CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM 1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		1

SEE SHEET NO. 2
FOR INDEX OF SHEETS

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
FEDERAL HIGHWAY IMPROVEMENT

FEDERAL PROJECT NUMBER
STP 2021(370)
CSJ 1427-01-040, ETC.

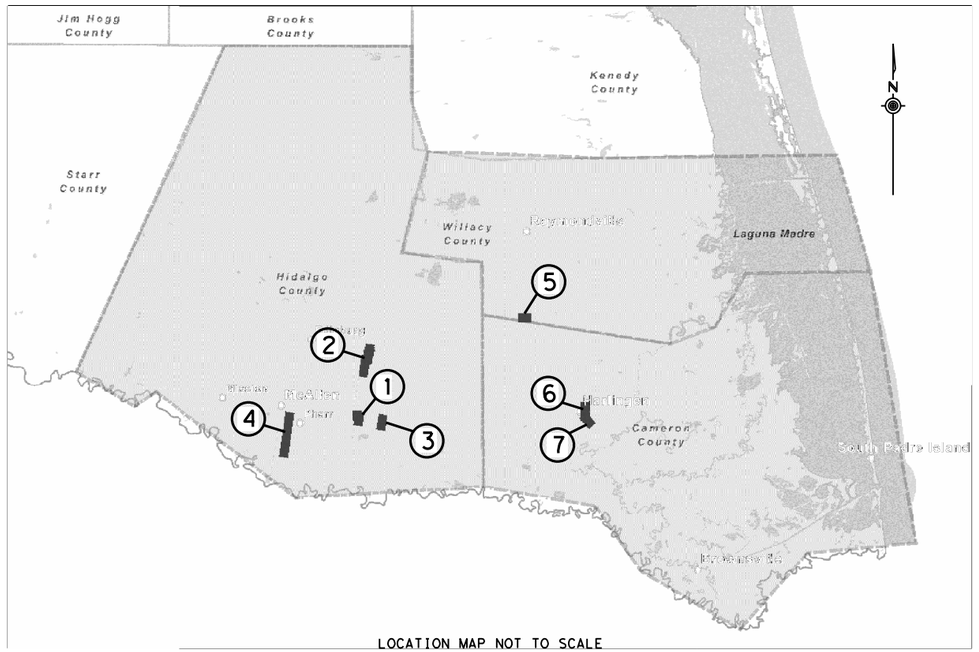
NET LENGTH OF PROJECT = 55,005.35 FEET = 10.418 MILES ——— ROADWAY = 55,015 FEET = 10.420 MILES

HIDALGO COUNTY, ETC.
FM 1423, ETC.

FROM: VARIES
TO: VARIES

FOR THE CONSTRUCTION OF PREVENTATIVE MAINTENANCE WORK

CONSISTING OF OVERLAY AND PAVEMENT MARKINGS



LOCATION MAP NOT TO SCALE

LOC	HWY	CSJ
1	FM 1423	1427-01-040
2	FM 1423	1427-01-041
3	FM 493	0863-01-071
4	FM 2061	1939-02-040
5	SS 413	0872-01-017
6	BUS 77-X	0327-08-099
7	BUS 77-X	0039-12-255

EXCEPTIONS: LOCATIONS 4
EQUATIONS: NONE
RAILROAD CROSSINGS: LOCATIONS 1, 3, & 6
DESIGN SPEED: VARIES

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:

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

_____ _____
RENE GARZA, P.E. DATE
PHARR AREA OFFICE ENGINEER

TDLR INSPECTION NOT REQUIRED

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION ON NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, MAY 2012).

RECOMMENDED FOR LETTING: DATE: 12/1/2020

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

SUBMITTED FOR LETTING: DATE: 11/30/2020

DocuSigned by: Romualdo Mena Jr 8D395A056F70440...
DISTRICT CENTRAL DESIGN SUPERVISOR

FILE: PHARR*TITLE*2019.dgn
DATE: 12/18/2020 11:43:51 AM

INDEX OF SHEETS

LEGEND
[D] - DISTRICT STANDARDS
[S] - STATE STANDARDS

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

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

12/17/2020

Pharr District Central Design

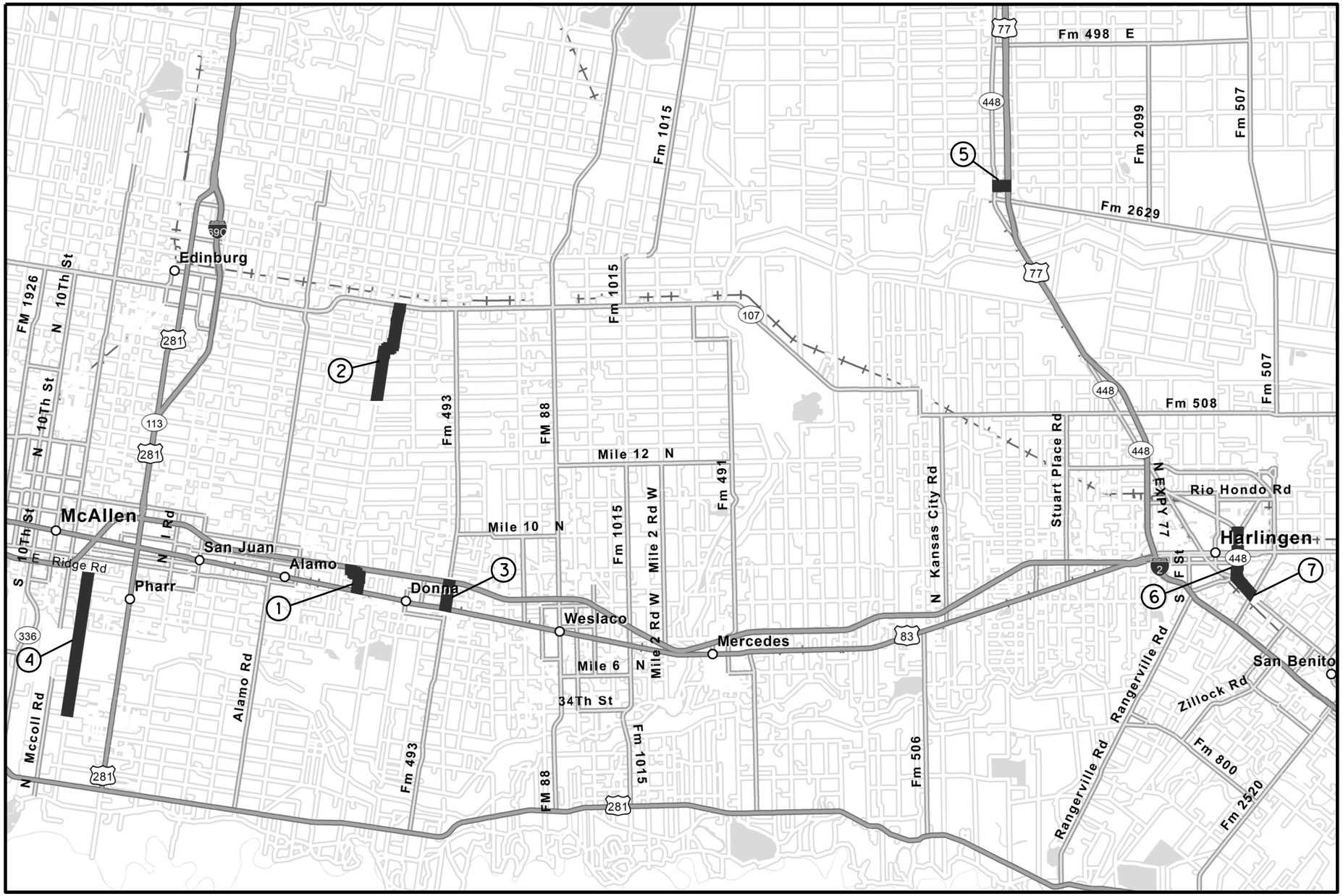
Texas Department of Transportation

INDEX OF SHEETS

SHEET 1 OF 1

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1427	01	040, etc.	FM1423, etc.
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	HIDALGO, etc.		2

DATE: 12/17/2020 2:48:43 PM
FILE: PHARR_INDEX_201901.dgn



LOC	HWY	CSJ	LIMITS FROM	LIMITS TO	LENGTH FT.	LENGTH MI.
1	FM 1423	1427-01-040	IH-2	BUS 83	4,066	0.770
2	FM 1423	1427-01-041	SH 107	WISCONSIN RD.	14,757	2.795
3	FM 493	0863-01-071	IH-2	BUS 83	3,847	0.729
4	FM 2061	1939-02-040	RIDGE RD.	FM 3072	21,066	3.990
5	SS 413	0872-01-017	BUS 77	IH-69E	1,875	0.355
6	BUS 77-X	0327-08-099	FM 507	FLOODWAY BRIDGE	7,719	1.462
7	BUS 77-X	0039-12-255	FLOODWAY BRIDGE	LP 499	1,685	0.319

DATE: 1/15/2020 2:43:05 PM
FILE: DISTRICT LOCATION MAP.dgn

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

Texas Department of Transportation

PHARR DISTRICT MAP

SCALE: N.T.S. SHEET 1 OF 1

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1427	01	040, etc.	FM1423, etc.
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	HIDALGO, etc.		3

N

Donna Main Canal

Casa Feliz

Casa Del Gato

Casa Bonita

Valverde Rd

Casa Del Sol

Date Palm Dr

Washingtonia Sq

Palm Shadows Blvd

RIO VALLEY SWITCHING CO.

Lee St

FM 1423

Pine St

Birch St

Elm St

Maple St

Oak St

Mesquite St

Dogwood St

Redwood St

Cottonwood St

Boxwood St

IH-2

BEGIN PROJECT
STA. 10+00

END PROJECT
STA. 50+66

83

LOCATION #1
CSJ : 1427-01-040
HIGHWAY : FM 1423
COUNTY : HIDALGO
LIMITS : FROM: IH-2
TO: BUS 83
LENGTH : 0.770 MI.
REF. MRK.: RM: 722+1.694
RM: 724+0.464
A.D.T. : 8,318

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

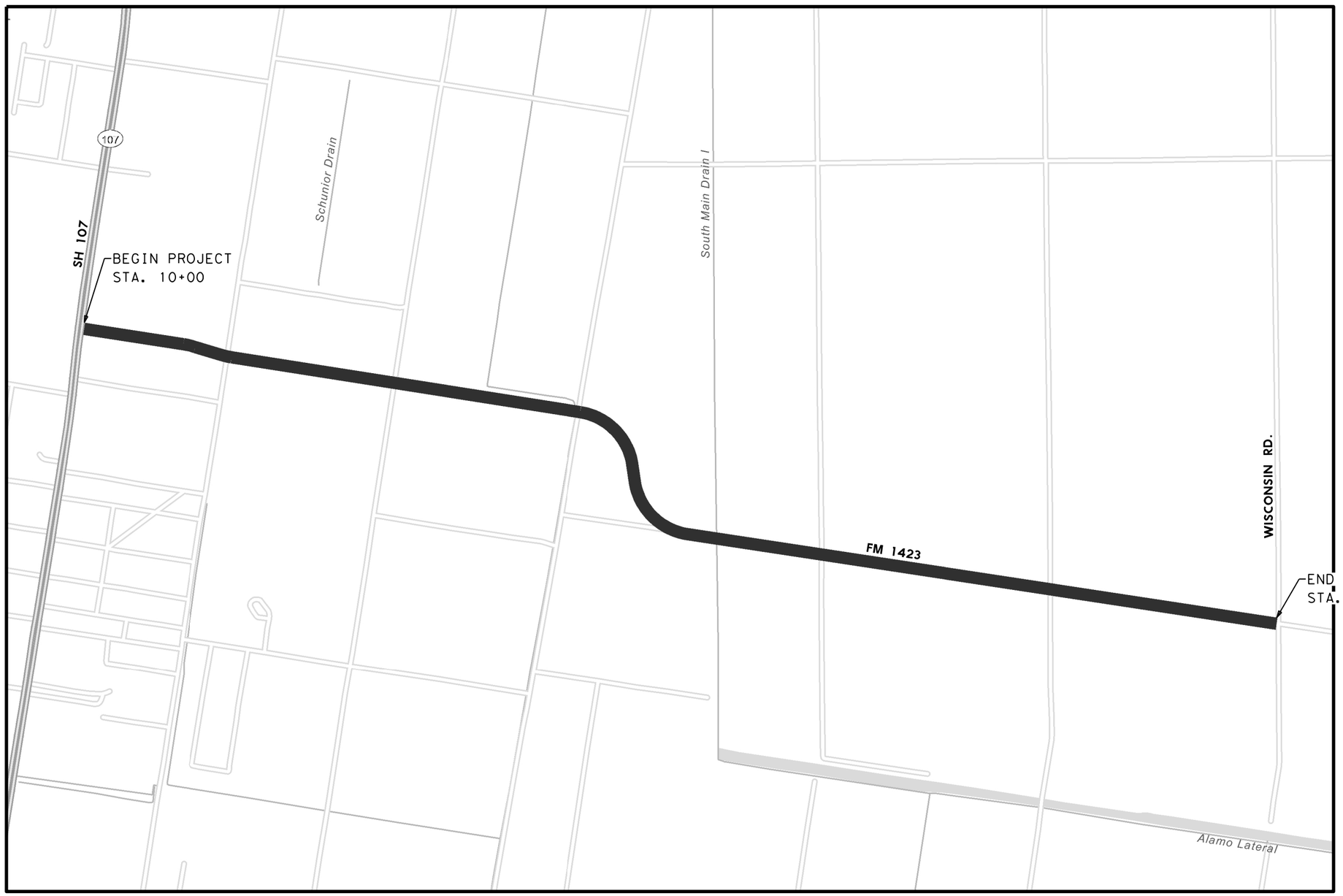
Texas Department of Transportation

FM 1423
LOCATION 1
LOCATION MAP

SCALE: 1"= 0.5 MILES SHEET 1 OF 7

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1427	01	040, etc.	FM1423, etc.
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	HIDALGO, etc.		4

DATE: 1/13/2020 9:31:24 AM
FILE: 01LOCATION MAP.dgn



LOCATION #2

CSJ	:	1427-01-041
HIGHWAY	:	FM 1423
COUNTY	:	HIDALGO
LIMITS	:	FROM: SH 107
		TO: Wisconsin Rd.
LENGTH	:	2.795 MI.
REF. MRK.	:	RM: 716-0.014
		RM: 718+0.780
A.D.T.	:	8,743

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

Texas Department of Transportation

FM 1423
LOCATION 2
LOCATION MAP

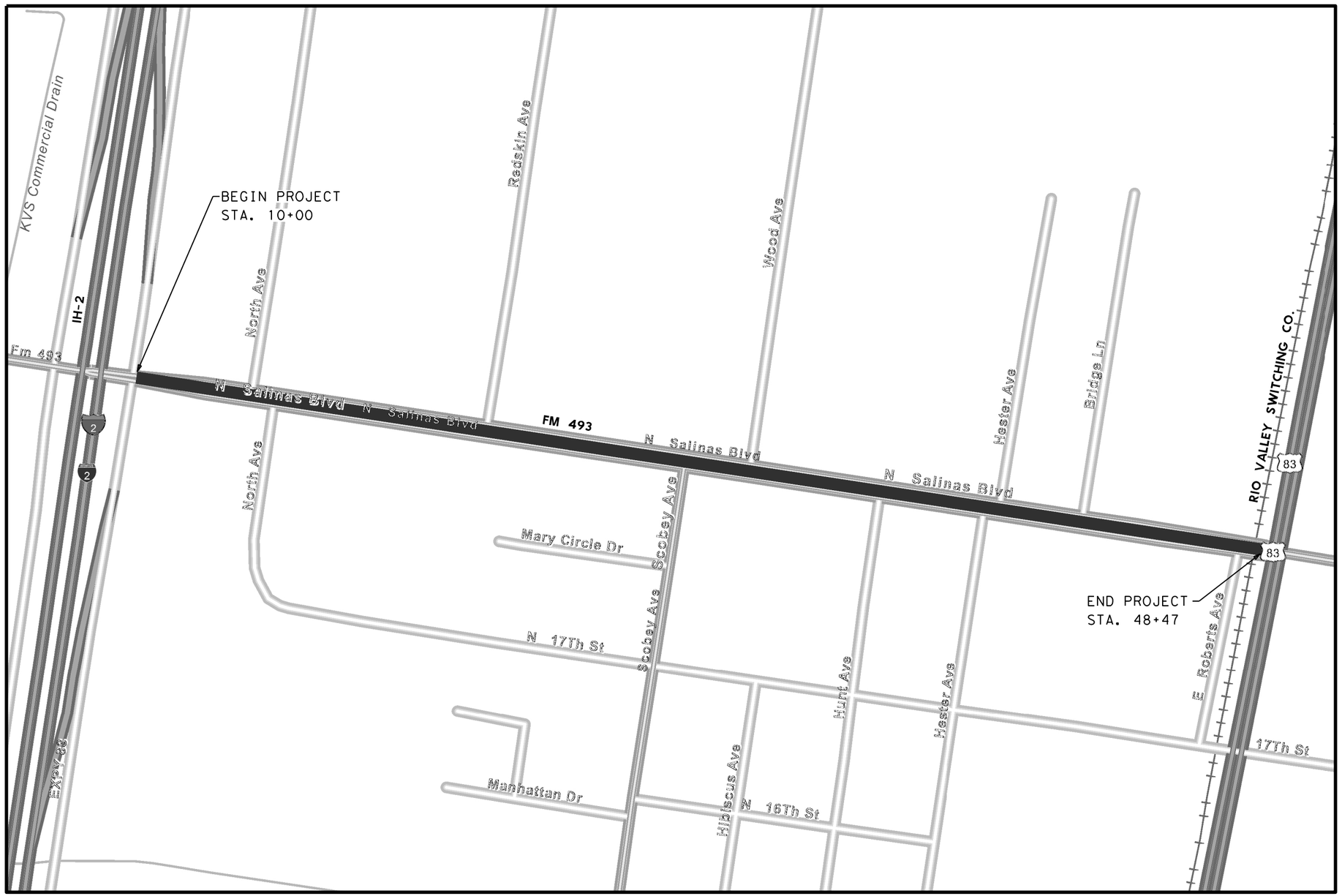
SCALE: 1"= 0.5 MILES SHEET 2 OF 7

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		5

DS: CK:
DW: CK:

DATE: 2/27/2020 8:28:56 AM
FILE: 02LOCATION MAP.dgn

N



LOCATION #3
CSJ : 0863-01-071
HIGHWAY : FM 493
COUNTY : HIDALGO
LIMITS : FROM: IH 2
TO: BUS 83
LENGTH : 0.729 MI.
REF. MRK.: RM: 724+1.748
RM: 726+0.467
A.D.T. : 20,801

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

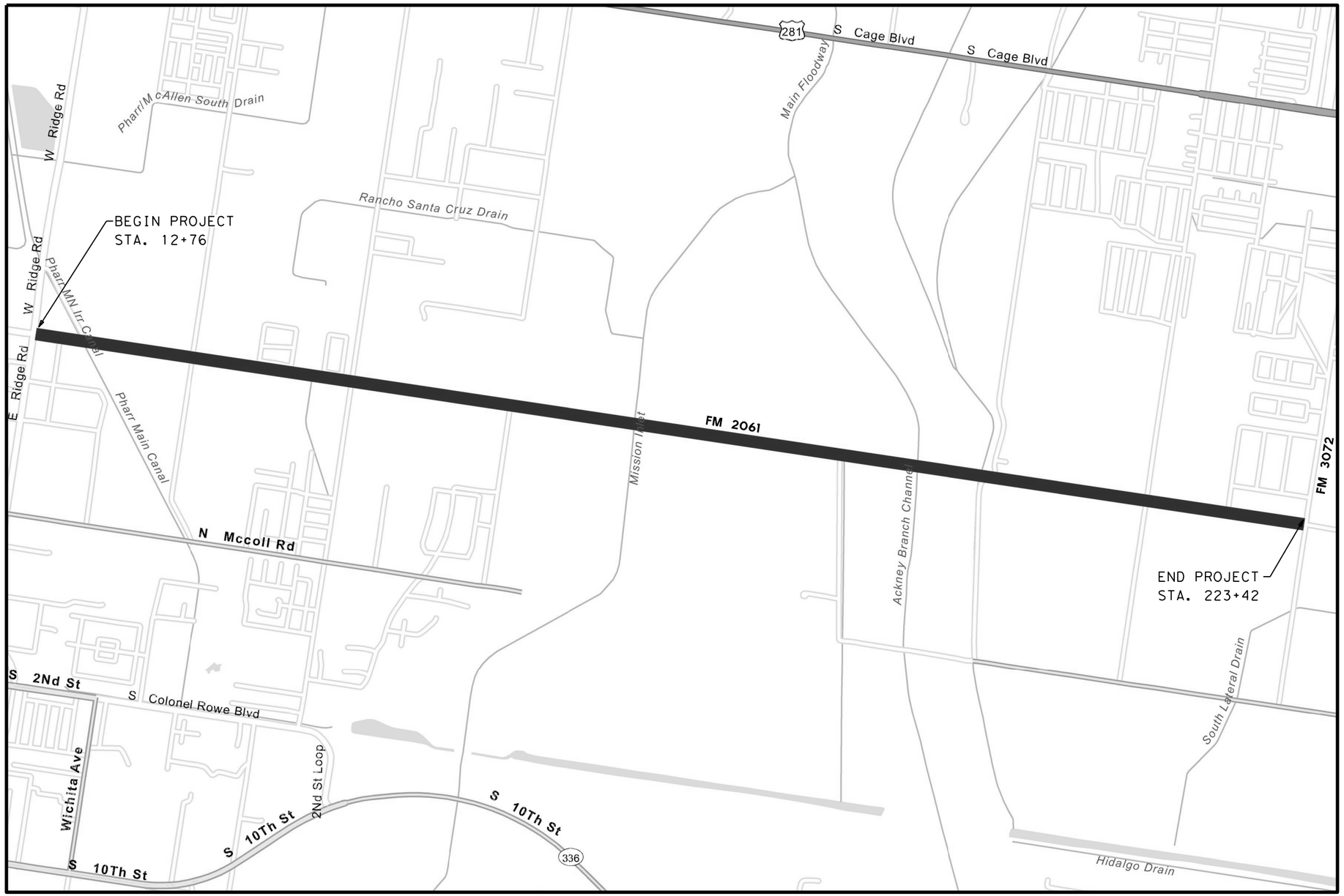
Texas Department of Transportation

FM 493
LOCATION 3
LOCATION MAP

SCALE: N.T.S. SHEET 3 OF 7

© 2019	CONT	SECT	JOB	HIGHWAY
DS: CK:	1427	01	040, etc.	FM 1423, etc.
DW: CK:	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO, etc.		6

DATE: 2/27/2020 10:27:18 AM
FILE: 03LOCATION MAP.dgn



LOCATION #4
CSJ : 1939-02-040
HIGHWAY : FM 2061
COUNTY : HIDALGO
LIMITS : FROM: Ridge Rd.
TO: FM 3072
LENGTH : 3.990 MI.
REF. MRK.: RM: 726-0.517
RM: 728+1.482
A.D.T. : 30,198

DATE: 1/13/2020 11:12:45 AM
FILE: 04LOCATION MAP.dgn

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER
02/25/2020

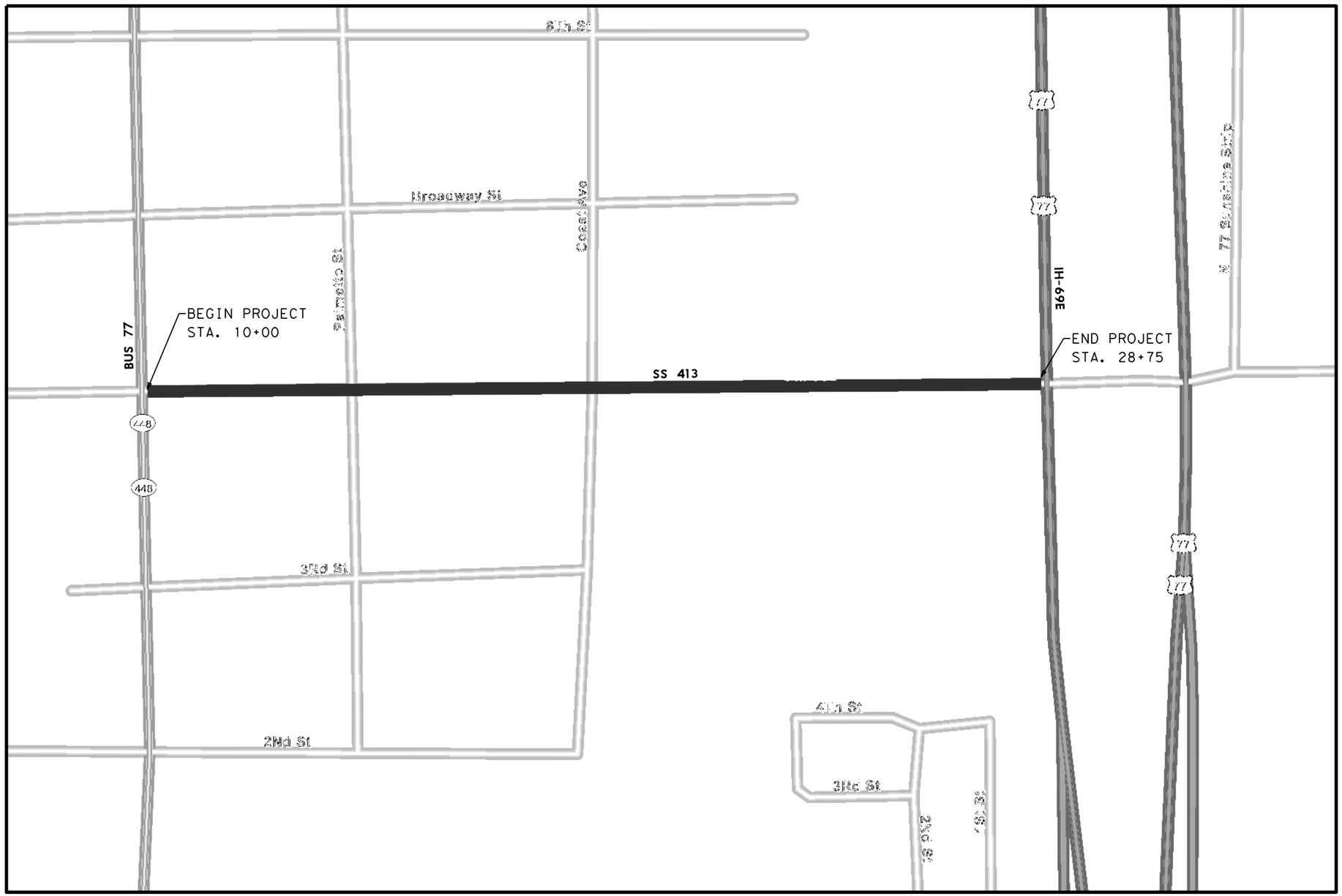
Pharr District Central Design

Texas Department of Transportation

FM 2061
LOCATION 4
LOCATION MAP

SCALE: 1"= 0.5 MILES SHEET 4 OF 7

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1427	01	040, etc.	FM1423, etc.
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	HIDALGO, etc.		7



LOCATION #5
CSJ : 0872-01-017
HIGHWAY : SS 413
COUNTY : WILLACY
LIMITS : FROM: BUS 77
TO: IH-69E
LENGTH : 0.355 MI.
REF. MRK.: RM: 640-0.032
RM: 640+0.323
A.D.T. : 2,820

ATIDIO R. GARZA
93834

02/25/2020

Pharr District Central Design

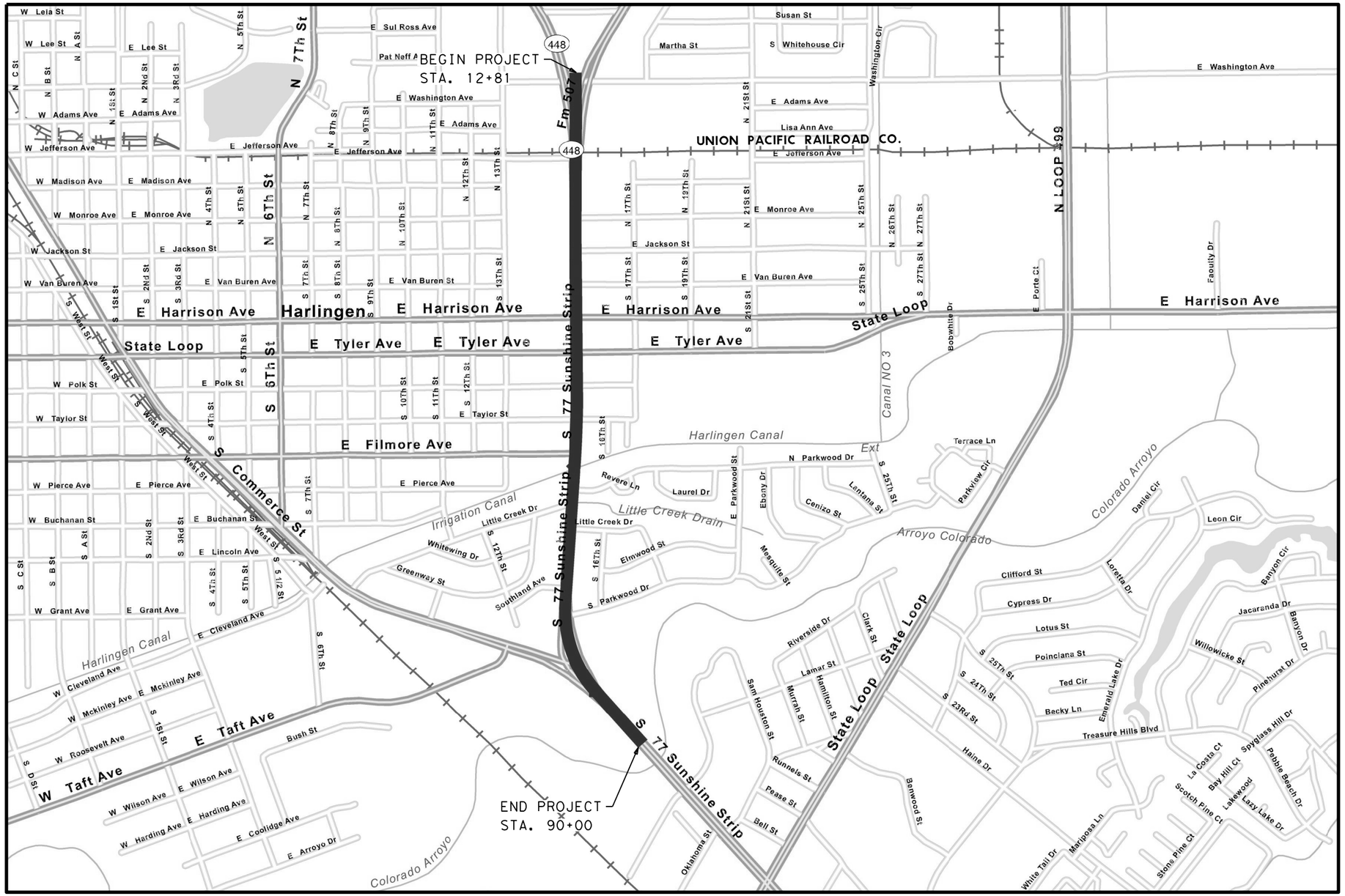
Texas Department of Transportation

SS 413
LOCATION 5
LOCATION MAP

SCALE: 1"= 0.5 MILES SHEET 5 OF 7

© 2019	CONT	SECT	JOB	HIGHWAY
DS: CK:	1427	01	040,etc.	FM1423,etc.
	DIST	COUNTY		SHEET NO.
DW: CK:	PHR	HIDALGO,etc.		8

DATE: 1/13/2020 2:35:49 PM
FILE: 05LOCATION MAP.dgn



LOCATION #6
CSJ : 0327-08-099
HIGHWAY : BUS 77-X
COUNTY : CAMERON
LIMITS : FROM: FM 507
TO: FLOODWAY BRIDGE
LENGTH : 1.462 MI.
REF. MRK.: RM: 570+0.087
RM: 570+1.549
A.D.T. : 26,913

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

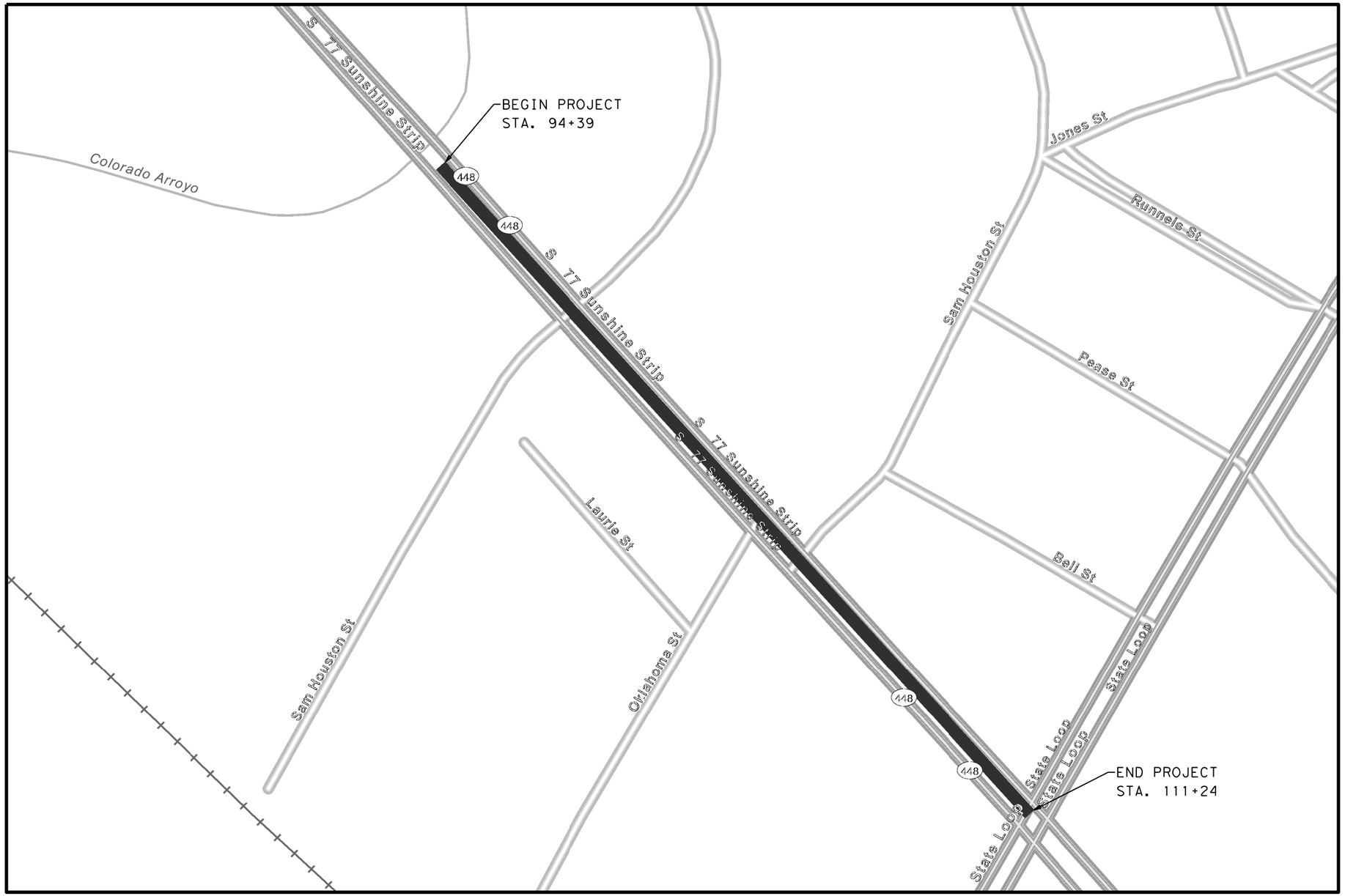
Texas Department of Transportation

BUS 77-X
LOCATION 6
LOCATION MAP

SCALE: 1"= N.T.S. SHEET 6 OF 7

© 2019	CONT	SECT	JOB	HIGHWAY
DS: CK:	1427	01	040, etc.	FM1423, etc.
DW: CK:	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO, etc.		9

DATE: 2/24/2020 1:57:46 PM
FILE: 06LOCATION MAP.dgn



LOCATION #7
CSJ : 0039-12-255
HIGHWAY : BUS 77-X
COUNTY : CAMERON
LIMITS : FROM: FLOODWAY BRIDGE
TO: LP 499
LENGTH : 0.319 MI.
REF. MRK.: RM: 570+1.634
RM: 570+1.953
A.D.T. : 33,068

DATE: 1/13/2020 2:36:12 PM
FILE: 07LOCATION MAP.dgn

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

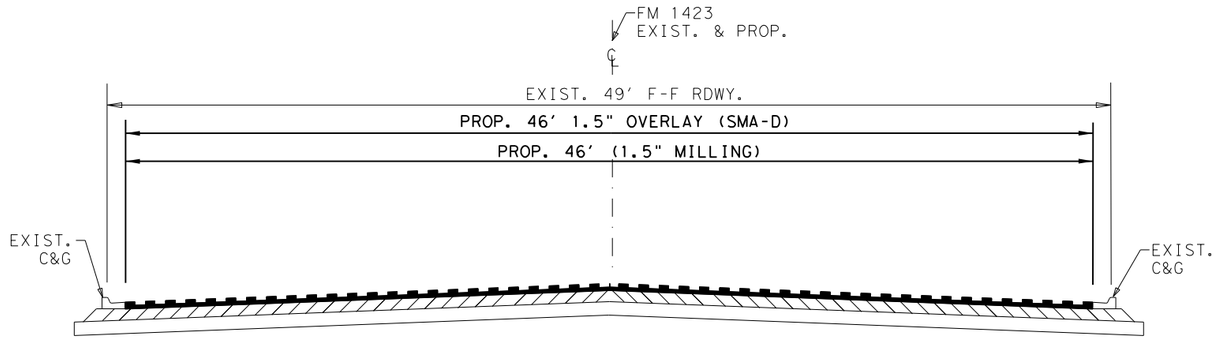
Pharr District Central Design

Texas Department of Transportation

BUS 77-X
LOCATION 7
LOCATION MAP

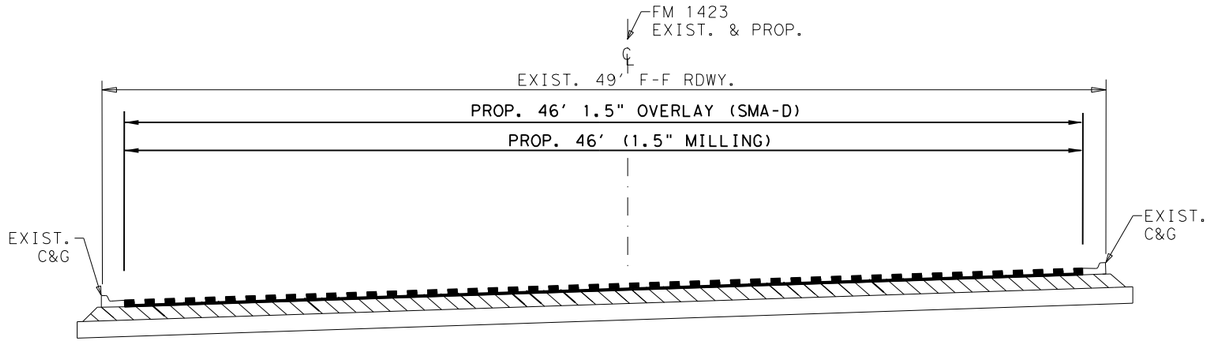
SCALE: 1"= 0.5 MILES SHEET 7 OF 7

© 2019	CONT	SECT	JOB	HIGHWAY
DS: CK:	1427	01	040, etc.	FM1423, etc.
DW: CK:	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO, etc.		10



FM 1423
EXIST. TYPICAL SECTION

STA. 10+00 TO STA. 11+20
STA. 19+00 TO STA. 21+00
STA. 31+00 TO STA. 50+30
STA. 50+30 TO STA. 50+40 (RAILROAD CROSSING)
STA. 50+40 TO STA. 50+66



FM 1423
EXIST. TYPICAL SECTION

STA. 11+20 TO STA. 19+00

LEGEND

PROP. - PROPOSED
℄ - CENTERLINE
EXIST. - EXISTING
RDWY. - ROADWAY
C&G - CURB AND GUTTER
N.T.S. - NOT TO SCALE
STA. - STATION
TRANS. - TRANSITION
MBGF - METAL BEAM GUARD FENCE
⇦ - TRAFFIC FLOW
▬ ▬ - MILLING & OVERLAY
▬▬▬ - OVERLAY

NOTE:
"MILLING" WILL BE PAID AS ITEM 354

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

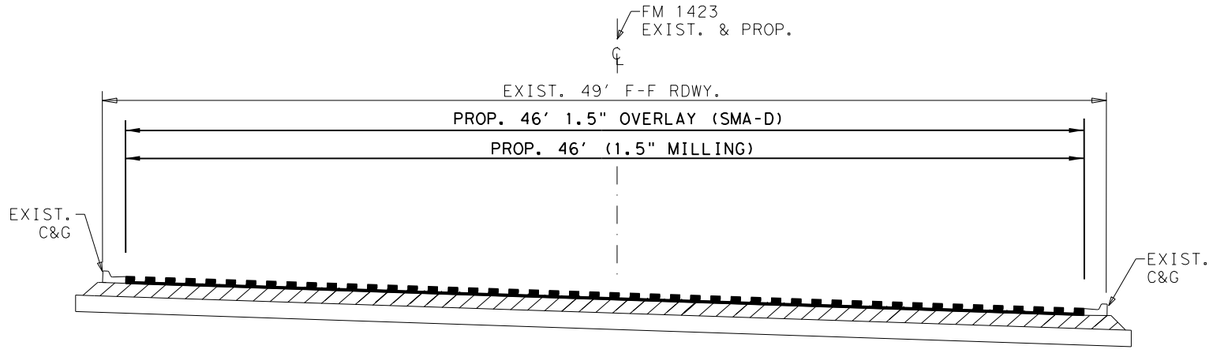
Texas Department of Transportation

FM 1423
LOCATION 1
TYPICAL SECTIONS

SCALE: N.T.S. SHEET 1 OF 2

© 2019	CONT	SECT	JOB	HIGHWAY
DS: CK:	1427	01	040, etc.	FM1423, etc.
DW: CK:	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO, etc.		11

DATE: 1/16/2020 2:00:31 PM
FILE: LOC1_TYP_SEC.dgn



FM 1423
EXIST. TYPICAL SECTION

STA. 21+00 TO STA. 31+00

LEGEND

PROP.	- PROPOSED
℄	- CENTERLINE
EXIST.	- EXISTING
RDWY.	- ROADWAY
C&G	- CURB AND GUTTER
N.T.S.	- NOT TO SCALE
STA.	- STATION
TRANS.	- TRANSITION
MBGF	- METAL BEAM GUARD FENCE
⇦	- TRAFFIC FLOW
▬ ▬	- MILLING & OVERLAY
▬▬	- OVERLAY

NOTE:
"MILLING" WILL BE PAID AS ITEM 354

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

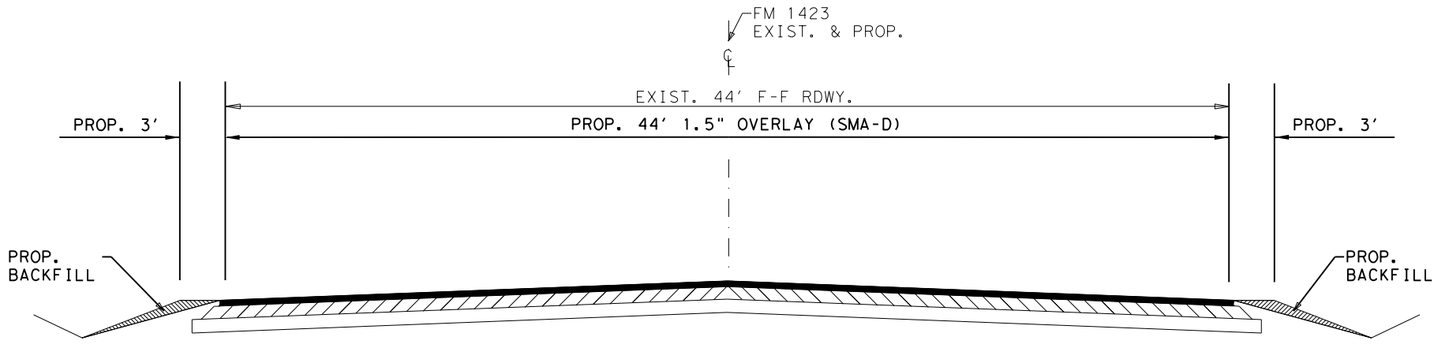
Texas Department of Transportation

FM 1423
LOCATION 1
TYPICAL SECTIONS

SCALE: N.T.S. SHEET 2 OF 2

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1427	01	040, etc.	FM1423, etc.
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	HIDALGO, etc.		12

DATE: 1/16/2020 2:00:33 PM
FILE: LOC1_TYP_SEC.dgn



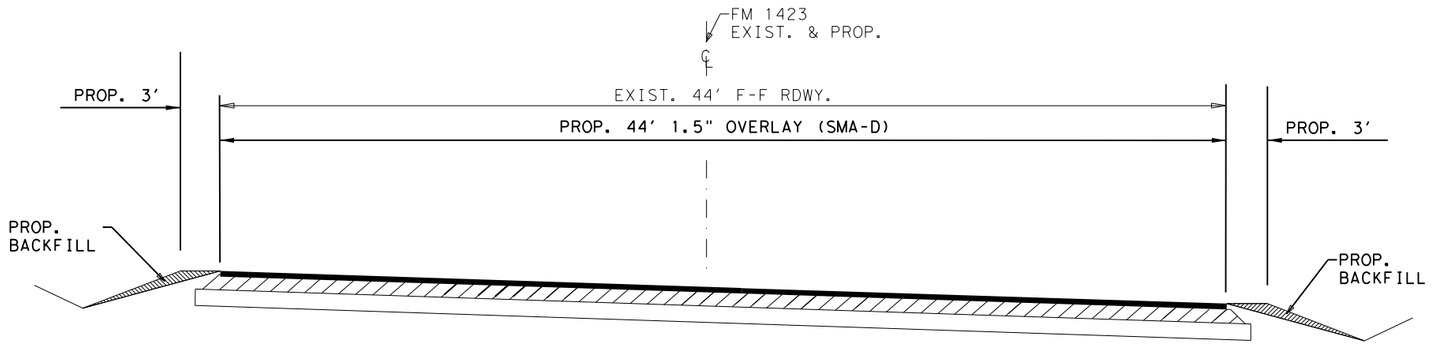
FM 1423
EXIST. TYPICAL SECTION

STA. 10+00 TO STA. 21+00
STA. 23+50 TO STA. 25+50
STA. 28+00 TO STA. 67+50
STA. 78+00 TO STA. 79+50
STA. 89+00 TO STA. 90+35
STA. 90+35 TO STA. 91+37 (TRANS. 44' F-F TO 40' F-F)
STA. 94+25 TO STA. 157+57

LEGEND

PROP. - PROPOSED
℄ - CENTERLINE
EXIST. - EXISTING
RDWY. - ROADWAY
C&G - CURB AND GUTTER
N.T.S. - NOT TO SCALE
STA. - STATION
TRANS. - TRANSITION
MBGF - METAL BEAM GUARD FENCE
⇦ - TRAFFIC FLOW
▬ ▬ - MILLING & OVERLAY
▬▬ - OVERLAY

NOTE:
"MILLING" WILL BE PAID AS ITEM 354



FM 1423
EXIST. TYPICAL SECTION

STA. 21+00 TO STA. 23+50
STA. 67+50 TO STA. 78+00

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

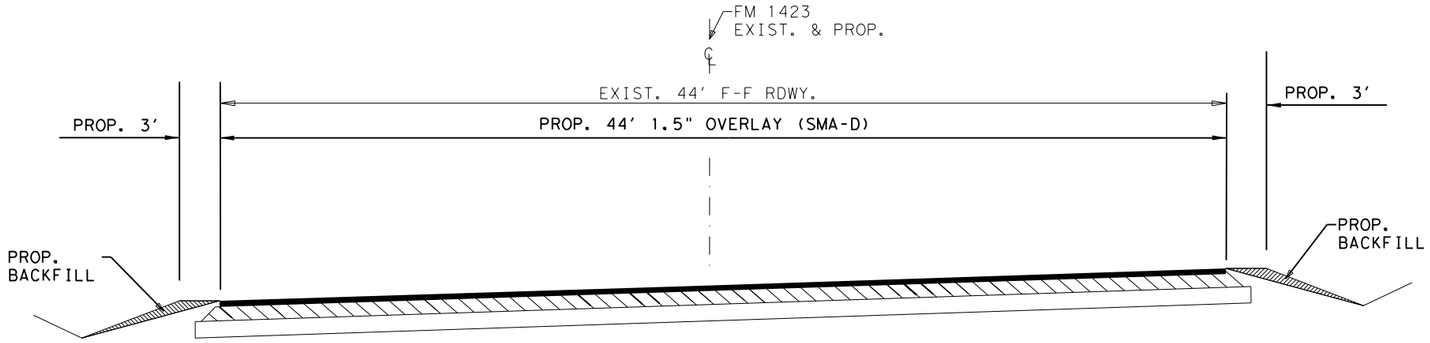
Texas Department of Transportation

FM 1423
LOCATION 2
TYPICAL SECTIONS

SCALE: N.T.S. SHEET 1 OF 2

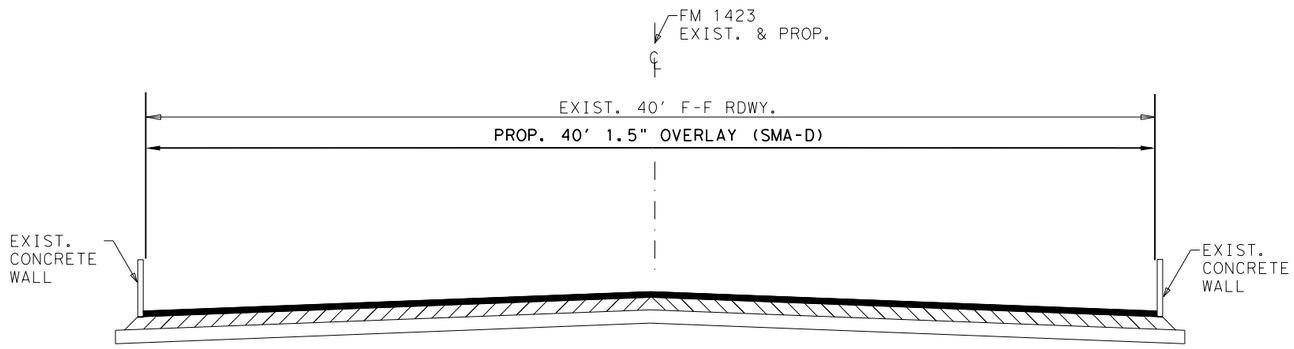
DS:	CK:	CONT	SECT	JOB	HIGHWAY
___	___	1427	01	040, etc.	FM1423, etc.
DW:	CK:	DIST	COUNTY		SHEET NO.
___	___	PHR	HIDALGO, etc.		13

DATE: 1/16/2020 2:00:56 PM
FILE: LOC2_TYP_SEC.dgn



FM 1423
EXIST. TYPICAL SECTION

STA. 25+50 TO STA. 28+00
STA. 79+50 TO STA. 89+00



FM 1423
EXIST. TYPICAL SECTION

STA. 91+37 TO STA. 92+24 (S. MAIN DRAIN BRIDGE)
STA. 92+24 TO STA. 94+25 (TRANS. 40' F-F TO 44' F-F)

LEGEND

PROP. - PROPOSED
℄ - CENTERLINE
EXIST. - EXISTING
RDWY. - ROADWAY
C&G - CURB AND GUTTER
N.T.S. - NOT TO SCALE
STA. - STATION
TRANS. - TRANSITION
MBGF - METAL BEAM GAURD FENCE
⇦ - TRAFFIC FLOW
▬ ▬ - MILLING & OVERLAY
▬▬ - OVERLAY

NOTE:
"MILLING" WILL BE PAID AS ITEM 354

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

Texas Department of Transportation

FM 1423
LOCATION 2
TYPICAL SECTIONS

SCALE: N.T.S. SHEET 2 OF 2

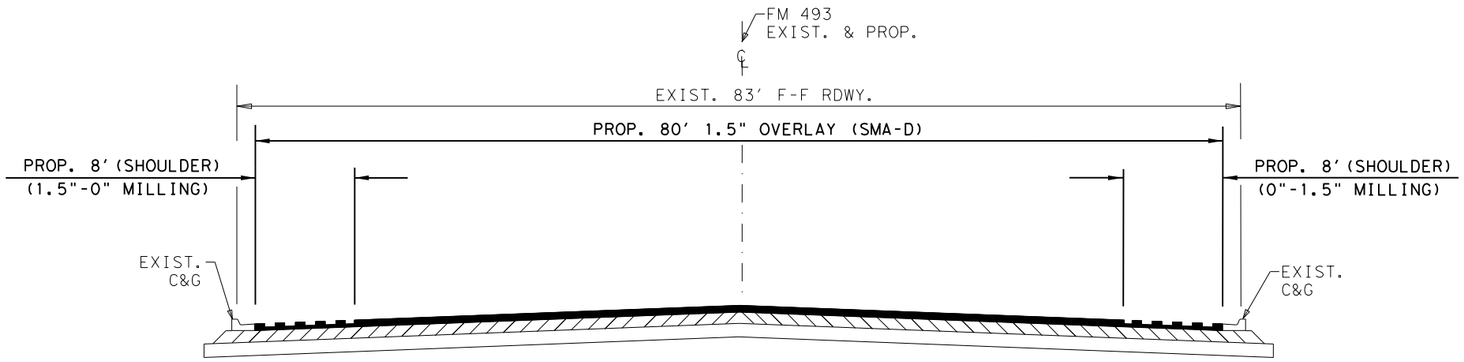
DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1427	01	040, etc.	FM1423, etc.
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	HIDALGO, etc.		14

DATE: 1/16/2020 2:00:58 PM
FILE: LOC2_TYP_SEC.dgn

LEGEND

PROP. - PROPOSED
℄ - CENTERLINE
EXIST. - EXISTING
RDWY. - ROADWAY
C&G - CURB AND GUTTER
N.T.S. - NOT TO SCALE
STA. - STATION
TRANS. - TRANSITION
MBGF - METAL BEAM GUARD FENCE
⇦ - TRAFFIC FLOW
▬ ▬ - MILLING & OVERLAY
▬▬ - OVERLAY

NOTE:
"MILLING" WILL BE PAID AS ITEM 354



FM 493
EXIST. TYPICAL SECTION

STA. 10+00 TO STA. 48+13
STA. 48+13 TO STA. 48+23 (RAILROAD CROSSING)
STA. 48+23 TO STA. 48+47

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

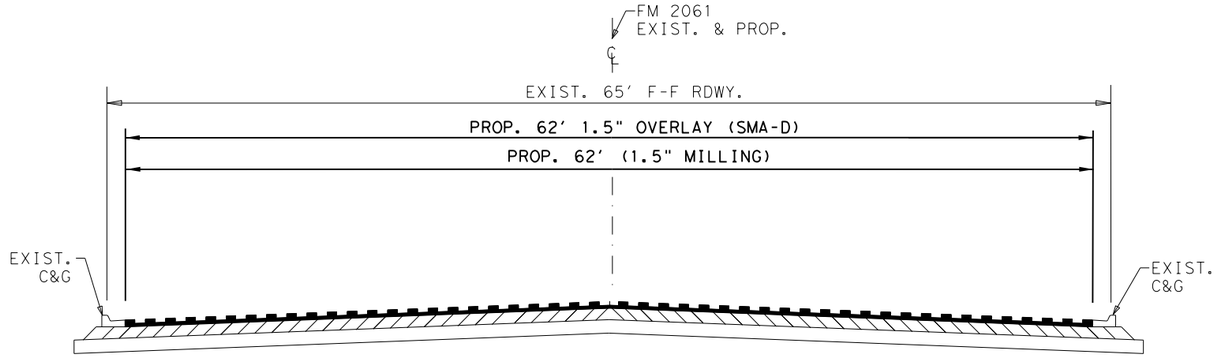
Texas Department of Transportation

FM 493
LOCATION 3
TYPICAL SECTIONS

SCALE: N.T.S. SHEET 1 OF 1

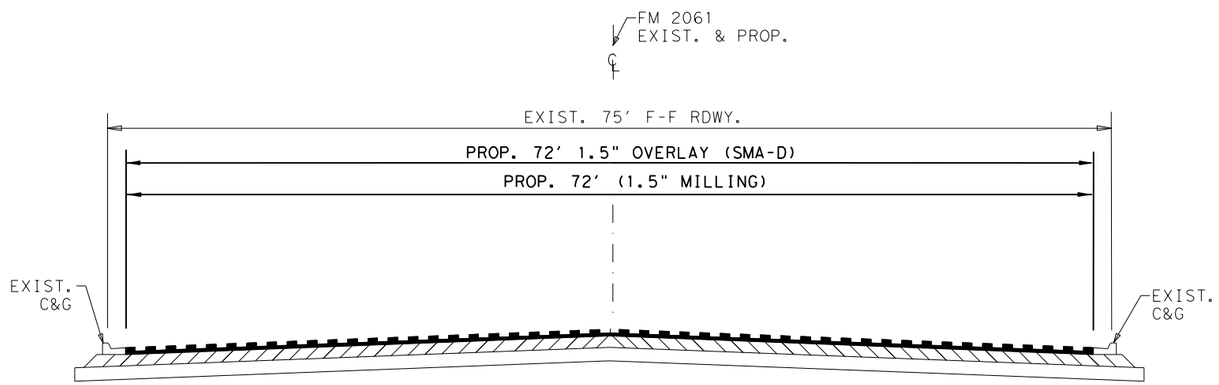
© 2019	CONT	SECT	JOB	HIGHWAY
DSI: CKI:	1427	01	040, etc.	FM1423, etc.
DWI: CKI:	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO, etc.		15

DATE: 1/16/2020 2:01:18 PM
FILE: LOC3_TYP_SEC.dgn



FM 2061
EXIST. TYPICAL SECTION

STA. 12+76 TO STA. 13+77
STA. 13+77 TO STA. 14+14 (TRANS. 65' F-F TO 75' F-F)
STA. 15+15 TO STA. 98+58



FM 2061
EXIST. TYPICAL SECTION

STA. 14+14 TO STA. 15+15

LEGEND

PROP.	- PROPOSED
℄	- CENTERLINE
EXIST.	- EXISTING
RDWY.	- ROADWAY
C&G	- CURB AND GUTTER
N.T.S.	- NOT TO SCALE
STA.	- STATION
TRANS.	- TRANSITION
MBGF	- METAL BEAM GUARD FENCE
⇦	- TRAFFIC FLOW
▬ ▬	- MILLING & OVERLAY
▬▬	- OVERLAY

NOTE:
"MILLING" WILL BE PAID AS ITEM 354

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

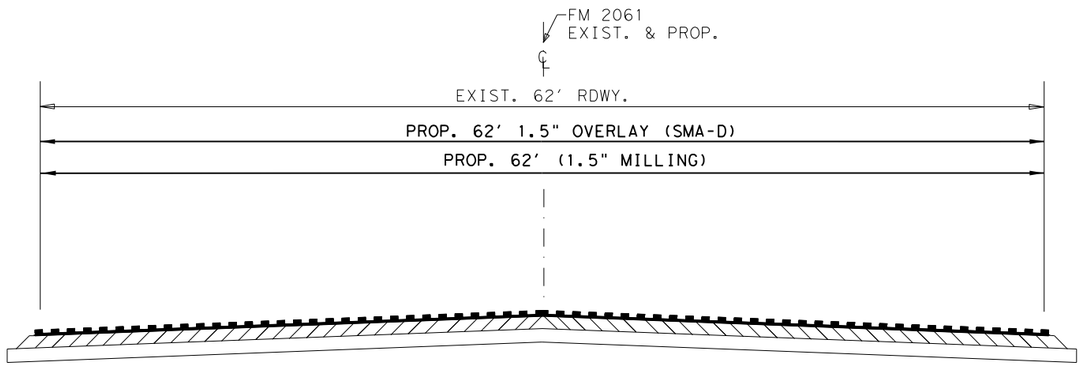
Texas Department of Transportation

FM 2061
LOCATION 4
TYPICAL SECTIONS

SCALE: N.T.S. SHEET 1 OF 3

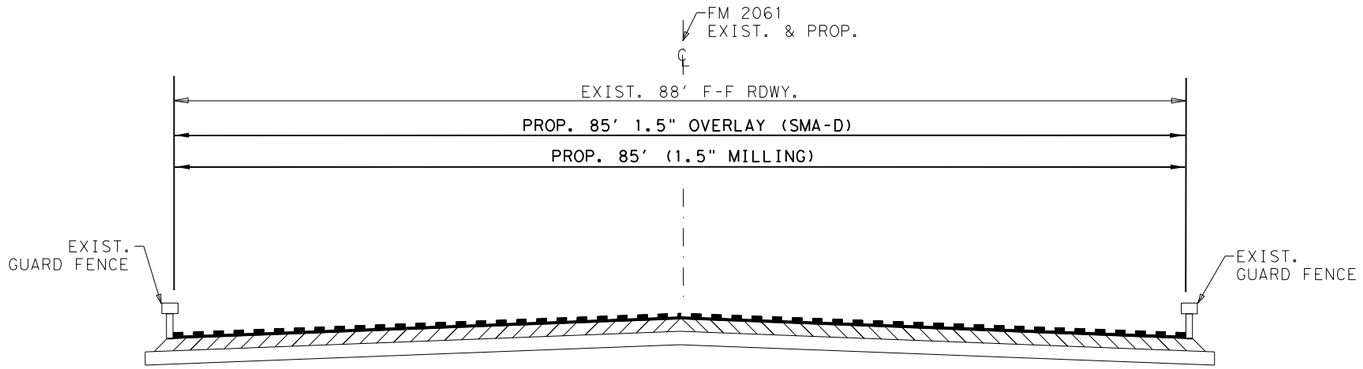
© 2019		CONT	SECT	JOB	HIGHWAY
DS:	CK:	1427	01	040, etc.	FM1423, etc.
		DIST	COUNTY		SHEET NO.
DW:	CK:	PHR	HIDALGO, etc.		16

DATE: 1/16/2020 2:01:36 PM
FILE: LOC4_TYP_SEC.dgn



FM 2061
EXIST. TYPICAL SECTION

STA. 98+58 TO STA. 107+57



FM 2061
EXIST. TYPICAL SECTION

STA. 111+43 TO STA. 113+03 (N. FLOODWAY BRIDGE)
STA. 158+14 TO STA. 160+41 (S. FLOODWAY BRIDGE)

LEGEND

PROP. - PROPOSED
℄ - CENTERLINE
EXIST. - EXISTING
RDWY. - ROADWAY
C&G - CURB AND GUTTER
N.T.S. - NOT TO SCALE
STA. - STATION
TRANS. - TRANSITION
MBGF - METAL BEAM GUARD FENCE
⇦ - TRAFFIC FLOW
▬ ▬ - MILLING & OVERLAY
▬▬ - OVERLAY

NOTE:
"MILLING" WILL BE PAID AS ITEM 354

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

Texas Department of Transportation

FM 2061
LOCATION 4
TYPICAL SECTIONS

SCALE: N.T.S. SHEET 2 OF 3

© 2019	CONT	SECT	JOB	HIGHWAY
DS: CK:	1427	01	040, etc.	FM1423, etc.
	DIST	COUNTY		SHEET NO.
DW: CK:	PHR	HIDALGO, etc.		17

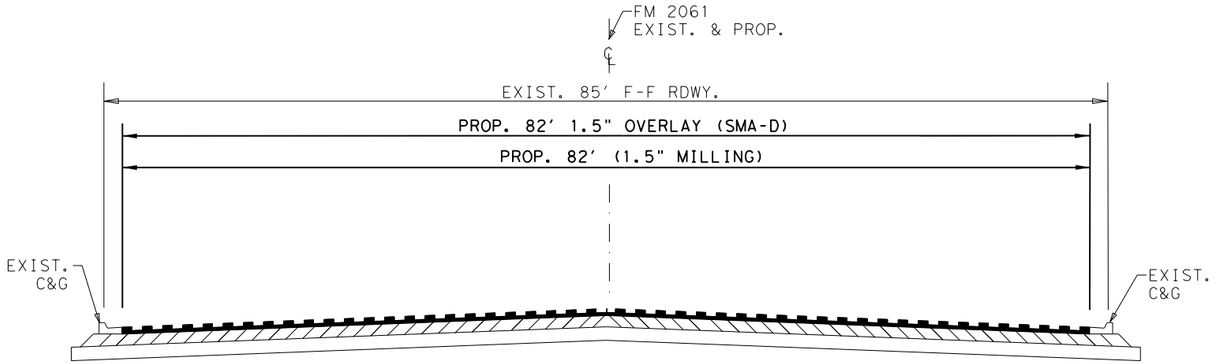
DATE: 1/16/2020 2:01:38 PM
FILE: LOC4_TYP_SEC.dgn

LEGEND

PROP. - PROPOSED
℄ - CENTERLINE
EXIST. - EXISTING
RDWY. - ROADWAY
C&G - CURB AND GUTTER
N.T.S. - NOT TO SCALE
STA. - STATION
TRANS. - TRANSITION
MBGF - METAL BEAM GUARD FENCE
⇦ - TRAFFIC FLOW
▬ ▬ - MILLING & OVERLAY
▬▬▬ - OVERLAY

NOTE:
"MILLING" WILL BE PAID AS ITEM 354

* NO MILING AND/OR OVERLAY WITHIN THESE LIMITS



FM 2061
EXIST. TYPICAL SECTION

STA. 107+57 TO STA. 109+90 (TRANS. 65' F-F TO 85' F-F)
STA. 109+90 TO STA. 111+43
STA. 113+03 TO STA. 147+52
* STA. 147+52 TO STA. 148+01 (CONCRETE LEVEE SECTION)
STA. 148+01 TO STA. 158+14
STA. 160+41 TO STA. 168+72
* STA. 168+72 TO STA. 169+20 (CONCRETE LEVEE SECTION)
STA. 169+20 TO STA. 223+42

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

Texas Department of Transportation

FM 2061
LOCATION 4
TYPICAL SECTIONS

SCALE: N.T.S. SHEET 3 OF 3

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		18

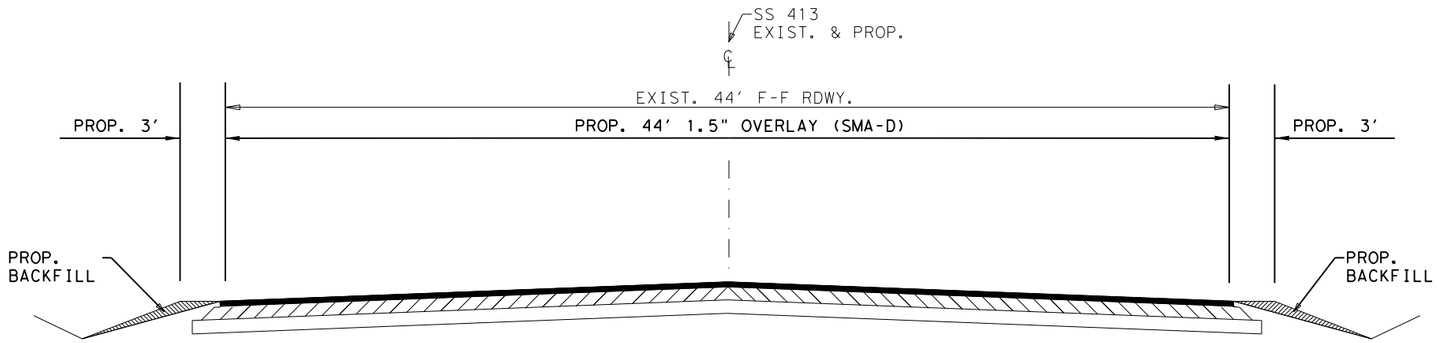
DS: CK: DW: CK:

DATE: 1/16/2020 2:01:40 PM
FILE: LOC4_TYP_SEC.dgn

LEGEND

PROP. - PROPOSED
℄ - CENTERLINE
EXIST. - EXISTING
RDWY. - ROADWAY
C&G - CURB AND GUTTER
N.T.S. - NOT TO SCALE
STA. - STATION
TRANS. - TRANSITION
MBGF - METAL BEAM GUARD FENCE
⇦ - TRAFFIC FLOW
▬ ▬ - MILLING & OVERLAY
▬▬▬ - OVERLAY

NOTE:
"MILLING" WILL BE PAID AS ITEM 354



SS 413
EXIST. TYPICAL SECTION
STA. 10+00 TO STA. 28+75

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

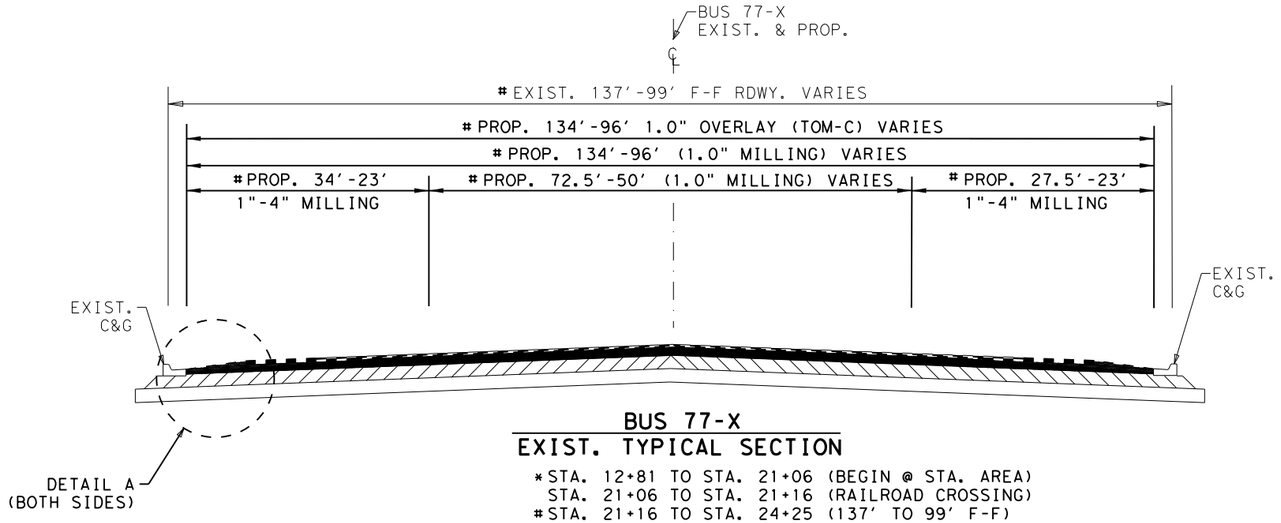
Texas Department of Transportation

SS 413
LOCATION 5
TYPICAL SECTIONS

SCALE: N.T.S. SHEET 1 OF 1

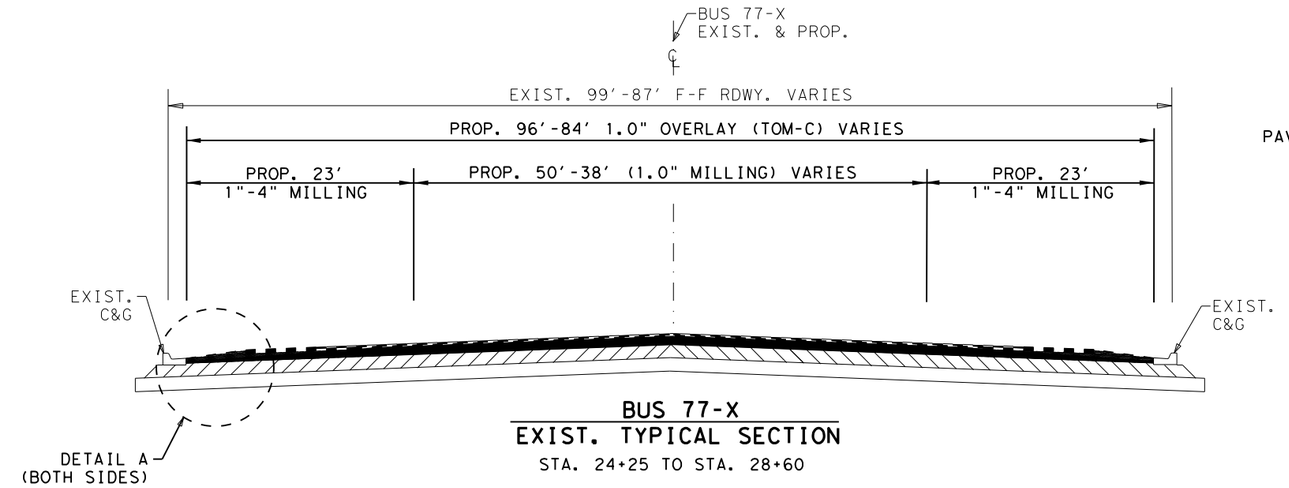
© 2019	CONT	SECT	JOB	HIGHWAY
DS: CK:	1427	01	040, etc.	FM1423, etc.
DW: CK:	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO, etc.		19

DATE: 1/16/2020 2:02:00 PM
FILE: LOC5_TYP_SEC.dgn



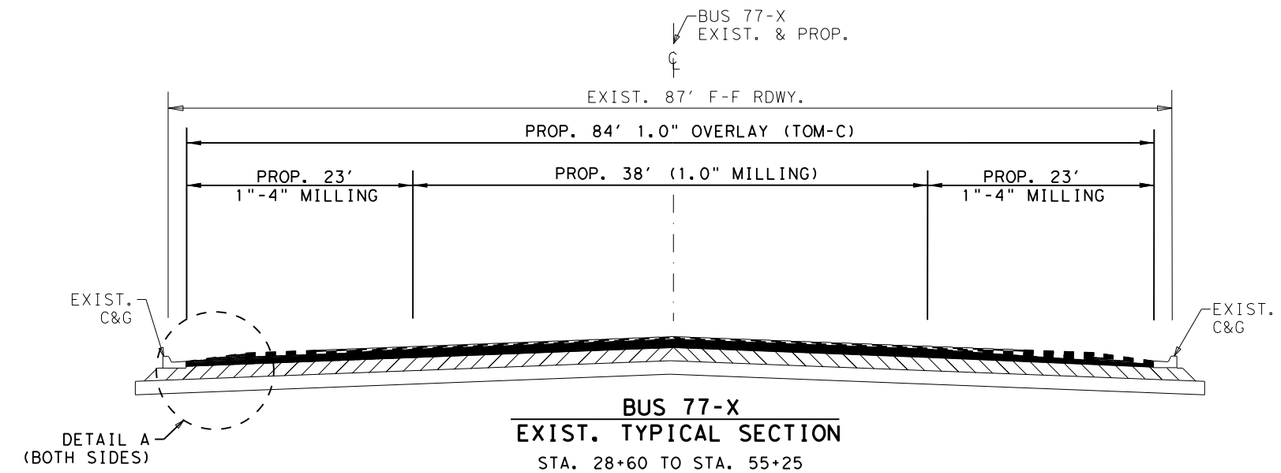
BUS 77-X
EXIST. TYPICAL SECTION

* STA. 12+81 TO STA. 21+06 (BEGIN @ STA. AREA)
STA. 21+06 TO STA. 21+16 (RAILROAD CROSSING)
STA. 21+16 TO STA. 24+25 (137' TO 99' F-F)



BUS 77-X
EXIST. TYPICAL SECTION

STA. 24+25 TO STA. 28+60



BUS 77-X
EXIST. TYPICAL SECTION

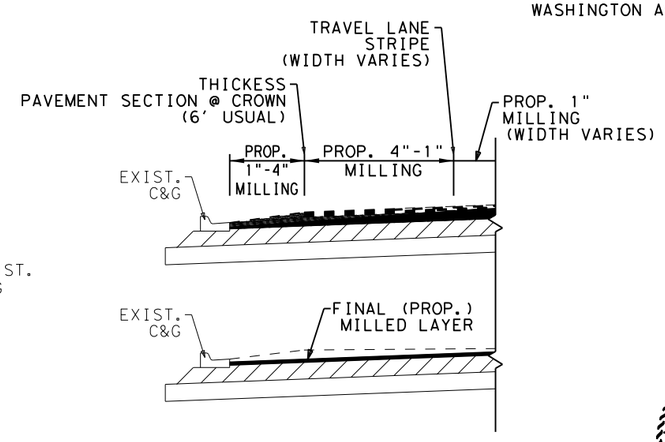
STA. 28+60 TO STA. 55+25

LEGEND

PROP.	- PROPOSED
℄	- CENTERLINE
EXIST.	- EXISTING
RDWY.	- ROADWAY
C&G	- CURB AND GUTTER
N.T.S.	- NOT TO SCALE
STA.	- STATION
TRANS.	- TRANSITION
MBGF	- METAL BEAM GUARD FENCE
⇦	- TRAFFIC FLOW
▬ ▬	- MILLING & OVERLAY
▬▬	- OVERLAY

NOTES:
"MILLING" WILL BE PAID AS ITEM 354

* MATCH ADJACENT PROJECTS AT WASHINGTON AVE.



DETAIL A

(FOR CONTRACTORS INFORMATION ONLY)

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

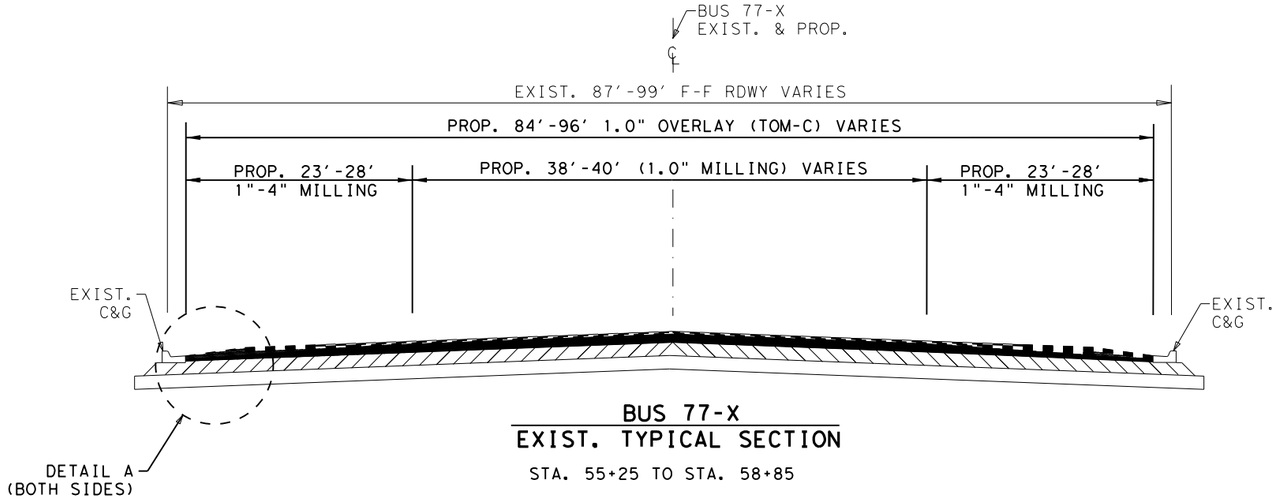
Texas Department of Transportation

BUS 77-X
LOCATION 6
TYPICAL SECTIONS

SCALE: N.T.S. SHEET 1 OF 2

© 2019	CONT	SECT	JOB	HIGHWAY
DS: CK:	1427	01	040, etc.	FM1423, etc.
DW: CK:	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO, etc.		20

DATE: 1/16/2020 2:02:21 PM
FILE: LOC6_TYP_SEC.dgn



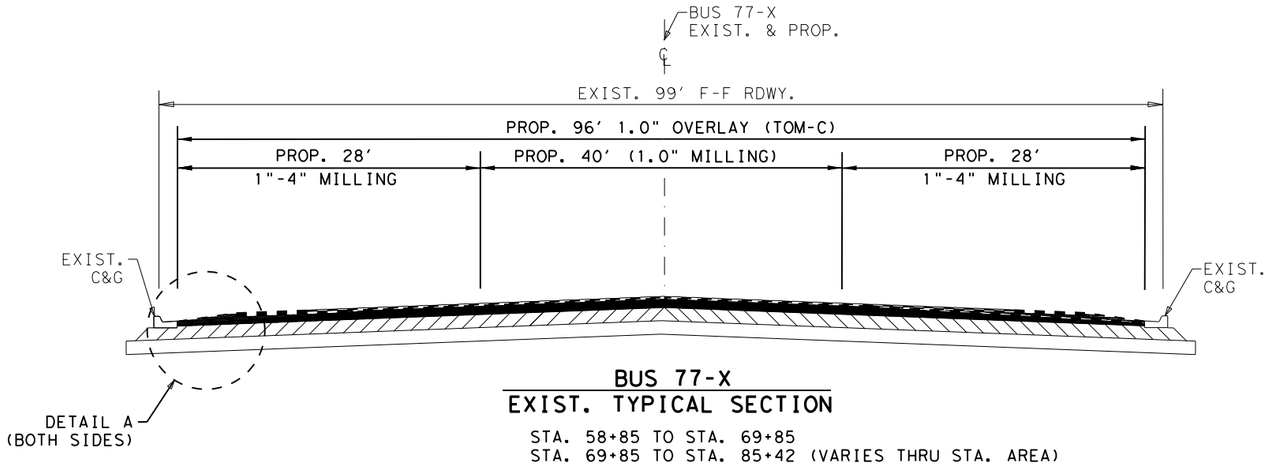
BUS 77-X
EXIST. TYPICAL SECTION

STA. 55+25 TO STA. 58+85

LEGEND

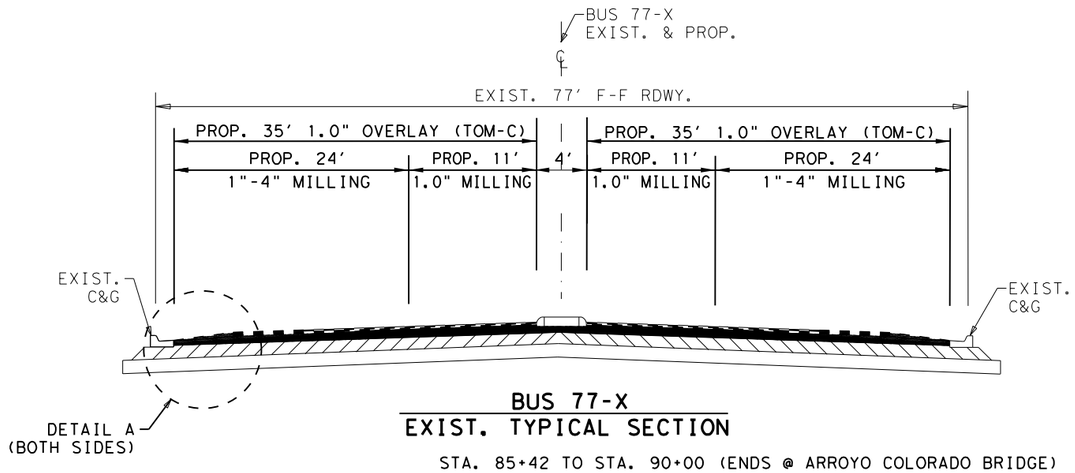
PROP. - PROPOSED
℄ - CENTERLINE
EXIST. - EXISTING
RDWY. - ROADWAY
C&G - CURB AND GUTTER
N.T.S. - NOT TO SCALE
STA. - STATION
TRANS. - TRANSITION
MBGF - METAL BEAM GUARD FENCE
⇦ - TRAFFIC FLOW
▬ - MILLING & OVERLAY
▬ - OVERLAY

NOTE:
"MILLING" WILL BE PAID AS ITEM 354



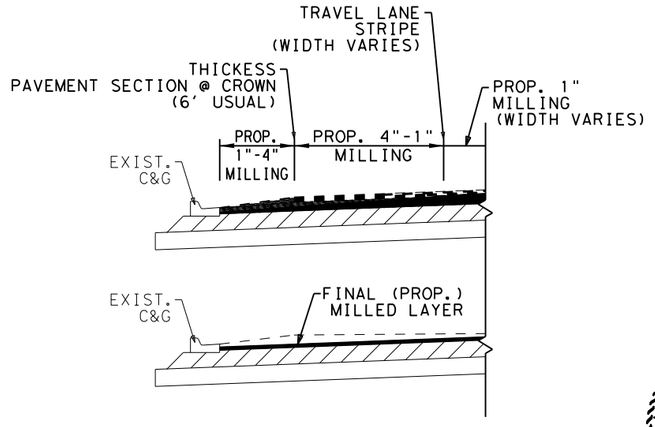
BUS 77-X
EXIST. TYPICAL SECTION

STA. 58+85 TO STA. 69+85
STA. 69+85 TO STA. 85+42 (VARIES THRU STA. AREA)



BUS 77-X
EXIST. TYPICAL SECTION

STA. 85+42 TO STA. 90+00 (ENDS @ ARROYO COLORADO BRIDGE)



DETAIL A
(FOR CONTRACTORS INFORMATION ONLY)

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

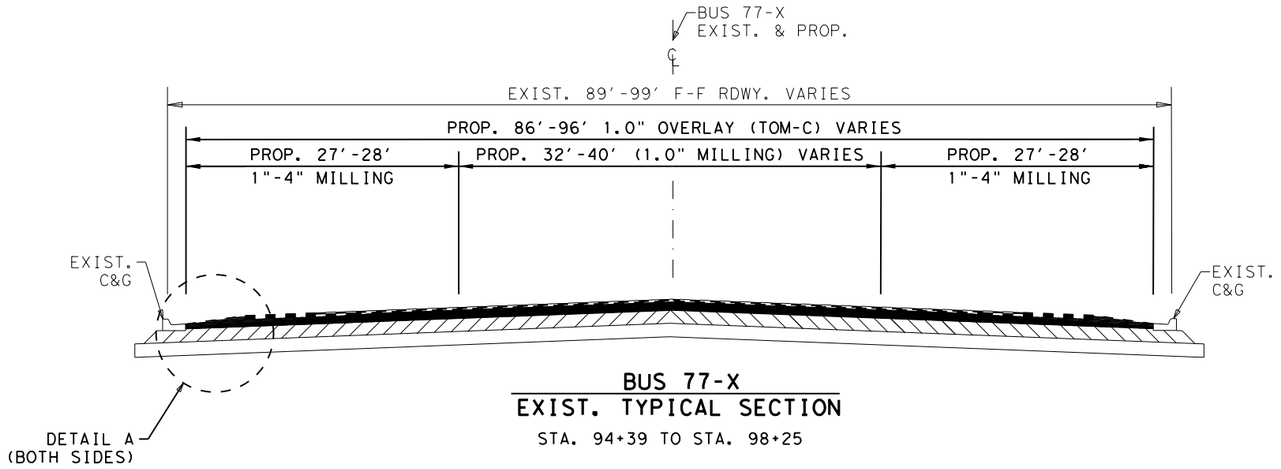
Texas Department of Transportation

BUS 77-X
LOCATION 6
TYPICAL SECTIONS

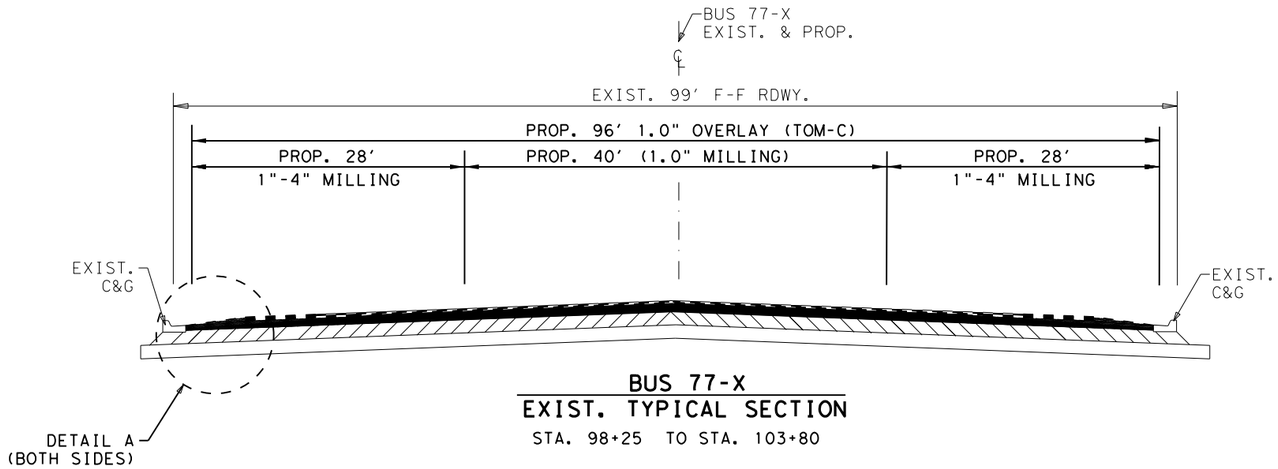
SCALE: N.T.S. SHEET 2 OF 2

© 2019	CONT	SECT	JOB	HIGHWAY
DS: CK:	1427	01	040, etc.	FM1423, etc.
DW: CK:	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO, etc.		21

DATE: 1/16/2020 2:02:23 PM
FILE: LOC6_TYP_SEC.dgn



BUS 77-X
EXIST. TYPICAL SECTION
STA. 94+39 TO STA. 98+25

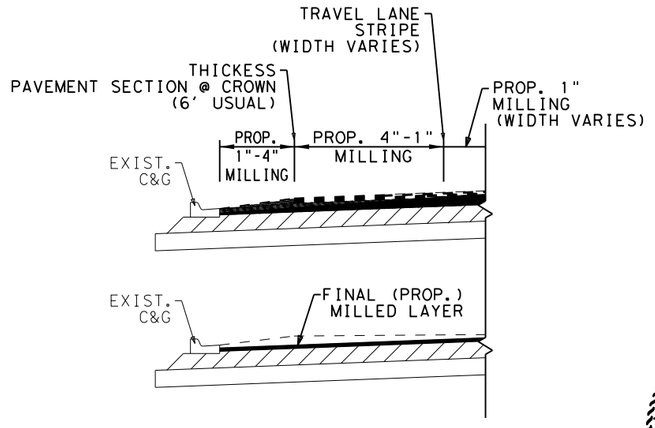


BUS 77-X
EXIST. TYPICAL SECTION
STA. 98+25 TO STA. 103+80

LEGEND

PROP. - PROPOSED
℄ - CENTERLINE
EXIST. - EXISTING
RDWY. - ROADWAY
C&G - CURB AND GUTTER
N.T.S. - NOT TO SCALE
STA. - STATION
TRANS. - TRANSITION
MBGF - METAL BEAM GUARD FENCE
⇦ - TRAFFIC FLOW
▬ ▬ - MILLING & OVERLAY
▬▬ - OVERLAY

NOTE:
"MILLING" WILL BE PAID AS ITEM 354



DETAIL A
(FOR CONTRACTORS INFORMATION ONLY)

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

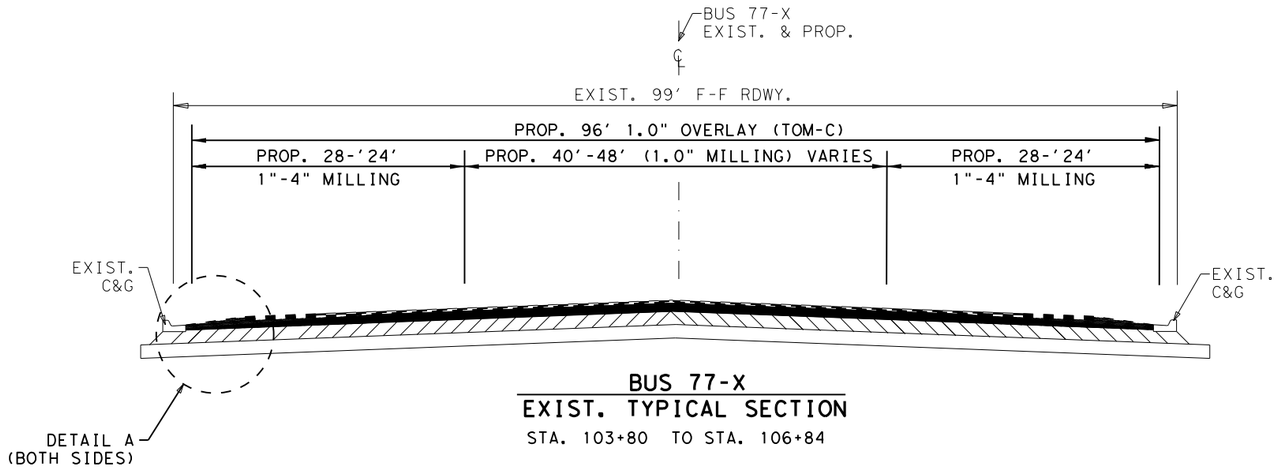
Texas Department of Transportation

BUS 77-X
LOCATION 7
TYPICAL SECTIONS

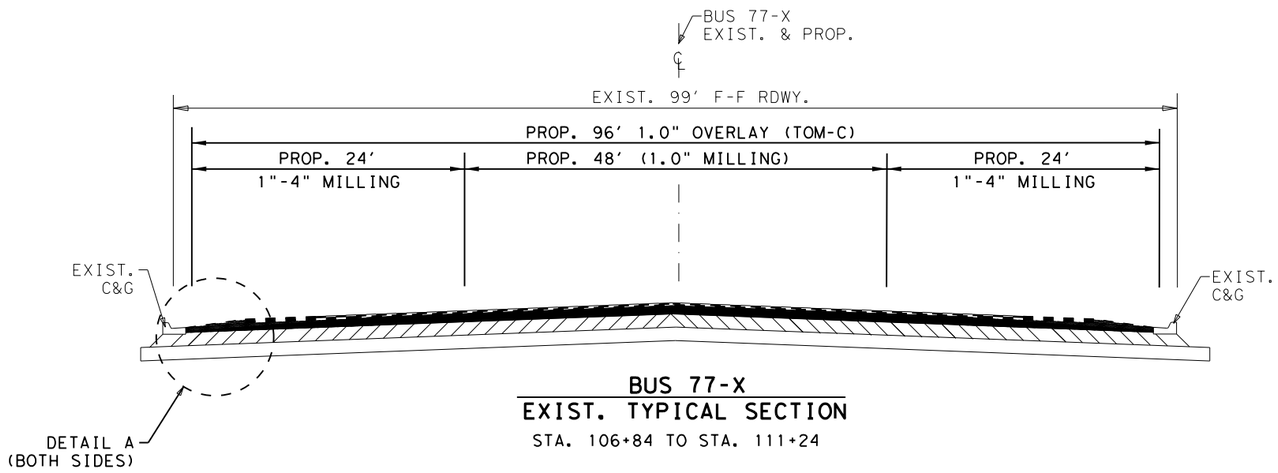
SCALE: N.T.S. SHEET 1 OF 2

© 2019	CONT	SECT	JOB	HIGHWAY
DS: CK:	1427	01	040, etc.	FM1423, etc.
DW: CK:	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO, etc.		22

DATE: 1/16/2020 2:02:43 PM
FILE: LOC7_TYP_SEC.dgn



BUS 77-X
EXIST. TYPICAL SECTION
STA. 103+80 TO STA. 106+84

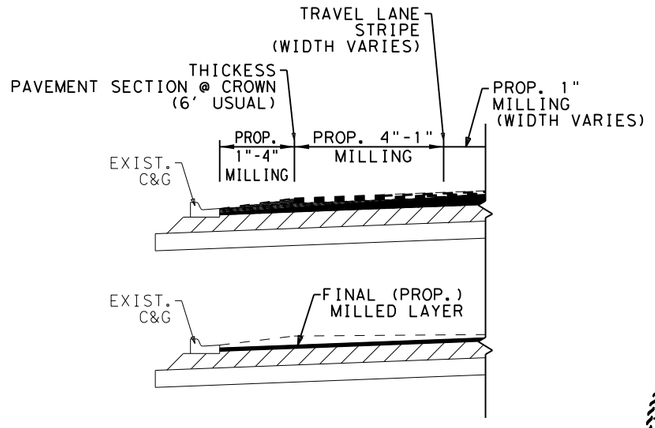


BUS 77-X
EXIST. TYPICAL SECTION
STA. 106+84 TO STA. 111+24

LEGEND

PROP. - PROPOSED
℄ - CENTERLINE
EXIST. - EXISTING
RDWY. - ROADWAY
C&G - CURB AND GUTTER
N.T.S. - NOT TO SCALE
STA. - STATION
TRANS. - TRANSITION
MBGF - METAL BEAM GUARD FENCE
⇦ - TRAFFIC FLOW
▬ - MILLING & OVERLAY
▬ - OVERLAY

NOTE:
"MILLING" WILL BE PAID AS ITEM 354



DETAIL A
(FOR CONTRACTORS INFORMATION ONLY)

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

Texas Department of Transportation

BUS 77-X
LOCATION 7
TYPICAL SECTIONS

SCALE: N.T.S. SHEET 2 OF 2

© 2019	CONT	SECT	JOB	HIGHWAY
DS: CK:	1427	01	040, etc.	FM1423, etc.
DW: CK:	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO, etc.		23

DATE: 1/16/2020 2:02:45 PM
FILE: LOC7_TYP_SEC.dgn

2014 SPECS GENERAL NOTES:

****

General Requirements and Covenants to ITEMS 1 thru 9

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

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

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

ITEM 2: Instruction to Bidders

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

Rene Garza, P.E., Pharr Area Engineer; Rene.Garza@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.

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

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

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

ITEM 5: Control of the Work

The responsibility for the construction surveying on this contract will be in accordance with Article 5.9.3., "Method C."

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

Project Number: **Sheet**

County: Hidalgo, etc. **Control:** 1427-01-040, etc.

Highway: FM 1423, etc.

ITEM 7: Legal Relations and Responsibilities

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

No significant traffic generator events identified.

ITEM 8: Prosecution and Progress

Prepare progress schedules as a Bar Chart.

The State Contractor shall not perform any work operations within the Railroad R.O.W. at Locations 1 (CSJ 1427-01-041, FM 1423), 3 (CSJ 0863-01-071, FM 493), & 6 (CSJ 0327-08-099, BUS77-X), until the railroad agreements have been executed.

Construction for Locations 2, 3, 4, 6 & 7 shall be done at night between the hours of 8:00 PM to 6:00 AM, or as directed by the Engineer.

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 164: Seeding for Erosion Control

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

DATE: 12/17/2020 3:06:48 PM
FILE: General Notes.dgn

Pharr District Central Design

Texas Department of Transportation

FM 1423

GENERAL NOTES

SHEET 1 OF 5

DS:	CK:	CONT	SECT	JOB	HIGHWAY
DW:	CK:	1427	01	040, etc.	FM1423, etc.
		DIST	COUNTY		SHEET NO.
		PHR	HIDALGO, etc.		24

SS-1 Tacking Agent shall be a ratio of 2:1, two (Emulsion) to one (water) and applied at a rate of 0.05 gallons per square yard. The SS-1 Tacking Agent required for Drill Seed operations, will not be paid for directly, but will be subsidiary to Item 164 "Drill Seeding." Watering shall not be used with the Drill Seed Method. A biodegradable tacking agent may be used in lieu of the SS-1 tacking agent in accordance with the manufacturer's recommendations when approved by the engineer.
Cool Season or Warm Season Grasses shall be included as part of Item 164 (See Table 3 and/or Table 4 in the Standard Specification Manual for dates and seed type).

Seed mixture shall be as specified under Item 164.

ITEM 300: Asphalts, Oils, and Emulsions

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

ITEM 301: Asphalt Antistripping Agents

Hydrated Lime shall be added as an Antistripping additive between the rates of 1 % minimum and 2.0% maximum by weight for Items 292, 341, 344, and 346. 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 341, 344, and 346.

ITEM 346: Stone-Matrix Asphalt

The contractor shall exercise diligence in the application of "Tack Coat" 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.

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

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

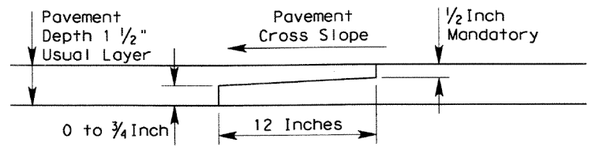
All unconfined longitudinal joints shall be constructed with a joint maker providing a maximum

Project Number: **Sheet**

County: Hidalgo, etc. **Control:** 1427-01-040, etc.

Highway: FM 1423, etc.

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 346.

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

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

ITEM 354: Planing and Texturing Pavement

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

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

For full width planing/milling locations, contractor is to place seal coat or ACP layer(s) as indicated on the plans within 2-calendar days of the planing/milling operation unless otherwise directed by the engineer. Contractor will not be allowed to move onto the next planing/milling location or seal coat/ACP overlay location until the exposed area is covered as per above. Contractor cannot get paid for the planing/milling operation until exposed area is covered as per above.

Pharr District Central Design

Texas Department of Transportation

FM 1423

GENERAL NOTES

SHEET 2 OF 5

© 2019		CONT	SECT	JOB	HIGHWAY
DS:	CK:	1427	01	040, etc.	FM1423, etc.
		DIST	COUNTY		SHEET NO.
DW:	CK:	PHR	HIDALGO, etc.		25

DATE: 10/19/2020 9:45:01 AM
FILE: General Notes.dgn

All planing/milling material; RAP (recycled asphalt pavement) from this project (Except Location 6 and Location 7) will be deemed property of the Contractor unless otherwise noted in the plans and/or as directed by the Engineer. Stockpile all excess milling (4,914 CY) material generated from Location 6 and Location 7 of the project at a designated site located at the intersection of FM 508 and FM 509. **Contractor will contact and coordinate with the San Benito Maintenance Section prior to hauling and stockpiling any milling material from Location 6 and/or Location 7 to the designated location.**

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

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.

Project Number: **Sheet**

County: Hidalgo, etc. **Control:** 1427-01-040, etc.

Highway: FM 1423, etc.

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

ITEM 504: Field Office and Laboratory

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

ITEM 506: Temporary Erosion, Sedimentation, and Environmental Controls

Due to the nature of this project, it is unlikely a significant amount of soil will be disturbed. However, if erosion control logs are needed; it shall be placed as directed by the Engineer.

The Contractor shall install the required Best Management Practice (BMP) elements accordingly at the required locations as per the appropriate phasing of the project or as needed or as directed by the Engineer. The Contractor is instructed to follow the SW3P Layouts for the typical BMP for each location.

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.

DATE: 10/19/2020 9:45:37 AM
FILE: General Notes.dgn

Pharr District Central Design

Texas Department of Transportation

FM 1423

GENERAL NOTES

SHEET 3 OF 5

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1427	01	040, etc.	FM1423, etc.
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	HIDALGO, etc.		26

ITEM 542: Removing Metal Beam Guard Fence

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

ITEM 544: Guardrail End Treatments

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

ITEM 585: Ride Quality for Pavement Surfaces

Diamond grinding shall be used to remove localized roughness.

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 Retroreflectorized 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.

Project Number: **Sheet**

County: Hidalgo, etc. **Control:** 1427-01-040, etc.

Highway: FM 1423, etc.

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.

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.

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 weather-proof 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 be kept open to traffic at all times. 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.

Pharr District Central Design

Texas Department of Transportation

FM 1423

GENERAL NOTES

SHEET 4 OF 5

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1427	01	040, etc.	FM1423, etc.
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	HIDALGO, etc.		27

Project Number: **Sheet**

County: Hidalgo, etc. **Control:** 1427-01-040, etc.

Highway: FM 1423, etc.

All construction operations shall be conducted to provide the least possible interference to traffic as shown on the plans, as provided for in the specifications and/or as directed. All signing, barricading and handling of traffic lane closures shall conform to the current edition of the "Texas Manual on Uniform Traffic Control Devices".

Sequence of work

1. The existing traffic signal installation shall remain in operation at all times during construction of the proposed loop detector work.
2. Final inspection shall be performed in conjunction with the District Signal Shop.

ITEM 3084: Bonding Course

The minimum application rates are listed in Table BC. The Engineer may adjust the application rate taking into consideration the existing pavement surface conditions.

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

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 2 additional shadow vehicle(s) with TMA
as per TCP (2-1) -18 as detailed on General Note 5 of this standard sheet;
or as per TCP (2-2) -18 as detailed on General Note 7 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;
or as per TCP (2-5) -18 as detailed on General Note 4 of this standard sheet.

Therefore, 3 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.

DATE: 10/19/2020 9:46:47 AM
FILE: General Notes.dgn

Pharr District Central Design

Texas Department of Transportation

FM 1423

GENERAL NOTES

SHEET 5 OF 5

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1427	01	040, etc.	FM1423, etc.
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	HIDALGO, etc.		28

BASIS OF ESTIMATE
LOCATION #1

CSJ: 1427-01-040
COUNTY: HIDALGO
LIMITS: FROM IH-2 TO BUS 83
STATION LIMITS: 10+00 TO 50+66
FROM RM: 722+1.694 TO RM: 724+0.464

HIGHWAY: FM 1423
TYPE: OVERLAY
RAILROADS: 1
TOTAL LENGTH (FT): 4,066
TOTAL LENGTH (MI): 0.770

*= AVERAGE WIDTHS TAKEN
(OMIT) RAILROAD CROSSING FROM STA. 50+30 TO STA. 50+40

	STATION	TO	STATION	OVERLAY WIDTH (FT)	LENGTH (FT)	OVERLAY AREA (SY)
	10+00		11+20	46	120	613
	11+20		19+00	46	780	3,987
	19+00		21+00	46	200	1,022
	21+00		31+00	46	1,000	5,111
	31+00		50+30	46	1,930	9,864
(OMIT)	50+30		50+40	0	10	0
	50+40		50+66	46	26	133
	RADII SECTIONS / VOIDS					200
					LOCATION #1 TOTALS:	20,930

ITEM NO.	DESC NO.	SPEC NO.	DESCRIPTION	UNIT	QTY
346	6014		STONE-MTRX-ASPH SMA-D SAC-A PG76-22	TON	1790.00
346	6058		TACK COAT	GAL	1465.00
354	6041		PLANE ASPH CONC PAV (1.5")	SY	20930.00
500	6001		MOBILIZATION	LS	1.00
502	6001		BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	6.00
506	6041	005	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	315.00
506	6043	005	BIODEG EROSN CONT LOGS (REMOVE)	LF	315.00
662	6109		WK ZN PAV MRK SHT TERM (TAB)TY W	EA	60.00
662	6111		WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	500.00
666	6036	007	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	405.00
666	6042	007	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	156.00
666	6048	007	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	709.00
666	6141	007	REFL PAV MRK TY I (Y)12"(SLD)(100MIL)	LF	94.00
⊕ 666	6170	007	REFL PAV MRK TY II (W) 4" (SLD)	LF	7330.00
⊕ 666	6178	007	REFL PAV MRK TY II (W) 8" (SLD)	LF	275.00
⊕ 666	6182	007	REFL PAV MRK TY II (W) 24" (SLD)	LF	190.00
⊕ 666	6184	007	REFL PAV MRK TY II (W) (ARROW)	EA	1.00
⊕ 666	6185	007	REFL PAV MRK TY II (W) (DBL ARROW)	EA	1.00
⊕ 666	6192	007	REFL PAV MRK TY II (W) (WORD)	EA	1.00
⊕ 666	6196	007	REFL PAV MRK TY II (W) (RR XING)	EA	1.00
⊕ 666	6205	007	REFL PAV MRK TY II (Y) 4" (BRK)	LF	550.00
⊕ 666	6207	007	REFL PAV MRK TY II (Y) 4" (SLD)	LF	5900.00
⊕ 666	6212	007	REFL PAV MRK TY II (Y) 12" (SLD)	LF	94.00
666	6303	007	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	7330.00
666	6312	007	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	550.00
666	6315	007	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	5900.00
668	6077		PREFAB PAV MRK TY C (W) (ARROW)	EA	1.00
668	6078		PREFAB PAV MRK TY C (W) (DBL ARROW)	EA	1.00

⊗ FOR CONTRACTOR'S INFORMATION ONLY:
PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED AS TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

668	6085		PREFAB PAV MRK TY C (W) (WORD)	EA	1.00
668	6089		PREFAB PAV MRK TY C (W) (RR XING)	EA	1.00
672	6007		REFL PAV MRKR TY I-C	EA	70.00
672	6009		REFL PAV MRKR TY II-A-A	EA	200.00
672	6010		REFL PAV MRKR TY II-C-R	EA	14.00
672	6017		TRAFFIC BUTTON TY Y	EA	1000.00
672	6018		TRAFFIC BUTTON TY B	EA	360.00
677	6003		ELIM EXT PAV MRK & MRKS (8")	LF	130.00
677	6005		ELIM EXT PAV MRK & MRKS (12")	LF	620.00
677	6007		ELIM EXT PAV MRK & MRKS (24")	LF	273.00
688	6004		VEH LP DETECT (SAWCUT)	LF	202.00
6185	6002		TMA (STATIONARY)	DAY	120.00
6185	6005		TMA (MOBILE OPERATION)	DAY	120.00

FOR CONTRACTOR'S INFORMATION ONLY:

RATE FOR OVERLAY:	STONE-MTRX-ASPH SMA-D SAC-A PG76-22 @ 171#/SY
RATE FOR TACK COAT:	0.07 GAL/SY #

FOR ESTIMATING PURPOSES

DATE: 12/1/2020 6:00:50 PM
FILE: LOCATION 1 ESTIMATE.dgn

Pharr District Central Design

Texas Department of Transportation

FM 1423
LOCATION 1
BASIS OF ESTIMATE

DS:	CK:	CONT	SECT	JOB	HIGHWAY
DW:	CK:	1427	01	040, etc.	FM1423, etc.
		DIST	COUNTY		SHEET NO.
		PHR	HIDALGO, etc.		29

BASIS OF ESTIMATE
LOCATION #2

CSJ: 1427-01-041
COUNTY: HIDALGO
LIMITS: FROM SH 107 TO WISCONSIN RD.
STATION LIMITS: 10+00 TO 157+57
FROM RM: 716-0.014 TO RM: 718+0.780

HIGHWAY: FM 1423
TYPE: OVERLAY
RAILROADS:
TOTAL LENGTH (FT): 14,757
TOTAL LENGTH (MI): 2.795

*= AVERAGE WIDTHS TAKEN

	STATION	TO	STATION	OVERLAY WIDTH (FT)	LENGTH (FT)	OVERLAY AREA (SY)
	10+00		21+00	44	1,100	5,378
	21+00		23+50	44	250	1,222
	23+50		25+50	44	200	978
	25+50		28+00	44	250	1,222
	28+00		67+50	44	3,950	19,311
	67+50		78+00	44	1,050	5,133
	78+00		79+50	44	150	733
	79+50		89+00	44	950	4,644
	89+00		90+35	44	135	660
*	90+35		91+37	42	102	476
	91+37		92+24	40	87	387
*	92+24		94+25	42	201	938
	94+25		157+57	44	6,332	30,956
	RADII SECTIONS / VOIDS					345
					LOCATION #2 TOTALS:	72,383

ITEM NO.	DESC NO.	SPEC NO.	DESCRIPTION	UNIT	QTY
134	6006		BACKFILL (TY A)	LF	29514.00
164	6033		DRILL SEEDING (PERM) (RURAL) (SANDY)	SY	9838.00
346	6014		STONE-MTRX-ASPH SMA-D SAC-A PG76-22	TON	6189.00
346	6058		TACK COAT	GAL	5067.00
432	6045		RIPRAP (MOW STRIP)(4 IN)	CY	38.00
540	6001		MTL W-BEAM GD FEN (TIM POST)	LF	400.00
540	6006		MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	2.00
542	6001		REMOVE METAL BEAM GUARD FENCE	LF	400.00
542	6002		REMOVE TERMINAL ANCHOR SECTION	EA	4.00
542	6004		RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA	8.00
544	6001		GUARDRAIL END TREATMENT (INSTALL)	EA	8.00
544	6003		GUARDRAIL END TREATMENT (REMOVE)	EA	8.00
658	6048		INSTL OM ASSM (OM-2Z)(FLX)GND	EA	8.00
658	6060		REMOVE DELIN & OBJECT MARKER ASSMS	EA	27.00
658	6061		INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	33.00
662	6111		WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	1620.00
666	6042	007	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	428.00
666	6048	007	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	521.00
666	6312	007	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	2700.00
666	6315	007	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	15060.00
666	6342	007	REF PROF PAV MRK TY I(W)4"(SLD)(100MIL)	LF	28550.00
672	6007		REFL PAV MRKR TY I-C	EA	1040.00
672	6009		REFL PAV MRKR TY II-A-A	EA	340.00
672	6016		TRAFFIC BUTTON TY W	EA	440.00
672	6017		TRAFFIC BUTTON TY Y	EA	3020.00
672	6018		TRAFFIC BUTTON TY B	EA	2780.00
677	6005		ELIM EXT PAV MRK & MRKS (12")	LF	372.00
677	6007		ELIM EXT PAV MRK & MRKS (24")	LF	347.00
688	6004		VEH LP DETECT (SAWCUT)	LF	192.00

FOR CONTRACTOR'S INFORMATION ONLY:

RATE FOR OVERLAY:	STONE-MTRX-ASPH SMA-D SAC-A PG76-22 @ 171#/SY
RATE FOR TACK COAT:	0.07 GAL/SY #

FOR ESTIMATING PURPOSES

DATE: 12/1/2020 6:01:22 PM
FILE: LOCATION 2 ESTIMATE.dgn

Pharr District Central Design

Texas Department of Transportation

FM 1423
LOCATION 2
BASIS OF ESTIMATE

SCALE

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1427	01	040, etc.	FM1423, etc.
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	HIDALGO, etc.		30

BASIS OF ESTIMATE
LOCATION #3

CSJ: 0863-01-071
COUNTY: HIDALGO
LIMITS: IH-2 TO BUS 83
STATION LIMITS: 10+00 TO 48+47
FROM RM: 724+1.748 TO RM: 726+0.467

HIGHWAY: FM 493
TYPE: OVERLAY
RAILROADS: 1
TOTAL LENGTH (FT): 3,847
TOTAL LENGTH (MI): 0.729

*= AVERAGE WIDTHS TAKEN
(OMIT) RAILROAD CROSSING STA. 48+13 TO STA. 48+23

	STATION	TO	STATION	OVERLAY WIDTH (FT)	LENGTH (FT)	OVERLAY AREA (SY)
	10+00		48+13	80	3,813	33,893
(OMIT)	48+13		48+23		10	0
	48+23		48+47	80	24	213
	RADII SECTIONS / VOIDS					143
					LOCATION #3 TOTALS:	34,249

	ITEM NO.	DESC NO.	SPEC NO.	DESCRIPTION	UNIT	QTY
	346	6014		STONE-MTRX-ASPH SMA-D SAC-A PG76-22	TON	2928.00
	346	6058		TACK COAT	GAL	2398.00
	354	6041		PLANE ASPH CONC PAV (1.5")	SY	7257.00
	506	6041	005	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	30.00
	506	6043	005	BIODEG EROSN CONT LOGS (REMOVE)	LF	30.00
	662	6109		WK ZN PAV MRK SHT TERM (TAB)TY W	EA	630.00
	662	6111		WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	760.00
	666	6006	007	REFL PAV MRK TY I (W)4"(DOT)(100MIL)	LF	217.00
	666	6036	007	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	895.00
	666	6042	007	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	160.00
	666	6048	007	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	1205.00
⊕	666	6170	007	REFL PAV MRK TY II (W) 4" (SLD)	LF	7180.00
⊕	666	6180	007	REFL PAV MRK TY II (W) 12" (SLD)	LF	32.00
⊕	666	6182	007	REFL PAV MRK TY II (W) 24" (SLD)	LF	124.00
	666	6300	007	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	1750.00
	666	6303	007	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	7180.00
	666	6312	007	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	1120.00
	666	6315	007	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	8480.00
	668	6077		PREFAB PAV MRK TY C (W) (ARROW)	EA	5.00
	668	6078		PREFAB PAV MRK TY C (W) (DBL ARROW)	EA	1.00
	668	6085		PREFAB PAV MRK TY C (W) (WORD)	EA	5.00
	668	6089		PREFAB PAV MRK TY C (W) (RR XING)	EA	2.00
	672	6007		REFL PAV MRKR TY I-C	EA	170.00
	672	6009		REFL PAV MRKR TY II-A-A	EA	320.00
	677	6001		ELIM EXT PAV MRK & MRKS (4")	LF	400.00
	677	6003		ELIM EXT PAV MRK & MRKS (8")	LF	880.00
	677	6005		ELIM EXT PAV MRK & MRKS (12")	LF	989.00
	677	6007		ELIM EXT PAV MRK & MRKS (24")	LF	747.00
	677	6008		ELIM EXT PAV MRK & MRKS (ARROW)	EA	6.00
	677	6009		ELIM EXT PAV MRK & MRKS (DBL ARROW)	EA	2.00
	677	6012		ELIM EXT PAV MRK & MRKS (WORD)	EA	4.00
	677	6016		ELIM EXT PAV MRK & MRKS (RR XING)	EA	2.00
	678	6001		PAV SURF PREP FOR MRK (4")	LF	400.00
	678	6004		PAV SURF PREP FOR MRK (8")	LF	30.00
	678	6008		PAV SURF PREP FOR MRK (24")	LF	442.00
	688	6004		VEH LP DETECT (SAWCUT)	LF	765.00

⊛ FOR CONTRACTOR'S INFORMATION ONLY:
PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED AS TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

FOR CONTRACTOR'S INFORMATION ONLY:

RATE FOR OVERLAY:	STONE-MTRX-ASPH SMA-D SAC-A PG76-22 @ 171#/SY
RATE FOR TACK COAT:	0.07 GAL/SY #

FOR ESTIMATING PURPOSES

DATE: 12/1/2020 6:01:49 PM
FILE: LOCATION 3 ESTIMATE.dgn

Pharr District Central Design

Texas Department of Transportation

FM 493
LOCATION 3
BASIS OF ESTIMATE

SCALE

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1427	01	040, etc.	FM1423, etc.
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	HIDALGO, etc.		31

BASIS OF ESTIMATE
LOCATION #4

CSJ: 1939-02-040
COUNTY: HIDALGO
LIMITS: RIDGE RD. TO FM 3072
STATION LIMITS: 12+76 TO 223+42
FROM RM: 726-0.517 TO RM: 728+1.482

HIGHWAY: FM 2061
TYPE: OVERLAY
RAILROADS:
TOTAL LENGTH (FT): 21,066
TOTAL LENGTH (MI): 3.990

*= AVERAGE WIDTHS TAKEN
(OMIT) CONCRETE LEVEE SECTION STA. 147+52 TO STA. 148+01
(OMIT) CONCRETE LEVEE SECTION STA. 168+72 TO STA. 169+20

	STATION	TO	STATION	OVERLAY WIDTH (FT)	LENGTH (FT)	OVERLAY AREA (SY)
	12+76		13+77	62	101	696
*	13+77		14+14	67	37	275
	14+14		15+15	72	101	808
	15+15		98+58	62	8,343	57,474
	98+58		107+57	62	899	6,193
*	107+57		109+90	72	233	1,864
	109+90		111+43	82	153	1,394
	111+43		113+03	85	160	1,511
	113+03		147+52	82	3,449	31,424
(OMIT)	147+52		148+01		49	0
	148+01		158+14	82	1,013	9,230
	158+14		160+41	85	227	2,144
	160+41		168+72	82	831	7,571
(OMIT)	168+72		169+20		48	0
	169+20		223+42	82	5,422	49,400

LOCATION #4 TOTALS: 169,984

ITEM NO.	DESC NO.	SPEC NO.	DESCRIPTION	UNIT	QTY
668	6077		PREFAB PAV MRK TY C (W) (ARROW)	EA	50
668	6085		PREFAB PAV MRK TY C (W) (WORD)	EA	11
672	6007		REFL PAV MRKR TY I-C	EA	580
672	6009		REFL PAV MRKR TY II-A-A	EA	1110
677	6001		ELIM EXT PAV MRK & MRKS (4")	LF	560
677	6005		ELIM EXT PAV MRK & MRKS (12")	LF	1389
677	6007		ELIM EXT PAV MRK & MRKS (24")	LF	650
678	6001		PAV SURF PREP FOR MRK (4")	LF	560
688	6004		VEH LP DETECT (SAWCUT)	LF	5136

ITEM NO.	DESC NO.	SPEC NO.	DESCRIPTION	UNIT	QTY
346	6014		STONE-MTRX-ASPH SMA-D SAC-A PG76-22	TON	14534
346	6058		TACK COAT	GAL	11899
354	6041		PLANE ASPH CONC PAV (1.5")	SY	169984
506	6041	005	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	1455
506	6043	005	BIODEG EROSN CONT LOGS (REMOVE)	LF	1455
658	6056		INSTL OM ASSM (OM-3R)(FLX)GND	EA	38
658	6060		REMOVE DELIN & OBJECT MARKER ASSMS	EA	38
662	6109		WK ZN PAV MRK SHT TERM (TAB)TY W	EA	3120
662	6111		WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	4700
666	6036	007	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	1225
666	6048	007	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	2297
666	6141	007	REFL PAV MRK TY I (Y)12"(SLD)(100MIL)	LF	74
⊕ 666	6167	007	REFL PAV MRK TY II (W) 4" (BRK)	LF	10120
⊕ 666	6170	007	REFL PAV MRK TY II (W) 4" (SLD)	LF	24400
⊕ 666	6178	007	REFL PAV MRK TY II (W) 8" (SLD)	LF	1225
⊕ 666	6182	007	REFL PAV MRK TY II (W) 24" (SLD)	LF	1063
⊕ 666	6184	007	REFL PAV MRK TY II (W) (ARROW)	EA	50
⊕ 666	6192	007	REFL PAV MRK TY II (W) (WORD)	EA	11
⊕ 666	6205	007	REFL PAV MRK TY II (Y) 4" (BRK)	LF	8960
⊕ 666	6207	007	REFL PAV MRK TY II (Y) 4" (SLD)	LF	39980
⊕ 666	6212	007	REFL PAV MRK TY II (Y) 12" (SLD)	LF	74
666	6300	007	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	10120
666	6342	007	REF PROF PAV MRK TY I(W)4"(SLD)(100MIL)	LF	24400
666	6344	007	REF PROF PAV MRK TY I(Y)4"(BRK)(100MIL)	LF	8960
666	6345	007	REF PROF PAV MRK TY I(Y)4"(SLD)(100MIL)	LF	39980

⊕ FOR CONTRACTOR'S INFORMATION ONLY:
PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED AS TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

FOR CONTRACTOR'S INFORMATION ONLY:

RATE FOR OVERLAY:	STONE-MTRX-ASPH SMA-D SAC-A PG76-22 @ 171#/SY
RATE FOR TACK COAT:	0.07 GAL/SY #

FOR ESTIMATING PURPOSES

Pharr District Central Design

Texas Department of Transportation

FM 2061
LOCATION 4
BASIS OF ESTIMATE

SCALE

SHEET 4 OF 7

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		32

DS: CK:
DW: CK:

DATE: 12/1/2020 6:02:17 PM
FILE: LOCATION 4 ESTIMATE.dgn

BASIS OF ESTIMATE
LOCATION #5

CSJ: 0872-01-017
COUNTY: CAMERON
LIMITS: FROM BUS 77X TO IH-69E
STATION LIMITS: 10+00 TO 28+75
FROM RM: 640-0.032 TO RM: 640+0.323

HIGHWAY: SS 413
TYPE: OVERLAY
RAILROADS:
TOTAL LENGTH (FT): 1,875
TOTAL LENGTH (MI): 0.355

*= AVERAGE WIDTHS TAKEN

STATION	TO	STATION	OVERLAY WIDTH (FT)	LENGTH (FT)	OVERLAY AREA (SY)
10+00		28+75	44	1,875	9,167
RADII SECTIONS / VOIDS					197
				LOCATION #5 TOTALS:	9,364

ITEM NO.	DESC NO.	SPEC NO.	DESCRIPTION	UNIT	QTY
134	6006		BACKFILL (TY A)	LF	3750.00
164	6037		DRILL SEEDING (PERM) (URBAN) (SANDY)	SY	1250.00
346	6014		STONE-MTRX-ASPH SMA-D SAC-A PG76-22	TON	801.00
346	6058		TACK COAT	GAL	656.00
658	6048		INSTL OM ASSM (OM-2Z)(FLX)GND	EA	6.00
658	6060		REMOVE DELIN & OBJECT MARKER ASSMS	EA	4.00
662	6109		WK ZN PAV MRK SHT TERM (TAB)TY W	EA	9.00
662	6111		WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	220.00
666	6048	007	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	308.00
666	6141	007	REFL PAV MRK TY I (Y)12"(SLD)(100MIL)	LF	152.00
666	6303	007	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	3160.00
666	6312	007	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	380.00
666	6315	007	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	2370.00
668	6077		PREFAB PAV MRK TY C (W) (ARROW)	EA	1.00
668	6078		PREFAB PAV MRK TY C (W) (DBL ARROW)	EA	1.00
668	6091		PREFAB PAV MRK TY C (W)18" (YLD TRI)	EA	28.00
672	6007		REFL PAV MRKR TY I-C	EA	2.00
672	6009		REFL PAV MRKR TY II-A-A	EA	110.00
677	6003		ELIM EXT PAV MRK & MRKS (8")	LF	100.00
677	6005		ELIM EXT PAV MRK & MRKS (12")	LF	240.00
677	6007		ELIM EXT PAV MRK & MRKS (24")	LF	290.00
677	6008		ELIM EXT PAV MRK & MRKS (ARROW)	EA	2.00
677	6009		ELIM EXT PAV MRK & MRKS (DBL ARROW)	EA	2.00

FOR CONTRACTOR'S INFORMATION ONLY:

RATE FOR OVERLAY:	STONE-MTRX-ASPH SMA-D SAC-A PG76-22 @ 171#/SY
RATE FOR TACK COAT:	0.07 GAL/SY #

FOR ESTIMATING PURPOSES

DATE: 12/1/2020 6:02:46 PM
FILE: LOCATION 5 ESTIMATE.dgn

Pharr District Central Design

Texas Department of Transportation

SS 413
LOCATION 5
BASIS OF ESTIMATE

SCALE

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1427	01	040, etc.	FM1423, etc.
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	HIDALGO, etc.		33

BASIS OF ESTIMATE
LOCATION #6

CSJ: 0327-08-099
COUNTY: CAMERON
LIMITS: FROM FM 507 TO FLOODWAY BRIDGE
STATION LIMITS: 12+81 TO 90+00
FROM RM: 570+0.087 TO RM: 570+1.549

HIGHWAY: BUS 77X
TYPE: OVERLAY
RAILROADS: 1
TOTAL LENGTH (FT): 7,719
TOTAL LENGTH (MI): 1.462

*= AVERAGE WIDTHS TAKEN
(OMIT) RAILROAD CROSSING FROM STA. 21+06 TO STA. 21+16

	STATION	TO	STATION	OVERLAY WIDTH (FT)	LENGTH (FT)	OVERLAY AREA (SY)
*	12+81		21+06	VARIES	825	13,214
(OMIT)	21+06		21+16		10	
*	21+16		24+25	VARIES	309	3,224
*	24+25		28+60	91.5	435	4,423
	28+60		55+25	84	2,665	24,873
*	55+25		58+85	90	360	3,600
	58+85		69+85	96	1,100	11,733
*	69+85		85+42	VARIES	1,557	25,221
	85+42		90+00	70	458	3,562
					LOCATION #6 TOTALS:	89,850

ITEM NO.	DESC NO.	SPEC NO.	DESCRIPTION	UNIT	QTY
134	6006		BACKFILL (TY A)	LF	168.00
164	6033		DRILL SEEDING (PERM)(RURAL)(SANDY)	SY	56.00
347	6001		TOM (ASPHALT) PG 76-22	TON	5122.00
347	6002		TOM-C (AGGREGATE) SAC-A	TON	5122.00
354	6043		PLANE ASPH CONC PAV (1")	SY	53750.00
354	6106		PLANE ASPH CONC PAV (1" TO 4")	SY	36100.00
432	6045		RIPRAP (MOW STRIP)(4 IN)	CY	7.00
506	6041	005	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	180.00
506	6043	005	BIODEG EROSN CONT LOGS (REMOVE)	LF	180.00
540	6001		MTL W-BEAM GD FEN (TIM POST)	LF	168.00
540	6006		MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	1.00
542	6001		REMOVE METAL BEAM GUARD FENCE	LF	168.00
542	6002		REMOVE TERMINAL ANCHOR SECTION	EA	1.00
544	6001		GUARDRAIL END TREATMENT (INSTALL)	EA	1.00
545	6005		CRASH CUSH ATTEN (REMOVE)	EA	1.00
545	6006		CRASH CUSHION ATTEN (INSTL)(L)(N)(LT2)	EA	1.00
658	6048		INSTL OM ASSM (OM-2Z)(FLX)GND	EA	1.00
658	6060		REMOVE DELIN & OBJECT MARKER ASSMS	EA	1.00
658	6061		INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	6.00
662	6109		WK ZN PAV MRK SHT TERM (TAB)TY W	EA	2010.00
662	6111		WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	1010.00
666	6006	007	REFL PAV MRK TY I (W)4"(DOT)(100MIL)	LF	100.00
666	6036	007	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	4517.00
666	6042	007	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	749.00
666	6048	007	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	1705.00
666	6141	007	REFL PAV MRK TY I (Y)12"(SLD)(100MIL)	LF	374.00
⊕ 666	6167	007	REFL PAV MRK TY II (W) 4" (BRK)	LF	6650.00
⊕ 666	6170	007	REFL PAV MRK TY II (W) 4" (SLD)	LF	2900.00
⊕ 666	6178	007	REFL PAV MRK TY II (W) 8" (SLD)	LF	4517.00
⊕ 666	6180	007	REFL PAV MRK TY II (W) 12" (SLD)	LF	245.00
⊕ 666	6182	007	REFL PAV MRK TY II (W) 24" (SLD)	LF	1031.00

⊕ FOR CONTRACTOR'S INFORMATION ONLY:
PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED AS TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

ITEM NO.	DESC NO.	SPEC NO.	DESCRIPTION	UNIT	QTY
⊕ 666	6184	007	REFL PAV MRK TY II (W) (ARROW)	EA	21.00
⊕ 666	6192	007	REFL PAV MRK TY II (W) (WORD)	EA	15.00
⊕ 666	6196	007	REFL PAV MRK TY II (W) (RR XING)	EA	6.00
⊕ 666	6205	007	REFL PAV MRK TY II (Y) 4" (BRK)	LF	1780.00
⊕ 666	6207	007	REFL PAV MRK TY II (Y) 4" (SLD)	LF	13330.00
⊕ 666	6212	007	REFL PAV MRK TY II (Y) 12" (SLD)	LF	374.00
666	6300	007	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	6650.00
666	6303	007	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	2900.00
666	6312	007	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	1780.00
666	6315	007	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	13330.00
668	6077		PREFAB PAV MRK TY C (W) (ARROW)	EA	21.00
668	6085		PREFAB PAV MRK TY C (W) (WORD)	EA	15.00
668	6089		PREFAB PAV MRK TY C (W) (RR XING)	EA	6.00
672	6007		REFL PAV MRKR TY I-C	EA	350.00
672	6009		REFL PAV MRKR TY II-A-A	EA	310.00
672	6010		REFL PAV MRKR TY II-C-R	EA	430.00
677	6005		ELIM EXT PAV MRK & MRKS (12")	LF	713.00
677	6007		ELIM EXT PAV MRK & MRKS (24")	LF	434.00
688	6004		VEH LP DETECT (SAWCUT)	LF	475.00
3066	6001		BONDING COURSE	GAL	8087.00

FOR CONTRACTOR'S INFORMATION ONLY:

RATE FOR OVERLAY:	TOM (ASPHALT) PG 76-22 @ 114 #/SY
RATE FOR OVERLAY:	TOM-C (AGGREGATE) SAC-A @ 114 #/SY
RATE FOR BONDING COURSE:	0.09 GAL/SY #

FOR ESTIMATING PURPOSES

DATE: 12/1/2020 6:03:18 PM
FILE: LOCATION 6 ESTIMATE.dgn

Pharr District Central Design

Texas Department of Transportation

BUS 77-X
LOCATION 6
BASIS OF ESTIMATE

SCALE

DS:	CK:	CONT	SECT	JOB	HIGHWAY
DW:	CK:	1427	01	040, etc.	FM1423, etc.
		DIST	COUNTY		SHEET NO.
		PHR	HIDALGO, etc.		34

BASIS OF ESTIMATE
LOCATION #7

CSJ: 0039-12-255
COUNTY: CAMERON
LIMITS: FLOODWAY BRIDGE TO LP 499
STATION LIMITS: 94+39 TO 111+24
FROM RM: 570+1.634 TO RM: 570+1.953

HIGHWAY: BUS 77X
TYPE: OVERLAY
RAILROADS:
TOTAL LENGTH (FT): 1,685
TOTAL LENGTH (MI): 0.319

*= AVERAGE WIDTHS TAKEN

	STATION	TO	STATION	OVERLAY WIDTH (FT)	LENGTH (FT)	OVERLAY AREA (SY)
*	94+39		98+25	91	386	3,903
	98+25		103+80	96	555	5,920
	103+80		106+84	96	304	3,243
	106+84		111+24	96	440	4,693
	RADII SECTIONS / VOIDS					110
					LOCATION #7 TOTALS:	17,869

	ITEM NO.	DESC NO.	SPEC NO.	DESCRIPTION	UNIT	QTY
	134	6006		BACKFILL (TY A)	LF	110.00
	164	6033		DRILL SEEDING (PERM)(RURAL)(SANDY)	SY	37.00
	347	6001		TOM (ASPHALT) PG 76-22	TON	1019.00
	347	6002		TOM-C (AGGREGATE) SAC-A	TON	1019.00
	354	6043		PLANE ASPH CONC PAV (1")	SY	7851.00
	354	6106		PLANE ASPH CONC PAV (1" TO 4")	SY	10018.00
	432	6045		RIPRAP (MOW STRIP)(4 IN)	CY	2.00
	506	6041	005	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	105.00
	506	6043	005	BIODEG EROSN CONT LOGS (REMOVE)	LF	105.00
	540	6006		MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	1.00
	542	6002		REMOVE TERMINAL ANCHOR SECTION	EA	1.00
	544	6001		GUARDRAIL END TREATMENT (INSTALL)	EA	1.00
	545	6005		CRASH CUSH ATTEN (REMOVE)	EA	1.00
	545	6006		CRASH CUSHION ATTEN (INSTL)(L)(N)(TL2)	EA	1.00
	658	6048		INSTL OM ASSM (OM-2Z)(FLX)GND	EA	1.00
	658	6061		INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	1.00
	662	6109		WK ZN PAV MRK SHT TERM (TAB)TY W	EA	500.00
	662	6111		WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	280.00
	666	6006	007	REFL PAV MRK TY I (W)4"(DOT)(100MIL)	LF	258.00
	666	6036	007	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	635.00
	666	6048	007	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	1038.00
	666	6141	007	REFL PAV MRK TY I (Y)12"(SLD)(100MIL)	LF	130.00
⊕	666	6167	007	REFL PAV MRK TY II (W) 4" (BRK)	LF	1500.00
⊕	666	6178	007	REFL PAV MRK TY II (W) 8" (SLD)	LF	635.00
⊕	666	6182	007	REFL PAV MRK TY II (W) 24" (SLD)	LF	452.00
⊕	666	6184	007	REFL PAV MRK TY II (W) (ARROW)	EA	5.00
⊕	666	6192	007	REFL PAV MRK TY II (W) (WORD)	EA	5.00
⊕	666	6205	007	REFL PAV MRK TY II (Y) 4" (BRK)	LF	320.00
⊕	666	6207	007	REFL PAV MRK TY II (Y) 4" (SLD)	LF	3500.00
⊕	666	6212	007	REFL PAV MRK TY II (Y) 12" (SLD)	LF	130.00

⊕ FOR CONTRACTOR'S INFORMATION ONLY:
PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED AS TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

ITEM NO.	DESC NO.	SPEC NO.	DESCRIPTION	UNIT	QTY
666	6300	007	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	1500.00
666	6312	007	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	320.00
666	6315	007	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	3500.00
668	6077		PREFAB PAV MRK TY C (W) (ARROW)	EA	5.00
668	6085		PREFAB PAV MRK TY C (W) (WORD)	EA	5.00
672	6007		REFL PAV MRKR TY I-C	EA	90.00
672	6009		REFL PAV MRKR TY II-A-A	EA	210.00
672	6010		REFL PAV MRKR TY II-C-R	EA	24.00
677	6001		ELIM EXT PAV MRK & MRKS (4")	LF	258.00
677	6005		ELIM EXT PAV MRK & MRKS (12")	LF	770.00
677	6007		ELIM EXT PAV MRK & MRKS (24")	LF	256.00
688	6004		VEH LP DETECT (SAWCUT)	LF	1035.00
3066	6001		BONDING COURSE	GAL	1608.00

FOR CONTRACTOR'S INFORMATION ONLY:

RATE FOR OVERLAY:	TOM (ASPHALT) PG 76-22 @ 114 #/SY
RATE FOR OVERLAY:	TOM-C (AGGREGATE) SAC-A @ 114 #/SY
RATE FOR BONDING COURSE:	0.09 GAL/SY #

FOR ESTIMATING PURPOSES

DATE: 12/1/2020 6:03:41 PM
FILE: LOCATION 7 ESTIMATE.dgn

Pharr District Central Design

Texas Department of Transportation

BUS 77-X
LOCATION 7
BASIS OF ESTIMATE

SCALE

DS:	CK:	CONT	SECT	JOB	HIGHWAY
DW:	CK:	1427	01	040, etc.	FM1423, etc.
		DIST	COUNTY		SHEET NO.
		PHR	HIDALGO, etc.		35

				CONTROL SECTION JOB	0039-12-255	0327-08-099	0863-01-071	0872-01-017	1427-01-040	1427-01-041	1939-02-040	GRAND TOTALS COLUMN
				PROJECT ID	A00128572	A00128571	A00128567	A00128570	A00128564	A00128565	A00128568	
				COUNTY	CAMERON	CAMERON	HIDALGO	WILLACY	HIDALGO	HIDALGO	HIDALGO	
				HIGHWAY	BU 77X	BU 77X	FM 493	SS 413	FM 1423	FM 1423	FM 2061	
ALT	BID CODE	DESCRIPTION	UNIT		EST.	EST.	EST.	EST.	EST.	EST.	EST.	
	134-6006	BACKFILL (TY A)	LF		110.000	168.000		3,750.000		29,514.000		33,542.000
	164-6033	DRILL SEEDING (PERM) (RURAL) (SANDY)	SY		37.000	56.000				9,838.000		9,931.000
	164-6037	DRILL SEEDING (PERM) (URBAN) (SANDY)	SY					1,250.000				1,250.000
	346-6014	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	TON				2,928.000	801.000	1,790.000	6,189.000	14,448.000	26,156.000
	346-6058	TACK COAT	GAL				2,398.000	656.000	1,465.000	5,067.000	11,829.000	21,415.000
	347-6001	TOM (ASPHALT) PG 76-22	TON		1,019.000	5,122.000						6,141.000
	347-6002	TOM-C (AGGREGATE) SAC-A	TON		1,019.000	5,122.000						6,141.000
	354-6041	PLANE ASPH CONC PAV (1.5")	SY				7,257.000		20,930.000		168,984.000	197,171.000
	354-6043	PLANE ASPH CONC PAV (1")	SY		7,851.000	53,750.000						61,601.000
	354-6106	PLANE ASPH CONC PAV (1" TO 4")	SY		10,018.000	36,100.000						46,118.000
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY		2.000	7.000				38.000		47.000
	500-6001	MOBILIZATION	LS						100.00%			100.00%
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO						7.000			7.000
	506-6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF		105.000	180.000	30.000		315.000		1,455.000	2,085.000
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF		105.000	180.000	30.000		315.000		1,455.000	2,085.000
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF			168.000				400.000		568.000
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA		1.000	1.000				2.000		4.000
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF			168.000				400.000		568.000
	542-6002	REMOVE TERMINAL ANCHOR SECTION	EA		1.000	1.000				4.000		6.000
	542-6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA							8.000		8.000
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA		1.000	1.000				8.000		10.000
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA							8.000		8.000
	545-6005	CRASH CUSH ATTEN (REMOVE)	EA		1.000	1.000						2.000
	545-6006	CRASH CUSH ATTEN (INSTL)(L)(N)(TL2)	EA		1.000	1.000						2.000
	658-6048	INSTL OM ASSM (OM-2Z)(FLX)GND	EA		1.000	1.000		6.000		8.000		16.000
	658-6056	INSTL OM ASSM (OM-3R)(FLX)GND	EA								38.000	38.000
	658-6060	REMOVE DELIN & OBJECT MARKER ASSMS	EA			1.000		4.000		27.000	38.000	70.000
	658-6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA		1.000	6.000				33.000		40.000
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA		500.000	2,010.000	630.000	9.000	60.000		3,120.000	6,329.000
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA		280.000	1,010.000	760.000	220.000	500.000	1,620.000	4,700.000	9,090.000
	666-6006	REFL PAV MRK TY I (W)4"(DOT)(100MIL)	LF		258.000	100.000	217.000					575.000
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF		635.000	4,517.000	895.000		405.000		1,225.000	7,677.000
	666-6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF			749.000	160.000		156.000	428.000		1,493.000
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF		1,038.000	1,705.000	1,205.000	308.000	709.000	521.000	2,297.000	7,783.000
	666-6141	REFL PAV MRK TY I (Y)12"(SLD)(100MIL)	LF		130.000	374.000		152.000	94.000		74.000	824.000
	666-6167	REFL PAV MRK TY II (W) 4" (BRK)	LF		1,500.000	6,650.000					10,120.000	18,270.000
	666-6170	REFL PAV MRK TY II (W) 4" (SLD)	LF			2,900.000	7,180.000		7,330.000		24,400.000	41,810.000
	666-6178	REFL PAV MRK TY II (W) 8" (SLD)	LF		635.000	4,517.000			275.000		1,225.000	6,652.000
	666-6180	REFL PAV MRK TY II (W) 12" (SLD)	LF			245.000	32.000					277.000
	666-6182	REFL PAV MRK TY II (W) 24" (SLD)	LF		452.000	1,031.000	124.000		190.000		1,063.000	2,860.000
	666-6184	REFL PAV MRK TY II (W) (ARROW)	EA		5.000	21.000			1.000		50.000	77.000
	666-6185	REFL PAV MRK TY II (W) (DBL ARROW)	EA						1.000			1.000
	666-6192	REFL PAV MRK TY II (W) (WORD)	EA		5.000	15.000			1.000		11.000	32.000
	666-6196	REFL PAV MRK TY II (W) (RR XING)	EA			6.000			1.000			7.000
	666-6205	REFL PAV MRK TY II (Y) 4" (BRK)	LF		320.000	1,780.000			550.000		8,960.000	11,610.000
	666-6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF		3,500.000	13,330.000			5,900.000		39,980.000	62,710.000
	666-6212	REFL PAV MRK TY II (Y) 12" (SLD)	LF		130.000	374.000			94.000		74.000	672.000
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF		1,500.000	6,650.000	1,750.000				10,120.000	20,020.000
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF			2,900.000	7,180.000	3,160.000	7,330.000			20,570.000
	666-6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF		320.000	1,780.000	1,120.000	380.000	550.000	2,700.000		6,850.000
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF		3,500.000	13,330.000	8,480.000	2,370.000	5,900.000	15,060.000		48,640.000
	666-6342	REF PROF PAV MRK TY I(W)4"(SLD)(100MIL)	LF							28,550.000	24,400.000	52,950.000
	666-6344	REF PROF PAV MRK TY I(Y)4"(BRK)(100MIL)	LF								8,960.000	8,960.000

DATE: 12/3/2020 8:38:06 AM
FILE: SUMMARY OF QUANTITIES.dgn

Pharr District Central Design

Texas Department of Transportation

SUMMARY OF QUANTITIES

SHEET 1 OF 2

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1427	01	040, etc.	FM1423, etc.
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	HIDALGO, etc.		36

				CONTROL SECTION JOB	0039-12-255	0327-08-099	0863-01-071	0872-01-017	1427-01-040	1427-01-041	1939-02-040	GRAND TOTALS COLUMN
				PROJECT ID	A00128572	A00128571	A00128567	A00128570	A00128564	A00128565	A00128568	
				COUNTY	CAMERON	CAMERON	HIDALGO	WILLACY	HIDALGO	HIDALGO	HIDALGO	
				HIGHWAY	BU 77X	BU 77X	FM 493	SS 413	FM 1423	FM 1423	FM 2061	
ALT	BID CODE	DESCRIPTION	UNIT		EST.	EST.	EST.	EST.	EST.	EST.	EST.	
	666-6345	REF PROF PAV MRK TY I(Y)4"(SLD)(100MIL)	LF							39,980.000	39,980.000
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	5.000	21.000	5.000	1.000	1.000		50.000	83.000
	668-6078	PREFAB PAV MRK TY C (W) (DBL ARROW)	EA			1.000	1.000	1.000			3.000
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA	5.000	15.000	5.000		1.000		11.000	37.000
	668-6089	PREFAB PAV MRK TY C (W) (RR XING)	EA		6.000	2.000		1.000			9.000
	668-6091	PREFAB PAV MRK TY C (W) (18")(YLD TRI)	EA				28.000				28.000
	672-6007	REFL PAV MRKR TY I-C	EA	90.000	350.000	170.000	2.000	70.000	1,040.000	580.000	2,302.000
	672-6009	REFL PAV MRKR TY II-A-A	EA	210.000	310.000	320.000	110.000	200.000	340.000	1,110.000	2,600.000
	672-6010	REFL PAV MRKR TY II-C-R	EA	24.000	430.000			14.000			468.000
	672-6016	TRAFFIC BUTTON TY W	EA						440.000		440.000
	672-6017	TRAFFIC BUTTON TY Y	EA					1,000.000	3,020.000		4,020.000
	672-6018	TRAFFIC BUTTON TY B	EA					360.000	2,780.000		3,140.000
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	258.000		400.000				560.000	1,218.000
	677-6003	ELIM EXT PAV MRK & MRKS (8")	LF			880.000	100.000	130.000			1,110.000
	677-6005	ELIM EXT PAV MRK & MRKS (12")	LF	770.000	713.000	989.000	240.000	620.000	372.000	1,389.000	5,093.000
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	256.000	434.000	747.000	290.000	273.000	347.000	650.000	2,997.000
	677-6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA			6.000	2.000				8.000
	677-6009	ELIM EXT PAV MRK & MRKS (DBL ARROW)	EA			2.000	2.000				4.000
	677-6012	ELIM EXT PAV MRK & MRKS (WORD)	EA			4.000					4.000
	677-6016	ELIM EXT PAV MRK & MRKS (RR XING)	EA			2.000					2.000
	678-6001	PAV SURF PREP FOR MRK (4")	LF			400.000				560.000	960.000
	678-6004	PAV SURF PREP FOR MRK (8")	LF			30.000					30.000
	678-6008	PAV SURF PREP FOR MRK (24")	LF			442.000					442.000
	688-6004	VEH LP DETECT (SAWCUT)	LF	1,035.000	475.000	765.000		202.000	192.000	5,136.000	7,805.000
	3084-6001	BONDING COURSE	GAL	1,608.000	8,087.000						9,695.000
	6185-6002	TMA (STATIONARY)	DAY					120.000			120 .000
	6185-6005	TMA (MOBILE OPERATION)	DAY					120.000			120 .000
	02	RAILROAD FLAGGING: RAILROAD FORCE ACCOUNT WORK	LS					1.000			1.000
	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

DATE: 12/3/2020 8:38:45 AM
FILE: SUMMARY OF QUANTITIES.dgn

Pharr District Central Design

Texas Department of Transportation

SUMMARY OF QUANTITIES

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		37

QUANTITY SHEET

CONTROLLING PROJECT ID 1427-01-040 **DISTRICT** Pharr **COUNTY** Cameron, Hidalgo, Willacy
HIGHWAY BU 77X, FM 1423, FM 2061, FM 493, SS 413

CATEGORY OF WORK				TOTAL EST.	TOTAL FINAL
ALT	BID CODE	DESCRIPTION	UNIT		
	134-6006	BACKFILL (TY A)	LF	33,542.000	
	164-6033	DRILL SEEDING (PERM) (RURAL) (SANDY)	SY	9,931.000	
	164-6037	DRILL SEEDING (PERM) (URBAN) (SANDY)	SY	1,250.000	
	346-6014	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	TON	26,156.000	
	346-6058	TACK COAT	GAL	21,415.000	
	347-6001	TOM (ASPHALT) PG 76-22	TON	6,141.000	
	347-6002	TOM-C (AGGREGATE) SAC-A	TON	6,141.000	
	354-6041	PLANE ASPH CONC PAV (1.5")	SY	197,171.000	
	354-6043	PLANE ASPH CONC PAV (1")	SY	61,601.000	
	354-6106	PLANE ASPH CONC PAV (1" TO 4")	SY	46,118.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	47.000	
	500-6001	MOBILIZATION	LS	100.00%	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	7.000	
	506-6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	2,085.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	2,085.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	568.000	
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	4.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF	568.000	
	542-6002	REMOVE TERMINAL ANCHOR SECTION	EA	6.000	
	542-6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA	8.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	10.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA	8.000	
	545-6005	CRASH CUSH ATTEN (REMOVE)	EA	2.000	
	545-6006	CRASH CUSH ATTEN (INSTL)(L)(N)(TL2)	EA	2.000	
	658-6048	INSTL OM ASSM (OM-2Z)(FLX)GND	EA	16.000	
	658-6056	INSTL OM ASSM (OM-3R)(FLX)GND	EA	38.000	
	658-6060	REMOVE DELIN & OBJECT MARKER ASSMS	EA	70.000	
	658-6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	40.000	
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	6,329.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	9,090.000	
	666-6006	REFL PAV MRK TY I (W)4"(DOT)(100MIL)	LF	575.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	7,677.000	
	666-6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	1,493.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	7,783.000	
	666-6141	REFL PAV MRK TY I (Y)12"(SLD)(100MIL)	LF	824.000	
	666-6167	REFL PAV MRK TY II (W) 4" (BRK)	LF	18,270.000	
	666-6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	41,810.000	
	666-6178	REFL PAV MRK TY II (W) 8" (SLD)	LF	6,652.000	
	666-6180	REFL PAV MRK TY II (W) 12" (SLD)	LF	277.000	
	666-6182	REFL PAV MRK TY II (W) 24" (SLD)	LF	2,860.000	

QUANTITY SHEET

CONTROLLING PROJECT ID 1427-01-040 **DISTRICT** Pharr **COUNTY** Cameron, Hidalgo, Willacy
HIGHWAY BU 77X, FM 1423, FM 2061, FM 493, SS 413

CATEGORY OF WORK				TOTAL EST.	TOTAL FINAL
ALT	BID CODE	DESCRIPTION	UNIT		
	666-6184	REFL PAV MRK TY II (W) (ARROW)	EA	77.000	
	666-6185	REFL PAV MRK TY II (W) (DBL ARROW)	EA	1.000	
	666-6192	REFL PAV MRK TY II (W) (WORD)	EA	32.000	
	666-6196	REFL PAV MRK TY II (W) (RR XING)	EA	7.000	
	666-6205	REFL PAV MRK TY II (Y) 4" (BRK)	LF	11,610.000	
	666-6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	62,710.000	
	666-6212	REFL PAV MRK TY II (Y) 12" (SLD)	LF	672.000	
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	20,020.000	
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	20,570.000	
	666-6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	6,850.000	
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	48,640.000	
	666-6342	REF PROF PAV MRK TY I(W)4"(SLD)(100MIL)	LF	52,950.000	
	666-6344	REF PROF PAV MRK TY I(Y)4"(BRK)(100MIL)	LF	8,960.000	
	666-6345	REF PROF PAV MRK TY I(Y)4"(SLD)(100MIL)	LF	39,980.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	83.000	
	668-6078	PREFAB PAV MRK TY C (W) (DBL ARROW)	EA	3.000	
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA	37.000	
	668-6089	PREFAB PAV MRK TY C (W) (RR XING)	EA	9.000	
	668-6091	PREFAB PAV MRK TY C (W) (18")(YLD TRI)	EA	28.000	
	672-6007	REFL PAV MRKR TY I-C	EA	2,302.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	2,600.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	468.000	
	672-6016	TRAFFIC BUTTON TY W	EA	440.000	
	672-6017	TRAFFIC BUTTON TY Y	EA	4,020.000	
	672-6018	TRAFFIC BUTTON TY B	EA	3,140.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	1,218.000	
	677-6003	ELIM EXT PAV MRK & MRKS (8")	LF	1,110.000	
	677-6005	ELIM EXT PAV MRK & MRKS (12")	LF	5,093.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	2,997.000	
	677-6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	8.000	
	677-6009	ELIM EXT PAV MRK & MRKS (DBL ARROW)	EA	4.000	
	677-6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	4.000	
	677-6016	ELIM EXT PAV MRK & MRKS (RR XING)	EA	2.000	
	678-6001	PAV SURF PREP FOR MRK (4")	LF	960.000	
	678-6004	PAV SURF PREP FOR MRK (8")	LF	30.000	
	678-6008	PAV SURF PREP FOR MRK (24")	LF	442.000	
	688-6004	VEH LP DETECT (SAWCUT)	LF	7,805.000	
	3084-6001	BONDING COURSE	GAL	9,695.000	
	6185-6002	TMA (STATIONARY)	DAY	120.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	120.000	

QUANTITY SHEET

CONTROLLING PROJECT ID 1427-01-040 **DISTRICT** Pharr **COUNTY** Cameron, Hidalgo, Willacy

HIGHWAY BU 77X, FM 1423, FM 2061, FM 493, SS 413

CATEGORY OF WORK				TOTAL EST.	TOTAL FINAL
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**		
	02	RAILROAD FLAGGING: RAILROAD FORCE ACCOUNT WORK		1.000	
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)		1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)		1.000	

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

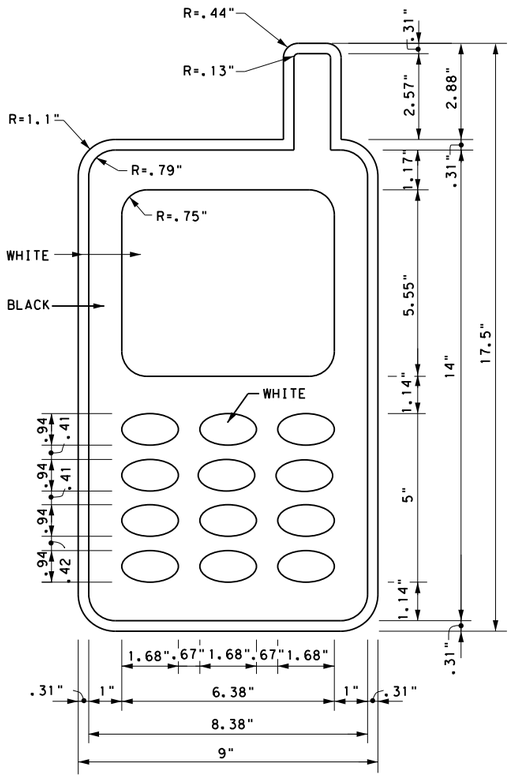
11. Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.

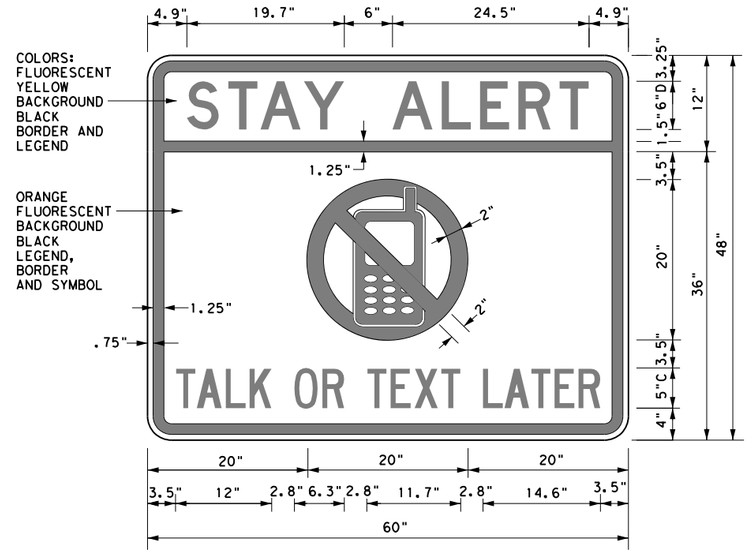
12. The Engineer has the final decision on the location of all traffic control devices.

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

WORKER SAFETY APPAREL NOTES:

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





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

SIGN DETAIL (G20-10T)

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

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

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

Texas Department of Transportation — Traffic Operations Division Standard

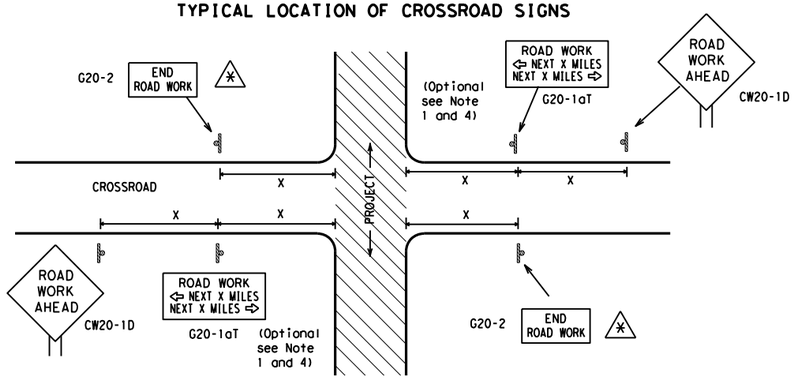
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040,etc.	FM1423,etc.
4-03 5-10 8-14	DIST	COUNTY		SHEET NO.
9-07 7-13	PHR	HIDALGO,etc.		41

DATE: 2/24/2020 3:27:49 PM
FILE: bc-14.dgn

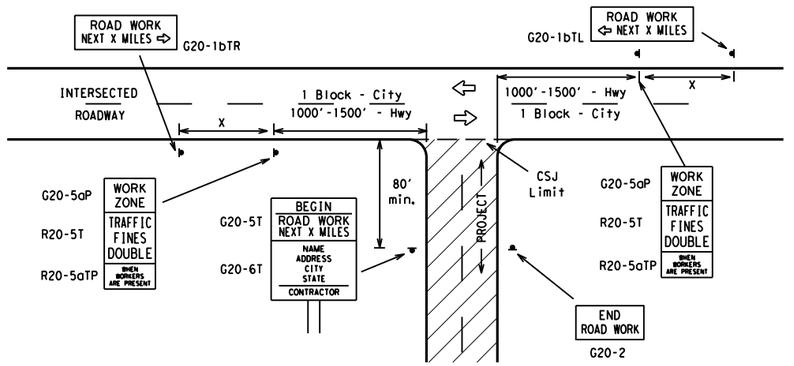
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE			SPACING	
Sign Number or Series	Conventional Road	Expressway/ Freeway	Posted Speed	Sign Spacing Δ "X"
			MPH	Feet (Apprx.)
CW20[4] CW21 CW22 CW23 CW25	48" x 48"	48" x 48"	30	120
			35	160
			40	240
			45	320
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"	50	400
			55	500[2]
			60	600[2]
			65	700[2]
			70	800[2]
			75	900[2]
			80	1000[2]
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"	✱	✱ [3]

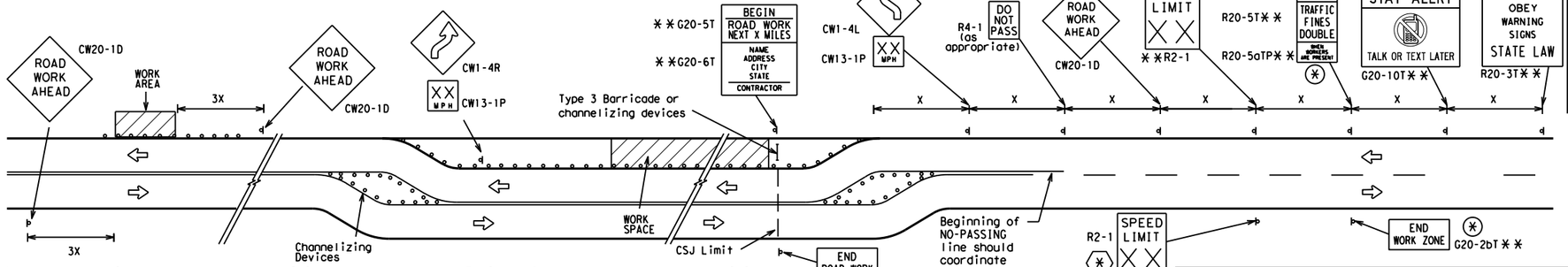
✱ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

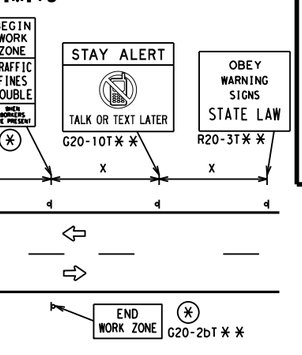
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

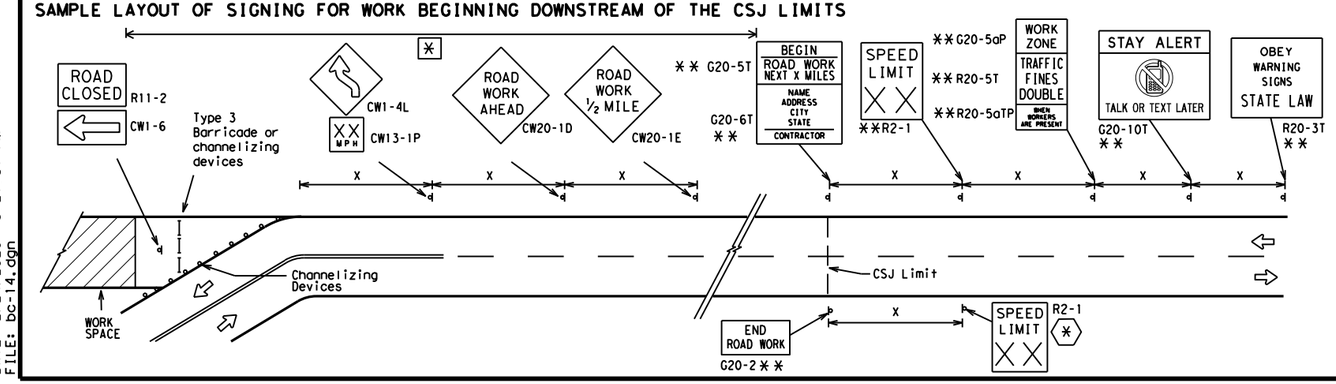


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-1D)signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



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



NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040,etc.	FM1423,etc.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	PHR	HIDALGO,etc.		42

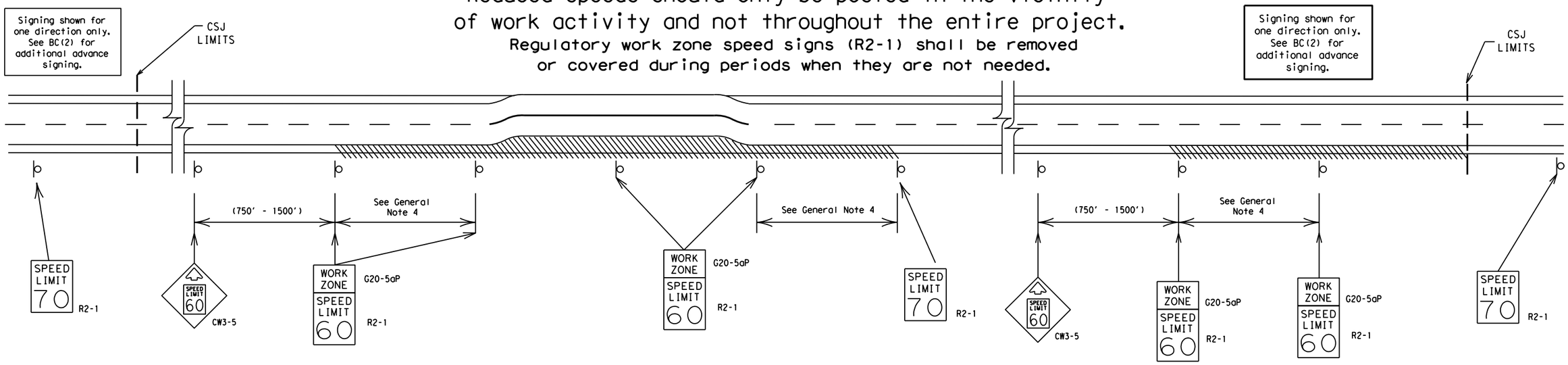
DATE: 2/24/2020 3:27:51 PM
FILE: bc-14.dgn

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

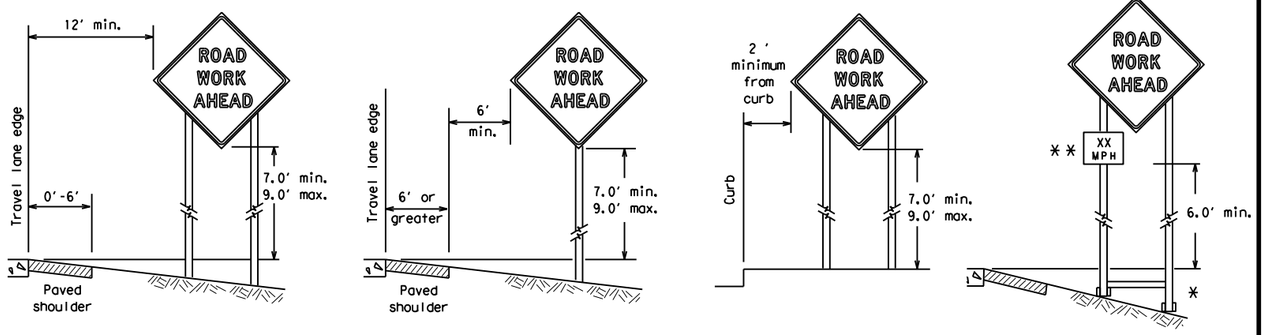
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13	1427	01	040,etc.	FM1423,etc.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO,etc.		43

DATE: 2/24/2020 3:27:53 PM
FILE: bc-14.dgn

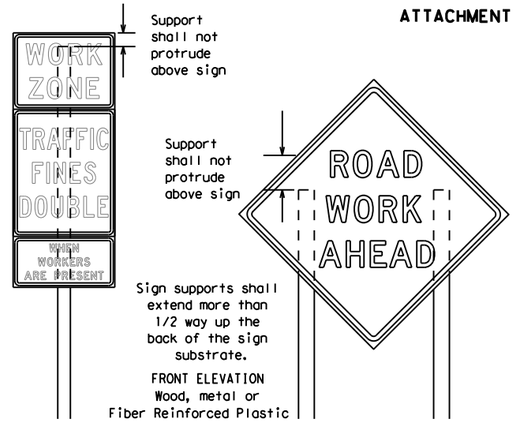
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

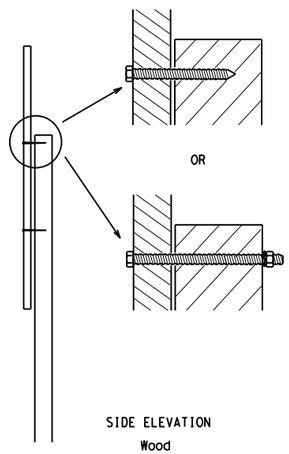


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** 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





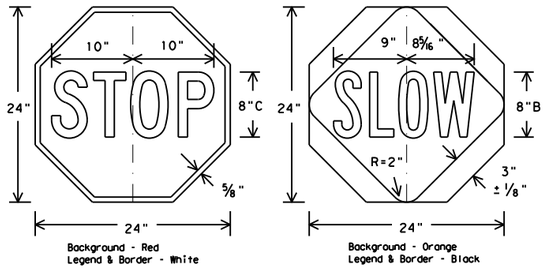
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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" as detailed below.
2. When used at night, the STOP/SLOW paddle shall be retroreflectorized.
3. STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
4. Any lights incorporated into the STOP or SLOW paddle faces shall only be as specifically described in Section 6E.03 Hand Signaling Devices in the TMUTCD.



CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation

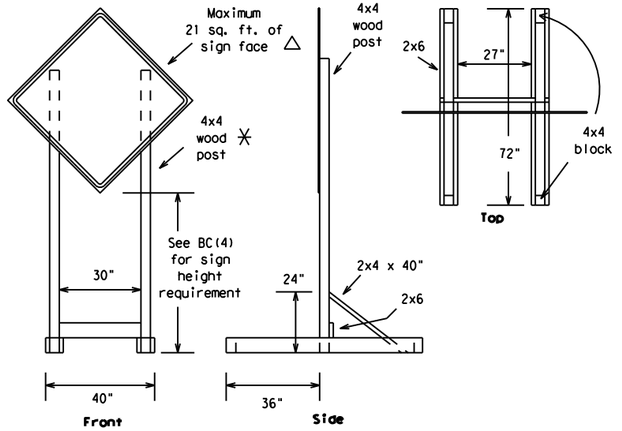
Traffic Operations Division Standard

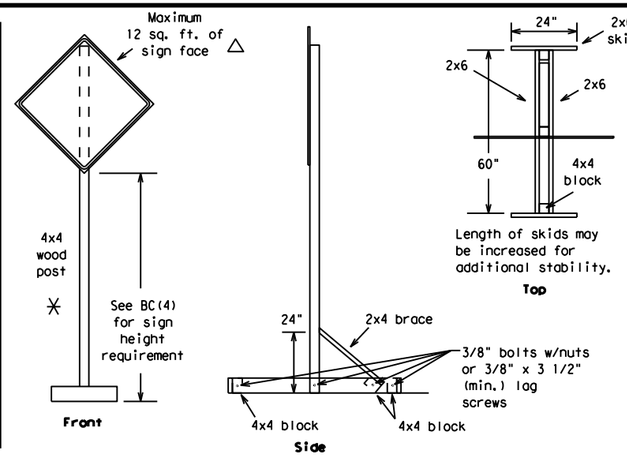
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040,etc.	FM1423,etc.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	PHR	HIDALGO,etc.		44

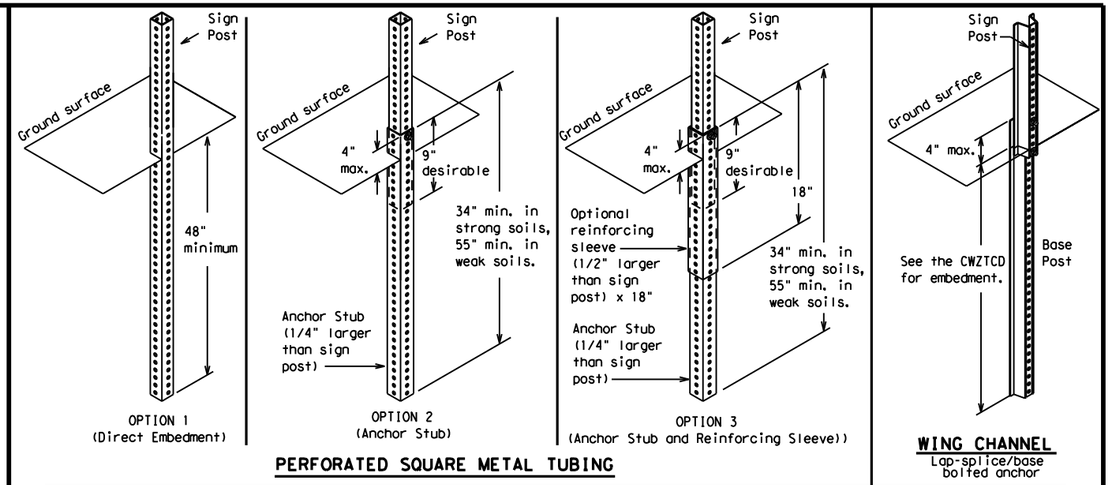
DATE: 2/24/2020 3:27:54 PM
FILE: bc-14.dgn





SKID MOUNTED WOOD SIGN SUPPORTS

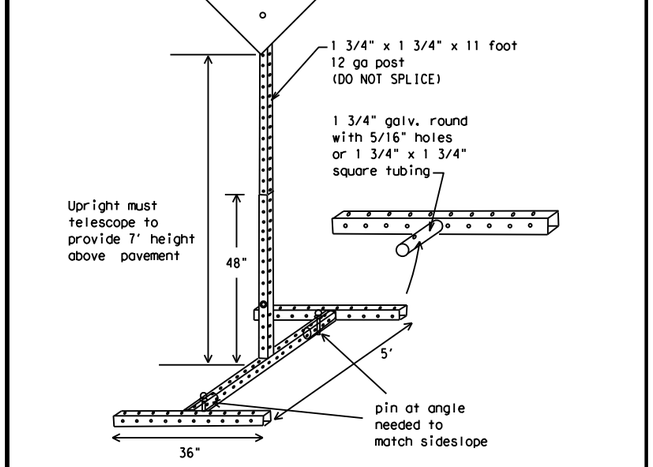
LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS □

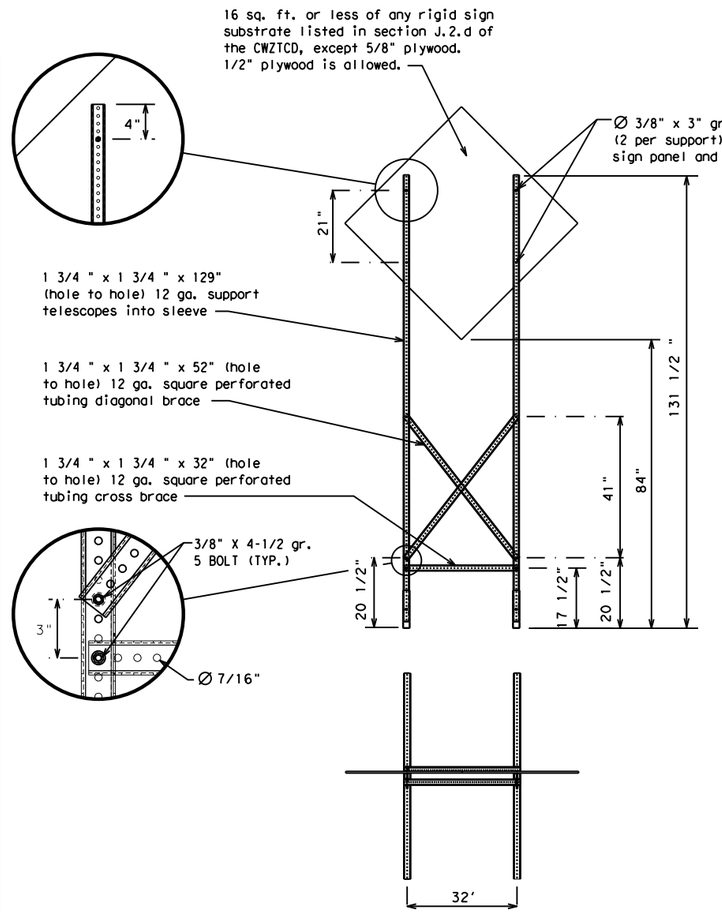


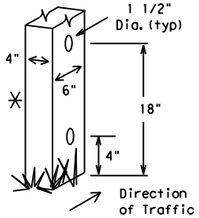
PERFORATED SQUARE METAL TUBING

GROUND MOUNTED SIGN SUPPORTS

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

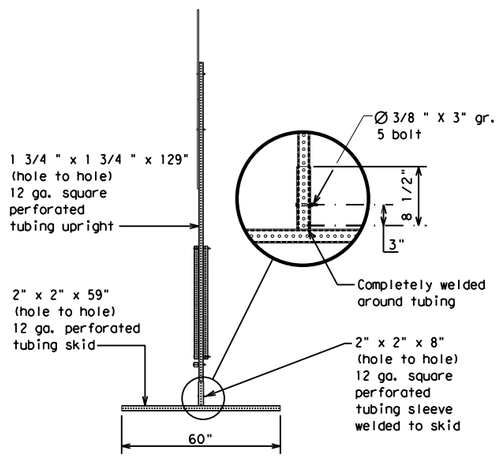






Nominal Post Size	Number of Posts	Maximum Sq. feet of Sign Face	Minimum Soil Embedment	Drilled Hole(s) Required
4 x 4	1	12	36"	NO
4 x 4	2	21	36"	NO
4 x 6	1	21	36"	YES
4 x 6	2	36	36"	YES

WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS



WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040, etc.	FM1423, etc.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	PHR	HIDALGO, etc.		45

DATE: 2/24/2020 3:27:56 PM
FILE: bc-14.dgn

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

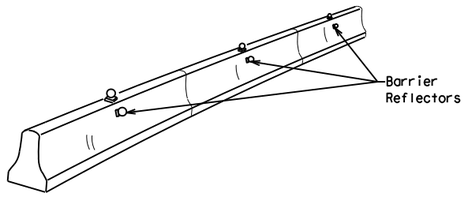
BC(6)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040,etc.	FM1423,etc.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	PHR	HIDALGO,etc.		46

100

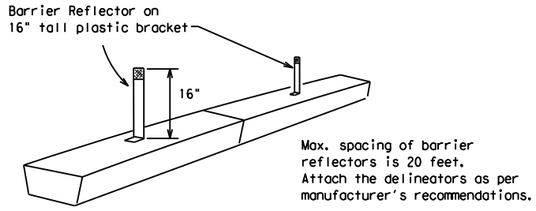
DATE: 2/24/2020 3:27:58 PM
FILE: bc-14.dgn

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

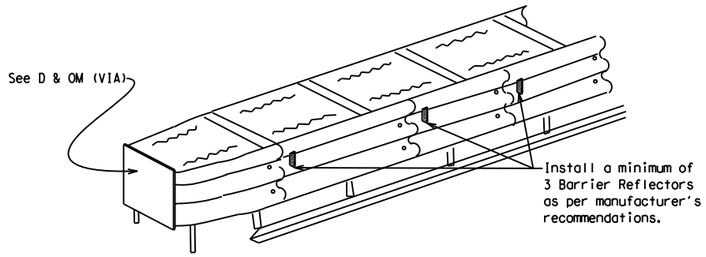


CONCRETE TRAFFIC BARRIER (CTB)

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



LOW PROFILE CONCRETE BARRIER (LPCB)

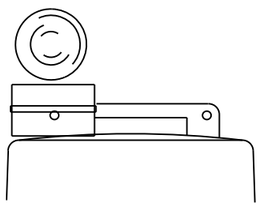


DELINEATION OF END TREATMENTS

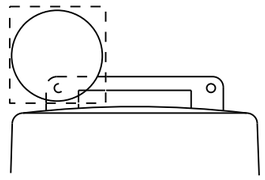
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

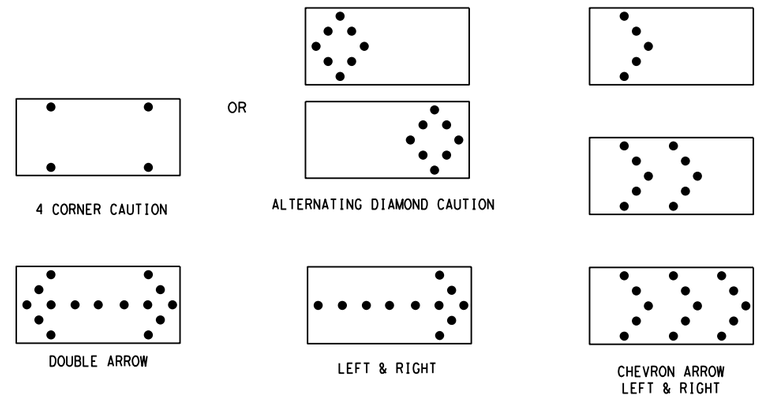
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

1. Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the National Cooperative Highway Research Report No. 350 (NCHRP 350) or the Manual for Assessing Safety Hardware (MASH).
2. Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
3. Refer to the CWZTCD for a list of approved TMAs.
4. TMAs are required on freeways unless otherwise noted in the plans.
5. A TMA should be used anytime that it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
6. The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.

Texas Department of Transportation

Traffic Operations Division Standard

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

BC(7)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13	1427	01	040,etc.	FM1423,etc.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO,etc.		47

101

DATE: 2/24/2020 3:27:59 PM
FILE: bc-14.dgn

GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

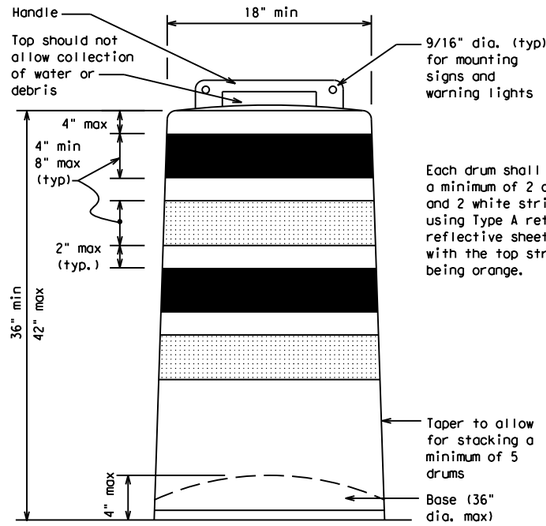
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

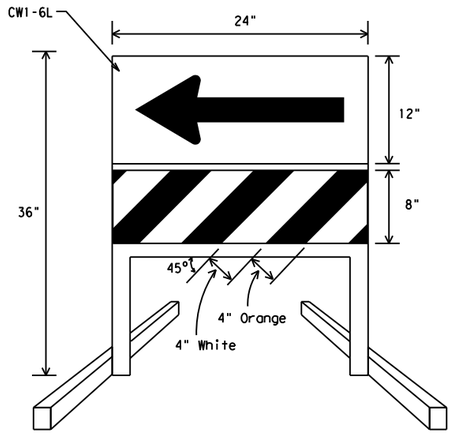
RETROREFLECTIVE SHEETING

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

BALLAST

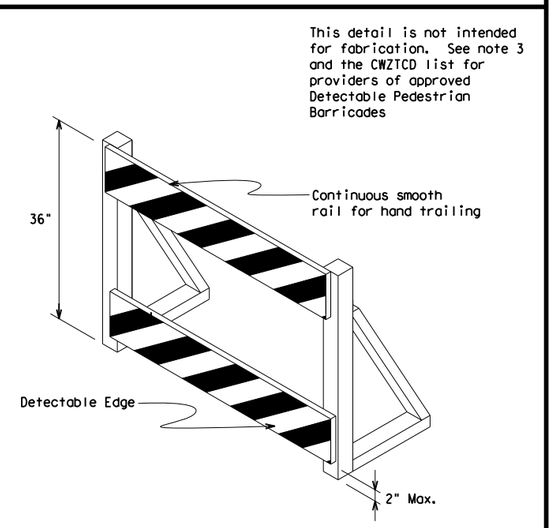
1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other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





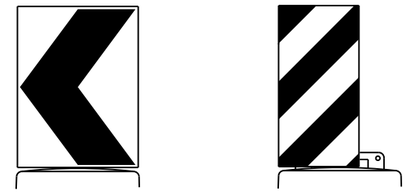
DIRECTION INDICATOR BARRICADE

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



DETECTABLE PEDESTRIAN BARRICADES

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



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

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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation

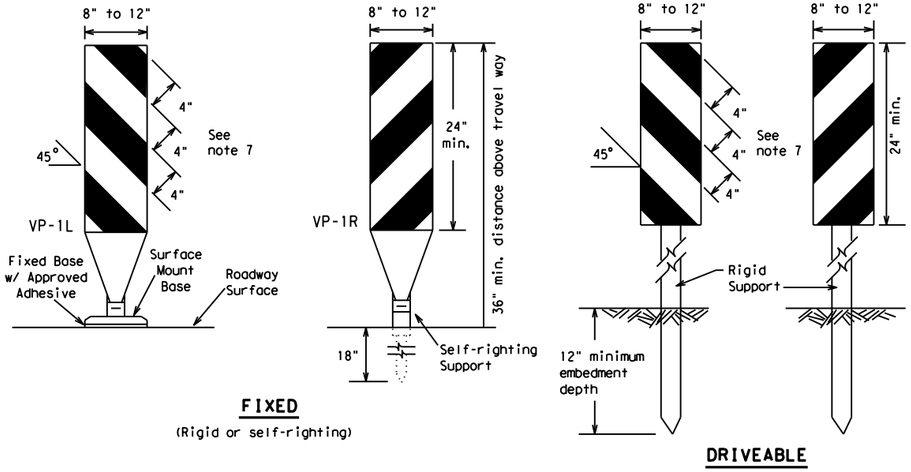
Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-14

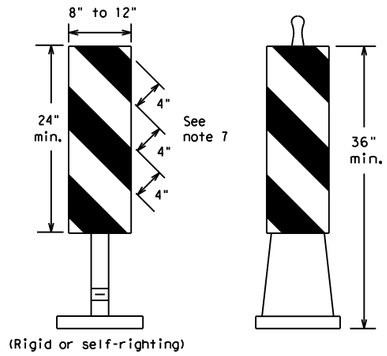
FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040, etc.	FM1423, etc.
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	PHR	HIDALGO, etc.		48

DATE: 2/24/2020 3:28:01 PM
FILE: bc-14.dgn



FIXED
(Rigid or self-righting)

DRIVEABLE

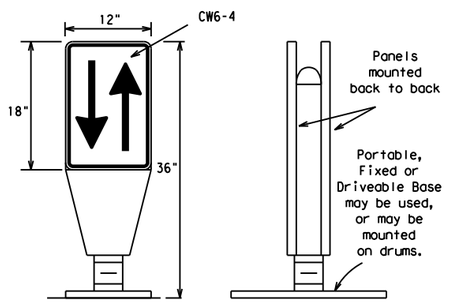


(Rigid or self-righting)

PORTABLE

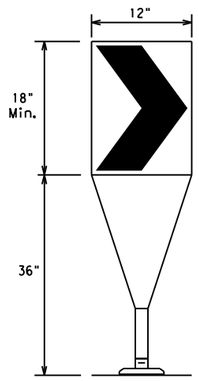
VERTICAL PANELS (VPs)

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 Appendix B "Treatment of Pavement Drop-offs in Work Zones" for additional guidelines on the use of VP's for drop-offs.
3. VP's should be mounted back to back if used at the edge of cuts adjacent to two-way two lane roadways. Stripes are to be reflective orange and reflective white and should always slope downward toward the travel lane.
4. VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
5. Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
6. Sheeting for the VP's shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
7. Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.



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

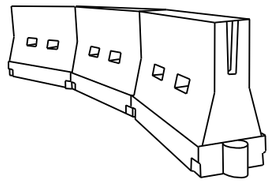
OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



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

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

CHEVRONS



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

1. Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate NCHRP 350 crashworthiness requirements based on roadway speed and barrier application.
2. Water ballasted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve daytime/nighttime visibility. They may also be supplemented with pavement markings.
3. Water ballasted systems used as barriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. Water ballasted systems used as barriers should not be used for a merging taper except in low speed (less than 45 MPH) urban areas. When used on a taper in a low speed urban area, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.
5. When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

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

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

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

Texas Department of Transportation | Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-14

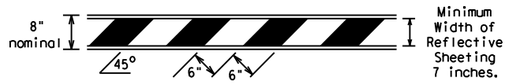
FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040, etc.	FM1423, etc.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	PHR	HIDALGO, etc.		49

DATE: 2/24/2020 3:28:02 PM
FILE: bc-14.dgn

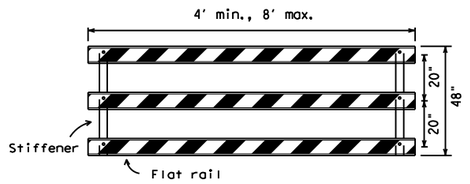
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



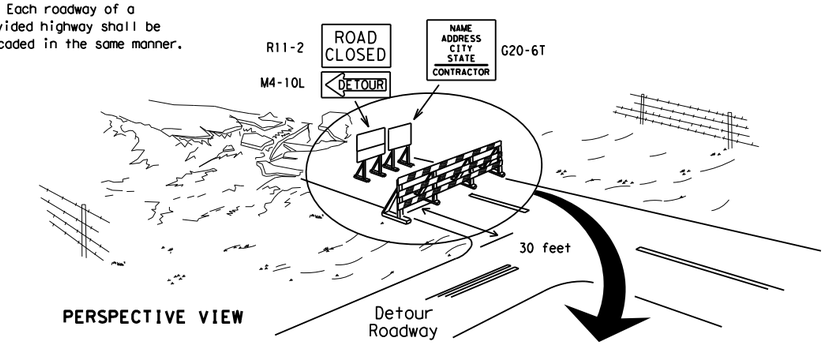
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

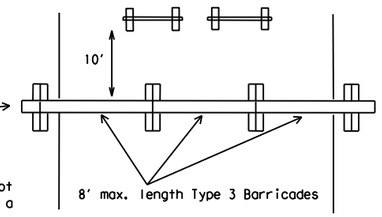
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

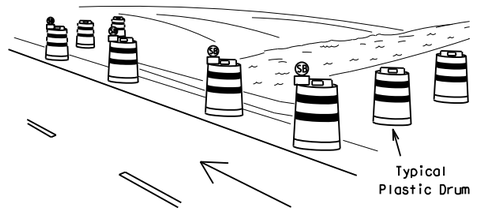
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

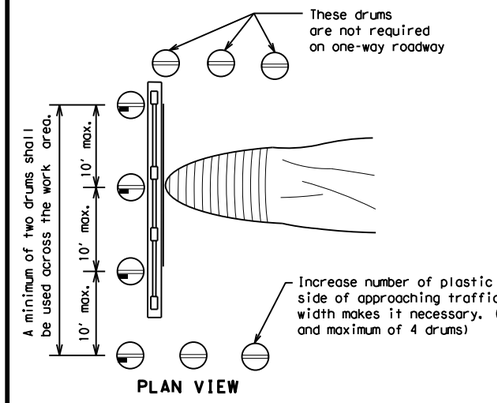
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

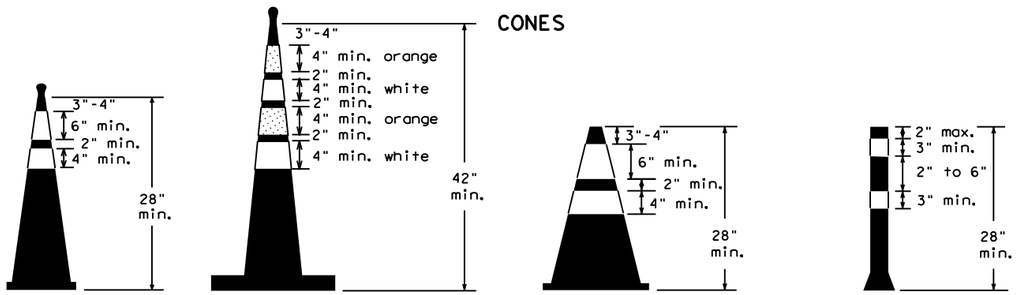
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



PLAN VIEW

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

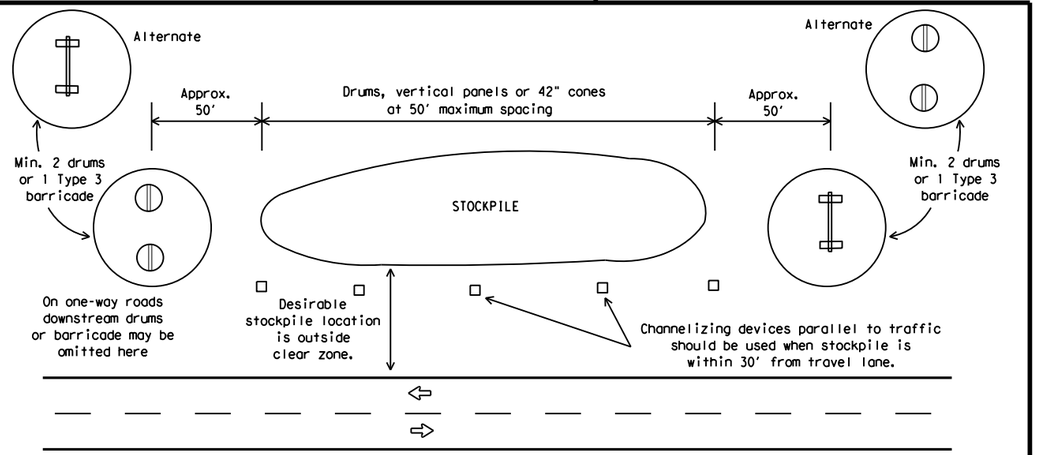
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

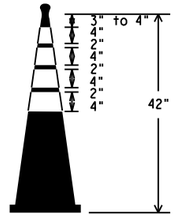
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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



EDGELINE CHANNELIZER

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

Texas Department of Transportation — Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13	1427	01	040, etc.	FM1423, etc.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO, etc.		50

104

DATE: 2/24/2020 3:28:04 PM
FILE: bc-14.dgn

WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

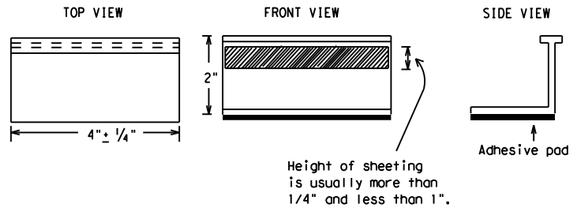
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-14

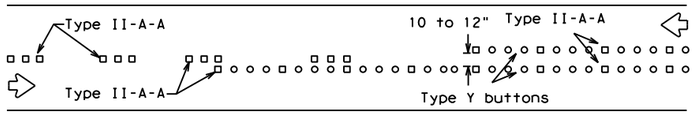
FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040,etc.	FM1423,etc.
2-98 9-07	DIST	COUNTY		SHEET NO.
1-02 7-13	PHR	HIDALGO,etc.		51
11-02 8-14				

105

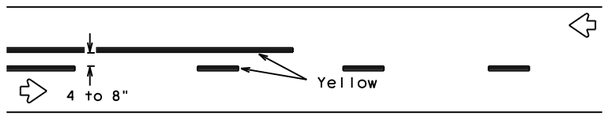
DATE: 2/24/2020 3:28:06 PM
FILE: bc-14.dgn

PAVEMENT MARKING PATTERNS

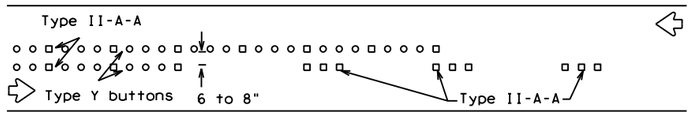
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



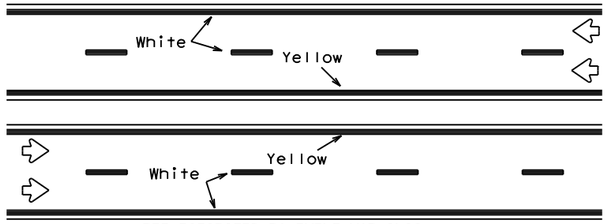
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



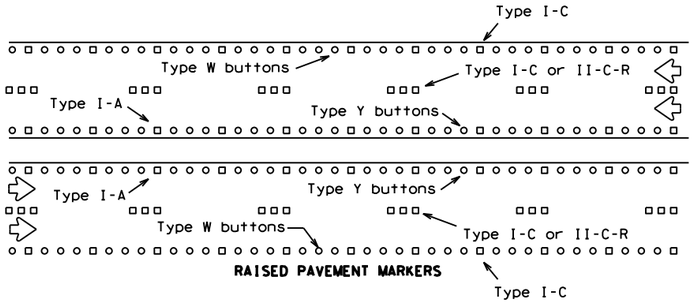
RAISED PAVEMENT MARKERS - PATTERN B

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

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



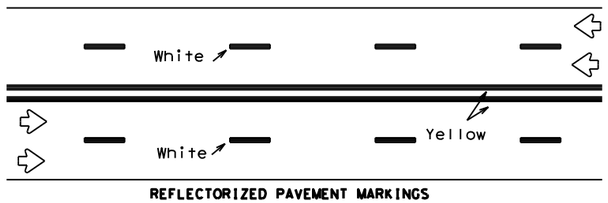
REFLECTORIZED PAVEMENT MARKINGS



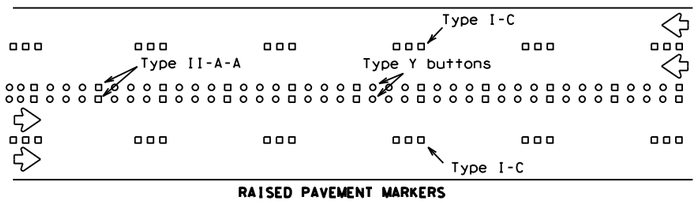
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



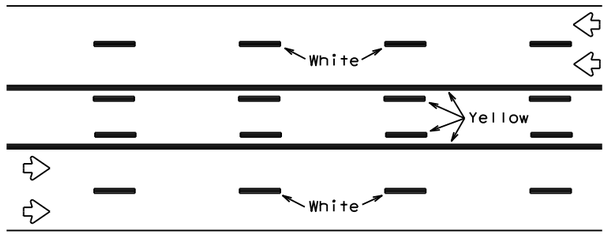
REFLECTORIZED PAVEMENT MARKINGS



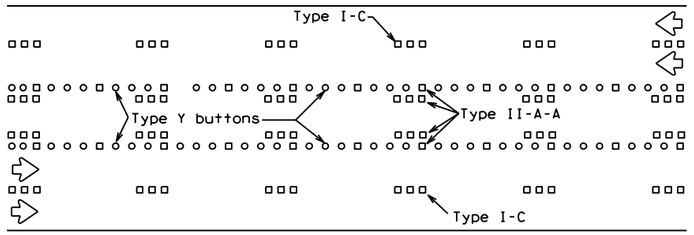
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

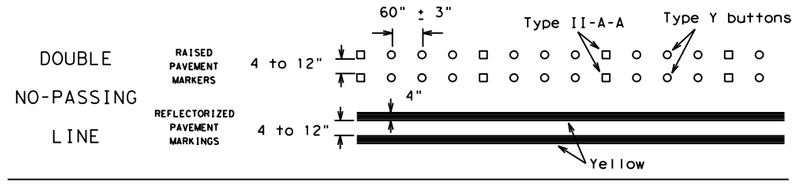
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

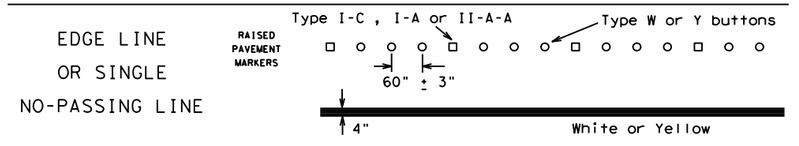
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

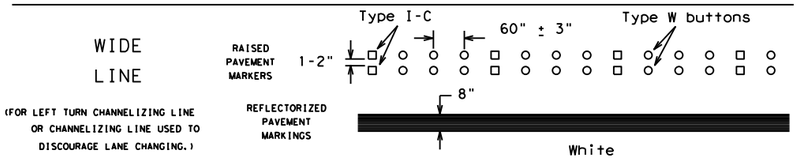


EDGE LINE OR SINGLE NO-PASSING LINE



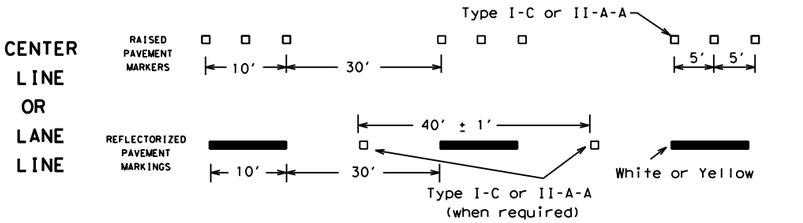
WIDE LINE

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

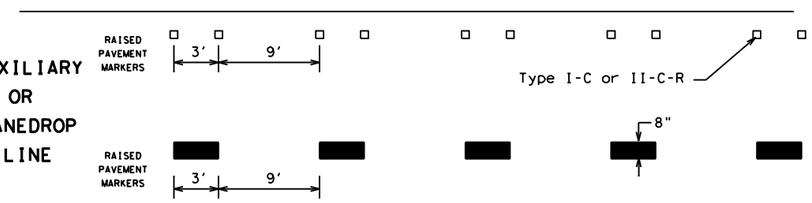


BROKEN LINES

CENTER LINE OR LANE LINE

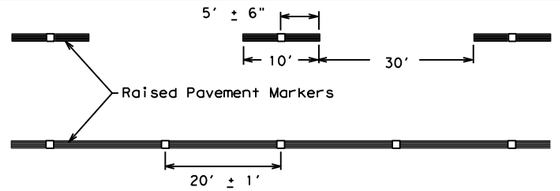


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Operations Division Standard

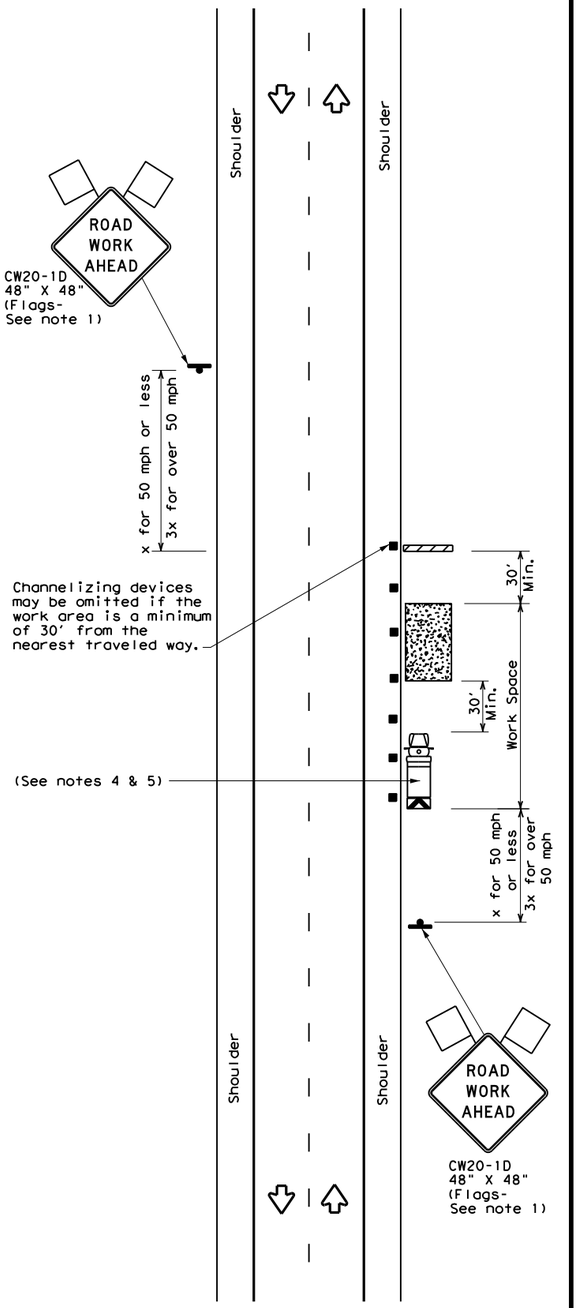
BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040, etc.	FM1423, etc.
1-97 9-07	DIST	COUNTY		SHEET NO.
2-98 7-13	PHR	HIDALGO, etc.		52
11-02 8-14				

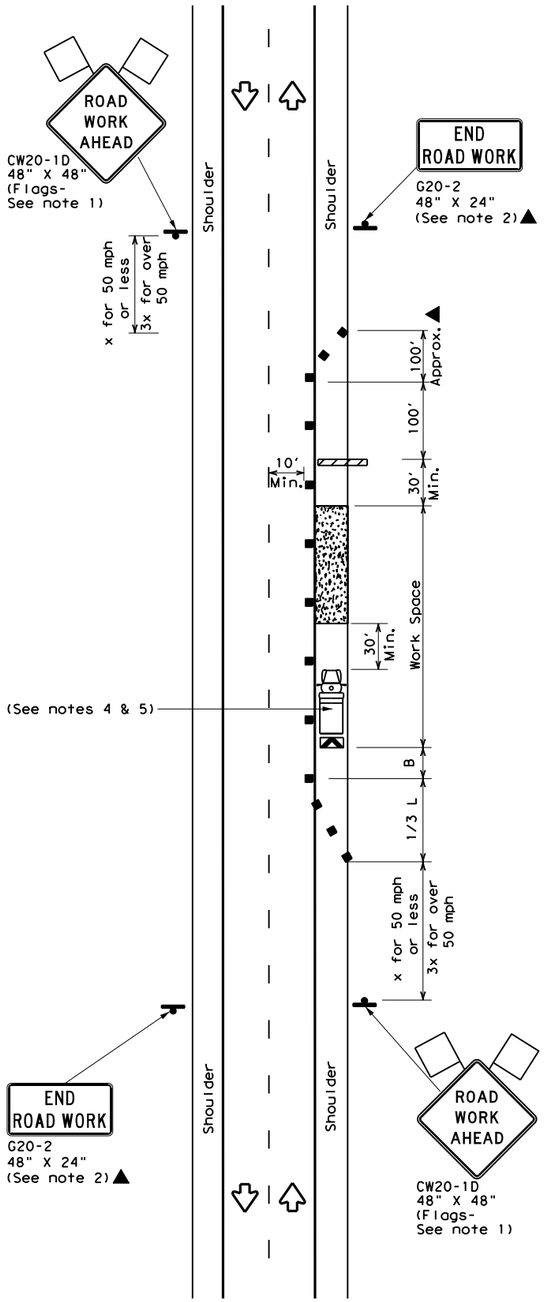
106

DATE: 2/24/2020 3:28:07 PM
FILE: bc-14.dgn



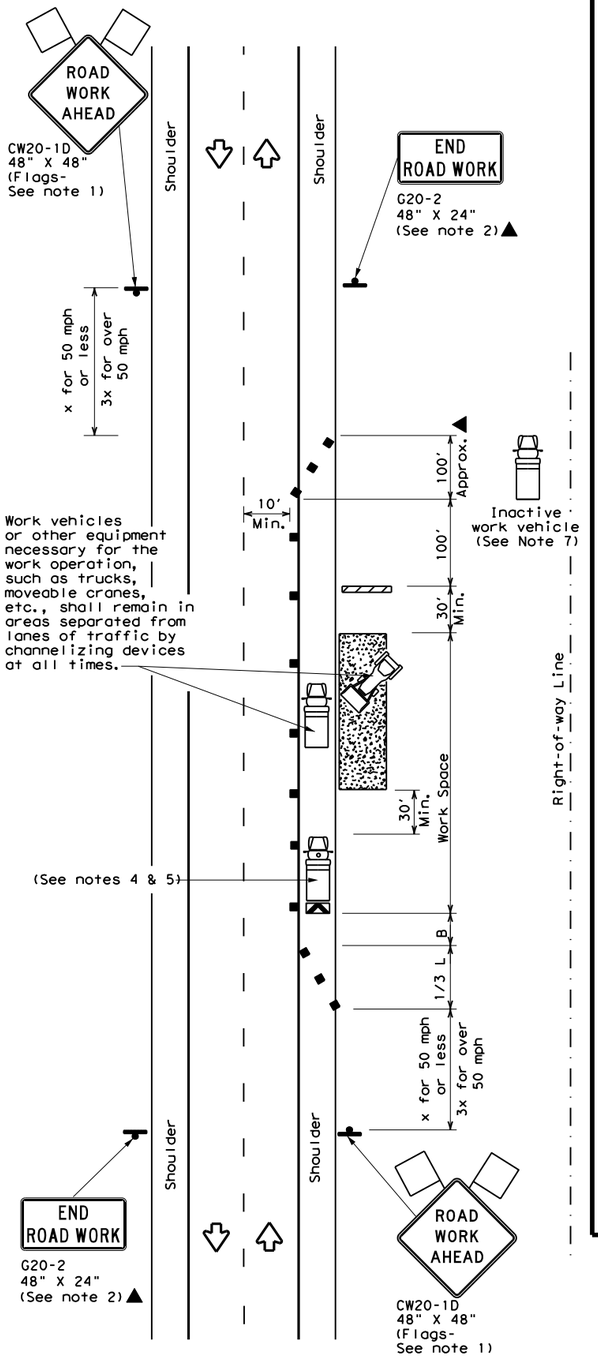
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

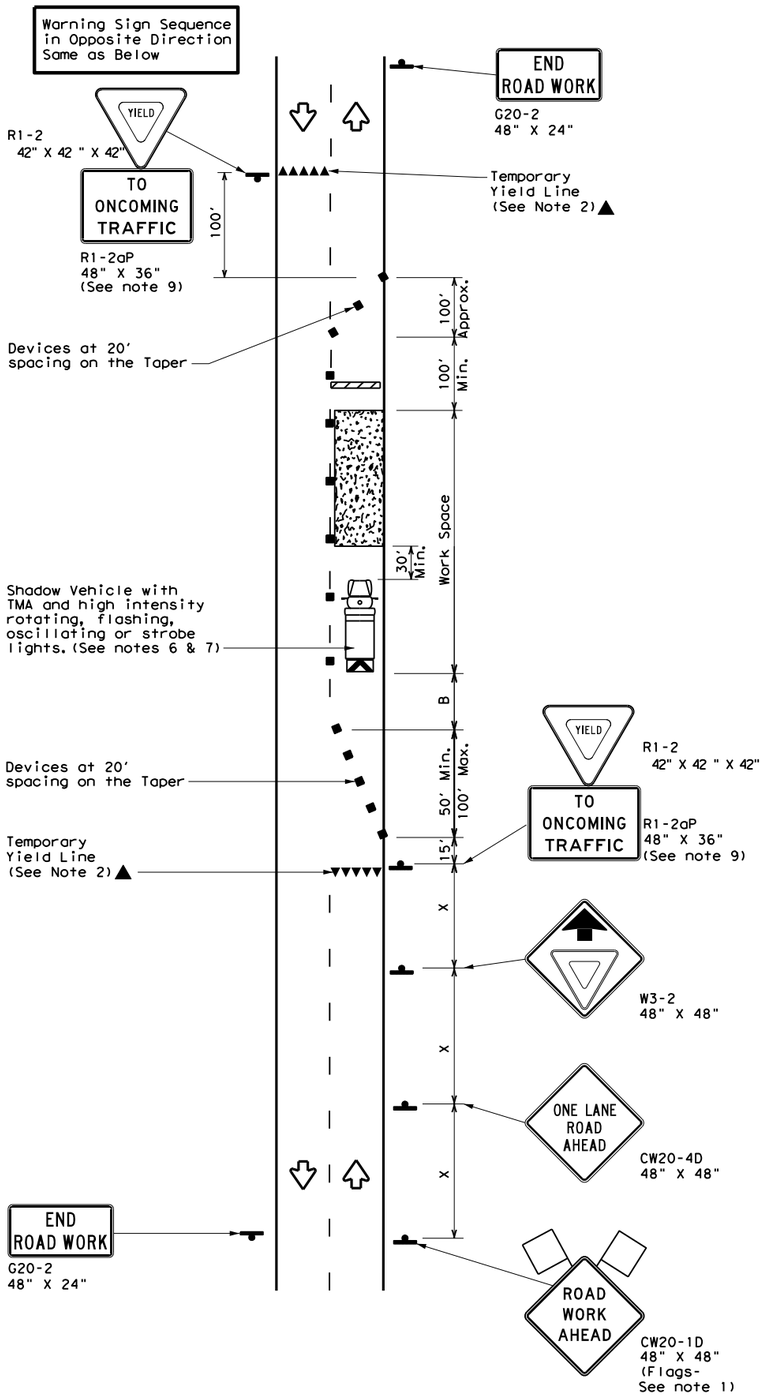
TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

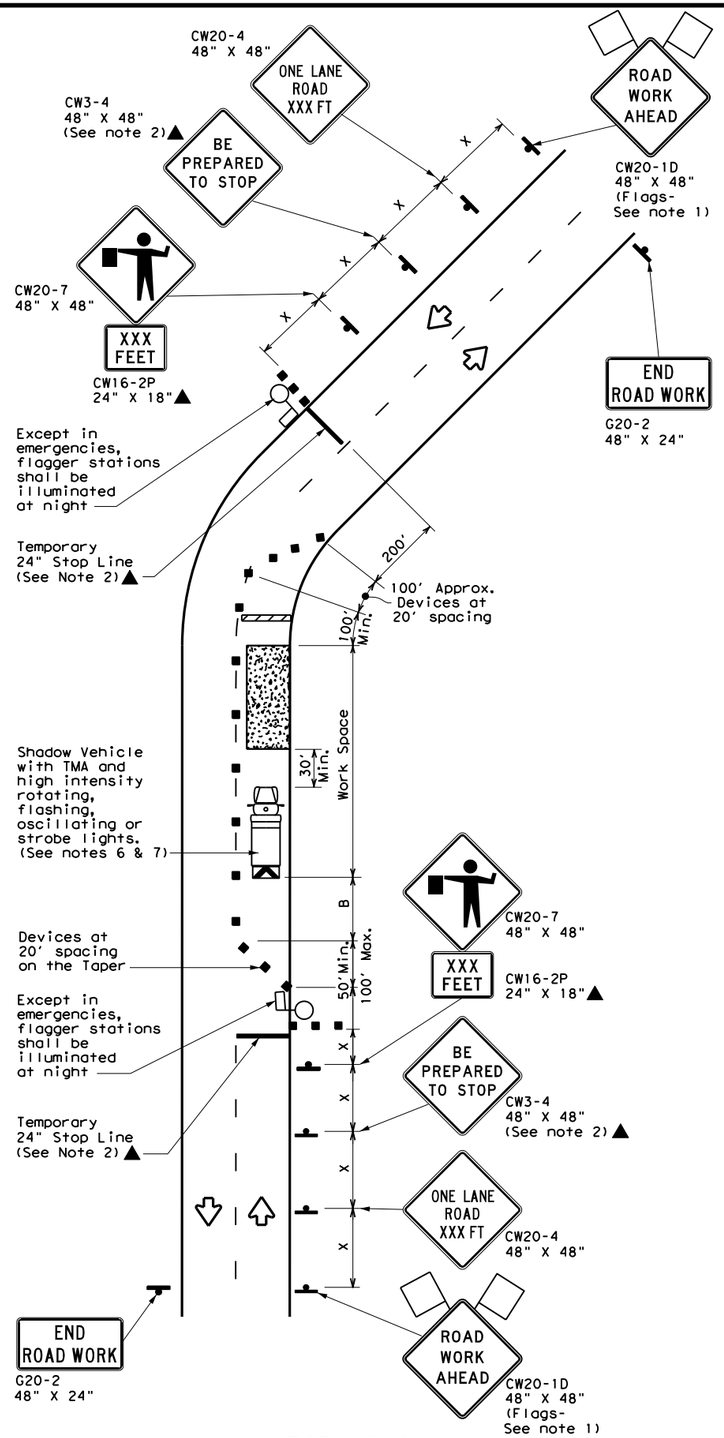
FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040,etc.	FM1423,etc.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	PHR	HIDALGO,etc.		53
1-97 2-18				

161

DATE: 2/24/2020 3:28:16 PM
FILE: tcp2-1-18.dgn



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



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

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

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

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

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

GENERAL NOTES

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

TCP (2-2a)

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

TCP (2-2b)

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

Texas Department of Transportation
Traffic Operations Division Standard

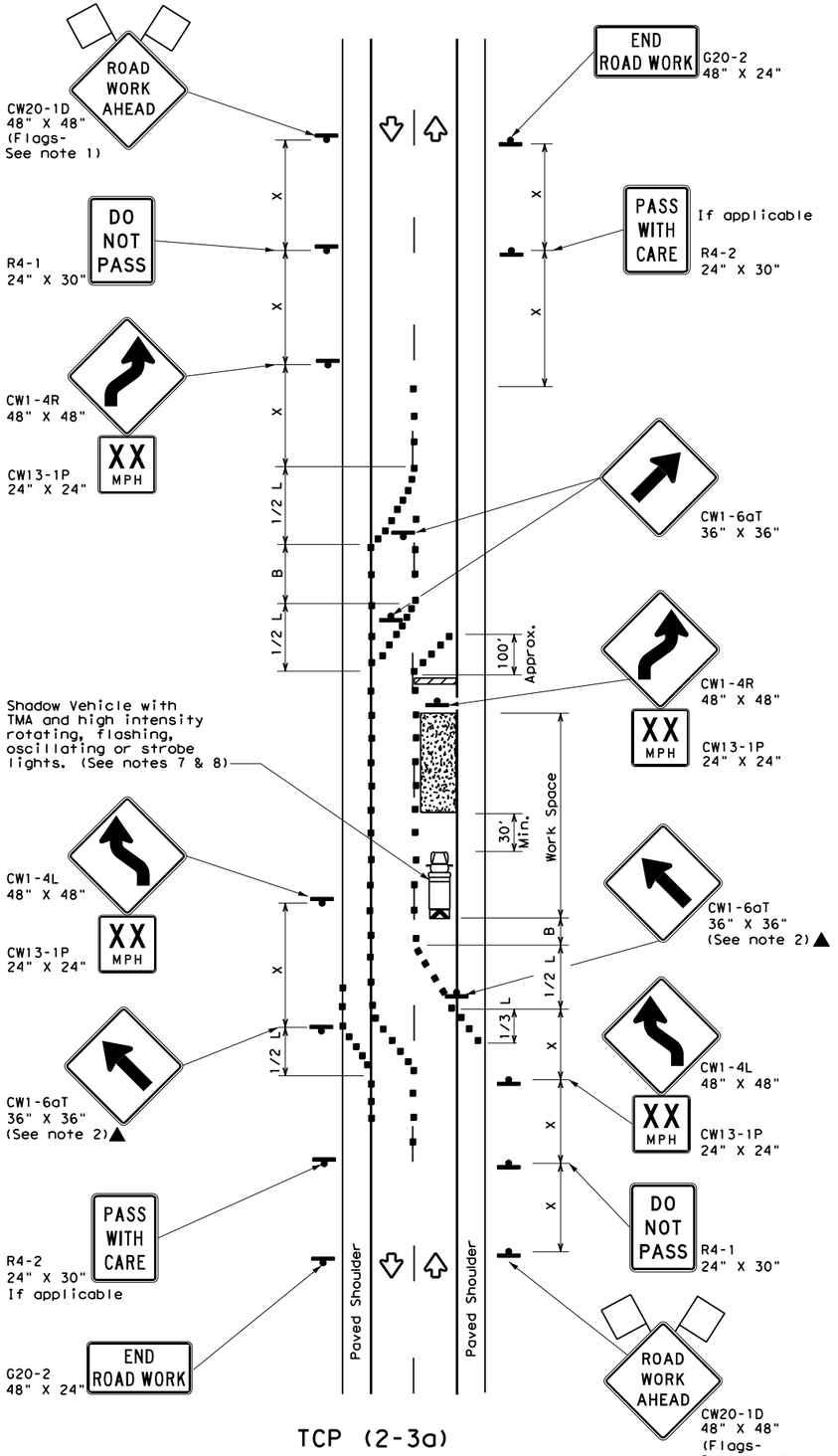
TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

TCP(2-2)-18

FILE: tcp2-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	1427	01	040,etc.	FM1423,etc.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO,etc.		54

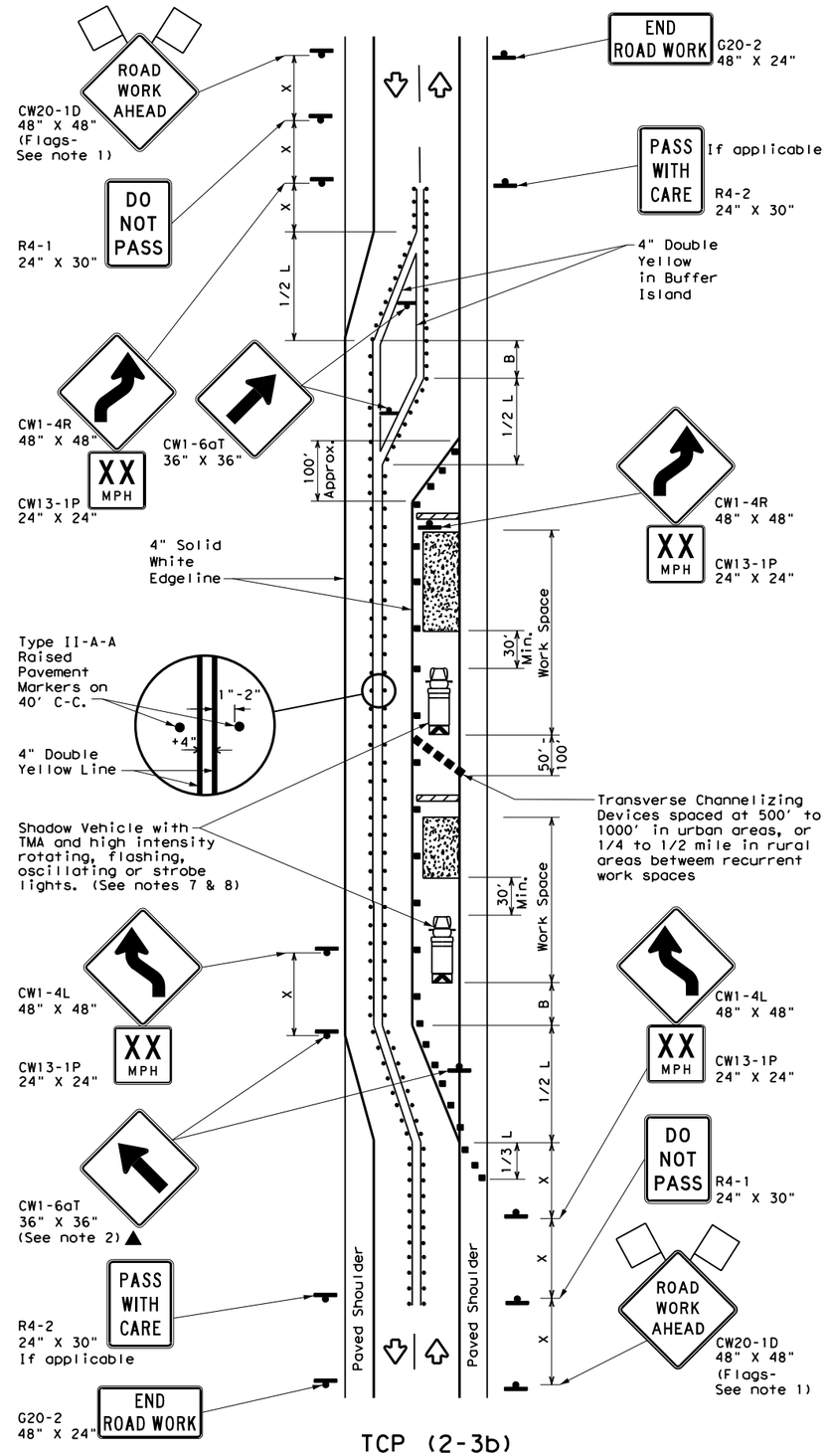
DATE: 2/24/2020 3:28:26 PM
FILE: tcp2-2-18.dgn

DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



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

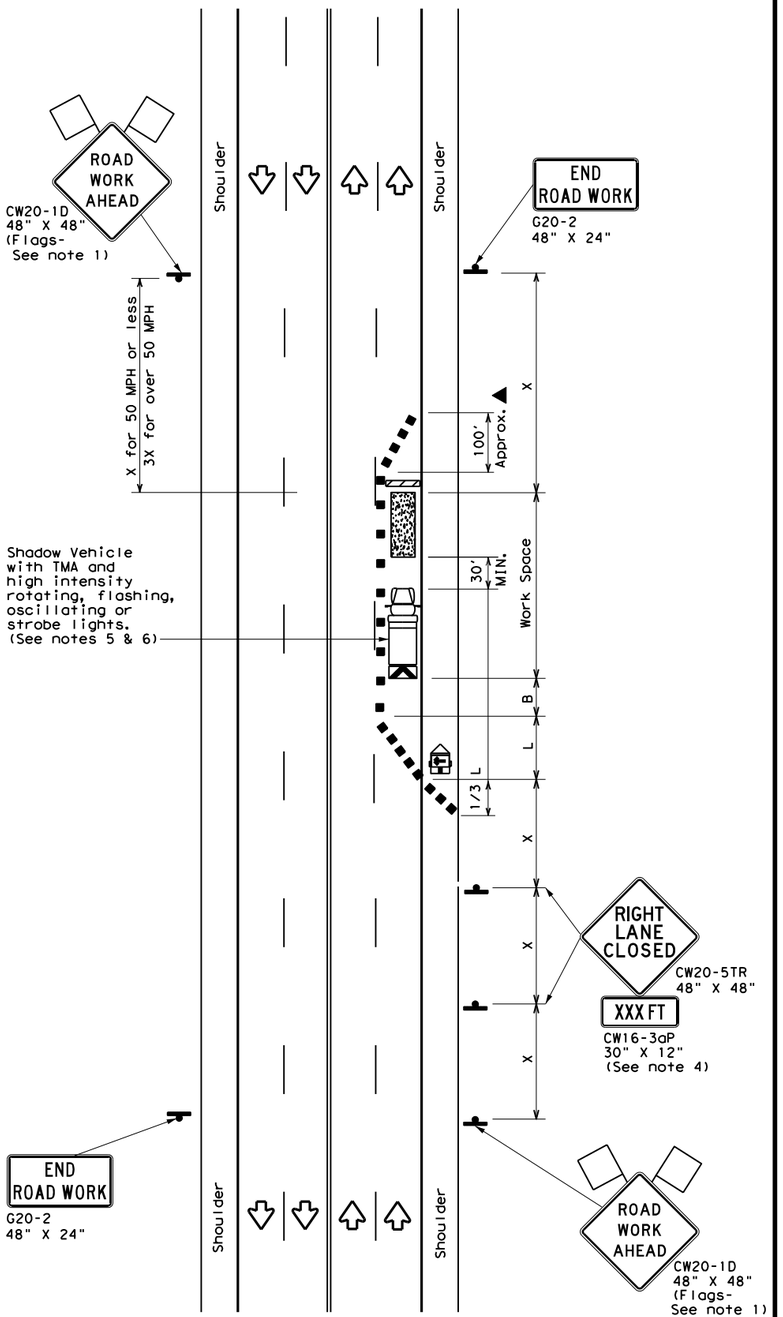
TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO-LANE ROADS

TCP(2-3)-18

FILE: tcp(2-3)-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040, etc.	FM1423, etc.
8-95 3-03	DIST	COUNTY		SHEET NO.
1-97 2-12	PHR	HIDALGO, etc.		55
4-98 2-18				

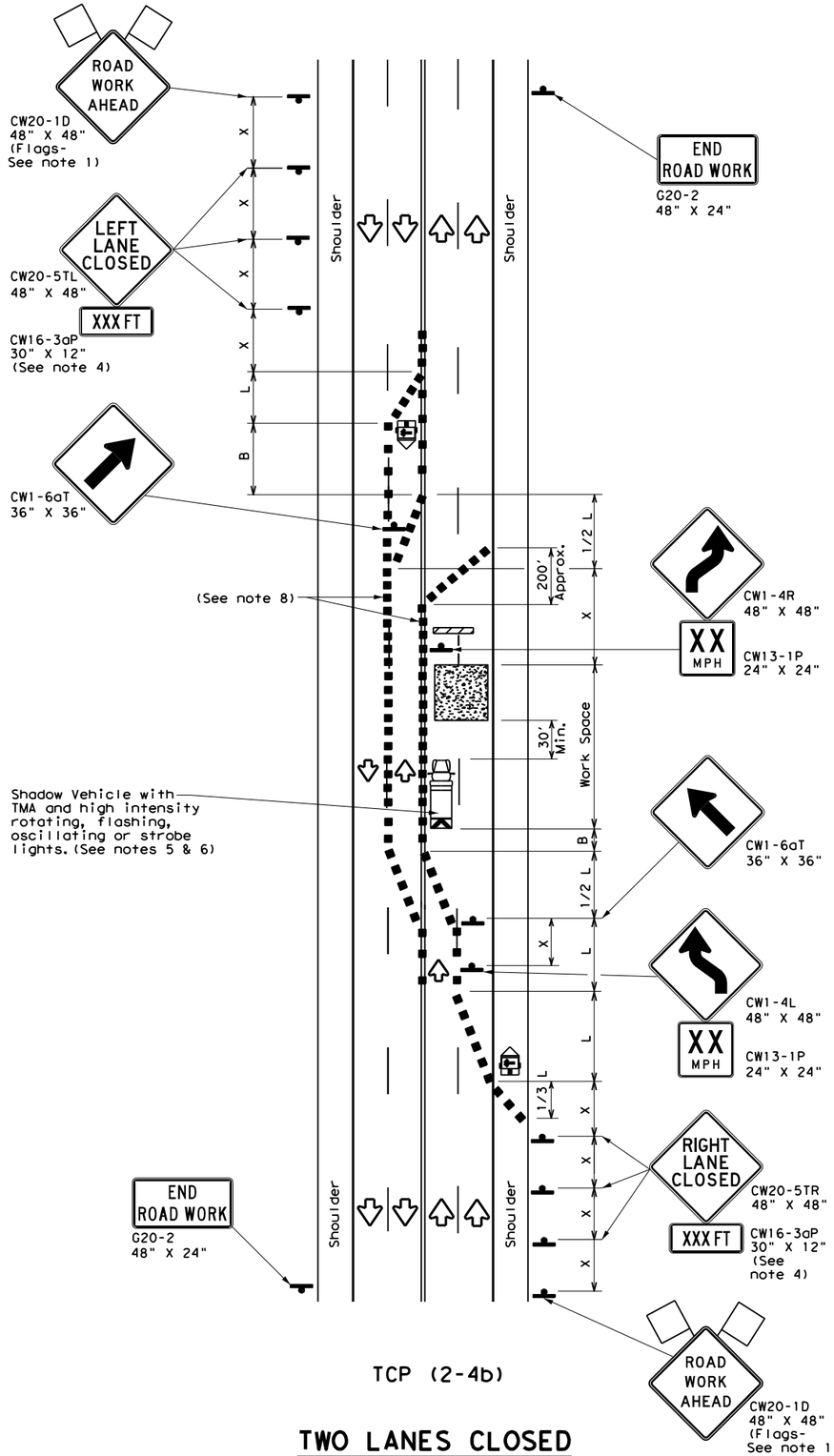
163

DATE: 2/24/2020 3:28:36 PM
FILE: tcp2-3-18.dgn



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.

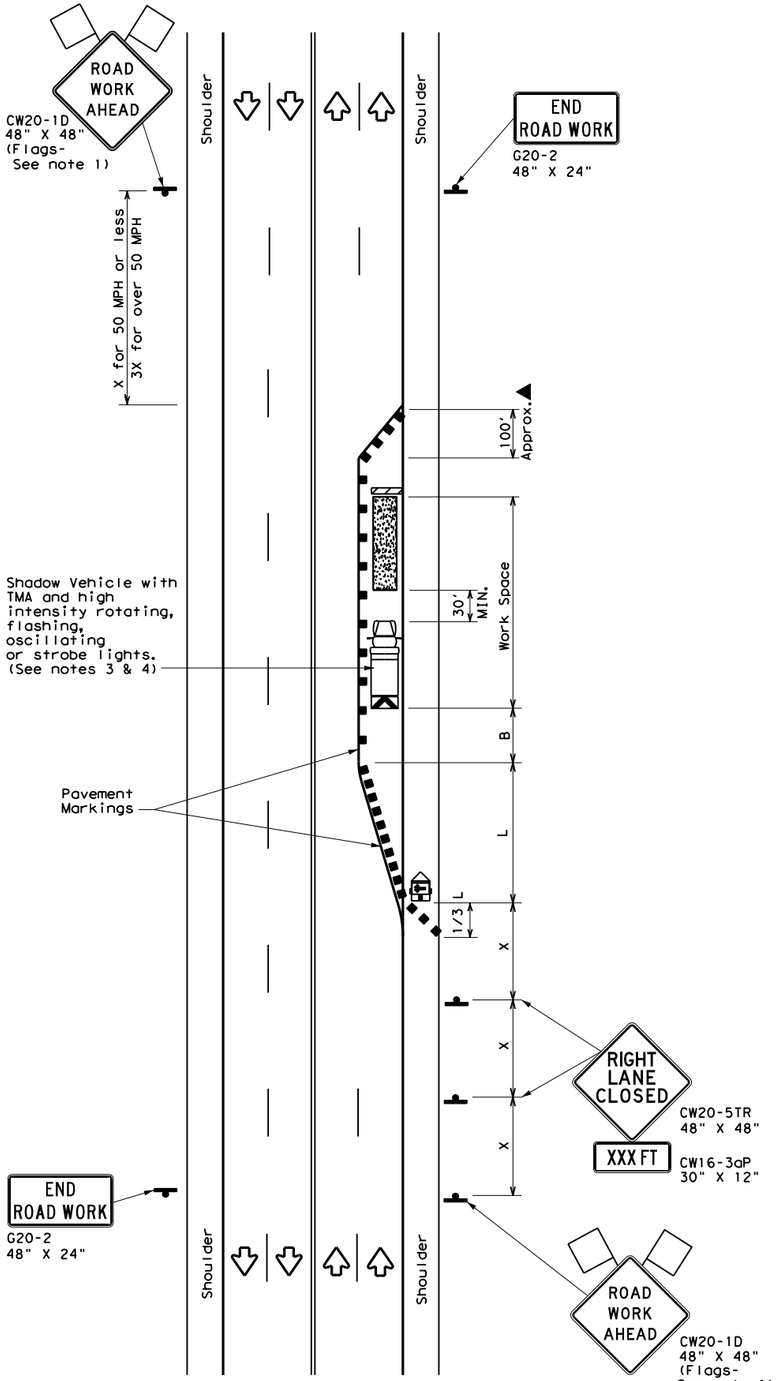
Texas Department of Transportation | Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

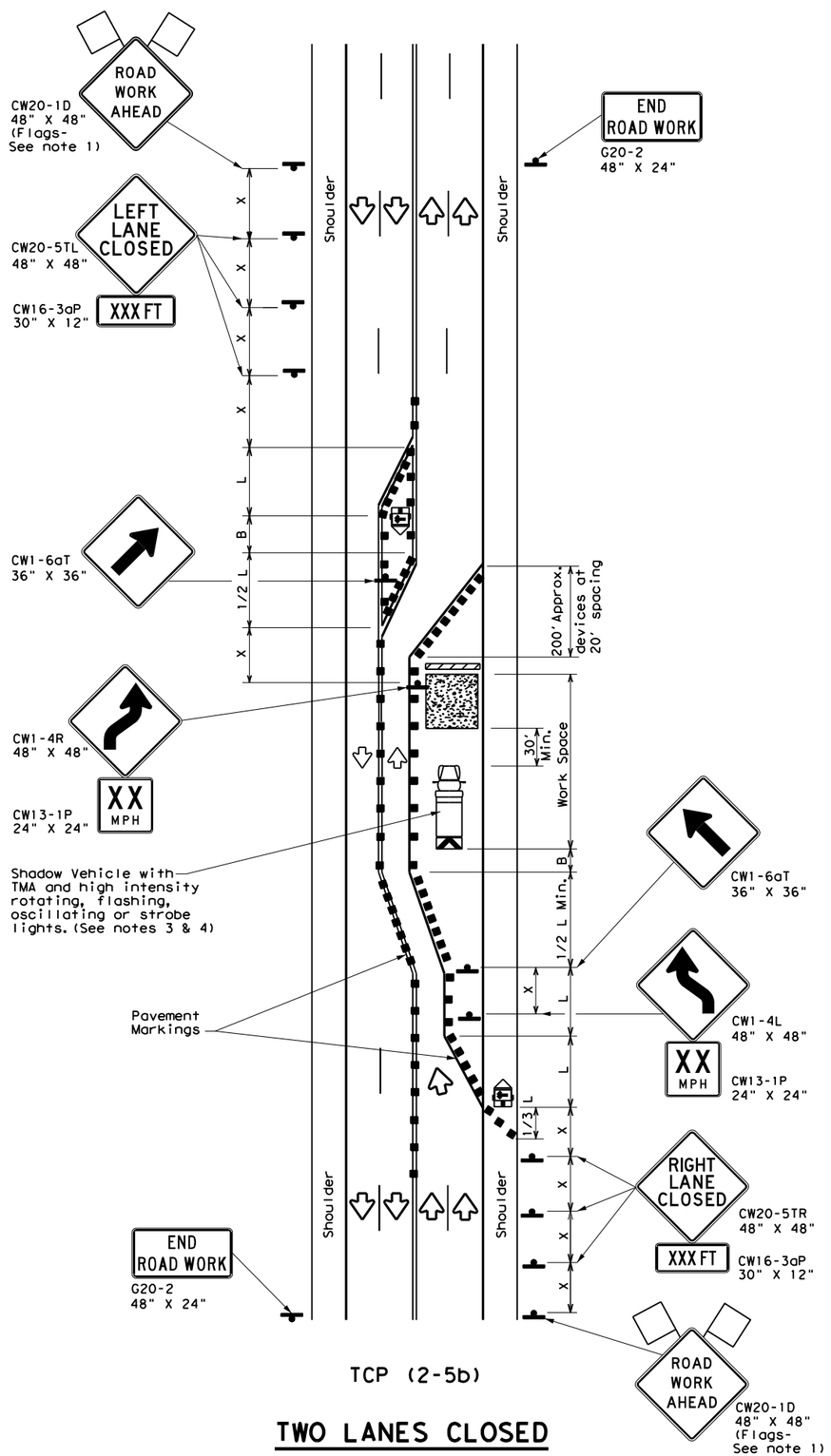
FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	1427	01	040,etc.	FM1423,etc.
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	PHR	HIDALGO,etc.		56

DATE: 2/24/2020 3:28:45 PM
FILE: tcp2-4-18.dgn



TCP (2-5a)

ONE LANE CLOSED



TCP (2-5b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

TCP (2-5a)

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

TCP (2-5b)

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

Texas Department of Transportation

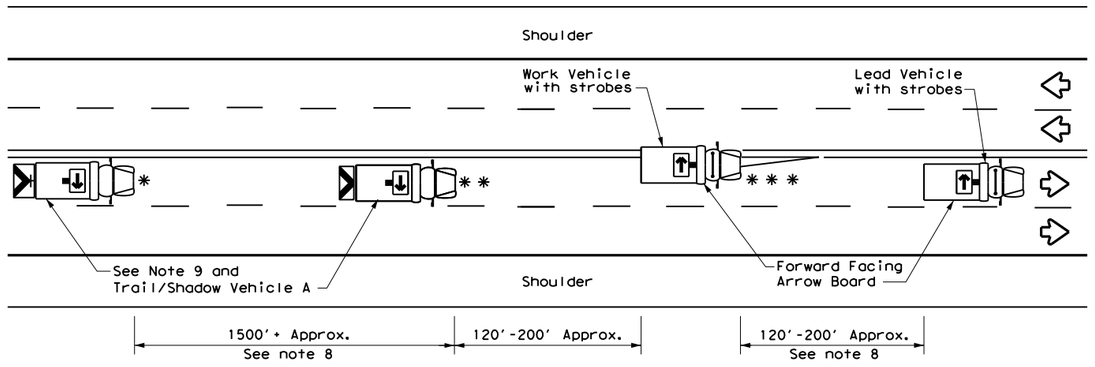
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
LONG TERM LANE CLOSURES
MULTILANE CONVENTIONAL RDS.

TCP(2-5)-18

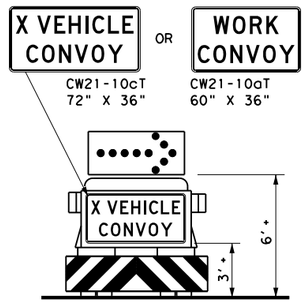
FILE: tcp2-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 2-12 1-97 3-03 4-98 2-18	1427	01	040,etc.	FM1423,etc.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO,etc.		57

DATE: 2/24/2020 3:28:53 PM
FILE: tcp2-5-18.dgn



TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

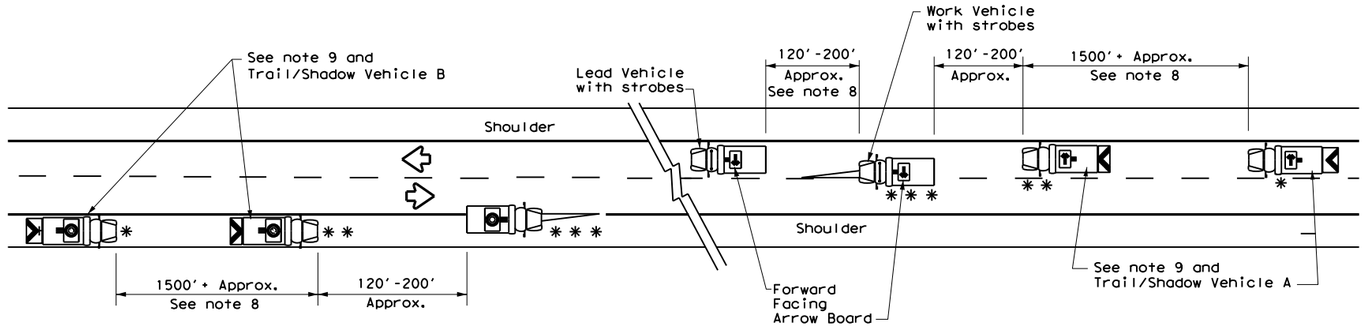
with RIGHT Directional display Flashing Arrow Board

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.

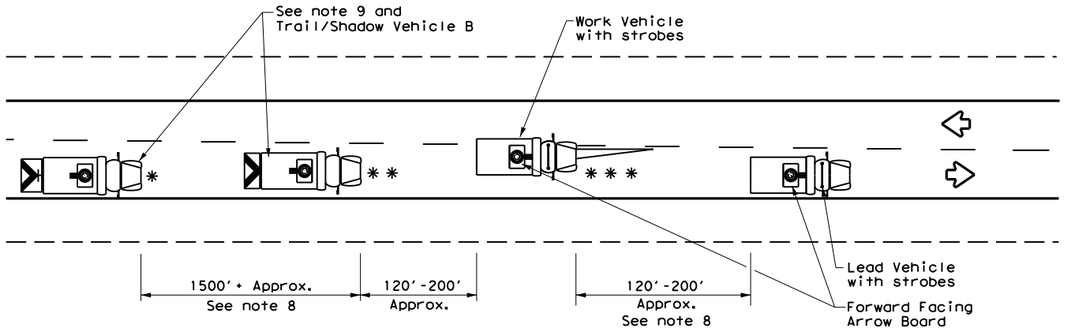


WORK ON SHOULDER

WORK ON TRAVEL LANE

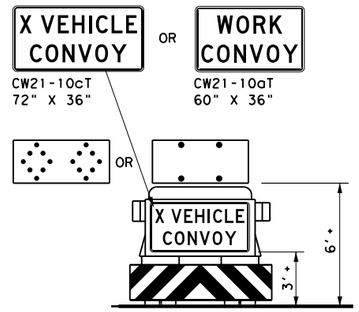
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



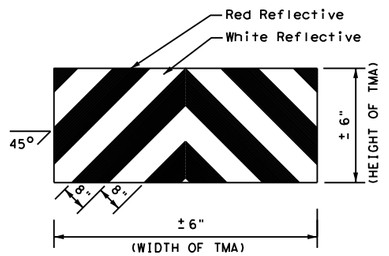
TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board in CAUTION display



STRIPING FOR TMA

Texas Department of Transportation

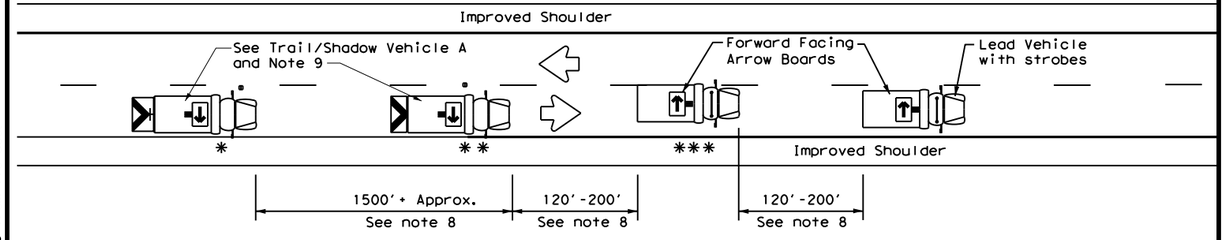
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

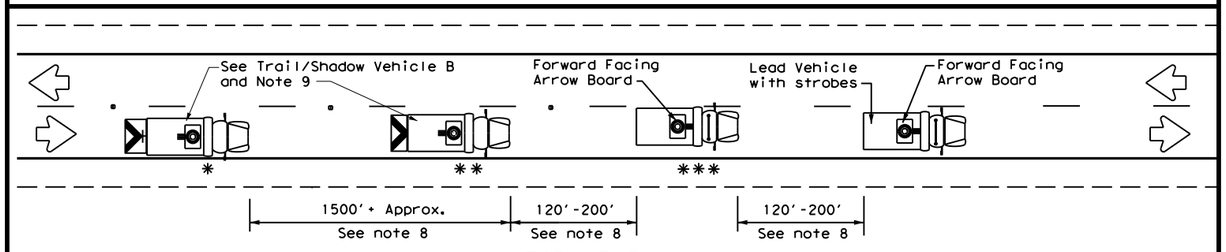
FILE: tcp3-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	1427	01	040,etc.	FM1423,etc.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO,etc.		58

DATE: 2/24/2020 3:29:01 PM
FILE: tcp3-1.dgn



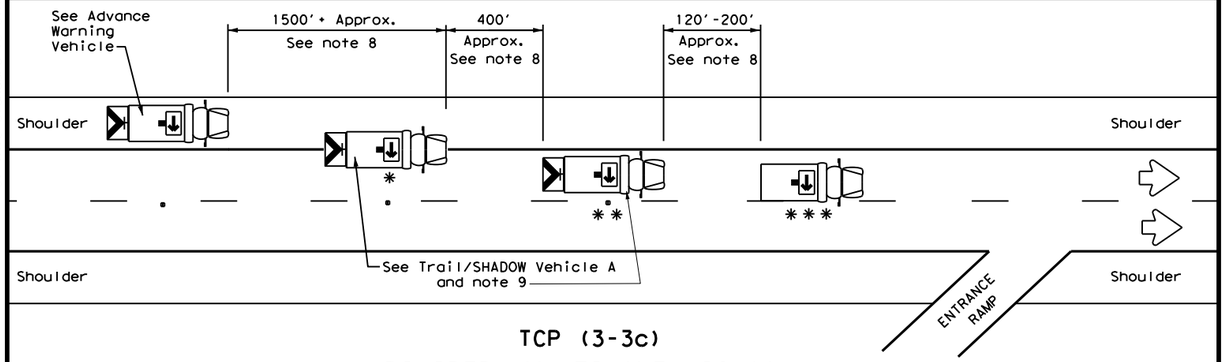
TCP (3-3a)

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



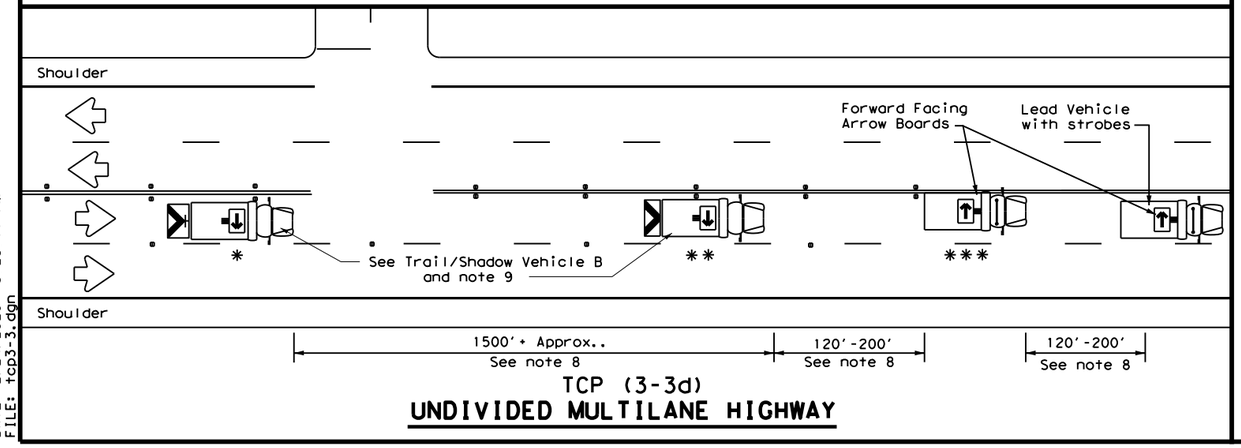
TCP (3-3b)

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



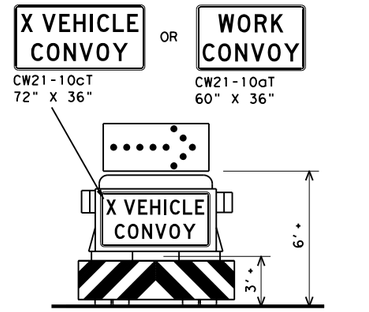
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



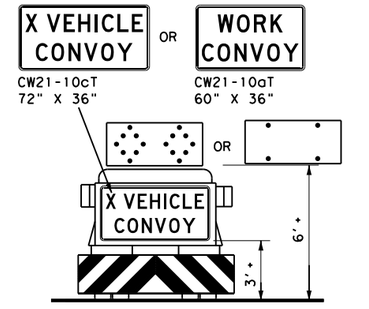
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



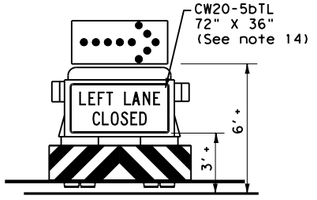
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

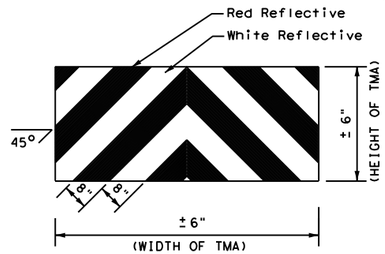


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

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

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

GENERAL NOTES

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

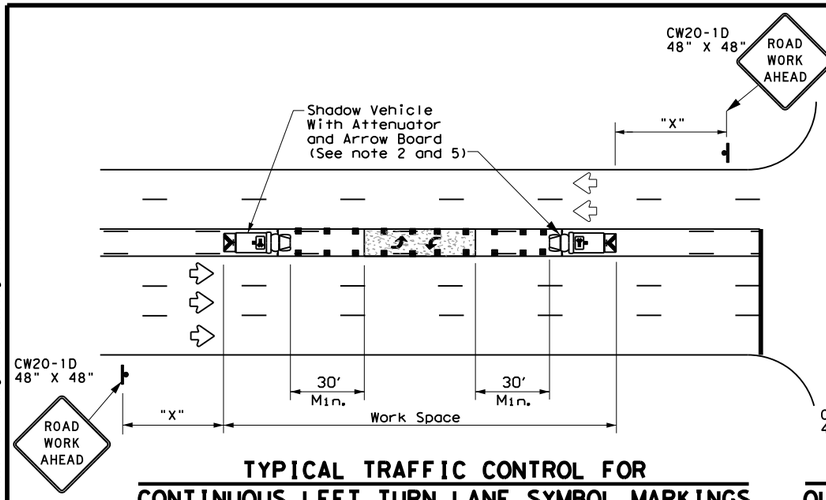
Texas Department of Transportation

Traffic Operations Division Standard

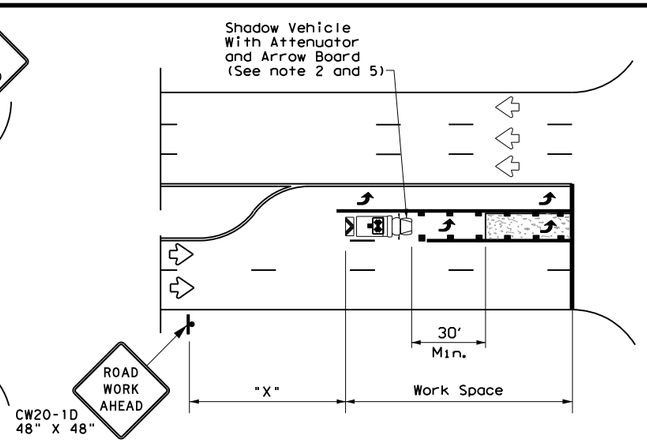
TRAFFIC CONTROL PLAN
MOBILE OPERATIONS
RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL
TCP(3-3)-14

FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040,etc.	FM1423,etc.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	PHR	HIDALGO,etc.		59
1-97 7-14				

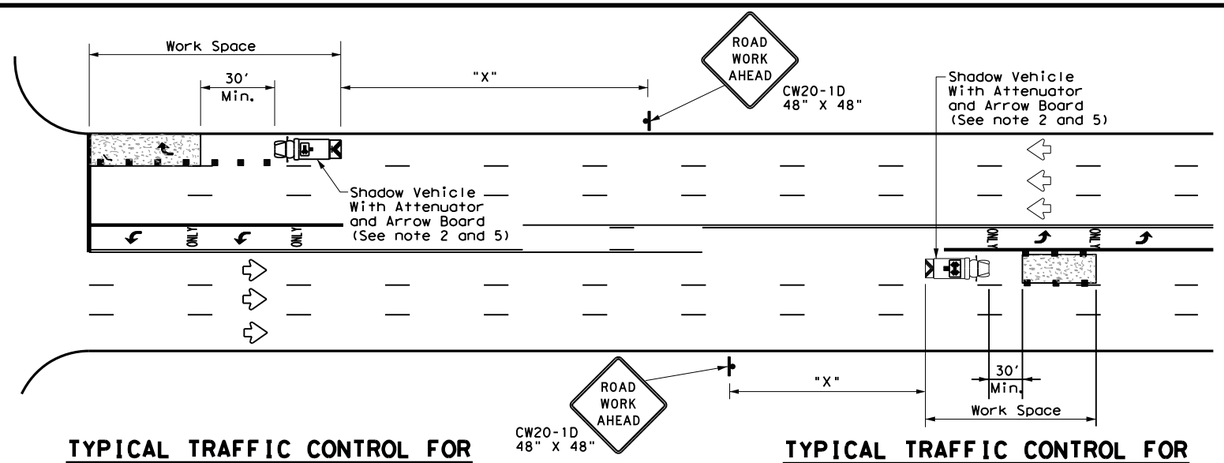
DATE: 2/24/2020 3:29:11 PM
FILE: tcp3-3.dgn



TYPICAL TRAFFIC CONTROL FOR CONTINUOUS LEFT TURN LANE SYMBOL MARKINGS

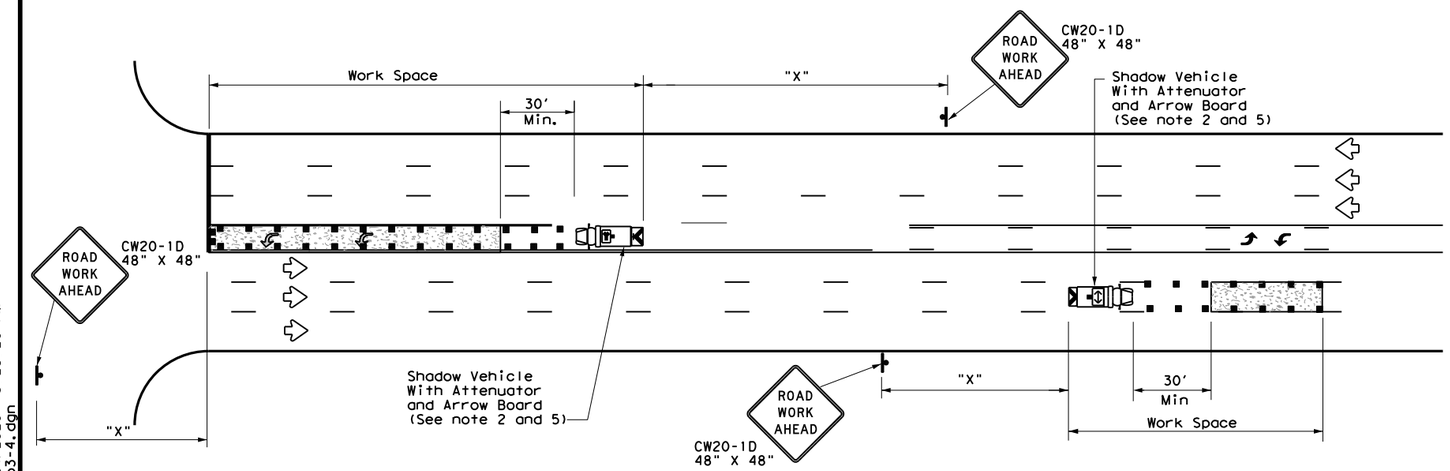


TYPICAL TRAFFIC CONTROL FOR OUTSIDE DUAL LEFT TURN LANE SYMBOL MARKINGS



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'

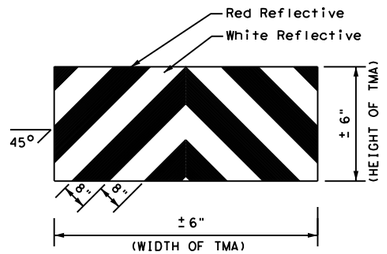
* Conventional Roads Only

** 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

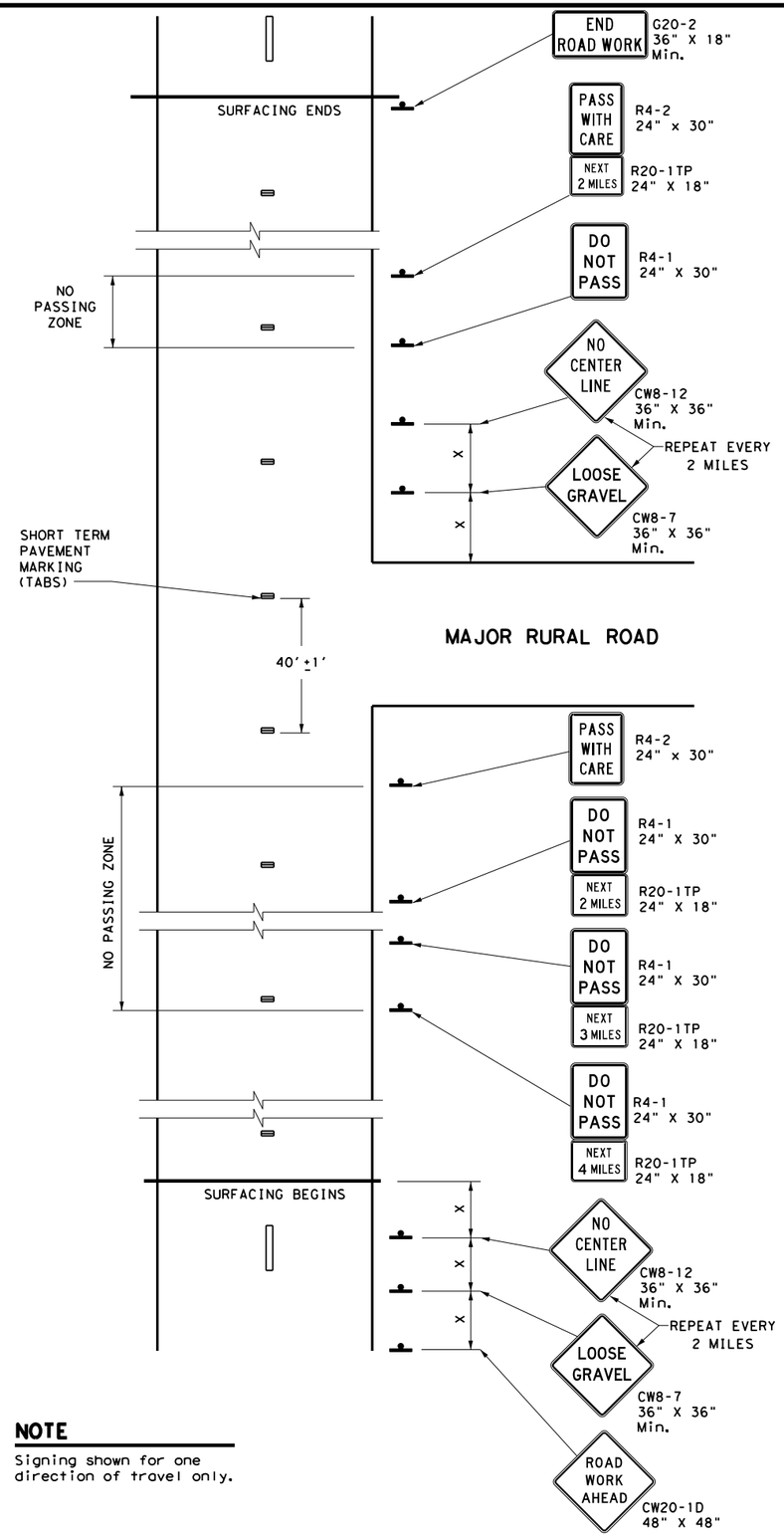
Traffic Operations Division Standard

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	1427	01	040,etc.	FM1423,etc.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO,etc.		60

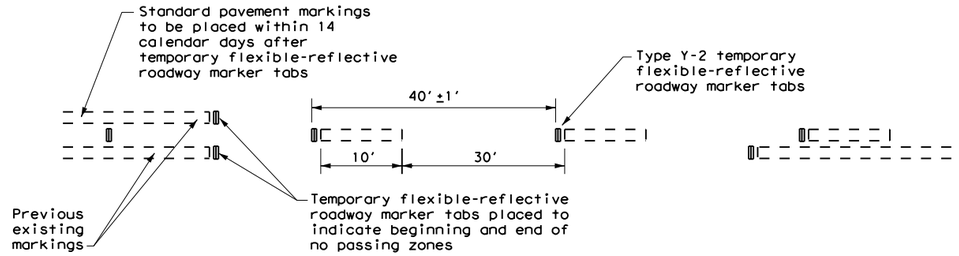
DATE: 2/24/2020 3:29:20 PM
FILE: tcp3-4.dgn



NOTE

Signing shown for one direction of travel only.

NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS



TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS

For seal coat, micro-surface or similar operations

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

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

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

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

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

"NO CENTER LINE" SIGN (CW8-12)

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

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

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

"LOOSE GRAVEL" SIGN (CW8-7)

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

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

PAVEMENT MARKINGS

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

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

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

COORDINATION OF SIGN LOCATIONS

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

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

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

* Conventional Roads Only

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

GENERAL NOTES

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

Texas Department of Transportation | Traffic Operations Division Standard

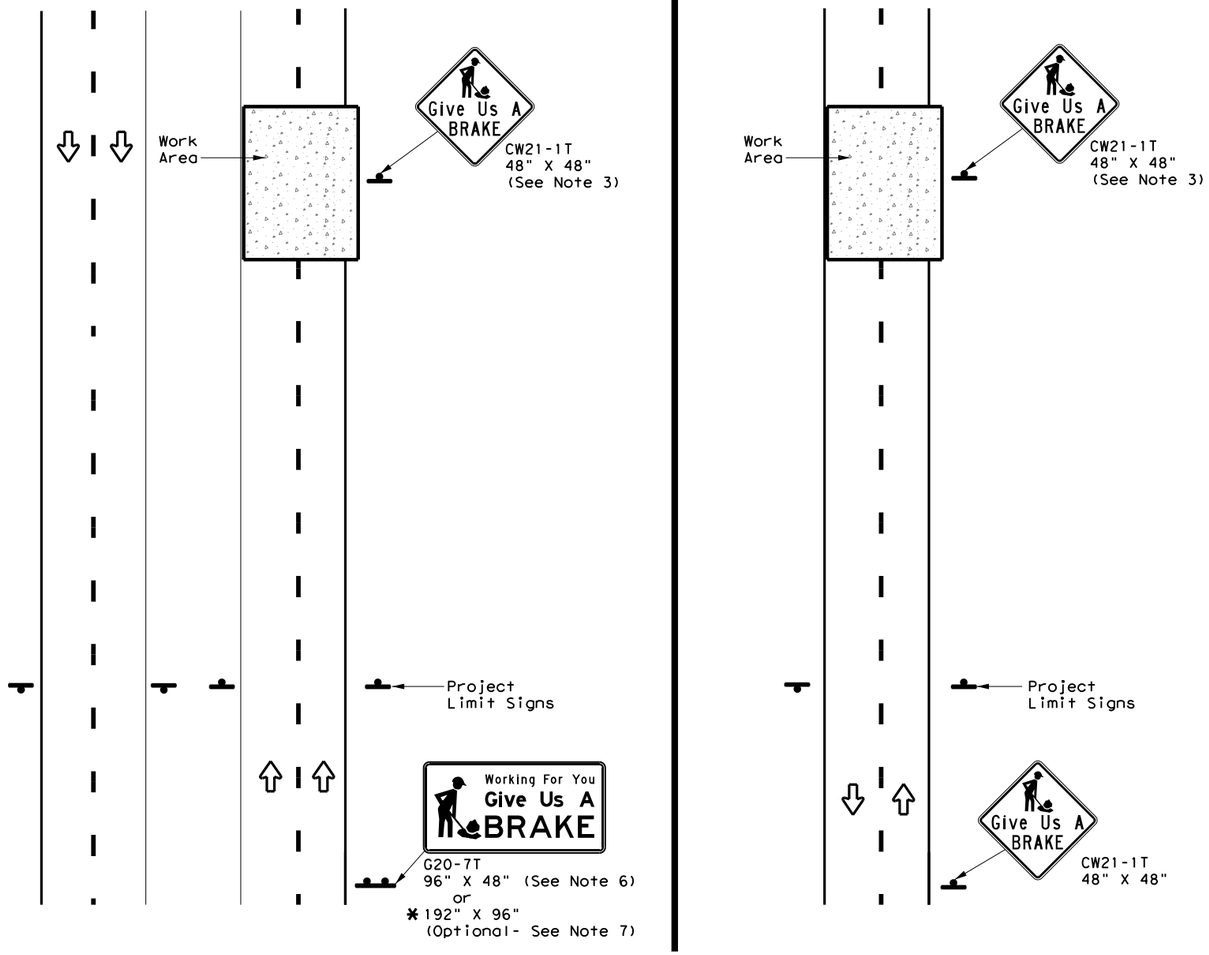
TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS

TCP(7-1)-13

FILE: tcp7-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT March 1991	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040,etc.	FM1423,etc.
4-92 4-98	DIST	COUNTY		SHEET NO.
1-97 7-13	PHR	HIDALGO,etc.		61

210

DATE: 2/24/2020 3:29:28 PM
FILE: tcp7-1.dgn



DIVIDED HIGHWAY

UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

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

SUMMARY OF LARGE SIGNS

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

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040, etc.	FM1423, etc.
6-96 5-98 7-13	DIST	COUNTY		SHEET NO.
8-96 3-03	PHR	HIDALGO, etc.		62

116

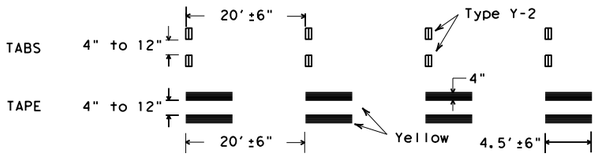
DATE: 2/24/2020 3:29:37 PM
FILE: wzbrk-13.dgn

DATE: 2/24/2020 3:29:49 PM
FILE: wzstpm-13.dgn

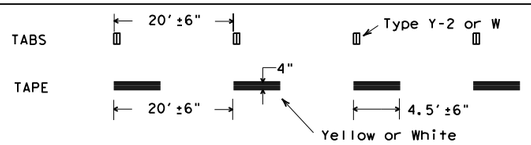
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

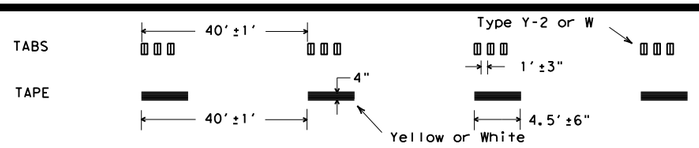


SINGLE NO-PASSING LINE or CHANNELIZATION LINE



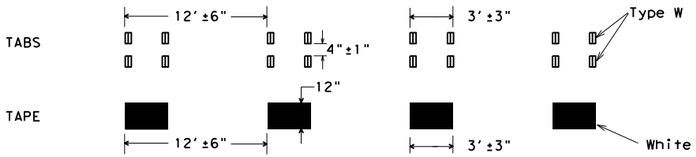
BROKEN LINES

(FOR CENTER LINE OR LANE LINE)

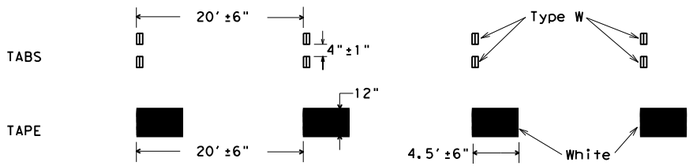


WIDE DOTTED LINES

(FOR LANE DROP LINES)



WIDE GORE MARKINGS



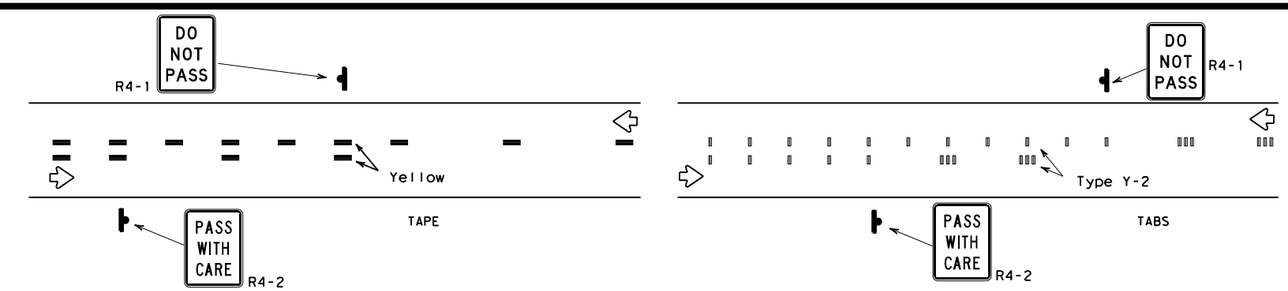
NOTES:

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.

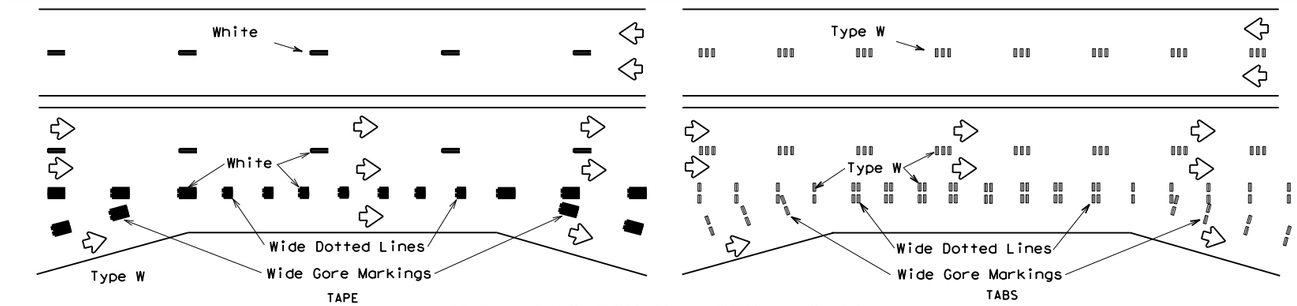
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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.

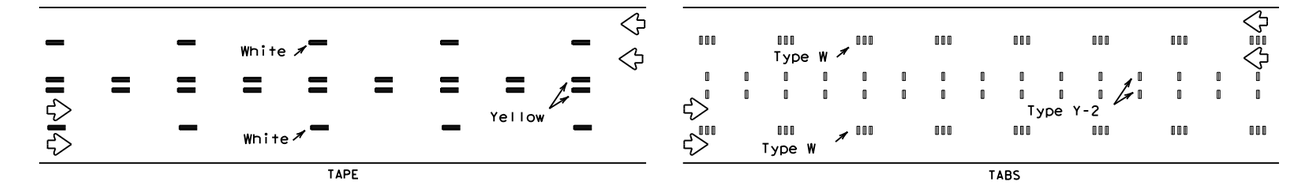
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



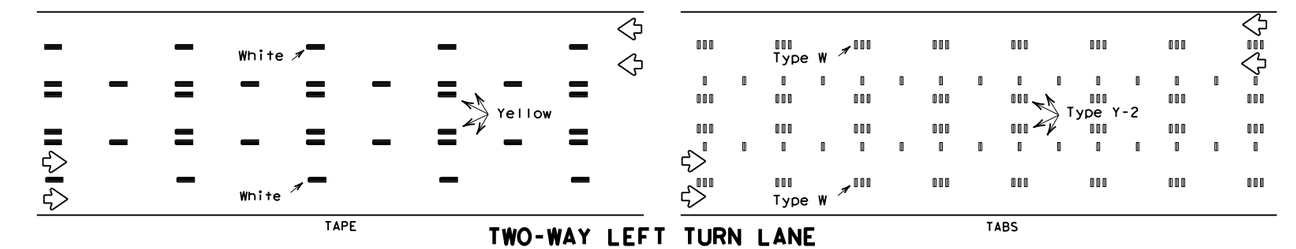
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



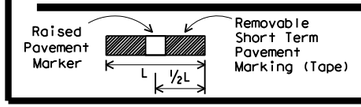
LANE LINES FOR DIVIDED HIGHWAY



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

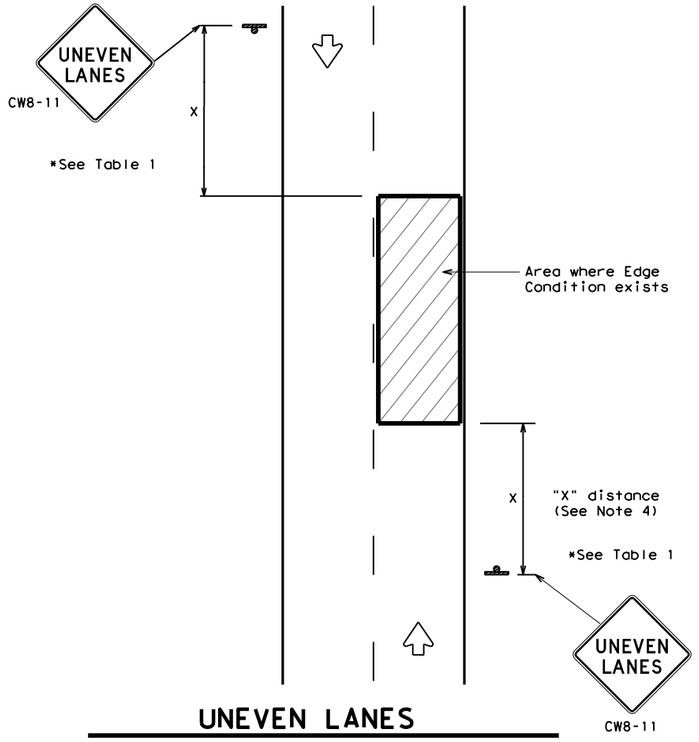
Texas Department of Transportation

Traffic Operations Division Standard

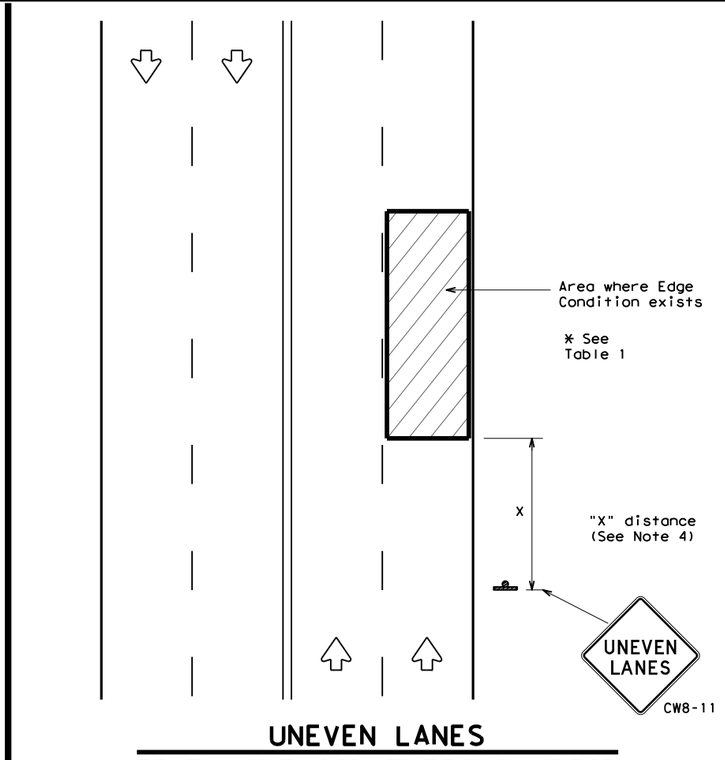
WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-13

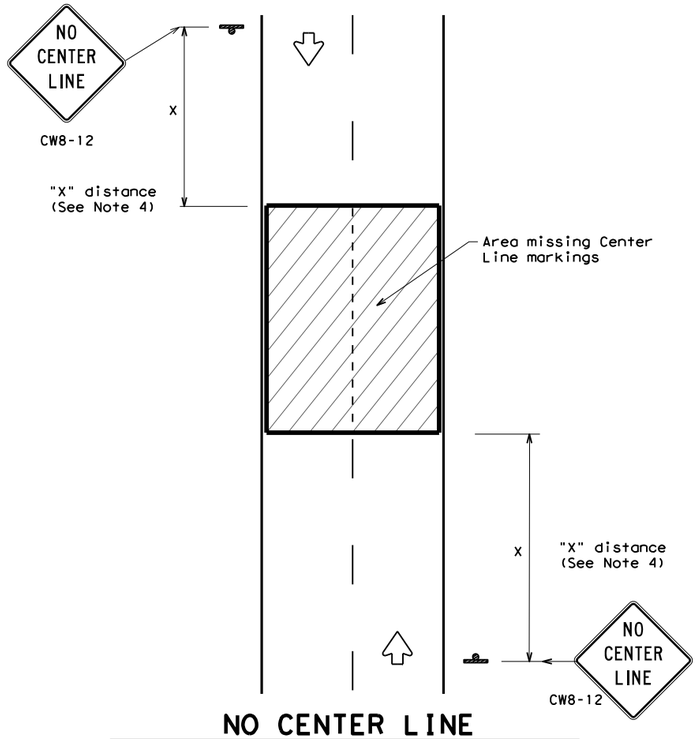
FILE:	wzstpm-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS		1427	01	040, etc.	FM1423, etc.
1-97		DIST	COUNTY		SHEET NO.
3-03		PHR	HIDALGO, etc.		63
7-13					



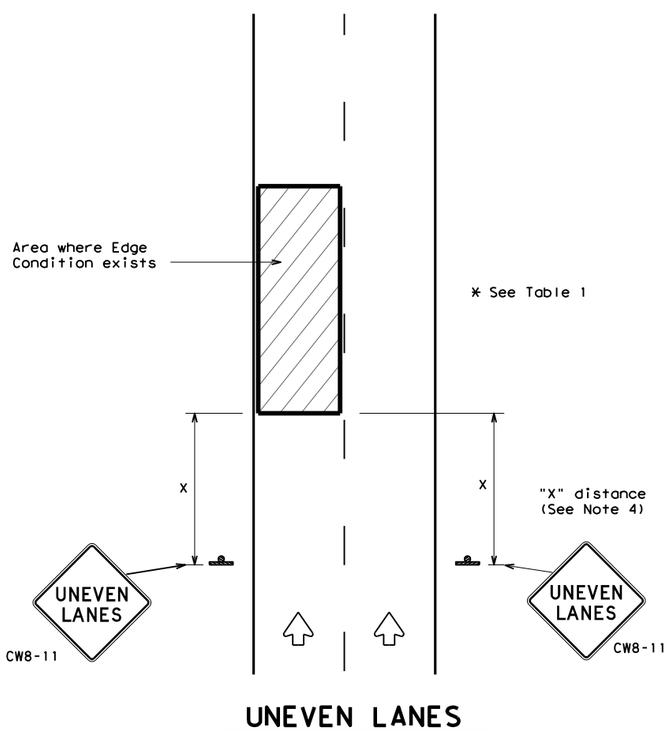
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

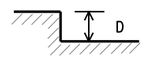
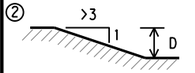
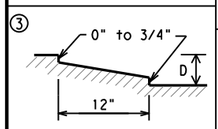
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

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

TABLE 1

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

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

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

Texas Department of Transportation

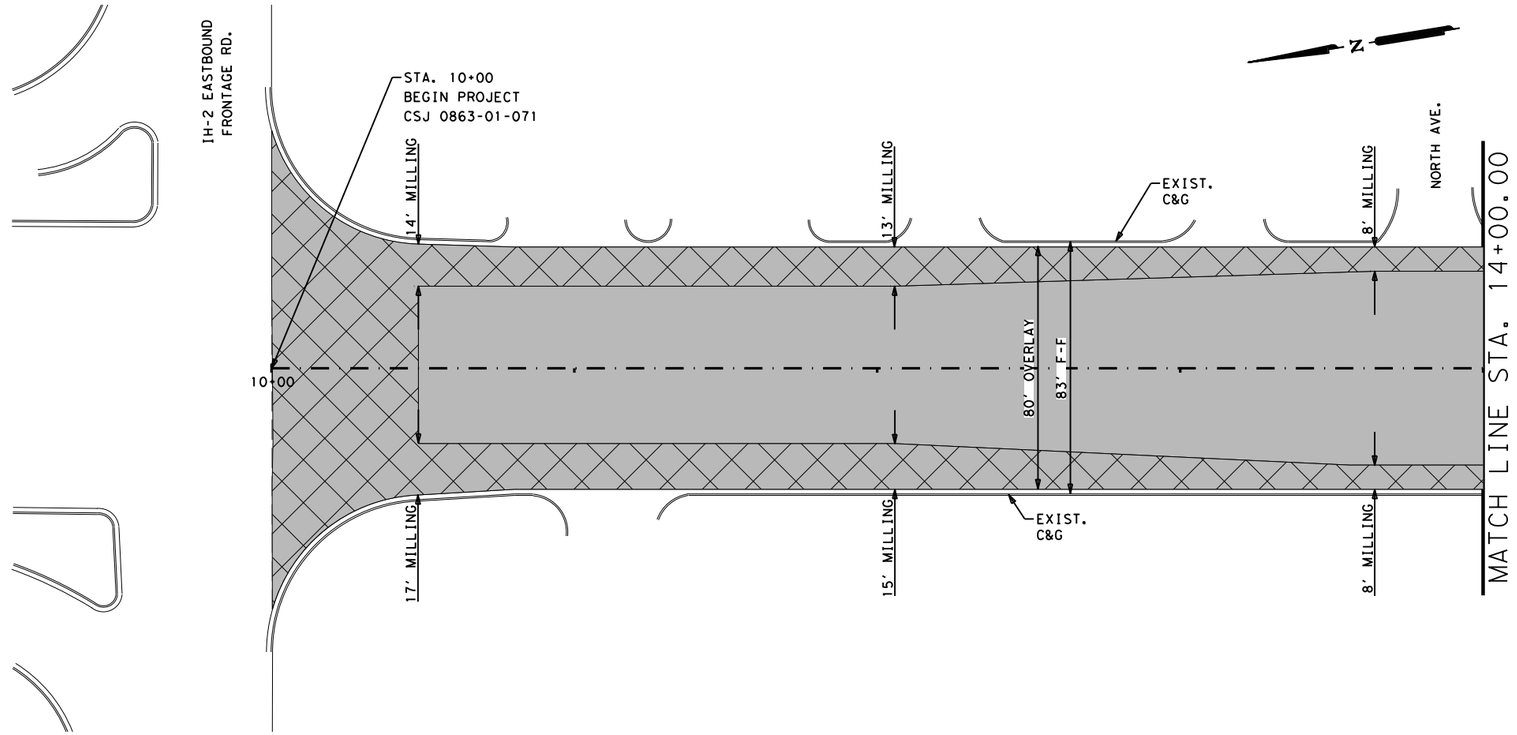
Traffic Operations Division Standard

SIGNING FOR UNEVEN LANES

WZ(UL)-13

FILE:	wzui-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS		1427	01	040, etc.	FM1423, etc.
8-95 2-98 7-13		DIST	COUNTY		SHEET NO.
1-97 3-03		PHR	HIDALGO, etc.		64

DATE: 2/24/2020 3:29:58 PM
FILE: wzui-13.dgn

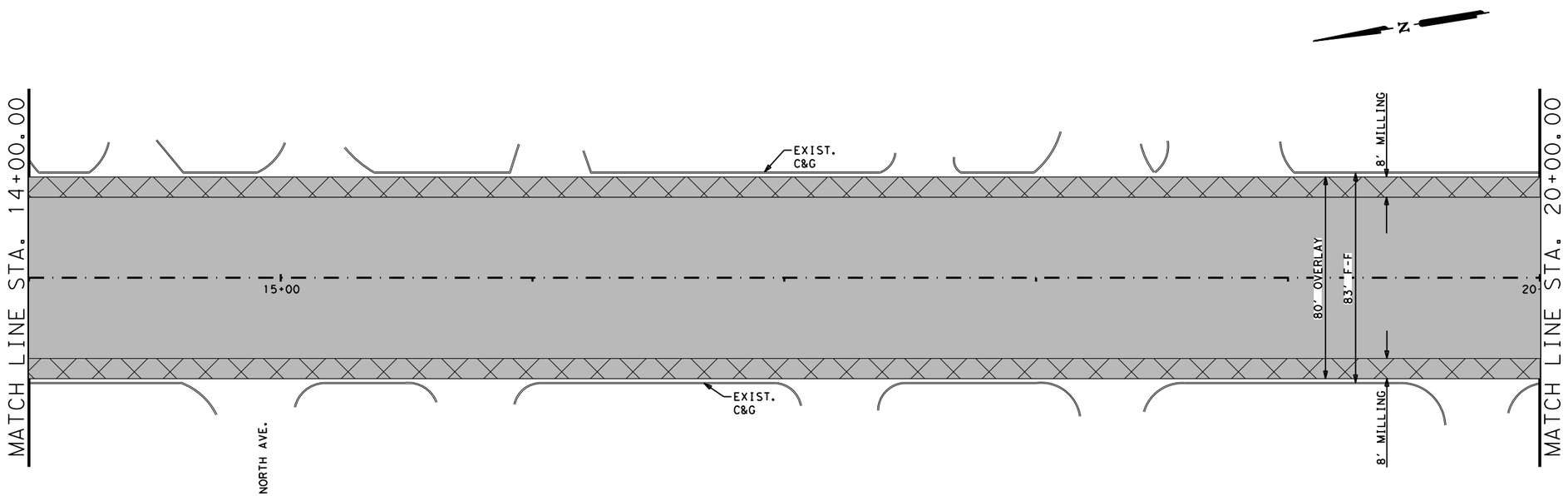


LEGEND:

PROP. OVERLAY

PROP. 0"-1.5" MILLING

* NOTE:
EXIST. MANHOLES SHALL MATCH FINAL SURFACE (OVERLAY) ELEVATIONS



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

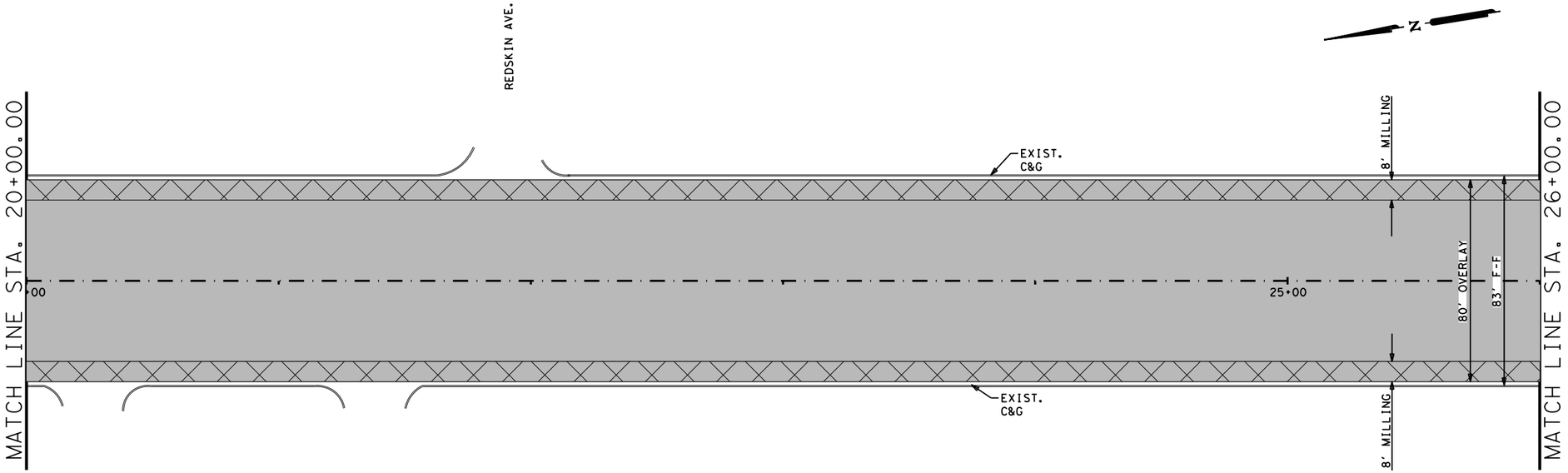
Texas Department of Transportation

FM 493
LOCATION 3
OVERLAY & MILLING DETAILS

SHEET 1 OF 4

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		65

DATE: 2/24/2020 3:30:18 PM
FILE: LOC3PP01.dgn

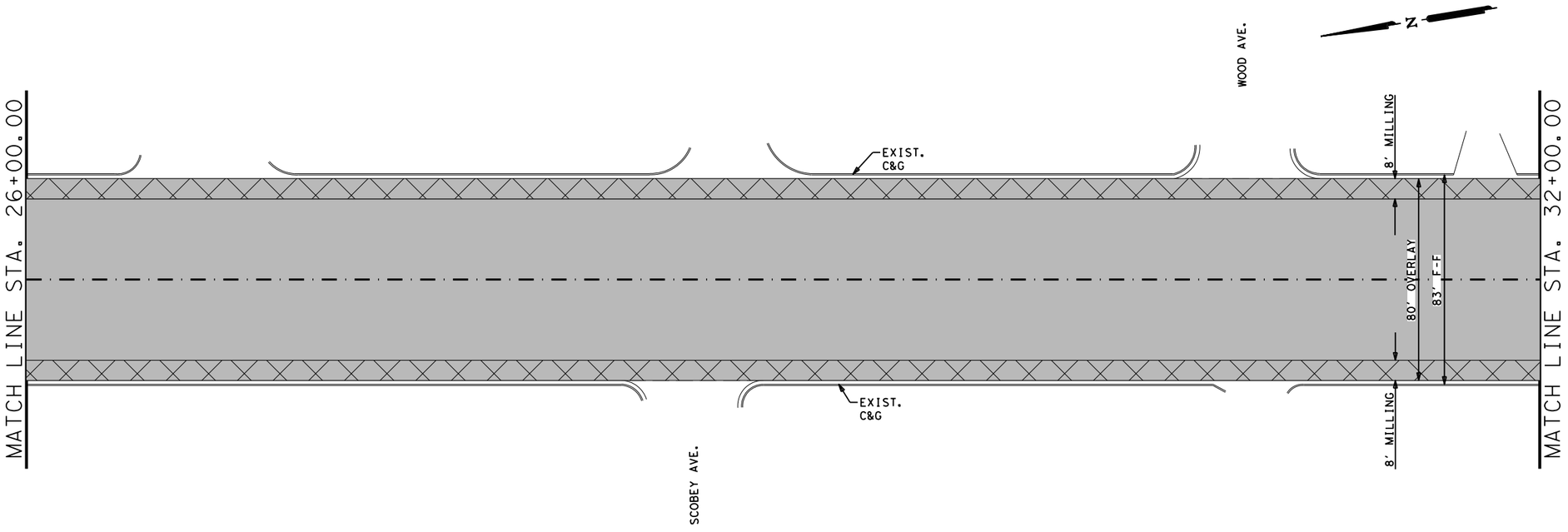


LEGEND:

PROP. OVERLAY

PROP. 0"-1.5" MILLING

* NOTE:
EXIST. MANHOLES SHALL MATCH FINAL SURFACE (OVERLAY) ELEVATIONS



SCALE (IN FEET):

0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

Texas Department of Transportation

FM 493 LOCATION 3 OVERLAY & MILLING DETAILS

SHEET 2 OF 4

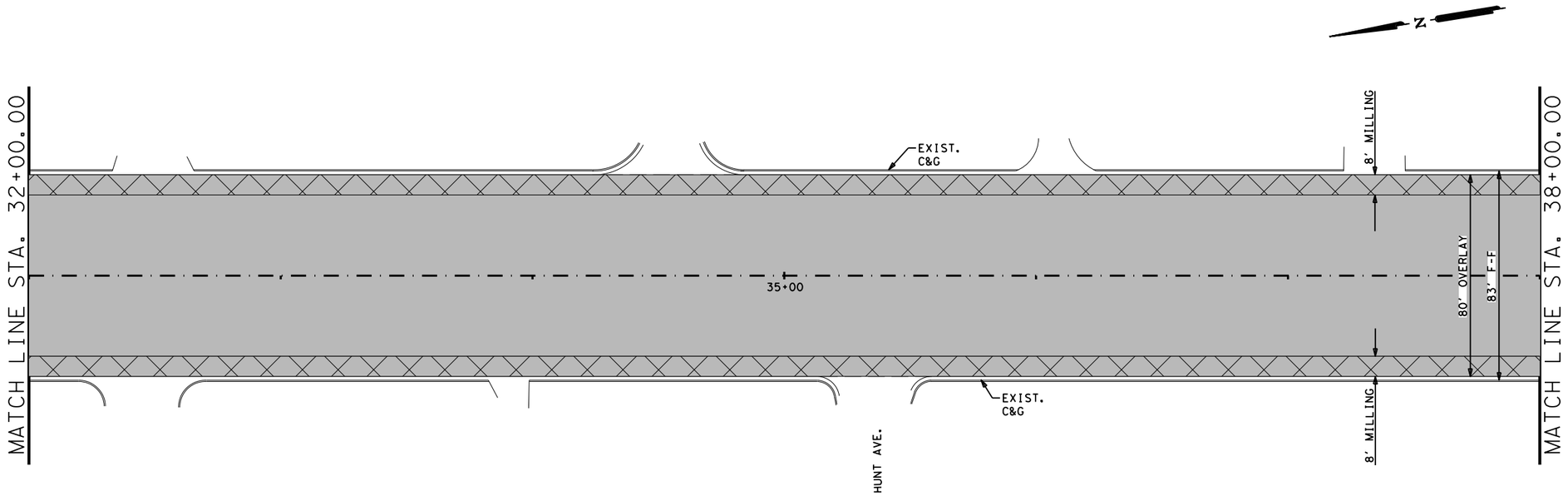
CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		66

DATE: 2/24/2020 3:30:28 PM
FILE: LOC3PP02.dgn

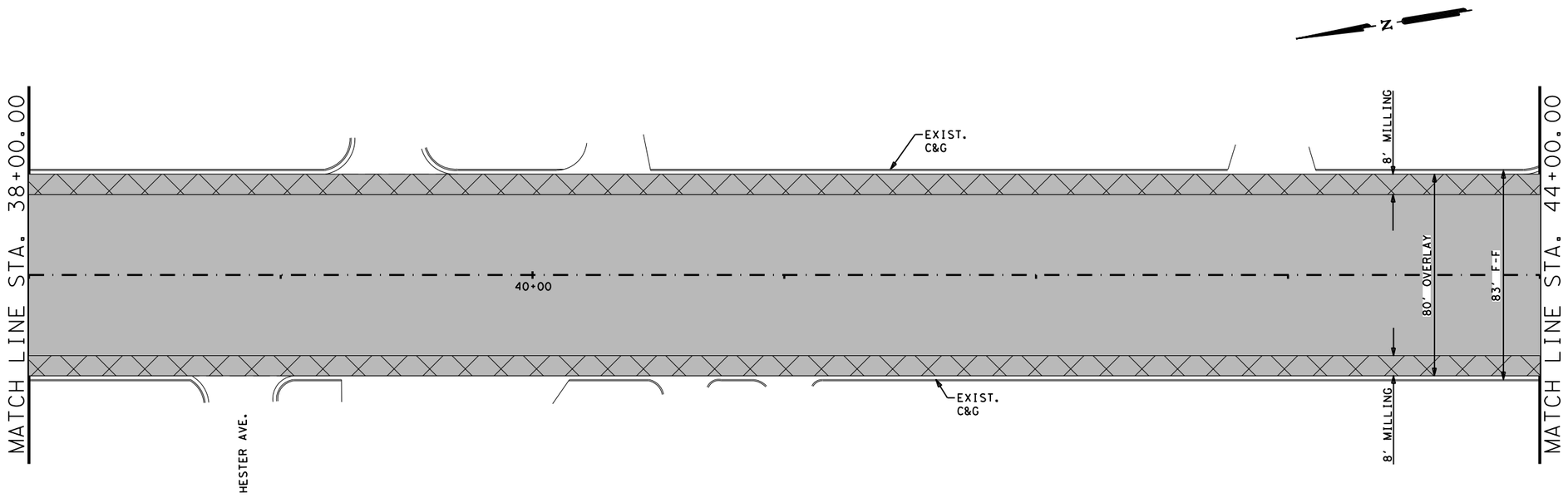
LEGEND:

PROP. OVERLAY

PROP. 0"-1.5" MILLING



* NOTE:
EXIST. MANHOLES SHALL MATCH FINAL SURFACE (OVERLAY) ELEVATIONS



SCALE (IN FEET):

0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

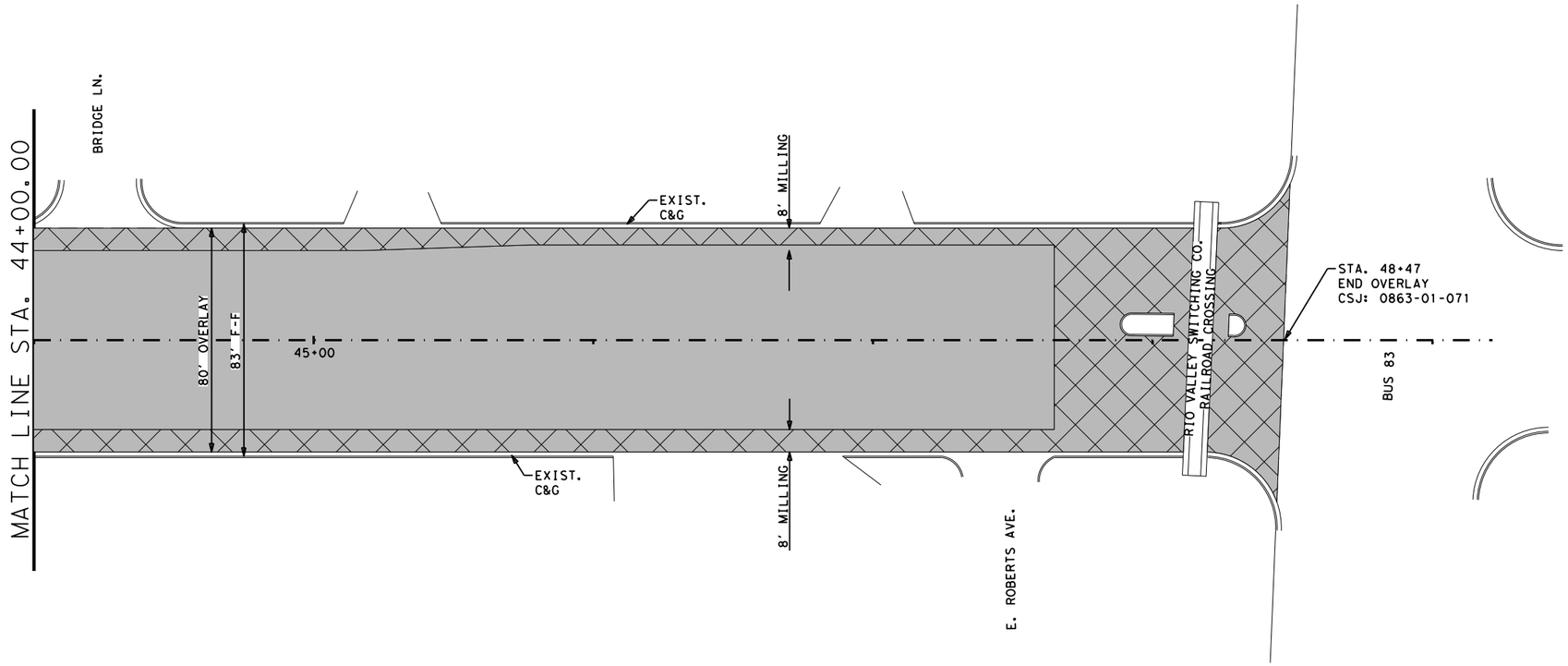
Texas Department of Transportation

FM 493
LOCATION 3
OVERLAY & MILLING DETAILS

SHEET 3 OF 4

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		67

DATE: 2/24/2020 3:30:36 PM
FILE: LOC3PP03.dgn



LEGEND:

PROP. OVERLAY

PROP. 0"-1.5" MILLING

* NOTE:
EXIST. MANHOLES SHALL MATCH FINAL SURFACE (OVERLAY) ELEVATIONS

SCALE (IN FEET):

0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

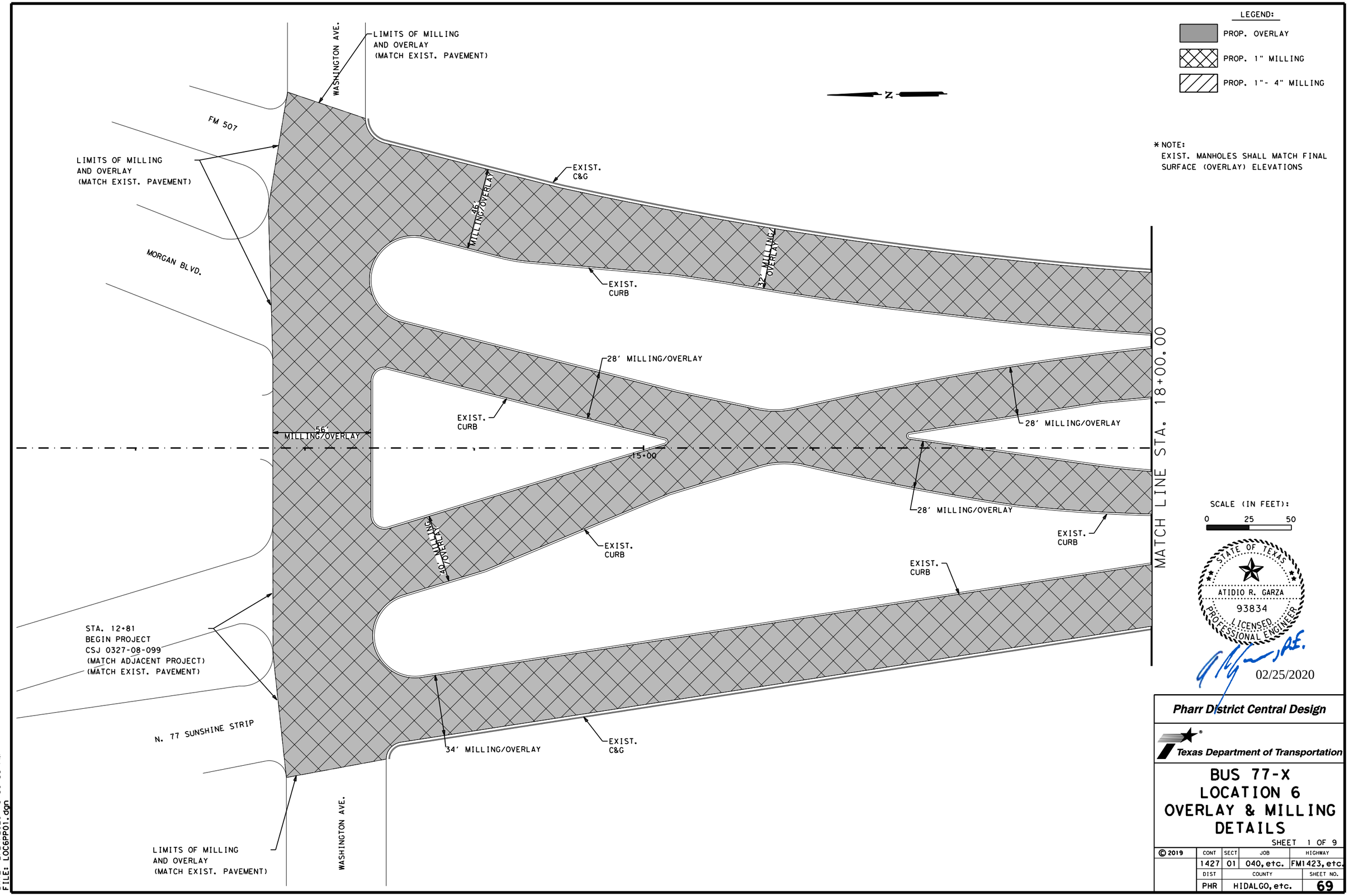
Texas Department of Transportation

FM 493
LOCATION 3
OVERLAY & MILLING DETAILS

SHEET 4 OF 4

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		68

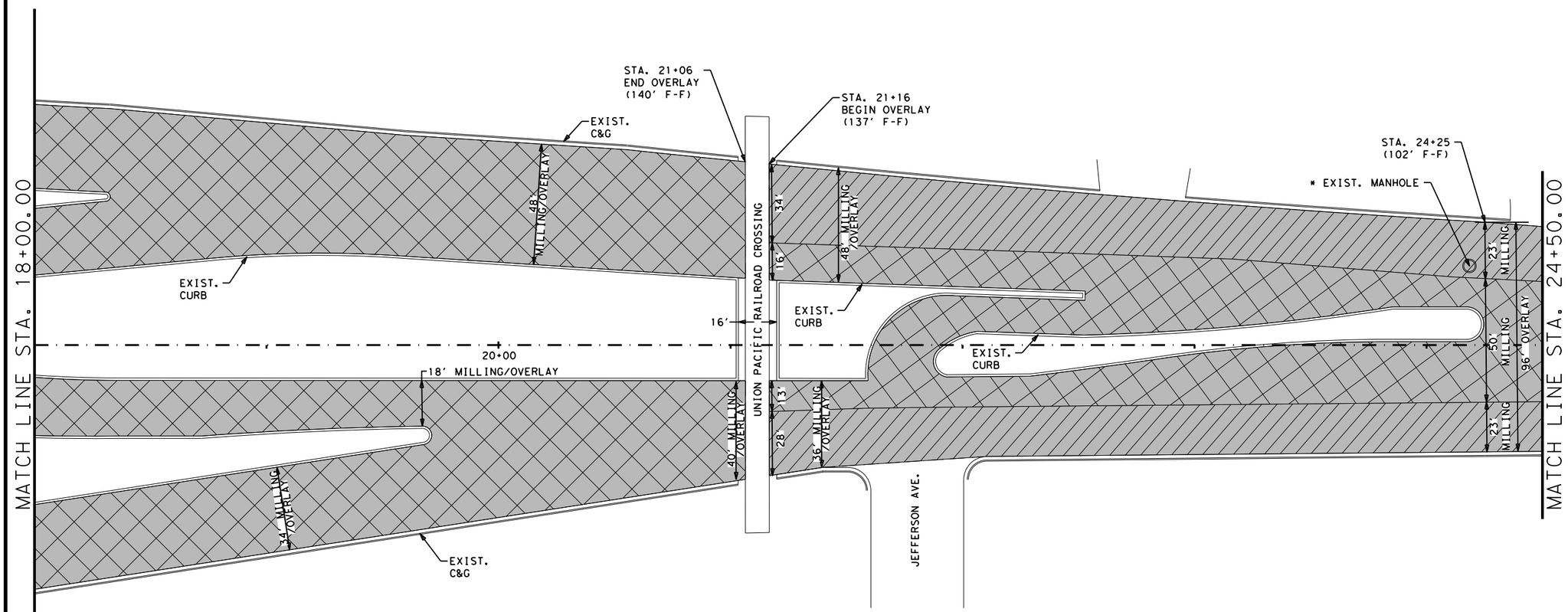
DATE: 2/24/2020 3:30:43 PM
FILE: LOC3PP04.dgn


LEGEND:
PROP. OVERLAY
PROP. 1" MILLING
PROP. 1"- 4" MILLING
* NOTE:
EXIST. MANHOLES SHALL MATCH FINAL SURFACE (OVERLAY) ELEVATIONS
N
WASHINGTON AVE.
LIMITS OF MILLING AND OVERLAY (MATCH EXIST. PAVEMENT)
FM 507
LIMITS OF MILLING AND OVERLAY (MATCH EXIST. PAVEMENT)
MORGAN BLVD.
EXIST. C&G
46' MILLING/OVERLAY
EXIST. CURB
32' MILLING/OVERLAY
28' MILLING/OVERLAY
EXIST. CURB
28' MILLING/OVERLAY
56' MILLING/OVERLAY
15+00
28' MILLING/OVERLAY
EXIST. CURB
40' MILLING/OVERLAY
EXIST. CURB
EXIST. CURB
STA. 12+81
BEGIN PROJECT
CSJ 0327-08-099
(MATCH ADJACENT PROJECT)
(MATCH EXIST. PAVEMENT)
N. 77 SUNSHINE STRIP
34' MILLING/OVERLAY
EXIST. C&G
LIMITS OF MILLING AND OVERLAY (MATCH EXIST. PAVEMENT)
WASHINGTON AVE.
MATCH LINE STA. 18+00.00
SCALE (IN FEET):
0 25 50
STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
02/25/2020
Pharr District Central Design
Texas Department of Transportation
BUS 77-X
LOCATION 6
OVERLAY & MILLING
DETAILS
SHEET 1 OF 9
© 2019
CONT 1427
SECT 01
JOB 040, etc.
HIGHWAY FM1423, etc.
DIST PHR
COUNTY HIDALGO, etc.
SHEET NO. 69
DATE: 2/24/2020 3:30:59 PM
FILE: LOC6PP01.dgn

LEGEND:

- PROP. OVERLAY
- PROP. 1" MILLING
- PROP. 1"- 4" MILLING

* NOTE:
EXIST. MANHOLES SHALL MATCH FINAL SURFACE (OVERLAY) ELEVATIONS



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

Texas Department of Transportation

BUS 77-X
LOCATION 6
OVERLAY & MILLING DETAILS

SHEET 2 OF 9

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		70

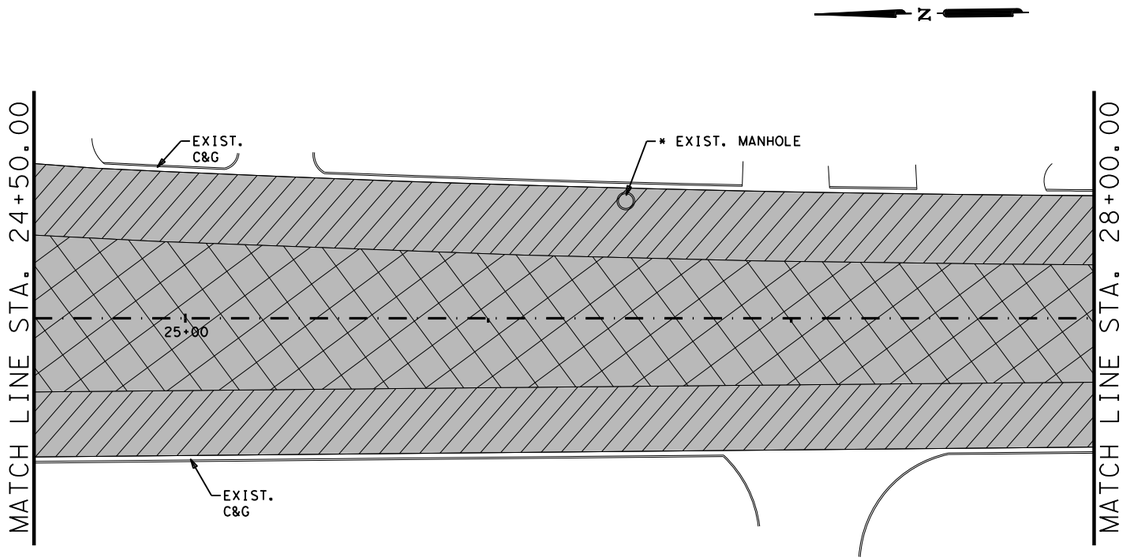
DATE: 2/24/2020 3:31:07 PM
FILE: LOC6PP02.dgn

LEGEND:

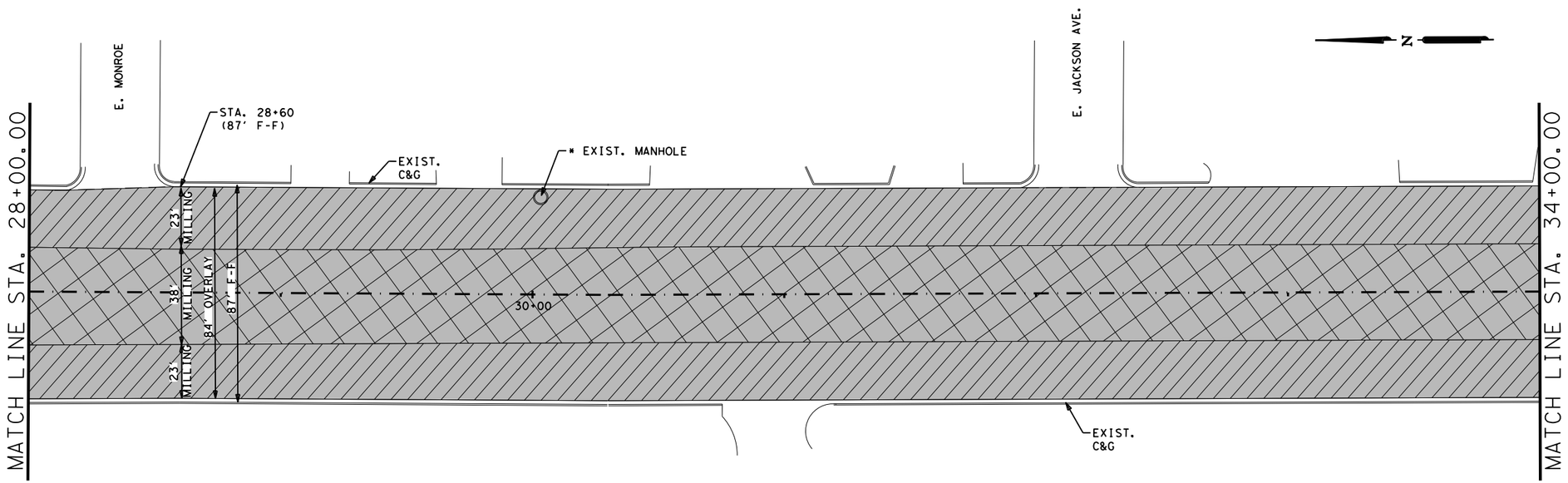
PROP. OVERLAY

PROP. 1" MILLING

PROP. 1"- 4" MILLING



* NOTE:
EXIST. MANHOLES SHALL MATCH FINAL SURFACE (OVERLAY) ELEVATIONS



SCALE (IN FEET):

0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

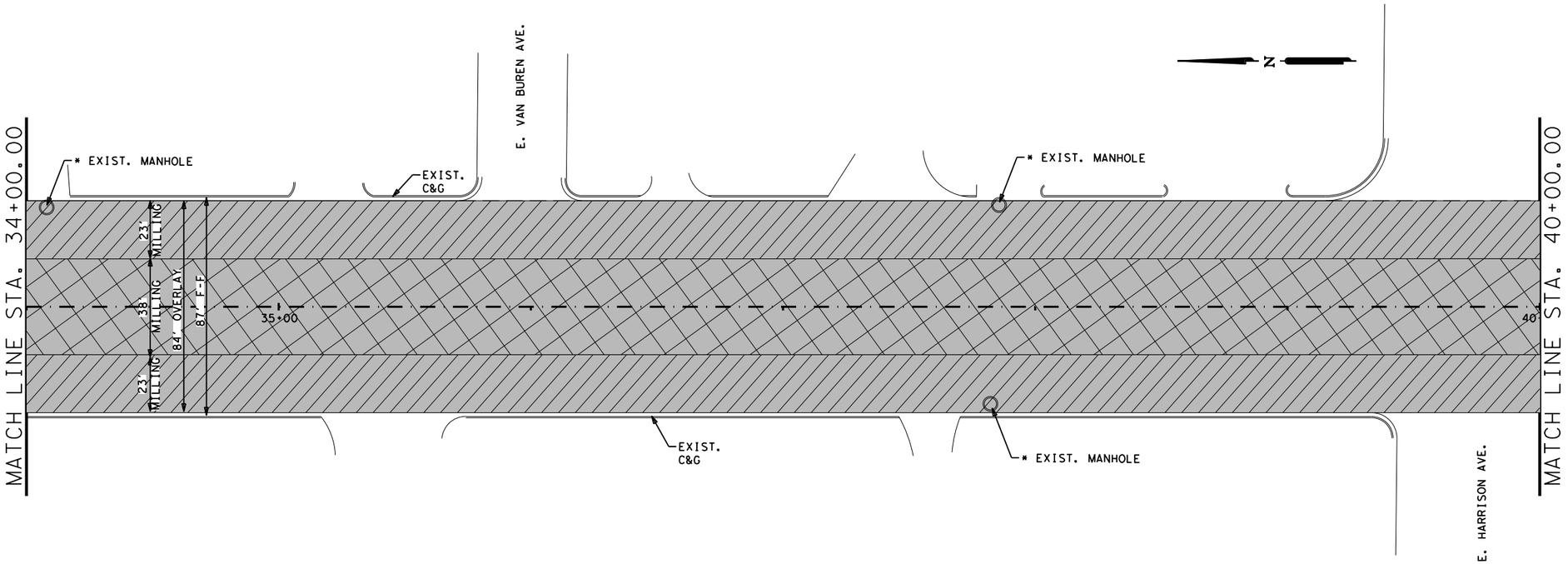
Texas Department of Transportation

BUS 77-X LOCATION 6 OVERLAY & MILLING DETAILS

SHEET 3 OF 9

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		71

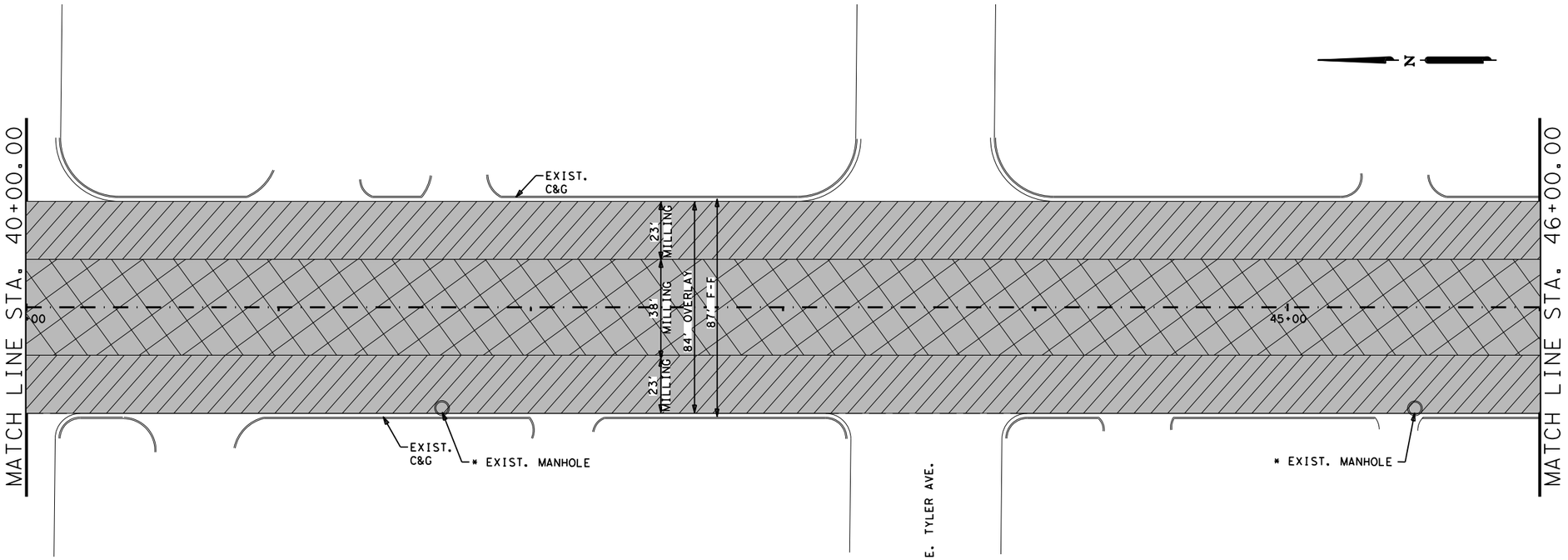
DATE: 2/24/2020 3:31:15 PM
FILE: LOC6PP03.dgn



LEGEND:

- PROP. OVERLAY
- PROP. 1" MILLING
- PROP. 1"- 4" MILLING

* NOTE:
EXIST. MANHOLES SHALL MATCH FINAL SURFACE (OVERLAY) ELEVATIONS



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

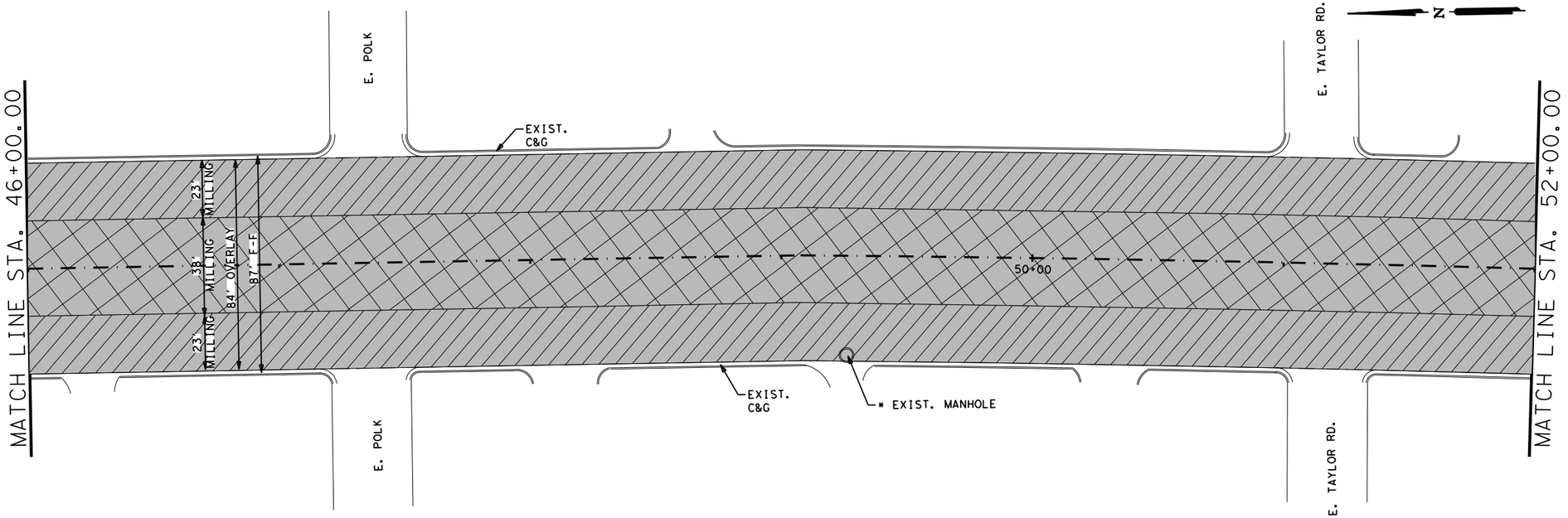
Texas Department of Transportation

BUS 77-X
LOCATION 6
OVERLAY & MILLING DETAILS

SHEET 4 OF 9

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		72

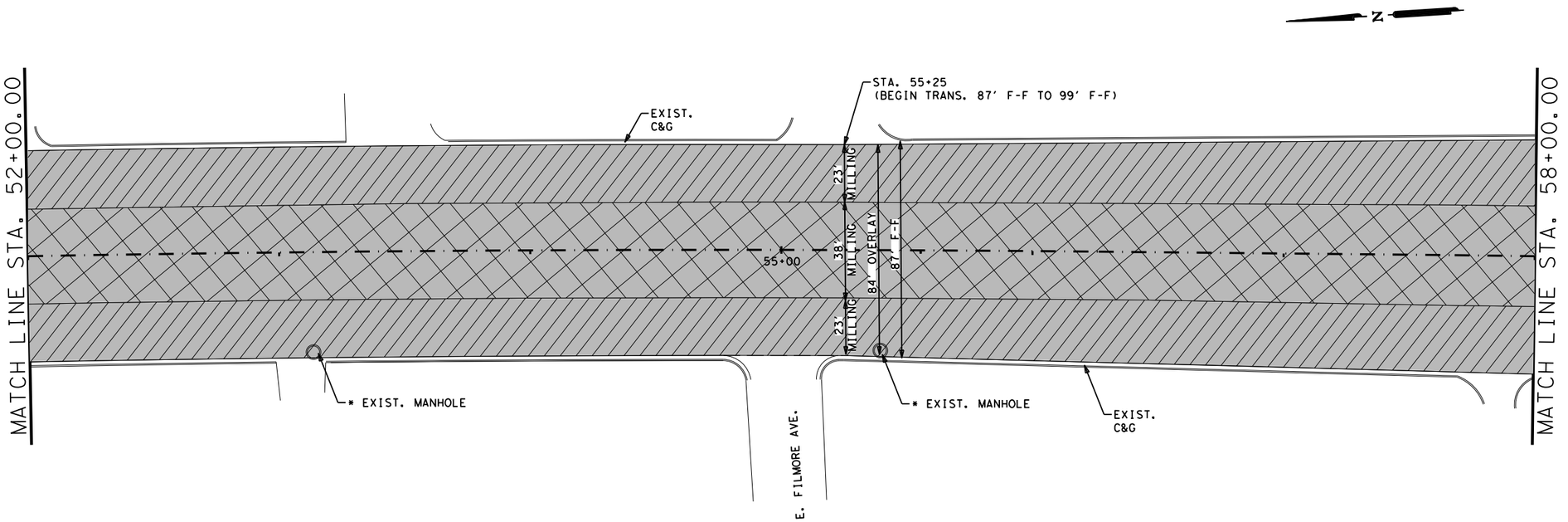
DATE: 2/24/2020 3:31:23 PM
FILE: LOC6PP04.dgn



LEGEND:

- PROP. OVERLAY
- PROP. 1" MILLING
- PROP. 1"- 4" MILLING

* NOTE:
EXIST. MANHOLES SHALL MATCH FINAL SURFACE (OVERLAY) ELEVATIONS



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

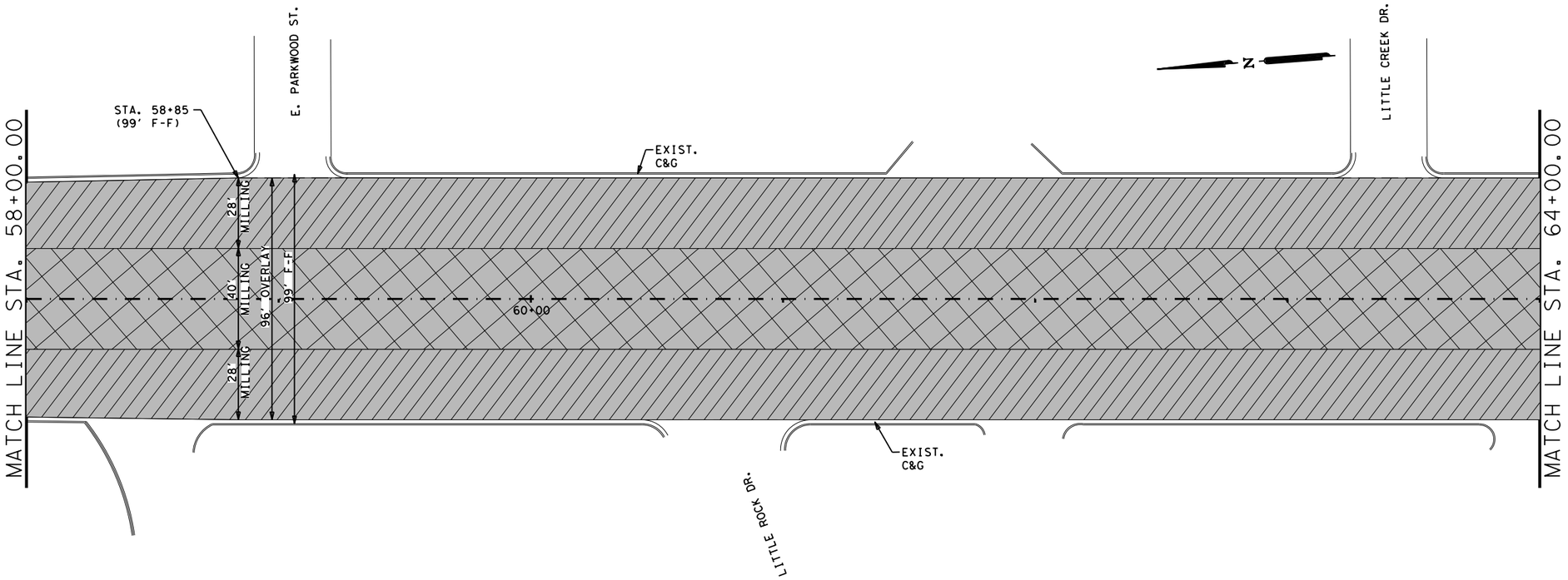
Texas Department of Transportation

BUS 77-X LOCATION 6 OVERLAY & MILLING DETAILS

SHEET 5 OF 9

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		73

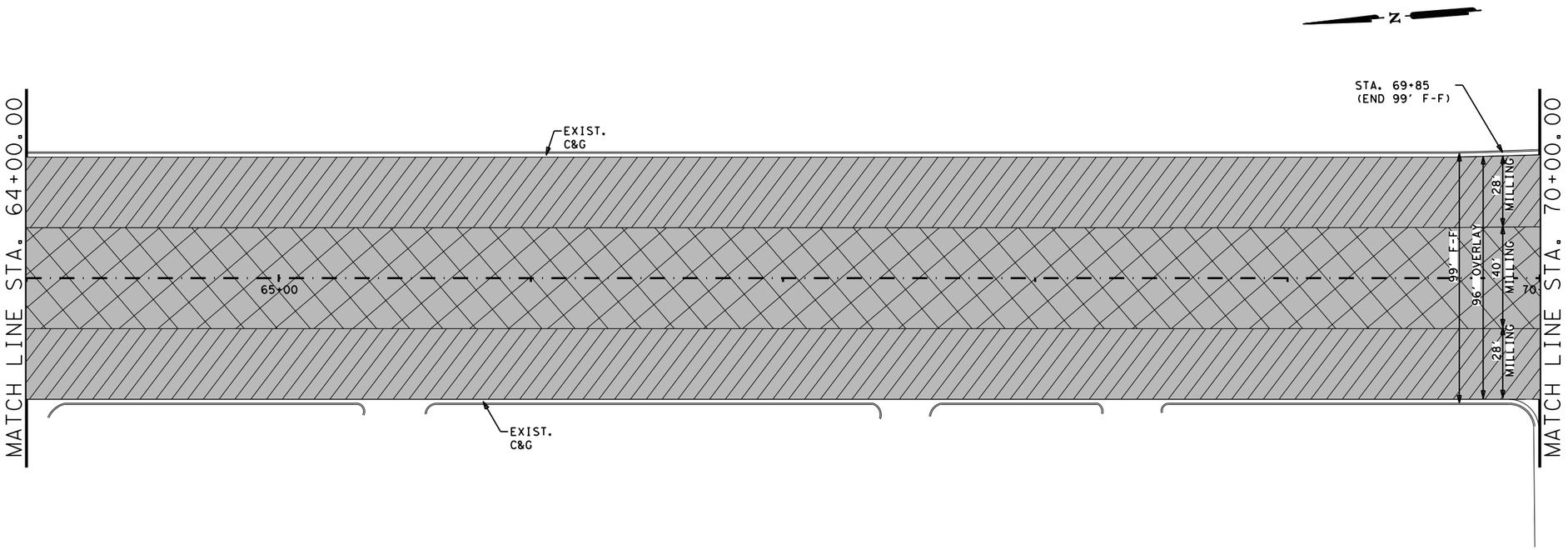
DATE: 2/24/2020 3:31:30 PM
FILE: LOC6PP05.dgn



LEGEND:

- PROP. OVERLAY
- PROP. 1" MILLING
- PROP. 1"- 4" MILLING

* NOTE:
EXIST. MANHOLES SHALL MATCH FINAL SURFACE (OVERLAY) ELEVATIONS



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

Texas Department of Transportation

BUS 77-X LOCATION 6 OVERLAY & MILLING DETAILS

SHEET 6 OF 9

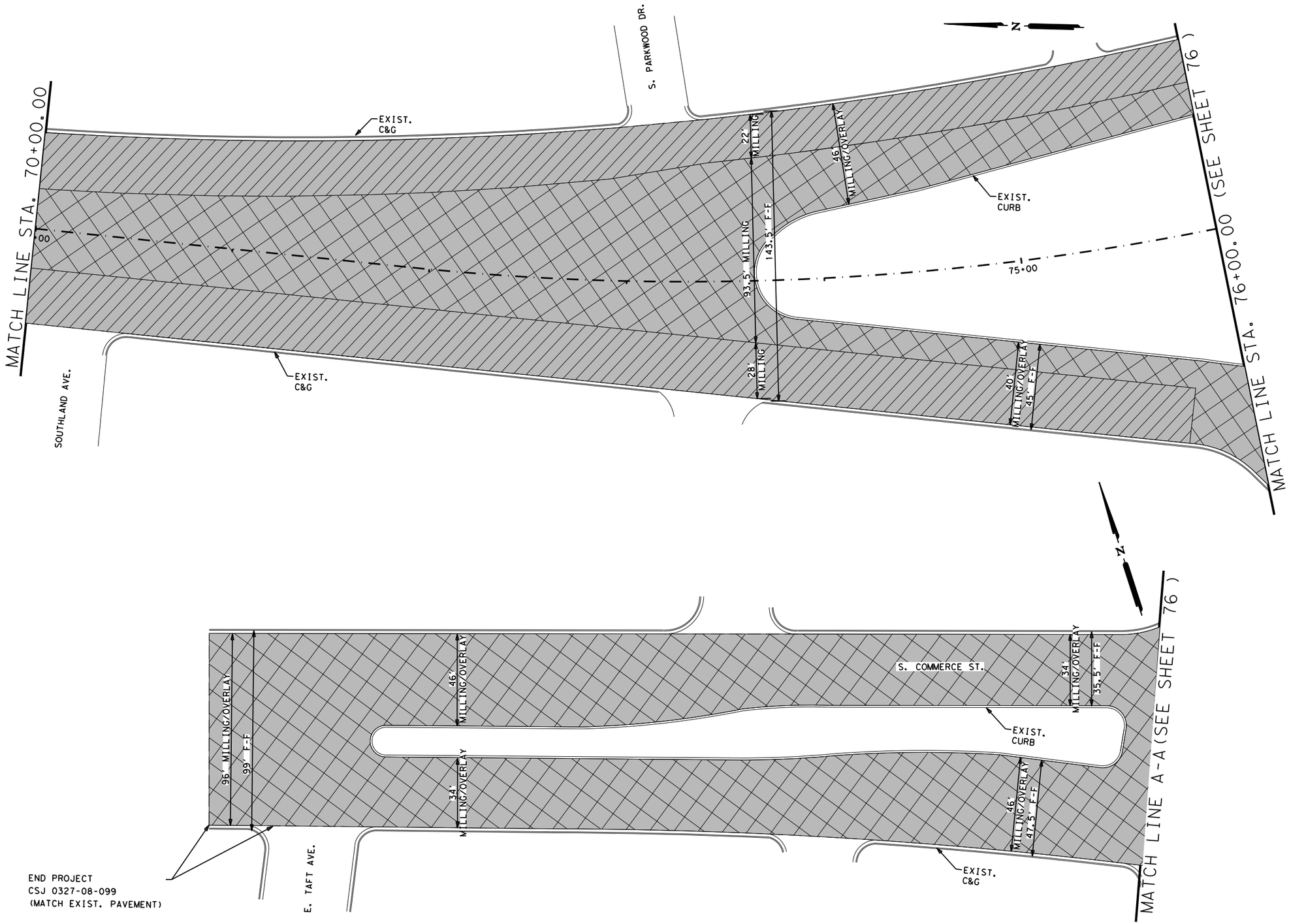
CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		74

DATE: 2/24/2020 3:31:38 PM
FILE: LOC6PP06.dgn

LEGEND:

- PROP. OVERLAY
- PROP. 1" MILLING
- PROP. 1"- 4" MILLING

* NOTE:
EXIST. MANHOLES SHALL MATCH FINAL SURFACE (OVERLAY) ELEVATIONS



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

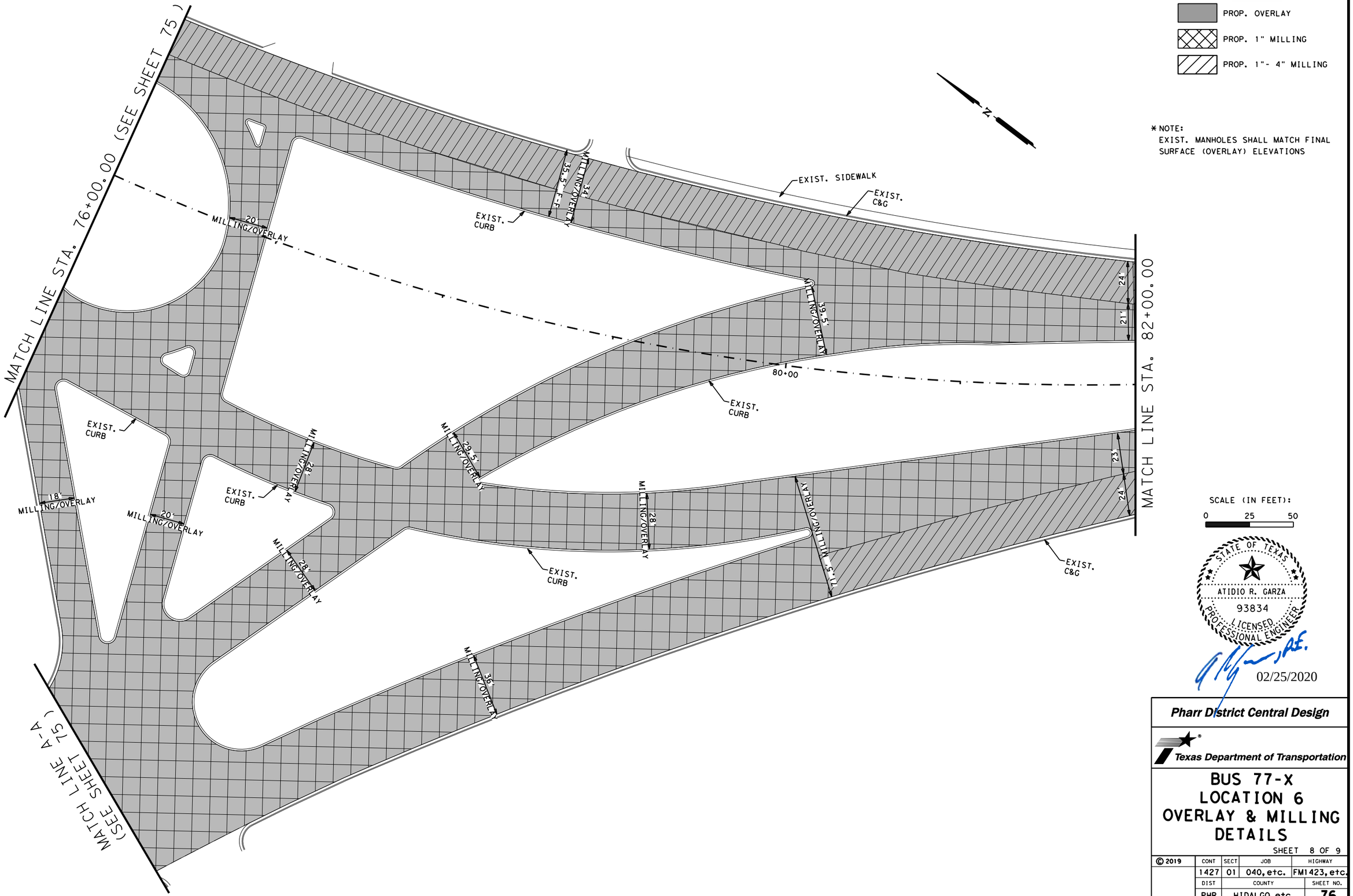
Texas Department of Transportation

BUS 77-X LOCATION 6 OVERLAY & MILLING DETAILS

SHEET 7 OF 9

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		75

DATE: 2/27/2020 8:57:48 AM
FILE: LOC6PP07.dgn



LEGEND:

- PROP. OVERLAY
- PROP. 1" MILLING
- PROP. 1"- 4" MILLING

* NOTE:
EXIST. MANHOLES SHALL MATCH FINAL SURFACE (OVERLAY) ELEVATIONS

SCALE (IN FEET):

0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

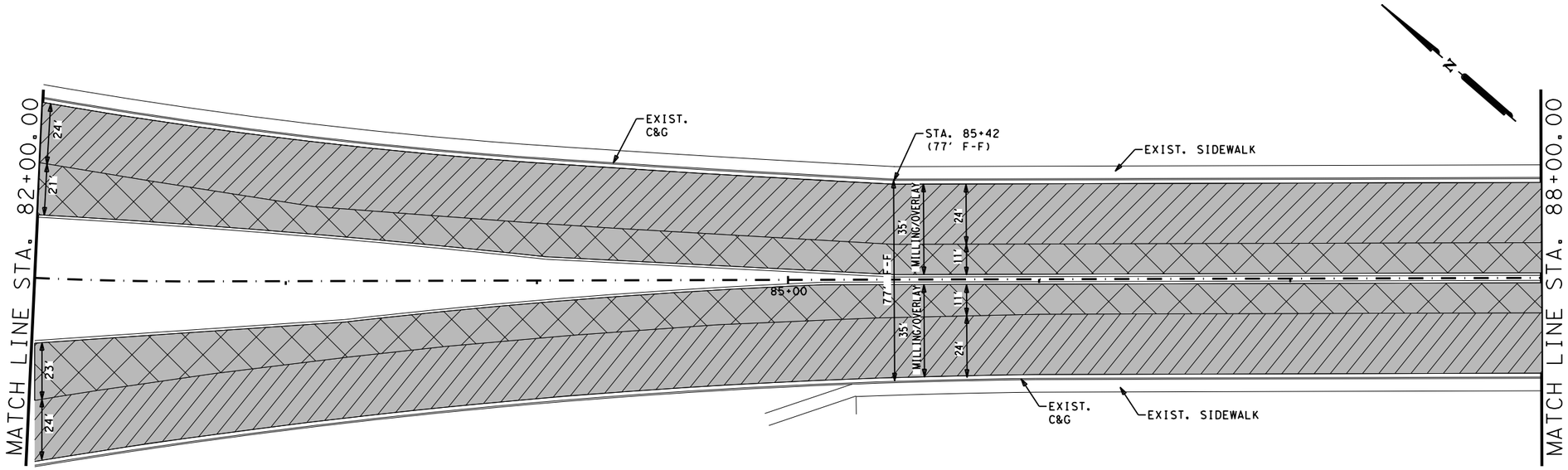
Texas Department of Transportation

BUS 77-X LOCATION 6 OVERLAY & MILLING DETAILS

SHEET 8 OF 9

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		76

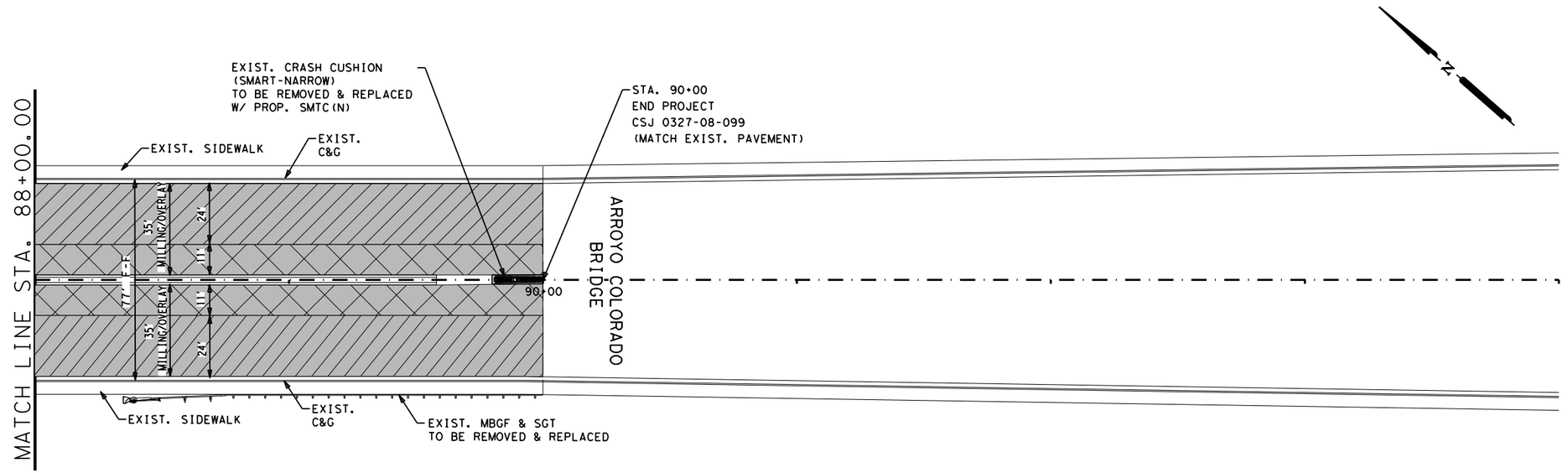
DATE: 2/24/2020 3:31:52 PM
FILE: LOC6PP08.dgn



LEGEND:

- PROP. OVERLAY
- PROP. 1" MILLING
- PROP. 1"- 4" MILLING

* NOTE:
EXIST. MANHOLES SHALL MATCH FINAL SURFACE (OVERLAY) ELEVATIONS



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

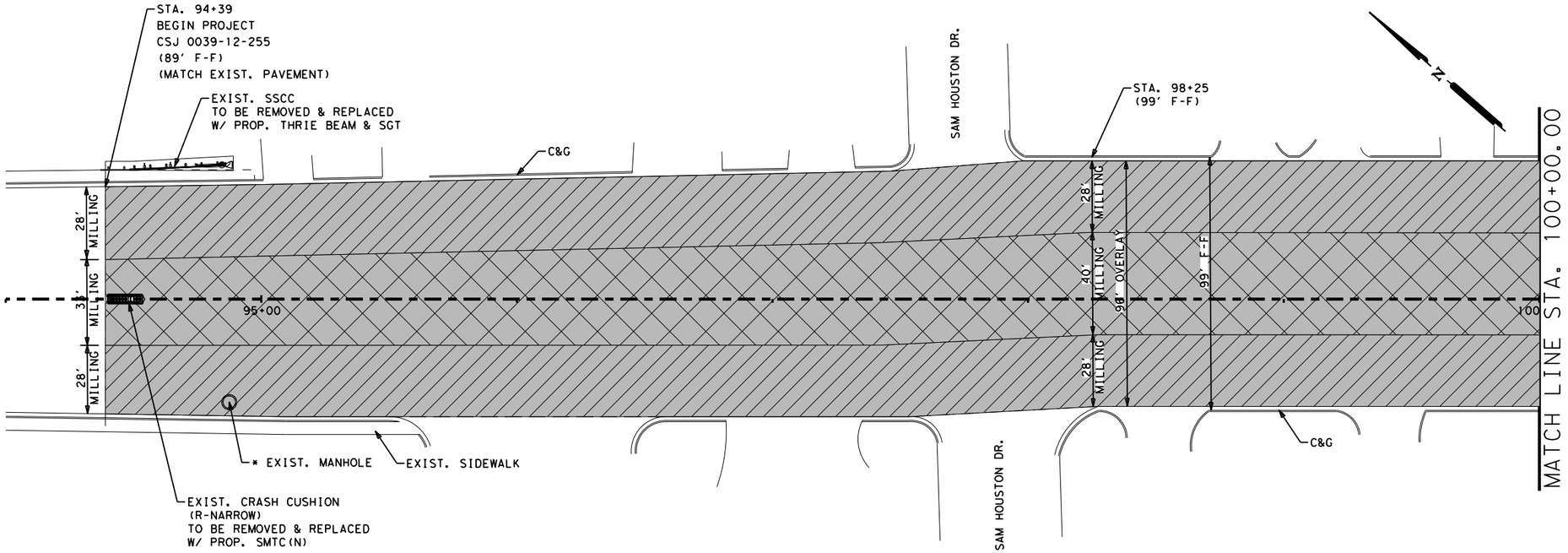
Texas Department of Transportation

BUS 77-X LOCATION 6 OVERLAY & MILLING DETAILS

SHEET 9 OF 9

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		77

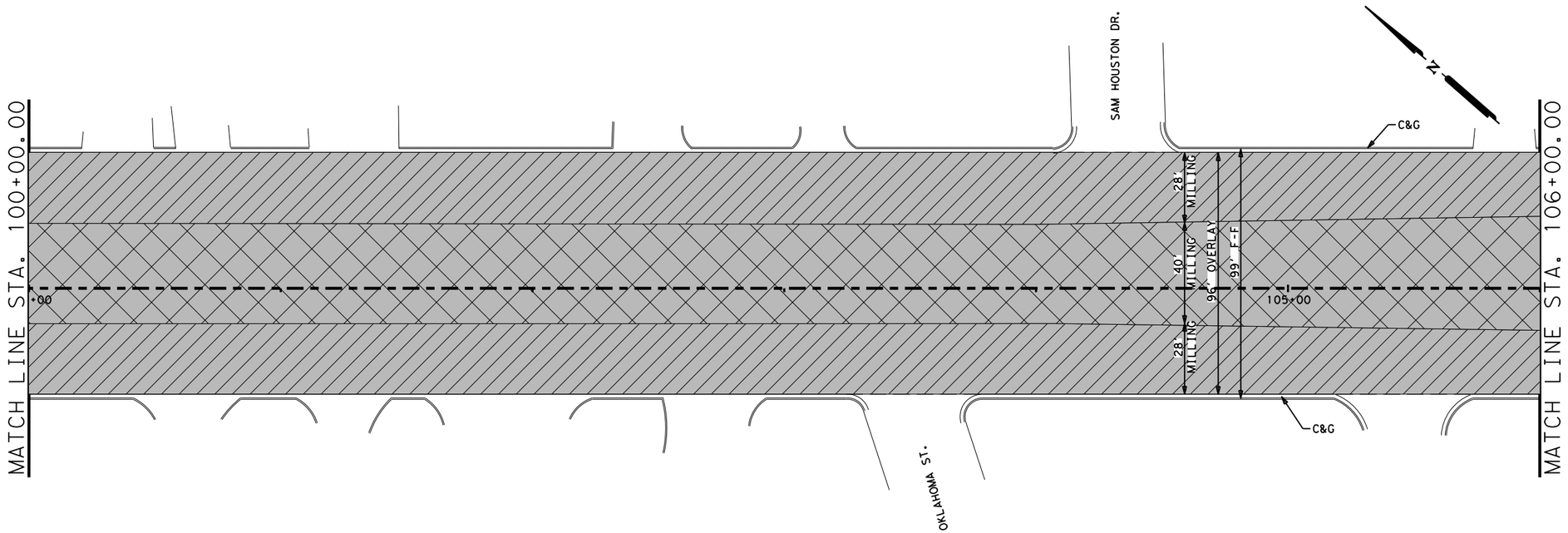
DATE: 2/24/2020 3:32:00 PM
FILE: LOC6PP09.dgn



LEGEND:

- PROP. OVERLAY
- PROP. 1" MILLING
- PROP. 1"- 4" MILLING

* NOTE:
EXIST. MANHOLES SHALL MATCH FINAL SURFACE (OVERLAY) ELEVATIONS



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

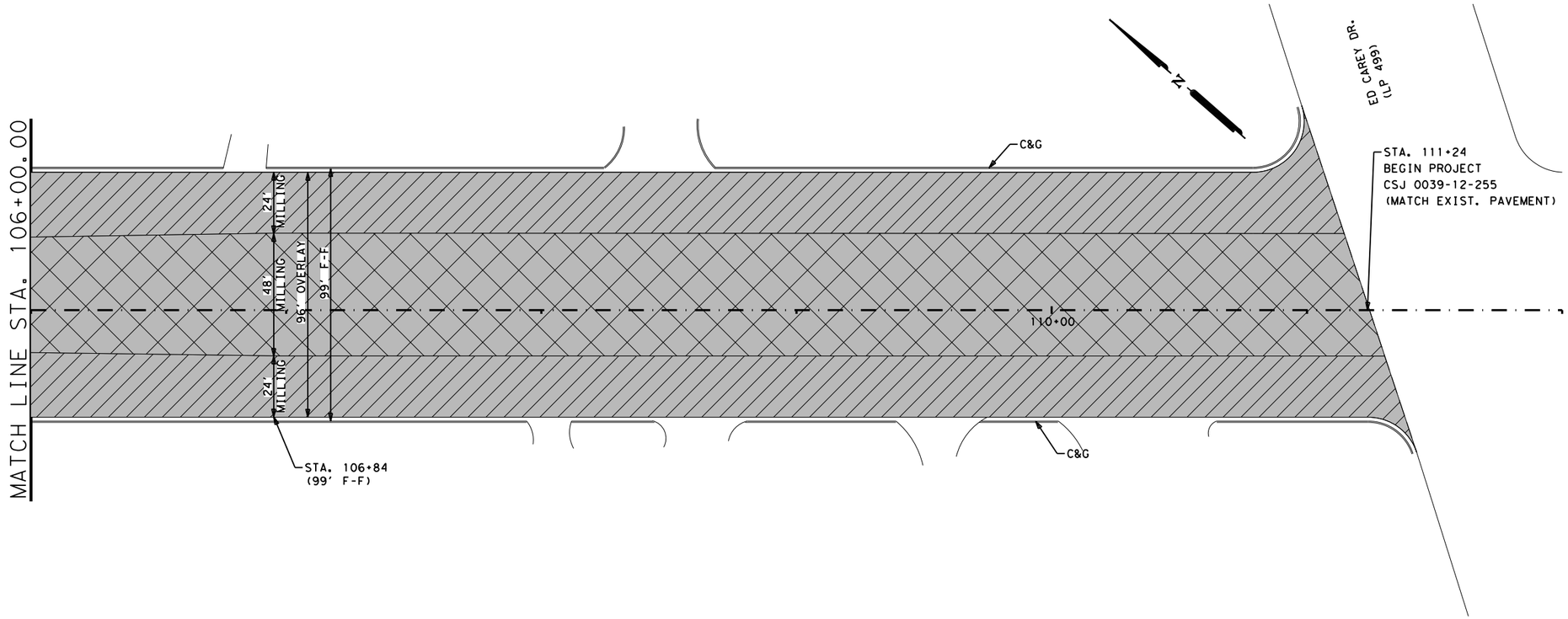
Texas Department of Transportation

BUS 77-X LOCATION 7 OVERLAY & MILLING DETAILS

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		78

DATE: 2/24/2020 3:32:16 PM
FILE: LOC7PP01.dgn



SCALE (IN FEET):

0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

Texas Department of Transportation

BUS 77-X LOCATION 7 OVERLAY & MILLING DETAILS

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		79

DATE: 2/24/2020 3:32:24 PM
FILE: LOC7PP02.dgn

SUMMARY OF METAL BEAM GUARD FENCE (MBGF)

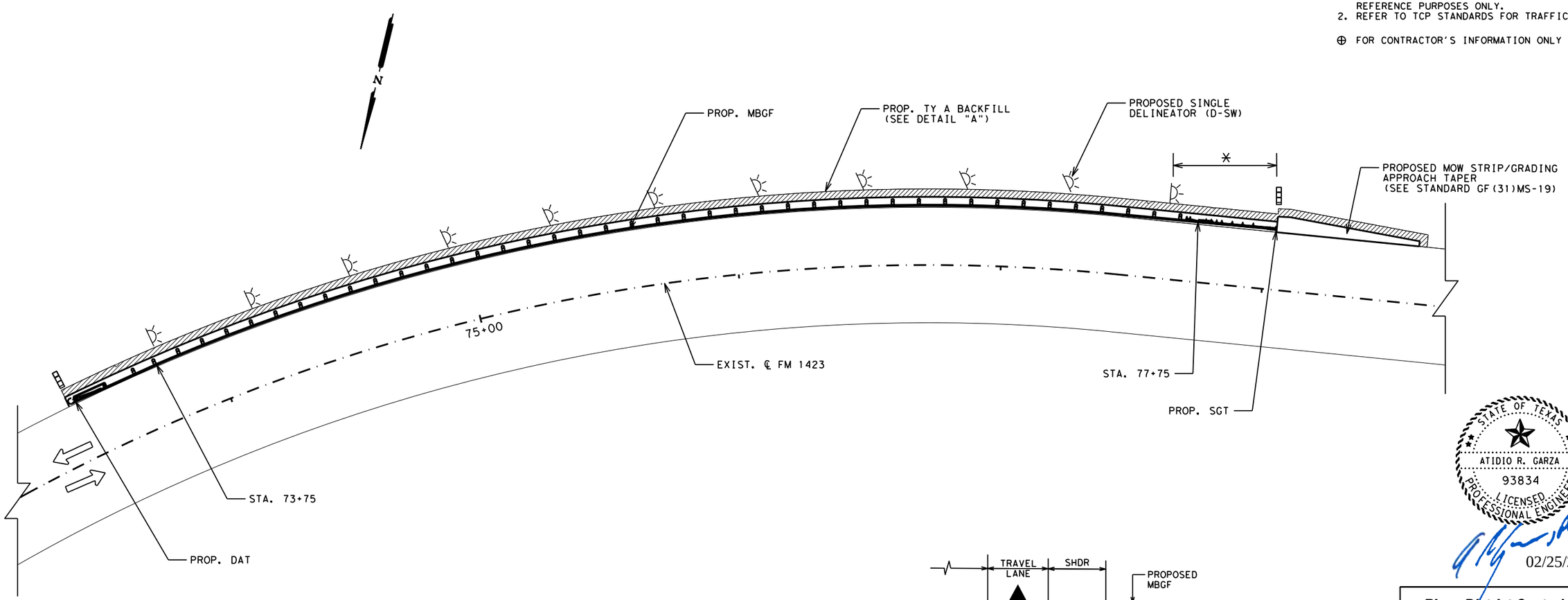
LOCATION #2 STATION	432	ITEM 540			ITEM 542			ITEM 544		ITEM 658			⊕ ITEM 134
	6045	6001	6006	6016	6001	6002	6004	6001	6003	6048	6060	6061	6006
	RIPRAP (MOW STRIP) (4 IN)	MTL W-BEAM GD FEN (TIM POST)	MTL BEAM GD FEN TRANS (THRIE-BEAM)	DOWNSTREAM ANCHOR TERMINAL SECTION	REMOVE METAL BEAM GUARD FENCE	REMOVE TERMINAL ANCHOR SECTION	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	GUARDRAIL END TREATMENT (INSTALL)	GUARDRAIL END TREATMENT (REMOVE)	INSTL OM ASSM (OM-2Z)(FLX) GND	REMOVE DELIN & OBJECT MARKER ASSMS	INSTL DEL ASSM (D-SW) SZ 1 (BRF)GF2	BACKFILL TY A
	CY	LF	EA	EA	LF	EA	EA	EA	EA	EA	EA	EA	LF
CSJ: 1427-01-041													
STA. 73+75 THRU. 77+75 (FM 1423)	25	400	2	-	400	1	2	2	2	2	11	11	500
TOTAL	25	400	2	-	400	1	2	2	2	2	11	11	500

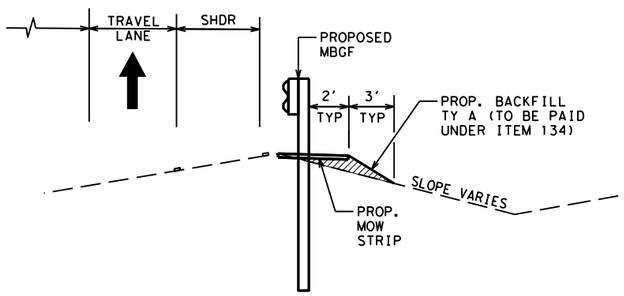
LEGEND

- MBGF - METAL BEAM GUARD FENCE
- SGT - SINGLE GUARDRAIL TERMINAL
- DAT - DOWNSTREAM ANCHOR TERMINAL
- W/ - WITH
- ⇦ - FLOW OF TRAFFIC
- - SINGLE DELINEATOR (D-SW)
- - OBJECT MARKER (OM-2Z)
- ✳ - 40' SPACING BETWEEN SINGLE DELINEATORS
- - EXISTING CONCRETE RIP RAP
- - PROPOSED BACKFILL TY A

NOTE:
1. ALIGNMENTS AND STATIONING ARE FOR REFERENCE PURPOSES ONLY.
2. REFER TO TCP STANDARDS FOR TRAFFIC CONTROL.

⊕ FOR CONTRACTOR'S INFORMATION ONLY





DETAIL "A"

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

Texas Department of Transportation

LOCATION 2 METAL BEAM GUARD FENCE DETAILS

SCALE 1": 40' SHEET 1 OF 2

DS:	CK:	CONT	SECT	JOB	HIGHWAY
DW:	CK:	1427	01	040, etc.	FM1423, etc.
		DIST	COUNTY		SHEET NO.
		PHR	HIDALGO, etc.		80

DATE: 2/24/2020 3:32:44 PM
FILE: MBGF_02A.dgn

SUMMARY OF METAL BEAM GUARD FENCE (MBGF)

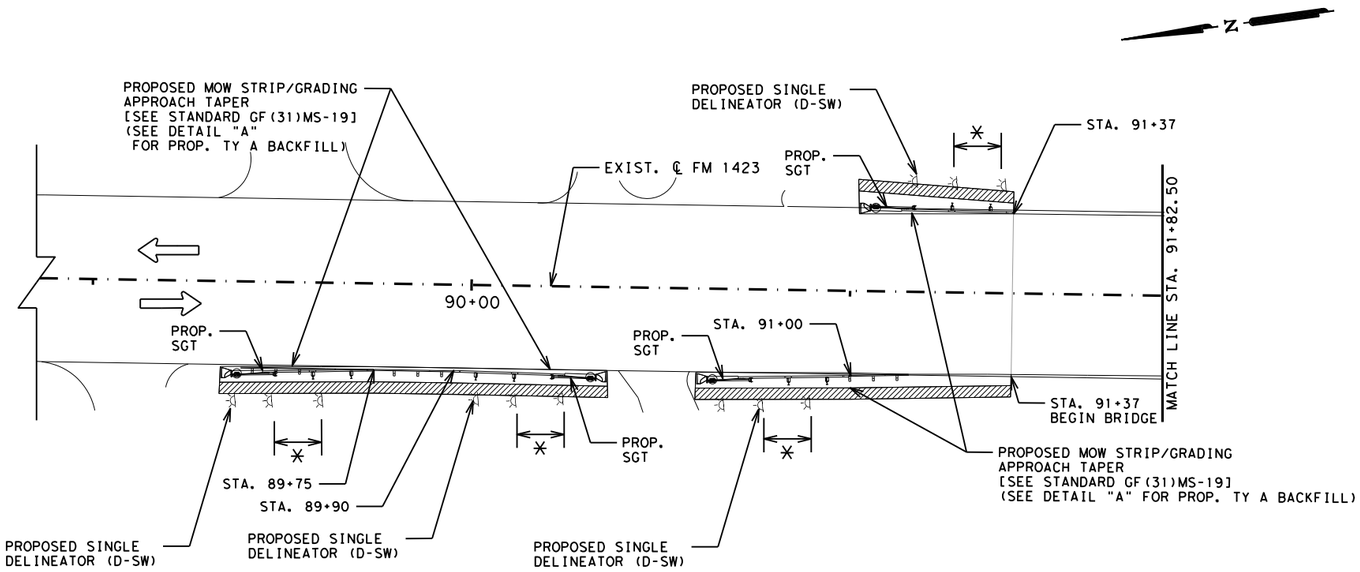
LOCATION #2 STATION	432	ITEM 540			ITEM 542			ITEM 544		ITEM 658			⊕ ITEM 134
	6045	6001	6006	6016	6001	6002	6004	6001	6003	6048	6060	6061	6006
	RIPRAP (MOW STRIP) (4 IN)	MTL W-BEAM GD FEN (TIM POST)	MTL BEAM GD FEN TRANS (THRIE-BEAM)	DOWNSTREAM ANCHOR TERMINAL SECTION	REMOVE METAL BEAM GUARD FENCE	REMOVE TERMINAL ANCHOR SECTION	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	GUARDRAIL END TREATMENT (INSTALL)	GUARDRAIL END TREATMENT (REMOVE)	INSTL OM ASSM (OM-3R)(FLX) GND	REMOVE DELIN & OBJECT MARKER ASSMS	INSTL DEL ASSM (D-SW) SZ 1 (BRF)GF2	BACKFILL TY A
	CY	LF	EA	EA	LF	EA	EA	EA	EA	EA	EA	EA	LF
CSJ: 1427-01-041													
STA. VARIES (SEE LAYOUT FOR STATIONS)	13	-	-	-	-	3	6	6	6	6	16	21	330
TOTAL	13	-	-	-	-	3	6	6	6	6	16	21	330

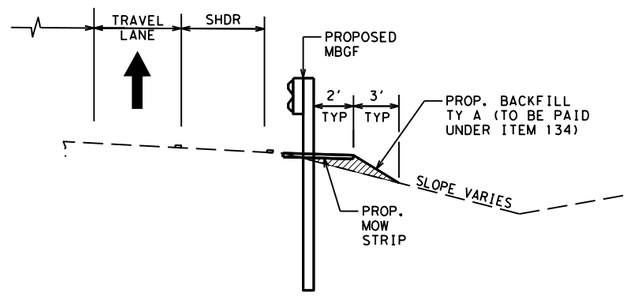
LEGEND

- MBGF - METAL BEAM GUARD FENCE
- SGT - SINGLE GUARDRAIL TERMINAL
- DAT - DOWNSTREAM ANCHOR TERMINAL
- W/ - WITH
- ⇦ - FLOW OF TRAFFIC
- ✳ - SINGLE DELINEATOR (D-SW)
- ▮ - OBJECT MARKER (OM-3R)
- ✳ - 25' SPACING BETWEEN SINGLE DELINEATORS
- ▒ - EXISTING CONCRETE RIP RAP
- ▨ - PROPOSED BACKFILL TY A

NOTE:
1. ALIGNMENTS AND STATIONING ARE FOR REFERENCE PURPOSES ONLY.
2. REFER TO TCP STANDARDS FOR TRAFFIC CONTROL.

⊕ FOR CONTRACTOR'S INFORMATION ONLY





DETAIL "A"

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

Texas Department of Transportation

LOCATION 2 METAL BEAM GUARD FENCE DETAILS

SCALE 1":40' SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		81

DS: CK: DW: CK:

DATE: 2/24/2020 3:32:52 PM
FILE: MBGF_02B.dgn

SUMMARY OF MBGF

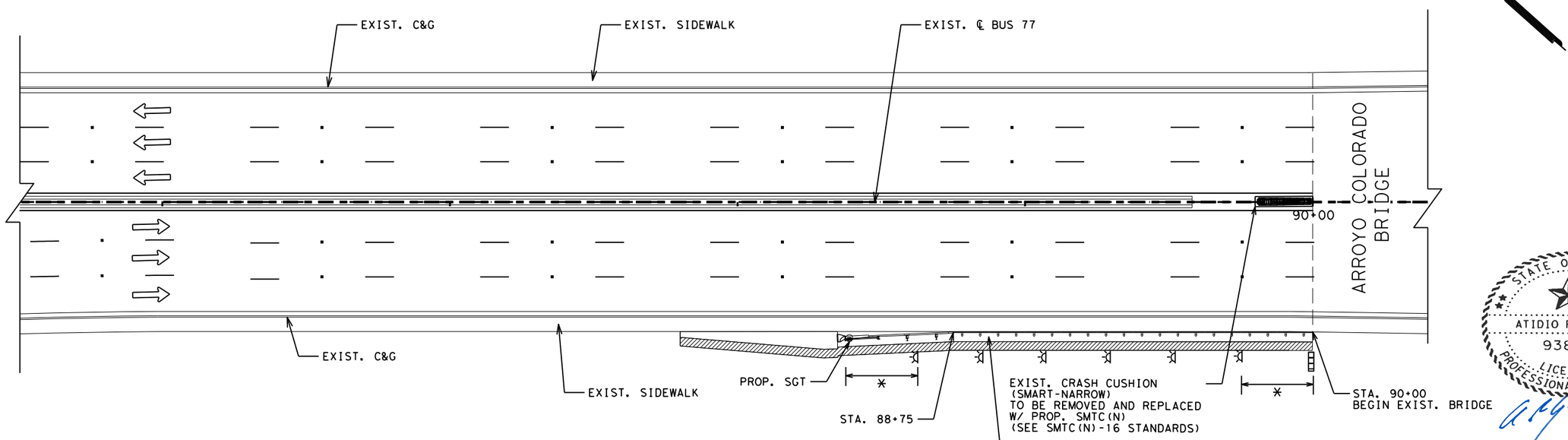
LOCATION #6 STATION	432	ITEM 540			ITEM 542			ITEM 544		ITEM 658			⊕ ITEM 134
	6045	6001	6006	6016	6001	6002	6004	6001	6003	6048	6060	6061	6006
	RIPRAP (MOW STRIP) (4 IN)	MTL W-BEAM GD FEN (TIM POST)	MTL BEAM GD FEN TRANS (THRIE-BEAM)	DOWNSTREAM ANCHOR TERMINAL SECTION	REMOVE METAL BEAM GUARD FENCE	REMOVE TERMINAL ANCHOR SECTION	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	GUARDRAIL END TREATMENT (INSTALL)	GUARDRAIL END TREATMENT (REMOVE)	INSTL OM ASSM (OM-2Z)(FLX) GND	REMOVE DELIN & OBJECT MARKER ASSMS	INSTL DEL ASSM (D-SW) SZ 1 (BRF)GF2	BACKFILL TY A
	CY	LF	EA	EA	LF	EA	EA	EA	EA	EA	EA	EA	LF
CSJ: 0327-08-099													
STA. 88+34 TO STA. 94+00	7	168	1	-	168	1	0	1	0	1	1	6	168
STA. 94+00													
TOTAL	7	168	1	-	168	1	0	1	0	1	1	6	168

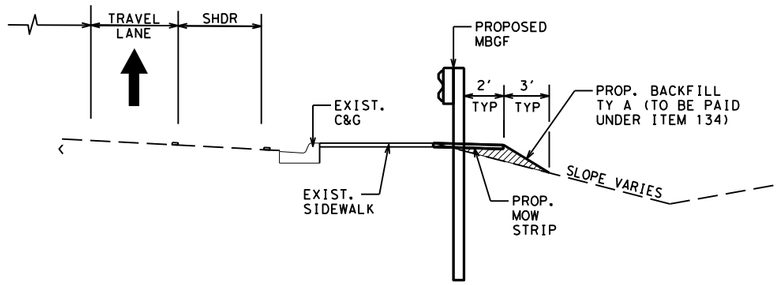
LEGEND

- MBGF - METAL BEAM GUARD FENCE
- SGT - SINGLE GUARDRAIL TERMINAL
- DAT - DOWNSTREAM ANCHOR TERMINAL
- W/ - WITH
- ⇦ - FLOW OF TRAFFIC
- ✳ - SINGLE DELINEATOR (D-SW)
- ▯ - OBJECT MARKER (OM-2Z)
- * - 25' SPACING BETWEEN SINGLE DELINEATORS
- ▒ - EXISTING CONCRETE RIP RAP
- ▨ - PROPOSED BACKFILL TY A

NOTE:
1. ALIGNMENTS AND STATIONING ARE FOR REFERENCE PURPOSES ONLY.
2. REFER TO TCP STANDARD FOR TRAFFIC CONTROL.

⊕ FOR CONTRACTOR'S INFORMATION ONLY





DETAIL "A"

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

Texas Department of Transportation

LOCATION 6 METAL BEAM GUARD FENCE DETAILS

SCALE 1": 40' SHEET 1 OF 1

DS:	CK:	CONT	SECT	JOB	HIGHWAY
DW:	CK:	1427	01	040, etc.	FM1423, etc.
		DIST	COUNTY		SHEET NO.
		PHR	HIDALGO, etc.		82

DATE: 2/26/2020 3:54:31 PM
FILE: MBGF_06.dgn

SUMMARY OF MBGF

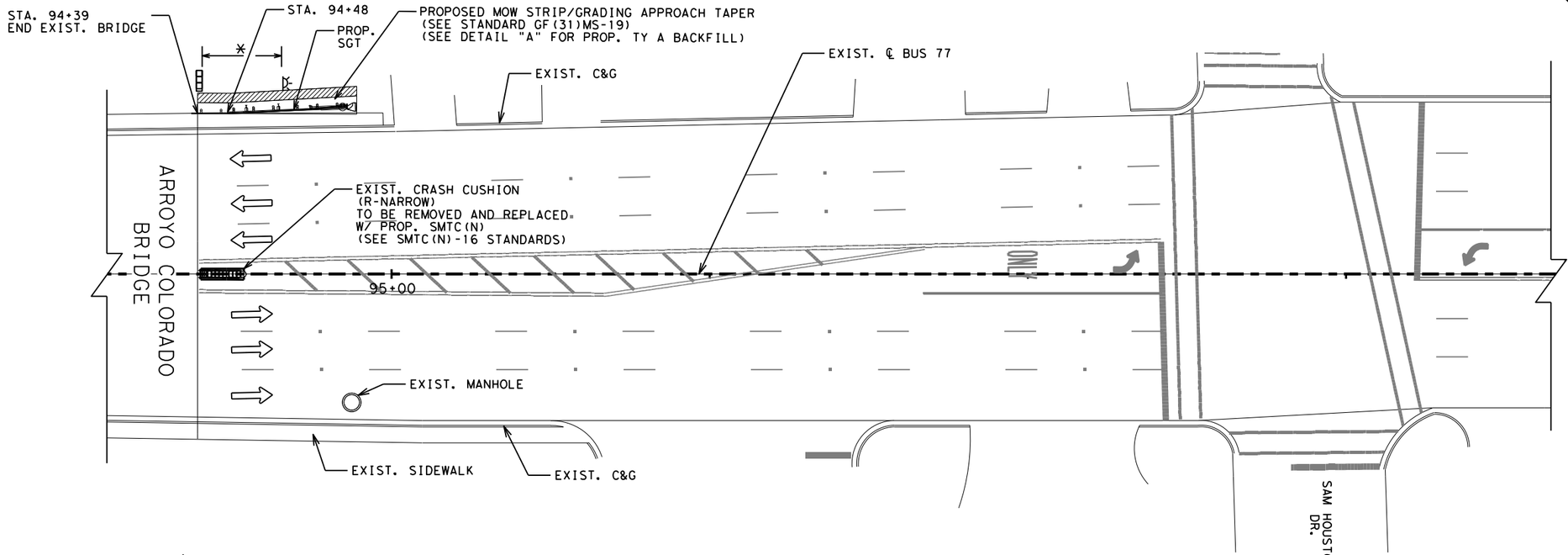
LOCATION #7 STATION	432	ITEM 540			ITEM 542			ITEM 544		ITEM 658			⊕ ITEM 134
	6045	6001	6006	6016	6001	6002	6004	6001	6003	6048	6060	6061	6006
	RIPRAP (MOW STRIP) (4 IN)	MTL W-BEAM GD FEN (TIM POST)	MTL BEAM GD FEN TRANS (THRIE-BEAM)	DOWNSTREAM ANCHOR TERMINAL SECTION	REMOVE METAL BEAM GUARD FENCE	REMOVE TERMINAL ANCHOR SECTION	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	GUARDRAIL END TREATMENT (INSTALL)	GUARDRAIL END TREATMENT (REMOVE)	INSTL OM ASSM (OM-2Z)(FLX) GND	REMOVE DELIN & OBJECT MARKER ASSMS	INSTL DEL ASSM (D-SW) SZ 1 (BRF)GF2	BACKFILL TY A
	CY	LF	EA	EA	LF	EA	EA	EA	EA	EA	EA	EA	LF
CSJ: 0039-12-255													
STA. 94+40	2	-	1	-	-	1	0	1	0	1	0	1	40
TOTAL	2	-	1	-	-	1	0	1	0	1	0	1	40

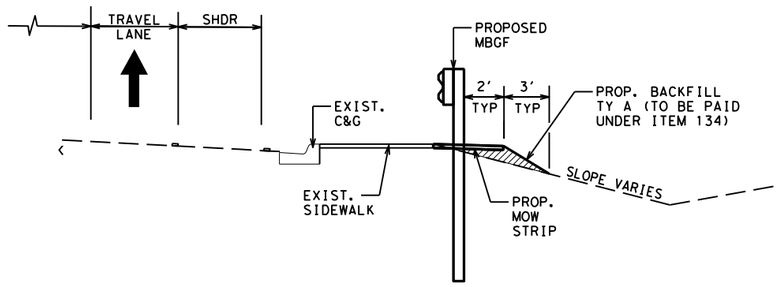
LEGEND

- MBGF - METAL BEAM GUARD FENCE
- SGT - SINGLE GUARDRAIL TERMINAL
- DAT - DOWNSTREAM ANCHOR TERMINAL
- W/ - WITH
- ⇦ - FLOW OF TRAFFIC
- - SINGLE DELINEATOR (D-SW)
- - OBJECT MARKER (OM-2Z)
- ✳ - 25' SPACING BETWEEN SINGLE DELINEATORS
- - EXISTING CONCRETE RIP RAP
- - PROPOSED BACKFILL TY A

NOTE:
1. ALIGNMENTS AND STATIONING ARE FOR REFERENCE PURPOSES ONLY.
2. REFER TO TCP STANDARD FOR TRAFFIC CONTROL.

⊕ FOR CONTRACTOR'S INFORMATION ONLY





DETAIL "A"

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

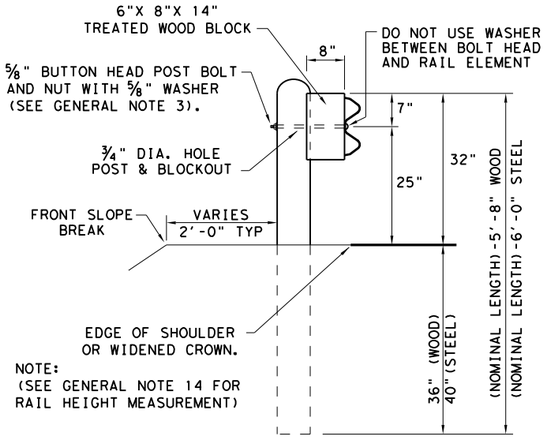
Texas Department of Transportation

LOCATION 7
METAL BEAM GUARD FENCE DETAILS

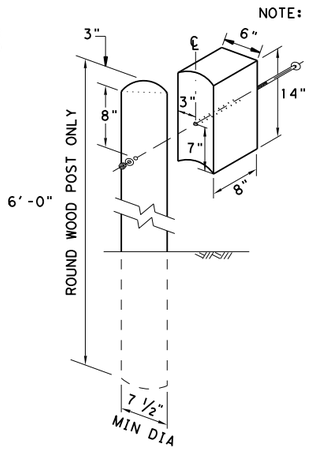
SCALE 1": 40' SHEET 1 OF 1

DS:	CK:	CONT	SECT	JOB	HIGHWAY
DW:	CK:	1427	01	040, etc.	FM1423, etc.
		DIST	COUNTY		SHEET NO.
		PHR	HIDALGO, etc.		83

DATE: 2/26/2020 3:54:52 PM
FILE: MBGF_07.dgn

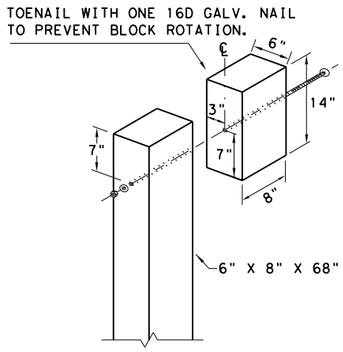


TYPICAL POST PLACEMENT

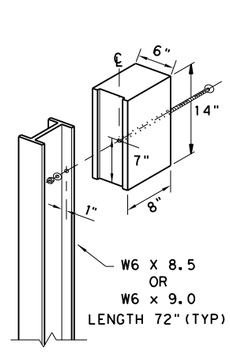


WOOD BLOCK TO ROUND WOOD POST

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

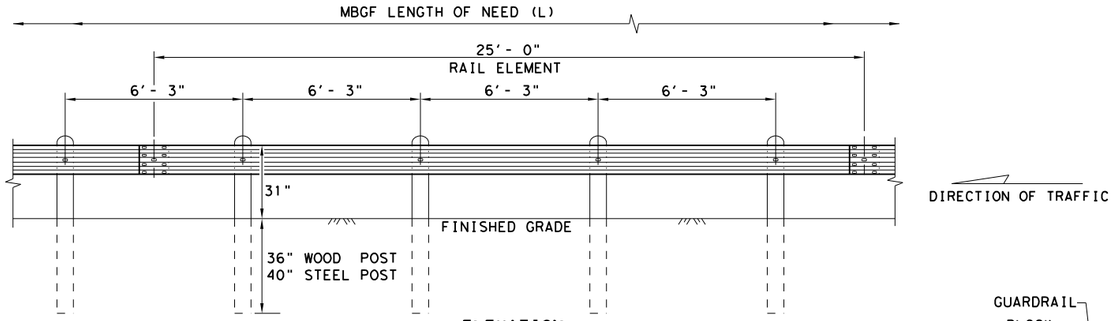


WOOD BLOCK TO RECTANGULAR WOOD POST



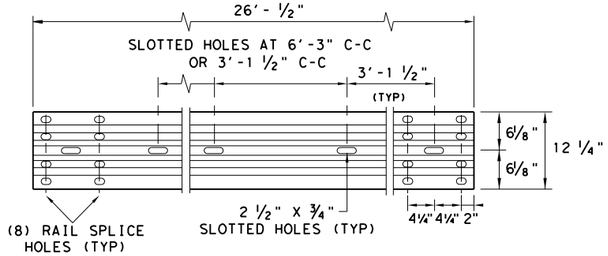
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

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



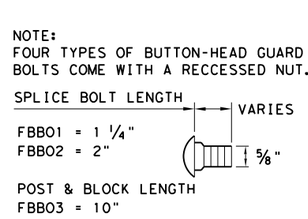
ELEVATION MID-SPAN RAIL SPLICE

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



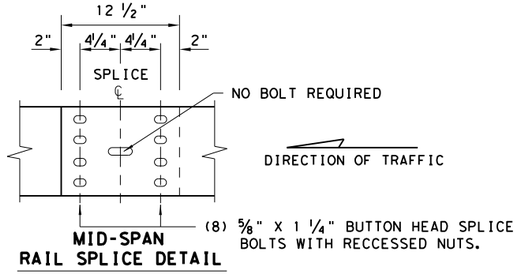
ELEVATION 25'- 0" (NOM.) W-BEAM SECTION

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



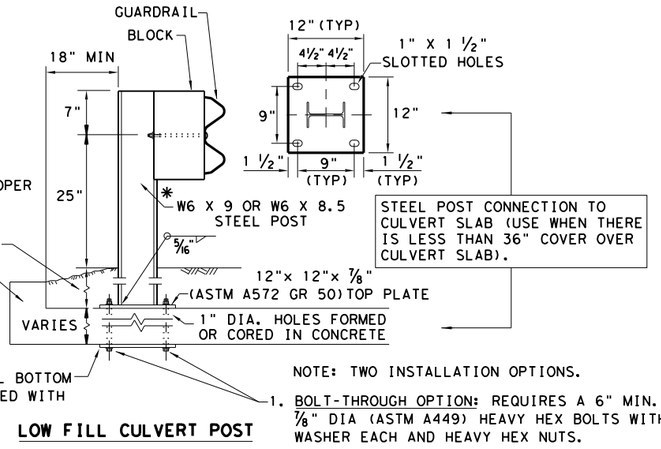
BUTTON HEAD BOLT

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: 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.

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

GENERAL NOTES

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

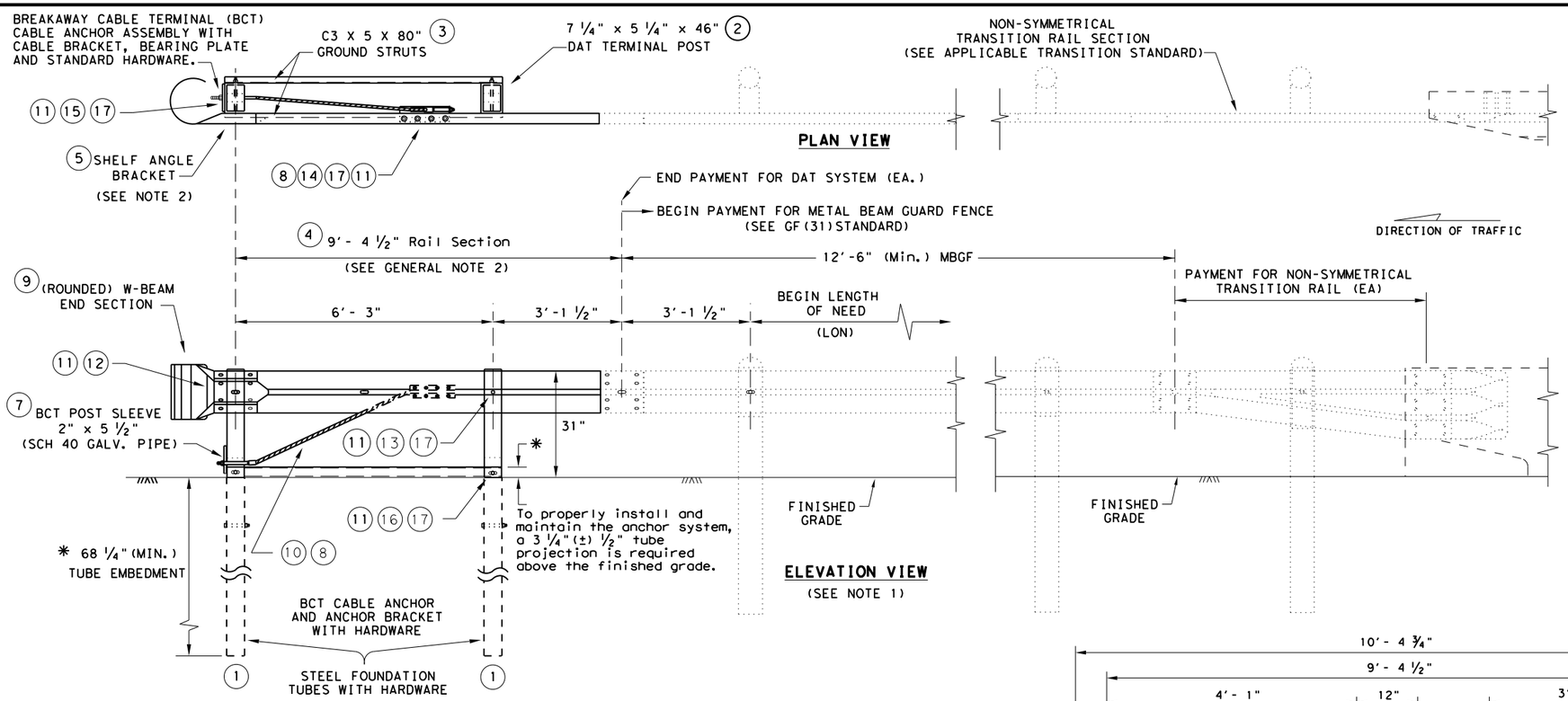
Texas Department of Transportation — Design Division Standard

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

FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040, etc.	FM1423, etc.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO, etc.		84

DATE: 2/24/2020
FILE: gf3119.dgn

DATE: 2/24/2020
FILE: gf31dat19.dgn



DOWNSTREAM ANCHOR TERMINAL (DAT)

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

GENERAL NOTES

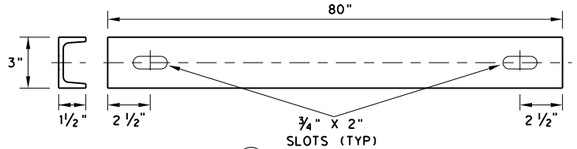
1. THE DETAIL SHOWN IS THE MINIMUM LENGTH OF NEED (LON) FOR A DOWNSTREAM ANCHOR TERMINAL (DAT) CONNECTED TO A CONCRETE RAIL.
2. THE RAIL SECTION AT THE END POST IS SUPPORTED BY THE SHELF ANGLE BRACKET. THE RAIL ELEMENT IS NOT ATTACHED TO THE END POST.
3. THE FOUNDATION TUBES SHALL NOT PROJECT MORE THAN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

MOW STRIP INSTALLATION

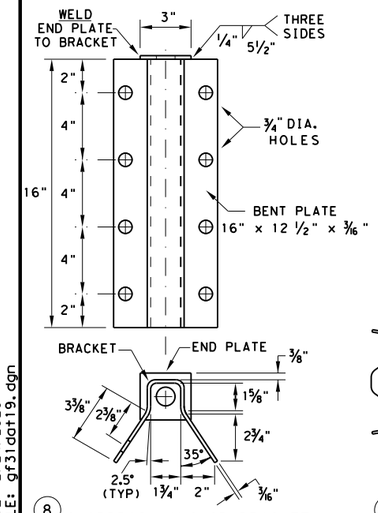
IF A MOW STRIP IS REQUIRED WITH THE DAT INSTALLATION THE LEAVE-OUT AREA AROUND THE STEEL FOUNDATION TUBES AND THE TWO CHANNEL STRUTS MAY BE OMITTED. THIS WILL REQUIRE A FULL POUR AT THE FOUNDATION TUBES.

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

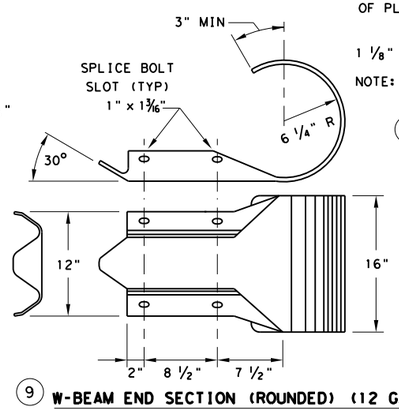
(4) TERMINAL RAIL ELEMENT FOR DAT



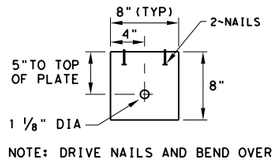
(3) CHANNEL STRUT
C3 X 5 X 80", GRADE A36



(8) GUARDRAIL ANCHOR BRACKET

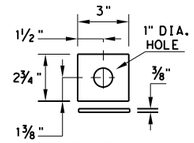


(9) W-BEAM END SECTION (ROUNDED) (12 GA.)

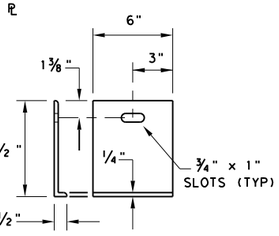


NOTE: DRIVE NAILS AND BEND OVER TO PREVENT PLATE ROTATION

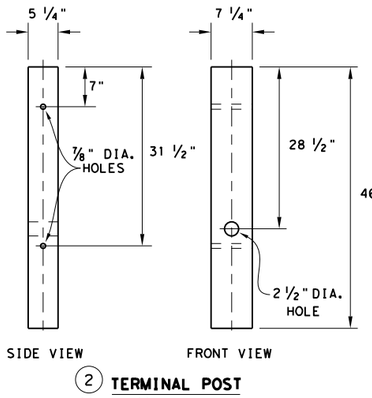
(6) BEARING PLATE
8"x 8"x 5/8" R



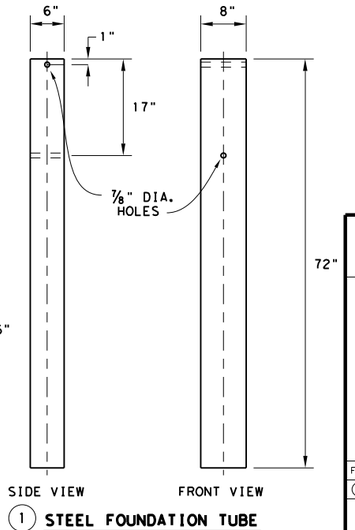
END PLATE



(5) SHELF ANGLE BRACKET



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



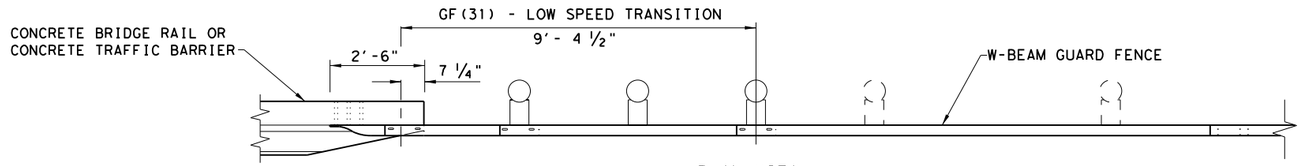
(1) STEEL FOUNDATION TUBE
6"x 8"x 1/8" x 72" STEEL TUBE

Texas Department of Transportation — Design Division Standard

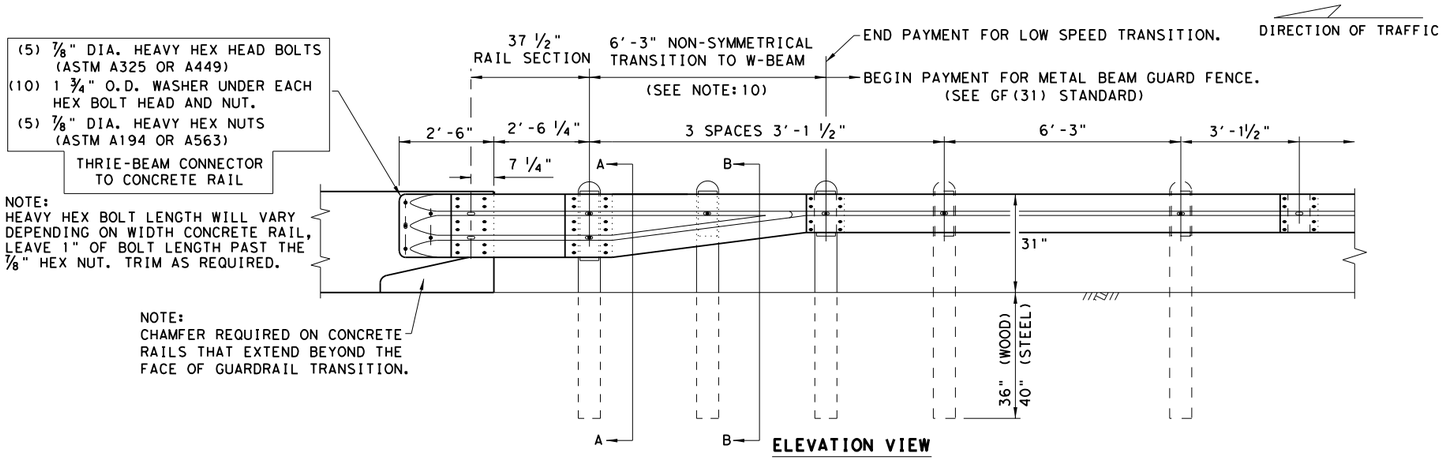
METAL BEAM GUARD FENCE (DOWNSTREAM ANCHOR TERMINAL) TL-3 MASH COMPLIANT

GF(31)DAT-19

FILE: gf31dat19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG	
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY	
REVISIONS	1427	01	040,etc.	FM1423,etc.	
	DIST	COUNTY		SHEET NO.	
	PHR	HIDALGO,etc.		85	



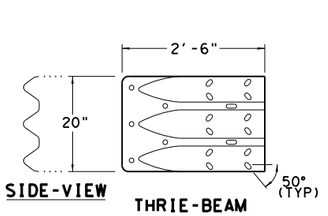
PLAN VIEW



ELEVATION VIEW

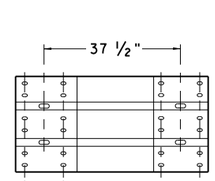
GENERAL NOTES

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

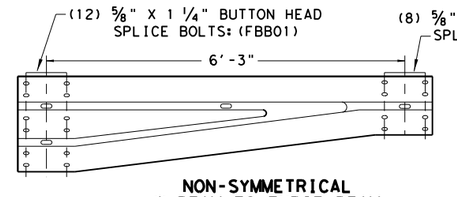


SIDE-VIEW

THRIE-BEAM TERMINAL CONNECTOR 10GA.
PART DESIGNATOR RTE01b



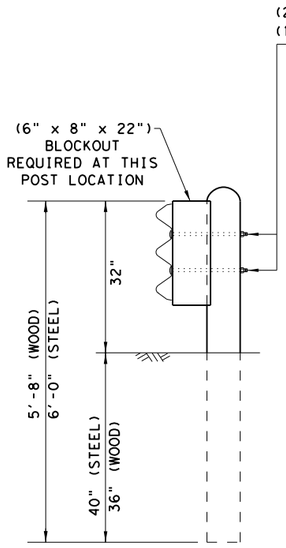
THRIE-BEAM RAIL SHORT SECTION 10GA.
PART DESIGNATOR RTM01a



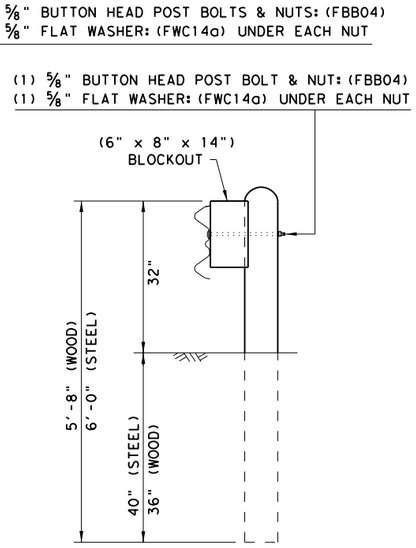
NON-SYMMETRICAL W-BEAM TO THRIE-BEAM TRANSISTION 10GA.
PART DESIGNATOR RWT02a OR RWT02b

PLATE WASHER INSTRUCTIONS

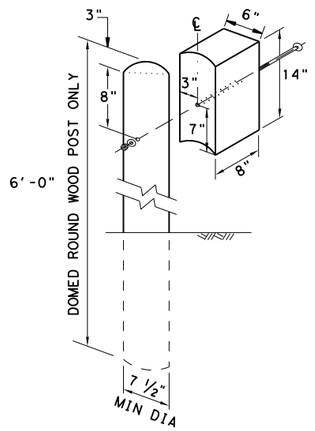
BRIDGE APPROACH - UPSTREAM: THE SHORT RAIL LAPS OVER THE TERMINAL CONNECTOR. PLATE WASHERS ARE INSTALLED UNDER THE SPLICE NUTS AGAINST INSIDE OF CONNECTOR.
BRIDGE EXIT - DOWNSTREAM: THE TERMINAL CONNECTOR LAPS OVER THE NESTED RAIL. PLATE WASHERS ARE INSTALLED UNDER THE BOLT HEAD AGAINST OUTSIDE OF CONNECTOR.



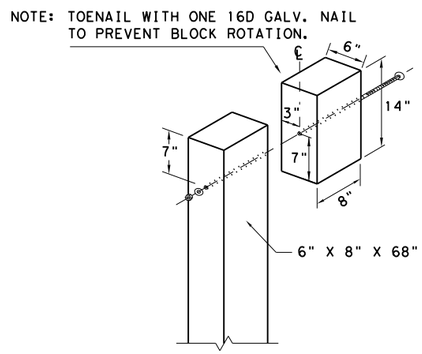
SECTION A-A



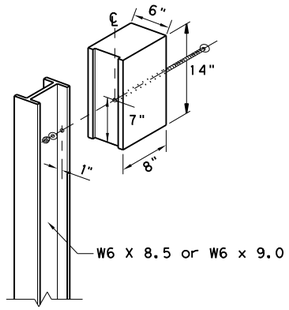
SECTION B-B



WOOD BLOCK TO ROUND WOOD POST



WOOD BLOCK TO RECTANGULAR WOOD POST



ROUTED WOOD BLOCK TO I-BEAM STEEL POST

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

LOW-SPEED TRANSITION

Texas Department of Transportation | Design Division Standard

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

GF(31)TR TL2-19

FILE: gf31tr1219.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG	
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY	
REVISIONS	1427	01	040, etc.	FM1423, etc.	
	DIST	COUNTY		SHEET NO.	
	PHR	HIDALGO, etc.		86	

DATE: 2/24/2020 3:34:00 PM
FILE: gf31tr1219.dgn

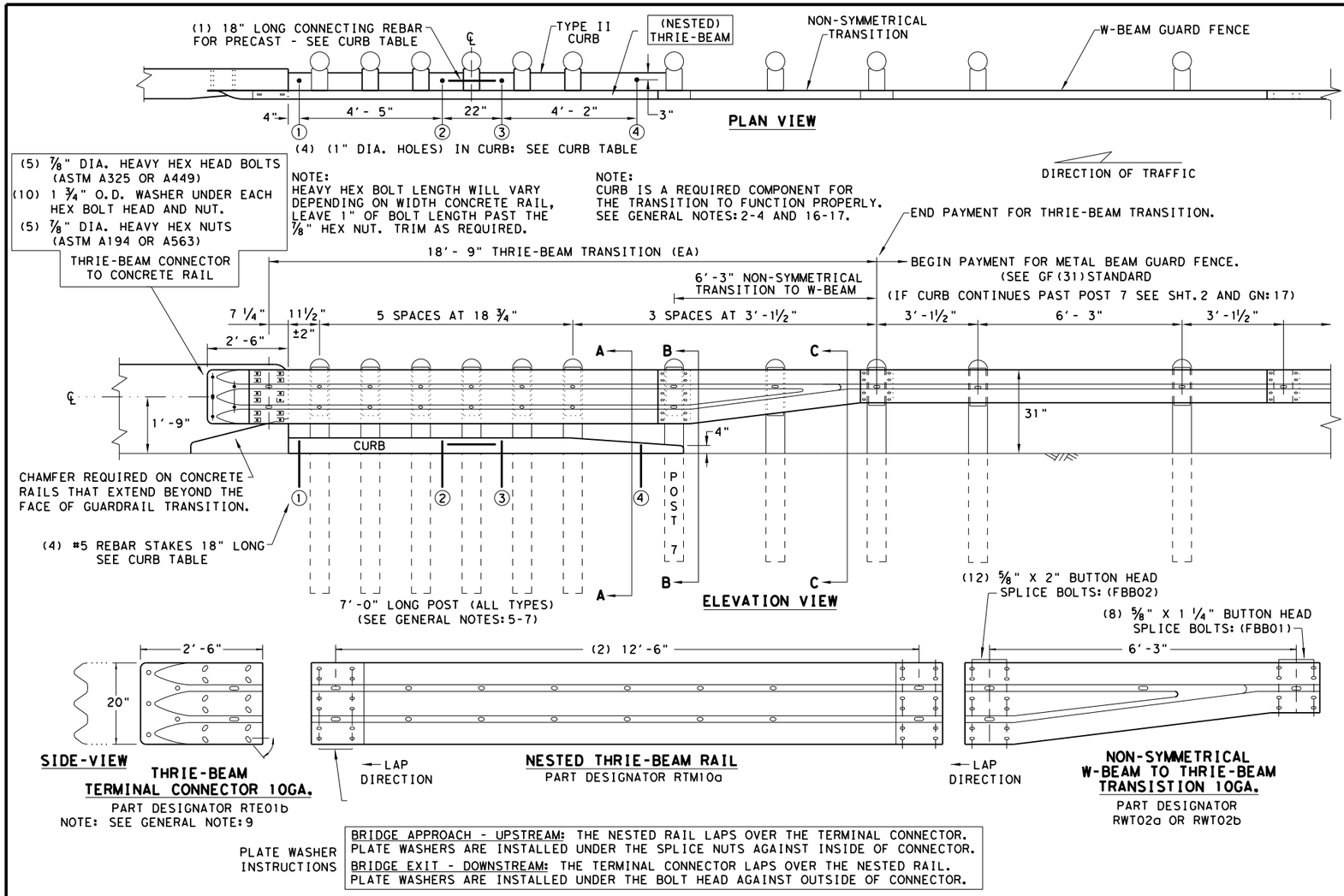
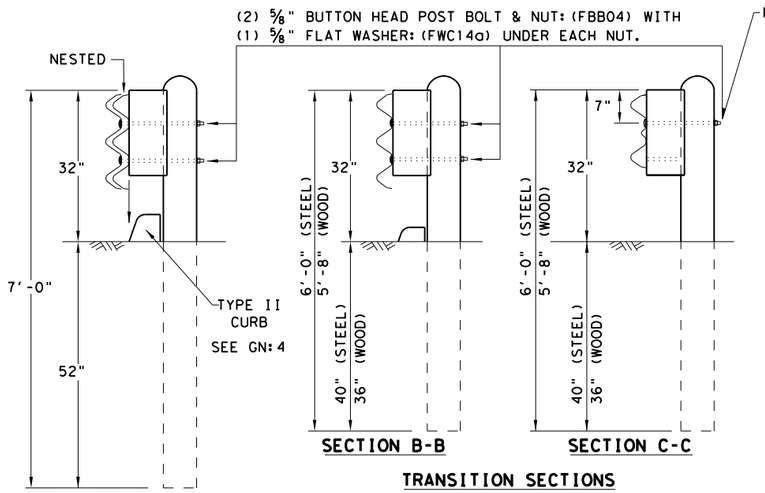


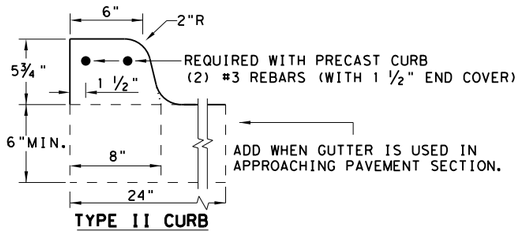
PLATE WASHER INSTRUCTIONS

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.



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 FOUR (1" DIA. HOLES), SEE BOTH VIEWS FOR HOLE LOCATIONS. DRIVE (4) #5 GR.60 REBAR STAKES 18" LONG INTO THE GROUND AND 1/2" BELOW TOP OF CURB. FILL HOLES WITH APPROVED GROUT MIXTURE.



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- 3/4") 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 1/2" 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 5/8" 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 5/8" 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 CONSTRUCTION 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

SHEET 1 OF 2

Texas Department of Transportation | Design Division Standard

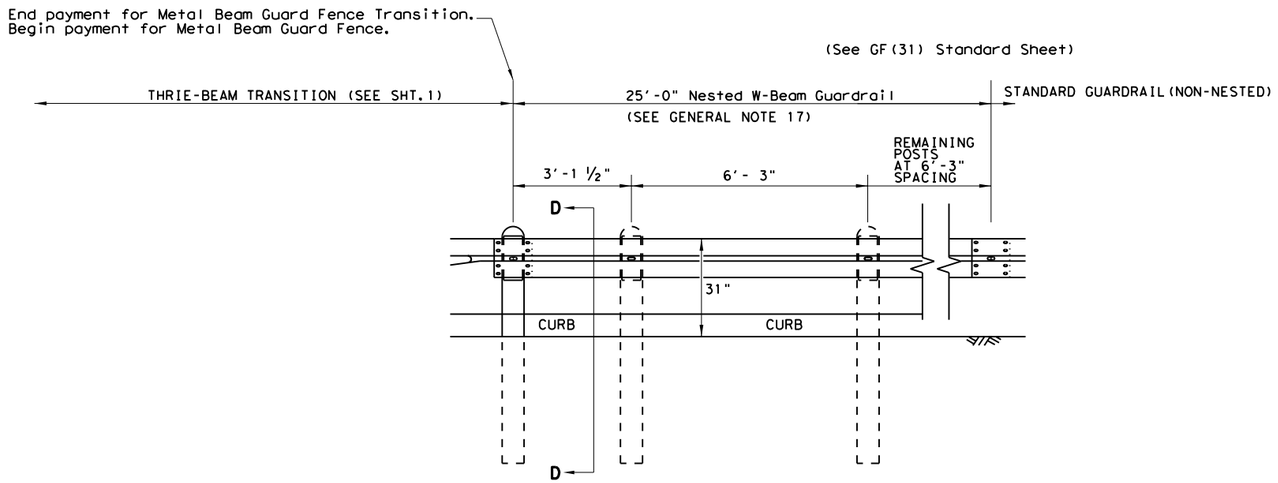
METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-3 MASH COMPLIANT

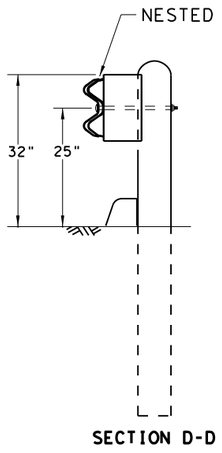
GF(31)TR TL3-19

FILE: gf31trt1319.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG	
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY	
REVISIONS	1427	01	040, etc.	FM1423, etc.	
	DIST	COUNTY		SHEET NO.	
	PHR	HIDALGO, etc.		87	

DATE: 2/24/2020
FILE: gf31trt1319.dgn

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





SECTION D-D

HIGH-SPEED TRANSITION

SHEET 2 OF 2

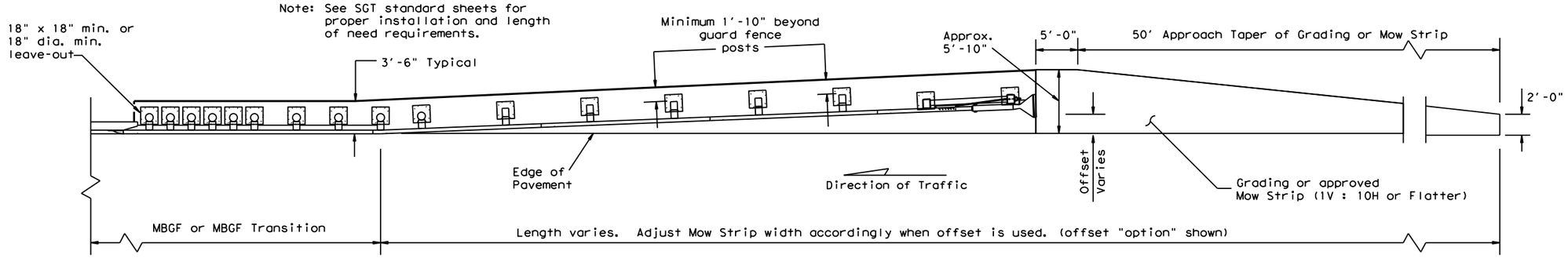
Texas Department of Transportation | Design Division Standard

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

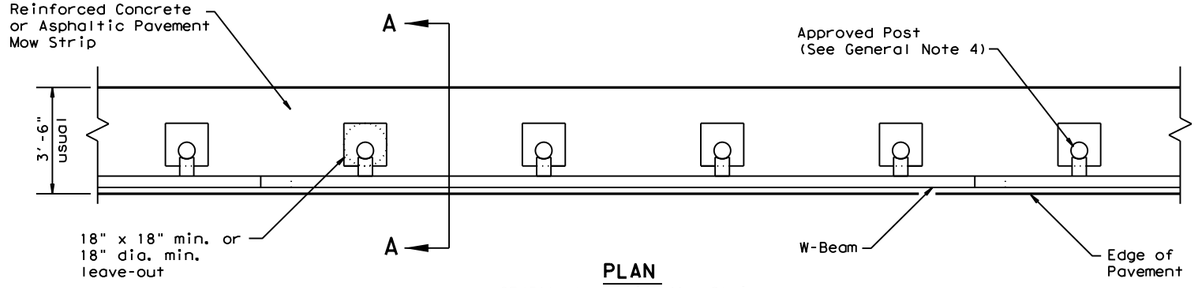
GF(31)TR TL3-19

FILE: gf31tr1319.dgn	DN: TxDOT	CK: KM	DW: KM	CK: CGL/AG		
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY		
REVISIONS	1427	01	040, etc.	FM1423, etc.		
	DIST	COUNTY		SHEET NO.		
	PHR	HIDALGO, etc.		88		

DATE: 2/24/2020
FILE: gf31tr1319.dgn

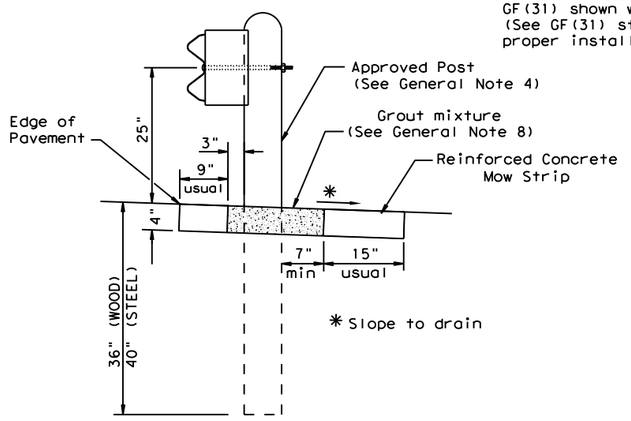


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



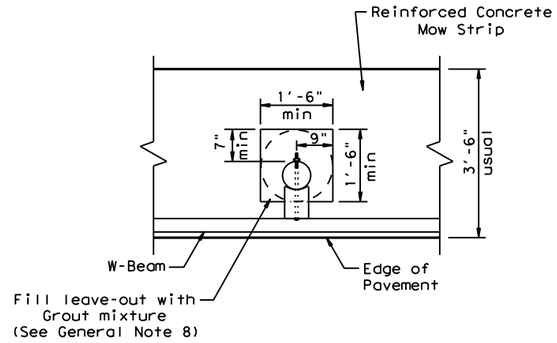
PLAN

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



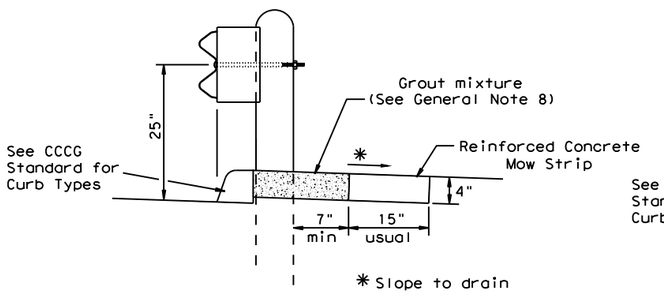
SECTION A-A

Typical



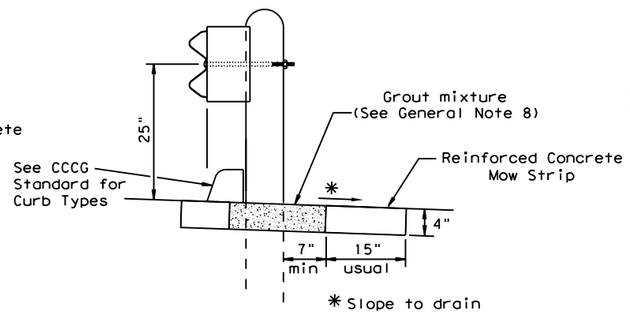
MOW STRIP DETAIL

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



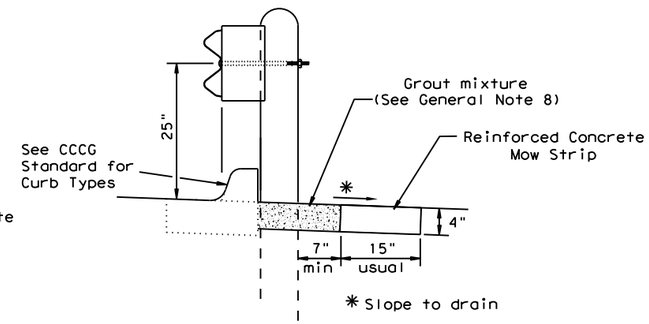
CURB OPTION (1)

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

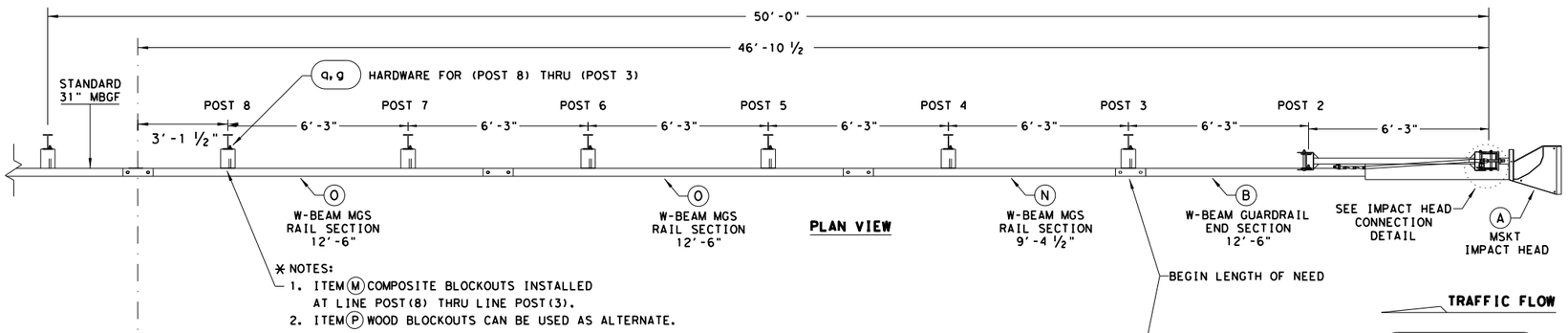
METAL BEAM GUARD FENCE (MOW STRIP)

TL-3 MASH COMPLIANT

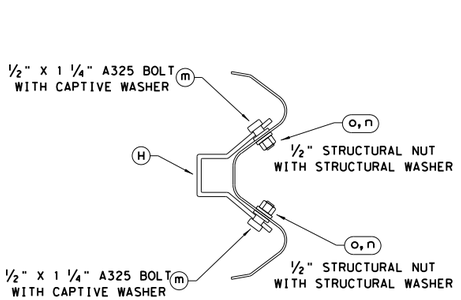
GF(31)MS-19

FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG	
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY	
REVISIONS	1427	01	040, etc.	FM1423, etc.	
	DIST	COUNTY		SHEET NO.	
	PHR	HIDALGO, etc.		89	

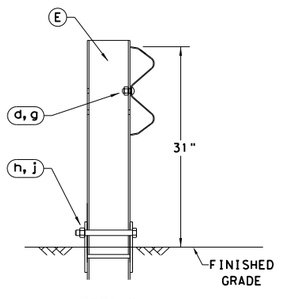
DATE: 2/24/2020
FILE: gf31ms19.dgn



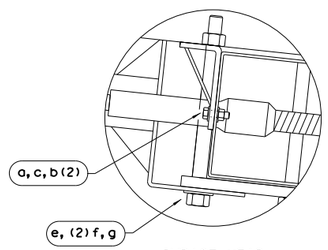
NOTE: SEE (GENERAL NOTE 14) FOR DRIVING CAP INFORMATION.



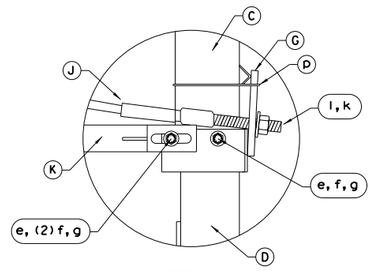
SECTION B-B
ANCHOR BRACKET



POST 2
SECTION A-A



IMPACT HEAD
CONNECTION DETAIL



POST 1
CONNECTION DETAIL

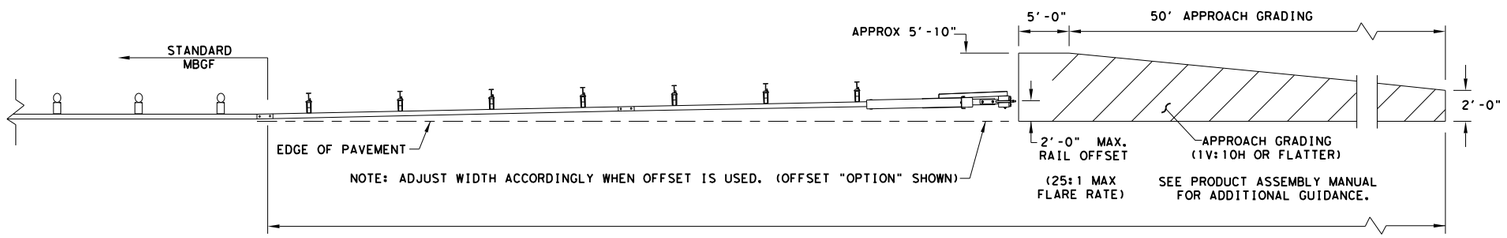
GENERAL NOTES

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.

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 ⅜" 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

SEE NOTES: *

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



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

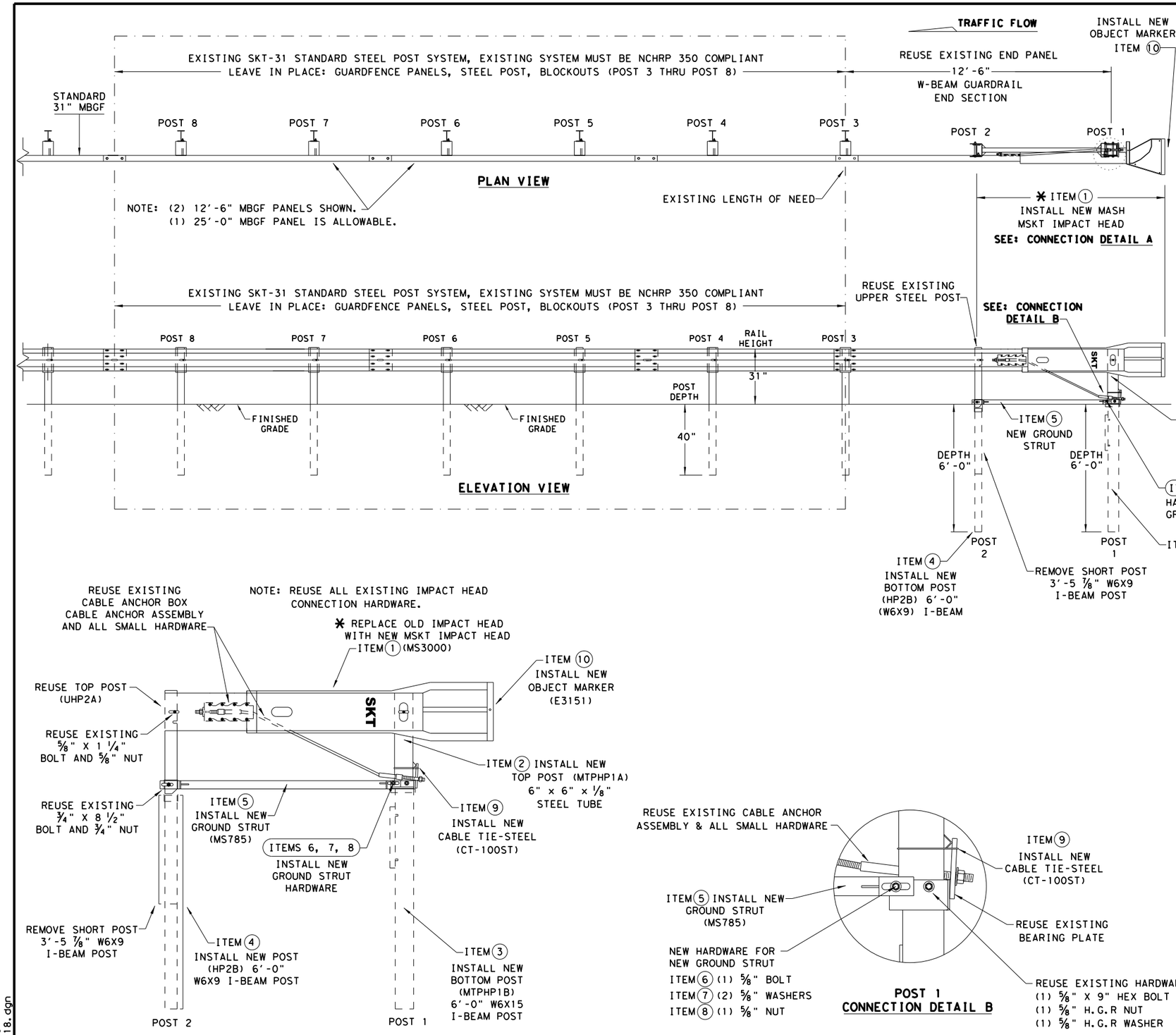
SINGLE GUARDRAIL TERMINAL

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	1427	01	040, etc.	FM1423, etc.	
	DIST	COUNTY		SHEET NO.	
	PHR	HIDALGO, etc.		90	

DATE: 2/24/2020
FILE: sgt12s3118.dgn



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; 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. IF SOLID ROCK IS ENCOUNTERED IN THE AREA OF (POST 1) AND / OR (POST 2) CONTACT THE MANUFACTURER, AND REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
7. POSTS SHALL NOT BE SET IN CONCRETE.
8. THE EXISTING SKT 31" STANDARD STEEL POST SYSTEM MUST BE THOROUGHLY INSPECTED, AND DETERMINED TO BE INTACT, AND FREE OF ANY DAMAGE OR DEFECTS BEFORE RETROFITTING. THIS INSPECTION INCLUDES COMPLETING THE MSKT RETROFIT INSPECTION CHECKLIST FOR THE EXISTING SKT 31" STEEL POST NCHRP 350 SYSTEM. ALL EXISTING, AND REUSABLE PARTS MUST BE FREE OF ANY DAMAGE FOR A MASH COMPLIANT RETROFIT.
9. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE MSKT SYSTEM BE CURVED.
10. 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.
11. SPECIAL DRIVING CAP TO BE USED WHEN DRIVING (LOWER POSTS 1 & 2) TO PREVENT DAMAGE TO THE WELDED PLATES.

CONNECTION DETAIL A
IMPACT HEAD (POST 1 & POST 2)

POST 1
CONNECTION DETAIL B

ITEMS	QTY	MAIN SYSTEM COMPONENTS	PART NUMBERS
* 1	1	MSKT IMPACT HEAD	MS3000
2	1	POST 1 - TOP (6" X 6" X 1/8" TUBE)	MTPHP1A
3	1	POST 1 - BOTTOM (6' W6X15)	MTPHP1B
4	1	POST 2 - ASSEMBLY BOTTOM (6' W6X9)	HP2B
5	1	GROUND STRUT	MS785
6	1	5/8" X 9" HEX BOLT (GRD A449)	B580904A
7	2	5/8" WASHERS	W050
8	1	5/8" H.G.R NUT	N050
9	1	CABLE TIE-STEEL	CT-100ST
* 10	1	OBJECT MARKER 18" X 18"	E3151

COMPONENTS REQUIRED TO RETROFIT: EXISTING 31" STEEL POST (NCHRP 350 SKT) GUARDRAIL TERMINAL WITH THE NEW 31" (MASH COMPLIANT MSKT IMPACT HEAD).

*** IF THE EXISTING NCHRP 350 (31" STEEL POST SKT) ALREADY HAS THE MSKT IMPACT HEAD THERE IS NO NEED TO REPLACE THE IMPACT HEAD OR OBJECT MARKER AS LONG AS IT IS NOT DAMAGED.**

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

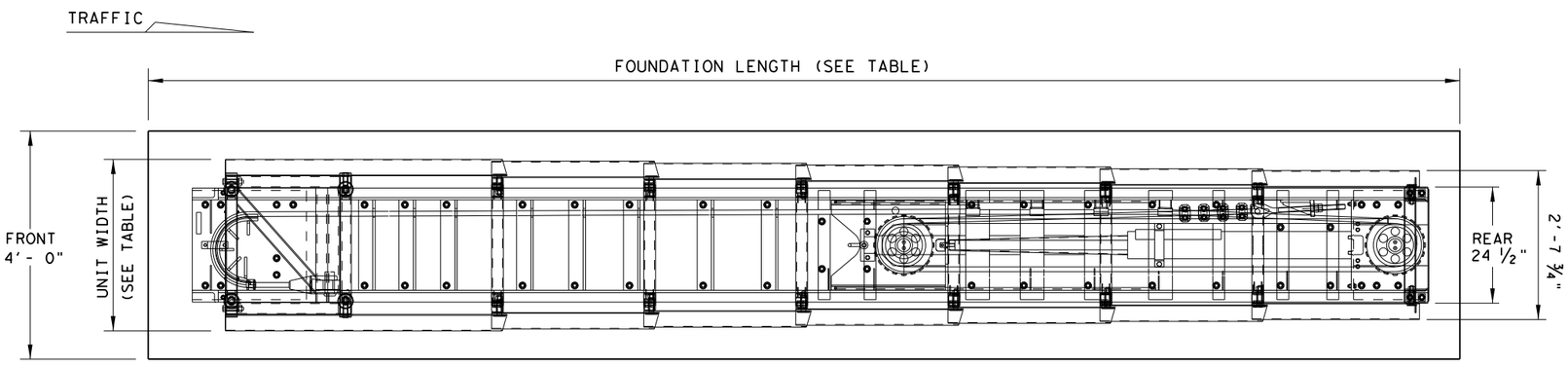
Texas Department of Transportation — Design Division Standard

RETROFIT STANDARD SKT 31" STEEL POST SYSTEM TO MASH MSKT

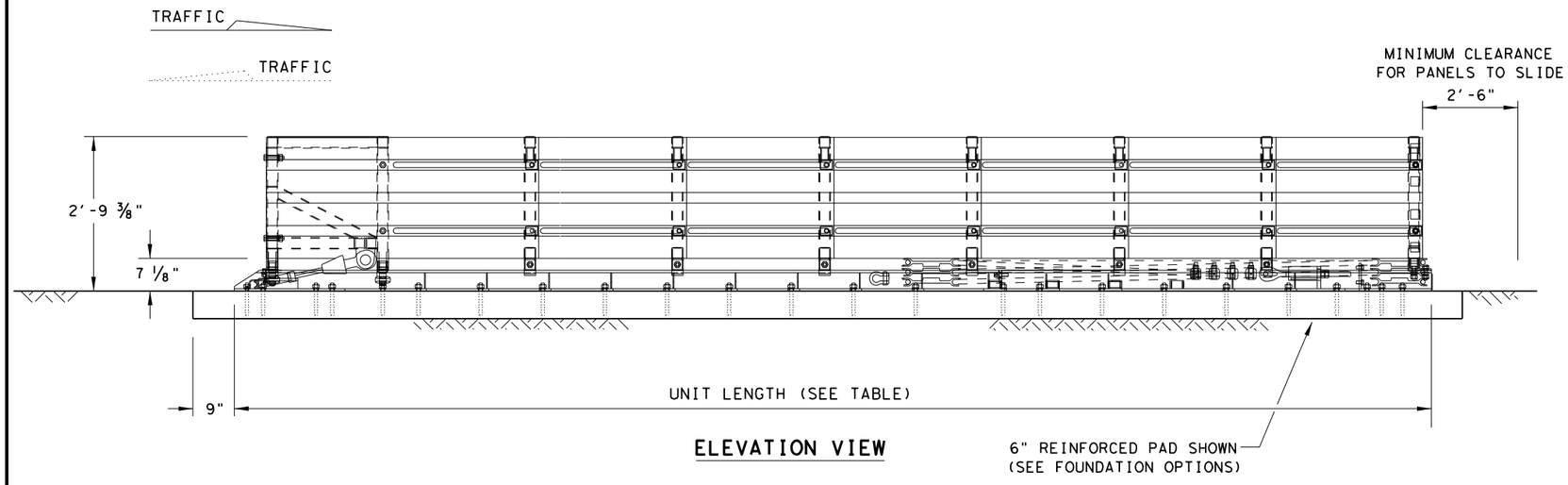
SGT(13S)31-18

FILE: sgt13s3118.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CL
© TxDOT: APRIL 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040, etc.	FM1423, etc.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO, etc.		91

DATE: 2/24/2020
FILE: sgt13s3118.dgn



PLAN VIEW



ELEVATION VIEW

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: WORK AREA PROTECTION, CORP. AT (800) 327-4417, OR (630) 377-9100.
2. FOR BI-DIRECTIONAL TRAFFIC, APPROPRIATE TRANSITION PANELS WILL BE REQUIRED.
3. ADDITIONAL DETAILS FOR THE TRANSITION OPTION AND FOUNDATION OPTION WILL BE SHOWN ON THE MANUFACTURER'S SHOP DRAWINGS FURNISHED TO THE ENGINEER.
4. CONCRETE SHALL BE CLASS "S" WITH A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI.
5. MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%.
6. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
7. THE SCI100GM & SCI70GM SYSTEMS SHOULD BE APPROXIMATELY PARALLEL WITH THE BARRIER OR CENTERLINE OF MERGING BARRIERS.

NOTE:
FOR ATTACHMENT AND TRANSITIONS TO OTHER SHAPES, BARRIERS, RAILINGS AND BI-DIRECTIONAL TRAFFIC FLOWS ARE AVAILABLE. (SEE MANUFACTURER'S PRODUCT MANUAL)

NOTE:
SIDE PANELS CAN TRAVEL 30" BEYOND THE LAST TERMINAL BRACE AT THE REAR OF THE CUSHION. ALL OBJECTS THAT MAY INTERFERE WITH THIS MOTION CAN AFFECT PERFORMANCE OF AND MAY CAUSE UNDUE DAMAGE TO THE CRASH CUSHION.

MODEL	TEST LEVEL	UNIT LENGTH (approx.)	UNIT WIDTH	FOUNDATION LENGTH	OBSTACLE WIDTH
SCI70GM	TL-2	13′-6"	2′-10 ⅝"	15′- 6 ¼"	24"to 36"
SCI100GM	TL-3	21′-6"	3′-1 ½"	23′- 0"	24"to 36"

SYSTEM AND PAD LENGTHS VARY DEPENDING ON BACKUP TYPE.

FOUNDATION OPTIONS
6" REINFORCED CONCRETE (5 ½" ANCHOR EMBEDMENT)
8" UNREINFORCED CONCRETE (5 ½" ANCHOR EMBEDMENT)
3" MIN. ASPHALT OVER 3" MIN. CONCRETE (16 ½" ANCHOR EMBED.)
6" ASPHALT OVER 6" COMPACT SUBBASE (16 ½" ANCHOR EMBED.)
8" MINIMUM ASPHALT (16 ½" ANCHOR EMBEDMENT)

FOR STEEL PLACEMENT IN CONCRETE FOUNDATIONS, SEE MANUFACTURER'S PRODUCT MANUAL.

TRANSITION OPTIONS
CONCRETE VERTICAL WALL
CONCRETE TRAFFIC BARRIERS
GUARDRAIL (W-BEAM)
GUARDRAIL (THRIE-BEAM)

TRANSITION TYPES ARE SHOWN ELSEWHERE ON THE PLANS (I.E. ATTENUATOR LOCATION DETAILS OR IN THE GENERAL NOTES).

FOR BI-DIRECTIONAL TRANSITION PANEL AND END SHOE DETAILS, SEE MANUFACTURER'S PRODUCT MANUAL.

LOW MAINTENANCE

Texas Department of Transportation

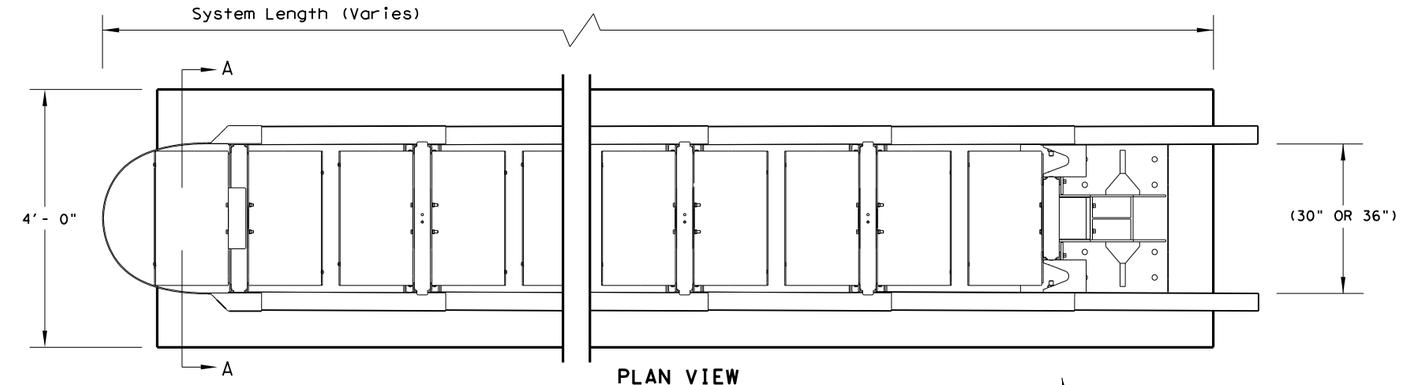
Design Division Standard

WORK AREA PROTECTION CORP (SMART-NARROW)

SMTC(N)-16

FILE: smtcn16.dgn	DN: TxDOT	CK: KM	DW: VP	CK: VP
© TxDOT: February 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED 06, 2013 (VP) REVISED 03, 2016 (VP)	1427	01	040, etc.	FM1423, etc.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO, etc.		92

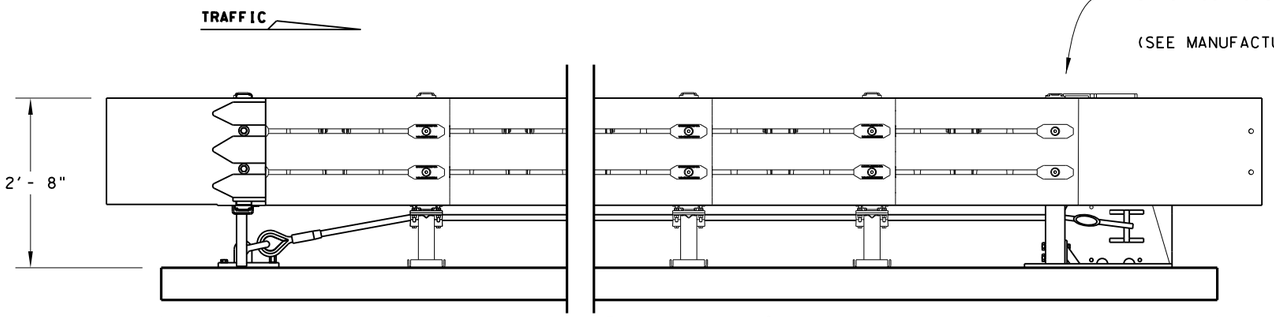
DATE: 2/24/2020
FILE: smtcn16.dgn



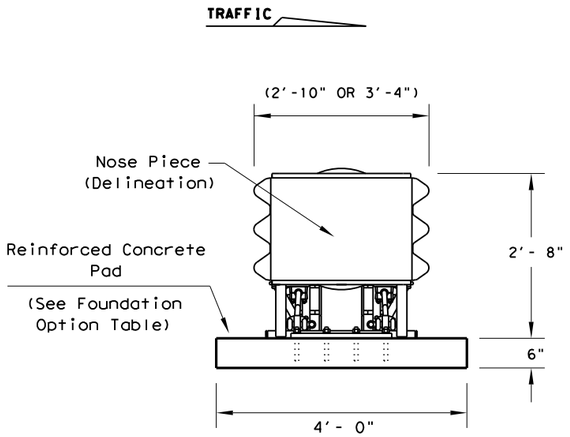
PLAN VIEW

Attachments and transitions to various barrier shapes, barrier railings and bi-directional traffic flows are available.

(SEE MANUFACTURER'S PRODUCT MANUAL)



ELEVATION VIEW



SECTION A-A

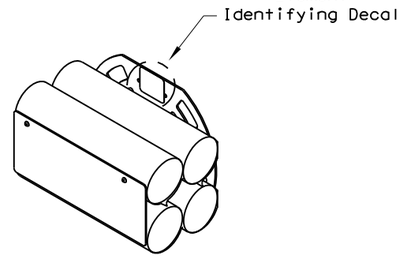
Nose Piece delineation orientation, is shown elsewhere on the plans.

TRANSITION OPTIONS
Vertical Wall
Concrete Traffic Barriers
W-Beam Guardrail
Thrie Beam Guardrail

For bi-directional transition panel and end shoe details.
(See manufacturer's product manual.)

FOUNDATION OPTIONS
6" Reinforced Concrete
8" Unreinforced Concrete
Asphalt over Concrete with Minimum 6" Embedment in Concrete
6" Asphalt over 6" Compact Subbase
8" Minimum Asphalt

For steel placement in concrete foundations.
(See manufacturer's product manual)



ENERGY ABSORBING ELEMENTS (EAE)

BACKUP SUPPORT OPTIONS
Compact (Stand Alone)
Flush Mount
PCB (Concrete Barrier)

TAU-II-R (NARROW) SYSTEM LENGTHS			
BACKSTOP	TL-2	TL-3	70 mph
PCB	13'-7"	27'-10"	30'-7"
Flush Mount	14'-0"	28'-3"	31'-0"
Compact	15'-3"	29'-6"	32'-3"

Backup and Transition types are shown elsewhere on the plans, (i.e. Attenuator location details or in the general notes).

Note: System lengths are ± 2"

GENERAL NOTES

1. For specific information regarding installation and technical guidance of the system, contact: Lindsay Transportation Solutions - Barrier Systems, Inc. at (707) 374-6800. 180 River Road, Rio Vista, CA 94571
2. For bi-directional traffic, appropriate transition panels will be required.
3. Additional details for the backup support option, transition options and foundation option will be shown on the manufacturer's shop drawings furnished to the Engineer.
4. Concrete shall be class "S" with a minimum compressive strength of 4,000 psi.
5. Maximum permissible cross-slope is 8%.
6. The installation area should be free from curbs, elevated objects, or depressions.
7. The TAU-II-R system should be approximately parallel with the barrier or center of merging barriers.
8. Refer to Universal TAU-II-R configuration chart for specific systems configuration number and location of each type of energy absorbing element.
9. 30-inch (30") model shown, also available in 36-inch (36") configuration.

BILL OF MATERIAL

PRODUCT CODE	QTY	DESCRIPTION
B030704	1	Front Support
B030703	TBD	Mid Support
TBD	1	Backstop Assembly (See Table)
TBD	1	Front Cable Anchor
TBD	1	Nose Assembly
B010202	TBD	Sliding Panel
B010659	2	End Panel
K001003	1	Slider Assembly Kit
BSI-1202006-KT	TBD	TAU-II-R Slider Kit
BSI-1107131-KT	TBD	TAU-II-R EAE Mounting Hw Kit
BSI-1012069-00	TBD	Energy Absorbing Element, Type 1
BSI-1012070-00	TBD	Energy Absorbing Element, Type 2
BSI-1012071-00	TBD	Energy Absorbing Element, Type 3
BSI-1110009-00	TBD	Energy Absorbing Element, Type 3N
TBD	TBD	Cable Assembly
K001004	TBD	Cable Guide Kit
K001005	2	Front Support Leg Kit
B010651	4	Pipe Panel Mount
TBD	1	Anchoring Package

(TBD) = To Be Determined, depending on Backup Type and System Length.

(See manufacturer's product manual for details)

Texas Department of Transportation

Design Division Standard

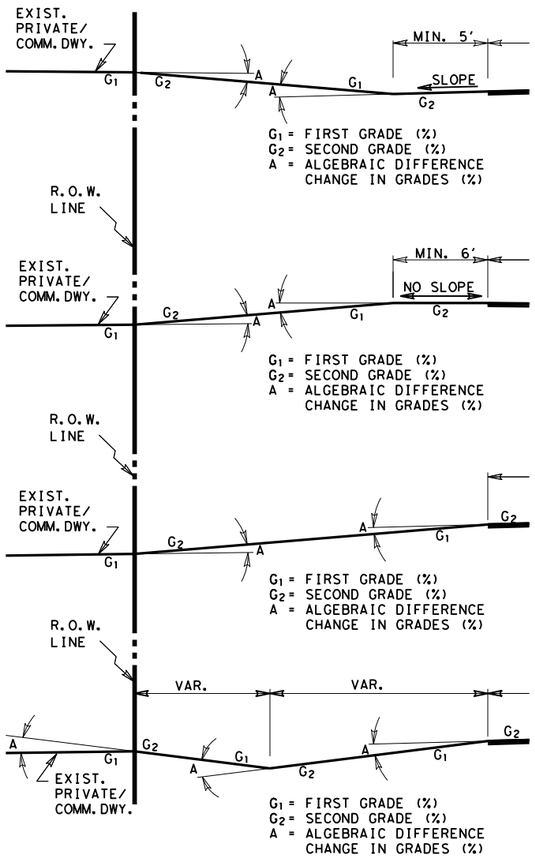
LTS-BARRIER SYSTEMS CRASH CUSHION (R-NARROW)

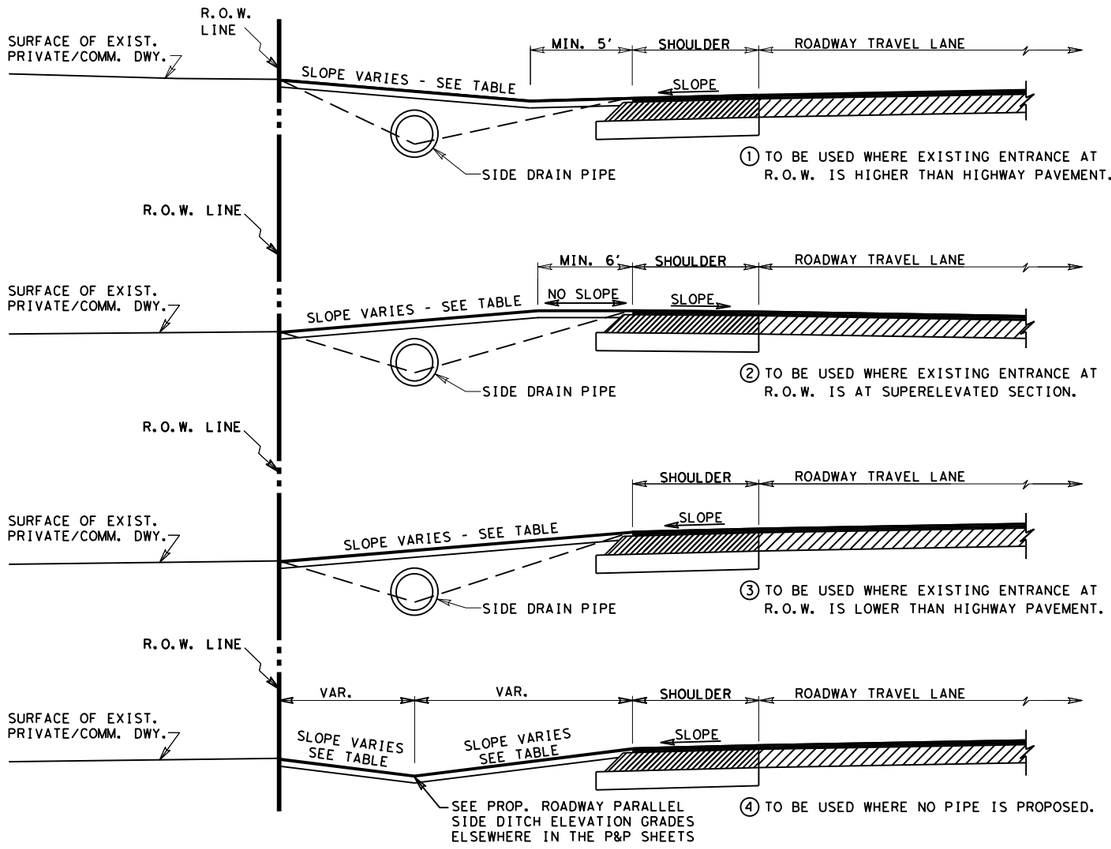
TAU-II-R(N)-16

LOW MAINTENANCE

FILE: tauiirn16.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL
©TxDOT: January 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED 06,2013 (VP) REVISED 03,2016 (VP)	1427	01	040,etc.	FM1423,etc.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO,etc.		92-A

DATE: 12/17/2020
FILE: tauiirn16.dgn





NOTES:

ALL ENTRANCES CONSTRUCTED ON THIS PROJECT ARE SUBJECT TO CONCURRENCE WITH EXISTING GOVERNING REGULATIONS AS SET OUT BY THE STATE - TEXAS TRANSPORTATION COMMISSION.

ENTRANCE'S BASE AND SURFACING MAY BE EXTENDED BEYOND R.O.W. LINE AS REQUIRED TO MEET EXISTING DRIVEWAY GRADE IN A SATISFACTORY MANNER OF WHICH NO STEEPER THAN 12:1 FOR COMMERCIAL DRIVEWAY AND 8:1 FOR RESIDENTIAL DRIVEWAY SLOPE WILL BE CONSTRUCTED.

ALL FLEXIBLE BASE USED FOR PRIVATE DRIVES & COMMERCIAL DRIVES WILL NOT REQUIRE LIME TREATMENT.

EXACT LOCATIONS, DIMENSIONS, AND TYPE TO BE ESTABLISHED DURING CONSTRUCTION BY THE ENGINEER.

PROP. WIDTH OF DRIVEWAYS TO MATCH EXISTING WIDTH AT R.O.W. LINE.

114 #/SY ACP (COMPACTED) IS EQUAL TO 1 IN. DEPTH,
171 #/SY ACP (COMPACTED) IS EQUAL TO 1½ IN. DEPTH.

SIDE DRAIN PIPES TO BE INSTALLED WHERE ROADWAY DITCH DRAINAGE IS NECESSARY, AS INDICATED ON PLANS AND/OR AS DIRECTED BY THE ENGINEER.

SIDE DRAIN PIPES TO BE INSTALLED WITH A MINIMUM OF 12" COVER WITH PROPOSED RESIDENTIAL & COMMERCIAL DRIVEWAY MATERIAL OR 15" COVER WITH PROPOSED COUNTY ROAD & CITY STREET ROADWAY MATERIAL.

AVERAGE DRIVEWAY DIMENSIONS SHOWN ON TABLE OF DRIVEWAYS (ELSEWHERE IN PLANS) ARE FOR ESTIMATING PURPOSES ONLY. ACTUAL DRIVEWAY DIMENSIONS MAY BE CHANGED BY THE ENGINEER BASED ON EXISTING FIELD CONDITIONS.

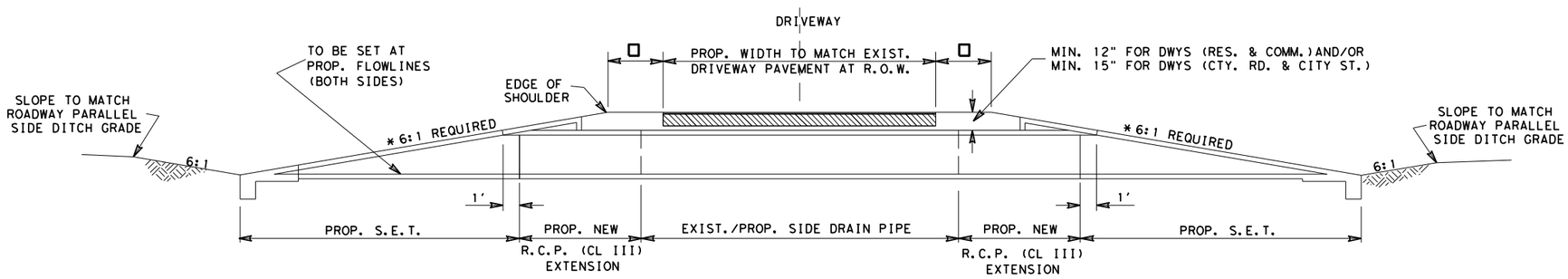
THE RATE OF PRIME COAT SHALL BE 0.10 GAL/SY FOR PRIVATE AND/OR COMMERCIAL DRIVEWAYS AND 0.20 GAL/SY FOR PUBLIC DRIVEWAYS (COUNTY ROADS AND/OR CITY STREETS).

TYPICALLY A CHANGE IN GRADE OF THREE PERCENT (3%) OR LESS AND A DISTANCE BETWEEN CHANGES IN GRADE OF AT LEAST ELEVEN FEET (11') ACCOMMODATES MOST VEHICLES. HOWEVER, LITERATURE SUGGESTS THAT A SIX PERCENT (6%) TO EIGHT PERCENT (8%) CHANGE IN GRADE MAY OPERATE EFFECTIVELY. INDIVIDUAL SITE CONDITIONS SHOULD BE EVALUATED TO ACCOMMODATE THE VEHICLE FLEET USING THE DRIVEWAY.

TYPICAL ENTRANCE PROFILE FOR DRIVEWAYS W/OUT C&G

PROPOSED DRIVEWAY SLOPE TABLE
COMMERCIAL DRIVEWAYS @ 12:1 MAX.
RESIDENTIAL DRIVEWAYS @ 8:1 MAX.

PROP. DWY ALGEBRAIC DIFFERENCE TABLE
COMMERCIAL DRIVEWAYS @ A = 6% MAX.
RESIDENTIAL DRIVEWAYS @ A = 8% MAX.



□ - 1' MIN. ON DRIVEWAYS (RES. & COMM.)
2' MIN. ON DRIVEWAYS (COUNTY RD. & CITY ST.)

* - 6:1 SLOPE REQUIRED

PHARR DISTRICT STANDARD

TEXAS DEPARTMENT OF TRANSPORTATION

DRIVEWAY PROFILE DETAILS

REV. 1/17

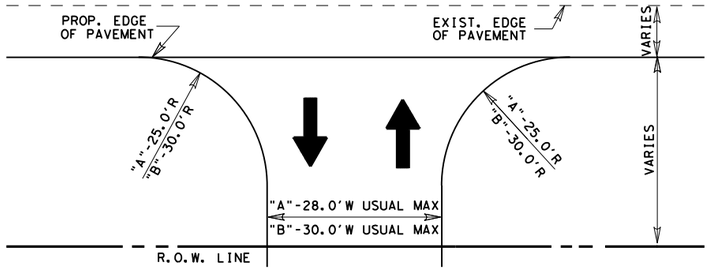
DRIVEWAY1.DGN

ED. RD. DIV. NO.	STATE AID PROJECT NO.	FILE NO.	SHEET NO.
6			93

STATE	STATE DIST. NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TEXAS	PHR	HIDALGO, etc.	1427	01	040, etc	FM 1423, etc.

2/24/2020 3:34:57 PM
DRIVEWAY1.dgn

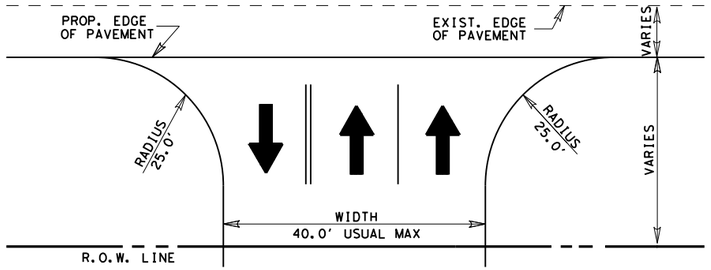
DESIGNS FOR TWO-WAY COMMERCIAL DRIVEWAYS



"A"- ONE ENTRY LANE AND ONE EXIT LANE, FEWER THAN 4 LARGE VEHICLES PER HOUR

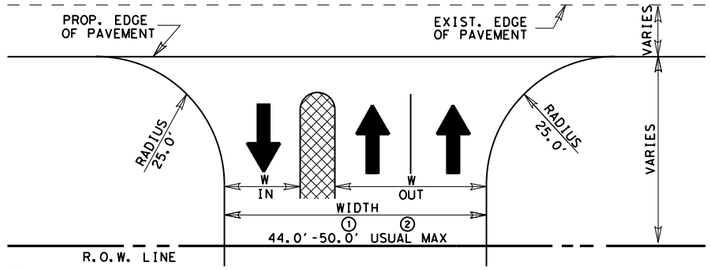
"B"- ONE ENTRY LANE AND ONE EXIT LANE, 4 OR MORE SINGLE UNIT VEHICLES① PER HOUR

① - *DRIVEWAY DESIGNS FOR LARGER VEHICLES WILL BE CONSIDERED ON A CASE BY CASE BASIS*



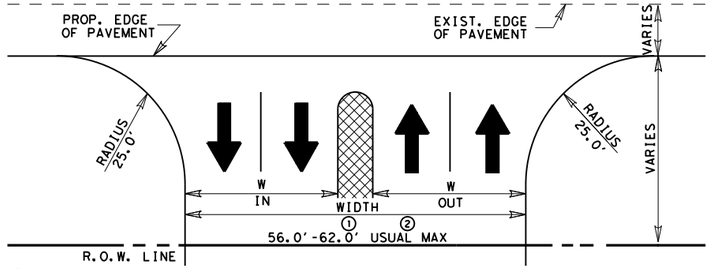
ONE ENTRY LANE AND TWO EXIT LANES (WITHOUT DIVIDERS)

DESIGNS FOR TWO-WAY COMMERCIAL DRIVEWAYS



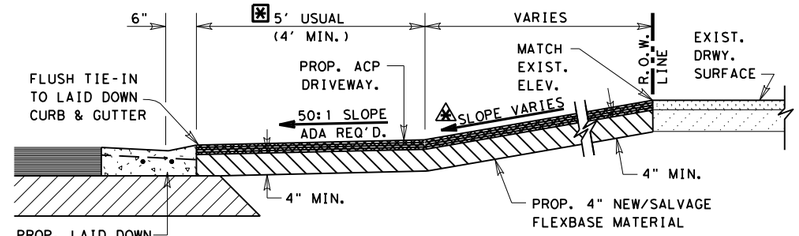
① - *4.0' WIDE DIVIDER, FACE-TO-FACE CURBS*
② - *10.0' WIDE DIVIDER, FACE-TO-FACE-CURBS*

ONE ENTRY LANE AND TWO EXIT LANES (WITH A DIVIDER)



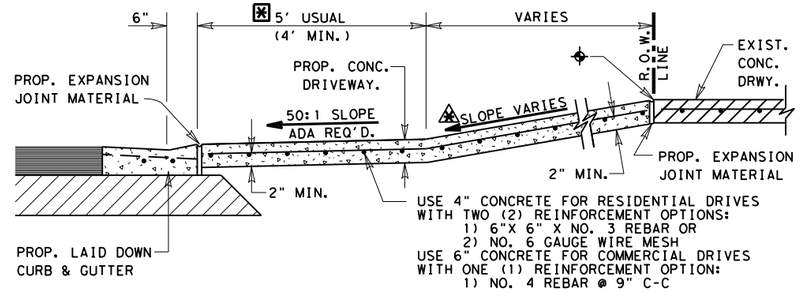
① - *4.0' WIDE DIVIDER, FACE-TO-FACE CURBS*
② - *10.0' WIDE DIVIDER, FACE-TO-FACE-CURBS*

TWO ENTRY LANES AND TWO EXIT LANES (WITH A DIVIDER)



TYPICAL ASPH. CONC. PVM'T. DRIVEWAY SECTION

N.T.S.



TYPICAL CONCRETE DRIVEWAY SECTION

N.T.S.

⊕ CONCRETE SHALL BE SAW CUT TO THE LIMITS OF REMOVAL WHERE APPLICABLE.

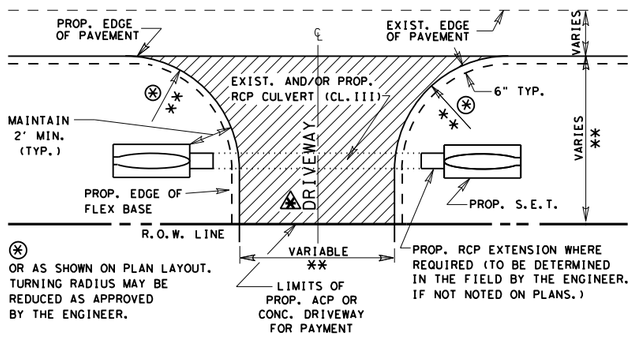
⊠ PROP./FUTURE SIDEWALK CROSSING LOCATION UNLESS SHOWN ELSEWHERE ON P&P SHEETS. SEE P&P SHEETS FOR PROP. SIDEWALK LOCATION IF SIDEWALKS ARE INCLUDED AS PART OF PROJECT. REFER TO STATE STANDARDS - PEDESTRIAN FACILITIES - FOR ADDITIONAL REQUIREMENTS.

⚠ ENTRANCE'S BASE AND SURFACING MAY BE EXTENDED BEYOND R.O.W. LINE AS REQUIRED TO MEET EXISTING GRADE IN A SATISFACTORY MANNER OF WHICH NO STEEPER THAN 12:1 FOR COMMERCIAL DRIVEWAY AND 8:1 FOR RESIDENTIAL DRIVEWAY SLOPE WILL BE CONSTRUCTED.

PROP. DWY ALGEBRAIC DIFFERENCE TABLE
COMMERCIAL DRIVEWAYS @ A = 6% MAX.
RESIDENTIAL DRIVEWAYS @ A = 8% MAX.

PROPOSED DRIVEWAY SLOPE TABLE
COMMERCIAL DRIVEWAYS @ 12:1 MAX.
RESIDENTIAL DRIVEWAYS @ 8:1 MAX.

PRIVATE AND COMMERCIAL DRIVES WITHOUT CURB & GUTTER

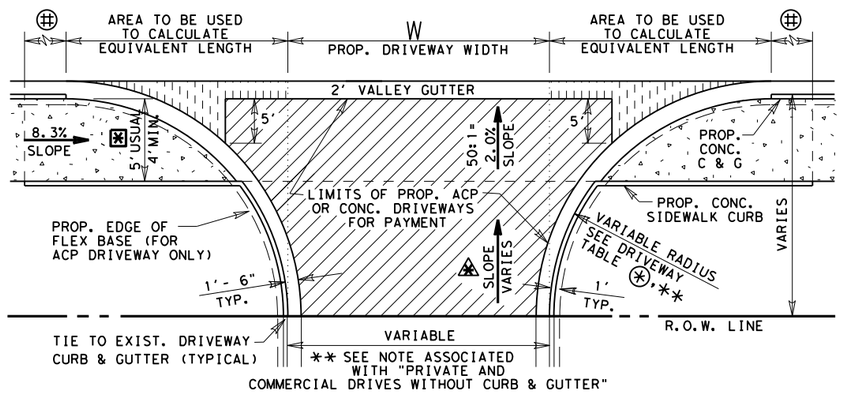


PLAN OF PRIVATE AND COMMERCIAL DRIVES

** FOR PRIVATE RESIDENTIAL DRIVES, TRY TO MATCH EXISTING WITH A MINIMUM WIDTH OF 12 FT. AND A MAXIMUM WIDTH OF 24 FT. WITH 15 FT. USUAL RADIUS. FOR COMMERCIAL DRIVES, USE ABOVE COMMERCIAL DRIVEWAY DETAILS.

⚠ SEE TYPICAL DRIVEWAY SECTIONS NOTES FOR DRIVEWAY SLOPE CRITERIA.

PRIVATE AND COMMERCIAL DRIVES WITH CURB & GUTTER



PLAN OF PRIVATE AND COMMERCIAL DRIVES

SEE P&P SHEETS FOR LOCATIONS OF DRIVES
N.T.S.

⊠ PROP./FUTURE CONC. SIDEWALK LOCATION UNLESS SHOWN ELSEWHERE ON P&P SHEETS. REFER TO STATE STANDARDS - PEDESTRIAN FACILITIES - FOR ADDITIONAL REQUIREMENTS.

⊕ LIMITS OF SLOPE FOR PROP. CONC. CURB BASED ON 8.3% SLOPE FOR SIDEWALK.

⚠ SEE TYPICAL DRIVEWAY SECTIONS NOTES FOR DRIVEWAY SLOPE CRITERIA.

LF EQUIVALENT TABLE FOR PAYMENT LIMITS OF 2' VALLEY GUTTER

LF OF VALLEY GUTTER= W + X1 + X2

WHERE X1 AND X2 MAY VARY DEPENDING ON RADIUS

Prop. Driveway Radius	X1 or X2 (Sq Ft Area / 2') Equivalent LF Length
5'	1
8'	2
10'	4
12'	6
15'	9
18'	12
20'	15
22'	18
25'	24
28'	30
30'	34

SEE DRIVEWAY TABLE FOR LIMITS OF LAID DOWN CURB TO BE PAID FOR AS CURB AND GUTTER

DRIVEWAY TYPES

TY PB-1
EXIST. PRIVATE OR COMMERCIAL DRIVEWAYS TO BE CONSTRUCTED AS SHOWN WITH 4" NEW AND/OR SALVAGE FLEX. BASE, PRIMED AND SURFACED WITH 114#/SY ACP.

CONCRETE (RESIDENTIAL)
EXIST. PRIVATE DRIVEWAYS TO BE CONSTRUCTED AS SHOWN WITH 4" CONCRETE. TO BE PAID FOR BY THE SQ.YD.

CONCRETE (COMMERCIAL)
EXIST. BUSINESS DRIVEWAYS TO BE CONSTRUCTED AS SHOWN WITH 6" CONCRETE. TO BE PAID FOR BY THE SQ.YD.

PHARR DISTRICT STANDARD

TEXAS DEPARTMENT OF TRANSPORTATION

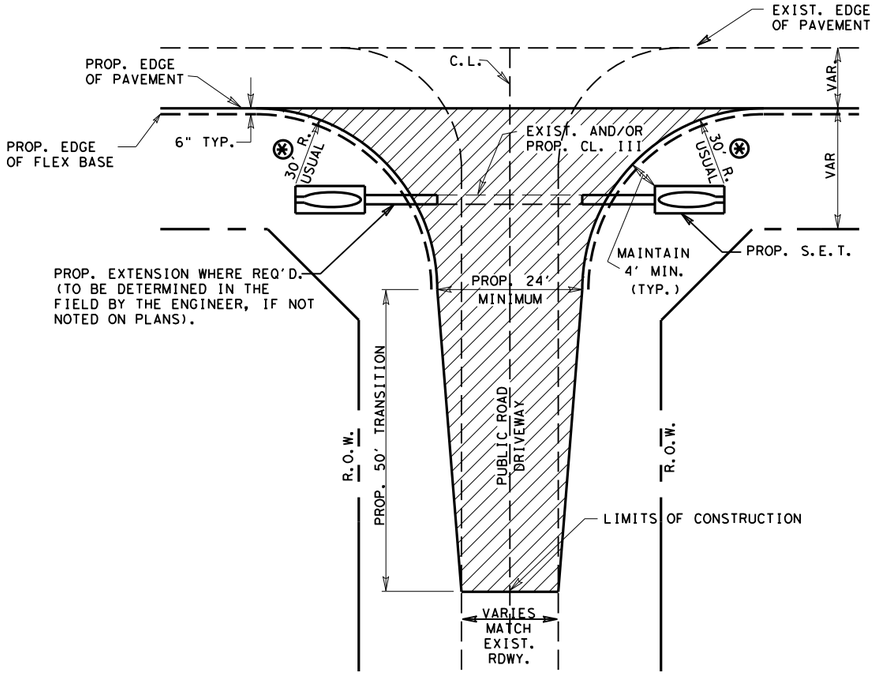
DRIVEWAY DETAILS PRIVATE (RESIDENTIAL-COMMERCIAL)

REV. 01/17

DRIVEWAY2.DGN

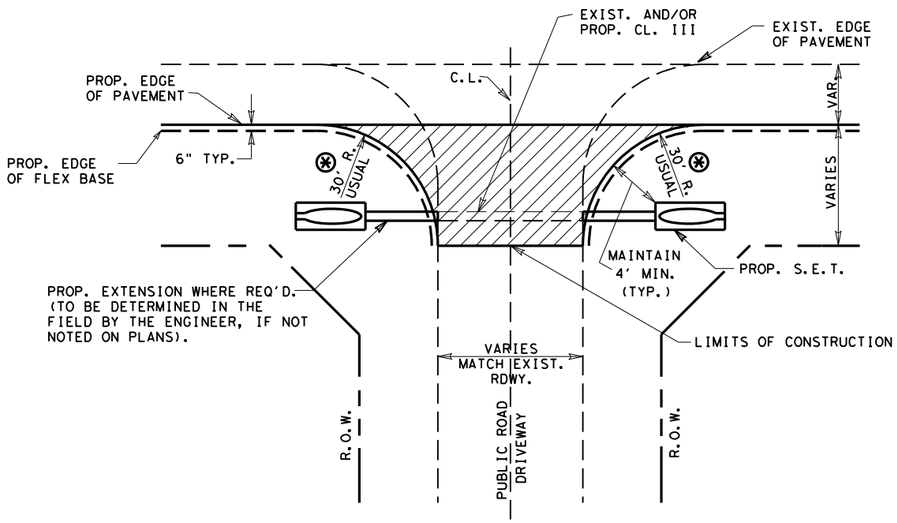
FED. RD. DIV. NO.	PROJECT NO.		FILE NO.			SHEET NO.
6						94
STATE	STATE DIST. NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TEXAS	PHR	HIDALGO, etc.	1427	01	040, etc.	FM1423, etc.

2/24/2020 3:35:04 PM
DRIVEWAY2.dgn



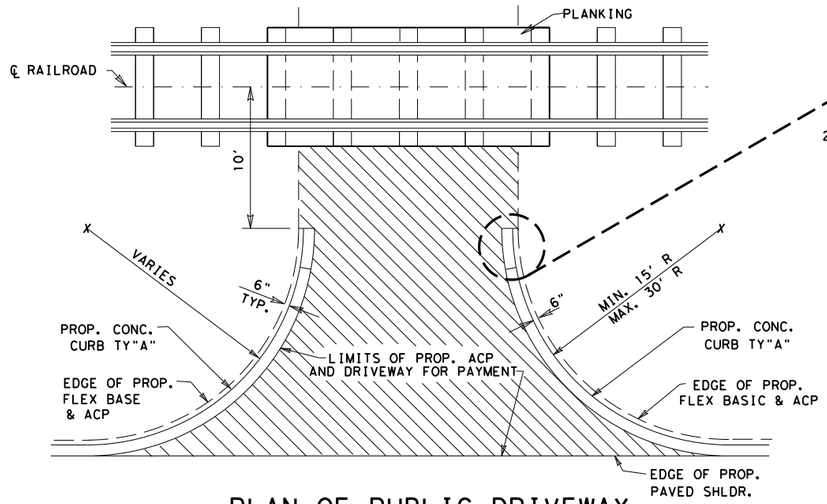
TYPICAL DETAIL

(WHEN EXIST. ROADWAY WIDTH LESS THAN 24'.)

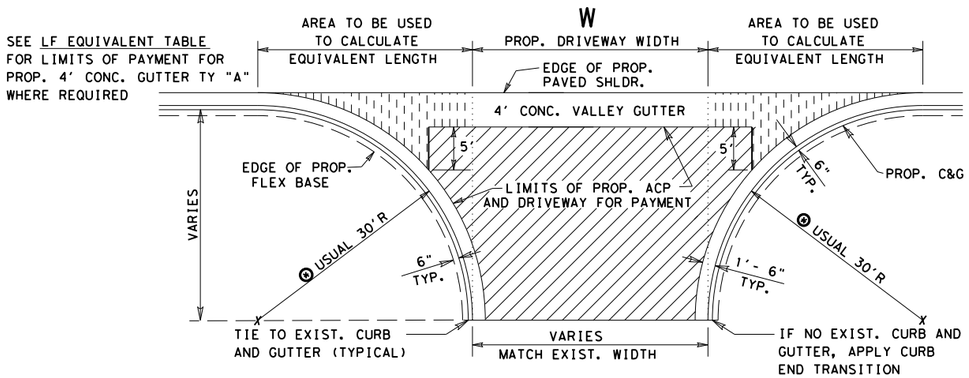


TYPICAL DETAIL

(WHEN EXIST. ROADWAY WIDTH EQUAL TO OR GREATER THAN 24'.)



PLAN OF PUBLIC DRIVEWAY ADJACENT TO R.R. CROSSING



PLAN OF PUBLIC DRIVEWAY

LF EQUIVALENT TABLE FOR PAYMENT LIMITS OF 4'CONC. GUTTER TY."A"

LF OF VALLEY GUTTER= W + X1 + X2

WHERE X1 AND X2 MAY VARY DEPENDING ON RADIUS

Prop. Driveway Radius	X1 or X2 (Sq Ft Area / 4') Equivalent LF Length
10	3
15	7
20	12
25	19
30	27
35	37
40	48
45	61
50	75
55	91
60	109
65	127
70	148
75	170

TY P

EXIST. PAVED DRIVEWAYS TO BE SURFACED W/171#/SY ACP.

TY PRB1

EXIST. PAVED, CALICHE AND/OR GRAVEL DRIVEWAYS TO BE SCARIFIED AND RECONTRUCTED WITH 4" NEW FLEX. BASE W/1% LIME TO MATCH THE PROPOSED WIDENED SECTION, THEN PRIMED AND SURFACED WITH 171#/SY ACP

TY PBS1

EXIST. UNPAVED PUBLIC DRIVEWAYS TO BE CONSTRUCTED AS SHOWN WITH 12" LIME TREAT. SUBGRADE, 8" FLEX. BASE 1% LIME, THEN PRIMED AND SURFACED WITH 171#/SY ACP.

TY PBS2

EXIST. DRIVEWAY TO BE CONSTRUCTED SAME AS ROADWAY.

GENERAL NOTES:

AVERAGE DIMENSIONS SHOWN ON TABLE OF DRIVEWAYS ARE FOR ESTIMATING PURPOSES ONLY.

LOCATIONS LISTED ON THE TABLE ARE APPROXIMATE, EXACT LOCATIONS, DIMENSIONS, AND TYPE TO BE ESTABLISHED DURING CONSTRUCTION BY THE ENGINEER AS REQUIRED.

⊛ SEE DRIVEWAY TABLE, TURNING RADIUS MAY BE REDUCED AS APPROVED BY THE ENGINEER.

SEE TABLE OF DRIVEWAYS FOR TOTAL LENGTH OF PROP. 4' CONC. VALLEY GUTTER FOR EACH LOCATION.

PHARR DISTRICT STANDARD

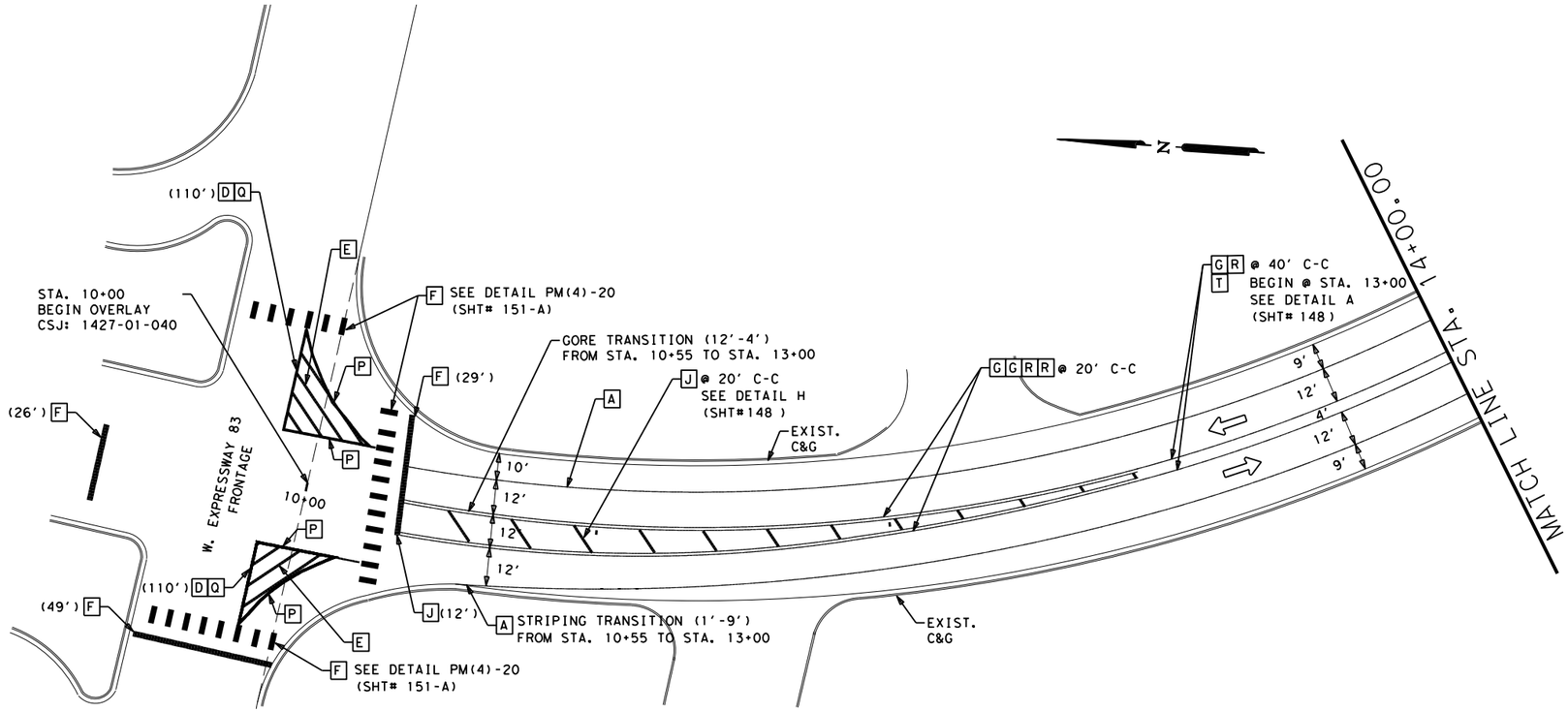
TEXAS DEPARTMENT OF TRANSPORTATION

DRIVEWAY DETAILS PUBLIC (COUNTY ROAD-CITY STREET)

REV. 4/05

DRIVEWAY3.DGN

FED. RD. DIV. NO.	STATE AID PROJECT NO.		FILE NO.			SHEET NO.
6						95
STATE	STATE DIST. NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TEXAS	21	HIDALGO, etc.	1427	01	040, etc	EM1423, etc.



LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
··· - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

08/20/2020

Pharr District Central Design

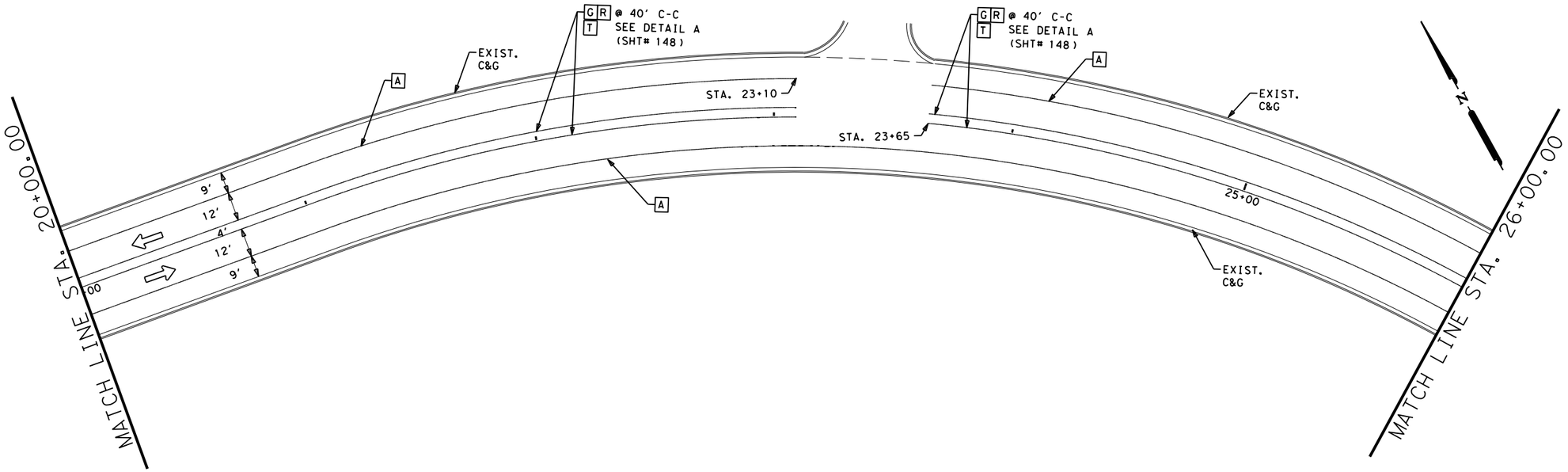
Texas Department of Transportation

FM 1423
LOCATION 1
PAVEMENT MARKING LAYOUTS

SHEET 1 OF 4

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		96

DATE: 8/19/2020 5:08:26 PM
FILE: LOC1PM01.dgn

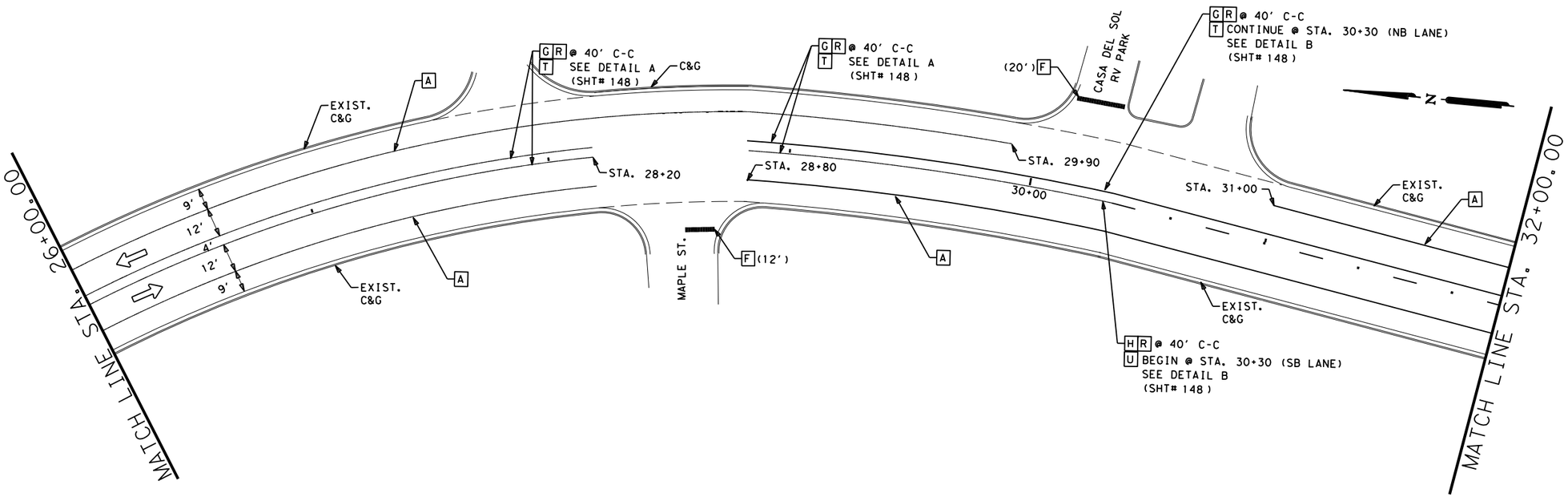


LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

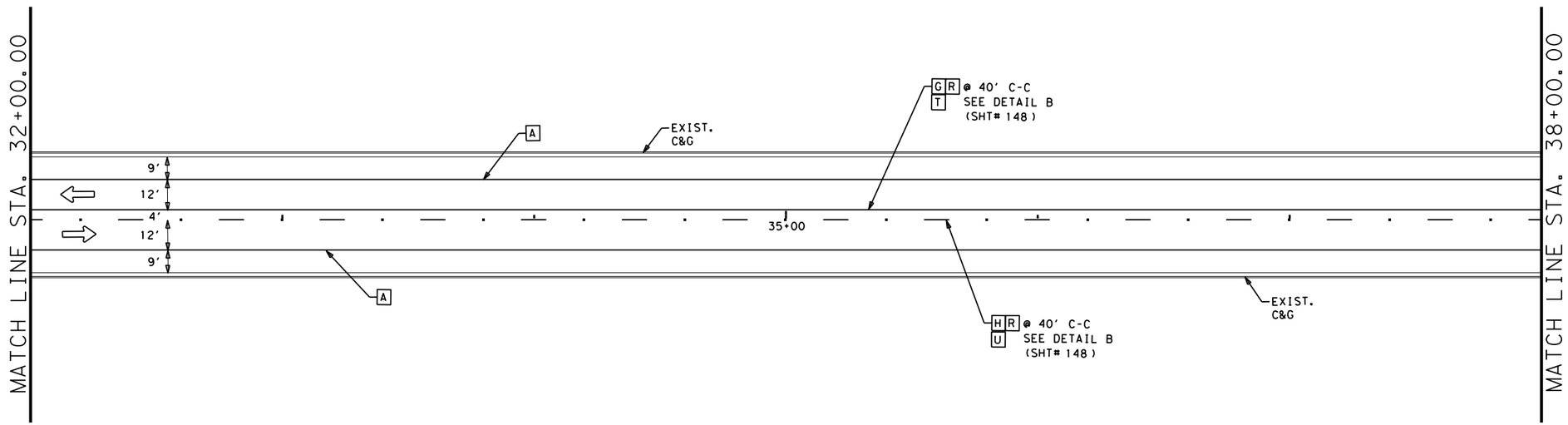
Texas Department of Transportation

FM 1423 LOCATION 1 PAVEMENT MARKING LAYOUTS

SHEET 2 OF 4

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		97

DATE: 2/25/2020 10:03:26 AM
FILE: LOC1PM02.dgn

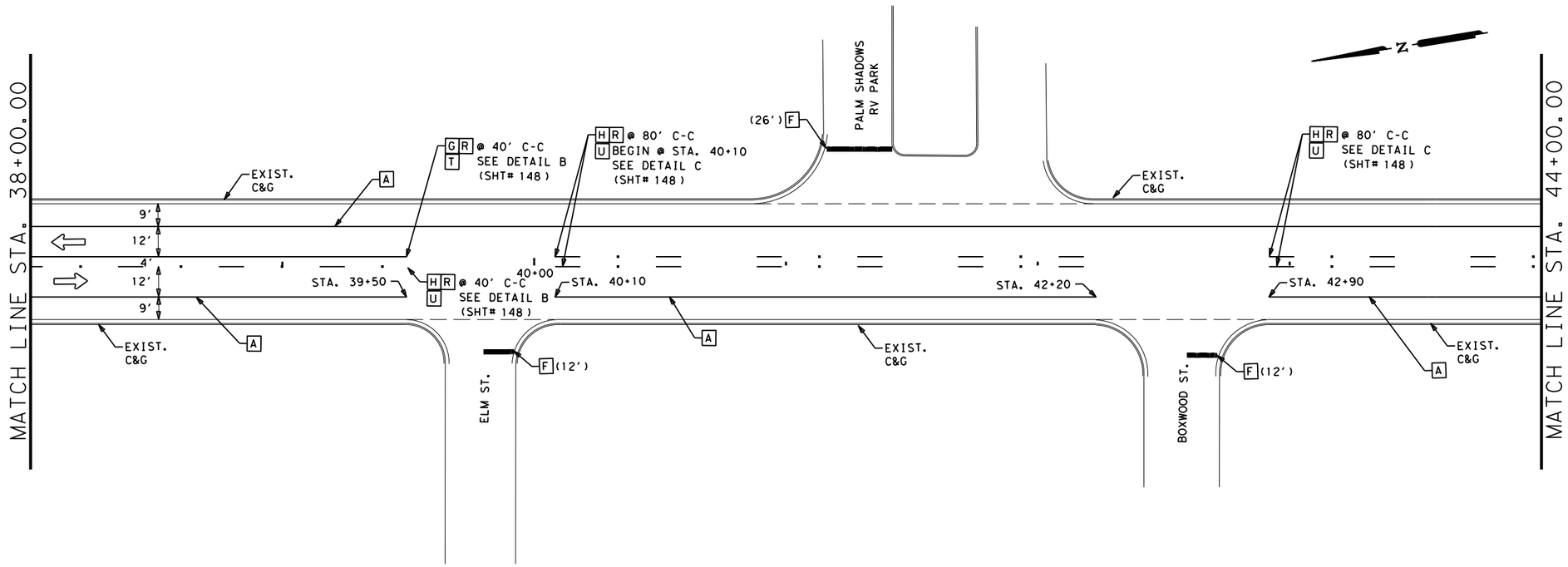


LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

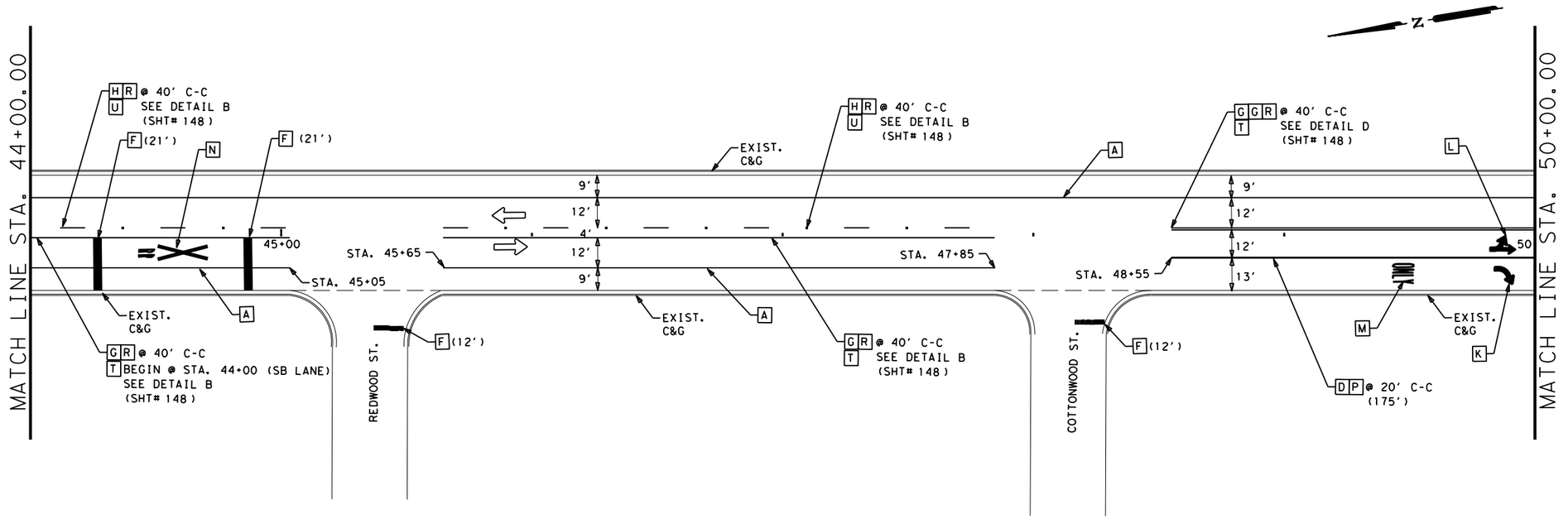
Texas Department of Transportation

FM 1423
LOCATION 1
PAVEMENT MARKING LAYOUTS

SHEET 3 OF 4

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		98

DATE: 2/25/2020 10:03:37 AM
FILE: LOC1PM03.dgn

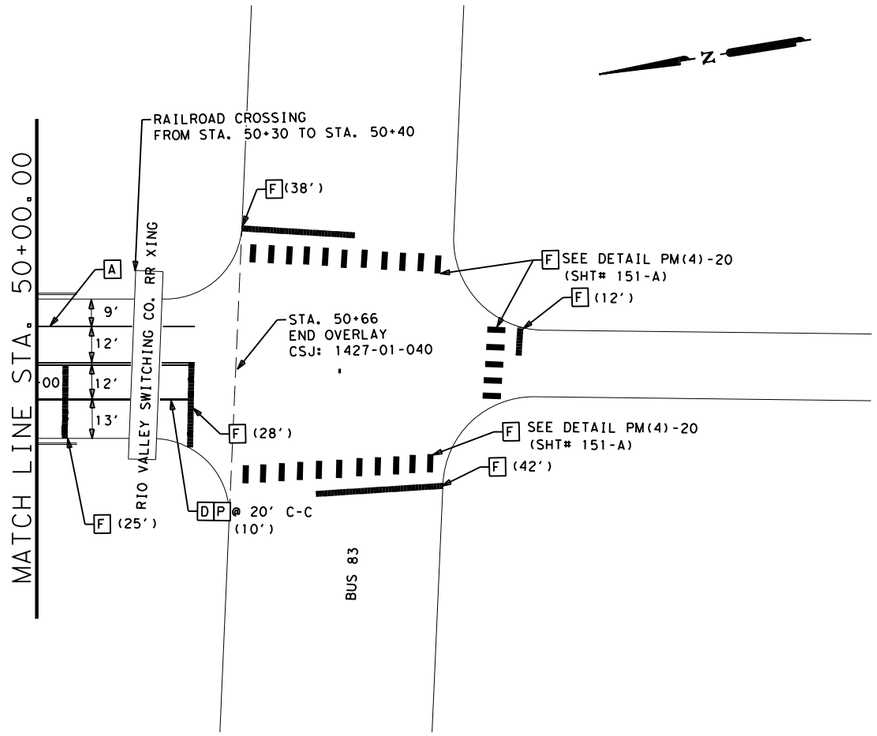


LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER

08/20/2020

Pharr District Central Design

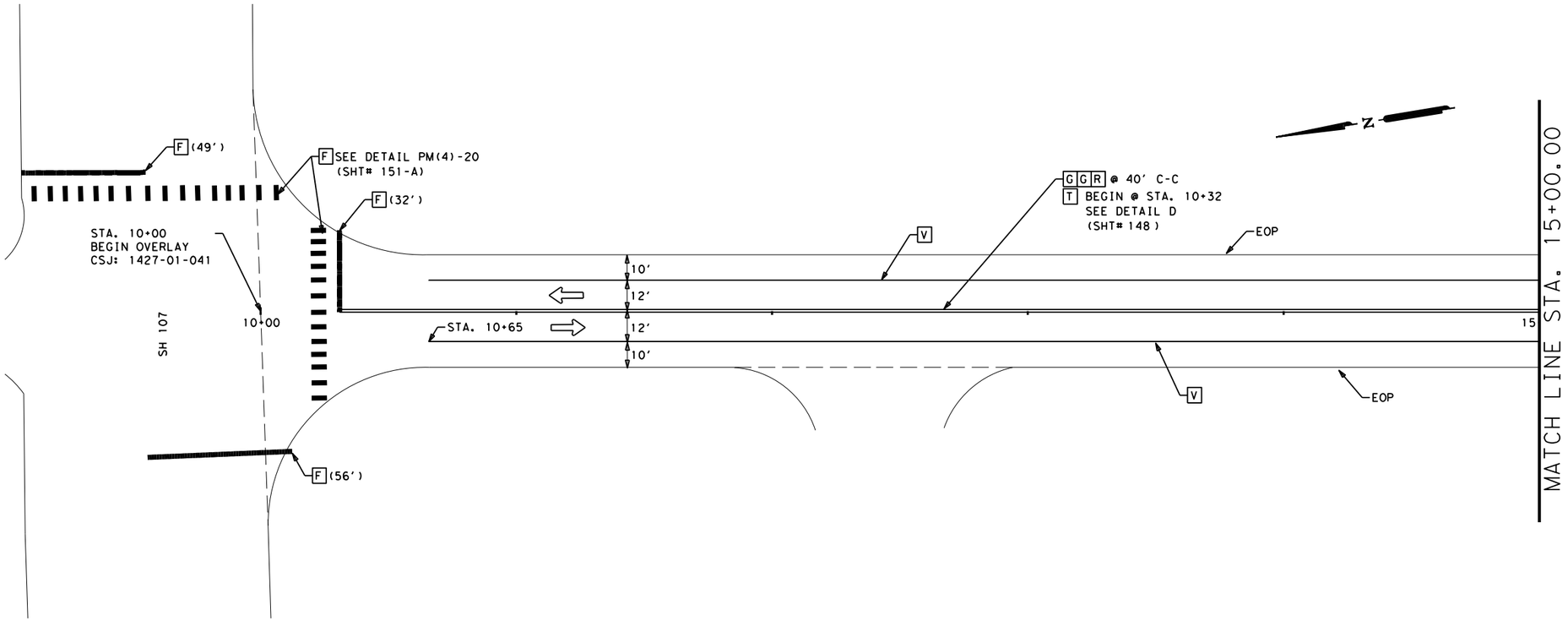
Texas Department of Transportation

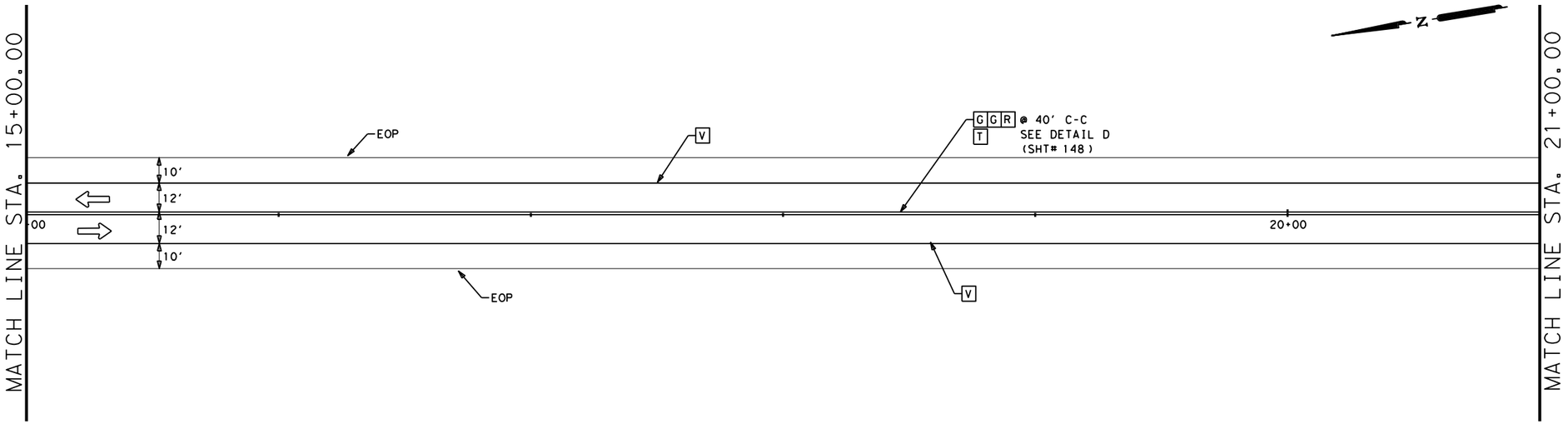
FM 1423
LOCATION 1
PAVEMENT MARKING LAYOUTS

SHEET 4 OF 4

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		99

DATE: 8/19/2020 5:24:03 PM
FILE: LOC1PM04.dgn





LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
08/20/2020

Pharr District Central Design

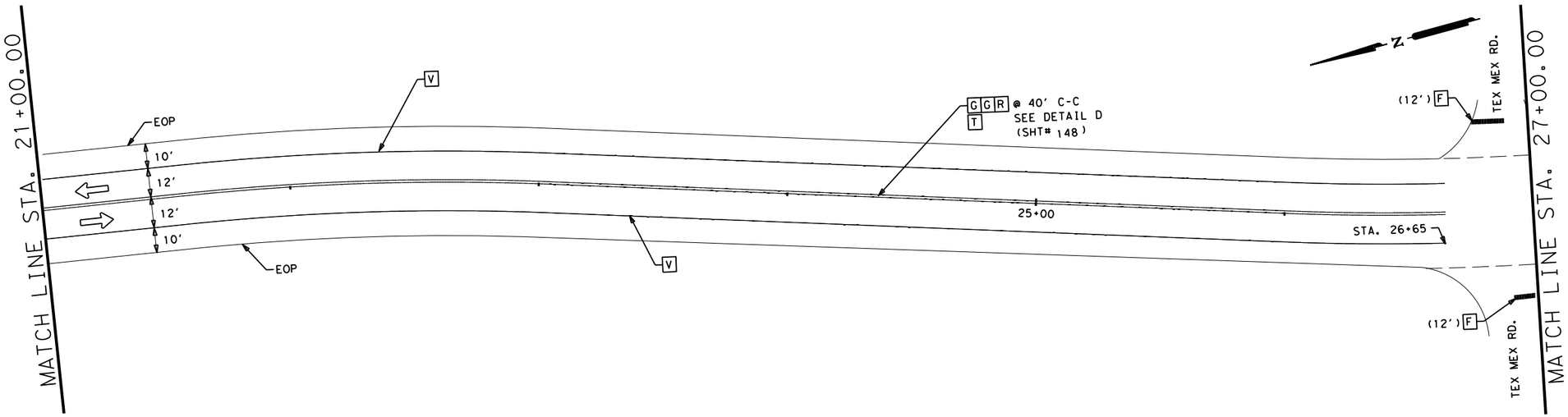
Texas Department of Transportation

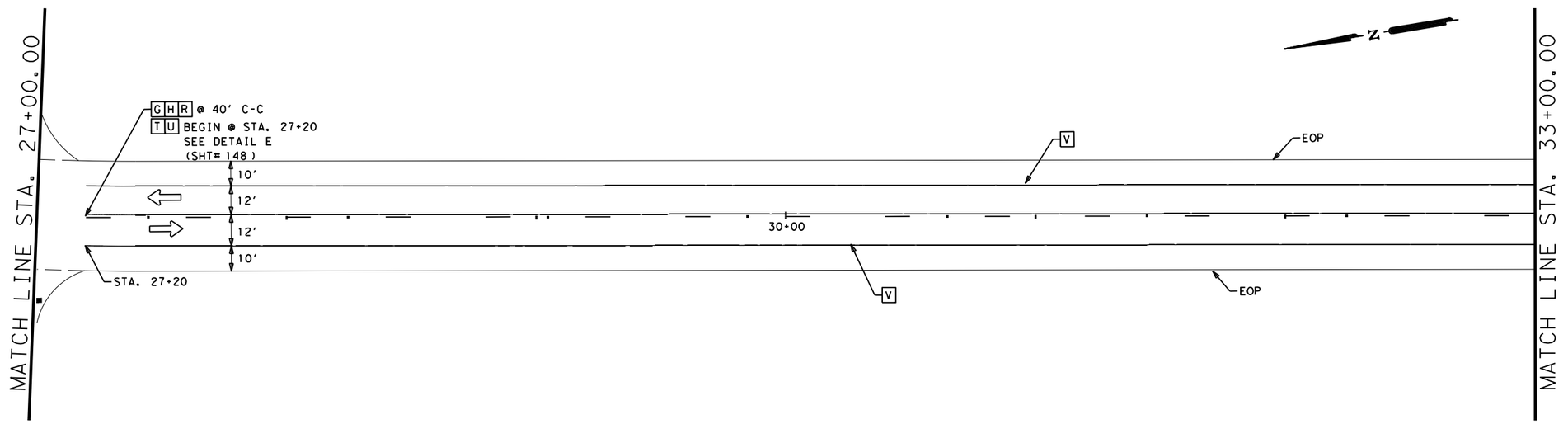
FM 1423
LOCATION 2
PAVEMENT MARKING LAYOUTS

SHEET 1 OF 13

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		100

DATE: 8/19/2020 5:28:19 PM
FILE: LOC2PM01.dgn





LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

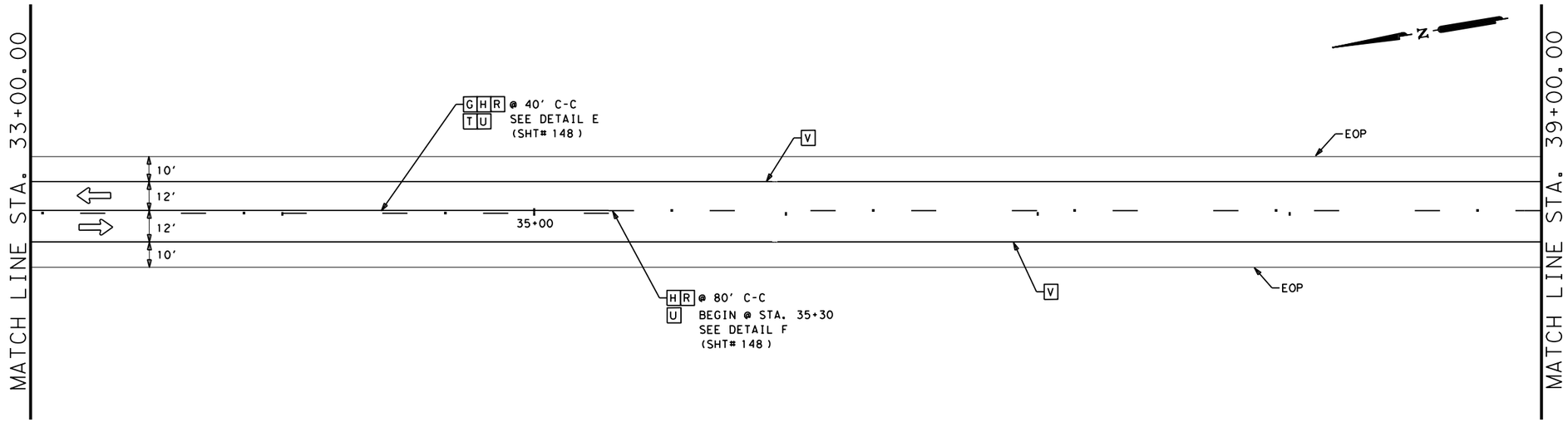
Texas Department of Transportation

FM 1423
LOCATION 2
PAVEMENT MARKING LAYOUTS

SHEET 2 OF 13

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		101

DATE: 2/25/2020 10:04:21 AM
FILE: LOC2PM02.dgn

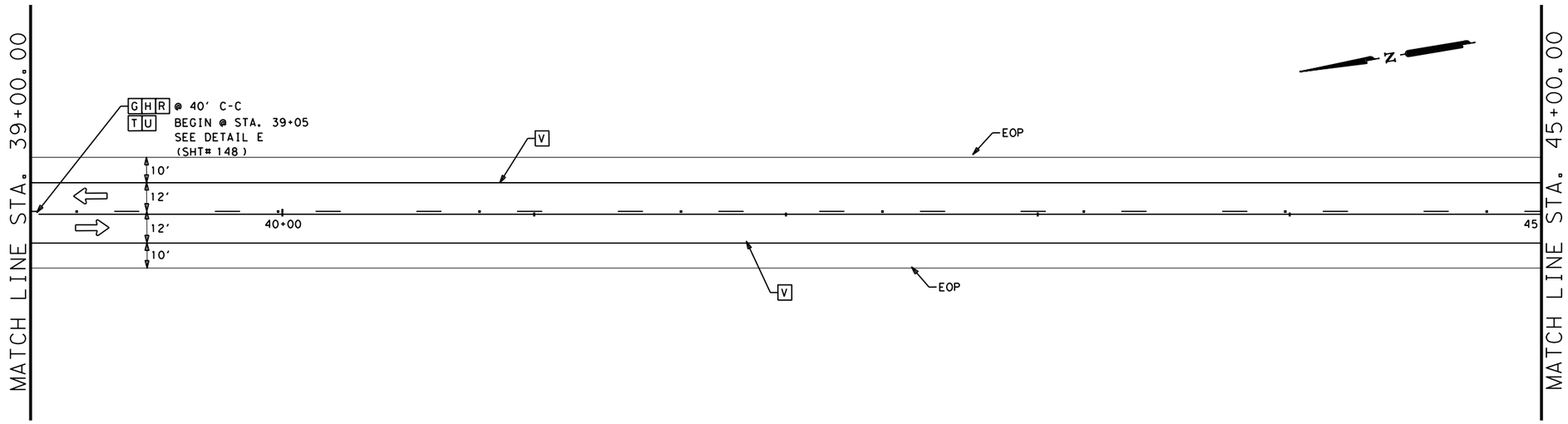


LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

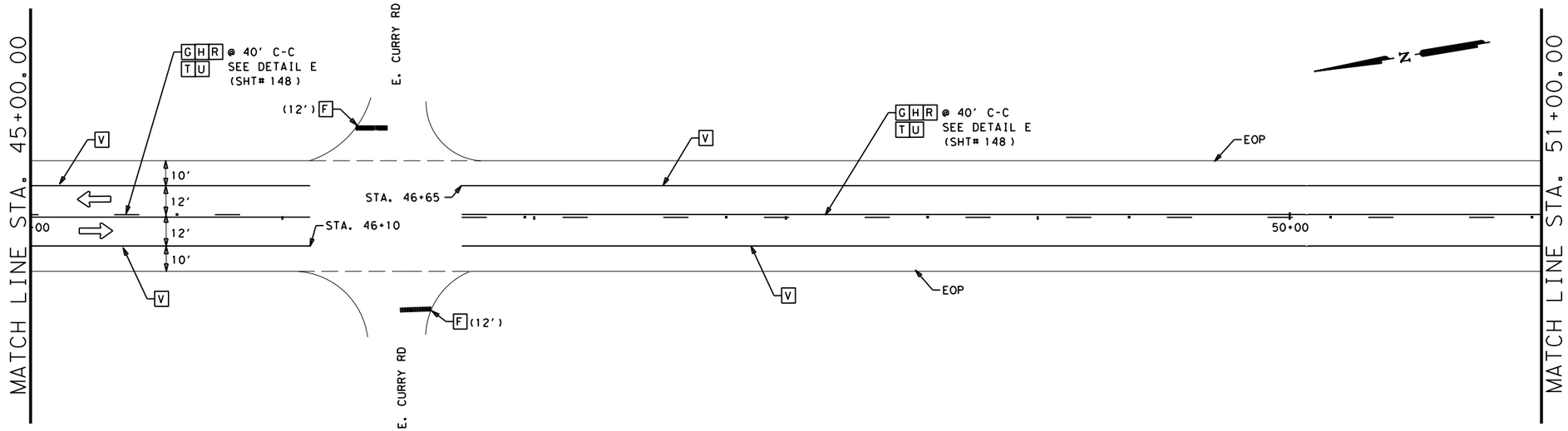
Texas Department of Transportation

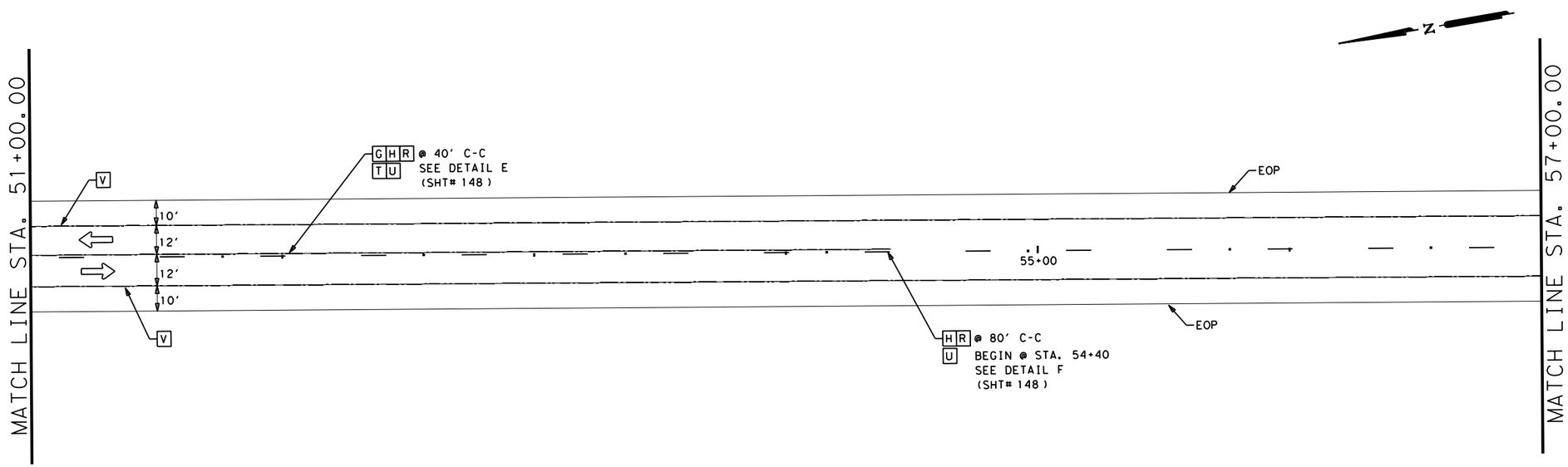
FM 1423
LOCATION 2
PAVEMENT MARKING LAYOUTS

SHEET 3 OF 13

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		102

DATE: 2/25/2020 10:04:32 AM
FILE: LOC2PM03.dgn





LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

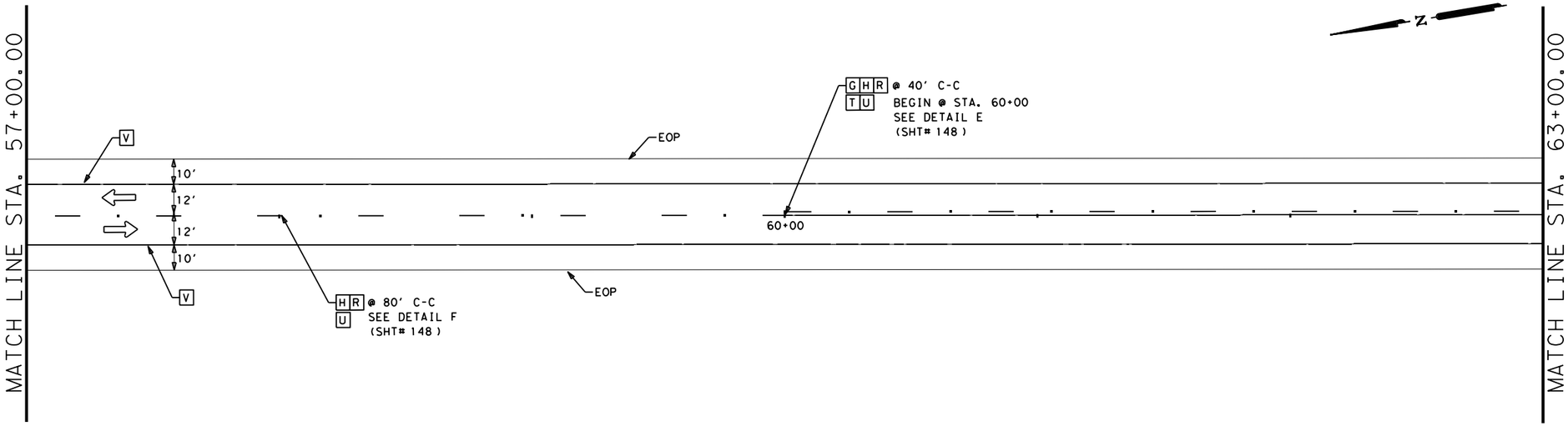
Texas Department of Transportation

FM 1423
LOCATION 2
PAVEMENT MARKING LAYOUTS

SHEET 4 OF 13

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		103

DATE: 2/25/2020 10:04:43 AM
FILE: LOC2PM04.dgn

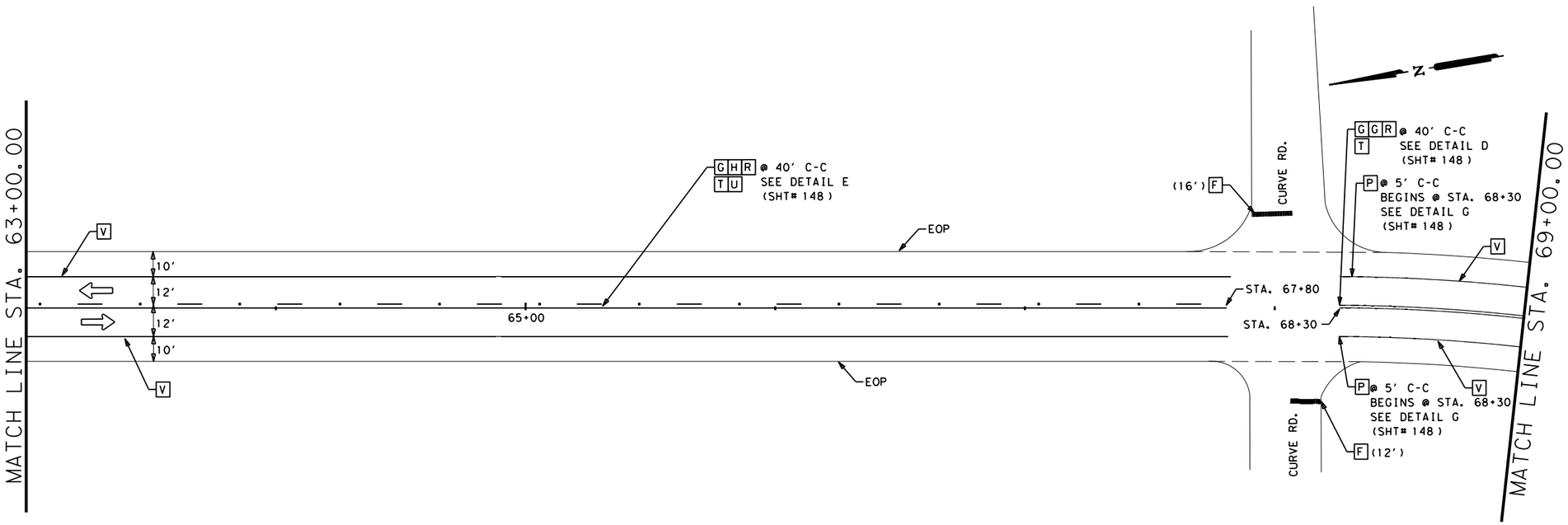


LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

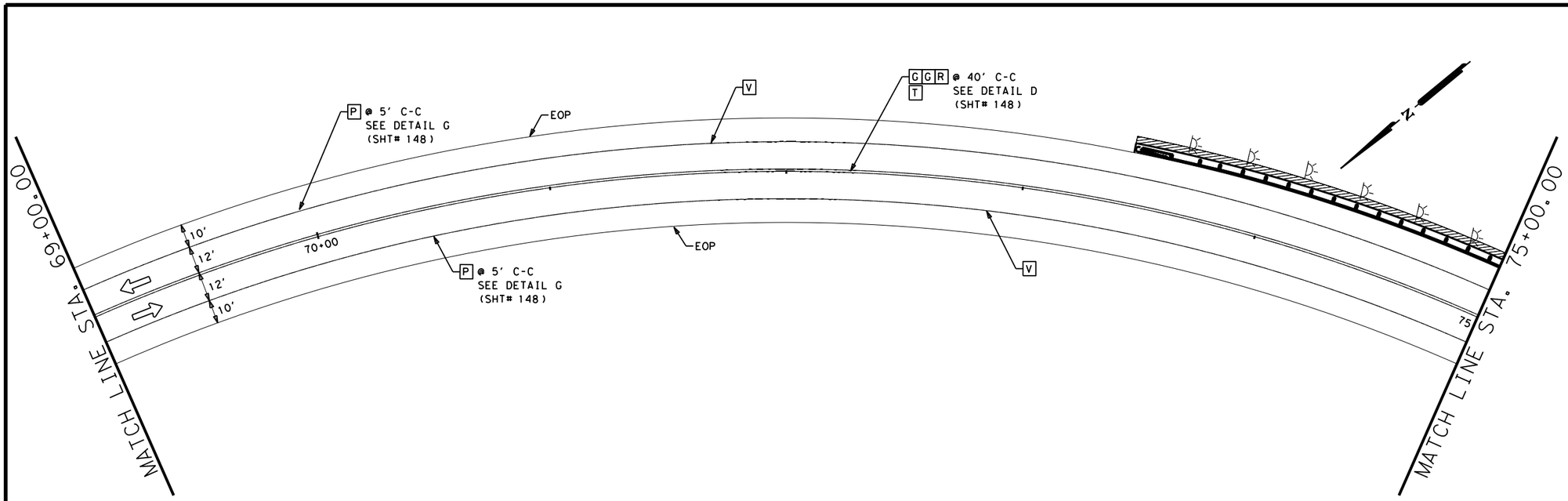
Texas Department of Transportation

FM 1423
LOCATION 2
PAVEMENT MARKING LAYOUTS

SHEET 5 OF 13

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		104

DATE: 2/25/2020 10:04:53 AM
FILE: LOC2PM05.dgn



LEGEND:

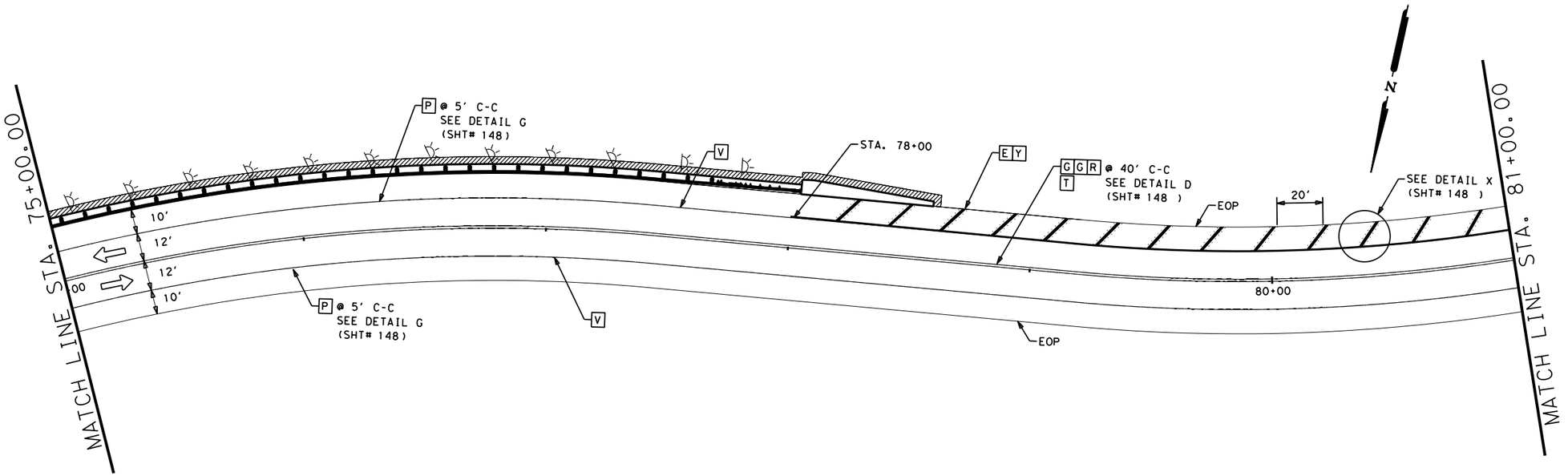
- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:

ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

SEE METAL BEAM GUARD FENCE DETAILS SHEETS FOR DETAILS



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

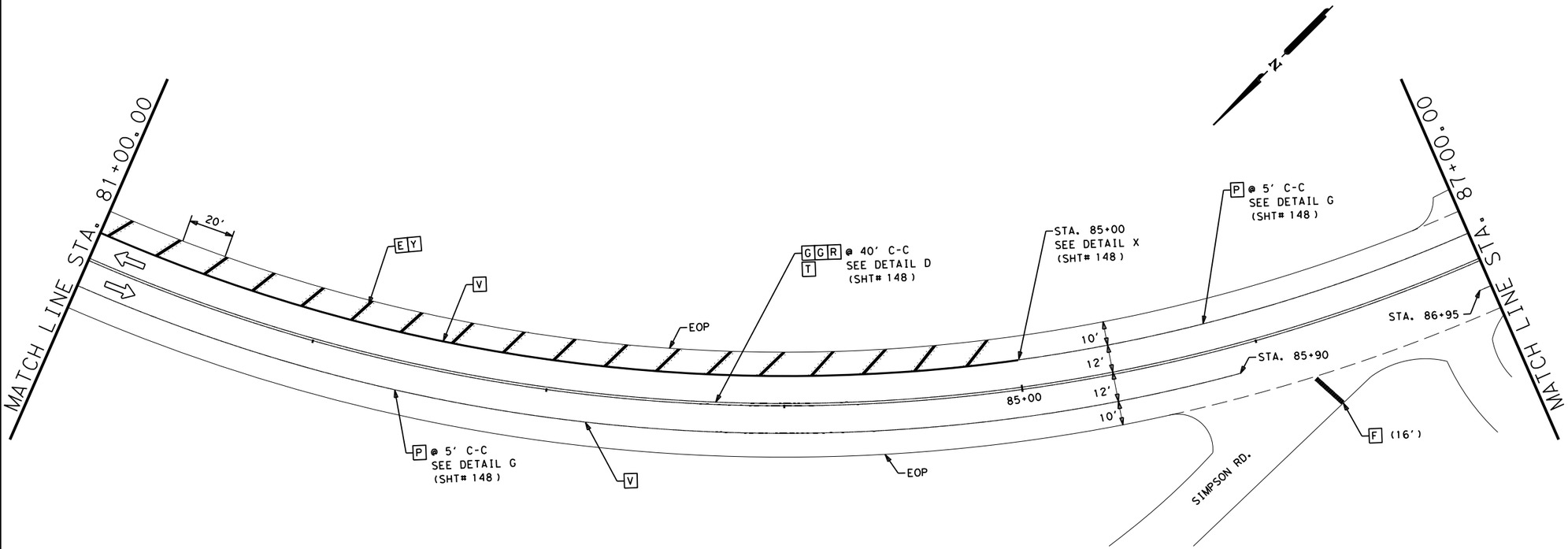
Texas Department of Transportation

FM 1423
LOCATION 2
PAVEMENT MARKING LAYOUTS

SHEET 6 OF 13

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		105

DATE: 2/25/2020 10:05:02 AM
FILE: LOC2PM06.dgn



LEGEND:

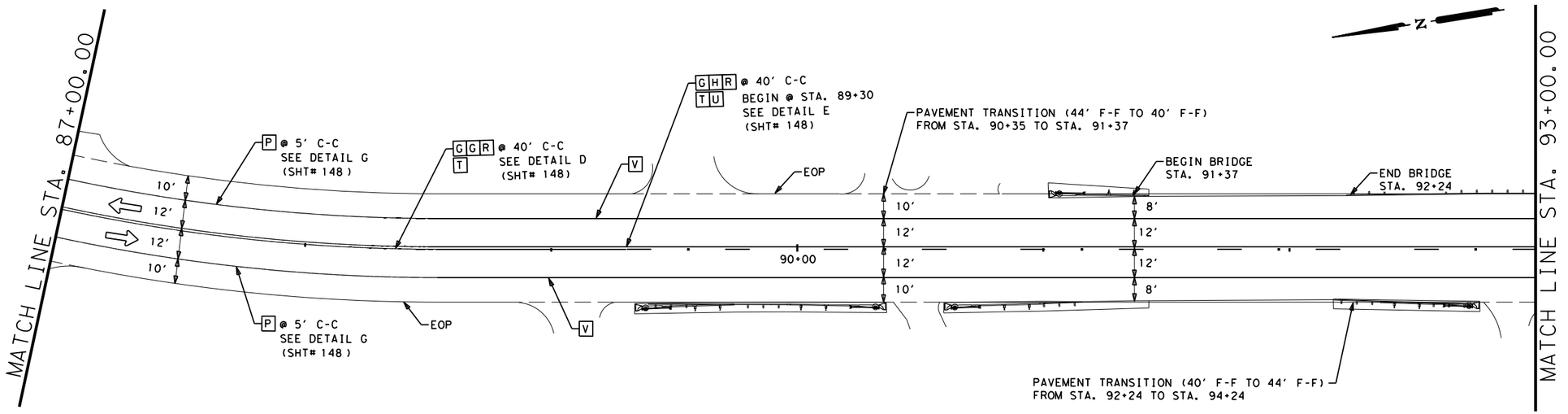
- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
▪▪▪ - LIMITS OF OVERLAY

NOTES:

ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

SEE METAL BEAM GUARD FENCE DETAILS SHEETS FOR DETAILS



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

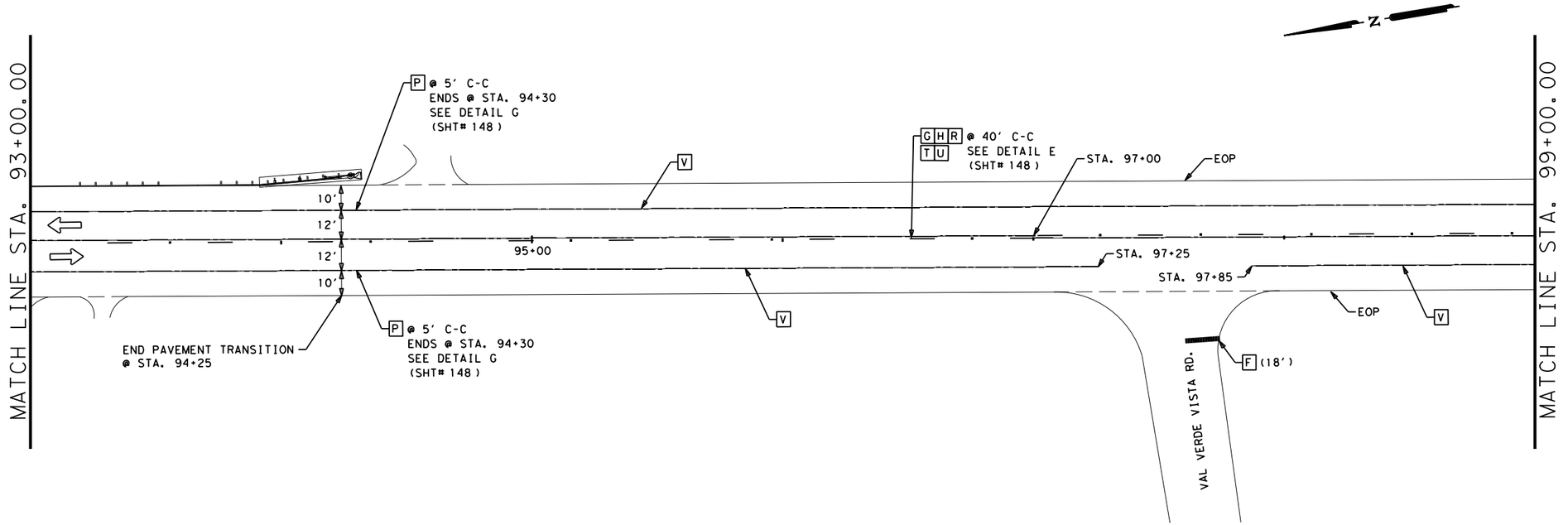
Texas Department of Transportation

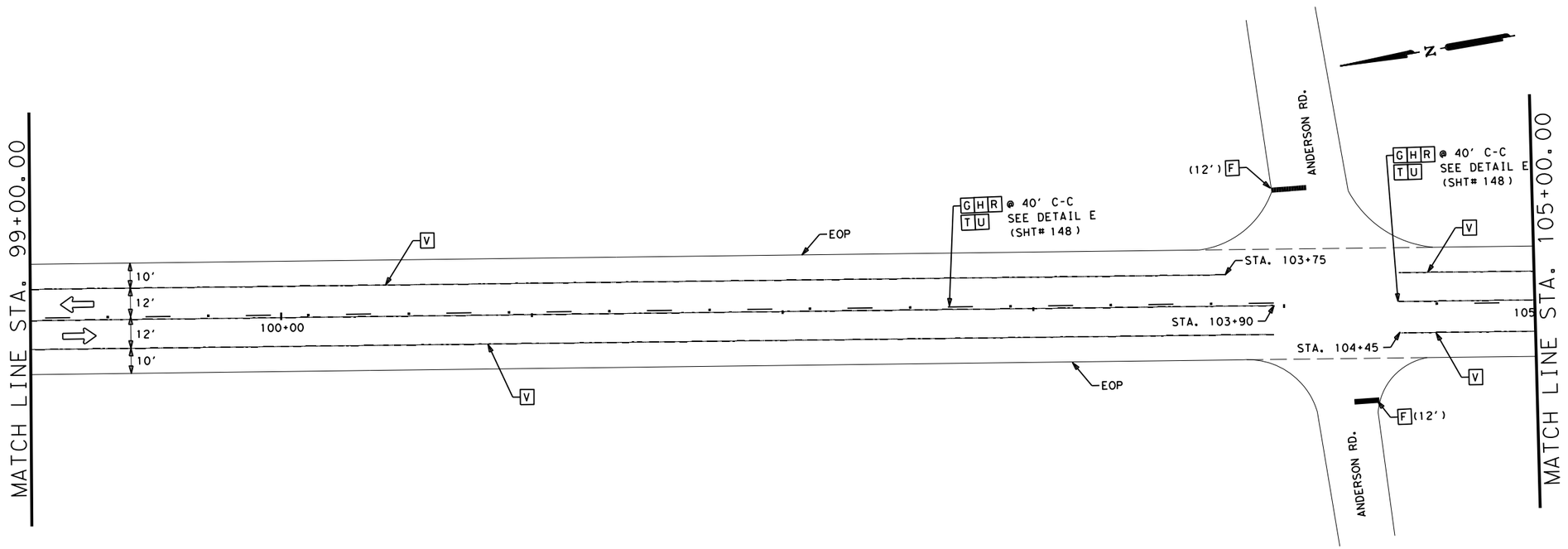
FM 1423
LOCATION 2
PAVEMENT MARKING LAYOUTS

SHEET 7 OF 13

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		106

DATE: 2/25/2020 10:05:11 AM
FILE: LOC2PM07.dgn





LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
··· - LIMITS OF OVERLAY

NOTES:

ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

SEE METAL BEAM GUARD FENCE DETAILS SHEETS FOR DETAILS

SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

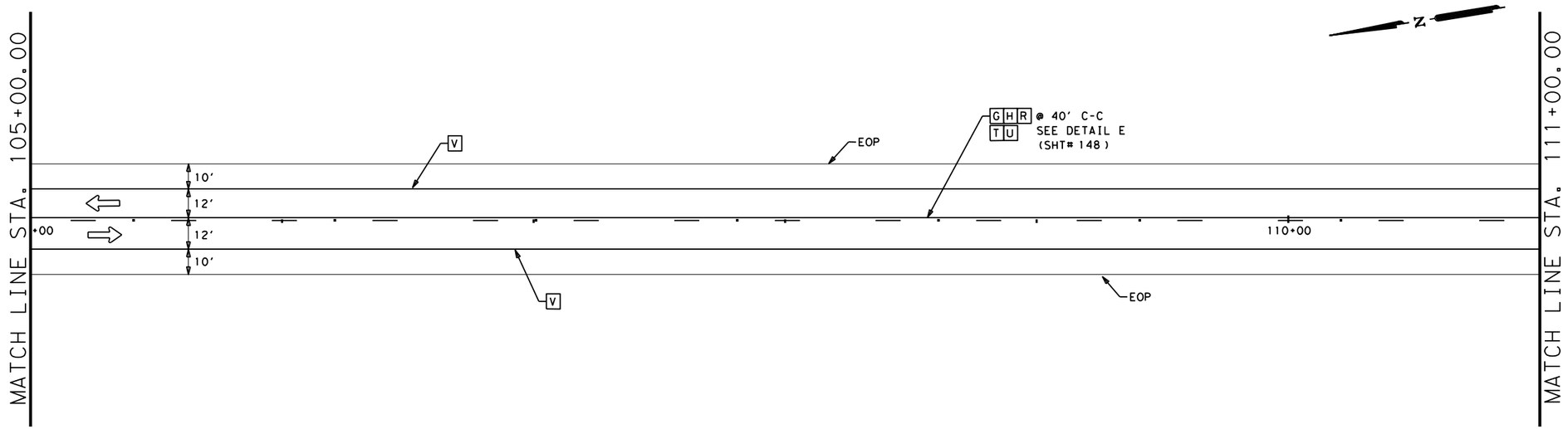
Texas Department of Transportation

FM 1423
LOCATION 2
PAVEMENT MARKING LAYOUTS

SHEET 8 OF 13

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		107

DATE: 2/26/2020 3:55:09 PM
FILE: LOC2PM08.dgn

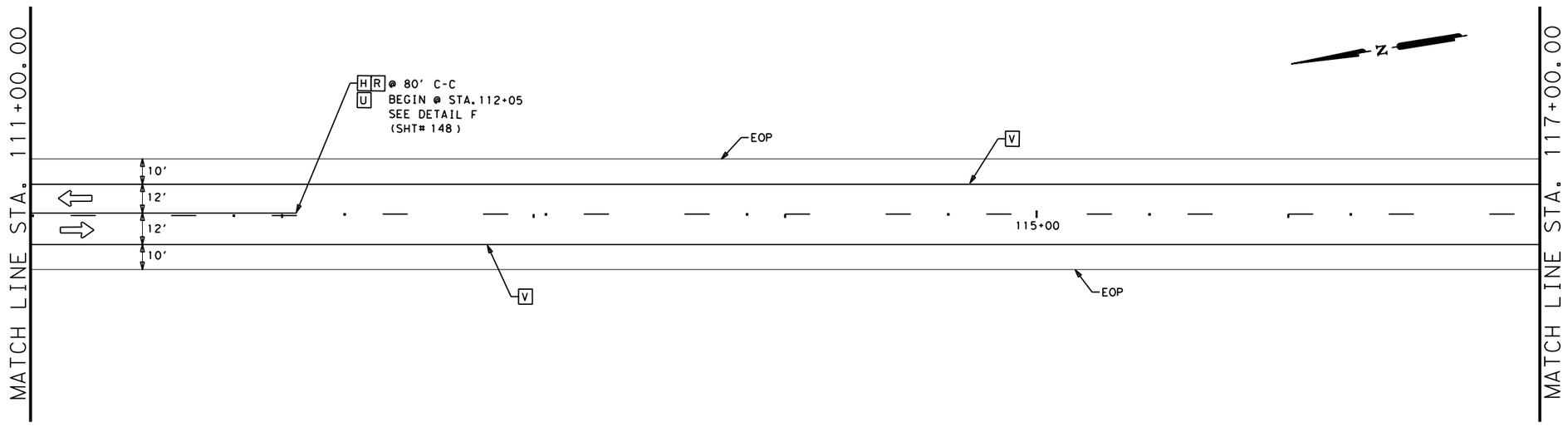


LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

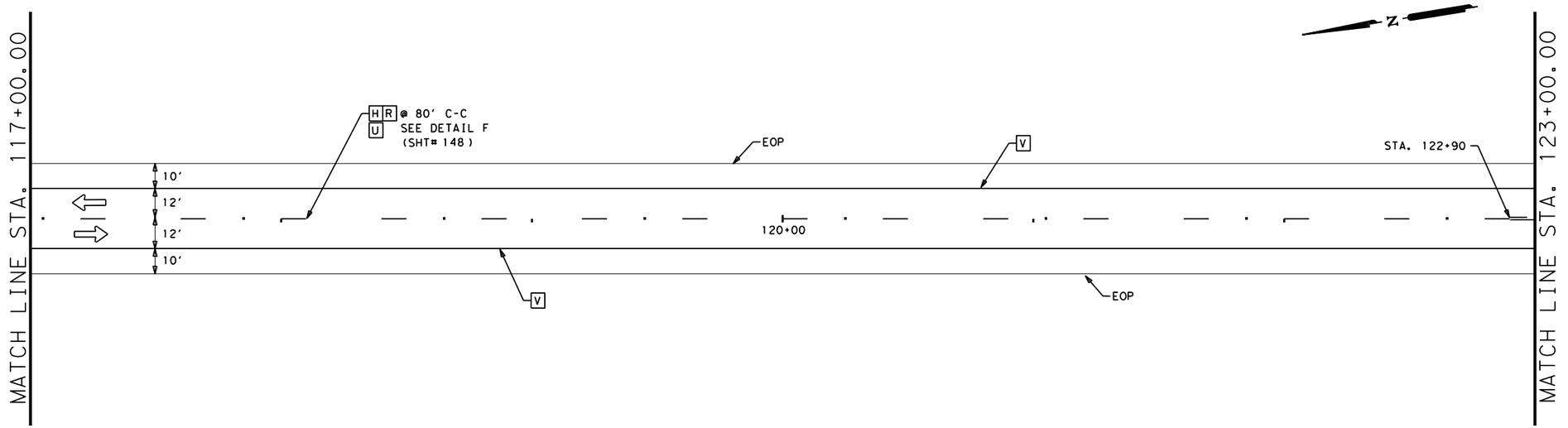
Texas Department of Transportation

FM 1423
LOCATION 2
PAVEMENT MARKING LAYOUTS

SHEET 9 OF 13

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		108

DATE: 2/25/2020 10:05:30 AM
FILE: LOC2PM09.dgn

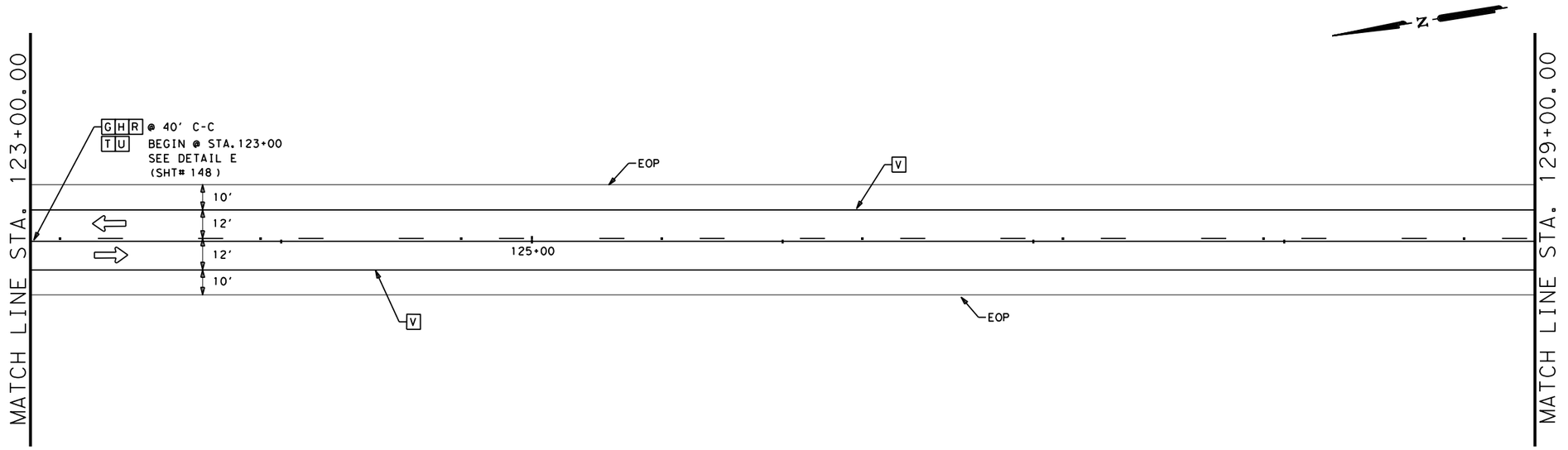


LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

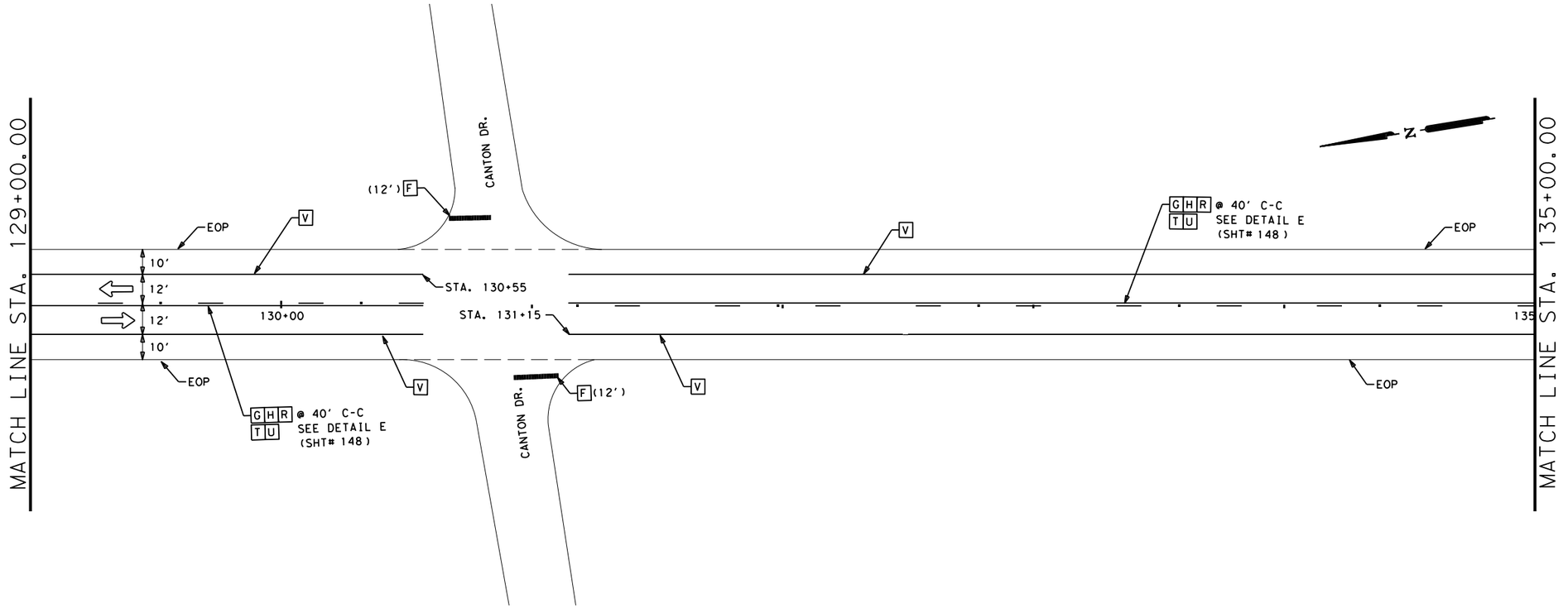
Texas Department of Transportation

FM 1423
LOCATION 2
PAVEMENT MARKING LAYOUTS

SHEET 10 OF 13

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		109

DATE: 2/25/2020 10:05:40 AM
FILE: LOC2PM10.dgn

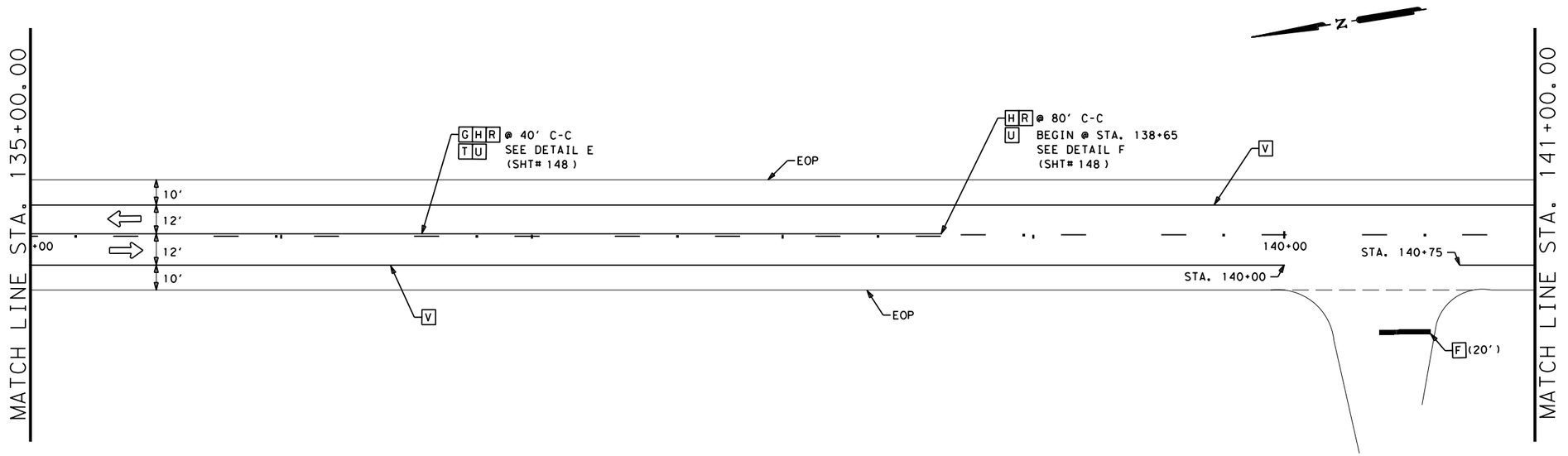


LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

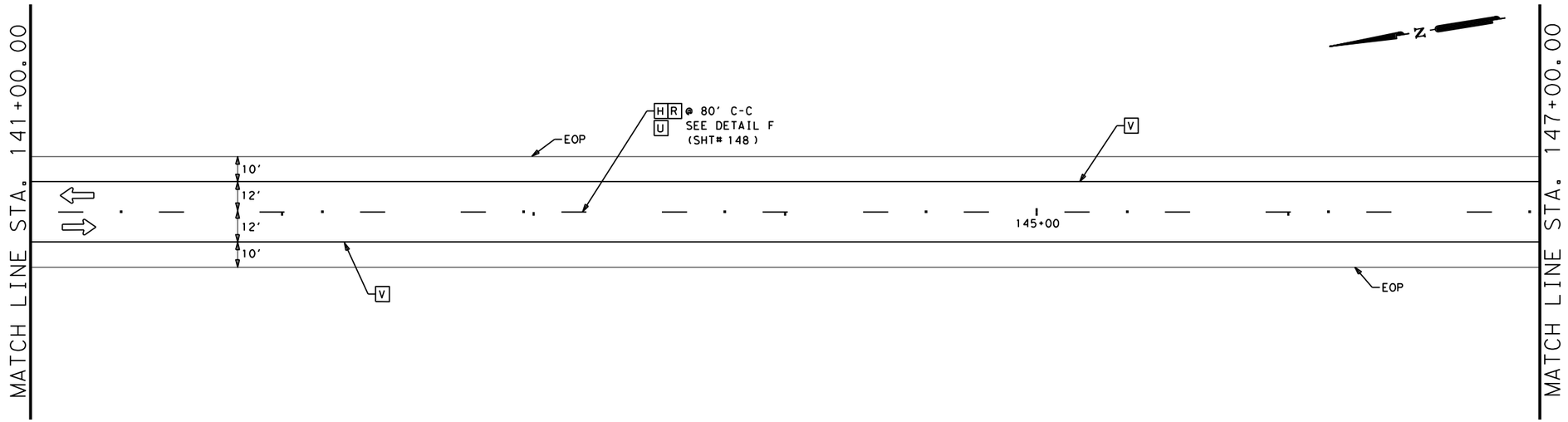
Texas Department of Transportation

FM 1423
LOCATION 2
PAVEMENT MARKING LAYOUTS

SHEET 11 OF 13

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		110

DATE: 2/25/2020 10:05:52 AM
FILE: LOC2PM11.dgn

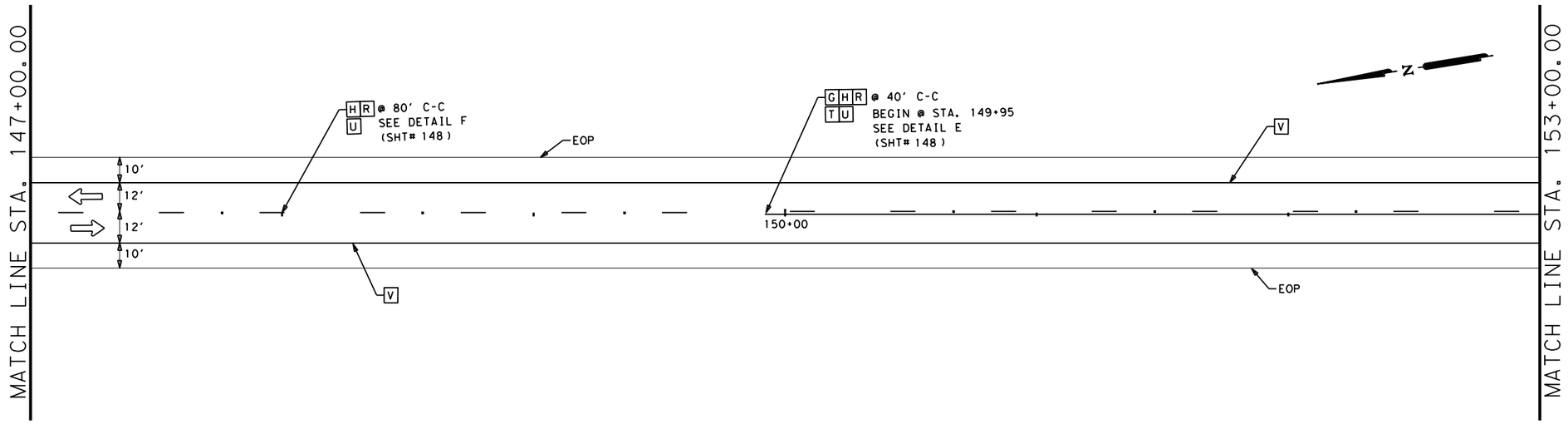


LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

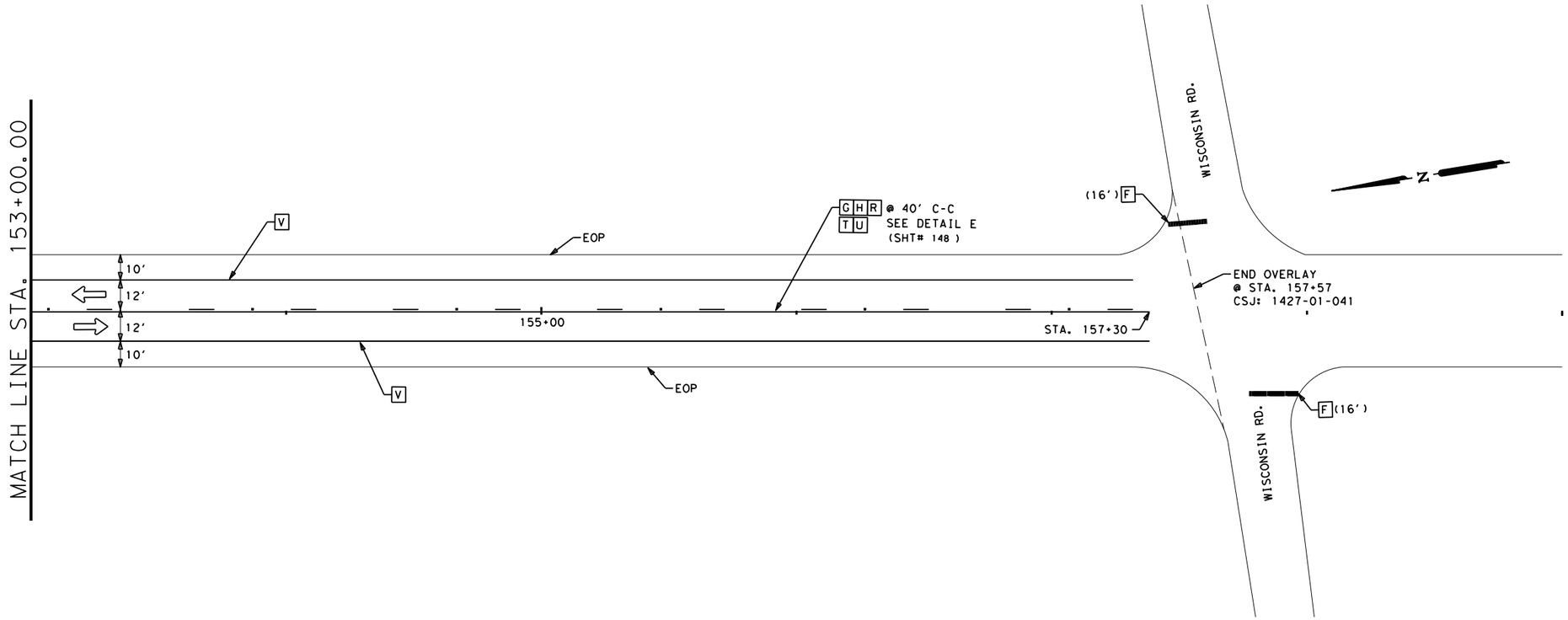
Texas Department of Transportation

FM 1423
LOCATION 2
PAVEMENT MARKING LAYOUTS

SHEET 12 OF 13

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		111

DATE: 2/25/2020 10:06:03 AM
FILE: LOC2PM12.dgn



LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

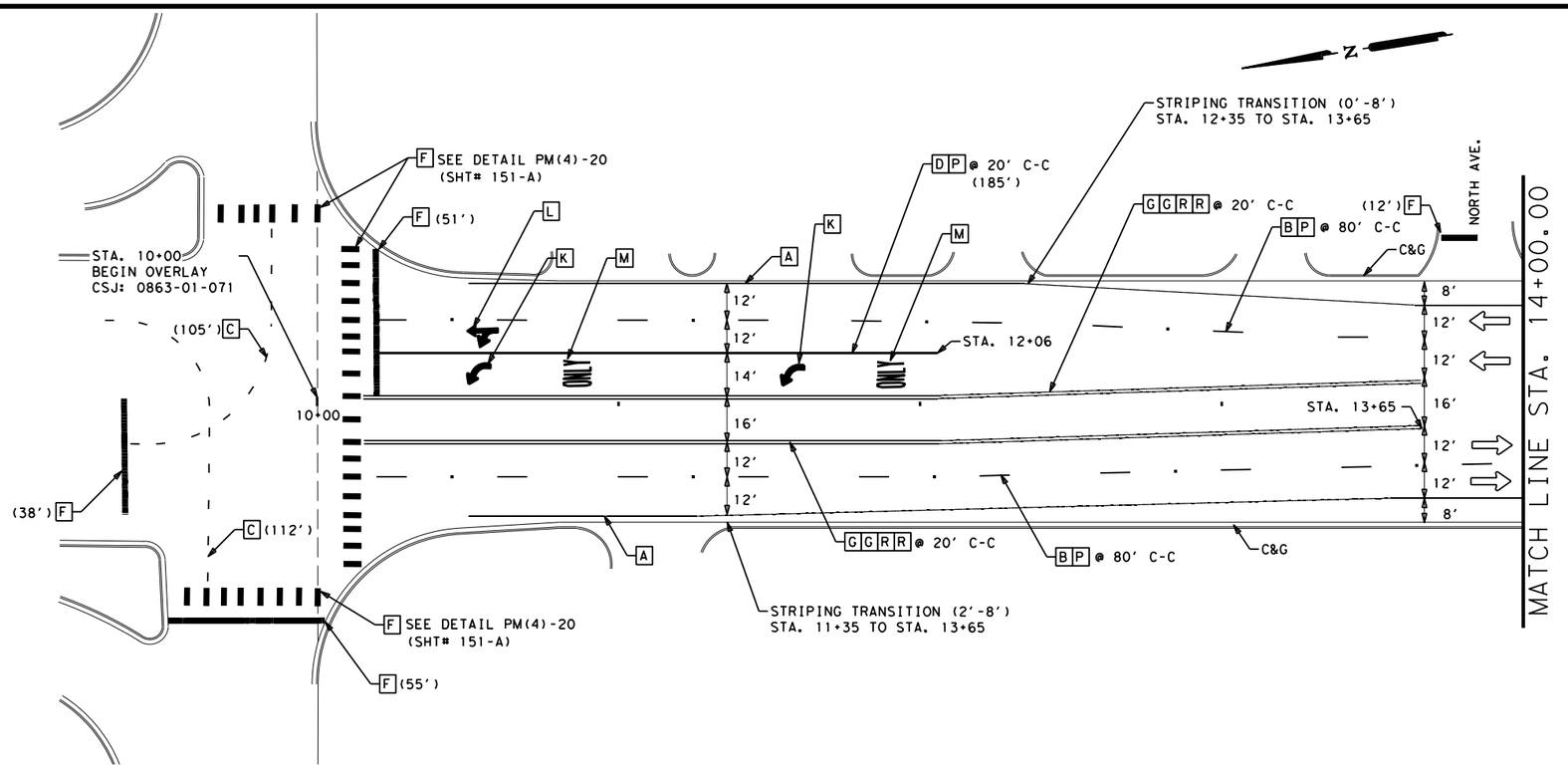
Texas Department of Transportation

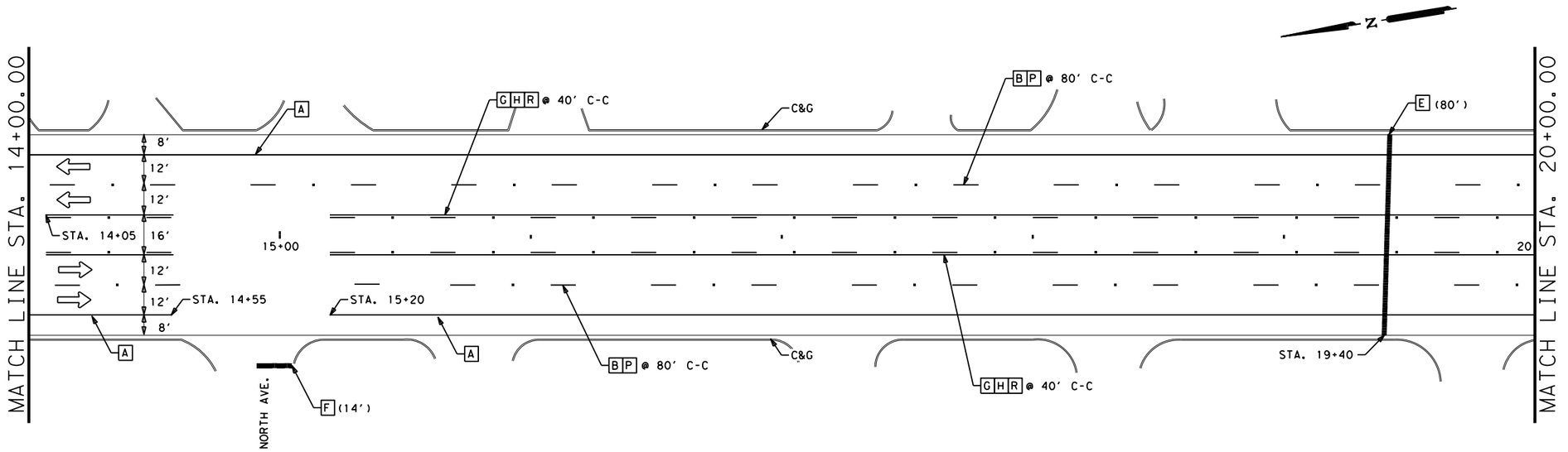
FM 1423
LOCATION 2
PAVEMENT MARKING LAYOUTS

SHEET 13 OF 13

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		112

DATE: 2/25/2020 10:06:13 AM
FILE: LOC2PM13.dgn





LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
08/20/2020

Pharr District Central Design

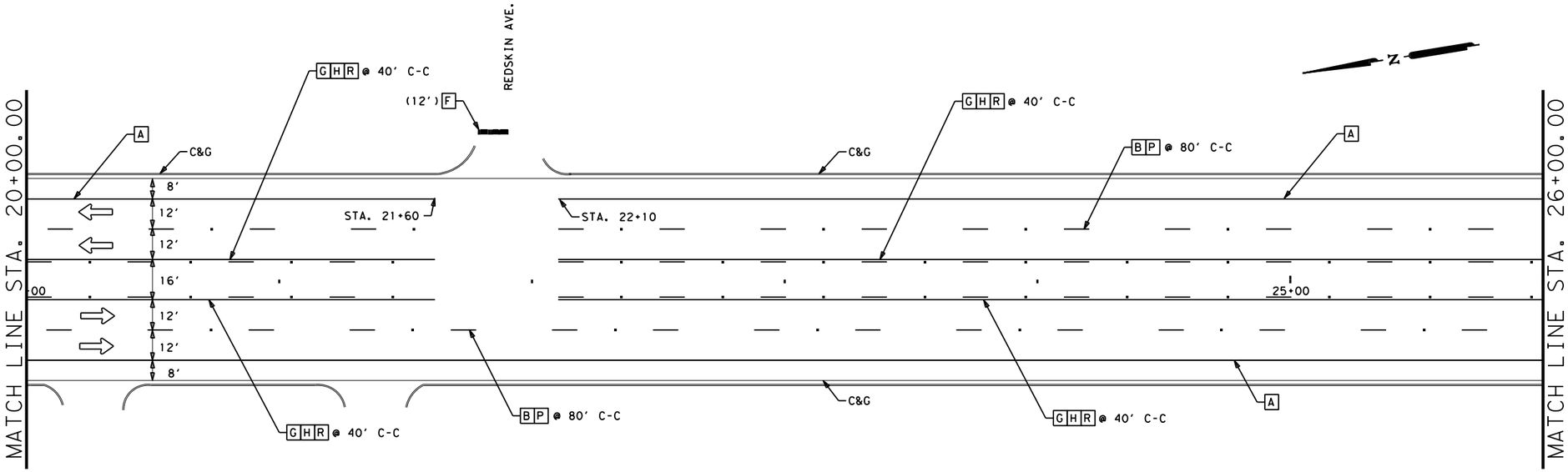
Texas Department of Transportation

FM 493
LOCATION 3
PAVEMENT MARKING LAYOUTS

SHEET 1 OF 4

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		113

DATE: 8/20/2020 9:01:06 AM
FILE: LOC3PM01.dgn

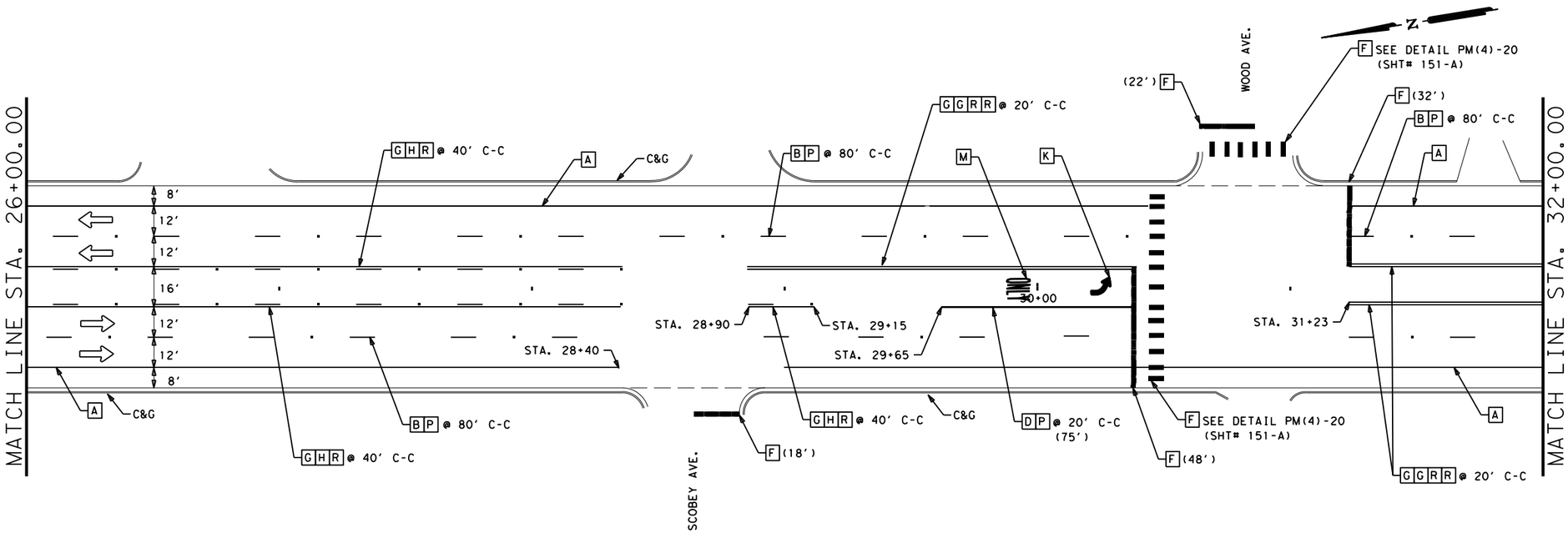


LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.



SCALE (IN FEET): 0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER

08/20/2020

Pharr District Central Design

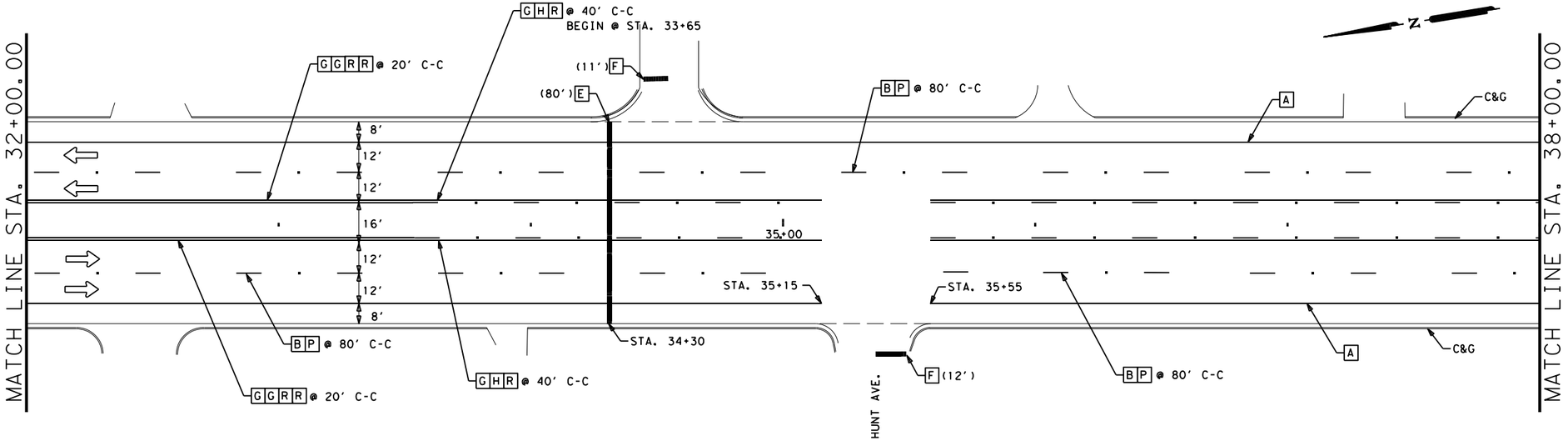
Texas Department of Transportation

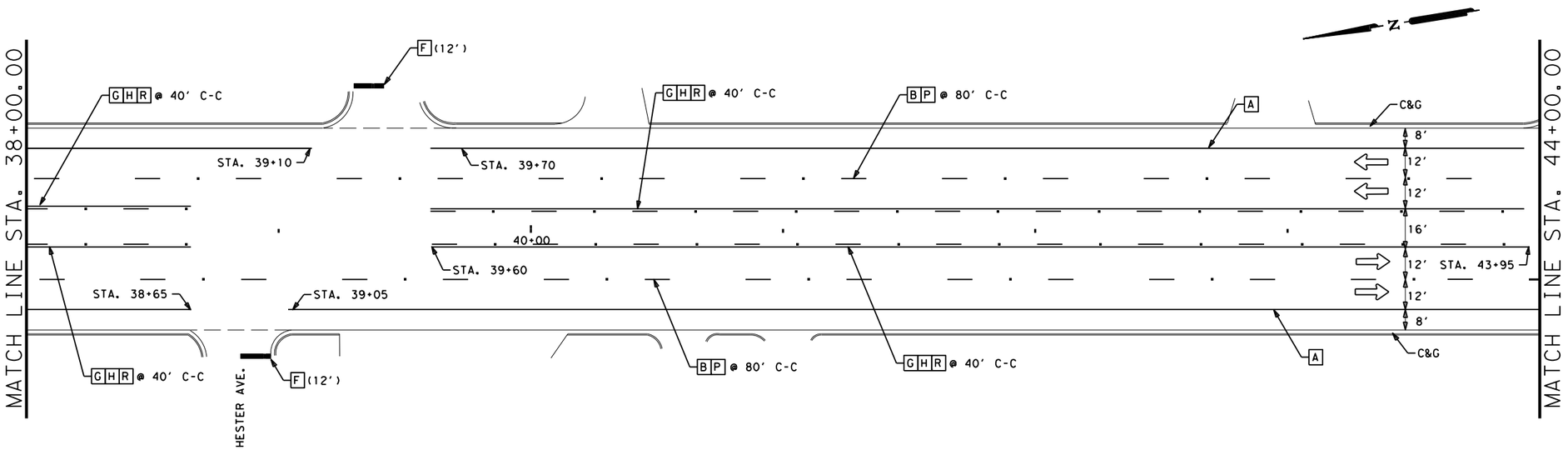
FM 493 LOCATION 3 PAVEMENT MARKING LAYOUTS

SHEET 2 OF 4

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		114

DATE: 8/20/2020 9:03:28 AM
FILE: LOC3PM02.dgn





LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

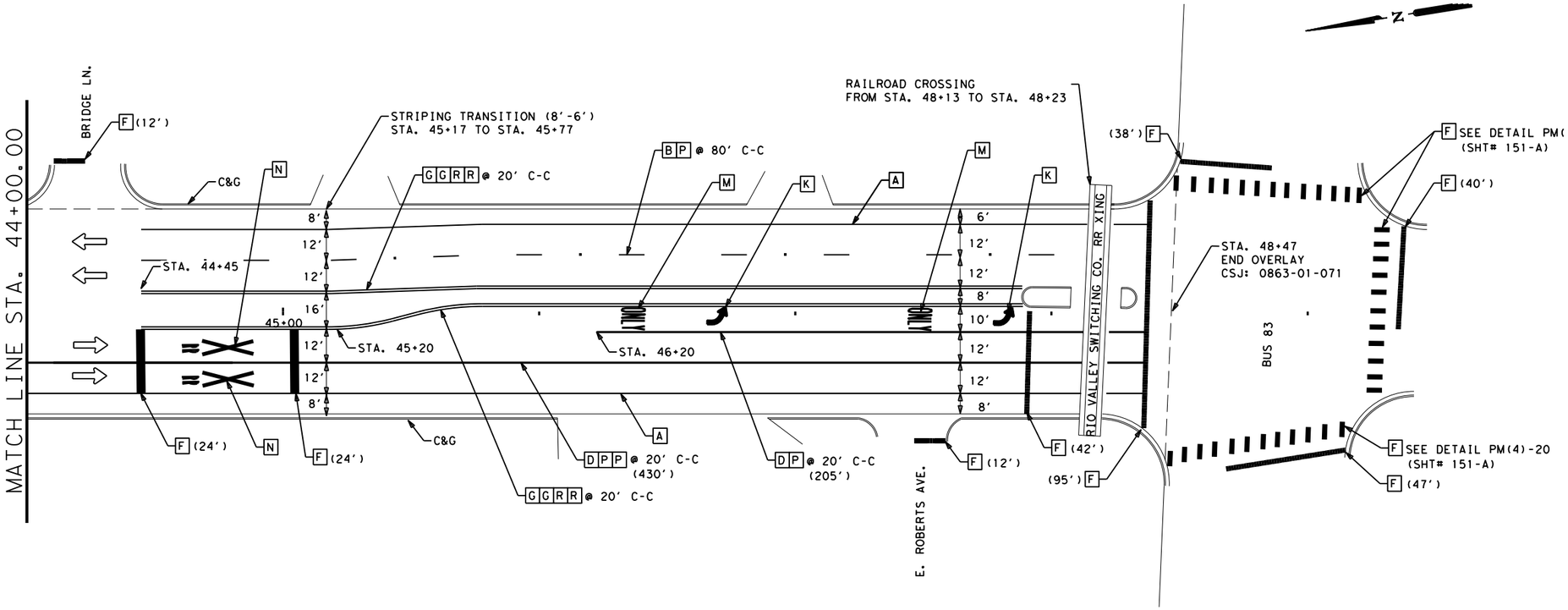
Texas Department of Transportation

FM 493
LOCATION 3
PAVEMENT MARKING LAYOUTS

SHEET 3 OF 4

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		115

DATE: 2/25/2020 10:06:58 AM
FILE: LOC3PM03.dgn



LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER
08/20/2020

Pharr District Central Design

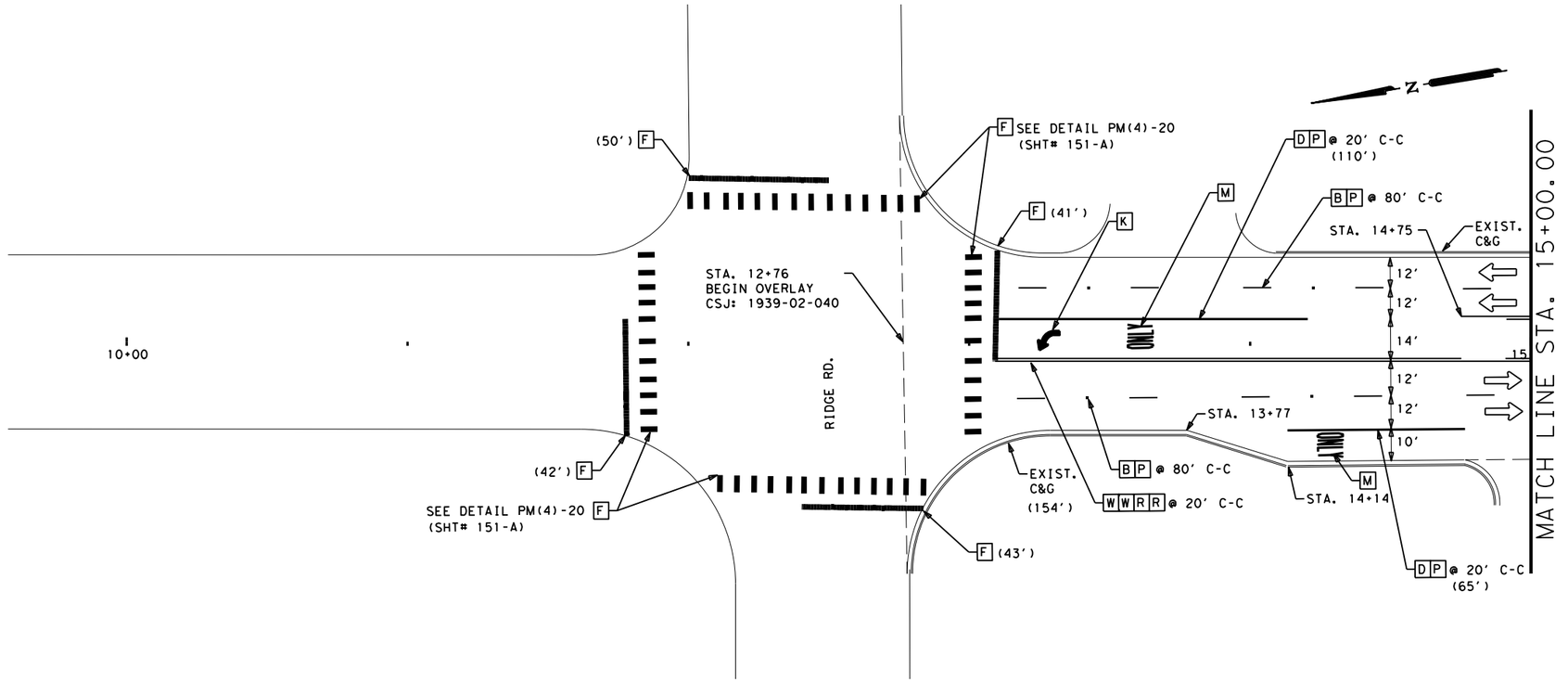
Texas Department of Transportation

FM 493
LOCATION 3
PAVEMENT MARKING LAYOUTS

SHEET 4 OF 4

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		116

DATE: 8/20/2020 9:07:52 AM
FILE: LOC3PM04.dgn

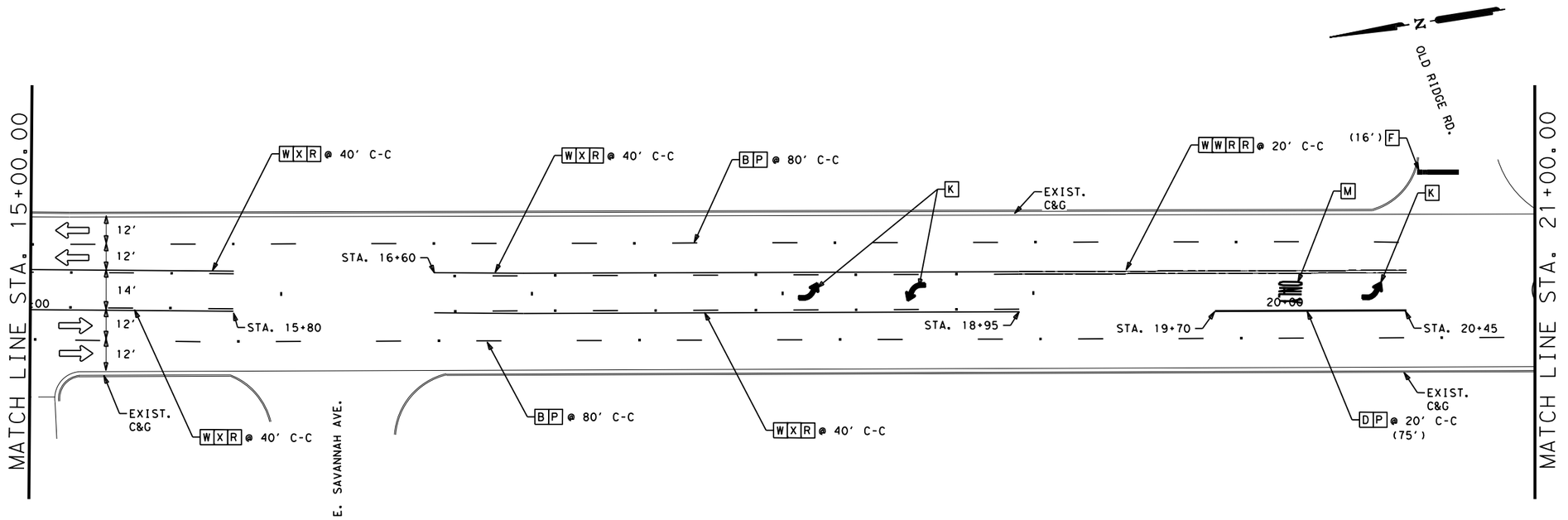


LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER
08/20/2020

Pharr District Central Design

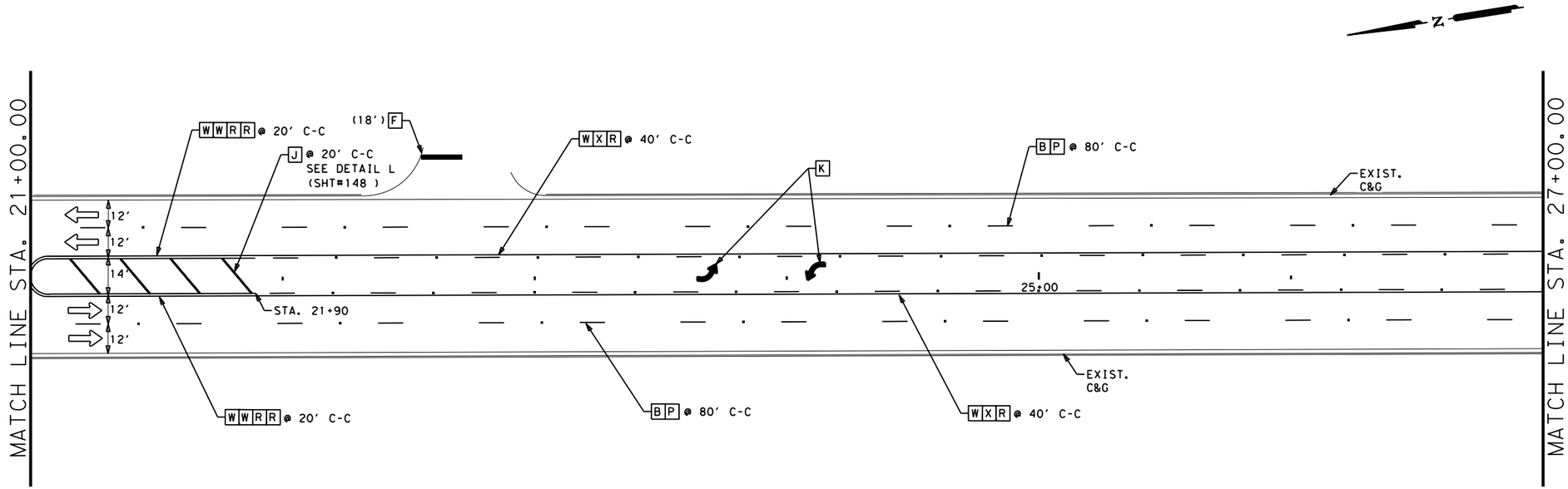
Texas Department of Transportation

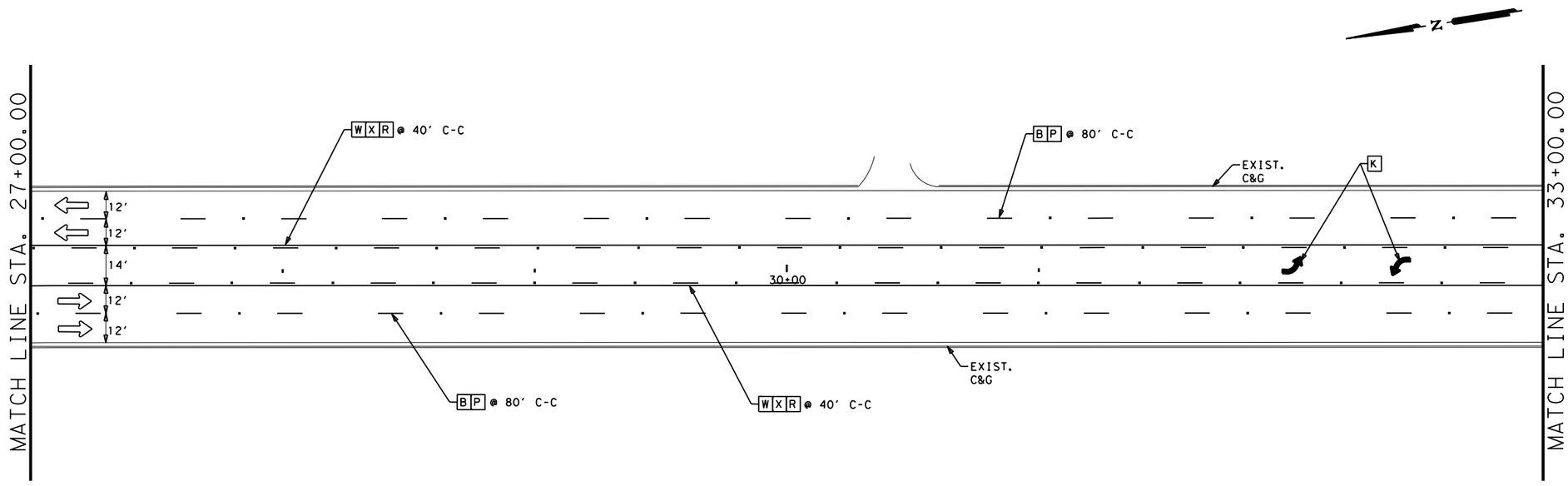
FM 2061
LOCATION 4
PAVEMENT MARKING LAYOUTS

SHEET 1 OF 18

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		117

DATE: 8/20/2020 9:17:49 AM
FILE: LOC4PM01.dgn





LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:

ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

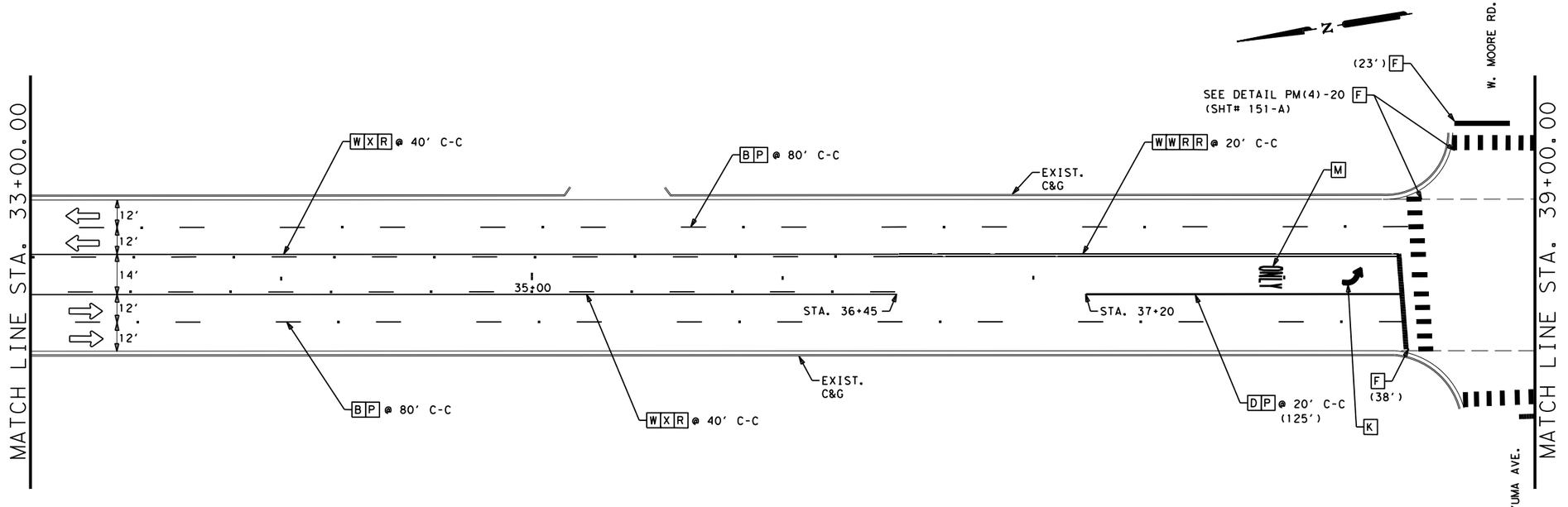
Texas Department of Transportation

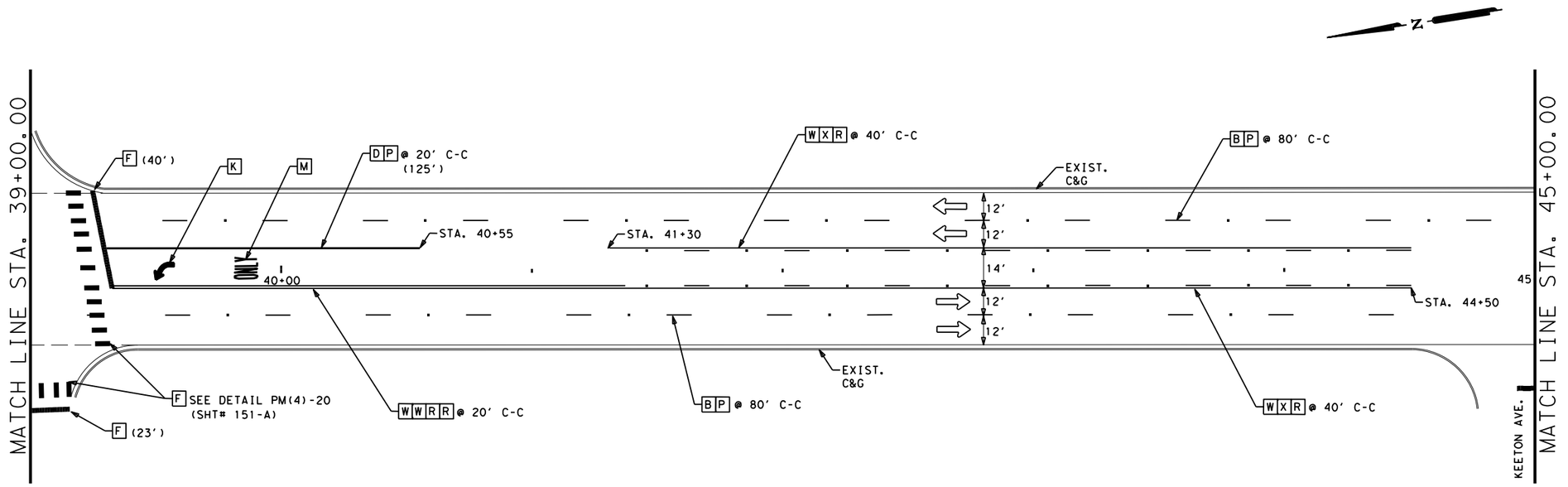
FM 2061
LOCATION 4
PAVEMENT MARKING LAYOUTS

SHEET 2 OF 18

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		118

DATE: 2/25/2020 10:07:38 AM
FILE: LOC4PM02.dgn





LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
08/20/2020

Pharr District Central Design

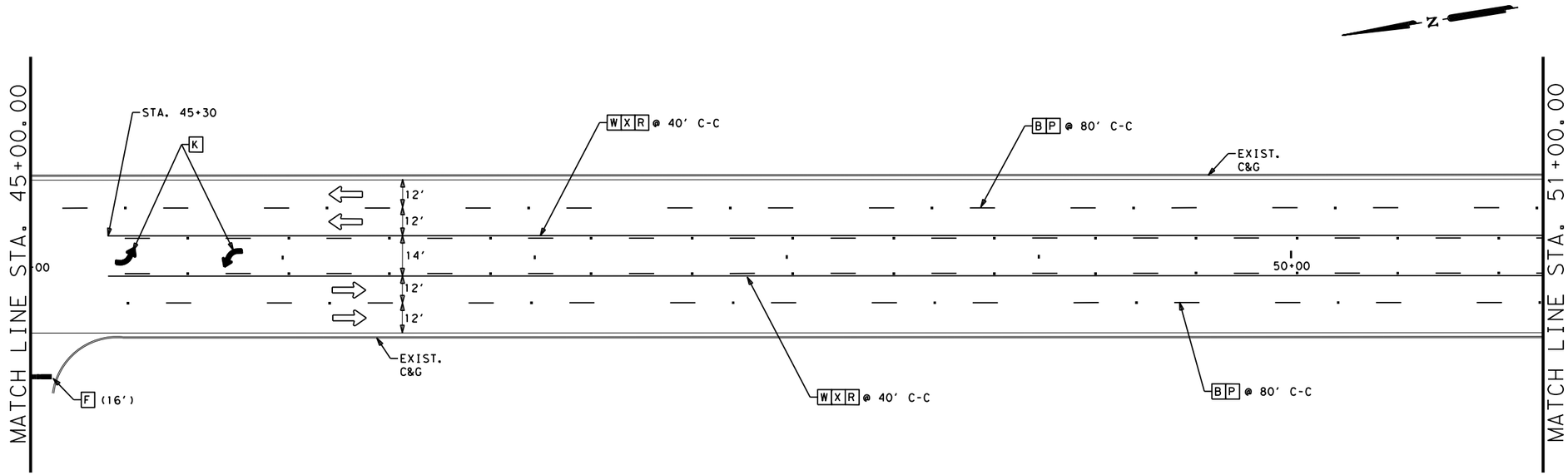
Texas Department of Transportation

FM 2061
LOCATION 4
PAVEMENT MARKING LAYOUTS

SHEET 3 OF 18

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		119

DATE: 8/20/2020 9:27:35 AM
FILE: LOC4PM03.dgn

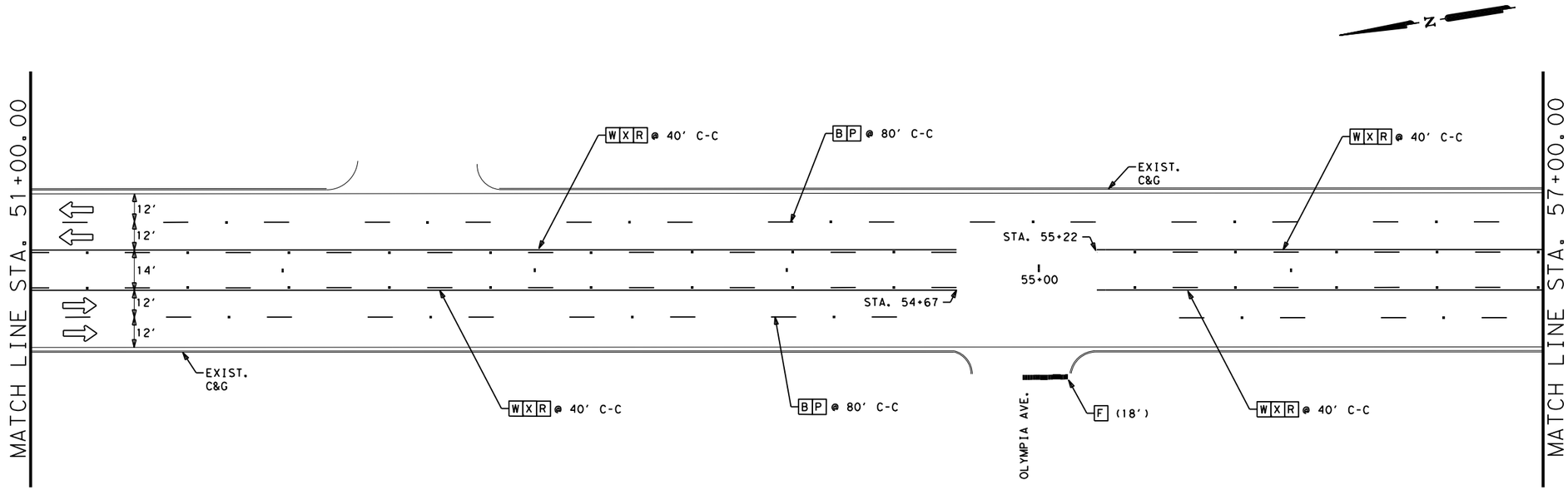


LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

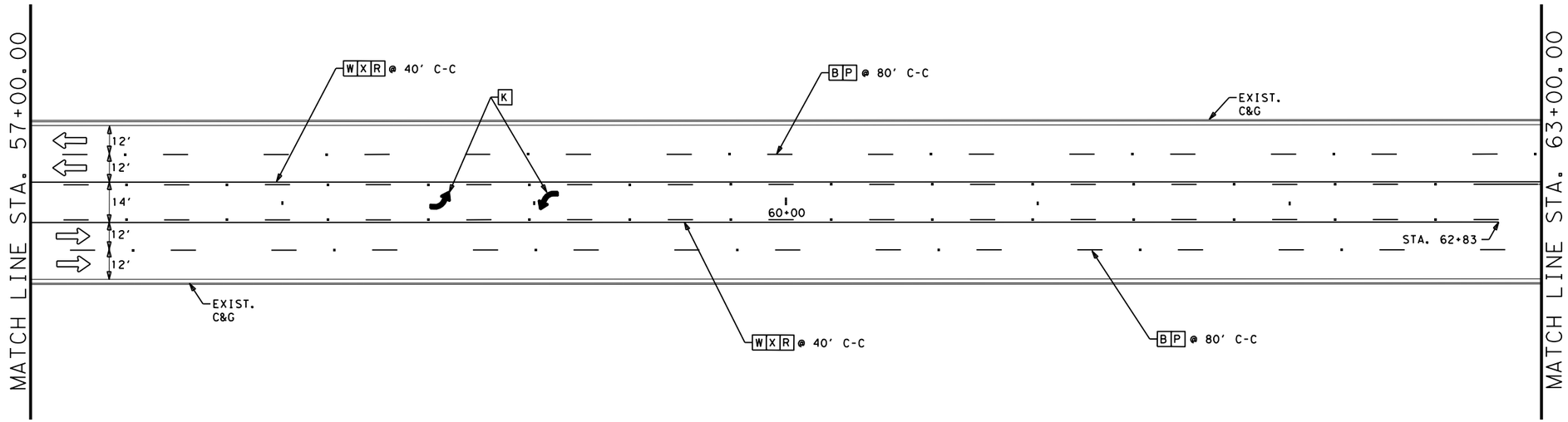
Texas Department of Transportation

FM 2061
LOCATION 4
PAVEMENT MARKING LAYOUTS

SHEET 4 OF 18

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		120

DATE: 2/25/2020 10:07:52 AM
FILE: LOC4PM04.dgn



LEGEND:

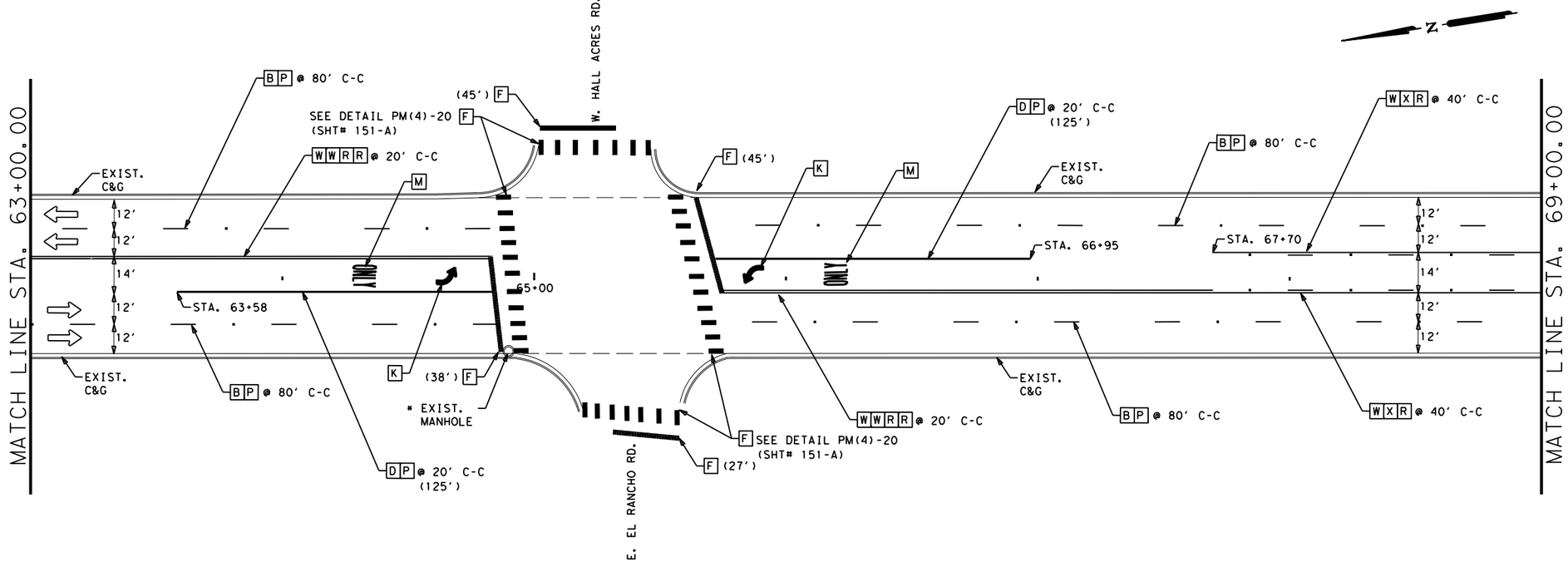
- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:

ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

* EXIST. MANHOLES SHALL MATCH FINAL SURFACE (OVERLAY) ELEVATIONS



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
08/20/2020

Pharr District Central Design

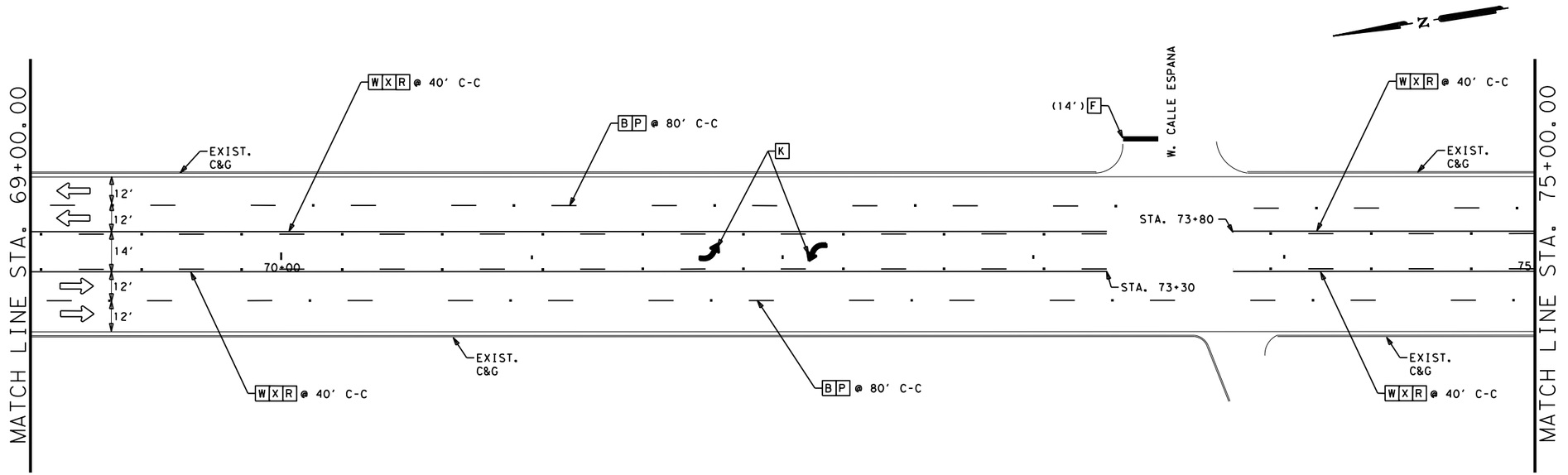
Texas Department of Transportation

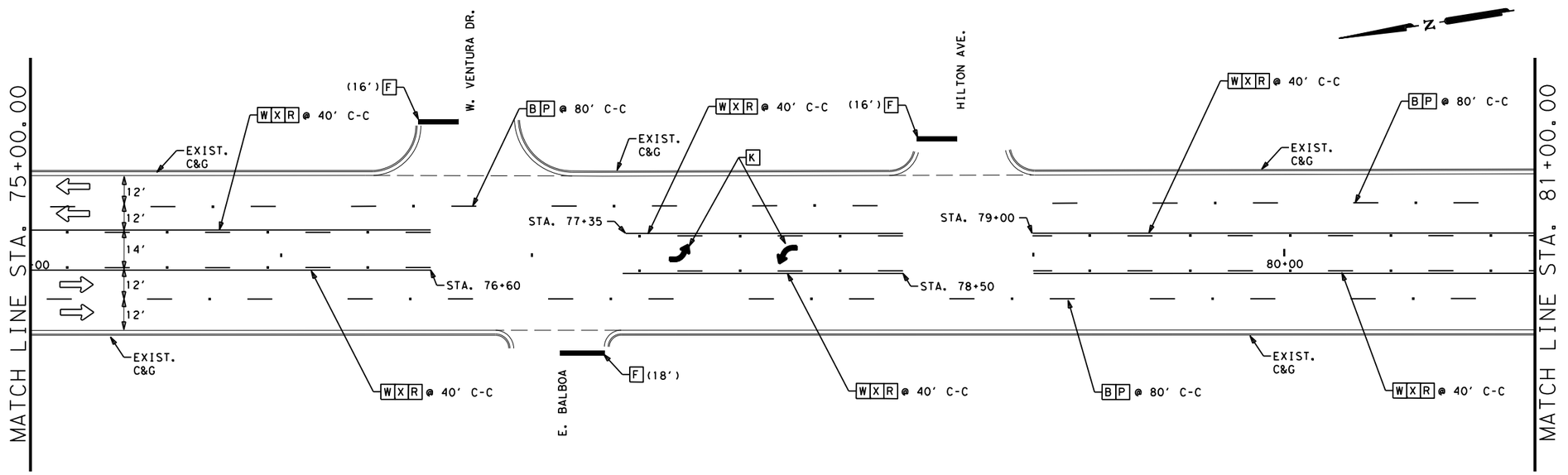
FM 2061 LOCATION 4 PAVEMENT MARKING LAYOUTS

SHEET 5 OF 18

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		121

DATE: 8/20/2020 9:33:22 AM
FILE: LOC4PM05.dgn





LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
▪▪▪ - LIMITS OF OVERLAY

NOTES:

ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

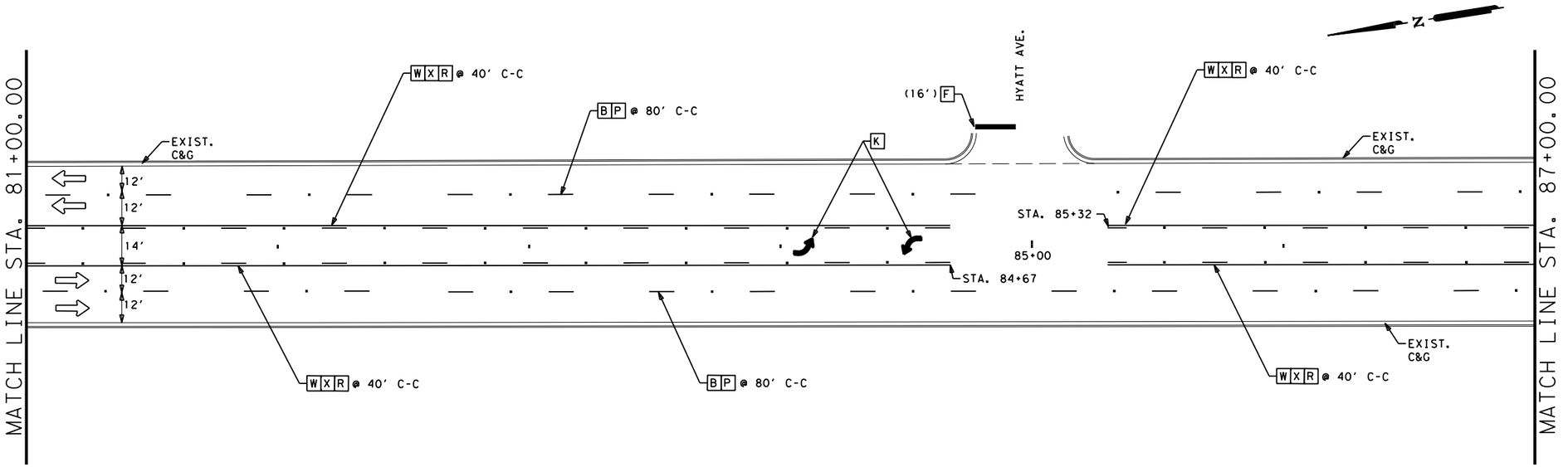
Texas Department of Transportation

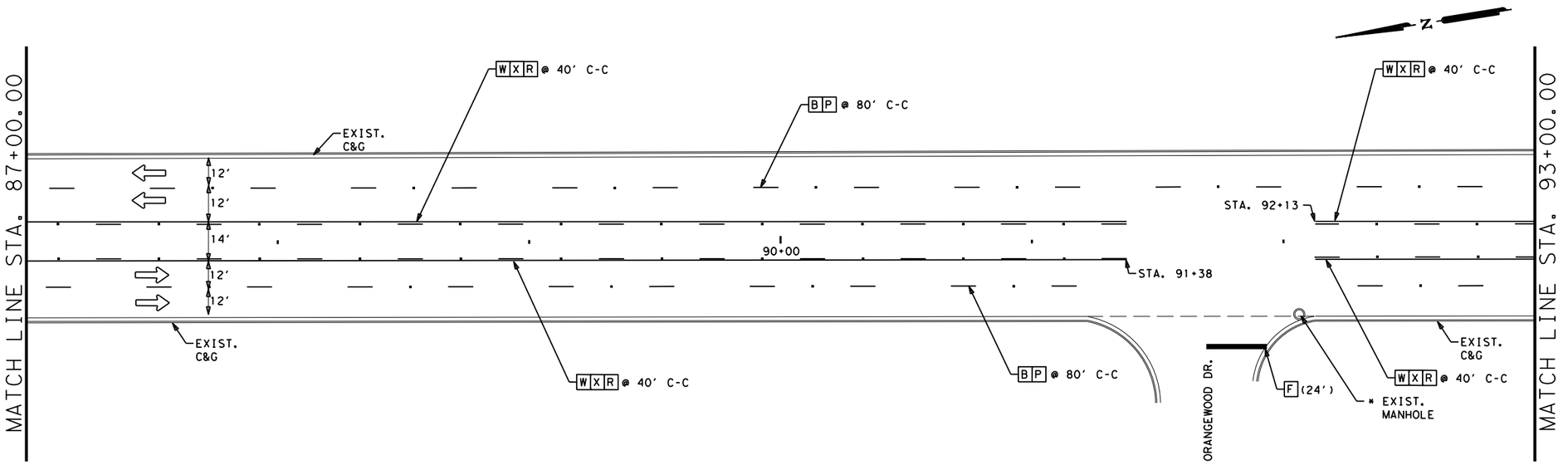
FM 2061
LOCATION 4
PAVEMENT MARKING LAYOUTS

SHEET 6 OF 18

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		122

DATE: 2/25/2020 10:08:09 AM
FILE: LOC4PM06.dgn





LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:

ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

* EXIST. MANHOLES SHALL MATCH FINAL SURFACE (OVERLAY) ELEVATIONS

SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

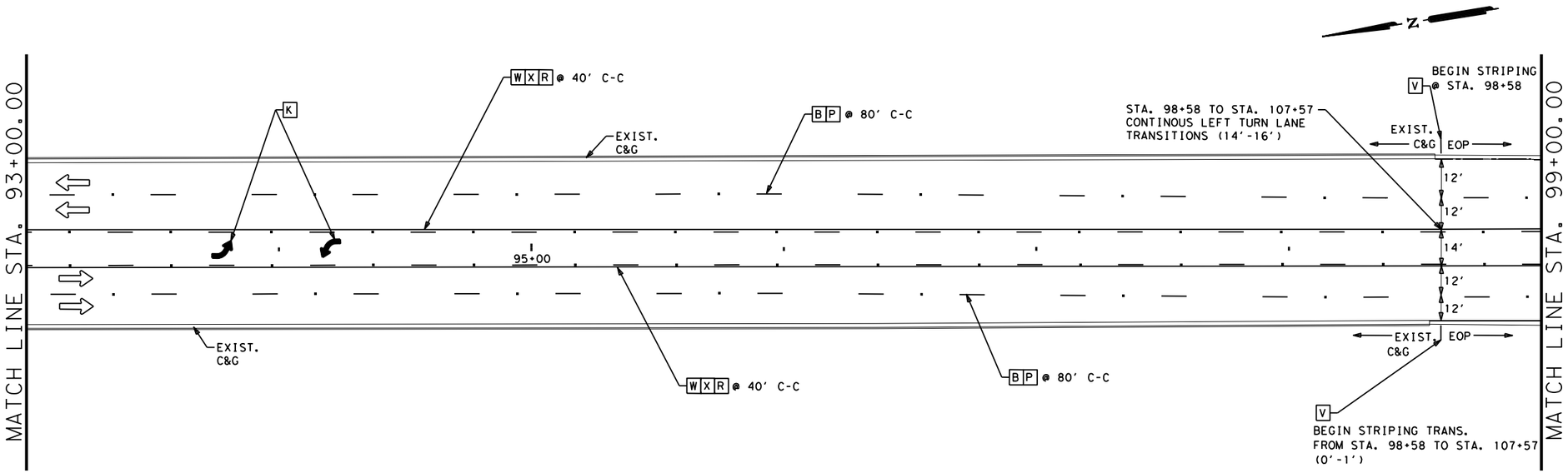
Texas Department of Transportation

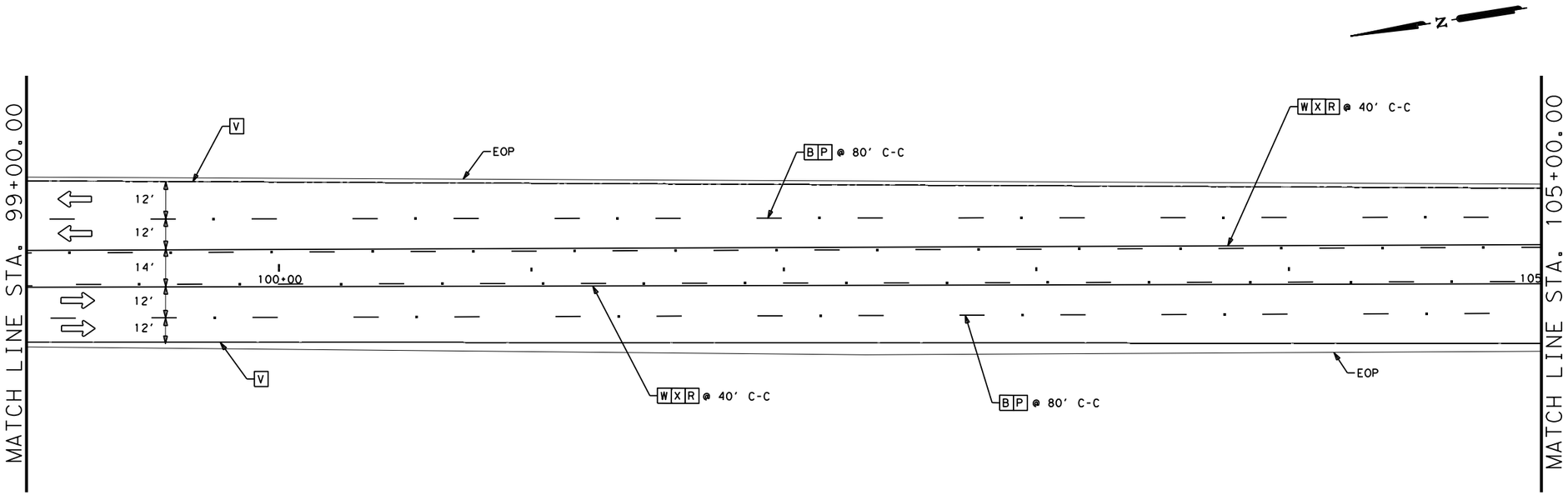
FM 2061
LOCATION 4
PAVEMENT MARKING LAYOUTS

SHEET 7 OF 18

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		123

DATE: 2/25/2020 10:08:18 AM
FILE: LOC4PM07.dgn





LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
··· - LIMITS OF OVERLAY

NOTES:

ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

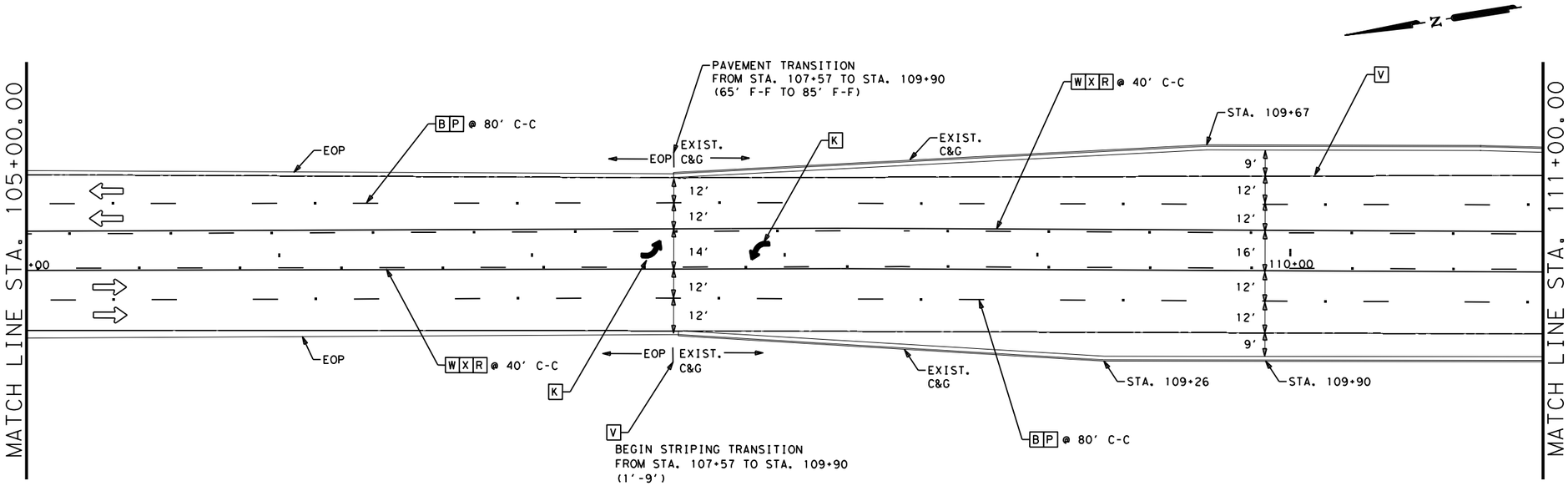
Texas Department of Transportation

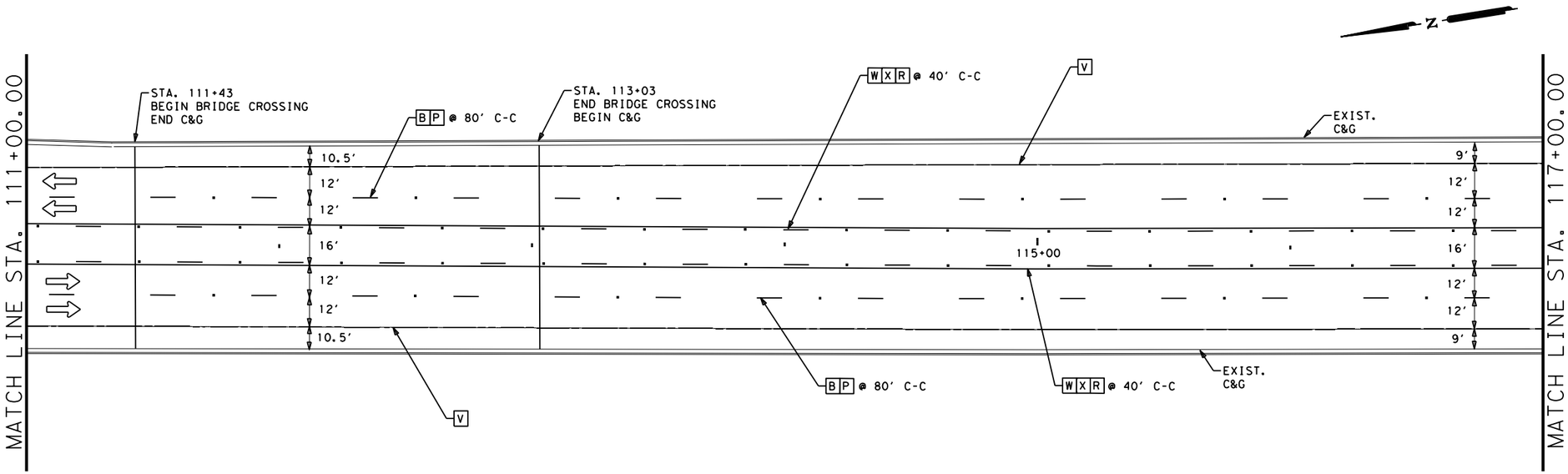
FM 2061
LOCATION 4
PAVEMENT MARKING LAYOUTS

SHEET 8 OF 18

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		124

DATE: 2/25/2020 10:08:25 AM
FILE: LOC4PM08.dgn





LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

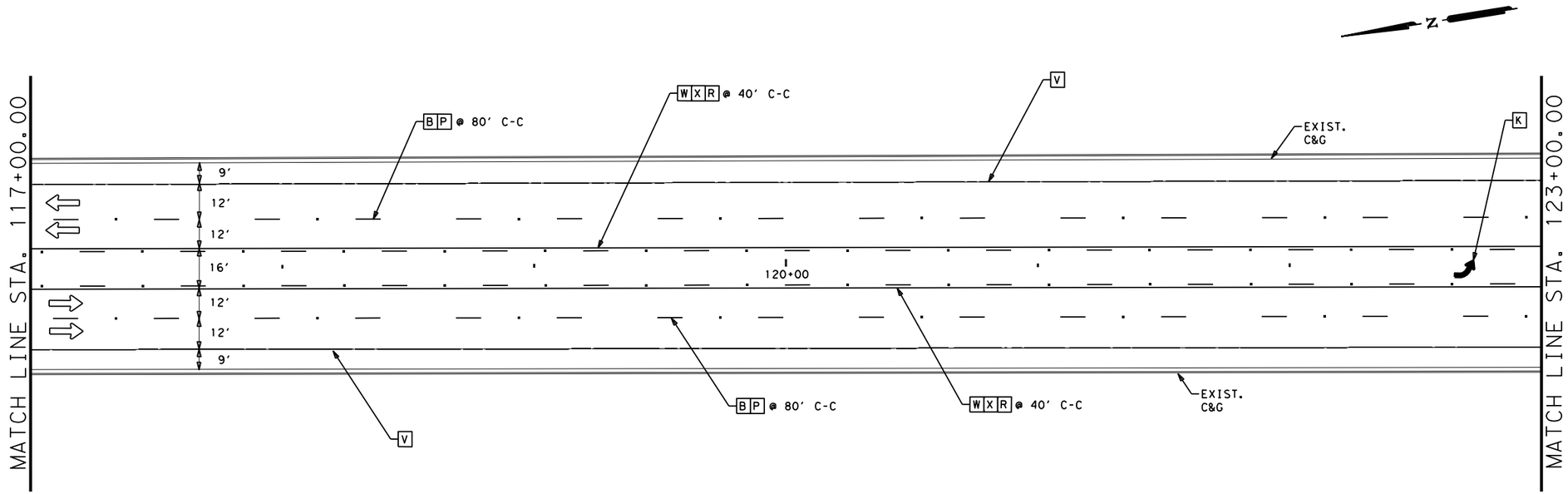
Texas Department of Transportation

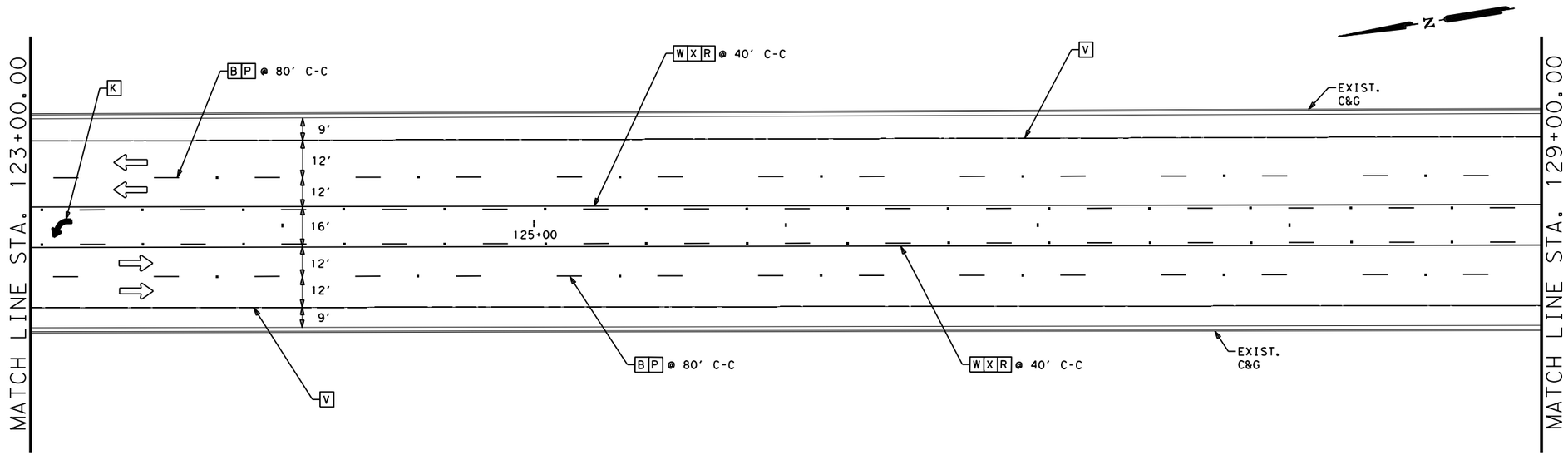
FM 2061
LOCATION 4
PAVEMENT MARKING LAYOUTS

SHEET 9 OF 18

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		125

DATE: 2/25/2020 10:08:32 AM
FILE: LOC4PM09.dgn





LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

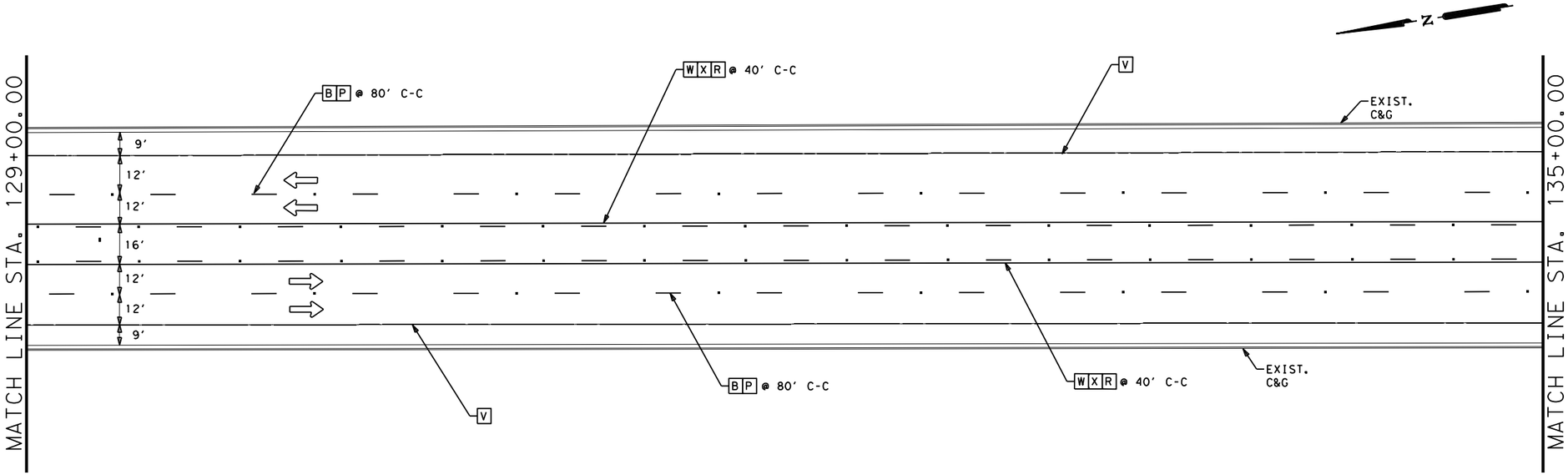
Texas Department of Transportation

FM 2061
LOCATION 4
PAVEMENT MARKING LAYOUTS

SHEET 10 OF 18

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		126

DATE: 2/25/2020 10:08:40 AM
FILE: LOC4PM010.dgn

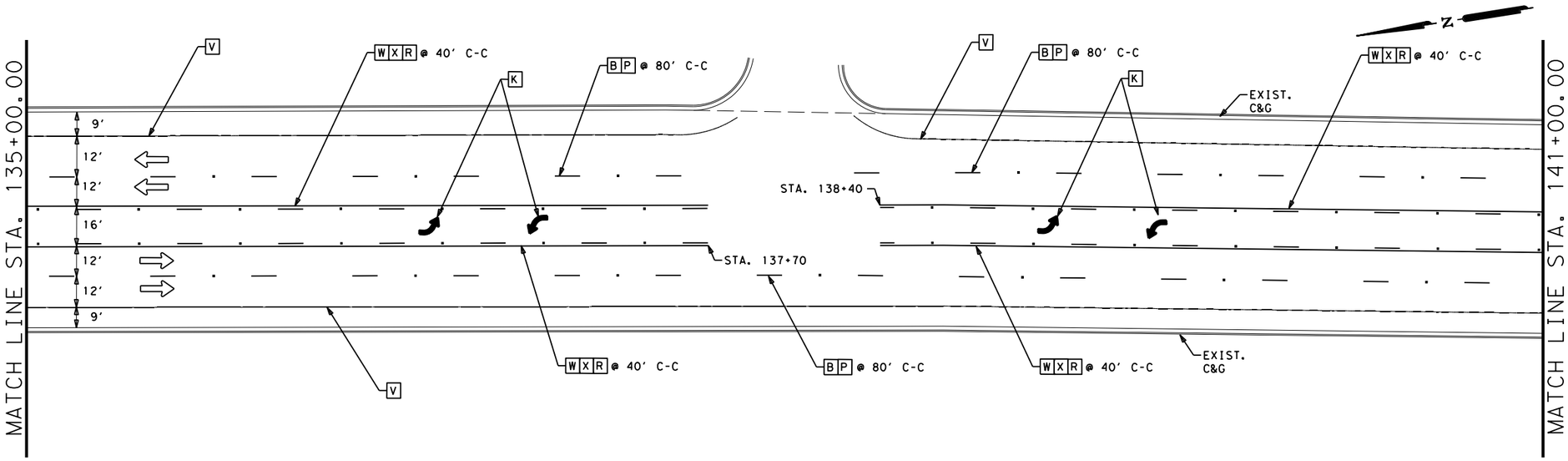


LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
··· - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

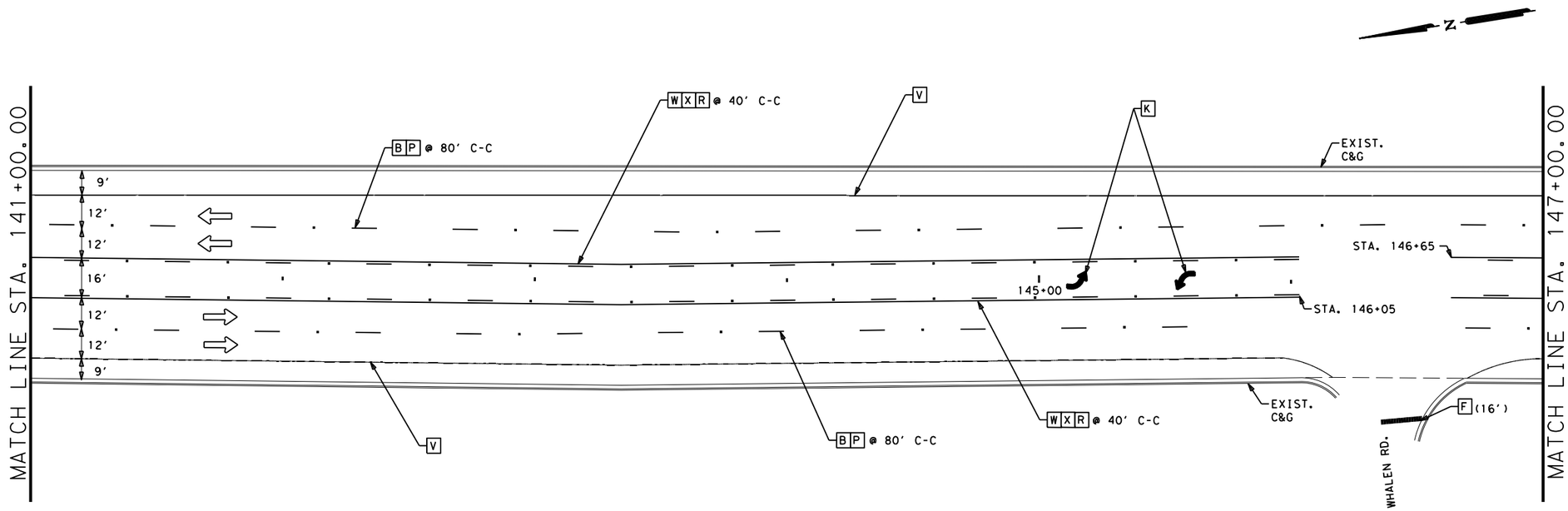
Texas Department of Transportation

FM 2061
LOCATION 4
PAVEMENT MARKING LAYOUTS

SHEET 11 OF 18

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		127

DATE: 2/25/2020 10:08:48 AM
FILE: LOC4PM011.dgn

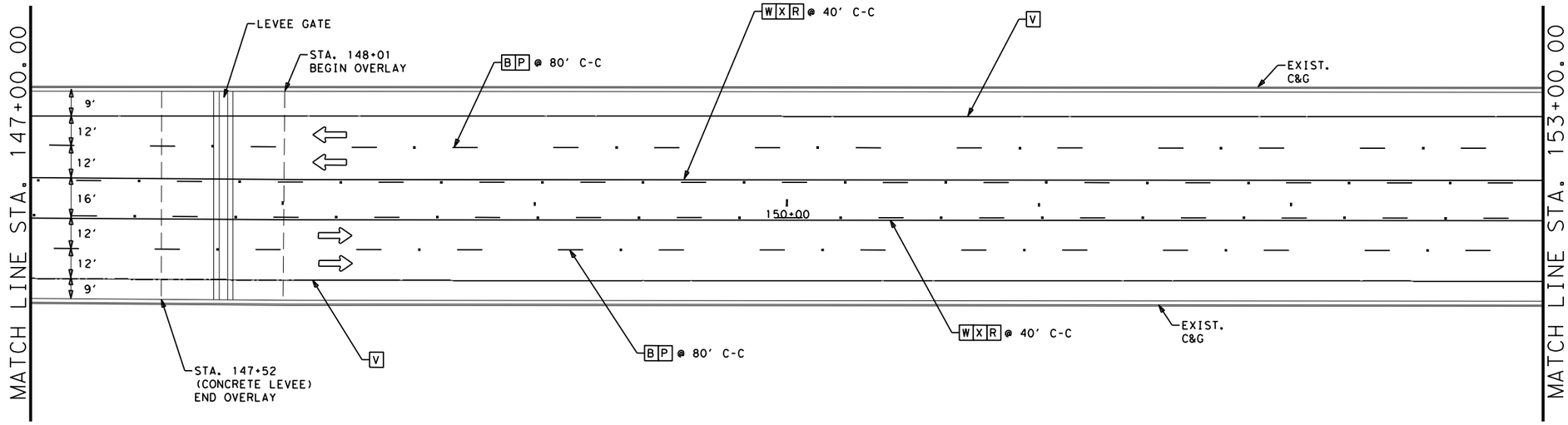


LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

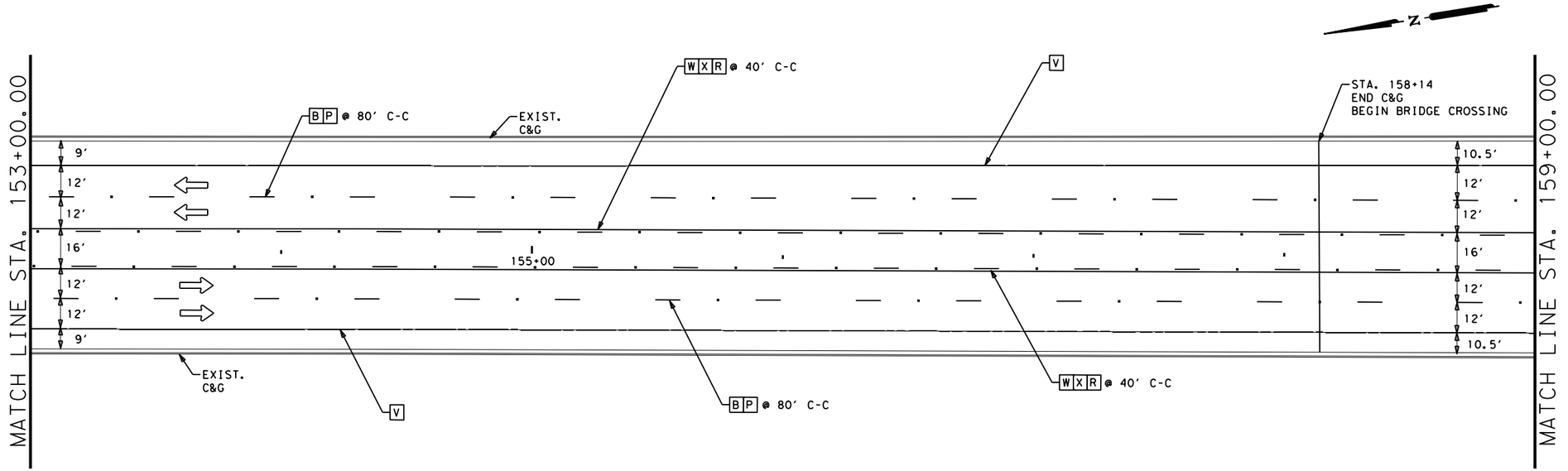
Texas Department of Transportation

FM 2061
LOCATION 4
PAVEMENT MARKING LAYOUTS

SHEET 12 OF 18

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		128

DATE: 2/25/2020 10:08:56 AM
FILE: LOC4PM012.dgn

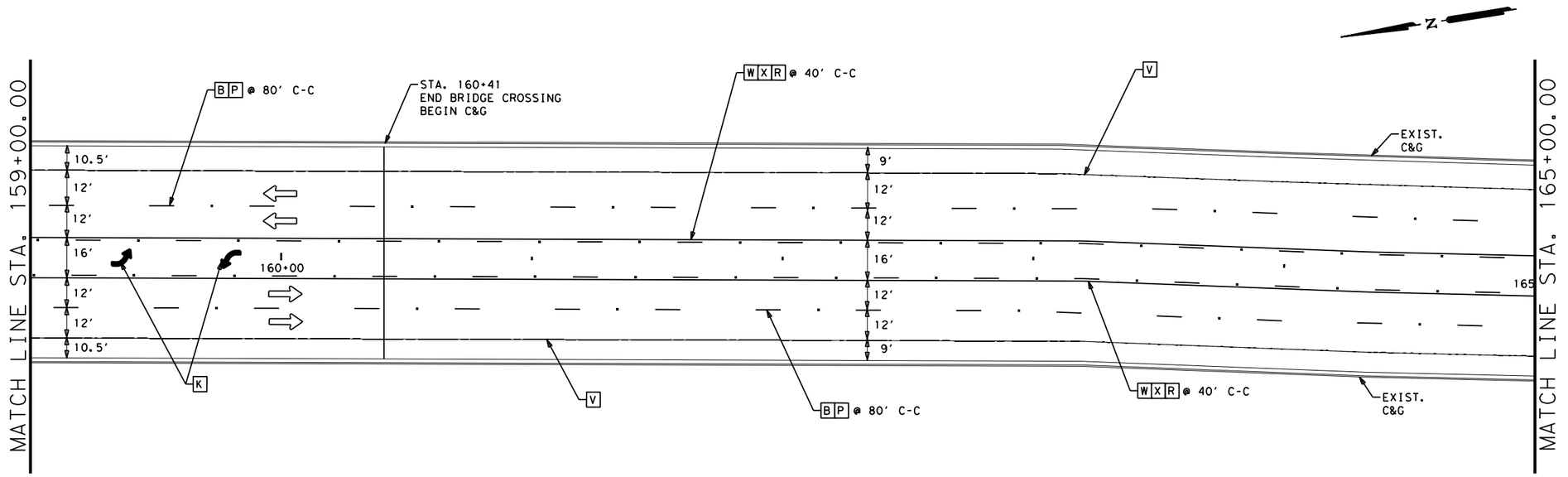


LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

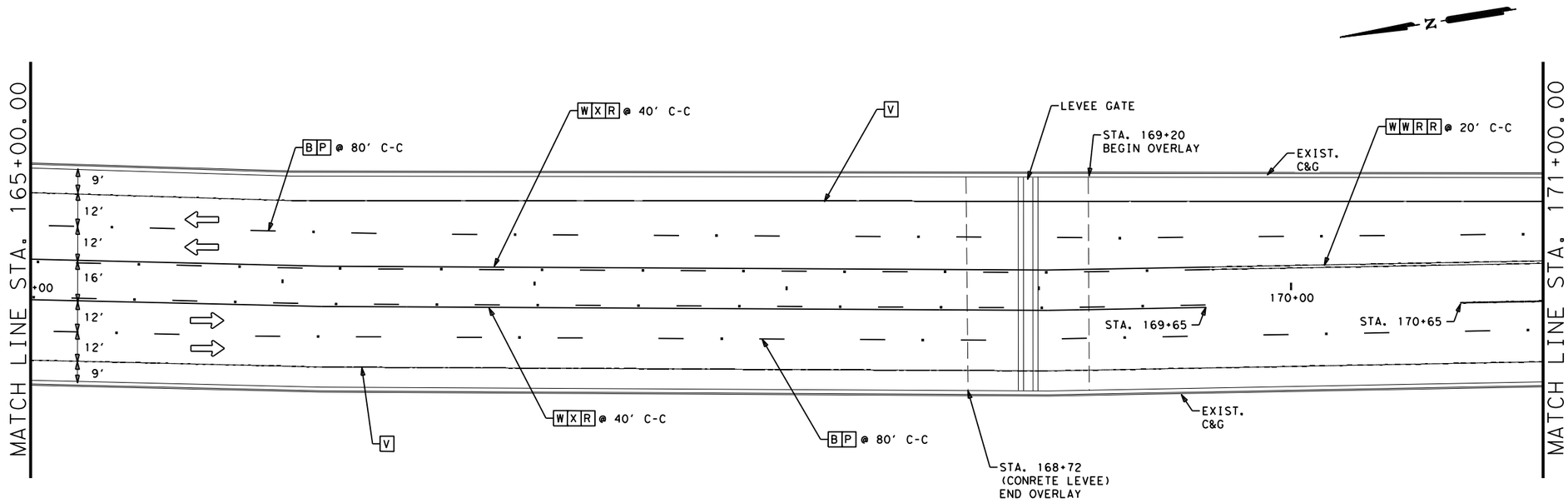
Texas Department of Transportation

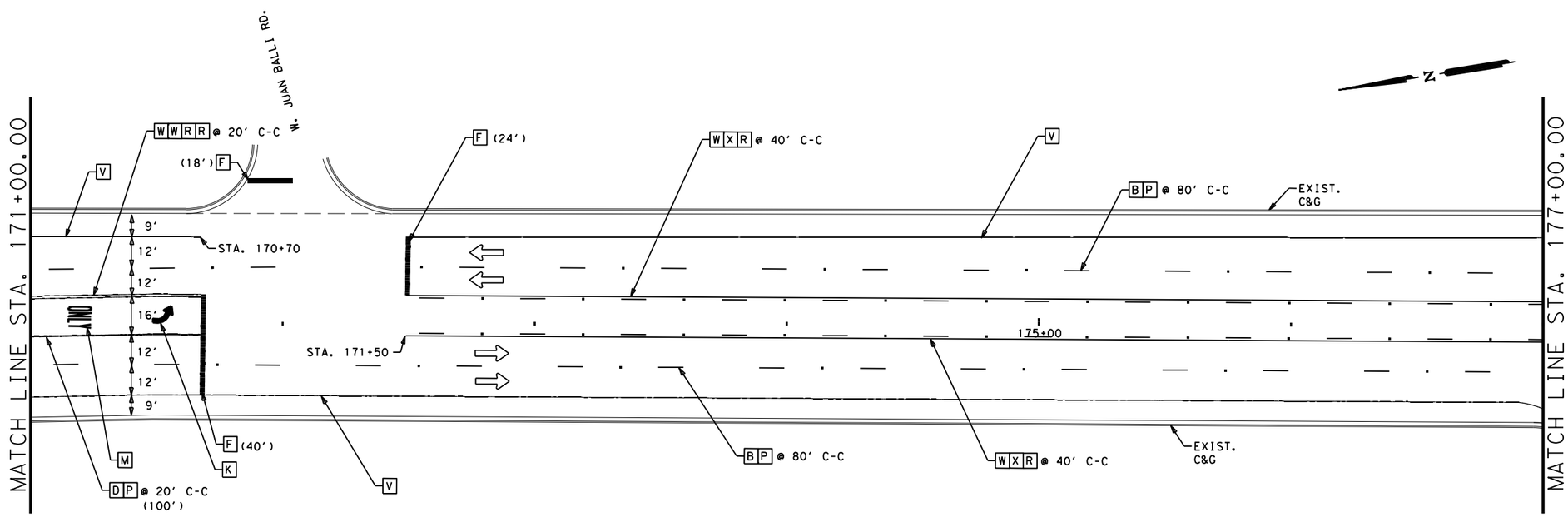
FM 2061
LOCATION 4
PAVEMENT MARKING LAYOUTS

SHEET 13 OF 18

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		129

DATE: 2/25/2020 10:09:03 AM
FILE: LOC4PM013.dgn





LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

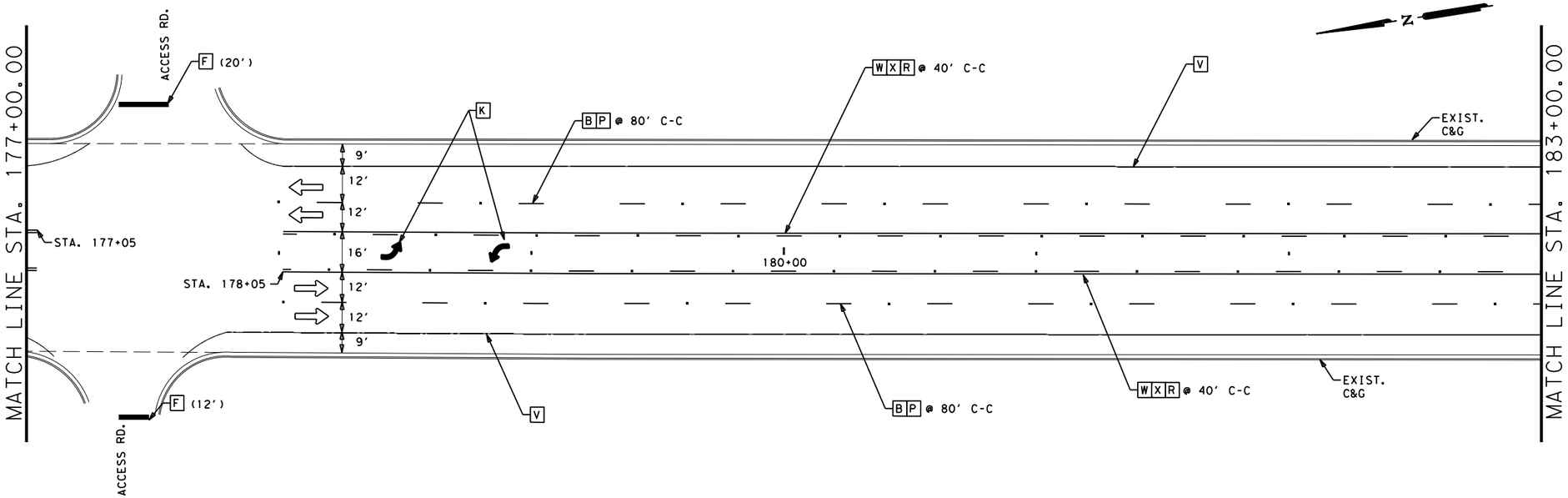
Texas Department of Transportation

FM 2061
LOCATION 4
PAVEMENT MARKING LAYOUTS

SHEET 14 OF 18

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		130

DATE: 2/25/2020 10:09:11 AM
FILE: LOC4PM014.dgn

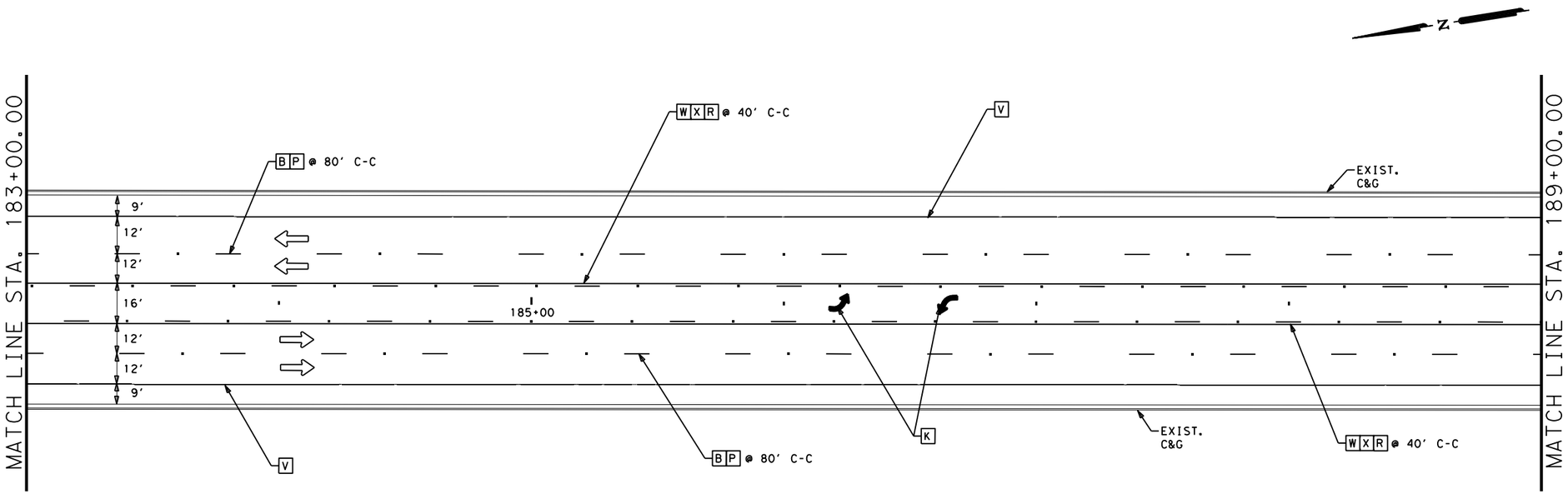


LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
··· - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

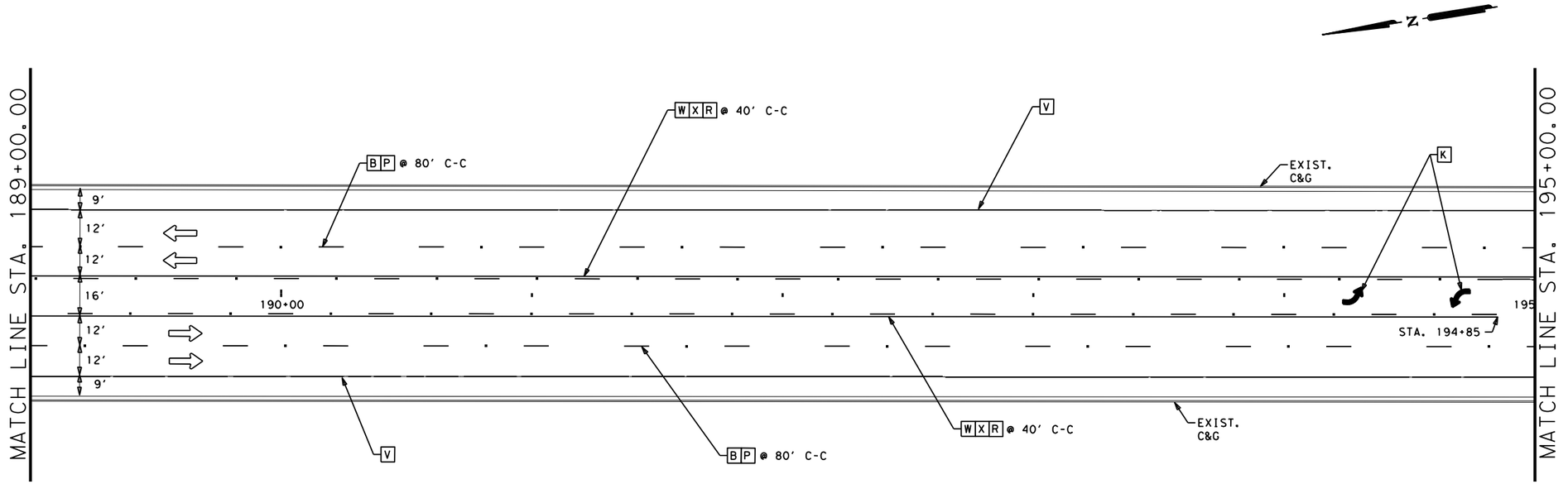
Texas Department of Transportation

FM 2061
LOCATION 4
PAVEMENT MARKING LAYOUTS

SHEET 15 OF 18

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		131

DATE: 2/25/2020 10:09:18 AM
FILE: LOC4PM015.dgn

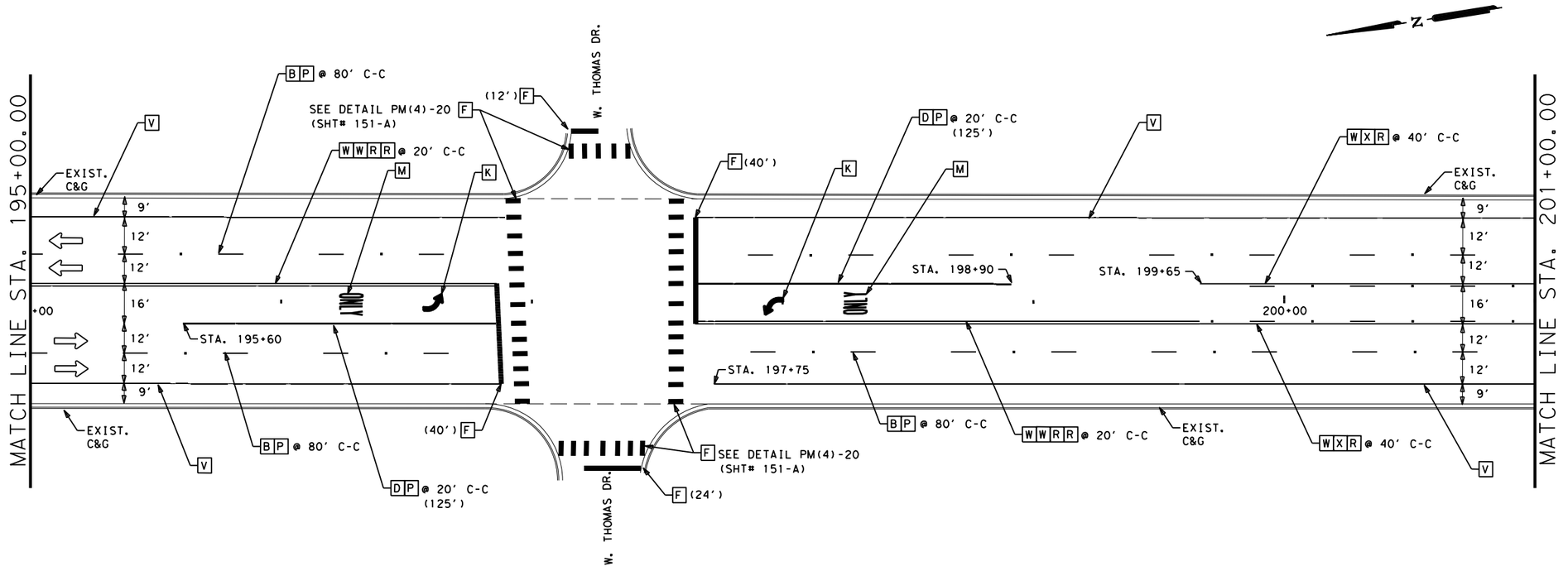


LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
▪▪▪ - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
08/20/2020

Pharr District Central Design

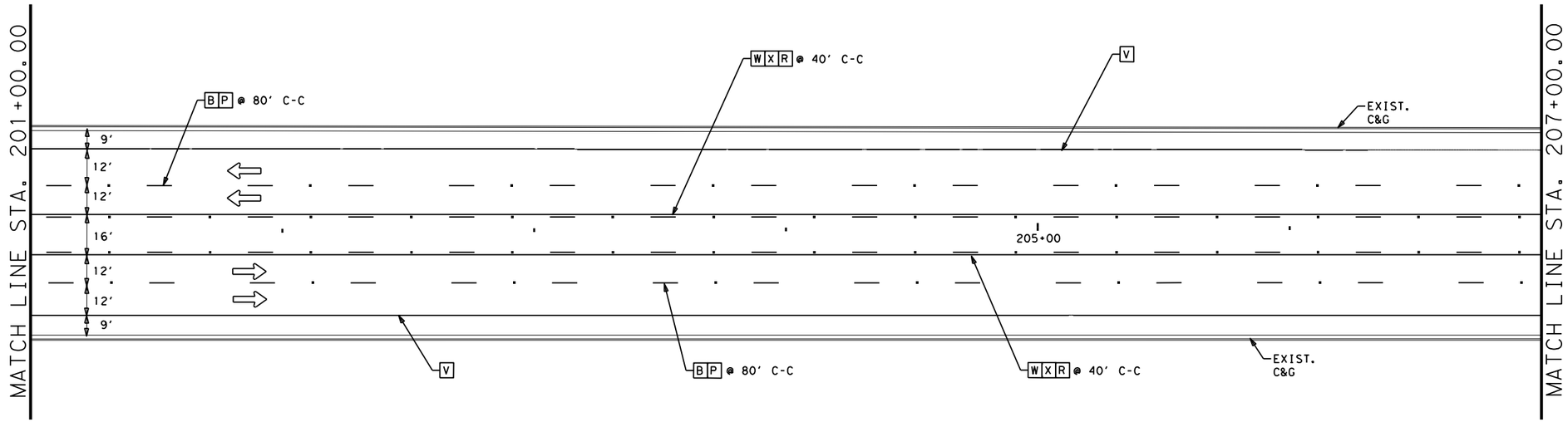
Texas Department of Transportation

FM 2061
LOCATION 4
PAVEMENT MARKING LAYOUTS

SHEET 16 OF 18

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		132

DATE: 8/20/2020 1:42:55 PM
FILE: LOC4PM016.dgn

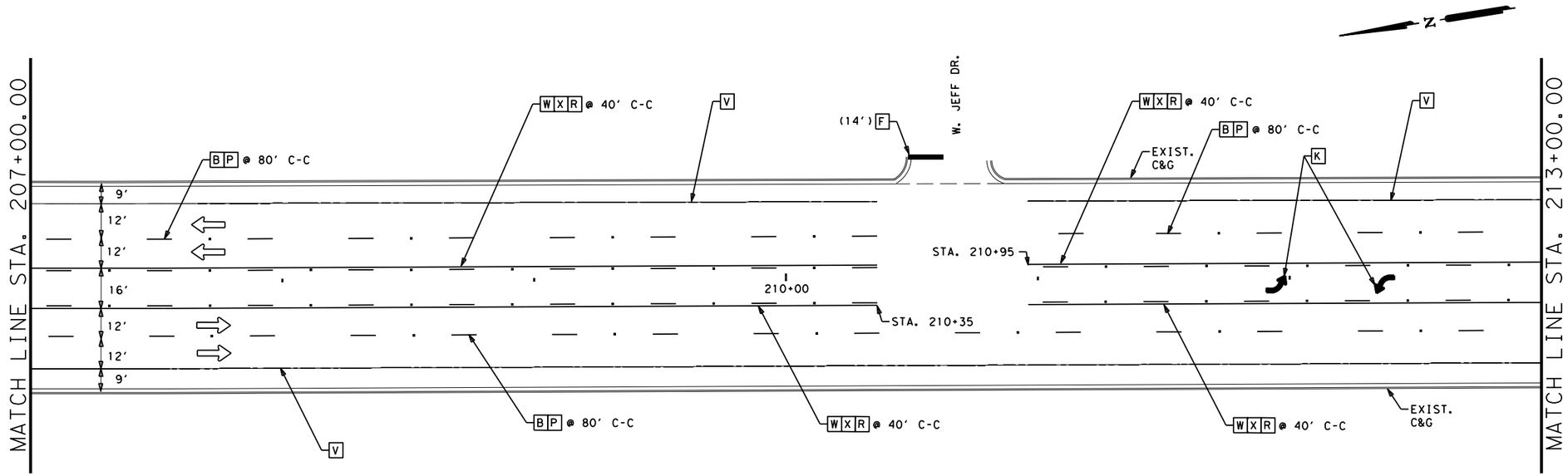


LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

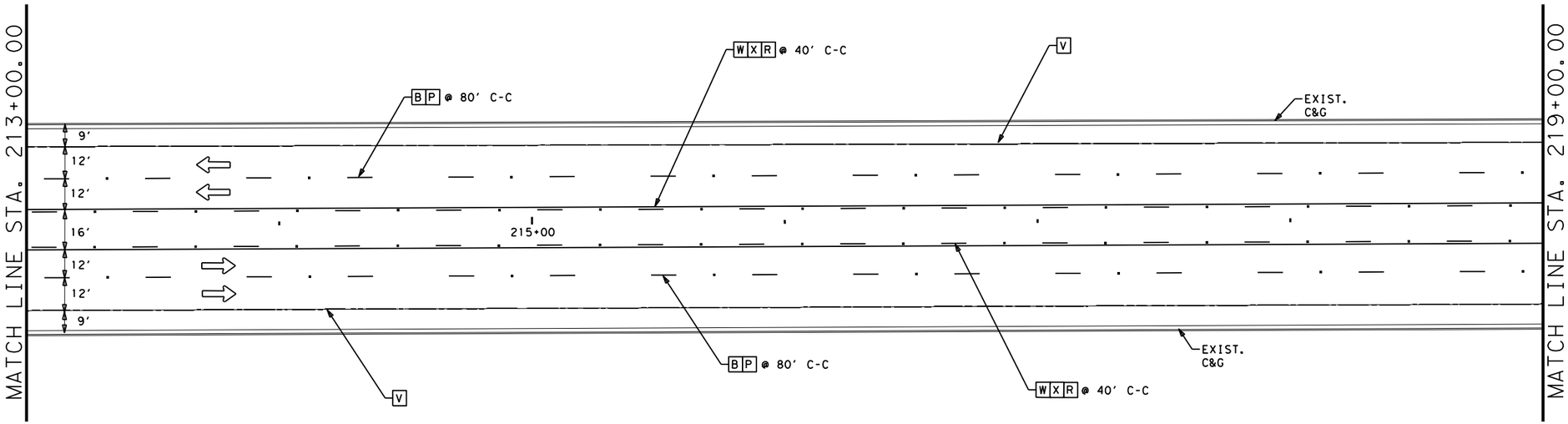
Texas Department of Transportation

FM 2061
LOCATION 4
PAVEMENT MARKING LAYOUTS

SHEET 17 OF 18

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		133

DATE: 2/25/2020 10:09:33 AM
FILE: LOC4PM017.dgn



LEGEND:

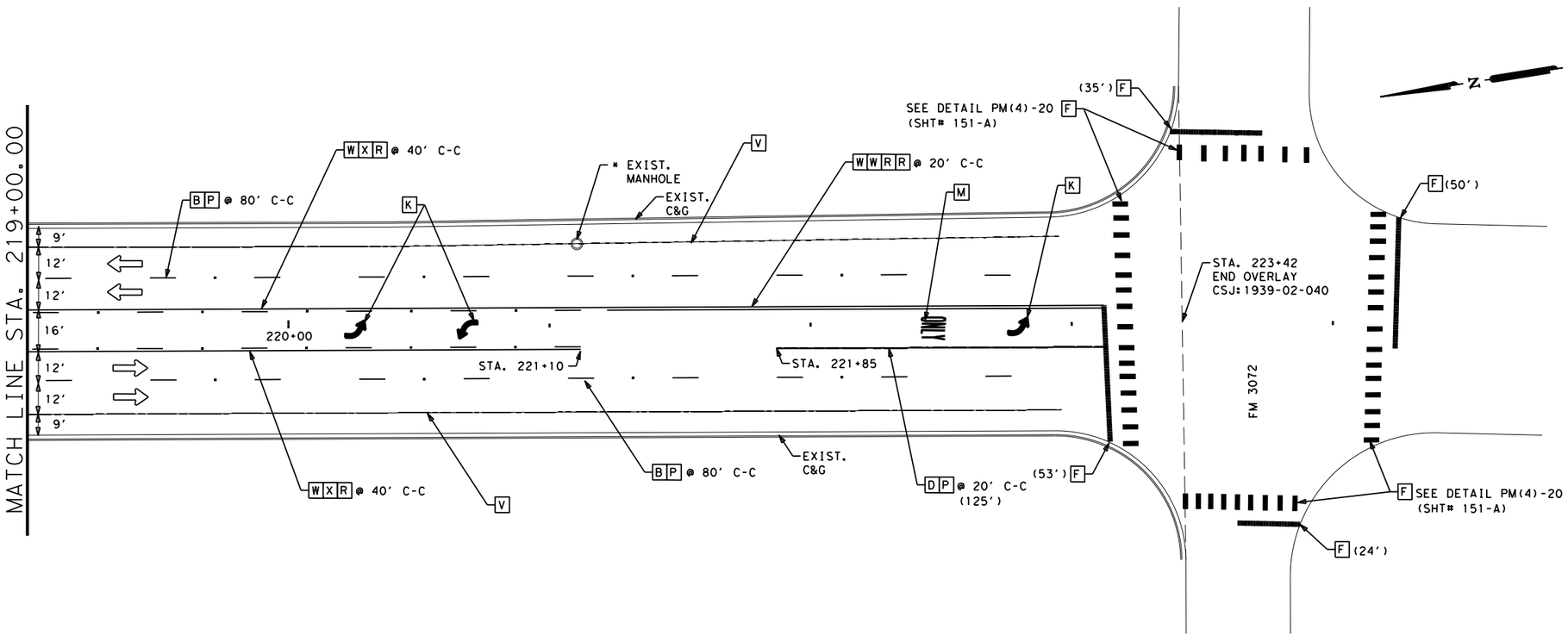
- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
··· - LIMITS OF OVERLAY

NOTES:

ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

* EXIST. MANHOLES SHALL MATCH FINAL SURFACE (OVERLAY) ELEVATIONS



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER

08/20/2020

Pharr District Central Design

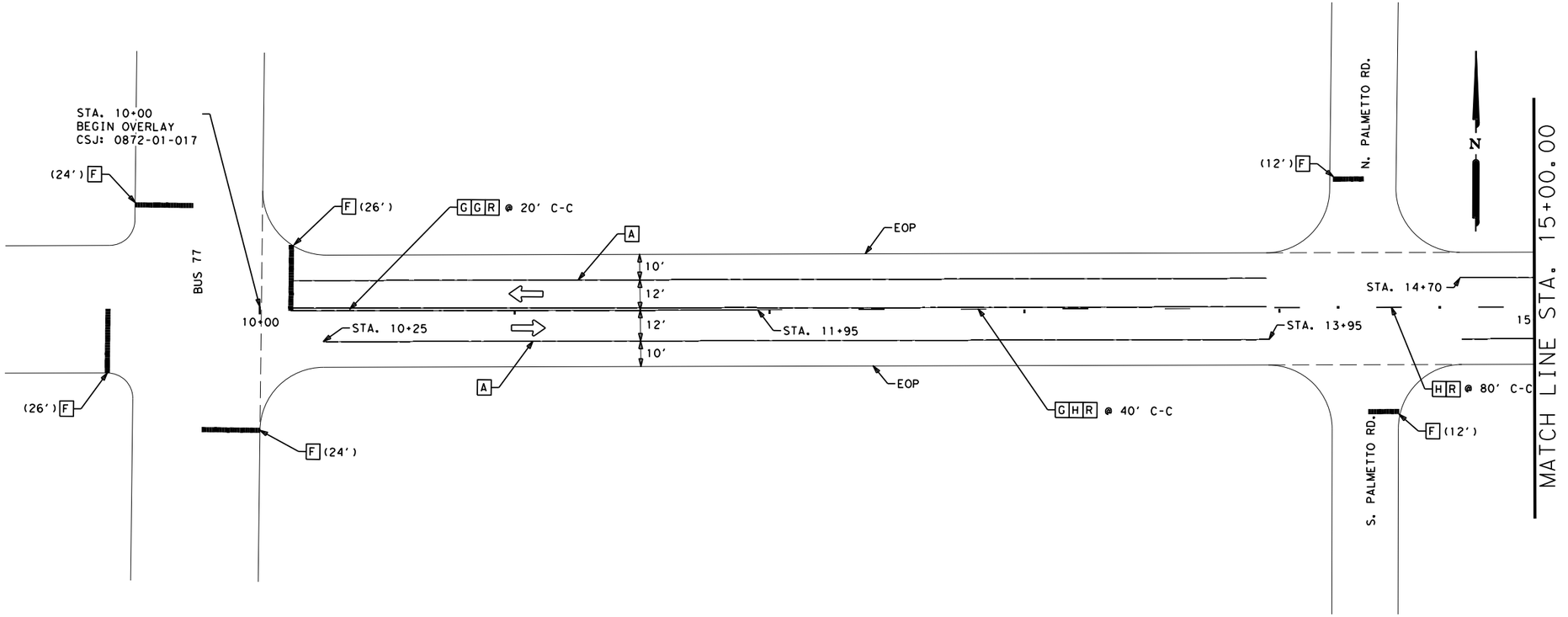
Texas Department of Transportation

FM 2061
LOCATION 4
PAVEMENT MARKING LAYOUTS

SHEET 18 OF 18

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		134

DATE: 8/20/2020 10:18:06 AM
FILE: LOC4PM018.dgn

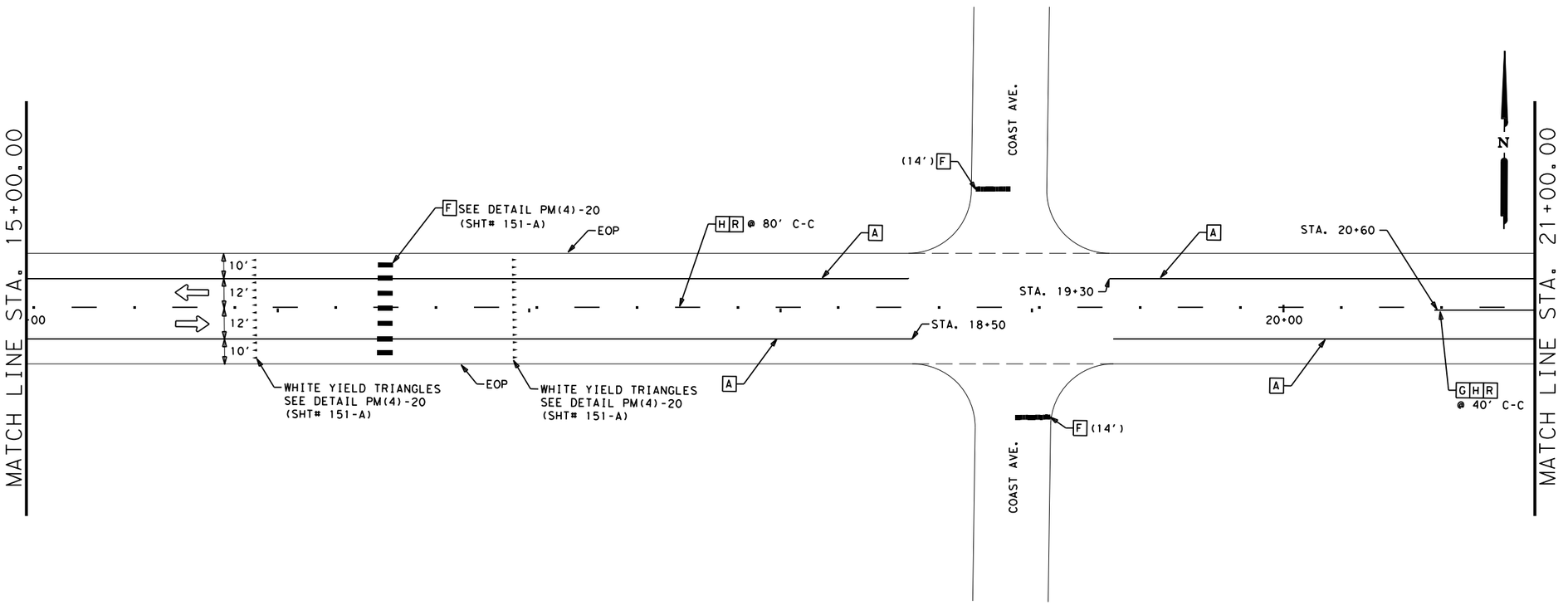


LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER
08/20/2020

Pharr District Central Design

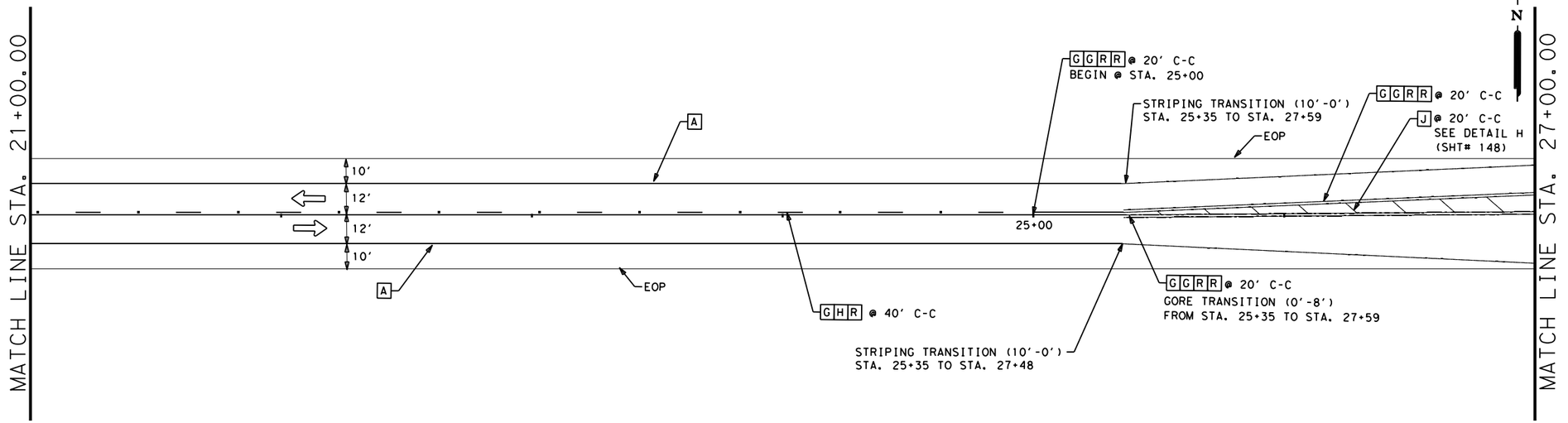
Texas Department of Transportation

SS 413
LOCATION 5
PAVEMENT MARKING LAYOUTS

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		135

DATE: 8/20/2020 10:37:46 AM
FILE: LOC5PM01.dgn

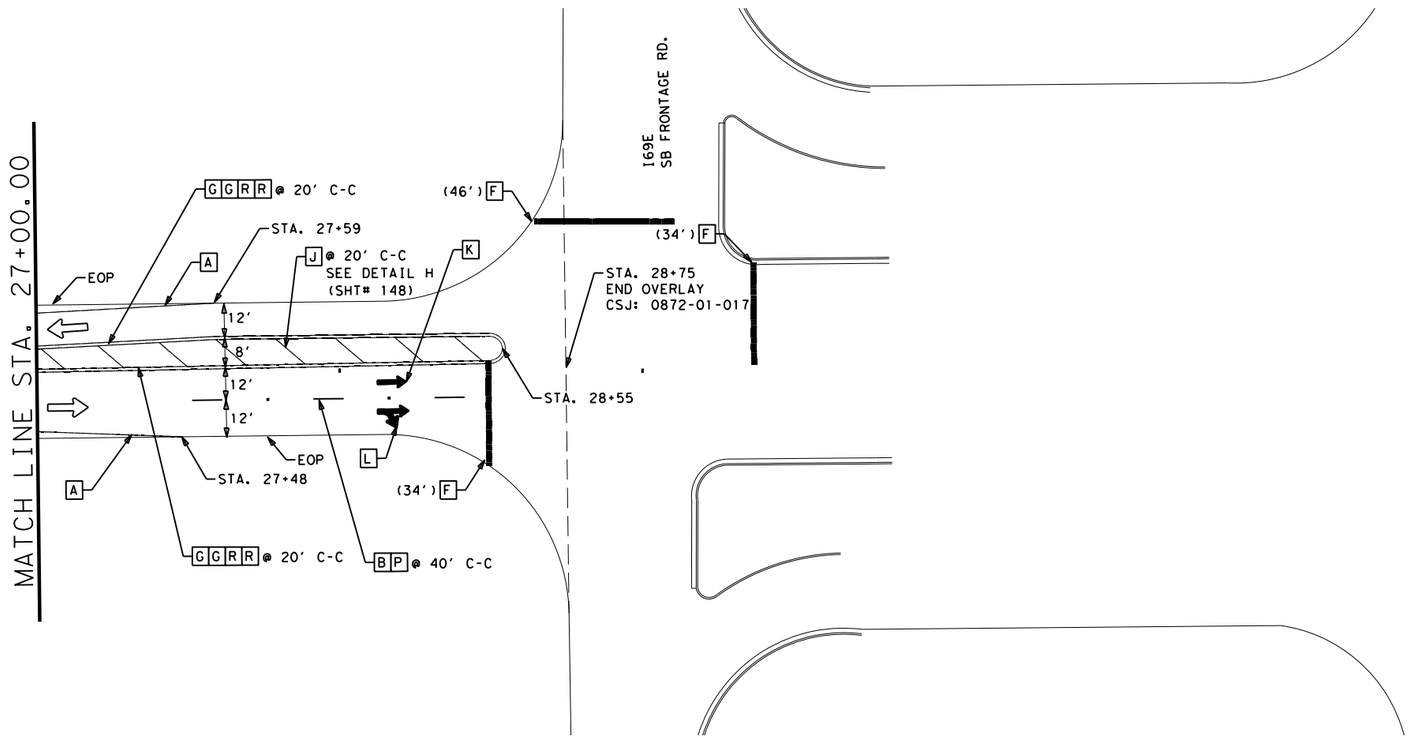


LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

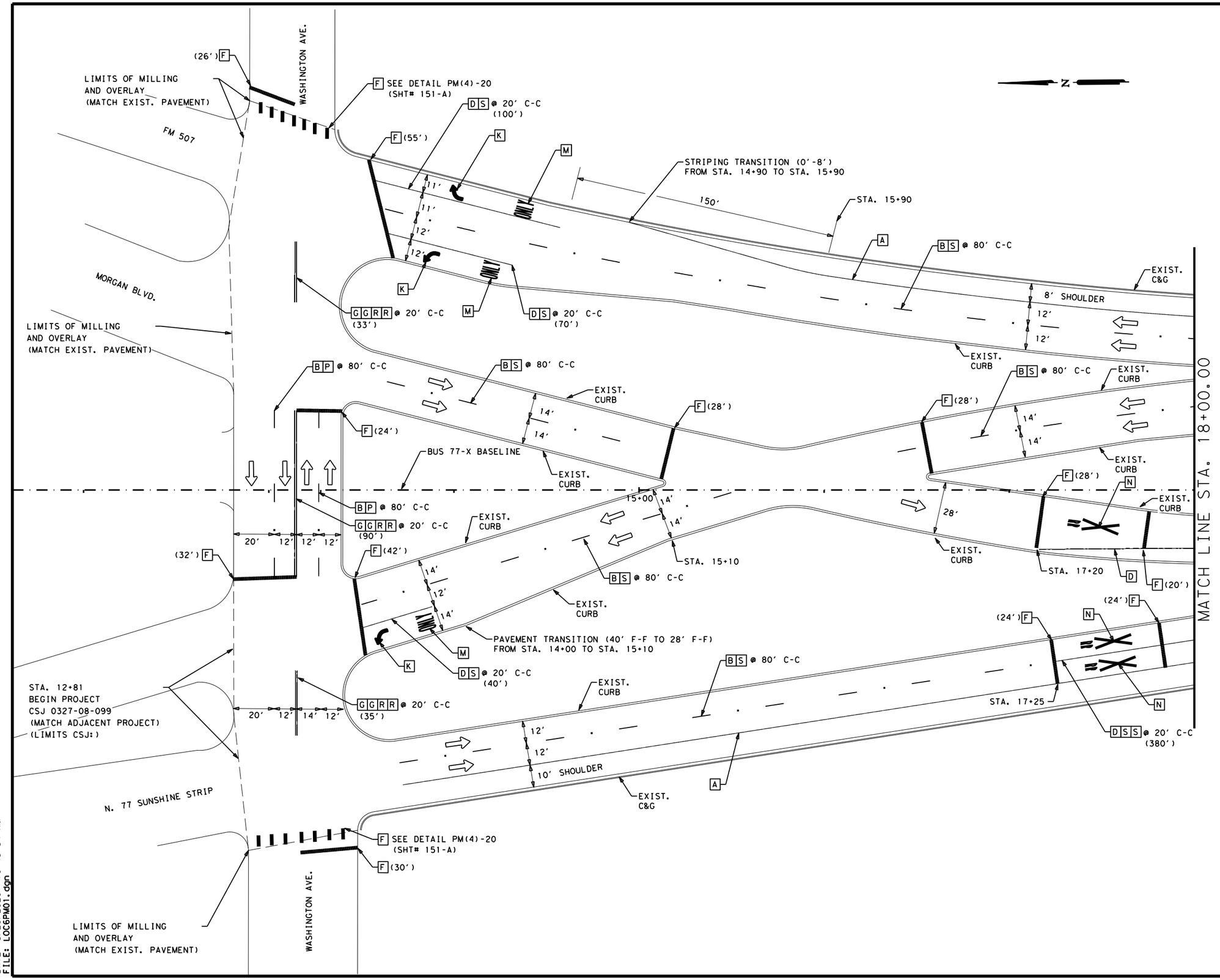
Texas Department of Transportation

SS 413
LOCATION 5
PAVEMENT MARKING LAYOUTS

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		136

DATE: 2/25/2020 10:10:04 AM
FILE: LOC5PM02.dgn



LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
▪▪▪ - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

SCALE (IN FEET): 0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
08/20/2020

Pharr District Central Design

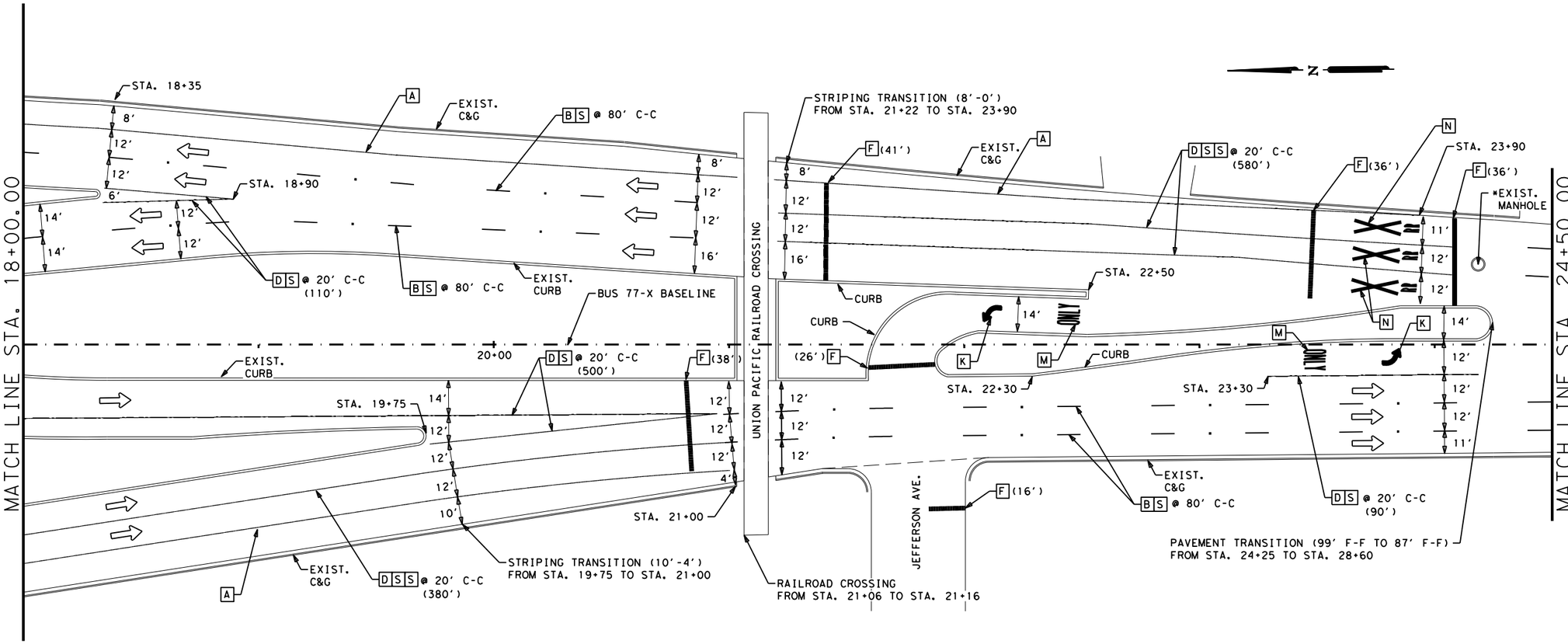
Texas Department of Transportation

BUS 77-X LOCATION 6 PAVEMENT MARKING LAYOUTS

SHEET 1 OF 9

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		137

DATE: 8/20/2020 10:43:34 AM
FILE: LOCGPM01.dgn



N

LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
··· - LIMITS OF OVERLAY

NOTES:

ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

* EXIST. MANHOLES SHALL MATCH FINAL SURFACE (OVERLAY) ELEVATIONS.

SCALE (IN FEET):

0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

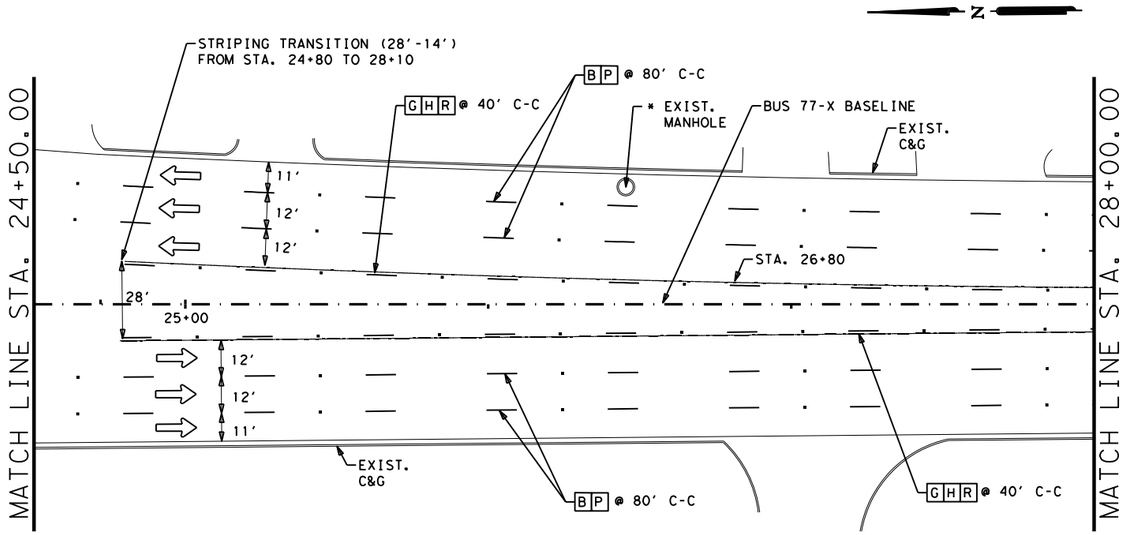
Texas Department of Transportation

BUS 77-X LOCATION 6 PAVEMENT MARKING LAYOUTS

SHEET 2 OF 9

© 2019	CONT	SECT	JOB	HIGHWAY
	1427	01	040, etc.	FM1423, etc.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO, etc.		138

DATE: 2/27/2020 10:36:39 AM
FILE: LOC6PM02.dgn



LEGEND:

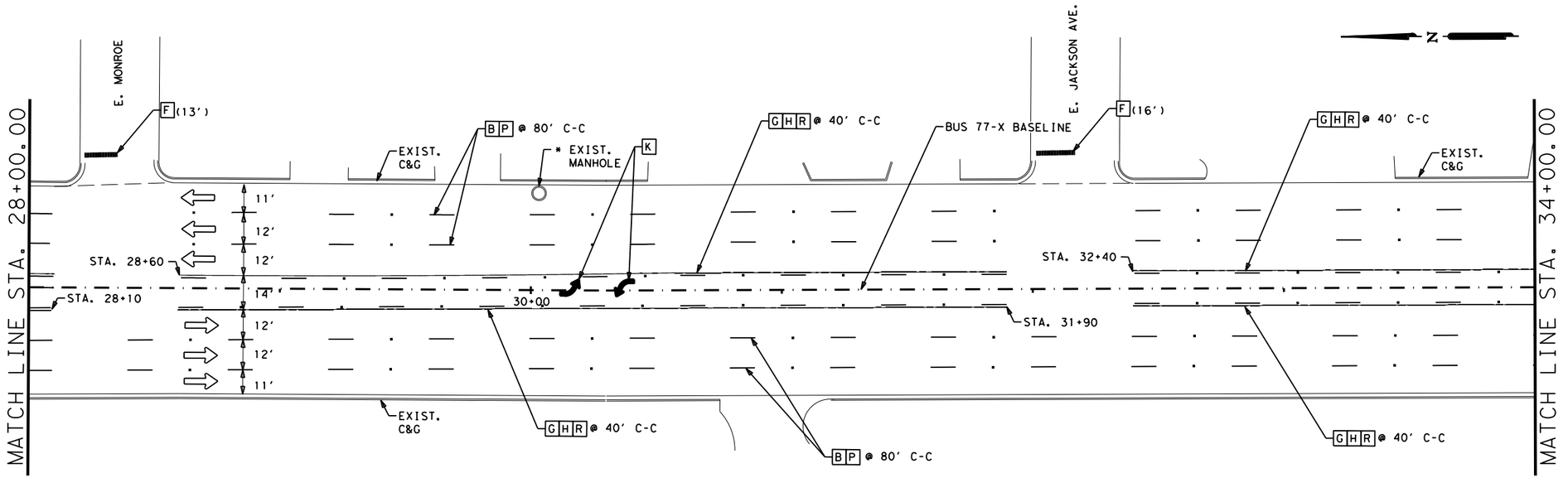
- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:

ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

* EXIST. MANHOLES SHALL MATCH FINAL SURFACE (OVERLAY) ELEVATIONS.



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

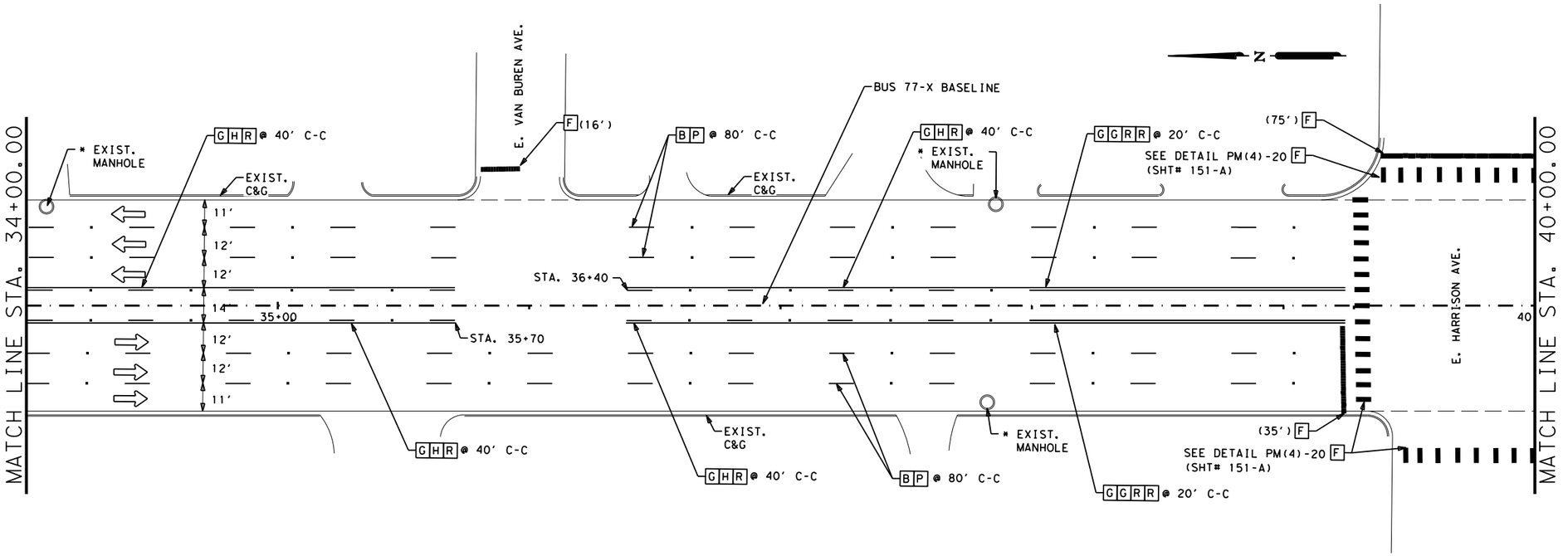
Texas Department of Transportation

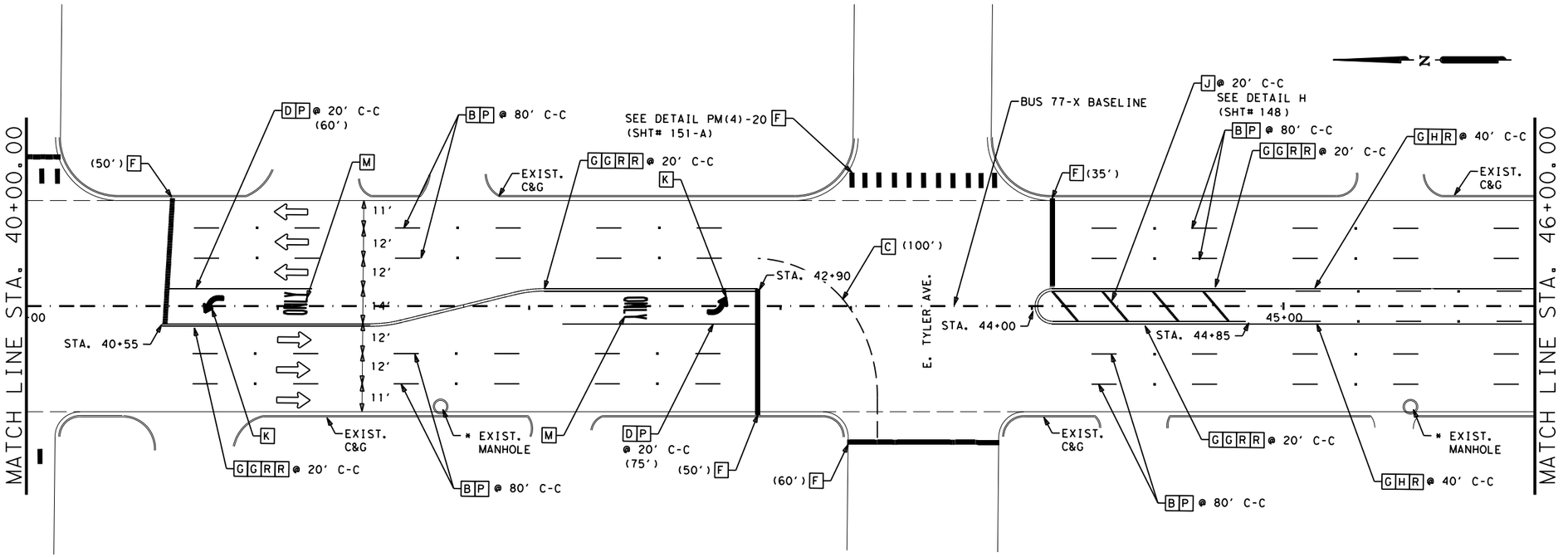
BUS 77-X LOCATION 6 PAVEMENT MARKING LAYOUTS

SHEET 3 OF 9

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		139

DATE: 2/27/2020 10:39:28 AM
FILE: LOCGPM03.dgn





LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:

ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

* EXIST. MANHOLES SHALL MATCH FINAL SURFACE (OVERLAY) ELEVATIONS.

SCALE (IN FEET): 0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER

08/20/2020

Pharr District Central Design

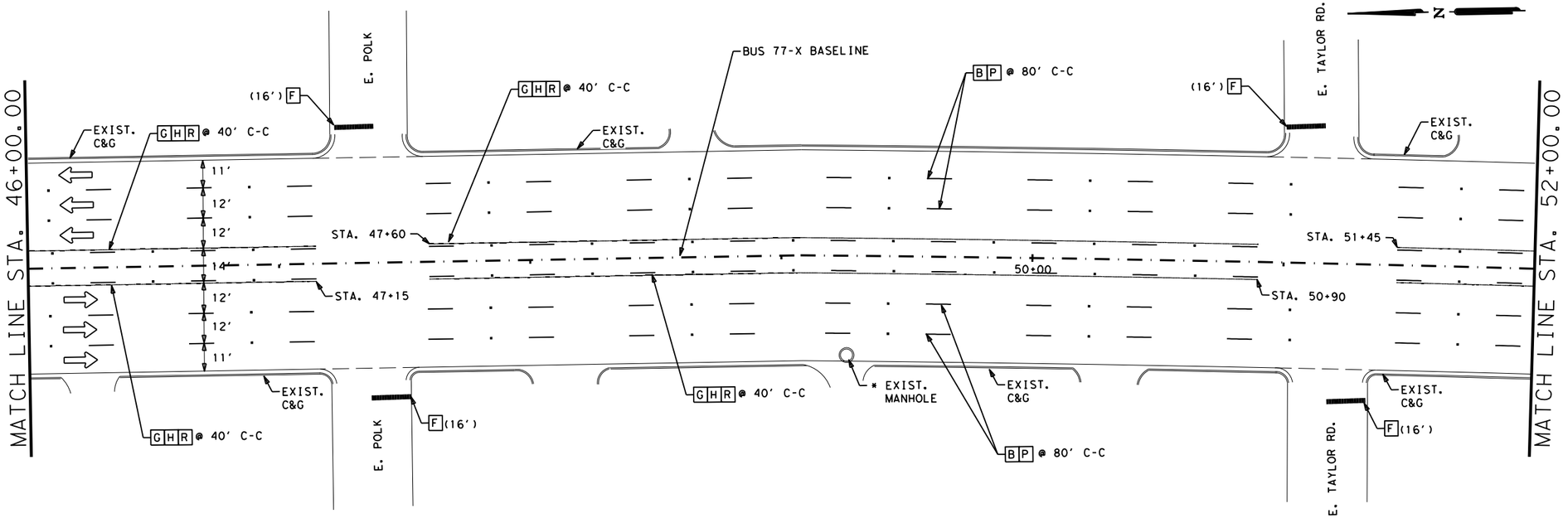
Texas Department of Transportation

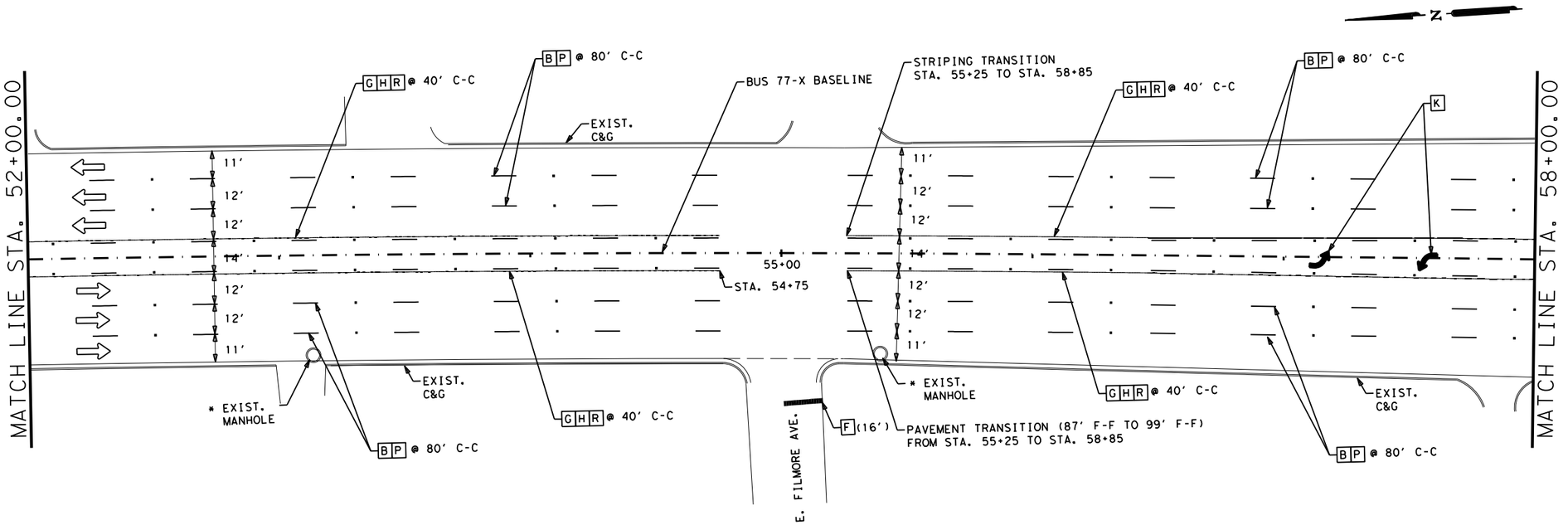
BUS 77-X LOCATION 6 PAVEMENT MARKING LAYOUTS

SHEET 4 OF 9

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		140

DATE: 8/20/2020 11:10:22 AM
FILE: LOC6PM04.dgn





LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
··· - LIMITS OF OVERLAY

NOTES:

ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

* EXIST. MANHOLES SHALL MATCH FINAL SURFACE (OVERLAY) ELEVATIONS.

SCALE (IN FEET): 0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

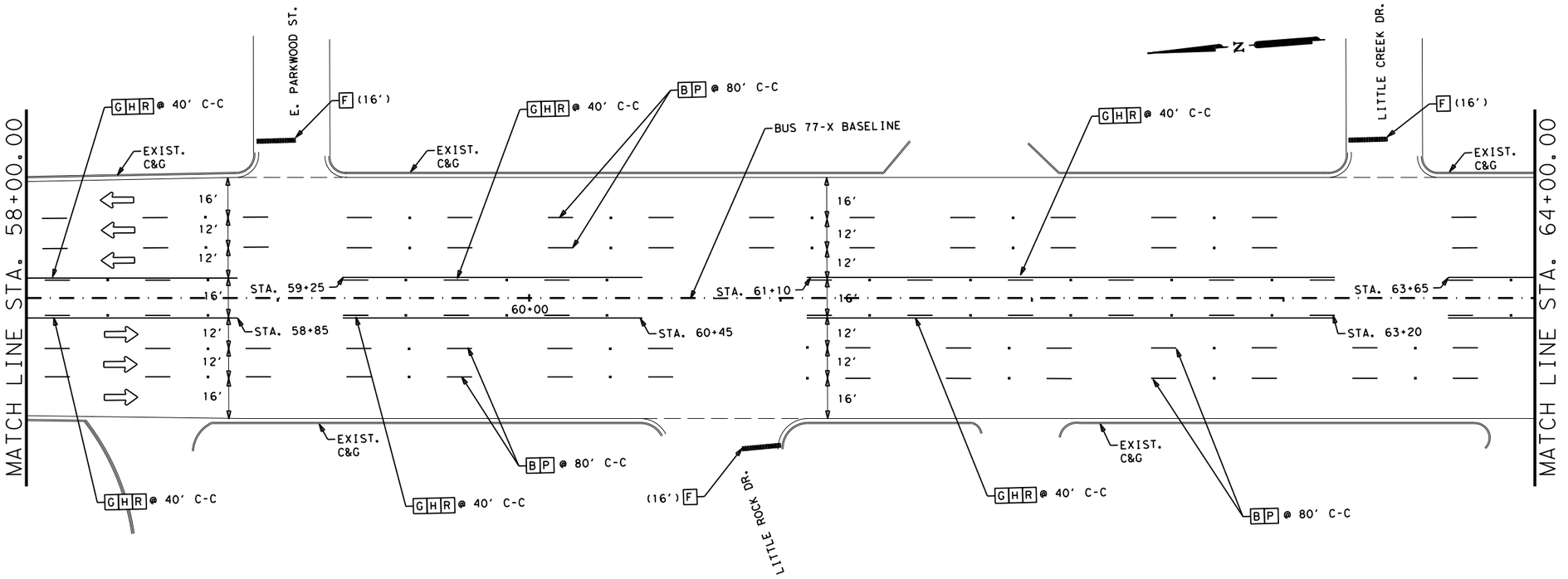
Texas Department of Transportation

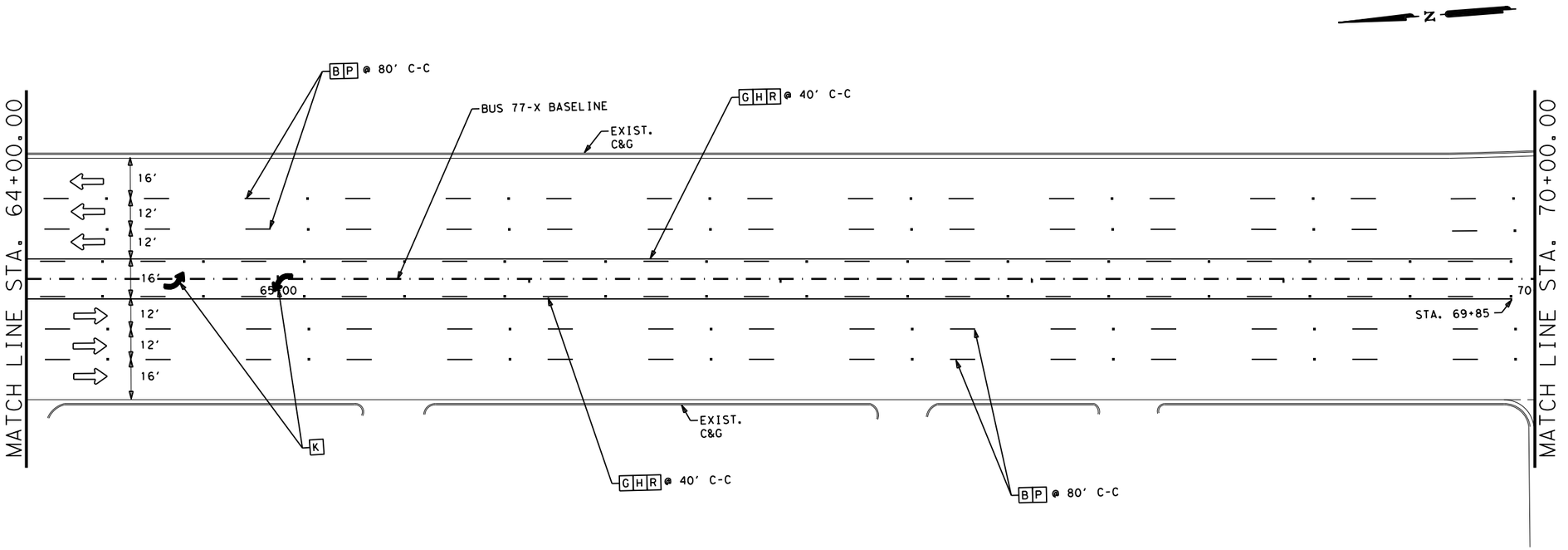
BUS 77-X LOCATION 6 PAVEMENT MARKING LAYOUTS

SHEET 5 OF 9

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		141

DATE: 2/27/2020 10:44:12 AM
FILE: LOC6PM05.dgn





LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

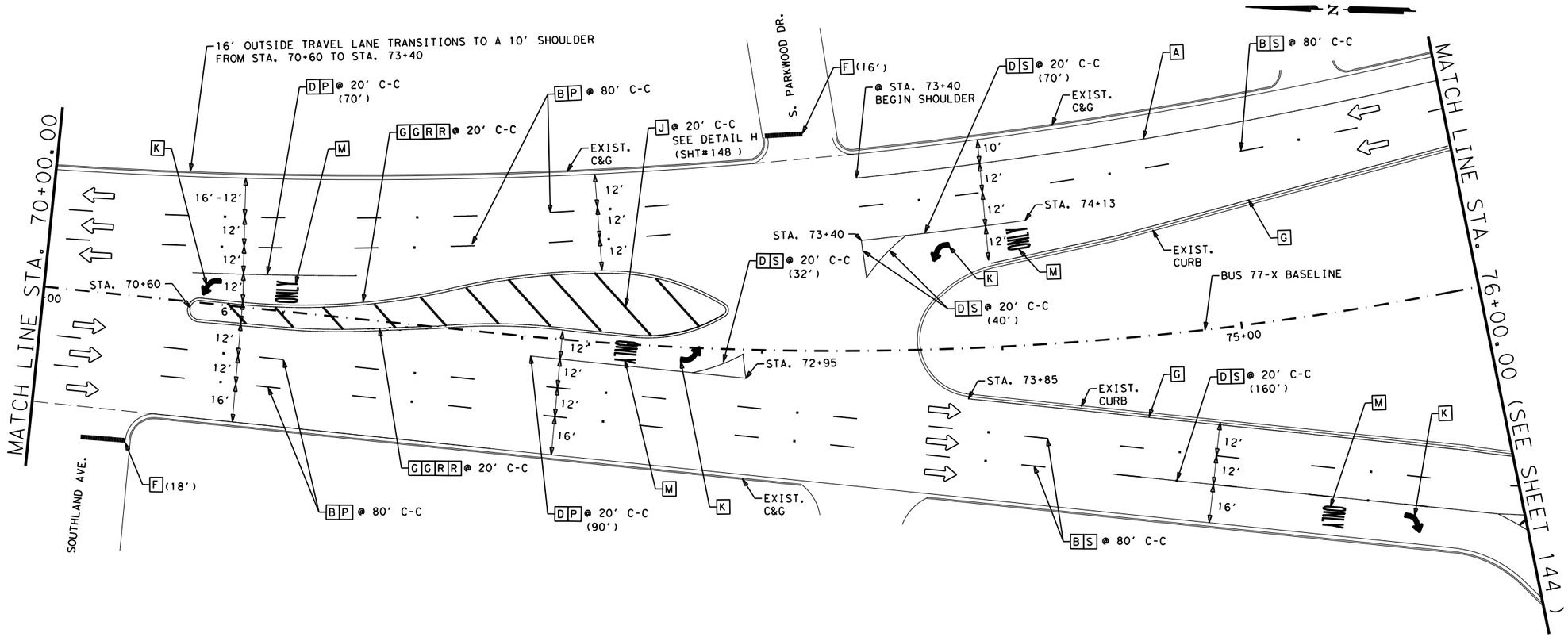
Texas Department of Transportation

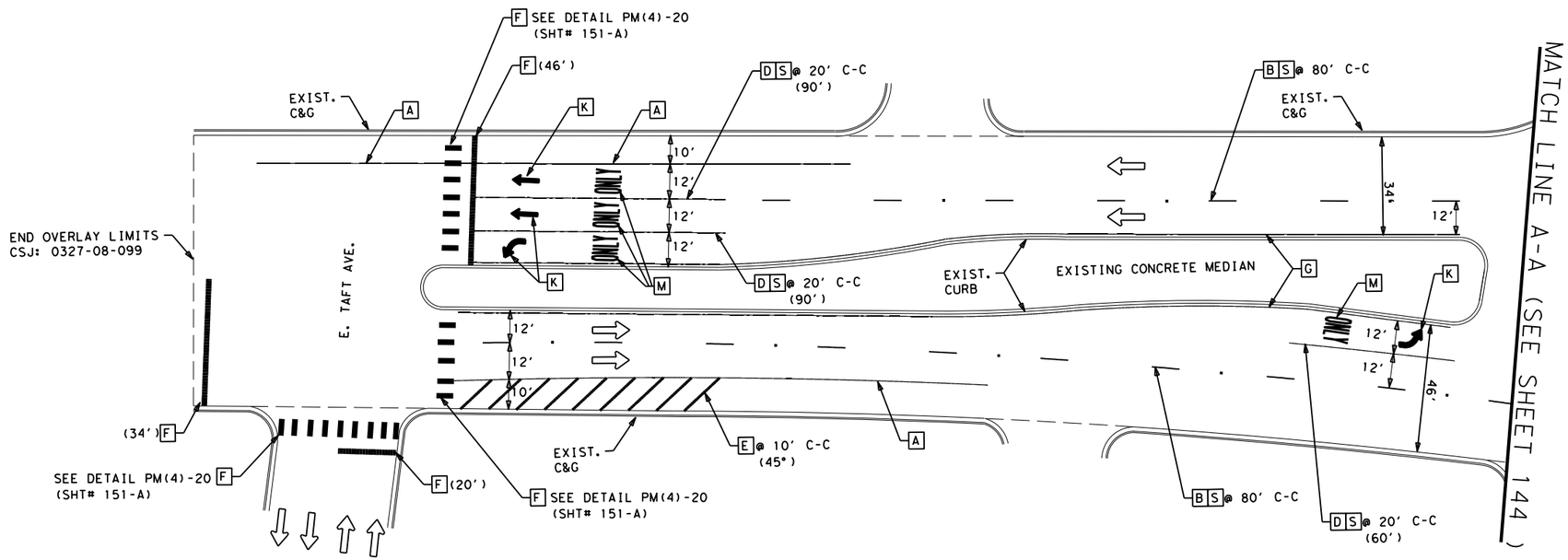
BUS 77-X LOCATION 6 PAVEMENT MARKING LAYOUTS

SHEET 6 OF 9

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		142

DATE: 2/25/2020 10:11:03 AM
FILE: LOC6PM06.dgn





LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
··· - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

SCALE (IN FEET): 0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
08/20/2020

Pharr District Central Design

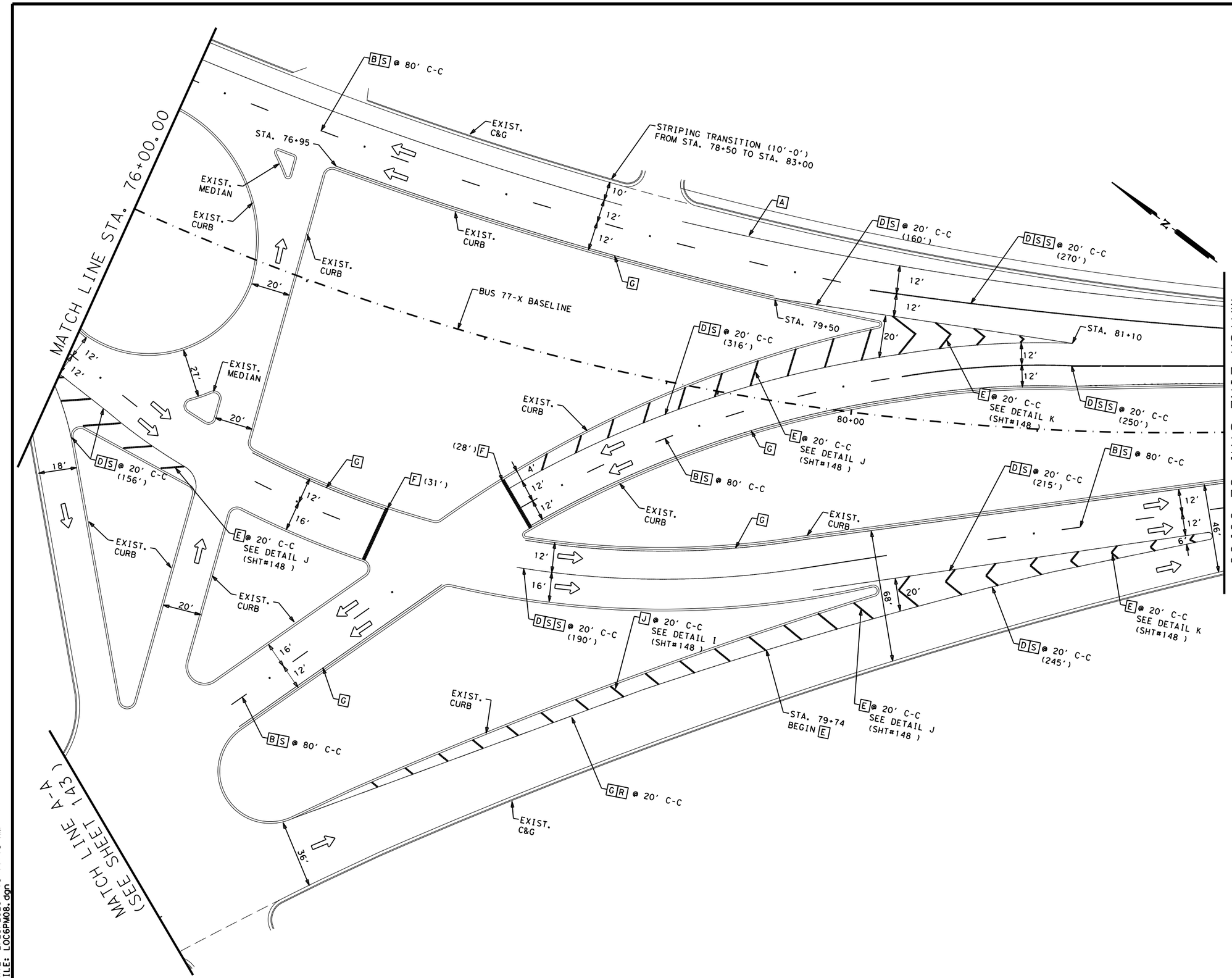
Texas Department of Transportation

BUS 77-X LOCATION 6 PAVEMENT MARKING LAYOUTS

SHEET 7 OF 9

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		143

DATE: 8/20/2020 11:20:55 AM
FILE: LOCGPM07.dgn



LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
▪▪▪ - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER
02/25/2020

Pharr District Central Design

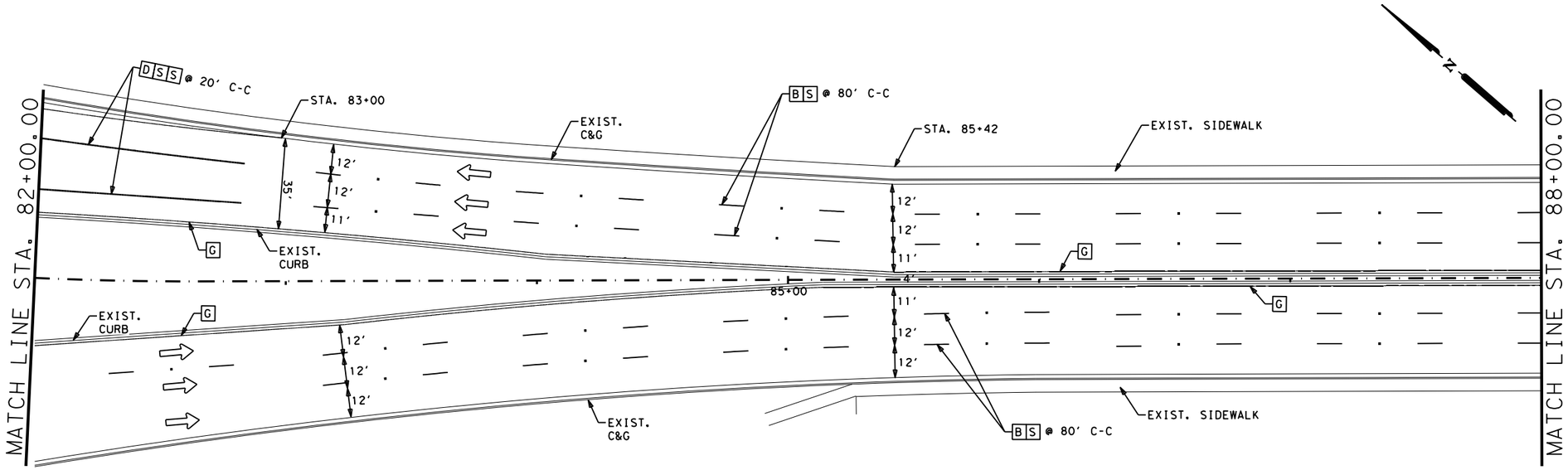
Texas Department of Transportation

BUS 77-X LOCATION 6 PAVEMENT MARKING LAYOUTS

SHEET 8 OF 9

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		144

DATE: 2/25/2020 10:11:19 AM
FILE: LOC6PM08.dgn

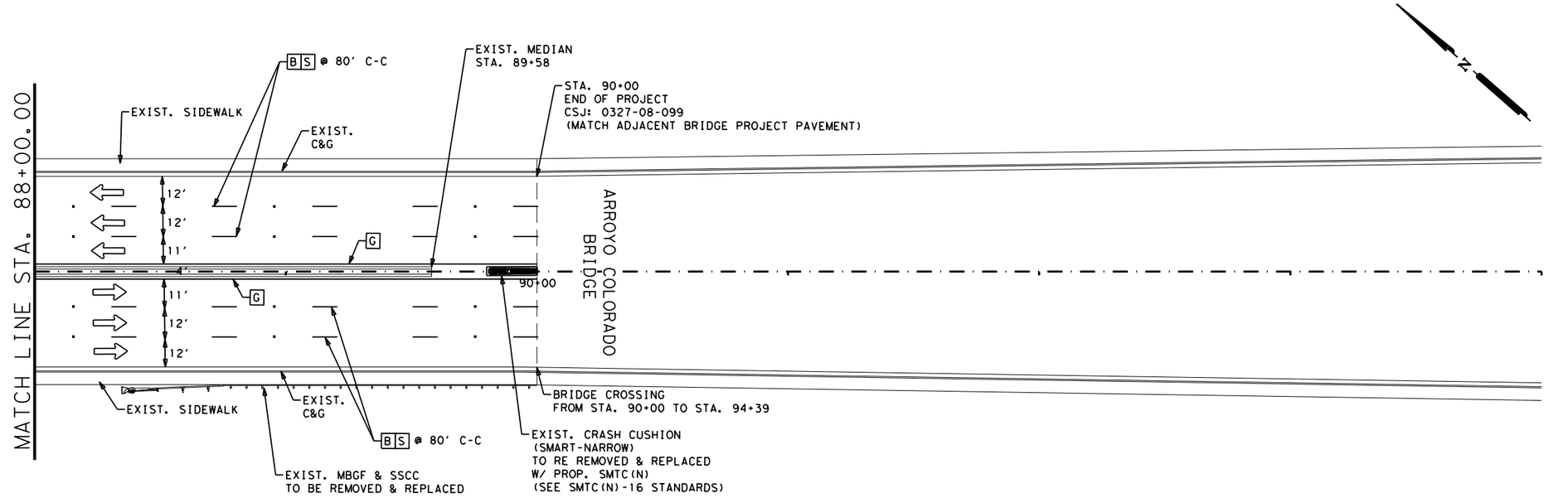


LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.



SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

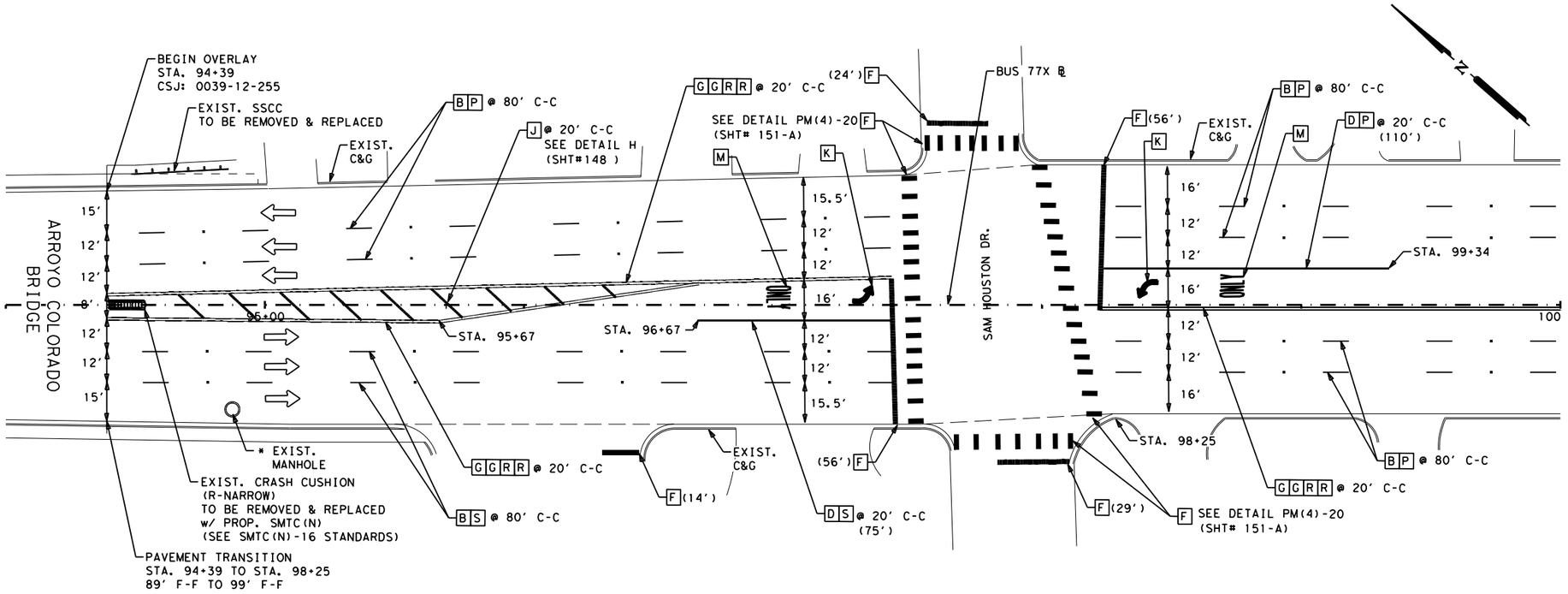
Texas Department of Transportation

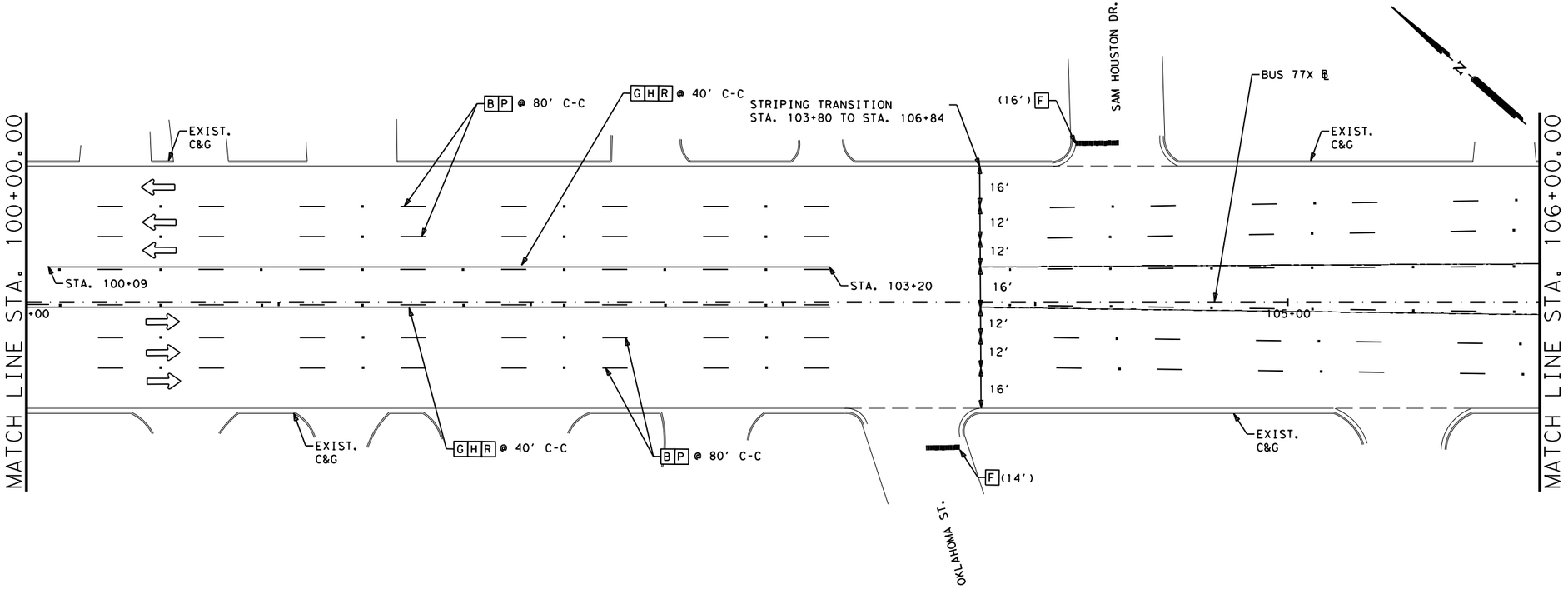
BUS 77-X LOCATION 6 PAVEMENT MARKING LAYOUTS

SHEET 9 OF 9

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		145

DATE: 2/25/2020 10:11:28 AM
FILE: LOC6PM09.dgn





LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
··· - LIMITS OF OVERLAY

NOTES:

ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

* EXIST. MANHOLES SHALL MATCH FINAL SURFACE (OVERLAY) ELEVATIONS.

SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

08/20/2020

Pharr District Central Design

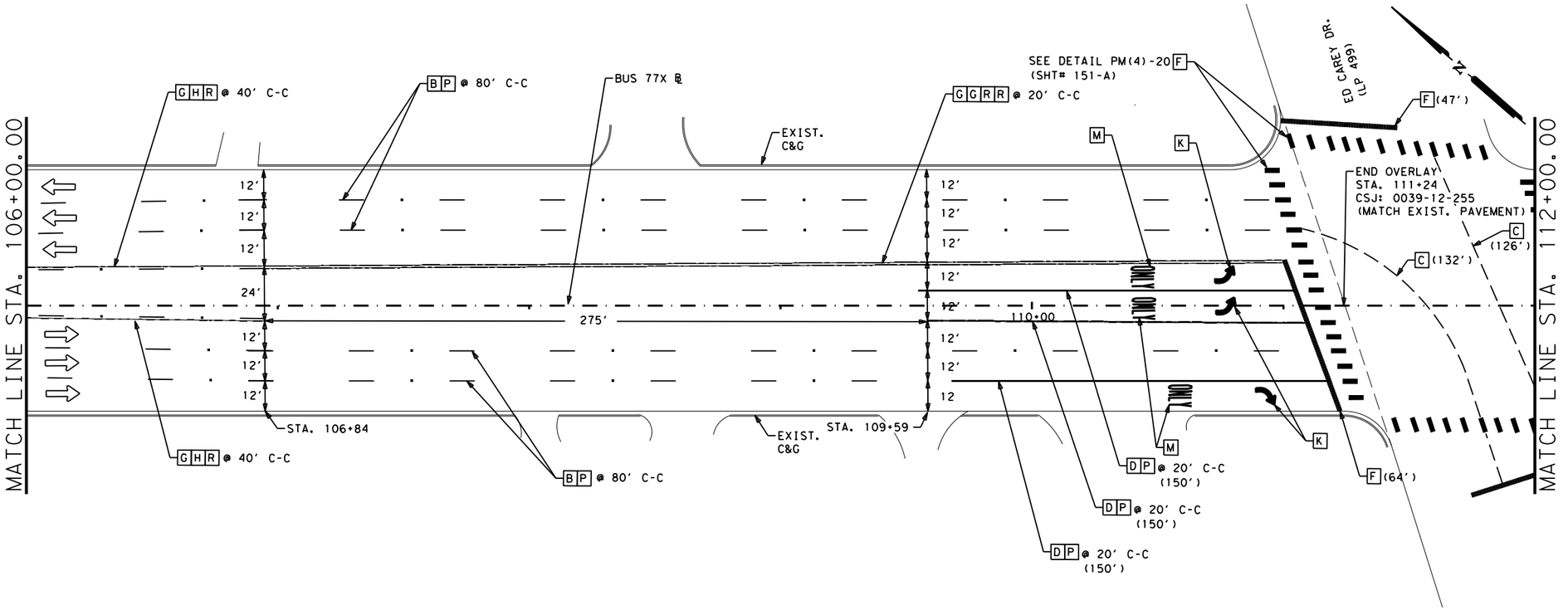
Texas Department of Transportation

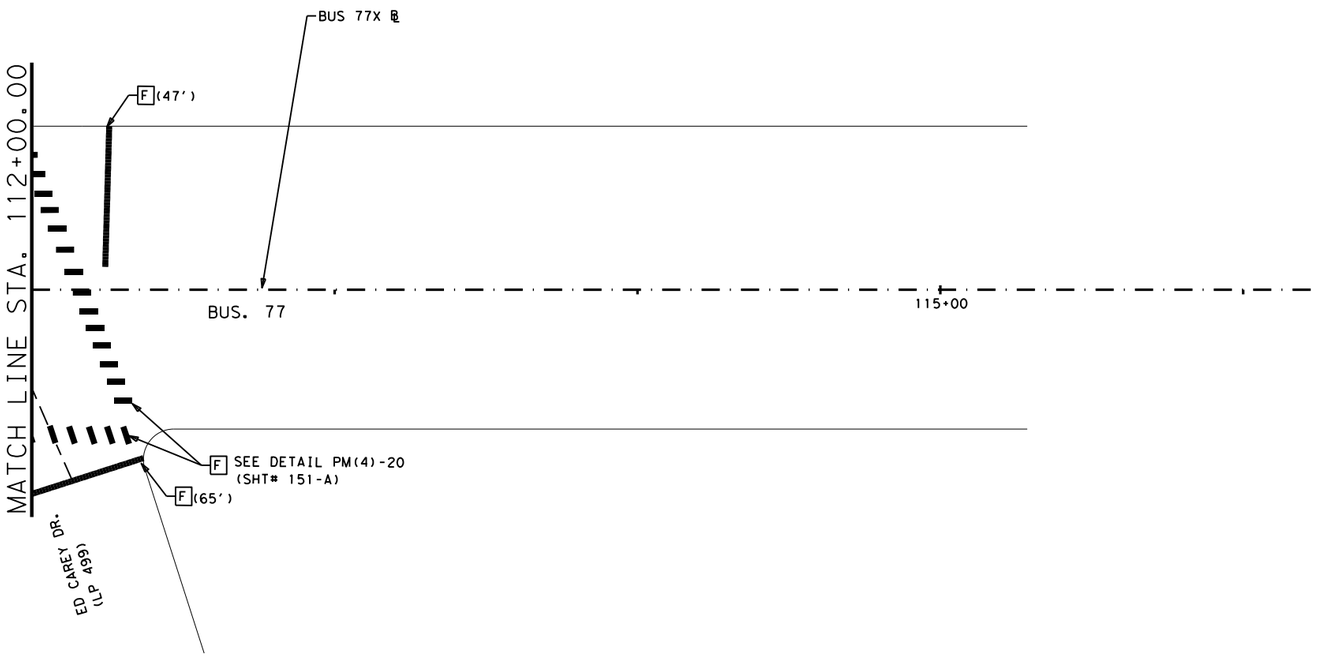
BUS 77-X
LOCATION 7
PAVEMENT MARKING LAYOUTS

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		146

DATE: 8/20/2020 11:31:15 AM
FILE: LOCTPM01.dgn





LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
••• - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.

SCALE (IN FEET):
0 25 50

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED PROFESSIONAL ENGINEER

08/20/2020

Pharr District Central Design

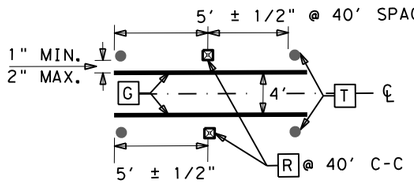
Texas Department of Transportation

BUS 77-X LOCATION 7 PAVEMENT MARKING LAYOUTS

SHEET 2 OF 2

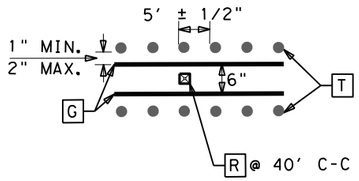
CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		147

DATE: 8/20/2020 11:33:00 AM
FILE: LOCTPM02.dgn



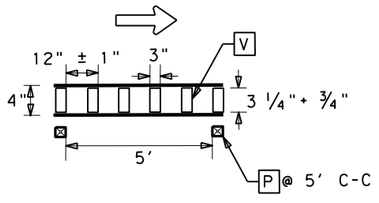
DETAIL A

LOCATION #1



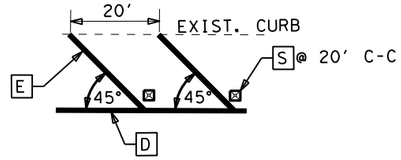
DETAIL D

LOCATION #1
LOCATION #2



DETAIL G

LOCATION #2



DETAIL J

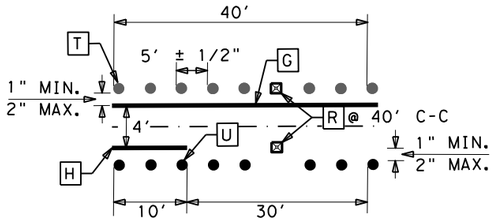
LOCATION #6

LEGEND:

- A - (W) 4" SLD
- B - (W) 4" BRK
- C - (W) 4" DOT
- D - (W) 8" SLD
- E - (W) 12" SLD
- F - (W) 24" SLD
- G - (Y) 4" SLD
- H - (Y) 4" BRK
- I - (Y) 4" DOT
- J - (Y) 12" SLD
- K - (W) TY C (ARROW)
- L - (W) TY C (DBL ARROW)
- M - (W) TY C (WORD)
- N - (W) TY C (RR XING)
- O - REFL PAV MRK TY I-A
- P - REFL PAV MRK TY I-C
- Q - REFL PAV MRK TY I-R
- R - REFL PAV MRK TY II A-A
- S - REFL PAV MRK TY II C-R
- T - TRAFFIC BUTTON TY Y
- U - TRAFFIC BUTTON TY B
- V - REFL PROF PAV MRK TY I (W) 4"(SLD)
- W - REFL PROF PAV MRK TY I (Y) 4" (SLD)
- X - REFL PROF PAV MRK TY I (Y) 4" (BRK)
- Y - TRAFFIC BUTTON TY W

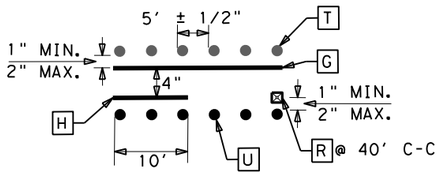
EOP - EDGE OF PAVEMENT
⇦ - TRAFFIC FLOW
C-C - CENTER TO CENTER
@ - AT
W/ - WITH
▪▪▪ - LIMITS OF OVERLAY

NOTES:
ALL PROPOSED TY II PAVEMENT MARKINGS SHALL BE CONSIDERED TEMPORARY WORK ZONE STRIPING AND SHALL FOLLOW THE PAVEMENT MARKING LAYOUTS.



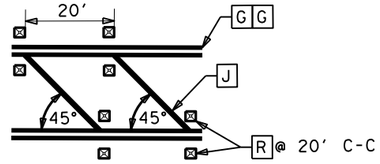
DETAIL B

LOCATION #1



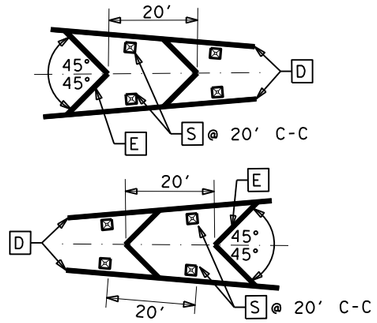
DETAIL E

LOCATION #2



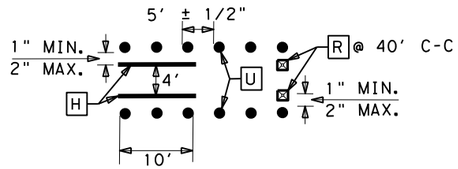
DETAIL H

LOCATION #1
LOCATION #4
LOCATION #5
LOCATION #6
LOCATION #7



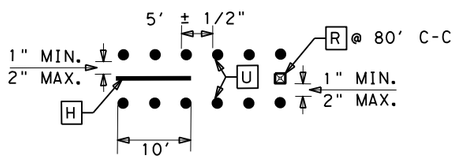
DETAIL K

LOCATION #6



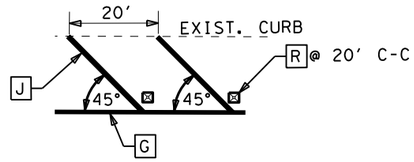
DETAIL C

LOCATION #1



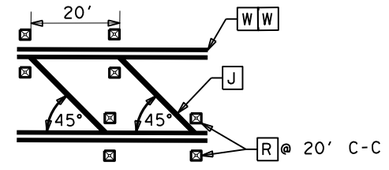
DETAIL F

LOCATION #2



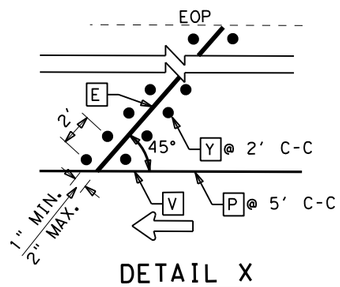
DETAIL I

LOCATION #6



DETAIL L

LOCATION #4



DETAIL X

LOCATION #2

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

Texas Department of Transportation

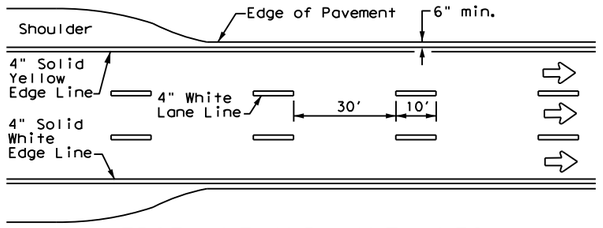
PAVEMENT MARKING DETAIL SHEET

N. T. S.

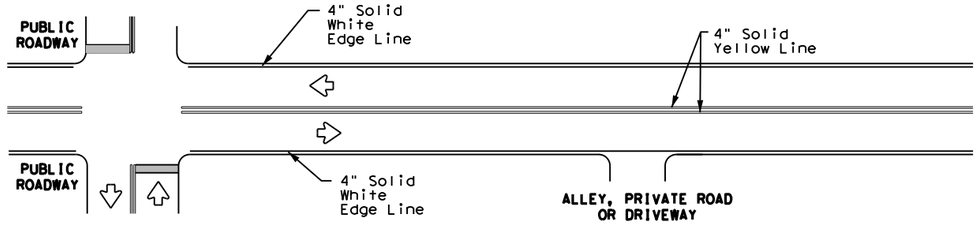
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		148

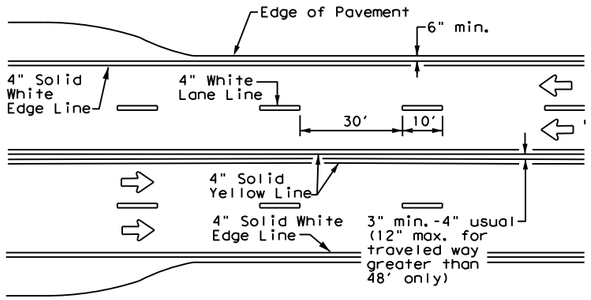
DATE: 2/25/2020 10:12:11 AM
FILE: BUTTON DETAIL.dgn



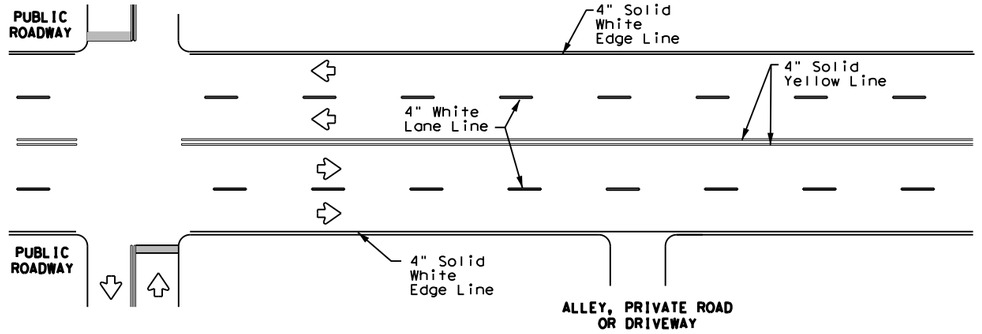
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



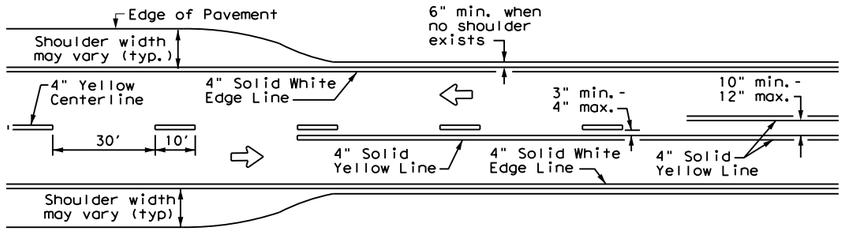
TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



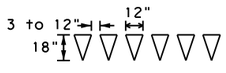
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



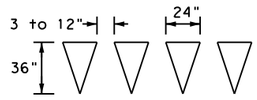
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

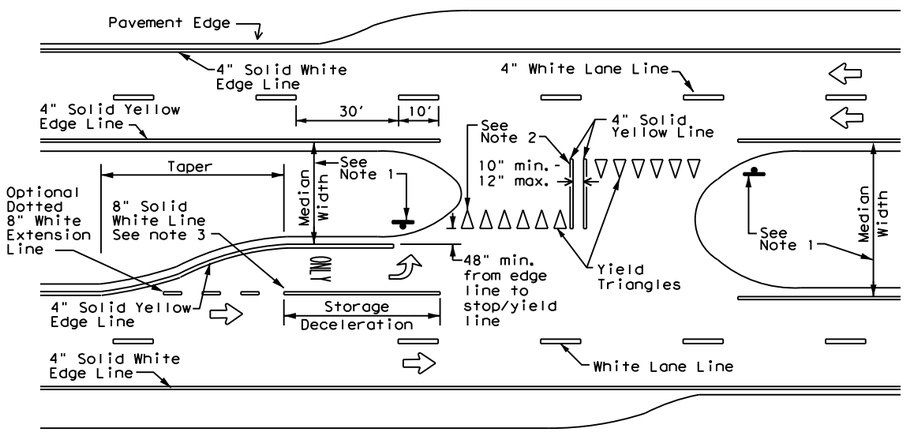


For posted speed on road being marked equal to or less than 40 MPH.



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

YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs are optional as determined by the Engineer.

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

3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

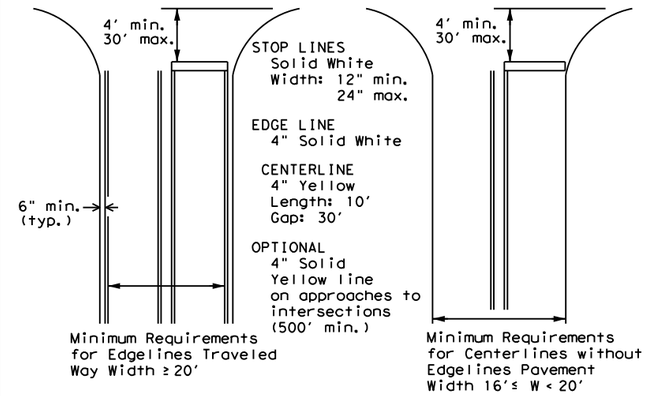
GENERAL NOTES

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

2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the inside of edgeline to the inside of edgeline of a two lane roadway.

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

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



GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Highways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

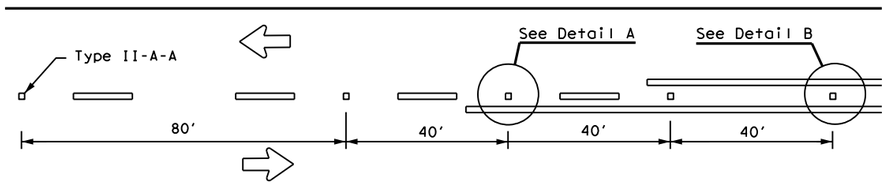
PM(1)-20

FILE: pm1-20.dgn	DN:	CK:	DW:	CK:
© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	1427	01	040, etc.	FM1423, etc.
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	PHR	HIDALGO, etc.		149

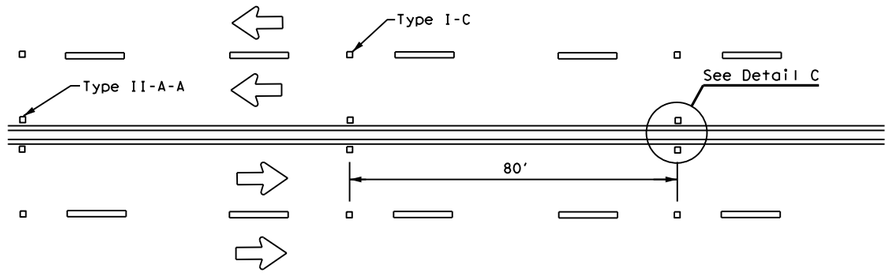
DATE:
FILE:

22B

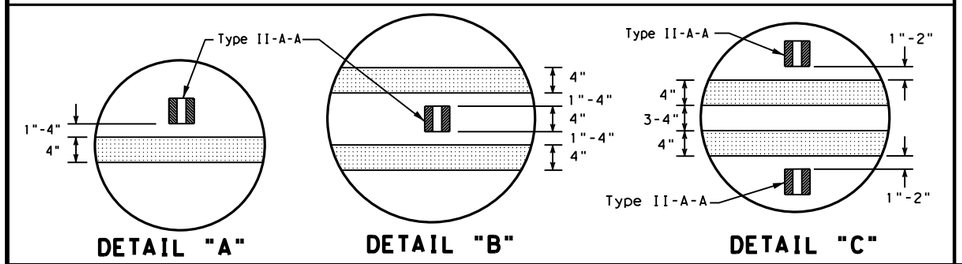
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



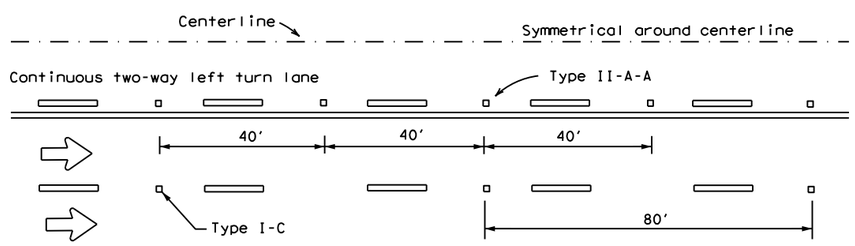
CENTERLINE FOR ALL TWO LANE ROADWAYS



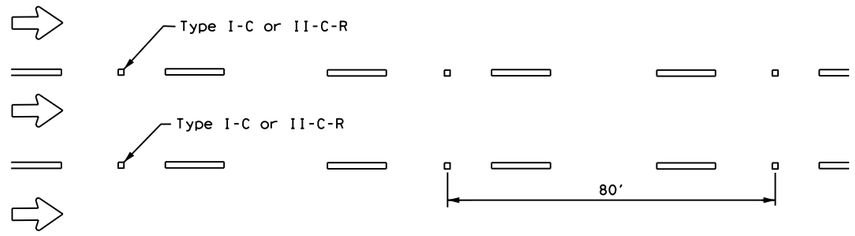
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



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

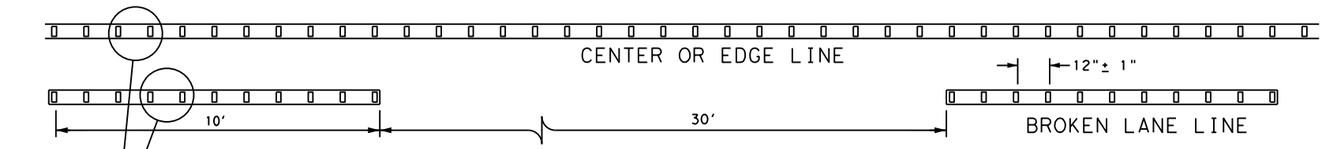


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



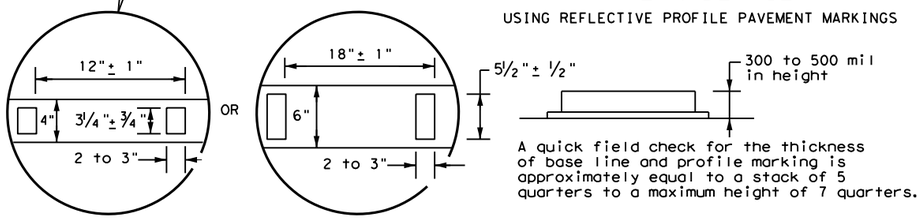
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

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



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS



4" EDGE LINE, CENTER LINE OR LANE LINE

OPTIONAL 6" EDGE LINE, CENTER LINE OR LANE LINE

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

NOTE

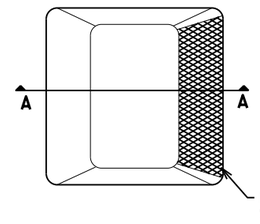
Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

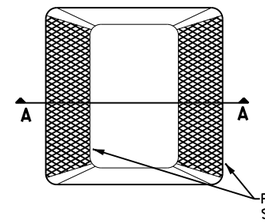
1. All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

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

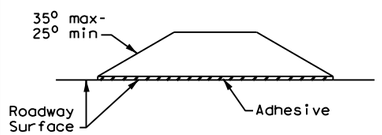
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

Texas Department of Transportation

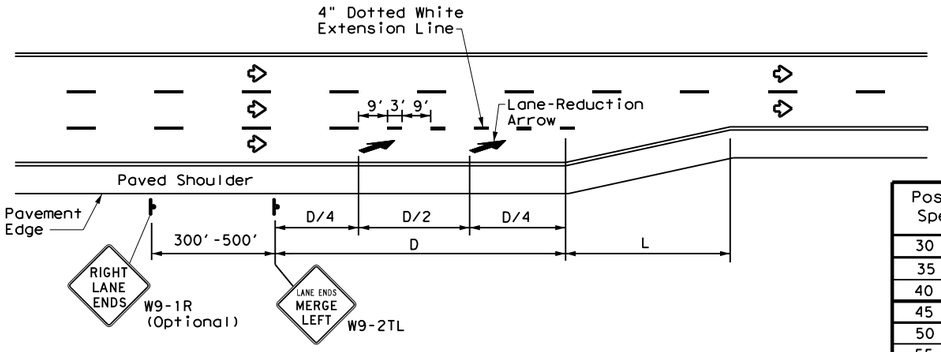
Traffic Safety Division Standard

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

FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-92 2-10 5-00 2-12 8-00 6-20	1427	01	040,etc.	FM1423,etc.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO,etc.		150

22B

DATE:
FILE:

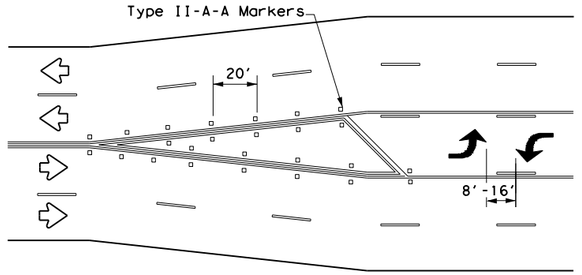


LANE REDUCTION

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

NOTES

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



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

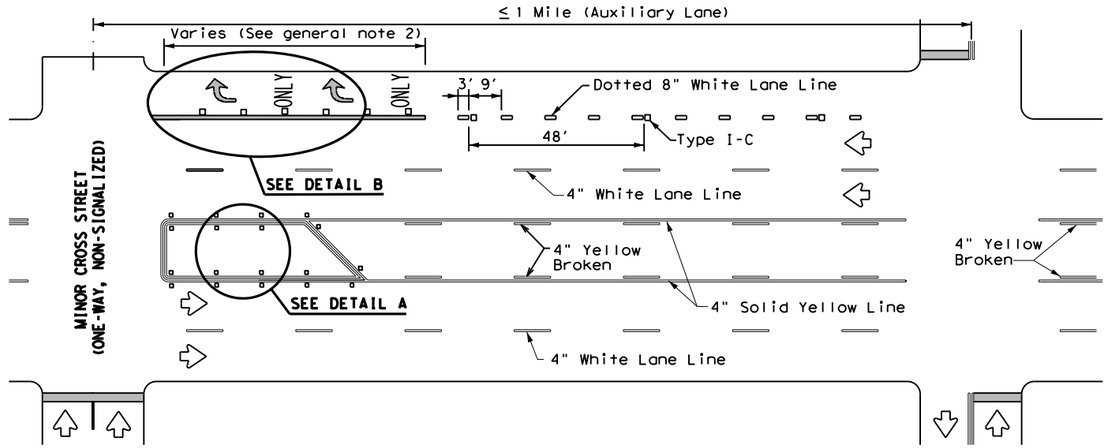
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

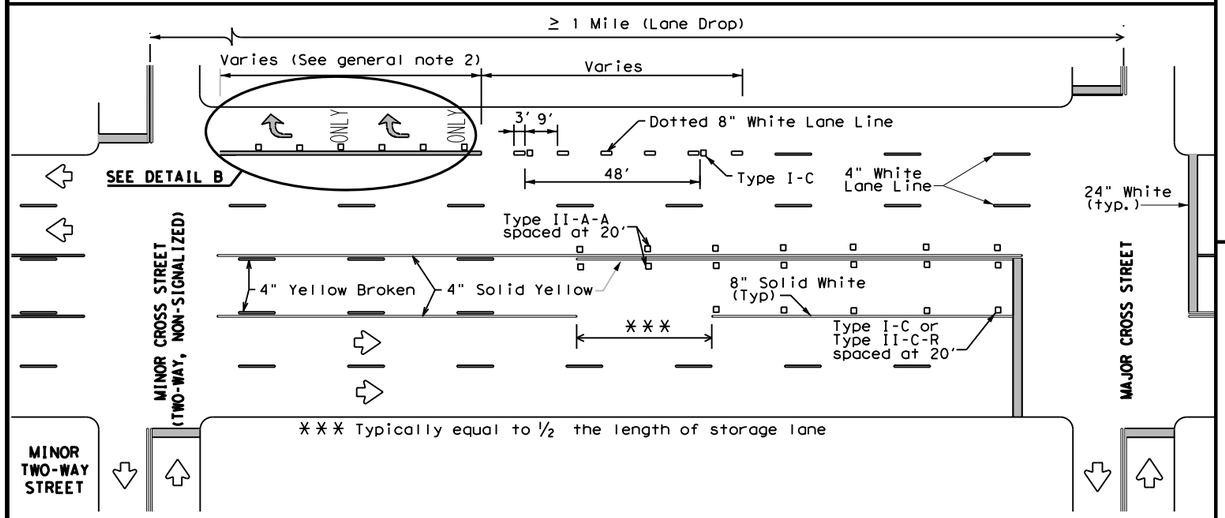
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn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

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

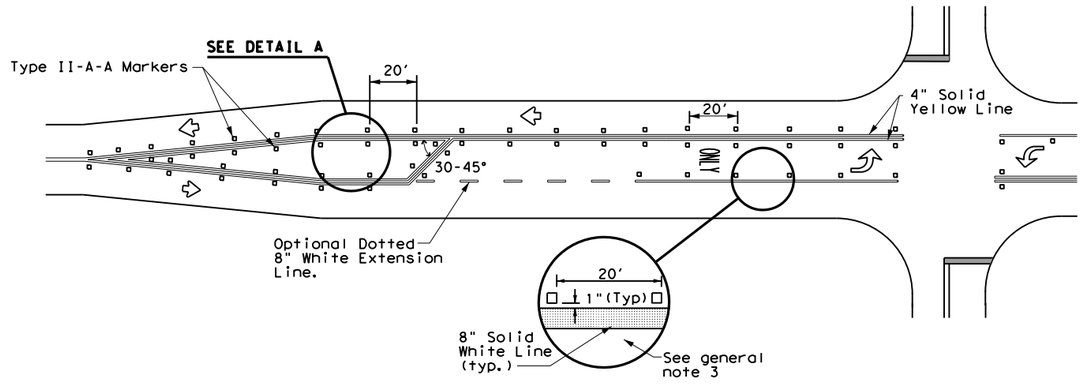
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



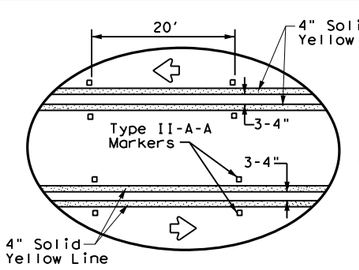
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



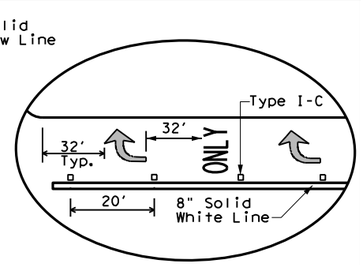
TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



DETAIL A



DETAIL B

Texas Department of Transportation

Traffic Safety Division Standard

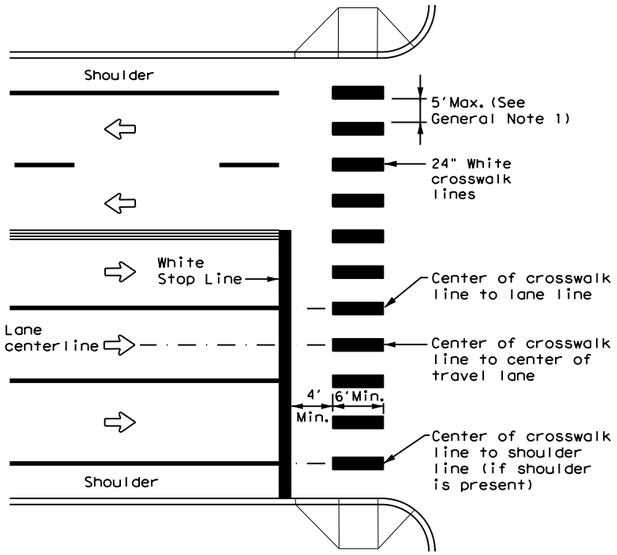
TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3)-20

FILE: pm3-20.dgn	DN:	CK:	DW:	CK:
© TxDOT April 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040, etc.	FM1423, etc.
5-00 2-10	DIST	COUNTY		SHEET NO.
8-00 2-12	PHR	HIDALGO, etc.		151
3-03 6-20				

220

DATE:
FILE:

DATE:
FILE:



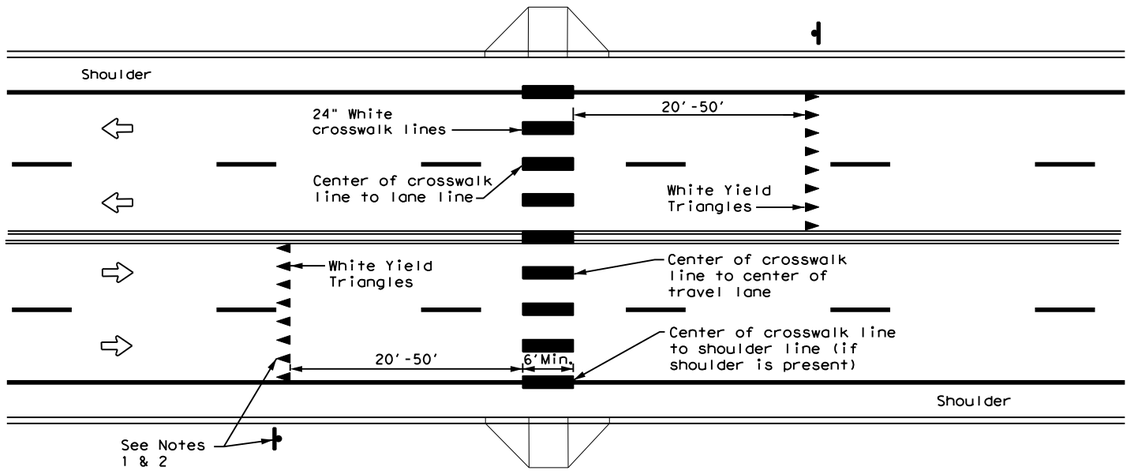
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

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/Yield Triangles and Crosswalk shall be approved by the Engineer in the field.

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

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



UNSIGNALIZED MID BLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

NOTES

1. Use yield triangles with "Yield Here to Pedestrians" signs at unsignalized mid block crosswalks.
2. Use stop bars with "Stop Here on Red" signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

Texas Department of Transportation

Traffic Safety Division Standard

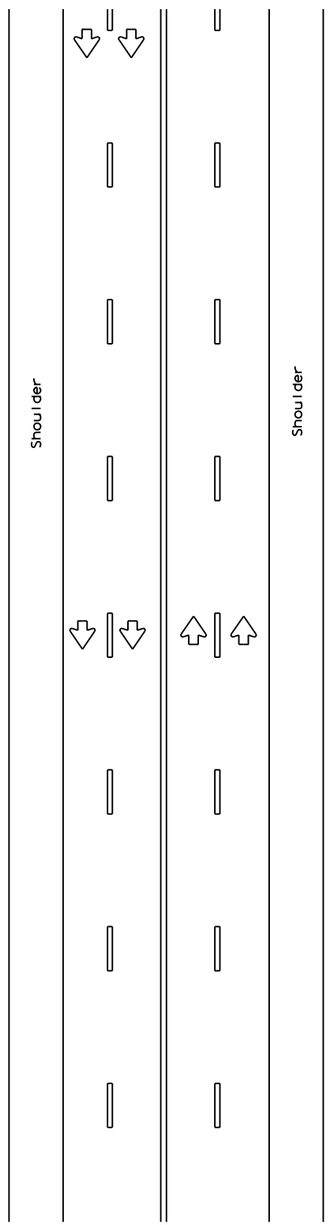
CROSSWALK PAVEMENT MARKINGS

PM(4)-20

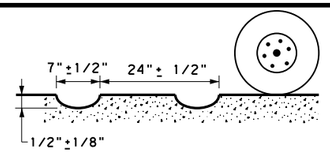
FILE: pm4-20.dgn	DN:	CK:	DW:	CK:
© TxDOT June 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040, etc.	FM1423, etc.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO, etc.		151-A

22D

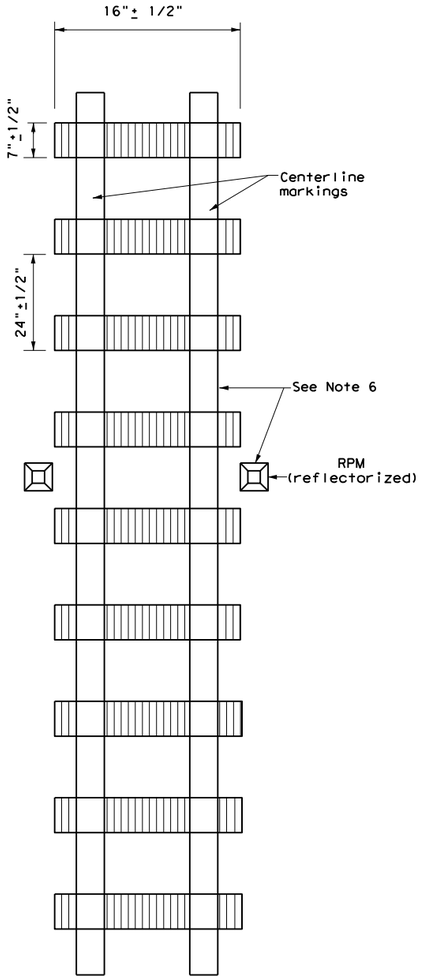
CENTERLINE RUMBLE STRIPS



MULTILANE UNDIVIDED HIGHWAY WITH SHOULDER

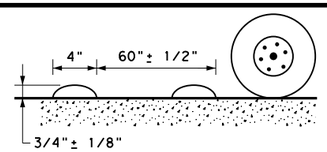


PROFILE VIEW

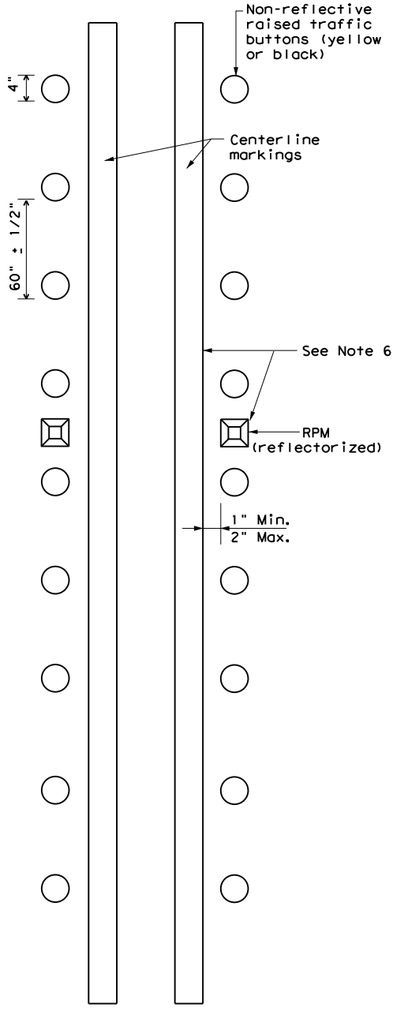


PLAN VIEW
OPTION 1

MILLED CENTERLINE RUMBLE STRIPS

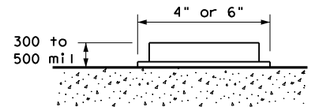


PROFILE VIEW

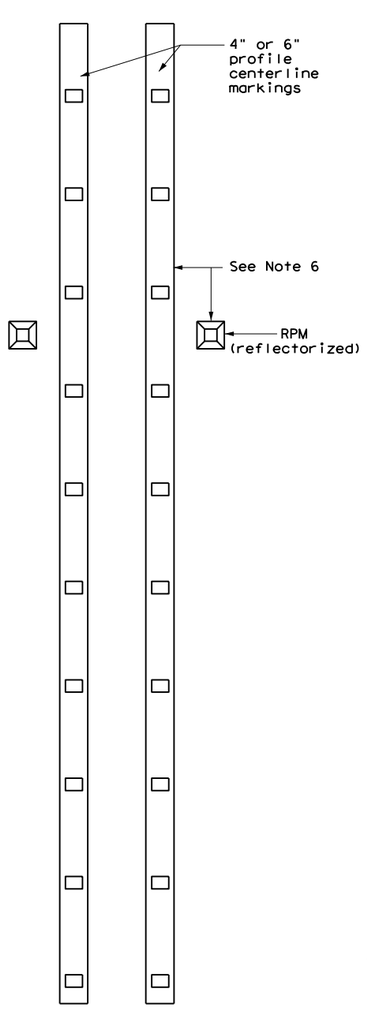


PLAN VIEW
OPTION 2

RAISED CENTERLINE RUMBLE STRIPS



PROFILE VIEW



PLAN VIEW
OPTION 3

PROFILE CENTERLINE MARKINGS

GENERAL NOTES

1. This standard sheet provides guidelines for installing centerline rumble strips on multilane undivided highways.
2. Centerline and edgeline rumble strips or profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
3. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
4. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Operations Division.
5. Breaks in milled centerline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossing, intersections and driveways with high usage of large trucks.
6. Use Standard Sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings and profile markings.
7. Consideration should be given to noise levels when centerline rumble strips are installed near residential areas, schools, churches, etc. A minimum of 3/8 inch depth of milled rumble strip may be considered in these areas.
8. Pavement markings must be applied over milled centerline rumble strips for normal centerline spacing. For wider medians, specify in the plans the exact placement of the rumble strips. Place the rumble strips under each centerline marking or centered in the middle of the median.

WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

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

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

11. See standard sheet RS(4).

DATE: 2/24/2020 3:43:30 PM
FILE: rs(2)-13.dgn

Texas Department of Transportation®
Traffic Operations Division Standard

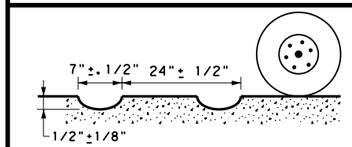
CENTERLINE RUMBLE STRIPS ON MULTILANE UNDIVIDED HIGHWAYS

RS(2)-13

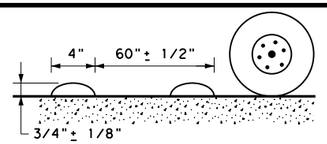
FILE: rs(2)-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040,etc.	FM1423,etc.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO,etc.		152

DATE: 2/24/2020 3:43:37 PM
FILE: rs(3)-13.dgn

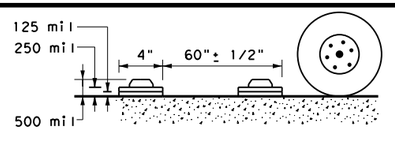
CENTERLINE RUMBLE STRIPS



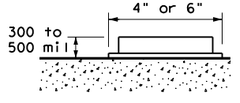
MILLED RUMBLE STRIPS



RAISED TRAFFIC BUTTONS

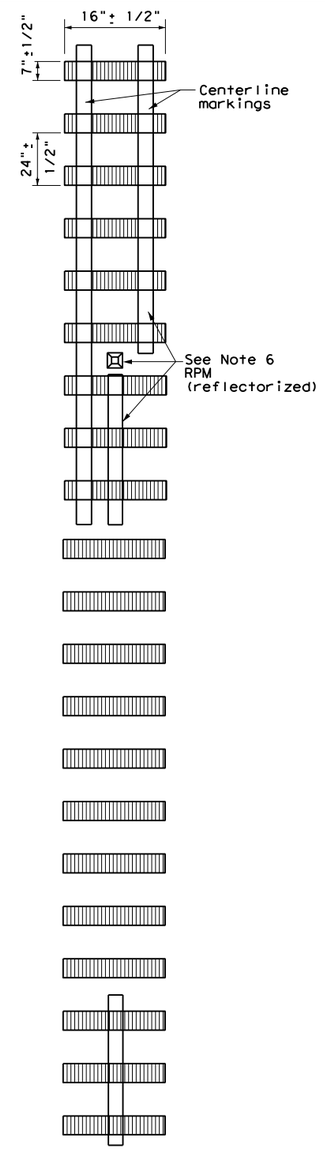


PREFORMED THERMOPLASTIC STRIPS



PROFILE MARKINGS

PROFILE VIEW

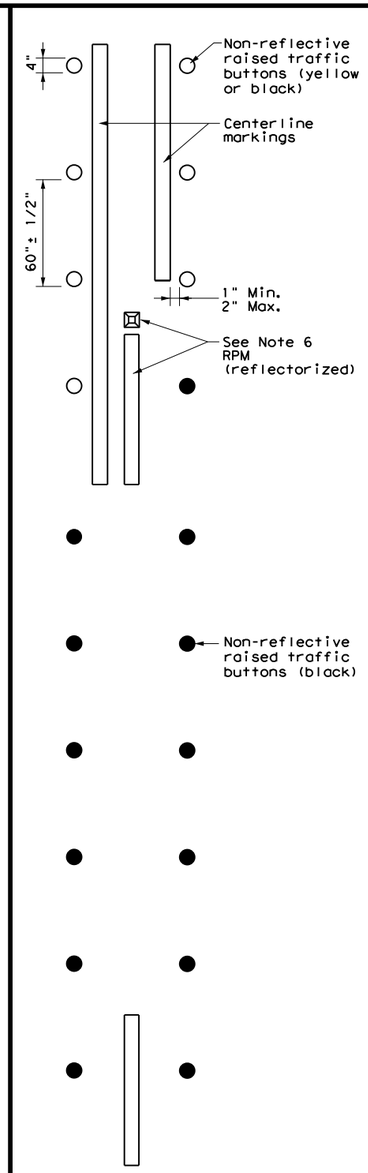


PLAN VIEW
OPTION 1

TWO LANE TWO-WAY ROADWAYS

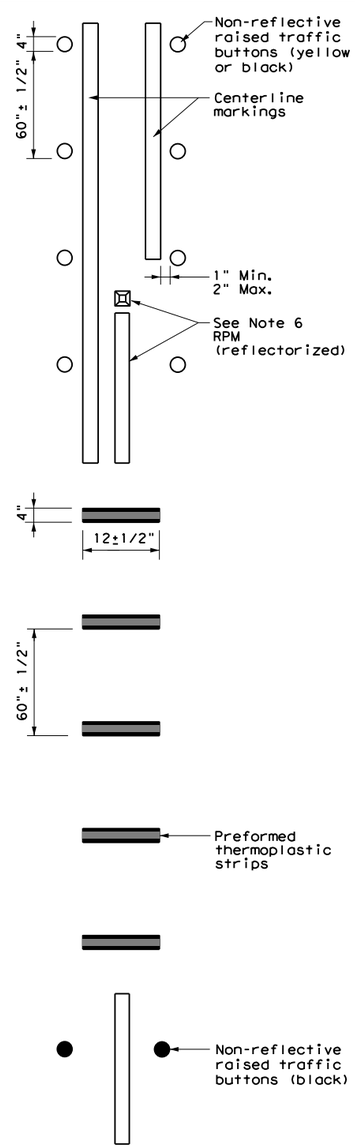
PLAN VIEW
OPTION 1

MILLED CENTERLINE RUMBLE STRIPS



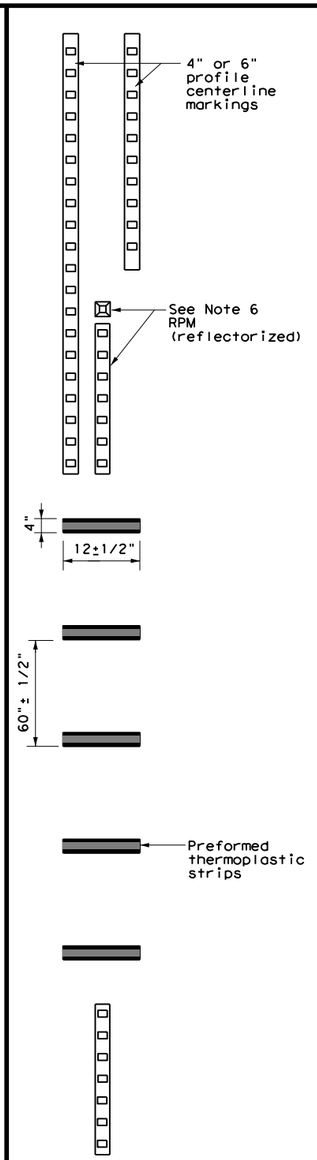
PLAN VIEW
OPTION 2

RAISED CENTERLINE RUMBLE STRIPS



PLAN VIEW
OPTION 3

RAISED CENTERLINE RUMBLE STRIPS AND PREFORMED THERMOPLASTIC STRIPS



PLAN VIEW
OPTION 4

PROFILE CENTERLINE MARKINGS AND PREFORMED THERMOPLASTIC STRIPS

GENERAL NOTES

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

WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

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

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

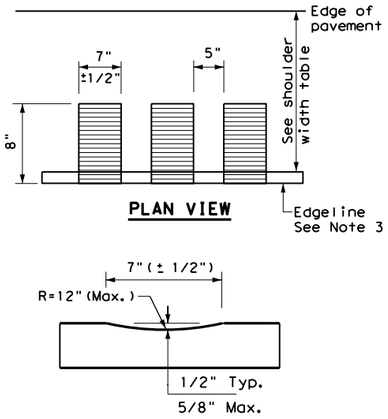
12. See standard sheet RS(4).

Texas Department of Transportation®
Traffic Operations Division Standard

CENTERLINE RUMBLE STRIPS ON TWO LANE TWO-WAY HIGHWAYS

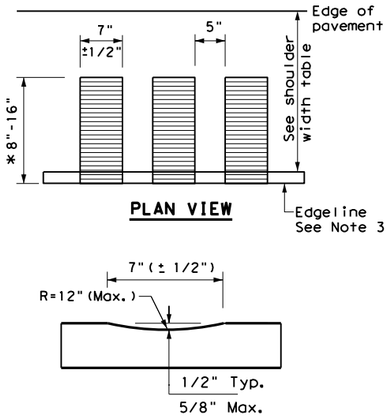
RS(3)-13

FILE: rs(3)-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040, etc.	FM1423, etc.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO, etc.		153



OPTION 1

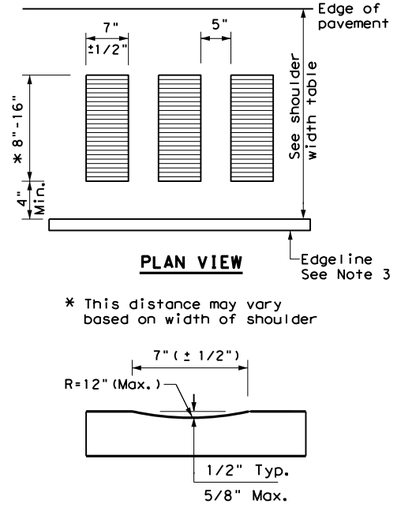
CONTINUOUS MILLED DEPRESSIONS
(Rumble Stripes)



* This distance may vary based on width of shoulder

OPTION 2

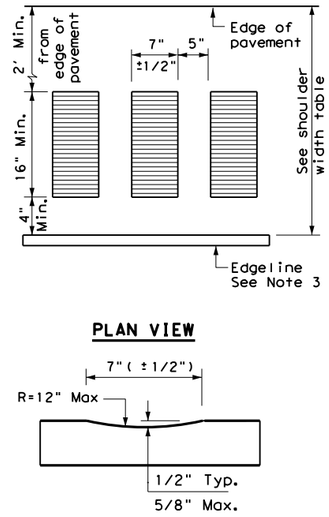
CONTINUOUS MILLED DEPRESSIONS
(Rumble Stripes)



* This distance may vary based on width of shoulder

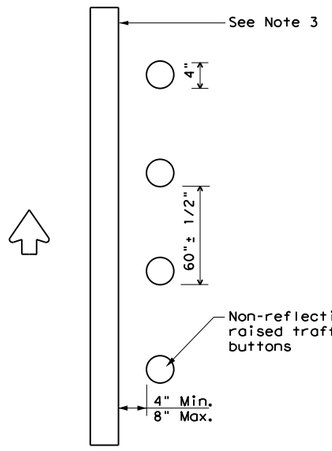
OPTION 3

CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)



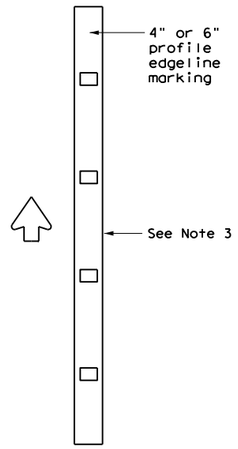
OPTION 4

CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)



OPTION 5

RAISED EDGELINE RUMBLE STRIPS



OPTION 6

PROFILE EDGELINE MARKINGS

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

GENERAL NOTES

1. Rumble strips and profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
2. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
3. Use Standard Sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings, and profile markings.
4. See the table below for determining what options may be used for edgeline rumble strips.

WHEN INSTALLING MILLED DEPRESSION EDGELINE RUMBLE STRIPS:

5. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Operations Division.
6. Pavement markings can be applied over milled shoulder rumble strips to create an edgeline rumble stripe.
7. Breaks in edgeline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections and driveways with high usage of large trucks when installed on conventional highways.
8. Rumble strips shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
9. Consideration should be given to noise levels when edgeline rumble strips are installed near residential areas, schools, churches, etc. A minimum of 3/8 inches depth of milled rumble strip may be considered in these areas.
10. On roadways with high bicycle activity, consideration should be given before the installation of edgeline rumble strips. Things to consider include size of rumble strips, rumble strip material and location of rumble strips on the shoulder. If the designer determines that gaps are needed in the rumble strips due to bicycle use of the road, then follow the requirement shown in FHWA Technical Advisory T5040.39, or latest version. A detail of the spacing shall be included in the plans.

WHEN INSTALLING RAISED OR PROFILE EDGELINE RUMBLE STRIPS:

11. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per the manufacturer's recommendations.
12. Non-reflective traffic buttons shall be placed adjacent to the pavement marking delineating the edgeline when used as a rumble strip. The color of the button should match the color of the adjacent edgeline marking (white or yellow). The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
13. Non-reflective traffic buttons shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
14. Breaks in edgeline rumble strips using raised traffic buttons shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossing, intersections and driveways with high usage of large trucks when installed on conventional highways.
15. The minimum distance between the edgeline and the buttons should be used if the shoulder is less than 8 feet in width.
16. Raised profile thermoplastic markings used as edgelines may substitute for buttons.

Texas Department of Transportation

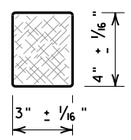
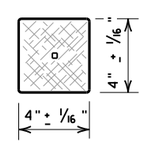
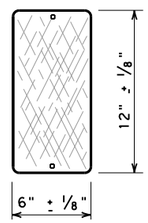
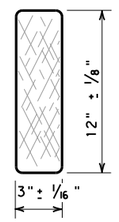
Traffic Operations Division Standard

EDGELINE RUMBLE STRIPS ON UNDIVIDED OR TWO LANE HIGHWAYS RS(4)-13

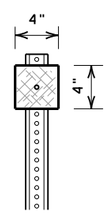
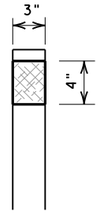
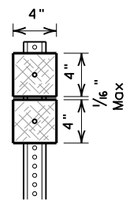
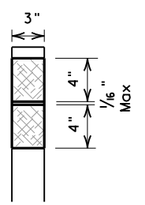
FILE: rs(4)-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040, etc.	FM1423, etc.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO, etc.		154

DATE: 2/24/2020 3:43:44 PM
FILE: rs(4)-13.dgn

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

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

DELINEATORS

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

D & OM DESCRIPTIVE CODES

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

NUMBER OF REFLECTORS
S = Single
D = Double

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

REFLECTOR UNIT SIZE
1 or 2

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

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

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

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

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

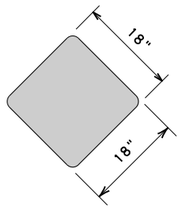
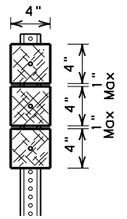
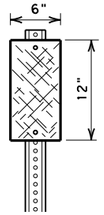
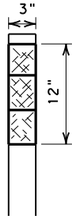
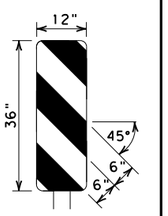
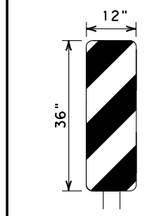
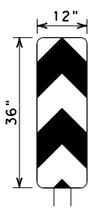
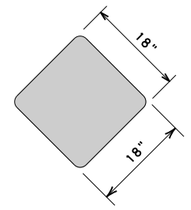
NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

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

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

DIRECTION
If Required
BI = Bi-Directional

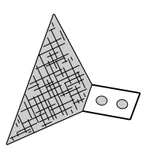
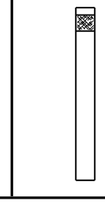
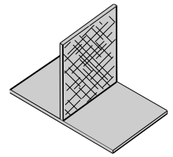
OBJECT MARKERS

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

DEPARTMENTAL MATERIAL SPECIFICATIONS

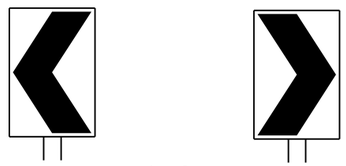
FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

BARRIER REFLECTORS (BRF)

	GF1	GF2	CTB
DEVICE			
	1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.		
SHEETING	Yellow, White, Red		
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.		

CHEVRONS

DEVICE

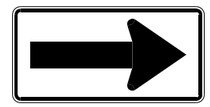


SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)
MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only	

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



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

NOTE:

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040,etc.	FM1423,etc.
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	PHR	HIDALGO,etc.		155

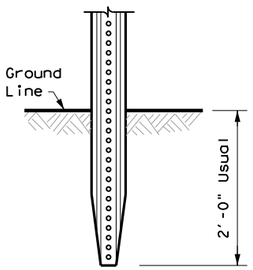
20A

DATE:
FILE:

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

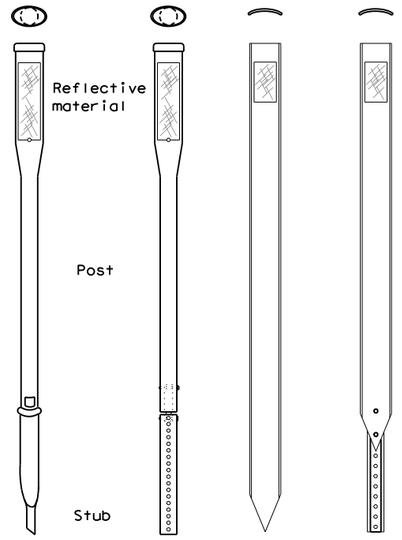


NOTES

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

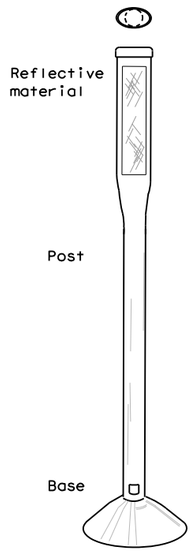
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



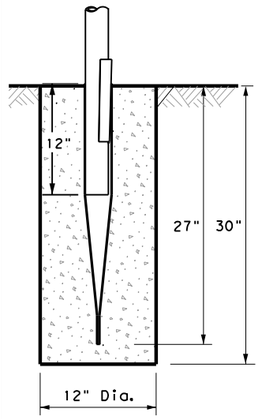
SURFACE MOUNT

NOTES

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

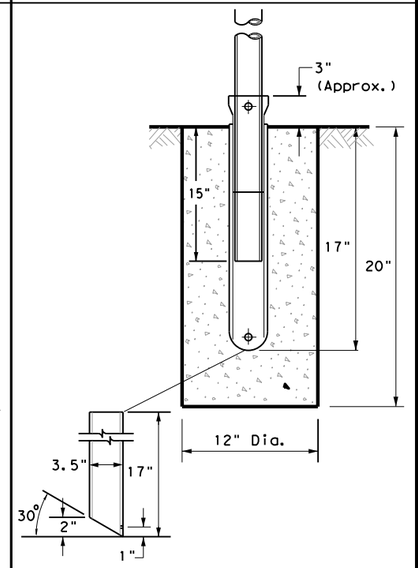
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

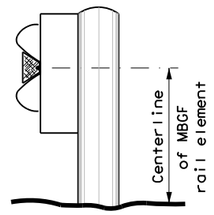
NOTE

1. Install per manufacturer's recommendations.

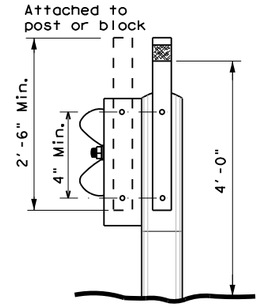
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

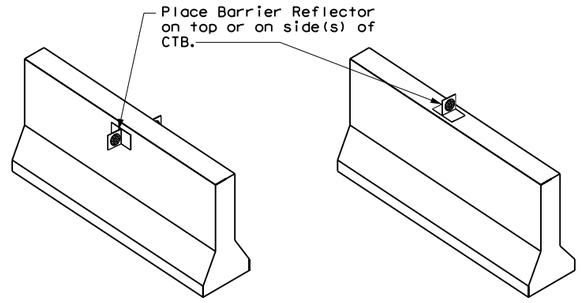
GF1



GF2



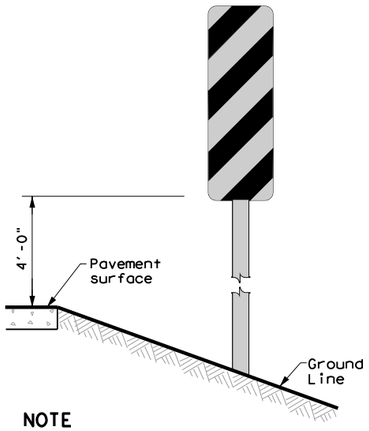
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

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

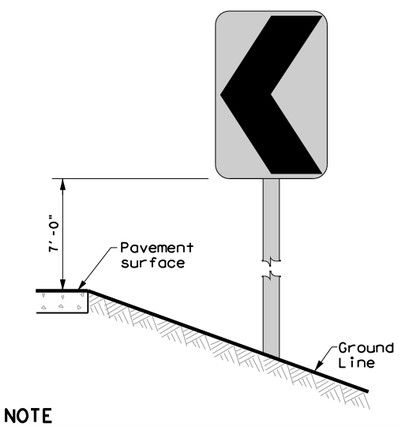
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

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

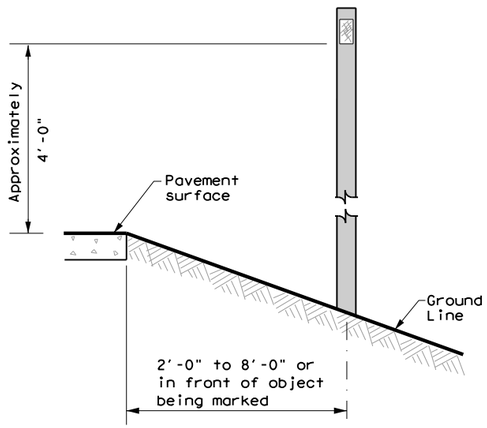
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

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

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation — Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

FILE: dom2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040, etc.	FM1423, etc.
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	PHR	HIDALGO, etc.		156

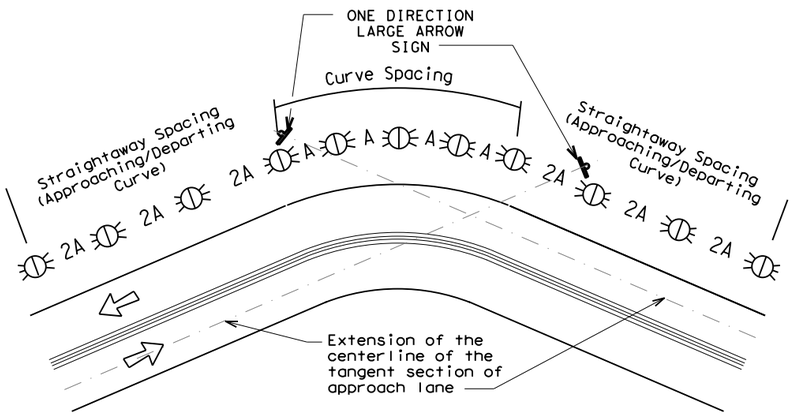
20B

DATE:
FILE:

MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

Amount by which Advisory Speed is less than Posted Speed	Curve Advisory Speed	
	Turn (30 MPH or less)	Curve (35 MPH or more)
5 MPH & 10 MPH	• RPMs	• RPMs
15 MPH & 20 MPH	• RPMs and One Direction Large Arrow sign	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons.
25 MPH & more	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons	• RPMs and Chevrons

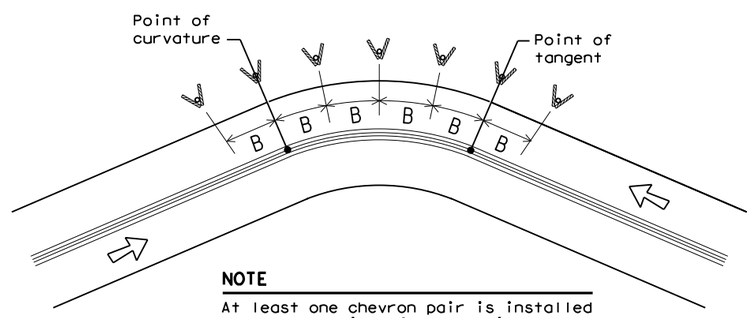
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



NOTE

ONE DIRECTION LARGE ARROW (W1-6) sign should be located at approximately and perpendicular to the extension of the centerline of the tangent section of approach lane.

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



NOTE

At least one chevron pair is installed beyond the point of tangent in tangent section.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN

Degree of Curve	FEET			
	Radius of Curve	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
		A	2A	B
1	5730	225	450	—
2	2865	160	320	—
3	1910	130	260	200
4	1433	110	220	160
5	1146	100	200	160
6	955	90	180	160
7	819	85	170	160
8	716	75	150	160
9	637	75	150	120
10	573	70	140	120
11	521	65	130	120
12	478	60	120	120
13	441	60	120	120
14	409	55	110	80
15	382	55	110	80
16	358	55	110	80
19	302	50	100	80
23	249	40	80	80
29	198	35	70	40
38	151	30	60	40
57	101	20	40	40

Curve delineator approach and departure spacing should include 3 delineators spaced at 2A. This spacing should be used during design preparation or when the degree of curve is known.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS NOT KNOWN

Advisory Speed (MPH)	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
	A	2xA	B
65	130	260	200
60	110	220	160
55	100	200	160
50	85	170	160
45	75	150	120
40	70	140	120
35	60	120	120
30	55	110	80
25	50	100	80
20	40	80	80
15	35	70	40

If the degree of curve is not known, delineator spacing may be determined based on the Advisory Speed of the curve. Use the delineator curve spacing for each Advisory Speed (MPH).

DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

CONDITION	REQUIRED TREATMENT	MINIMUM SPACING
Frwy./Exp. Tangent	RPMs	See PM-series and FPM-series standard sheets
Frwy./Exp. Curve	Single delineators on right side	See delineator spacing table
Frwy/Exp.Ramp	Single delineators on at least one side of ramp (should be on outside of curves) (see Detail 3 on D&OM(4))	100 feet on ramp tangents Use delineator spacing table for ramp curves ("straightway spacing" does not apply to ramp curves)
Acceleration/Deceleration Lane	Double delineators (see Detail 3 on D&OM(4))	100 feet (See Detail 3 on D & OM (4))
Truck Escape Ramp	Single red delineators on both sides	50 feet
Bridge Rail (steel or concrete)and Metal Beam Guard Fence	Bi-Directional Delineators when undivided with one lane each direction Single Delineators when multiple lanes each direction	Equal spacing (100'max) but not less than 3 delineators
Concrete Traffic Barrier (CTB) or Steel Traffic Barrier	Barrier reflectors matching the color of the edge line	Equal spacing 100' max
Cable Barrier	Reflectors matching the color of the edge line	Every 5th cable barrier post (up to 100'max)
Guard Rail Terminus/Impact Head	Divided highway - Object marker on approach end Undivided 2-lane highways - Object marker on approach and departure end	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5) and D & OM (6)
Bridges with no Approach Rail	Type 3 Object Marker (OM-3) at end of rail and 3 single delineators approaching rail	See D & OM(5)
Reduced Width Approaches to Bridge Rail	Type 2 and Type 3 Object Markers (OM-3) and 3 single delineators approaching bridge	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5)
Culverts without MBGF	Type 2 Object Markers	See Detail 2 on D & OM(4)
Crossovers	Double yellow delineators and RPMs	See Detail 1 on D & OM (4)
Pavement Narrowing (lane merge) on Freeways/Expressway	Single delineators adjacent to affected lane for full length of transition	100 feet

NOTES

1. Unless indicated otherwise, the delineator or barrier reflector color shall conform to the color of the pavement edge line on the side of the road where the delineators or barrier reflectors are placed.
2. Barrier reflectors may be used to replace required delineators.
3. Single red delineators may be mounted on the back side of delineator posts for wrong way driver applications

LEGEND

	Bi-directional Delineator
	Delineator
	Sign

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

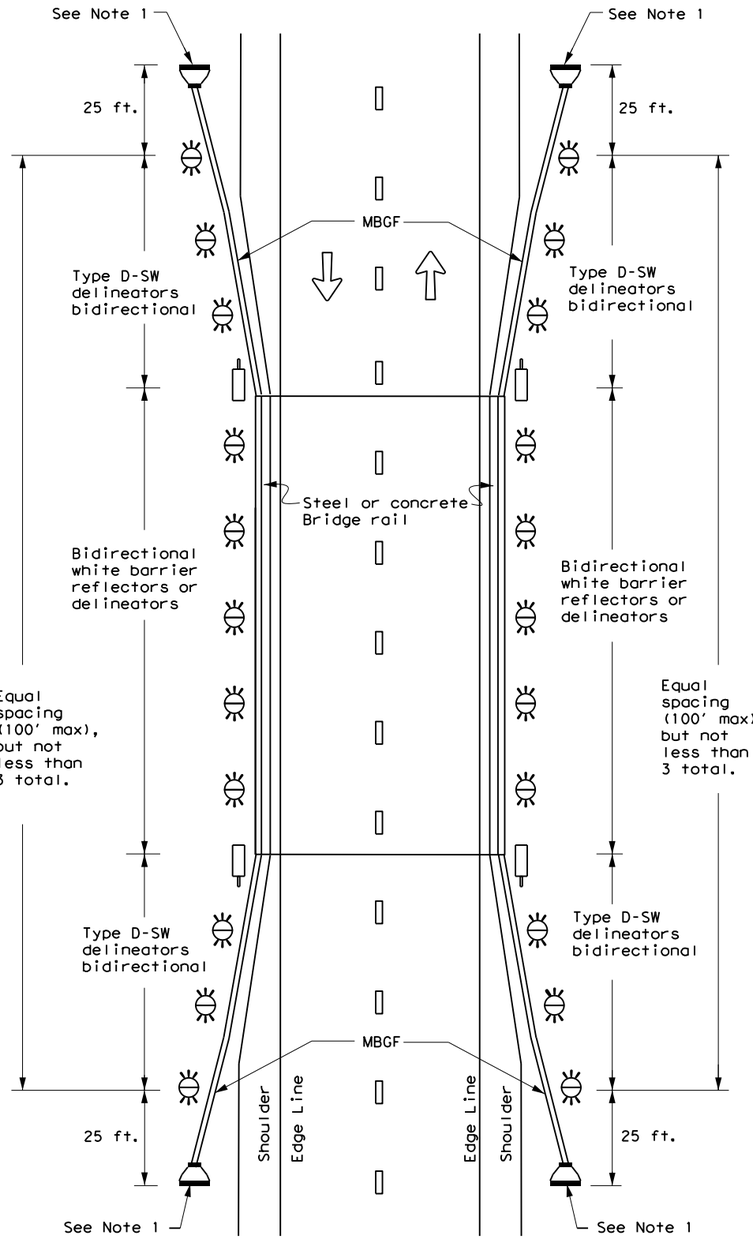
D & OM(3)-20

FILE: dom3-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040, etc.	FM1423, etc.
3-15 8-15	DIST	COUNTY		SHEET NO.
8-15 7-20	PHR	HIDALGO, etc.		157

DATE:
FILE:

20C

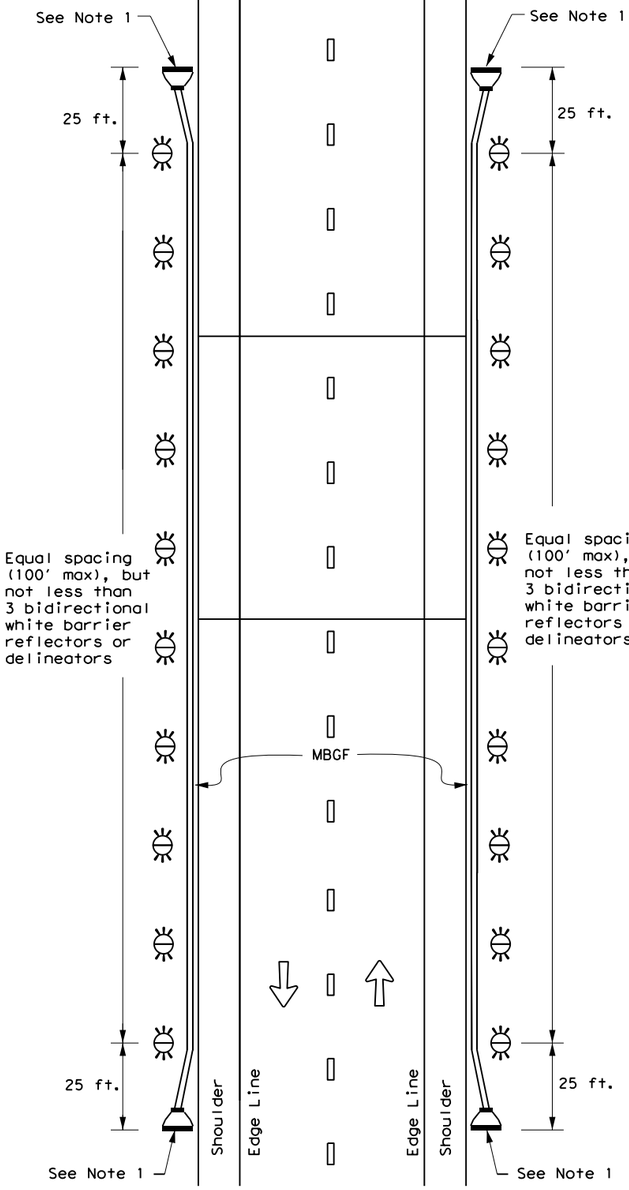
TWO-WAY, TWO LANE ROADWAY WITH REDUCED WIDTH APPROACH RAIL



NOTE:

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

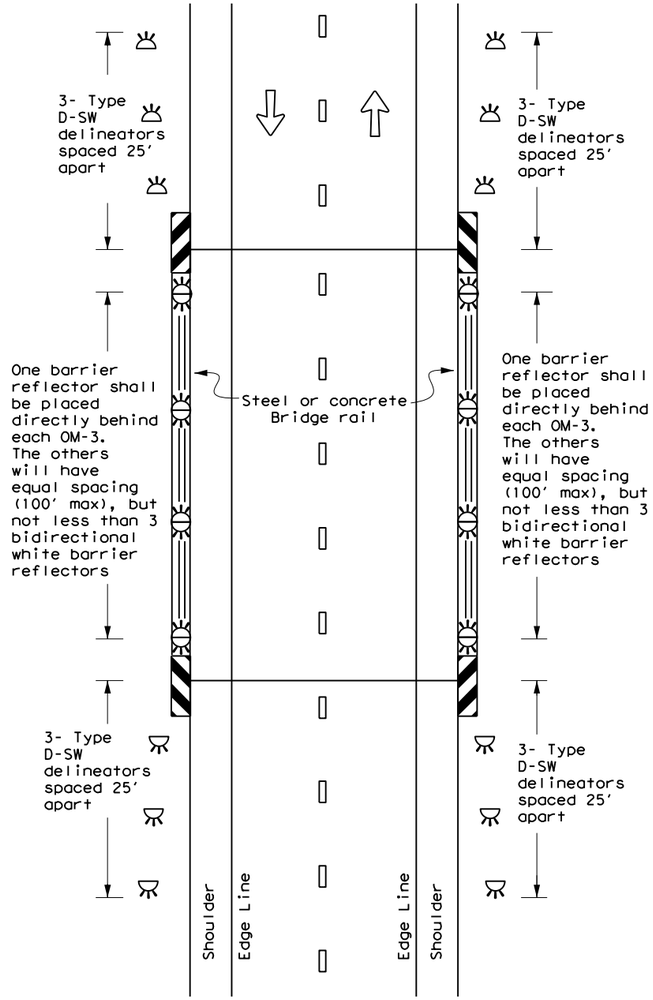
TWO-WAY, TWO LANE ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



NOTE:

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

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



LEGEND

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(5)-20

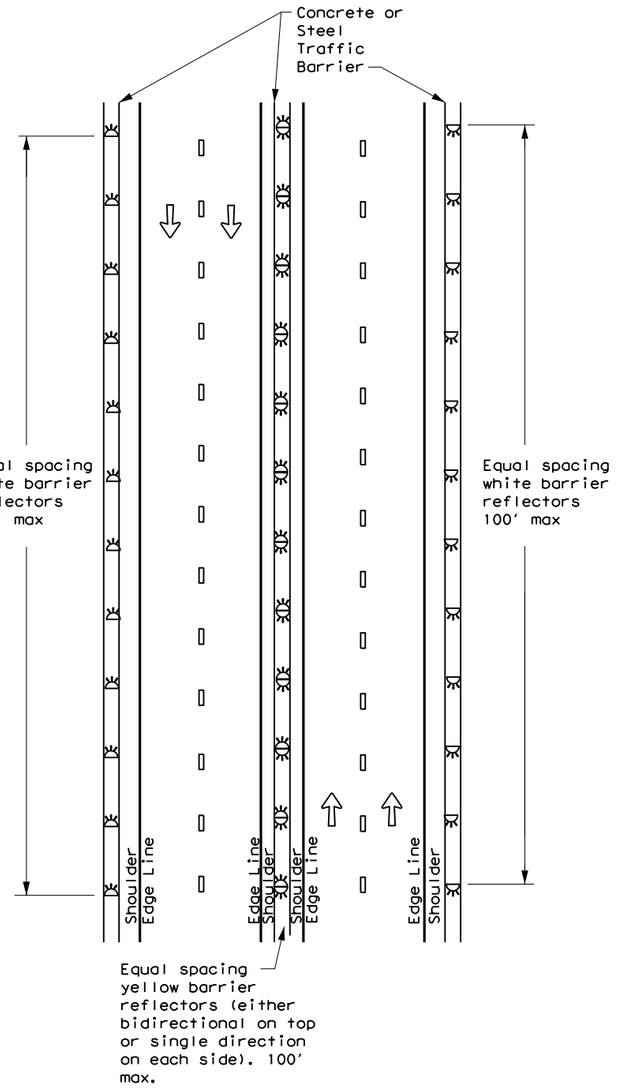
FILE: dom5-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040, etc.	FM1423, etc.
7-20	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO, etc.		158

20E

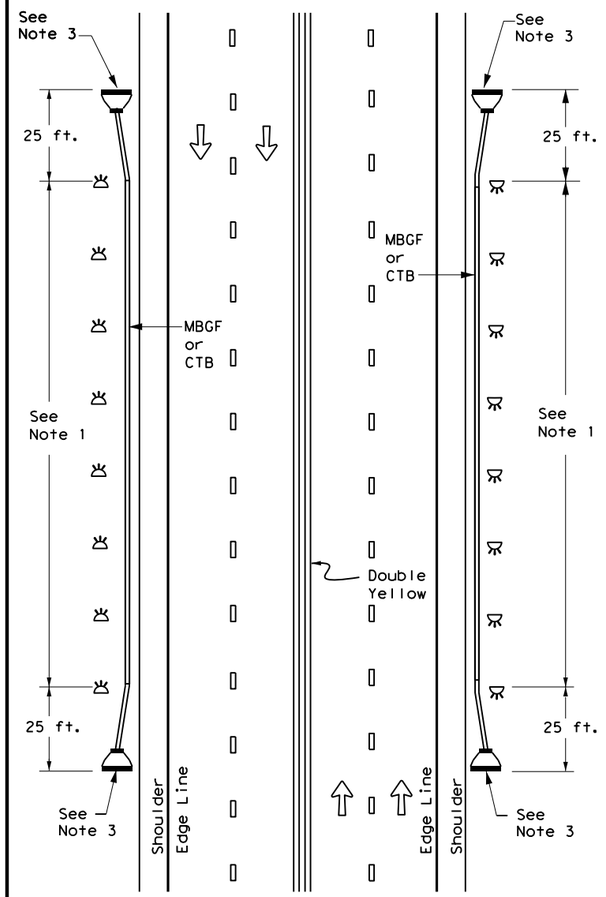
DATE:
FILE:

DATE:
FILE:

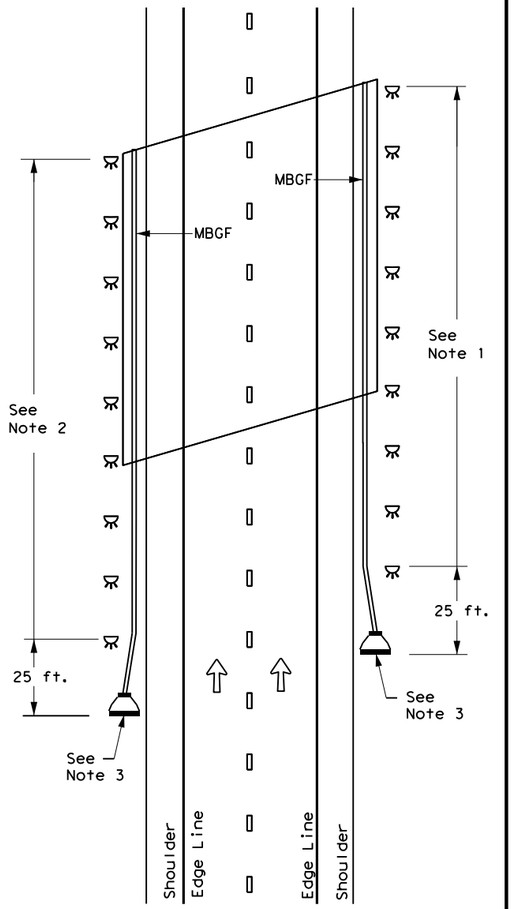
CONTINUOUS CONCRETE OR STEEL BARRIER



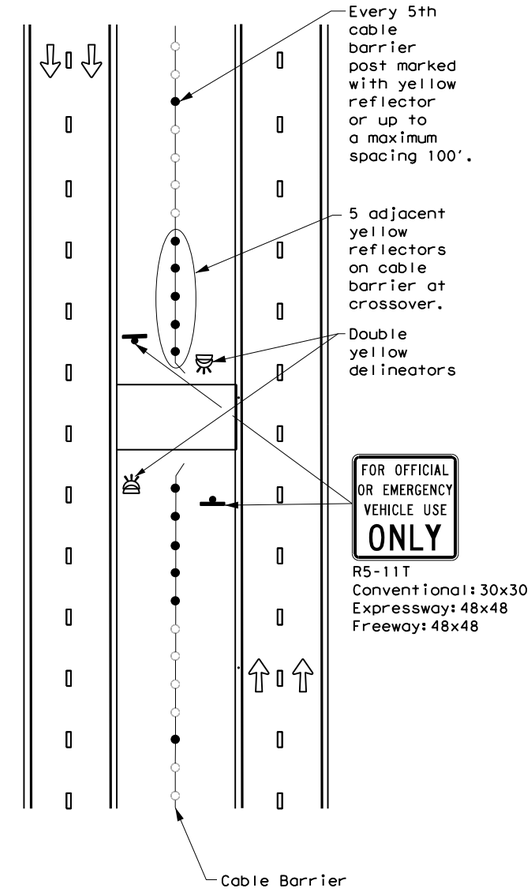
MULTI-LANE UNDIVIDED, TWO-WAY ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



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

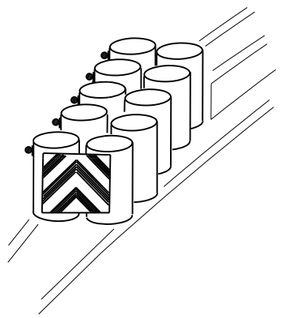
Traffic Safety Division Standard

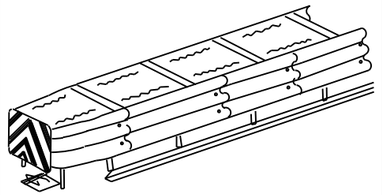
DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

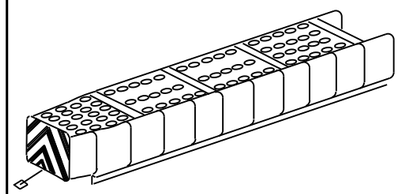
D & OM(6)-20

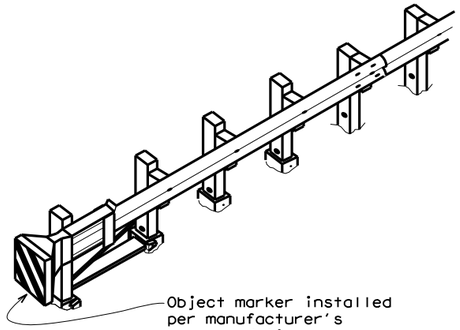
FILE: dom6-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	142701		040, etc.	FM1423, etc.
7-20	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO, etc.		159

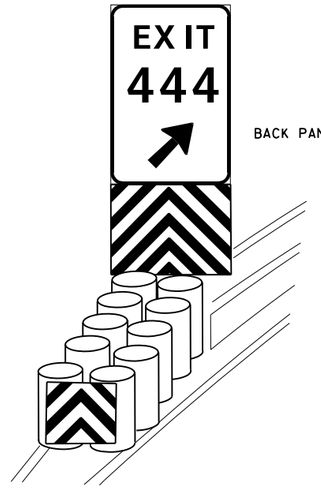
20F

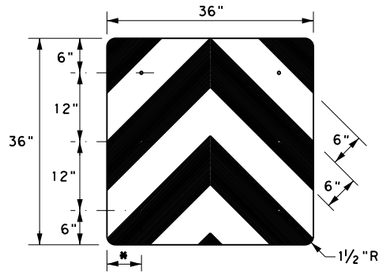


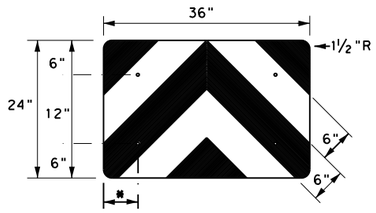




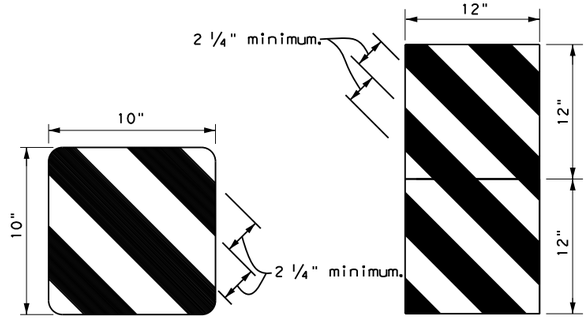




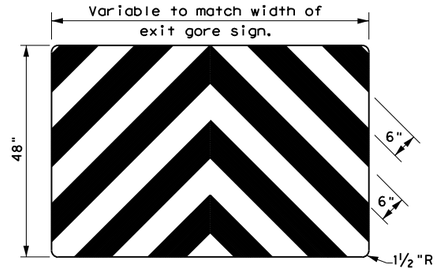


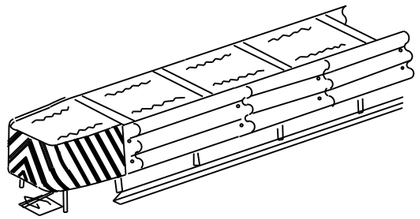


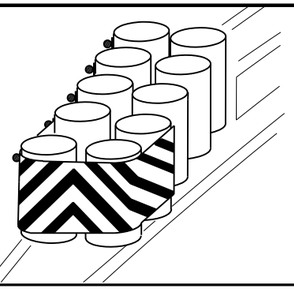
* Adjust to fit attenuator per manufacturer's recommendation, or as directed by the Engineer

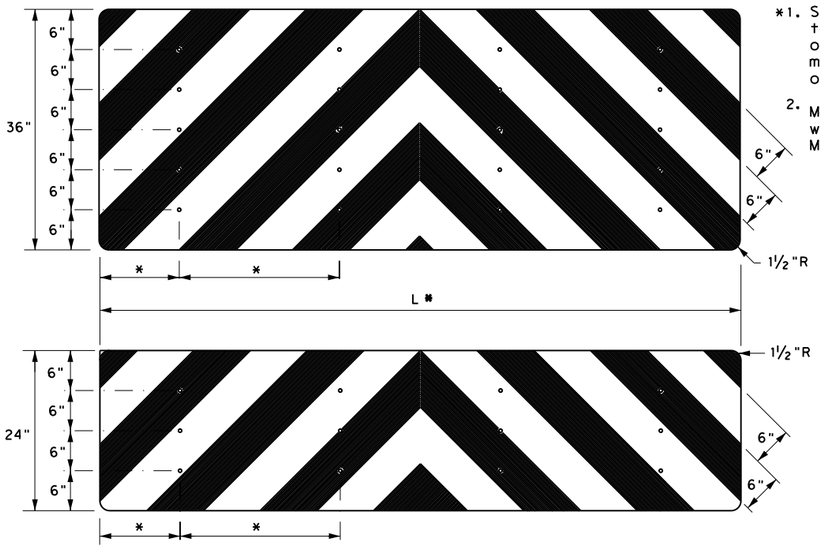


OBJECT MARKERS SMALLER THAN 3 FT^2









NOTES

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

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

NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

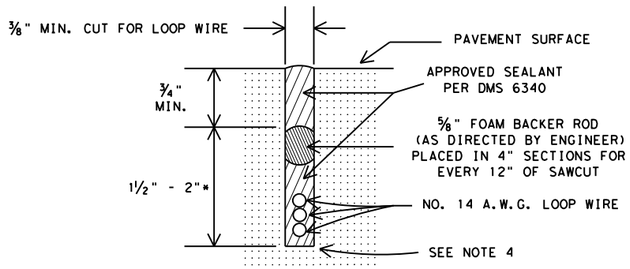
DELINEATOR & OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS

D & OM(VIA)-20

FILE: domvia20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT December 1989	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040, etc.	FM1423, etc.
4-92 8-04	DIST	COUNTY		SHEET NO.
8-95 3-15	PHR	HIDALGO, etc.		159-A
4-98 7-20				

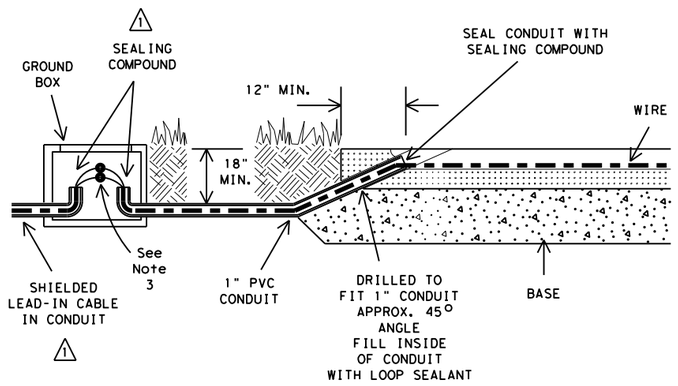
20G

DATE: 12/17/2020 10:26:06 AM
FILE: DOCUMENT2ONLINE

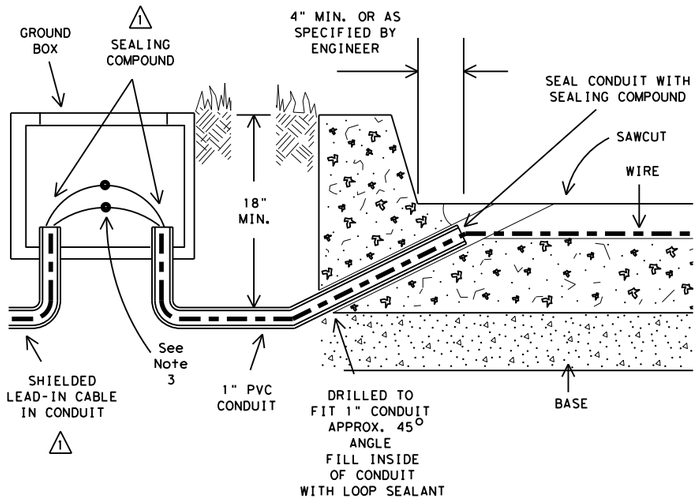


LOOP SAW CUT CROSS-SECTION

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



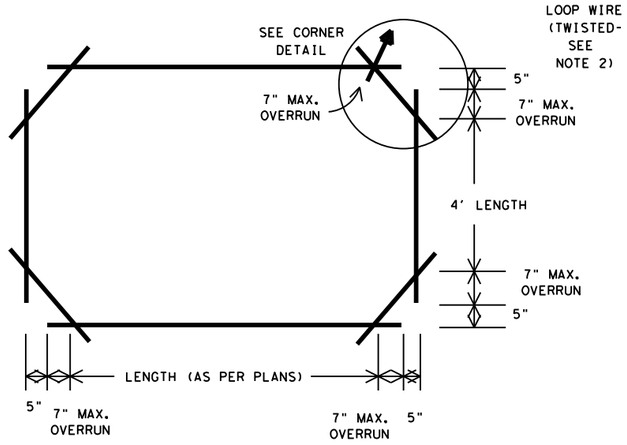
TYPICAL LEAD IN CONFIGURATION (WITHOUT CURBING)



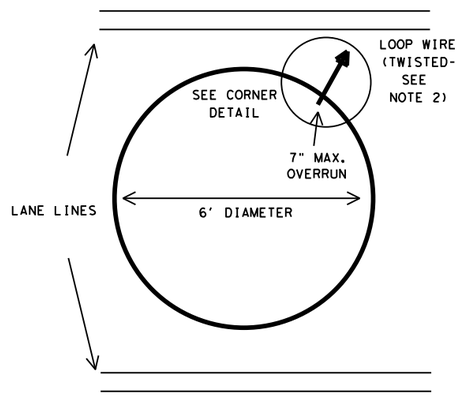
TYPICAL LEAD IN CONFIGURATION (WITH CURBING)

TYPICAL LOOP DETECTOR LAYOUTS

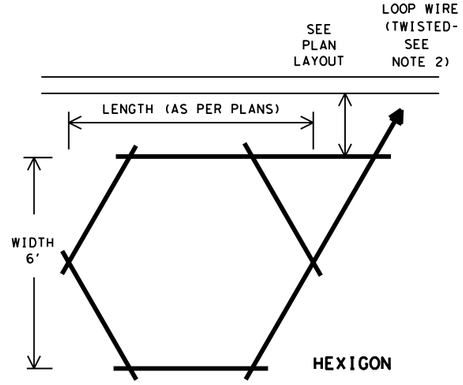
(AS SPECIFIED IN PLANS)



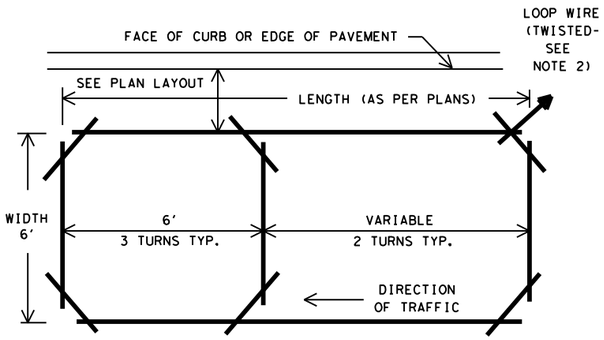
RECTANGULAR



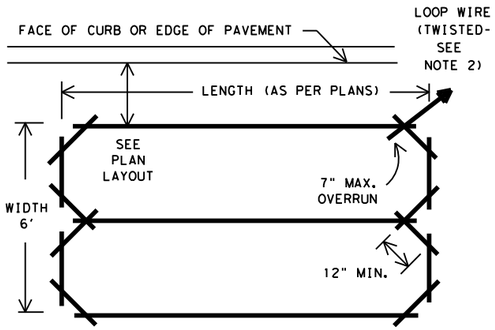
CIRCULAR



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.

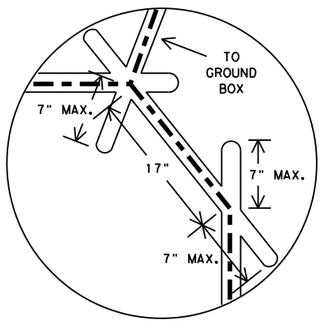
Recommended Number of Turns for Loop Detectors

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.

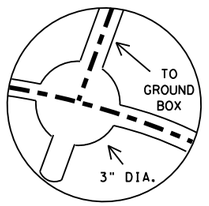
For additionnal information refer to "Texas Traffic Signal Detector" manual, TTI Report 1163-1.

TYPICAL CORNER DETAILS

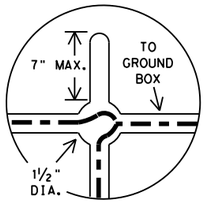


RECTANGULAR & HEXIGON LOOP
SAWCUT CORNER DETAIL

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

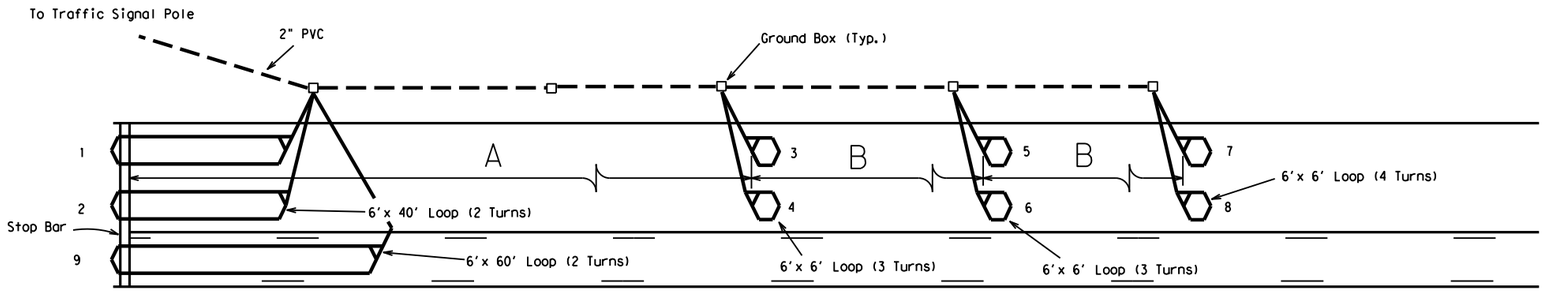
LOOP DETECTOR INSTALLATION DETAILS

LD(1)-03

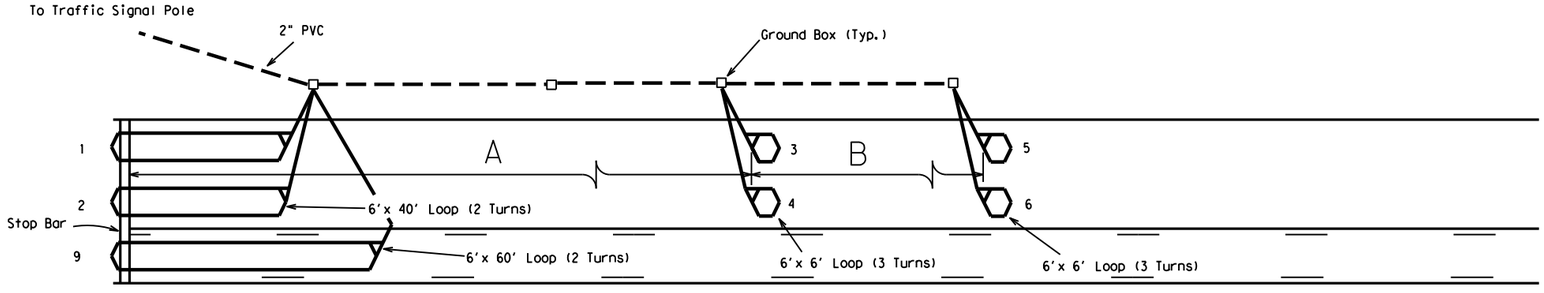
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		160

REVISIONS
2-99
1-03

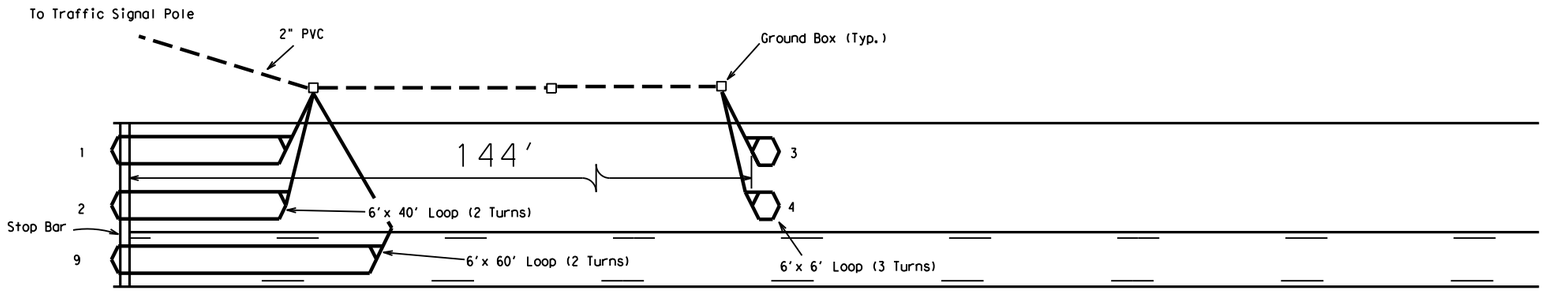
DATE: 2/24/2020 3:44:32 PM
FILE: ld-03.dgn



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:

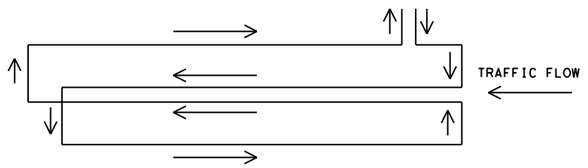
Loops 1 and 2 shall be connected to the controller cabinet by means of the same loop lead-in (2/C #14 AWG).

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

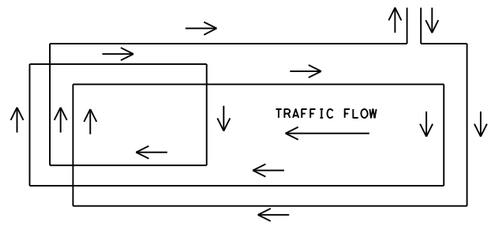
Loops 7 and 8 shall be connected to the controller cabinet by means of the same loop lead-in (2/C #14 AWG).

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

Texas Department of Transportation
Traffic Operations Division

LOOP DETECTOR PLACEMENT DETAILS

LD(2)-03

REVISIONS

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

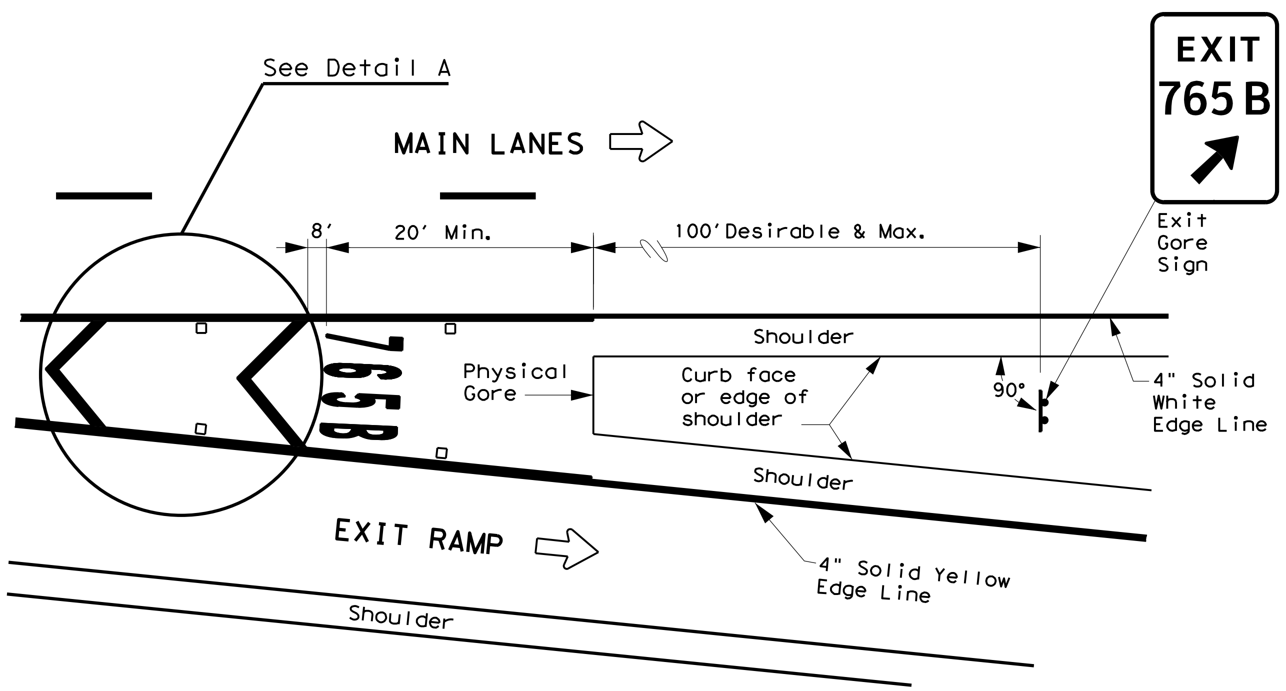
CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		161

DATE: 2/24/2020 3:44:33 PM
FILE: ld-03.dgn

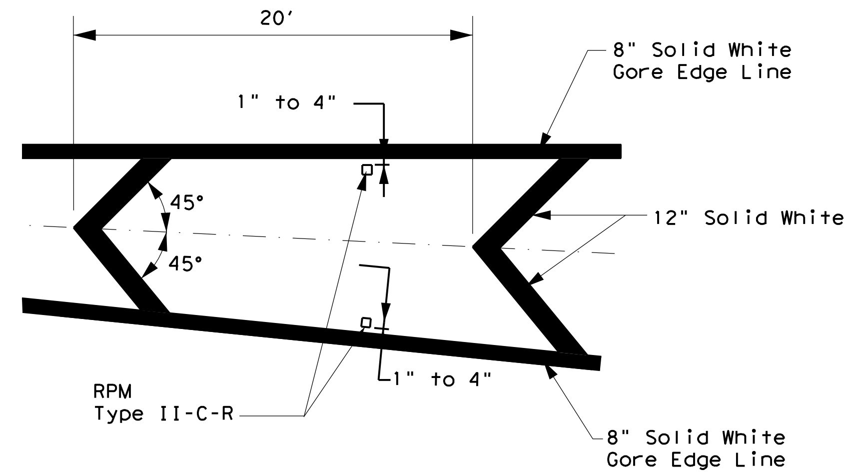
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

EXIT NUMBER PAVEMENT MARKING NOTES

1. Minimum 8 foot white markings should be used, unless otherwise noted.
2. Spacing between letters and numbers should be approximately 4 inches.
3. Pavement markings are to be located as specified elsewhere in the plans.
4. All pavement marking materials shall meet the required Departmental Material Specifications or as specified in these plans.
5. Numbers and Letters details can be found in the Standard Highway Design for Texas (SHSD) Chapter 12 at http://www.txdot.gov



MARKINGS WITH EXIT NUMBER



NOTES

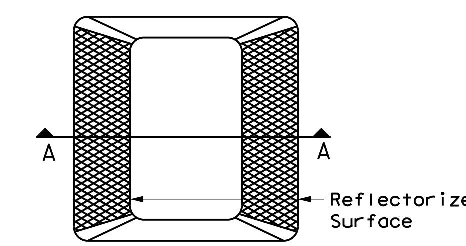
1. Raised pavement markers shall be centered between chevron or gore lines.
2. For more information, see Reflectorized Raised Pavement Marker Detail.

DETAIL A

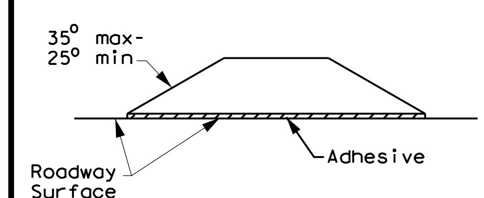
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

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

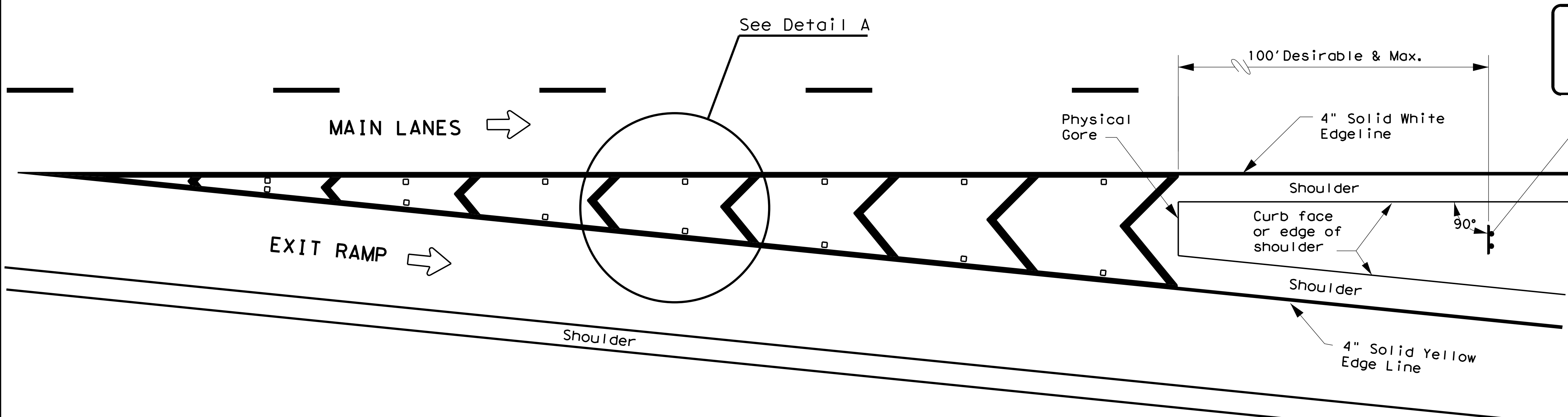


Type II (Top View)



SECTION A

REFLECTORIZED RAISED PAVEMENT MARKER (RPM)



MARKINGS WITHOUT EXIT NUMBER

Texas Department of Transportation

Traffic Safety Division Standard

EXIT GORE PAVEMENT MARKINGS

FPM(5)-19

FILE: fpm(5)-19.dgn	DN:	CK:	DW:	CK:
© TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040, etc.	FM1423, etc.
	DIST		COUNTY	SHEET NO.
	PHR		HIDALGO, etc.	162

23F

N

Donna Main Canal

IH-2

BEGIN PROJECT
STA. 10+00

Valverde Rd

Casa Feliz

Casa Del Gato

Casa Bonita

Casa Del Sol

Pine St

Birch St

Elm St

Maple St

Oak St

Mesquite St

Date Palm Dr

Washingtonia Sq

Palm Shadows Blvd

Dogwood St

Redwood St

Cottonwood St

Boxwood St

Fm 1423

RIO VALLEY SWITCHING CO.

SEE DETAIL "A"

END PROJECT
STA. 50+66

Lee St

83

83

DETAIL "A"

FM 1423
RR NAME: RIO VALLEY SWITCHING Co.
DOT#: 435 676L
RR MP: 24.08
TRAINS PER DAY: 4
SWITCHING MOVES: 1
RR SUBDIVISION: MISSION

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

Texas Department of Transportation

FM 1423
LOCATION 1
RAILROAD CROSSING
LOCATION MAP

SCALE: 1" = 0.5 MILES SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		163

DS: CK:
DW: CK:

DATE: 2/25/2020 9:49:26 AM
FILE: 01LOCATION MAP_RAILROAD.dgn

DATE:
FILE:

I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

DOT #: 435 676L
Crossing Type: PUBLIC AT GRADE
RR Company Owning Track at Crossing: UNION PACIFIC RAILROAD CO.
Operating RR Company at Track: RIO VALLEY SWITCHING CO.
RR MP: 24.08
RR Subdivision: MISSION
City: DONNA
County: HIDALGO
CSJ at this Crossing: 1427-01-040
Highway/Roadway name crossing the railroad: FM 1423 (VAL VERDE RD.)
# of regularly scheduled trains per day at this crossing: 4
# of switching movements per day at this crossing: 1
% of estimated contract cost of work within railroad ROW: 0.01

Scope of Work at this Crossing to Be Performed by State Contractor:
OVERLAY MAINTENANCE: CONSISTING OF INSTALLING AND MAINTAINING TRAFFIC CONTROL DEVICES, AS WELL AS AN OVERLAY OF EXISTING ROADWAY & TRAFFIC PAVEMENT MARKINGS.

Scope of Work at this Crossing to Be Performed by Railroad Company:
PROVIDE FLAGGING SERVICES

** Choose: Highway Overpass, Highway Underpass, At Grade, Pedestrian, or Closed/Abandoned

II. OTHER PROJECT WORK WITHIN RAILROAD RIGHTS-OF-WAY (ROW)

NONE

III. FLAGGING & INSPECTION

of Days of Railroad Flagging Expected: 3

On this project, night or weekend flagging is:

☒ Expected
☐ Not Expected

Flagging services will be provided by:

☒ Railroad Company: TxDOT will pay flagging invoices
☐ Outside Party: Contractor will pay flagging invoices, to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30 day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

☐ UPRR - UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging

☐ BNSF - BNSF.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging

☐ KCS - KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
- Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☒ OTHERS PATRICK JOHNSON (MANAGER OF OPERATIONS)
RIO VALLEY SWITCHING CO.
101 NORTH 21ST STREET MCALLEN, TEXAS 78501
PHONE NO. (956)971-9111 EXT. 117

Contractor must incorporate Construction Inspection into anticipated construction schedule.

☒ Not Required

☐ Required: Contact Information for Construction Inspection:

IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

On this project, construction work to be performed by a railroad company is:

☒ Required
☐ Not Required

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

V. RAILROAD INSURANCE REQUIREMENTS

Railroad reference number shall be provided by TxDOT CST or DO.

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies must be issued for and on behalf of the Railroad. Where more than one Railroad Company is operating on the same right of way or where several Railroad Companies are involved and operate on their own separate rights of way, provide separate insurance policies in the name of each Railroad Company.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000 combined single limit
Railroad Protective Liability	
☐ Not Required	
☒ Non - Bridge Projects	$2,000,000 / $6,000,000
☐ Bridge Projects	$5,000,000 / $10,000,000
☐ Other	

VI. CONTRACTOR'S RIGHT OF ENTRY (ROE) AGREEMENT

On this project, an ROE agreement is:

☐ Not Required
☐ Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)
☒ Required: Contractor to obtain (see Item 5, Article 8.4)
With the following railroad companies: RIO VALLEY SWITCHING CO.

To view previously approved ROE Agreement templates agreed upon between the State and Railroad, see:

http://www.txdot.gov/inside-txdot/division/rail/samples.html

Approved ROE Agreement templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed ROE agreement between the Contractor and the Railroad if required on project.

VII. RAILROAD COORDINATION MEETING

On this project, a Railroad Coordination Meeting is:

☒ Not Required
☐ Required

See Item 5, Article 8.1 for more details.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are required to maintain the same insurance coverage as required of the Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call Rio Valley Switching Co.
Railroad Emergency Line at 956-971-9111 EXT. 117
Location: DOT 435 676L
RR Milepost :24.08
Subdivision : Mission Subdivision

Texas Department of Transportation | Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS
LOCATION #1

FILE: RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:			
©TxDOT June 2014	CONT	SECT	JOB	HIGHWAY			
REVISIONS	1427	01	040, ETC.	FM 1423, ETC.			
3/2020	DIST	COUNTY		SHEET NO.			
	21	HIDALGO, ETC.		164			

N

DETAIL "A"

FM 493
RR NAME: RIO VALLEY SWITCHING CO.
DOT#: 435 651R
RR MP: 22.08
TRAINS PER DAY: 2
SWITCHING MOVES: 0
RR SUBDIVISION: MISSION

BEGIN PROJECT
STA. 10+51

END PROJECT
STA. 48+47

SEE DETAIL "A"

KVS Commercial Drain
IH-2
Fm 493
North Ave
Redskin Ave
Wood Ave
Hester Ave
Bridge Ln
RIO VALLEY SWITCHING CO.
N Salinas Blvd
Mary Circle Dr
Scobey Ave
N 17Th St
Hibiscus Ave
Manhattan Dr
N 16Th St
Hurst Ave
E Roberts Ave
17Th St
Expy 83
83
2

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

Texas Department of Transportation

FM 493
LOCATION 3
RAILROAD CROSSING
LOCATION MAP

SCALE: N. T. S. SHEET 1 OF 1

© 2019	CONT	SECT	JOB	HIGHWAY
DS: CK:	1427	01	040, etc.	FM1423, etc.
DW: CK:	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO, etc.		165

DATE: 2/25/2020 9:52:03 AM
FILE: 03LOCATION MAP_RAILROAD.dgn

I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

DOT #: 435 651R
Crossing Type: PUBLIC AT GRADE
RR Company Owning Track at Crossing: UNION PACIFIC RAILROAD CO.
Operating RR Company at Track: RIO VALLEY SWITCHING CO.
RR MP: 22.08
RR Subdivision: MISSION
City: DONNA
County: HIDALGO
CSJ at this Crossing: 0863-01-071
Highway/Roadway name crossing the railroad: FM 493 (SALINAS BLVD.)
# of regularly scheduled trains per day at this crossing: 2
# of switching movements per day at this crossing: 0
% of estimated contract cost of work within railroad ROW: 0.01

Scope of Work at this Crossing to Be Performed by State Contractor:
OVERLAY MAINTENANCE: CONSISTING OF INSTALLING AND MAINTAINING TRAFFIC CONTROL DEVICES, AS WELL AS AN OVERLAY OF EXISTING ROADWAY & TRAFFIC PAVEMENT MARKINGS.

Scope of Work at this Crossing to Be Performed by Railroad Company:
PROVIDE FLAGGING SERVICES

** Choose: Highway Overpass, Highway Underpass, At Grade, Pedestrian, or Closed/Abandoned

II. OTHER PROJECT WORK WITHIN RAILROAD RIGHTS-OF-WAY (ROW)

NONE

III. FLAGGING & INSPECTION

of Days of Railroad Flagging Expected: 3
On this project, night or weekend flagging is:
☒ Expected
☐ Not Expected

Flagging services will be provided by:
☒ Railroad Company: TxDOT will pay flagging invoices
☐ Outside Party: Contractor will pay flagging invoices, to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30 day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

☐ UPRR - UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging

☐ BNSF - BNSF.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging

☐ KCS - KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
- Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☒ OTHERS PATRICK JOHNSON (MANANGER OF OPERATIONS)
RIO VALLEY SWITCHING CO.
101 NORTH 21ST STREET MCALLEN, TEXAS 78501
PHONE NO. (956)971-9111 EXT. 117

Contractor must incorporate Construction Inspection into anticipated construction schedule.

☒ Not Required

☐ Required: Contact Information for Construction Inspection:

IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

On this project, construction work to be performed by a railroad company is:
☐ Required
☒ Not Required

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

V. RAILROAD INSURANCE REQUIREMENTS

Railroad reference number shall be provided by TxDOT CST or DO.

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies must be issued for and on behalf of the Railroad. Where more than one Railroad Company is operating on the same right of way or where several Railroad Companies are involved and operate on their own separate rights of way, provide separate insurance policies in the name of each Railroad Company.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000 combined single limit
Railroad Protective Liability	
☐ Not Required	
☒ Non - Bridge Projects	$2,000,000 / $6,000,000
☐ Bridge Projects	$5,000,000 / $10,000,000
☐ Other	

VI. CONTRACTOR'S RIGHT OF ENTRY (ROE) AGREEMENT

On this project, an ROE agreement is:
☐ Not Required
☐ Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)
☒ Required: Contractor to obtain (see Item 5, Article 8.4)
With the following railroad companies: RIO VALLEY SWITCHING CO.

To view previously approved ROE Agreement templates agreed upon between the State and Railroad, see:

http://www.txdot.gov/inside-txdot/division/rail/samples.html

Approved ROE Agreement templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed ROE agreement between the Contractor and the Railroad if required on project.

VII. RAILROAD COORDINATION MEETING

On this project, a Railroad Coordination Meeting is:
☒ Not Required
☐ Required

See Item 5, Article 8.1 for more details.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are required to maintain the same insurance coverage as required of the Contractor.

IX. EMERGENCY NOTIFICATION

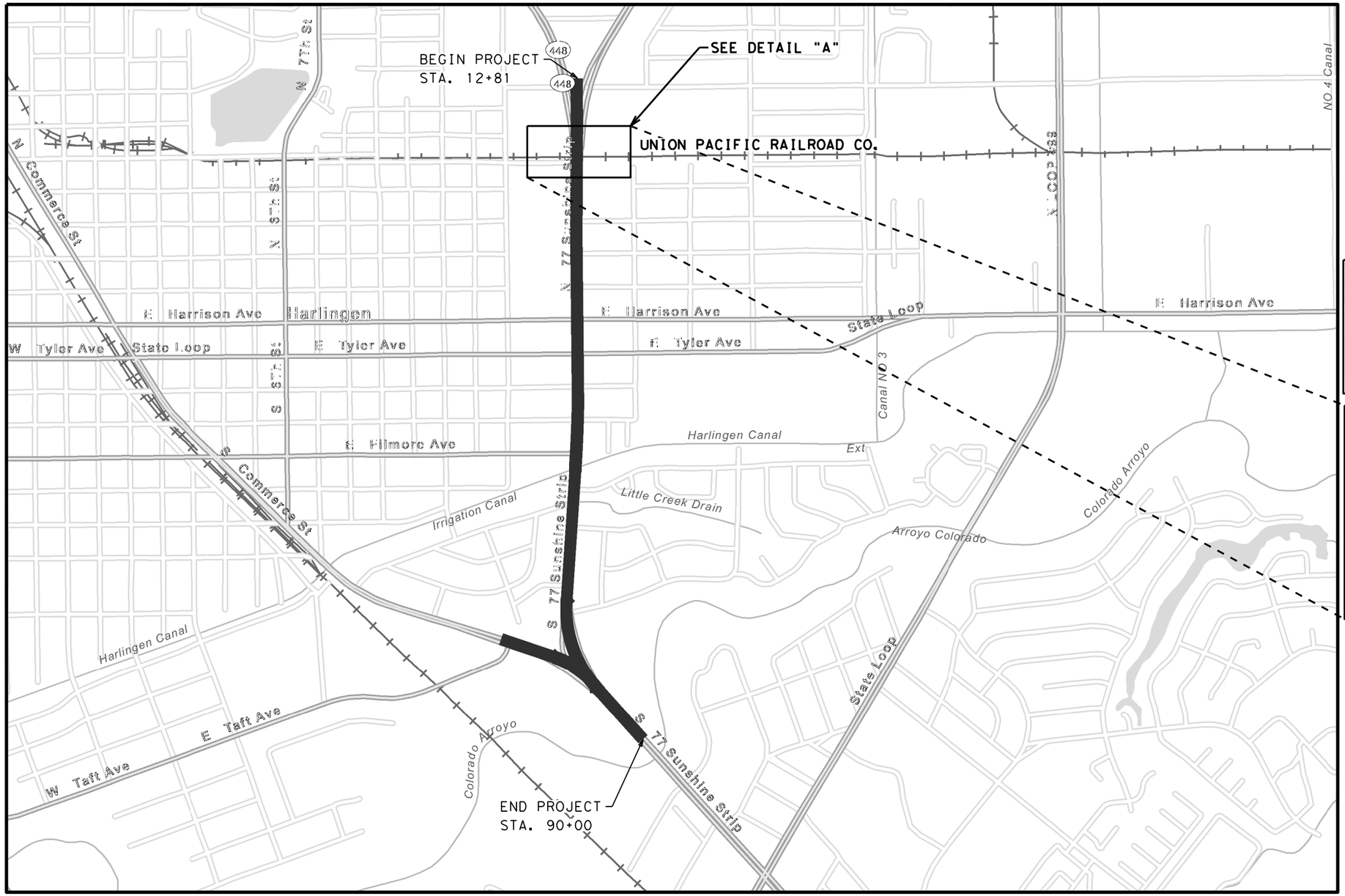
In Case of Railroad Emergency
Call Rio Valley Switching Co.
Railroad Emergency Line at 956-971-9111 EXT. 117
Location: DOT 435 651R
RR Milepost : 22.08
Subdivision : Mission Subdivision

Texas Department of Transportation | Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS
LOCATION #3

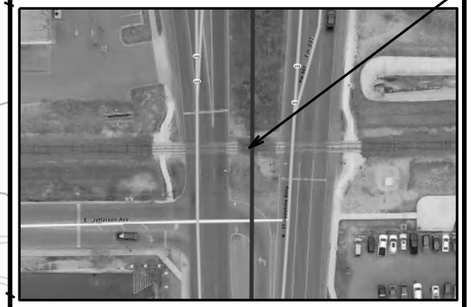
FILE: RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:			
©TxDOT June 2014	CONT	SECT	JOB	HIGHWAY			
REVISIONS	1427	01	040, ETC	FM 1423, ETC.			
3/2020	DIST	COUNTY		SHEET NO.			
	21	HIDALGO, ETC.		166			

DATE:
FILE:



DETAIL "A"

BUS 77X
RR NAME: UNION PACIFIC RAILROAD CO.
DOT#: 758 324Y
RR MP: 2.85
TRAINS PER DAY: 6
SWITCHING MOVES: 0
RR SUBDIVISION: HARLINGEN



STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

02/25/2020

Pharr District Central Design

Texas Department of Transportation

BUS 77X
LOCATION 6
RAILROAD CROSSING
LOCATION MAP

SCALE: 1" = N.T.S. SHEET 1 OF 1

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1427	01	040, etc.	FM1423, etc.
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	HIDALGO, etc.		167

DATE: 2/27/2020 10:34:12 AM
FILE: 06LOCATION MAP_RAILROAD.dgn

DATE:
FILE:

I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

DOT #: 758 324Y
Crossing Type: PUBLIC AT GRADE
RR Company Owning Track at Crossing: UNION PACIFIC RAILROAD CO.
Operating RR Company at Track: UNION PACIFIC RAILROAD CO.
RR MP: 2.85
RR Subdivision: HARLINGEN
City: HARLINGEN
County: CAMERON
CSJ at this Crossing: 0327-08-099
Highway/Roadway name crossing the railroad: BUS 77X(77 SUNSHINE STRIP)
# of regularly scheduled trains per day at this crossing: 6
# of switching movements per day at this crossing: 0
% of estimated contract cost of work within railroad ROW: 0.006

Scope of Work at this Crossing to Be Performed by State Contractor:
OVERLAY MAINTENANCE: CONSISTING OF INSTALLING AND MAINTAINING TRAFFIC CONTROL DEVICES, AS WELL AS AN OVERLAY OF EXISTING ROADWAY & TRAFFIC PAVEMENT MARKINGS

Scope of Work at this Crossing to Be Performed by Railroad Company:
PROVIDE FLAGGING SERVICES

** Choose: Highway Overpass, Highway Underpass, At Grade, Pedestrian, or Closed/Abandoned

II. OTHER PROJECT WORK WITHIN RAILROAD RIGHTS-OF-WAY (ROW)

NONE

III. FLAGGING & INSPECTION

of Days of Railroad Flagging Expected: 3

On this project, night or weekend flagging is:

☒ Expected
☐ Not Expected

Flagging services will be provided by:

☐ Railroad Company: TxDOT will pay flagging invoices
☒ Outside Party: Contractor will pay flagging invoices, to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30 day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

☒ UPRR - UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging

☐ BNSF - BNSF.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging

☐ KCS - KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
- Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS _____

Contractor must incorporate Construction Inspection into anticipated construction schedule.

☒ Not Required

☐ Required: Contact Information for Construction Inspection:

IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

On this project, construction work to be performed by a railroad company is:

☒ Required
☐ Not Required

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

V. RAILROAD INSURANCE REQUIREMENTS

Railroad reference number shall be provided by TxDOT CST or DO.

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies must be issued for and on behalf of the Railroad. Where more than one Railroad Company is operating on the same right of way or where several Railroad Companies are involved and operate on their own separate rights of way, provide separate insurance policies in the name of each Railroad Company.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000 combined single limit
Railroad Protective Liability	
☐ Not Required	
☒ Non - Bridge Projects	$2,000,000 / $6,000,000
☐ Bridge Projects	$5,000,000 / $10,000,000
☐ Other	

VI. CONTRACTOR'S RIGHT OF ENTRY (ROE) AGREEMENT

On this project, an ROE agreement is:

☒ Not Required
☐ Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)
☐ Required: Contractor to obtain (see Item 5, Article 8.4)
With the following railroad companies: _____

To view previously approved ROE Agreement templates agreed upon between the State and Railroad, see:

http://www.txdot.gov/inside-txdot/division/rail/samples.html

Approved ROE Agreement templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed ROE agreement between the Contractor and the Railroad if required on project.

VII. RAILROAD COORDINATION MEETING

On this project, a Railroad Coordination Meeting is:

☒ Not Required
☐ Required

See Item 5, Article 8.1 for more details.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are required to maintain the same insurance coverage as required of the Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call Union Pacific Railroad Co.
Railroad Emergency Line at 1-800-848-8715
Location: DOT 758 324Y
RR Milepost :2.85
Subdivision : Harlingen Subdivision

Texas Department of Transportation — Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS
LOCATION #6

FILE: RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:			
©TxDOT June 2014	CONT	SECT	JOB	HIGHWAY			
REVISIONS	1427	01	040, ETC	FM 1423, ETC.			
3/2020	DIST	COUNTY		SHEET NO.			
	21	HIDALGO, ETC.		168			

PART 1 - GENERAL

1.01 DESCRIPTION

This project includes construction work within the right of way and/or properties of the Railroad and adjacent to its tracks, wire lines and other facilities. These sheets describe the minimum special requirements for coordination with the Railroad when working upon, over or under Railroad Right of Way or when impacting current or future Railroad operations. Coordinate with the Railroad while performing the work outlined herein, and afford the same cooperation with the Railroad as with TxDOT. Complete all submittals and work in accordance with TxDOT Standard Specifications, Railroad Guidelines and AREMA recommendations as modified by these minimum special requirements or as directed in writing by the Railroad Designated Representative.

For purposes of this project, the Railroad Designated Representative is the person or persons designated by the Railroad Manager of Industry and Public Projects to handle specific tasks related to the project.

1.02 REQUEST FOR INFORMATION / CLARIFICATION

Submit Requests for Information ("RFI") involving work within any Railroad Right of Way to the TxDOT Engineer. The TxDOT Engineer will submit the RFI to the Railroad Designated Representative for review and approval for RFI's corresponding to work within Railroad Right of Way. Allow six (6) weeks total time for review and approval, which includes four (4) weeks for review and approval by the Railroad.

1.03 PLANS / SPECIFICATIONS

TxDOT has received written Railroad approval of the plans and specifications for this project. Any revisions or changes in the plans after award of the Contract must have the approval of TxDOT and the Railroad.

PART 2 - UTILITIES AND FIBER OPTIC

Construct all utility installations in accordance with current AREMA recommendations, Railroad, TxDOT and owning utility specifications and requirements. Railroad general guidelines can be found on the Railroad website or by contacting the Railroad Designated Representative.

PART 3 - CONSTRUCTION

3.01 GENERAL

A. Perform all work in compliance with all applicable Railroad, Federal Railroad Administration (FRA), and TxDOT rules and regulations. Arrange and conduct work in a manner that does not endanger or interfere with the safe operation of the tracks and property of the Railroad and the traffic moving on such tracks, or the wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the Work. The safe operation of railroad train movements takes precedence over any work to be performed by the Contractor. The Contractor is responsible for train delay cost and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction or other activities.

B. Construction activities within 15 feet of the operational tracks will only be allowed if absolutely necessary and the Railroad's Designated Representative grants approval. Construction activities within 15 feet of the operational track(s) preferably allow the tracks to stay operational. In such cases, coordination and approval by the Railroad Track Manager is required with regard to schedule, flagging, and slow orders. See Sections 3.07 and 3.08 for additional information.

C. Provide track protection for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail. When not in use, keep Contractor machinery and materials at least 50 feet from the Railroad's nearest track.

D. Vehicular crossings of railroad track are allowed only at existing crossings, or haul road crossings developed with Railroad approval.

E. The Contractor is also advised that new railroad facilities within the project may be built by the Railroad. If applicable, these facilities are delineated in the plans. Be aware of the limits of responsibilities and coordinate efforts with the Railroad and TxDOT.

F. Railroad requirements do not allow work within 50 feet of track centers when a train passes the work site and all personnel must clear the area within 50 feet of the track centerline and secure all equipment. Additional allowances may be pursued as outlined in 3.02 and 3.03.

G. All permanent clearances shall be verified before project closing.

3.02 RAILROAD OPERATIONS

A. Trains and/or equipment are expected on any track, at any time, in either direction. Become familiar with the train schedules in this location and structure bid assuming intermittent track windows in this period, as defined in Paragraph B that follows.

B. All railroad tracks within and adjacent to the contract site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. Coordinate and schedule the work so that construction activities do not interfere with railroad operations.

C. Coordinate work windows with TxDOT and the Railroad's Designated Representative. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:

1. Conditional Work Window: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and/or adjacent to the railroad tracks within 25 feet of the nearest track, a railroad flag person will be required. At the direction of the railroad flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the Railroad Designated Representative, from the tracks). Conditional Work Windows are available for the Project.

2. Absolute Work Window: An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame, the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window, the railroad tracks and/or signals must be completely operational for train operations and all Railroad, Public Utilities Commission (PUC) and FRA requirements, codes and regulations for operational tracks must be satisfied. In the situation where the operating tracks and/or signals have been affected, the Railroad will perform inspections of the work prior to placing that track back into service. Railroad flag persons will be required for construction activities requiring an Absolute Work Window. Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for Railroad review.

3.03 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES

A. Do not perform any work within Railroad Right of Way without a valid executed Right of Entry Agreement if required on this project.

B. Give advance notice to the Railroad as required in the "Contractor's Right of Entry Agreement" before commencing work in connection with construction upon or over Railroad Right of Way and observe the Railroad's rules and regulations with respect thereto.

C. Perform all work upon Railroad Right of Way in a manner to avoid interference with or endanger the operations of the Railroad. Whenever work may affect the operations or safety of trains, submit the work method to the Railroad Designated Representative for approval. Approval does not relieve the Contractor from liability. Do not commence any work which requires flagging service or inspection service until the flagging protection required by the Railroad is available at the job site. See Section 3.15 for railroad flagging requirements.

D. Make requests in writing for both Absolute and Conditional Work Windows, at least 30 days in advance of any work. Include in the written request:
1. Exactly what the work entails.
2. The days and hours that work will be performed.
3. The exact location of work, and proximity to the tracks.
4. The type of window requested and the amount of time requested.
5. The designated contact person.

Provide a written confirmation notice to the Railroad at least 48 hours before commencing work in connection with approved work windows when work is within 25 feet of nearest rail. Perform all work in accordance with previously approved work plans.

E. Make provisions to protect operations and property of the Railroad should a condition arising from, or in connection with the work, require immediate and unusual action. If in the judgment of the Railroad Designated Representative such provisions are insufficient, the Railroad Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the Railroad or TxDOT. The Railroad or TxDOT shall have the right to order the Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the Railroad Designated Representative, the Contractor's operations could endanger railroad operations. In the event of such an order, immediately notify TxDOT of the order.

3.04 INSURANCE

Do not begin work upon or over Railroad Right of Way until furnishing the Railroad with the insurance policies, binders, certificates and endorsements required by the "Contractor's Right of Entry Agreement", and until the Railroad Designated Representative has advised TxDOT that such insurance is in accordance with the Agreement.

3.05 RAILROAD SAFETY ORIENTATION

A. Complete the railroad course "Orientation for Contractor's Safety", and maintain current registration prior to working on railroad property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

"UPRR, BNSF, KCS/TEXMEX will not accept on-track safety training certificates from other railroads. Refer to Railroad specific contractor right of entry for training information."

B. Know and follow the "Contractor's Right of Entry Agreement" EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

3.06 COOPERATION

The Railroad will cooperate with Contractor so that work may be conducted in an efficient manner, and will cooperate with Contractor in enabling use of Railroad Right of Way in performing the work.

3.07 MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES

Abide by the following minimum temporary clearances during the course of construction:
A. 15' - 0" (BNSF)(UPRR)and 14'-0" (KCS) horizontal from centerline of track
B. 22' (KCS) and 21' - 6" (UPRR & BNSF) vertically above top of rail.

For construction clearance less than listed above, obtain local Railroad Operating Unit review and approval.

3.08 APPROVAL OF REDUCED CLEARANCES

A. Maintain minimum track clearances during construction as specified in Section 3.07.

B. Submit any proposed infringement on the specified minimum clearances to the Railroad Designated Representative through TxDOT at least 30 days in advance of the work. Do not proceed with such infringement without written approval by the Railroad Designated Representative.

C. Do not commence work involving an approved infringement without receiving written assurance from the Railroad Designated Representative that arrangements have been made for any necessary flagging service.

Texas Department of Transportation | Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	1427	01	040 ETC.	FM 1423, ETC.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO, ETC.		169

DATE:
FILE:

3.09 MAINTENANCE OF RAILROAD FACILITIES

A. Maintain all ditches and drainage structures free of silt or other obstructions resulting from Contractor's operations. Repair eroded areas and any other damage within Railroad Right of Way and repair any other damage to the property of the Railroad, or its tenants.

B. Perform all such maintenance and repair of damages due to the Contractors's operations at Contractor's expense.

C. Submit a proposed method of erosion control for review by the Railroad prior to beginning any grading on the project site. Comply with all applicable local, state and federal regulations when developing and implementing such erosion control.

3.10 SITE INSPECTIONS BY RAILROAD's DESIGNATED REPRESENTATIVE

A. In addition to the office reviews of construction submittals, site inspections may be performed by the Railroad Designated Representative at significant points during construction, including the following if applicable:
   1. Pre-construction meetings.
   2. Pile driving/drilling of caissons or drilled shafts.
   3. Reinforcement and concrete placement for railroad bridge substructure and/or superstructure.
   4. Erection of precast concrete or steel bridge superstructure.
   5. Placement of waterproofing (prior to placing ballast on bridge deck).
   6. Completion of the bridge structure.

B. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by the Railroad.

C. Provide a detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to TxDOT for submittal to the Railroad Designated Representative for review prior to commencement of work. Include the anticipated dates when the above listed events will occur. Update this schedule for the above listed events as necessary and each month at a minimum to allow the Railroad to schedule site inspections.

3.11 RAILROAD REPRESENTATIVES

Railroad representatives, conductors, flag person or watch person will be provided by the Railroad at expense of TxDOT to protect Railroad facilities, property and movements of its trains or engines. In general, the Railroad will furnish such personnel or other protective services as follows:

A. When any part of any equipment is standing or being operated within 25 feet, measured horizontally, from nearest rail of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25 foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.

B. For any excavation below elevation of track subgrade if, in the opinion of the Railroad Designated Representative, track or other railroad facilities may be subject to settlement or movement.

C. During any clearing, grubbing, excavation or grading in proximity to railroad facilities, which, in the opinion of the Railroad Designated Representative, may endanger railroad facilities or operations.

D. During any Contractor's operations when, in the opinion of the Railroad Designated Representative, railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.

E. Arrange with the Railroad Designated Representative to provide the adequate number of flag persons to accomplish the work.

3.12 COMMUNICATIONS AND SIGNAL LINES

If required, the Railroad will rearrange its communications and signal lines, its grade crossing warning devices, train signals and tracks, and facilities that are in use and maintained by the Railroad's forces in connection with its operation at expense of TxDOT. This work by the Railroad will be done by its own forces and it is not a part of the Work under this Contract.

3.13 TRAFFIC CONTROL

Coordinate any operations that control traffic across or around railroad facilities with the Railroad Designated Representative.

3.14 CONSTRUCTION EXCAVATIONS AND BORING ACTIVITIES UNDER TRACK

A. Take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of TxDOT, OSHA, AREMA and Railroad "Guidelines for Temporary Shoring".

B. The project plans indicate whether there are fiber optic lines or other such telecommunications systems that require consideration. Regardless, contact the necessary call center to determine if such cable systems are present:

   UPRR 1-800-336-9193
   7:00 AM to 9:00 PM CST Monday-Friday except holidays,
   staffed 24 hrs/day for emergencies
   48 hrs notice required

   BNSF 1-800-533-2891
   24 hour number
   5 working days notice required

   KCS 1-800-344-8377
   Texas One Call, a 24 hour number
   48 hrs notice required, excluding weekends and holidays

   If a telecommunications system is buried anywhere on or near railroad property, coordinate with TxDOT, the Railroad and the Telecommunication Company(ies) to arrange for relocation or protective measures prior to beginning work on or near railroad property. Refer to the project General Notes for additional information.

C. Projects involving a boring or jack and bore operation under track such as drainage pipes or culverts and utilities require an installation plan reviewed and approved by the Railroad and TxDOT prior to proceeding with such construction. A railroad inspector and contractor assisted monitoring of ground and track movement is required to maintain safe passage of rail traffic. Stop installation and do not allow passage of trains if movements in excess of 1/4 inch vertical or horizontal is detected in the tracks. Immediately repair the damage to the satisfaction of TxDOT and the Railroad before proceeding.

3.15 RAILROAD FLAGGING

Per the Right of Entry Agreement for flagging, notify the Railroad Representative at least 10 working days in advance of Contractor's work and at least 30 working days in advance of any Contractor's work in which any person or equipment will be within 25 feet of nearest rail or as specified in the Contractor Right of Entry (CROE).

3.16 CLEANING OF RIGHT-OF-WAY

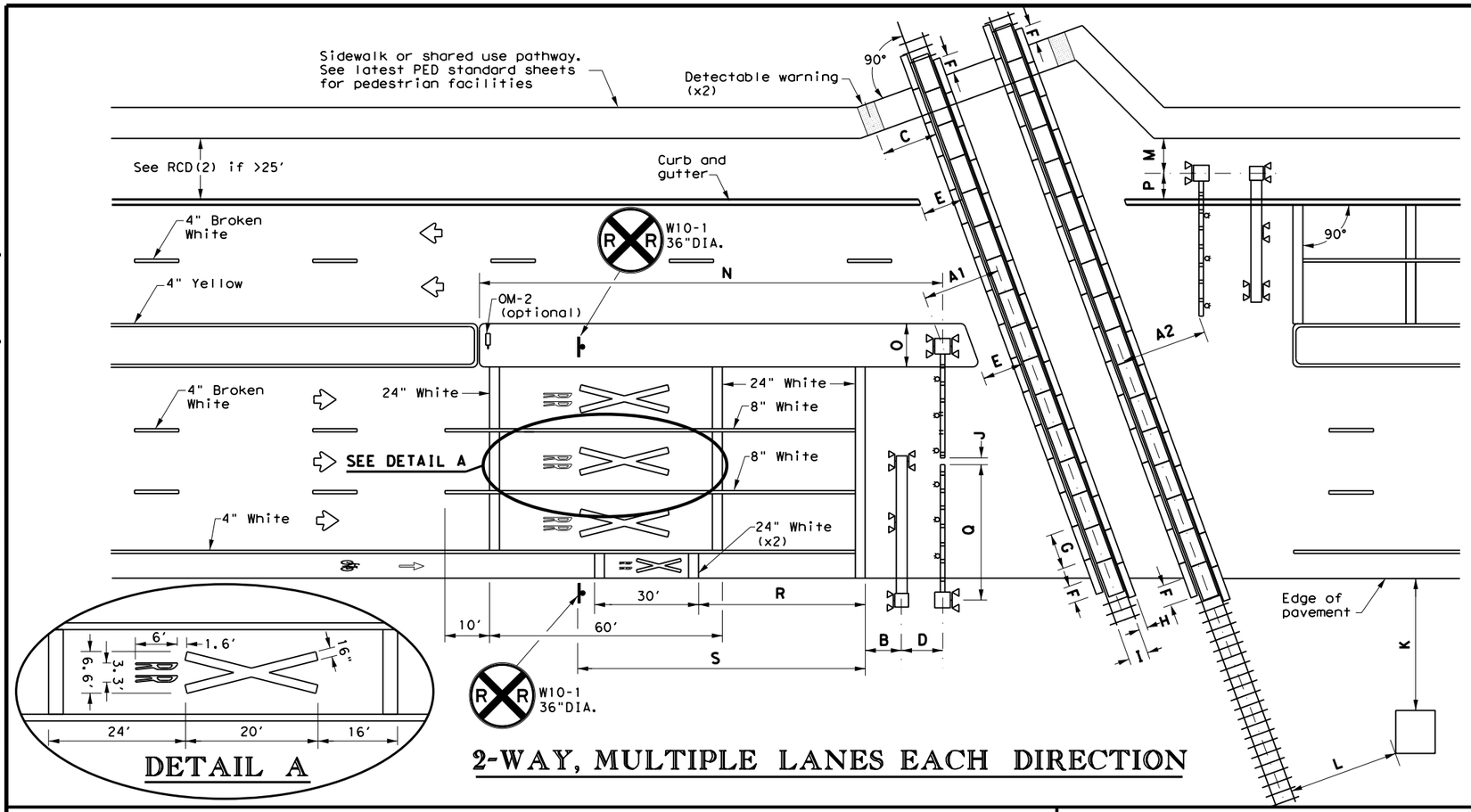
When work is complete, remove all tools, implements, and other materials brought into Railroad Right of Way and leave the right of Way in a clean and presentable condition to the satisfaction of TxDOT and the Railroad.

Texas Department of Transportation | Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	1427	01	040, ETC.	FM 1423, ETC.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO, ETC.		170

DATE:
FILE:



DETAIL A

2-WAY, MULTIPLE LANES EACH DIRECTION

NOTES

A1: Center of RR mast to center of rail: 12' minimum, 15' typical.

A2: Tip of gate to center of rail: 12' minimum, 15' typical.

B: Center of mast (cantilever, gate, or mast flasher) of nearest active traffic control device to stop line: 8' (NOTE: Stop line may be moved as needed, but should be at least 8' back from gates, if present).

C: Center of detectable warning device to nearest rail: 6' minimum

D: Center of gate mast to center of cantilever mast: 6' typical. NOTE: Cantilever may be located in front or behind gates.

E: Edge of median or curb to nearest rail: 10' typical. NOTE: Design median edge to be parallel with rail.

F: Edge of planking panel from edge of pavement or sidewalk: 3' minimum. NOTE: Field panels need not be in line with gauge panels.

G: Length of panels along rail: 8' typical.

H: Width of field panel: 2' typical (check with railroad company).

I: Distance between rails: 4'-8.5".

J: Tip of gate to tip of gate: 2' maximum for Quiet Zone SSM or 90% of traveled way covered by gates for all other locations.

K: Nearest edge of RR cabin from edge of pavement: 30' typical. NOTE: Cabinet not required to be parallel to edge of pavement.

L: Nearest edge of RR cabin from nearest rail: 25' typical.

M: Center of RR mast to edge of sidewalk: 6' minimum.

N: Center of gate mast to leading edge of non-traversable median: 100' minimum to qualify as a Quiet Zone SSM. NOTE: 60'will suffice if there is a street intersection within the 100' and all street intersections within 60' are closed.

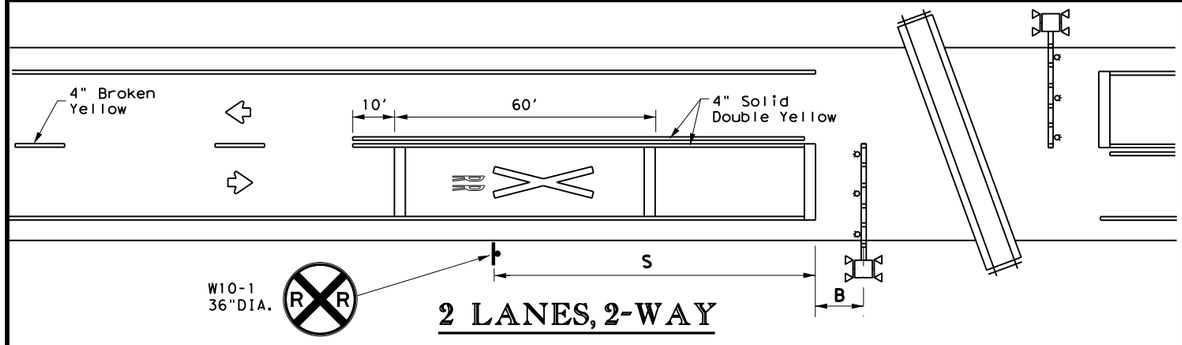
O: Width of median: 8'-6" minimum, 10' typical when using median gates. NOTE: Center of gate mast minimum 4'-3" from face of curb.

P: Center of RR mast to face of curb: 4'-3" minimum.
Center of RR mast to edge of pavement (with shoulder): 6' minimum
Center of RR mast to edge of pavement (no shoulder): 8'-3" minimum
NOTE: BNSF prefers 5'-3", 7', and 9'-3" minimums, respectively.

Q: Gate length: 28' or less typical, but railroad company may allow up to 32'under special circumstances.

R: Stop line to first RR Crossing transverse line (bike lane): 50' typical.

S: Stop line to GRADE CROSSING ADVANCE WARNING (W10-1) sign and adjacent RR Crossing pavement markings. See Table 1. See RCD(2) for other signs.



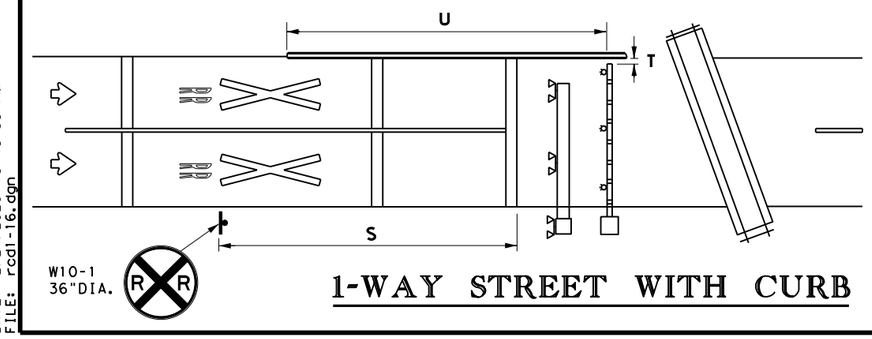
2 LANES, 2-WAY

TABLE 1	
Approach Speed (mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

LEGEND	
	Sign
	Object Marker
	Traffic Flow
	Cantilever
	Gate Assembly
	Mast Flasher Pair

GENERAL NOTES

1. Medians and curbs must be non-traversable to qualify as a Quiet Zone Supplementary Safety Measure (SSM). Non-traversable curbs in Quiet Zones are 6" tall minimum and used on roadways where speed does not exceed 40 mph.
2. Raised pavement markers may be used to supplement striping. See PM(2) and PM(3) standard sheets.
3. Medians preferred whenever possible to prevent vehicles from driving around gates.
4. Longitudinal edge striping may be continued thru crossing as needed. Illumination may also be considered for nighttime visibility.
5. See SMD standard sheets for sign mounting details.
6. See the Standard Highway Sign Design for Texas (SHSD) manual for sign and pavement marking details.

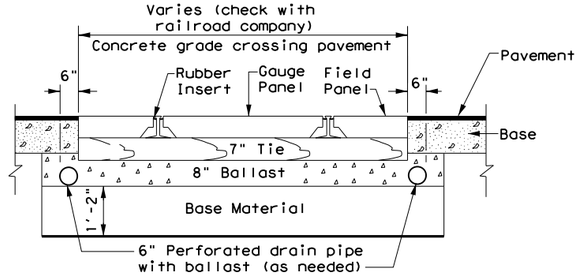


1-WAY STREET WITH CURB

NOTES

T: Tip of gate to edge of curb: 1' max for Quiet Zone SSM, 90% of traveled way covered by gates for all other locations

U: Non-traversable curb length from gate: 100' min. for a Quiet Zone SSM, 10' min for all other locations.



CROSSING SURFACE CROSS SECTION

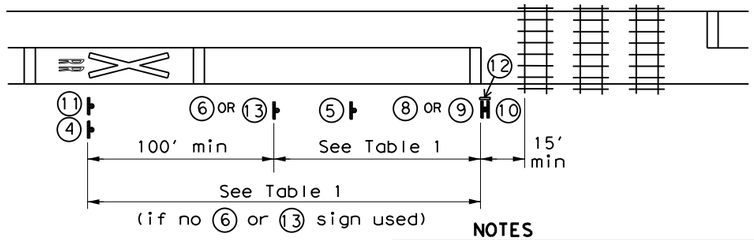
Texas Department of Transportation

Traffic Operations Division Standard

RAILROAD CROSSING DETAILS SIGNING, STRIPING, AND DEVICE PLACEMENT RCD(1)-16

FILE: rcd1-16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT FEBRUARY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040, etc.	FM1423, etc.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO, etc.		171

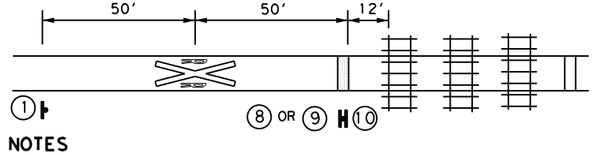
DATE: 2/24/2020 3:46:39 PM
FILE: rcd1-16.dgn



NOTES

1. Stop or yield sign may also be installed to the left of the crossbuck sign, rather than below it.
2. A 2" white retroreflective strip shall be installed on front and back of crossbuck sign post.

PASSIVE CROSSING



NOTES

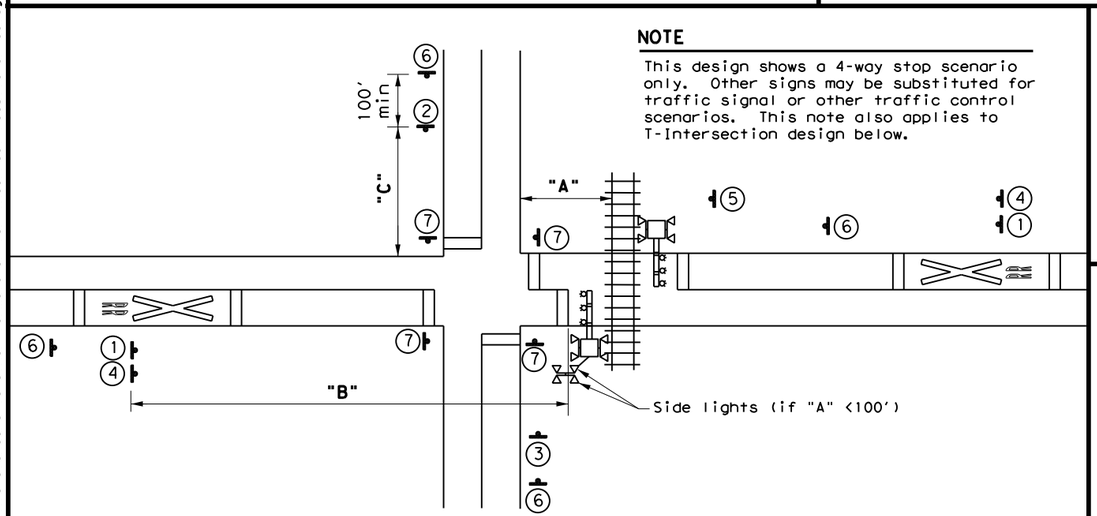
1. A shared use pathway is considered a separate pathway crossing when more than 25′ from traveled way of adjacent roadway.
2. Detectable warning used at stop bar.
3. Smaller sign sizes preferred than shown to the right on this sheet.

PATHWAY CROSSING

TABLE 1	
Approach Speed (mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

GENERAL NOTES

1. Railroad company to provide active traffic control devices, CROSSBUCK (R15-1), NUMBER OF TRACKS Plaque (R15-2P) (if more than 1 track), and EMERGENCY NOTIFICATION (I-13) signs.
2. LOW GROUND CLEARANCE (W10-5) signs may be relocated further upstream of crossing to provide advance warning of alternate route.
3. GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-2) signs may be modified as needed to fit roadway geometry.
4. Table 1 placement distances may vary per Sect. 2C.05 of the TMUTCD.
5. See Table 1 to determine placement of STOP AHEAD (W3-1) and YIELD AHEAD (W3-2) signs unless shown otherwise.
6. DO NOT STOP ON TRACKS (R8-8) signs installed when potential for vehicles stopping on tracks is significant as determined by sealing engineer. Install so sign does not block view of RR mast.
7. See the Standard Highway Sign Design for Texas (SHSD) manual for sign and pavement marking details.

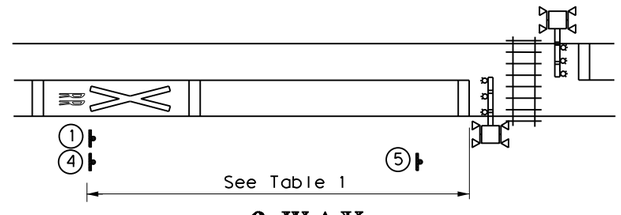


NOTE

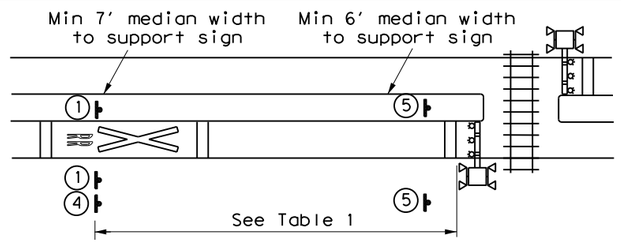
This design shows a 4-way stop scenario only. Other signs may be substituted for traffic signal or other traffic control scenarios. This note also applies to T-Intersection design below.

	"A" <100′	"A" ≥100′
"B"	See Table 1. Place pavement markings and signs on opposite side of intersection from rail if spacing from Table 1 would put markings within intersection.	See Table 1. Place pavement markings and signs between rail and intersection if spacing from Table 1 would put markings within intersection.
"C"	See Table 1.	GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-2, W10-3, W10-4) signs should only be installed if W10-1 sign is not between intersection and railroad crossing. If needed, see Table 1.

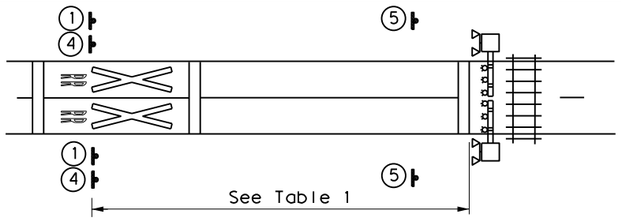
GRADE CROSSING NEAR A PARALLEL STREET



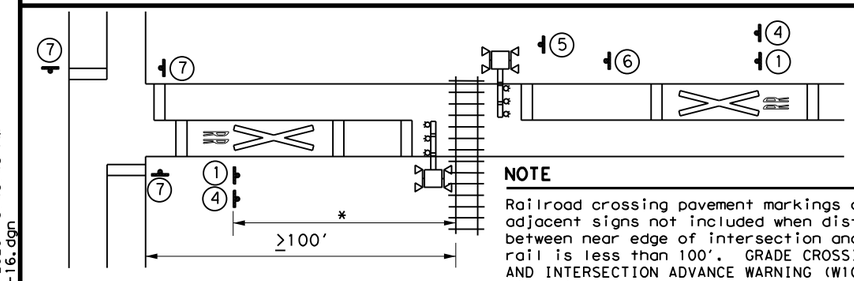
2-WAY



2-WAY WITH MEDIAN



1-WAY

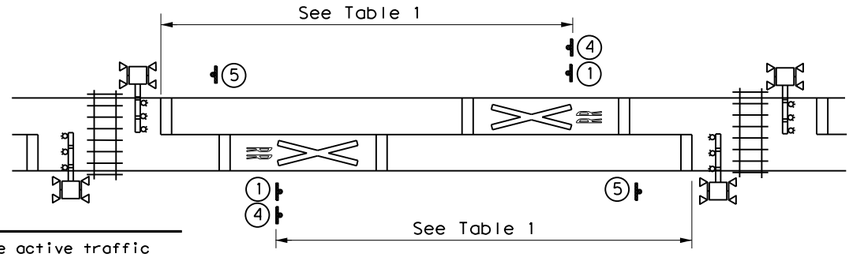


*Use Table 1 if sufficient space exists.

NOTE

Railroad crossing pavement markings and adjacent signs not included when distance between near edge of intersection and near rail is less than 100′. GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-3) signs installed on roadway parallel with rail in this case.

T-INTERSECTION



NOTE

Separate active traffic control devices, railroad crossing pavement markings, and adjacent signs required when tracks are more than 100′ apart.

2 ADJACENT CROSSINGS

SIGNS

** ① W10-1 36"DIA.	** ② W10-2L 36"X36"	** ③ W10-2R 36"X36"	IF NEEDED ④ W10-5 36"X36" / LOW GROUND CLEARANCE W10-5P 30"x24"
IF NEEDED ⑤ R8-8 24"X30"	IF NEEDED ⑥ W3-1 30"X30"	⑦ STOP R1-1 36"X36" / ALL WAY R1-3P 18"X6"	RAIL CROSSING ROAD 3 TRACKS R15-1 48"X9" / R15-2P 27"X18" / STOP R1-1 36"X36" ⑧
RAIL CROSSING ROAD 3 TRACKS R15-1 48"X9" / R15-2P 27"X18" / YIELD R1-2 48"X48"X48" ⑨	RAIL CROSSING ROAD 3 TRACKS R15-1 48"X9" / R15-2P 27"X18" ⑩	W10-1 36"DIA. / NO GATES OR LIGHTS W10-13P 30"X24" ⑪ **	REPORT EMERGENCY OR PROBLEM 1-800-555-5555 CROSSING 836 597 H — Sign may be placed perpend. to travel lanes. ⑫ I-13 15"X9"
IF NEEDED ⑬ W3-2 30"X30"	** Includes a NO TRAIN HORN Plaque (W10-9P) if crossing is in a Quiet Zone. LOW GROUND CLEARANCE Plaque (W10-5P) if needed is mounted below W10-2/W10-3/W10-4 signs.		
NO TRAIN HORN W10-9P 30"X24"	LOW GROUND CLEARANCE W10-5P 30"X24"		

Texas Department of Transportation — Traffic Operations Division Standard

RAILROAD CROSSING DETAILS SIGNING & STRIPING

RCD(2)-16

FILE: rcd2-16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT FEBRUARY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040,etc.	FM1423,etc.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO,etc.		172

DATE: 2/24/2020 3:46:48 PM
FILE: rcd2-16.dgn

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

I. Clean Water Act, Section 402; Stormwater Pollution Prevention

Action Items Required : ☐ No Action Required

1. ☒ The contractor must implement the SW3P by installing Best Management Practices (BMPs) as indicated in the construction plans and maintained appropriately throughout construction. BMPs must be in place prior to the start of construction. The SW3P may need to be revised as necessary as construction progresses.

2. ☒ For all construction PSL's off the ROW, the contractor must certify compliance with all applicable laws, rules and regulations pertaining to the preservation of cultural resources, natural resources and the environment.

3. ☒ Based on the acreage of impact, select the appropriate box below:

   ☒ This project will disturb less than 1 acre of soil and is not part of a larger common plan of development; therefore, a NOI and TPDES Site Notice are not required for this project.

   or

   ☐ This project will disturb equal to or more than 1 acre of soil but less than 5 acres; therefore a NOI is not required but a TPDES Site Notice is required. The Construction Site Notice (CSN) is required to be posted at the construction site in a publicly accessible location for review by the public, TCEQ, EPA and other Inspectors.

   or

   ☐ This project will disturb equal to or more than 5 acres of soil and will require a NOI and TPDES Site Notice. The NOI and Site Notice are required to be posted at the construction site in a publicly accessible location.

4. ☒ Need to address MS4 requirements (Cameron & Hidalgo Counties only) ☐ MS4 requirements not needed

II. Clean Water Act, Sections 401 and 404 Compliance

Action Items Rquired : ☐ No Action Required

1. ☒ Filling, dredging or excavating in any water bodies, rivers, creeks, streams, wetlands or wet areas is prohibited unless specified in the USACE permit and approved by the Engineer. The contractor shall adhere to all agreements, mitigation plans, and BMPs required by the NWP as regulated by the USACE.

   The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

   ☒ No Permit Required

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

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

   ☐ Individual 404 Permit Required

   ☐ Other Nationwide Permit Required: NWP#_____

2. ☒ The contractor is responsible for obtaining new or revised Section 404 permit(s) for Contractor initiated changes in construction methods that change Impacts To Waters Of The U.S., including wetlands. The Contractor will ensure that the water quality of the State will be maintained and not degraded.

3. ☒ Best Management Practices for applicable Section 401 General Conditions:

General Condition 12 - Categories I and II BMPs required

Category I (Erosion Control)

☐ Temporary Vegetation	☐ Interceptor Swale	☒ Mulch Filter Berms and/or Socks
☐ Blankets, Matting	☐ Diversion Dike	☐ Compost Filter Berms and/or Socks
☐ Mulch	☐ Erosion Control Compost	☐ Compost Blankets
☐ Sodding		

Category II (Sedimentation Control)

☐ Silt Fence	☐ Hay (Straw) Bale Dike	☒ Mulch Filter Berms and/or Socks
☐ Rock Berm	☐ Brush Berms	☐ Compost Filter Berms and/or Socks
☐ Triangular Filter Dike	☐ Sediment Basins	☐ Stone Outlet Sediment Traps
☐ Sand Bag Berm	☐ Erosion Control Compost	

General Condition 21 - Category III BMPs required

Category III (Post-Construction TSS Control)

☐ Vegetative Filter Strips	☐ Wet Basins	☒ Mulch Filter Berms and/or Socks
☐ Retention/Irrigation	☐ Grassy Swales	☐ Compost Filter Berms and/or Socks
☐ Extended Detention Basin	☐ Vegetation-Lined Ditches	☐ Sand Filter Systems
☐ Constructed Wetlands	☐ Erosion Control Compost	☐ Sedimentation Chambers

II. Clean Water Act, Sections 401 and 404 Compliance - Continued:

4. ☒ The Contractor's designated and qualified Contractor Responsible Person Environmental (CRPe) will monitor the project site daily to ensue compliance with SW3P and TPDES General Permit TXR 150000. Daily Monitoring Reports shall be provided to TxDOT within 48 hours, in accordance with Item 506.3.1.

5. ☐ Other Project Specific Actions:

III. Cultural Resources

Action Items Required : ☐ No Action Required

1. ☒ Refer to the 2014 TxDOT Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges, Item 7.7.1., in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

2. ☐ Other Project Specific Actions:

IV. Vegetation Resources

Action Items Required : ☐ No Action Required

1. ☒ In accordance with the 2014 TxDOT Standard Specifications; Item 164 - Seeding For Erosion Control; provide and install temporary or permanent seeding for erosion control as shown on the plans or as directed by the Engineer for all seeding and replanting of right of way where possible. (Required for Urban Settings)

2. ☐ In accordance with Executive Order 13112 on invasive species and the Executive Memorandum on Beneficial Landscaping, native species of plants shall be used for all seeding and replanting of right of way where possible for rural roadways. (Required for Rural Settings)

3. ☒ Preserve vegetation where possible throughout the project and minimize clearing, grubbing and excavation within stream banks, bed and approach sections.

4. ☐ Other Project Specific Actions:

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

List of Abbreviations

BMP: Best Management Practice	NWP: Nationwide Permit
CGP: Construction General Permit	PCN: Pre-Construction Notification
CRPe: Contractor Responsible Person Environmental	PSL: Project Specific Location
DSHS: Texas Department of State Health Services	SPCC: Spill Prevention Control and Countermeasure
FEMA: Federal Emergency Management Agency	SW3P: Storm Water Pollution Prevention Plan
FHWA: Federal Highway Administration	TCEQ: Texas Commission on Environmental Quality
MOA: Memorandum of Agreement	THC: Texas Historical Commission
MOU: Memorandum of Understanding	TPDES: Texas Pollutant Discharge Elimination System
MS4: Municipal Separate Stormwater Sewer System	TPWD: Texas Parks and Wildlife Department
MSAT: Mobile Source Air Toxic	TxDOT: Texas Department of Transportation
MBTA: Migratory Bird Treaty Act	T&E: Threatened and Endangered Species
NOI: Notice of Intent	USACE: U.S. Army Corp of Engineers
NOT: Notice of Termination	USFWS: U.S. Fish and Wildlife Service

Texas Department of Transportation

PHARR DISTRICT

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6			FM1423, etc
STATE	DISTRICT	COUNTY	
TEXAS	PHR	HIDALGO, etc.	
CONTROL	SECTION	JOB	SHEET NO.
1427	01	040, etc.	173

Date Printed: X-X-XX

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. State listed species that may occur in the project area include: Black-spotted newt (Notophthalmus meridionalis), South Texas Siren (large form)(Serin intermedia), Sheep Frog (Hypopachus variolosus), Texas Tortoise (Gopherus berlandien), Texas Indigo Snake (Drymarchon melanurus erebennus), Plains Spotted Skunk (Spilogale putorius interrupta), Speckled Racer (Drymobius margaritiferus), Texas Horned Lizard (Phynosoma cornutum)

   2. Vasey's ayenia (Adelia vaseyi), Large selenia (Selenia grandis), Texas stonecrop (Lenophyllum texanum), Bailey's ballmoss (Tillandsia bailey), Shinner's rocket (Thelypodiopsis shinnersii), Buckley's spiderwart (Tradescantia buckleryi)

VI. Hazardous Materials on Contamination Issues

Action Items Required : ☐ No Action Required

General (applies to all projects):

Comply with the Hazard Communication Act (HCA) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the HCA.

Maintain an adequate supply of on-site spill response materials as indicated in the MSDS. In the event of a spill, take immediate action to mitigate the spill as indicated in the MSDS and in accordance with safe work practices. Contact the TxDOT Pharr District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

- Dead or distressed vegetation (identified as not normal)
- Trash piles, drums, canisters, barrels, etc.
- Undesirable smells or odors
- Evidence of leaching or seepage of contaminant substances

Any other evidence indicating possible hazardous materials or contamination discovered on site.

1. ☒ If potentially hazardous material and/or contaminated media (i.e.: soil, groundwater, surface water, sediment, building materials) are unexpectedly encountered during construction, assure that such materials and contamination are handled according to applicable federal and state regulations, cease work in the immediate area and contact the Engineer immediately.

VI. Hazardous Materials on Contamination Issues - Continued:

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

   ☐ Yes ☒ No

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

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

   ☐ Yes ☐ No

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

   If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

4. ☐ The Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and an Asbestos Consultant in order to minimize construction delays and subsequent claims.

VII. Other Environmental Issues

Action Items Required : ☐ No Action Required

1. ☒ Noise

   Contractor shall make every reasonable effort to minimize construction noise through abatement measures such as work hour controls and proper maintenance of equipment mufflers.

2. ☒ Air

   Contractor shall practice common dust control techniques such as surface chemical treatment or watering of unpaved road surfaces and vehicle speed reduction shall be implemented to minimize and prevent airborne dust during construction.

   Contractor should minimize MSAT by utilizing measures to encourage use of EPA required cleaner diesel fuels, limits on idling, increase use of cleaner burning diesel engines, and other emission limitation techniques, as appropriate.

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

List of Abbreviations

BMP: Best Management Practice	NWP: Nationwide Permit
CGP: Construction General Permit	PCN: Pre-Construction Notification
CRPe: Contractor Responsible Person Environmental	PSL: Project Specific Location
DSHS: Texas Department of State Health Services	SPCC: Spill Prevention Control and Countermeasure
FEMA: Federal Emergency Management Agency	SW3P: Storm Water Pollution Prevention Plan
FHWA: Federal Highway Administration	TCEQ: Texas Commission on Environmental Quality
MOA: Memorandum of Agreement	THC: Texas Historical Commission
MOU: Memorandum of Understanding	TPDES: Texas Pollutant Discharge Elimination System
MS4: Municipal Separate Stormwater Sewer System	TPWD: Texas Parks and Wildlife Department
MSAT: Mobile Source Air Toxic	TxDOT: Texas Department of Transportation
MBTA: Migratory Bird Treaty Act	T&E: Threatened and Endangered Species
NOI: Notice of Intent	USACE: U.S. Army Corp of Engineers
NOT: Notice of Termination	USFWS: U.S. Fish and Wildlife Service

Texas Department of Transportation

PHARR DISTRICT

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

SHEET 2 OF 2

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6			FM1423, etc.
STATE	DISTRICT	COUNTY	
TEXAS	PHR	HIDALGO, etc.	SHEET NO.
CONTROL	SECTION	JOB	
1427	01	040, etc.	174

Date Printed: X-X-XX

TPWD BMPs

The Programmatic Agreement defines Best Management Practices (BMPs) to be implemented by Texas Department of Transportation (TxDOT) per §2.213 (Programmatic Agreements) of the 2017 Memorandum of Understanding (MOU) between TxDOT and Texas Parks and Wildlife Department (TPWD). These BMPs are measures that TxDOT and TPWD agree will result in avoidance and minimization of potential impacts to natural resources and in some cases apply to particular types of TxDOT projects.

The purpose of this section is to provide BMPs to minimize impacts to species or groups of species. Implementation of these BMPs by TxDOT eliminates the need for coordination under §2.206(1)of the MOU, except as noted.

Due diligence should be used to avoid killing or harming any wildlife species in the implementation of TxDOT projects.

☒ Bird BMPs (Required)

In addition to complying with the Migratory Bird Treaty Act (MBTA) perform the following BMPs:

- ☒ Prior to construction, perform daytime surveys for nests including under bridges and in culverts to determine if they are active before removal. Nests that are active should not be disturbed.
- ☒ Do not disturb, destroy, or remove active nests, including ground nesting birds, during the nesting season.
- ☒ Avoid the removal of unoccupied, inactive nests, as practicable.
- ☒ Prevent the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair.
- ☒ Do not collect, capture, relocate, or transport birds, eggs, young, or active nests without a permit.

☐ Bald Eagle *(Haliaeetus leucocephalus)*

- ☐ Bird BMPs and Bald and Golden Eagle Protection Act compliance

☐ Reddish Egret *(Egretta rufescens)* or
☐ White-faced Ibis *(Plegadis chihi)*

- ☐ Bird BMPs unless project is within 300 meters (984 feet)of a known colonial water bird rookery then coordinate with TPWD.

☐ Rookeries (Recommendations)

In general, nesting dates for herons and egrets range from early February to late August in Texas, depending on the species. Great Blue Herons (GBHE) are usually the first to nest. When GBHE get disrupted from the nest and abandon nesting, then the other species of herons and egrets may not attempt to nest at the colony that year. Breeding dates for rookery species are approximately as follows:

Species	Dates
Cattle Egret	Early April to late October
Little Blue Heron	Late March to late July
Snowy Egret	Late March to early August
Great Egret	Early March to early August
Black-crowned Night Heron	Early February to late July
Great Blue Heron	February to late August

☐ Rookeries (Recommendations) (Continued)

- ☐ Vegetation clearing in a primary buffer area of 300 meters (984 feet) from a heronry periphery should be avoided. Utilizing areas that have already been cleared within this buffer area may be acceptable depending on site-specific characteristics. Additionally, human foot-traffic or machinery use should not occur within this buffer area during the nesting season.
- ☐ Clearing activities or construction using heavy machinery in a secondary buffer area of 1,000 meters (3,281 feet) from the heronry periphery should be avoided during the breeding season (courting and nesting).

☐ Bat BMPs (Required)

To determine the appropriate BMP to avoid or minimize impacts to bats, review the habitat description for the species of interest on the TPWD Rare, Threatened, and Endangered Species of Texas by County List or other trusted resources. All bat surveys and other activities that include direct contact with bats shall comply with TPWD' recommended white-nose syndrome protocols located on the TPWD Wildlife Habitat Assessment Program website under "Project Design and Construction".

The following survey and exclusion protocols should be followed prior to commencement of construction activities. For the purposes of this document, structures are defined as bridges, culverts (concrete or metal), wells, and buildings.

- ☐ For activities that have the potential to impact structures, cliffs or caves, or trees; a qualified biologist will perform a habitat assessment and occupancy survey of the feature(s) with roost potential as early in the planning process as possible or within one year before project letting.
- ☐ For roosts where occupancy is strongly suspected but unconfirmed during the initial survey, revisit feature(s) at most four weeks prior to scheduled disturbance to confirm absence of bats.
- ☐ If bats are present or recent signs of occupation (i.e., piles of guano, distinct musky odor, or staining and rub marks at potential entry points) are observed, take appropriate measures to ensure that bats are not harmed, such as implementing non-lethal exclusion activities or timing or phasing of construction.
- ☐ Exclusion devices can be installed by a qualified individual between September 1 and March 31. Exclusion devices should be used for a minimum of seven days when minimum nighttime temperatures are above 50°F and minimum daytime temperatures are above 70°F. Prior to exclusion, ensure that alternate roosting habitat is available in the immediate area. If no suitable roosting habitat is available, installation of alternate roosts is recommended to replace the loss of an occupied roost. If alternate roost sites are not provided, bats may seek shelter in other inappropriate sites, such as buildings, in the surrounding area. See Additional Bat BMPs (Recommendations) for recommended acceptable methods for excluding bats from structures.
- ☐ If feature(s) used by bats are removed as a result of construction, replacement structures should incorporate bat-friendly design or artificial roosts should be constructed to replace these features, as practicable.
- ☐ Conversion of property containing cave or cliff features to transportation purposes should be avoided where feasible.

☐ Bat BMPs (Required)(Continued)

- ☐ Avoid unnecessary removal of dead fronds on native and ornamental palm trees in south Texas (Cameron, Hidalgo, Willacy, Kenedy, Brooks, Kleberg, Nueces, and San Patricio counties) from April 1st through October 31st. If removal of dead fronds is necessary at other times of the year, limit frond removal to extended warm periods (nighttime temperatures: 55°F for at least two consecutive nights), so bats can move away from the disturbance and find new roosts.
- ☐ Large hollow trees, snags (dead standing trees), and trees with shaggy bark should be surveyed for colonies and, if found, should not be disturbed until the bats are no longer occupying these features. Post-occupancy surveys should be conducted by a qualified biologist prior to tree removal from the landscape.
- ☐ Retain mature, large diameter hardwood forest species and native/ornamental palm trees where feasible.
- ☐ In all instances, avoid harm or death to bats. Bats should only be handled as a last resort and after communication with TPWD.

☐ Mexican Long-tongues Bat *(Choeronycteris mexicana)*

- ☐ Avoid unnecessary impacts to cacti and agave species.
- ☐ Bat BMPs.

☐ Additional Bat BMPs (Recommendations)

- ☐ Bat surveys of structures should include visual inspections of structural fissures (cracked or spalled concrete, damaged or split beams, split or damaged timber railings), crevices (expansion joints, space between parallel beams, spaces above supports piers), and alternative structures (drainage pipes, bolt cavities, open sections between support beams, swallow nests) for the presence of bats.
- ☐ Before excluding bats from any occupied structure, bat species, weather, temperature, season, and geographic location must be incorporated into any exclusion plans to avoid unnecessary harm or death to bats. Winter exclusion must entail a survey to confirm either, 1) bats are absent or 2) present but active (i.e. continuously active - not intermittently active due to arousals from hibernation).
- ☐ Avoid using materials that degrade quickly, like paper, steel wool or rags, to close holes.
- ☐ Avoid using products or making structural modifications that may block natural ventilation, like hanging plastic sheeting over an active roost entrance, thereby altering roost microclimate.
- ☐ Avoid using chemical and ultrasonic repellents.
- ☐ Avoid use of silicone, polyurethane or similar non-water-based caulk products.
- ☐ Avoid use of expandable foam products at occupied sites.
- ☐ Avoid the use of flexible netting attached with duct tape.

Pharr District Contact No. 956-702-6100

Revised 07/12/2017

List of Abbreviations

BMP: Best Management Practice
CGP: Construction General Permit
CRPe: Contractor Responsible Person Environmental
DSHS: Texas Department of State Health Services
FEMA: Federal Emergency Management Agency
FHWA: Federal Highway Administration
MOA: Memorandum of Agreement
MOU: Memorandum of Understanding
MS4: Municipal Separate Stormwater Sewer System
MSAT: Mobile Source Air Toxic
MBTA: Migratory Bird Treaty Act
NOI: Notice of Intent
NOT: Notice of Termination
NWP: Nationwide Permit
PCN: Pre-Construction Notification
PSL: Project Specific Location
SPCC: Spill Prevention Control and Countermeasure
SW3P: Storm Water Pollution Prevention Plan
TCEQ: Texas Commission on Environmental Quality
THC: Texas Historical Commission
TPDES: Texas Pollutant Discharge Elimination System
TPWD: Texas Parks and Wildlife Department
TxDOT: Texas Department of Transportation
T&E: Threatened and Endangered Species
USACE: U.S. Army Corp of Engineers
USFWS: U.S. Fish and Wildlife Service

Texas Department of Transportation

PHARR DISTRICT

EPIC SHEET SUPPLEMENTALS

TPWD BMPs

SHEET 1 OF 3

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6			FM1423,etc
STATE	DISTRICT	COUNTY	
TEXAS	PHR	HIDALGO,etc.	SHEET NO.
CONTROL	SECTION	JOB	
1427	01	040,etc.	175

Date Printed: X-X-XX

☐ Additional Bat BMPs (Recommendations) (Continued)

- ☐ In order to avoid entombing bats, exclusion activities should be only implemented by a qualified individual. A qualified individual or company should possess at least the following minimum qualifications:
  - Experience in bat exclusion (the individual, not just the company).
  - Proof of rabies pre-exposure vaccinations.
  - Demonstrated knowledge of the relevant bat species, including maternity season date range and habitat requirements.
  - Demonstrated knowledge of rabies and histoplasmosis in relation to bat roosts.
- ☐ Contact TPWD for additional resources and information to assist in executing successful bat exclusions that will avoid unnecessary harm or death in bats.

☐ Fossorial Mammal BMPs (Required)

- ☐ If black-tailed prairie dog (BTPD) burrows or pocket gopher mounds are to be excavated/directly impacted coordinate with TPWD WHAB.
- ☐ When a construction zone is adjacent to active BTPD burrows or pocket gopher mounds, erect barriers to discourage individuals moving through or into the construction area.
- ☐ When seeding or revegetation is planned in an area adjacent to BTPD burrows or pocket gopher mounds, a vegetative barrier should be considered in the planting to discourage dispersal into the ROW.

☐ Coues' Rice Rat *(Oryzomys couesi)*

- ☐ Minimize impacts to wetland, Resaca, oxbow lakes, and marsh habitats.
- ☐ Contractors will be advised of potential occurrence in the project area and to avoid harming the species if encountered.
- ☐ Water Quality BMPs.

☒ Plains Spotted Skunk *(Spilogale putorius interrupta)* or
☐ Swift Fox *(Vulpes velox)*

- ☒ Contractor will be advised of potential occurrence in the project area and to avoid harming the species if encountered and to avoid unnecessary impacts to dens.

☐ White nosed Coati *(Nasua narica)*/
☐ Yellow nosed Cotton Rat *(Sigmodon ochrognathus)*

- ☐ Contractors will be advised of potential occurrence in the project area and to avoid harming the species if encountered.

☒ Terrestrial Reptile BMPs (Required)

- ☒ Apply hydro mulching and/or hydro seeding in areas for soil stabilization and/or revegetation of disturbed areas where feasible. If hydro mulching and/or hydro seeding are not feasible due to site conditions, utilize erosion control blankets or mats that contain no netting or contain loosely woven, natural fiber netting is preferred. Plastic netting should be avoided to the extent practicable.
- ☒ For open trenches and excavated pits, install escape ramps at an angle of less than 45 degrees (1 :1) in areas left uncovered. Visually inspect excavation areas for trapped wildlife prior to backfilling.
- ☒ Inform contractors that if reptiles are found on project site allow species to safely leave the project area.
- ☐ Avoid or minimize disturbing or removing downed trees, rotting stumps, and leaf litter where feasible.
- ☒ Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered.

☒ Texas Tortoise *(Gopherus berlandieri)*

- ☒ Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered.
- ☒ Utility trenches should be covered overnight or visually inspected before filling to avoid burial of the species.
- ☒ Terrestrial Reptile BMPs.

☒ Texas Horned Lizard *(Phrynosoma cornutum)*

- ☒ Avoid harvester ant mounds in the selection of Project Specific Locations (PSLs) where feasible.
- ☒ Terrestrial Reptile BMPs.

☒ Additional Reptile BMPs (Recommendations)

- ☒ Due to increased activity (mating) of reptiles during the spring, construction activities like clearing or grading should attempt to be scheduled outside of the spring (April-May) season. Also, timing ground disturbing activities before October when reptiles become less active and may be using burrows in the project area is also encouraged.
- ☒ When designing roadways with curbs, consider using Type I or Type III curbs to provide a gentle slope to enable turtles and small animals to get out of roadways.
- ☒ If Texas Tortoises are present in a project area, they should be removed from the area. After removal of the tortoises, the area that will be disturbed during active construction and project specific locations should be fenced off to exclude tortoises and other reptiles. The exclusion fence should be constructed and maintained as follows:
  a. The exclusion fence should be constructed with metal flashing or drift fence material.
  b. Rolled erosion control mesh material should not be used.
  c. The exclusion fence should be buried at least 6 inches deep and be at least 24 inches high.
  d. The exclusion fence should be maintained for the life of the project and only removed after the construction is completed and the disturbed site has been revegetated.

☒ Amphibian and Aquatic Reptile BMPs (Required)

Unless absence of the species can be demonstrated, assume presence in suitable habitat and implement the following BMPs. Absence can only be demonstrated using TPWD-approved survey efforts (contact TPWD for minimum survey protocols for species and project site conditions).

- ☐ For projects within one mile of a known occupied location or observation of the species recorded from 1980 until the current year and suitable habitat is present, coordinate with TPWD.
- ☐ For new location roadway projects, coordinate with TPWD.
- ☒ For projects within existing right-of-way (ROW) when work is in water or will permanently impact a water feature and potential habitat exists for the target species complete the following:
  a) Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered.
  b) Minimize impacts to wetland, temporary and permanent open water features, including depressions, and riverine habitats.
  c) Maintain hydrologic regime and connections between wetlands and other aquatic features.

Pharr District Contact No. 956-702-6100

☒ Amphibian and Aquatic Reptile BMPs (Continued)

  d) Use barrier fencing to direct animal movements away from construction activities and areas of potential wildlife-vehicle collisions in construction areas directly adjacent, or that may directly impact, potential habitat for the target species.
  e) Apply hydromulching and/or hydroseeding in areas for soil stabilization and/or revegetation of disturbed areas where feasible. If hydromulching and/or hydroseeding are not feasible due to site conditions, using erosion control blankets or mats that contain no netting, or only contain loosely woven natural fiber netting is preferred. Plastic netting should be avoided to the extent practicable.
  f) Project specific locations (PSLs) proposed within state-owned ROW should be located in uplands away from aquatic features.
  g) When work is directly adjacent to the water, minimize impacts to shoreline basking sites (e.g., downed trees, sand bars, exposed bedrock) and overwinter sites (e.g., brush and debris piles, crayfish burrows) where feasible.
  h) Avoid or minimize disturbing or removing downed trees, rotting stumps, and leaf litter, which may be refugia for terrestrial amphibians, where feasible.
  i) If gutters and curbs are part of the roadway design, where feasible install gutters that do not include the side box inlet and include sloped (i.e. mountable) curbs to allow small animals to leave roadway. If this modification to the entire curb system is not possible, install sections of sloped curb on either side of the storm water drain for several feet to allow small animals to leave the roadway. Priority areas for these design recommendations are those with nearby wetlands or other aquatic features.

☐ For projects that require acquisition of additional ROW and work within that new ROW is in water or will permanently impact a water feature, implement a) - i) above plus j) -l) below, where applicable:

  j) For sections of roadway adjacent to wetlands or other aquatic features, install wildlife barriers that prevent climbing. Barriers should terminate at culvert openings in order to funnel animals under the road. The barriers should be of the same length as the adjacent feature or 80 feet long in each direction, or whichever is the lesser of the two.
  k) For culvert extensions and culvert replacement/installation, incorporate measures to funnel animals toward culverts such as concrete wingwalls and barrier walls with overhangs.
  l) When riprap or other bank stabilization devices are necessary, their placement should not impede the movement of terrestrial or aquatic wildlife through the water feature. Where feasible, biotechnical streambank stabilization methods using live native vegetation or a combination of vegetative and structural materials should be used.

Revised 07/12/2017

List of Abbreviations

BMP: Best Management Practice	MSAT: Mobile Source Air Toxic	TCEQ: Texas Commission on Environmental Quality
CGP: Construction General Permit	MBTA: Migratory Bird Treaty Act	THC: Texas Historical Commission
CRPe: Contractor Responsible Person Environmental	NOI: Notice of Intent	TPDES: Texas Pollutant Discharge Elimination System
DSHS: Texas Department of State Health Services	NOT: Notice of Termination	TPWD: Texas Parks and Wildlife Department
FEMA: Federal Emergency Management Agency	NWP: Nationwide Permit	TxDOT: Texas Department of Transportation
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			FM1423, etc
STATE	DISTRICT	COUNTY	
TEXAS	PHR	HIDALGO, etc.	
CONTROL	SECTION	JOB	SHEET NO.
1427	01	040, etc.	176

Date Printed: X-X-XX

☒ Sheep Frog *(Hypopachus variolosus)*

- ☒ Minimize disturbance to burrows or downed woody debris.
- ☒ Water Quality BMPs.
- ☒ Amphibian BMPs.

☒ South Texas Siren (Large Form) *(Siren sp 1)*

- ☒ Minimize impacts to warm, shallow waters with vegetative cover such as ponds and ditches.
- ☒ Water Quality BMPs.
- ☒ Amphibian BMPs.

☐ Freshwater Mussel BMPs (Required)

- ☐ When work is in the water; survey project footprints for state listed species where appropriate habitat exists.
- ☐ When work is in the water and mussels are discovered during surveys; relocate state listed and SGCN mussels under TPWD authorization and implement Water Quality BMPs.
- ☐ When work is adjacent to the water; Water Quality BMPs implemented as part of the SWPPP for a construction general permit or any conditions of the Section 401 water quality certification for the project will be implemented.

☐ Fish BMPs (Required)

- ☐ For projects within the range of a SGCN or State-Listed fish and work is adjacent to water: Use Water Quality BMPs. No TPWD Coordination required.
- ☐ For projects within the range of a SGCN or State-Listed fish, and work is in the water: TPWD coordination is required.

☒ Water Quality BMPs (Required)

In addition to BMPs required for a TCEQ Storm Water Pollution Prevention Plan and/or Section 401 water quality permit:

- ☒ Minimize the use of equipment in streams and riparian areas during construction. When possible, equipment access should be from banks, bridge decks, or barges.
- ☐ When temporary stream crossings are unavoidable, remove stream crossings once they are no longer needed and stabilize banks and soils around the crossing.

☒ Additional Water Quality BMPs (Recommendations)

- ☒ Wet-Bottomed detention ponds are recommended to benefit wildlife and downstream water quality. Consider potential wildlife-vehicle interactions when siting detention ponds.
- ☐ Rubbish found near bridges on TxDOT ROW should be removed and disposed of properly to minimize the risk of pollution. Rubbish does not include brush piles or snags.

☐ Aquatic Mitigation (Recommendations)

- ☐ In-kind compensatory mitigation should be considered for all unavoidable impacts to aquatic resources including, but not limited to streams, wetlands, oysters, seagrass and mudflats, regardless of their jurisdictional status.
- ☐ Compensatory mitigation plans should be developed in consultation with TPWD Transportation Conservation Coordinator.

☐ Stream Crossings (Recommendations)

- ☐ Use spanning bridges rather than culverts when feasible.
- ☐ If using a culvert, staggered culverts that concentrate low flows but provide conveyance of higher flows through staggered culverts placed at higher elevations is recommended.
- ☐ Bottomless culverts are recommended to allow for fish and other aquatic wildlife passage in the low flow channel. If bottomless culverts are not feasible, making a low flow channel for fish passage is recommended.
- ☐ Avoid placing riprap across stream channels and instead use alternative stabilization such as biotechnical stream bank stabilization methods including live native vegetation or a combination of vegetative and structural materials. When riprap or other bank stabilization devices are necessary, their placement should not impede the movement of aquatic and terrestrial wildlife underneath the bridge. In some instances, riprap may be buried, back-filled with topsoil and planted with native vegetation.
- ☐ Incorporate bat-friendly design into bridges and culverts.
- ☐ Design bridges for adequate vertical and horizontal clearances under the roadway to allow for terrestrial wildlife to safely pass under the road.
- ☐ A span wide enough to cross the stream and allow for dry ground and a natural surface path under the roadway is encouraged. For culverts, incorporation of an artificial ledge inside the culvert on one or both sides for use by terrestrial wildlife is recommended.
- ☐ Riparian buffer zones should remain undisturbed where possible.

☒ Vegetation BMPs (Recommendations)

- ☒ Minimize the amount of vegetation cleared. Removal of native vegetation, particularly mature native trees and shrubs should be avoided to the greatest extent practicable. Wherever practicable, impacted vegetation should be replaced with in-kind on-site replacement/restoration of native vegetation.
- ☐ To minimize adverse effects, activities should be planned to preserve mature trees, particularly acorn, nut or berry producing varieties. These types of vegetation have high value to wildlife as food and cover.
- ☐ It is strongly recommended that trees greater than 12 inches in diameter at breast height (dbh) that are removed be replaced. TPWD's experience indicates that for ecologically effective replacement, a ratio of three trees for every one (3:1) lost should be provided to the extent practicable either on-site or off-site. Trees less than 12 inches dbh should be replaced at a 1:1 ratio.
- ☐ Replacement trees should be of equal or better wildlife quality than those removed and be regionally adapted native species.
- ☒ When trees are planted, a maintenance plan that ensures at least an 85 percent survival rate after three (3) years should be developed for the replacement trees.
- ☒ The use of any non-native vegetation in landscaping and revegetation is discouraged. Locally adapted native species should be used.
- ☒ The use of seed mix that contains seeds from only locally adapted native species is recommended.
- ☒ Avoid vegetation clearing activities during the general bird nesting season, March through August, to minimize adverse impacts to birds.

☒ Invasive Species BMPs (Recommendations)

- ☐ For all work in waters listed in the distribution of Zebra mussels on http://texasinvasives .org/ as well as those waters specified in 31 TAC §57.972 and any TPWD emergency orders regarding prevention of the spread of Zebra mussels all machinery, equipment, or vehicles coming in contact with such waters should follow clean/drain/dry protocols to prevent the potential spread of invasive Zebra mussels.
- ☐ Care should be taken to avoid the spread of aquatic invasive plants (such as Giant Salvinia, Hydrilla, Hyacinth, Watermilfoil, Water Lettuce, and Alligatorweed) from infested water bodies into areas not currently infested. All machinery/equipment/vehicles coming in contact with waters containing aquatic invasive plant species should follow clean/drain/dry protocols to prevent the potential spread of invasive plants.
- ☒ Colonization by invasive plants should be actively prevented on disturbed sites in terrestrial habitats. Vegetation management should include removing invasive species as soon as practical while allowing the existing native plants to revegetate the disturbed areas. If using hay bales for sediment control, use locally grown weed-free hay to prevent the spread of invasive species. Leave the hay bales in place and allow them to break down, as this acts as mulch assisting in revegetation.

☐ Wildlife Crossings (Recommendations)

- ☐ Design roadways on new location to incorporate wildlife crossings, particularly in areas that bisect wildlife travel corridors or seasonal movement routes.
- ☐ Consider using cable median barrier instead of concrete traffic barrier when feasible to increase permeability for animals encountering barriers.

Pharr District Contact No. 956-702-6100

Revised 07/12/2017

Date Printed: X-X-XX

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 3 OF 3

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6			FM1423, etc.
STATE	DISTRICT	COUNTY	
TEXAS	PHR	HIDALGO, etc.	SHEET NO.
CONTROL	SECTION	JOB	
1427	01	040, etc.	177

SITE DESCRIPTION

PROJECT LIMITS:
VARIOUS

PROJECT SITE MAPS:
- *Project Location Map: Pharr District Map (Sheet LOC
- *No Drainage Patterns: No Drainage Area Maps
- *Approx. Slopes Anticipated After Major Gradings and Areas of Soil Distrubance: Typ Sects (Sheets $TYPBTM$P9I$
- *Major Controls and Locations of Stabilization Practices: SW3P Site Map Sheets (Sheets $SW3P$
- *Project Specific Locations: To be specified by Project Field Office and located in the Project SW3P File
- *No Surface Waters and Discharge Locations: No Drainage and Culvert Layout Sheets

PROJECT DESCRIPTION: Construction and upgrading of a non-freeway road facility consisting of: Seal coat & pavement markings.

MAJOR SOIL DISTURBING ACTIVITIES: Preparing right of way facility erosion & sediment controls.

TOTAL PROJECT AREA: VARIOUS LOCATIONS

TOTAL AREA TO BE DISTURBED: N/A

WEIGHTED RUNOFF COEFFICIENT: N/A

EXISTING CONDITION OF SOIL & VEGETATIVE N/A

NAME OF RECEIVING WATERS: Sardinos Resaca, Edinburg Main Channel, North floodway, various drainage ditches

ENDANGERED SPECIES, DESIGNATED CRITICAL HABITAT AND HISTORICAL PROPERTY:
A. For a list of species please refer to the EPIC sheet

or

If bats are present, take appropriate measures as practical to ensure that bats are not harmed such as exclusion or timing activities. For maternity colonies, exclusion activities should be timed to avoid separating lactating females from nursing pups. If trees used by bats are removed as a result of construction, trees should be relocated. Avoid unnecessary removal of dead fronds on native and ornamental palm trees. Large hollow trees should be surveyed for maternity colonies and, if found, should not be disturbed until after the pups fledge.

Note: Designer shall supply statement A. or B. only.

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. IH2
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
- ___ STORM INLET SEDIMENT TRAP
- ___ STONE OUTLET STRUCTURES
- ___ CURBS AND GUTTERS
- ___ STORM SEWERS
- ___ VELOCITY CONTROL DEVICES
- ___ OTHER: (Specify Practice)

STORM WATER MANAGEMENT: N/A

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. Install SW3P devices as shown in the plans and as directed.
3. Begin phase construction as shown in the plans.
4. Update and maintain SW3P devices as shown in the plans and as directed during phase construction.
5. Complete phase construction and sod disturbed areas ready for stabilization.
6. Install, update and maintain SW3P devices during all subsequent phases of construction.
7. Permanently stabilize all disturbed areas as shown in the plans. Remove all remaining SW3P devices once the vegetation has reached an acceptable growth.

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, 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 required, 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
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER

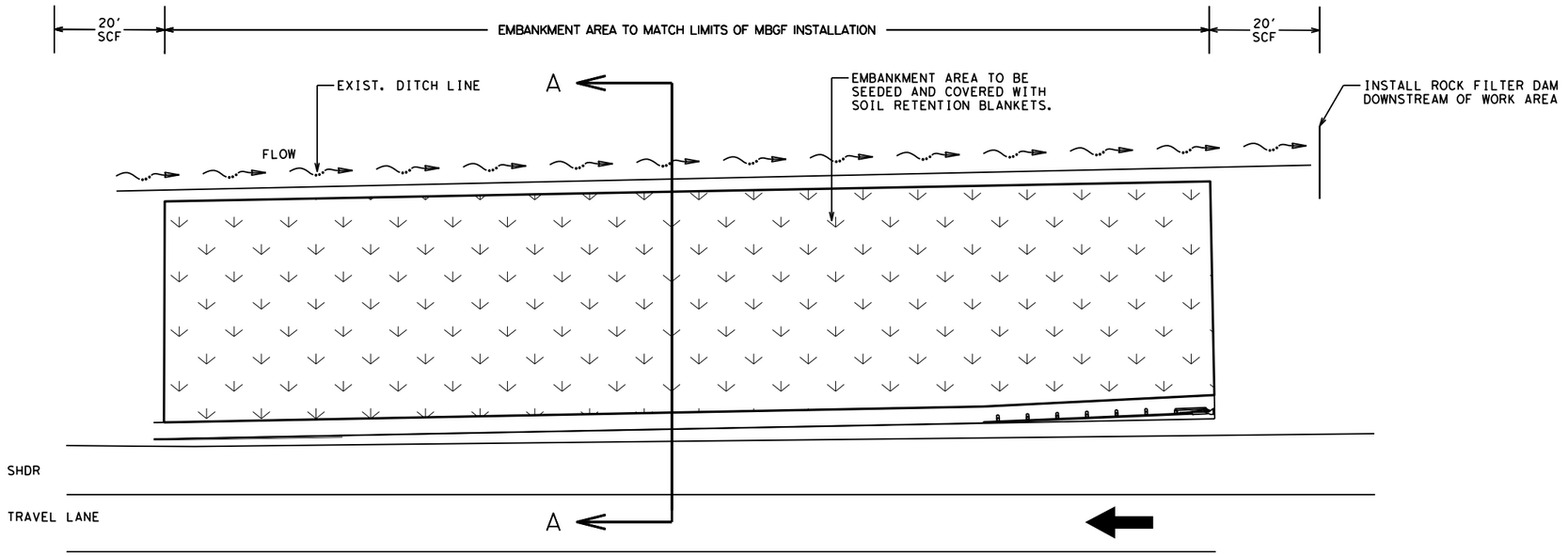
02/25/2020
, P.E.
Signature of Registrant & Date

Texas Department of Transportation

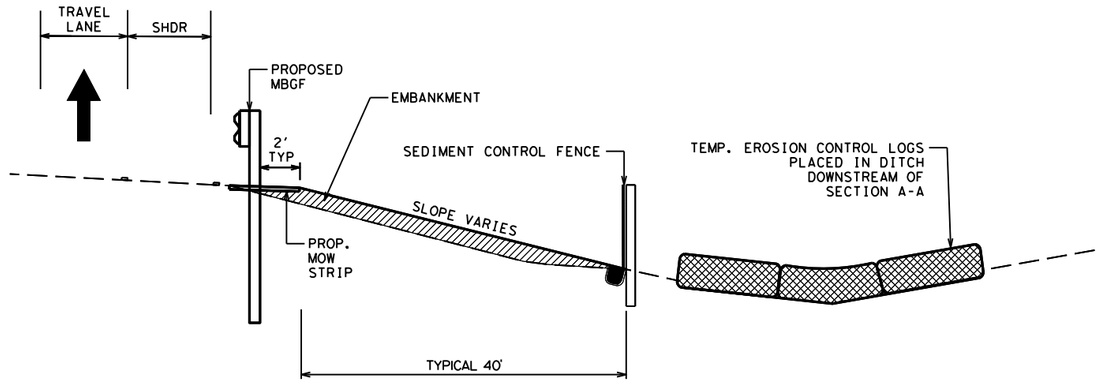
TxDOT STORM WATER POLLUTION PREVENTION PLAN (SW3P)

REV. 2-20-14 SW3P.DGN

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			178
STATE	DIST.	COUNTY	
TEXAS	PHARR	HIDALGO, etc.	
CONT.	SECT.	JOB	HIGHWAY NO.
1427	01	040, etc.	FM1423, etc



PLAN



SECTION A-A

SW3P GENERAL NOTES

1. REFER TO SW3P STANDARD SHEETS FOR DETAILS
2. INSTALLED MEASURES SHALL REMAIN IN PLACE AND INSPECTED WEEKLY. ALL ITEMS SHALL BE MAINTAINED AND REPAIRED THROUGHOUT THE DURATION OF USE. MEASURES WILL BE REMOVED WHEN NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER
3. INSTALLATION OF SW3P MEASURES WILL BE AS SHOWN AND MODIFIED TO ACCOMODATE ACTUAL FIELD CONDITIONS
4. REFER TO PROJECT LAYOUT FOR EMBANKMENT AREA / MBGF INSTALLATION LOCATIONS.
5. EMBANKMENT MATERIAL WILL NOT PAY DIRECTLY . THIS WILL BE SUBSIDARY TO ITEM 132 RIP RAP MOWSTRIP

SW3P LEGEND

- TRAFFIC FLOW DIRECTIONAL ARROW
- DRAINAGE FLOW ARROW
- ROCK FILTER DAM
- TEMPORARY SEDIMENT CONTROL FENCE
- EMBANKMENT / SEEDING / SOIL RETENTION BLANKET

STATE OF TEXAS
ATIDIO R. GARZA
93834
LICENSED
PROFESSIONAL ENGINEER
P.E.
02/25/2020

Pharr District Central Design

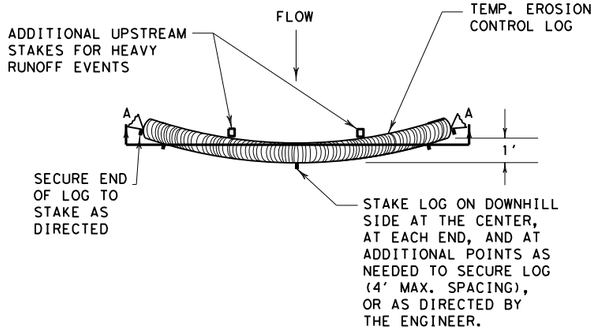
Texas Department of Transportation

SW3P TYPICAL AT MBGF

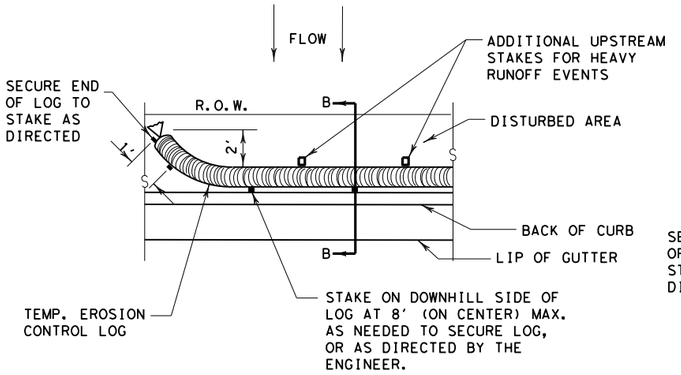
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
1427	01	040, etc.	FM1423, etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO, etc.		179

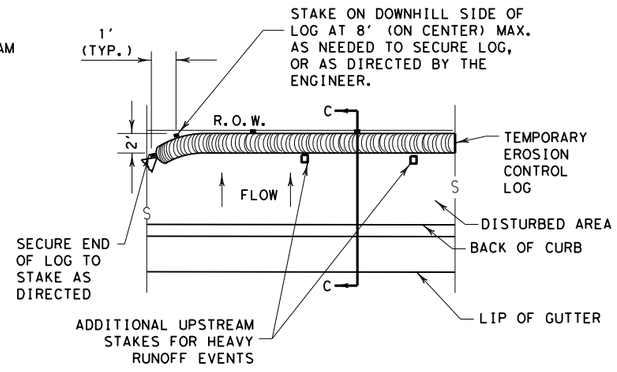
DATE: 2/24/2020 3:47:32 PM
FILE: SW3P_typ at MBGF.DGN



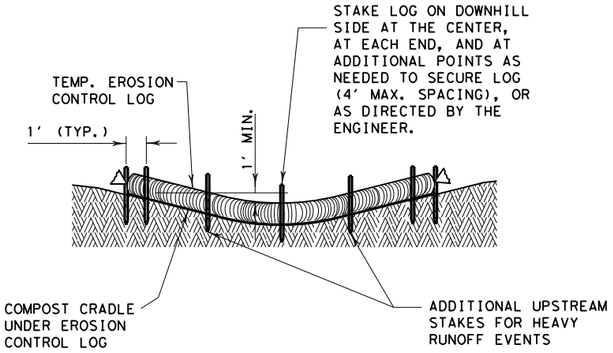
PLAN VIEW



PLAN VIEW



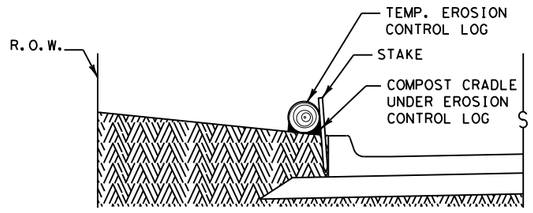
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

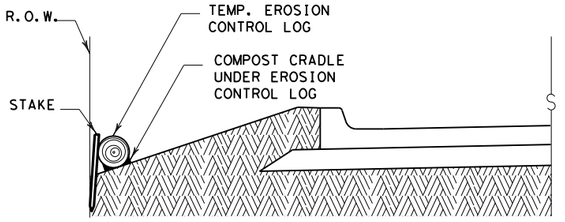
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

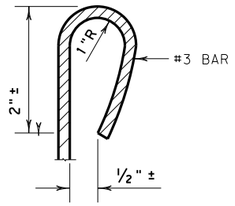
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



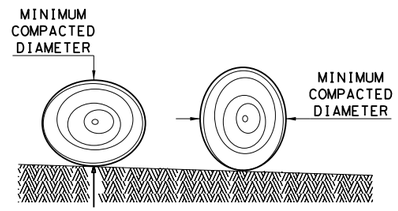
REBAR STAKE DETAIL

LEGEND

- CL-D — EROSION CONTROL LOG DAM
- CL-BOC — EROSION CONTROL LOG AT BACK OF CURB
- CL-ROW — EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- CL-SST — EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
- CL-SSL — EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
- CL-DI — EROSION CONTROL LOG AT DROP INLET
- CL-CI — EROSION CONTROL LOG AT CURB INLET
- CL-GI — EROSION CONTROL LOG AT CURB & GRATE INLET

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

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

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.

DATE: 2/24/2020
FILE: ec916.dgn

Texas Department of Transportation

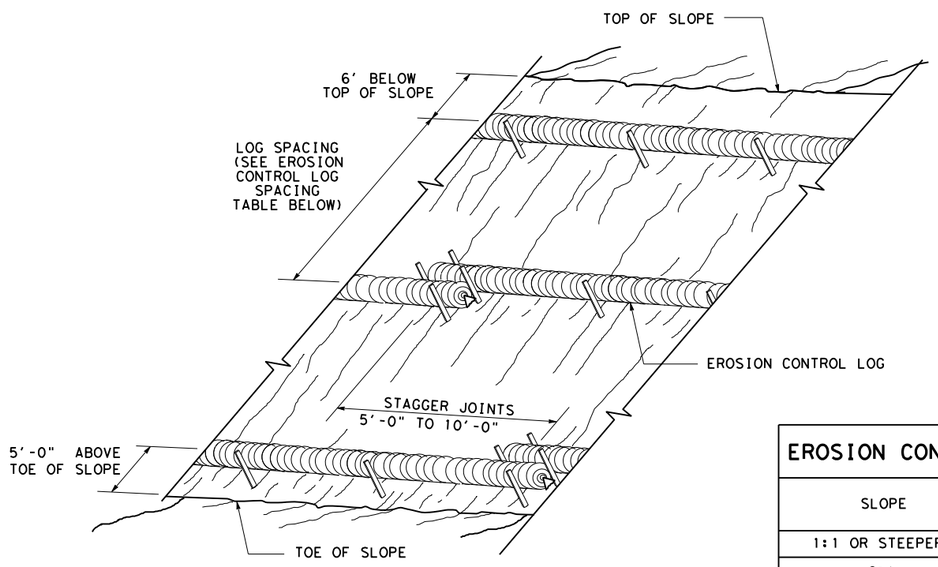
Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

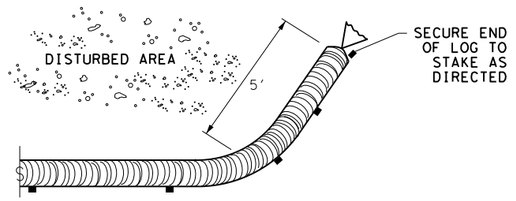
EC(9)-16

FILE: ec916	DN: TxDOT		CK: KM		DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
REVISIONS	1427	01	040, etc.		FM1423, etc.		
	DIST	COUNTY			SHEET NO.		
	PHR	HIDALGO, etc.			180		



EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

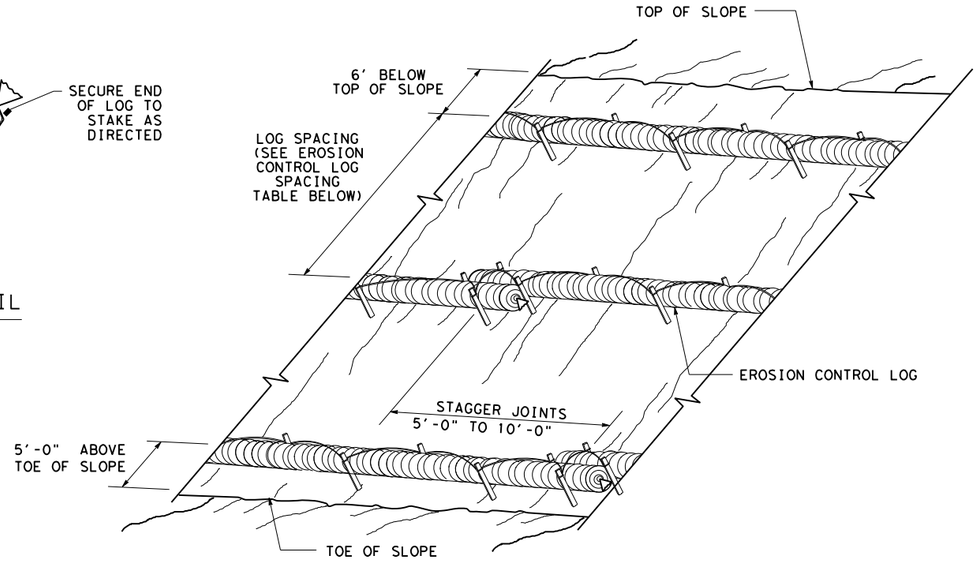
CL-SST



END SECTION RAP DETAIL

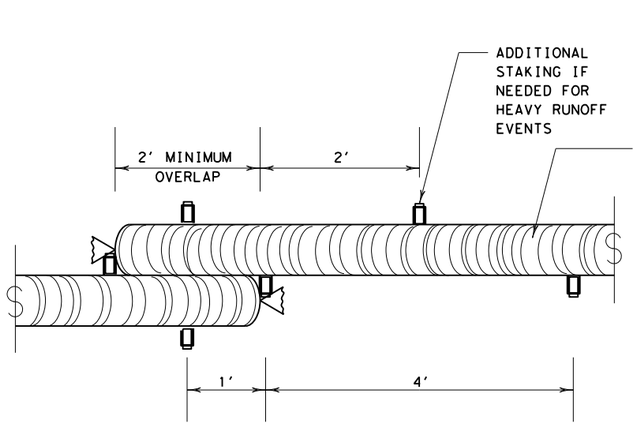
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

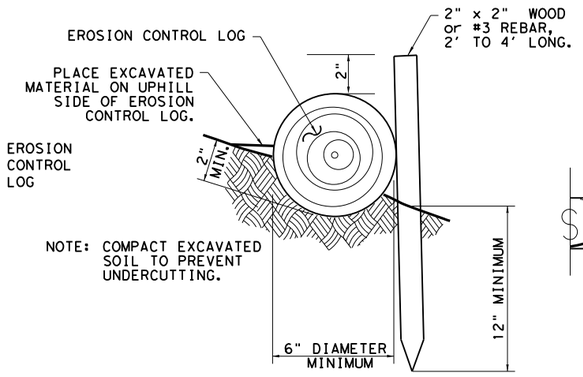
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

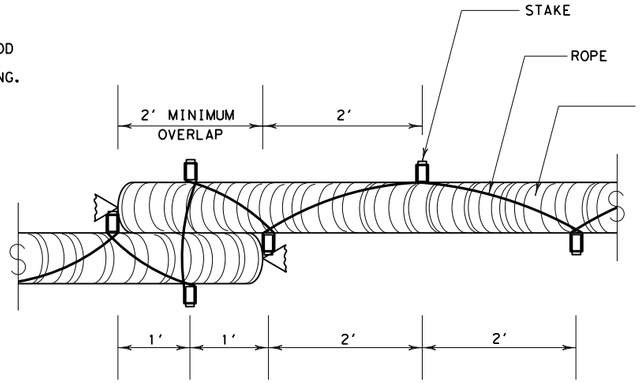


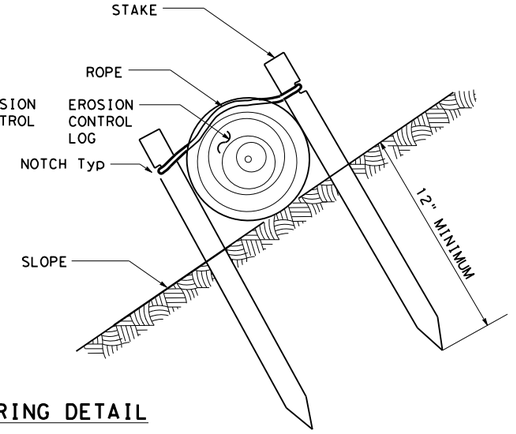


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

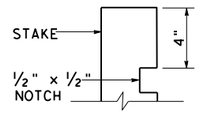
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

SHEET 2 OF 3

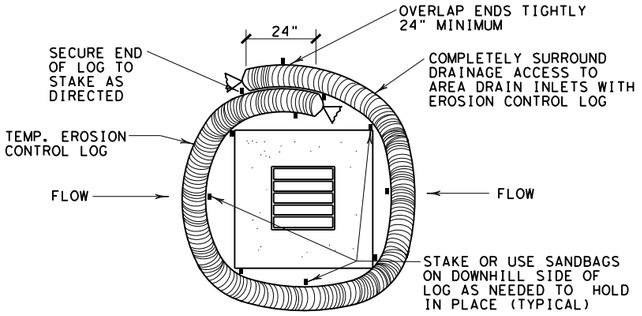
Texas Department of Transportation

Design Division Standard

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

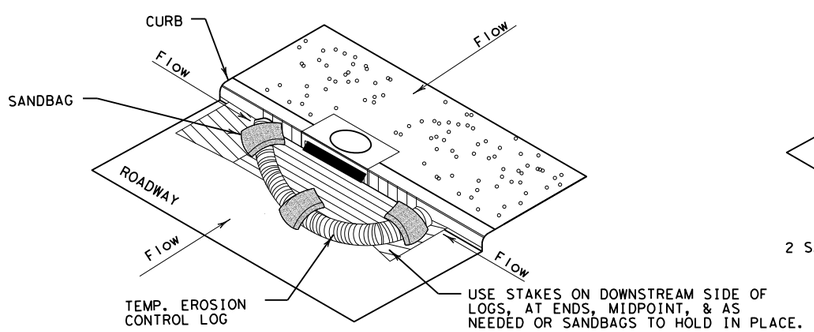
FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040, etc.	FM1423, etc.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO, etc.		181

DATE: 2/24/2020
FILE: ec916.dgn



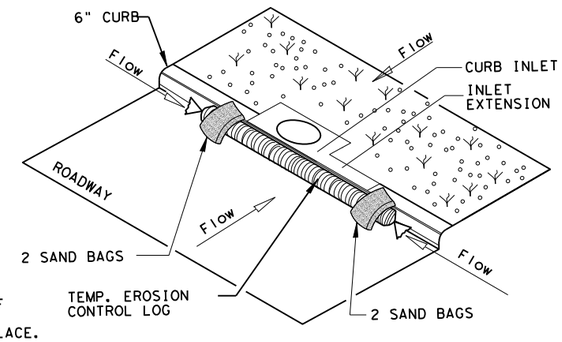
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

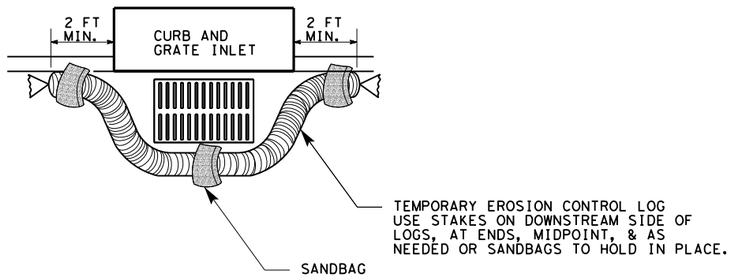
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

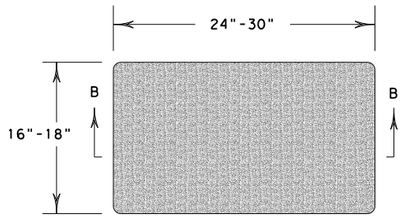
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation

Design Division Standard

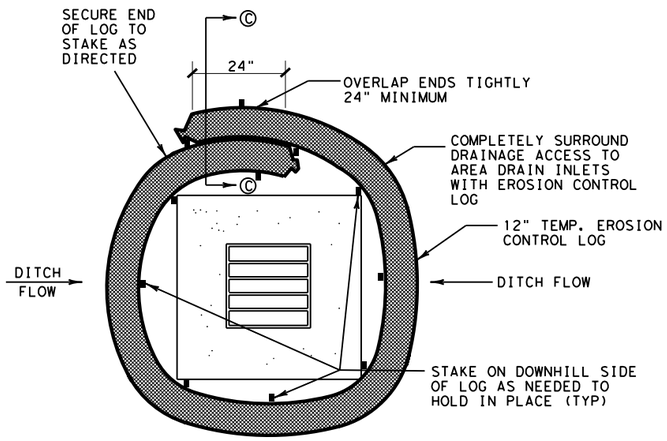
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
	CONT	SECT	JOB	HIGHWAY
REVISIONS	1427	01	040, etc.	FM1423, etc.
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO, etc.		182

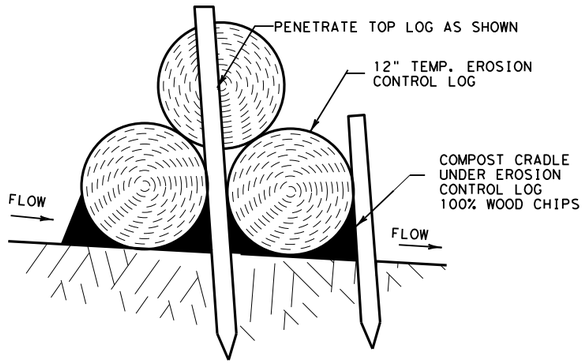
DATE: 2/24/2020
FILE: ec916.dgn



DROP INLET SEDIMENT TRAP

NTS

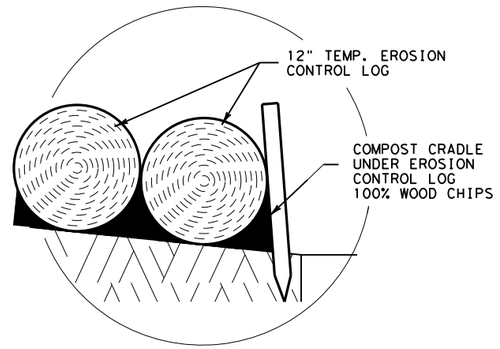
DI-ST



SECTION A-A

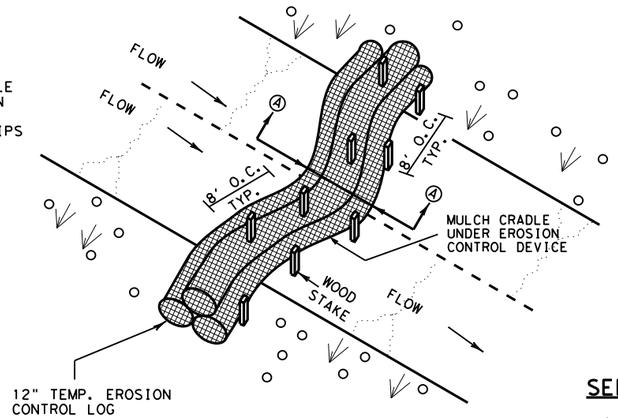
DITCH LINE SEDIMENT TRAP A-A

DL-ST



SECTION C-C

OVERLAP WITH COMPOST CRADLE



DITCH LINE SEDIMENT TRAP

DL-ST

PLANS SHEET LEGEND

DI-ST — DROP INLET SEDIMENT TRAP

DL-ST — DITCH LINE SEDIMENT TRAP

BOCI-ST — BACK OF CURB INLET SEDIMENT TRAP

ROW-ST — RIGHT OF WAY SEDIMENT TRAP

CI-ST — CURB INLET SEDIMENT TRAP

SEDIMENT BASIN & TRAP USAGE GUIDELINES

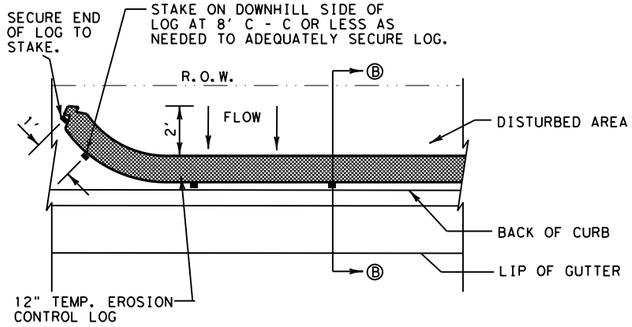
A sediment trap may be used to precipitate sediment out of runoff draining from an unstabilized area.

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

Sediment traps should be placed in the following locations:

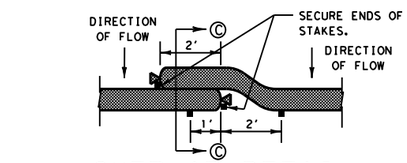
1. Immediately preceding drain inlets
2. Just before the drainage enters a water course
3. Just before the drainage leaves the right of way
4. Just before the drainage leaves the construction limits where drainage flows away from the project

The trap should be cleaned when the capacity has been reduced by ½ or the sediment has accumulated to a depth of 1', whichever is less. Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for seperately.



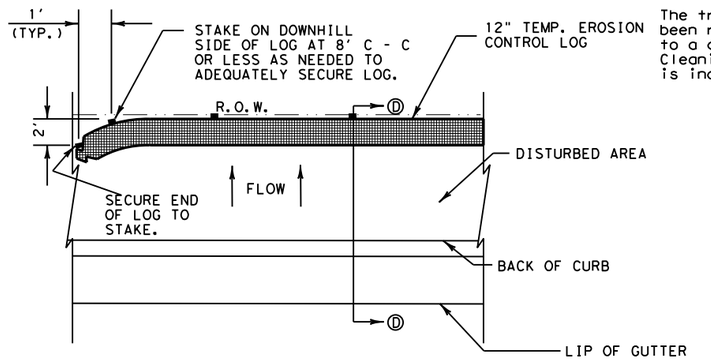
PLAN VIEW

NTS



OVERLAP DETAIL PLAN VIEW

NTS

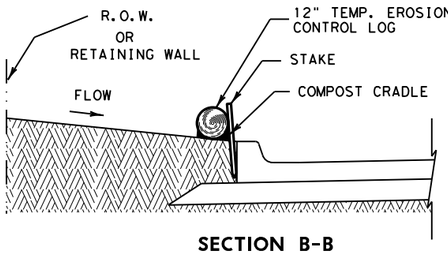


PLAN VIEW

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.

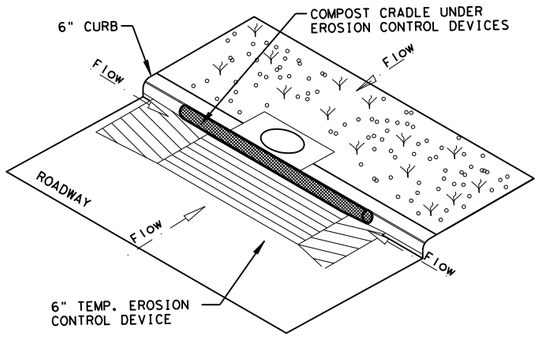


SECTION B-B

BACK OF CURB INLET SEDIMENT TRAP

NTS

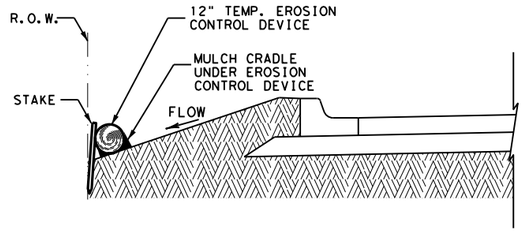
BOCI-ST



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			FM1423, etc.
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	PHARR	HIDALGO, etc.	183
CONTROL	SECTION	JOB	
1427	01	040, 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		