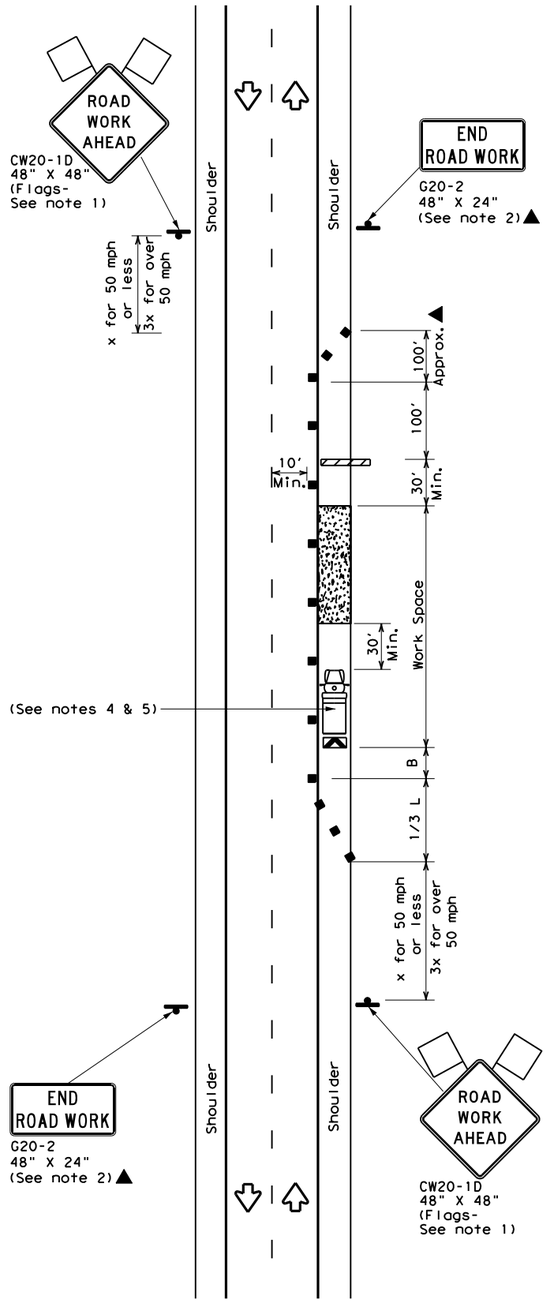
DATE:
FILE:



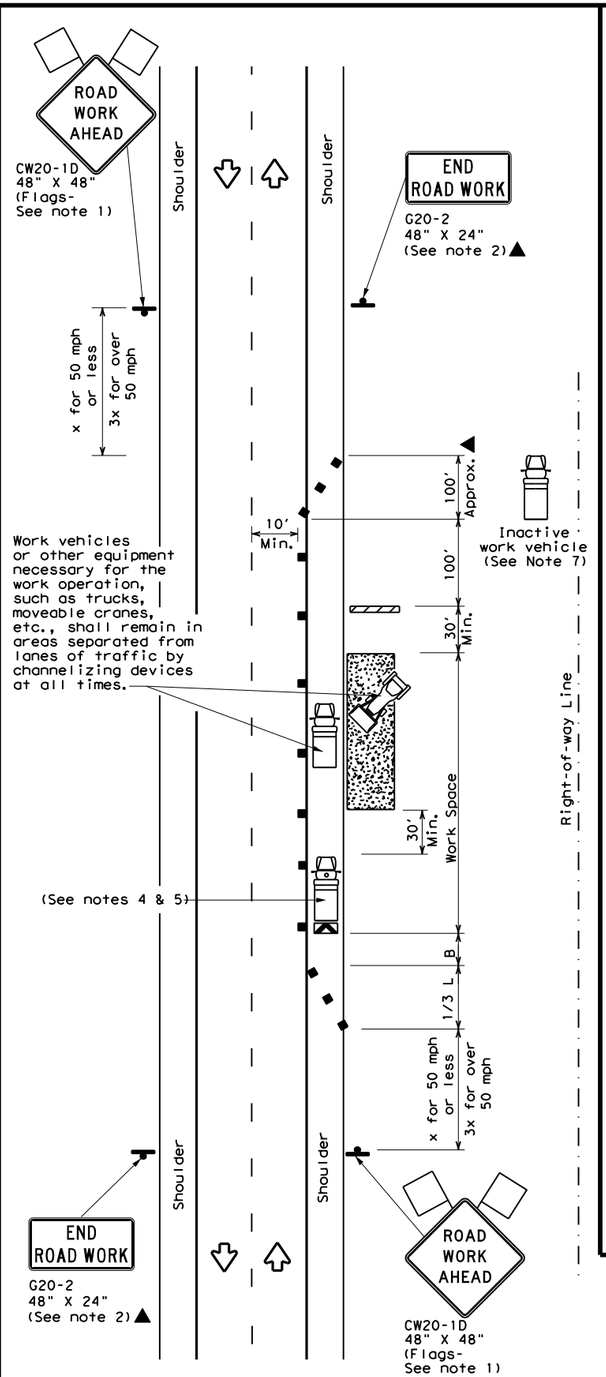
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	PHR	HIDALGO		34
1-97 2-18				

DATE:
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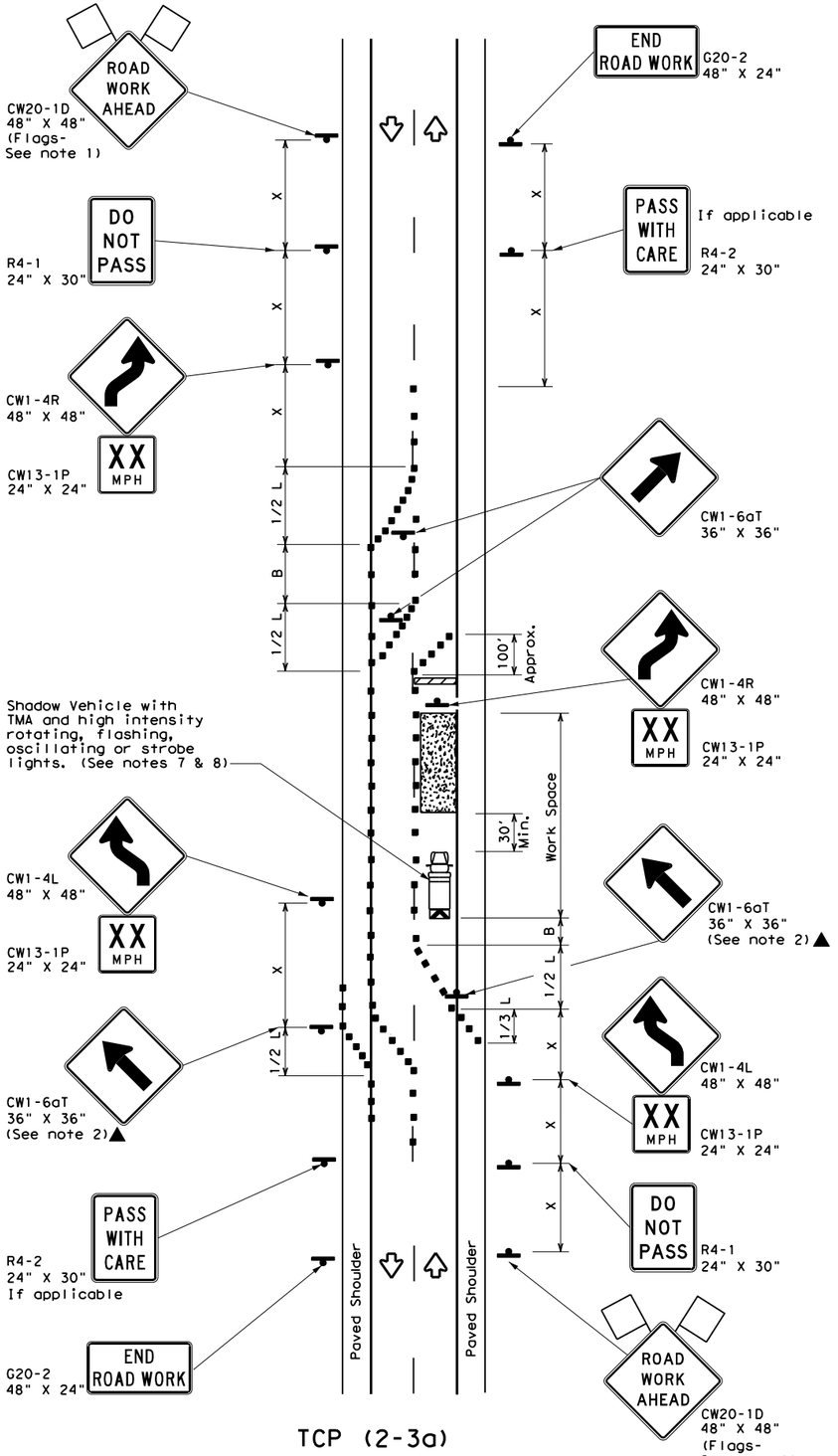
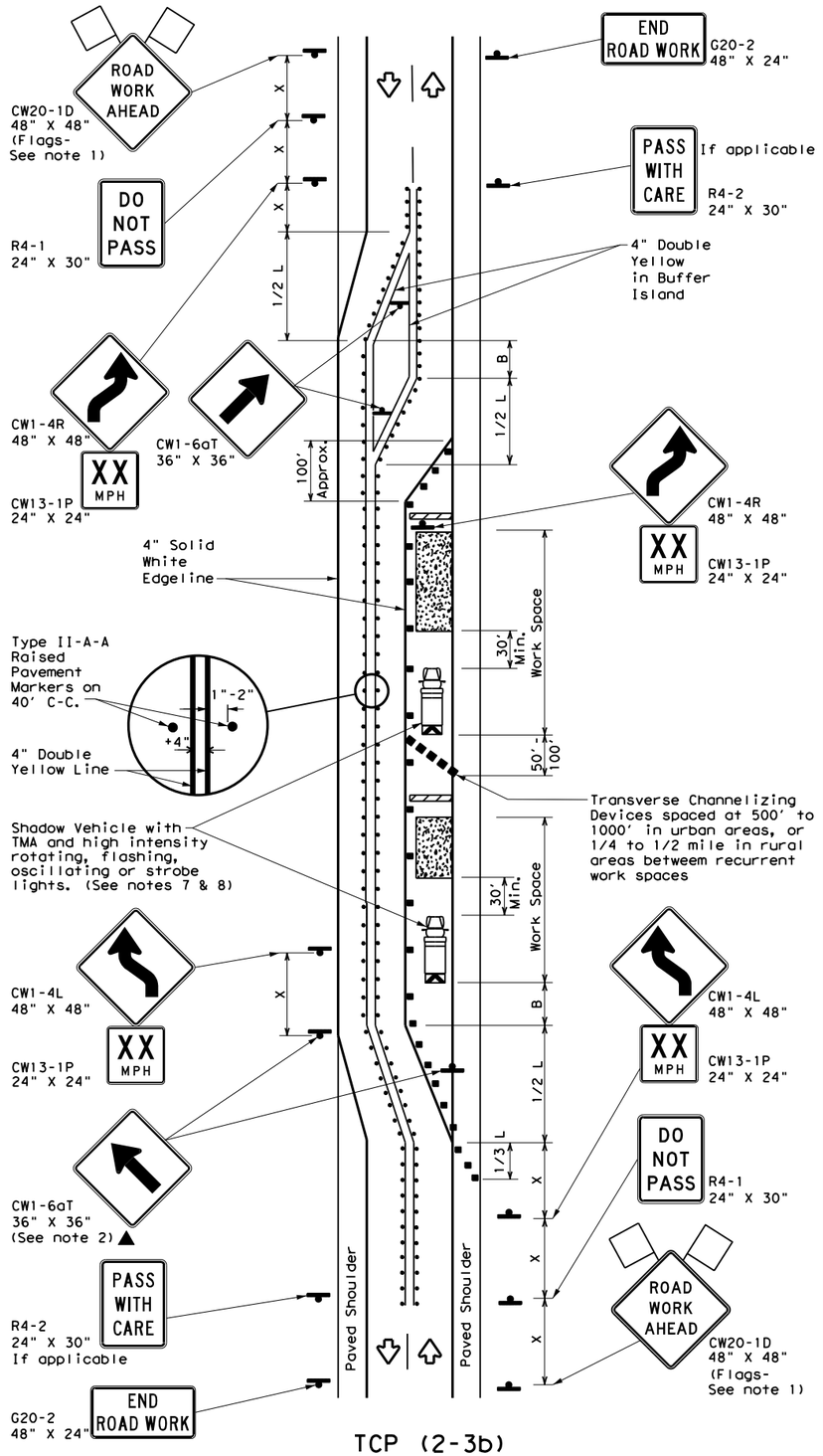


TCP (2-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



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

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

TCP (2-3a)

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

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO-LANE ROADS

TCP(2-3)-18

FILE: tcp(2-3)-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	1804	01	082,ETC.	SS 115,ETC.
8-95 3-03	DIST	COUNTY		SHEET NO.
1-97 2-12	PHR	HIDALGO		35
4-98 2-18				

DATE:
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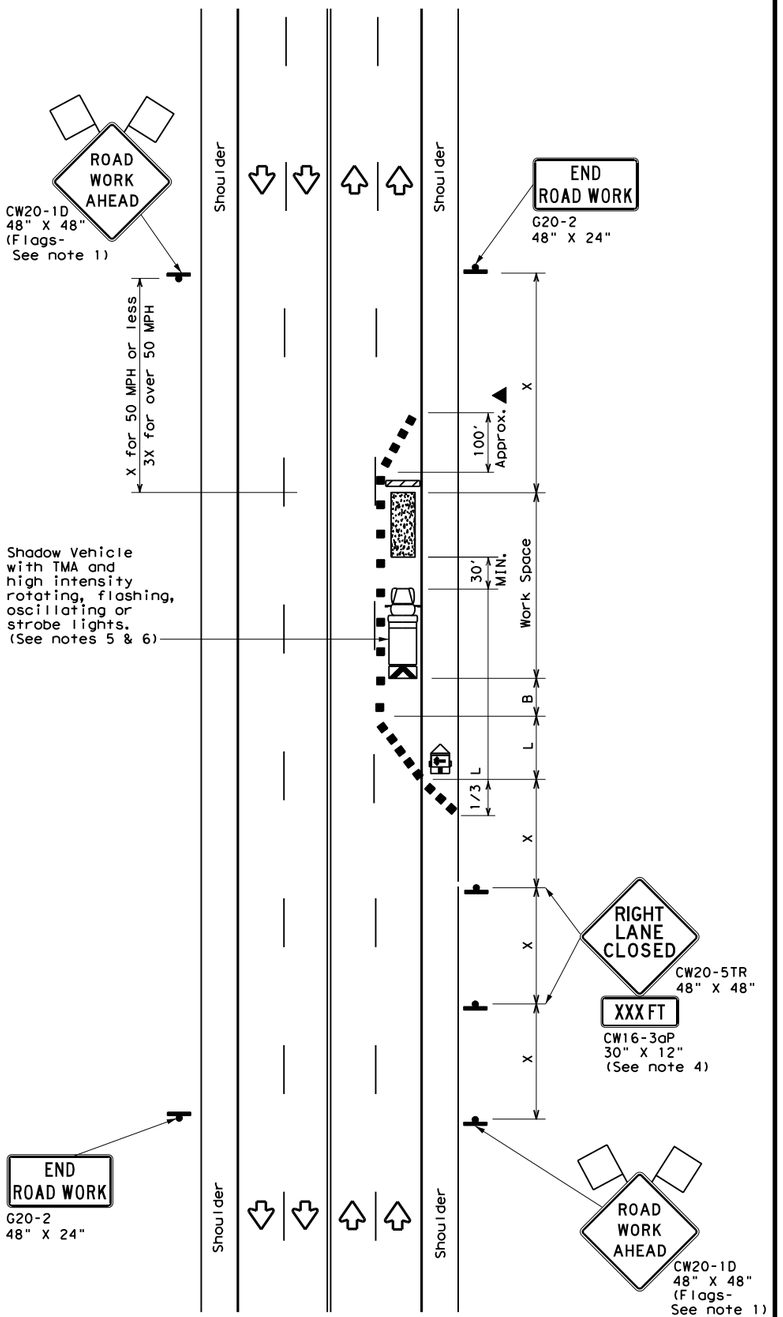
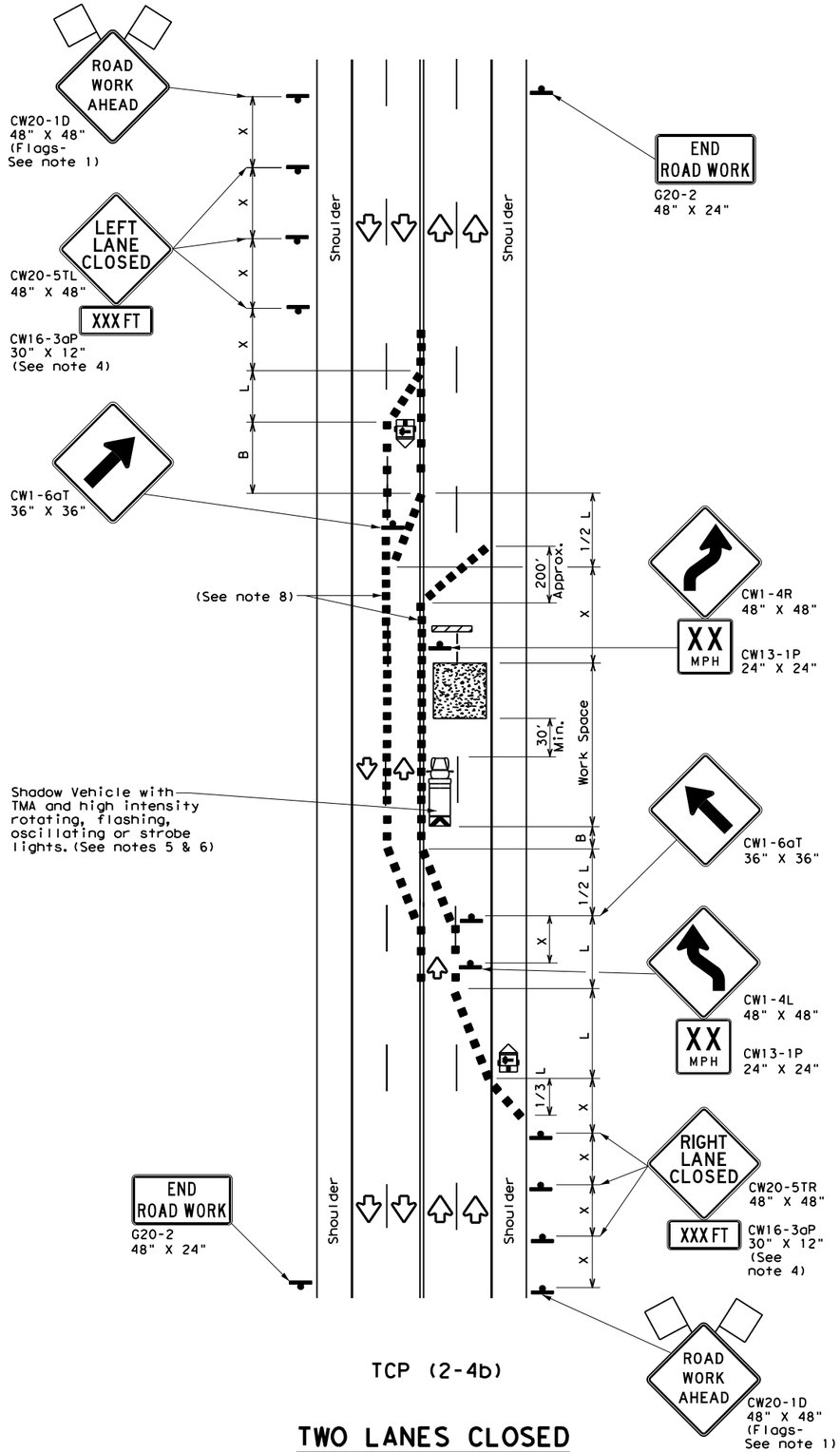


TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

TCP (2-4a)

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

TCP (2-4b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	1804	01	082,ETC.	SS 115,ETC.
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	PHR	HIDALGO		36

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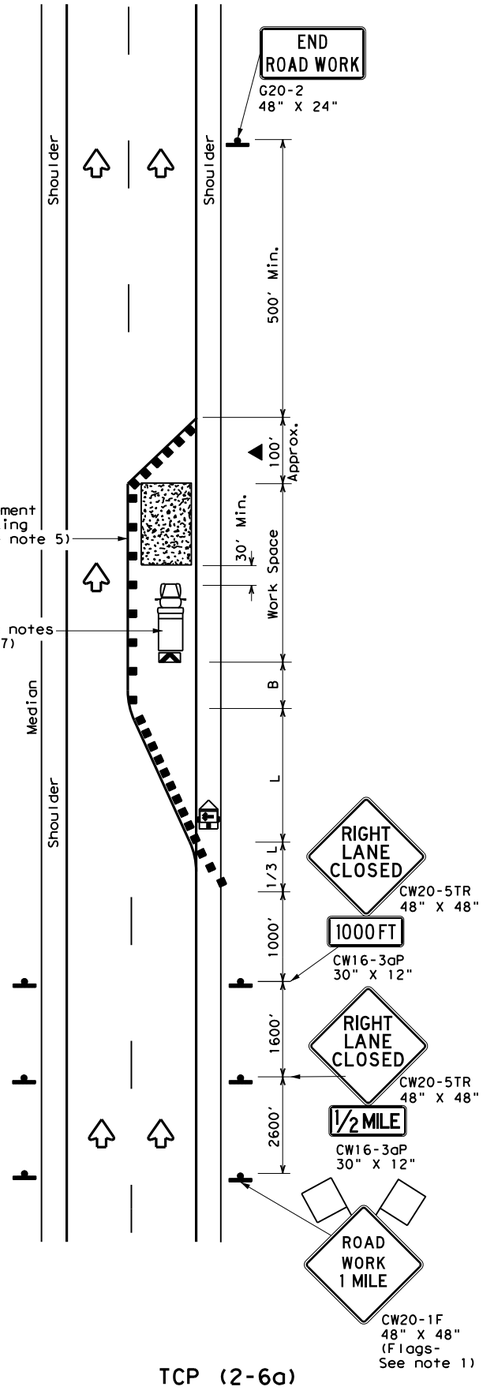
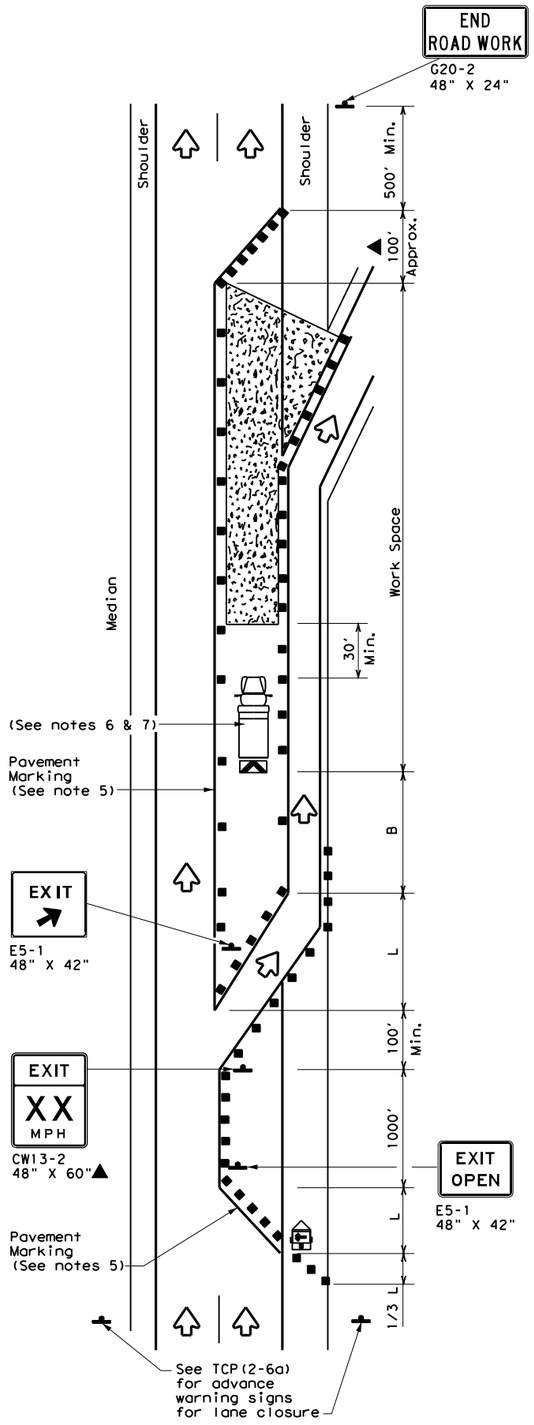
DATE:
FILE:



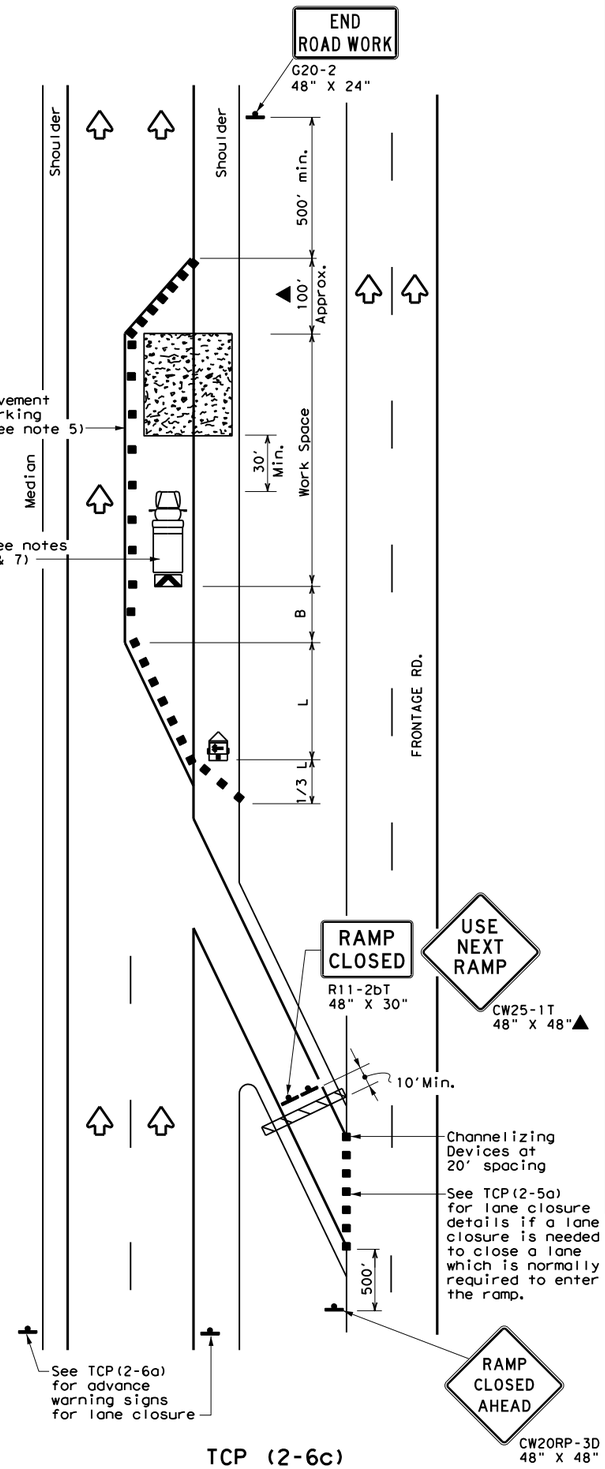
TCP (2-6a)

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

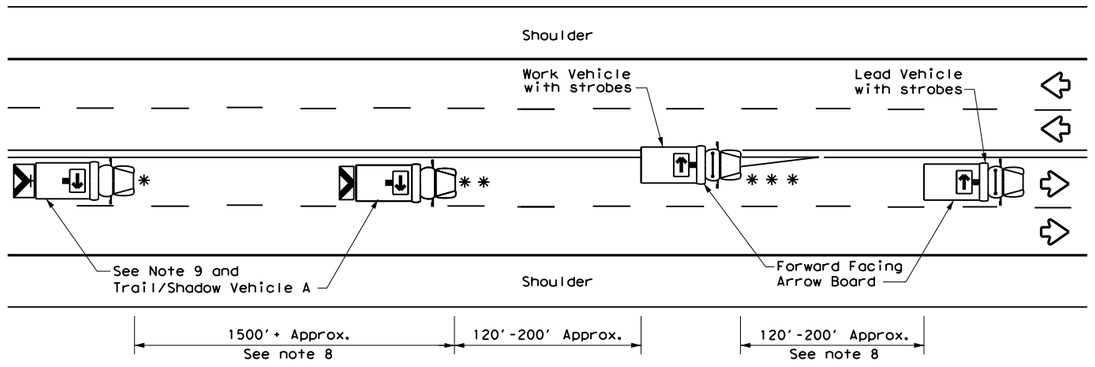
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON DIVIDED HIGHWAYS

TCP(2-6)-18

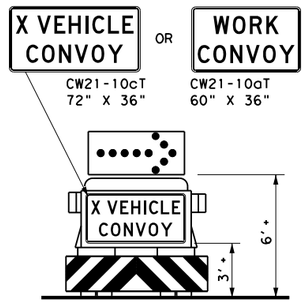
FILE: tcp2-6-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	1804	01	082,ETC.	SS 115,ETC.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		37

DATE:
FILE:



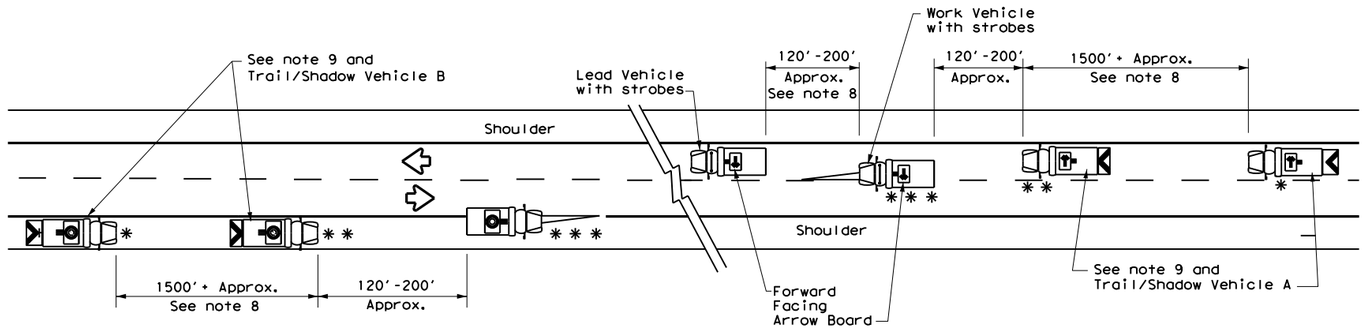
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

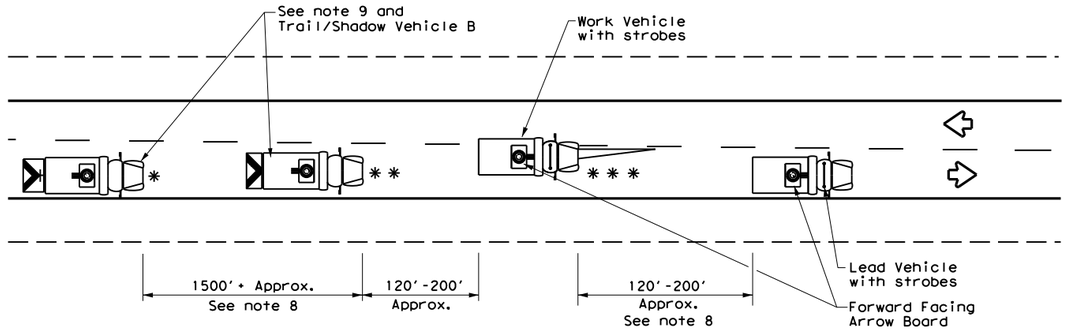


WORK ON SHOULDER

WORK ON TRAVEL LANE

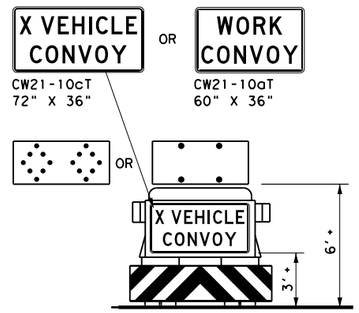
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

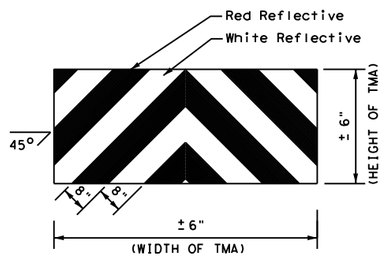
with Flashing Arrow Board in CAUTION display

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

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	1804	01	082,ETC.	SS 115,ETC.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		38

DATE:
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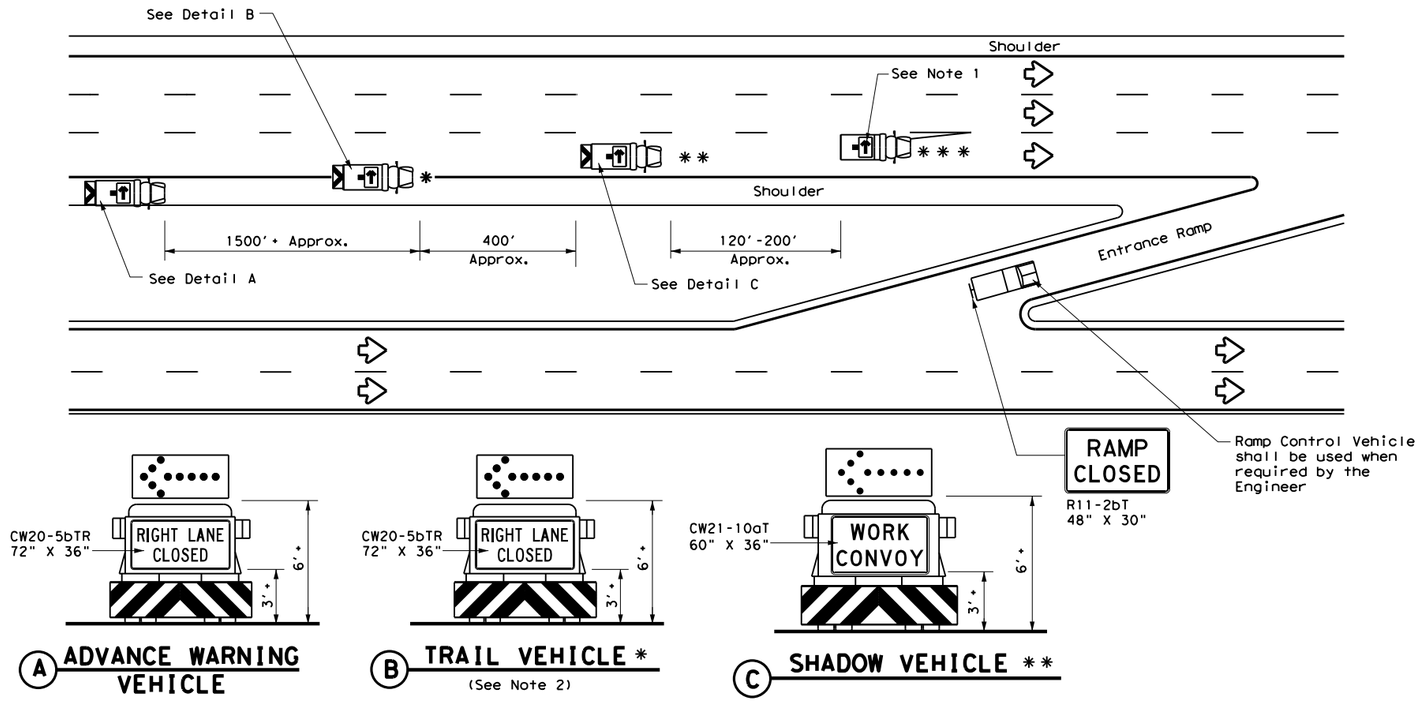
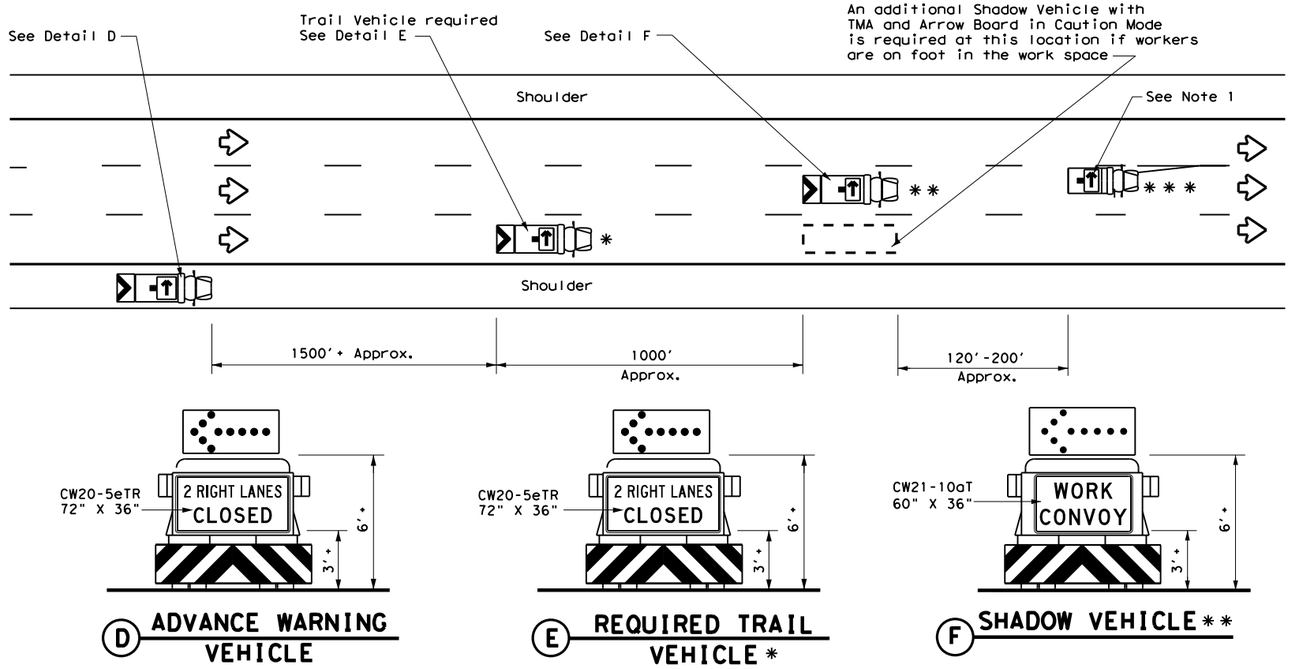


RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2a)



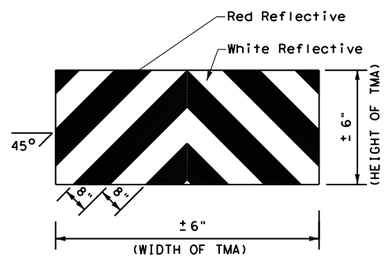
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

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

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

TCP(3-2)-13

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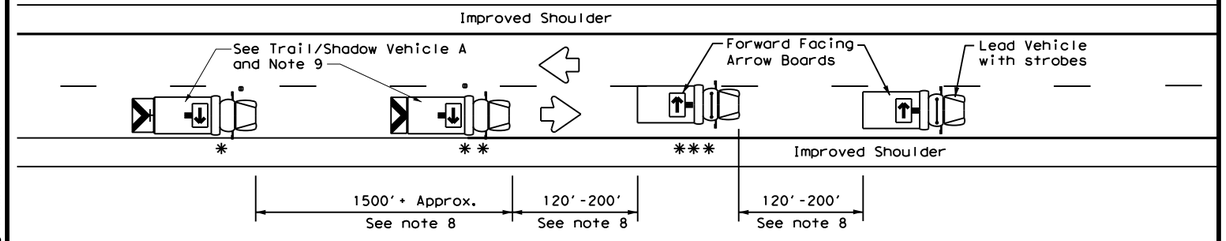
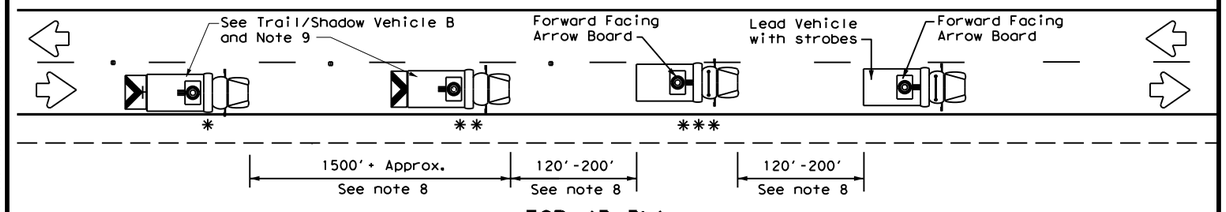
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	1804	01	082,ETC.	SS 115,ETC.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		39

176



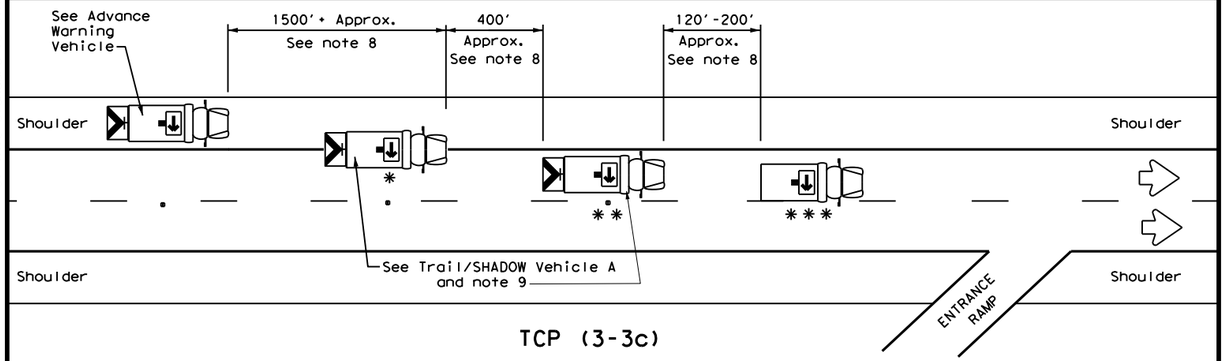
TCP (3-3a)

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



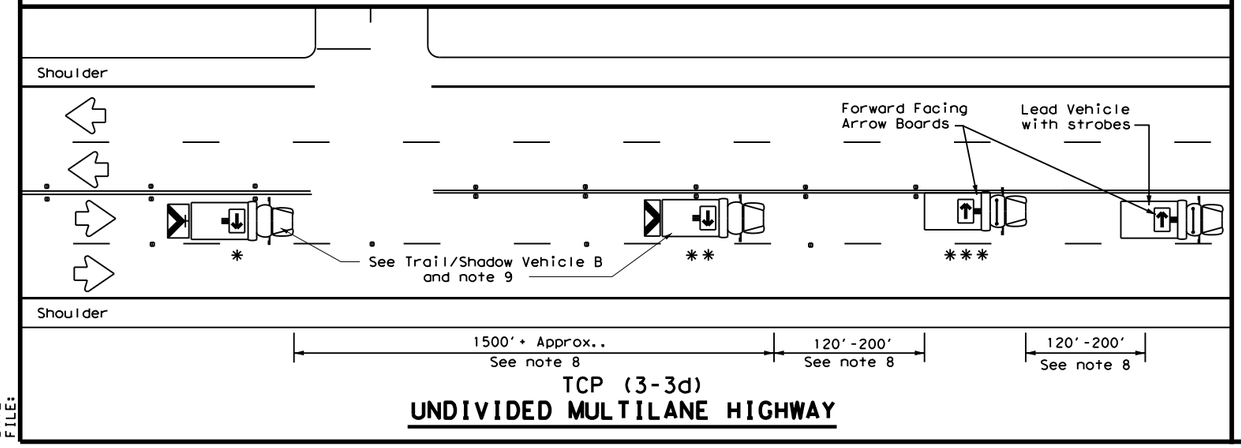
TCP (3-3b)

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



TCP (3-3c)

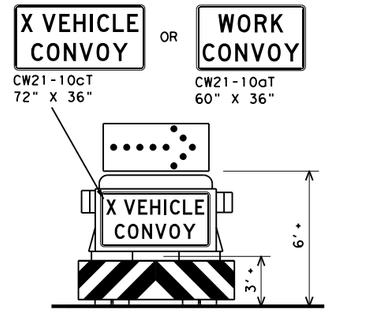
DIVIDED MULTILANE HIGHWAY



TCP (3-3d)

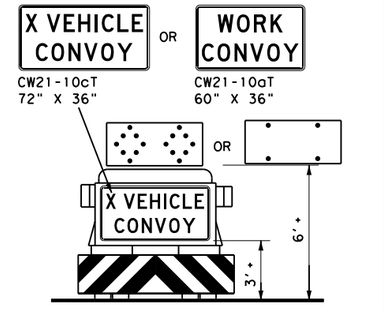
UNDIVIDED MULTILANE HIGHWAY

DATE:
FILE:



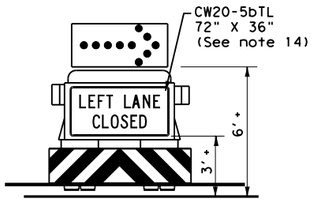
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

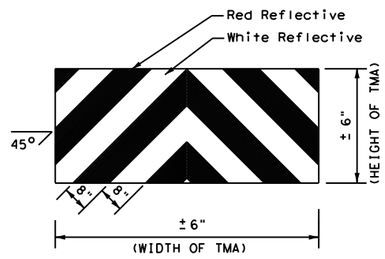


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL

TCP(3-3)-14

FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	1804	01	082,ETC.	SS 115,ETC.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	PHR	HIDALGO		40
1-97 7-14				

DATE:
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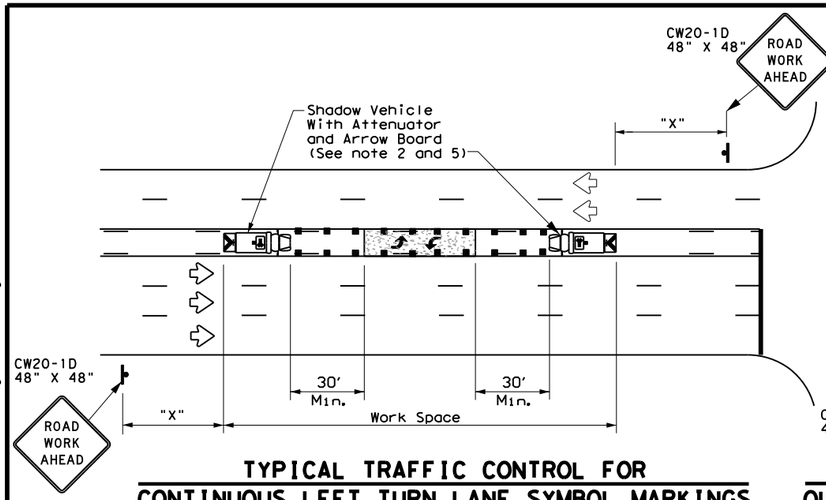
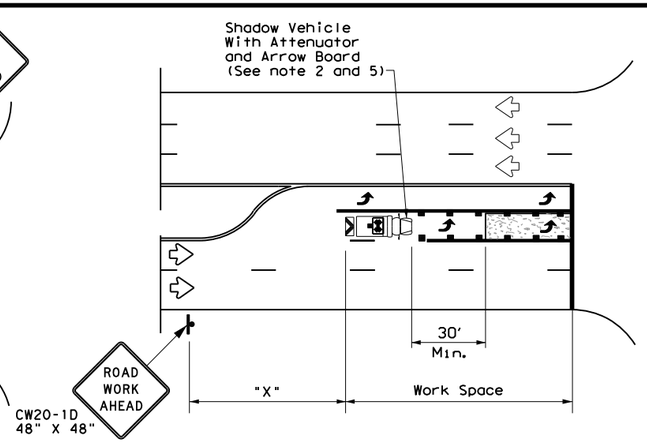
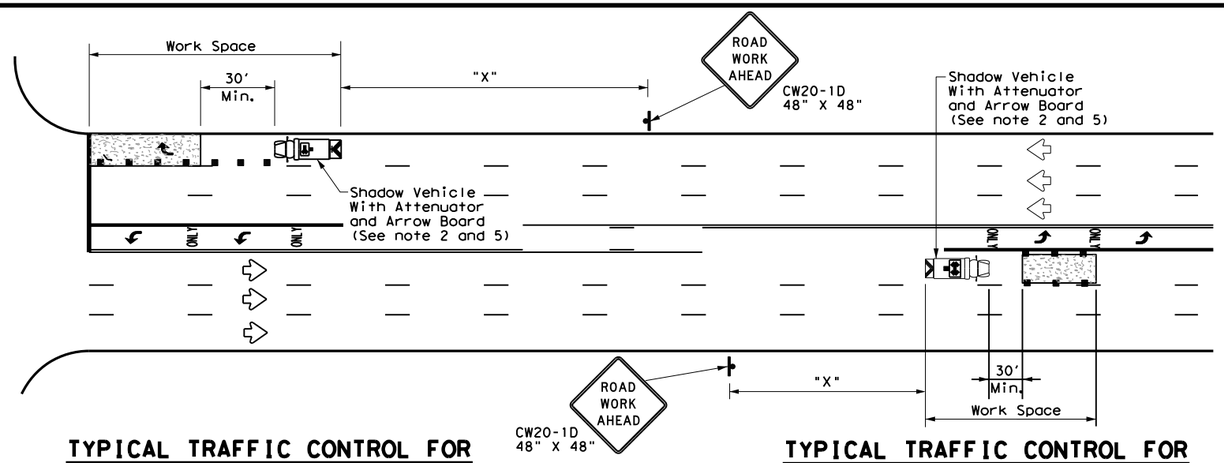


TYPICAL TRAFFIC CONTROL FOR CONTINUOUS LEFT TURN LANE SYMBOL MARKINGS

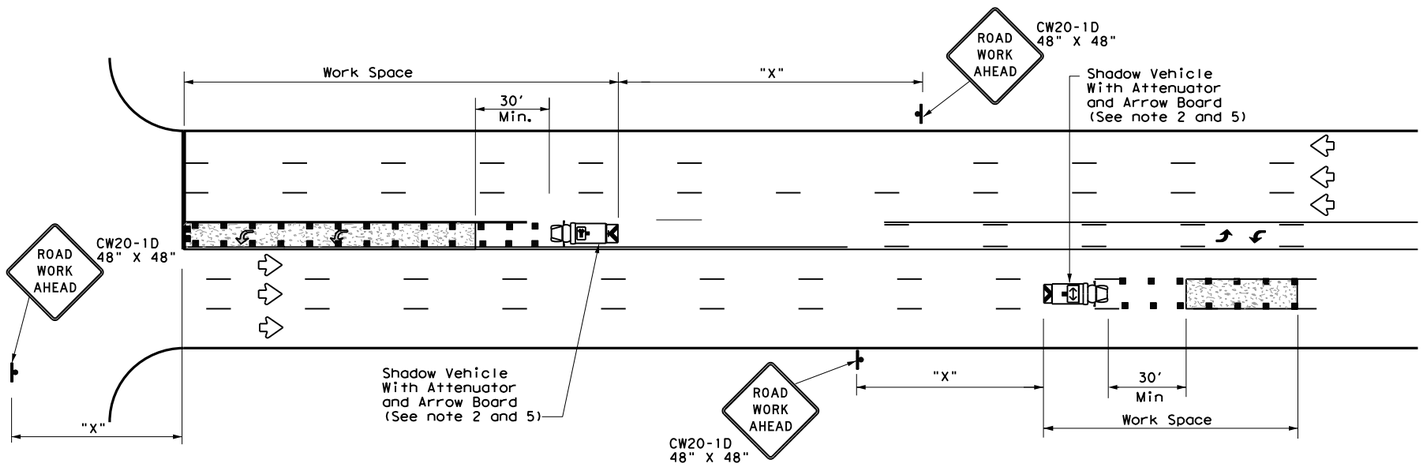


TYPICAL TRAFFIC CONTROL FOR OUTSIDE DUAL LEFT TURN LANE SYMBOL MARKINGS



TYPICAL TRAFFIC CONTROL FOR OUTSIDE LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR INSIDE LANE MARKINGS



TYPICAL TRAFFIC CONTROL FOR LEFT TURN LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR CENTER LANE MARKINGS

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

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

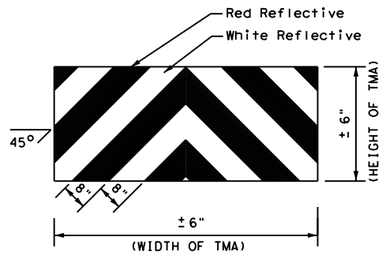
* Conventional Roads Only

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

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

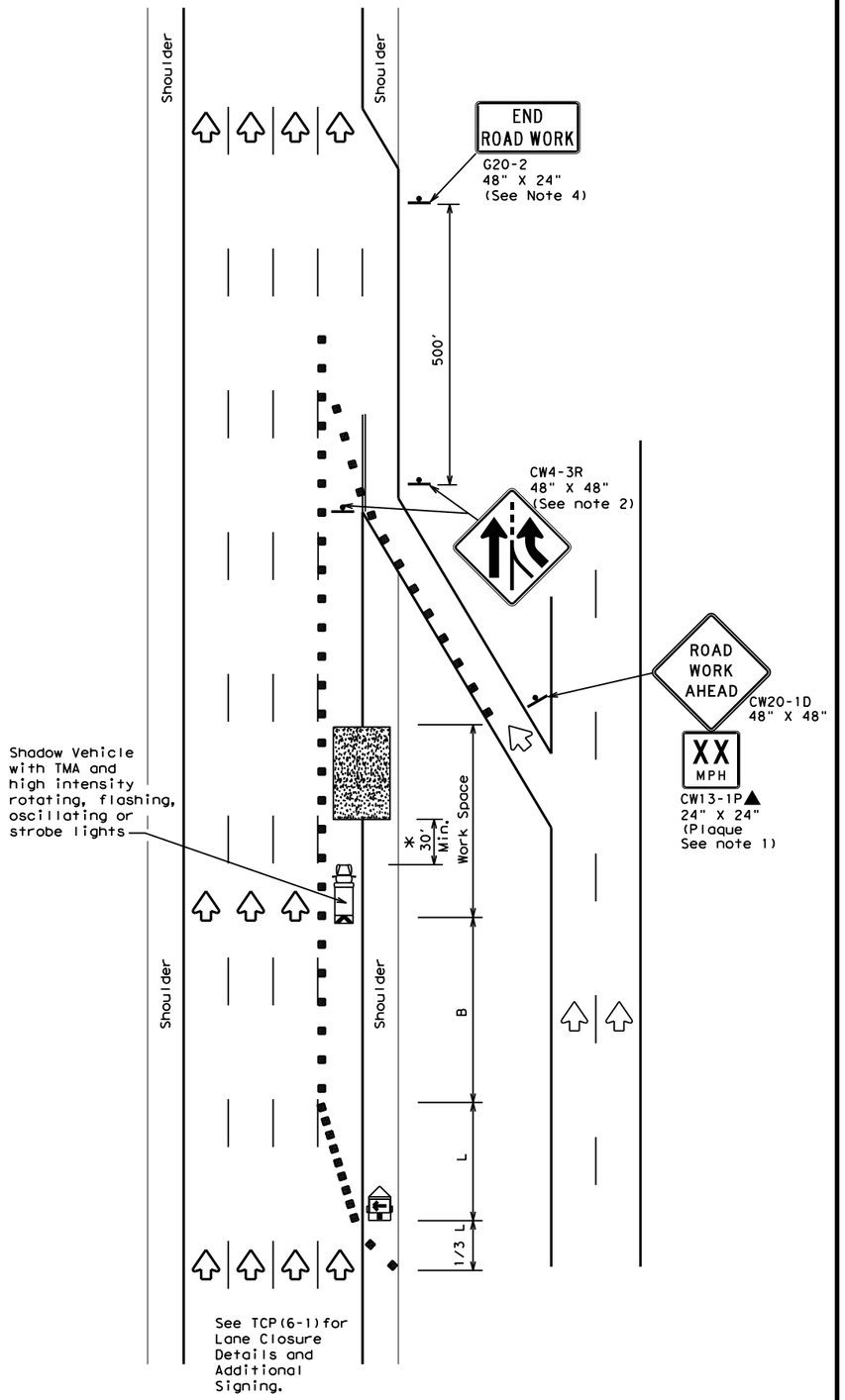
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS FOR ISOLATED WORK AREAS UNDIVIDED HIGHWAYS

TCP(3-4)-13

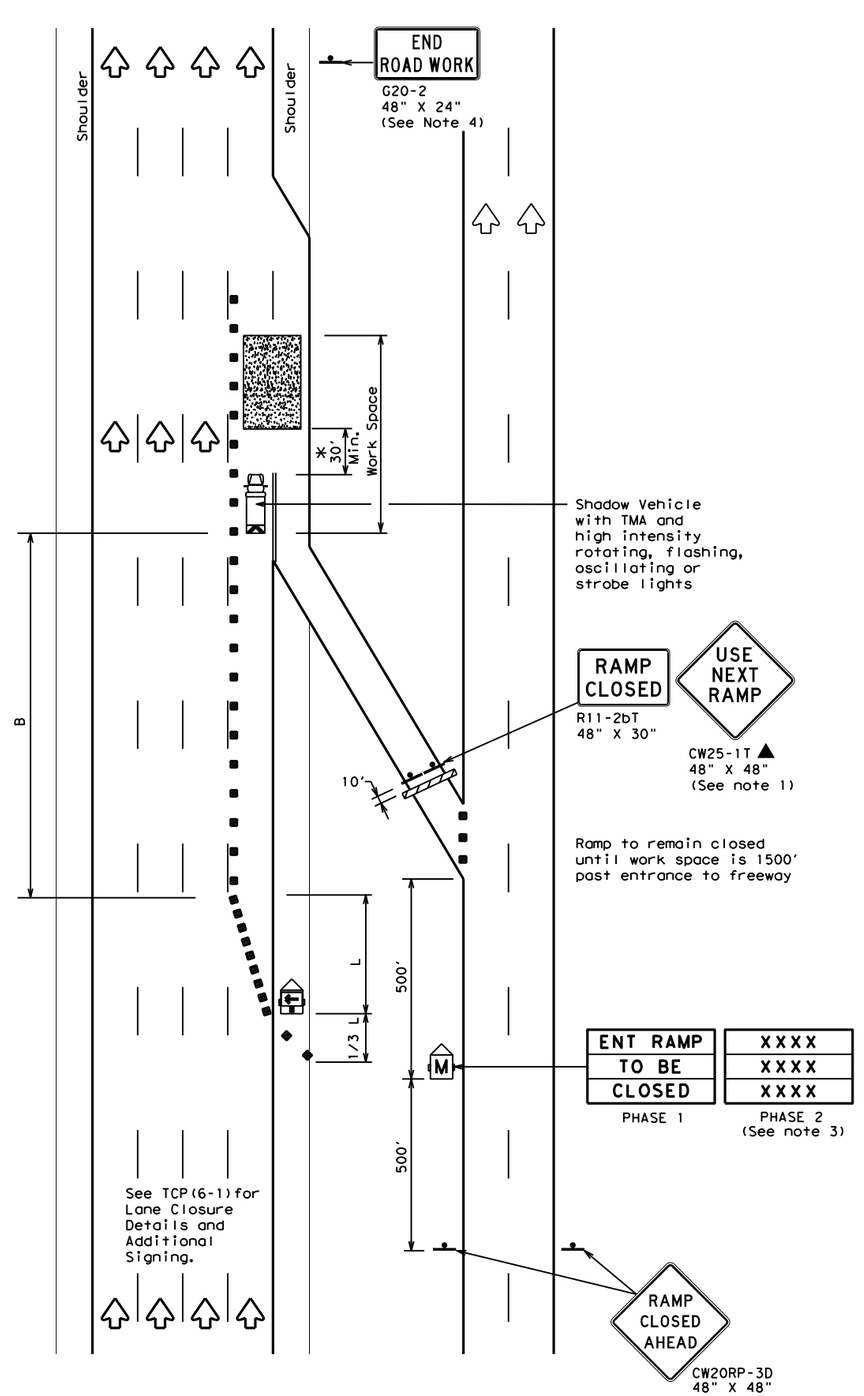
FILE: tcp3-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT July, 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	1804	01	082,ETC.	SS 115,ETC.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		41

DATE:
FILE:



TCP (6-2a)

ENTRANCE RAMP OPEN
WORK WITHIN 500' OF RAMP



TCP (6-2b)

ENTRANCE RAMP CLOSED

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

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

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

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

GENERAL NOTES

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

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

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

Texas Department of Transportation
Traffic Operations Division Standard

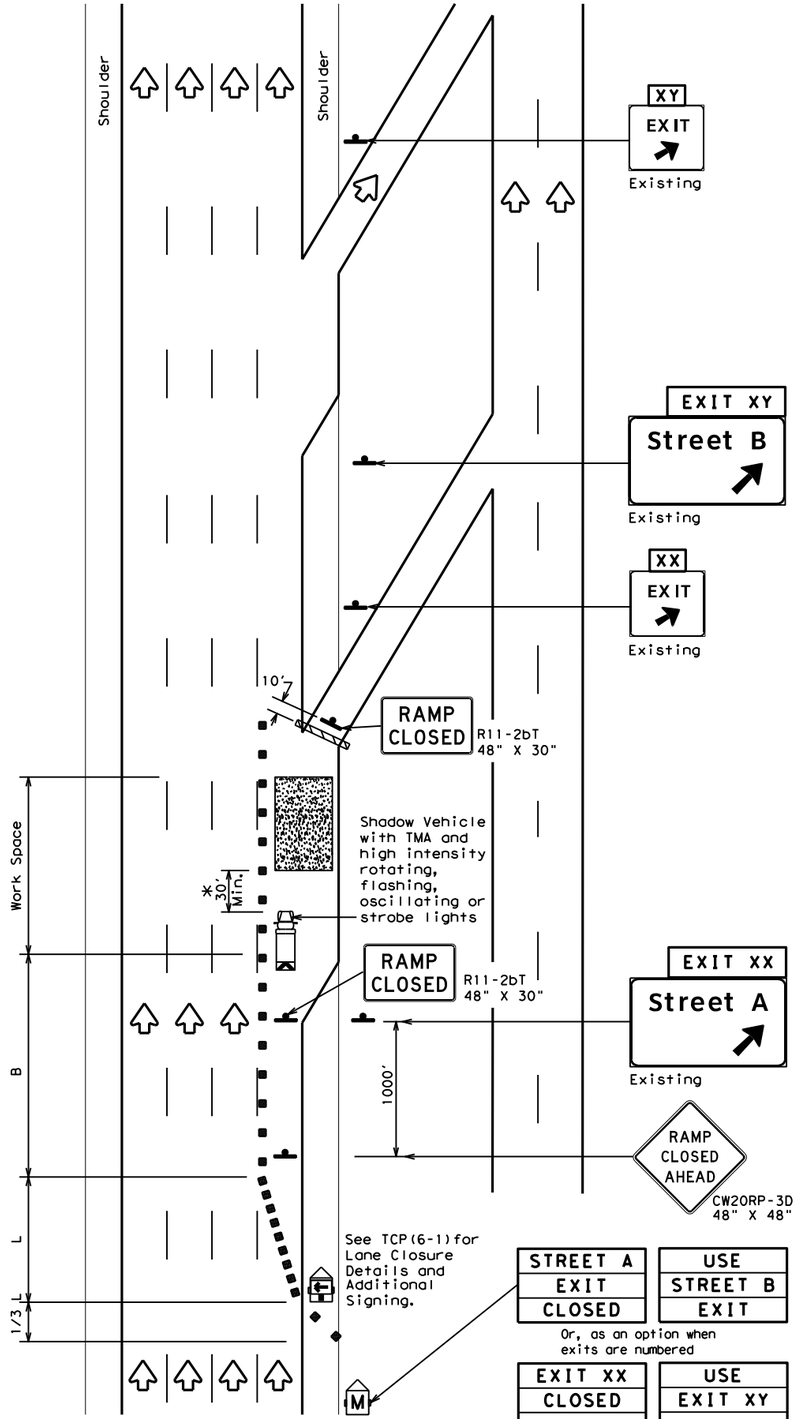
TRAFFIC CONTROL PLAN
WORK AREA NEAR RAMP

TCP(6-2)-12

FILE: tcp6-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	1804	01	082,ETC.	SS 115,ETC.
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	PHR	HIDALGO		42

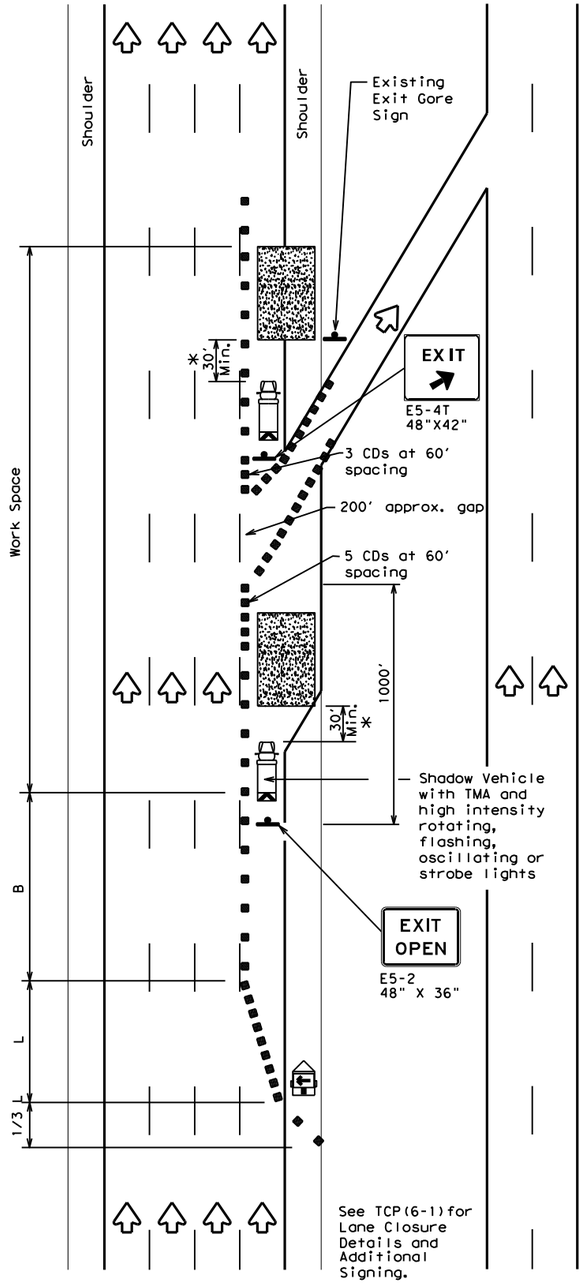
202

DATE:
FILE:



TCP (6-4a)

EXIT RAMP CLOSED
TRAFFIC EXITS PAST CLOSED RAMP



TCP (6-4b)

EXIT RAMP OPEN

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

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

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

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA AT EXIT RAMP

TCP(6-4)-12

FILE: tcp6-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT Feburary 1994	CONT	SECT	JOB	HIGHWAY
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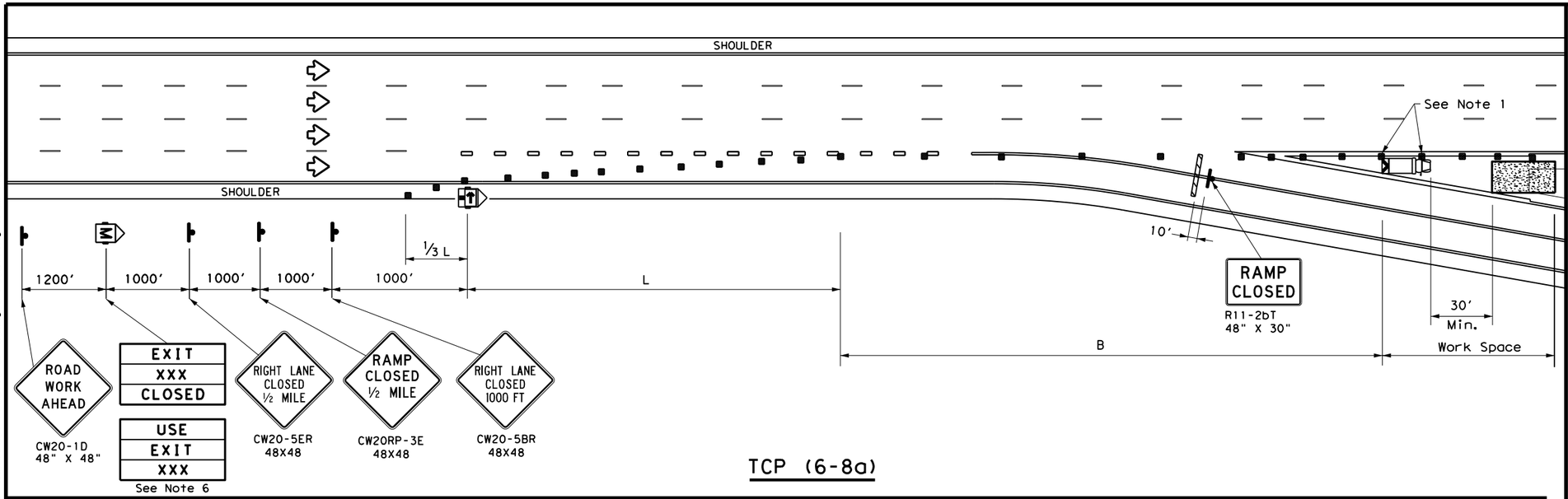
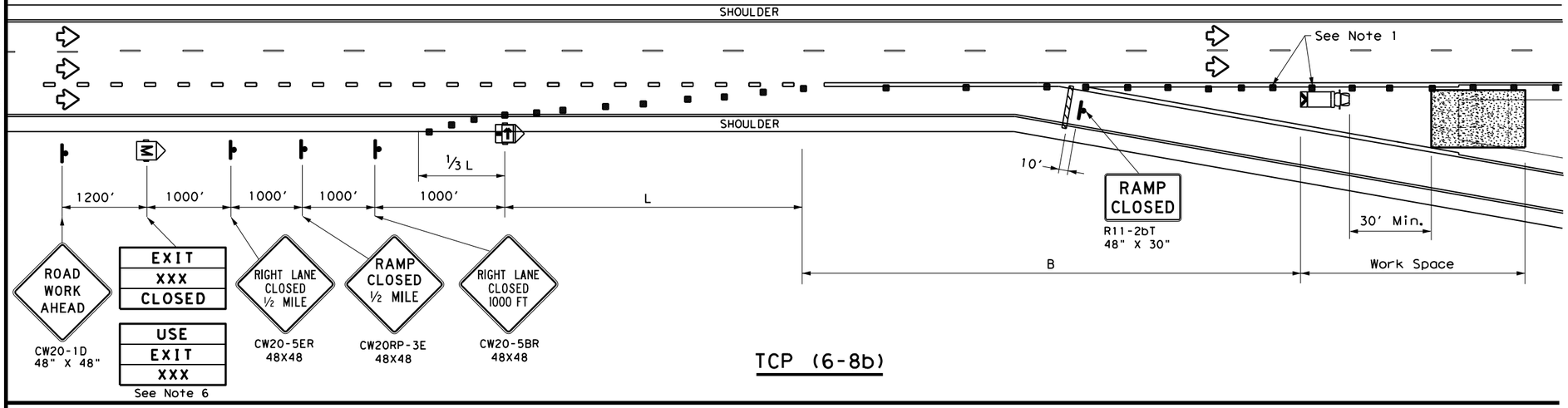
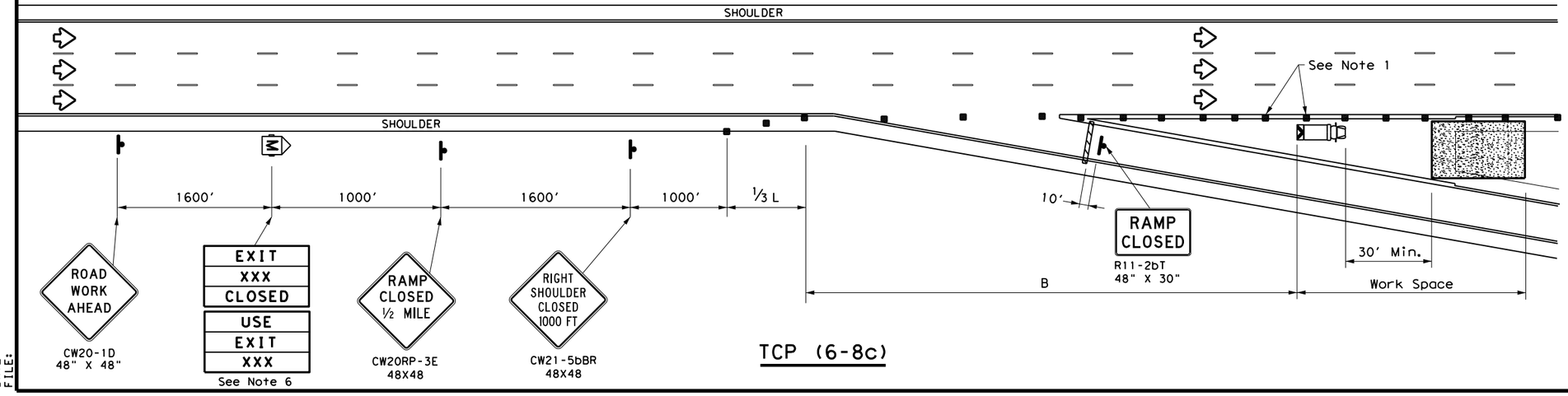
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	PHR	HIDALGO		43



TCP (6-8a)



TCP (6-8b)



TCP (6-8c)

DATE:
FILE:

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

WORK IN EXIT GORE FOR ADT GREATER THAN 10,000

TCP(6-8)-14

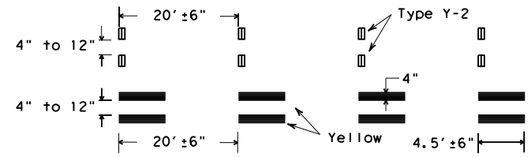
FILE: tcp6-8.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	1804	01	082,ETC.	SS 115,ETC.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		44

DATE:
FILE:

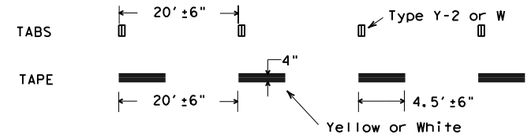
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

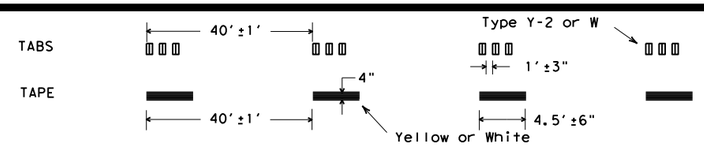


SINGLE NO-PASSING LINE or CHANNELIZATION LINE



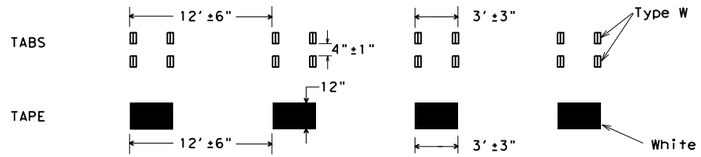
BROKEN LINES

(FOR CENTER LINE OR LANE LINE)

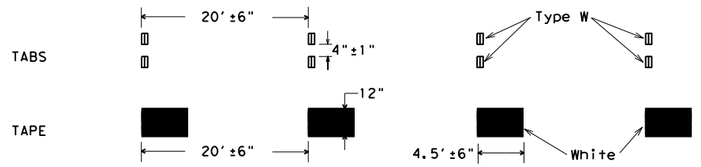


WIDE DOTTED LINES

(FOR LANE DROP LINES)



WIDE GORE MARKINGS



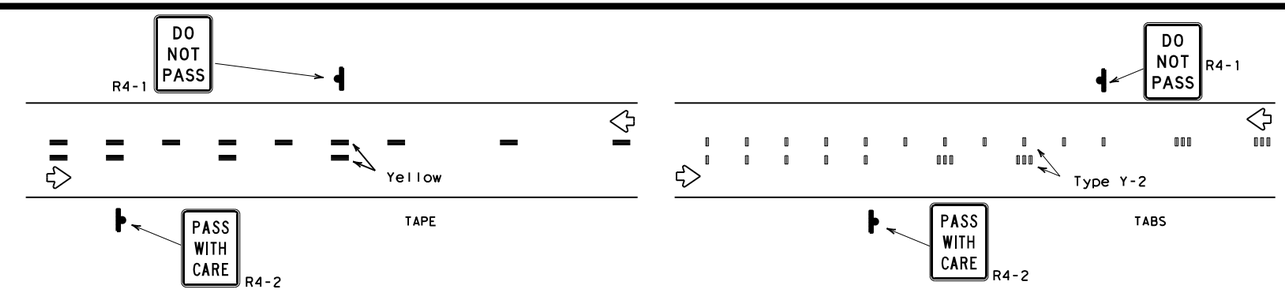
NOTES:

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

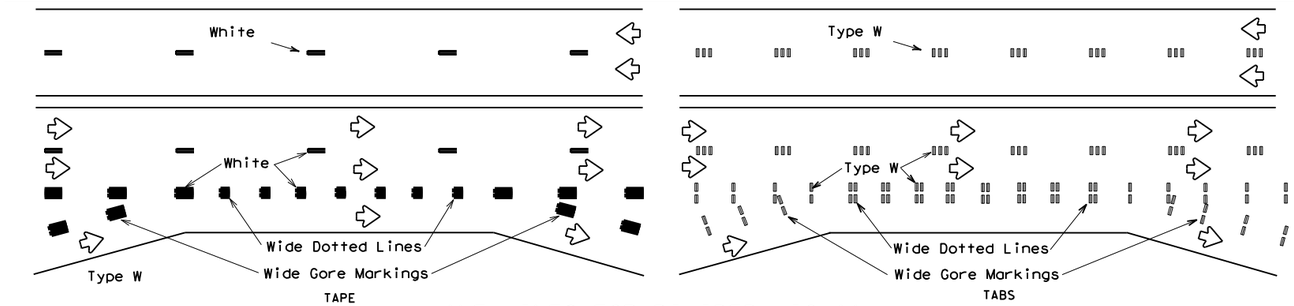
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

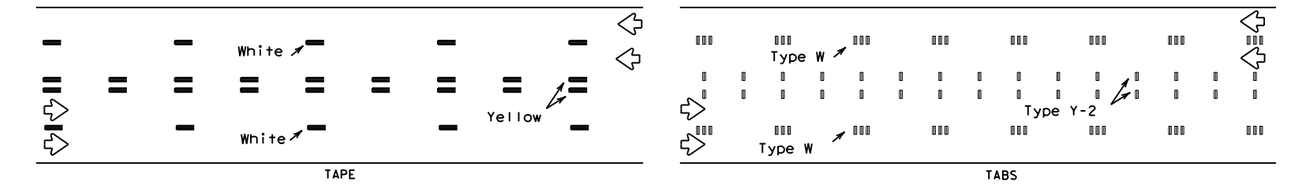
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



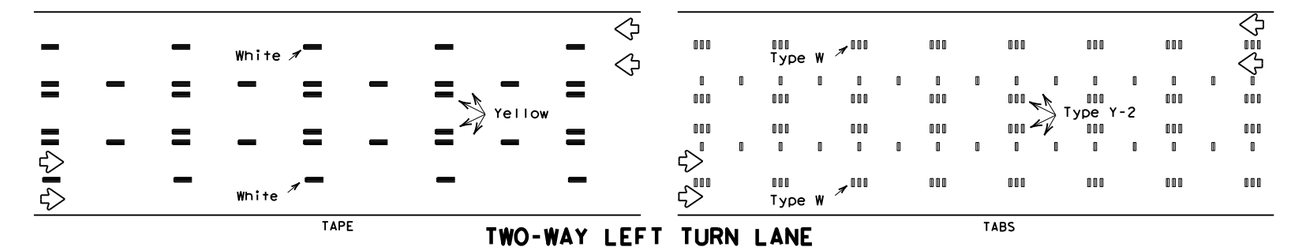
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



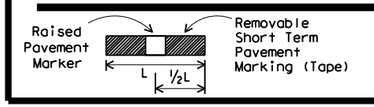
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

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

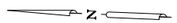
Texas Department of Transportation

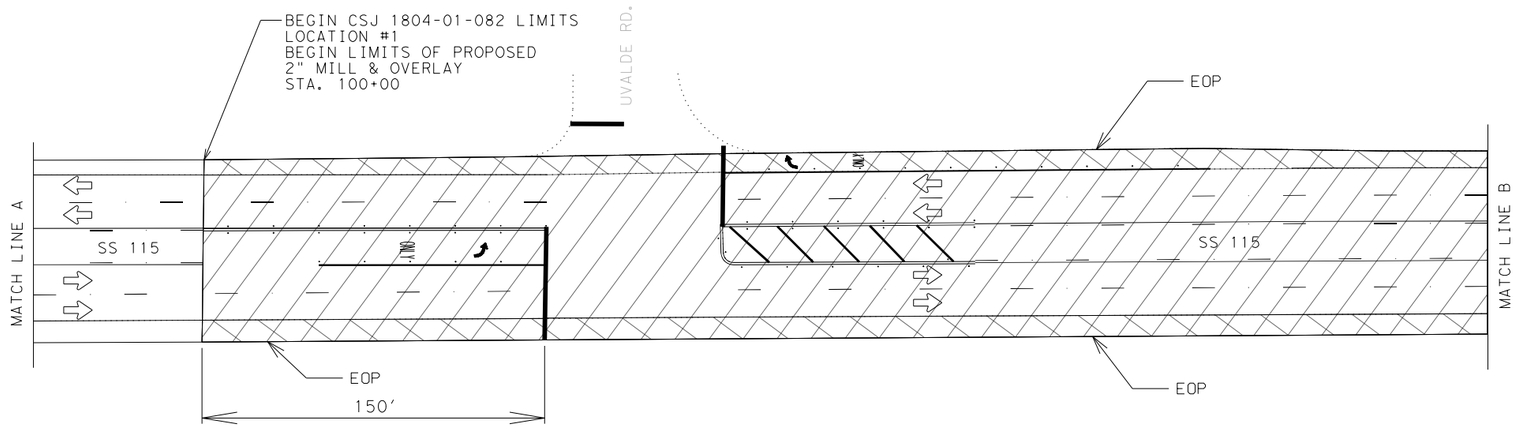
Traffic Operations Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-13

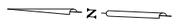
FILE:	wzstpm-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS		1804	01	082,ETC.	SS 115,ETC.
1-97		DIST	COUNTY		SHEET NO.
3-03		PHR	HIDALGO		45
7-13					

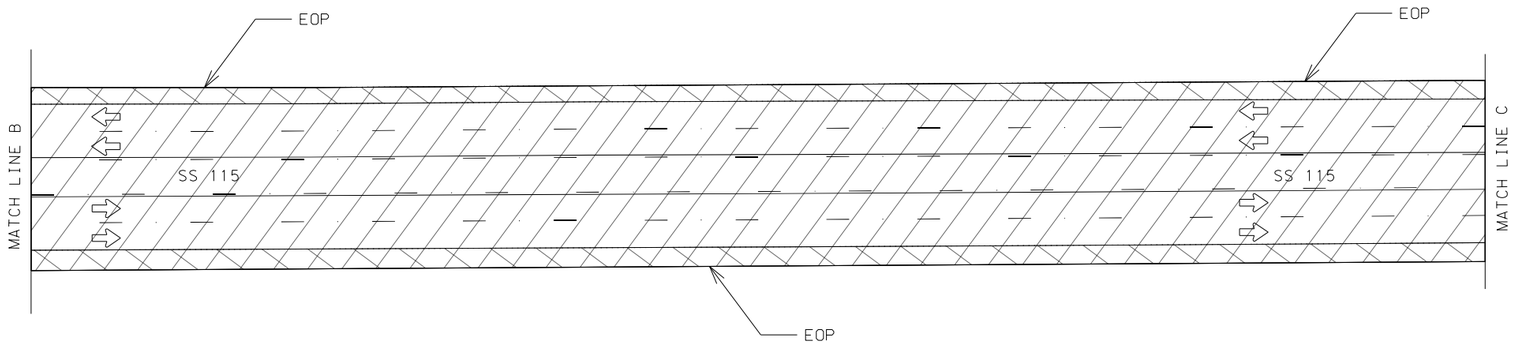




LEGEND

- EOP - EXISTING EDGE OF PAVEMENT
- ⇨ - TRAFFIC FLOW
- PROPOSED OVERLAY (2")
- PROPOSED MILLING (0"-2") & OVERLAY (2")
- — — — - LIMITS OF MILL & OVERLAY (2")





NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #1
PAVING PLAN LAYOUT

SHEET 1 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		46
STATE	STATE DIST.NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LEGEND

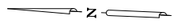
EOP - EXISTING EDGE OF PAVEMENT

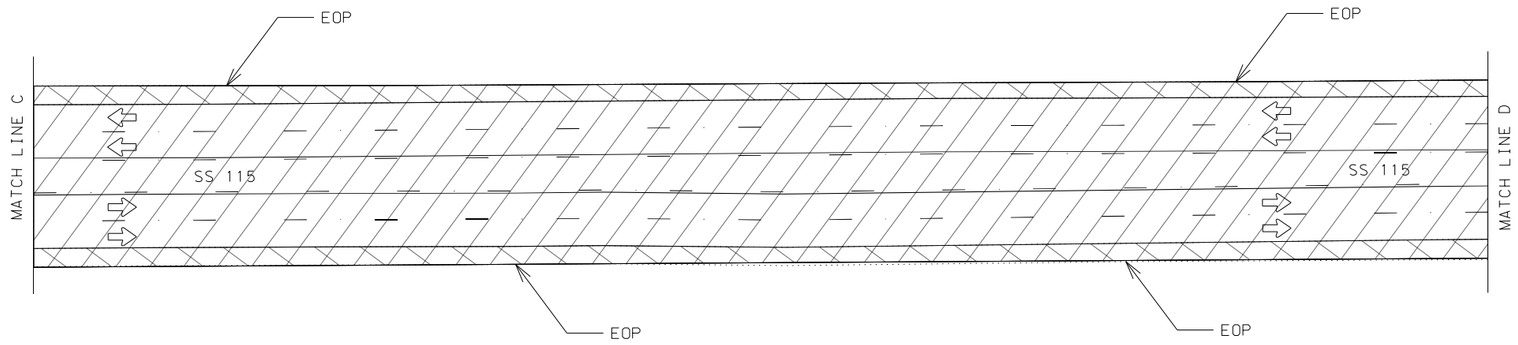
- TRAFFIC FLOW

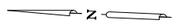
- PROPOSED OVERLAY (2")

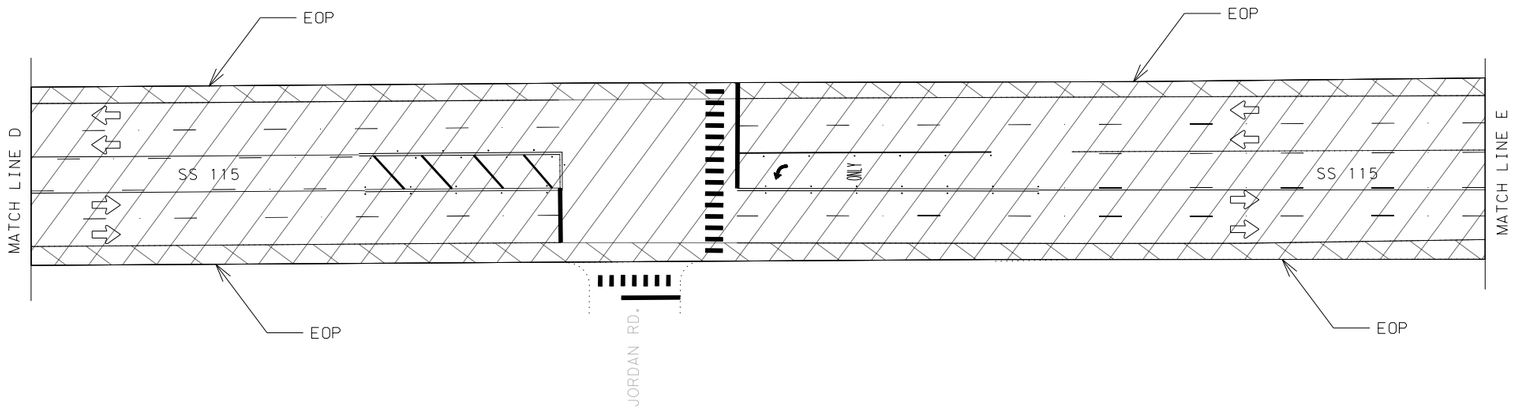
- PROPOSED MILLING (0"-2") & OVERLAY (2")

- - - - LIMITS OF MILL & OVERLAY (2")









NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #1
PAVING PLAN LAYOUT
SHEET 2 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		47
STATE	STATE DIST.NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LEGEND

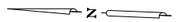
EOP - EXISTING EDGE OF PAVEMENT

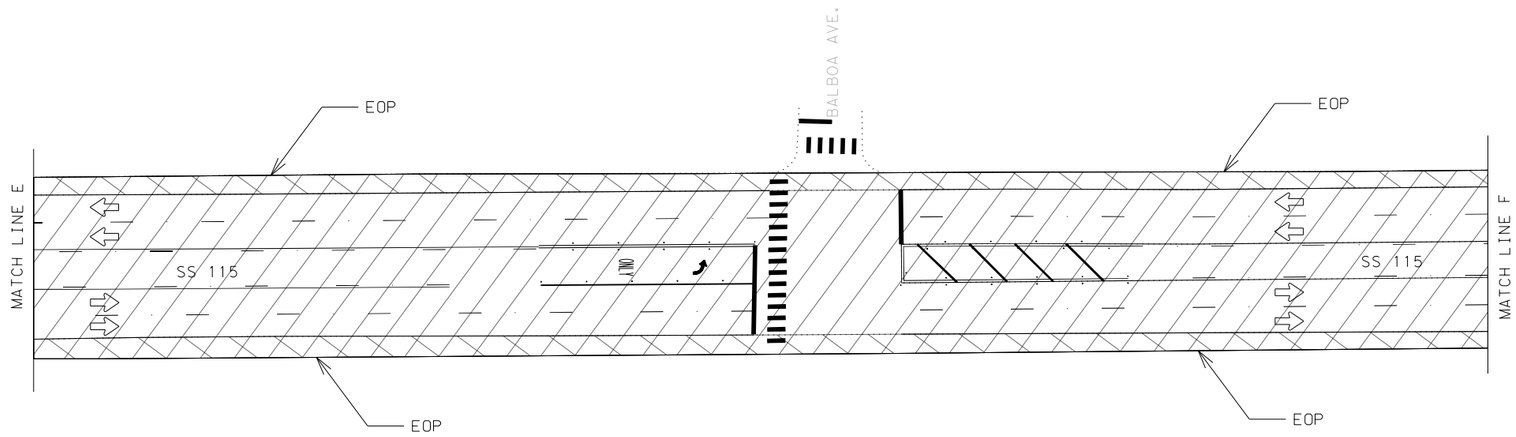
- TRAFFIC FLOW

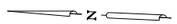
- PROPOSED OVERLAY (2")

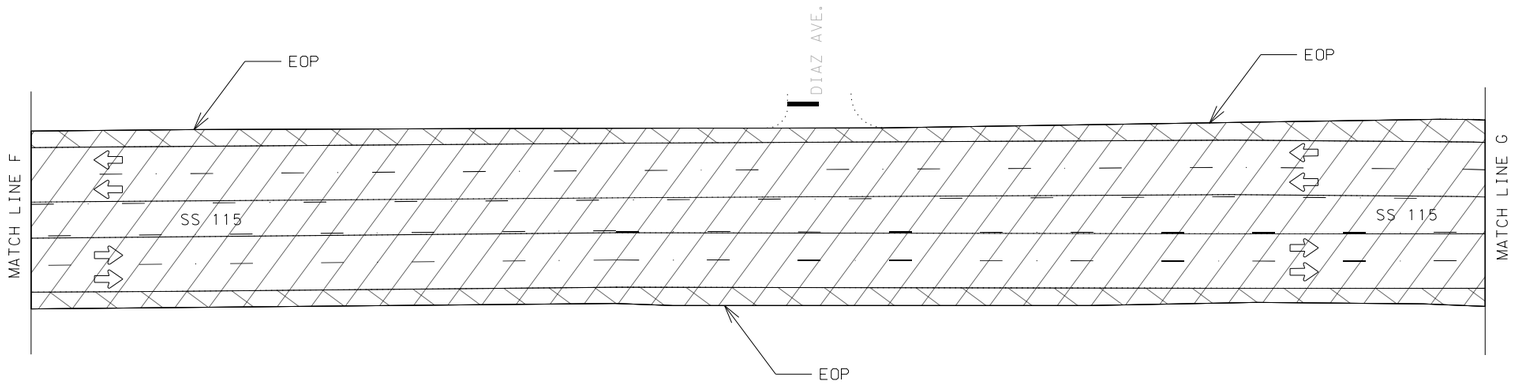
- PROPOSED MILLING (0"-2") & OVERLAY (2")

— — — - LIMITS OF MILL & OVERLAY (2")



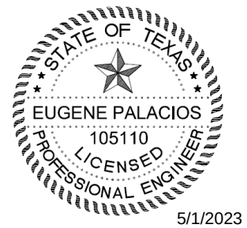






NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION



5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #1
PAVING PLAN LAYOUT

SHEET 3 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		48
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LEGEND

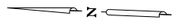
EOP - EXISTING EDGE OF PAVEMENT

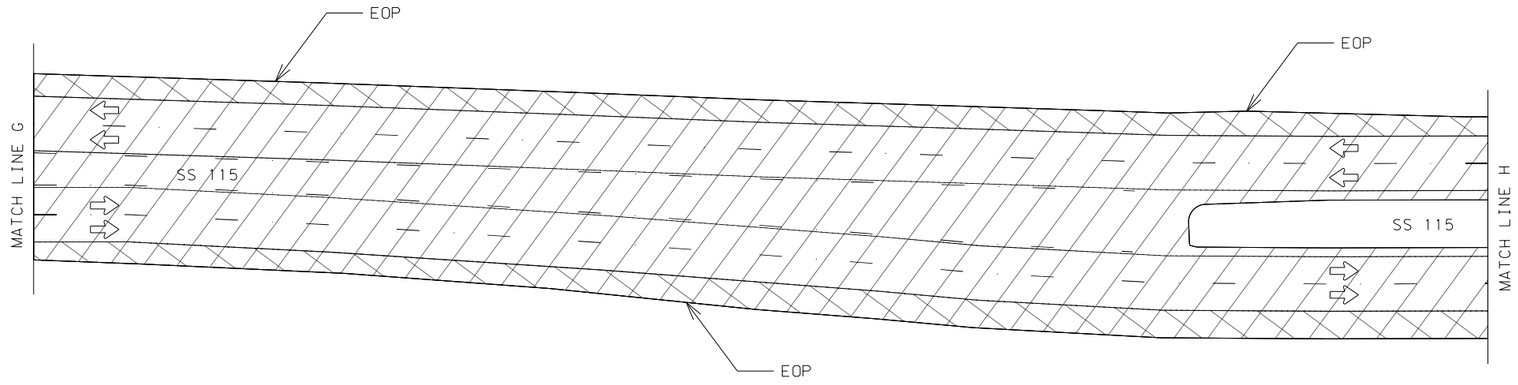
- TRAFFIC FLOW

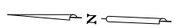
- PROPOSED OVERLAY (2")

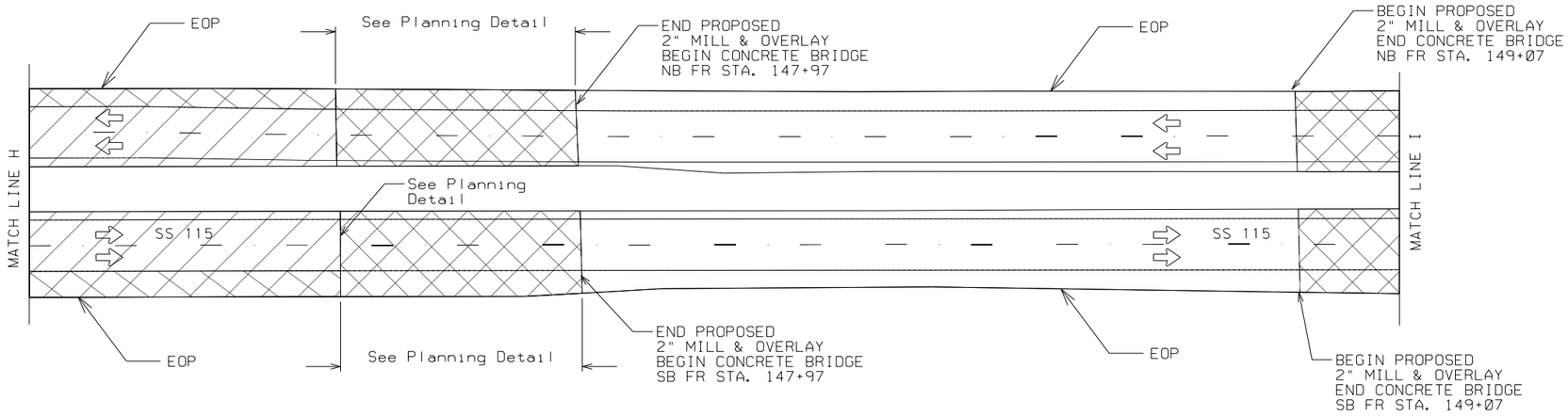
- PROPOSED MILL (0"-2") & OVERLAY (2")

- - - - LIMITS OF MILL & OVERLAY (2")









NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

Eugene Palacios

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #1
PAVING PLAN LAYOUT
SHEET 4 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		49
STATE	STATE DIST.NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LEGEND

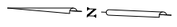
EOP - EXISTING EDGE OF PAVEMENT

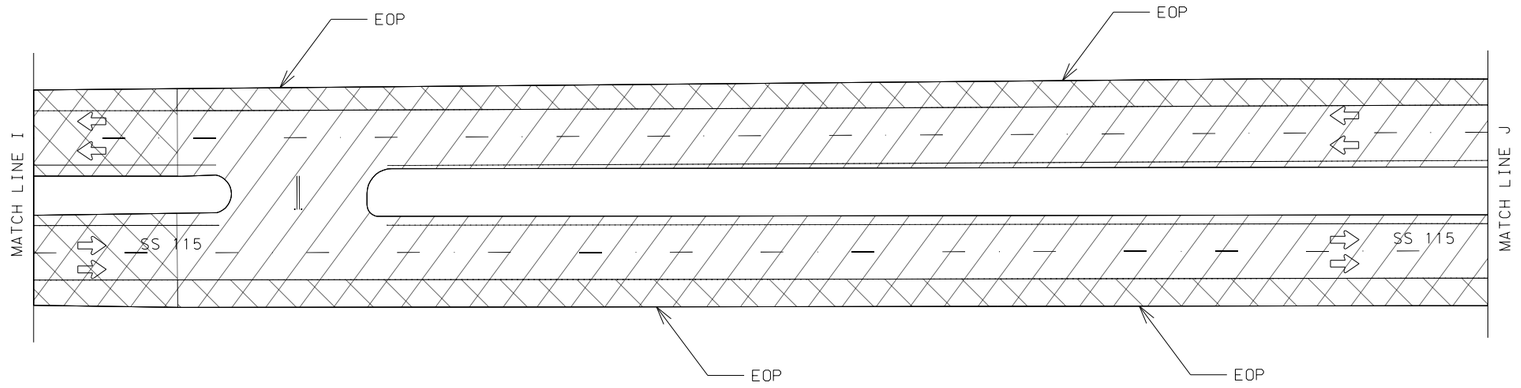
- TRAFFIC FLOW

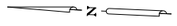
- PROPOSED OVERLAY (2")

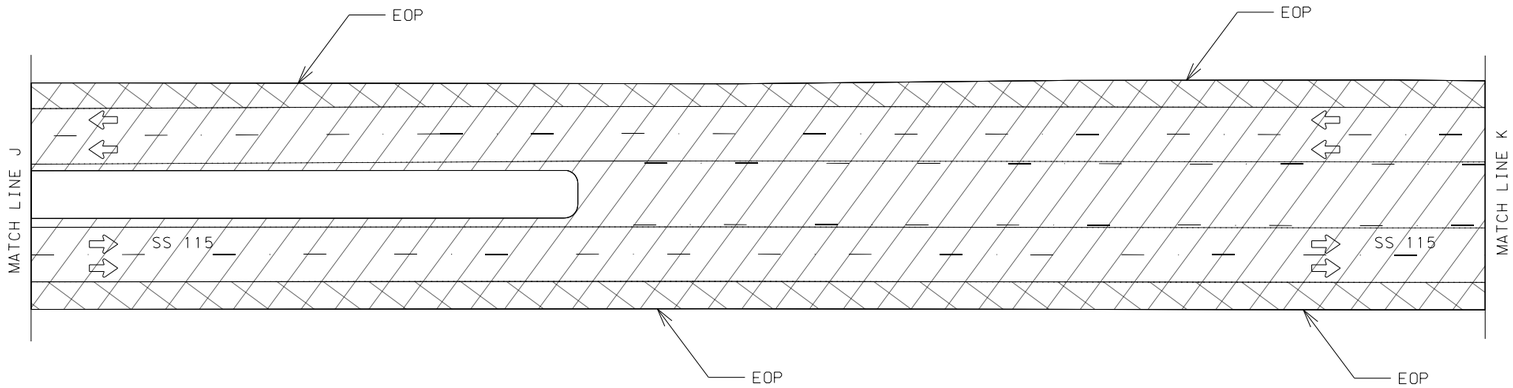
- PROPOSED MILL (0"-2") & OVERLAY (2")

— — — - LIMITS OF MILL & OVERLAY (2")









NOTES

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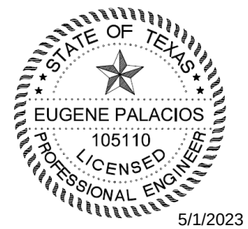


5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #1
PAVING PLAN LAYOUT
SHEET 5 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		50
STATE	STATE DIST.NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LEGEND

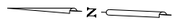
EOP - EXISTING EDGE OF PAVEMENT

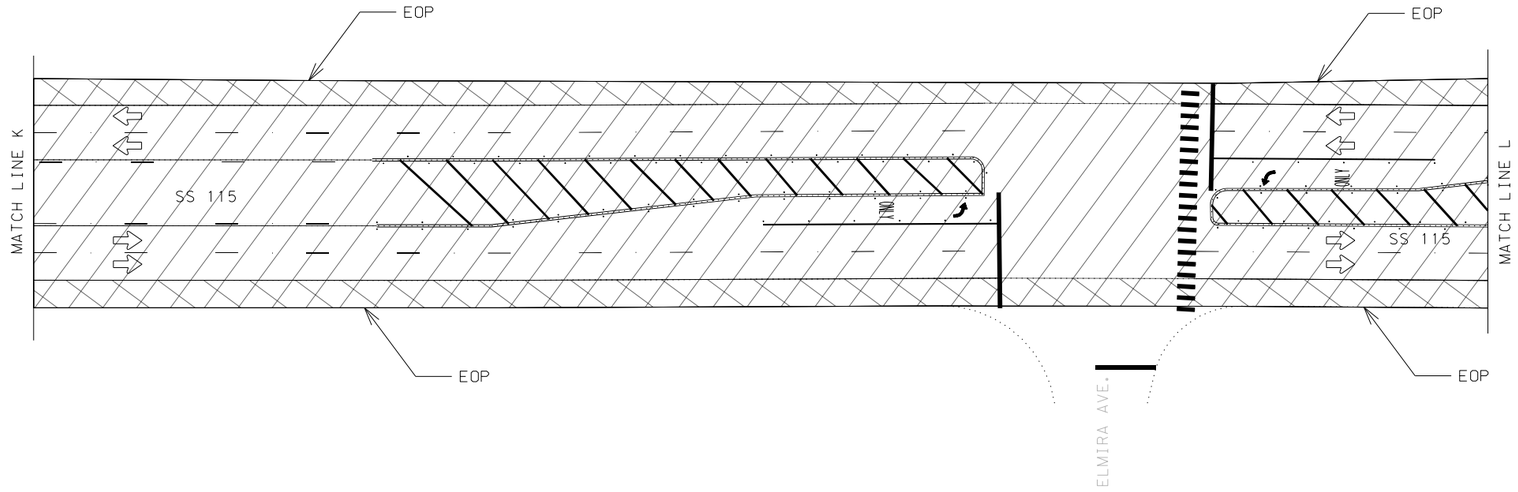
- TRAFFIC FLOW

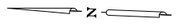
- PROPOSED OVERLAY (2")

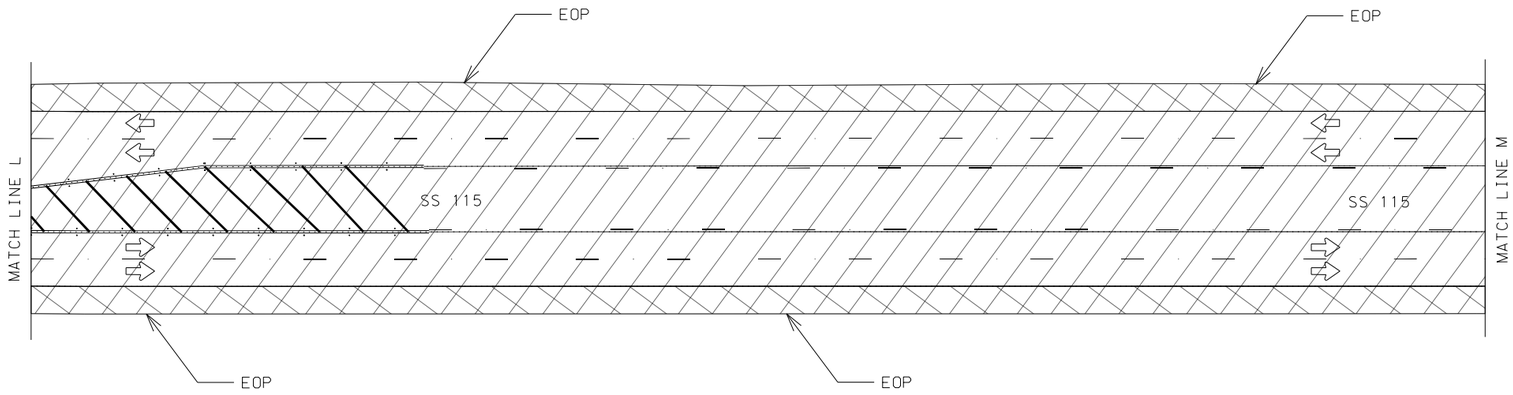
- PROPOSED MILL (0"-2") & OVERLAY (2")

— — — - LIMITS OF MILL & OVERLAY (2")









NOTES

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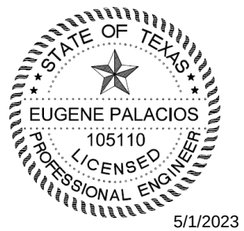


5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #1
PAVING PLAN LAYOUT

SHEET 6 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		51
STATE	STATE DIST.NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LEGEND

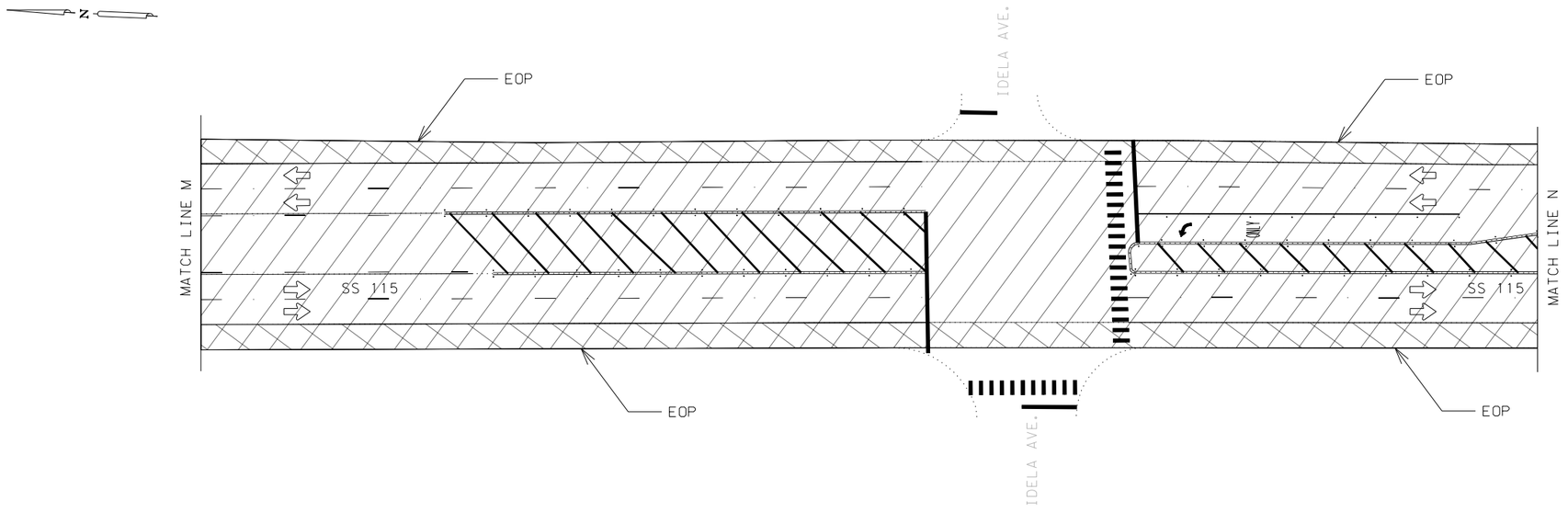
EOP - EXISTING EDGE OF PAVEMENT

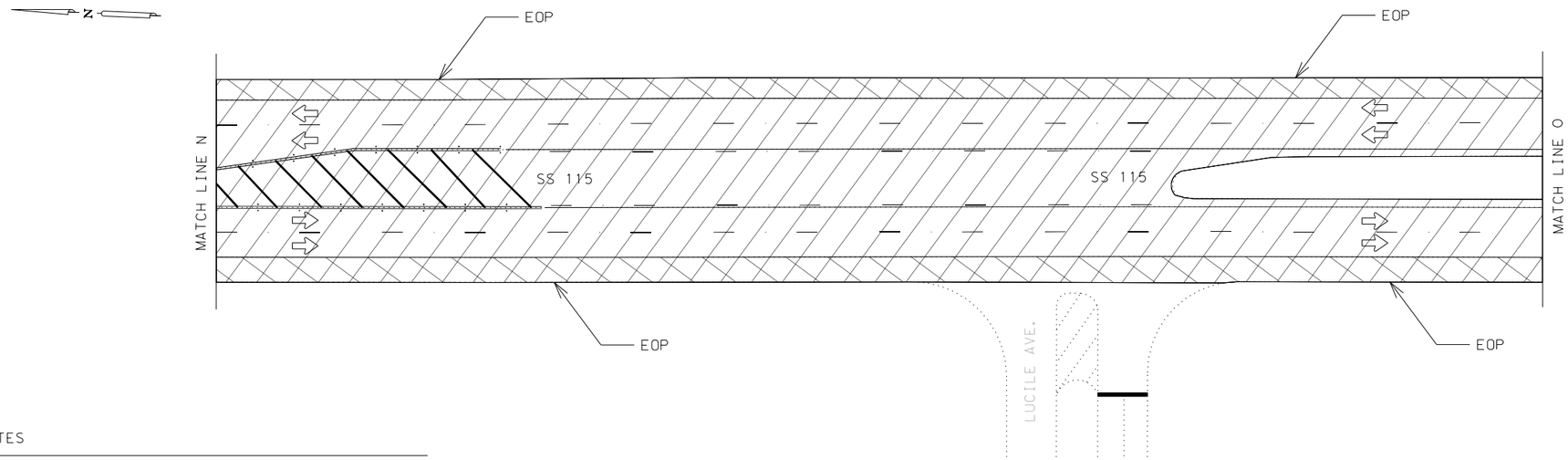
- TRAFFIC FLOW

- PROPOSED OVERLAY (2")

- PROPOSED MILL (0"-2") & OVERLAY (2")

— — — - LIMITS OF MILL & OVERLAY (2")





NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS

5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #1
PAVING PLAN LAYOUT

SHEET 7 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		52
STATE	STATE DIST.NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LEGEND

EOP - EXISTING EDGE OF PAVEMENT

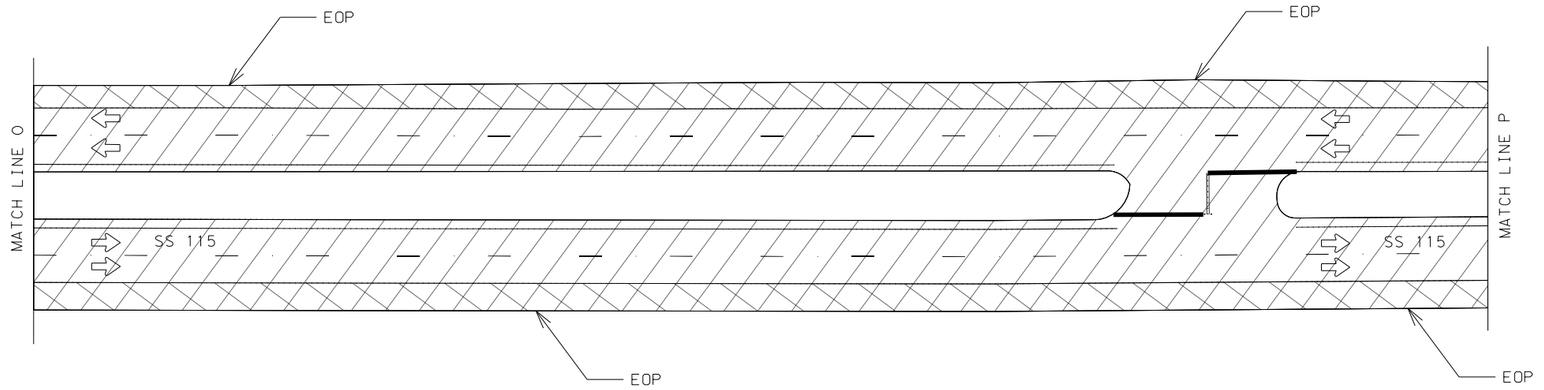
- TRAFFIC FLOW

- PROPOSED OVERLAY (2")

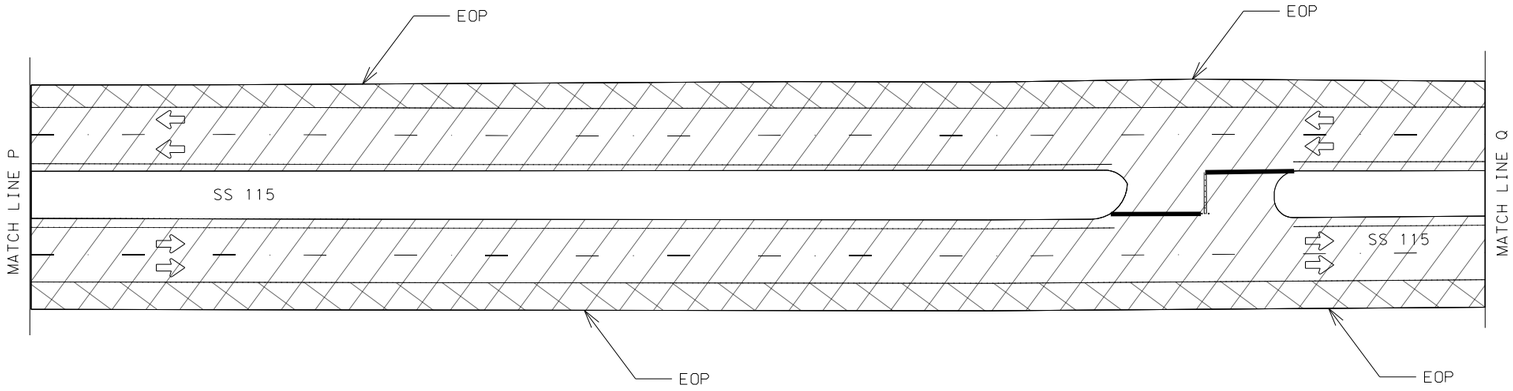
- PROPOSED MILL (0"-2") & OVERLAY (2")

— — — - LIMITS OF MILL & OVERLAY (2")

N



N



NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

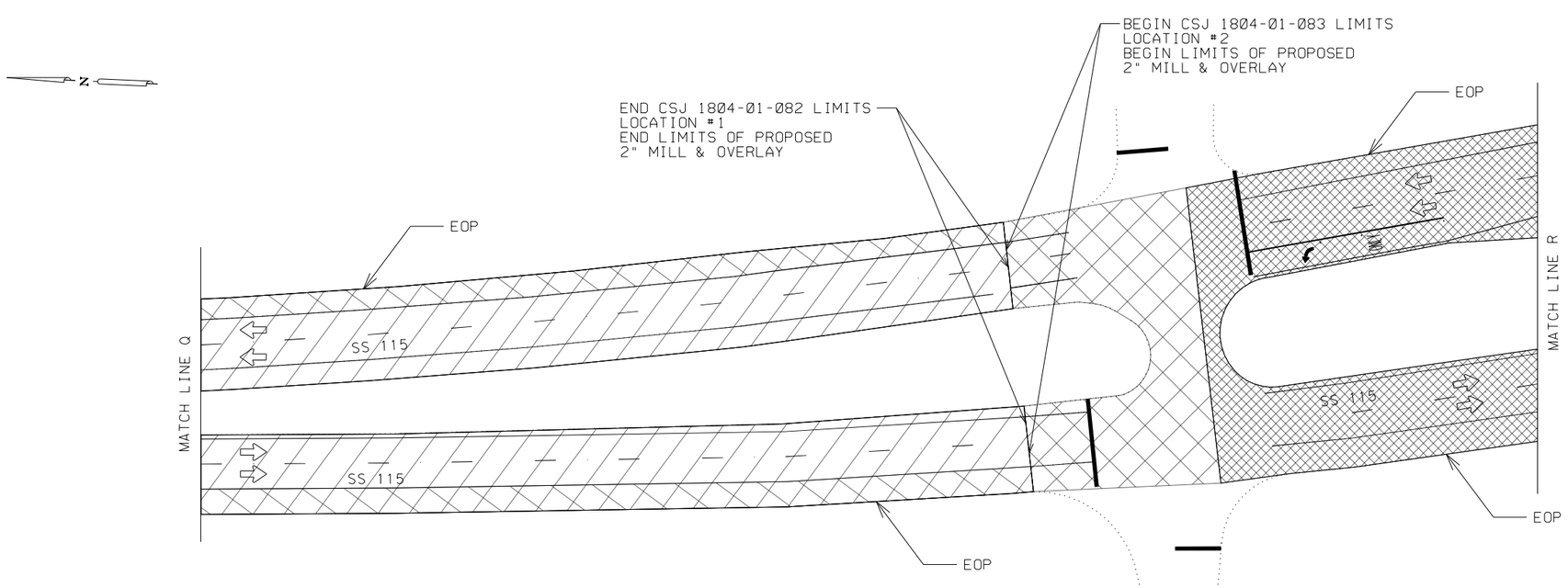
STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

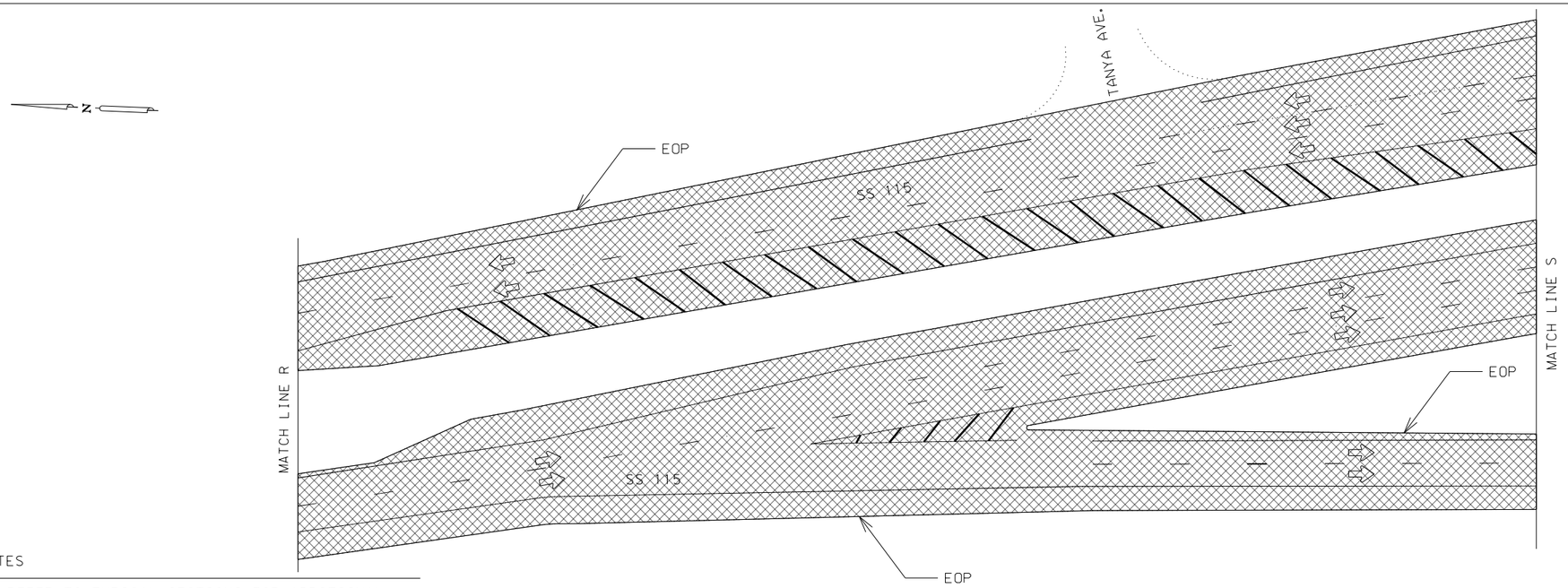
SS 115
LOCATION #1
PAVING PLAN LAYOUT
SHEET 8 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		53
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.



LEGEND

- EOP - EXISTING EDGE OF PAVEMENT
- ⇨ - TRAFFIC FLOW
- PROPOSED OVERLAY (2")
- PROPOSED MILLING (0"-2") & OVERLAY (2")
- PROPOSED MILLING (2") & OVERLAY (2")
- — — — LIMITS OF MILL & OVERLAY (2")



NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

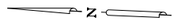
Eugene Palacios

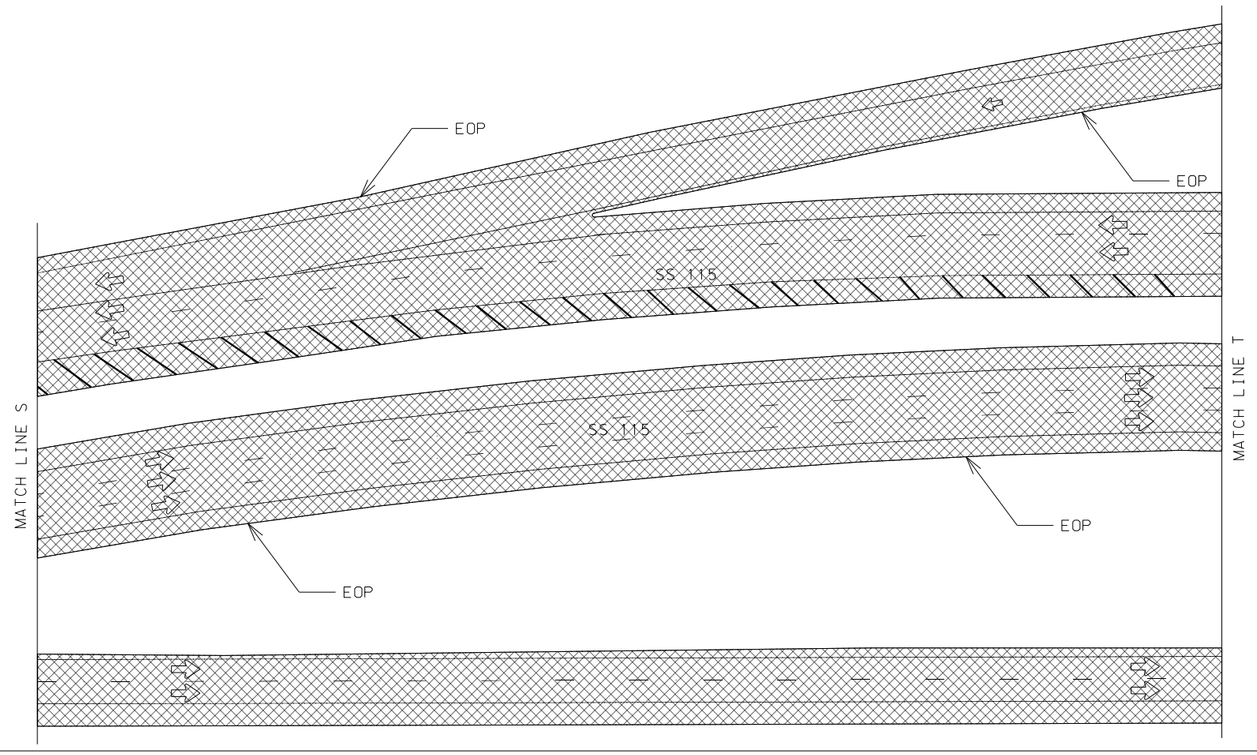
TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #1 & #2
PAVING PLAN LAYOUT

SHEET 9 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		54
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.





LEGEND

EOP - EXISTING EDGE OF PAVEMENT

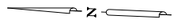
- TRAFFIC FLOW

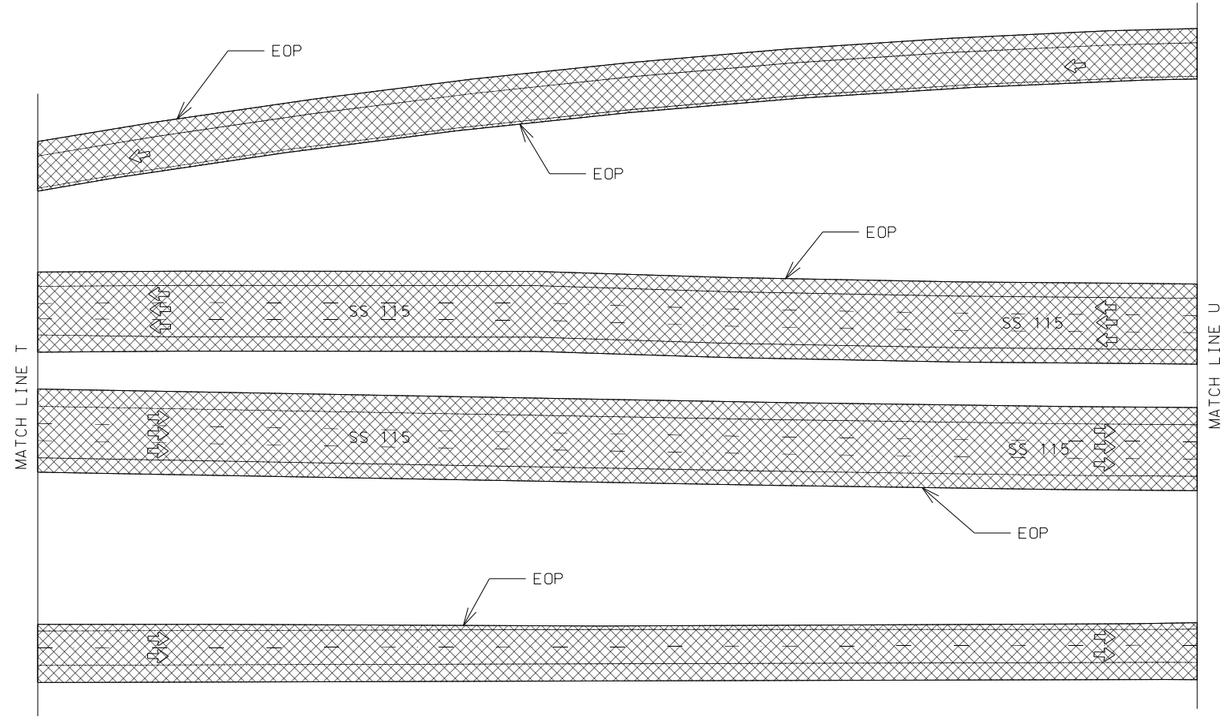
- PROPOSED OVERLAY (2")

- PROPOSED MILLING (0"-2") & OVERLAY (2")

- PROPOSED MILLING (2") & OVERLAY (2")

— — — - LIMITS OF MILL & OVERLAY (2")





NOTES

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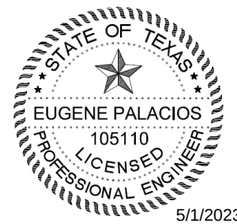
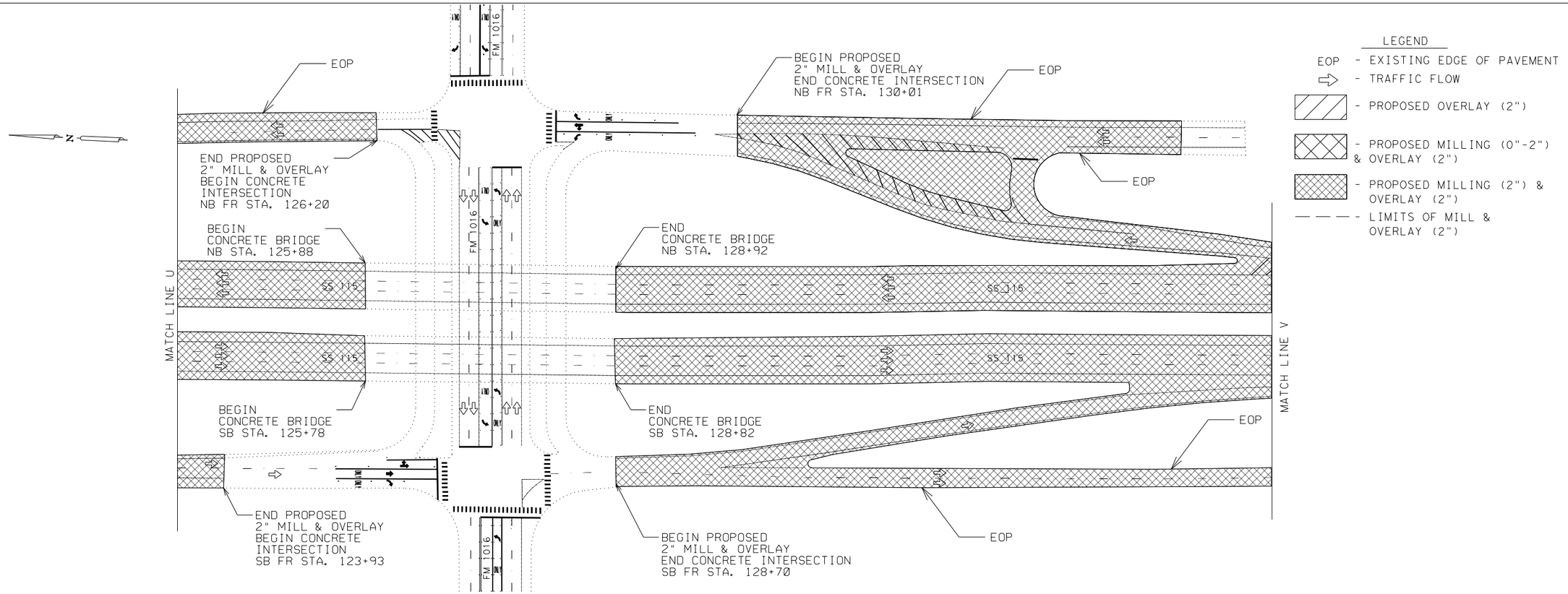


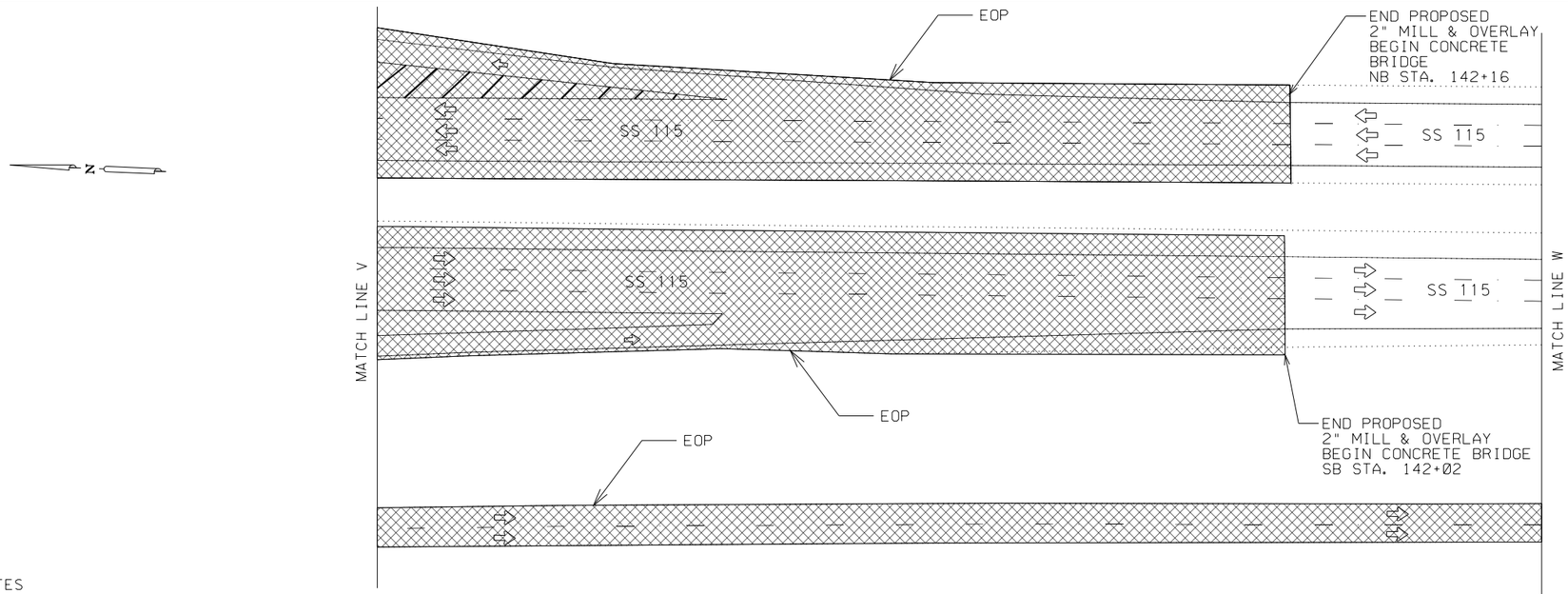
5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #2
PAVING PLAN LAYOUT
SHEET 10 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		55
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.





NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

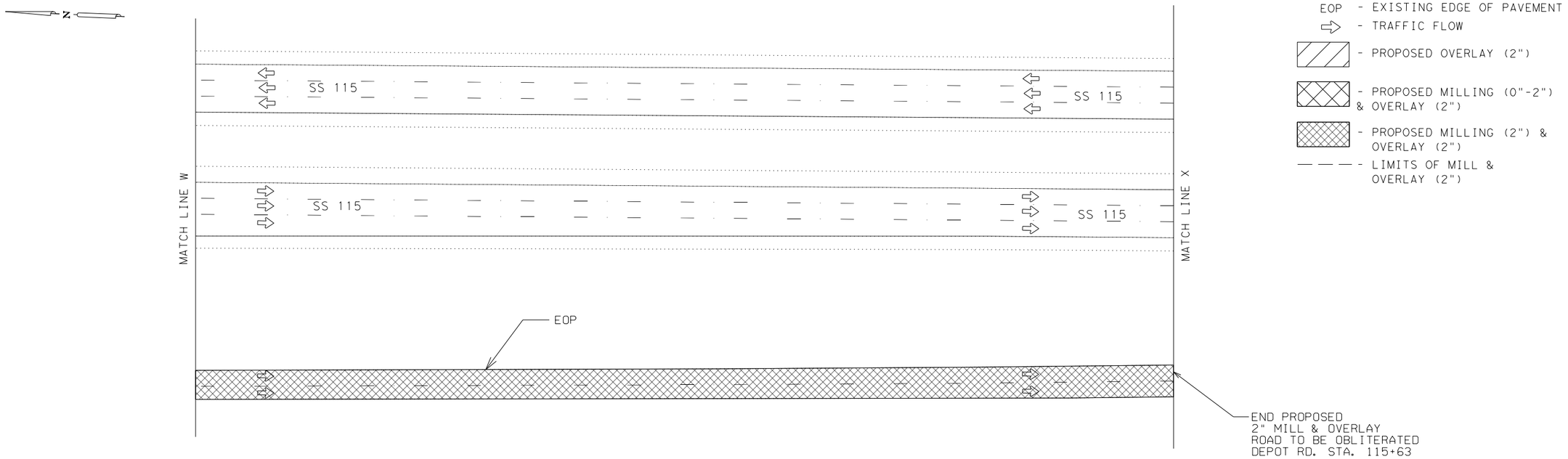
Eugene Palacios

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #2
PAVING PLAN LAYOUT

SHEET 11 OF 22 N.T.S.

FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		56
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.



LEGEND

EOP - EXISTING EDGE OF PAVEMENT

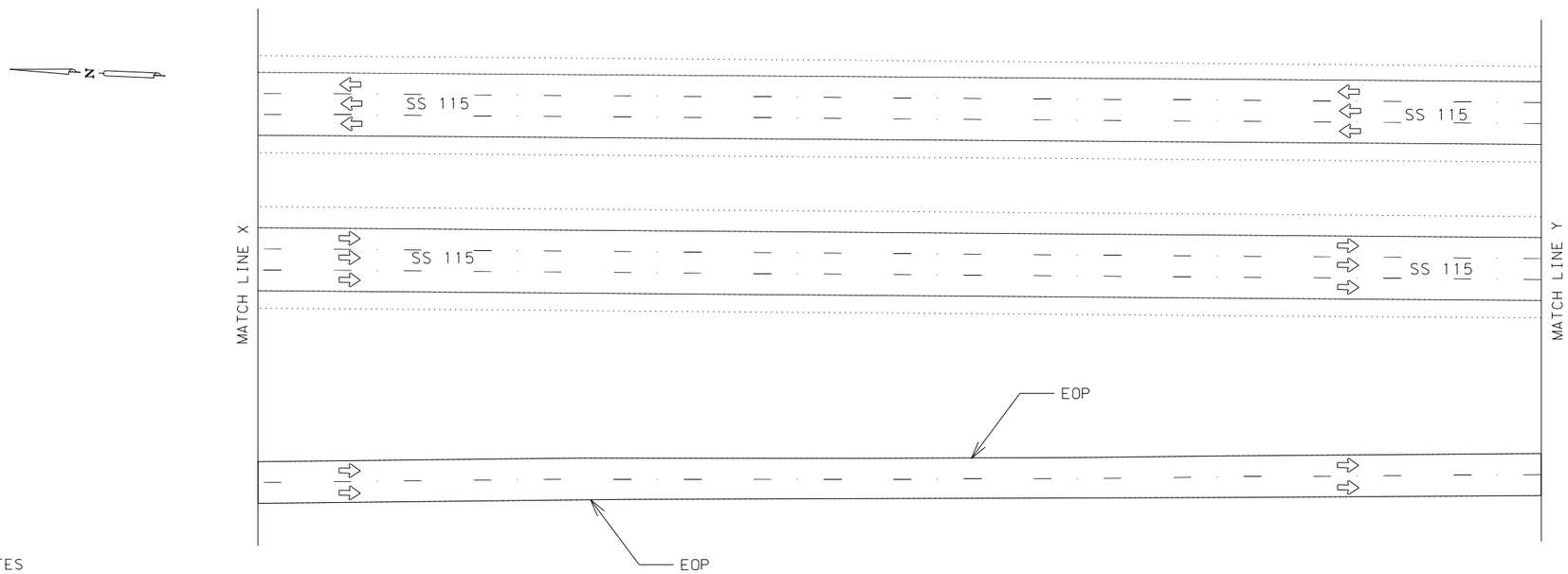
- TRAFFIC FLOW

- PROPOSED OVERLAY (2")

- PROPOSED MILLING (0"-2") & OVERLAY (2")

- PROPOSED MILLING (2") & OVERLAY (2")

- - - - LIMITS OF MILL & OVERLAY (2")



NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

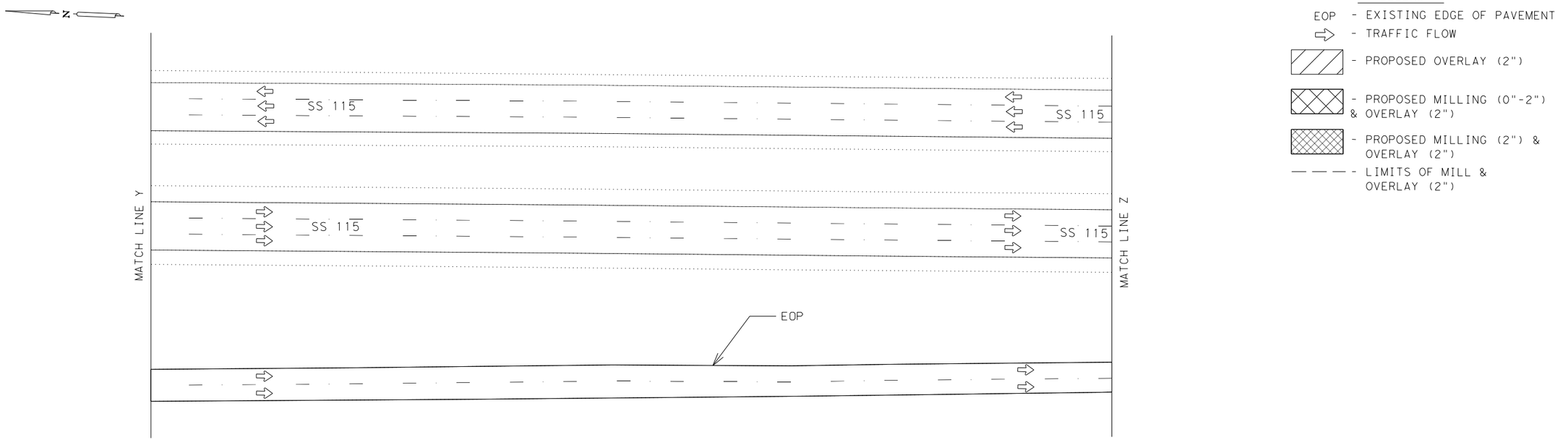
STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #2
PAVING PLAN LAYOUT
SHEET 12 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		57
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.



LEGEND

EOP - EXISTING EDGE OF PAVEMENT

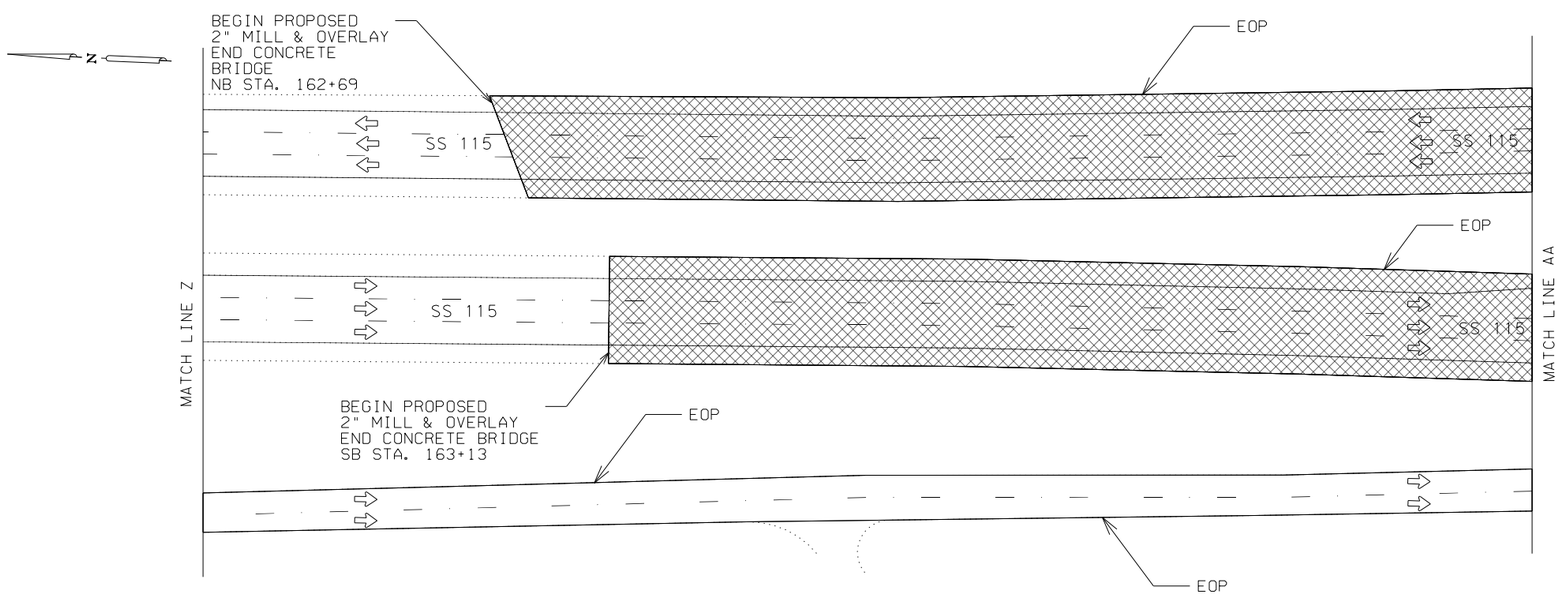
- TRAFFIC FLOW

- PROPOSED OVERLAY (2")

- PROPOSED MILLING (0"-2") & OVERLAY (2")

- PROPOSED MILLING (2") & OVERLAY (2")

- - - - LIMITS OF MILL & OVERLAY (2")



NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

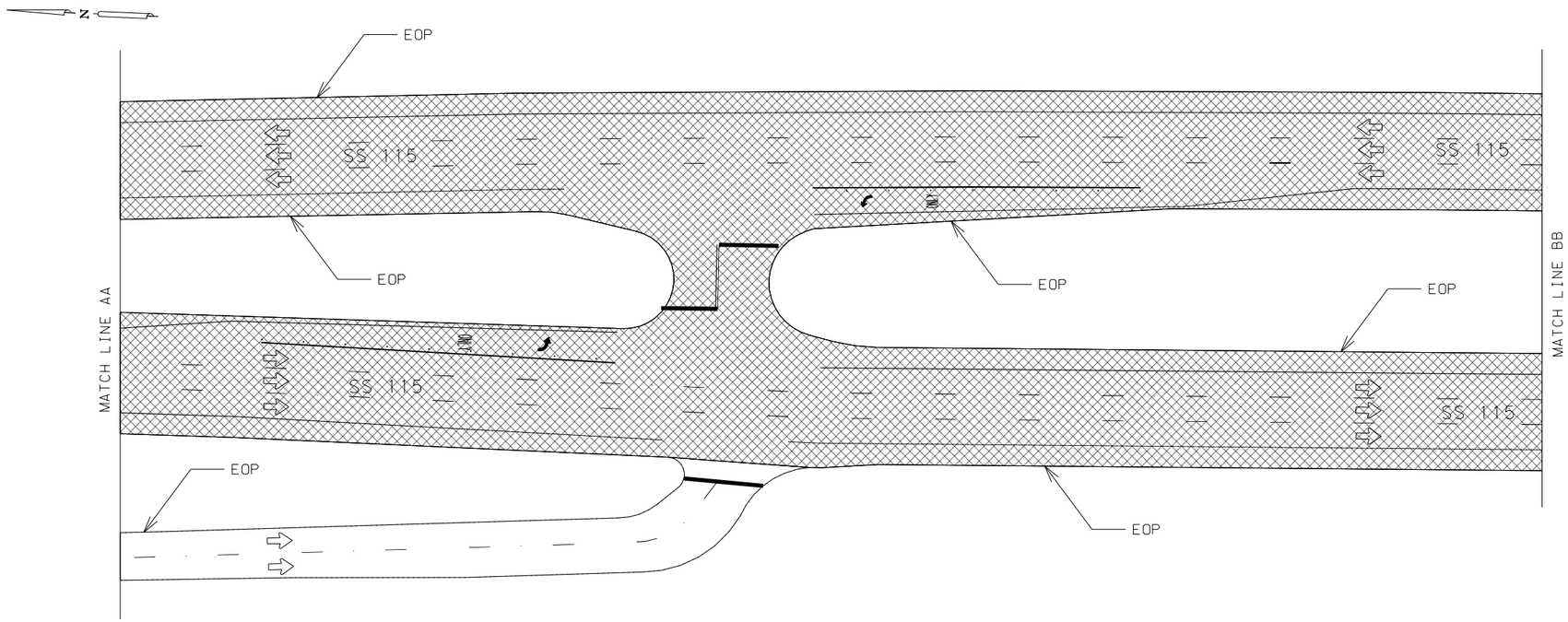
5/1/2023

Eugene Palacios

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #2
PAVING PLAN LAYOUT
SHEET 13 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		58
STATE	STATE DIST.NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.



LEGEND

EOP - EXISTING EDGE OF PAVEMENT

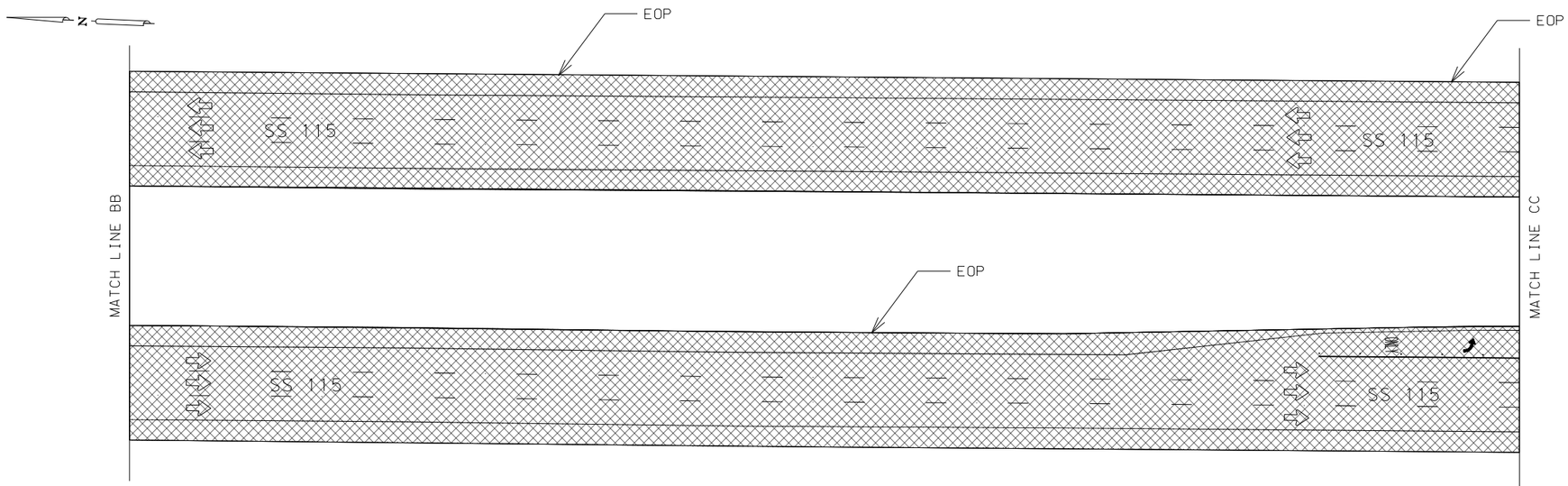
- TRAFFIC FLOW

- PROPOSED OVERLAY (2")

- PROPOSED MILLING (0"-2") & OVERLAY (2")

- PROPOSED MILLING (2") & OVERLAY (2")

- - - - LIMITS OF MILL & OVERLAY (2")



NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

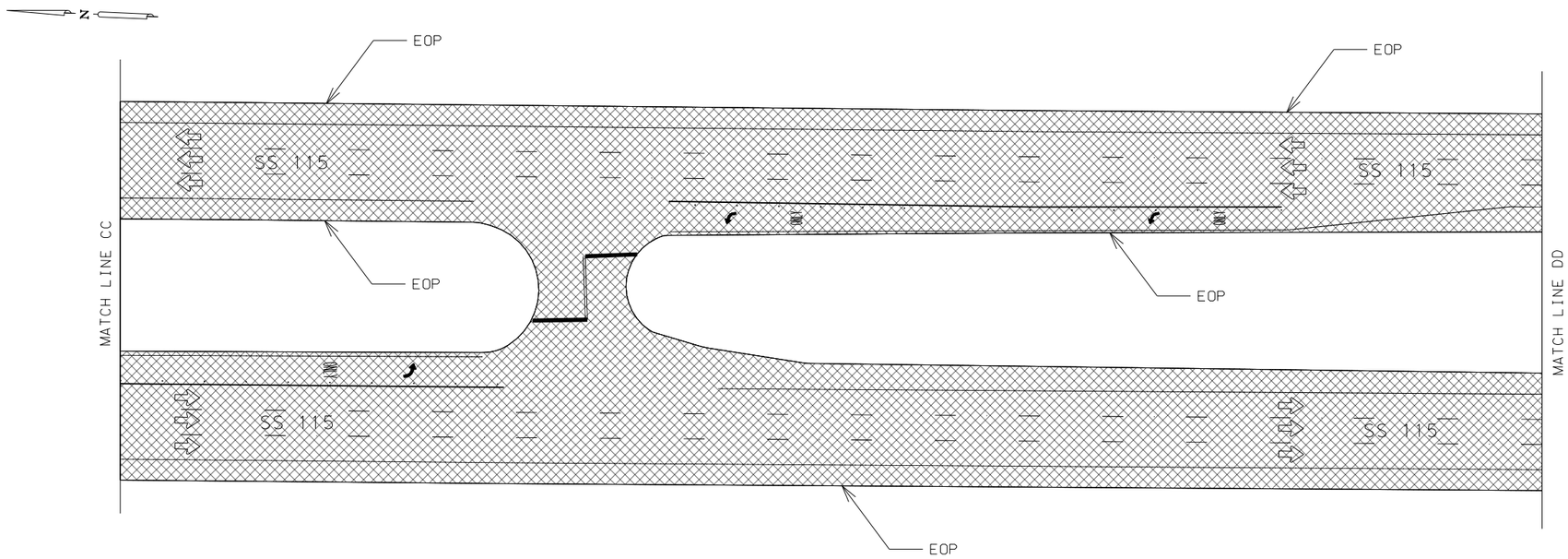
5/1/2023

Eugene Palacios

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #2
PAVING PLAN LAYOUT
SHEET 14 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		59
STATE	STATE DIST.NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.



LEGEND

EOP - EXISTING EDGE OF PAVEMENT

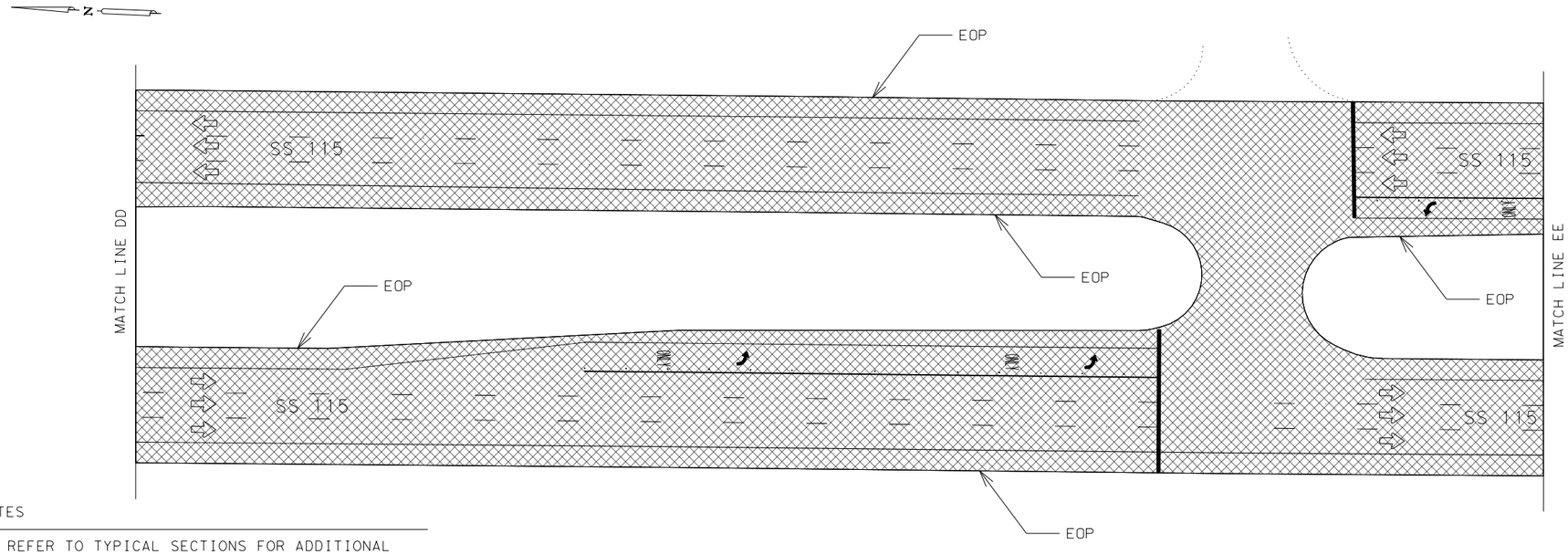
- TRAFFIC FLOW

- PROPOSED OVERLAY (2")

- PROPOSED MILLING (0"-2") & OVERLAY (2")

- PROPOSED MILLING (2") & OVERLAY (2")

- - - - LIMITS OF MILL & OVERLAY (2")



NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

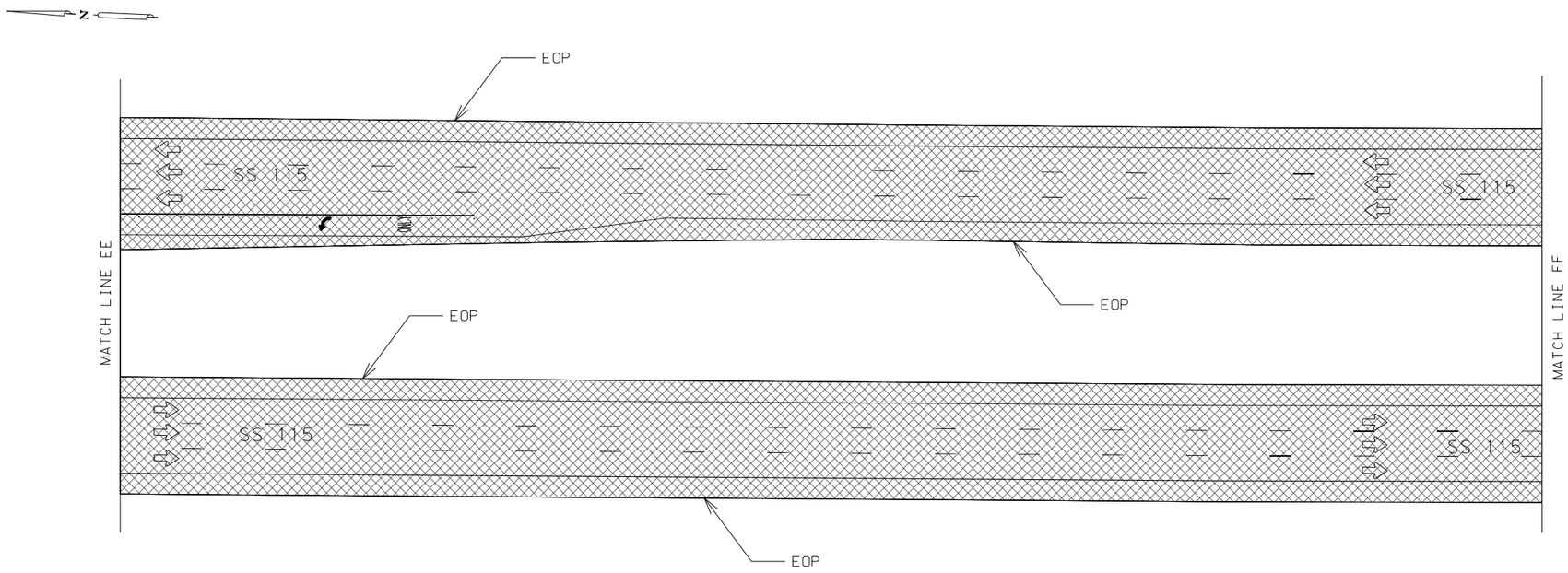
STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #2
PAVING PLAN LAYOUT
SHEET 15 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		60
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.



LEGEND

EOP - EXISTING EDGE OF PAVEMENT

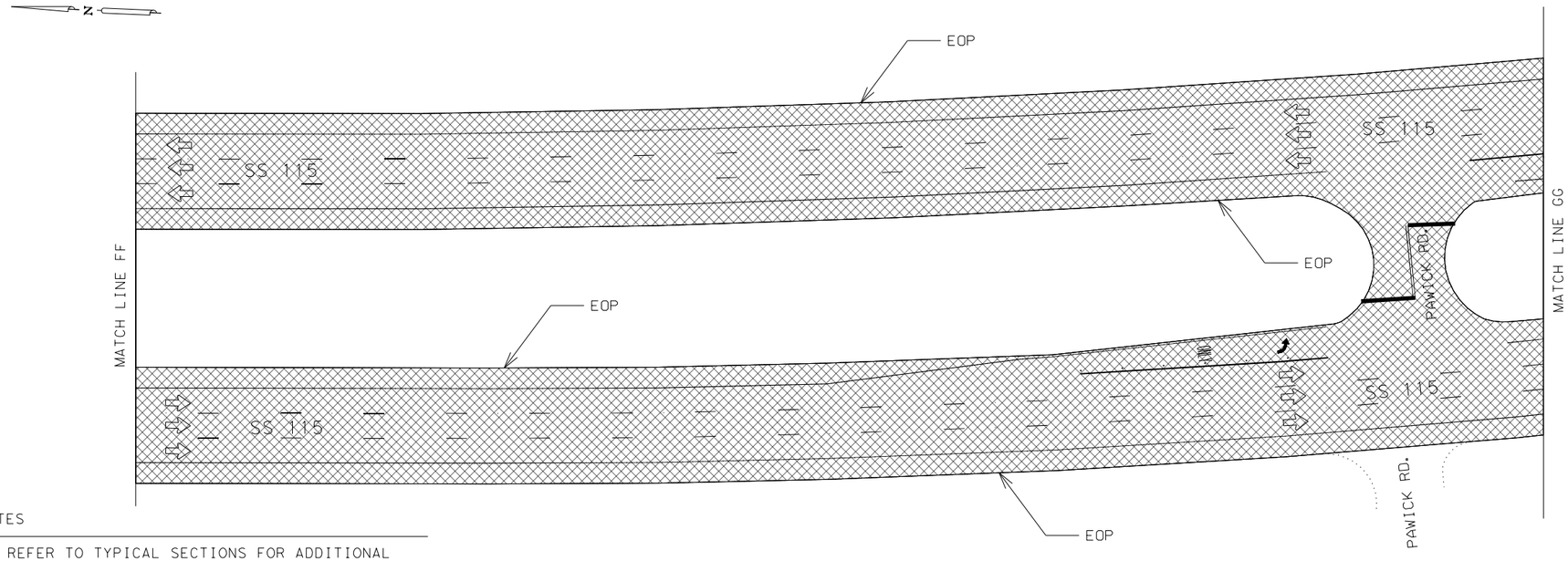
- TRAFFIC FLOW

- PROPOSED OVERLAY (2")

- PROPOSED MILLING (0"-2") & OVERLAY (2")

- PROPOSED MILLING (2") & OVERLAY (2")

- - - - LIMITS OF MILL & OVERLAY (2")



NOTES

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STATE OF TEXAS
EUGENE PALACIOS
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LICENSED
PROFESSIONAL ENGINEER

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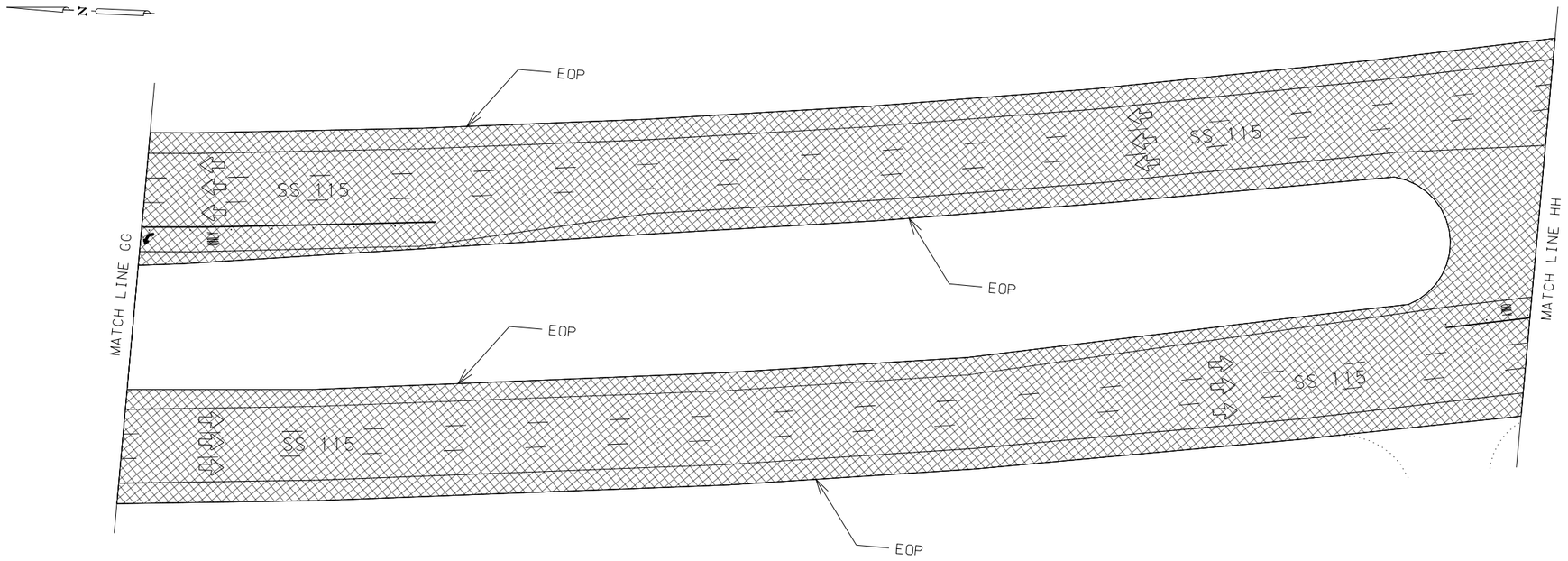
Eugene Palacios

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #2
PAVING PLAN LAYOUT
SHEET 16 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		61
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.



LEGEND

EOP - EXISTING EDGE OF PAVEMENT

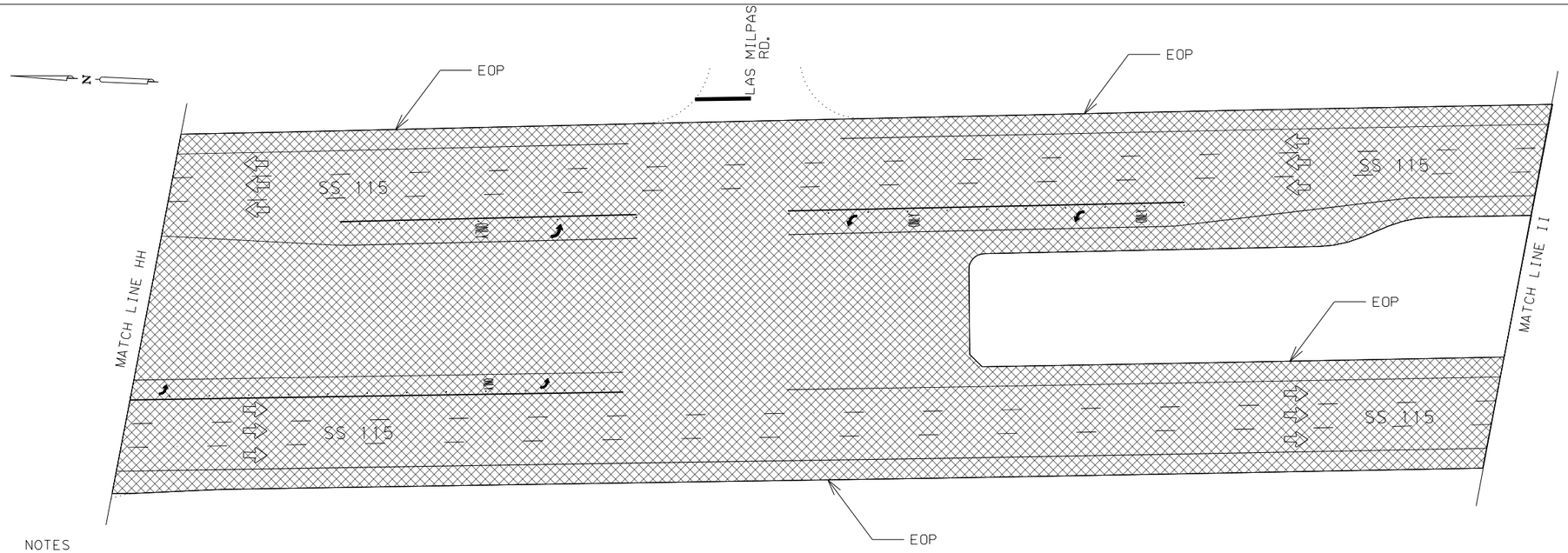
- TRAFFIC FLOW

- PROPOSED OVERLAY (2")

- PROPOSED MILLING (0"-2") & OVERLAY (2")

- PROPOSED MILLING (2") & OVERLAY (2")

- - - - LIMITS OF MILL & OVERLAY (2")



NOTES

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STATE OF TEXAS
EUGENE PALACIOS
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LICENSED
PROFESSIONAL ENGINEER

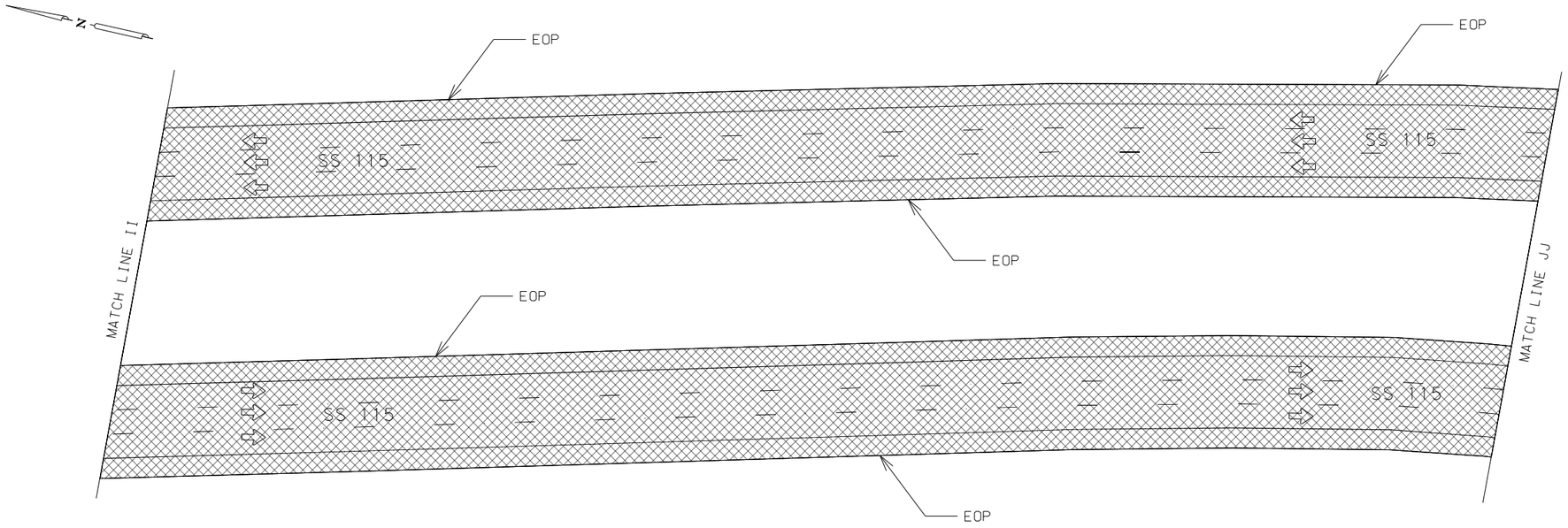
5/1/2023

Eugene Palacios

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #2
PAVING PLAN LAYOUT
SHEET 17 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		62
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.



LEGEND

EOP - EXISTING EDGE OF PAVEMENT

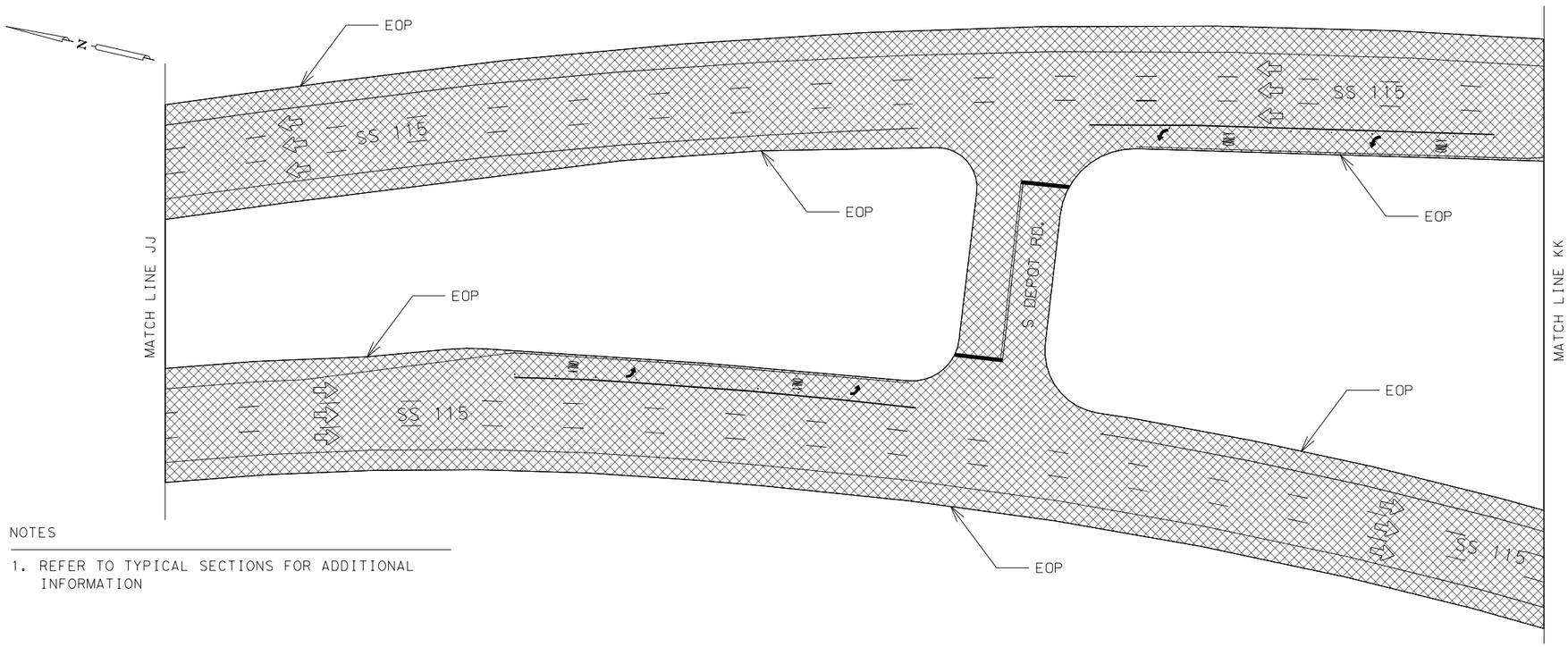
- TRAFFIC FLOW

- PROPOSED OVERLAY (2")

- PROPOSED MILLING (0"-2") & OVERLAY (2")

- PROPOSED MILLING (2") & OVERLAY (2")

- - - - LIMITS OF MILL & OVERLAY (2")



NOTES

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STATE OF TEXAS
EUGENE PALACIOS
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PROFESSIONAL ENGINEER

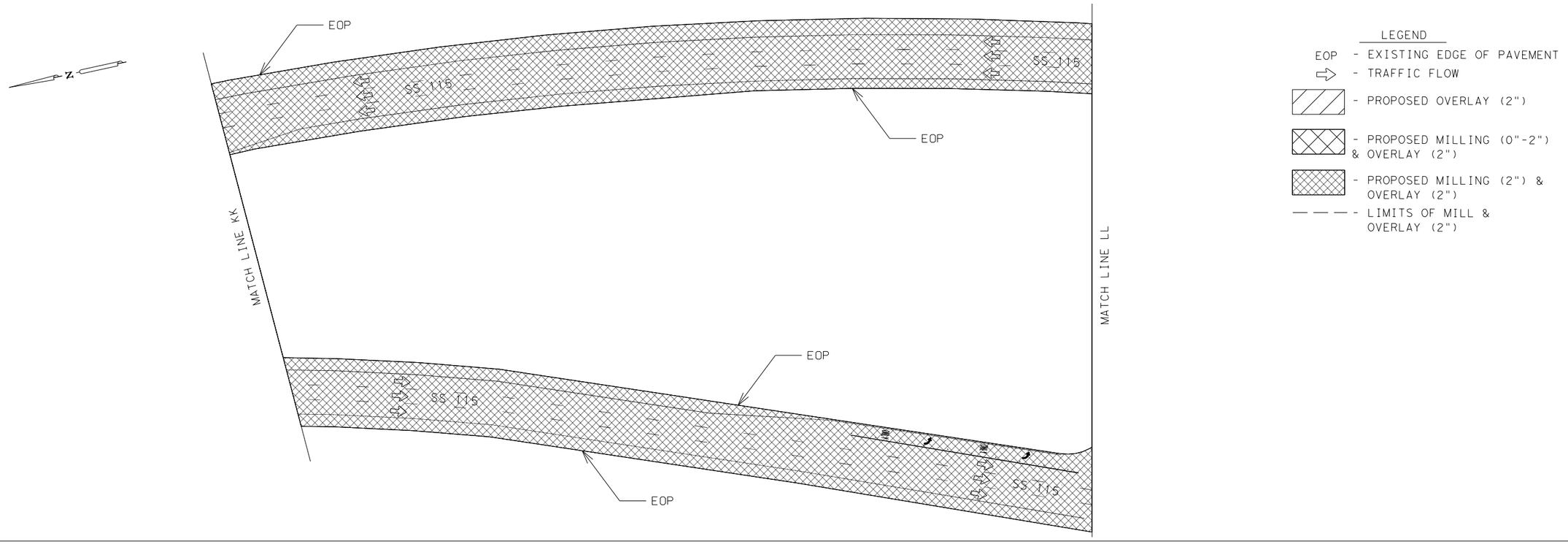
5/1/2023

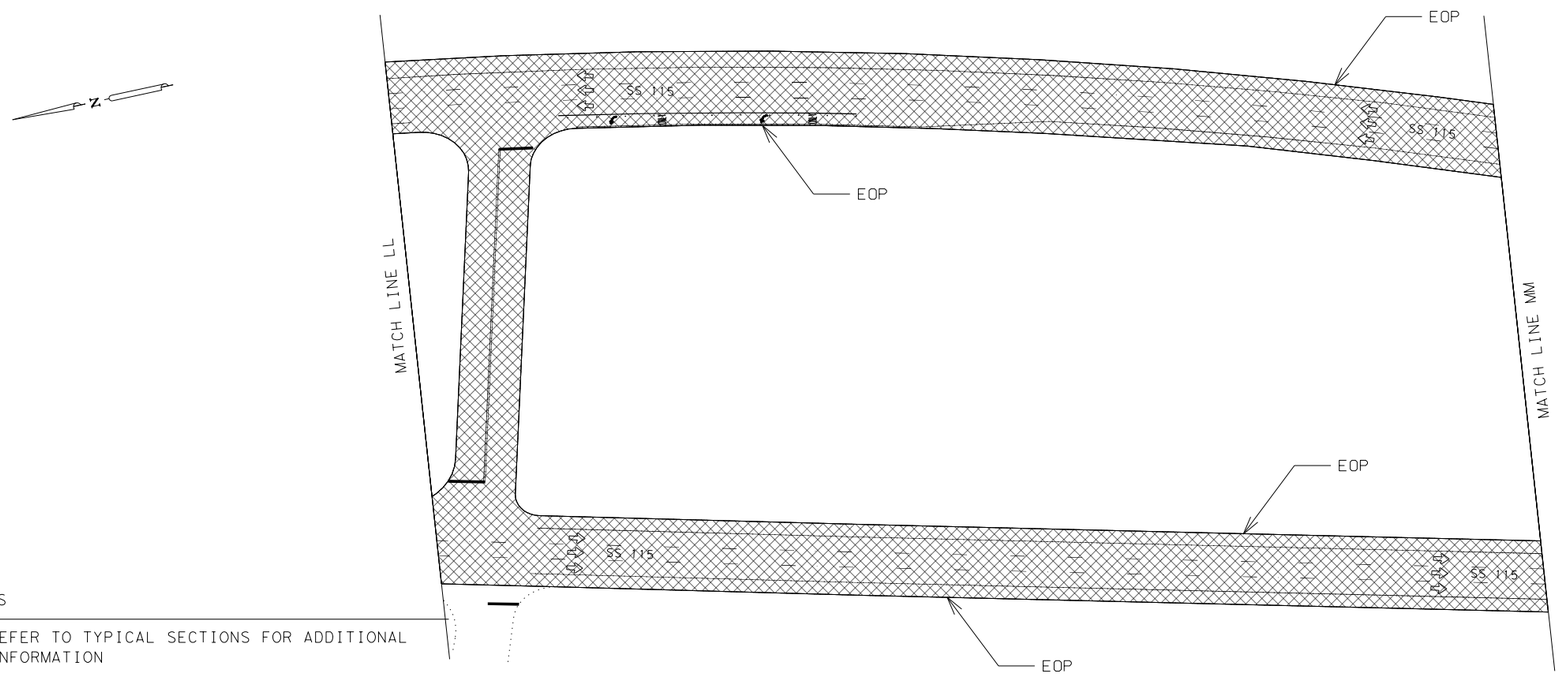
TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #2
PAVING PLAN LAYOUT

SHEET 18 OF 22 N.T.S.

FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		63
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.





NOTES

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STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

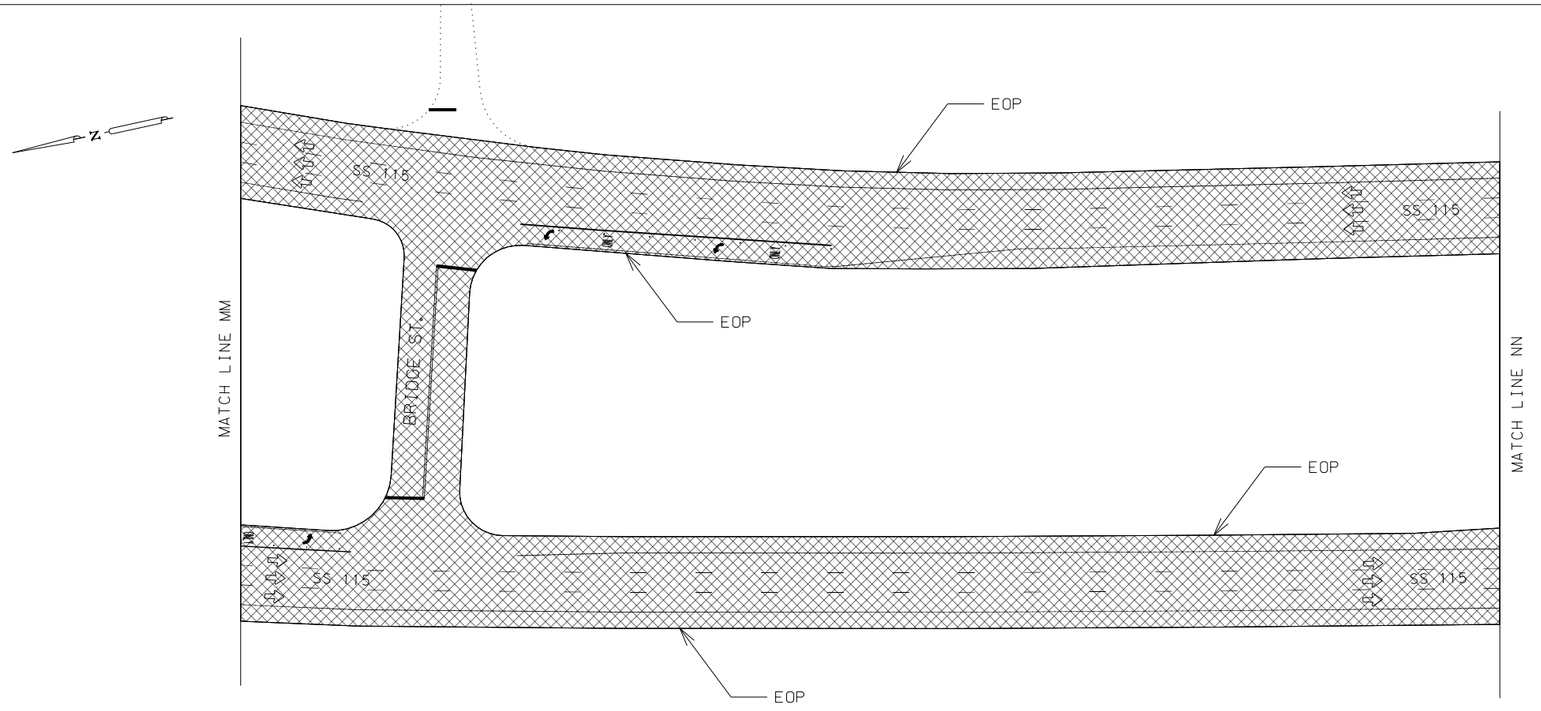
5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #2
PAVING PLAN LAYOUT

SHEET 19 OF 22 N.T.S.

FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		64
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.



LEGEND

EOP - EXISTING EDGE OF PAVEMENT

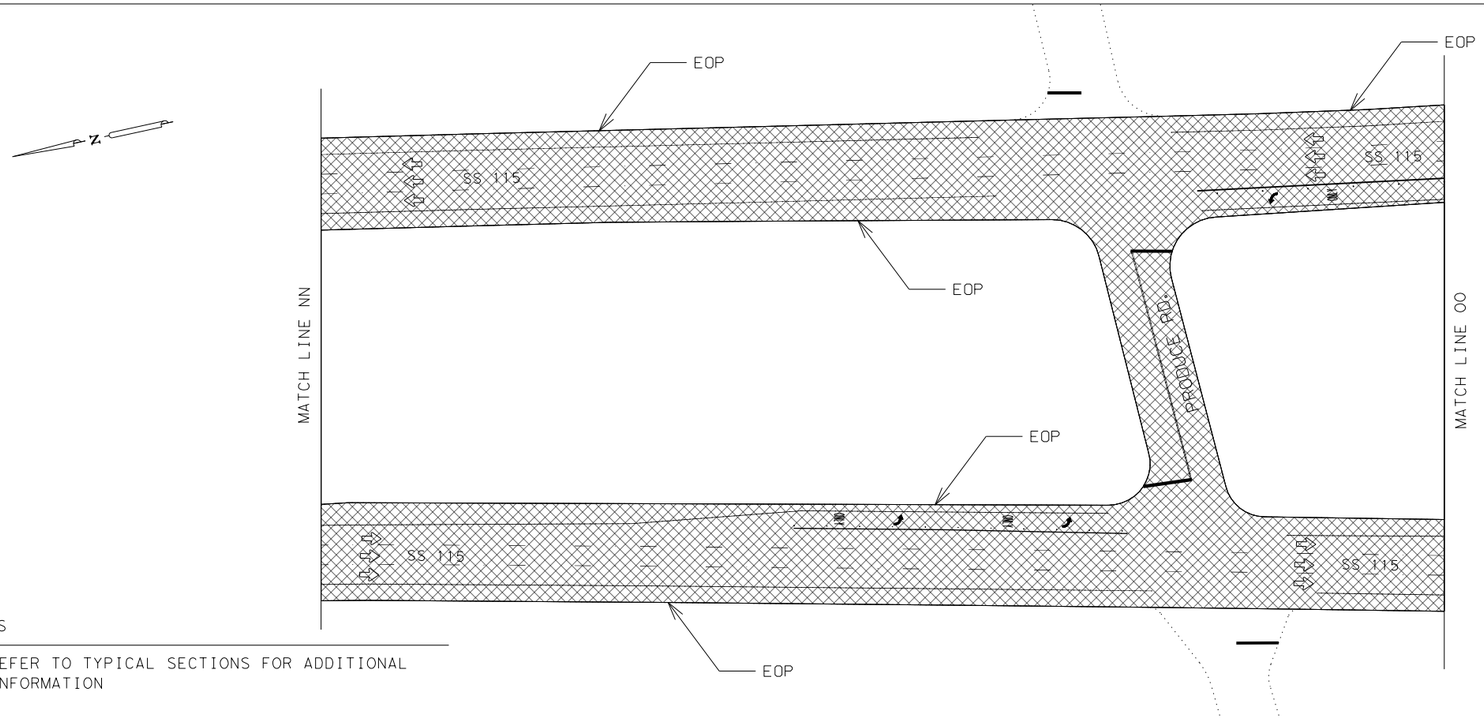
⇨ - TRAFFIC FLOW

- PROPOSED OVERLAY (2")

- PROPOSED MILLING (0"-2") & OVERLAY (2")

- PROPOSED MILLING (2") & OVERLAY (2")

— — — - LIMITS OF MILL & OVERLAY (2")



NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

STATE OF TEXAS
EUGENE PALACIOS
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LICENSED
PROFESSIONAL ENGINEER

5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #2
PAVING PLAN LAYOUT

SHEET 20 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		65
STATE	STATE DIST.NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LEGEND

EOP - EXISTING EDGE OF PAVEMENT

- TRAFFIC FLOW

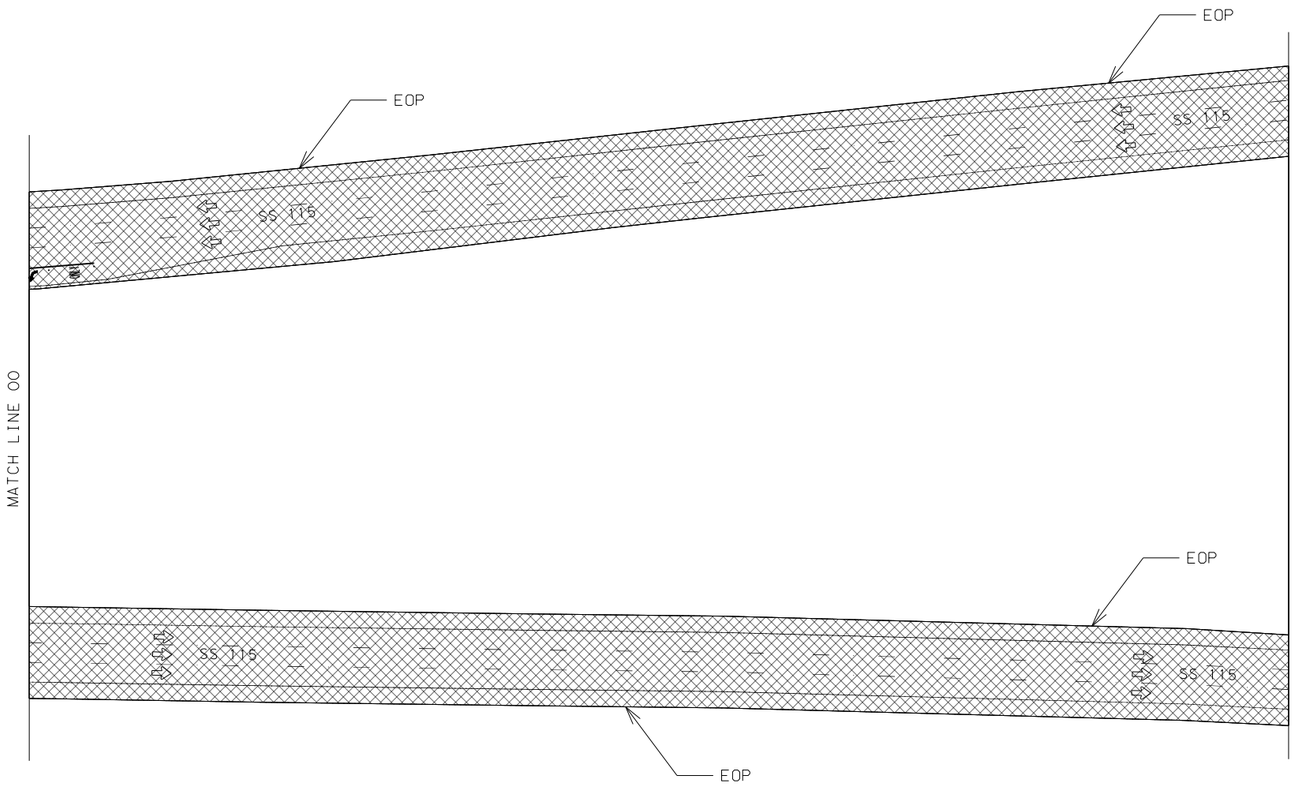
- PROPOSED OVERLAY (2")

- PROPOSED MILLING (0"-2") & OVERLAY (2")

- PROPOSED MILLING (2") & OVERLAY (2")

- - - - LIMITS OF MILL & OVERLAY (2")

N



NOTES

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STATE OF TEXAS
EUGENE PALACIOS
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LICENSED
PROFESSIONAL ENGINEER

5/1/2023

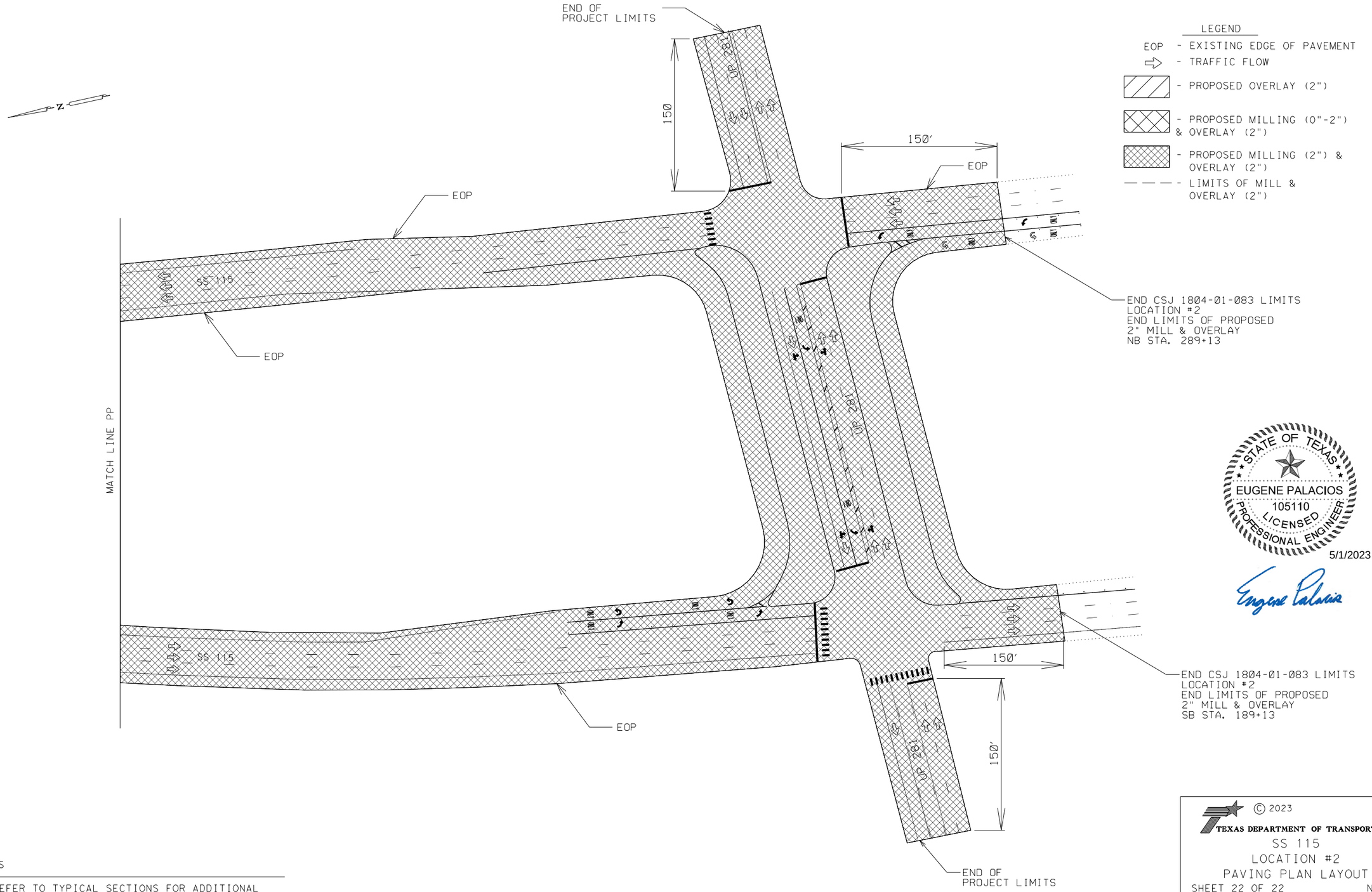
Eugene Palacios

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #2
PAVING PLAN LAYOUT

SHEET 21 OF 22 N.T.S.

FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		66
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.



STATE OF TEXAS
EUGENE PALACIOS
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PROFESSIONAL ENGINEER
5/1/2023

Eugene Palacios

NOTES

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TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #2
PAVING PLAN LAYOUT

SHEET 22 OF 22 N.T.S.

FED. RD. DIV. NO.	PROJECT NO.		COUNTY			SHEET No.
6	F 2023(909)		HIDALGO			67
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB		HIGHWAY No.
TX	PHR	1804	01	082,ETC.		SS 115,ETC.

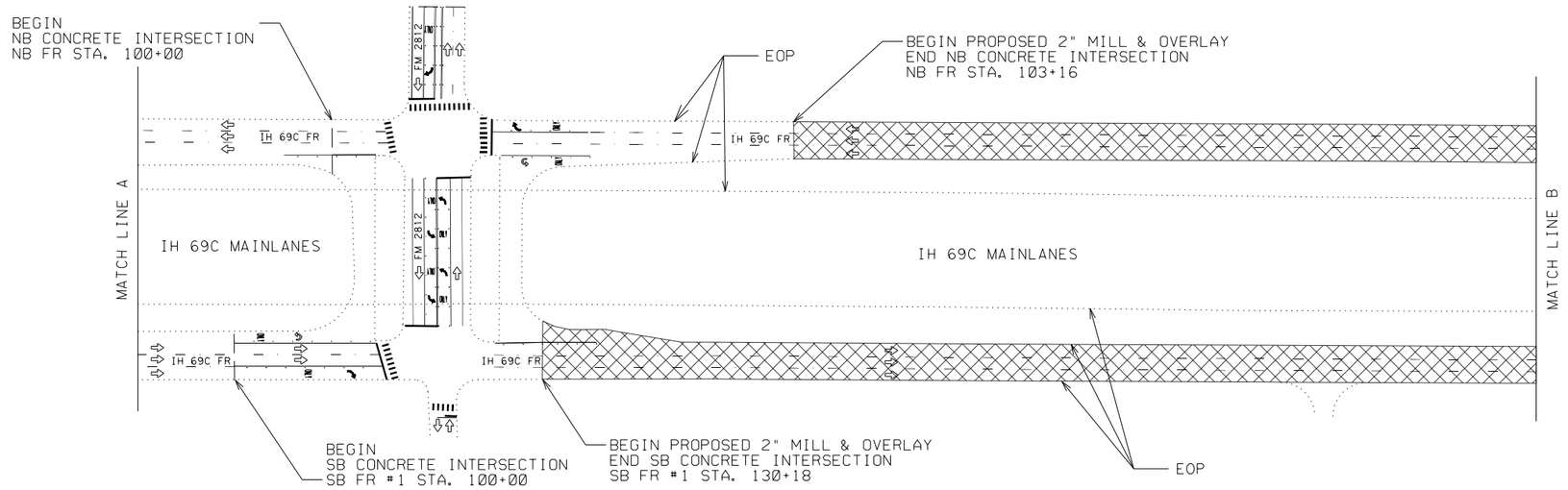
LEGEND

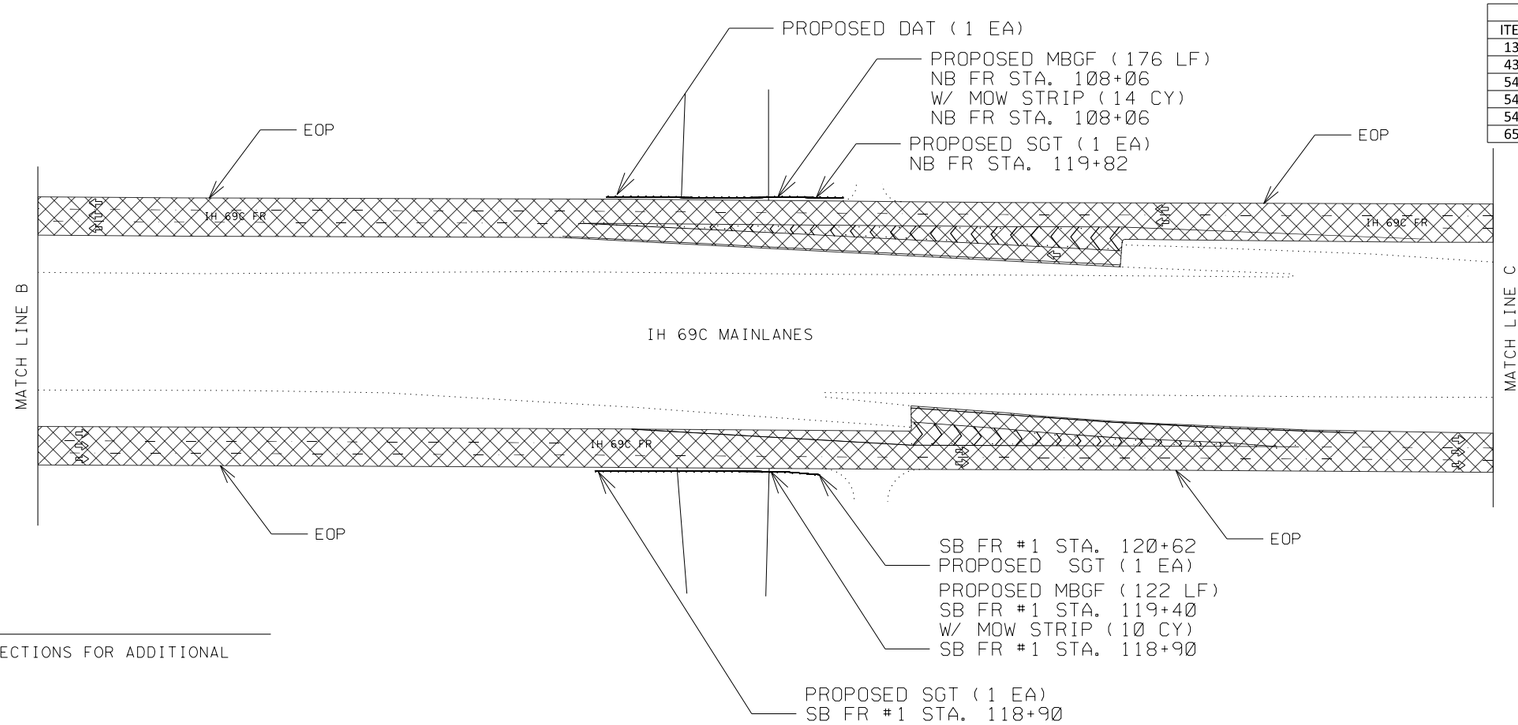
EOP - EXISTING EDGE OF PAVEMENT

- TRAFFIC FLOW

- PROPOSED MILLING & OVERLAY (2")

— — — - LIMITS OF MILL & OVERLAY (2")





NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

SHEET TOTALS

ITEM	DES CODE	EST.	UNIT	DESCRIPTION
134	6006	456	LF	BACKFILL (TY A)
432	6045	24	CY	RIPRAP (MOW STRIP) (4 IN)
540	6001	298	LF	MTL W-BEAM GD FEN TIM POST
540	6016	1	EA	DOWNSTREAM ANCHOR TERMINCAL SECTION
544	6001	3	EA	GUARDRAIL END TREATMENT (INSTALL)
658	6061	9	EA	INSTL DEL ASSM (D-SW) SZ 1 (BRF) GF2

STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

IH 69C FR.
LOCATION #3
PAVING PLAN LAYOUT

SHEET 1 OF 7 N.T.S.

FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		68
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

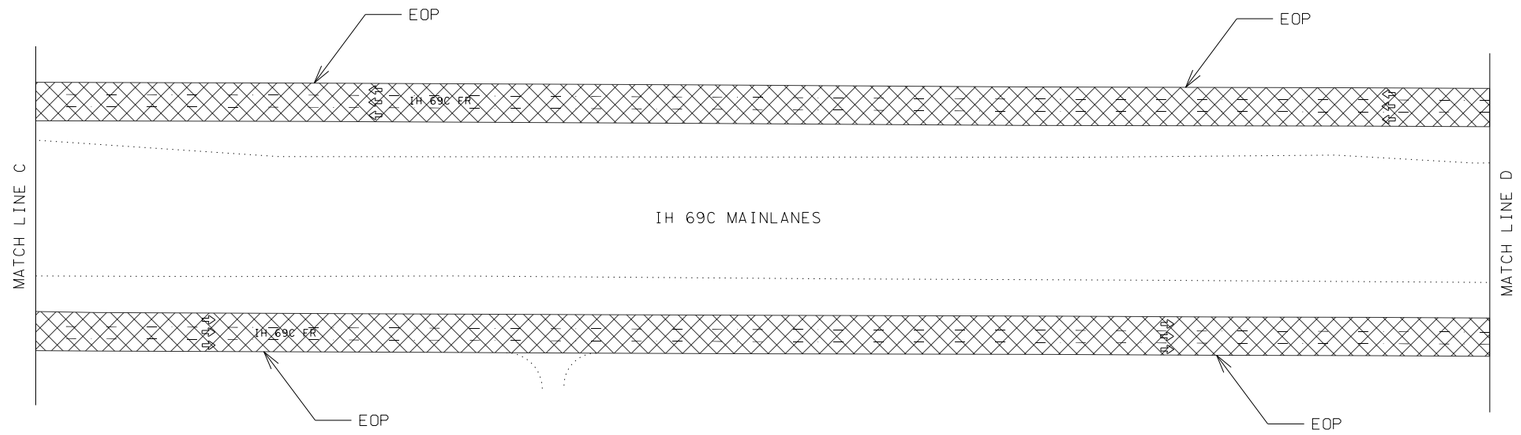
LEGEND

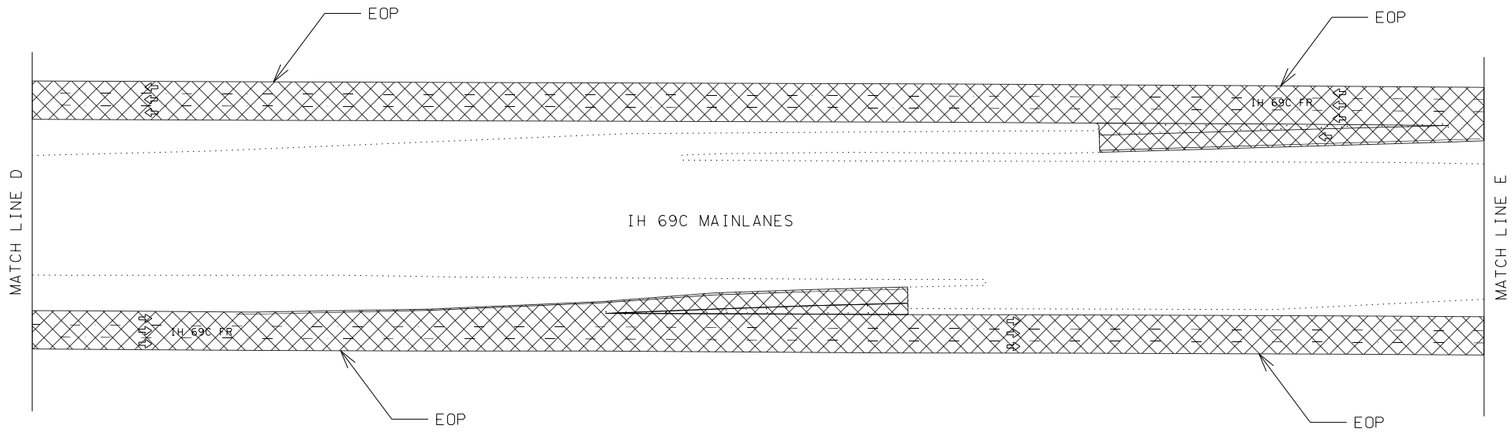
EOP - EXISTING EDGE OF PAVEMENT

- TRAFFIC FLOW

- PROPOSED MILLING & OVERLAY (2")

— — — - LIMITS OF MILL & OVERLAY (2")





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STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

IH 69C FR.
LOCATION #3
PAVING PLAN LAYOUT

SHEET 2 OF 7 N.T.S.

FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		69
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

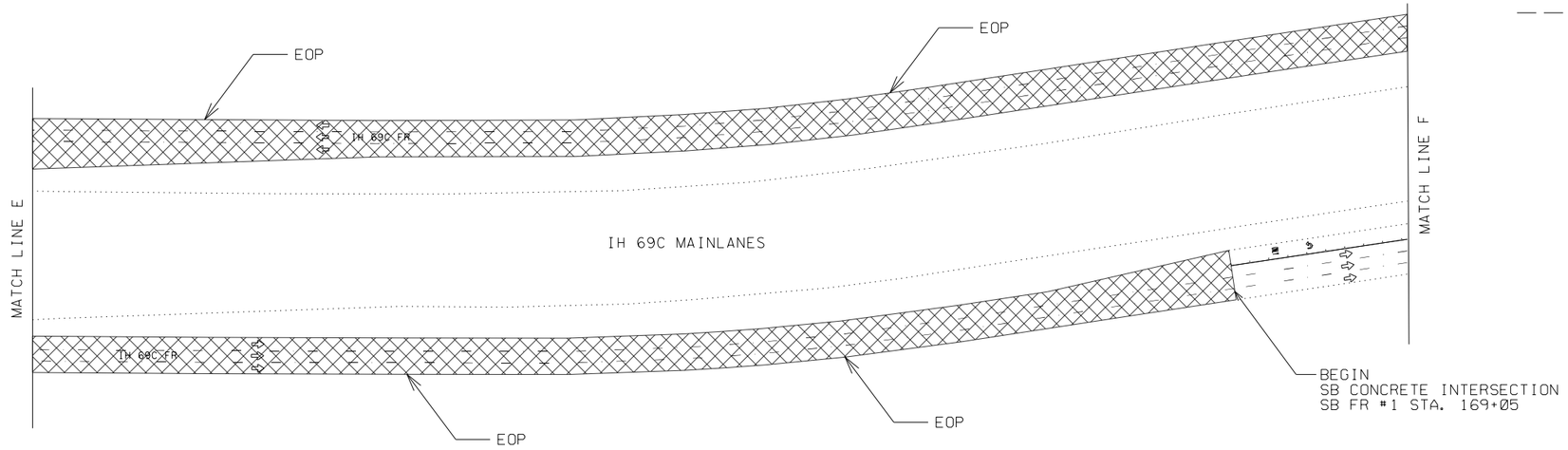
LEGEND

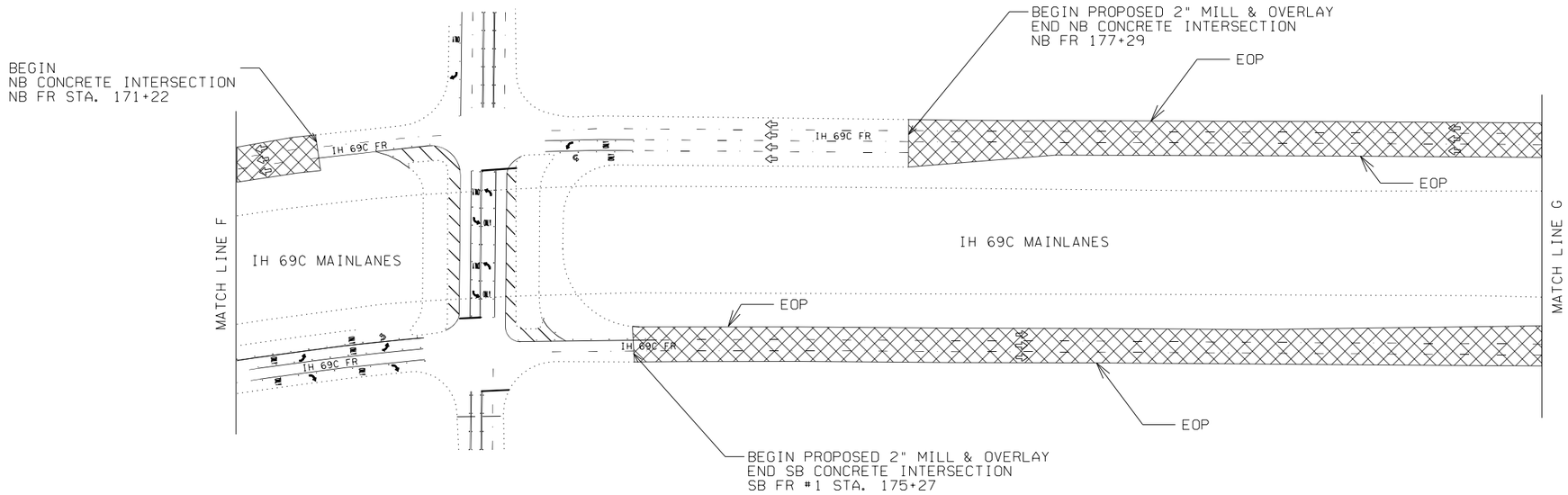
EOP - EXISTING EDGE OF PAVEMENT

- TRAFFIC FLOW

- PROPOSED MILLING & OVERLAY (2")

— — — - LIMITS OF MILL & OVERLAY (2")





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STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

IH 69C FR.
LOCATION #3
PAVING PLAN LAYOUT

SHEET 3 OF 7 N.T.S.

FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		70
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LEGEND

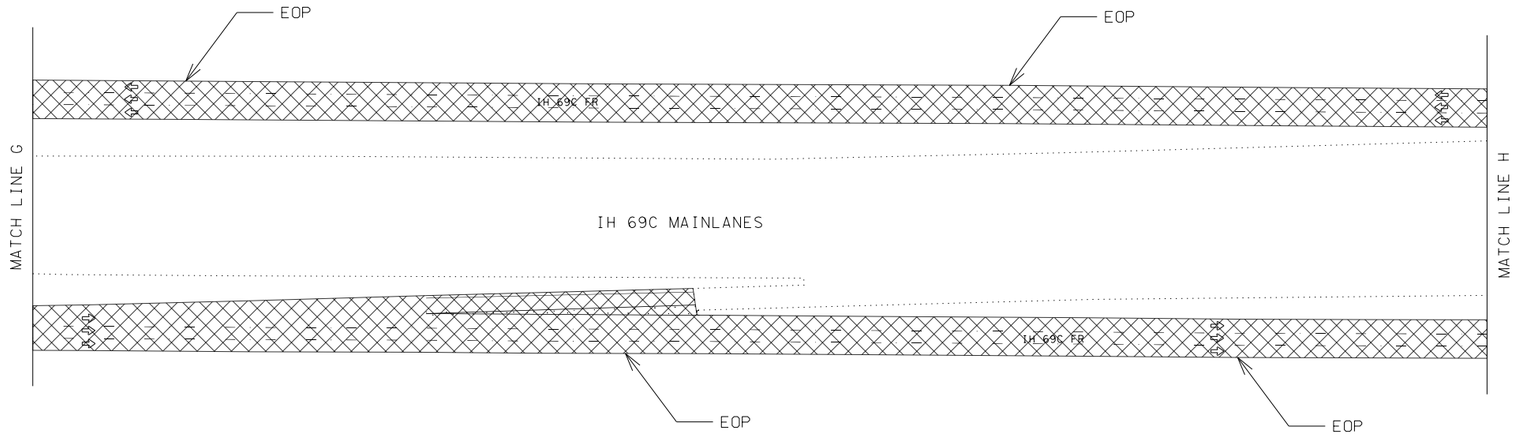
EOP - EXISTING EDGE OF PAVEMENT

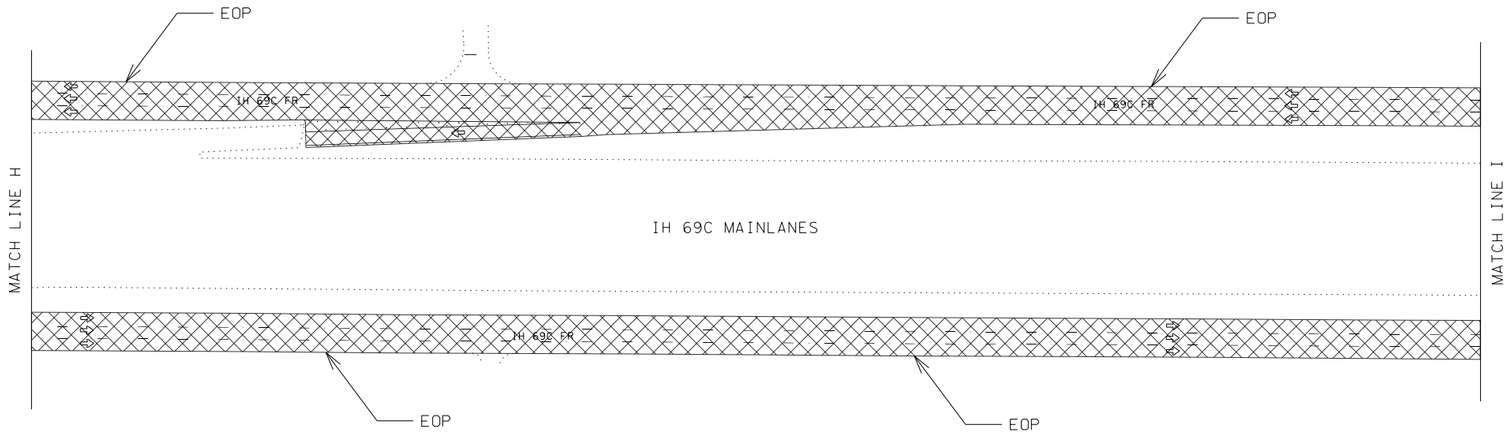
- TRAFFIC FLOW

- PROPOSED MILLING & OVERLAY (2")

— — — - LIMITS OF MILL & OVERLAY (2")

N





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STATE OF TEXAS
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PROFESSIONAL ENGINEER

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TEXAS DEPARTMENT OF TRANSPORTATION

IH 69C FR.
LOCATION #3
PAVING PLAN LAYOUT

SHEET 4 OF 7 N.T.S.

FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		71
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

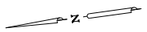
LEGEND

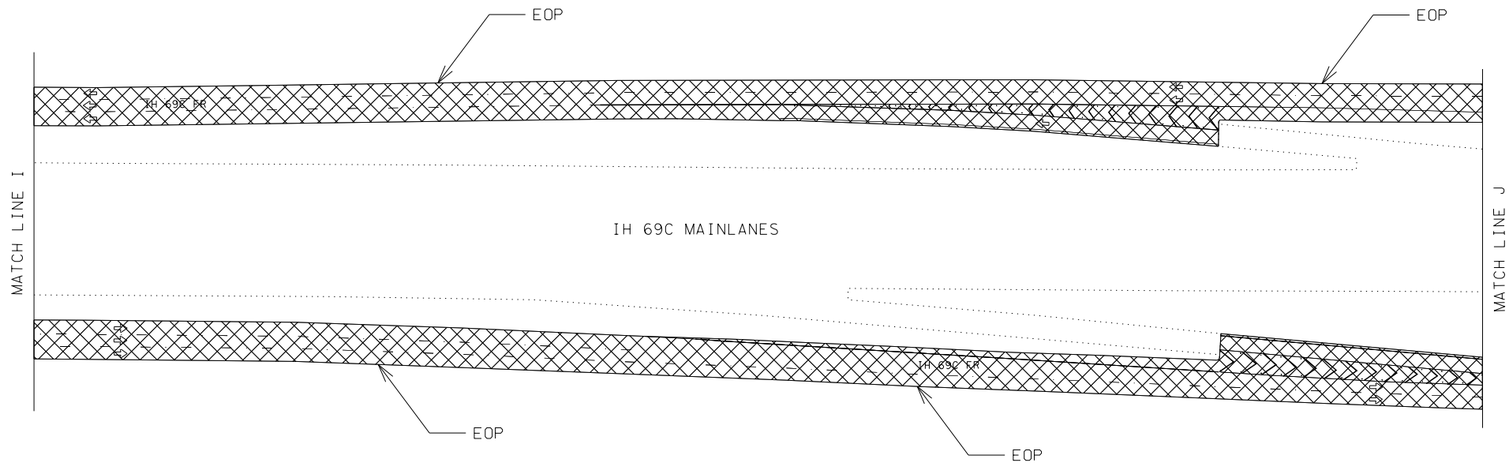
EOP - EXISTING EDGE OF PAVEMENT

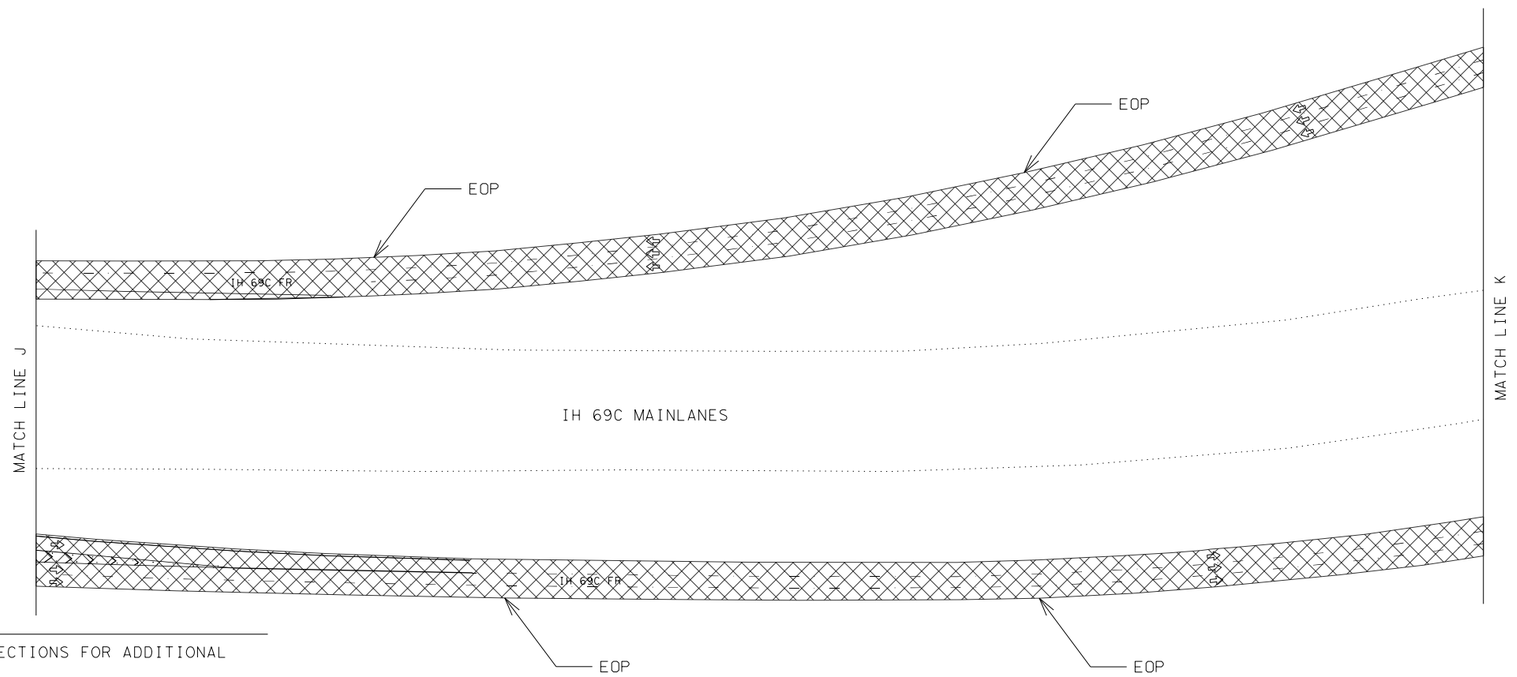
- TRAFFIC FLOW

- PROPOSED MILLING & OVERLAY (2")

— — — - LIMITS OF MILL & OVERLAY (2")







NOTES

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STATE OF TEXAS
EUGENE PALACIOS
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LICENSED
PROFESSIONAL ENGINEER

5/1/2023

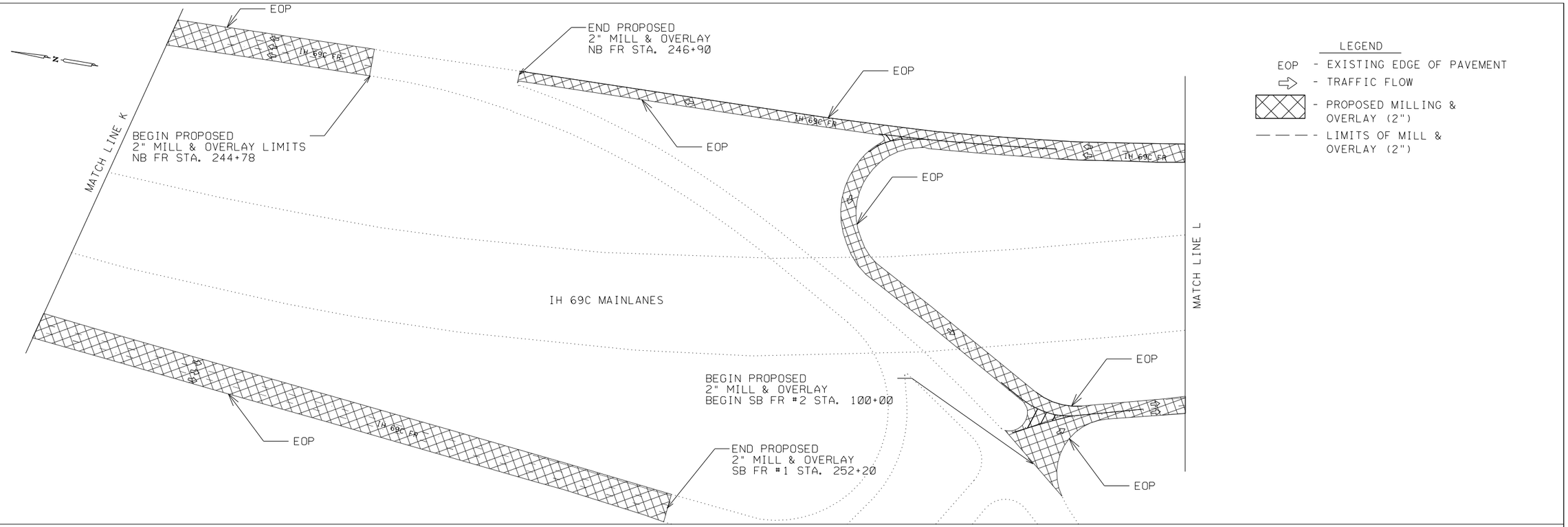
Eugene Palacios

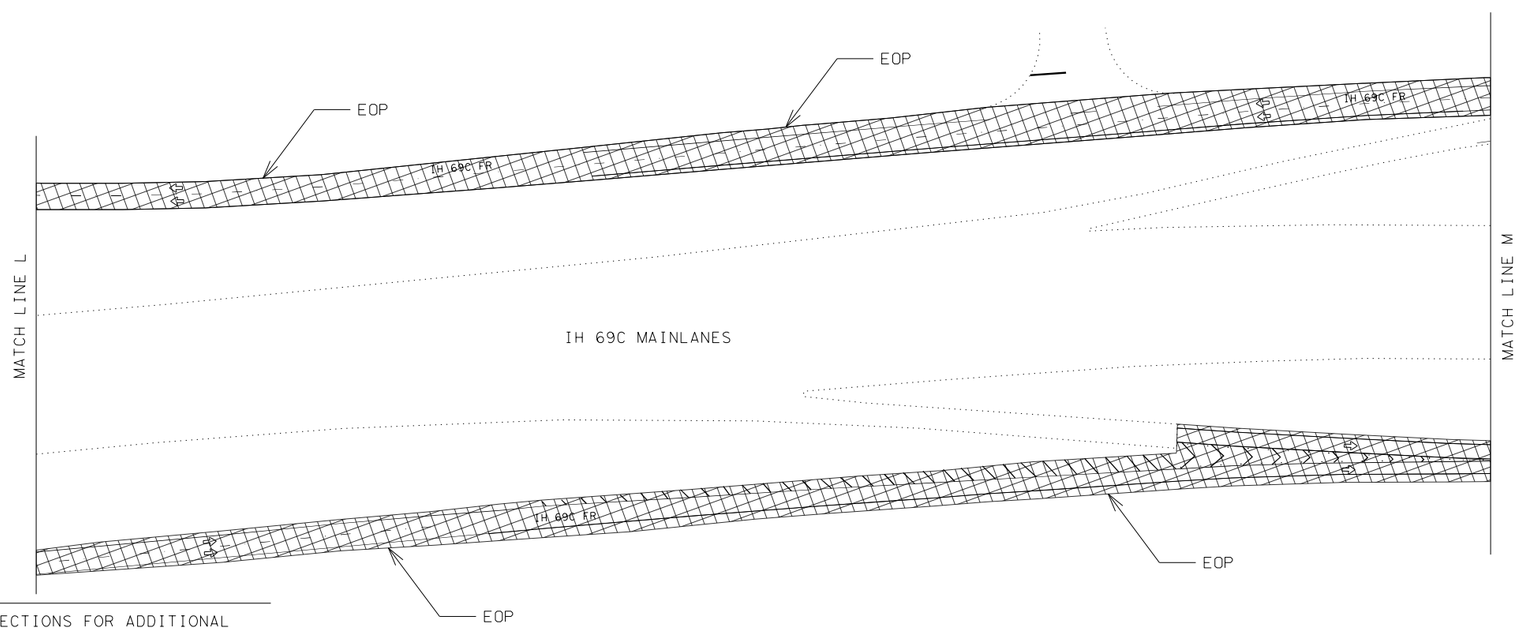
TEXAS DEPARTMENT OF TRANSPORTATION

IH 69C FR.
LOCATION #3
PAVING PLAN LAYOUT

SHEET 5 OF 7 N.T.S.

FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		72
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.





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STATE OF TEXAS
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PROFESSIONAL ENGINEER
5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

IH 69C FR.
LOCATION #3
PAVING PLAN LAYOUT
SHEET 6 OF 7 N.T.S.

FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		73
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

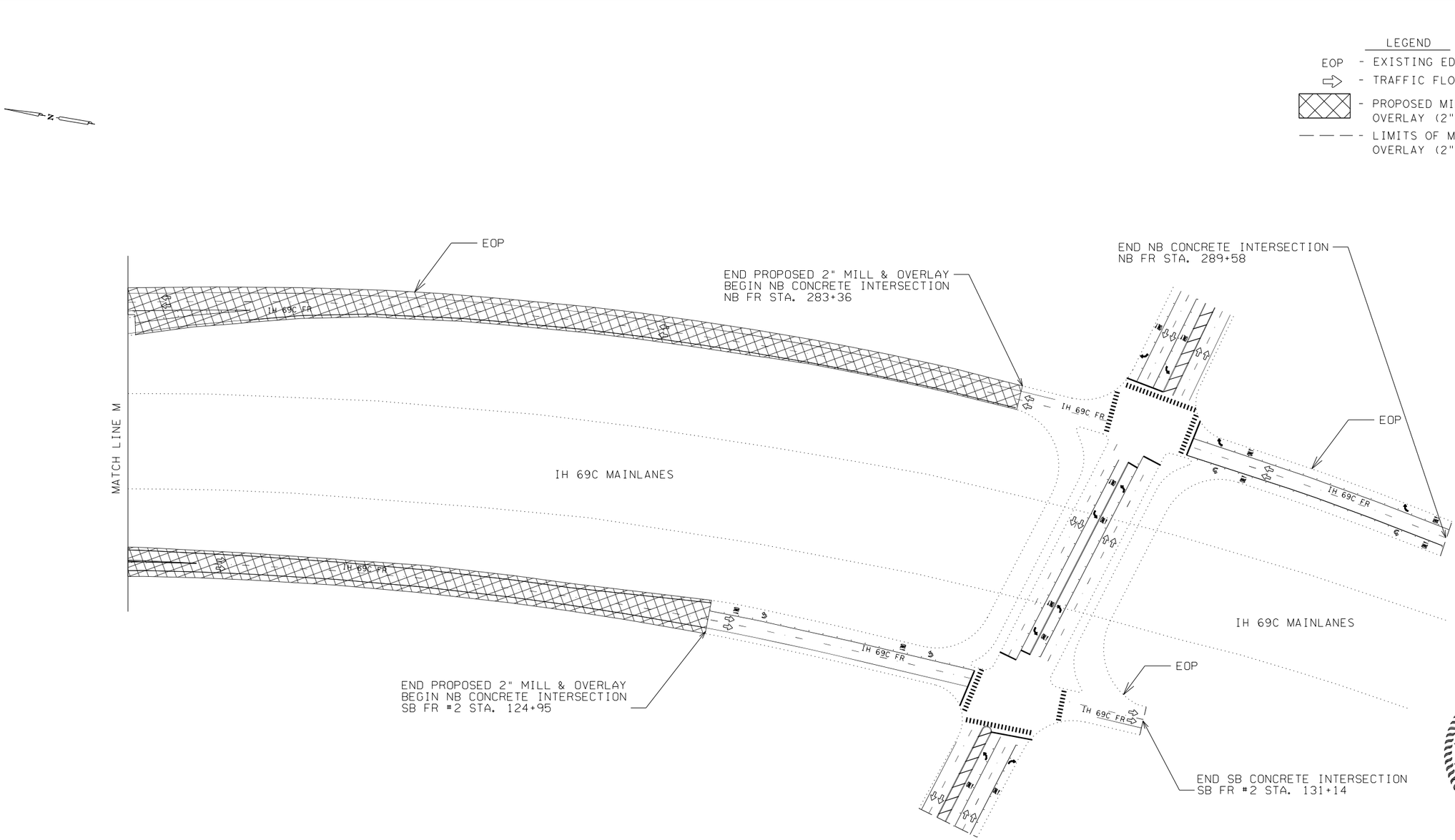
LEGEND

EOP - EXISTING EDGE OF PAVEMENT

- TRAFFIC FLOW

- PROPOSED MILLING & OVERLAY (2")

— — — - LIMITS OF MILL & OVERLAY (2")



STATE OF TEXAS
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105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

Eugene Palacios

NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

TEXAS DEPARTMENT OF TRANSPORTATION

IH 69C FR.
LOCATION #3
PAVING PLAN LAYOUT

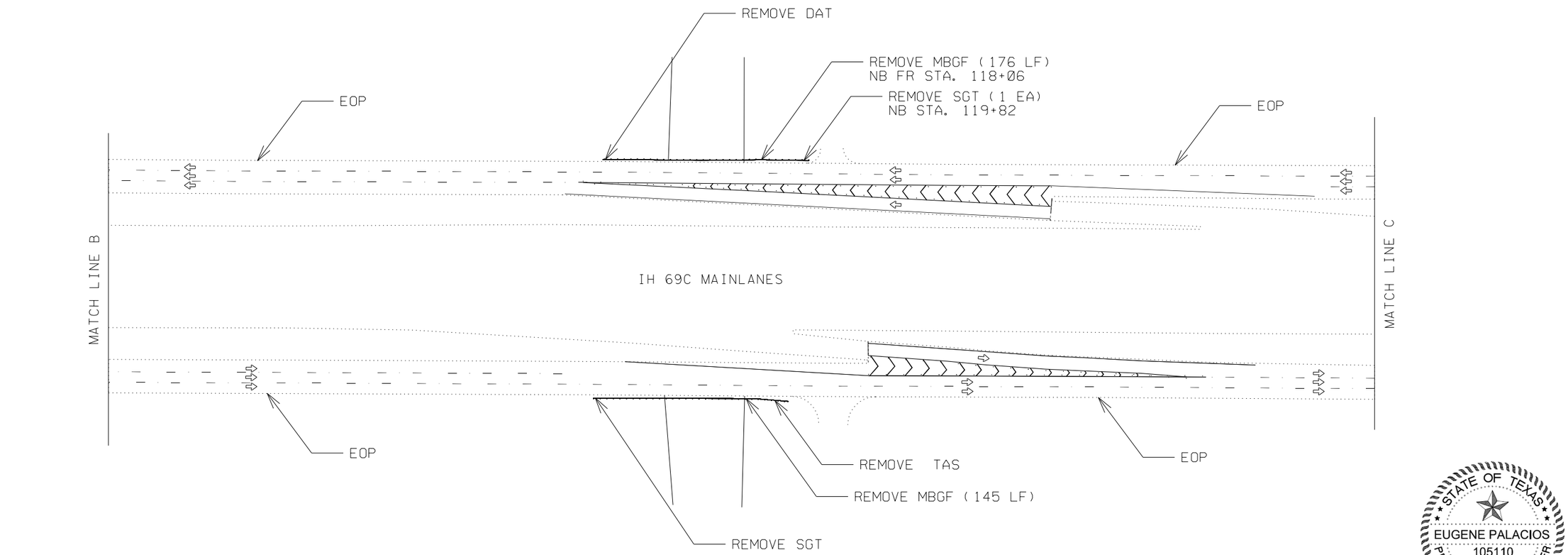
SHEET 7 OF 7 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		74
STATE	STATE DIST.NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LEGEND

EOP - EXISTING EDGE OF PAVEMENT

⇨ - TRAFFIC FLOW



SHEET TOTALS				
ITEM	DES CODE	EST.	UNIT	DESCRIPTION
542	6001	321	LF	REMOVE METAL BEAM GUARD FENCE
542	6002	1	EA	REMOVE TERMINAL ANCHOR SECTION
542	6003	1	EA	REMOVE DOWNSTREAM ANCHOR TERMINAL
544	6003	2	EA	GUARDRAIL END TREATMENT (REMOVE)
658	6060	9	EA	REMOVE DELIN & OBJECT MARKER ASSMS

NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION
2. SEE PAVING PLAN FOR MATCHLINE ORDER

STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

Eugene Palacios

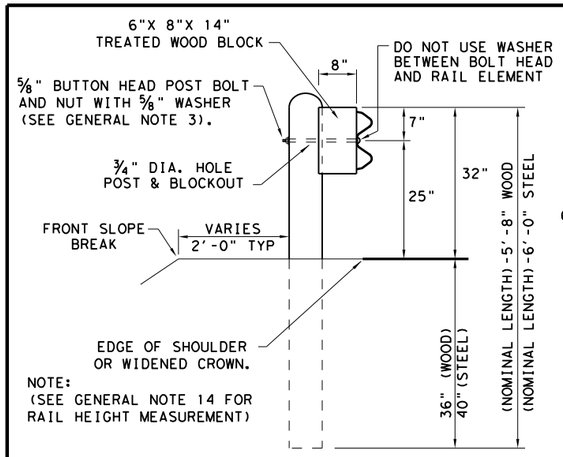
TEXAS DEPARTMENT OF TRANSPORTATION

IH 69C FR.
LOCATION #3
MBGF REMOVAL PLAN

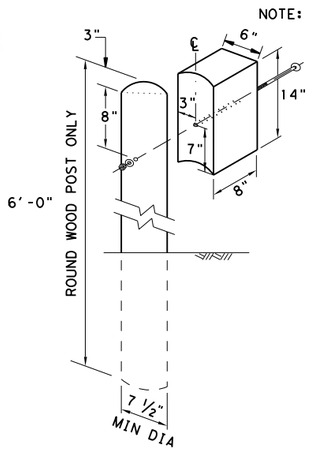
N. T. S.

FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		75
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

DATE:
FILE:

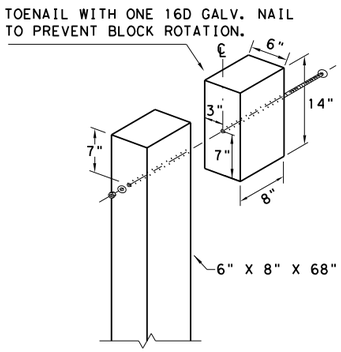


TYPICAL POST PLACEMENT

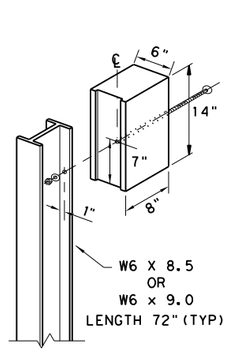


WOOD BLOCK TO ROUND WOOD POST

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

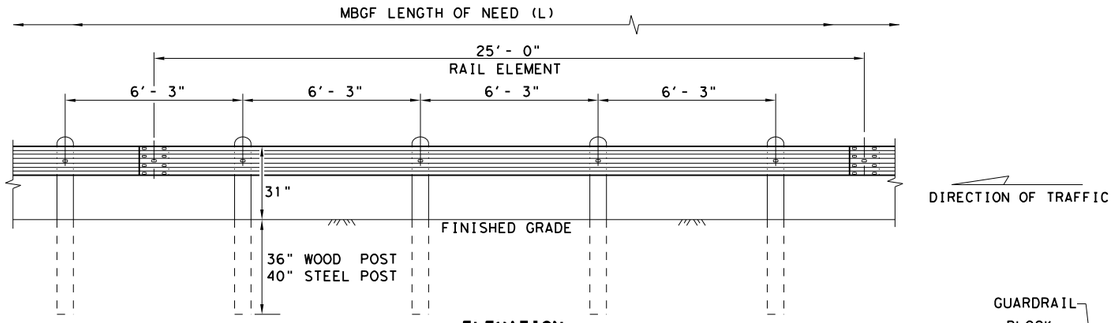


WOOD BLOCK TO RECTANGULAR WOOD POST



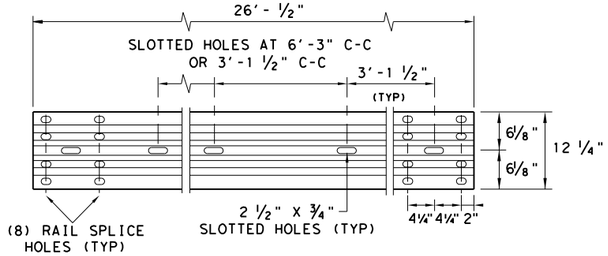
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

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



ELEVATION MID-SPAN RAIL SPLICE

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

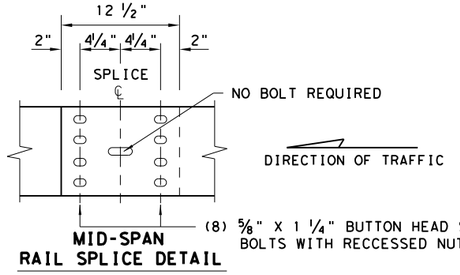


ELEVATION 25'- 0" (NOM.) W-BEAM SECTION

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

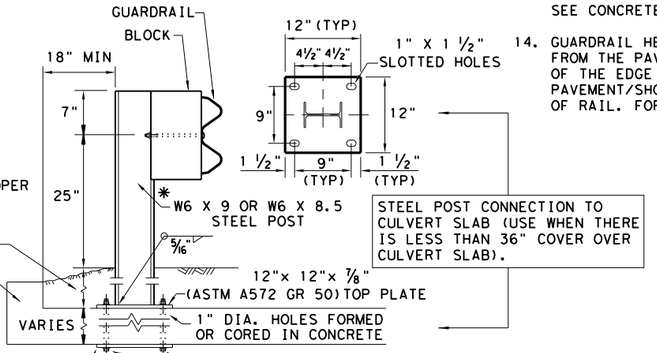
BUTTON HEAD BOLT

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.

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

GENERAL NOTES

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

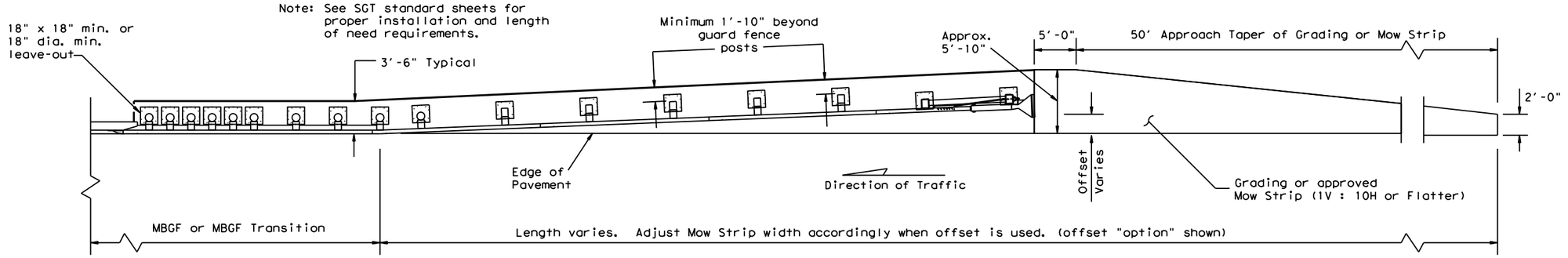
Texas Department of Transportation

Design Division Standard

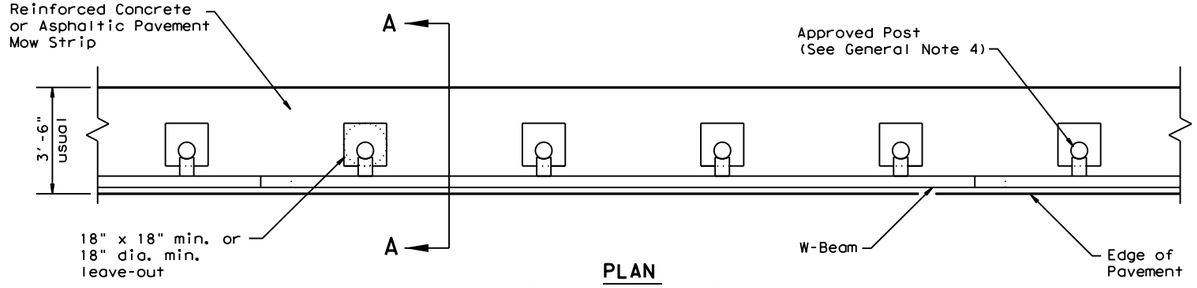
METAL BEAM GUARD FENCE
TL-3 MASH COMPLIANT
GF(31)-19

FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
	1804	01	082,ETC.	SS 115,ETC.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		76

DATE:
FILE:

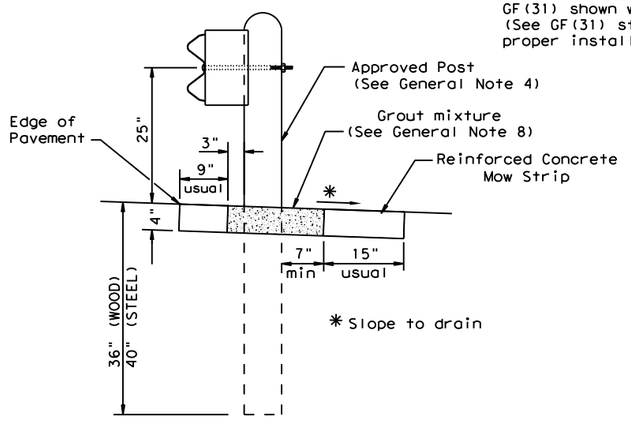


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



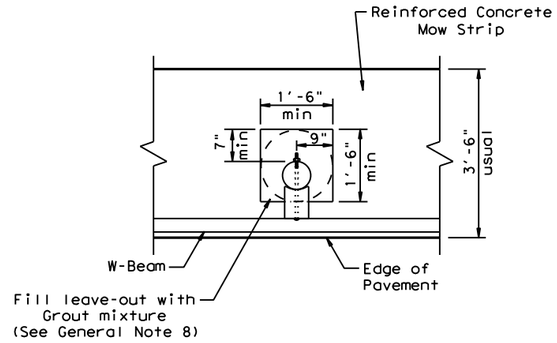
PLAN

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



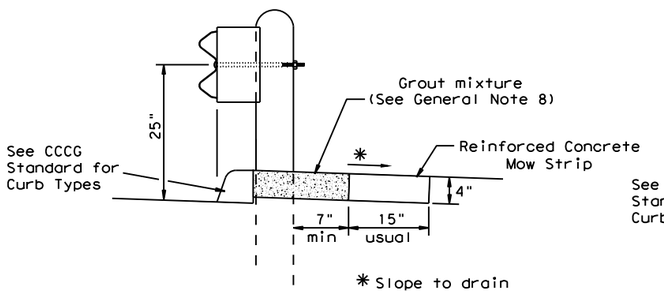
SECTION A-A

Typical



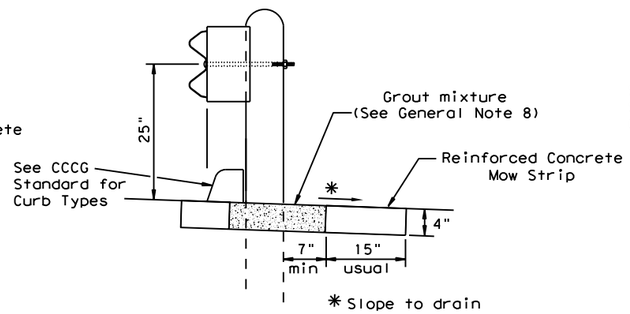
MOW STRIP DETAIL

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



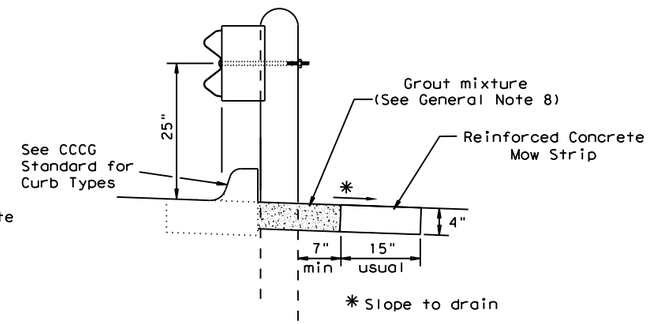
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

Note: Site Condition(s)

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

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

GENERAL NOTES

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

Texas Department of Transportation

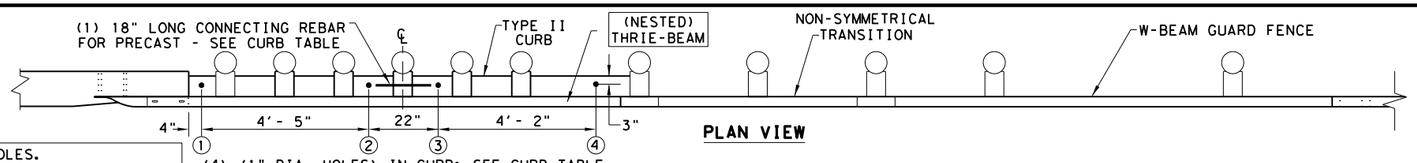
Design Division Standard

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

GF(31)MS-19

FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG	
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY	
REVISIONS	1804	01	082, ETC.	SS 115, ETC.	
	DIST	COUNTY		SHEET NO.	
	PHR	HIDALGO		77	

DATE:
FILE:



PLAN VIEW

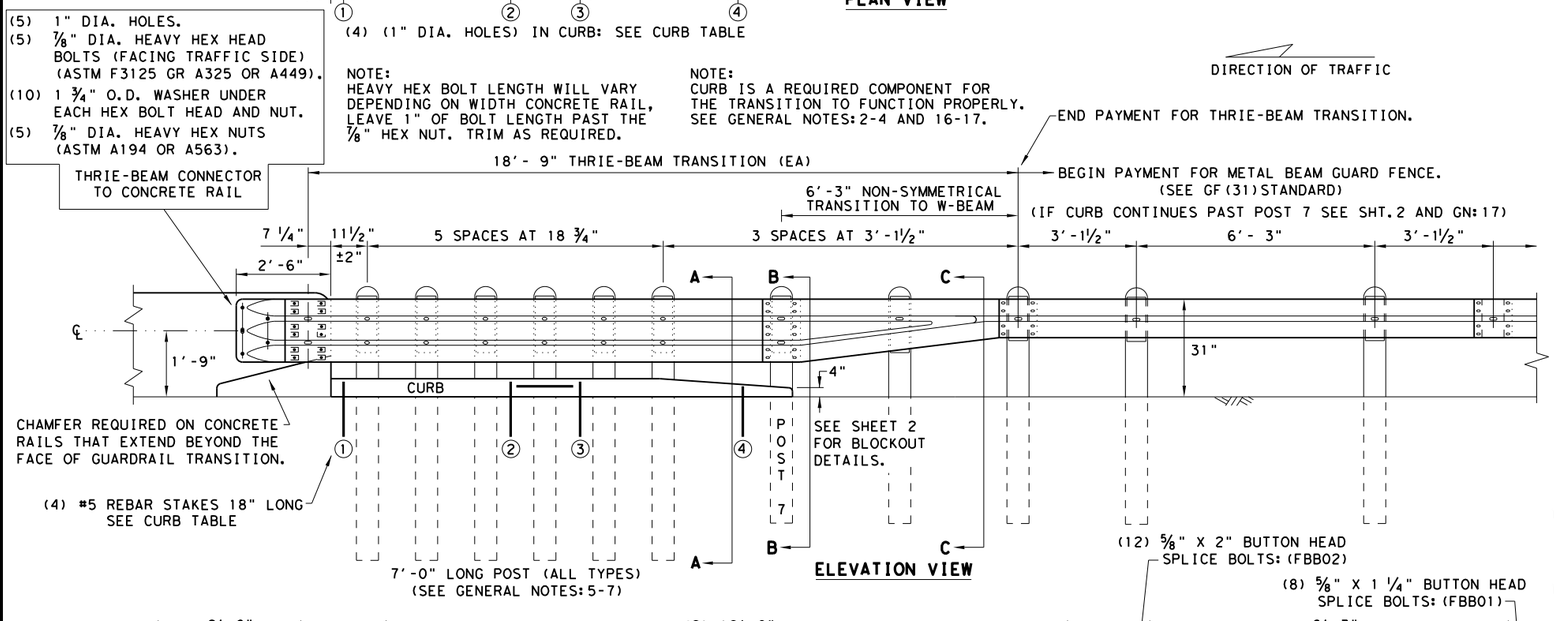
(4) (1" DIA. HOLES) IN CURB: SEE CURB TABLE

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

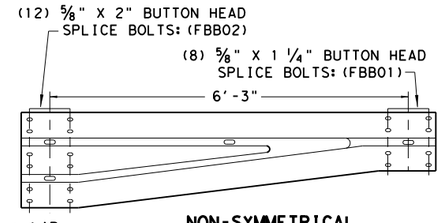
NOTE:
HEAVY HEX BOLT LENGTH WILL VARY DEPENDING ON WIDTH CONCRETE RAIL, LEAVE 1" OF BOLT LENGTH PAST THE ⅞" HEX NUT. TRIM AS REQUIRED.

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

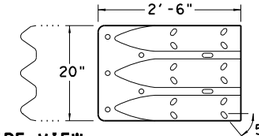
DIRECTION OF TRAFFIC



ELEVATION VIEW

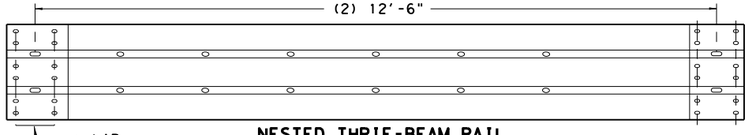


NON-SYMMETRICAL W-BEAM TO THRIE-BEAM TRANSITION 10GA.
PART DESIGNATOR RWT02a OR RWT02b



SIDE-VIEW

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

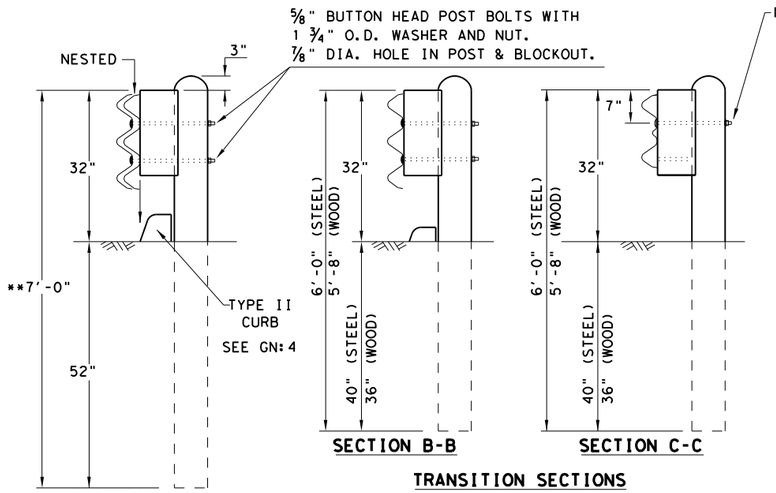


NESTED THRIE-BEAM RAIL
PART DESIGNATOR RTM10a

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

PLATE WASHER INSTRUCTIONS

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



SECTION A-A

SECTION B-B

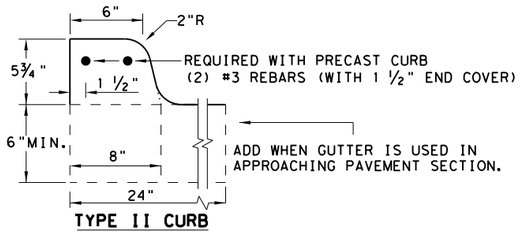
SECTION C-C

TRANSITION SECTIONS

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

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

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



TYPE II CURB

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

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

TYPE II CURB DETAILS

GENERAL NOTES

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

HIGH-SPEED TRANSITION

Texas Department of Transportation — Design Division Standard

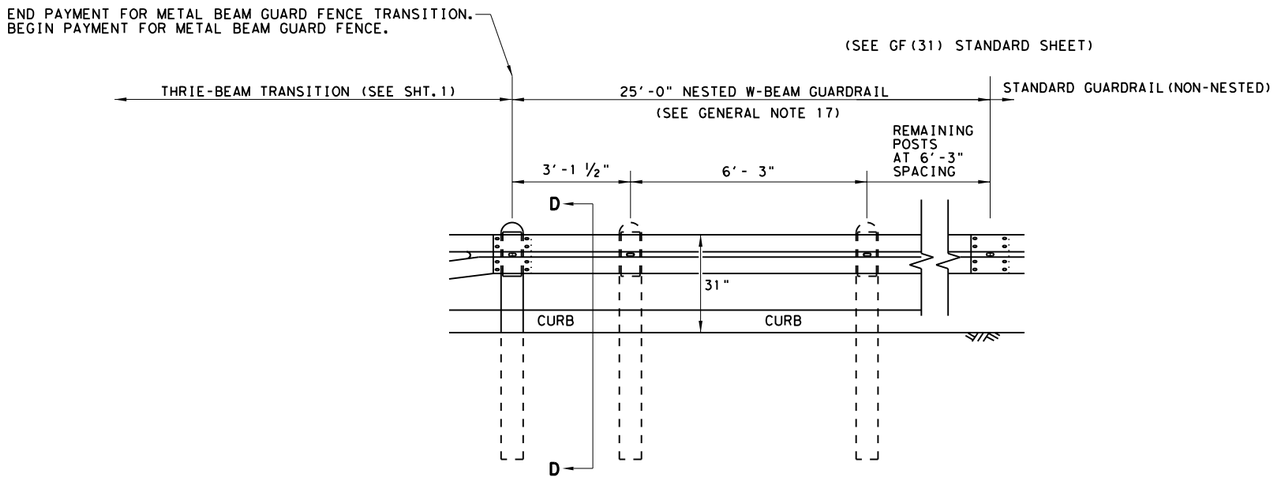
METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-3 MASH COMPLIANT

GF(31)TR TL3-20

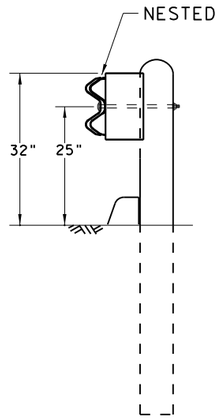
FILE: gf31trtl320.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG		
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB		HIGHWAY	
REVISIONS	1804	01	082,ETC.		SS 115,ETC.	
	DIST	COUNTY			SHEET NO.	
	PHR	HIDALGO			78	

DATE:
FILE:

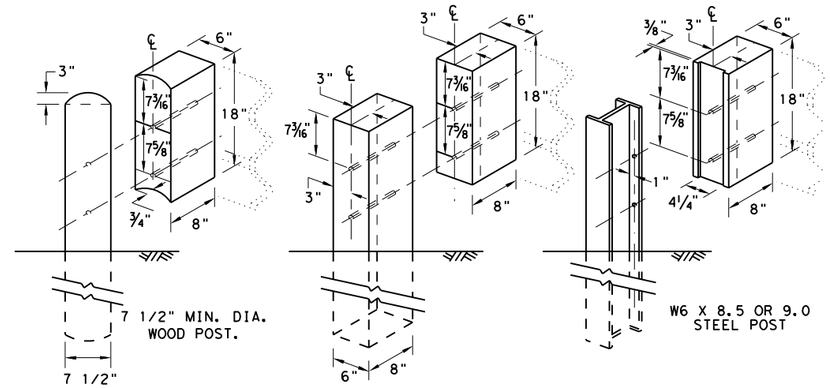
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



ELEVATION VIEW



SECTION D-D



THRIE BEAM TRANSITION BLOCKOUT DETAILS

HIGH-SPEED TRANSITION

SHEET 2 OF 2

Texas Department of Transportation | Design Division Standard

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

GF(31)TR TL3-20

FILE: gf31tr1320.dgn	DN: TxDOT	CK: KM	DW: KM	CK: CGL/AG	
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	1804	01	082,ETC.	SS 115,ETC.	
	DIST	COUNTY		SHEET NO.	
	PHR	HIDALGO		79	

DATE:
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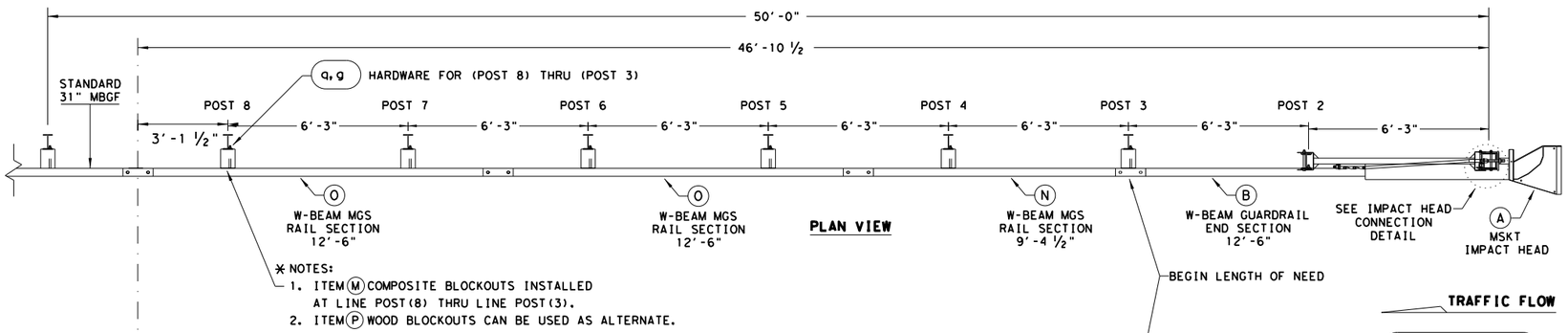
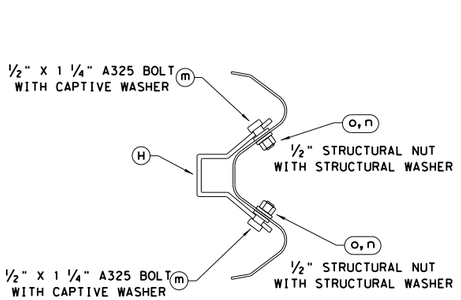
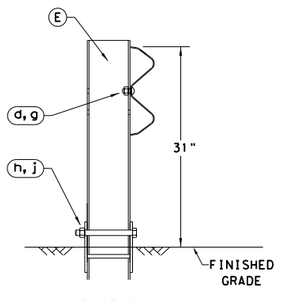


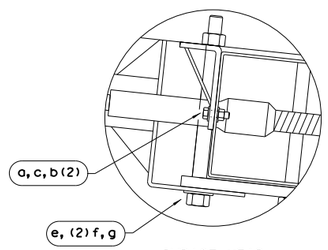
NOTE: SEE (GENERAL NOTE 14) FOR DRIVING CAP INFORMATION.



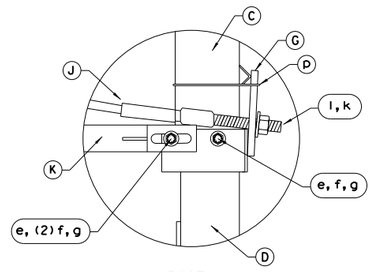
SECTION B-B
ANCHOR BRACKET



POST 2
SECTION A-A



IMPACT HEAD
CONNECTION DETAIL



POST 1
CONNECTION DETAIL

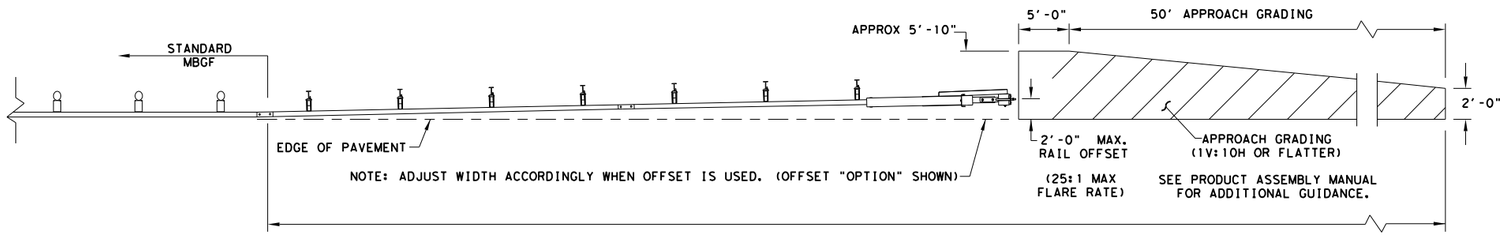
GENERAL NOTES

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

SEE NOTES: *

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

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM NUMBERS
A	1	MSKT IMPACT HEAD	MS3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 Ga.	SF1303
C	1	POST 1 - TOP (6" X 6" X ⅛" 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 ½")	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	⅝" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	⅝" WASHER	W0516
c	2	⅝" HEX NUT	N0516
d	25	⅝" Dia. x 1 ¼" SPLICE BOLT (POST 2)	B580122
e	2	⅝" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	⅝" WASHER	W050
g	33	⅝" Dia. H.G.R NUT	N050
h	1	¾" Dia. x 8 ½" HEX BOLT (GRD A449)	B340854A
j	1	¾" Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	½" x 1 ¼" A325 BOLT WITH CAPTIVE WASHER	SB12A
n	8	½" 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	⅝" x 10" H.G.R. BOLT	B581002
r	1	OBJECT MARKER 18" X 18"	E3151



APPROACH GRADING AT GUARDRAIL END TREATMENTS

TRAFFIC FLOW

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

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

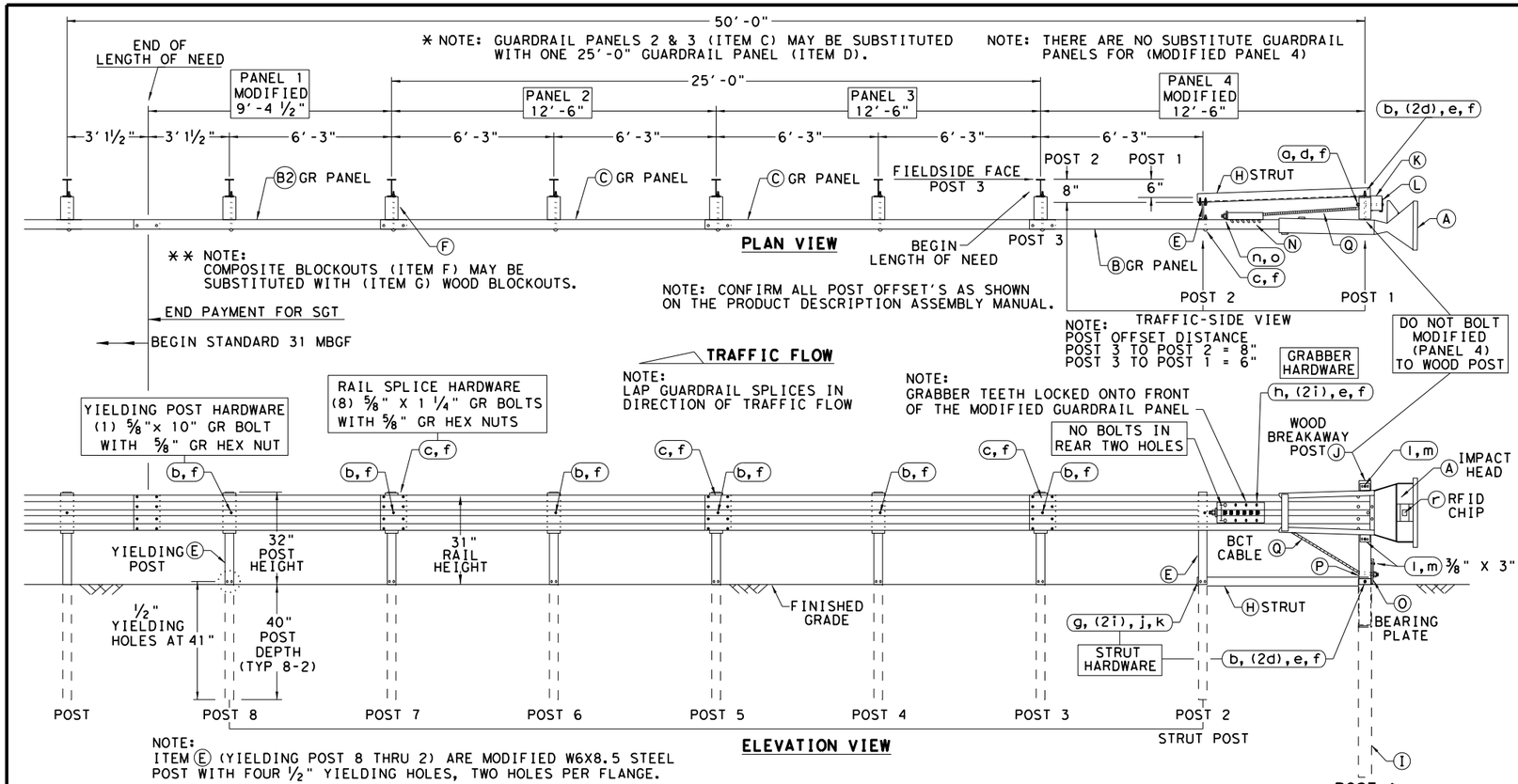
Texas Department of Transportation

Design Division Standard

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

FILE: sgt12s3118.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CL		
© TxDOT: APRIL 2018	CONT	SECT	JOB	HIGHWAY		
REVISIONS	1804	01	082,ETC.	SS 115,ETC.		
	DIST	COUNTY		SHEET NO.		
	PHR	HIDALGO		80		

DATE:
FILE:

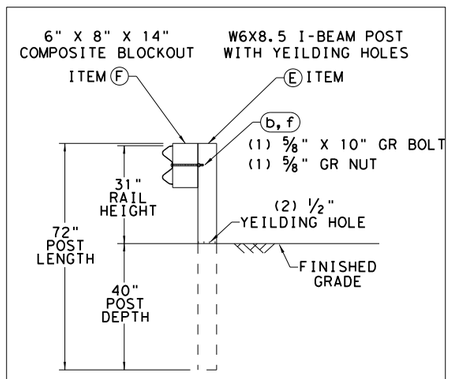


GENERAL NOTES

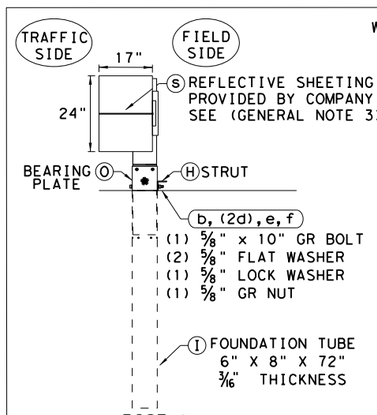
1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: SPIG INDUSTRY, INC. AT 1(267) 644-9510. 14675 INDUSTRIAL PARK RD; BRISTOL, VA 24202
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE MANUFACTURER'S; SGET END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY 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

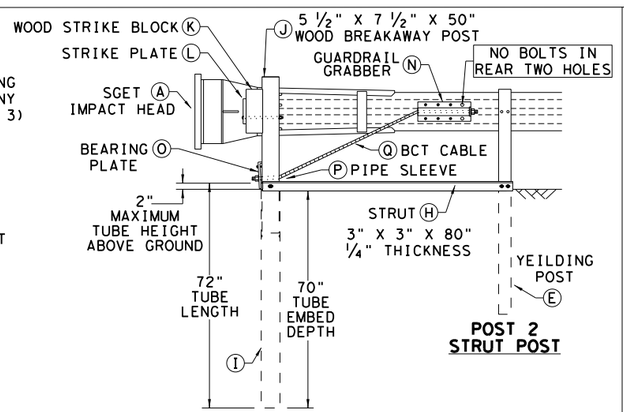
ALTERNATIVE ITEMS
NOTE: SEE PLAN VIEW
* D
** G



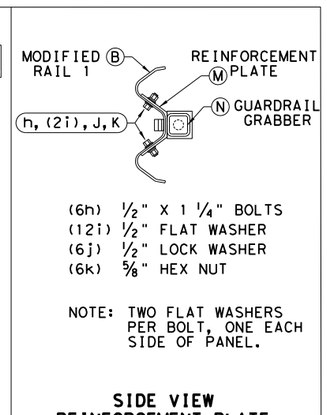
SIDE VIEW
POST 8 - POST 3 (TYP)



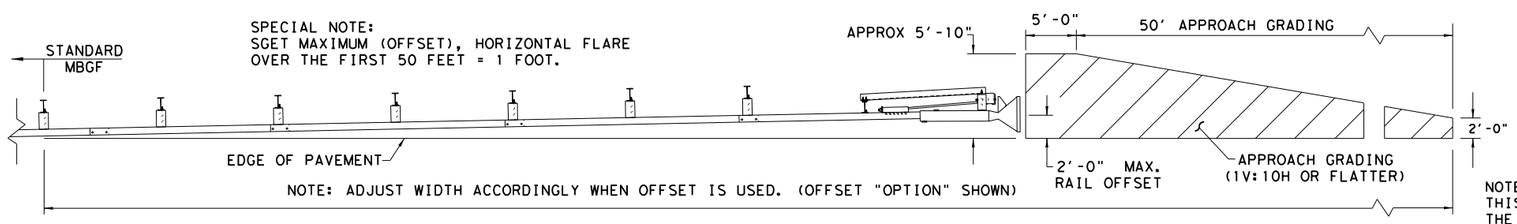
POST 1
FRONT END VIEW



POST 1
FIELD SIDE VIEW



SIDE VIEW
REINFORCEMENT PLATE
WITH GUARDRAIL GRABBER



APPROACH GRADING AT GUARDRAIL END TREATMENTS

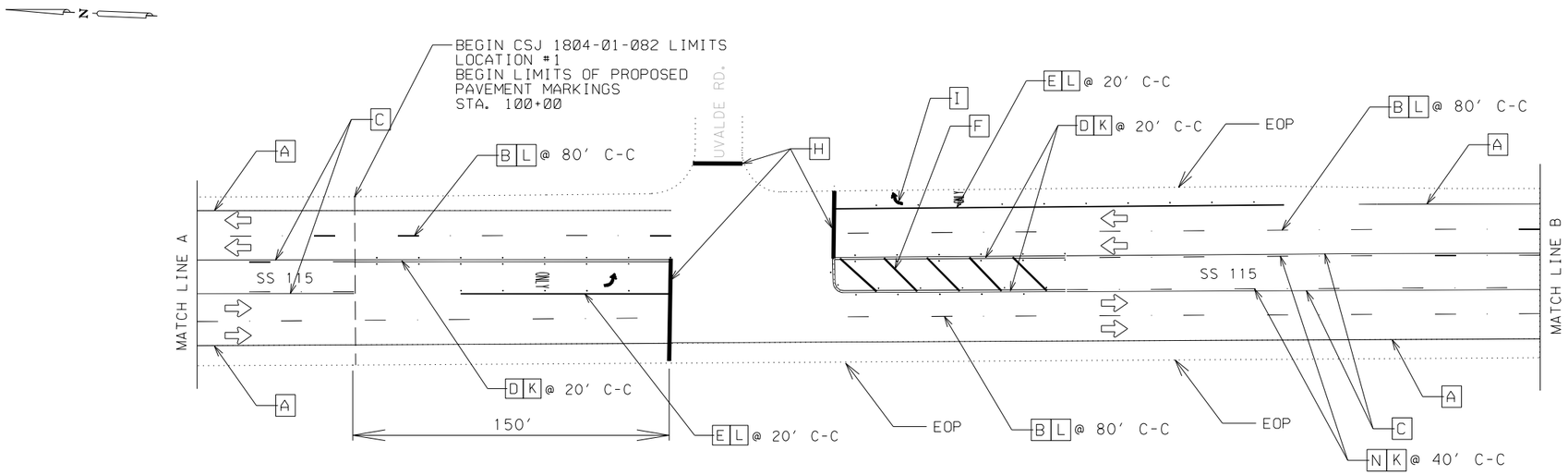
NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SGET TERMINAL SYSTEM AND IS NOT INTENDED TO REPLACE THE MANUFACTURER'S ASSEMBLY MANUAL.

Texas Department of Transportation

Design Division Standard

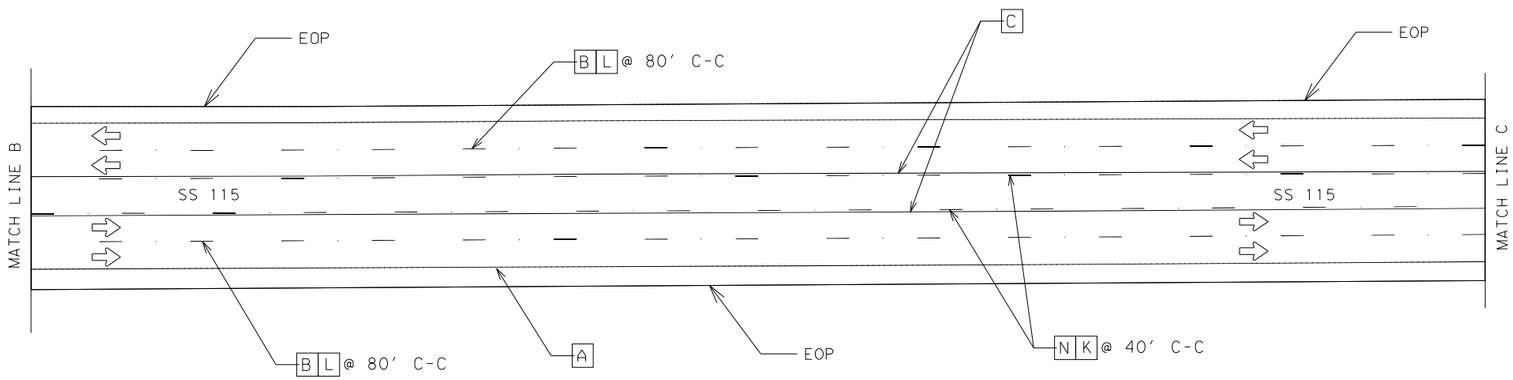
SPIG INDUSTRY, LLC
SINGLE GUARDRAIL TERMINAL
SGET - TL-3 - MASH
SGT(15)31-20

FILE: sgt153120.dgn	DN: TxDOT	CK: KM	DW: VP	CK: VP		
©TxDOT: APRIL 2020	CONT	SECT	JOB	HIGHWAY		
REVISIONS	1804	01	082,ETC.	SS 115,ETC.		
	DIST	COUNTY		SHEET NO.		
	PHR	HIDALGO		81		



LEGEND

- A - PROP. 6" SLD WHITE LINE
- B - PROP. 6" BKN WHITE LINE
- C - PROP. 6" SLD YELLOW LINE
- D - PROP. 6" DBL YELLOW LINE
- E - PROP. 8" SLD WHITE LINE
- F - PROP. 12" SLD YELLOW LINE
- G - PROP. 12" SLD WHITE LINE
- H - PROP. 24" SLD WHITE LINE
- I - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
- J - PROP. PREFABRICATED WORD TY-C
- K - PROP. PAV MRKR II-A-A
- L - PROP. PAV MRKR TY I-C
- M - PROP. PAV MRKR TY II-C-R
- N - 6" BRK YELLOW LINE
- O - YIELD LINES



NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

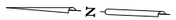
STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

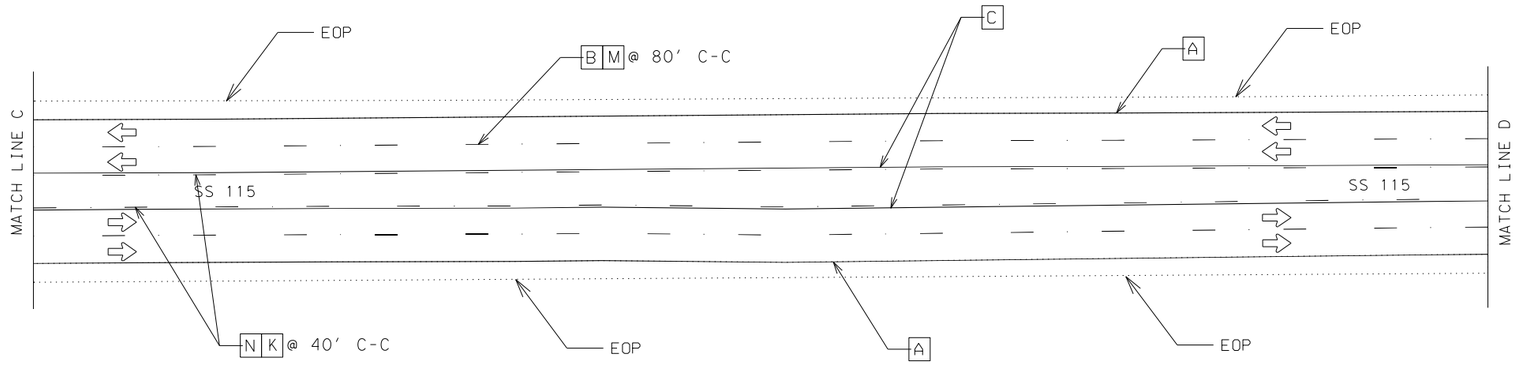
5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #1
PAVEMENT MARKING LAYOUT
SHEET 1 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		82
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.





LEGEND

- A - PROP. 6" SLD WHITE LINE
- B - PROP. 6" BKN WHITE LINE
- C - PROP. 6" SLD YELLOW LINE
- D - PROP. 6" DBL YELLOW LINE
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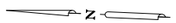
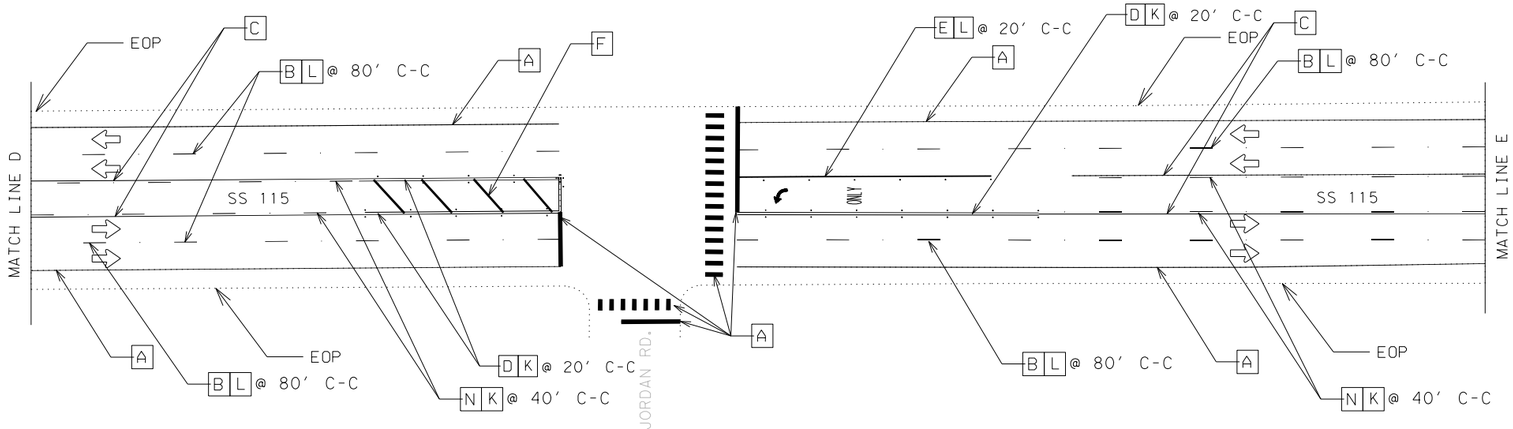
- H - PROP. 24" SLD WHITE LINE
- I - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
- J - PROP. PREFABRICATED WORD TY-C
- K - PROP. PAV MRKR II-A-A
- L - PROP. PAV MRKR TY I-C
- M - PROP. PAV MRKR TY II-C-R
- N - YIELD LINES
- N - 6" BRK YELLOW LINE





NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

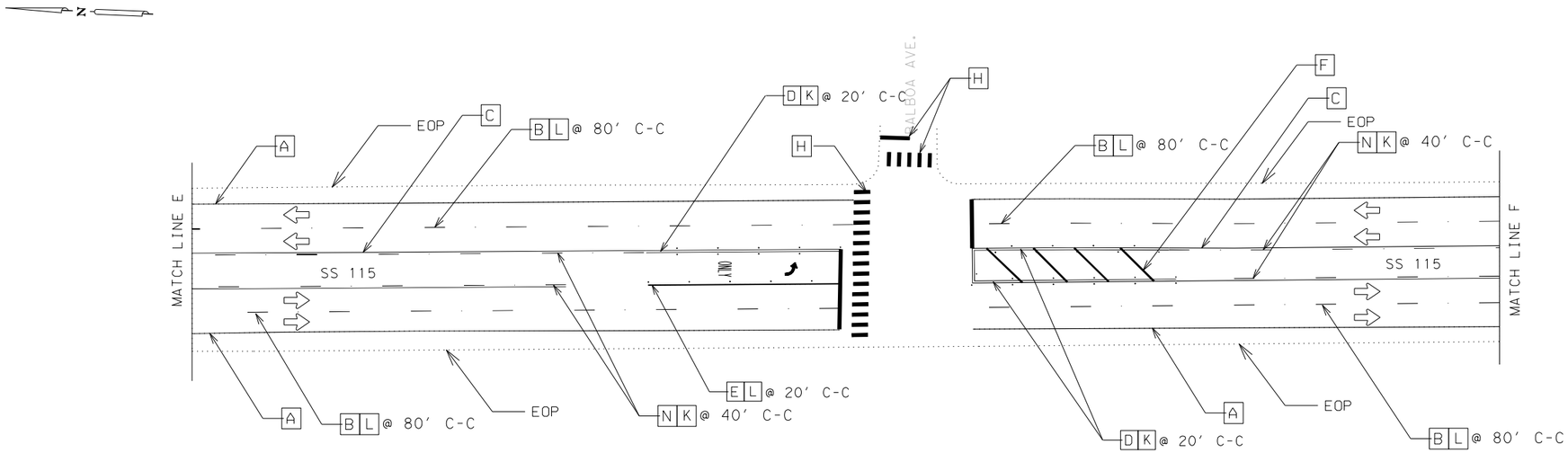
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS

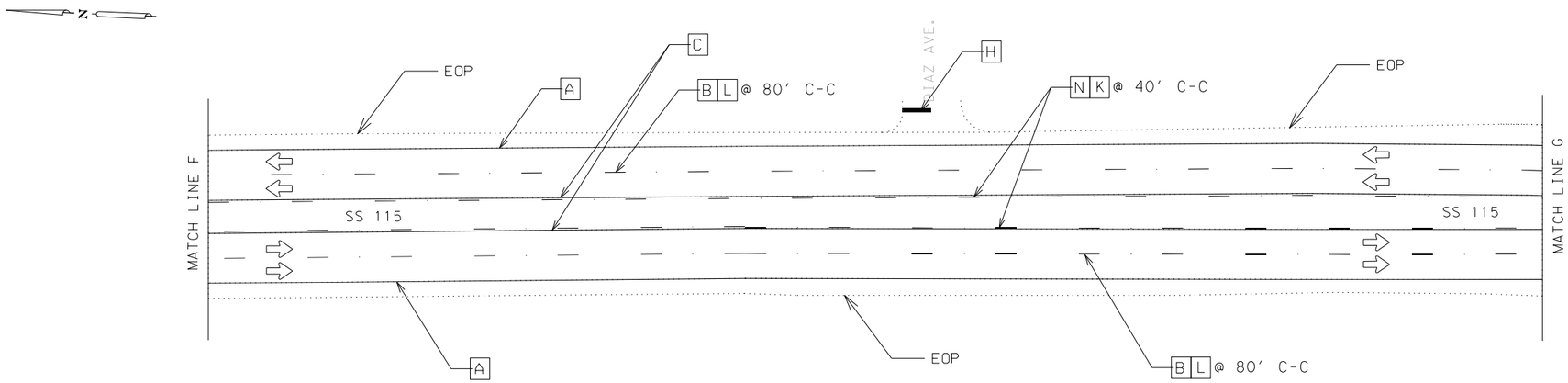
5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #1
PAVEMENT MARKING LAYOUT
SHEET 2 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		83
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.





LEGEND

- A - PROP. 6" SLD WHITE LINE
- B - PROP. 6" BKN WHITE LINE
- C - PROP. 6" SLD YELLOW LINE
- D - PROP. 6" DBL YELLOW LINE
- E - PROP. 8" SLD WHITE LINE
- F - PROP. 12" SLD YELLOW LINE
- G - PROP. 12" SLD WHITE LINE
- H - PROP. 24" SLD WHITE LINE
- I - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
- J - PROP. PREFABRICATED WORD TY-C
- K - PROP. PAV MRKR II-A-A
- L - PROP. PAV MRKR TY I-C
- M - PROP. PAV MRKR TY II-C-R
- N - YIELD LINES
- N - 6" BRK YELLOW LINE

NOTES

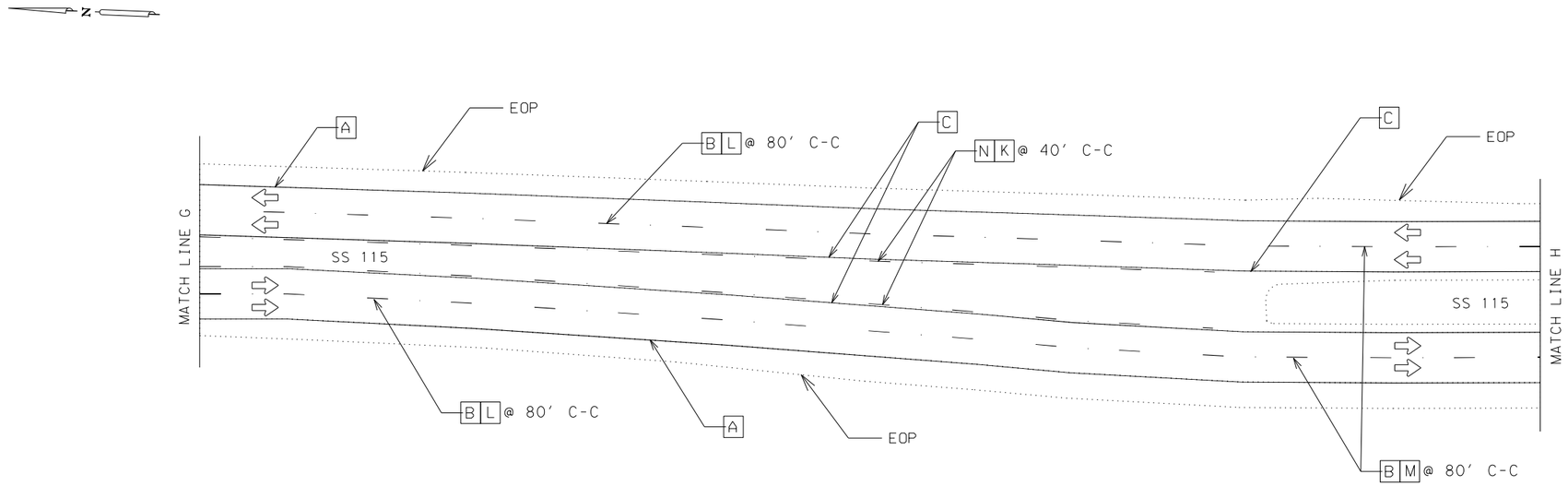
1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER
5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

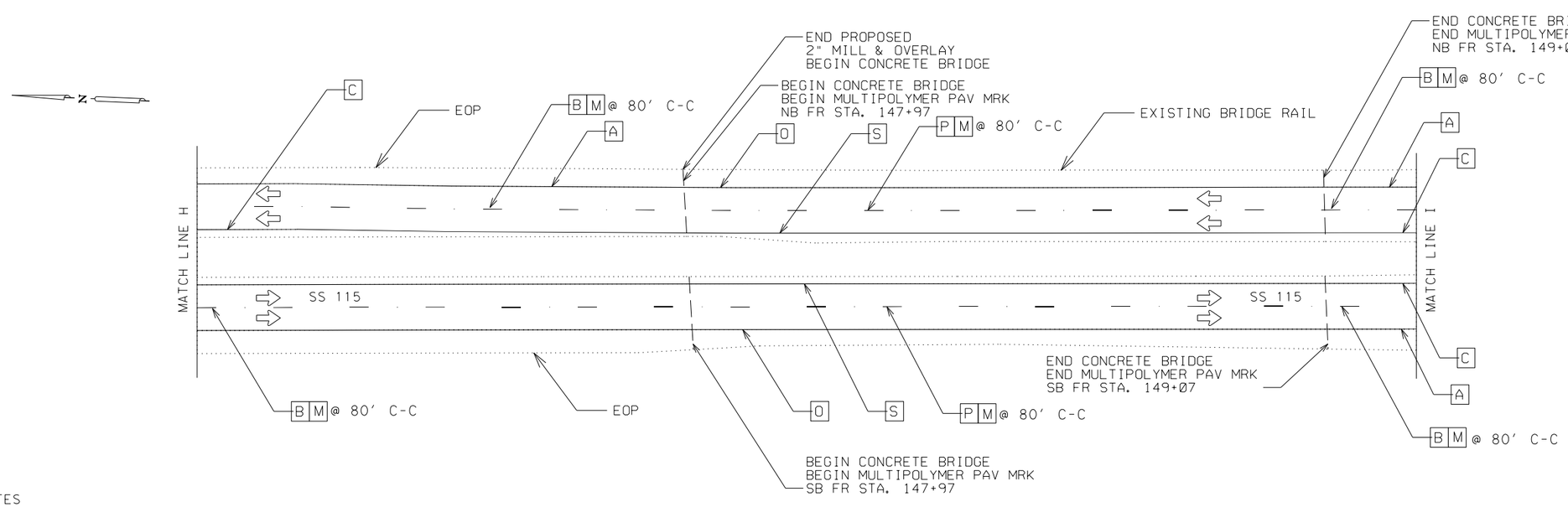
SS 115
LOCATION #1
PAVEMENT MARKING LAYOUT
SHEET 3 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		84
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.



LEGEND

- A - PROP. 6" SLD WHITE LINE
- B - PROP. 6" BKN WHITE LINE
- C - PROP. 6" SLD YELLOW LINE
- D - PROP. 6" DBL YELLOW LINE
- E - PROP. 8" SLD WHITE LINE
- F - PROP. 12" SLD YELLOW LINE
- G - PROP. 12" SLD WHITE LINE
- H - PROP. 24" SLD WHITE LINE
- I - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
- J - PROP. PREFABRICATED WORD TY-C
- K - PROP. PAV MRKR II-A-A
- L - PROP. PAV MRKR TY I-C
- M - PROP. PAV MRKR TY II-C-R
- N - YIELD LINES
- N - 6" BRK YELLOW LINE
- O - PROP. MULTIPOLYMER PAV MRK (W)(6")(SLD)
- P - PROP. MULTIPOLYMER PAV MRK (W)(6")(BRK)
- Q - PROP. MULTIPOLYMER PAV MRK (W)(24")(SLD)
- R - PROP. MULTIPOLYMER PAV MRK (Y)(6")(BRK)
- S - PROP. MULTIPOLYMER PAV MRK (Y)(6")(SLD)
- T - PROP. MULTIPOLYMER PAV MRK (W)(ARROW)
- U - PROP. MULTIPOLYMER PAV MRK (W)(DBL ARROW)
- V - PROP. MULTIPOLYMER PAV MRK (W)(WORD)
- W - PROP. MULTIPOLYMER PAV MRK (W)(8")(SLD)



NOTES

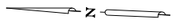
1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

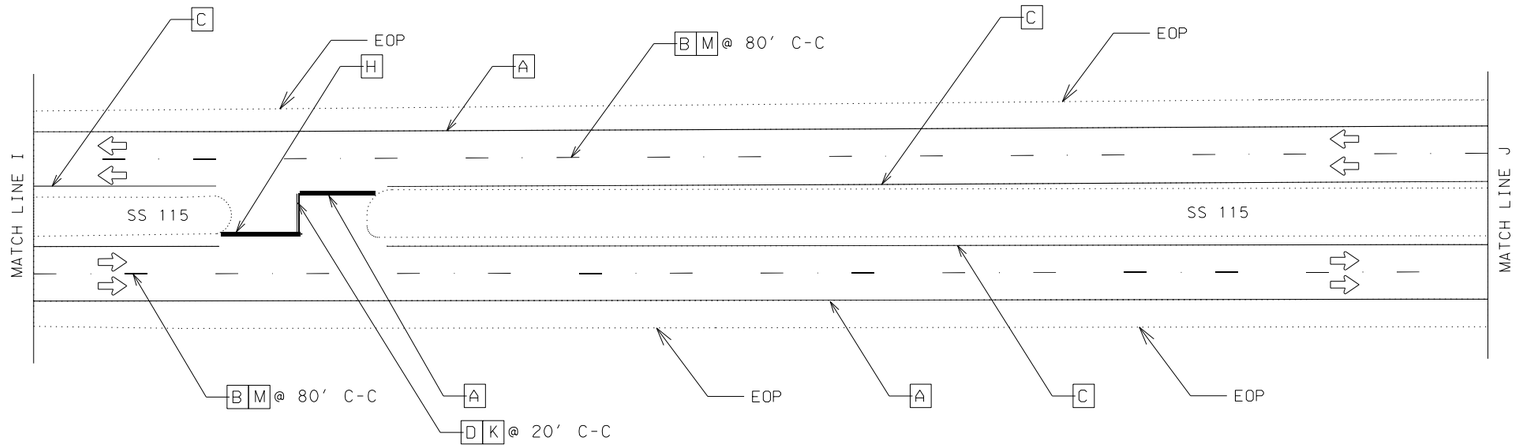
STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER
5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #1
PAVEMENT MARKING LAYOUT
SHEET 4 OF 22 N.T.S.

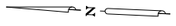
FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		85
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

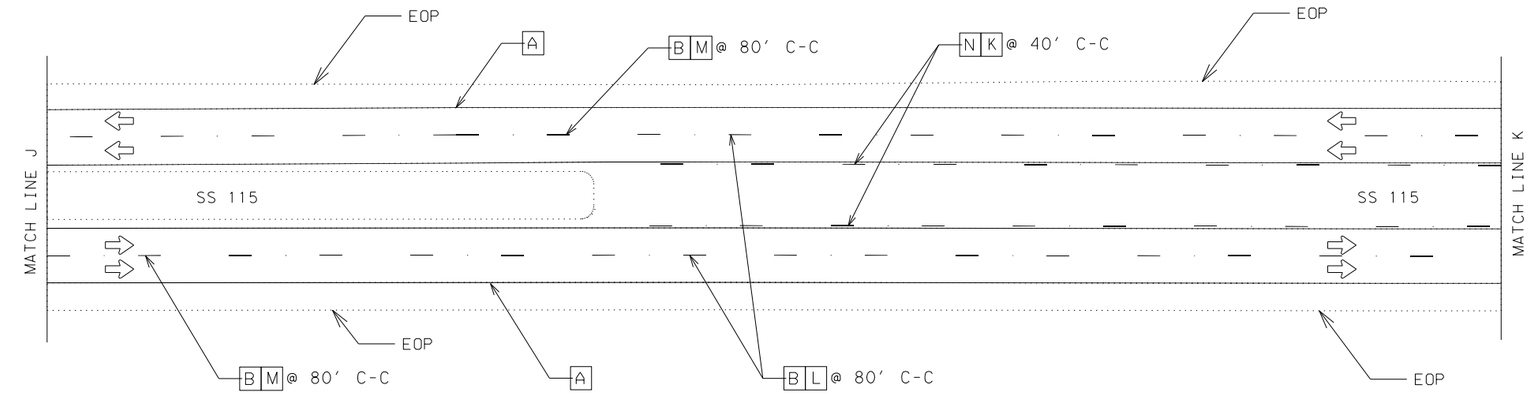




LEGEND

- A - PROP. 6" SLD WHITE LINE
- B - PROP. 6" BKN WHITE LINE
- C - PROP. 6" SLD YELLOW LINE
- D - PROP. 6" DBL YELLOW LINE
- E - PROP. 8" SLD WHITE LINE
- F - PROP. 12" SLD YELLOW LINE
- G - PROP. 12" SLD WHITE LINE
- H - PROP. 24" SLD WHITE LINE
- I - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
- J - PROP. PREFABRICATED WORD TY-C
- K - PROP. PAV MRKR II-A-A
- L - PROP. PAV MRKR TY I-C
- M - PROP. PAV MRKR TY II-C-R
- N - YIELD LINES
- N - 6" BRK YELLOW LINE





NOTES

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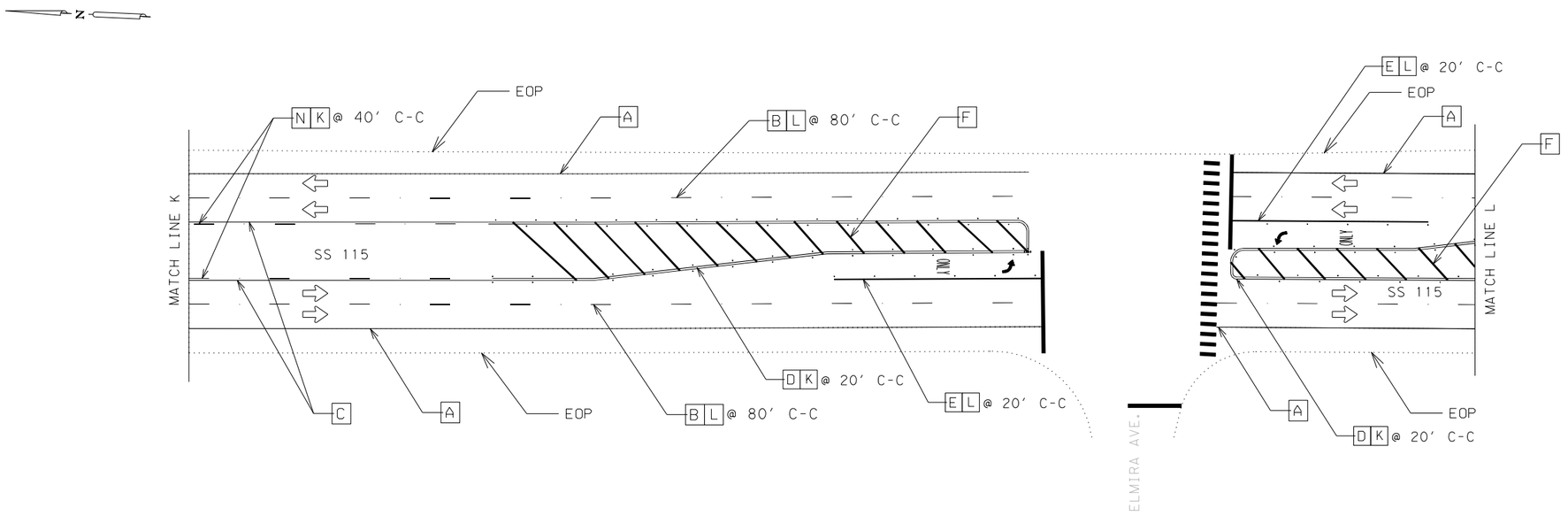
STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

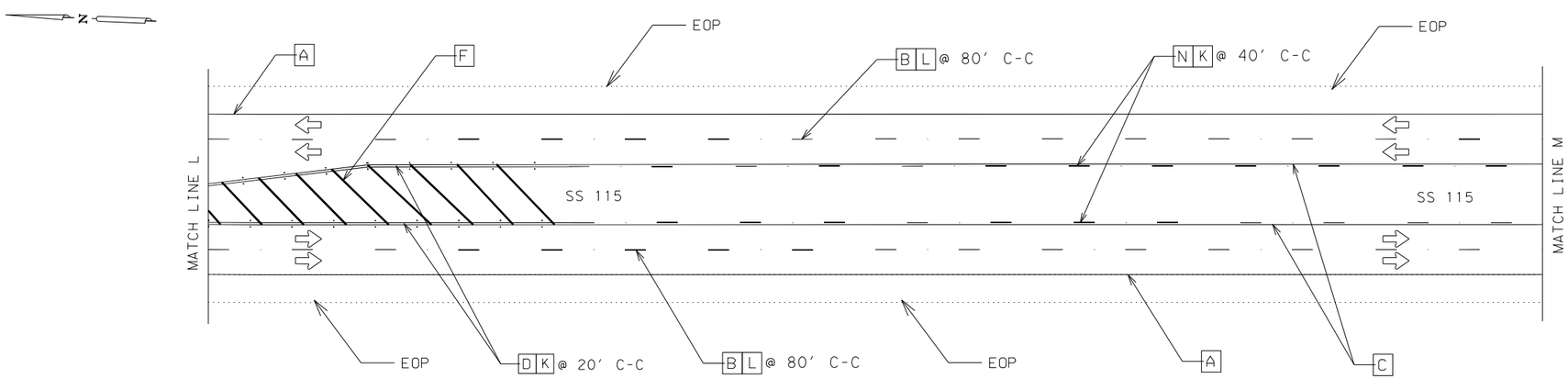
SS 115
LOCATION #1
PAVEMENT MARKING LAYOUT
SHEET 5 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		86
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.



LEGEND

- A - PROP. 6" SLD WHITE LINE
- B - PROP. 6" BKN WHITE LINE
- C - PROP. 6" SLD YELLOW LINE
- D - PROP. 6" DBL YELLOW LINE
- E - PROP. 8" SLD WHITE LINE
- F - PROP. 12" SLD YELLOW LINE
- G - PROP. 12" SLD WHITE LINE
- H - PROP. 24" SLD WHITE LINE
- I - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
- J - PROP. PREFABRICATED WORD TY-C
- K - PROP. PAV MRKR II-A-A
- L - PROP. PAV MRKR TY I-C
- M - PROP. PAV MRKR TY II-C-R
- N - YIELD LINES
- N - 6" BRK YELLOW LINE



NOTES

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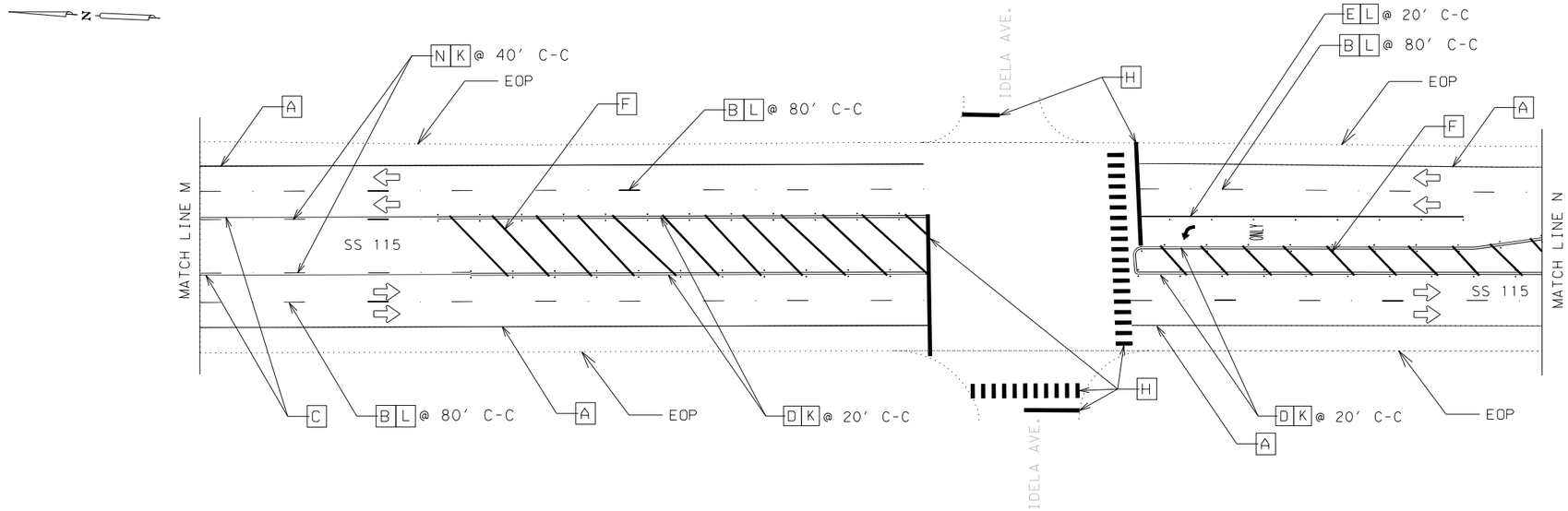
STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

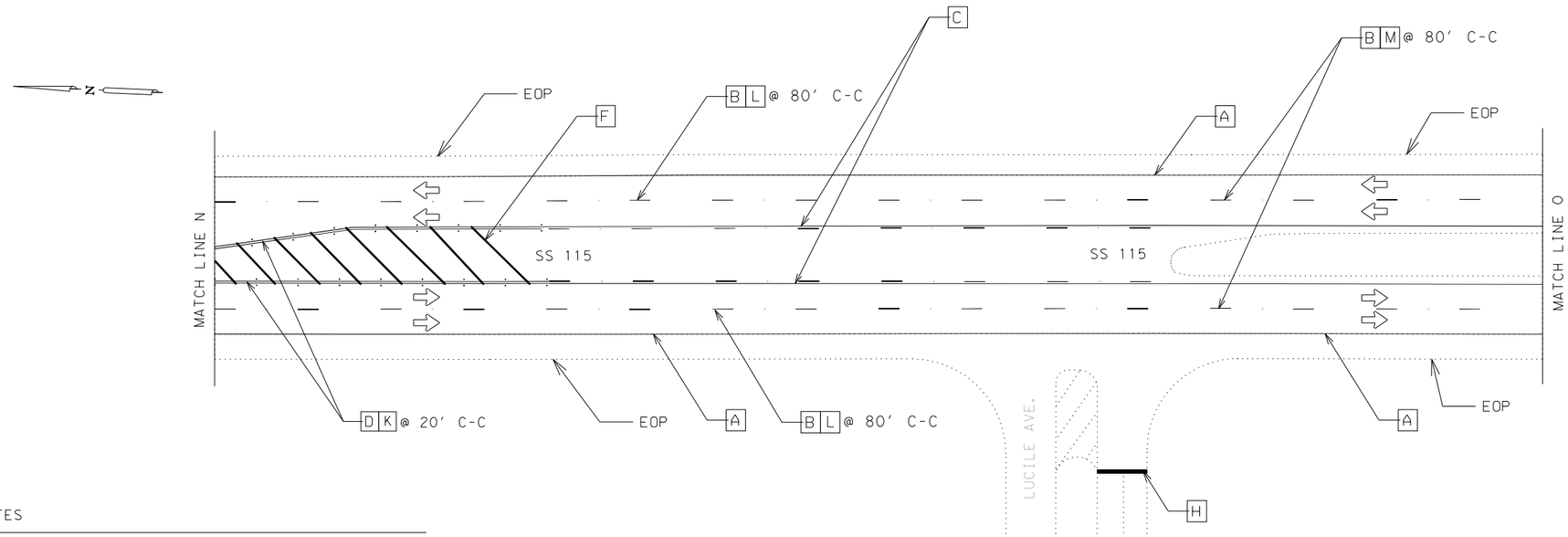
SS 115
LOCATION #1
PAVEMENT MARKING LAYOUT
SHEET 6 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		87
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.



LEGEND

- A - PROP. 6" SLD WHITE LINE
- B - PROP. 6" BKN WHITE LINE
- C - PROP. 6" SLD YELLOW LINE
- D - PROP. 6" DBL YELLOW LINE
- E - PROP. 8" SLD WHITE LINE
- F - PROP. 12" SLD YELLOW LINE
- G - PROP. 12" SLD WHITE LINE
- H - PROP. 24" SLD WHITE LINE
- I - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
- J - PROP. PREFABRICATED WORD TY-C
- K - PROP. PAV MRKR II-A-A
- L - PROP. PAV MRKR TY I-C
- M - PROP. PAV MRKR TY II-C-R
- N - YIELD LINES
- N - 6" BRK YELLOW LINE



NOTES

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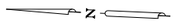
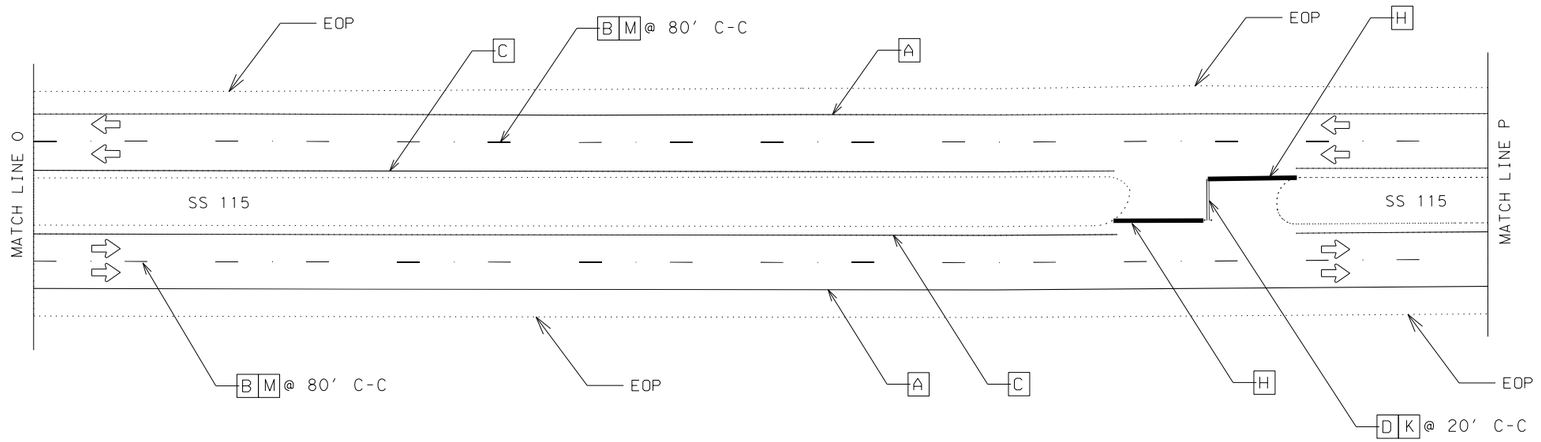
STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER
5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #1
PAVEMENT MARKING LAYOUT
SHEET 7 OF 22 N.T.S.

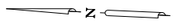
FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		88
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

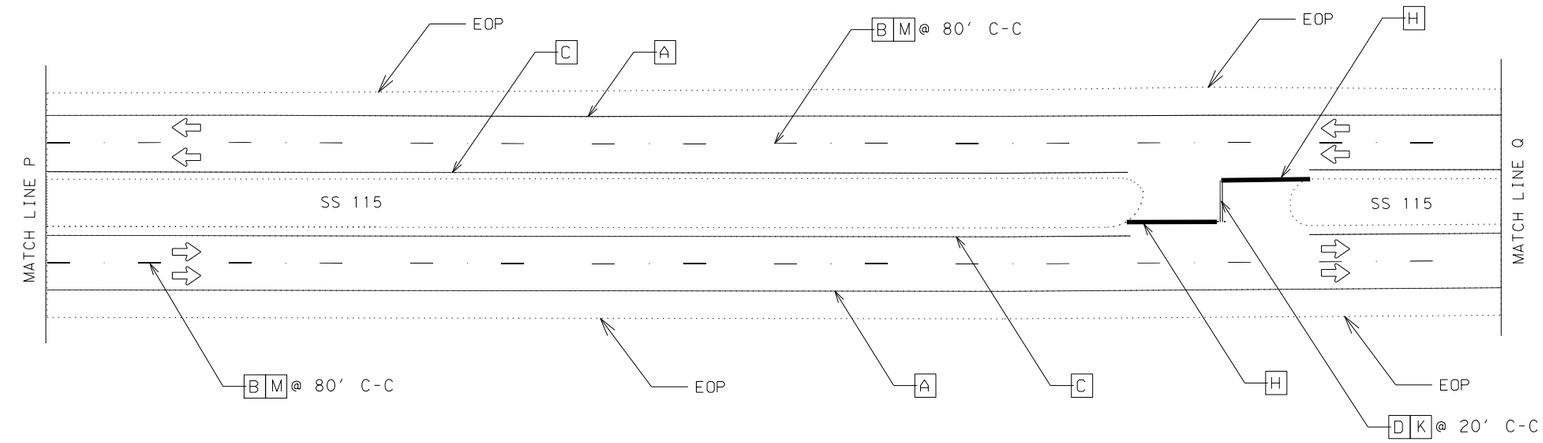




LEGEND

- A - PROP. 6" SLD WHITE LINE
- B - PROP. 6" BKN WHITE LINE
- C - PROP. 6" SLD YELLOW LINE
- D - PROP. 6" DBL YELLOW LINE
- E - PROP. 8" SLD WHITE LINE
- F - PROP. 12" SLD YELLOW LINE
- G - PROP. 12" SLD WHITE LINE
- H - PROP. 24" SLD WHITE LINE
- I - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
- J - PROP. PREFABRICATED WORD TY-C
- K - PROP. PAV MRKR II-A-A
- L - PROP. PAV MRKR TY I-C
- M - PROP. PAV MRKR TY II-C-R
- N - YIELD LINES
- N - 6" BRK YELLOW LINE





NOTES

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STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

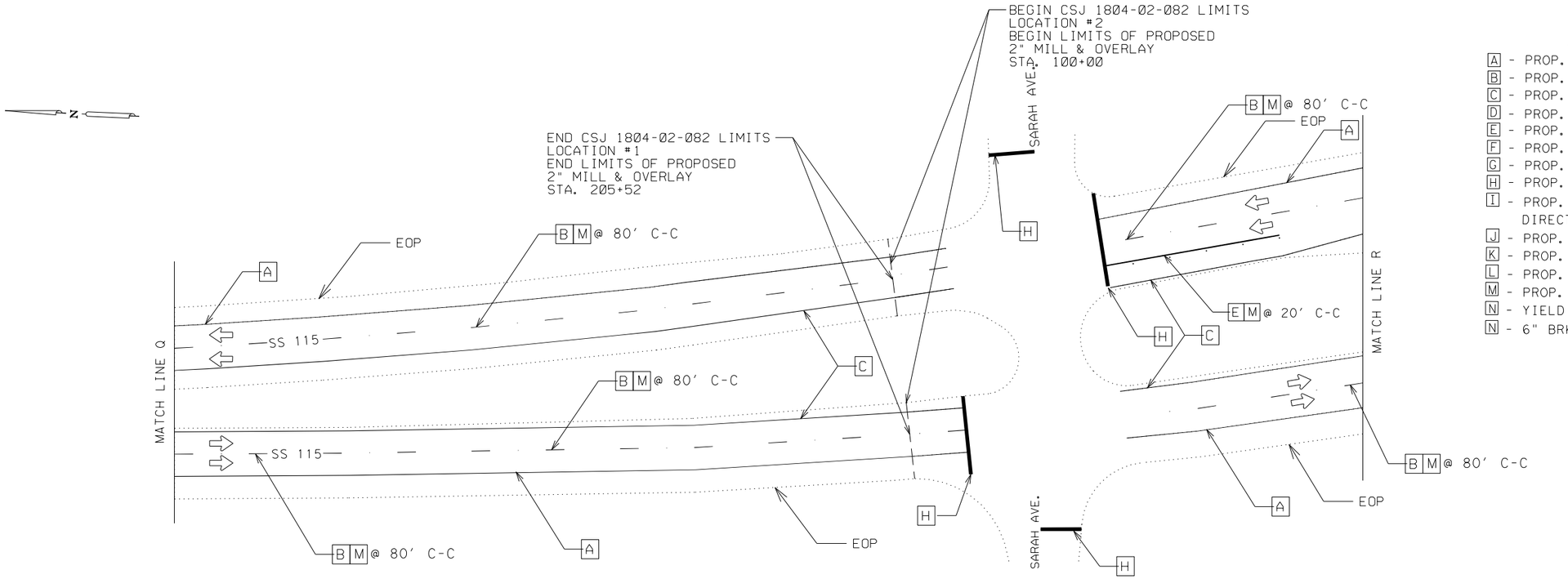
5/1/2023

Eugene Palacios

TEXAS DEPARTMENT OF TRANSPORTATION

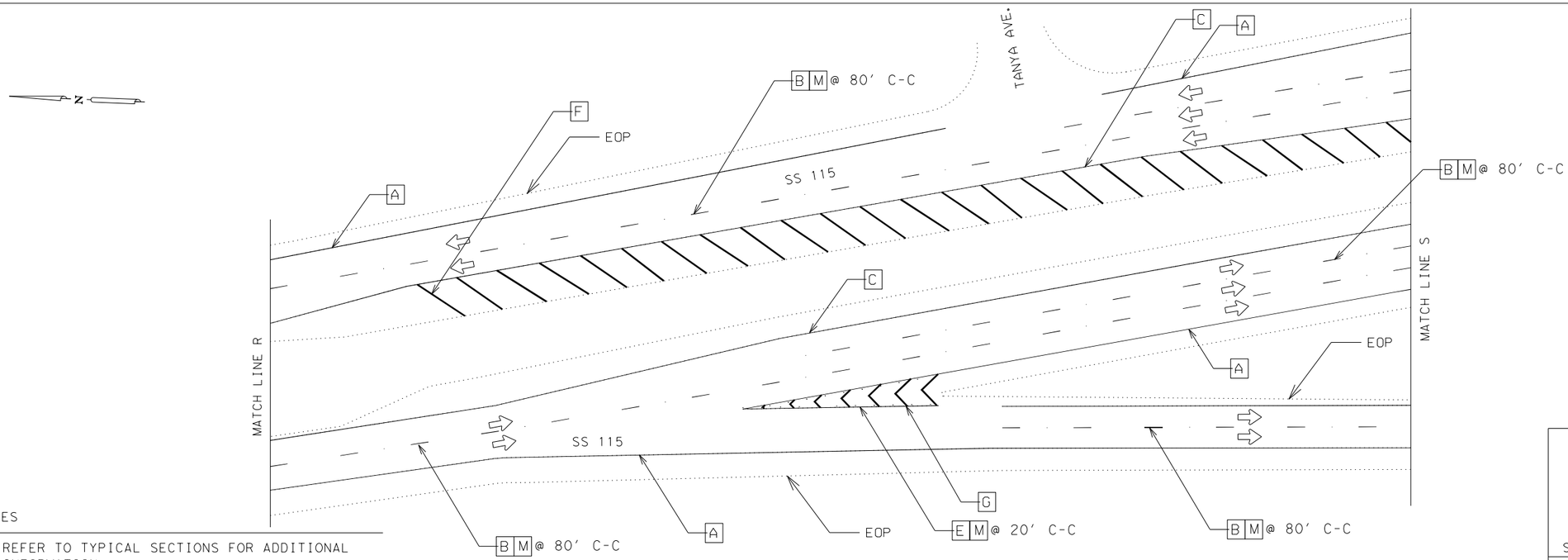
SS 115
LOCATION #1
PAVEMENT MARKING LAYOUT
SHEET 8 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		89
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.



LEGEND

- A - PROP. 6" SLD WHITE LINE
- B - PROP. 6" BKN WHITE LINE
- C - PROP. 6" SLD YELLOW LINE
- D - PROP. 6" DBL YELLOW LINE
- E - PROP. 8" SLD WHITE LINE
- F - PROP. 12" SLD YELLOW LINE
- G - PROP. 12" SLD WHITE LINE
- H - PROP. 24" SLD WHITE LINE
- I - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
- J - PROP. PREFABRICATED WORD TY-C
- K - PROP. PAV MRKR II-A-A
- L - PROP. PAV MRKR TY I-C
- M - PROP. PAV MRKR TY II-C-R
- N - YIELD LINES
- N - 6" BRK YELLOW LINE



NOTES

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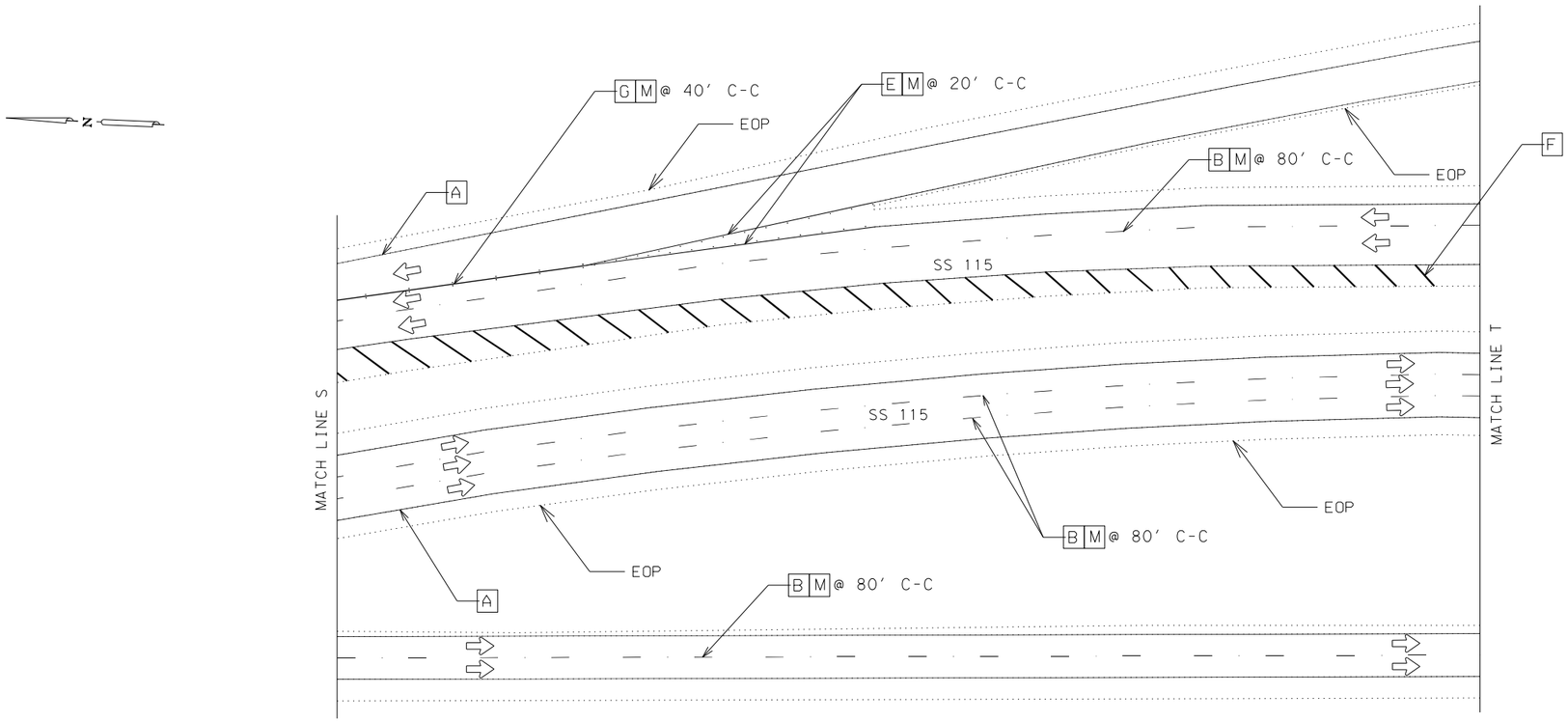
STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

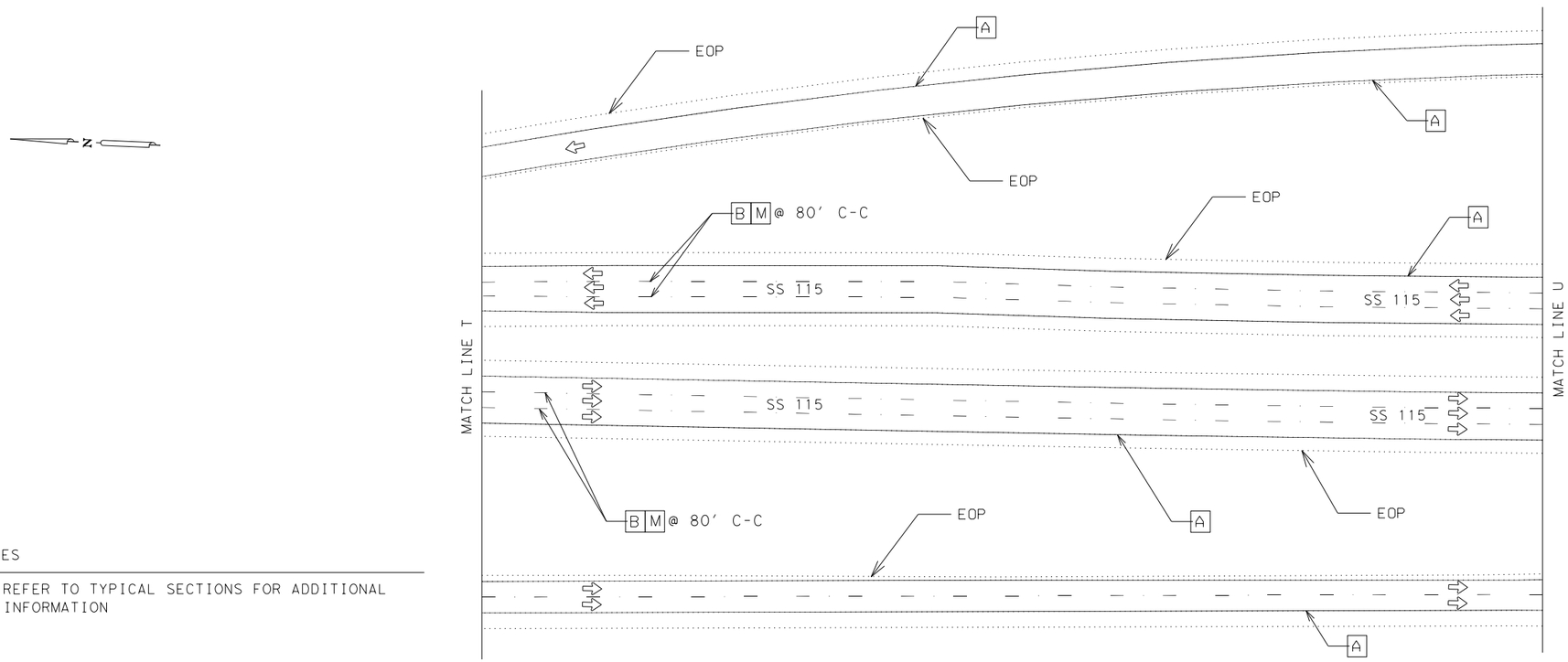
SS 115
LOCATION #1 & #2
PAVEMENT MARKING LAYOUT
SHEET 9 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		90
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.



LEGEND

- A - PROP. 6" SLD WHITE LINE
- B - PROP. 6" BKN WHITE LINE
- C - PROP. 6" SLD YELLOW LINE
- D - PROP. 6" DBL YELLOW LINE
- E - PROP. 8" SLD WHITE LINE
- F - PROP. 12" SLD YELLOW LINE
- G - PROP. 12" SLD WHITE LINE
- H - PROP. 24" SLD WHITE LINE
- I - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
- J - PROP. PREFABRICATED WORD TY-C
- K - PROP. PAV MRKR II-A-A
- L - PROP. PAV MRKR TY I-C
- M - PROP. PAV MRKR TY II-C-R
- N - YIELD LINES
- N - 6" BRK YELLOW LINE



NOTES

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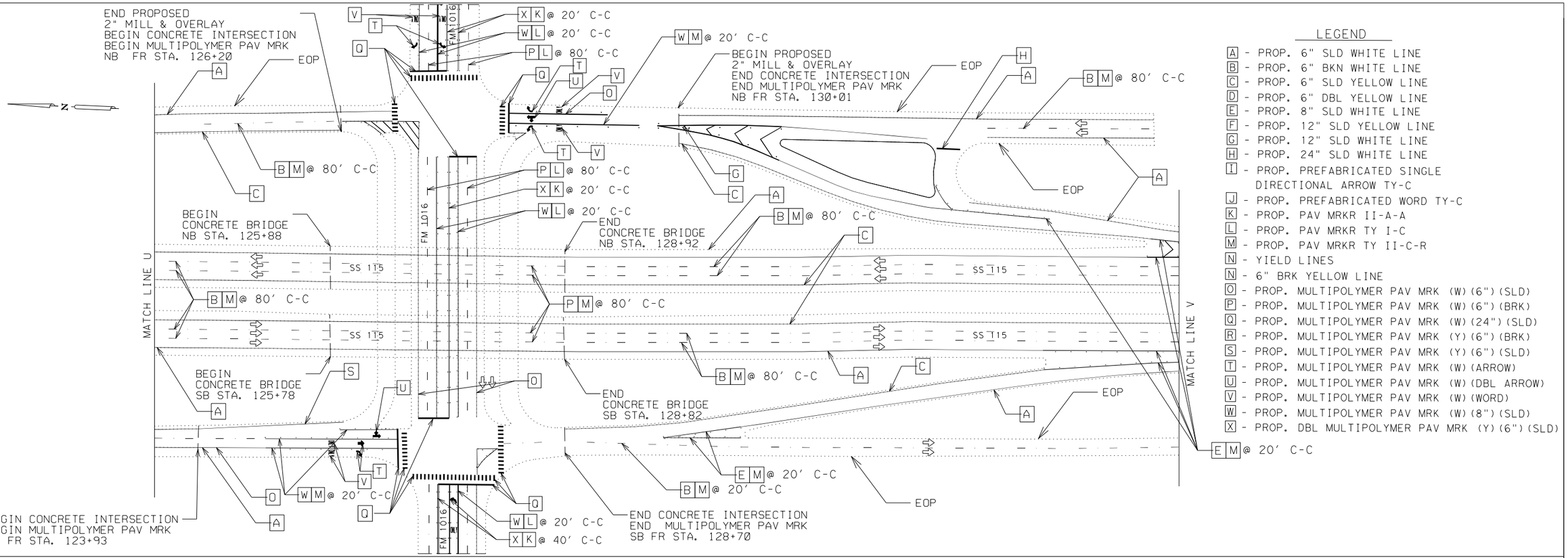
STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

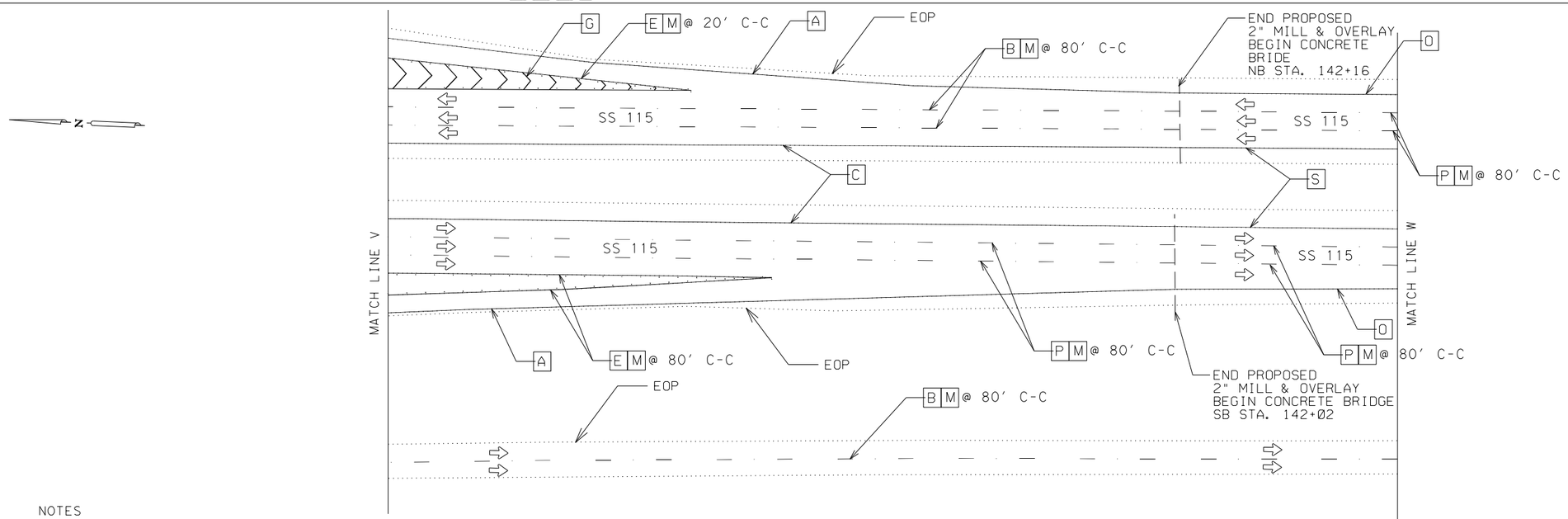
SS 115
LOCATION #2
PAVEMENT MARKING LAYOUT
SHEET 10 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		91
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.



LEGEND

- A - PROP. 6" SLD WHITE LINE
- B - PROP. 6" BKN WHITE LINE
- C - PROP. 6" SLD YELLOW LINE
- D - PROP. 6" DBL YELLOW LINE
- E - PROP. 8" SLD WHITE LINE
- F - PROP. 12" SLD YELLOW LINE
- G - PROP. 12" SLD WHITE LINE
- H - PROP. 24" SLD WHITE LINE
- I - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
- J - PROP. PREFABRICATED WORD TY-C
- K - PROP. PAV MRKR II-A-A
- L - PROP. PAV MRKR TY I-C
- M - PROP. PAV MRKR TY II-C-R
- N - YIELD LINES
- N - 6" BRK YELLOW LINE
- O - PROP. MULTIPOLYMER PAV MRK (W)(6")(SLD)
- P - PROP. MULTIPOLYMER PAV MRK (W)(6")(BRK)
- Q - PROP. MULTIPOLYMER PAV MRK (W)(24")(SLD)
- R - PROP. MULTIPOLYMER PAV MRK (Y)(6")(BRK)
- S - PROP. MULTIPOLYMER PAV MRK (Y)(6")(SLD)
- T - PROP. MULTIPOLYMER PAV MRK (W)(ARROW)
- U - PROP. MULTIPOLYMER PAV MRK (W)(DBL ARROW)
- V - PROP. MULTIPOLYMER PAV MRK (W)(WORD)
- W - PROP. MULTIPOLYMER PAV MRK (W)(8")(SLD)
- X - PROP. DBL MULTIPOLYMER PAV MRK (Y)(6")(SLD)



NOTES

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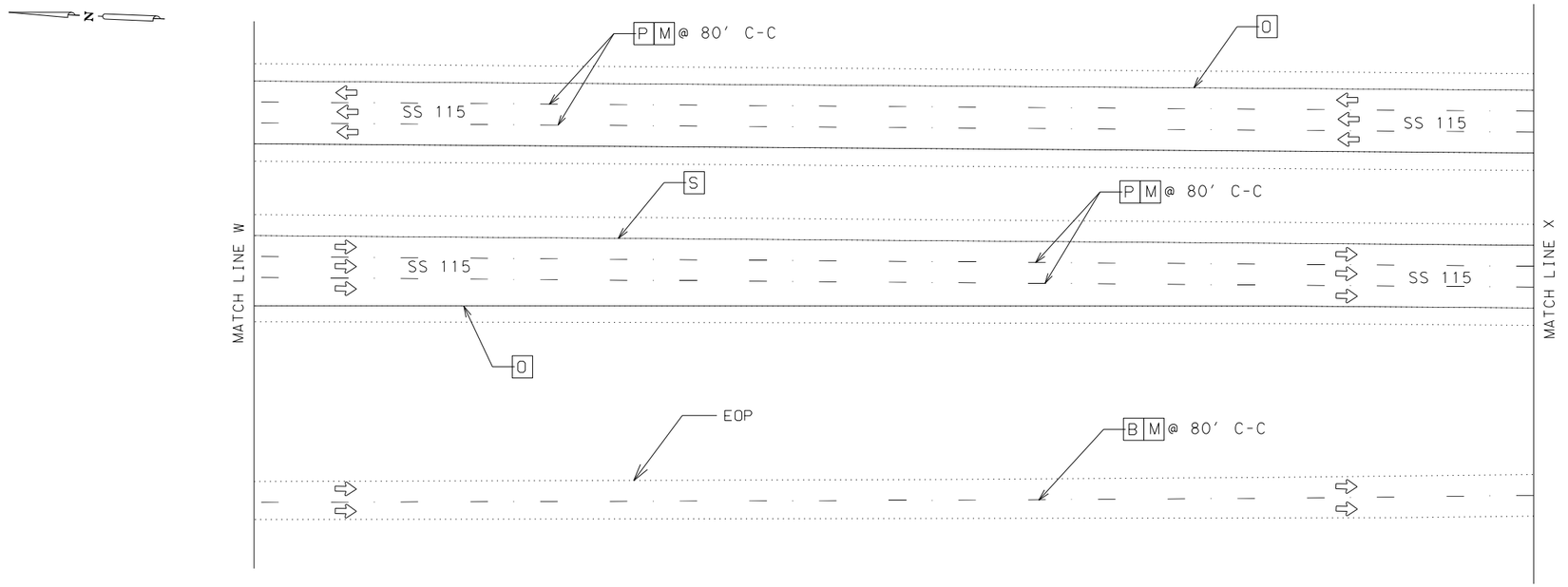
STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

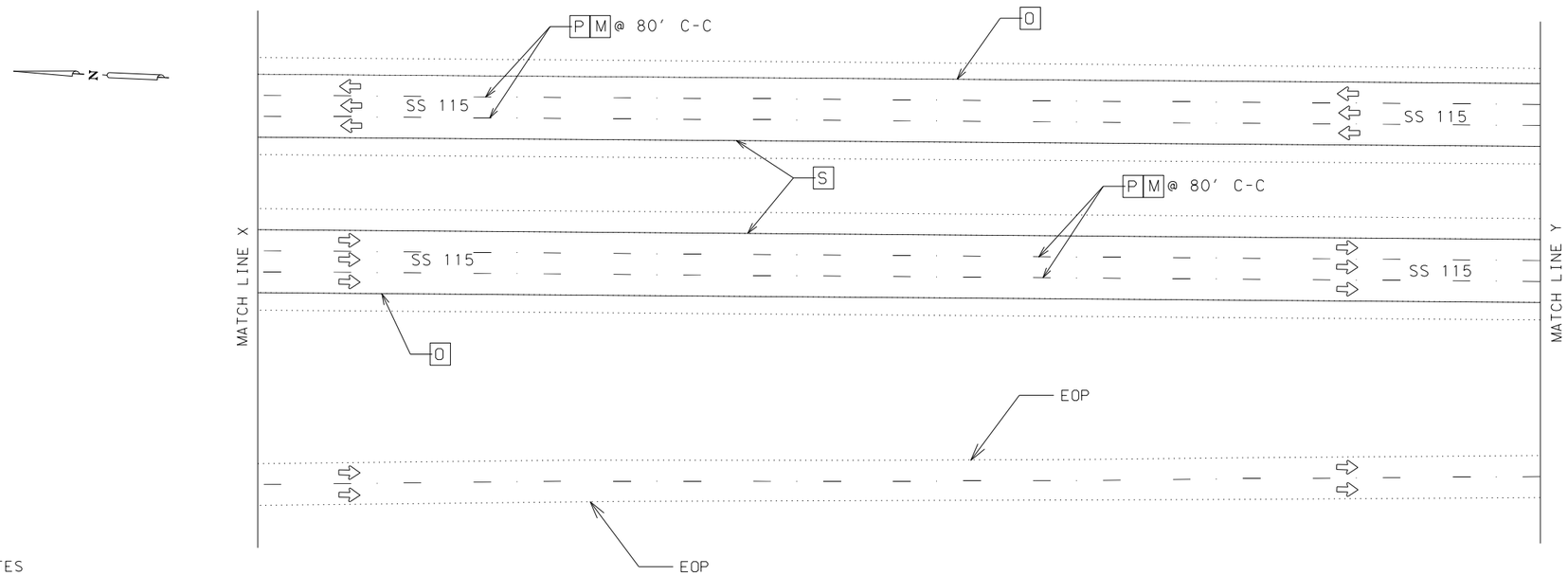
SS 115
LOCATION #2
PAVEMENT MARKING LAYOUT
SHEET 11 OF 22 N.T.S.

FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		92
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.



LEGEND

- A - PROP. 6" SLD WHITE LINE
- B - PROP. 6" BKN WHITE LINE
- C - PROP. 6" SLD YELLOW LINE
- D - PROP. 6" DBL YELLOW LINE
- E - PROP. 8" SLD WHITE LINE
- F - PROP. 12" SLD YELLOW LINE
- G - PROP. 12" SLD WHITE LINE
- H - PROP. 24" SLD WHITE LINE
- I - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
- J - PROP. PREFABRICATED WORD TY-C
- K - PROP. PAV MRKR II-A-A
- L - PROP. PAV MRKR TY I-C
- M - PROP. PAV MRKR TY II-C-R
- N - YIELD LINES
- N - 6" BRK YELLOW LINE
- O - PROP. MULTIPOLYMER PAV MRK (W)(6")(SLD)
- P - PROP. MULTIPOLYMER PAV MRK (W)(6")(BRK)
- Q - PROP. MULTIPOLYMER PAV MRK (W)(24")(SLD)
- R - PROP. MULTIPOLYMER PAV MRK (Y)(6")(BRK)
- S - PROP. MULTIPOLYMER PAV MRK (Y)(6")(SLD)
- T - PROP. MULTIPOLYMER PAV MRK (W)(ARROW)
- U - PROP. MULTIPOLYMER PAV MRK (W)(DBL ARROW)
- V - PROP. MULTIPOLYMER PAV MRK (W)(WORD)
- W - PROP. MULTIPOLYMER PAV MRK (W)(8")(SLD)



NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

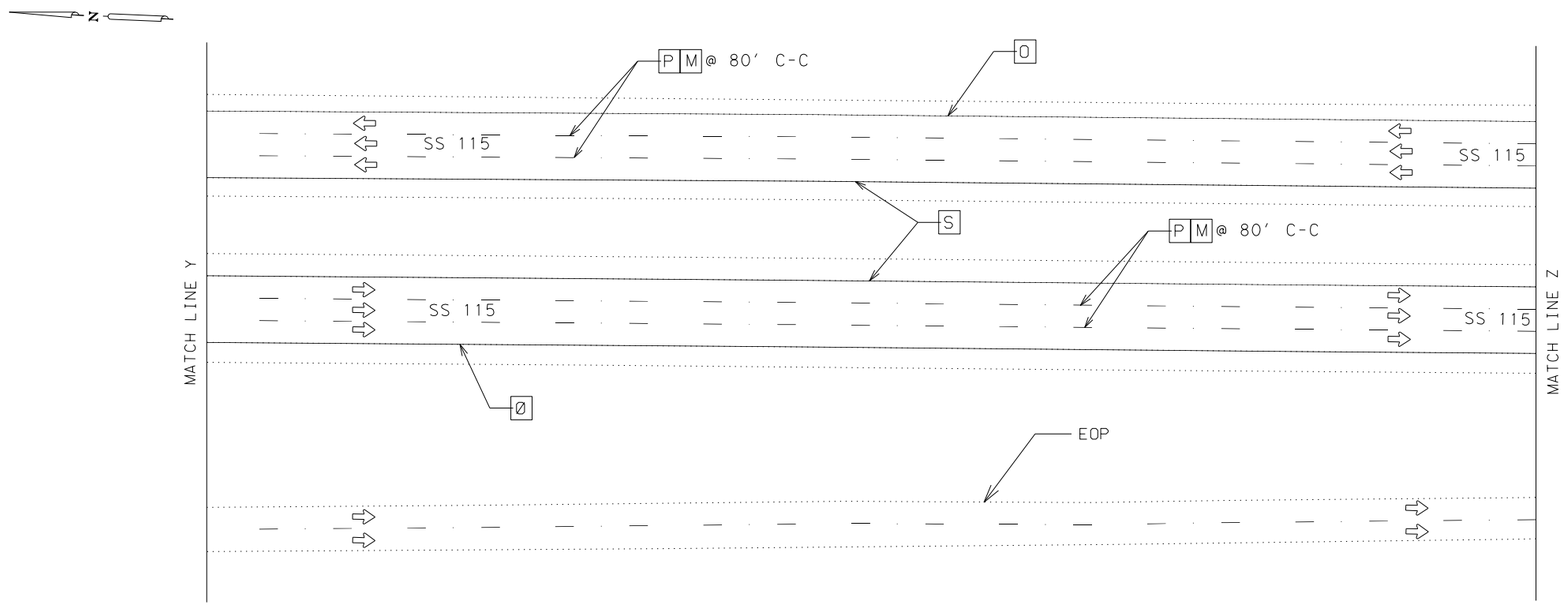
STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

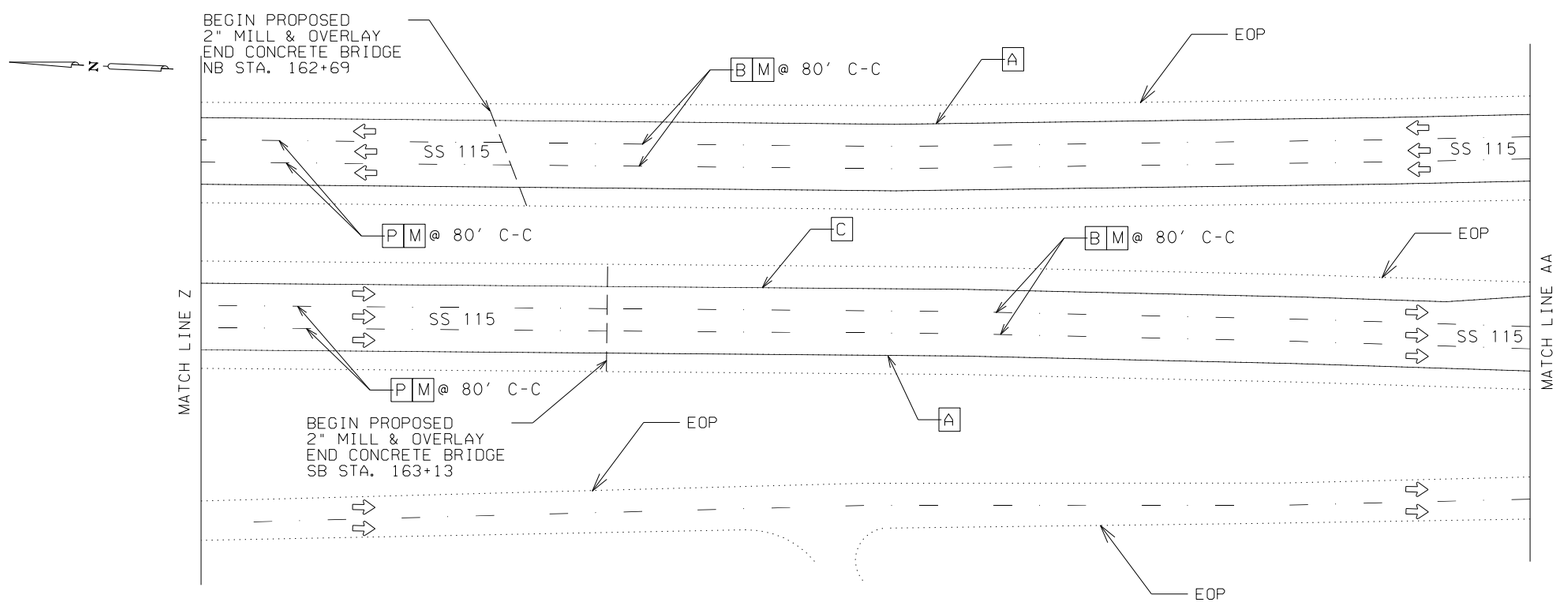
SS 115
LOCATION #2
PAVEMENT MARKING LAYOUT
SHEET 12 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		93
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.



LEGEND

- A - PROP. 6" SLD WHITE LINE
- B - PROP. 6" BKN WHITE LINE
- C - PROP. 6" SLD YELLOW LINE
- D - PROP. 6" DBL YELLOW LINE
- E - PROP. 8" SLD WHITE LINE
- F - PROP. 12" SLD YELLOW LINE
- G - PROP. 12" SLD WHITE LINE
- H - PROP. 24" SLD WHITE LINE
- I - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
- J - PROP. PREFABRICATED WORD TY-C
- K - PROP. PAV MRKR II-A-A
- L - PROP. PAV MRKR TY I-C
- M - PROP. PAV MRKR TY II-C-R
- N - YIELD LINES
- N - 6" BRK YELLOW LINE
- O - PROP. MULTIPOLYMER PAV MRK (W)(6")(SLD)
- P - PROP. MULTIPOLYMER PAV MRK (W)(6")(BRK)
- Q - PROP. MULTIPOLYMER PAV MRK (W)(24")(SLD)
- R - PROP. MULTIPOLYMER PAV MRK (Y)(6")(BRK)
- S - PROP. MULTIPOLYMER PAV MRK (Y)(6")(SLD)
- T - PROP. MULTIPOLYMER PAV MRK (W)(ARROW)
- U - PROP. MULTIPOLYMER PAV MRK (W)(DBL ARROW)
- V - PROP. MULTIPOLYMER PAV MRK (W)(WORD)
- W - PROP. MULTIPOLYMER PAV MRK (W)(8")(SLD)



NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

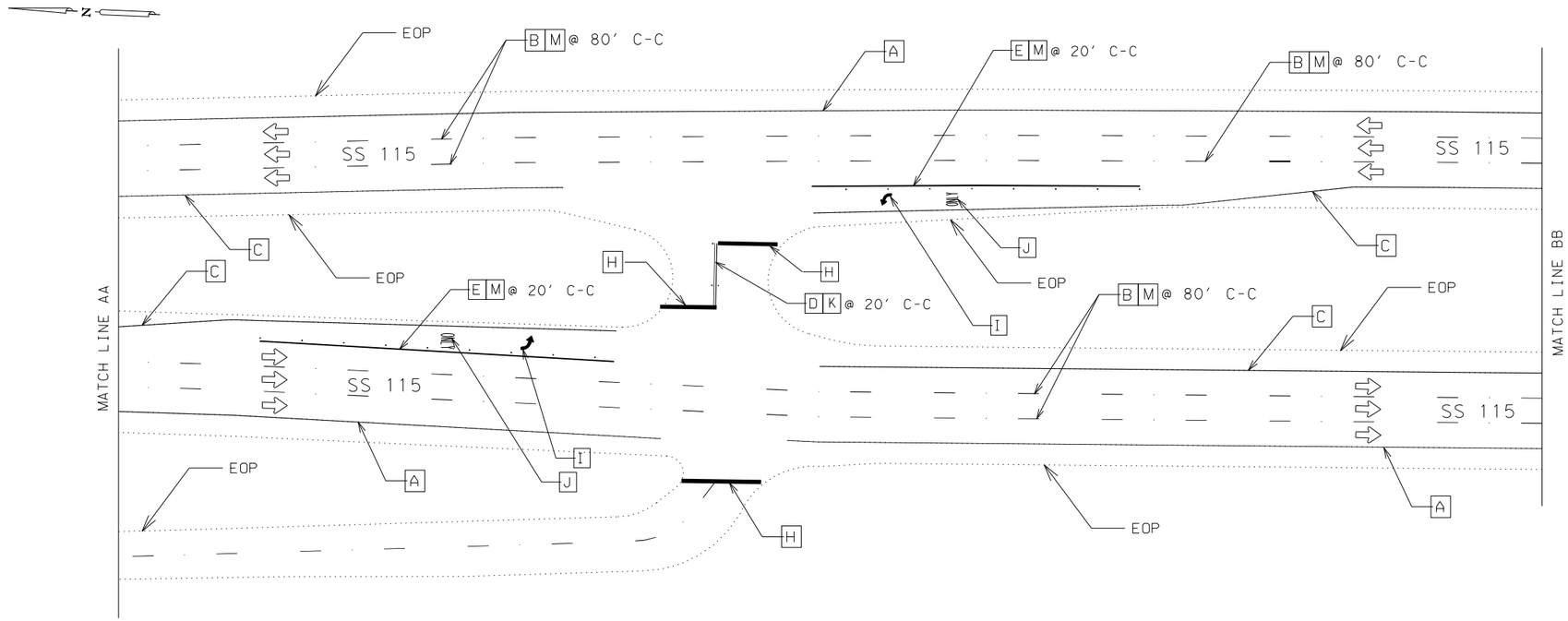
5/1/2023

Eugene Palacios

TEXAS DEPARTMENT OF TRANSPORTATION

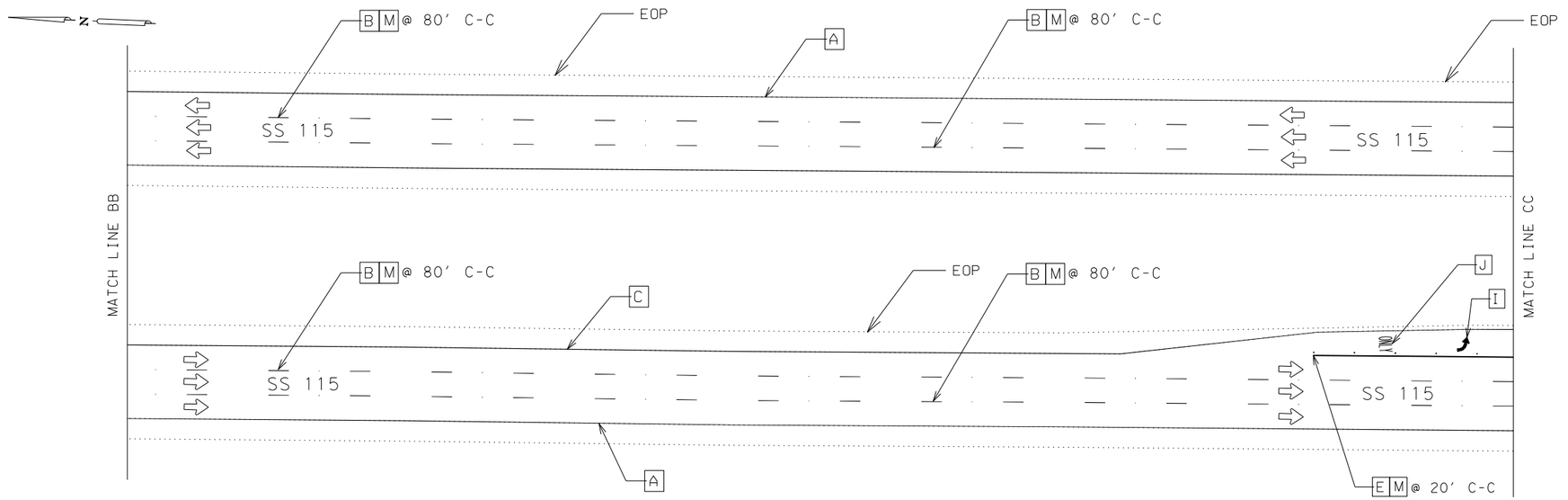
SS 115
LOCATION #2
PAVEMENT MARKING LAYOUT
SHEET 13 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		94
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.



LEGEND

- A - PROP. 6" SLD WHITE LINE
- B - PROP. 6" BKN WHITE LINE
- C - PROP. 6" SLD YELLOW LINE
- D - PROP. 6" DBL YELLOW LINE
- E - PROP. 8" SLD WHITE LINE
- F - PROP. 12" SLD YELLOW LINE
- G - PROP. 12" SLD WHITE LINE
- H - PROP. 24" SLD WHITE LINE
- I - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
- J - PROP. PREFABRICATED WORD TY-C
- K - PROP. PAV MRKR II-A-A
- L - PROP. PAV MRKR TY I-C
- M - PROP. PAV MRKR TY II-C-R
- N - YIELD LINES
- N - 6" BRK YELLOW LINE



NOTES

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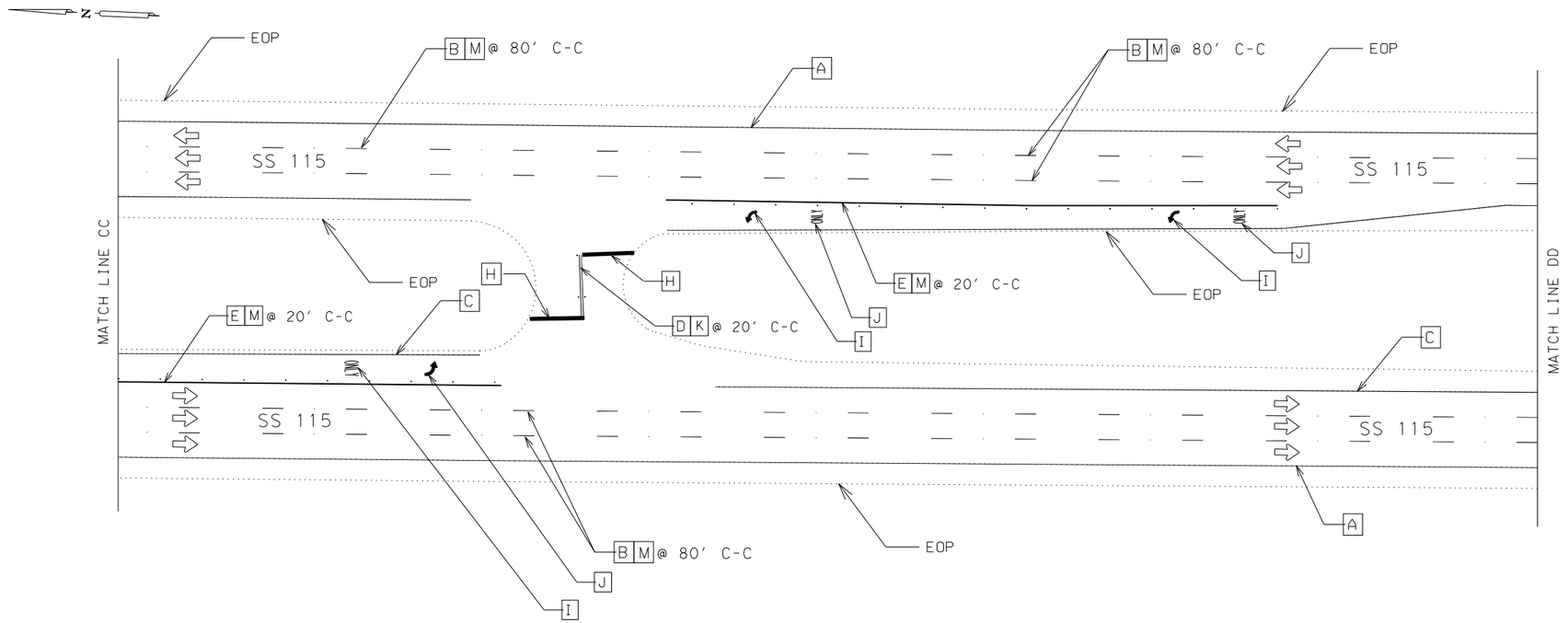
STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER
5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

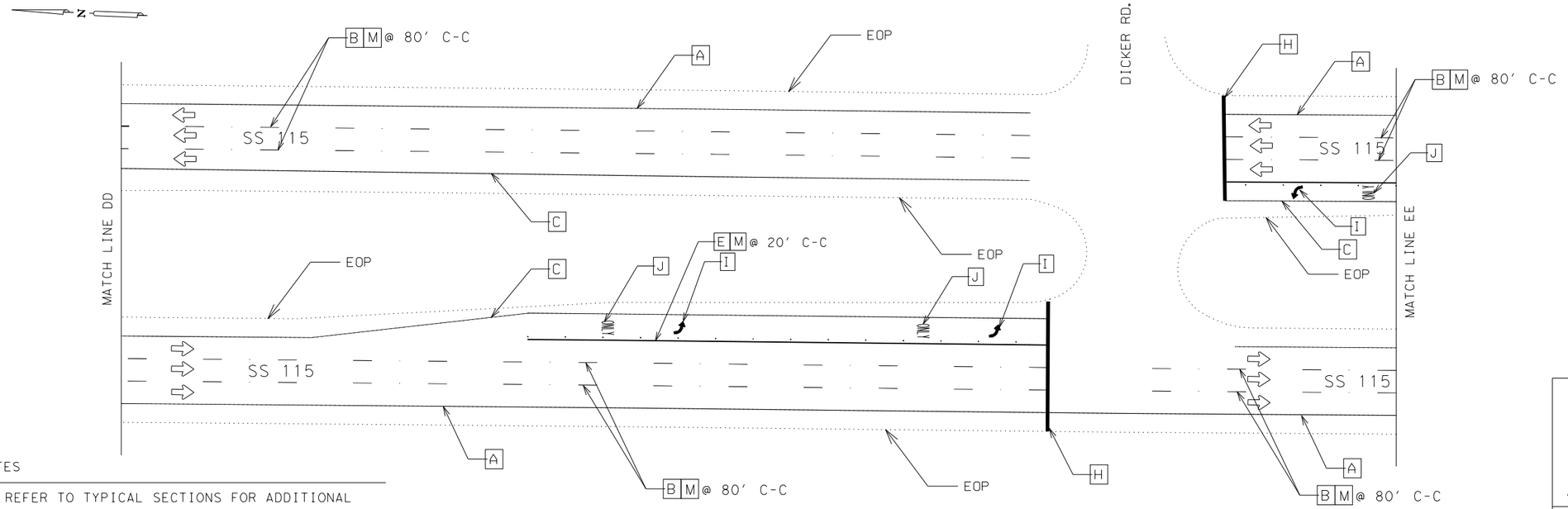
SS 115
LOCATION #2
PAVEMENT MARKING LAYOUT
SHEET 14 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY			SHEET No.
6	F 2023(909)		HIDALGO			95
STATE	STATE DIST.NO.	CONTROL	SECTION	JOB	HIGHWAY No.	
TX	PHR	1804	01	082,ETC.	SS 115,ETC.	



LEGEND

- A - PROP. 6" SLD WHITE LINE
- B - PROP. 6" BKN WHITE LINE
- C - PROP. 6" SLD YELLOW LINE
- D - PROP. 6" DBL YELLOW LINE
- E - PROP. 8" SLD WHITE LINE
- F - PROP. 12" SLD YELLOW LINE
- G - PROP. 12" SLD WHITE LINE
- H - PROP. 24" SLD WHITE LINE
- I - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
- J - PROP. PREFABRICATED WORD TY-C
- K - PROP. PAV MRKR II-A-A
- L - PROP. PAV MRKR TY I-C
- M - PROP. PAV MRKR TY II-C-R
- N - YIELD LINES
- N - 6" BRK YELLOW LINE



NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

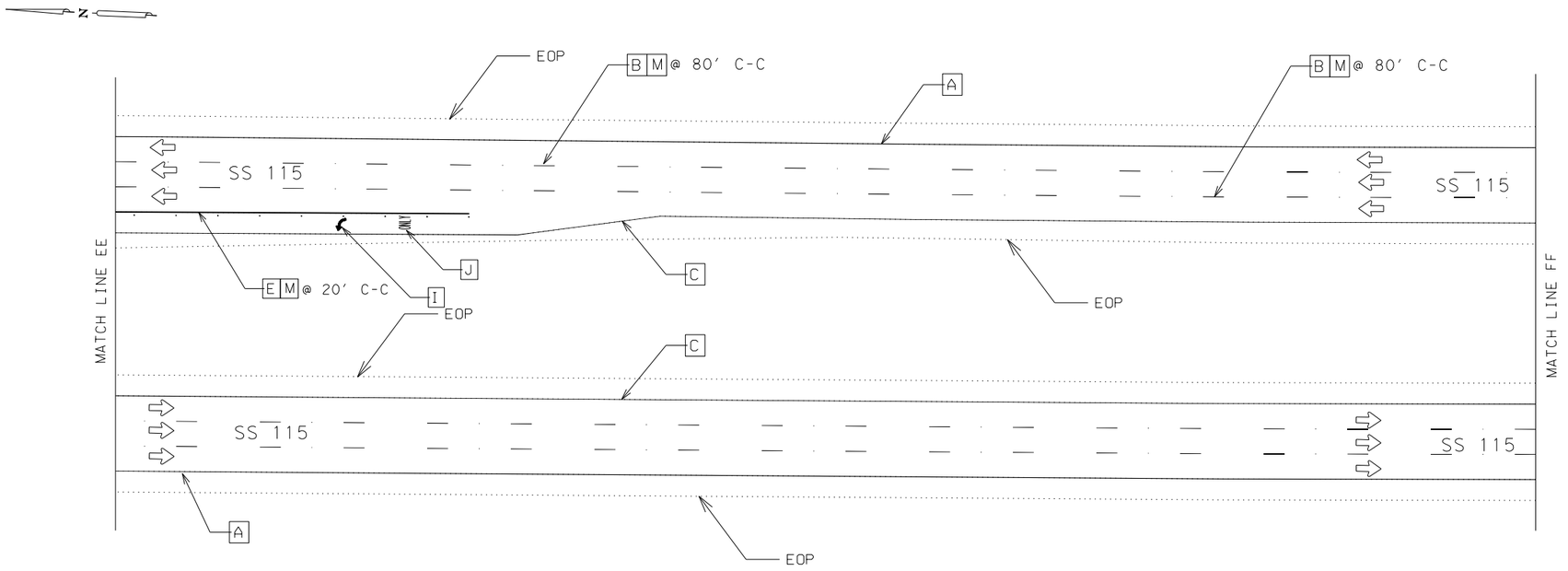
STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

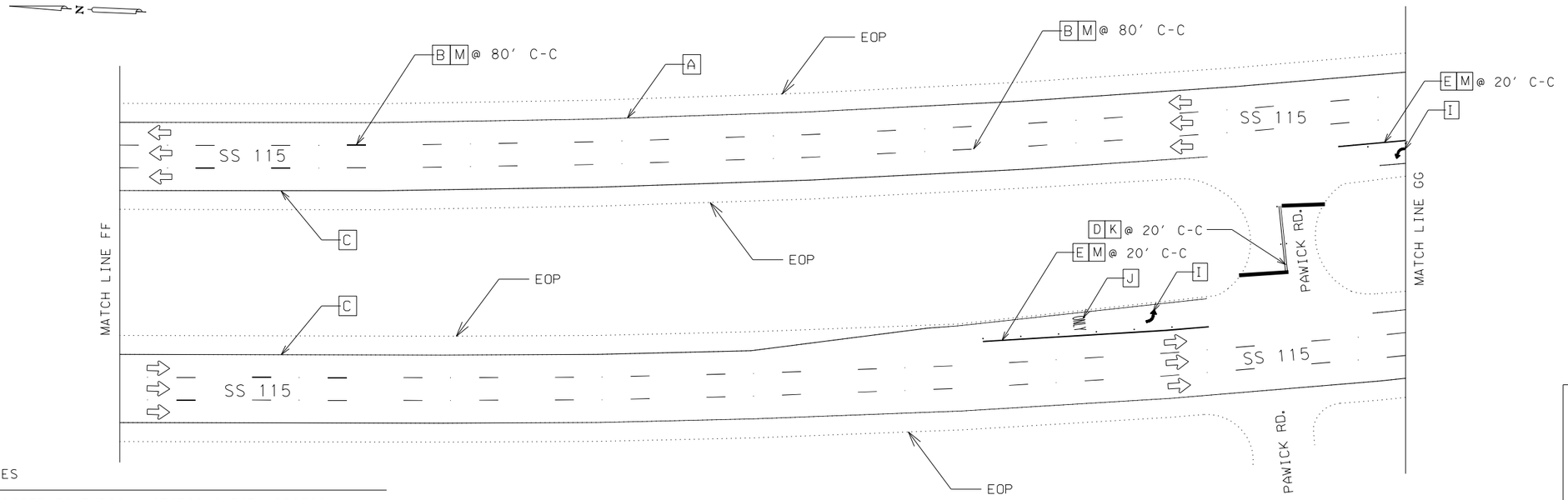
SS 115
LOCATION #2
PAVEMENT MARKING LAYOUT
SHEET 15 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		96
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.



LEGEND

- A - PROP. 6" SLD WHITE LINE
- B - PROP. 6" BKN WHITE LINE
- C - PROP. 6" SLD YELLOW LINE
- D - PROP. 6" DBL YELLOW LINE
- E - PROP. 8" SLD WHITE LINE
- F - PROP. 12" SLD YELLOW LINE
- G - PROP. 12" SLD WHITE LINE
- H - PROP. 24" SLD WHITE LINE
- I - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
- J - PROP. PREFABRICATED WORD TY-C
- K - PROP. PAV MRKR II-A-A
- L - PROP. PAV MRKR TY I-C
- M - PROP. PAV MRKR TY II-C-R
- N - YIELD LINES
- N - 6" BRK YELLOW LINE



NOTES

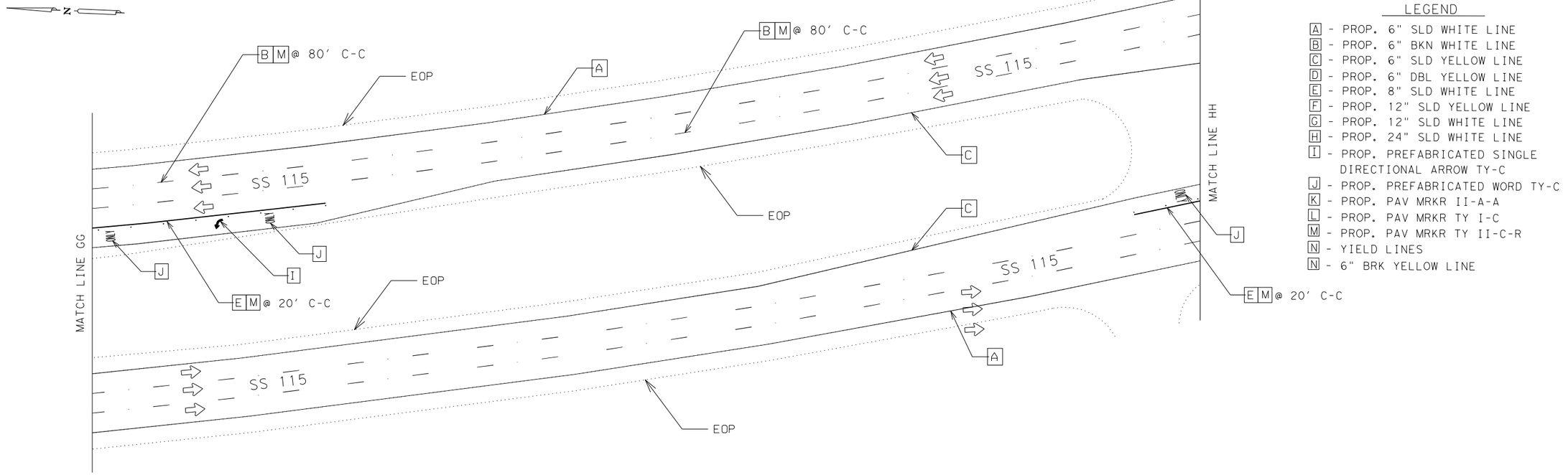
1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

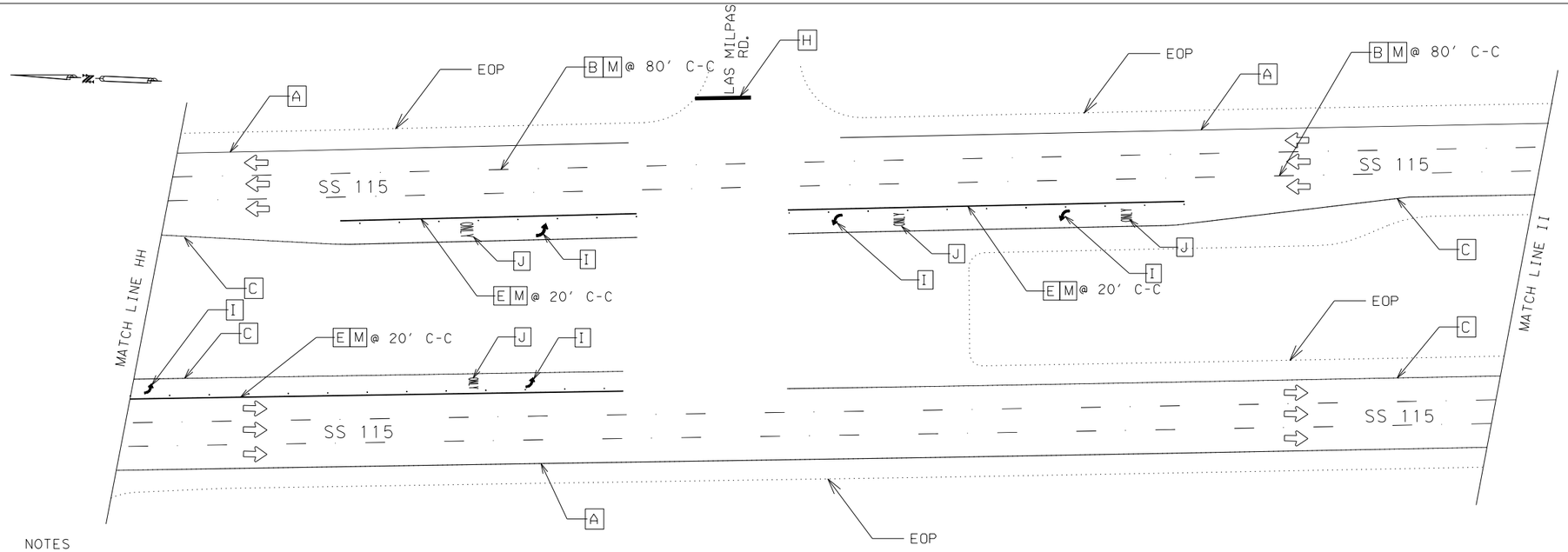
STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER
5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #2
PAVEMENT MARKING LAYOUT
SHEET 16 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		97
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.





NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

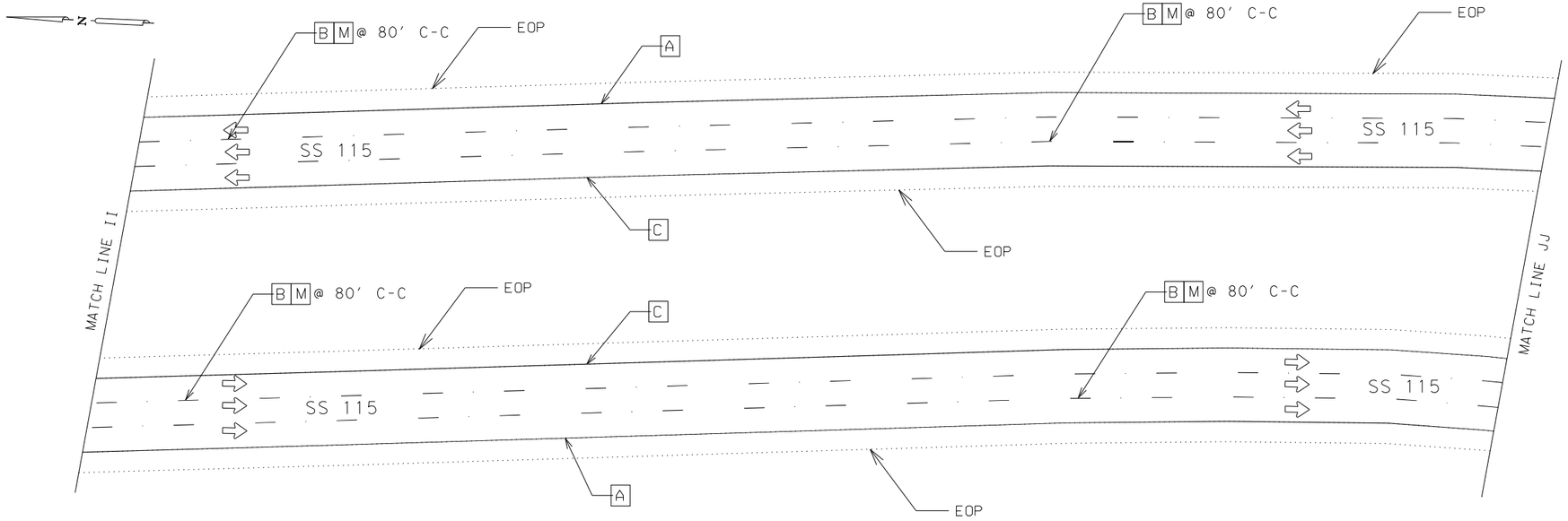
STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

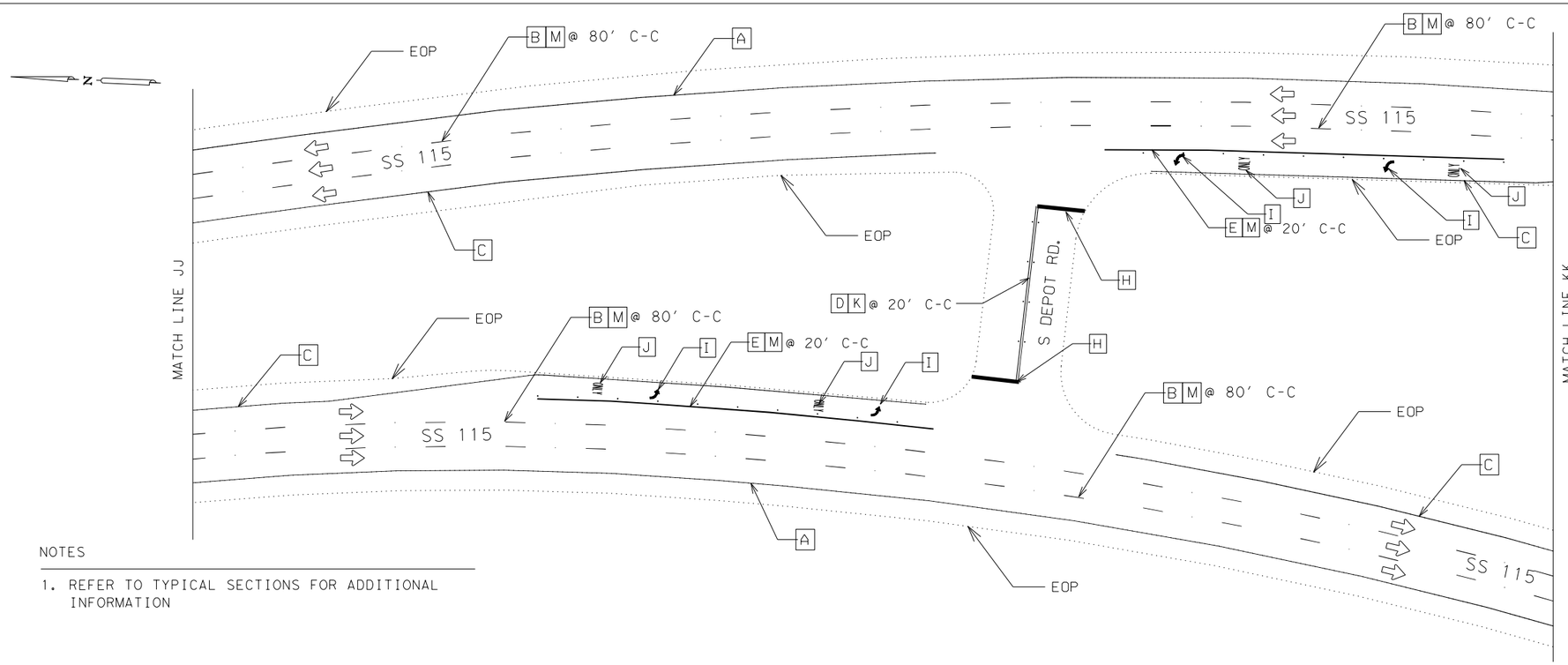
SS 115
LOCATION #2
PAVEMENT MARKING LAYOUT
SHEET 17 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		98
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.



LEGEND

- A - PROP. 6" SLD WHITE LINE
- B - PROP. 6" BKN WHITE LINE
- C - PROP. 6" SLD YELLOW LINE
- D - PROP. 6" DBL YELLOW LINE
- E - PROP. 8" SLD WHITE LINE
- F - PROP. 12" SLD YELLOW LINE
- G - PROP. 12" SLD WHITE LINE
- H - PROP. 24" SLD WHITE LINE
- I - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
- J - PROP. PREFABRICATED WORD TY-C
- K - PROP. PAV MRKR II-A-A
- L - PROP. PAV MRKR TY I-C
- M - PROP. PAV MRKR TY II-C-R
- N - YIELD LINES
- N - 6" BRK YELLOW LINE



NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

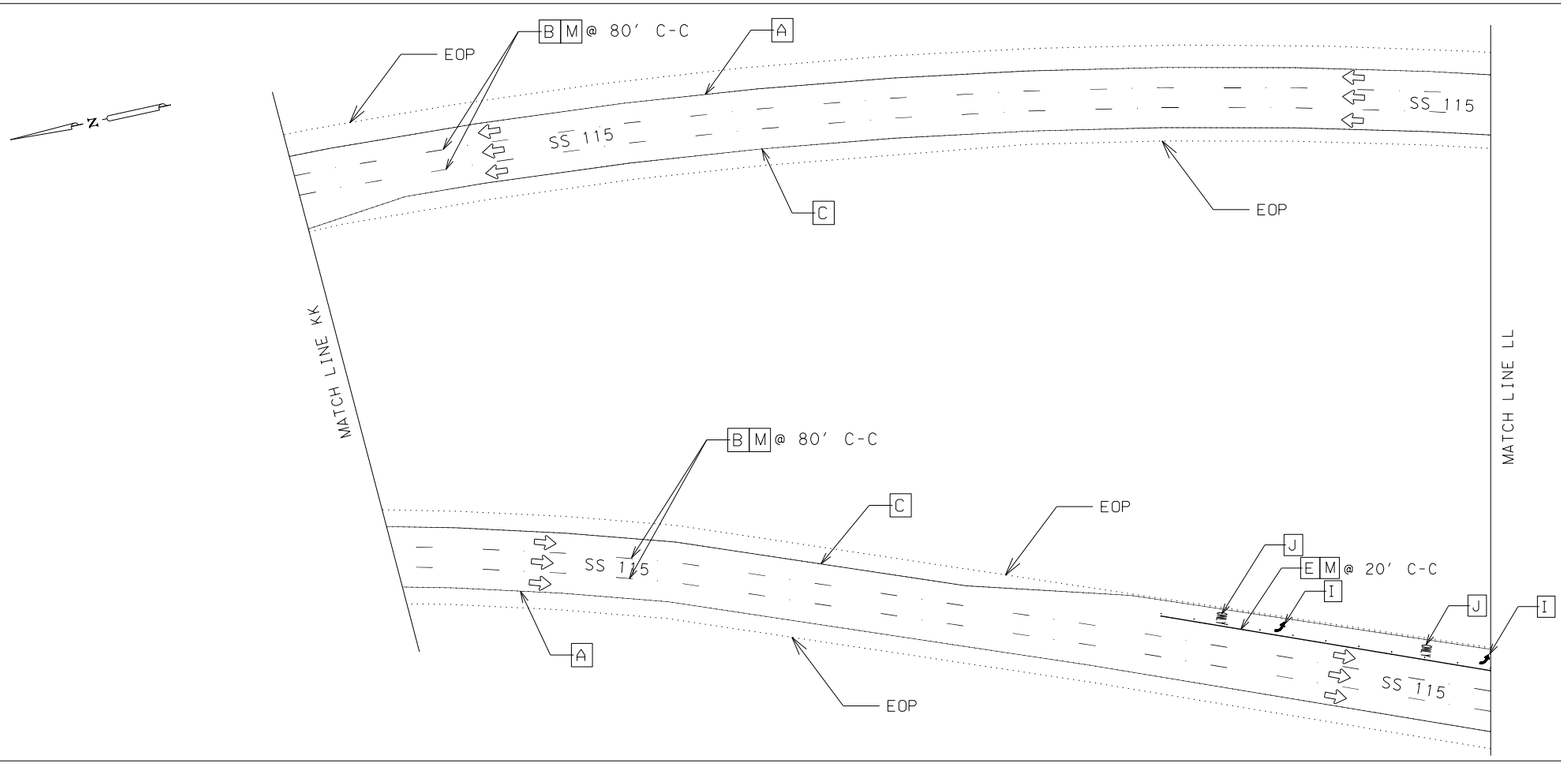
STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

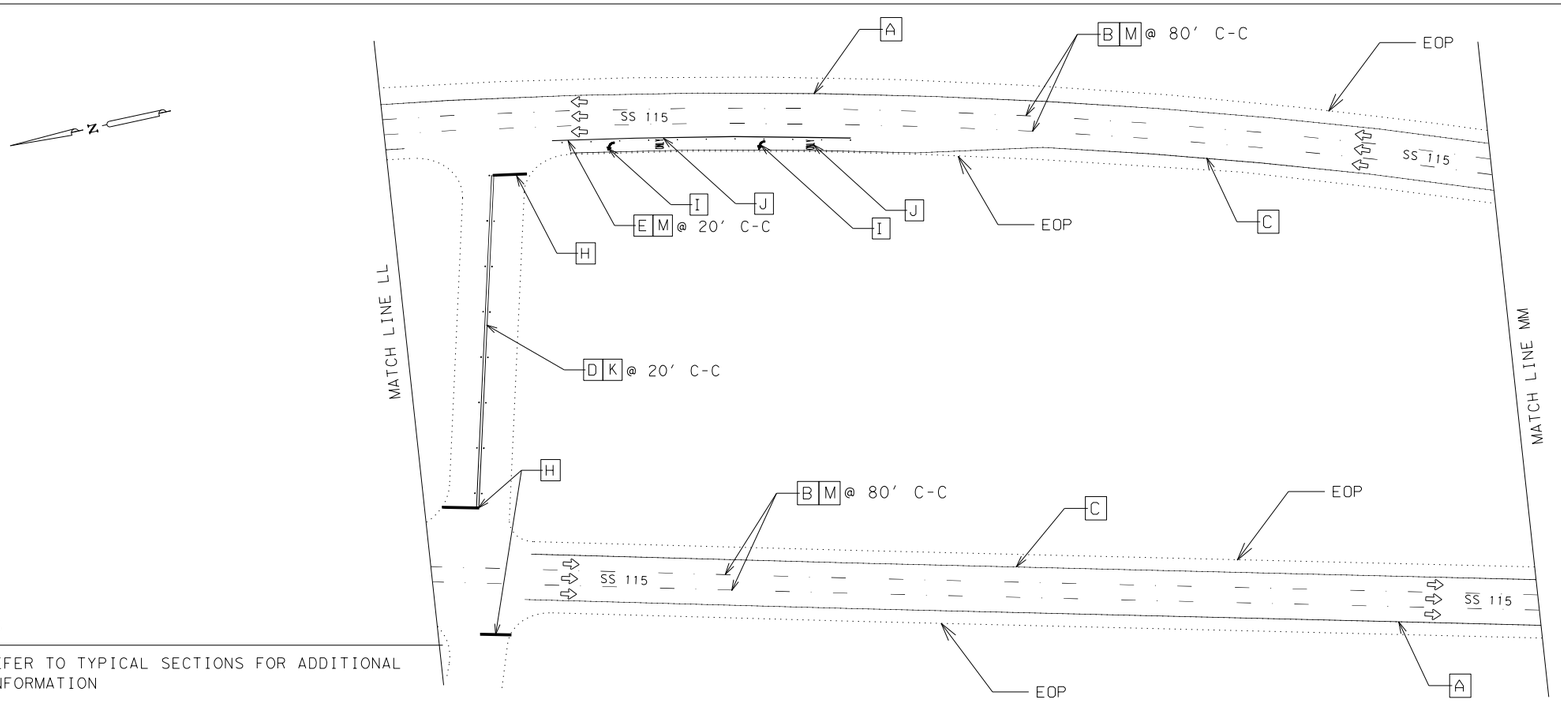
5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #2
PAVEMENT MARKING LAYOUT
SHEET 18 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		99
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.





LEGEND

- A - PROP. 6" SLD WHITE LINE
- B - PROP. 6" BKN WHITE LINE
- C - PROP. 6" SLD YELLOW LINE
- D - PROP. 6" DBL YELLOW LINE
- E - PROP. 8" SLD WHITE LINE
- F - PROP. 12" SLD YELLOW LINE
- G - PROP. 12" SLD WHITE LINE
- H - PROP. 24" SLD WHITE LINE
- I - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
- J - PROP. PREFABRICATED WORD TY-C
- K - PROP. PAV MRKR II-A-A
- L - PROP. PAV MRKR TY I-C
- M - PROP. PAV MRKR TY II-C-R
- N - YIELD LINES
- N - 6" BRK YELLOW LINE

NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

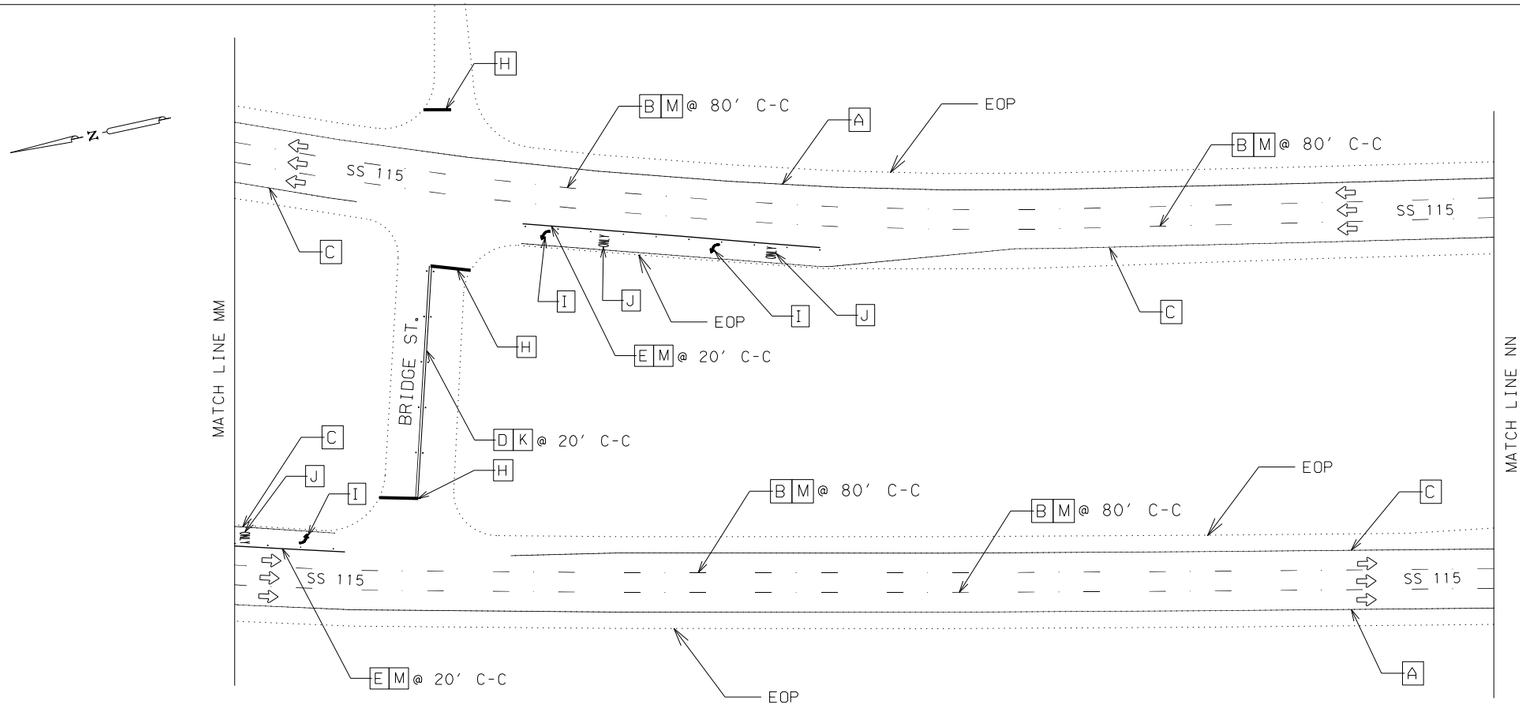
5/1/2023

Eugene Palacios

TEXAS DEPARTMENT OF TRANSPORTATION

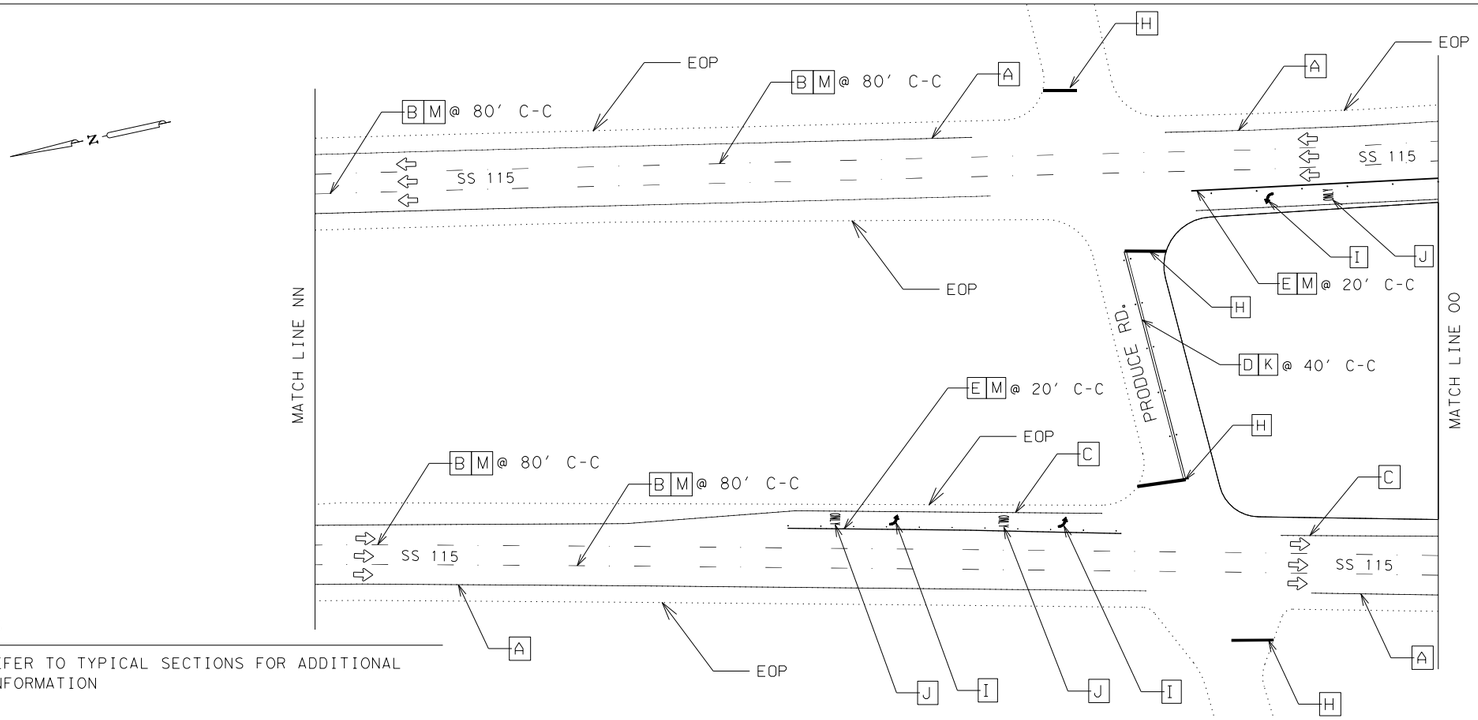
SS 115
LOCATION #2
PAVEMENT MARKING LAYOUT
SHEET 19 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY			SHEET No.
6	F 2023(909)		HIDALGO			100
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.	
TX	PHR	1804	01	082,ETC.	SS 115,ETC.	



LEGEND

- A - PROP. 6" SLD WHITE LINE
- B - PROP. 6" BKN WHITE LINE
- C - PROP. 6" SLD YELLOW LINE
- D - PROP. 6" DBL YELLOW LINE
- E - PROP. 8" SLD WHITE LINE
- F - PROP. 12" SLD YELLOW LINE
- G - PROP. 12" SLD WHITE LINE
- H - PROP. 24" SLD WHITE LINE
- I - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
- J - PROP. PREFABRICATED WORD TY-C
- K - PROP. PAV MRKR II-A-A
- L - PROP. PAV MRKR TY I-C
- M - PROP. PAV MRKR TY II-C-R
- N - YIELD LINES
- O - 6" BRK YELLOW LINE



NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

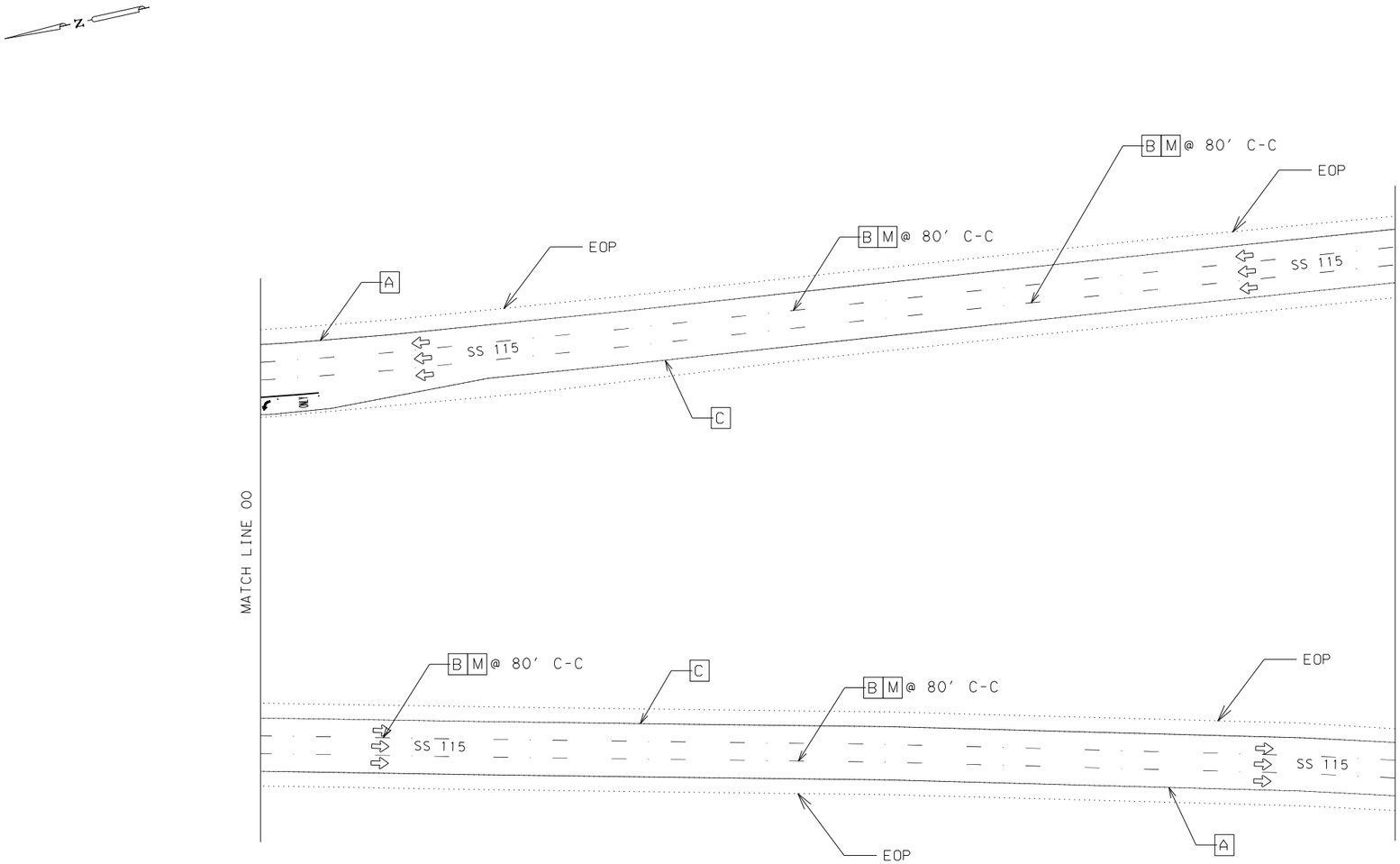
STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #2
PAVEMENT MARKING LAYOUT
SHEET 20 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		101
STATE	STATE DIST.NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.



LEGEND

- A - PROP. 6" SLD WHITE LINE
- B - PROP. 6" BKN WHITE LINE
- C - PROP. 6" SLD YELLOW LINE
- D - PROP. 6" DBL YELLOW LINE
- E - PROP. 8" SLD WHITE LINE
- F - PROP. 12" SLD YELLOW LINE
- G - PROP. 12" SLD WHITE LINE
- H - PROP. 24" SLD WHITE LINE
- I - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
- J - PROP. PREFABRICATED WORD TY-C
- K - PROP. PAV MRKR II-A-A
- L - PROP. PAV MRKR TY I-C
- M - PROP. PAV MRKR TY II-C-R
- N - YIELD LINES
- O - 6" BRK YELLOW LINE

NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

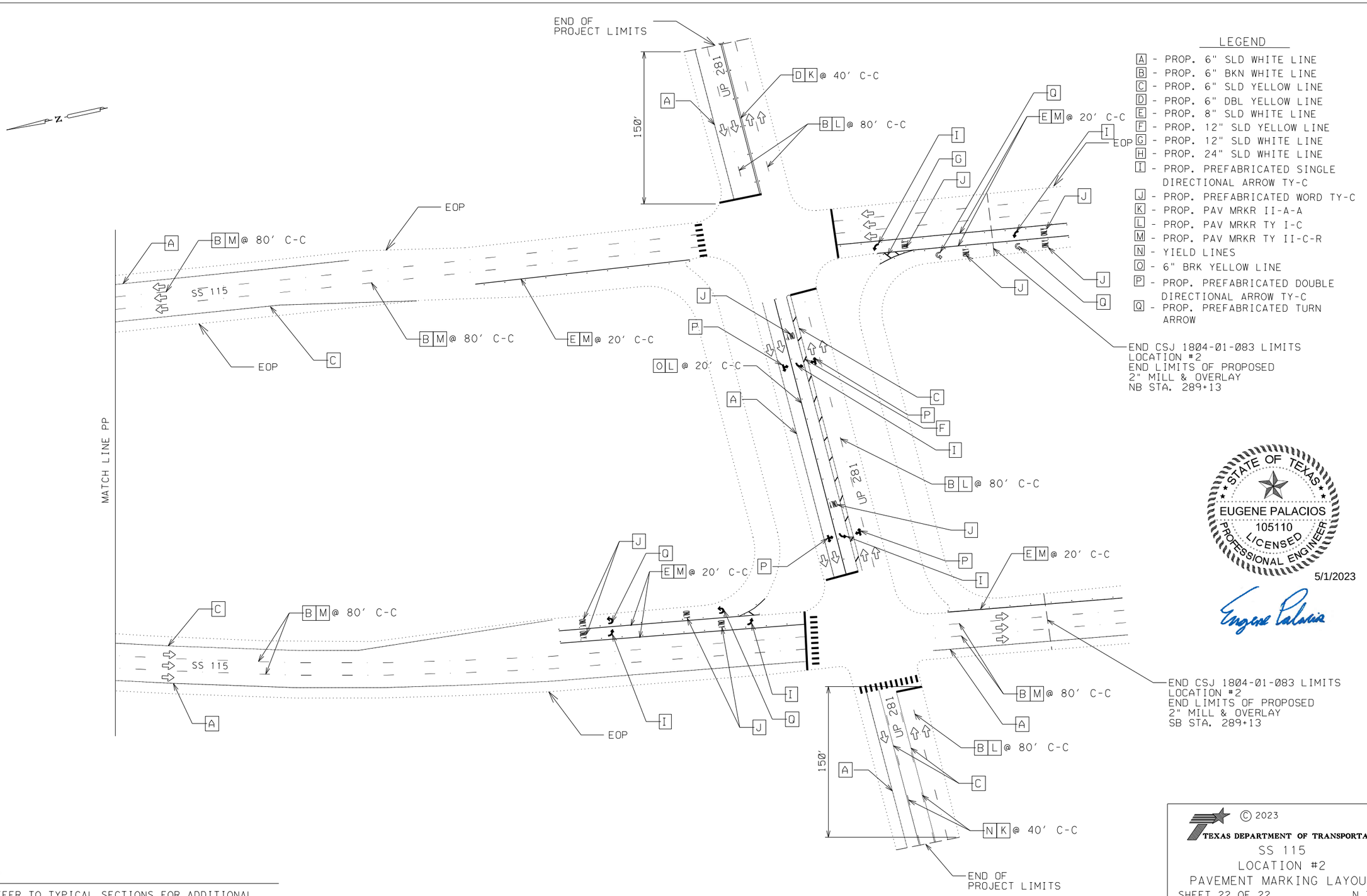
5/1/2023

Eugene Palacios

TEXAS DEPARTMENT OF TRANSPORTATION

SS 115
LOCATION #2
PAVEMENT MARKING LAYOUT
SHEET 21 OF 22 N.T.S.

FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		102
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.



LEGEND

- A - PROP. 6" SLD WHITE LINE
- B - PROP. 6" BKN WHITE LINE
- C - PROP. 6" SLD YELLOW LINE
- D - PROP. 6" DBL YELLOW LINE
- E - PROP. 8" SLD WHITE LINE
- F - PROP. 12" SLD YELLOW LINE
- G - PROP. 12" SLD WHITE LINE
- H - PROP. 24" SLD WHITE LINE
- I - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
- J - PROP. PREFABRICATED WORD TY-C
- K - PROP. PAV MRKR II-A-A
- L - PROP. PAV MRKR TY I-C
- M - PROP. PAV MRKR TY II-C-R
- N - YIELD LINES
- O - 6" BRK YELLOW LINE
- P - PROP. PREFABRICATED DOUBLE DIRECTIONAL ARROW TY-C
- Q - PROP. PREFABRICATED TURN ARROW

STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

Eugene Palacios

NOTES

1. REFER TO TYPICAL SECTIONS FOR ADDITIONAL INFORMATION

TEXAS DEPARTMENT OF TRANSPORTATION

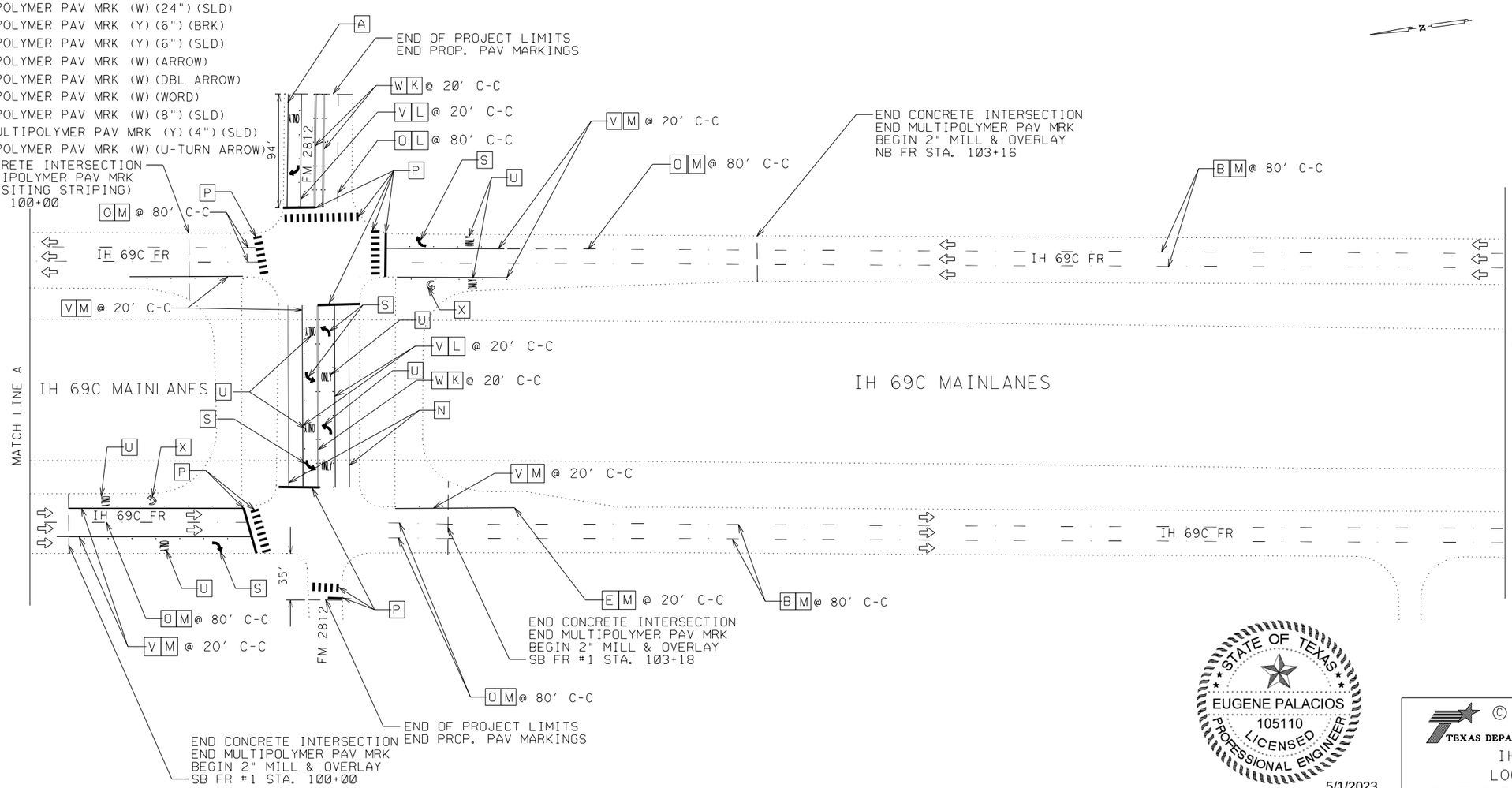
SS 115
LOCATION #2
PAVEMENT MARKING LAYOUT
SHEET 22 OF 22 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		103
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LEGEND

[A] - PROP. 6" SLD WHITE LINE
[B] - PROP. 6" BKN WHITE LINE
[C] - PROP. 6" SLD YELLOW LINE
[D] - PROP. 6" DBL YELLOW LINE
[E] - PROP. 8" SLD WHITE LINE
[F] - PROP. 12" SLD YELLOW LINE
[G] - PROP. 12" SLD WHITE LINE
[H] - PROP. 24" SLD WHITE LINE
[I] - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
[J] - PROP. PREFABRICATED WORD TY-C
[K] - PROP. PAV MRKR II-A-A
[L] - PROP. PAV MRKR TY I-C
[M] - PROP. PAV MRKR TY II-C-R
[N] - PROP. MULTIPOLYMER PAV MRK (W)(6")(SLD)
[O] - PROP. MULTIPOLYMER PAV MRK (W)(6")(BRK)
[P] - PROP. MULTIPOLYMER PAV MRK (W)(24")(SLD)
[Q] - PROP. MULTIPOLYMER PAV MRK (Y)(6")(BRK)
[R] - PROP. MULTIPOLYMER PAV MRK (Y)(6")(SLD)
[S] - PROP. MULTIPOLYMER PAV MRK (W)(ARROW)
[T] - PROP. MULTIPOLYMER PAV MRK (W)(DBL ARROW)
[U] - PROP. MULTIPOLYMER PAV MRK (W)(WORD)
[V] - PROP. MULTIPOLYMER PAV MRK (W)(8")(SLD)
[W] - PROP. DBL MULTIPOLYMER PAV MRK (Y)(4")(SLD)
[X] - PROP. MULTIPOLYMER PAV MRK (W)(U-TURN ARROW)

EOP - EXISTING EDGE OF PAVEMENT
⇨ - TRAFFIC FLOW
PROP. - PROPOSED
SLD - SOLID
BRK - BROKEN
PAV - PAVEMENT
DBL - DOUBLE



NOTES

1. SEE PAVEMENT MARKING STANDARDS FOR ADDITIONAL INFORMATION
2. MULTIPOLYMER PAVEMENT MARKINGS ARE ONLY APPLICABLE WITHIN CONCRETE PAVEMENT LIMITS.

STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER
5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

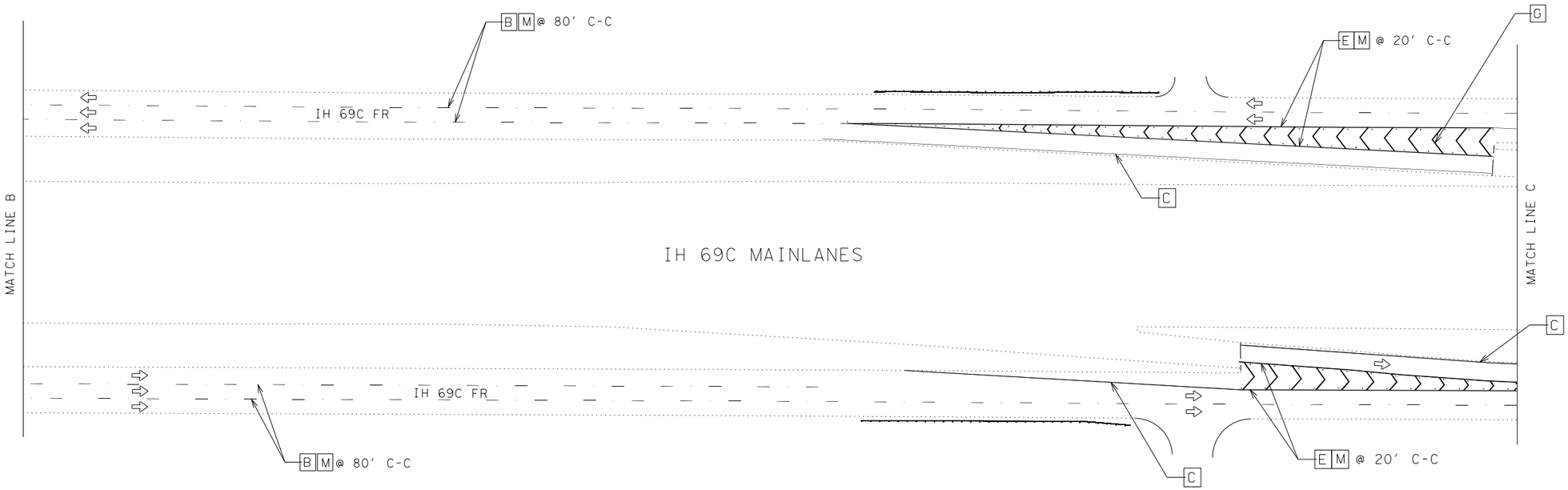
IH 69C FR.
LOCATION #3
PAVEMENT MARKING LAYOUT
SHEET 1 OF 16 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		104
STATE	STATE DIST.NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LEGEND

A - PROP. 6" SLD WHITE LINE
B - PROP. 6" BKN WHITE LINE
C - PROP. 6" SLD YELLOW LINE
D - PROP. 6" DBL YELLOW LINE
E - PROP. 8" SLD WHITE LINE
F - PROP. 12" SLD YELLOW LINE
G - PROP. 12" SLD WHITE LINE
H - PROP. 24" SLD WHITE LINE
I - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
J - PROP. PREFABRICATED WORD TY-C
K - PROP. PAV MRKR II-A-A
L - PROP. PAV MRKR TY I-C
M - PROP. PAV MRKR TY II-C-R
N - PROP. MULTIPOLYMER PAV MRK (W)(6")(SLD)
O - PROP. MULTIPOLYMER PAV MRK (W)(6")(BRK)
P - PROP. MULTIPOLYMER PAV MRK (W)(24")(SLD)
Q - PROP. MULTIPOLYMER PAV MRK (Y)(6")(BRK)
R - PROP. MULTIPOLYMER PAV MRK (Y)(6")(SLD)
S - PROP. MULTIPOLYMER PAV MRK (W)(ARROW)
T - PROP. MULTIPOLYMER PAV MRK (W)(DBL ARROW)
U - PROP. MULTIPOLYMER PAV MRK (W)(WORD)
V - PROP. MULTIPOLYMER PAV MRK (W)(8")(SLD)
W - PROP. DBL MULTIPOLYMER PAV MRK (Y)(4")(SLD)

EOP - EXISTING EDGE OF PAVEMENT
⇨ - TRAFFIC FLOW
PROP. - PROPOSED
SLD - SOLID
BRK - BROKEN
PAV - PAVEMENT
DBL - DOUBLE
– —– - PROJECT LIMITS



NOTES

1. SEE PAVEMENT MARKING STANDARDS FOR ADDITIONAL INFORMATION
2. MULTIPOLYMER PAVEMENT MARKINGS ARE ONLY APPLICABLE WITHIN CONCRETE PAVEMENT LIMITS.

STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER
5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

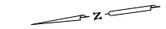
IH 69C FR.
LOCATION #3
PAVEMENT MARKING LAYOUT
SHEET 2 OF 16 N.T.S.

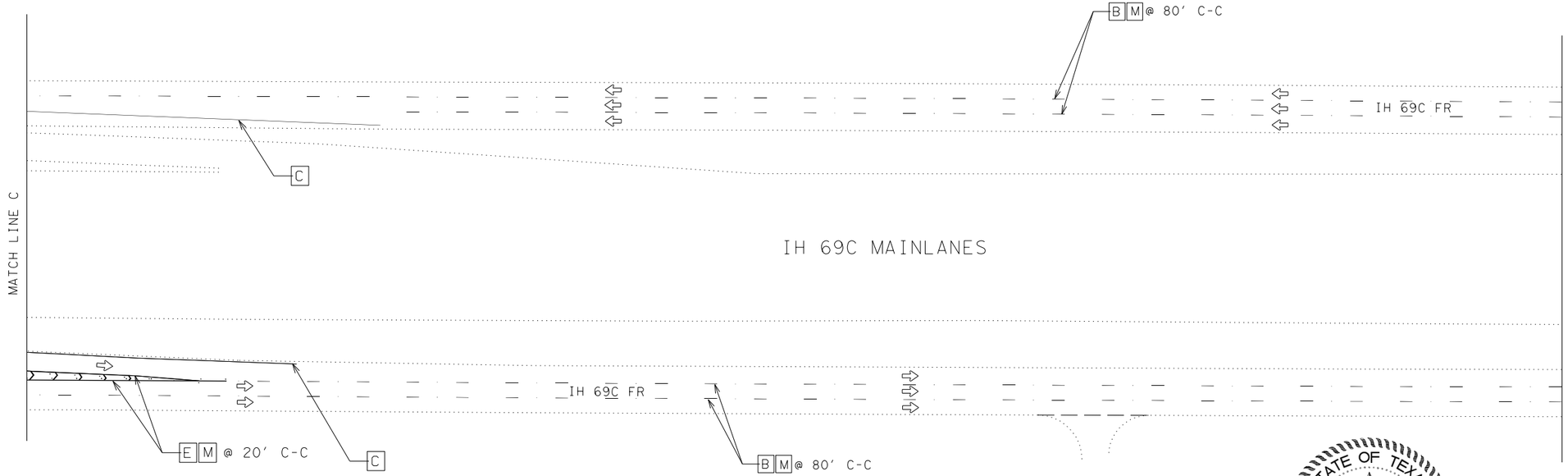
FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET NO.
6	F 2023(909)		HIDALGO		105
STATE	STATE DIST.NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LEGEND

A - PROP. 6" SLD WHITE LINE
B - PROP. 6" BKN WHITE LINE
C - PROP. 6" SLD YELLOW LINE
D - PROP. 6" DBL YELLOW LINE
E - PROP. 8" SLD WHITE LINE
F - PROP. 12" SLD YELLOW LINE
G - PROP. 12" SLD WHITE LINE
H - PROP. 24" SLD WHITE LINE
I - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
J - PROP. PREFABRICATED WORD TY-C
K - PROP. PAV MRKR II-A-A
L - PROP. PAV MRKR TY I-C
M - PROP. PAV MRKR TY II-C-R
N - PROP. MULTIPOLYMER PAV MRK (W)(6")(SLD)
O - PROP. MULTIPOLYMER PAV MRK (W)(6")(BRK)
P - PROP. MULTIPOLYMER PAV MRK (W)(24")(SLD)
Q - PROP. MULTIPOLYMER PAV MRK (Y)(6")(BRK)
R - PROP. MULTIPOLYMER PAV MRK (Y)(6")(SLD)
S - PROP. MULTIPOLYMER PAV MRK (W)(ARROW)
T - PROP. MULTIPOLYMER PAV MRK (W)(DBL ARROW)
U - PROP. MULTIPOLYMER PAV MRK (W)(WORD)
V - PROP. MULTIPOLYMER PAV MRK (W)(8")(SLD)
W - PROP. DBL MULTIPOLYMER PAV MRK (Y)(4")(SLD)

EOP - EXISTING EDGE OF PAVEMENT
⇨ - TRAFFIC FLOW
PROP. - PROPOSED
SLD - SOLID
BRK - BROKEN
PAV - PAVEMENT
DBL - DOUBLE
— — - PROJECT LIMITS





STATE OF TEXAS
EUGENE PALACIOS
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PROFESSIONAL ENGINEER
5/1/2023

Eugene Palacios

TEXAS DEPARTMENT OF TRANSPORTATION

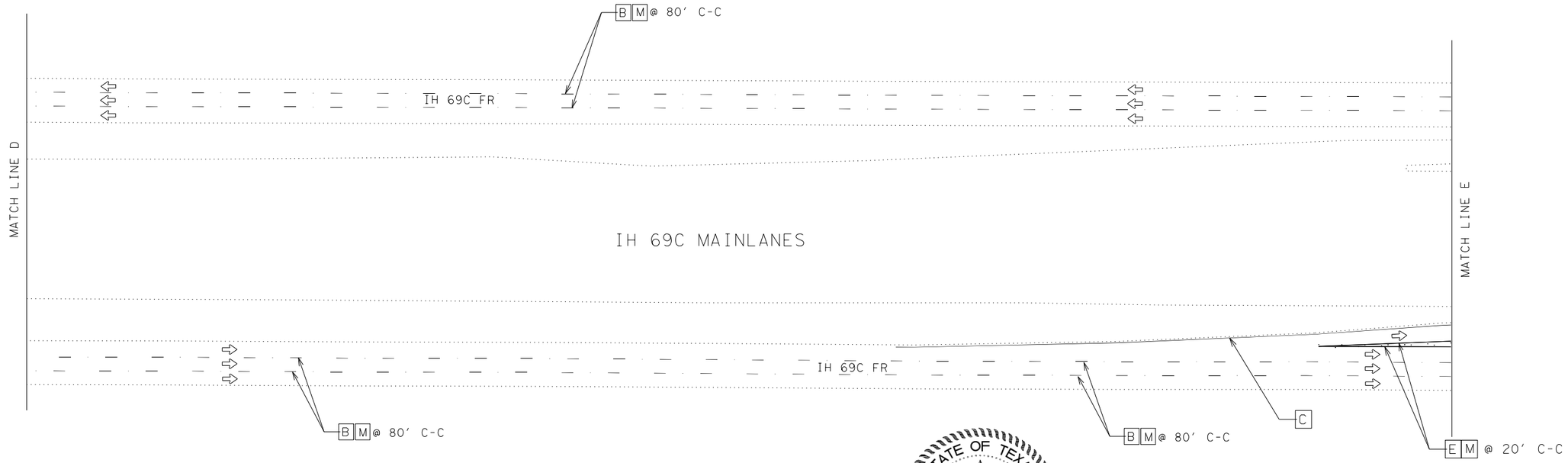
IH 69C FR.
LOCATION #3
PAVEMENT MARKING LAYOUT
SHEET 3 OF 16 N.T.S.

FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		106
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LEGEND

[A] - PROP. 6" SLD WHITE LINE
[B] - PROP. 6" BKN WHITE LINE
[C] - PROP. 6" SLD YELLOW LINE
[D] - PROP. 6" DBL YELLOW LINE
[E] - PROP. 8" SLD WHITE LINE
[F] - PROP. 12" SLD YELLOW LINE
[G] - PROP. 12" SLD WHITE LINE
[H] - PROP. 24" SLD WHITE LINE
[I] - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
[J] - PROP. PREFABRICATED WORD TY-C
[K] - PROP. PAV MRKR II-A-A
[L] - PROP. PAV MRKR TY I-C
[M] - PROP. PAV MRKR TY II-C-R
[N] - PROP. MULTIPOLYMER PAV MRK (W)(6")(SLD)
[O] - PROP. MULTIPOLYMER PAV MRK (W)(6")(BRK)
[P] - PROP. MULTIPOLYMER PAV MRK (W)(24")(SLD)
[Q] - PROP. MULTIPOLYMER PAV MRK (Y)(6")(BRK)
[R] - PROP. MULTIPOLYMER PAV MRK (Y)(6")(SLD)
[S] - PROP. MULTIPOLYMER PAV MRK (W)(ARROW)
[T] - PROP. MULTIPOLYMER PAV MRK (W)(DBL ARROW)
[U] - PROP. MULTIPOLYMER PAV MRK (W)(WORD)
[V] - PROP. MULTIPOLYMER PAV MRK (W)(8")(SLD)
[W] - PROP. DBL MULTIPOLYMER PAV MRK (Y)(4")(SLD)

EOP - EXISTING EDGE OF PAVEMENT
⇨ - TRAFFIC FLOW
PROP. - PROPOSED
SLD - SOLID
BRK - BROKEN
PAV - PAVEMENT
DBL - DOUBLE
— — - PROJECT LIMITS



NOTES

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STATE OF TEXAS
EUGENE PALACIOS
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5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

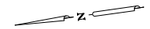
IH 69C FR.
LOCATION #3
PAVEMENT MARKING LAYOUT
SHEET 4 OF 16 N.T.S.

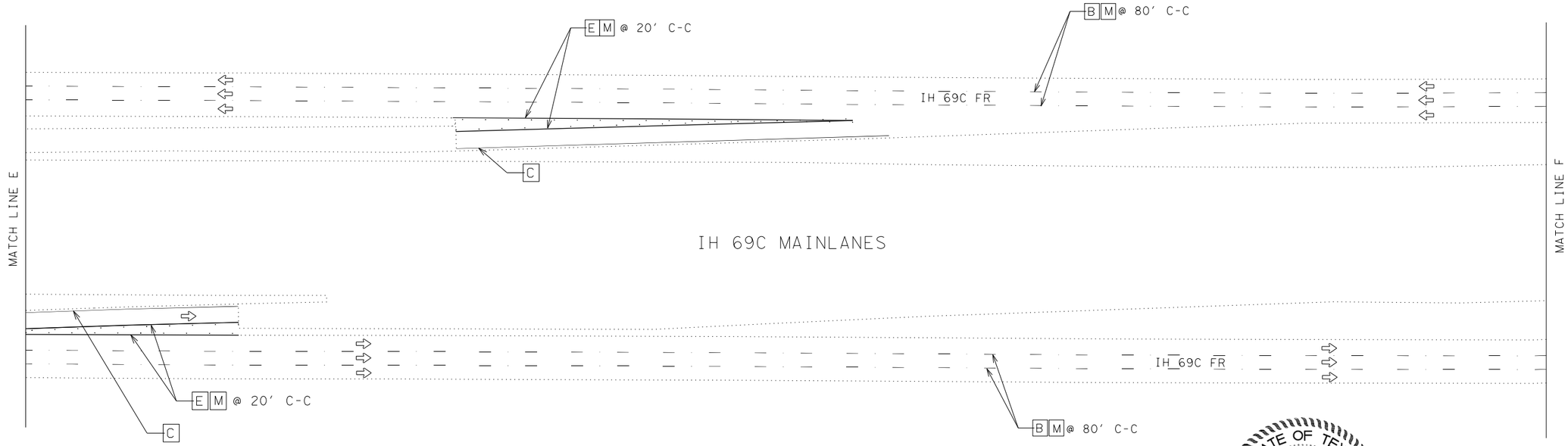
FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET NO.
6	F 2023(909)		HIDALGO		107
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LEGEND

A - PROP. 6" SLD WHITE LINE
B - PROP. 6" BKN WHITE LINE
C - PROP. 6" SLD YELLOW LINE
D - PROP. 6" DBL YELLOW LINE
E - PROP. 8" SLD WHITE LINE
F - PROP. 12" SLD YELLOW LINE
G - PROP. 12" SLD WHITE LINE
H - PROP. 24" SLD WHITE LINE
I - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
J - PROP. PREFABRICATED WORD TY-C
K - PROP. PAV MRKR II-A-A
L - PROP. PAV MRKR TY I-C
M - PROP. PAV MRKR TY II-C-R
N - PROP. MULTIPOLYMER PAV MRK (W)(6")(SLD)
O - PROP. MULTIPOLYMER PAV MRK (W)(6")(BRK)
P - PROP. MULTIPOLYMER PAV MRK (W)(24")(SLD)
Q - PROP. MULTIPOLYMER PAV MRK (Y)(6")(BRK)
R - PROP. MULTIPOLYMER PAV MRK (Y)(6")(SLD)
S - PROP. MULTIPOLYMER PAV MRK (W)(ARROW)
T - PROP. MULTIPOLYMER PAV MRK (W)(DBL ARROW)
U - PROP. MULTIPOLYMER PAV MRK (W)(WORD)
V - PROP. MULTIPOLYMER PAV MRK (W)(8")(SLD)
W - PROP. DBL MULTIPOLYMER PAV MRK (Y)(4")(SLD)

EOP - EXISTING EDGE OF PAVEMENT
⇨ - TRAFFIC FLOW
PROP. - PROPOSED
SLD - SOLID
BRK - BROKEN
PAV - PAVEMENT
DBL - DOUBLE
– — - PROJECT LIMITS





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STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER
5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

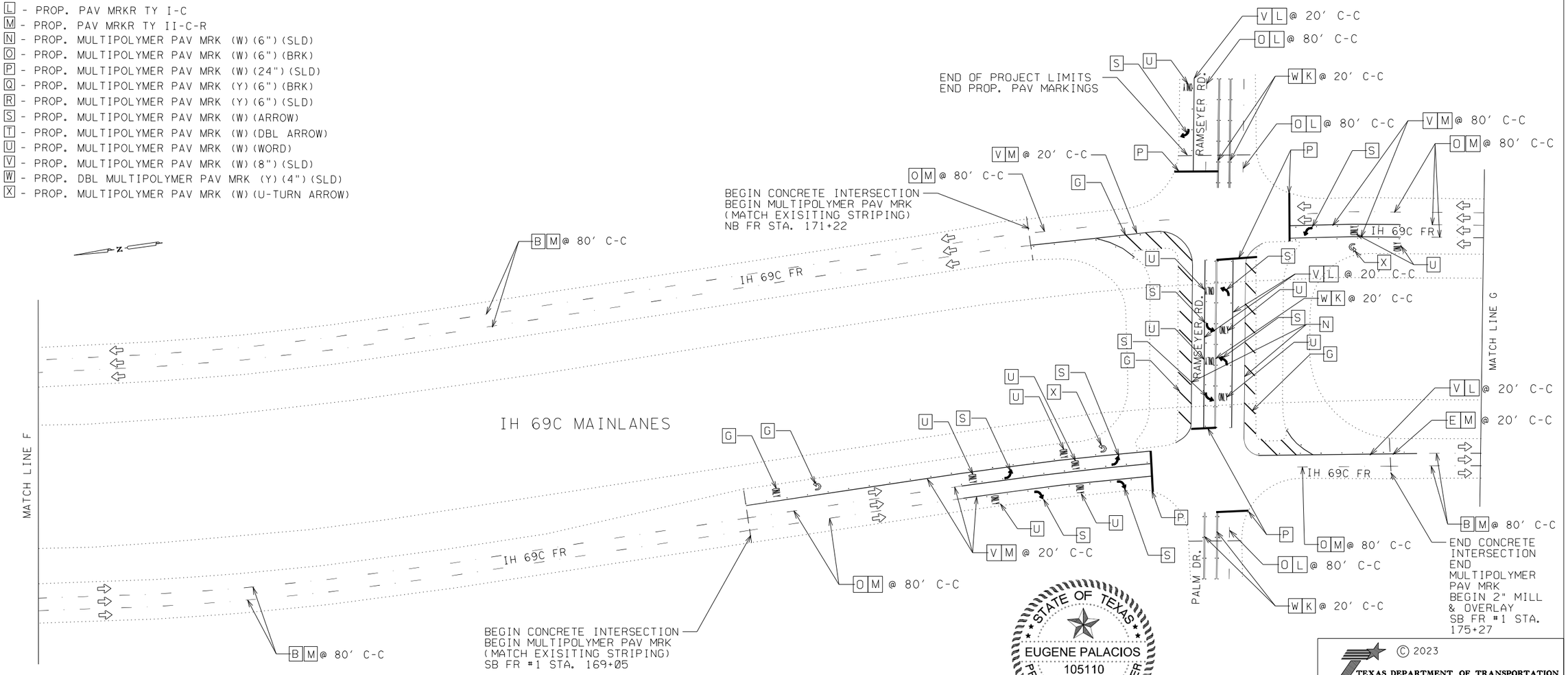
IH 69C FR.
LOCATION #3
PAVEMENT MARKING LAYOUT
SHEET 5 OF 16 N.T.S.

FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		108
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LEGEND

- [A] - PROP. 6" SLD WHITE LINE
- [B] - PROP. 6" BKN WHITE LINE
- [C] - PROP. 6" SLD YELLOW LINE
- [D] - PROP. 6" DBL YELLOW LINE
- [E] - PROP. 8" SLD WHITE LINE
- [F] - PROP. 12" SLD YELLOW LINE
- [G] - PROP. 12" SLD WHITE LINE
- [H] - PROP. 24" SLD WHITE LINE
- [I] - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
- [J] - PROP. PREFABRICATED WORD TY-C
- [K] - PROP. PAV MRKR II-A-A
- [L] - PROP. PAV MRKR TY I-C
- [M] - PROP. PAV MRKR TY II-C-R
- [N] - PROP. MULTIPOLYMER PAV MRK (W)(6")(SLD)
- [O] - PROP. MULTIPOLYMER PAV MRK (W)(6")(BRK)
- [P] - PROP. MULTIPOLYMER PAV MRK (W)(24")(SLD)
- [Q] - PROP. MULTIPOLYMER PAV MRK (Y)(6")(BRK)
- [R] - PROP. MULTIPOLYMER PAV MRK (Y)(6")(SLD)
- [S] - PROP. MULTIPOLYMER PAV MRK (W)(ARROW)
- [T] - PROP. MULTIPOLYMER PAV MRK (W)(DBL ARROW)
- [U] - PROP. MULTIPOLYMER PAV MRK (W)(WORD)
- [V] - PROP. MULTIPOLYMER PAV MRK (W)(8")(SLD)
- [W] - PROP. DBL MULTIPOLYMER PAV MRK (Y)(4")(SLD)
- [X] - PROP. MULTIPOLYMER PAV MRK (W)(U-TURN ARROW)

EOP - EXISTING EDGE OF PAVEMENT
⇨ - TRAFFIC FLOW
PROP. - PROPOSED
SLD - SOLID
BRK - BROKEN
PAV - PAVEMENT
DBL - DOUBLE
– —– - PROJECT LIMITS



NOTES

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STATE OF TEXAS
EUGENE PALACIOS
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LICENSED
PROFESSIONAL ENGINEER

5/1/2023

Eugene Palacios

TEXAS DEPARTMENT OF TRANSPORTATION

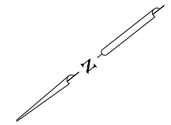
IH 69C FR.
LOCATION #3
PAVEMENT MARKING LAYOUT
SHEET 6 OF 16 N.T.S.

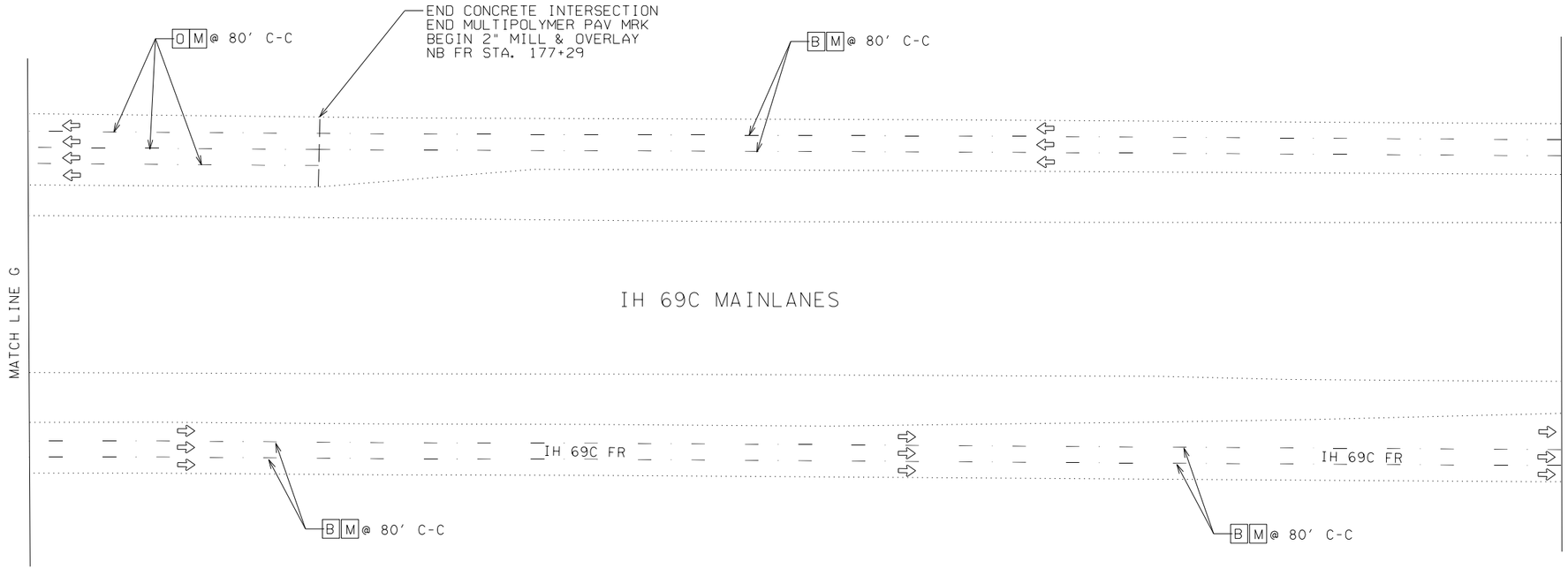
FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		109
STATE	STATE DIST.NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LEGEND

[A] - PROP. 6" SLD WHITE LINE
[B] - PROP. 6" BKN WHITE LINE
[C] - PROP. 6" SLD YELLOW LINE
[D] - PROP. 6" DBL YELLOW LINE
[E] - PROP. 8" SLD WHITE LINE
[F] - PROP. 12" SLD YELLOW LINE
[G] - PROP. 12" SLD WHITE LINE
[H] - PROP. 24" SLD WHITE LINE
[I] - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
[J] - PROP. PREFABRICATED WORD TY-C
[K] - PROP. PAV MRKR II-A-A
[L] - PROP. PAV MRKR TY I-C
[M] - PROP. PAV MRKR TY II-C-R
[N] - PROP. MULTIPOLYMER PAV MRK (W)(6")(SLD)
[O] - PROP. MULTIPOLYMER PAV MRK (W)(6")(BRK)
[P] - PROP. MULTIPOLYMER PAV MRK (W)(24")(SLD)
[Q] - PROP. MULTIPOLYMER PAV MRK (Y)(6")(BRK)
[R] - PROP. MULTIPOLYMER PAV MRK (Y)(6")(SLD)
[S] - PROP. MULTIPOLYMER PAV MRK (W)(ARROW)
[T] - PROP. MULTIPOLYMER PAV MRK (W)(DBL ARROW)
[U] - PROP. MULTIPOLYMER PAV MRK (W)(WORD)
[V] - PROP. MULTIPOLYMER PAV MRK (W)(8")(SLD)
[W] - PROP. DBL MULTIPOLYMER PAV MRK (Y)(4")(SLD)

EOP - EXISTING EDGE OF PAVEMENT
⇨ - TRAFFIC FLOW
PROP. - PROPOSED
SLD - SOLID
BRK - BROKEN
PAV - PAVEMENT
DBL - DOUBLE
– —– - PROJECT LIMITS





NOTES

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STATE OF TEXAS
EUGENE PALACIOS
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LICENSED
PROFESSIONAL ENGINEER
5/1/2023

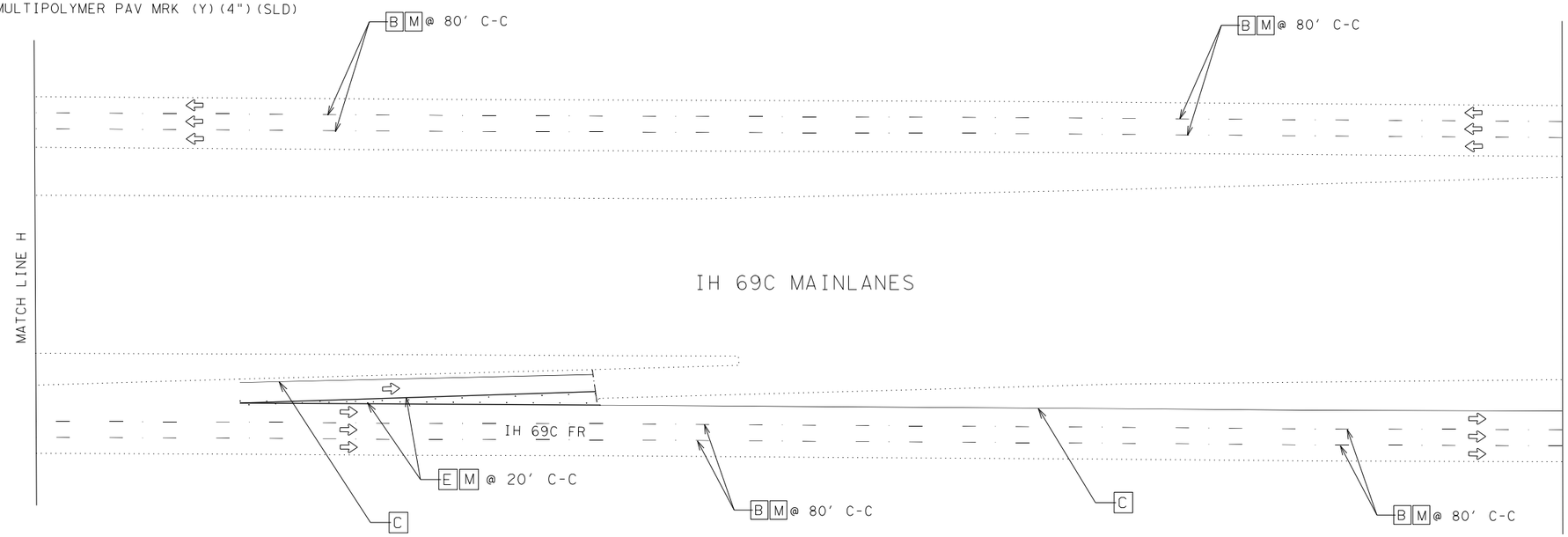
TEXAS DEPARTMENT OF TRANSPORTATION
IH 69C FR.
LOCATION #3
PAVEMENT MARKING LAYOUT
SHEET 7 OF 16 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		110
STATE	STATE DIST.NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LEGEND

[A] - PROP. 6" SLD WHITE LINE
[B] - PROP. 6" BKN WHITE LINE
[C] - PROP. 6" SLD YELLOW LINE
[D] - PROP. 6" DBL YELLOW LINE
[E] - PROP. 8" SLD WHITE LINE
[F] - PROP. 12" SLD YELLOW LINE
[G] - PROP. 12" SLD WHITE LINE
[H] - PROP. 24" SLD WHITE LINE
[I] - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
[J] - PROP. PREFABRICATED WORD TY-C
[K] - PROP. PAV MRKR II-A-A
[L] - PROP. PAV MRKR TY I-C
[M] - PROP. PAV MRKR TY II-C-R
[N] - PROP. MULTIPOLYMER PAV MRK (W)(6")(SLD)
[O] - PROP. MULTIPOLYMER PAV MRK (W)(6")(BRK)
[P] - PROP. MULTIPOLYMER PAV MRK (W)(24")(SLD)
[Q] - PROP. MULTIPOLYMER PAV MRK (Y)(6")(BRK)
[R] - PROP. MULTIPOLYMER PAV MRK (Y)(6")(SLD)
[S] - PROP. MULTIPOLYMER PAV MRK (W)(ARROW)
[T] - PROP. MULTIPOLYMER PAV MRK (W)(DBL ARROW)
[U] - PROP. MULTIPOLYMER PAV MRK (W)(WORD)
[V] - PROP. MULTIPOLYMER PAV MRK (W)(8")(SLD)
[W] - PROP. DBL MULTIPOLYMER PAV MRK (Y)(4")(SLD)

EOP - EXISTING EDGE OF PAVEMENT
⇨ - TRAFFIC FLOW
PROP. - PROPOSED
SLD - SOLID
BRK - BROKEN
PAV - PAVEMENT
DBL - DOUBLE
– —– - PROJECT LIMITS



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STATE OF TEXAS
EUGENE PALACIOS
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PROFESSIONAL ENGINEER
5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

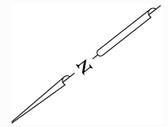
IH 69C FR.
LOCATION #3
PAVEMENT MARKING LAYOUT
SHEET 8 OF 16 N.T.S.

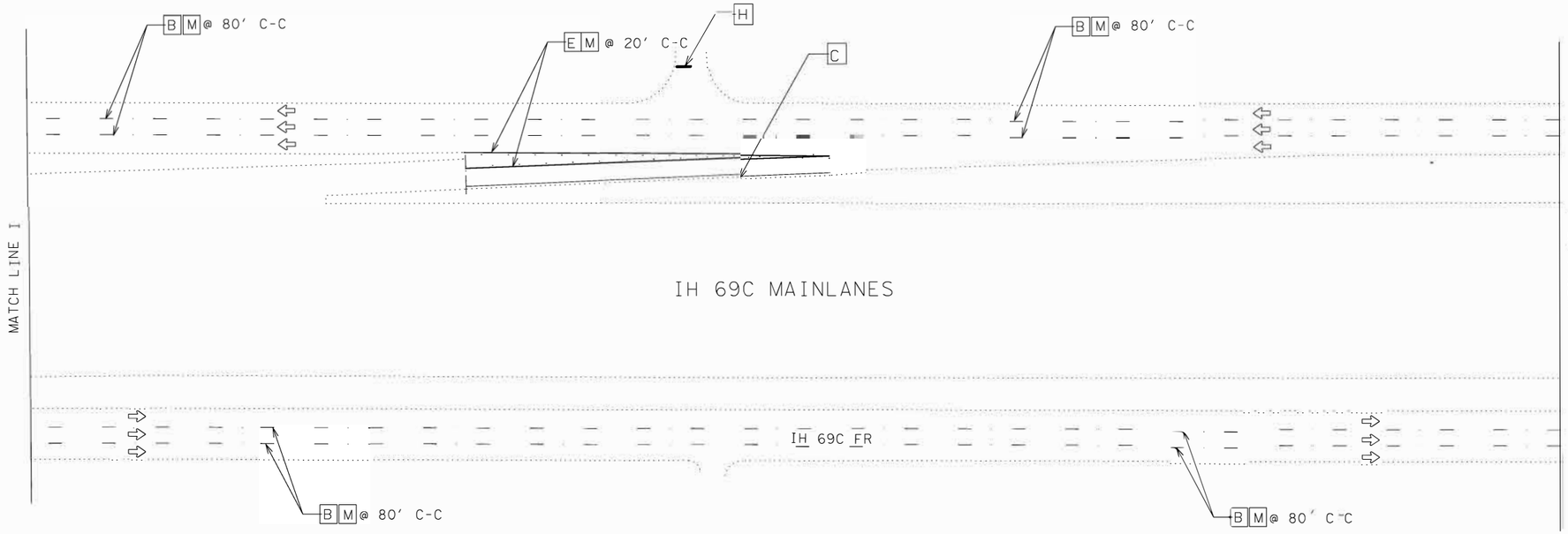
FED.RD. DIV.NO.	PROJECT NO.		COUNTY			SHEET NO.
6	F 2023(909)		HIDALGO			111
STATE	STATE DIST.NO.	CONTROL	SECTION	JOB	HIGHWAY No.	
TX	PHR	1804	01	082,ETC.	SS 115,ETC.	

LEGEND

A - PROP. 6" SLD WHITE LINE
B - PROP. 6" BKN WHITE LINE
C - PROP. 6" SLD YELLOW LINE
D - PROP. 6" DBL YELLOW LINE
E - PROP. 8" SLD WHITE LINE
F - PROP. 12" SLD YELLOW LINE
G - PROP. 12" SLD WHITE LINE
H - PROP. 24" SLD WHITE LINE
I - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
J - PROP. PREFABRICATED WORD TY-C
K - PROP. PAV MRKR II-A-A
L - PROP. PAV MRKR TY I-C
M - PROP. PAV MRKR TY II-C-R
N - PROP. MULTIPOLYMER PAV MRK (W)(6")(SLD)
O - PROP. MULTIPOLYMER PAV MRK (W)(6")(BRK)
P - PROP. MULTIPOLYMER PAV MRK (W)(24")(SLD)
Q - PROP. MULTIPOLYMER PAV MRK (Y)(6")(BRK)
R - PROP. MULTIPOLYMER PAV MRK (Y)(6")(SLD)
S - PROP. MULTIPOLYMER PAV MRK (W)(ARROW)
T - PROP. MULTIPOLYMER PAV MRK (W)(DBL ARROW)
U - PROP. MULTIPOLYMER PAV MRK (W)(WORD)
V - PROP. MULTIPOLYMER PAV MRK (W)(8")(SLD)
W - PROP. DBL MULTIPOLYMER PAV MRK (Y)(4")(SLD)

EOP - EXISTING EDGE OF PAVEMENT
⇨ - TRAFFIC FLOW
PROP. - PROPOSED
SLD - SOLID
BRK - BROKEN
PAV - PAVEMENT
DBL - DOUBLE
— — - PROJECT LIMITS





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STATE OF TEXAS
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PROFESSIONAL ENGINEER
5/1/2023

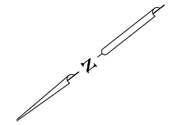
TEXAS DEPARTMENT OF TRANSPORTATION
IH 69C FR.
LOCATION #3
PAVEMENT MARKING LAYOUT
SHEET 9 OF 16 N.T.S.

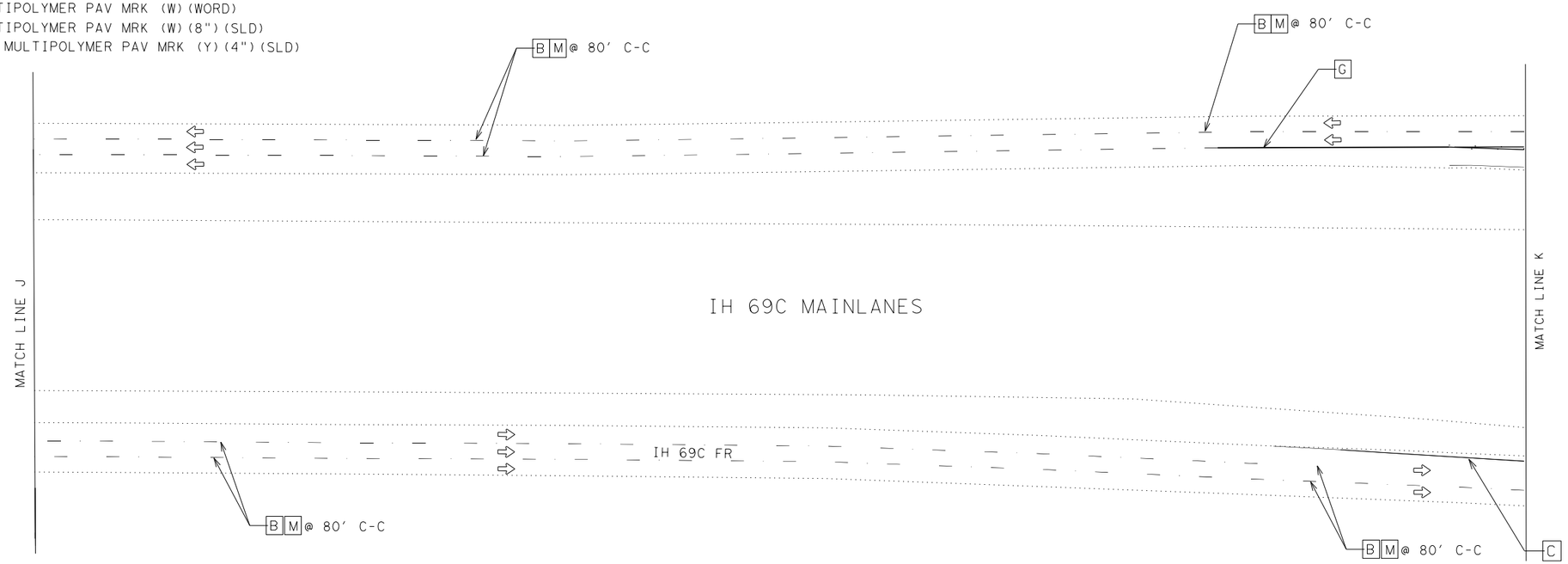
FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET NO.
6	F 2023(909)		HIDALGO		112
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LEGEND

- [A] - PROP. 6" SLD WHITE LINE
- [B] - PROP. 6" BKN WHITE LINE
- [C] - PROP. 6" SLD YELLOW LINE
- [D] - PROP. 6" DBL YELLOW LINE
- [E] - PROP. 8" SLD WHITE LINE
- [F] - PROP. 12" SLD YELLOW LINE
- [G] - PROP. 12" SLD WHITE LINE
- [H] - PROP. 24" SLD WHITE LINE
- [I] - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
- [J] - PROP. PREFABRICATED WORD TY-C
- [K] - PROP. PAV MRKR II-A-A
- [L] - PROP. PAV MRKR TY I-C
- [M] - PROP. PAV MRKR TY II-C-R
- [N] - PROP. MULTIPOLYMER PAV MRK (W)(6")(SLD)
- [O] - PROP. MULTIPOLYMER PAV MRK (W)(6")(BRK)
- [P] - PROP. MULTIPOLYMER PAV MRK (W)(24")(SLD)
- [Q] - PROP. MULTIPOLYMER PAV MRK (Y)(6")(BRK)
- [R] - PROP. MULTIPOLYMER PAV MRK (Y)(6")(SLD)
- [S] - PROP. MULTIPOLYMER PAV MRK (W)(ARROW)
- [T] - PROP. MULTIPOLYMER PAV MRK (W)(DBL ARROW)
- [U] - PROP. MULTIPOLYMER PAV MRK (W)(WORD)
- [V] - PROP. MULTIPOLYMER PAV MRK (W)(8")(SLD)
- [W] - PROP. DBL MULTIPOLYMER PAV MRK (Y)(4")(SLD)

EOP - EXISTING EDGE OF PAVEMENT
⇨ - TRAFFIC FLOW
PROP. - PROPOSED
SLD - SOLID
BRK - BROKEN
PAV - PAVEMENT
DBL - DOUBLE
– —– - PROJECT LIMITS





STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER
5/1/2023

NOTES

1. SEE PAVEMENT MARKING STANDARDS FOR ADDITIONAL INFORMATION
2. MULTIPOLYMER PAVEMENT MARKINGS ARE ONLY APPLICABLE WITHIN CONCRETE PAVEMENT LIMITS.

TEXAS DEPARTMENT OF TRANSPORTATION

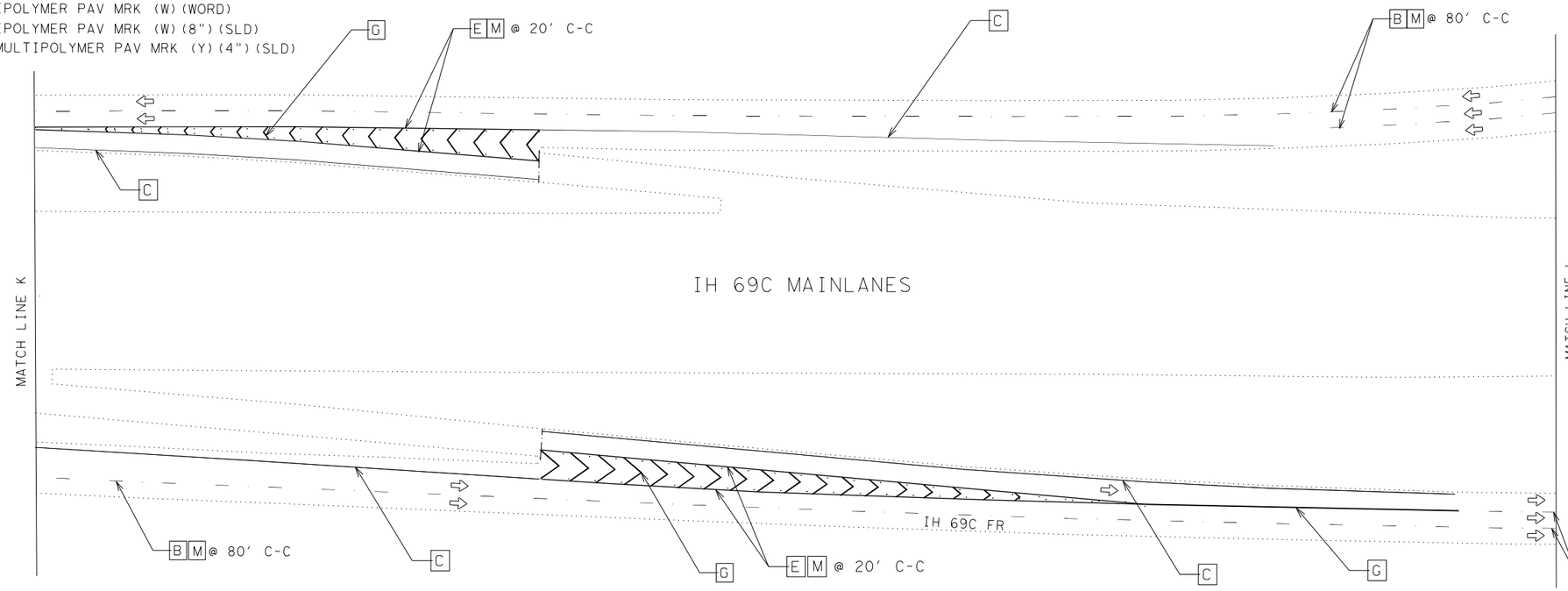
IH 69C FR.
LOCATION #3
PAVEMENT MARKING LAYOUT
SHEET 10 OF 16 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		113
STATE	STATE DIST.NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LEGEND

[A] - PROP. 6" SLD WHITE LINE
[B] - PROP. 6" BKN WHITE LINE
[C] - PROP. 6" SLD YELLOW LINE
[D] - PROP. 6" DBL YELLOW LINE
[E] - PROP. 8" SLD WHITE LINE
[F] - PROP. 12" SLD YELLOW LINE
[G] - PROP. 12" SLD WHITE LINE
[H] - PROP. 24" SLD WHITE LINE
[I] - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
[J] - PROP. PREFABRICATED WORD TY-C
[K] - PROP. PAV MRKR II-A-A
[L] - PROP. PAV MRKR TY I-C
[M] - PROP. PAV MRKR TY II-C-R
[N] - PROP. MULTIPOLYMER PAV MRK (W)(6")(SLD)
[O] - PROP. MULTIPOLYMER PAV MRK (W)(6")(BRK)
[P] - PROP. MULTIPOLYMER PAV MRK (W)(24")(SLD)
[Q] - PROP. MULTIPOLYMER PAV MRK (Y)(6")(BRK)
[R] - PROP. MULTIPOLYMER PAV MRK (Y)(6")(SLD)
[S] - PROP. MULTIPOLYMER PAV MRK (W)(ARROW)
[T] - PROP. MULTIPOLYMER PAV MRK (W)(DBL ARROW)
[U] - PROP. MULTIPOLYMER PAV MRK (W)(WORD)
[V] - PROP. MULTIPOLYMER PAV MRK (W)(8")(SLD)
[W] - PROP. DBL MULTIPOLYMER PAV MRK (Y)(4")(SLD)

EOP - EXISTING EDGE OF PAVEMENT
⇨ - TRAFFIC FLOW
PROP. - PROPOSED
SLD - SOLID
BRK - BROKEN
PAV - PAVEMENT
DBL - DOUBLE
– — – PROJECT LIMITS



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STATE OF TEXAS
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TEXAS DEPARTMENT OF TRANSPORTATION

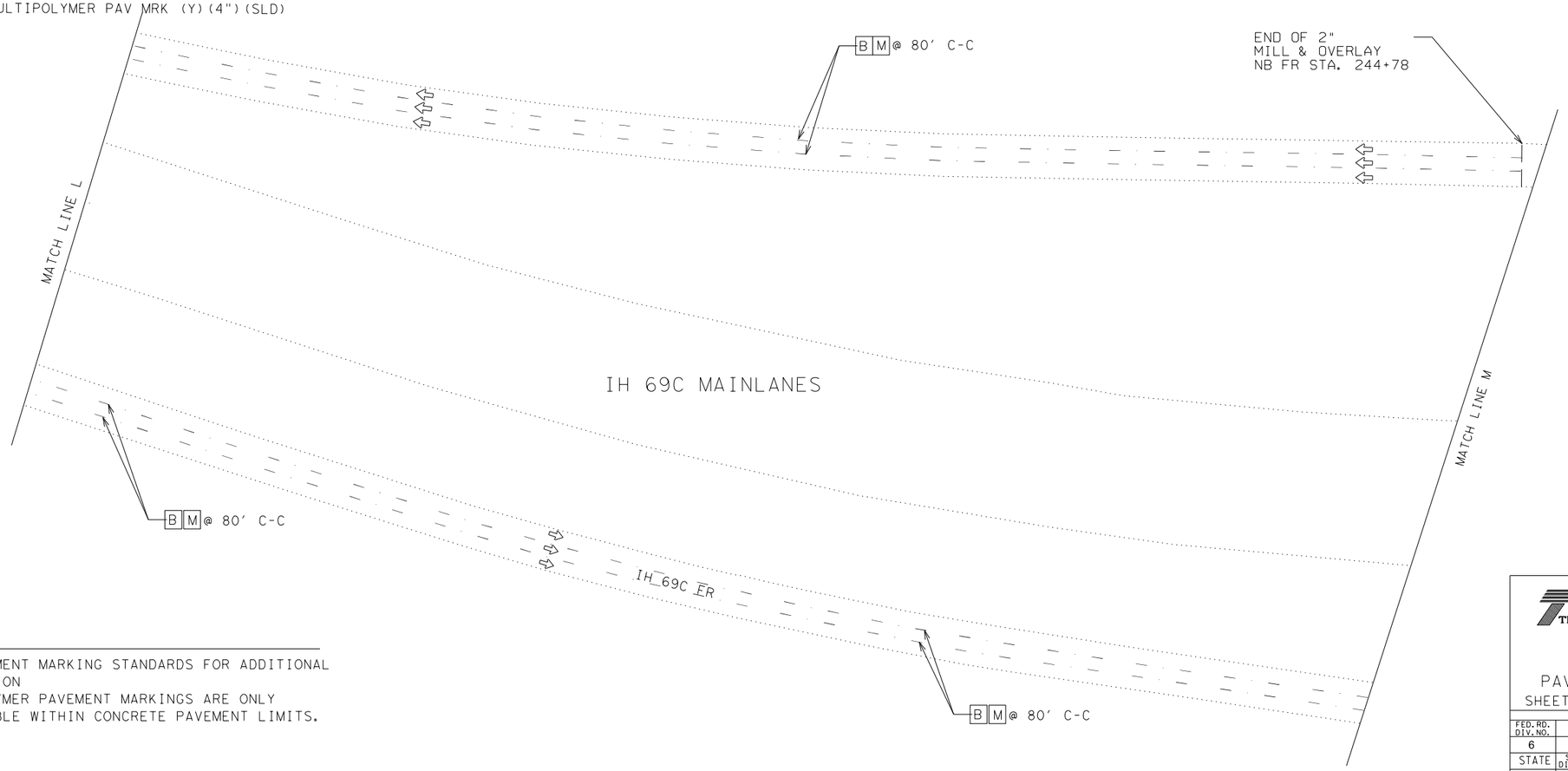
IH 69C FR.
LOCATION #3
PAVEMENT MARKING LAYOUT
SHEET 11 OF 16 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET NO.
6	F 2023(909)		HIDALGO		114
STATE	STATE DIST.NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LEGEND

[A] - PROP. 6" SLD WHITE LINE
[B] - PROP. 6" BKN WHITE LINE
[C] - PROP. 6" SLD YELLOW LINE
[D] - PROP. 6" DBL YELLOW LINE
[E] - PROP. 8" SLD WHITE LINE
[F] - PROP. 12" SLD YELLOW LINE
[G] - PROP. 12" SLD WHITE LINE
[H] - PROP. 24" SLD WHITE LINE
[I] - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
[J] - PROP. PREFABRICATED WORD TY-C
[K] - PROP. PAV MRKR II-A-A
[L] - PROP. PAV MRKR TY I-C
[M] - PROP. PAV MRKR TY II-C-R
[N] - PROP. MULTIPOLYMER PAV MRK (W)(6")(SLD)
[O] - PROP. MULTIPOLYMER PAV MRK (W)(6")(BRK)
[P] - PROP. MULTIPOLYMER PAV MRK (W)(24")(SLD)
[Q] - PROP. MULTIPOLYMER PAV MRK (Y)(6")(BRK)
[R] - PROP. MULTIPOLYMER PAV MRK (Y)(6")(SLD)
[S] - PROP. MULTIPOLYMER PAV MRK (W)(ARROW)
[T] - PROP. MULTIPOLYMER PAV MRK (W)(DBL ARROW)
[U] - PROP. MULTIPOLYMER PAV MRK (W)(WORD)
[V] - PROP. MULTIPOLYMER PAV MRK (W)(8")(SLD)
[W] - PROP. DBL MULTIPOLYMER PAV MRK (Y)(4")(SLD)

EOP - EXISTING EDGE OF PAVEMENT
⇨ - TRAFFIC FLOW
PROP. - PROPOSED
SLD - SOLID
BRK - BROKEN
PAV - PAVEMENT
DBL - DOUBLE
– — – PROJECT LIMITS



NOTES

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STATE OF TEXAS
EUGENE PALACIOS
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5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

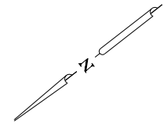
IH 69C FR.
LOCATION #3
PAVEMENT MARKING LAYOUT
SHEET 12 OF 16 N.T.S.

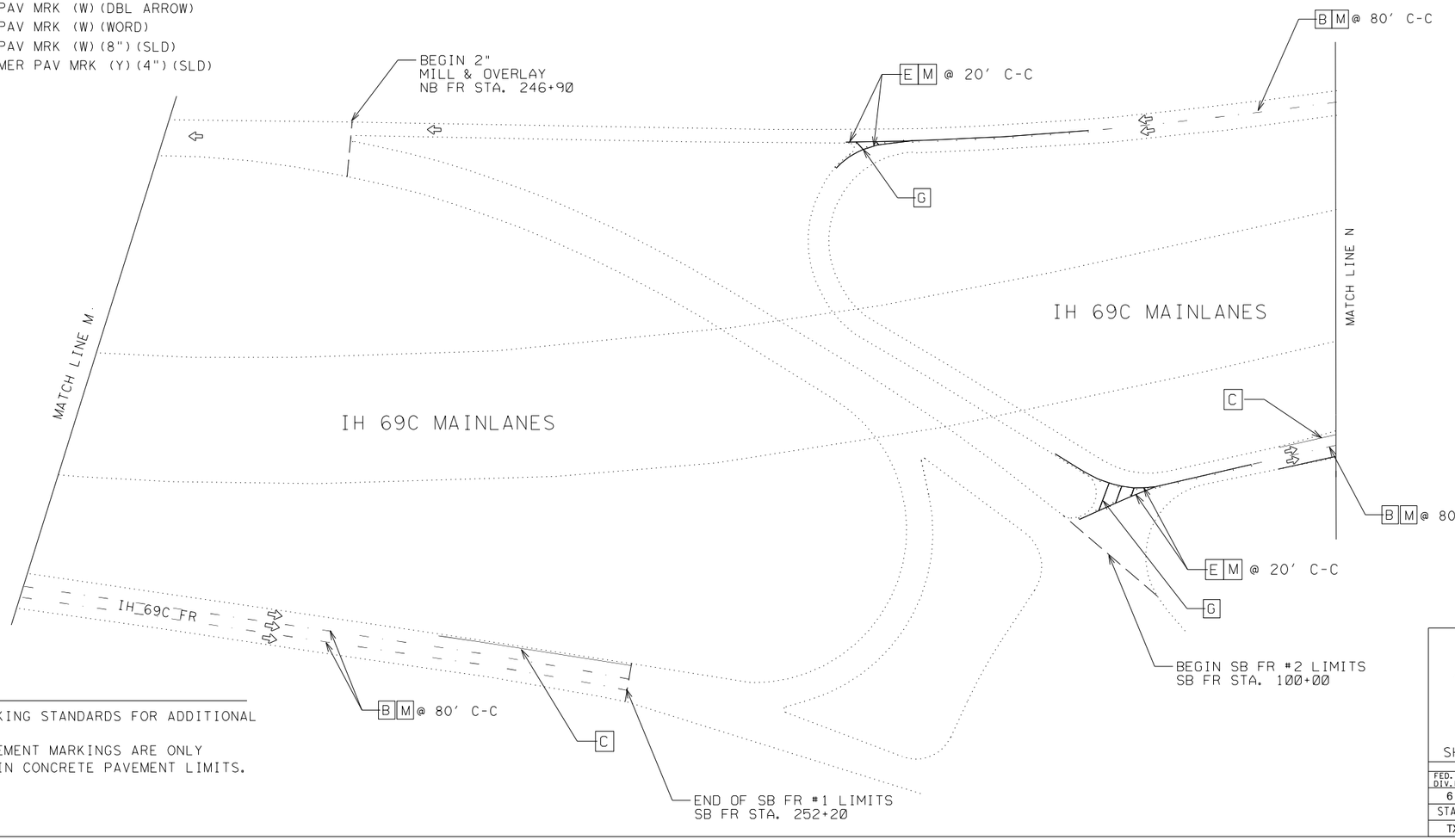
FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET NO.
6	F 2023(909)		HIDALGO		115
STATE	STATE DIST.NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LEGEND

[A] - PROP. 6" SLD WHITE LINE
[B] - PROP. 6" BKN WHITE LINE
[C] - PROP. 6" SLD YELLOW LINE
[D] - PROP. 6" DBL YELLOW LINE
[E] - PROP. 8" SLD WHITE LINE
[F] - PROP. 12" SLD YELLOW LINE
[G] - PROP. 12" SLD WHITE LINE
[H] - PROP. 24" SLD WHITE LINE
[I] - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
[J] - PROP. PREFABRICATED WORD TY-C
[K] - PROP. PAV MRKR II-A-A
[L] - PROP. PAV MRKR TY I-C
[M] - PROP. PAV MRKR TY II-C-R
[N] - PROP. MULTIPOLYMER PAV MRK (W)(6")(SLD)
[O] - PROP. MULTIPOLYMER PAV MRK (W)(6")(BRK)
[P] - PROP. MULTIPOLYMER PAV MRK (W)(24")(SLD)
[Q] - PROP. MULTIPOLYMER PAV MRK (Y)(6")(BRK)
[R] - PROP. MULTIPOLYMER PAV MRK (Y)(6")(SLD)
[S] - PROP. MULTIPOLYMER PAV MRK (W)(ARROW)
[T] - PROP. MULTIPOLYMER PAV MRK (W)(DBL ARROW)
[U] - PROP. MULTIPOLYMER PAV MRK (W)(WORD)
[V] - PROP. MULTIPOLYMER PAV MRK (W)(8")(SLD)
[W] - PROP. DBL MULTIPOLYMER PAV MRK (Y)(4")(SLD)

EOP - EXISTING EDGE OF PAVEMENT
⇨ - TRAFFIC FLOW
PROP. - PROPOSED
SLD - SOLID
BRK - BROKEN
PAV - PAVEMENT
DBL - DOUBLE





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STATE OF TEXAS
EUGENE PALACIOS
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5/1/2023

TEXAS DEPARTMENT OF TRANSPORTATION

IH 69C FR.
LOCATION #3
PAVEMENT MARKING LAYOUT
SHEET 13 OF 16 N.T.S.

FED.RD. DIV.NO.	PROJECT NO.		COUNTY		SHEET NO.
6	F 2023(909)		HIDALGO		116
STATE	STATE DIST.NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LEGEND

[A] - PROP. 6" SLD WHITE LINE
[B] - PROP. 6" BKN WHITE LINE
[C] - PROP. 6" SLD YELLOW LINE
[D] - PROP. 6" DBL YELLOW LINE
[E] - PROP. 8" SLD WHITE LINE
[F] - PROP. 12" SLD YELLOW LINE
[G] - PROP. 12" SLD WHITE LINE
[H] - PROP. 24" SLD WHITE LINE
[I] - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
[J] - PROP. PREFABRICATED WORD TY-C
[K] - PROP. PAV MRKR II-A-A
[L] - PROP. PAV MRKR TY I-C
[M] - PROP. PAV MRKR TY II-C-R
[N] - PROP. MULTIPOLYMER PAV MRK (W)(6")(SLD)
[O] - PROP. MULTIPOLYMER PAV MRK (W)(6")(BRK)
[P] - PROP. MULTIPOLYMER PAV MRK (W)(24")(SLD)
[Q] - PROP. MULTIPOLYMER PAV MRK (Y)(6")(BRK)
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[S] - PROP. MULTIPOLYMER PAV MRK (W)(ARROW)
[T] - PROP. MULTIPOLYMER PAV MRK (W)(DBL ARROW)
[U] - PROP. MULTIPOLYMER PAV MRK (W)(WORD)
[V] - PROP. MULTIPOLYMER PAV MRK (W)(8")(SLD)
[W] - PROP. DBL MULTIPOLYMER PAV MRK (Y)(4")(SLD)

EOP - EXISTING EDGE OF PAVEMENT
⇨ - TRAFFIC FLOW
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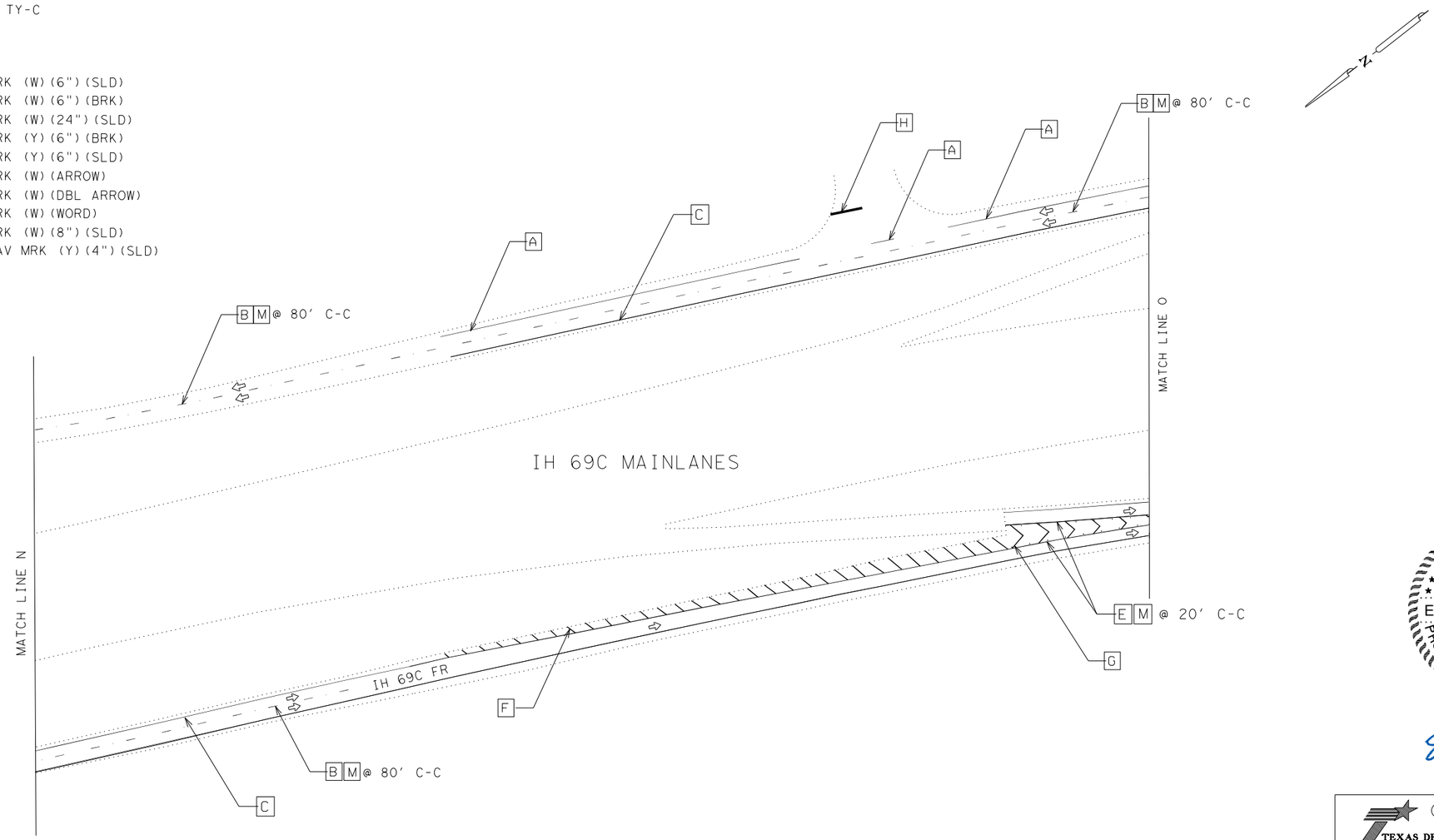
SLD - SOLID
BRK - BROKEN
PAV - PAVEMENT
DBL - DOUBLE



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STATE OF TEXAS
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5/1/2023

IH 69C FR.
LOCATION #3
PAVEMENT MARKING LAYOUT
SHEET 14 OF 16 N.T.S.

FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		117
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LEGEND

[A] - PROP. 6" SLD WHITE LINE
[B] - PROP. 6" BKN WHITE LINE
[C] - PROP. 6" SLD YELLOW LINE
[D] - PROP. 6" DBL YELLOW LINE
[E] - PROP. 8" SLD WHITE LINE
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[G] - PROP. 12" SLD WHITE LINE
[H] - PROP. 24" SLD WHITE LINE
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[P] - PROP. MULTIPOLYMER PAV MRK (W)(24")(SLD)
[Q] - PROP. MULTIPOLYMER PAV MRK (Y)(6")(BRK)
[R] - PROP. MULTIPOLYMER PAV MRK (Y)(6")(SLD)
[S] - PROP. MULTIPOLYMER PAV MRK (W)(ARROW)
[T] - PROP. MULTIPOLYMER PAV MRK (W)(DBL ARROW)
[U] - PROP. MULTIPOLYMER PAV MRK (W)(WORD)
[V] - PROP. MULTIPOLYMER PAV MRK (W)(8")(SLD)
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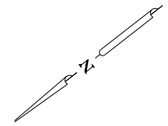

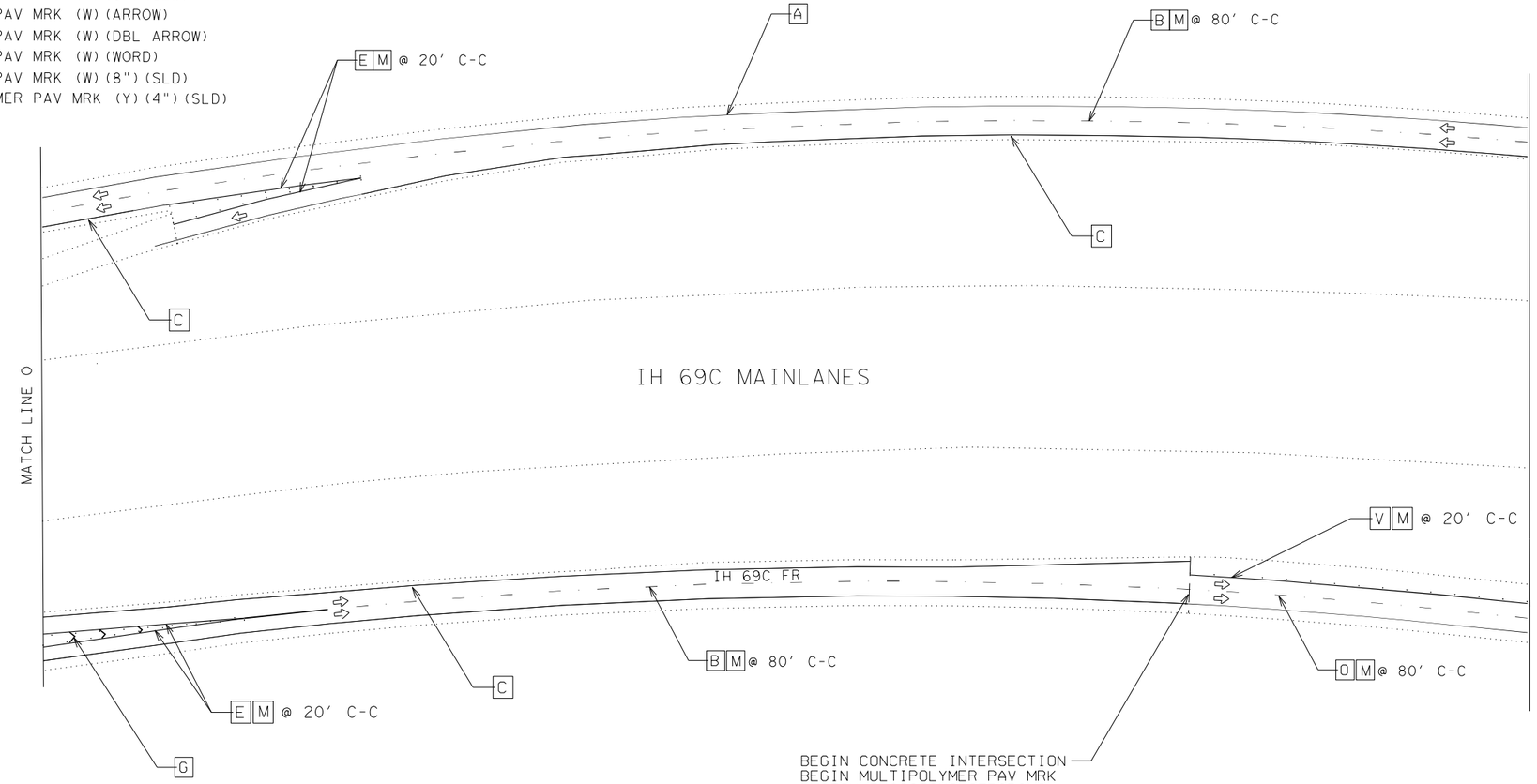

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TEXAS DEPARTMENT OF TRANSPORTATION

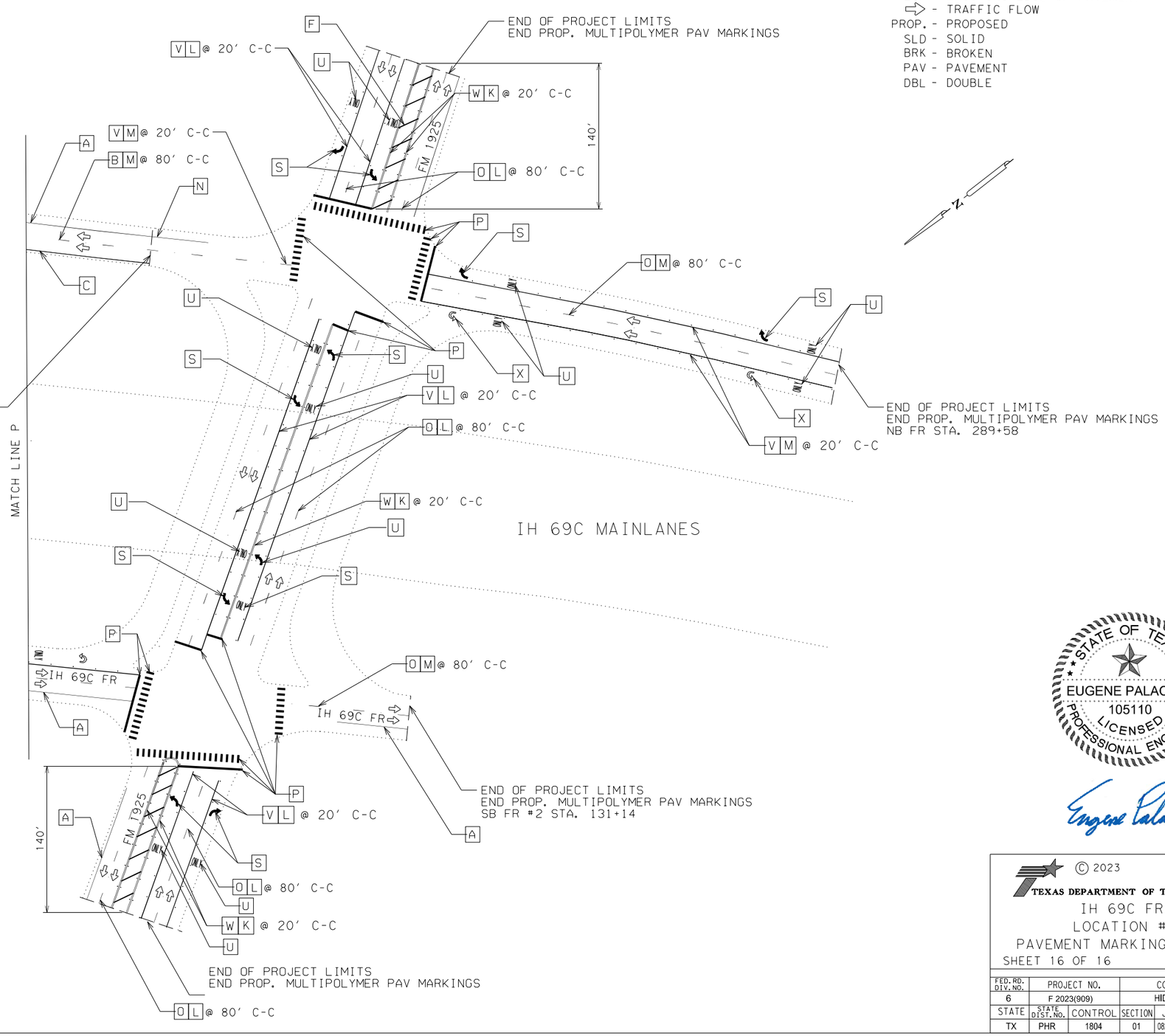
IH 69C FR.
LOCATION #3
PAVEMENT MARKING LAYOUT
SHEET 15 OF 16 N.T.S.

FED. RD. DIV. NO.	PROJECT NO.		COUNTY		SHEET No.
6	F 2023(909)		HIDALGO		118
STATE	STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY No.
TX	PHR	1804	01	082,ETC.	SS 115,ETC.

LEGEND

- A - PROP. 6" SLD WHITE LINE
- B - PROP. 6" BKN WHITE LINE
- C - PROP. 6" SLD YELLOW LINE
- D - PROP. 6" DBL YELLOW LINE
- E - PROP. 8" SLD WHITE LINE
- F - PROP. 12" SLD YELLOW LINE
- G - PROP. 12" SLD WHITE LINE
- H - PROP. 24" SLD WHITE LINE
- I - PROP. PREFABRICATED SINGLE DIRECTIONAL ARROW TY-C
- J - PROP. PREFABRICATED WORD TY-C
- K - PROP. PAV MRKR II-A-A
- L - PROP. PAV MRKR TY I-C
- M - PROP. PAV MRKR TY II-C-R
- N - PROP. MULTIPOLYMER PAV MRK (W)(6")(SLD)
- O - PROP. MULTIPOLYMER PAV MRK (W)(6")(BRK)
- P - PROP. MULTIPOLYMER PAV MRK (W)(24")(SLD)
- Q - PROP. MULTIPOLYMER PAV MRK (Y)(6")(BRK)
- R - PROP. MULTIPOLYMER PAV MRK (Y)(6")(SLD)
- S - PROP. MULTIPOLYMER PAV MRK (W)(ARROW)
- T - PROP. MULTIPOLYMER PAV MRK (W)(DBL ARROW)
- U - PROP. MULTIPOLYMER PAV MRK (W)(WORD)
- V - PROP. MULTIPOLYMER PAV MRK (W)(8")(SLD)
- W - PROP. DBL MULTIPOLYMER PAV MRK (Y)(4")(SLD)

EOP - EXISTING EDGE OF PAVEMENT
⇨ - TRAFFIC FLOW
PROP. - PROPOSED
SLD - SOLID
BRK - BROKEN
PAV - PAVEMENT
DBL - DOUBLE



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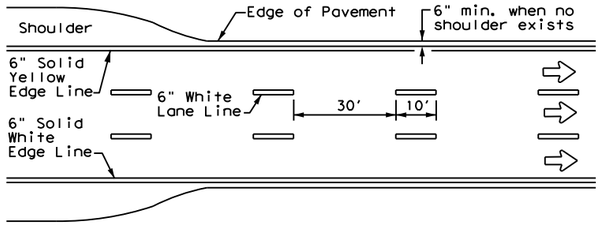
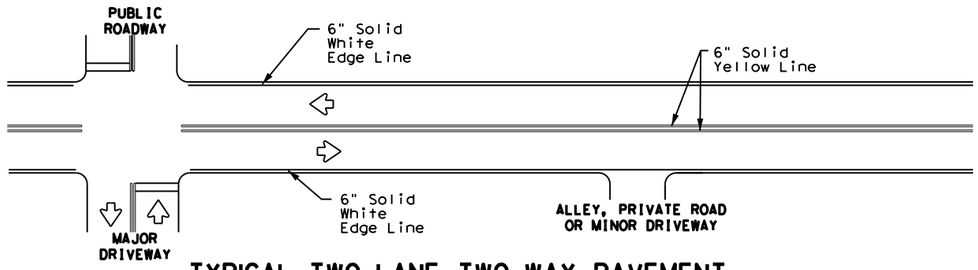
LOCATION #3
PAVEMENT MARKING LAYOUT
SHEET 16 OF 16 N.T.S.

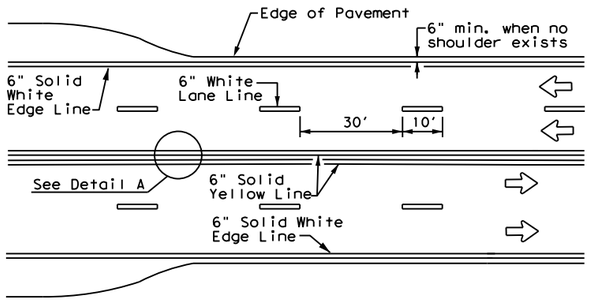
FED.RD. DIV.NO.	PROJECT NO.		COUNTY			SHEET No.
6	F 2023(909)		HIDALGO			119
STATE	STATE DIST.NO.	CONTROL	SECTION	JOB		HIGHWAY No.
TX	PHR	1804	01	082,ETC.		SS 115,ETC.

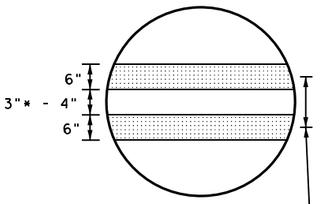


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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

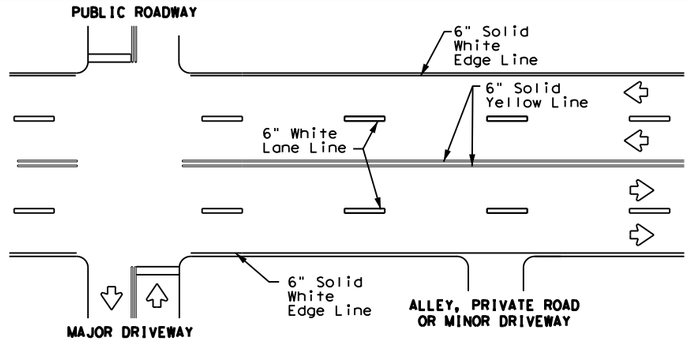




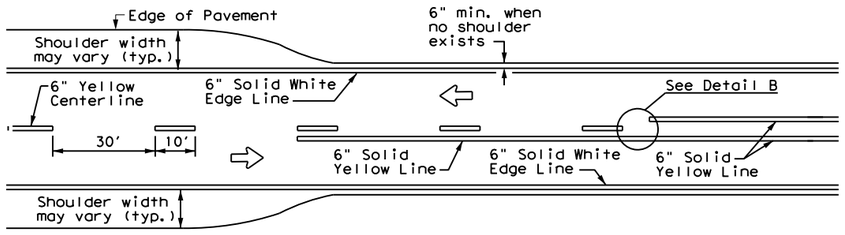
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

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

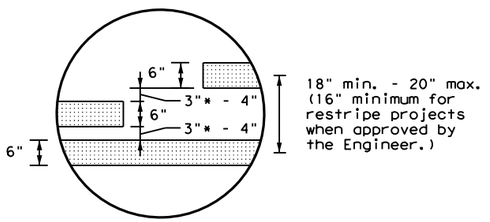
** 8" minimum for restripe projects when approved by the Engineer.



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

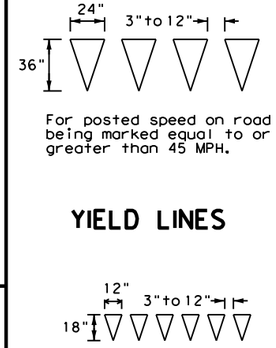


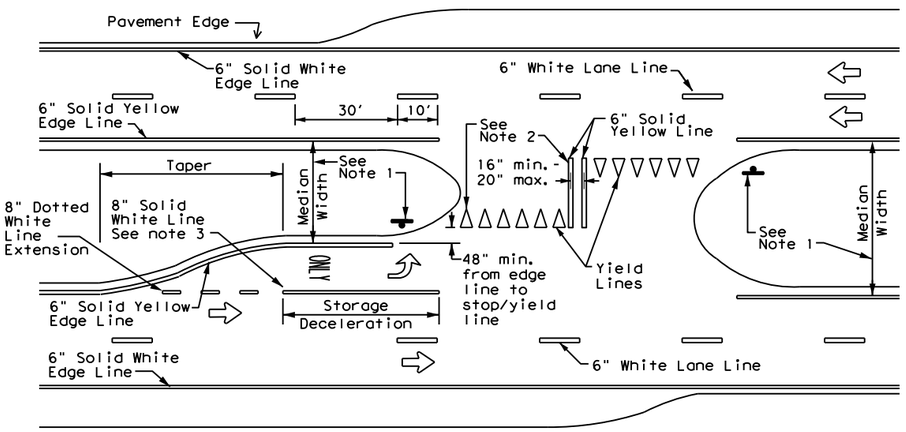
TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



DETAIL "B"

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





FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

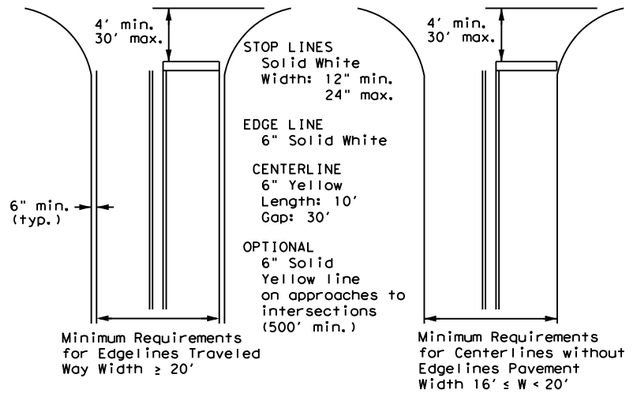
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling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

GENERAL NOTES

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

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

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



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

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

Texas Department of Transportation

Traffic Safety Division Standard

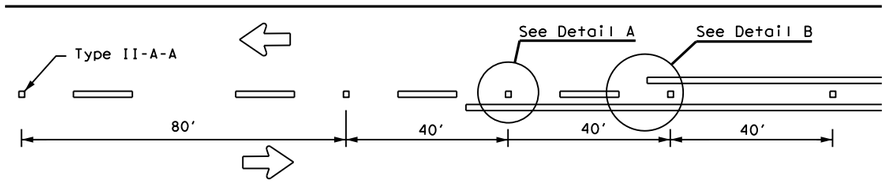
TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-22

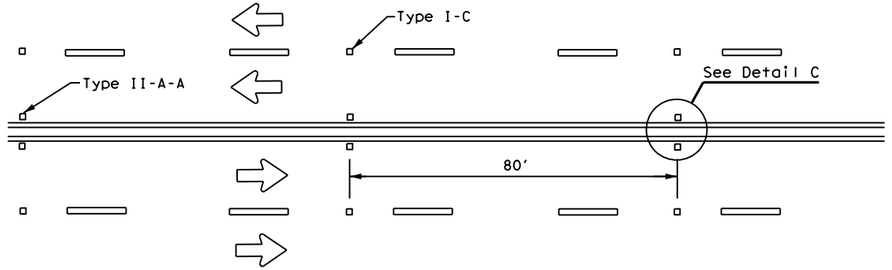
FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 11-78 8-00 6-20	1804	01	082,ETC.	SS 115,ETC.
8-95 3-03 12-22	DIST	COUNTY		SHEET NO.
5-00 2-12	PHR	HIDALGO		120

22A

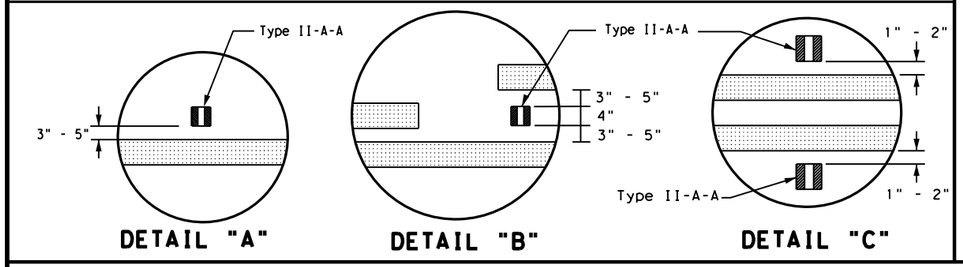
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

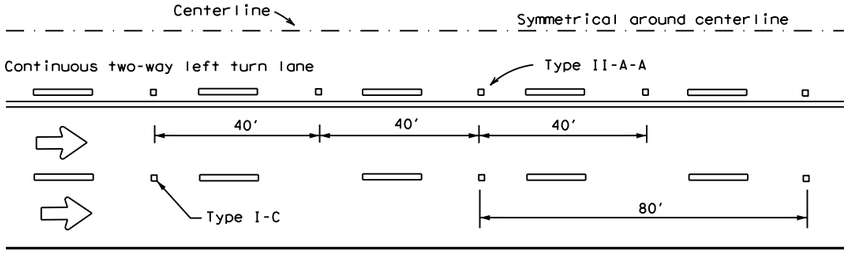


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

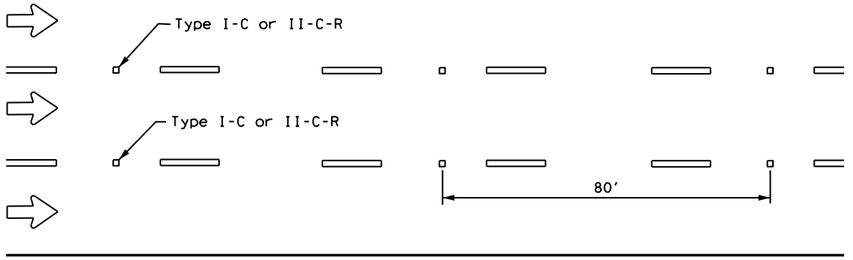


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS





CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



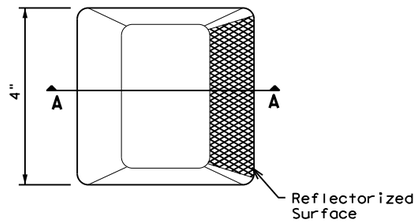
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

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

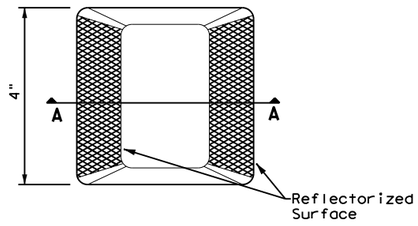
See Note 3.

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

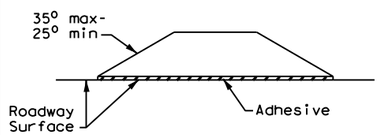
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

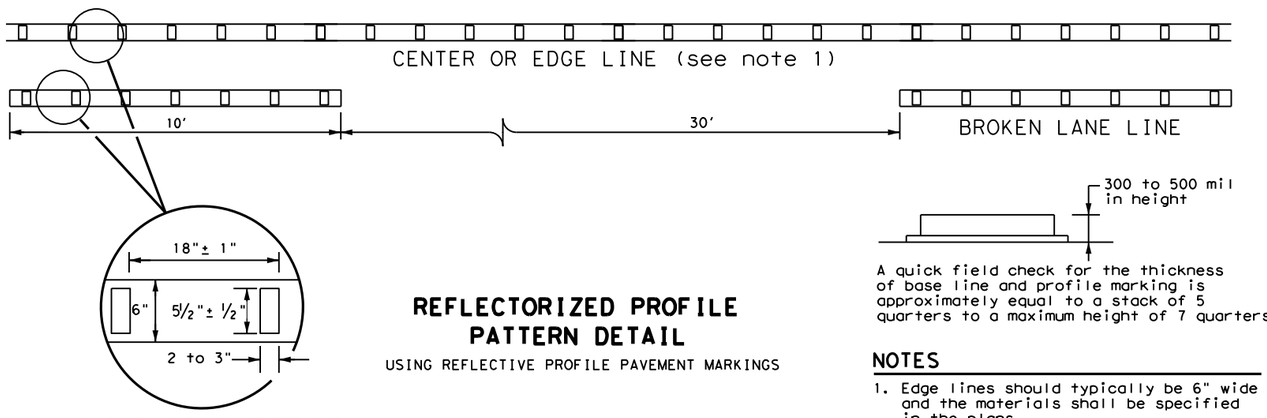


Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



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

REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

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

NOTES

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

GENERAL NOTES

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

Texas Department of Transportation

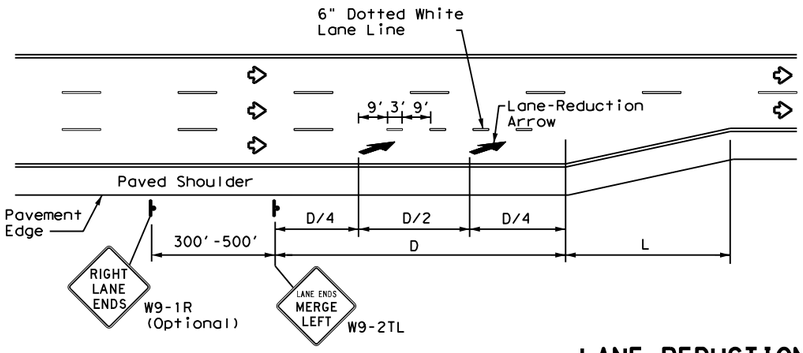
Traffic Safety Division Standard

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

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-77 8-00 6-20 4-92 2-10 12-22 5-00 2-12	1804	01	082,ETC.	SS 115,ETC.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		121

22B

DATE:
FILE:



LANE REDUCTION

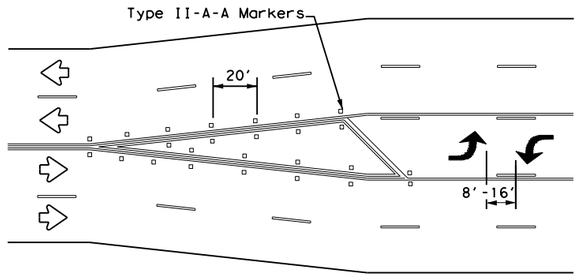
NOTES

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

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

GENERAL NOTES

1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
2. When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
3. Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
4. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer. See Chapter 3 of the Roadway Design Manual for additional information on turning lanes or storage lengths.

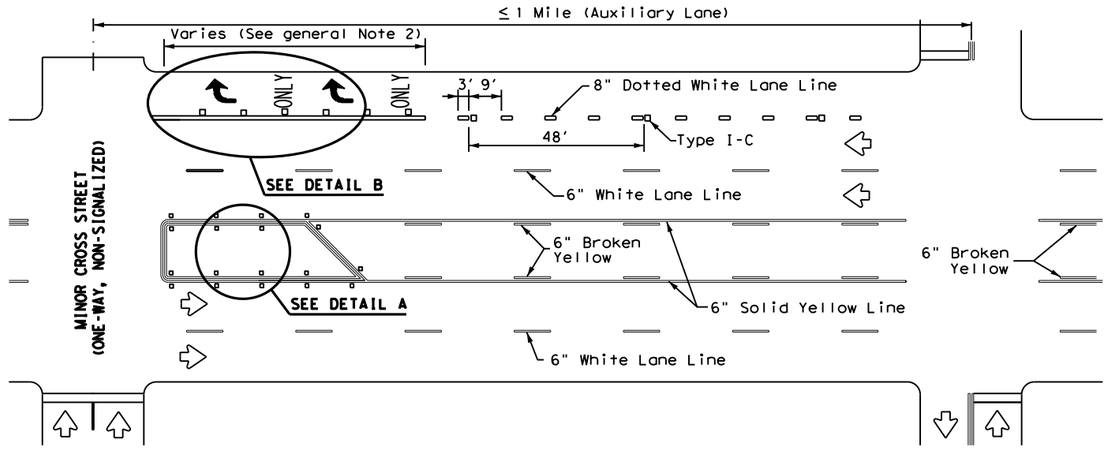


A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

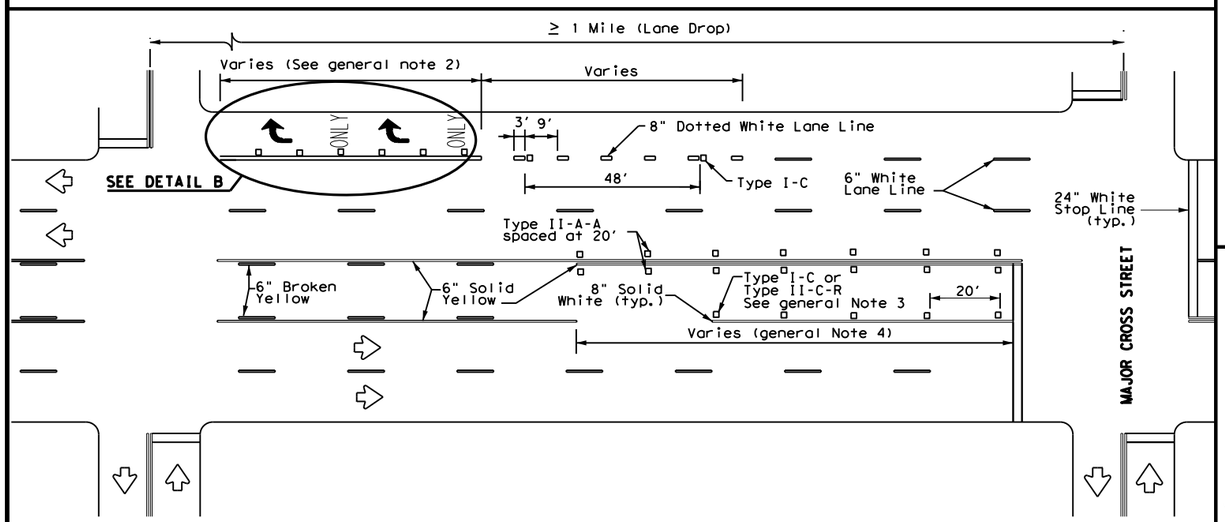
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

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

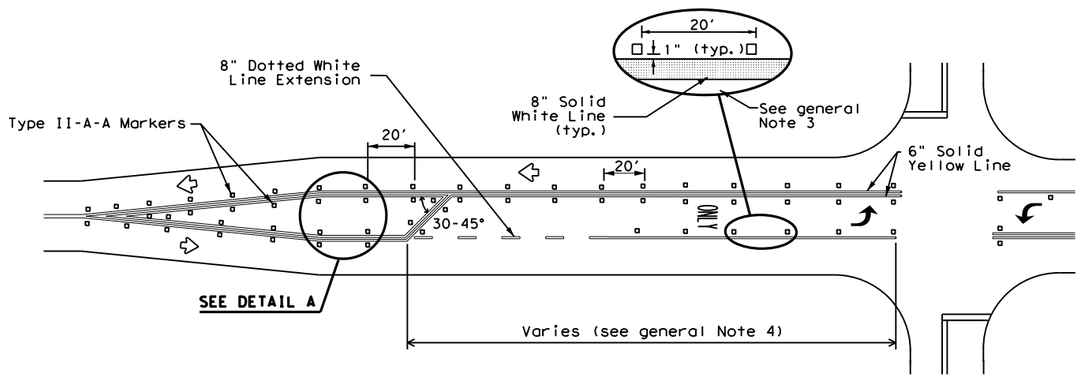
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



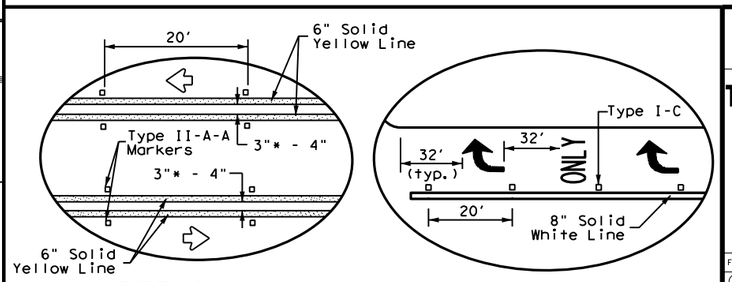
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



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



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



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

Texas Department of Transportation

Traffic Safety Division Standard

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

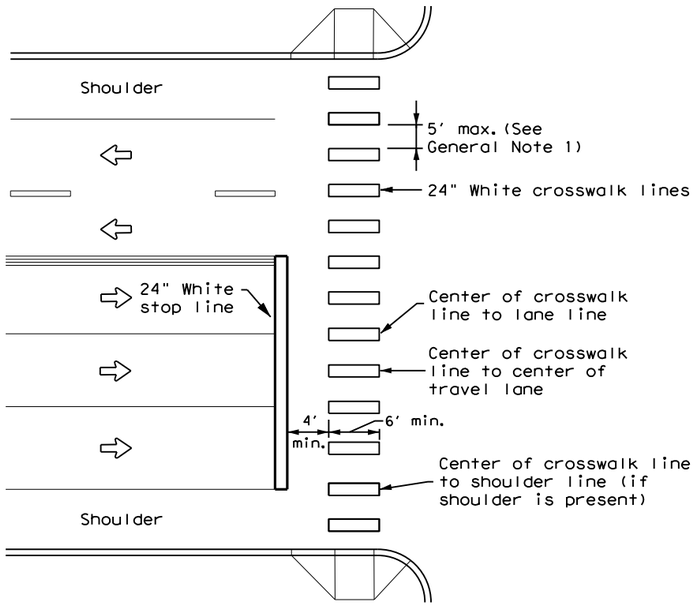
PM(3)-22

FILE: pm3-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 3-03 6-20	1804	01	082,ETC.	SS 115,ETC.
5-00 2-10 12-22	DIST	COUNTY		SHEET NO.
8-00 2-12	PHR	HIDALGO		122

DATE:
FILE:

22C

DATE:
FILE:



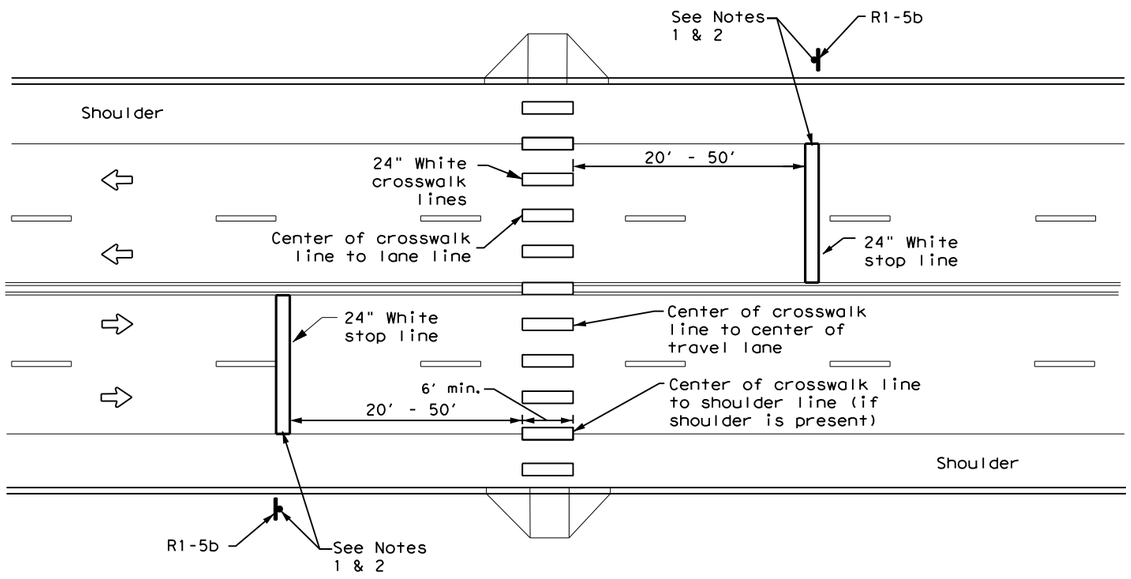
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

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 MIDBLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

NOTES:

1. Use stop bars with Stop Here For Pedestrians (R1-5b) signs at unsignalized midblock cross walks.
2. Use stop bars with STOP HERE ON RED (R10-6 or R10-6a) signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

Texas Department of Transportation

Traffic Safety Division Standard

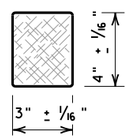
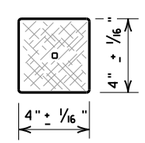
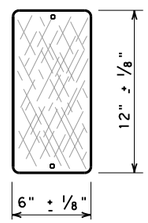
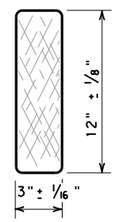
CROSSWALK PAVEMENT MARKINGS

PM(4)-22A

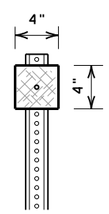
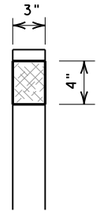
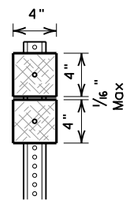
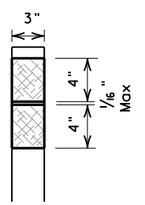
FILE: pm4-22a.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	1804	01	082,ETC.	SS 115,ETC.
6-20	DIST	COUNTY		SHEET NO.
6-22	PHR	HIDALGO		123
12-22				

22D

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

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

DELINEATORS

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

D & OM DESCRIPTIVE CODES

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

NUMBER OF REFLECTORS
S = Single
D = Double

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

REFLECTOR UNIT SIZE
1 or 2

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

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

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

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

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

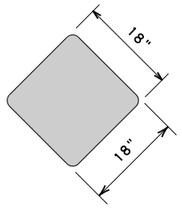
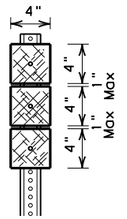
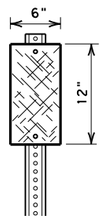
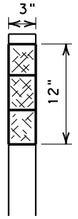
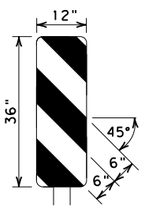
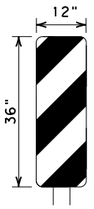
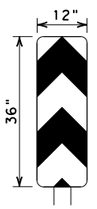
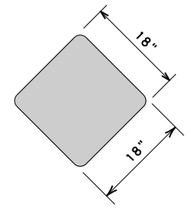
NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

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

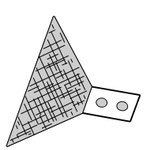
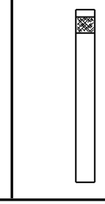
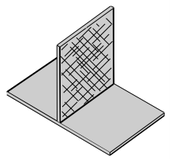
TYPE OF MOUNT
GND = Embedded (drivable)
SRF = Surface Mount
WAS = Wedge Anchor Steel
WAP = Wedge Anchor Plastic

DIRECTION
If Required
BI = Bi-Directional

OBJECT MARKERS

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

BARRIER REFLECTORS (BRF)

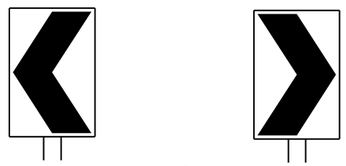
	GF1	GF2	CTB
DEVICE			

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

SHEETING: Yellow, White, Red

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

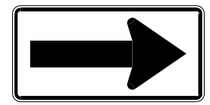
CHEVRONS

DEVICE:  W1-8

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

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

ONE DIRECTION LARGE ARROW

DEVICE:  W1-6

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

NOTE:

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

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

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	1804	01	082,ETC.	SS 115,ETC.
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	PHR	HIDALGO		124

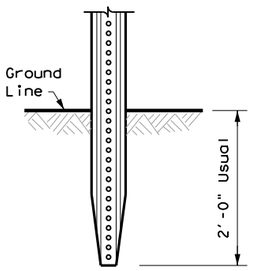
DATE:
FILE:

20A

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

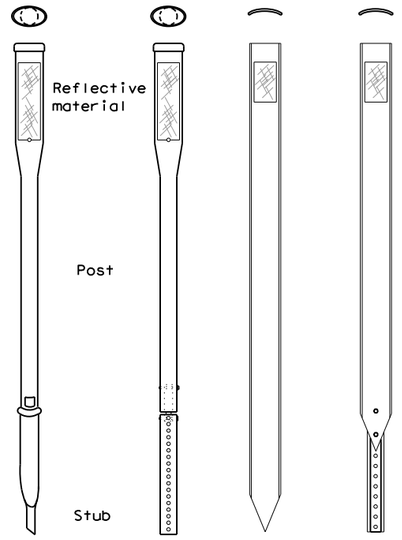


NOTES

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

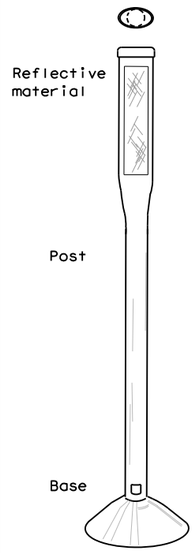
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



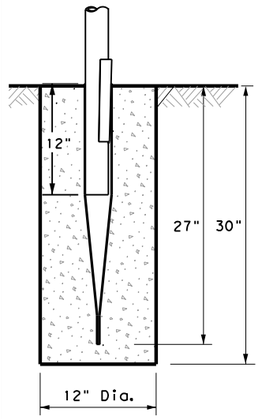
SURFACE MOUNT

NOTES

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

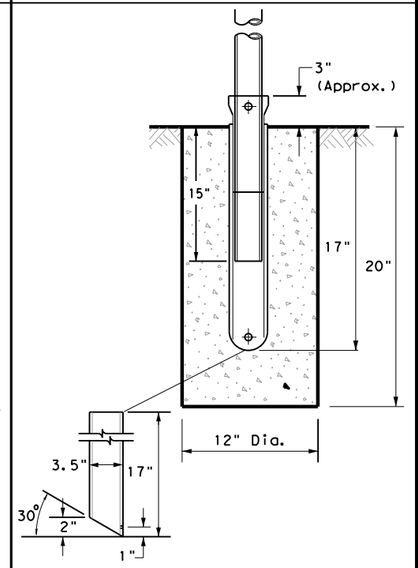
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

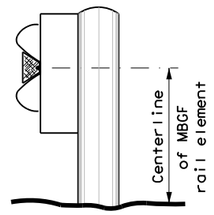
NOTE

1. Install per manufacturer's recommendations.

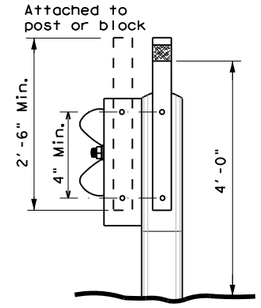
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

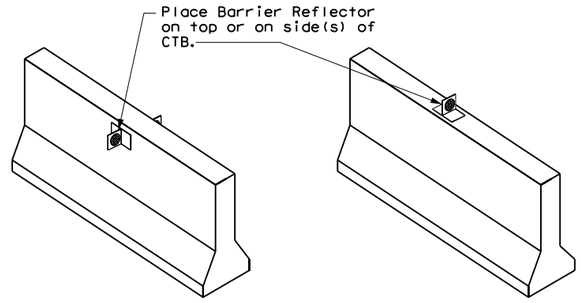
GF1



GF2



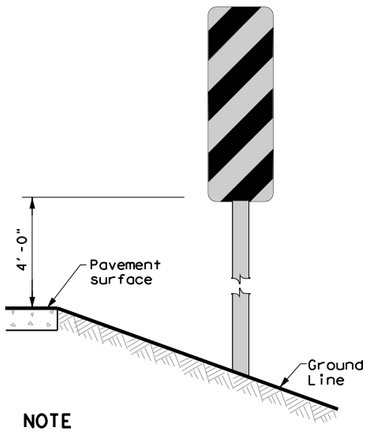
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

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

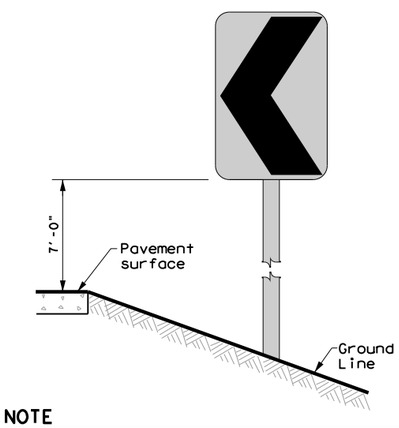
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

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

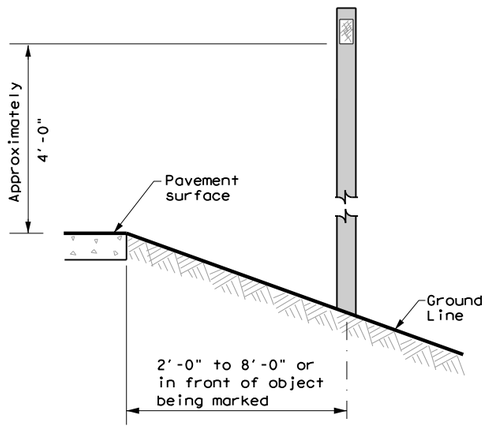
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

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

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

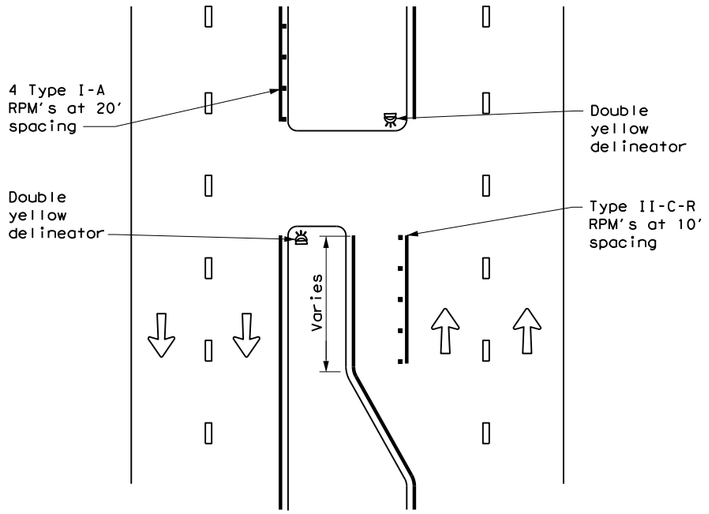
D & OM(2)-20

FILE: dom2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	1804	01	082, ETC.	SS 115, ETC.
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	PHR	HIDALGO		125

20B

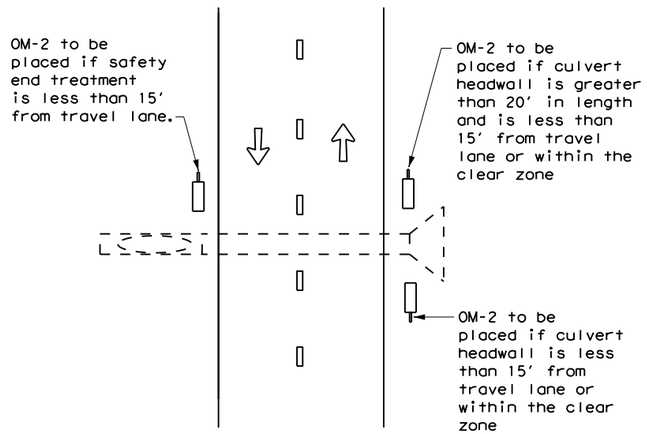
DATE:
FILE:

CROSSOVERS



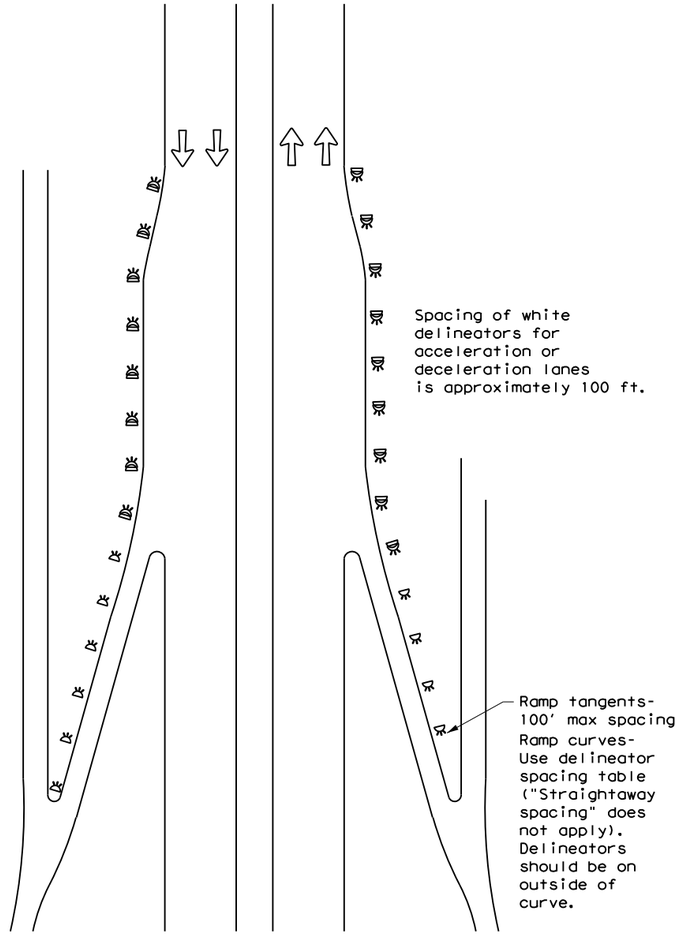
DETAIL 1

FOR CULVERTS WITHOUT MBGF



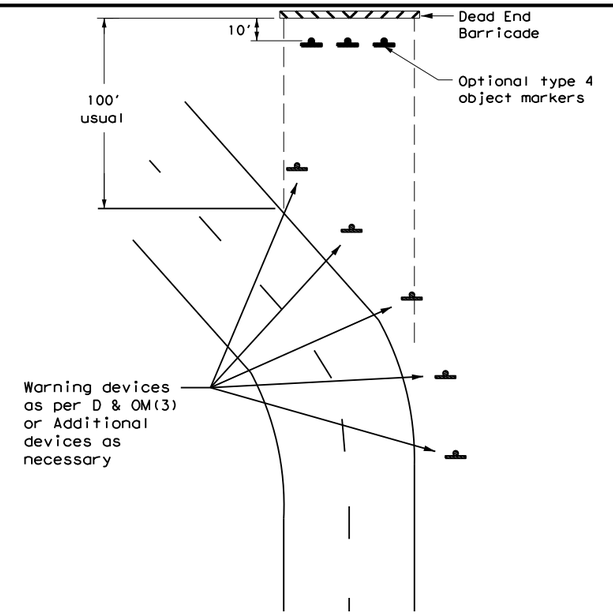
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



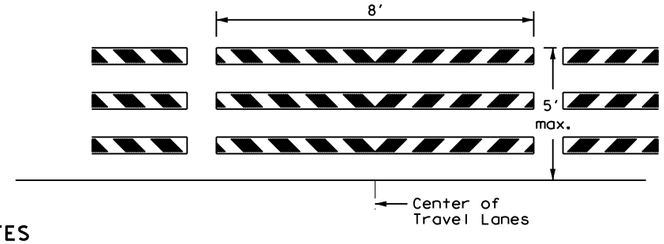
DETAIL 3

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 4

TYPICAL DEAD END BARRICADE INSTALLATION



NOTES

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

DETAIL 5

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(4)-20

FILE: dom4-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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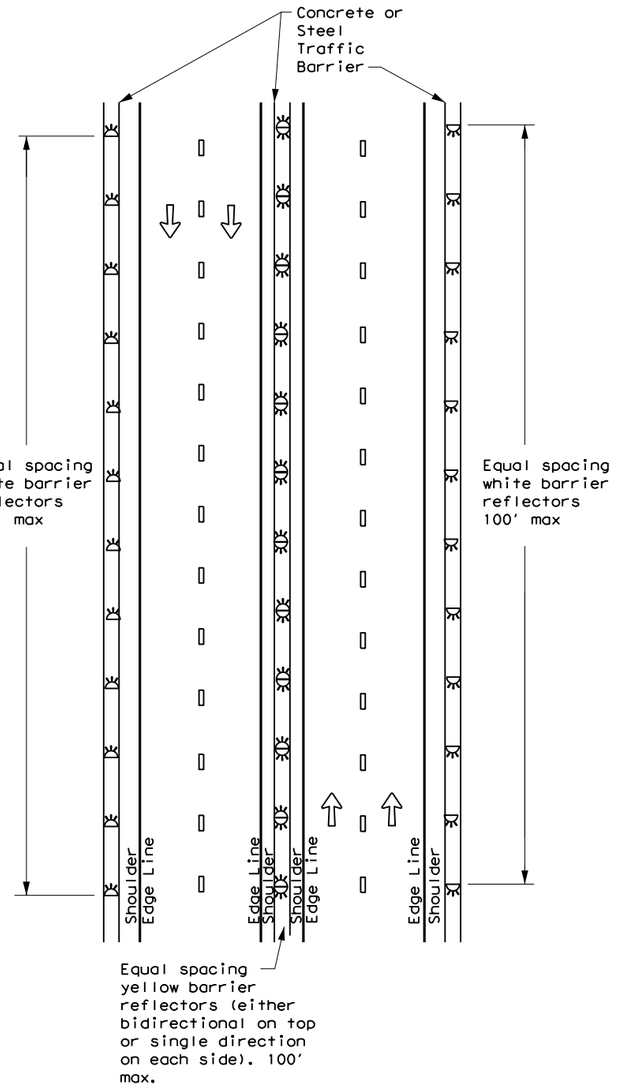
REVISIONS	1804	01	082, ETC.	SS 115, ETC
3-15	DIST	COUNTY		SHEET NO.
7-20	PHR	HIDALGO		126

DATE:
FILE:

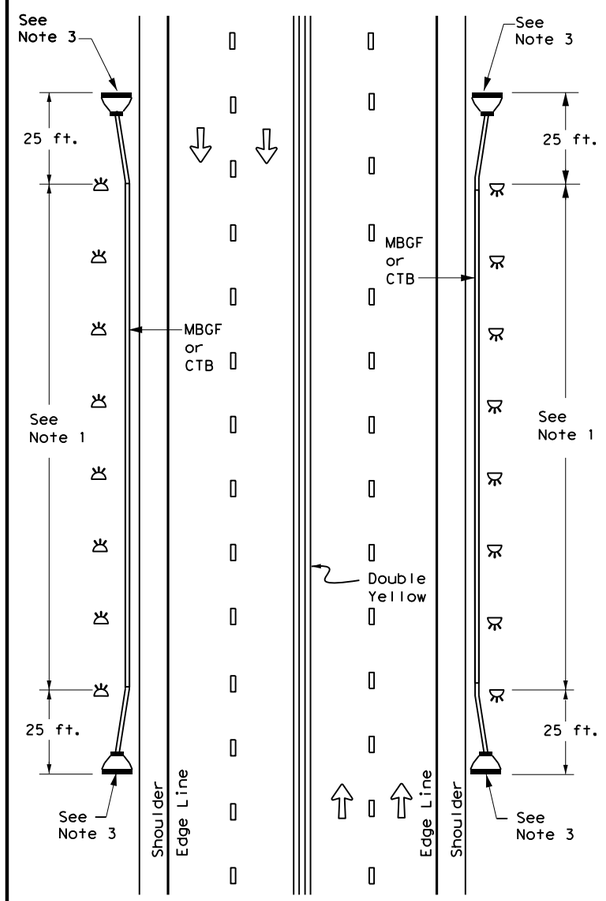
20D

DATE:
FILE:

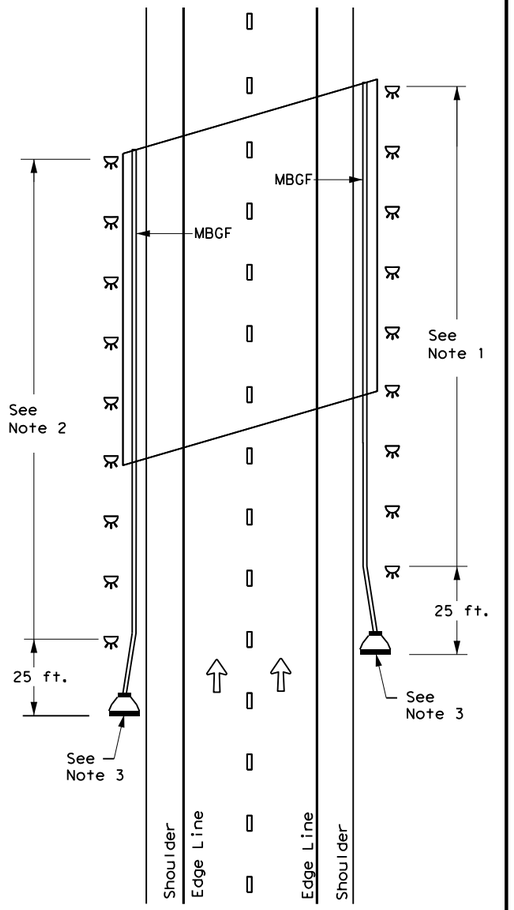
CONTINUOUS CONCRETE OR STEEL BARRIER



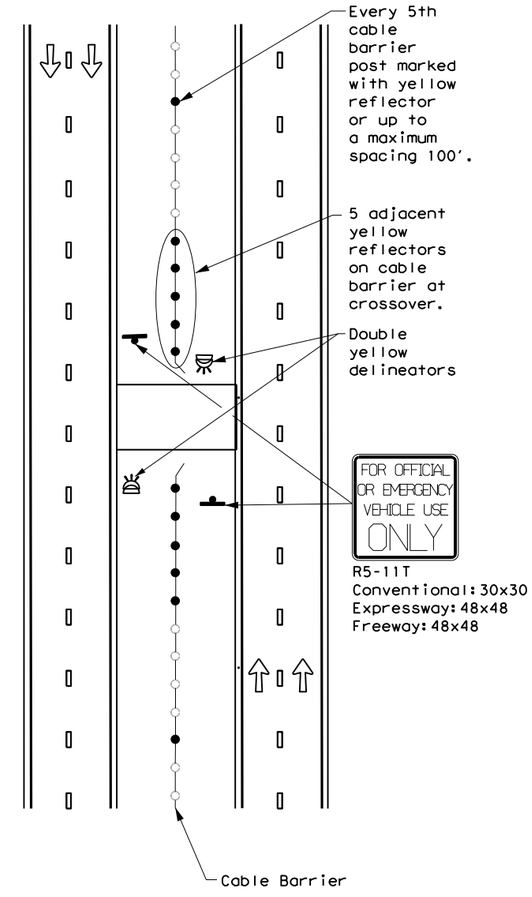
MULTI-LANE UNDIVIDED, TWO-WAY ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



DIVIDED ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



EMERGENCY CROSSOVER



NOTES

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

LEGEND

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(6)-20

FILE: dom6-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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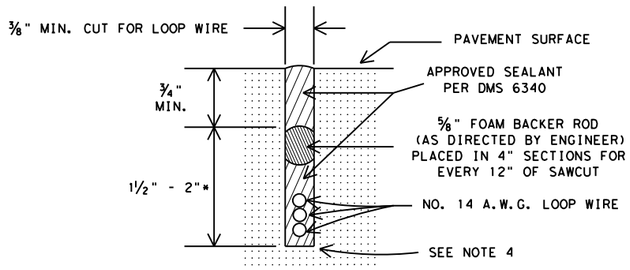
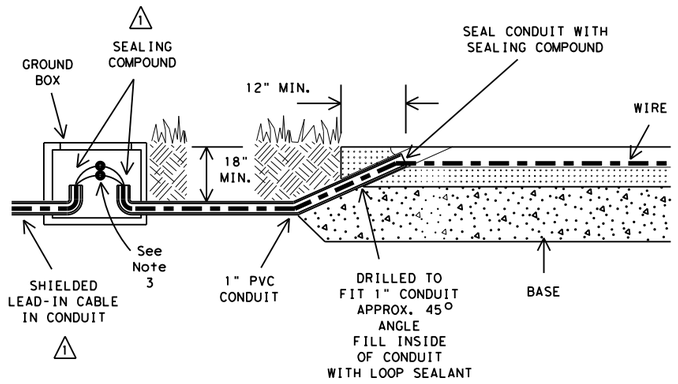
7-20	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		127

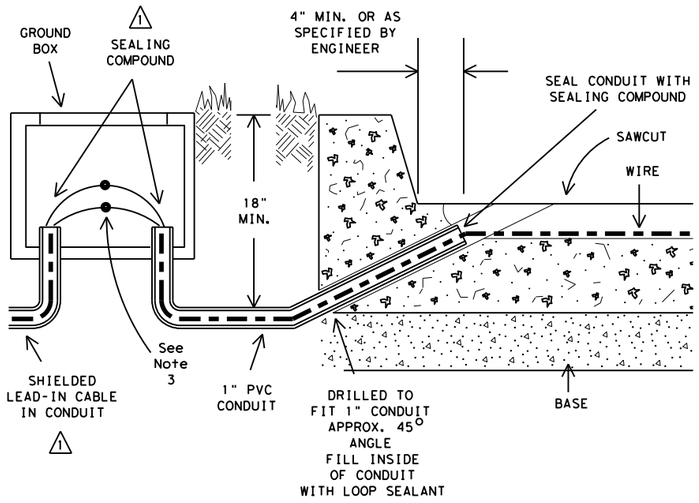


LOOP SAW CUT CROSS-SECTION

* SAWCUTS IN BRIDGE DECKS ARE TYPICALLY 1" DEPTH MAXIMUM
SAWCUTS IN BRIDGE DECKS AND ACROSS EXPANSION JOINTS
SHALL BE AS APPROVED BY ENGINEER



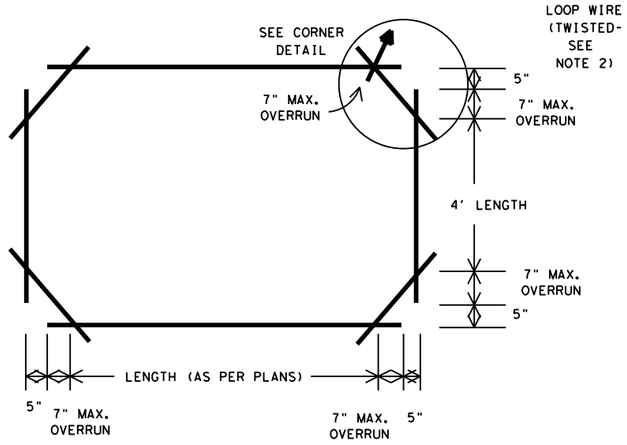
TYPICAL LEAD IN CONFIGURATION (WITHOUT CURBING)



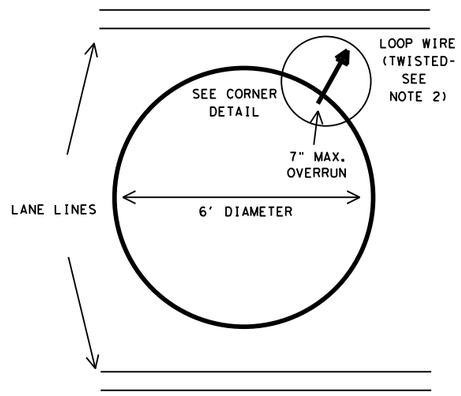
TYPICAL LEAD IN CONFIGURATION (WITH CURBING)

TYPICAL LOOP DETECTOR LAYOUTS

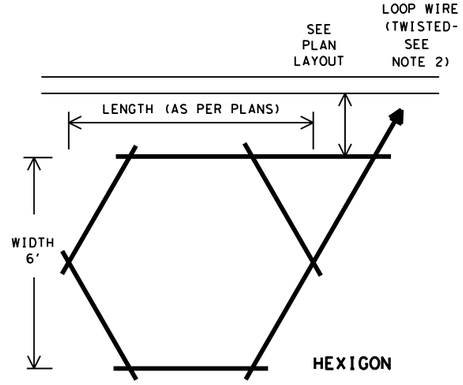
(AS SPECIFIED IN PLANS)



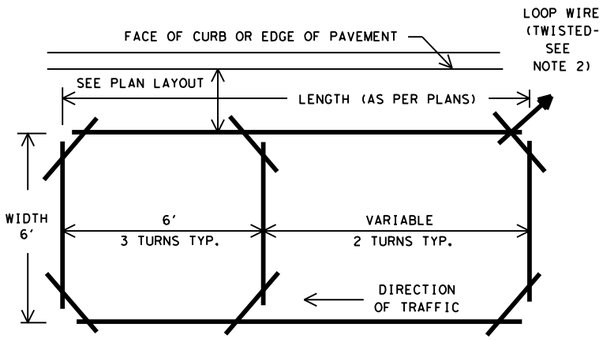
RECTANGULAR



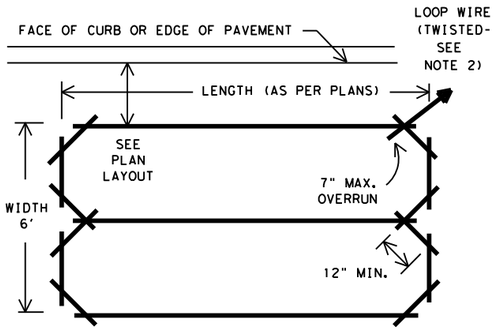
CIRCULAR



HEXIGON



POWER HEADER



QUADRAPOLE

GENERAL NOTES:

1. The pavement cut is to be made with a concrete saw to neat lines and loose material removed. The cut shall be clean and dry when the wire and sealing compound is placed.
2. Loop wire shall be 14 AWG Stranded Type XHHW. Wire from the loop to the ground box shall be twisted a minimum of 5 turns per foot. No splices shall be permitted in the loop or in the run to the ground box.
3. The home run cable from the pull box to the controller shall be IMSA 50-2 shielded cable and shall be soldered to the loop wire. The solder joints shall be sealed with Scotchcast or other method acceptable to the Engineer. The shield shall be grounded only at the controller end. Loop home run cable shall be two conductor 14 AWG shielded, Type XHHW.
4. All wire placed in the saw cut shall be sealed by fully encapsulating it in a sealant acceptable to the Engineer. Sealing compound shall be in accordance with DMS 6340.
5. The loop location, confirguration and number of turns shall be as indicated on the plans or as directed by the Engineer.

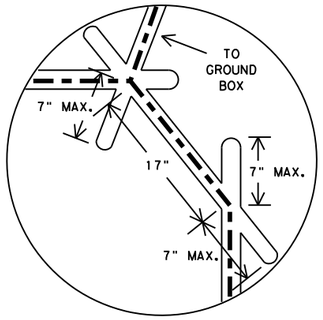
Recommended Number of Turns for Loop Detectors

LOOP PERIMETER SIZE (FT.)	NUMBER OF TURNS	APPROXIMATE LOOP SIZES INCLUDED
24' or Less	3 or 4	5' x 5', 6' x 6'
25' - 110'	2 or 3	6' x 10', 6' x 45'
110' or More	1 or 2	6' x 50' or Longer

6. A separate saw cut shall be made from each loop to the edge of pavement or as specified by the Engineer.
7. Splices between the loop lead-in cable and loop detector shall be made only in the ground box near the loop it is serving.
8. Circular loops may use prewound loops encased in continuous pvc tubing. Sawcut width may be adjusted to accommodate tubing.
9. The lead-in wire in the circular loop shall be coiled at the 3 inch drilled corner to reduce bending stress.
10. Loop duct may be used as specified by Engineer.

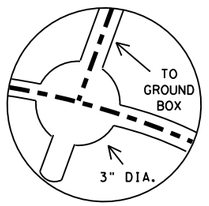
For additionnal information refer to "Texas Traffic Signal Detector" manual, TTI Report 1163-1.

TYPICAL CORNER DETAILS

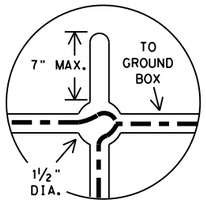


RECTANGULAR & HEXIGON LOOP
SAWCUT CORNER DETAIL

7" OVERRUN BASED ON 24" DIAMETER SAW BLADE



CIRCULAR LOOP
DRILLED CORNER DETAIL



RECTANGULAR & HEXIGON LOOP (ALT.)
DRILLED CORNER DETAIL

Texas Department of Transportation
Traffic Operations Division

LOOP DETECTOR INSTALLATION DETAILS

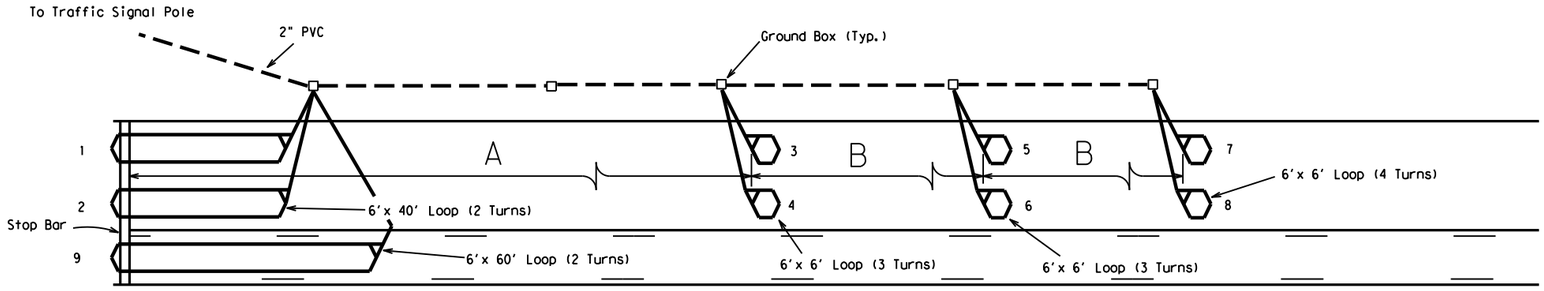
LD(1)-03

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

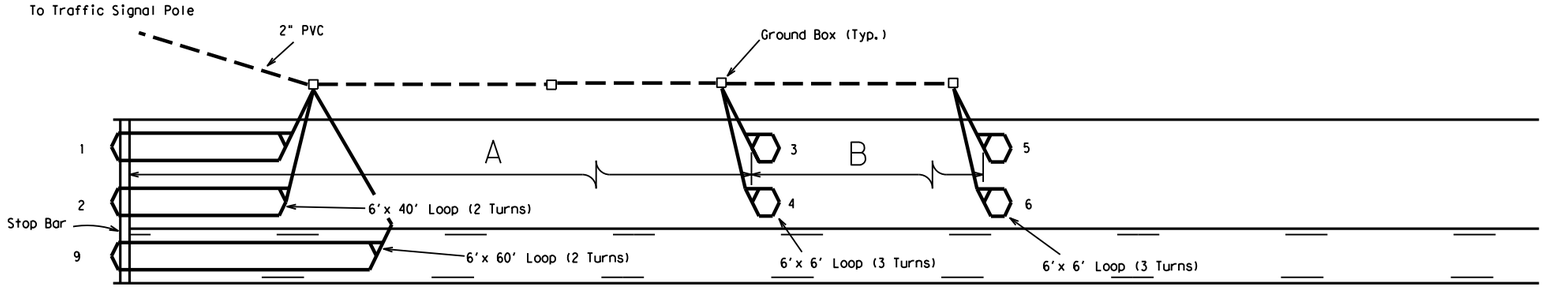
REVISIONS
2-99
1-03

CONT	SECT	JOB	HIGHWAY
1804	01	082,ETC.	SS 115,ETC.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO		128

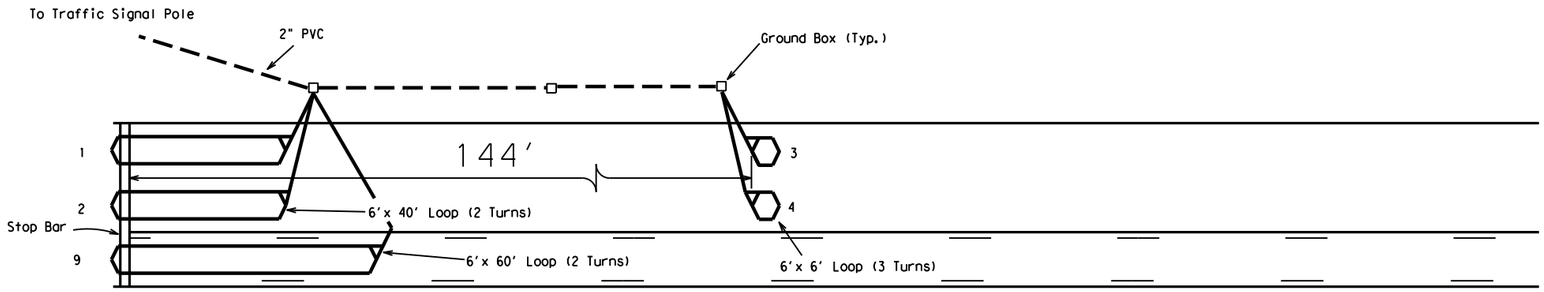
DATE:
FILE:



55 MPH (A=225', B=95') 60 MPH (A=275', B=100')
65 MPH (A=320', B=110') 70 MPH (A=350', B=125')



35 MPH (A=90', B=100') 40 MPH (A=110', B=130')
45 MPH (A=175', B=115') 50 MPH (A=220', B=130')



30 MPH

GENERAL NOTES:

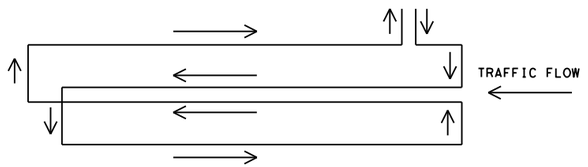
Loops 1 and 2 shall be connected to the controller cabinet by means of the same loop lead-in (2/C #14 AWG).

Loops 3 thru 6 shall be connected to the controller cabinet by means of the same loop lead-in (2/C #14 AWG).

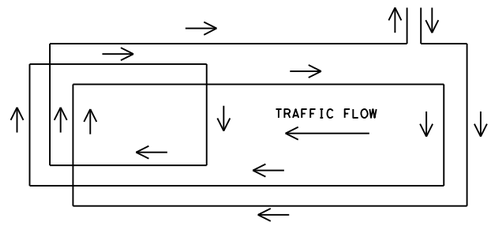
Loops 7 and 8 shall be connected to the controller cabinet by means of the same loop lead-in (2/C #14 AWG).

Loop 9 shall be connected to the controller cabinet by means of a loop lead-in (2/C #14 AWG). Loop 9 shall be placed only when a left turn lane exists.

LOOP WINDING DETAILS



QUADRAPOLE LOOP



POWER HEADER LOOP

DATE:
FILE:

Texas Department of Transportation
Traffic Operations Division

LOOP DETECTOR PLACEMENT DETAILS

LD(2)-03

REVISIONS

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

CONT	SECT	JOB	HIGHWAY
1804	01	082,ETC.	SS 115,ETC.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO		129

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:

   1. Contractor must sweep roadway & remove loose aggregate along C&G upon completed daily operations.
   2. Contractor shall not place removed aggregate along adjacent grass areas.
   3. The project locations and limits are near or crosses FEMA Flood Plains. No PSL are allowed in the waters of the U.S. of Floodplain areas.

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:

   1. Minimize loose aggregate or paving material along grassy areas.

Pharr District Contact No. 956-702-6100 Revised 01/30/2017

List of Abbreviations

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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
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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)

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	F 2023(909)		SS 115, ETC.
STATE	DISTRICT	COUNTY	
TEXAS	PHR	HIDALGO	
CONTROL	SECTION	JOB	SHEET NO.
1804	01	082, ETC.	130

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 1st.). 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:

1. FEDERAL AND STATE LISTED SPECIES:
TEXAS HORNED LIZARD (PHRYNOSOMA CORCUTUM)
TEXAS INDIGO SNAKE ((DRYMARCHON MELANURUS EREBENNUS)
TEXAS TORTOISE (GOPHERUS BERIANDIERI)

2. NO WORK SHALL BE PERFORMED BETWEEN SUNSET AND SUNRISE. CONSTRUCTION AND MAINTENANCE ACTIVITIES SHALL BE CONDUCTED DURING DAYLIGHT HOURS ONLY.

3. SEE EPIC SHEET SUPPLEMENTALS FOR TWPD BPMS FOR LISTED SPECIES.

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

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Texas Department of Transportation

PHARR DISTRICT

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

(EPIC)

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
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TPWD BMPs

Under Section 12.0011 of the Texas Parks and Wildlife Code, Texas Parks and Wildlife Department (TPWD) is charged with "providing recommendations that will protect fish and wildlife resources to local, state, and federal agencies that approve, permit, license, or construct developmental projects" and "providing information on fish and wildlife resources to any local, state, and federal agencies or private organizations that make decisions affecting those resources."

The purpose of this section is to provide beneficial management practices (BMP) that should be implemented during construction, and maintenance activities statewide for transportation projects with the goal of avoidance and minimization of impacts to natural resources. Statewide Standard BMP pertain to all fish and wildlife species, including state-listed species and other Species of Greatest Conservation Need (SGCN). Implementing the recommendations as outlined below will improve conservation of species and their habitat.

☒ General Design/Construction BMPs

- ☒ Prior to start of construction, information will be provided to personnel of the potential for all state-listed threatened species or other SGCN to occur within the project area and should be advised of relevant rules and regulations to protect plants, fish, and wildlife.
- ☒ Contractor should avoid harming all wildlife species if encountered and allow them to safely leave the project site. Due diligence should be used to avoid killing or harming any wildlife species in the implementation of transportation projects.
- ☐ Contractors should install wildlife exclusion fencing and should examine the inside of the exclusion area daily to determine if any wildlife species have been trapped inside the area of impact and provide safe egress opportunities prior to initiation of construction activities.
- ☐ Apply hydromulching and/or hydroseeding in areas for soil stabilization and/or revegetation of disturbed areas around wetlands and in riparian areas.
- ☐ Contractor should use woven natural fiber netting in which the mesh design allows the threads to move, therefore allowing expansion of the mesh openings. Plastic netting should be avoided.
- ☒ Project staging areas, stockpiles, temporary construction easements, and other project related sites should be situated in previously disturbed areas to avoid or minimize impacts to sensitive or unique habitats including intact native vegetation, floodplains, riparian corridors, wetlands, playa lakes, and habitat for wildlife species.
- ☐ When lighting is added, consider wildlife impacts from light pollution and incorporating dark-sky practices into design strategies. Minimize sky glow by focusing light downward, with full cutoff luminaries to avoid light emitting above the horizontal. The minimum amount of night-time lighting needed for safety and security should be used.

☒ Vegetation BMPs

- ☒ Minimize the amount of vegetation cleared. Removal of native vegetation, particularly mature native trees and shrubs should be avoided. Impacted vegetation should be replaced with in-kind on- site replacement /restoration of native vegetation.
- ☐ It is strongly recommended that trees greater than 12 inches in diameter at breast height (DBH) that are removed be replaced. TPWD 9/32 s experience indicates that for ecologically effective replacement, a ratio of three trees for every one (3:1) lost should be provided to either on-site or off-site. Trees less than 12 inches DBH should be replaced at a 1:1 ratio.
- ☐ 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 regional ecotype native species is recommended

☐ Invasive Species BMPs

- ☐ For all work in water bodies designated as 3/32 infested 5/32 or 3/32 positive 5/32 for invasive zebra (Dreissena polymorpha) OR quagga mussels (Dreissena bugensis) as well as waters downstream of these lakes, all machinery, equipment, vessels, or vehicles coming in contact with such waters should be cleaned prior to leaving the site to remove any mud, plants, organisms, or debris, water drained (if applicable), and dried completely before use in another water body to prevent the potential spread of invasive mussels.
- ☐ Care should be taken to prevent the spread of aquatic and terrestrial invasive plants during construction activities.
- ☐ Care should be taken to avoid the spread of aquatic invasive plants such as giant Salvinia (Salvinia molesta), common salvinia (Salvinia minima), hydrilla (Hydrilla verticillata), water hyacinth (Eichhornia spp.), Eurasian watermilfoil (Myriophyllum spicatum), water lettuce (Pistia stratiotes), and alligatorweed (Alternanthera philoxeroides) from infested water bodies into areas not currently infested. All machinery, equipment, vessels, boat trailers, or vehicles coming in contact with waters containing aquatic invasive plant species should be cleaned prior to leaving the site to remove all aquatic plant material and dried completely before use on another water body to prevent the potential spread of invasive plants. Removed plants should be transported for disposal in a secure manner to prevent dispersal.
- ☐ Only native or non-invasive plants should be planted. Care should be taken to avoid mowing invasive giant reed (Arundo donax), which spreads by fragmentation, and to clean equipment if inadvertently mowed to prevent spread. 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.

☐ Stream Crossings BMPs

- ☐ Riparian buffer zones should remain undisturbed.

☐ Dewatering BMPs

- ☐ Impact avoidance measures for aquatic organisms, including all native fish and freshwater mussel species, regardless of state-listing status, should be considered during project planning and construction activities.

☐ Wildlife Crossing BMPs

- ☐ Incorporate wildlife crossings with fencing, particularly in areas that bisect wildlife travel corridors or seasonal movement routes to avoid further habitat fragmentation and minimize wildlife-vehicle interactions.

☐ Rare Plant BMPs

- ☐ Avoid impacts and minimize unavoidable impacts. Plant locations should be protected with temporary barrier fencing and contractors should be instructed to avoid protected areas. Conducting construction outside of the growing season or after a plant has produced mature fruit is the preferred way to avoid/minimize impacts to SGCN plant populations. Staging areas, stockpiles, and other project related sites on TxDOT ROW should not impact SGCN plant populations. After construction begins, minimize herbicide use near SGCN plant populations (if possible, use hand-held spot sprayers, several meters from rare plants, on still or days with little wind).

Pharr District Contact No. 956-702-6100

☐ Rare Plants BMPs (Continued)

- ☐ If there are unintended impacts to SGCN populations, these impacts should be reported to TPWD Transportation Staff.
- ☐ During project period, conduct work during times of the year when plants are dormant and/or conditions minimize disturbance of the habitat.

☒ Bird BMPs

- ☐ Avoid vegetation clearing activities during the general bird nesting season, February 15th to October 1st to minimize adverse impacts to birds.
- ☒ Do not collect, capture, relocate, or transport birds, eggs, young, or active nests without a permit.
- ☐ Minimize extended human presence near nesting birds during construction and maintenance activities. Protect sensitive habitat areas with temporary barriers or fencing to limit human foot- traffic and off-road vehicle use to alert and discourage contractors from causing any unintentional impacts.
- ☒ Minimize construction noise above ambient levels during general bird nesting season to minimize adverse impacts on birds.
- ☒ Minimize construction lighting during the general bird nesting season by scheduling work activities between dawn and dusk.

☐ Rookeries BMPs

- ☐ 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) (Ardea herodis) 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.
- ☐ If rookeries are encountered, avoid and minimize disturbance during nesting to protect rookery species and their habitat.
- ☐ Vegetation clearing in a primary buffer area of 300 meters (984 feet) from a rookery or 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 1000 meters (3281 feet) from the heronry periphery should be avoided during the breeding season (courting and nesting).

Revised 02/24/2022

List of Abbreviations

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Texas Department of Transportation

PHARR DISTRICT

EPIC SHEET SUPPLEMENTALS

TPWD BMPs

SHEET 1 OF 3

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
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☐ Fish BMPs

- ☐ The following Fish BMP apply to projects for all fish species in waters of the state to minimize impacts to water quality and aquatic passage from transportation projects.
- ☐ For projects in waters of the state and work is adjacent to water: follow Water Quality and Stream Crossing BMPs.
- ☐ For projects in waters of the state and work is in the water: follow Water Quality, Stream Crossing, and Dewatering BMP.

☐ Aquatic Invertebrate BMPs

- ☐ For projects within the range of a SGCN or state-listed species and work is adjacent to water: Water Quality and Stream Crossing BMP
- ☐ For projects within the range of a SGCN or state-listed species and work is in the water: Water Quality, Stream Crossing, and Dewatering BMP.
- ☐ For spring-seep associated caddisflies (Cheumatopsyche morsei, Chimarra holzenthali, and Hydroptila ouachita): Avoid or minimize impacts to the natural riparian buffer along stream channel including native shrubs and trees.

☐ Crayfish BMP

- ☐ For projects within the range of a SGCN or state-listed species and work is adjacent to water: Water Quality and Stream Crossing BMP.
- ☐ For projects within the range of a SGCN or state-listed species and work is in the water: Water Quality, Stream Crossing, and Dewatering BMP.
- ☐ Avoid or minimize impacts to the natural riparian buffer that provides terrestrial and aquatic plant matter for the diet of most crayfish species.

☐ Freshwater Mussel BMP

- ☐ In addition to Water Quality and Stream Crossing BMP, follow the most recent, 7/32 TPWD 9/32 TxDOT Annual Work Plan for Pre-Construction Surveys, Aquatic Resources Relocations, and Other Best Management Practices to Avoid, Minimize, and Mitigate Impacts to Freshwater Resources. 9/32
- ☐ When work is adjacent to the water: Water Quality BMP implemented as part of the Texas Commission on Environmental Quality (TCEQ) Stormwater Pollution Prevention Plan (SWPPP) for a construction general permit or any conditions of the 401 Water Quality Certification for the project will be implemented.

☒ Insect Pollinator BMP

- ☐ Deep soil disturbances, such as, tilling or deep disking in areas that host aggregations of ground- nesting bees should be avoided. Tilling and disking also may promote the invasion or germination of non-native plants. Different species of native ground-nesting bees prefer different soil conditions, although research suggests that many ground nesting bees prefer sandy, loamy sand or sandy loam soils. In areas with these soil types consider leaving open patches of soil.
- ☒ Allow dead trees to stand (so long as they do not pose a risk to property or people) and protect shrubs and herbaceous plants with pithy or hollow stems (e.g., cane fruits, sumac, elderberry), as these provide nesting habitat for tunnel-nesting native bees.
  Retain dead or dying branches whenever it is safe and practical at the edges of the ROW. Wood- boring beetle larvae often fill dead trees and branches with narrow tunnels into which tunnel- nesting bees will establish nests. Additionally, bumble bees may choose to nest in wood piles.
- ☒ Retain rotting logs at edges of the ROW where some bee species may burrow tunnels in which to nest.

☒ Insect Pollinator BMP (Continued)

- ☒ Protect sloped or well-drained ground sites where plants are sparse and direct access to soil is available. These are the areas where ground-nesting bees may dig nests. Turning the soil destroys all ground nests that are present at that depth and hinders the emergence of bees that are nesting deeper in the ground.
- ☒ Protect grassy thickets, or other areas of dense, low cover from mowing or other disturbance. These are the sites where bumble bees might find the nest cavities they need, as well as annual and perennial wildflowers that can provide important food resources.
- ☐ Where available and economical, native plants and seed should be procured from local eco-type providers. Seed mixes should be diverse and include as many ecoregion natives as possible ensuring full season floral resources. Species by Texas ecoregion can be found in the Texas Management Recommendations for Native Insect Pollinators in Texas document: https://tpwd.texas.gov/publications/pwdpubs/media/pwd*bk*w7000*1813.pdf
- ☐ Planting at least three different native flowering plants within each of three blooming periods are recommended (spring, summer, early fall) in high rainfall regions of Texas. In drier regions of the state, a target of three native flowering plants within each of two blooming periods can be used.

☐ Small Mammal BMP

For Coues' rice rat (Oryzomys couesi aquaticus):

- ☐ Minimize impacts to wetland, resaca, oxbow Conversion of property containing cave or cliff features to transportation purposes should be avoided.lake, and marsh habitats
- ☐ Water Quality BMP

☐ Fossorial Mammal BMP

- ☐ 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.

☐ Bat BMP

- ☐ 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.

Pharr District Contact No. 956-702-6100

☐ Bat BMP (Continued)

- ☐ 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.
- ☐ 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 1 through October 31. If removal of dead fronds is necessary at other times of the year, limit frond removal to extended warms 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.
- ☐ In all instances, avoid harm or death to bats. Bats should only be handled as a last resort and after communication with TPWD.

☐ Aquatic Amphibian and Reptile BMP

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:

- ☐ Minimize impacts to wetlands, temporary and permanent open water features, including depressions, and riverine habitats.
- ☐ Maintain the existing hydrologic regime and any connections between wetlands and other aquatic features.
- ☐ 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.
- ☐ Apply hydromulching and/or hydroseeding in areas for soil stabilization and/or revegetation of disturbed areas around wetlands and in riparian areas. If erosion control blankets or mats will be used, the product should not contain netting, but should only contain loosely woven natural fiber netting in which the mesh design allows the threads to move, therefore allowing expansion of the mesh openings. Plastic netting should be avoided.
- ☐ Project specific locations (PSLs) proposed within state-owned ROW should be located in uplands away from aquatic features.
- ☐ When work is directly adjacent to the water, minimize impacts to shoreline basking sites (e.g., downed trees, sand bars, exposed bedrock) and refugia/overwinter sites (e.g., brush and debris piles, crayfish burrows, aquatic logjams, and leaf packs).

Revised 02/24/2022

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
FHWA: Federal Highway Administration	PCN: Pre-Construction Notification	T&E: Threatened and Endangered Species
MOA: Memorandum of Agreement	PSL: Project Specific Location	USACE: U.S. Army Corp of Engineers
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

SHEET 2 OF 3

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	F 2023(909)		SS 115, ETC.
STATE	DISTRICT	COUNTY	
TEXAS	PHR	HIDALGO	SHEET NO.
CONTROL	SECTION	JOB	
1804	01	082, ETC.	133

☐ Aquatic Amphibian and Reptile BMP (Continued)

- ☐ If gutters and curbs are part of the roadway design, 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 BMP for projects within existing ROW above plus those below:

- ☐ 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.
- ☐ For culvert extensions and culvert replacement/installation, incorporate measures to funnel animals toward culverts such as concrete wingwalls and barrier walls with overhangs.
- ☐ 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. Biotechnical streambank stabilization methods using live native vegetation, or a combination of vegetative and structural materials should be used.

☒ Terrestrial Amphibian and Reptile BMP

- ☐ 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
- ☒ Avoid or minimize disturbing or removing cover objects, such as downed trees, rotting stumps, brush piles, and leaf litter. If avoidance or minimization is not practicable, consider removing cover objects prior to the start of the project and replace them at project completion.
- ☒ Examine heavy equipment stored on site before use, particularly after rain events when reptile and amphibian movements occur more often, to ensure use will not harm individuals that might be seeking temporary refuge.
- ☐ Due to increased activity (mating) of reptiles and amphibian during the spring, construction activities like clearing or grading should attempt to be scheduled outside of the spring (March-May) season.
  Also, timing ground disturbing activities before October when reptiles and amphibians become less active and may be using burrows in the project area is also encouraged.
- ☒ If Texas tortoises (Gopherus berlandieri) or box turtles (Terrepene spp.) are present in a project area, they should be removed from the area and relocated between 100 and 200 meters from the project area. After removal of the individuals, the area that will be disturbed during active construction and project specific locations should be fenced off to exclude reentry by turtles, tortoises, and other reptiles. The exclusion fence should be constructed and maintained as follows:
  - The exclusion fence should be constructed with metal flashing or drift fence material.
  - Rolled erosion control mesh material should not be used.
  - The exclusion fence should be buried at least 6 inches deep and be at least 24 inches high.
  - 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.

☐ Terrestrial Amphibian and Reptile BMP (Continued)

- ☐ After project is complete, revegetate disturbed areas with an appropriate locally sourced native seed mix. If erosion control blankets or mats will be used, the product should not contain nylon netting, but should only contain loosely woven natural fiber netting in which the mesh design allows the threads to move, therefore allowing expansion of the mesh openings. Plastic netting should be avoided.

☐ Black-spotted newt/Mexican Burrowing toad/ Mexican treefrog/ Strecker's chorus frog/White-lipped frog/Woodhouse's toad

- ☐ Aquatic Amphibian and Reptile BMP
- ☐ Terrestrial Amphibian and Reptile BMP
- ☐ Water Quality BMP
- ☐ Vegetation BMP

☐ Sheep Frog

- ☐ Minimize disturbance to burrows or downed woody debris
- ☐ Aquatic Amphibian and Reptile BMP
- ☐ Terrestrial Amphibian and Reptile BMP
- ☐ Water Quality BMP
- ☐ Vegetation BMP

☐ South Texas Siren (Large Form)

- ☐ Minimize impacts to warm, shallow waters with vegetative cover such as ponds and ditches
- ☐ Aquatic Amphibian and Reptile BMP
- ☐ Water Quality BMP

☒ Black-striped snake/ Eastern box turtle/Northern cat-eyed snake/Plateau spot-tailed earless lizard/ Reticulate collared lizard/ Slender glass lizard/ Speckler racer/Tamaulipan spot-tailed earless lizard/ Texas Indigo snake/ Western box turtle/Western hognose snake/Western massasauga

- ☒ Terrestrial Amphibian and Reptile BMP
- ☒ Vegetation BMP

☐ Rio Grande River Cooter

- ☐ Aquatic Amphibian and Reptile BMP
- ☐ Water Quality BMP

☒ Texas Horned Lizard

- ☒ Avoid harvester ant mounds in the selection of Project Specific Locations (PSLs).
- ☒ Terrestrial Amphibian and Reptile BMP
- ☒ Vegetation BMP

☒ Texas Tortoise

- ☒ Utility trenches should be covered overnight or visually inspected before filling to avoid burial of the species
- ☒ Terrestrial Amphibian and Reptile BMP
- ☒ Vegetation BMP

Pharr District Contact No. 956-702-6100

OTHER PERTINENT INFORMATION

☐ Trifold Available

- ☐ Ocelot information
- ☐ Pelican information
- ☐ Ashy dogweed

☐ Stockcards Available

- ☐ Mitigatory Bird Treaty Act
- ☐ Texas Tortoise
- ☐ Harvester Ants and Horn Lizards

Revised 02/24/2022

List of Abbreviations

BMP: Best Management Practice	MSAT: Mobile Source Air Toxic	TCEQ: Texas Commission on Environmental Quality
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MOA: Memorandum of Agreement	PSL: Project Specific Location	USACE: U.S. Army Corp of Engineers
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(909)		SS 115, ETC.
STATE	DISTRICT	COUNTY	
TEXAS	PHR	HIDALGO	SHEET NO.
CONTROL	SECTION	JOB	
1804	01	082, ETC.	134

SITE DESCRIPTION

PROJECT LIMITS: *Various Locations In Hidalgo County.*

PROJECT SITE MAPS: *See Title Sheet & Location Maps*

PROJECT DESCRIPTION: *Overlay*

MAJOR SOIL DISTURBING ACTIVITIES: *N/A*

TOTAL PROJECT AREA: *74.4 Acres*

TOTAL AREA TO BE DISTURBED: *N/A*

WEIGHTED RUNOFF COEFFICIENT: *Not Changing Runoff Coefficient*
Before Construction: Not Calculated
After Construction: Same as Before

EXISTING CONDITION OF SOIL & VEGETATIVE
See EPIC Sheet

NAME OF RECEIVING WATERS: *N/A*
Overlay project locations runoff flows into roadside ditches or storm water inlets and drains into outfalls and drainage canals.

ENDANGERED SPECIES, DESIGNATED CRITICAL HABITAT AND HISTORICAL PROPERTY:

A. See EPIC SHEET 2 of 2 for federal and state listed species.

B. No critical habitat or historical properties have been determined to be within the project area.

The documentation satisfying TPDES Construction General Permit eligibility pertaining to the existence or of any protective action taken with regards to endangered species or designated critical habitat or historical property in this project area is contained in the project's Environmental Impact Study and can be viewed under the State Open Records Act at the address shown below:

TEXAS DEPARTMENT OF TRANSPORTATION
PHARR DISTRICT HEADQUARTERS
ATTN: ENVIRONMENTAL COORDINATOR
600 W. EXPRESSWAY 83
PHARR, TX 78577
PHONE: 956-702-6100

EROSION AND SEDIMENT CONTROLS

SOIL STABILIZATION PRACTICES: (Select T = Temporary or P = Permanent, as applicable)

___ TEMPORARY SEEDING
___ MULCHING (Hay or Straw)
___ BUFFER ZONES
___ PLANTING
___ SEEDING
___ SODDING
___ OTHER: (Specify Practice)

___ PRESERVATION OF NATURAL RESOURCES
___ FLEXIBLE CHANNEL LINER
___ RIGID CHANNEL LINER
___ SOIL RETENTION BLANKET
___ COMPOST MANUFACTURED COMPOST
T BIODEGRADABLE EROSION CONTROL SOCKS

STRUCTURAL PRACTICES: (Select T = Temporary or P = Permanent, as applicable)

___ SILT FENCES
T BIODEGRADABLE EROSION CONTROL SOCKS
___ HAY BALES
___ ROCK FILTER DAMS
___ DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
___ DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
___ DIVERSION DIKE AND SWALE COMBINATIONS
___ PIPE SLOPE DRAINS
___ PAVED FLUMES
___ ROCK BEDDING AT CONSTRUCTION EXIT
___ TIMBER MATTING AT CONSTRUCTION EXIT
___ PIPE MATTING OR EQUAL AT CONSTRUCTION EXIT
___ CHANNEL LINERS
___ SEDIMENT TRAPS
___ SEDIMENT BASINS
T STORM INLET SEDIMENT TRAP
___ STONE OUTLET STRUCTURES
___ CURBS AND GUTTERS
___ STORM SEWERS
___ VELOCITY CONTROL DEVICES
___ OTHER: (Specify Practice)

STORM WATER MANAGEMENT:
Storm water drainage will be provided by storm sewer networks. This storm drain system will carry drainage within the row to low points in the highway where cross drainage may occur and ultimately to the designated outfall.

STORM WATER MANAGEMENT ACTIVITIES:

The order of activities will be as follows:
1.- Install perimeter controls, clear R.O.W. on side where construction will take place, and make required utility adjustments
2. Construct proposed roadway.

NON-STORM WATER MANAGEMENT DISCHARGES:
Non-storm water discharges should be filtered, or held in retention basins, before being allowed to mix with storm water. These discharges consist of non-polluted ground water, spring water, foundation and/or footing drain water; and water used for dust control, pavement washing and vehicle wastewater containing no detergents.

OTHER REQUIREMENTS & PRACTICES

OTHER EROSION AND SEDIMENT CONTROLS:

MAINTENANCE: *All erosion and sediment controls will be maintained in good working order. If a repair is necessary, it will be done at the earliest date possible, but no later than 7 calendar days after the surrounding exposed ground has dried sufficiently to prevent further damage from heavy equipment. The areas adjacent to creeks and drainage ways shall have priority followed by devices protecting storm sewer inlets.*

INSPECTION: *For areas of the construction site that have not been finally stabilized, area used for storage of materials, structural control measures, and locations where vehicles enter or exit the site, personnel provided by the permittee and familiar with the SW3P must inspect disturbed areas at least once every fourteen (14) calendar days and within twenty-four (24) hours of the end of a storm event 0.5 inches or greater.*

WASTE MATERIALS: *All waste materials will be collected and stored in a securely lidded dumpster. All trash and construction debris from the site will be deposited as necessary at a local dump. No construction waste material will be buried on site.*

HAZARDOUS WASTE (INCLUDING SPILL REPORTING): *At a minimum, any products in the following categories to be hazardous: Paints, Acids for cleaning masonry surfaces, Cleaning Solvents, Asphalt products, Petroleum fuels and oils, Chemical additives for soil stabilization, or Concrete curing compounds and additives. In the event of a spill which may be hazardous, the spill Coordinator should be contacted immediately. Emptying of excess concrete should not be allowed on site. Likewise, washout of concrete trucks should not be performed on site. These discharges are considered non-allowable non-storm water discharges. Concrete trucks should never be allowed to dump into storm drains or sanitary sewers.*

SANITARY WASTE: *All sanitary waste will be collected from the portable units as necessary or as required by local regulation by a licensed sanitary waste management contractor.*

OFFSITE VEHICLE TRACKING: *The Contractor shall be rquired, on a regular basis or as may be directed by the Engineer, to dampen haul roads for dust control, stabilize construction entrances and to remove excess dirt from the roadway.*

MANAGEMENT PRACTICES: *(Example Below - May be used as applicable, revised or expanded):*
1. Disposal areas, stockpiles, and haul roads shall be constructed in a manner that will minimize and control the amount of sediment that may enter receiving waters. Disposal areas shall not be located in any wetland, water body or stream bed.
2. Construction staging areas and vehicle maintenance areas shall be constructed by the Contractor in a manner to minimize the runoff of pollutants.
3. All waterways shall be cleared as soon as practicable of temporary embankment, temporary bridges, matting, falsework, piling, or debris or other obstructions placed during construction operations that are not a part of the finished work.

OTHER: *Contractor shall adhere to the following:*
1. Construction Materials List of materials stored on job site to be provided by Contractor.
2. The project SW3P File shall be located at the project field office or within the Contractor's mobile office at all times and shall contain the N.O.I., CGP, Signature Authorization, Certification/Qualification Statements, Inspection Reports, Required Maps, and the TPDES Permit, Part II. This File to be persented to authorized State and Federal Agents upon request.

STATE OF TEXAS
EUGENE PALACIOS
105110
LICENSED
PROFESSIONAL ENGINEER

5/1/2023

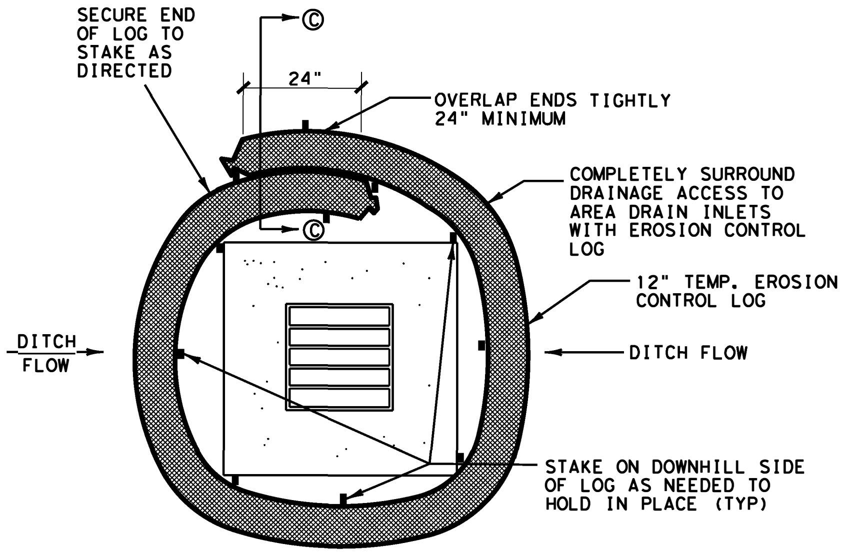
Eugene Palacios

Texas Department of Transportation

TxDOT STORM WATER POLLUTION PREVENTION PLAN (SW3P)

REV. 2-20-14 SW3P.DGN

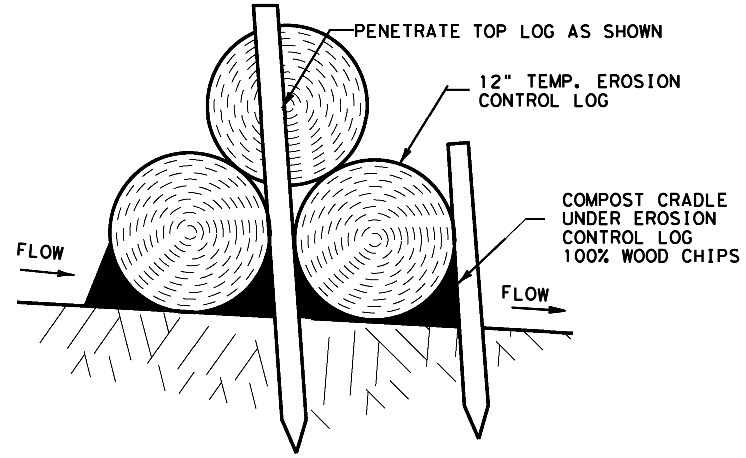
FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6	F 2023(909)	135
STATE	DIST.	COUNTY
TEXAS	PHARR	HIDALGO
CONT.	SECT.	JOB / HIGHWAY NO.
1804	01	082,ETC. / SS 115,ETC.



DROP INLET SEDIMENT TRAP

NTS

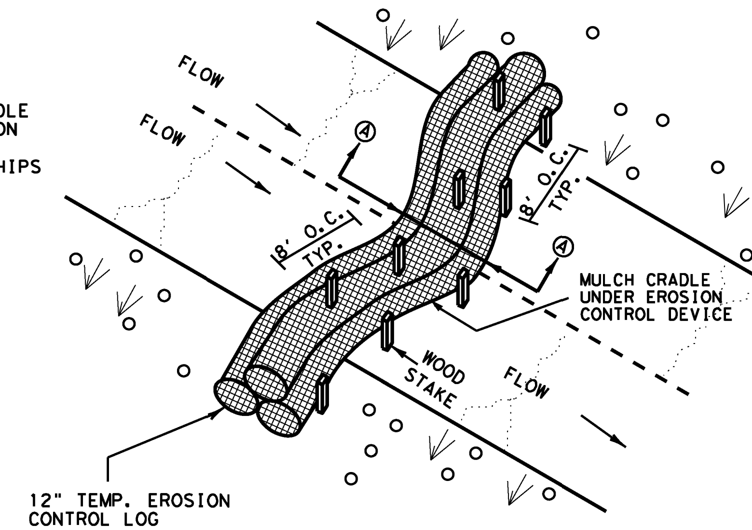
(DI-ST)



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

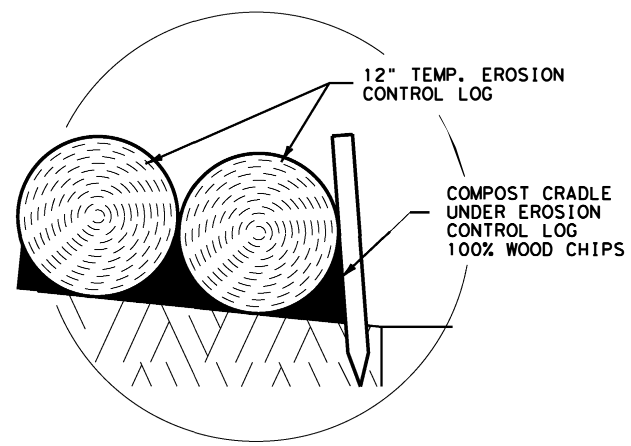
SEDIMENT BASIN & TRAP USAGE GUIDELINES

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).

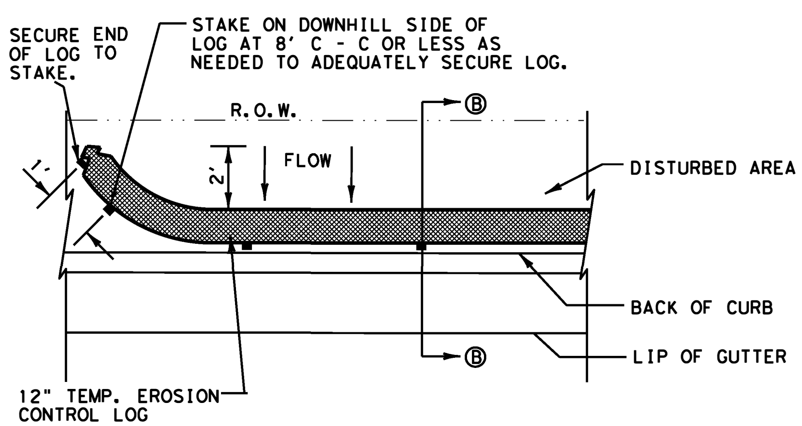
Sediment traps should be placed in the following locations:
1. Immediately preceding drain inlets
2. Just before the drainage enters a water course
3. Just before the drainage leaves the right of way
4. Just before the drainage leaves the construction limits where drainage flows away from the project

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.



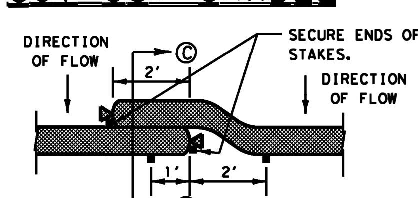
SECTION C-C

OVERLAP WITH COMPOST CRADLE



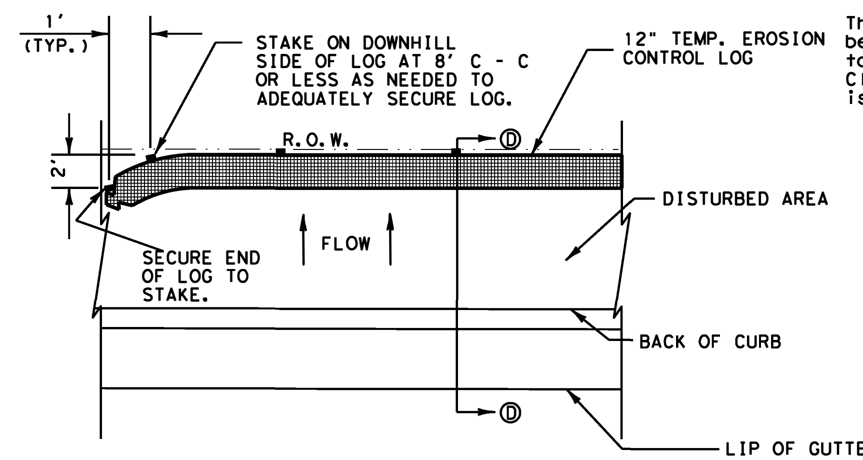
PLAN VIEW

NTS



OVERLAP DETAIL PLAN VIEW

NTS

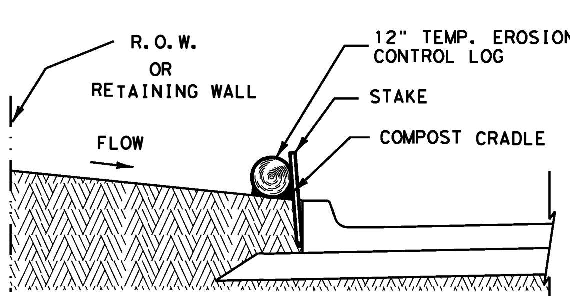


PLAN VIEW

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.

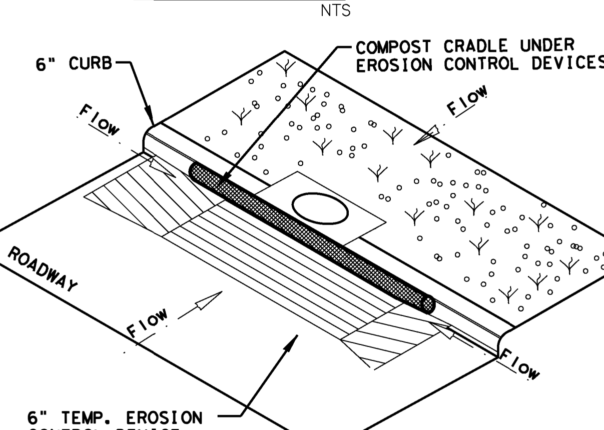


SECTION B-B

BACK OF CURB INLET SEDIMENT TRAP

NTS

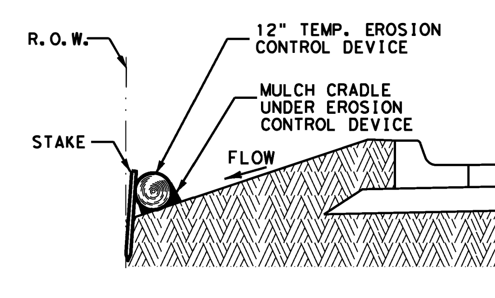
(BOCI-ST)



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			SS 115, ETC.
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	PHARR	HIDALGO	136
CONTROL	SECTION	JOB	
1804	01	082, ETC.	

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	