CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		1

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	INDEX OF SHEETS

FINAL PLANS

DATE OF LETTING: _____

DATE WORK BEGAN: _____

DATE WORK COMPLETED: _____

DATE WORK ACCEPTED: _____

FINAL CONTRACT COST: _____

CONTRACTOR: _____

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

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

ANDRES ESPINOZA, P.E.
SAN BENITO AREA ENGINEER

DATE

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

STATE PROJECT NUMBER: C 1057-3-51

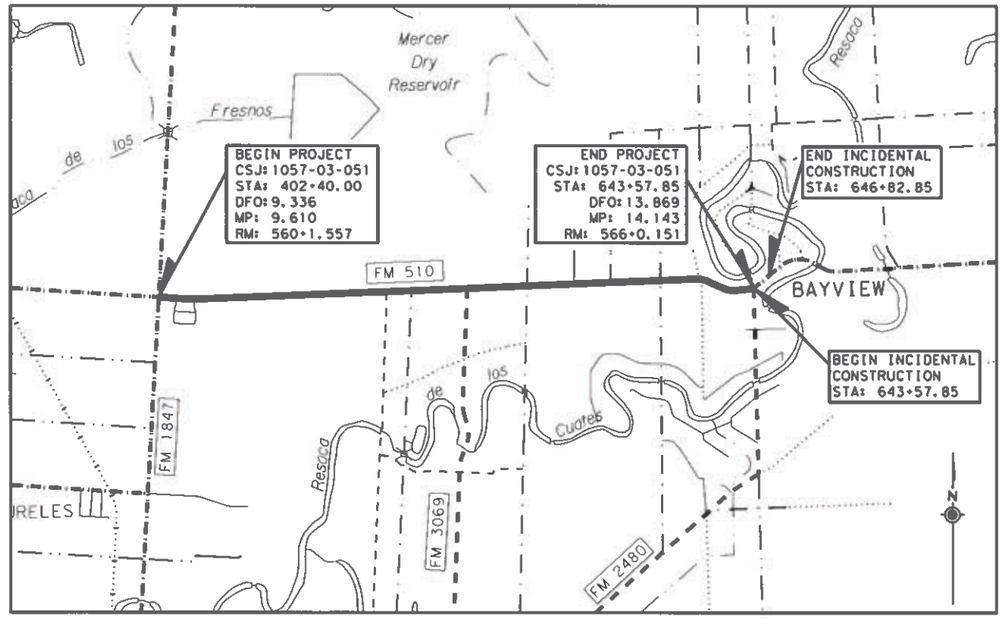
CSJ: 1057-03-051

NET LENGTH OF PROJECT = 24,117.85 FEET = 4.568 MILES

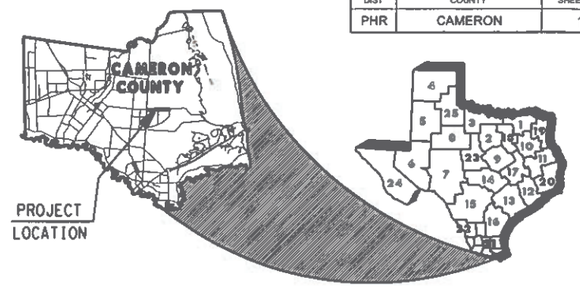
CAMERON COUNTY
FM 510

LIMITS FROM: FM 1847
TO: FM 2480

FOR THE REHABILITATION OF A NON-FREEWAY ROADWAY FACILITY CONSISTING OF GRADING, LIME-STABILIZED SUBGRADE, CEMENT-TREATED FLEXIBLE BASE, ASPHALTIC CONCRETE PAVEMENT, RETROREFECTORIZED PAVEMENT MARKINGS, RAISED PAVEMENT MARKERS, AND OBJECT MARKER ASSEMBLIES.



LOCATION MAP NOT TO SCALE



POSTED SPEED
RURAL: 55 MPH
BAYVIEW: 40 MPH

DESIGN SPEED
RURAL: 55 MPH
BAYVIEW: 40 MPH

HIGHWAY FUNCTIONAL CLASSIFICATION
MAJOR COLLECTOR

TRAFFIC VOLUMES
2021: 4,327 VPD
2041: 6,059 VPD

PERCENT TRUCK: 6.2% ADT

EXCEPTIONS
NONE

EQUATIONS
NONE

RAILROADS
NONE

INCIDENTAL CONSTRUCTION
STA. 643+57.85 TO STA. 646+82.85

CONCURRENCE: DATE: 06/11/2024
CAMERON COUNTY DRAINAGE DISTRICT No. 4

CONCURRENCE: DATE: 06/11/2024
CAMERON COUNTY WATER IMPROVEMENT DISTRICT No. 10

CONCURRENCE: DATE: 06/11/2024
BAYVIEW IRRIGATION DISTRICT No. 11

TDLR INSPECTION NOT REQUIRED

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

RECOMMENDED FOR LETTING: DATE: 7/1/2024

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

SUBMITTED FOR LETTING: DATE: 7/1/2024

DocuSigned by: Andres Espinoza P.E.
936E4CCF321D42E...
SAN BENITO AREA ENGINEER

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DATE: 6/10/2024 4:11:36 PM

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7-10	PROPOSED ROADWAY TYPICAL SECTIONS
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# 74	[S] BC (2)-21
# 75	[S] BC (3)-21
# 76	[S] BC (4)-21
# 77	[S] BC (5)-21
# 78	[S] BC (6)-21
# 79	[S] BC (7)-21
# 80	[S] BC (8)-21
# 81	[S] BC (9)-21
# 82	[S] BC (10)-21
# 83	[S] BC (11)-21
# 84	[S] BC (12)-21
# 85	[S] TCP (2-1)-18
# 86	[S] TCP (2-3)-18
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LEGEND

[S] STATE STANDARDS
[D] DISTRICT STANDARDS

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

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

07/02/24

Pharr District Central Design

Texas Department of Transportation

FM 510
INDEX OF SHEETS

SHEET 1 OF 1

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DW:	CK:	DIST	COUNTY		SHEET NO.
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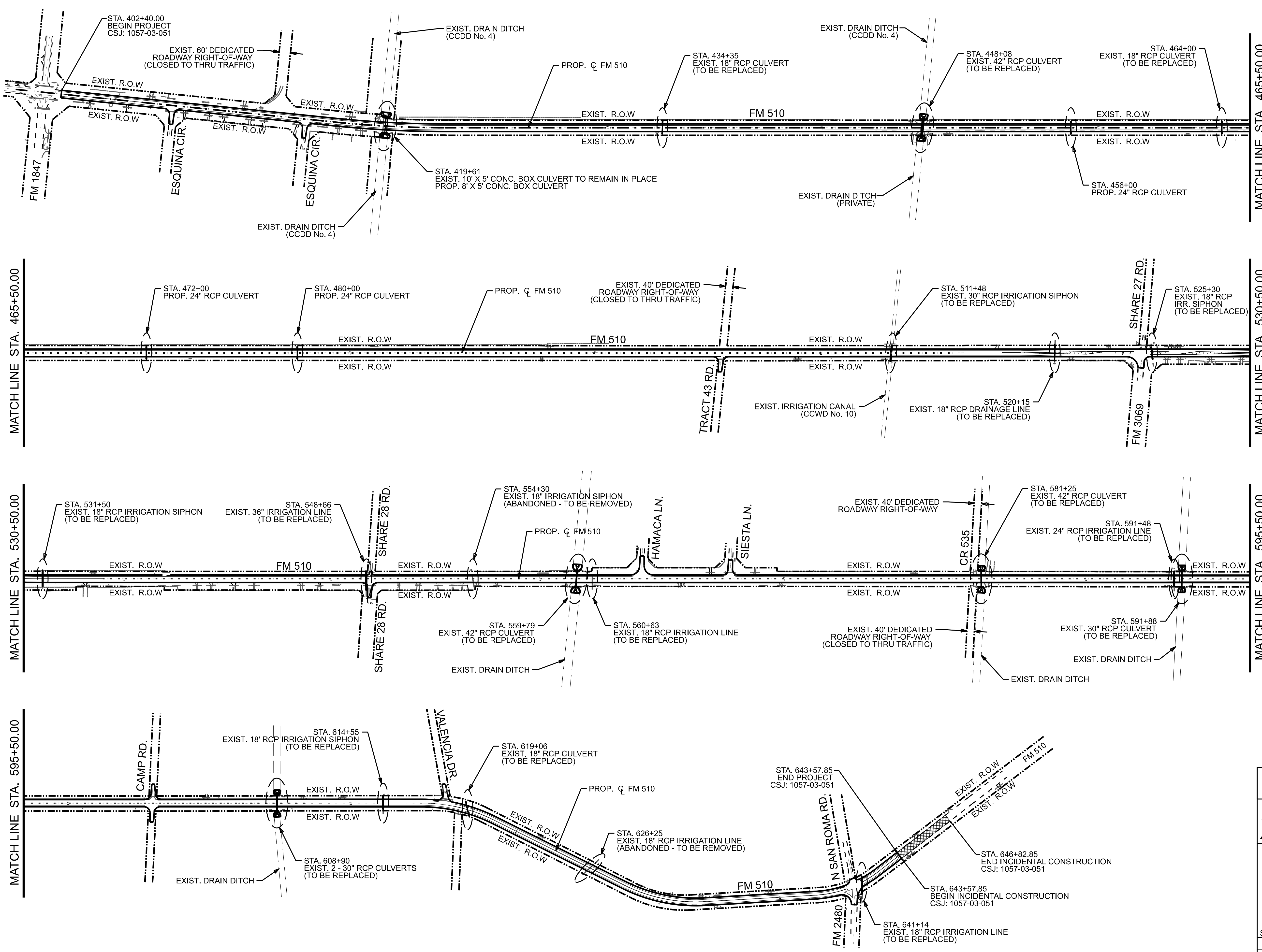

STATE OF TEXAS
JOSE A. RODRIGUEZ
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PROJECT LOCATION LAYOUT

SCALE: 1"=500'

SHEET 1 OF 1

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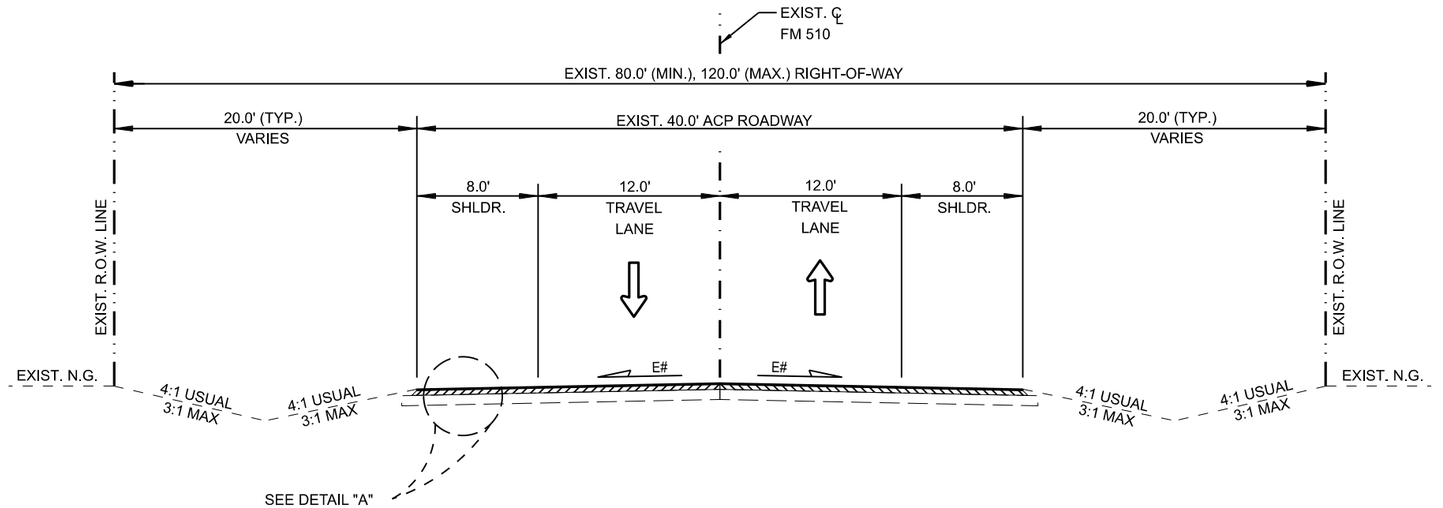
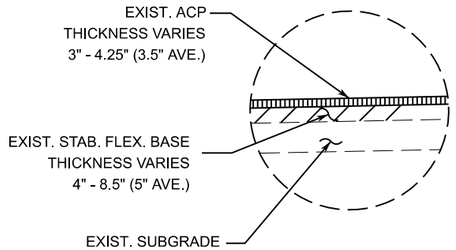


EXISTING ROADWAY TYPICAL SECTION

STA. 402+40.00 TO STA. 416+97.33
STA. 422+82.59 TO STA. 518+25.00
STA. 531+10.00 TO STA. 616+61.44
STA. 620+54.42 TO STA. 628+26.90
STA. 632+68.90 TO STA. 638+56.00
STA. 642+15.85 TO STA. 643+57.85



DETAIL "A"

GENERAL NOTES

THE EXISTING ACP SHALL BE SALVAGED IN ACCORDANCE WITH ITEM 305, ALL RAP SHALL BECOME THE PROPERTY OF THE CONTRACTOR.

THE EXISTING BASE MATERIAL SHALL BE SALVAGED IN ACCORDANCE WITH ITEM 251. ALL SURPLUS BASE MATERIAL SHALL BECOME PROPERTY OF THE CONTRACTOR TO BE HAULED OFF AFTER PROJECT COMPLETION.

A STATION IS EQUIVALENT TO 100 FT.

LEGEND

E#	-	EXISTING CROSS SLOPE
N.G.	-	NATURAL GROUND
STA.	-	STATION
ACP	-	ASPHALTIC CONCRETE PAVEMENT
AVE.	-	AVERAGE
R.O.W.	-	RIGHT-OF-WAY
SHLDR.	-	SHOULDER
B-B	-	BACK-TO-BACK
E-E	-	EDGE-TO-EDGE
C&G	-	CURB & GUTTER
LTL	-	LEFT TURN LANE
MBGF	-	METAL BEAM GUARD FENCE
RDWY.	-	ROADWAY
PVMT.	-	PAVEMENT
TRANS.	-	TRANSITION
⇨	-	DIRECTION OF TRAFFIC FLOW

STATE OF TEXAS
JOSE A. RODRIGUEZ
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06/13/24

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Texas Department of Transportation

FM 510

EXISTING ROADWAY
TYPICAL SECTIONS

SCALE: N.T.S.

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GENERAL NOTES

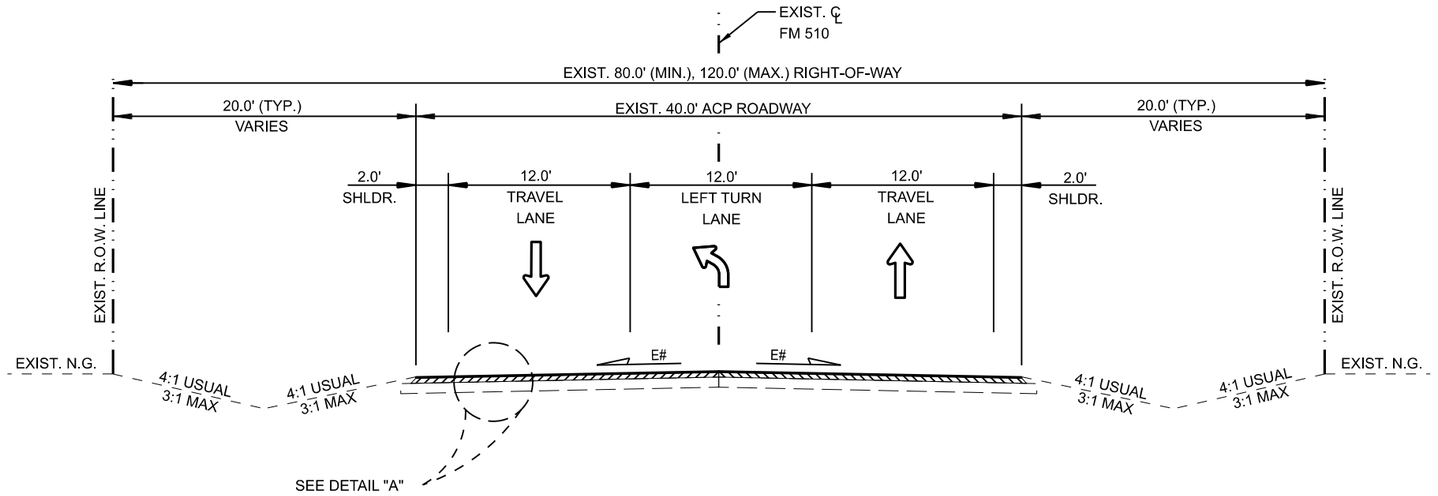
THE EXISTING ACP SHALL BE SALVAGED IN ACCORDANCE WITH ITEM 305, ALL RAP SHALL BECOME THE PROPERTY OF THE CONTRACTOR.

THE EXISTING BASE MATERIAL SHALL BE SALVAGED IN ACCORDANCE WITH ITEM 251. ALL SURPLUS BASE MATERIAL SHALL BECOME PROPERTY OF THE CONTRACTOR TO BE HAULED OFF AFTER PROJECT COMPLETION.

A STATION IS EQUIVALENT TO 100 FT.

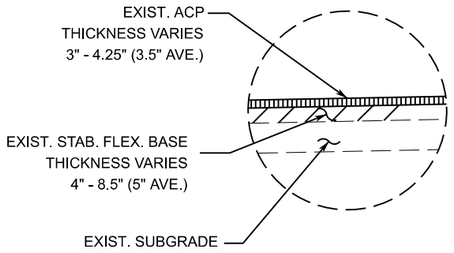
LEGEND

E#	-	EXISTING CROSS SLOPE
N.G.	-	NATURAL GROUND
STA.	-	STATION
ACP	-	ASPHALTIC CONCRETE PAVEMENT
AVE.	-	AVERAGE
R.O.W.	-	RIGHT-OF-WAY
SHLDR.	-	SHOULDER
B-B	-	BACK-TO-BACK
E-E	-	EDGE-TO-EDGE
C&G	-	CURB & GUTTER
LTL	-	LEFT TURN LANE
MBGF	-	METAL BEAM GUARD FENCE
RDWY.	-	ROADWAY
PVMT.	-	PAVEMENT
TRANS.	-	TRANSITION
⇨	-	DIRECTION OF TRAFFIC FLOW



EXISTING ROADWAY TYPICAL SECTION
(EAST-BOUND LEFT-TURN LANE)

STA. 518+25.00 TO STA. 524+78.00



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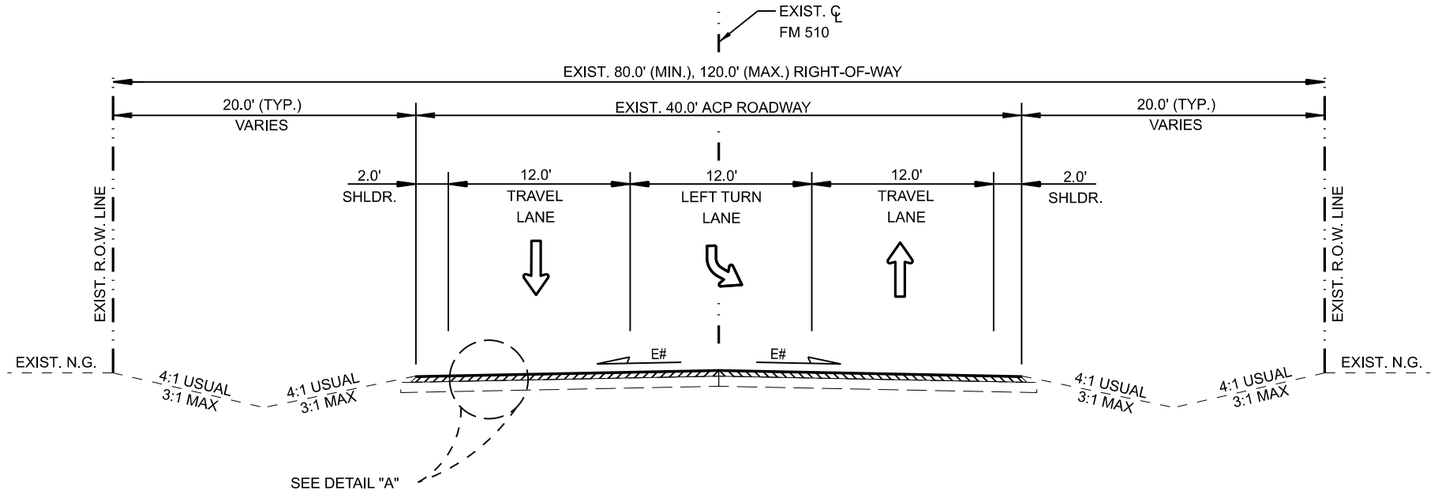

EXISTING ROADWAY TYPICAL SECTION
(WEST-BOUND LEFT-TURN LANE)

STA. 524+78.00 TO STA. 531+10.00

STATE OF TEXAS
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EXISTING ROADWAY
TYPICAL SECTIONS

SCALE: N.T.S.

SHEET 2 OF 3

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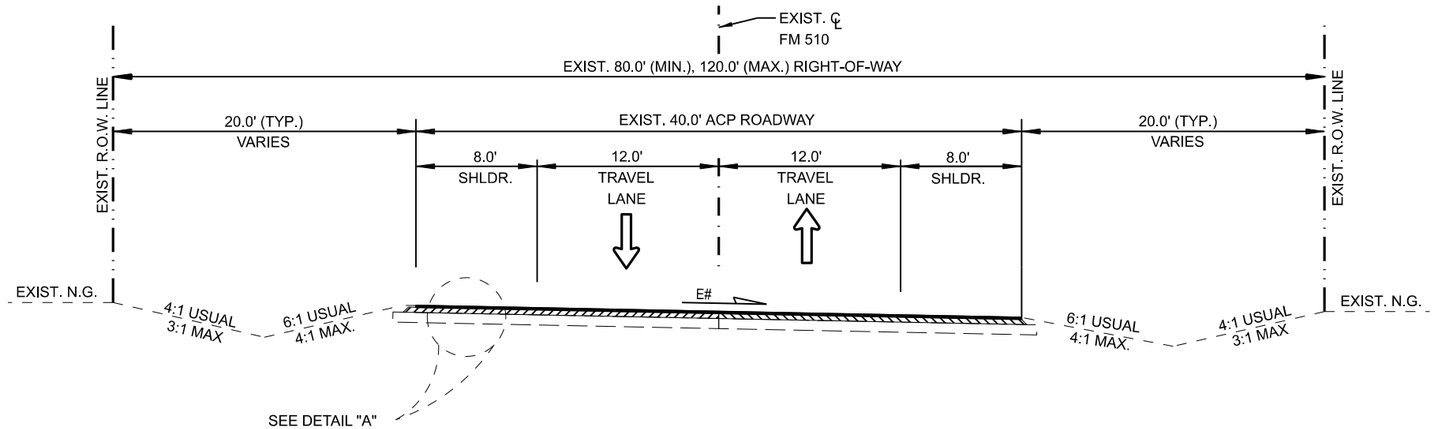
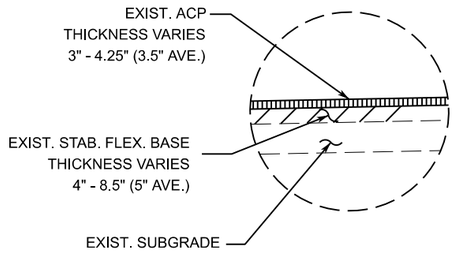


EXISTING ROADWAY SUPERELEVATED
TYPICAL SECTION

STA. 616+61.44 TO STA. 620+54.42



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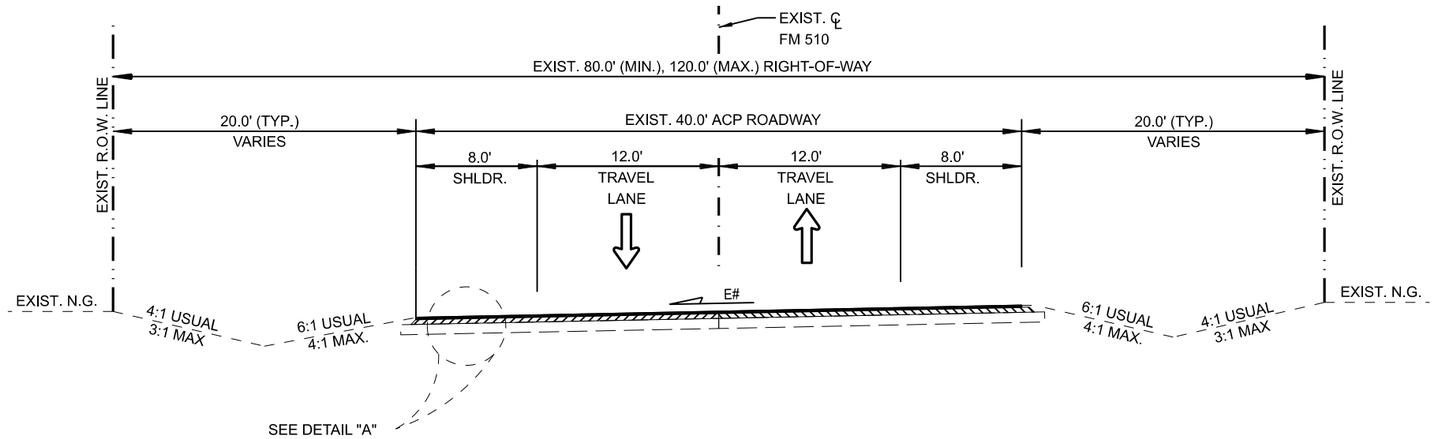

EXISTING ROADWAY SUPERELEVATED
TYPICAL SECTION

STA. 416+97.33 TO STA. 422+82.59
STA. 628+26.90 TO STA. 632+68.90
STA. 638+56.00 TO STA. 642+15.85

GENERAL NOTES

THE EXISTING ACP SHALL BE SALVAGED IN ACCORDANCE WITH ITEM 305, ALL RAP SHALL BECOME THE PROPERTY OF THE CONTRACTOR.

THE EXISTING BASE MATERIAL SHALL BE SALVAGED IN ACCORDANCE WITH ITEM 251. ALL SURPLUS BASE MATERIAL SHALL BECOME PROPERTY OF THE CONTRACTOR TO BE HAULED OFF AFTER PROJECT COMPLETION.

A STATION IS EQUIVALENT TO 100 FT.

LEGEND

E#	-	EXISTING CROSS SLOPE
N.G.	-	NATURAL GROUND
STA.	-	STATION
ACP	-	ASPHALTIC CONCRETE PAVEMENT
AVE.	-	AVERAGE
R.O.W.	-	RIGHT-OF-WAY
SHLDR.	-	SHOULDER
B-B	-	BACK-TO-BACK
E-E	-	EDGE-TO-EDGE
C&G	-	CURB & GUTTER
LTL	-	LEFT TURN LANE
MBGF	-	METAL BEAM GUARD FENCE
RDWY.	-	ROADWAY
PVMT.	-	PAVEMENT
TRANS.	-	TRANSITION
⇨	-	DIRECTION OF TRAFFIC FLOW

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED
PROFESSIONAL ENGINEER

06/13/24

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Texas Department of Transportation

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EXISTING ROADWAY
TYPICAL SECTIONS

SCALE: N.T.S.

SHEET 3 OF 3

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	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
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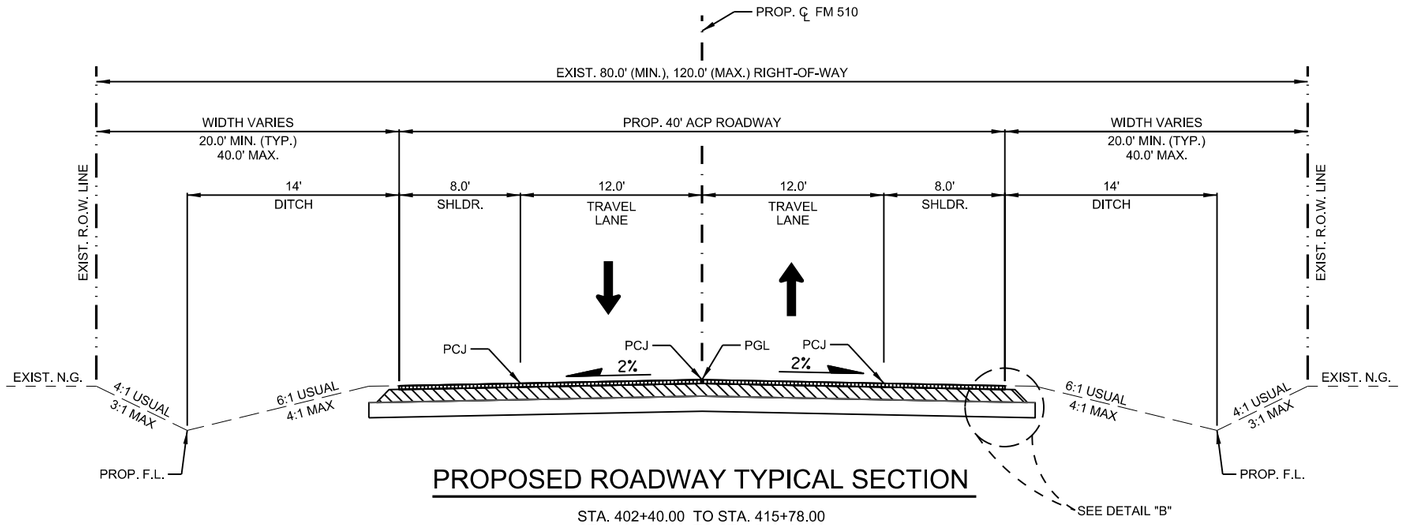
LEGEND

e%	-	SUPERELEVATED CROSS SLOPE
N.G.	-	NATURAL GROUND
STA.	-	STATION
ACP	-	ASPHALTIC CONCRETE PAVEMENT
PGL	-	PROPOSED GRADE LINE
PCJ	-	PERMISSIBLE CONSTRUCTION JOINT
R.O.W.	-	RIGHT-OF-WAY
SHLDR.	-	SHOULDER
E-E	-	EDGE-TO-EDGE
LTL	-	LEFT TURN LANE
RDWY.	-	ROADWAY
PVMT.	-	PAVEMENT
TRANS.	-	TRANSITION
➡	-	DIRECTION OF TRAFFIC FLOW



PROPOSED ROADWAY TYPICAL SECTION

STA. 402+40.00 TO STA. 415+78.00
STA. 424+02.00 TO STA. 518+33.00
STA. 531+07.00 TO STA. 614+88.00
STA. 622+28.00 TO STA. 626+53.00
STA. 634+43.00 TO STA. 637+59.00
STA. 643+12.00 TO STA. 643+57.85

GENERAL NOTES

WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS, THE GOVERNING SLOPES MAY BE VARIED WHEN SPECIFICALLY DIRECTED BY THE ENGINEER.

WHERE POSSIBLE AND UNLESS OTHERWISE DIRECTED BY THE ENGINEER, PERMISSIBLE CONSTRUCTION JOINTS SHALL FALL ON STRIPING LINES AS SHOWN ON THE PAVEMENT MARKING LAYOUTS.

ALL GRADING SHALL BE DONE WITHIN EXISTING RIGHT-OF-WAY LIMITS UNLESS OTHERWISE SPECIFIED IN THE PLANS.

THE SUBGRADE SHALL BE SHAPED, BLADED, ROLLED AND PROOF ROLLED A MINIMUM DISTANCE OF 24" BEYOND THE EDGE OF THE PROPOSED BASE COURSE.

ANY DAMAGES TO EXISTING CROSS CULVERTS OR IRRIGATION CROSSINGS OR STRUCTURES CAUSED BY THE CONTRACTOR SHALL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

UTILITY DEPTHS AND OFFSETS ARE APPROXIMATE AND ARE SHOWN FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY OWNERS TO FIELD VERIFY ALL HORIZONATAL AND VERTICAL LOCATION PRIOR TO COMMENCING WORK.

MIN. COVER OF FOUR (4) INCHES OF NEW FLEX. BASE WILL BE REQUIRED WHERE SALVAGE IS PART OF FLEX BASE.

THE EXISTING BITUMINOUS MATERIAL IS TO BE SALVAGE IN ACCORDANCE WITH ITEM 305.

ANY EXCESS MATERAL SHALL BECOME PROPERTY OF THE CONTRACTOR AND SHALL BE HAULED OFF.

1-COURSE SURF. TREATMENT - ASPH (TIER II)0.30 GAL/SY (APPROX) W/ AGGREGATE (TY-B GR 4P)(SAC-B) AT 1 CY/125 SY

BONDING COURSE RATE OF 0.07 GAL/SY IS APPROXIMATE AND FOR ESTIMATING PURPOSES ONLY. RATE TO BE ADJUSTED IN THE FIELD AS PER SPECIFICATION AND ENGINEER.

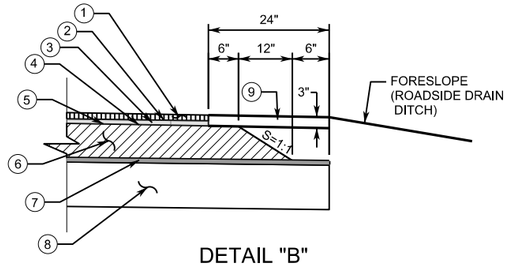
A STATION IS EQUIVALENT TO 100 FT.

114 LBS/SY IS EQUIVALENT TO 1" OF COMPACTED ACP.

EST. PRIME COAT = 0.2 GAL/SY

EST. FLEX. BASE WT. = 3375 LBS/CY (COMPACTED)

EST. SUBGRADE MATL. WT. = 2970 LBS/CY (COMPACTED)

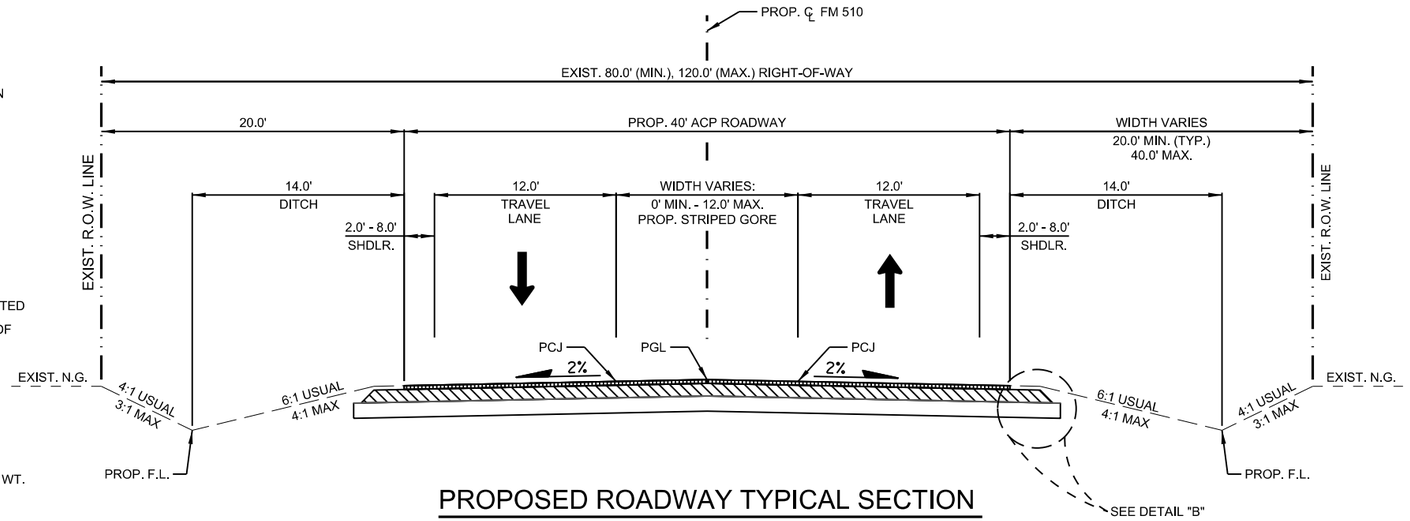


DETAIL "B"

LEGEND:

TO BE CONSTRUCTED ON PHASE III (SEE SEQUENCE OF CONSTRUCTION)

1. PROPOSED 1.5" SP-D PG 76-22 SAC A
2. PROPOSED BONDING COURSE
3. PROPOSED 1.5" SP-D PG 76-22 SAC A
4. PROPOSED 1 COURSE UNDERSEAL TREATMENT
5. PROPOSED MC-30 PRIME COAT
6. PROPOSED 12" TY-E GR-4 W/ 2% CEMENT ADMIX BY WT FLEX BASE (2 EQ LIFTS)
7. GEOGRID BASE REINFORCEMENT (TYPE 2)
8. PROPOSED 12" LIME TREATED SUBGRADE W/ 6% LIME ADMIX BY WT.
9. PROPOSED TY. "A" BACKFILL (ITEM 134) (NOT APPLICABLE AT INTERSECTING ROADWAY TURNOUTS AND DRIVEWAYS)



PROPOSED ROADWAY TYPICAL SECTION

STA. 518+33.00 TO STA. 522+84.00
STA. 526+57.00 TO STA. 531+07.00

07/01/24

Pharr District Central Design

Texas Department of Transportation

FM 510

PROPOSED ROADWAY TYPICAL SECTIONS

SCALE: N.T.S.

SHEET 1 OF 4

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		7

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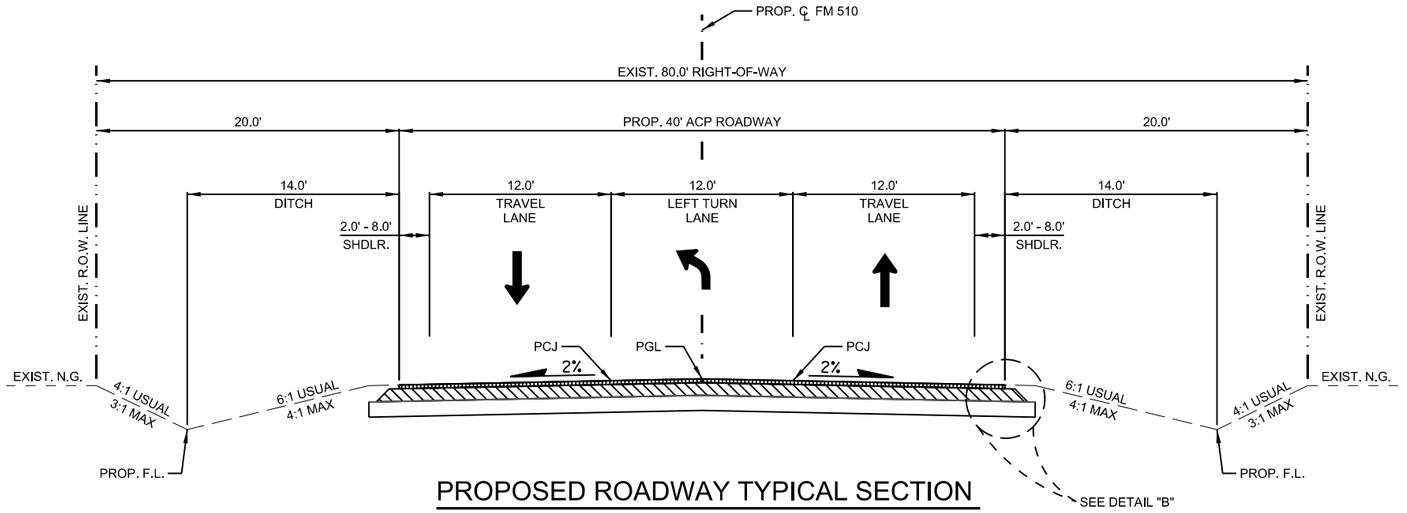
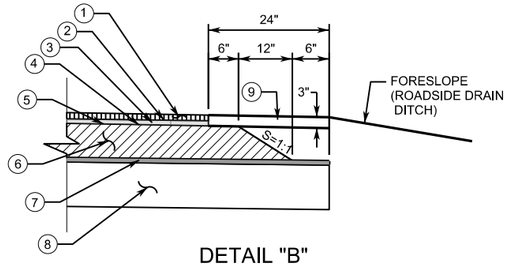
LEGEND

e%	-	SUPERELEVATED CROSS SLOPE
N.G.	-	NATURAL GROUND
STA.	-	STATION
ACP	-	ASPHALTIC CONCRETE PAVEMENT
PGL	-	PROPOSED GRADE LINE
PCJ	-	PERMISSIBLE CONSTRUCTION JOINT
R.O.W.	-	RIGHT-OF-WAY
SHLDR.	-	SHOULDER
E-E	-	EDGE-TO-EDGE
LTL	-	LEFT TURN LANE
RDWY.	-	ROADWAY
PVMT.	-	PAVEMENT
TRANS.	-	TRANSITION
➡	-	DIRECTION OF TRAFFIC FLOW



PROPOSED ROADWAY TYPICAL SECTION
EAST-BOUND LEFT TURN LANE

STA. 522+84.00 TO STA. 523+50.00

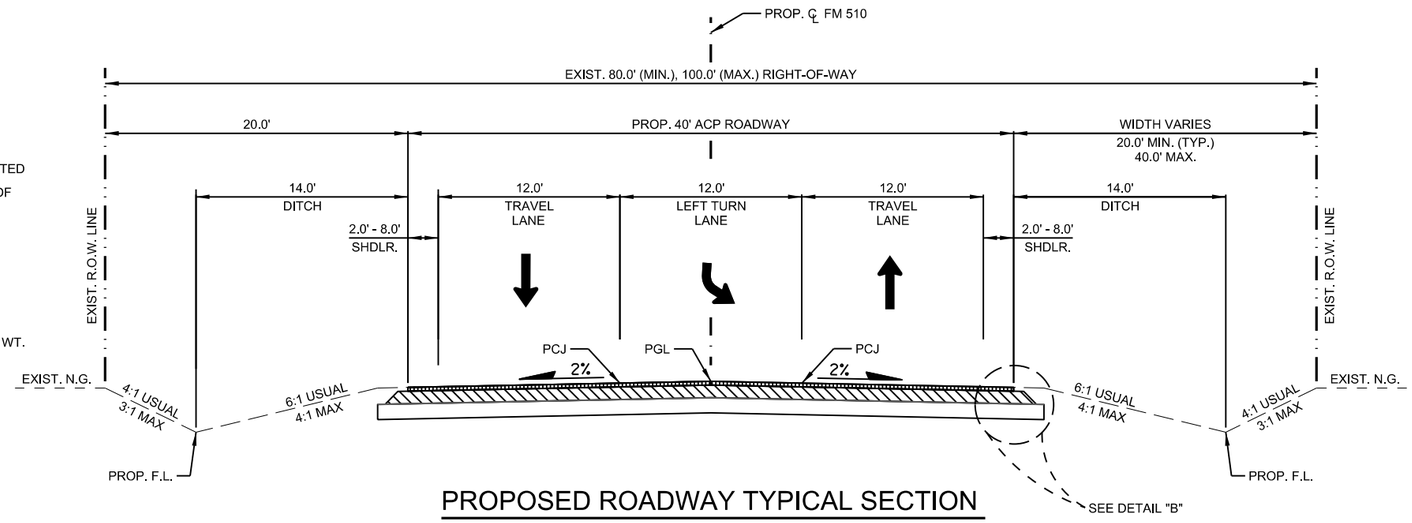


DETAIL "B"

LEGEND:

TO BE CONSTRUCTED ON PHASE III (SEE SEQUENCE OF CONSTRUCTION)

1. PROPOSED 1.5" SP-D PG 76-22 SAC A
2. PROPOSED BONDING COURSE
3. PROPOSED 1.5" SP-D PG 76-22 SAC A
4. PROPOSED 1 COURSE UNDERSEAL TREATMENT
5. PROPOSED MC-30 PRIME COAT
6. PROPOSED 12" TY-E GR-4 W/ 2% CEMENT ADMIX BY WT FLEX BASE (2 EQ LIFTS)
7. GEOGRID BASE REINFORCEMENT (TYPE 2)
8. PROPOSED 12" LIME TREATED SUBGRADE W/ 6% LIME ADMIX BY WT.
9. PROPOSED TY. "A" BACKFILL (ITEM 134) (NOT APPLICABLE AT INTERSECTING ROADWAY TURNOUTS AND DRIVEWAYS)



PROPOSED ROADWAY TYPICAL SECTION
WEST-BOUND LEFT TURN LANE

STA. 525+80.00 TO STA. 526+57.00

GENERAL NOTES

WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS, THE GOVERNING SLOPES MAY BE VARIED WHEN SPECIFICALLY DIRECTED BY THE ENGINEER.

WHERE POSSIBLE AND UNLESS OTHERWISE DIRECTED BY THE ENGINEER, PERMISSIBLE CONSTRUCTION JOINTS SHALL FALL ON STRIPING LINES AS SHOWN ON THE PAVEMENT MARKING LAYOUTS.

ALL GRADING SHALL BE DONE WITHIN EXISTING RIGHT-OF-WAY LIMITS UNLESS OTHERWISE SPECIFIED IN THE PLANS.

THE SUBGRADE SHALL BE SHAPED, BLADED, ROLLED AND PROOF ROLLED A MINIMUM DISTANCE OF 24" BEYOND THE EDGE OF THE PROPOSED BASE COURSE.

ANY DAMAGES TO EXISTING CROSS CULVERTS OR IRRIGATION CROSSINGS OR STRUCTURES CAUSED BY THE CONTRACTOR SHALL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

UTILITY DEPTHS AND OFFSETS ARE APPROXIMATE AND ARE SHOWN FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY OWNERS TO FIELD VERIFY ALL HORIZONATAL AND VERTICAL LOCATION PRIOR TO COMMENCING WORK.

MIN. COVER OF FOUR (4) INCHES OF NEW FLEX. BASE WILL BE REQUIRED WHERE SALVAGE IS PART OF FLEX BASE.

THE EXISTING BITUMINOUS MATERIAL IS TO BE SALVAGE IN ACCORDANCE WITH ITEM 305.

ANY EXCESS MATERAL SHALL BECOME PROPERTY OF THE CONTRACTOR AND SHALL BE HAULED OFF.

1-COURSE SURF. TREATMENT - ASPH (TIER II)0.30 GAL/SY (APPROX) W/ AGGREGATE (TY-B GR 4P)(SAC-B) AT 1 CY/125 SY

BONDING COURSE RATE OF 0.07 GAL/SY IS APPROXIMATE AND FOR ESTIMATING PURPOSES ONLY. RATE TO BE ADJUSTED IN THE FIELD AS PER SPECIFICATION AND ENGINEER.

A STATION IS EQUIVALENT TO 100 FT.

114 LBS/SY IS EQUIVALENT TO 1" OF COMPACTED ACP.

EST. PRIME COAT = 0.2 GAL/SY

EST. FLEX. BASE WT. = 3375 LBS/CY (COMPACTED)

EST. SUBGRADE MATL. WT. = 2970 LBS/CY (COMPACTED)

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED
PROFESSIONAL ENGINEER

07/01/24

Pharr District Central Design

Texas Department of Transportation

FM 510

PROPOSED ROADWAY TYPICAL SECTIONS

SCALE: N.T.S.

SHEET 2 OF 4

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510

DIST	COUNTY	SHEET NO.
PHR	CAMERON	8

DATE: 06/28/24 08:53:32
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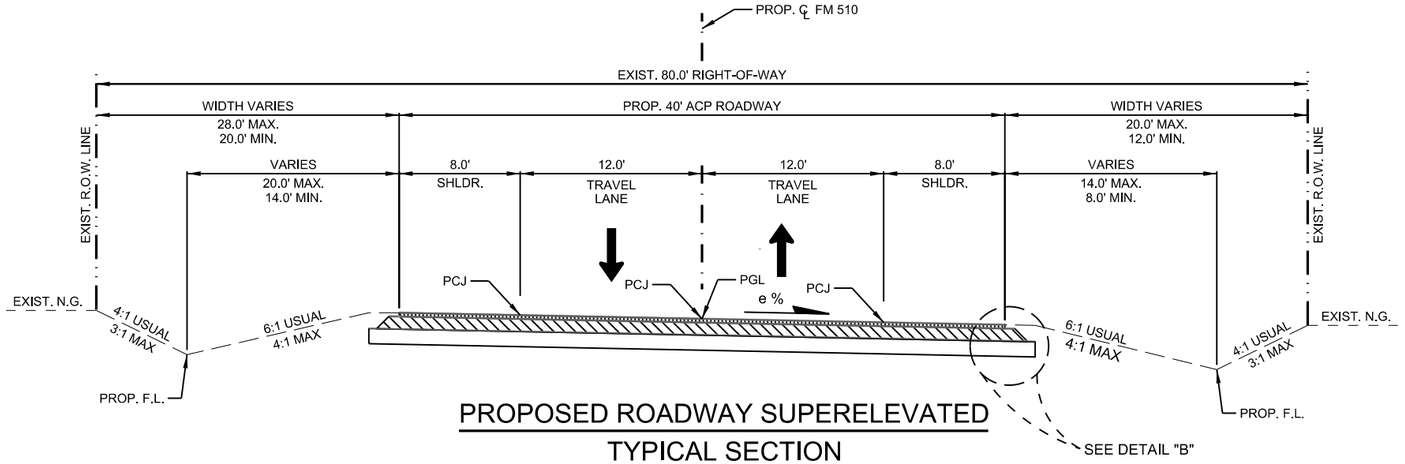
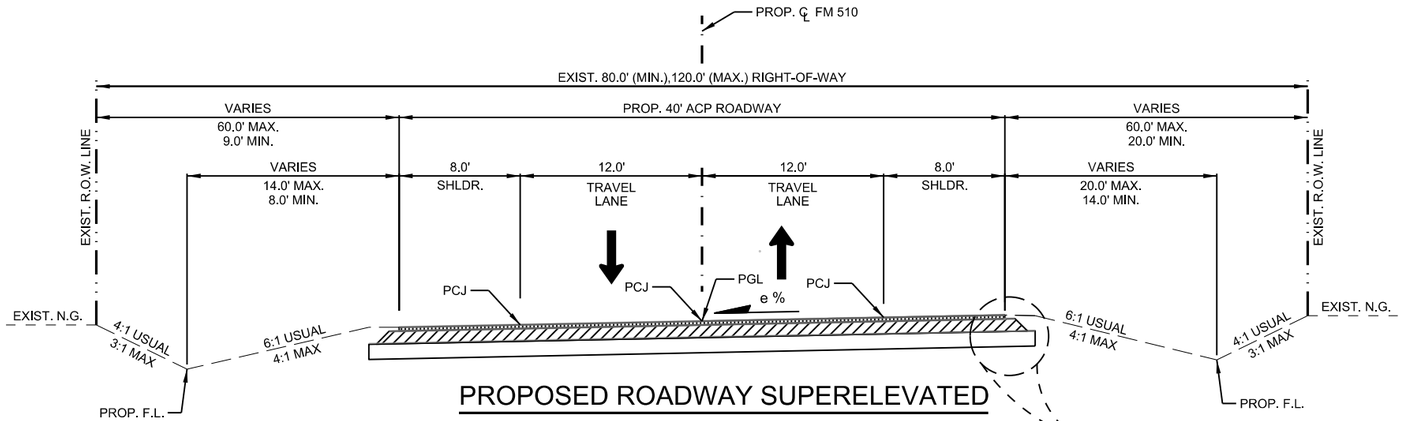
LEGEND

e%	-	SUPERELEVATED CROSS SLOPE
N.G.	-	NATURAL GROUND
STA.	-	STATION
ACP	-	ASPHALTIC CONCRETE PAVEMENT
PGL	-	PROPOSED GRADE LINE
PCJ	-	PERMISSIBLE CONSTRUCTION JOINT
R.O.W.	-	RIGHT-OF-WAY
SHLDR.	-	SHOULDER
E-E	-	EDGE-TO-EDGE
LTL	-	LEFT TURN LANE
RDWY.	-	ROADWAY
PVMT.	-	PAVEMENT
TRANS.	-	TRANSITION
➡	-	DIRECTION OF TRAFFIC FLOW



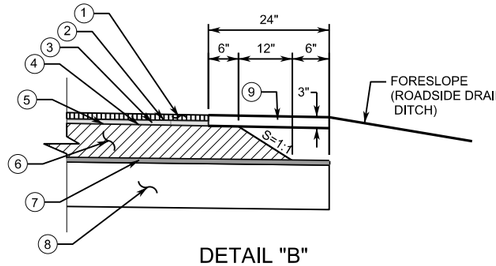
PROPOSED ROADWAY SUPERELEVATED TYPICAL SECTION

STA. 614+88.00 TO STA. 622+28.00



PROPOSED ROADWAY SUPERELEVATED TYPICAL SECTION

STA. 415+78.00 TO STA. 424+02.00
STA. 626+53.00 TO STA. 634+43.00
STA. 637+59.00 TO STA. 639+80.00
STA. 641+30.00 TO STA. 643+12.00



DETAIL "B"

LEGEND:

1. PROPOSED 1.5" SP-D PG 76-22 SAC A
2. PROPOSED BONDING COURSE

(TO BE CONSTRUCTED ON PHASE III (SEE SEQUENCE OF CONSTRUCTION))

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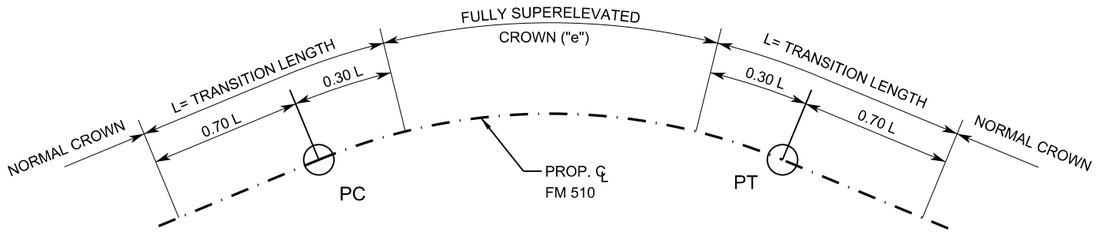

SUPERELEVATION DATA TABLE

CURVE	STATION LIMITS FULL "e"	PC STA.	PT STA.	SUPERELEVATION RATE	DESIGN SPEED (MPH)	TRANSITION LENGTH AT PC			TRANSITION LENGTH AT PT		
						BEGIN STA.	END STA.	LENGTH	BEGIN STA.	END STA.	LENGTH
P-FM510-1	417+48 - 422+32	416+97.33	422+82.59	2.3%	* 55	415+78	417+48	170	422+32	424+02	170
P-FM510-2	617+36 - 619+80	616+61.44	620+54.42	5.1%	* 40	614+88	617+36	248	619+80	622+28	248
P-FM510-3	629+01 - 631+94	628+26.90	632+68.90	5.1%	* 40	626+53	629+01	248	631+94	634+43	248
P-FM510-4	638+97 - 641+74	638+56.00	642+15.85	2.00%	** 40	637+59	638+97	138	641+74	643+12	138

* AS PER TABLE 2-6 HIGH-SPEED NON-URBAN STREET; TXDOT ROADWAY DESIGN MANUAL.
** AS PER TABLE 2-5 LOW-SPEED URBAN STREET; TXDOT ROADWAY DESIGN MANUAL. SPEED REDUCTION DUE TO HORIZONTAL CURVATURE.

GENERAL NOTES

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EST. FLEX. BASE WT. = 3375 LBS/CY (COMPACTED)

EST. SUBGRADE MATL. WT. = 2970 LBS/CY (COMPACTED)

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

07/01/24

Pharr District Central Design

Texas Department of Transportation

FM 510

PROPOSED ROADWAY TYPICAL SECTIONS

SCALE: N.T.S.

SHEET 3 OF 4

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		9

DATE: 06/28/24 08:53:33
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LEGEND

e%	-	SUPERELEVATED CROSS SLOPE
N.G.	-	NATURAL GROUND
STA.	-	STATION
ACP	-	ASPHALTIC CONCRETE PAVEMENT
PGL	-	PROPOSED GRADE LINE
PCJ	-	PERMISSIBLE CONSTRUCTION JOINT
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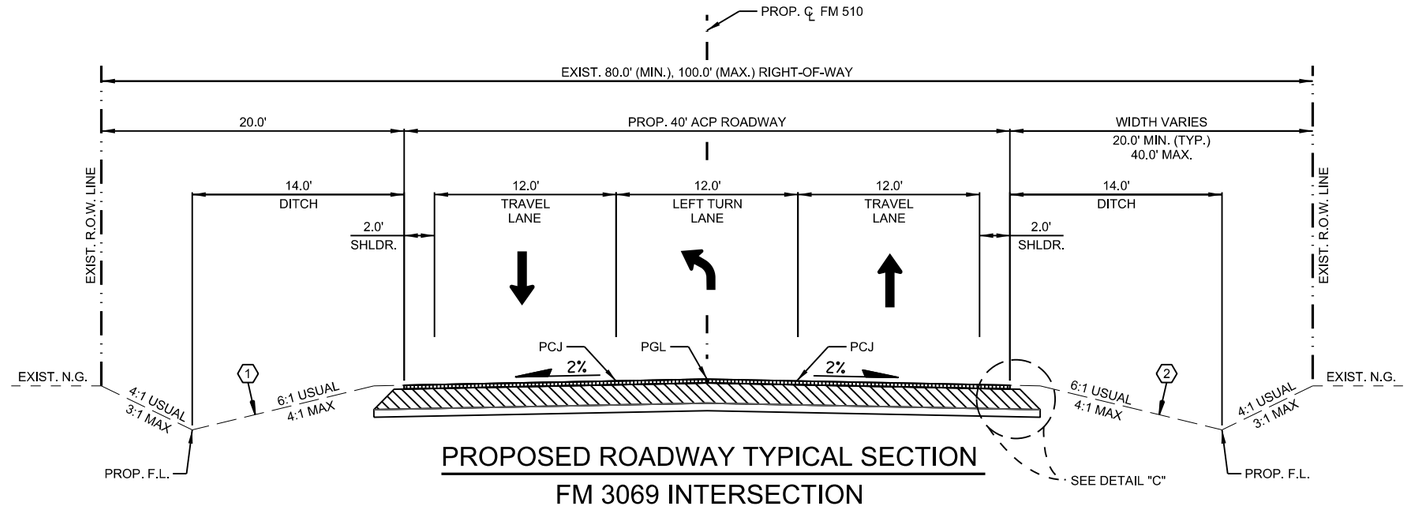
RDWY.	-	ROADWAY
PVMT.	-	PAVEMENT
TRANS.	-	TRANSITION
➡	-	DIRECTION OF TRAFFIC FLOW



PROPOSED ROADWAY TYPICAL SECTION
FM 3069 INTERSECTION

STA. 523+50 TO STA. 525+80

1 DRAIN DITCH LIMITS:
STA. 523+50 - STA. 524+60
STA. 525+13 - STA. 525+80

TURNOUT LIMITS (SHARE 27 RD.)
STA. 524+60 - STA. 525+13

2 DRAIN DITCH LIMITS:
STA. 523+50 - STA. 524+00
STA. 525+18 - STA. 525+80

TURNOUT LIMITS (FM 3069)
STA. 524+00 - STA. 525+18

GENERAL NOTES

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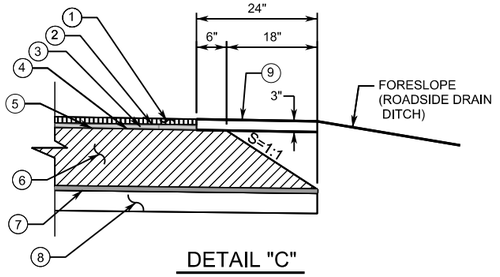
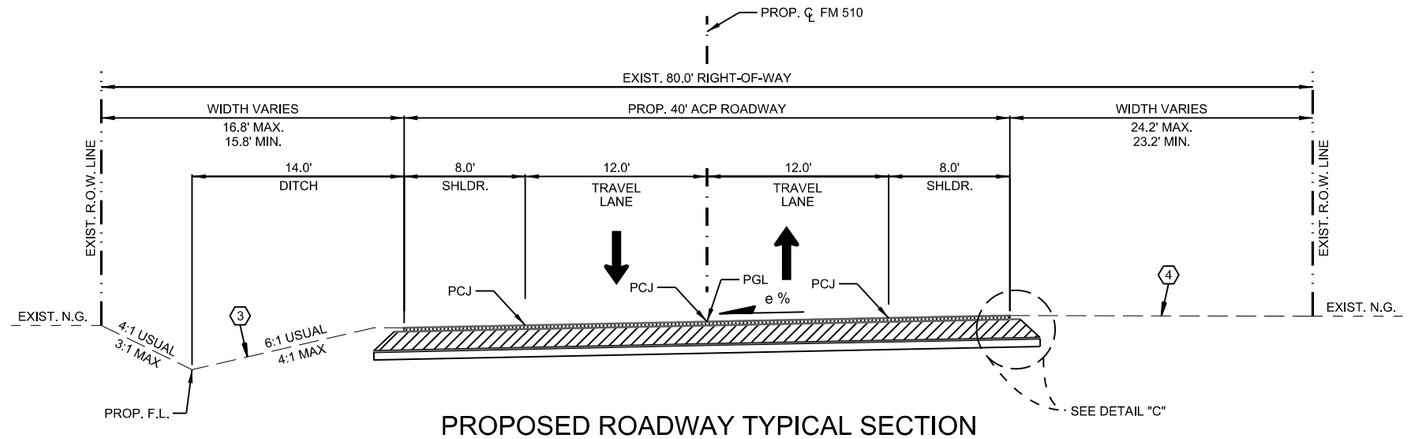


DETAIL "C"

LEGEND:

1	PROPOSED 1.5" SP-D PG 76-22 SAC A
2	PROPOSED BONDING COURSE
	(TO BE CONSTRUCTED ON PHASE III (SEE SEQUENCE OF CONSTRUCTION))
3	PROPOSED 1.5" SP-D PG 76-22 SAC A
4	PROPOSED 1 COURSE UNDERSEAL TREATMENT
5	PROPOSED MC-30 PRIME COAT
6	PROPOSED 18" TY-E GR-4 FLEX BASE (2 EQ LIFTS) NEW UNTREATED MATERIAL COMPACTED TO 98% DENSITY
7	GEOGRID BASE REINFORCEMENT (TYPE 2)
8	PROOF ROLL SUBGRADE
9	PROPOSED TY. "A" BACKFILL (ITEM 134) (NOT APPLICABLE AT INTERSECTING ROADWAY TURNOUTS AND DRIVEWAYS)



PROPOSED ROADWAY TYPICAL SECTION
FM 2480 INTERSECTION

STA. 639+80 TO STA. 641+30

3 DRAIN DITCH LIMITS:
STA. 639+80 - STA. 640+29
STA. 641+10 - STA. 641+30

TURNOUT LIMITS (N. SAN ROMAN RD.)
STA. 640+29 - STA. 641+30

4 TURNOUT LIMITS (FM 2480)
STA. 639+80 - STA. 641+30

STATE OF TEXAS
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117308
LICENSED PROFESSIONAL ENGINEER

07/01/24

Pharr District Central Design

Texas Department of Transportation

FM 510

PROPOSED ROADWAY TYPICAL SECTIONS

SHEET 4 OF 4

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		10

DATE: 06/28/24 08:53:35
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SEAL COAT MATERIAL SELECTION TABLE

Contractor:

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

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

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

☒ Tier 2: Moderate Use (500-5,000 ADT)

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

Type	Asphalt Cement (A-C) ☒ A-C Only	Asphalt Emulsion ☐ Emulsion Only
Asphalt	☒ AC-10-2TR ☒ AC-5 W/2% SBR ☒ AC-10 ☒ AC-10 W/2% SBR ☐ AC-15P	☐ CHFRS-2P ☐ CRS-2P ☐ HFRS-2P ☐ SP 300-016&039
Aggregate Type	☐ Ty PA ☐ Ty PB ☐ Ty PC ☐ Ty PD ☐ Ty PE ☐ Ty PL ☒ Allow uncoated aggregate	☐ Ty A ☐ Ty B ☐ Ty C ☐ Ty D ☐ Ty E ☐ Ty L
Aggregate Grade	☐ 3S ☐ 4S ☐ 5 ☐ 3non-lw ☒ 4P ☐ 5S ☐ 3 lw ☒ SP 302-001	☐ 3S ☐ 4S ☐ 5S ☐ 3non-lw ☐ 4P ☐ 5 ☐ 3 lw ☐ SP 302-013
Aggregate SAC	☐ A ☒ B	☐ A ☐ B

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

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

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

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

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

☒ Season 4: CRP, LRD, PHR	Apr 1 to Sept 30

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED
PROFESSIONAL ENGINEER

07/01/24

Texas Department of Transportation
Design Division (Roadway)

SEAL COAT MATERIAL SELECTION TABLE "UNDERSEAL"

FILE: sctable.dgn	DN: TxDOT	CK: AM	DW: BGD	CK:		
© TxDOT June 2011	DIST	FEDERAL AID PROJECT				SHEET
REVISIONS September 2020	PHR					11
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	CAMERON		1057	03	051	FM 510

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DATE: 6/27/2024 5:47:50 PM

Project Number:

County: Cameron **Control:** 1057-03-051

Highway: FM 510

2024 SPECS GENERAL NOTES:

****

General Requirements and Covenants to ITEMS 1 thru 9:

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

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

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

ITEM 2: Instructions to Bidders

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

Andres Espinoza, P.E., San Benito Area Engineer; Andres.Espinoza@txdot.gov
Gabriel Villareal, P.E., Assist. Area Engineer; Gabriel.Villarreal@txdot.gov

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

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

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

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

Information found on TxDOT's FTP server will be considered for informational purposes only. Index of /pub/txdot-info/Pre-Letting Responses/Pharr District/21-Pharr District (Construction) (state.tx.us)

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ITEM 5: Control of the Work

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

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

ITEM 7: Legal Relations and Responsibilities

Project Specific Locations (PSL's) Coordination

The Contractor shall not initiate activities in a project specific location (PSL) associated with a U.S. Army Corps of Engineers (USACE) permit area that has not been previously evaluated by the USACE as part of the permitting for this project. Such activities include, but are not limited to, haul roads, equipment staging areas, borrow and disposal sites. Associated defined here includes materials delivered to or from the PSL. The permit area includes all waters of the U.S. or associated wetlands affected by activities associated with this project. Special restrictions may be required for such work. The Contractor shall be responsible for any and all consultations with the USACE regarding activities, including project specific locations (PSLs) that have not been previously evaluated by the USACE.

The Contractor shall provide the department with a copy of all consultation(s), or approval(s), from the USACE prior to initiating activities.

The Contractor may proceed with activities in PSLs that do not affect a USACE permit area if a self-determination has been made that the PSL is non-jurisdictional or proper USACE clearances have been obtained in jurisdictional areas or have been previously evaluated by the USACE as part of the permit review of this project. The Contractor is solely responsible for documenting any determination(s) that their activities do not affect a USACE permit area. The Contractor shall maintain copies of their determination(s) for review by the department or any regulatory agency.

The disturbed area for all project locations in the Contract, and the Contractor project specific locations (PSLs) within 1 mile of the project limits for the Contract, will further establish the authorization requirements for storm water discharges. The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. The Contractor is to obtain required authorization from the TCEQ for Contractor PSLs for construction support activities on or off the right of way. When the total area disturbed in the Contract and PSLs within 1 mile of the

project limits exceeds 5 acres, provide a copy of the Contractor NOI for PSLs on the right of way to the Engineer and to the local government that operates a separate storm sewer system.

In order to expedite the approval process for PSL's or to eliminate or minimize potential impacts to project progress, initiate coordination efforts with the USACE **within 30 days from the date of "authorization to begin work".** If this is not done, the Contractor waives the right to request any contract time considerations if project progress is impacted and PSL'S approval is still pending.

Requests submitted to the Area Engineer will be evaluated on this basis and will require documentation showing substantial early coordination efforts to expedite the approval process as herein stated. The request shall include a detailed chronological summary status with dates of coordination activities with the resource agencies, including those occurring after the initial coordination, to be reviewed and confirmed by the district's environmental section.

ITEM 8: Prosecution and Progress

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

Working days will be computed and charged in accordance with Article 8.3.1.6. defined as follows:

Work and time charges will continue until the start of the bird nesting season. Upon the start of the bird nesting season, work and time charges will stop for a maximum period of 120-Working days for the bird nesting season delay to be completed. Time charges in accordance with Article 8.3.1.4. will resume at the end of the 120-day bird nesting season delay or earlier if mutually agreed in writing by the Engineer and Contractor.

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

ITEM 100: Preparing Right of Way

Preparation of right of way will be done in accordance with the construction phasing shown on the Traffic Control Plans. Performance of this item will not be allowed outside of the project's current construction phase without prior approval by the Engineer.

Removal of all existing vegetation and trees within the ROW will be subsidiary to prep ROW.

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ITEM 132: Embankment

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

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

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

ITEM 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 160: Topsoil

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

ITEM 164: Seeding for Erosion Control

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

SS-1 Tacking Agent shall be a ratio of 2:1, two (Emulsion) to one (water) and applied at a rate of 0.05 gallons per square yard. The SS-1 Tacking Agent required for Drill Seed operations, will

not be paid for directly, but will be subsidiary to Item 164 “Drill Seeding.” Watering shall not be used with the Drill Seed Method. A biodegradable tacking agent may be used in lieu of the SS-1 tacking agent in accordance with the manufacturer’s recommendations when approved by the Engineer.

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

Seed mixture shall be as specified under Item 164.

ITEM 166: Fertilizer

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

Fertilizer shall be homogenized.

ITEM 247: Flexible Base

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

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

Table 1: Gradation Requirements for Flexible Base

Retained on Sq. Sieve:	Percent Retained
2”	0
½”	20-60
No. 4	40-75
No. 40	70-90
Max. PI	15
Max. Wet Ball PI	15
Wet Ball Mill Max. Amount	50
Min. Comp. Strength PSI	150 at 15 PSI lateral pressure
Triaxial Test	Tex-117-E

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

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Flexible Base (TY E GR 4) caliche shall meet minimum compressive strength specified on Table 1 Gradation Requirements for Flexible Base above.

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

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

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

ITEM 250: Geogrid Base Reinforcement

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

ITEM 251: Reworking Base Courses

Quantities of Flexible Base to be salvaged, shown on the typical sections, are for estimating purposes only. All acceptable base material encountered in existing base is to be salvaged as directed by the Engineer regardless of the quantities involved.

Salvaged base shall be used in the bottom course on any of the proposed roadway and/or turnout sections.

Salvaged base may be used on any of the proposed driveway sections.

All surplus salvage base not used on the project will remain the property of the Contractor, unless otherwise directed by Engineer.

Proof roll the roadbed in accordance with Item 216, “Proof Rolling.” Correct soft spots as directed.

ITEM 260: Lime Treatment (Road-Mixed)

The Contractor's attention is called to the fact that certain existing and/or proposed structures are within the limits of the lime-treated Subgrade. Unless otherwise directed by the Engineer, these

structures shall be installed before the final rolling of this Subgrade. It shall be the Contractor's responsibility to perform the proper lime treating operation without damage to these structures.

The slurry method of applying lime will be required, except when the lime is to be added to naturally wet materials as directed by the Engineer.

For this project, the Engineer will direct a random number of lime trucks to be check weighed.

The percent of density as determined by Tex-121-E for the new and salvage Flexible Base shall be a minimum of 98% for all courses.

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

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

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

Allow the mixture to mellow for a minimum period of 48 hours for all types of lime utilized. Additional time might be required due to sulfate and organic testing requirements, as directed by Engineer.

ITEM 275: Cement Treatment (Road-Mixed)

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

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

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

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

ITEM 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 292, 341, 344, and 346.

ITEM 302: Aggregates for Surface Treatments

Loc.	County	CSJ	Highway	Binder	SAC
1	Cameron	1057-03-051	FM 510	Tier 2	A

* Crushed gravel will not be allowed on the above locations noted with (*).

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

ITEM 310: Prime Coat

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

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

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

ITEM 314: Emulsified Asphalt Treatment

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

ITEM 316: Seal Coat

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

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

The type and grade of asphalt as shown on the plans and/or as directed by the Engineer, shall be used on these projects. Asphalt cement will be used during the warm season. An emulsified asphalt will be used during the cooler season if permitted in writing by the Engineer. The emulsified asphalt, if used, shall be CMS-1P. Estimated quantities shown for the bid Item is based on an average of the estimated rates of application for asphaltic cement and emulsified asphalt. These rates should be used for estimating and comparison purposes only.

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

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

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

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

ITEM 341: Dense-Graded Hot-Mix Asphalt

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

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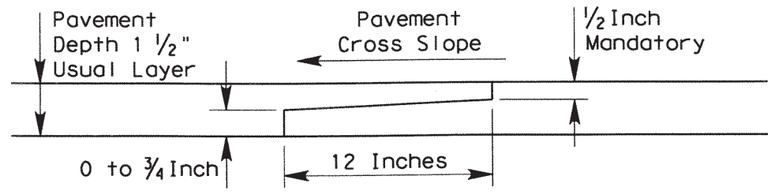
Blading (not to exceed more than 3-ft from the pavement edge) may also be necessary to clean dirt and grass from pavement edges and turnout areas as work under this bid Item. The cost of this blading will not be paid for directly but shall be considered subsidiary to this bid Item.

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

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

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



NOTCHED WEDGE JOINT

The engineer may allow for variances to the dimensions shown.

The Hamburg Wheel Test requirement for PG 64 binder will be 5,000 passes @ 0.5-inch rut depth.

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 341.

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.

The percentage of RAS used in the total mix shall not exceed 3% when allowed.

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

ITEM 344: Superpave Mixtures

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

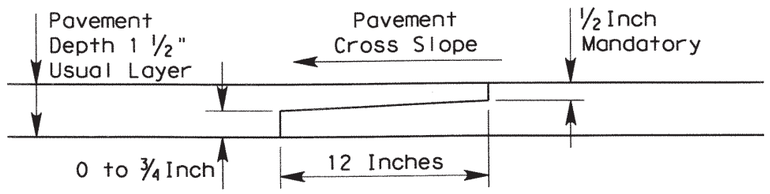
Blading (not to exceed more than 3-ft from the pavement edge) may also be necessary to clean dirt and grass from pavement edges and turnout areas as work under this bid Item. The cost of this blading will not be paid for directly but shall be considered subsidiary to this bid Item.

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

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

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

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



NOTCHED WEDGE JOINT

The engineer may allow for variances to the dimensions shown.

Public and private driveways need to have a smooth vertical transition between the edge of pavement and the existing driveways. The Contractor is to add a vertical taper if needed which will be subsidiary to Item 344.

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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.

The percentage of RAS used in the total mix shall not exceed 3% when allowed.

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

ITEM 3007 – Bonding Course

The minimum application rates are listed in Table BC.

The target shear bond strengths are listed in Table BCS. Results from these informational tests will not be used for specification compliance.

Table BC

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

Table BCS (For Informational Tests)

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

ITEM 354: Planing and Texturing Pavement

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

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

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

ITEM 400: Excavation and Backfill for Structures

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

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

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

ITEM 421: Hydraulic Cement Concrete

Provide Sulfate Resistant Concrete for all concrete piling and drilled shafts.

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

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

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

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

Fiber Reinforced Concrete is not permitted.

ITEM 432: Riprap

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

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

ITEM 462: Concrete Box Culverts and Drains

Provide joints in pre-cast concrete box culverts using any of the methods specified in Item 464, except mortar joints.

Provide pre-cast concrete boxes to expedite traffic handling unless otherwise shown on the plans.

Provide the Area Engineer with the casting schedule of all pre-cast concrete boxes prior to beginning any fabrication.

ITEM 464: Reinforced Concrete Pipe

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

Do not use mortar joints.

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

ITEM 465: Junction Boxes, Manholes, and Inlets

For TY PSL with RG, FG, or SFG lid inlets, provide Class B concrete riprap with (6”x6” W3xW3 (No. 6 gauge) welded wire fabric) for any side that is touching the natural ground. The

riprap will be 4-in thick and 3-ft wide with an 8-in deep by 6-in wide toe unless otherwise shown in the plans. The cost will be subsidiary to Item 465, unless otherwise shown in the plans.

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

ITEM 466: Headwalls and Wingwalls

Do not use pre-cast headwalls/wingwalls.

ITEM 467: Safety End Treatment

All Type II SET's shall have riprap, Class "A" minimum, aprons as shown on the plans. The Contractor may submit an alternate precast SET design for approval by the Engineer.

ITEM 471: Frames, Grates, Rings, and Covers

All grates will be tack welded to the frames in a manner satisfactory to the Engineer.

ITEM 502: Barricades, Signs, and Traffic Handling

Shadow vehicles equipped with Truck-Mounted Attenuators are required for traffic handling. See notes for Item 505: Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA), for additional references pertaining to the TMAs.

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

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relocation of these signs required for traffic control will not be paid for directly but shall be considered subsidiary to Item 502.

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

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

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

ITEM 504: Field Office and Laboratory

Furnish (1) Field Office (Type C).

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

Laboratory room:

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

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

ITEM 505: Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)

In addition to the shadow vehicles with truck mounted attenuator (TMA) that are specified as being required on the traffic control plan for the project, provide 2 additional shadow vehicle(s) with TMA as per TCP (1-1) -18 as detailed on General Note 5 of this standard sheet;
or as per TCP(2-1) -18 as detailed on General Note 5 of this standard sheet;
or as per TCP(2-3) -23 as detailed on General Note 8 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.

ITEM 506: Temporary Erosion, Sedimentation, and Environmental Controls

Before starting each phase of construction, review with the Engineer the SWP3 used for temporary erosion control as outlined on the plans. Before construction, place the temporary erosion and sedimentation control features as shown on the SWP3. Location of construction exits are to be approved by the Engineer. After completing earthwork operations reseed and restore the disturbed areas with the Department's specifications for temporary or permanent erosion control (for stabilization or finished work). Before starting grading operations and during the project duration, place the temporary or permanent erosion control measures to prevent sediment from leaving the right of way.

The Contractor Force Account "Erosion Control Maintenance" that has been established for this project is intended to be utilized for work zone Best Management Practice (BMP) maintenance, to improve the effectiveness of the Environmental Controls that may need maintenance attention and/or require replacement while the project is still under the construction stage. These procedures will be mutually agreed upon by the Engineer and the Contractor's Responsible Person based on weekly or more frequent BMP management reviews on the project. The "Erosion Control Maintenance" is not intended to be used in lieu of bid Items established by the contract.

ITEM 508: Constructing Detours

Flexible Base, prime coat, and Asphaltic Concrete Pavement used for detours shall meet the requirements of Items 247, 310 and 341 respectively, except for measurement and payment.

ITEM 530: Intersections, Driveways, and Turnouts

Prime coat shall meet the requirements of Item 310.

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

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ITEM 552: Wire Fence

Contractor is to repair any wire fence that is damaged by the Contractor's construction operations to insure the retention of livestock, if any, in their respective pastures along the project.

ITEM 560: Mailbox Assemblies

Coordinate and verify final mailbox locations with TxDOT and the US Postmaster.

ITEM 585: Ride Quality for Pavement Surfaces

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

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

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

Diamond grinding shall be used to remove localized roughness.

Use Surface Test Type B pay adjustment schedule __1__ to evaluate ride quality of the travel lanes in accordance with Item 585, "Ride Quality for Pavement Surfaces." This includes ramps and service road travel lanes.

ITEMS 636: Signs

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

ITEM 644: Small Roadside Sign Assemblies

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

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

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

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

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

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

ITEM 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.

Project Number:

County: Cameron **Control:** 1057-03-051

Highway: FM 510

Any permanent pavement markings or non-removal work zone pavement markings lacking reflectivity in accordance with the requirements of Tex 828-B, or that fail to meet minimum retro reflectivity requirements for longitudinal pavement markings when required, will be addressed per the requirements of the specification. The roadway will be re-striped at no additional compensation.

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

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

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

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.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 1057-03-051 **DISTRICT** Pharr **COUNTY** Cameron
HIGHWAY FM 510

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**1057-03-051**			
		PROJECT ID		**A00127949**			
		COUNTY		**Cameron**			
		HIGHWAY		**FM 510**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	100-7002	PREPARING ROW	STA	242.000		242.000	
	104-7006	REMOV CONC (RIPRAP)	SY	843.000		843.000	
	104-7011	REMOV CONC (DRIVEWAYS)	SY	342.000		342.000	
	105-7007	RMV (7"-11") TRT/UNTRT BASE & ASPH PAV	SY	2,850.000		2,850.000	
	110-7001	EXCAV (ROADWAY)	CY	39,310.000		39,310.000	
	110-7002	EXCAV (CHANNEL)	CY	2,000.000		2,000.000	
	132-7003	EMBANK (FNL)(OC)(TY B)	CY	205.000		205.000	
	132-7006	EMBANK (FNL)(DC)(TY C)	CY	4,005.000		4,005.000	
	134-7001	BACKFILL (TY A)	STA	242.000		242.000	
	160-7007	FURN & PLACE TOPSOIL (VEH)	CY	50.000		50.000	
	164-7018	HYDRO MULCH SEED (PERM_RURAL_CLAY)	SY	115,360.000		115,360.000	
	164-7021	HYDRO MULCH SEED (TEMP_WARM)	SY	115,360.000		115,360.000	
	168-7001	VEGETATIVE WATERING	TGL	2,104.000		2,104.000	
	204-7001	SPRINKLING (DUST CONTROL)	TGL	968.000		968.000	
	216-7001	PROOF ROLLING	HR	5.000		5.000	
	247-7277	FL BS (RDWY DEL)(TY E GR 4)(FNL POS)	CY	22,293.000		22,293.000	
	250-7002	GEOGRID BASE REINFORCEMENT (TYPE 2)	SY	112,551.000		112,551.000	
	251-7036	REWORK BS MTL (TY B)(8")(DC)(ORG POS)	CY	15,520.000		15,520.000	
	260-7005	LIME (COM OR QK)(SLURRY)	TON	3,446.000		3,446.000	
	260-7009	LIME TRT (EXIST MATL)(12")	SY	116,052.000		116,052.000	
	275-7001	CEMENT	TON	1,246.000		1,246.000	
	275-7009	CEMENT TRT (EXIST MATL & NEW BASE)(12")	SY	110,776.000		110,776.000	
	305-7017	SALV, HAUL & STKPL RCL APH PV (3 1/2")	SY	105,010.000		105,010.000	
	310-7004	PRIME COAT (MC-30)	GAL	21,439.000		21,439.000	
	316-7266	ASPH (TIER II)	GAL	32,158.000		32,158.000	
	316-7267	AGGR (TY-B GR-4P SAC-B)	CY	860.000		860.000	
	344-7064	SP MIXES SP-D SAC-A PG76-22	TON	18,484.000		18,484.000	
	354-7018	PLANE & TEXT ASPH CONC PAV(1.5")	SY	1,868.000		1,868.000	
	400-7005	STRUCT EXCAV (SPECIAL)	CY	367.000		367.000	
	400-7006	CUT & RESTORING PAV	SY	607.000		607.000	
	400-7010	CEM STABIL BKFL	CY	473.000		473.000	
	402-7001	TRENCH EXCAVATION PROTECTION	LF	1,301.000		1,301.000	
	432-7008	RIPRAP (CONC)(CL B)(5 IN)	CY	295.000		295.000	
	462-7022	CONC BOX CULV (8 FT X 5 FT)	LF	97.000		97.000	
	464-7003	RC PIPE (CL III)(18 IN)	LF	2,880.000		2,880.000	
	464-7005	RC PIPE (CL III)(24 IN)	LF	1,144.000		1,144.000	
	464-7019	RC PIPE (CL IV)(18 IN)	LF	272.000		272.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 1057-03-051 **DISTRICT** Pharr **COUNTY** Cameron
HIGHWAY FM 510

			CONTROL SECTION JOB		**1057-03-051**	TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00127949**		
			COUNTY		**Cameron**		
			HIGHWAY		**FM 510**		
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	464-7021	RC PIPE (CL IV)(24 IN)	LF	207.000		207.000	
	464-7023	RC PIPE (CL IV)(30 IN)	LF	312.000		312.000	
	464-7025	RC PIPE (CL IV)(42 IN)	LF	312.000		312.000	
	465-7128	INLET (COMPL)(PSL)(FG)(4FTX4FT-4FTX4FT)	EA	1.000		1.000	
	466-7007	HEADWALL (CH - FW - 0) (DIA= 30 IN)	EA	4.000		4.000	
	466-7010	HEADWALL (CH - FW - 0) (DIA= 42 IN)	EA	6.000		6.000	
	466-7148	WINGWALL (FW - 0) (HW=6 FT)	EA	4.000		4.000	
	467-7305	SET (TY II) (18 IN) (RCP) (3: 1) (C)	EA	3.000		3.000	
	467-7306	SET (TY II) (18 IN) (RCP) (4: 1) (C)	EA	1.000		1.000	
	467-7308	SET (TY II) (18 IN) (RCP) (6: 1) (P)	EA	154.000		154.000	
	467-7325	SET (TY II) (24 IN) (RCP) (3: 1) (C)	EA	8.000		8.000	
	467-7328	SET (TY II) (24 IN) (RCP) (6: 1) (P)	EA	40.000		40.000	
	480-7001	CLEAN EXIST CULVERTS	EA	1.000		1.000	
	496-7002	REMOV STR (INLET)	EA	1.000		1.000	
	496-7004	REMOV STR (SET)	EA	178.000		178.000	
	496-7005	REMOV STR (WINGWALL)	EA	12.000		12.000	
	496-7006	REMOV STR (HEADWALL)	EA	9.000		9.000	
	496-7007	REMOV STR (PIPE)	LF	5,377.000		5,377.000	
	500-7001	MOBILIZATION	LS	1.000		1.000	
	502-7001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	20.000		20.000	
	503-7002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	4.000		4.000	
	505-7001	TMA (STATIONARY)	DAY	320.000		320.000	
	505-7003	TMA (MOBILE OPERATION)	DAY	30.000		30.000	
	506-7021	CONSTRUCTION EXITS (INSTALL) (TY 2)	SY	468.000		468.000	
	506-7024	CONSTRUCTION EXITS (REMOVE)	SY	468.000		468.000	
	506-7039	TEMP SEDMT CONT FENCE (INSTALL)	LF	200.000		200.000	
	506-7041	TEMP SEDMT CONT FENCE (REMOVE)	LF	200.000		200.000	
	506-7044	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	5,420.000		5,420.000	
	506-7046	BIODEG EROSN CONT LOGS (REMOVE)	LF	5,420.000		5,420.000	
	508-7001	CONSTRUCTING DETOURS	SY	436.000		436.000	
	530-7006	DRIVEWAYS (CONC)	SY	370.000		370.000	
	530-7010	DRIVEWAYS (ACP)	SY	4,730.000		4,730.000	
	530-7018	TURNOUTS (ACP)	SY	3,184.000		3,184.000	
	560-7008	MAILBOX INSTALL-S (TWW-POST) TY 4	EA	47.000		47.000	
	560-7010	MAILBOX INSTALL-M (TWW-POST) TY 4	EA	1.000		1.000	
	636-7001	ALUMINUM SIGNS (TY A)	SF	70.000		70.000	
	644-7025	IN SM RD SN SUP&AM TYS80(1)SA(P)	EA	35.000		35.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 1057-03-051 **DISTRICT** Pharr **COUNTY** Cameron
HIGHWAY FM 510

			CONTROL SECTION JOB		**1057-03-051**	TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00127949**		
			COUNTY		**Cameron**		
			HIGHWAY		**FM 510**		
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	644-7028	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	11.000		11.000	
	644-7031	IN SM RD SN SUP&AM TYS80(1)SA(U)	EA	4.000		4.000	
	644-7073	REMOVE SM RD SN SUP&AM	EA	49.000		49.000	
	658-7059	INSTL OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	26.000		26.000	
	658-7078	REMOVE DELIN & OBJECT MARKER ASSMS	EA	16.000		16.000	
	662-7017	WK ZN PAV MRK NON-REMOV (W)24"(SLD)	LF	131.000		131.000	
	662-7051	WK ZN PAV MRK REMOV (REFL) TY II-A-A	EA	1,300.000		1,300.000	
	662-7064	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	62,706.000		62,706.000	
	662-7097	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	63,506.000		63,506.000	
	662-7112	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	10.000		10.000	
	662-7114	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	6,571.000		6,571.000	
	666-7024	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	355.000		355.000	
	666-7036	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	215.000		215.000	
	666-7117	REFL PAV MRK TY I (Y)12"(SLD)(100MIL)	LF	345.000		345.000	
	666-7266	RE PROFILE PM TY I(W)6"(SLD)(100MIL)	LF	47,566.000		47,566.000	
	666-7420	REFL PAV MRK TY I (Y)6"(BRK)(100MIL)	LF	5,040.000		5,040.000	
	666-7423	REFL PAV MRK TY I (Y)6"(SLD)(100MIL)	LF	11,252.000		11,252.000	
	668-7091	PREFAB PM TY C (W)(ARROW)	EA	2.000		2.000	
	668-7103	PREFAB PM TY C (W)(WORD)	EA	2.000		2.000	
	672-7002	REFL PAV MRKR TY I-C	EA	10.000		10.000	
	672-7004	REFL PAV MRKR TY II-A-A	EA	651.000		651.000	
	672-7008	TRAFFIC BUTTON TY Y	EA	1,388.000		1,388.000	
	672-7009	TRAFFIC BUTTON TY B	EA	7,705.000		7,705.000	
	677-7001	ELIM EXT PM & MRKS (4")	LF	29,488.000		29,488.000	
	677-7004	ELIM EXT PM & MRKS (8")	LF	140.000		140.000	
	677-7008	ELIM EXT PM & MRKS (24")	LF	12.000		12.000	
	677-7009	ELIM EXT PM & MRKS (ARROW)	EA	2.000		2.000	
	677-7015	ELIM EXT PM & MRKS (WORD)	EA	1.000		1.000	
	1000-7001	PRSSR IRRIG PVC PIPE (18")	LF	297.000		297.000	
	1000-7002	PRSSR IRRIG PVC PIPE (24")	LF	175.000		175.000	
	1000-7003	PRSSR IRRIG PVC PIPE (30")	LF	80.000		80.000	
	3007-7001	BONDING COURSE	GAL	7,605.000		7,605.000	
	7003-7001	WELDED STL CASING PIPE (OPEN CUT)(24")	LF	251.000		251.000	
	7003-7002	WELDED STL CASING PIPE (OPEN CUT)(30")	LF	152.000		152.000	
	7003-7003	WELDED STL CASING PIPE (OPEN CUT)(42")	LF	72.000		72.000	
	08	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (NON-PART)	LS	1.000		1.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 1057-03-051 **DISTRICT** Pharr **COUNTY** Cameron
HIGHWAY FM 510

		CONTROL SECTION JOB		**1057-03-051**		TOTAL EST.	TOTAL FINAL
		PROJECT ID		**A00127949**			
		COUNTY		**Cameron**			
		HIGHWAY		**FM 510**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	08	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (NON-PART)	LS	1.000		1.000	

SUMMARY OF ROADWAY ITEMS

LOCATION	LENGTH	(&) ① + EXIST. STAB BASE (4" - 8 1/2") (5" AVER.)	105 7007 ④ RMV (7"-11") TRT/UNTRT BASE & ASPH PAV	(&) PROP FL BS MATL INFO ONLY AREA	(&) ② TOTAL REQUIRED FL BS MATL (12")	(&) ③ TOTAL REQUIRED FL BS MATL (18")	(&) MINIMUM REQUIRED NEW FL BS MATL (4")	216 7001 PROOF ROLLING	247 7277 ② FL BS (RWDY DEL) (TY E GR 4) (FNL POS)	247 7277 ③ FL BS (RWDY DEL) (TY E GR 4) (FNL POS)	251 7036 ① REWORK BS MTL (TY B) (8") (DC) (ORG POS)	250 7002 GEOGRID BASE REINFOR - CEMENT (TYPE 2)	275 7001 CEMENT	275 7009 CEMENT TRT (EXIST MATL & NEW BASE) (12")	260 7009 LIME TRT (EXIST MATL) (12")	260 7005 LIME (COM OR QK) (SLURRY)	305 7017 ⊕ SALV, HAUL & STKPL RCL APH PV (3 1/2")	(&) ⊕ EXIST. RAP (3" - 4 1/4") (3 1/2" AVER.)	310 7004 PRIME COAT (MC - 30) (0.2 GAL/SY)	316 7266 ASPH (TIER II) (0.30 GAL/SY)	316 7267 AGGR (TY-B GR-4P) (SAC-B) (1 CY/125 SY)	354 7018 PLANE & TEXT ASPH CONC PAV (1.5")	344 7064 SP MIXES SP-D SAC-A PG 76-22 (171 #/SY) (1.5" THICK)	3007 7001 ⊠ BONDING COURSE (0.07 GAL/SY)	508 7001 CONST-RUCTING DETOURS
FM 510	(LF)	(CY)	(SY)	(SY)	(CY)	(CY)	(CY)	(HR)	(CY)	(CY)	(CY)	(SY)	(TON)	(SY)	(SY)	(TON)	(SY)	(CY)	(GAL)	(GAL)	(CY)	(SY)	(TON)	(GAL)	(SY)
(CSJ 1057-03-051)	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.
PHASE I																									
PHASE I, STEP A, STAGE 1	130	55		390		195		1		195		390					380	37	75	113	4	29	35		
PHASE I, STEP A, STAGE 2	12,110	5,072		36,327	12,109		4,036		6,982		5,127	36,327	409	36,327	37,673	1,119	35,173	3,420	6,996	10,495	280	29	2,994		
PHASE I, STEP B, STAGE 1	230	53	310	384		192		1		192		384					357	35	72	107	3	16	32		
PHASE I, STEP B, STAGE 2	12,110	2,628	685	20,185	6,728		2,243		4,047		2,681	20,185	227	20,185	21,530	639	17,579	1,709	3,768	5,652	151	16	1,613		
PHASE I TOTAL:	24,580	7,808	995	57,286	18,837	387	6,279	2	11,029	387	7,808	57,286	636	56,512	59,203	1,758	53,489	5,201	10,911	16,367	438	90	4,674		
PHASE II																									
PHASE II, STEP A, STAGE 1	458																								436
PHASE II, STEP A, STAGE 2	250	98	84	745		373		2		373		745					675	66	144	215	6		62		
PHASE II, STEP A, STAGE 3	11,628	4,702	876	34,875	11,625		3,875		6,825		4,800	34,875	392	34,875	36,166	1,074	32,561	3,166	6,717	10,075	269	29	2,874		
PHASE II, STEP B, STAGE 1	150	52	450	256		128		1		128		256					353	34	48	72	2		21		
PHASE II, STEP B, STAGE 2	11,628	2,670	445	19,389	6,463		2,154		3,551		Δ 2,912	19,389	218	19,389	20,683	614	17,932	1,743	3,619	5,429	145	16	1,549		
PHASE II TOTAL:	24,114	7,522	1,855	55,265	18,088	501	6,029	3	10,376	501	7,712	55,265	610	54,264	56,849	1,688	51,521	5,009	10,528	15,791	422	45	4,506		436
PHASE III																						1,445	9,304	7,605	
PHASE III TOTAL:																						1,445	9,304	7,605	
PROJECT TOTAL:	**48,694**	**15,330**	**2,850**	**112,551**	**36,925**	**888**	**12,308**	**5**	**21,405**	**888**	**15,520**	**112,551**	**1,246**	**110,776**	**116,052**	**3,446**	**105,010**	**10,210**	**21,439**	**32,158**	**860**	**1,580**	**18,484**	**7,605**	**436**

KEY NOTES

(&) FOR CONTRACTOR INFORMATION ONLY (NON-PAY).

① REWORK (SALVAGE) MATERIAL IS CALCULATED FROM EXISTING AVERAGE OF 5" STAB BASE PAID UNDER ITEM 251. (FOR ESTIMATING PURPOSES ONLY)

② 12" TREATED FLEX BASE MATERIAL.

③ 18" UNTREATED FLEX BASE MATERIAL.

②③ TOTAL FLEX BASE = 12" TREATED FLEX BASE + 18" UNTREATED FLEX BASE.

④ EXISTING BASE MATERIAL FROM PUBLIC TURNOUTS IS NOT CONSIDERED SALVAGEABLE MATERIAL AND SHALL NOT BE UTILIZED AS REWORK BASE MATERIAL. MATERIAL SHALL BECOME PROPERTY OF THE CONTRACTOR TO BE HAULED OFF AFTER PROJECT COMPLETION, TO BE PAID UNDER ITEM 105.

Δ QUANTITY REPRESENTS SALVAGE MATERIAL TAKEN FROM PHASE II, STEP B, STAGES 1 & 2, PLUS SALVAGE MATERIAL TAKEN FROM DETOUR CONSTRUCTED IN PHASE II, STEP A, STAGE 1.

+ SURPLUS OF SALVAGE MATERIAL SHALL BECOME PROPERTY OF THE CONTRACTOR TO BE HAULED OFF AFTER PROJECT COMPLETION.

⊕ ALL RAP MATERIAL SHALL BECOME PROPERTY OF THE CONTRACTOR.

⊠ BONDING COURSE RATE SHOWN IS PROVIDED FOR ESTIMATING PURPOSES ONLY. APPLICATION RATE SHALL BE DETERMINED AND SET IN THE FIELD BY THE ENGINEER PER PERTINENT ITEM 344.

QUANTITIES FOR PROPOSED PUBLIC TURNOUTS ARE NOT INCLUDED IN THIS TABLE. PROPOSED AREAS FOR TY PBS2 TURNOUTS ARE SHOWN IN THE PUBLIC ROADWAY TURNOUT TABLE INCLUDED IN THESE PLANS.

EST. WT OF FLEXIBLE BASE = 3375 #/CY COMPACTED DRY WEIGHT
EST. WT OF SUBGRADE = 2970 #/CY (COMPACTED)
EST. RATE OF APPLICATION FOR PRIME COAT = 0.2 GAL/SY
EST. RATE OF APPLICATION FOR TACK COAT = 0.07 GAL/SY

SUMMARY OF EARTHWORK & OTHER ROADWAY ITEMS

LOCATION	100 7002 PREPARING ROW	204 7001 SPRINKLING (DUST CONTROL)	110 7001 EXCAV (ROADWAY)	132 7006 EMBANK (FNL) (DC) (TY C)	134 7001 BACKFILL (TY A)	500 7001 MOBILIZATION
FM 510	(STA)	(TGL)	(CY)	(CY)	(STA)	(LS)
(CSJ 1057-03-051)	EST.	EST.	EST.	EST.	EST.	EST.
STA. 402+40 TO STA. 643+57.85	242	968	39,310	4,005	242	1
PROJECT TOTAL:	242	968	39,310	4,005	242	1

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

07/01/24

Pharr District Central Design

Texas Department of Transportation

FM 510

SUMMARY TABLES OF ESTIMATED QUANTITIES

SCALE: N.T.S. SHEET 1 OF 6

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		25

DATE: 06/28/24 09:22:46
FILE: c:\txdot\pw_online\txdot5\denise.vasquez\d0483266\E&Q.dgn

SUMMARY OF PRIVATE DRIVEWAY ITEMS

ROADWAY PLAN & PROFILE SHEET NO.	DWY. ID #	STATION	OFFSET	EXIST. DRIVEWAY WIDTH (FT)	PROP. WIDTH @ EDGE OF PAVEMENT (FT)	PROP. WIDTH @ R.O.W. LINE (FT)	PROP. RAD. (FT)	ITEM 530			ITEM 464		ITEM 467		ITEM 496		ITEM 496	ITEM 104	ITEM 560	
								7010	7006		7003	7005	7308	7328	7007		7004	7011	7008	7010
								DRIVEWAYS (ACP)	DRIVEWAYS (CONC)		RC PIPE (CL III)		S.E.T. (TY II) (RCP) (6:1)(P)		REMOV STR (PIPE)		REMOV STR (SET)	REMOV CONC (DRIVEWAYS)	☒ MAILBOX INSTALL - S (TWW-POST) TY 4	☒ MAILBOX INSTALL - M (TWW-POST) TY 4
								(SY)	(SY)	(SY)	(LF)	(LF)	(EA)	(EA)	(LF)		(EA)	(SY)	(EA)	(EA)
								TY PB-1	4"	6"	18"	24"	18"	24"	18"	24"				
1 OF 41	1	403+31	RT	12	42	12	15	65			24		2		24		2			
1 OF 41	2	403+98	RT	17	42	12	15	65			24		2		24		2		1	
2 OF 41	3	405+07	RT	22	42	12	15	65			24		2		24		2		1	
2 OF 41	4	405+98	RT	32	42	12	15	65			24		2		28		2		1	
2 OF 41	5	407+17	LT	24	46	16	15		83		32		2		28		2	83	1	
2 OF 41	6	408+20	LT	18	42	12	15	65			24		2		24		2			
2 OF 41	7	409+01	RT	20	42	12	15	64			24		2		24		2		1	
2 OF 41	8	410+08	LT	20	42	12	15	65			24		2		24		2			
2 OF 41	9	410+30	RT	21	42	12	15	65			24		2		27		2		1	
3 OF 41	10	411+08	RT	25	42	12	15	65			24		2		36		2		1	
3 OF 41	11	412+14	LT	17	42	12	15	65			24		2		27		2		1	
3 OF 41	12	412+48	RT	34	42	12	15	65			24		2		36		2		1	
3 OF 41	13	413+01	LT	18	42	12	15	65			24		2		24		2			
3 OF 41	14	413+25	RT	26	42	12	15	65			24		2		28		2		1	
3 OF 41	15	414+50	RT	0	42	12	15	65			24		2		84					
3 OF 41	16	415+50	LT	12	42	12	15	65			24		2		24		2			
3 OF 41	17	416+46	LT	12	42	12	15	65			24		2		24		2			
3 OF 41	18	416+46	RT	12	42	12	15	65			24		2		24		2			
4 OF 41	19	417+21	RT	13	42	12	15	64			24		2		23		2		1	
4 OF 41	20	417+83	LT	26	42	12	15	65			24		2		44		2		1	
▽▽ 4 OF 41	21	418+45	RT	13	42	12	15	64			32	88	2	2	119		4		1	
▽▽ 4 OF 41	22	419+27	LT	29	42	12	15	65				104		2	87		2			
6 OF 41	23	434+07	RT	26	42	12	15	38												
9 OF 41	24	447+62	LT	58	50	20	15	53				72		1		64	1			
9 OF 41	25	447+72	RT	44	47	17	15	48				56	1		46		1			
9 OF 41	26	448+36	RT	47	42	12	15	38				48	1		50		1			
9 OF 41	27	448+46	LT	29	42	12	15	37				48		1		41	1			
9 OF 41	28	449+49	RT	23	54	24	15	65			40		2		43		2			
11 OF 41	29	462+18	RT	0	42	12	15	38			24		2		20					
13 OF 41	30	474+33	RT	0	42	12	15	38			24		2		19					
15 OF 41	31	484+05	LT	0	42	12	15	36			24		2		27		2			
16 OF 41	32	492+96	RT	21	42	12	15	38			32		2		20					
16 OF 41	33	493+37	LT	20	42	12	15	36			24		2		35		2			
18 OF 41	34	506+49	RT	37	42	12	15	40			32		2		28		2		1	
19 OF 41	35	511+13	RT	18	42	12	15	39			56		2		26		2			
19 OF 41	36	511+32	LT	21	43	13	15	39			24		2		24		2			
20 OF 41	37	515+37	LT	37	42	12	15		58		32		2		24		2	58	1	
21 OF 41	38	521+01	RT	27	45	15	15	45			32		2		27		2			
21 OF 41	39	523+04	LT	15	42	12	15	38			24		2		24					
22 OF 41	40	524+86	LT	54	54	18	30	62												
22 OF 41	41	526+06	RT	40	42	12	15	38			32		2		24		2		1	
22 OF 41	42	526+27	LT	27	42	12	15	38			48		1		40		1			
22 OF 41	43	526+73	LT	38	43	13	15	39			48		1		40		1			
22 OF 41	44	526+77	RT	31	42	12	15	38			32		2		24		2			
22 OF 41	45	528+40	RT	26	54	24	15	55			32		2		27		2		1	
22 OF 41	46	530+05	RT	23	42	12	15	65			32		2		19		2		1	
23 OF 41	47	533+79	RT	31	42	12	15	38			32		2		27		2		1	
23 OF 41	48	534+20	LT	29	45	15	15	43			32		2		27		2			
24 OF 41	49	537+84	RT	12	42	12	15	38			32		2		55		4			
24 OF 41	50	538+07	LT	12	42	12	15	37			24		2		28		2			
24 OF 41	51	539+68	RT	13	42	12	15	65			32		2		27		2		1	
24 OF 41	52	540+44	RT	19	42	12	15	65			32		2		27		2		1	
24 OF 41	53	541+66	RT	40	42	12	15	65			32		2		27		2		1	
25 OF 41	54	542+70	RT	20	42	12	15	65			32		2		35		2			
25 OF 41	55	545+21	RT	21	42	12	15	65			32		2		27		2		1	
25 OF 41	56	546+11	RT	18	49	19	15	96			32		2		35		2		1	
25 OF 41	57	547+06	RT	18	42	12	15	65			32		2		26		2			
26 OF 41	58	548+90	LT	29	42	12	15	37				48		2		27	2		1	
26 OF 41	59	550+38	RT	9	42	12	15	65			32		2		17				1	
26 OF 41	60	551+40	RT	39	44	14	15	75			32		2		26		2		1	
26 OF 41	61	552+46	RT	25	42	12	15	65			32		2		27		2		1	
26 OF 41	62	553+24	RT	11	42	12	15	65			24		2		22				1	
26 OF 41	63	553+72	RT	28	42	12	15	65			24		2		27		2		1	
27 OF 41	64	554+56	RT	22	42	12	15	39			40		2		27		2		1	
27 OF 41	65	555+59	RT	19	42	12	15	39			32		2		27		2			
27 OF 41	66	558+02	LT	18	40	12	15	37			48		2		44		2			
27 OF 41	67	559+37	LT	46	42	12	15	37			64		1		55		1			
27 OF 41	68	559+38	RT	12	42	12	15	37			56		1		55		1			
27 OF 41	69	560+18	LT	12	42	12	15	37			56		1		55		1			
27 OF 41	70	560+21	RT	12	42	12	15	39			64		1		55		1			
28 OF 41	71	560+93	RT	19	42	12	15	39			24		2		27		2			
28 OF 41	72	565+35	RT	17	27	12	15	80											1	

KEY NOTES

▽▽ PROPOSED S.E.T. AND RCP QUANTITIES THAT LEAD TO THE OUTFALL ARE SHOWN ON NEAREST DRIVEWAY LOCATION.

☒ MAILBOXES AND INSTALLATION SHALL BE SUBSIDIARY TO ITEM 560.
LOCATION AS PER FIELD CONDITIONS (SEE MB(1)-21 THRU MB(4)-21 STANDARDS).

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STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED
PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

SUMMARY TABLES OF ESTIMATED QUANTITIES

SCALE: N.T.S. SHEET 2 OF 6

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		26

SUMMARY OF PRIVATE DRIVEWAY ITEMS (CONT.)

ROADWAY PLAN & PROFILE SHEET NO.	DWY. ID #	STATION	OFFSET	EXIST. DRIVEWAY WIDTH (FT)	PROP. WIDTH @ EDGE OF PAVEMENT (FT)	PROP. WIDTH @ R.O.W. LINE (FT)	PROP. RAD. (FT)	ITEM 530 7010 DRIVEWAYS (ACP) (SY) TY PB-1	ITEM 530 7006 DRIVEWAYS (CONC) (SY) 4"	ITEM 530 7006 DRIVEWAYS (CONC) (SY) 6"	ITEM 464 7003 RC PIPE (CL III) (LF) 18"	ITEM 464 7005 RC PIPE (CL III) (LF) 24"	ITEM 467 7308 S.E.T. (TY II) (RCP) (6:1)(P) (EA) 18"	ITEM 467 7328 S.E.T. (TY II) (RCP) (6:1)(P) (EA) 24"	ITEM 496 7007 REMOV STR (PIPE) (LF) 18"	ITEM 496 7007 REMOV STR (PIPE) (LF) 24"	ITEM 496 7004 REMOV STR (SET) (EA)	ITEM 104 7011 REMOV CONC (DRIVEWAYS) (SY)	ITEM 560 7008 ☒ MAILBOX INSTALL - S (TWW-POST) TY 4 (EA)	ITEM 560 7010 ☒ MAILBOX INSTALL - M (TWW-POST) TY 4 (EA)
29 OF 41	73	566+91	LT	16	42	12	15	63			24		2		27		2		1	
29 OF 41	74	569+28	LT	17	42	12	15	63			24		2		27		2		1	
29 OF 41	75	569+69	RT	12	42	12	15	39			32		2		27		2			
29 OF 41	76	570+69	RT	22	42	12	15	39			32		2		27		2			
29 OF 41	77	572+23	LT	16	42	12	15	37			24		2		20				1	
30 OF 41	78	577+70	LT	20	42	12	15	38			24		2		40				1	
31 OF 41	79	580+92	LT	29	42	12	15	37			56		1		47		1			1
31 OF 41	80	580+93	RT	30	42	12	15	39			48		1		46		1			
31 OF 41	81	581+57	RT	32	43	13	15	40			56		1		46		1			
31 OF 41	82	581+60	LT	39	48	18	15	50			56		1		56		1			
33 OF 41	83	591+27	LT	20	42	12	15	36			80		1		71		1			
33 OF 41	84	591+27	RT	20	42	12	15	40			88		1		75		1			
33 OF 41	85	592+20	LT	20	42	12	15	36			56		1		40		1			
33 OF 41	86	592+20	RT	20	42	12	15	40			56		1		44		1			
35 OF 41	87	605+18	LT	35	42	12	15	35				24		2		27	2		2	
▽▽ 36 OF 41	88	610+28	LT	24	44	14	15		40			112		4		80	4	40	1	
▽▽ 36 OF 41	89	610+28	RT		46	16	15	48			32	80	2	2		63	2			
36 OF 41	90	612+40	LT	27	44	14	15		43			32		2		27	2	43	1	
37 OF 41	91	615+68	RT		46	16	15	47			32		2							
37 OF 41	92	618+70	RT	17	42	12	15	26				32		2		34	2			
38 OF 41	93	623+23	LT	25	42	12	15	37				24		2		27	2		1	
39 OF 41	94	629+09	LT	26	43	13	15		28			32		2		27	2		1	
39 OF 41	95	630+87	LT	21	43	14	15		25		32		2		19		2	25	1	
39 OF 41	96	632+54	LT	17	45	14	15	43			32		2		19		2		1	
40 OF 41	97	633+25	RT	36	44	14	15		42			32		2		17		42		
40 OF 41	98	633+38	LT	15	45	14	15	44				32		2		27	2		1	
40 OF 41	99	635+72	RT	24	48	24	15		51			32		2		24	2	51		
40 OF 41	100	636+15	LT	27	42	12	15	38				24		2		26	2		2	
41 OF 41	101	644+07	RT	32	35	20	15	54												
PROJECT TOTAL:								**4,730**	**370**		**2,768**	**920**	**150**	**32**	**2,830**	**511**	**160**	**342**	**47**	**1**

KEY NOTES

▽▽ PROPOSED S.E.T. AND RCP QUANTITIES THAT LEAD TO THE OUTFALL ARE SHOWN ON NEAREST DRIVEWAY LOCATION.

☒ MAILBOXES AND INSTALLATION SHALL BE SUBSIDIARY TO ITEM 560.
LOCATION AS PER FIELD CONDITIONS (SEE MB(1)-21 THRU MB(4)-21 STANDARDS).

SUMMARY OF PUBLIC ROADWAY TURNOUT ITEMS

ROADWAY PLAN & PROFILE SHEET NO.	DWY. ID #	STATION	OFFSET	DESCRIPTION	EXIST. DRIVEWAY WIDTH (FT)	PROP. WIDTH @ EDGE OF PAVEMENT (FT)	PROP. WIDTH @ R.O.W. LINE (FT)	PROP. RADIUS (FT)	ITEM 354 7018 PLANE & TEXT ASPH CONC PAV (1.5") (SY)	ITEM 530 7018 TURNOUTS (ACP) ① TY PBS1 (SY)	ITEM 530 7018 TURNOUTS (ACP) ① TY PBS2 (SY)	ITEM 464 7003 RC PIPE (CL III) (LF) 18"	ITEM 464 7005 RC PIPE (CL III) (LF) 24"	ITEM 467 7308 SET (TY II)(RCP) (6:1)(P) (EA) 18"	ITEM 467 7328 SET (TY II)(RCP) (6:1)(P) (EA) 24"	ITEM 496 7007 REMOV STR (PIPE) (LF) 18"	ITEM 496 7007 REMOV STR (PIPE) (LF) 24"	ITEM 496 7004 REMOV STR (SET) (EA)
2 OF 41	1	408+34	RT	ESQUINA CIR.	20	84	24	30	23		246	56		2		52		2
3 OF 41	2	415+42	RT	ESQUINA CIR.	18	84	24	30	20		241	56		2		84		2
18 OF 41	3	502+45	RT	TRACT 43 RD.	18	84	24	30	20		240		56		2		39	2
22 OF 41	4	524+75	RT	FM 3069	32	123	12	60/30	36		320							
26 OF 41	5	548+84	RT	SHARE 28 RD.	17	84	24	30	19		236		56		2		43	2
28 OF 41	6	563+26	LT	HAMACA LN.	21	124	24	50	24		377							
29 OF 41	7	567+95	LT	SIESTA LN.	22	84	24	30	25		250		56		2		48	2
34 OF 41	8	602+30	RT	S. CAMP RD.	18	84	24	30	20		240							
34 OF 41	9	602+36	LT	N. CAMP RD.	14	84	24	30	16		228						53	
37 OF 41	10	617+85	LT	N. VALENCIA DR.	17	84	22	30	19		268		56		2		52	2
41 OF 41	11	640+50	RT	FM 2480	30	155	30	50/100	34		448							
41 OF 41	12	640+60	LT	N. SAN ROMAN RD.	28	80	28	30/20	32		90							
PROJECT TOTAL:									**288**		**3,184**	**112**	**224**	**4**	**8**	**136**	**235**	**12**

KEY NOTES

① PAVEMENT STRUCTURE FOR TY PBS2 TURNOUTS SHALL BE CONSTRUCTED SAME AS PROPOSED ROADWAY.

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

SUMMARY TABLES OF ESTIMATED QUANTITIES

SCALE: N.T.S. SHEET 3 OF 6

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		27

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SUMMARY OF CULVERT & IRRIGATION STRUCTURE ITEMS

CULVERT & IRRIGATION CROSSING LAYOUT SHEET NO.	104 7006 REMOV CONC (RIPRAP)	110 7002 EXCAV (CHANNEL)	132 7003 EMBANK (FNL) (OC) (TY B)	400 7001 (&) STRUCT EXCAV (NON-PAY)	400 7010 CEMENT STABIL BKFL	400 7005 STRUCT EXCAV (SPECIAL)	432 7008 RIPRAP (CONC) (CL B) (5 IN)	402 7001 TRENCH EXCAVATION PROTECTION	462 7022 CONC BOX CULV (8 FT X 5 FT)	464 7019 RC PIPE (CL IV) (18 IN)	464 7021 RC PIPE (CL IV) (24 IN)	464 7023 RC PIPE (CL IV) (30 IN)	464 7025 RC PIPE (CL IV) (42 IN)	465 7128 INLET (COMPL) (PSL)(FG) (4FTX4FT - 4FTX4FT)	466 7148 WINGWALL (FW - 0) (HW = 6FT)	466 7007 HEADWALL (CH - FW - 0) (DIA = 30 IN)	466 7010 HEADWALL (CH - FW - 0) (DIA = 42 IN)	467 7305 SET (TY II) (18 IN) (RCP) (3:1) (C)	467 7306 SET (TY II) (18 IN) (RCP) (4:1) (C)	467 7325 SET (TY II) (24 IN) (RCP) (3:1) (C)	480 7001 CLEAN EXIST CULVERTS
FM 510	(SY)	(CY)	(CY)	(CY)	(CY)	(CY)	(CY)	(LF)	(LF)	(LF)	(LF)	(LF)	(LF)	EA	(EA)	(EA)	(EA)	(EA)	(EA)	(EA)	(EA)
(CSJ 1057-03-051)	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.
CULVERT SHEET 1 OF 13	200	780			45	43	58	97	97						4						1
CULVERT SHEET 2 OF 13				26	14	10				54								2			
CULVERT SHEET 3 OF 13	102	890	60	284	58	47	52	104					208				2				
CULVERT SHEET 4 OF 13					18	11					53									2	
CULVERT SHEET 5 OF 13				33	18	11					52									2	
CULVERT SHEET 6 OF 13					18	11					51									2	
CULVERT SHEET 7 OF 13					18	11					51									2	
CULVERT SHEET 8 OF 13				130	14	12		84		80				1							
CULVERT SHEET 9 OF 13	187	70	87	194	31	26	60	112		69							2				
CULVERT SHEET 10 OF 13	145	85	15	109	31	25	45	104					104				2				
CULVERT SHEET 11 OF 13	108	75	33	97	22	20	42	104				104				2					
CULVERT SHEET 12 OF 13	101	100	10	178	39	37	38	104				208				2					
CULVERT SHEET 13 OF 13				35	17	12		40		69								1	1		
IRRIGATION SHEET 1 OF 10				63	25	17		80													
IRRIGATION SHEET 2 OF 10				40	15	9		60													
IRRIGATION SHEET 3 OF 10				41	15	12		80													
IRRIGATION SHEET 4 OF 10				65	23	17		100													
IRRIGATION SHEET 5 OF 10				40																	
IRRIGATION SHEET 6 OF 10				52																	
IRRIGATION SHEET 7 OF 10				58	18	13		75													
IRRIGATION SHEET 8 OF 10				41	15	10		67													
IRRIGATION SHEET 9 OF 10				33																	
IRRIGATION SHEET 10 OF 10				46	19	13		90													
PROJECT TOTAL:	843	2,000	205	1,565	473	367	295	1,301	97	272	207	312	312	1	4	4	6	3	1	8	1

SUMMARY OF CULVERT & IRRIGATION STRUCTURE ITEMS (CONT.)

CULVERT & IRRIGATION CROSSING LAYOUT SHEET NO.	496 7002 REMOV STR (INLET)	496 7004 REMOV STR (SET)	496 7005 REMOV STR (WINGWALL)	496 7006 REMOV STR (HEADWALL)	496 7007 REMOV STR (PIPE)	1000 7001 PRSSR IRRIG PVC PIPE (18")	1000 7002 PRSSR IRRIG PVC PIPE (24")	1000 7003 PRSSR IRRIG PVC PIPE (30")	7003 7001 WELDED STL CASING PIPE (OPEN CUT) (24")	7003 7002 WELDED STL CASING PIPE (OPEN CUT) (30")	7003 7003 WELDED STL CASING PIPE (OPEN CUT) (42")
FM 510	(EA)	(EA)	(EA)	(EA)	(LF)	(LF)	(LF)	(LF)	(LF)	(LF)	(LF)
(CSJ 1057-03-051)	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.
CULVERT SHEET 1 OF 13			4	2							
CULVERT SHEET 2 OF 13		2			51						
CULVERT SHEET 3 OF 13				2	83						
CULVERT SHEET 4 OF 13											
CULVERT SHEET 5 OF 13		2			58						
CULVERT SHEET 6 OF 13											
CULVERT SHEET 7 OF 13											
CULVERT SHEET 8 OF 13	1				80						
CULVERT SHEET 9 OF 13			4	2	97						
CULVERT SHEET 10 OF 13			4	2	97						
CULVERT SHEET 11 OF 13					94						
CULVERT SHEET 12 OF 13					212						
CULVERT SHEET 13 OF 13		2			75						
IRRIGATION SHEET 1 OF 10					80			80			72
IRRIGATION SHEET 2 OF 10					60	60			50		
IRRIGATION SHEET 3 OF 10					80	80			76		
IRRIGATION SHEET 4 OF 10					100		100			80	
IRRIGATION SHEET 5 OF 10				1	81						
IRRIGATION SHEET 6 OF 10					100						
IRRIGATION SHEET 7 OF 10					75		75			72	
IRRIGATION SHEET 8 OF 10					67	67			65		
IRRIGATION SHEET 9 OF 10					85						
IRRIGATION SHEET 10 OF 10					90	90			60		
PROJECT TOTAL:	1	6	12	9	1,665	297	175	80	251	152	72

KEY NOTES

(&) FOR CONTRACTOR INFORMATION ONLY (NON-PAY).

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED
PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

SUMMARY TABLES
OF
ESTIMATED QUANTITIES

SCALE: N.T.S. SHEET 4 OF 6

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		28

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SUMMARY OF TRAFFIC CONTROL PLAN ITEMS

TRAFFIC CONTROL PLAN	400 7006 CUT & RESTORING PAV	502 7001 BARRICADES, SIGNS AND TRAFFIC HANDLING	662 7112 WK ZN PAV MRK SHT TERM (TAB) TY W	662 7114 WK ZN PAV MRK SHT TERM (TAB) TY Y-2	662 7017 WK ZN PAV MRK NON-REMOV (W) 24" (SLD)	662 7051 WK ZN PAV MRK REMOV (REFL) TY II-A-A	662 7064 WK ZN PAV MRK REMOV (W) 4" (SLD)	662 7097 WK ZN PAV MRK REMOV (Y) 4" (SLD)	677 7001 ELIM EXT PM & MRKS (4")	677 7004 ELIM EXT PM & MRKS (8")	677 7008 ELIM EXT PM & MRKS (24")	677 7009 ELIM EXT PM & MRKS (ARROW)	677 7015 ELIM EXT PM & MRKS (WORD)	503 7002 PORTABLE CHANGEABLE MESSAGE SIGN	505 7001 TMA (STATIONARY)	505 7003 TMA (MOBILE OPERATION)
FM 510	(SY)	(MO)	(EA)	(EA)	(LF)	(EA)	(LF)	(LF)	(LF)	(LF)	(LF)	(EA)	(EA)	(EA)	(DAY)	(DAY)
(CSJ 1057-03-051)	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.
PHASE I																
(STA 402+40 TO STA 524+80)																
PHASE I, STEP A	233				35		12,160	12,160	12,160					4		
PHASE I, STEP B	41					650	25,820	25,820	3,600	100		2	1			
PHASE I TOTAL:	274				35	650	37,980	37,980	15,760	100		2	1	4		
PHASE II																
(STA 524+80 TO STA 643+57.85)																
PHASE II, STEP A	333				60	50	12,646	13,446	12,428	40	12					
PHASE II, STEP B					36	600	12,080	12,080	1,300							
PHASE II TOTAL:	333				96	650	24,726	25,526	13,728	40	12					
PHASE III																
(STA 402+40 TO STA 643+57.85)																
FINAL SURFACE COURSE			10	6,571												
PHASE III TOTAL:			10	6,571												
PROJECT TOTAL:	607	20	10	6,571	131	1,300	62,706	63,506	29,488	140	12	2	1	4	320	30

SUMMARY OF PAVEMENT MARKINGS ITEMS

PAVEMENT MARKING LAYOUTS	666 7266 RE PROFILE PM TY I (W) 6" (SLD) (100 MIL)	666 7420 REFL PAV MRK TY I (Y) 6" (BRK) (100 MIL)	666 7423 REFL PAV MRK TY I (Y) 6" (SLD) (100 MIL)	666 7024 REFL PAV MRK TY I (W) 8" (SLD) (100 MIL)	666 7117 REFL PAV MRK TY I (Y) 12" (SLD) (100 MIL)	666 7036 REFL PAV MRK TY I (W) 24" (SLD) (100 MIL)	668 7091 PREFAB PM TY C (W) (ARROW)	668 7103 PREFAB PM TY C (W) (WORD)	672 7002 REFL PAV MRKR TY I-C	672 7004 REFL PAV MRKR TY II-A-A	672 7008 TRAFFIC BUTTON TY Y	672 7009 TRAFFIC BUTTON TY B
FM 510	(LF)	(LF)	(LF)	(LF)	(LF)	(LF)	(EA)	(EA)	(EA)	(EA)	(EA)	(EA)
(CSJ 1057-03-051)	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.
SHEET 1 OF 7	6,312	810	498			36				47	100	1,193
SHEET 2 OF 7	7,200	900								45		1,440
SHEET 3 OF 7	7,140	900				18				45		1,440
SHEET 4 OF 7	6,822	530	4,991	200	345	12	2	2	10	268	95	757
SHEET 5 OF 7	6,903	900				51				45		1,440
SHEET 6 OF 7	7,059	900	410			24				51	83	1,358
SHEET 7 OF 7	6,130	100	5,353	155		74				150	1,110	77
PROJECT TOTAL:	47,566	5,040	11,252	355	345	215	2	2	10	651	1,388	7,705

SUMMARY OF SMALL SIGN ITEMS

SIGNING LAYOUTS	644 7025 IN SM RD SN SUP&AM TYS80 (1) SA (P)	644 7028 IN SM RD SN SUP&AM TYS80 (1) SA (T)	644 7031 IN SM RD SN SUP&AM TYS80 (1) SA (U)	644 7073 REMOVE SM RD SN SUP&AM	636 7001 ALUMINUM SIGNS (TY A)
FM 510	(EA)	(EA)	(EA)	(EA)	(SF)
(CSJ 1057-03-051)	EST.	EST.	EST.	EST.	EST.
SHEET 1 OF 8	5		2	7	27
SHEET 2 OF 8	2			2	
SHEET 3 OF 8	9	1	1	11	
SHEET 4 OF 8	2	3		4	24
SHEET 5 OF 8	1	1		2	8
SHEET 6 OF 8	2	4		6	11
SHEET 7 OF 8	7	2		9	
SHEET 8 OF 8	7		1	8	
PROJECT TOTAL:	35	11	4	49	70

SUMMARY OF DELINEATOR & OBJECT MARKER ITEMS

CULVERT CROSSING LAYOUTS	658 7059 INSTL OM ASSM (OM-2Z) (WFLX) GND (BI)	658 7078 REMOVE DELIN & OBJECT MARKER ASSMS
FM 510	(EA)	(EA)
(CSJ 1057-03-051)	EST.	EST.
SHEET 1 OF 13	2	2
SHEET 2 OF 13	2	
SHEET 3 OF 13	2	2
SHEET 4 OF 13	2	
SHEET 5 OF 13	2	2
SHEET 6 OF 13	2	
SHEET 7 OF 13	2	
SHEET 8 OF 13	2	2
SHEET 9 OF 13	2	2
SHEET 10 OF 13	2	2
SHEET 11 OF 13	2	2
SHEET 12 OF 13	2	2
SHEET 13 OF 13	2	
PROJECT TOTAL:	26	16

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

SUMMARY TABLES OF ESTIMATED QUANTITIES

SCALE: N.T.S. SHEET 5 OF 6

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		29

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SUMMARY OF EROSION CONTROL DEVICES ITEMS

SWP3 LAYOUTS	160 7007 ## FURN & PLACE TOPSOIL (VEH)	164 7018 ★ HYDRO MULCH SEED (PERM_RURAL_CLAY)	164 7021 HYDRO MULCH SEED (TEMP_WARM)	166 7002 (&) ★★ FERTILIZER (NON-PAY)	168 7001 VEGETATIVE WATERING	506 7021 ★★★ CONSTRUCTION EXITS (INSTALL) (TY 2)	506 7024 CONSTRUCTION EXITS (REMOVE)	506 7039 TEMP SEDMT CONT FENCE (INSTALL)	506 7041 TEMP SEDMT CONT FENCE (REMOVE)	506 7044 BIODEG EROSN CONT LOGS (INSTL) (12")	506 7046 BIODEG EROSN CONT LOGS (REMOVE)
FM 510	(CY)	(SY)	(SY)	(TON)	(TGL)	(SY)	(SY)	(LF)	(LF)	(LF)	(LF)
(CSJ 1057-03-051)	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.
SHEET 1 OF 7		20,512	20,512	0.21	374	156	156	200	200	720	720
SHEET 2 OF 7		15,474	15,474	0.16	282					840	840
SHEET 3 OF 7		15,423	15,423	0.16	281					720	720
SHEET 4 OF 7		17,349	17,349	0.18	317	156	156			800	800
SHEET 5 OF 7		19,790	19,790	0.20	361					780	780
SHEET 6 OF 7		15,295	15,295	0.16	279					960	960
SHEET 7 OF 7		11,517	11,517	0.12	210	156	156			600	600
PROJECT TOTAL:	50	115,360	115,360	1.2	2,104	468	468	200	200	5,420	5,420

KEY NOTES

(&) FOR CONTRACTOR INFORMATION ONLY (NON-PAY).

TOPSOIL TO BE USED AS NEEDED AND AS DIRECTED BY THE ENGINEER FOR SELECT PROBLEM AREAS.

★ PERMANENT SEEDING TO BE DONE AFTER ROADWAY CONSTRUCTION IS COMPLETE

★★ FERTILIZER QUANTITIES (TON) ARE BASED ON A RATE OF 100 LBS OF NITROGEN PER ACRE NPK 10-5-5

★★★ CONSTRUCTION EXIT MIN AREA = 78 SY (50'X14') , LOCATIONS ARE APPROXIMATE AND MAY BE MODIFIED IN THE FIELD AS APPROVED BY ENGINEER

VEGETATIVE WATERING APLICATION RATE = 88,300 GAL/ACRE @ 13 CYCLES / 1000 (TGL)
LOG MAX LENGTH = 30 FEET
STD LENGTH = 10 FEET WEIGHT = 33 LBS

EROSION CONTROL DEVICES MAY BE MODIFIED TO MEET FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER.

CONTRACTOR SHALL CONSULT WITH THE FIELD ENGINEER BEFORE ANY EROSION CONTROL DEVICES ARE INSTALLED.

SUMMARY OF REMOVAL ITEMS

LOCATION	104 7006 REMOV CONC (RIPRAP)	104 7011 REMOV CONC (DRIVEWAYS)	496 7002 REMOV STR (INLET)	496 7005 REMOV STR (WINGWALL)	496 7006 REMOV STR (HEADWALL)	496 7007 REMOV STR (PIPE)
FM 510	(SY)	(SY)	(EA)	(EA)	(EA)	(LF)
(CSJ 1057-03-051)	EST.	EST.	EST.	EST.	EST.	EST.
ROADWAY PLAN & PROFILE SHEET 2 of 41		83				
ROADWAY PLAN & PROFILE SHEET 20 of 41		58				
ROADWAY PLAN & PROFILE SHEET 36 of 41		83				
ROADWAY PLAN & PROFILE SHEET 39 of 41		25				
ROADWAY PLAN & PROFILE SHEET 40 of 41		93				
CULVERT SHEET 1 OF 13	200			4	2	
CULVERT SHEET 2 OF 13						51
CULVERT SHEET 3 OF 13	102				2	83
CULVERT SHEET 4 OF 13						
CULVERT SHEET 5 OF 13						58
CULVERT SHEET 6 OF 13						
CULVERT SHEET 7 OF 13						
CULVERT SHEET 8 OF 13			1			80
CULVERT SHEET 9 OF 13	187			4	2	97
CULVERT SHEET 10 OF 13	145			4	2	97
CULVERT SHEET 11 OF 13	108					94
CULVERT SHEET 12 OF 13	101					212
CULVERT SHEET 13 OF 13						75
IRRIGATION SHEET 1 OF 10						80
IRRIGATION SHEET 2 OF 10						60
IRRIGATION SHEET 3 OF 10						80
IRRIGATION SHEET 4 OF 10						100
IRRIGATION SHEET 5 OF 10					1	81
IRRIGATION SHEET 6 OF 10						100
IRRIGATION SHEET 7 OF 10						75
IRRIGATION SHEET 8 OF 10						67
IRRIGATION SHEET 9 OF 10						85
IRRIGATION SHEET 10 OF 10						90
TOTAL:	843	342	1	12	9	1,665

KEY NOTES

ITEMS AND QUANTITIES SHOWN ON THIS TABLE MAY BE SHOWN ON OTHER SUMMARY TABLES.

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

07/02/24

Pharr District Central Design

Texas Department of Transportation

FM 510

SUMMARY TABLES OF ESTIMATED QUANTITIES

SCALE: N.T.S. SHEET 6 OF 6

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		30

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Baseline Station	Station Quantities								Mass Ordinate	
	Cut				Fill					
	Factor	Area	Volume	Adjusted	Factor	Area	Volume	Adjusted	(Incremental)	(Cumulative)
402+40.000	1	20.94	0	0	1	7.195	0	0	0	0
403+00.000	1	47.662	76.225	76.225	1	9.387	18.424	18.424	57.801	57.801
404+00.000	1	56.104	192.161	192.161	1	0.993	19.221	19.221	172.94	230.741
405+00.000	1	61.216	217.26	217.26	1	3.238	7.835	7.835	209.425	440.166
406+00.000	1	67.081	237.587	237.587	1	0	5.997	5.997	231.59	671.756
407+00.000	1	44.896	207.365	207.365	1	4.981	9.223	9.223	198.142	869.898
408+00.000	1	27.483	134.035	134.035	1	73.239	144.85	144.85	-10.815	859.083
409+00.000	1	79.068	197.316	197.316	1	0.403	136.374	136.374	60.942	920.025
410+00.000	1	53.398	245.308	245.308	1	13.465	25.681	25.681	219.627	1139.652
411+00.000	1	61.75	213.238	213.238	1	2.449	29.47	29.47	183.768	1323.42
412+00.000	1	45.396	198.418	198.418	1	20.347	42.216	42.216	156.202	1479.622
413+00.000	1	80.862	233.811	233.811	1	10.107	56.398	56.398	177.413	1657.035
414+00.000	1	61.395	263.439	263.439	1	0.174	19.04	19.04	244.399	1901.434
415+00.000	1	89.221	278.919	278.919	1	0.519	1.283	1.283	277.636	2179.07
416+00.000	1	57.303	271.342	271.342	1	13.987	26.863	26.863	244.479	2423.549
417+00.000	1	61.404	219.828	219.828	1	10.329	45.031	45.031	174.797	2598.346
418+00.000	1	50.644	207.495	207.495	1	16.525	49.73	49.73	157.765	2756.111
419+00.000	1	23.947	138.13	138.13	1	125.113	262.293	262.293	-124.163	2631.948
420+00.000	1	25.422	91.423	91.423	1	17.511	264.119	264.119	-172.696	2459.252
421+00.000	1	46.739	133.631	133.631	1	1.561	35.32	35.32	98.311	2557.563
422+00.000	1	46.412	172.502	172.502	1	0.967	4.683	4.683	167.819	2725.382
423+00.000	1	40.537	161.017	161.017	1	1.251	4.108	4.108	156.909	2882.291
424+00.000	1	37.223	144	144	1	1.506	5.105	5.105	138.895	3021.186
425+00.000	1	40.809	144.504	144.504	1	1.198	5.006	5.006	139.498	3160.684
426+00.000	1	31.333	133.596	133.596	1	2.531	6.904	6.904	126.692	3287.376
427+00.000	1	31.334	116.049	116.049	1	2.252	8.857	8.857	107.192	3394.568
428+00.000	1	31.081	115.583	115.583	1	2.649	9.075	9.075	106.508	3501.076
429+00.000	1	25.033	103.915	103.915	1	3.036	10.527	10.527	93.388	3594.464
430+00.000	1	20.66	84.616	84.616	1	3.31	11.751	11.751	72.865	3667.329
431+00.000	1	13.685	63.601	63.601	1	6.72	18.573	18.573	45.028	3712.357
432+00.000	1	7.941	40.049	40.049	1	7.83	26.944	26.944	13.105	3725.462
433+00.000	1	7.788	29.128	29.128	1	9.327	31.773	31.773	-2.645	3722.817
434+00.000	1	16.991	45.887	45.887	1	8.531	33.07	33.07	12.817	3735.634
435+00.000	1	10.699	51.277	51.277	1	10.682	35.579	35.579	15.698	3751.332
436+00.000	1	13.102	44.075	44.075	1	6.7	32.188	32.188	11.887	3763.219
437+00.000	1	21.293	63.695	63.695	1	6.575	24.583	24.583	39.112	3802.331
438+00.000	1	28.466	92.147	92.147	1	3.36	18.398	18.398	73.749	3876.08
439+00.000	1	32.938	113.711	113.711	1	2.716	11.253	11.253	102.458	3978.538
440+00.000	1	33.933	123.834	123.834	1	4.083	12.591	12.591	111.243	4089.781
441+00.000	1	41.784	140.217	140.217	1	2.291	11.805	11.805	128.412	4218.193
442+00.000	1	33.108	138.689	138.689	1	1.769	7.519	7.519	131.17	4349.363
443+00.000	1	41.173	137.556	137.556	1	1.408	5.884	5.884	131.672	4481.035
444+00.000	1	45.094	159.753	159.753	1	0.201	2.98	2.98	156.773	4637.808
445+00.000	1	54.408	184.263	184.263	1	0.241	0.817	0.817	183.446	4821.254
446+00.000	1	41.629	177.846	177.846	1	0.984	2.268	2.268	175.578	4996.832
447+00.000	1	52.405	174.137	174.137	1	0.169	2.135	2.135	172.002	5168.834
448+00.000	1	45.383	181.089	181.089	1	2.64	5.202	5.202	175.887	5344.721
449+00.000	1	49.715	176.106	176.106	1	0.071	5.022	5.022	171.084	5515.805
450+00.000	1	53.96	191.991	191.991	1	0.437	0.942	0.942	191.049	5706.854
451+00.000	1	60.187	211.384	211.384	1	0	0.81	0.81	210.574	5917.428
452+00.000	1	51.773	207.334	207.334	1	0.308	0.571	0.571	206.763	6124.191
453+00.000	1	56.733	200.937	200.937	1	0.024	0.616	0.616	200.321	6324.512
454+00.000	1	46.945	191.995	191.995	1	1.22	2.304	2.304	189.691	6514.203
455+00.000	1	55.018	188.82	188.82	1	0.548	3.273	3.273	185.547	6699.75
456+00.000	1	52.981	199.997	199.997	1	0.11	1.217	1.217	198.78	6898.53
457+00.000	1	58.795	206.992	206.992	1	0.112	0.411	0.411	206.581	7105.111
458+00.000	1	60.704	221.295	221.295	1	0	0.208	0.208	221.087	7326.198
459+00.000	1	53.567	211.613	211.613	1	0.007	0.012	0.012	211.601	7537.799
460+00.000	1	56.467	203.766	203.766	1	0	0.012	0.012	203.754	7741.553
461+00.000	1	49.071	195.44	195.44	1	0.153	0.284	0.284	195.156	7936.709
462+00.000	1	49.267	182.107	182.107	1	0.406	1.035	1.035	181.072	8117.781
463+00.000	1	47.545	179.282	179.282	1	0.289	1.287	1.287	177.995	8295.776
464+00.000	1	24.129	132.73	132.73	1	4.755	9.342	9.342	123.388	8419.164
465+00.000	1	47.512	132.668	132.668	1	1.169	10.971	10.971	121.697	8540.861
466+00.000	1	42.789	167.225	167.225	1	1.622	5.168	5.168	162.057	8702.918
467+00.000	1	50.216	172.232	172.232	1	2.949	8.465	8.465	163.767	8866.685
468+00.000	1	50.096	185.763	185.763	1	0	5.462	5.462	180.301	9046.986
469+00.000	1	51.564	188.259	188.259	1	0.248	0.46	0.46	187.799	9234.785
470+00.000	1	48.729	185.728	185.728	1	0.545	1.47	1.47	184.258	9419.043

Baseline Station	Station Quantities								Mass Ordinate	
	Cut				Fill					
	Factor	Area	Volume	Adjusted	Factor	Area	Volume	Adjusted	(Incremental)	(Cumulative)
471+00.000	1	49.052	181.076	181.076	1	0.041	1.085	1.085	179.991	9599.034
472+00.000	1	52.772	188.564	188.564	1	0	0.075	0.075	188.489	9787.523
473+00.000	1	52.482	194.915	194.915	1	0.108	0.2	0.2	194.715	9982.238
474+00.000	1	52.406	194.236	194.236	1	4.254	8.079	8.079	186.157	10168.395
475+00.000	1	50.812	191.144	191.144	1	0.069	8.006	8.006	183.138	10351.533
476+00.000	1	45.147	177.701	177.701	1	0.127	0.363	0.363	177.338	10528.871
477+00.000	1	53.89	183.401	183.401	1	0.011	0.255	0.255	183.146	10712.017
478+00.000	1	46.61	186.11	186.11	1	0.255	0.492	0.492	185.618	10897.635
479+00.000	1	49.619	178.201	178.201	1	0.148	0.747	0.747	177.454	11075.089
480+00.000	1	44.673	174.615	174.615	1	0.229	0.698	0.698	173.917	11249.006
481+00.000	1	40.654	158.014	158.014	1	0.839	1.978	1.978	156.036	11405.042
482+00.000	1	44.919	158.47	158.47	1	0.124	1.785	1.785	156.685	11561.727
483+00.000	1	39.621	156.555	156.555	1	0.094	0.404	0.404	156.151	11717.878
484+00.000	1	47.895	162.066	162.066	1	0.185	0.515	0.515	161.551	11879.429
485+00.000	1	40.576	163.835	163.835	1	1.404	2.941	2.941	160.894	12040.323
486+00.000	1	42.566	153.966	153.966	1	0.161	2.897	2.897	151.069	12191.392
487+00.000	1	42.133	156.849	156.849	1	0.182	0.634	0.634	156.215	12347.607
488+00.000	1	43.428	158.447	158.447	1	0.417	1.109	1.109	157.338	12504.945
489+00.000	1	42.81	159.701	159.701	1	0.598	1.88	1.88	157.821	12662.766
490+00.000	1	36.996	147.788	147.788	1	0	1.107	1.107	146.681	12809.447
491+00.000	1	27.793	119.978	119.978	1	1.248	2.311	2.311	117.667	12927.114
492+00.000	1	18.776	86.238	86.238	1	0.766	3.729	3.729	82.509	13009.623
493+00.000	1	28.734	87.981	87.981	1	12.022	23.681	23.681	64.3	13073.923
494+00.000	1	38.42	124.36	124.36	1	0	22.264	22.264	102.096	13176.019
495+00.000	1	40.317	145.809	145.809	1	0.024	0.046	0.046	145.763	13321.782
496+00.000	1	41.696	151.876	151.876	1	0	0.045	0.045	151.831	13473.613
497+00.000	1	30.748	134.155	134.155	1	0.366	0.679	0.679	133.476	13607.089
498+00.000	1	38.608	128.436	128.436	1	0	0.679	0.679	127.757	13734.846
499+00.000	1	40.441	146.386	146.386	1	0	0	0	146.386	13881.232
500+00.000	1	41.18	151.149	151.149	1	0.056	0.105	0.105	151.044	14032.276
501+00.000	1	40.72	151.666	151.666	1	0.03	0.159	0.159	151.507	14183.783
502+00.000	1	33.04	136.592	136.592	1	9.555	17.749	17.749	118.843	14302.626
503+00.000	1	43.35	141.463	141.463	1	2.933	23.126	23.126	118.337	14420.963
504+00.000	1	53.179	178.758	178.758	1	0	5.432	5.432	173.326	14594.289
505+00.000	1	58.981	207.704	207.704	1	0.163	0.301	0.301	207.403	14801.692
506+00.000	1	73.715	245.733	245.733	1	0.063	0.418	0.418	245.315	15047.007
507+00.000	1	65.75	258.268	258.268	1	0.163	0.418	0.418	257.85	15304.857
508+00.000	1	63.694	239.712	239.712	1	0	0.302	0.302	239.41	15544.267
509+00.000	1	63.792	236.086	236.086	1	0	0	0	236.086	15780.353
510+00.000	1	58.914	227.234	227.234	1	0	0	0	227.234	16007.587
511+00.000	1	50.994	203.534	203.534	1	0.082	0.151	0.151	203.383	16210.97
512+00.000	1	45.762	179.179	179.179	1	0.946	1.904	1.904	177.275	16388.245
513+00.000	1	41.974	162.475	162.475	1	2.404	6.204	6.204	156.271	16544.516
514+00.000	1	46.871	164.528	164.528	1	0.313	5.031	5.031	159.497	16704.013
515+00.000	1	52.77	184.521	184.521	1	0.309	1.153	1.153	183.368	16887.381
516+00.000	1	56.514	202.378	202.378	1	0.265	1.064	1.064	201.314	17088.695
517+00.000	1	56.763	209.772	209.772	1	0.386	1.206	1.206	208.566	17297.261
518+00.000	1	37.386	174.35	174.35	1	2.241	4.865	4.865	169.485	17466.746
519+00.000	1	41.505	146.093	146.093	1	9.438	21.628	21.628	124.465	17591.211
520+00.000	1	50.492	170.365	170.365	1	1.333	19.946	19.946	150.419	17741.63
521+00.000	1	70.942	224.877	224.877	1	0.056	2.573	2.573	222.304	17963.934
522+00.000	1	66.877	255.22	255.22	1	0.516	1.059	1.059	254.161	18218.095
523+00.000	1	59.588	234.194	234.194	1	0.524	1.925	1.925	232.269	18450.364
524+00.000	1	51.83	206.33	206.33	1	3.255	6.998	6.998	199.332	18649.696
525+00.000	1	18.151	129.595	129.595	1	39.688	79.524	79.524	50.071	18699.767
526+00.000	1	25.544	80.917	80.917	1	5.429	83.549	83.549	-2.632	18697.135
527+00.000	1	17.785	80.24	80.24	1	17.67	42.777	42.777	37.463	18734.598
528+00.000	1	17.466	65.279	65.279	1	22.599	74.573	74.573	-9.294	18725.304
529+00.000	1	20.302	69.94	69.94	1	18.182	75.52	75.52	-5.58	18719.724
530+00.000	1	12.205	60.198	60.198	1	6.382	45.489	45.489	14.709	18734.433
531+00.000	1	14.119	48.747	48.747	1	18.749	46.539	46.539	2.208	18736.641
532+00.000	1	6.876	38.879	38.879	1	26.304	83.43	83.43	-44.551	18692.09
533+00.000	1	6.81	25.345	25.345	1	23.169	91.616	91.616	-66.271	18625.819
534+00.000	1	13.328	37.293	37.293	1	6.304	54.579	54.579	-17.286	18608.533
535+00.000	1	19.969	61.662	61.662	1	2.133	15.625	15.625	46.037	18654.57
536+00.000	1	26.431	85.927	85.927	1	1.384	6.514	6.514	79.413	18733.983
537+00.000	1	34.283	112.433	112.433	1	0.588	3.653	3.653	108.78	18842.763
538+00.000	1	67.271	188.062	188.062	1	0.073	1.224	1.224	186.838	19029.601
539+00.000	1	56.622	229.432	229.432	1	0.06	0.247	0.247	229.185	19258.786

NOTES:

SHRINKING OR SWELLING FACTORS ARE NOT CONSIDERED IN DETERMINING QUANTITIES. VOLUMES ARE MEASURED AS ORIGINAL AND FINAL POSITIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING VALUES WHEN NEEDED.

ALL UNITS IN THIS REPORT ARE IN FEET, SQUARE FEET, AND CUBIC YARDS UNLESS SPECIFIEC OTHERWISE.

SEE SHEET 2 OF 2 FOR GRAND SUMMARY TOTAL OF EARTHWORK QUANTITY.

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

SUMMARY TABLES OF ESTIMATED EARTHWORK QUANTITIES

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		31

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Baseline Station	Station Quantities								Mass Ordinate	
	Cut				Fill					
	Factor	Area	Volume	Adjusted	Factor	Area	Volume	Adjusted	(Incremental)	(Cumulative)
540+00.000	1	54.831	206.394	206.394	1	1.628	3.126	3.126	203.268	19462.054
541+00.000	1	63.578	219.276	219.276	1	0.199	3.383	3.383	215.893	19677.947
542+00.000	1	66.432	240.759	240.759	1	0.127	0.604	0.604	240.155	19918.102
543+00.000	1	70.285	253.18	253.18	1	1.395	2.819	2.819	250.361	20168.463
544+00.000	1	69.773	259.368	259.368	1	0	2.584	2.584	256.784	20425.247
545+00.000	1	79.53	276.488	276.488	1	0.018	0.032	0.032	276.456	20701.703
546+00.000	1	92.615	318.787	318.787	1	0	0.032	0.032	318.755	21020.458
547+00.000	1	80.141	319.918	319.918	1	0.299	0.553	0.553	319.365	21339.823
548+00.000	1	60.573	260.581	260.581	1	1.047	2.492	2.492	258.089	21597.912
549+00.000	1	113.617	322.575	322.575	1	8.631	17.923	17.923	304.652	21902.564
550+00.000	1	63.211	327.46	327.46	1	3.438	22.35	22.35	305.11	22207.674
551+00.000	1	65.252	237.894	237.894	1	3.714	13.245	13.245	224.649	22432.323
552+00.000	1	62.094	235.826	235.826	1	3.147	12.707	12.707	223.119	22655.442
553+00.000	1	60.997	227.947	227.947	1	4.379	13.938	13.938	214.009	22869.451
554+00.000	1	58.401	221.106	221.106	1	4.828	17.05	17.05	204.056	23073.507
555+00.000	1	34.201	171.485	171.485	1	5.488	19.104	19.104	152.381	23225.888
556+00.000	1	35.055	128.253	128.253	1	8.024	25.024	25.024	103.229	23329.117
557+00.000	1	34.889	129.527	129.527	1	3.284	20.941	20.941	108.586	23437.703
558+00.000	1	45.304	148.505	148.505	1	0.666	7.314	7.314	141.191	23578.894
559+00.000	1	27.115	134.11	134.11	1	6.78	13.788	13.788	120.322	23699.216
560+00.000	1	23.512	93.754	93.754	1	7.95	27.278	27.278	66.476	23765.692
561+00.000	1	57.818	150.61	150.61	1	0.94	16.464	16.464	134.146	23899.838
562+00.000	1	29.77	162.199	162.199	1	10.986	22.086	22.086	140.113	24039.951
563+00.000	1	38.7	126.796	126.796	1	74.036	157.448	157.448	-30.652	24009.299
564+00.000	1	41.52	148.557	148.557	1	8.259	152.398	152.398	-3.841	24005.458
565+00.000	1	47.603	165.043	165.043	1	3.36	21.517	21.517	143.526	24148.984
566+00.000	1	39.083	160.53	160.53	1	3.195	12.139	12.139	148.391	24297.375
567+00.000	1	66.576	195.665	195.665	1	0.013	5.942	5.942	189.723	24487.098
568+00.000	1	47.939	212.066	212.066	1	3.677	6.835	6.835	205.231	24692.329
569+00.000	1	32.383	148.746	148.746	1	6.342	18.555	18.555	130.191	24822.52
570+00.000	1	34.692	124.214	124.214	1	6.727	24.202	24.202	100.012	24922.532
571+00.000	1	23.818	108.351	108.351	1	6.746	24.949	24.949	83.402	25005.934
572+00.000	1	25.989	92.235	92.235	1	5.851	23.327	23.327	68.908	25074.842
573+00.000	1	23.351	91.371	91.371	1	5.114	20.305	20.305	71.066	25145.908
574+00.000	1	21.542	83.135	83.135	1	5.422	19.509	19.509	63.626	25209.534
575+00.000	1	23.939	84.223	84.223	1	3.482	16.489	16.489	67.734	25277.268
576+00.000	1	25.116	90.841	90.841	1	6.227	17.98	17.98	72.861	25350.129
577+00.000	1	25.761	94.216	94.216	1	8.932	28.073	28.073	66.143	25416.272
578+00.000	1	23.881	91.929	91.929	1	9.018	33.242	33.242	58.687	25474.959
579+00.000	1	32.492	104.393	104.393	1	4.815	25.617	25.617	78.776	25553.735
580+00.000	1	32.86	121.022	121.022	1	5.037	18.244	18.244	102.778	25656.513
581+00.000	1	28.561	113.743	113.743	1	5.218	18.99	18.99	94.753	25751.266
582+00.000	1	23.573	96.546	96.546	1	10.562	29.222	29.222	67.324	25818.59
583+00.000	1	51.687	139.371	139.371	1	0	19.559	19.559	119.812	25938.402
584+00.000	1	43.276	175.858	175.858	1	0	0	0	175.858	26114.26
585+00.000	1	45.655	164.687	164.687	1	0	0	0	164.687	26278.947
586+00.000	1	43.282	164.698	164.698	1	0.056	0.104	0.104	164.594	26443.541
587+00.000	1	37.056	148.775	148.775	1	0.075	0.242	0.242	148.533	26592.074
588+00.000	1	38.551	140.014	140.014	1	0.973	1.941	1.941	138.073	26730.147
589+00.000	1	38.594	142.861	142.861	1	0.314	2.384	2.384	140.477	26870.624
590+00.000	1	47.4	159.247	159.247	1	0.808	2.078	2.078	157.169	27027.793
591+00.000	1	19.493	123.874	123.874	1	26.73	50.996	50.996	72.878	27100.671
592+00.000	1	22.451	77.672	77.672	1	7.51	63.407	63.407	14.265	27114.936
593+00.000	1	42.768	120.775	120.775	1	1.183	16.098	16.098	104.677	27219.613
594+00.000	1	48.117	168.305	168.305	1	0.04	2.265	2.265	166.04	27385.653
595+00.000	1	53.73	188.605	188.605	1	0	0.075	0.075	188.53	27574.183
596+00.000	1	60.36	211.277	211.277	1	0.048	0.089	0.089	211.188	27785.371
597+00.000	1	55.534	214.617	214.617	1	0.346	0.731	0.731	213.886	27999.257
598+00.000	1	61.456	216.648	216.648	1	0	0.642	0.642	216.006	28215.263
599+00.000	1	55.439	216.472	216.472	1	0.083	0.154	0.154	216.318	28431.581
600+00.000	1	66.596	225.99	225.99	1	0.021	0.193	0.193	225.797	28657.378
601+00.000	1	60.722	235.774	235.774	1	0.263	0.526	0.526	235.248	28892.626
602+00.000	1	52.581	209.82	209.82	1	0.155	0.773	0.773	209.047	29101.673
603+00.000	1	71.725	230.195	230.195	1	0.226	0.705	0.705	229.49	29331.163
604+00.000	1	70.198	262.82	262.82	1	0	0.418	0.418	262.402	29593.565
605+00.000	1	57.911	237.238	237.238	1	0.404	0.748	0.748	236.49	29830.055
606+00.000	1	58.235	215.085	215.085	1	0.138	1.003	1.003	214.082	30044.137
607+00.000	1	42.671	186.864	186.864	1	0.316	0.841	0.841	186.023	30230.16
608+00.000	1	47.375	166.752	166.752	1	1.716	3.764	3.764	162.988	30393.148

Baseline Station	Station Quantities								Mass Ordinate	
	Cut				Fill					
	Factor	Area	Volume	Adjusted	Factor	Area	Volume	Adjusted	(Incremental)	(Cumulative)
609+00.000	1	29.834	142.979	142.979	1	5.045	12.521	12.521	130.458	30523.606
610+00.000	1	34.522	119.178	119.178	1	7.051	22.4	22.4	96.778	30620.384
611+00.000	1	36.831	132.136	132.136	1	4.673	21.71	21.71	110.426	30730.81
612+00.000	1	31.88	127.243	127.243	1	4.612	17.194	17.194	110.049	30840.859
613+00.000	1	29.227	113.161	113.161	1	6.109	19.853	19.853	93.308	30934.167
614+00.000	1	39.13	126.587	126.587	1	3.696	18.158	18.158	108.429	31042.596
615+00.000	1	50.472	165.931	165.931	1	1.309	9.269	9.269	156.662	31199.258
616+00.000	1	47.349	181.151	181.151	1	0.817	3.936	3.936	177.215	31376.473
617+00.000	1	42.322	166.057	166.057	1	4.422	9.701	9.701	156.356	31532.829
618+00.000	1	28.649	131.428	131.428	1	3.247	14.201	14.201	117.227	31650.056
619+00.000	1	37.867	123.179	123.179	1	1.036	7.931	7.931	115.248	31765.304
620+00.000	1	50.759	164.123	164.123	1	0.223	2.332	2.332	161.791	31927.095
621+00.000	1	56.362	198.372	198.372	1	0.032	0.472	0.472	197.9	32124.995
622+00.000	1	53.355	203.18	203.18	1	0.001	0.062	0.062	203.118	32328.113
623+00.000	1	35.295	164.167	164.167	1	2.855	5.289	5.289	158.878	32486.991
624+00.000	1	41.113	141.496	141.496	1	1.832	8.68	8.68	132.816	32619.807
625+00.000	1	44.066	157.739	157.739	1	2.462	7.952	7.952	149.787	32769.594
626+00.000	1	43.234	161.667	161.667	1	2.018	8.295	8.295	153.372	32922.966
627+00.000	1	37.794	150.052	150.052	1	2.19	7.792	7.792	142.26	33065.226
628+00.000	1	52.417	167.057	167.057	1	0.158	4.348	4.348	162.709	33227.935
629+00.000	1	49.217	188.21	188.21	1	0.92	1.997	1.997	186.213	33414.148
630+00.000	1	47.087	178.341	178.341	1	1.536	4.549	4.549	173.792	33587.94
631+00.000	1	34.047	150.249	150.249	1	4.345	10.892	10.892	139.357	33727.297
632+00.000	1	34.599	127.123	127.123	1	6.772	20.588	20.588	106.535	33833.832
633+00.000	1	28.127	116.159	116.159	1	5.759	23.206	23.206	92.953	33926.785
634+00.000	1	36.958	120.528	120.528	1	2.379	15.071	15.071	105.457	34032.242
635+00.000	1	35.803	134.742	134.742	1	2.077	8.251	8.251	126.491	34158.733
636+00.000	1	32.104	125.754	125.754	1	3.855	10.984	10.984	114.77	34273.503
637+00.000	1	28.466	112.168	112.168	1	2.308	11.413	11.413	100.755	34374.258
638+00.000	1	34.142	115.941	115.941	1	2.943	9.724	9.724	106.217	34480.475
639+00.000	1	36.204	130.269	130.269	1	3.955	12.774	12.774	117.495	34597.97
640+00.000	1	61.874	181.626	181.626	1	4.048	14.82	14.82	166.806	34764.776
641+00.000	1	63.946	233.001	233.001	1	0.243	7.947	7.947	225.054	34989.83
642+00.000	1	27.996	170.264	170.264	1	1.608	3.428	3.428	166.836	35156.666
643+00.000	1	28.024	103.741	103.741	1	1.873	6.445	6.445	97.296	35253.962
643+57.850	1	24.778	56.566	56.566	1	3.848	6.129	6.129	50.437	35304.399

Grand Total: Total Cut Volume = 39,310 Total Fill Volume = 4,005

	ITEM 110 - 7001	ITEM 132 - 7006
FM 510 CSJ 1057-03-051	EXCAV (ROADWAY) (CY)	EMBANK (FNL)(DC)(TY C) (CY)
STA. 402+40 TO STA. 643+57.85	39,310	4,005
GRAND TOTAL:	39,310	4,005

NOTES:

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STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

SUMMARY TABLES OF ESTIMATED EARTHWORK QUANTITIES

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		32

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TRAFFIC CONTROL PLAN
COVER SHEET

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Pharr District Central Design

Texas Department of Transportation

FM 510

TRAFFIC CONTROL PLAN
COVER SHEET

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		33

CK:
DW:
CK:
DN:

TCP GENERAL NOTES - F.M. 510 (CSJ 1057-03-051)

GENERAL NOTES AND SPECIFICATIONS DATA:

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

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

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

DO NOT BLOCK DRAINAGE WHEN HANDLING & STOCKPILING EXCAVATED MATERIAL.

MAINTAIN ACCESS TO DRIVEWAYS AND INTERSECTIONS THROUGH ALL PHASES OF CONSTRUCTION,

UNLESS OTHERWISE CALLED ON THE PLANS AND/OR SPECIFICATIONS.

MAINTAIN POSITIVE DRAINAGE DURING ALL PHASES OF CONSTRUCTION.

COMPLETE THE PROPOSED DRIVEWAYS THAT COINCIDE WITH THEIR RESPECTIVE PHASE BEFORE PROCEEDING WITH THE NEXT PHASE AND/OR STEP, UNLESS DIRECTED BY THE ENGINEER.

ALL WORK MENTIONED ABOVE SHALL BE SUSIDIARY TO THE VARIOUS PERTINENT ITEMS.

TRAFFIC CONTROL DEVICES:

AT THE COMMENCEMENT OF THE PROJECT, ALL TRAFFIC CONTROL DEVICES SHALL BE IN ACCEPTABLE

CONDITION, AND MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT, AS PER GUIDELINES FOR TEMPORARY TRAFFIC CONTROL DEVICES AND FEATURES.

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

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

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

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

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

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

NOTIFY THE ENGINEER IN WRITING WHEN MAJOR TRAFFIC CHANGES ARE TO BE MADE. NOTIFICATIONS MUST BE GIVEN A MINIMUM OF THREE (3) WORKING DAYS PRIOR TO THE CHANGE.

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

SAFETY:

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

PEDESTRIAN SAFETY, PLASTIC CONSTRUCTION FENCING, A MINIMUM 4 FEET HIGH, SHALL BE USED AROUND OPEN EXCAVATIONS.

ALL WORK SHALL BE DONE EXPEDITIOUSLY DURING DAYLIGHT HOURS, OR AS DIRECTED BY THE AREA ENGINEER. NECESSARY EXPERIENCED FLAGGERS AND APPROPRIATE SIGNING TO SAFELY GUIDE TRAFFIC THROUGH THE WORK AREA WILL BE REQUIRED AT NO ADDITIONAL COST.

PROJECT SPECIFIC NOTES:

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

THE CONTRACTOR SHALL NOTIFY THE PROPER CITY, COUNTY, E.M.S., FIRE DEPARTMENT, POLICE DEPARTMENT, TEXAS D.P.S. AND TxDOT OFFICIALS WHEN MAJOR TRAFFIC CHANGES ARE TO BE MADE. NOTIFICATIONS MUST BE GIVEN A MINIMUM OF THREE (3) DAYS PRIOR TO THE CHANGE. IN ADDITION, THE CONTRACTOR SHALL PROVIDE A WRITTEN WORK PLAN TO THE AREA ENGINEER FOR APPROVAL.

EXISTING ROADWAY SHALL BE CLOSED DURING CONSTRUCTION TO THRU AND COMMERCIAL TRUCK TRAFFIC AS PER PHASES OF CONSTRUCTION AS SHOWN ON THE TRAFFIC CONTROL PLANS AND DETOUR LAYOUTS UNTIL COMPLETION.

ROADWAY SHALL BE USED BY LOCAL TRAFFIC ONLY IF SPECIFICALLY CALLED FOR ON THE TRAFFIC CONTROL PLANS AND/OR SEQUENCE OF CONSTRUCTION. THE CONTRACTOR SHALL MAINTAIN THE ROADWAY IN ONE LANE WEATHER PASSABLE CONDITION DURING DAILY OPERATIONS (MIN 11.0 FT WIDE LANE) AND THE LOCAL TRAFFIC WILL BE SHIFTED AS SHOWN ON THE TCP TYPICAL SECTION FOR EACH PHASE.

CONTRACTOR SHALL USE PLASTIC DRUMS AND/OR VERTICAL PANELS DURING OPERATIONS. CONTRACTOR MUST FOLLOW TxDOT BC STANDARDS AND TxDOT TCP (1-2)-18 STANDARDS FOR PROPER SIGNAGE AND SIGNS SPACING.

WHEN CONNECTING PROPOSED ROADWAY AND/OR DETOURS TO SECTIONS OF EXISTING PAVEMENT BEING USED BY TRAFFIC, AND SUCH OPERATIONS RESULTS IN A DROP-OFF OF MORE THAN 2-INCHES, A 3:1 SLOPE WILL BE REQUIRED. SEE TXDOT GUIDELINES FOR WARNING AND PROTECTIVE DEVICES FOR PAVEMENT "DROP-OFFS". THIS WORK SHALL BE DONE EXPEDITIOUSLY DURING DAYLIGHT HOURS OR AS APPROVED BY THE ENGINEER. NECESSARY FLAGGERS AND APPROPRIATE SIGNING TO SAFELY GUIDE TRAFFIC THROUGH THE WORK AREA WILL BE REQUIRED.

EXISTING AND ABOVE GROUND UTILITIES AND TOPOGRAPHY HAVE BEEN PLOTTED BY DIRECT FIELD INFORMATION PROVIDED AND AS SPOTTED BY UTILITY LOCATE REQUESTS. THE CONTRACTOR WILL BE RESPONSIBLE FOR ESTABLISHING THEIR EXACT LOCATION, DEPTH, AND SIZE. THE CONTRACTOR SHALL NOTIFY AND COORDINATE WITH THE UTILITY COMPANIES 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY EXCAVATION WORK. THE CONTRACTOR WILL ALSO BE RESPONSIBLE, AT THEIR EXPENSE, FOR THE REPLACEMENT OR REPAIR OF ALL DISRUPTED, DAMAGED, AND/OR SEVERED SYSTEMS, GAS LINES, POWER LINES, TELEPHONE CABLES, FIBER OPTIC, AND/OR ANY OTHER UTILITY LINES.

THE CONTRACTOR SHALL FURNISH AND INSTALL FOUR (4) PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS), TO INFORM THE PUBLIC OF ANY CHANGES IN TRAFFIC DURING ALL CONSTRUCTION PHASES; THE PCMS SHOULD BE PLACED PER THE TRAFFIC CONTROL DETOUR LAYOUTS. UPON COMPLETION OF THE PROJECT THE PORTABLE CHANGEABLE MESSAGE SIGNS SHALL REMAIN THE PROPERTY OF THE CONTRACTOR.

THE PORTABLE CHANGEABLE MESSAGE SINGS AND ALL RELATED COSTS FOR SETUP, RELOCATION, MAINTENANCE, REMOVAL, AND INCIDENTALS SHALL BE PAID UNDER ITEM 503 "PORTABLE CHANGEABLE MESSAGE SIGN". THE CONTRACTOR SHALL BE RESPONSIBLE FOR UPDATING MESSAGES.

TEMPORARY WORK ZONE PAVEMENT MARKINGS INSTALLED AFTER THE COMPLETION OF WORK, AND WHICH ARE TO BE REMOVED ON A SUBSEQUENT SEQUENCE OF WORK, SHALL BE REMOVABLE. ALL NON-REMOVABLE WORK ZONE PAVEMENT MARKINGS SHALL BE THERMOPLASTIC (100 MIL THICKNESS).

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

THE CONTRACTOR SHALL KEEP ALL PAVEMENT SURFACES CLEAR AND FREE OF DIRT AND DEBRIS AT ALL TIMES, INCLUDING DURING AND AFTER HAULING OPERATIONS.

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06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

TRAFFIC CONTROL PLAN
GENERAL NOTES

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY		SHEET NO.
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IN LIEU OF IMPLEMENTING THE TCP PLANS INLCUDED FOR THIS PROJECT, THE CONTRACTOR MAY OPT AND SUBMIT AN ALTERNATE CONSTRUCTION SEQUENCE AND TRAFFIC CONTROL PLAN, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF TEXAS. SUCH PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR CONSIDERATION. HOWEVER, THE CONTRACTOR MUST FOLLOW THE TCP CONSTRUCTION PHASES AS SHOWN ON THE TCP PLANS.

THE CONTRACTOR SHALL BE PROHIBITED FROM WORKING SIMULTANOUSLY ON MULTIPLE PHASES. THE CONTRACTOR SHALL COMPLETE ALL STEPS IN EACH PHASE PRIOR TO INITIATING AND COMMENCING THE SUBSEQENT PHASE IN CONSTRUCTION.

IN ADDITION TO THE GENERAL NOTES REQUIREMENTS, THE FOLLOWING PROVISIONS GOVERN THIS CONTRACT.

SEQUENCE OF CONSTRUCTION.

CONSTRUCT THE FM 510 ROADWAY IMPROVEMENTS IN TWO (2) MAIN PHASES AS NOTED IN THIS NARRATIVE.

INSTALL PROJECT LIMIT AND ADVANCED WARNING SIGNS. INSTALL CROSSROAD BARRICADES/SIGNS, AS SHOWN ON THE TRAFFIC CONTROL PLANS (TCP), AND IN ACCORDANCE WITH THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD), LATEST EDITION, AND/OR AS DIRECTED BY THE ENGINEER. THESE SIGNS SHALL BE ERECTED AND PLACED PRIOR TO COMMENCING ANY PROPOSED ROADWAY CONSTRUCTION AND SHALL REMAIN IN PLACE FOR THE DURATION OF THE PROJECT AND UNTIL FINAL ACCEPTANCE OF THE PROJECT BY TXDOT.

TEMPORARY EROSION CONTROL DEVICES SHALL BE INSTALLED PRIOR TO THE START OF ANY CONSTRUCTION.

PORTABLE CHANGEABLE MESSAGE BOARDS SHALL BE PLACED TO NOTIFY TRAVELING PUBLIC OF PLANNED ROADWAY CLOSURE DATE(S) OR MOVEMENTS RESTRICTIONS A MINIMUM OF FIVE (5) WORKING DAYS IN ADVANCE OF ROADWAY CLOSURE.

PHASE I: STA. 402+40 TO STA. 524+80 (2.318 MILES)

STEP A - STAGE 1, STA. 523+50 TO STA. 524+80

(NORTH SIDE CONSTRUCTION OF FM 3069 INTERSECTION)

1. INSTALL THE TRAFFIC DETOUR SIGNS, TRAFFIC CONTROL DEVICES, AND SW3P ELEMENTS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. CONSTRUCTION WORK SHALL NOT BEGIN UNTIL THE ENGINEER HAS PROVIDED WRITTEN APPROVAL.
2. INSTALL ROADWAY CLOSURE SETUP AT BOTH ENDS OF PHASE AS SHOWN ON THE TCP PLANS.
3. ROADWAY SHALL BE CLOSED DURING CONSTRUCTION TO THRU TRAFFIC FROM F.M. 1847 TO F.M. 3069. REFER TO DETOUR LAYOUT FOR THIS PHASE.
4. SHIFT TRAFFIC AS SHOWN IN TCP PLANS AND TCP TYPICAL SECTIONS FOR PHASE 1 - STEP A. ACCESS SHALL ONLY BE ALLOWED TO LOCAL TRAFFIC FROM THE WEST END OF THIS PHASE. THE EAST END SHALL BE CLOSED (DAY AND NIGHT) FOR ALL WEST-BOUND TRAFFIC, INCLUDING LOCAL TRAFFIC.
5. ALL EGRESSING LOCAL TRAFFIC SHALL BE DIRECTED EAST-BOUND.
6. CONSTRUCT THE PAVEMENT STRUCTURE FROM STA. 523+50 TO STA. 524+80 WITH MATERIALS IN ACORDANCE TO THE PROPOSED ROADWAY TYPICAL SECTION FOR THE F.M. 3069 INTERSECTION. PLACE 1.5-INCHES OF SUPER PAVE COURSE.
7. ADJUST THE TRAFFIC CONTROL ELEMENTS AS NECESSARY AND OPEN THE NEWLY CONSTRUCTED PAVEMENT AREA. INTERSECTION OF F.M. 510 WITH F.M. 3069 TO REMAIN OPEN DURING THE ENTIRE CONSTRUCTION PERIOD OF THE NEXT STAGE.

STEP A - STAGE 2, STA. 402+40 TO STA. 523+50

(NORTH SIDE CONSTRUCTION)

1. MAINTAIN THE ADVANCED WARNING SIGNS, TRAFFIC CONTROL DEVICES, AND SW3P ELEMENTS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. THIS STAGE SHALL NOT BEGIN UNTIL PREVIOUS STAGE HAS BEEN COMPLETED.
2. REMOVE AND REPLACE THE EXISTING IRRIGATION LINE CROSSINGS AS SHOWN ON THE PLANS.
3. REMOVE AND REPLACE THE EXISTING DRAINAGE CROSSINGS AND NEW DRAINAGE CROSSINGS AS SHOWN ON THE PLANS.
4. CONSTRUCT PAVEMENT STRUCTURE FROM STA. 402+40 TO STA. 523+50 AND AS SHOWN ON THE PLANS.
5. CONSTRUCT DRIVEWAYS, DRAINAGE CULVERTS, AND SAFETY END TREATMENT (S.E.T.) AS SHOWN ON PLANS.
6. PLACE 1.5-INCHES OF SUPER PAVE COURSE.
7. RESHAPE FORESLOPES AND BACKSLOPES OF THE EXISTING ROADSIDE DITCHES, AND PLACE TEMPORARY AND/OR PERMANENT SODDING.
8. INSTALL TEMPORARY WORK ZONE PAVEMENT MARKERS AND MARKINGS IN PREPARATION FOR THE FOLLOWING STEP AND STAGES.

STEP B - STAGE 1, STA. 523+50 TO STA. 525+80

(SOUTH SIDE CONSTRUCTION OF FM 3069 INTERSECTION)

1. MAINTAIN THE ADVANCED WARNING SIGNS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. CONSTRUCTION WORK SHALL NOT BEGIN UNTIL THE ENGINEER HAS PROVIDED WRITTEN APPROVAL. THIS STEP SHALL NOT BEGIN UNTIL PREVIOUS STEP HAS BEEN COMPLETED.
2. ADJUST THE TRAFFIC CONTROL ELEMENTS ACORDING TO THE PLANS AND TCP SECTIONS FOR PHASE I - STEP B.
3. SHIFT TRAFFIC TO THE NEW PAVEMENT SECTIONS AND TWO-WAY TRAVEL LANES CONSTRUCTED IN STEP A - STAGES 1AND 2.
4. REMOVE AND/OR COVER DETOUR SIGNS - ALL TRAFFIC WILL BE ALLOWED TO UTILIZE THE NEWLY CONSTRUCTED TWO-WAY TRAVEL LANES.
5. INSTALL FULL ROADWAY CLOSURE SETUP FOR NORTH-BOUND TRAFFIC ON FM 3069.
6. REMOVE AND REPLACE THE IRRIGATION LINE CROSSING AS SHOWN ON THE PLANS.
7. CONSTRUCT THE PAVEMENT STRUCTURE FROM STA. 523+50 TO STA. 525+80 WITH MATERIALS IN ACORDANCE TO THE PROPOSED ROADWAY TYPICAL SECTION FOR THE F.M. 3069 INTERSECTION. PLACE 1.5-INCHES OF SUPER PAVE COURSE.
8. REMOVE THE FULL ROADWAY CLOSURE SETUP ON F.M. 3069, ADJUST THE TRAFFIC CONTROL ELEMENTS AS NECESSARY AND OPEN THE NEWLY CONSTRUCTED PAVEMENT AREA. INTERSECTION OF FM 510 WITH FM 3069 TO REMAIN OPEN DURING THE ENTIRE CONSTRUCTION PERIOD OF THE NEXT STAGE.

STEP B - STAGE 2, STA. 402+40 TO STA. 523+50

(SOUTH SIDE CONSTRUCTION)

1. MAINTAIN THE ADVANCED WARNING SIGNS, TRAFFIC CONTROL DEVICES, AND SW3P ELEMENTS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. THIS STAGE SHALL NOT BEGIN UNTIL PREVIOUS STAGE HAS BEEN COMPLETED.
2. CONSTRUCT PAVEMENT STRUCTURE FROM STA. 402+40 TO STA. 523+50 AND AS SHOWN ON THE PLANS.
3. CONSTRUCT DRIVEWAYS, DRAINAGE CULVERTS, AND SAFETY END TREATMENT (S.E.T.) AS SHOWN ON PLANS.
4. PLACE 1.5-INCHES OF SUPER PAVE COURSE.
5. RESHAPE FORESLOPES AND BACKSLOPES OF THE EXISTING ROADSIDE DITCHES, AND PLACE TEMPORARY AND/OR PERMANENT SODDING.
6. INSTALL TEMPORARY WORK ZONE PAVEMENT MARKERS AND MARKINGS IN PREPARATION FOR THE FOLLOWING PHASE.

PHASE II: STA. 524+80 TO STA. 643+57.85 (2.25 MILES)

STEP A - STAGE 1, STA. 640+62 TO STA. 645+20

(TEMPORARY DETOUR CONSTRUCTION)

1. MAINTAIN THE ADVANCED WARNING SIGNS, TRAFFIC CONTROL DEVICES, AND SW3P ELEMENTS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. THIS PHASE SHALL NOT BEGIN UNTIL THE PREVIOUS PHASE HAS BEEN COMPLETED.
2. INSTALL ROADWAY CLOSURE SETUP AT BOTH ENDS OF PHASE AS SHOWN ON THE TCP PLANS.
3. REMOVE AND REPLACE THE EXISTING IRRIGATON LINE CROSSING AT STA. 641+14 AS SHOWN ON THE PLANS.
4. CONSTRUCT THE TEMPORARY DETOUR PAVEMENT STRUCTURE FROM STA. 640+62 TO STA. 645+20 WITH MATERIALS IN ACORDANCE TO THE PROPOSED ROADWAY TCP TYPICAL SECTION FOR PHASE II, STEP-A, STAGE-1.

STEP A - STAGE 2

STA. 524+80 TO STA. 525+80 (NORTH SIDE CONSTRUCTION OF FM 3069 INTERSECTION)

STA. 639+80 TO STA. 641+30 (NORTH SIDE CONSTRUCTION OF FM 2480 INTERSECTION)

1. MAINTAIN THE ADVANCED WARNING SIGNS, TRAFFIC CONTROL DEVICES, AND SW3P ELEMENTS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
2. MAINTAIN THE ROADWAY CLOSURE SETUP AT BOTH ENDS OF PHASE AS SHOWN ON THE TCP PLANS.
3. ROADWAY SHALL BE CLOSED TO THRU TRAFFIC DURING CONSTRUCTION FROM F.M. 3069 TO F.M. 2480. REFER TO DETOUR LAYOUT FOR THIS PHASE .

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FM 510

TRAFFIC CONTROL PLAN SEQUENCE OF CONSTRUCTION

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
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4. DETOUR THRU TRAFFIC VIA F.M. 3069 AND F.M. 2480 .

5. SHIFT TRAFFIC AS SHOWN IN TCP PLANS AND TCP TYPICAL SECTIONS FOR PHASE 2 - STEP A. ACCESS SHALL ONLY BE ALLOWED TO LOCAL TRAFFIC FROM THE WEST END OF THIS PHASE. THE EAST END SHALL BE CLOSED (DAY AND NIGHT) FOR ALL WEST-BOUND TRAFFIC, INCLUDING LOCAL TRAFFIC.

6. ALL EGRESSING LOCAL TRAFFIC SHALL BE DIRECTED EAST-BOUND .

7. CONSTRUCT THE PAVEMENT STRUCTURE FROM STA. 524+80 TO STA. 525+80 AND STA. 639+80 TO STA. 641+30 WITH MATERIALS IN ACORDANCE TO THE PROPOSED ROADWAY TYPICAL SECTION FOR THE F.M. 3069 INTERSECTION AND THE F.M. 2480 INTERSECTION. PLACE 1.5-INCHES OF SUPER PAVE COURSE.

8. REMOVE THE FULL ROADWAY CLOSURE SETUP ON FM 3069 AND FM 2480, ADJUST THE TRAFFIC CONTROL ELEMENTS AS NECESSARY AND OPEN THE NEWLY CONSTRUCTED PAVEMENT AREA. INTERSECTION OF FM 510 WITH FM 3069 AND FM 2480 TO REMAIN OPEN DURING THE ENTIRE CONSTRUCTION PERIOD OF THE NEXT STAGE.

STEP A - STAGE 3

STA. 525+80 TO STA. 639+80 (NORTH SIDE CONSTRUCTION)

STA. 641+30 TO STA. 643+57.85 (NORTH SIDE CONSTRUCTION)

1. MAINTAIN THE ADVANCED WARNING SIGNS, TRAFFIC CONTROL DEVICES, AND SW3P ELEMENTS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. THIS STAGE SHALL NOT BEGIN UNTIL PREVIOUS STAGE HAS BEEN COMPLETED.

2. REMOVE AND REPLACE THE EXISTING IRRIGATION LINE CROSSINGS AS SHOWN ON THE PLANS.

3. REMOVE AND REPLACE THE EXISTING DRAINAGE CROSSINGS AS SHOWN ON THE PLANS.

4. CONSTRUCT PAVEMENT STRUCTURE FROM STA. 525+80 TO STA. 639+80 AND STA. 641+30 TO STA. 643+57.85 AS SHOWN ON THE PLANS.

5. CONSTRUCT DRIVEWAYS, DRAINAGE CULVERTS, AND SAFETY END TREATMENT (S.E.T.) AS SHOWN ON PLANS.

6. PLACE 1.5-INCHES OF SUPER PAVE COURSE.

7. RESHAPE FORESLOPES AND BACKSLOPES OF THE EXISTING ROADSIDE DITCHES, AND PLACE TEMPORARY AND/OR PERMANENT SODDING.

8. INSTALL TEMPORARY WORK ZONE PAVEMENT MARKERS AND MARKINGS IN PREPARATION FOR THE FOLLOWING STEP AND STAGES.

STEP B - STAGE 1

STA. 639+80 TO STA. 641+30

(SOUTH SIDE CONSTRUCTION OF FM 2480 INTERSECTION)

1. MAINTAIN THE ADVANCED WARNING SIGNS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. CONSTRUCTION WORK SHALL NOT BEGIN UNTIL THE ENGINEER HAS PROVIDED WRITTEN APPROVAL. THIS STEP SHALL NOT BEGIN UNTIL PREVIOUS STEP HAS BEEN COMPLETED.

2. ADJUST THE TRAFFIC CONTROL ELEMENTS ACORDING TO THE PLANS AND TCP SECTIONS FOR PHASE II - STEP B.

3. SHIFT TRAFFIC TO THE NEW PAVEMENT SECTIONS AND TWO-WAY TRAVEL LANES CONSTRUCTED IN STEP A - STAGES 2 AND 3.

4. ADJUST DETOUR SIGNS PER THE DETOUR LAYOUT FOR PHASE II, STEP-B, STAGE-1. ALL TRAFFIC WILL BE ALLOWED TO UTILIZE THE NEWLY CONSTRUCTED TWO-WAY TRAVEL LANES.

5. INSTALL FULL ROADWAY CLOSURE SETUP FOR NORTH-BOUND TRAFFIC ON FM 2480.

6. DEMOLISH AND REMOVE THE TEMPORARY DETOUR CONSTRUCTED IN PHASE II - STEP A. FLEX BASE MATERIAL SHALL BE SCARIFIED UNDER ITEM 251 AND INCORPORATED INTO THE FLEX BASE MATERIAL REQUIRED FOR THE SOUTH SIDE CONSTRUCTION OF THE F.M. 2480 INTERSECTION.

7. CONSTRUCT THE PAVEMENT STRUCTURE FROM STA. 639+80 TO STA. 641+30 WITH MATERIALS IN ACORDANCE TO THE PROPOSED ROADWAY TYPICAL SECTION FOR THE F.M. 2480 INTERSECTION. PLACE 1.5-INCHES OF SUPER PAVE COURSE.

8. REMOVE THE FULL ROADWAY CLOSURE SETUP ON FM 2480, ADJUST THE TRAFFIC CONTROL ELEMENTS AS NECESSARY AND OPEN THE NEWLY CONSTRUCTED PAVEMENT AREA. INTERSECTION OF FM 510 WITH FM 2480 TO REMAIN OPEN DURING THE ENTIRE CONSTRUCTION PERIOD OF THE NEXT STAGE.

STEP B - STAGE 2

STA. 525+80 TO STA. 639+80 (SOUTH SIDE CONSTRUCTION)

STA. 641+30 TO STA. 643+57.85 (SOUTH SIDE CONSTRUCTION)

1. MAINTAIN THE ADVANCED WARNING SIGNS, TRAFFIC CONTROL DEVICES, AND SW3P ELEMENTS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. THIS STAGE SHALL NOT BEGIN UNTIL PREVIOUS STAGE HAS BEEN COMPLETED.

2. CONSTRUCT PAVEMENT STRUCTURE FROM STA. 525+80 TO STA. 639+80 AND STA. 641+30 TO STA. 643+57.85 AS SHOWN ON THE PLANS.

3. CONSTRUCT DRIVEWAYS, DRAINAGE CULVERTS, AND SAFETY END TREATMENT (S.E.T.) AS SHOWN ON PLANS.

4. PLACE 1.5-INCHES OF SUPER PAVE COURSE.

5. RESHAPE FORESLOPES AND BACKSLOPES OF THE EXISTING ROADSIDE DITCHES, AND PLACE TEMPORARY AND/OR PERMANENT SODDING.

PHASE III - STA 402+40 TO STA 643+57.85 (FINAL SURFACE COURSE) (4.568 MILES):

1. PLACE FINAL SURFACE COURSE OF 1.5-INCHES OF SUPER PAVE FOR THE FULL WIDTH AND LENGTH OF THE ROADWAY AS SHOWN IN THE PLANS AND THE PROPOSED ROADWAY TYPICAL SECTIONS.

2. MILLING OPERATIONS SHALL BE DONE AT NON-PEAK HOURS, NON-STOP WORK.

3. INSTALL FINAL PAVEMENT MARKINGS, RAISED PAVEMENT MARKERS, AND OBJECT MARKERS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. PERMANENT PAVEMENT MARKINGS SHALL BE THERMOPLASTIC (100 MIL.).

4. INSTALL TRAFFIC REGULATORY SIGNS AND MAILBOXES IN THEIR FINAL POSITION AS SHOWN ON THE PLANS.

5. PLACE FINAL SEEDING AS SHOWN AND SPECIFIED ON THE PLANS.

6. REMOVE SW3P ELEMENTS AS SHOWN ON SW3P LAYOUTS.

7. PROCEED WITH FINAL CLEAN UP OF ENTIRE PROJECT LIMITS.

8. UPON WRITTEN APPROVAL AND ACCEPTANCE BY THE ENGINEER, CONTRACTOR SHALL REMOVE ALL TEMPORARY WORK ZONE TRAFFIC CONTROL DEVICES AND ADVANCED WARNING SIGNS.

9. OPEN ALL TRAVEL LANES FROM BEGINNING TO END OF PROJECT.

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FM 510

TRAFFIC CONTROL PLAN SEQUENCE OF CONSTRUCTION

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
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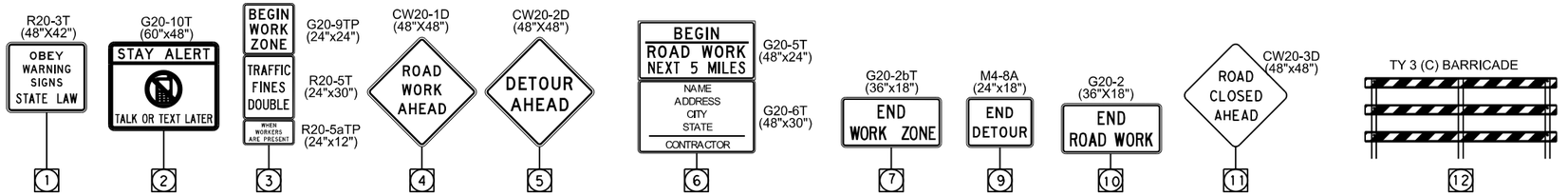
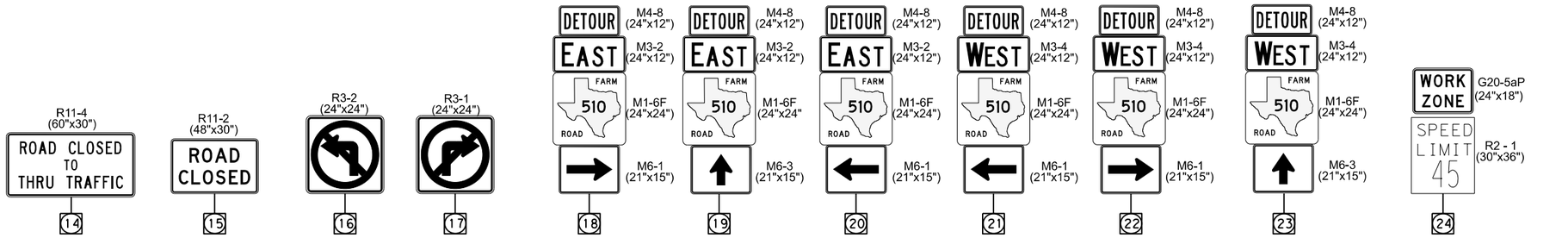
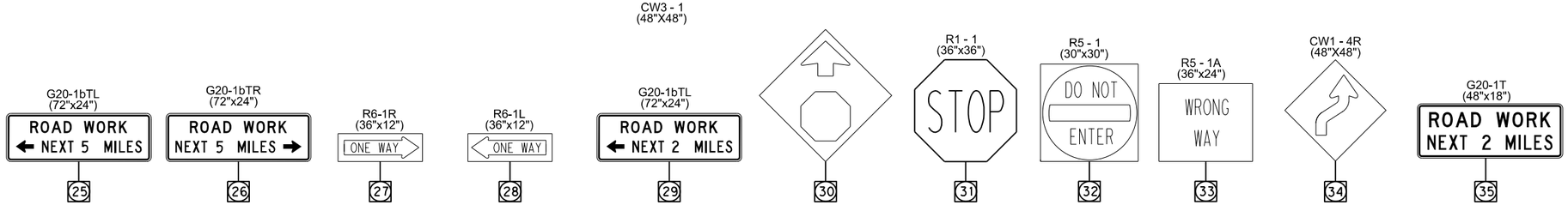
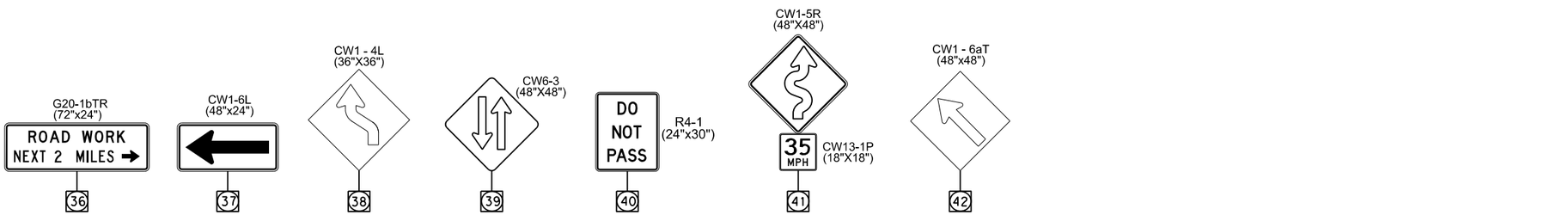
PHR	CAMERON		36



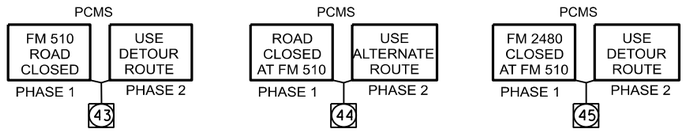






PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS)

1. THE ENGINEER SHALL APPROVE ALL MESSAGES USED ON PCMS.
2. THE LOCATION OF THE PCMS SHALL BE APPROVED BY THE ENGINEER PRIOR TO START OF CONTRUCTION.



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FM 510

TRAFFIC CONTROL PLAN SIGNS

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

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	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
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PHASE I - STEP A
STAGE 2
CONSTRUCTION

PHASE I - STEP A
STAGE 1
CONSTRUCTION

FM 1847

FM 510 (San Jose Ranch Rd.)

Share 27 Rd.

Siesta Ln.

CR-535

Camp Rd.

S Valencia Dr.

Calle Hermosa

FM 2480

Cactus Rd.

Union Pacific Railroad

Ebony Rd.

Bingley Rd.

Kretz Rd.

Stanford Rd.

Henderson Rd.

Whipple Rd.

Resaca de las Antonias

Tract 43 Rd

FM 3069

Share 28 Rd.

Shoemaker Rd.

Share 27 Rd.

FM 2480 (Old Port Rd.)

San Roman Rd.

CITY OF LOS FRESNOS

SH 100 (E Ocean Blvd)

Arroyo Blvd.

R20-3T (48"X42")
OBEY WARNING SIGNS STATE LAW
1

G20-10T (60"x48")
STAY ALERT
TALK OR TEXT LATER
2

G20-9TP (24"x24")
BEGIN WORK ZONE
R20-5T (24"x30")
TRAFFIC FINES DOUBLE
R20-5aTP (24"x12")
WHEN WORKERS ARE PRESENT
3

CW20-1D (48"X48")
ROAD WORK AHEAD
4

CW20-2D (48"X48")
DETOUR AHEAD
5

G20-5T (48"x24")
BEGIN ROAD WORK NEXT 5 MILES
G20-6T (48"x30")
NAME
ADDRESS
CITY
STATE
CONTRACTOR
6

G20-2bT (36"X18")
END WORK ZONE
7

M4-8A (24"X18")
END DETOUR
9

G20-2 (36"X18")
END ROAD WORK
10

CW20-3D (48"x48")
ROAD CLOSED AHEAD
11

TY 3 (C) BARRICADE
12

R11-4 (60"x30")
ROAD CLOSED TO THRU TRAFFIC
14

R11-2 (48"x30")
ROAD CLOSED
15

R3-2 (24"x24")
16

R3-1 (24"x24")
17

DETOUR M4-8 (24"x12")
EAST M3-2 (24"x12")
FARM 510 ROAD M1-6F (24"x24")
M6-1 (21"x15")
18

DETOUR M4-8 (24"x12")
EAST M3-2 (24"x12")
FARM 510 ROAD M1-6F (24"x24")
M6-3 (21"x15")
19

DETOUR M4-8 (24"x12")
EAST M3-2 (24"x12")
FARM 510 ROAD M1-6F (24"x24")
M6-1 (21"x15")
20

DETOUR M4-8 (24"x12")
WEST M3-4 (24"x12")
FARM 510 ROAD M1-6F (24"x24")
M6-1 (21"x15")
21

DETOUR M4-8 (24"x12")
WEST M3-4 (24"x12")
FARM 510 ROAD M1-6F (24"x24")
M6-1 (21"x15")
22

DETOUR M4-8 (24"x12")
WEST M3-4 (24"x12")
FARM 510 ROAD M1-6F (24"x24")
M6-3 (21"x15")
23

PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS)

1. THE ENGINEER SHALL APPROVE ALL MESSAGES USED ON PCMS.
2. THE LOCATION OF THE PCMS SHALL BE APPROVED BY THE ENGINEER PRIOR TO START OF CONTRUCTION.

PCMS

FM 510 ROAD CLOSED	USE DETOUR ROUTE
PHASE 1	PHASE 2

43

LEGEND

- TRAFFIC SIGN I.D.
- PROP. CONSTRUCTION
- PREVIOUSLY CONSTRUCTED
- DIRECTION OF TRAFFIC FLOW
- TRAFFIC BARREL w/REFLECTOR
- PROP. TY 3 BARRICADES
- PROP. VERTICAL PANELS
- PROP. SIGN
- CONTRACTOR TO FOLLOW TxDOT LATEST BC-21 STANDARDS AND TxDOT TCP STANDARDS FOR PROPER SIGNAGE & SIGN SPACING.

N

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

TRAFFIC CONTROL PLAN
DETOUR LAYOUT
PHASE I - STEP A
STAGE 1 AND 2

SCALE: N.T.S

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		38

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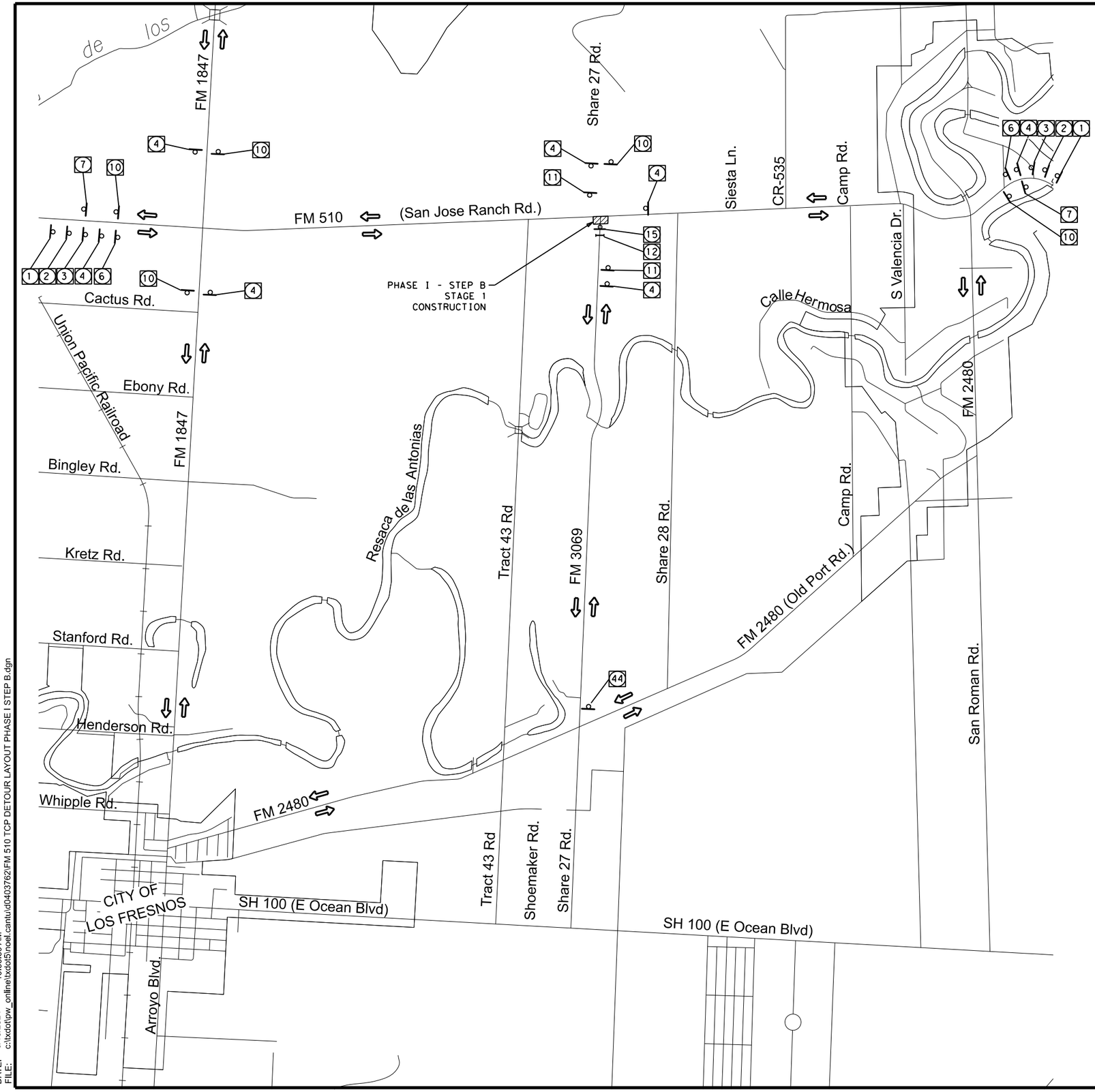

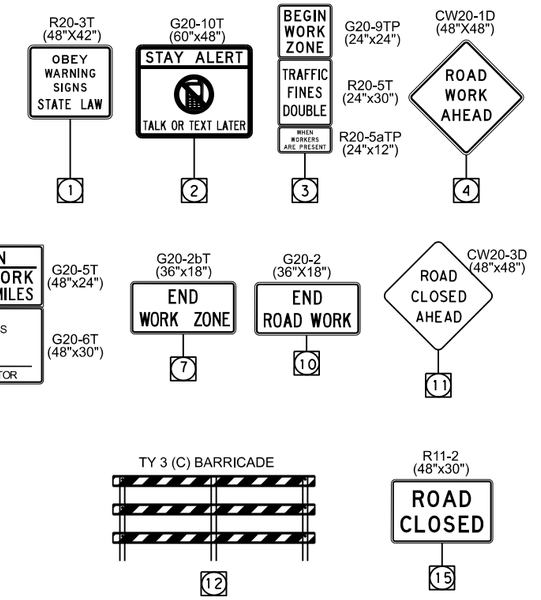

PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS)

1. THE ENGINEER SHALL APPROVE ALL MESSAGES USED ON PCMS.
2. THE LOCATION OF THE PCMS SHALL BE APPROVED BY THE ENGINEER PRIOR TO START OF CONTRUCTION.

PCMS

ROAD CLOSED AT FM 510	USE ALTERNATE ROUTE
PHASE 1	PHASE 2

44

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED
PROFESSIONAL ENGINEER

06/13/24

LEGEND

- TRAFFIC SIGN I.D.
- PROP. CONSTRUCTION
- PREVIOUSLY CONSTRUCTED
- DIRECTION OF TRAFFIC FLOW
- TRAFFIC BARREL w/REFLECTOR
- PROP. TY 3 BARRICADES
- PROP. VERTICAL PANELS
- PROP. SIGN
- X CONTRACTOR TO FOLLOW TxDOT LATEST BC-21 STANDARDS AND TxDOT TCP STANDARDS FOR PROPER SIGNAGE & SIGN SPACING.

Pharr District Central Design

Texas Department of Transportation

FM 510

TRAFFIC CONTROL PLAN
DETOUR LAYOUT
PHASE I - STEP B
STAGE 1

SCALE: N.T.S SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		39

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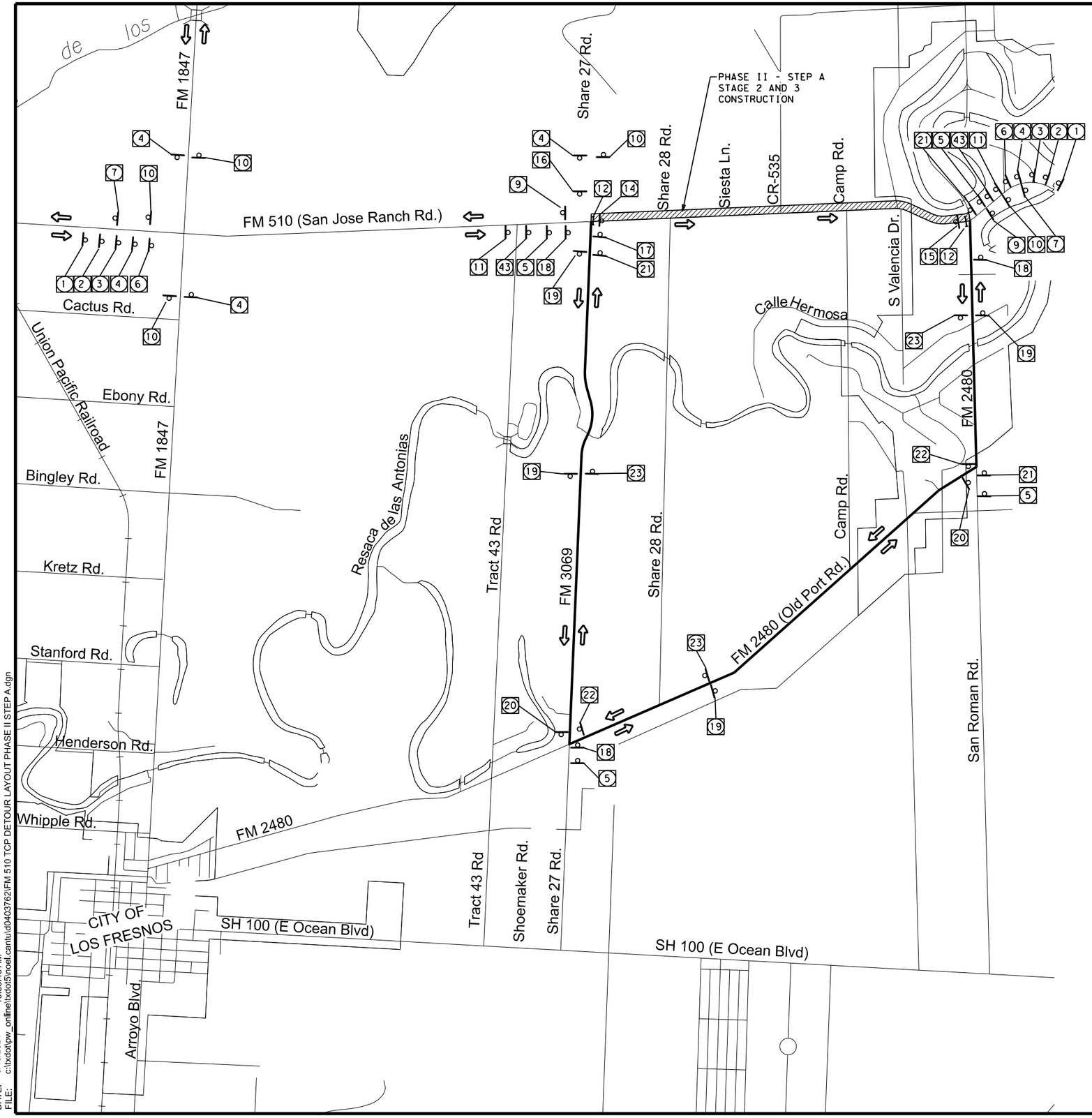

R20-3T (48"X42") — OBEY WARNING SIGNS STATE LAW — 1

G20-10T (60"x48") — STAY ALERT / TALK OR TEXT LATER — 2

G20-9TP (24"x24") — BEGIN WORK ZONE
R20-5T (24"x30") — TRAFFIC FINES DOUBLE
R20-5aTP (24"x12") — WHEN WORKERS ARE PRESENT — 3

CW20-1D (48"X48") — ROAD WORK AHEAD — 4

CW20-2D (48"X48") — DETOUR AHEAD — 5

G20-5T (48"x24") — BEGIN ROAD WORK NEXT 5 MILES
G20-6T (48"x30") — NAME / ADDRESS / CITY / STATE / CONTRACTOR — 6

G20-2bT (36"x18") — END WORK ZONE — 7

M4-8A (24"x18") — END DETOUR — 9

G20-2 (36"X18") — END ROAD WORK — 10

CW20-3D (48"x48") — ROAD CLOSED AHEAD — 11

TY 3 (C) BARRICADE — 12

R11-4 (60"x30") — ROAD CLOSED TO THRU TRAFFIC — 14

R11-2 (48"x30") — ROAD CLOSED — 15

R3-2 (24"x24") — 16

R3-1 (24"x24") — 17

DETOUR (M4-8 24"x12") EAST (M3-2 24"x12") FARM 510 ROAD (M1-6F 24"x24") M6-1 (21"x15") — 18

DETOUR (M4-8 24"x12") EAST (M3-2 24"x12") FARM 510 ROAD (M1-6F 24"x24") M6-3 (21"x15") — 19

DETOUR (M4-8 24"x12") EAST (M3-2 24"x12") FARM 510 ROAD (M1-6F 24"x24") M6-1 (21"x15") — 20

DETOUR (M4-8 24"x12") WEST (M3-4 24"x12") FARM 510 ROAD (M1-6F 24"x24") M6-1 (21"x15") — 21

DETOUR (M4-8 24"x12") WEST (M3-4 24"x12") FARM 510 ROAD (M1-6F 24"x24") M6-1 (21"x15") — 22

DETOUR (M4-8 24"x12") WEST (M3-4 24"x12") FARM 510 ROAD (M1-6F 24"x24") M6-3 (21"x15") — 23

PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS)

1. THE ENGINEER SHALL APPROVE ALL MESSAGES USED ON PCMS.
2. THE LOCATION OF THE PCMS SHALL BE APPROVED BY THE ENGINEER PRIOR TO START OF CONTRUCTION.

PCMS

FM 510 ROAD CLOSED	USE DETOUR ROUTE
PHASE 1	PHASE 2

43

LEGEND

- TRAFFIC SIGN I.D.
- PROP. CONSTRUCTION
- PREVIOUSLY CONSTRUCTED
- DIRECTION OF TRAFFIC FLOW
- TRAFFIC BARREL w/REFLECTOR
- PROP. TY 3 BARRICADES
- PROP. VERTICAL PANELS
- PROP. SIGN
- CONTRACTOR TO FOLLOW TxDOT LATEST BC-21 STANDARDS AND TxDOT TCP STANDARDS FOR PROPER SIGNAGE & SIGN SPACING.

N

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

TRAFFIC CONTROL PLAN
DETOUR LAYOUT
PHASE II - STEP A
STAGE 2 AND 3

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

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		40

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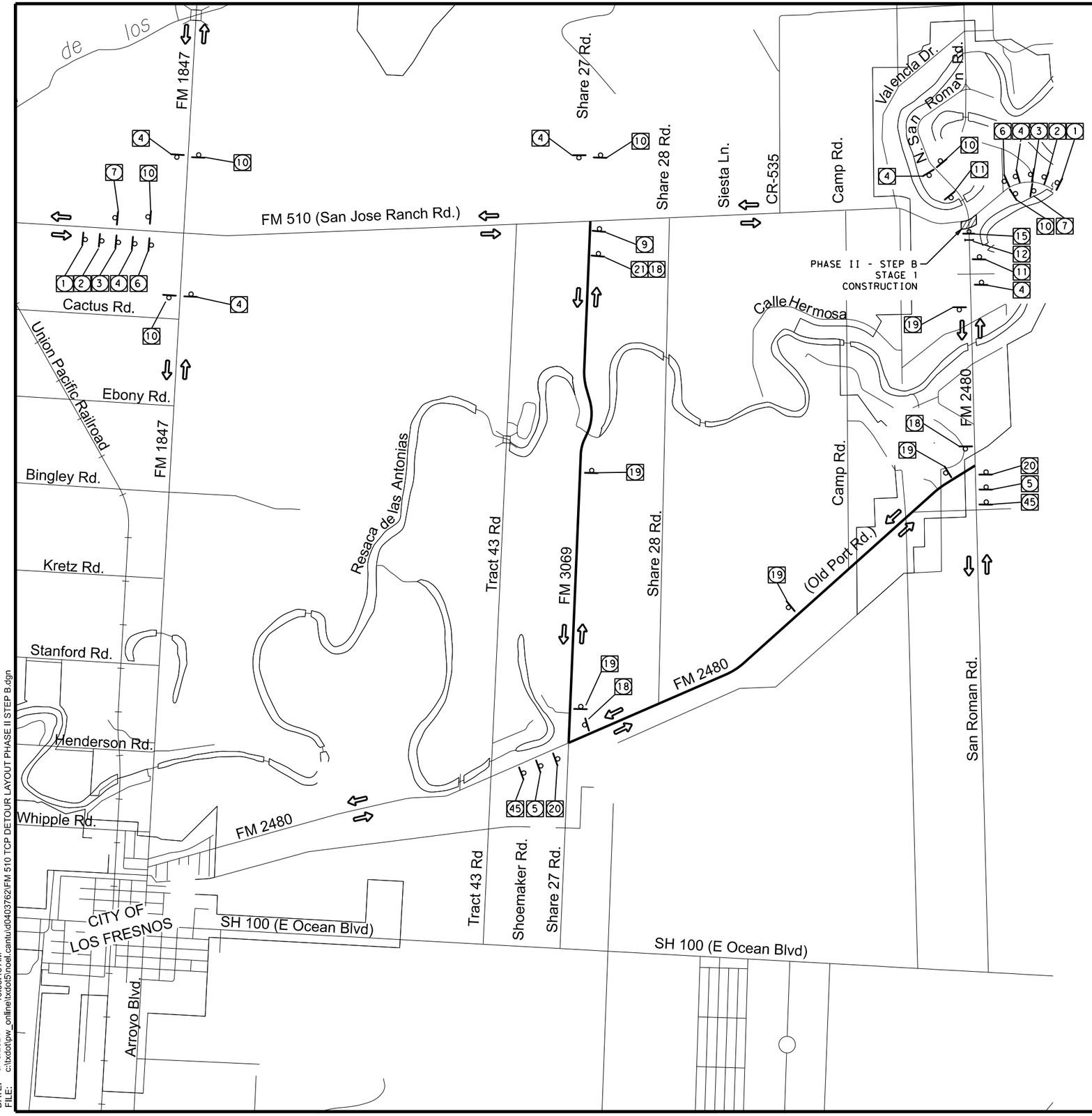

R20-3T (48"X42")
OBEY WARNING SIGNS STATE LAW
1

G20-10T (60"x48")
STAY ALERT
TALK OR TEXT LATER
2

BEGIN WORK ZONE
G20-9TP (24"x24")
TRAFFIC FINES DOUBLE
R20-5T (24"x30")
WHEN WORKERS ARE PRESENT
R20-5aTP (24"x12")
3

CW20-1D (48"X48")
ROAD WORK AHEAD
4

CW20-2D (48"X48")
DETOUR AHEAD
5

BEGIN ROAD WORK NEXT 5 MILES
G20-5T (48"x24")
NAME
ADDRESS
CITY
STATE
CONTRACTOR
G20-6T (48"x30")
6

G20-2bT (36"x18")
END WORK ZONE
7

M4-8A (24"x18")
END DETOUR
9

G20-2 (36"X18")
END ROAD WORK
10

CW20-3D (48"x48")
ROAD CLOSED AHEAD
11

TY 3 (C) BARRICADE
12

R11-2 (48"x30")
ROAD CLOSED
15

DETOUR M4-8 (24"x12")
EAST M3-2 (24"x12")
FARM 510 ROAD M1-6F (24"x24")
M6-1 (21"x15")
18

DETOUR M4-8 (24"x12")
EAST M3-2 (24"x12")
FARM 510 ROAD M1-6F (24"x24")
M6-3 (21"x15")
19

DETOUR M4-8 (24"x12")
EAST M3-2 (24"x12")
FARM 510 ROAD M1-6F (24"x24")
M6-1 (21"x15")
20

DETOUR M4-8 (24"x12")
WEST M3-4 (24"x12")
FARM 510 ROAD M1-6F (24"x24")
M6-1 (21"x15")
21

PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS)

1. THE ENGINEER SHALL APPROVE ALL MESSAGES USED ON PCMS.
2. THE LOCATION OF THE PCMS SHALL BE APPROVED BY THE ENGINEER PRIOR TO START OF CONTRUCTION.

PCMS

FM 2480 CLOSED AT FM 510	USE DETOUR ROUTE
PHASE 1	PHASE 2

45

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

LEGEND

- TRAFFIC SIGN I.D.
- PROP. CONSTRUCTION
- PREVIOUSLY CONSTRUCTED
- DIRECTION OF TRAFFIC FLOW
- TRAFFIC BARREL w/REFLECTOR
- PROP. TY 3 BARRICADES
- PROP. VERTICAL PANELS
- PROP. SIGN
- CONTRACTOR TO FOLLOW TxDOT LATEST BC-21 STANDARDS AND TxDOT TCP STANDARDS FOR PROPER SIGNAGE & SIGN SPACING.

Pharr District Central Design

Texas Department of Transportation

FM 510

TRAFFIC CONTROL PLAN DETOUR LAYOUT PHASE II - STEP B STAGE 1

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

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		41

DATE: 6/13/2024 10:33:48 AM
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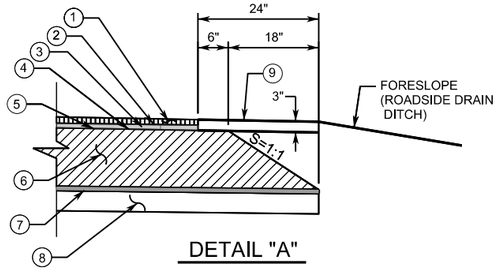
LEGEND	
	CONSTRUCTION AREA
A	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
C	TYP II -A-A RAISED PAVEMENT MARKERS
	DROP OFFS GREATER THAN OR EQUAL TO 2" MUST BE PROTECTED BY A 3:1 OR FLATTER SLOPE WHEN NO ROAD WORK IS BEING DONE IN THE IMMEDIATE AREA. (EDGE COND I)
	DRUMS WITH REFLECTORS. SPACED AS PER BC(9)-21 AND TCP TxDOT STANDARDS
	VERTICAL PANEL (PORTABLE). SPACED AS PER PER BC(9)-21 AND TCP TxDOT STANDARDS.
	MATCH EXISTING/ADJACENT CROSS SLOPE AND ELEVATION
	EXISTING TRAFFIC DIRECTION
	PROPOSED TRAFFIC DIRECTION

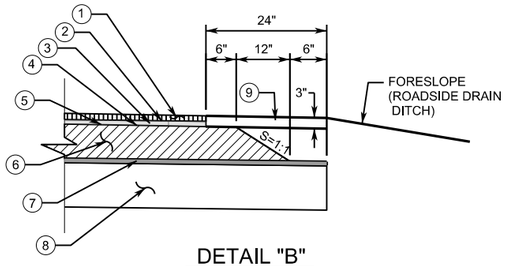


DETAIL "A"

LEGEND:

TO BE CONSTRUCTED ON PHASE III (SEE SEQUENCE OF CONSTRUCTION)

1. PROPOSED 1.5" SP-D PG 76-22 SAC A
2. PROPOSED BONDING COURSE
3. PROPOSED 1.5" SP-D PG 76-22 SAC A
4. PROPOSED 1 COURSE UNDERSEAL TREATMENT
5. PROPOSED MC-30 PRIME COAT
6. PROPOSED 18" TY-E GR-4 FLEX BASE (2 EQ LIFTS) NEW UNTREATED MATERIAL COMPACTED TO 98% DENSITY
7. GEOGRID BASE REINFORCEMENT (TYPE 2)
8. PROOF ROLL SUBGRADE
9. PROPOSED TY. "A" BACKFILL (ITEM 134) (NOT APPLICABLE AT INTERSECTING ROADWAY TURNOUTS AND DRIVEWAYS)

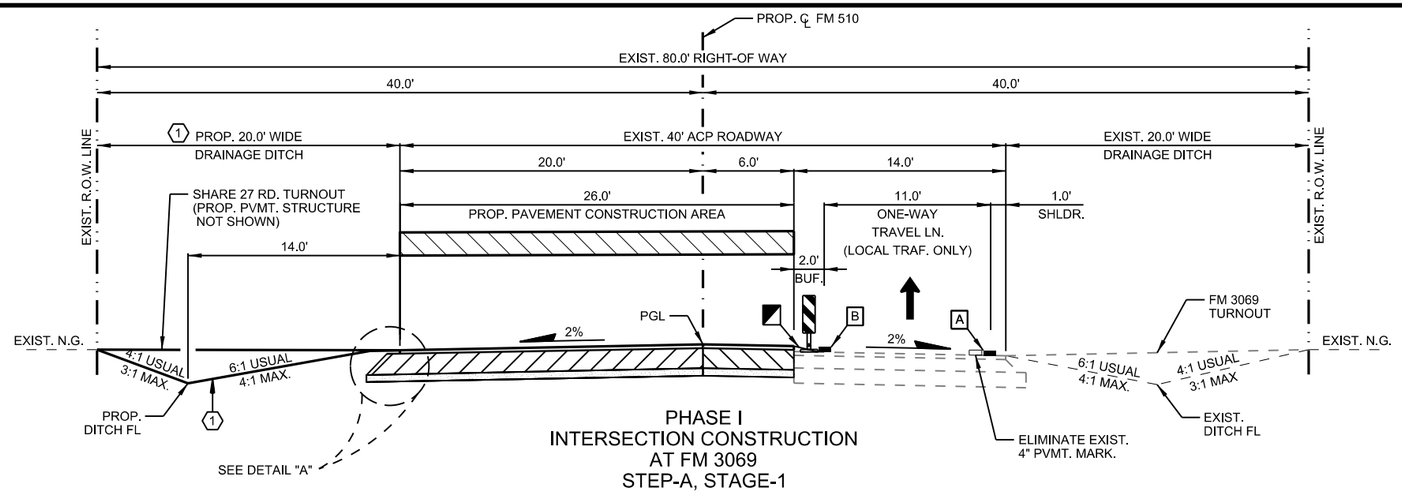


DETAIL "B"

LEGEND:

TO BE CONSTRUCTED ON PHASE III (SEE SEQUENCE OF CONSTRUCTION)

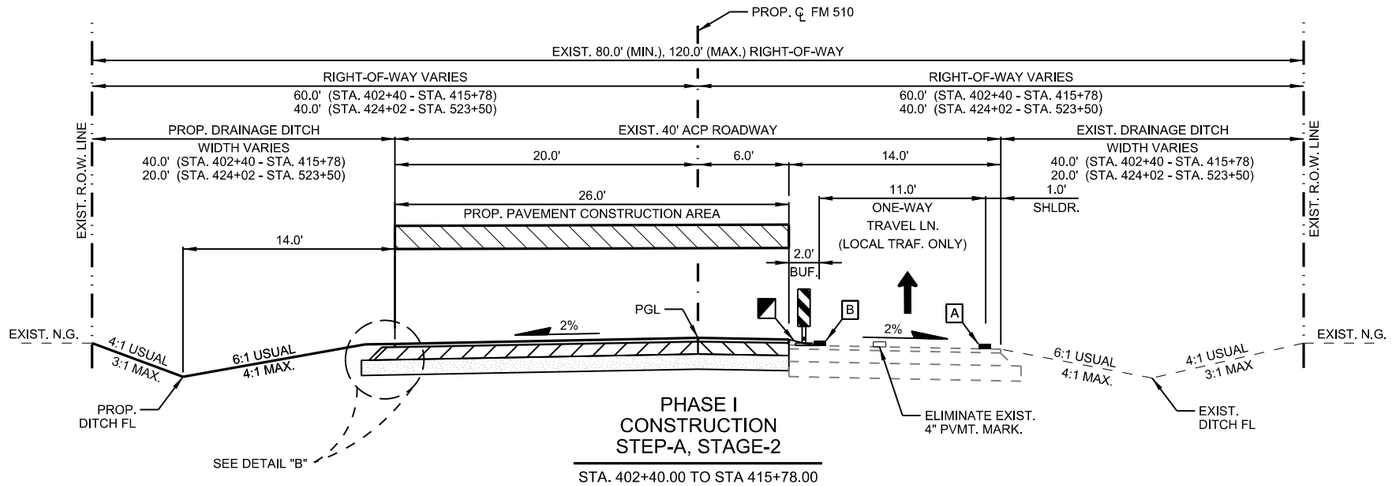
1. PROPOSED 1.5" SP-D PG 76-22 SAC A
2. PROPOSED BONDING COURSE
3. PROPOSED 1.5" SP-D PG 76-22 SAC A
4. PROPOSED 1 COURSE UNDERSEAL TREATMENT
5. PROPOSED MC-30 PRIME COAT
6. PROPOSED 12" TY-E GR-4 W/ 2% CEMENT ADMIX BY WT FLEX BASE (2 EQ LIFTS)
7. GEOGRID BASE REINFORCEMENT (TYPE 2)
8. PROPOSED 12" LIME TREATED SUBGRADE W/ 6% LIME ADMIX BY WT.
9. PROPOSED TY. "A" BACKFILL (ITEM 134) (NOT APPLICABLE AT INTERSECTING ROADWAY TURNOUTS AND DRIVEWAYS)



PHASE I
INTERSECTION CONSTRUCTION
AT FM 3069
STEP-A, STAGE-1

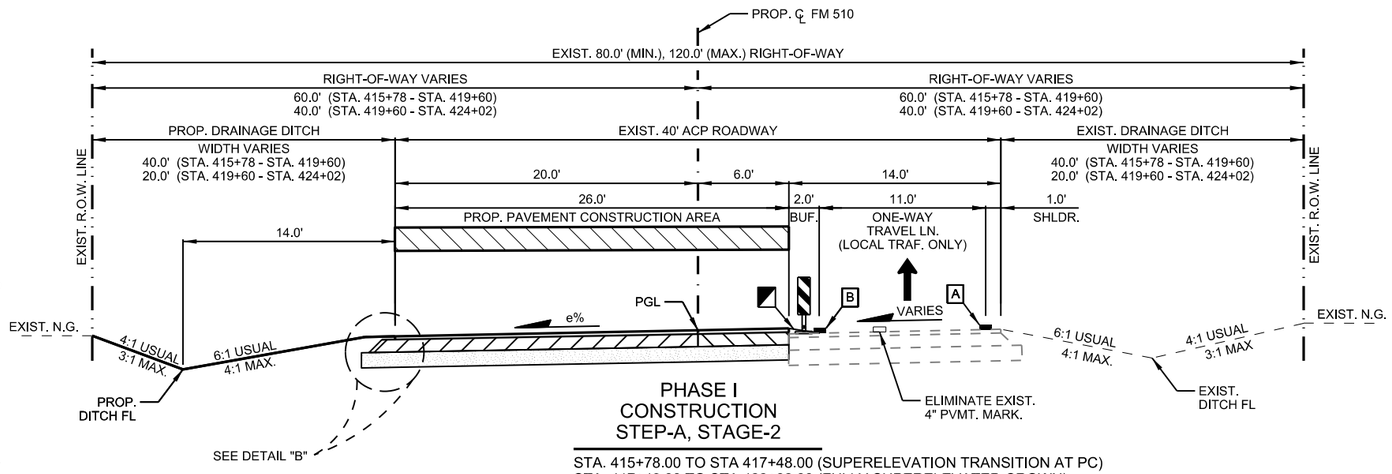
STA. 523+50.00 TO STA 524+80.00

1 DRAIN DITCH LIMITS:
STA. 523+50 - STA. 524+60



PHASE I
CONSTRUCTION
STEP-A, STAGE-2

STA. 402+40.00 TO STA 415+78.00
STA. 424+02.00 TO STA 523+50.00



PHASE I
CONSTRUCTION
STEP-A, STAGE-2

STA. 415+78.00 TO STA 417+48.00 (SUPERELEVATION TRANSITION AT PC)
STA. 417+48.00 TO STA 422+32.00 (FULLY SUPERELEVATED CROWN)
STA. 422+32.00 TO STA 424+02.00 (SUPERELEVATION TRANSITION AT PT)

GENERAL NOTES

PGL - DENOTES PROFILE GRADE LINE

PCJ - DENOTES PERMISSIBLE CONSTRUCTION JOINT. REFER TO PROPOSED ROADWAY TYPICAL SECTIONS FOR PLACEMENT OF PERMISSIBLE CONSTRUCTION JOINTS (PCJ).

WHERE POSSIBLE AND UNLESS OTHERWISE DIRECTED BY THE ENGINEER, PERMISSIBLE CONSTRUCTION JOINTS SHALL FALL ON STRIPING LINES AS SHOWN ON STRIPING DETAILS.

WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS THE GOVERNING SLOPES MAY BE VARIED WHEN SPECIFICALLY DIRECTED BY THE ENGINEER.

THE SUBGRADE SHALL BE SHAPED, BLADED, ROLLED AND PROOF ROLLED A MINIMUM DISTANCE OF 24" BEYOND THE EDGE OF THE PROPOSED BASE COURSE.

A STATION EQUALS 100 FT.

114 LBS/SY IS EQUIVALENT TO 1" OF ACP

1-COURSE SURF. TREATM. - ASPH (TIER II)0.30 GAL/SY (APPROX) W/ AGGREGATE (TY-B GR 4P)(SAC-B) AT 1 CY/125 SY

PRIME COAT - 0.2 GAL/SY

BONDING COURSE - 0.07 GAL/SY (FOR ESTIMATING PURPOSES ONLY- RATE TO BE DETERMINED AND SET IN THE FIELD BY THE ENGINEER)

FLEXIBLE BASE WT - 3375 LBS/CY (APPROX)(COMPACTED)
SUBGRADE WT - 2970 LBS/CY (APPROX)(COMPACTED)

ALL GRADING SHALL BE WITHIN THE R.O.W. LIMITS

SAW CUT WILL BE SUBSIDIARY TO THE OTHER ROADWAY ITEMS.

A 3:1 MAX SLOPE SHALL BE PROVIDED AT THE END OF EACH WORKING DAY ON ALL EXPOSED EDGES OF ROADWAY CONSTRUCTION OR EXCAVATION.

MIN. COVER OF FOUR (4) INCHES OF NEW FLEX. BASE WILL BE REQUIRED WHERE SALVAGE IS PART OF FLEX. BASE.

THE EXISTING BITUMINOUS MATERIAL IS TO BE SALVAGE IN ACCORDANCE WITH ITEM 305.

ANY EXCESS MATERIAL SHALL BECOME PROPERTY OF THE CONTRACTOR AND SHALL BE HAULED OFF.

STATE OF TEXAS
JOSE A. RODRIGUEZ
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LICENSED PROFESSIONAL ENGINEER

07/01/24

Pharr District Central Design

Texas Department of Transportation

FM 510

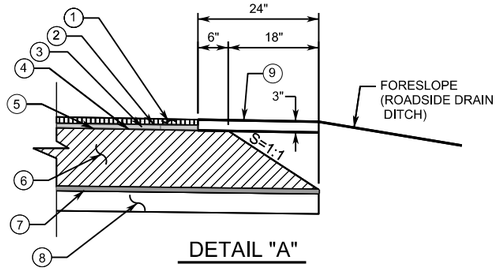
TRAFFIC CONTROL PLAN
PROPOSED TYPICAL SECTIONS
PHASE I

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

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		42

DATE: 06/28/24 09:04:53
FILE: c:\txdot\pw_onfile\txdot5\denise.vasquez\d0403762\FM 510 TYP SEC_TCP PH I_PH II.dgn

LEGEND	
	CONSTRUCTION AREA
A	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
C	TYP II -A-A RAISED PAVEMENT MARKERS
	DROP OFFS GREATER THAN OR EQUAL TO 2" MUST BE PROTECTED BY A 3:1 OR FLATTER SLOPE WHEN NO ROAD WORK IS BEING DONE IN THE IMMEDIATE AREA. (EDGE COND I)
	DRUMS WITH REFLECTORS. SPACED AS PER BC(9)-21 AND TCP TxDOT STANDARDS
	VERTICAL PANEL (PORTABLE). SPACED AS PER PER BC(9)-21 AND TCP TxDOT STANDARDS.
	MATCH EXISTING/ADJACENT CROSS SLOPE AND ELEVATION
	EXISTING TRAFFIC DIRECTION
	PROPOSED TRAFFIC DIRECTION



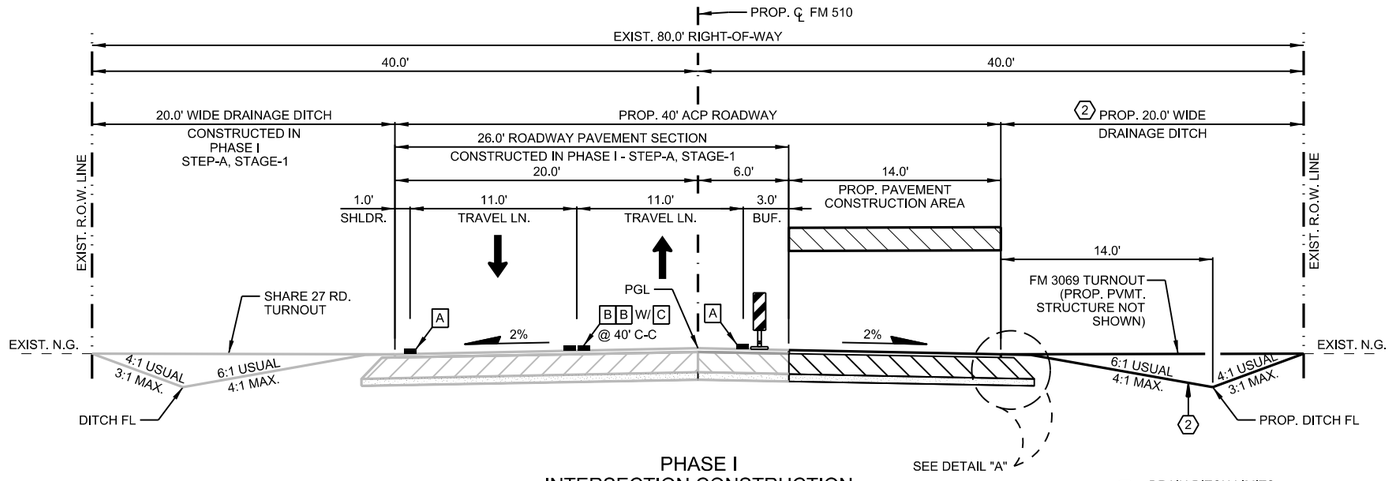
DETAIL "A"

LEGEND:

1. PROPOSED 1.5" SP-D PG 76-22 SAC A
2. PROPOSED BONDING COURSE

TO BE CONSTRUCTED ON PHASE III (SEE SEQUENCE OF CONSTRUCTION)

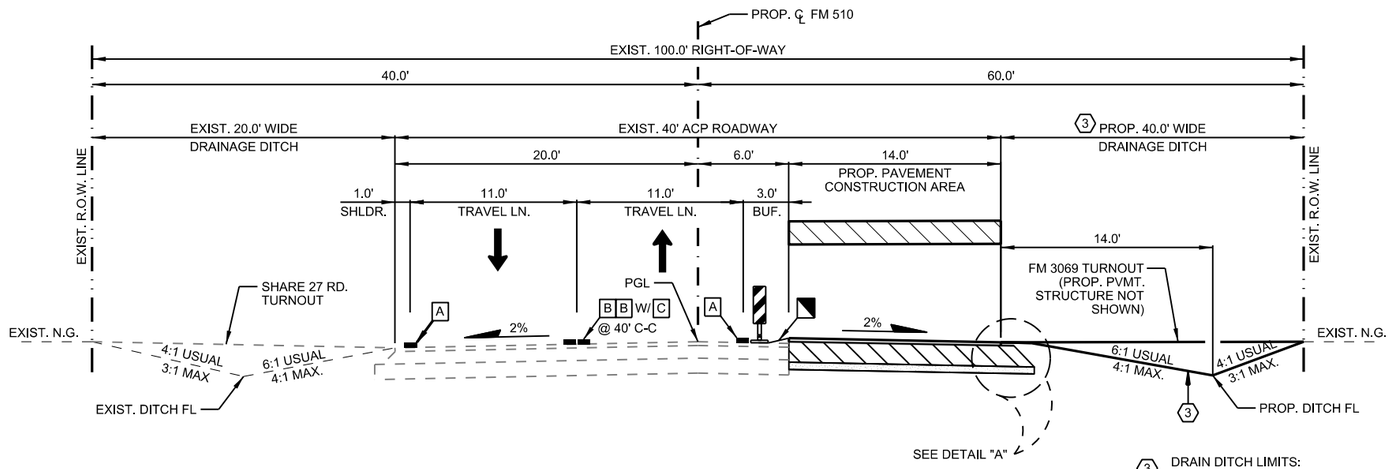
3. PROPOSED 1.5" SP-D PG 76-22 SAC A
4. PROPOSED 1 COURSE UNDERSEAL TREATMENT
5. PROPOSED MC-30 PRIME COAT
6. PROPOSED 18" TY-E GR-4 FLEX BASE (2 EQ LIFTS) NEW UNTREATED MATERIAL COMPACTED TO 98% DENSITY
7. GEOGRID BASE REINFORCEMENT (TYPE 2)
8. PROOF ROLL SUBGRADE
9. PROPOSED TY. "A" BACKFILL (ITEM 134) (NOT APPLICABLE AT INTERSECTING ROADWAY TURNOUTS AND DRIVEWAYS)



PHASE I
INTERSECTION CONSTRUCTION
AT FM 3069
STEP-B, STAGE-1

STA. 523+50.00 TO STA 524+80.00

2 DRAIN DITCH LIMITS: STA. 523+50 - STA. 524+00



PHASE I
INTERSECTION CONSTRUCTION
AT FM 3069
STEP-B, STAGE-1

STA. 524+80.00 TO STA 525+80.00

3 DRAIN DITCH LIMITS: STA. 525+18 - STA. 525+80

GENERAL NOTES

PGL - DENOTES PROFILE GRADE LINE

PCJ - DENOTES PERMISSIBLE CONSTRUCTION JOINT. REFER TO PROPOSED ROADWAY TYPICAL SECTIONS FOR PLACEMENT OF PERMISSIBLE CONSTRUCTION JOINTS (PCJ).

WHERE POSSIBLE AND UNLESS OTHERWISE DIRECTED BY THE ENGINEER, PERMISSIBLE CONSTRUCTION JOINTS SHALL FALL ON STRIPING LINES AS SHOWN ON STRIPING DETAILS.

WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS THE GOVERNING SLOPES MAY BE VARIED WHEN SPECIFICALLY DIRECTED BY THE ENGINEER.

THE SUBGRADE SHALL BE SHAPED, BLADED, ROLLED AND PROOF ROLLED A MINIMUM DISTANCE OF 24" BEYOND THE EDGE OF THE PROPOSED BASE COURSE.

A STATION EQUALS 100 FT.

114 LBS/SY IS EQUIVALENT TO 1" OF ACP

1-COURSE SURF. TREATM. - ASPH (TIER II)0.30 GAL/SY (APPROX) W/ AGGREGATE (TY-B GR 4P)(SAC-B) AT 1 CY/125 SY

PRIME COAT - 0.2 GAL/SY

BONDING COURSE - 0.07 GAL/SY (FOR ESTIMATING PURPOSES ONLY- RATE TO BE DETERMINED AND SET IN THE FIELD BY THE ENGINEER)

FLEXIBLE BASE WT - 3375 LBS/CY (APPROX)(COMPACTED)
SUBGRADE WT - 2970 LBS/CY (APPROX)(COMPACTED)

ALL GRADING SHALL BE WITHIN THE R.O.W. LIMITS

SAW CUT WILL BE SUBSIDIARY TO THE OTHER ROADWAY ITEMS.

A 3:1 MAX SLOPE SHALL BE PROVIDED AT THE END OF EACH WORKING DAY ON ALL EXPOSED EDGES OF ROADWAY CONSTRUCTION OR EXCAVATION.

MIN. COVER OF FOUR (4) INCHES OF NEW FLEX. BASE WILL BE REQUIRED WHERE SALVAGE IS PART OF FLEX. BASE.

THE EXISTING BITUMINOUS MATERIAL IS TO BE SALVAGE IN ACCORDANCE WITH ITEM 305.

ANY EXCESS MATERIAL SHALL BECOME PROPERTY OF THE CONTRACTOR AND SHALL BE HAULED OFF.

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

07/01/24

Pharr District Central Design

Texas Department of Transportation

FM 510

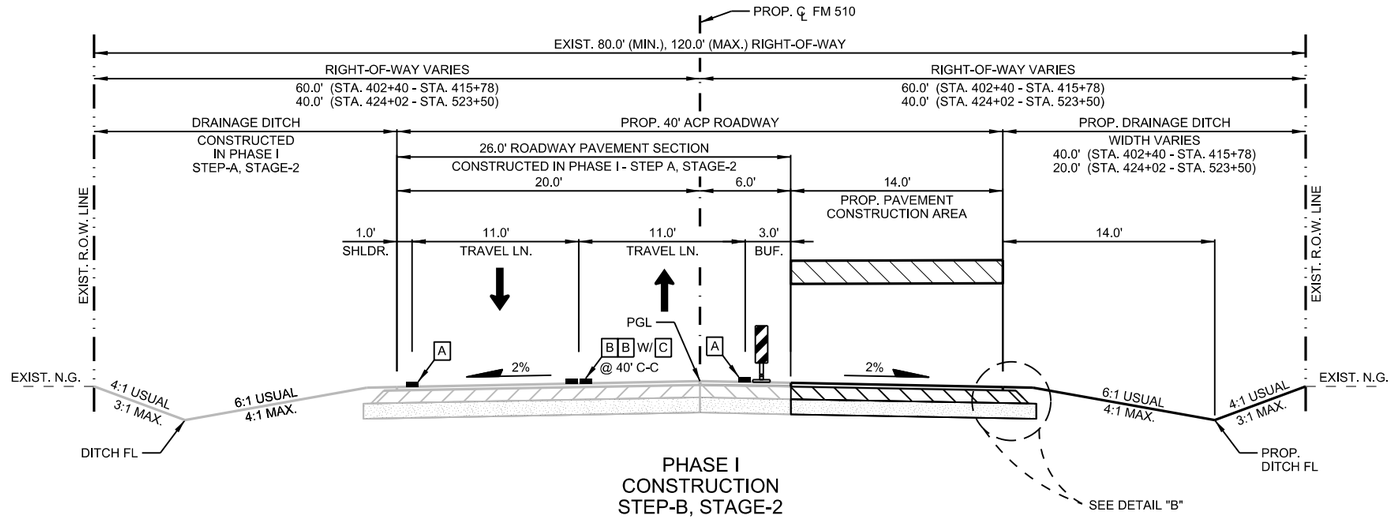
TRAFFIC CONTROL PLAN
PROPOSED TYPICAL SECTIONS
PHASE I

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

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		43

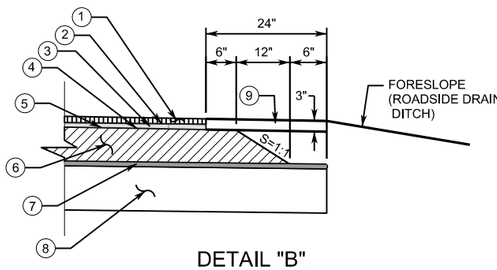
DATE: 06/28/24 09:04:55
FILE: c:\txdot\pw_online\txdot5\denise.vasquez\d0403762\FM 510 TYP SEC_TCP PH I_PH II.dgn

LEGEND	
	CONSTRUCTION AREA
A	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
C	TYP II -A-A RAISED PAVEMENT MARKERS
	DROP OFFS GREATER THAN OR EQUAL TO 2" MUST BE PROTECTED BY A 3:1 OR FLATTER SLOPE WHEN NO ROAD WORK IS BEING DONE IN THE IMMEDIATE AREA. (EDGE COND I)
	DRUMS WITH REFLECTORS. SPACED AS PER BC(9)-21 AND TCP TxDOT STANDARDS
	VERTICAL PANEL (PORTABLE). SPACED AS PER PER BC(9)-21 AND TCP TxDOT STANDARDS.
	MATCH EXISTING/ADJACENT CROSS SLOPE AND ELEVATION
	EXISTING TRAFFIC DIRECTION
	PROPOSED TRAFFIC DIRECTION



PHASE I CONSTRUCTION STEP-B, STAGE-2

STA. 402+40.00 TO STA 415+78.00
STA. 424+02.00 TO STA 523+50.00

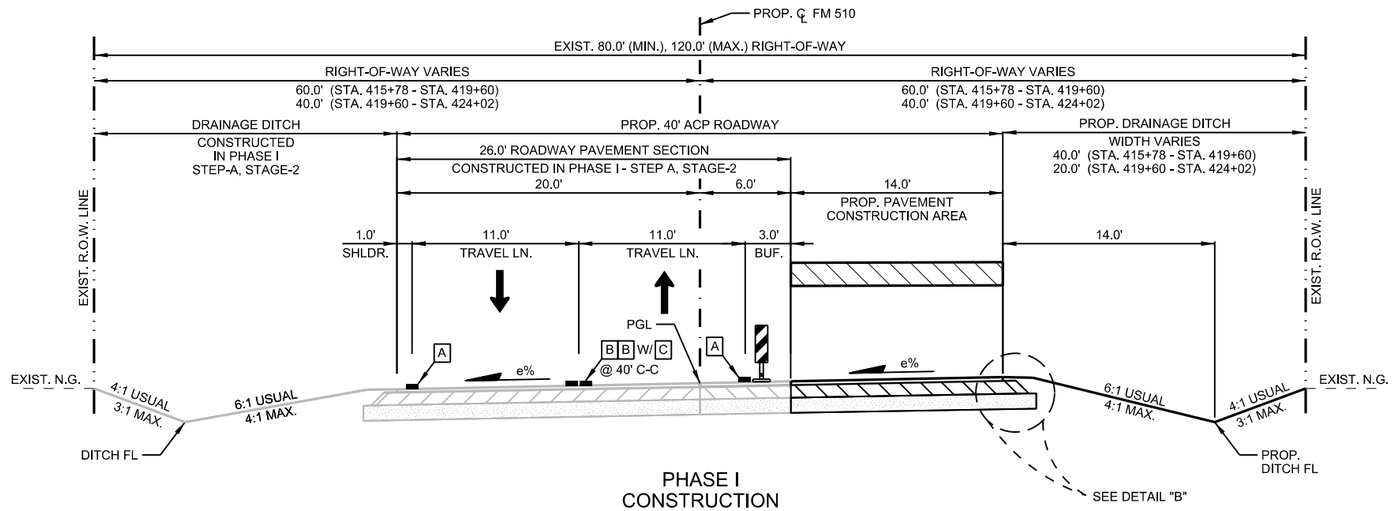


DETAIL "B"

LEGEND:

TO BE CONSTRUCTED ON PHASE III (SEE SEQUENCE OF CONSTRUCTION)

1. PROPOSED 1.5" SP-D PG 76-22 SAC A
2. PROPOSED BONDING COURSE
3. PROPOSED 1.5" SP-D PG 76-22 SAC A
4. PROPOSED 1 COURSE UNDERSEAL TREATMENT
5. PROPOSED MC-30 PRIME COAT
6. PROPOSED 12" TY-E GR-4 W/ 2% CEMENT ADMIX BY WT FLEX BASE (2 EQ LIFTS)
7. GEOGRID BASE REINFORCEMENT (TYPE 2)
8. PROPOSED 12" LIME TREATED SUBGRADE W/ 6% LIME ADMIX BY WT.
9. PROPOSED TY. "A" BACKFILL (ITEM 134) (NOT APPLICABLE AT INTERSECTING ROADWAY TURNOUTS AND DRIVEWAYS)



PHASE I CONSTRUCTION STEP-B, STAGE-2

STA. 415+78.00 TO STA 417+48.00 (SUPERELEVATION TRANSITION AT PC)
STA. 417+48.00 TO STA 422+32.00 (FULLY SUPERELEVATED CROWN)
STA. 422+32.00 TO STA 424+02.00 (SUPERELEVATION TRANSITION AT PT)

GENERAL NOTES

PGL - DENOTES PROFILE GRADE LINE

PCJ - DENOTES PERMISSIBLE CONSTRUCTION JOINT. REFER TO PROPOSED ROADWAY TYPICAL SECTIONS FOR PLACEMENT OF PERMISSIBLE CONSTRUCTION JOINTS (PCJ).

WHERE POSSIBLE AND UNLESS OTHERWISE DIRECTED BY THE ENGINEER, PERMISSIBLE CONSTRUCTION JOINTS SHALL FALL ON STRIPING LINES AS SHOWN ON STRIPING DETAILS.

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THE SUBGRADE SHALL BE SHAPED, BLADED, ROLLED AND PROOF ROLLED A MINIMUM DISTANCE OF 24" BEYOND THE EDGE OF THE PROPOSED BASE COURSE.

A STATION EQUALS 100 FT.

114 LBS/SY IS EQUIVALENT TO 1" OF ACP

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Pharr District Central Design

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FM 510

TRAFFIC CONTROL PLAN
PROPOSED TYPICAL SECTIONS
PHASE I

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

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		44

DATE: 06/28/24 09:04:57
FILE: c:\txdot\pw_ontfile\txdot05\denise.vasquez\d0403762\FM 510 TYP SEC_TCP PH I_PH II.dgn

LEGEND	
	CONSTRUCTION AREA
A	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
C	TYP II -A-A RAISED PAVEMENT MARKERS
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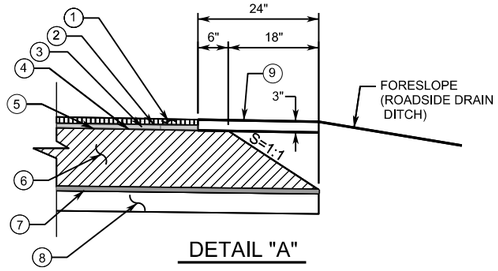
	EXISTING TRAFFIC DIRECTION
	PROPOSED TRAFFIC DIRECTION



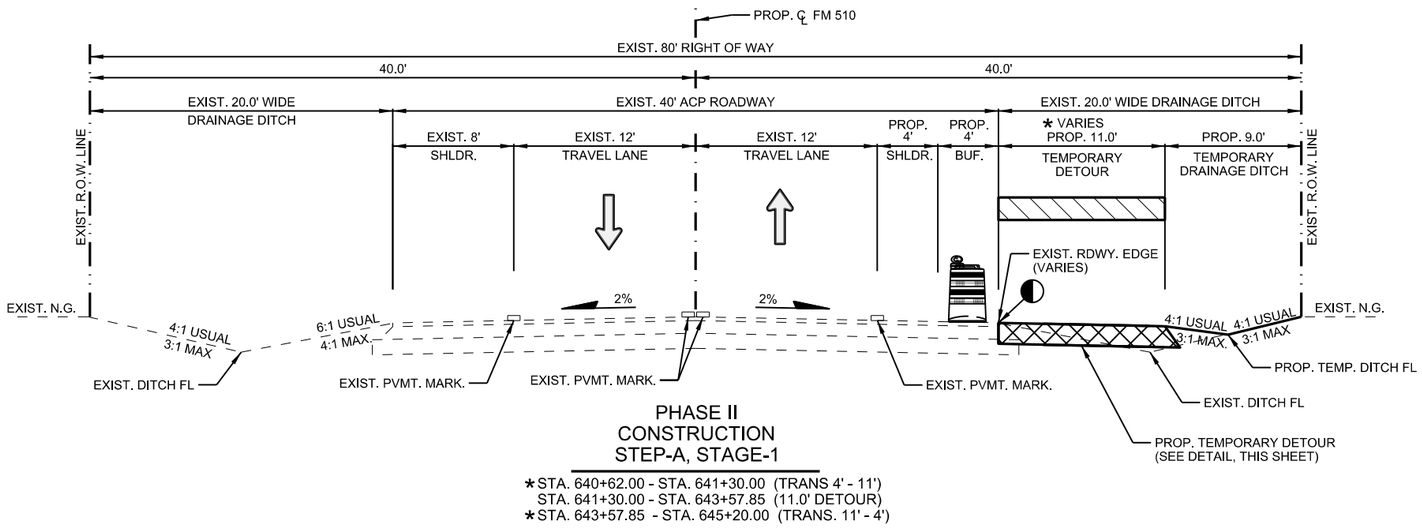
DETAIL "A"

LEGEND:

1. PROPOSED 1.5" SP-D PG 76-22 SAC A
2. PROPOSED BONDING COURSE

(TO BE CONSTRUCTED ON PHASE III (SEE SEQUENCE OF CONSTRUCTION))

3. PROPOSED 1.5" SP-D PG 76-22 SAC A
4. PROPOSED 1 COURSE UNDERSEAL TREATMENT
5. PROPOSED MC-30 PRIME COAT
6. PROPOSED 18" TY-E GR-4 FLEX BASE (2 EQ LIFTS) NEW UNTREATED MATERIAL COMPACTED TO 98% DENSITY
7. GEOGRID BASE REINFORCEMENT (TYPE 2)
8. PROOF ROLL SUBGRADE
9. PROPOSED TY. "A" BACKFILL (ITEM 134) (NOT APPLICABLE AT INTERSECTING ROADWAY TURNOUTS AND DRIVEWAYS)



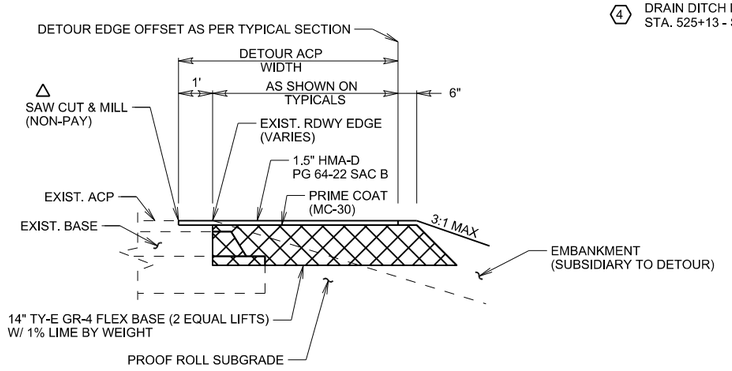
PHASE II CONSTRUCTION STEP-A, STAGE-1

✱STA. 640+62.00 - STA. 641+30.00 (TRANS 4' - 11')
STA. 641+30.00 - STA. 643+57.85 (11.0' DETOUR)
✱STA. 643+57.85 - STA. 645+20.00 (TRANS. 11' - 4')

PHASE II INTERSECTION CONSTRUCTION AT FM 3069 STEP-A, STAGE-2

STA. 524+80.00 TO STA 525+80.00

4 DRAIN DITCH LIMITS:
STA. 525+13 - STA. 525+80



TYPICAL DETOUR DETAIL

△ SAW CUT TO BE SUBSIDIARY TO ITEM 508.

GENERAL NOTES

PGL - DENOTES PROFILE GRADE LINE

PCJ - DENOTES PERMISSIBLE CONSTRUCTION JOINT. REFER TO PROPOSED ROADWAY TYPICAL SECTIONS FOR PLACEMENT OF PERMISSIBLE CONSTRUCTION JOINTS (PCJ).

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FM 510

TRAFFIC CONTROL PLAN
PROPOSED TYPICAL SECTIONS
PHASE II

SCALE: N.T.S. SHEET 1 OF 6

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		45

DATE: 06/28/24 09:04:59
FILE: c:\txdot\pw_online\txdot5\denise.vasquez\d0403762\FM 510 TYP SEC_TCP PH I_PH II.dgn

LEGEND	
	CONSTRUCTION AREA
A	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
C	TYP II -A-A RAISED PAVEMENT MARKERS
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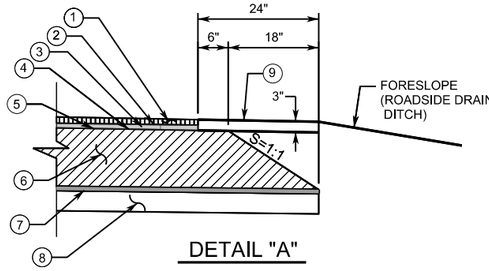


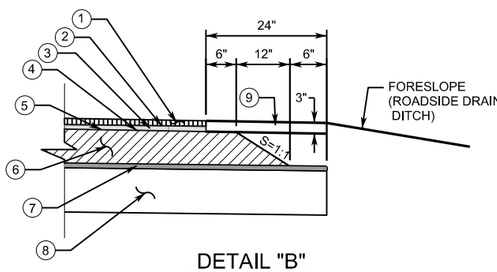
DETAIL "A"

LEGEND:

- (1) PROPOSED 1.5" SP-D PG 76-22 SAC A
- (2) PROPOSED BONDING COURSE

TO BE CONSTRUCTED ON PHASE III (SEE SEQUENCE OF CONSTRUCTION)

- (3) PROPOSED 1.5" SP-D PG 76-22 SAC A
- (4) PROPOSED 1 COURSE UNDERSEAL TREATMENT
- (5) PROPOSED MC-30 PRIME COAT
- (6) PROPOSED 18" TY-E GR-4 FLEX BASE (2 EQ LIFTS) NEW UNTREATED MATERIAL COMPACTED TO 98% DENSITY
- (7) GEOGRID BASE REINFORCEMENT (TYPE 2)
- (8) PROOF ROLL SUBGRADE
- (9) PROPOSED TY. "A" BACKFILL (ITEM 134) (NOT APPLICABLE AT INTERSECTING ROADWAY TURNOUTS AND DRIVEWAYS)



DETAIL "B"

LEGEND:

- (1) PROPOSED 1.5" SP-D PG 76-22 SAC A
- (2) PROPOSED BONDING COURSE

TO BE CONSTRUCTED ON PHASE III (SEE SEQUENCE OF CONSTRUCTION)

- (3) PROPOSED 1.5" SP-D PG 76-22 SAC A
- (4) PROPOSED 1 COURSE UNDERSEAL TREATMENT
- (5) PROPOSED MC-30 PRIME COAT
- (6) PROPOSED 12" TY-E GR-4 W/ 2% CEMENT ADMIX BY WT FLEX BASE (2 EQ LIFTS)
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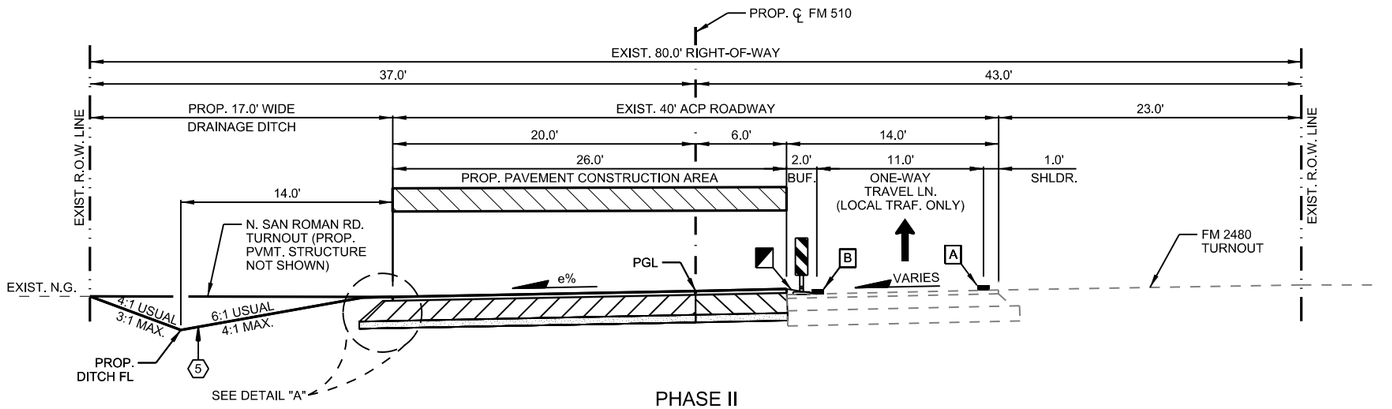
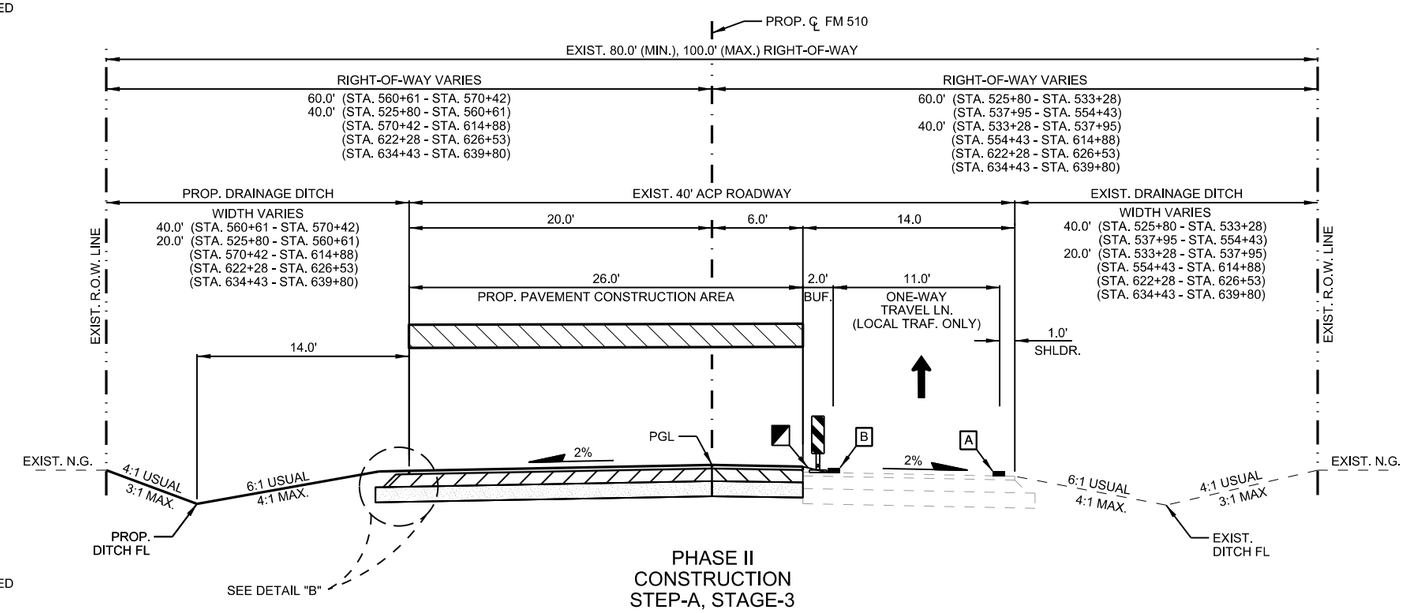


(5) DRAIN DITCH LIMITS:
STA. 639+80 - STA. 640+29
STA. 641+10 - STA. 641+30

PHASE II
INTERSECTION CONSTRUCTION
AT FM 2480
STEP-A, STAGE-2

STA. 639+80.00 TO STA 641+30.00



PHASE II
CONSTRUCTION
STEP-A, STAGE-3

STA. 525+80.00 TO STA 614+88.00
STA. 622+28.00 TO STA 626+53.00
STA. 634+43.00 TO STA 639+80.00

GENERAL NOTES

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07/01/24

Pharr District Central Design

Texas Department of Transportation

FM 510

TRAFFIC CONTROL PLAN
PROPOSED TYPICAL SECTIONS
PHASE II

SCALE: N.T.S. SHEET 2 OF 6

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		46

DATE: 06/28/24 09:05:01
FILE: c:\txdot\pw_online\txdot5\denise.vasquez\d0403762\FM 510 TYP SEC_TCP PH I_PH II.dgn

LEGEND	
	CONSTRUCTION AREA
A	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
C	TYP II -A-A RAISED PAVEMENT MARKERS
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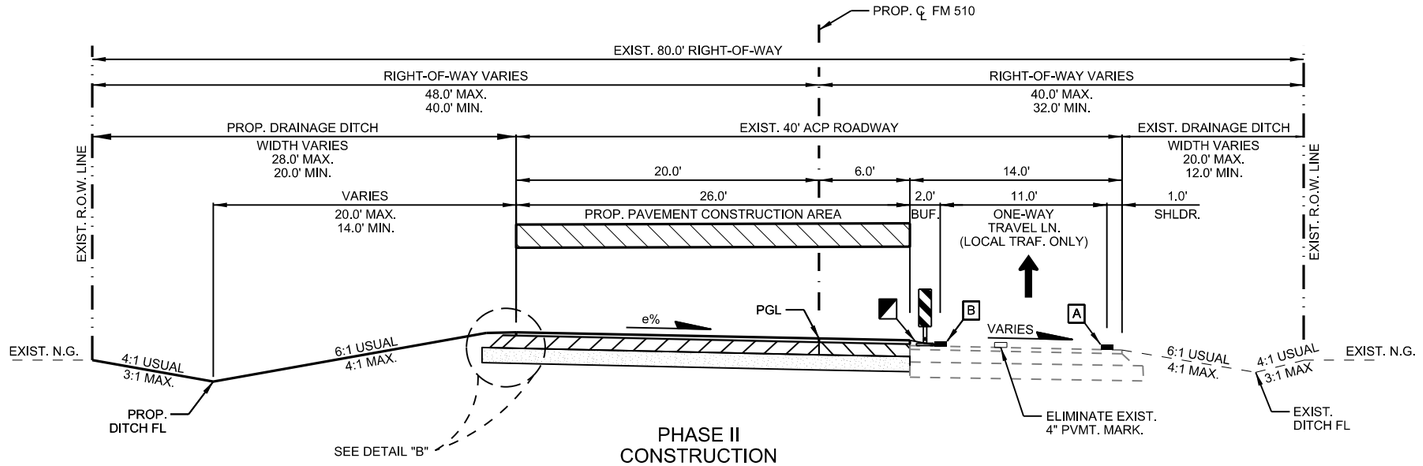
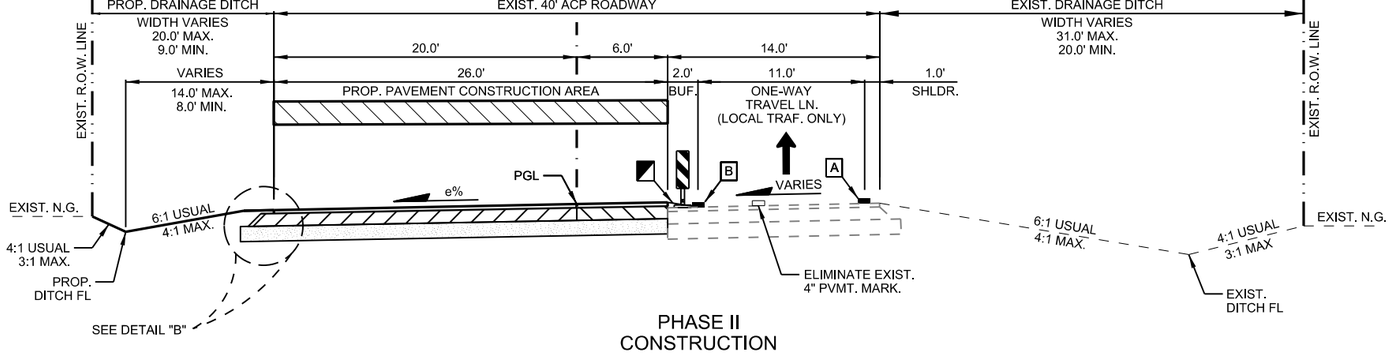
	PROPOSED TRAFFIC DIRECTION



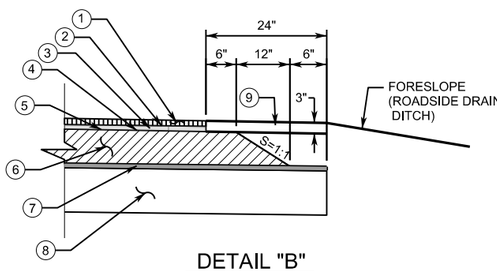
PHASE II CONSTRUCTION STEP-A, STAGE-3

STA. 614+88.00 TO STA 617+36.00 (SUPERELEVATION TRANSITION AT PC)
STA. 617+36.00 TO STA 619+80.00 (FULLY SUPERELEVATED CROWN)
STA. 619+80.00 TO STA 622+28.00 (SUPERELEVATION TRANSITION AT PT)



PHASE II CONSTRUCTION STEP-A, STAGE-3

STA. 626+53.00 TO STA 629+01.00 (SUPERELEVATION TRANSITION AT PC)
STA. 629+01.00 TO STA 631+94.00 (FULLY SUPERELEVATED CROWN)
STA. 631+94.00 TO STA 634+43.00 (SUPERELEVATION TRANSITION AT PT)



DETAIL "B"

LEGEND:

①	PROPOSED 1.5" SP-D PG 76-22 SAC A (TO BE CONSTRUCTED ON PHASE III (SEE SEQUENCE OF CONSTRUCTION))
②	PROPOSED BONDING COURSE (TO BE CONSTRUCTED ON PHASE III (SEE SEQUENCE OF CONSTRUCTION))
③	PROPOSED 1.5" SP-D PG 76-22 SAC A
④	PROPOSED 1 COURSE UNDERSEAL TREATMENT
⑤	PROPOSED MC-30 PRIME COAT
⑥	PROPOSED 12" TY-E GR-4 W/ 2% CEMENT ADMIX BY WT FLEX BASE (2 EQ LIFTS)
⑦	GEOGRID BASE REINFORCEMENT (TYPE 2)
⑧	PROPOSED 12" LIME TREATED SUBGRADE W/ 6% LIME ADMIX BY WT.
⑨	PROPOSED TY. "A" BACKFILL (ITEM 134) (NOT APPLICABLE AT INTERSECTING ROADWAY TURNOUTS AND DRIVEWAYS)

GENERAL NOTES

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MIN. COVER OF FOUR (4) INCHES OF NEW FLEX. BASE WILL BE REQUIRED WHERE SALVAGE IS PART OF FLEX. BASE.

THE EXISTING BITUMINOUS MATERIAL IS TO BE SALVAGE IN ACCORDANCE WITH ITEM 305.

ANY EXCESS MATERIAL SHALL BECOME PROPERTY OF THE CONTRACTOR AND SHALL BE HAULED OFF.

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED
PROFESSIONAL ENGINEER

07/01/24

Pharr District Central Design

Texas Department of Transportation

FM 510

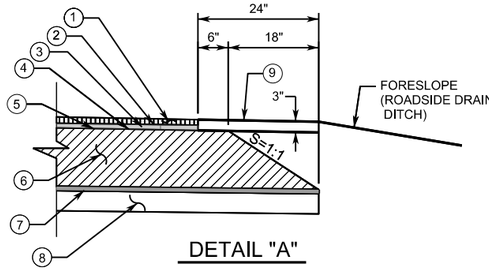
TRAFFIC CONTROL PLAN
PROPOSED TYPICAL SECTIONS
PHASE II

SCALE: N.T.S. SHEET 3 OF 6

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		47

DATE: 06/28/24 09:05:03
FILE: c:\txdot\pw_onfile\txdot5\denise.vasquez\d0403762\FM 510 TYP SEC_TCP PH I_PH II.dgn

LEGEND	
	CONSTRUCTION AREA
A	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
C	TYP II -A-A RAISED PAVEMENT MARKERS
	DROP OFFS GREATER THAN OR EQUAL TO 2" MUST BE PROTECTED BY A 3:1 OR FLATTER SLOPE WHEN NO ROAD WORK IS BEING DONE IN THE IMMEDIATE AREA. (EDGE COND I)
	DRUMS WITH REFLECTORS. SPACED AS PER BC(9)-21 AND TCP TxDOT STANDARDS
	VERTICAL PANEL (PORTABLE). SPACED AS PER PER BC(9)-21 AND TCP TxDOT STANDARDS.
	MATCH EXISTING/ADJACENT CROSS SLOPE AND ELEVATION
	EXISTING TRAFFIC DIRECTION
	PROPOSED TRAFFIC DIRECTION

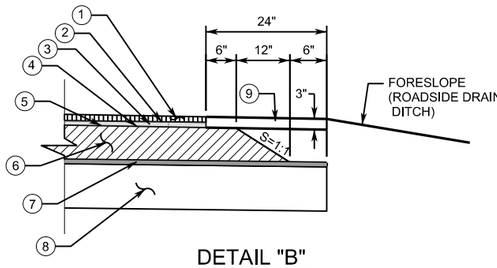


DETAIL "A"

LEGEND:

TO BE CONSTRUCTED ON PHASE III (SEE SEQUENCE OF CONSTRUCTION)

1. PROPOSED 1.5" SP-D PG 76-22 SAC A
2. PROPOSED BONDING COURSE
3. PROPOSED 1.5" SP-D PG 76-22 SAC A
4. PROPOSED 1 COURSE UNDERSEAL TREATMENT
5. PROPOSED MC-30 PRIME COAT
6. PROPOSED 18" TY-E GR-4 FLEX BASE (2 EQ LIFTS) NEW UNTREATED MATERIAL COMPACTED TO 98% DENSITY
7. GEOGRID BASE REINFORCEMENT (TYPE 2)
8. PROOF ROLL SUBGRADE
9. PROPOSED TY. "A" BACKFILL (ITEM 134) (NOT APPLICABLE AT INTERSECTING ROADWAY TURNOUTS AND DRIVEWAYS)

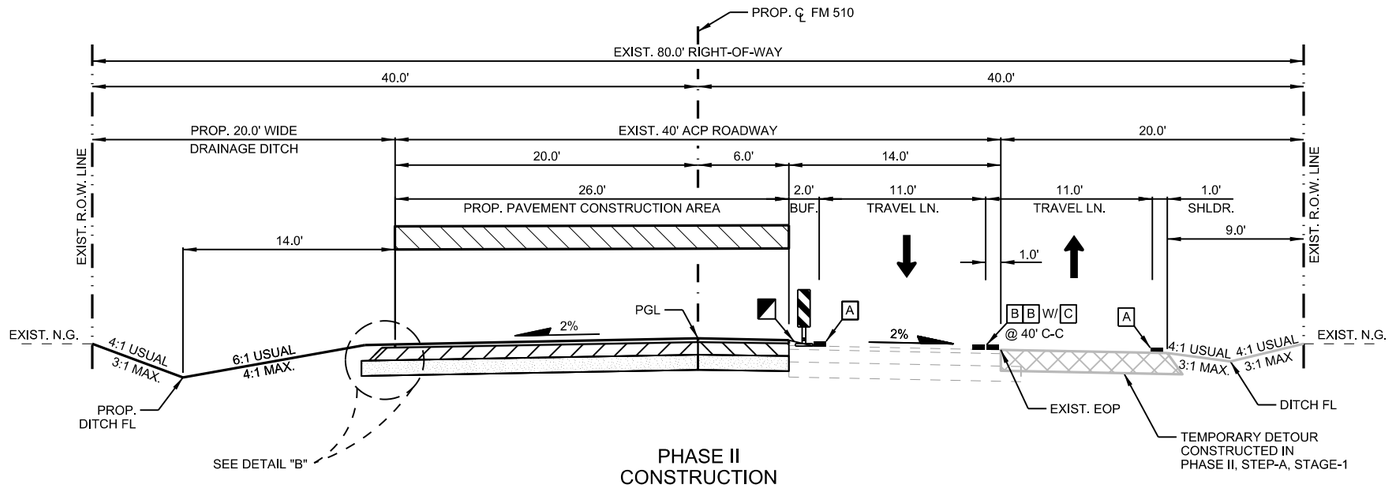


DETAIL "B"

LEGEND:

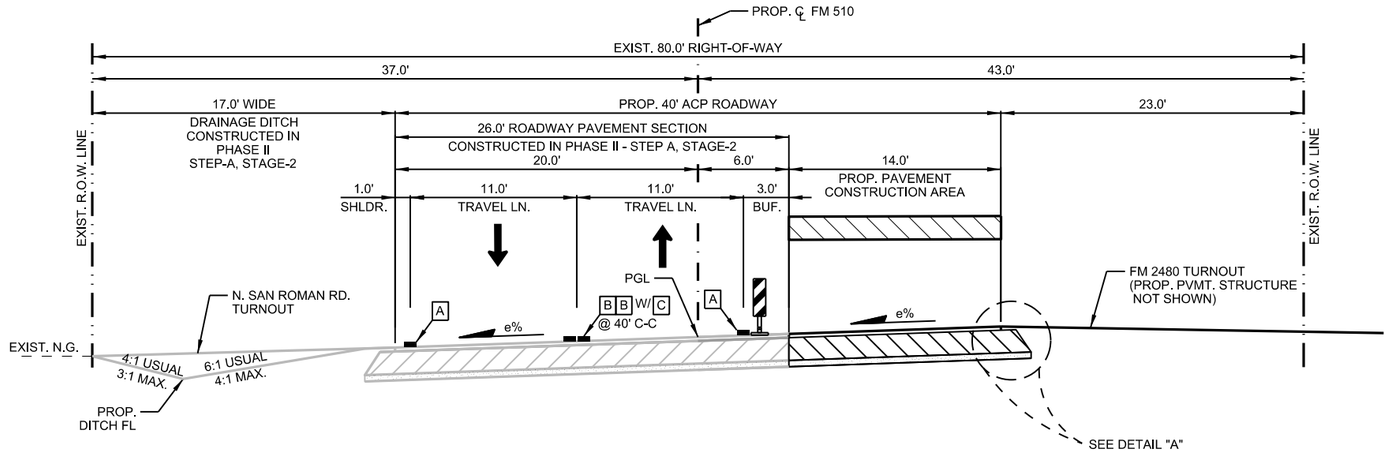
TO BE CONSTRUCTED ON PHASE III (SEE SEQUENCE OF CONSTRUCTION)

1. PROPOSED 1.5" SP-D PG 76-22 SAC A
2. PROPOSED BONDING COURSE
3. PROPOSED 1.5" SP-D PG 76-22 SAC A
4. PROPOSED 1 COURSE UNDERSEAL TREATMENT
5. PROPOSED MC-30 PRIME COAT
6. PROPOSED 12" TY-E GR-4 W/ 2% CEMENT ADMIX BY WT FLEX BASE (2 EQ LIFTS)
7. GEOGRID BASE REINFORCEMENT (TYPE 2)
8. PROPOSED 12" LIME TREATED SUBGRADE W/ 6% LIME ADMIX BY WT.
9. PROPOSED TY. "A" BACKFILL (ITEM 134) (NOT APPLICABLE AT INTERSECTING ROADWAY TURNOUTS AND DRIVEWAYS)



PHASE II CONSTRUCTION STEP-A, STAGE-3

STA. 641+30.00 TO STA 643+57.85



PHASE II INTERSECTION CONSTRUCTION AT FM 2480 STEP-B, STAGE-1

STA. 639+80.00 TO STA 641+30.00

GENERAL NOTES

PGL - DENOTES PROFILE GRADE LINE

PCJ - DENOTES PERMISSIBLE CONSTRUCTION JOINT. REFER TO PROPOSED ROADWAY TYPICAL SECTIONS FOR PLACEMENT OF PERMISSIBLE CONSTRUCTION JOINTS (PCJ).

WHERE POSSIBLE AND UNLESS OTHERWISE DIRECTED BY THE ENGINEER, PERMISSIBLE CONSTRUCTION JOINTS SHALL FALL ON STRIPING LINES AS SHOWN ON STRIPING DETAILS.

WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS THE GOVERNING SLOPES MAY BE VARIED WHEN SPECIFICALLY DIRECTED BY THE ENGINEER.

THE SUBGRADE SHALL BE SHAPED, BLADED, ROLLED AND PROOF ROLLED A MINIMUM DISTANCE OF 24" BEYOND THE EDGE OF THE PROPOSED BASE COURSE.

A STATION EQUALS 100 FT.

114 LBS/SY IS EQUIVALENT TO 1" OF ACP

1-COURSE SURF. TREATM. - ASPH (TIER II)0.30 GAL/SY (APPROX) W/ AGGREGATE (TY-B GR 4P)(SAC-B) AT 1 CY/125 SY

PRIME COAT - 0.2 GAL/SY

BONDING COURSE - 0.07 GAL/SY (FOR ESTIMATING PURPOSES ONLY- RATE TO BE DETERMINED AND SET IN THE FIELD BY THE ENGINEER)

FLEXIBLE BASE WT - 3375 LBS/CY (APPROX)(COMPACTED)
SUBGRADE WT - 2970 LBS/CY (APPROX)(COMPACTED)

ALL GRADING SHALL BE WITHIN THE R.O.W. LIMITS

SAW CUT WILL BE SUBSIDIARY TO THE OTHER ROADWAY ITEMS.

A 3:1 MAX SLOPE SHALL BE PROVIDED AT THE END OF EACH WORKING DAY ON ALL EXPOSED EDGES OF ROADWAY CONSTRUCTION OR EXCAVATION.

MIN. COVER OF FOUR (4) INCHES OF NEW FLEX. BASE WILL BE REQUIRED WHERE SALVAGE IS PART OF FLEX. BASE.

THE EXISTING BITUMINOUS MATERIAL IS TO BE SALVAGE IN ACCORDANCE WITH ITEM 305.

ANY EXCESS MATERIAL SHALL BECOME PROPERTY OF THE CONTRACTOR AND SHALL BE HAULED OFF.

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

07/01/24

Pharr District Central Design

Texas Department of Transportation

FM 510

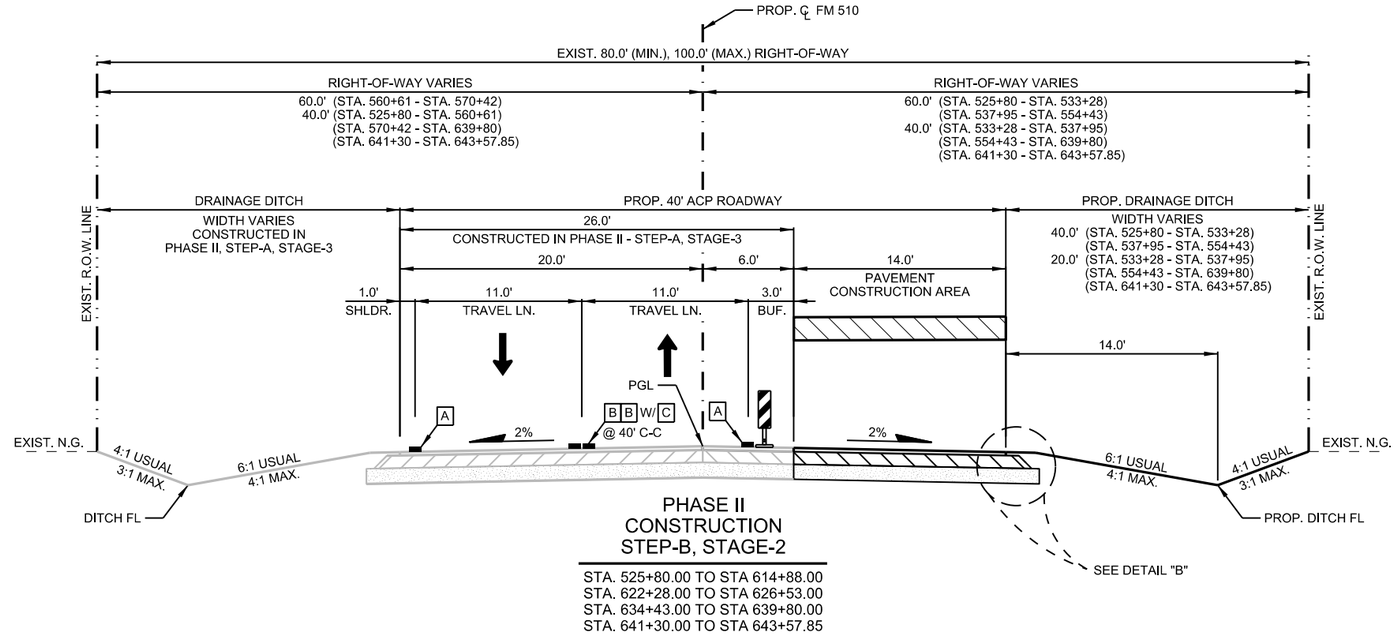
TRAFFIC CONTROL PLAN
PROPOSED TYPICAL SECTIONS
PHASE II

SCALE: N.T.S. SHEET 4 OF 6

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		48

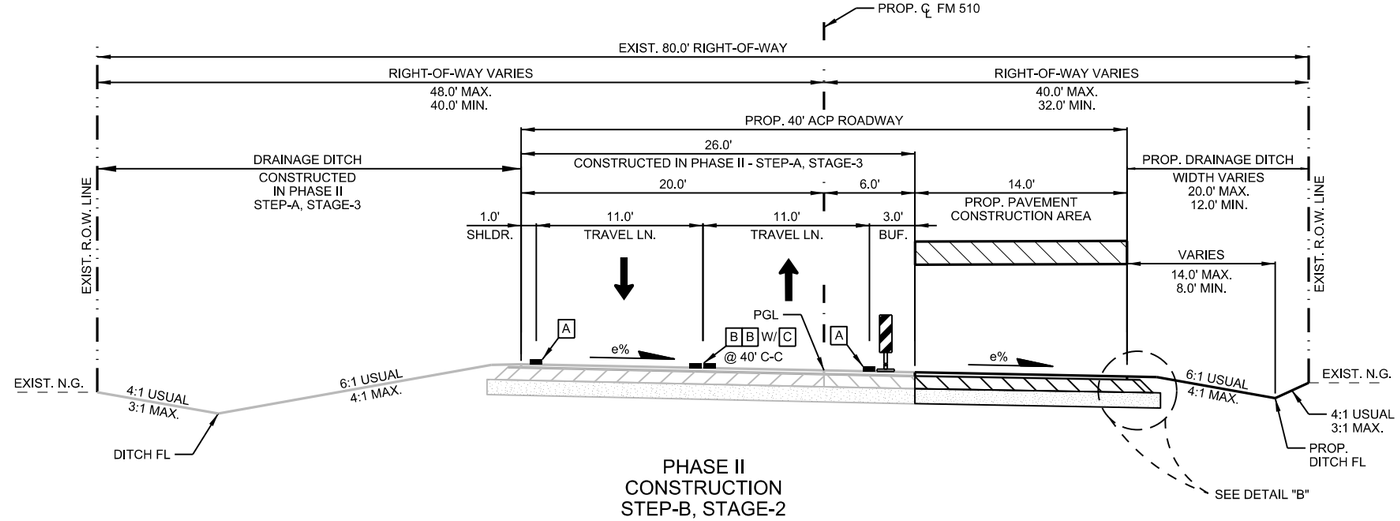
DATE: 06/28/24 09:05:06
FILE: c:\txdot\pw_online\txdot5\denise.vasquez\d0403762\FM 510 TYP SEC_TCP PH I_PH II.dgn

LEGEND	
	CONSTRUCTION AREA
A	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
C	TYP II -A-A RAISED PAVEMENT MARKERS
	DROP OFFS GREATER THAN OR EQUAL TO 2" MUST BE PROTECTED BY A 3:1 OR FLATTER SLOPE WHEN NO ROAD WORK IS BEING DONE IN THE IMMEDIATE AREA. (EDGE COND I)
	DRUMS WITH REFLECTORS. SPACED AS PER BC(9)-21 AND TCP TxDOT STANDARDS
	VERTICAL PANEL (PORTABLE). SPACED AS PER PER BC(9)-21 AND TCP TxDOT STANDARDS.
	MATCH EXISTING/ADJACENT CROSS SLOPE AND ELEVATION
	EXISTING TRAFFIC DIRECTION
	PROPOSED TRAFFIC DIRECTION



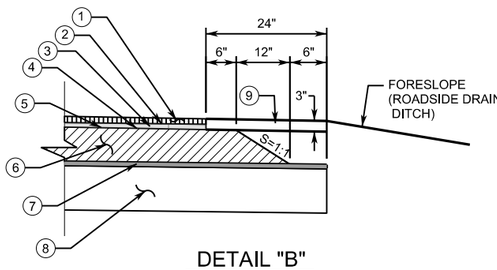
PHASE II CONSTRUCTION STEP-B, STAGE-2

STA. 525+80.00 TO STA 614+88.00
STA. 622+28.00 TO STA 626+53.00
STA. 634+43.00 TO STA 639+80.00
STA. 641+30.00 TO STA 643+57.85



PHASE II CONSTRUCTION STEP-B, STAGE-2

STA. 614+88.00 TO STA 617+36.00 (SUPERELEVATION TRANSITION AT PC)
STA. 617+36.00 TO STA 619+80.00 (FULLY SUPERELEVATED CROWN)
STA. 619+80.00 TO STA 622+28.00 (SUPERELEVATION TRANSITION AT PT)



DETAIL "B"

LEGEND:

(1)	PROPOSED 1.5" SP-D PG 76-22 SAC A
(2)	PROPOSED BONDING COURSE

TO BE CONSTRUCTED ON PHASE III (SEE SEQUENCE OF CONSTRUCTION)

(3)	PROPOSED 1.5" SP-D PG 76-22 SAC A
(4)	PROPOSED 1 COURSE UNDERSEAL TREATMENT
(5)	PROPOSED MC-30 PRIME COAT
(6)	PROPOSED 12" TY-E GR-4 W/ 2% CEMENT ADMIX BY WT FLEX BASE (2 EQ LIFTS)
(7)	GEOGRID BASE REINFORCEMENT (TYPE 2)
(8)	PROPOSED 12" LIME TREATED SUBGRADE W/ 6% LIME ADMIX BY WT.
(9)	PROPOSED TY. "A" BACKFILL (ITEM 134) (NOT APPLICABLE AT INTERSECTING ROADWAY TURNOUTS AND DRIVEWAYS)

GENERAL NOTES

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WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS THE GOVERNING SLOPES MAY BE VARIED WHEN SPECIFICALLY DIRECTED BY THE ENGINEER.

THE SUBGRADE SHALL BE SHAPED, BLADED, ROLLED AND PROOF ROLLED A MINIMUM DISTANCE OF 24" BEYOND THE EDGE OF THE PROPOSED BASE COURSE.

A STATION EQUALS 100 FT.

114 LBS/SY IS EQUIVALENT TO 1" OF ACP

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07/01/24

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FM 510

TRAFFIC CONTROL PLAN
PROPOSED TYPICAL SECTIONS
PHASE II

SCALE: N.T.S. SHEET 5 OF 6

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		49

DATE: 06/28/24 09:05:08
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LEGEND	
	CONSTRUCTION AREA
A	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
C	TYP II -A-A RAISED PAVEMENT MARKERS
	DROP OFFS GREATER THAN OR EQUAL TO 2" MUST BE PROTECTED BY A 3:1 OR FLATTER SLOPE WHEN NO ROAD WORK IS BEING DONE IN THE IMMEDIATE AREA. (EDGE COND I)
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	EXISTING TRAFFIC DIRECTION
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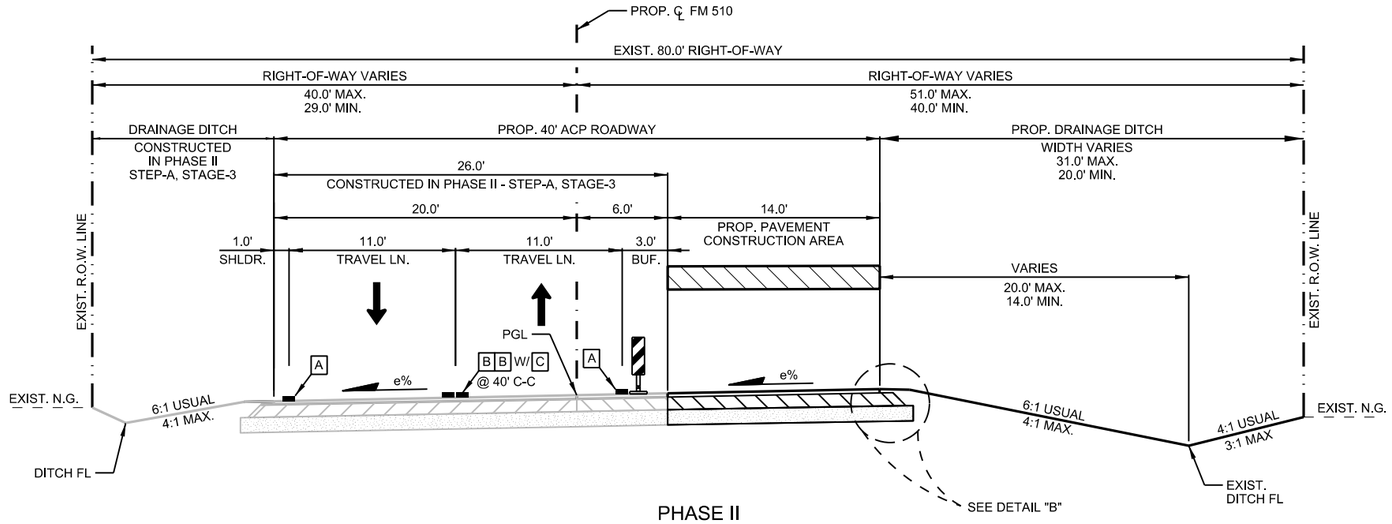

PHASE II CONSTRUCTION STEP-B, STAGE-2

STA. 626+53.00 TO STA 629+01.00 (SUPERELEVATION TRANSITION AT PC)
STA. 629+01.00 TO STA 631+94.00 (FULLY SUPERELEVATED CROWN)
STA. 631+94.00 TO STA 634+43.00 (SUPERELEVATION TRANSITION AT PT)

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BONDING COURSE - 0.07 GAL/SY (FOR ESTIMATING PURPOSES ONLY- RATE TO BE DETERMINED AND SET IN THE FIELD BY THE ENGINEER)

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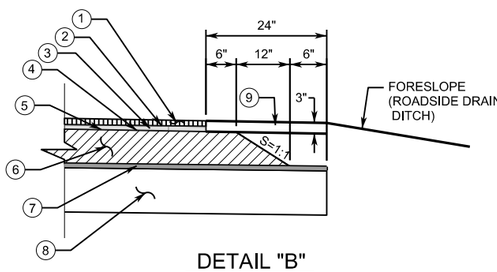

DETAIL "B"

LEGEND:

1	PROPOSED 1.5" SP-D PG 76-22 SAC A	TO BE CONSTRUCTED ON PHASE III (SEE SEQUENCE OF CONSTRUCTION)
2	PROPOSED BONDING COURSE	
3	PROPOSED 1.5" SP-D PG 76-22 SAC A	
4	PROPOSED 1 COURSE UNDERSEAL TREATMENT	
5	PROPOSED MC-30 PRIME COAT	
6	PROPOSED 12" TY-E GR-4 W/ 2% CEMENT ADMIX BY WT FLEX BASE (2 EQ LIFTS)	
7	GEOGRID BASE REINFORCEMENT (TYPE 2)	
8	PROPOSED 12" LIME TREATED SUBGRADE W/ 6% LIME ADMIX BY WT.	
9	PROPOSED TY. "A" BACKFILL (ITEM 134) (NOT APPLICABLE AT INTERSECTING ROADWAY TURNOUTS AND DRIVEWAYS)	

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

07/01/24

Pharr District Central Design

Texas Department of Transportation

FM 510

TRAFFIC CONTROL PLAN
PROPOSED TYPICAL SECTIONS
PHASE II

SCALE: N.T.S. SHEET 6 OF 6

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		50

DATE: 06/28/24 09:05:10
FILE: c:\txdot\pw_online\txdot5\denise.vasquez\d0403762\FM 510 TYP SEC_TCP PH I_PH II.dgn

PHASE I
CONSTRUCTION
STEP-A
STAGE-2

STA. 402+40.00
BEGIN STAGE-2 CONSTRUCTION
BEGIN PAVEMENT RE-CONSTRUCTION

FM 510

POT 400+00.00

PI 401+47.50

S 85° 41' 16.47" E

400+00

405+00

410+00

EXIST. R.O.W

PROP. ℄ FM 510

EOP

S 85° 42' 54.52" E

11' TRAVEL LANE

EXIST. R.O.W

MATCH LINE STA. 411+50.00

ELIMINATE EXIST.
4" PVMT. MARKINGS

PROP. VERTICAL PANELS
(REFER TO BC STANDARDS
FOR SPACING)

PROP. WORK ZONE PVMT.
MARKING (REM)
4" YELLOW SOLID

PROP. WORK ZONE PVMT.
MARKING (REM)
4" WHITE SOLID

ELIMINATE EXIST.
4" PVMT. MARKINGS

FM 1847

ESQUINA
CIR.

LEGEND

- TRAFFIC SIGN I.D.
- PROP. CONSTRUCTION
- PREVIOUSLY CONSTRUCTED
- DIRECTION OF TRAFFIC FLOW
- TRAFFIC BARREL w/REFLECTOR
- PROP. TY 3 BARRICADES
- PROP. VERTICAL PANELS
- PROP. SIGN
- X CONTRACTOR TO FOLLOW TxDOT LATEST BC-21 STANDARDS AND TxDOT TCP STANDARDS FOR PROPER SIGNAGE & SIGN SPACING.

N

PHASE I
CONSTRUCTION
STEP-A
STAGE-2

EXIST. 60' DEDICATED
ROAD RIGHT-OF-WAY
(CLOSED TO THRU TRAFFIC)

PROP. ℄ FM 510

EXIST. R.O.W

PC 416+97.33

PT 421+82.59

415+00

420+00

11' TRAVEL LANE

EXIST. R.O.W

MATCH LINE STA. 424+50.00

PROP. VERTICAL PANELS
(REFER TO BC STANDARDS
FOR SPACING)

PROP. WORK ZONE PVMT.
MARKING (REM)
4" YELLOW SOLID

PROP. WORK ZONE PVMT.
MARKING (REM)
4" WHITE SOLID

PROP. CUT & RESTORE
EXIST. PVMT. (37 SY)

STA. 419+61
PROP. 8'X5' CONC. BOX CULVERT
SEE "CULVERT CROSSING LAYOUTS"

ELIMINATE EXIST.
4" PVMT. MARKINGS

ELIMINATE EXIST.
4" PVMT. MARKINGS

STA. 419+61
EXIST. 10'X5' CONC. BOX CULVERT
(TO REMAIN IN PLACE)

ESQUINA
CIR.

G20-1bTL (72"x24")
ROAD WORK
← NEXT 5 MILES

G20-1bTR (72"x24")
ROAD WORK
NEXT 5 MILES →

R6-1R (36"x12")
ONE WAY

R6-1L (36"x12")
ONE WAY

R20-3T (48"X42")
OBEY WARNING SIGNS STATE LAW

G20-10T (60"x48")
STAY ALERT
TALK OR TEXT LATER

BEGIN WORK ZONE
TRAFFIC FINES DOUBLE
WHEN WORKERS ARE PRESENT
G20-9TP (24"x24")
R20-5T (24"x30")
R20-5aTP (24"x12")

CW20-1D (48"X48")
ROAD WORK AHEAD

CW20-2D (48"X48")
DETOUR AHEAD

BEGIN
ROAD WORK
NEXT 5 MILES
NAME
ADDRESS
CITY
STATE
CONTRACTOR
G20-5T (48"x24")
G20-6T (48"x30")

END WORK ZONE
G20-2bT (36"x18")

END DETOUR
M4-8A (24x18)

END ROAD WORK
G20-2 (36"X18")

CW20-3D (48"X48")
ROAD CLOSED AHEAD

TY 3 (C) BARRICADE

R11-4 (60"x30")
ROAD CLOSED TO THRU TRAFFIC

R3-2 (24"x24")

DETOUR M4-8 (24"x12")
EAST M3-2 (24"x12")
FARM 510 ROAD M1-6F (24"x24")
M6-1 (21"x15")

DETOUR M4-8 (24"x12")
EAST M3-2 (24"x12")
FARM 510 ROAD M1-6F (24"x24")
M6-3 (21"x15")

DETOUR M4-8 (24"x12")
WEST M3-4 (24"x12")
FARM 510 ROAD M1-6F (24"x24")
M6-1 (21"x15")

WORK ZONE
SPEED LIMIT 45
G20-5aP (24"x18")
R2 - 1 (30"x36")

NOTES:

X 1. ALL SIGNS SHOWN ON THIS SHEET ARE NOT TO SCALE.
2. ALL DETOUR AND ADVANCE WARNING SIGNS SHALL BE IN PLACE PRIOR TO COMMENCING CONSTRUCTION AND SHALL REMAIN IN PLACE THROUGHOUT THE DURATION OF CONSTRUCTION UNTIL THE PROJECT IS COMPLETE AND ACCEPTED BY TXDOT.
3. ALL SIGNS SHOWN FOR CONSTRUCTION SHALL BE SPACED PER THE TXDOT BC STANDARDS AND TXDOT TCP STANDARDS AND MAY BE ADJUSTED DUE TO FIELD CONDITIONS.
4. CONTRACTOR SHALL REMOVE ANY EXISTING PAVEMENT MARKINGS THAT ARE IN COFLICT WITH ANY PHASE OF CONSTRUCTION.

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STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

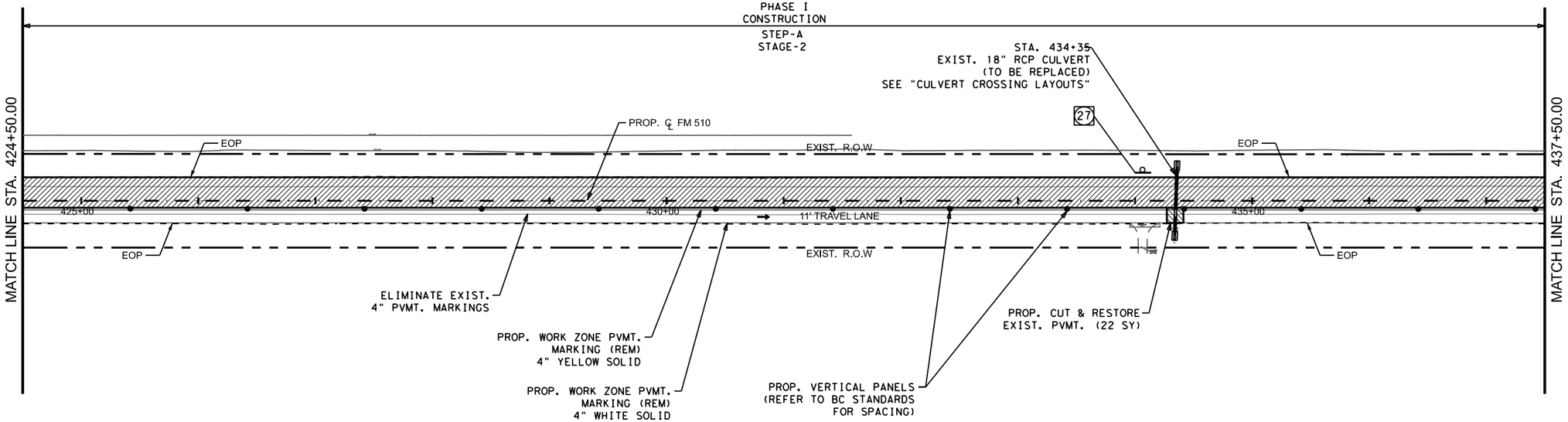
Texas Department of Transportation

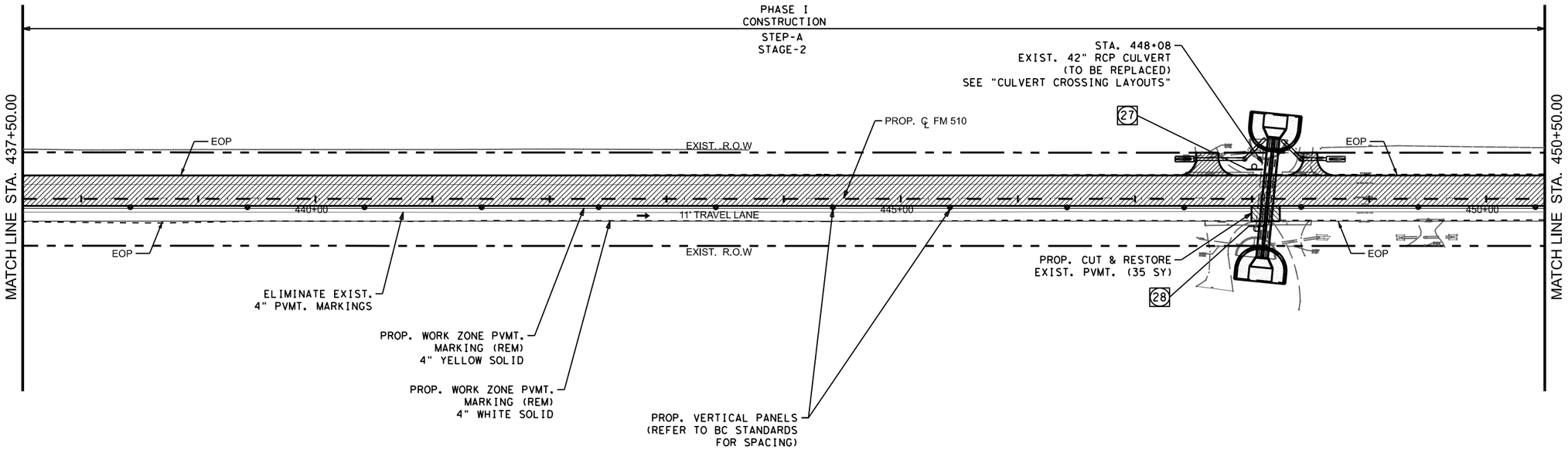
FM 510

TRAFFIC CONTROL PLAN
PHASE I, STEP - A
STA 402+40 - STA 424+50

SCALE: 1"=100' SHEET 1 OF 5

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		51





LEGEND

- TRAFFIC SIGN I.D.
- PROP. CONSTRUCTION
- PREVIOUSLY CONSTRUCTED
- DIRECTION OF TRAFFIC FLOW
- TRAFFIC BARREL w/REFLECTOR
- PROP. TY 3 BARRICADES
- PROP. VERTICAL PANELS
- PROP. SIGN
- X CONTRACTOR TO FOLLOW TxDOT LATEST BC-21 STANDARDS AND TxDOT TCP STANDARDS FOR PROPER SIGNAGE & SIGN SPACING.

N

NOTES:

X 1. ALL SIGNS SHOWN ON THIS SHEET ARE NOT TO SCALE.
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3. ALL SIGNS SHOWN FOR CONSTRUCTION SHALL BE SPACED PER THE TXDOT BC STANDARDS AND TXDOT TCP STANDARDS AND MAY BE ADJUSTED DUE TO FIELD CONDITIONS.
4. CONTRACTOR SHALL REMOVE ANY EXISTING PAVEMENT MARKINGS THAT ARE IN COFLICT WITH ANY PHASE OF CONSTRUCTION.

R6-1R (36"x12") — ONE WAY — 27

R6-1L (36"x12") — ONE WAY — 28

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

TRAFFIC CONTROL PLAN
PHASE I, STEP - A
STA 424+50 - STA 450+50

SCALE: 1"=100' SHEET 2 OF 5

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		52

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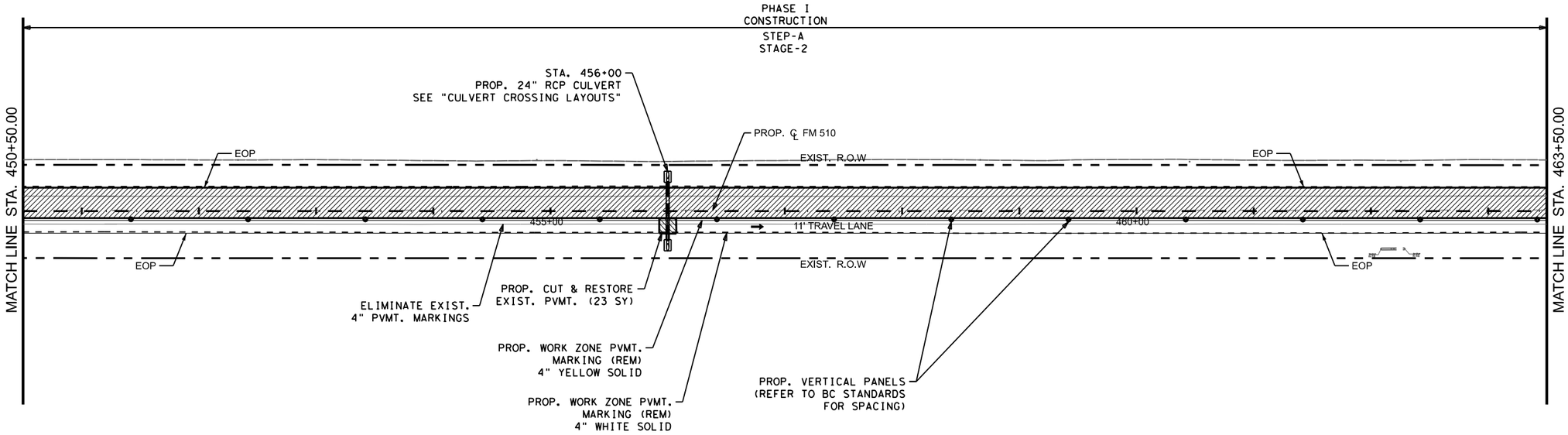

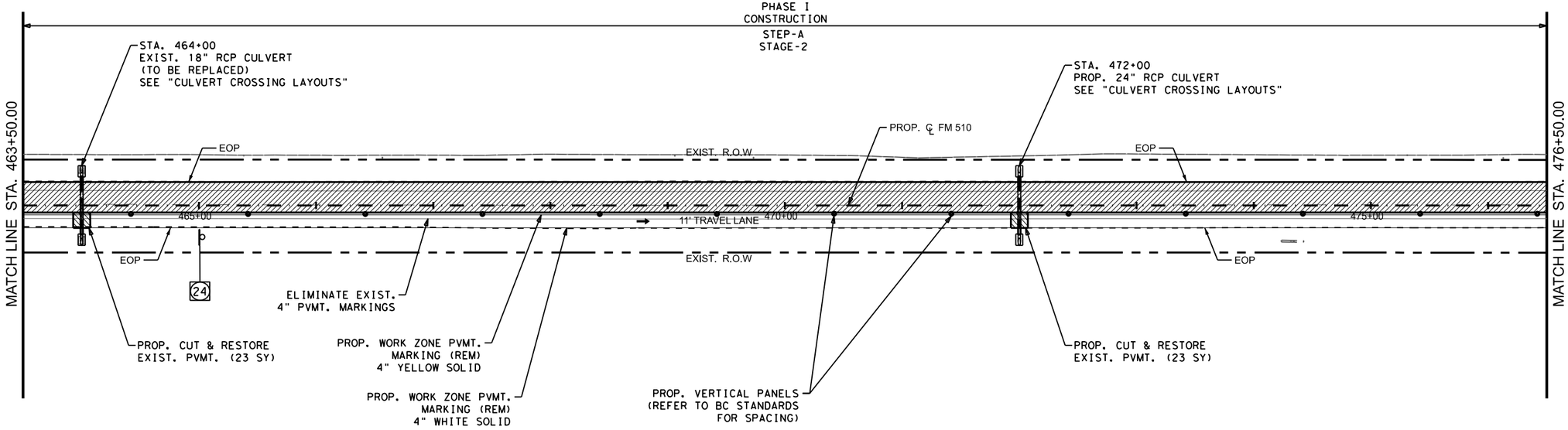

LEGEND

- TRAFFIC SIGN I.D.
- PROP. CONSTRUCTION
- PREVIOUSLY CONSTRUCTED
- DIRECTION OF TRAFFIC FLOW
- TRAFFIC BARREL w/REFLECTOR
- PROP. TY 3 BARRICADES
- PROP. VERTICAL PANELS
- PROP. SIGN
- X CONTRACTOR TO FOLLOW TxDOT LATEST BC-21 STANDARDS AND TxDOT TCP STANDARDS FOR PROPER SIGNAGE & SIGN SPACING.

N

WORK ZONE — G20-5aP (24"x18")

SPEED LIMIT 45 — R2 - 1 (30"x36")

24

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STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

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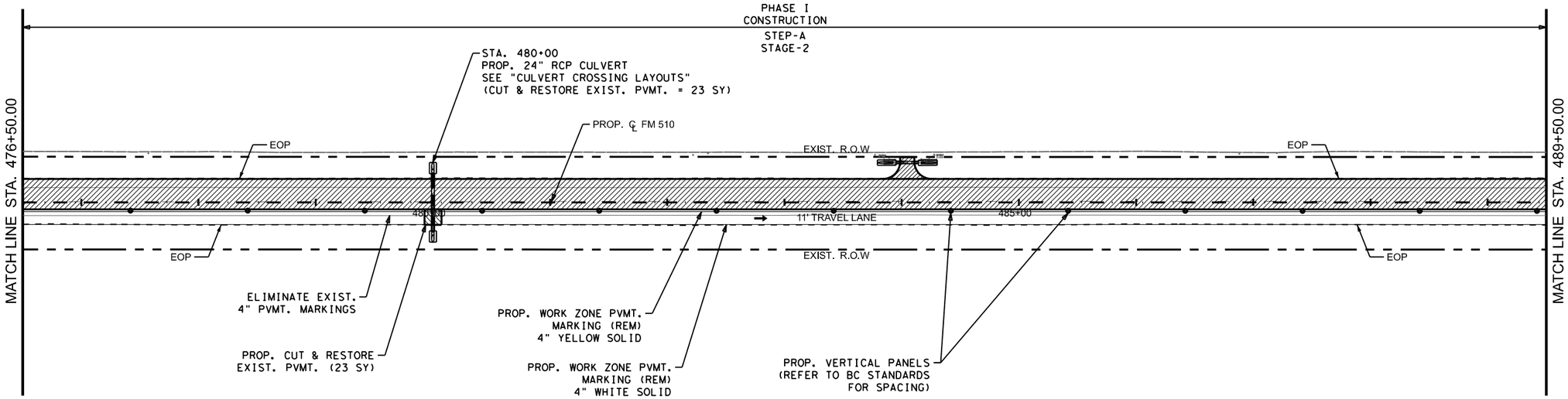
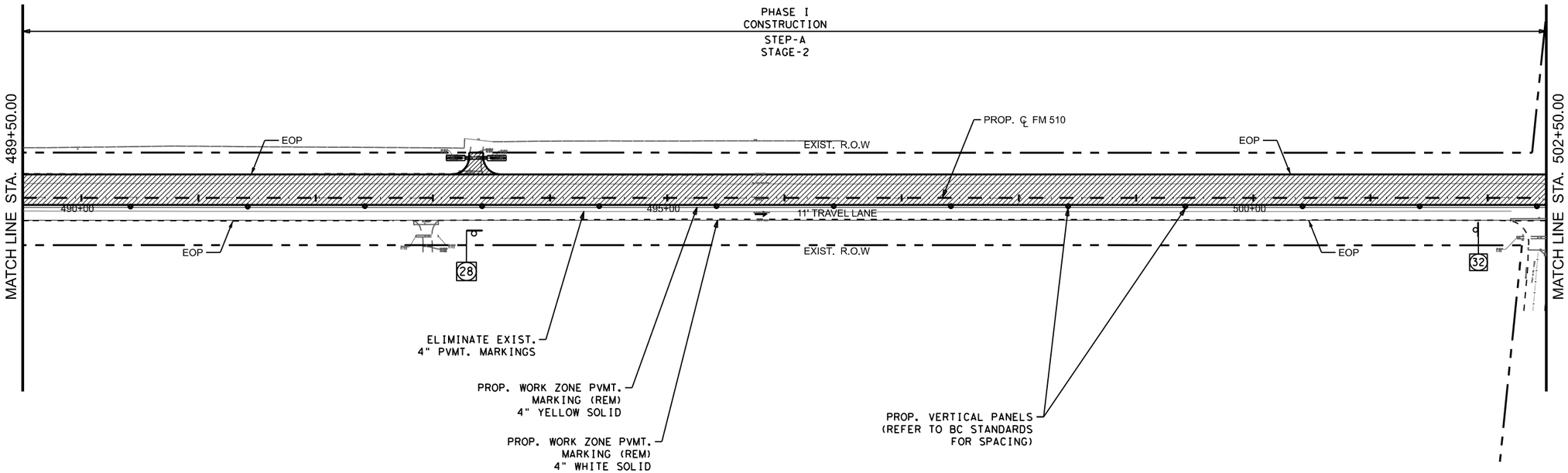
TRAFFIC CONTROL PLAN
PHASE I, STEP - A
STA 450+50 - STA 476+50

SCALE: 1"=100' SHEET 3 OF 5

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		53





LEGEND

- TRAFFIC SIGN I.D.
- PROP. CONSTRUCTION
- PREVIOUSLY CONSTRUCTED
- DIRECTION OF TRAFFIC FLOW
- TRAFFIC BARREL w/REFLECTOR
- PROP. TY 3 BARRICADES
- PROP. VERTICAL PANELS
- PROP. SIGN
- X CONTRACTOR TO FOLLOW TxDOT LATEST BC-21 STANDARDS AND TxDOT TCP STANDARDS FOR PROPER SIGNAGE & SIGN SPACING.

N

R6-1L (36"x12")
ONE WAY
28

R5 - 1 (30"x30")
DO NOT
ENTER
32

NOTES:

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TRAFFIC CONTROL PLAN
PHASE I, STEP - A
STA 476+50 - STA 502+50

SCALE: 1"=100' SHEET 4 OF 5

© 2024	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		54

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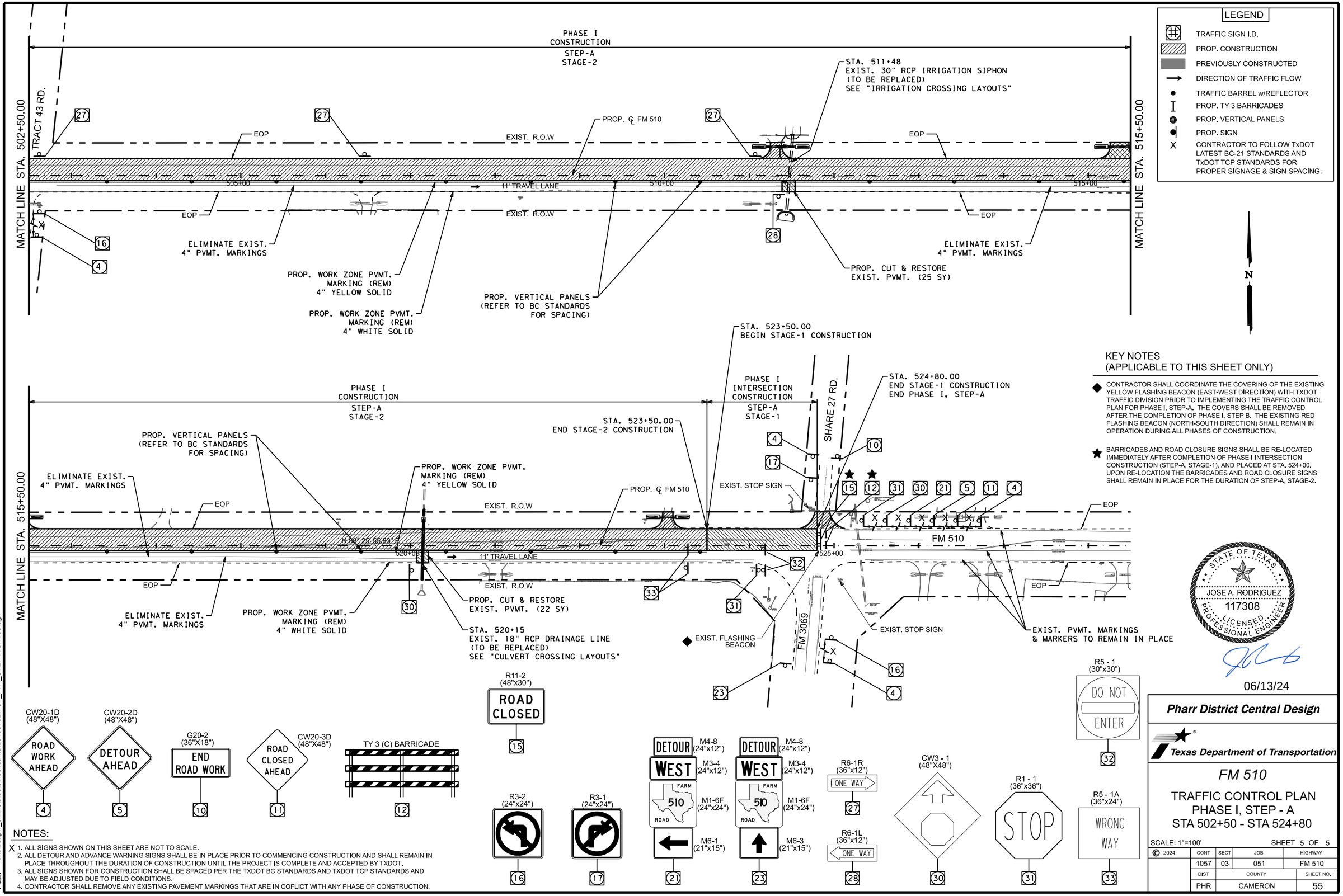

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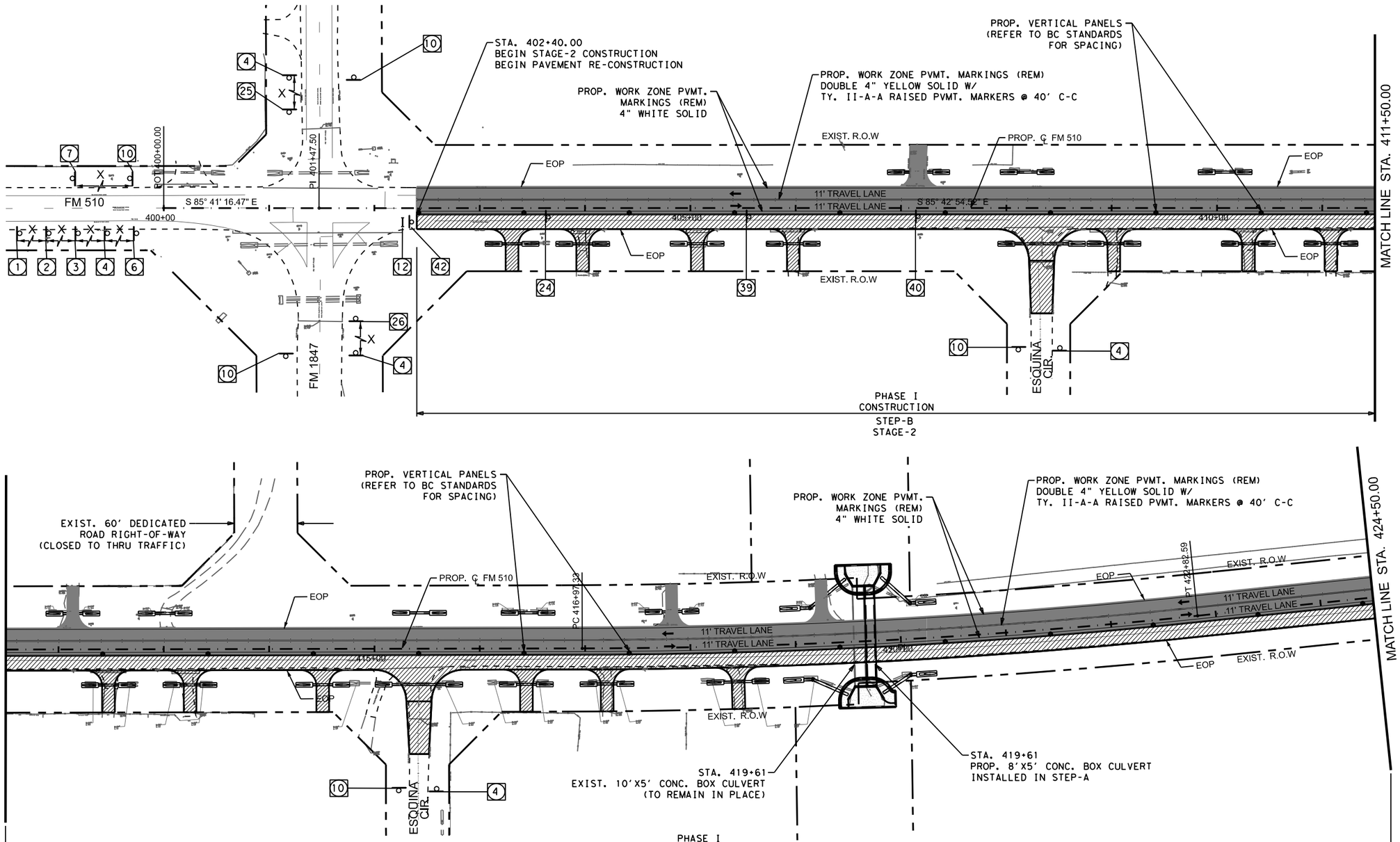
TRAFFIC CONTROL PLAN
PHASE I, STEP - A
STA 502+50 - STA 524+80

SCALE: 1"=100' SHEET 5 OF 5

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		55



LEGEND

- TRAFFIC SIGN I.D.
- PROP. CONSTRUCTION
- PREVIOUSLY CONSTRUCTED
- DIRECTION OF TRAFFIC FLOW
- TRAFFIC BARREL w/REFLECTOR
- PROP. TY 3 BARRICADES
- PROP. VERTICAL PANELS
- PROP. SIGN
- X CONTRACTOR TO FOLLOW TxDOT LATEST BC-21 STANDARDS AND TxDOT TCP STANDARDS FOR PROPER SIGNAGE & SIGN SPACING.

N

R20-3T (48"X42") — OBEY WARNING SIGNS STATE LAW — 1

G20-10T (60"x48") — STAY ALERT — TALK OR TEXT LATER — 2

BEGIN WORK ZONE (G20-9TP (24"x24")) / TRAFFIC FINES DOUBLE (R20-5T (24"x30")) / WHEN WORKERS ARE PRESENT (R20-5aTP (24"x12")) — 3

CW20-1D (48"X48") — ROAD WORK AHEAD — 4

BEGIN ROAD WORK NEXT 5 MILES (G20-5T (48"x24")) / NAME ADDRESS CITY STATE CONTRACTOR (G20-6T (48"x30")) — 6

G20-2bT (36"x18") — END WORK ZONE — 7

G20-2 (36"X18") — END ROAD WORK — 10

TY 3 (C) BARRICADE — 12

WORK ZONE (G20-5aP (24"x18")) / SPEED LIMIT 45 (R2 - 1 (30"x36")) — 24

G20-1bTL (72"x24") — ROAD WORK ← NEXT 5 MILES — 25

G20-1bTR (72"x24") — ROAD WORK NEXT 5 MILES → — 26

CW6-3 (48"X48") — 39

DO NOT PASS (R4-1 (24"x30")) — 40

CW1 - 6aT (48"x48") — 42

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STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

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TRAFFIC CONTROL PLAN
PHASE I, STEP - B
STA 400+40 - STA 424+50

SCALE: 1"=100' SHEET 1 OF 5

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
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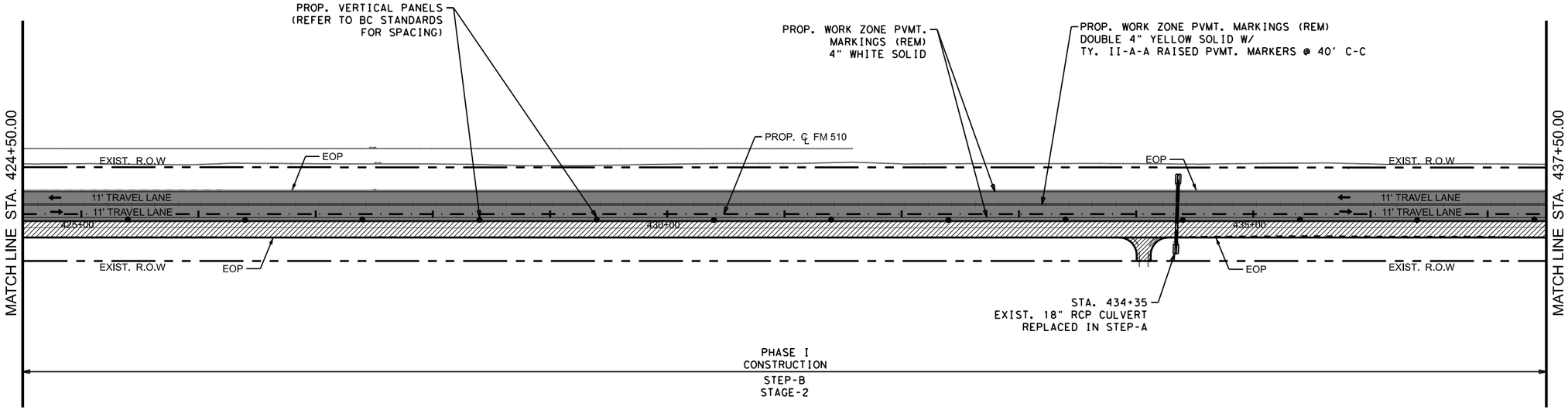
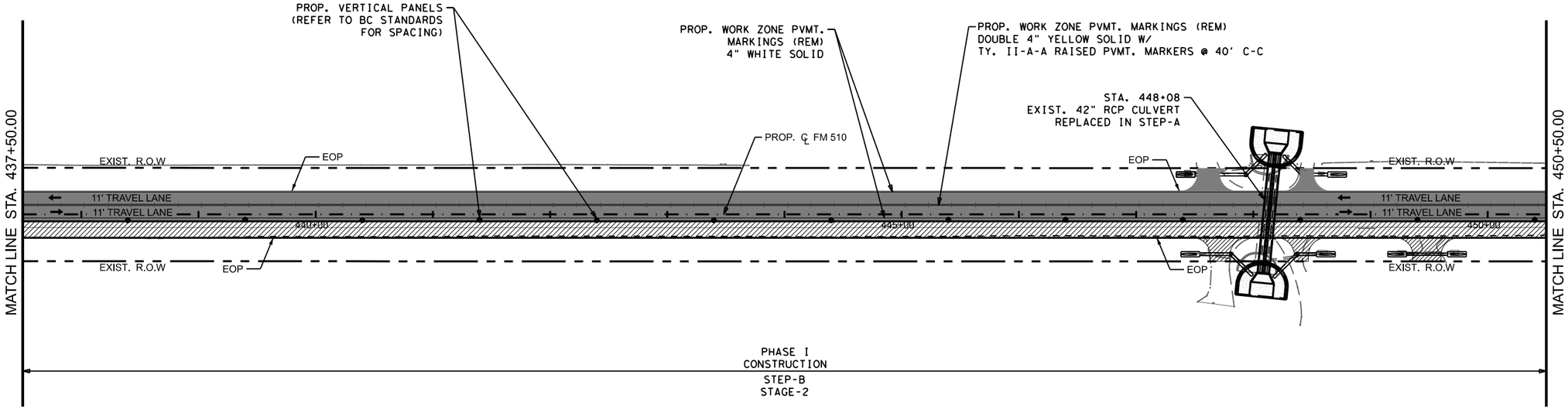
	PHR	CAMERON		56





LEGEND

- TRAFFIC SIGN I.D.
- PROP. CONSTRUCTION
- PREVIOUSLY CONSTRUCTED
- DIRECTION OF TRAFFIC FLOW
- TRAFFIC BARREL w/REFLECTOR
- PROP. TY 3 BARRICADES
- PROP. VERTICAL PANELS
- PROP. SIGN
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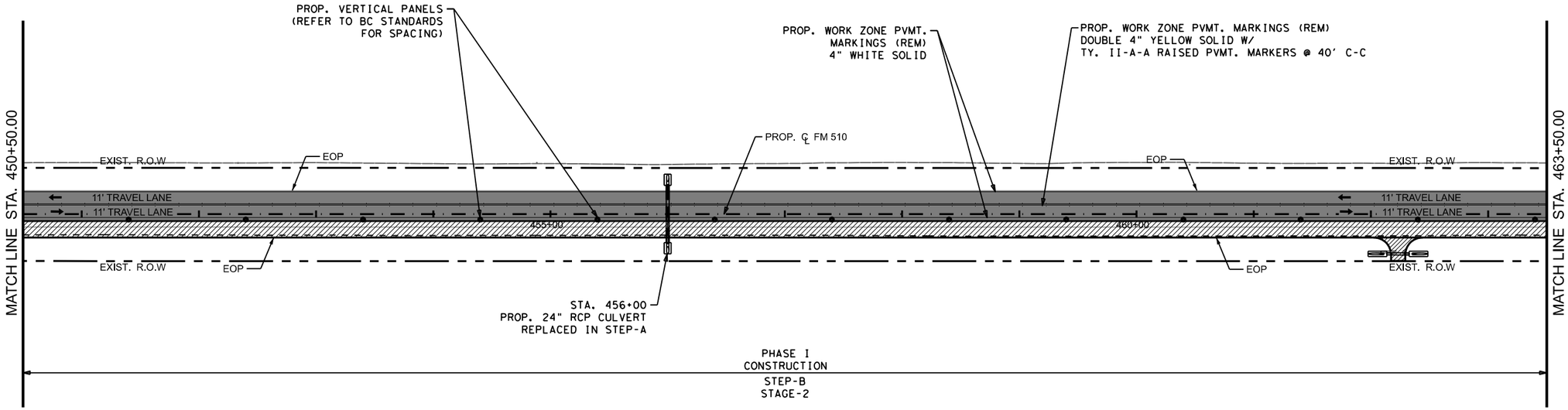
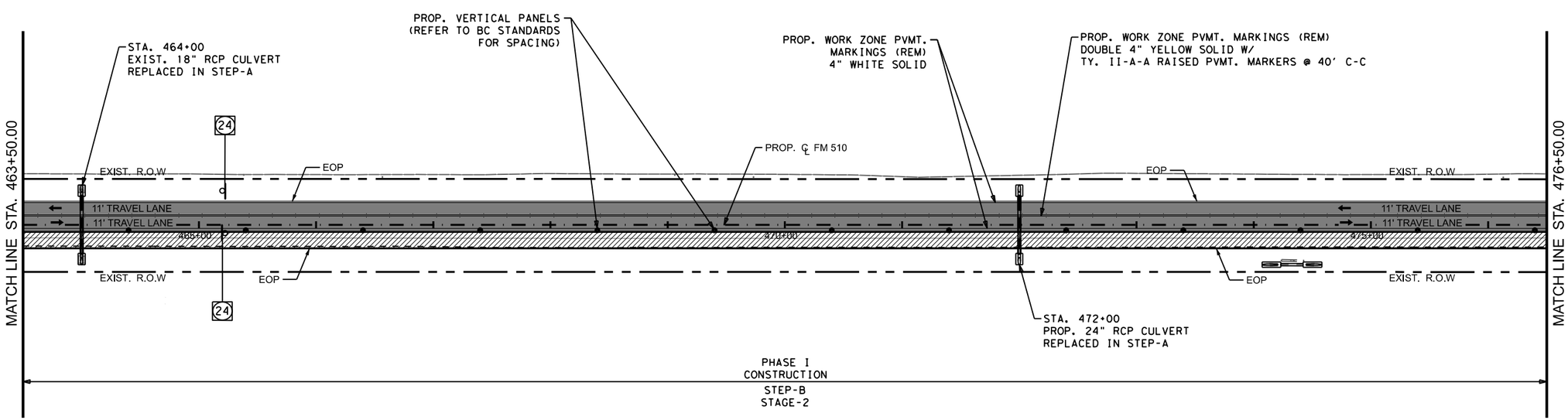
TRAFFIC CONTROL PLAN
PHASE I, STEP - B
STA 424+50 - STA 450+50

SCALE: 1"=100' SHEET 2 OF 5

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		57





LEGEND

- TRAFFIC SIGN I.D.
- PROP. CONSTRUCTION
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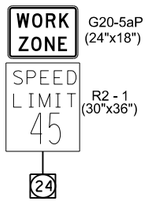
N



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STATE OF TEXAS
JOSE A. RODRIGUEZ
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LICENSED PROFESSIONAL ENGINEER

06/13/24

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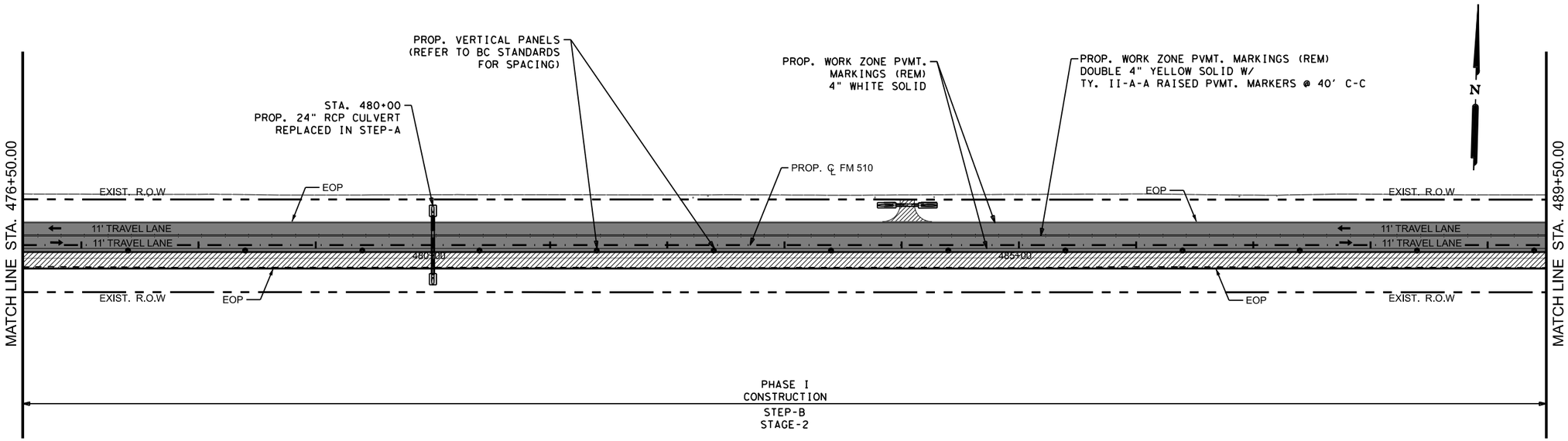
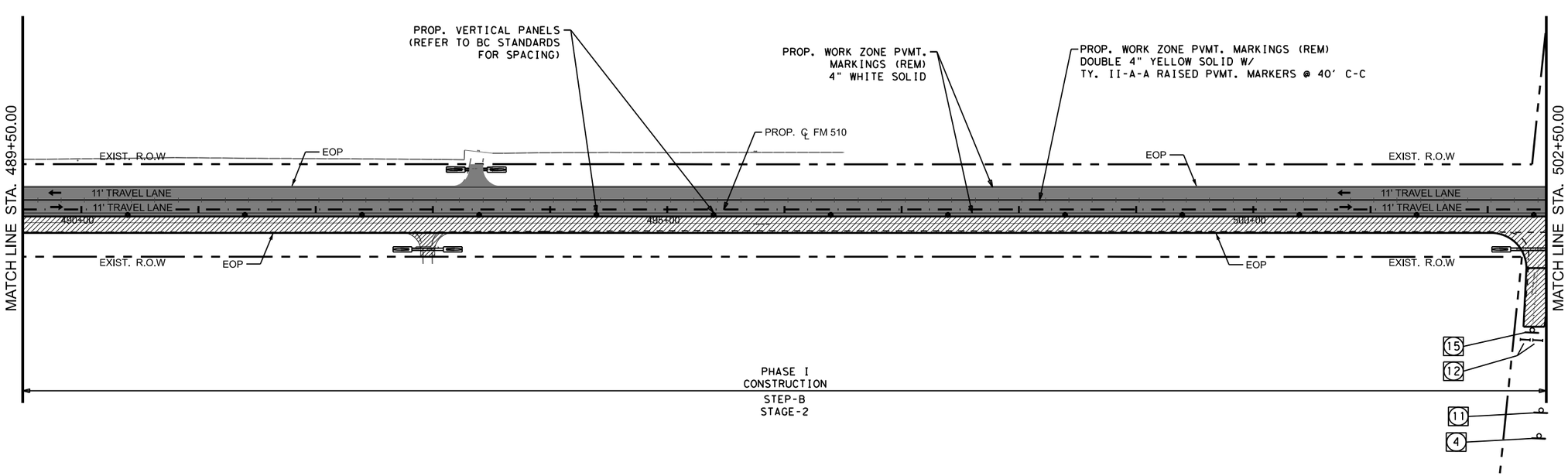
TRAFFIC CONTROL PLAN
PHASE I, STEP - B
STA 450+50 - STA 476+50

SCALE: 1"=100' SHEET 3 OF 5

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		58





LEGEND

- TRAFFIC SIGN I.D.
- PROP. CONSTRUCTION
- PREVIOUSLY CONSTRUCTED
- DIRECTION OF TRAFFIC FLOW
- TRAFFIC BARREL w/REFLECTOR
- PROP. TY 3 BARRICADES
- PROP. VERTICAL PANELS
- PROP. SIGN
- CONTRACTOR TO FOLLOW TxDOT LATEST BC-21 STANDARDS AND TxDOT TCP STANDARDS FOR PROPER SIGNAGE & SIGN SPACING.

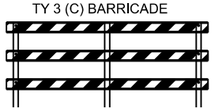
N

N

CW20-1D (48"X48")

CW20-3D (48"X48")

TY 3 (C) BARRICADE



R11-2 (48"x30")

NOTES:

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TRAFFIC CONTROL PLAN
PHASE I, STEP - B
STA 476+50 - STA 502+50

SCALE: 1"=100'

SHEET 4 OF 5

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		59

DATE: 6/13/2024 10:34:50 AM
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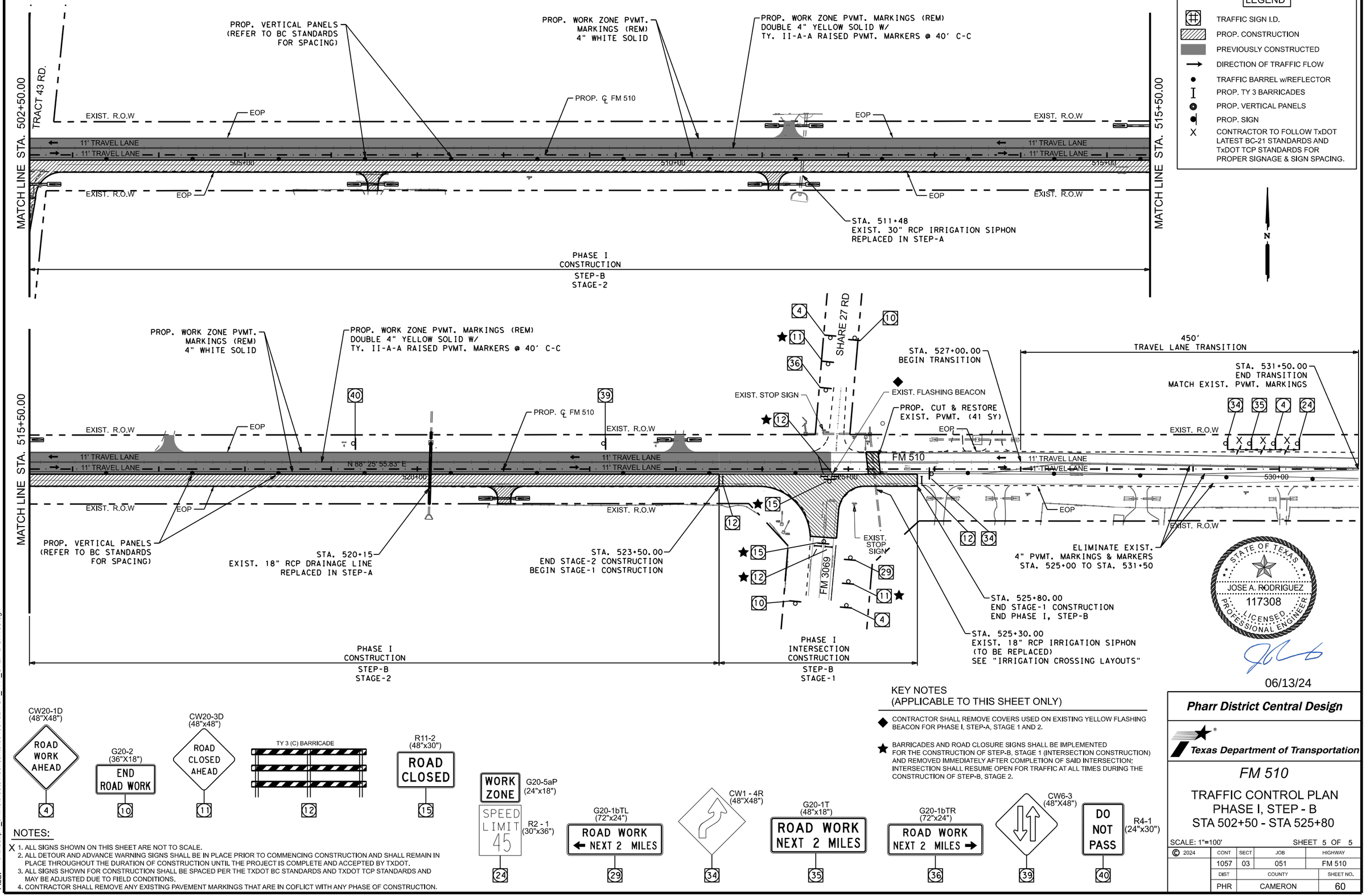

CW20-1D (48"X48") ROAD WORK AHEAD — 4
G20-2 (36"X18") END ROAD WORK — 10
CW20-3D (48"x48") ROAD CLOSED AHEAD — 11
TY 3 (C) BARRICADE — 12
R11-2 (48"x30") ROAD CLOSED — 15
WORK ZONE / SPEED LIMIT 45 — G20-5aP (24"x18") / R2-1 (30"x36") — 24
G20-1bTL (72"x24") ROAD WORK ← NEXT 2 MILES — 29
CW1-4R (48"X48") — 34
G20-1T (48"x18") ROAD WORK NEXT 2 MILES — 35
G20-1bTR (72"x24") ROAD WORK NEXT 2 MILES → — 36
CW6-3 (48"X48") — 39
DO NOT PASS — R4-1 (24"x30") — 40

NOTES:

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KEY NOTES
(APPLICABLE TO THIS SHEET ONLY)

◆ CONTRACTOR SHALL REMOVE COVERS USED ON EXISTING YELLOW FLASHING BEACON FOR PHASE I, STEP-A, STAGE 1 AND 2.

★ BARRICADES AND ROAD CLOSURE SIGNS SHALL BE IMPLEMENTED FOR THE CONSTRUCTION OF STEP-B, STAGE 1 (INTERSECTION CONSTRUCTION) AND REMOVED IMMEDIATELY AFTER COMPLETION OF SAID INTERSECTION; INTERSECTION SHALL RESUME OPEN FOR TRAFFIC AT ALL TIMES DURING THE CONSTRUCTION OF STEP-B, STAGE 2.

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TRAFFIC CONTROL PLAN
PHASE I, STEP - B
STA 502+50 - STA 525+80

SCALE: 1"=100' SHEET 5 OF 5

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		60

DATE: 6/13/2024 10:34:55 AM
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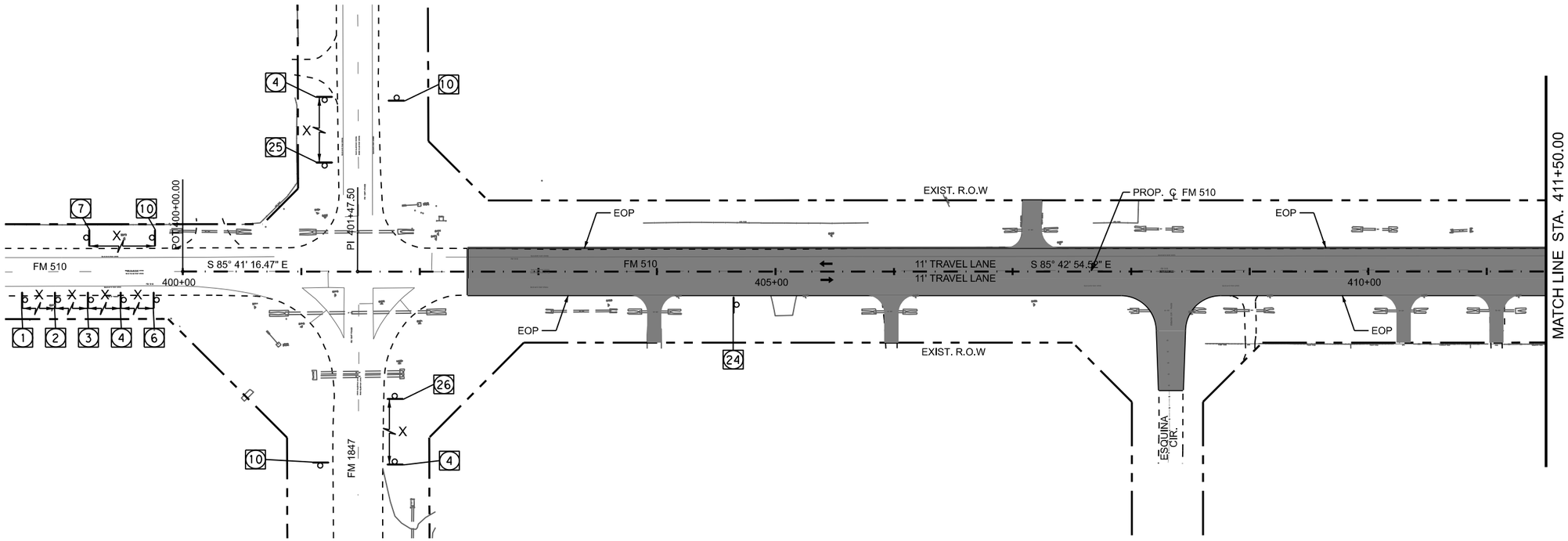

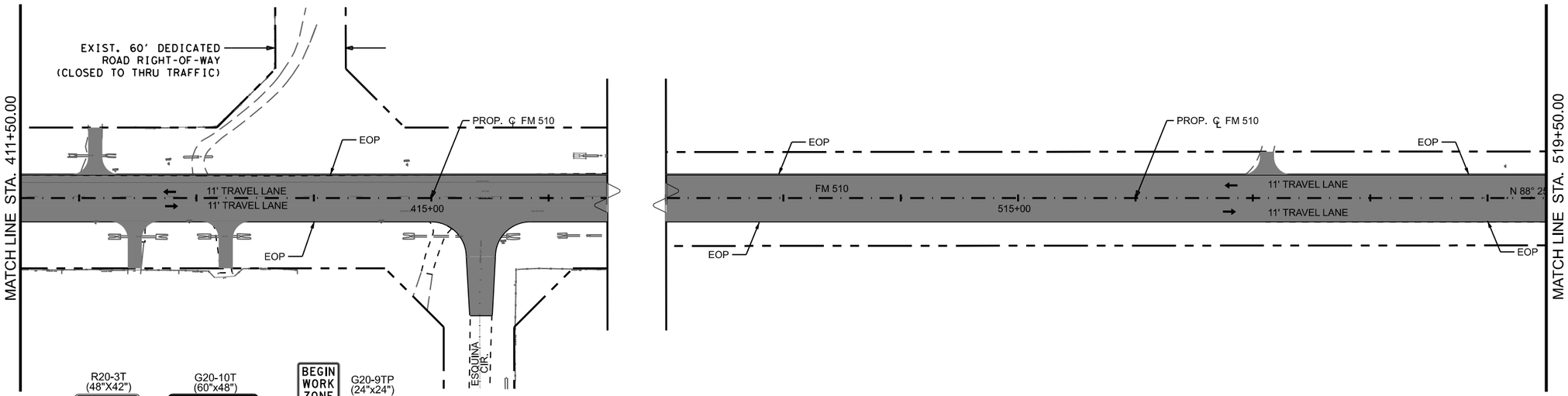

LEGEND

- TRAFFIC SIGN I.D.
- PROP. CONSTRUCTION
- PREVIOUSLY CONSTRUCTED
- DIRECTION OF TRAFFIC FLOW
- TRAFFIC BARREL w/REFLECTOR
- PROP. TY 3 BARRICADES
- PROP. VERTICAL PANELS
- PROP. SIGN
- X CONTRACTOR TO FOLLOW TxDOT LATEST BC-21 STANDARDS AND TxDOT TCP STANDARDS FOR PROPER SIGNAGE & SIGN SPACING.

N

R20-3T (48"X42")
OBEY WARNING SIGNS STATE LAW
1

G20-10T (60"x48")
STAY ALERT
TALK OR TEXT LATER
2

BEGIN WORK ZONE — G20-9TP (24"x24")
TRAFFIC FINES DOUBLE — R20-5T (24"x30")
WHEN WORKERS ARE PRESENT — R20-5aTP (24"x12")
3

CW20-1D (48"X48")
ROAD WORK AHEAD
4

BEGIN ROAD WORK NEXT 5 MILES — G20-5T (48"x24")
NAME ADDRESS CITY STATE CONTRACTOR — G20-6T (48"x30")
6

G20-2bT (36"x18")
END WORK ZONE
7

G20-2 (36"x18")
END ROAD WORK
10

WORK ZONE — G20-5aP (24"x18")
SPEED LIMIT 45 — R2 - 1 (30"x36")
24

G20-1bTL (72"x24")
ROAD WORK ← NEXT 5 MILES
25

G20-1bTR (72"x24")
ROAD WORK NEXT 5 MILES →
26

NOTES:

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4. CONTRACTOR SHALL REMOVE ANY EXISTING PAVEMENT MARKINGS THAT ARE IN COFLICT WITH ANY PHASE OF CONSTRUCTION.

DATE: 6/13/2024 10:35:01 AM
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STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

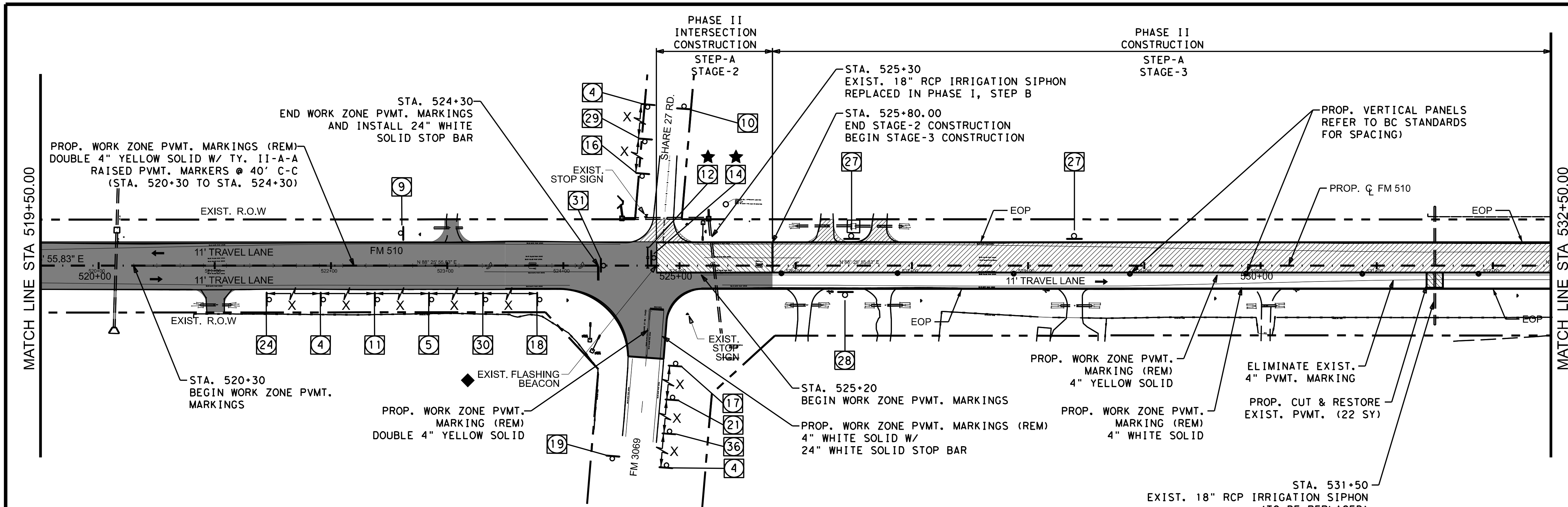
Texas Department of Transportation

FM 510

TRAFFIC CONTROL PLAN
PHASE II, STEP - A
STA 400+00 - STA 519+50

SCALE: 1"=100' SHEET 1 OF 6

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		61



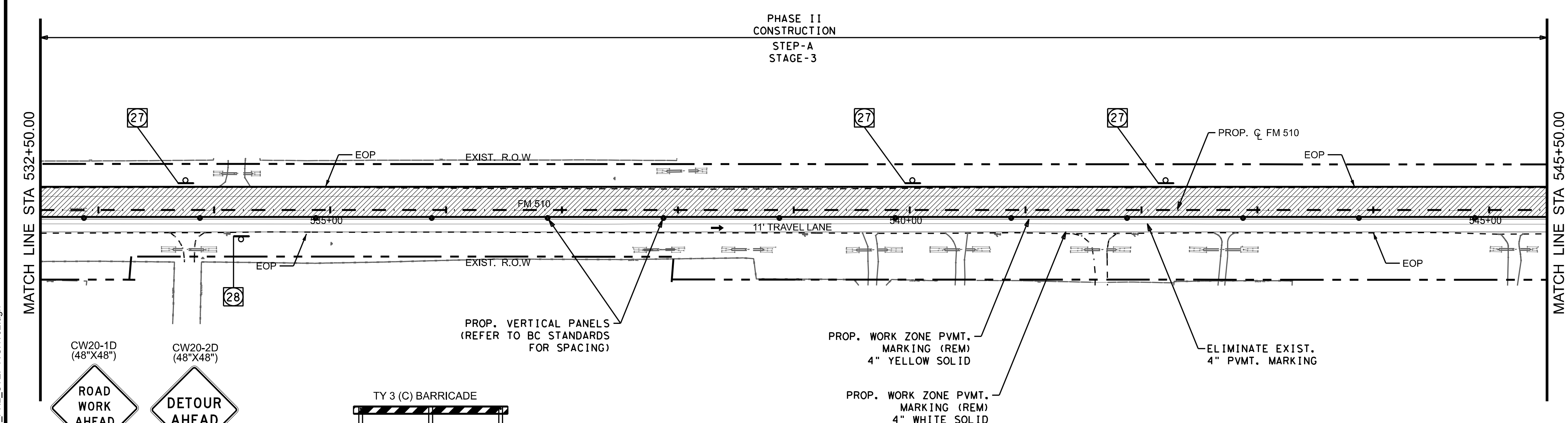
LEGEND

- TRAFFIC SIGN I.D.
- PROP. CONSTRUCTION
- PREVIOUSLY CONSTRUCTED
- DIRECTION OF TRAFFIC FLOW
- TRAFFIC BARREL w/REFLECTOR
- PROP. TY 3 BARRICADES
- PROP. VERTICAL PANELS
- PROP. SIGN
- X CONTRACTOR TO FOLLOW TxDOT LATEST BC-21 STANDARDS AND TxDOT TCP STANDARDS FOR PROPER SIGNAGE & SIGN SPACING.

KEY NOTES (APPLICABLE TO THIS SHEET ONLY)

◆ CONTRACTOR SHALL COORDINATE THE COVERING OF THE EXISTING YELLOW FLASHING BEACON (EAST-WEST DIRECTION) WITH TXDOT TRAFFIC DIVISION PRIOR TO IMPLEMENTING THE TRAFFIC CONTROL PLAN FOR PHASE II, STEP-A. THE COVERS SHALL REMAIN IN PLACE FOR THE REMAINDER OF PHASE II CONSTRUCTION. THE EXISTING RED FLASHING BEACON (NORTH-SOUTH DIRECTION) SHALL REMAIN IN OPERATION DURING ALL PHASES OF CONSTRUCTION.

★ BARRICADES AND ROAD CLOSURE SIGNS SHALL BE RE-LOCATED IMMEDIATELY AFTER COMPLETION OF PHASE II INTERSECTION CONSTRUCTION (STEP-A, STAGE-2), AND PLACED AT STA. 525+50. UPON RE-LOCATION THE BARRICADES AND ROAD CLOSURE SIGNS SHALL REMAIN IN PLACE FOR THE DURATION OF STEP-A, STAGE-3.



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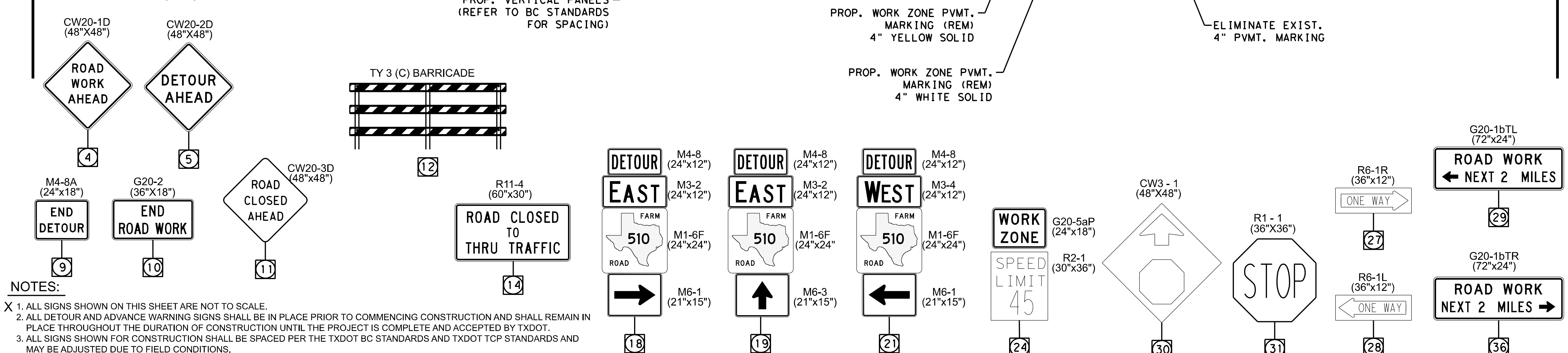
06/13/24



NOTES:

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2. ALL DETOUR AND ADVANCE WARNING SIGNS SHALL BE IN PLACE PRIOR TO COMMENCING CONSTRUCTION AND SHALL REMAIN IN PLACE THROUGHOUT THE DURATION OF CONSTRUCTION UNTIL THE PROJECT IS COMPLETE AND ACCEPTED BY TXDOT.
3. ALL SIGNS SHOWN FOR CONSTRUCTION SHALL BE SPACED PER THE TXDOT BC STANDARDS AND TXDOT TCP STANDARDS AND MAY BE ADJUSTED DUE TO FIELD CONDITIONS.
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Pharr District Central Design

Texas Department of Transportation

FM 510

TRAFFIC CONTROL PLAN
PHASE II, STEP - A
STA 519+50 - STA 545+50

SCALE: 1"=100' SHEET 2 OF 6

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST		COUNTY	SHEET NO.
PHR		CAMERON	62

PHASE II
CONSTRUCTION
STEP-A
STAGE-3

MATCH LINE STA 545+50.00

STA. 548+66
EXIST. 36" RCP IRRIGATION LINE
(TO BE REPLACED)
SEE "IRRIGATION CROSSING LAYOUTS"

PROP. CUT & RESTORE
EXIST. PVMT. (31 SY)

SHARE 28 RD.

EXIST. R.O.W

EOP

11' TRAVEL LANE

PROP. ℄ FM 510

STA. 554+30
EXIST. 18" RCP IRRIGATION SIPHON
(ABANDONED - TO BE REMOVED)
SEE "IRRIGATION CROSSING LAYOUTS"

MATCH LINE STA 558+50.00

PROP. VERTICAL PANELS
(REFER TO BC STANDARDS
FOR SPACING)

PROP. WORK ZONE PVMT.
MARKING (REM)
4" WHITE SOLID

PROP. WORK ZONE PVMT.
MARKING (REM)
4" YELLOW SOLID

PROP. CUT & RESTORE
EXIST. PVMT. (22 SY)

ELIMINATE EXIST.
4" PVMT. MARKING

PHASE II
CONSTRUCTION
STEP-A
STAGE-3

MATCH LINE STA 558+50.00

STA. 560+63
EXIST. 18" RCP
IRRIGATION LINE
(ABANDONED - TO BE REMOVED)
SEE "IRRIGATION
CROSSING LAYOUTS"

PROP. CUT & RESTORE
EXIST. PVMT. (22 SY)

HAMACA LN.

SIESTA LN.

PROP. ℄ FM 510

PROP. CUT & RESTORE
EXIST. PVMT. (26 SY)

STA. 559+79
EXIST. 42" RCP CULVERT
(TO BE REPLACED)
SEE "CULVERT CROSSING LAYOUT"

PROP. WORK ZONE PVMT.
MARKING (REM)
4" YELLOW SOLID

PROP. WORK ZONE PVMT.
MARKING (REM)
4" WHITE SOLID

ELIMINATE EXIST.
4" PVMT. MARKING

PROP. VERTICAL PANELS
(REFER TO BC STANDARDS
FOR SPACING)

MATCH LINE STA 571+50.00

LEGEND

- TRAFFIC SIGN I.D.
- PROP. CONSTRUCTION
- PREVIOUSLY CONSTRUCTED
- DIRECTION OF TRAFFIC FLOW
- TRAFFIC BARREL w/REFLECTOR
- PROP. TY 3 BARRICADES
- PROP. VERTICAL PANELS
- PROP. SIGN
- X CONTRACTOR TO FOLLOW TxDOT LATEST BC-21 STANDARDS AND TxDOT TCP STANDARDS FOR PROPER SIGNAGE & SIGN SPACING.

N

CW20-1D (48"X48") — ROAD WORK AHEAD — 4
G20-2 (36"X18") — END ROAD WORK — 10
R3-2 (24"x24") — 16
R3-1 (24"x24") — 17
R6-1R (36"x12") — ONE WAY — 27
R6-1L (36"x12") — ONE WAY — 28
R1-1 (36"x36") — STOP — 31
R5 - 1 (30"x30") — DO NOT ENTER — 32

NOTES:

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STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
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06/13/24

Pharr District Central Design

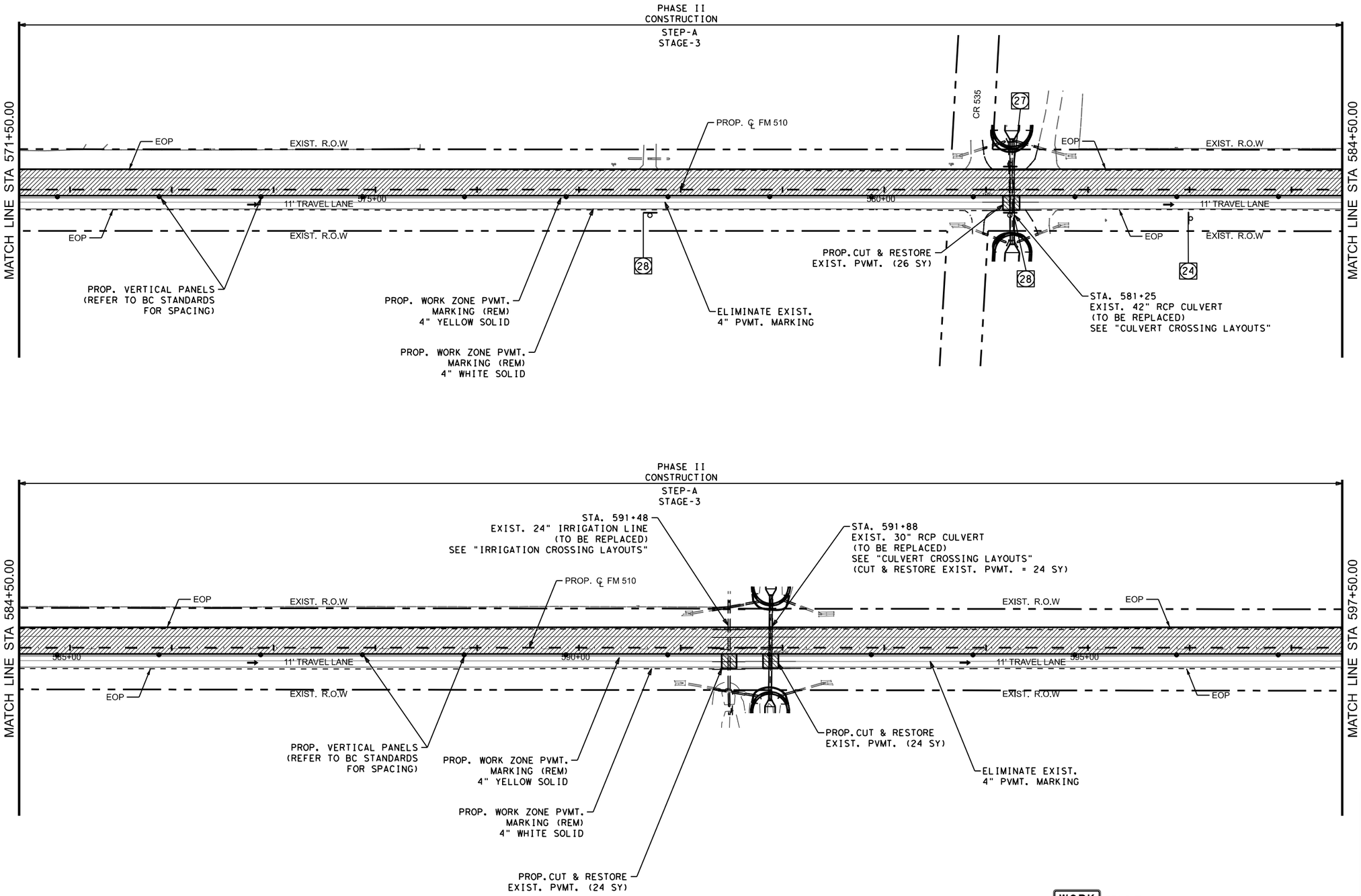
Texas Department of Transportation

FM 510

TRAFFIC CONTROL PLAN
PHASE II, STEP - A
STA 545+50 - STA 571+50

SCALE: 1"=100' SHEET 3 OF 6

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		63



LEGEND

- TRAFFIC SIGN I.D.
- PROP. CONSTRUCTION
- PREVIOUSLY CONSTRUCTED
- DIRECTION OF TRAFFIC FLOW
- TRAFFIC BARREL w/REFLECTOR
- PROP. TY 3 BARRICADES
- PROP. VERTICAL PANELS
- PROP. SIGN
- X CONTRACTOR TO FOLLOW TxDOT LATEST BC-21 STANDARDS AND TxDOT TCP STANDARDS FOR PROPER SIGNAGE & SIGN SPACING.

N

WORK ZONE G20-5aP (24"x18")

SPEED LIMIT 45 R2-1 (30"x36")

R6-1R (36"x12") ONE WAY

R6-1L (36"x12") ONE WAY

24 27 28

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STATE OF TEXAS
JOSE A. RODRIGUEZ
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06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

TRAFFIC CONTROL PLAN
PHASE II, STEP - A
STA 571+50 - STA 597+50

SCALE: 1"=100' SHEET 4 OF 6

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		64

PHASE II
CONSTRUCTION
STEP-A
STAGE-3

N

MATCH LINE STA 597+50.00

EXIST. R.O.W

EOP

11' TRAVEL LANE

600+00

605+00

610+00

EXIST. R.O.W

EOP

27

32

28

16

4

CAMP RD.

STA. 608+90
EXIST. 2 - 30" RCP CULVERT
(TO BE REPLACED)
SEE "CULVERT CROSSING LAYOUTS"

PROP. ℄ FM 510

EOP

EOP

28

MATCH LINE STA 610+50.00

PROP. WORK ZONE PVMT.
MARKING (REM)
4" YELLOW SOLID

PROP. WORK ZONE PVMT.
MARKING (REM)
4" WHITE SOLID

ELIMINATE EXIST.
4" PVMT. MARKING

ELIMINATE EXIST.
4" PVMT. MARKING

PROP. VERTICAL PANELS
(REFER TO BC STANDARDS
FOR SPACING)

PROP. CUT & RESTORE
EXIST. PVMT. (32 SY)

N

PHASE II
CONSTRUCTION
STEP-A
STAGE-3

N. VALENCIA DR.

4

17

31

10

27

PI

STA. 614+55
EXIST. 18" RCP IRRIGATION SIPHON
(TO BE REPLACED)
SEE "IRRIGATION CROSSING LAYOUTS"

PC 616+61.44

EOP

EXIST. R.O.W

615+00

11' TRAVEL LANE

EXIST. R.O.W

EOP

28

41

32

28

S VALENCIA DR.

STA. 619+06
EXIST. 18" RCP CULVERT
(TO BE REPLACED)
SEE "CULVERT CROSSING LAYOUTS"

PROP. ℄ FM 510

PT 620+54.42

EOP

620+00

EXIST. R.O.W

11' TRAVEL LANE

EXIST. R.O.W

EOP

28

MATCH LINE STA 623+50.00

PROP. CUT & RESTORE
EXIST. PVMT. (22 SY)

PROP. VERTICAL PANELS
(REFER TO BC STANDARDS
FOR SPACING)

PROP. WORK ZONE PVMT.
MARKING (REM)
4" YELLOW SOLID

PROP. WORK ZONE PVMT.
MARKING (REM)
4" WHITE SOLID

ELIMINATE EXIST.
4" PVMT. MARKING

PROP. CUT & RESTORE
EXIST. PVMT. (23 SY)

N

LEGEND

- TRAFFIC SIGN I.D.
- PROP. CONSTRUCTION
- PREVIOUSLY CONSTRUCTED
- DIRECTION OF TRAFFIC FLOW
- TRAFFIC BARREL w/REFLECTOR
- PROP. TY 3 BARRICADES
- PROP. VERTICAL PANELS
- PROP. SIGN
- X CONTRACTOR TO FOLLOW TxDOT LATEST BC-21 STANDARDS AND TxDOT TCP STANDARDS FOR PROPER SIGNAGE & SIGN SPACING.

CW20-1D (48"X48")
ROAD WORK AHEAD
4

G20-2 (36"X18")
END ROAD WORK
10

R3-2 (24"x24")
16

R3-1 (24"x24")
17

R6-1R (36"x12")
ONE WAY
27

R6-1L (36"x12")
ONE WAY
28

R1-1 (36"x36")
STOP
31

R5 - 1 (30"x30")
DO NOT ENTER
32

CW1-5R (48"X48")
35 MPH
CW13-1P (18"X18")
41

NOTES:

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STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

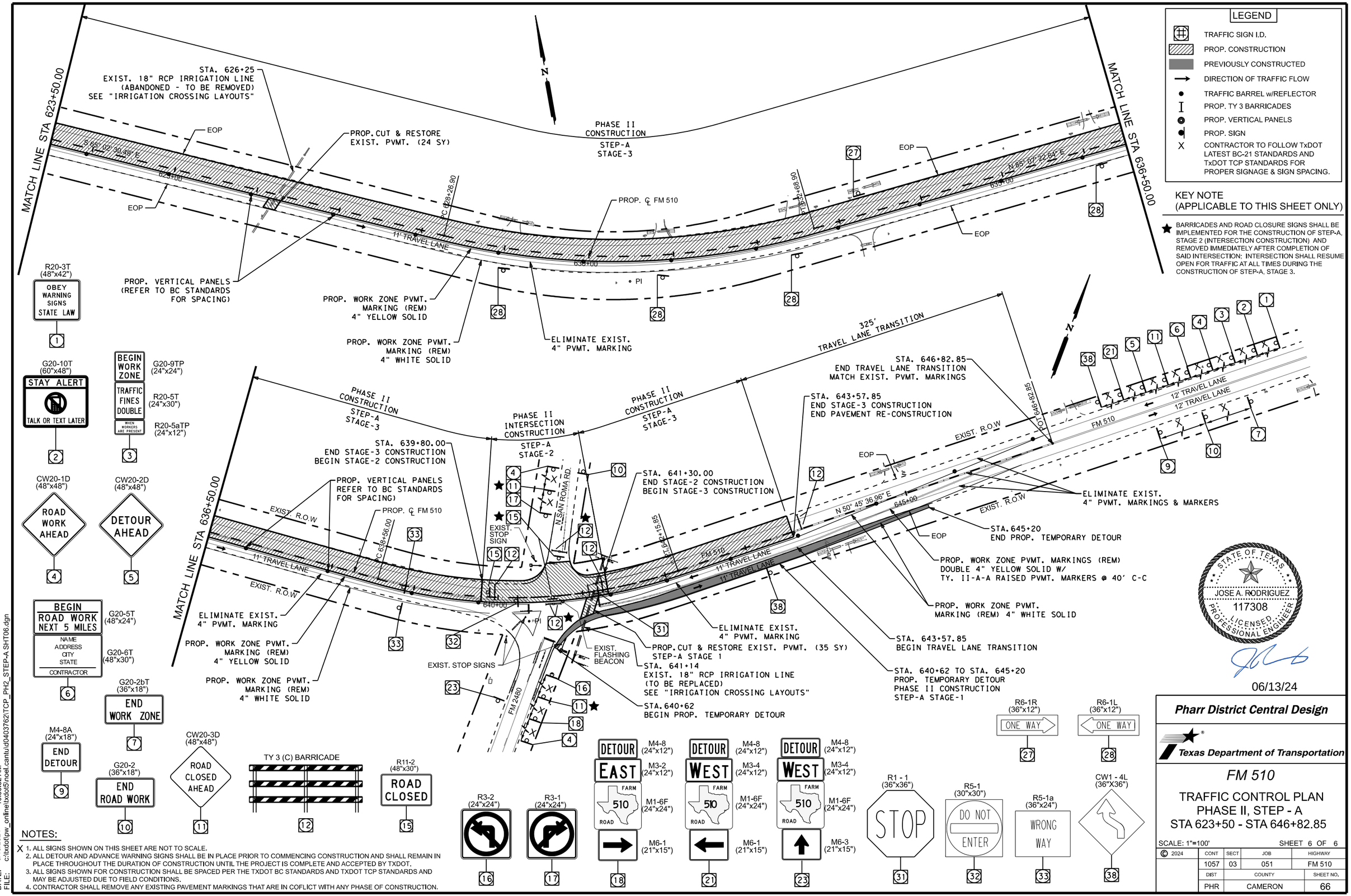
Texas Department of Transportation

FM 510

TRAFFIC CONTROL PLAN
PHASE II, STEP - A
STA 597+50 - STA 623+50

SCALE: 1"=100' SHEET 5 OF 6

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		65



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STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED
PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

TRAFFIC CONTROL PLAN
PHASE II, STEP - A
STA 623+50 - STA 646+82.85

SCALE: 1"=100' SHEET 6 OF 6

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		66

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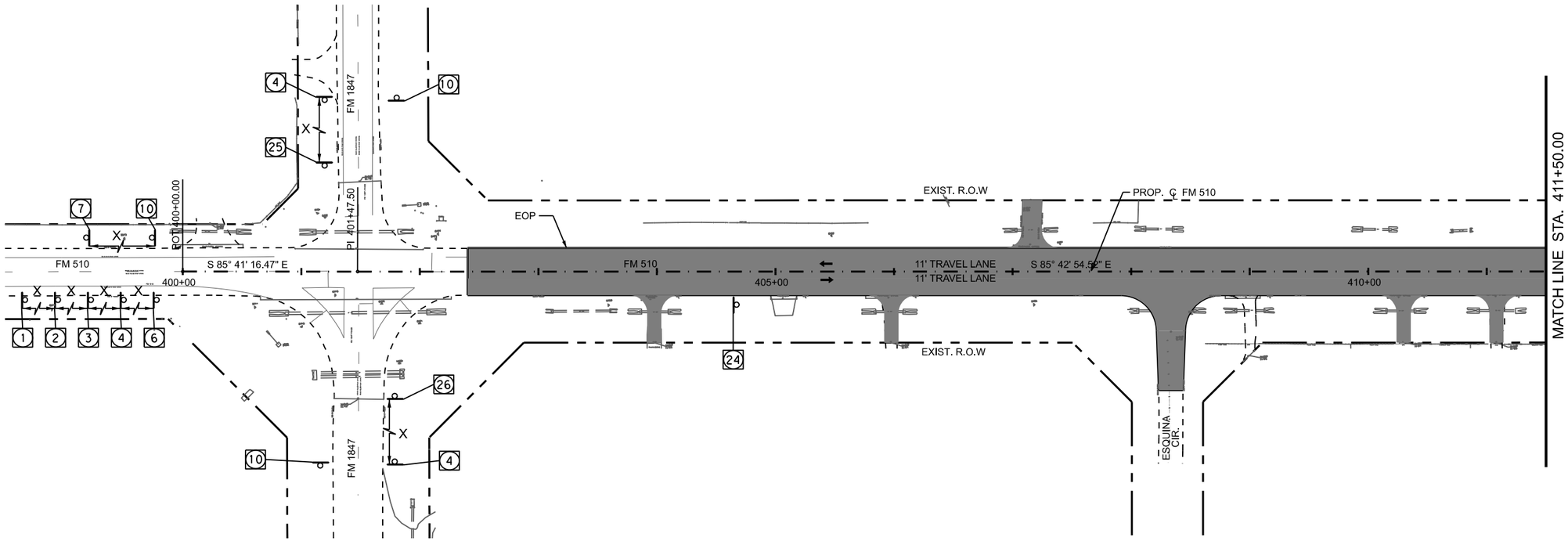

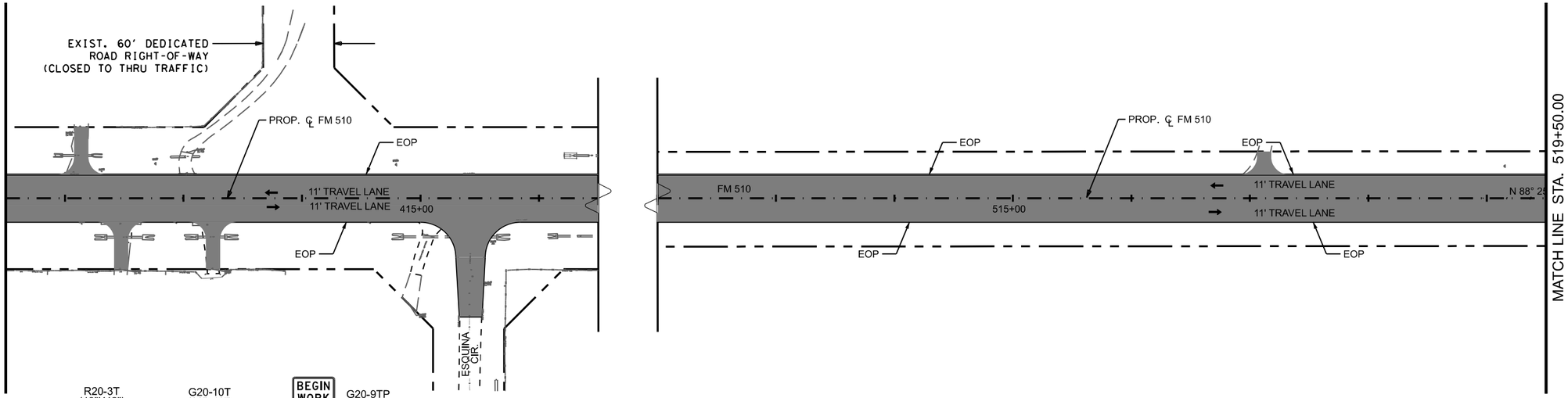

LEGEND

- TRAFFIC SIGN I.D.
- PROP. CONSTRUCTION
- PREVIOUSLY CONSTRUCTED
- DIRECTION OF TRAFFIC FLOW
- TRAFFIC BARREL w/REFLECTOR
- PROP. TY 3 BARRICADES
- PROP. VERTICAL PANELS
- PROP. SIGN
- X CONTRACTOR TO FOLLOW TxDOT LATEST BC-21 STANDARDS AND TxDOT TCP STANDARDS FOR PROPER SIGNAGE & SIGN SPACING.

N

R20-3T (48"X42") — OBEY WARNING SIGNS STATE LAW — 1

G20-10T (60"x48") — STAY ALERT / TALK OR TEXT LATER — 2

BEGIN WORK ZONE — G20-9TP (24"x24")
TRAFFIC FINES DOUBLE — R20-5T (24"x30")
WHEN WORKERS ARE PRESENT — R20-5aTP (24"x12") — 3

CW20-1D (48"X48") — ROAD WORK AHEAD — 4

BEGIN ROAD WORK NEXT 5 MILES — G20-5T (48"x24")
NAME ADDRESS CITY STATE CONTRACTOR — G20-6T (48"x30") — 6

G20-2bT (36"x18") — END WORK ZONE — 7

G20-2 (36"x18") — END ROAD WORK — 10

WORK ZONE — G20-5aP (24"x18")
SPEED LIMIT 45 — R2 - 1 (30"x36") — 24

G20-1bTL (72"x24") — ROAD WORK ← NEXT 5 MILES — 25

G20-1bTR (72"x24") — ROAD WORK NEXT 5 MILES → — 26

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STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

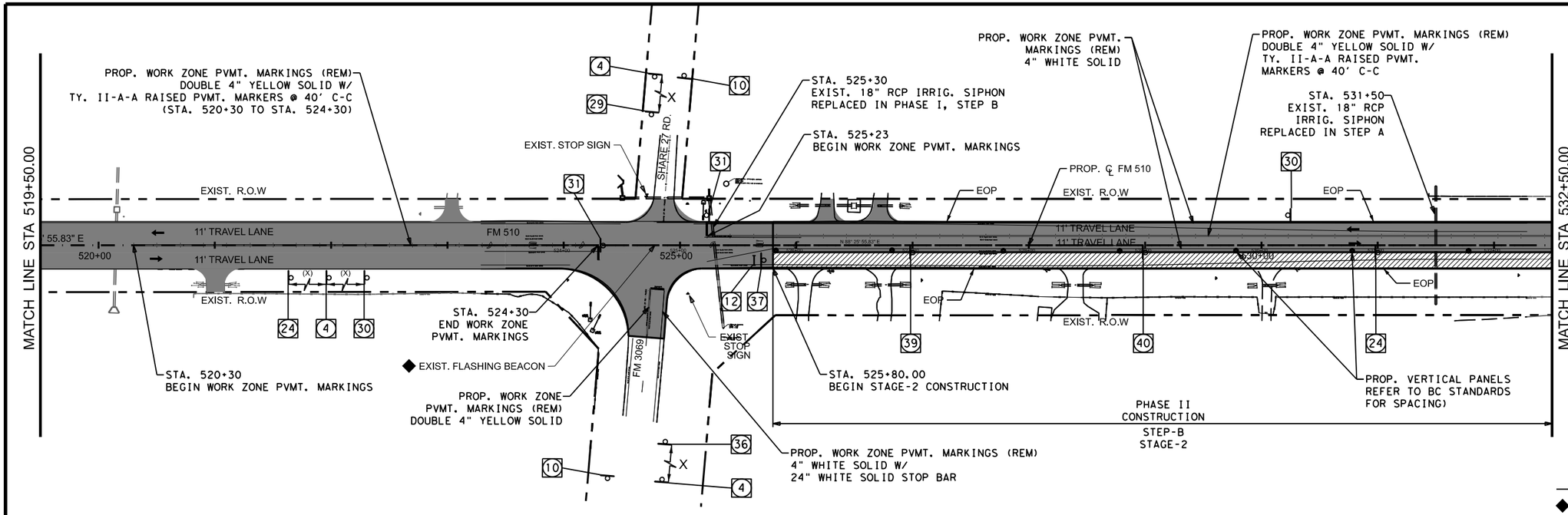
FM 510

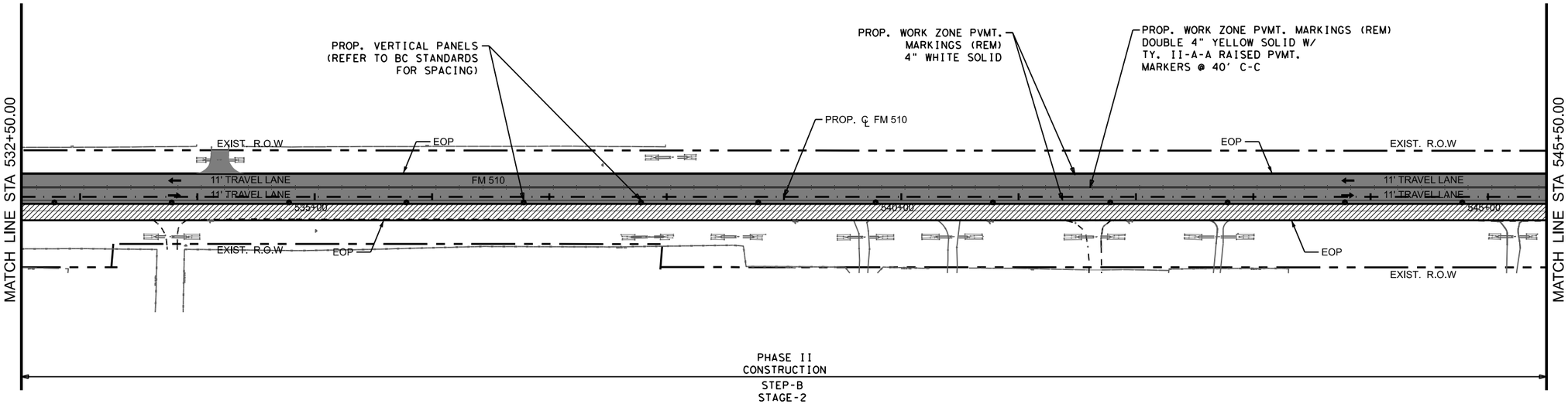
TRAFFIC CONTROL PLAN
PHASE II, STEP - B
STA 400+00 - STA 519+50

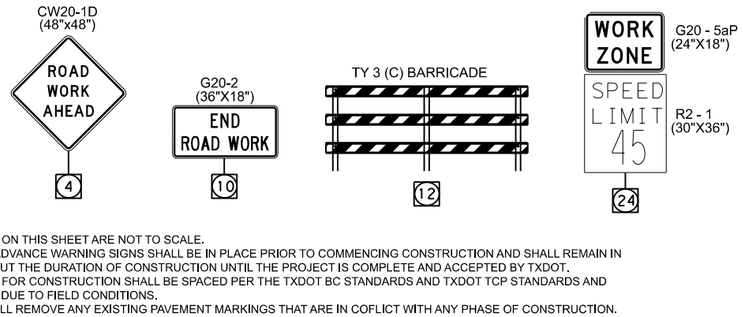
SCALE: 1"=100' SHEET 1 OF 6

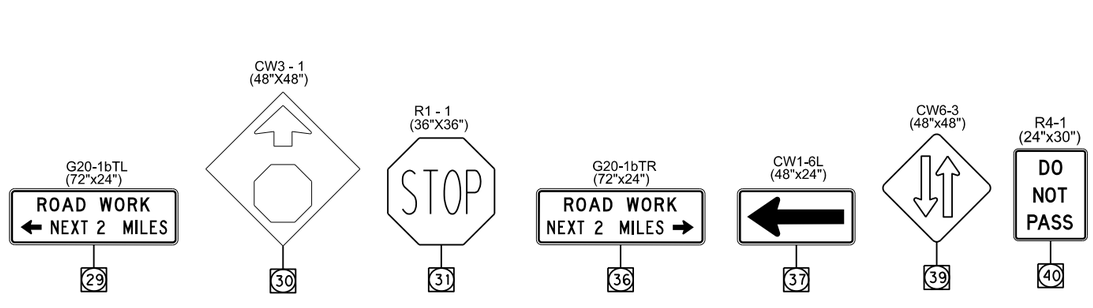
CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510

DIST	COUNTY	SHEET NO.
PHR	CAMERON	67









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LEGEND

- TRAFFIC SIGN I.D.
- PROP. CONSTRUCTION
- PREVIOUSLY CONSTRUCTED
- DIRECTION OF TRAFFIC FLOW
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- PROP. TY 3 BARRICADES
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- PROP. SIGN
- X CONTRACTOR TO FOLLOW TxDOT LATEST BC-21 STANDARDS AND TxDOT TCP STANDARDS FOR PROPER SIGNAGE & SIGN SPACING.

N

KEY NOTE
(APPLICABLE TO THIS SHEET ONLY)

◆ COVERS ON EXISTING YELLOW FLASHING BEACON (EAST-WEST DIRECTION) PLACED PRIOR TO PHASE II, STEP-A CONSTRUCITON SHALL REMAIN IN PLACE FOR THE REMAINDER OF PHASE II CONSTRUCTION. THE EXISTING RED FLASHING BEACON (NORTH-SOUTH DIRECTION) SHALL REMAIN IN OPERATION DURING ALL PHASES OF CONSTRUCTION.

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Texas Department of Transportation

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TRAFFIC CONTROL PLAN
PHASE II, STEP - B
STA 519+50 - STA 545+50

SCALE: 1"=100' SHEET 2 OF 6

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		68

DATE: 6/13/2024 10:35:45 AM
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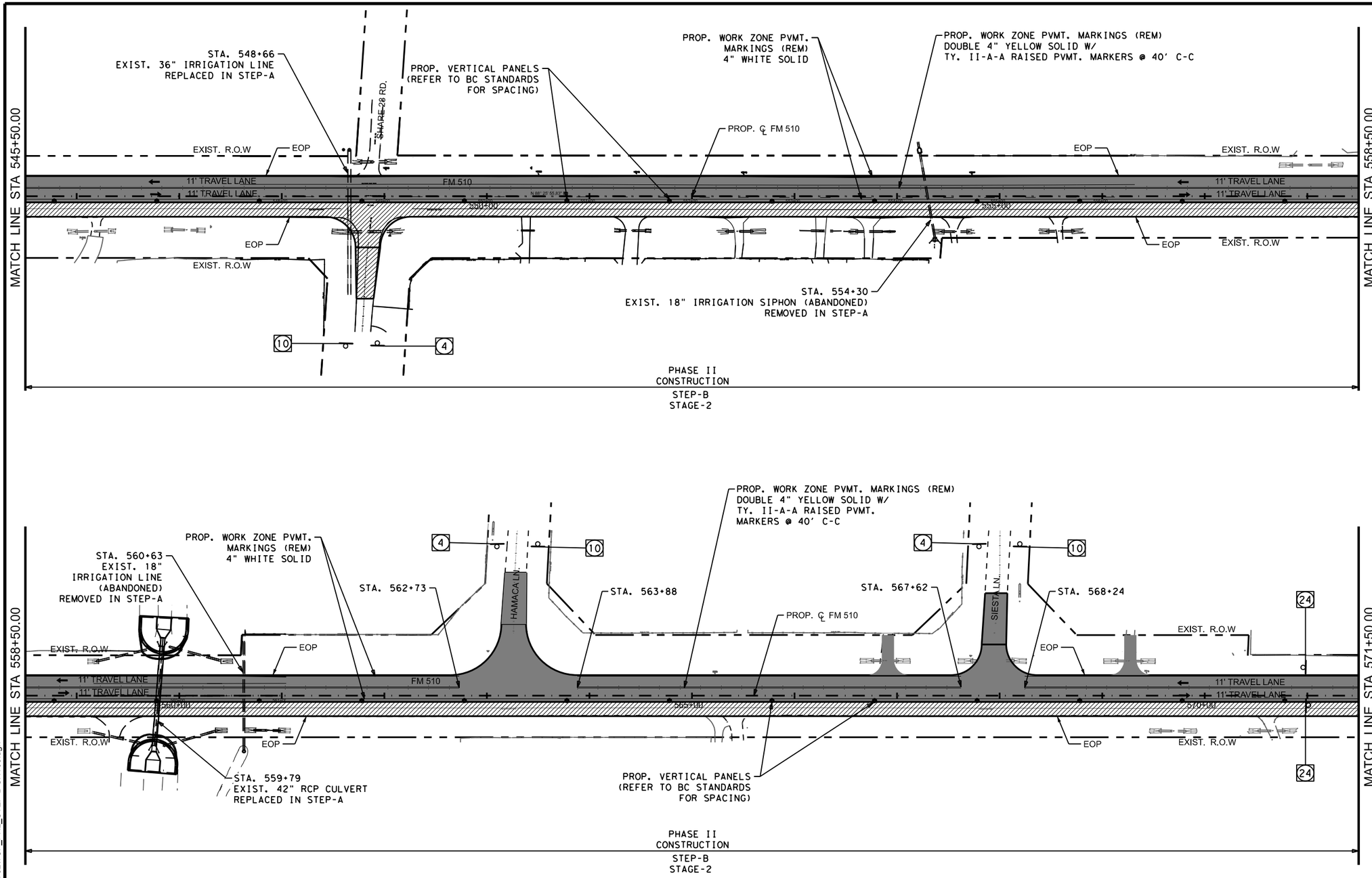

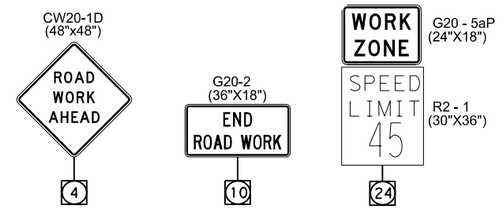

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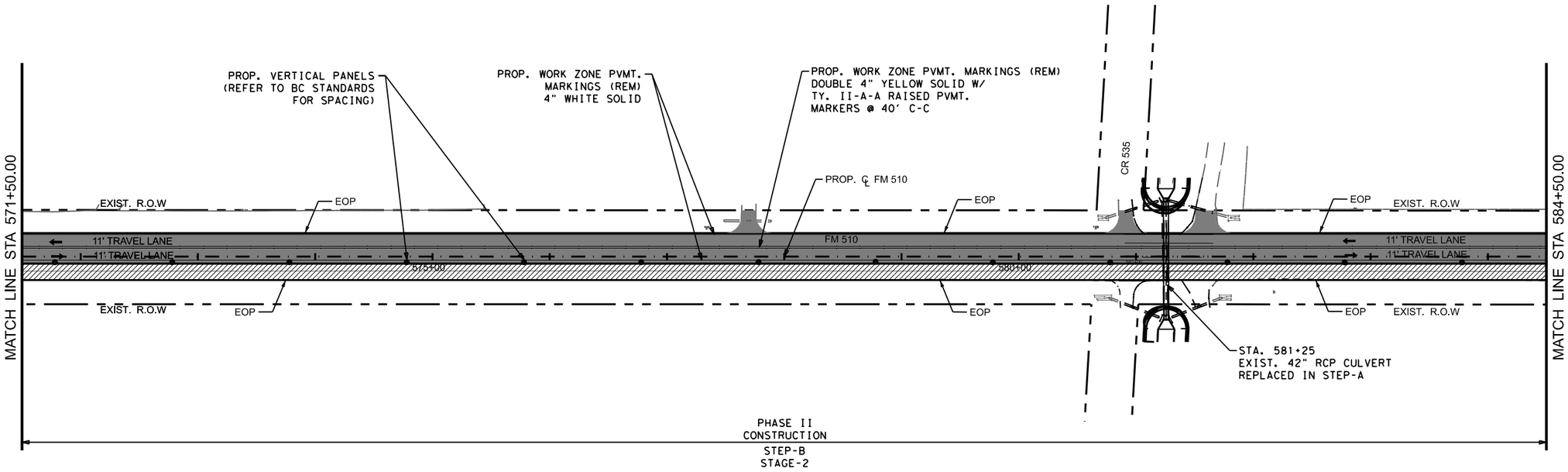
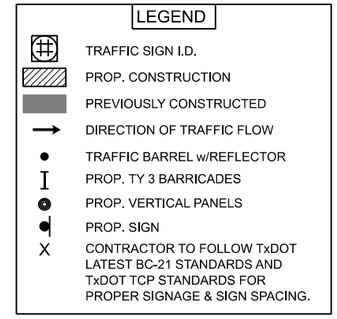
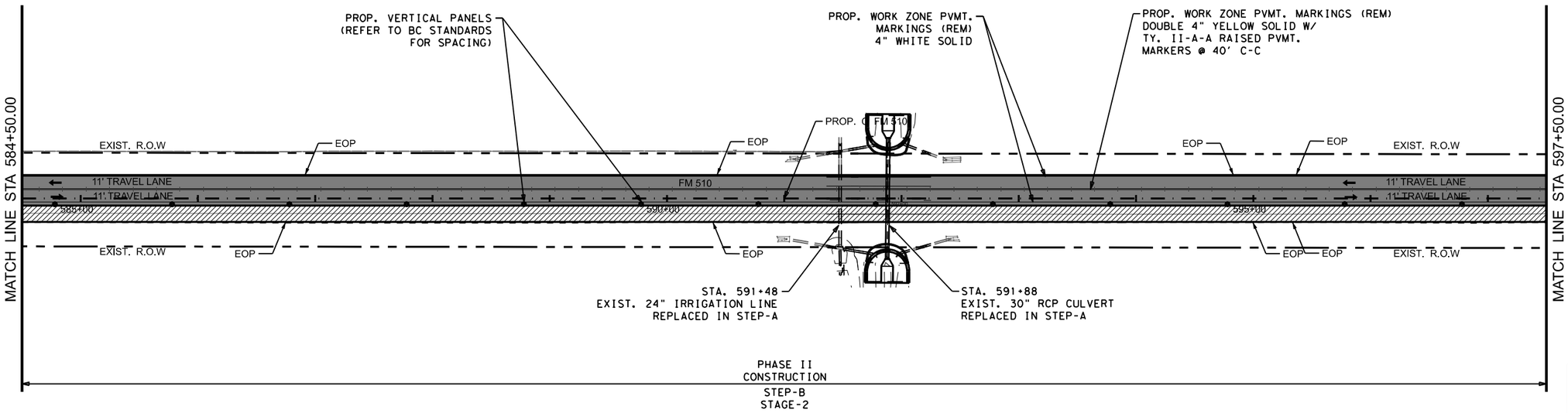
TRAFFIC CONTROL PLAN
PHASE II, STEP - B
STA 545+50 - STA 571+50

SCALE: 1"=100' SHEET 3 OF 6

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		69







NOTES:

X 1. ALL SIGNS SHOWN ON THIS SHEET ARE NOT TO SCALE.
2. ALL DETOUR AND ADVANCE WARNING SIGNS SHALL BE IN PLACE PRIOR TO COMMENCING CONSTRUCTION AND SHALL REMAIN IN PLACE THROUGHOUT THE DURATION OF CONSTRUCTION UNTIL THE PROJECT IS COMPLETE AND ACCEPTED BY TXDOT.
3. ALL SIGNS SHOWN FOR CONSTRUCTION SHALL BE SPACED PER THE TXDOT BC STANDARDS AND TXDOT TCP STANDARDS AND MAY BE ADJUSTED DUE TO FIELD CONDITIONS.
4. CONTRACTOR SHALL REMOVE ANY EXISTING PAVEMENT MARKINGS THAT ARE IN COFLICT WITH ANY PHASE OF CONSTRUCTION.

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STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

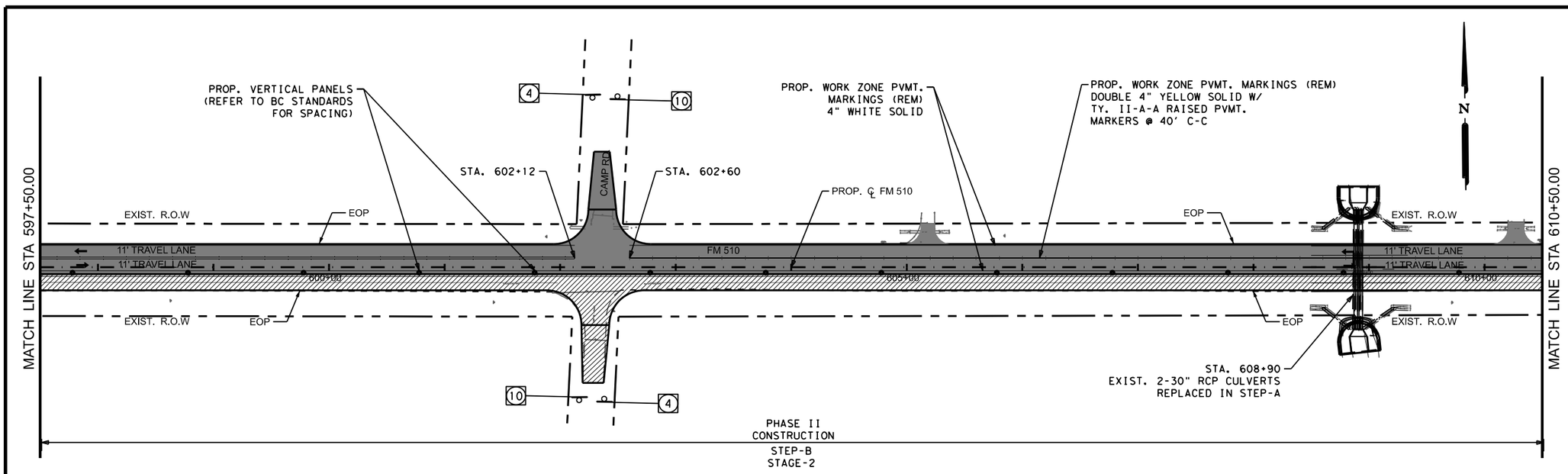
Texas Department of Transportation

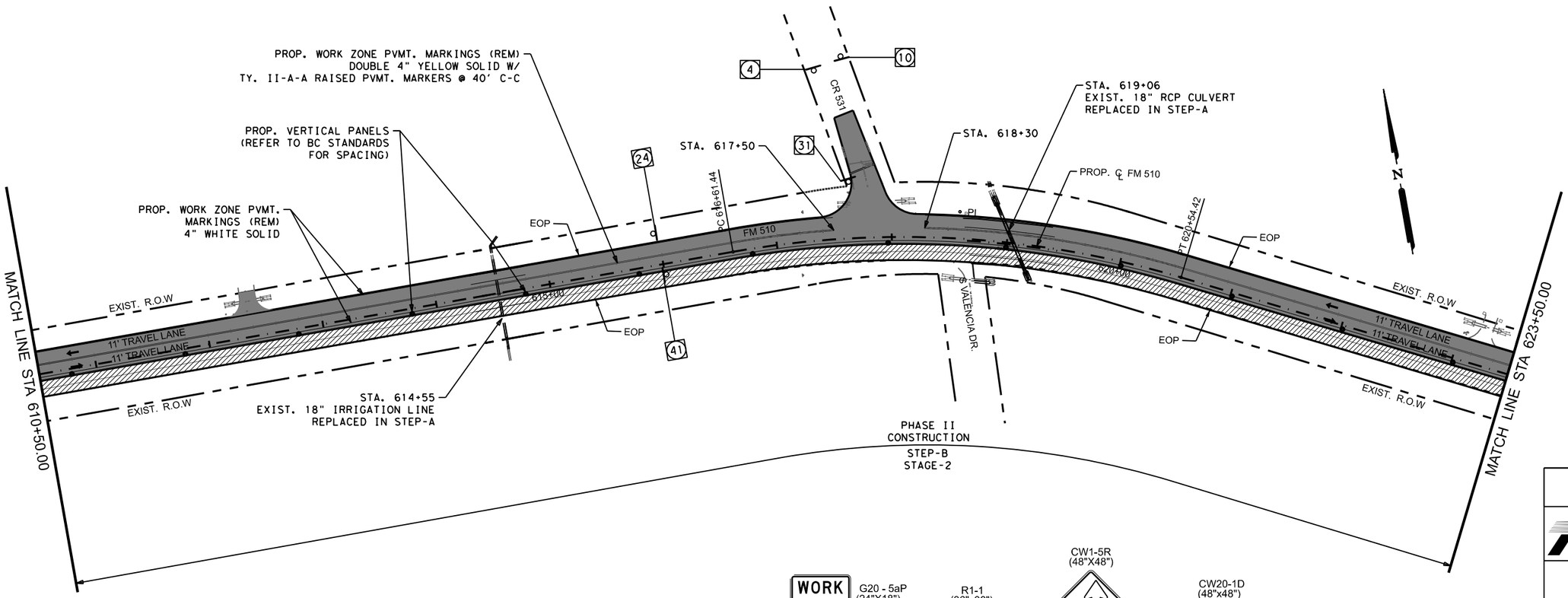
FM 510

TRAFFIC CONTROL PLAN
PHASE II, STEP - B
STA 571+50 - STA 597+50

SCALE: 1"=100' SHEET 4 OF 6

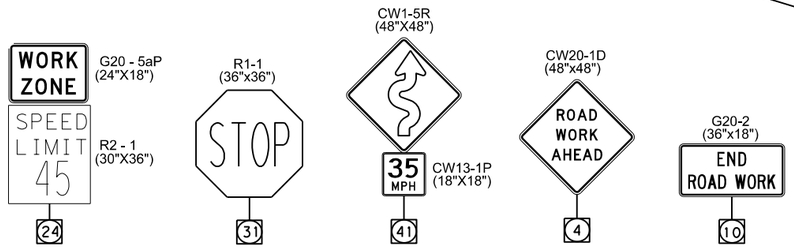
CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		70





LEGEND

- TRAFFIC SIGN I.D.
- PROP. CONSTRUCTION
- PREVIOUSLY CONSTRUCTED
- DIRECTION OF TRAFFIC FLOW
- TRAFFIC BARREL w/REFLECTOR
- PROP. TY 3 BARRICADES
- PROP. VERTICAL PANELS
- PROP. SIGN
- X CONTRACTOR TO FOLLOW TxDOT LATEST BC-21 STANDARDS AND TxDOT TCP STANDARDS FOR PROPER SIGNAGE & SIGN SPACING.



NOTES:

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STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

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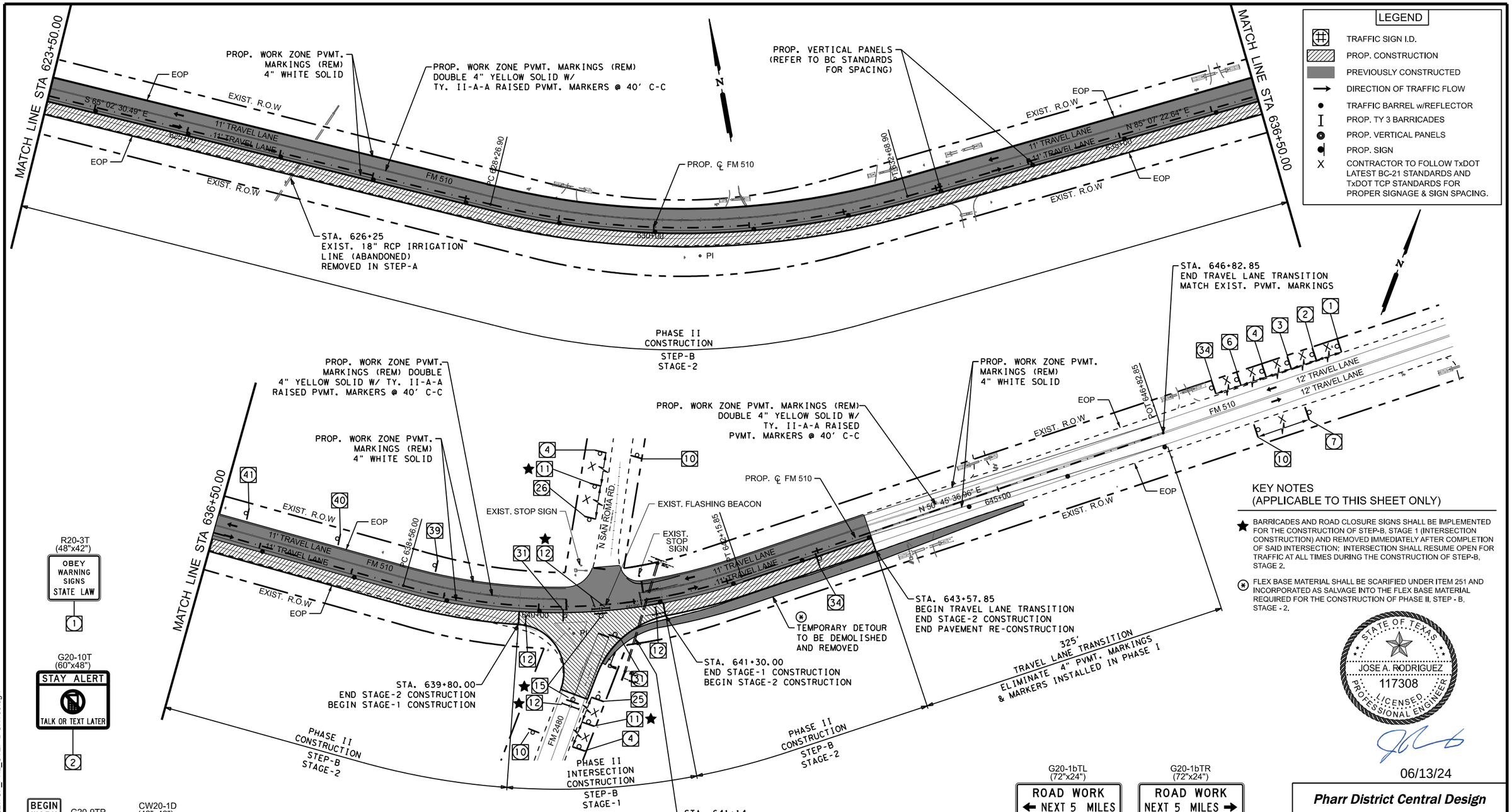
TRAFFIC CONTROL PLAN
PHASE II, STEP - B
STA 597+50 - STA 623+50

SCALE: 1"=100' SHEET 5 OF 6

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		71



LEGEND

- TRAFFIC SIGN I.D.
- PROP. CONSTRUCTION
- PREVIOUSLY CONSTRUCTED
- DIRECTION OF TRAFFIC FLOW
- TRAFFIC BARREL w/REFLECTOR
- PROP. TY 3 BARRICADES
- PROP. VERTICAL PANELS
- PROP. SIGN
- CONTRACTOR TO FOLLOW TxDOT LATEST BC-21 STANDARDS AND TxDOT TCP STANDARDS FOR PROPER SIGNAGE & SIGN SPACING.

KEY NOTES
(APPLICABLE TO THIS SHEET ONLY)

★ BARRICADES AND ROAD CLOSURE SIGNS SHALL BE IMPLEMENTED FOR THE CONSTRUCTION OF STEP-B, STAGE 1 (INTERSECTION CONSTRUCTION) AND REMOVED IMMEDIATELY AFTER COMPLETION OF SAID INTERSECTION; INTERSECTION SHALL RESUME OPEN FOR TRAFFIC AT ALL TIMES DURING THE CONSTRUCTION OF STEP-B, STAGE 2.

(*) FLEX BASE MATERIAL SHALL BE SCARIFIED UNDER ITEM 251 AND INCORPORATED AS SALVAGE INTO THE FLEX BASE MATERIAL REQUIRED FOR THE CONSTRUCTION OF PHASE II, STEP - B, STAGE - 2.

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

R20-3T (48"x42")
OBEY WARNING SIGNS STATE LAW
1

G20-10T (60"x48")
STAY ALERT
TALK OR TEXT LATER
2

BEGIN WORK ZONE
TRAFFIC FINES DOUBLE
WHEN WORKERS ARE PRESENT
G20-9TP (24"x24")
R20-5T (24"x30")
R20-5aTP (24"x12")
3

CW20-1D (48"x48")
ROAD WORK AHEAD
4

BEGIN ROAD WORK NEXT 5 MILES
NAME ADDRESS CITY STATE
CONTRACTOR
G20-5T (48"x24")
G20-6T (48"x30")
6

G20-2bT (36"x18")
END WORK ZONE
7

G20-2 (36"x18")
END ROAD WORK
10

CW20-3D (48"x48")
ROAD CLOSED AHEAD
11

TY 3 (C) BARRICADE
12

R11-2 (48"x30")
ROAD CLOSED
15

R1 - 1 (36"x36")
STOP
31

CW1 - 4R (36"X36")
34

CW6-3 (48"x48")
39

R4-1 (24"x30")
DO NOT PASS
40

CW1-5R (48"x48")
35 MPH
CW13-1P (18"X18")
41

G20-1bTL (72"x24")
ROAD WORK ← NEXT 5 MILES
25

G20-1bTR (72"x24")
ROAD WORK NEXT 5 MILES →
26

NOTES:

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Pharr District Central Design

Texas Department of Transportation

FM 510

TRAFFIC CONTROL PLAN
PHASE II, STEP - B
STA 623+50 - STA 646+82.85

SCALE: 1"=100' SHEET 6 OF 6

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	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		72

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

Texas Department of Transportation

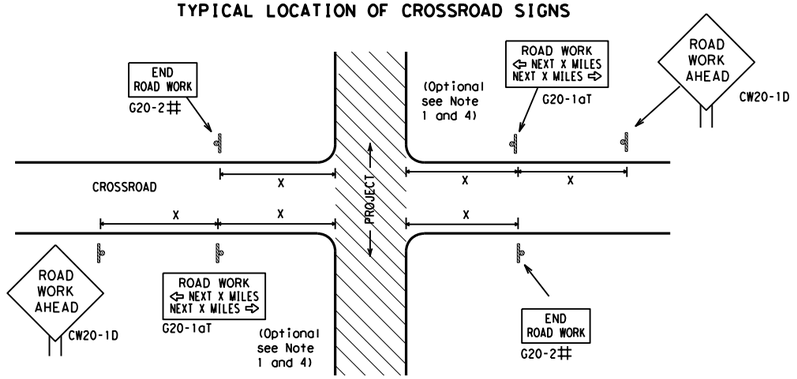
Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	PHR	CAMERON		73
5-10 5-21				

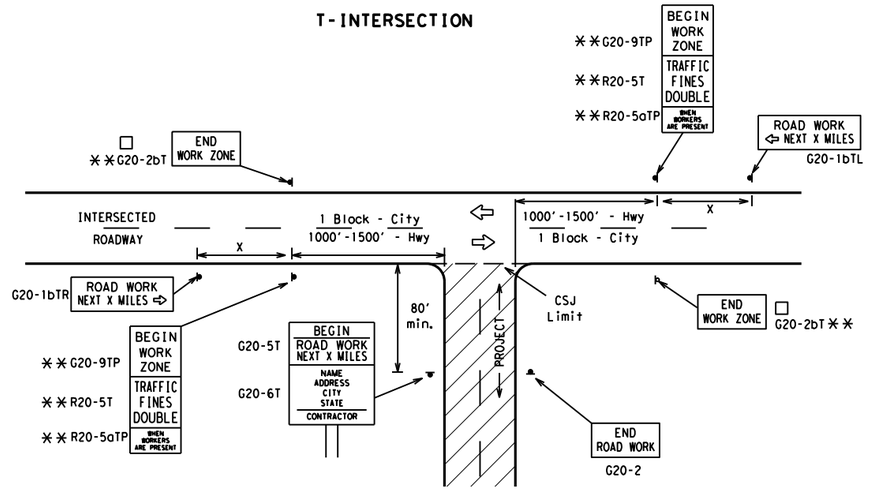
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

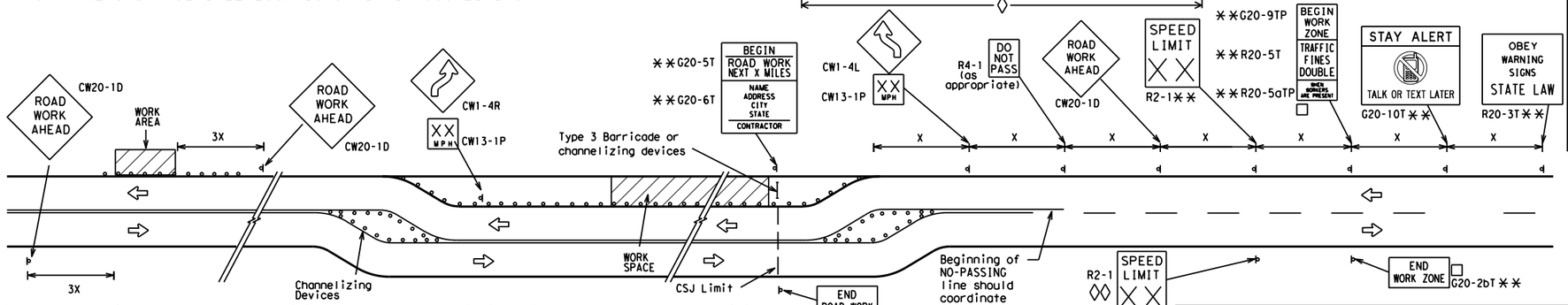
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

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

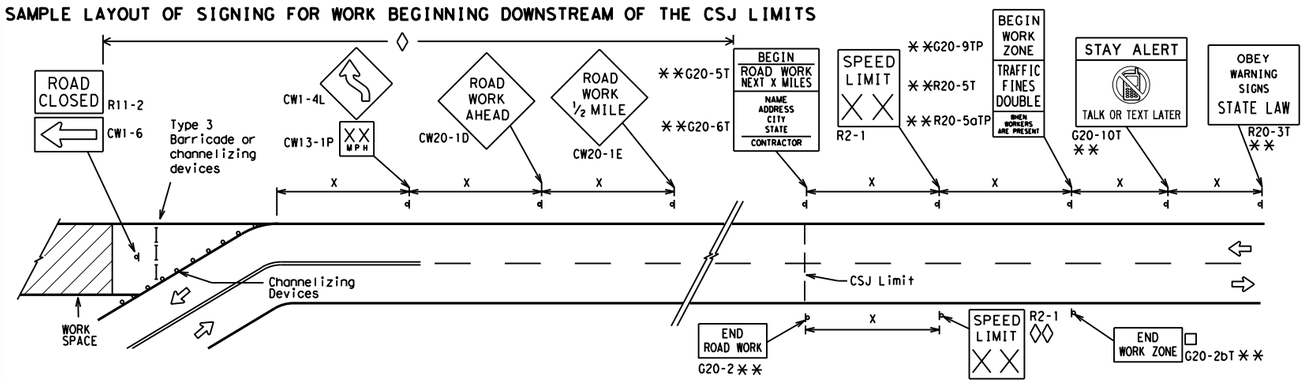
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING 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.

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	1057	03	051	FM 510
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	CAMERON		74

DATE: 6/13/2024 10:37:19 AM
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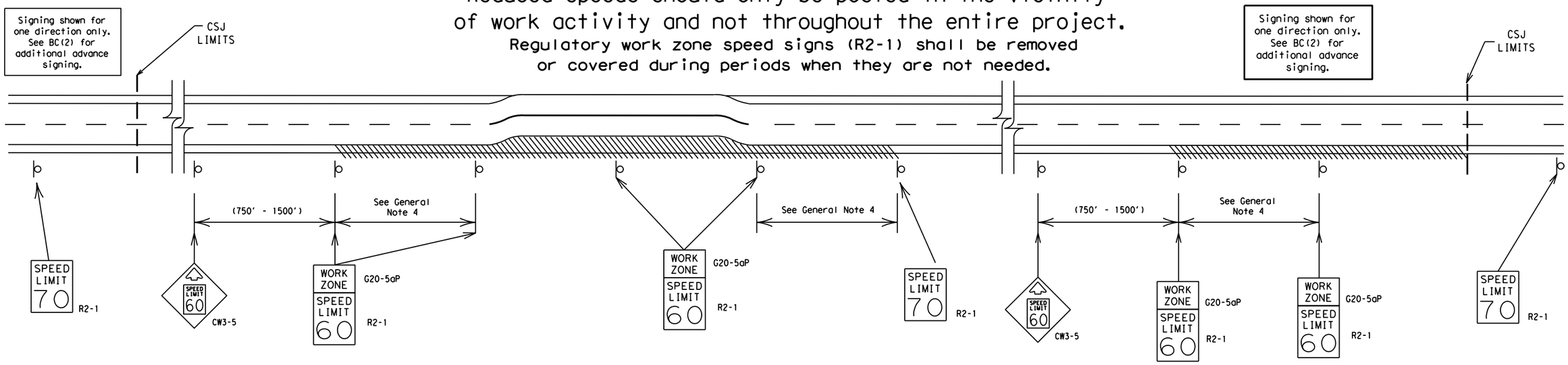
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

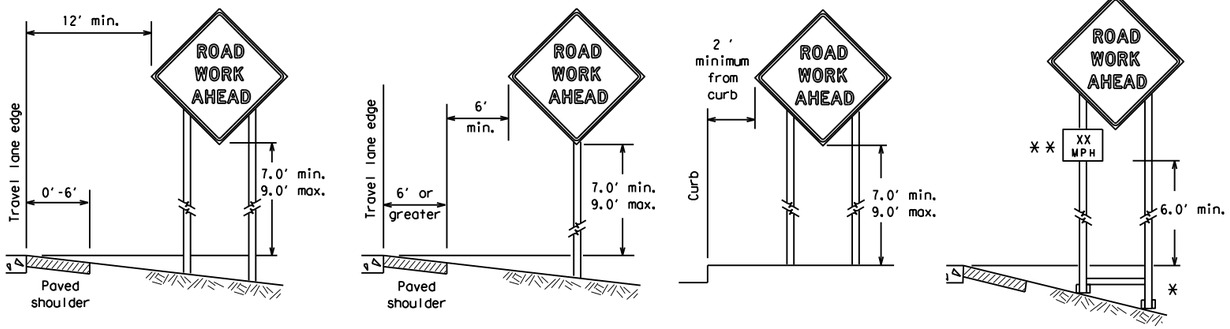
Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	CAMERON		75

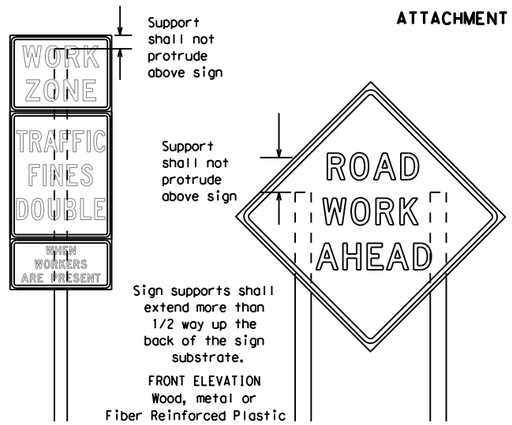
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

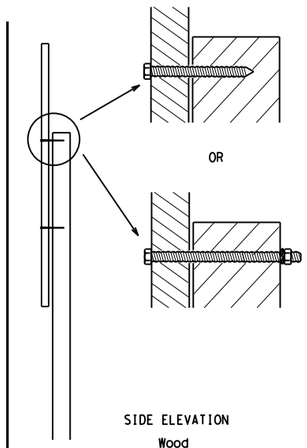


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.

ATTACHMENT FOR SIGN SUPPORTS





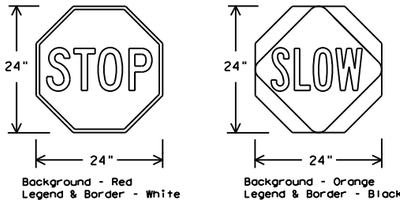
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	CAMERON		76

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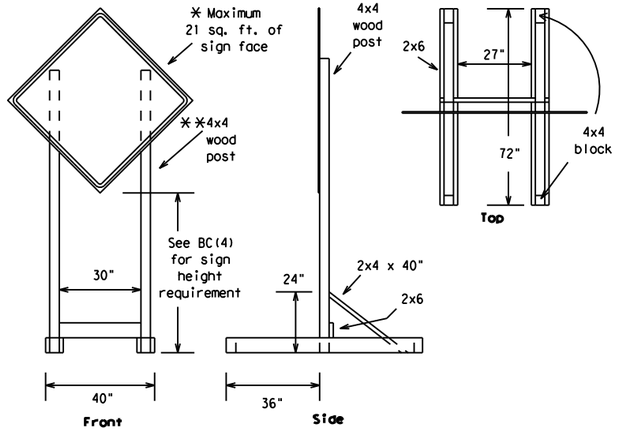
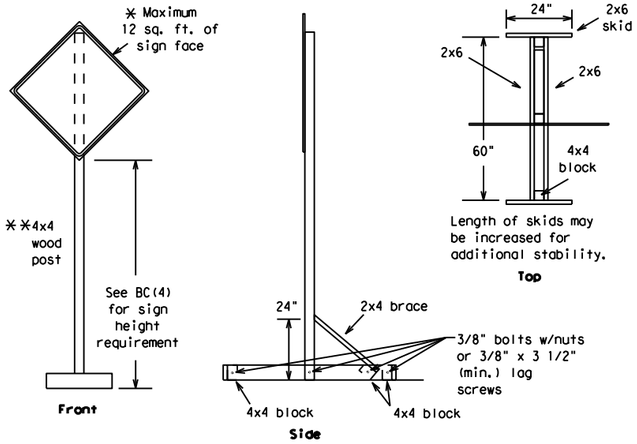
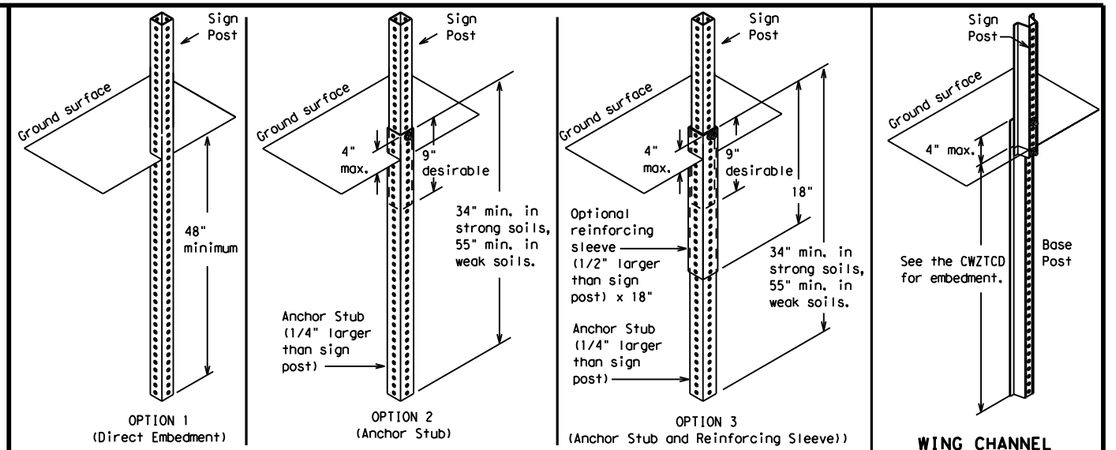




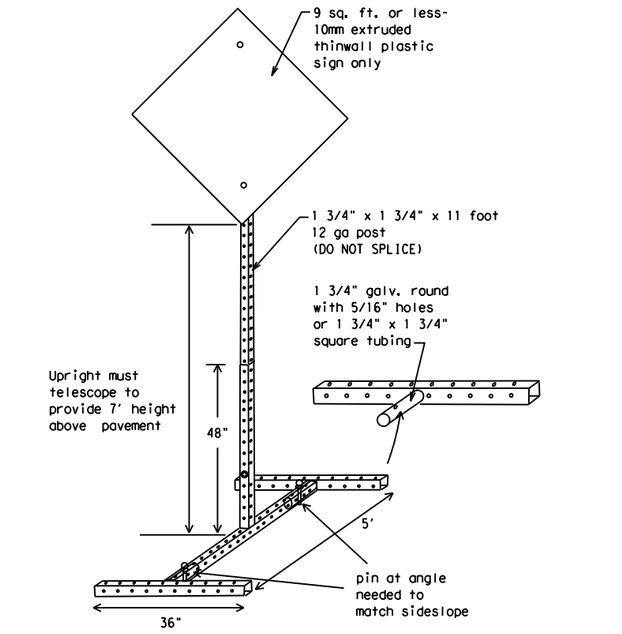
SKID MOUNTED WOOD SIGN SUPPORTS

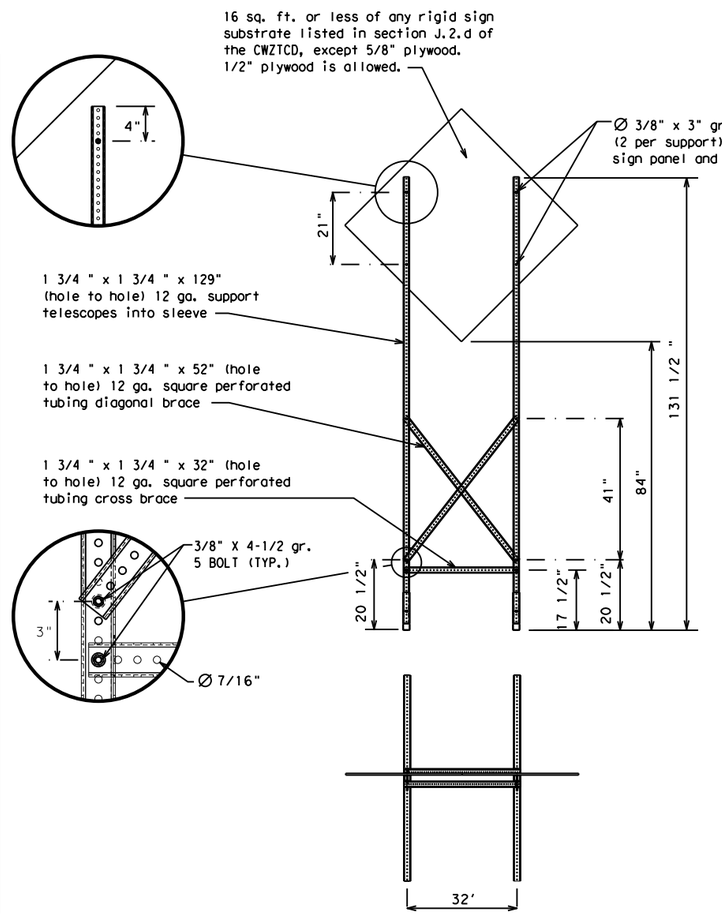
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

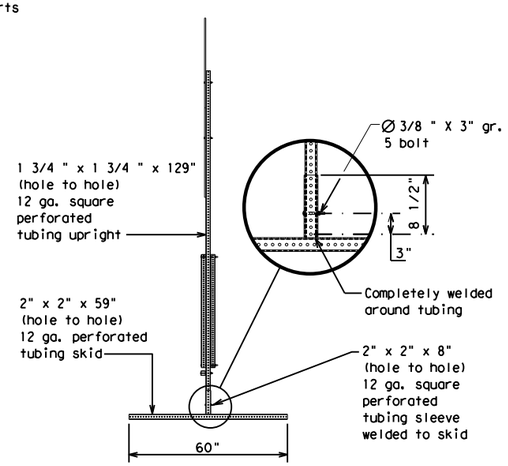


GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	CAMERON		77

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD
Alternate	ALT
Avenue	AVE
Best Route	BEST RTE
Boulevard	BLVD
Bridge	BRDG
Cannot	CANT
Center	CTR
Construction Ahead	CONST AHD
CROSSING	XING
Detour Route	DETOUR RTE
Do Not	DONT
East	E
Eastbound	(route) E
Emergency	EMER
Emergency Vehicle	EMER VEH
Entrance, Enter	ENT
Express Lane	EXP LN
Expressway	EXPWY
XXXX Feet	XXXX FT
Fog Ahead	FOG AHD
Freeway	FRWY, FWY
Freeway Blocked	FWY BLKD
Friday	FRI
Hazardous Driving	HAZ DRIVING
Hazardous Material	HAZMAT
High-Occupancy	HOV
Vehicle Highway	HWY
Hour(s)	HR, HRS
Information	INFO
It Is	ITS
Junction	JCT
Left	LFT
Left Lane	LFT LN
Lane Closed	LN CLOSED
Lower Level	LWR LEVEL
Maintenance	MAINT
Major	MAJ
Miles	MI
Miles Per Hour	MPH
Minor	MNR
Monday	MON
Normal	NORM
North	N
Northbound	(route) N
Parking	PKING
Road	RD
Right Lane	RT LN
Saturday	SAT
Service Road	SERV RD
Shoulder	SHLDR
Slippery	SLIP
South	S
Southbound	(route) S
Speed	SPD
Street	ST
Sunday	SUN
Telephone	PHONE
Temporary	TEMP
Thursday	THURS
To Downtown	TO DWNTN
Traffic	TRAF
Travelers	TRVLRS
Tuesday	TUES
Time Minutes	TIME MIN
Upper Level	UPR LEVEL
Vehicles (s)	VEH, VEHS
Warning	WARN
Wednesday	WED
Weight Limit	WT LIMIT
West	W
Westbound	(route) W
Wet Pavement	WET PVMT
Will Not	WONT

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

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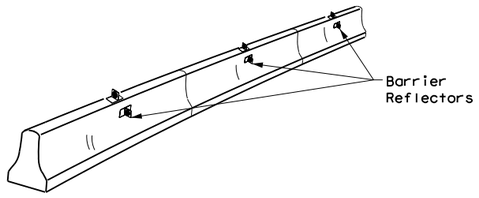
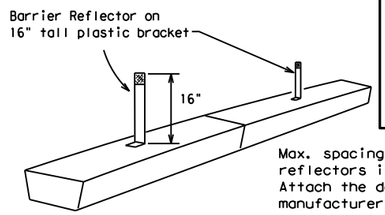
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	CAMERON		78

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



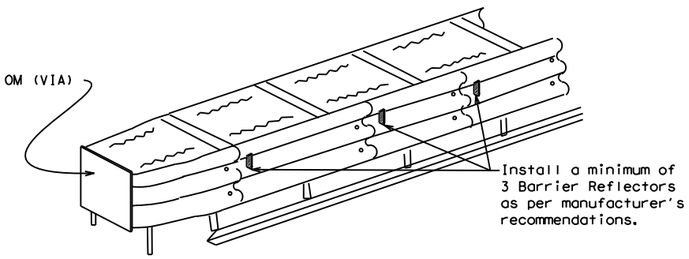
CONCRETE TRAFFIC BARRIER (CTB)

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



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

LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

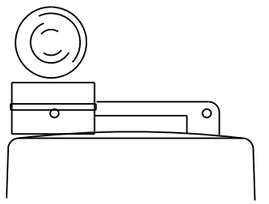
LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

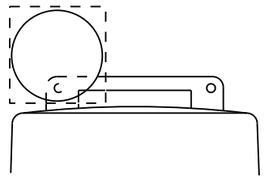
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

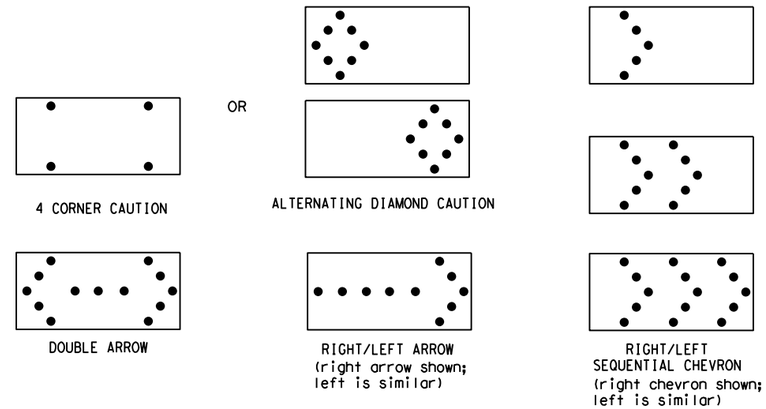
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION
Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

SHEET 7 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	CAMERON		79

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

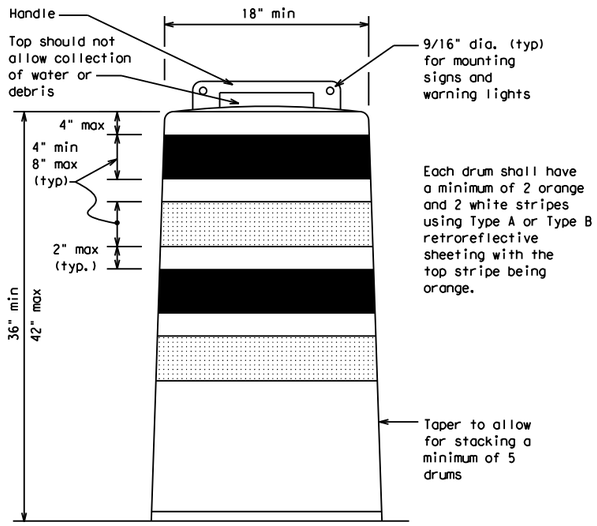
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

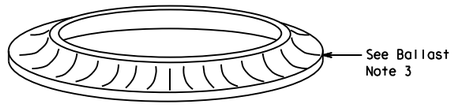
RETROREFLECTIVE SHEETING

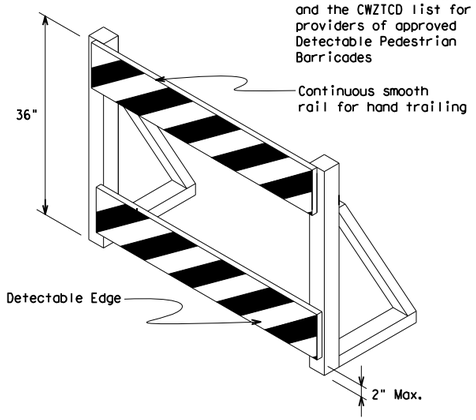
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

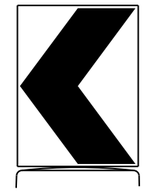




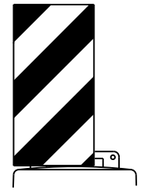


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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9-07 5-21	PHR	CAMERON		80
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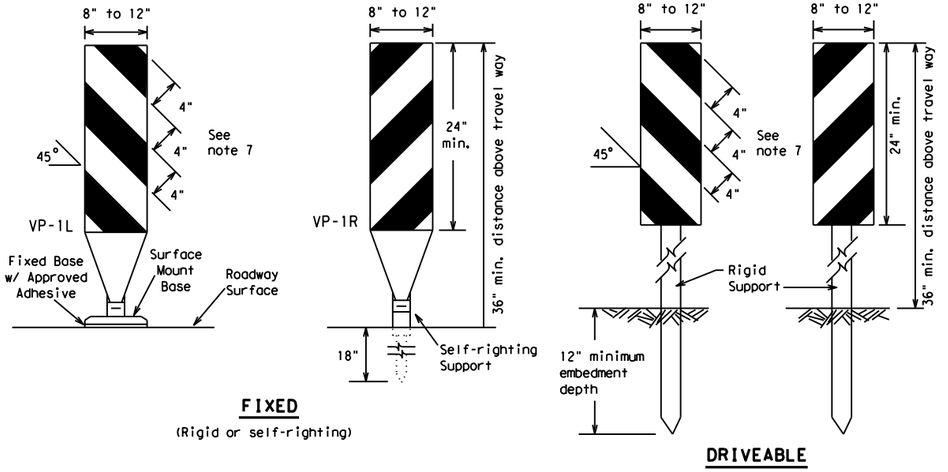
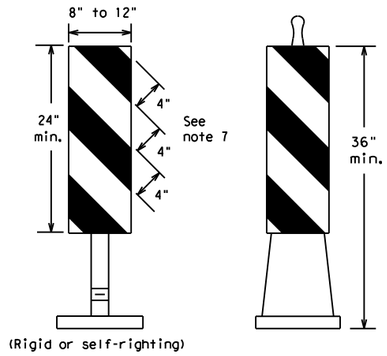


FIXED
(Rigid or self-righting)

DRIVEABLE

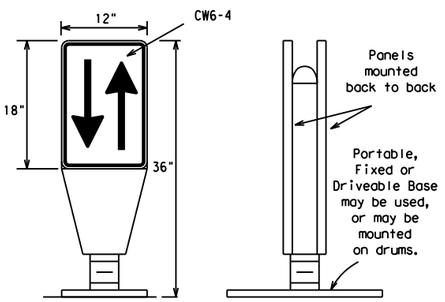


(Rigid or self-righting)

PORTABLE

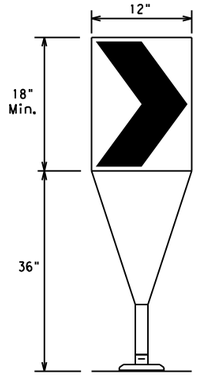
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



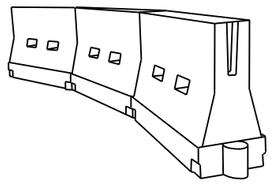
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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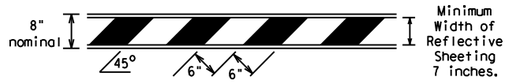
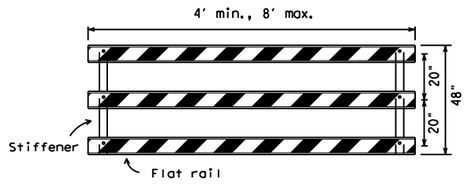
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



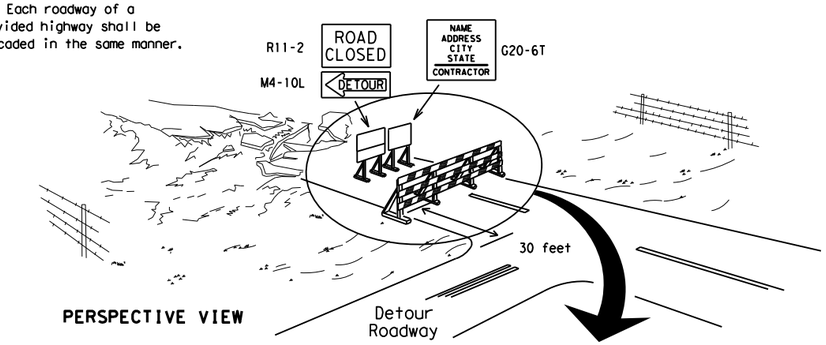
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

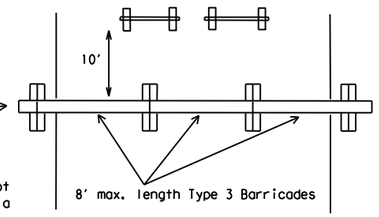
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

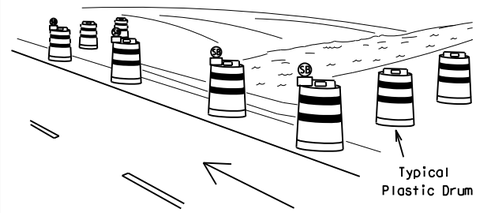
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

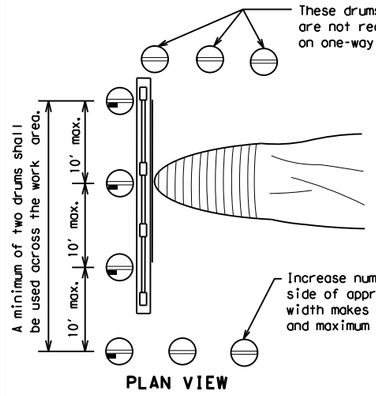
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

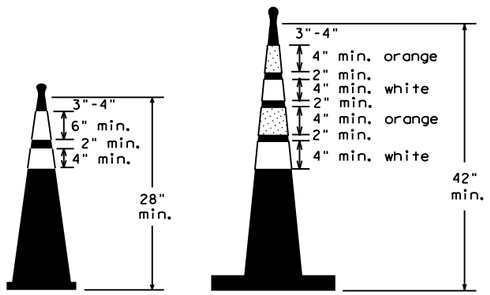
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



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

PLAN VIEW

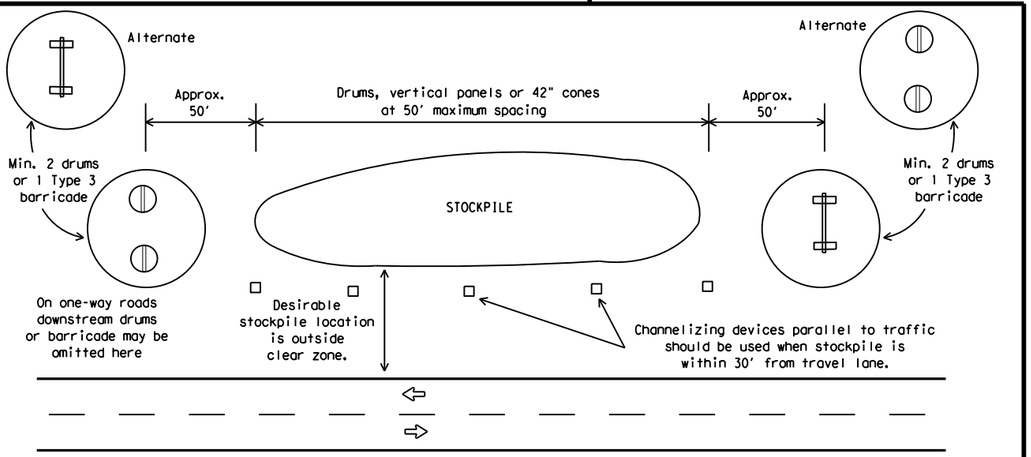
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

SHEET 10 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

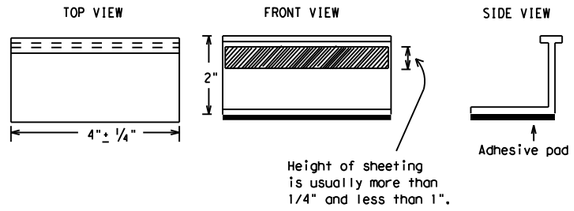
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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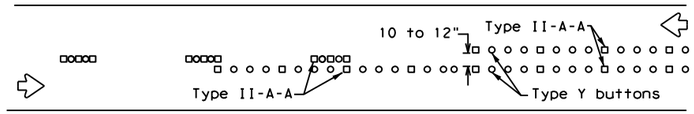
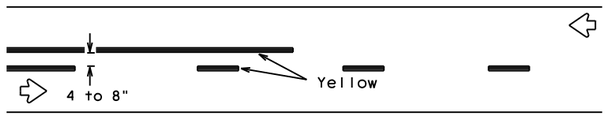
PAVEMENT MARKING PATTERNS

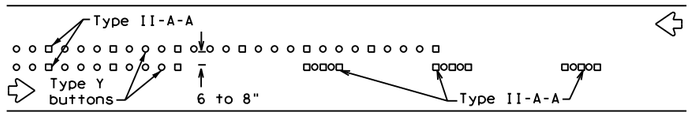
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



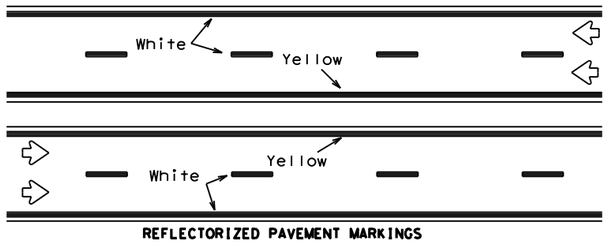
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



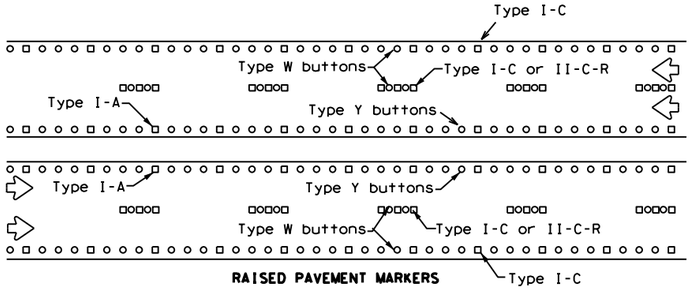
RAISED PAVEMENT MARKERS - PATTERN B

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

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



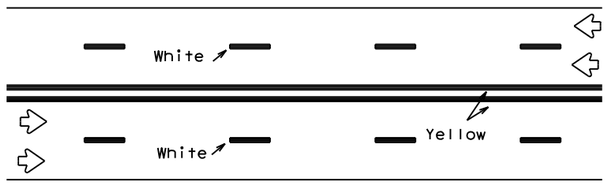
REFLECTORIZED PAVEMENT MARKINGS



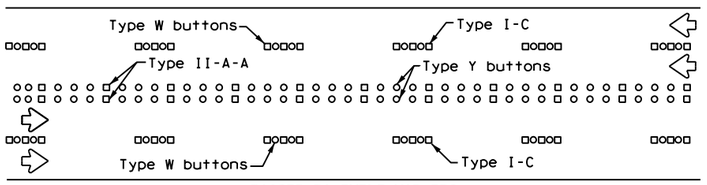
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



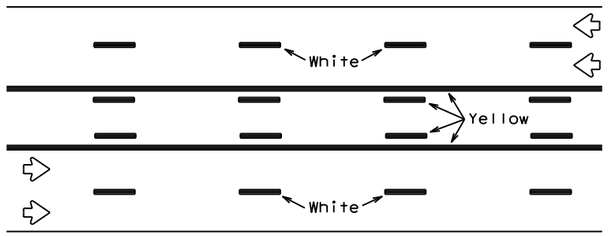
REFLECTORIZED PAVEMENT MARKINGS



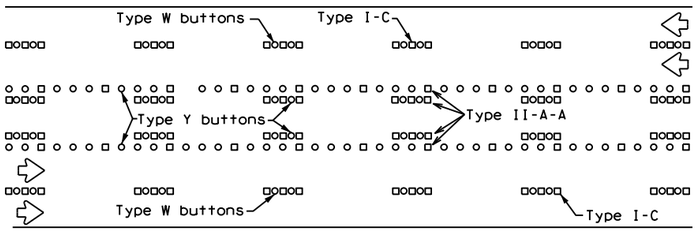
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

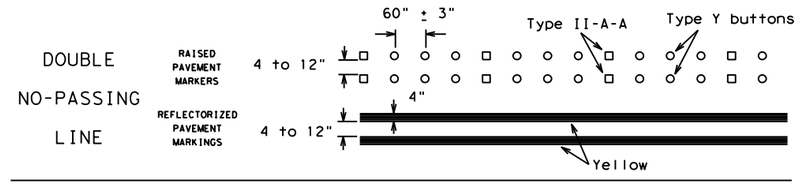
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

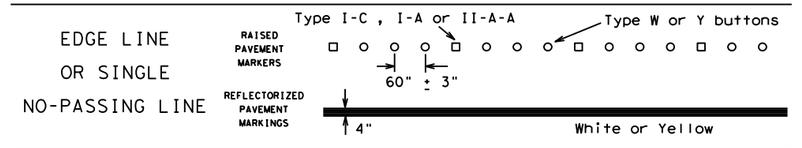
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

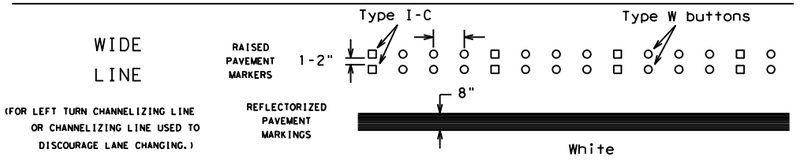


EDGE LINE OR SINGLE NO-PASSING LINE



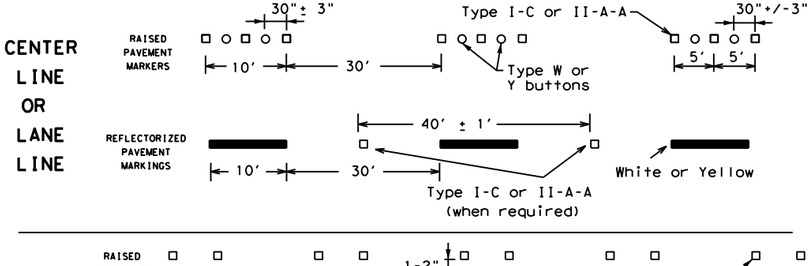
WIDE LINE

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

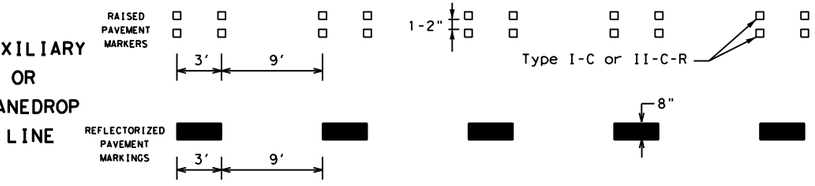


BROKEN LINES

CENTER LINE OR LANE LINE

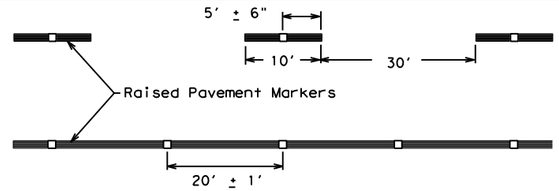


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

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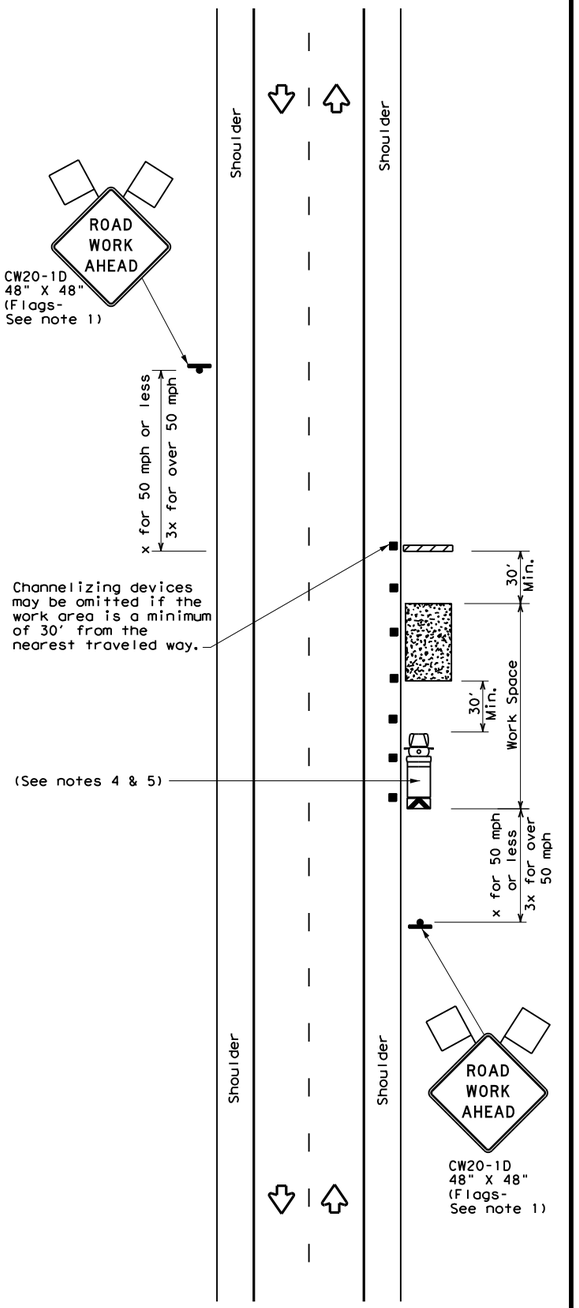
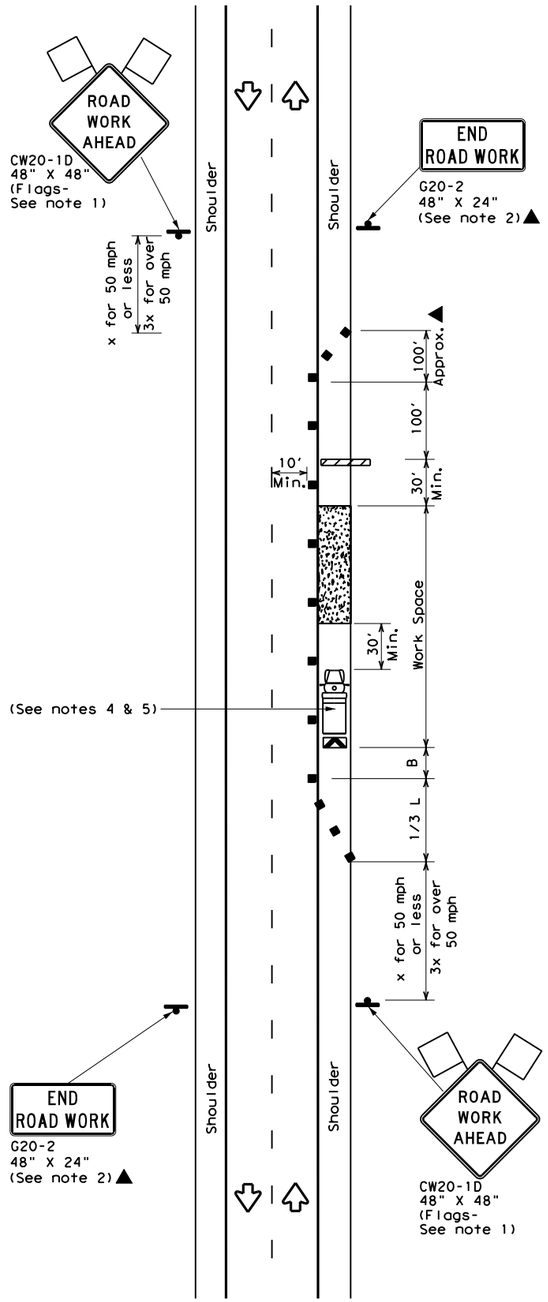


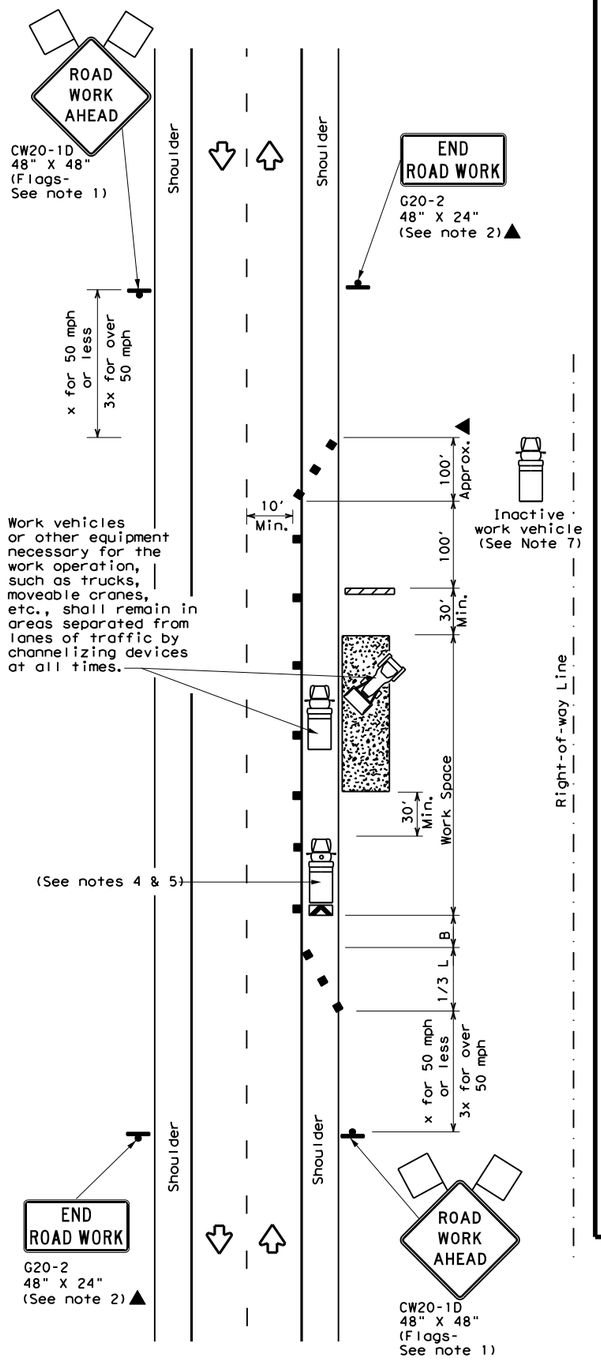
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	PHR	CAMERON		85
1-97 2-18				

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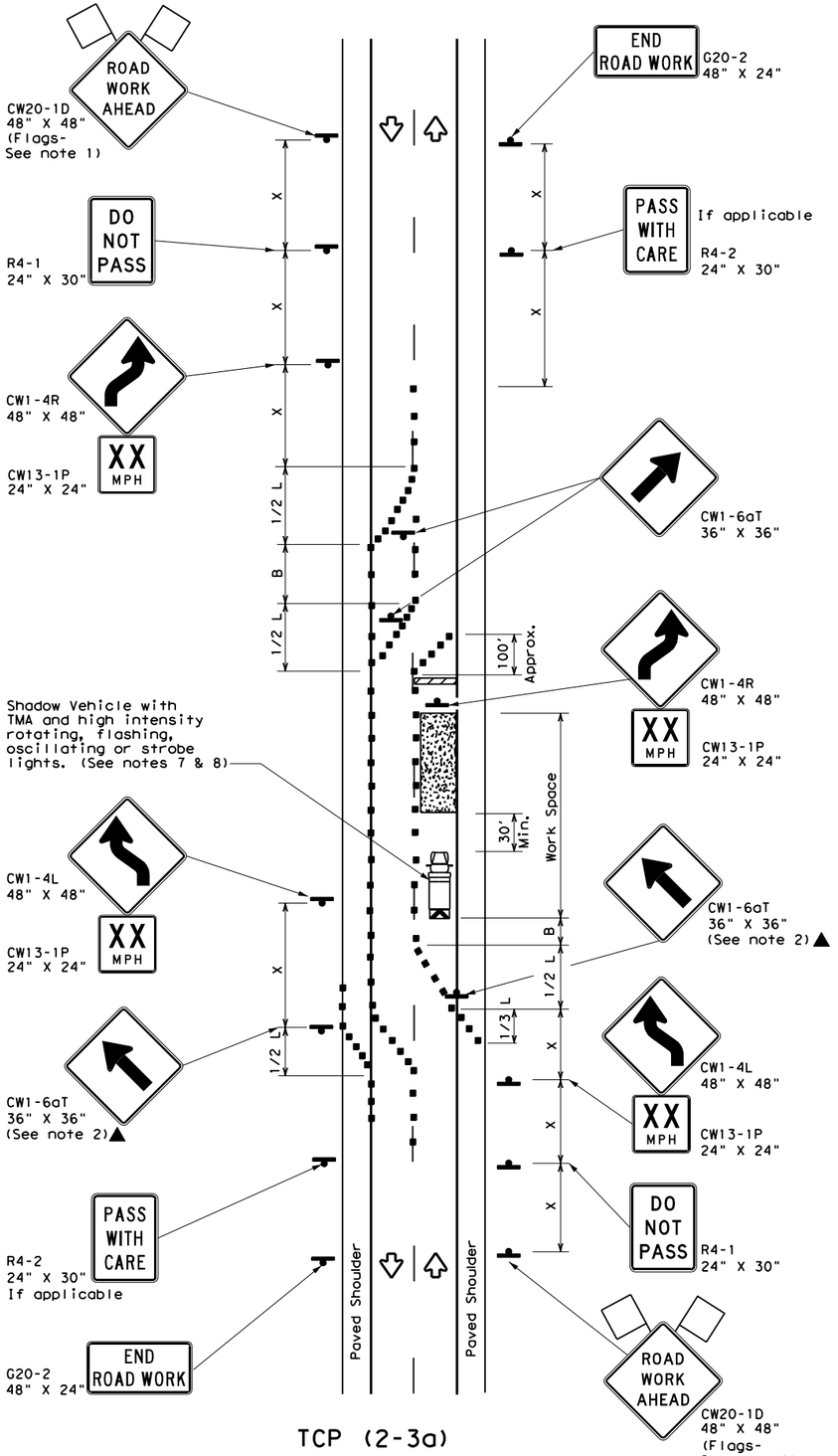
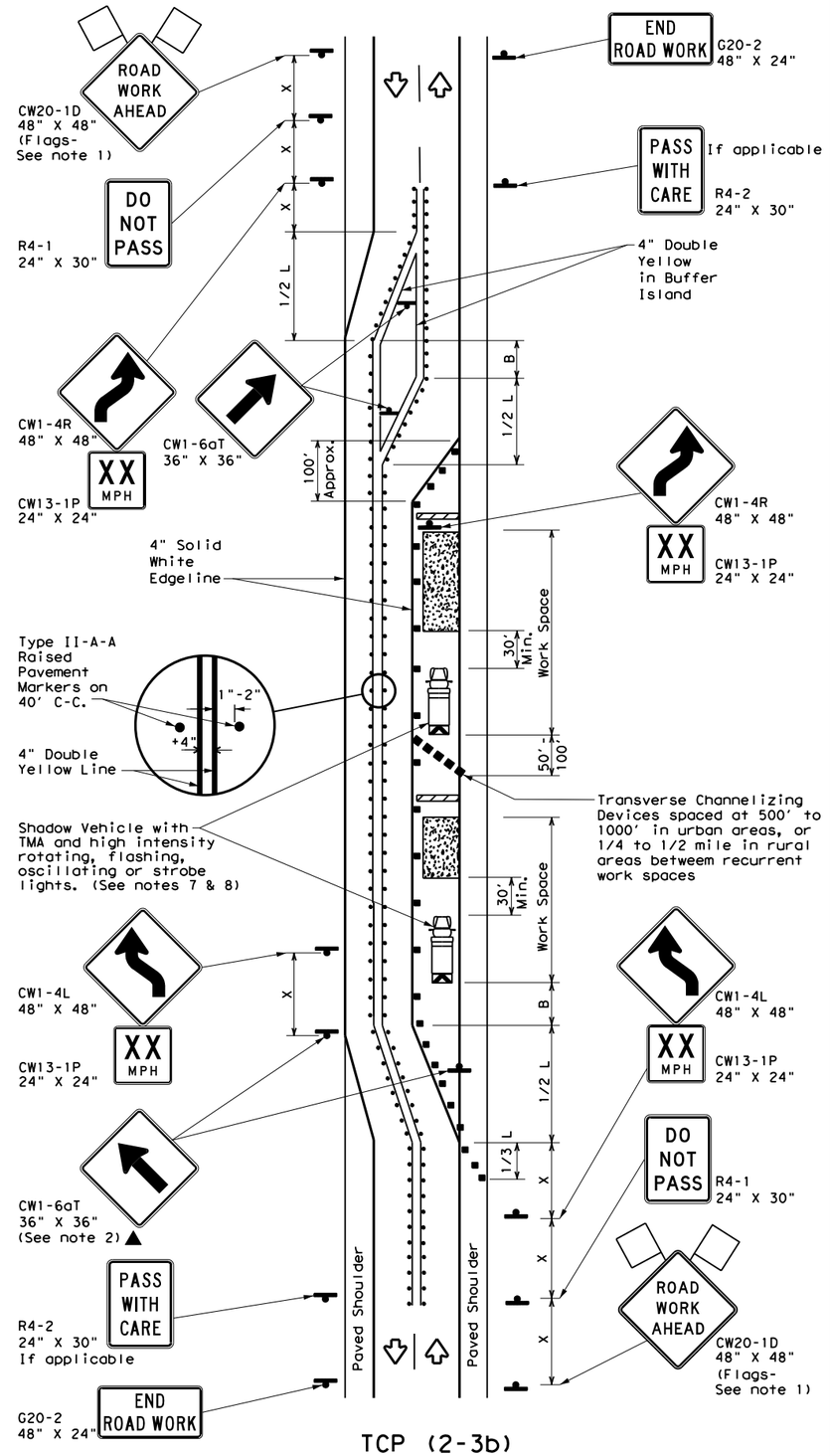


TCP (2-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



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

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

TCP (2-3a)

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

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO-LANE ROADS

TCP(2-3)-18

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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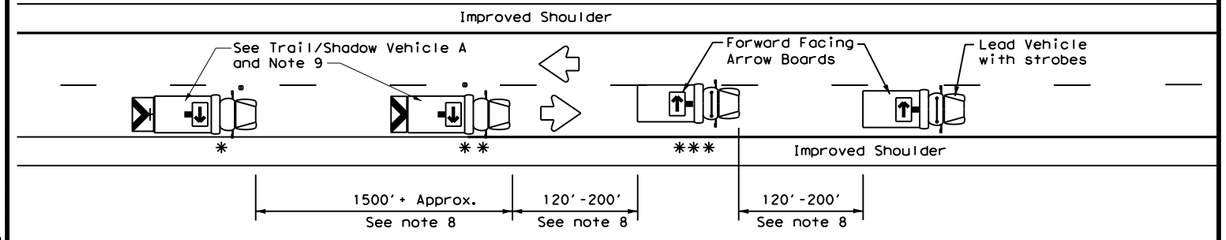
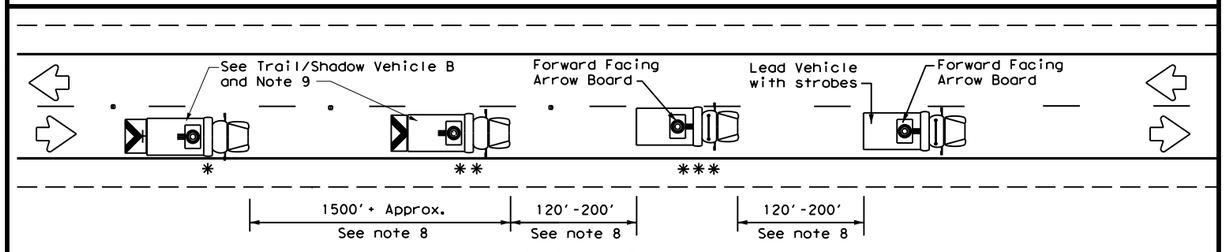
1-97 2-12	PHR	CAMERON		86
4-98 2-18				



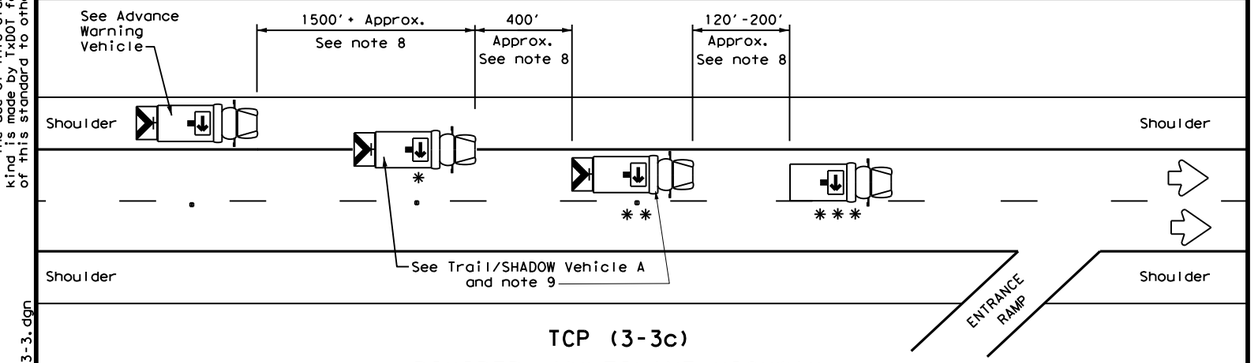
TCP (3-3a)

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



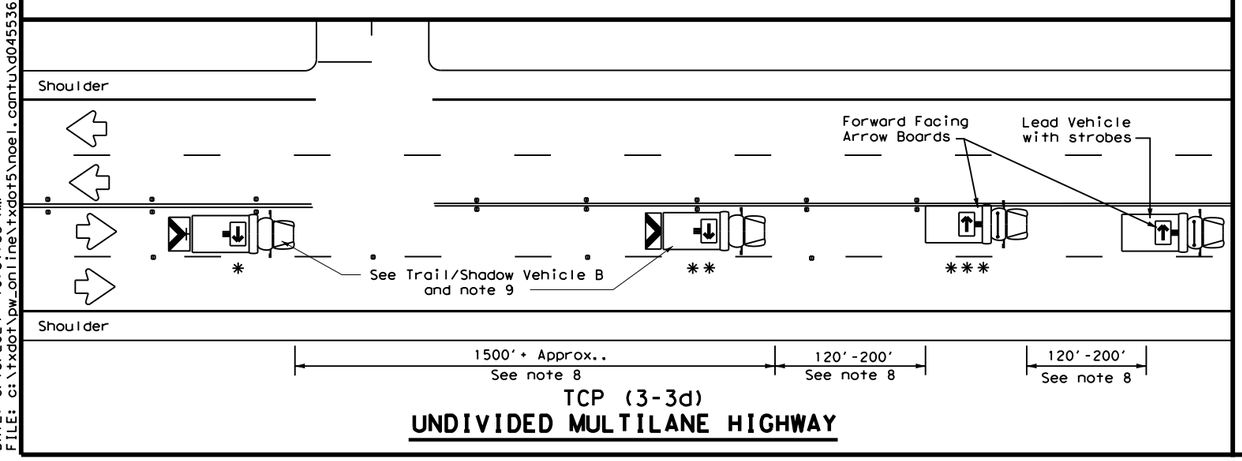
TCP (3-3b)

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



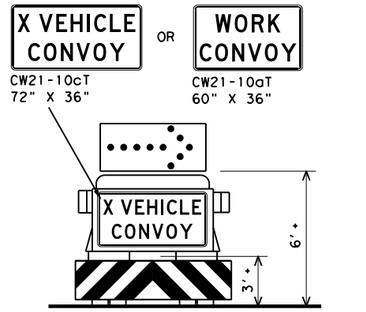
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



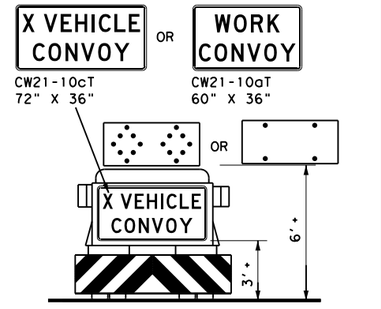
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



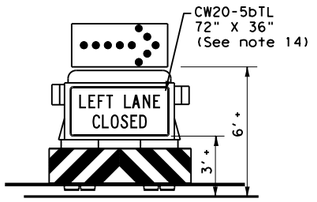
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

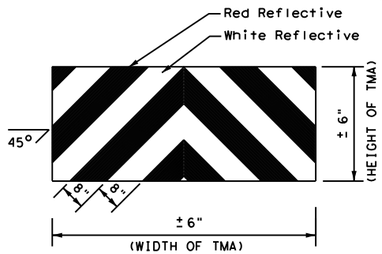


TRAIL/SHADOW VEHICLE B

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

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©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
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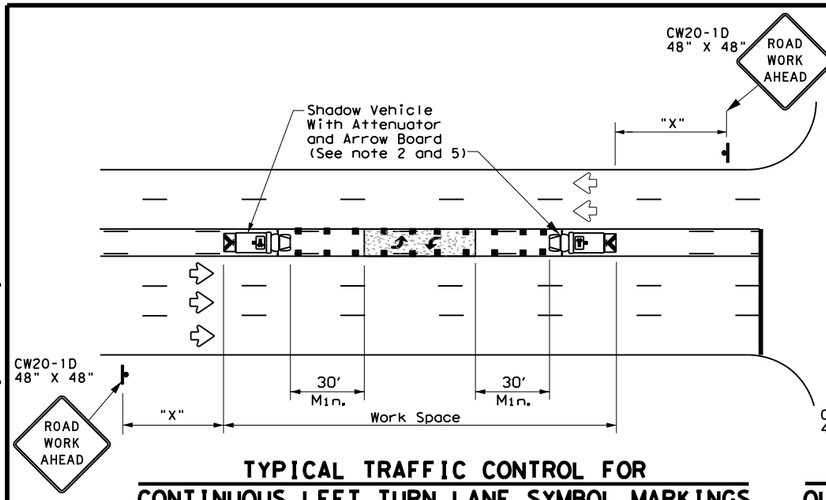
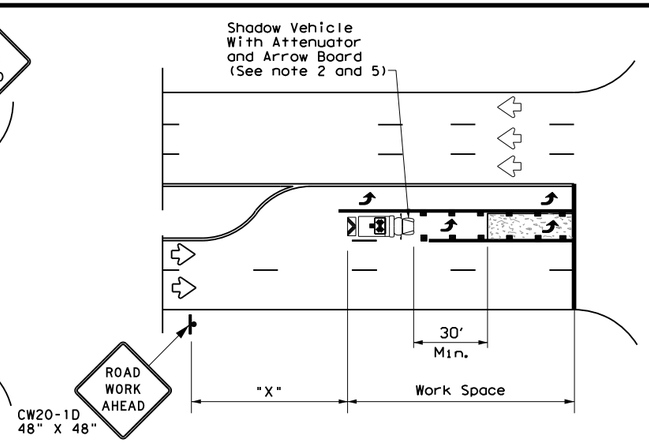
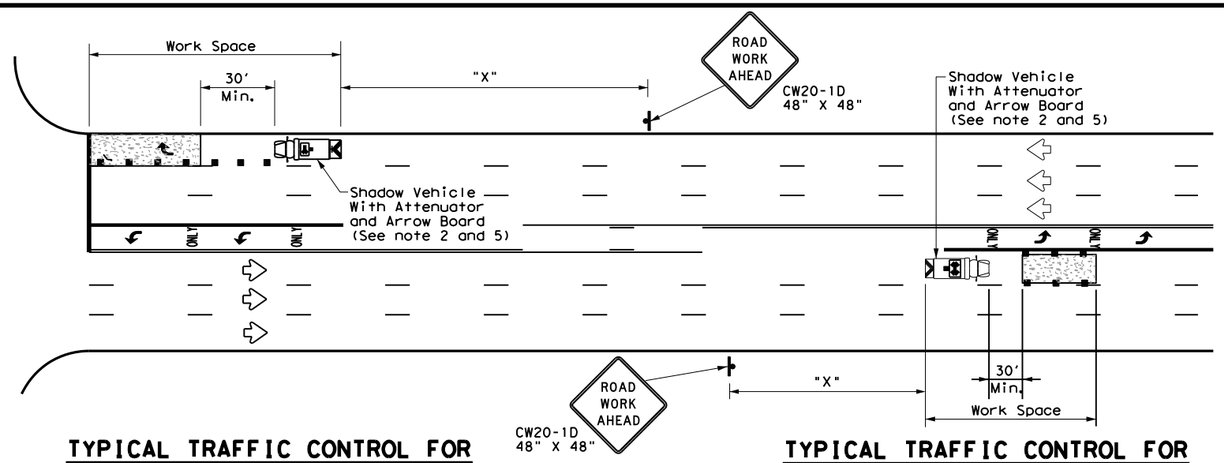
8-95 7-13	PHR	CAMERON		87
1-97 7-14				



TYPICAL TRAFFIC CONTROL FOR CONTINUOUS LEFT TURN LANE SYMBOL MARKINGS

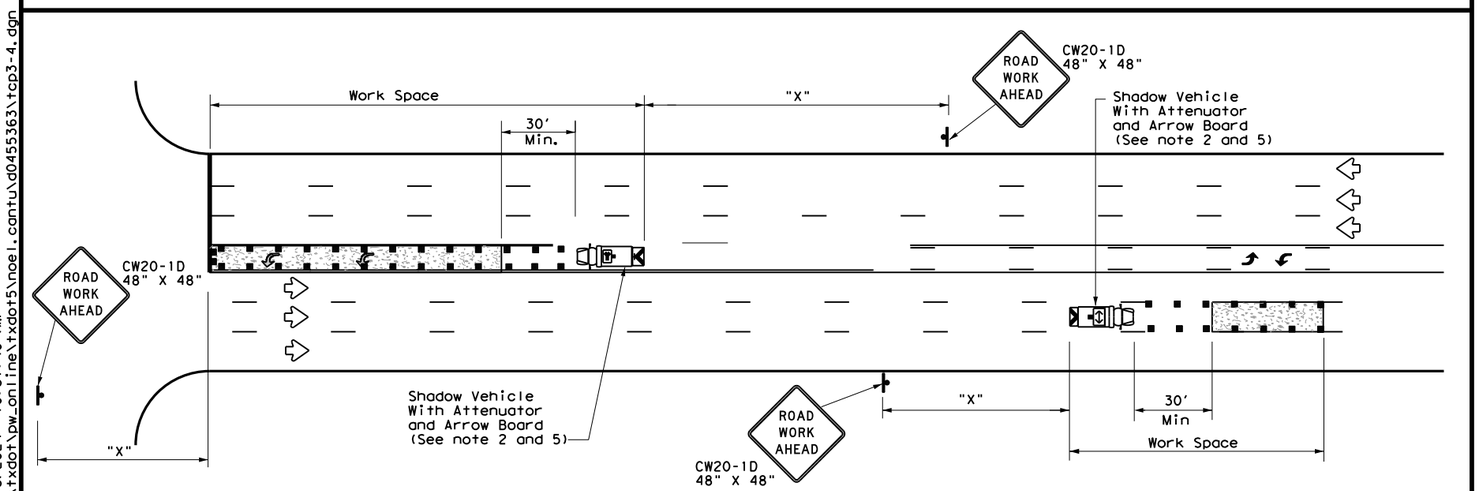


TYPICAL TRAFFIC CONTROL FOR OUTSIDE DUAL LEFT TURN LANE SYMBOL MARKINGS



TYPICAL TRAFFIC CONTROL FOR OUTSIDE LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR INSIDE LANE MARKINGS



TYPICAL TRAFFIC CONTROL FOR LEFT TURN LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR CENTER LANE MARKINGS

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'

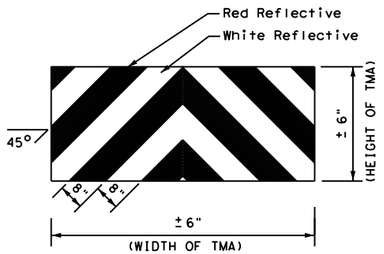
* Conventional Roads Only

** 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

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© TxDOT July, 2013	CONT	SECT	JOB	HIGHWAY
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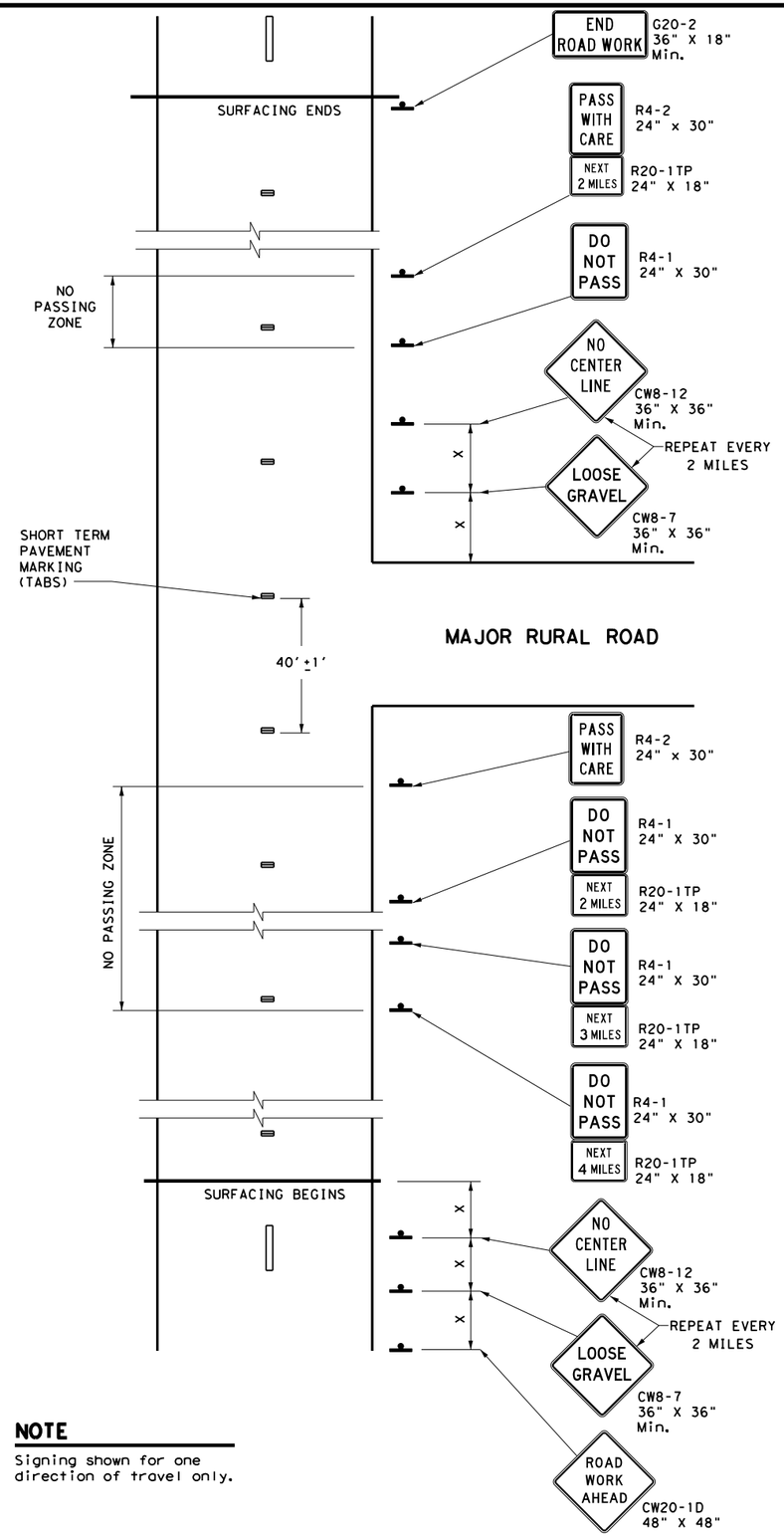
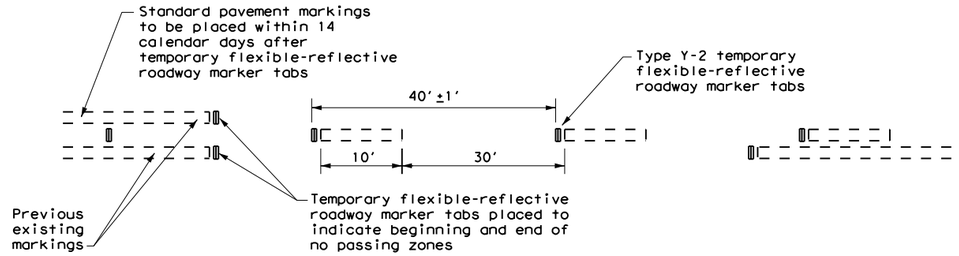


NOTE

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	1057	03	051	FM 510
4-92 4-98	DIST	COUNTY		SHEET NO.
1-97 7-13	PHR	CAMERON		89

210

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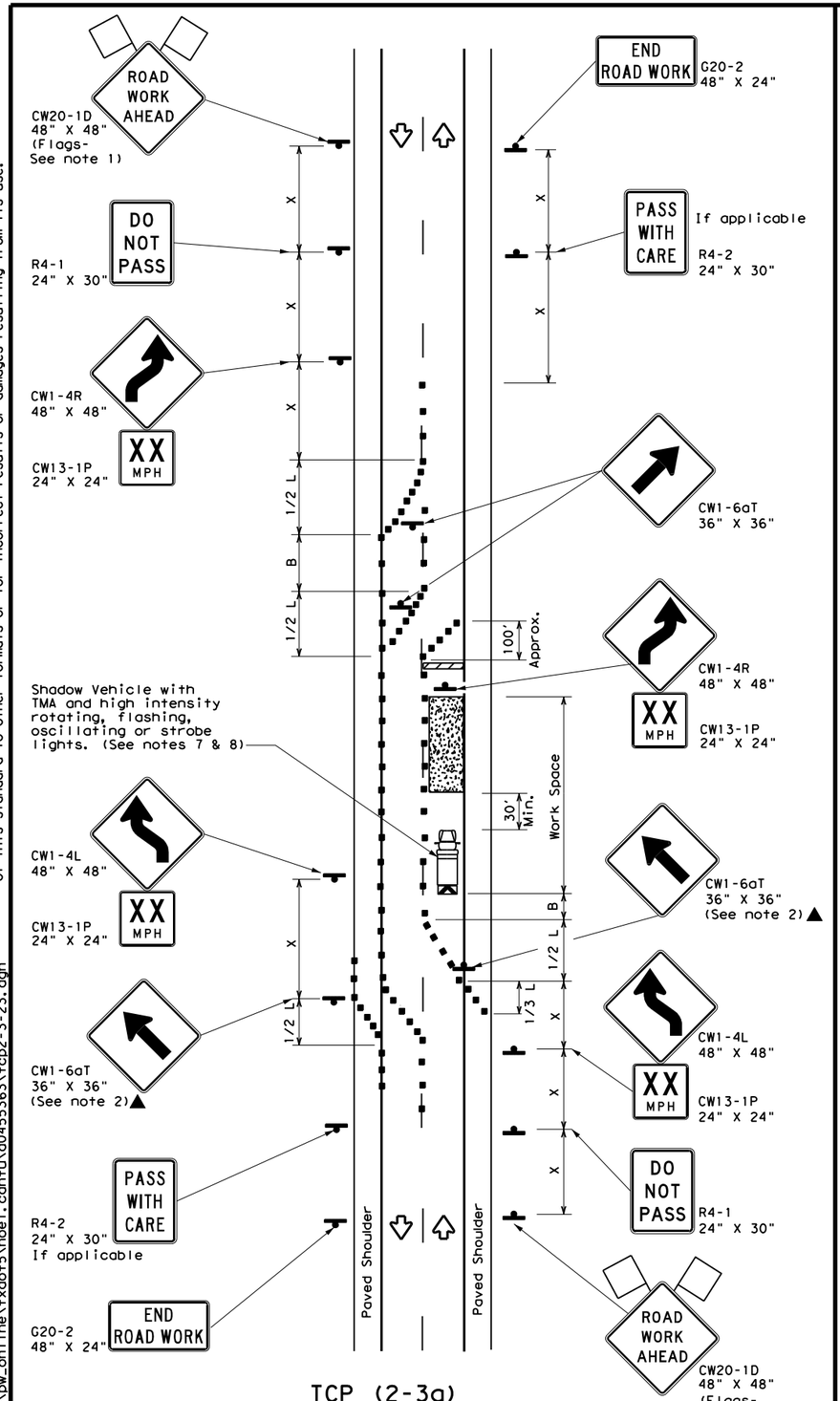
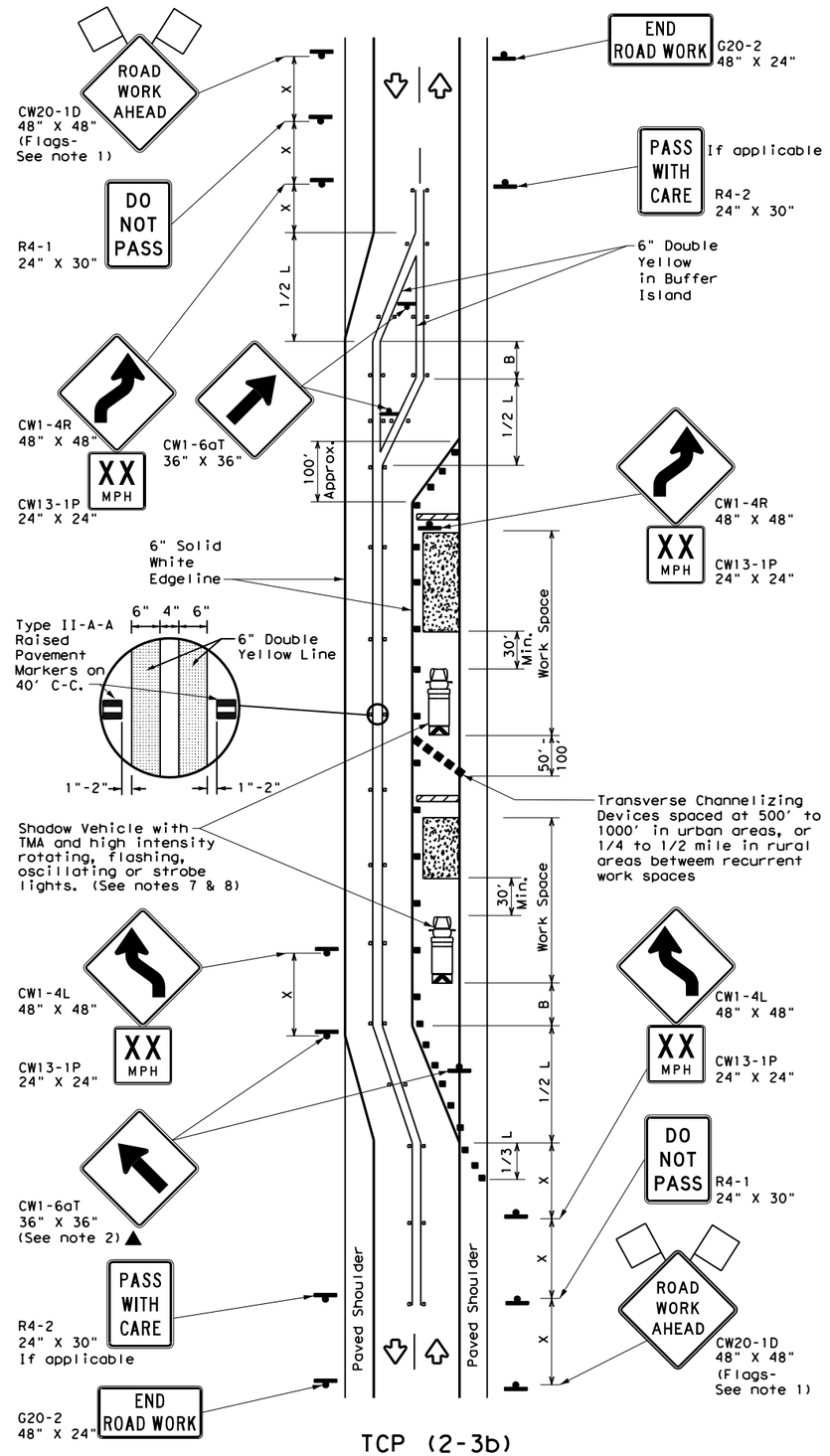


TCP (2-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



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

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

TCP (2-3a)

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

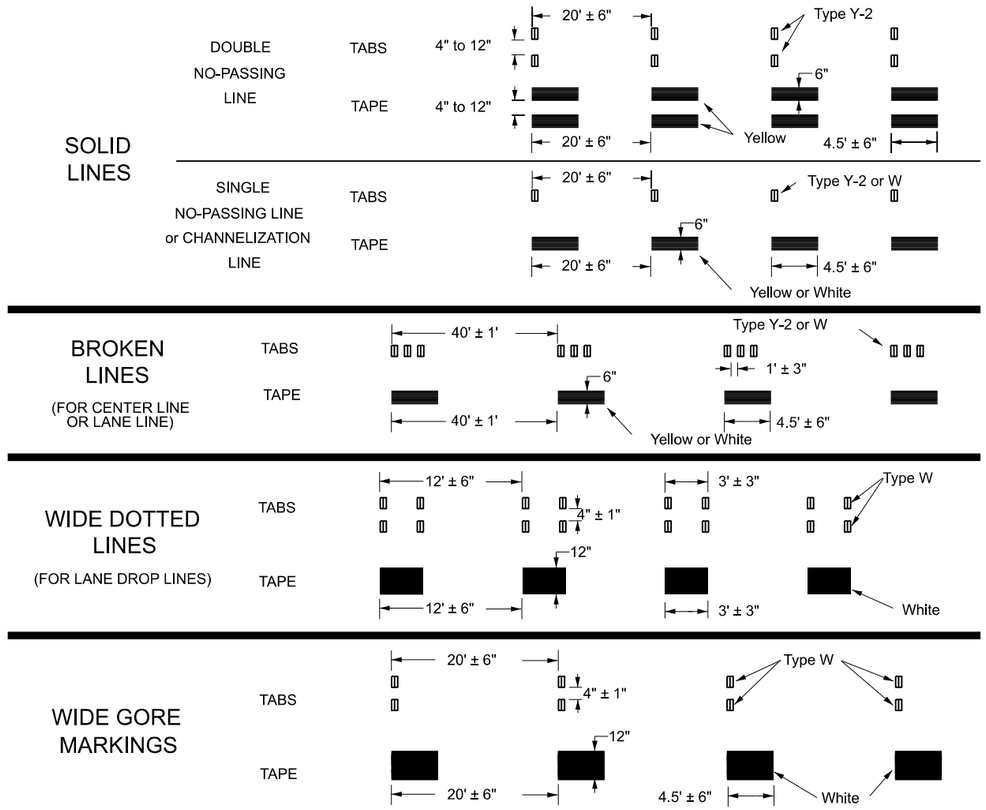
Texas Department of Transportation — *Traffic Safety Division Standard*

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO-LANE ROADS

TCP(2-3)-23

FILE: tcp(2-3)-23.dgn	DN:	CK:	DW:	CK:
© TxDOT April 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-85 4-98 2-18	1057	03	051	FM 510
8-95 3-03 4-23	DIST	COUNTY		SHEET NO.
1-97 2-12	PHR	CAMERON		90

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



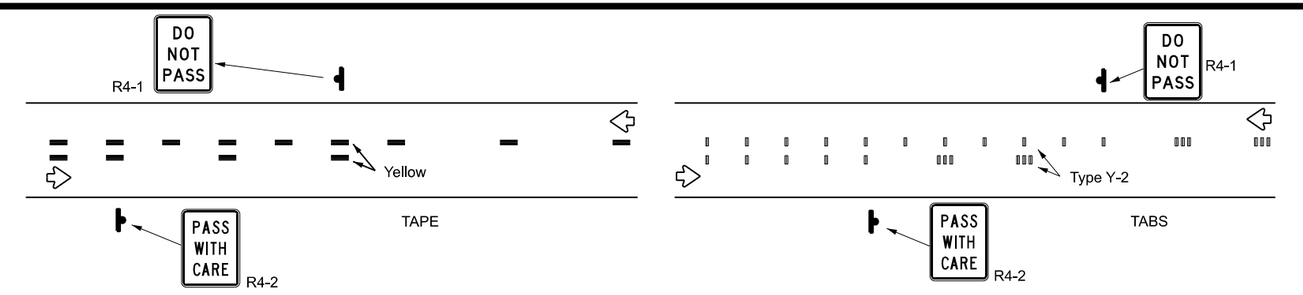
NOTES:

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

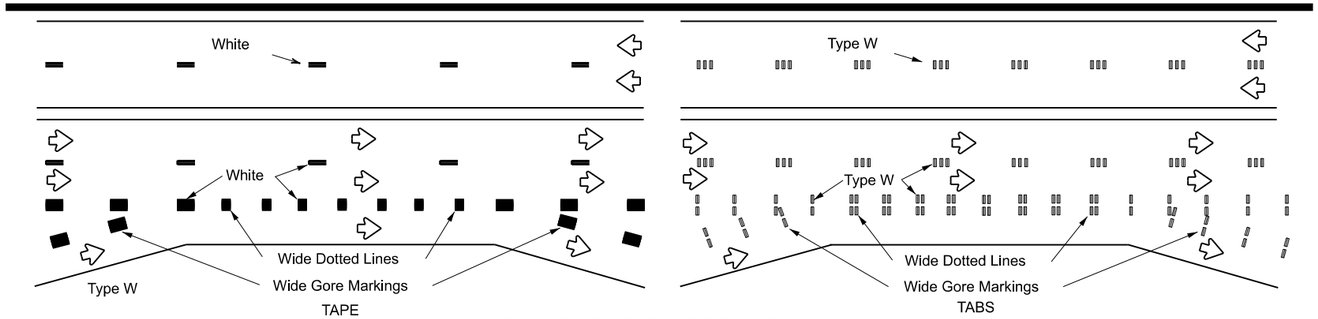
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

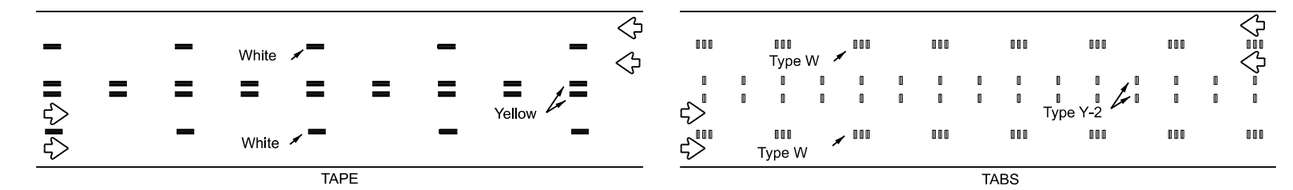
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



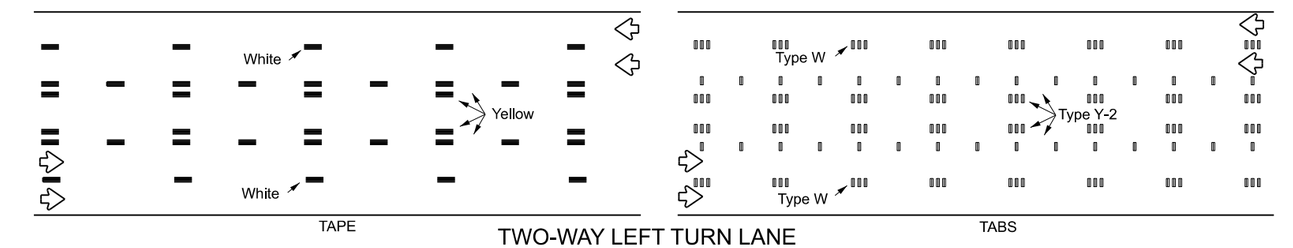
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



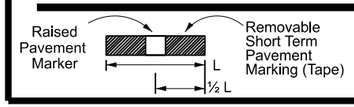
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

1. DMSs referenced above can be found along with embedded links to their respective MPLs at the following website:

http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm

Texas Department of Transportation

Traffic Safety Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-23

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© TxDOT February 2023	CONT	SECT	JOB	HIGHWAY
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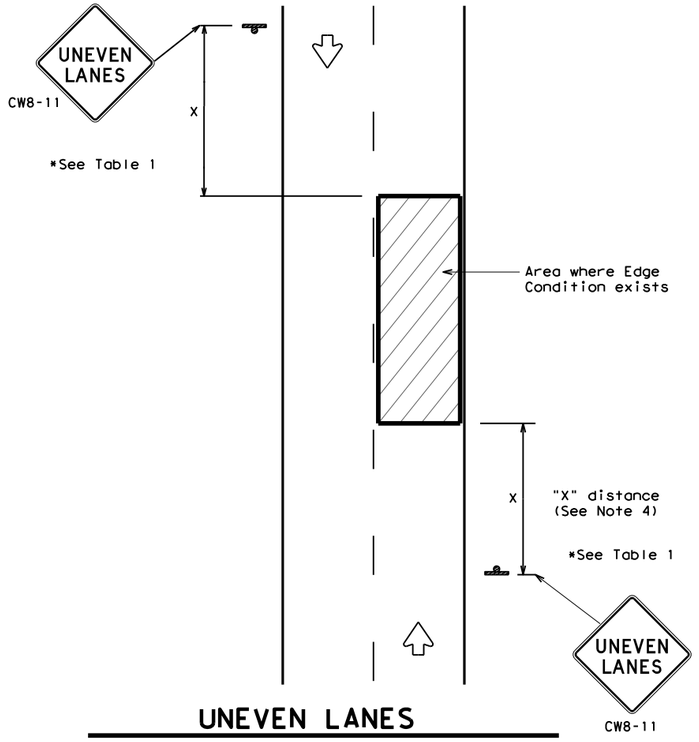
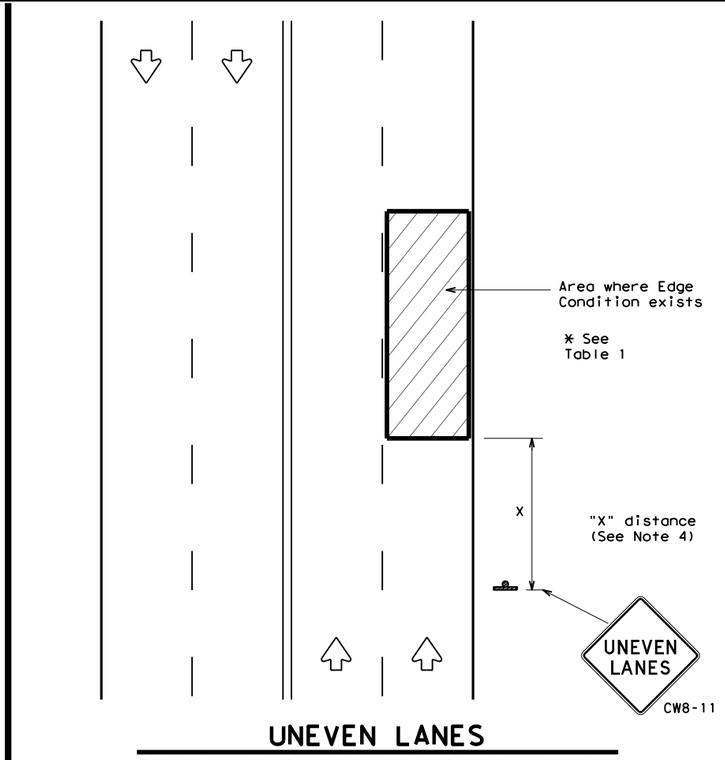
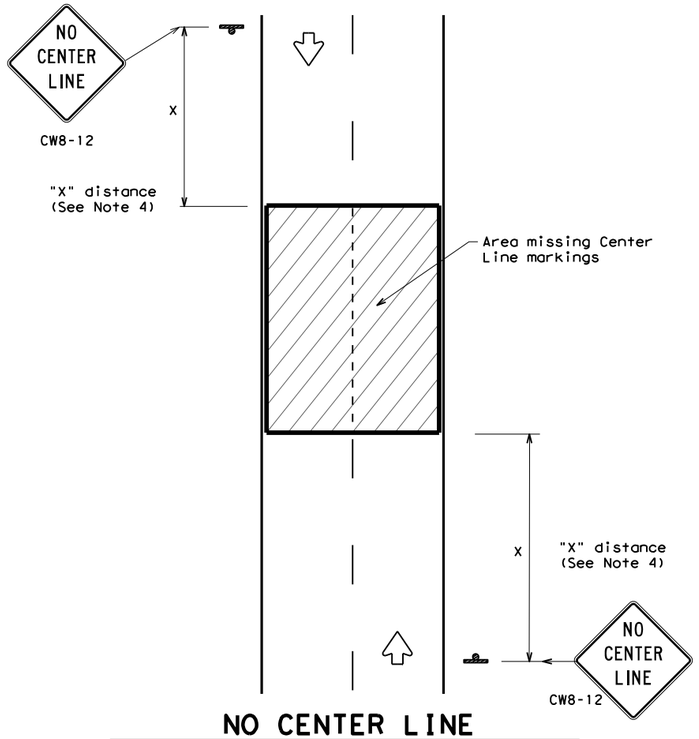


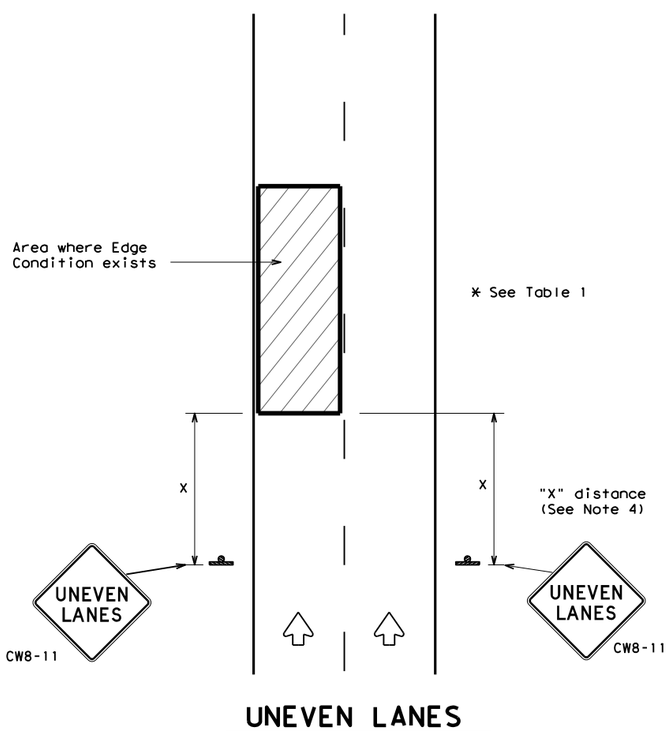
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

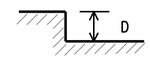
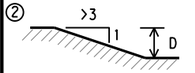
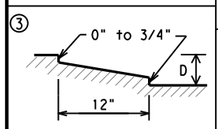
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

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

TABLE 1

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

SIGNING FOR UNEVEN LANES

WZ(UL)-13

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©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
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1-97 3-03	PHR	CAMERON		92

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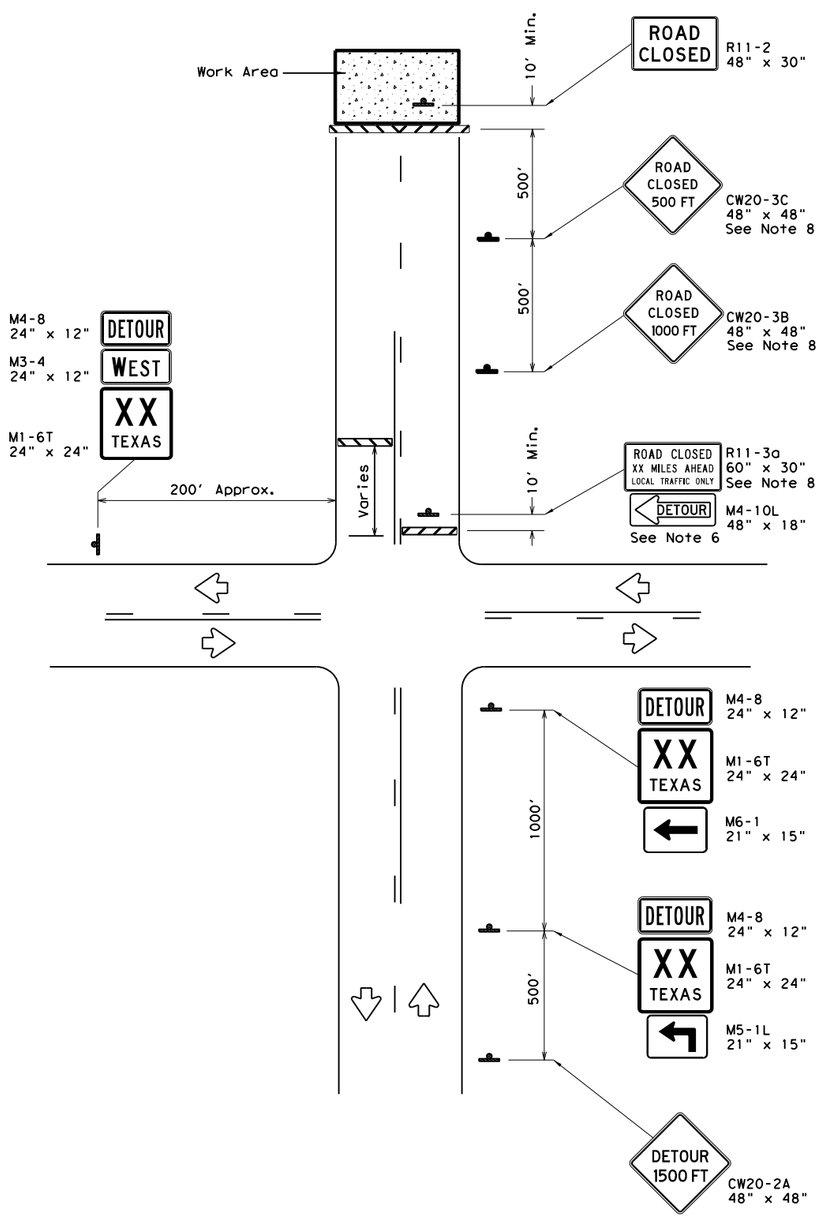
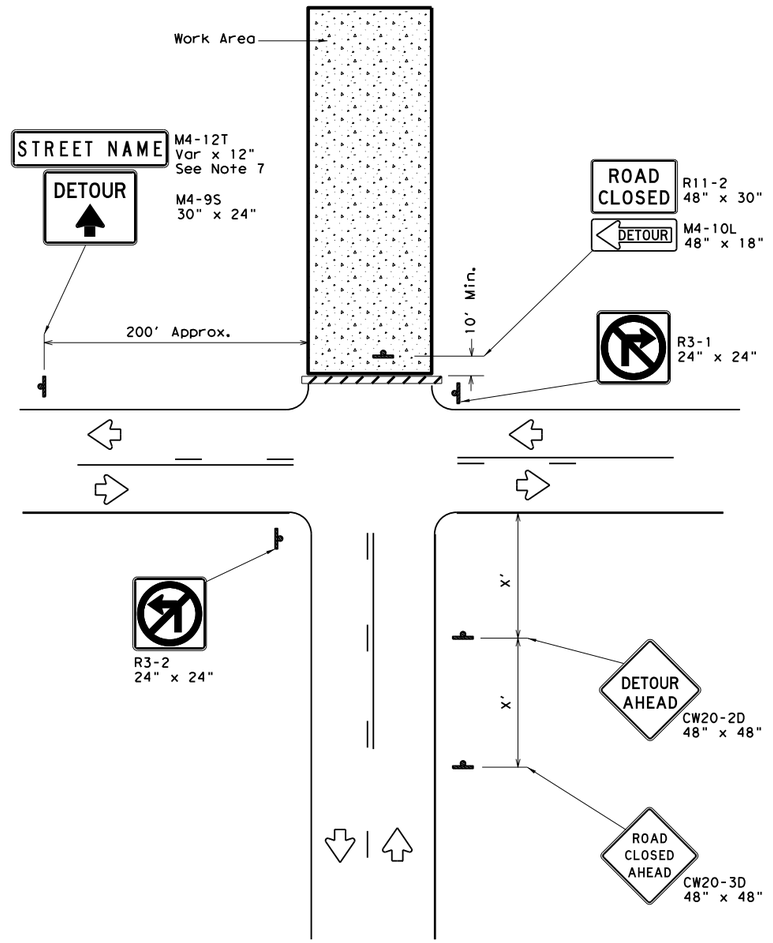


ROAD CLOSURE BEYOND THE INTERSECTION

Signing for a Numbered Route with an Off-Site Detour



ROAD CLOSURE AT THE INTERSECTION

Signing for an Un-numbered Route with an Off-Site Detour

LEGEND	
	Type 3 Barricade
	Sign

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

GENERAL NOTES

1. This sheet is intended to provide details for temporary work zone road closures. For permanent road closure details see the D&OM standards.
2. Barricades used shall meet the requirements shown on Barricade and Construction Standard BC(10) and listed on the Compliant Work Zone Traffic Control Devices list (CWZTCD).
3. Stockpiled materials shall not be placed on the traffic side of barricades.
4. Barricades at the road closure should extend from pavement edge to pavement edge.
5. Detour signing shown is intended to illustrate the type of signing that is appropriate for numbered routes or un-numbered routes as labeled. It does not indicate the full extent of detour signing required. Detour routes should be signed as shown elsewhere in the plans.
6. If the road is open for a significant distance beyond the intersection or there are significant origin/destination points beyond the intersection, the signs and barricades at this location should be located at the edge of the traveled way.
7. The Street Name (M4-12T) sign is to be placed above the DETOUR (M4-9S) sign.
8. For urban areas where there is a shorter distance between the intersection and the actual closure location, the ROAD CLOSED XX MILES AHEAD (R11-3a) sign may be replaced with a ROAD CLOSED TO THRU TRAFFIC (R11-4) sign. If adequate space does not exist between the intersection and the closure a single ROAD CLOSED AHEAD (CW20-3D) sign spaced as per the table above may replace the ROAD CLOSED 1000 FT (CW20-3B) and ROAD CLOSED 500 FT (CW20-3C) signs.
9. Signs and barricades shown shall be subsidiary to Item 502. Locations where these details will be required shall be as shown elsewhere in the plans.

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE ROAD CLOSURE DETAILS

WZ(RCD)-13

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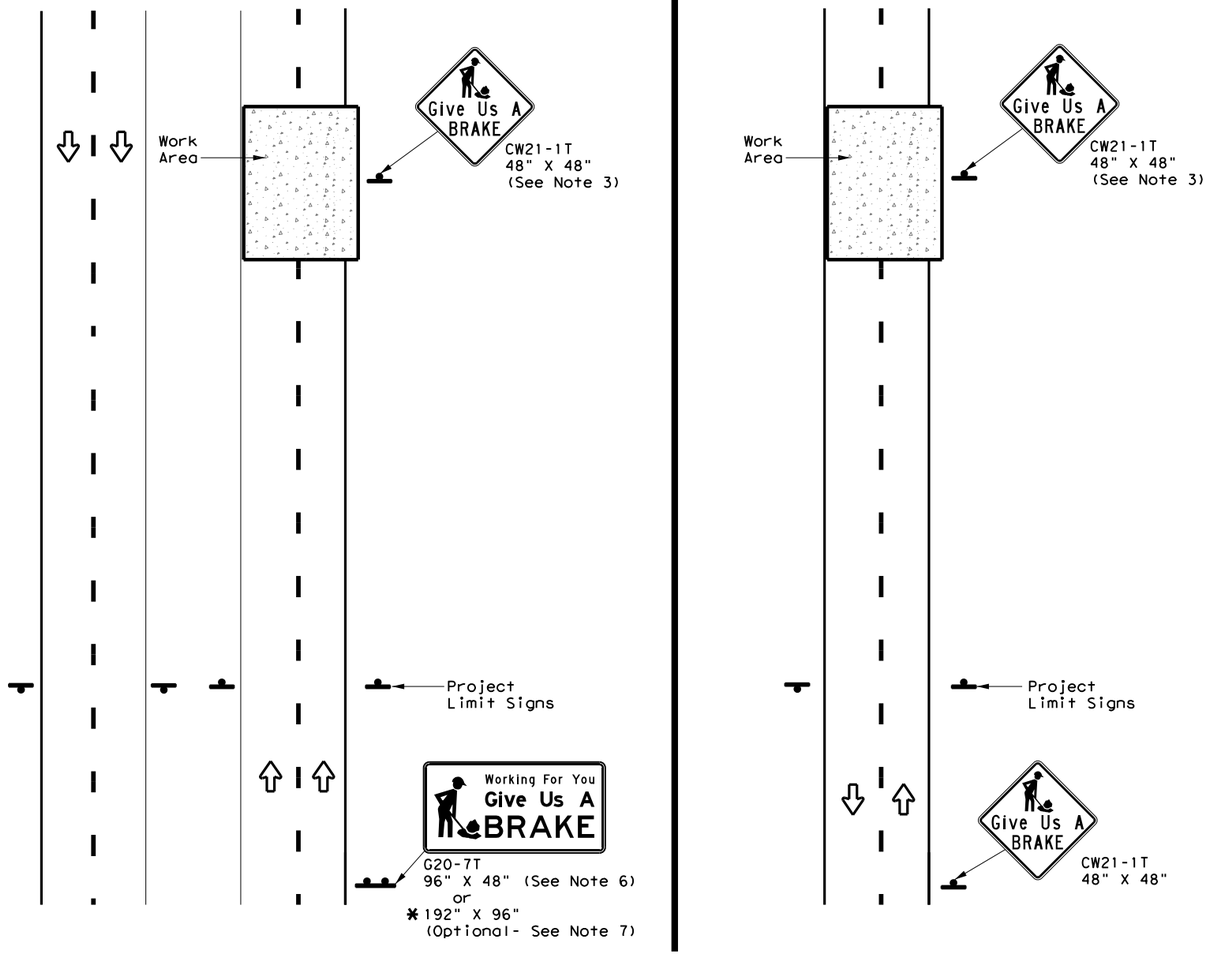

DIVIDED HIGHWAY

UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

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

SUMMARY OF LARGE SIGNS

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

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

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

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

GENERAL NOTES

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

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	1057	03	051	FM 510
6-96 5-98 7-13	DIST	COUNTY		SHEET NO.
8-96 3-03	PHR	CAMERON		94

116

DATE: 6/13/2024 10:38:10 AM
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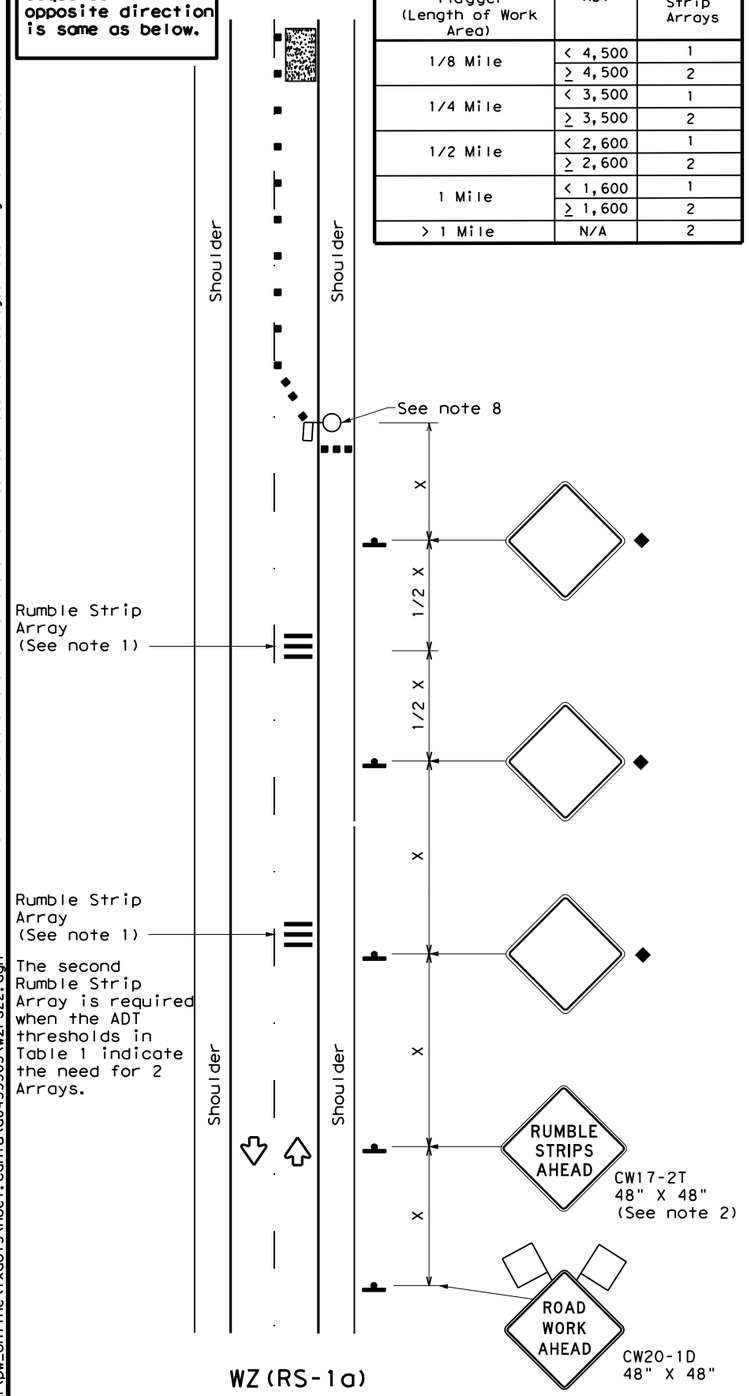
DATE: 6/13/2024 10:38:14 AM
FILE: c:\txdot\pw_online\txdot5\noel.cantu\d0455363\wzrs22.dgn

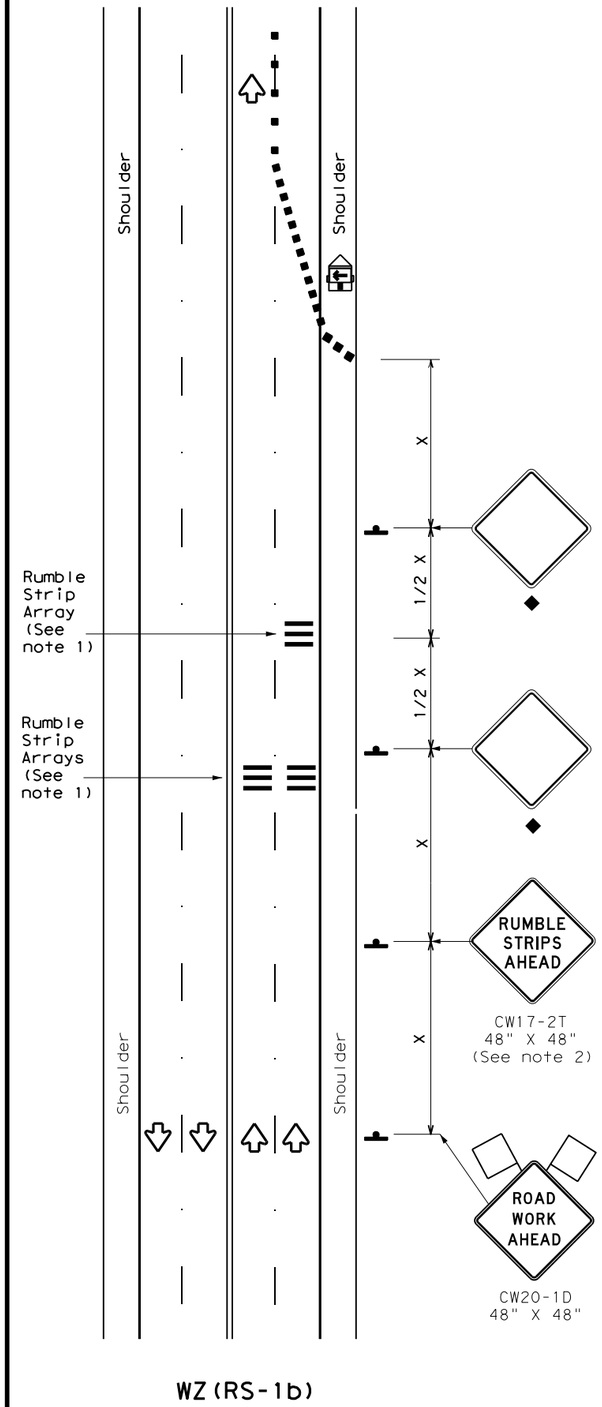
Warning sign and rumble strip sequence in opposite direction is same as below.

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



WZ(RS-1a)

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

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

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

* Conventional Roads Only

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

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

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

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

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

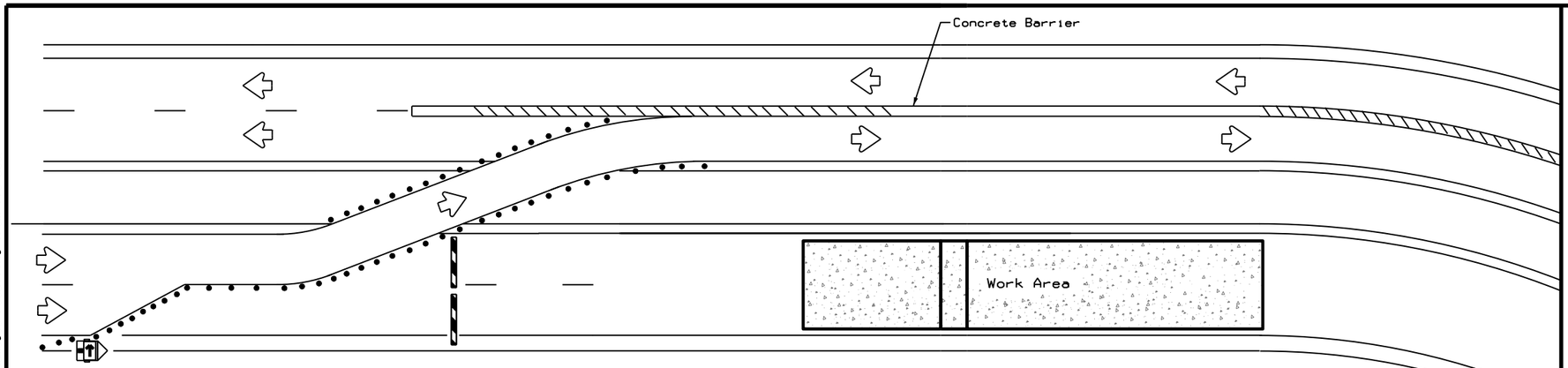
Texas Department of Transportation — Traffic Safety Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-22

FILE: wzrs22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-14 1-22 4-16	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		95

117



NOTES:

1. Length of Safety Glare screen will be specified elsewhere in the plans.
2. The cumulative nominal length of the modular safety glare screen units shall equal the length of the individual sections of temporary concrete traffic barrier on which they are installed so the joint between barrier sections will not be spanned by any one safety glare screen unit.
3. Screen Panel/blades will be designed such that reflective sheeting conforming with Departmental Material Specification DMS-8300, Sign Face Materials, Type B or C Yellow, minimum size of 2 inches by 12 inches can be attached to the edge of the panel/blade. The sheeting shall be attached to one glare screen panel/blade per section of concrete barrier not to exceed a spacing of 30 feet. Barrier reflectors are not necessary when panel/blades are installed with reflective sheeting as described.
4. Payment for these devices will be under statewide Special Specification "Modular Glare Screens for Headlight Barrier."
5. This detail is only intended to show types of locations where Glare Screens would be appropriate. Required signing and other devices shall be as shown elsewhere in the plans.

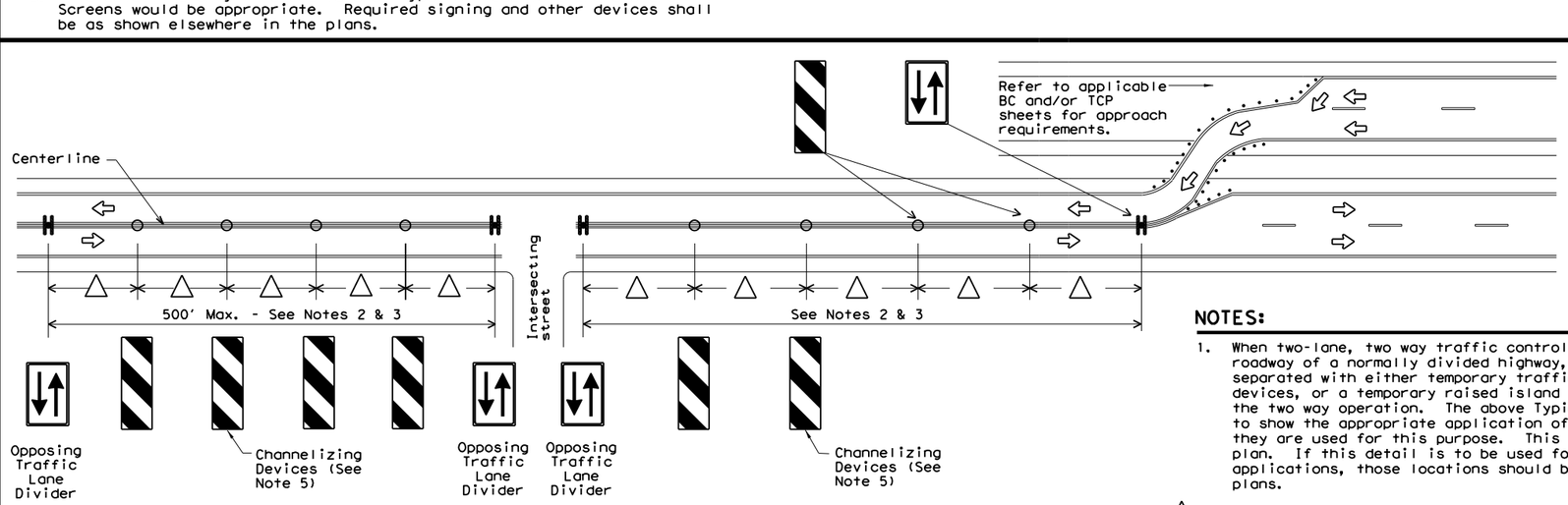
BARRIER DELINEATION WITH MODULAR GLARE SCREENS

LEGEND	
	Type 3 Barricade
• • •	Channelizing Devices
	Trailer Mounted Flashing Arrow Board
	Sign
\\\\	Safety glare screen

DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
DELINEATORS AND OBJECT MARKERS	DMS-8600
MODULAR GLARE SCREENS FOR HEADLIGHT BARRIER	DMS-8610

Only pre-qualified products shall be used. A copy of the Compliant Work Zone Traffic Control Devices List" CWZTCD)describes pre-qualified products and their sources and may be found at the following web address:

http://www.txdot.gov/business/resources/producer-list.html



VERTICAL PANELS & OPPOSING TRAFFIC LANE DIVIDERS (OTLD) SEPARATING TWO-WAY TRAFFIC ON NORMALLY DIVIDED HIGHWAYS

NOTES:

1. When two-lane, two way traffic control must be maintained on one roadway of a normally divided highway, opposing traffic shall be separated with either temporary traffic barriers, channelizing devices, or a temporary raised island throughout the length of the two way operation. The above Typical Application is intended to show the appropriate application of channelizing devices when they are used for this purpose. This is not a traffic control plan. If this detail is to be used for other types of roads or applications, those locations should be stated elsewhere in the plans.

△2. Space devices according to the Tangent Spacing shown on the Device Spacing table on BC(9) but not exceeding 100'.

3. Every fifth device should be an OTLD except when spaced closer to accommodate an intersection. An OTLD should be the first device on each side of intersecting streets or roads.
4. Locations where surface mount bases with adhesives or self-righting devices will be required in order to maintain them in their proper position should be noted elsewhere in the plans.
5. Channelizing devices are to be vertical panels, 42" cones or tubular markers that are at least 36" tall. Tubular markers used to separate traffic should have a rubber base weighing at least 30 pounds. Tubular markers that are 42" tall or more shall have four bands of reflective material as detailed for 42" cones on BC(10). Tubular markers less than 42" but at least 36" tall shall have three bands of 3" wide white reflective material spaced 2" apart. Reflective material shall meet DMS-8300, Type A.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TYPICAL DETAILS

WZ(TD)-17

FILE: wztd-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 2-17 3-03 7-13	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		96

110

DATE: 6/13/2024 10:38:19 AM
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ROADWAY
COVER SHEET

DATE: 6/13/2024 3:52:46 PM
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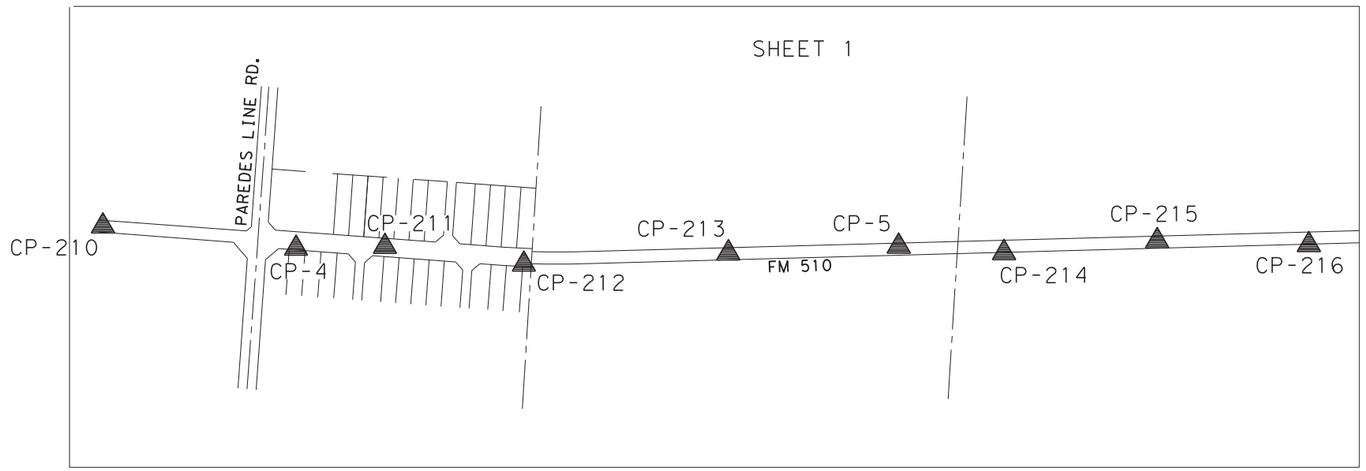
Pharr District Central Design

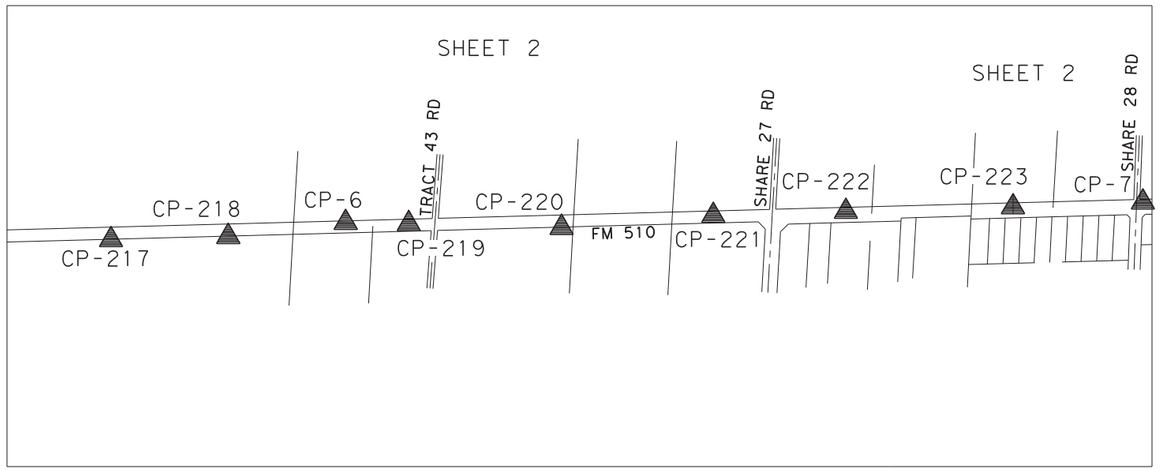
Texas Department of Transportation

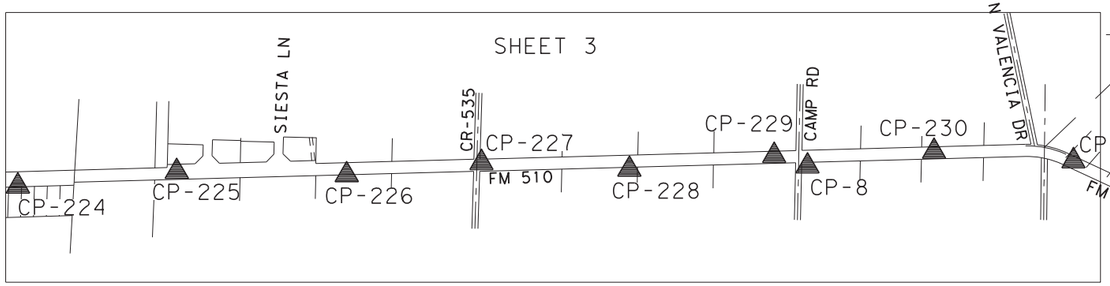
FM 510

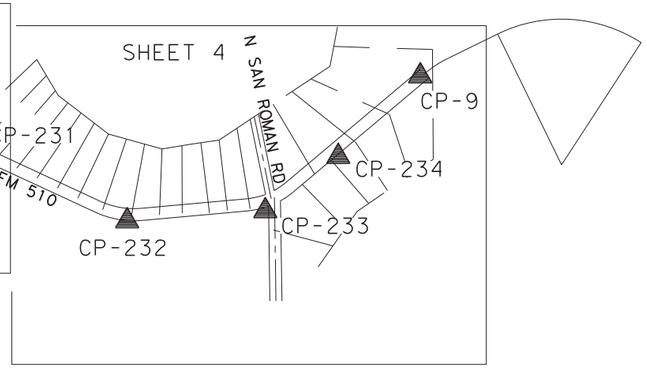
ROADWAY
COVER SHEET

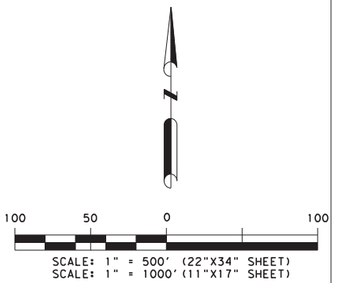
CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		97











NOTES:

1. BEARINGS OF LINES SHOWN HEREON REFER TO GRID NORTH OF THE TEXAS COORDINATE SYSTEM OF 1983, (SOUTH ZONE NAD83 ADJUSTED 2011) EPOCH (2010) AS DERIVED FROM TWO HOUR STATIC SESSIONS AND ADJUSTED LOCALLY FROM TxDOT'S CONTINUOUSLY OPERATING REFERENCE STATIONS (CORS). AN AVERAGE COMBINATION FACTOR OF 0.99996 WAS USED TO SCALE GRID COORDINATES AND DISTANCES TO SURFACE. ALL COORDINATES SHOWN ARE IN SURFACE.
2. THE ELEVATIONS SHOWN ARE NAV88 AND DERIVED FROM THE STATIC SESSIONS. ORTHOMETRIC HEIGHTS WERE CALCULATED BY APPLYING THE GEOID 12b MODEL TO THE ELLIPSOID HEIGHTS.
3. FIELD SURVEYS WERE CONDUCTED BY COBB FENDLEY & ASSOCIATES, INC. SEPTEMBER 2019
4. CONTROL POINTS SHOWN HEREIN WERE ESTABLISHED BY AN ON THE GROUND SURVEY UNDER THE SUPERVISION OF AND CERTIFIED BY OSCAR HERNANDEZ, RPLS 5005, REVISED ON 02/21/2020.

STATE OF TEXAS
REGISTERED
KYLE CARSON SUNDAY
5924
PROFESSIONAL
LAND SURVEYOR

SURVEYOR CERTIFICATION

FIELD NOTES, AND CONTROL COORDINATE VALUES SHOWN HEREON WERE REVIEWED FOR CORRECTNESS, TO UPDATE TITLE BLOCK.

5/5/2022
KYLE CARSON SUNDAY DATE
RPLS #5924

REVISION: 05/05/22

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

CobbFendley
505 East Huntland Drive, Suite 485
Austin, Texas 78752
512.834.9798 | fax 512.834.9553 | www.cobbfendley.com
TBPE NO. F-274 TBPLS NO. 100467

FM 510

SURVEY CONTROL INDEX SHEET

SHEET 1 OF 5

FED. RD. DIV. NO.	FEDERAL PROJECT NO.		SHEET NO.
6			98
STATE	DISTRICT	COUNTY	
TEXAS	PHARR	CAMERON	
CONTROL	SECTION	JOB	HIGHWAY
1057	03	051	FM 510

DATE: #DATE#
PATH: #FILE#

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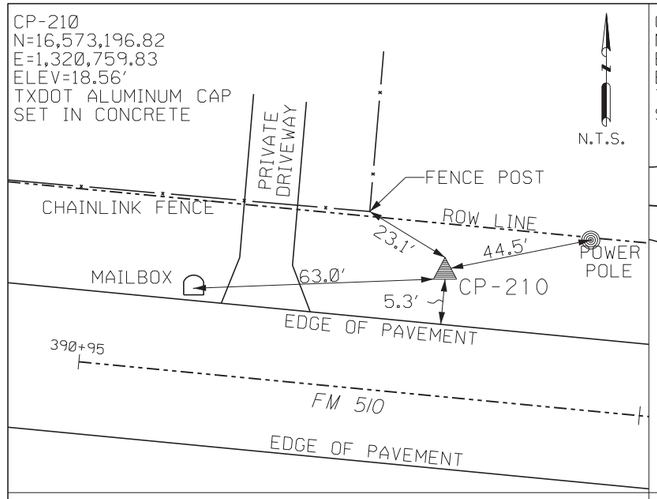

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STA. 391+30.93
LT. 24.13'

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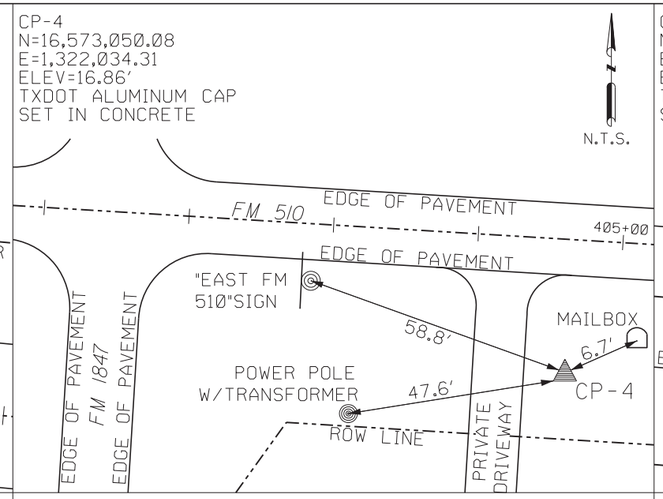

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STA. 404+12.82
RT. 26.49'

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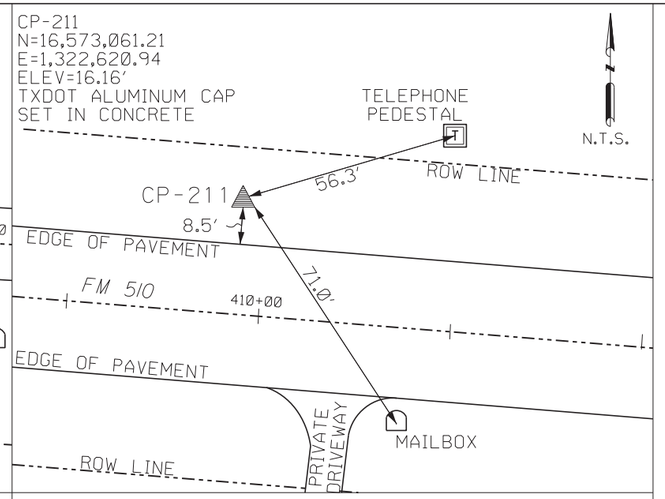

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STA. 409+96.98
LT. 28.44'

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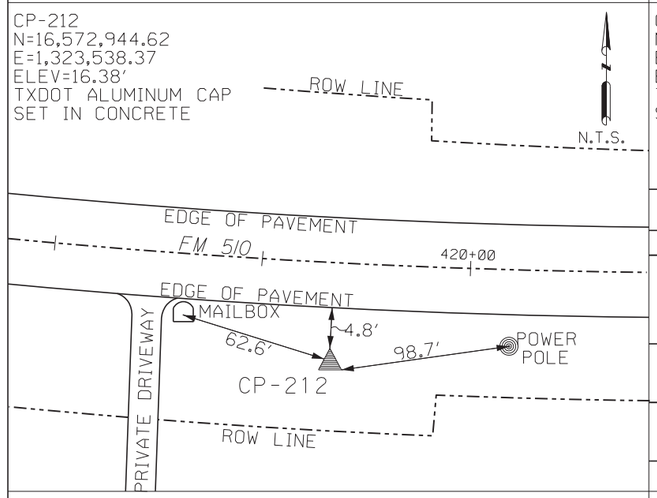

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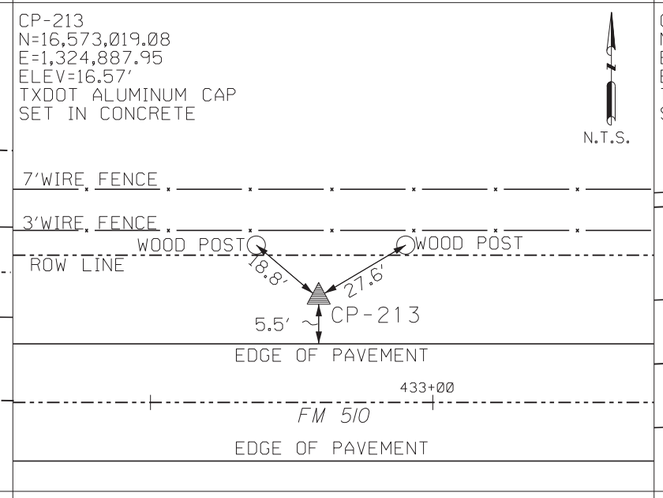

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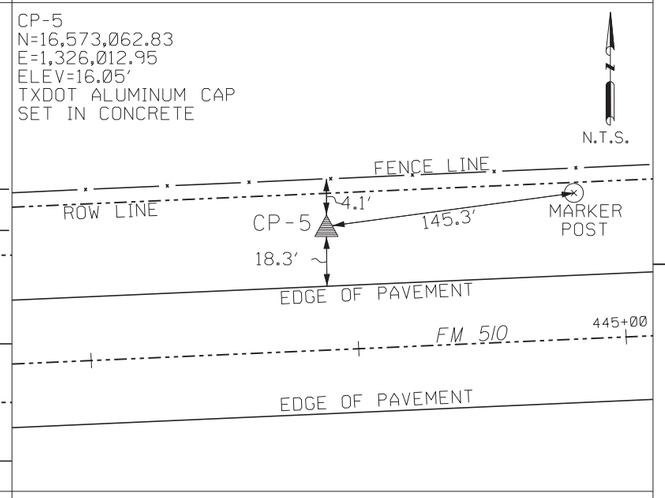

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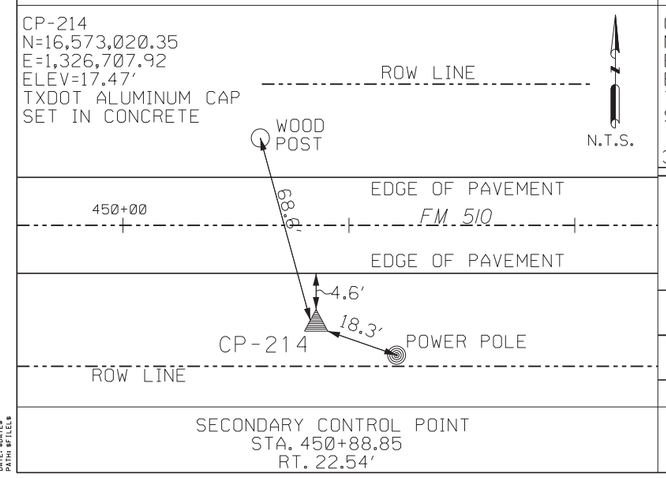

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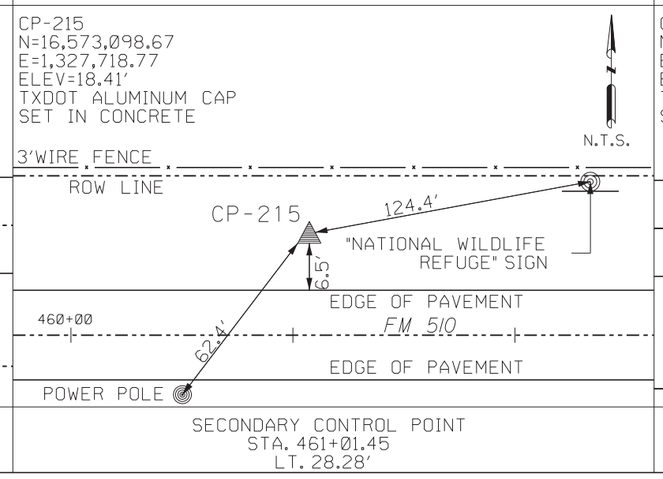

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LT. 28.28'

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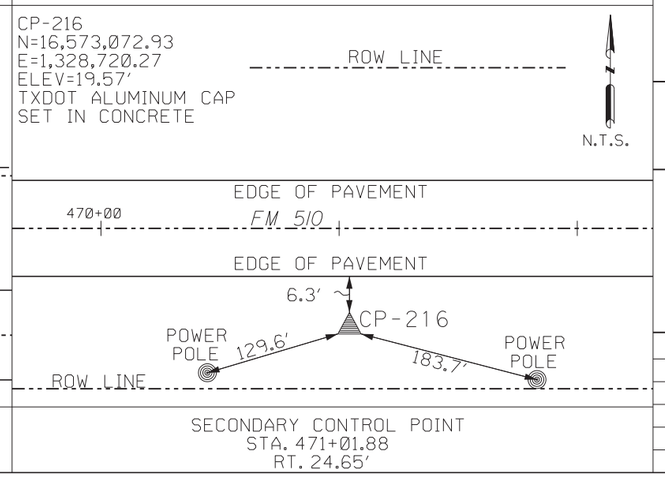

SECONDARY CONTROL POINT
STA. 471+01.88
RT. 24.65'

NOTES:

1.BEARINGS OF LINES SHOWN HEREON REFER TO GRID NORTH OF THE TEXAS COORDINATE SYSTEM OF 1983, (SOUTH ZONE NAD83 ADJUSTED 2011) EPOCH (2010) AS DERIVED FROM TWO HOUR STATIC SESSIONS AND ADJUSTED LOCALLY FROM TxDOT'S CONTINUOUSLY OPERATING REFERENCE STATIONS (CORS). AN AVERAGE COMBINATION FACTOR OF 0.99996 WAS USED TO SCALE GRID COORDINATES AND DISTANCES TO SURFACE. ALL COORDINATES SHOWN ARE IN SURFACE.

2.THE ELEVATIONS SHOWN ARE NAV88 AND DERIVED FROM THE STATIC SESSIONS. ORTHOMETRIC HEIGHTS WERE CALCULATED BY APPLYING THE GEOID 12b MODEL TO THE ELLIPSOID HEIGHTS.

3.FIELD SURVEYS WERE CONDUCTED BY COBB FENDLEY & ASSOCIATES, INC. SEPTEMBER 2019

4.CONTROL POINTS SHOWN HEREIN WERE ESTABLISHED BY AN ON THE GROUND SURVEY UNDER THE SUPERVISION OF AND CERTIFIED BY OSCAR HERNANDEZ, RPLS 5005, REVISED ON 02/21/2020.

STATE OF TEXAS
REGISTERED
KYLE CARSON SUNDAY
5924
PROFESSIONAL
LAND SURVEYOR

SURVEYOR CERTIFICATION

FIELD NOTES, AND CONTROL COORDINATE VALUES SHOWN HEREON WERE REVIEWED FOR CORRECTNESS, TO UPDATE TITLE BLOCK.

5/5/2022
KYLE CARSON SUNDAY — DATE
RPLS #5924

REVISED: 05/05/22

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

CobbFendley
505 East Huntland Drive, Suite 485
Austin, Texas 78752
512.834.9798 | fax 512.834.9553 | www.cobbfendley.com
TBPE NO. F-274 TBPLS NO. 100467

FM 510

HORIZONTAL & VERTICAL CONTROL SHEET

FED. RD. DIV. NO.	FEDERAL PROJECT NO.		SHEET NO.
6			99
STATE	DISTRICT	COUNTY	
TEXAS	PHARR	CAMERON	
CONTROL	SECTION	JOB	HIGHWAY
1057	03	051	FM 510

DATE: 8/24/22
FILE: #FILE#

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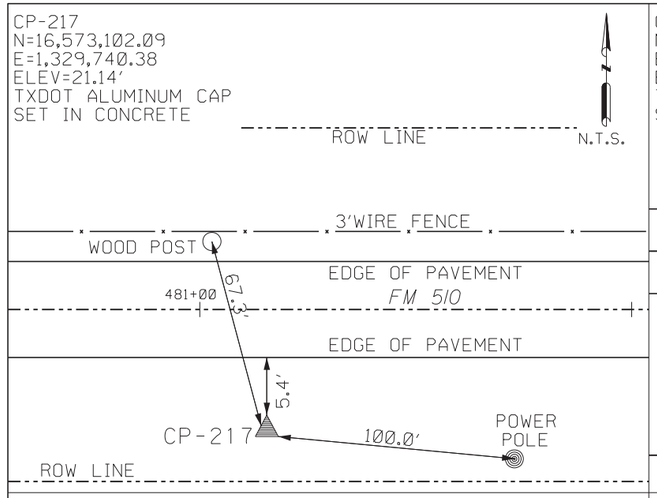

SECONDARY CONTROL POINT
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RT. 23.22'

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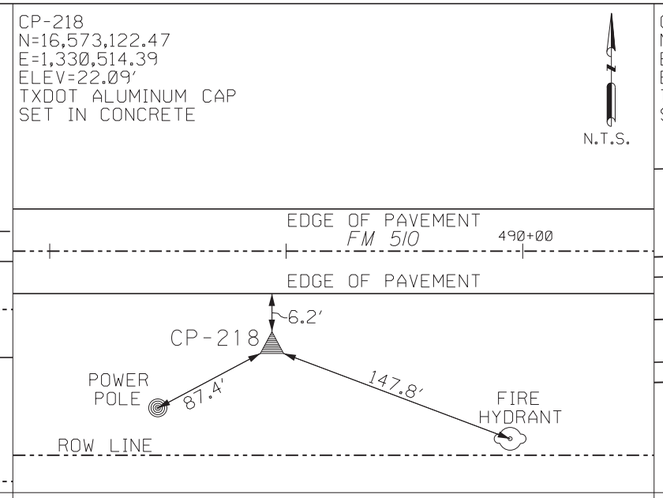

SECONDARY CONTROL POINT
STA. 488+96.69
RT. 23.87'

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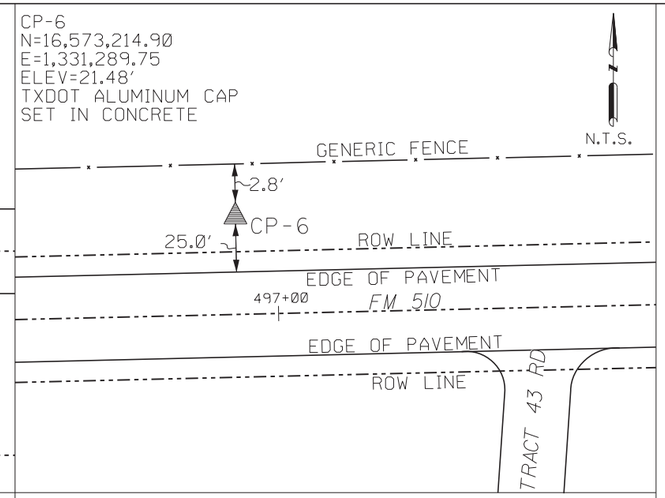


PRIMARY CONTROL POINT
STA. 496+74.28
LT. 47.47'

NOTES:

1.BEARINGS OF LINES SHOWN HEREON REFER TO GRID NORTH OF THE TEXAS COORDINATE SYSTEM OF 1983, (SOUTH ZONE NAD83 ADJUSTED 2011) EPOCH (2010) AS DERIVED FROM TWO HOUR STATIC SESSIONS AND ADJUSTED LOCALLY FROM TxDOT'S CONTINUOUSLY OPERATING REFERENCE STATIONS (CORS). AN AVERAGE COMBINATION FACTOR OF 0.99996 WAS USED TO SCALE GRID COORDINATES AND DISTANCES TO SURFACE. ALL COORDINATES SHOWN ARE IN SURFACE.

2.THE ELEVATIONS SHOWN ARE NAV88 AND DERIVED FROM THE STATIC SESSIONS. ORTHOMETRIC HEIGHTS WERE CALCULATED BY APPLYING THE GEOID 12b MODEL TO THE ELLIPSOID HEIGHTS.

3.FIELD SURVEYS WERE CONDUCTED BY COBB FENDLEY & ASSOCIATES, INC. SEPTEMBER 2019

4.CONTROL POINTS SHOWN HEREIN WERE ESTABLISHED BY AN ON THE GROUND SURVEY UNDER THE SUPERVISION OF AND CERTIFIED BY OSCAR HERNANDEZ, RPLS 5005, REVISED ON 02/21/2020.

STATE OF TEXAS
REGISTERED
KYLE CARSON SUNDAY
5924
PROFESSIONAL
LAND SURVEYOR

SURVEYOR CERTIFICATION

FIELD NOTES, AND CONTROL COORDINATE VALUES SHOWN HEREON WERE REVIEWED FOR CORRECTNESS, TO UPDATE TITLE BLOCK.

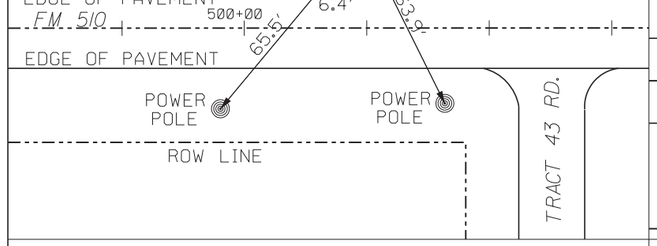
5/5/2022

KYLE CARSON SUNDAY
RPLS #5924
DATE

REVISED: 05/05/22

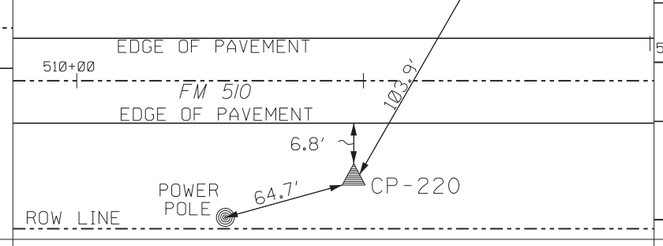
THE SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED IN TO THIS PS&E

CP-219
N=16,573,207.43
E=1,331,705.40
ELEV=24.38'
TXDOT ALUMINUM CAP
SET IN CONCRETE



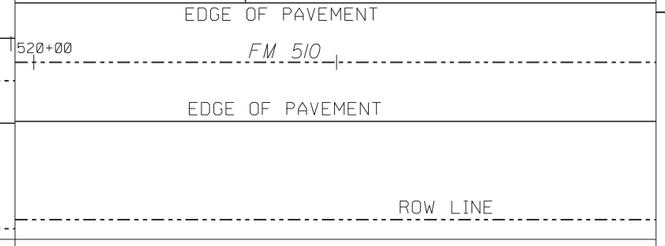
SECONDARY CONTROL POINT
STA. 500+89.57
LT. 28.71'

CP-220
N=16,573,182.31
E=1,332,714.27
ELEV=27.27'
TXDOT ALUMINUM CAP
SET IN CONCRETE



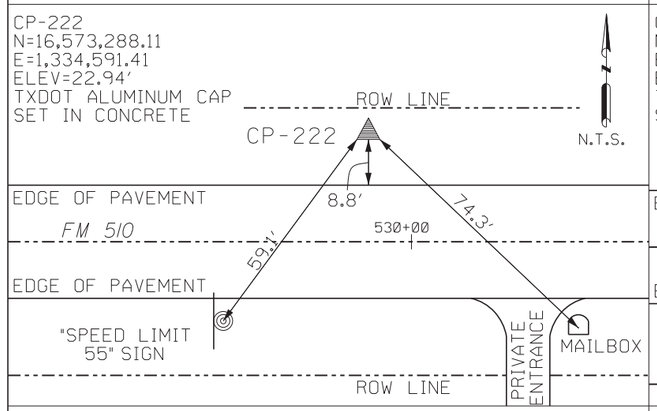
SECONDARY CONTROL POINT
STA. 510+97.37
RT. 24.56'

CP-221
N=16,573,261.29
E=1,333,716.24
ELEV=25.75'
TXDOT ALUMINUM CAP
SET IN CONCRETE



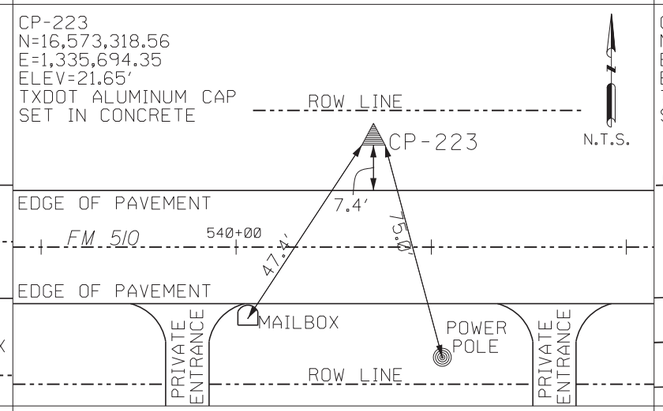
SECONDARY CONTROL POINT
STA. 521+01.16
LT. 26.29'

CP-222
N=16,573,288.11
E=1,334,591.41
ELEV=22.94'
TXDOT ALUMINUM CAP
SET IN CONCRETE



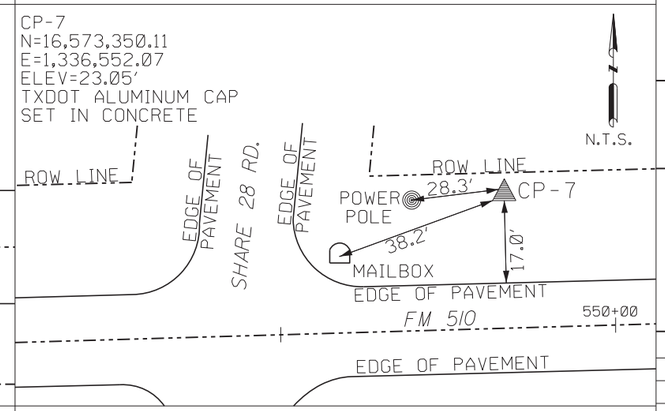
SECONDARY CONTROL POINT
STA. 529+76.70
LT. 29.00'

CP-223
N=16,573,318.56
E=1,335,694.35
ELEV=21.65'
TXDOT ALUMINUM CAP
SET IN CONCRETE



SECONDARY CONTROL POINT
STA. 540+80.07
LT. 29.52'

CP-7
N=16,573,350.11
E=1,336,552.07
ELEV=23.05'
TXDOT ALUMINUM CAP
SET IN CONCRETE



PRIMARY CONTROL POINT
STA. 549+38.33
LT. 37.78'

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TBPE NO. F-274 TBPLS NO. 100467

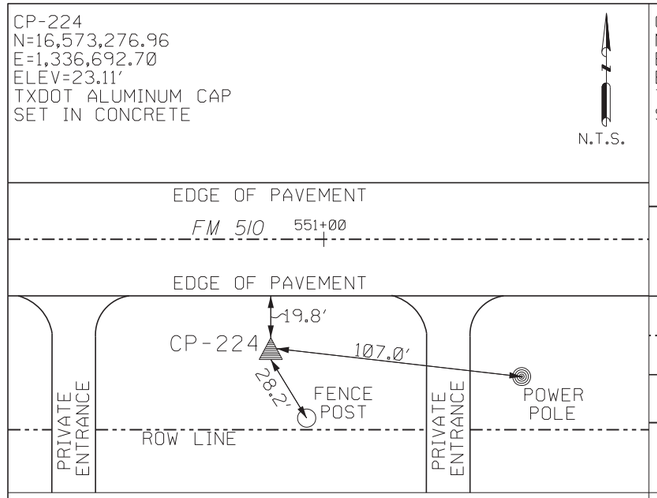
FM 510

HORIZONTAL & VERTICAL CONTROL SHEET

SHEET 3 OF 5

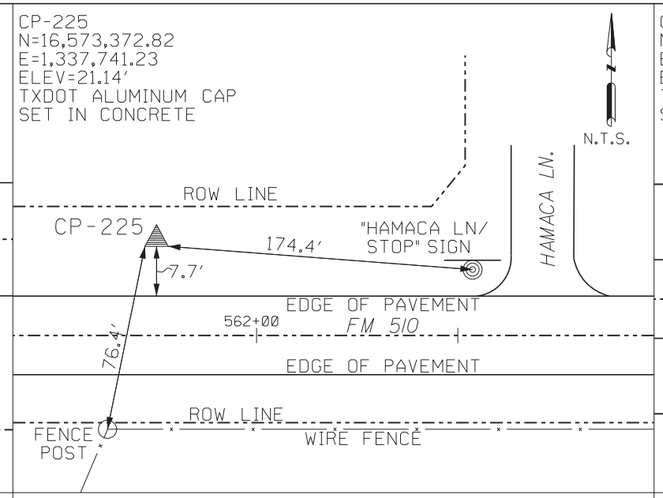
FED. RD. DIV. NO.	FEDERAL PROJECT NO.		SHEET NO.
6			100
STATE	DISTRICT	COUNTY	
TEXAS	PHARR	CAMERON	
CONTROL	SECTION	JOB	HIGHWAY
1057	03	051	FM 510

CP-224
N=16,573,276.96
E=1,336,692.70
ELEV=23.11'
TXDOT ALUMINUM CAP
SET IN CONCRETE



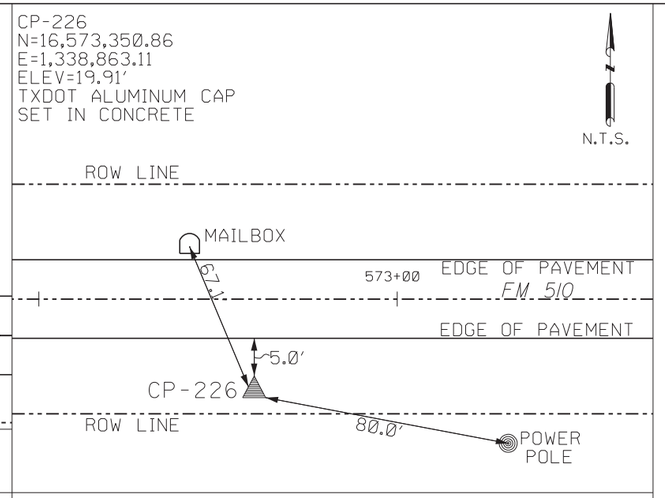
SECONDARY CONTROL POINT
STA. 550+76.91
RT. 39.19'

CP-225
N=16,573,372.82
E=1,337,741.23
ELEV=21.14'
TXDOT ALUMINUM CAP
SET IN CONCRETE



SECONDARY CONTROL POINT
STA. 561+27.67
LT. 27.94'

CP-226
N=16,573,350.86
E=1,338,863.11
ELEV=19.91'
TXDOT ALUMINUM CAP
SET IN CONCRETE



SECONDARY CONTROL POINT
STA. 572+48.53
RT. 24.71'

NOTES:

1.BEARINGS OF LINES SHOWN HEREON REFER TO GRID NORTH OF THE TEXAS COORDINATE SYSTEM OF 1983, (SOUTH ZONE NAD83 ADJUSTED 2011) EPOCH (2010) AS DERIVED FROM TWO HOUR STATIC SESSIONS AND ADJUSTED LOCALLY FROM TxDOT'S CONTINUOUSLY OPERATING REFERENCE STATIONS (CORS). AN AVERAGE COMBINATION FACTOR OF 0.99996 WAS USED TO SCALE GRID COORDINATES AND DISTANCES TO SURFACE. ALL COORDINATES SHOWN ARE IN SURFACE.

2.THE ELEVATIONS SHOWN ARE NAV88 AND DERIVED FROM THE STATIC SESSIONS. ORTHOMETRIC HEIGHTS WERE CALCULATED BY APPLYING THE GEOID 12b MODEL TO THE ELLIPSOID HEIGHTS.

3.FIELD SURVEYS WERE CONDUCTED BY COBB FENDLEY & ASSOCIATES, INC. SEPTEMBER 2019

4.CONTROL POINTS SHOWN HEREIN WERE ESTABLISHED BY AN ON THE GROUND SURVEY UNDER THE SUPERVISION OF AND CERTIFIED BY OSCAR HERNANDEZ, RPLS 5005, REVISED ON 02/21/2020.

STATE OF TEXAS
REGISTERED
KYLE CARSON SUNDAY
5924
PROFESSIONAL
LAND SURVEYOR

SURVEYOR CERTIFICATION

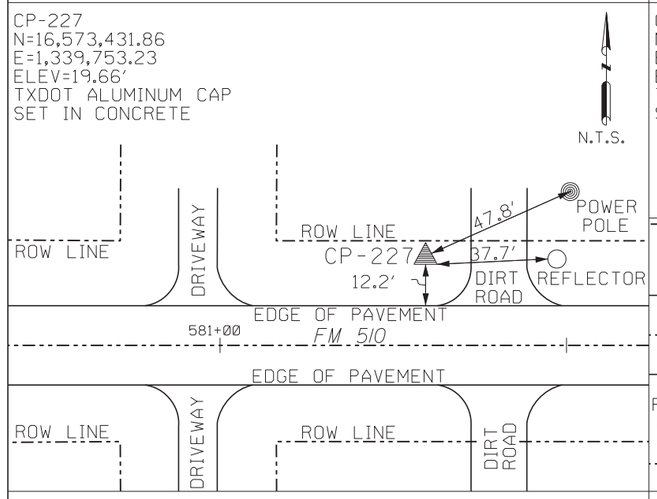
FIELD NOTES, AND CONTROL COORDINATE VALUES SHOWN HEREON WERE REVIEWED FOR CORRECTNESS, TO UPDATE TITLE BLOCK.

5/5/2022
KYLE CARSON SUNDAY DATE
RPLS #5924

REVISED: 05/05/22

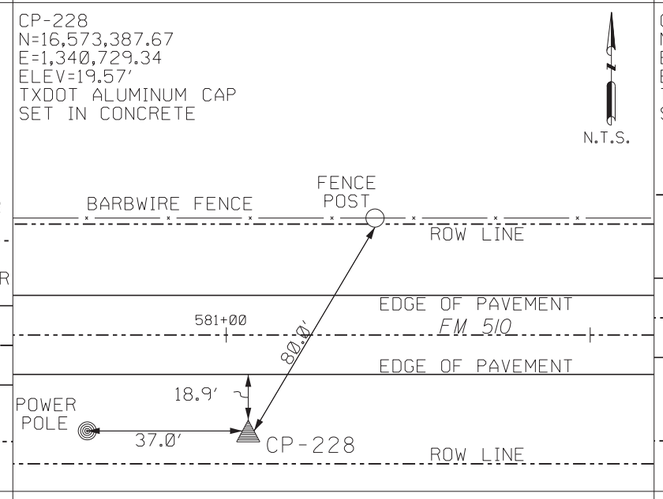
THE SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED IN TO THIS PS&E

CP-227
N=16,573,431.86
E=1,339,753.23
ELEV=19.66'
TXDOT ALUMINUM CAP
SET IN CONCRETE



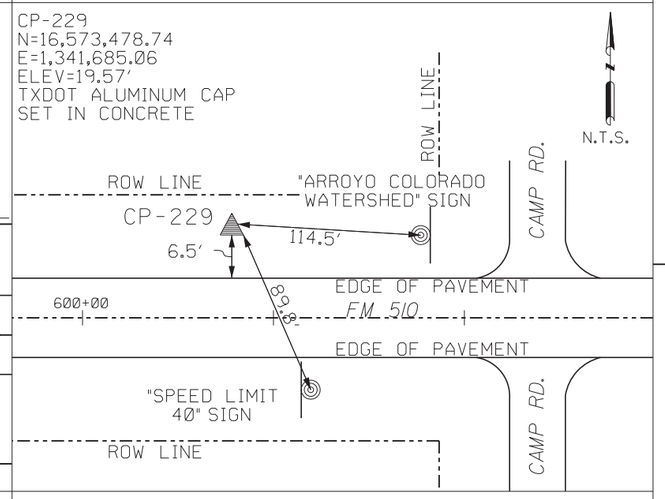
SECONDARY CONTROL POINT
STA. 581+40.50
LT. 31.96'

CP-228
N=16,573,387.67
E=1,340,729.34
ELEV=19.57'
TXDOT ALUMINUM CAP
SET IN CONCRETE



SECONDARY CONTROL POINT
STA. 591+15.10
RT. 37.91'

CP-229
N=16,573,478.74
E=1,341,685.06
ELEV=19.57'
TXDOT ALUMINUM CAP
SET IN CONCRETE



SECONDARY CONTROL POINT
STA. 600+72.89
LT. 27.97'

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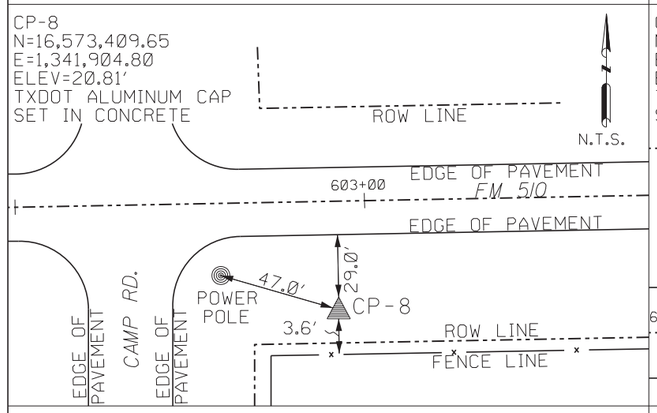
FM 510

HORIZONTAL & VERTICAL CONTROL SHEET

SHEET 4 OF 5

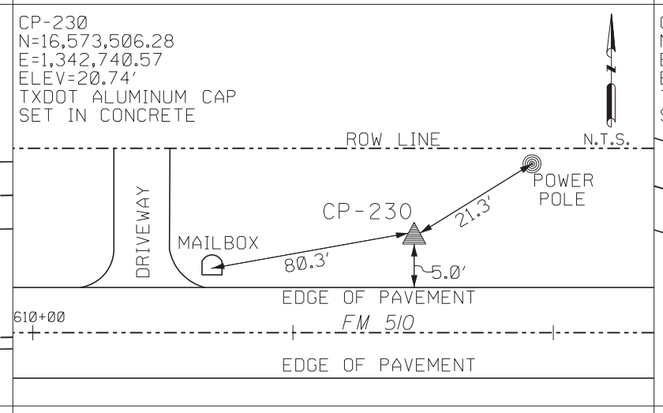
FED. RD. DIV. NO.	FEDERAL PROJECT NO.		SHEET NO.
6			101
STATE	DISTRICT	COUNTY	
TEXAS	PHARR	CAMERON	
CONTROL	SECTION	JOB	HIGHWAY
1057	03	051	FM 510

CP-8
N=16,573,409.65
E=1,341,904.80
ELEV=20.81'
TXDOT ALUMINUM CAP
SET IN CONCRETE



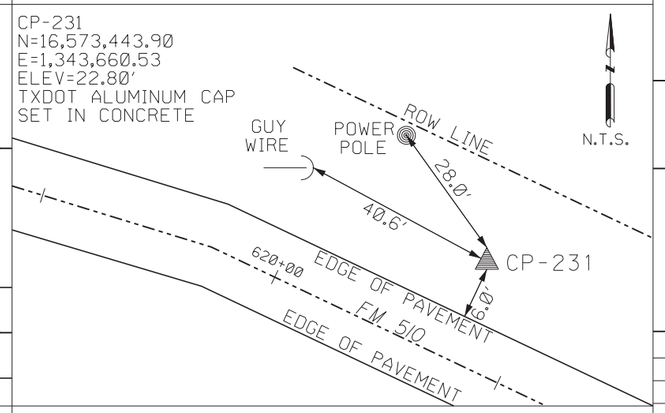
PRIMARY CONTROL POINT
STA. 602+90.61
RT. 47.06'

CP-230
N=16,573,506.28
E=1,342,740.57
ELEV=20.74'
TXDOT ALUMINUM CAP
SET IN CONCRETE



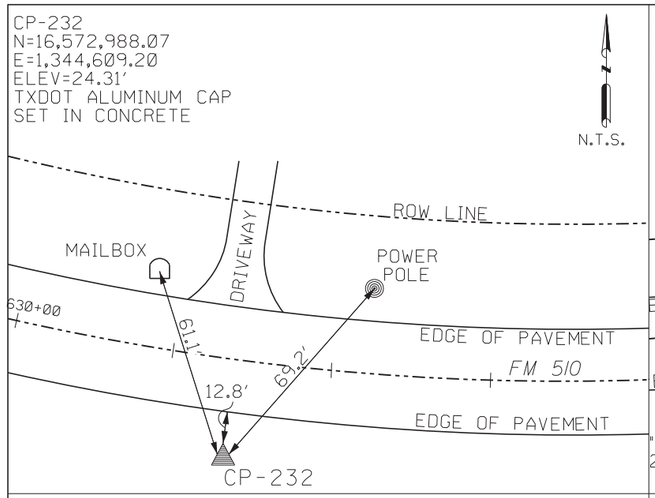
SECONDARY CONTROL POINT
STA. 611+28.84
LT. 25.11'

CP-231
N=16,573,443.90
E=1,343,660.53
ELEV=22.80'
TXDOT ALUMINUM CAP
SET IN CONCRETE



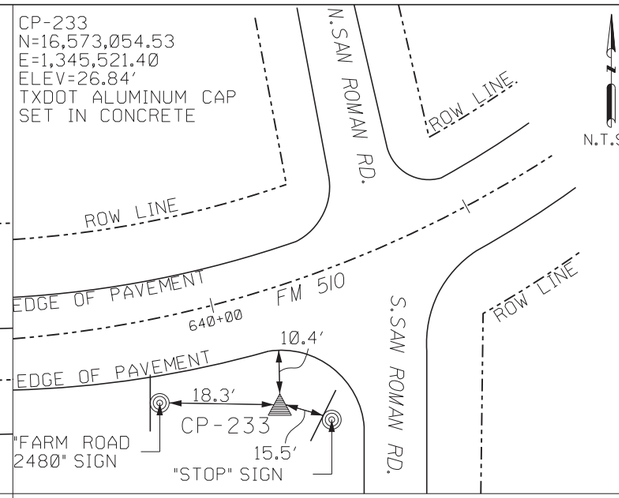
SECONDARY CONTROL POINT
STA. 620+50.99
LT. 24.65'

CP-232
N=16,572,988.07
E=1,344,609.20
ELEV=24.31'
TXDOT ALUMINUM CAP
SET IN CONCRETE



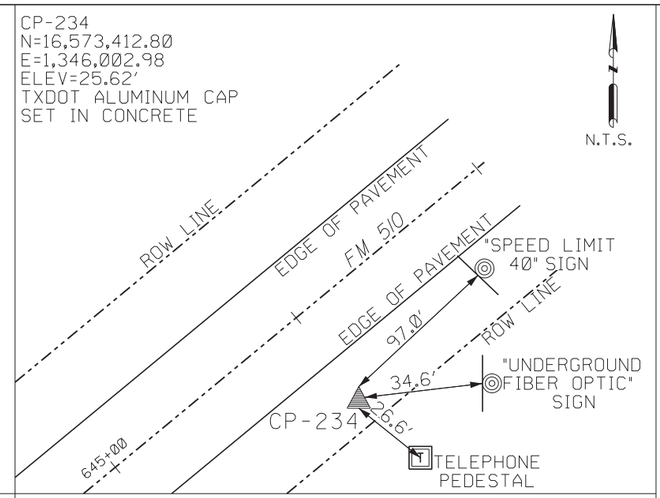
SECONDARY CONTROL POINT
STA. 631+00.60
RT. 21.28'

CP-233
N=16,573,054.53
E=1,345,521.40
ELEV=26.84'
TXDOT ALUMINUM CAP
SET IN CONCRETE



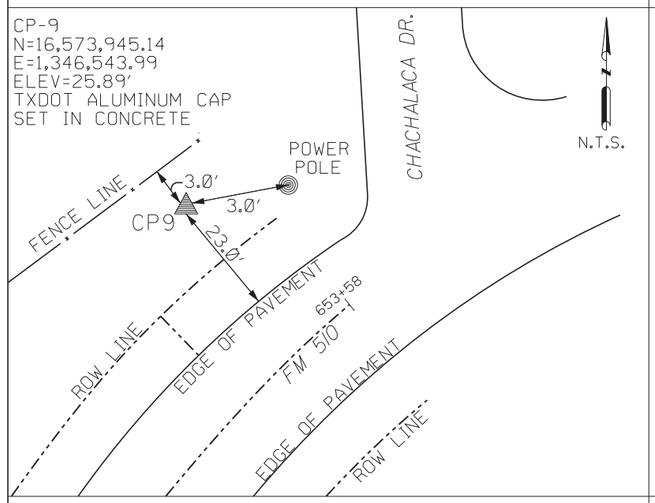
SECONDARY CONTROL POINT
STA. 640+05.06
RT. 38.73'

CP-234
N=16,573,412.80
E=1,346,002.98
ELEV=25.62'
TXDOT ALUMINUM CAP
SET IN CONCRETE



SECONDARY CONTROL POINT
STA. 645+94.87
RT. 24.88'

CP-9
N=16,573,945.14
E=1,346,543.99
ELEV=25.89'
TXDOT ALUMINUM CAP
SET IN CONCRETE



PRIMARY CONTROL POINT
STA. 653+50.35
RT. 48.10'

NOTES:

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STATE OF TEXAS
REGISTERED
KYLE CARSON SUNDAY
5924
PROFESSIONAL
LAND SURVEYOR

SURVEYOR CERTIFICATION

FIELD NOTES, AND CONTROL COORDINATE VALUES SHOWN HEREON WERE REVIEWED FOR CORRECTNESS, TO UPDATE TITLE BLOCK.

5/5/2022

KYLE CARSON SUNDAY DATE
RPLS #5924

REVISED: 05/05/22

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

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FM 510

HORIZONTAL & VERTICAL CONTROL SHEET

SHEET 5 OF 5

FED. RD. DIV. NO.	FEDERAL PROJECT NO.		SHEET NO.
6			102
STATE	DISTRICT	COUNTY	
TEXAS	PHARR	CAMERON	
CONTROL	SECTION	JOB	HIGHWAY
1057	03	051	FM 510

HORIZONTAL ALIGNMENT REPORT - FM 510

Alignment name: FM 510

==========

Point 1000 N 16,573,107.41 E 1,321,624.63 Sta 400+00.00

Course from 1000 to 1001 S 85° 41' 16.47" E Dist 147.50

Point 1001 N 16,573,096.32 E 1,321,771.71 Sta 401+47.50

Course from 1001 to PC FM510_011 S 85° 42' 54.52" E Dist 1,549.83

Curve Data

Curve FM510_011
P.I. Station 419+90.21 N 16,572,958.64 E 1,323,609.27
Delta = 5° 51' 09.65" (LT)
Degree = 1° 00' 00.00"
Tangent = 292.89
Length = 585.27
Radius = 5,729.58
External = 7.48
Long Chord = 585.01
Mid. Ord. = 7.47
P.C. Station 416+97.33 N 16,572,980.52 E 1,323,317.20
P.T. Station 422+82.59 N 16,572,966.65 E 1,323,902.05
C.C. N 16,578,694.08 E 1,323,745.29
Back = S 85° 42' 54.52" E
Ahead = N 88° 25' 55.83" E
Chord Bear = S 88° 38' 29.35" E

Course from PT FM510_011 to PC FM510_012 N 88° 25' 55.83" E Dist 19,378.84

Curve Data

Curve FM510_012
P.I. Station 618+61.51 N 16,573,502.34 E 1,343,473.64
Delta = 26° 31' 33.69" (RT)
Degree = 6° 45' 00.00"
Tangent = 200.08
Length = 392.98
Radius = 848.83
External = 23.26
Long Chord = 389.48
Mid. Ord. = 22.64
P.C. Station 616+61.44 N 16,573,496.86 E 1,343,273.64
P.T. Station 620+54.42 N 16,573,417.91 E 1,343,655.03
C.C. N 16,572,648.35 E 1,343,296.87
Back = N 88° 25' 55.83" E
Ahead = S 65° 02' 30.49" E
Chord Bear = S 78° 18' 17.33" E

Course from PT FM510_012 to PC FM510_013 S 65° 02' 30.49" E Dist 772.48

Curve Data

Curve FM510_013
P.I. Station 630+53.03 N 16,572,996.54 E 1,344,560.40
Delta = 29° 50' 06.88" (LT)
Degree = 6° 45' 00.00"
Tangent = 226.13
Length = 442.00
Radius = 848.83
External = 29.61
Long Chord = 437.03
Mid. Ord. = 28.61
P.C. Station 628+26.90 N 16,573,091.96 E 1,344,355.38
P.T. Station 632+68.90 N 16,573,015.76 E 1,344,785.71
C.C. N 16,573,861.52 E 1,344,713.55
Back = S 65° 02' 30.49" E
Ahead = N 85° 07' 22.64" E
Chord Bear = S 79° 57' 33.92" E

Course from PT FM510_013 to PC FM510_014 N 85° 07' 22.64" E Dist 587.10

Curve Data

Curve FM510_014
P.I. Station 640+41.52 N 16,573,081.45 E 1,345,555.53
Delta = 34° 21' 45.67" (LT)
Degree = 9° 32' 57.47"
Tangent = 185.52
Length = 359.85
Radius = 600.00
External = 28.03
Long Chord = 354.48
Mid. Ord. = 26.78
P.C. Station 638+56.00 N 16,573,065.68 E 1,345,370.69
P.T. Station 642+15.85 N 16,573,198.80 E 1,345,699.22
C.C. N 16,573,663.51 E 1,345,319.68
Back = N 85° 07' 22.64" E
Ahead = N 50° 45' 36.96" E
Chord Bear = N 67° 56' 29.80" E

Course from PT FM510_014 to 1002 N 50° 45' 36.96" E Dist 467.00

Point 1002 N 16,573,494.21 E 1,346,060.91 Sta 646+82.85

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Ending chain FM510_01 description

==========

Ending chain FM510_01 description

DATE: 6/13/2024 3:52:53 PM
FILE: c:\txdot\pw_online\txdot05\jose.cavazos1\d0403763\FM 510 Roadway Horz Data Sheet.dgn

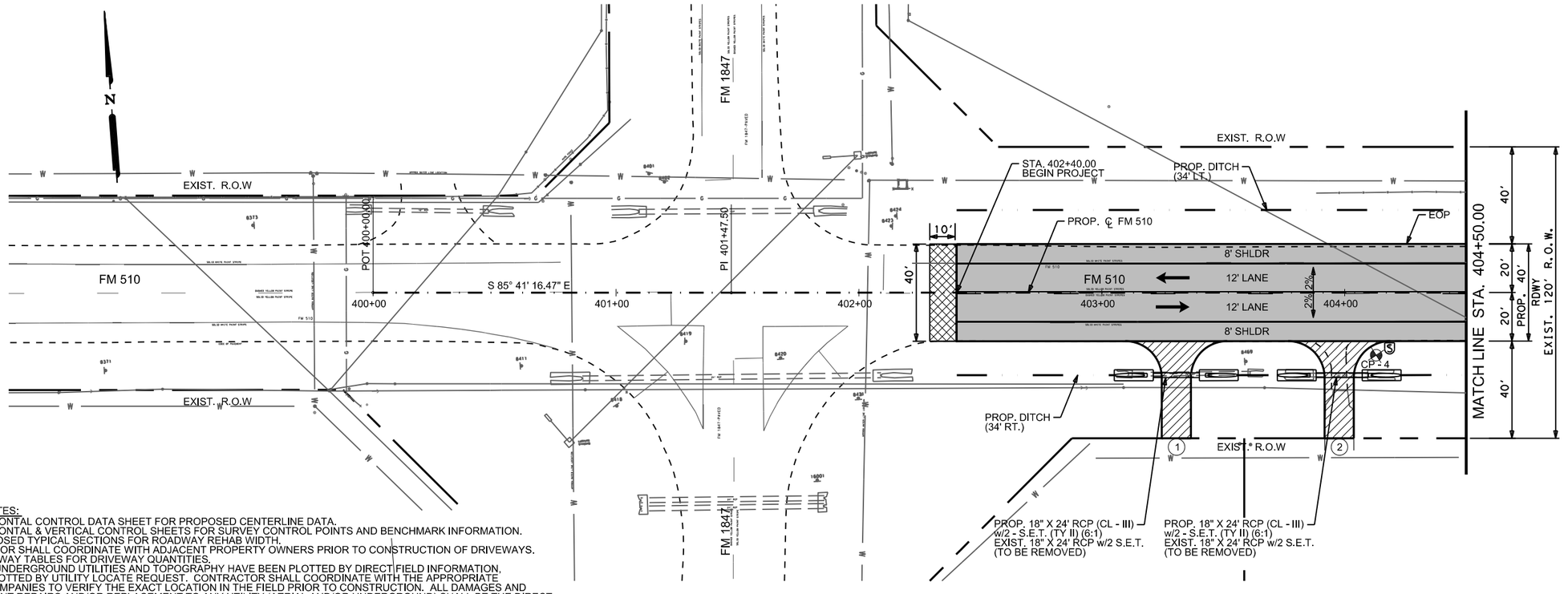
Pharr District Central Design

Texas Department of Transportation

FM 510

ROADWAY
CENTERLINE ALIGNMENT
CONTROL DATA

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		103

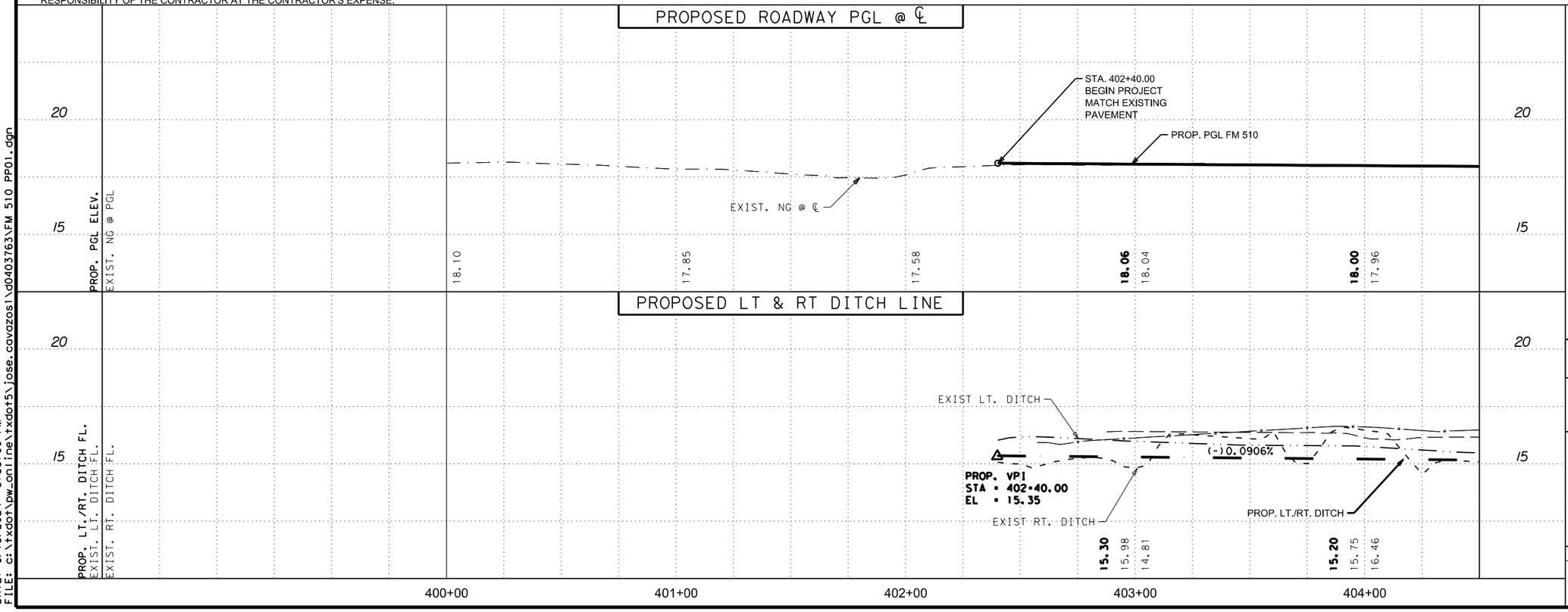


LEGEND:

- DRIVEWAY NUMBER
- TURNOUT NUMBER
- SINGLE MAILBOX
- MULTIPLE MAILBOX
- PROP. ACP ROADWAY
- PROP. ASPHALT DRIVEWAY
- PROP. CONCRETE DRIVEWAY
- PROP. MILLING/OVERLAY (1.5")
- NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS
- DIRECTION OF TRAFFIC FLOW
- PROP. SAFETY END TREATMENT
- EXIST. SAFETY END TREATMENT
- HORIZONTAL & VERTICAL CONTROL BENCHMARKS (SEE SURVEY CONTROL SHEETS FOR DETAILS)
- HVTL — EXIST. HIGH VOLTAGE TRANSMISSION LINE
- OHE — EXIST. OVERHEAD ELECTRIC LINE
- W — EXIST. WATER LINE
- G — EXIST. GAS PIPELINE

GENERAL NOTES:

1. SEE HORIZONTAL CONTROL DATA SHEET FOR PROPOSED CENTERLINE DATA.
2. SEE HORIZONTAL & VERTICAL CONTROL SHEETS FOR SURVEY CONTROL POINTS AND BENCHMARK INFORMATION.
3. SEE PROPOSED TYPICAL SECTIONS FOR ROADWAY REHAB WIDTH.
4. CONTRACTOR SHALL COORDINATE WITH ADJACENT PROPERTY OWNERS PRIOR TO CONSTRUCTION OF DRIVEWAYS.
5. SEE DRIVEWAY TABLES FOR DRIVEWAY QUANTITIES.
6. EXISTING UNDERGROUND UTILITIES AND TOPOGRAPHY HAVE BEEN PLOTTED BY DIRECT FIELD INFORMATION, AND AS SPOTTED BY UTILITY LOCATE REQUEST. CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANIES TO VERIFY THE EXACT LOCATION IN THE FIELD PRIOR TO CONSTRUCTION. ALL DAMAGES AND SUBSEQUENT REPAIRS AND/OR REPLACEMENT TO ANY UTILITY (AERIAL AND/OR UNDERGROUND) SHALL BE THE DIRECT RESPONSIBILITY OF THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.



PROP. PGL
EXIST. NG @ PGL
EXIST. LT. DITCH
EXIST. RT. DITCH
EXIST. LT. R.O.W.
EXIST. RT. R.O.W.
PROP. LT./RT. DITCH

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
ROADWAY
PLAN AND PROFILE
STA 400+00 - STA 404+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 1 OF 41

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		104

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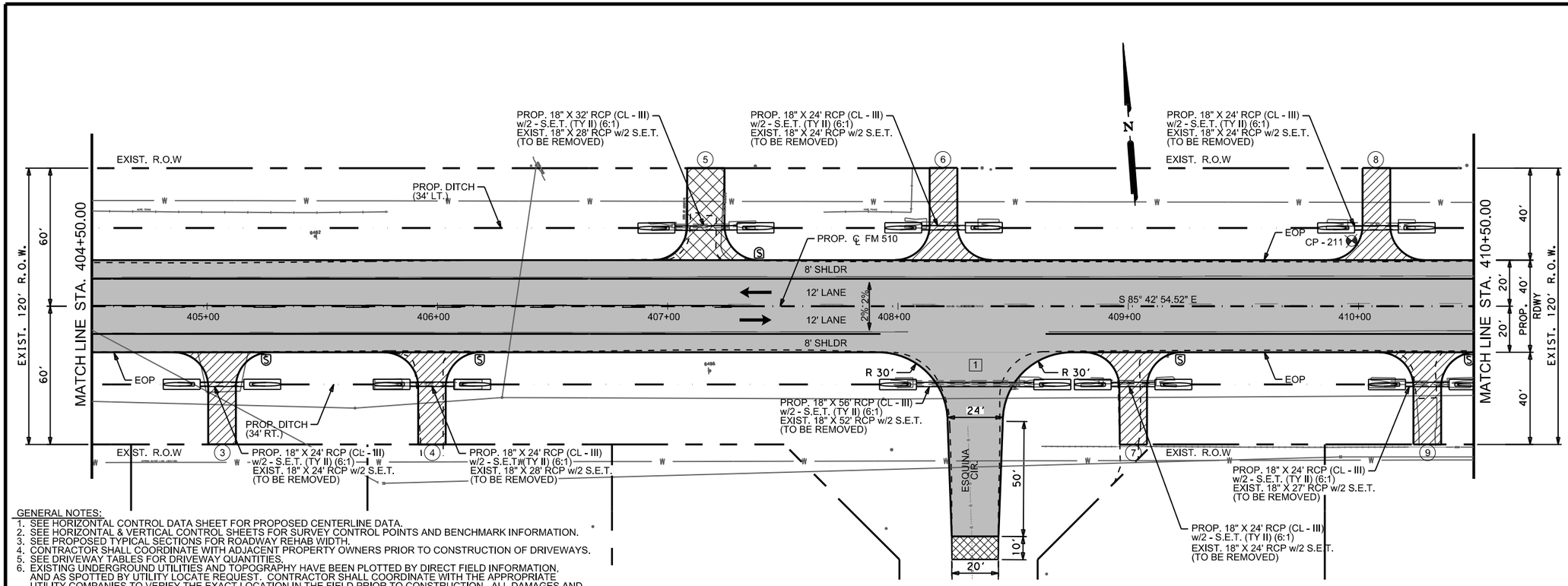
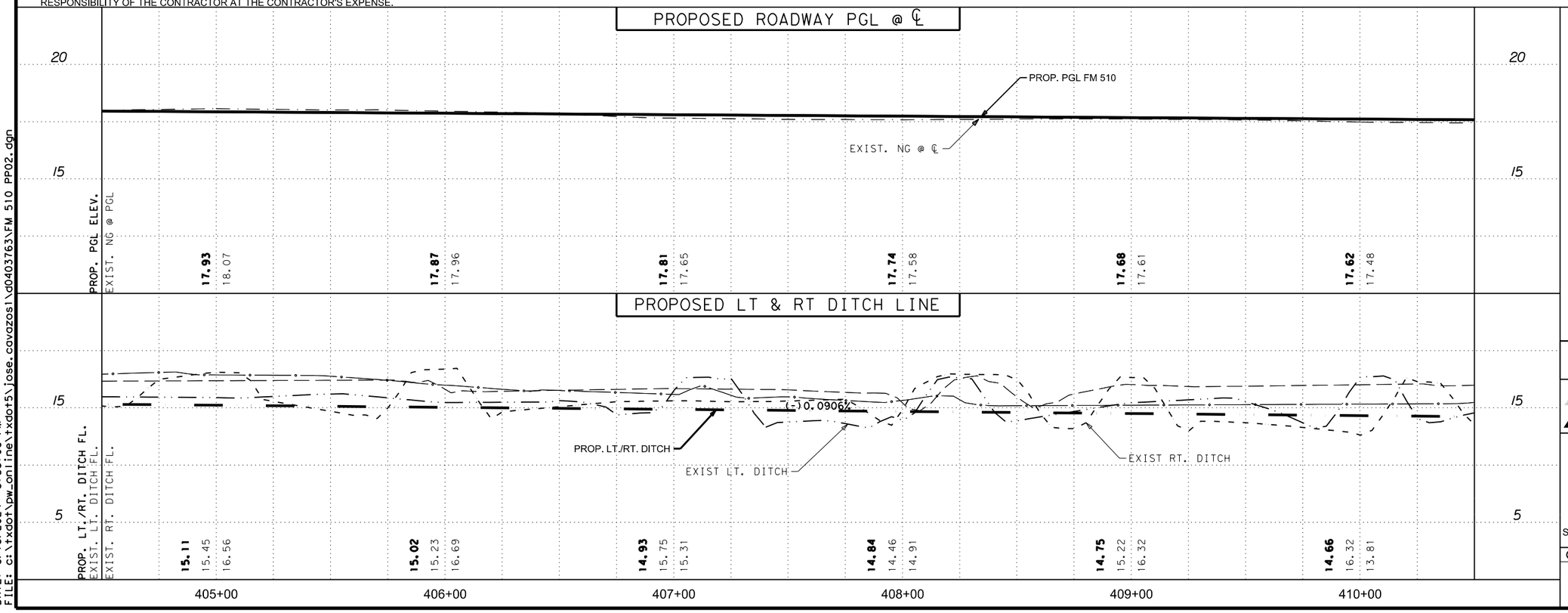


GENERAL NOTES:
1. SEE HORIZONTAL CONTROL DATA SHEET FOR PROPOSED CENTERLINE DATA.
2. SEE HORIZONTAL & VERTICAL CONTROL SHEETS FOR SURVEY CONTROL POINTS AND BENCHMARK INFORMATION.
3. SEE PROPOSED TYPICAL SECTIONS FOR ROADWAY REHAB WIDTH.
4. CONTRACTOR SHALL COORDINATE WITH ADJACENT PROPERTY OWNERS PRIOR TO CONSTRUCTION OF DRIVEWAYS.
5. SEE DRIVEWAY TABLES FOR DRIVEWAY QUANTITIES.
6. EXISTING UNDERGROUND UTILITIES AND TOPOGRAPHY HAVE BEEN PLOTTED BY DIRECT FIELD INFORMATION, AND AS SPOTTED BY UTILITY LOCATE REQUEST. CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANIES TO VERIFY THE EXACT LOCATION IN THE FIELD PRIOR TO CONSTRUCTION. ALL DAMAGES AND SUBSEQUENT REPAIRS AND/OR REPLACEMENT TO ANY UTILITY (AERIAL AND/OR UNDERGROUND) SHALL BE THE DIRECT RESPONSIBILITY OF THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.



PROP. PGL
EXIST. NG @ PGL
EXIST. LT. DITCH
EXIST. RT. DITCH
EXIST. LT. R.O.W.
EXIST. RT. R.O.W.
PROP. LT./RT. DITCH

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
ROADWAY
PLAN AND PROFILE
STA 404+50 - STA 410+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 2 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		105

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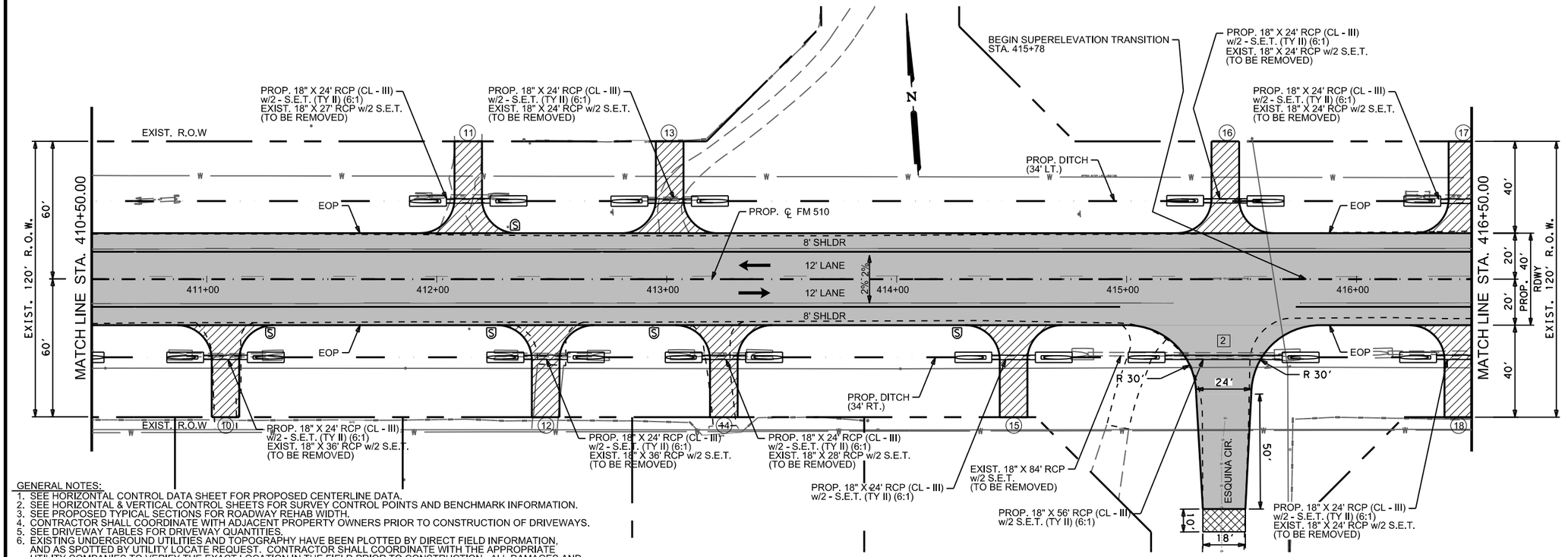

LEGEND:

- DRIVEWAY NUMBER
- TURNOUT NUMBER
- SINGLE MAILBOX
- MULTIPLE MAILBOX
- PROP. ACP ROADWAY
- PROP. ASPHALT DRIVEWAY
- PROP. CONCRETE DRIVEWAY
- PROP. MILLING/OVERLAY (1.5")
- NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS
- DIRECTION OF TRAFFIC FLOW
- PROP. SAFETY END TREATMENT
- EXIST. SAFETY END TREATMENT
- HORIZONTAL & VERTICAL CONTROL BENCHMARKS (SEE SURVEY CONTROL SHEETS FOR DETAILS)
- HVTL — EXIST. HIGH VOLTAGE TRANSMISSION LINE
- OHE — EXIST. OVERHEAD ELECTRIC LINE
- W — EXIST. WATER LINE
- G — EXIST. GAS PIPELINE

GENERAL NOTES:

1. SEE HORIZONTAL CONTROL DATA SHEET FOR PROPOSED CENTERLINE DATA.
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3. SEE PROPOSED TYPICAL SECTIONS FOR ROADWAY REHAB WIDTH.
4. CONTRACTOR SHALL COORDINATE WITH ADJACENT PROPERTY OWNERS PRIOR TO CONSTRUCTION OF DRIVEWAYS.
5. SEE DRIVEWAY TABLES FOR DRIVEWAY QUANTITIES.
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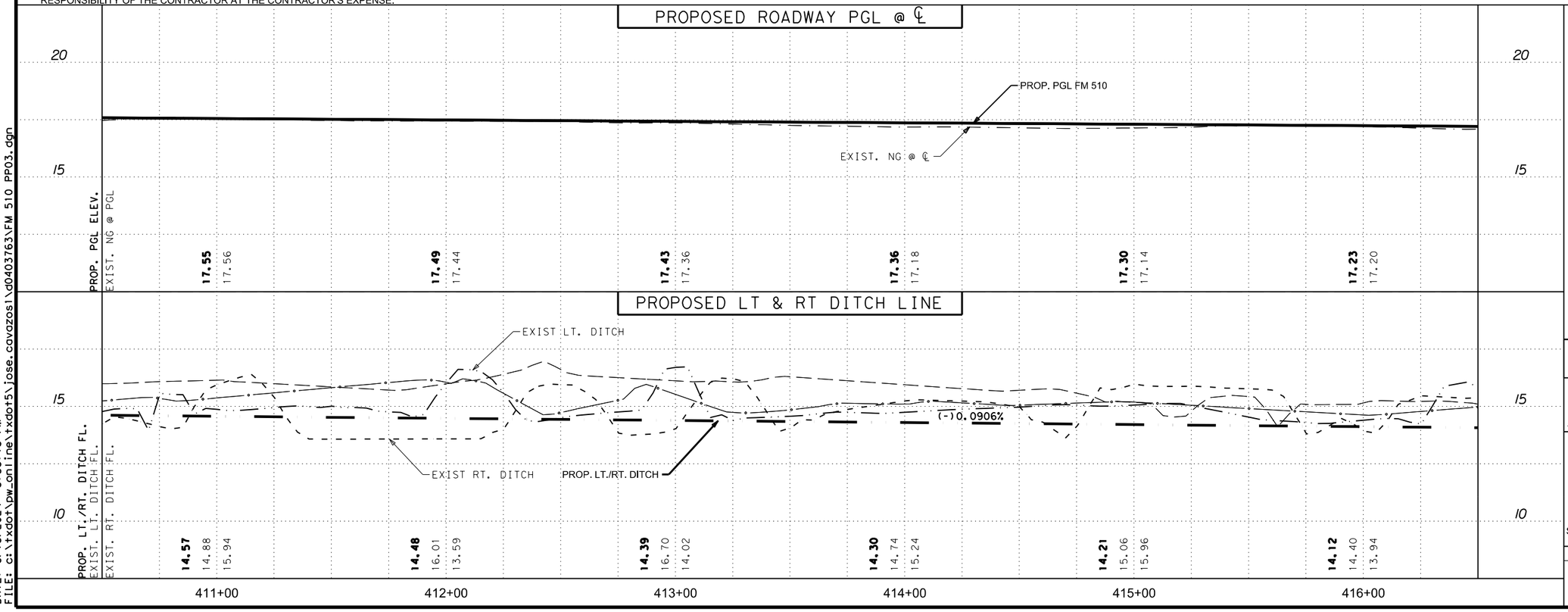

PROP. PGL
EXIST. NG @ PGL
EXIST. LT. DITCH
EXIST. RT. DITCH
EXIST. LT. R.O.W.
EXIST. RT. R.O.W.
PROP. LT./RT. DITCH

STATE OF TEXAS
JOSE A. RODRIGUEZ
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LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
ROADWAY
PLAN AND PROFILE
STA 410+50 - STA 416+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 3 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		106

DATE: 6/13/2024 3:53:13 PM
FILE: c:\txdot\pw_online\txdot5\jose.covazos1\d0403763\FM 510 PP03.dgn

PI STATION = 419+90.21
DELTA = 5° 51' 09.65" (LT)
DEGREE OF CURVE = 1° 00' 00.00"
TANGENT = 292.89
LENGTH = 585.27
RADIUS = 5,729.58
PC STATION = 416+97.33
PT STATION = 422+82.59

PROP. DRAIN DITCH IMPROVEMENTS (SEE CULVERT CROSSING LAYOUT)

STA. 419+61
EXIST. 10' X 5' CONC. BOX CULVERT
(TO REMAIN IN PLACE)

PROP. 18" X 24' RCP (CL - III) w/2 - S.E.T. (TY II) (6:1)
EXIST. 18" X 44' RCP w/2 S.E.T.
(TO BE REMOVED)

PROP. 24" X 56' RCP (CL - III) & S.E.T. (TY II) (6:1)
EXIST. 18" X 43' RCP w S.E.T.
(TO BE REMOVED)

STA. 419+61
PROP. 8' X 5' CONC. BOX CULVERT
SEE "CULVERT CROSSING LAYOUTS"

PROP. 24" X 48' RCP (CL - III) & S.E.T. (TY II) (6:1)
EXIST. 18" X 44' RCP w S.E.T.
(TO BE REMOVED)

END FULL SUPERELEVATION
STA. 422+32
BEGIN SUPERELEVATION TRANSITION
STA. 422+32

EXIST. R.O.W

EXIST. 120' R.O.W.
60'
60'
MATCH LINE STA. 416+50.00
PC 416+97.33
PROP. DITCH (34' LT.)
PROP. ℄ FM 510
EXIST. R.O.W
EOP
8' SHLDR
12' LANE
12' LANE
8' SHLDR
417+00
418+00
419+00
420+00
421+00
422+00
2.3%
2.3%
PI
CP - 212
EOP
MATCH LINE STA. 422+50.00
20'
20'
20'
20'
PROP. 40' RDWY
EXIST. 80' R.O.W.

END SUPERELEVATION TRANSITION
STA. 417+48
BEGIN FULL SUPERELEVATION
STA. 417+48

PROP. DITCH (34' RT.)
EXIST. R.O.W
PROP. 18" X 24' RCP (CL - III) w/2 - S.E.T. (TY II) (6:1)
EXIST. 18" X 23' RCP w/2 S.E.T.
(TO BE REMOVED)

PROP. 24" X 48' RCP (CL - III) & S.E.T. (TY II) (6:1)
EXIST. 18" X 38' RCP w S.E.T.
(TO BE REMOVED)

PROP. 18" X 32' RCP (CL - III) w/2 - S.E.T. (TY II) (6:1)
EXIST. 18" X 43' RCP w/2 S.E.T.
(TO BE REMOVED)

EXIST. R.O.W

PROP. 24" X 40' RCP (CL - III) & S.E.T. (TY II) (6:1)
EXIST. 18" X 38' RCP w S.E.T.
(TO BE REMOVED)

PROP. DRAIN DITCH IMPROVEMENTS (SEE CULVERT CROSSING LAYOUT)

N

LEGEND:
- (#) DRIVEWAY NUMBER
- [#] TURNOUT NUMBER
- (S) SINGLE MAILBOX
- (M) MULTIPLE MAILBOX
- PROP. ACP ROADWAY
- PROP. ASPHALT DRIVEWAY
- PROP. CONCRETE DRIVEWAY
- PROP. MILLING/OVERLAY (1.5")
- NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS
- DIRECTION OF TRAFFIC FLOW
- PROP. SAFETY END TREATMENT
- EXIST. SAFETY END TREATMENT
- HORIZONTAL & VERTICAL CONTROL BENCHMARKS (SEE SURVEY CONTROL SHEETS FOR DETAILS)
- HVTL — EXIST. HIGH VOLTAGE TRANSMISSION LINE
- OHE — EXIST. OVERHEAD ELECTRIC LINE
- W — EXIST. WATER LINE
- G — EXIST. GAS PIPELINE

GENERAL NOTES:
1. SEE HORIZONTAL CONTROL DATA SHEET FOR PROPOSED CENTERLINE DATA.
2. SEE HORIZONTAL & VERTICAL CONTROL SHEETS FOR SURVEY CONTROL POINTS AND BENCHMARK INFORMATION.
3. SEE PROPOSED TYPICAL SECTIONS FOR ROADWAY REHAB WIDTH.
4. CONTRACTOR SHALL COORDINATE WITH ADJACENT PROPERTY OWNERS PRIOR TO CONSTRUCTION OF DRIVEWAYS.
5. SEE DRIVEWAY TABLES FOR DRIVEWAY QUANTITIES.
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PROPOSED ROADWAY PGL @ ℄

PROP. PGL FM 510
EXIST. NG @ ℄
PROP. VPI
STA = 420+80.00
EL = 16.93'
(-)0.0635 %
(+)0.1427 %

STA. 419+61
EXIST. 10' X 5' CONC. BOX CULVERT
(TO REMAIN IN PLACE)

STA. 419+61
PROP. 8' X 5' CONC. BOX CULVERT
SEE "CULVERT CROSSING LAYOUTS"

PROP. PGL ELEV. / EXIST. NG @ PGL

417+00	418+00	419+00	420+00	421+00	422+00
17.17 / 17.16	17.11 / 17.16	17.04 / 17.04	16.98 / 17.00	16.96 / 16.97	17.10 / 17.19

PROPOSED LT & RT DITCH LINE

PROP. VPI
STA = 419+50.00
EL = 13.80'
(-)0.0906%
(+)0.1215%

EXIST LT. DITCH
EXIST RT. DITCH
PROP. LT./RT. DITCH

STA. 419+61
EXIST. 10' X 5' CONC. BOX CULVERT
(TO REMAIN IN PLACE)

STA. 419+61
PROP. 8' X 5' CONC. BOX CULVERT
SEE "CULVERT CROSSING LAYOUTS"

PROP. LT./RT. DITCH FL. / EXIST. LT. DITCH FL. / EXIST. RT. DITCH FL.

417+00	418+00	419+00	420+00	421+00	422+00
14.03 / 15.70 / 14.67	13.94 / 14.87 / 13.59	13.85 / 13.42 / 12.55	13.86 / 15.66 / 15.06	13.98 / 14.82 / 15.90	14.10 / 14.80 / 16.05

PROP. PGL
EXIST. NG @ PGL
EXIST. LT. DITCH
EXIST. RT. DITCH
EXIST. LT. R.O.W.
EXIST. RT. R.O.W.
PROP. LT./RT. DITCH

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
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06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
ROADWAY PLAN AND PROFILE
STA 416+50 - STA 422+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'
SHEET 4 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		107

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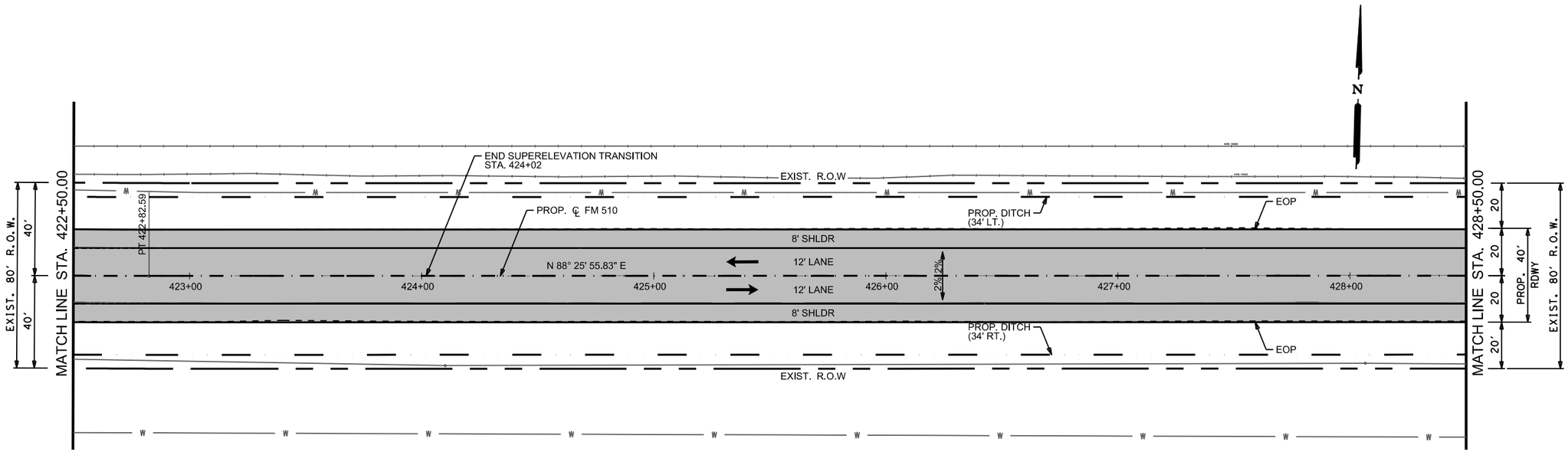

GENERAL NOTES:

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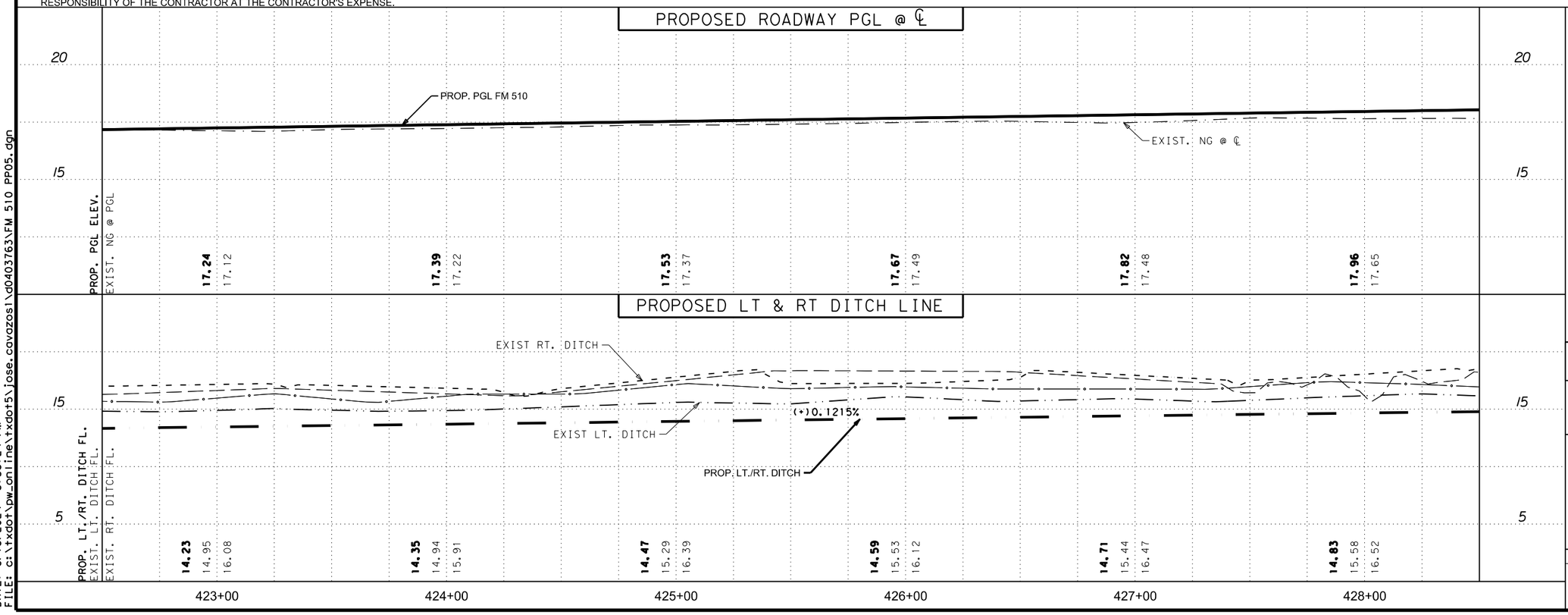

PROP. PGL
EXIST. NG @ PGL
EXIST. LT. DITCH
EXIST. RT. DITCH
EXIST. LT. R.O.W.
EXIST. RT. R.O.W.
PROP. LT./RT. DITCH

STATE OF TEXAS
JOSE A. RODRIGUEZ
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06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
ROADWAY PLAN AND PROFILE
STA 422+50 - STA 428+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 5 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		108

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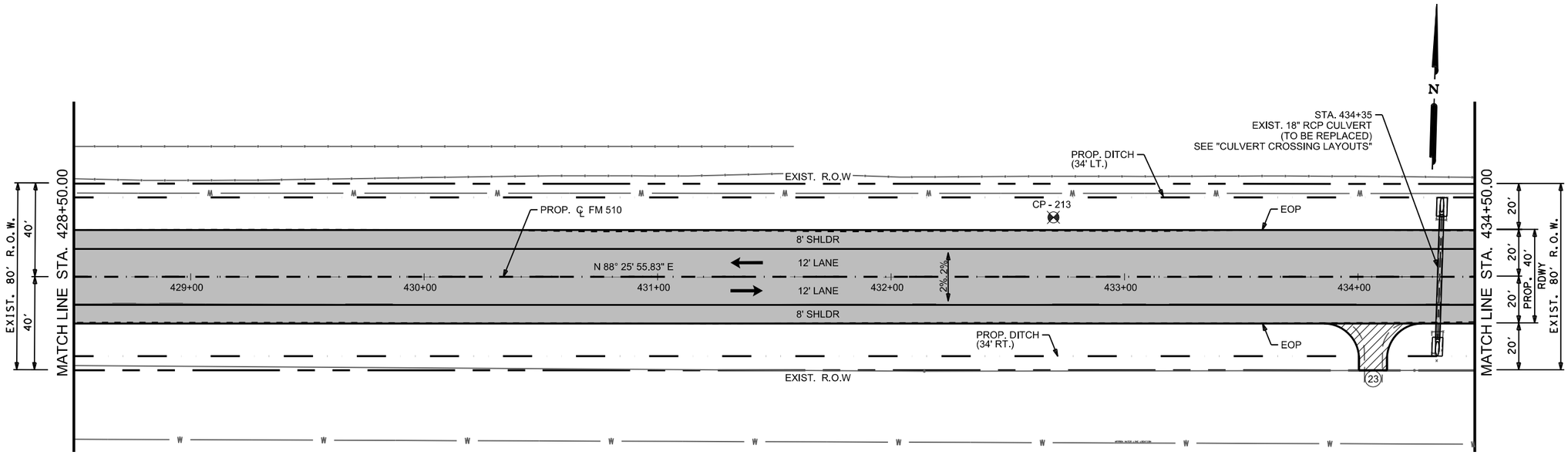

LEGEND:

- DRIVEWAY NUMBER
- TURNOUT NUMBER
- SINGLE MAILBOX
- MULTIPLE MAILBOX
- PROP. ACP ROADWAY
- PROP. ASPHALT DRIVEWAY
- PROP. CONCRETE DRIVEWAY
- PROP. MILLING/OVERLAY (1.5")
- NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS
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GENERAL NOTES:

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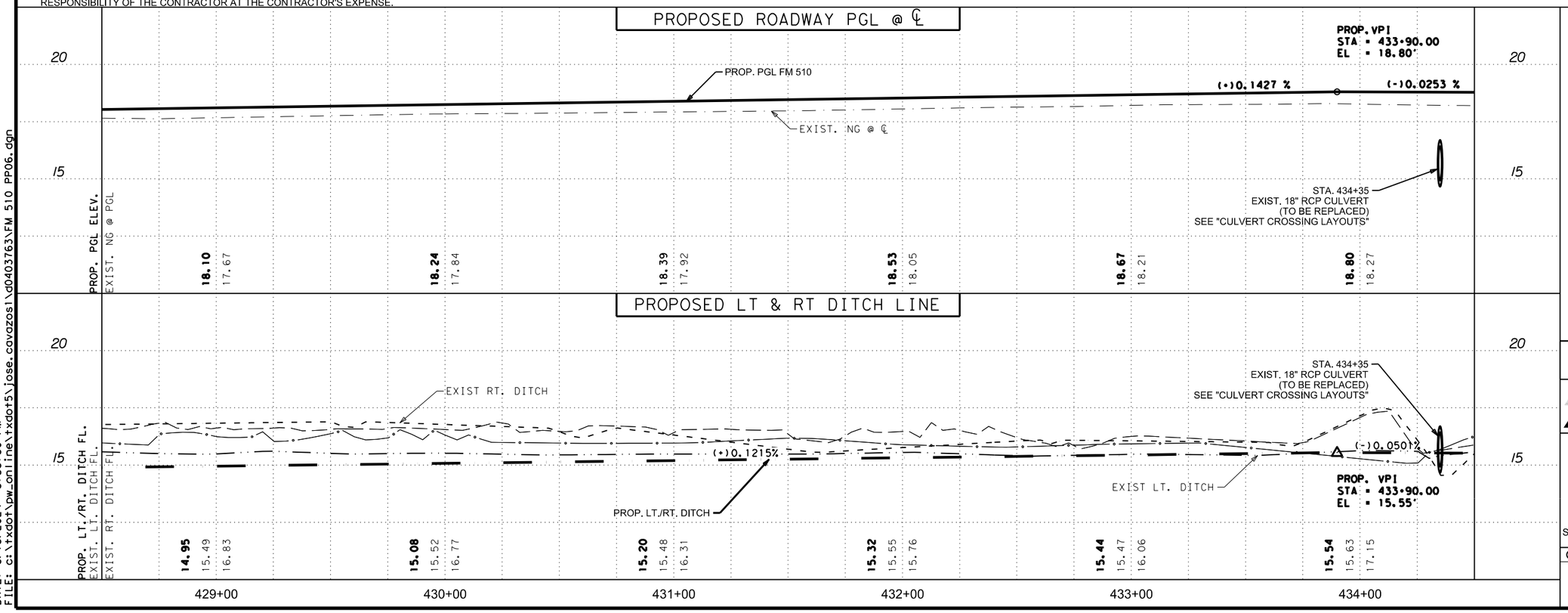

- PROP. PGL
- EXIST. NG @ PGL
- EXIST. LT. DITCH
- EXIST. RT. DITCH
- EXIST. LT. R.O.W.
- EXIST. RT. R.O.W.
- PROP. LT./RT. DITCH

STATE OF TEXAS
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06/13/24

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Texas Department of Transportation

FM 510
ROADWAY
PLAN AND PROFILE
STA 428+50 - STA 434+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 6 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		109

DATE: 6/13/2024 3:53:30 PM
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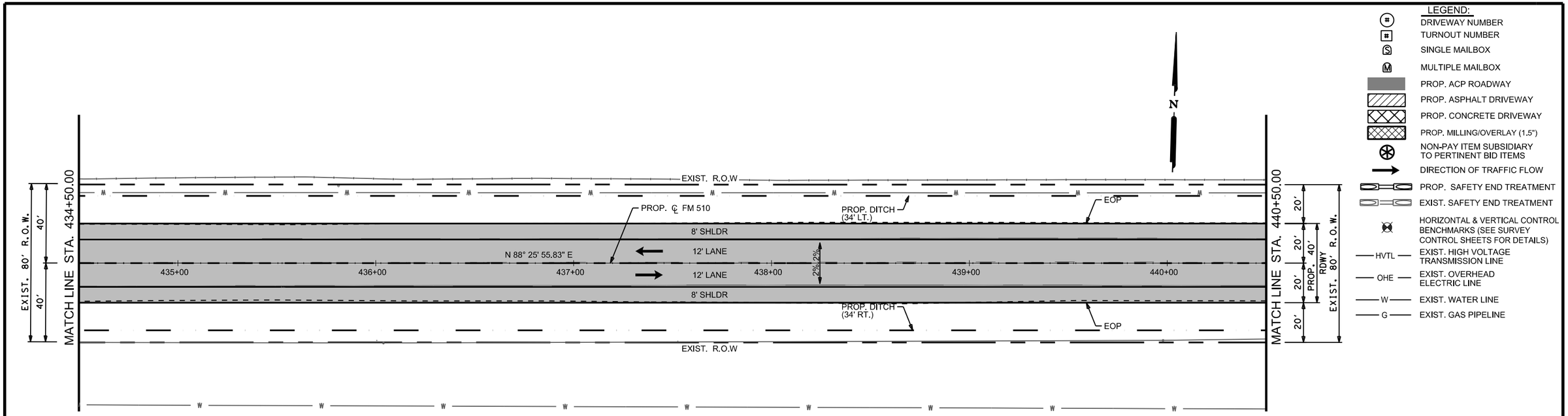

LEGEND:

- DRIVEWAY NUMBER
- TURNOUT NUMBER
- SINGLE MAILBOX
- MULTIPLE MAILBOX
- PROP. ACP ROADWAY
- PROP. ASPHALT DRIVEWAY
- PROP. CONCRETE DRIVEWAY
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- NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS
- DIRECTION OF TRAFFIC FLOW
- PROP. SAFETY END TREATMENT
- EXIST. SAFETY END TREATMENT
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GENERAL NOTES:

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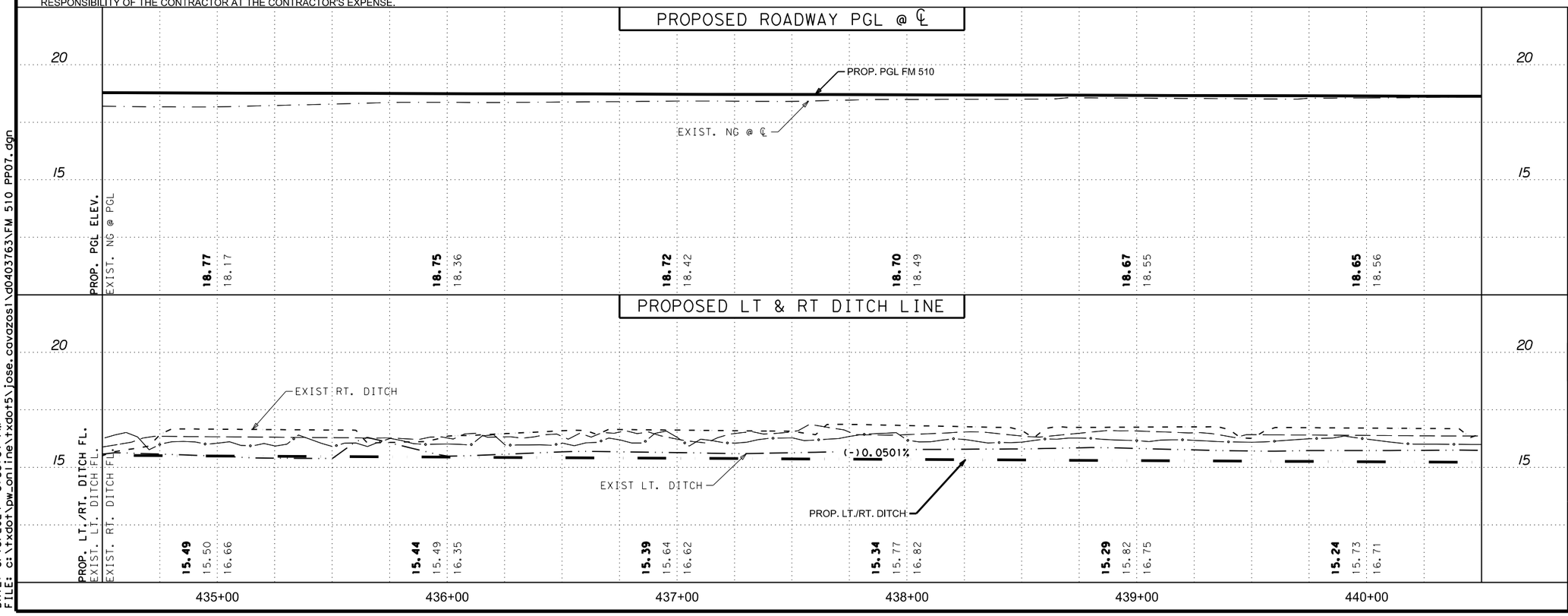

PROP. PGL
EXIST. NG @ PGL
EXIST. LT. DITCH
EXIST. RT. DITCH
EXIST. LT. R.O.W.
EXIST. RT. R.O.W.
PROP. LT./RT. DITCH

STATE OF TEXAS
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06/13/24

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Texas Department of Transportation

FM 510
ROADWAY PLAN AND PROFILE
STA 434+50 - STA 440+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 7 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		110

DATE: 6/13/2024 3:53:37 PM
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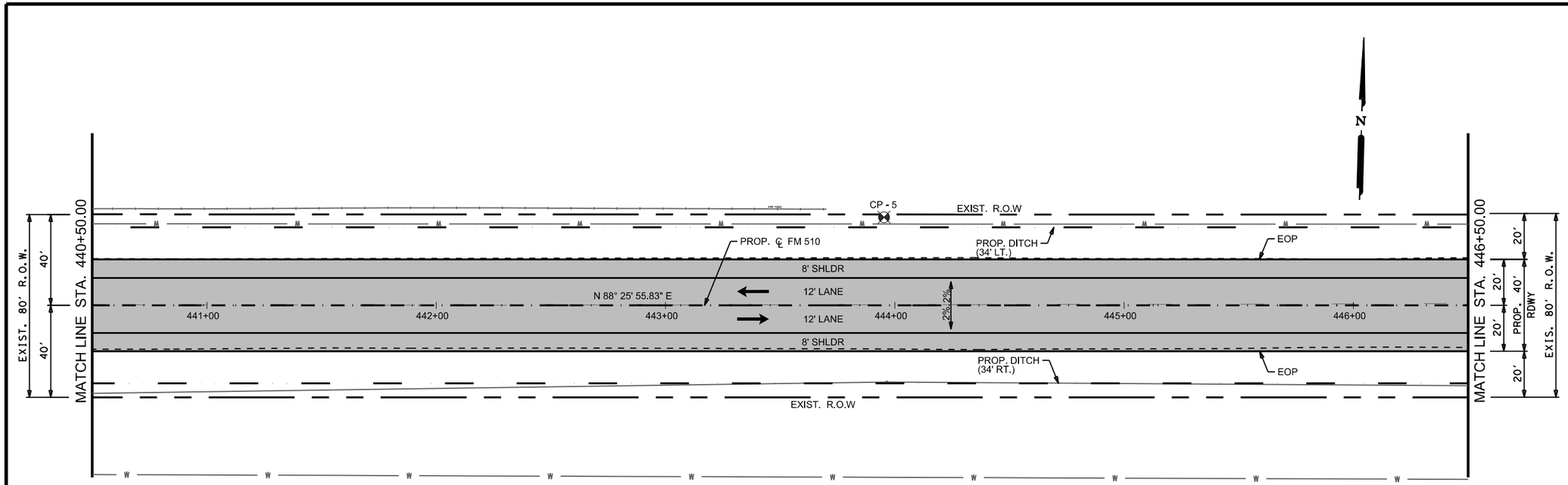

GENERAL NOTES:

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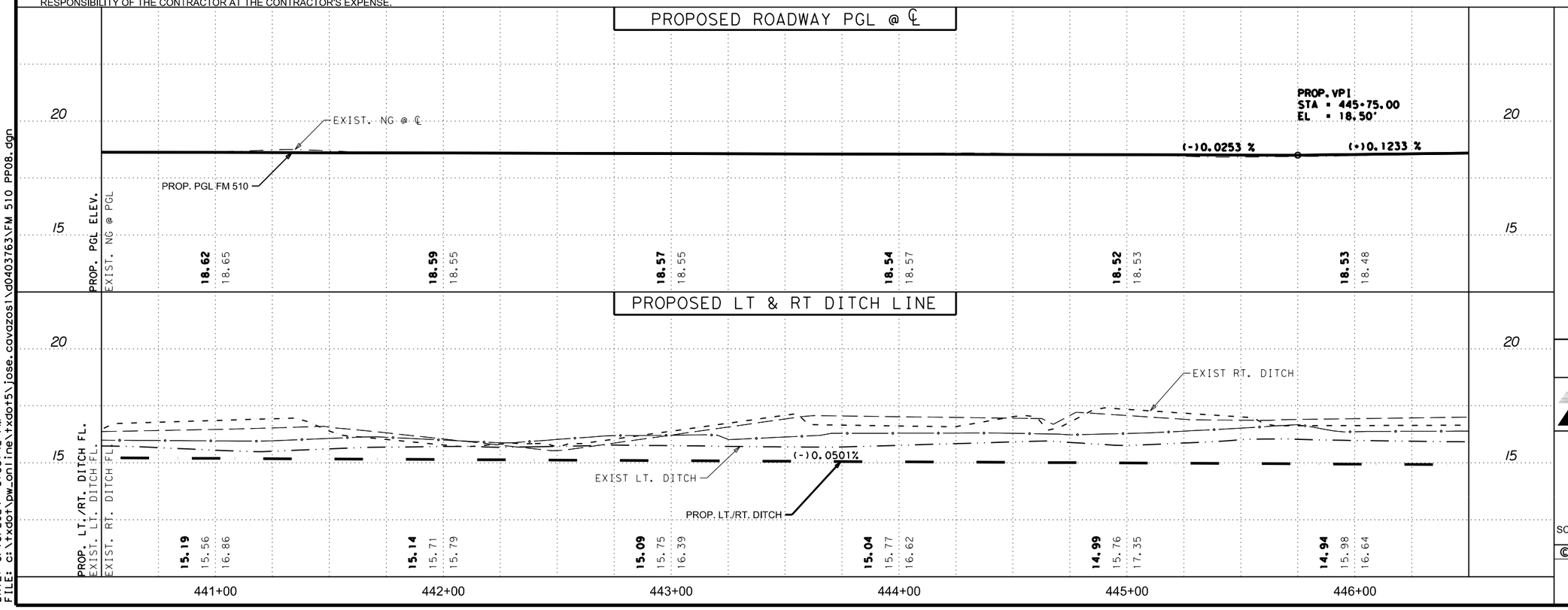

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06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
ROADWAY PLAN AND PROFILE
STA 440+50 - STA 446+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 8 OF 41

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		111

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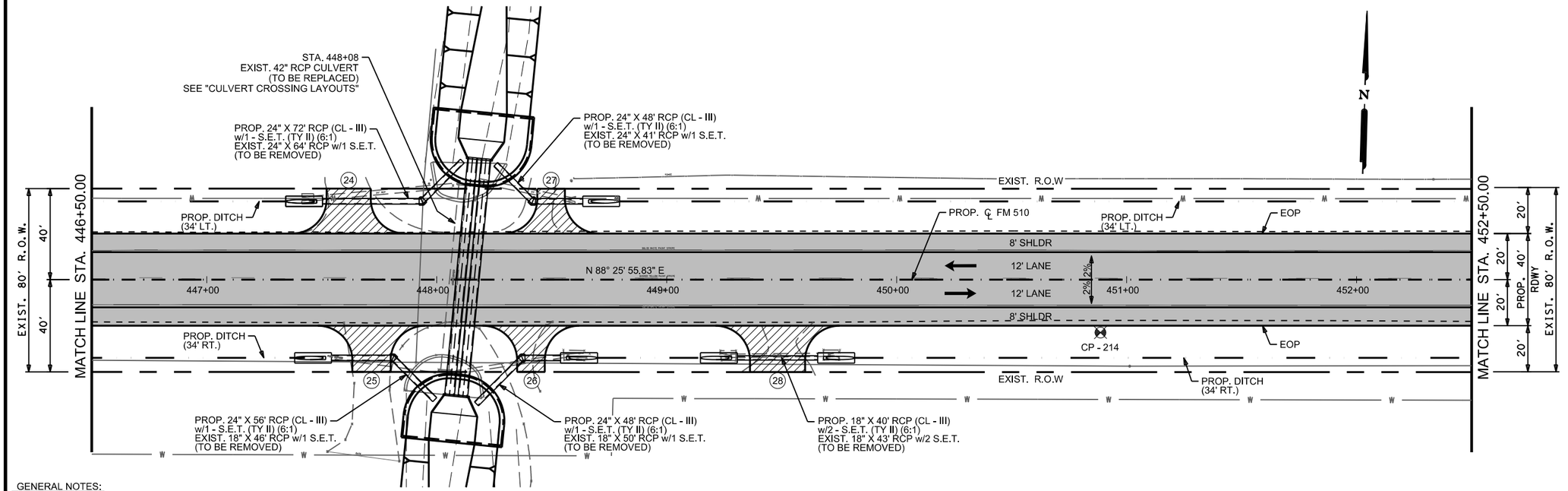
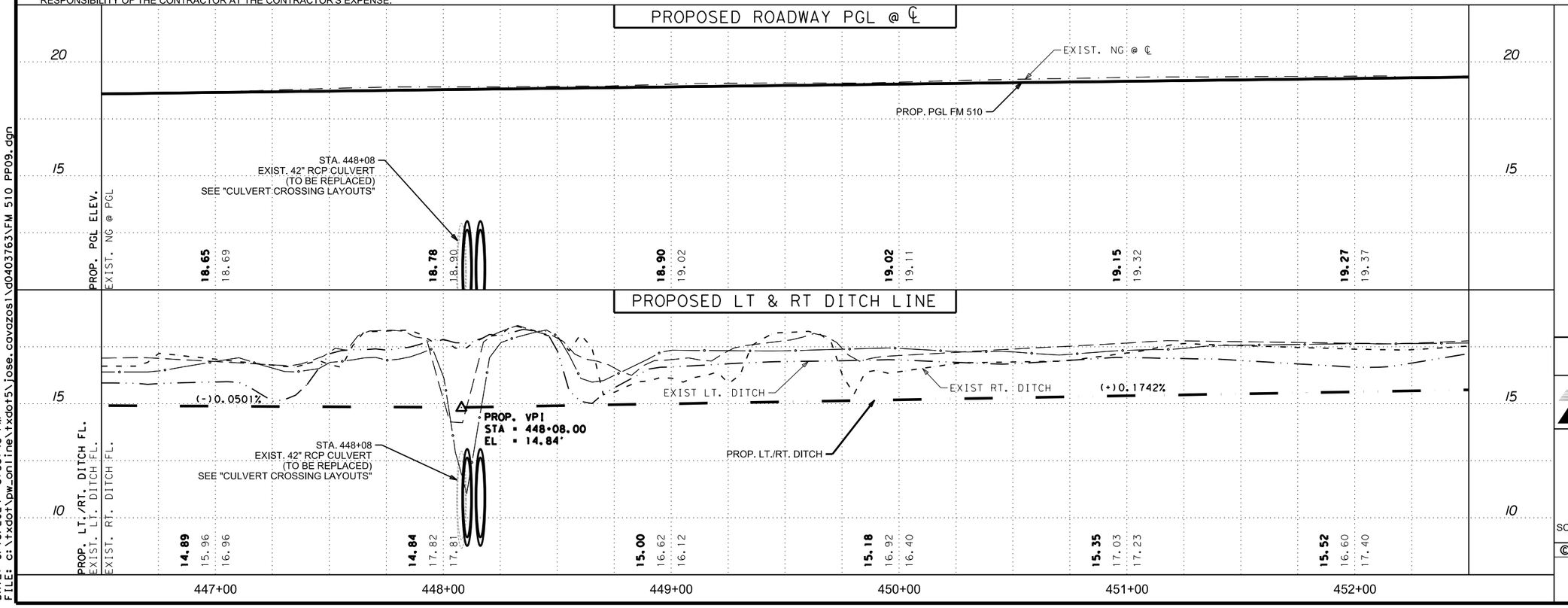


GENERAL NOTES:
1. SEE HORIZONTAL CONTROL DATA SHEET FOR PROPOSED CENTERLINE DATA.
2. SEE HORIZONTAL & VERTICAL CONTROL SHEETS FOR SURVEY CONTROL POINTS AND BENCHMARK INFORMATION.
3. SEE PROPOSED TYPICAL SECTIONS FOR ROADWAY REHAB WIDTH.
4. CONTRACTOR SHALL COORDINATE WITH ADJACENT PROPERTY OWNERS PRIOR TO CONSTRUCTION OF DRIVEWAYS.
5. SEE DRIVEWAY TABLES FOR DRIVEWAY QUANTITIES.
6. EXISTING UNDERGROUND UTILITIES AND TOPOGRAPHY HAVE BEEN PLOTTED BY DIRECT FIELD INFORMATION, AND AS SPOTTED BY UTILITY LOCATE REQUEST. CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANIES TO VERIFY THE EXACT LOCATION IN THE FIELD PRIOR TO CONSTRUCTION. ALL DAMAGES AND SUBSEQUENT REPAIRS AND/OR REPLACEMENT TO ANY UTILITY (AERIAL AND/OR UNDERGROUND) SHALL BE THE DIRECT RESPONSIBILITY OF THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.



STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
ROADWAY PLAN AND PROFILE
STA 446+50 - STA 452+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		112

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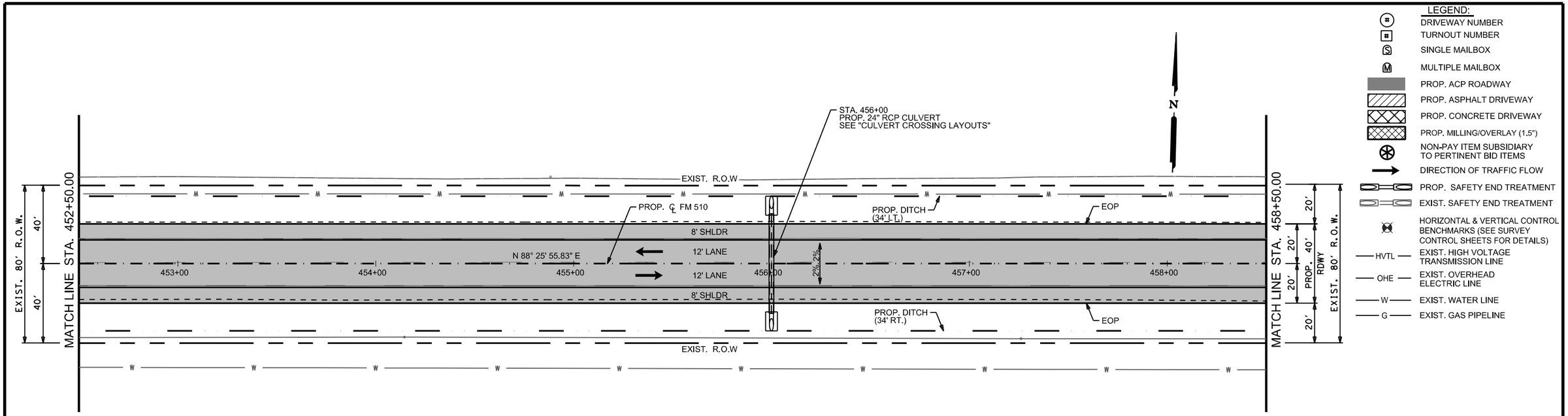

GENERAL NOTES:

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2. SEE HORIZONTAL & VERTICAL CONTROL SHEETS FOR SURVEY CONTROL POINTS AND BENCHMARK INFORMATION.
3. SEE PROPOSED TYPICAL SECTIONS FOR ROADWAY REHAB WIDTH.
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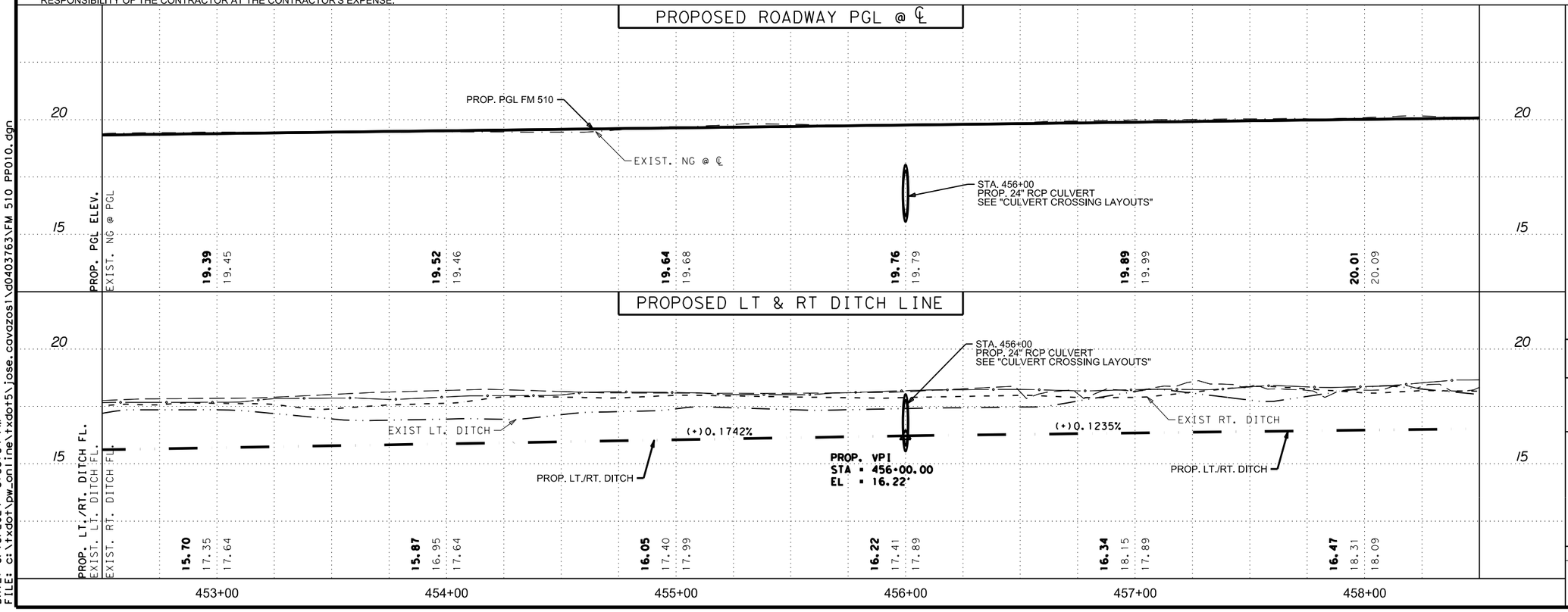

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STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

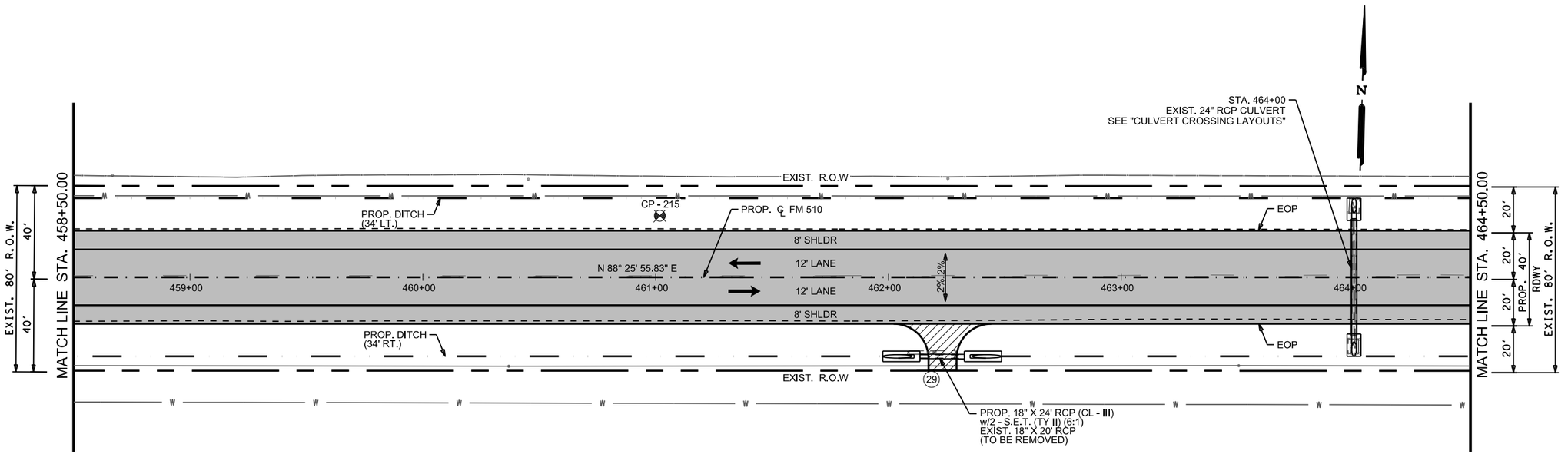
Pharr District Central Design

Texas Department of Transportation

FM 510
ROADWAY
PLAN AND PROFILE
STA 452+50 - STA 458+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		113



LEGEND:

- DRIVEWAY NUMBER
- TURNOUT NUMBER
- SINGLE MAILBOX
- MULTIPLE MAILBOX
- PROP. ACP ROADWAY
- PROP. ASPHALT DRIVEWAY
- PROP. CONCRETE DRIVEWAY
- PROP. MILLING/OVERLAY (1.5")
- NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS
- DIRECTION OF TRAFFIC FLOW
- PROP. SAFETY END TREATMENT
- EXIST. SAFETY END TREATMENT
- HORIZONTAL & VERTICAL CONTROL BENCHMARKS (SEE SURVEY CONTROL SHEETS FOR DETAILS)
- HVTL — EXIST. HIGH VOLTAGE TRANSMISSION LINE
- OHE — EXIST. OVERHEAD ELECTRIC LINE
- W — EXIST. WATER LINE
- G — EXIST. GAS PIPELINE

GENERAL NOTES:

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2. SEE HORIZONTAL & VERTICAL CONTROL SHEETS FOR SURVEY CONTROL POINTS AND BENCHMARK INFORMATION.
3. SEE PROPOSED TYPICAL SECTIONS FOR ROADWAY REHAB WIDTH.
4. CONTRACTOR SHALL COORDINATE WITH ADJACENT PROPERTY OWNERS PRIOR TO CONSTRUCTION OF DRIVEWAYS.
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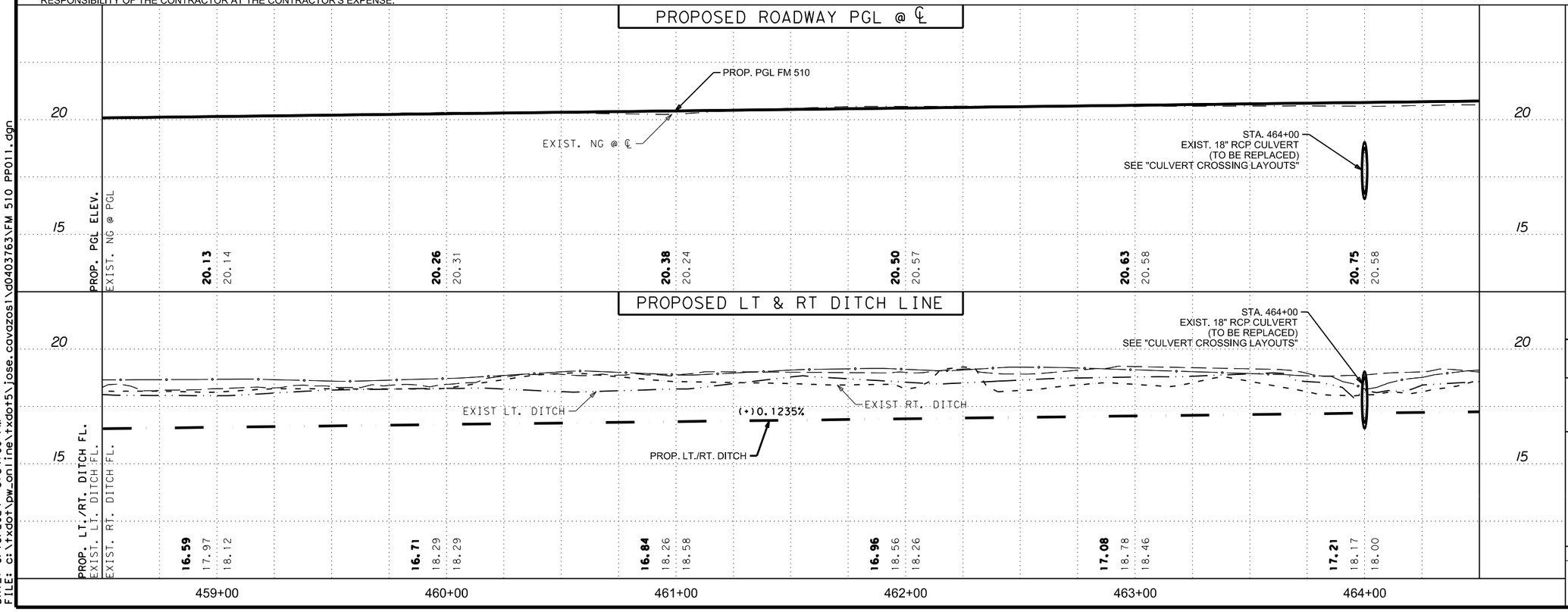

PROP. PGL
EXIST. NG @ PGL
EXIST. LT. DITCH
EXIST. RT. DITCH
EXIST. LT. R.O.W.
EXIST. RT. R.O.W.
PROP. LT./RT. DITCH

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
ROADWAY PLAN AND PROFILE
STA 458+50 - STA 464+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 11 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		114

DATE: 6/13/2024 3:54:00 PM
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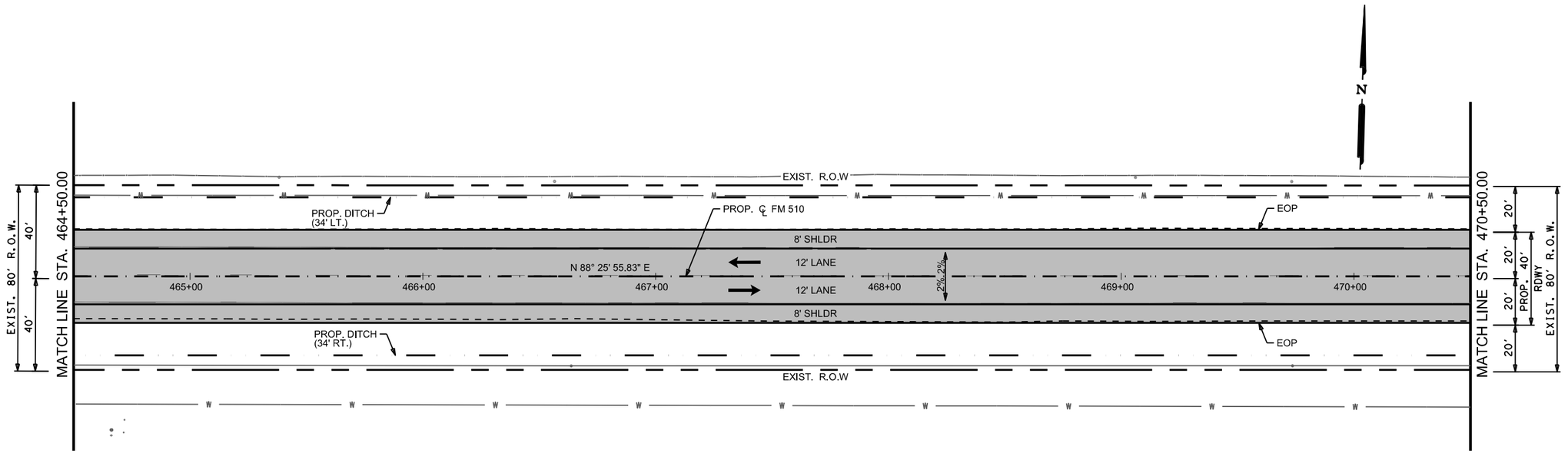

LEGEND:

- DRIVEWAY NUMBER
- TURNOUT NUMBER
- SINGLE MAILBOX
- MULTIPLE MAILBOX
- PROP. ACP ROADWAY
- PROP. ASPHALT DRIVEWAY
- PROP. CONCRETE DRIVEWAY
- PROP. MILLING/OVERLAY (1.5")
- NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS
- DIRECTION OF TRAFFIC FLOW
- PROP. SAFETY END TREATMENT
- EXIST. SAFETY END TREATMENT
- HORIZONTAL & VERTICAL CONTROL BENCHMARKS (SEE SURVEY CONTROL SHEETS FOR DETAILS)
- HVTL — EXIST. HIGH VOLTAGE TRANSMISSION LINE
- OHE — EXIST. OVERHEAD ELECTRIC LINE
- W — EXIST. WATER LINE
- G — EXIST. GAS PIPELINE

GENERAL NOTES:

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5. SEE DRIVEWAY TABLES FOR DRIVEWAY QUANTITIES.
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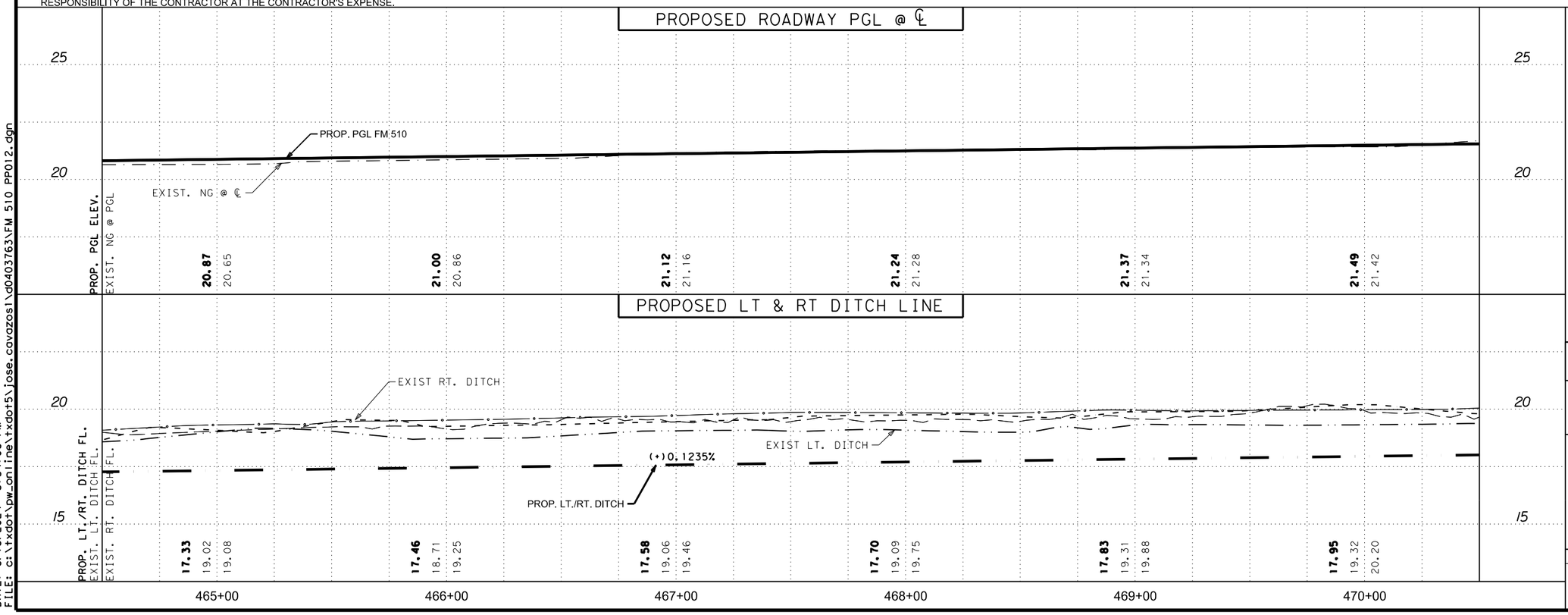

PROP. PGL
EXIST. NG @ PGL
EXIST. LT. DITCH
EXIST. RT. DITCH
EXIST. LT. R.O.W.
EXIST. RT. R.O.W.
PROP. LT./RT. DITCH

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
ROADWAY
PLAN AND PROFILE
STA 464+50 - STA 470+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 12 OF 41

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		115

DATE: 6/13/2024 3:54:06 PM
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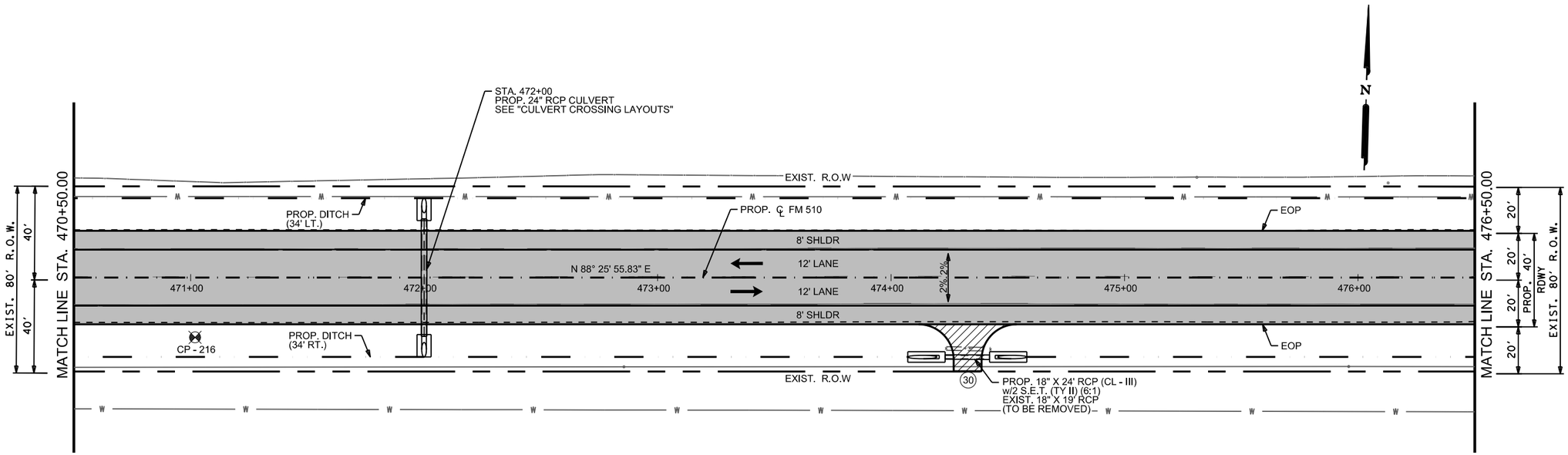

LEGEND:

- DRIVEWAY NUMBER
- TURNOUT NUMBER
- SINGLE MAILBOX
- MULTIPLE MAILBOX
- PROP. ACP ROADWAY
- PROP. ASPHALT DRIVEWAY
- PROP. CONCRETE DRIVEWAY
- PROP. MILLING/OVERLAY (1.5")
- NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS
- DIRECTION OF TRAFFIC FLOW
- PROP. SAFETY END TREATMENT
- EXIST. SAFETY END TREATMENT
- HORIZONTAL & VERTICAL CONTROL BENCHMARKS (SEE SURVEY CONTROL SHEETS FOR DETAILS)
- HVTL — EXIST. HIGH VOLTAGE TRANSMISSION LINE
- OHE — EXIST. OVERHEAD ELECTRIC LINE
- W — EXIST. WATER LINE
- G — EXIST. GAS PIPELINE

GENERAL NOTES:

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4. CONTRACTOR SHALL COORDINATE WITH ADJACENT PROPERTY OWNERS PRIOR TO CONSTRUCTION OF DRIVEWAYS.
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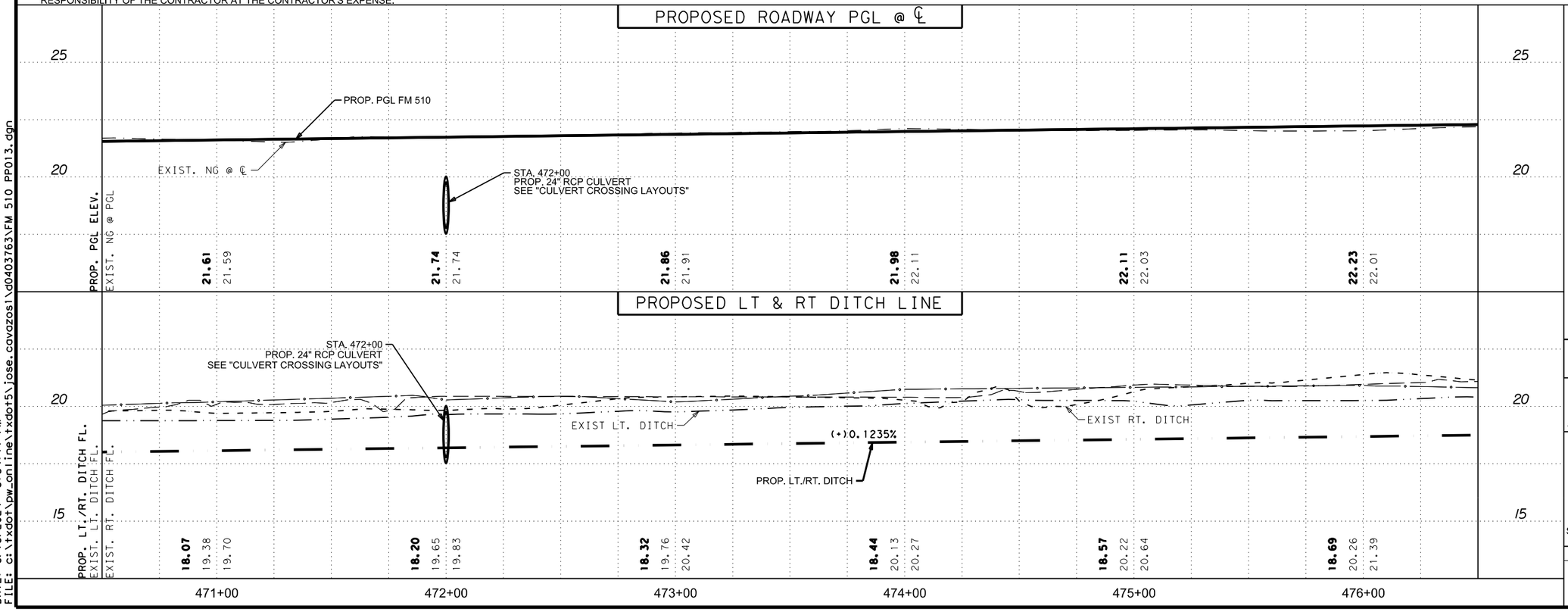

- PROP. PGL
- EXIST. NG @ PGL
- EXIST. LT. DITCH
- EXIST. RT. DITCH
- EXIST. LT. R.O.W.
- EXIST. RT. R.O.W.
- PROP. LT./RT. DITCH

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
ROADWAY
PLAN AND PROFILE
STA 470+50 - STA 476+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 13 OF 41

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		116

DATE: 6/13/2024 3:54:11 PM
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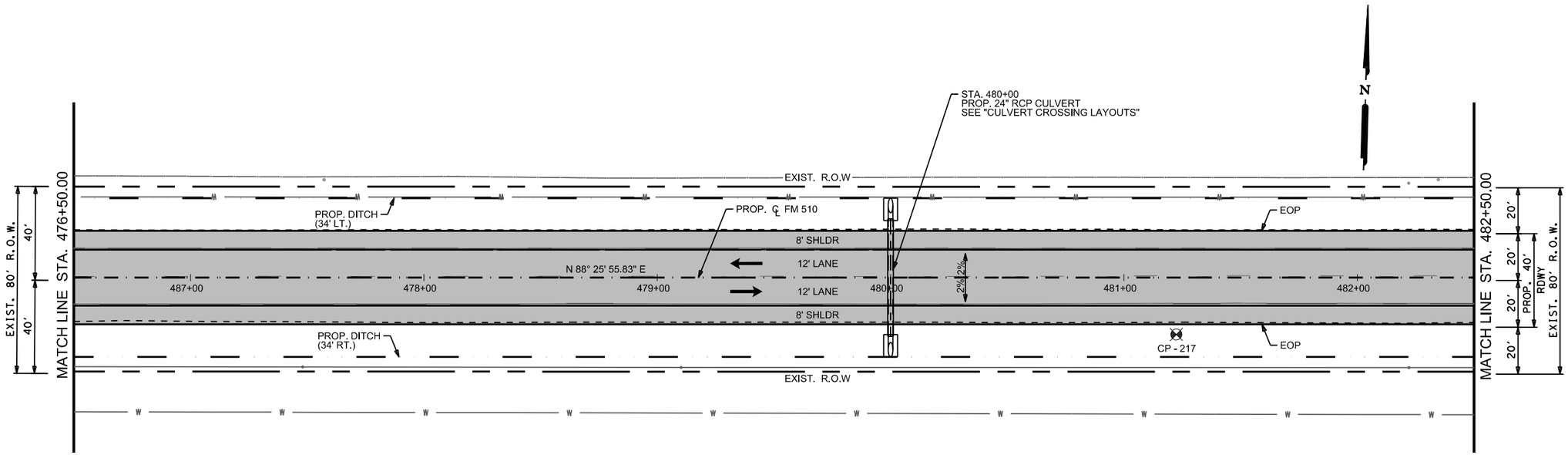

LEGEND:

- DRIVEWAY NUMBER
- TURNOUT NUMBER
- SINGLE MAILBOX
- MULTIPLE MAILBOX
- PROP. ACP ROADWAY
- PROP. ASPHALT DRIVEWAY
- PROP. CONCRETE DRIVEWAY
- PROP. MILLING/OVERLAY (1.5")
- NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS
- DIRECTION OF TRAFFIC FLOW
- PROP. SAFETY END TREATMENT
- EXIST. SAFETY END TREATMENT
- HORIZONTAL & VERTICAL CONTROL BENCHMARKS (SEE SURVEY CONTROL SHEETS FOR DETAILS)
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- OHE — EXIST. OVERHEAD ELECTRIC LINE
- W — EXIST. WATER LINE
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GENERAL NOTES:

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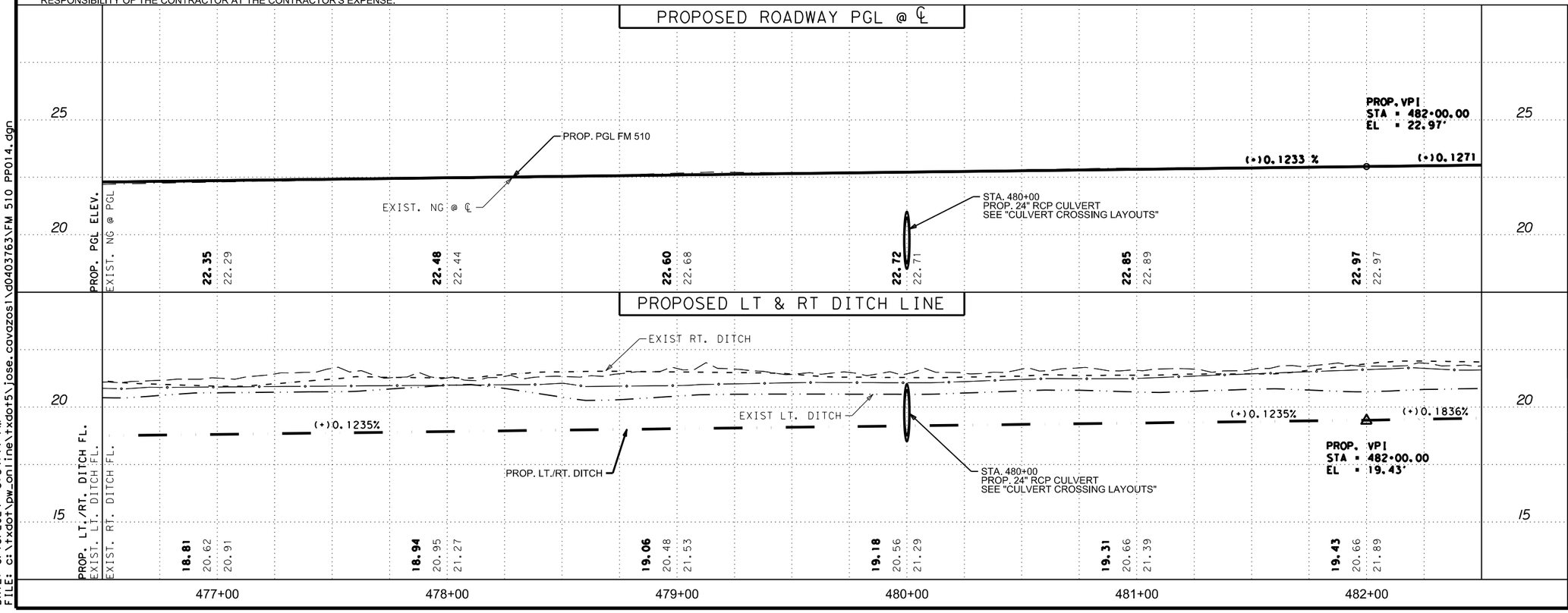

- PROP. PGL
- EXIST. NG @ PGL
- EXIST. LT. DITCH
- EXIST. RT. DITCH
- EXIST. LT. R.O.W.
- EXIST. RT. R.O.W.
- PROP. LT./RT. DITCH

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
ROADWAY PLAN AND PROFILE
STA 476+50 - STA 482+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 14 OF 41

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		117

DATE: 6/13/2024 3:54:17 PM
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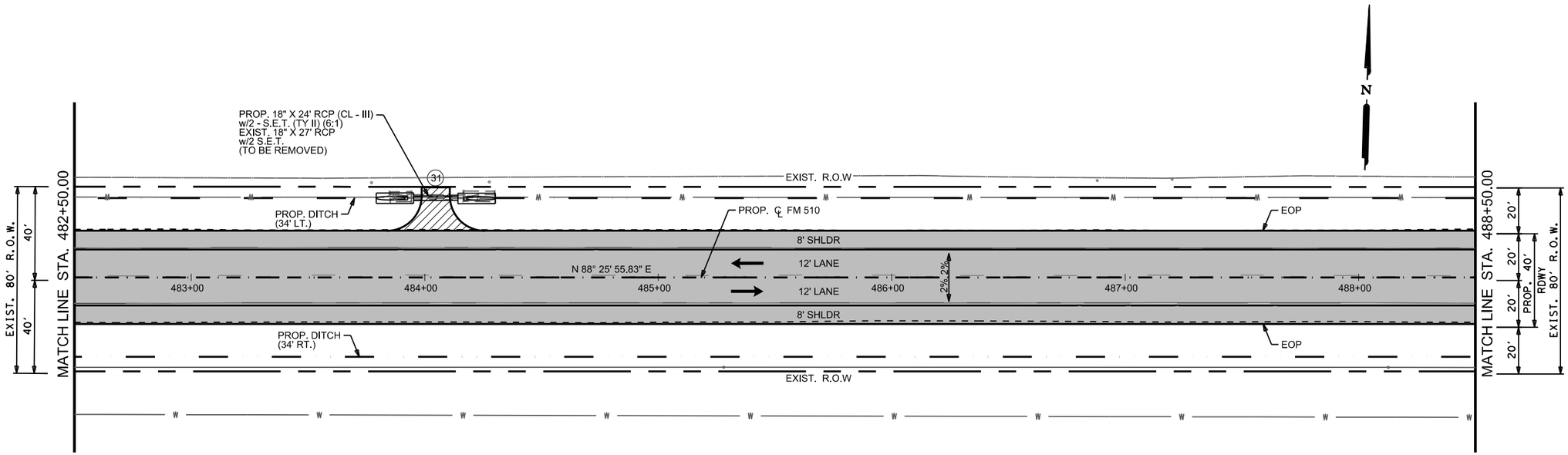

LEGEND:

- DRIVEWAY NUMBER
- TURNOUT NUMBER
- SINGLE MAILBOX
- MULTIPLE MAILBOX
- PROP. ACP ROADWAY
- PROP. ASPHALT DRIVEWAY
- PROP. CONCRETE DRIVEWAY
- PROP. MILLING/OVERLAY (1.5")
- NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS
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- EXIST. SAFETY END TREATMENT
- HORIZONTAL & VERTICAL CONTROL BENCHMARKS (SEE SURVEY CONTROL SHEETS FOR DETAILS)
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GENERAL NOTES:

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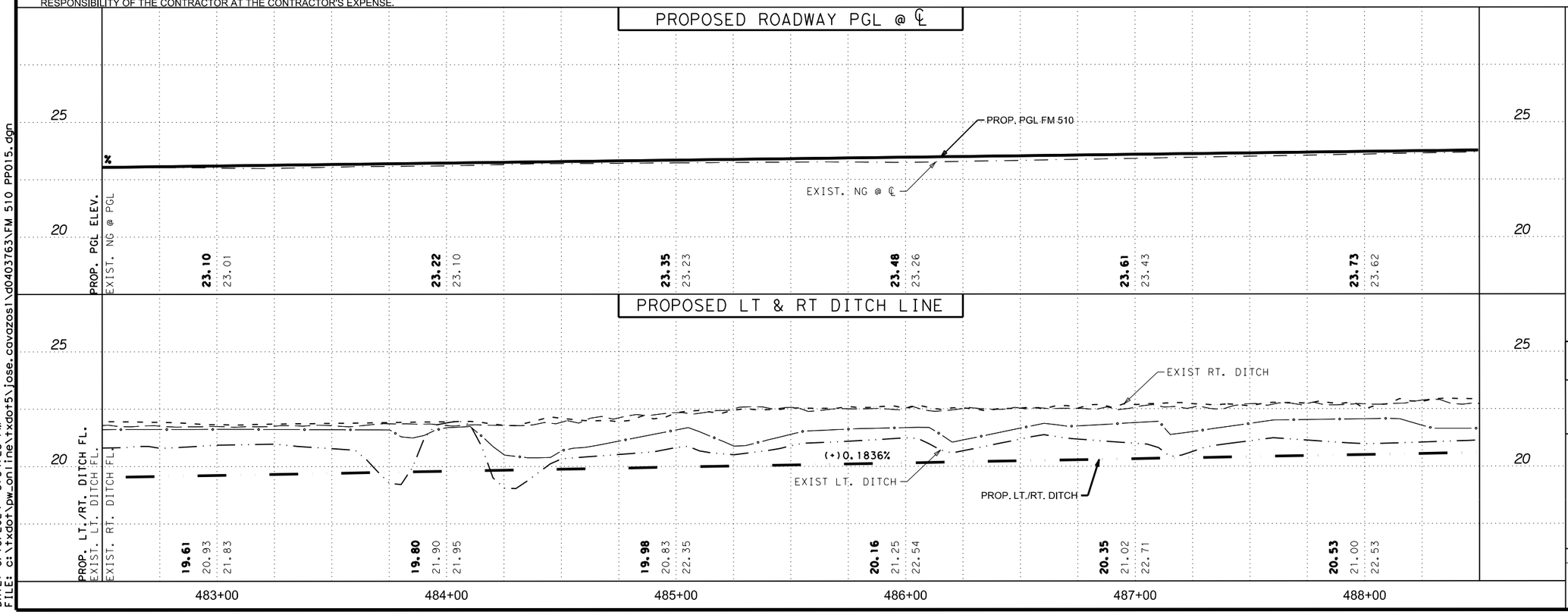

PROP. PGL
EXIST. NG @ PGL
EXIST. LT. DITCH
EXIST. RT. DITCH
EXIST. LT. R.O.W.
EXIST. RT. R.O.W.
PROP. LT./RT. DITCH

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
ROADWAY
PLAN AND PROFILE
STA 482+50 - STA 488+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 15 OF 41

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CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		118

DATE: 6/13/2024 3:54:23 PM
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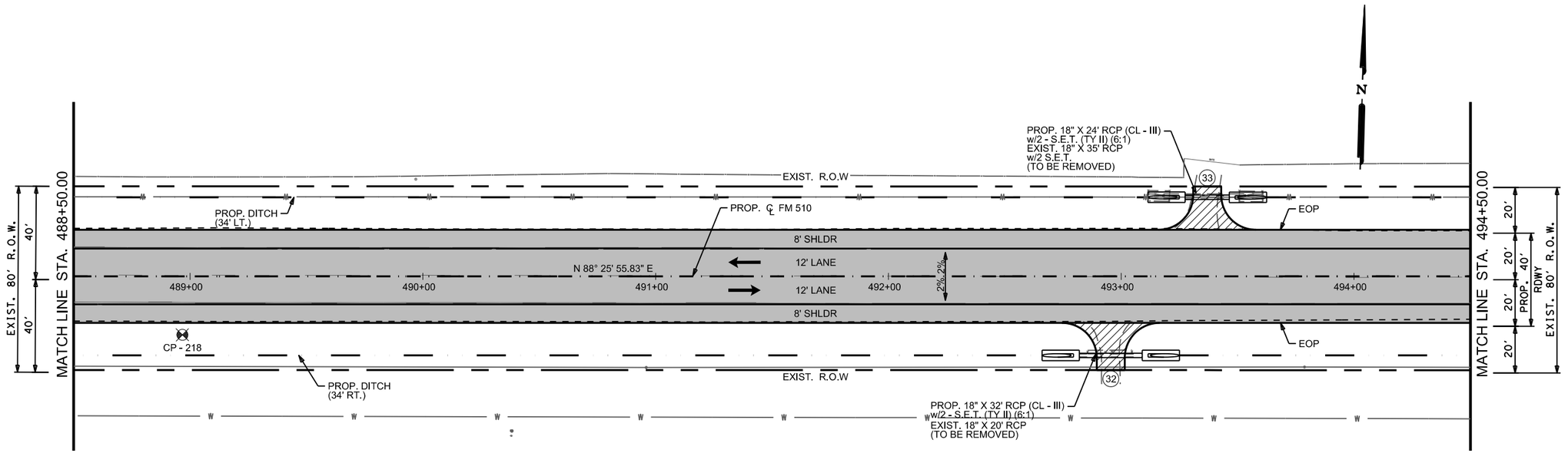

GENERAL NOTES:

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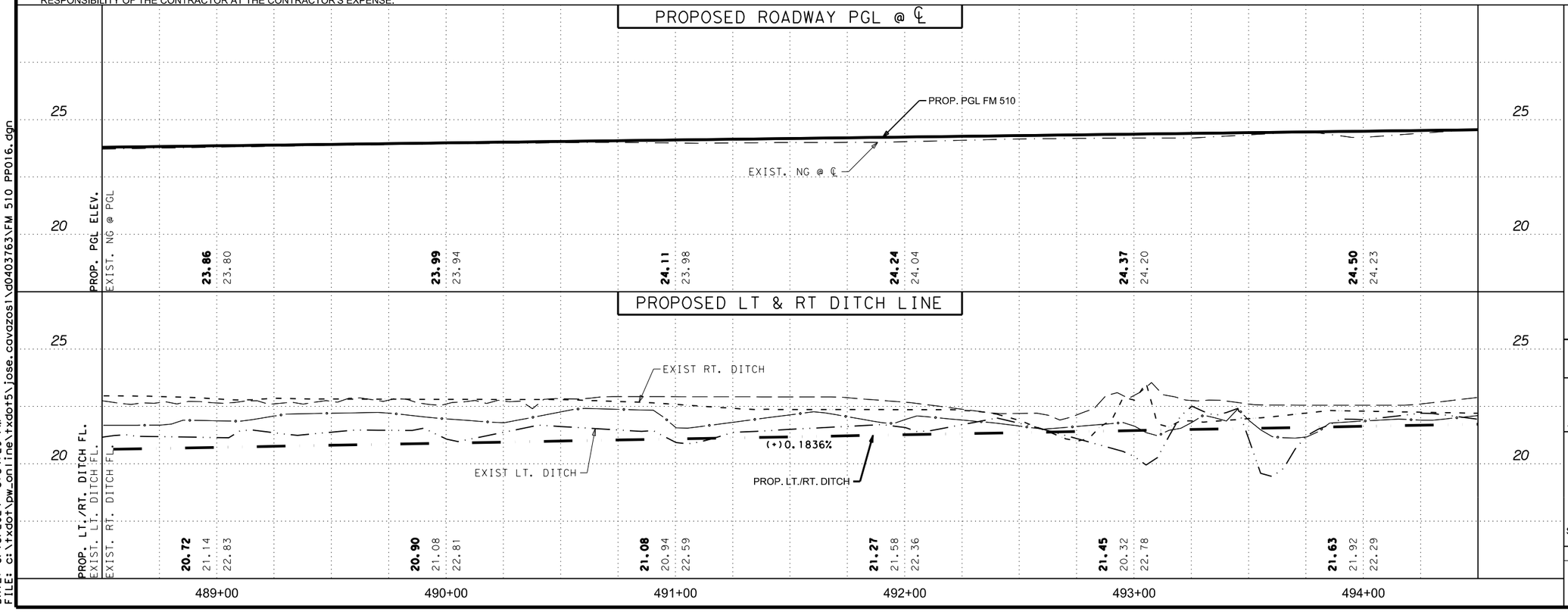

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STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

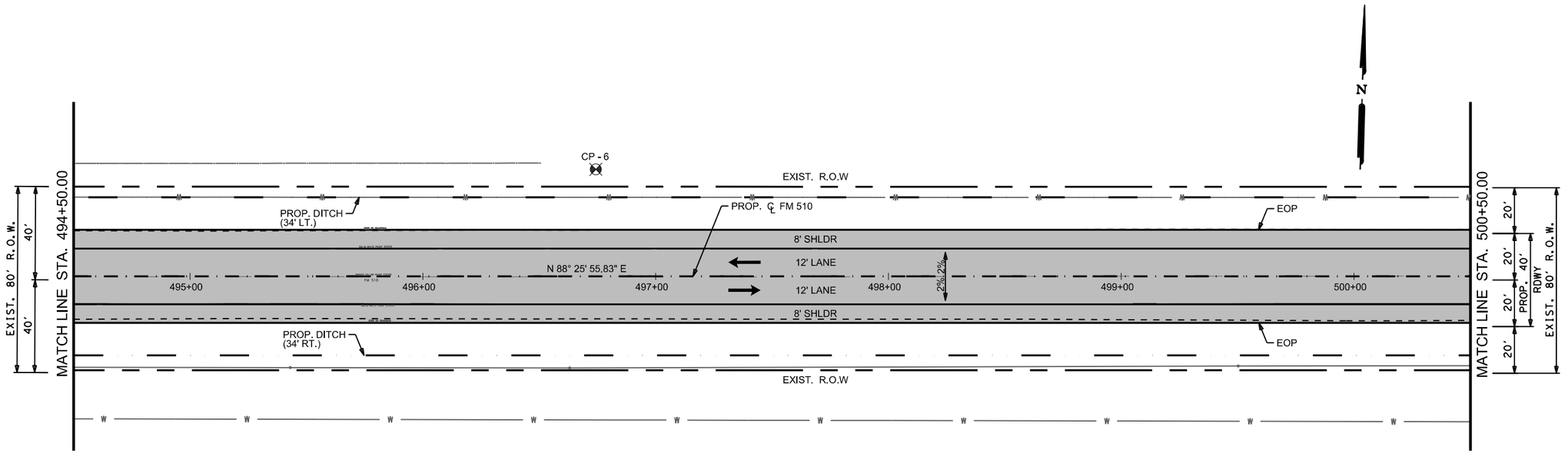
Texas Department of Transportation

FM 510
ROADWAY
PLAN AND PROFILE
STA 488+50 - STA 494+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 16 OF 41

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		119



LEGEND:

- DRIVEWAY NUMBER
- TURNOUT NUMBER
- SINGLE MAILBOX
- MULTIPLE MAILBOX
- PROP. ACP ROADWAY
- PROP. ASPHALT DRIVEWAY
- PROP. CONCRETE DRIVEWAY
- PROP. MILLING/OVERLAY (1.5")
- NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS
- DIRECTION OF TRAFFIC FLOW
- PROP. SAFETY END TREATMENT
- EXIST. SAFETY END TREATMENT
- HORIZONTAL & VERTICAL CONTROL BENCHMARKS (SEE SURVEY CONTROL SHEETS FOR DETAILS)
- HVTL — EXIST. HIGH VOLTAGE TRANSMISSION LINE
- OHE — EXIST. OVERHEAD ELECTRIC LINE
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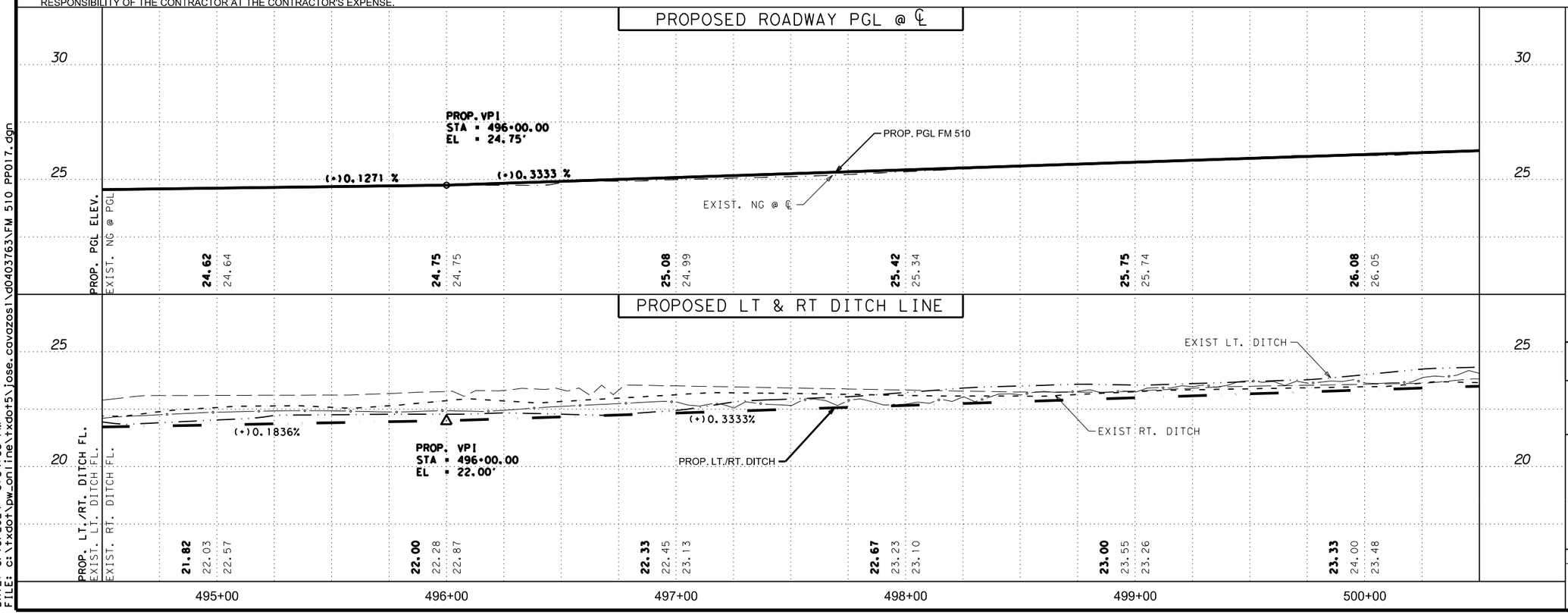
- G — EXIST. GAS PIPELINE

GENERAL NOTES:

1. SEE HORIZONTAL CONTROL DATA SHEET FOR PROPOSED CENTERLINE DATA.
2. SEE HORIZONTAL & VERTICAL CONTROL SHEETS FOR SURVEY CONTROL POINTS AND BENCHMARK INFORMATION.
3. SEE PROPOSED TYPICAL SECTIONS FOR ROADWAY REHAB WIDTH.
4. CONTRACTOR SHALL COORDINATE WITH ADJACENT PROPERTY OWNERS PRIOR TO CONSTRUCTION OF DRIVEWAYS.
5. SEE DRIVEWAY TABLES FOR DRIVEWAY QUANTITIES.
6. EXISTING UNDERGROUND UTILITIES AND TOPOGRAPHY HAVE BEEN PLOTTED BY DIRECT FIELD INFORMATION, AND AS SPOTTED BY UTILITY LOCATE REQUEST. CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANIES TO VERIFY THE EXACT LOCATION IN THE FIELD PRIOR TO CONSTRUCTION. ALL DAMAGES AND SUBSEQUENT REPAIRS AND/OR REPLACEMENT TO ANY UTILITY (AERIAL AND/OR UNDERGROUND) SHALL BE THE DIRECT RESPONSIBILITY OF THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.



PROP. PGL
EXIST. NG @ PGL
EXIST. LT. DITCH
EXIST. RT. DITCH
EXIST. LT. R.O.W.
EXIST. RT. R.O.W.
PROP. LT./RT. DITCH

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
ROADWAY
PLAN AND PROFILE
STA 494+50 - STA 500+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 17 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		120

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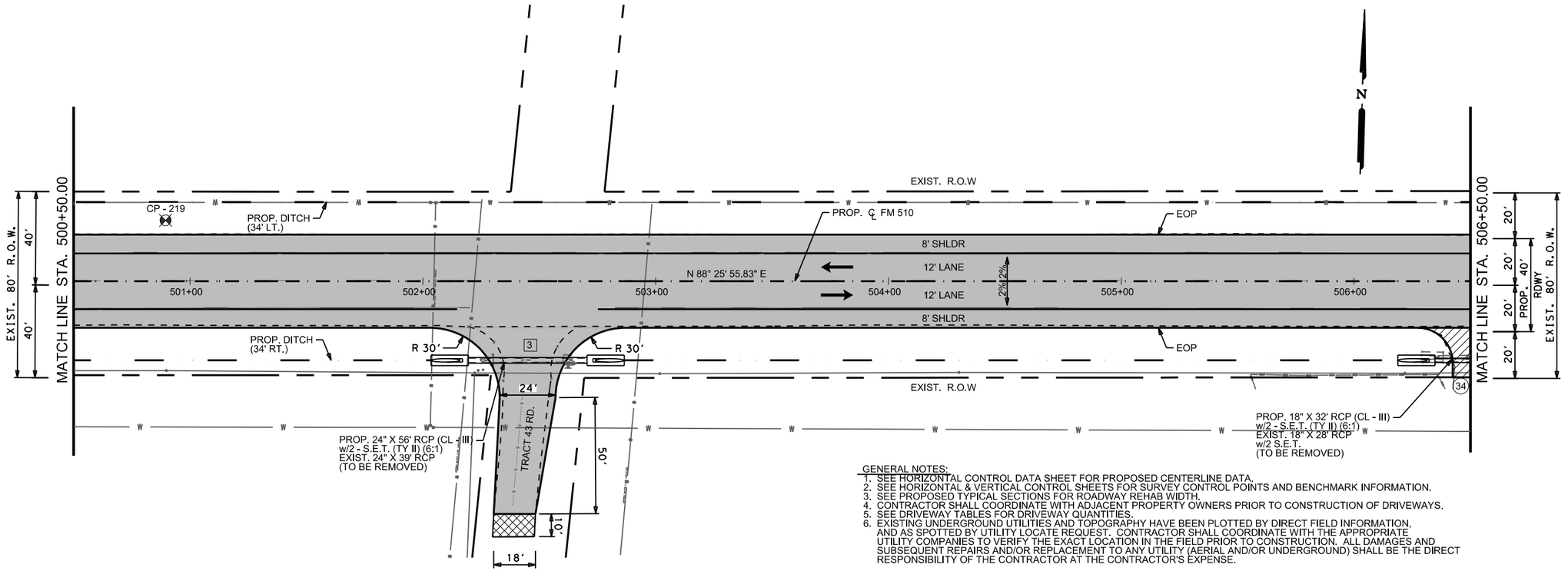
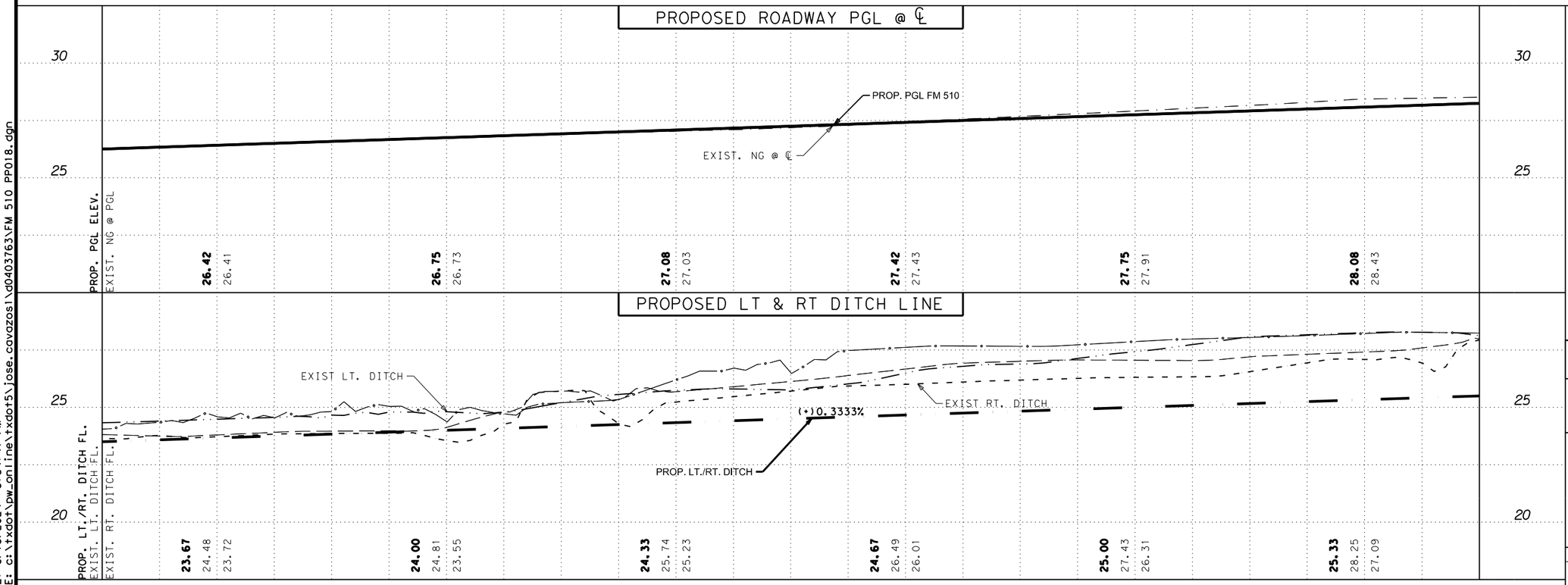


LEGEND:

- DRIVEWAY NUMBER
- TURNOUT NUMBER
- SINGLE MAILBOX
- MULTIPLE MAILBOX
- PROP. ACP ROADWAY
- PROP. ASPHALT DRIVEWAY
- PROP. CONCRETE DRIVEWAY
- PROP. MILLING/OVERLAY (1.5")
- NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS
- DIRECTION OF TRAFFIC FLOW
- PROP. SAFETY END TREATMENT
- EXIST. SAFETY END TREATMENT
- HORIZONTAL & VERTICAL CONTROL BENCHMARKS (SEE SURVEY CONTROL SHEETS FOR DETAILS)
- HVTL — EXIST. HIGH VOLTAGE TRANSMISSION LINE
- OHE — EXIST. OVERHEAD ELECTRIC LINE
- W — EXIST. WATER LINE
- G — EXIST. GAS PIPELINE

GENERAL NOTES:

1. SEE HORIZONTAL CONTROL DATA SHEET FOR PROPOSED CENTERLINE DATA.
2. SEE HORIZONTAL & VERTICAL CONTROL SHEETS FOR SURVEY CONTROL POINTS AND BENCHMARK INFORMATION.
3. SEE PROPOSED TYPICAL SECTIONS FOR ROADWAY REHAB WIDTH.
4. CONTRACTOR SHALL COORDINATE WITH ADJACENT PROPERTY OWNERS PRIOR TO CONSTRUCTION OF DRIVEWAYS.
5. SEE DRIVEWAY TABLES FOR DRIVEWAY QUANTITIES.
6. EXISTING UNDERGROUND UTILITIES AND TOPOGRAPHY HAVE BEEN PLOTTED BY DIRECT FIELD INFORMATION, AND AS SPOTTED BY UTILITY LOCATE REQUEST. CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANIES TO VERIFY THE EXACT LOCATION IN THE FIELD PRIOR TO CONSTRUCTION. ALL DAMAGES AND SUBSEQUENT REPAIRS AND/OR REPLACEMENT TO ANY UTILITY (AERIAL AND/OR UNDERGROUND) SHALL BE THE DIRECT RESPONSIBILITY OF THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.



PROP. PGL
EXIST. NG @ PGL
EXIST. LT. DITCH
EXIST. RT. DITCH
EXIST. LT. R.O.W.
EXIST. RT. R.O.W.
PROP. LT./RT. DITCH

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
ROADWAY
PLAN AND PROFILE
STA 500+50 - STA 506+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 18 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		121

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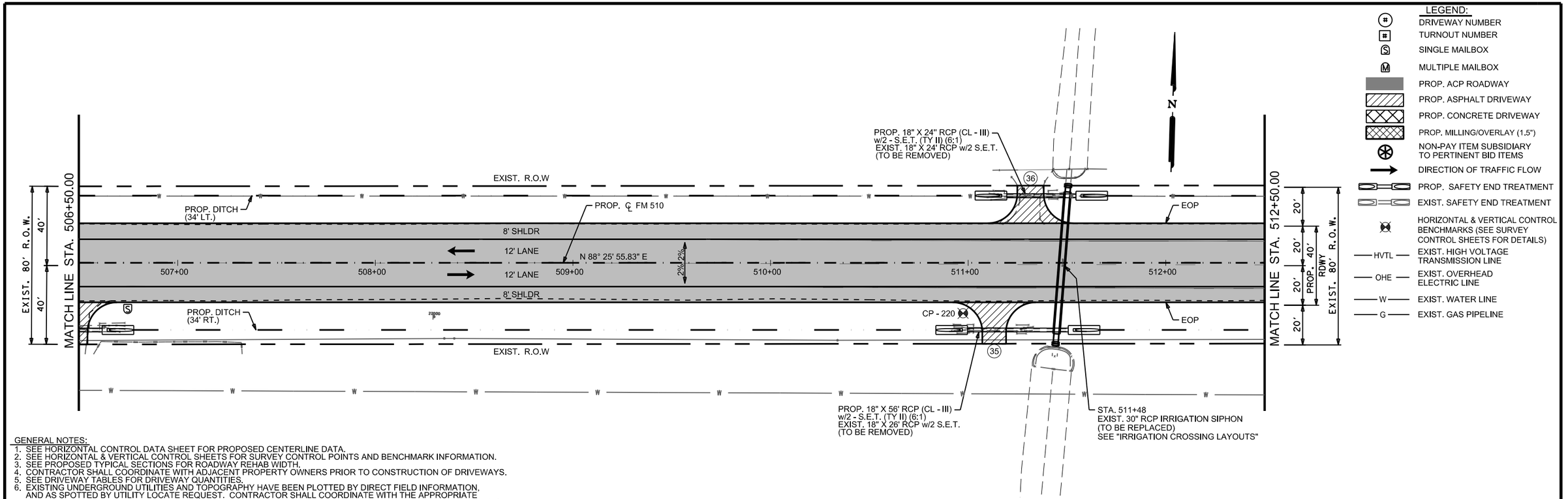

LEGEND:

- DRIVEWAY NUMBER
- TURNOUT NUMBER
- SINGLE MAILBOX
- MULTIPLE MAILBOX
- PROP. ACP ROADWAY
- PROP. ASPHALT DRIVEWAY
- PROP. CONCRETE DRIVEWAY
- PROP. MILLING/OVERLAY (1.5")
- NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS
- DIRECTION OF TRAFFIC FLOW
- PROP. SAFETY END TREATMENT
- EXIST. SAFETY END TREATMENT
- HORIZONTAL & VERTICAL CONTROL BENCHMARKS (SEE SURVEY CONTROL SHEETS FOR DETAILS)
- HVTL — EXIST. HIGH VOLTAGE TRANSMISSION LINE
- OHE — EXIST. OVERHEAD ELECTRIC LINE
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GENERAL NOTES:

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3. SEE PROPOSED TYPICAL SECTIONS FOR ROADWAY REHAB WIDTH.
4. CONTRACTOR SHALL COORDINATE WITH ADJACENT PROPERTY OWNERS PRIOR TO CONSTRUCTION OF DRIVEWAYS.
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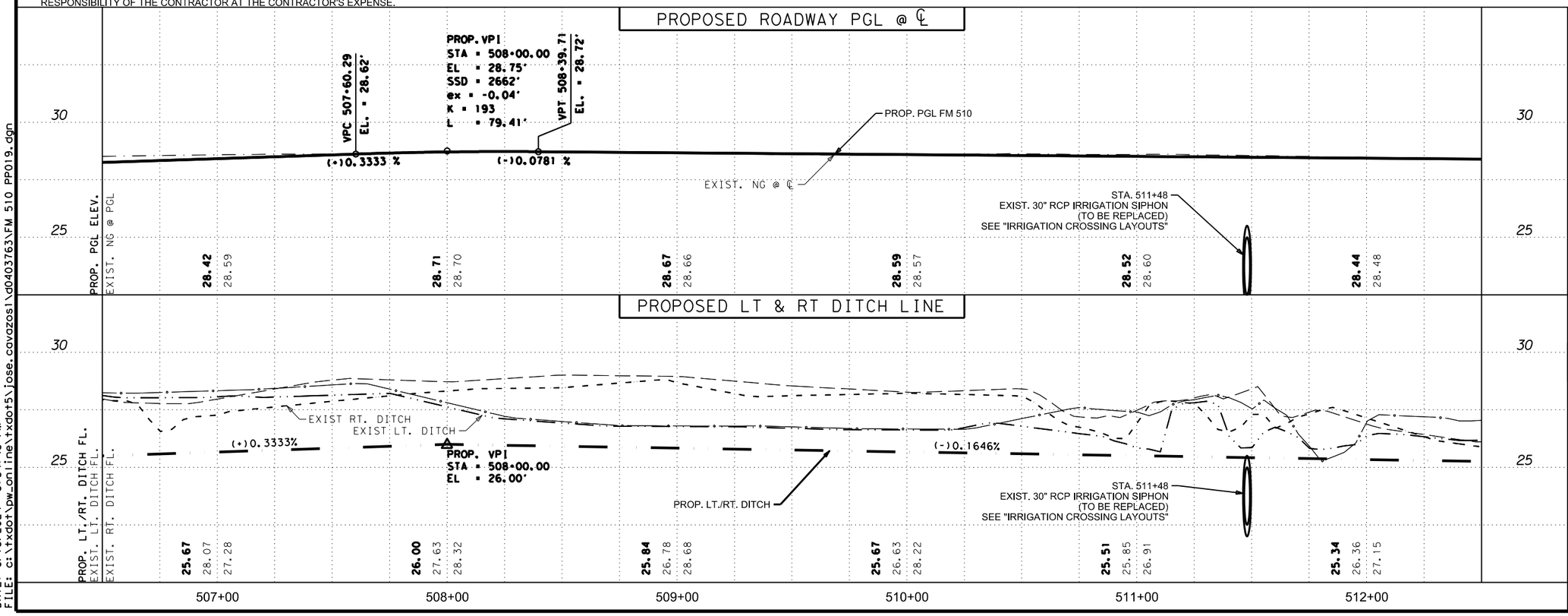

PROP. PGL
EXIST. NG @ PGL
EXIST. LT. DITCH
EXIST. RT. DITCH
EXIST. LT. R.O.W.
EXIST. RT. R.O.W.
PROP. LT./RT. DITCH

STATE OF TEXAS
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06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
ROADWAY PLAN AND PROFILE
STA 506+50 - STA 512+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 19 OF 41

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		122

DATE: 6/13/2024 3:54:48 PM
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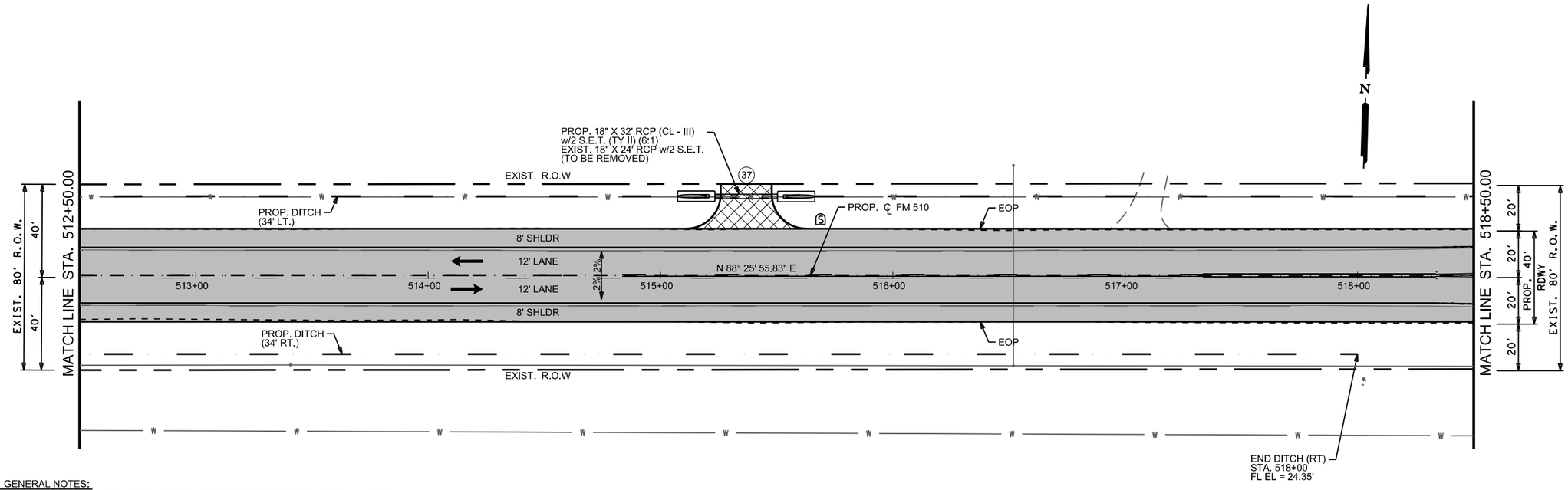

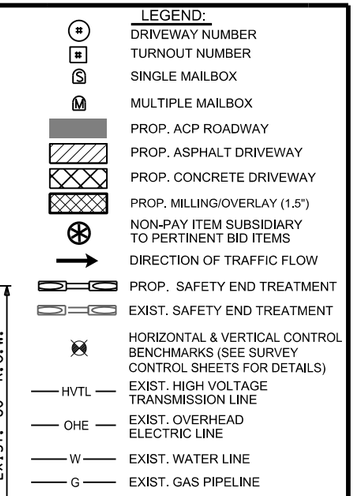

GENERAL NOTES:
1. SEE HORIZONTAL CONTROL DATA SHEET FOR PROPOSED CENTERLINE DATA.
2. SEE HORIZONTAL & VERTICAL CONTROL SHEETS FOR SURVEY CONTROL POINTS AND BENCHMARK INFORMATION.
3. SEE PROPOSED TYPICAL SECTIONS FOR ROADWAY REHAB WIDTH.
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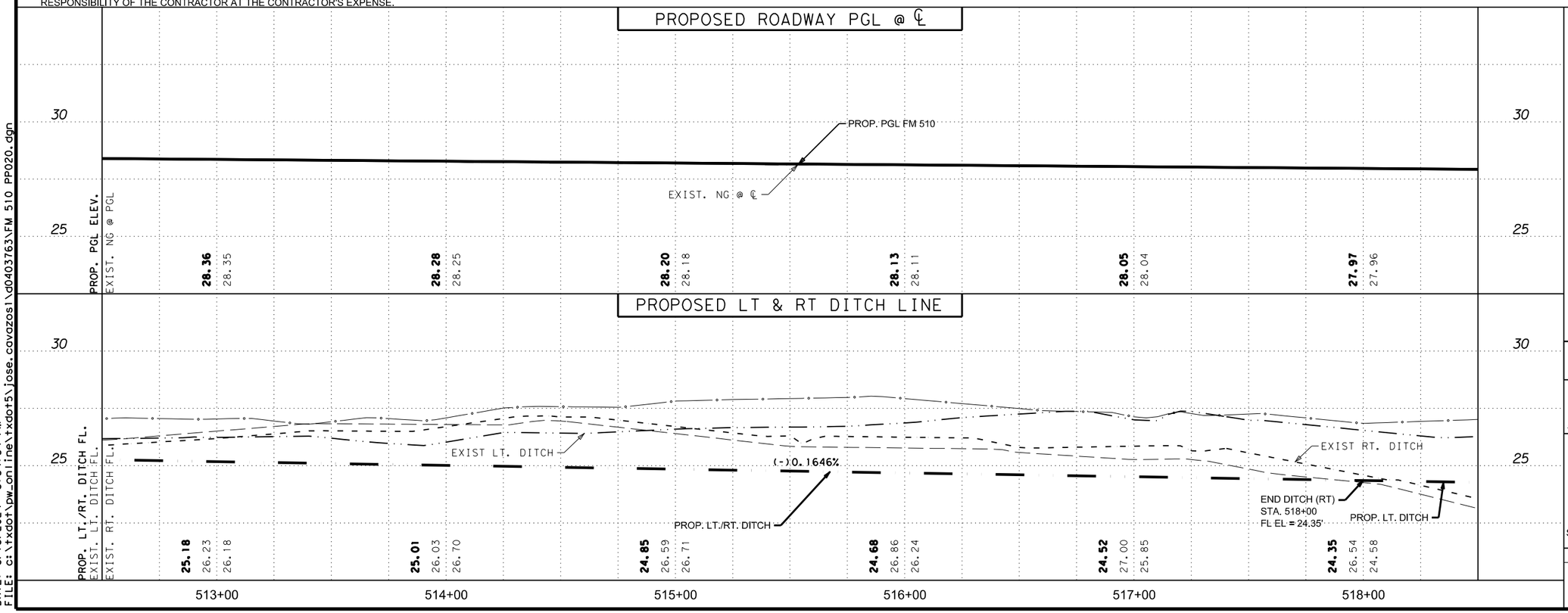

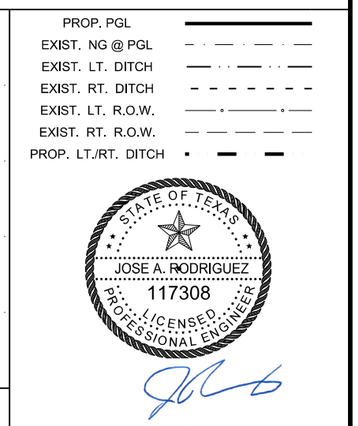

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
ROADWAY
PLAN AND PROFILE
STA 512+50 - STA 518+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 20 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		123

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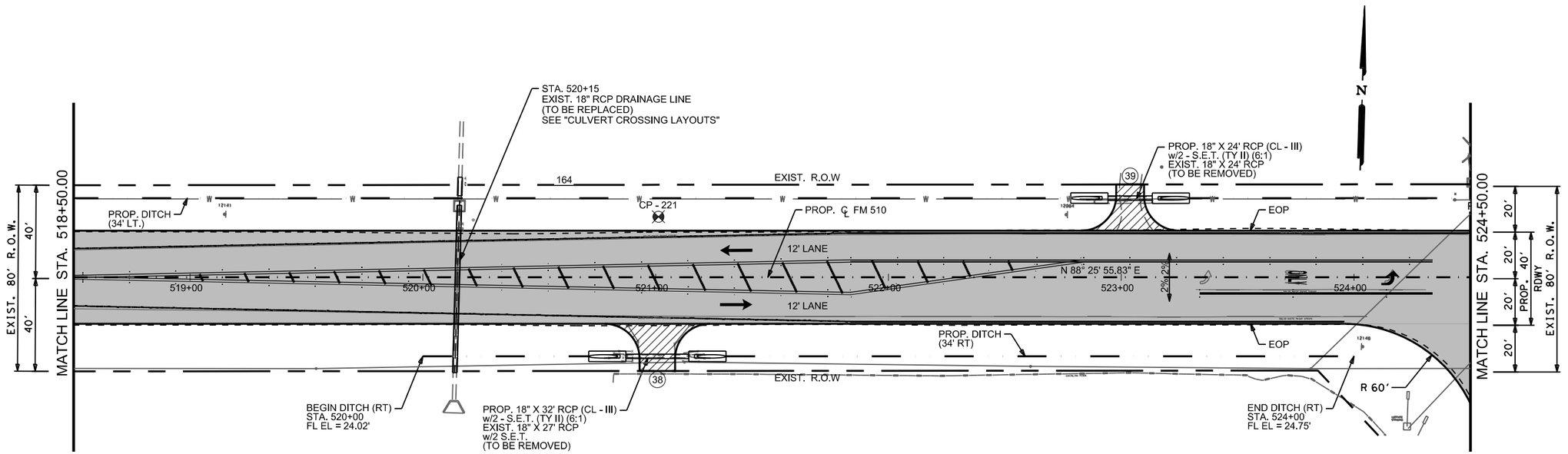

GENERAL NOTES:
1. SEE HORIZONTAL CONTROL DATA SHEET FOR PROPOSED CENTERLINE DATA.
2. SEE HORIZONTAL & VERTICAL CONTROL SHEETS FOR SURVEY CONTROL POINTS AND BENCHMARK INFORMATION.
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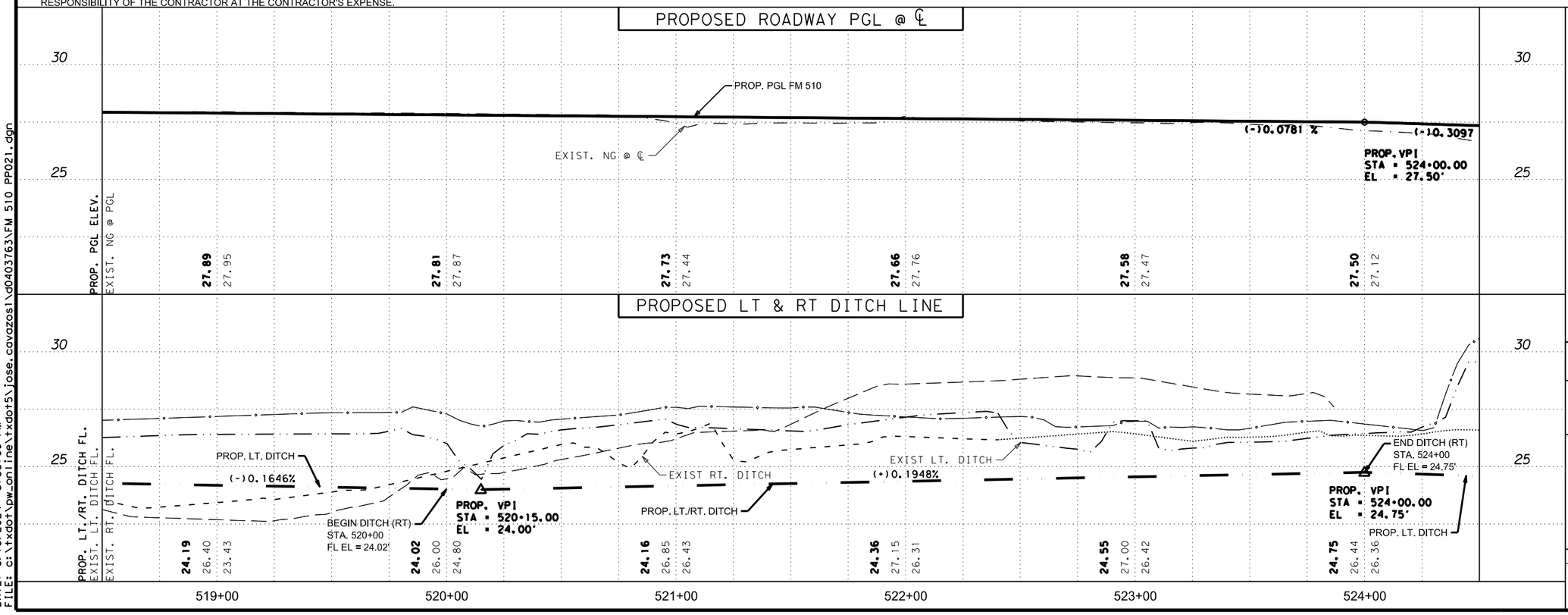

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STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

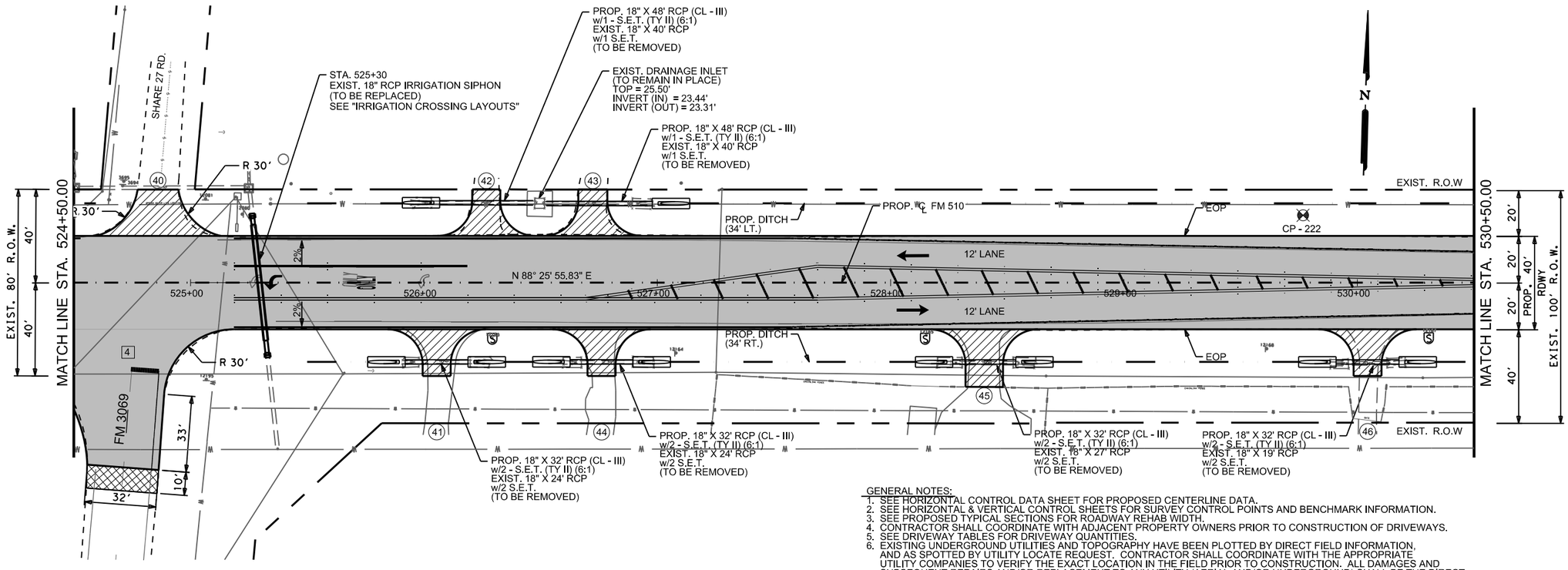
Texas Department of Transportation

FM 510
ROADWAY
PLAN AND PROFILE
STA 518+50 - STA 524+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 21 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		124



GENERAL NOTES:

1. SEE HORIZONTAL CONTROL DATA SHEET FOR PROPOSED CENTERLINE DATA.
2. SEE HORIZONTAL & VERTICAL CONTROL SHEETS FOR SURVEY CONTROL POINTS AND BENCHMARK INFORMATION.
3. SEE PROPOSED TYPICAL SECTIONS FOR ROADWAY REHAB WIDTH.
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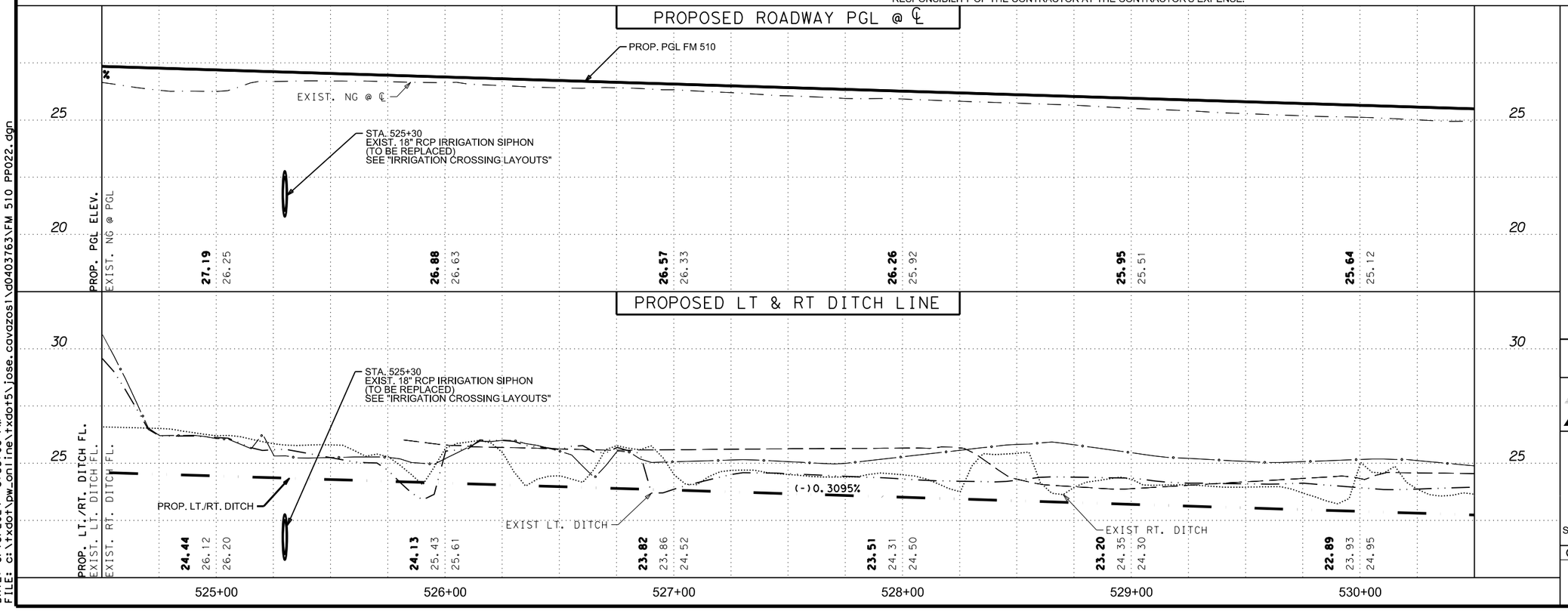

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
ROADWAY
PLAN AND PROFILE
STA 524+50 - STA 530+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 22 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510

DIST	COUNTY	SHEET NO.
PHR	CAMERON	125

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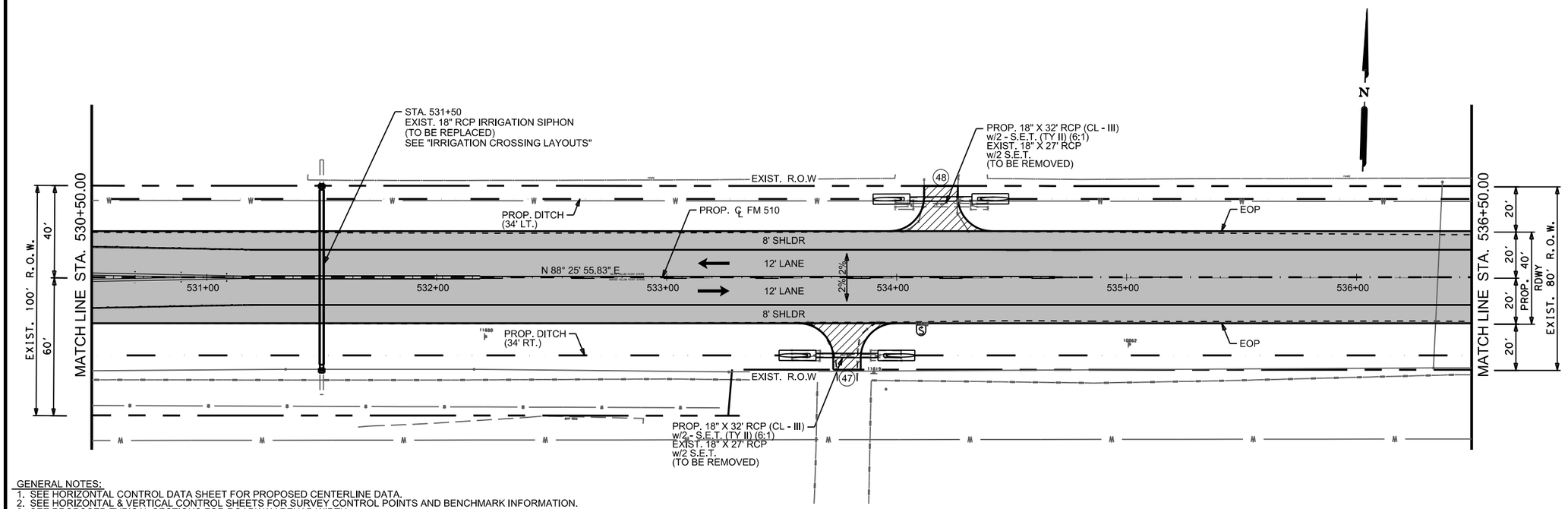

GENERAL NOTES:
1. SEE HORIZONTAL CONTROL DATA SHEET FOR PROPOSED CENTERLINE DATA.
2. SEE HORIZONTAL & VERTICAL CONTROL SHEETS FOR SURVEY CONTROL POINTS AND BENCHMARK INFORMATION.
3. SEE PROPOSED TYPICAL SECTIONS FOR ROADWAY REHAB WIDTH.
4. CONTRACTOR SHALL COORDINATE WITH ADJACENT PROPERTY OWNERS PRIOR TO CONSTRUCTION OF DRIVEWAYS.
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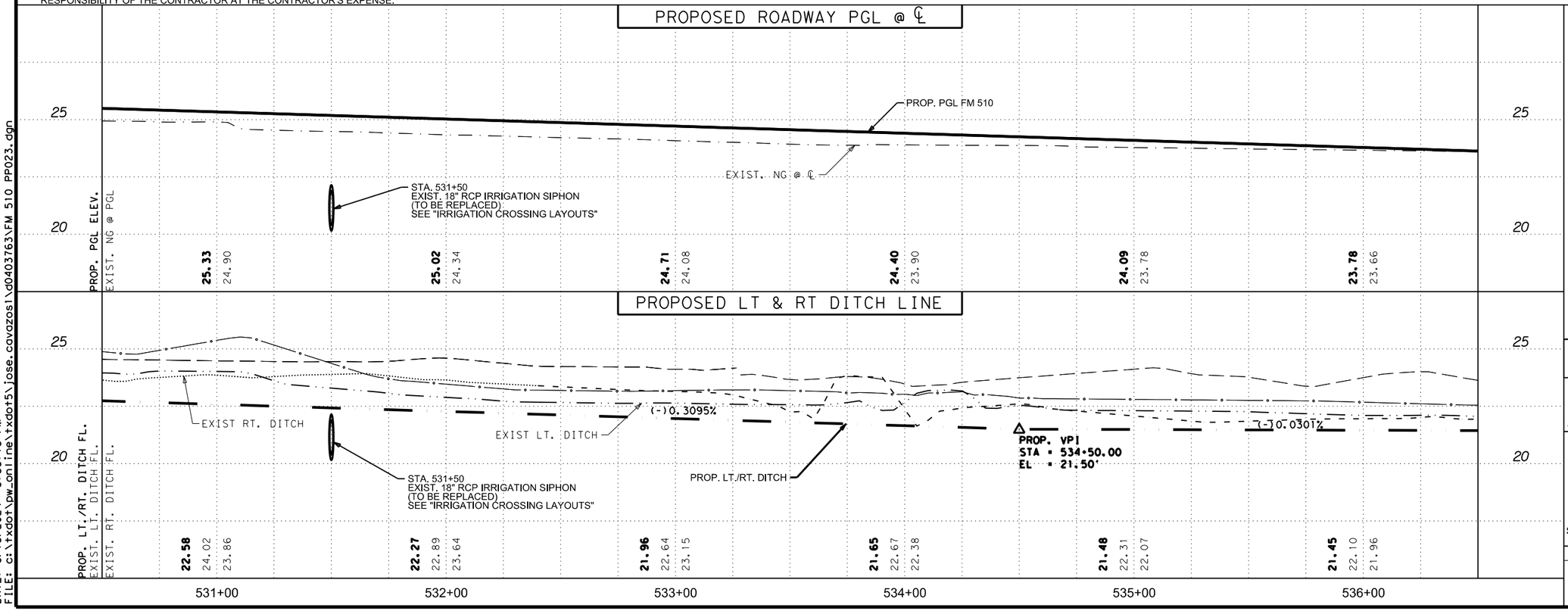

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STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER
06/13/24

Pharr District Central Design

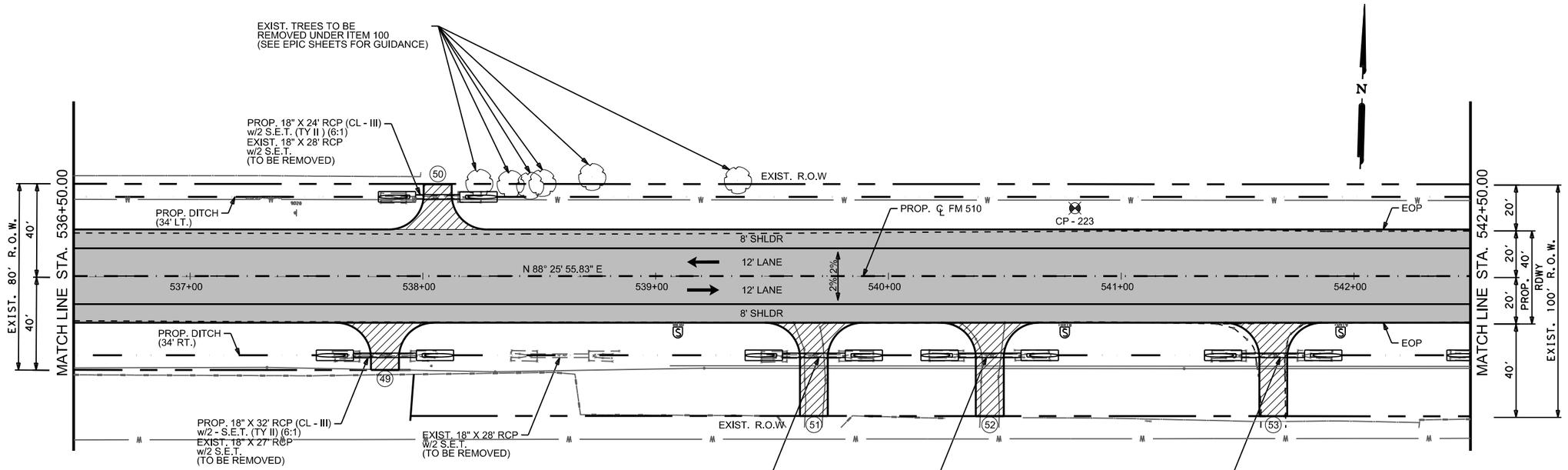
Texas Department of Transportation

FM 510
ROADWAY
PLAN AND PROFILE
STA 530+50 - STA 536+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 23 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		126



GENERAL NOTES:

1. SEE HORIZONTAL CONTROL DATA SHEET FOR PROPOSED CENTERLINE DATA.
2. SEE HORIZONTAL & VERTICAL CONTROL SHEETS FOR SURVEY CONTROL POINTS AND BENCHMARK INFORMATION.
3. SEE PROPOSED TYPICAL SECTIONS FOR ROADWAY REHAB WIDTH.
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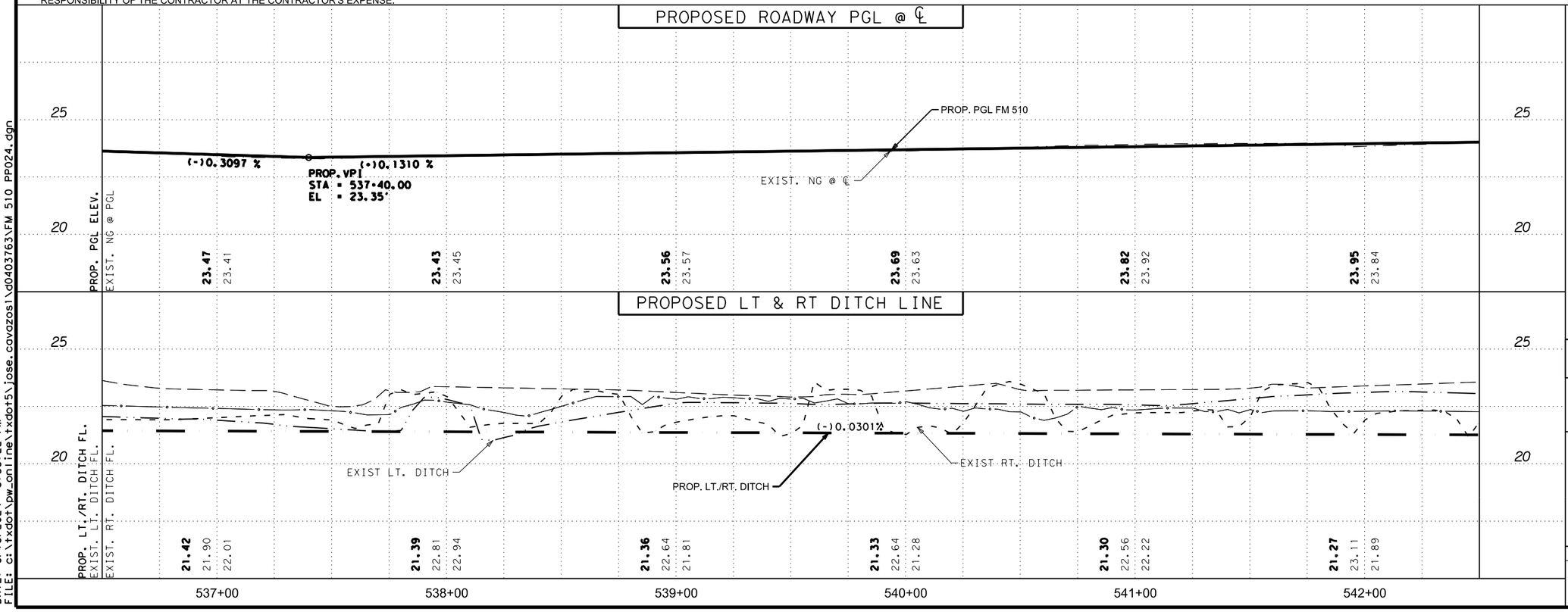

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STATE OF TEXAS
JOSE A. RODRIGUEZ
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LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

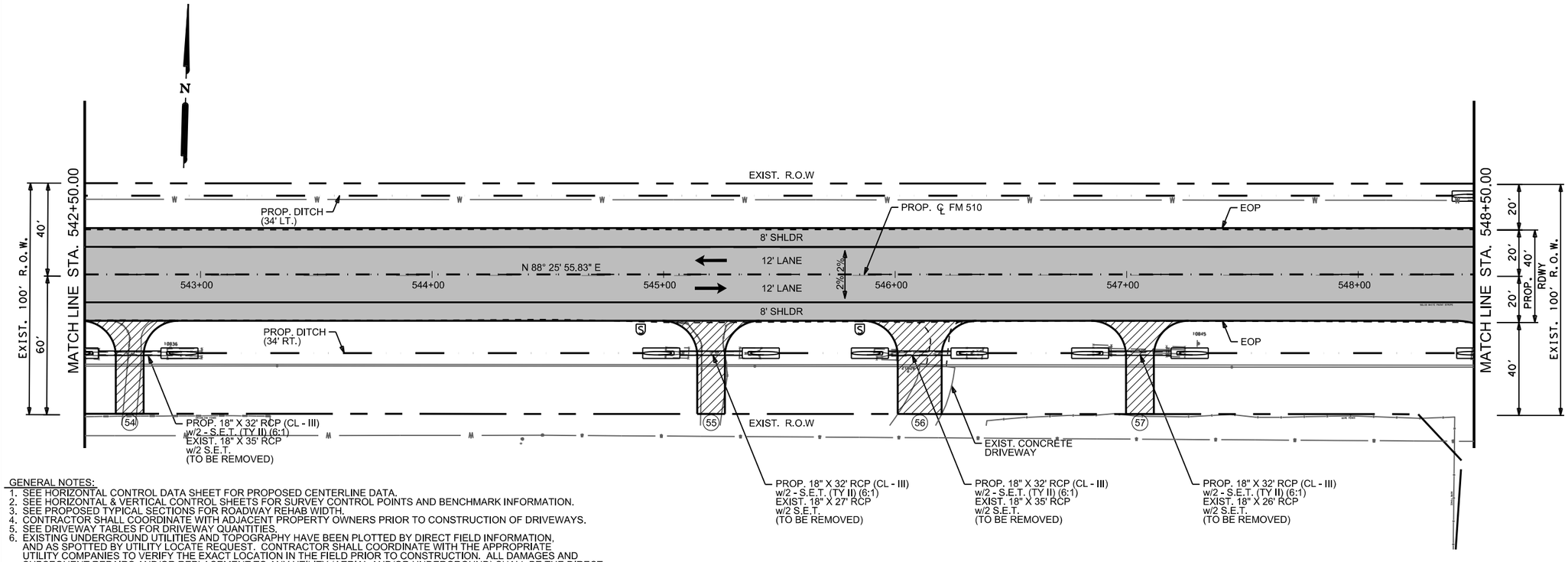
Texas Department of Transportation

FM 510
ROADWAY PLAN AND PROFILE
STA 536+50 - STA 542+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 24 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		127



LEGEND:

- DRIVEWAY NUMBER
- TURNOUT NUMBER
- SINGLE MAILBOX
- MULTIPLE MAILBOX
- PROP. ACP ROADWAY
- PROP. ASPHALT DRIVEWAY
- PROP. CONCRETE DRIVEWAY
- PROP. MILLING/OVERLAY (1.5")
- NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS
- DIRECTION OF TRAFFIC FLOW
- PROP. SAFETY END TREATMENT
- EXIST. SAFETY END TREATMENT
- HORIZONTAL & VERTICAL CONTROL BENCHMARKS (SEE SURVEY CONTROL SHEETS FOR DETAILS)
- HVTL — EXIST. HIGH VOLTAGE TRANSMISSION LINE
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- W — EXIST. WATER LINE
- G — EXIST. GAS PIPELINE

GENERAL NOTES:

1. SEE HORIZONTAL CONTROL DATA SHEET FOR PROPOSED CENTERLINE DATA.
2. SEE HORIZONTAL & VERTICAL CONTROL SHEETS FOR SURVEY CONTROL POINTS AND BENCHMARK INFORMATION.
3. SEE PROPOSED TYPICAL SECTIONS FOR ROADWAY REHAB WIDTH.
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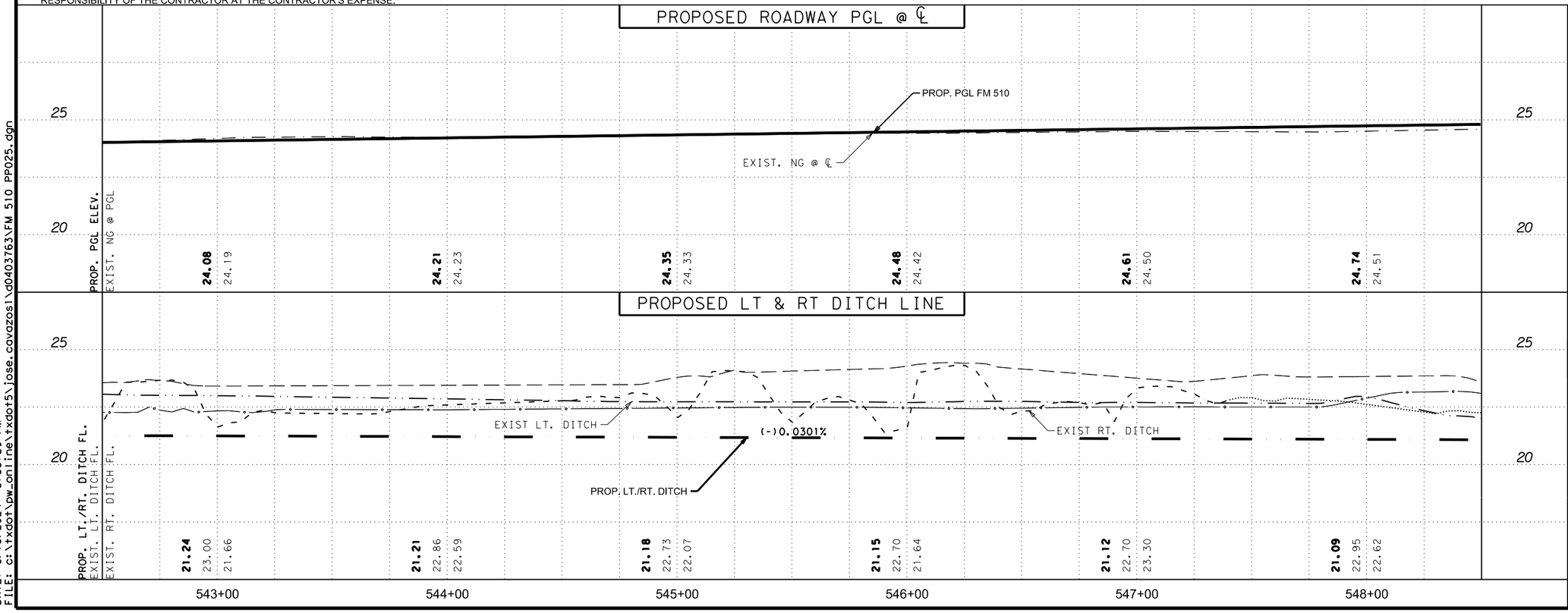

PROP. PGL
EXIST. NG @ PGL
EXIST. LT. DITCH
EXIST. RT. DITCH
EXIST. LT. R.O.W.
EXIST. RT. R.O.W.
PROP. LT./RT. DITCH

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
ROADWAY PLAN AND PROFILE
STA 542+50 - STA 548+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 25 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		128

DATE: 6/13/2024 3:55:29 PM
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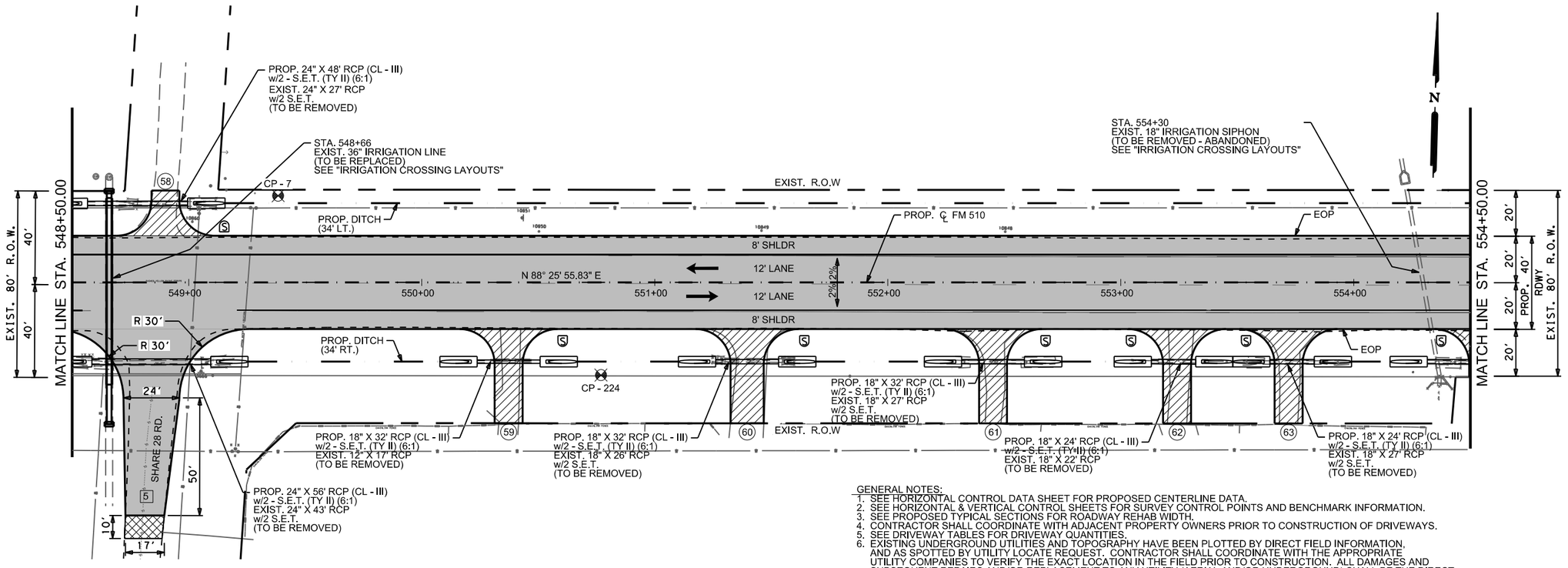
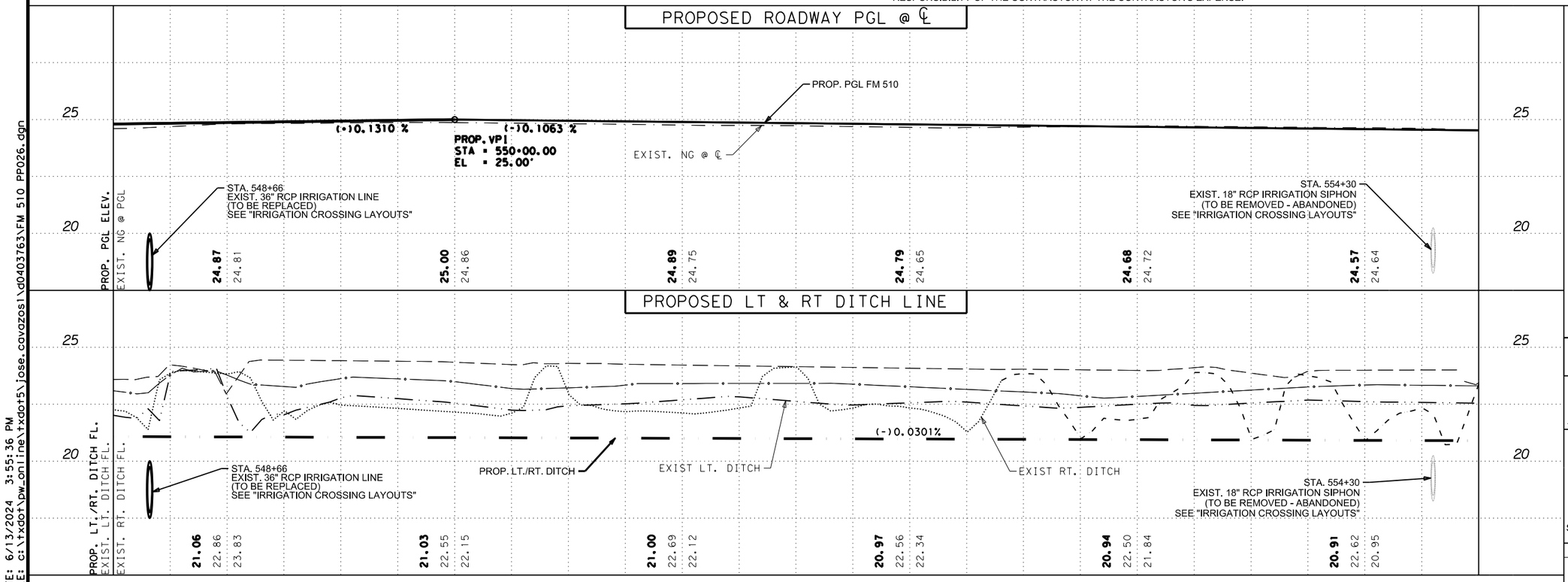


LEGEND:

- DRIVEWAY NUMBER
- TURNOUT NUMBER
- SINGLE MAILBOX
- MULTIPLE MAILBOX
- PROP. ACP ROADWAY
- PROP. ASPHALT DRIVEWAY
- PROP. CONCRETE DRIVEWAY
- PROP. MILLING/OVERLAY (1.5")
- NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS
- DIRECTION OF TRAFFIC FLOW
- PROP. SAFETY END TREATMENT
- EXIST. SAFETY END TREATMENT
- HORIZONTAL & VERTICAL CONTROL BENCHMARKS (SEE SURVEY CONTROL SHEETS FOR DETAILS)
- HVTL — EXIST. HIGH VOLTAGE TRANSMISSION LINE
- OHE — EXIST. OVERHEAD ELECTRIC LINE
- W — EXIST. WATER LINE
- G — EXIST. GAS PIPELINE

GENERAL NOTES:

1. SEE HORIZONTAL CONTROL DATA SHEET FOR PROPOSED CENTERLINE DATA.
2. SEE HORIZONTAL & VERTICAL CONTROL SHEETS FOR SURVEY CONTROL POINTS AND BENCHMARK INFORMATION.
3. SEE PROPOSED TYPICAL SECTIONS FOR ROADWAY REHAB WIDTH.
4. CONTRACTOR SHALL COORDINATE WITH ADJACENT PROPERTY OWNERS PRIOR TO CONSTRUCTION OF DRIVEWAYS.
5. SEE DRIVEWAY TABLES FOR DRIVEWAY QUANTITIES.
6. EXISTING UNDERGROUND UTILITIES AND TOPOGRAPHY HAVE BEEN PLOTTED BY DIRECT FIELD INFORMATION, AND AS SPOTTED BY UTILITY LOCATE REQUEST. CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANIES TO VERIFY THE EXACT LOCATION IN THE FIELD PRIOR TO CONSTRUCTION. ALL DAMAGES AND SUBSEQUENT REPAIRS AND/OR REPLACEMENT TO ANY UTILITY (AERIAL AND/OR UNDERGROUND) SHALL BE THE DIRECT RESPONSIBILITY OF THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.



PROP. PGL
EXIST. NG @ PGL
EXIST. LT. DITCH
EXIST. RT. DITCH
EXIST. LT. R.O.W.
EXIST. RT. R.O.W.
PROP. LT./RT. DITCH

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
ROADWAY
PLAN AND PROFILE
STA 548+50 - STA 554+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 26 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		129

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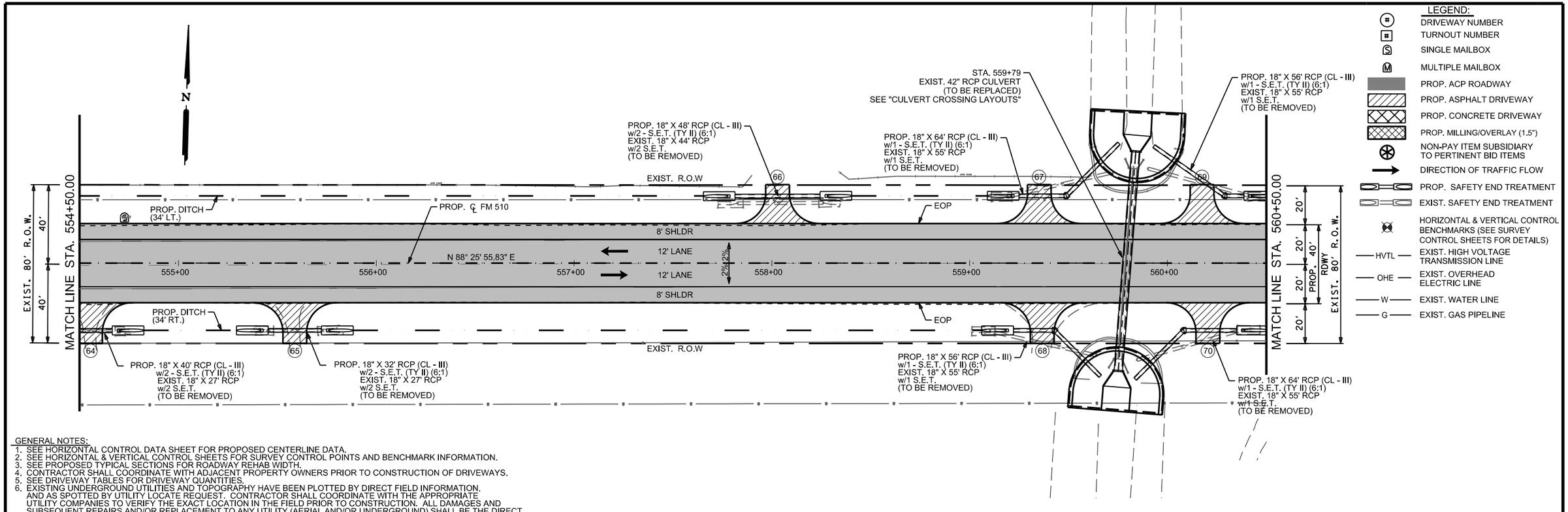
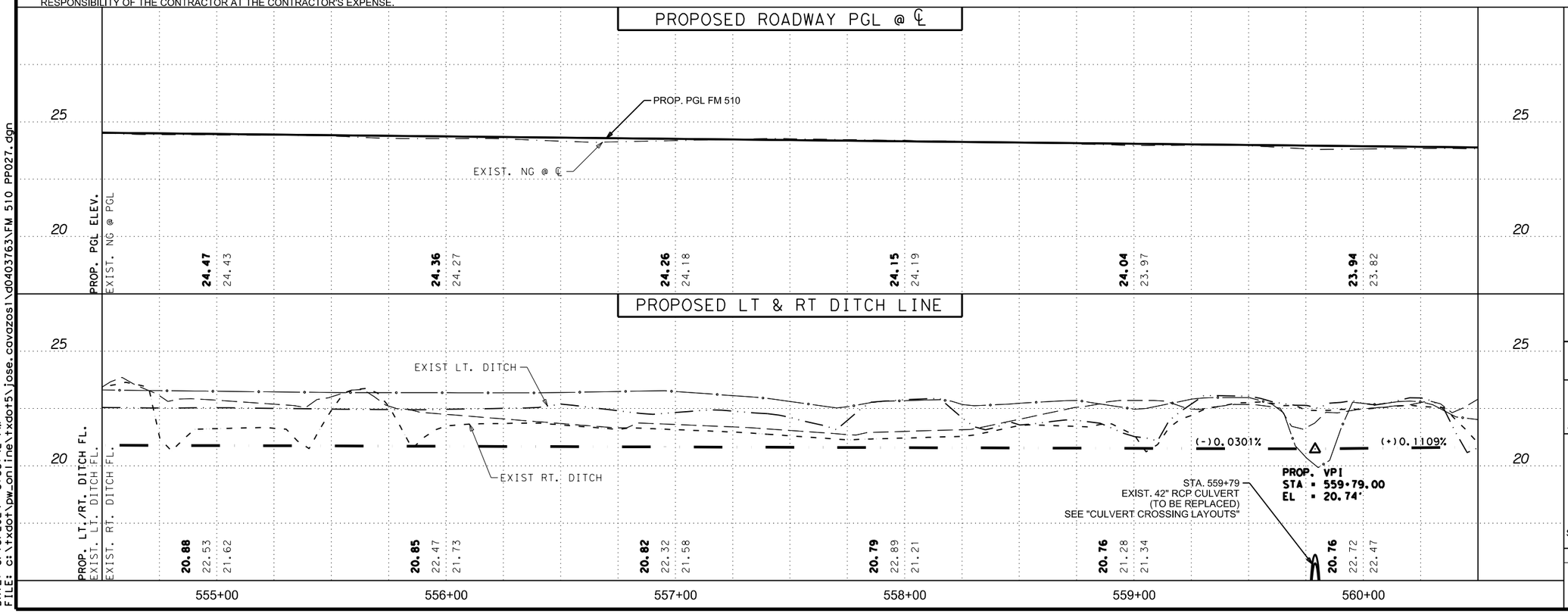


LEGEND:

- DRIVEWAY NUMBER
- TURNOUT NUMBER
- SINGLE MAILBOX
- MULTIPLE MAILBOX
- PROP. ACP ROADWAY
- PROP. ASPHALT DRIVEWAY
- PROP. CONCRETE DRIVEWAY
- PROP. MILLING/OVERLAY (1.5")
- NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS
- DIRECTION OF TRAFFIC FLOW
- PROP. SAFETY END TREATMENT
- EXIST. SAFETY END TREATMENT
- HORIZONTAL & VERTICAL CONTROL BENCHMARKS (SEE SURVEY CONTROL SHEETS FOR DETAILS)
- HVTL — EXIST. HIGH VOLTAGE TRANSMISSION LINE
- OHE — EXIST. OVERHEAD ELECTRIC LINE
- W — EXIST. WATER LINE
- G — EXIST. GAS PIPELINE

GENERAL NOTES:

1. SEE HORIZONTAL CONTROL DATA SHEET FOR PROPOSED CENTERLINE DATA.
2. SEE HORIZONTAL & VERTICAL CONTROL SHEETS FOR SURVEY CONTROL POINTS AND BENCHMARK INFORMATION.
3. SEE PROPOSED TYPICAL SECTIONS FOR ROADWAY REHAB WIDTH.
4. CONTRACTOR SHALL COORDINATE WITH ADJACENT PROPERTY OWNERS PRIOR TO CONSTRUCTION OF DRIVEWAYS.
5. SEE DRIVEWAY TABLES FOR DRIVEWAY QUANTITIES.
6. EXISTING UNDERGROUND UTILITIES AND TOPOGRAPHY HAVE BEEN PLOTTED BY DIRECT FIELD INFORMATION, AND AS SPOTTED BY UTILITY LOCATE REQUEST. CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANIES TO VERIFY THE EXACT LOCATION IN THE FIELD PRIOR TO CONSTRUCTION. ALL DAMAGES AND SUBSEQUENT REPAIRS AND/OR REPLACEMENT TO ANY UTILITY (AERIAL AND/OR UNDERGROUND) SHALL BE THE DIRECT RESPONSIBILITY OF THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.



PROP. PGL
EXIST. NG @ PGL
EXIST. LT. DITCH
EXIST. RT. DITCH
EXIST. LT. R.O.W.
EXIST. RT. R.O.W.
PROP. LT./RT. DITCH

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
ROADWAY PLAN AND PROFILE
STA 554+50 - STA 560+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 27 OF 41

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		130

DATE: 6/13/2024 3:55:42 PM
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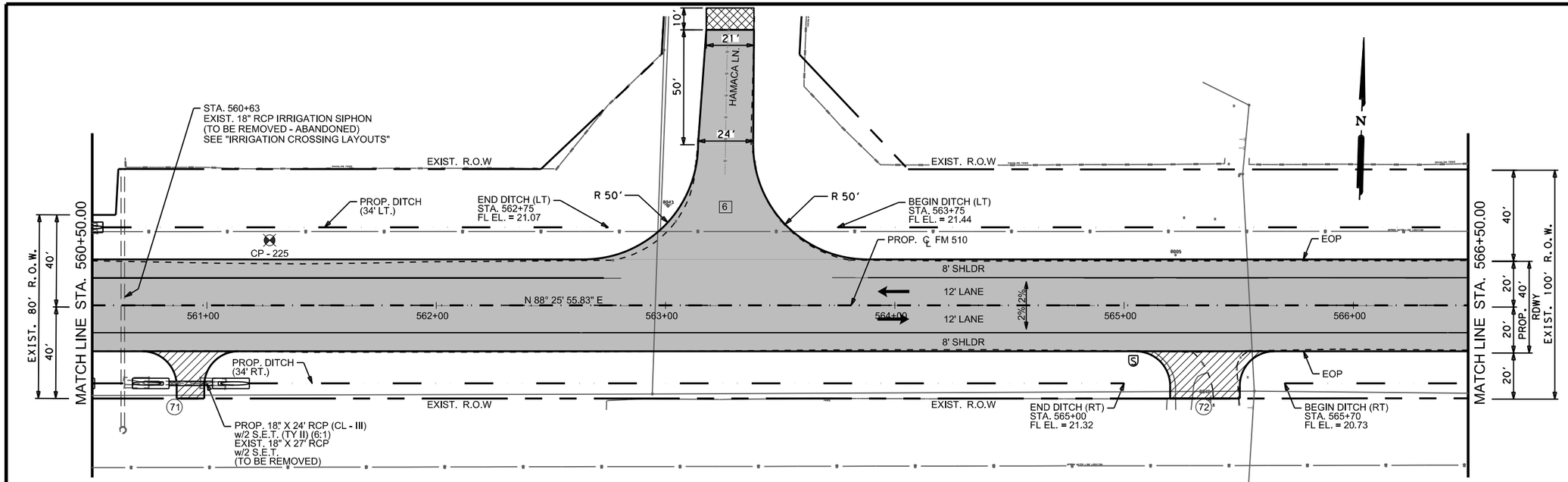

GENERAL NOTES:
1. SEE HORIZONTAL CONTROL DATA SHEET FOR PROPOSED CENTERLINE DATA.
2. SEE HORIZONTAL & VERTICAL CONTROL SHEETS FOR SURVEY CONTROL POINTS AND BENCHMARK INFORMATION.
3. SEE PROPOSED TYPICAL SECTIONS FOR ROADWAY REHAB WIDTH.
4. CONTRACTOR SHALL COORDINATE WITH ADJACENT PROPERTY OWNERS PRIOR TO CONSTRUCTION OF DRIVEWAYS.
5. SEE DRIVEWAY TABLES FOR DRIVEWAY QUANTITIES.
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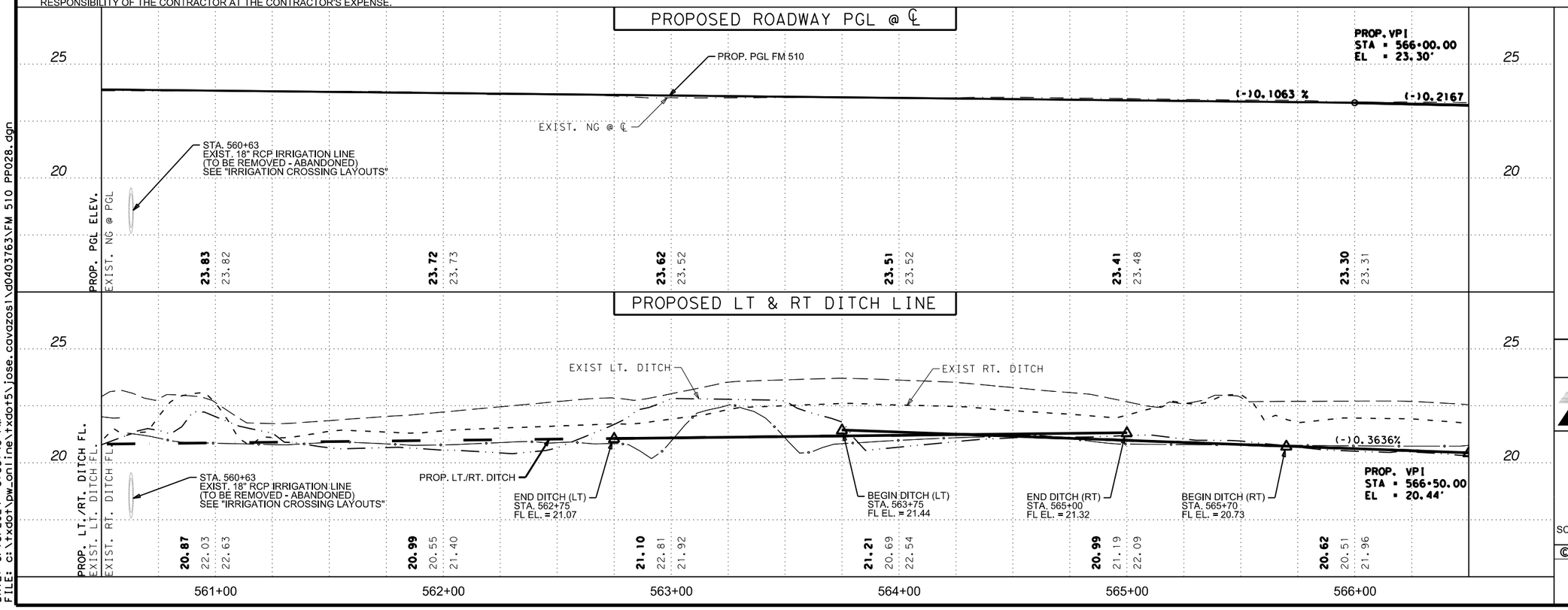

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STATE OF TEXAS
JOSE A. RODRIGUEZ
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06/13/24

Pharr District Central Design

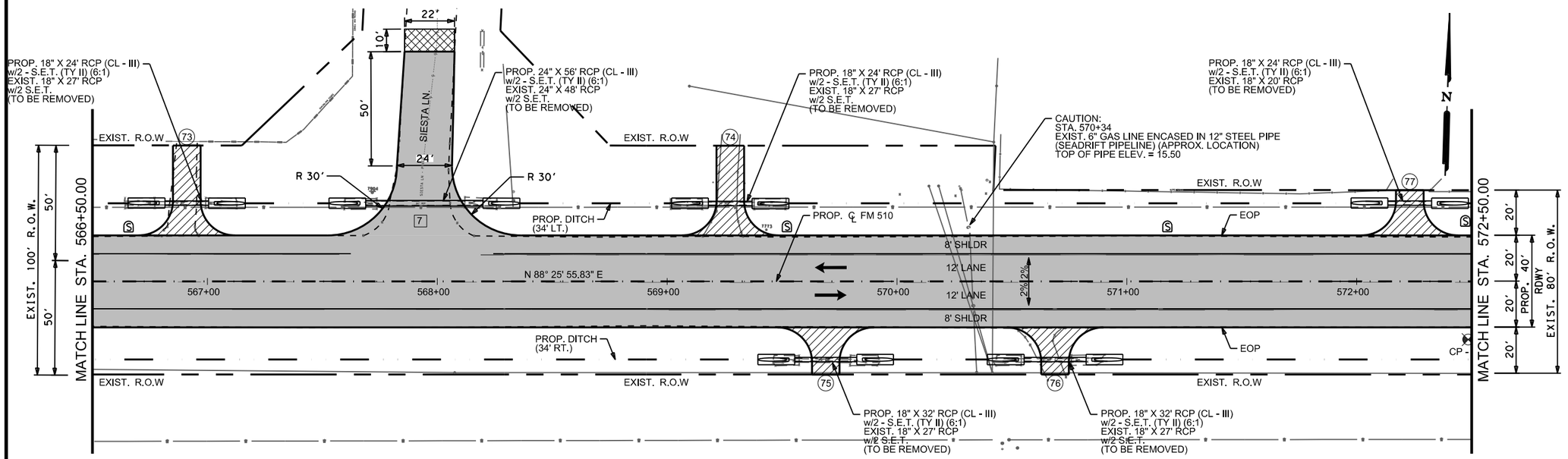
Texas Department of Transportation

FM 510
ROADWAY PLAN AND PROFILE
STA 560+50 - STA 566+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 28 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		131



GENERAL NOTES:

1. SEE HORIZONTAL CONTROL DATA SHEET FOR PROPOSED CENTERLINE DATA.
2. SEE HORIZONTAL & VERTICAL CONTROL SHEETS FOR SURVEY CONTROL POINTS AND BENCHMARK INFORMATION.
3. SEE PROPOSED TYPICAL SECTIONS FOR ROADWAY REHAB WIDTH.
4. CONTRACTOR SHALL COORDINATE WITH ADJACENT PROPERTY OWNERS PRIOR TO CONSTRUCTION OF DRIVEWAYS.
5. SEE DRIVEWAY TABLES FOR DRIVEWAY QUANTITIES.
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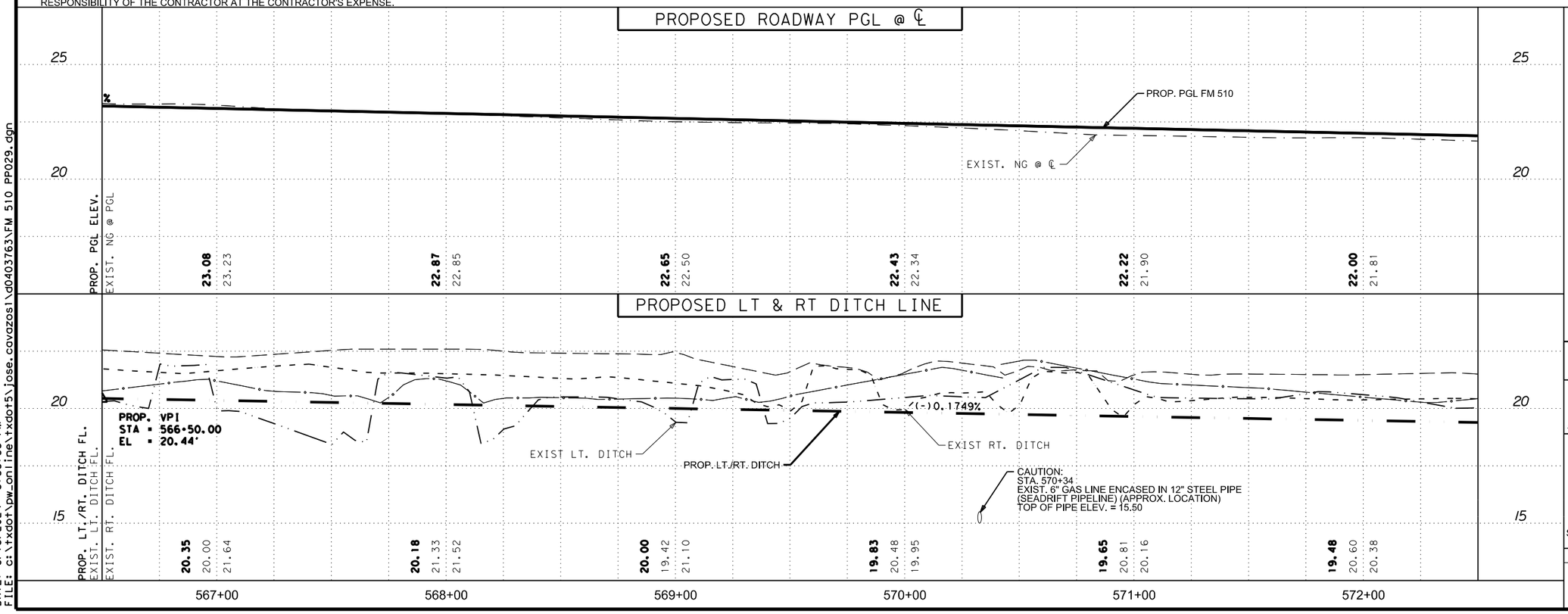

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STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

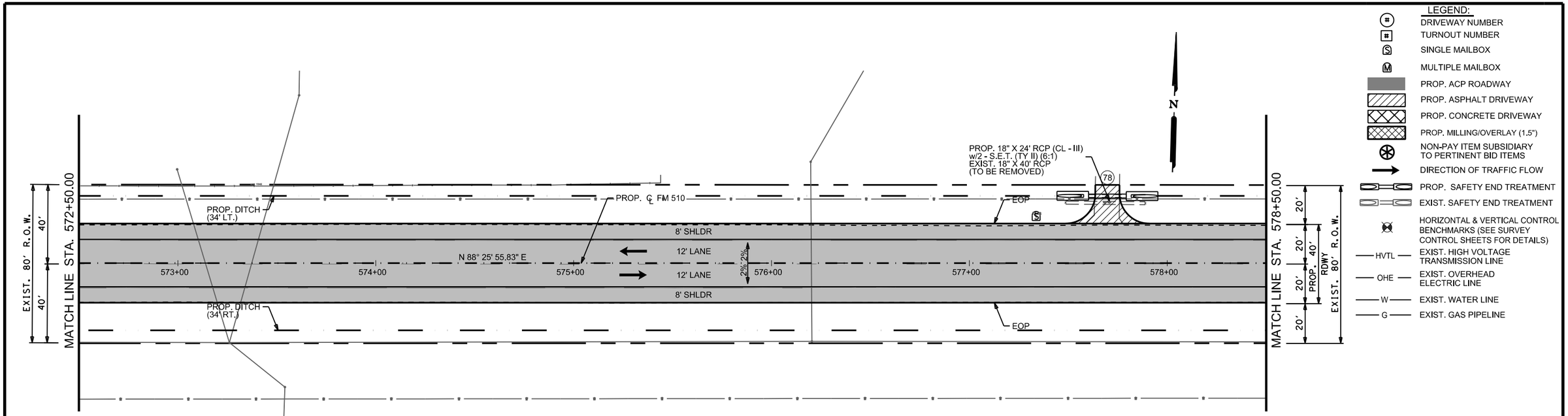
Texas Department of Transportation

FM 510
ROADWAY PLAN AND PROFILE
STA 566+50 - STA 572+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 29 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		132

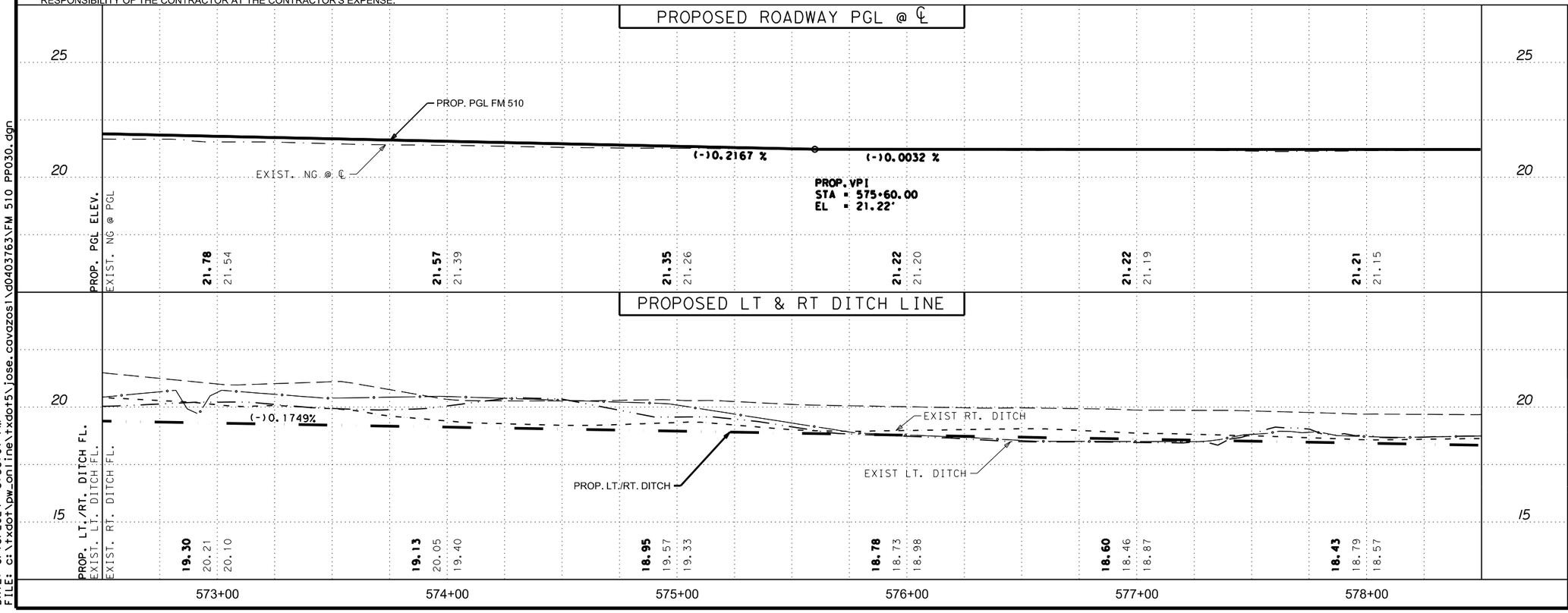


LEGEND:

- DRIVEWAY NUMBER
- TURNOUT NUMBER
- SINGLE MAILBOX
- MULTIPLE MAILBOX
- PROP. ACP ROADWAY
- PROP. ASPHALT DRIVEWAY
- PROP. CONCRETE DRIVEWAY
- PROP. MILLING/OVERLAY (1.5")
- NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS
- DIRECTION OF TRAFFIC FLOW
- PROP. SAFETY END TREATMENT
- EXIST. SAFETY END TREATMENT
- HORIZONTAL & VERTICAL CONTROL BENCHMARKS (SEE SURVEY CONTROL SHEETS FOR DETAILS)
- HVTL — EXIST. HIGH VOLTAGE TRANSMISSION LINE
- OHE — EXIST. OVERHEAD ELECTRIC LINE
- W — EXIST. WATER LINE
- G — EXIST. GAS PIPELINE

GENERAL NOTES:

1. SEE HORIZONTAL CONTROL DATA SHEET FOR PROPOSED CENTERLINE DATA.
2. SEE HORIZONTAL & VERTICAL CONTROL SHEETS FOR SURVEY CONTROL POINTS AND BENCHMARK INFORMATION.
3. SEE PROPOSED TYPICAL SECTIONS FOR ROADWAY REHAB WIDTH.
4. CONTRACTOR SHALL COORDINATE WITH ADJACENT PROPERTY OWNERS PRIOR TO CONSTRUCTION OF DRIVEWAYS.
5. SEE DRIVEWAY TABLES FOR DRIVEWAY QUANTITIES.
6. EXISTING UNDERGROUND UTILITIES AND TOPOGRAPHY HAVE BEEN PLOTTED BY DIRECT FIELD INFORMATION, AND AS SPOTTED BY UTILITY LOCATE REQUEST. CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANIES TO VERIFY THE EXACT LOCATION IN THE FIELD PRIOR TO CONSTRUCTION. ALL DAMAGES AND SUBSEQUENT REPAIRS AND/OR REPLACEMENT TO ANY UTILITY (AERIAL AND/OR UNDERGROUND) SHALL BE THE DIRECT RESPONSIBILITY OF THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.



PROP. PGL
EXIST. NG @ PGL
EXIST. LT. DITCH
EXIST. RT. DITCH
EXIST. LT. R.O.W.
EXIST. RT. R.O.W.
PROP. LT./RT. DITCH

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
ROADWAY PLAN AND PROFILE
STA 572+50 - STA 578+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 30 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		133

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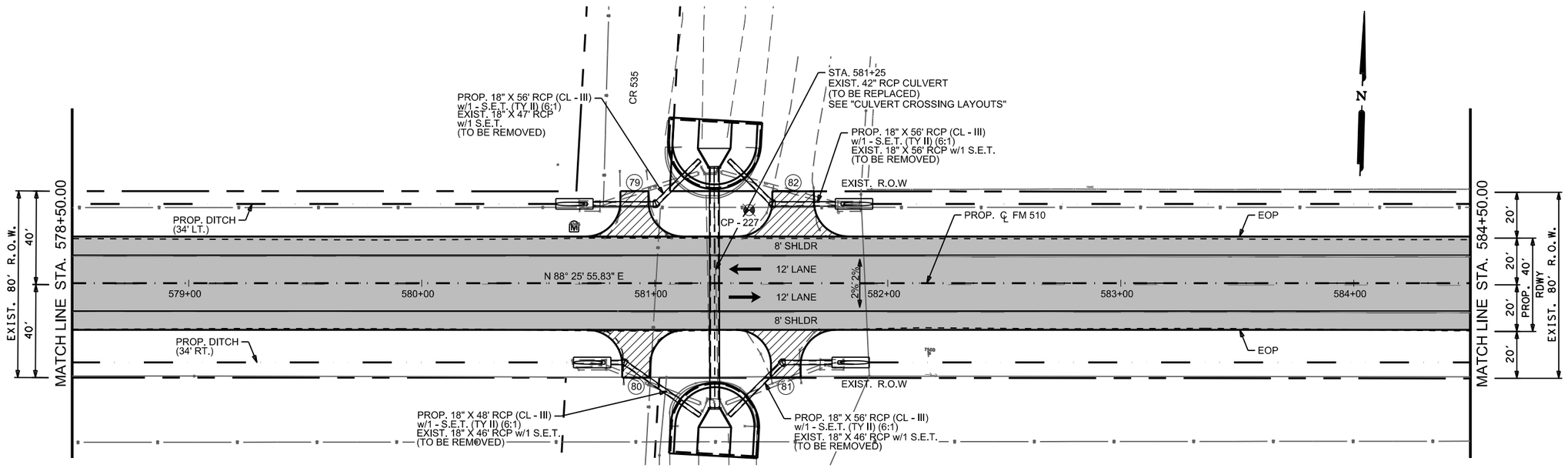

GENERAL NOTES:

1. SEE HORIZONTAL CONTROL DATA SHEET FOR PROPOSED CENTERLINE DATA.
2. SEE HORIZONTAL & VERTICAL CONTROL SHEETS FOR SURVEY CONTROL POINTS AND BENCHMARK INFORMATION.
3. SEE PROPOSED TYPICAL SECTIONS FOR ROADWAY REHAB WIDTH.
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5. SEE DRIVEWAY TABLES FOR DRIVEWAY QUANTITIES.
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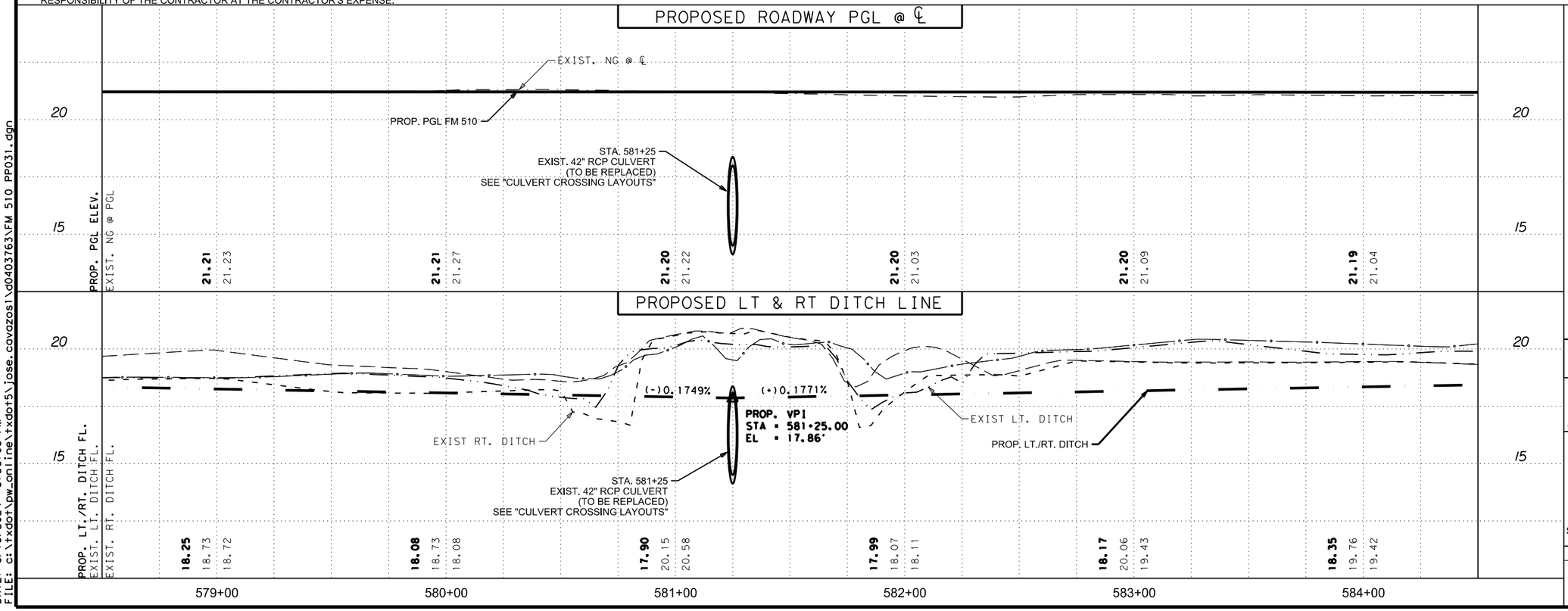

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STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

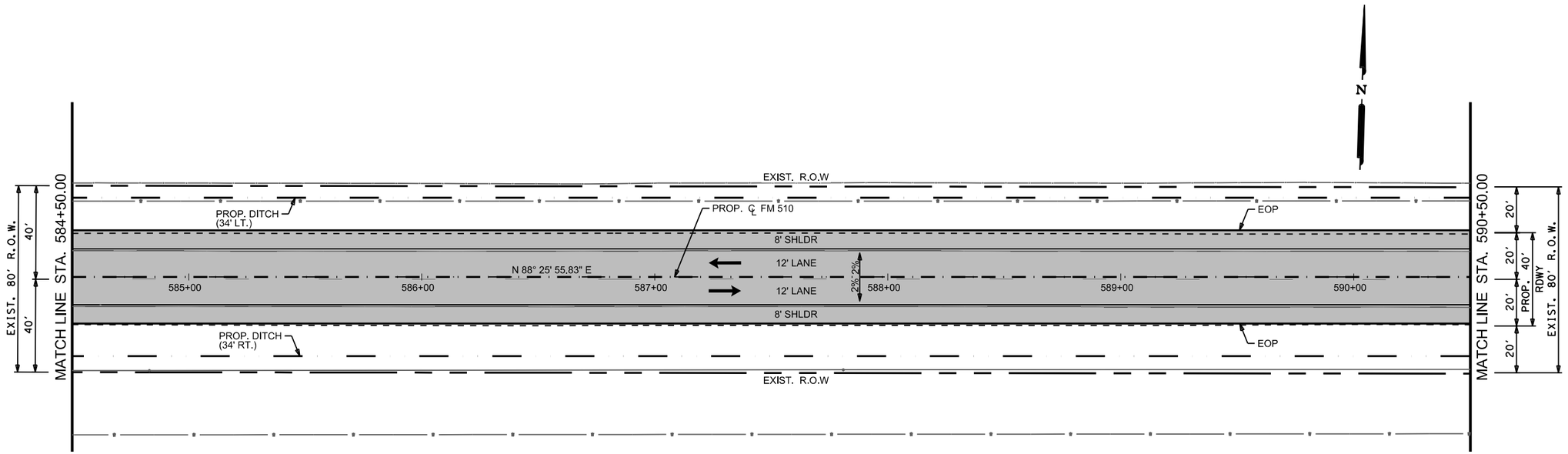
Texas Department of Transportation

FM 510
ROADWAY
PLAN AND PROFILE
STA 578+50 - STA 584+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 31 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		134

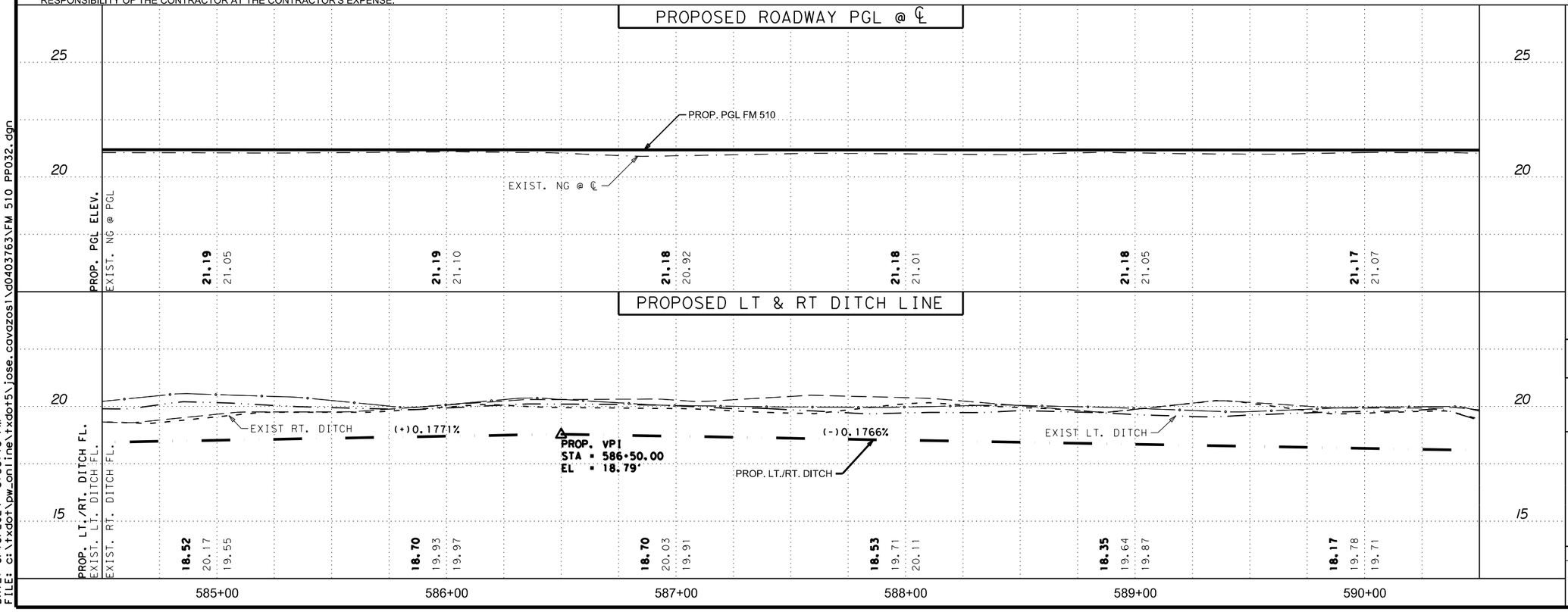


LEGEND:

- DRIVEWAY NUMBER
- TURNOUT NUMBER
- SINGLE MAILBOX
- MULTIPLE MAILBOX
- PROP. ACP ROADWAY
- PROP. ASPHALT DRIVEWAY
- PROP. CONCRETE DRIVEWAY
- PROP. MILLING/OVERLAY (1.5")
- NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS
- DIRECTION OF TRAFFIC FLOW
- PROP. SAFETY END TREATMENT
- EXIST. SAFETY END TREATMENT
- HORIZONTAL & VERTICAL CONTROL BENCHMARKS (SEE SURVEY CONTROL SHEETS FOR DETAILS)
- HVTL — EXIST. HIGH VOLTAGE TRANSMISSION LINE
- OHE — EXIST. OVERHEAD ELECTRIC LINE
- W — EXIST. WATER LINE
- G — EXIST. GAS PIPELINE

GENERAL NOTES:

1. SEE HORIZONTAL CONTROL DATA SHEET FOR PROPOSED CENTERLINE DATA.
2. SEE HORIZONTAL & VERTICAL CONTROL SHEETS FOR SURVEY CONTROL POINTS AND BENCHMARK INFORMATION.
3. SEE PROPOSED TYPICAL SECTIONS FOR ROADWAY REHAB WIDTH.
4. CONTRACTOR SHALL COORDINATE WITH ADJACENT PROPERTY OWNERS PRIOR TO CONSTRUCTION OF DRIVEWAYS.
5. SEE DRIVEWAY TABLES FOR DRIVEWAY QUANTITIES.
6. EXISTING UNDERGROUND UTILITIES AND TOPOGRAPHY HAVE BEEN PLOTTED BY DIRECT FIELD INFORMATION, AND AS SPOTTED BY UTILITY LOCATE REQUEST. CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANIES TO VERIFY THE EXACT LOCATION IN THE FIELD PRIOR TO CONSTRUCTION. ALL DAMAGES AND SUBSEQUENT REPAIRS AND/OR REPLACEMENT TO ANY UTILITY (AERIAL AND/OR UNDERGROUND) SHALL BE THE DIRECT RESPONSIBILITY OF THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.



PROP. PGL
EXIST. NG @ PGL
EXIST. LT. DITCH
EXIST. RT. DITCH
EXIST. LT. R.O.W.
EXIST. RT. R.O.W.
PROP. LT./RT. DITCH

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
ROADWAY PLAN AND PROFILE STA 584+50 - STA 590+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 32 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		135

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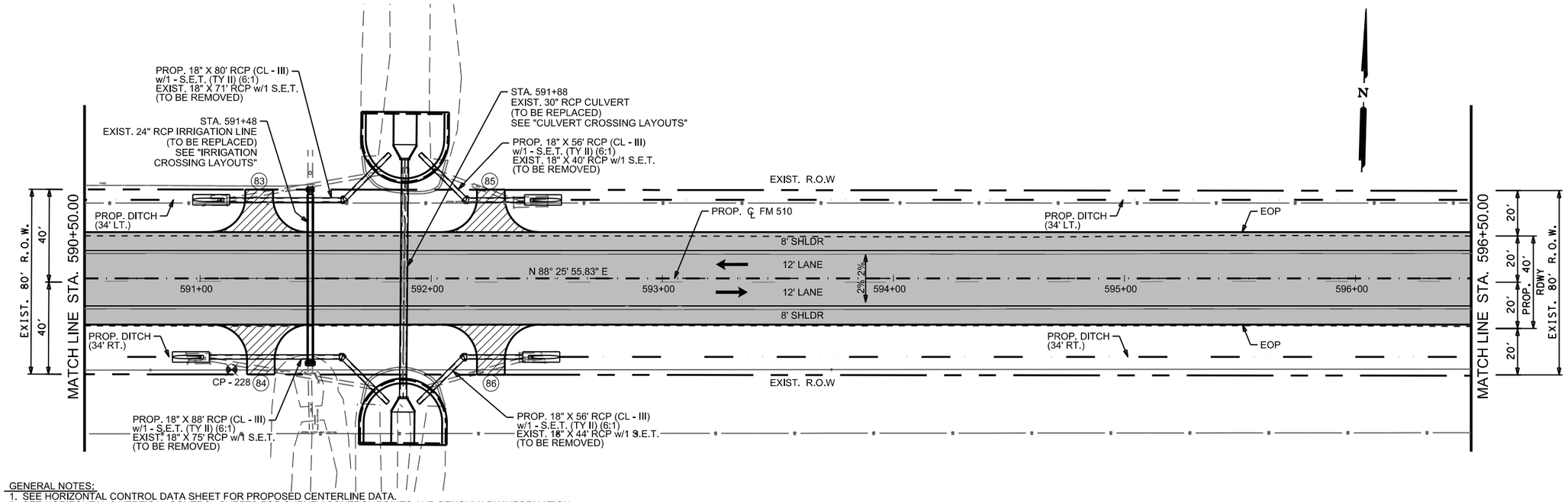

GENERAL NOTES:
1. SEE HORIZONTAL CONTROL DATA SHEET FOR PROPOSED CENTERLINE DATA.
2. SEE HORIZONTAL & VERTICAL CONTROL SHEETS FOR SURVEY CONTROL POINTS AND BENCHMARK INFORMATION.
3. SEE PROPOSED TYPICAL SECTIONS FOR ROADWAY REHAB WIDTH.
4. CONTRACTOR SHALL COORDINATE WITH ADJACENT PROPERTY OWNERS PRIOR TO CONSTRUCTION OF DRIVEWAYS.
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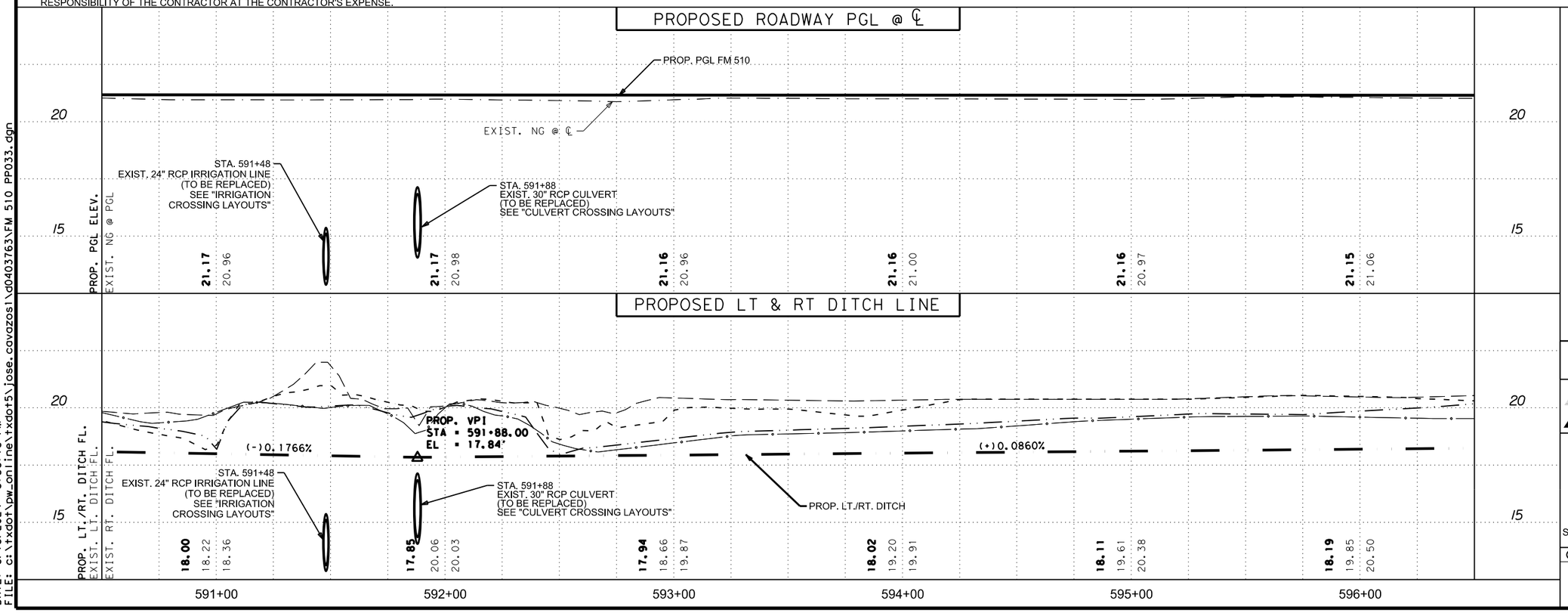

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STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER
06/13/24

Pharr District Central Design

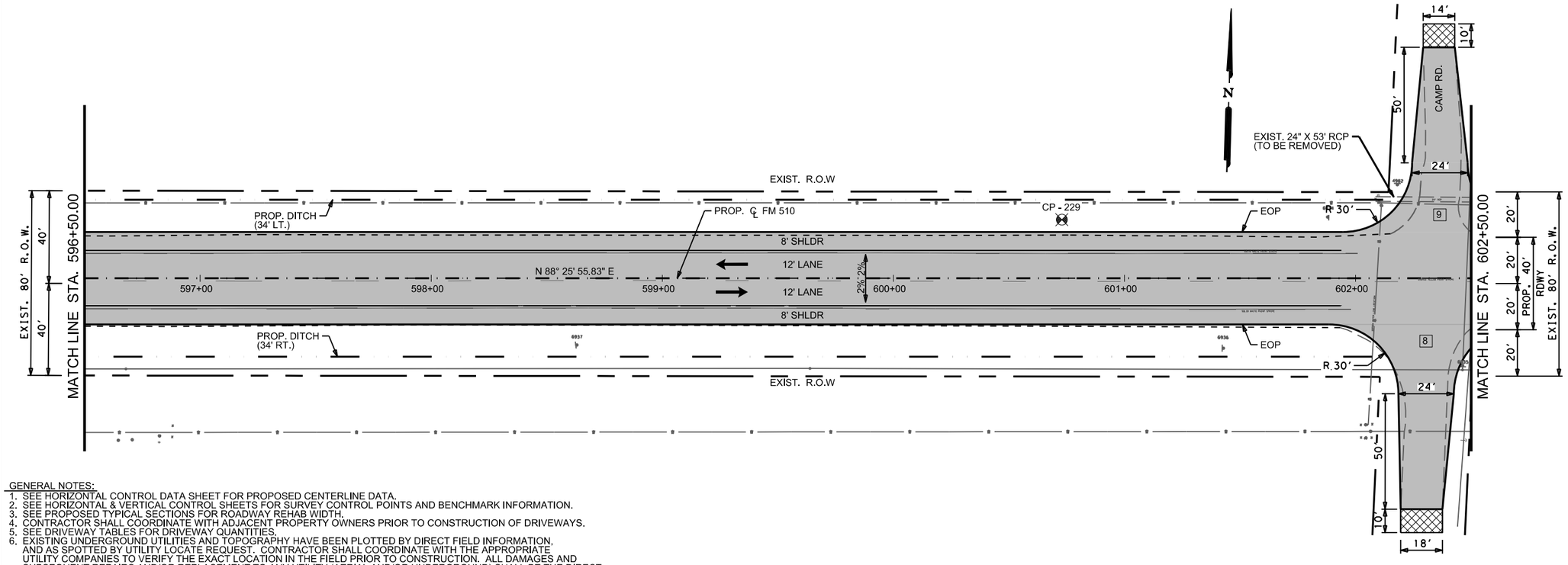
Texas Department of Transportation

FM 510
ROADWAY PLAN AND PROFILE
STA 590+50 - STA 596+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 33 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		136



LEGEND:

- DRIVEWAY NUMBER
- TURNOUT NUMBER
- SINGLE MAILBOX
- MULTIPLE MAILBOX
- PROP. ACP ROADWAY
- PROP. ASPHALT DRIVEWAY
- PROP. CONCRETE DRIVEWAY
- PROP. MILLING/OVERLAY (1.5")
- NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS
- DIRECTION OF TRAFFIC FLOW
- PROP. SAFETY END TREATMENT
- EXIST. SAFETY END TREATMENT
- HORIZONTAL & VERTICAL CONTROL BENCHMARKS (SEE SURVEY CONTROL SHEETS FOR DETAILS)
- HVTL — EXIST. HIGH VOLTAGE TRANSMISSION LINE
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GENERAL NOTES:

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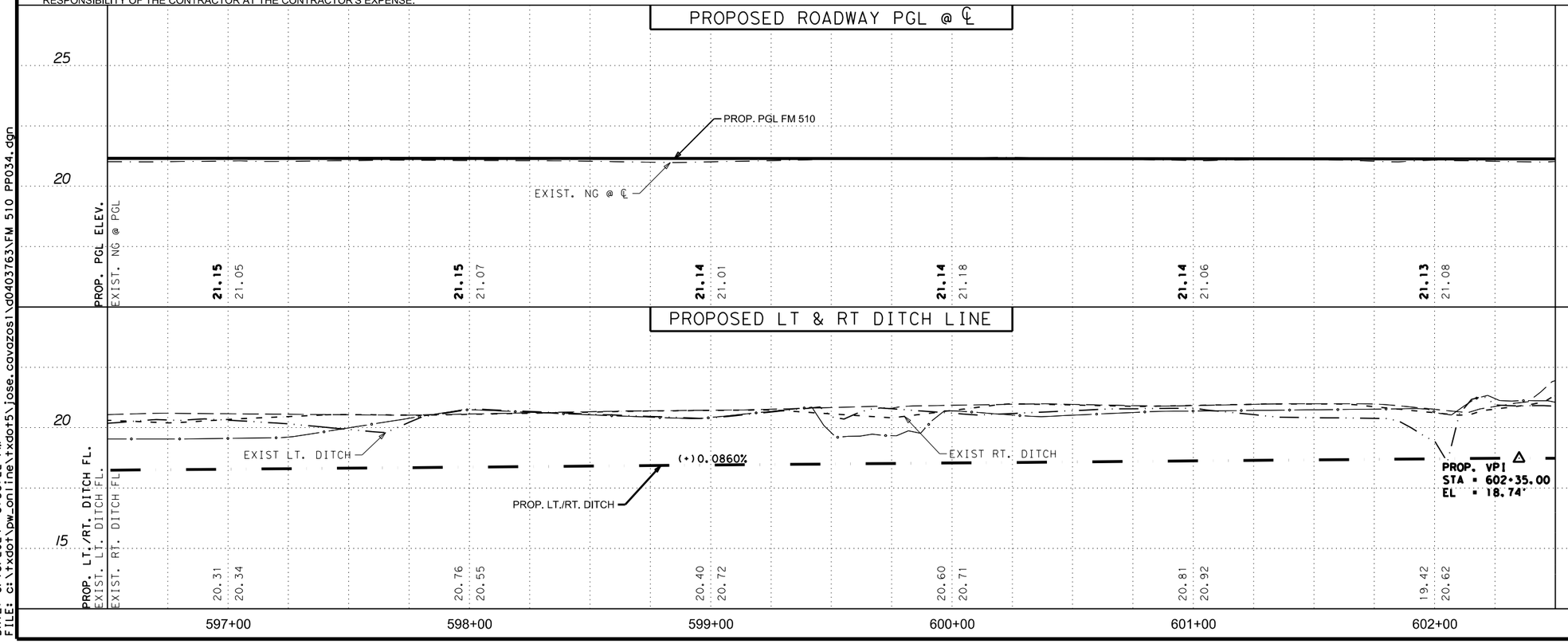

PROP. PGL
EXIST. NG @ PGL
EXIST. LT. DITCH
EXIST. RT. DITCH
EXIST. LT. R.O.W.
EXIST. RT. R.O.W.
PROP. LT./RT. DITCH

STATE OF TEXAS
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06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
ROADWAY PLAN AND PROFILE
STA 596+50 - STA 602+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 34 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		137

DATE: 6/13/2024 3:56:22 PM
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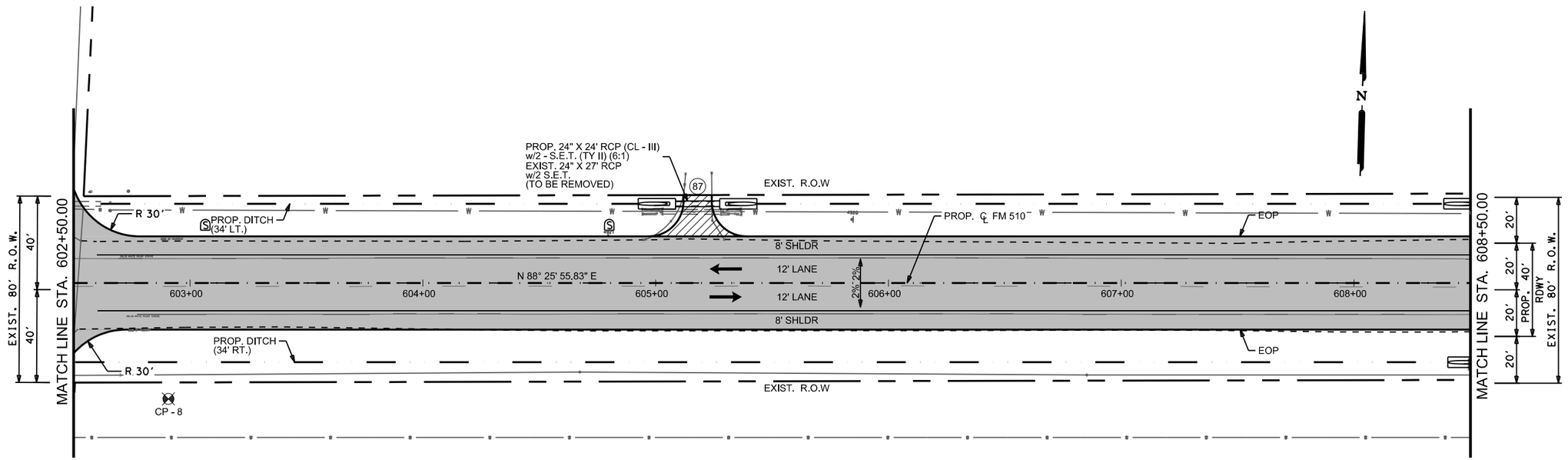

LEGEND:

- DRIVEWAY NUMBER
- TURNOUT NUMBER
- SINGLE MAILBOX
- MULTIPLE MAILBOX
- PROP. ACP ROADWAY
- PROP. ASPHALT DRIVEWAY
- PROP. CONCRETE DRIVEWAY
- PROP. MILLING/OVERLAY (1.5")
- NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS
- DIRECTION OF TRAFFIC FLOW
- PROP. SAFETY END TREATMENT
- EXIST. SAFETY END TREATMENT
- HORIZONTAL & VERTICAL CONTROL BENCHMARKS (SEE SURVEY CONTROL SHEETS FOR DETAILS)
- HVTL — EXIST. HIGH VOLTAGE TRANSMISSION LINE
- OHE — EXIST. OVERHEAD ELECTRIC LINE
- W — EXIST. WATER LINE
- G — EXIST. GAS PIPELINE

GENERAL NOTES:

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2. SEE HORIZONTAL & VERTICAL CONTROL SHEETS FOR SURVEY CONTROL POINTS AND BENCHMARK INFORMATION.
3. SEE PROPOSED TYPICAL SECTIONS FOR ROADWAY REHAB WIDTH.
4. CONTRACTOR SHALL COORDINATE WITH ADJACENT PROPERTY OWNERS PRIOR TO CONSTRUCTION OF DRIVEWAYS.
5. SEE DRIVEWAY TABLES FOR DRIVEWAY QUANTITIES.
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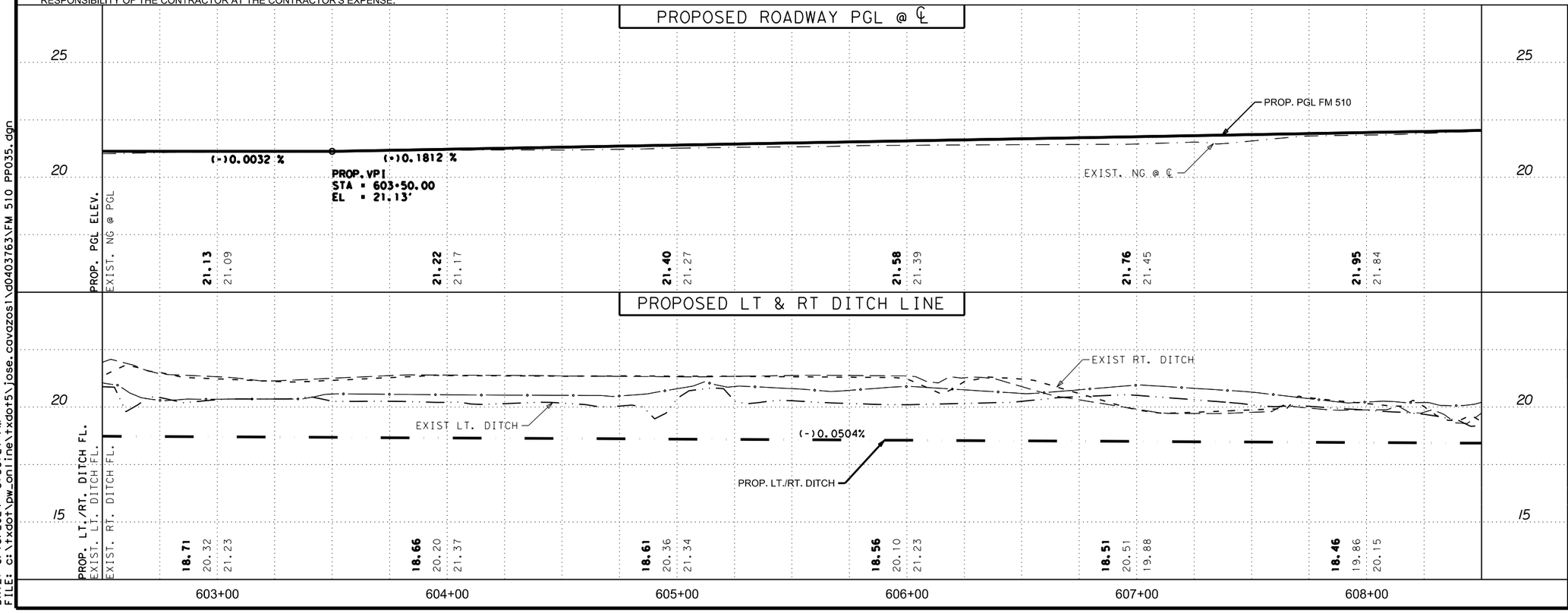

- PROP. PGL
- EXIST. NG @ PGL
- EXIST. LT. DITCH
- EXIST. RT. DITCH
- EXIST. LT. R.O.W.
- EXIST. RT. R.O.W.
- PROP. LT./RT. DITCH

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
ROADWAY
PLAN AND PROFILE
STA 602+50 - STA 608+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 35 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		138

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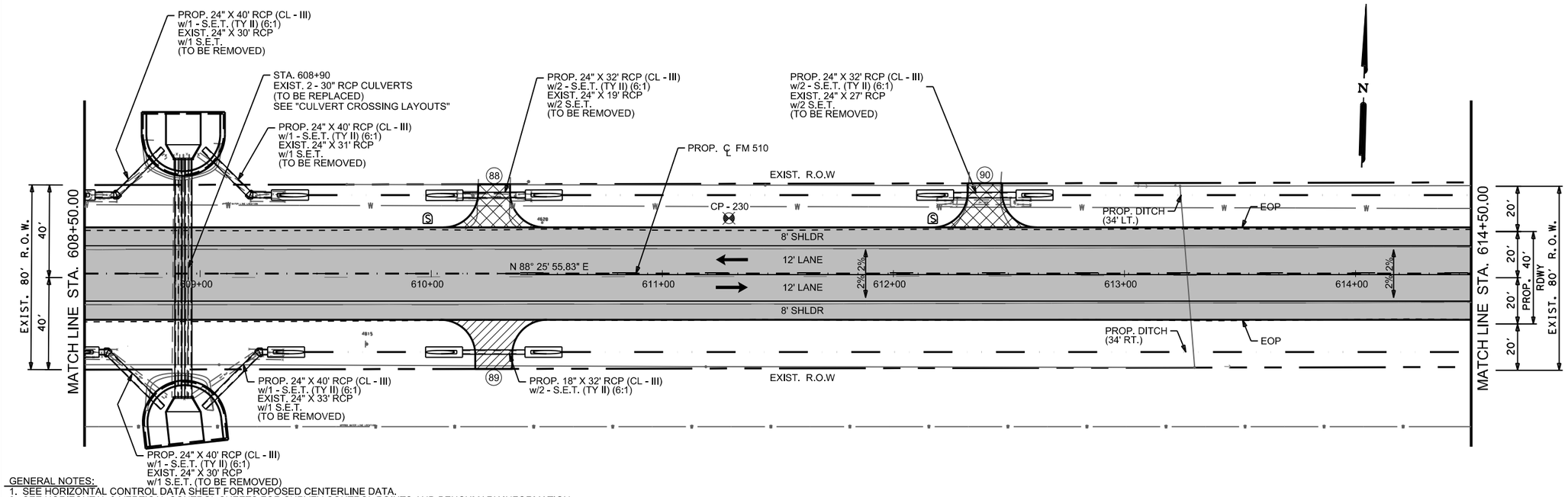

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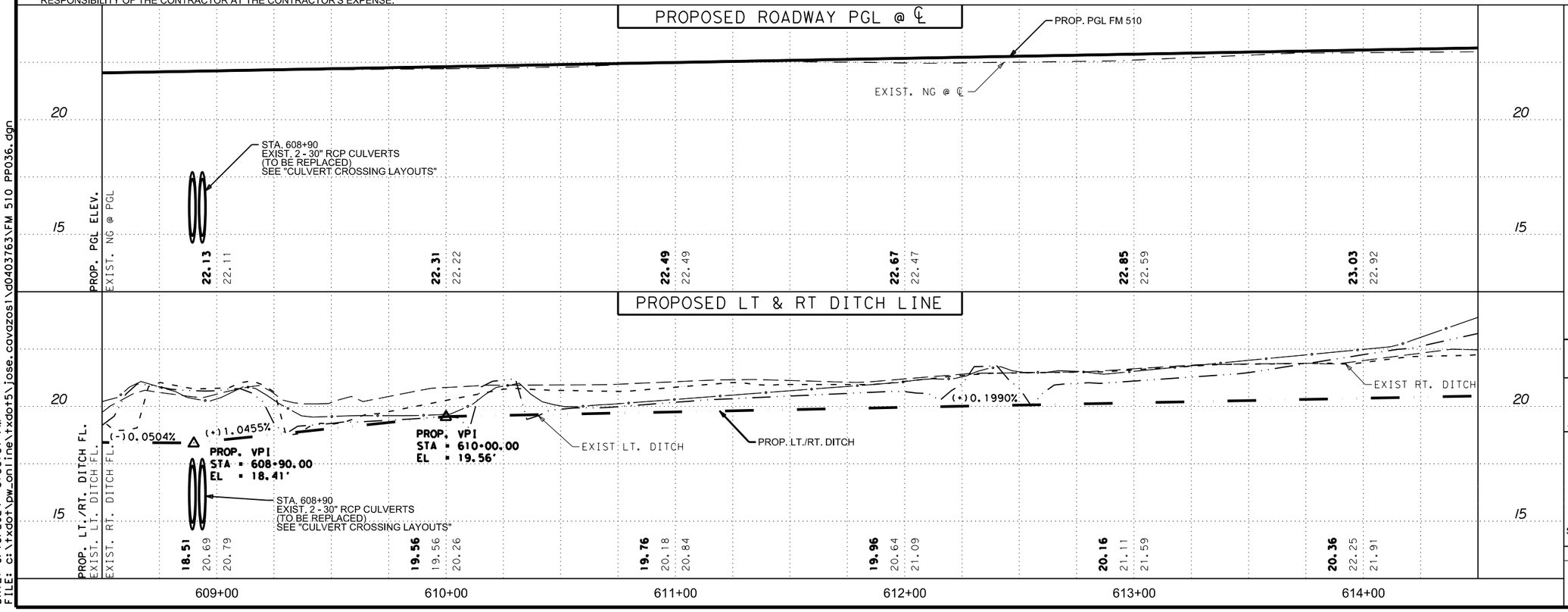

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STATE OF TEXAS
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06/13/24

Pharr District Central Design

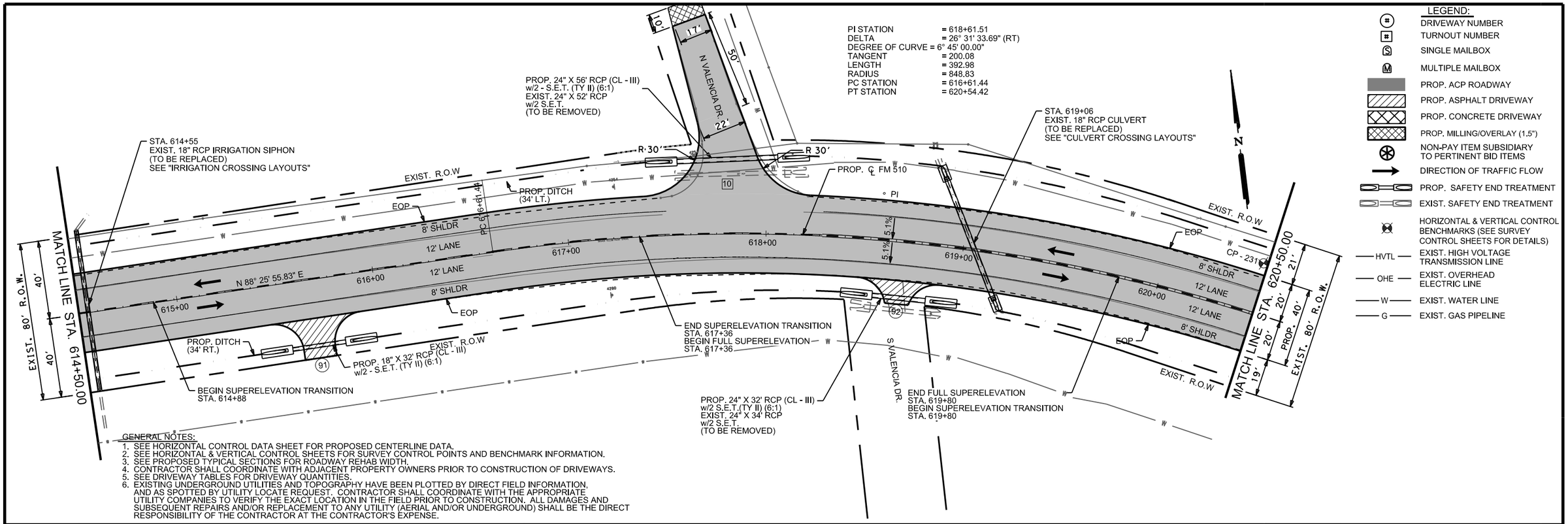
Texas Department of Transportation

FM 510
ROADWAY
PLAN AND PROFILE
STA 608+50 - STA 614+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 36 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		139



GENERAL NOTES:
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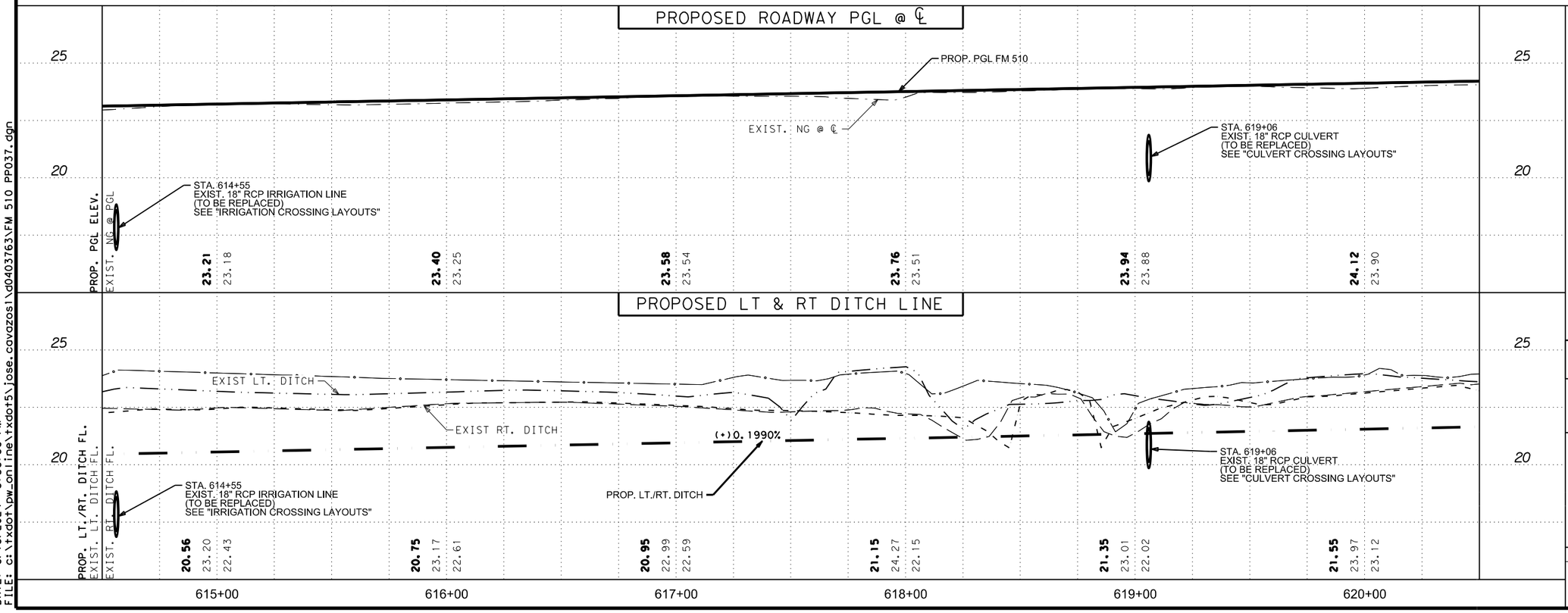

PROP. PGL
EXIST. NG @ PGL
EXIST. LT. DITCH
EXIST. RT. DITCH
EXIST. LT. R.O.W.
EXIST. RT. R.O.W.
PROP. LT./RT. DITCH

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FM 510
ROADWAY PLAN AND PROFILE
STA 614+50 - STA 620+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 37 OF 41

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		140

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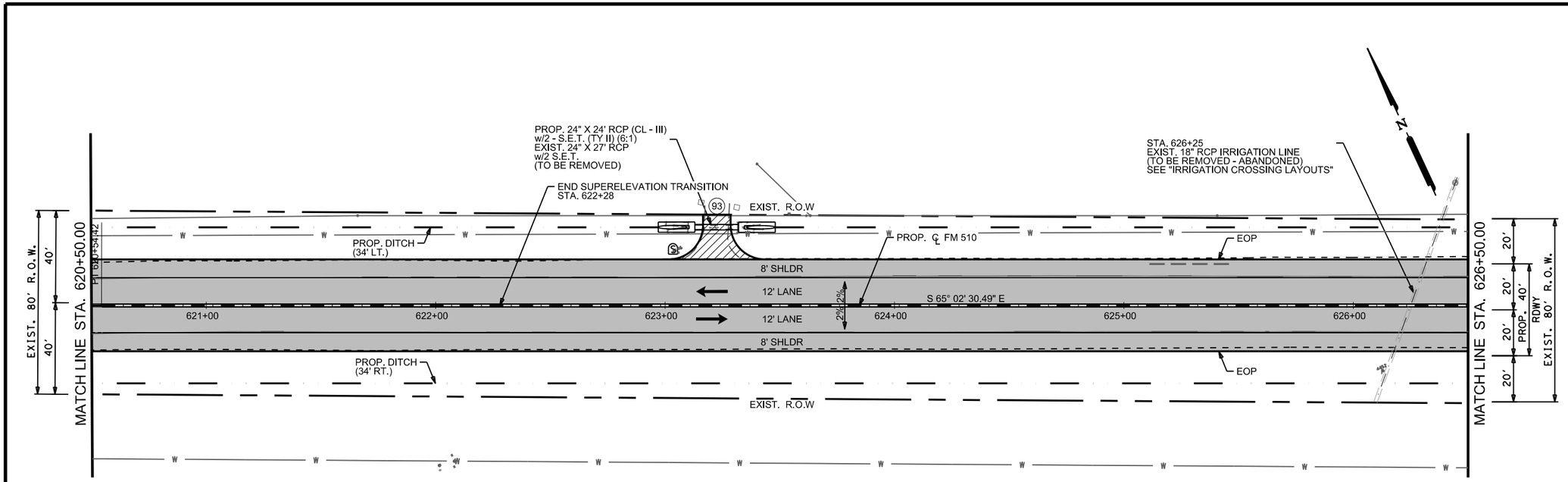

LEGEND:

- DRIVEWAY NUMBER
- TURNOUT NUMBER
- SINGLE MAILBOX
- MULTIPLE MAILBOX
- PROP. ACP ROADWAY
- PROP. ASPHALT DRIVEWAY
- PROP. CONCRETE DRIVEWAY
- PROP. MILLING/OVERLAY (1.5")
- NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS
- DIRECTION OF TRAFFIC FLOW
- PROP. SAFETY END TREATMENT
- EXIST. SAFETY END TREATMENT
- HORIZONTAL & VERTICAL CONTROL BENCHMARKS (SEE SURVEY CONTROL SHEETS FOR DETAILS)
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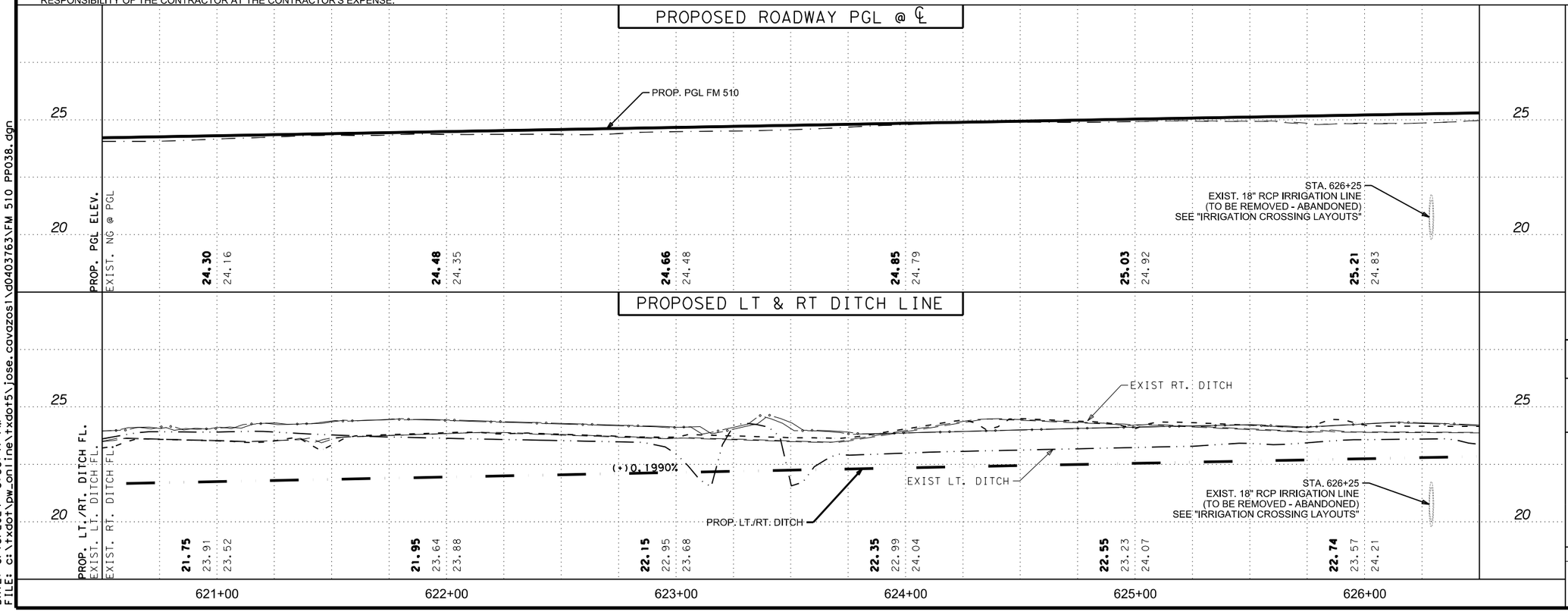

PROP. PGL
EXIST. NG @ PGL
EXIST. LT. DITCH
EXIST. RT. DITCH
EXIST. LT. R.O.W.
EXIST. RT. R.O.W.
PROP. LT./RT. DITCH

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Texas Department of Transportation

FM 510
ROADWAY PLAN AND PROFILE
STA 620+50 - STA 626+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 38 OF 41

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CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		141

DATE: 6/13/2024 3:56:41 PM
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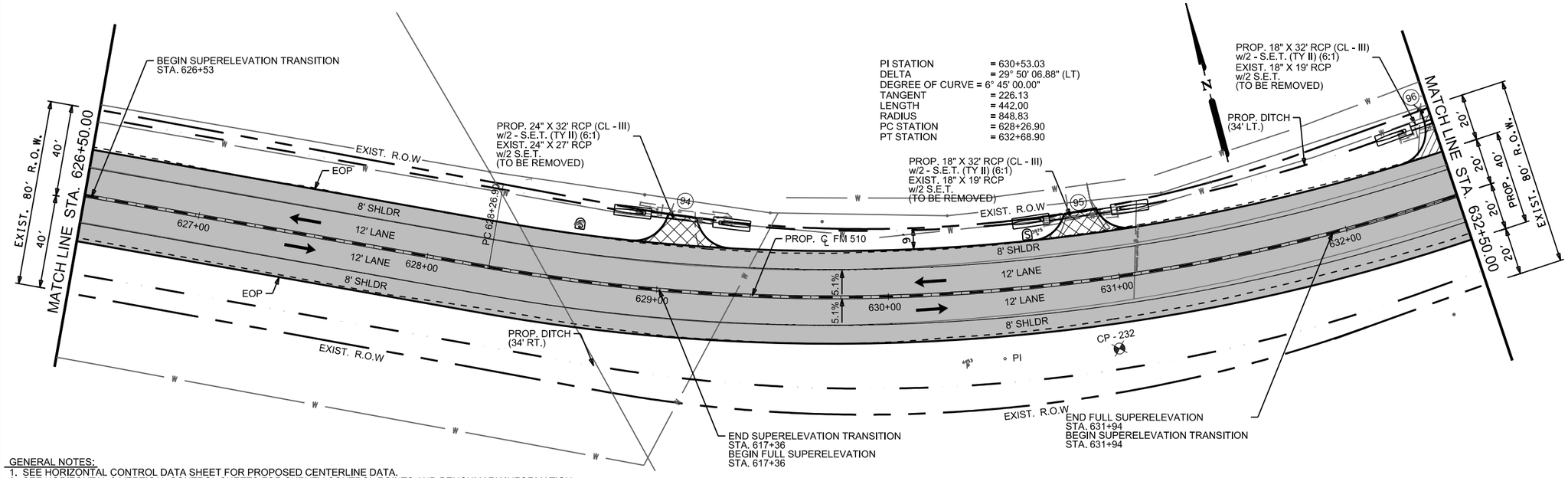

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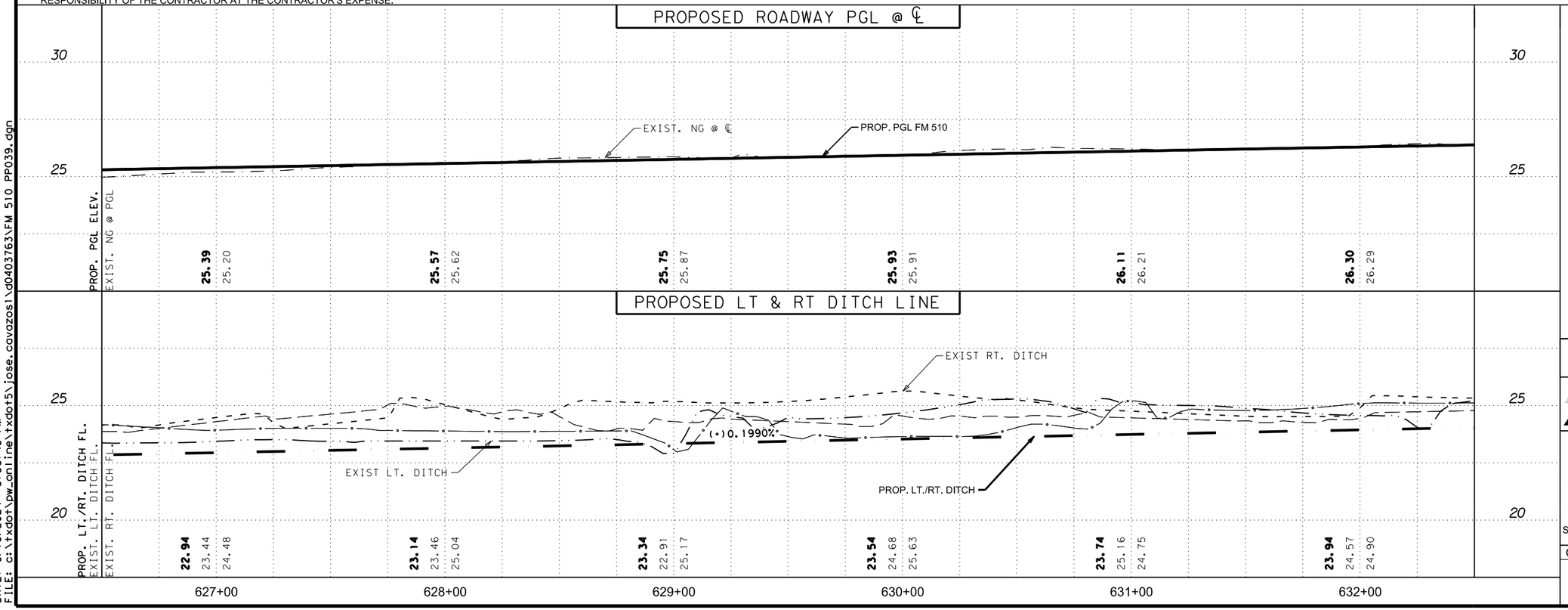

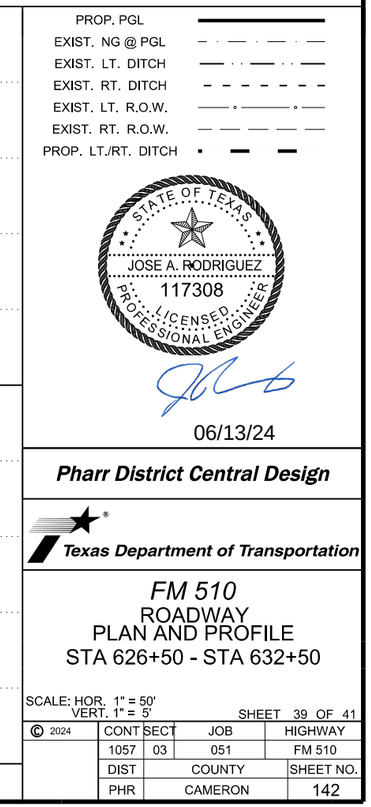

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
ROADWAY PLAN AND PROFILE
STA 626+50 - STA 632+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 39 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		142

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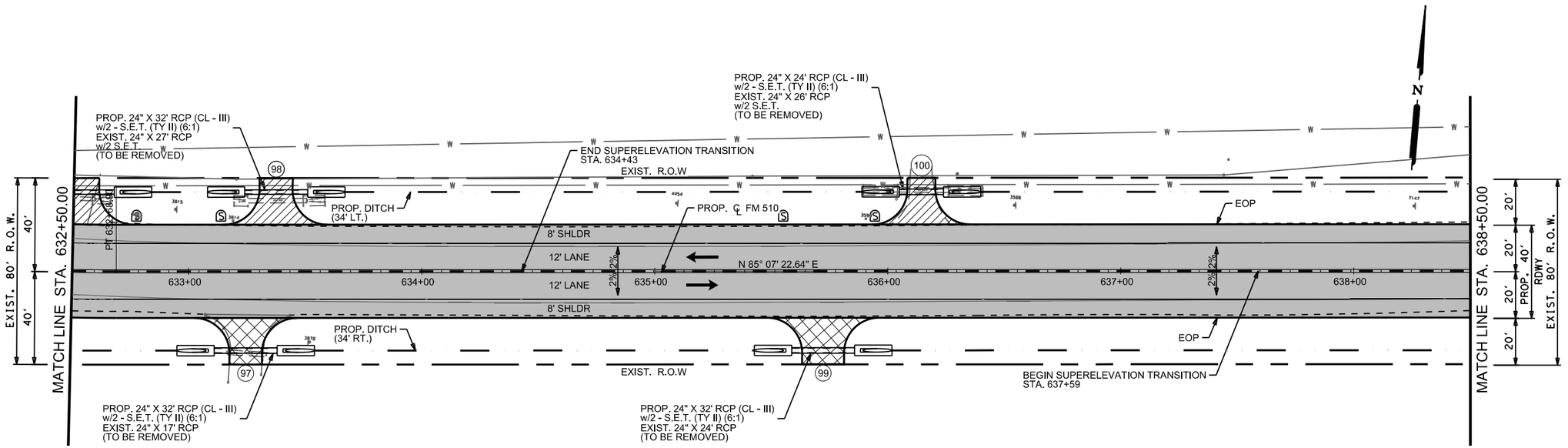

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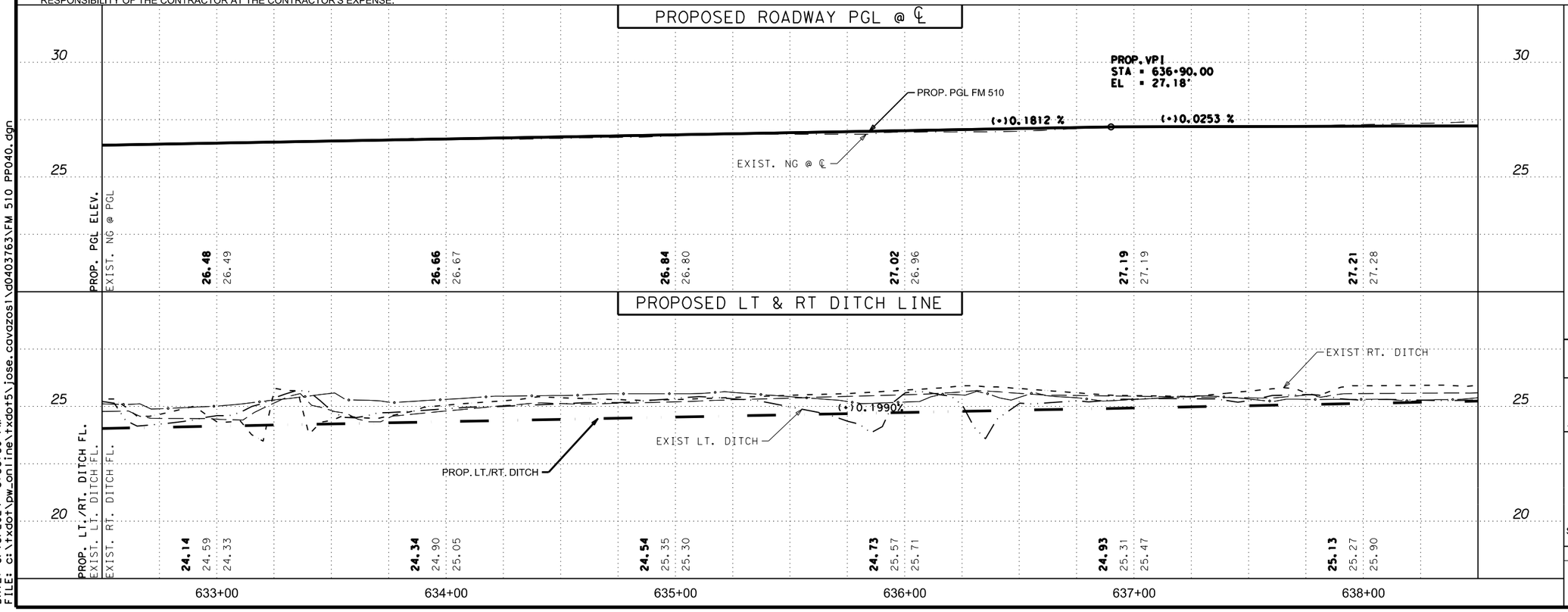

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STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

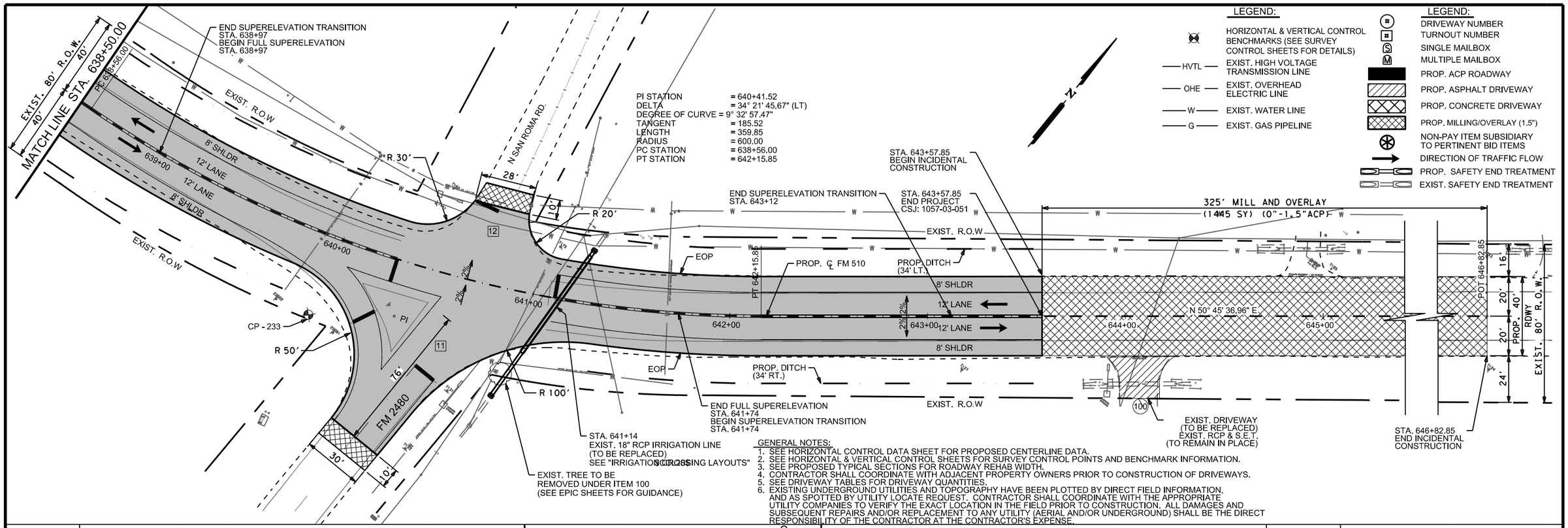
Texas Department of Transportation

FM 510
ROADWAY PLAN AND PROFILE
STA 632+50 - STA 638+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 40 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		143



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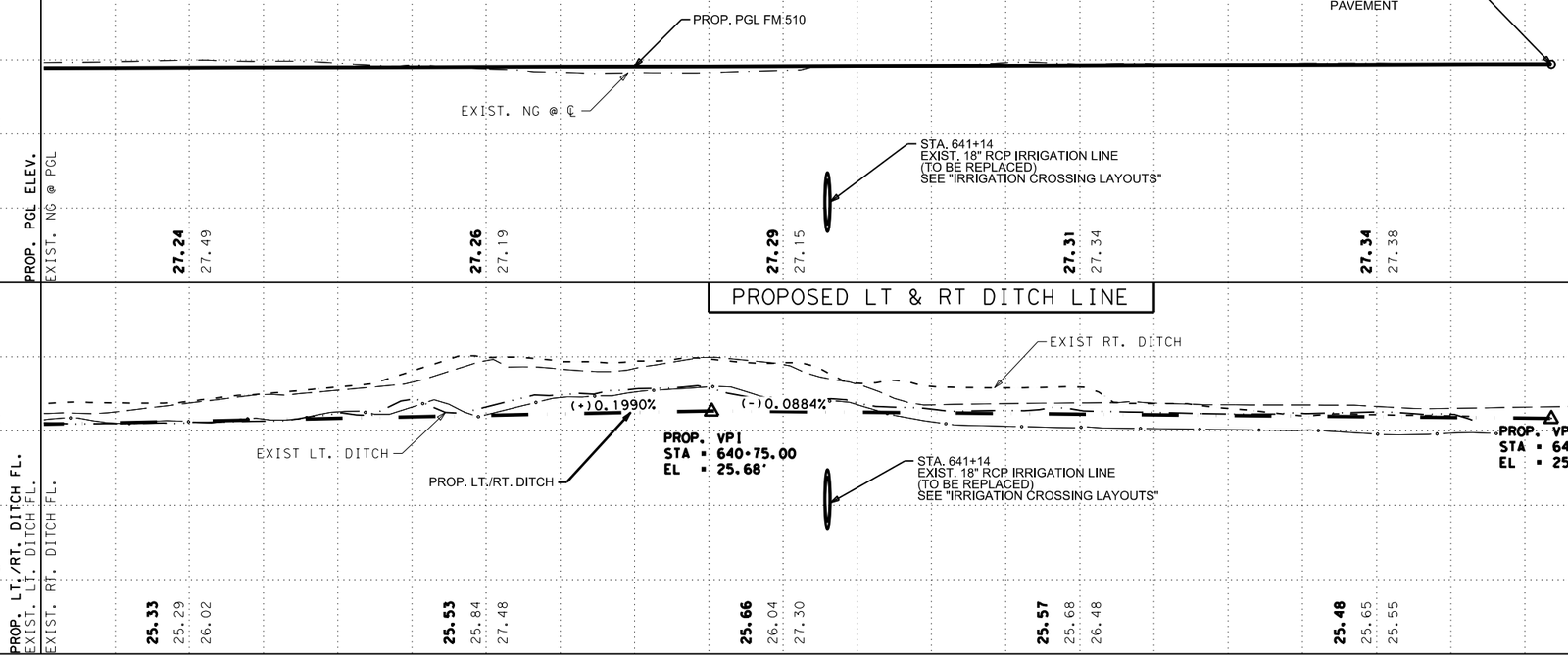
PROPOSED ROADWAY PGL @ ℄



PROPOSED LT & RT DITCH LINE

PROP. PGL
EXIST. NG @ PGL
EXIST. LT. DITCH
EXIST. RT. DITCH
EXIST. LT. R.O.W.
EXIST. RT. R.O.W.
PROP. LT./RT. DITCH

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06/13/24

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Texas Department of Transportation

FM 510
ROADWAY
PLAN AND PROFILE
STA 638+50 - STA 644+50

SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SHEET 41 OF 41

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		144

DATE: 6/13/2024 3:56:55 PM
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SUMMARY OF PRIVATE DRIVEWAY ITEMS

ROADWAY PLAN & PROFILE SHEET NO.	DWY. ID #	STATION	OFFSET	EXIST. DRIVEWAY WIDTH (FT)	PROP. WIDTH @ EDGE OF PAVEMENT (FT)	PROP. WIDTH @ R.O.W. LINE (FT)	PROP. RAD. (FT)	ITEM 530			ITEM 464		ITEM 467		ITEM 496		ITEM 496	ITEM 104	ITEM 560	
								7010	7006		7003	7005	7308	7328	7007		7004	7011	7008	7010
								DRIVEWAYS (ACP)	DRIVEWAYS (CONC)		RC PIPE (CL III)		S.E.T. (TY II) (RCP) (6:1)(P)		REMOV STR (PIPE)		REMOV STR (SET)	REMOV CONC (DRIVEWAYS)	☒ MAILBOX INSTALL - S (TWW-POST) TY 4	☒ MAILBOX INSTALL - M (TWW-POST) TY 4
								(SY)	(SY)	(SY)	(LF)	(LF)	(EA)	(EA)	(LF)		(EA)	(SY)	(EA)	(EA)
								TY PB-1	4"	6"	18"	24"	18"	24"	18"	24"				
1 OF 41	1	403+31	RT	12	42	12	15	65			24		2		24		2			
1 OF 41	2	403+98	RT	17	42	12	15	65			24		2		24		2		1	
2 OF 41	3	405+07	RT	22	42	12	15	65			24		2		24		2		1	
2 OF 41	4	405+98	RT	32	42	12	15	65			24		2		28		2		1	
2 OF 41	5	407+17	LT	24	46	16	15		83		32		2		28		2	83	1	
2 OF 41	6	408+20	LT	18	42	12	15	65			24		2		24		2			
2 OF 41	7	409+01	RT	20	42	12	15	64			24		2		24		2		1	
2 OF 41	8	410+08	LT	20	42	12	15	65			24		2		24		2			
2 OF 41	9	410+30	RT	21	42	12	15	65			24		2		27		2		1	
3 OF 41	10	411+08	RT	25	42	12	15	65			24		2		36		2		1	
3 OF 41	11	412+14	LT	17	42	12	15	65			24		2		27		2		1	
3 OF 41	12	412+48	RT	34	42	12	15	65			24		2		36		2		1	
3 OF 41	13	413+01	LT	18	42	12	15	65			24		2		24		2			
3 OF 41	14	413+25	RT	26	42	12	15	65			24		2		28		2		1	
3 OF 41	15	414+50	RT	0	42	12	15	65			24		2		84					
3 OF 41	16	415+50	LT	12	42	12	15	65			24		2		24		2			
3 OF 41	17	416+46	LT	12	42	12	15	65			24		2		24		2			
3 OF 41	18	416+46	RT	12	42	12	15	65			24		2		24		2			
4 OF 41	19	417+21	RT	13	42	12	15	64			24		2		23		2		1	
4 OF 41	20	417+83	LT	26	42	12	15	65			24		2		44		2		1	
▽▽ 4 OF 41	21	418+45	RT	13	42	12	15	64			32	88	2	2	119		4		1	
▽▽ 4 OF 41	22	419+27	LT	29	42	12	15	65				104		2	87		2			
6 OF 41	23	434+07	RT	26	42	12	15	38												
9 OF 41	24	447+62	LT	58	50	20	15	53				72		1		64	1			
9 OF 41	25	447+72	RT	44	47	17	15	48				56	1		46		1			
9 OF 41	26	448+36	RT	47	42	12	15	38				48	1		50		1			
9 OF 41	27	448+46	LT	29	42	12	15	37				48		1		41	1			
9 OF 41	28	449+49	RT	23	54	24	15	65			40		2		43		2			
11 OF 41	29	462+18	RT	0	42	12	15	38			24		2		20					
13 OF 41	30	474+33	RT	0	42	12	15	38			24		2		19					
15 OF 41	31	484+05	LT	0	42	12	15	36			24		2		27		2			
16 OF 41	32	492+96	RT	21	42	12	15	38			32		2		20					
16 OF 41	33	493+37	LT	20	42	12	15	36			24		2		35		2			
18 OF 41	34	506+49	RT	37	42	12	15	40			32		2		28		2		1	
19 OF 41	35	511+13	RT	18	42	12	15	39			56		2		26		2			
19 OF 41	36	511+32	LT	21	43	13	15	39			24		2		24		2			
20 OF 41	37	515+37	LT	37	42	12	15		58		32		2		24		2	58	1	
21 OF 41	38	521+01	RT	27	45	15	15	45			32		2		27		2			
21 OF 41	39	523+04	LT	15	42	12	15	38			24		2		24					
22 OF 41	40	524+86	LT	54	54	18	30	62												
22 OF 41	41	526+06	RT	40	42	12	15	38			32		2		24		2		1	
22 OF 41	42	526+27	LT	27	42	12	15	38			48		1		40		1			
22 OF 41	43	526+73	LT	38	43	13	15	39			48		1		40		1			
22 OF 41	44	526+77	RT	31	42	12	15	38			32		2		24		2			
22 OF 41	45	528+40	RT	26	54	24	15	55			32		2		27		2		1	
22 OF 41	46	530+05	RT	23	42	12	15	65			32		2		19		2		1	
23 OF 41	47	533+79	RT	31	42	12	15	38			32		2		27		2		1	
23 OF 41	48	534+20	LT	29	45	15	15	43			32		2		27		2			
24 OF 41	49	537+84	RT	12	42	12	15	38			32		2		55		4			
24 OF 41	50	538+07	LT	12	42	12	15	37			24		2		28		2			
24 OF 41	51	539+68	RT	13	42	12	15	65			32		2		27		2		1	
24 OF 41	52	540+44	RT	19	42	12	15	65			32		2		27		2		1	
24 OF 41	53	541+66	RT	40	42	12	15	65			32		2		27		2		1	
25 OF 41	54	542+70	RT	20	42	12	15	65			32		2		35		2			
25 OF 41	55	545+21	RT	21	42	12	15	65			32		2		27		2		1	
25 OF 41	56	546+11	RT	18	49	19	15	96			32		2		35		2		1	
25 OF 41	57	547+06	RT	18	42	12	15	65			32		2		26		2			
26 OF 41	58	548+90	LT	29	42	12	15	37				48		2		27	2		1	
26 OF 41	59	550+38	RT	9	42	12	15	65			32		2		17				1	
26 OF 41	60	551+40	RT	39	44	14	15	75			32		2		26		2		1	
26 OF 41	61	552+46	RT	25	42	12	15	65			32		2		27		2		1	
26 OF 41	62	553+24	RT	11	42	12	15	65			24		2		22				1	
26 OF 41	63	553+72	RT	28	42	12	15	65			24		2		27		2		1	
27 OF 41	64	554+56	RT	22	42	12	15	39			40		2		27		2		1	
27 OF 41	65	555+59	RT	19	42	12	15	39			32		2		27		2			
27 OF 41	66	558+02	LT	18	40	12	15	37			48		2		44		2			
27 OF 41	67	559+37	LT	46	42	12	15	37			64		1		55		1			
27 OF 41	68	559+38	RT	12	42	12	15	37			56		1		55		1			
27 OF 41	69	560+18	LT	12	42	12	15	37			56		1		55		1			
27 OF 41	70	560+21	RT	12	42	12	15	39			64		1		55		1			
28 OF 41	71	560+93	RT	19	42	12	15	39			24		2		27		2			
28 OF 41	72	565+35	RT	17	27	12	15	80											1	

KEY NOTES

▽▽ PROPOSED S.E.T. AND RCP QUANTITIES THAT LEAD TO THE OUTFALL ARE SHOWN ON NEAREST DRIVEWAY LOCATION.

☒ MAILBOXES AND INSTALLATION SHALL BE SUBSIDIARY TO ITEM 560.
LOCATION AS PER FIELD CONDITIONS (SEE MB(1)-21 THRU MB(4)-21 STANDARDS).

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED
PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

PRIVATE DRIVEWAY TABLE

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		145

DATE: 6/13/2024 10:45:49 AM
FILE: c:\txdot\tpw_online\txdot5\noel.cantu\d0403763\FM 510 Private and Public Driveway Tables.dgn

SUMMARY OF PRIVATE DRIVEWAY ITEMS (CONT.)

ROADWAY PLAN & PROFILE SHEET NO.	DWY. ID #	STATION	OFFSET	EXIST. DRIVEWAY WIDTH (FT)	PROP. WIDTH @ EDGE OF PAVEMENT (FT)	PROP. WIDTH @ R.O.W. LINE (FT)	PROP. RAD. (FT)	ITEM 530			ITEM 464		ITEM 467		ITEM 496		ITEM 496	ITEM 104	ITEM 560	
								7010	7006		7003	7005	7308	7328	7007		7004	7011	7008	7010
								DRIVEWAYS (ACP)	DRIVEWAYS (CONC)		RC PIPE (CL III)		S.E.T. (TY II) (RCP) (6:1)(P)		REMOV STR (PIPE)		REMOV STR (SET)	REMOV CONC (DRIVEWAYS)	☒ MAILBOX INSTALL - S (TWW-POST) TY 4	☒ MAILBOX INSTALL - M (TWW-POST) TY 4
								(SY)	(SY)	(SY)	(LF)	(LF)	(EA)	(EA)	(LF)		(EA)	(SY)	(EA)	(EA)
								TY PB-1	4"	6"	18"	24"	18"	24"	18"	24"				
29 OF 41	73	566+91	LT	16	42	12	15	63			24		2		27		2		1	
29 OF 41	74	569+28	LT	17	42	12	15	63			24		2		27		2		1	
29 OF 41	75	569+69	RT	12	42	12	15	39			32		2		27		2			
29 OF 41	76	570+69	RT	22	42	12	15	39			32		2		27		2			
29 OF 41	77	572+23	LT	16	42	12	15	37			24		2		20				1	
30 OF 41	78	577+70	LT	20	42	12	15	38			24		2		40				1	
31 OF 41	79	580+92	LT	29	42	12	15	37			56		1		47		1			1
31 OF 41	80	580+93	RT	30	42	12	15	39			48		1		46		1			
31 OF 41	81	581+57	RT	32	43	13	15	40			56		1		46		1			
31 OF 41	82	581+60	LT	39	48	18	15	50			56		1		56		1			
33 OF 41	83	591+27	LT	20	42	12	15	36			80		1		71		1			
33 OF 41	84	591+27	RT	20	42	12	15	40			88		1		75		1			
33 OF 41	85	592+20	LT	20	42	12	15	36			56		1		40		1			
33 OF 41	86	592+20	RT	20	42	12	15	40			56		1		44		1			
35 OF 41	87	605+18	LT	35	42	12	15	35				24		2		27	2		2	
▽▽ 36 OF 41	88	610+28	LT	24	44	14	15		40			112		4		80	4	40	1	
▽▽ 36 OF 41	89	610+28	RT		46	16	15	48			32	80	2	2		63	2			
36 OF 41	90	612+40	LT	27	44	14	15		43			32		2		27	2	43	1	
37 OF 41	91	615+68	RT		46	16	15	47			32		2							
37 OF 41	92	618+70	RT	17	42	12	15	26				32		2		34	2			
38 OF 41	93	623+23	LT	25	42	12	15	37				24		2		27	2		1	
39 OF 41	94	629+09	LT	26	43	13	15		28			32		2		27	2		1	
39 OF 41	95	630+87	LT	21	43	14	15		25		32		2		19		2	25	1	
39 OF 41	96	632+54	LT	17	45	14	15	43			32		2		19		2		1	
40 OF 41	97	633+25	RT	36	44	14	15		42			32		2		17		42		
40 OF 41	98	633+38	LT	15	45	14	15	44				32		2		27	2		1	
40 OF 41	99	635+72	RT	24	48	24	15		51			32		2		24	2	51		
40 OF 41	100	636+15	LT	27	42	12	15	38				24		2		26	2		2	
41 OF 41	101	644+07	RT	32	35	20	15	54												
PROJECT TOTAL:								**4,730**	**370**		**2,768**	**920**	**150**	**32**	**2,830**	**511**	**160**	**342**	**47**	**1**

KEY NOTES

▽▽ PROPOSED S.E.T. AND RCP QUANTITIES THAT LEAD TO THE OUTFALL ARE SHOWN ON NEAREST DRIVEWAY LOCATION.

☒ MAILBOXES AND INSTALLATION SHALL BE SUBSIDIARY TO ITEM 560.
LOCATION AS PER FIELD CONDITIONS (SEE MB(1)-21 THRU MB(4)-21 STANDARDS).

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

PRIVATE DRIVEWAY TABLE

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		146

DATE: 6/13/2024 10:45:49 AM
FILE: c:\txdot\pw_online\txdot5\noel.cantu\d0403763\FM 510 Private and Public Driveway Tables.dgn

SUMMARY OF PUBLIC ROADWAY TURNOUT ITEMS

ROADWAY PLAN & PROFILE SHEET NO.	DWY. ID #	STATION	OFFSET	DESCRIPTION	EXIST. DRIVEWAY WIDTH	PROP. WIDTH @ EDGE OF PAVEMENT	PROP. WIDTH @ R.O.W. LINE	PROP. RADIUS	ITEM 354 7018 PLANE & TEXT ASPH CONC PAV (1.5")	ITEM 530 7018 TURNOUTS (ACP) ①		ITEM 464 7003 7005 RC PIPE (CL III)		ITEM 467 7308 7328 SET (TY II)(RCP) (6:1)(P)		ITEM 496 7007 REMOV STR (PIPE)		ITEM 496 7004 REMOV STR (SET)
										TY PBS1	TY PBS2							
					(FT)	(FT)	(FT)	(FT)	(SY)	(SY)	(SY)	(LF) 18"	(LF) 24"	(EA) 18"	(EA) 24"	(LF) 18"	(LF) 24"	(EA)
2 OF 41	1	408+34	RT	ESQUINA CIR.	20	84	24	30	23		246	56		2		52		2
3 OF 41	2	415+42	RT	ESQUINA CIR.	18	84	24	30	20		241	56		2		84		2
18 OF 41	3	502+45	RT	TRACT 43 RD.	18	84	24	30	20		240		56		2		39	2
22 OF 41	4	524+75	RT	FM 3069	32	123	12	60/30	36		320							
26 OF 41	5	548+84	RT	SHARE 28 RD.	17	84	24	30	19		236		56		2		43	2
28 OF 41	6	563+26	LT	HAMACA LN.	21	124	24	50	24		377							
29 OF 41	7	567+95	LT	SIESTA LN.	22	84	24	30	25		250		56		2		48	2
34 OF 41	8	602+30	RT	S. CAMP RD.	18	84	24	30	20		240							
34 OF 41	9	602+36	LT	N. CAMP RD.	14	84	24	30	16		228						53	
37 OF 41	10	617+85	LT	N. VALENCIA DR.	17	84	22	30	19		268		56		2		52	2
41 OF 41	11	640+50	RT	FM 2480	30	155	30	50/100	34		448							
41 OF 41	12	640+60	LT	N. SAN ROMAN RD.	28	80	28	30/20	32		90							
								PROJECT TOTAL:	**288**		**3,184**	**112**	**224**	**4**	**8**	**136**	**235**	**12**

KEY NOTES

① PAVEMENT STRUCTURE FOR TY PBS2 TURNOUTS SHALL BE CONSTRUCTED SAME AS PROPOSED ROADWAY.

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

PUBLIC TURNOUT TABLE

SHEET 1 OF 1

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		147

DATE: 6/13/2024 10:45:50 AM
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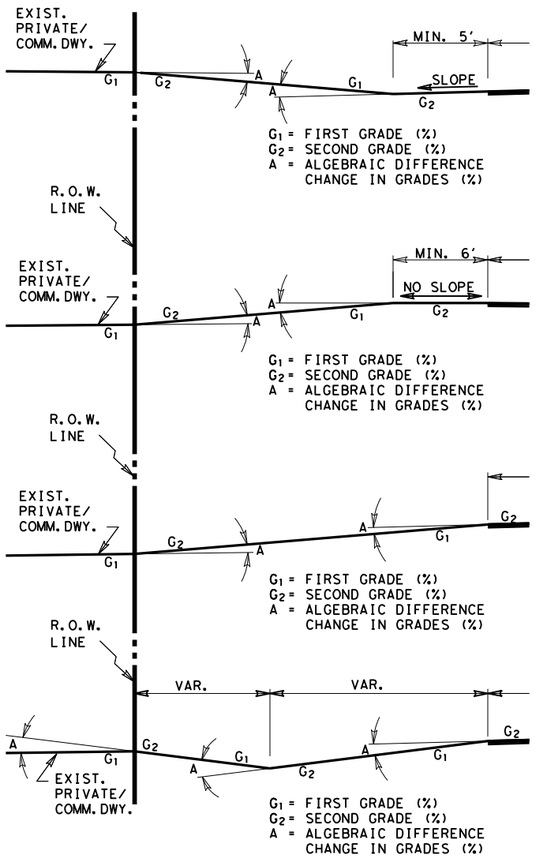
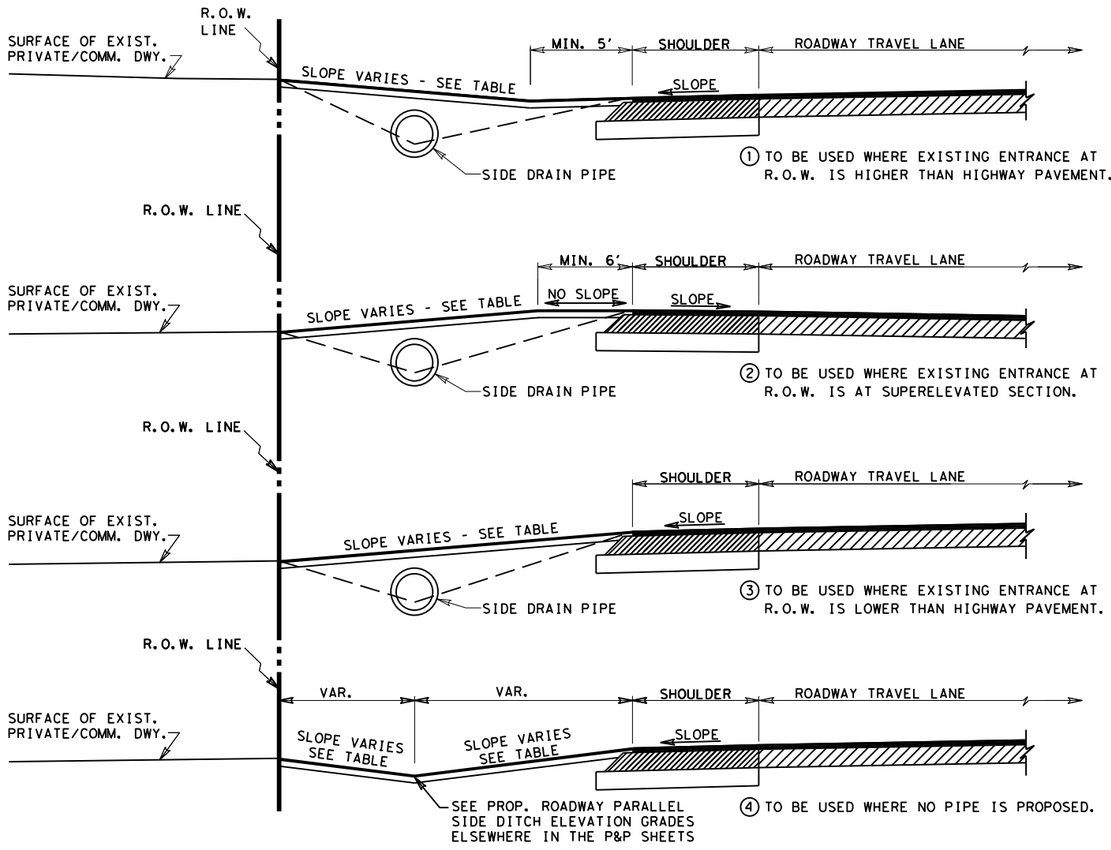
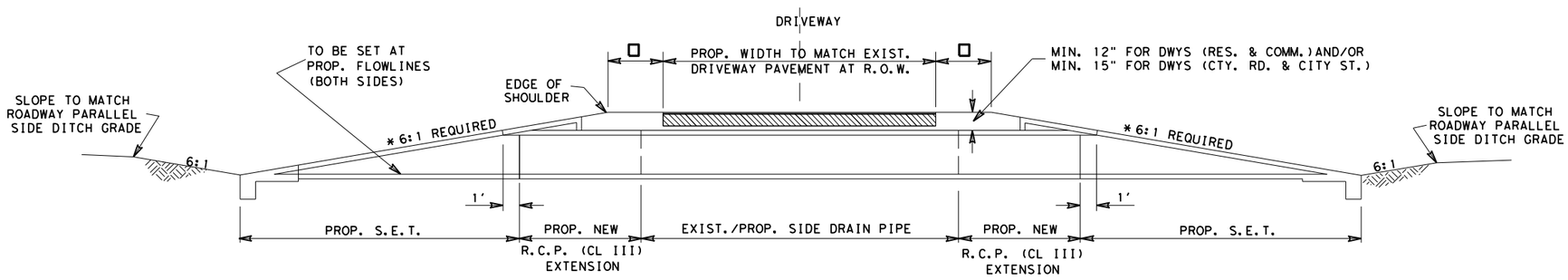




TYPICAL ENTRANCE PROFILE FOR DRIVEWAYS W/OUT C&G

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

PROP. DWY ALGEBRAIC DIFFERENCE TABLE
COMMERCIAL DRIVEWAYS @ A = 6% DESIRABLE
RESIDENTIAL DRIVEWAYS @ A = 8% DESIRABLE
FORMULA, A=G2-G1



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

* - 6:1 SLOPE REQUIRED

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.

PHARR DISTRICT STANDARD

TEXAS DEPARTMENT OF TRANSPORTATION

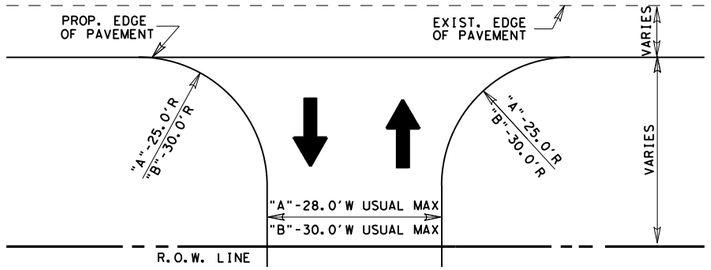
DRIVEWAY PROFILE DETAILS

REV. 3/2020

DRIVEWAY1.DGN

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		FILE NO.			SHEET NO.
6						148
STATE	STATE DIST. NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TEXAS	21	CAMERON	1057	03	051	FM 510

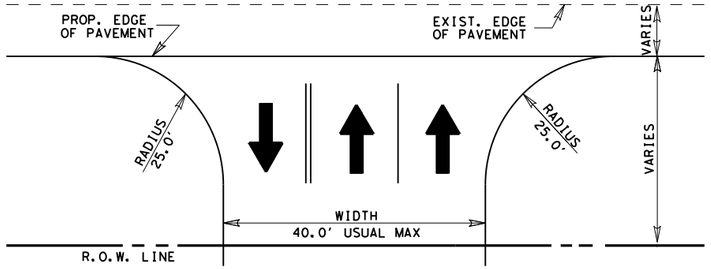
DESIGNS FOR TWO-WAY COMMERCIAL DRIVEWAYS



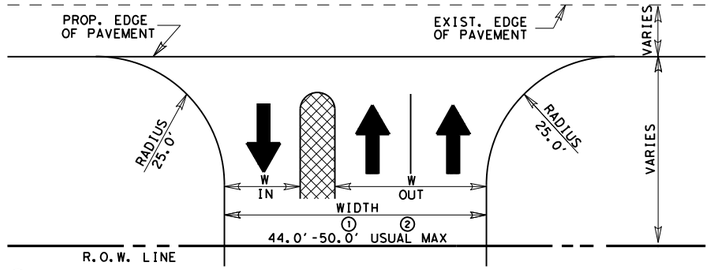
"A"- ONE ENTRY LANE AND ONE EXIT LANE, FEWER THAN 4 LARGE VEHICLES PER HOUR

"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*

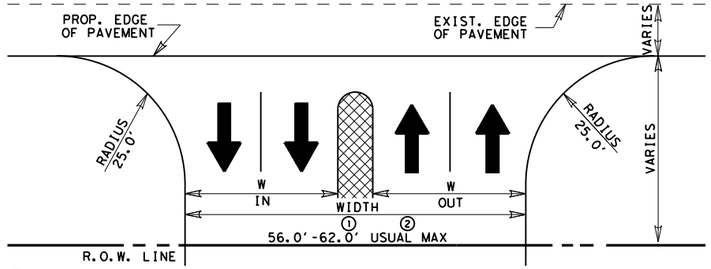


ONE ENTRY LANE AND TWO EXIT LANES (WITHOUT DIVIDERS)



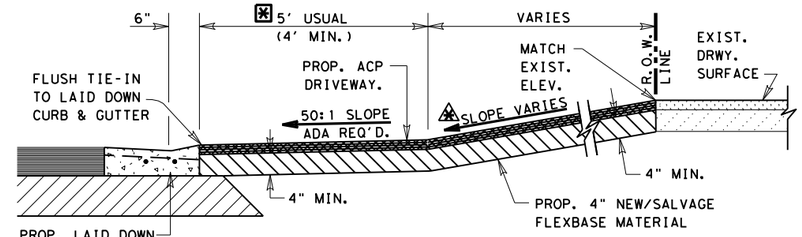
① - *4.0' WIDE DIVIDER, FACE-TO-FACE CURBS*
② - *10.0' WIDE DIVIDER, FACE-TO-FACE-CURBS*

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



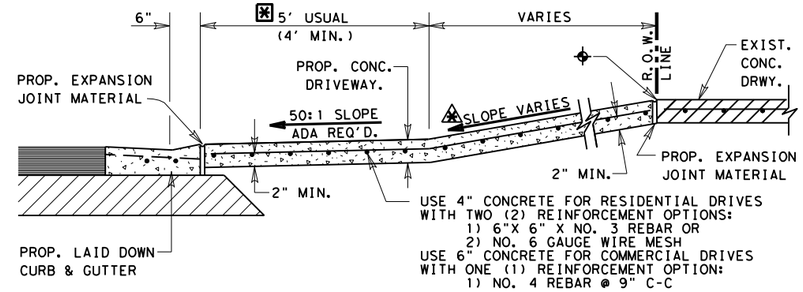
① - *4.0' WIDE DIVIDER, FACE-TO-FACE CURBS*
② - *10.0' WIDE DIVIDER, FACE-TO-FACE-CURBS*

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.

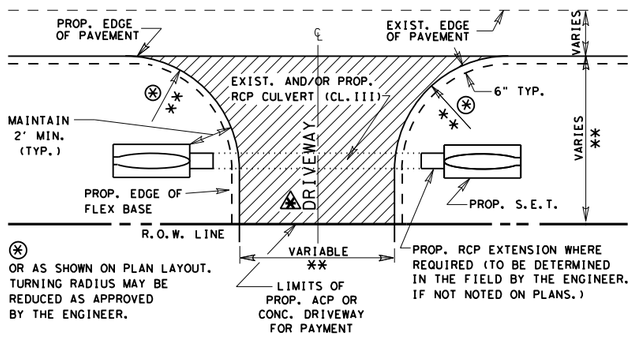
⊠ PROP./FUTURE SIDEWALK CROSSING LOCATION UNLESS SHOWN ELSEWHERE ON P&P SHEETS. SEE P&P SHEETS FOR PROP. SIDEWALK LOCATION IF SIDEWALKS ARE INCLUDED AS PART OF PROJECT. REFER TO STATE STANDARDS - PEDESTRIAN FACILITIES - FOR ADDITIONAL REQUIREMENTS.

⚠ 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



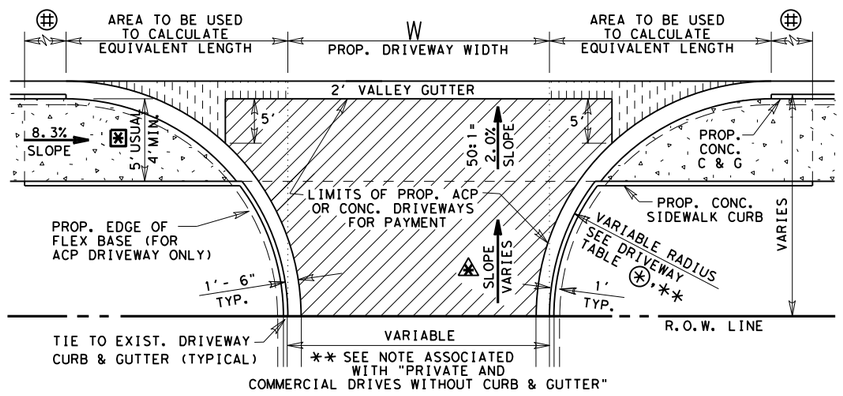
⌖ OR AS SHOWN ON PLAN LAYOUT. TURNING RADIUS MAY BE REDUCED AS APPROVED BY THE ENGINEER.

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 171#/SY ACP. (HMA-D PG 64-22 SAC B MEETING ITEM 340)

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

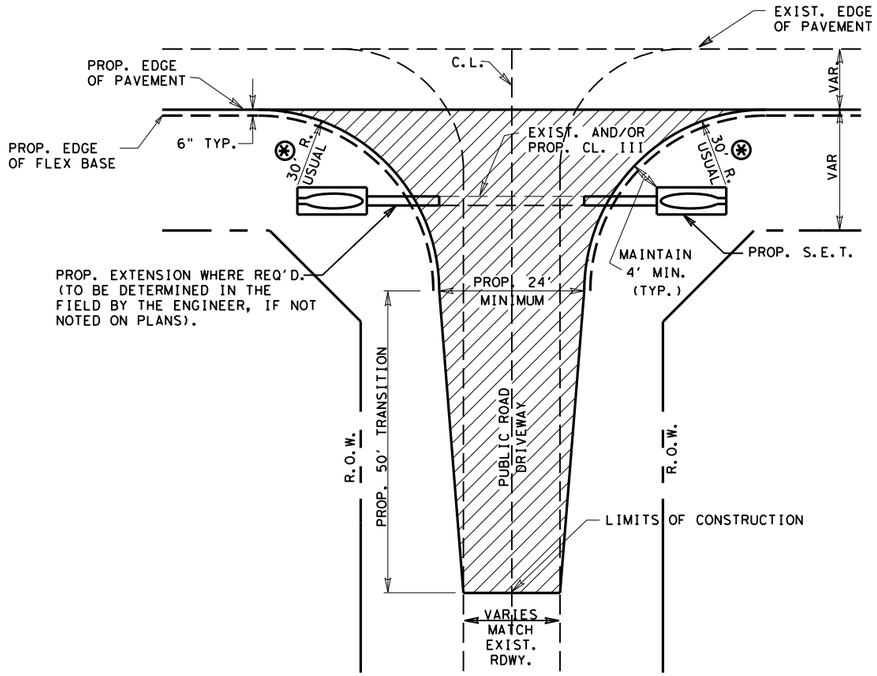
TEXAS DEPARTMENT OF TRANSPORTATION

DRIVEWAY DETAILS PRIVATE (RESIDENTIAL-COMMERCIAL)

REV. 08/22

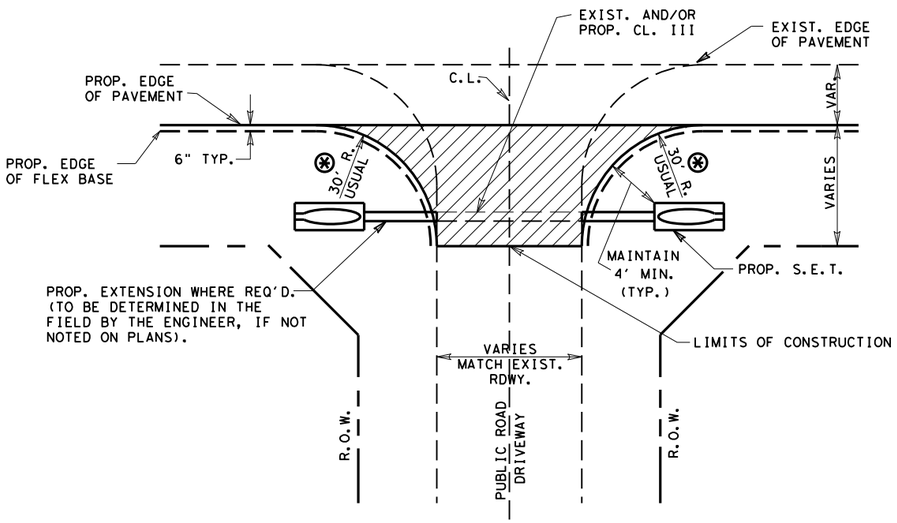
DRIVEWAY2.DGN

FED. RD. DIV. NO.	PROJECT NO.		FILE NO.			SHEET NO.
6						149
STATE	STATE DIST. NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TEXAS	21	CAMERON	1057	03	051	FM 510



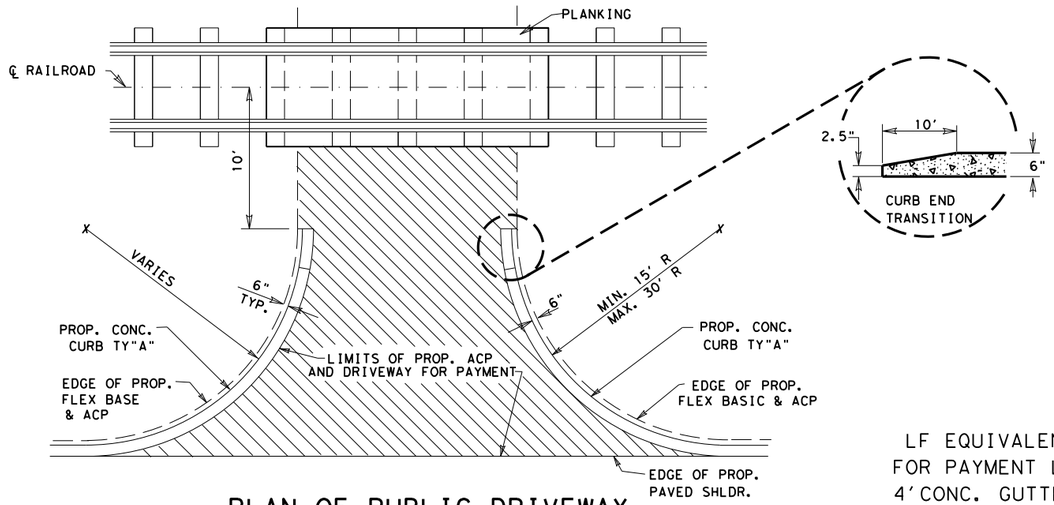
TYPICAL DETAIL

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

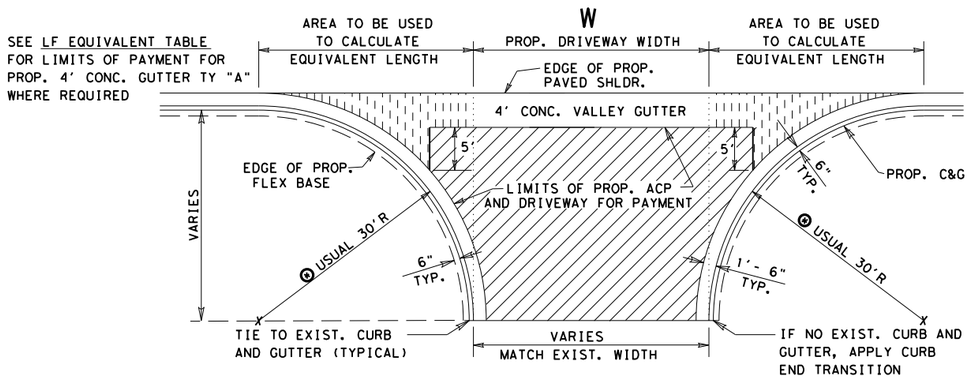


TYPICAL DETAIL

(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

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.

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. (HMA-D PG 64-22 SAC B MEETING ITEM 340)

TY PBS2

EXIST. DRIVEWAY TO BE CONSTRUCTED SAME AS PROPOSED ROADWAY.

PHARR DISTRICT STANDARD

TEXAS DEPARTMENT OF TRANSPORTATION

DRIVEWAY DETAILS PUBLIC (COUNTY ROAD-CITY STREET)

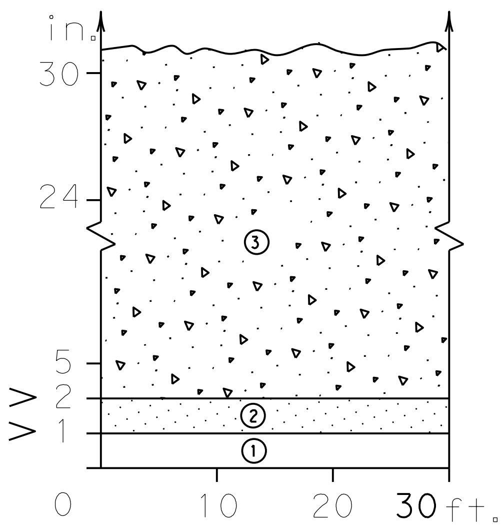
REV. 8/22

DRIVEWAY3.DGN

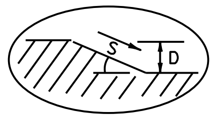
FED.RD. DIV.NO.	STATE AID PROJECT NO.			FILE NO.			SHEET NO.
6							150
STATE	STATE DIST.NO.	COUNTY	CONT.	SECT.	JOB		HIGHWAY NO.
TEXAS	21	CAMERON	1057	03	051		FM 510

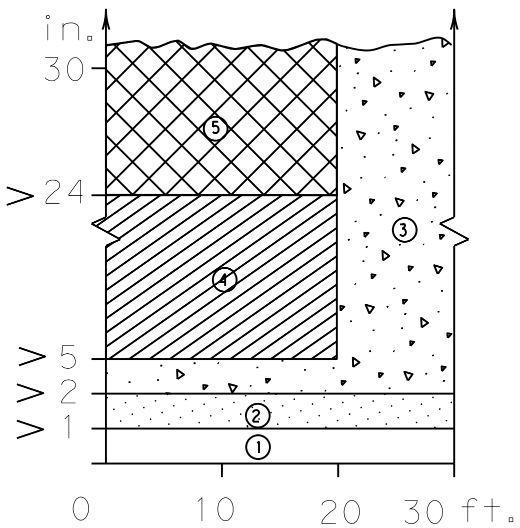
DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

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

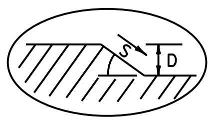


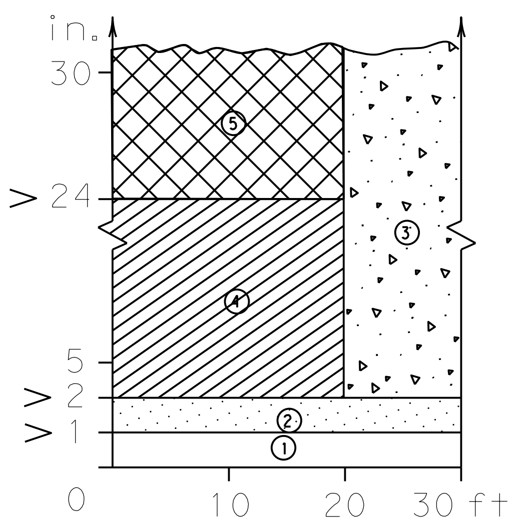
Edge Condition I
S = (3:1) (or flatter)



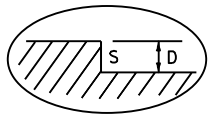


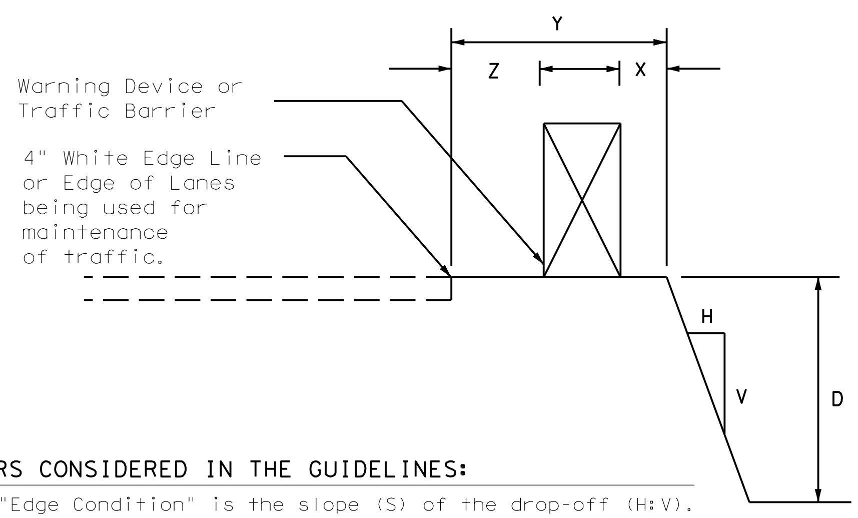
Edge Condition II
S = ((2.99):1) to (1:1)





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





FACTORS CONSIDERED IN THE GUIDELINES:

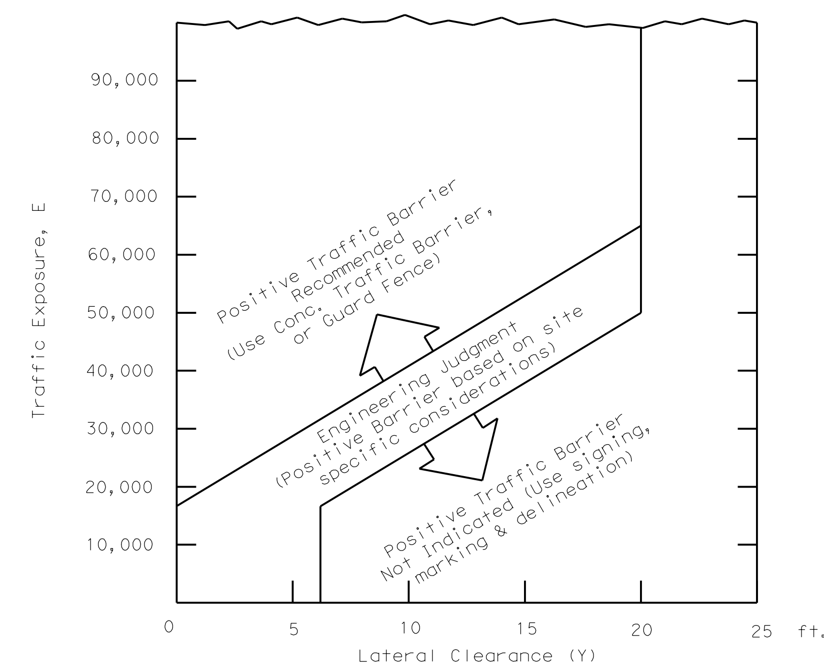
1. The "Edge Condition" is the slope (S) of the drop-off (H:V). The "Edge Height is the depth of the drop-off "D".
2. Distance "X" is to be the maximum practical under job conditions. Two feet minimum for high speed conditions. Distance "Y" is the lateral clearance from edge of travel lane to edge of dropoff. Distance "Z" does not have a minimum.
3. In addition to the factors considered in the guidelines, each construction zone drop-off situation should be analyzed individually, taking into account other variables, such as: traffic mix, posted speed in the construction zone, horizontal curvature, and the practicality of the treatment options.
4. The conditions for indicating the use of positive or protective barriers are given by Zone-5 and Figure-1. Traffic barriers are primarily applicable for high speed conditions. Urban areas with speeds of 30 mph or less may have a lesser need for signing, delineation, and barriers. Right-angled edges, however, with "D" greater than 2 inches and located within a lateral offset of 6 feet, may indicate a higher level of treatment.
5. If the distance "Y" must be less than 3 feet, the use of a positive barrier may not be feasible. In such a case, consider either: 1) narrowing the lanes to a desired 11 to 12 feet or 10 foot minimum (see CW20-8 sign), or 2) provide an edge slope such as Edge Condition I.

Zone	Treatment Types Guidelines:
1	No treatment
2	CW 8-11 "Uneven Lanes" signs.
3	CW 8-9a Shoulder Drop-Off" or CW 8-11 signs plus vertical panels.
4	CW8-9a or CW 8-11, signs plus drums. Where restricted space precludes the use of drums, use vertical panels. An edge slope to that of the profered Edge Condition I.
5	Check indications (Figure-1) for possitive barrier. Where positive barrier is not indicated, the treatment shown above for Zone-4 may be used after consideration of other applicable factors.

Edge Condition Notes:

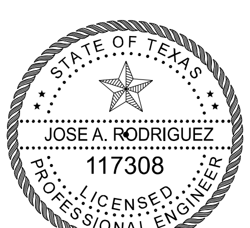
1. Edge Condition I: Most vehicles are able to traverse an edge condition with a slope rate of (3 to 1) or flatter. The slope must be constructed with a compacted material capable of supporting vehicles.
2. Edge Condition II: Most vehicles are able to traverse an edge condition with a slope between (2.99 to 1) and (1 to 1) so long as "D" does not exceed 5 inches. Under-carriage drag on most automobiles will occur when "D" exceeds 6 inches. As "D" exeeds 24 inches, the possibility for rollover is greater in most vehicles.
3. Edge Condition III: When slopes are greater than (1 to 1) and where "D" is greater than 2 inches, a more difficult control factor may exist for some vehicles, if not properly treated. For example, where "D" is greater than 2 inches and up to 24 inches different types of vehicles may experience different steering control at different edge heights. Automobiles might experience more steering control differential when "D" is greater than 2 inches and up to 5 inches. Trucks, particularly those with high loads, have more steering control differential when "D" is greater than 5 inches and up to 24 inches. When "D" exceeds 24 inches, the possibility of rollover is greater for most vehicles.
4. Milling or overlay operations that result in Edge Condition III should not be in place without appropriate warning treatments, and these conditions should not be left in place for extended periods of time.

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



1. E = ADT x T
Where ADT is that portion of the average daily traffic volume traveling within 20 feet (generally two adjacent lanes) of the edge dropoff condition; and, T is the duration time in years of the dropoff condition.
2. Figure-1 provides a practical approach to the use of positive barriers for the protection of vehicles from pavement drop-offs. Other factors, such as the presence of heavy machinery, construction workers, or the mix and volume of traffic may make the use of positive barriers appropriate, even when the edge condition alone may not justify the use of a barrier.
3. An approved end treatment should be provided for any positive barrier end located within the clear zone.

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



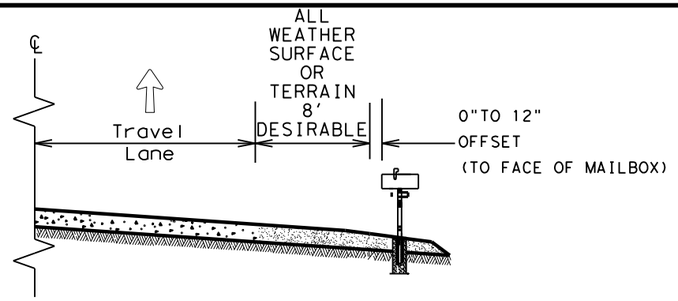
Date 06/13/24

Texas Department of Transportation

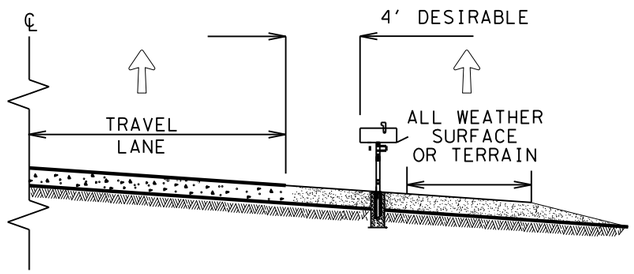
Traffic Safety Division Standard

TREATMENT FOR VARIOUS EDGE CONDITIONS

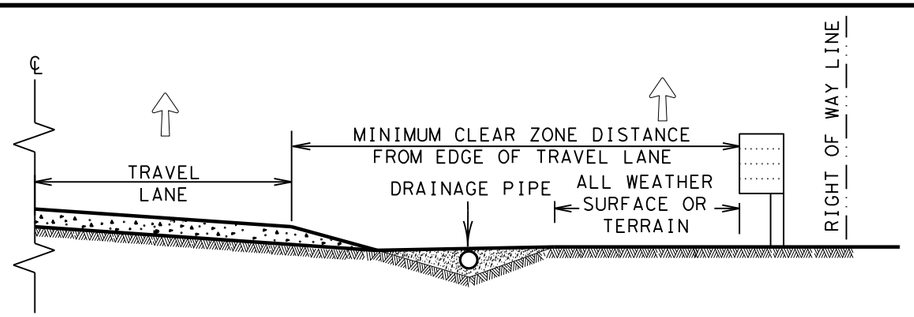
FILE: edgecon.dgn	DN:	CK:	DW:	CK:
© TxDOT August 2000	CONT	SECT	JOB	HIGHWAY
REVISIONS 03-01 08-01 9-21	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	21	CAMERON		151



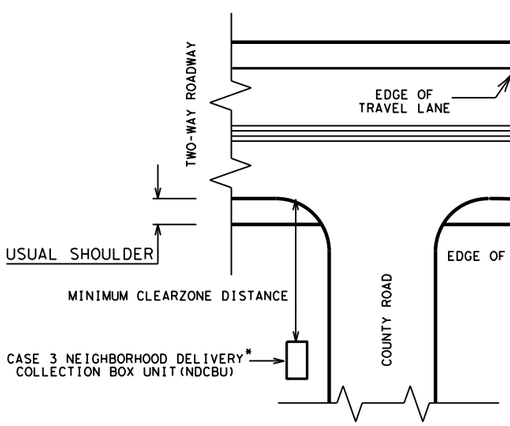
CASE 1. OFF TRAVEL WAY DELIVERY

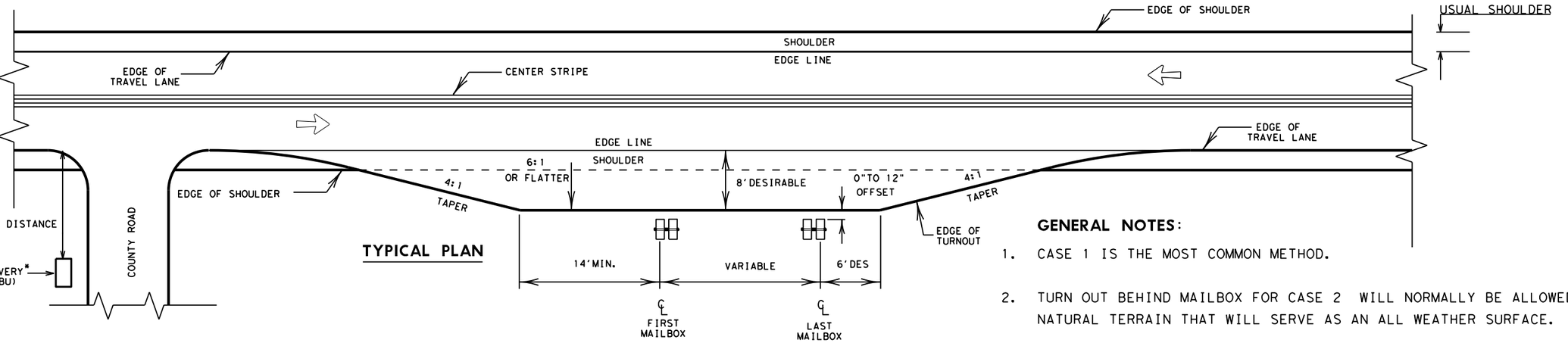


CASE 2. BACK SIDE DELIVERY

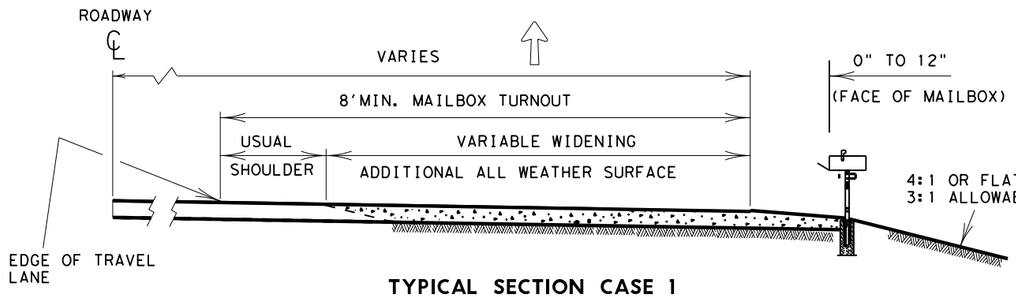


CASE 3. DELIVERY NEAR RIGHT OF WAY LINE





TYPICAL PLAN



TYPICAL SECTION CASE 1

GENERAL NOTES:

1. CASE 1 IS THE MOST COMMON METHOD.
2. TURN OUT BEHIND MAILBOX FOR CASE 2 WILL NORMALLY BE ALLOWED FOR NATURAL TERRAIN THAT WILL SERVE AS AN ALL WEATHER SURFACE.
3. ALL WEATHER DRIVEWAYS FOR CASE 3 MAILBOXES LOCATED AT THE RIGHT OF WAY LINE SHOULD NORMALLY BE PLACED IN CONJUNCTION WITH COUNTY ROADS OR OTHER CONNECTING COMMUNITY ROADS OR STREETS. WHEN 3 OR MORE MULTI-RACKS ARE ANTICIPATED, THE USE OF AN NDCBU IS RECOMMENDED. ONLY RURAL PATRONS LOCATED ON STATE MAINTAINED HIGHWAYS MAY HAVE A MAILBOX OR NDCBU SLOT ON TXDOT RIGHT OF WAY.

* NDCBU MAY BE INSTALLED ON COUNTY ROAD ROW WITH APPROVAL OF COUNTY.

MAIL DELIVERY VEHICLE TRAVEL DIRECTION

DATE:
FILE:

Texas Department of Transportation | Maintenance Division Standard

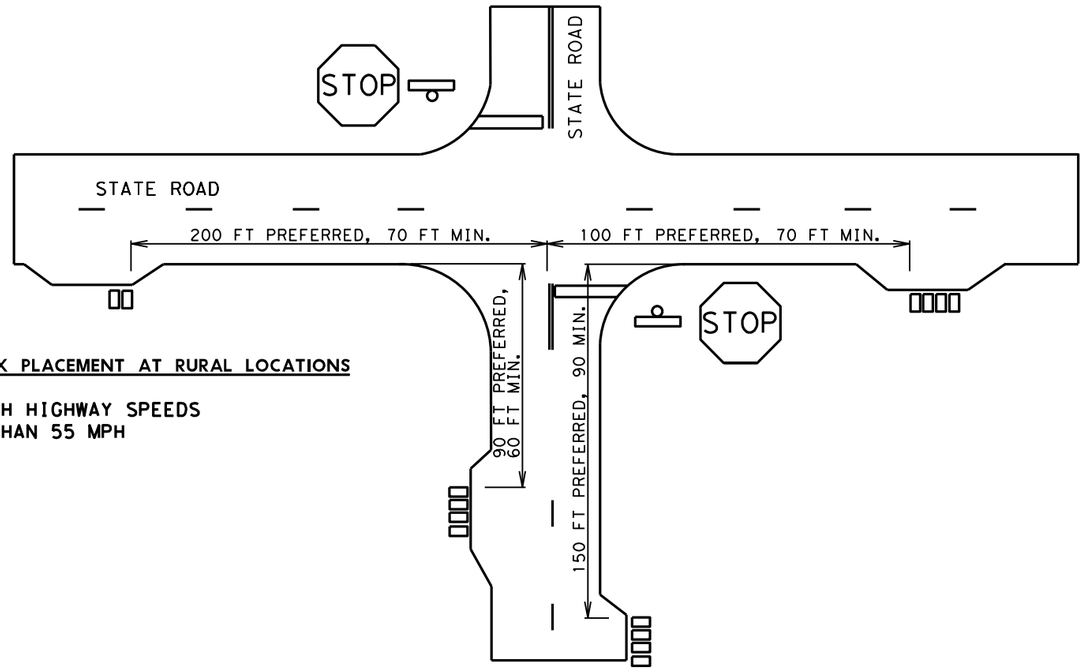
Guideline

MAILBOX SIDE ROAD PLACEMENT AND TURNOUTS

MBP(1)-22

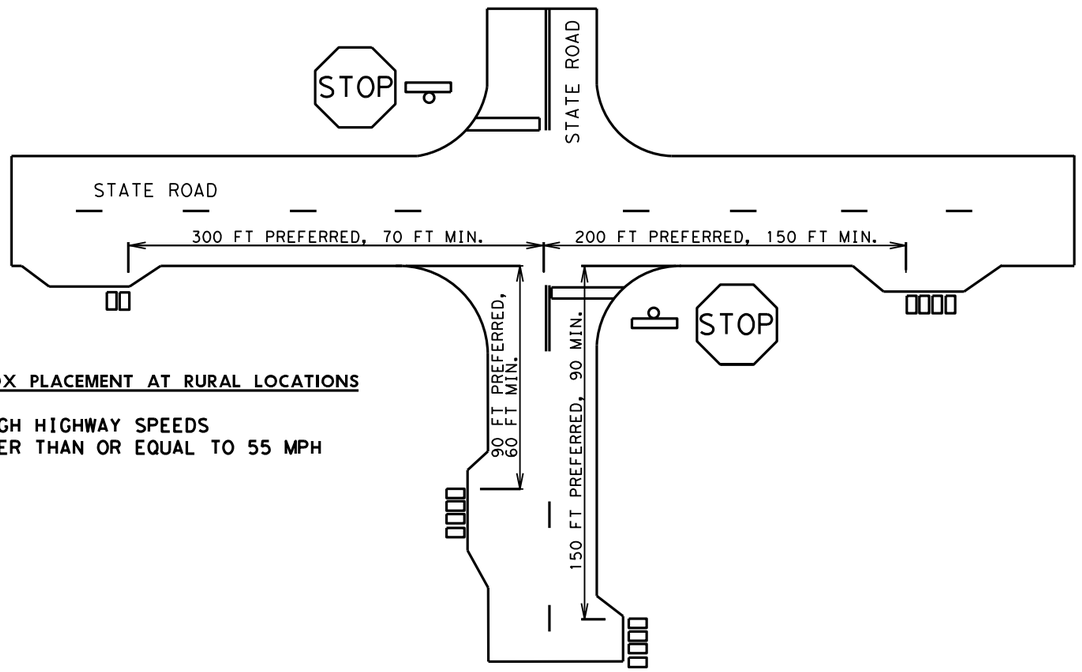
FILE: MBP-22.DGN	DN: VS	CK:	DW: VS	CK:
© TxDOT OCTOBER 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 12/2012 5/2014	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		152

DATE:
FILE:



MAILBOX PLACEMENT AT RURAL LOCATIONS

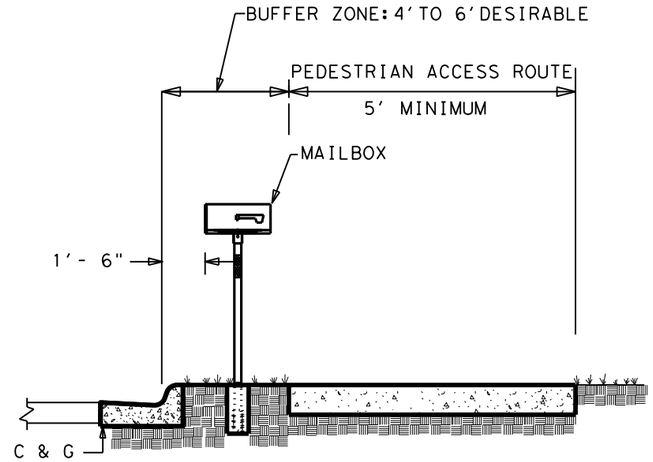
THROUGH HIGHWAY SPEEDS
LESS THAN 55 MPH



MAILBOX PLACEMENT AT RURAL LOCATIONS

THROUGH HIGHWAY SPEEDS
GREATER THAN OR EQUAL TO 55 MPH

CURB AND GUTTER MAILBOX INSTALLATION



NOTES:
1. A NON-TRAVERSABLE SURFACE MUST BE INSTALLED NEAR THE MAILBOX (NATURAL VEGETATION OR OTHER) IN THE BUFFER ZONE. ALTERNATIVELY, A BASE WITH A MINIMUM HEIGHT OF 2.5 INCHES MAY BE INSTALLED SO THAT THE EDGE OF THE MAILBOX DOES NOT EXTEND OUT MORE THAN 4 INCHES HORIZONTALLY BEYOND THE BASE.

2. THE SIDEWALK WIDTH MAY BE REDUCED TO 4 FOOT FOR SHORT DISTANCES AROUND THE MAILBOX IF NEEDED.

3. MAINTAIN A MINIMUM OF 5 FEET BETWEEN OBSTRUCTIONS IN THE PEDESTRIAN ACCESS ROUTE.

Texas Department of Transportation | Maintenance Division Standard

MAILBOX PLACEMENT CURBS & INTERSECTIONS

MBP(2)-22

FILE: MBP-22.DGN	DN: VS	CK:	DW: VS	CK:		
	CONT	SECT	JOB		HIGHWAY	
REVISIONS 12/2012 5/2014	1057	03	051		FM 510	
	DIST	COUNTY			SHEET NO.	
	PHR	CAMERON			153	

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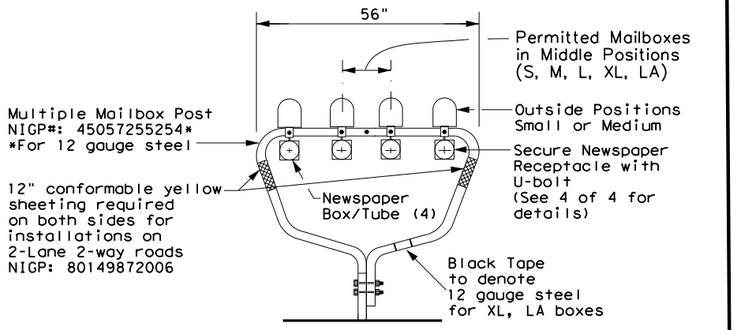
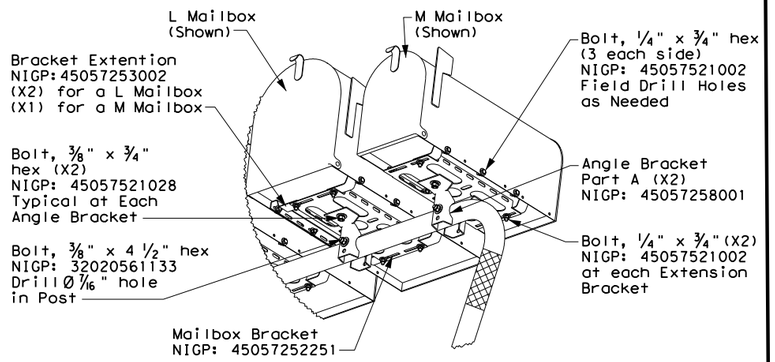
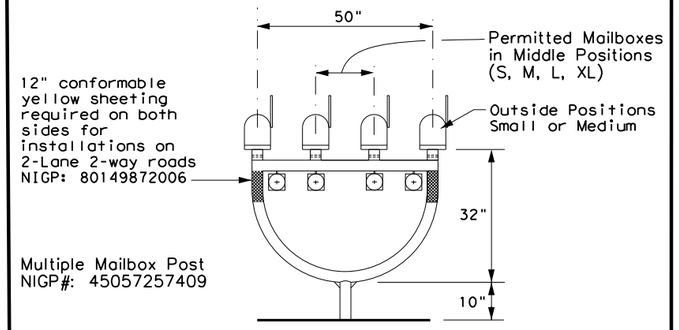
DATE:
FILE:

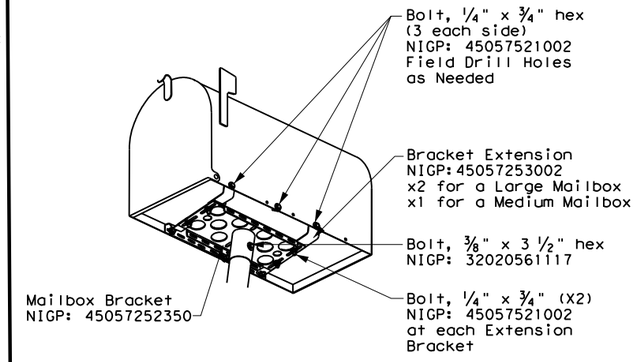
TYPE 1 - MULTIPLE





TYPE 4 - MULTIPLE





MAILBOX SIZES

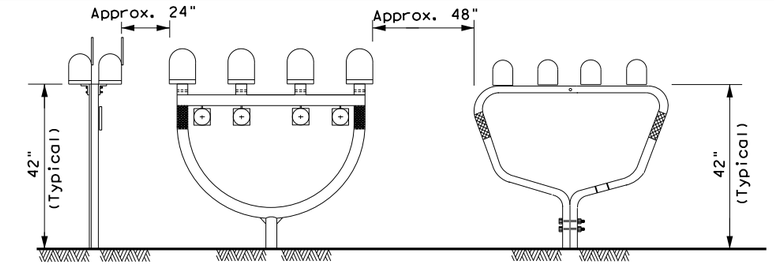
MAILBOX SIZE	TYPICAL DIMENSIONS			MAX **
	LENGTH	WIDTH	HEIGHT	WEIGHT
SMALL	19 1/2"	6"	7"	6 LBS
MEDIUM	22 1/2" *	8" *	11 1/2" *	8 LBS
LARGE	23 1/2"	11 1/2"	13 1/2"	11 LBS
EXTRA LARGE	18"	14"	12"	13 LBS
LOCKABLE	18"	11 1/2"	15"	23 LBS

* See Note 1.
** Excluding Molded Plastic on 4 X 4 Post

GENERAL NOTES:

1. Dimensions shown (length, width, and height) are typical, not maximums. However, anytime a medium size mailbox is mounted on a single/double mount or on the outside position on a multi mount, the dimensions shown are maximums.
2. Mailboxes shall be made of light weight sheet metal or light weight plastic. Heavy steel, cast iron or decorative mailboxes shall not be used on the state highway system.

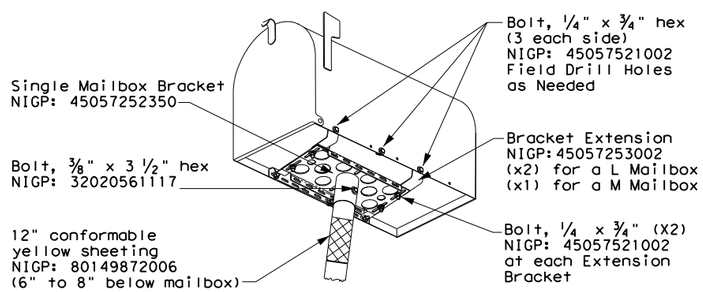
TYPICAL INSTALLATION MEASUREMENTS

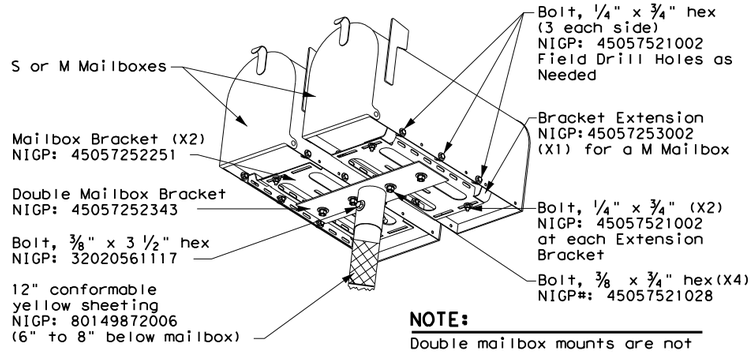


NOTE:

Mailbox installations in sidewalk areas shall be in accordance with the latest TxDOT Design Standard sheets PED-Pedestrian Facilities Curb Ramps.

TYPE 2 and 4 - SINGLE/DOUBLE

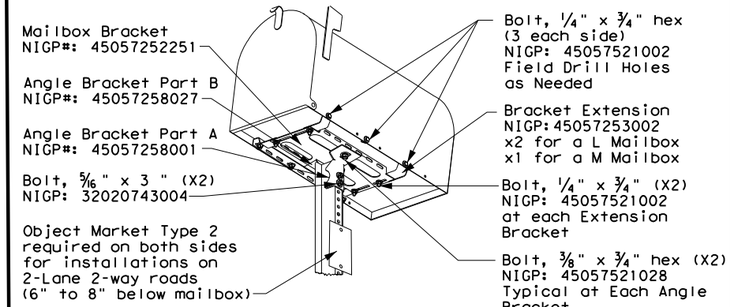


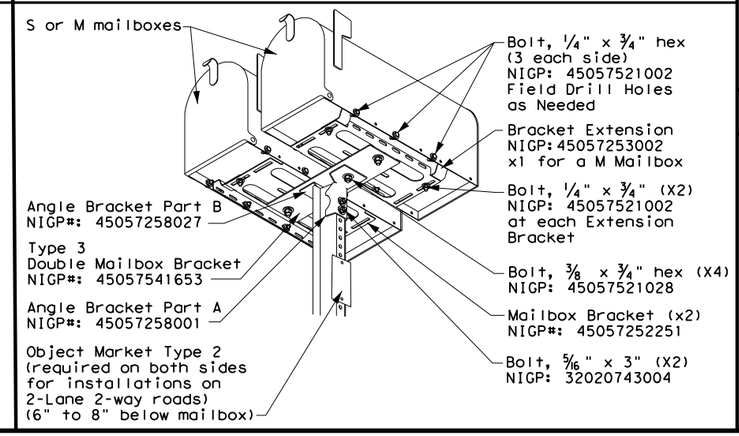


NOTE:

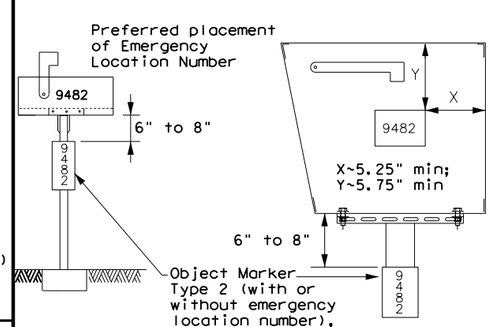
Double mailbox mounts are not allowed with a type 4 multiple mailbox installation

TYPE 3 - SINGLE/DOUBLE





PLACEMENT OF EMERGENCY LOCATION NUMBER

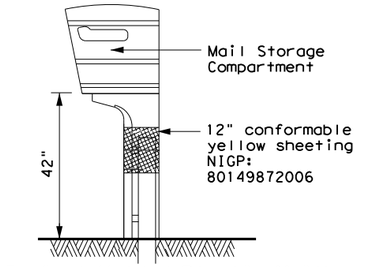


NOTES:

1. Location numbers are provided by homeowner. Minimum size 1" height.
2. Location number is typically placed on the mailbox in a contrasting color.
3. Black numbers may be placed on the Type 2 object marker if the numbers cannot be placed on the mailbox.
4. Alternatively, a green or blue plate with white numbers attached may be mounted below the object marker. Other contrasting color configuration, as approved, may be used.
5. See 3 of 4 for Foundation details.
6. See 4 of 4 for Hardware details.

SHEET 1 OF 4

TYPE 5



Typical Molded Plastic Mailbox

Texas Department of Transportation — Maintenance Division Standard

MAILBOX MOUNTING AND ASSEMBLY

MB(1)-21

FILE: MB-21.dgn	DN:	CK:	DW:	CK:
© TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS 2/2005 11/2009 4/2015 6/2005 1/2011 11/2006 7/2014	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	21	CAMERON		154

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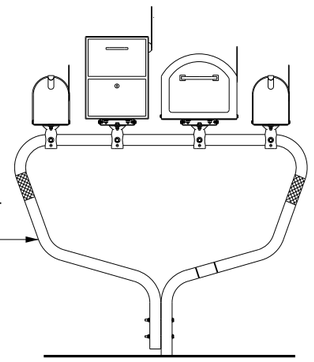
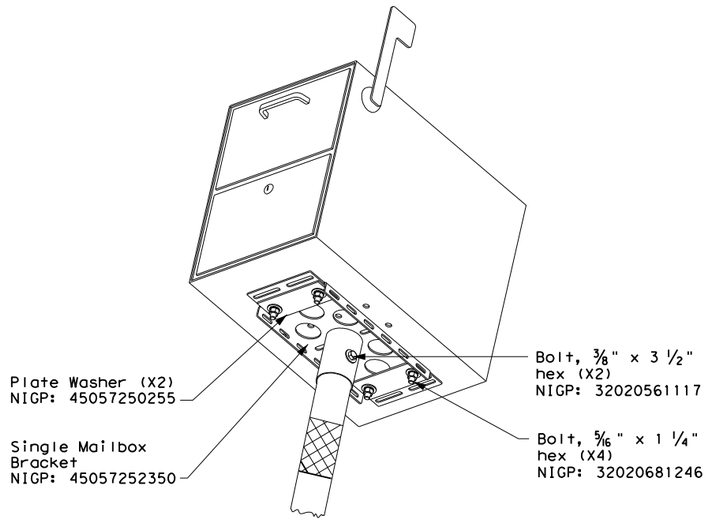
DATE:
FILE:

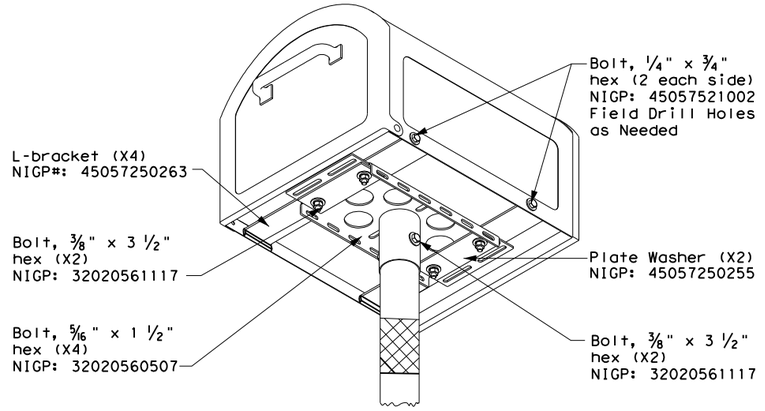
TYPE 1- MULTI LOCKABLE AND XL MAILBOX



TYPE 2/4 - SINGLE LOCKABLE MAILBOX

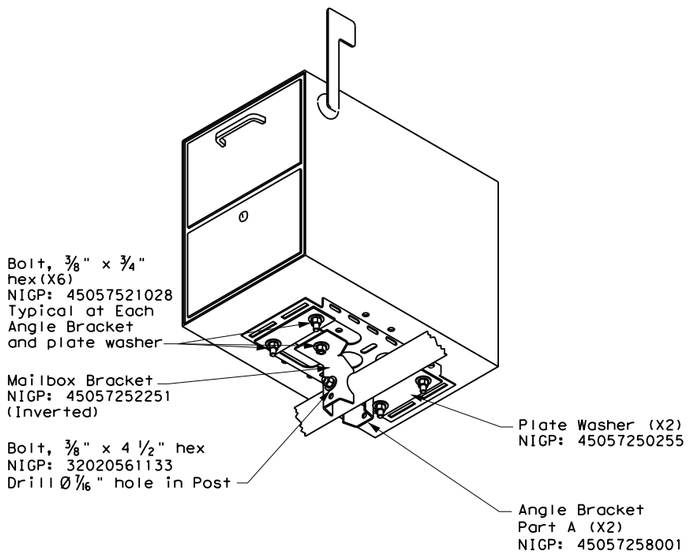


TYPE 2/4 - SINGLE XL MAILBOX

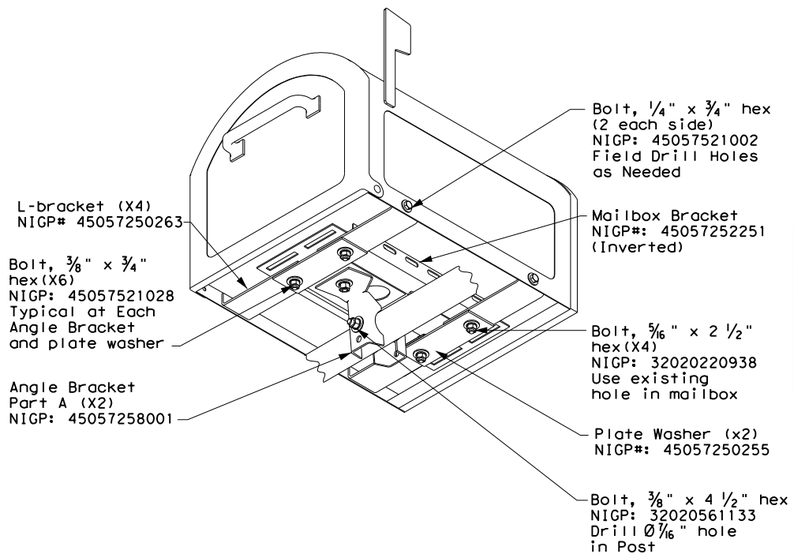


NOTE:
Follow same configuration when mounting an XL mailbox on a Type 4 multi post.

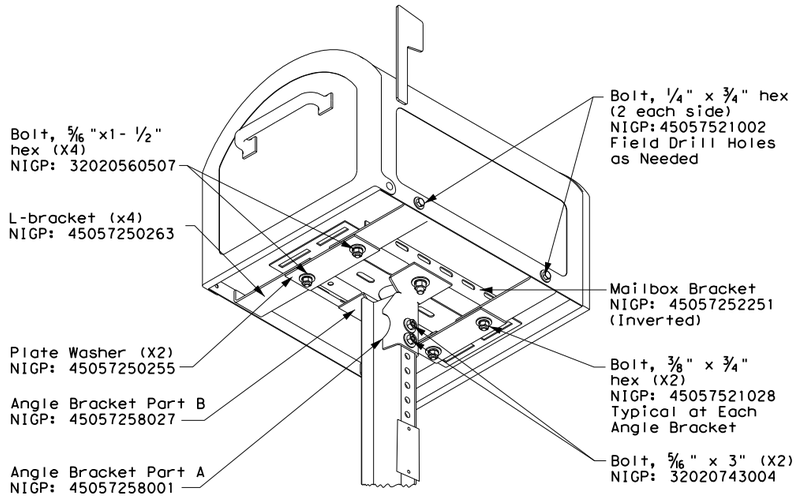
TYPE 1 MULTI – LOCKABLE ARCHITECTURAL (LA)



TYPE 1 MULTI – XL MAILBOX



TYPE 3 - XL MAILBOX MOUNTING



Texas Department of Transportation

Maintenance Division Standard

XL AND LOCKABLE ARCHITECTURAL MAILBOX ASSEMBLY

MB(2)-21

FILE: MB-21.dgn	DN:	CK:	DW:	CK:
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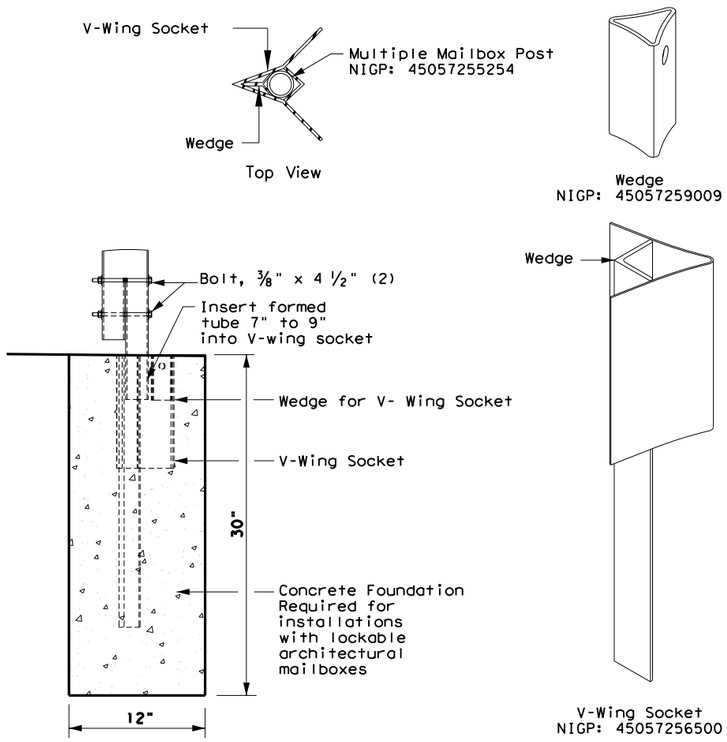
	DIST	COUNTY		SHEET NO.
	21	CAMERON		155

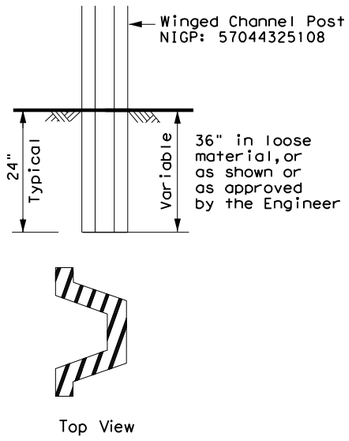
DATE:
FILE:

TYPE 1 - SUPPORT/FOUNDATION

Thin Wall Tube w/ V-LOC Anchorage



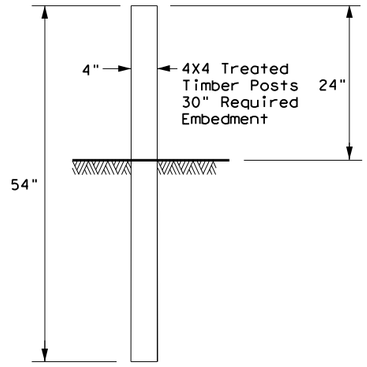
TYPE 3 - SUPPORT/FOUNDATION



NOTES:

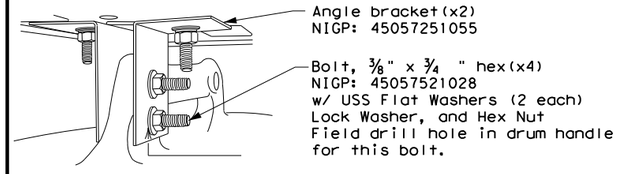
1. Attach Object Marker (OM) facing direction of traffic.
2. OM will also be required on opposite side if installed on a 2-Lane, 2-Way roadway.

TYPE 5 - SUPPORT/FOUNDATION



Molded Plastic Mailboxes shall be installed on 4"x4" treated timber posts only. The use of steel pipe or structural tubing in place of timber post is prohibited.

TYPE 6 - TEMPORARY MAILBOX SUPPORT



Plastic Drum NIGP: 55093383655
Rubber Collar NIGP: 55093387102

NOTES:

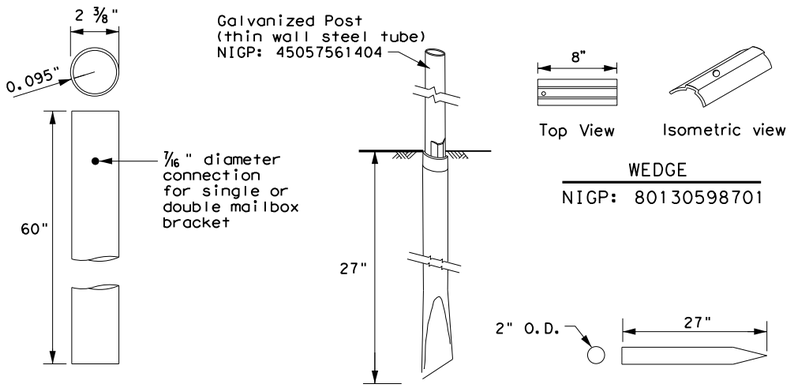
1. Place on approved plastic drum as shown in the Compliant Work Zone Traffic Control Devices (CWZTCD).
2. Existing attachment hardware shall be used unless damaged. Damaged hardware shall be replaced.

GENERAL NOTES:

1. Erect post plumb or vertical.
2. When galvanized part is required galvanize in accordance with Item 445.
3. Use a concrete footing as shown or when directed. Concrete footing will be required when soils do not hold the support/foundations in a stable condition, only on Type 1, Type 2, and Type 4

TYPE 2 - SUPPORT/FOUNDATION

Thin Wall Steel Tube w/Wedge Anchor System

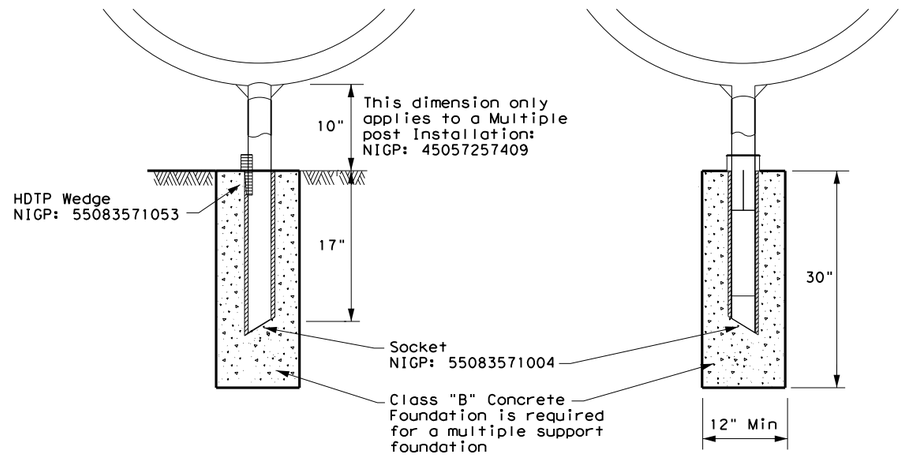


MAILBOX POST

WEDGE ANCHOR
NIGP: 80130238407

TYPE 4 - SUPPORT/FOUNDATION

Whitecoated steel post NIGP: 45057561107
Multiple post NIGP: 45057257409
Recycled Rubber post (RR) NIGP: 45057561057



SHEET 3 OF 4

Texas Department of Transportation

Maintenance Division Standard

MAILBOX SUPPORT AND FOUNDATION

MB(3)-21

FILE: MB-21.dgn	DN:	CK:	DW:	CK:
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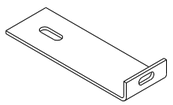
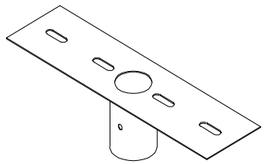
DATE:
FILE:

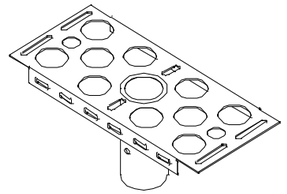
TYPE	TYPE 1	TYPE 2	TYPE 3	TYPE 4			TYPE 5	TYPE 6
Configuration	Multiple	Single or Double	Single or Double	Single	Double	Multiple	Single	Single
Mailbox Size NIGP #	Outside Position: S or M Inside Position: S, M, L, XL, or LA	Single: S, M, L, XL, or LA Double: SS, SM, MM	Single: S, M, L, or XL Double: SS, SM, MM	S, M, L, XL, or LA	SS, SM, or MM	Outside Position: S or M Inside Position: S, M, L, or XL	Molded Plastic	S, or M
Mailbox Post NIGP #	45057255254 (Galvanized Multiple)	45057561404 (Thin Walled Gavanize)	57044325108 (Wing Channel Post)	45057561107 (Thin walled white powder coated) 45057561057 (Recycled Rubber Post: S or M only)	45057561107 (Thin Walled White Powder Coated)	45057257409 (White Powder Coated Multiple)	4x4 Timber	Construction Barrel
Post and Mailbox Hardware NIGP #	45057259009 (Wedge) 45057256500 (V-Wing Socket) 45057253002 (Bracket Extension) 45057252251 (Mailbox Bracket) 45057258001 (Part A Angle Bracket x2) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	80130598701 (Wedge) 80130238407 (Wedge Anchor) 45057253002 (Bracket Extension) 45057252343 (Double MB Bracket) 45057252350 (S. Mailbox Bracket) 45057252251 (Mailbox Bracket) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket forXL x4)	45057541653 (Type 3 Double Mailbox Bracket) 45057252251 (Mailbox Bracket) 45057253002 (Bracket Extension) 45057258001 (Part A Angle Bracket) 45057258027 (Part B Angle Bracket) 45057250255 (Plate Washer for XL x2) 45057250263 (L-Bracket for XL x4)	55083571053 (Wedge) 55083571004 (Socket) 45057252350 (Single Mailbox Bracket) 45057253002 (Bracket Extension) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	55083571053 (Wedge) 55083571004 (Socket) 45057253002 (Bracket Extension) 45057252343 (Double Mount Bracket) 45057252251 (Mailbox Bracket x2)	55083571053 (Wedge) 55083571004 (Socket) 45057253002 (Bracket Extension) 45057252350 (Single Mount Bracket) 45057250255 (Plate Washer for XL x2) 45057250263 (L-Bracket for XL x4)	None	45057251055 Angle Bracket (x2)
Foundation Used	Class B Concrete (Required for LA Mailboxes)	Class B Concrete (Required for LA Mailboxes)	None	Class B Concrete (not used with recycled rubber post, required for LA Mailboxes)	Class B Concrete (not required)	Class B Concrete	None	None



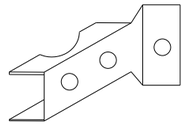
NIGP: 45057250263
L-Bracket x4 for
XL sized mailboxes



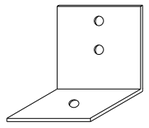
NIGP: 45057252343
Double Mailbox Bracket
For Type 2 and Type 4
double mount



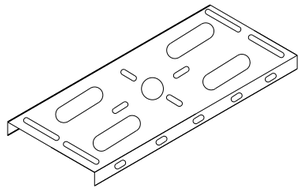
NIGP: 45057252350
Single Mailbox Bracket
For Type 2 single and for
Type 4 single and multi mount



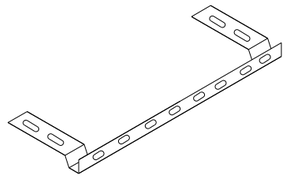
NIGP: 45057258001
Part "A" Angle Bracket
For Type 1 multi (2 per mailbox)
and Type 3 single and double



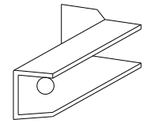
NIGP: 45057251055
Type 6 Angle Bracket
(2 per mailbox)



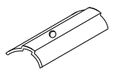
NIGP: 45057252251
Mailbox Bracket
For Type 1 multi and
any double mount (use 2)



NIGP: 45057253002
Bracket Extension
Use 1 for a medium Mailbox
Use 2 for a Large Mailbox



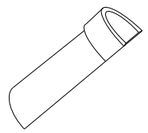
NIGP: 45057258027
Part "B" Angle Bracket
For Type 3 single
and double



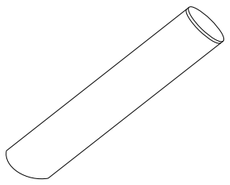
NIGP: 80130598701
Wedge for Type 2

NIGP: 45057250255
Plate Washer for Architecural
and XL Mailboxes

NIGP: 45057541653
Type 3 double mailbox bracket

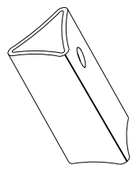


NIGP: 55083571053
Type 4 Mailbox Wedge

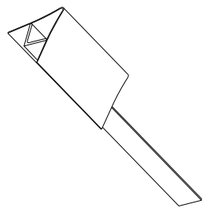


NIGP: 55083571004
Type 4 Mailbox Socket

NIGP: 80130238407
Type 2 Wedge Anchor



NIGP: 45057259009
Wedge for Type 1 V-wing Socket



NIGP: 45057256500
V-wing Socket for
Type 1 Foundation

NIGP #	OBJECT MARKERS AND CONFORMABLE SHEETING
55008311759	Type 2 OM 4"x4" (3 Needed) for Type 3 Wing Channel Post
55008312906	Type 2 OM 6"x12" (1 needed) for Type 3 Wing Channel Post
80149872006	12" Conformable Reflective Yellow Sheeting for Flexible Posts

NOTES:

1. Type 2 object marker in accordance with Traffic Engineering Standard Delineators & Object Markers.
2. A light weight receptacle for newspaper delivery can be attached to mailbox posts if the receptacle does not touch the mailbox, present a hazard to traffic or delivery of the mail, extend beyond the front of the mailbox, or display advertising, except the publication title.

BID CODES FOR CONTRACTS

MB-(X) ASSM TY (XXX) (X)

Type of Mailbox
- S = Single
- D = Double
- M = Multiple
- MP = Molded Plastic

Type of Post
- WC = Winged Channel Post
- RR = Recycled Rubber
- TWW = Thin Walled White Tubing
- TWG = Thin Walled Galvanized Tubing
- TIM = Timber

Type of Foundation
- Ty 1 = V-Loc
- Ty 2 = Wedge Anchor Steel System
- Ty 3 = Winged Channel post
- Ty 4 = Wedge Anchor Plastic System
- Ty 5 = 4 X 4 Post

Texas Department of Transportation — Maintenance Division Standard

NIGP PARTS LIST AND COMPATIBILITY

MB(4)-21

FILE: MB-21.dgn	DN:	CK:	DW:	CK:
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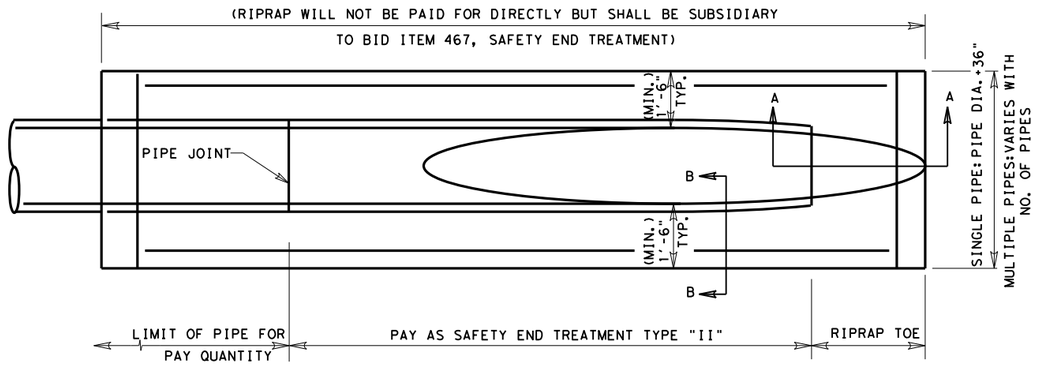
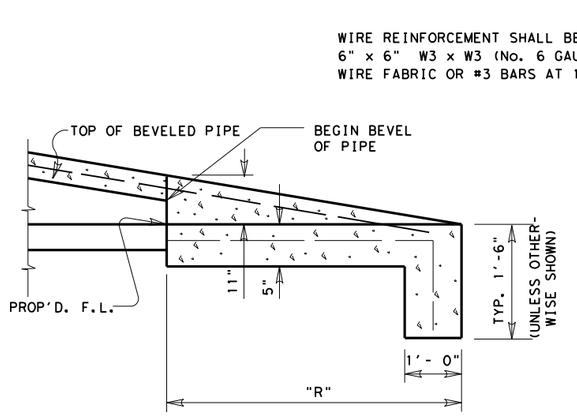
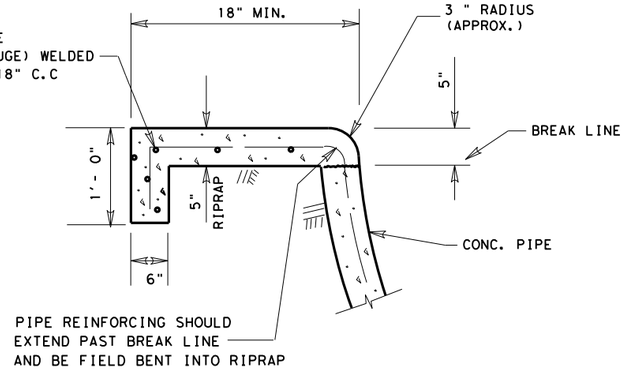
REVISIONS 2/2005 11/2009 4/2015 6/2005 1/2011 11/2006 7/2014	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	21	CAMERON		157



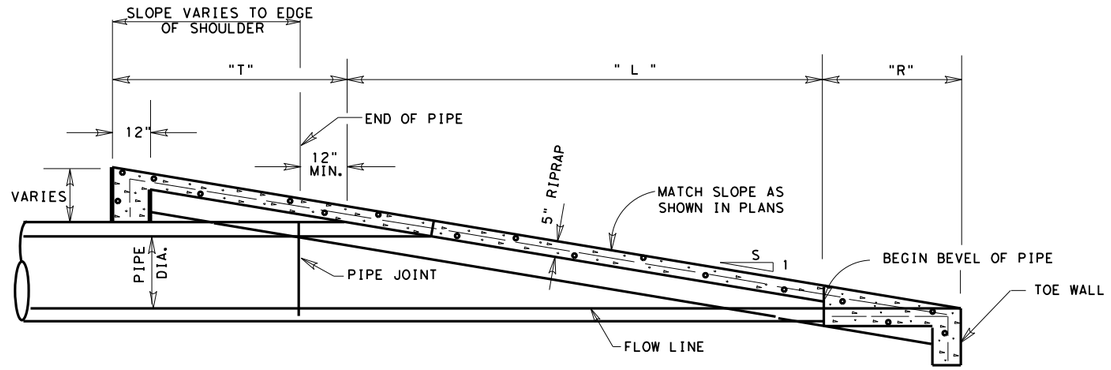
PLAN VIEW



SEC. A-A



SEC. B-B



ELEVATION
SAFETY END TREATMENT

SAFETY END TREATMENT PIPE LENGTHS

PIPE DIA. (IN.)	"L"			
	3:1	4:1	5:1	6:1
12	2'-0"	2'-8"	3'-4"	4'-0"
15	2'-9"	3'-8"	4'-7"	5'-6"
18	3'-6"	4'-8"	5'-10"	7'-0"
24	5'-1½"	6'-10"	8'-6½"	10'-3"
30	6'-9"	9-0"	11'-3"	13'-6"
36	8'-6"	11'-4"	14'-2"	17'-0"
42	10'-1½"	13'-6"	16'-10½"	20'-3"
48	11'-9"	15'-8"	19'-7"	23'-6"

⊛ DRIVEWAYS & TURNOUTS ARE 6:1 ONLY

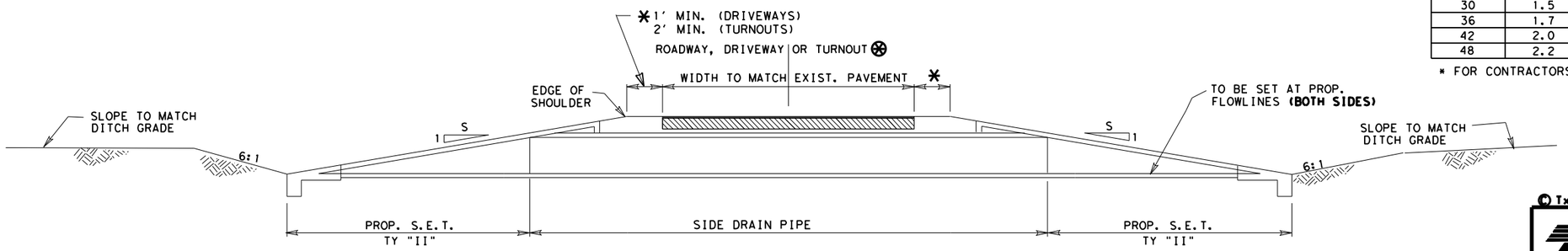
RIPRAP TOE LENGTHS

SLOPE	" R "	"T"
3:1	2'-9"	1'-9"
4:1	3'-8"	2'-4"
5:1	4'-7"	2'-11"
6:1	5'-6"	3'-6"

ESTIMATED RIPRAP VOLUME (CY)

PIPE DIA. (IN.)				
	3:1	4:1	5:1	6:1
12	.9	1.1	1.3	1.6
15	1.0	1.2	1.5	1.8
18	1.1	1.4	1.6	1.9
24	1.3	1.6	2.0	2.3
30	1.5	1.9	2.3	2.7
36	1.7	2.2	2.7	3.2
42	2.0	2.5	3.1	3.6
48	2.2	2.8	3.4	4.1

* FOR CONTRACTORS INFORMATION ONLY (SINGLE PIPE)



TYPICAL SIDEDRAIN SECTION

NOTE:

ALL EXCAVATION AND BACKFILL REQUIRED AT ALL PIPE SIDE DRAIN CONNECTIONS, ADJUSTMENTS AND/OR EXTENSIONS WILL NOT BE PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO THE BID ITEMS INVOLVED AND IN ACCORDANCE WITH ITEM 400 "STRUCTURAL EXCAVATION".

PHARR DISTRICT STANDARDS

TEXAS DEPARTMENT OF TRANSPORTATION

SAFETY END TREATMENT DETAILS

REV. 9/16

SET.DGN

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	FILE NO.	SHEET NO.
6			158

STATE	STATE DIST. NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TEXAS	21	CAMERON	1057	03	051	FM 510

DRAINAGE
COVER SHEET

DATE: 6/13/2024 10:51:04 AM
FILE: c:\txdot\pw_online\txdot05\noel.cantu\d0403765\DRAINAGE_COVER.dgn

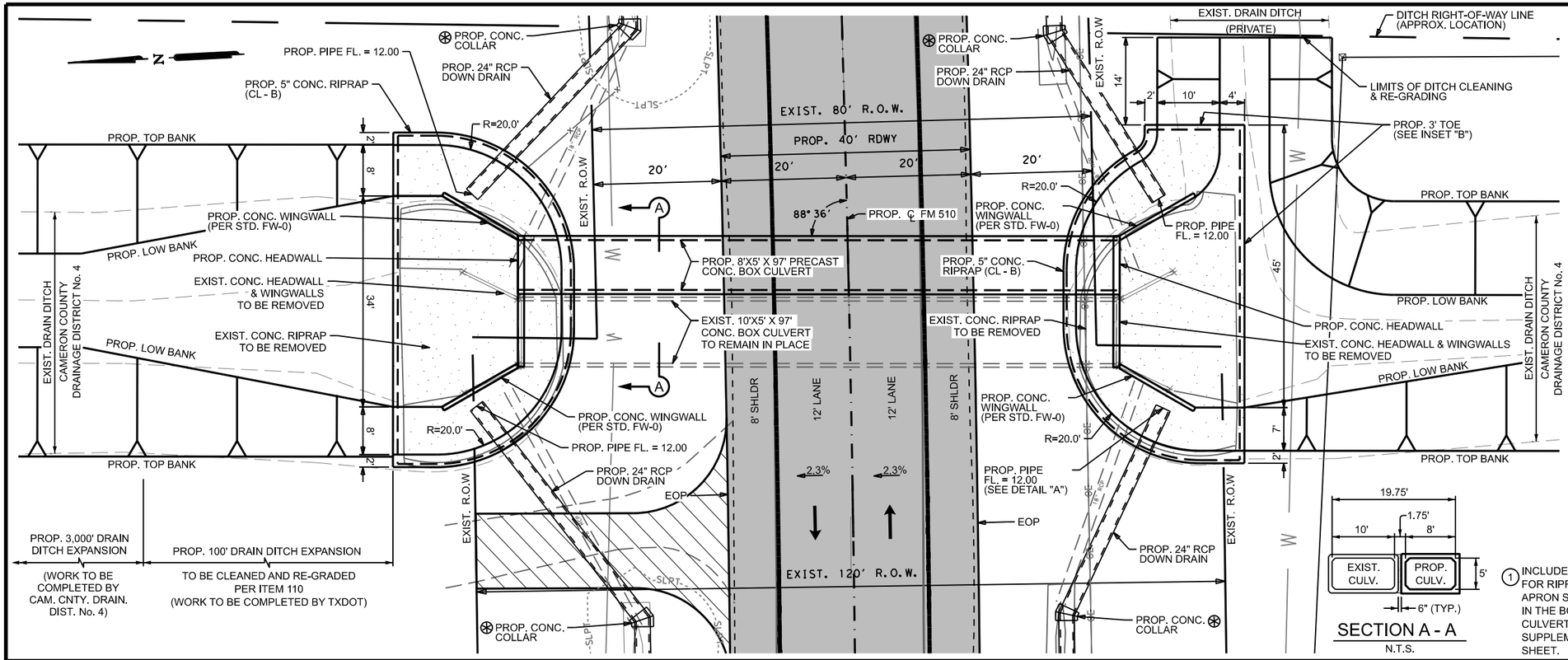
Pharr District Central Design

Texas Department of Transportation

FM 510

DRAINAGE
COVER SHEET

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		159



LEGEND

- OBJ. MARK. ASSM (OM-2Z) (WFLX) GND (BI)
- ** (NON-PAY ITEM) FOR CONTRACTOR'S INFORMATION ONLY
- *** TO BE PAID UNDER ITEM 110
- ⊛ NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS

GENERAL NOTES

1. THE CONTRACTOR SHALL COORDINATE WITH CAMERON COUNTY DRAIANGE DISTRICT No. 4, TELEPHONE: (956) 838-0162 ADDRESS: 3510 OLD PORT ISABEL RD, BROWNSVILLE, TX, 78526, 72 HOURS PRIOR TO ANY WORK ON OR NEAR THE DRAINAGE STRUCTURES.
2. ALL UTILITIES ARE SHOWN FOR INFORMATION PURPOSES ONLY AND SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL HORIZONTAL AND VERTICAL INFORMATION.
3. PRIOR TO WORKING OUTSIDE THE ROW THE CONTRACTOR SHALL NOTIFY PROPERTY OWNER(S). CAUTION SHALL BE TAKEN NOT TO DAMAGE EXISTING FENCE, TREES, ETC. ANY DAMAGES DONE TO THEIR PROPERTY SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
4. THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

	ITEM	DESCRIPTION	UNIT	QTY.
	104 7006	REMOV CONC (RIPRAP)	SY	200
	110 7002	EXCAV (CHANNEL)	CY	780
	400 7010	CEM STABIL BKFL	CY	45
	400 7005	STRUCT EXCAV (SPECIAL)	CY	43
	402 7001	TRENCH EXCAVATION PROTECTION	LF	97
(1)	432 7008	RIPRAP (CONC) (CL B)(5 IN)	CY	58
	462 7022	CONC BOX CULV (8FT X 5FT)	LF	97
	466 7148	WINGWALL (FW - 0) (HW = 6 FT)	EA	4
	480 7001	CLEAN EXIST CULVERTS	EA	1
	496 7005	REMOV STR (WINGWALL)	EA	4
	496 7006	REMOV STR (HEADWALL)	EA	2
	658 7078	REMOVE DELIN & OBJECT MARKER ASSMS	EA	2
	658 7059	INSTL OM ASSM (OM-2Z) (WFLX) GND (BI)	EA	2

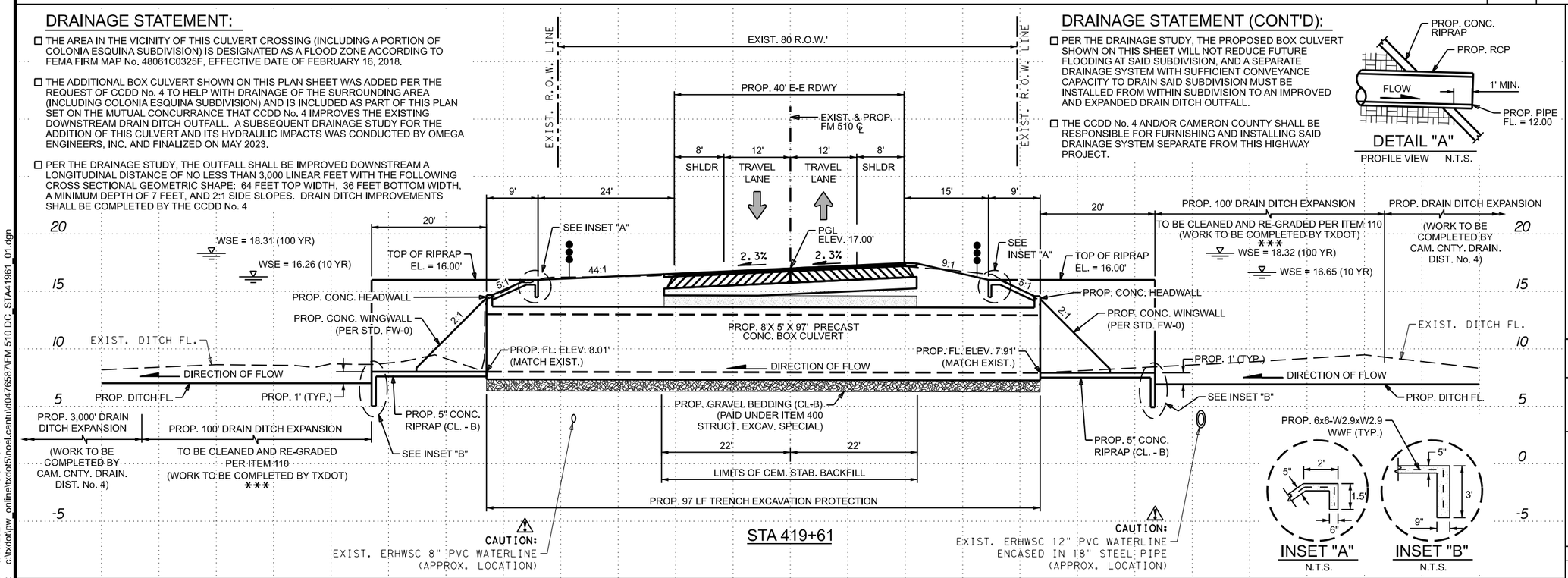
(1) INCLUDES QTY FOR RIPRAP APRON SHOWN IN THE BOX CULVERT SUPPLEMENT SHEET.

DRAINAGE STATEMENT:

- ☐ THE AREA IN THE VICINITY OF THIS CULVERT CROSSING (INCLUDING A PORTION OF COLONIA ESQUINA SUBDIVISION) IS DESIGNATED AS A FLOOD ZONE ACCORDING TO FEMA FIRM MAP No. 48061C0325F, EFFECTIVE DATE OF FEBRUARY 16, 2018.
- ☐ THE ADDITIONAL BOX CULVERT SHOWN ON THIS PLAN SHEET WAS ADDED PER THE REQUEST OF CCDD No. 4 TO HELP WITH DRAINAGE OF THE SURROUNDING AREA (INCLUDING COLONIA ESQUINA SUBDIVISION) AND IS INCLUDED AS PART OF THIS PLAN SET ON THE MUTUAL CONCURRANCE THAT CCDD No. 4 IMPROVES THE EXISTING DOWNSTREAM DRAIN DITCH OUTFALL. A SUBSEQUENT DRAINAGE STUDY FOR THE ADDITION OF THIS CULVERT AND ITS HYDRAULIC IMPACTS WAS CONDUCTED BY OMEGA ENGINEERS, INC. AND FINALIZED ON MAY 2023.
- ☐ PER THE DRAINAGE STUDY, THE OUTFALL SHALL BE IMPROVED DOWNSTREAM A LONGITUDINAL DISTANCE OF NO LESS THAN 3,000 LINEAR FEET WITH THE FOLLOWING CROSS SECTIONAL GEOMETRIC SHAPE: 64 FEET TOP WIDTH, 36 FEET BOTTOM WIDTH, A MINIMUM DEPTH OF 7 FEET, AND 2:1 SIDE SLOPES. DRAIN DITCH IMPROVEMENTS SHALL BE COMPLETED BY THE CCDD No. 4

DRAINAGE STATEMENT (CONT'D):

- ☐ PER THE DRAINAGE STUDY, THE PROPOSED BOX CULVERT SHOWN ON THIS SHEET WILL NOT REDUCE FUTURE FLOODING AT SAID SUBDIVISION, AND A SEPARATE DRAINAGE SYSTEM WITH SUFFICIENT CONVEYANCE CAPACITY TO DRAIN SAID SUBDIVISION MUST BE INSTALLED FROM WITHIN SUBDIVISION TO AN IMPROVED AND EXPANDED DRAIN DITCH OUTFALL.
- ☐ THE CCDD No. 4 AND/OR CAMERON COUNTY SHALL BE RESPONSIBLE FOR FURNISHING AND INSTALLING SAID DRAINAGE SYSTEM SEPARATE FROM THIS HIGHWAY PROJECT.



DETAIL "A"
PROFILE VIEW N.T.S.

HYDRAULIC DATA				
	PEAK FLOW RATE (C.F.S.)		WATER SURF. ELEV. (FT.)	
	10 YR	100 YR	10 YR	100 YR
UPSTREAM	375	527	16.65	18.32
DOWNSTREAM	493	621	16.26	18.31
DATA PROVIDED BY OMEGA ENGINEERS, INC.				

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

CULVERT CROSSING LAYOUT STA 419+61

SCALE: HOR. 1"= 20'
VERT. 1"= 10'

SHEET 1 OF 13

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		160

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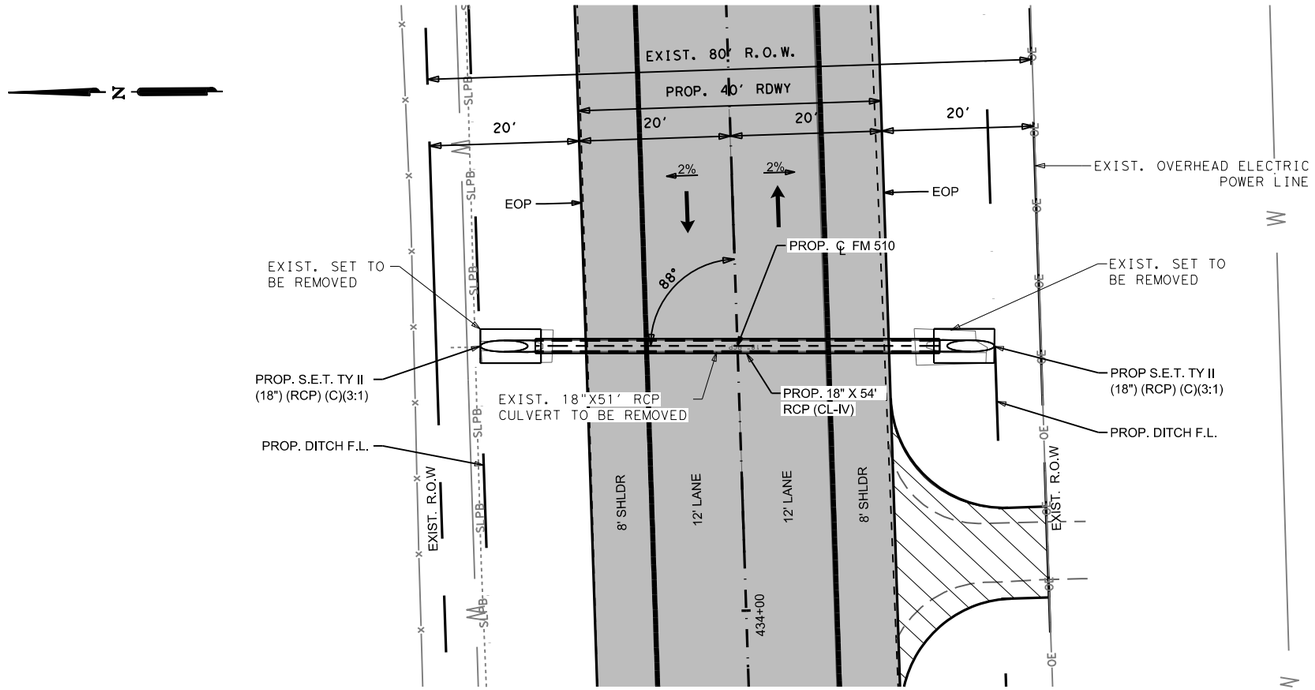

LEGEND

- OBJ. MARK. ASSM (OM-2Z) (WFLX) GND (BI)
- ** (NON-PAY ITEM) FOR CONTRACTOR'S INFORMATION ONLY
- ⊛ NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS

GENERAL NOTES

1. ALL UTILITIES ARE SHOWN FOR INFORMATION PURPOSES ONLY AND SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL HORIZONTAL AND VERTICAL INFORMATION.
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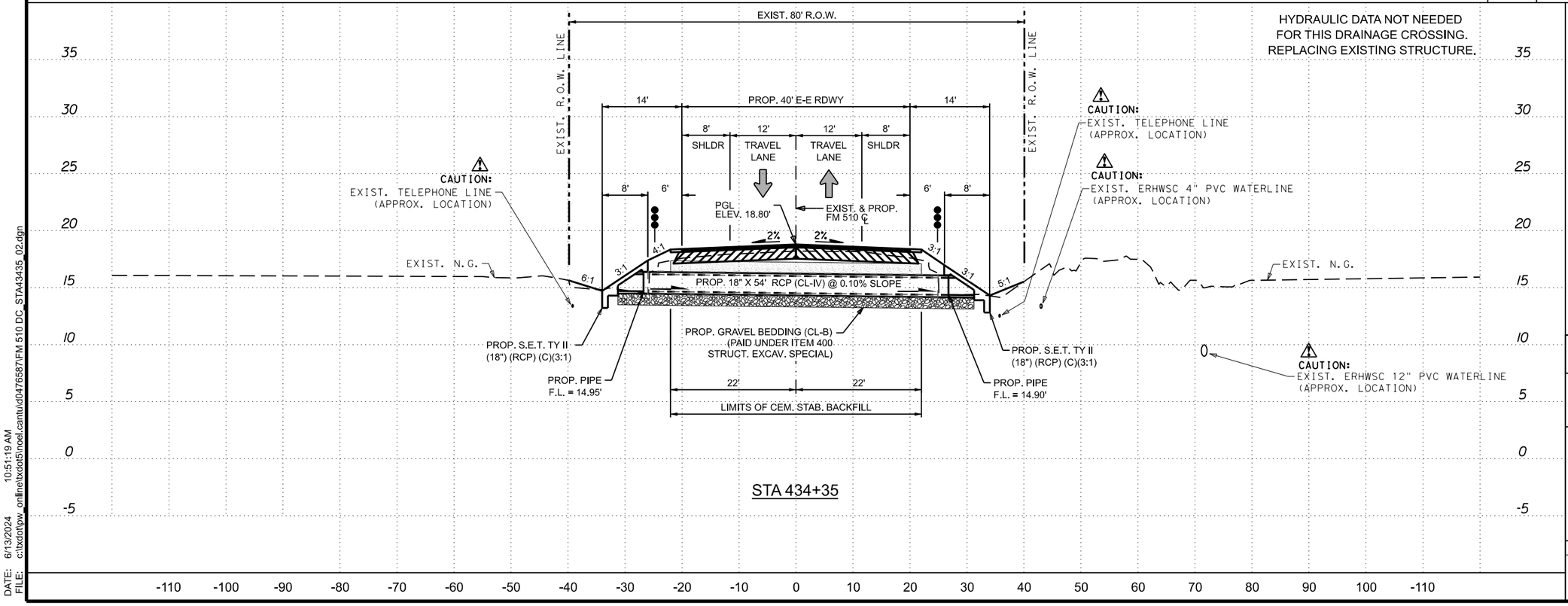
	ITEM	DESCRIPTION	UNIT	QTY.
**	400 7001	STRUCT EXCAVATION	CY	26
	400 7010	CEM STABIL BKFL	CY	14
	400 7005	STRUCT EXCAV (SPECIAL)	CY	10
	464 7019	RC PIPE (CL IV) (18 IN)	LF	54
	467 7305	SET (TY II) (18 IN) (RCP) (3:1) (C)	EA	2
	496 7004	REMOV STR (SET)	EA	2
	496 7007	REMOV STR (PIPE)	LF	51
	658 7059	INSTL OM ASSM (OM-2Z) (WFLX) GND (BI)	EA	2



STA 434+35

HYDRAULIC DATA NOT NEEDED
FOR THIS DRAINAGE CROSSING.
REPLACING EXISTING STRUCTURE.

STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

CULVERT CROSSING LAYOUT STA 434+35

SCALE: HOR. 1"= 20'
VERT. 1"= 10'

SHEET 2 OF 13

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		161

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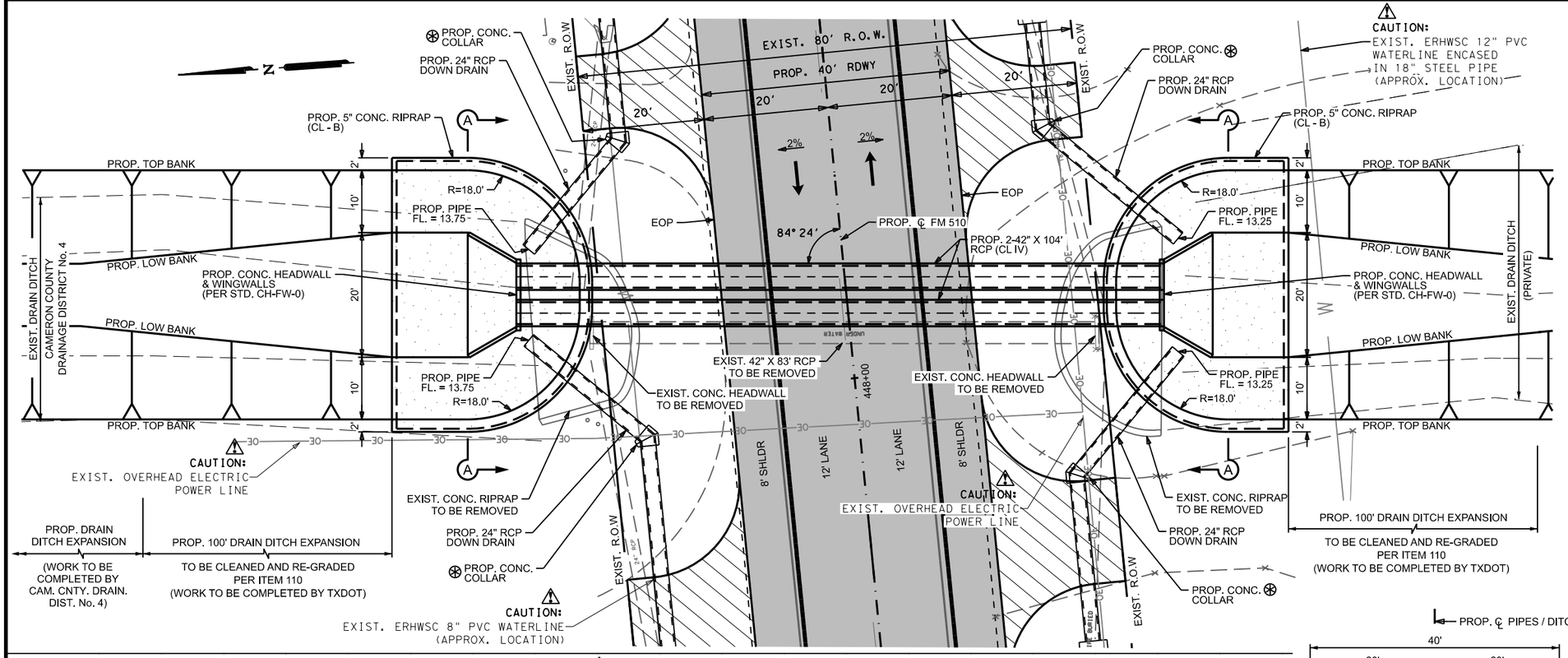

LEGEND

●	OBJ. MARK. ASSM (OM-2Z) (WFLX) GND (BI)
**	(NON-PAY ITEM) FOR CONTRACTOR'S INFORMATION ONLY
***	TO BE PAID UNDER ITEM 110
⊛	NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS

GENERAL NOTES

1. THE CONTRACTOR SHALL COORDINATE WITH CAMERON COUNTY DRAIANGE DISTRICT No. 4, TELEPHONE: (956) 838-0162 ADDRESS: 3510 OLD PORT ISABEL RD. BROWNSVILLE, TX. 78526, 72 HOURS PRIOR TO ANY WORK ON OR NEAR THE DRAINAGE STRUCTURES.
2. ALL UTILITIES ARE SHOWN FOR INFORMATION PURPOSES ONLY AND SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL HORIZONTAL AND VERTICAL INFORMATION.
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	ITEM	DESCRIPTION	UNIT	QTY.
	104 7006	REMOV CONC (RIPRAP)	SY	102
	110 7002	EXCAV (CHANNEL)	CY	890
	132 7003	EMBANK (FNL) (OC) (TY B)	CY	60
**	400 7001	STRUCT EXCAVATION	CY	284
	400 7010	CEM STABIL BKFL	CY	58
	400 7005	STRUCT EXCAV (SPECIAL)	CY	47
	402 7001	TRENCH EXCAVATION PROTECTION	LF	104
	432 7008	RIPRAP (CONC) (CL B) (5 IN)	CY	52
	464 7025	RC PIPE (CL IV) (42 IN)	LF	208
	466 7010	HEADWALL (CH-FW-0) (DIA=42 IN)	EA	2
	496 7006	REMOV STR (HEADWALL)	EA	2
	496 7007	REMOV STR (PIPE)	LF	83
	658 7078	REMOVE DELIN & OBJECT MARKER ASSMS	EA	2
	658 7059	INSTL OM ASSM (OM-2Z) (WFLX) GND (BI)	EA	2

DRAINAGE STATEMENT:

☐ A SINGLE 42-INCH RCP (THE EXISTING CONDITION) MEETS THE DRAINAGE REQUIREMENTS FOR THIS ROADWAY AND RAINFALL EVENT AS PER TXDOT'S HYDRAULIC MANUAL. THROUGH COORDINATION WITH CAMERON COUNTY DRAINAGE DISTRICT No. 4, THE COUNTY OF CAMERON REQUESTED THIS CROSSING BE UPSIZED TO DOUBLE THE FLOW CAPACITY - AN ADDITIONAL 42-INCH RCP.

☐ THE COUNTY OF CAMERON IN COORDINATION WITH THE CCDD No. 4 WILL EXCAVATE THE EXISTING DRAIN DITCH A DISTANCE UPSTREAM AND DOWNSTREAM TO SUPPORT DRAINAGE OF THE WATERSHED FOR A RAINFALL EVENT AND BE RESPONSIBLE FOR DOWNSTREAM FLOOD MITIGATION.

SECTION A - A
N.T.S.

INSET "A"
N.T.S.

INSET "B"
N.T.S.

DRAINAGE STATEMENT (CONT'D):

☐ THE DRAIN DITCH IMPROVEMENTS TO RECEIVE THE RUNOFF (SIZE AND LIMITS) WILL BE WITHIN THE DRAIN DITCH TOP BANK BOUNDARIES AS DETERMINED BY THE COUNTY OF CAMERON. THE ADDITIONAL 42-INCH RCP WILL BE CLOSED OFF ON BOTH ENDS AND THE COUNTY WILL REMOVE THE BLOCKED PIPE OPENINGS AFTER THE COMPLETED IMPROVEMENTS OF THE SUBJECT DRAIN DITCH.

JOSE A. RODRIGUEZ
117308

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
CULVERT CROSSING
LAYOUT
STA 448+08

SCALE: HOR. 1"= 20'
VERT. 1"= 10'
SHEET 3 OF 13

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		162

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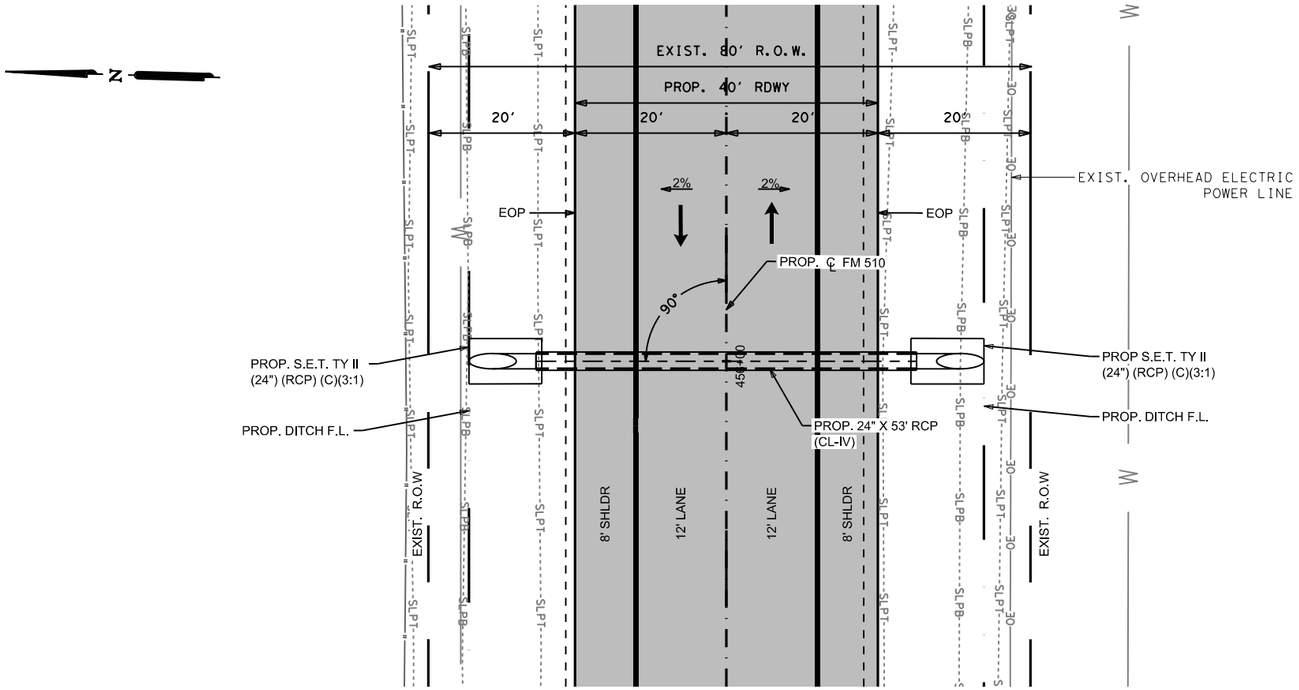

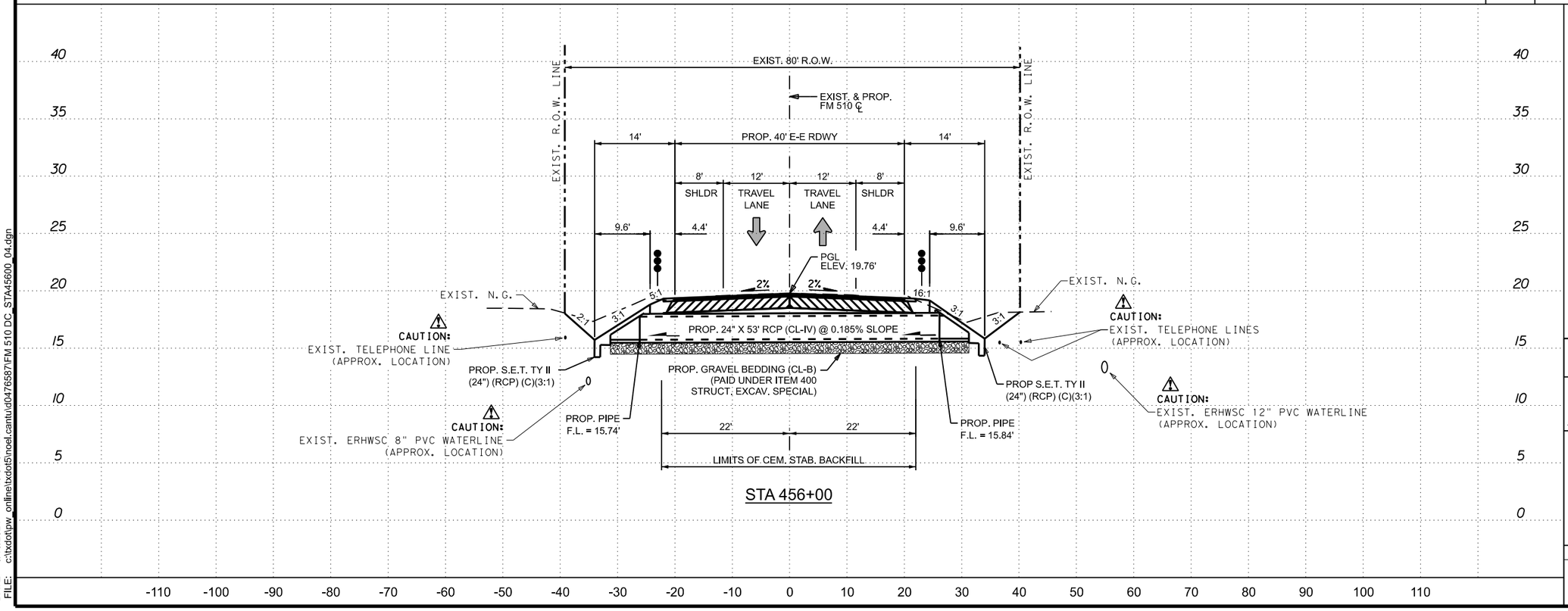

LEGEND

- OBJ. MARK. ASSM (OM-2Z) (WFLX) GND (BI)
- ** (NON-PAY ITEM) FOR CONTRACTOR'S INFORMATION ONLY
- ⊛ NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS

GENERAL NOTES

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ITEM	DESCRIPTION	UNIT	QTY.
400 7010	CEM STABIL BKFL	CY	18
400 7005	STRUCT EXCAV (SPECIAL)	CY	11
464 7021	RC PIPE (CL IV) (24 IN)	LF	53
467 7325	SET (TY II) (24 IN) (RCP) (3:1) (C)	EA	2
658 7059	INSTL OM ASSM (OM-2Z) (WFLX) GND (BI)	EA	2

JOSE A. RODRIGUEZ
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LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

CULVERT CROSSING LAYOUT STA 456+00

SCALE: HOR. 1"= 20'
VERT. 1"= 10'

SHEET 4 OF 13

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		163

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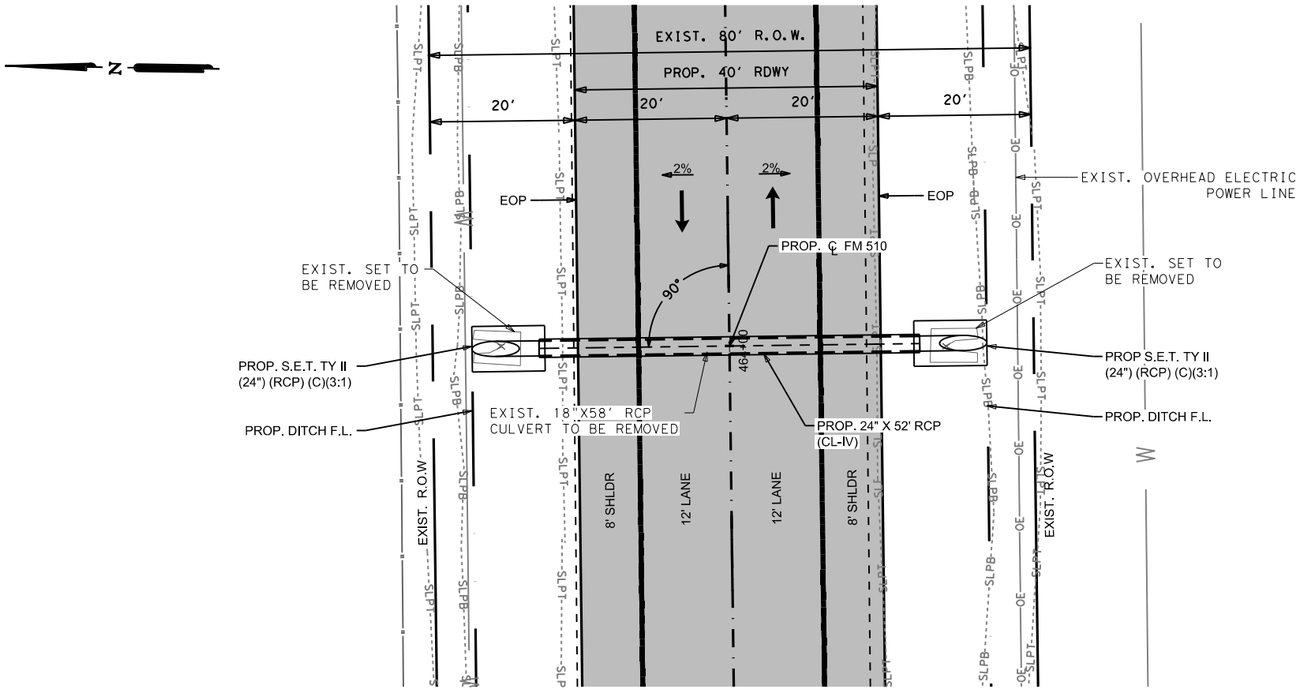

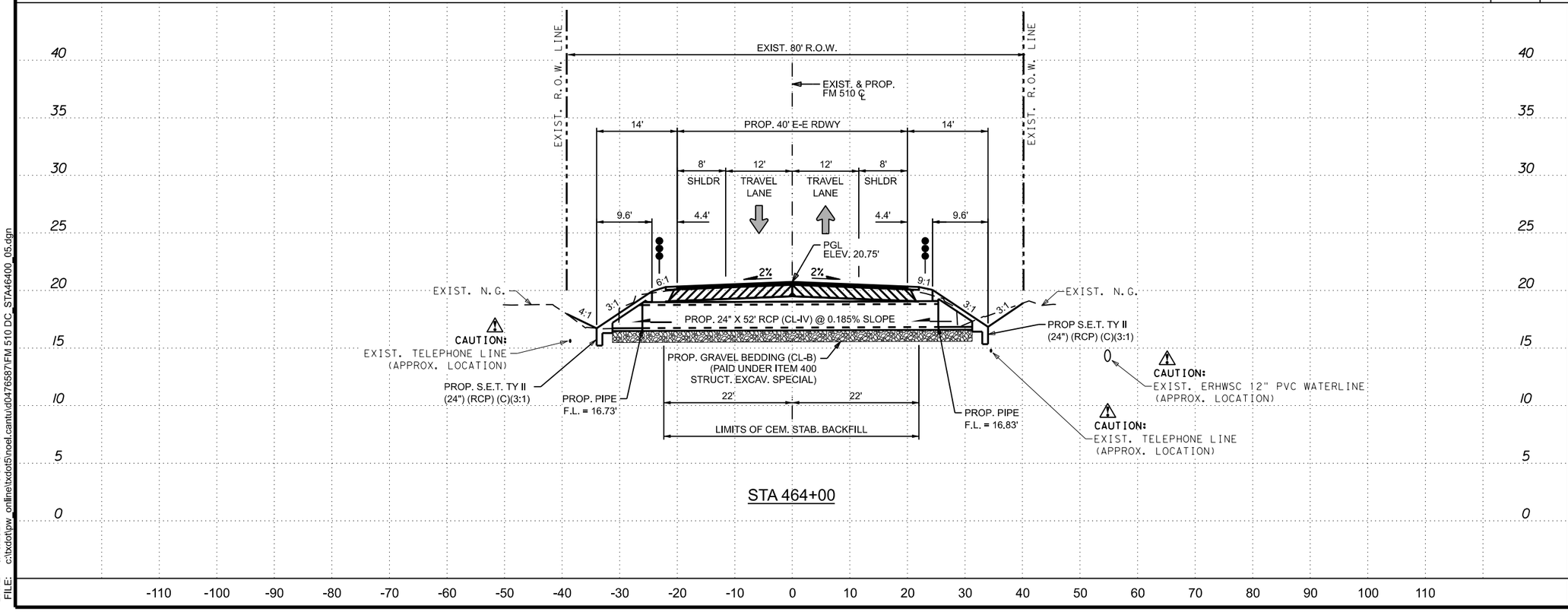

STA 464+00

LEGEND

- OBJ. MARK. ASSM (OM-2Z) (WFLX) GND (BI)
- ** (NON-PAY ITEM) FOR CONTRACTOR'S INFORMATION ONLY
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	ITEM	DESCRIPTION	UNIT	QTY.
**	400 7001	STRUCT EXCAVATION	CY	33
	400 7010	CEM STABIL BKFL	CY	18
	400 7005	STRUCT EXCAV (SPECIAL)	CY	11
	464 7021	RC PIPE (CL IV) (24 IN)	LF	52
	467 7325	SET (TY II) (24 IN) (RCP) (3:1) (C)	EA	2
	496 7004	REMOV STR (SET)	EA	2
	496 7007	REMOV STR (PIPE)	LF	58
	658 7078	REMOVE DELIN & OBJECT MARKER ASSMS	EA	2
	658 7059	INSTL OM ASSM (OM-2Z) (WFLX) GND (BI)	EA	2

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

CULVERT CROSSING LAYOUT STA 464+00

SCALE: HOR. 1"= 20'
VERT. 1"= 10'

SHEET 5 OF 13

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		164

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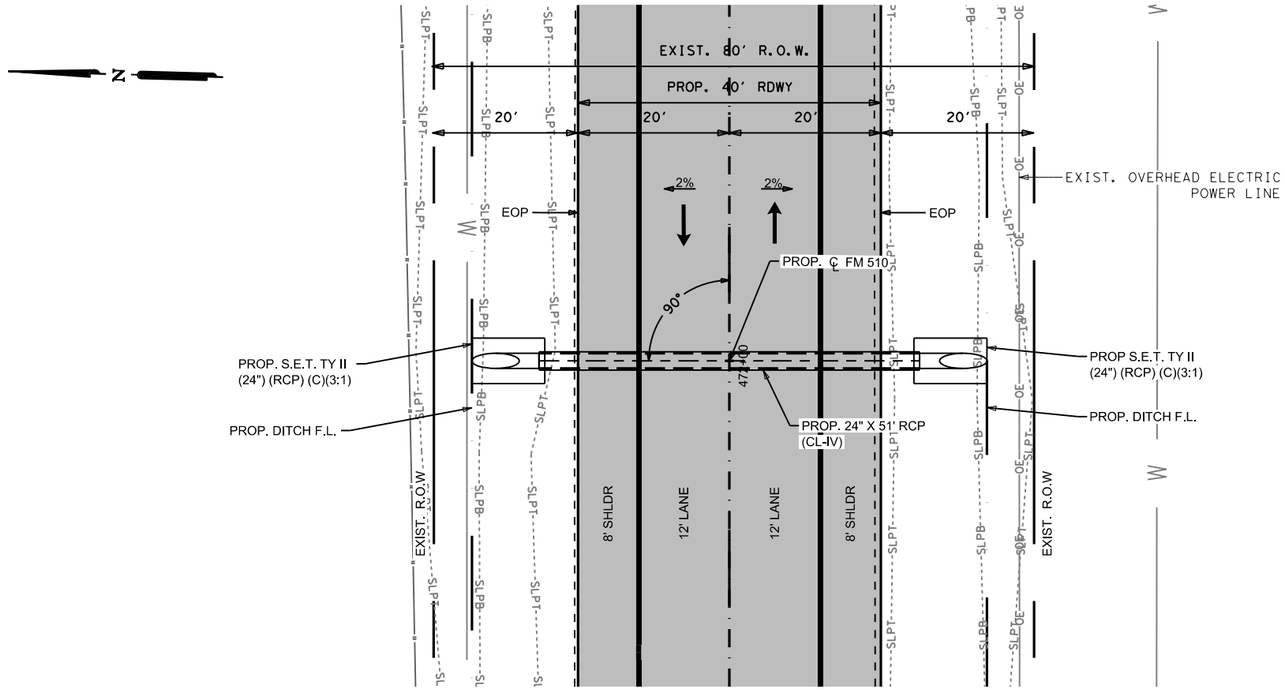

LEGEND

- OBJ. MARK. ASSM (OM-2Z) (WFLX) GND (BI)
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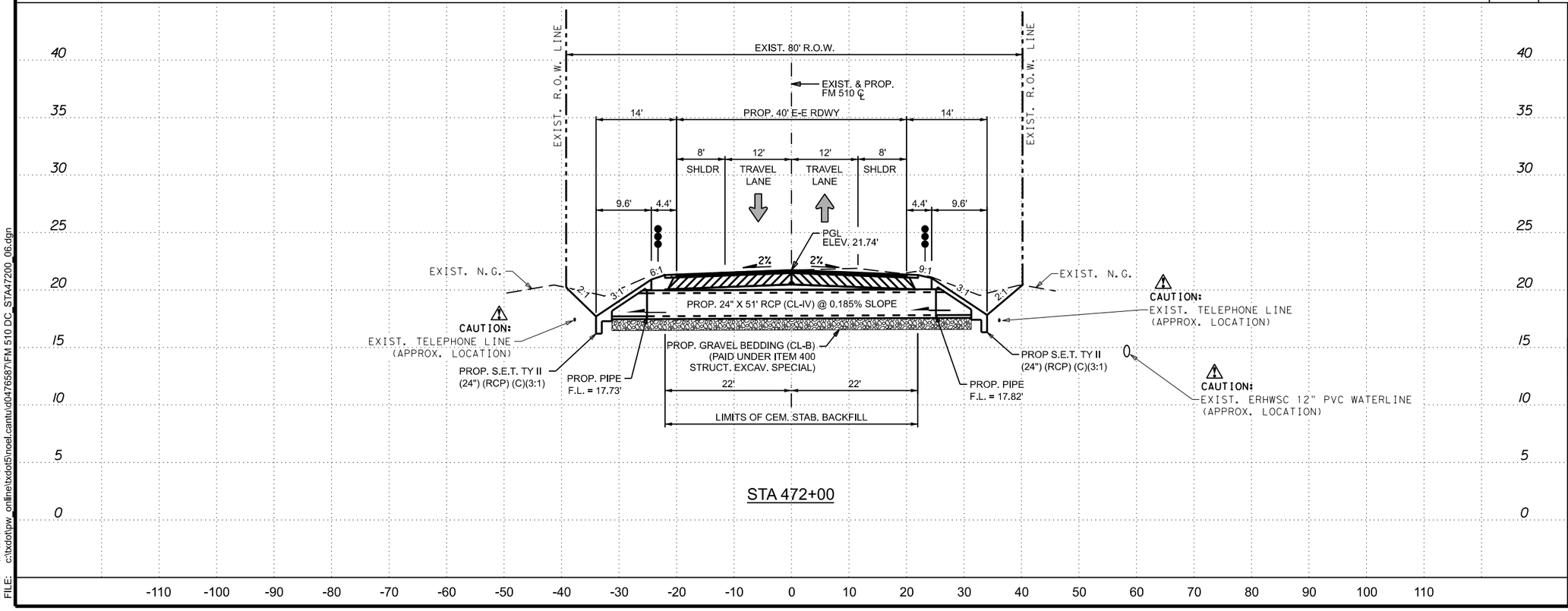
ITEM	DESCRIPTION	UNIT	QTY.
400 7010	CEM STABIL BKFL	CY	18
400 7005	STRUCT EXCAV (SPECIAL)	CY	11
464 7021	RC PIPE (CL IV) (24 IN)	LF	51
467 7325	SET (TY II) (24 IN) (RCP) (3:1) (C)	EA	2
658 7059	INSTL OM ASSM (OM-2Z) (WFLX) GND (BI)	EA	2



STA 472+00

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JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
06/13/24

Pharr District Central Design

Texas Department of Transportation

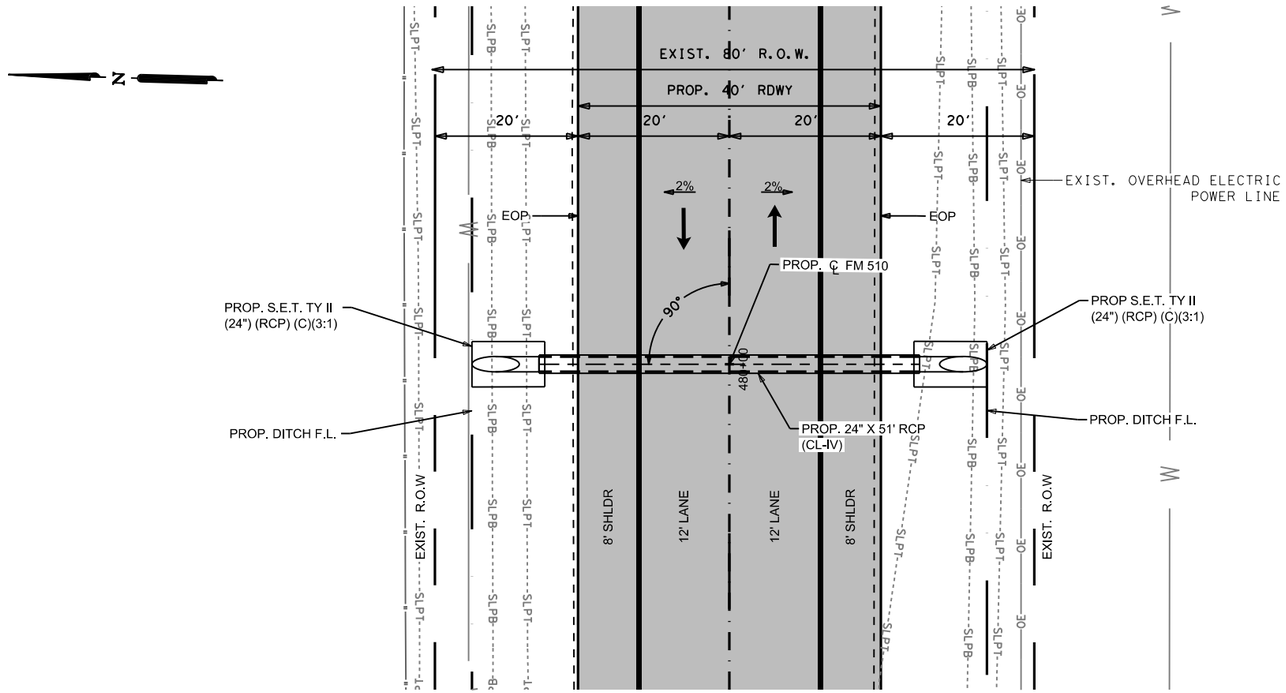
FM 510

CULVERT CROSSING LAYOUT STA 472+00

SCALE: HOR. 1"= 20'
VERT. 1"= 10'

SHEET 6 OF 13

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		165



LEGEND	
	OBJ. MARK. ASSM (OM-2Z) (WFLX) GND (BI)
**	(NON-PAY ITEM) FOR CONTRACTOR'S INFORMATION ONLY
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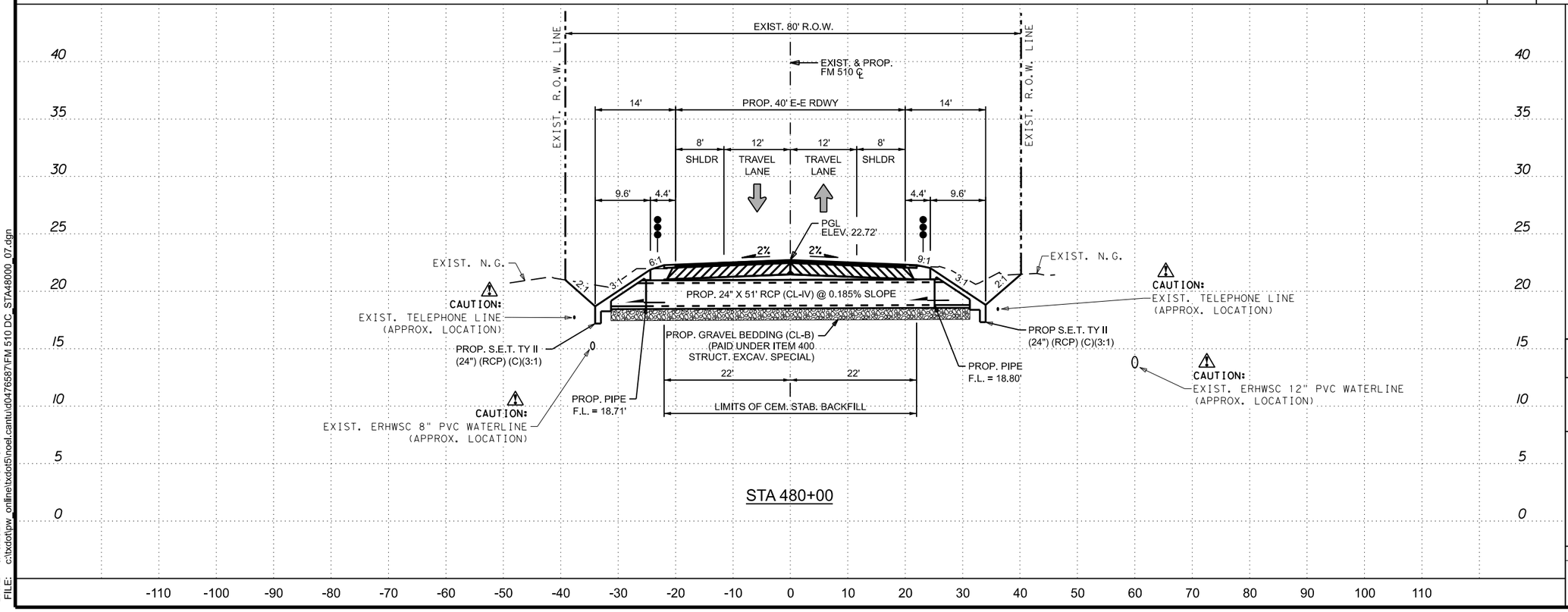
ITEM	DESCRIPTION	UNIT	QTY.
400 7010	CEM STABIL BKFL	CY	18
400 7005	STRUCT EXCAV (SPECIAL)	CY	11
464 7021	RC PIPE (CL IV) (24 IN)	LF	51
467 7325	SET (TY II) (24 IN) (RCP) (3:1) (C)	EA	2
658 7059	INSTL OM ASSM (OM-2Z) (WFLX) GND (BI)	EA	2



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STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

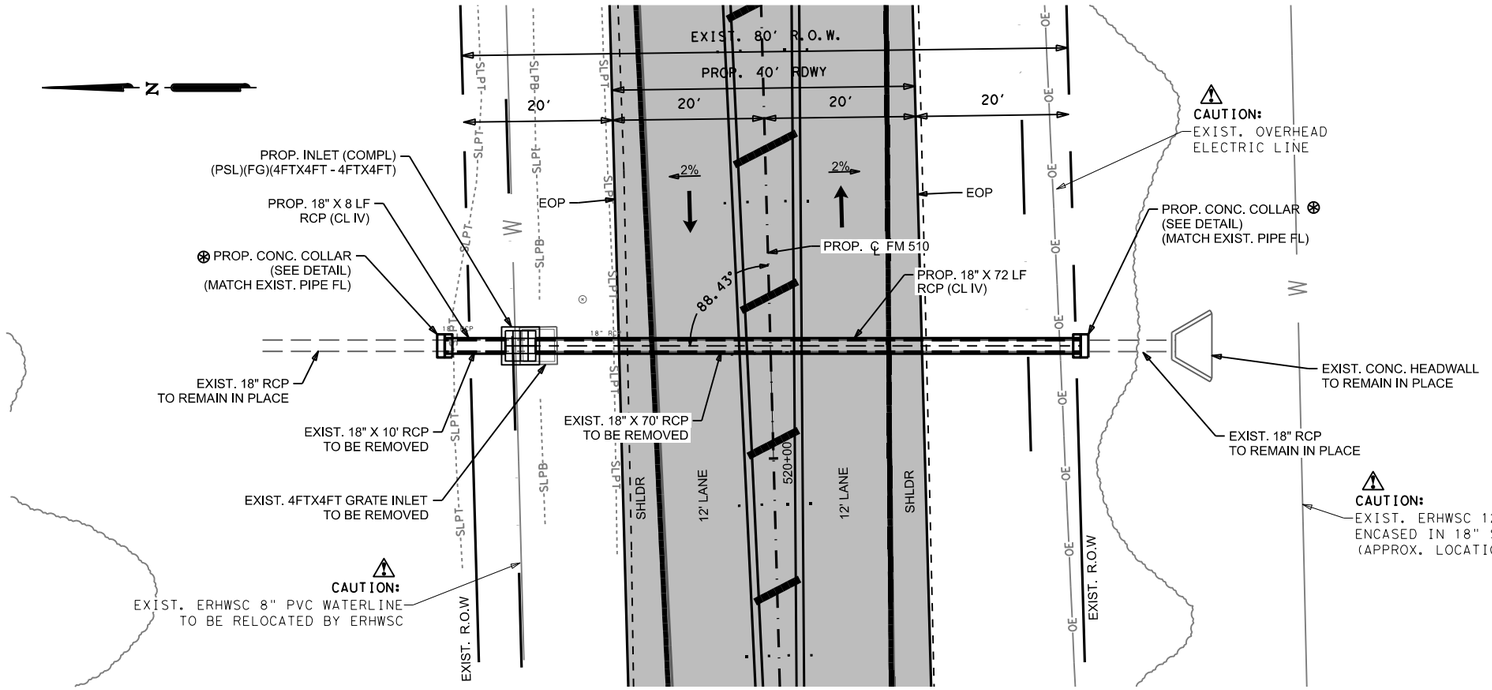
FM 510

CULVERT CROSSING LAYOUT STA 480+00

SCALE: HOR. 1"= 20'
VERT. 1"= 10'

SHEET 7 OF 13

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		166



LEGEND

- OBJ. MARK. ASSM (OM-2Z) (WFLX) GND (BI)
- ** (NON-PAY ITEM) FOR CONTRACTOR'S INFORMATION ONLY
- ⊛ NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS

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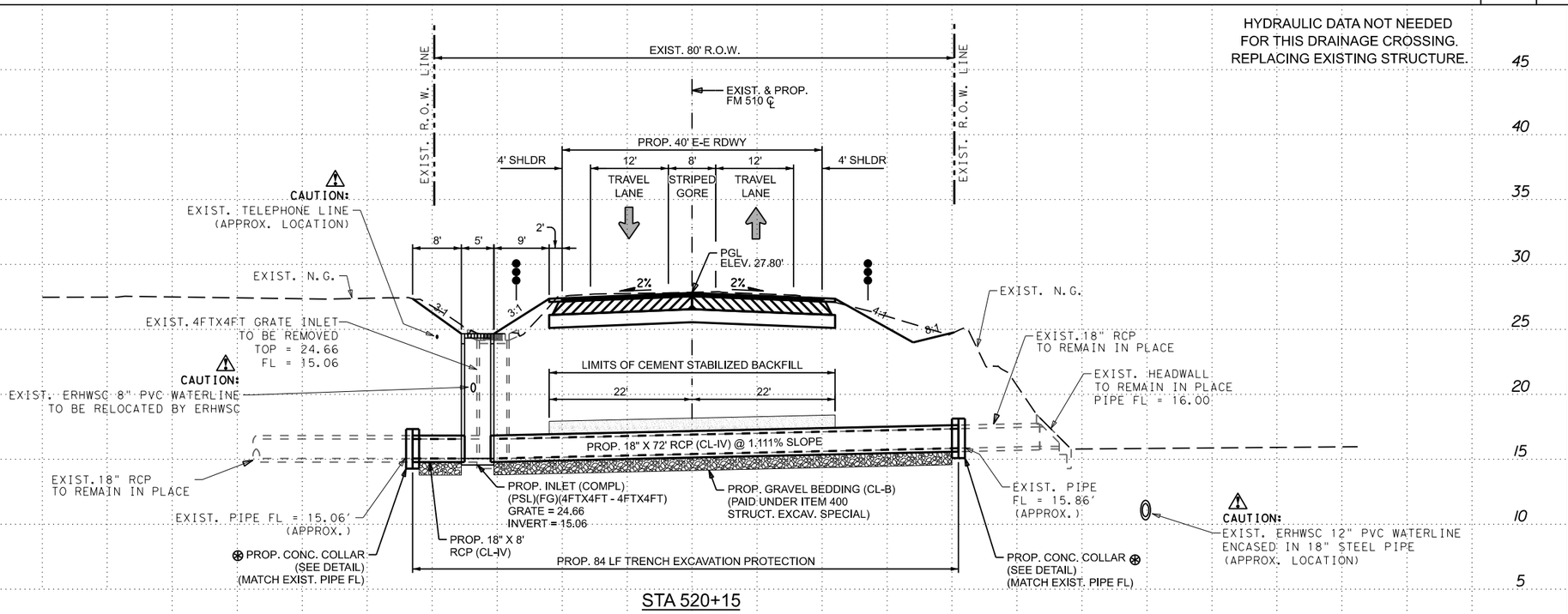
	ITEM	DESCRIPTION	UNIT	QTY.
**	400 7001	STRUCT EXCAVATION	CY	130
	400 7010	CEM STABIL BKFL	CY	14
	400 7005	STRUCT EXCAV (SPECIAL)	CY	12
	402 7001	TRENCH EXCAVATION PROTECTION	LF	84
	464 7019	RC PIPE (CL IV) (18 IN)	LF	80
	465 7128	INLET (COMPL)(PSL)(FG)(4FTX4FT-4FTX4FT	EA	1
	496 7002	REMOV STR (INLET)	EA	1
	496 7007	REMOV STR (PIPE)	LF	80
	658 7078	REMOVE DELIN & OBJECT MARKER ASSMS	EA	2
	658 7059	INSTL OM ASSM (OM-2Z) (WFLX) GND (BI)	EA	2



STA 520+15

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

CULVERT CROSSING LAYOUT STA 520+15

SCALE: HOR. 1"= 20'
VERT. 1"= 10'

SHEET 8 OF 13

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		167

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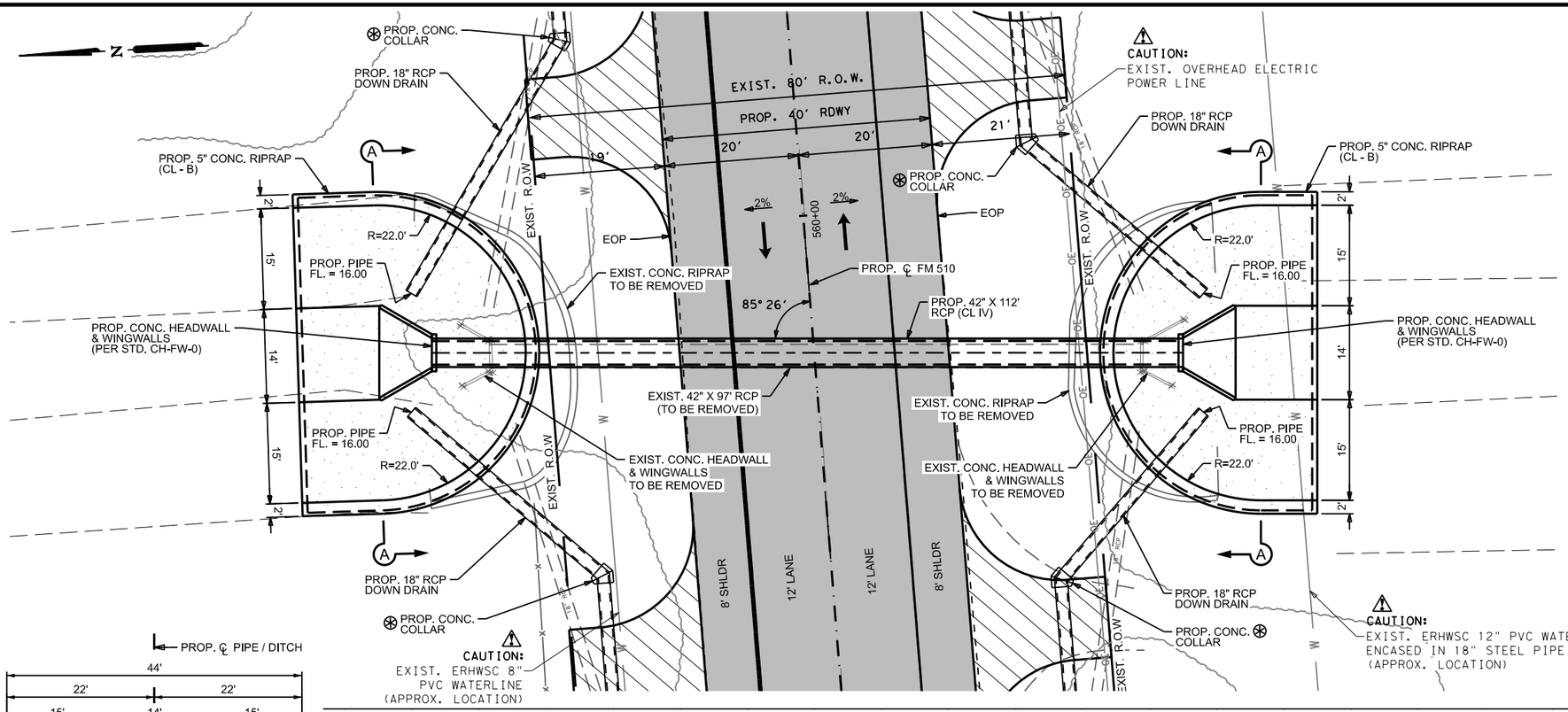
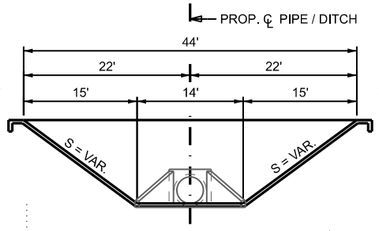
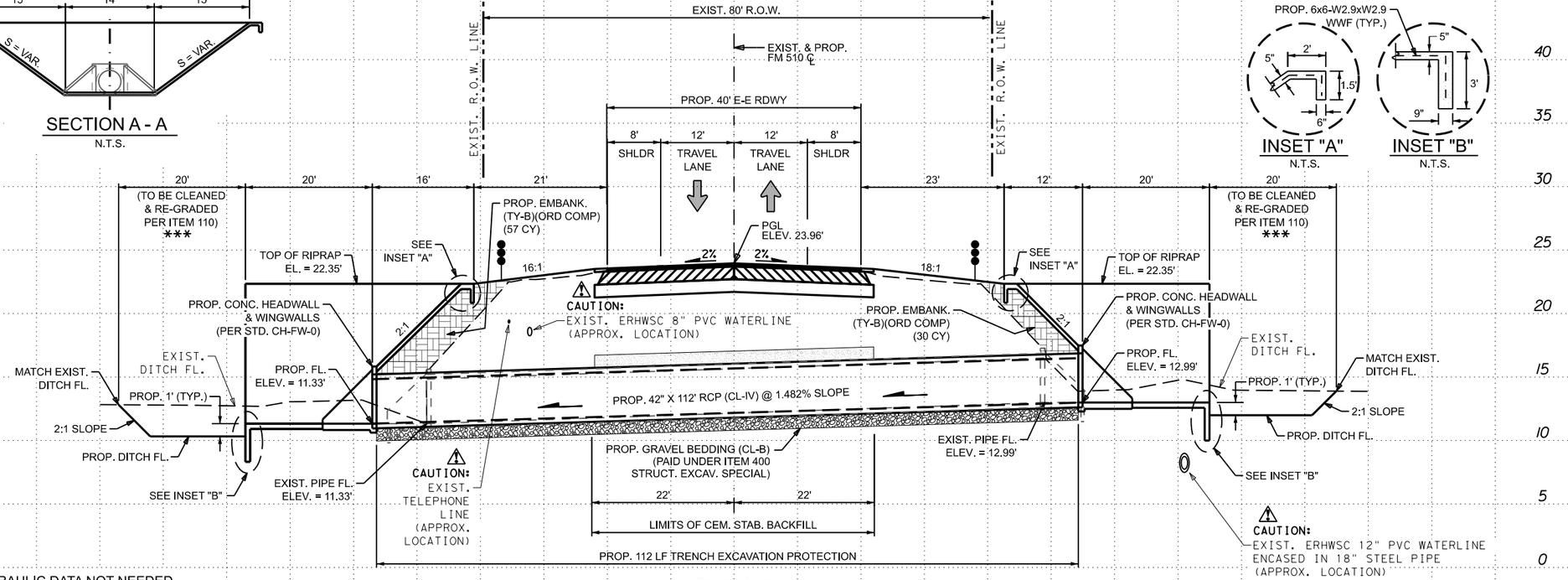




SECTION A - A
N.T.S.



STA 559+79

INSET "A"
N.T.S.

INSET "B"
N.T.S.

HYDRAULIC DATA NOT NEEDED FOR THIS DRAINAGE CROSSING. REPLACING EXISTING STRUCTURE.

LEGEND	
	OBJ. MARK. ASSM (OM-2Z) (WFLX) GND (BI)
**	(NON-PAY ITEM) FOR CONTRACTOR'S INFORMATION ONLY
***	TO BE PAID UNDER ITEM 110
⊛	NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS

GENERAL NOTES

1. THE CONTRACTOR SHALL COORDINATE WITH CAMERON COUNTY DRAIANGE DISTRICT No, 4, TELEPHONE: (956) 838-0162 ADDRESS: 3510 OLD PORT ISABEL RD, BROWNSVILLE, TX, 78526, 72 HOURS PRIOR TO ANY WORK ON OR NEAR THE DRAINAGE STRUCTURES.
2. ALL UTILITIES ARE SHOWN FOR INFORMATION PURPOSES ONLY AND SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL HORIZONTAL AND VERTICAL INFORMATION.
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	ITEM	DESCRIPTION	UNIT	QTY.
	104 7006	REMOV CONC (RIPRAP)	SY	187
	110 7002	EXCAV (CHANNEL)	CY	70
	132 7003	EMBANK (FNL) (OC) (TY B)	CY	87
**	400 7001	STRUCT EXCAVATION	CY	194
	400 7010	CEM STABIL BKFL	CY	31
	400 7005	STRUCT EXCAV (SPECIAL)	CY	26
	402 7001	TRENCH EXCAVATION PROTECTION	LF	112
	432 7008	RIPRAP (CONC)(CL B)(5 IN)	CY	60
	464 7025	RC PIPE (CL IV) (42 IN)	LF	112
	466 7010	HEADWALL (CH - FW - 0) (DIA = 42 IN)	EA	2
	496 7005	REMOV STR (WINGWALL)	EA	4
	496 7006	REMOV STR (HEADWALL)	EA	2
	496 7007	REMOV STR (PIPE)	LF	97
	658 7078	REMOVE DELIN & OBJECT MARKER ASSMS	EA	2
	658 7059	ISNTL OM ASSM (OM-2Z) (WFLX) GND (BI)	EA	2

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
CULVERT CROSSING LAYOUT STA 559+79

SCALE: HOR. 1"= 20'
VERT. 1"= 10'

SHEET 9 OF 13

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		168

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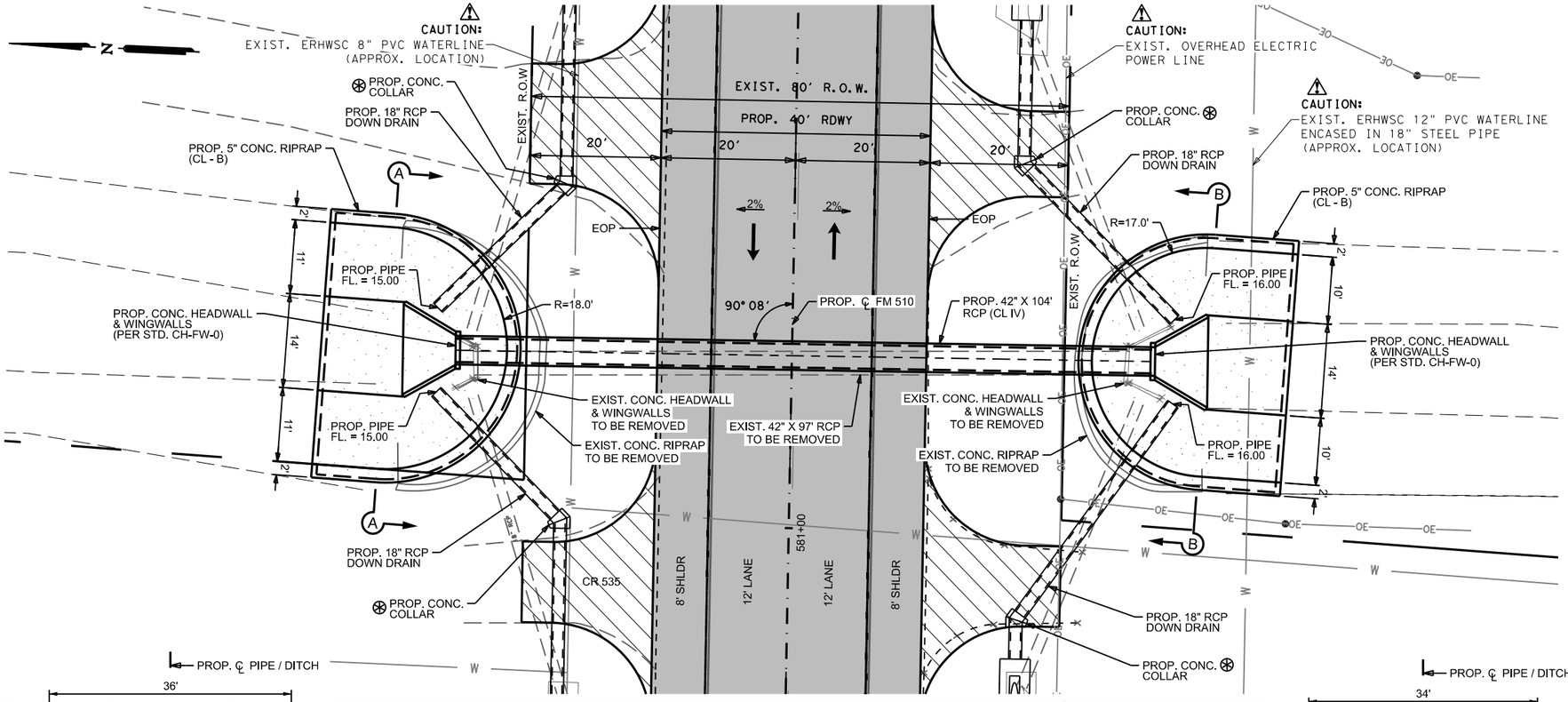

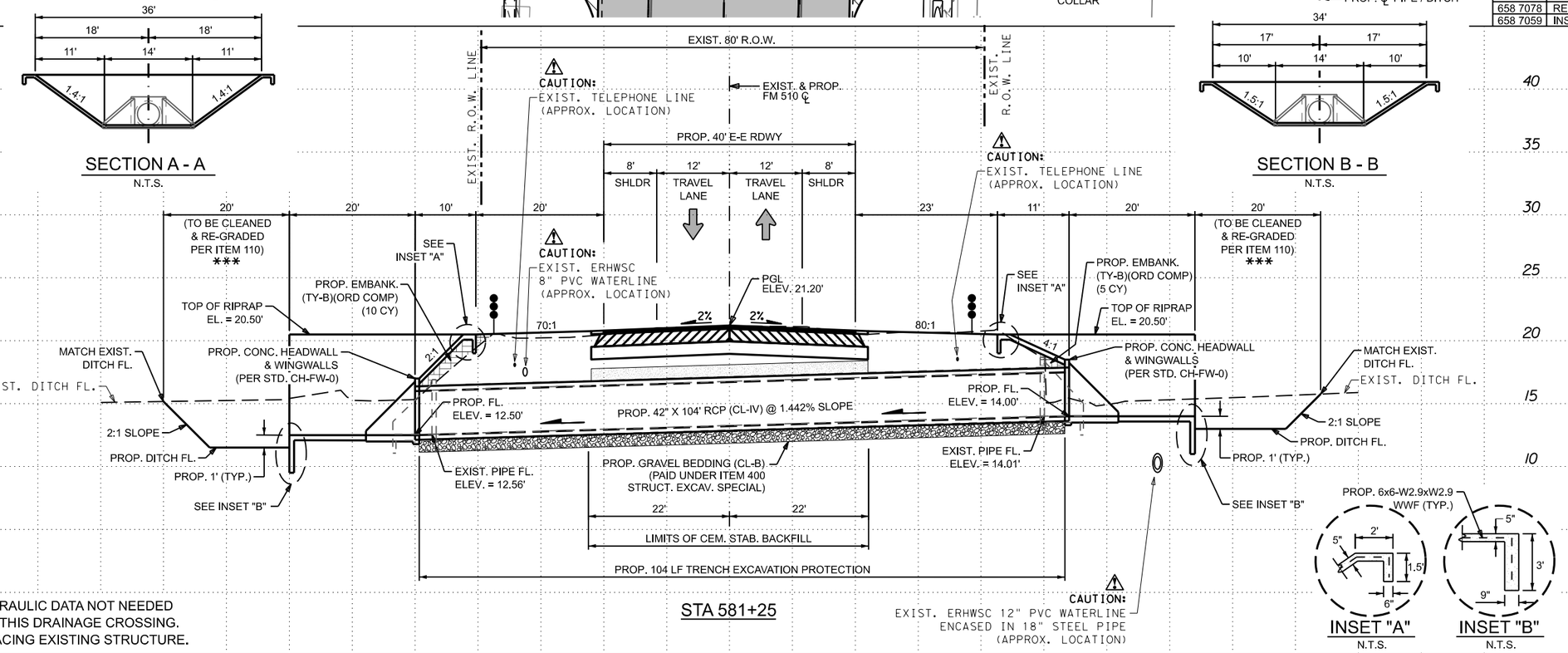

LEGEND	
	OBJ. MARK. ASSM (OM-2Z) (WFLX) GND (BI)
**	(NON-PAY ITEM) FOR CONTRACTOR'S INFORMATION ONLY
***	TO BE PAID UNDER ITEM 110
⊛	NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS

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	ITEM	DESCRIPTION	UNIT	QTY.
	104 7006	REMOV CONC (RIPRAP)	SY	145
	110 7002	EXCAV (CHANNEL)	CY	85
	132 7003	EMBANK (FNL)(OC)(TY B)	CY	15
**	400 7001	STRUCT EXCAVATION	CY	109
	400 7010	CEM STABIL BKFL	CY	31
	400 7005	STRUCT EXCAV (SPECIAL)	CY	25
	402 7001	TRENCH EXCAVATION PROTECTION	LF	104
	432 7008	RIPRAP (CONC)(CL B) (5 IN)	CY	45
	464 7025	RC PIPE (CL IV) (42 IN)	LF	104
	466 7010	HEADWALL (CH - FW - 0) (DIA = 42 IN)	EA	2
	496 7005	REMOV STR (WINGWALL)	EA	4
	496 7006	REMOV STR (HEADWALL)	EA	2
	496 7007	REMOV STR (PIPE)	LF	97
	658 7078	REMOVE DELIN & OBJECT MARKER ASSMS	EA	2
	658 7059	INSTL OM ASSM (OM-2Z) (WFLX) GND (BI)	EA	2

JOSE A. RODRIGUEZ
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STATE OF TEXAS

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
CULVERT CROSSING LAYOUT
STA 581+25

SCALE: HOR. 1"= 20'
VERT. 1"= 10'
SHEET 10 OF 13

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		169

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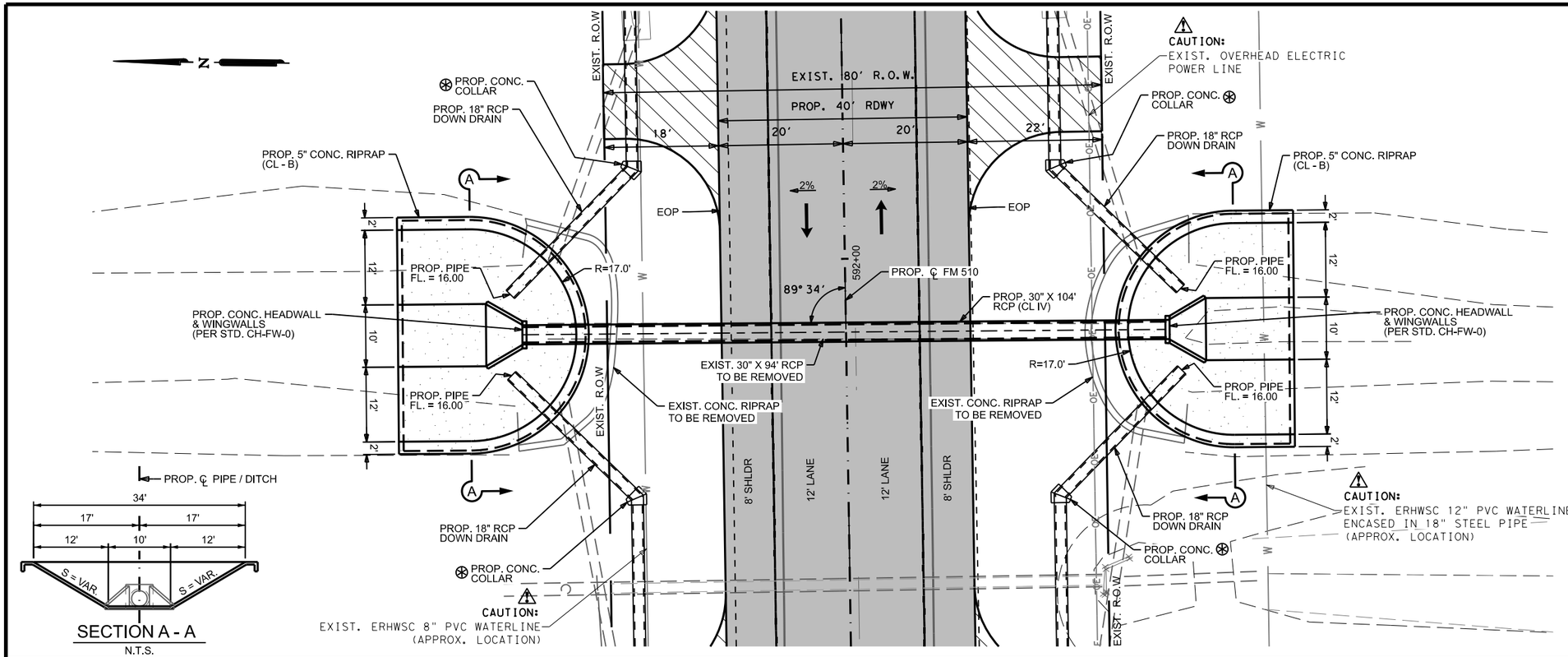

LEGEND	
	OBJ. MARK. ASSM (OM-2Z) (WFLX) GND (BI)
**	(NON-PAY ITEM) FOR CONTRACTOR'S INFORMATION ONLY
***	TO BE PAID UNDER ITEM 110
⊛	NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS

GENERAL NOTES

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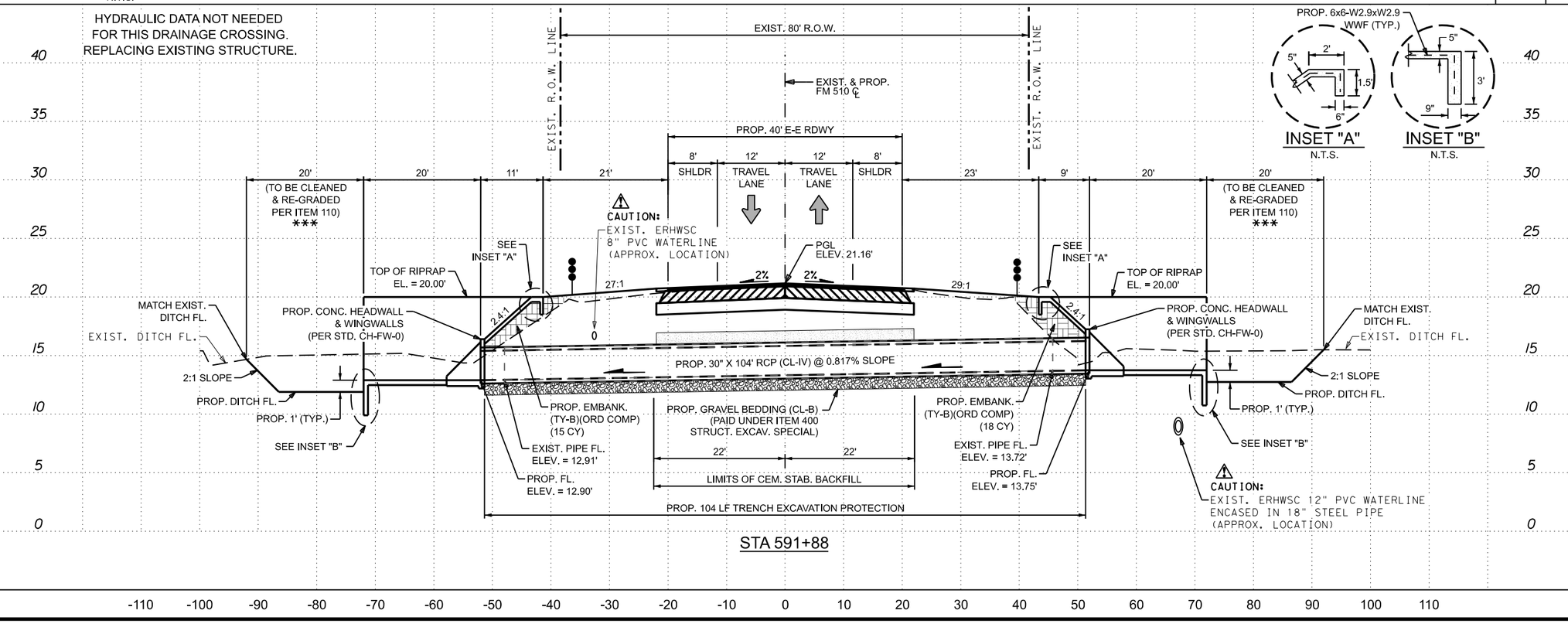
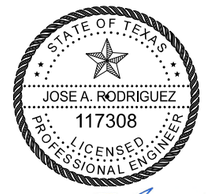
	ITEM	DESCRIPTION	UNIT	QTY.
	104 7006	REMOV CONC (RIPRAP)	SY	108
	110 7002	EXCAV (CHANNEL)	CY	75
	132 7003	EMBANK (FNL)(OC)(TY B)	CY	33
**	400 7001	STRUCT EXCAVATION	CY	97
	400 7010	CEM STABIL BKFL	CY	22
	400 7005	STRUCT EXCAV (SPECIAL)	CY	20
	402 7001	TRENCH EXCAVATION PROTECTION	LF	104
	432 7008	RIPRAP (CONC)(CL B)(5 IN)	CY	42
	464 7023	RC PIPE (CL IV) (30 IN)	LF	104
	466 7007	HEADWALL (CH - FW - 0) (DIA = 30 IN)	EA	2
	496 7007	REMOV STR (PIPE)	LF	94
	658 7078	REMOVE DELIN & OBJECT MARKER ASSMS	EA	2
	658 7059	INSTL OM ASSM (OM-2Z) (WFLX) GND (BI)	EA	2

HYDRAULIC DATA NOT NEEDED
FOR THIS DRAINAGE CROSSING.
REPLACING EXISTING STRUCTURE.





06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
CULVERT CROSSING LAYOUT
STA 591+88

SCALE: HOR. 1"= 20'
VERT. 1"= 10'

SHEET 11 OF 13

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		170

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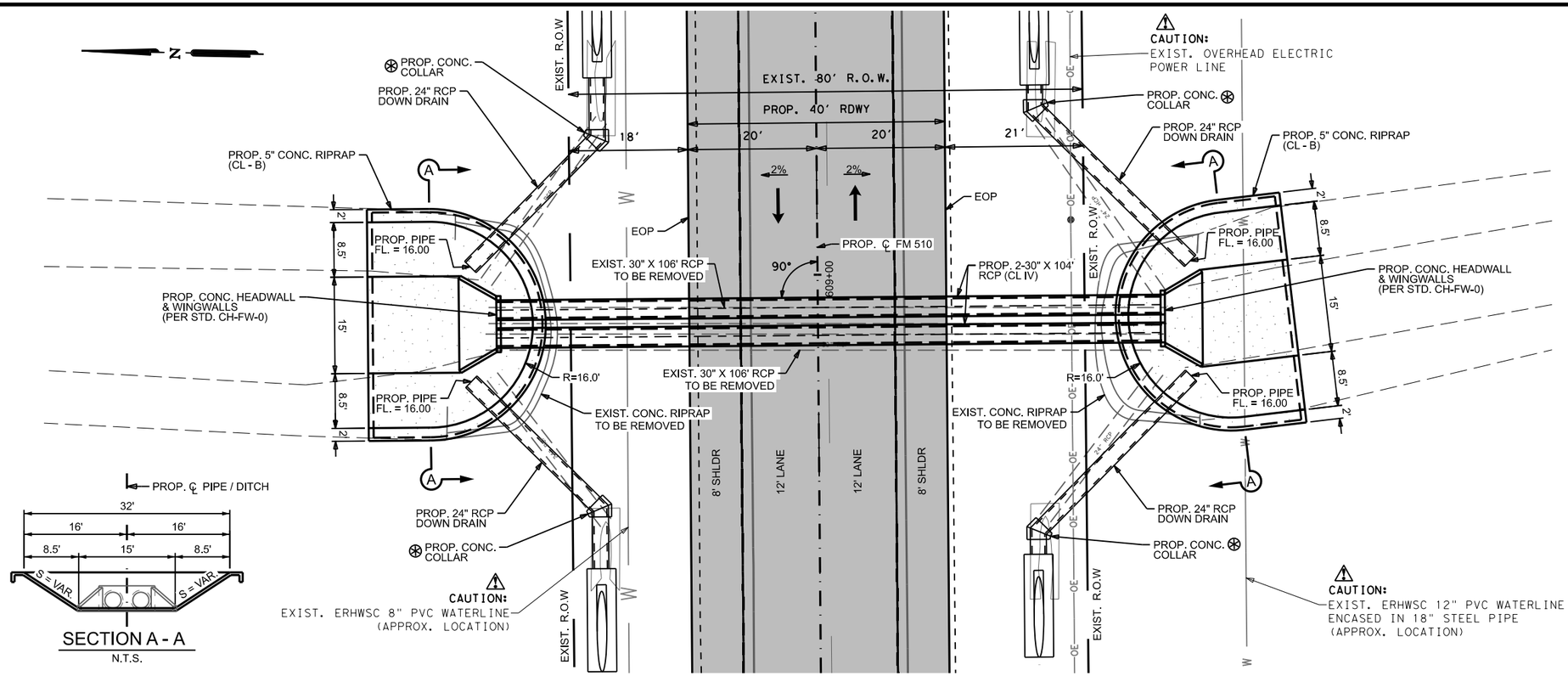

LEGEND

	OBJ. MARK. ASSM (OM-2Z) (WFLX) GND (BI)
**	(NON-PAY ITEM) FOR CONTRACTOR'S INFORMATION ONLY
***	TO BE PAID UNDER ITEM 110
⊛	NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS

GENERAL NOTES

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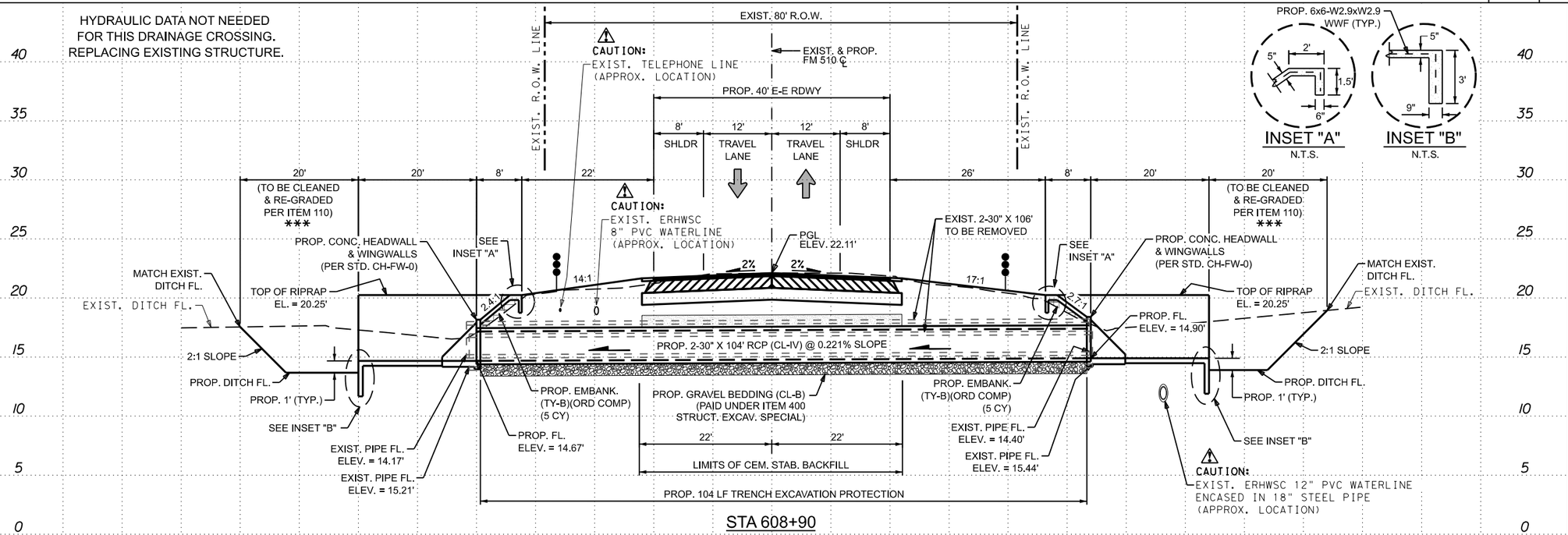
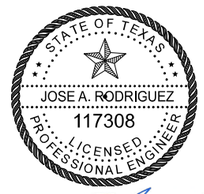
	ITEM	DESCRIPTION	UNIT	QTY.
	104 7006	REMOV CONC (RIPRAP)	SY	101
	110 7002	EXCAV (CHANNEL)	CY	100
	132 7003	EMBANK (FNL)(OC)(TY B)	CY	10
**	400 7001	STRUCT EXCAVATION	CY	178
	400 7010	CEM STABIL BKFL	CY	39
	400 7005	STRUCT EXCAV (SPECIAL)	CY	37
	402 7001	TRENCH EXCAVATION PROTECTION	LF	104
	432 7008	RIPRAP (CONC)(CL B)(5 IN)	CY	38
	464 7023	RC PIPE (CL IV) (30 IN)	LF	208
	466 7007	HEADWALL (CH - FW - 0) (DIA = 30 IN)	EA	2
	496 7007	REMOV STR (PIPE)	LF	212
	658 7078	REMOVE DELIN & OBJECT MARKER ASSMS	EA	2
	658 7059	INSTL OM ASSM (OM-2Z) (WFLX) GND (BI)	EA	2

HYDRAULIC DATA NOT NEEDED FOR THIS DRAINAGE CROSSING. REPLACING EXISTING STRUCTURE.





06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
CULVERT CROSSING LAYOUT
STA 608+90

SCALE: HOR. 1"= 20'
VERT. 1"= 10'

SHEET 12 OF 13

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		171

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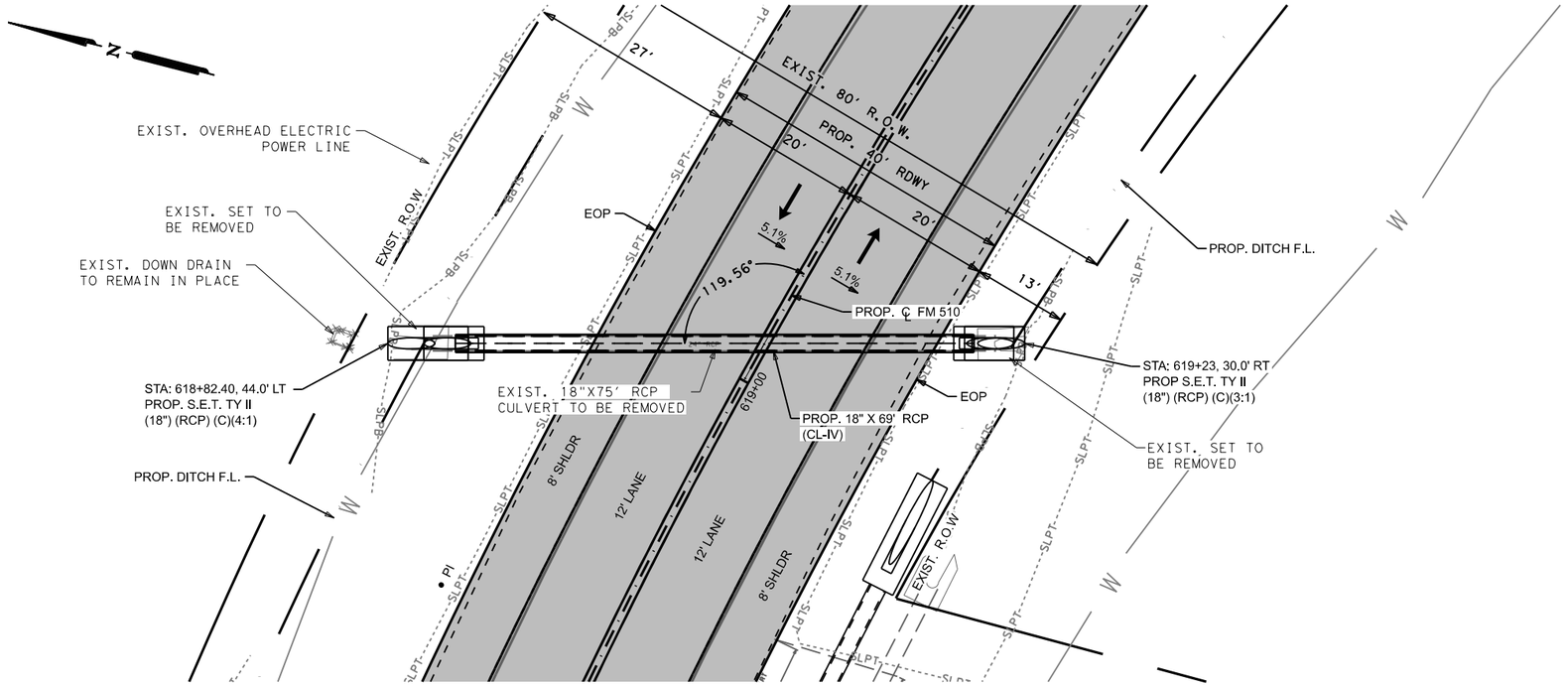

LEGEND

- OBJ. MARK. ASSM (OM-2Z) (WFLX) GND (BI)
- ** (NON-PAY ITEM) FOR CONTRACTOR'S INFORMATION ONLY
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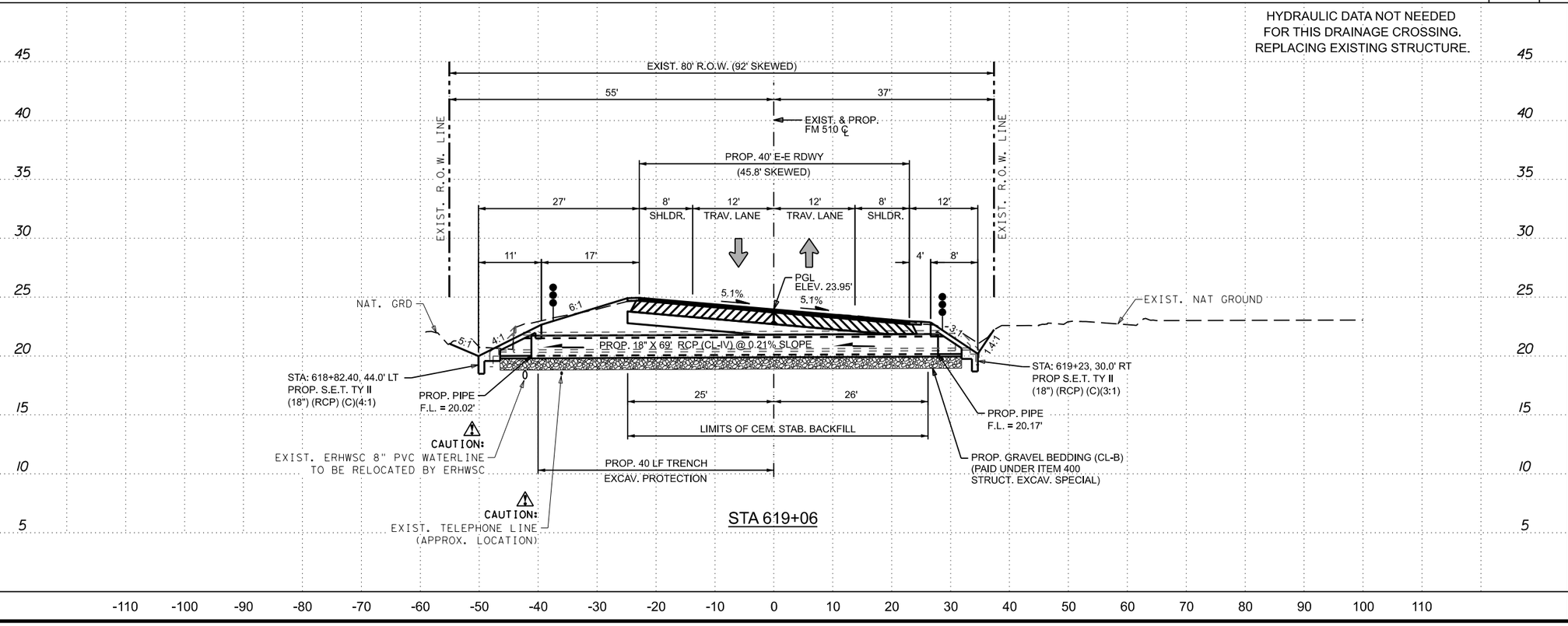
	ITEM	DESCRIPTION	UNIT	QTY.
**	400 7001	STRUCT EXCAVATION	CY	35
	400 7010	CEM STABIL BKFL	CY	17
	400 7005	STRUCT EXCAV (SPECIAL)	CY	12
	402 7001	TRENCH EXCAVATION PROTECTION	LF	40
	464 7019	RC PIPE (CL IV) (18 IN)	LF	69
	467 7305	SET (TY II) (18 IN) (RCP) (3:1) (C)	EA	1
	467 7306	SET (TY II) (18 IN) (RCP) (4:1) (C)	EA	1
	496 7004	REMOV STR (SET)	EA	2
	496 7007	REMOV STR (PIPE)	LF	75
	658 7059	INSTL OM ASSM (OM-2Z) (WFLX) GND (BI)	EA	2

HYDRAULIC DATA NOT NEEDED
FOR THIS DRAINAGE CROSSING.
REPLACING EXISTING STRUCTURE.



STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
CULVERT CROSSING LAYOUT
STA 619+06

SCALE: HOR. 1"= 20'
VERT. 1"= 10'

SHEET 13 OF 13

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		172

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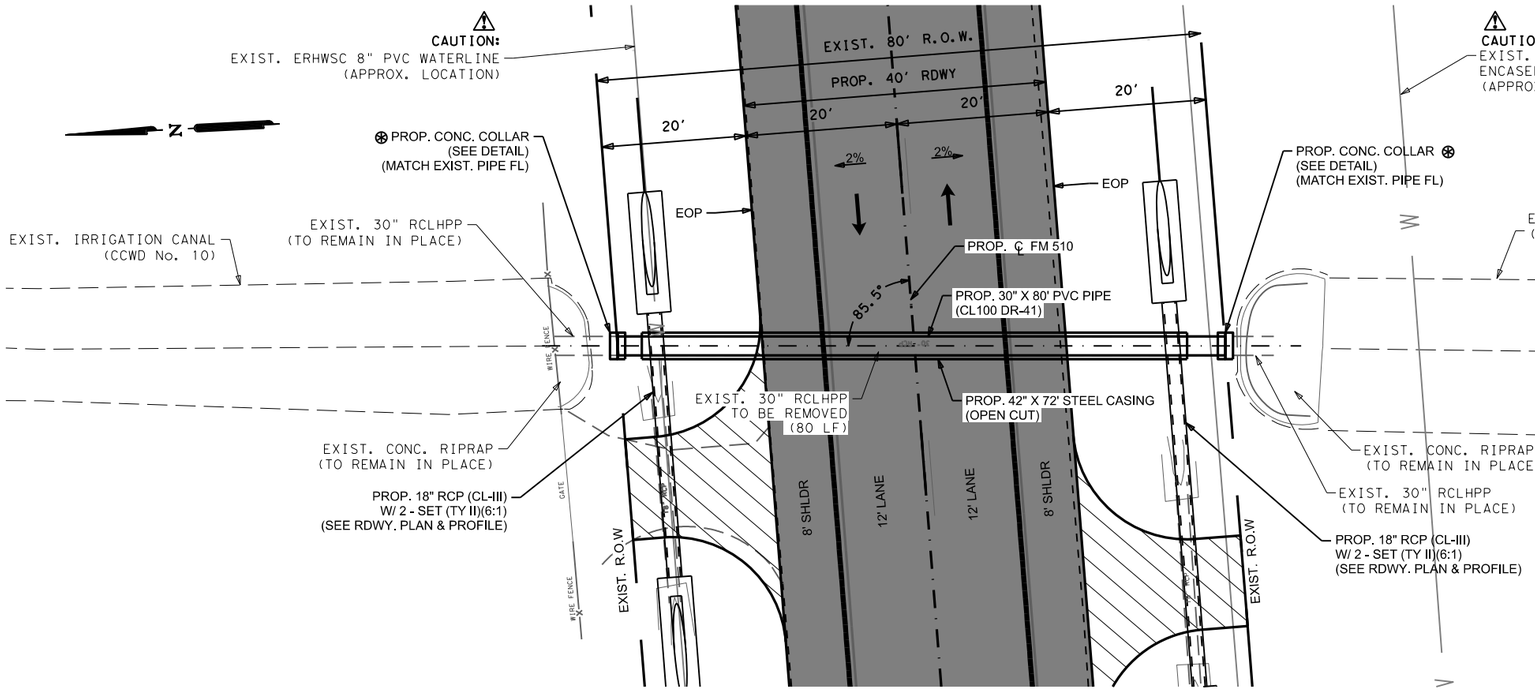

LEGEND

** (NON-PAY ITEM) FOR CONTRACTOR'S INFORMATION ONLY

⊛ NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS

GENERAL NOTES

1. THE CONTRACTOR SHALL COORDINATE WITH CAMERON COUNTY WATER IMPROVEMENT DISTRICT No. 10 A MINIMUM OF 72 HOURS PRIOR TO ANY WORK ON OR NEAR THE IRRIGATION STRUCTURES. ADDRESS: 30592 BRIZA DRIVE, LOS FRESNOS, TX. 78566 TELEPHONE: 956-233-5513
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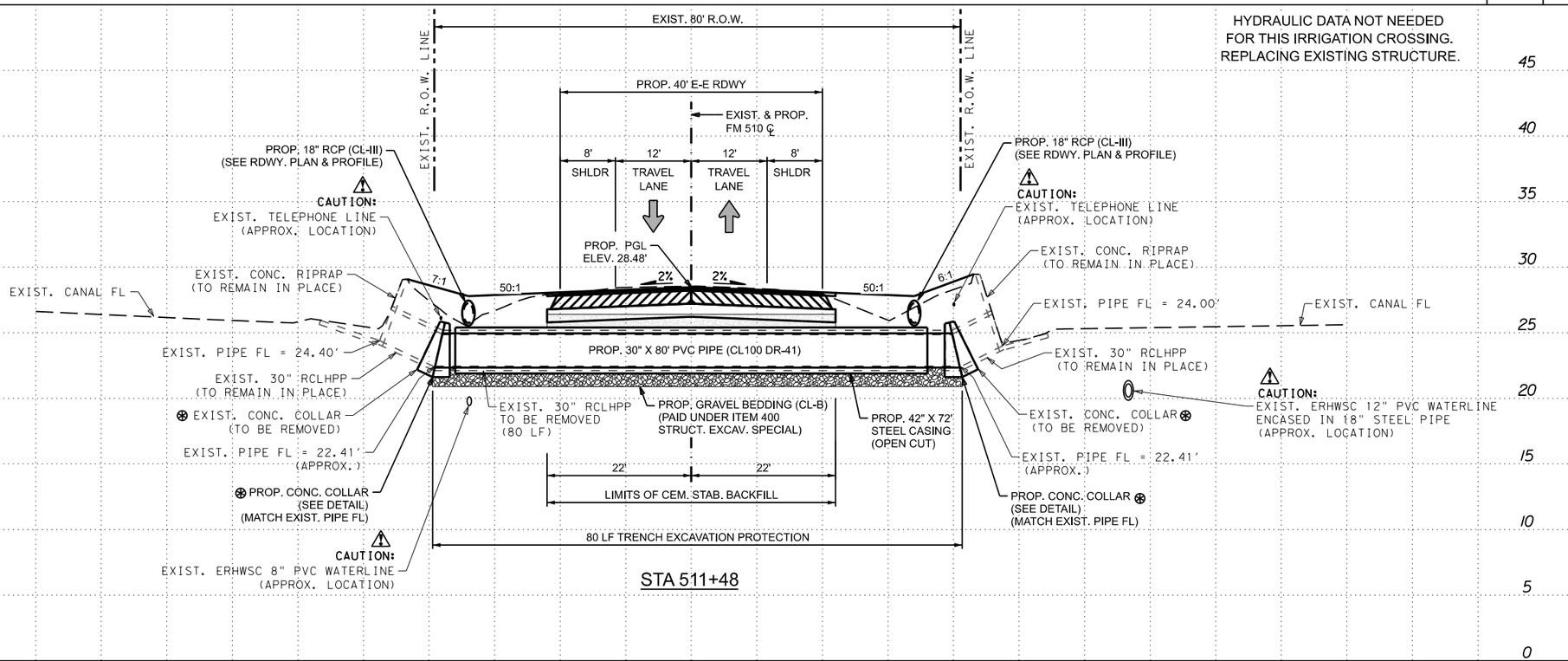
	ITEM	DESCRIPTION	UNIT	QTY.
**	400 7001	STRUCT EXCAVATION	CY	63
	400 7010	CEM STABIL BKFL	CY	25
	400 7005	STRUCT EXCAV (SPECIAL)	CY	17
	402 7001	TRENCH EXCAVATION PROTECTION	LF	80
	496 7007	REMOV STR (PIPE)	LF	80
	1000 7003	PRSSR IRRIG PVC PIPE (30")	LF	80
	7003 7003	WELDED STL CASING pipe (OPEN CUT)(42")	LF	72



HYDRAULIC DATA NOT NEEDED
FOR THIS IRRIGATION CROSSING.
REPLACING EXISTING STRUCTURE.

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED
PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

IRRIGATION CROSSING LAYOUT STA 511+48

SCALE: HOR. 1"= 20'
VERT. 1"= 10'

SHEET 1 OF 10

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		173

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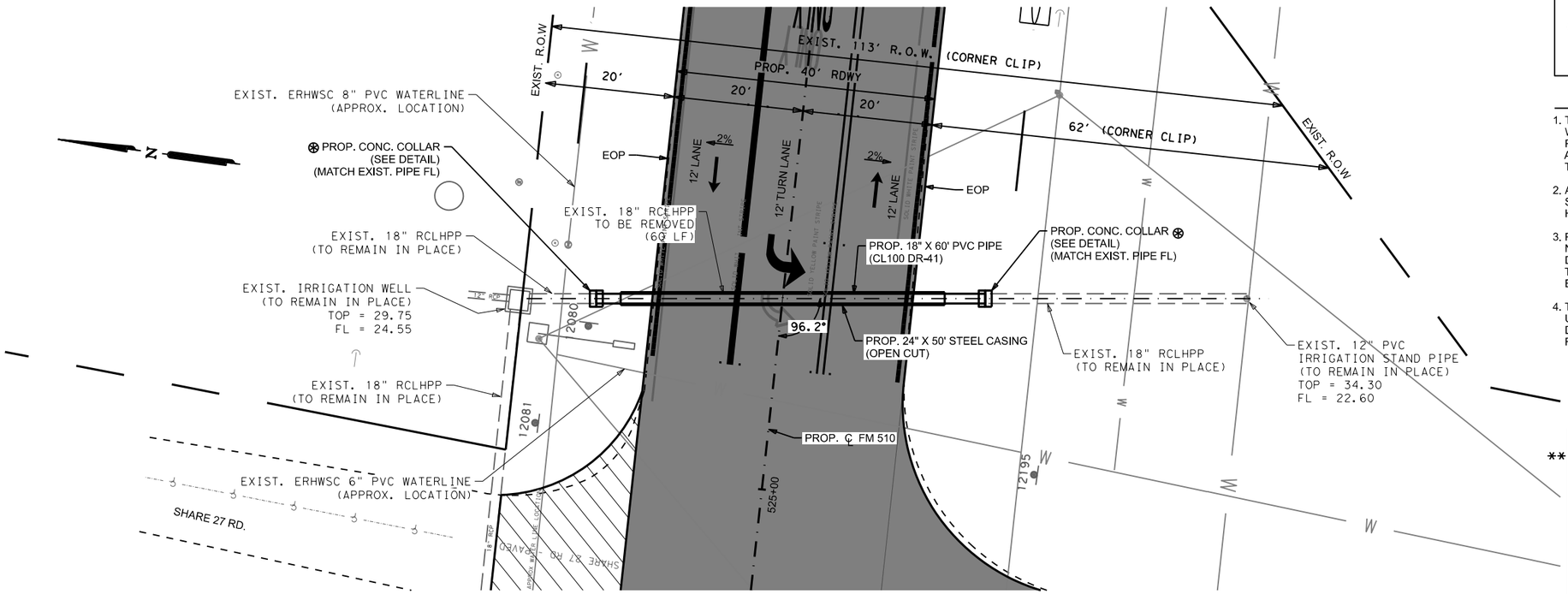

LEGEND

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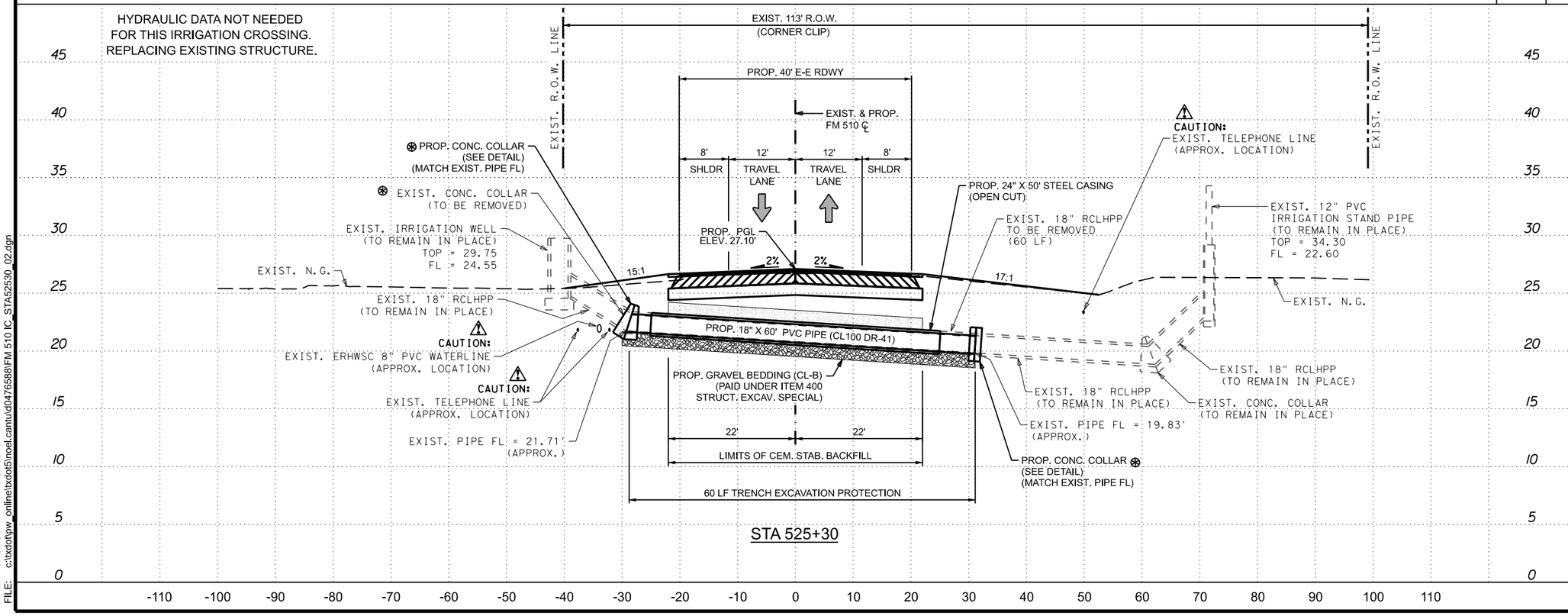
	ITEM	DESCRIPTION	UNIT	QTY.
**	400 7001	STRUCT EXCAVATION	CY	40
	400 7010	CEM STABIL BKFL	CY	15
	400 7005	STRUCT EXCAV (SPECIAL)	CY	9
	402 7001	TRENCH EXCAVATION PROTECTION	LF	60
	496 7007	REMOV STR (PIPE)	LF	60
	1000 7001	PRSSR IRRIG PVC PIPE (18")	LF	60
	7003 7001	WELDED STL CASING PIPE (OPEN CUT)(24")	LF	50

HYDRAULIC DATA NOT NEEDED FOR THIS IRRIGATION CROSSING. REPLACING EXISTING STRUCTURE.



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STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

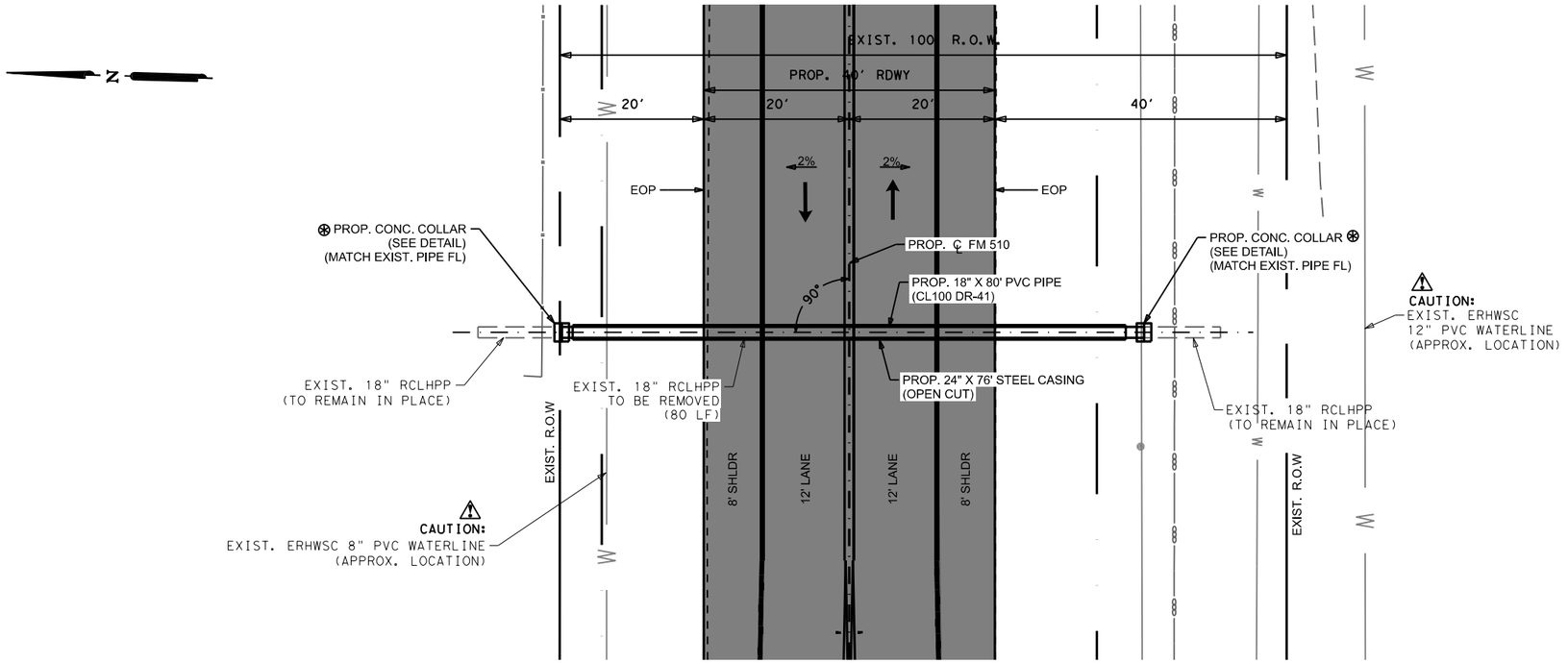
Texas Department of Transportation

FM 510
IRRIGATION CROSSING LAYOUT
STA 525+30

SCALE: HOR. 1"= 20'
VERT. 1"= 10'

SHEET 2 OF 10

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		174



LEGEND	
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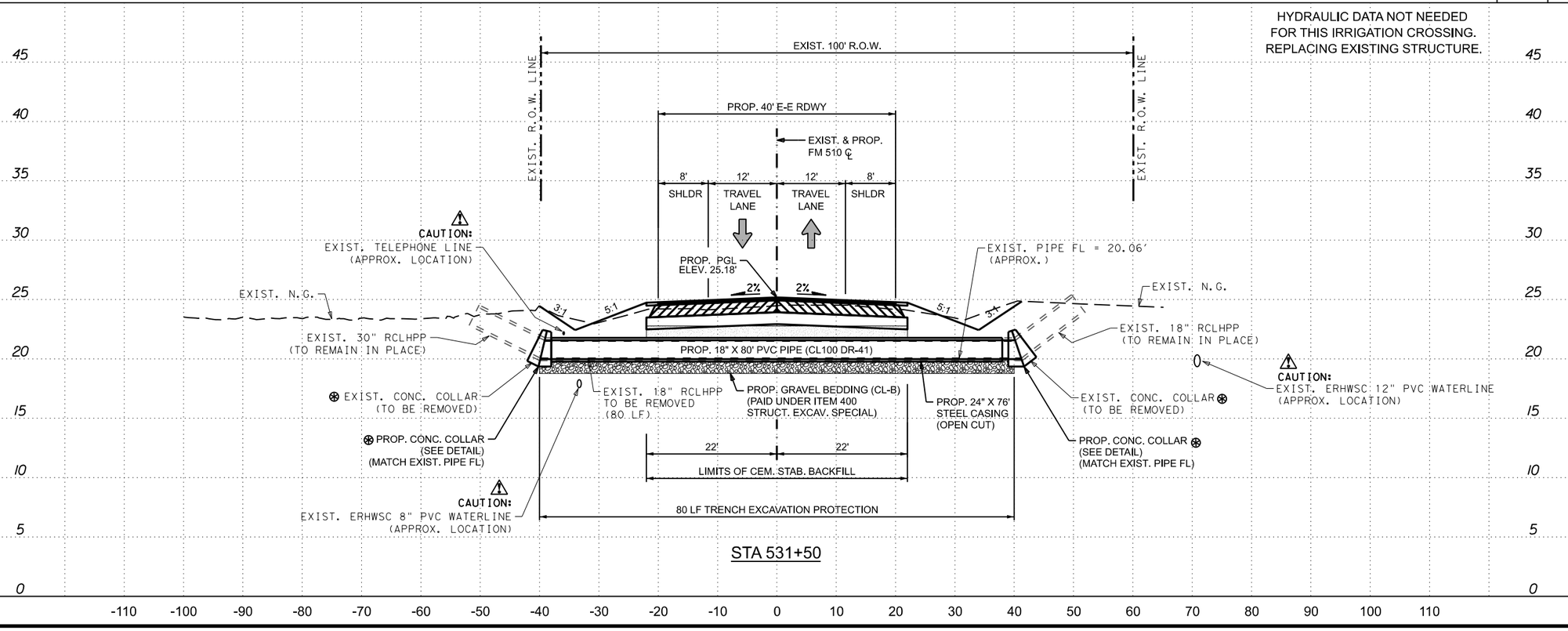
	ITEM	DESCRIPTION	UNIT	QTY.
**	400 7001	STRUCT EXCAVATION	CY	41
	400 7010	CEM STABIL BKFL	CY	15
	400 7005	STRUCT EXCAV (SPECIAL)	CY	12
	402 7001	TRENCH EXCAVATION PROTECTION	LF	80
	496 7007	REMOV STR (PIPE)	LF	80
	1000 7001	PRSSR IRRIG PVC PIPE (18")	LF	80
	7003 7001	WELDED STL CASING PIPE (OPEN CUT)(24")	LF	76

HYDRAULIC DATA NOT NEEDED FOR THIS IRRIGATION CROSSING. REPLACING EXISTING STRUCTURE.



STA 531+50

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
IRRIGATION CROSSING LAYOUT
STA 531+50

SCALE: HOR. 1"= 20'
VERT. 1"= 10'

SHEET 3 OF 10

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		175

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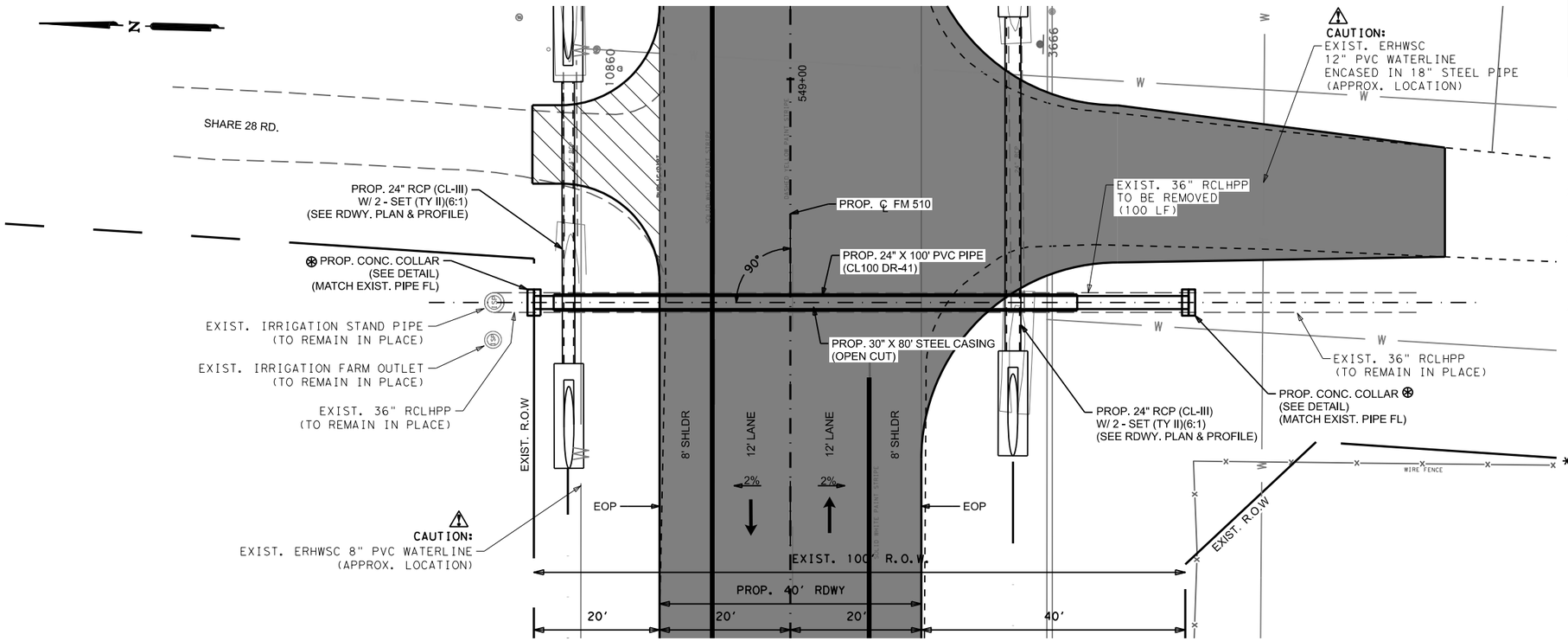

LEGEND

**	(NON-PAY ITEM) FOR CONTRACTOR'S INFORMATION ONLY
⊛	NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS

GENERAL NOTES

1. THE CONTRACTOR SHALL COORDINATE WITH CAMERON COUNTY WATER IMPROVEMENT DISTRICT No. 10 A MINIMUM OF 72 HOURS PRIOR TO ANY WORK ON OR NEAR THE IRRIGATION STRUCTURES. ADDRESS: 30592 BRIZA DRIVE, LOS FRESNOS, TX. 78566 TELEPHONE: 956-233-5513
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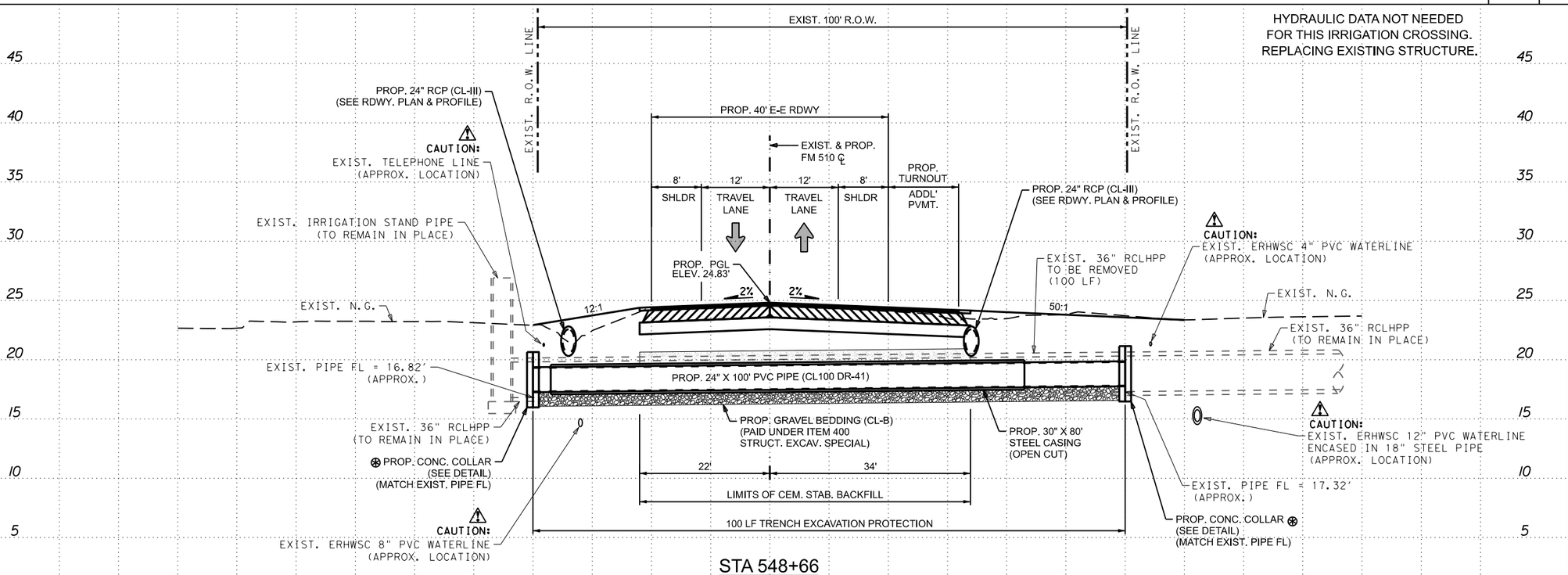
ITEM	DESCRIPTION	UNIT	QTY.
400 7001	STRUCT EXCAVATION	CY	65
400 7010	CEM STABIL BKFL	CY	23
400 7005	STRUCT EXCAV (SPECIAL)	CY	17
402 7001	TRENCH EXCAVATION PROTECTION	LF	100
496 7007	REMOV STR (PIPE)	LF	100
1000 7002	PRSSR IRRIG PVC PIPE (24")	LF	100
7003 7002	WELDED STL CASING PIPE (OPEN CUT)(30")	LF	80



STA 548+66

HYDRAULIC DATA NOT NEEDED
FOR THIS IRRIGATION CROSSING.
REPLACING EXISTING STRUCTURE.

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED
PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
IRRIGATION CROSSING LAYOUT
STA 548+66

SCALE: HOR. 1"= 20'
VERT. 1"= 10'

SHEET 4 OF 10

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		176

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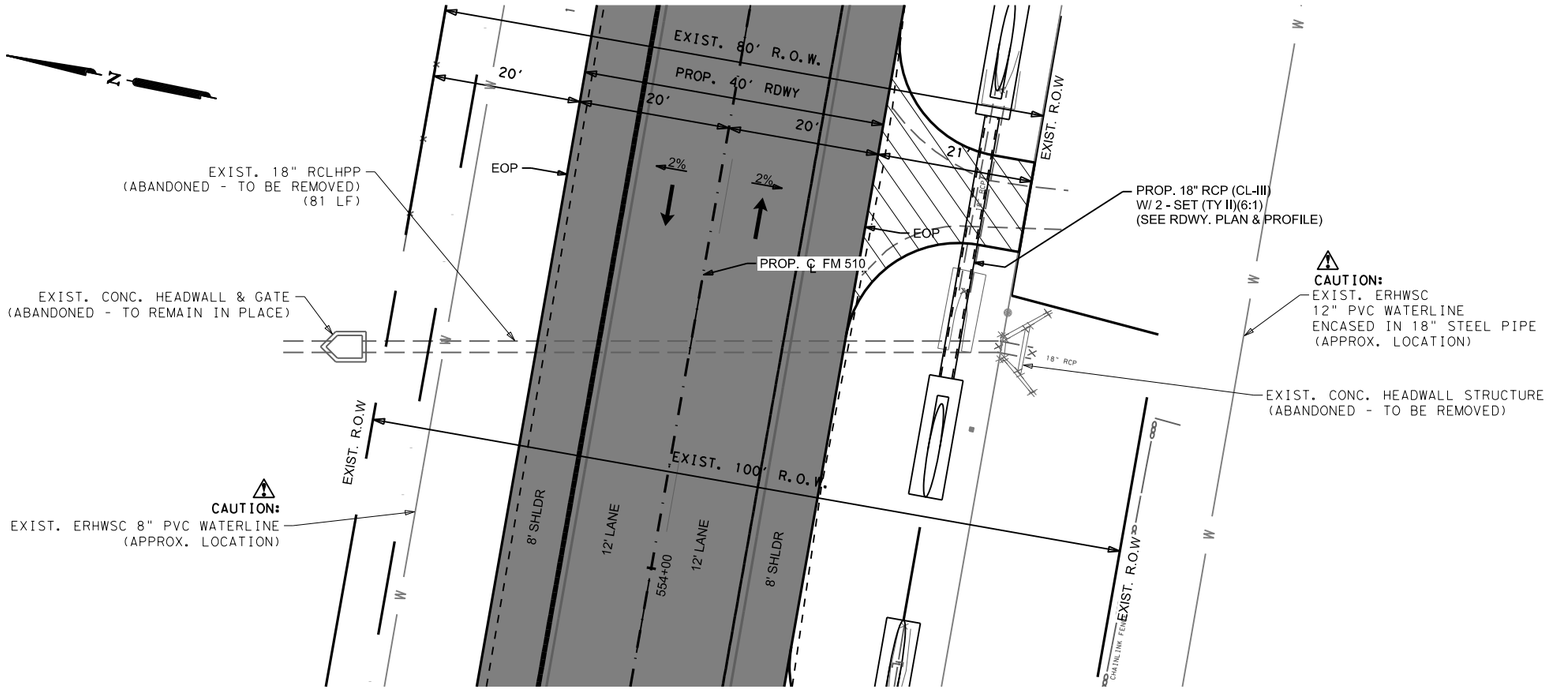

LEGEND

** (NON-PAY ITEM) FOR CONTRACTOR'S INFORMATION ONLY

⊛ NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS

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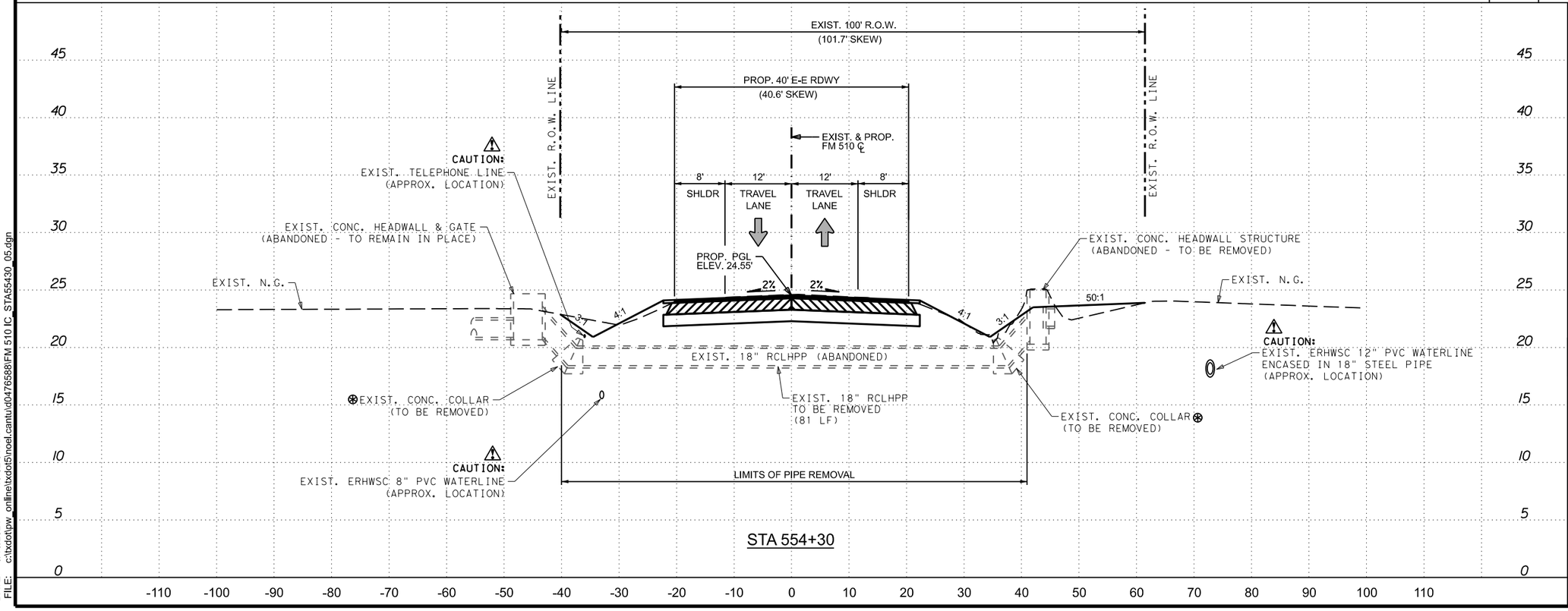
	ITEM	DESCRIPTION	UNIT	QTY.
**	400 7001	STRUCT EXCAVATION	CY	40
	496 7006	REMOV STR (HEADWALL)	EA	1
	496 7007	REMOV STR (PIPE)	LF	81



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STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

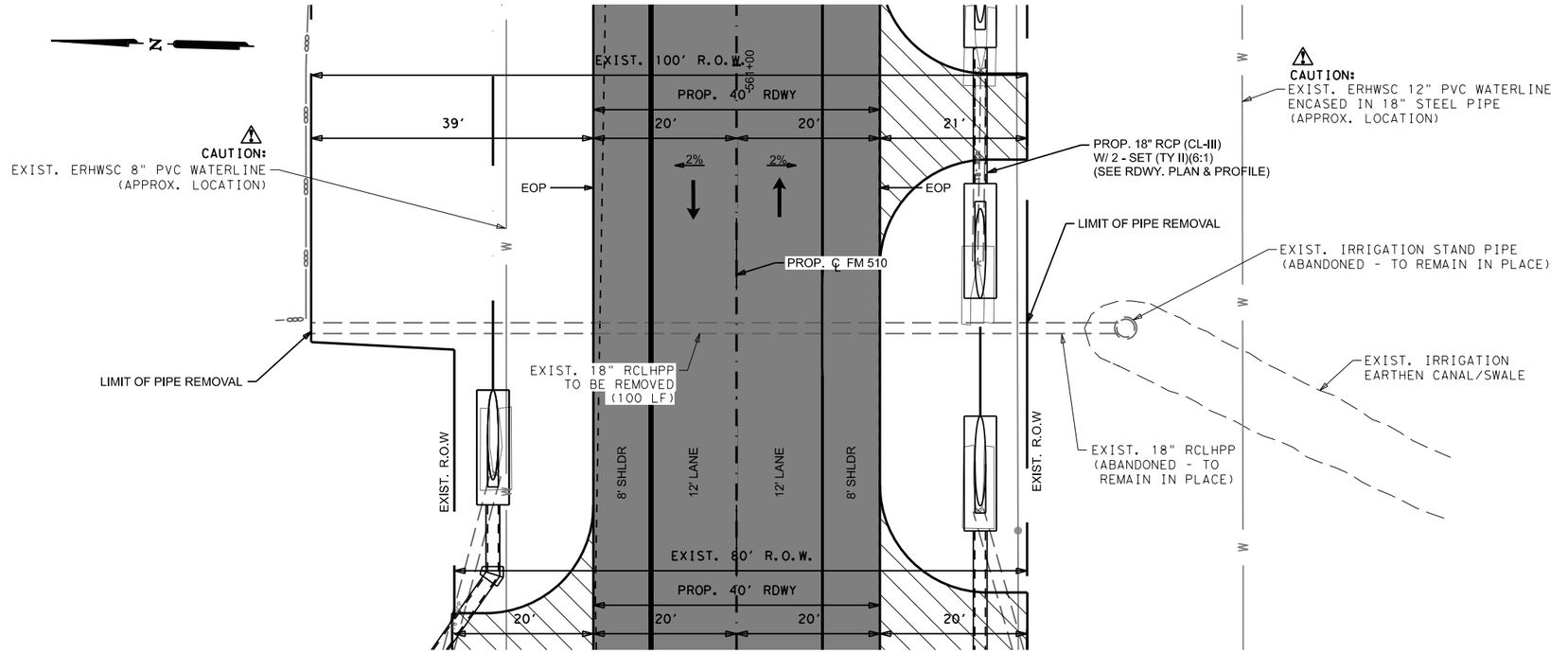
Texas Department of Transportation

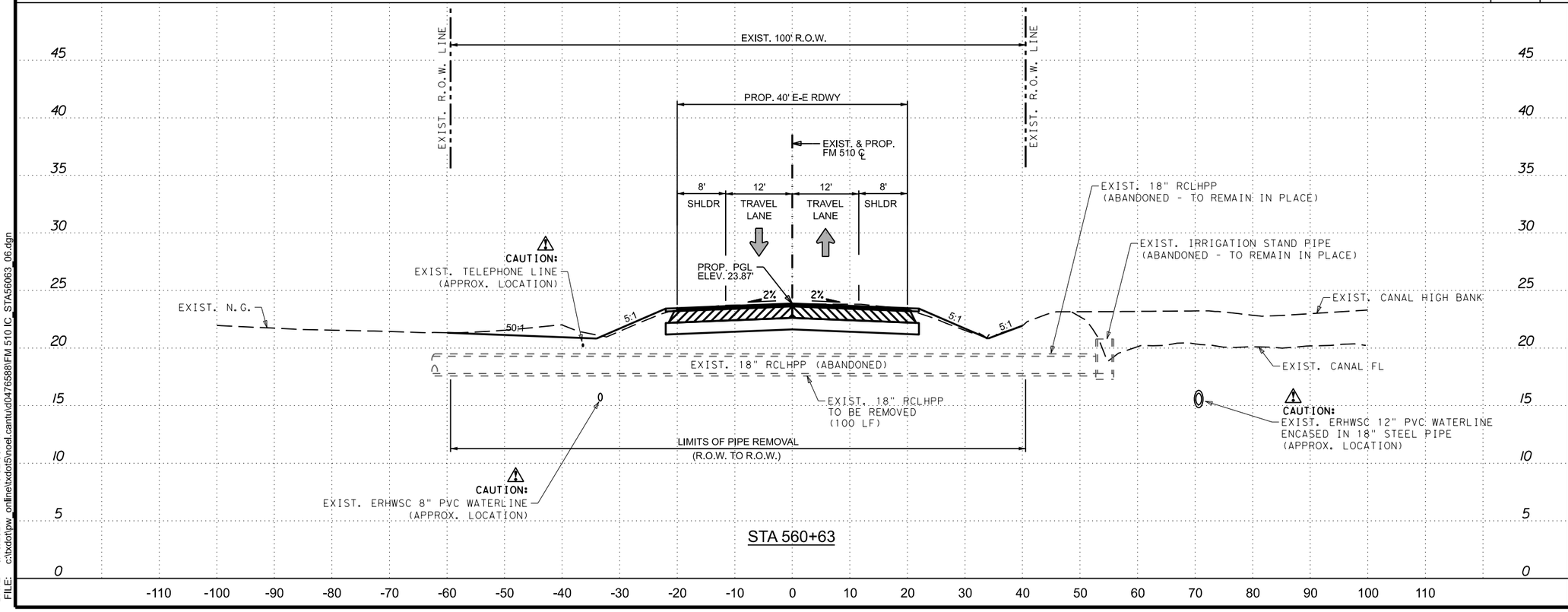
FM 510
IRRIGATION CROSSING LAYOUT
STA 554+30

SCALE: HOR. 1"= 20'
VERT. 1"= 10'

SHEET 5 OF 10

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		177





LEGEND

** (NON-PAY ITEM) FOR CONTRACTOR'S INFORMATION ONLY

⊛ NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS

GENERAL NOTES

1. THE CONTRACTOR SHALL COORDINATE WITH BAYVIEW IRRIGATION DISTRICT No. 11 A MINIMUM OF 72 HOURS PRIOR TO ANY WORK ON OR NEAR THE IRRIGATION STRUCTURES.
   ADDRESS: 110 S. SAN ROMAN ROAD, BAYVIEW, TX. 78566
   TELEPHONE: 956-233-5800
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	ITEM	DESCRIPTION	UNIT	QTY.
**	400 7001	STRUCT EXCAVATION	CY	52
**	496 7007	REMOV STR (PIPE)	LF	100

STATE OF TEXAS
JOSE A. RODRIGUEZ
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06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
IRRIGATION CROSSING LAYOUT
STA 560+63

SCALE: HOR. 1"= 20'
VERT. 1"= 10'

SHEET 6 OF 10

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		178

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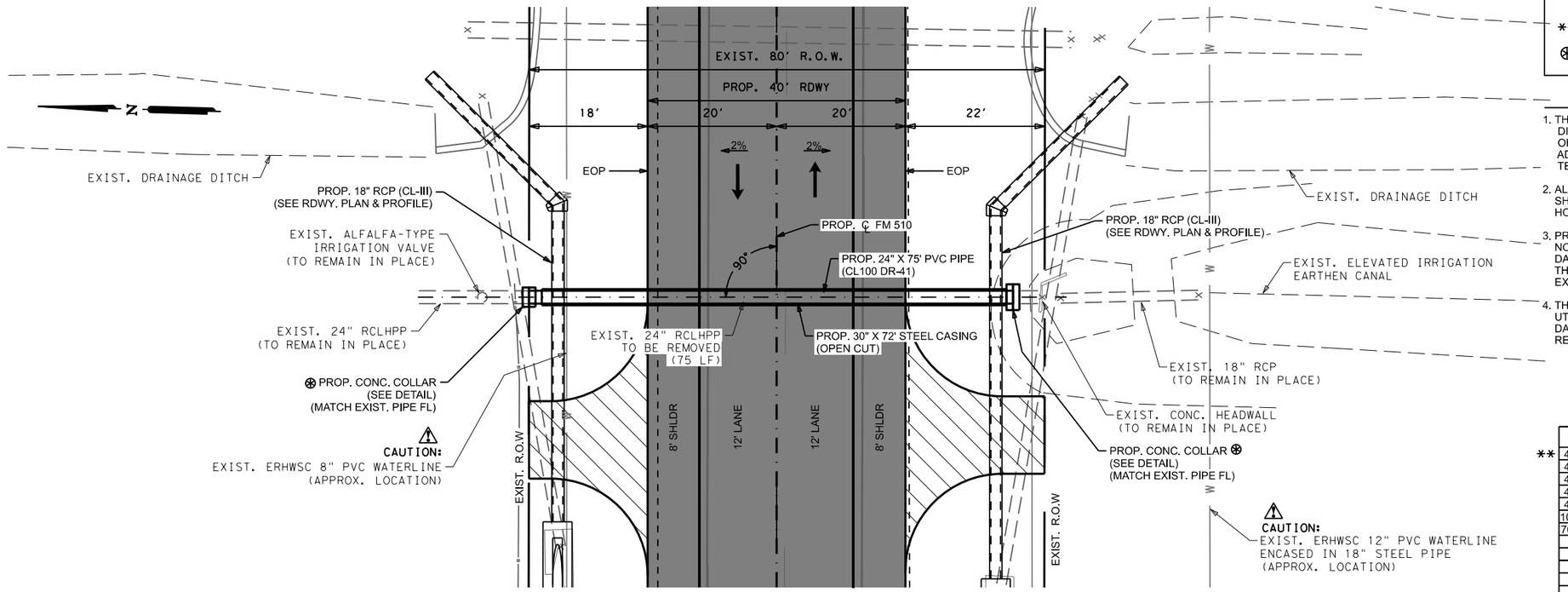

LEGEND

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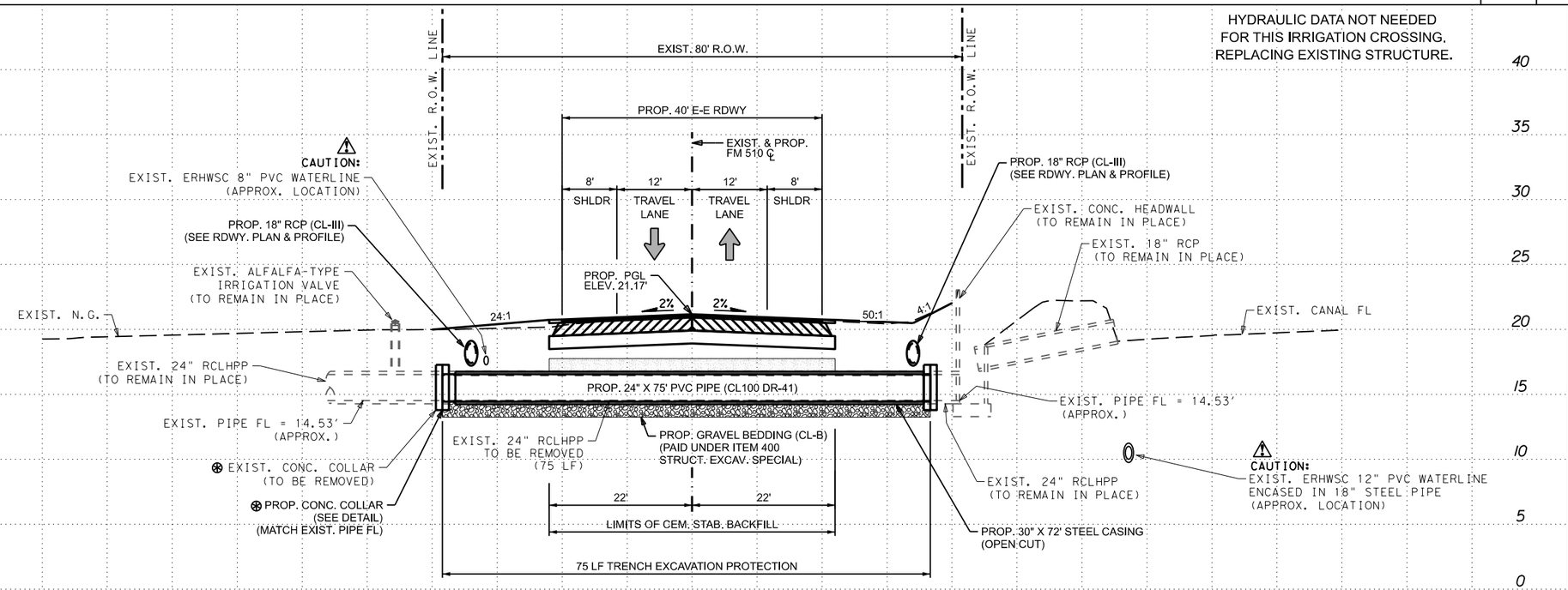
	ITEM	DESCRIPTION	UNIT	QTY.
**	400 7001	STRUCT EXCAVATION	CY	58
	400 7010	CEM STABIL BKFL	CY	18
	400 7005	STRUCT EXCAV (SPECIAL)	CY	13
	402 7001	TRENCH EXCAVATION PROTECTION	LF	75
	496 7007	REMOV STR (PIPE)	LF	75
	1000 7002	PRSSR IRRIG PVC PIPE (24")	LF	75
	7003 7002	WELDED STL CASING (OPEN CUT)(30")	LF	72

HYDRAULIC DATA NOT NEEDED
FOR THIS IRRIGATION CROSSING.
REPLACING EXISTING STRUCTURE.



STA 591+48

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
IRRIGATION CROSSING LAYOUT
STA 591+48

SCALE: HOR. 1"= 20'
VERT. 1"= 10'

SHEET 7 OF 10

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		179

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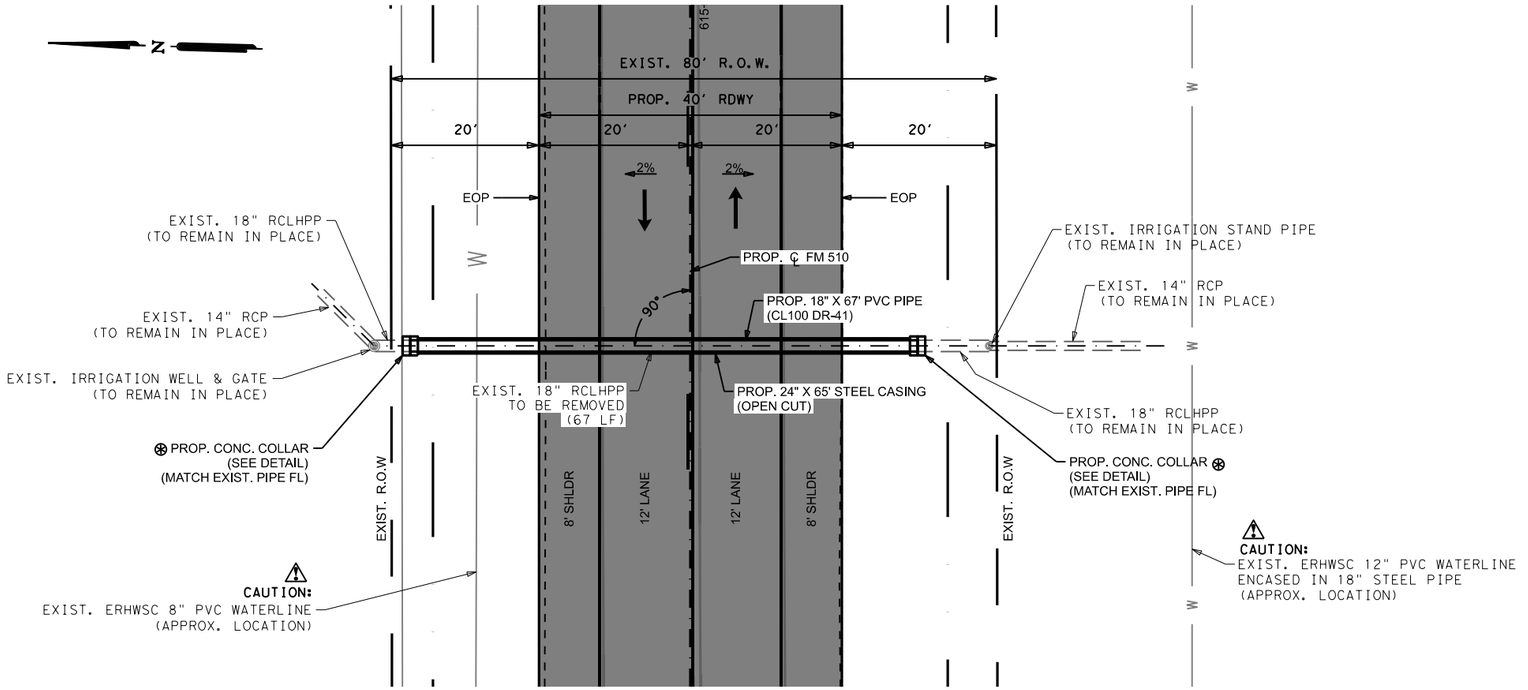

LEGEND

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⊛ NON-PAY ITEM SUBSIDIARY TO PERTINENT BID ITEMS

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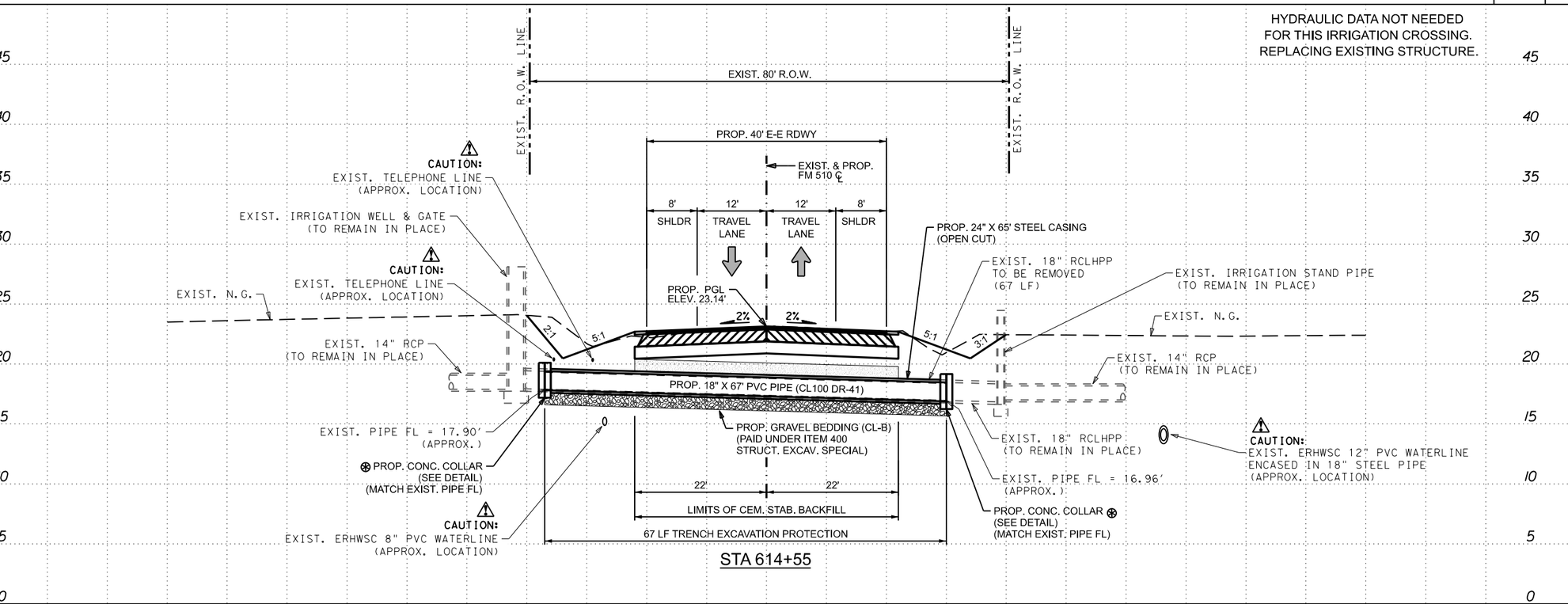
	ITEM	DESCRIPTION	UNIT	QTY.
**	400 7001	STRUCT EXCAVATION	CY	41
	400 7010	CEM STABIL BKFL	CY	15
	400 7005	STRUCT EXCAV (SPECIAL)	CY	10
	402 7001	TRENCH EXCAVATION PROTECTION	LF	67
	496 7007	REMOV STR (PIPE)	LF	67
	1000 7001	PRSSR IRRIG PVC PIPE (18")	LF	67
	7003 7001	WELDED STL CASING PIPE (OPEN CUT)(24")	LF	65

HYDRAULIC DATA NOT NEEDED
FOR THIS IRRIGATION CROSSING.
REPLACING EXISTING STRUCTURE.



STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
IRRIGATION CROSSING LAYOUT
STA 614+55

SCALE: HOR. 1"= 20'
VERT. 1"= 10'

SHEET 8 OF 10

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		180

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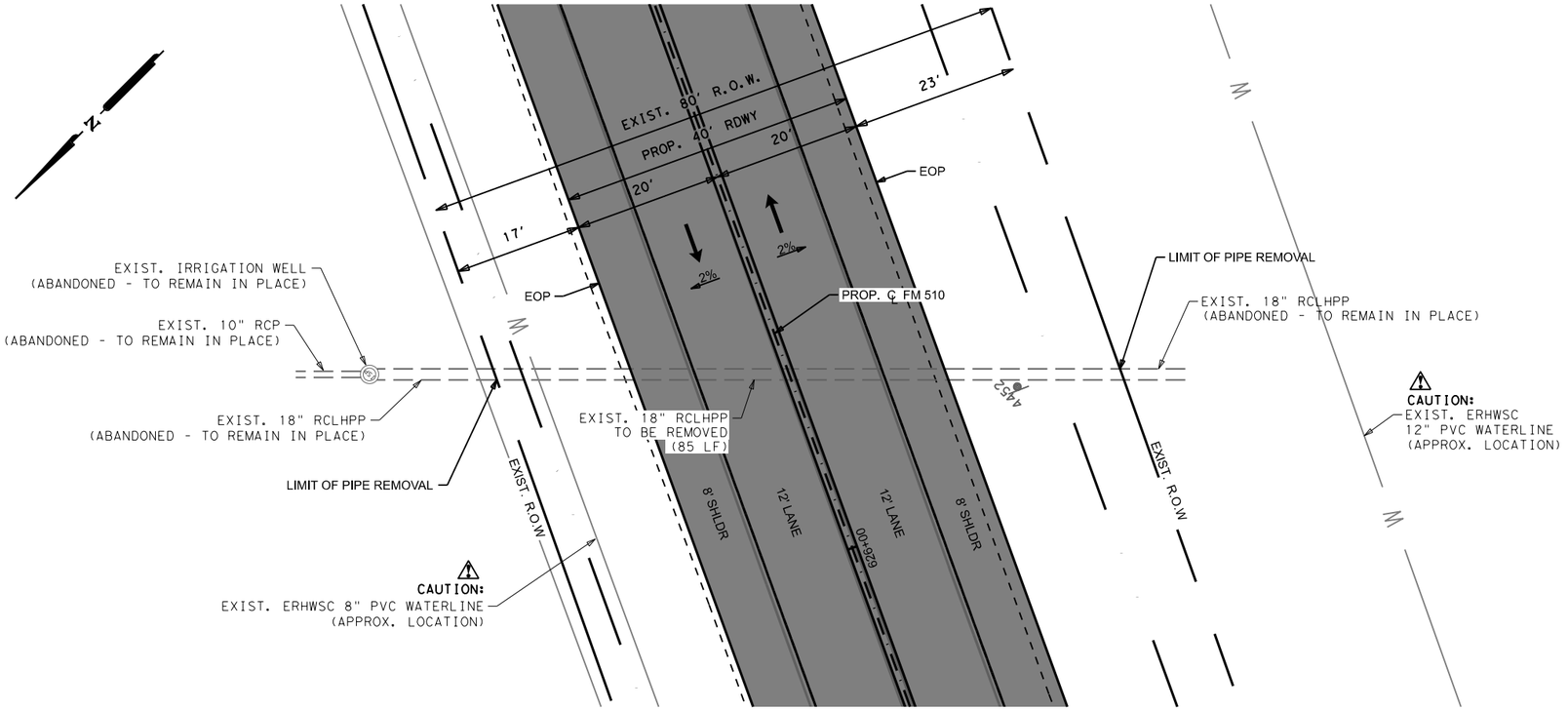

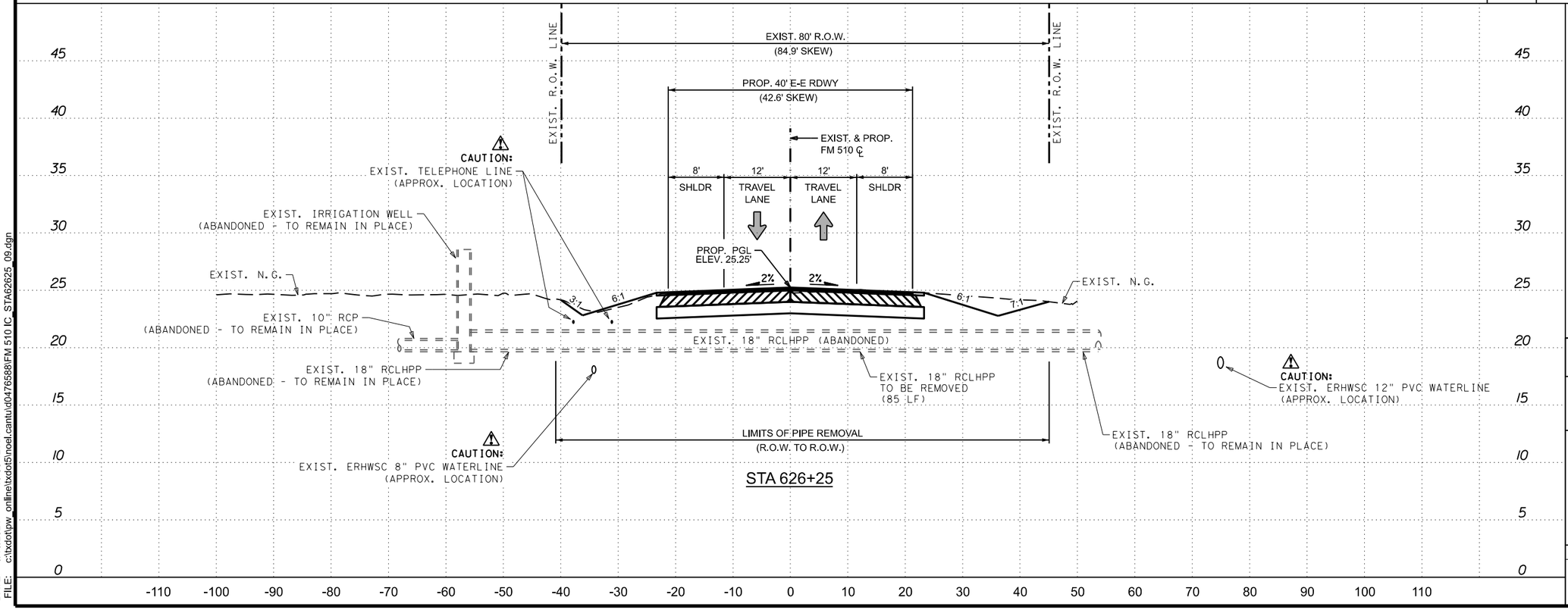

LEGEND	
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	ITEM	DESCRIPTION	UNIT	QTY.
**	400 7001	STRUCT EXCAVATION	CY	33
**	496 7007	REMOV STR (PIPE)	LF	85

STATE OF TEXAS
JOSE A. RODRIGUEZ
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06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
IRRIGATION CROSSING LAYOUT
STA 626+25

SCALE: HOR. 1"= 20'
VERT. 1"= 10'

SHEET 9 OF 10

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		181

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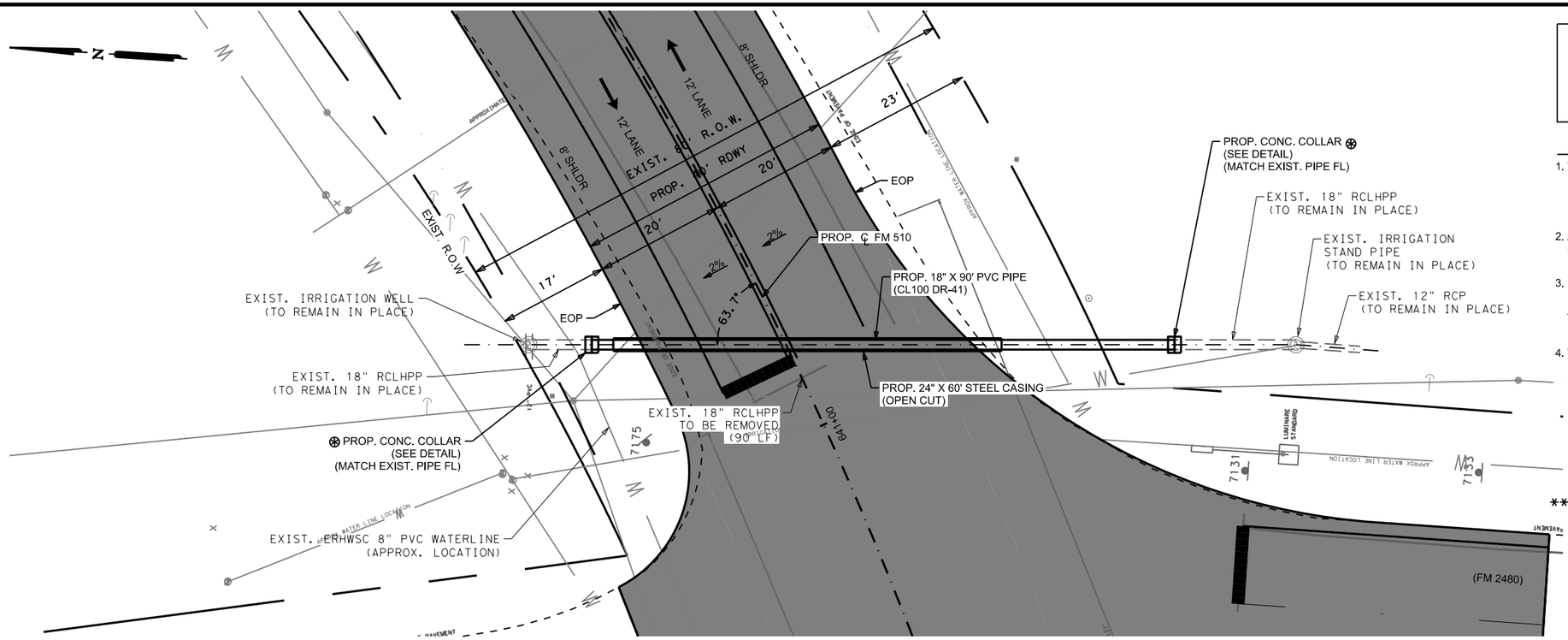

LEGEND

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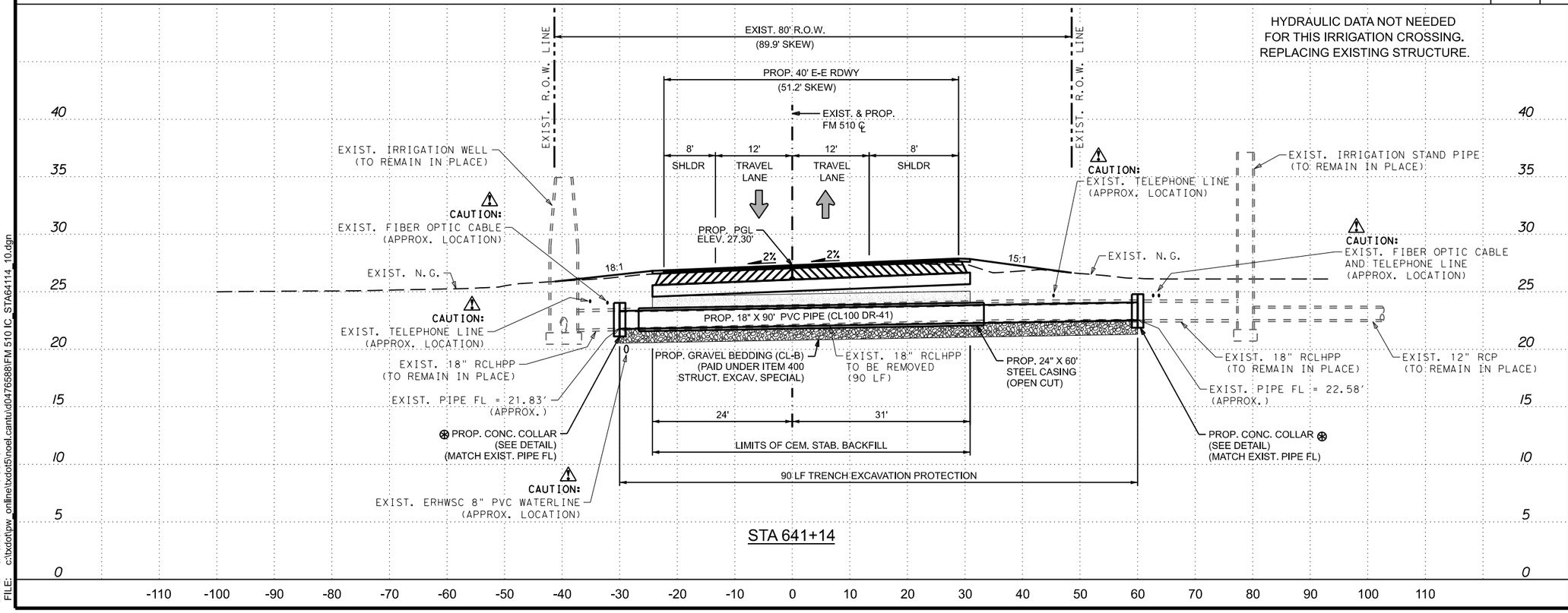
ITEM	DESCRIPTION	UNIT	QTY.
** 400 7001	STRUCT EXCAVATION	CY	46
400 7010	CEM STABIL BKFL	CY	19
400 7005	STRUCT EXCAV (SPECIAL)	CY	13
402 7001	TRENCH EXCAVATION PROTECTION	LF	90
496 7007	REMOV STR (PIPE)	LF	90
1000 7001	PRSSR IRRIG PVC PIPE (18")	LF	90
7003 7001	WELDED STL CASING PIPE (OPEN CUT)(24")	LF	60



STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510
IRRIGATION CROSSING LAYOUT
STA 641+14

SCALE: HOR. 1"= 20'
VERT. 1"= 10'

SHEET 10 OF 10

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		182

DATE: 6/13/2024 10:53:18 AM
FILE: c:\txdot\pw_online\txdot5\noel.cantu\d0476588\FM 510 IC_STA641+14_10.dgn

NOTES:

PROP. CEMENT STABILIZED BACKFILL SHALL EXTEND 2.0' BEYOND THE OUTSIDE EDGE OF THE PROP. PAVEMENT.

∗ REFER TO TRAFFIC CONTROL PLAN FOR CUT & RESTORE ESTIMATED QUANTITIES.

\# 12" PROP. GRAVEL BEDDING, TO BE PAID UNDER ITEM 400 "STRUCT EXCAV. SPL"

⊕ PLACE CEMENT STABILIZED BACKFILL TO FINISH GRADE OF FLEXBASE.

⊛ PLACE CEMENT STABILIZED BACKFILL TO FINISH GRADE OF SUBGRADE.

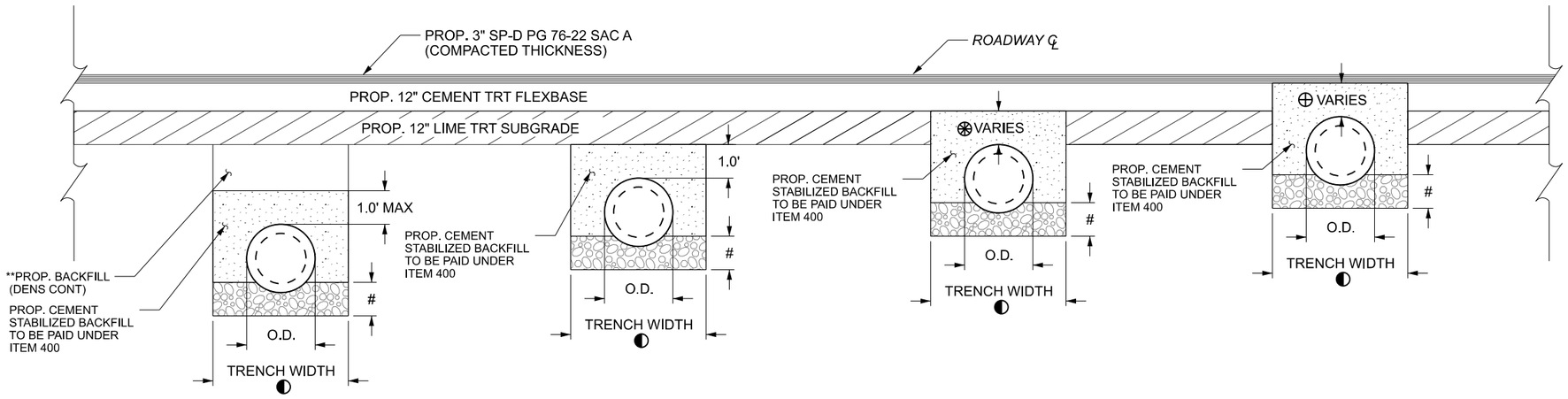
◐ FOR 42" RCP OR LESS (O.D. + 2 FT)
FOR 48" RCP OR GREATER (O.D. + 4 FT)

△ SAWCUT TO BE SUBSIDIARY TO PERTINENT BID ITEM 400.

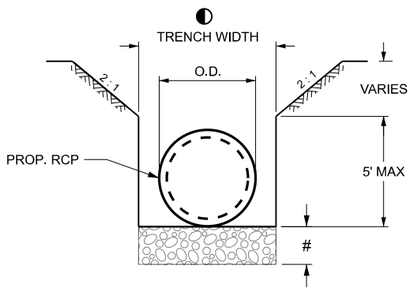
"I.D." DENOTES "INSIDE DIAMETER"

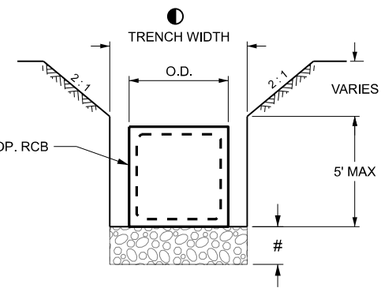
"O.D." DENOTES "OUTER DIAMETER"

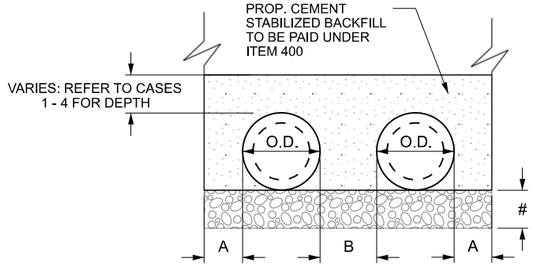
** PROP. BACKFILL TO BE PAID SUBSIDIARY TO PERTINENT BID ITEMS PER ITEM 400 SPECIFICATIONS.

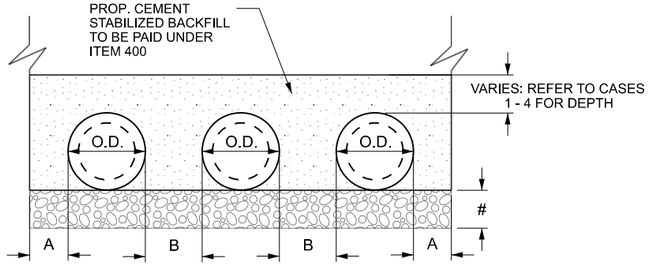


CASE 1 CASE 2 CASE 3 CASE 4



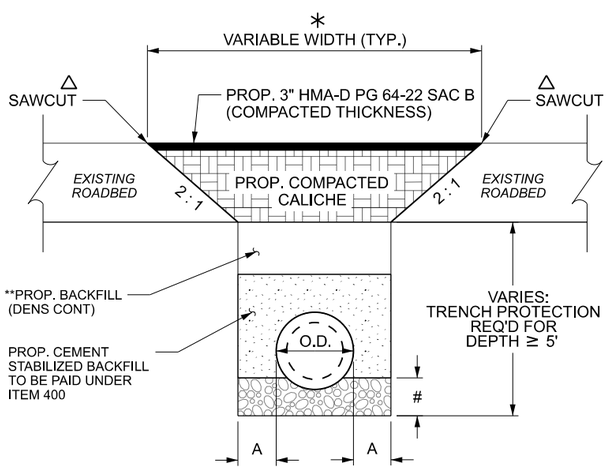






TYPICAL TRENCH EXCAVATION DETAILS FOR RCP & RCB

FOR TRENCH DEPTHS EQUAL TO OR GREATER THAN 5 FT



TYPICAL CEMENT STABILIZED BACKFILL DETAILS FOR MULTIPLE BARREL CULVERTS

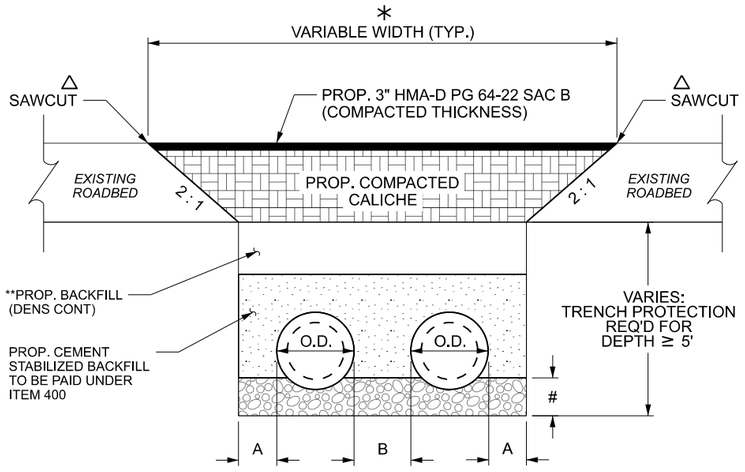


TABLE OF PIPE SEPARATION DIMENSIONS		
DIA. OF PIPE (I.D.)	A	B
18"	1' - 0"	0' - 9"
24"	1' - 0"	1' - 1"
30"	1' - 0"	1' - 3"
36"	1' - 0"	1' - 5"
42"	1' - 0"	1' - 7"
48"	2' - 0"	1' - 9"
54"	2' - 0"	2' - 0"
60"	2' - 0"	2' - 2"
72"	2' - 0"	2' - 4"

TYPICAL PAVEMENT CUT & RESTORE DETAILS FOR SINGLE AND MULTIPLE BARREL CULVERTS

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED
PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

CULVERT CROSSING CEMENT STABILIZATION & MISCELLANEOUS TYPICAL DETAILS

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

© 2024	CONT	SECT	JOB	HIGHWAY
DS: CK:	1057	03	051	FM 510
DW: CK:	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		183

DATE: 6/13/2024 10:54:58 AM
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DATE:
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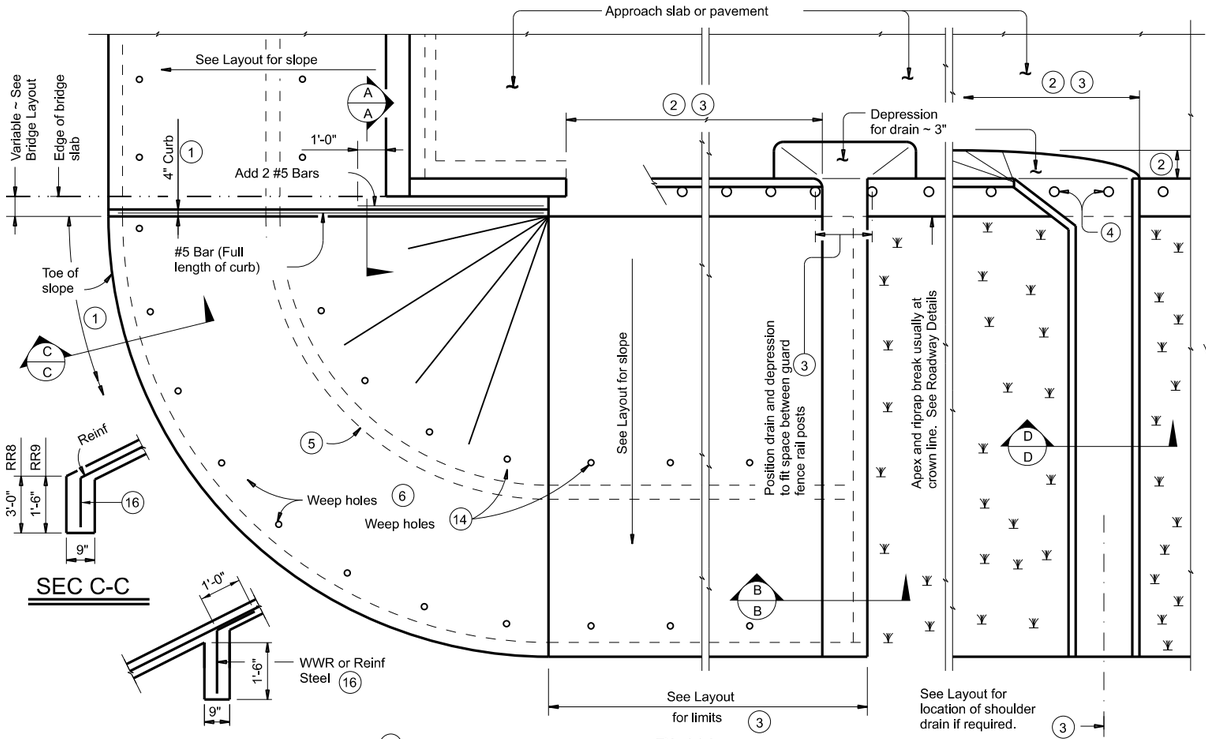
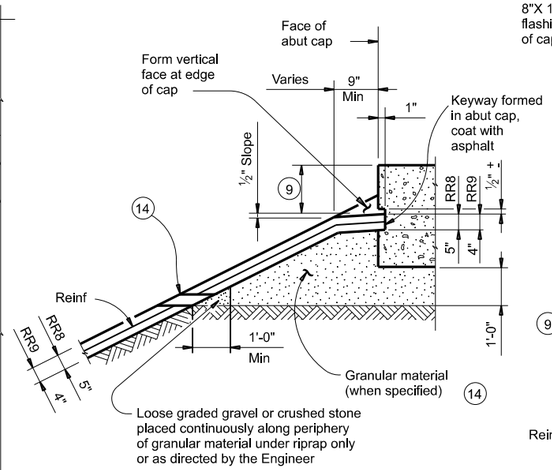


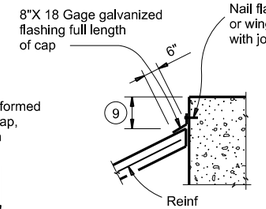
PLAN

SEC C-C

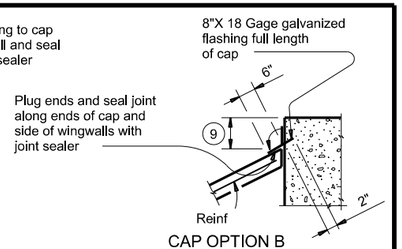
INTERMEDIATE TOEWALL (5)



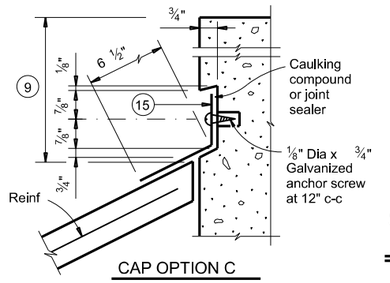
SHOWING KEYWAY OPTION



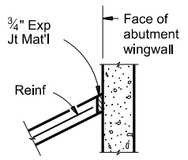
CAP OPTION A



CAP OPTION B

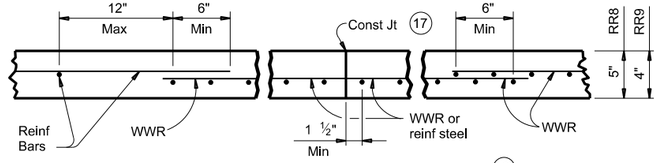


CAP OPTION C



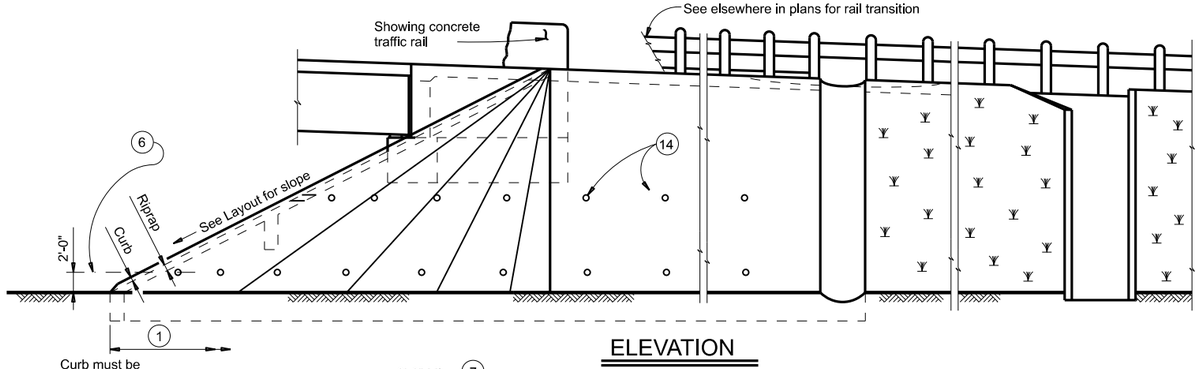
SECT THRU RIPRAP AT WINGWALL (12)

SECTIONS THRU RIPRAP AT CAP (11)

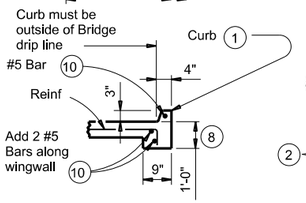


REINFORCEMENT DETAILS (13)

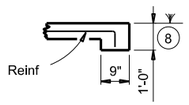
See General Notes for optional synthetic fiber reinforcement.



ELEVATION

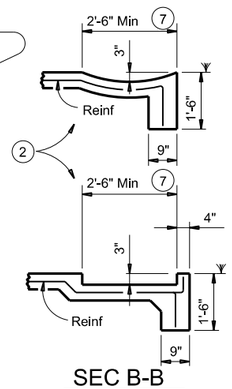


SEC A-A



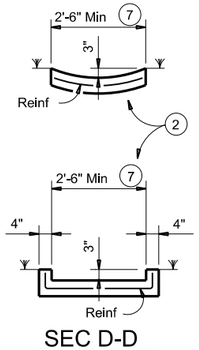
SEC B-B

(No drain)



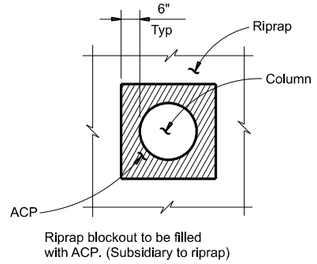
SEC B-B

(Shoulder drain integral with riprap)



SEC D-D

(Shoulder drain)



RIPRAP DETAIL AT COLUMNS

(As directed by the Engineer)

1. When riprap is shown extended around header on layout, extend slab and toewall as shown and eliminate 4" curb.
2. Limits and configuration of drains and depressions are as shown elsewhere in plans or as directed by the Engineer.
3. Location of shoulder drain must consider limitations imposed by rail transition. Do not locate shoulder drains at expansion joints between approach slab and concrete pavement.
4. See details elsewhere in plans for installation of guard fence posts through concrete riprap.
5. Provide intermediate toewall only when designated elsewhere in the plans or included in the specifications.
6. Provide lower level of 2" Dia weep holes at 10' c-c backed by 1 CF packet of gravel and galvanized hardware cloth at all locations unless directed by the Engineer to eliminate.
7. Use wider or other drain configurations if shown elsewhere in plans or if directed by the Engineer.
8. Wall extension may be reduced or modified if approved by the Engineer. Increase wall extension to 1'-6" whenever the optional intermediate toewall is called for in the plans.
9. Top of cap to top of riprap dimension varies as directed by the Engineer. Should be 9" Min for beam/slab type bridges and 1'-6" for slab span, box beam, or slab beam bridges.
10. #5 bars shown are required even when synthetic fiber reinforcing option is selected.
11. Provide sealing option for joint between the face of cap and riprap as designated by the Engineer or as shown elsewhere on plans.
12. Flashing (shown in Cap Option A) may be used at wingwall in addition to Exp Jt Mat'l if shown on plans or directed by the Engineer.
13. Provide #3 reinforcing bars at 18" Spa c-c. Provide Welded Wire Reinforcement (WWR) as 6x6-D2.9xD2.9 or D3xD3. Combinations of WWR and reinforcing bars may be used if both are permitted. Use lap splices of a minimum 6 inches, measured from the transverse wire of WWR, and the ends of reinforcing bars.
14. If granular material is specified, provide upper level of 2" Dia weep holes at 10' c-c backed by galvanized hardware cloth.
15. 8" x 18 Gage Galv Sheet Metal
16. Provide WWR or #3 bars, with 1'-0" extension into slope.
17. WWR or reinforcing steel is continuous through riprap construction joints. Provide WWR or reinforcing steel that extends 1'-1" minimum into adjacent riprap on each side of construction joint even if synthetic reinforcing fiber is utilized.

FOR CONTRACTOR'S INFORMATION ONLY:
5" of RR8 = 0.015 CY/SF
4" of RR9 = 0.012 CY/SF
#3 Reinf at 18" c-c = 0.501 Lbs/SF
6x6-D3xD3 = 0.408 Lbs/SF

GENERAL NOTES:

Provide Class "B" concrete (f'c = 2,000 psi) unless noted elsewhere in plans.

Provide Grade 60 reinforcing steel.

Provide deformed welded wire reinforcement (WWR) meeting ASTM A1064, unless otherwise shown.

Provide reinforcing bars, deformed WWR, or any suitable combination of both types for riprap reinforcing, unless specified elsewhere in the plans.

Optionally synthetic fibers may be used if approved by the Engineer. Provide synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) in lieu of steel reinforcing in riprap concrete.

Install construction joints or grooved joints extending the full slant slope height at intervals of approximately 20 feet unless otherwise directed by the Engineer.

Hardware cloth, loose grade stone behind weep holes, flashing, or other sealing material are subsidiary to the bid item "Riprap".

See Layout for limits of riprap.

RR8 is to be used on stream crossings.

RR9 is to be used on other embankments.

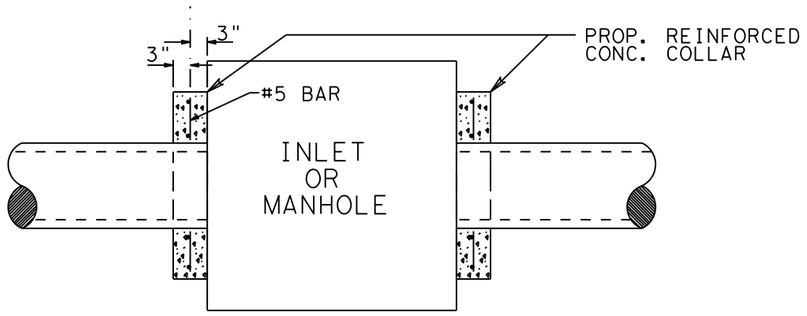
Texas Department of Transportation

Bridge Division Standard

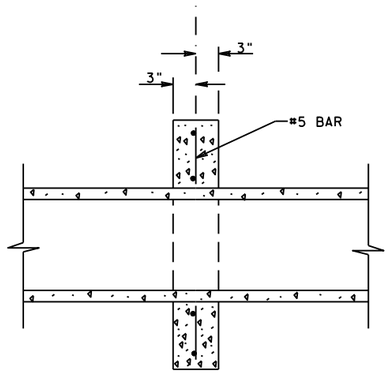
CONCRETE RIPRAP AND SHOULDER DRAINS
EMBANKMENTS AT BRIDGE ENDS (TYPES RR8 & RR9)

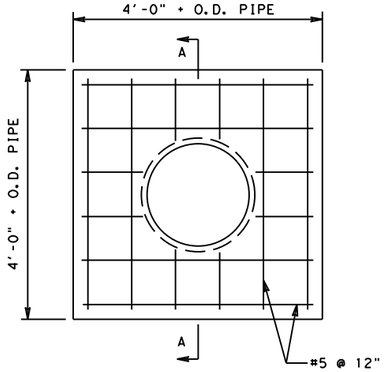
CRR

FILE: MS-CRR-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		184



INLET OR MANHOLE CONNECTION
PLAN VIEW

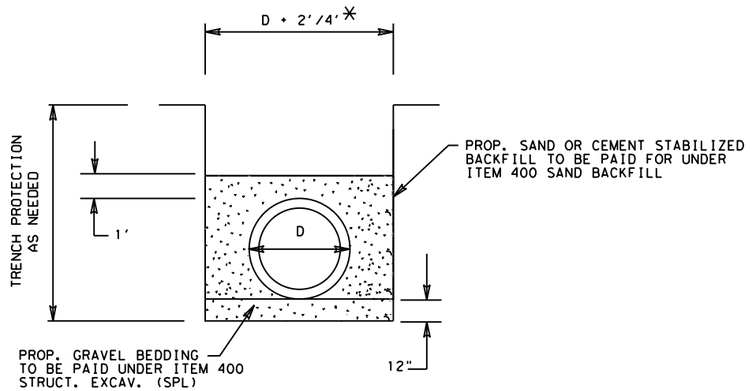




SECTION A-A

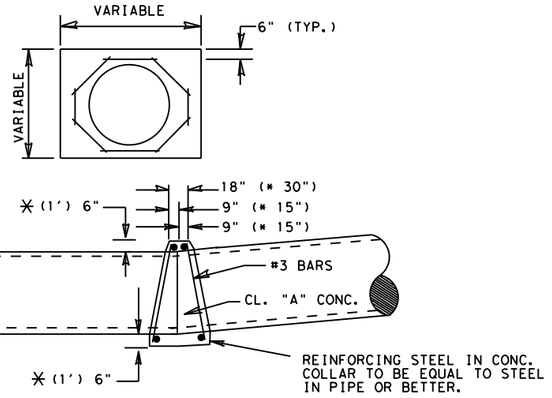
FRONT ELEVATION

CONCRETE PIPE COLLAR



✳ FOR PIPE 42" DIAMETER OR LESS PLACE 1'OF FILL
ON EACH SIDE OF THE PIPE.
FOR PIPE LARGER THAN 42" DIAMETER PLACE 2' OF FILL
ON EACH SIDE OF THE PIPE.

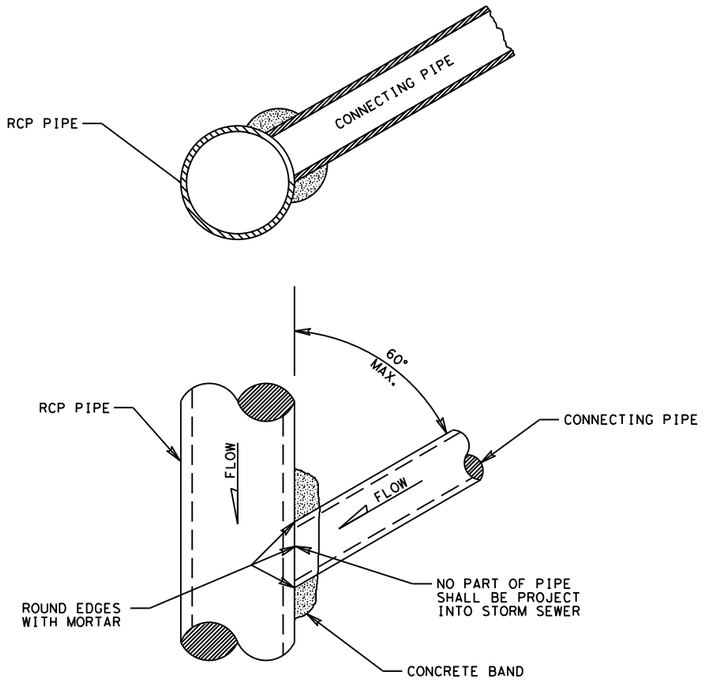
SPIRAL RIB CMP
TYPICAL BACKFILL DETAIL
GRAVEL & SAND



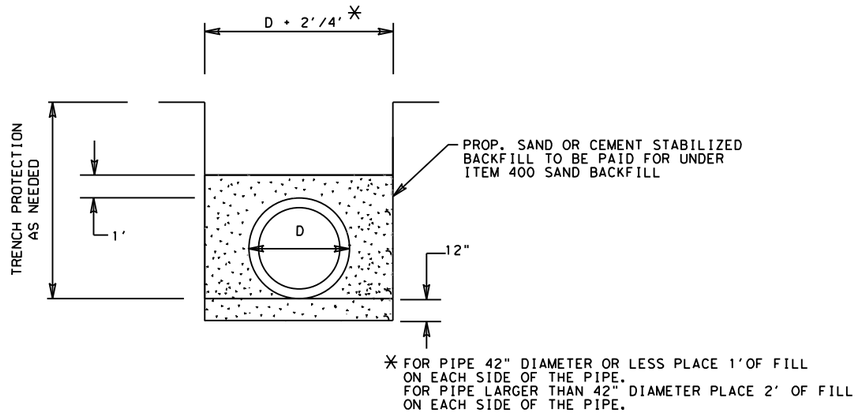
DETAIL FOR CONC. COLLARS
DRAINAGE STRUCTURES AND PIPE
SIPHONS (HORIZ. & VERT. BENDS)

NOTE: PROP. CONC. COLLAR WILL NOT BE PAID FOR DIRECTLY BUT WILL BE SUBSIDIARY TO THE BIDS ITEMS INVOLVED.

✳ FOR 42" DIAMETER AND LARGER PIPE



TYPICAL REINFORCED CONC. PIPE
CONNECTION WITHOUT MANHOLE



✳ FOR PIPE 42" DIAMETER OR LESS PLACE 1'OF FILL
ON EACH SIDE OF THE PIPE.
FOR PIPE LARGER THAN 42" DIAMETER PLACE 2' OF FILL
ON EACH SIDE OF THE PIPE.

REINFORCED CONCRETE PIPE
TYPICAL BACKFILL DETAIL-GRAVEL & SAND

PHARR DISTRICT STANDARD

TEXAS DEPARTMENT OF TRANSPORTATION

MISCELLANEOUS
PIPE STANDARD

REV. 2/19

MISC.PIPE.DGN

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		FILE NO.			SHEET NO.
6						185
STATE	STATE DIST.NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TEXAS	21	CAMERON	1057	03	051	FM 510

FILE: c:\txdot\pw\online\txdot5\noel.contu\d0455366\MISC. PIPE.dgn
DATE: 6/13/2024 10:56:26 AM

Culvert Station and/or Creek Name followed by applicable end (Lt, Rt or Both)	Description of Box Culvert No. Spans ~ Span X Height	Max Fill Height (Ft)	Applicable Box Culvert Standard (4)	Applicable Wingwall or End Treatment Standard	Skew Angle (0°,15°, 30° or 45°)	Side Slope or Channel Slope Ratio (SL:1)	T Culvert Top Slab Thickness (In)	U Culvert Wall Thickness (In)	C Estimated Curb Height (Ft)	Hw Height of Wingwall (1) (Ft)	A Curb to End of Wingwall (Ft)	B Offset of End of Wingwall (Ft)	Lw Length of Longest Wingwall (Ft)	Ltw Culvert Toewall Length (Ft)	Atw Anchor Toewall Length (Ft)	(5) Riprap Apron (CY)	(2)(5) Class "C" Conc (Curb) (CY)	(3)(5) Class "C" Conc (Wingwall) (CY)	(5) Total Wingwall Area (SF)
STA 419+61, Drainage Ditch (Both)	1 ~ 10' X 5' (Existing)	4'	N/A	FW-0	0	2:1	Exist.	Exist.	1.000	6.417	12.167	7.024	14.049	N/A	N/A				
STA 419+61, Drainage Ditch (Both)	1 ~ 8' X 5' (Proposed)	4'	SCP-8	FW-0	0	2:1	8"	8"	1.000	6.417	12.167	7.024	14.049	N/A	N/A	10.0	1.6	11.6	190

DATE:
FILE:

NOTES:
Skew = 0° on SW-0, FW-0, SETB-CD, SETB-SW-0, and SETB-FW-0 standard sheets;
30° maximum for safety end treatment

SL:1 = Horizontal : 1 Vertical
· Side slope at culvert for flared or straight wingwalls.
· Channel slope for parallel wingwalls.
· Slope must be 3:1 or flatter for safety end treatments.

T = Box culvert top slab thickness. Dimension can be found on the applicable box culvert standard sheet.

U = Box culvert wall thickness. Dimension can be found on the applicable box culvert standard sheet.

C = Curb height

See applicable wing or end treatment standard sheets for calculations of Hw, A, B, Lw, Ltw, Atw, and Total Wingwall Area.

Hw = Height of wingwall

A = Distance from face of curb to end of wingwall (not applicable to parallel or straight wingwalls)

B = Offset of end of wingwall (not applicable to parallel or straight wingwalls)

Lw = Length of longest wingwall.

Ltw = Length of culvert toewall (not applicable when using riprap apron)

Atw = Length of anchor toewall (applicable to safety end treatment only)
Total Wingwall Area = Wingwall area in sq. ft. for two wingwalls (one structure end) if Lt or Rt.
Area for four wingwalls (two structure ends) if Both.

(1) Round the wall heights shown to the nearest foot for bidding purposes.

(2) Concrete volume shown is for box culvert curb only. For curbs using the Box Culvert Rail Mounting Details (RAC) standard sheet quantities shown must be increased by a factor of 2.25. If Class S concrete is required for the top slab of the culvert, also provide Class S concrete for the curb. Curb concrete is considered part of the Box Culvert for payment.

(3) Concrete volume shown is total of wings, footings, culvert toewall (if any), anchor toewalls (if any) and wingwall toewalls. Riprap aprons, culverts, and curb quantities are not included.

(4) Regardless of the type of culvert shown on this sheet, the Contractor has the option of furnishing cast-in-place or precast culverts unless otherwise shown elsewhere on the plans. If the Contractor elects to provide culverts of a different type than those shown on this sheet, it is the Contractor's responsibility to make the necessary adjustments to the dimensions and quantities shown.

(5) Quantities shown include the concrete curbs, wingwalls, riprap, and toewalls needed for the existing box culvert and the proposed box culvert as shown on the plans.

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED
PROFESSIONAL ENGINEER

06/13/24

Texas Department of Transportation

Bridge Division Standard

BOX CULVERT SUPPLEMENT
WINGS AND END TREATMENTS

BCS

FILE: CD-BCS-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	21	CAMERON		186

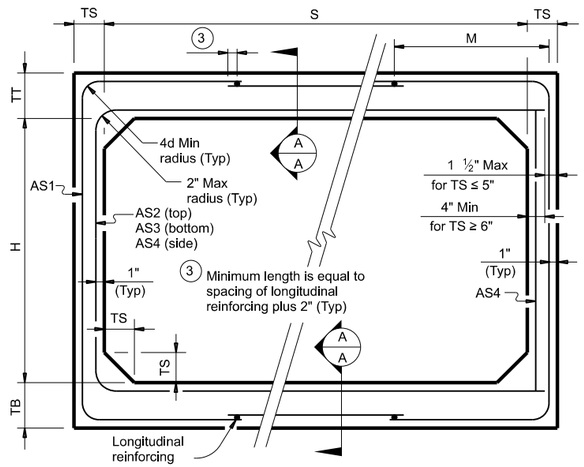
DATE:
FILE:

BOX DATA

SECTION DIMENSIONS					Fill Height	M (Min)	REINFORCING (sq. in. / ft.) (2)							(1) Lift Weight
S (ft.)	H (ft.)	TT (in.)	TB (in.)	TS (in.)	(ft.)	(in.)	AS1	AS2	AS3	AS4	AS5	AS7	AS8	(tons)
8	3	8	8	8	< 2	-	0.31	0.35	0.25	0.19	0.19	0.19	0.19	10.4
8	3	8	8	8	2 < 3	55	0.35	0.29	0.28	0.19	-	-	-	10.4
8	3	8	8	8	3 - 5	50	0.28	0.23	0.24	0.19	-	-	-	10.4
8	3	8	8	8	10	45	0.29	0.25	0.26	0.19	-	-	-	10.4
8	3	8	8	8	15	45	0.39	0.33	0.34	0.19	-	-	-	10.4
8	3	8	8	8	20	45	0.51	0.43	0.44	0.19	-	-	-	10.4
8	3	8	8	8	25	45	0.63	0.53	0.54	0.19	-	-	-	10.4
8	4	8	8	8	< 2	-	0.27	0.38	0.29	0.19	0.19	0.19	0.19	11.2
8	4	8	8	8	2 < 3	50	0.31	0.34	0.32	0.19	-	-	-	11.2
8	4	8	8	8	3 - 5	50	0.25	0.27	0.27	0.19	-	-	-	11.2
8	4	8	8	8	10	45	0.26	0.28	0.29	0.19	-	-	-	11.2
8	4	8	8	8	15	41	0.34	0.37	0.38	0.19	-	-	-	11.2
8	4	8	8	8	20	41	0.44	0.48	0.49	0.19	-	-	-	11.2
8	5	8	8	8	< 2	-	0.24	0.40	0.32	0.19	0.19	0.19	0.19	12.0
8	5	8	8	8	2 < 3	50	0.28	0.37	0.35	0.19	-	-	-	12.0
8	5	8	8	8	3 - 5	45	0.23	0.29	0.30	0.19	-	-	-	12.0
8	5	8	8	8	10	45	0.23	0.31	0.32	0.19	-	-	-	12.0
8	5	8	8	8	15	41	0.30	0.41	0.42	0.19	-	-	-	12.0
8	5	8	8	8	20	41	0.39	0.52	0.54	0.19	-	-	-	12.0
8	6	8	8	8	< 2	-	0.22	0.42	0.35	0.19	0.19	0.19	0.19	12.8
8	6	8	8	8	2 < 3	50	0.25	0.40	0.38	0.19	-	-	-	12.8
8	6	8	8	8	3 - 5	50	0.21	0.32	0.33	0.19	-	-	-	12.8
8	6	8	8	8	10	45	0.22	0.33	0.34	0.19	-	-	-	12.8
8	6	8	8	8	15	41	0.28	0.43	0.45	0.19	-	-	-	12.8
8	6	8	8	8	20	41	0.36	0.55	0.57	0.19	-	-	-	12.8
8	7	8	8	8	< 2	-	0.20	0.44	0.37	0.19	0.19	0.19	0.19	13.6
8	7	8	8	8	2 < 3	55	0.23	0.43	0.41	0.19	-	-	-	13.6
8	7	8	8	8	3 - 5	55	0.19	0.34	0.35	0.19	-	-	-	13.6
8	7	8	8	8	10	50	0.20	0.34	0.36	0.19	-	-	-	13.6
8	7	8	8	8	15	41	0.26	0.45	0.47	0.19	-	-	-	13.6
8	7	8	8	8	20	41	0.33	0.57	0.60	0.19	-	-	-	13.6
8	8	8	8	8	< 2	-	0.20	0.45	0.40	0.19	0.19	0.19	0.19	14.4
8	8	8	8	8	2 < 3	65	0.21	0.45	0.44	0.19	-	-	-	14.4
8	8	8	8	8	3 - 5	65	0.19	0.36	0.38	0.19	-	-	-	14.4
8	8	8	8	8	10	55	0.19	0.35	0.38	0.19	-	-	-	14.4
8	8	8	8	8	15	45	0.24	0.46	0.49	0.19	-	-	-	14.4
8	8	8	8	8	20	45	0.31	0.59	0.62	0.19	-	-	-	14.4

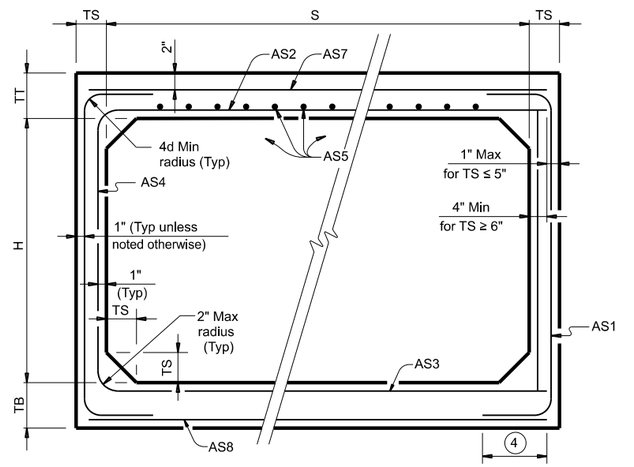
(1) For box length = 8'-0"

(2) AS1 thru AS4, AS7 and AS8 are minimum required areas of reinforcement per linear foot of box length. AS5 is minimum required area of reinforcement per linear foot of box width.



CORNER OPTION "A" CORNER OPTION "B"

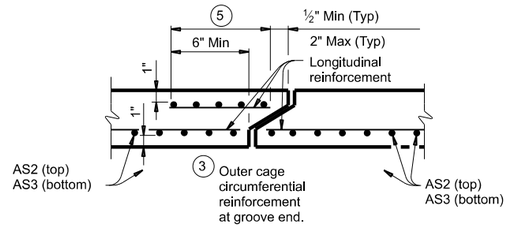
FILL HEIGHT 2 FT AND GREATER



CORNER OPTION "A" CORNER OPTION "B"

FILL HEIGHT LESS THAN 2 FT

(4) Length is equal to spacing of longitudinal reinforcing plus 2". (10" Min) (Typ)



SECTION A-A

(Showing top and bottom slab joint reinforcement.)

MATERIAL NOTES:

Provide 0.03 sq. in./ft. minimum longitudinal reinforcement at each face in slabs and walls. This minimum requirement may be met by the transverse wires when wire mesh reinforcement is used.

Provide Class H concrete (f'_c = 5,000 psi).

GENERAL NOTES:

Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.

See Box Culverts Precast Miscellaneous Details (SCP-MD) standard sheet for details and notes not shown.

In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Submit shop plans for alternate designs in accordance with Item "Precast Concrete Structural Members (Fabrication)".

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

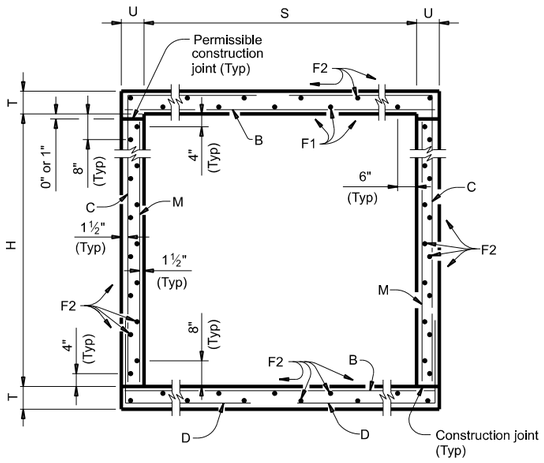
SINGLE BOX CULVERTS PRECAST

8'-0" SPAN

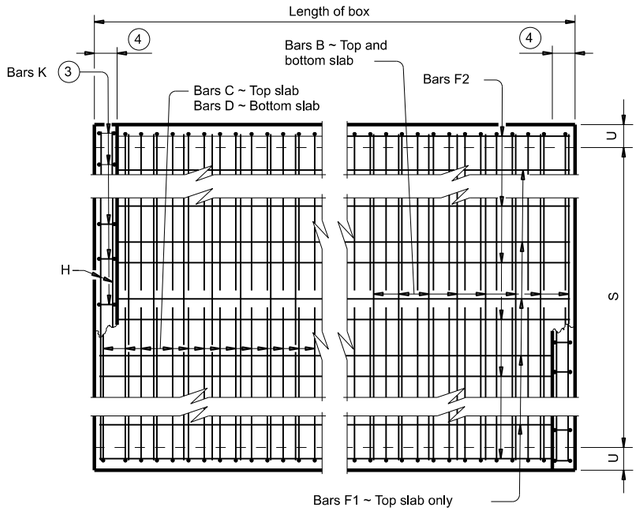
SCP-8

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	21	CAMERON		187

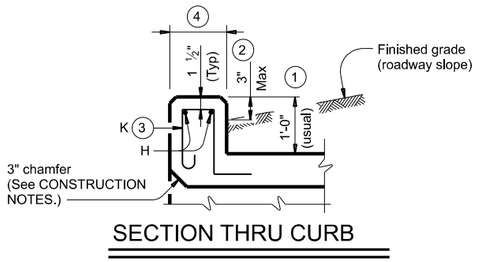
DATE:
FILE:



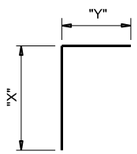
TYPICAL SECTION



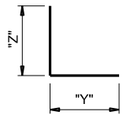
PLAN OF REINF STEEL



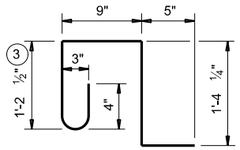
SECTION THRU CURB



BARS C



BARS D



BARS K (#4)
(Spa = 1'-0" Max)
(Length = 4'-2")

1. 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Rail Anchorage Curb (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.

2. For vehicle safety, the following requirements must be met:
   · For structures without bridge rail, construct curbs no more than 3" above finished grade.
   · For structures with bridge rail, construct curbs flush with finished grade.
   Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

3. For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.

4. 1'-0" typical. 2'-3" when the Rail Anchorage Curb (RAC) standard sheet is referred to elsewhere in the plans.

The Contractor may replace Bars B, C, D, E, F1, F2, M, Y, and/or Z with deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes. The lap length required for WWR is never less than the lap length required for uncoated #4 bars.

Example conversion: Replacing No. 6 Gr 60 at 6" Spacing with WWR.
Required WWR = (0.44 sq. in. per 0.5 ft.) x (60 ksi / 70 ksi) = 0.755 sq. in. per ft.
If D30.6 wire is used to meet the 0.755 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.755 sq. in. per ft.) x (12 in. per ft.) = 4.86" Max spacing. Required lap length for the provided D30.6 wire is 2'-1" (the same minimum lap length required for uncoated #5 bars, as listed under MATERIAL NOTES).

CONSTRUCTION NOTES:

Do not use permanent forms.
Chamfer the bottom edge of the top slab 3" at the entrance.
Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised, Bars C and D may be reversed.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
Provide Class C concrete (f'c = 3,600 psi) for culvert barrel and curb, with the following exceptions: provide Class S concrete (f'c = 4,000 psi) for top slabs of:
· culverts with overlay,
· culverts with 1-to-2 course surface treatment, or
· culverts with the top slab as the final riding surface.
Provide bar laps, where required, as follows:
· Uncoated or galvanized ~ #4 = 1'-8" Min
· Uncoated or galvanized ~ #5 = 2'-1" Min
· Uncoated or galvanized ~ #6 = 2'-6" Min

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications for the range of fill heights shown.
See the Single Box Culverts Cast-In-Place Miscellaneous Detail (SCC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

SINGLE BOX CULVERTS CAST-IN-PLACE

0' TO 30' FILL

SCC-8

FILE:	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
04/2021 Updated X values.	DIST	COUNTY		SHEET NO.
	21	CAMERON		188

DATE:
FILE:

SECTION DIMENSIONS				⑤ FILL HEIGHT	BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																												QUANTITIES					
					Bars B					Bars C							Bars D							Bars M ~ #4				Bars F1 ~ #4 at 18" Spa			Bars F2 ~ #4 at 18" Spa			Bars H 4 ~ #4		Bars K		Per Foot of Barrel		Curb		Total	
S	H	T	U		No.	Size	Spa	Length	Weight	No.	Size	Spa	Length	Weight	" X "	" Y "	No.	Size	Spa	Length	Weight	" Y "	" Z "	No.	Spa	Length	Weight	No.	Length	Wt	No.	Length	Weight	Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)
8' - 0"	3' - 0"	8"	7"	13'	162	#6	6"	8' - 11"	2,170	108	#6	9"	8' - 8"	1,406	3' - 6"	5' - 2"	108	#6	9"	8' - 3"	1,338	5' - 2"	3' - 1"	108	9"	3' - 0"	216	6	39' - 9"	159	32	39' - 9"	850	8' - 11"	24	20	56	0.582	153.5	0.7	80	24.0	6,219
8' - 0"	3' - 0"	8"	7"	16'	162	#6	6"	8' - 11"	2,170	108	#6	9"	8' - 8"	1,406	3' - 6"	5' - 2"	108	#6	9"	8' - 3"	1,338	5' - 2"	3' - 1"	108	9"	3' - 0"	216	6	39' - 9"	159	32	39' - 9"	850	8' - 11"	24	20	56	0.582	153.5	0.7	80	24.0	6,219
8' - 0"	3' - 0"	10"	8"	20'	162	#6	6"	9' - 1"	2,210	108	#6	9"	8' - 10"	1,433	3' - 8"	5' - 2"	108	#6	9"	8' - 5"	1,365	5' - 2"	3' - 3"	82	12"	3' - 0"	164	6	39' - 9"	159	32	39' - 9"	850	9' - 1"	24	22	61	0.724	154.5	0.7	85	29.6	6,266
8' - 0"	3' - 0"	11"	8"	23'	162	#6	6"	9' - 1"	2,210	108	#6	9"	8' - 11"	1,446	3' - 9"	5' - 2"	108	#6	9"	8' - 6"	1,379	5' - 2"	3' - 4"	82	12"	3' - 0"	164	6	39' - 9"	159	32	39' - 9"	850	9' - 1"	24	22	61	0.782	155.2	0.7	85	32.0	6,293
8' - 0"	3' - 0"	13"	9"	30'	162	#6	6"	9' - 3"	2,251	108	#6	9"	9' - 2"	1,487	3' - 11"	5' - 3"	108	#6	9"	8' - 9"	1,419	5' - 3"	3' - 6"	108	9"	3' - 0"	216	6	39' - 9"	159	32	39' - 9"	850	9' - 3"	25	22	61	0.929	159.6	0.7	86	37.9	6,468
8' - 0"	4' - 0"	8"	7"	13'	162	#6	6"	8' - 11"	2,170	108	#6	9"	9' - 8"	1,568	4' - 6"	5' - 2"	108	#6	9"	8' - 3"	1,338	5' - 2"	3' - 1"	108	9"	4' - 0"	289	6	39' - 9"	159	32	39' - 9"	850	8' - 11"	24	20	56	0.626	159.4	0.7	80	25.7	6,454
8' - 0"	4' - 0"	8"	7"	16'	162	#6	6"	8' - 11"	2,170	108	#6	9"	9' - 8"	1,568	4' - 6"	5' - 2"	108	#6	9"	8' - 3"	1,338	5' - 2"	3' - 1"	108	9"	4' - 0"	289	6	39' - 9"	159	32	39' - 9"	850	8' - 11"	24	20	56	0.626	159.4	0.7	80	25.7	6,454
8' - 0"	4' - 0"	10"	8"	20'	162	#6	6"	9' - 1"	2,210	108	#6	9"	9' - 10"	1,595	4' - 8"	5' - 2"	108	#6	9"	8' - 5"	1,365	5' - 2"	3' - 3"	82	12"	4' - 0"	219	6	39' - 9"	159	32	39' - 9"	850	9' - 1"	24	22	61	0.774	160.0	0.7	85	31.6	6,483
8' - 0"	4' - 0"	11"	8"	23'	162	#6	6"	9' - 1"	2,210	108	#6	9"	9' - 11"	1,609	4' - 9"	5' - 2"	108	#6	9"	8' - 6"	1,379	5' - 2"	3' - 4"	82	12"	4' - 0"	219	6	39' - 9"	159	32	39' - 9"	850	9' - 1"	24	22	61	0.831	160.7	0.7	85	33.9	6,511
8' - 0"	4' - 0"	13"	9"	30'	162	#6	6"	9' - 3"	2,251	108	#6	9"	10' - 2"	1,649	4' - 11"	5' - 3"	108	#6	9"	8' - 9"	1,419	5' - 3"	3' - 6"	108	9"	4' - 0"	289	6	39' - 9"	159	32	39' - 9"	850	9' - 3"	25	22	61	0.985	165.4	0.7	86	40.1	6,703
8' - 0"	5' - 0"	8"	7"	13'	162	#6	6"	8' - 11"	2,170	108	#6	9"	10' - 8"	1,730	5' - 6"	5' - 2"	108	#6	9"	8' - 3"	1,338	5' - 2"	3' - 1"	108	9"	5' - 0"	361	6	39' - 9"	159	36	39' - 9"	956	8' - 11"	24	20	56	0.669	167.9	0.7	80	27.4	6,794
8' - 0"	5' - 0"	8"	7"	16'	162	#6	6"	8' - 11"	2,170	108	#6	9"	10' - 8"	1,730	5' - 6"	5' - 2"	108	#6	9"	8' - 3"	1,338	5' - 2"	3' - 1"	108	9"	5' - 0"	361	6	39' - 9"	159	36	39' - 9"	956	8' - 11"	24	20	56	0.669	167.9	0.7	80	27.4	6,794
8' - 0"	5' - 0"	10"	8"	20'	162	#6	6"	9' - 1"	2,210	108	#6	9"	10' - 10"	1,757	5' - 8"	5' - 2"	108	#6	9"	8' - 5"	1,365	5' - 2"	3' - 3"	82	12"	5' - 0"	274	6	39' - 9"	159	36	39' - 9"	956	9' - 1"	24	22	61	0.823	168.0	0.7	85	33.6	6,806
8' - 0"	5' - 0"	11"	8"	23'	162	#6	6"	9' - 1"	2,210	108	#6	9"	10' - 11"	1,771	5' - 9"	5' - 2"	108	#6	9"	8' - 6"	1,379	5' - 2"	3' - 4"	82	12"	5' - 0"	274	6	39' - 9"	159	36	39' - 9"	956	9' - 1"	24	22	61	0.881	168.7	0.7	85	35.9	6,834
8' - 0"	5' - 0"	13"	9"	30'	162	#6	6"	9' - 3"	2,251	108	#6	9"	11' - 2"	1,811	5' - 11"	5' - 3"	108	#6	9"	8' - 9"	1,419	5' - 3"	3' - 6"	108	9"	5' - 0"	361	6	39' - 9"	159	36	39' - 9"	956	9' - 3"	25	22	61	1.040	173.9	0.7	86	42.3	7,043
8' - 0"	6' - 0"	8"	7"	13'	162	#6	6"	8' - 11"	2,170	108	#6	9"	11' - 8"	1,893	6' - 6"	5' - 2"	108	#6	9"	8' - 3"	1,338	5' - 2"	3' - 1"	108	9"	6' - 0"	433	6	39' - 9"	159	40	39' - 9"	1,062	8' - 11"	24	20	56	0.712	176.4	0.7	80	29.2	7,135
8' - 0"	6' - 0"	8"	7"	16'	162	#6	6"	8' - 11"	2,170	108	#6	9"	11' - 8"	1,893	6' - 6"	5' - 2"	108	#6	9"	8' - 3"	1,338	5' - 2"	3' - 1"	108	9"	6' - 0"	433	6	39' - 9"	159	40	39' - 9"	1,062	8' - 11"	24	20	56	0.712	176.4	0.7	80	29.2	7,135
8' - 0"	6' - 0"	10"	8"	20'	162	#6	6"	9' - 1"	2,210	108	#6	9"	11' - 10"	1,920	6' - 8"	5' - 2"	108	#6	9"	8' - 5"	1,365	5' - 2"	3' - 3"	82	12"	6' - 0"	329	6	39' - 9"	159	40	39' - 9"	1,062	9' - 1"	24	22	61	0.872	176.1	0.7	85	35.6	7,130
8' - 0"	6' - 0"	11"	8"	23'	162	#6	6"	9' - 1"	2,210	108	#6	9"	11' - 11"	1,933	6' - 9"	5' - 2"	108	#6	9"	8' - 6"	1,379	5' - 2"	3' - 4"	82	12"	6' - 0"	329	6	39' - 9"	159	40	39' - 9"	1,062	9' - 1"	24	22	61	0.930	176.8	0.7	85	37.9	7,157
8' - 0"	6' - 0"	13"	9"	30'	162	#6	6"	9' - 3"	2,251	108	#6	9"	12' - 2"	1,974	6' - 11"	5' - 3"	108	#6	9"	8' - 9"	1,419	5' - 3"	3' - 6"	108	9"	6' - 0"	433	6	39' - 9"	159	40	39' - 9"	1,062	9' - 3"	25	22	61	1.096	182.5	0.7	86	44.5	7,384
8' - 0"	7' - 0"	8"	7"	13'	162	#6	6"	8' - 11"	2,170	108	#6	9"	12' - 8"	2,055	7' - 6"	5' - 2"	108	#6	9"	8' - 3"	1,338	5' - 2"	3' - 1"	108	9"	7' - 0"	505	6	39' - 9"	159	40	39' - 9"	1,062	8' - 11"	24	20	56	0.755	182.2	0.7	80	30.9	7,369
8' - 0"	7' - 0"	8"	7"	16'	162	#6	6"	8' - 11"	2,170	162	#6	6"	12' - 8"	3,082	7' - 6"	5' - 2"	162	#6	6"	8' - 3"	2,007	5' - 2"	3' - 1"	108	9"	7' - 0"	505	6	39' - 9"	159	40	39' - 9"	1,062	8' - 11"	24	20	56	0.755	224.6	0.7	80	30.9	9,065
8' - 0"	7' - 0"	10"	8"	20'	162	#6	6"	9' - 1"	2,210	162	#6	6"	12' - 10"	3,123	7' - 8"	5' - 2"	162	#6	6"	8' - 5"	2,048	5' - 2"	3' - 3"	82	12"	7' - 0"	383	6	39' - 9"	159	40	39' - 9"	1,062	9' - 1"	24	22	61	0.922	224.6	0.7	85	37.6	9,070
8' - 0"	7' - 0"	11"	8"	23'	162	#6	6"	9' - 1"	2,210	162	#6	6"	12' - 11"	3,143	7' - 9"	5' - 2"	162	#6	6"	8' - 6"	2,068	5' - 2"	3' - 4"	82	12"	7' - 0"	383	6	39' - 9"	159	40	39' - 9"	1,062	9' - 1"	24	22	61	0.979	225.6	0.7	85	39.8	9,110
8' - 0"	7' - 0"	13"	9"	30'	162	#6	6"	9' - 3"	2,251	162	#6	6"	13' - 2"	3,204	7' - 11"	5' - 3"	162	#6	6"	8' - 9"	2,129	5' - 3"	3' - 6"	108	9"	7' - 0"	505	6	39' - 9"	159	40	39' - 9"	1,062	9' - 3"	25	22	61	1.151	232.8	0.7	86	46.7	9,396
8' - 0"	8' - 0"	8"	7"	13'	162	#6	6"	8' - 11"	2,170	108	#6	9"	13' - 8"	2,217	8' - 6"	5' - 2"	108	#6	9"	8' - 3"	1,338	5' - 2"	3' - 1"	108	9"	8' - 0"	577	6	39' - 9"	159	44	39' - 9"	1,168	8' - 11"	24	20	56	0.798	190.7	0.7	80	32.6	7,709
8' - 0"	8' - 0"	8"	7"	16'	162	#6	6"	8' - 11"	2,170	162	#6	6"	13' - 8"	3,325	8' - 6"	5' - 2"	162	#6	6"	8' - 3"	2,007	5' - 2"	3' - 1"	108	9"	8' - 0"	577	6	39' - 9"	159	44	39' - 9"	1,168	8' - 11"	24	20	56	0.798	235.2	0.7	80	32.6	9,486
8' - 0"	8' - 0"	10"	8"	20'	162	#6	6"	9' - 1"	2,210	162	#6	6"	13' - 10"	3,366	8' - 8"	5' - 2"	162	#6	6"	8' - 5"	2,048	5' - 2"	3' - 3"	108	9"	8' - 0"	577	6	39' - 9"	159	44	39' - 9"	1,168	9' - 1"	24	22	61	0.971	238.2	0.7	85	39.5	9,613
8' - 0"	8' - 0"	11"	8"	23'	162	#6	6"	9' - 1"	2,210	162	#6	6"	13' - 11"	3,386	8' - 9"	5' - 2"	162	#6	6"	8' - 6"	2,068	5' - 2"	3' - 4"	162	6"	8' - 0"	866	6	39' - 9"	159	44	39' - 9"	1,168	9' - 1"	24	22	61	1.029	246.4	0.7	85	41.8	9,942
8' - 0"	8' - 0"	13"	9"	30'	162	#6	6"	9' - 3"	2,251	162	#6	6"	14' - 2"	3,447	8' - 11"	5' - 3"	162	#6	6"	8' - 9"	2,129	5' - 3"	3' - 6"	162	6"	8' - 0"	866	6	39' - 9"	159	44	39' - 9"	1,168	9' - 3"	25	22	61	1.207	250.5	0.7	86	49.0	10,106

⑤ For direct traffic culverts (fill height ≤ 2 ft.), identify the required box size and select the option with the minimum fill height.

HL93 LOADING SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

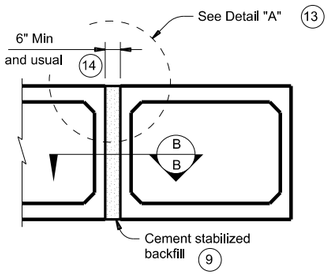
SINGLE BOX CULVERTS CAST-IN-PLACE

0' TO 30' FILL

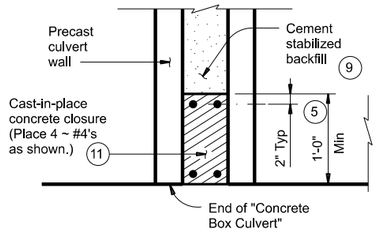
SCC-8

FILE:	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
04/2021 Updated X values.	DIST	COUNTY		SHEET NO.
	21	CAMERON		189

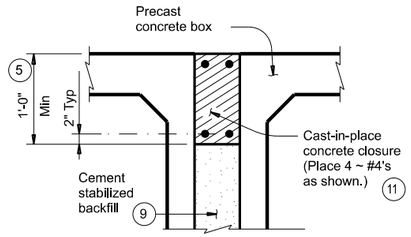
DATE:
FILE:



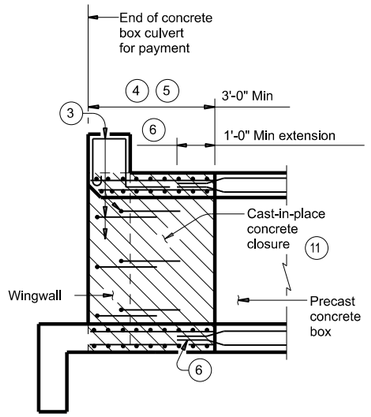
MULTIPLE UNIT PLACEMENT



SECTION B-B

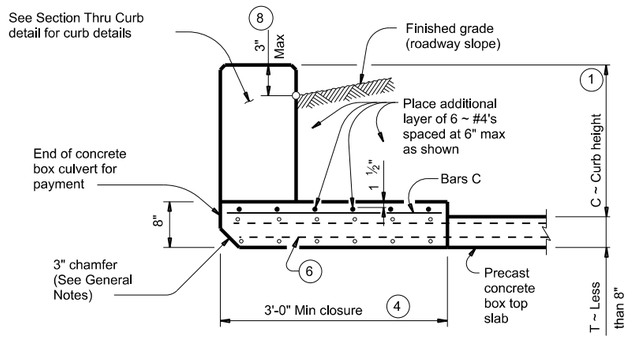


DETAIL "A" (13)

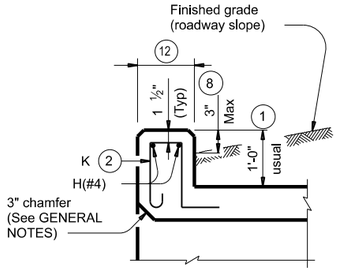


WINGWALL CONNECTION

(Also applies to safety end treatment.)

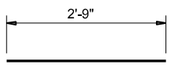


SECTION THRU TOP SLABS LESS THAN 8"

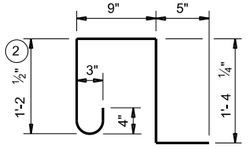


SECTION THRU CURB

QUANTITIES PER FOOT OF CURB (10)	
Reinforcing Steel	4.12 Lb
Concrete	0.037 CY



BARS C (#4)
(Spa = 1'-0" Max)



BARS K (#4)
(Spa = 1'-0" Max)
(Length = 4'-2")

1 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail, or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.

2 For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.

3 Extend curb, wingwall, or safety end treatment reinforcing into concrete closure. Bend or trim, as necessary, any reinforcing that does not fit into closure area.

4 Provide a 3'-0" Min cast-in-place concrete closure. Break back boxes in the field or cast boxes short. Provide bands of reinforcing in the closure that are the same size and spacing as in the precast box section. Provide #4 longitudinal reinforcement spaced at 12 inches Max within the closure. Except where shown otherwise, construct the cast-in-place closure flush with the inside and outside faces of the precast box section.

5 For multiple unit placements, adjust the length of the closure for the interior walls as necessary. Provide a 3'-0" Min cast-in-place closure in the top slab, bottom slab, and exterior wall. See Section B-B detail when interior walls are cast full length.

6 Extend precast box reinforcing a minimum of 1'-0" into concrete closure (Typ).

7 Place bands of reinforcing matching the inside and outside face reinforcing in the gaps of the top and bottom slabs. Place a band matching the outside face reinforcing of the wall in the gaps of the walls (placed in the outside face only). Tack weld the bands to the exposed reinforcing at each point of contact.

8 For vehicle safety, the following requirements must be met:
- For structures without bridge rail, construct curbs no more than 3" above finished grade.
- For structures with bridge rail, construct curbs flush with finished grade.

Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

9 Cement stabilized backfill between boxes is considered part of the box culvert for payment.

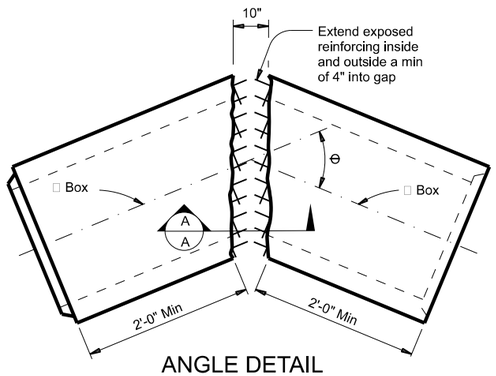
10 All curb concrete and reinforcing is considered part of the box culvert for payment.

11 Any additional concrete and reinforcing required for the closures will be considered subsidiary to the box culvert for payment.

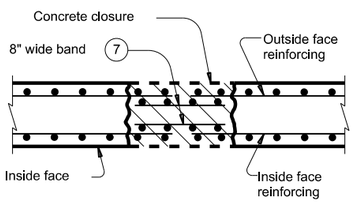
12 1'-0" typical. 2'-3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.

13 For multiple unit placement with overlay, with 1 to 2 course surface treatment, or with the top slab as the final riding surface, provide wall closure as shown in Detail "A".

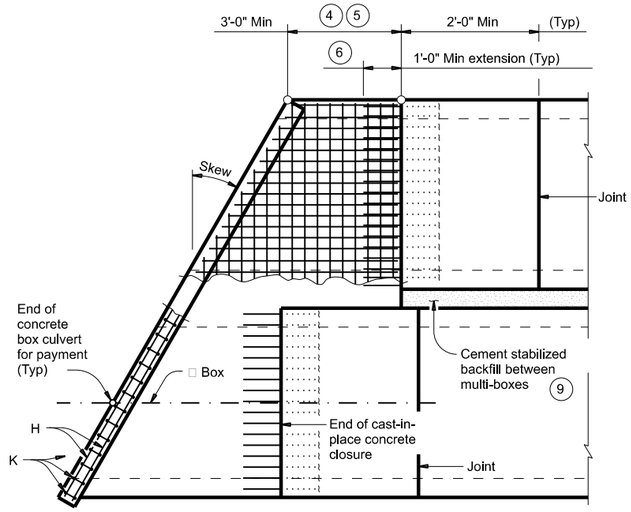
14 This dimension may be increased with approval of the Engineer to allow the precast boxes to be tunneled or jacked in accordance with Item 476, "Jacking, Boring, or Tunneling Pipe or Box." No payment will be made for any additional material in the gap between adjacent boxes.



ANGLE DETAIL



SECTION A-A



PLAN OF SKEWED ENDS

(Showing multi-box placement.)

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
Provide ASTM A1064 welded wire reinforcement.
Provide Class C concrete (f'c = 3,600 psi) for the closures.
Provide cement stabilized backfill meeting the requirements of Item 400, "Excavation and Backfill for Structures."
Any additional concrete required for the closures will be considered subsidiary to the box culvert.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
Refer to the Single Box Culverts Precast (SCP) standard sheets for details and notes not shown.
Chamfer the bottom edge of the top slab closure 3 inches at culvert closure ends.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bars dimensions are out-to-out of bars.

HL93 LOADING

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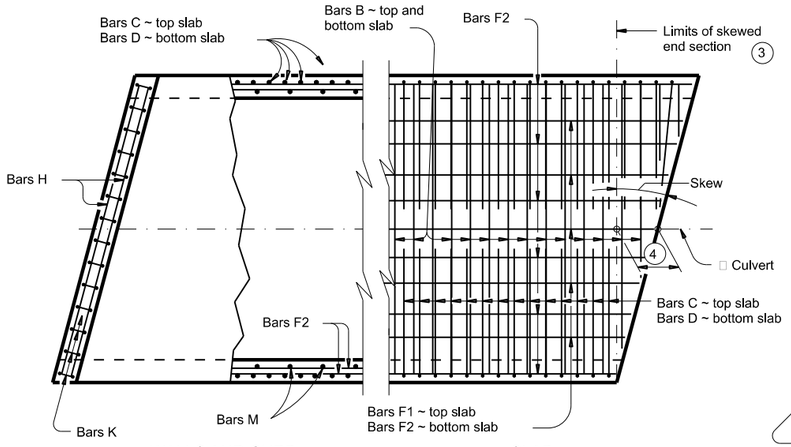
Bridge Division Standard

BOX CULVERTS PRECAST MISCELLANEOUS DETAILS

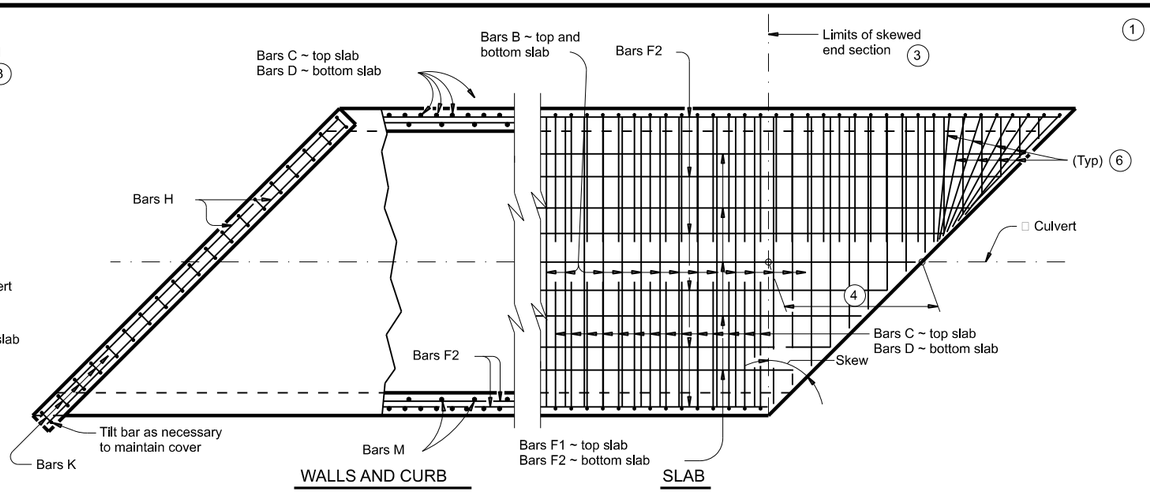
SCP-MD

FILE:	DN: GAF	CK: LMW	DW: BWH/TxDOT	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		190

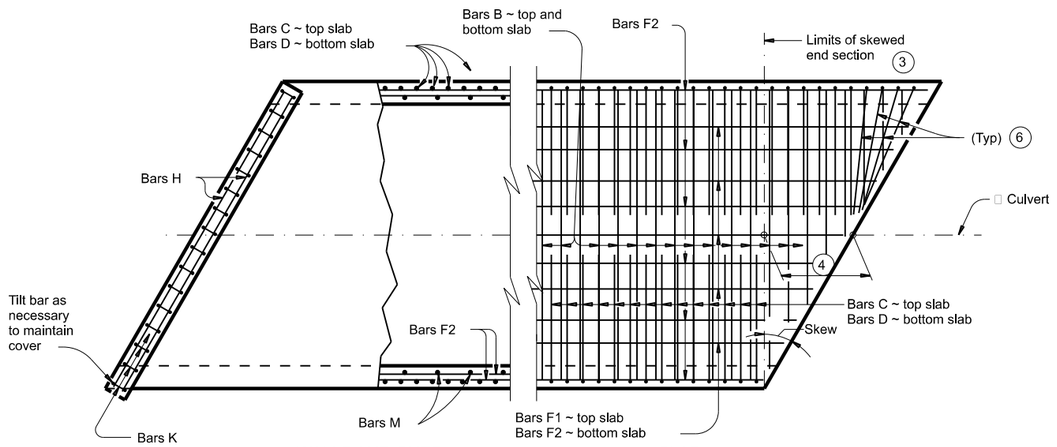
DATE:
FILE:



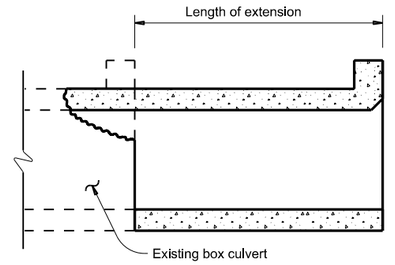
PLAN OF SKEWED ENDS ~ FROM 0° TO 15° (7)



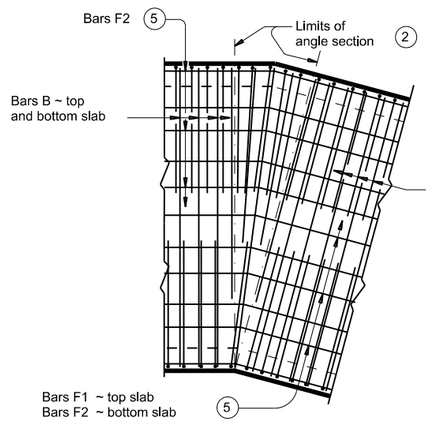
PLAN OF SKEWED ENDS ~ OVER 30° TO 45°



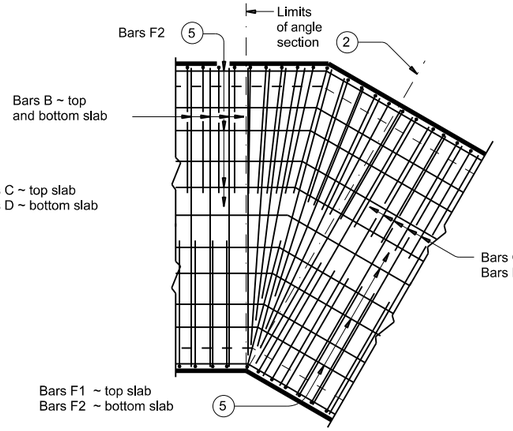
PLAN OF SKEWED ENDS ~ OVER 15° TO 30°



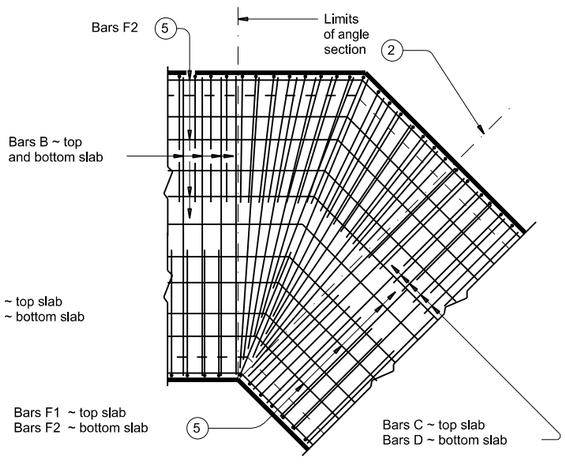
LENGTHENING DETAIL (1)



PLAN OF ANGLE SECTION ~ FROM 0° TO 15°



PLAN OF ANGLE SECTION ~ OVER 15° TO 30°



PLAN OF ANGLE SECTION ~ OVER 30° TO 45°

(1) For skewed box culverts with less than 2'-0" of fill, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension.

For non-skewed box culverts with less than 2'-0" of fill and for skewed or non-skewed culverts with a fill depth of 2'-0" or greater, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension. Alternatively, if the box is non-skewed, embed #6 anchor bars with a Type III, C, D , E, or F anchor adhesive into the existing walls, top and bottom slab at 1'-6" center-to-center spacing. Minimum embedment depth is 8". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, Nba, of 26.4 kips. Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing." Test adhesive anchors in accordance with Item 450.3.3, "Tests." Test 3 anchors per 100 anchors installed.

Break back wings and apron as necessary to install the extension. Clean and extend the exposed wingwall and apron reinforcing into the extension. When lengthening existing box culverts with dimensions different than current standard dimensions, form horizontal and vertical transitions as directed by the Engineer. Match bottom slabs to maintain an uninterrupted flow line. Field bend existing and new reinforcing into transitions and maintain specified cover requirements. For top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface, adjust the "H" dimension to provide a smooth riding surface.

(2) When the spacing between Bars B becomes less than half of the normal spacing, cut bars to avoid conflict.

(3) The length of Bars B vary in the skewed end sections.

(4) [One half of overall width] x [tangent of the skew angle]

(5) Place Bars F1 and F2 continuously through the angle section. Bend Bars F1 and F2 to remain parallel to the walls of the box culvert.

(6) When necessary to avoid conflict in acute corners, shorten the slab extension leg of Bars C and Bars D to a minimum of 1'-6" for skews of 30° thru 45°.

(7) At the Contractor's option, for skews of 15° or less, place Bars B, C, and D parallel to the skewed end while maintaining spacing along centerline of box. Increase lengths of Bars B shown on the Single Box Culverts Cast-In-Place (SCC) standards sheets to accommodate the skew.

CONSTRUCTION NOTES:

Do not use permanent forms.
When required, lap Bars H 1'-8" for uncoated or galvanized bars.
Provide a minimum of 1 ½" clear cover.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel, if required elsewhere in the plans.
Provide Class C concrete (f'c = 3,600 psi) with these exceptions:
provide Class S concrete (f'c = 4,000 psi) for top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

Refer to Single Box Culverts Cast-in-Place (SCC) standard sheets for details of straight sections of culvert.

For skewed sections and angle sections, refer to Single Box Culverts Cast-in-Place (SCC) standard sheets for slab and wall dimensions, bar sizes, maximum bar spacing, and any other details not shown.

For skewed ends with curbs, adjust length of Bars H, number of Bars K, curb concrete volume, and reinforcing steel weight by dividing the values shown on the culvert Single Box Culverts Cast-In-Place (SCC) standard sheets by the cosine of the skew angle.

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

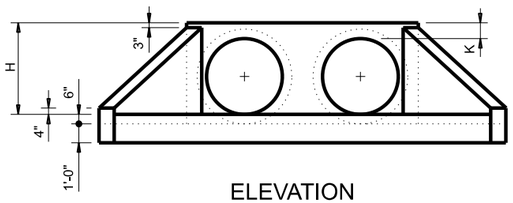
SINGLE BOX CULVERTS CAST-IN-PLACE MISCELLANEOUS DETAILS

SCC-MD

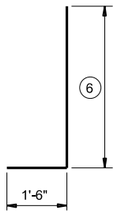
FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		191

TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL (5)

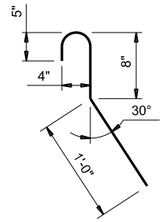
Slope	Dia of Pipe (D)	Values for One Pipe W	X	Y	L	Reinf (Lbs)	Conc (CY) (1)	Values to be Added for Each Addt'l Pipe X and W	Reinf (Lbs)	Conc (CY) (1)
2:1	12"	4' - 7 ½"	2' - 6"	2' - 10"	3' - 3 ¼"	88	0.6	1' - 9"	20	0.2
	15"	5' - 5 ¾"	2' - 9 ½"	3' - 4"	3' - 10 ¼"	103	0.7	2' - 2"	24	0.3
	18"	6' - 4 ¼"	3' - 1"	3' - 10"	4' - 5"	124	0.9	2' - 8"	32	0.3
	21"	7' - 2 ¾"	3' - 4 ½"	4' - 4"	5' - 0"	143	1.1	3' - 1"	43	0.4
	24"	8' - 2 ½"	3' - 9 ½"	4' - 10"	5' - 7"	164	1.3	3' - 7"	50	0.5
	27"	9' - 1"	4' - 1"	5' - 4"	6' - 2"	179	1.5	3' - 11"	56	0.6
	30"	9' - 11 ½"	4' - 4 ½"	5' - 10"	6' - 8 ¾"	203	1.7	4' - 4"	65	0.8
	33"	10' - 10"	4' - 8"	6' - 4"	7' - 3 ¾"	224	2.0	4' - 8"	71	0.9
	36"	11' - 8 ¼"	4' - 11 ½"	6' - 10"	7' - 10 ¾"	249	2.2	5' - 1"	81	1.0
	42"	13' - 5 ¼"	5' - 6 ½"	7' - 10"	9' - 0 ½"	298	2.8	5' - 10"	97	1.3
	48"	15' - 9"	6' - 1 ½"	9' - 4"	10' - 9 ¼"	360	3.8	6' - 7"	117	1.7
	54"	17' - 5 ¾"	6' - 8 ½"	10' - 4"	11' - 11 ¼"	427	4.5	7' - 6"	151	2.1
	60"	19' - 2 ¾"	7' - 3 ½"	11' - 4"	13' - 1"	481	5.3	8' - 3"	174	2.5
	66"	20' - 11 ½"	7' - 10 ½"	12' - 4"	14' - 3"	544	6.2	8' - 9"	194	2.9
	72"	22' - 8 ½"	8' - 5 ½"	13' - 4"	15' - 4 ¾"	601	7.1	9' - 4"	213	3.3
3:1	12"	6' - 3"	2' - 6"	4' - 3"	4' - 11"	118	0.8	1' - 9"	22	0.2
	15"	7' - 5"	2' - 9 ½"	5' - 0"	5' - 9 ¼"	137	1.1	2' - 2"	28	0.3
	18"	8' - 6 ¾"	3' - 1"	5' - 9"	6' - 7 ¾"	170	1.3	2' - 8"	37	0.5
	21"	9' - 8 ¼"	3' - 4 ½"	6' - 6"	7' - 6"	195	1.6	3' - 1"	48	0.6
	24"	11' - 0"	3' - 9 ½"	7' - 3"	8' - 4 ½"	227	2.0	3' - 7"	58	0.7
	27"	12' - 2"	4' - 1"	8' - 0"	9' - 2 ¾"	251	2.3	3' - 11"	67	0.8
	30"	13' - 4"	4' - 4 ½"	8' - 9"	10' - 1 ¼"	293	2.7	4' - 4"	77	1.0
	33"	14' - 5 ¾"	4' - 8"	9' - 6"	10' - 11 ¾"	318	3.1	4' - 8"	84	1.2
	36"	15' - 7 ¾"	4' - 11 ½"	10' - 3"	11' - 10"	351	3.5	5' - 1"	96	1.4
	42"	17' - 11 ½"	5' - 6 ½"	11' - 9"	13' - 6 ¾"	432	4.5	5' - 10"	119	1.7
	48"	21' - 1 ¾"	6' - 1 ½"	14' - 0"	16' - 2"	537	6.1	6' - 7"	146	2.3
	54"	23' - 5 ½"	6' - 8 ½"	15' - 6"	17' - 10 ¾"	630	7.3	7' - 6"	186	2.9
	60"	25' - 9 ¼"	7' - 3 ½"	17' - 0"	19' - 7 ½"	719	8.7	8' - 3"	219	3.4
	66"	28' - 1"	7' - 10 ½"	18' - 6"	21' - 4 ¼"	811	10.1	8' - 9"	242	3.9
	72"	30' - 4 ¾"	8' - 5 ½"	20' - 0"	23' - 1 ¼"	924	11.7	9' - 4"	272	4.4
4:1	12"	7' - 10 ¾"	2' - 6"	5' - 8"	6' - 6 ½"	148	1.1	1' - 9"	24	0.3
	15"	9' - 4"	2' - 9 ½"	6' - 8"	7' - 8 ½"	181	1.5	2' - 2"	32	0.4
	18"	10' - 9 ½"	3' - 1"	7' - 8"	8' - 10 ¼"	221	1.9	2' - 8"	42	0.5
	21"	12' - 2 ¾"	3' - 4 ½"	8' - 8"	10' - 0"	260	2.3	3' - 1"	57	0.7
	24"	13' - 9 ½"	3' - 9 ½"	9' - 8"	11' - 2"	301	2.8	3' - 7"	67	0.9
	27"	15' - 3"	4' - 1"	10' - 8"	12' - 3 ¾"	334	3.3	3' - 11"	77	1.0
	30"	16' - 8 ¼"	4' - 4 ½"	11' - 8"	13' - 5 ¾"	385	3.8	4' - 4"	89	1.3
	33"	18' - 1 ¾"	4' - 8"	12' - 8"	14' - 7 ½"	425	4.5	4' - 8"	101	1.4
	36"	19' - 7"	4' - 11 ½"	13' - 8"	15' - 9 ¼"	472	5.1	5' - 1"	115	1.7
	42"	22' - 5 ¾"	5' - 6 ½"	15' - 8"	18' - 1"	583	6.5	5' - 10"	141	2.1
	48"	26' - 6 ¼"	6' - 1 ½"	18' - 8"	21' - 6 ¾"	730	8.9	6' - 7"	175	2.8
	54"	29' - 5"	6' - 8 ½"	20' - 8"	23' - 10 ¼"	875	10.7	7' - 6"	226	3.6
	60"	32' - 3 ¾"	7' - 3 ½"	22' - 8"	26' - 2"	996	12.7	8' - 3"	264	4.3
	66"	35' - 2 ½"	7' - 10 ½"	24' - 8"	28' - 5 ¾"	1,140	14.9	8' - 9"	300	4.9
	72"	38' - 1 ¼"	8' - 5 ½"	26' - 8"	30' - 9 ½"	1,297	17.3	9' - 4"	334	5.6
6:1	12"	11' - 2"	2' - 6"	8' - 6"	9' - 9 ¾"	224	1.9	1' - 9"	28	0.4
	15"	13' - 2 ¼"	2' - 9 ½"	10' - 0"	11' - 6 ½"	268	2.5	2' - 2"	37	0.5
	18"	15' - 2 ½"	3' - 1"	11' - 6"	13' - 3 ¼"	330	3.2	2' - 8"	50	0.7
	21"	17' - 2 ¾"	3' - 4 ½"	13' - 0"	15' - 0 ¼"	387	3.9	3' - 1"	69	0.9
	24"	19' - 4 ½"	3' - 9 ½"	14' - 6"	16' - 9"	453	4.8	3' - 7"	80	1.2
	27"	21' - 4 ¾"	4' - 1"	16' - 0"	18' - 5 ¾"	512	5.7	3' - 11"	96	1.4
	30"	23' - 5 ¼"	4' - 4 ½"	17' - 6"	20' - 2 ½"	593	6.7	4' - 4"	110	1.7
	33"	25' - 5 ½"	4' - 8"	19' - 0"	21' - 11 ¼"	675	7.8	4' - 8"	127	2.0
	36"	27' - 5 ¾"	4' - 11 ½"	20' - 6"	23' - 8"	735	9.0	5' - 1"	144	2.3
	42"	31' - 6 ¼"	5' - 6 ½"	23' - 6"	27' - 1 ½"	922	11.5	5' - 10"	179	3.0
	48"	37' - 3 ½"	6' - 1 ½"	28' - 0"	32' - 4"	1,191	15.9	6' - 7"	231	4.0
	54"	41' - 4 ¼"	6' - 8 ½"	31' - 0"	35' - 9 ½"	1,424	19.2	7' - 6"	300	5.0
	60"	45' - 4 ¾"	7' - 3 ½"	34' - 0"	39' - 3"	1,631	22.9	8' - 3"	353	6.0



ELEVATION
(Showing dimensions.)



BARS V



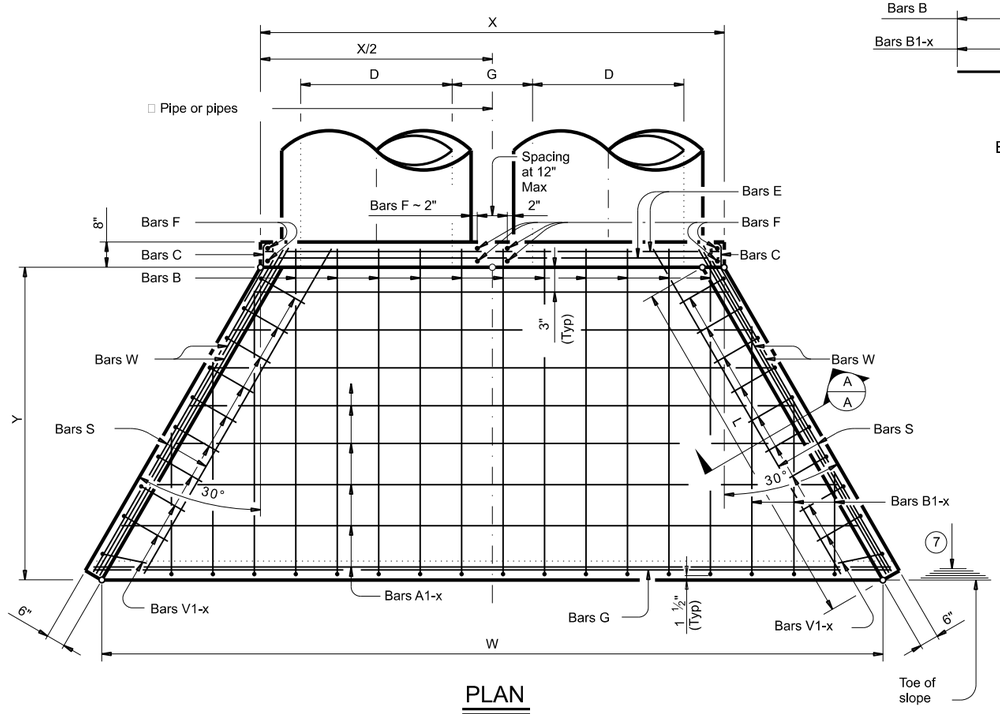
BARS CL
(Length = 2'-5")

TABLE OF REINFORCING STEEL (5)

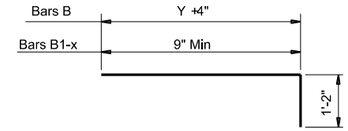
Bar	Size	Spa	No.
A	#4	1' - 0"	~
B	#3	1' - 6"	~
C	#4	1' - 0"	~
D	#3	1' - 0"	~
E	#5	~	4
F	#5	~	~
G	#3	~	2
S	#4	~	6
V	#4	1' - 0"	~
W	#5	~	4

TABLE OF CONSTANT DIMENSIONS

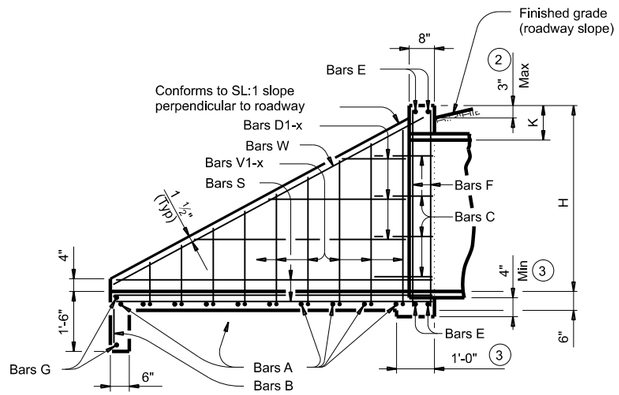
Dia of Pipe (D)	G	K (4)	H
12"	0' - 9"	1' - 0"	2' - 0"
15"	0' - 11"	1' - 0"	2' - 3"
18"	1' - 2"	1' - 0"	2' - 6"
21"	1' - 4"	1' - 0"	2' - 9"
24"	1' - 7"	1' - 0"	3' - 0"
27"	1' - 8"	1' - 0"	3' - 3"
30"	1' - 10"	1' - 0"	3' - 6"
33"	1' - 11"	1' - 0"	3' - 9"
36"	2' - 1"	1' - 0"	4' - 0"
42"	2' - 4"	1' - 0"	4' - 6"
48"	2' - 7"	1' - 3"	5' - 3"
54"	3' - 0"	1' - 3"	5' - 9"
60"	3' - 3"	1' - 3"	6' - 3"
66"	3' - 3"	1' - 3"	6' - 9"
72"	3' - 4"	1' - 3"	7' - 3"



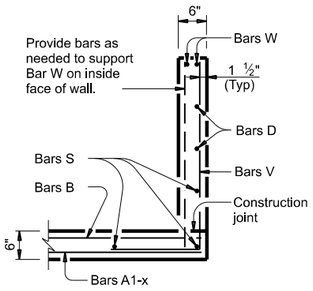
PLAN



BARS B and B1-x



TYPICAL WING ELEVATION



SECTION A-A

(1) Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.

(2) For vehicle safety, construct curbs no more than 3" above finished grade. Reduce curb heights, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

(3) Provide a 1'-0" footing as shown where required to maintain 4" minimum cover for pipes.

(4) Dimensions shown are usual and maximum.

(5) Quantities shown are for one structure end only (one headwall).

(6) Min Length = 6" 3" x $\left(\frac{12 \times H \ 7\text{-}}{12 \times L}\right)$

Max Length = 12 x H 3" x - $\left(\frac{12 \times H \ 7\text{-}}{12 \times L}\right)$ -

(7) Lengths of wings based on SL:1 slope along this line.

MATERIAL NOTES:
Provide Grade 60 reinforcing steel.
Provide Class C concrete (f'c = 3,600 psi).

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
Do not mount bridge rails of any type directly to these culvert headwalls.
This standard may not be used for wall heights, H, exceeding the values shown.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing dimensions are out-to-out of bars.

Texas Department of Transportation

Bridge Division Standard

CONCRETE HEADWALLS
WITH FLARED WINGS FOR 0° SKEW PIPE CULVERTS

CH-FW-0

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		192

DATE: 6/13/2024 10:58:16 AM
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DATE: 6/13/2024 10:58:22 AM
FILE: c:\txdot\pw_online\txdot5\noel.conlu\d0455366\CD-FW0-20.dgn

TABLE OF DIMENSIONS AND REINFORCING STEEL
(Wings for one structure end)

Dimensions					Variable Reinforcing				Estimated Quantities per ft of wing length (2~wings) (3)	
					Bars J1		Bars J2			
Maximum Wingwall Height Hw	W	X	Y	Z	Size	Spa	Size	Spa	Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	33.73	0.248
3'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.07	0.261
3'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.74	0.273
4'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	38.41	0.285
4'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	41.75	0.330
5'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.09	0.343
5'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.75	0.355
6'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	46.42	0.367
7'-0"	3'-8"	1'-9"	1'-3"	7"	#4	1'-0"	#4	1'-0"	52.77	0.414
8'-0"	4'-2"	2'-0"	1'-6"	8"	#5	1'-0"	#4	1'-0"	60.19	0.486
9'-0"	4'-8"	2'-3"	1'-9"	8"	#4	6"	#4	6"	81.49	0.535
10'-0"	5'-2"	2'-6"	2'-0"	8"	#5	6"	#4	6"	97.25	0.584
11'-0"	5'-8"	2'-9"	2'-3"	8"	#6	6"	#5	6"	133.65	0.634
12'-0"	6'-2"	3'-0"	2'-6"	9"	#7	6"	#5	6"	162.29	0.721
13'-0"	6'-8"	3'-3"	2'-9"	11"	#7	6"	#5	6"	178.80	0.856
14'-0"	7'-2"	3'-6"	3'-0"	1'-0"	#8	6"	#5	6"	216.78	0.959
15'-0"	7'-8"	4'-0"	3'-0"	1'-1"	#9	6"	#6	6"	283.06	1.068
16'-0"	8'-2"	4'-6"	3'-0"	1'-3"	#9	6"	#6	6"	297.02	1.234

TABLE OF WINGWALL REINFORCING
(2~wings)

Bar	Size	No.	Spa
D	#5	~	1'-0"
E	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	4	~
M	#4	4	~
P	#4	~	1'-0"
R	#5	6	~
V	#4	~	1'-0"

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES

Bar	Size	No.	Spa
L	#4	~	1'-6"
Q	#4	1	~
Reinf (Lb/Ft)			2.45
Conc (CY/Ft)			0.037

WING DIMENSION FORMULAS:
(All values are in feet.)

Hw = H + T + C - 0.250'
A = (Hw - 0.333') (SL)
B = (A) tangent (30°)
Lw = (A) ÷ cosine (30°)

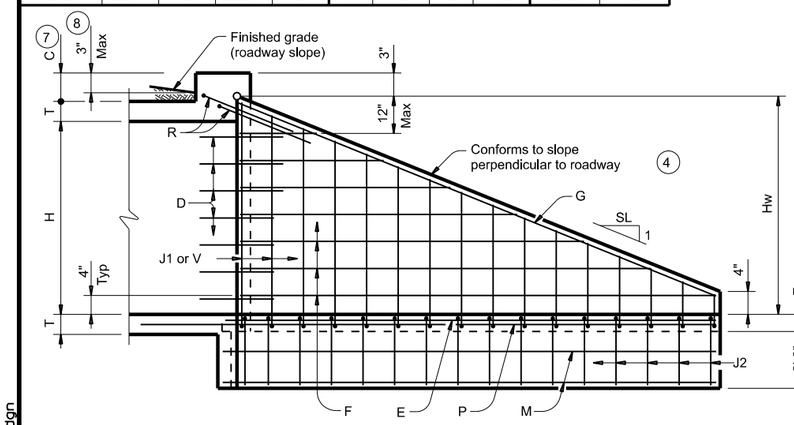
For cast-in-place culverts:
Ltw = (N) (S) + (N + 1) (U)

For precast culverts:
Ltw = (N) (2U + S) + (N - 1) (0.5')

Total wingwall area (two wings ~ SF) = (Hw + 0.333') (Lw)

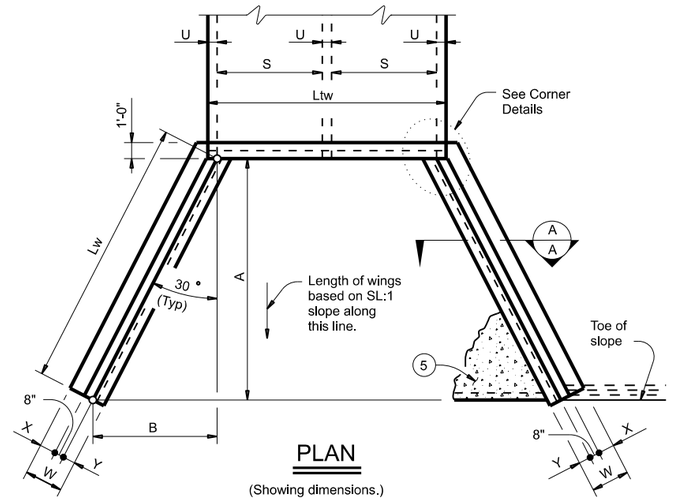
Hw = Height of wingwall
SL:1 = Side slope ratio (horizontal:1 vertical)
Lw = Length of wingwall
Ltw = Culvert toewall length
N = Number of culvert spans

See applicable box culvert standard sheet for H, S, T, and U values.



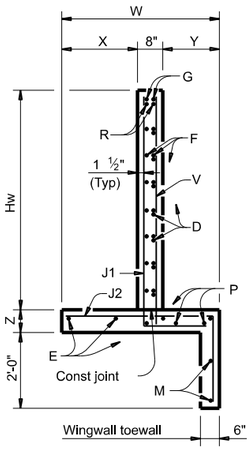
INSIDE ELEVATION

(Showing reinforcing. Culvert and culvert toewall reinforcing not shown for clarity.)

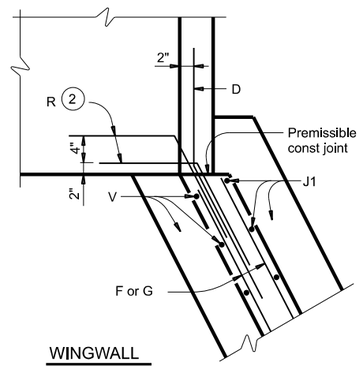


PLAN

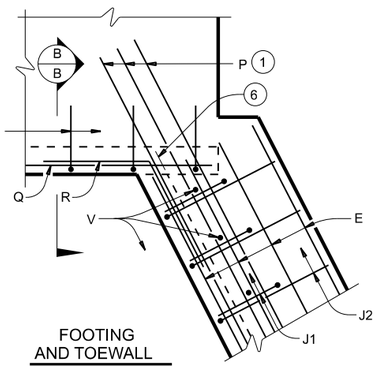
(Showing dimensions.)



SECTION A-A



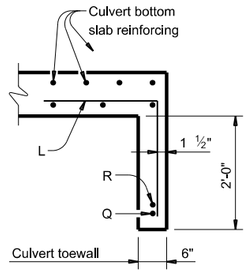
WINGWALL



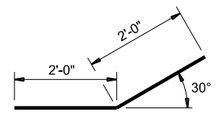
FOOTING AND TOEWALL

CORNER DETAILS

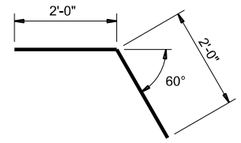
(Culvert and culvert toewall reinforcing not shown for clarity.)



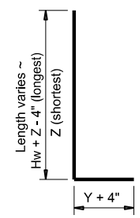
SECTION B-B (5)



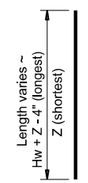
BARS D



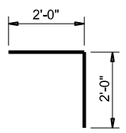
BARS R



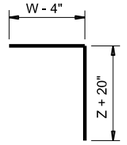
BARS J1



BARS V



BARS L



BARS J2

(1) Extend Bars P 3'-0" minimum into bottom slab of box culvert.

(2) Adjust as necessary to maintain 1 1#2" clear cover and 4" minimum between bars.

(3) Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings, multiply the tabulated values by Lw.

(4) Recommended values of side slope are: 2:1, 3:1, 4:1, and 6:1.

(5) When shown elsewhere on the plans, construct 5" deep concrete riprap. Payment for riprap is as required by Item 432, "Riprap." Unless otherwise shown on the plans or directed by the Engineer, provide a 6" wide by 1'-6" deep reinforced concrete toewall along all edges of the riprap adjacent to natural ground; reinforce the toewall by extending typical riprap reinforcing into the toewall; and extend construction joints or grooved joints oriented in the direction of flow across the full distance of the riprap at intervals of approximately 20'. When such riprap is provided, the culvert toewall shown in SECTION B-B will not be required.

(6) At Contractor's option, culvert toewall may be ended flush with wingwall toewall. Adjust reinforcing as needed.

(7) 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.

(8) For vehicle safety, the following requirements must be met:
- For structures without bridge rail, construct curbs no more than 3" above finished grade.
- For structures with bridge rail, construct curbs flush with finished grade.

Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

MATERIAL NOTES:
Provide Class C concrete (f'c=3,600 psi).
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
In riprap concrete synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing unless noted otherwise.

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.
See Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.
The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing dimensions are out-to-out of bars.

Texas Department of Transportation

Bridge Division Standard

CONCRETE WINGWALLS
WITH FLARED WINGS FOR 0° SKEW BOX CULVERTS

FW-0

FILE:	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
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REVISIONS	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		193

DATE:
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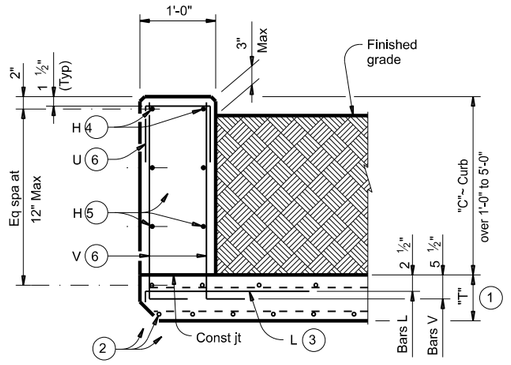
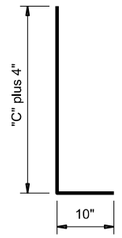
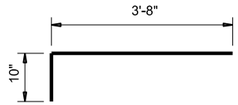


TYPICAL SECTION

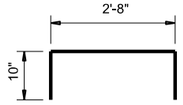
Used for curbs over 1'-0" to 5'-0"



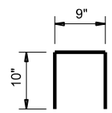
BARS V (#5) (6)
Spaced at 12" Max



BARS L (#5) (3)
Spaced at 12" Max



OPTIONAL BARS L (#5) (3) (7)
Spaced at 12" Max



BARS U (#4) (6)
Spaced at 12" Max

(1) "T" is equal to the culvert top slab thickness. For precast boxes with slabs less than 8" thick, see SCP-MD standard for additional details.

(2) Adjust normal culvert slab bars as necessary to clear obstructions.

(3) Place bars L as shown. Tilt hook as necessary to maintain cover.

(4) Place normal culvert curb bars H(#4) as shown. Adjust as necessary to clear obstructions.

(5) Additional bars H(#4) as required to maintain 12" Max spacing.

(6) Replace normal culvert curb bars K with one bar U and two bars V as shown spaced at 12" Max. Adjust length of bars V as necessary to maintain clear cover.

(7) Optional bars L are to be used only for precast box culverts with 3'-0" closure pour.

(8) Quantities shown are for Contractor's information only. Quantities are per linear foot of curb length. The value in table can be interpolated for intermediate values of curb height, "C". Quantity includes bars K (when applicable).

TABLE OF ESTIMATED CURB QUANTITIES (8)

Curb Height "C"	Conc (CY/LF)	Reinf Steel (Lb/LF)
1'-0"	0.037	10.4
1'-6"	0.056	14.5
2'-0"	0.074	15.6
2'-6"	0.093	18.0
3'-0"	0.111	19.0
3'-6"	0.130	21.3
4'-0"	0.148	22.4
4'-6"	0.167	24.8
5'-0"	0.185	25.9

CONSTRUCTION NOTES:

Adjust reinforcing steel as necessary to provide 1 ¼" cover.
For vehicle safety, top of the curb must not project more than 3" above the finished grade.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
Provide Class "C" concrete (f'c = 3,600 psi) minimum for curbs.
Provide bar laps, where required, as follows:
· Uncoated or galvanized ~ #4 = 1'-8" Min

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
These extended curb details have sufficient strength to allow for future retrofit of Type T631 or T631LS railing. These details are suitable for use with PR11, PR22 and PR3 type rails. These details are not suitable for the mounting of other rail types. For new construction using T631 or T631LS railing, use the T631-CM standard.
This Curb is considered as part of the Box Culvert for payment.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.

Texas Department of Transportation

Bridge Division Standard

EXTENDED CURB DETAILS
FOR BOX CULVERTS WITH CURBS OVER 1'-0" TO 5'-0" TALL

ECD

FILE:	DN: GAF	CK: TxDOT	DW: TxDOT	CK: GAF
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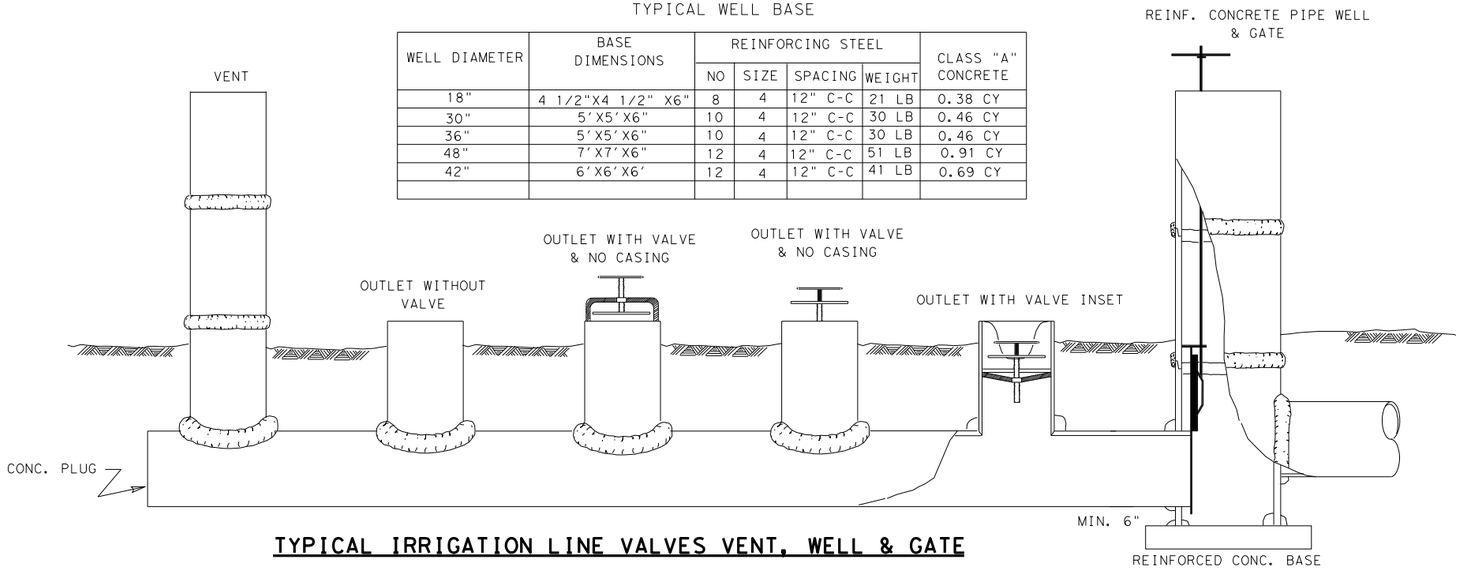
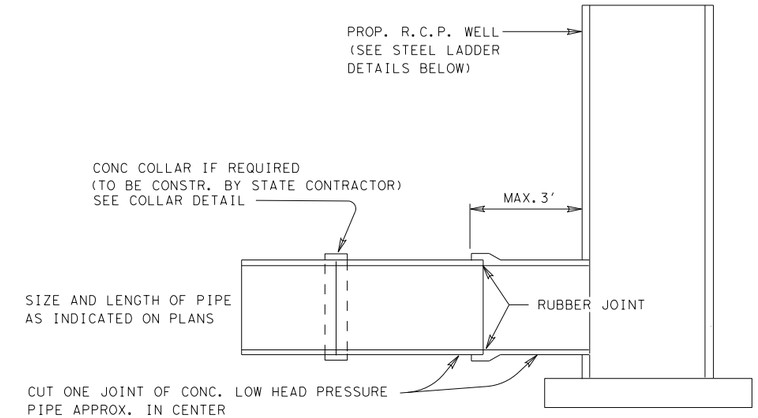
REVISIONS	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	21	CAMERON		194

ESTIMATED QUANTITIES FOR
TYPICAL WELL BASE

WELL DIAMETER	BASE DIMENSIONS	REINFORCING STEEL				CLASS "A" CONCRETE
		NO	SIZE	SPACING	WEIGHT	
18"	4 1/2"X4 1/2" X6"	8	4	12" C-C	21 LB	0.38 CY
30"	5'X5'X6"	10	4	12" C-C	30 LB	0.46 CY
36"	5'X5'X6"	10	4	12" C-C	30 LB	0.46 CY
48"	7'X7'X6"	12	4	12" C-C	51 LB	0.91 CY
42"	6'X6'X6'	12	4	12" C-C	41 LB	0.69 CY



TYPICAL IRRIGATION LINE VALVES VENT, WELL & GATE



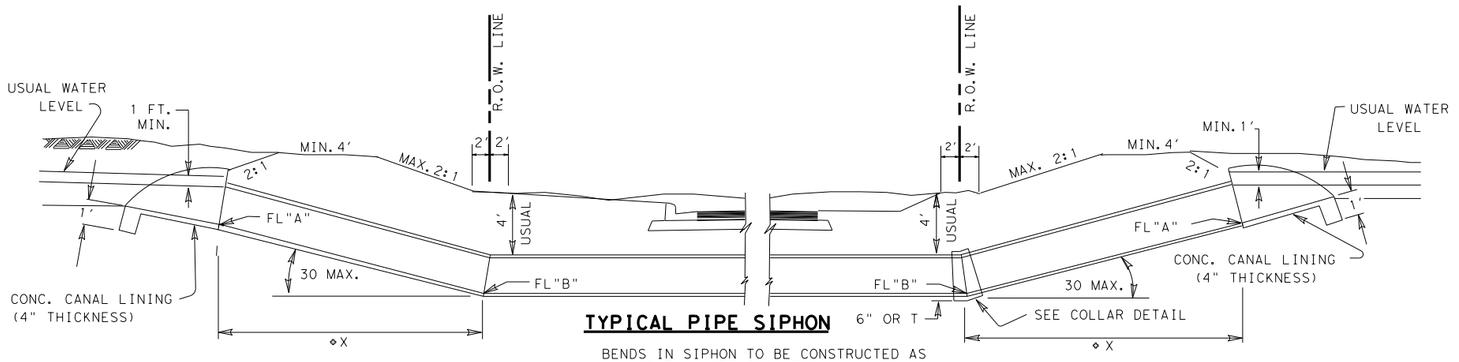
TYPICAL CONC. PIPE WELL DETAILS FOR CONNECTING CONC. LOW HEAD PRESSURE PIPE

GENERAL NOTES

HEIGHT OF RELOCATED WELLS AND VENTS TO BE EQUIVALENT TO THAT OF EXISTING STRUCTURES OR AS REQUIREDFOR PROPER OPERATION.

CONCRETE REQUIRED FOR BASE, PLUGS, OR CAPS WILL NOT BE PAID FOR DIRECTLY BUT SHALL BE CONSIDERED AS SUB-SIDIARY TO THE VARIOUS BID ITEMS OF THIS CONTRACT.

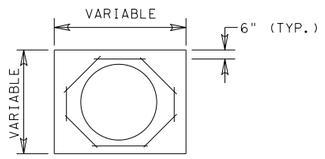
IN GENERAL THE PARTICULAR TYPE OR DESIGN OF THE EXISTING FACILITY TO BE EXTENDED OR RELOCATED SHALL BE DUPLICATED.

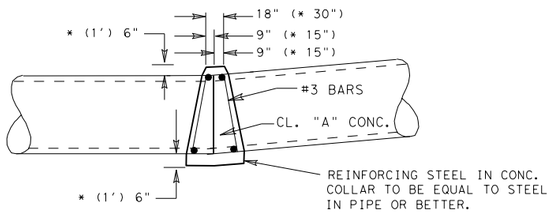


TYPICAL PIPE SIPHON

BENDS IN SIPHON TO BE CONSTRUCTED AS PROVIDED IN SPECIFICATIONS

* X AND FL "A" AS SHOWN ON PLANS ARE NOMINAL DESIGN DIMENSIONS AND MAY BE VARIED IN FIELD TO FIT EXISTING CONDITIONS.





DETAIL FOR CONC. COLLARS DRAINAGE STRUCTURES AND PIPE SIPHONS (HORIZ. & VERT. BENDS)

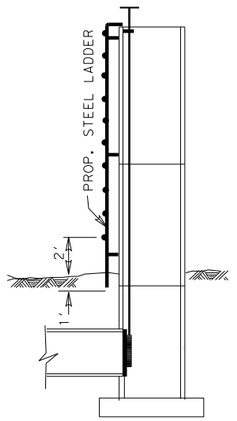
NOTE: PROP. CONC. COLLAR WILL NOT BE PAID FOR DIRECTLY BUT WILL BE SUBSIDIARY TO THE BIDS ITEMS INVOLVED.

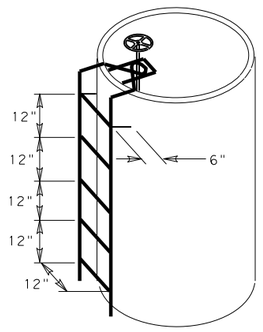
* FOR 42" AND LARGER PIPE

LADDER TO BE CONSTRUCTED OF ¾" DIA. REINF. STEEL. THE PARALLEL SIDEPIECES SPACED 12" APART TO BE HOOKED OVER TOP OF WELL AND STAND-OFFS WELDED AT TOP RUNG, AT THEIR MID-POINT AND BOTTOM. RUNGS TO BE WELDED TO SIDEPIECES AT 12" INTERVALS THE FIRST RUNG TO BE 2' FROM NATURAL GROUND.

STEEL LADDER TO BE PAID FOR AS SUBSIDIARY TO PRICE OF WELL.

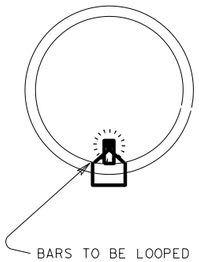
NOTE: COMMERCIAL FABRICATED OR CAST METAL STEPS MAY BE USED IF APPROVED BY THE ENGINEER AND/OR THE WATER DISTRICT INVOLVED.





STEEL LADDER DETAILS

TO BE USED ON ALL WELLS WITH GATES WHEN THE DISTANCE FROM NATURAL GROUND TO TOP OF WELL IS 6 FT. OR MORE.



PHARR DISTRICT STANDARD

TEXAS DEPARTMENT OF TRANSPORTATION

IRRIGATION CROSSING DETAIL

REV. 4/15 IRRIG1.DGN

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.			FILE NO.			SHEET NO.
6							195
STATE	STATE DIST. NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.	
TEXAS	21	CAMERON	1057	03	051	FM 510	

SIGNING
COVER SHEET

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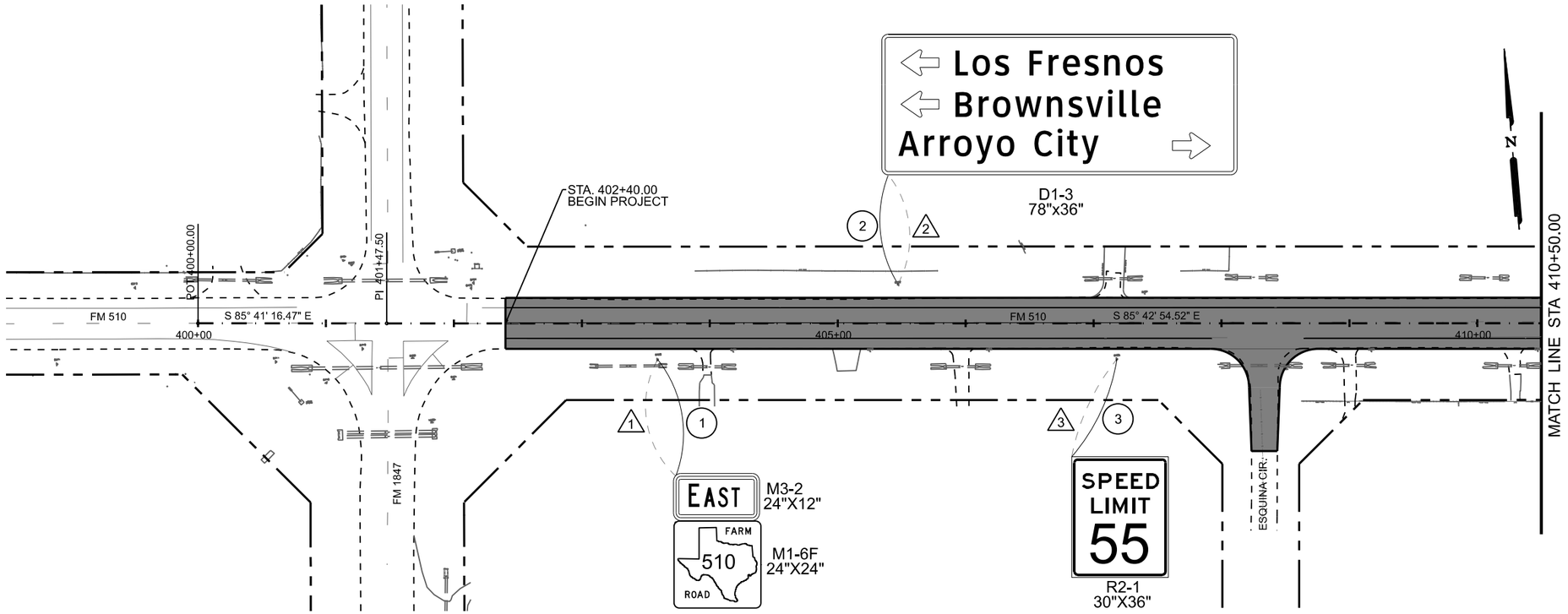
Pharr District Central Design

Texas Department of Transportation

FM 510

SIGNING
COVER SHEET

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		196



GENERAL NOTES:

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ALL SIGNS TO BE REMOVED ARE TO BE DELIVERED TO THE TXDOT MAINTENANCE YARD IN PHARR LOCATED AT:

521 WEST FERGUSON STREET
PHARR, TX 78577

ALL PROPOSED SMALL SIGNS TO BE INSTALLED OUTSIDE OF PROPOSED EDGE OF PAVEMENT PER STANDARD SHEET SMD(GEN)-08.

SEE APPLICABLE TXDOT SIGNING STANDARD SHEETS FOR ADDITIONAL INFORMATION.

LEGEND

- EXISTING SIGN TO REMAIN IN PLACE
- SIGN TO BE INSTALLED (ITEM 644)
- SIGNS TO BE REMOVED (ITEM 644)
- SIGNS TO BE RELOCATED
- TRAFFIC FLOW INDICATOR
- EXISTING SIGN
- EXISTING STREET NAME SIGN TO BE INSTALLED BY LOCAL ENTITY
- EXISTING SIGN TO BE RELOCATED BY THE IRRIGATION DISTRICT

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

SIGNING LAYOUTS
STA. 402+40 - STA. 422+50

SCALE: 1"=100'

SHEET 1 OF 8

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		197

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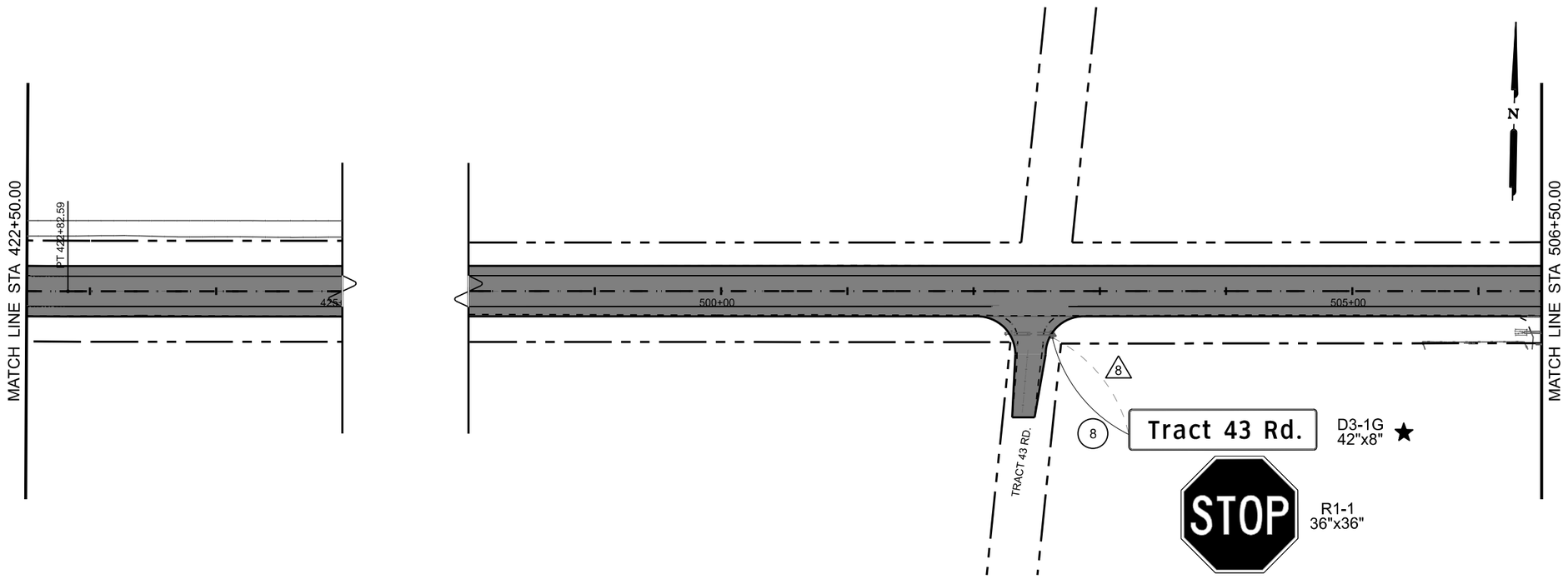

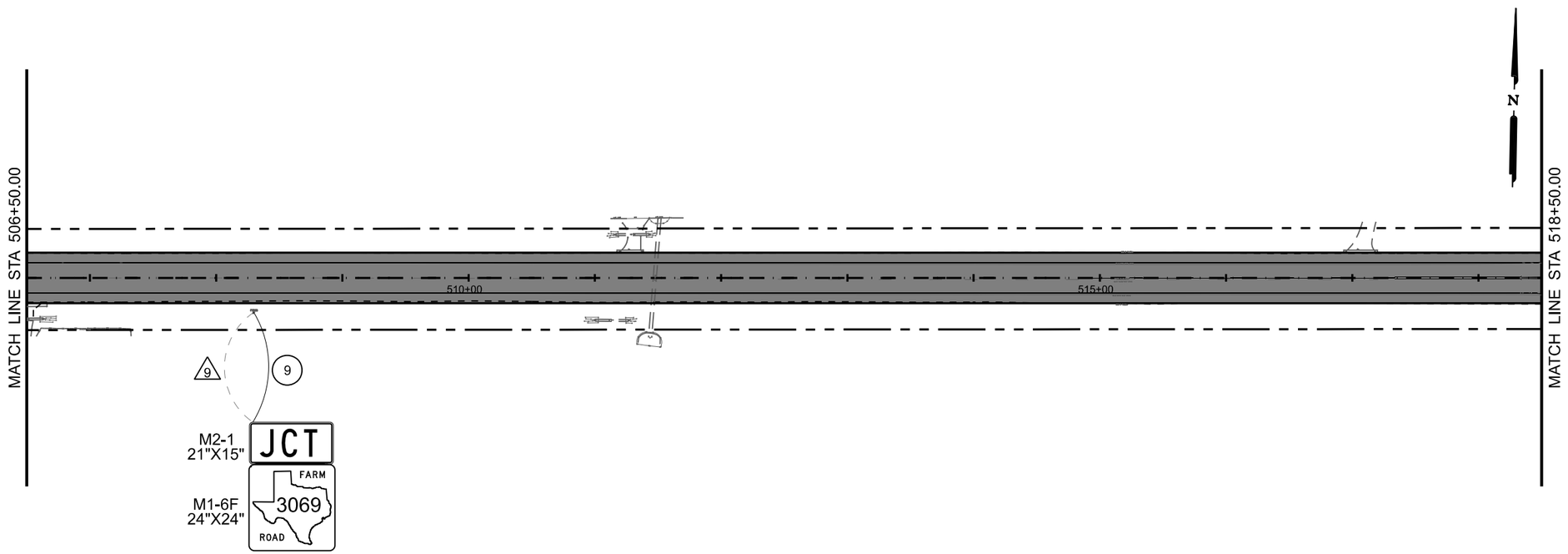

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STATE OF TEXAS
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06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

SIGNING LAYOUTS
STA. 422+50 - STA. 518+50

SCALE: 1"=100'

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		198

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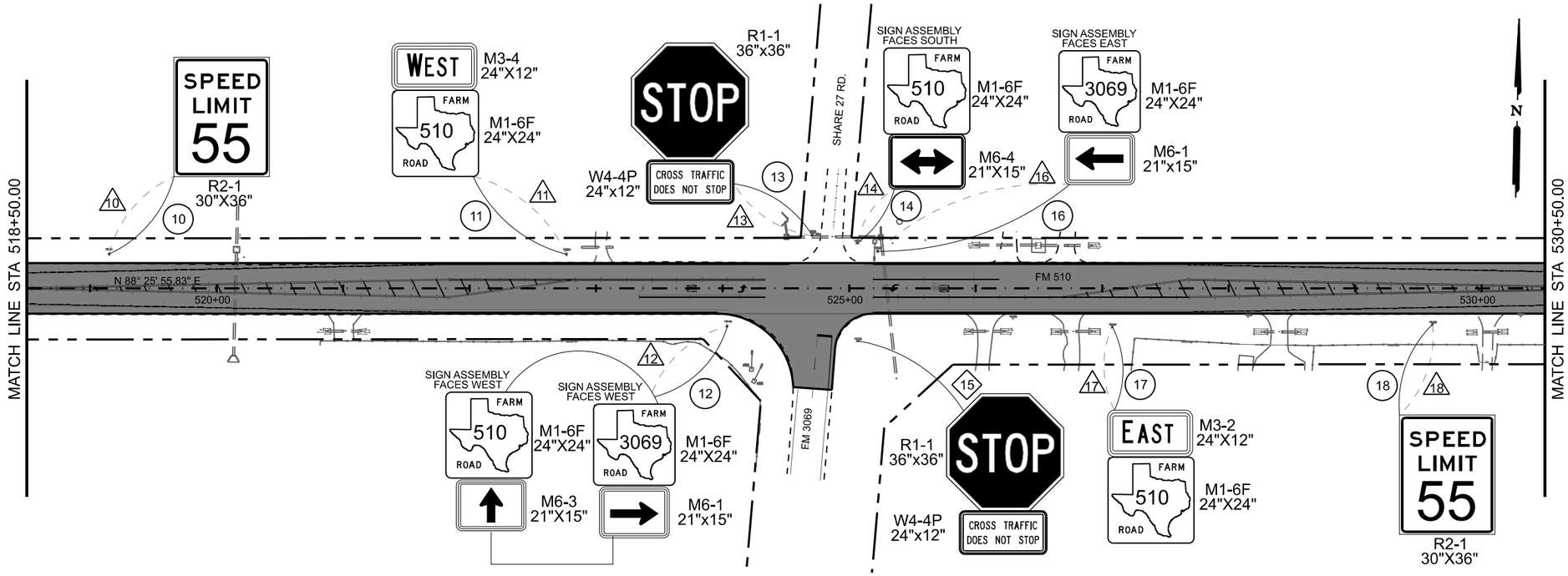

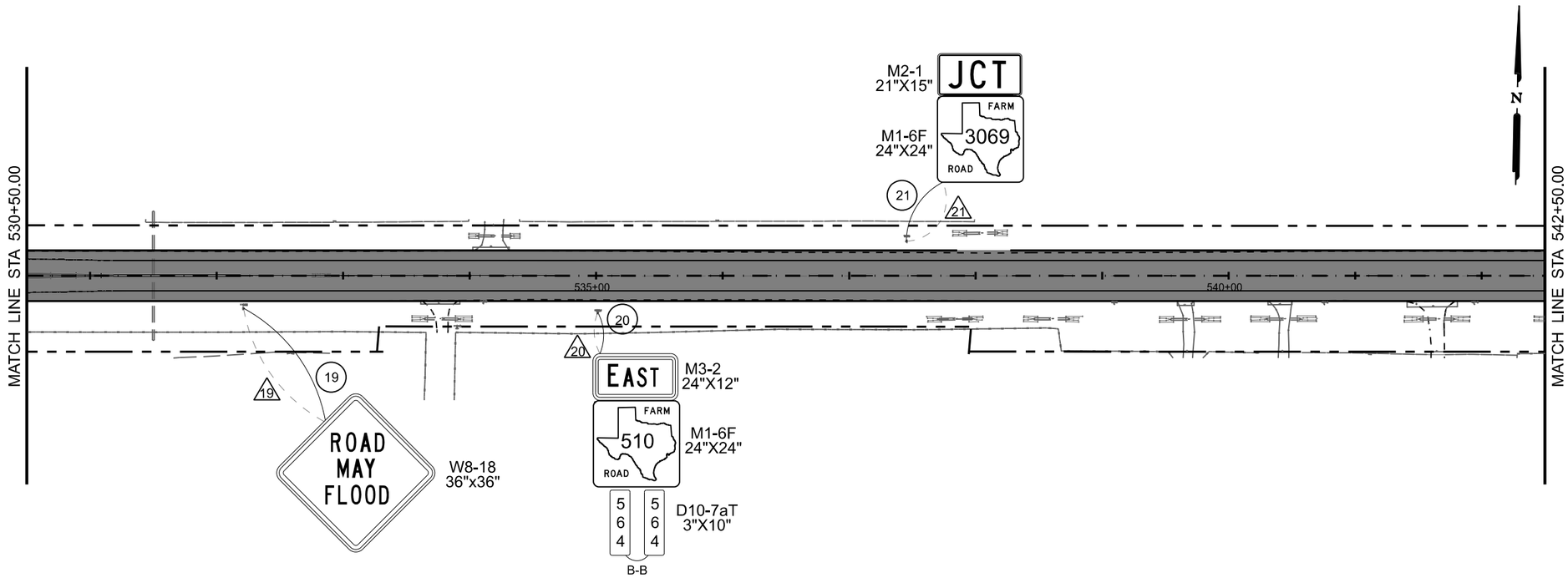

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STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

SIGNING LAYOUTS
STA. 518+50 - STA. 542+50

SCALE: 1"=100' SHEET 3 OF 8

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		199

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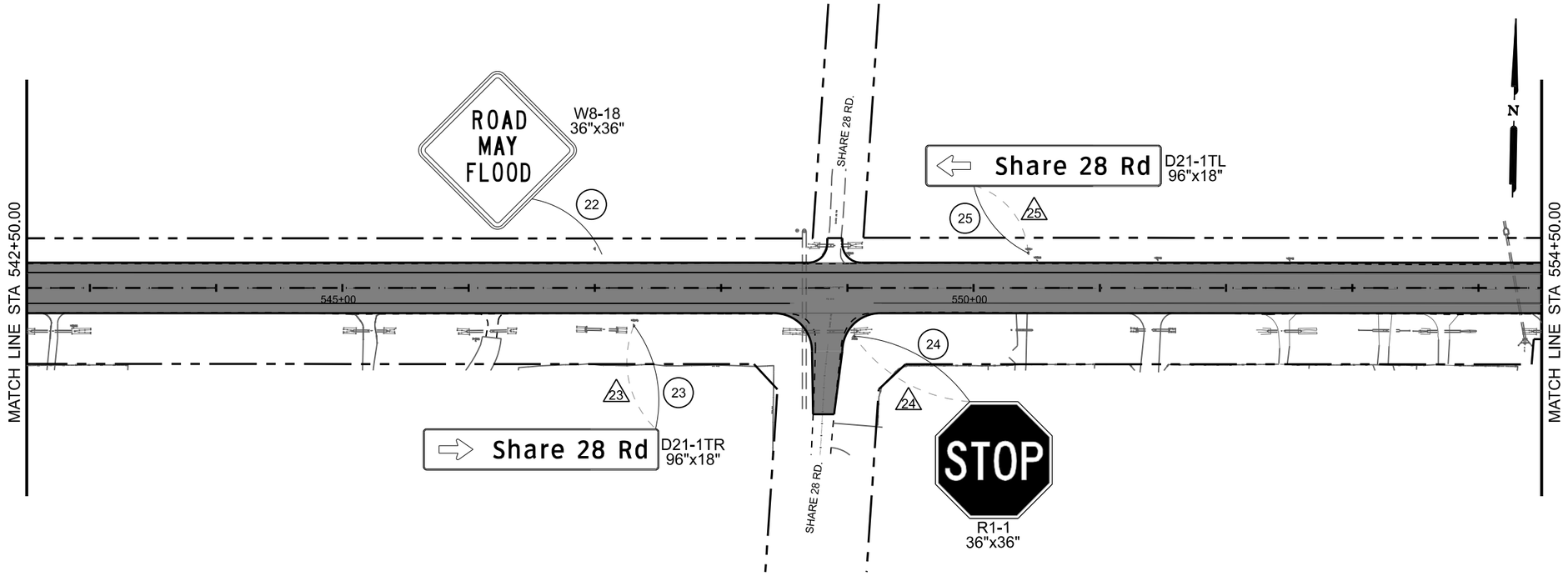

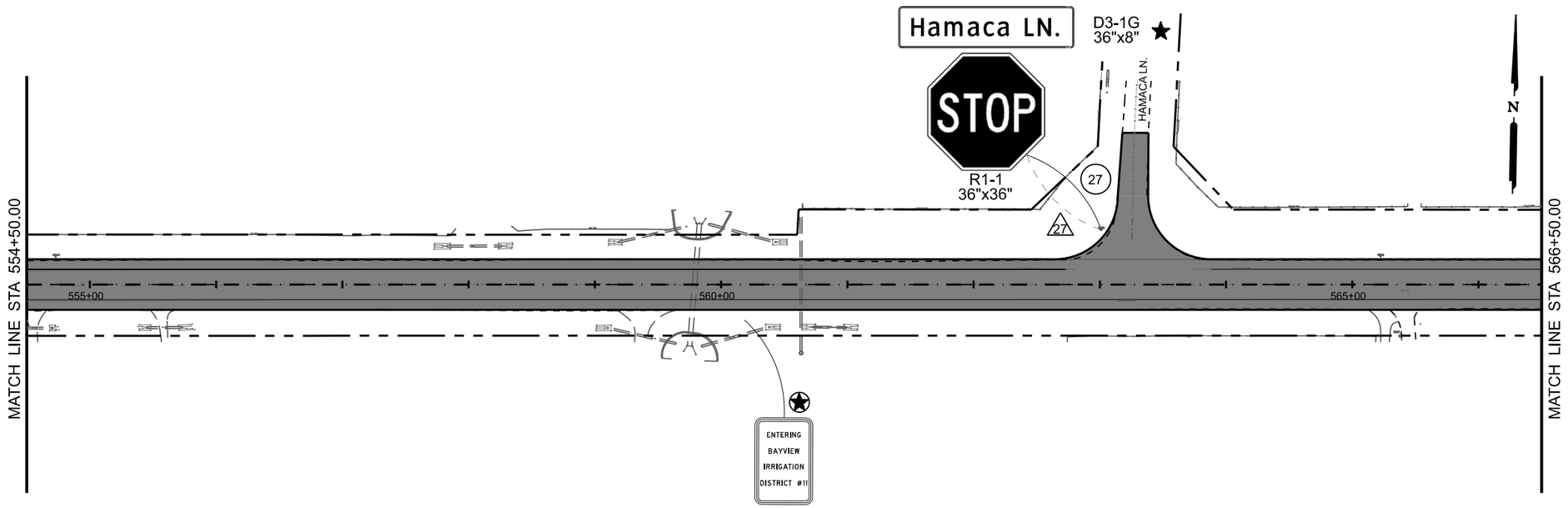

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06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

SIGNING LAYOUTS
STA. 542+50 - STA. 566+50

SCALE: 1"=100' SHEET 4 OF 8

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		200

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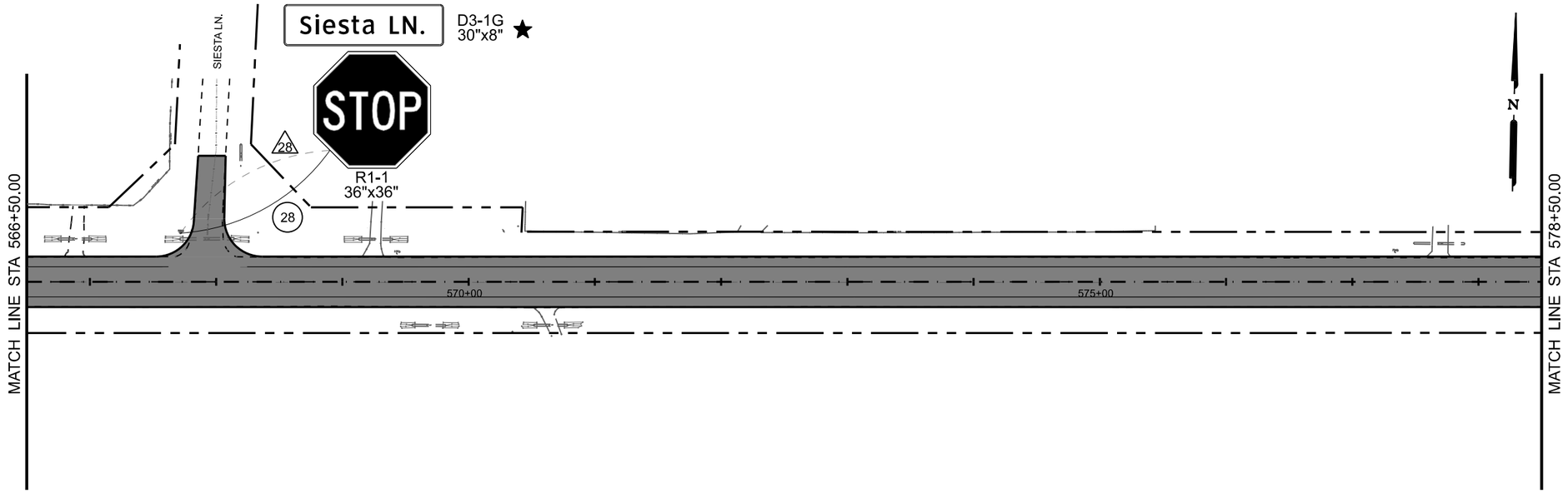

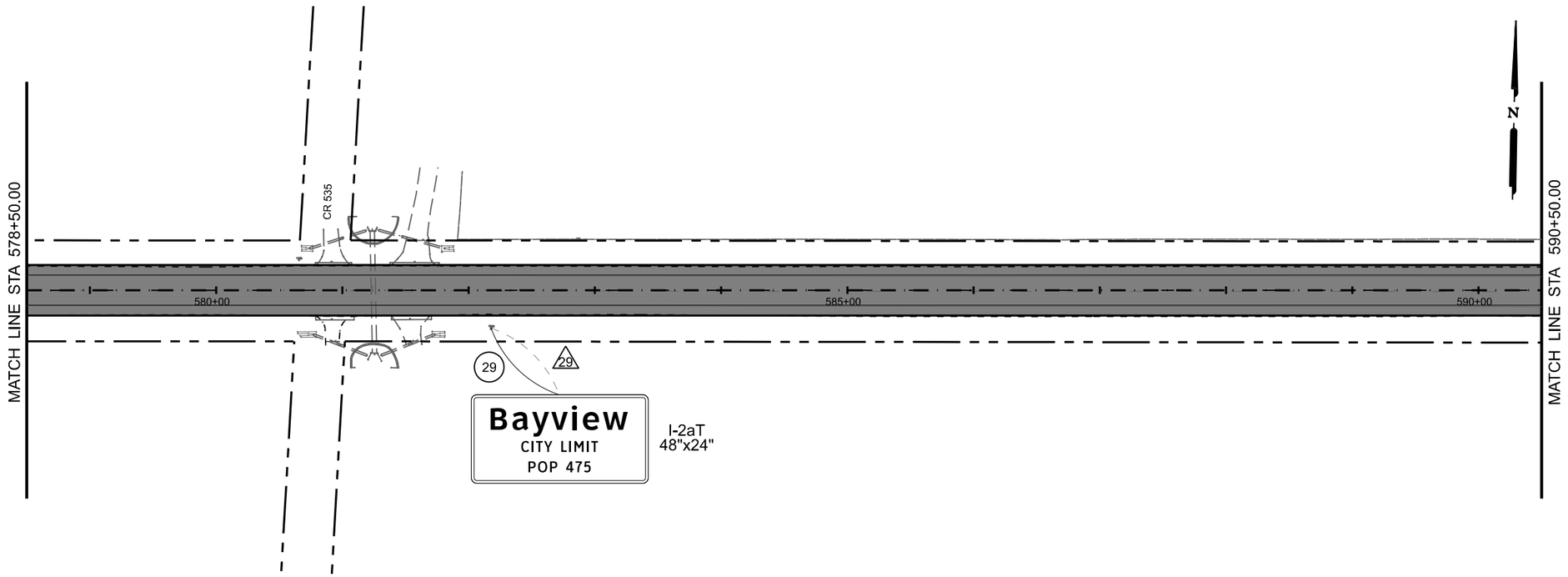

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06/13/24

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Texas Department of Transportation

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SIGNING LAYOUTS
STA. 566+40 - STA. 590+50

SCALE: 1"=100' SHEET 5 OF 8

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		201

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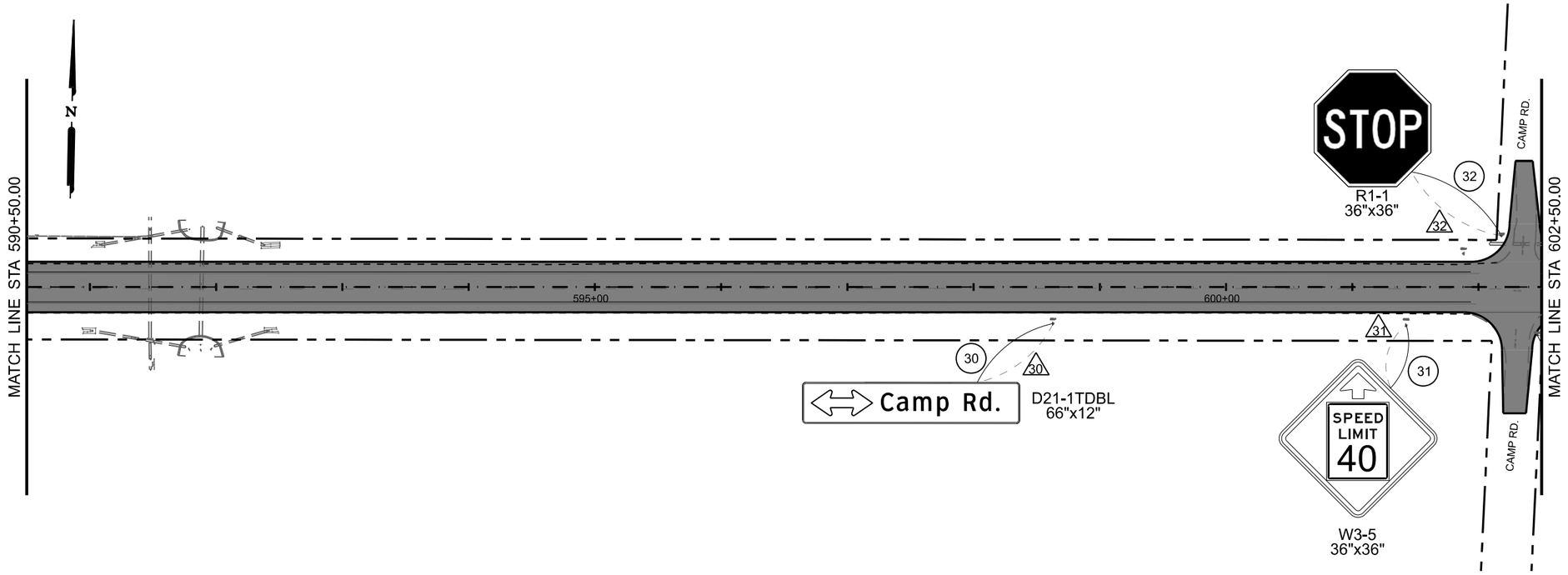

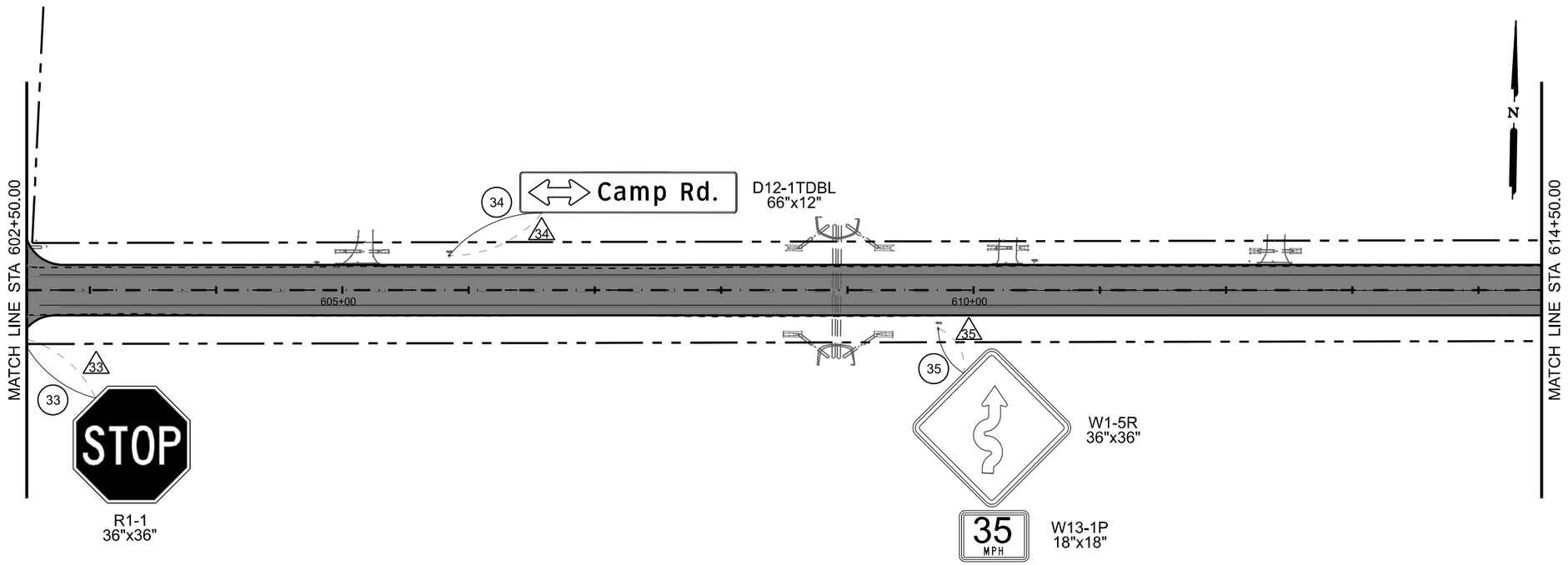

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06/13/24

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SIGNING LAYOUTS
STA. 590+50 - STA. 614+50

SCALE: 1"=100' SHEET 6 OF 8

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		202

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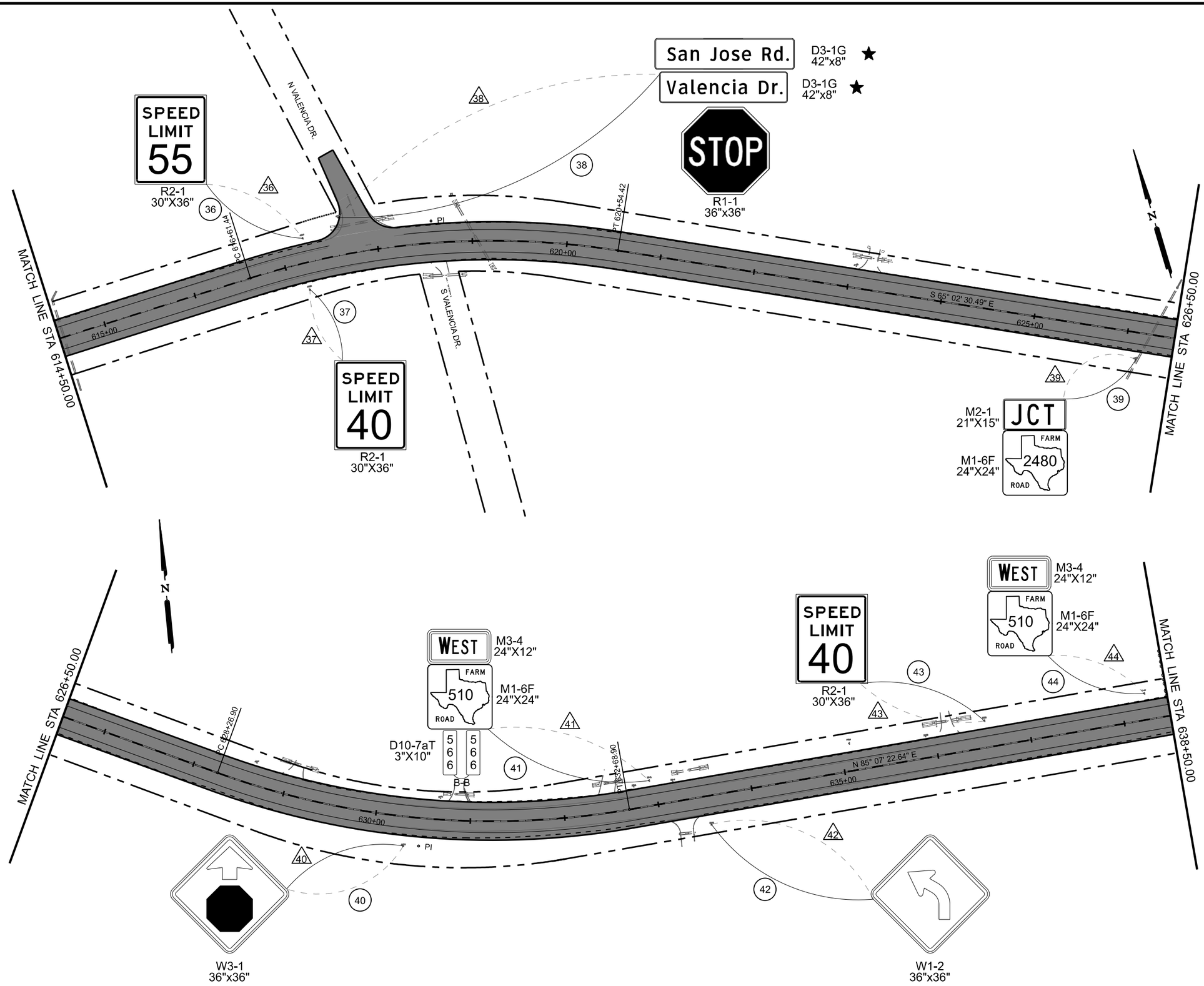

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06/13/24

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Texas Department of Transportation

FM 510

SIGNING LAYOUTS
STA. 614+50 - STA. 638+50

SCALE: 1"=100' SHEET 7 OF 8

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		203

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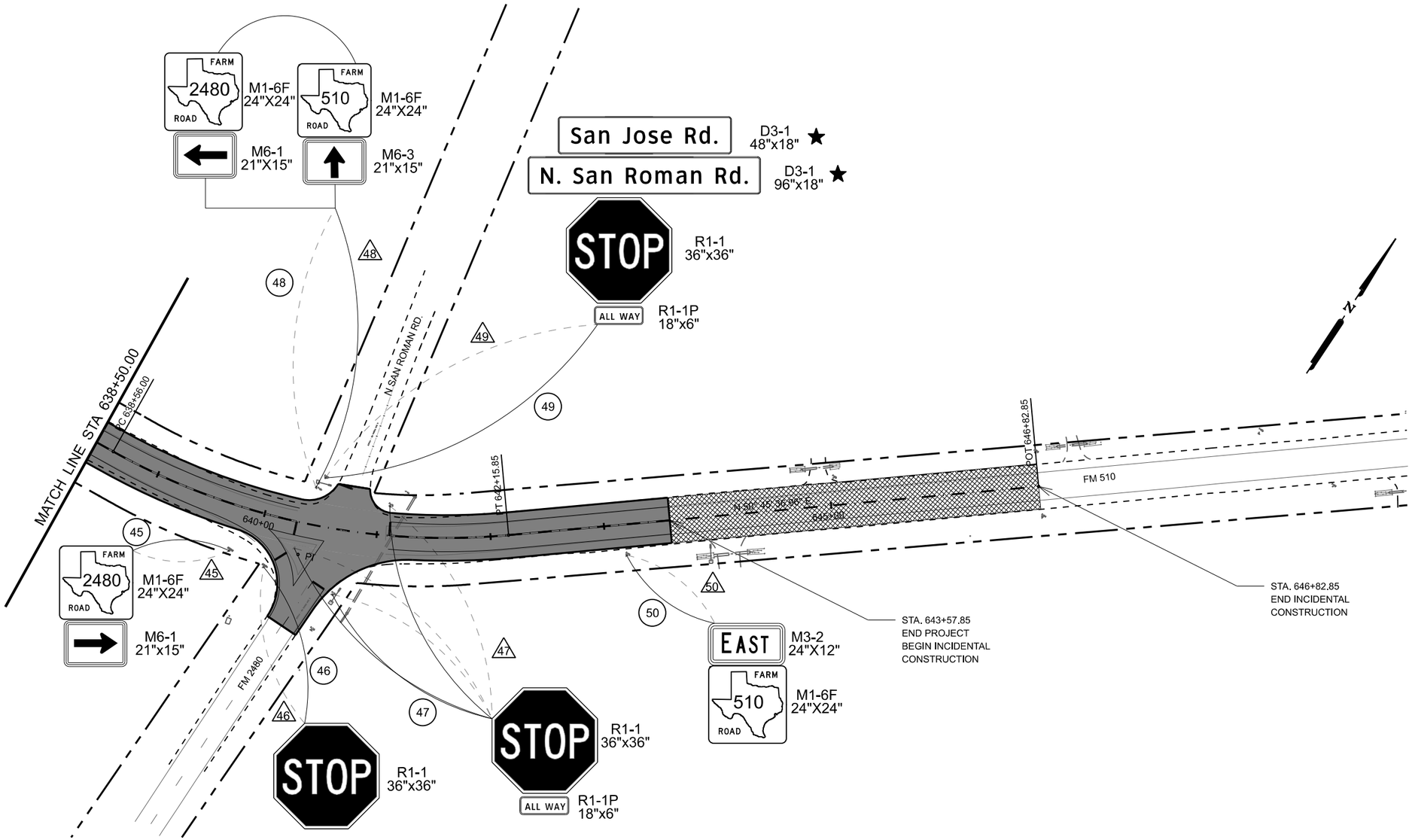

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06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

SIGNING LAYOUTS
STA. 638+50 - STA. 646+82.85

SCALE: 1"=100' SHEET 8 OF 8

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		204

DATE: 6/13/2024 11:01:55 AM
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SUMMARY OF SMALL SIGN ITEMS

SIGNING LAYOUTS	644 7025 IN SM RD SN SUP&AM TYS80 (1) SA (P)	644 7028 IN SM RD SN SUP&AM TYS80 (1) SA (T)	644 7031 IN SM RD SN SUP&AM TYS80 (1) SA (U)	644 7073 REMOVE SM RD SN SUP&AM	636 7001 ALUMINUM SIGNS (TY A)
FM 510	(EA)	(EA)	(EA)	(EA)	(SF)
(CSJ 1057-03-051)	EST.	EST.	EST.	EST.	EST.
SHEET 1 OF 8	5		2	7	27
SHEET 2 OF 8	2			2	
SHEET 3 OF 8	9	1	1	11	
SHEET 4 OF 8	2	3		4	24
SHEET 5 OF 8	1	1		2	8
SHEET 6 OF 8	2	4		6	11
SHEET 7 OF 8	7	2		9	
SHEET 8 OF 8	7		1	8	
PROJECT TOTAL:	35	11	4	49	70

STATE OF TEXAS
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06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

SMALL SIGN
ESTIMATED QUANTITIES

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		205

DATE: 6/13/2024 11:02:00 AM
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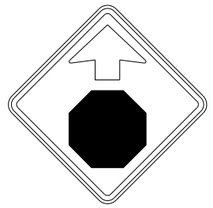
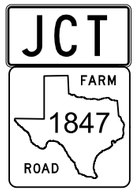
SUMMARY OF SMALL SIGNS

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

SHEET No.	SIGN No.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
1 OF 8	1	M3-2		24x12	X		S80	1	SA	P		
		M1-6F		24x24	X							
1 OF 8	2	D1-3		78x36	X		S80	1	SA	U		
1 OF 8	3	R2-1		30x36	X		S80	1	SA	P		
1 OF 8	4	W3-1		30x30	X		S80	1	SA	P		
1 OF 8	5	M2-1		21x15	X		S80	1	SA	P		
		M1-6F		24x24	X							

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.
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NOTE:

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Texas Department of Transportation

Traffic Operations Division Standard

FM 510

SUMMARY OF SMALL SIGNS

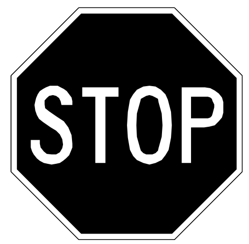
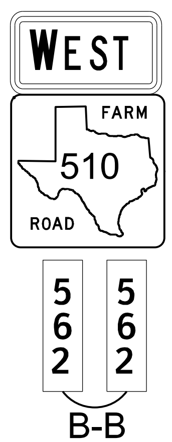
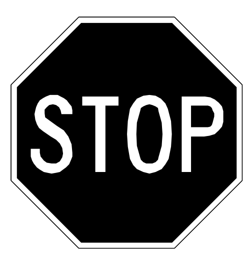
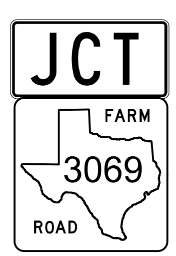
SOSS SHEET 1 OF 11

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		1057	03	051	FM 510
4-16		DIST	COUNTY		SHEET NO.
8-16		PHR	CAMERON		206

DATE: 6/13/2024
FILE: c:\txdot\pw_online\txdot5\noel.cant\d0465297\SOSS.dgn

SUMMARY OF SMALL SIGNS

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

SHEET No.	SIGN No.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION: PREFABRICATED	MOUNTING DESIGNATION	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY N TY S
1 OF 8	6	R1-1		36x36	X		S80	1	SA	P		
1 OF 8	7	M3-4 M1-6F D10-7aT D10-7aT		24x12 24x24 3x10 3x10	X X X X		S80	1	SA	P		
2 OF 8	8	R1-1		36x36	X		S80	1	SA	P		
2 OF 8	9	M2-1 M1-6F		21x15 24x24	X X		S80	1	SA	P		

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

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

DATE: 6/13/2024

Texas Department of Transportation — Traffic Operations Division Standard

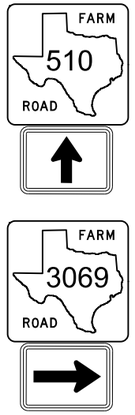
FM 510

SUMMARY OF SMALL SIGNS

SOSS — SHEET 2 OF 11

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-16 8-16	1057	03	051	FM 510
	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	207

SUMMARY OF SMALL SIGNS

SHEET No.	SIGN No.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)
										PREFABRICATED		TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY N TY S
3 OF 8	10	R2-1		30x36	X		S80	1	SA	P		
3 OF 8	11	M3-4 M1-6F		24x12 24x24	X X		S80	1	SA	P		
3 OF 8	12	M1-6F M6-3 M1-6F M6-1		24x24 21x15 24x24 21x15	X X X X		S80	1	SA	U		
3 OF 8	13	R1-1 W4-4P		36x36 24x12	X X		S80	1	SA	P		

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

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http://www.txdot.gov/

NOTE:

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

Texas Department of Transportation — Traffic Operations Division Standard

FM 510

SUMMARY OF SMALL SIGNS

SOSS — SHEET 3 OF 11

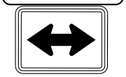
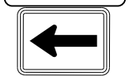
FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
4-16	DIST	COUNTY		SHEET NO.
8-16	PHR	CAMERON		208

T8

DATE: 6/13/2024
FILE: c:\txdot\pw_online\txdot5\noel.contu\d0465297\SOSS.dgn

SUMMARY OF SMALL SIGNS

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

SHEET No.	SIGN No.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
3 OF 8	14	M1-6F		24x24	X		S80	1	SA	P		
		M6-4		21x15	X							
3 OF 8	15	R1-1		36x36	X		S80	1	SA	P		
3 OF 8	16	M1-6F		24x24	X		S80	1	SA	P		
		M6-1		21x15								
3 OF 8	17	M3-2		24x12	X		S80	1	SA	P		
		M1-6F		24x24	X							
3 OF 8	18	R2-1		30x36	X		S80	1	SA	P		
3 OF 8	19	W8-18		36x36	X		S80	1	SA	T		

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.
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3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

Texas Department of Transportation | Traffic Operations Division Standard

FM 510

SUMMARY OF SMALL SIGNS

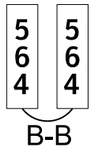
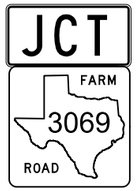
SOSS SHEET 4 OF 11

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		1057	03	051	FM 510
4-16		DIST	COUNTY		SHEET NO.
8-16		PHR	CAMERON		209

DATE: 6/13/2024
FILE: c:\txdot\pw_online\txdot5\noel.cant\d0465297\SOSS.dgn

SUMMARY OF SMALL SIGNS

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

SHEET No.	SIGN No.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
3 OF 8	20	M3-2		24x12	X		S80	1	SA	P		
		M1-6F		24x24	X							
		D10-7aT		3x10	X							
		D10-7aT		3x10	X							
3 OF 8	21	M2-1		21x15	X		S80	1	SA	P		
		M1-6F		24x24	X							
4 OF 8	22	W8-18		36x36	X		S80	1	SA	T		
4 OF 8	24	R1-1		36x36	X		S80	1	SA	P		
4 OF 8	26	R1-1		12x18	X		S80	1	SA	P		

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

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Texas Department of Transportation | Traffic Operations Division Standard

FM 510

SUMMARY OF SMALL SIGNS

SOSS SHEET 5 OF 11

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
4-16 8-16	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		210

DATE: 6/13/2024
FILE: c:\txdot\pw_online\txdot5\noel.cantu\d0465297\SOSS.dgn

SUMMARY OF SMALL SIGNS

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

SHEET No.	SIGN No.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
4 OF 8	27	R1-1		36x36	X		S80	1	SA	P		
5 OF 8	28	R1-1		36x36	X		S80	1	SA	P		
6 OF 8	31	W3-5		36x36	X		S80	1	SA	T		
6 OF 8	32	R1-1		36x36	X		S80	1	SA	P		
6 OF 8	33	R1-1		36x36	X		S80	1	SA	P		

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

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Texas Department of Transportation

Traffic Operations Division Standard

FM 510

SUMMARY OF SMALL SIGNS

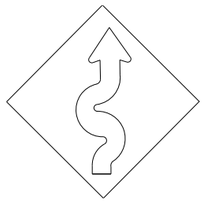
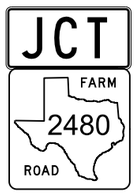
SOSS SHEET 6 OF 11

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
4-16	DIST	COUNTY		SHEET NO.
8-16	PHR	CAMERON		211

DATE: 6/13/2024
FILE: c:\txdot\pw_online\txdot5\noel.cantu\d0465297\SOSS.dgn

SUMMARY OF SMALL SIGNS

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

SHEET No.	SIGN No.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
6 OF 8	35	W1-5R		36x36	X		S80	1	SA	T		
		W13-1P		18x18	X							
7 OF 8	36	R2-1		30x36	X		S80	1	SA	P		
7 OF 8	37	R2-1		30x36	X		S80	1	SA	P		
7 OF 8	38	R1-1		36x36	X		S80	1	SA	P		
7 OF 8	39	M2-1		21x15	X		S80	1	SA	P		
		M1-6F		24x24	X							

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
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Texas Department of Transportation

Traffic Operations Division Standard

FM 510

SUMMARY OF SMALL SIGNS

SOSS

SHEET 7 OF 11

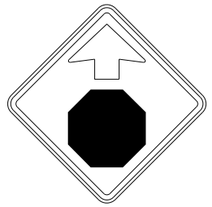
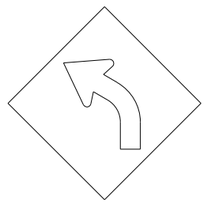
FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
4-16	DIST	COUNTY		SHEET NO.
8-16	PHR	CAMERON		212

18

DATE: 6/13/2024
FILE: c:\txdot\pw_online\txdot5\noel.contu\d0465297\SOSS.dgn

SUMMARY OF SMALL SIGNS

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

SHEET No.	SIGN No.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
7 OF 8	40	W3-1		30x30	X		S80	1	SA	P		
7 OF 8	41	M3-4 M1-6F D10-7aT D10-7aT		24x12 24x24 3x10 3x10	X X X X		S80	1	SA	P		
7 OF 8	42	W1-2		36x36	X		S80	1	SA	T		
7 OF 8	43	R2-1		30x36	X		S80	1	SA	P		

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

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Texas Department of Transportation

Traffic Operations Division Standard

FM 510

SUMMARY OF SMALL SIGNS

SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
4-16 8-16	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		213

18

DATE: 6/13/2024
FILE: c:\txdot\pw_online\txdot5\noel.cantu\d0465297\SOSS.dgn

SUMMARY OF SMALL SIGNS

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

SHEET No.	SIGN No.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
7 OF 8	44	M3-4		24x12	X		S80	1	SA	P		
		M1-6F		24x24	X							
8 OF 8	45	M1-6F		24x24	X		S80	1	SA	P		
		M6-1		21x15	X							
8 OF 8	46	R1-1		36x36	X		S80	1	SA	P		
8 OF 8	47	R1-1		36x36	X		S80	1	SA	P		
		R1-1P		18x6	X							
8 OF 8	47	R1-1		36x36	X		S80	1	SA	P		
		R1-1P		18x6	X							

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.
http://www.txdot.gov/

NOTE:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.

2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.

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

Texas Department of Transportation

Traffic Operations Division Standard

FM 510

SUMMARY OF SMALL SIGNS

SOSS

SHEET 9 OF 11

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		1057	03	051	FM 510
4-16		DIST	COUNTY		SHEET NO.
8-16		PHR	CAMERON		214

TB

DATE: 6/13/2024
FILE: c:\txdot\pw_online\txdot5\noel.cantu\d0465297\SOSS.dgn

SUMMARY OF SMALL SIGNS

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

SHEET No.	SIGN No.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
8 OF 8	47	R1-1		36x36	X		S80	1	SA	P		
		R1-1P		18x6	X							
8 OF 8	48	M1-6F		24x24	X		S80	1	SA	U		
		M6-1		21x15	X							
		M1-6F		24x24	X							
		M6-3		21x15	X							
8 OF 8	49	R1-1		36x36	X		S80	1	SA	P		
		R1-1P		18x6	X							

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.
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NOTE:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.
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Texas Department of Transportation

Traffic Operations Division Standard

FM 510

SUMMARY OF SMALL SIGNS

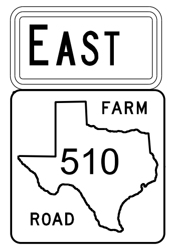
SOSS SHEET 10 OF 11

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-16 8-16	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		215

DATE: 6/13/2024
FILE: c:\txdot\pw_online\txdot5\noel.contu\d0465297\SOSS.dgn

SUMMARY OF SMALL SIGNS

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

SHEET No.	SIGN No.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION: PREFABRICATED	MOUNTING DESIGNATION	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY N TY S
8 OF 8	50	M3-2 M1-6F		24x12 24x24	X X		S80	1	SA	P		

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.
http://www.txdot.gov/

NOTE:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.

2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.

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

Texas Department of Transportation

Traffic Operations Division Standard

FM 510

SUMMARY OF SMALL SIGNS

SOSS

SHEET 11 OF 11

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
4-16 8-16	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		216

DATE: 6/13/2024

SUMMARY OF SMALL SIGNS TO BE REMOVED

SHEET No.	SIGN No.	SIGN NOMENCLATURE	SIGN TEXT	DIMENSIONS (INCHES)	644 7073 REMOVE SM RD SN SUP & AM EA
1 OF 8	1	M3-2 M1-6F	EAST FARM ROAD 510	24x12 24x24	1
1 OF 8	2	D1-3	LOS FRESNOS BROWNSVILLE ARROYO CITY	78x36	1
1 OF 8	3	R2-1	SPEED LIMIT 55	30x36	1
1 OF 8	4	W3-1	STOP SIGN AHEAD	36x36	1
1 OF 8	5	M2-1 M1-6F	JUNCTION FARM ROAD 1847	21x15 24x24	1
1 OF 8	6	R1-1	STOP	36x36	1
1 OF 8	7	M3-4 M1-6F D10-7aT D10-7aT	WEST FARM ROAD 510 B-B MILE MARKER 562 B-B MILE MARKER 562	24x12 24x24 3x10 3x10	1
2 OF 8	8	R1-1	STOP	36x36	1
2 OF 8	9	M2-1 M1-6F	JUNCTION FARM ROAD 3069	21x15 24x24	1
3 OF 8	10	R2-1	SPEED LIMIT 55	30x36	1
3 OF 8	11	M3-4 M1-6F	WEST FARM ROAD 510	24x12 24x24	1
3 OF 8	12	M1-6F M6-3 M1-6F M6-1	FARM ROAD 510 UPWARD ARROW FARM ROAD 3069 RIGHT ARROW	24x24 21x15 24x24 21x15	1
3 OF 8	13	R1-1 W4-4P	STOP CROSS TRAFFIC DOES NOT STOP	36x36 24x12	1
3 OF 8	14	M1-6F M6-4	FARM ROAD 510 DOUBLE HEADED ARROW	24x24 21x15	1
3 OF 8	16	M1-6F M6-1	FARM ROAD 3069 LEFT ARROW	24x24 21x15	1
3 OF 8	17	M3-2 M1-6F	EAST FARM ROAD 510	24x12 24x24	1
3 OF 8	18	R2-1	SPEED LIMIT 55	30x36	1
3 OF 8	19	W8-18	ROAD MAY FLOOD	36x36	1
3 OF 8	20	M3-2 M1-6F D10-7aT D10-7aT	EAST FARM ROAD 510 MILE MARKER 564 MILE MARKER 564	24x12 24x24 3x10 3x10	1
3 OF 8	21	M2-1 M1-6F	JUNCTION FARM ROAD 3069	21x15 24x24	1
4 OF 8	23	D21-1TR	SHARE 28 RD	96x18	1
4 OF 8	24	R1-1	STOP	36x36	1
4 OF 8	25	D21-1TR	SHARE 28 RD	96x18	1
4 OF 8	27	R1-1	STOP	36x36	1
5 OF 8	28	R1-1	STOP	36x36	1
5 OF 8	29	I-2aT	BAYVIEW CITY LIMIT POP 475	48x24	1
6 OF 8	30	D21-1TDBL	CAMP RD	66x12	1
6 OF 8	31	W3-5	REDUCE SPEED LIMIT 40 AHEAD	36x36	1
6 OF 8	32	R1-1	STOP	36x36	1
6 OF 8	33	R1-1	STOP	36x36	1
6 OF 8	34	D21-1TDBL	CAMP RD	66x12	1
6 OF 8	35	W1-5R W13-1P	WINDING ROAD ADVISORY SPEED PLAQUE	36x36 18x18	1
7 OF 8	36	R2-1	SPEED LIMIT 55	30x36	1
7 OF 8	37	R2-1	SPEED LIMIT 40	30x36	1
7 OF 8	38	R1-1	STOP	36x36	1
7 OF 8	39	M2-1 M1-6F	JUNCTION FARM ROAD 2480	21x15 24x24	1
7 OF 8	40	W3-1	STOP SIGN AHEAD	36x36	1
7 OF 8	41	M3-4 M1-6F D10-7aT D10-7aT	WEST FARM ROAD 510 B-B MILE MARKER 566 B-B MILE MARKER 566	24x12 24x24 3x10 3x10	1
7 OF 8	42	W1-2	LEFT CURVE	36x36	1
7 OF 8	43	R2-1	SPEED LIMIT 40	30x36	1
7 OF 8	44	M3-4 M1-6F	WEST FARM ROAD 510	24x12 24x24	1
8 OF 8	45	M1-6F M6-1	FARM ROAD 2480 RIGHT ARROW	24x24 21x15	1

SUMMARY OF SMALL SIGNS TO BE REMOVED

SHEET No.	SIGN No.	SIGN NOMENCLATURE	SIGN TEXT	DIMENSIONS (INCHES)	644 7073 REMOVE SM RD SN SUP & AM EA
8 OF 8	46	R1-1	STOP	36x36	1
8 OF 8	47	R1-1 R1-1P	STOP ALL WAY	36x36 18x6	1
8 OF 8	47	R1-1 R1-1P	STOP ALL WAY	36x36 18x6	1
8 OF 8	47	R1-1 R1-1P	STOP ALL WAY	36x36 18x6	1
8 OF 8	48	M1-6F M6-1 M1-6F M6-3	FARM ROAD 2480 LEFT ARROW FARM ROAD 510 UPWARD ARROW	24x24 21x15 24x24 21x15	1
8 OF 8	49	R1-1 R1-1P	STOP ALL WAY	36x36 18x6	1
8 OF 8	50	M3-2 M1-6F	EAST FARM ROAD 510	24x12 24x24	1
				PROJECT TOTALS	49

Pharr District Central Design

Texas Department of Transportation

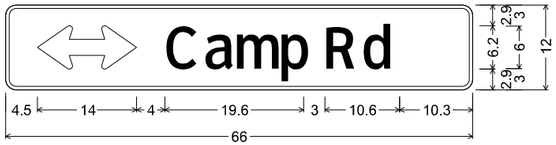
Traffic Operations Division Standard

FM 510

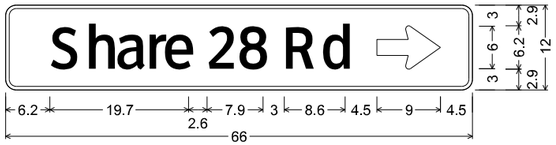
SUMMARY TABLE OF SMALL SIGNS TO BE REMOVED SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
4-16 8-16	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		217

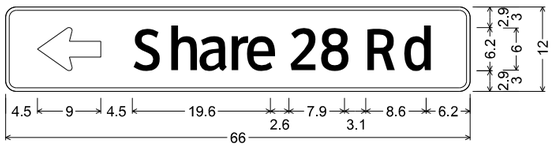
18



D21-1TDBL_VARx12;
1.5" Radius, 0.5" Border, White on, Green;
Double Headed Arrow Custom - 14.0" 0';
"Camp Rd.", ClearviewHwy-3-W;



D21-1TR_VARx12;
1.5" Radius, 0.5" Border, White on, Green;
"Share 28 Rd", ClearviewHwy-3-W;
Standard Arrow Custom 9.0" X 6.1" 0';



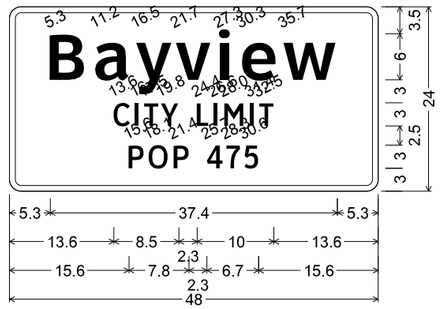
D21-1TL_VARx12;
1.5" Radius, 0.5" Border, White on, Green;
Standard Arrow Custom 9.0" X 6.1" 180';
"Share 28 Rd", ClearviewHwy-3-W;

D1-3 8in LT-LT-RT;

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

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

2.3" Radius, 0.8" Border, White on, Green;
"Arroyo City", ClearviewHwy-3-W; Standard Arrow Custom 12.0" X 7.1" 0';



I-2aT 6in;
1.5" Radius, 0.8" Border, White on Green;
"Bayview", ClearviewHwy-5-W-R;
"CITY LIMIT", ClearviewHwy-3-W;
"POP 475", ClearviewHwy-3-W;

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED
PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

SMALL SIGN
DETAILS

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		218

DATE: 6/13/2024 11:02:49 AM
FILE: c:\txdot\pw_online\txdot\5\noel.cantu\d0465297\SMALL SIGN DETAILS.dgn

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
TWT = Thin-Walled Tubing (see SMD(TWT))
10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

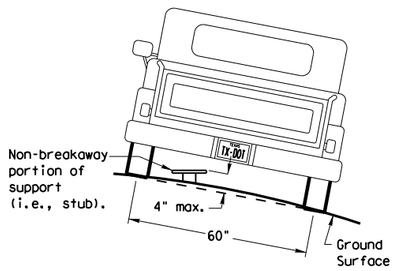
Anchor Type

UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
WS = Wedge Anchor Steel - (see SMD(TWT))
WP = Wedge Anchor Plastic (see SMD(TWT))
SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation

P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-1) to (SLIP-3))

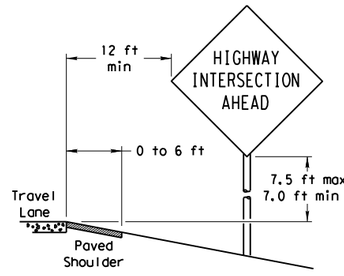
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

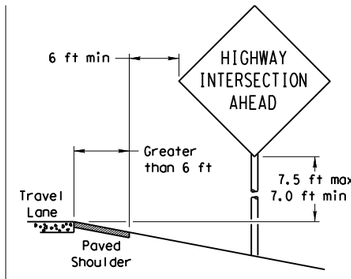
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

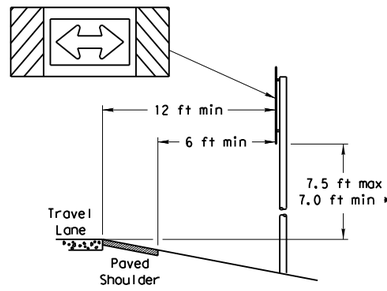
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



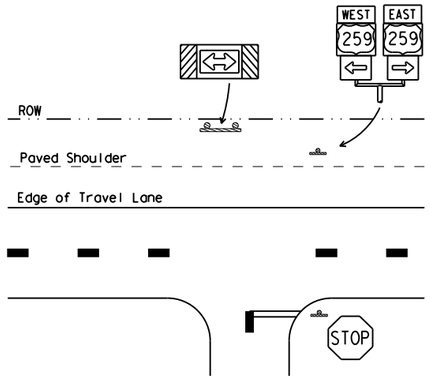
GREATER THAN 6 FT. WIDE

When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

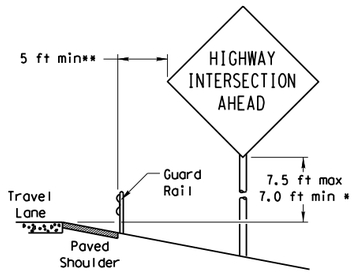
T-INTERSECTION



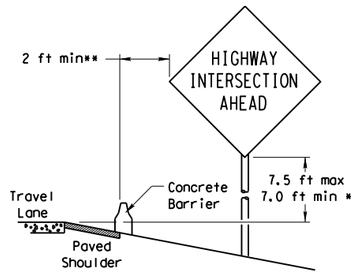
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



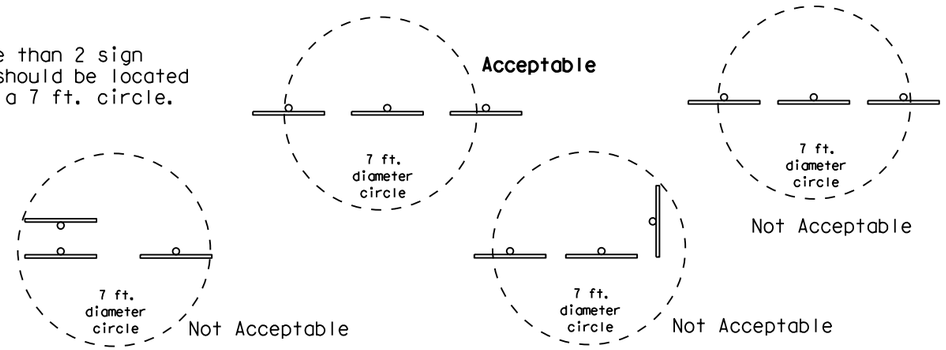
BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

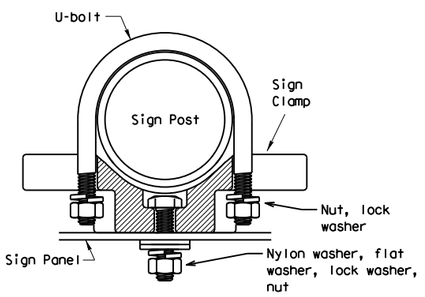
**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

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

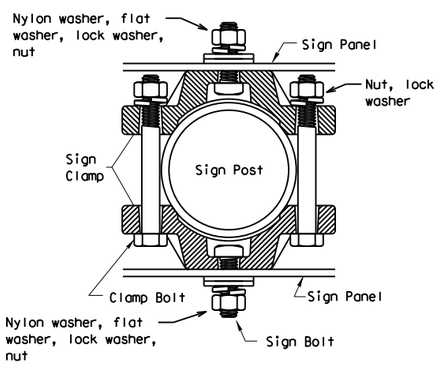


TYPICAL SIGN ATTACHMENT DETAIL

Single Signs



Back-to-Back Signs



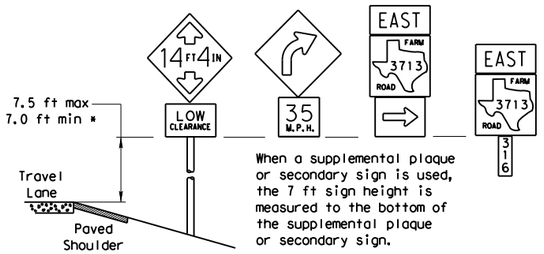
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

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

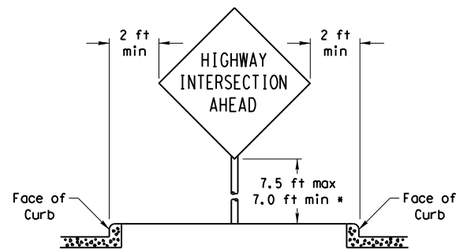
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



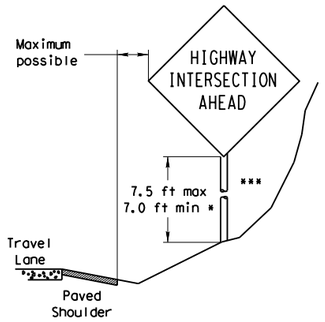
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

* Signs shall be mounted using the following condition that results in the greatest sign elevation:

(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website address is:
http://www.txdot.gov/publications/traffic.htm

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

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

REVISIONS	CONT	SECT	JOB	HIGHWAY
9-08	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		219

DATE: 6/13/2024 11:02:54 AM
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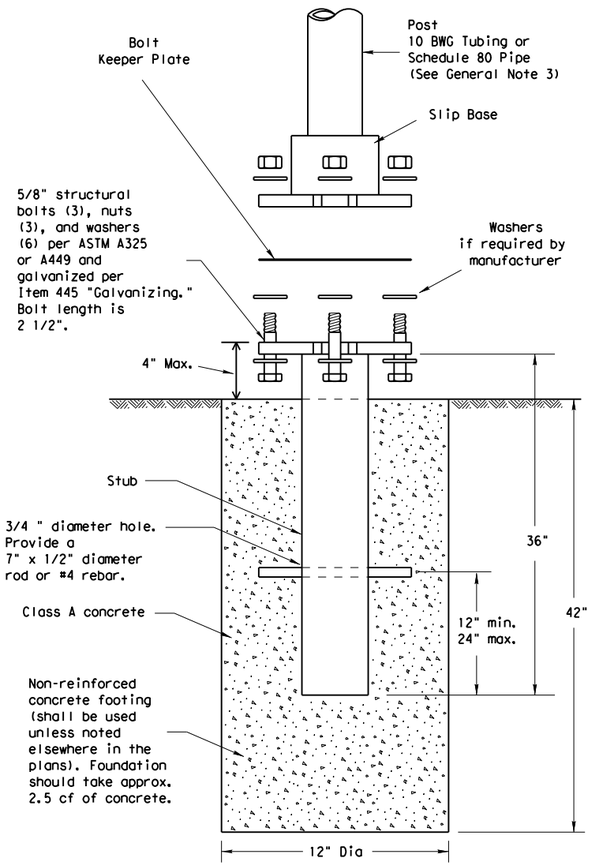
TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   - 0.134" nominal wall thickness
   - Seamless or electric-resistance welded steel tubing or pipe
   - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   - Other steels may be used if they meet the following:
     - 55,000 PSI minimum yield strength
     - 70,000 PSI minimum tensile strength
     - 20% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.

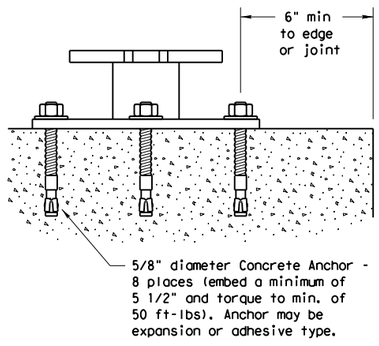
   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum yield strength
     - 62,000 PSI minimum tensile strength
     - 21% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   - Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support
1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



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

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
REVISIONS 9-08			

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DIST	COUNTY		SHEET NO.
PHR	CAMERON		220

DATE: 6/13/2024 11:02:59 AM
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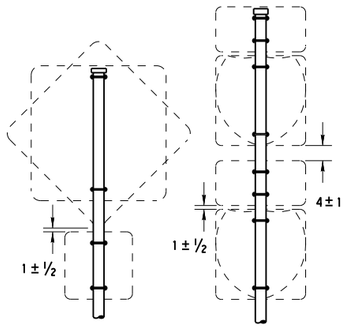
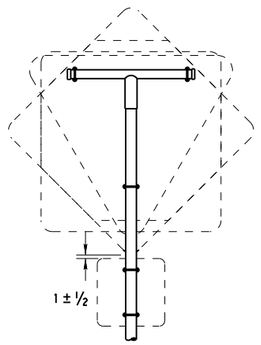


SM RD SGN ASSM TY XXXXX(1)XX(P)



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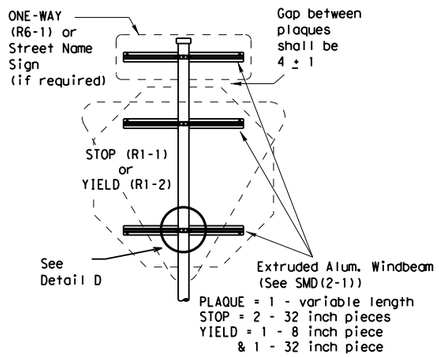
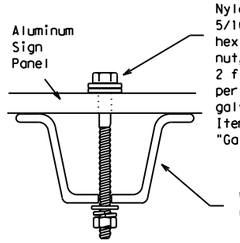
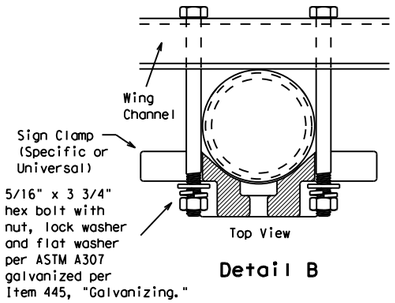


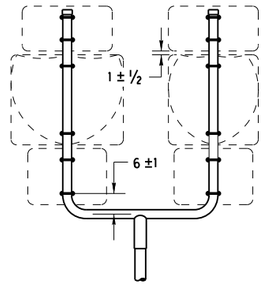
SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



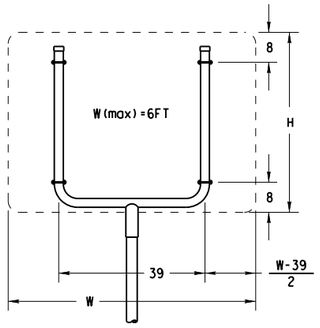
Detail A



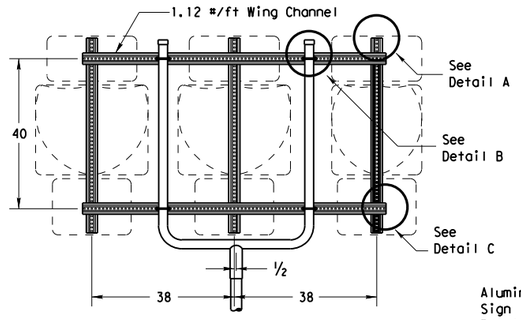
Detail B



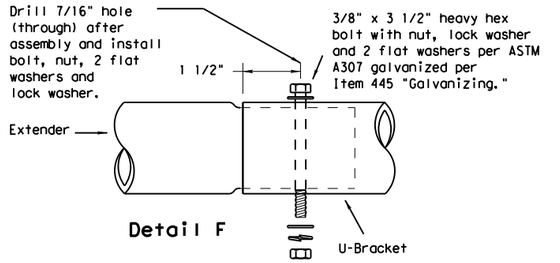
SM RD SGN ASSM TY XXXXX(1)XX(U)



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

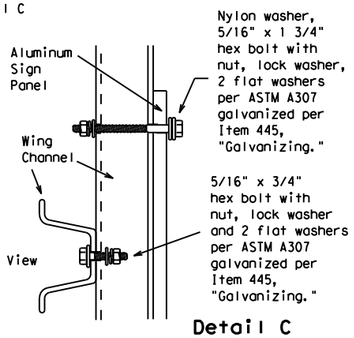


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

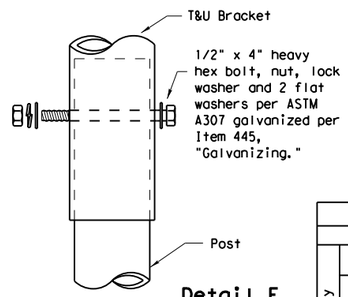


Detail F

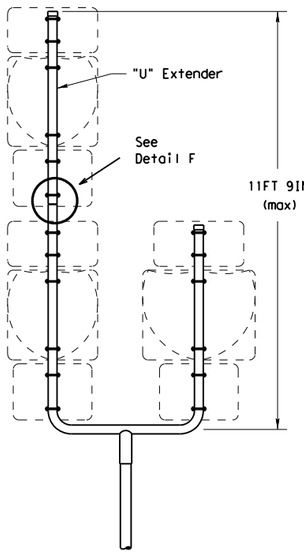
Splices shall only be allowed behind the sign substrate.



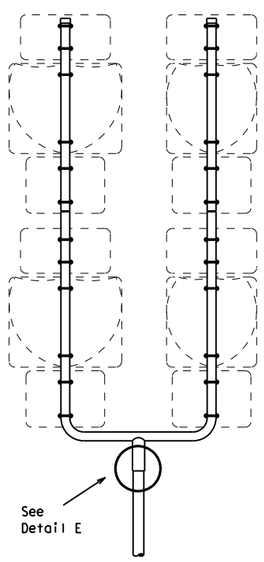
Detail C



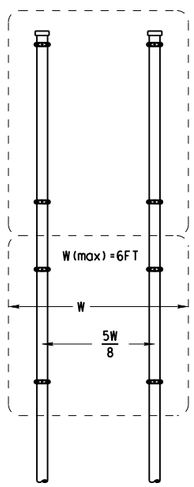
Detail E



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

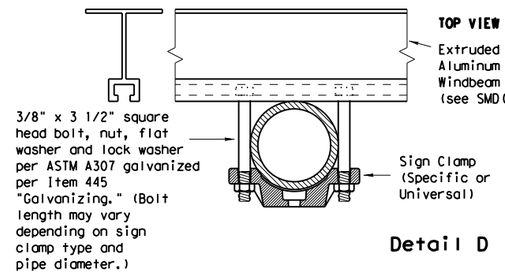


SM RD SGN ASSM TY S80(1)XX(U-2EXT)

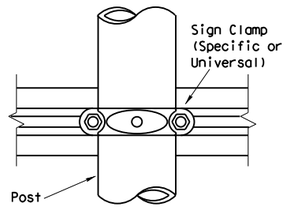


SM RD SGN ASSYM TY XXXXX(2)XX(P)

SIDE VIEW



Detail D



GENERAL NOTES:

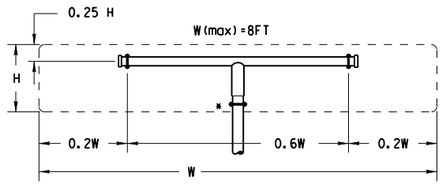
1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.

REQUIRED SUPPORT

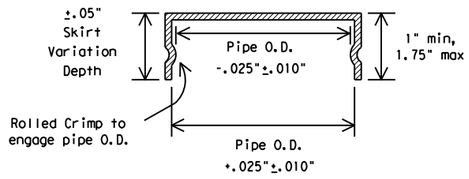
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)



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

All dimensions are in english unless detailed otherwise.

FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

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

REVISIONS	CONT	SECT	JOB	HIGHWAY
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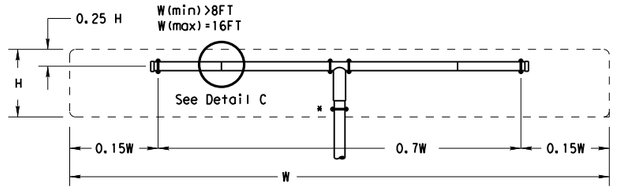
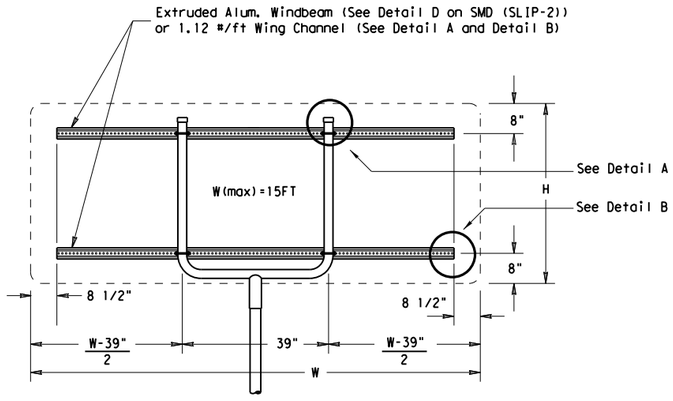
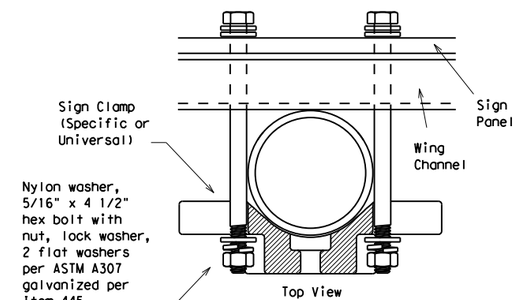


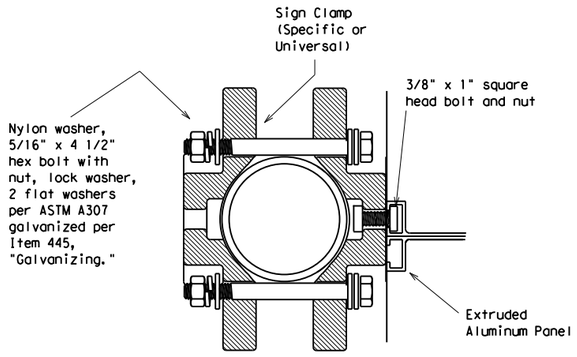
SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)



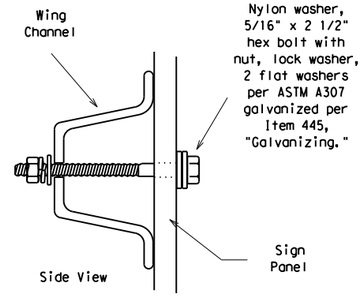
SM RD SGN ASSM TY XXXXX(1)XX(U-XX)



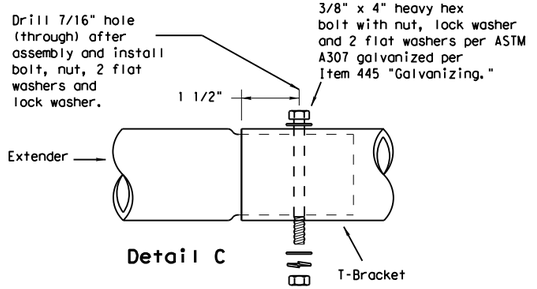
Detail A



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET

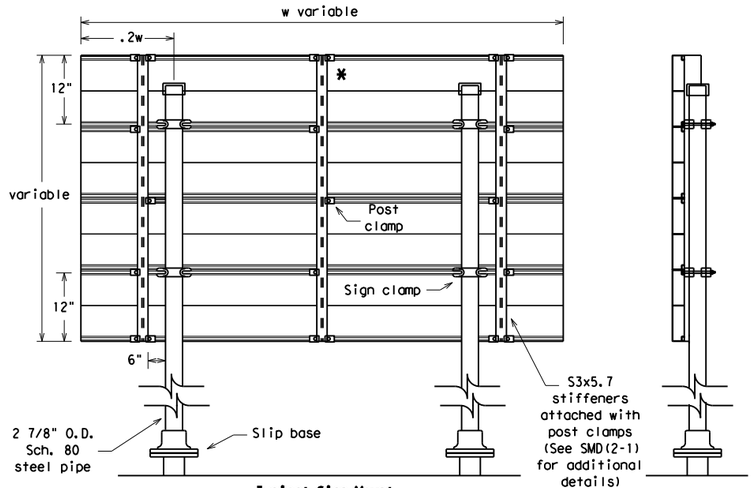


Detail B



Detail C

Splices shall only be allowed behind the sign substrate.

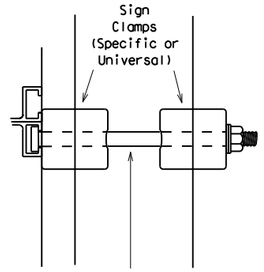


Typical Sign Mount

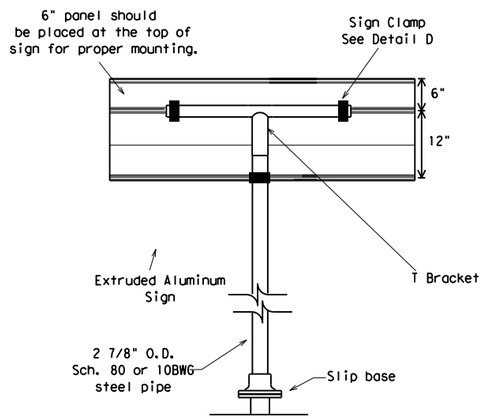
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

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

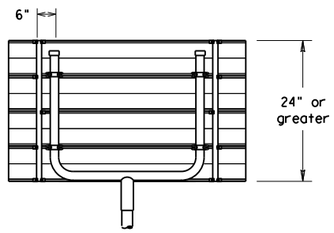
See Detail E
for clamp installation



Detail E



Extruded Aluminum Sign
With T Bracket



Use Extruded Alum. Windbeam as stiffeners
See SMD (2-1) for additional details

See Detail E
for clamp installation

GENERAL NOTES:

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

1. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
2. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
3. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
4. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
5. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
6. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
7. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
8. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
9. Sign blanks shall be the sizes and shapes shown on the plans.
10. Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
11. Post open ends shall be fitted with Friction Caps.

REQUIRED SUPPORT

	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

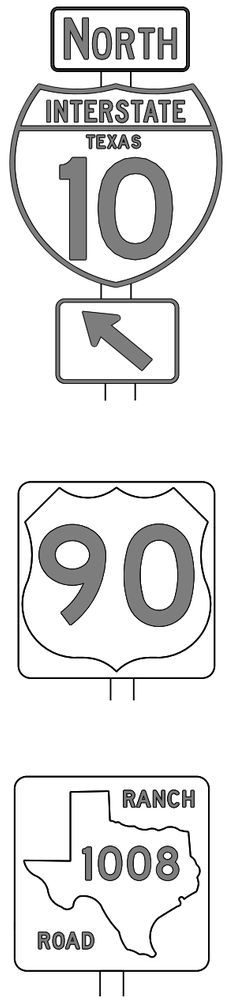
SMD(SLIP-3)-08

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		222

DATE: 6/13/2024 11:03:14 AM
FILE: c:\txdot\pw_online\txdot5\noel.contu\d0455362\tsr3-13.dgn

REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

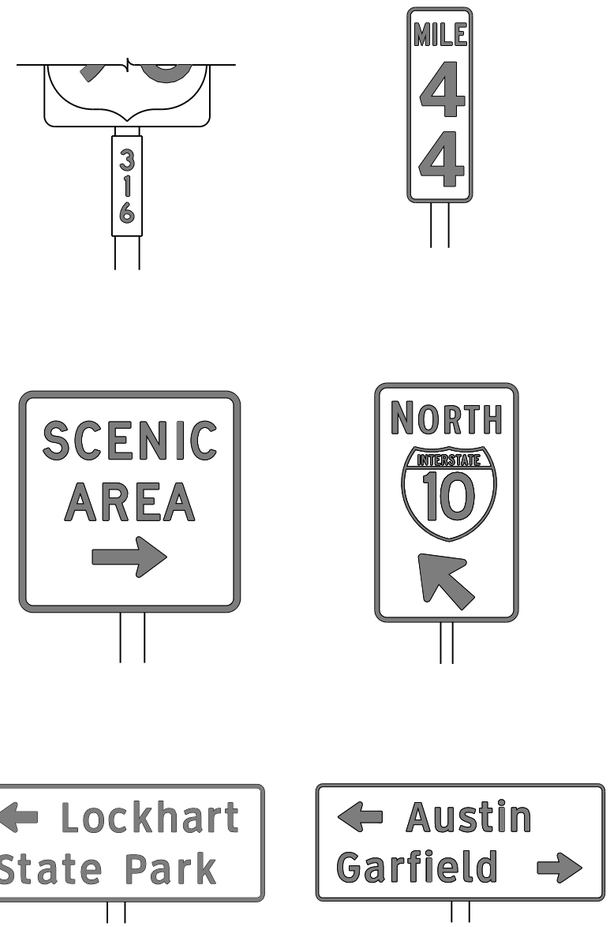
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



TYPICAL EXAMPLES

REQUIREMENTS FOR BLUE, BROWN & GREEN D AND I SERIES GUIDE SIGNS

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE D SHEETING
LEGEND, SYMBOLS & BORDERS	ALL OTHERS	TYPE B OR C SHEETING



TYPICAL EXAMPLES

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).

2. White legend shall use the Clearview Alphabet. The following Clearview fonts shall be used to replace the existing white Federal Highway Administration (FHWA) Standard Highway Alphabets, when not specified in the SHSD, or in the plans.

B	CV-1W
C	CV-2W
D	CV-3W
E	CV-4W
Emod	CV-5WR
F	CV-6W

3. Route sign legend (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets B, C, D, E, Emod or F).

4. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.

5. Independent mounted route sign with white or colored legend and borders shall be applied by screening process with transparent color ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof. White legend, symbols and borders on all other signs shall be cut-out white sheeting applied to colored background sheeting.

6. Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius should be trimmed or rounded.

7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.

8. Mounting details of roadside signs are shown in the "SMD series" Standard Plan Sheets.

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

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

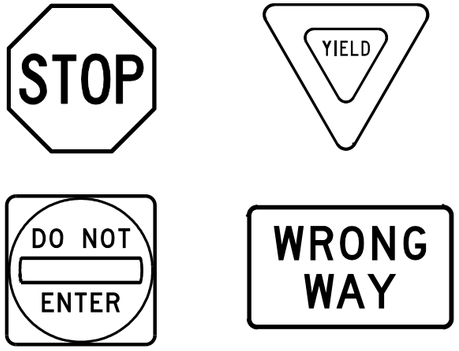
TSR(3)-13

FILE: tsr3-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	PHR	CAMERON		223

DATE: 6/13/2024 11:03:19 AM
FILE: c:\txdot\pw_online\txdot5\noel.cantu\d0455362\tsr4-13.dgn

REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS

(STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	WHITE	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE B OR C SHEETING
LEGEND	RED	TYPE B OR C SHEETING

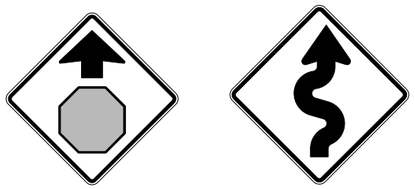
REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)

TYPICAL EXAMPLES

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

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	FLOURESCENT YELLOW	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR SCHOOL SIGNS

TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	FLOURESCENT YELLOW GREEN	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
SYMBOLS	RED	TYPE B OR C SHEETING

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod or F).
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
5. White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
6. Colored legend shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to background sheeting, or combination thereof.
7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
8. Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

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

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

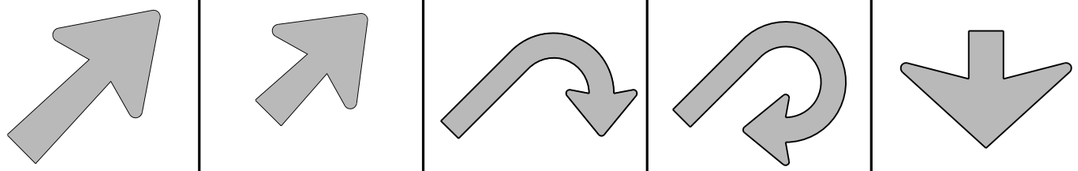
TSR(4)-13

FILE: tsr4-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
12-03 7-13 9-08	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		224

DATE: 6/13/2024 11:03:24 AM
FILE: c:\txdot\pw_online\txdot5\noel.cantu\d0455362\tsr5-13.dgn

ARROW DETAILS

for Large Ground-Mounted and Overhead Guide Signs



TYPE	LETTER SIZE	USE
A-1	10.67" U/L and 10" Caps	Single Lane Exits
A-2	13.33" U/L and 12" Caps	
A-3	16" & 20" U/L	
B-1	10.67" U/L and 10" Caps	Multiple Lane Exits
B-2	13.33" U/L and 12" Caps	
B-3	16" & 20" U/L	

CODE	USED ON SIGN NO.
E-3	E5-1aT
E-4	E5-1bT

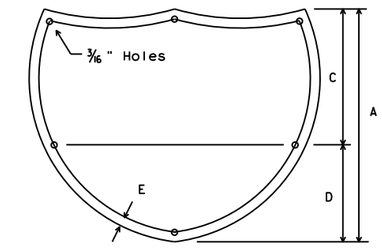
NOTE

Arrow dimensions are shown in the "Standard Highway Sign Designs for Texas" manual.

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

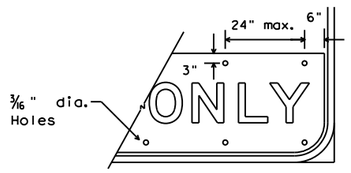
http://www.txdot.gov/

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

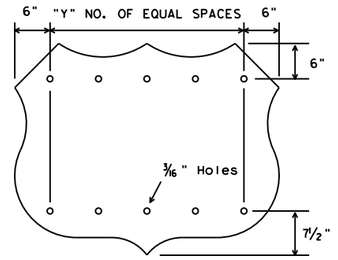


INTERSTATE ROUTE MARKERS

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

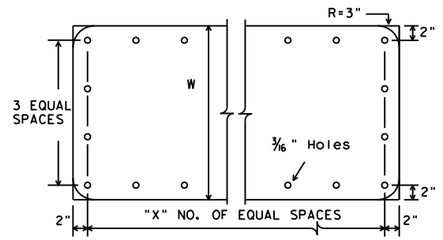


EXIT ONLY PANEL



U.S. ROUTE MARKERS

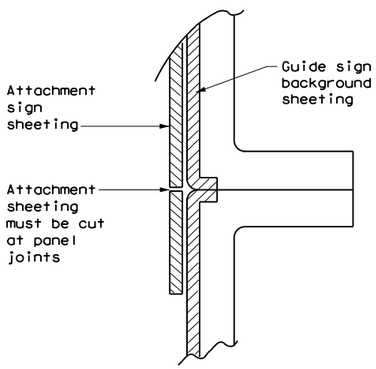
Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



STATE ROUTE MARKERS

No. of Digits	W	X
4	24	4
4	36	5
4	48	6
3	24	3
3	36	4
3	48	5

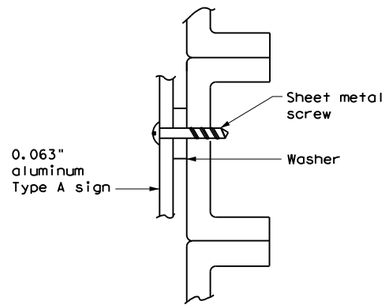
MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



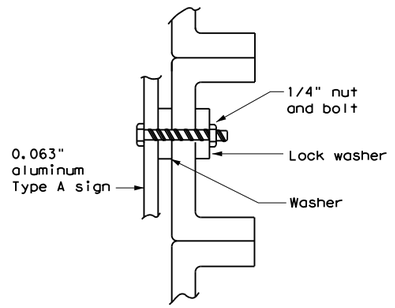
DIRECT APPLIED ATTACHMENT

NOTE:

1. Sheeting for legend, symbols, and borders must be cut at panel joints.
2. Direct applied attachment signs will be subsidiary to "Aluminum Signs" or "Fiberglass Signs".



SCREW ATTACHMENT



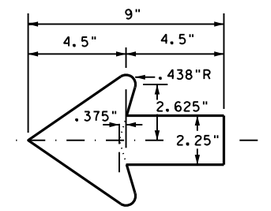
NUT/BOLT ATTACHMENT

NOTE:

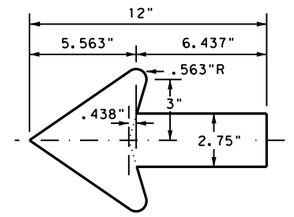
Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

ARROW DETAILS

for Destination Signs (Type D)



Standard arrow to be used with 6 inch letters.



Standard arrow to be used with 8 inch letters.

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(5)-13

FILE: tsr5-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	PHR	CAMERON		225

PAVEMENT MARKINGS
COVER SHEET

DATE: 6/13/2024 11:04:55 AM
FILE: c:\txdot\pw_online\txdot5\noel.cantu\d0465296\PAV MARK COVER.dgn

Pharr District Central Design

Texas Department of Transportation

FM 510

PAVEMENT MARKINGS
COVER SHEET

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		226

A (FT)	B (FT)	C (FT)	D (FT)	E (FT)	F (FT)	G (FT)	H (EA)	I (EA)	J (EA)	K (EA)	L (EA)	M (EA)	N (EA)	O (EA)	P (EA)	Q (EA)	R (EA)	S (LF)	T (EA)	U (EA)	V (EA)	W (EA)	X (FT)	Y (FT)
6,312	810	498	-	-	-	36	-	-	47	-	-	100	1,193	-	-	-	-	-	-	-	-	-	-	-

LEGEND

A	REFL PROFILE PAV MRK (TY I)(W)(6")(SLD)(100 MIL)
B	REFL PAV MRK (TY I)(Y)(6")(BRK)(100 MIL)
C	REFL PAV MRK (TY I)(Y)(6")(SLD)(100 MIL)
D	REFL PAV MRK (TY I)(W)(8")(SLD)(100 MIL)
E	REFL PAV MRK (TY I)(W)(12")(SLD)(100 MIL)
F	REFL PAV MRK (TY I)(Y)(12")(SLD)(100 MIL)
G	REFL PAV MRK (TY I)(W)(24")(SLD)(100 MIL)
H	PREFAB PAV MRK (TY C)(W)(ARROW)
I	PREFAB PAV MRK (TY C)(W)(WORD)
J	REFL PAV MRKR TY II-A-A
K	REFL PAV MRKR TY I-C
L	X (RR XING)
M	TRAFFIC BUTTON TY Y
N	TRAFFIC BUTTON TY B
W/	WITH
@	AT
EOP	EDGE OF PAVEMENT
C-C	CENTER TO CENTER
←	TRAFFIC FLOW

NOTES:

1. THE PAVEMENT SURFACE SHALL BE FREE OF DELETERIOUS MATERIAL BEFORE APPLICATION OF PERMANENT STRIPING AND PAVEMENT MARKERS. IF THE SURFACE NEEDS TO BE CLEANED, AS DETERMINED BY THE AREA ENGINEER, THE CONTRACTOR SHALL PREPARE SURFACE IN ACCORDANCE WITH ITEM 678, "PAVEMENT SURFACE PREPARATION FOR MARKINGS", EXCEPT FOR "MEASUREMENT" AND "PAYMENT". THE PREPARATION OF PAVEMENT SURFACE SHALL BE SUBSIDIARY TO ITEM 666, 668 AND 672.
2. ALL PERMANENT PAVEMENT MARKINGS SHALL BE 0.100 INCHES (100 MIL) THICK THERMOPLASTIC.
3. FOR RUMBLE STRIPS SEE SHEETS RS(3)-23 AND RS(4)-23 FOR MORE DETAILS.
4. FOR PAVEMENT MARKINGS SEE SHEETS PM(1)-22 THRU PM(3)-22 FOR MORE DETAILS.

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

PAVEMENT MARKING LAYOUT

SCALE: 1" = 100'

SHEET 1 OF 7

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		227

DATE: 6/13/2024 11:05:03 AM
FILE: c:\txdot\pw_online\txdot\noel.cantu\d0465296\PM SHT01.dgn

A (FT)	B (FT)	C (FT)	D (FT)	E (FT)	F (FT)	G (FT)	H (EA)	I (EA)	J (EA)	K (EA)	L (EA)	M (EA)	N (EA)	O (EA)	P (EA)	Q (EA)	R (EA)	S (LF)	T (EA)	U (EA)	V (EA)	W (EA)	X (FT)	Y (FT)
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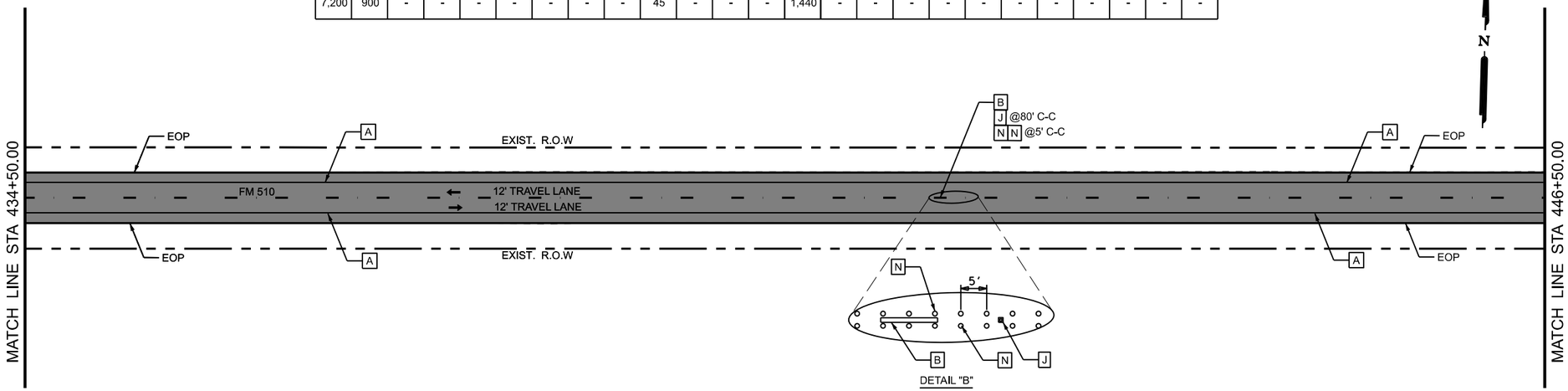
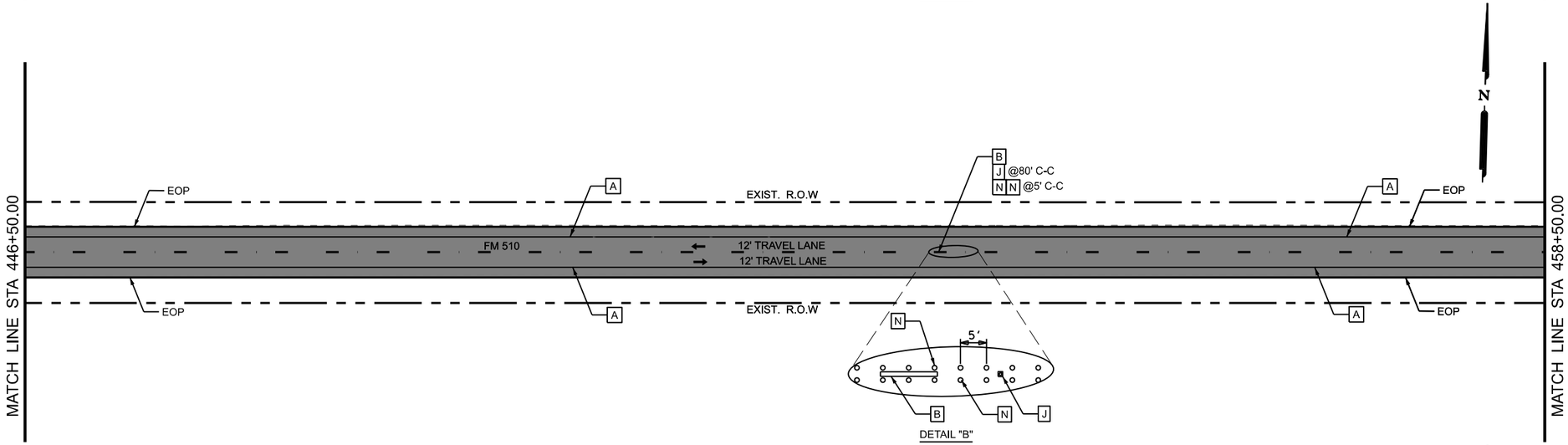
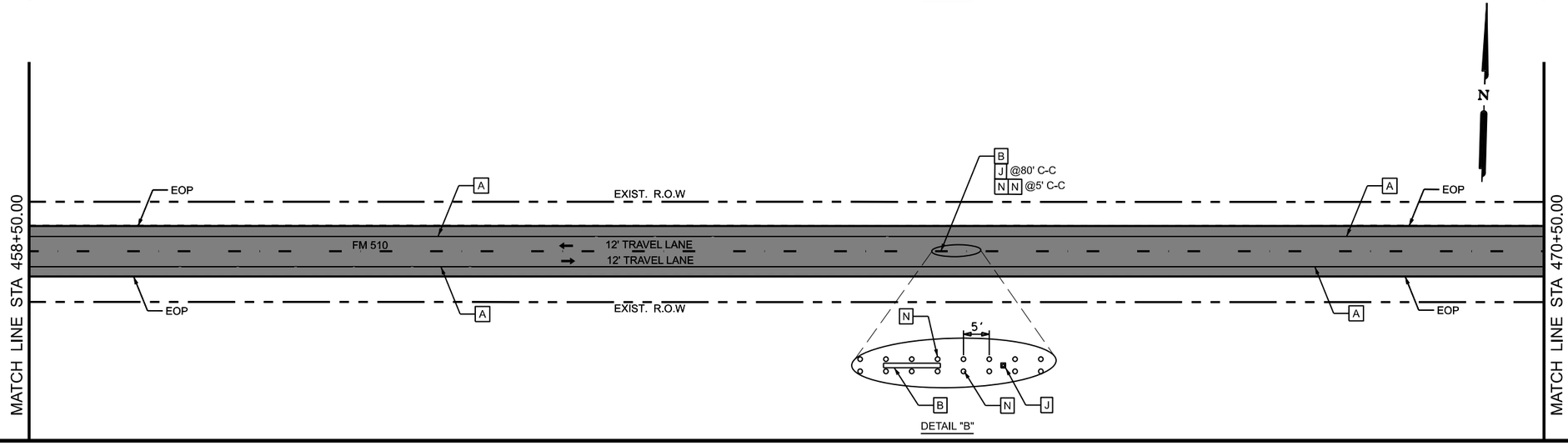






LEGEND

A	REFL PROFILE PAV MRK (TY I)(W)(6")(SLD)(100 MIL)
B	REFL PAV MRK (TY I)(Y)(6")(BRK)(100 MIL)
C	REFL PAV MRK (TY I)(Y)(6")(SLD)(100 MIL)
D	REFL PAV MRK (TY I)(W)(8")(SLD)(100 MIL)
E	REFL PAV MRK (TY I)(W)(12")(SLD)(100 MIL)
F	REFL PAV MRK (TY I)(Y)(12")(SLD)(100 MIL)
G	REFL PAV MRK (TY I)(W)(24")(SLD)(100 MIL)
H	PREFAB PAV MRK (TY C)(W)(ARROW)
I	PREFAB PAV MRK (TY C)(W)(WORD)
J	REFL PAV MRKR TY II-A-A
K	REFL PAV MRKR TY I-C
L	X (RR XING)
M	TRAFFIC BUTTON TY Y
N	TRAFFIC BUTTON TY B
W/	WITH
@	AT
EOP	EDGE OF PAVEMENT
C-C	CENTER TO CENTER
←	TRAFFIC FLOW

NOTES:

1. THE PAVEMENT SURFACE SHALL BE FREE OF DELETERIOUS MATERIAL BEFORE APPLICATION OF PERMANENT STRIPING AND PAVEMENT MARKERS. IF THE SURFACE NEEDS TO BE CLEANED, AS DETERMINED BY THE AREA ENGINEER, THE CONTRACTOR SHALL PREPARE SURFACE IN ACCORDANCE WITH ITEM 678, "PAVEMENT SURFACE PREPARATION FOR MARKINGS", EXCEPT FOR "MEASUREMENT" AND "PAYMENT". THE PREPARATION OF PAVEMENT SURFACE SHALL BE SUBSIDIARY TO ITEM 666, 668 AND 672.
2. ALL PERMANENT PAVEMENT MARKINGS SHALL BE 0.100 INCHES (100 MIL) THICK THERMOPLASTIC.
3. FOR RUMBLE STRIPS SEE SHEETS RS(3)-23 AND RS(4)-23 FOR MORE DETAILS.
4. FOR PAVEMENT MARKINGS SEE SHEETS PM(1)-22 THRU PM(3)-22 FOR MORE DETAILS.

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

PAVEMENT MARKING LAYOUT

SCALE: 1" = 100' SHEET 2 OF 7

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		228

DATE: 6/13/2024 11:05:08 AM
FILE: c:\txdot\pw_online\txdot5\noel.cantu\d0465296\PM SHT02.dgn

A (FT)	B (FT)	C (FT)	D (FT)	E (FT)	F (FT)	G (FT)	H (EA)	I (EA)	J (EA)	K (EA)	L (EA)	M (EA)	N (EA)	O (EA)	P (EA)	Q (EA)	R (EA)	S (LF)	T (EA)	U (EA)	V (EA)	W (EA)	X (FT)	Y (FT)
7,140	900	-	-	-	-	18	-	-	45	-	-	-	1,440	-	-	-	-	-	-	-	-	-	-	-

LEGEND

A	REFL PROFILE PAV MRK (TY I)(W)(6")(SLD)(100 MIL)
B	REFL PAV MRK (TY I)(Y)(6")(BRK)(100 MIL)
C	REFL PAV MRK (TY I)(Y)(6")(SLD)(100 MIL)
D	REFL PAV MRK (TY I)(W)(8")(SLD)(100 MIL)
E	REFL PAV MRK (TY I)(W)(12")(SLD)(100 MIL)
F	REFL PAV MRK (TY I)(Y)(12")(SLD)(100 MIL)
G	REFL PAV MRK (TY I)(W)(24")(SLD)(100 MIL)
H	PREFAB PAV MRK (TY C)(W)(ARROW)
I	PREFAB PAV MRK (TY C)(W)(WORD)
J	REFL PAV MRKR TY II-A-A
K	REFL PAV MRKR TY I-C
L	X (RR XING)
M	TRAFFIC BUTTON TY Y
N	TRAFFIC BUTTON TY B
W/	WITH
@	AT
EOP	EDGE OF PAVEMENT
C-C	CENTER TO CENTER
←	TRAFFIC FLOW

NOTES:

1. THE PAVEMENT SURFACE SHALL BE FREE OF DELETERIOUS MATERIAL BEFORE APPLICATION OF PERMANENT STRIPING AND PAVEMENT MARKERS. IF THE SURFACE NEEDS TO BE CLEANED, AS DETERMINED BY THE AREA ENGINEER, THE CONTRACTOR SHALL PREPARE SURFACE IN ACCORDANCE WITH ITEM 678, "PAVEMENT SURFACE PREPARATION FOR MARKINGS", EXCEPT FOR "MEASUREMENT" AND "PAYMENT". THE PREPARATION OF PAVEMENT SURFACE SHALL BE SUBSIDIARY TO ITEM 666, 668 AND 672.
2. ALL PERMANENT PAVEMENT MARKINGS SHALL BE 0.100 INCHES (100 MIL) THICK THERMOPLASTIC.
3. FOR RUMBLE STRIPS SEE SHEETS RS(3)-23 AND RS(4)-23 FOR MORE DETAILS.
4. FOR PAVEMENT MARKINGS SEE SHEETS PM(1)-22 THRU PM(3)-22 FOR MORE DETAILS.

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED
PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

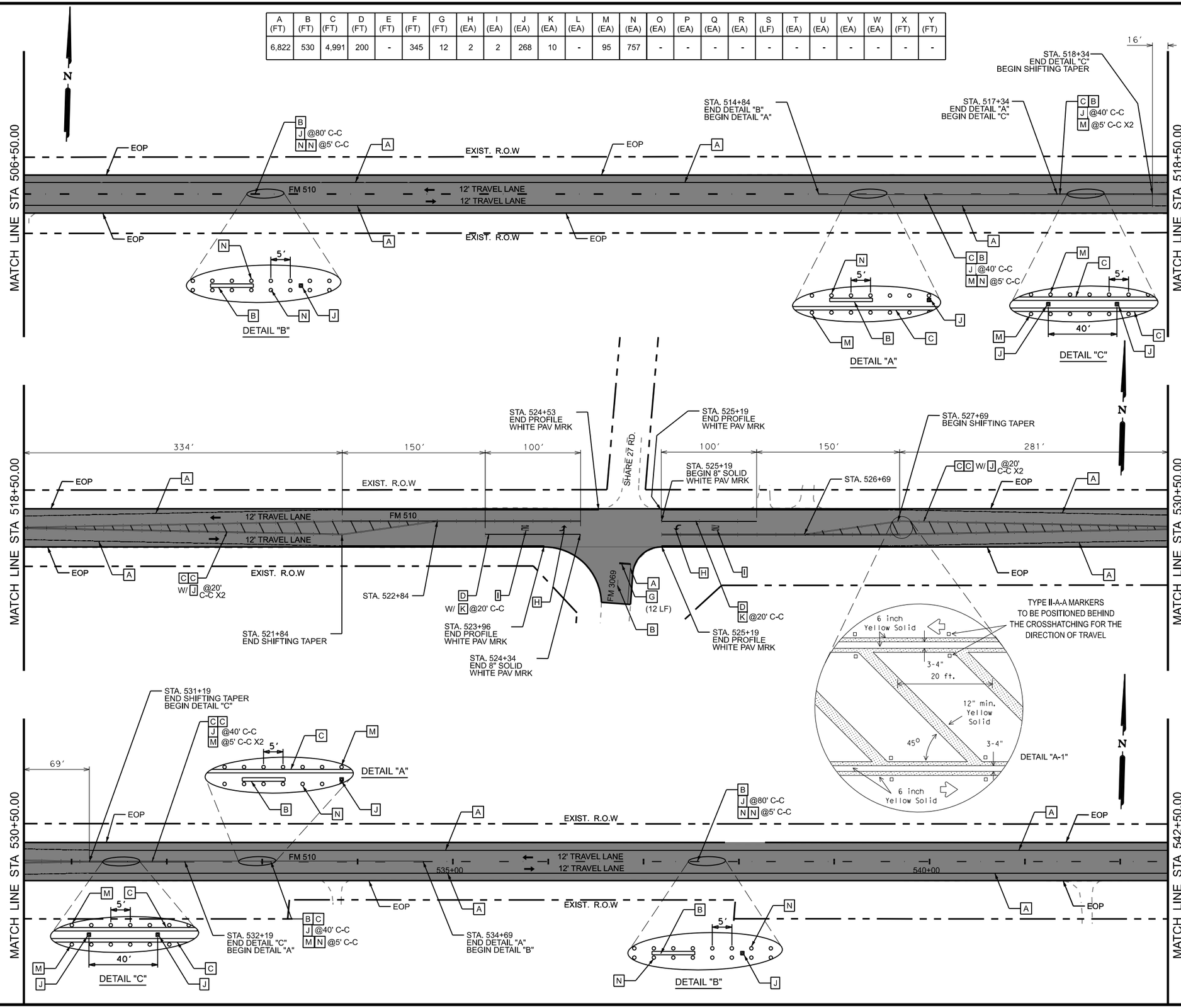
PAVEMENT MARKING LAYOUT

SCALE: 1" = 100' SHEET 3 OF 7

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		229

DATE: 6/13/2024 11:05:14 AM
FILE: c:\txdot\pw_online\txdot5\noel.cantu\d0465296\PM SHT03.dgn

A (FT)	B (FT)	C (FT)	D (FT)	E (FT)	F (FT)	G (FT)	H (EA)	I (EA)	J (EA)	K (EA)	L (EA)	M (EA)	N (EA)	O (EA)	P (EA)	Q (EA)	R (EA)	S (LF)	T (EA)	U (EA)	V (EA)	W (EA)	X (FT)	Y (FT)
6,822	530	4,991	200	-	345	12	2	2	268	10	-	95	757	-	-	-	-	-	-	-	-	-	-	-



LEGEND

A	REFL PROFILE PAV MRK (TY I)(W)(6")(SLD)(100 MIL)
B	REFL PAV MRK (TY I)(Y)(6")(BRK)(100 MIL)
C	REFL PAV MRK (TY I)(Y)(6")(SLD)(100 MIL)
D	REFL PAV MRK (TY I)(W)(8")(SLD)(100 MIL)
E	REFL PAV MRK (TY I)(W)(12")(SLD)(100 MIL)
F	REFL PAV MRK (TY I)(Y)(12")(SLD)(100 MIL)
G	REFL PAV MRK (TY I)(W)(24")(SLD)(100 MIL)
H	PREFAB PAV MRK (TY C)(W)(ARROW)
I	PREFAB PAV MRK (TY C)(W)(WORD)
J	REFL PAV MRKR TY II-A-A
K	REFL PAV MRKR TY I-C
L	X (RR XING)
M	TRAFFIC BUTTON TY Y
N	TRAFFIC BUTTON TY B
W/	WITH
@	AT
EOP	EDGE OF PAVEMENT
C-C	CENTER TO CENTER
←	TRAFFIC FLOW

NOTES:

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4. FOR PAVEMENT MARKINGS SEE SHEETS PM(1)-22 THRU PM(3)-22 FOR MORE DETAILS.

STATE OF TEXAS
JOSE A. RODRIGUEZ
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06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

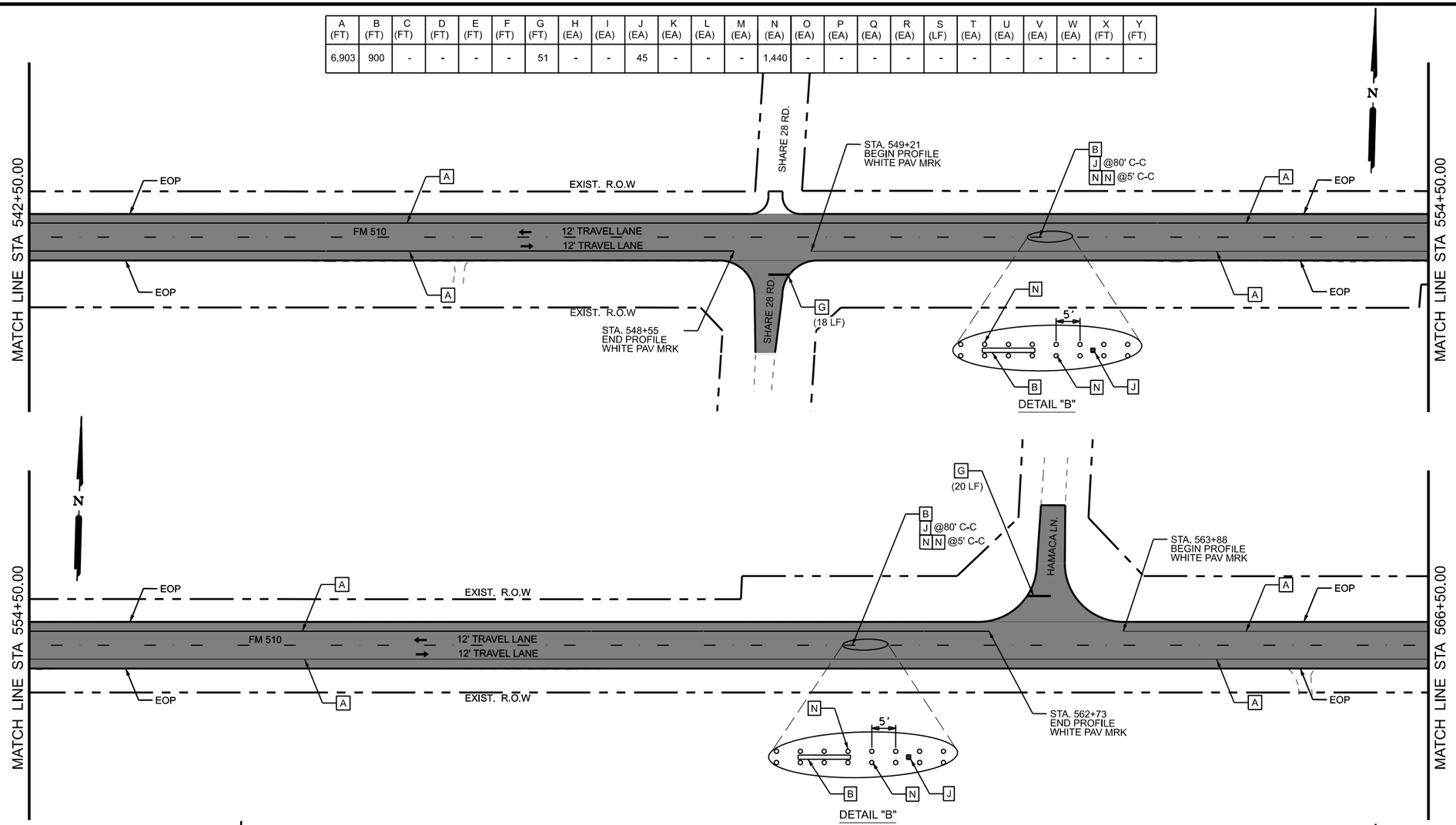
PAVEMENT MARKING LAYOUT

SCALE: 1" = 100' SHEET 4 OF 7

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		230

DATE: 6/13/2024 11:05:20 AM
FILE: c:\txdot\pw_online\txdot5\noel.cantu\d0465296\FM SHT04.dgn

A (FT)	B (FT)	C (FT)	D (FT)	E (FT)	F (FT)	G (FT)	H (EA)	I (EA)	J (EA)	K (EA)	L (EA)	M (EA)	N (EA)	O (EA)	P (EA)	Q (EA)	R (EA)	S (LF)	T (EA)	U (EA)	V (EA)	W (EA)	X (FT)	Y (FT)
6,903	900	-	-	-	-	51	-	-	45	-	-	-	1,440	-	-	-	-	-	-	-	-	-	-	-



LEGEND

- A REFL PROFILE PAV MRK (TY I)(W)(6")(SLD)(100 MIL)
- B REFL PAV MRK (TY I)(Y)(6")(BRK)(100 MIL)
- C REFL PAV MRK (TY I)(Y)(6")(SLD)(100 MIL)
- D REFL PAV MRK (TY I)(W)(8")(SLD)(100 MIL)
- E REFL PAV MRK (TY I)(W)(12")(SLD)(100 MIL)
- F REFL PAV MRK (TY I)(Y)(12")(SLD)(100 MIL)
- G REFL PAV MRK (TY I)(W)(24")(SLD)(100 MIL)
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- I PREFAB PAV MRK (TY C)(W)(WORD)
- J REFL PAV MRKR TY II-A-A
- K REFL PAV MRKR TY I-C
- L X (RR XING)
- M TRAFFIC BUTTON TY Y
- N TRAFFIC BUTTON TY B

W/ WITH
@ AT
EOP EDGE OF PAVEMENT
C-C CENTER TO CENTER
← TRAFFIC FLOW

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STATE OF TEXAS
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06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

PAVEMENT MARKING LAYOUT

SCALE: 1" = 100' SHEET 5 OF 7

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		231

DATE: 6/13/2024 11:05:26 AM
FILE: c:\txdot\pw_online\txdot\snoel.cantu\d0465296\PM SHT05.dgn

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7,059	900	410	-	-	-	24	-	-	51	-	-	83	1,358	-	-	-	-	-	-	-	-	-	-	-

LEGEND

A	REFL PROFILE PAV MRK (TY I)(W)(6")(SLD)(100 MIL)
B	REFL PAV MRK (TY I)(Y)(6")(BRK)(100 MIL)
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K	REFL PAV MRKR TY I-C
L	X (RR XING)
M	TRAFFIC BUTTON TY Y
N	TRAFFIC BUTTON TY B
W/	WITH
@	AT
EOP	EDGE OF PAVEMENT
C-C	CENTER TO CENTER
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06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

PAVEMENT MARKING LAYOUT

SCALE: 1" = 100' SHEET 6 OF 7

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		232

DATE: 6/13/2024 11:05:32 AM
FILE: c:\txdot\pw_online\txdot5\noel.cantu\d0465296\PM SHT06.dgn

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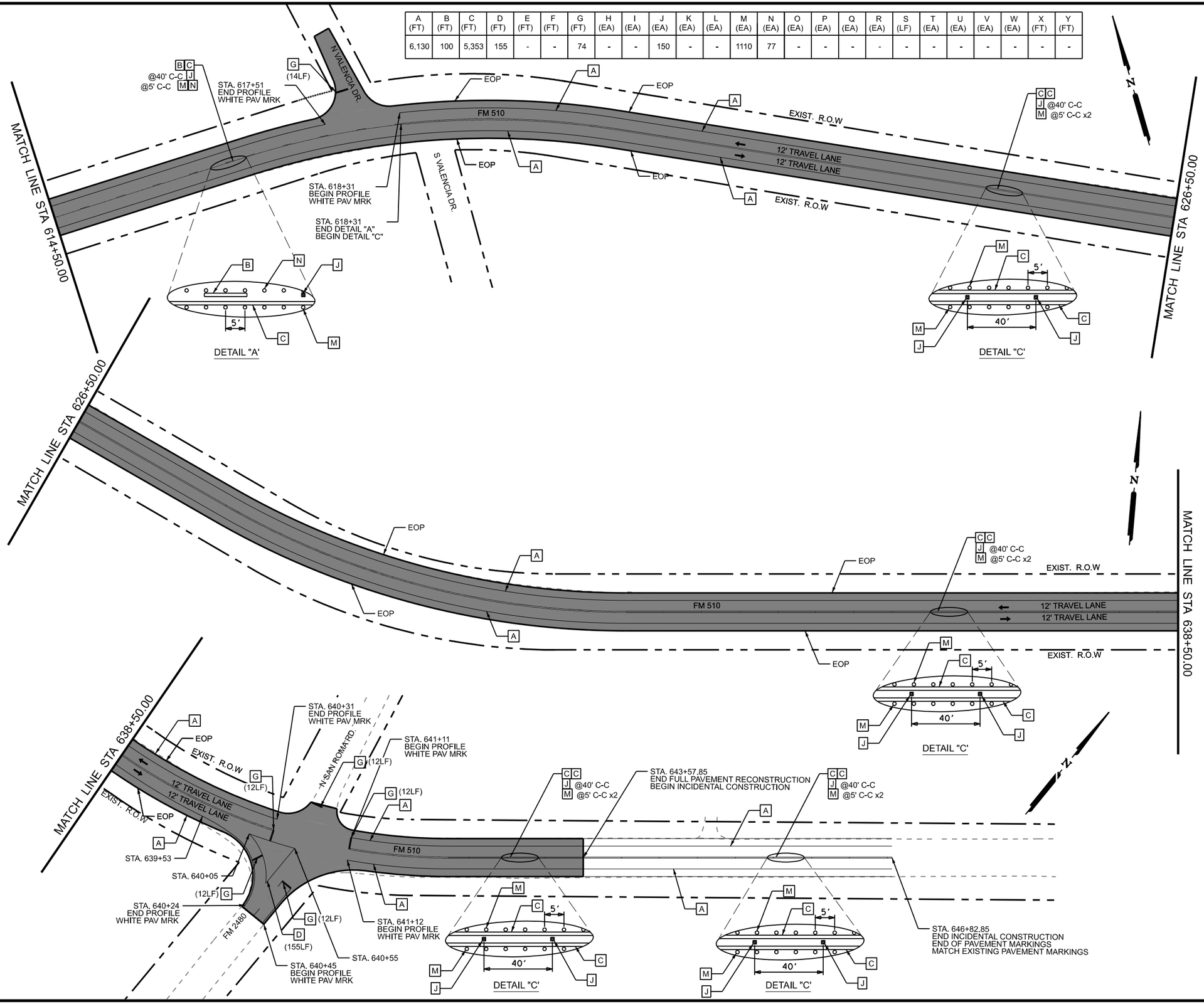
6,130	100	5,353	155	-	-	74	-	-	150	-	-	1110	77	-	-	-	-	-	-	-	-	-	-	-



LEGEND

A	REFL PROFILE PAV MRK (TY I)(W)(6")(SLD)(100 MIL)
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L	X (RR XING)
M	TRAFFIC BUTTON TY Y
N	TRAFFIC BUTTON TY B
W/	WITH
@	AT
EOP	EDGE OF PAVEMENT
C-C	CENTER TO CENTER
←	TRAFFIC FLOW

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06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

PAVEMENT MARKING LAYOUT

SCALE: 1" = 100' SHEET 7 OF 7

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		233

DATE: 6/13/2024 11:05:37 AM
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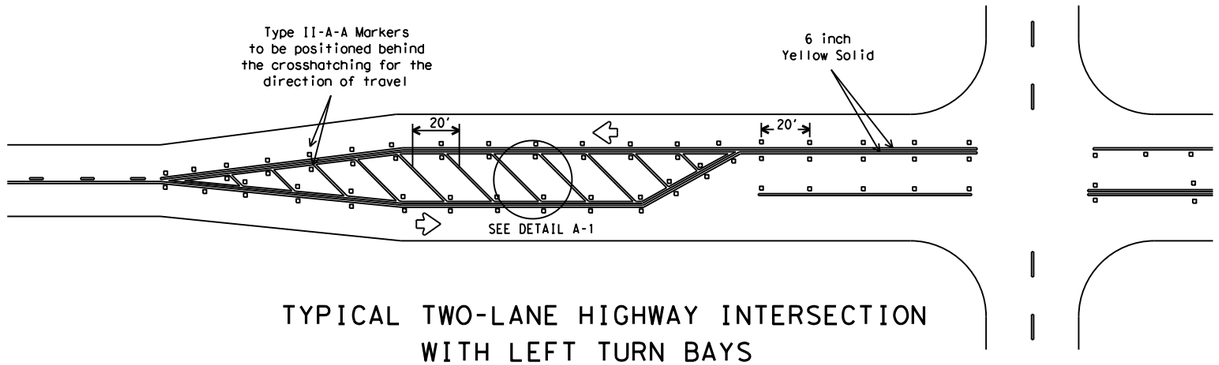
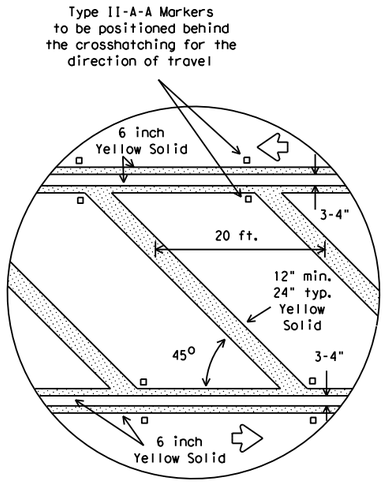


TYPICAL TWO-LANE HIGHWAY INTERSECTION
WITH LEFT TURN BAYS



DETAIL A-1

JOSE A. RODRIGUEZ
117308
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS

06/13/24

Pharr District Central Design

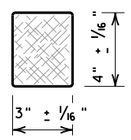
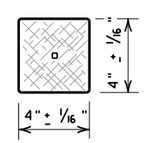
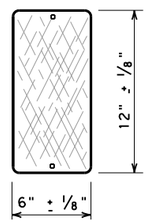
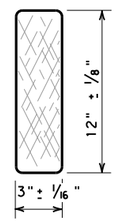
Texas Department of Transportation

PAVEMENT MARKINGS FOR
TWO-WAY LEFT TURN LANES
DIVIDED HIGHWAYS AND
RURAL LEFT TURN BAYS

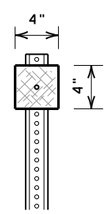
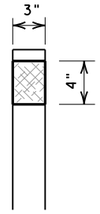
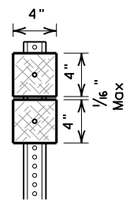
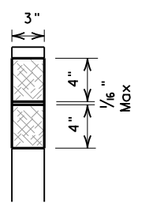
CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		234

DATE: 6/13/2024 11:05:43 AM
FILE: c:\txdot\pw_online\txdot5\noel.cantu\d0455367\PM3_DETAILA1.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

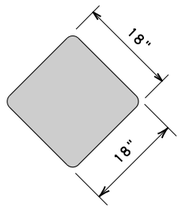
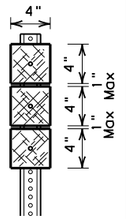
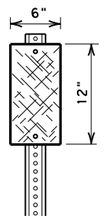
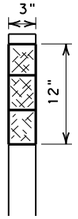
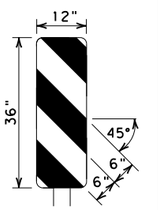
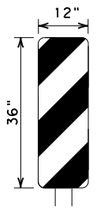
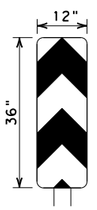
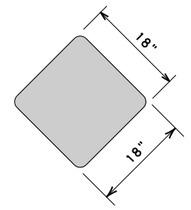
NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

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

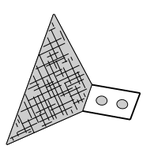
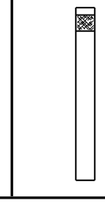
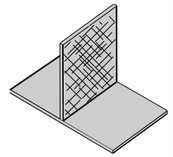
OBJECT MARKERS

	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)

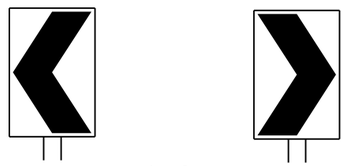
	GF1	GF2	CTB
DEVICE			

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.

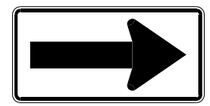
CHEVRONS

DEVICE:  W1-8

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

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

ONE DIRECTION LARGE ARROW

DEVICE:  W1-6

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

NOTE:

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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REVISIONS	1057	03	051	FM 510
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4-10 7-20	PHR	CAMERON		235

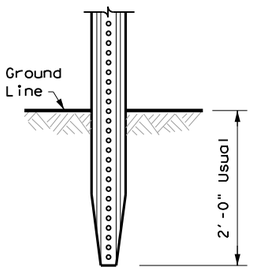
20A

DATE: 6/13/2024 11:06:35 AM
FILE: c:\txdot\pw_online\txdot5\noel.contu\d0455367\dom1-20.dgn

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

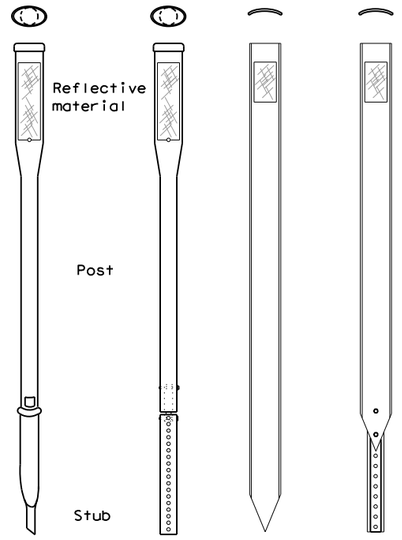


NOTES

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.

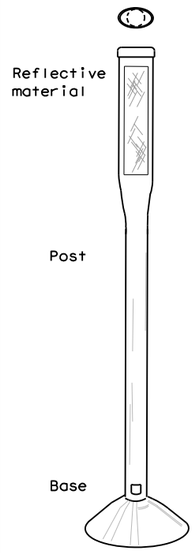
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



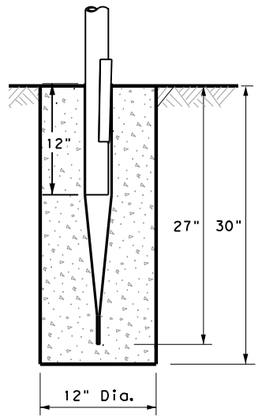
SURFACE MOUNT

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.

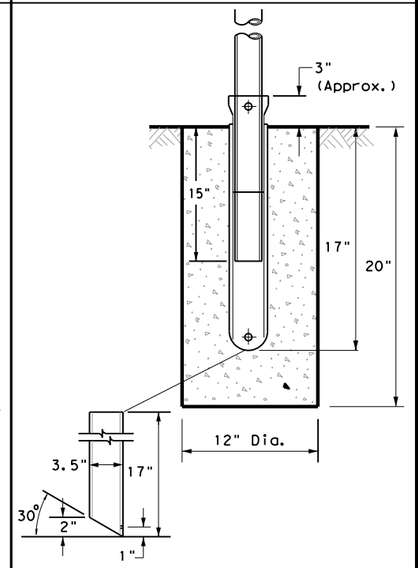
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

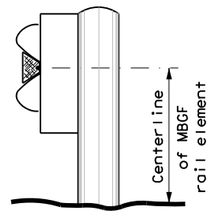
NOTE

1. Install per manufacturer's recommendations.

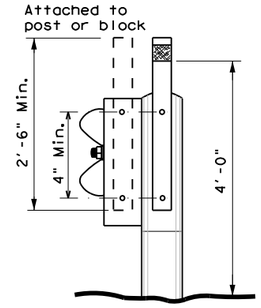
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

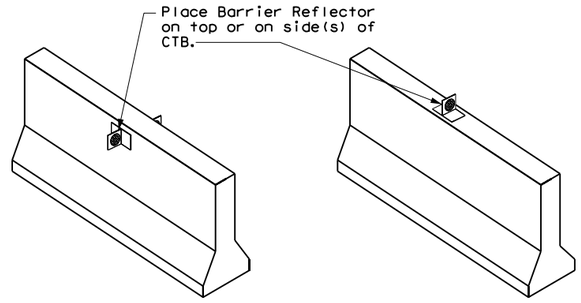
GF1



GF2



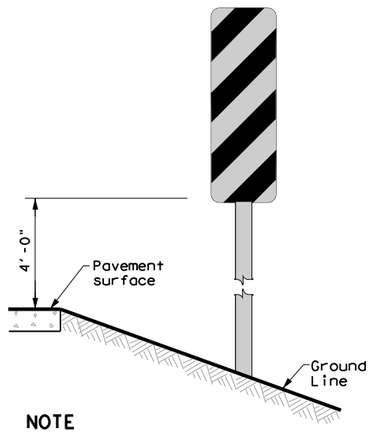
CONCRETE TRAFFIC BARRIER (CTB)



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.

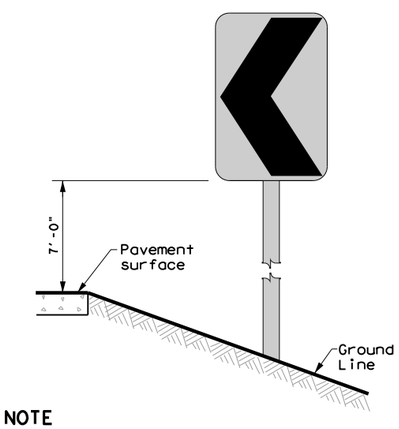
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



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)

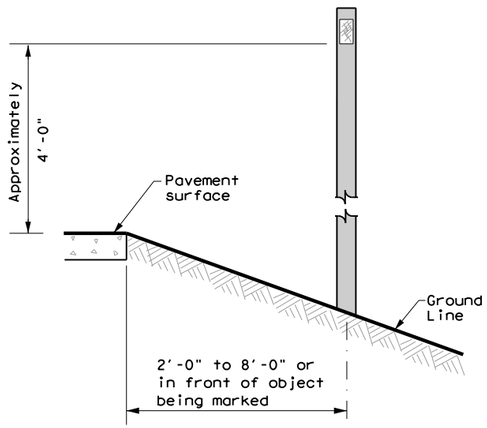
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



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
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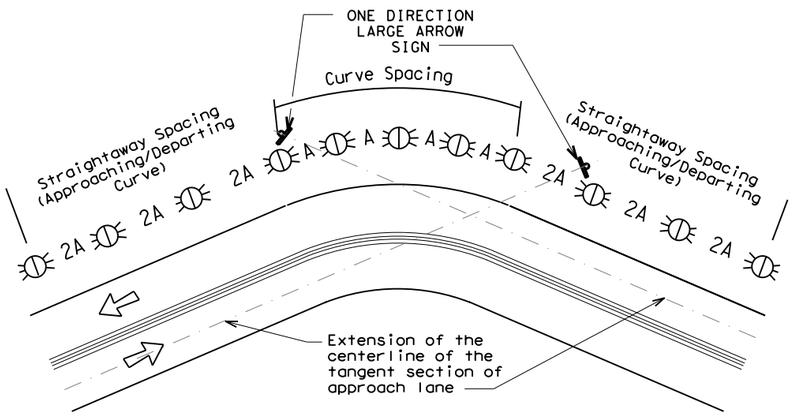
20B

MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

Amount by which Advisory Speed is less than Posted Speed	Curve Advisory Speed	
	Turn (30 MPH or less)	Curve (35 MPH or more)
5 MPH & 10 MPH	• RPMs	• RPMs
15 MPH & 20 MPH	• RPMs and One Direction Large Arrow sign	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons.
25 MPH & more	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons	• RPMs and Chevrons

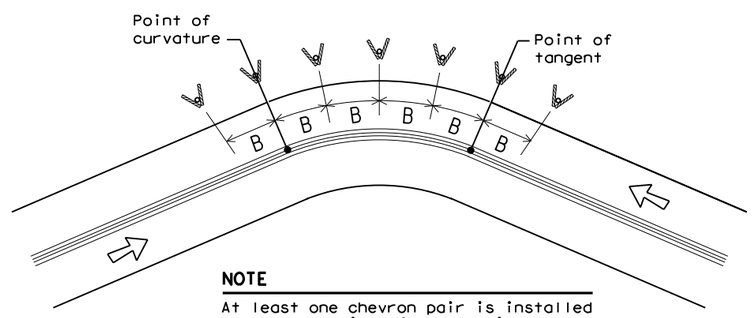
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



NOTE

ONE DIRECTION LARGE ARROW (W1-6) sign should be located at approximately and perpendicular to the extension of the centerline of the tangent section of approach lane.

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



NOTE

At least one chevron pair is installed beyond the point of tangent in tangent section.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN

Degree of Curve	FEET			
	Radius of Curve	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
		A	2A	B
1	5730	225	450	—
2	2865	160	320	—
3	1910	130	260	200
4	1433	110	220	160
5	1146	100	200	160
6	955	90	180	160
7	819	85	170	160
8	716	75	150	160
9	637	75	150	120
10	573	70	140	120
11	521	65	130	120
12	478	60	120	120
13	441	60	120	120
14	409	55	110	80
15	382	55	110	80
16	358	55	110	80
19	302	50	100	80
23	249	40	80	80
29	198	35	70	40
38	151	30	60	40
57	101	20	40	40

Curve delineator approach and departure spacing should include 3 delineators spaced at 2A. This spacing should be used during design preparation or when the degree of curve is known.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS NOT KNOWN

Advisory Speed (MPH)	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
	A	2xA	B
65	130	260	200
60	110	220	160
55	100	200	160
50	85	170	160
45	75	150	120
40	70	140	120
35	60	120	120
30	55	110	80
25	50	100	80
20	40	80	80
15	35	70	40

If the degree of curve is not known, delineator spacing may be determined based on the Advisory Speed of the curve. Use the delineator curve spacing for each Advisory Speed (MPH).

DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

CONDITION	REQUIRED TREATMENT	MINIMUM SPACING
Frwy./Exp. Tangent	RPMs	See PM-series and FPM-series standard sheets
Frwy./Exp. Curve	Single delineators on right side	See delineator spacing table
Frwy/Exp.Ramp	Single delineators on at least one side of ramp (should be on outside of curves) (see Detail 3 on D&OM(4))	100 feet on ramp tangents Use delineator spacing table for ramp curves ("straightway spacing" does not apply to ramp curves)
Acceleration/Deceleration Lane	Double delineators (see Detail 3 on D&OM(4))	100 feet (See Detail 3 on D & OM (4))
Truck Escape Ramp	Single red delineators on both sides	50 feet
Bridge Rail (steel or concrete)and Metal Beam Guard Fence	Bi-Directional Delineators when undivided with one lane each direction Single Delineators when multiple lanes each direction	Equal spacing (100'max) but not less than 3 delineators
Concrete Traffic Barrier (CTB) or Steel Traffic Barrier	Barrier reflectors matching the color of the edge line	Equal spacing 100' max
Cable Barrier	Reflectors matching the color of the edge line	Every 5th cable barrier post (up to 100'max)
Guard Rail Terminus/Impact Head	Divided highway - Object marker on approach end Undivided 2-lane highways - Object marker on approach and departure end	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5) and D & OM (6)
Bridges with no Approach Rail	Type 3 Object Marker (OM-3) at end of rail and 3 single delineators approaching rail	See D & OM(5)
Reduced Width Approaches to Bridge Rail	Type 2 and Type 3 Object Markers (OM-3) and 3 single delineators approaching bridge	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5)
Culverts without MBGF	Type 2 Object Markers	See Detail 2 on D & OM(4)
Crossovers	Double yellow delineators and RPMs	See Detail 1 on D & OM (4)
Pavement Narrowing (lane merge) on Freeways/Expressway	Single delineators adjacent to affected lane for full length of transition	100 feet

NOTES

1. Unless indicated otherwise, the delineator or barrier reflector color shall conform to the color of the pavement edge line on the side of the road where the delineators or barrier reflectors are placed.
2. Barrier reflectors may be used to replace required delineators.
3. Single red delineators may be mounted on the back side of delineator posts for wrong way driver applications

LEGEND

	Bi-directional Delineator
	Delineator
	Sign

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(3)-20

FILE: dom3-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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8-15 7-20	PHR	CAMERON		237

20C

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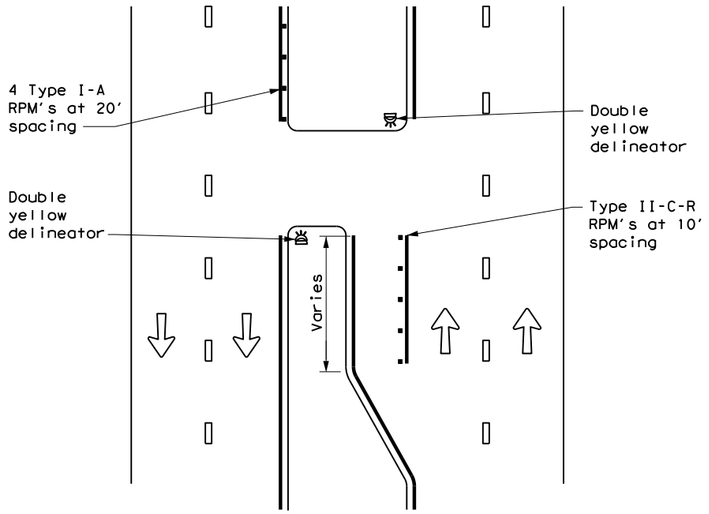
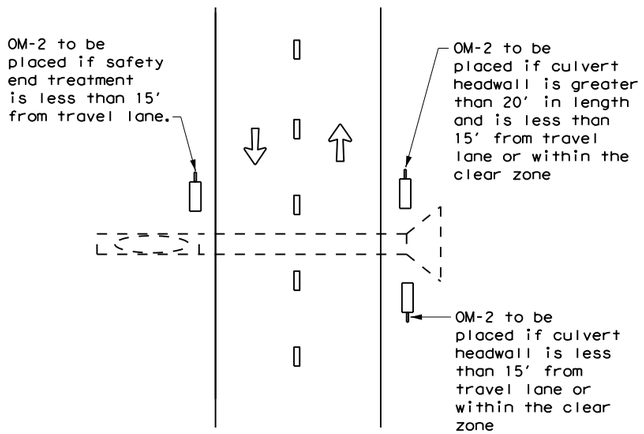
CROSSOVERS



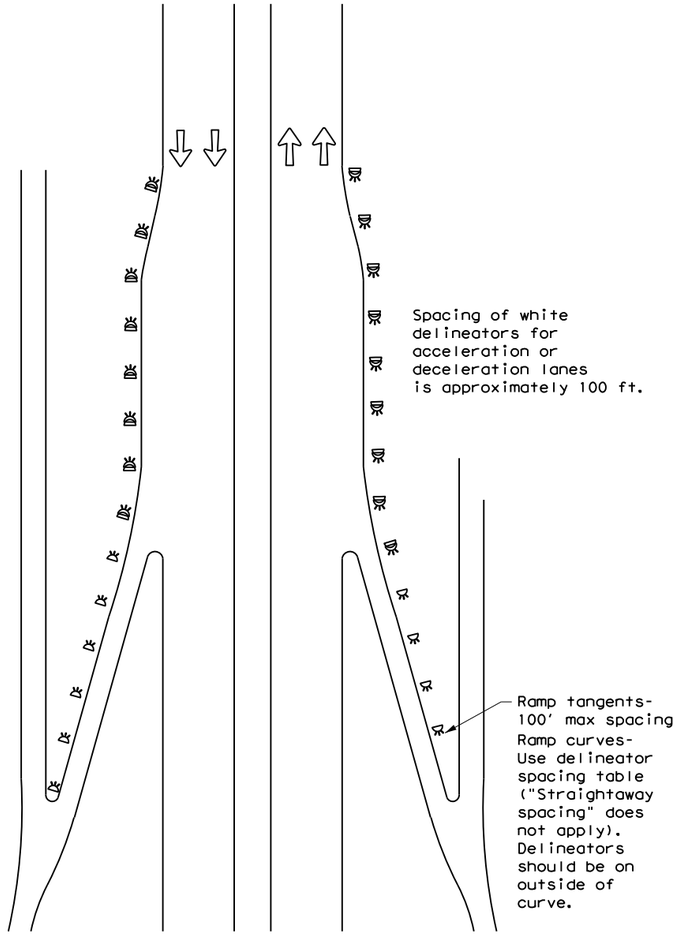
DETAIL 1

FOR CULVERTS WITHOUT MBGF



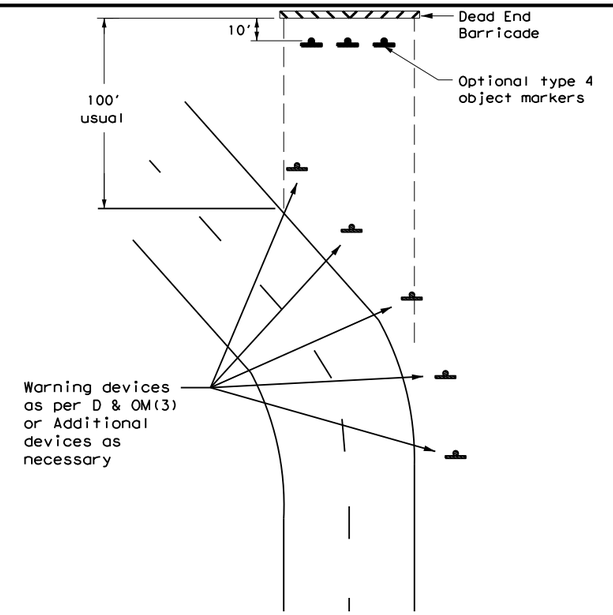
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



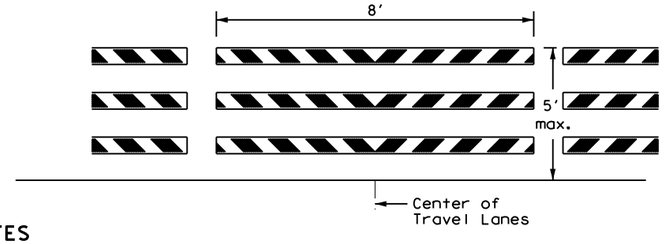
DETAIL 3

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 4

TYPICAL DEAD END BARRICADE INSTALLATION



NOTES

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

DETAIL 5

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(4)-20

FILE: dom4-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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	PHR	CAMERON		238

20D

DATE: 6/13/2024 11:06:55 AM
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DATE: 6/13/2024 11:07:00 AM
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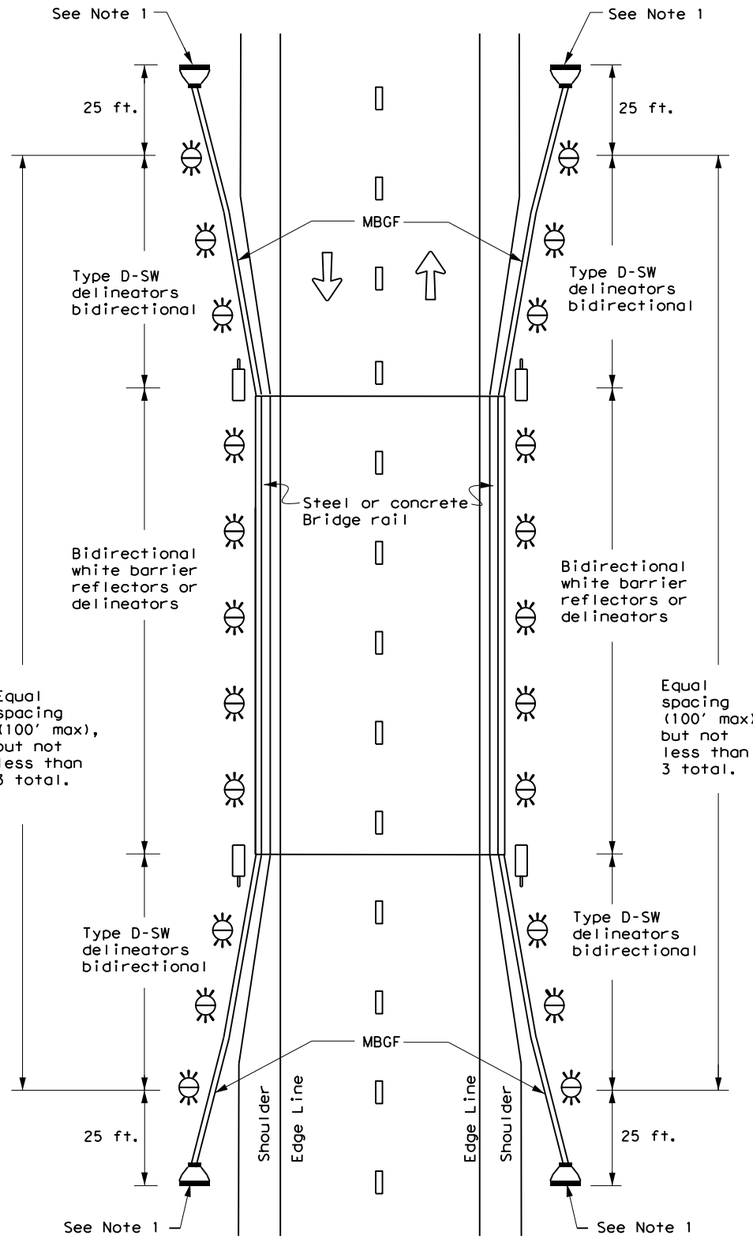
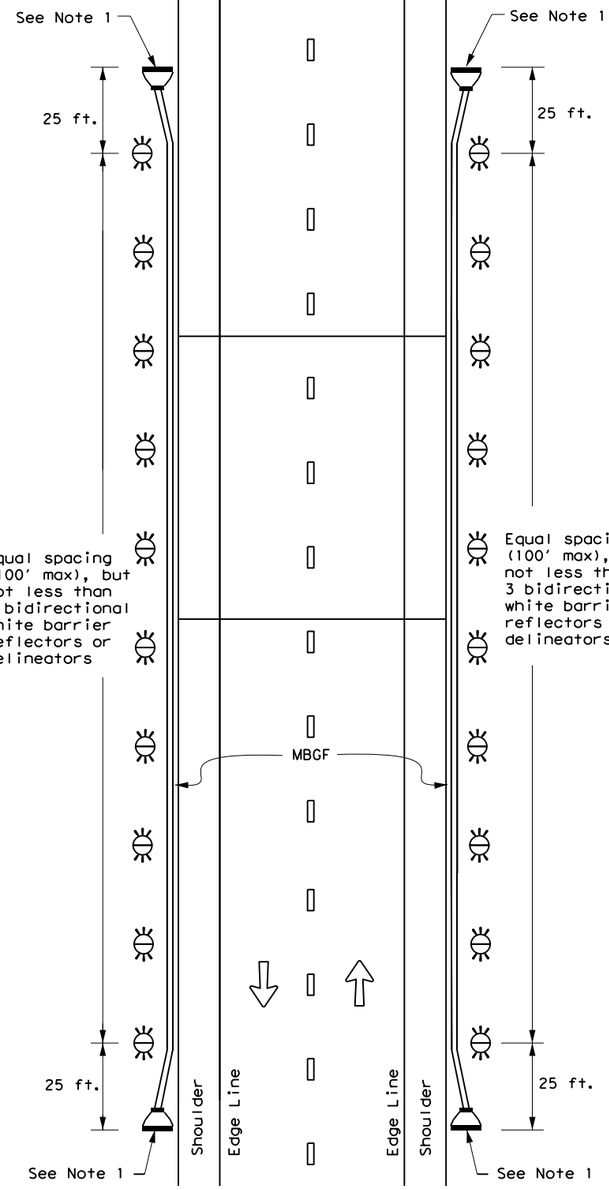
TWO-WAY, TWO LANE ROADWAY WITH REDUCED WIDTH APPROACH RAIL



NOTE:

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

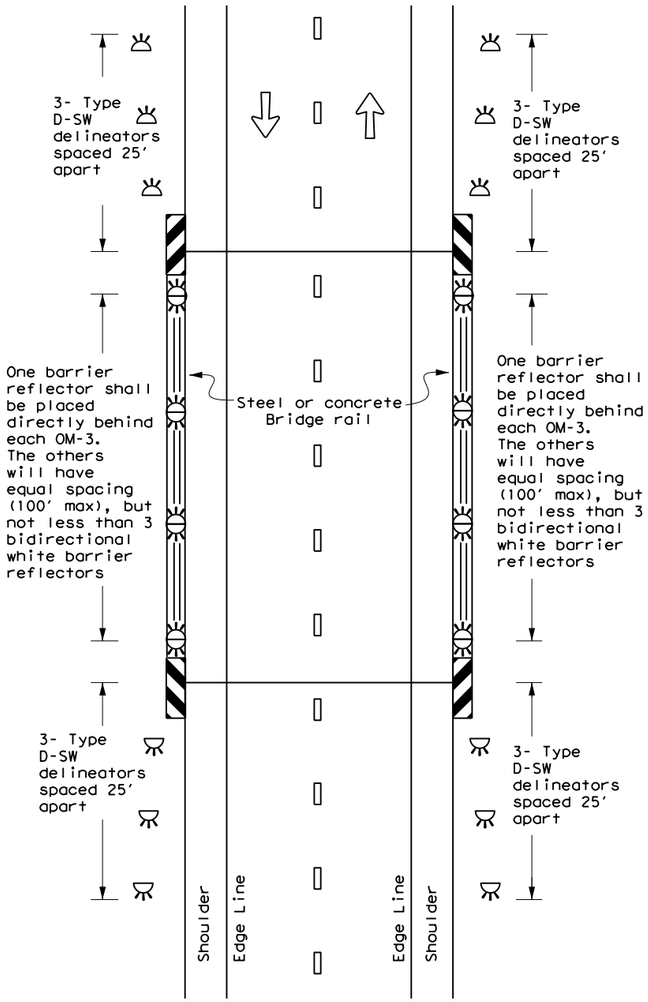
TWO-WAY, TWO LANE ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



NOTE:

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

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



LEGEND

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(5)-20

FILE: dom5-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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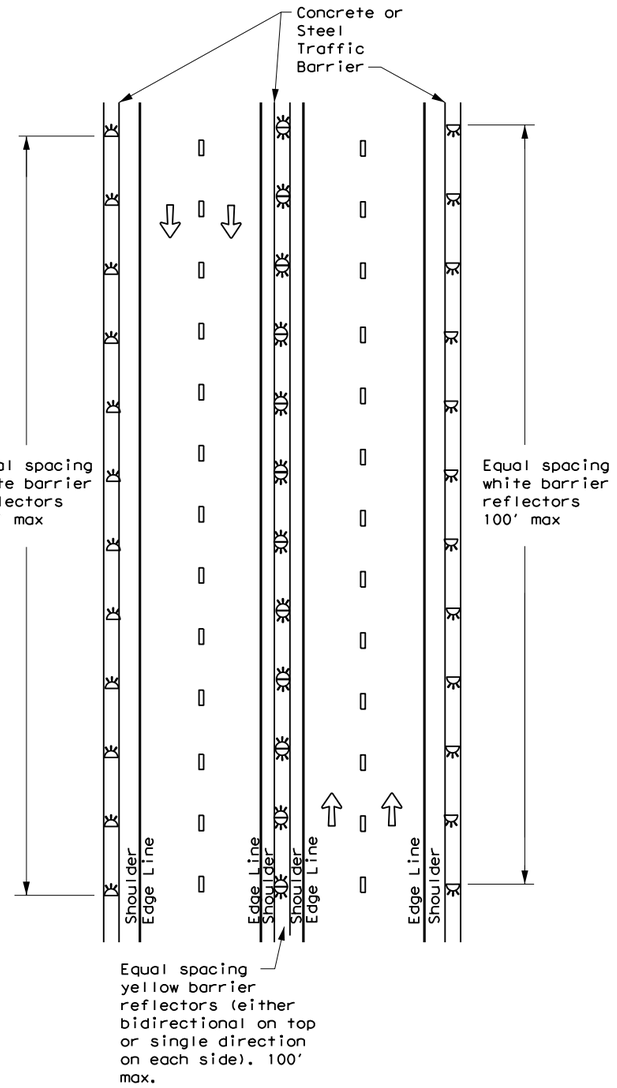
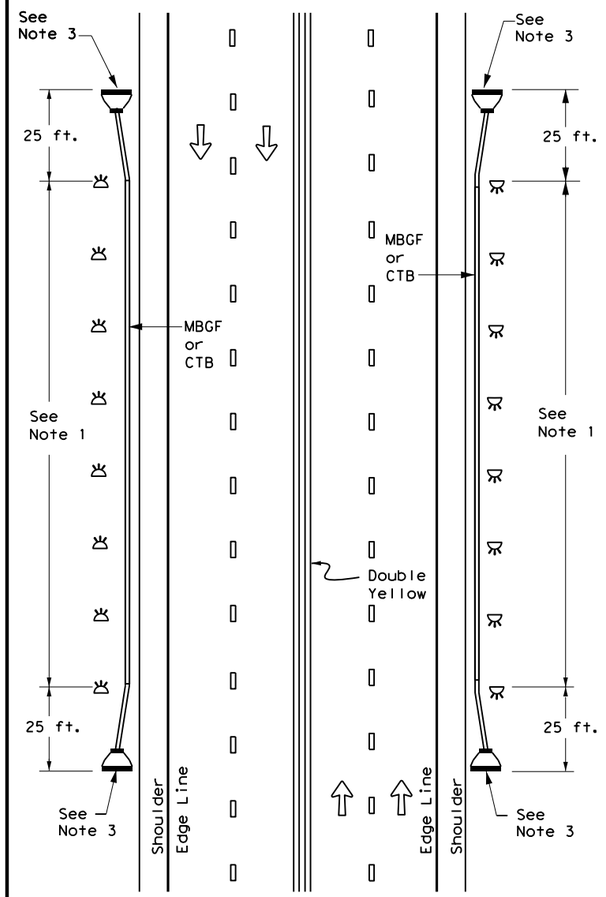
REVISIONS	1057	03	051	FM 510
7-20	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		239

20E

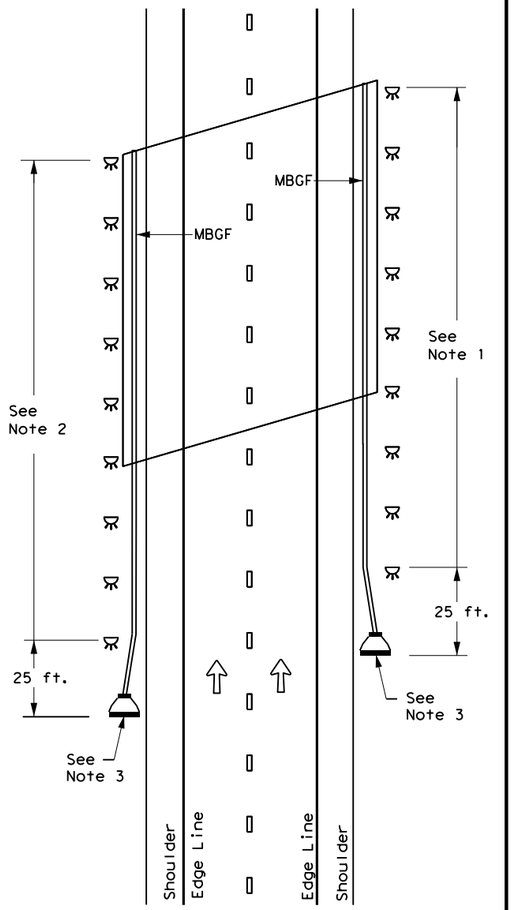
CONTINUOUS CONCRETE OR STEEL BARRIER



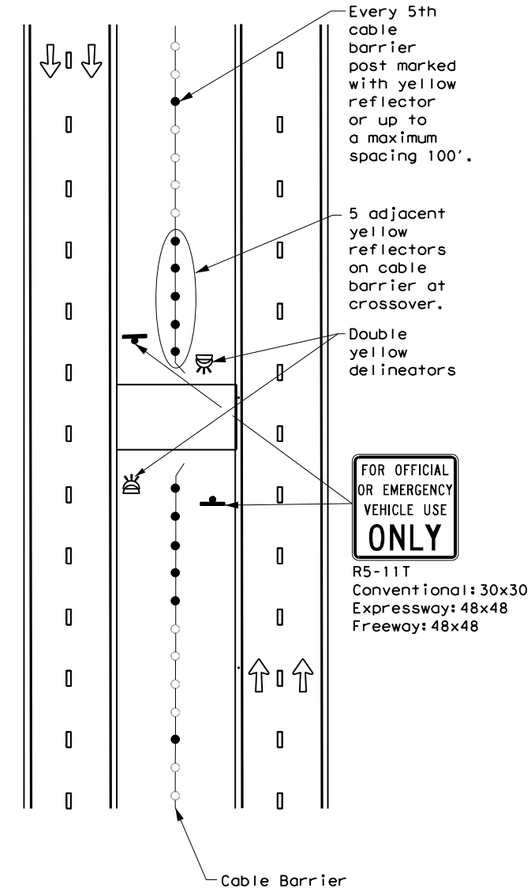
MULTI-LANE UNDIVIDED, TWO-WAY ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



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	1057	03	051	FM 510
7-20	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		240

20F

DATE: 6/13/2024 11:07:05 AM
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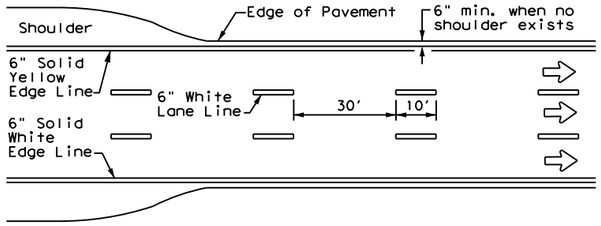
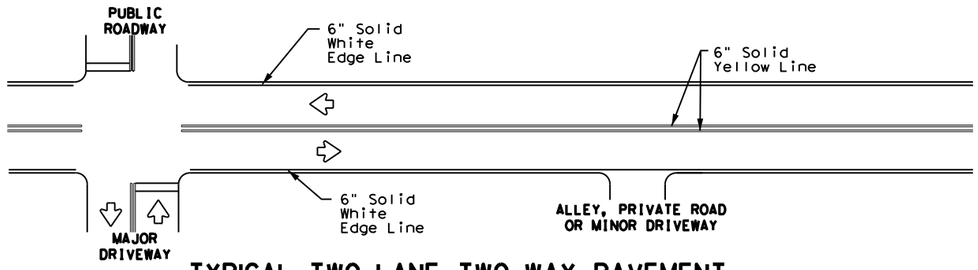
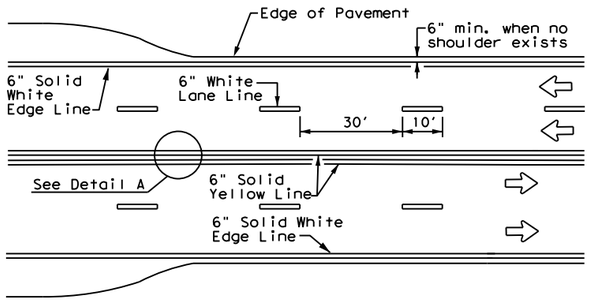
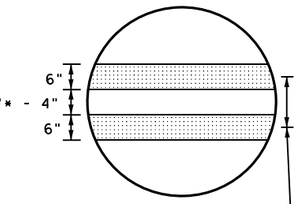


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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

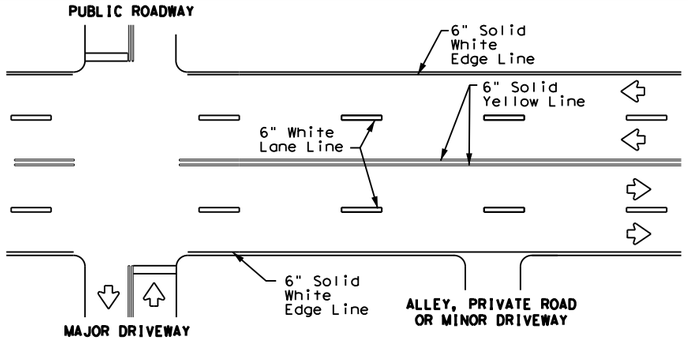




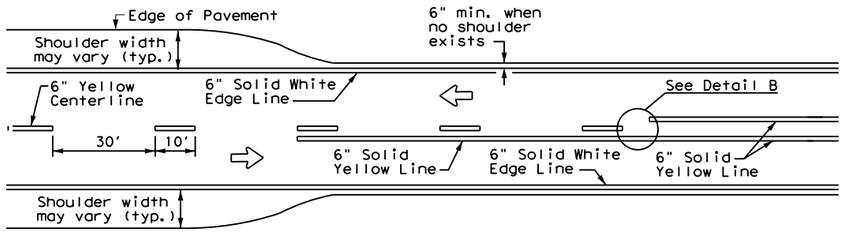
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

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

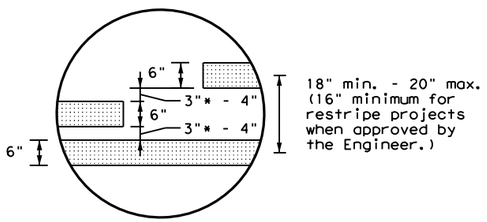
** 8" minimum for restripe projects when approved by the Engineer.



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

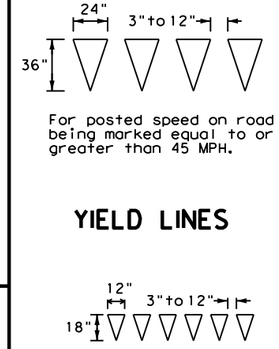


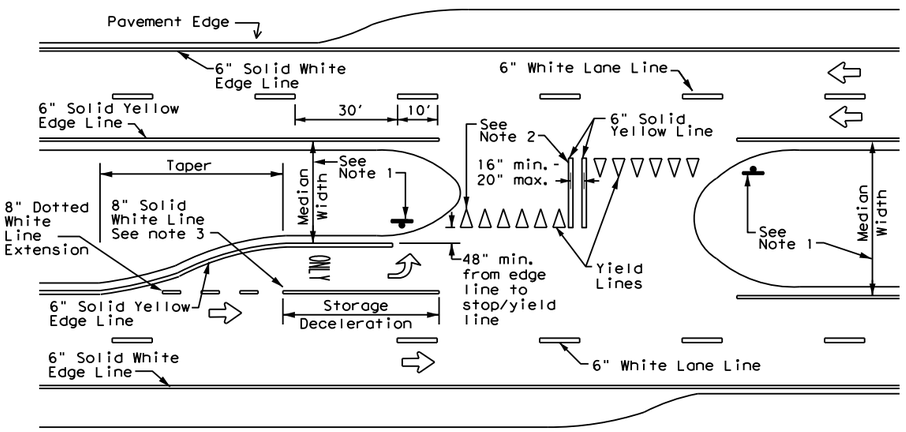
TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



DETAIL "B"

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





FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

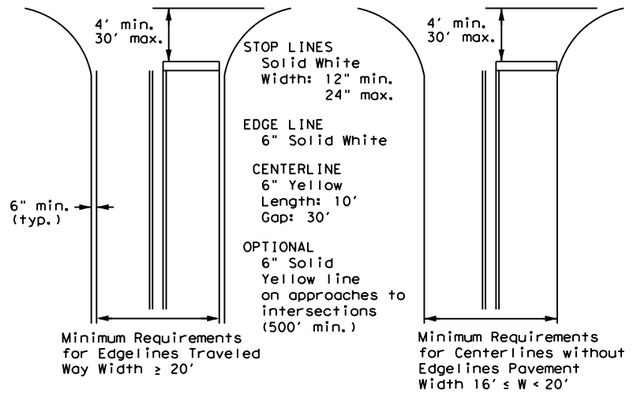
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections.
   Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling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

GENERAL NOTES

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

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

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



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

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

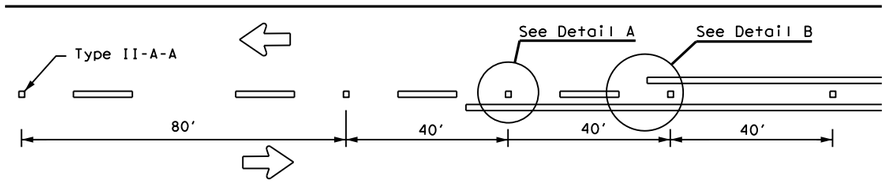
PM(1)-22

FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
11-78 8-00 6-20	DIST	COUNTY		SHEET NO.
8-95 3-03 12-22	PHR	CAMERON		241
5-00 2-12				

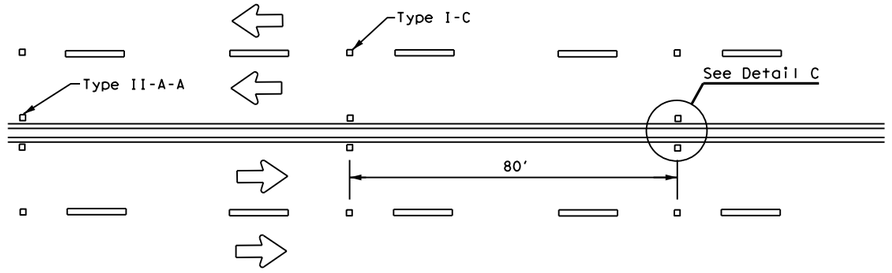
22A

DATE:
FILE:

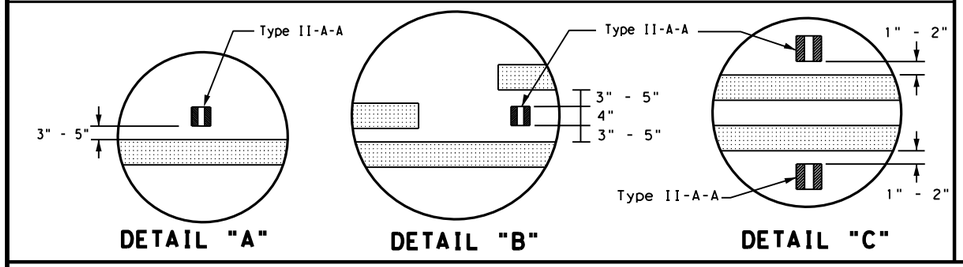
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

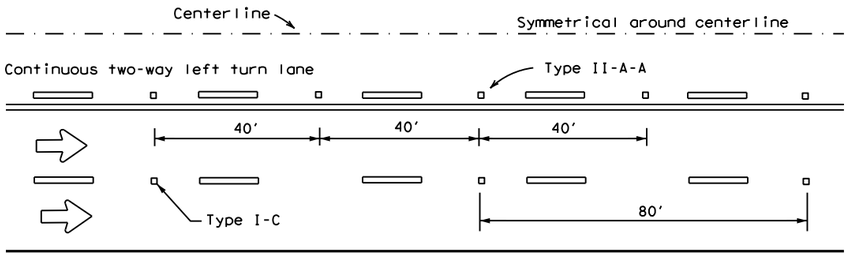


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

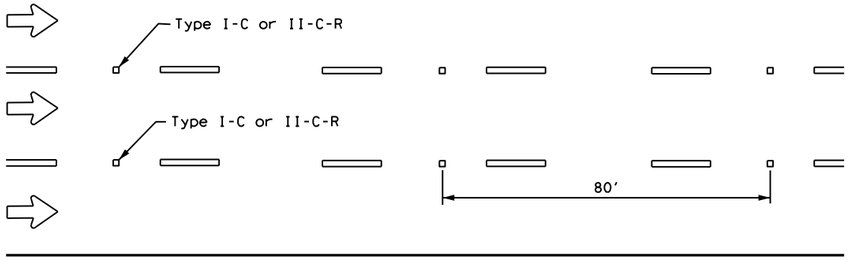


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS





CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



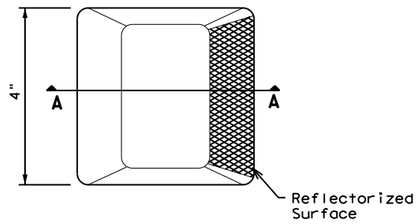
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

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

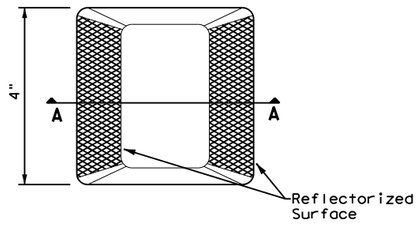
See Note 3.

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

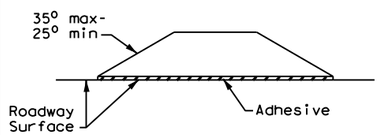
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

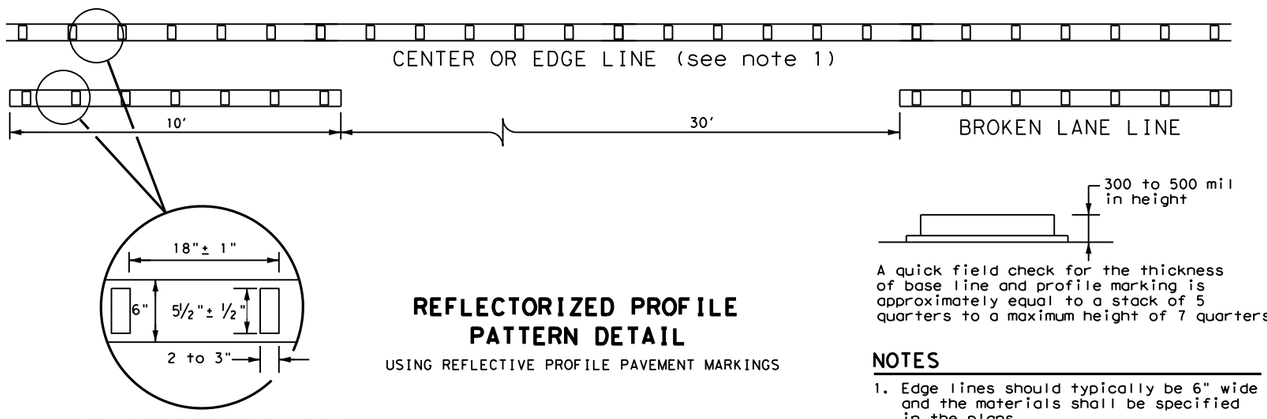


Type II (Top View)



SECTION A

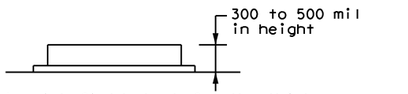
RAISED PAVEMENT MARKERS



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

REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS



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

NOTES

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

GENERAL NOTES

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

Texas Department of Transportation

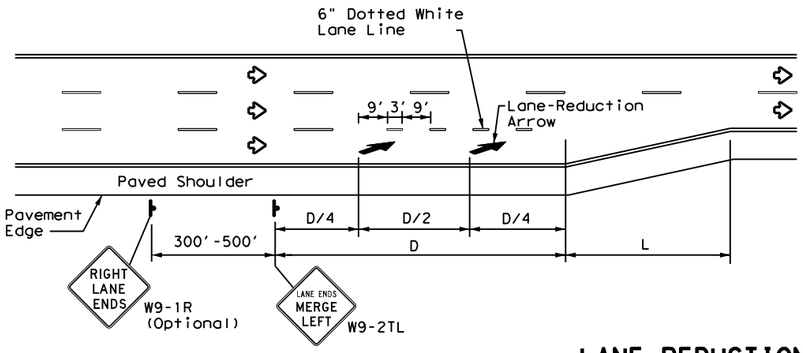
Traffic Safety Division Standard

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

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-77 8-00 6-20 4-92 2-10 12-22 5-00 2-12	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		242

22B

DATE:
FILE:

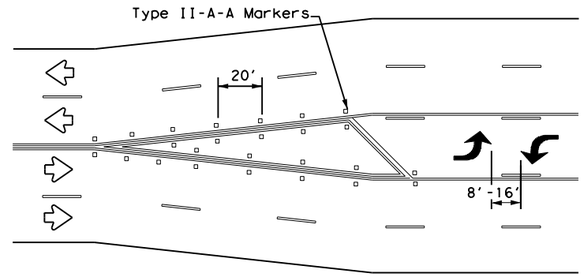


LANE REDUCTION

NOTES

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

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



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

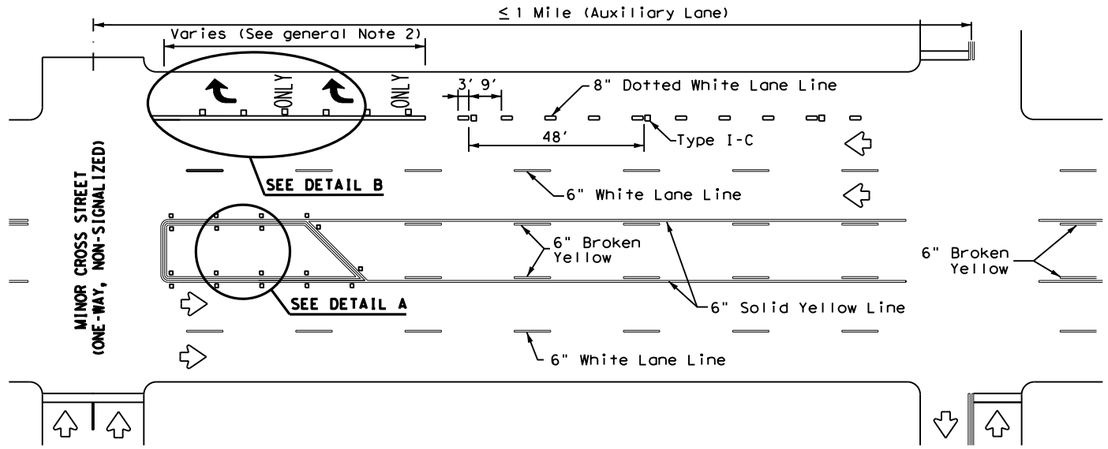
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

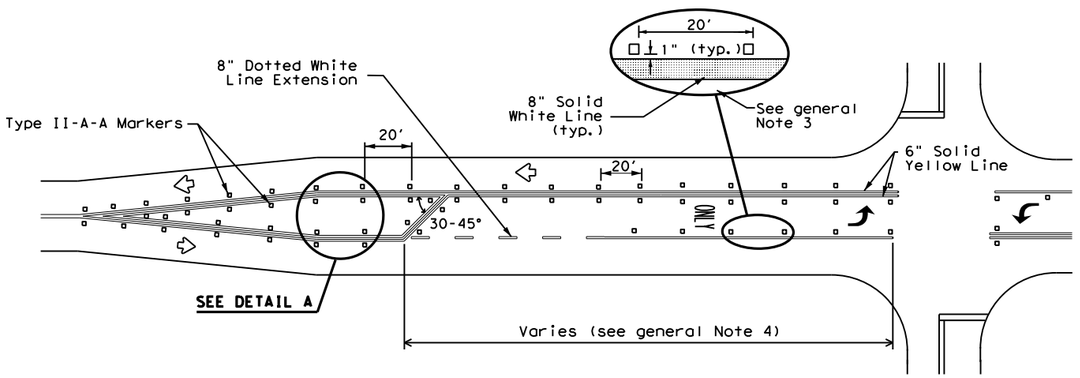
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn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

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

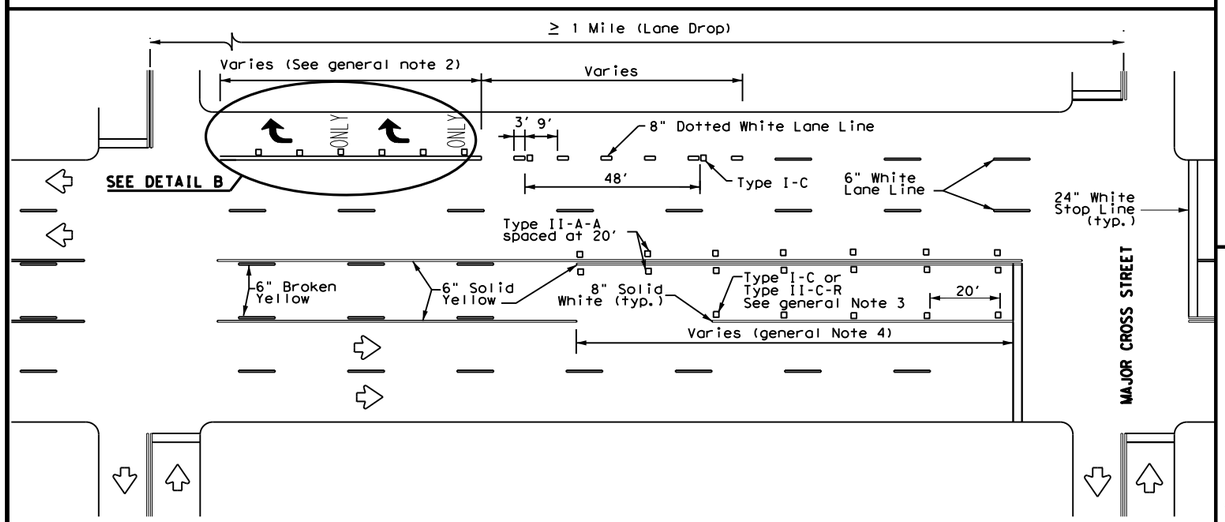
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



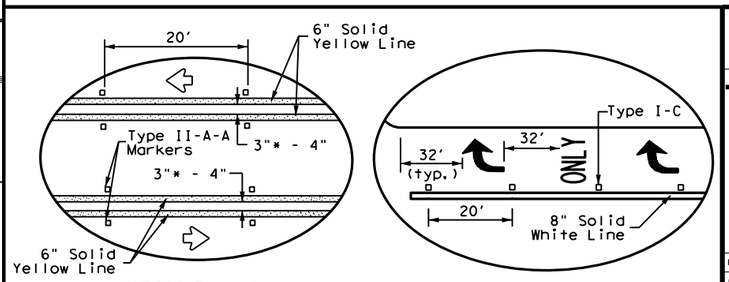
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



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



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

Texas Department of Transportation

Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3)-22

FILE: pm3-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 3-03 6-20 5-00 2-10 12-22 8-00 2-12	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		243

22C

DATE:
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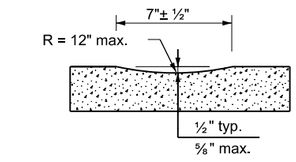
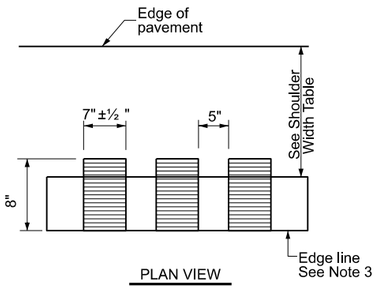
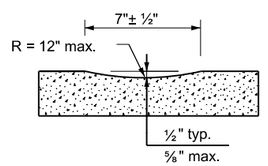


PROFILE VIEW
OPTION 1

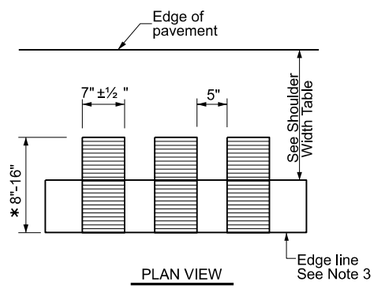


PLAN VIEW

CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)



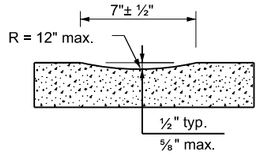
PROFILE VIEW
OPTION 2



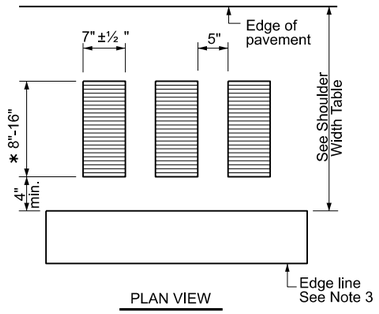
PLAN VIEW

∗ This distance may vary based on width of shoulder

CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)



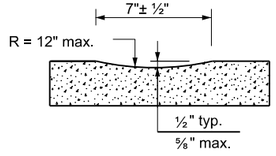
PROFILE VIEW
OPTION 3



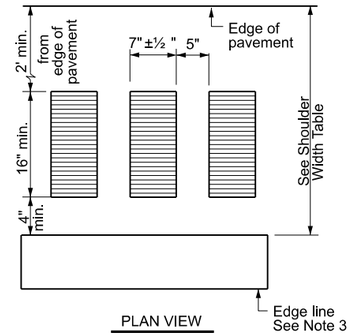
PLAN VIEW

∗ This distance may vary based on width of shoulder

CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)

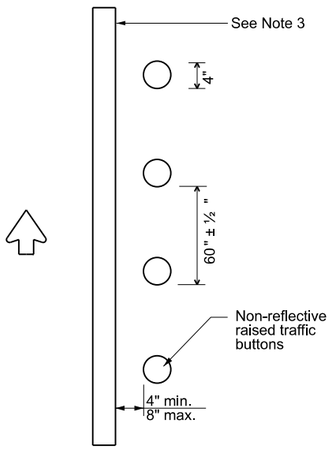


PROFILE VIEW
OPTION 4



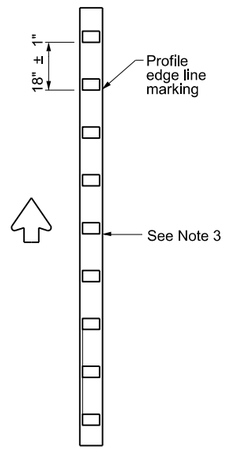
PLAN VIEW

CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)



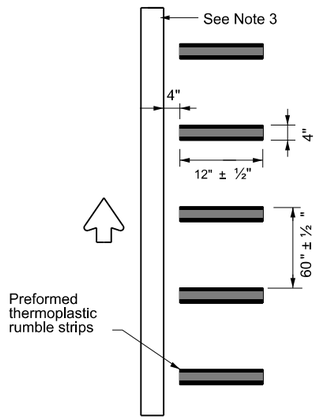
PLAN VIEW
OPTION 5

RAISED EDGE LINE
(Rumble Strips)



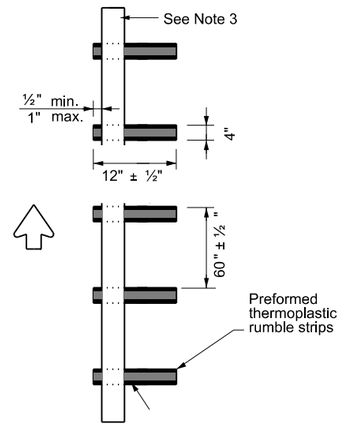
PLAN VIEW
OPTION 6

PROFILE EDGE LINE MARKINGS
(Rumble Strips)



PLAN VIEW
OPTION 7

PREFORMED THERMOPLASTIC EDGE LINE
(Rumble Strips)



PLAN VIEW
OPTION 8

PREFORMED THERMOPLASTIC EDGE LINE
(Rumble Strips)

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

GENERAL NOTES

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

WHEN INSTALLING MILLED DEPRESSION EDGE LINE RUMBLE STRIPS:

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

WHEN INSTALLING RAISED OR PROFILE EDGE LINE RUMBLE STRIPS:

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

Texas Department of Transportation

Traffic Safety Division Standard

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

FILE: rs(2)-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT January 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
10-13	DIST	COUNTY		SHEET NO.
1-23	PHR	CAMERON		244

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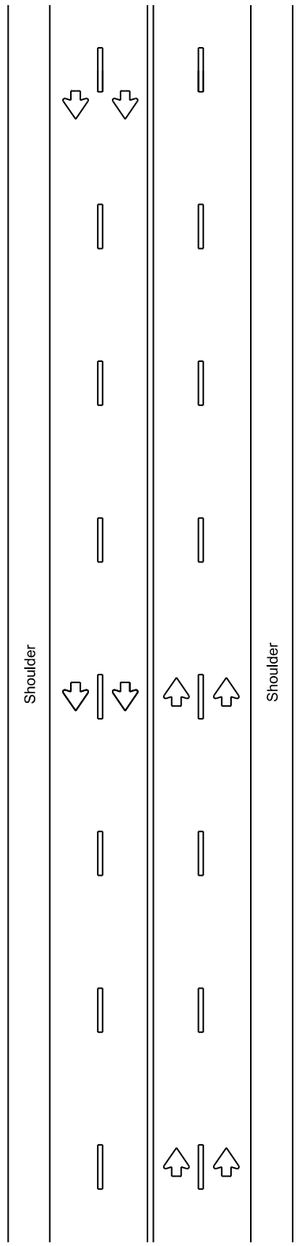
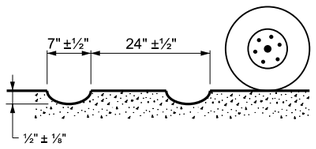
FILE:

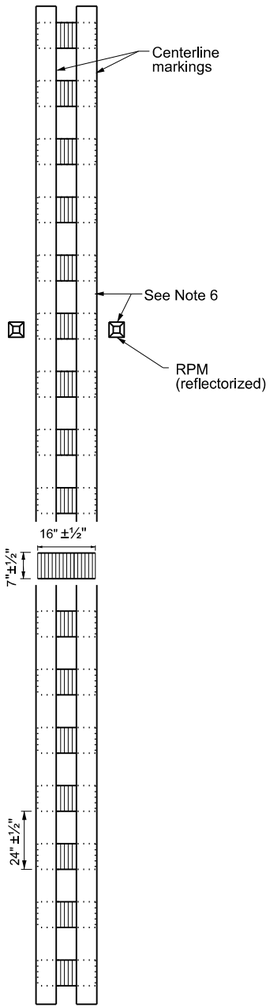
CENTERLINE RUMBLE STRIPS



MULTILANE UNDIVIDED HIGHWAY WITH SHOULDER

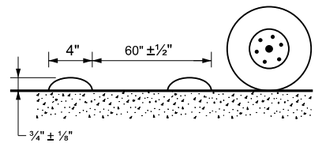


PROFILE VIEW

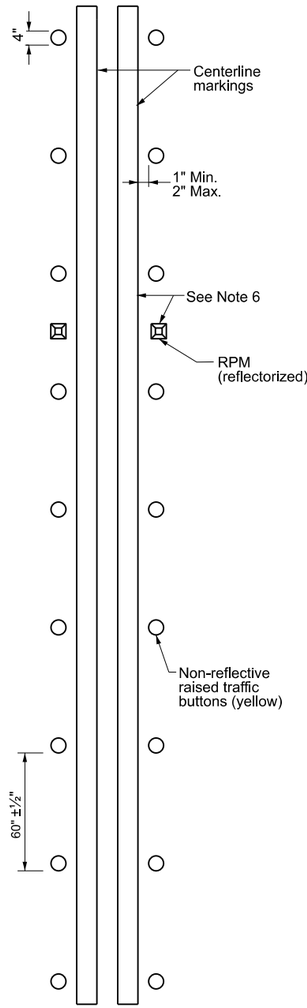


PLAN VIEW
OPTION 1

MILLED CENTERLINE RUMBLE STRIPS

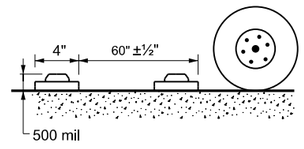


PROFILE VIEW



PLAN VIEW
OPTION 2

RAISED CENTERLINE RUMBLE STRIPS



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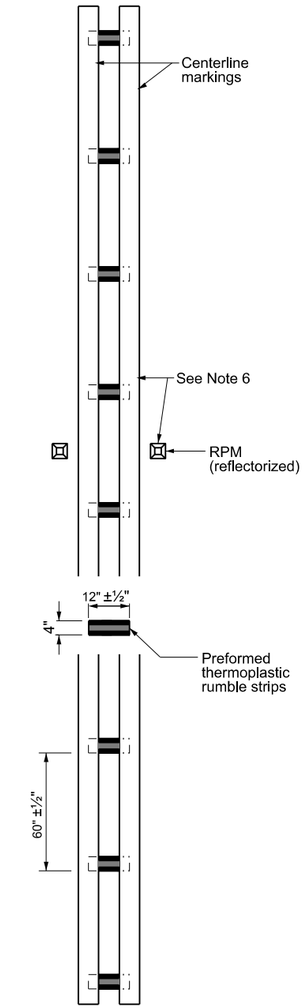
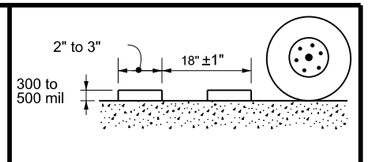
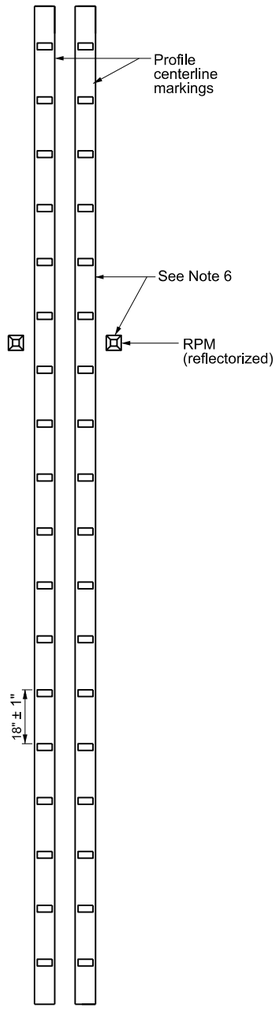


PLAN VIEW
OPTION 3

PREFORMED THERMOPLASTIC RUMBLE STRIPS



PROFILE VIEW



PLAN VIEW
OPTION 4

PROFILE CENTERLINE MARKINGS

GENERAL NOTES

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

WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

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

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

12. See standard sheet RS(2).

Texas Department of Transportation

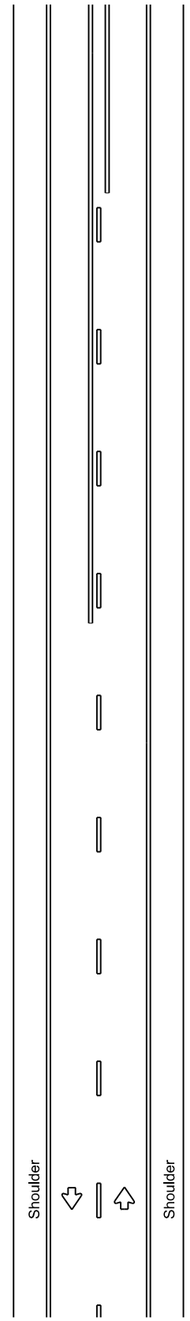
Traffic Safety Division Standard

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

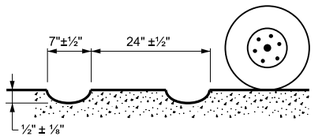
FILE: rs(3)-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT January 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
10-13	DIST	COUNTY		SHEET NO.
1-23	PHR	CAMERON		245

DATE:
FILE:

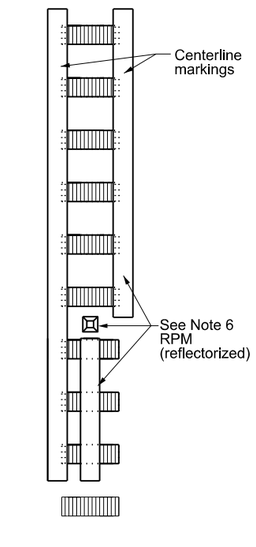
CENTERLINE RUMBLE STRIPS



TWO LANE TWO-WAY HIGHWAYS

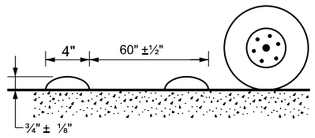


PROFILE VIEW

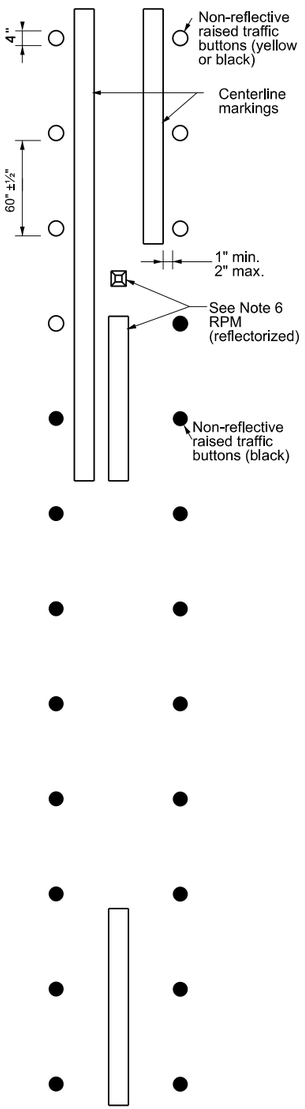


PLAN VIEW
OPTION 1

MILLED CENTERLINE RUMBLE STRIPS

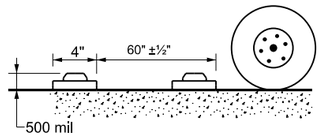


PROFILE VIEW

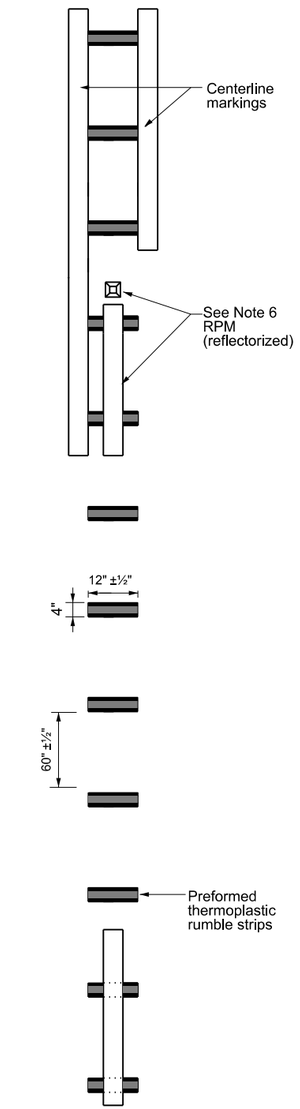


PLAN VIEW
OPTION 2

RAISED CENTERLINE RUMBLE STRIPS

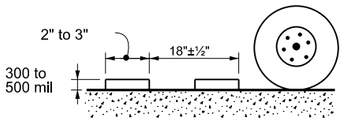


PROFILE VIEW



PLAN VIEW
OPTION 3

PREFORMED THERMOPLASTIC RUMBLE STRIPS



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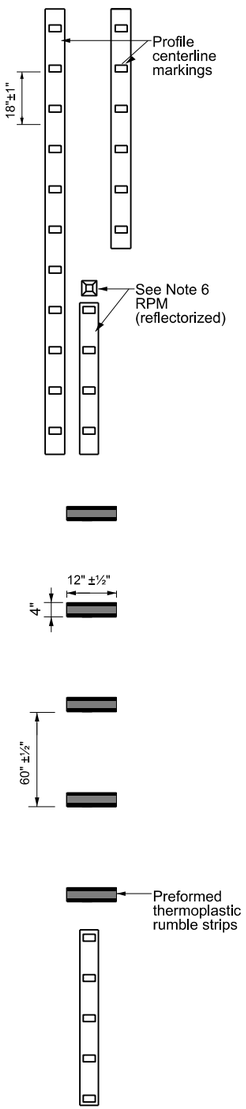

PLAN VIEW
OPTION 4

PROFILE CENTERLINE MARKINGS AND PREFORMED THERMOPLASTIC RUMBLE STRIPS

GENERAL NOTES

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

WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

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

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

13. See standard sheet RS(2).

Texas Department of Transportation

Traffic Safety Division Standard

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

FILE: rs(4)-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT January 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
10-13	DIST	COUNTY		SHEET NO.
1-23	PHR	CAMERON		246

ENVIRONMENTAL COVER SHEET

DATE: 6/13/2024 11:10:11 AM
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Pharr District Central Design

Texas Department of Transportation

FM 510

ENVIRONMENTAL
COVER SHEET

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		247

GENERAL NOTES

1. THE CONTRACTOR MUST CONTACT THE ENGINEER BEFORE PLACEMENT OF ANY EROSION CONTROL DEVICES.
2. CONSTRUCTION EXITS ARE TO BE LOCATED AND INSTALLED BASED ON FIELD CONDITIONS AND AS APPROVED BY THE ENGINEER. THE LOCATION OF THE CONSTRUCTION EXIT SHOULD BE SUFFICIENT FOR CONTINUOUS USE BY THE CONTRACTOR DURING CONSTRUCTION.
3. EROSION CONTROL DEVICES SHALL ONLY BE PLACED DURING PHASE CONSTRUCTION. DEVICES SHALL NOT BE PLACED ALL AT THE SAME TIME.
4. EROSION CONTROL DEVICES MAY BE MODIFIED TO MEET FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER.
5. VEGETATIVE WATERING APPLICATION RATE = 88,300 GAL/AC @ 13 CYCLES.

ITEM	DESCRIPTION	UNIT	QTY.
164 7018	HYDRO MULCH SEED (PERM_RURAL_CLAY)	SY	22,743
164 7021	HYDRO MULCH SEED (TEMP_WARM)	SY	22,743
* 166	FERTILIZER	TON	0.23
168 7001	VEGETATIVE WATERING	TGL	415
506 7021	CONSTRUCTION EXITS (INSTALL) (TY 2)	SY	156
506 7024	CONSTRUCTION EXITS (REMOVE)	SY	156
506 7039	TEMP SEDMT CONT FENCE (INSTALL)	LF	200
506 7041	TEMP SEDMT CONT FENCE (REMOVE)	LF	200
506 7044	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	720
506 7046	BIODEG EROSN CONT LOGS (REMOVE)	LF	720

* FOR CONTRACTORS INFORMATION ONLY (NON-PAY ITEM)

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

SWP3
LAYOUTS

SCALE: 1" = 100' SHEET 1 OF 7

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		248

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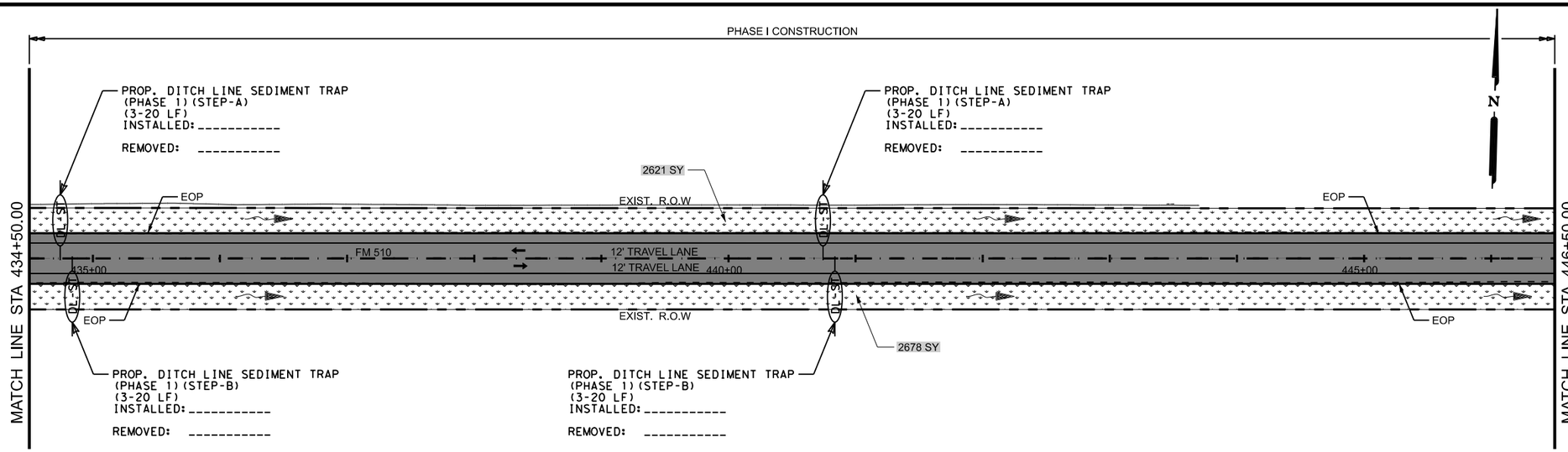

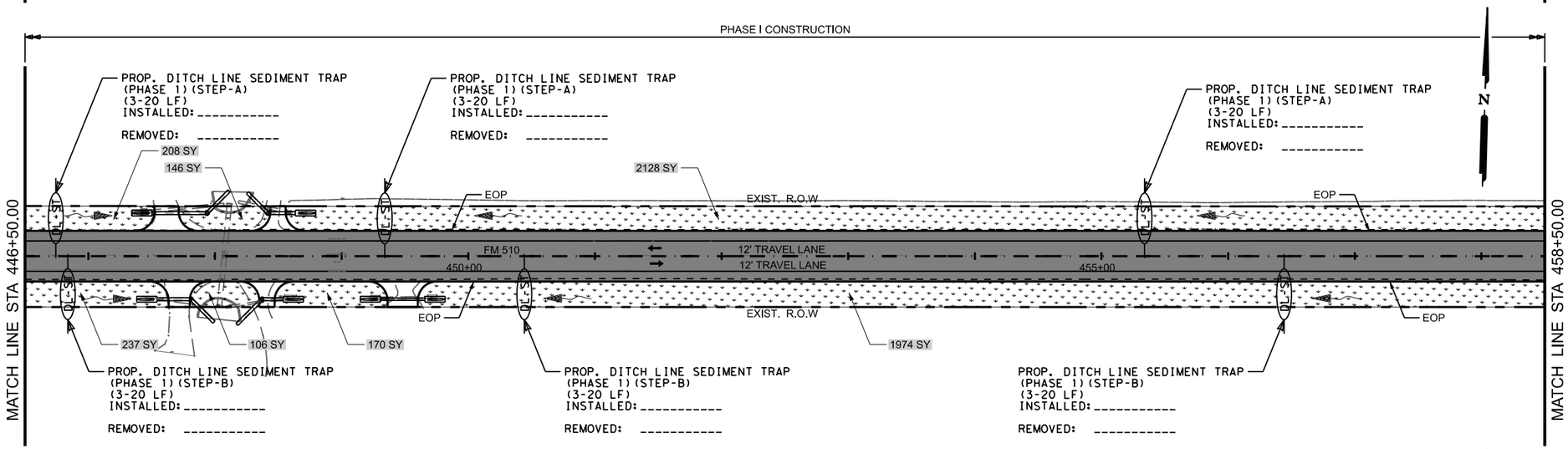

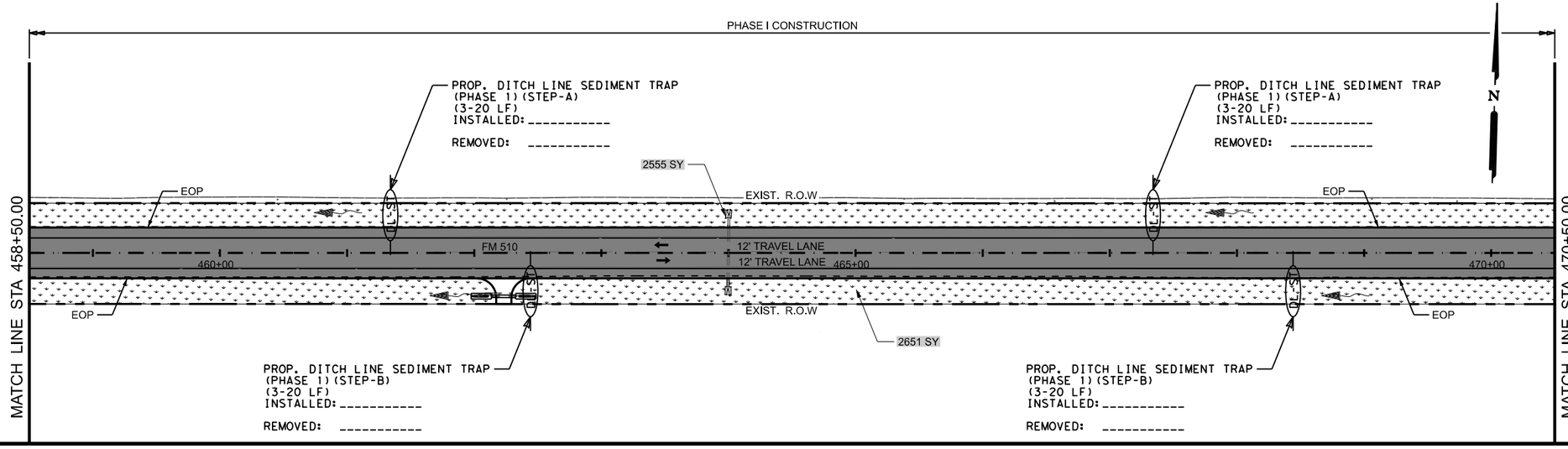

LEGEND:

- CULVERT LOCATION
- DIRECTION OF FLOW
- SEEDING AREA
- CONSTRUCTION EXIT (TYPE 2)
- PROP. ACP ROADWAY
- SCF — TEMP SEDIMENT CONTROL FENCE
- DL-ST — DITCH LINE SEDIMENT TRAP (LOG)
- DI-ST — DROP INLET SEDIMENT TRAP (LOG) (40' EA)

GENERAL NOTES

1. THE CONTRACTOR MUST CONTACT THE ENGINEER BEFORE PLACEMENT OF ANY EROSION CONTROL DEVICES.
2. CONSTRUCTION EXITS ARE TO BE LOCATED AND INSTALLED BASED ON FIELD CONDITIONS AND AS APPROVED BY THE ENGINEER. THE LOCATION OF THE CONSTRUCTION EXIT SHOULD BE SUFFICIENT FOR CONTINUOUS USE BY THE CONTRACTOR DURING CONSTRUCTION.
3. EROSION CONTROL DEVICES SHALL ONLY BE PLACED DURING PHASE CONSTRUCTION. DEVICES SHALL NOT BE PLACED ALL AT THE SAME TIME.
4. EROSION CONTROL DEVICES MAY BE MODIFIED TO MEET FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER.
5. VEGETATIVE WATERING APPLICATION RATE = 88,300 GAL/AC @ 13 CYCLES.

ITEM	DESCRIPTION	UNIT	QTY.
164 7018	HYDRO MULCH SEED (PERM_RURAL_CLAY)	SY	15,488
164 7021	HYDRO MULCH SEED (TEMP_WARM)	SY	15,488
* 166	FERTILIZER	TON	0.16
168 7001	VEGETATIVE WATERING	TGL	283
506 7021	CONSTRUCTION EXITS (INSTALL) (TY 2)	SY	
506 7024	CONSTRUCTION EXITS (REMOVE)	SY	
506 7044	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	840
506 7046	BIODEG EROSN CONT LOGS (REMOVE)	LF	840

* FOR CONTRACTORS INFORMATION ONLY (NON-PAY ITEM)

STATE OF TEXAS
JOSE A. RODRIGUEZ
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06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

SWP3
LAYOUTS

SCALE: 1" = 100' SHEET 2 OF 7

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		249

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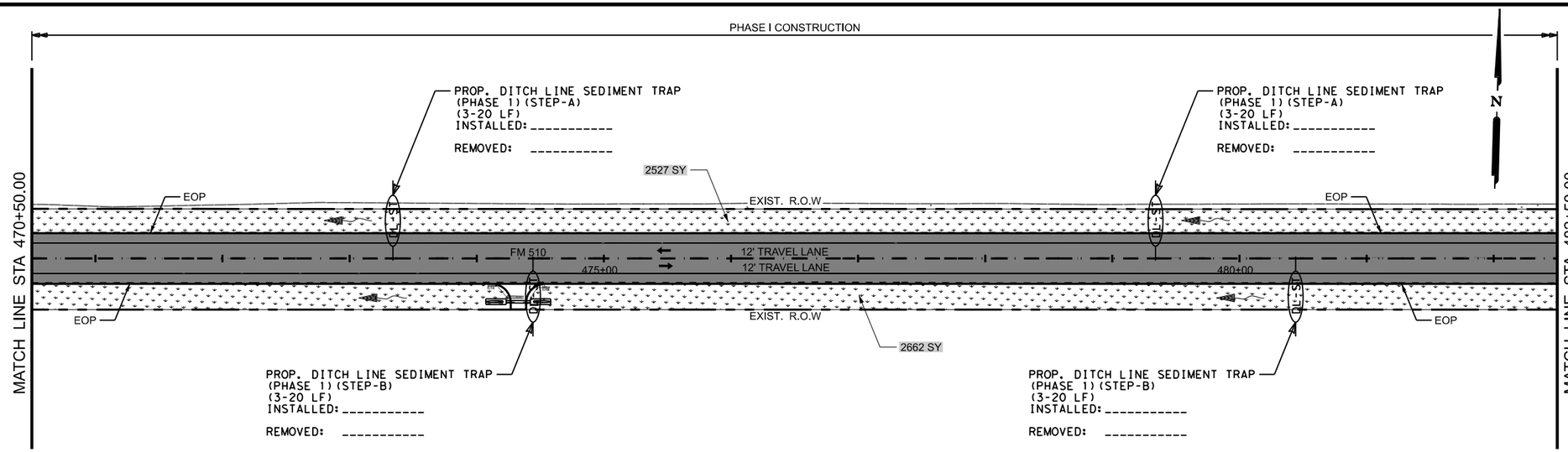

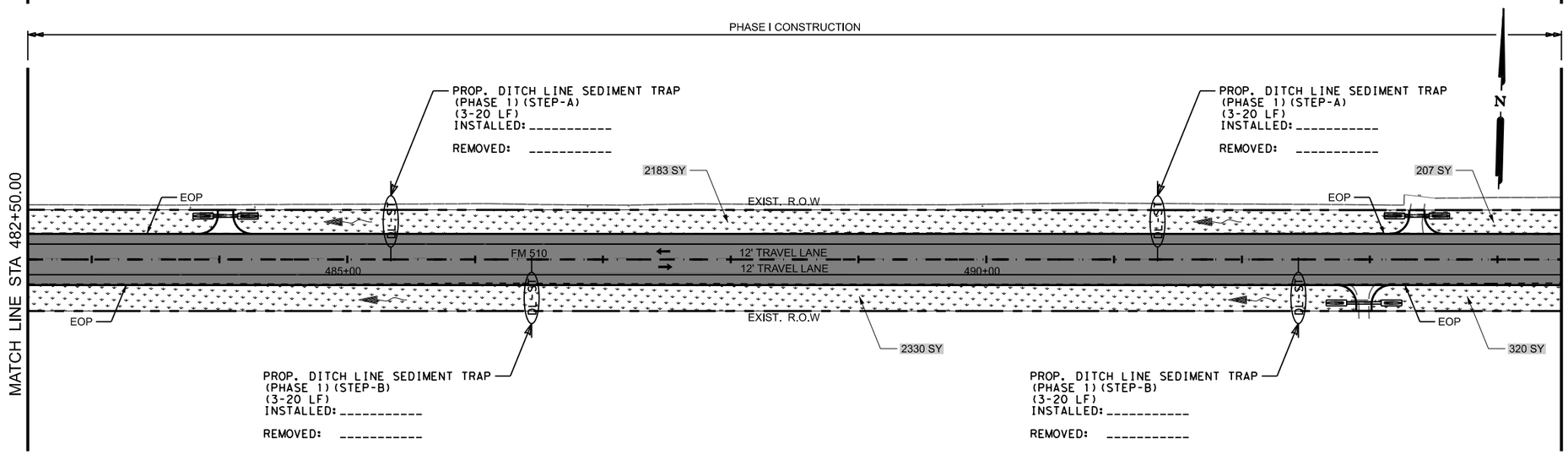

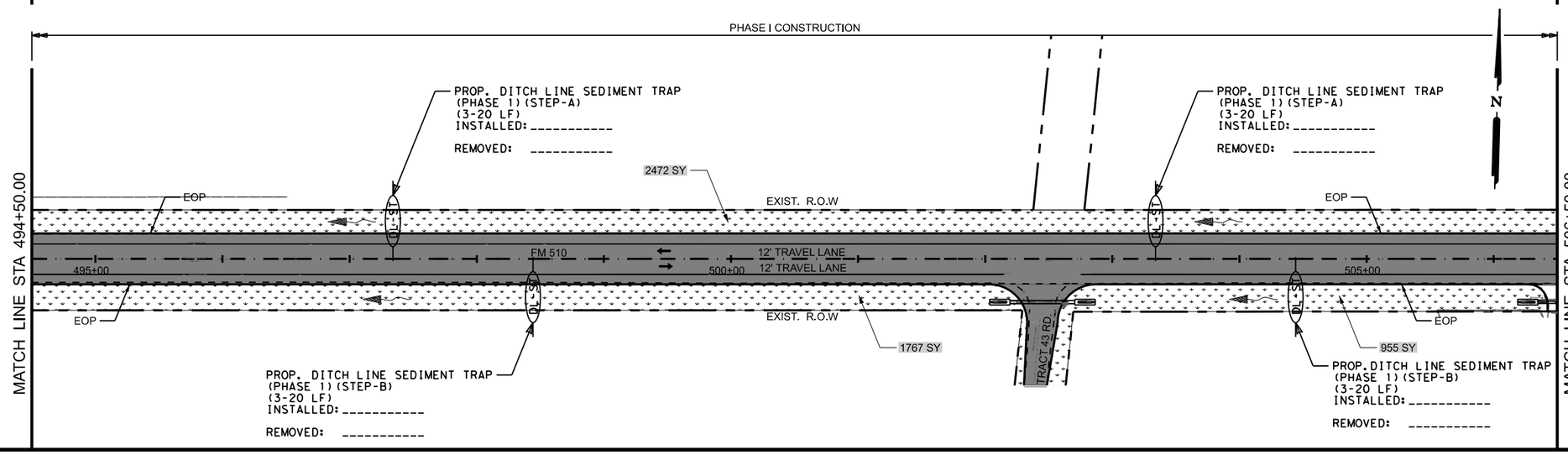

LEGEND:

- CULVERT LOCATION
- DIRECTION OF FLOW
- SEEDING AREA
- CONSTRUCTION EXIT (TYPE 2)
- PROP. ACP ROADWAY
- SCF — TEMP SEDIMENT CONTROL FENCE
- DL-ST — DITCH LINE SEDIMENT TRAP (LOG)
- DI-ST — DROP INLET SEDIMENT TRAP (LOG) (40' EA)

GENERAL NOTES

1. THE CONTRACTOR MUST CONTACT THE ENGINEER BEFORE PLACEMENT OF ANY EROSION CONTROL DEVICES.
2. CONSTRUCTION EXITS ARE TO BE LOCATED AND INSTALLED BASED ON FIELD CONDITIONS AND AS APPROVED BY THE ENGINEER. THE LOCATION OF THE CONSTRUCTION EXIT SHOULD BE SUFFICIENT FOR CONTINUOUS USE BY THE CONTRACTOR DURING CONSTRUCTION.
3. EROSION CONTROL DEVICES SHALL ONLY BE PLACED DURING PHASE CONSTRUCTION. DEVICES SHALL NOT BE PLACED ALL AT THE SAME TIME.
4. EROSION CONTROL DEVICES MAY BE MODIFIED TO MEET FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER.
5. VEGETATIVE WATERING APPLICATION RATE = 88,300 GAL/AC @ 13 CYCLES.

ITEM	DESCRIPTION	UNIT	QTY.
164 7018	HYDRO MULCH SEED (PERM_RURAL_CLAY)	SY	15,522
164 7021	HYDRO MULCH SEED (TEMP_WARM)	SY	15,522
* 166	FERTILIZER	TON	0.16
168 7001	VEGETATIVE WATERING	TGL	283
506 7021	CONSTRUCTION EXITS (INSTALL) (TY 2)	SY	
506 7024	CONSTRUCTION EXITS (REMOVE)	SY	
506 7044	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	720
506 7046	BIODEG EROSN CONT LOGS (REMOVE)	LF	720

* FOR CONTRACTORS INFORMATION ONLY (NON-PAY ITEM)

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED
PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

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FM 510

SWP3
LAYOUTS

SCALE: 1" = 100' SHEET 3 OF 7

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		250

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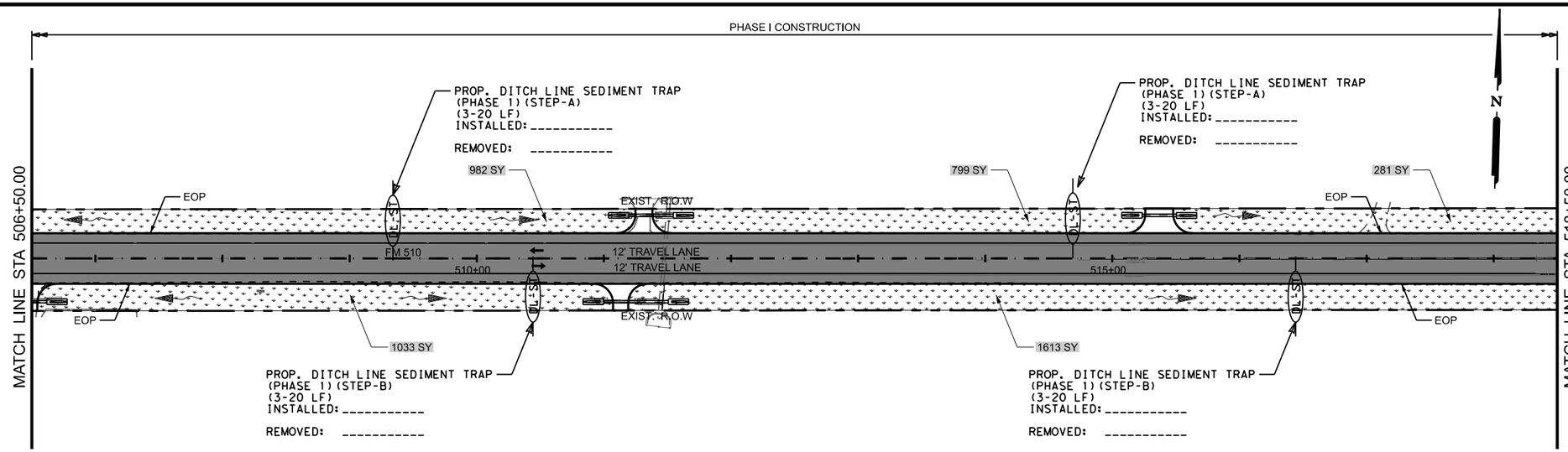

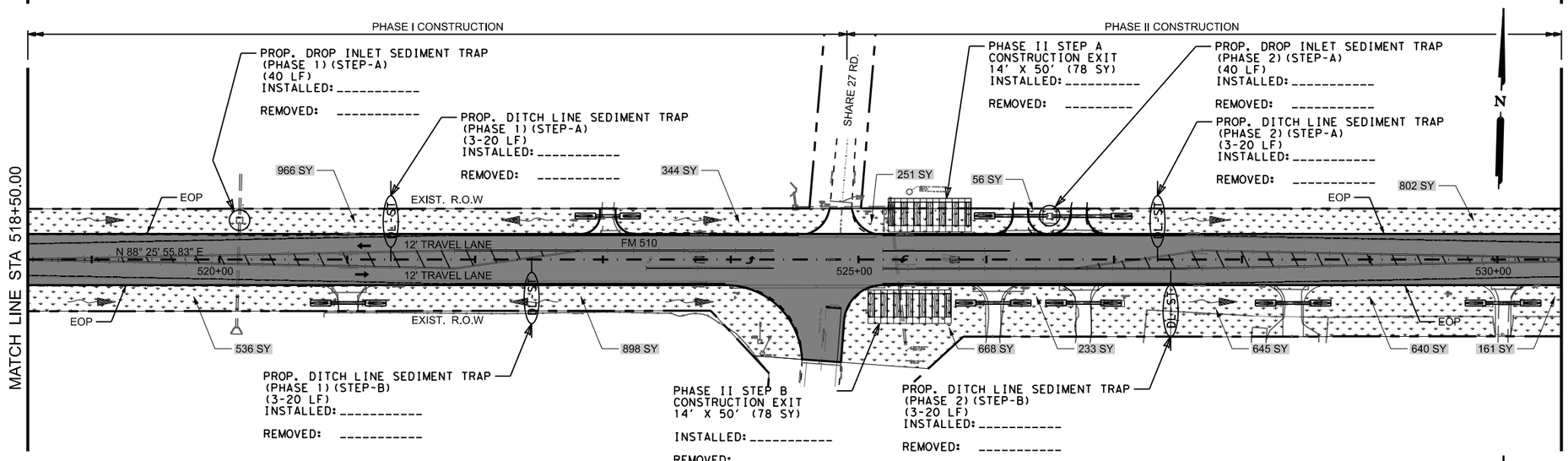

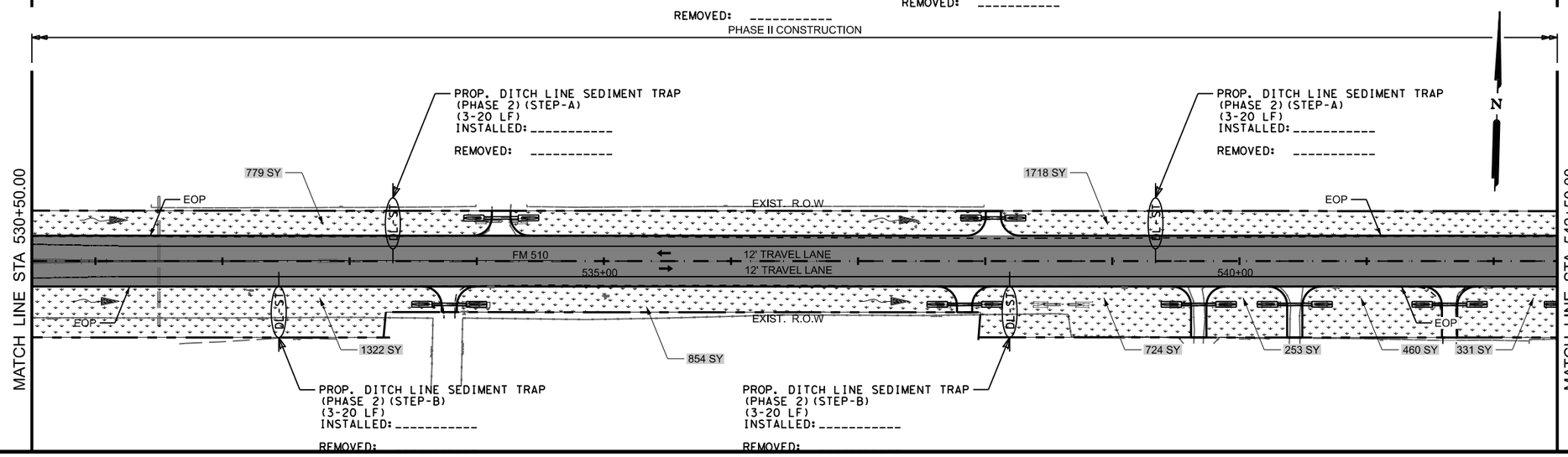

LEGEND:

- CULVERT LOCATION
- DIRECTION OF FLOW
- SEEDING AREA
- CONSTRUCTION EXIT (TYPE 2)
- PROP. ACP ROADWAY
- SCF — TEMP SEDIMENT CONTROL FENCE
- DL-ST — DITCH LINE SEDIMENT TRAP (LOG)
- DI-ST — DROP INLET SEDIMENT TRAP (LOG) (40' EA)

GENERAL NOTES

1. THE CONTRACTOR MUST CONTACT THE ENGINEER BEFORE PLACEMENT OF ANY EROSION CONTROL DEVICES.
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3. EROSION CONTROL DEVICES SHALL ONLY BE PLACED DURING PHASE CONSTRUCTION. DEVICES SHALL NOT BE PLACED ALL AT THE SAME TIME.
4. EROSION CONTROL DEVICES MAY BE MODIFIED TO MEET FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER.
5. VEGETATIVE WATERING APPLICATION RATE = 88,300 GAL/AC @ 13 CYCLES.

ITEM	DESCRIPTION	UNIT	QTY.
164 7018	HYDRO MULCH SEED (PERM_RURAL_CLAY)	SY	17,994
164 7021	HYDRO MULCH SEED (TEMP_WARM)	SY	17,994
* 166	FERTILIZER	TON	0.19
168 7001	VEGETATIVE WATERING	TGL	328
506 7021	CONSTRUCTION EXITS (INSTALL) (TY 2)	SY	156
506 7024	CONSTRUCTION EXITS (REMOVE)	SY	156
506 7044	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	800
506 7046	BIODEG EROSN CONT LOGS (REMOVE)	LF	800

* FOR CONTRACTORS INFORMATION ONLY (NON-PAY ITEM)

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

SWP3
LAYOUTS

SCALE: 1" = 100' SHEET 4 OF 7

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		251

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LEGEND:

- CULVERT LOCATION
- DIRECTION OF FLOW
- SEEDING AREA
- CONSTRUCTION EXIT (TYPE 2)
- PROP. ACP ROADWAY
- SCF — TEMP SEDIMENT CONTROL FENCE
- DL-ST — DITCH LINE SEDIMENT TRAP (LOG)
- DI-ST — DROP INLET SEDIMENT TRAP (LOG) (40' EA)

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5. VEGETATIVE WATERING APPLICATION RATE = 88,300 GAL/AC @ 13 CYCLES.

ITEM	DESCRIPTION	UNIT	QTY.
164 7018	HYDRO MULCH SEED (PERM_RURAL_CLAY)	SY	20,466
164 7021	HYDRO MULCH SEED (TEMP_WARM)	SY	20,466
* 166	FERTILIZER	TON	0.21
168 7001	VEGETATIVE WATERING	TGL	373
506 7021	CONSTRUCTION EXITS (INSTALL) (TY 2)	SY	
506 7024	CONSTRUCTION EXITS (REMOVE)	SY	
506 7044	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	780
506 7046	BIODEG EROSN CONT LOGS (REMOVE)	LF	780

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FM 510

SWP3
LAYOUTS

SCALE: 1" = 100' SHEET 5 OF 7

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		252

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LEGEND:

- CULVERT LOCATION
- DIRECTION OF FLOW
- SEEDING AREA
- CONSTRUCTION EXIT (TYPE 2)
- PROP. ACP ROADWAY
- SCF — TEMP SEDIMENT CONTROL FENCE
- DL-ST — DITCH LINE SEDIMENT TRAP (LOG)
- DI-ST — DROP INLET SEDIMENT TRAP (LOG) (40' EA)

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5. VEGETATIVE WATERING APPLICATION RATE = 88,300 GAL/AC @ 13 CYCLES.

ITEM	DESCRIPTION	UNIT	QTY.
164 7018	HYDRO MULCH SEED (PERM_RURAL_CLAY)	SY	15,059
164 7021	HYDRO MULCH SEED (TEMP_WARM)	SY	15,059
* 166	FERTILIZER	TON	0.16
168 7001	VEGETATIVE WATERING	TGL	275
506 7021	CONSTRUCTION EXITS (INSTALL) (TY 2)	SY	
506 7024	CONSTRUCTION EXITS (REMOVE)	SY	
506 7044	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	960
506 7046	BIODEG EROSN CONT LOGS (REMOVE)	LF	960

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FM 510

SWP3
LAYOUTS

SCALE: 1" = 100' SHEET 6 OF 7

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		253

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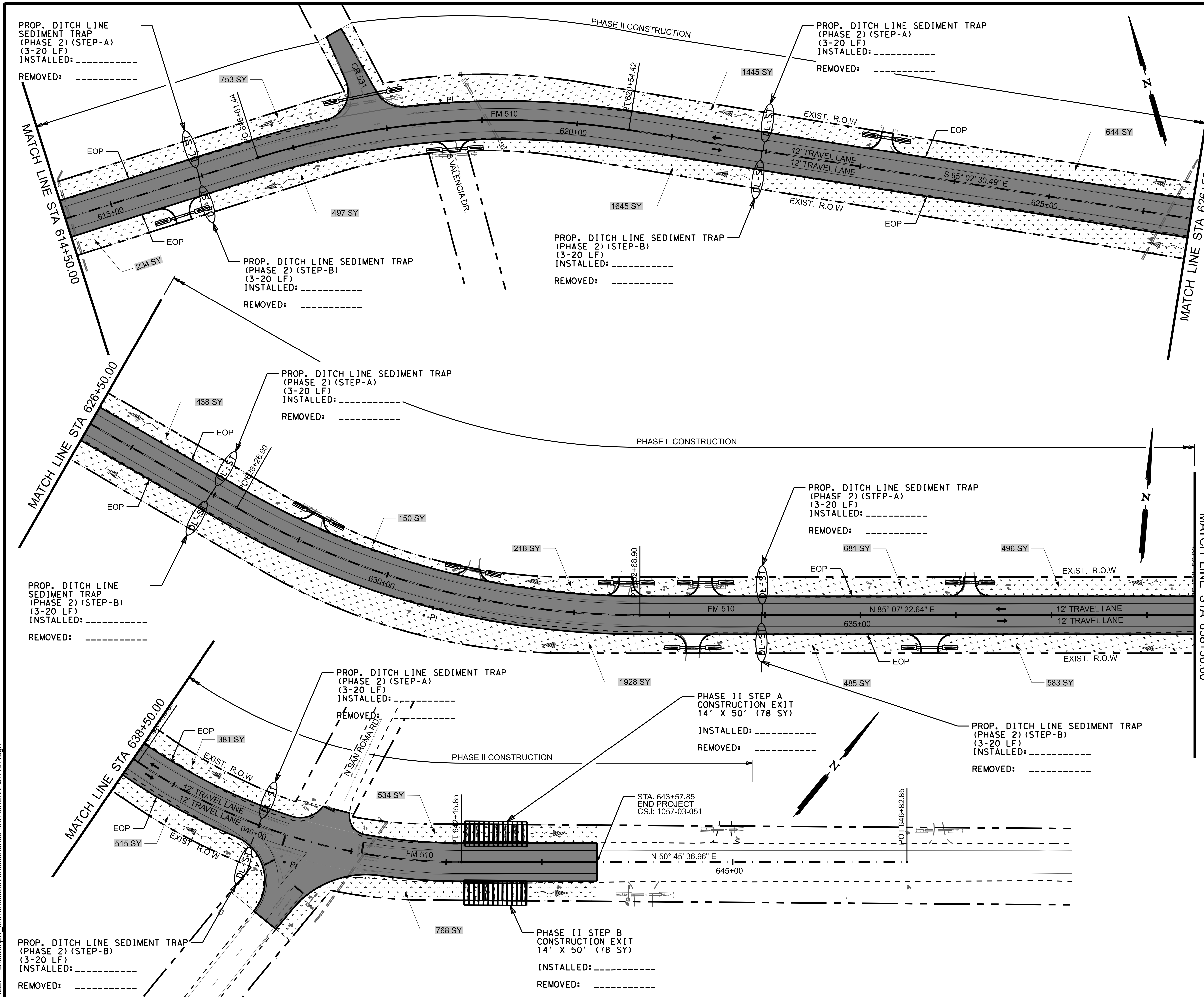

LEGEND:

- CULVERT LOCATION
- DIRECTION OF FLOW
- SEEDING AREA
- CONSTRUCTION EXIT (TYPE 2)
- PROP. ACP ROADWAY
- SCF — TEMP SEDIMENT CONTROL FENCE
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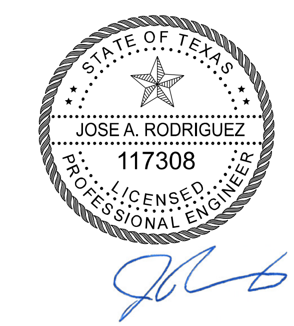
5. VEGETATIVE WATERING APPLICATION RATE = 88,300 GAL/AC @ 13 CYCLES.

ITEM	DESCRIPTION	UNIT	QTY.
164 7018	HYDRO MULCH SEED (PERM_RURAL_CLAY)	SY	10,415
164 7021	HYDRO MULCH SEED (TEMP_WARM)	SY	10,415
* 166	FERTILIZER	TON	0.11
168 7001	VEGETATIVE WATERING	TGL	190
506 7021	CONSTRUCTION EXITS (INSTALL) (TY 2)	SY	156
506 7024	CONSTRUCTION EXITS (REMOVE)	SY	156
506 7044	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	600
506 7046	BIODEG EROSN CONT LOGS (REMOVE)	LF	600

* FOR CONTRACTORS INFORMATION ONLY (NON-PAY ITEM)



06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

SWP3 LAYOUTS

SCALE: 1" = 100'

SHEET 7 OF 7

© 2024	CONT	SECT	JOB	HIGHWAY
	1057	03	051	FM 510
	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	254

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SUMMARY OF EROSION CONTROL DEVICES ITEMS

SWP3 LAYOUTS	160 7007 ## FURN & PLACE TOPSOIL (VEH)	164 7018 * HYDRO MULCH SEED (PERM_RURAL_CLAY)	164 7021 HYDRO MULCH SEED (TEMP_WARM)	166 7002 (&) ** FERTILIZER (NON-PAY)	168 7001 VEGETATIVE WATERING	506 7021 *** CONSTRUCTION EXITS (INSTALL) (TY 2)	506 7024 CONSTRUCTION EXITS (REMOVE)	506 7039 TEMP SEDMT CONT FENCE (INSTALL)	506 7041 TEMP SEDMT CONT FENCE (REMOVE)	506 7044 BIODEG EROSN CONT LOGS (INSTL) (12")	506 7046 BIODEG EROSN CONT LOGS (REMOVE)
FM 510	(CY)	(SY)	(SY)	(TON)	(TGL)	(SY)	(SY)	(LF)	(LF)	(LF)	(LF)
(CSJ 1057-03-051)	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.
SHEET 1 OF 7		20,512	20,512	0.21	374	156	156	200	200	720	720
SHEET 2 OF 7		15,474	15,474	0.16	282					840	840
SHEET 3 OF 7		15,423	15,423	0.16	281					720	720
SHEET 4 OF 7		17,349	17,349	0.18	317	156	156			800	800
SHEET 5 OF 7		19,790	19,790	0.20	361					780	780
SHEET 6 OF 7		15,295	15,295	0.16	279					960	960
SHEET 7 OF 7		11,517	11,517	0.12	210	156	156			600	600
PROJECT TOTAL:	50	115,360	115,360	1.2	2,104	468	468	200	200	5,420	5,420

KEY NOTES

(&) FOR CONTRACTOR INFORMATION ONLY (NON-PAY).

TOPSOIL TO BE USED AS NEEDED AND AS DIRECTED BY THE ENGINEER FOR SELECT PROBLEM AREAS.

* PERMANENT SEEDING TO BE DONE AFTER ROADWAY CONSTRUCTION IS COMPLETE

** FERTILIZER QUANTITIES (TON) ARE BASED ON A RATE OF 100 LBS OF NITROGEN PER ACRE NPK 10-5-5

*** CONSTRUCTION EXIT MIN AREA = 78 SY (50'X14') , LOCATIONS ARE APPROXIMATE AND MAY BE MODIFIED IN THE FIELD AS APPROVED BY ENGINEER

VEGETATIVE WATERING APLICATION RATE = 88,300 GAL/ACRE @ 13 CYCLES / 1000 (TGL)
LOG MAX LENGTH = 30 FEET
STD LENGTH = 10 FEET WEIGHT = 33 LBS

EROSION CONTROL DEVICES MAY BE MODIFIED TO MEET FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER.

CONTRACTOR SHALL CONSULT WITH THE FIELD ENGINEER BEFORE ANY EROSION CONTROL DEVICES ARE INSTALLED.

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

06/13/24

Pharr District Central Design

Texas Department of Transportation

FM 510

SUMMARY OF EROSION CONTROL DEVICES

CONT	SECT	JOB	HIGHWAY
1057	03	051	FM 510
DIST	COUNTY		SHEET NO.
PHR	CAMERON		255

DATE: 6/13/2024 11:11:02 AM
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TPWD BMPs

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

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

☒ General Design/Construction BMPs

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

☒ Vegetation BMPs

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

☐ Invasive Species BMPs

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

☐ Stream Crossings BMPs

- ☐ Riparian buffer zones should remain undisturbed.

☐ Dewatering BMPs

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

☐ Wildlife Crossing BMPs

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

☐ Rare Plant BMPs

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

Pharr District Contact No. 956-702-6100

☐ Rare Plants BMPs (Continued)

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

☒ Bird BMPs

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

☐ Rookeries BMPs

- ☐ In general, nesting dates for herons and egrets range from early February to late August in Texas, depending on the species. Great blue herons (GBHE) (Ardea herodis) are usually the first to nest. When GBHE get disrupted from the nest and abandon nesting, then the other species of herons and egrets may not attempt to nest at the colony that year.
- ☐ If rookeries are encountered, avoid and minimize disturbance during nesting to protect rookery species and their habitat.
- ☐ Vegetation clearing in a primary buffer area of 300 meters (984 feet) from a rookery or heronry periphery should be avoided. Utilizing areas that have already been cleared within this buffer area may be acceptable depending on site-specific characteristics. Additionally, human foot-traffic or machinery use should not occur within this buffer area during the nesting season.
- ☐ Clearing activities or construction using heavy machinery in a secondary buffer area of 1000 meters (3281 feet) from the heronry periphery should be avoided during the breeding season (courting and nesting).

Revised 02/24/2022

List of Abbreviations

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 1 OF 3

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6			FM 510
STATE	DISTRICT	COUNTY	
TEXAS	PHR	CAMERON	SHEET NO.
CONTROL	SECTION	JOB	
1057	03	051	256

Date Printed: X-X-XX

☐ Fish BMPs

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

☐ Aquatic Invertebrate BMPs

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

☐ Crayfish BMP

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

☐ Freshwater Mussel BMP

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

☐ Insect Pollinator BMP

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

☐ Insect Pollinator BMP (Continued)

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

☐ Small Mammal BMP

For Coues' rice rat (Oryzomys couesi aquaticus):

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

☐ Fossorial Mammal BMP

- ☐ When a construction zone is adjacent to active BTPD burrows or pocket gopher mounds, erect barriers to discourage individuals moving through or into the construction area.
- ☐ When seeding or revegetation is planned in an area adjacent to BTPD burrows or pocket gopher mounds, a vegetative barrier should be considered in the planting to discourage dispersal into the ROW.

☐ Bat BMP

- ☐ For activities that have the potential to impact structures, cliffs or caves, or trees; a qualified biologist will perform a habitat assessment and occupancy survey of the feature(s) with roost potential as early in the planning process as possible or within one year before project letting.
- ☐ For roosts where occupancy is strongly suspected but unconfirmed during the initial survey, revisit feature(s) at most four weeks prior to scheduled disturbance to confirm absence of bats.
- ☐ If bats are present or recent signs of occupation (i.e., piles of guano, distinct musky odor, or staining and rub marks at potential entry points) are observed, take appropriate measures to ensure that bats are not harmed, such as implementing non-lethal exclusion activities or timing or phasing of construction.
- ☐ Exclusion devices can be installed by a qualified individual between September 1 and March 31. Exclusion devices should be used for a minimum of seven days when minimum nighttime temperatures are above 50°F AND minimum daytime temperatures are above 70°F. Prior to exclusion, ensure that alternate roosting habitat is available in the immediate area. If no suitable roosting habitat is available, installation of alternate roosts is recommended to replace the loss of an occupied roost. If alternate roost sites are not provided, bats may seek shelter in other inappropriate sites, such as buildings, in the surrounding area.

Pharr District Contact No. 956-702-6100

☐ Bat BMP (Continued)

- ☐ If feature(s) used by bats are removed as a result of construction, replacement structures should incorporate bat-friendly design or artificial roosts should be constructed to replace these features.
- ☐ Avoid unnecessary removal of dead fronds on native and ornamental palm trees in south Texas (Cameron, Hidalgo, Willacy, Kenedy, Brooks, Kleberg, Nueces, and San Patricio counties) from April 1 through October 31. If removal of dead fronds is necessary at other times of the year, limit frond removal to extended warms periods (nighttime temperatures = 55°F for at least two consecutive nights), so bats can move away from the disturbance and find new roosts.
- ☐ Large hollow trees, snags (dead standing trees), and trees with shaggy bark should be surveyed for colonies and, if found, should not be disturbed until the bats are no longer occupying these features. Post-occupancy surveys should be conducted by a qualified biologist prior to tree removal from the landscape.
- ☐ Retain mature, large diameter hardwood forest species and native/ornamental palm trees.
- ☐ In all instances, avoid harm or death to bats. Bats should only be handled as a last resort and after communication with TPWD.

☒ Aquatic Amphibian and Reptile BMP

For projects within existing right-of-way (ROW) when work is in water or will permanently impact a water feature and potential habitat exists for the target species complete the following:

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

Revised 02/24/2022

List of Abbreviations

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Texas Department of Transportation

PHARR DISTRICT

EPIC SHEET SUPPLEMENTALS

TPWD BMPs

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6			FM 510
STATE	DISTRICT	COUNTY	
TEXAS	PHR	CAMERON	SHEET NO.
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☐ Aquatic Amphibian and Reptile BMP (Continued)

- ☐ If gutters and curbs are part of the roadway design, install gutters that do not include the side box inlet and include sloped (i.e., mountable) curbs to allow small animals to leave roadway. If this modification to the entire curb system is not possible, install sections of sloped curb on either side of the storm water drain for several feet to allow small animals to leave the roadway. Priority areas for these design recommendations are those with nearby wetlands or other aquatic features.

For projects that require acquisition of additional ROW and work within that new ROW is in water or will permanently impact a water feature, implement BMP for projects within existing ROW above plus those below:

- ☐ For sections of roadway adjacent to wetlands or other aquatic features, install wildlife barriers that prevent climbing. Barriers should terminate at culvert openings in order to funnel animals under the road. The barriers should be of the same length as the adjacent feature or 80 feet long in each direction, or whichever is the lesser of the two.
- ☐ For culvert extensions and culvert replacement/installation, incorporate measures to funnel animals toward culverts such as concrete wingwalls and barrier walls with overhangs.
- ☐ When riprap or other bank stabilization devices are necessary, their placement should not impede the movement of terrestrial or aquatic wildlife through the water feature. Biotechnical streambank stabilization methods using live native vegetation, or a combination of vegetative and structural materials should be used.

☒ Terrestrial Amphibian and Reptile BMP

- ☒ For open trenches and excavated pits, install escape ramps at an angle of less than 45 degrees (1:1) in areas left uncovered. Visually inspect excavation areas for trapped wildlife prior to backfilling
- ☒ Avoid or minimize disturbing or removing cover objects, such as downed trees, rotting stumps, brush piles, and leaf litter. If avoidance or minimization is not practicable, consider removing cover objects prior to the start of the project and replace them at project completion.
- ☒ Examine heavy equipment stored on site before use, particularly after rain events when reptile and amphibian movements occur more often, to ensure use will not harm individuals that might be seeking temporary refuge.
- ☒ Due to increased activity (mating) of reptiles and amphibian during the spring, construction activities like clearing or grading should attempt to be scheduled outside of the spring (March-May) season.
  Also, timing ground disturbing activities before October when reptiles and amphibians become less active and may be using burrows in the project area is also encouraged.
- ☒ If Texas tortoises (Gopherus berlandieri) or box turtles (Terrepene spp.) are present in a project area, they should be removed from the area and relocated between 100 and 200 meters from the project area. After removal of the individuals, the area that will be disturbed during active construction and project specific locations should be fenced off to exclude reentry by turtles, tortoises, and other reptiles. The exclusion fence should be constructed and maintained as follows:

  - The exclusion fence should be constructed with metal flashing or drift fence material.
  - Rolled erosion control mesh material should not be used.
  - The exclusion fence should be buried at least 6 inches deep and be at least 24 inches high.
  - The exclusion fence should be maintained for the life of the project and only removed after the construction is completed and the disturbed site has been revegetated.

☒ Terrestrial Amphibian and Reptile BMP (Continued)

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

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

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

☒ Sheep Frog

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

☐ South Texas Siren (Large Form)

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

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

- ☐ Terrestrial Amphibian and Reptile BMP
- ☐ Vegetation BMP

☐ Rio Grande River Cooter

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

☐ Texas Horned Lizard

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

☐ Texas Tortoise

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

Pharr District Contact No. 956-702-6100

OTHER PERTINENT INFORMATION

☐ Trifold Available

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

☐ Stockcards Available

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

Revised 02/24/2022

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Texas Department of Transportation

PHARR DISTRICT

EPIC SHEET SUPPLEMENTALS

TPWD BMPs

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6			FM 510
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During the planning phase of project development, the following Environmental Permits, Issues and Commitments have been developed during coordination with resource agencies, local governmental entities and the general public. Any change orders and/or deviations from the final design must be reported to the Engineer prior to the commencement of construction activities as additional environmental clearances may be required.

I. Clean Water Act, Section 402; Stormwater Pollution Prevention

Action Items Required : ☐ No Action Required

1. ☒ The contractor must implement the SW3P by installing Best Management Practices (BMPs) as indicated in the construction plans and maintained appropriately throughout construction. BMPs must be in place prior to the start of construction. The SW3P may need to be revised as necessary as construction progresses.

2. ☒ For all construction PSL's off the ROW, the contractor must certify compliance with all applicable laws, rules and regulations pertaining to the preservation of cultural resources, natural resources and the environment.

3. ☒ Based on the acreage of impact, select the appropriate box below:

   ☐ This project will disturb less than 1 acre of soil and is not part of a larger common plan of development; therefore, a NOI and TPDES Site Notice are not required for this project.

   or

   ☐ This project will disturb equal to or more than 1 acre of soil but less than 5 acres; therefore a NOI is not required but a TPDES Site Notice is required. The Construction Site Notice (CSN) is required to be posted at the construction site in a publicly accessible location for review by the public, TCEQ, EPA and other Inspectors.

   or

   ☒ This project will disturb equal to or more than 5 acres of soil and will require a NOI and TPDES Site Notice. The NOI and Site Notice are required to be posted at the construction site in a publicly accessible location.

4. ☒ Need to address MS4 requirements (Cameron & Hidalgo Counties only) ☐ MS4 requirements not needed

II. Clean Water Act, Sections 401 and 404 Compliance

Action Items Rquired : ☐ No Action Required

1. ☒ Filling, dredging or excavating in any water bodies, rivers, creeks, streams, wetlands or wet areas is prohibited unless specified in the USACE permit and approved by the Engineer. The contractor shall adhere to all agreements, mitigation plans, and BMPs required by the NWP as regulated by the USACE.

   The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

   ☐ No Permit Required

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

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

   ☐ Individual 404 Permit Required

   ☐ Other Nationwide Permit Required: NWP#_____

2. ☒ The contractor is responsible for obtaining new or revised Section 404 permit(s) for Contractor initiated changes in construction methods that change Impacts To Waters Of The U.S., including wetlands. The Contractor will ensure that the water quality of the State will be maintained and not degraded.

3. ☒ Best Management Practices for applicable Section 401 General Conditions:

General Condition 12 - Categories I and II BMPs required

Category I (Erosion Control)

☒ Temporary Vegetation	☐ Interceptor Swale	☐ Mulch Filter Berms and/or Socks
☐ Blankets, Matting	☐ Diversion Dike	☒ Compost Filter Berms and/or Socks
☐ Mulch	☐ Erosion Control Compost	☐ Compost Blankets
☐ Sodding		

Category II (Sedimentation Control)

☒ Silt Fence	☐ Hay (Straw) Bale Dike	☐ Mulch Filter Berms and/or Socks
☐ Rock Berm	☐ Brush Berms	☒ Compost Filter Berms and/or Socks
☐ Triangular Filter Dike	☐ Sediment Basins	☐ Stone Outlet Sediment Traps
☐ Sand Bag Berm	☐ Erosion Control Compost	

General Condition 21 - Category III BMPs required

Category III (Post-Construction TSS Control)

☐ Vegetative Filter Strips	☐ Wet Basins	☐ Mulch Filter Berms and/or Socks
☐ Retention/Irrigation	☐ Grassy Swales	☒ Compost Filter Berms and/or Socks
☐ Extended Detention Basin	☐ Vegetation-Lined Ditches	☐ Sand Filter Systems
☐ Constructed Wetlands	☐ Erosion Control Compost	☐ Sedimentation Chambers

II. Clean Water Act, Sections 401 and 404 Compliance - Continued:

4. ☒ The Contractor's designated and qualified Contractor Responsible Person Environmental (CRPe) will monitor the project site daily to ensue compliance with SW3P and TPDES General Permit TXR 150000. Daily Monitoring Reports shall be provided to TxDOT within 48 hours, in accordance with Item 506.3.1.

5. ☒ Other Project Specific Actions:

   1. Contractor must sweep roadway & remove loose aggregate along C&G upon completed daily operations.
   2. Contractor shall not place removed aggregate along adjacent grass areas.

III. Cultural Resources

Action Items Required : ☐ No Action Required

1. ☒ Refer to the 2024 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 2024 TxDOT Standard Specifications; Item 164 - Seeding For Erosion Control; provide and install temporary or permanent seeding for erosion control as shown on the plans or as directed by the Engineer for all seeding and replanting of right of way where possible. (Required for Urban Settings)

2. ☒ In accordance with Executive Order 13112 on invasive species and the Executive Memorandum on Beneficial Landscaping, native species of plants shall be used for all seeding and replanting of right of way where possible for rural roadways. (Required for Rural Settings)

3. ☒ Preserve vegetation where possible throughout the project and minimize clearing, grubbing and excavation within stream banks, bed and approach sections.

4. ☒ Other Project Specific Actions:

   1. A rare plant survey will be conducted by a qualified biologist for the following species (prior to construction): South Texas spikesege, Texas stonecrop, South Texas Ambrosia, and Texas Ayenia.

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

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Texas Department of Transportation

PHARR DISTRICT

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6			FM510
STATE	DISTRICT	COUNTY	
TEXAS	PHR	CAMERON	
CONTROL	SECTION	JOB	SHEET NO.
1057	03	051	259

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V. Federal Listed, and Proposed Threatened and Endangered Species, Critical Habitat, State Listed Species, Candidate Species and Migratory Birds

Action Items Required : ☐ No Action Required

1. ☒ Under the Migratory Bird Treaty Act (MBTA) of 1918, codified at 16 U.S.C. § 703-712 and as enforced by the USFWS, the proposed construction work will not remove active nests from bridges, trees, ground and other structures during migratory bird nesting season, (February 1st. through October 1st.). If the Contractor needs to perform work within the right of way during nesting season, a qualified Biologist shall conduct a survey to determine if active nests are present. If present, the Contractor shall maintain a buffer zone around the nest(s) as directed by the Biologist. The buffer zone will be protected from clearing and disturbance until such time as the Biologist has determined that the nest(s) is no longer active. Prior to the nesting season, existing bridges and culverts should be treated against migratory bird nesting by utilizing Bird Exclusion Methods. Bird Exclusion Methods should be monitored and maintained throughout the nesting season. Refer to Standard Bird Exclusion Details.

2. ☒ There is the potential for the presence of state-listed species & species of concern in the project area and state law prohibits the taking (incidental or otherwise) of state-listed species. Taking is defined as the collection, hooking, hunting, netting, shooting, or share by any means or devices. If any listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately.

3. ☒ Other Project Specific Actions:

   1. Federal or State listed species that may potentially occur within the project limits include: Gulf Coast Jaguarundi, Ocelot, Northern Aplomado Falcon, South Texas Ambrosia, Texas Ayenia, Sheep frog, Mexican treefrog, South Texas spikesege, and Texas Stonecrop.

   During construction activities, if TxDOT or the contractor locates a dead, injured or sick Ocelot or Jaguarundi, initial notification must be made to the project Engineer (956-702-6160) or Environmental Supervisor (956-702-6130) and US Fish and Wildlife Service's Law Enforvement office (956- 686-8591) or Ecological Service's Office at Santa Ana NWR (956-784-7560) and to the extent practicable, the finder has the responsibility to ensure that evidence intrinsic to the specimen is not necessarily disturbed.

   1. A rare plant survey will be conducted by a qualififed biolofist for the following species (prior construction): South Texas spikesege, Texas stone crop, South Texas Ambrosia, and Texas Ayenia.

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.

   3. All construction work must occur during daylight hours only, from sunrise to sunset.

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

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Texas Department of Transportation

PHARR DISTRICT

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

SHEET 2 OF 2

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6			FM510
STATE	DISTRICT	COUNTY	
TEXAS	PHR	CAMERON	SHEET NO.
CONTROL	SECTION	JOB	
1057	03	051	260

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

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

For all projects with soil disturbing activity and for projects that have Environmental, Permits, Issues, and Commitments (EPICs) dependent on stormwater controls and water quality measures TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office, Area Office, or electronically.

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

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):
1057-03-051

1.2 PROJECT LIMITS:
From: FM 1847

To: FM 2480

1.3 PROJECT COORDINATES:
BEGIN: (Lat) 26.129418 ,(Long) -97.470881

END: (Lat) 26.129405 ,(Long) -97.397920

1.4 TOTAL PROJECT AREA (Acres): 22.80

1.5 TOTAL AREA TO BE DISTURBED (Acres): 47.12

1.6 NATURE OF CONSTRUCTION ACTIVITY:
REHABILITATION OF AN EXISTING ROADWAY.

1.7 MAJOR SOIL TYPES:

Soil Type	Description
Benito clay, ponded	
Cameron silty clay	
Harlingen clay	
Laredo silty clay loam 0 to 1 percent slopes	
Olmito silty clay	

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

- [X] PSLs determined during preconstruction meeting
- [ ] PSLs determined during construction
- [ ] No PSLs planned for construction

Type	Sheet #s

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

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

- [X] Mobilization
- [X] Install sediment and erosion controls
- [X] Blade existing topsoil into windrows, prep ROW, clear and grub
- [X] Remove existing pavement
- [X] Grading operations, excavation, and embankment
- [X] Excavate and prepare subgrade for proposed pavement widening
- [X] Remove existing culverts, safety end treatments (SETs)
- [X] Remove existing metal beam guard fence (MBGF), bridge rail
- [X] Install proposed pavement per plans
- [X] Install culverts, culvert extensions, SETs
- [X] Install mow strip, MBGF, bridge rail
- [X] Place flex base
- [X] Rework slopes, grade ditches
- [X] Blade windrowed material back across slopes
- [X] Revegetation of unpaved areas
- [X] Achieve site stabilization and remove sediment and erosion control measures
- [X] Other: Dewatering for drainage/Irrigation Installation. Dewatering plan must be submitted to TxDOT prior to dewatering operations.
- [ ] Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

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

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

Tributaries	Classified Waterbody
Freshwater Stream	Drainage ditches flowing into segment (2491A)
Freshwater Stream	Drainage ditches flowing into Lower Laguna Madre (2491C)

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

1.12 ROLES AND RESPONSIBILITIES: TxDOT

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

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

- [X] Day To Day Operational Control
- [X] Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
- [X] Post Construction Site Notice
- [X] Submit NOI/CSN to local MS4
- [X] Maintain schedule of major construction activities
- [X] Install, maintain and modify BMPs
- [X] Complete and submit Notice of Termination to TCEQ
- [X] Maintain SWP3 records for 3 years
- [X] Other: Conduct daily dewatering inspections. Complete daily dewatering checklist for each dewatering location.
- [ ] Other: _____
- [ ] Other: _____

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

MS4 Entity
Bayview Irrigation District No. 11

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

07/02/24

STORMWATER POLLUTION PREVENTION PLAN (SWP3)

 July 2023 Sheet 1 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			261
STATE	STATE DIST.	COUNTY	
TEXAS	PHR	CAMERON	
CONT.	SECT.	JOB	HIGHWAY NO.
1057	03	051	FM 510

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

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

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

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

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

2.2 SEDIMENT CONTROL BMPs:

T / P

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

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

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

T / P

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

2.3 PERMANENT CONTROLS:

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

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

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

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

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

2.5 POLLUTION PREVENTION MEASURES:

- ☒ Chemical Management
- ☒ Concrete and Materials Waste Management
- ☒ Debris and Trash Management
- ☒ Dust Control
- ☒ Sanitary Facilities
- ☒ Other: Removal of erosion and sediment control BMP's upon completion.
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

2.6 VEGETATED BUFFER ZONES:

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

Type	Stationing	
	From	To

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

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

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

2.8 DEWATERING:

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

2.9 INSPECTIONS:

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

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

2.10 MAINTENANCE:

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

STATE OF TEXAS
JOSE A. RODRIGUEZ
117308
LICENSED PROFESSIONAL ENGINEER

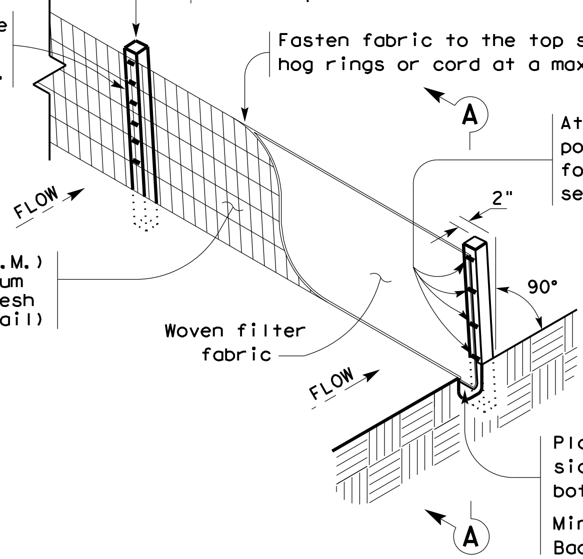
07/02/24

STORMWATER POLLUTION PREVENTION PLAN (SWP3)

July 2023 Sheet 2 of 2

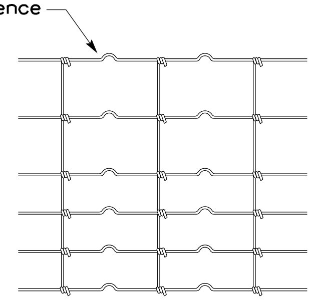
Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			262
STATE	STATE DIST.	COUNTY	
TEXAS	PHR	CAMERON	
CONT.	SECT.	JOB	HIGHWAY NO.
1057	03	051	FM 510



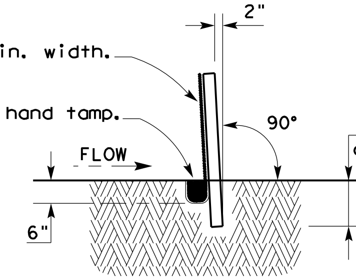
TEMPORARY SEDIMENT CONTROL FENCE

SCF



HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA.SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.



SECTION A-A

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

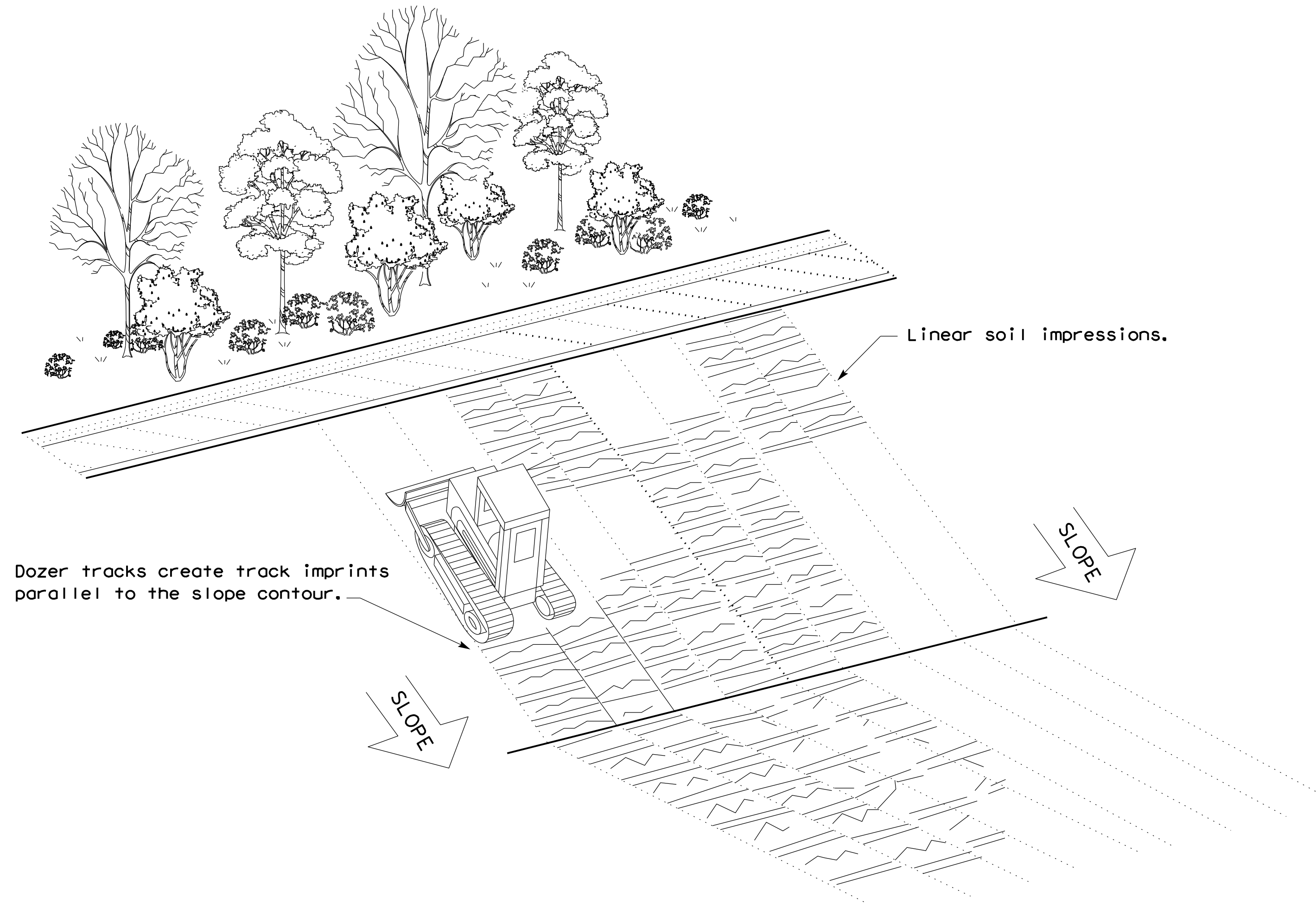
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



VERTICAL TRACKING

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

EC(1)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT 1057	SECT 03	JOB 051	HIGHWAY FM 510
REVISIONS	DIST PHR	COUNTY CAMERON		SHEET NO. 263

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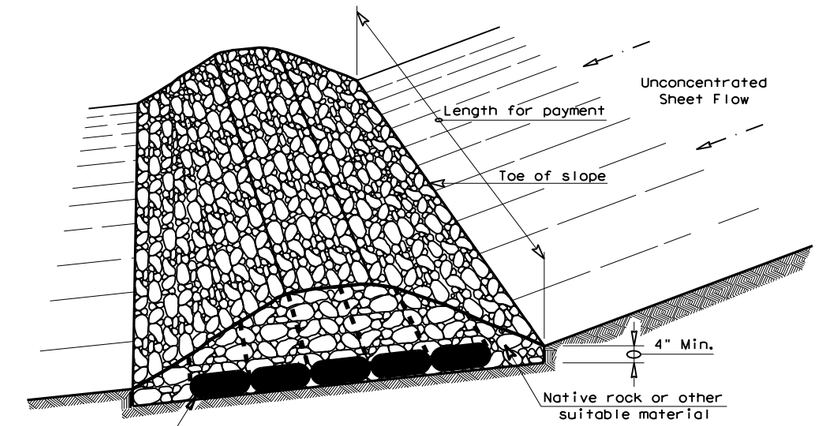
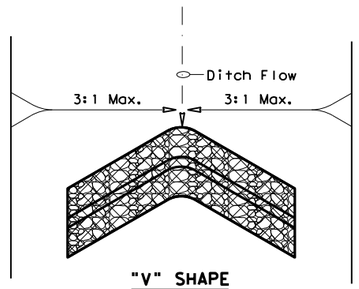
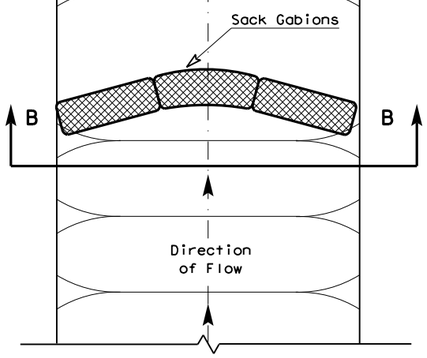


FILTER DAM AT TOE OF SLOPE

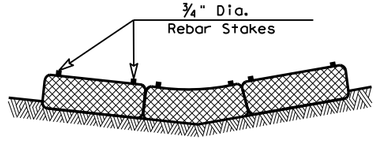
RFD1



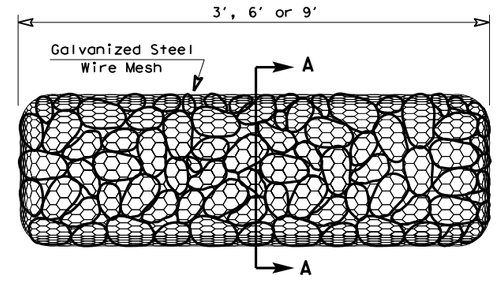
"V" SHAPE PLAN VIEW



PLAN VIEW

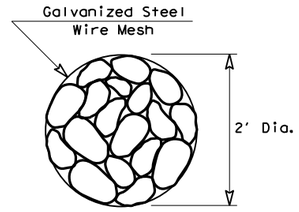


SECTION B-B

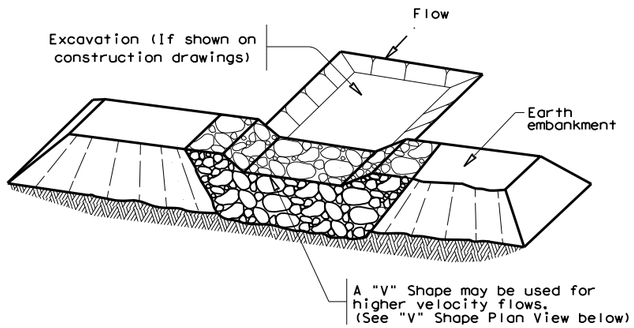


TYPE 4 (SACK GABIONS)

RFD4

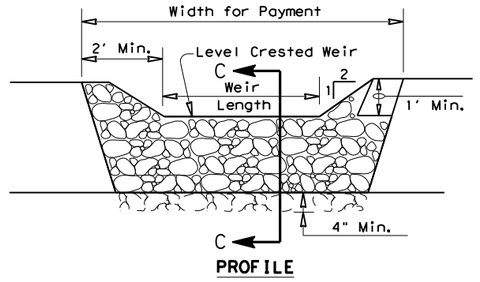


SECTION A-A

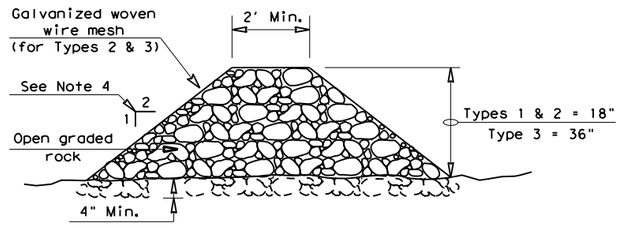


FILTER DAM AT SEDIMENT TRAP

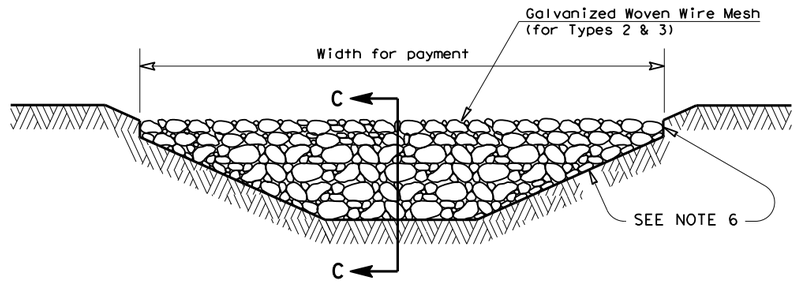
RFD1 OR RFD2



PROFILE



SECTION C-C



FILTER DAM AT CHANNEL SECTIONS

RFD1 OR RFD2 OR RFD3

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with ¾" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 ½" x 3 ¼"
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT^2 of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximently 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh) (3" to 6" aggregate): Type 2 may be used in ditches and at dike or swale outlets.

Type 3 (36" high with wire mesh) (4" to 8" aggregate): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions) (3" to 6" aggregate): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

Type 5: Provide rock filter dams as shown on plans.

PLAN SHEET LEGEND

Type 1 Rock Filter Dam	RFD1
Type 2 Rock Filter Dam	RFD2
Type 3 Rock Filter Dam	RFD3
Type 4 Rock Filter Dam	RFD4

Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

ROCK FILTER DAMS

EC(2)-16

FILE: ec216	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		264

DATE: 6/13/2024
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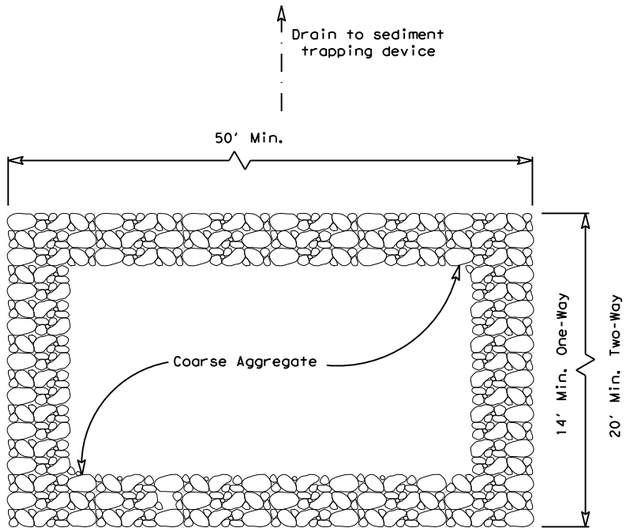
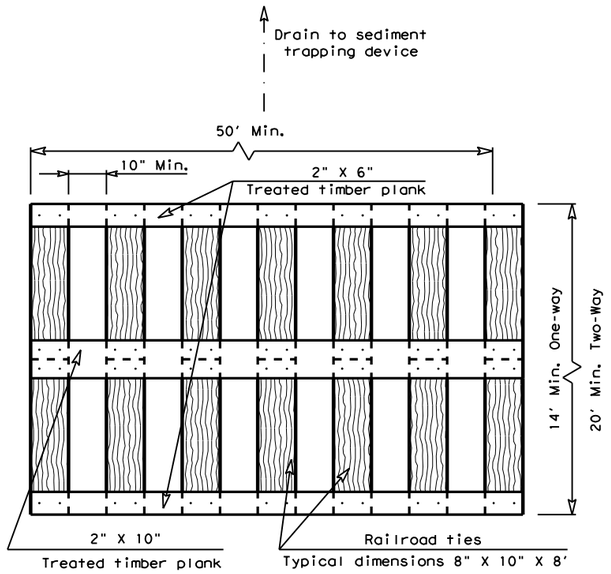
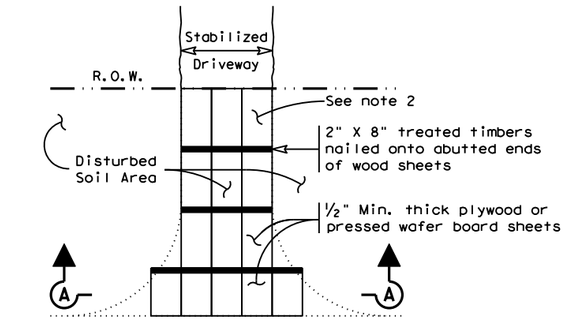


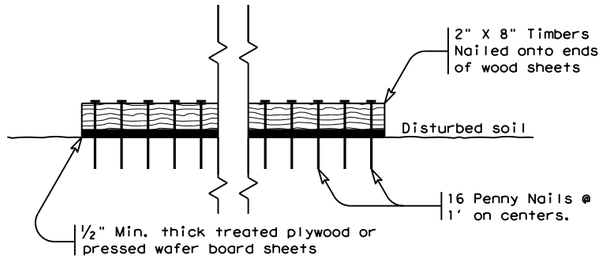
PLAN VIEW



PLAN VIEW



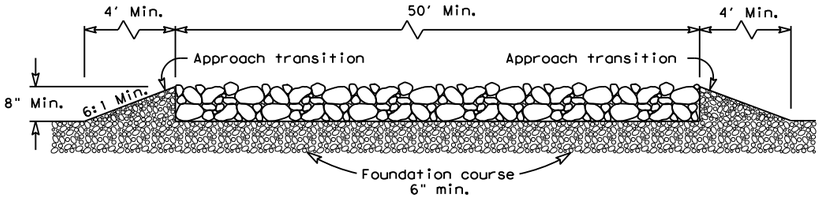
PLAN VIEW



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

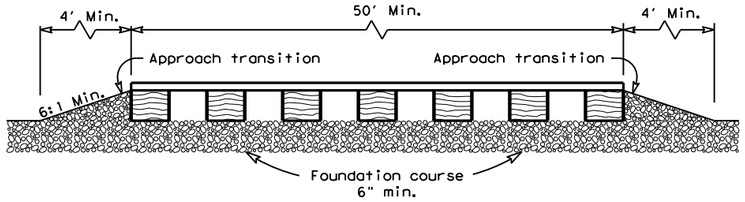
SHORT TERM



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK CONSTRUCTION (LONG TERM)



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

1. The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50'.
2. The coarse aggregate should be open graded with a size of 4" to 8".
3. The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
4. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other materialas approved by the Engineer.
5. The construction exit shall be graded to allow drainage to a sediment trapping device.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
7. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 2)

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
2. The treated timber planks shall be attached to the railroad ties with ½"x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
8. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 3)

1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

EC(3)-16

FILE: ec316	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		265

DATE: 6/13/2024
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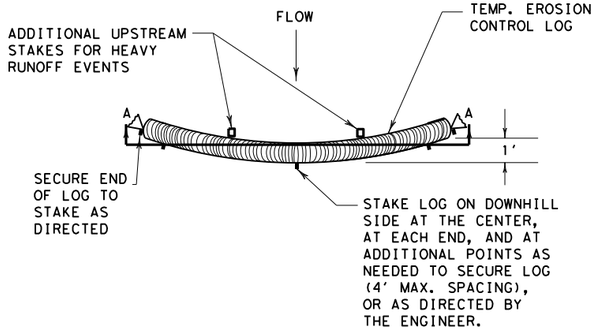
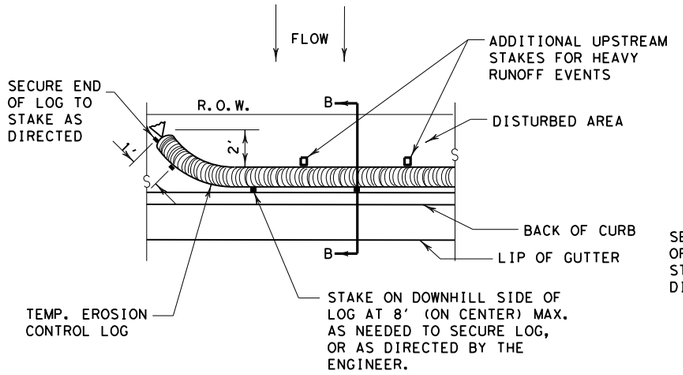
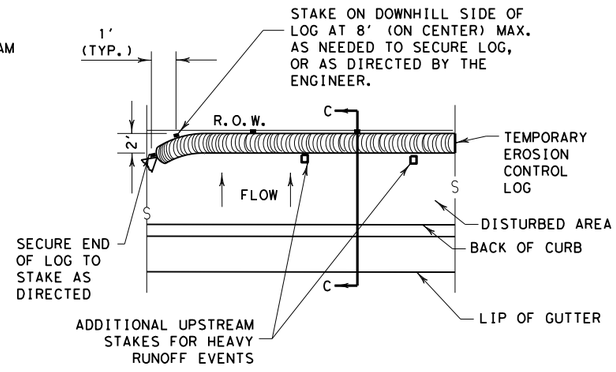


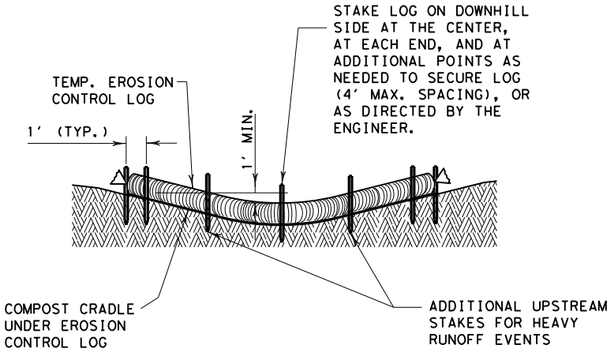
PLAN VIEW



PLAN VIEW



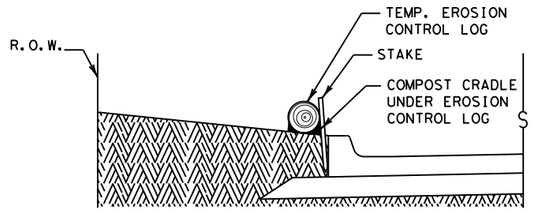
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

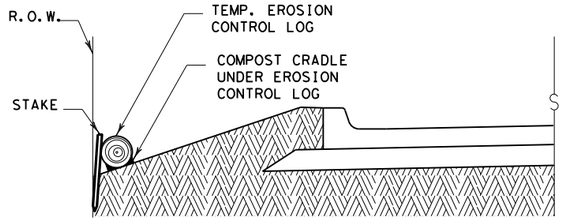
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

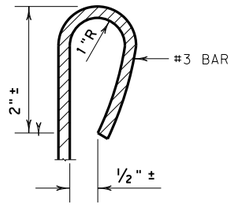
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



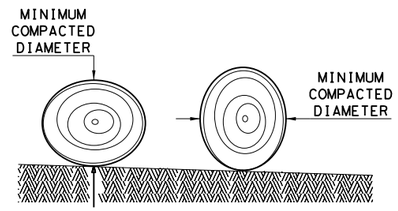
REBAR STAKE DETAIL

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.

Texas Department of Transportation

Design Division Standard

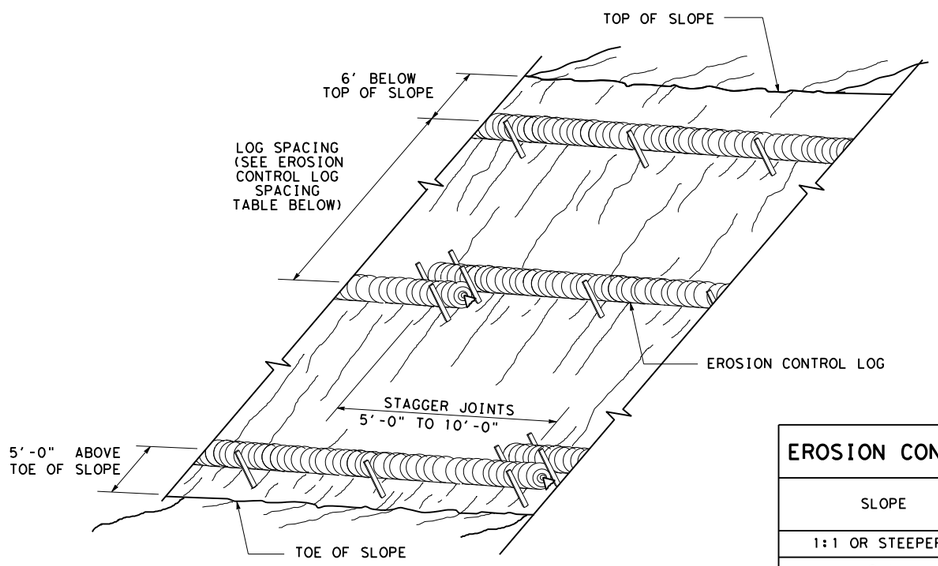
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

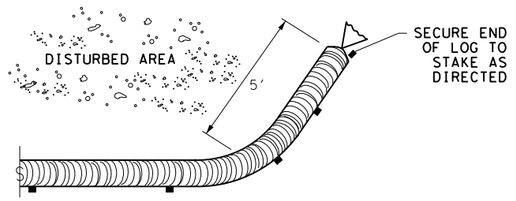
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	1057	03	051	FM 510
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		266

DATE: 6/13/2024
FILE: c:\txdot\pw_online\txdot5\noel.contu\d0455360\ec916.dgn



EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

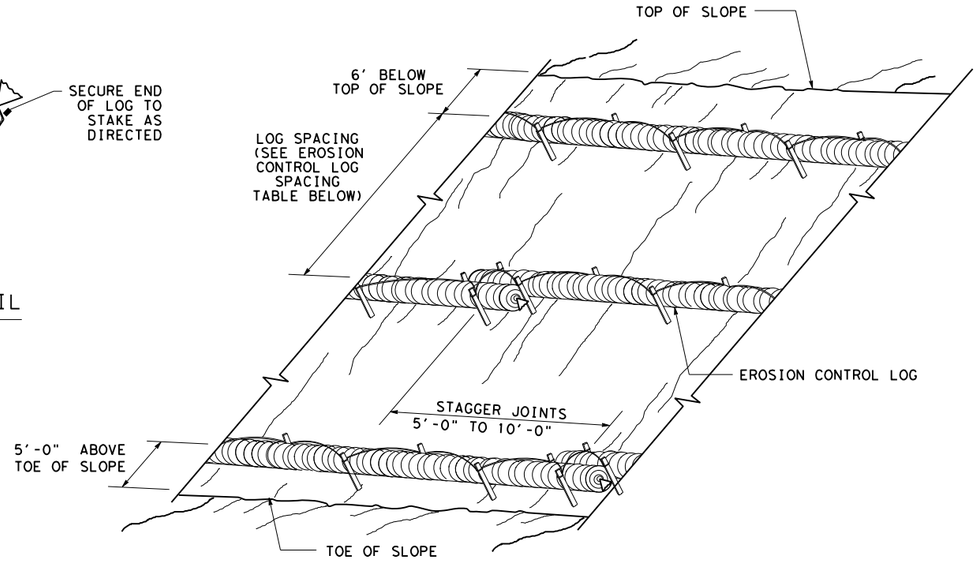
CL-SST



END SECTION RAP DETAIL

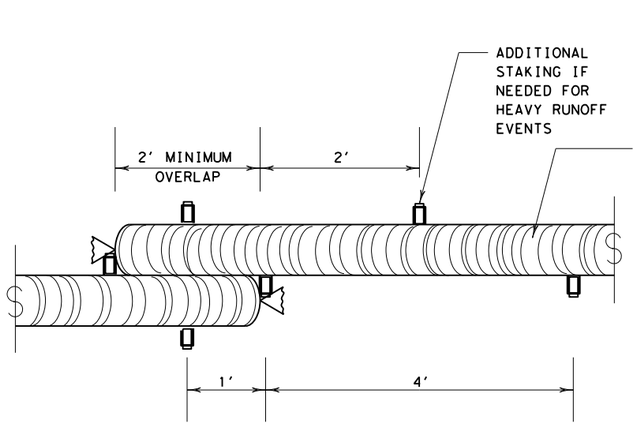
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

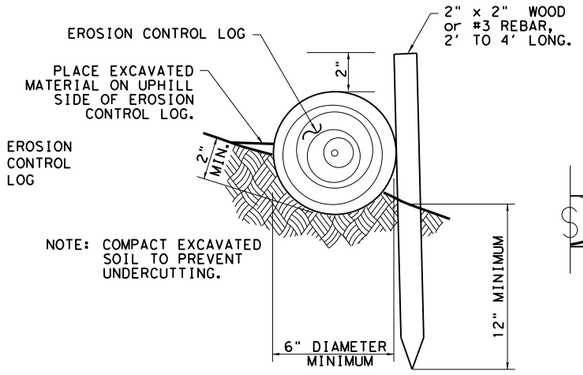
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

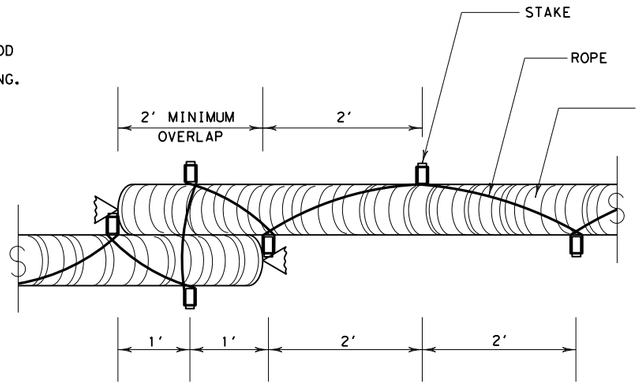


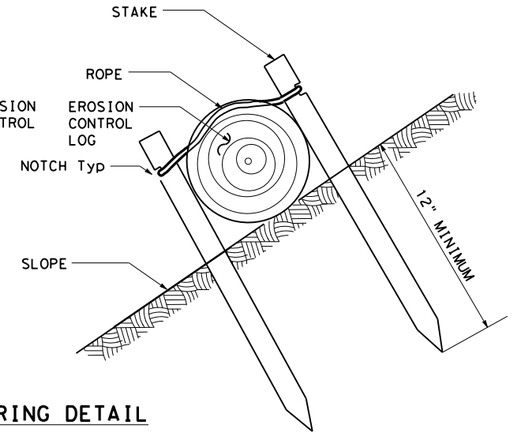


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

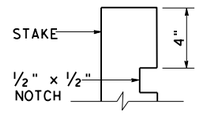
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

SHEET 2 OF 3

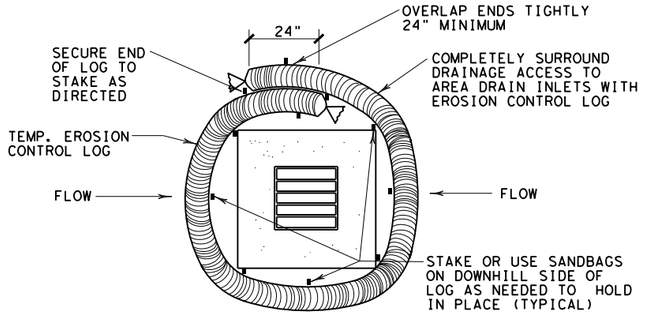
Texas Department of Transportation

Design Division Standard

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

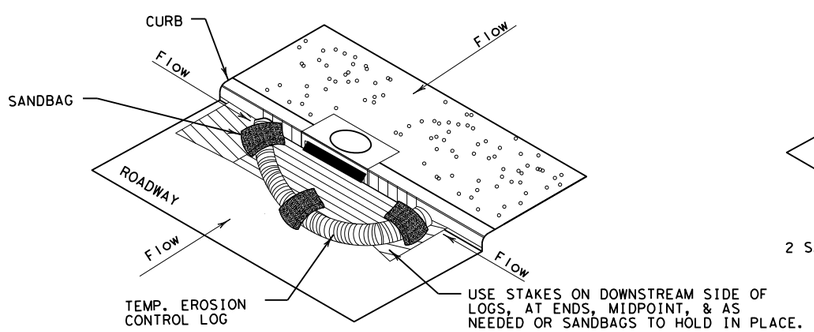
FILE: ec116	DN: TxDOT		CK: KM		DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	1057	03	051		FM 510	
	DIST	COUNTY			SHEET NO.	
	PHR	CAMERON			267	

DATE: 6/13/2024
FILE: c:\txdot\pw_online\txdot5\noel.cntu\d0455360\ec916.dgn



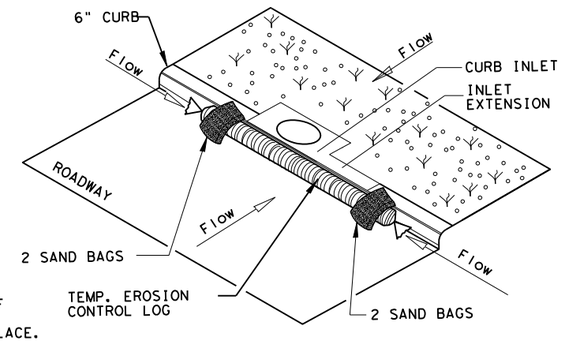
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

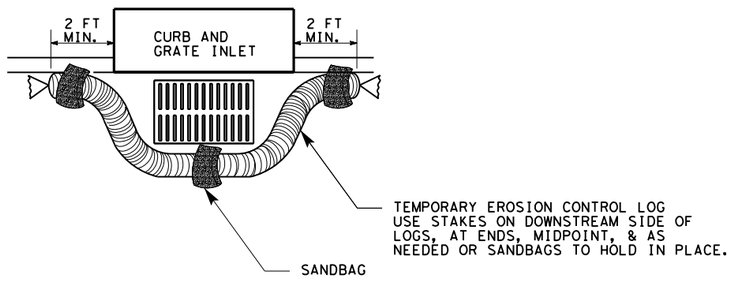
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

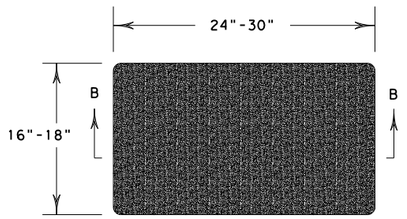
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation

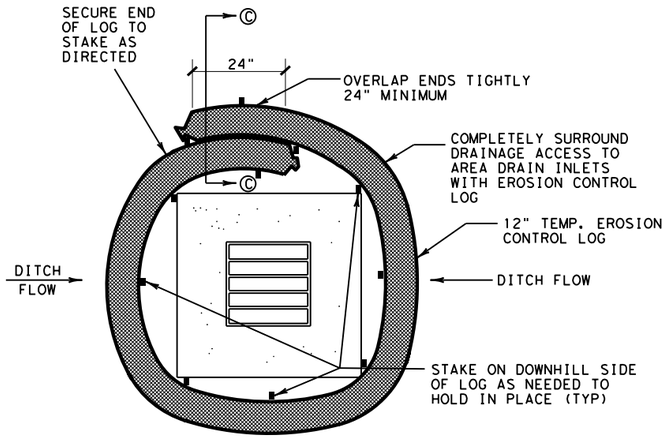
Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

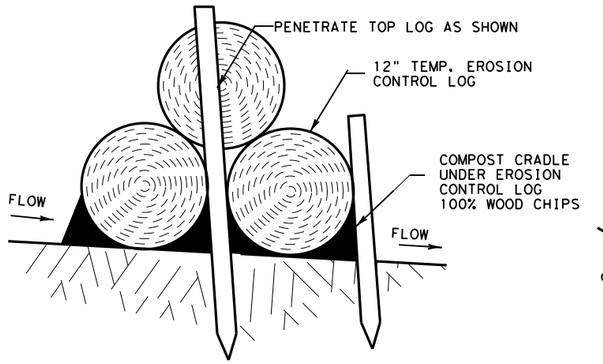
FILE: ec916	DN: TxDOT		CK: KM	DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	1057	03	051		FM 510	
	DIST	COUNTY				SHEET NO.
	PHR	CAMERON				268



DROP INLET SEDIMENT TRAP

NTS

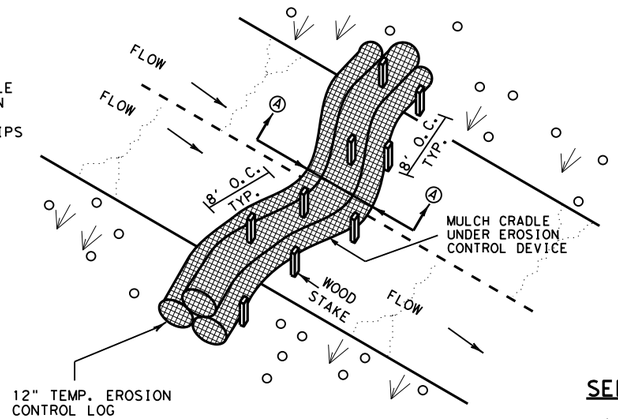
DI-ST



SECTION A-A

DITCH LINE SEDIMENT TRAP A-A

DL-ST



DITCH LINE SEDIMENT TRAP

DL-ST

PLANS SHEET LEGEND

DI-ST — DROP INLET SEDIMENT TRAP

DL-ST — DITCH LINE SEDIMENT TRAP

BOCI-ST — BACK OF CURB INLET SEDIMENT TRAP

ROW-ST — RIGHT OF WAY SEDIMENT TRAP

CI-ST — CURB INLET SEDIMENT TRAP

SEDIMENT BASIN & TRAP USAGE GUIDELINES

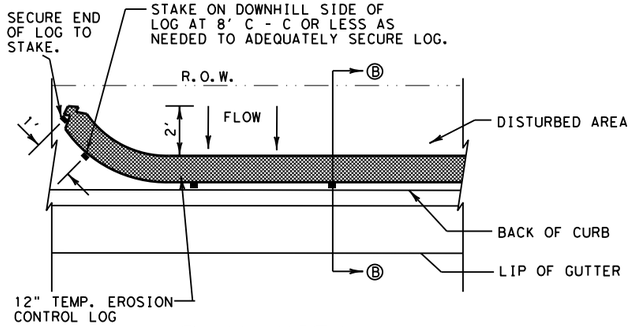
A sediment trap may be used to precipitate sediment out of runoff draining from an unstabilized area.

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

Sediment traps should be placed in the following locations:

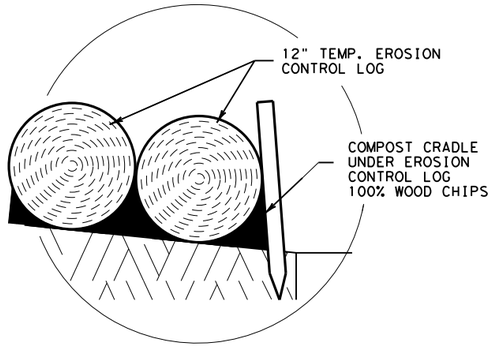
1. Immediately preceding drain inlets
2. Just before the drainage enters a water course
3. Just before the drainage leaves the right of way
4. Just before the drainage leaves the construction limits where drainage flows away from the project

The trap should be cleaned when the capacity has been reduced by ½ or the sediment has accumulated to a depth of 1', whichever is less. Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for seperately.



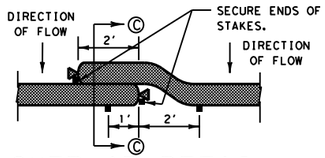
PLAN VIEW

NTS



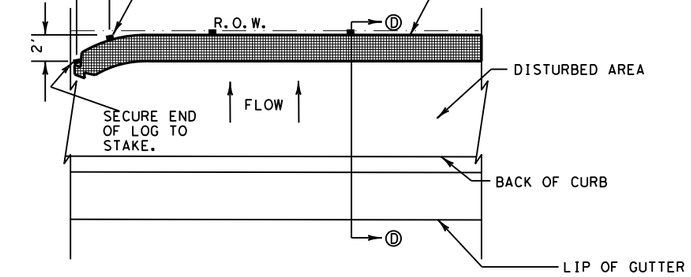
SECTION C-C

OVERLAP WITH COMPOST CRADLE



OVERLAP DETAIL PLAN VIEW

NTS

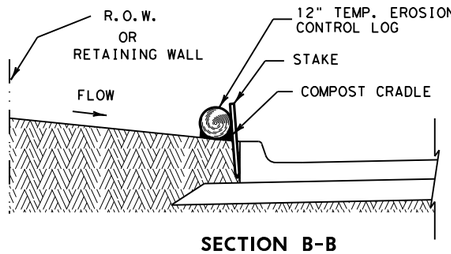


PLAN VIEW

NTS

GENERAL NOTES

1. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED. MAXIMUM LENGTH OF LOGS SHALL BE 30' FOR 12" DIAMETER LOGS.
2. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
3. STUFF LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE DENSITY THAT WILL HOLD SHAPE WITHOUT EXCESSIVE DEFORMATION.
4. STAKES SHALL BE 2" X 2" WOOD 4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG.
5. COMPOST CRADLE MATERIAL IS INCIDENTAL AND WILL NOT BE PAID FOR SEPARATELY.

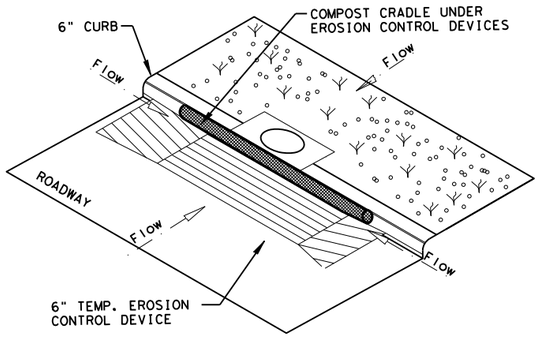


SECTION B-B

BACK OF CURB INLET SEDIMENT TRAP

NTS

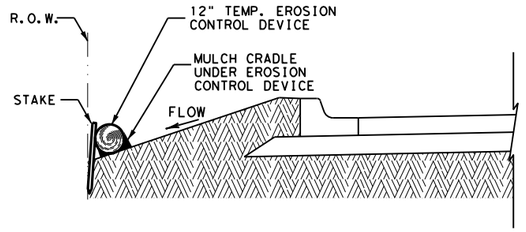
BOCI-ST



CURB INLET SEDIMENT TRAP

NTS

CI-ST



SECTION D-D

RIGHT-OF-WAY SEDIMENT TRAP

NTS

ROW-ST

PHARR DISTRICT STANDARD

Texas Department of Transportation

TEMPORARY EROSION CONTROL LOGS TECL-17 (PHR)

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6			FM 510
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	PHARR	CAMERON	269
CONTROL	SECTION	JOB	
1057	03	051	

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		