CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
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. DATE
SAN BENITO AREA ENGINEER

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT NUMBER
F 2022(108)
CSJ: 1065-02-039

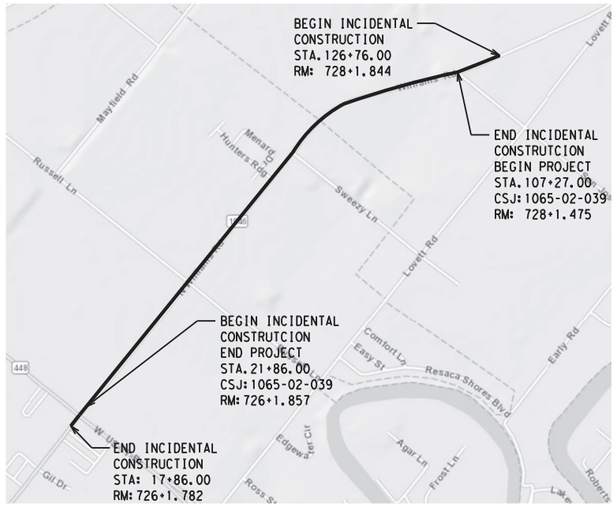
NET LENGTH OF PROJECT = 8,541 FEET = 1.618 MILES
BRIDGE LENGTH = 100 FEET = 0.019 MILES

CAMERON COUNTY
FM 1846

FROM: SAN JOSE RANCH ROAD
TO: BUSINESS 77

FOR THE REHABILITATION OF AN EXISTING ROADWAY

CONSISTING OF A FULL DEPTH REHABILITATION OF EXISTING ASPHALT ROADWAY, GRADING, LIME TREATMENT SUBGRADE, CEMENT TREATMENT FLEXIBLE BASE, ASPHALT, DRIVEWAYS, S.E.T.'S, STRIPING, AND RAISED PAVEMENT MARKERS.



LOCATION MAP NOT TO SCALE

EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: NONE

DESIGN SPEED

MAIN LANES: 50 MPH

A.D.T.

2021: 7,406 VPD
2041: 10,366 VPD

CONCURRENCE: DATE:

CAMERON COUNTY IRRIGATION DISTRICT #2

RECOMMENDED FOR LETTING: DATE: 9/1/2021

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

SUBMITTED FOR LETTING: DATE: 9/1/2021

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

TDLR INSPECTION NOT REQUIRED

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

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SHEET NO.		DESCRIPTION
		GENERAL
1		TITLE SHEET
2		INDEX OF SHEETS
3-6		PROJECT LAYOUT
7-13		EXISTING TYPICAL SECTIONS
14-21		PROPOSED TYPICAL SECTIONS
22		SUPERELEVATION DETAILS
23-33		GENERAL NOTES
34-38		QUANTITY SUMMARY SHEETS
39-42		EARTHWORK SUMMARY SHEETS
43-46		ESTIMATE AND QUANTITY SHEETS
47		SEAL COAT MATERIAL SELECTION TABLE "UNDERSEAL"
		TRAFFIC CONTROL PLAN
48-49		TCP - GENERAL NOTES AND SEQUENCE OF CONSTRUCTION
50		TCP - SIGN SUMMARY
51		CRASH CUSHION SUMMARY SHEET
52-54		TCP TYPICAL SECTIONS - PHASE 1 STEP 1 (DETOUR)
55		TCP - TEMPORARY TYPICAL SECTION (DURING WORK HOURS)
56-60		TCP LAYOUT - PHASE 1 STEP 1 (DETOUR)
61		TCP - ALTERNATIVE PLAN (DURING WORK HOURS)
62		TEMPORARY SIGNAL TCP PHASE 1 STEP 2 @ SAN JOSE RANCH ROAD
63		TCP DETOUR - PHASE 1 STEP 2 SAN JOSE RANCH ROAD
64-66		TCP TYPICAL SECTIONS - PHASE 1 STEP 2
67-68		TCP LAYOUT - PHASE 1 STEP 2
69		TEMPORARY SIGNAL TCP PHASE 2 @ BUS 77
70		TEMPORARY SIGNAL TCP PHASE 2 @ RUSSELL LANE
71		TEMPORARY SIGNAL TCP PHASE 2 @ SAN JOSE RANCH ROAD
72		TCP DETOUR - PHASE 2 WEST RUSSELL LANE
73-78		TCP TYPICAL SECTIONS - PHASE 2
79-83		TCP LAYOUT - PHASE 2
84		TEMPORARY SIGNAL TCP PHASE 3 @ BUSS 77
85		TEMPORARY SIGNAL TCP PHASE 3 @ RUSSELL LANE
86		TCP DETOUR - PHASE 3 EAST RUSSELL LANE
87-89		TCP TYPICAL SECTION - PHASE 3
90-94		TCP LAYOUT - PHASE 3
95-96		TCP - DETAIL SHEET
		TRAFFIC CONTROL PLAN STANDARDS
* [S]	97-108	BC (1)-21 THRU BC (12)-21
* [S]	109	TCP (1-1) - 18
* [S]	110	TCP (1-2) - 18
* [S]	111	TCP (1-3) - 18
* [S]	112	TCP (1-6) - 18
* [S]	113	TCP (2-1) - 18
* [S]	114	TCP (2-2) - 18
* [S]	115	TCP (2-3) - 18
* [S]	116	TCP (2-8) - 18
* [S]	117	TCP (3-1) - 13
* [S]	118	TCP (3-3) - 14
* [S]	119	TCP (7-1) - 13
* [S]	120	WZ (UL) - 13
* [S]	121	WZ (RS) - 16
* [S]	122	WZ (BTS-1) - 13
* [S]	123	WZ (BTS-2) - 13
* [S]	124	WZ (RCD) - 13
* [S]	125	WZ (BRK) - 13
* [S]	126	WZ (STPM) - 13
* [S]	127	ABSORB(M) - 19
* [S]	128	SLED - 19
		ROADWAY DETAILS
	129-131	SURVEY CONTROL INDEX SHEETS
	132	ALIGNMENT DATA
	133-141	PLAN AND PROFILE
	142	PRIVATE DRIVEWAY TABLE
	143	OMITTED
	144	MISCELLANEOUS ROADWAY DETAILS

SHEET NO.		DESCRIPTION
		ROADWAY DETAILS STANDARDS
* [D]	145	DRIVEWAY PROFILE DETAILS
* [D]	146	DRIVEWAY DETAILS PRIVATE (RESIDENTIAL - COMMERCIAL)
* [D]	147	DRIVEWAY DETAILS PUBLIC (COUNTY ROAD - CITY STREET)
* [S]	148	MBGF - 19
* [S]	149	GF (31) - 19
* [S]	150	GF (31) DAT - 19
* [S]	151	GF (31) MS - 19
* [S]	152-155	MB - 15 (1)
		DRAINAGE DETAILS
	156-158	CROSS CULVERT DETAIL SHEETS
	159-161	IRRIGATION CROSSINGS
		DRAINAGE DETAILS STANDARDS
* [S]	162	PB
* [S]	163	PBGC
* [S]	164	PDD
* [S]	165-166	PSL
* [D]	167	MISCELLANEOUS DRAINAGE STRUCTURE DETAILS
* [D]	168	BACKFILL DETAILS
		TRAFFIC SIGNALS
	169-170	TRAFFIC SIGNAL LAYOUT PROPOSED INSTALLATION @ BUS 77
	171-173	TRAFFIC SIGNAL LAYOUT PROPOSED INSTALLATION @ RUSSELL LANE
	174	OMITTED
	175	SUMMARY OF MATERIALS TRAFFIC SIGNAL
		TRAFFIC SIGNAL STANDARDS
$ [S]	176	LD (1) - 03
$ [S]	177	LD (2) - 03
		SIGNING
	178-179	SIGNING LAYOUT
	180	SUMMARY OF SMALL SIGNS (REMOVAL)
	181-182	SUMMARY OF SMALL SIGNS
	183	SIGN PANEL DETAILS
		SIGNING STANDARDS
* [S]	184	TSR (3) - 13
* [S]	185	TSR (4) - 13
* [S]	186	TSR (5) - 13
* [S]	187	SMD (GEN) - 08
* [S]	188	SMD (SLIP-1) - 08
* [S]	189	SMD (SLIP-2) - 08
* [S]	190	SMD (SLIP-3) - 08
* [S]	191	SMD (TWT) - 08
* [S]	192	SMD (FRP) - 08
		PAVEMENT MARKINGS & DELINEATION
	193-196	PAVEMENT MARKING LAYOUT
		PAVEMENT MARKINGS & DELINEATION STANDARDS
* [S]	197	PM (1) - 20
* [S]	198	PM (2) - 20
* [S]	199	PM (3) - 20
* [S]	200	PM (4) - 20
* [S]	201	RS (4) - 13
* [D]	202	CENTERLINE RUMBLE STRIPS SUPPLEMENTAL DETAILS
		ENVIRONMENTAL ISSUES
	203	STORMWATER POLLUTION PREVENTION PLAN (SW3P)
	204-205	ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)
	206-208	EPIC SHEET SUPPLEMENTALS TPWD BMPs
	209-212	SW3P LAYOUT

SHEET NO.		DESCRIPTION
		ENVIRONMENTAL ISSUES STANDARDS
* [S]	213	EC (1) - 16
* [S]	214-216	EC (9) - 16
* [D]	217	TECL-17

LEGEND

D - DISTRICT STANDARD
S - STATE STANDARD

THE STANDARD SHEETS SPECIFICALLY INDENTIFIED WITH A "*" SYMBOL HAVE BEEN ISSUED BY ME OR UNDER MY REPONSIBLE SUPERVISION, AS BEING APPLICABLE TO THIS PROJECT.

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED PROFESSIONAL ENGINEER

P.E.
09/29/2021

THE STANDARD SHEETS SPECIFICALLY INDENTIFIED WITH A "$" SYMBOL HAVE BEEN ISSUED BY ME OR UNDER MY REPONSIBLE SUPERVISION, AS BEING APPLICABLE TO THIS PROJECT.

STATE OF TEXAS
ELIGIO ALVAREZ
107123
LICENSED PROFESSIONAL ENGINEER

Eligio Alvarez, P.E
9-29-2021

Pharr District Central Design

Texas Department of Transportation

FM 1846
INDEX OF SHEETS

SHEET 1 OF 1

© 2021		CONT	SECT	JOB	HIGHWAY
DS:	CK:	1065	02	039	FM 1846
		DIST	COUNTY		SHEET NO.
DW:	CK:	PHR	CAMERON		2

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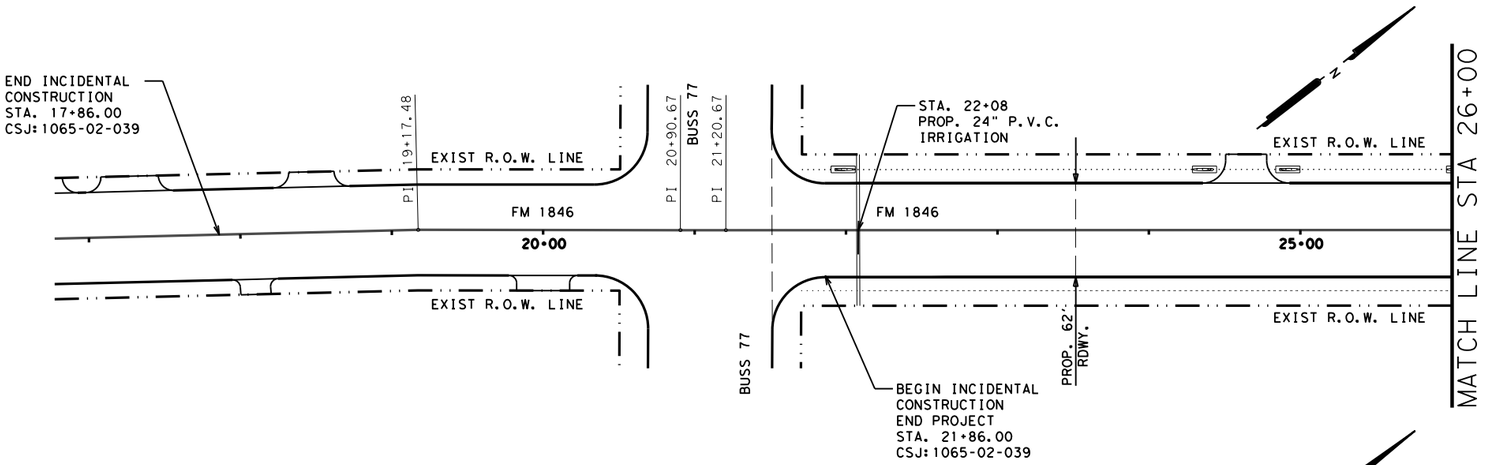

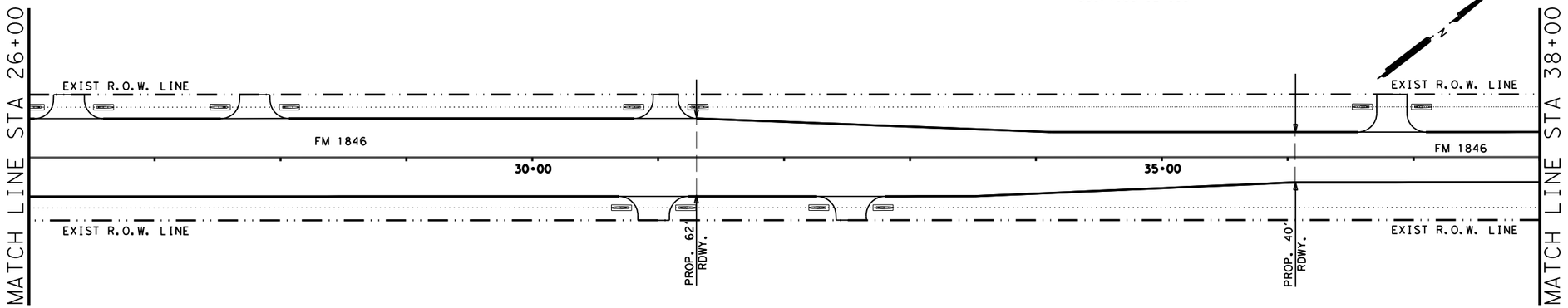

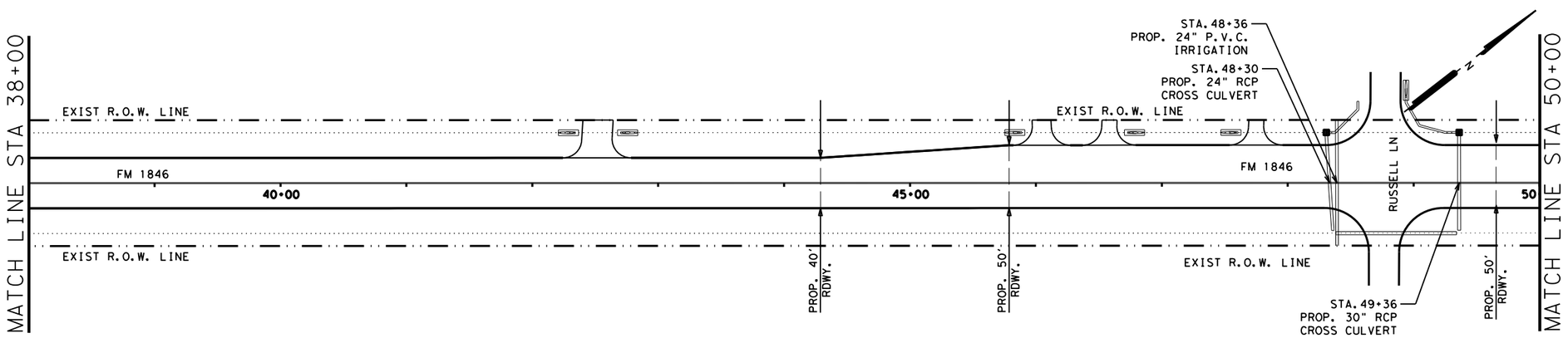

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED
PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846
PROJECT LAYOUT

1" = 100'

SHEET 1 OF 4

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	CAMERON		3

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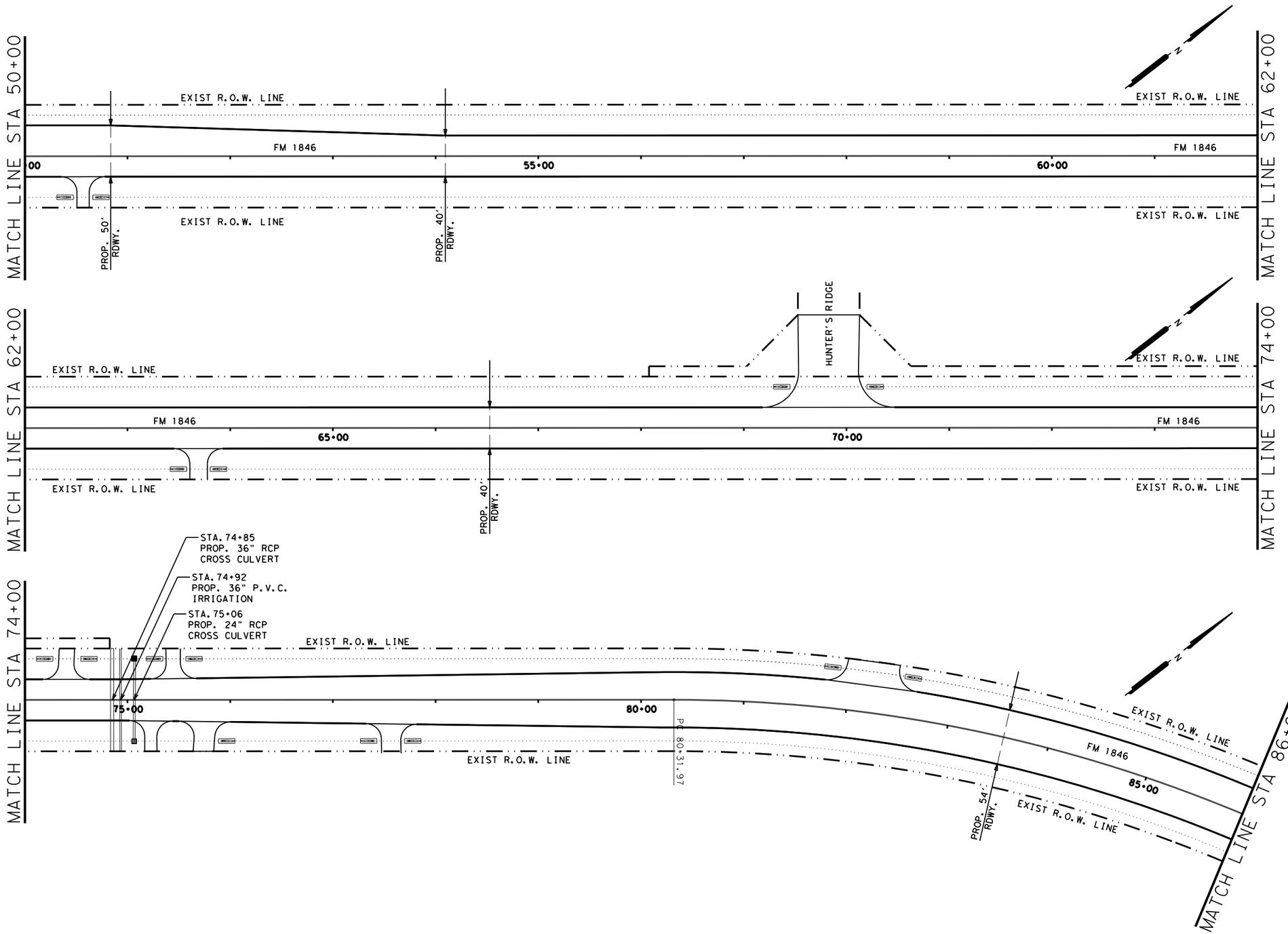

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 PROJECT LAYOUT

1" = 100'

SHEET 2 OF 4

© 2021

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	CAMERON		4

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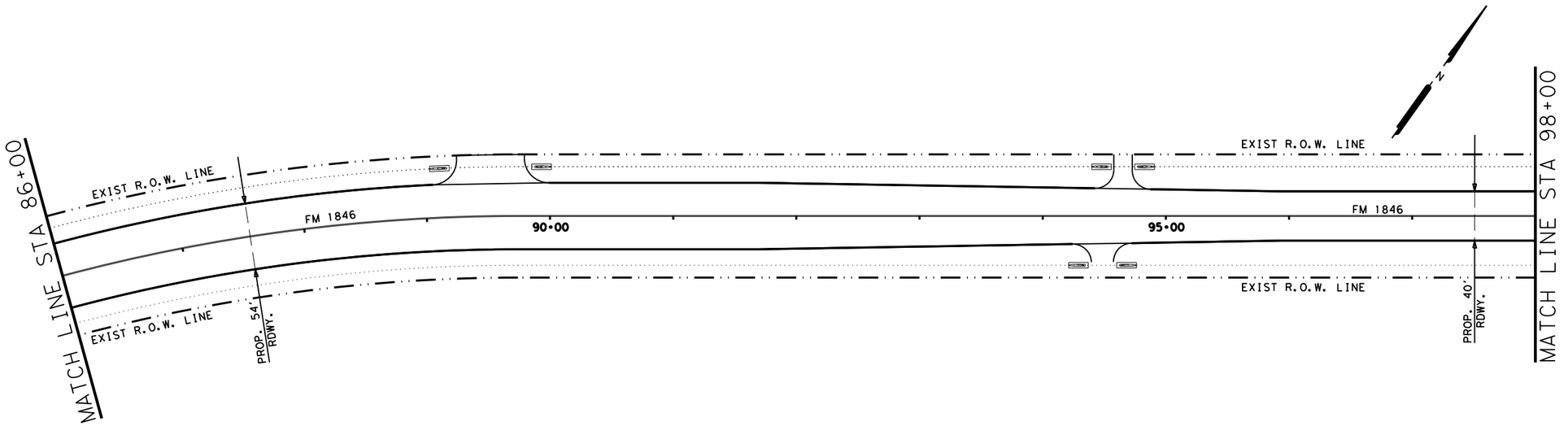

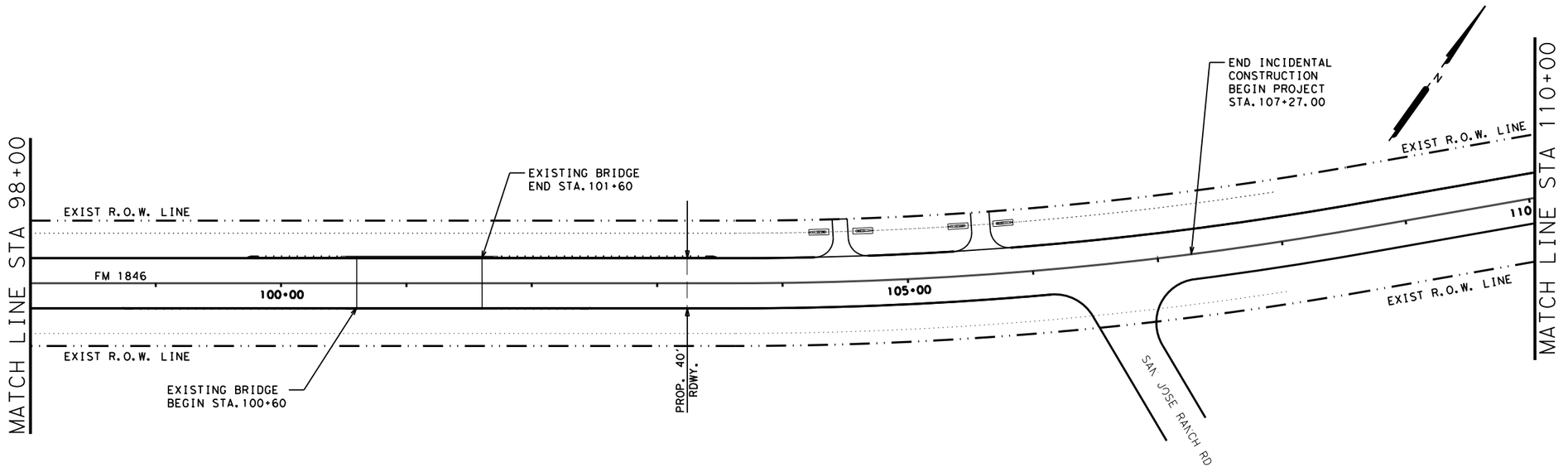

STATE OF TEXAS
ABEL MARROQUIN III
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07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846
PROJECT LAYOUT

1" = 100'

SHEET 3 OF 4

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		5

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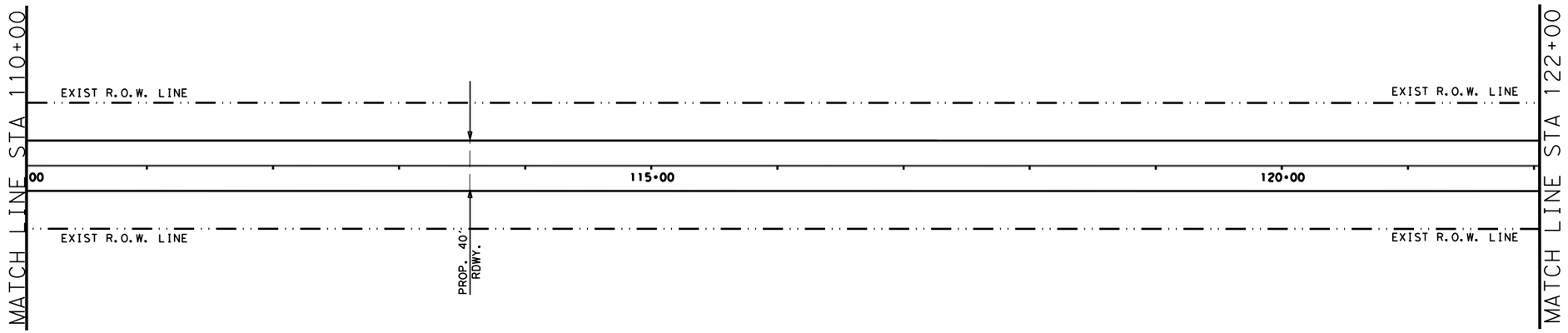

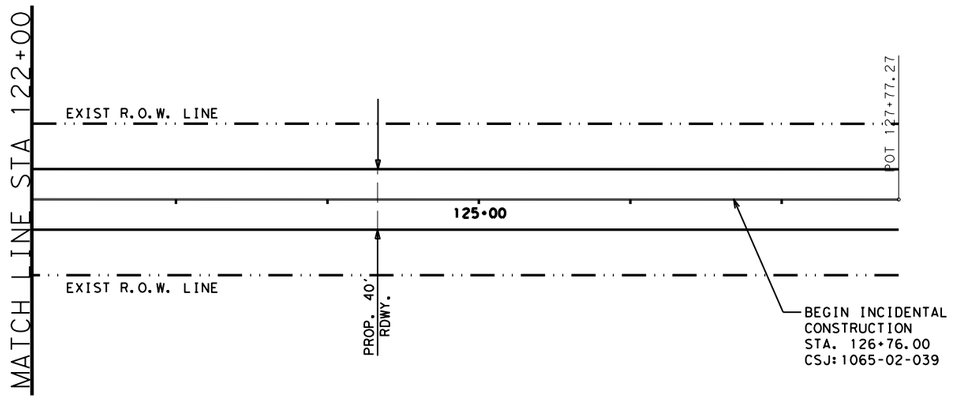

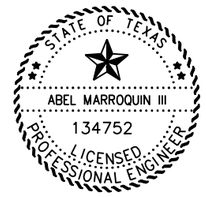

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846
PROJECT LAYOUT

1" = 100'

SHEET 4 OF 4

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	CAMERON		6

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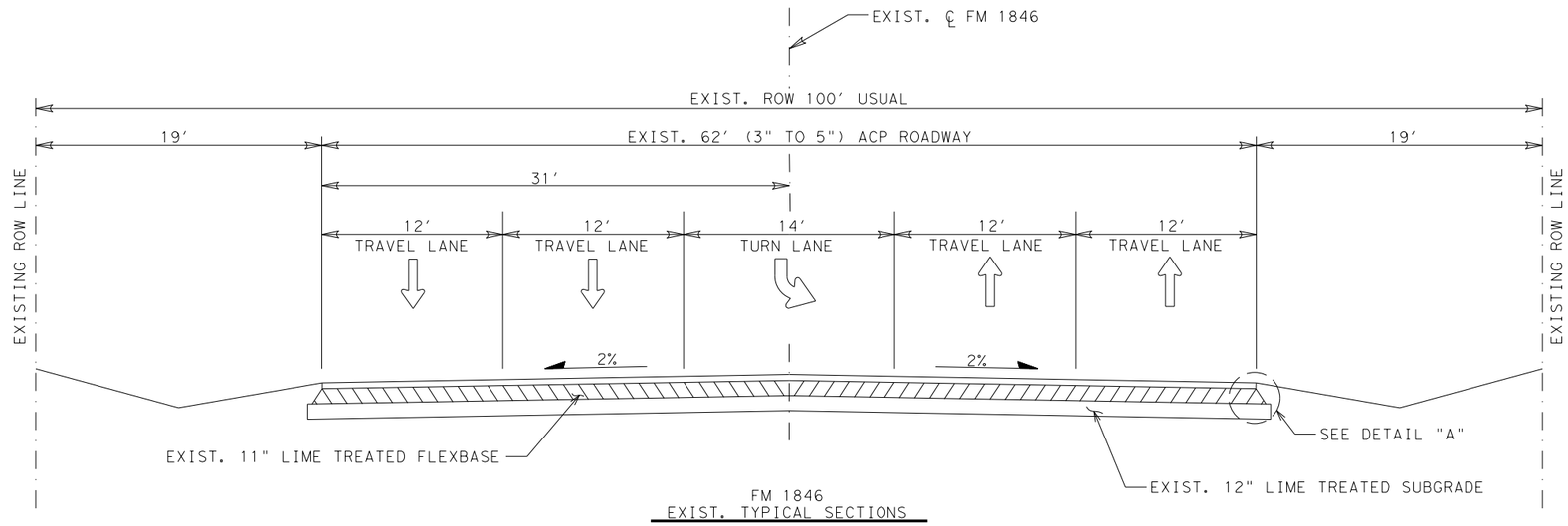
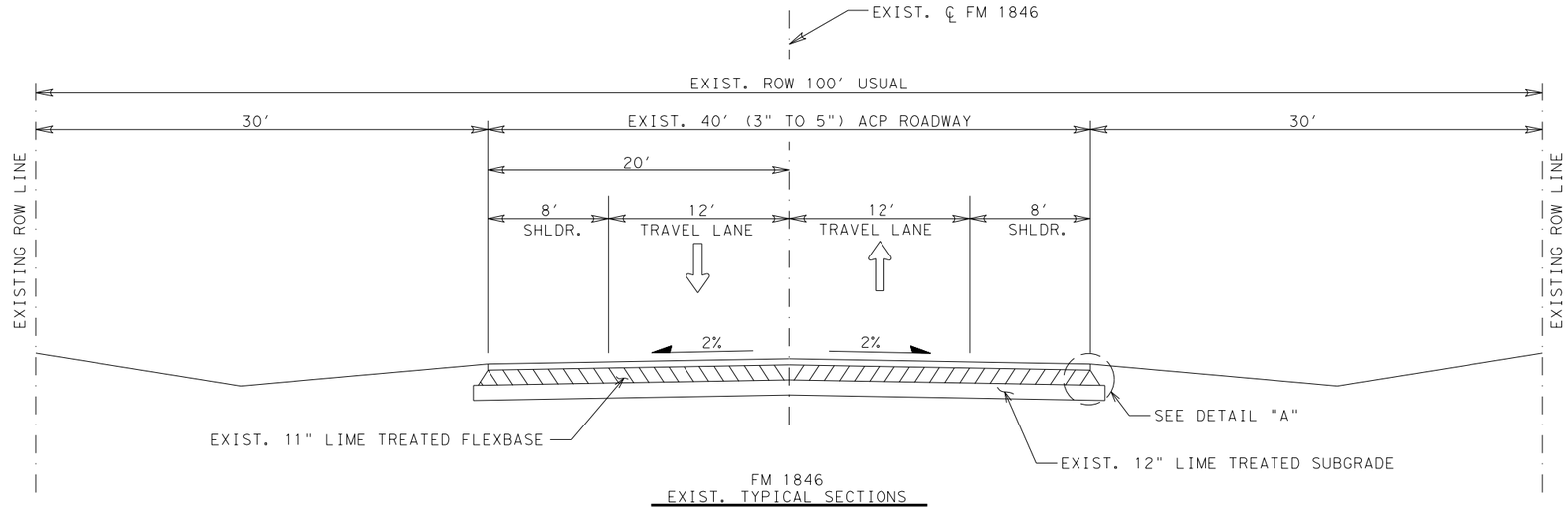


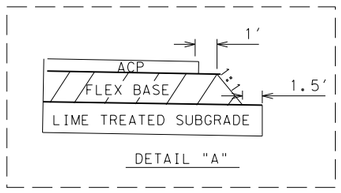
FM 1846
EXIST. TYPICAL SECTIONS

STA. 21+50 TO STA. 31+30
STA. 31+30 TO STA. 36+06 (RDWY. TRANS. 62'-40')



FM 1846
EXIST. TYPICAL SECTIONS

STA. 36+06 TO STA. 43+13
STA. 54+10 TO STA. 74+92
STA. 95+94 TO STA. 100+60
STA. 101+60 TO STA. 102+42



DETAIL "A"

LEGEND:

PROP.	-	PROPOSED
STA.	-	STATION
CRS	-	COURSE
TYP.	-	TYPICAL
SHLDR.	-	SHOULDER
ACP	-	ASPHALT CONCRETE PAVEMENT
RDWY	-	ROADWAY
PGL.	-	PROFILE GRADE LINE
PCJ.	-	PERMISSIBLE CONSTRUCTION JOINT
#%	-	EXIST. SUPERELVATION
⇨	-	TRAFFIC FLOW

NOTE:

1.) CONTRACTOR SHALL FIELD VERIFY EXISTING ROADWAY CONSTRUCTION JOINTS FOR LIMITS OF PROJECT.

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED
PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 EXISTING TYPICAL SECTIONS

NOT TO SCALE SHEET 1 OF 7

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		7

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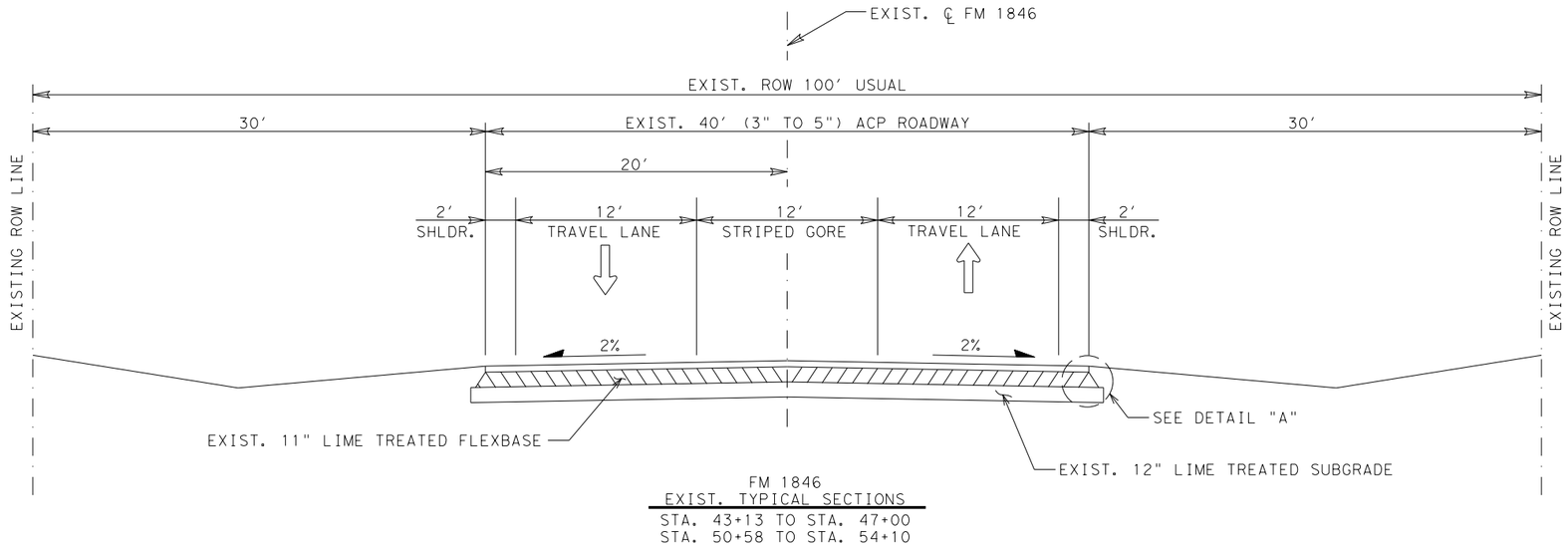
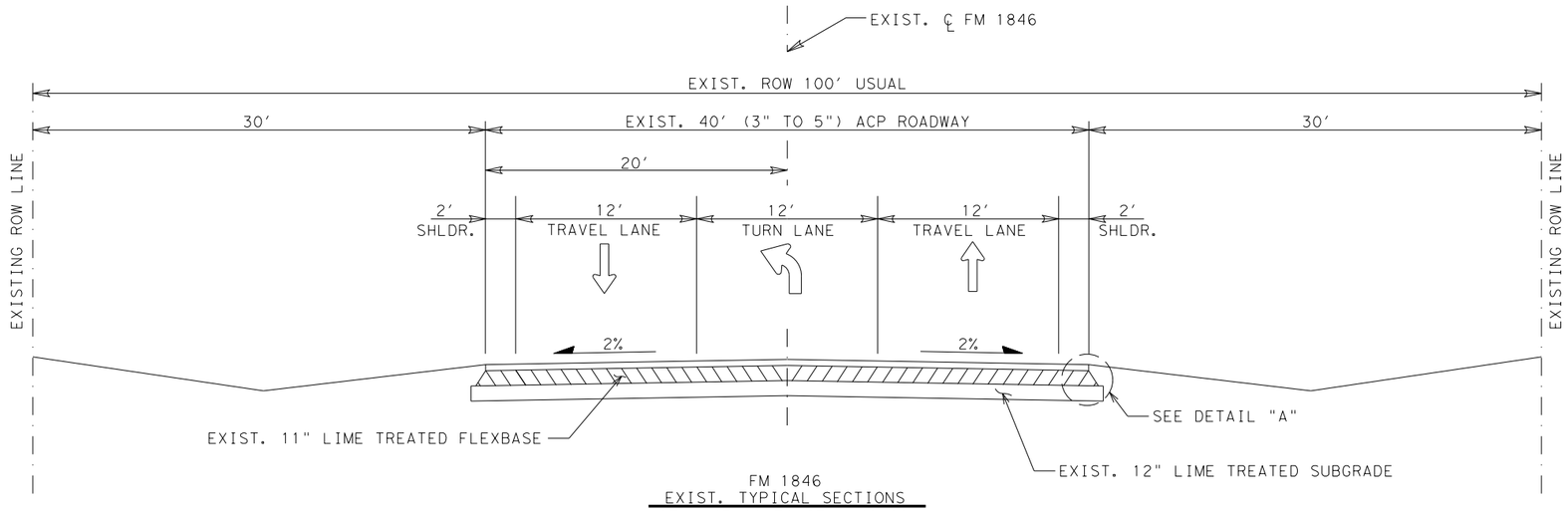
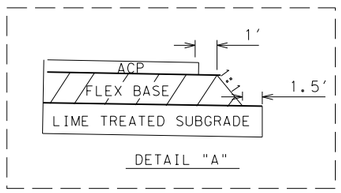


FM 1846
EXIST. TYPICAL SECTIONS
STA. 43+13 TO STA. 47+00
STA. 50+58 TO STA. 54+10



FM 1846
EXIST. TYPICAL SECTIONS
STA. 47+00 TO STA. 48+29



DETAIL "A"

LEGEND:

PROP.	-	PROPOSED
STA.	-	STATION
CRS	-	COURSE
TYP.	-	TYPICAL
SHLDR.	-	SHOULDER
ACP	-	ASPHALT CONCRETE PAVEMENT
RDWY	-	ROADWAY
PGL.	-	PROFILE GRADE LINE
PCJ.	-	PERMISSIBLE CONSTRUCTION JOINT
#%	-	EXIST. SUPERELVATION
⇨	-	TRAFFIC FLOW

NOTE:

1.) CONTRACTOR SHALL FIELD VERIFY EXISTING ROADWAY CONSTRUCTION JOINTS FOR LIMITS OF PROJECT.

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED
PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846
EXISTING TYPICAL SECTIONS

NOT TO SCALE — SHEET 2 OF 7

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	CAMERON		8

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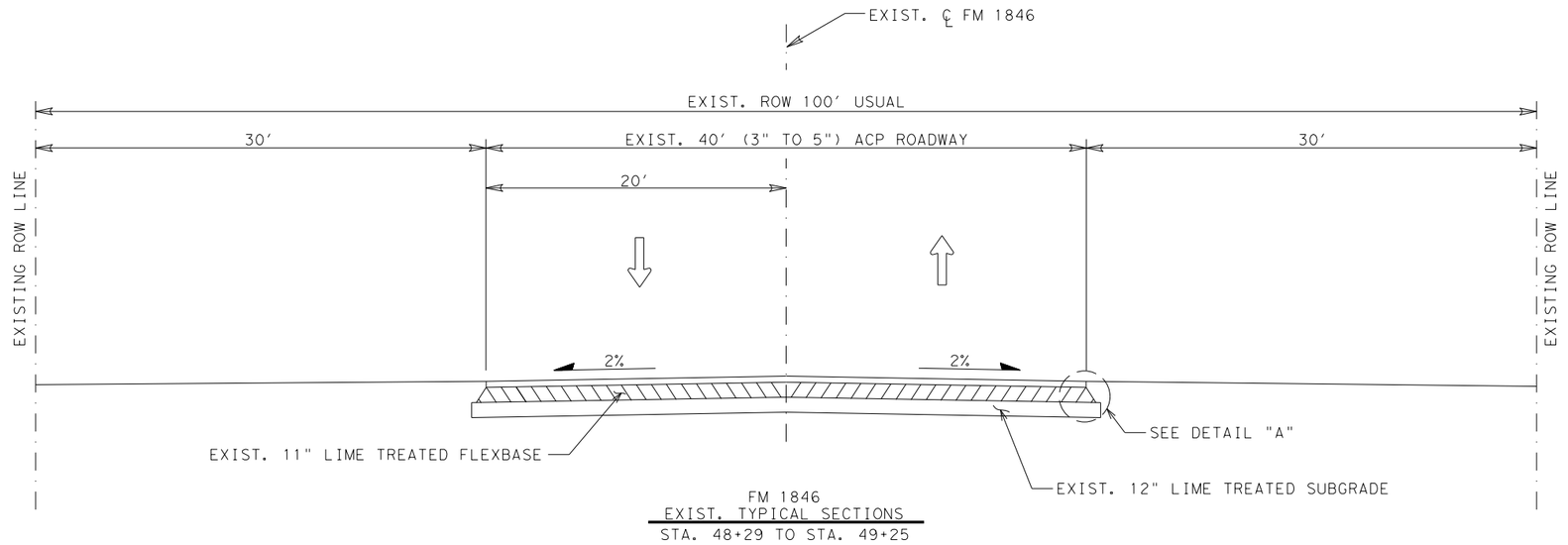
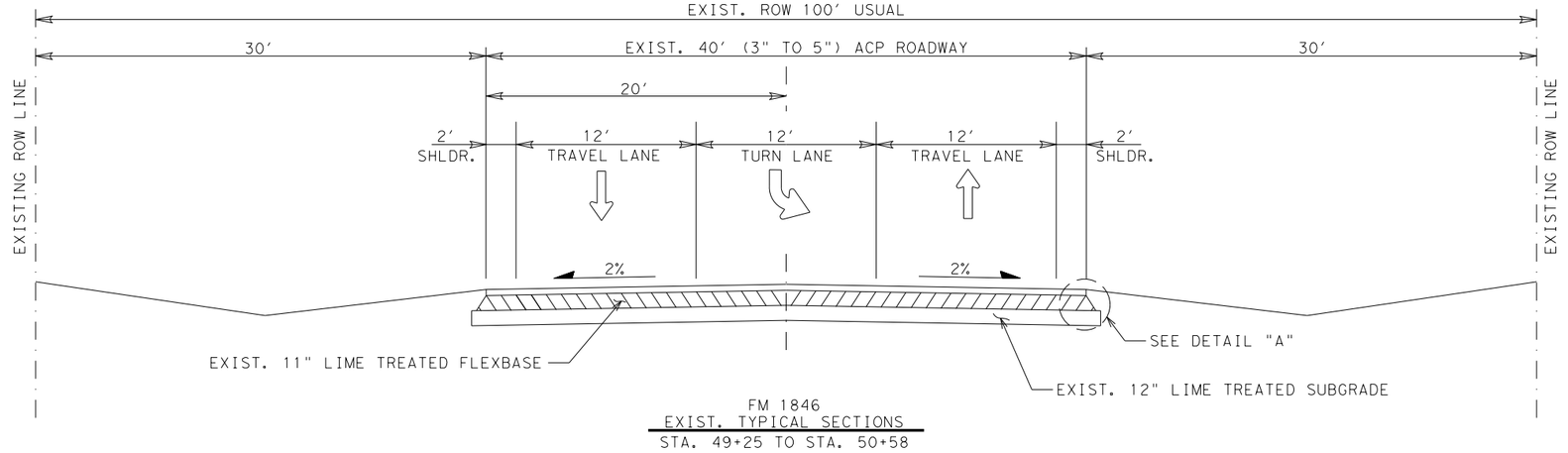
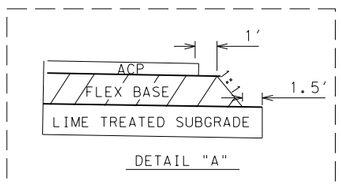


FM 1846
EXIST. TYPICAL SECTIONS
STA. 48+29 TO STA. 49+25



FM 1846
EXIST. TYPICAL SECTIONS
STA. 49+25 TO STA. 50+58



DETAIL "A"

LEGEND:

PROP.	-	PROPOSED
STA.	-	STATION
CRS	-	COURSE
TYP.	-	TYPICAL
SHLDR.	-	SHOULDER
ACP	-	ASPHALT CONCRETE PAVEMENT
RDWY	-	ROADWAY
PGL.	-	PROFILE GRADE LINE
PCJ.	-	PERMISSIBLE CONSTRUCTION JOINT
#%	-	EXIST. SUPERELVATION
⇨	-	TRAFFIC FLOW

NOTE:

1.) CONTRACTOR SHALL FIELD VERIFY EXISTING ROADWAY CONSTRUCTION JOINTS FOR LIMITS OF PROJECT.

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED
PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846
EXISTING TYPICAL SECTIONS

NOT TO SCALE — SHEET 3 OF 7

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		9

DS: ___ CK: ___ DW: ___ CK: ___

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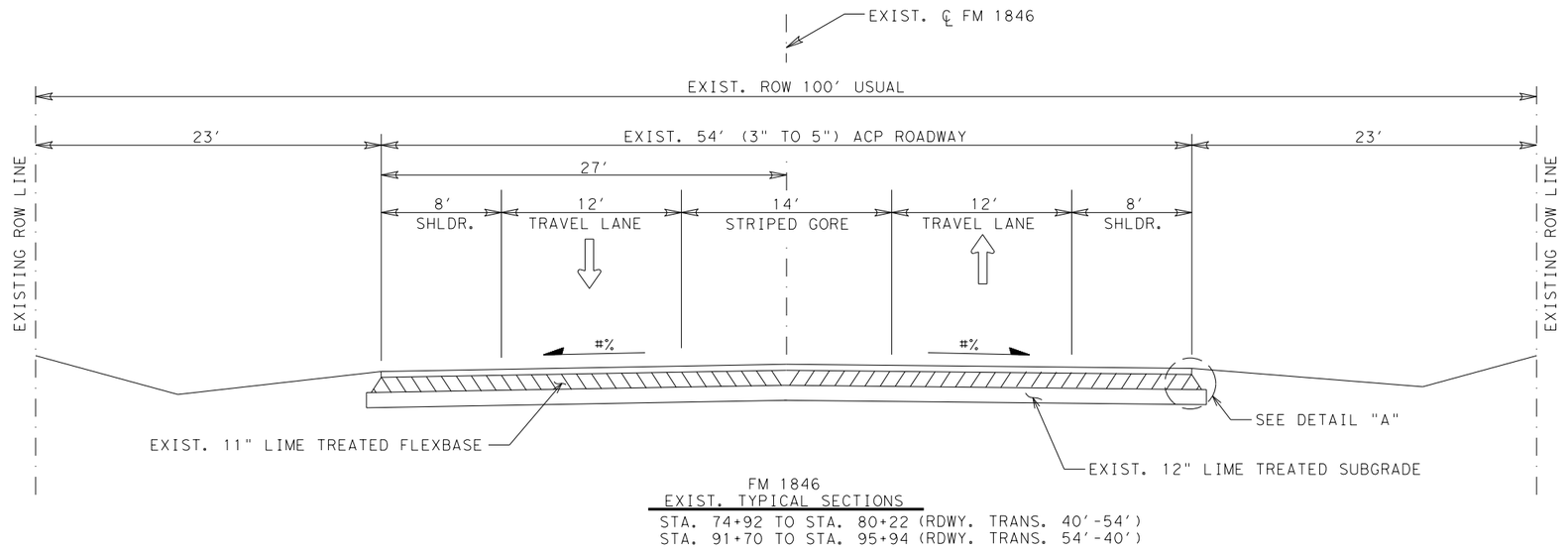
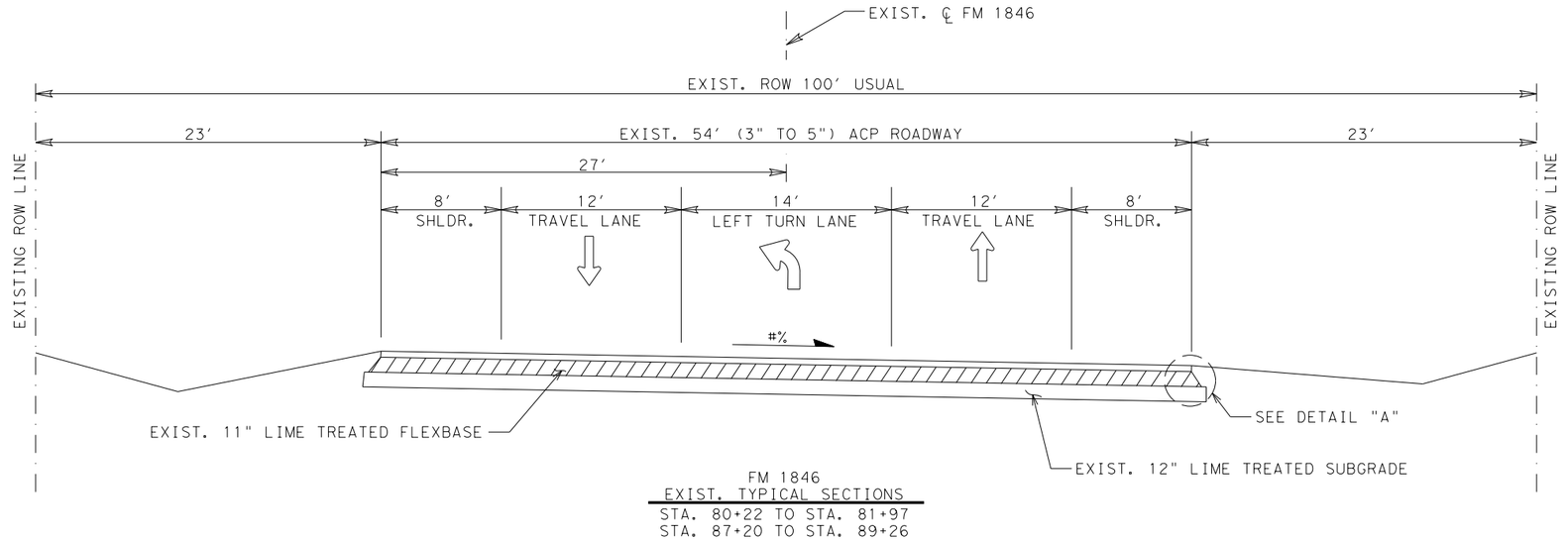


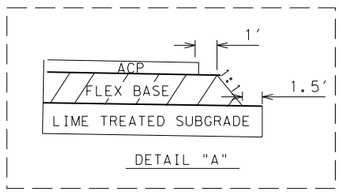
FM 1846
EXIST. TYPICAL SECTIONS

STA. 74+92 TO STA. 80+22 (RDWY. TRANS. 40'-54')
STA. 91+70 TO STA. 95+94 (RDWY. TRANS. 54'-40')



FM 1846
EXIST. TYPICAL SECTIONS

STA. 80+22 TO STA. 81+97
STA. 87+20 TO STA. 89+26



DETAIL "A"

LEGEND:

PROP.	-	PROPOSED
STA.	-	STATION
CRS	-	COURSE
TYP.	-	TYPICAL
SHLDR.	-	SHOULDER
ACP	-	ASPHALT CONCRETE PAVEMENT
RDWY	-	ROADWAY
PGL.	-	PROFILE GRADE LINE
PCJ.	-	PERMISSIBLE CONSTRUCTION JOINT
#%	-	EXIST. SUPERELVATION
⇨	-	TRAFFIC FLOW

NOTE:

1.) CONTRACTOR SHALL FIELD VERIFY EXISTING ROADWAY CONSTRUCTION JOINTS FOR LIMITS OF PROJECT.

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED
PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 EXISTING TYPICAL SECTIONS

NOT TO SCALE — SHEET 4 OF 7

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		10

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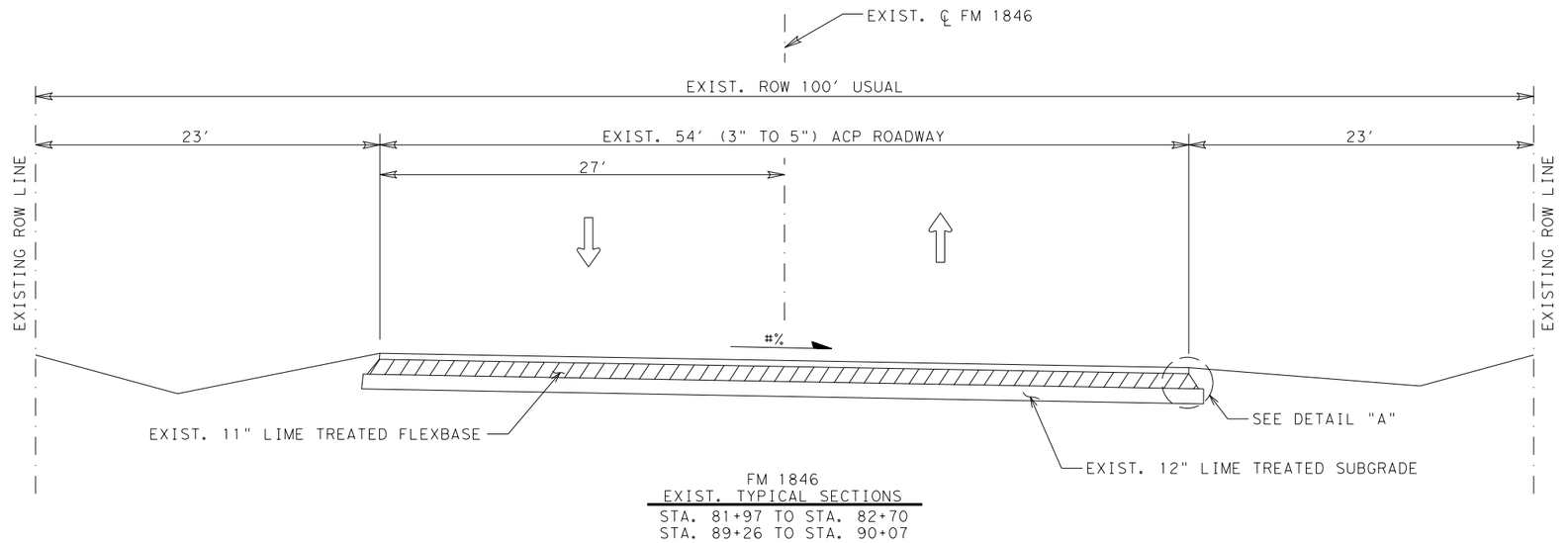
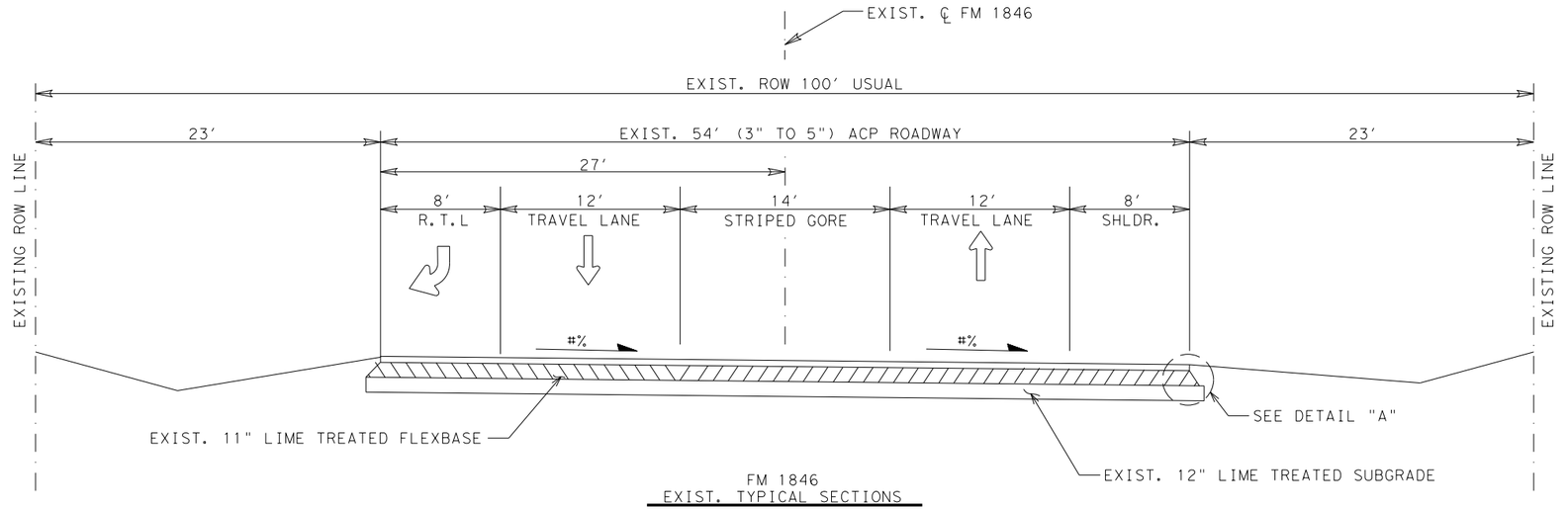
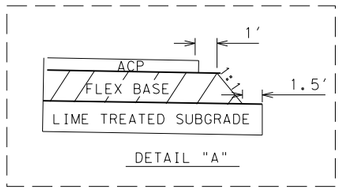


FM 1846
EXIST. TYPICAL SECTIONS
STA. 81+97 TO STA. 82+70
STA. 89+26 TO STA. 90+07



FM 1846
EXIST. TYPICAL SECTIONS
STA. 82+70 TO STA. 83+62
STA. 90+07 TO STA. 90+95



DETAIL "A"

LEGEND:

PROP.	-	PROPOSED
STA.	-	STATION
CRS	-	COURSE
TYP.	-	TYPICAL
SHLDR.	-	SHOULDER
ACP	-	ASPHALT CONCRETE PAVEMENT
RDWY	-	ROADWAY
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FM 1846 EXISTING TYPICAL SECTIONS

NOT TO SCALE — SHEET 5 OF 7

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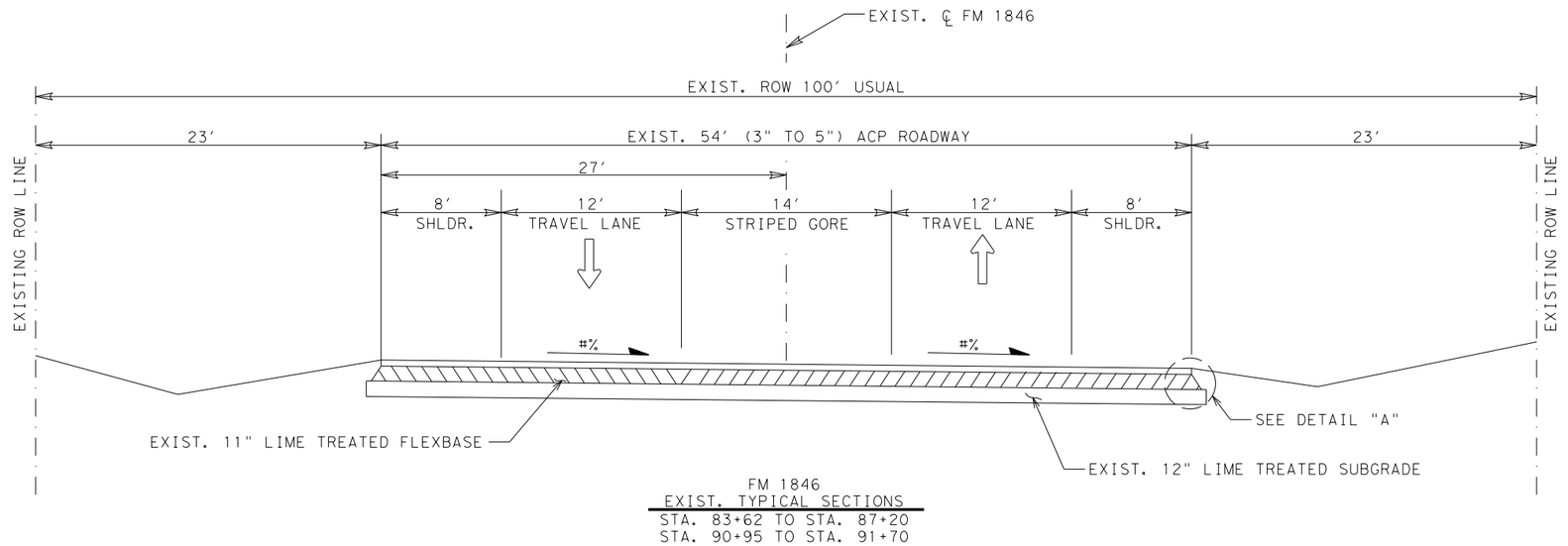
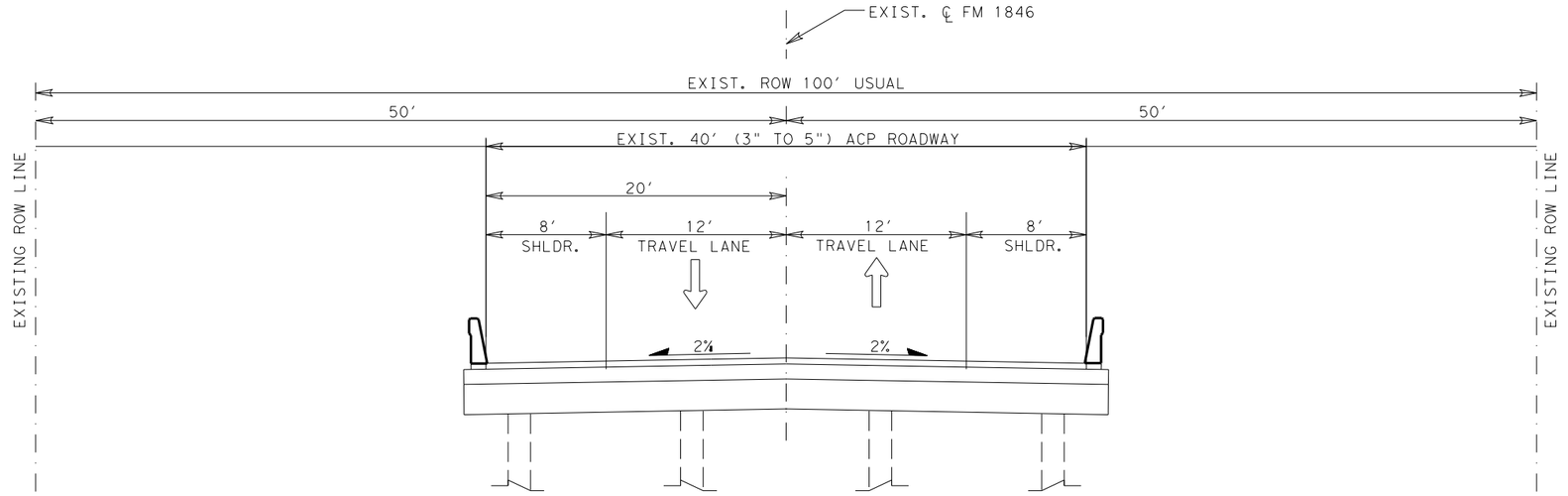
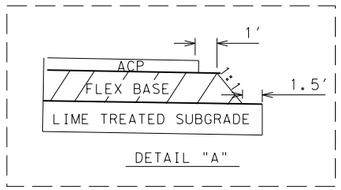


FM 1846
EXIST. TYPICAL SECTIONS
STA. 83+62 TO STA. 87+20
STA. 90+95 TO STA. 91+70



FM 1846
PROP. BRIDGE SECTION
STA. 100+60 TO 101+60



DETAIL "A"

LEGEND:

PROP.	-	PROPOSED
STA.	-	STATION
CRS	-	COURSE
TYP.	-	TYPICAL
SHLDR.	-	SHOULDER
ACP	-	ASPHALT CONCRETE PAVEMENT
RDWY	-	ROADWAY
PGL.	-	PROFILE GRADE LINE
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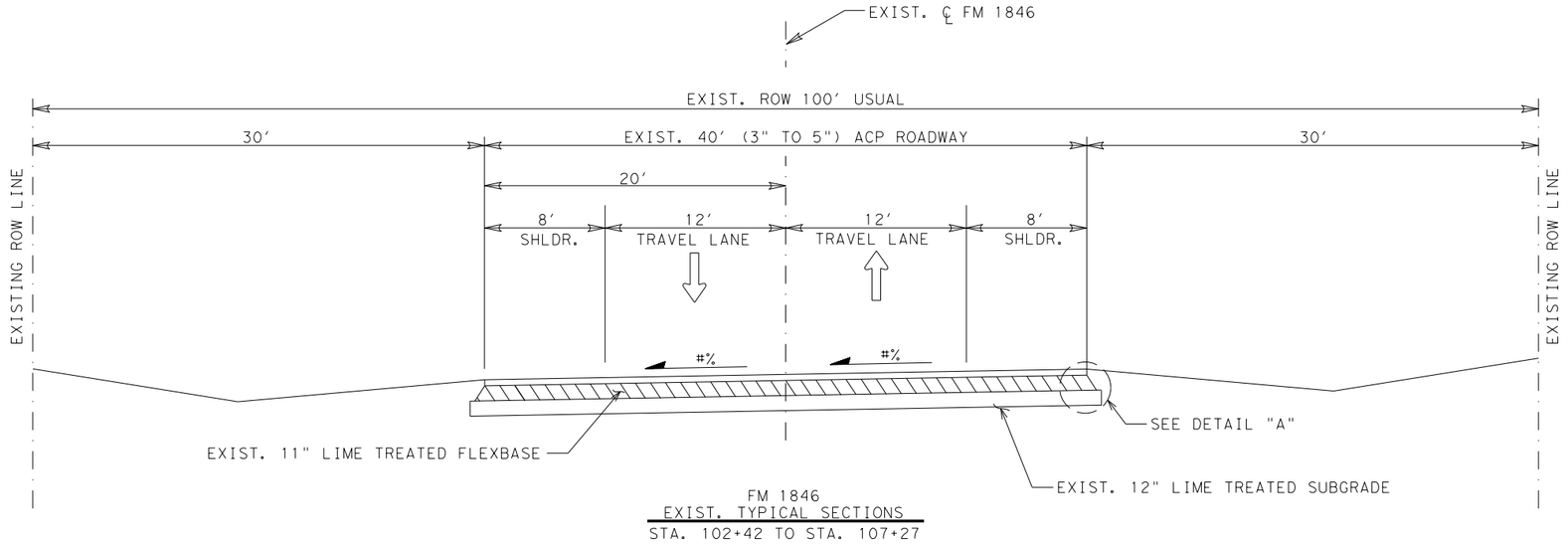
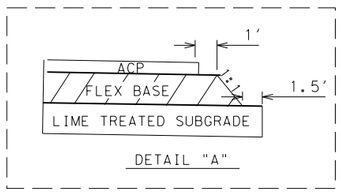


FM 1846
EXIST. TYPICAL SECTIONS
STA. 102+42 TO STA. 107+27



DETAIL "A"

LEGEND:

PROP.	-	PROPOSED
STA.	-	STATION
CRS	-	COURSE
TYP.	-	TYPICAL
SHLDR.	-	SHOULDER
ACP	-	ASPHALT CONCRETE PAVEMENT
RDWY	-	ROADWAY
PGL.	-	PROFILE GRADE LINE
PCJ.	-	PERMISSIBLE CONSTRUCTION JOINT
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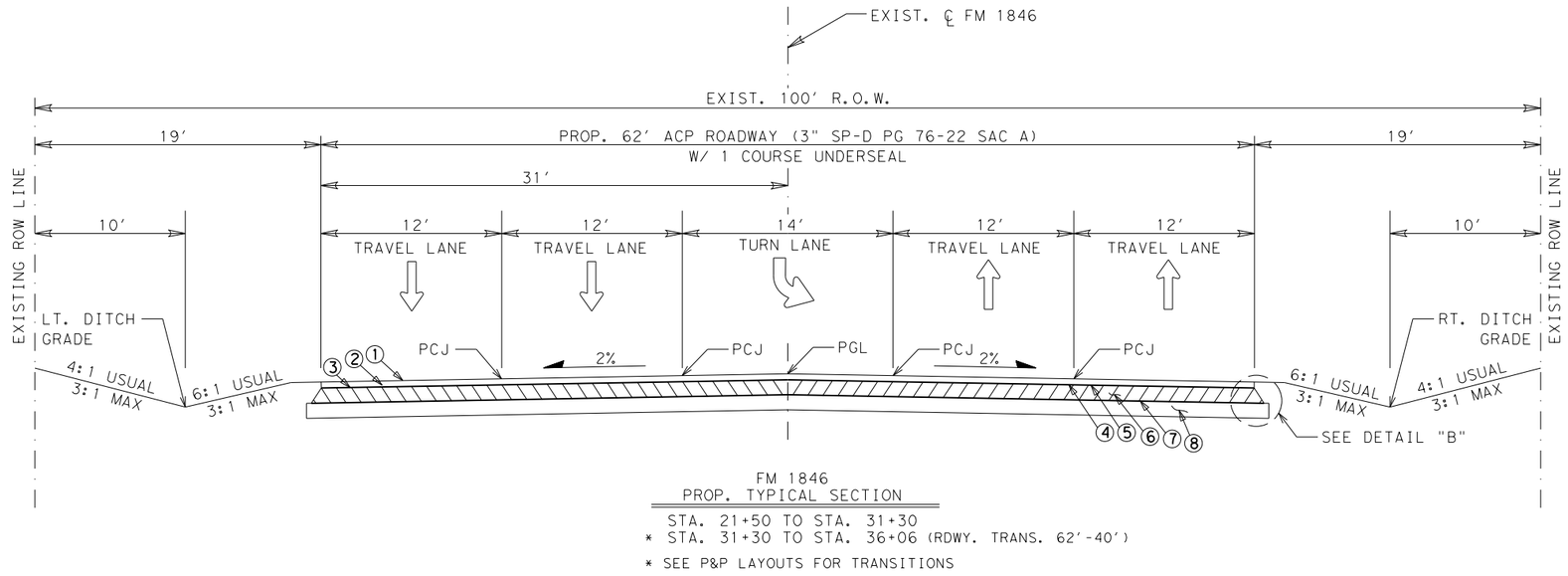
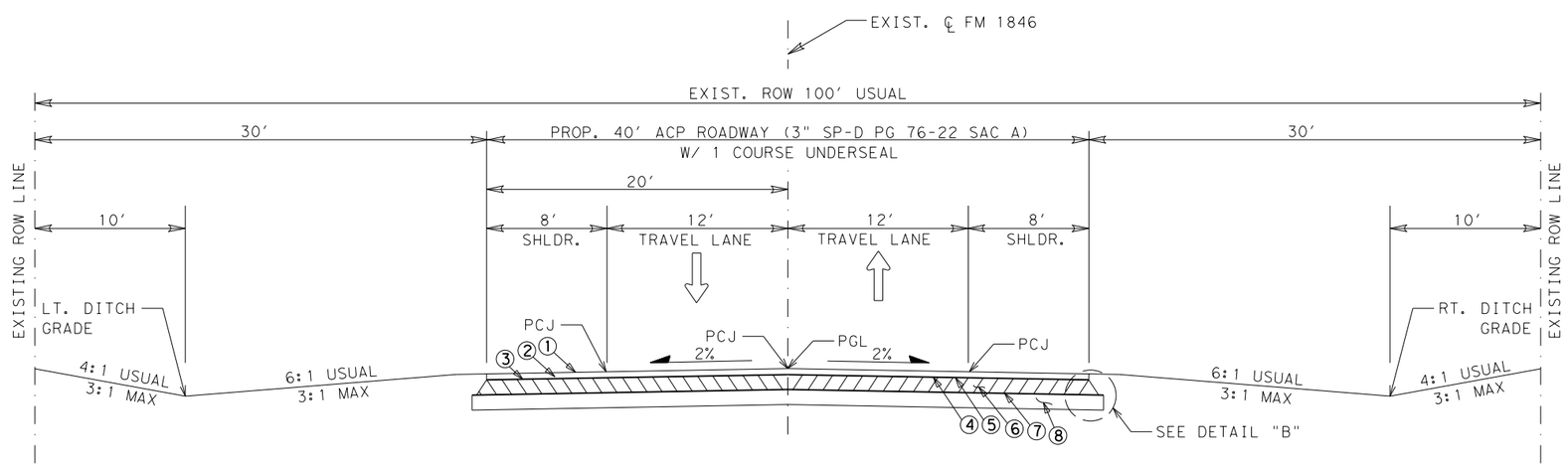


FM 1846
PROP. TYPICAL SECTION

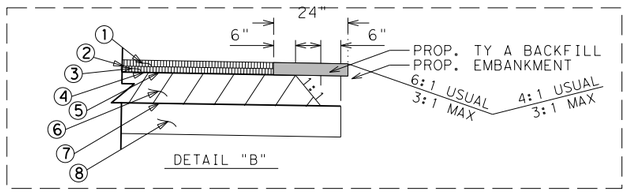
STA. 21+50 TO STA. 31+30
* STA. 31+30 TO STA. 36+06 (RDWY. TRANS. 62'-40')

* SEE P&P LAYOUTS FOR TRANSITIONS



FM 1846
PROP. TYPICAL SECTION

STA. 36+06 TO STA. 44+29
STA. 54+10 TO STA. 74+92
STA. 74+92 TO STA. 78+70 (RDWY. TRANS. 40'-50')
STA. 95+94 TO STA 100+60
STA. 101+60 TO STA. 102+42



GENERAL NOTES:
WHEN 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 STRIPING DETAILS.

THE COMPLETE BASE SHALL BE ROLLED BEFORE THE EARTH SHOULDER IS SHAPED AND FINAL COMPACTION SHALL BE DONE OVER BASE AND EDGE OF SHOULDER. ALL GRADING SHALL BE WITHIN THE LIMITS SHOWN.

114 #/SY OF ACP IS EQUIVALENT TO 1" IN DEPTH OF ACP.

A STATION IS EQUIVALENT TO 100 FT.

MIN. COVER OF 4" OF NEW FLEX. BASE WILL BE REQUIRED WHERE SALVAGE IS PART OF FLEXBASE.

ANY DAMAGE TO EXISTING CROSS CULVERTS OR IRRIGATION CROSSINGS CAUSED BY THE CONTRACTOR AS A RESULT OF HIGHWAY WORK WILL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

LEGEND:
① PROPOSED 1.5" SP-D PG76-22 (SAC-A) ACP (2ND LIFT)
② PROPOSED BONDING COURSE BETWEEN LIFTS
③ PROPOSED 1.5" SP-D PG76-22 (SAC-A) ACP (1ST LIFT)
④ PROPOSED 1 COURSE UNDER SEAL
⑤ PROPOSED MC-30 (0.2 GAL/SY)
⑥ PROPOSED 10.0" TY-A GR-1/2 BASE W/2% CEMENT BY WEIGHT
⑦ PROPOSED 1-TYII GEOGRID
⑧ PROPOSED 12.0" STABILIZED SUBGRADE W/4% LIME BY WEIGHT

NOTE: SEE PROPOSED PAVEMENT MARKING LAYOUTS FOR MORE INFORMATION.

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FM 1846 PROPOSED TYPICAL SECTIONS

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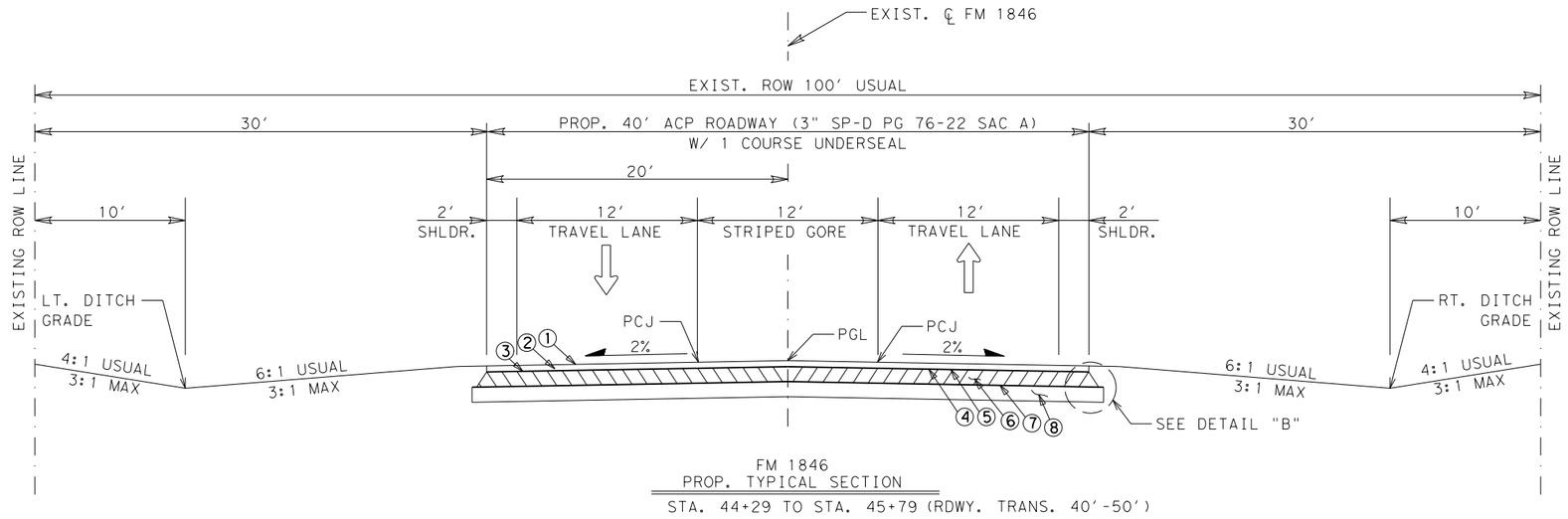
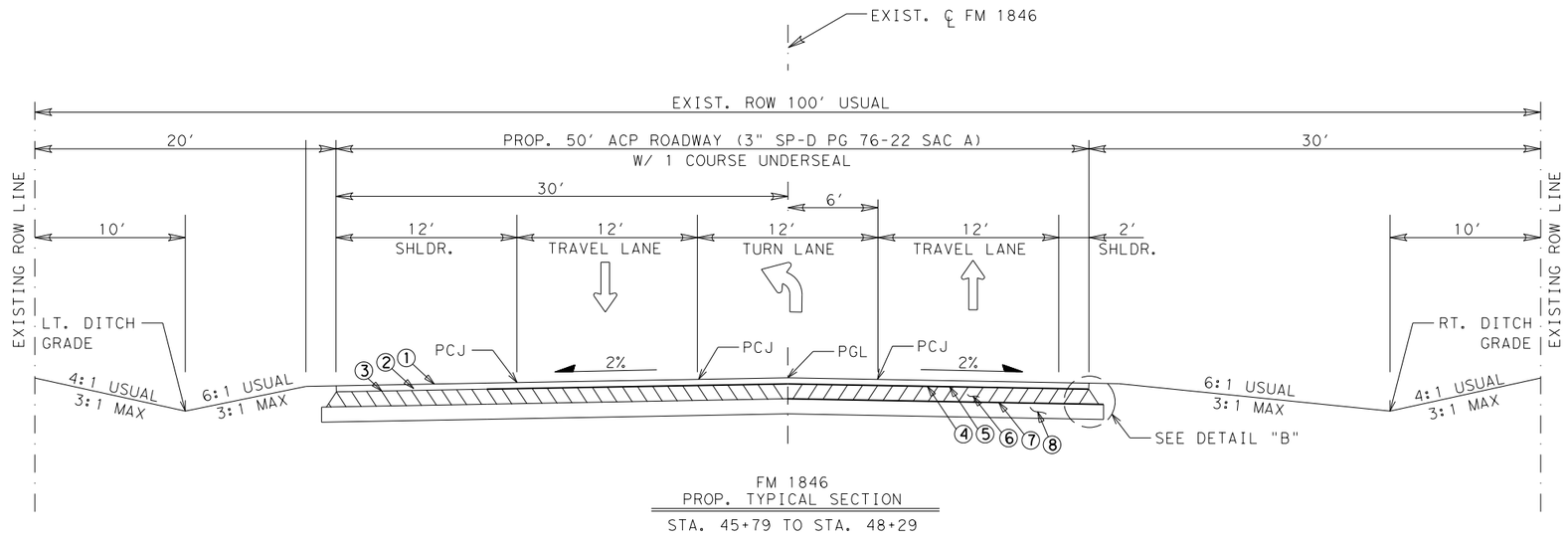


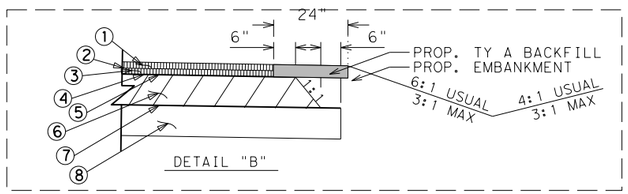
FM 1846
PROP. TYPICAL SECTION

STA. 44+29 TO STA. 45+79 (RDWY. TRANS. 40'-50')



FM 1846
PROP. TYPICAL SECTION

STA. 45+79 TO STA. 48+29



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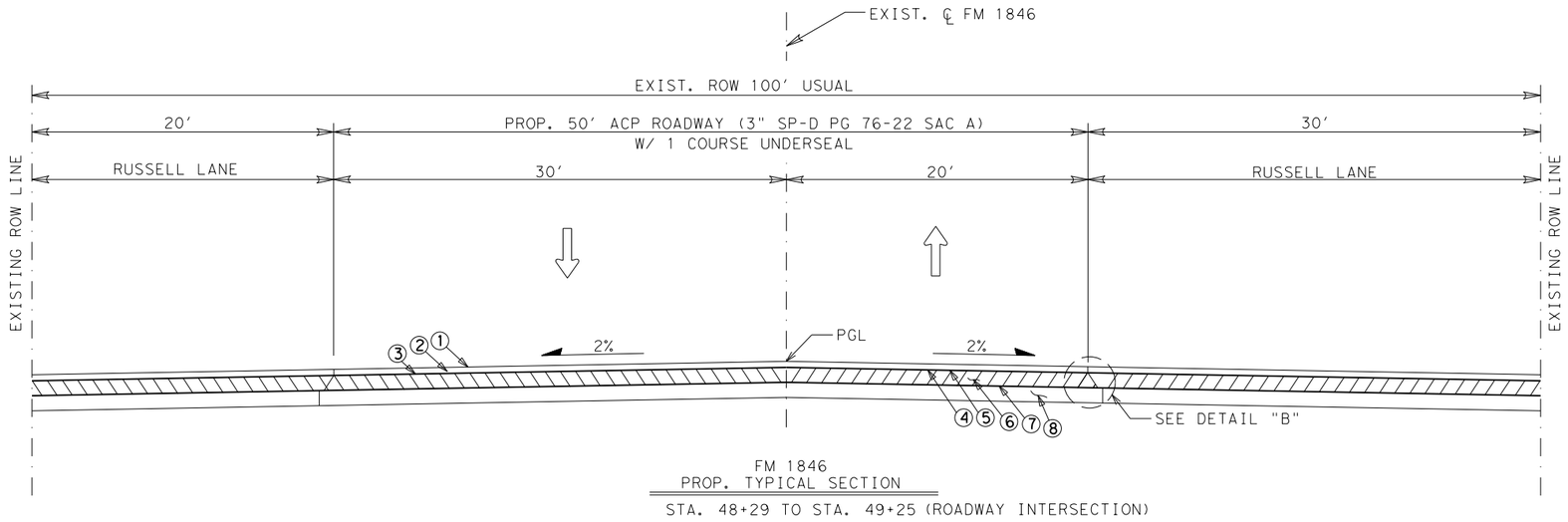
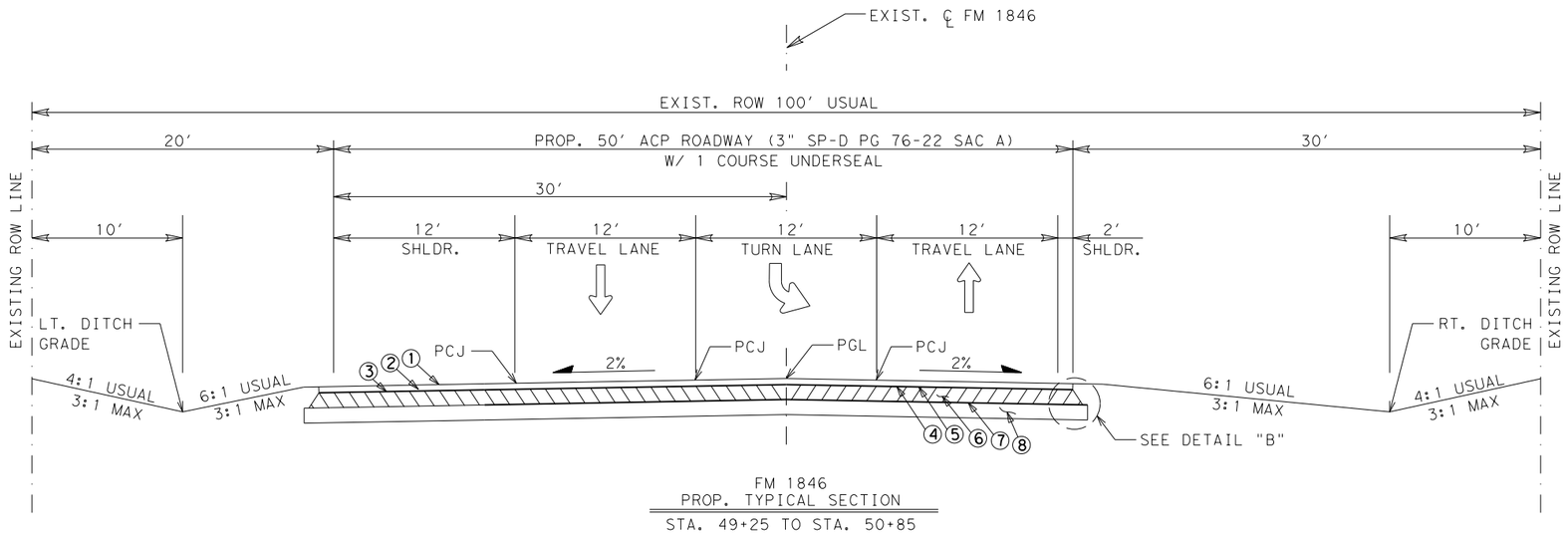


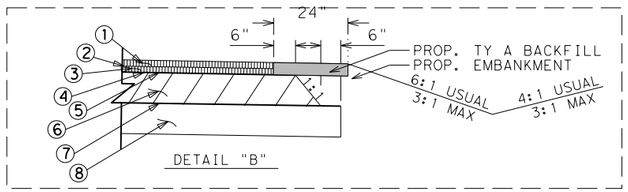
FM 1846
PROP. TYPICAL SECTION

STA. 48+29 TO STA. 49+25 (ROADWAY INTERSECTION)



FM 1846
PROP. TYPICAL SECTION

STA. 49+25 TO STA. 50+85



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FM 1846 PROPOSED TYPICAL SECTIONS

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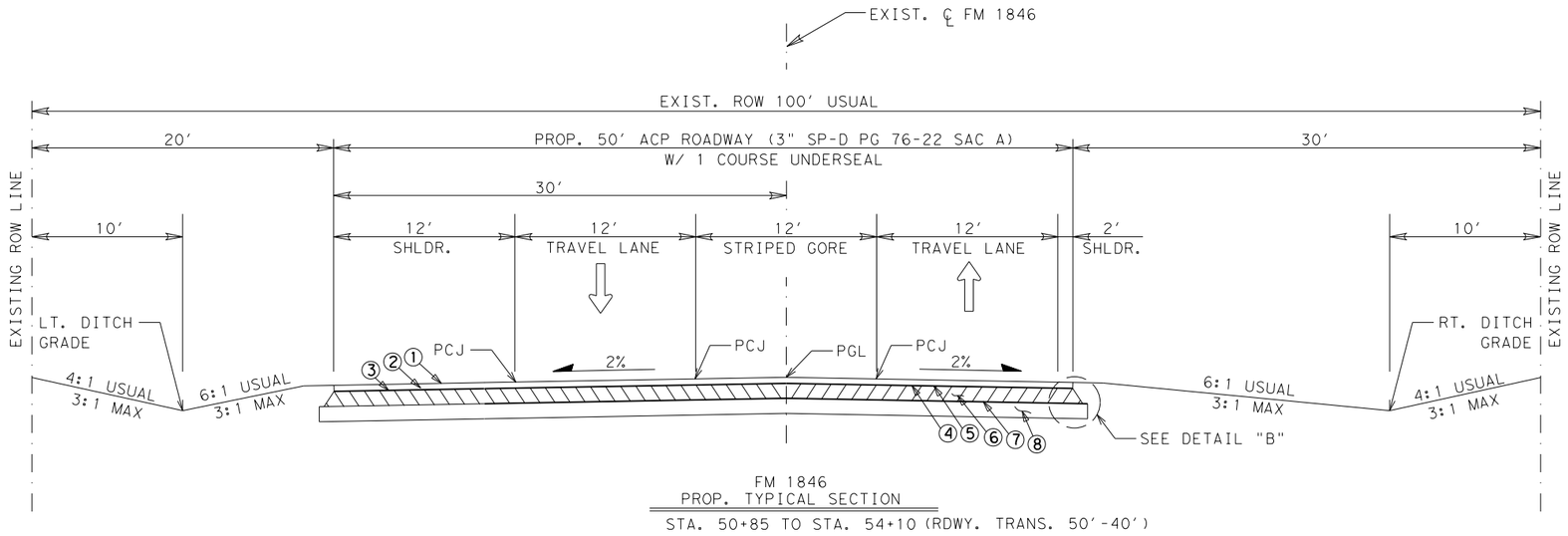

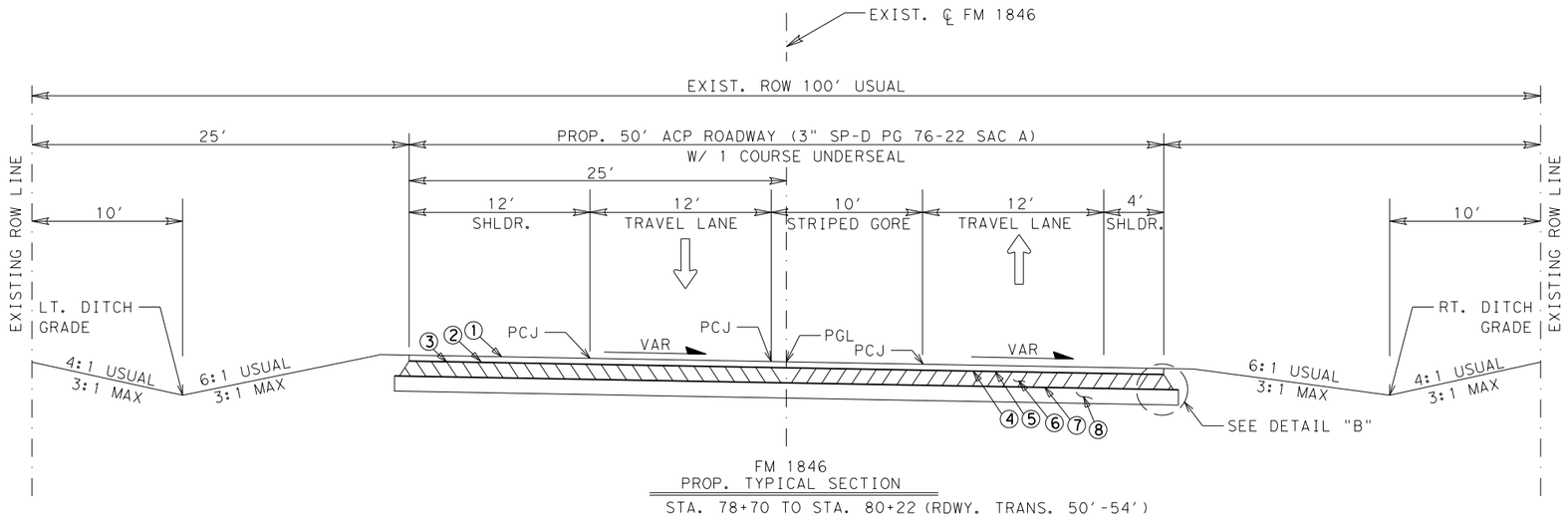

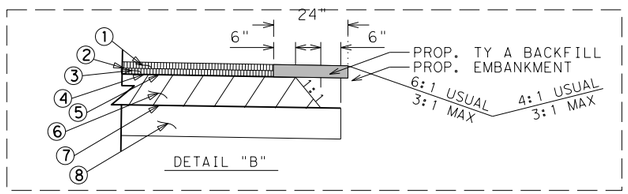

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NOTE: SEE PROPOSED PAVEMENT MARKING LAYOUTS FOR MORE INFORMATION.

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FM 1846 PROPOSED TYPICAL SECTIONS

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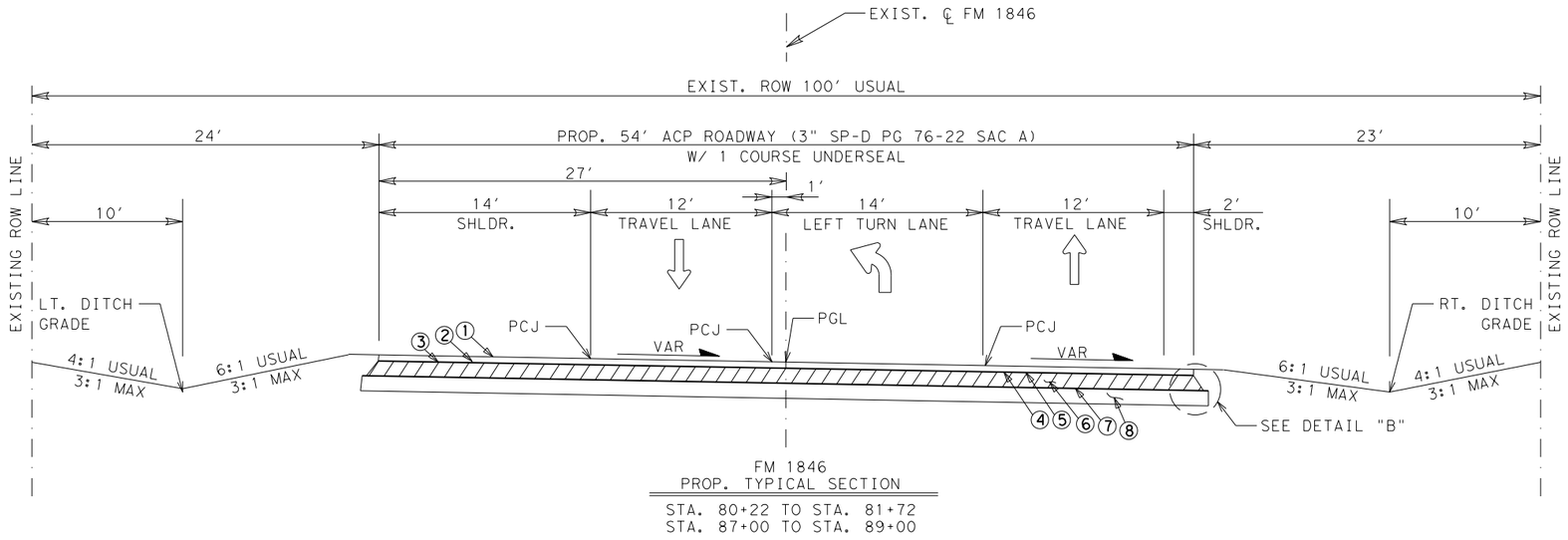

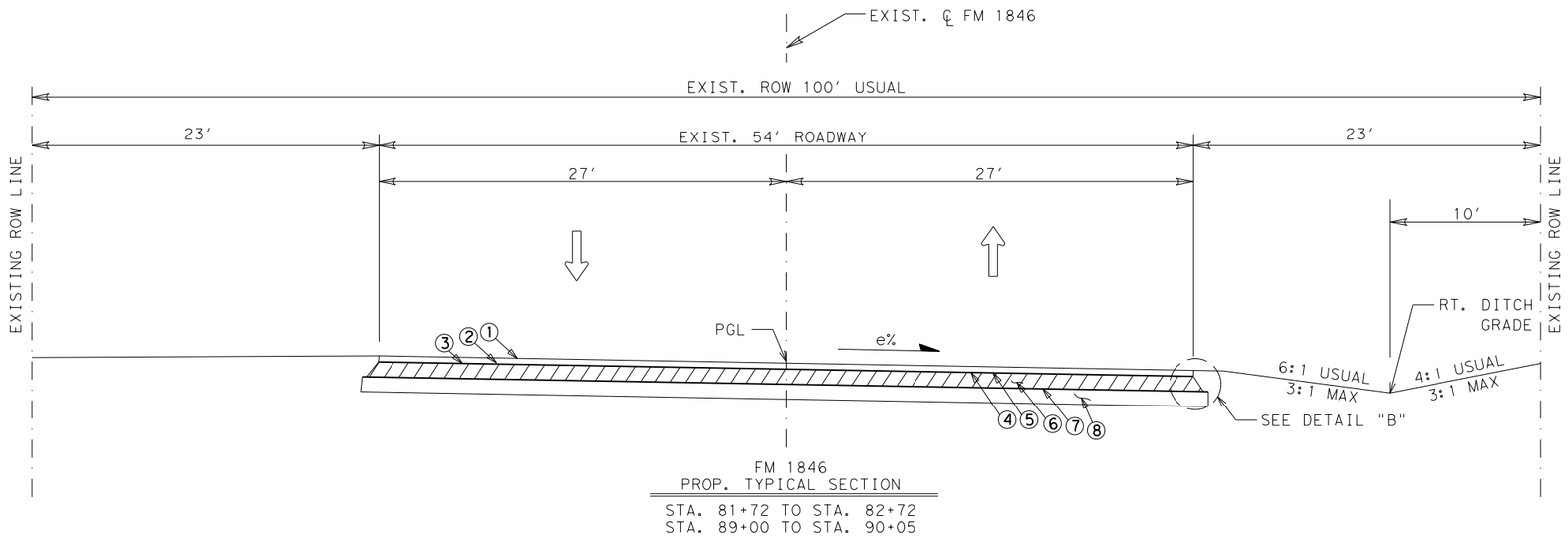

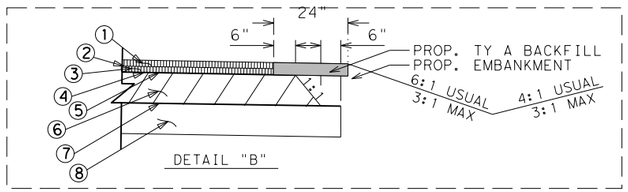

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NOTE: SEE PROPOSED PAVEMENT MARKING LAYOUTS FOR MORE INFORMATION.

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED
PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 PROPOSED TYPICAL SECTIONS

NOT TO SCALE — SHEET 5 OF 8

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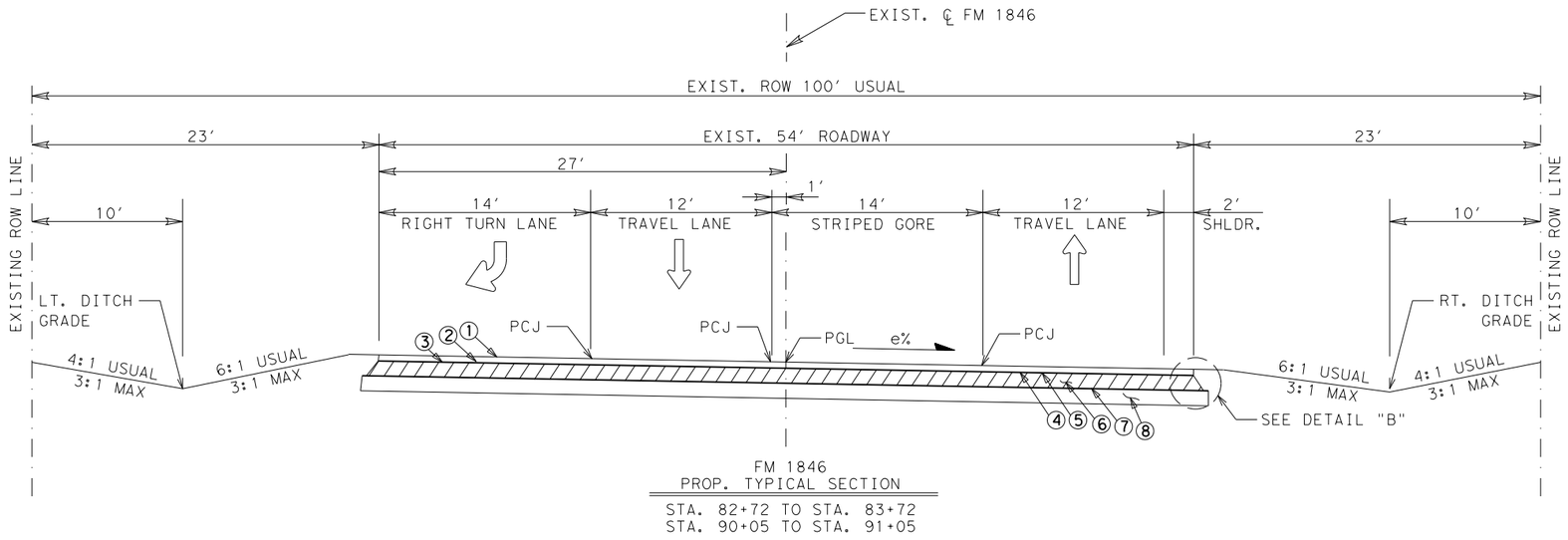

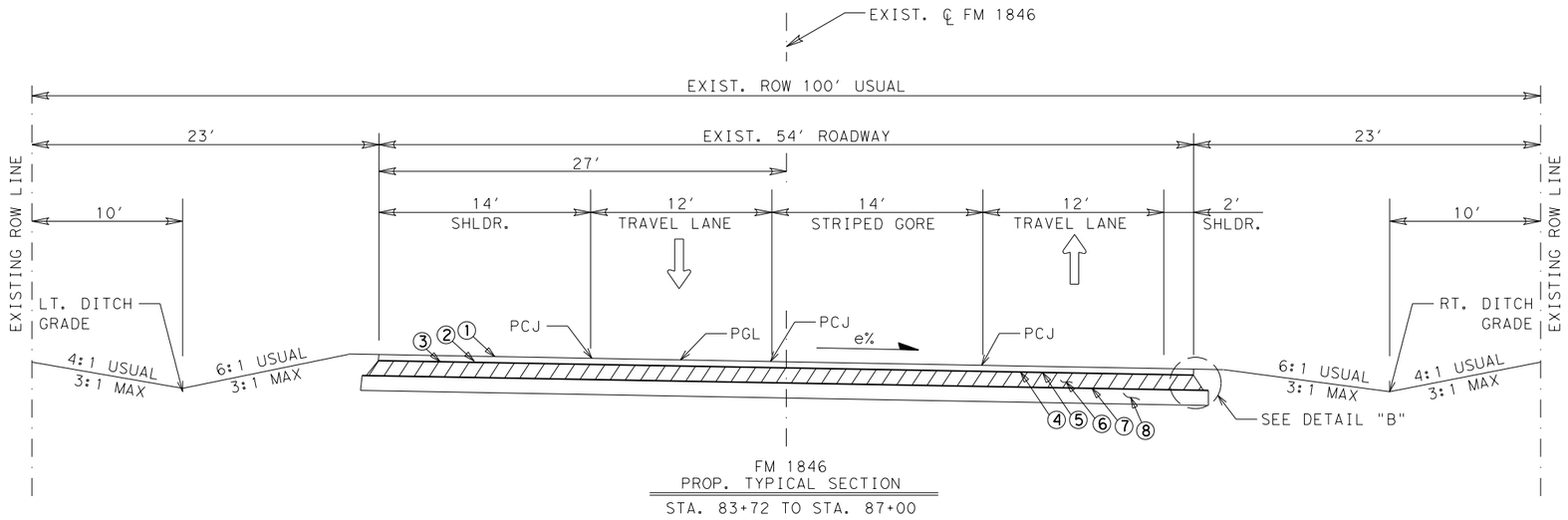

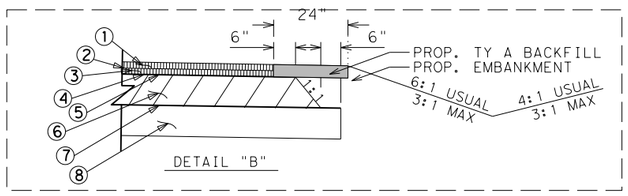

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FM 1846 PROPOSED TYPICAL SECTIONS

NOT TO SCALE — SHEET 6 OF 8

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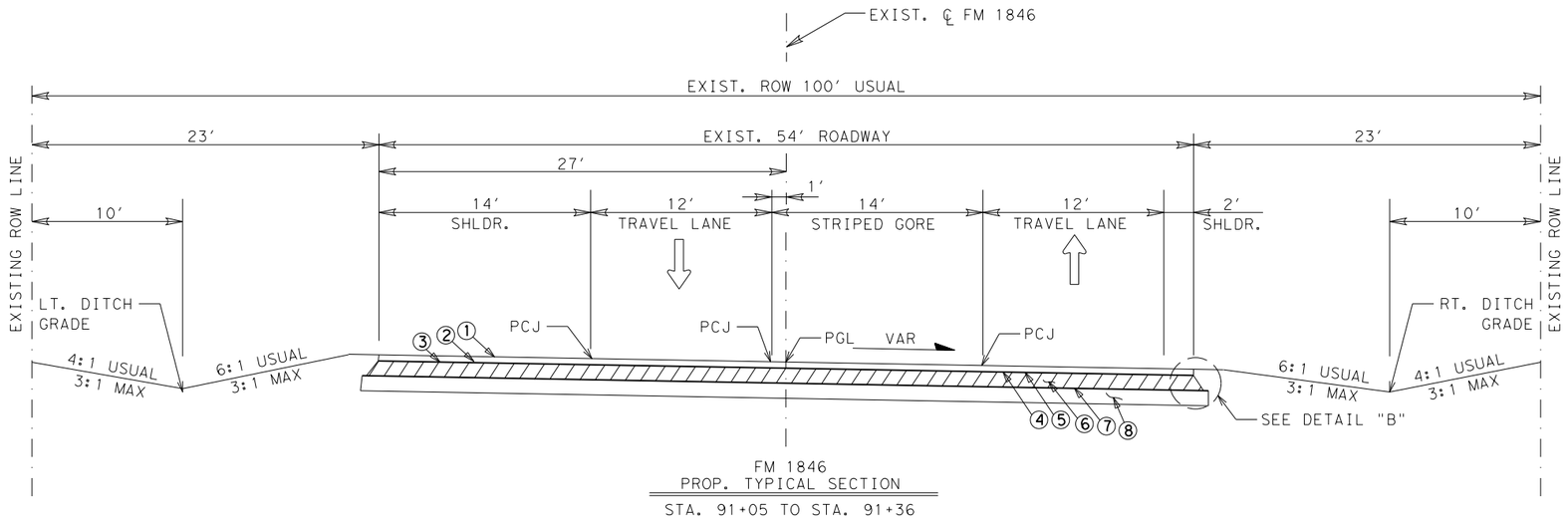

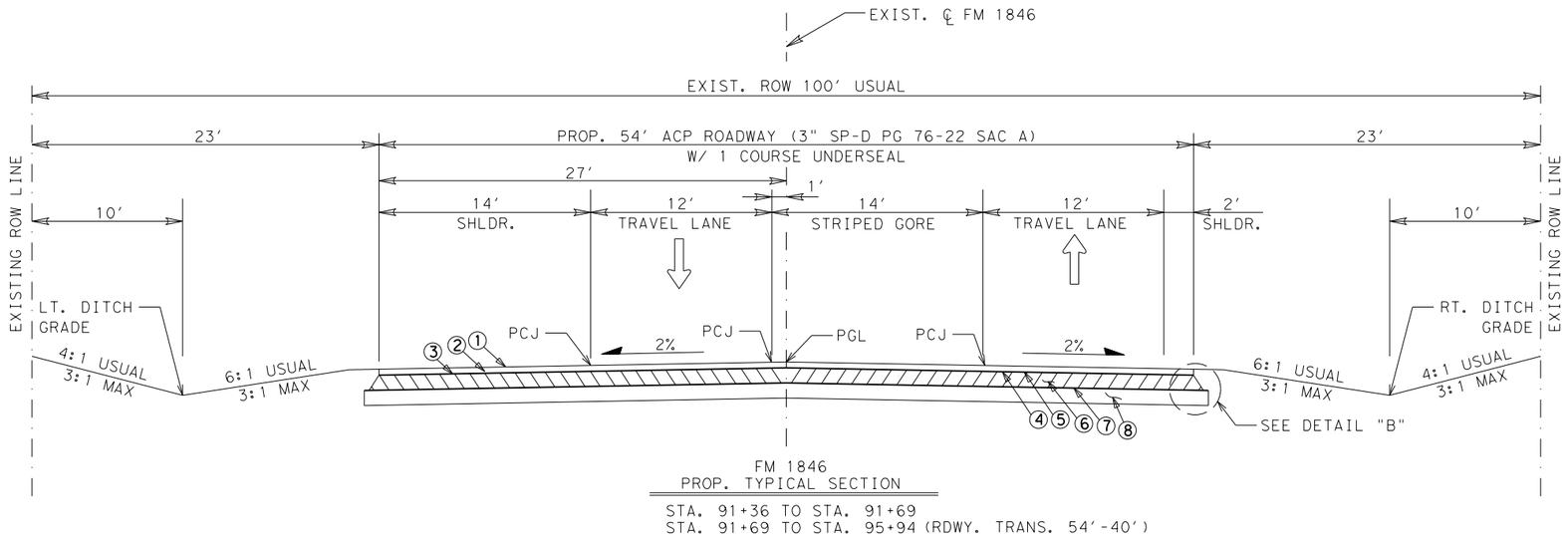

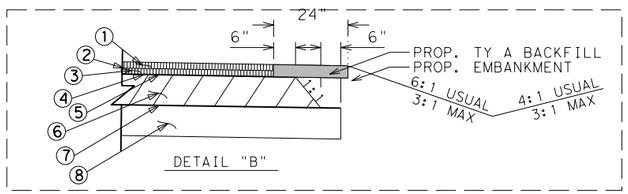

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FM 1846 PROPOSED TYPICAL SECTIONS

NOT TO SCALE — SHEET 7 OF 8

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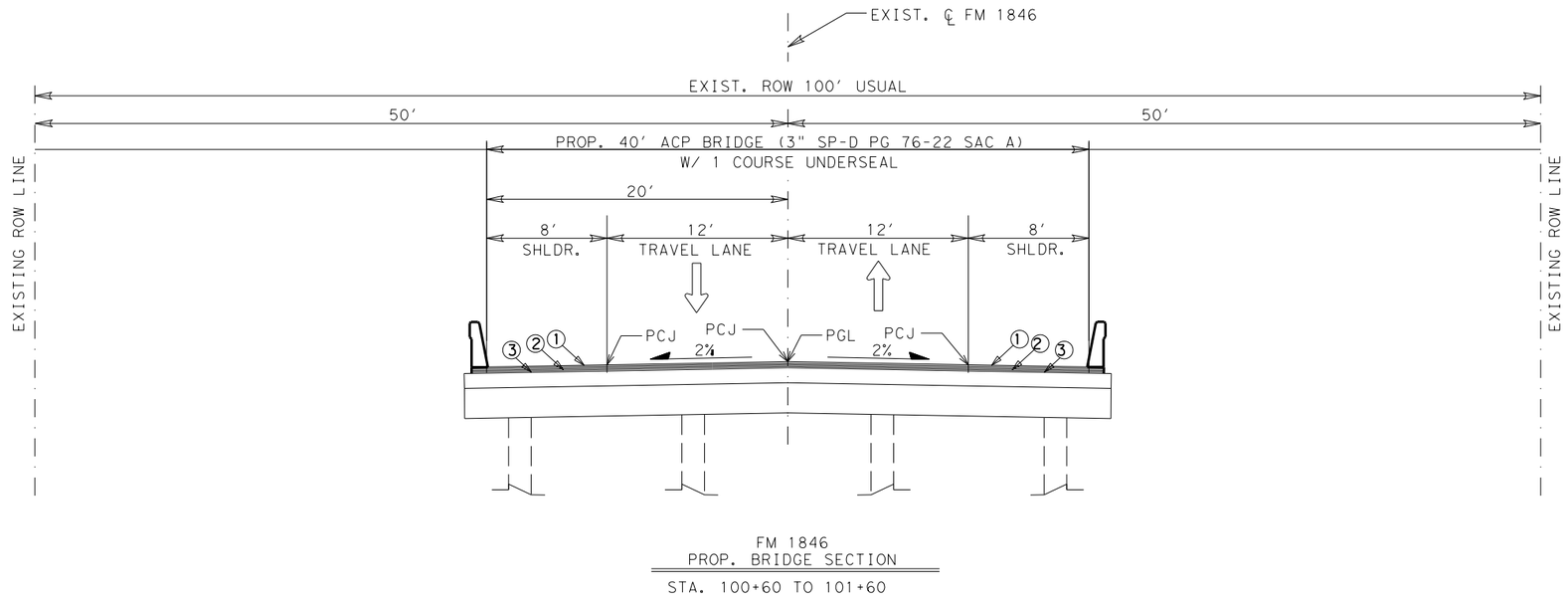
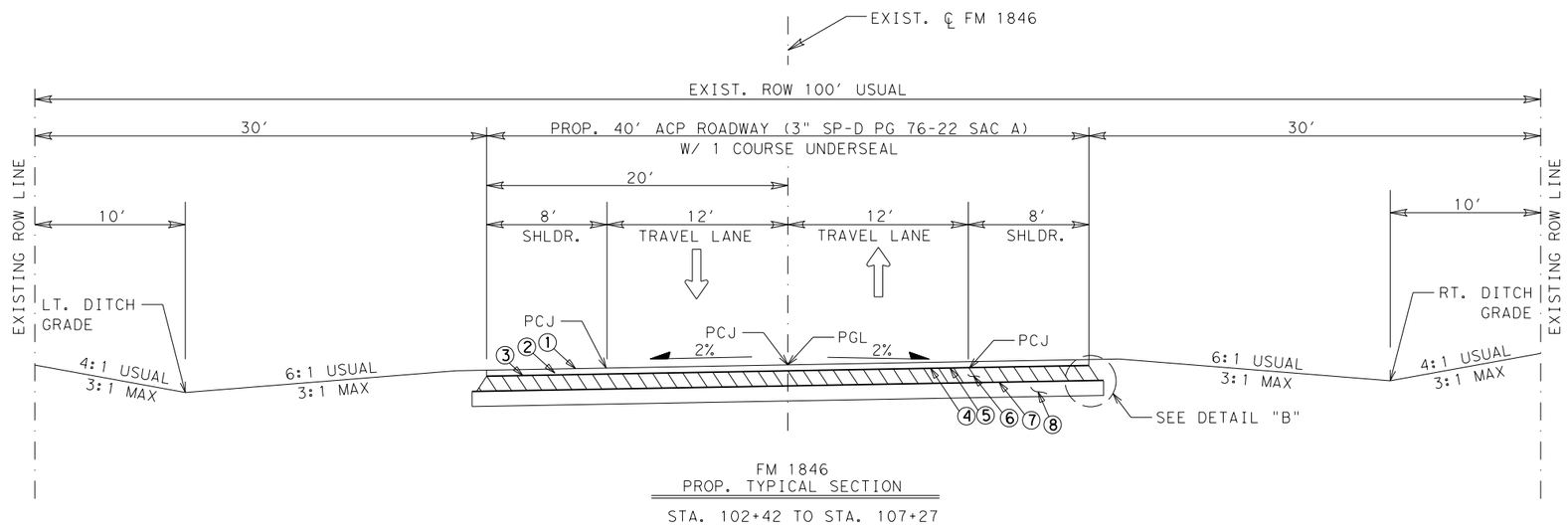


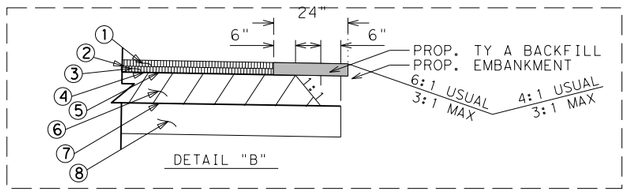
FM 1846
PROP. BRIDGE SECTION

STA. 100+60 TO 101+60



FM 1846
PROP. TYPICAL SECTION

STA. 102+42 TO STA. 107+27



DETAIL "B"

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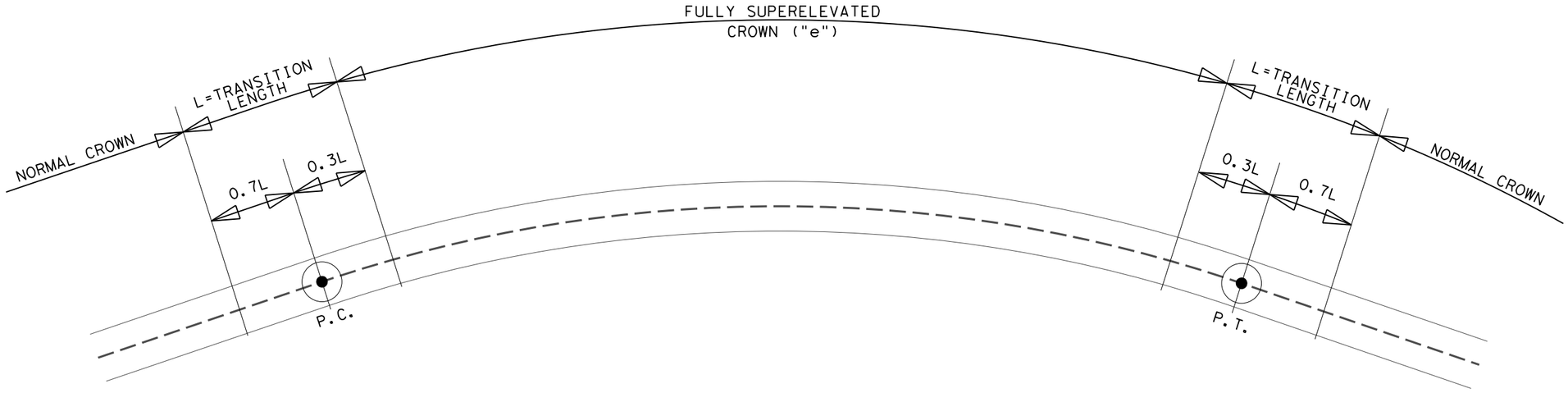

CURVE ID	STATION LIMITS FULL "e"	STATIONS P.C.	STATIONS P.T.	DEGREE OF CURVE D	"e" %	TRANSITIONS LENGTH AT PC			TRANSITION LENGTH AT PT		
						BEGIN	END	LENGTH	BEGIN	END	LENGTH
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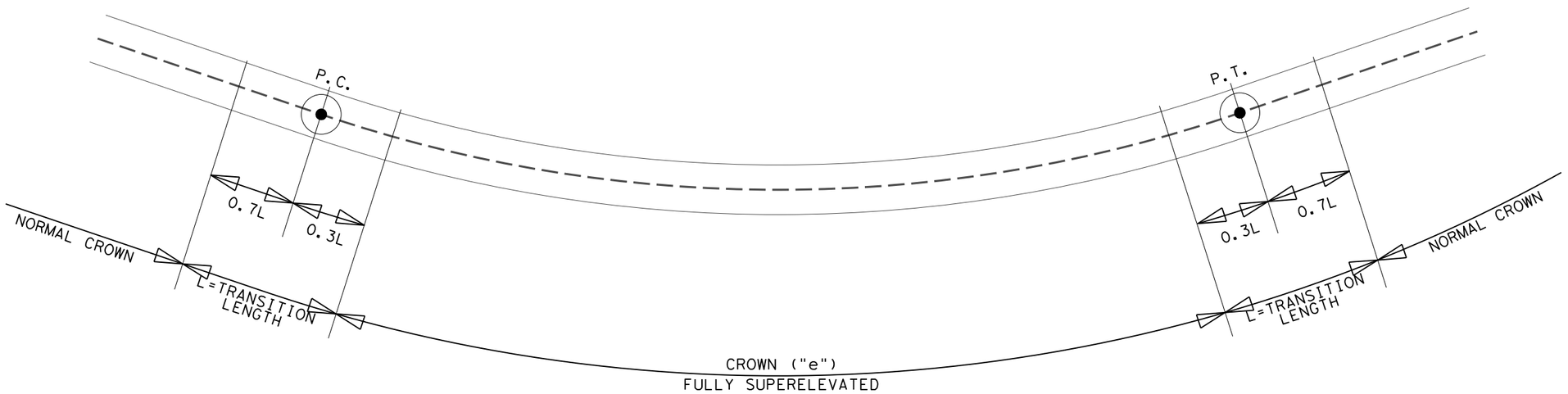

CURVE ID	STATION LIMITS FULL "e"	STATIONS P.C.	STATIONS P.T.	DEGREE OF CURVE D	"e" %	TRANSITIONS LENGTH AT PC			TRANSITION LENGTH AT PT		
						BEGIN	END	LENGTH	BEGIN	END	LENGTH
FM1846-2	STA. 104+15.00 TO STA. 108+09.00	103+62.76	108+61.07	9 58' 00.00" (LT)	4.50%	102+42.00	104+15.00	173	108+09.00	109+82.00	173

STATE OF TEXAS
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FM 1846 SUPERELEVATION DETAILS

NOT TO SCALE — SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
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2014 SPECS GENERAL NOTES:

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General Requirements and Covenants to ITEMS 1 thru 9

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

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

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

ITEM 2: Instructions to Bidders

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

Andres Espinoza, P.E., San Benito Area Engineer; andres.espinoza@txdot.gov

Hector Siller, P.E., Assist. Area Engineer; hector.siller@txdot.gov

Contractor questions will be accepted through email, phone, and in person by the above individuals.

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

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

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

ITEM 5: Control of the Work

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

ITEM 7: Legal Relations and Responsibilities

No significant traffic generator events identified.

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

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

ITEM 8: Prosecution and Progress

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

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 pre-cast members for the proposed structure have been cast, tested and approved for use.

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.

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 2-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 Manual for 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 percent phosphorous and 5 percent Potassium. Fertilizer shall be homogenized.

ITEM 247: Flexible Base

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

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

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

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

ITEM 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.

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.

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, 346, 3076 and 3077. 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 346, 3076, and 3077.

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 any earlier than the day after the prime coat was applied, unless otherwise authorized or directed by the Engineer.

ITEM 316: Seal Coat

In addition to cleaning by brooming of paved surfaces to be sealed as required by this Item, blading may also be necessary to clean dirt and grass from edges of the pavement and/or turnout areas. The cost of this blading will not be paid for directly, but will be considered subsidiary to the various bid Items of the project.
The type and grade of asphalt as shown on the plans and/or as directed by the Engineer, shall be used on these projects. Asphalt cement will be used during the warm season. An emulsified asphalt will be used during the cooler season if permitted in writing by the Engineer. The emulsified asphalt, if used, shall be HFRS 2P. Estimated quantities shown for the bid Item is based on an average of the estimated rates of application for asphaltic cement and emulsified asphalt. These rates should be used for estimating and comparison purposes only.

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

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

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

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

ITEM 3077: Superpave Mixtures

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

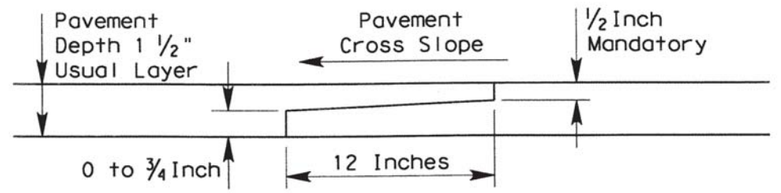
Blading (not to exceed more than 3-ft from the pavement edge) may also be necessary to clean dirt and grass from pavement edges and turnout areas as work under this bid item. The cost of this blading will not be paid for directly, but shall be considered subsidiary to this bid item.

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

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

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

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



NOTCHED WEDGE JOINT

The engineer may allow for variances to the dimensions shown.

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

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

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

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

ITEM 354: Planing and Texturing Pavement

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

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

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

ITEM 400: Excavation and Backfill for Structures

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

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

Structural Excavation Special (Gravel):

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

ITEM 416: Drilled Shaft Foundations

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

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

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

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

In the presence of excess ground water and/or unstable conditions in sub-grade soils prevents excavation to the line and depths indicated on the plans for “Drilled Shaft Foundation”, other proposed methods of foundation installation such as casing, etc. shall be submitted for review and approved by the Engineer.

ITEM 421: Hydraulic Cement Concrete

Provide 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

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

Use membrane curing, Type 2, for concrete curb, gutter and combined curb and gutter, concrete medians, directional islands and sidewalks.

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 is subsidiary to Item 465.

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 6185: Truck Mounted Attenuator/Trailer Attenuator, 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 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.

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 be maintained at 76 degrees Fahrenheit at all times.

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

ITEM 506: Temporary Erosion, Sedimentation, and Environmental Controls

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

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

ITEM 508: Constructing Detours

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

ITEM 512: Portable Traffic Barrier

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

ITEM 530: Intersections, Driveways, and Turnouts

Prime coat shall meet the requirements of Item 310.

Daily testing requirements for Hot Mix Asphaltic Concrete Pavements for drives, commercial entrances and/or turnouts may be waived by the Engineer.

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

ITEM 540: Metal Beam Guard Fence

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

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

ITEM 542: Removing Metal Beam Guard Fence

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

ITEM 544: Guardrail End Treatments

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

ITEM 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.

ITEM 618: Conduit

All conduit ends in pole bases, controllers and ground boxes shall be plugged with 4 to 6 inches of polyurethane sealant or its equivalent after cables are in place.

Conduit shall be placed in a straight line not to exceed 2.0 feet in any direction. The depth of the conduit shall be 2.0 feet except when crossing a roadway where the depth shall not be more than 3.0 feet nor less than 1.0 foot below the bottom of the base material in the roadway when placed by the jacking or boring method. Any evidence of damage to the roadway during the jacking or boring operation shall be sufficient grounds to stop the method being used.

Conduit runs under paved roadways or driveways shall be jacked or bored and then pushed across. At these locations, galvanized rigid metal may be used. All other runs shall be made by trenching. Existing pavement which will be removed, reconstructed or overlaid with new pavement may be trenched across.Trenches for conduit runs shall be a minimum 2 feet deep and 4 inches wide. The conduit shall be placed on a 2-inch sand cushion and then backfilled with a minimum of 6 inches sand fill. The remainder of the trench shall be backfilled with flexible base, soil or two-sack concrete as required by location of conduit on the project or as directed. The top 3 inches shall match the existing surface material.

All conduit elbows and rigid extensions required to be installed on PVC conduit systems will not be paid for separately, but will be considered subsidiary to the various bid items.

Use materials from prequalified material producers list as shown on the Texas Department of Transportation (TxDOT) - Construction Division's (CST) materials producers list. Category is "Roadway Illumination and Electrical Supplies."

ITEM 620: Electrical Conductors

Use Bussman HEBW, Littelfuse LEB, Ferraz-Shawmut FEB, or equal on ungrounded conductors.

For all grounded conductors use Bussman HET, Littelfuse LET, Ferraz-Shawmut FEBN, or equal on ungrounded conductors. For all grounded conductors use Bussman HET, Littelfuse LET, Ferraz-Shawmut FEBN, or equal. These breakaway connectors have a white colored marking and a permanently installed solid neutral.

ITEM 621: Tray Cable

Connect luminaires on traffic signal poles using a 4 conductor tray cable with conductor colors of red, black and green #12 AWG (XHHW). The white (neutral) conductor will not be needed and will be capped.

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 ware-house 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.

Existing signs shown to be removed and relocated within this project shall first be identified in the field before they are removed and relocated to their new installation position as determined in the plans. The complete sign assembly shall be removed and the sign with post shall be separated at the concrete foundation. The concrete foundation shall be disposed off in accordance with this bid Item. No sign shall be removed without prior approval.

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

ITEM 658: Delineator and Object Marker Assemblies

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

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

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

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

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

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

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

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

ITEM 677: Eliminating Existing Pavement Markings and Markers

Asphalt and aggregate types and grades shall be as approved in writing when a surface treatment is used to eliminate existing pavement markings.

ITEM 680: Highway Traffic Signals

The installation of highway traffic signals shall consist of the following principal Items:

1. Furnishing and installing 16-phase full traffic actuated controllers, base mounted cabinets, conflict monitors, load switches and loop amplifiers.
2. Furnishing and installing post mounted flashing beacon controllers and cabinets.
3. Furnishing and installing either, steel strain and/or mast arm poles, electrical service, luminaires, signal heads and cables, pedestrian heads and push buttons with signs that meet the "Americans with Disabilities Act" Standards, galvanized steel span wire, loop detectors, ground boxes, conduit runs and controller foundations.
4. Removal and disposal of existing signal material specified in the plans.
5. All other Items not listed above which are needed to provide for complete traffic signal installations and for proper signal operation as called for in the plans and specifications shall be furnished and installed.

Any deviation of location for proposed signal work shall be as approved.

Signal controller

The signal installations shall be wired in accordance with the phase diagrams in the plans. The proposed base mounted cabinets shall contain 16-phase conflict monitors, which display the "R-Y-G" and "Walk" phases. In addition to detecting phasing conflicts, the Conflict monitors shall also be able to detect multiple signal head indications within every phase. The conflict monitors shall continue to operate in the event of a power supply failure in the timer and shall be able to retain in memory the time and date of the failure detection. Time changes shall be programmable in the field without replacing components or use of external devices. The full-actuated controllers shall meet N.E.M.A. Specifications. The flasher Controllers shall be solid state.

A controller manufacturer's technician shall be required to load initial timing programs into the controllers as called for in the plans. Once the traffic signals are turned on, the same technician shall

monitor the signal operation and traffic movement and shall adjust settings for best signal operation. The technician shall provide the State with a certification that the timing plan and coordination has been established according to the plans. This certification shall include a record showing all settings and functions programmed into the timer and any related units.

The controller must be delivered with two sets of wiring diagrams and operating manuals enclosed in a weatherproof bag.

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

Under this Item, the proposed cabinets shall be base mounted or as shown in the plans.

Existing utilities

The exact location of existing underground utilities shall be verified with the utility companies prior to construction to avoid conflict with or damage to these utilities.

The coordination with the utility companies will be required to make any adjustments, due to utility conflicts, as defined in the specifications or deemed necessary.

Uniformity in equipment

1. All traffic signal controllers furnished shall be by the same manufacturer.
2. All flashing beacon controllers furnished shall be by the same manufacturer.
3. All traffic signal heads and flashing beacon heads furnished shall be by the same manufacturer.
4. All signal fittings and pipe brackets shall be of an approved metallic material and of the same design and manufacturer.
5. All traffic signal poles furnished shall be by the same manufacturer.
6. All loop detector amplifiers furnished shall be by the same manufacturer and of the same type.

Handling of traffic

Roads and streets shall be kept open to traffic at all times. The setting of loop detectors shall be arranged so as to close only one lane of a roadway at a time. The installation of signal heads, poles and conduit shall also be arranged so as to permit the continuous movement of traffic in both directions at all times.
All construction operations shall be conducted to provide the least possible interference to traffic as shown on the plans, as provided for in the specifications and/or as directed. All signing, barricading and handling of traffic shall conform to the current edition of the "Texas Manual on Uniform Traffic Control Devices".

Project Number:

County: Cameron **Control:** 1065-02-039

Highway: FM 1846

Sequence of work

1. The existing traffic signal installations and/or flashing beacon installations shall remain in operation at all times during construction of the proposed traffic signal and/or flashing beacon installations or modifications.
2. The complete removal of the specified existing traffic signal and/or flashing beacon installations or specified Items when the proposed traffic signal and/or flashing beacon installations are in place and operational.
3. All labor, tools, and materials used to remove the specified existing traffic signal material shall not be paid for directly, but shall be considered subsidiary to the various items of work.
4. Final inspection shall be performed in conjunction with the district signal shop.

ITEM 682: Vehicle and Pedestrian Signal Heads

All signal heads shall be covered with burlap from the time of installation until the signal is placed in operation. All signal heads shall be of polycarbonate material and yellow in color. Signal heads shall have standard detachable visors. LED's shall be furnished for all traffic signal heads.

Signal heads shall be positioned carefully to provide the best view of signal indications to motorists. All signal heads shall be installed to a neat overall appearance.

Nominal height for signal heads above pavement surface shall be 18 feet 6 inches, plus/minus 3 inches.

Pedestrian signal heads shall be positioned carefully to provide the best view to pedestrians.

ITEM 682: Vehicle and Pedestrian Signal Heads

All flashing beacon heads shall be covered with burlap from the time of installation until they are placed in operation. All flashing beacon heads shall be of polycarbonate material and yellow in color. Flashing beacon heads shall have standard detachable visors. LED's shall be furnished for all traffic signal heads.

Flashing beacon heads shall be positioned carefully to provide the best view of head indications to motorists. All beacon heads shall be installed to a neat overall appearance.

Nominal height for flashing beacon heads above pavement surface shall be 18 feet 6 inches, plus/minus 3 inches.

ITEM 684: Traffic Signal Cables

All signal cable shall be #12 AWG; 2/c loop. Lead-In shall be #14 AWG shielded and loop wires in pavement.

ITEM 685: Roadside Flashing Beacon Assemblies

The roadside flashing beacons shall be installed at locations shown on the signing detail sheets and as shown on Standard Sheet RFBA-13.

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

Grounding and bonding

A continuous bare or green insulated copper wire no. 8 or larger shall be installed in every conduit throughout the electrical and traffic signal system in accordance with Item 680, the Electrical Detail Sheets and the latest edition of the National Electrical Code.

Existing utilities

The exact location of existing underground utilities shall be verified with the utility company prior to construction to avoid conflict with or damage to these utilities.

Coordination with the utility companies will be required to make any adjustments, due to utility conflicts, as defined in the specifications or deemed necessary.

Handling of traffic

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

ITEM 688: Pedestrian Detectors and Vehicle Loop Detectors

The Contractor shall install loop vehicle detectors in accordance with the Intersection layouts in the plans or as directed. Each loop detector Lead-In cable shall be tagged inside the controller cabinet with its loop number. The loop amplifiers shall indicate the loop and phase of control or direction of

control. Loop wires in street shall be #14 AWG. Pedestrian detectors shall meet the minimum requirements called for by the "Americans with Disabilities Act".

Loop detector lead-in cable shall be continuous from ground box to the controller.

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

A minimum length of 2.0 feet for each cable shall be left in each ground box.

ITEM 5001: Geogrid Base Reinforcement

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

ITEM 6185: Truck Mounted Attenuator/Trailer Attenuator

In addition to the shadow vehicles with truck mounted attenuator (TMA) that are specified as being required on the traffic control plan for the project, provide 2 additional shadow vehicle(s) with TMA
as per TCP (1-1) -18 as detailed on General Note 5 of this standard sheet;
or as per TCP (1-2) -18 as detailed on General Note 6 of this standard sheet;
or as per TCP (1-3) -18 as detailed on General Note 7 of this standard sheet;
or as per TCP (2-1) -18 as detailed on General Note 5 of this standard sheet;
or as per TCP (2-3) -18 as detailed on General Note 8 of this standard sheet.
or as per TCP (3-1) -13 as detailed on General Note 3 of this standard sheet;
or as per TCP (3-3) -14 as detailed on General Note 3 of this standard sheet;
or as per TCP (3-3) -14 as detailed on General Note 1 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.

SUMMARY OF ROADWAY PLAN & PROFILE

ROADWAY PLAN & PROFILE ESTIMATED QUANTITIES

LOCATION	100 6002	⊗	105 6118	204 6003	216 6001	247 6041	251 6159	251 6206	260 6043	260 6084	275 6001	275 6012	305 6043
	PREPARING ROW	REMOVE TRTD BASE & ASPH (11")	REMOVE TRTD BASE & ASPH (11")	SPRINKLING (DUST CONTROL)	PROOF ROLLING	FL BS (CMP IN PLC)(TYA GR1-2)(FNAL POS)	REWORK BS MATL (TY B)(10")(DC)(ORG POS) + +	REWORK BS MATL (TY B)(11")(DENS CONT)	LIME (HYD, COM OR QK)(SLURRY)	LIME TRT (SUBGRADE)(12")	CEMENT	CEMENT TRT (MX EXST MTL & NW BS)(10")	SALV, HAUL & STKPL RCL ASPH PAV (3"-5")
	STA	SY	CY	MG	HR	CY	CY	CY	TON	SY	TON	SY	SY
PHASE 1 STEP 1 (DETOUR)	24			187	2								
PHASE 1 STEP 2 - SAN JOSE		702	100		1	78		118					702
PHASE 1 STEP 2	8	4,827	651	67	2	563		845	109	5,533	51	5,441	4,827
SUBTOTAL PHASE 1	**32**	**5,529**	**751**	**254**	**5**	**641**		**963**	**109**	**5,533**	**51**	**5,441**	**5,529**
PHASE 2	43	22,862	2,920	342	3	2,772		4,158	486	24,562		24,098	22,862
PHASE 2 - RUSSELL LN (WEST)		423			1	94		140			226		423
SUBTOTAL PHASE 2	**43**	**23,285**	**2,920**	**342**	**4**	**2,866**		**4,298**	**486**	**24,562**	**226**	**24,098**	**23,285**
PHASE 3	11	15,411	2,030	342	3	245	1,586	2,747				16,415	15,411
PHASE 3 - RUSSELL LN (EAST)		405	59		1	45		67	332	16,792	154		405
SUBTOTAL PHASE 3	**11**	**15,816**	**2,089**	**342**	**4**	**290**	**1,586**	**2,814**	**332**	**16,792**	**154**	**16,415**	**15,816**
PHASE 4													
SUBTOTAL PHASE 4													
PROJECT TOTALS	**86**	**44,630**		**938**	**13**	**3,797**	**1,586**	**8,075**	**927**	**46,887**	**431**	**45,954**	**44,630**

SUMMARY OF ROADWAY PLAN & PROFILE (CONT.)

ROADWAY PLAN & PROFILE ESTIMATED QUANTITIES

LOCATION	310 6009	316 6005	316 6486	508 6001	3077 6065	3084 6001	5001 6002
	PRIME COAT (MC-30)	ASPH (TIER II)	AGGR (TY-D GR-4P)(SAC-B)	CONSTRUCTING DETOURS	SUPERPAVE MIXTURES SP-D SAC-A PG76-22	BONDING COURSE	GEOGRID BASE REINFORCEMENT (TY II)
	GAL	GAL	CY	SY	TON	GAL	SY
PHASE 1 STEP 1 (DETOUR)				5,735			
PHASE 1 STEP 2 - SAN JOSE							
PHASE 1 STEP 2	1,088	1,632	45		465		5,533
SUBTOTAL PHASE 1	**1,088**	**1,632**	**45**	**5,735**	**465**		**5,533**
PHASE 2	4,820	7,229	201		2,060		24,562
PHASE 2 - RUSSELL LN (WEST)							
SUBTOTAL PHASE 2	**4,820**	**7,229**	**201**		**2,060**		**24,562**
PHASE 3	3,283	4,925	137		1,403		
PHASE 3 - RUSSELL LN (EAST)							16,792
SUBTOTAL PHASE 3	**3,283**	**4,925**	**137**		**1,403**		**16,792**
PHASE 4					4,031	**3,300**	
SUBTOTAL PHASE 4					**4,031**	**3,300**	
PROJECT TOTALS	**9,191**	**13,786**	**383**	**5,735**	**7,959**	**3,300**	**46,887**

NEW ASPHALTIC MATERIAL 1" = 114#/SY.
ESTIMATED WEIGHT OF FLEX BASE = 3375#/CY COMPACTED DRY WEIGHT.
ESTIMATED WEIGHT OF SUBGRADE = 2970#/CY.
TACK COAT RATE = 0.07GAL/SY. TACK COAT QUANTITY IS FOR ESTIMATED PURPOSES ONLY (FINAL RATE SHALL BE DETERMINED IN THE FIELD)
PRIME COAT RATE = 0.2 GAL/SY
ASPH (TIER II) RATE = 0.3 GAL/SY
AGGR = 1 CY/120 SY

NOTE:
FLEX BASE SHALL BE COMPOSED OF 5" MIN. NEW FLEX BASE. QUANTITIES REFLECT 5" OF NEW FLEX BASE.

ITEM 251 FOR PHASE II IS TAKEN FROM EXISTING MATERIAL ON PH II. FOR PHASE III, IT'S A COMBINATION OF EXISTING AND DETOUR MATERIAL.

ESTIMATED DETOUR VOLUME TO BE USED IN PHASE III AS NEW MATERIAL. REMAINING MATERIAL TO BE PROPERTY OF THE CONTRACTOR

* DETOUR BASE TREATMENT 1% LIME

⊗ FOR CONTRACTORS INFORMATION ONLY, NON-PAY ITEM.

+ + MATERIAL TAKEN FROM DETOUR

SUMMARY OF REMOVING CONCRETE

LOCATION	ITEM 104	
	6017	6029
	REMOVING CONCRETE (DRIVEWAYS)	REMOVING CONCRETE (CURB OR CURB & GUTTER)
	SY	LF
SEE DRIVEWAY TABLES	429	31

SUMMARY OF INCIDENTAL CONSTRUCTION

LOCATION	ITEM 354	
	6041	6051
	PLANE ASPH CONCRETE PAVEMENT (1.5")	PLANE ASPH CONCRETE PAVEMENT (0" TO 1-1/2")
	SY	SY
21+50 TO 21+86	300	
107+27 TO 126+76		890
PROJECT TOTAL	300	890

Pharr District Central Design

Texas Department of Transportation

FM 1846 QUANTITY SUMMARY SHEETS

SHEET 1 OF 5

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		34

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SUMMARY OF TRAFFIC CONTROL PLAN

FM 1846 CSJ: 1065-02-039 TRAFFIC CONTROL PLAN	502 6001 BARRICADES, SIGNS AND TRAFFIC HANDLING MO	508 6001 CONSTRUCTING DETOURS SY	510 6003 ONE-WAY TRAF CONT (PORT TRAF SIG) MO	512 6001 PORT CTB (FUR & INST) (SGL SLOPE) (TY 1) LF	512 6025 PORT CTB (MOVE) (SGL SLP) (TY 1) LF	512 6049 PORT CTB (REMOVE) (SGL SLP) (TY 1) LF	545 6003 CRASH CUSH ATTEN (MOVE & RESET) EA	545 6005 CRASH CUSH ATTEN (REMOVE) EA	545 6019 CRASH CUSH ATTEN (INSTL) (S) (N) (TL 3) EA	ITEM 662 "WORK ZONE PAVEMENT MARKINGS" 662 6050 WK ZN PAV MRK REMOV (REFL) TY II-A-A EA	662 6063 WK ZN PAV MRK REMOV (W) 4" (SLD) LF	662 6069 WK ZN PAV MRK REMOV (W) 8" (DOT) LF	662 6075 WK ZN PAV MRK REMOV (W) 24" (SLD) LF	662 6095 WK ZN PAV MRK REMOV (Y) 4" (SLD) LF	662 6109 WK ZN PAV MRK SHT TERM (TAB) TY W EA	662 6111 WK ZN PAV MRK SHT TERM (TAB) TY Y-2 EA	ITEM 677 "ELIMINATE PAVEMENT MARKINGS & MARKERS" 677 6001 ELIM EXT PAV MRK & MRKS (4") LF	677 6003 ELIM EXT PAV MRK & MRKS (8") LF	677 6005 ELIM EXT PAV MRK & MRKS (12") LF	677 6007 ELIM EXT PAV MRK & MRKS (24") LF	677 6008 ELIM EXT PAV MRK & MRKS (ARROW) EA	677 6012 ELIM EXT PAV MRK & MRKS (WORD) EA	6001 6002 PORTABLE CHANGEABLE MESSAGE SIGN EA
SEE PHASE 1 STEP 1 (DETOUR) SHEETS		5,735																						
SHEET 1 OF 5																								
SHEET 2 OF 5																								
SHEET 3 OF 5																								
ALT. PLAN - DURING WORK HOURS																								
SUBTOTAL PHASE 1 STEP 1 (DETOUR)	**1**	**5,735**																						
SEE PHASE 1 STEP 2 SHEETS																								
SHEET 1 OF 2				1,290					4		2,109		14					2,007	80			2	1	
SHEET 2 OF 2											377		12					1,225						
PHASE 1 STEP 2 - SAN JOSE RANCH RD.																								
SUBTOTAL PHASE 1 STEP 2	**2**		**1**	**1,290**					**4**		**2,486**		**26**					**3,232**	**80**			**2**	**1**	
SEE PHASE 2 SHEETS																								
SHEET 1 OF 5										79	791	415	12	1,582				3,976		29	7	2	1	
SHEET 2 OF 5										231	2,306		22	4,612				2,427	100	93	32	4	2	
SHEET 3 OF 5										240	2,397			4,794				3,202	105	51		4	2	
SHEET 4 OF 5				120	1,290		4		2	243	2,428			4,856						247				
PHASE 2 - RUSSELL LANE (WEST)																								
SUBTOTAL PHASE 2	**4**			**120**	**1,290**		**4**		**2**	**793**	**7,922**	**415**	**34**	**15,844**				**9,605**	**205**	**420**	**39**	**10**	**5**	
SEE PHASE 3 SHEETS																								
SHEET 1 OF 5										201	2,012	414		4,024					415					
SHEET 2 OF 5										256	2,555			5,110										
SHEET 3 OF 5										240	2,398			4,796										
SHEET 4 OF 5						1,410		6		559	5,589			11,178				7,304						
PHASE 3 - RUSSELL LANE (EAST)																								
SUBTOTAL PHASE 3	**4**					**1,410**		**6**		**1,256**	**12,554**	**414**		**25,108**				**7,304**	**415**					
PHASE 4																								2
SUBTOTAL PHASE 4	**2**														**1,200**	**1,355**								**2**
PROJECT TOTALS	**13**	**5,735**	**1**	**1,410**	**1,290**	**1,410**	**4**	**6**	**6**	**2,049**	**22,962**	**829**	**60**	**40,952**	**1,200**	**1,355**		**20,141**	**700**	**420**	**39**	**12**	**6**	**2**

SUMMARY OF PORTABLE MESSAGE SIGN & TMA

LOCATION	ITEM 6001 6002 PORTABLE CHANGEABLE MESSAGE SIGN (EA)	ITEM 6185 6002 TMA (STATIONARY) (DAY)	ITEM 6185 6005 TMA (MOBILE OPERATION) (DAY)
MOBILIZATION		18	18
PHASE 1 STEP 1 (DETOUR)	2	6	6
PHASE 1 STEP 2		27	27
PHASE 2		76	76
PHASE 3		61	61
PHASE 4		18	18
PROJECT TOTAL	2	206	206

SUMMARY OF METAL BEAM GUARD FENCE

LOCATION CSJ: 1065-02-039 MBGF ROAD ITEMS	104 6054 REMOVING CONCRETE (MOW STRIP) LF	432 6045 RIPRAP (MOW STRIP) (4 IN) CY	540 6001 MTL W-BEAM GD FEN (TIM POST) LF	542 6001 REMOVE METAL BEAM GUARD FENCE LF	544 6001 GUARDRAIL END TREATMENT (INSTALL) EA	544 6003 GUARDRAIL END TREATMENT (REMOVE) EA
SEE TCP SHEETS						
PHASE 1 STEP 2						
SHEET 1 OF 2	270	14	150	150	2	2
PHASE 2						
SHEET 4 OF 5	290	14	150	150	2	2
PROJECT TOTALS	**560**	**28**	**300**	**300**	**4**	**4**

Pharr District Central Design

Texas Department of Transportation

FM 1846
QUANTITY SUMMARY SHEETS

SHEET 2 OF 5

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		35

SUMMARY OF DRAINAGE & IRRIGATION

FM 1846 CSJ: 1065-02-039 DRAINAGE LAYOUT SHEETS	ITEM 400 "EXCAVATION & BACKFILL FOR STRUCTURES"					ITEM 464 "REINFORCED CONCRETE PIPE"				ITEM 465 "INLET"		ITEM 467 "S.E.T."
	400 6001	400 6010	400 6005	400 6006	402 6001	464 6038	464 6060	464 6061	464 6062	465 6126	465 6140	467 6363
	⊗ STRUCT EXCAV	⊗ STRUCT EXCAV (SPECIAL)	CEM STABIL BKFL	CUT & RESTORING PAV	TRENCH EXCAVATION PROTECTION	RC PIPE (CL III) (18 IN) (SPL)	RC PIPE (CL IV) (24 IN) (SPL)	RC PIPE (CL IV) (30 IN) (SPL)	RC PIPE (CL IV) (36 IN) (SPL)	INLET (COMPL) (PSL) (FG) (3FTX3FT-3FT X3FT)	INLET (COMPL) (PSL) (FG) (6FTX6FT-3FT X3FT)	SET (TY II) (18 IN) (RCP) (6:1) (P)
	CY	CY	CY	SY	LF	LF	LF	LF	LF	EA	EA	EA
SEE CROSS CULVERT DETAIL SHEET												
SHEET 1 OF 3 STA. 48+30.60	65		95		65		75			1	1	
SHEET 1 OF 3 @ RUSSELL LN	200		16		95			95				
SHEET 2 OF 3 STA. 49+36.00	75		33		65			76		2		
SHEET 2 OF 3 STA. 74+85.00	124		32		65				100			
SHEET 3 OF 3 STA. 75+06.40	71		22		60		83			2		
SEE IRRIGATION CROSSING SHEET												
SHEET 1 OF 3 STA. 21+85.33		170	50	138	50				100			
SHEET 2 OF 3 STA. 75+00.60		152	41	116	62				100			
SHEET 3 OF 3 STA. 82+83.49		142	35	71	70				100			
SEE DRIVEWAY TABLES						1,042						42
SEE P&P SHEETS												
PROJECT TOTALS	**535**	**464**	**324**	**325**	**532**	**1,042**	**158**	**171**	**400**	**5**	**1**	**42**

⊗ FOR CONTRACTORS INFORMATION ONLY, NON-PAY ITEM.

SUMMARY OF DRAINAGE & IRRIGATION (CONT.)

FM 1846 CSJ: 1065-02-039 DRAINAGE LAYOUT SHEETS	ITEM 496 "REMOVE S.E.T."				
	496 6002	496 6004	496 6007	1008 6001	1008 6002
	REMOV STR (INLET)	REMOV STR (SET)	REMOV STR (PIPE)	PRSSR IRRIG PVC PIPE (18")	PRSSR IRRIG PVC PIPE (24")
	EA	EA	LF	LF	LF
SEE CROSS CULVERT DETAIL SHEET					
SHEET 1 OF 3 STA. 48+30.60					
SHEET 1 OF 3 @ RUSSELL LN					
SHEET 2 OF 3 STA. 49+36.00					
SHEET 2 OF 3 STA. 74+85.00					
SHEET 3 OF 3 STA. 75+06.40					
SEE IRRIGATION CROSSING SHEET					
SHEET 1 OF 3 STA. 21+85.33					100
SHEET 2 OF 3 STA. 75+00.60					100
SHEET 3 OF 3 STA. 82+83.49				100	
SEE DRIVEWAY TABLES	2	47	1,076		
SEE P&P SHEETS					
PROJECT TOTALS	**2**	**47**	**1,076**	**100**	**200**

SUMMARY OF EXCAVATION & EMBANKMENT

LOCATION	ITEM 110 6001	ITEM 132 6006
	EXCAVATION (ROADWAY)	EMBANKMENT (FIN AL) (DENS CONT) (TY C)
	CY	CY
SEE SHEETS 124-125	5,520	3,146
PROJECT TOTAL	5,520	3,146

SUMMARY OF BACKFILL & POTHOLE

LOCATION	ITEM 134 6001	ITEM 700 6001
	BACKFILL (TY A)	POTHOLE REPAIR (STANDARD)
	STA	SY
PHASE 1 STEP 2	8	40
PHASE 2	43	80
PHASE 3	43	80
PROJECT TOTAL	94	200

Pharr District Central Design

Texas Department of Transportation

FM 1846 QUANTITY SUMMARY SHEETS

SHEET 3 OF 5

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		36

SUMMARY OF SW3P ITEMS

FM 1846 CSJ: 1065-02-039 SW3P LAYOUT SHEETS	160 6005 FURNISHING AND PLACING TOPSOIL CY	164 6035 DRILL SEEDING (PERM) (RURAL) (CLAY) SY	164 6041 DRILL SEEDING (TEMP) (WARM) SY	168 6001 # VEGETATIVE WATERING MG	506 6021 CONSTRUCTION EXITS (INSTALL) (TY 2) SY	506 6024 CONSTRUCTION EXITS (REMOVE) SY	506 6038 TEMP SEDMT CONT FENCE (INSTALL) LF	506 6039 TEMP SEDMT CONT FENCE (REMOVE) LF	506 6041 BIODEG EROSN CONT LOGS (INSTL) (12") LF	506 6043 BIODEG EROSN CONT LOGS (REMOVE) LF	166 6001 ⊗ FERTILIZER AC
SEE SW3P LAYOUT SHEETS	50										
SHEET 1 OF 4		10,792	10,792	2.6	156	156			120	120	2.23
SHEET 2 OF 4		14,686	14,686	3.0			20	20	240	240	3.03
SHEET 3 OF 4		8,299	8,299	2.0	156	156			280	280	1.71
SHEET 4 OF 4		11,003	11,003	2.6	156	156	80	80	480	480	2.27
PROJECT TOTALS	**50**	**44,780**	**44,780**	**10.2**	**468**	**468**	**100**	**100**	**1,120**	**1,120**	**9.24**

⊗ FOR CONTRACTORS INFORMATION ONLY, NON-PAY ITEM
VEGETATIVE WATERING APPLICATION RATE= 88,300 GAL/AC/CYCLE @ 13 CYCLES.
FERTILIZER APPLICATION RATE= 500 LB/ACRE

SUMMARY OF PAVEMENT MARKINGS

FM 1846 CSJ: 1065-02-039 PAVEMENT MARKING LAYOUT SHEETS	666 6036 REFL PAV MRK TY I (W)8" (SLD) (100M IL) LF	666 6048 REFL PAV MRK TY I (W)24" (SLD) (100 MIL) LF	666 6141 REFL PAV MRK TY I (Y)12" (SLD) (100 MIL) LF	666 6300 RE PM W/RET REQ TY I (W)4" (BRK) (100M IL) LF	666 6303 RE PM W/RET REQ TY I (W)4" (SLD) (100M IL) LF	666 6312 RE PM W/RET REQ TY I (Y)4" (BRK) (100M IL) LF	666 6315 RE PM W/RET REQ TY I (Y)4" (SLD) (100M IL) LF	666 6342 REF PROF PAV MRK TY I(W)4" (SLD) (100 MIL) LF	672 6007 REFL PAV MRKR TY I-C EA	672 6009 REFL PAV MRKR TY II-A-A EA	672 6017 TRAFFIC BUTTON TY Y EA	672 6018 TRAFFIC BUTTON TY B EA	668 6077 PREFAB PAV MRK TY C (W) (ARROW) EA	668 6085 PREFAB PAV MRK TY C (W) (WORD) EA
SEE PM LAYOUTS SHEETS														
SHEET 1 OF 4	100	427	135	465	390	404	5,086	3,870	35	153	303		2	2
SHEET 2 OF 4	200	72	192		458	300	3,718	4,060	12	183	138	430	4	4
SHEET 3 OF 4	400		498		550	186	5,673	3,750	24	270	301	180	8	8
SHEET 4 OF 4		33	203		1,278	771	2,776	5,747		150	141	921		
PROJECT TOTALS	**700**	**532**	**1,028**	**465**	**2,676**	**1,661**	**17,253**	**17,427**	**71**	**756**	**883**	**1,531**	**14**	**14**

SUMMARY OF SIGNING ITEMS

FM 1846 CSJ: 1065-02-039 SIGNING LAYOUT SHEETS	636 6001 ALUMINUM SIGNS (TY A) SF	644 6027 IN SM RD SN SUP&AM TYS80(1)SA(P) EA	644 6030 IN SM RD SN SUP&AM TYS80(1)SA(T) EA	644 6076 REMOVE SM RD SN SUP&AM EA	685 6004 INSTL RDSD FLSH BCN ASSM (SOLAR PWRD) EA	685 6006 REMOV RDSD FLSH BCN AM (SOLAR PWRD) EA
SEE SIGNING LAYOUT SHEETS						
SHEET 1 OF 2	64	6	2	8		
SHEET 2 OF 2	40	1	3	4	2	2
PROJECT TOTALS	**104**	**7**	**5**	**12**	**2**	**2**

SUMMARY OF MAILBOXES

LOCATION	ITEM 560 6014 ⊙ MAILBOX INSTALL-S (TWG-POST) (TY 4) (EA)
SEE P&P SHEETS	
SHEET 3 OF 9	3
SHEET 5 OF 9	1
PROJECT TOTAL	4

⊙ CONTRACTOR SHALL PROVIDE NEW MAILBOXES AS REQUIRED.

SUMMARY OF DRIVEWAYS

LOCATION	ITEM 530 6004 DRIVEWAYS (CONCRETE) SY	 6005 DRIVEWAYS (ACP) SY
SEE DRIVEWAY TABLES	543	1,431

Pharr District Central Design

Texas Department of Transportation

FM 1846 QUANTITY SUMMARY SHEETS

SHEET 4 OF 5

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		37

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SUMMARY OF TRAFFIC SIGNAL ITEMS

ITEM	DESC CODE	ITEM DESCRIPTION	UNIT	(1) FM 1846 AT BUS 77	(2) FM 1846 AT RUSSELL	(3) FM 1846 AT SAN JOSE						TOTALS
				EST	EST	EST						
416	**6030**	DRILL SHAFT (TRF SIG POLE) (24 IN)	LF									
416	**6032**	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF									
618	**6016**	CONDT (PVC)(SCH 40)(1")	LF	89	188							277
618	**6023**	CONDT (PVC)(SCH 40)(2")	LF		1150							1150
618	**6033**	CONDT (PVC)(SCH 40)(4")	LF									
618	**6059**	CONDT (PVC)(SCH 80)(4")(BORE)	LF		160							160
620	**6007**	ELEC CONDR (NO. 8) BARE	LF		30							30
620	**6009**	ELEC CONDR (NO.6) BARE	LF									
620	**6010**	ELEC CONDR (NO.6) INSULATED	LF									
621	**6005**	TRAY CABLE (4 CONDR)(12 AWG)	LF	370	460							830
624	**6002**	GROUND BOX TY A (122311)W/APRON	EA		12							12
624	**6010**	GROUND BOX TY D (162922W/APRON	EA		1							1
625	**6003**	ZINC-COAT STL WIRE STRAND (3/8 IN)	LF									
628	**6301**	ELC SRV TY T 120/240 000(NS)GS(L)TS(O)	EA									
680	**6001**	INSTALL HWY TRF SIG(FLASH BEACON)	EA									
✱680		FLASHER CONTROLLER	EA									
680	**6002**	INSTALL HWY TRF SIG (ISOLATED)	EA	1	1							2
✱680		LUMINAIRE W/LED (250W EQ)	EA	2	3							5
✱680		TS2-TYPE 1 CABINET (FULLY ACTUATED)	EA									
✱680		SIGN "LT TRN YIELD FL YEL ARR"R10-17T 30"x30"	EA	4	2							6
✱680		SIGN "STREET NAME"	EA									
680	**6004**	REMOVING TRAFFIC SIGNALS	EA	1	1							2
681	**6001**	TEMP TRAF SIGNALS	EA	1	1	1						3
682	**6001**	VEH SIG SEC (12") LED (GRN)	EA	8	8							16
682	**6002**	VEH SIG SEC (12") LED (GRN ARW)	EA	4	2							6
682	**6003**	VEH SIG SEC (12") LED (YEL)	EA	8	8	4						20
682	**6004**	VEH SIG SEC (12") LED (YEL ARW)	EA	8	4							12
682	**6005**	VEH SIG SEC (12") LED (RED)	EA	8	8	2						18
682	**6006**	VEH SIG SEC (12") LED (RED ARW)	EA	4	2							6
682	**6018**	PED SIG SEC (LED)(COUNTDOWN)	EA	6								6
682	**6060**	BACKPLATE W/REFL BRDR(3 SEC)	EA	8	8							16
682	**6049**	BACKPLATE W/REFL BRDR(4 SEC)	EA	4	2							6
682	**6050**	BACKPLATE W/REFL BRDR(5 SEC)	EA									
684	**6007**	TRF SIG CBL (TY A)(12 AWG)(2 CONDR)	LF	1405								1405
684	**6010**	TRF SIG CBL (TY A)(12 AWG)(5 CONDR)	LF	2220	556	130						2906
684	**6012**	TRF SIG CBL (TY A)(12 AWG)(7 CONDR)	LF	800	260							1060
684	**6080**	TRF SIG CBL (TY C)(14 AWG)(2 CONDR)SHIELDED LOOP LEAD-IN	LF	178	2045							2223
685	**6001**	INSTALL RDSD FLASH BEACON ASSEMBLY	EA									
685	**6003**	REMOVE RDSD FLASH BEACON ASSEMBLY	EA									
686	**6008**	INS TRF SIG PL AM(S) STR(TY B) LUM										
686	**6020**	INS TRF SIG PL AM(S) STR(TY D) LUM	EA									
687	**6001**	PED POLE ASSEMBLY	EA									
688	**6001**	PED DETECT PUSH BUTTON (APS)	EA	6								6
688	**6003**	PED DETECTER CONTROLER UNIT	EA	1								1
688	**6004**	VEH LP DETECT (SAW CUT)	LF	447	895							1342
✱688		1/C #14 AWG LOOP WIRE (XHHW)	LF	894	1982							2876

✱ QUANTITIES SHOWN ARE FOR THE CONTRACTORS INFORMATION ONLY. THESE ITEMS ARE SUBSIDIARY TO VARIOUS OTHER ITEMS.

STATE OF TEXAS
ELIGIO ALVAREZ
107123
LICENSED PROFESSIONAL ENGINEER

Eligio Alvarez, P.E
7-15-2021

Pharr District Central Design

Texas Department of Transportation

SUMMARY OF MATERIALS TRAFFIC SIGNAL

© 2021	CONT	SECT	JOB	HIGHWAY
	1065	02	039	FM 1846
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		38

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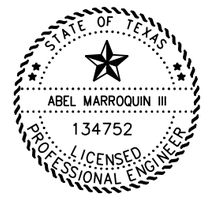
Baseline Station	Cut Shrink/ Swell	Station Cut Area	Station Cut Volume	Adjusted Station Cut	Fill Shrink/ Swell	Station Fill Area	Station Fill Volume	Adjusted Station Fill	Mass Ordinate
21+86.00 R1	0	0	0	0	0		0	0	
Station Total:				0					0
22+00.00 R1	0	0	0	0	0		0	0	
Station Total:				0					0
23+00.00 R1	1	10	478	478	1	1	46.8	46.8	
Station Total:				478				46.8	431.2
24+00.00 R1	1	5	748.9	748.9	1	2	140.6	140.6	
Station Total:				748.9				140.6	1039.5
25+00.00 R1	1	6	557.3	557.3	1	1	166.5	166.5	
Station Total:				557.3				166.5	1430.3
26+00.00 R1	1	6	609.3	609.3	1	1	146.1	146.1	
Station Total:				609.3				146.1	1893.5
27+00.00 R1	1	6	637.6	637.6	1	3	241.9	241.9	
Station Total:				637.6				241.9	2289.2
28+00.00 R1	1	20	1311.7	1311.7	1	2	282.5	282.5	
Station Total:				1311.7				282.5	3318.4
29+00.00 R1	1	1	1040.6	1040.6	1	5	375.8	375.8	
Station Total:				1040.6				375.8	3983.1
30+00.00 R1	1	1	90.5	90.5	1	6	565	565	
Station Total:				90.5				565	3508.5
31+00.00 R1	1	34	1756.3	1756.3	1	0	314.3	314.3	
Station Total:				1756.3				314.3	4950.5
32+00.00 R1	1	3	1881.5	1881.5	1	5	282	282	
Station Total:				1881.5				282	6549.9
33+00.00 R1	1	3	336.6	336.6	1	3	412.3	412.3	
Station Total:				336.6				412.3	6474.2
34+00.00 R1	1	9	622.1	622.1	1	0	141.5	141.5	
Station Total:				622.1				141.5	6954.8
35+00.00 R1	1	15	1188.1	1188.1	1	0	0.2	0.2	
Station Total:				1188.1				0.2	8142.7
36+00.00 R1	1	8	1129.9	1129.9	1	2	108.5	108.5	
Station Total:				1129.9				108.5	9164.1
37+00.00 R1	1	21	1433.3	1433.3	1	1	147.6	147.6	
Station Total:				1433.3				147.6	10449.8
38+00.00 R1	1	13	1691.8	1691.8	1	1	72.9	72.9	
Station Total:				1691.8				72.9	12068.7
39+00.00 R1	1	16	1472.6	1472.6	1	0	33.9	33.9	
Station Total:				1472.6				33.9	13507.4
40+00.00 R1	1	17	1652.2	1652.2	1	1	59.6	59.6	
Station Total:				1652.2				59.6	15100
41+00.00 R1	1	21	1883.8	1883.8	1	0	59.6	59.6	
Station Total:				1883.8				59.6	16924.2
42+00.00 R1	1	19	1980.3	1980.3	1	0	3.5	3.5	
Station Total:				1980.3				3.5	18901
43+00.00 R1	1	18	1854.1	1854.1	1	0	17.6	17.6	
Station Total:				1854.1				17.6	20737.5
44+00.00 R1	1	24	2113.2	2113.2	1	1	47.3	47.3	
Station Total:				2113.2				47.3	22803.4
45+00.00 R1	1	22	2298.8	2298.8	1	1	96.6	96.6	
Station Total:				2298.8				96.6	25005.6
46+00.00 R1	1	43	3240.2	3240.2	1	0	72.5	72.5	
Station Total:				3240.2				72.5	28173.3
47+00.00 R1	1	27	3483.5	3483.5	1	1	82	82	
Station Total:				3483.5				82	31574.9
48+00.00 R1	1	22	2447.1	2447.1	1	5	338.7	338.7	
Station Total:				2447.1				338.7	33683.4

CONTINUE TO SHEET 2 OF 4



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Pharr District Central Design

Texas Department of Transportation

FM 1846
EARTHWORK SUMMARY SHEET

SHEET 1 OF 4

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	CAMERON		39

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Baseline Station	Cut Shrink/ Swell	Station Cut Area	Station Cut Volume	Adjusted Station Cut	Fill Shrink/ Swell	Station Fill Area	Station Fill Volume	Adjusted Station Fill	Mass Ordinate
49+00.00 R1	1	0	1098.1	1098.1	1	0	265.8	265.8	
Station Total:				1098.1				265.8	34515.6
50+00.00 R1	1	2	85.4	85.4	1	29	1431.8	1431.8	
Station Total:				85.4				1431.8	33169.2
51+00.00 R1	1	0	88.9	88.9	1	26	2755.8	2755.8	
Station Total:				88.9				2755.8	30502.3
52+00.00 R1	1	2	102.2	102.2	1	21	2353.1	2353.1	
Station Total:				102.2				2353.1	28251.4
53+00.00 R1	1	7	456.7	456.7	1	16	1819.9	1819.9	
Station Total:				456.7				1819.9	26888.1
54+00.00 R1	1	10	861.5	861.5	1	11	1333.2	1333.2	
Station Total:				861.5				1333.2	26416.5
55+00.00 R1	1	9	930.4	930.4	1	15	1290.5	1290.5	
Station Total:				930.4				1290.5	26056.4
56+00.00 R1	1	7	795.4	795.4	1	16	1533.2	1533.2	
Station Total:				795.4				1533.2	25318.5
57+00.00 R1	1	7	724.2	724.2	1	16	1572.1	1572.1	
Station Total:				724.2				1572.1	24470.6
58+00.00 R1	1	6	656.1	656.1	1	16	1588.9	1588.9	
Station Total:				656.1				1588.9	23537.8
59+00.00 R1	1	6	597.8	597.8	1	13	1464.8	1464.8	
Station Total:				597.8				1464.8	22670.8
60+00.00 R1	1	5	572	572	1	14	1377	1377	
Station Total:				572				1377	21865.9
61+00.00 R1	1	6	599.5	599.5	1	9	1188.7	1188.7	
Station Total:				599.5				1188.7	21276.7
62+00.00 R1	1	6	647.5	647.5	1	10	957	957	
Station Total:				647.5				957	20967.2
63+00.00 R1	1	5	583.2	583.2	1	14	1190.8	1190.8	
Station Total:				583.2				1190.8	20359.6
64+00.00 R1	1	13	926	926	1	8	1123.7	1123.7	
Station Total:				926				1123.7	20161.9
65+00.00 R1	1	5	909.8	909.8	1	13	1066.7	1066.7	
Station Total:				909.8				1066.7	20004.9
66+00.00 R1	1	5	499.1	499.1	1	10	1162	1162	
Station Total:				499.1				1162	19342.1
67+00.00 R1	1	4	472.2	472.2	1	12	1101.4	1101.4	
Station Total:				472.2				1101.4	18712.8
68+00.00 R1	1	5	443.8	443.8	1	13	1240.8	1240.8	
Station Total:				443.8				1240.8	17915.8
69+00.00 R1	1	4	403.2	403.2	1	16	1472.9	1472.9	
Station Total:				403.2				1472.9	16846.1
70+00.00 R1	1	26	1475.7	1475.7	1	8	1201.3	1201.3	
Station Total:				1475.7				1201.3	17120.5
71+00.00 R1	1	4	1508.3	1508.3	1	14	1086.7	1086.7	
Station Total:				1508.3				1086.7	17542
72+00.00 R1	1	4	434.1	434.1	1	16	1526.4	1526.4	
Station Total:				434.1				1526.4	16449.7
73+00.00 R1	1	5	487.8	487.8	1	18	1717.8	1717.8	
Station Total:				331.3				1717.8	15219.6
74+00.00 R1	1	5	502.7	502.7	1	19	1866.9	1866.9	
Station Total: 1/64				502.7				1866.9	13855.4
75+00.00 R1	1	2	363.6	363.6	1	32	2554.2	2554.2	
Station Total: 1/64				363.6				2554.2	11664.8
76+00.00 R1	1	20	1142	1142	1	20	2600.8	2600.8	
Station Total: 1/64				1142				2600.8	10206.1

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STATE OF TEXAS
ABEL MARROQUIN III
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Pharr District Central Design

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FM 1846
EARTHWORK SUMMARY SHEET

SHEET 2 OF 4

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		40

DS: CK: DW: CK:

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Baseline Station	Cut Shrink/ Swell	Station Cut Area	Station Cut Volume	Adjusted Station Cut	Fill Shrink/ Swell	Station Fill Area	Station Fill Volume	Adjusted Station Fill	Mass Ordinate
77+00.00 R1	1	7	1344.4	1344.4	1	16	1825	1825	
Station Total:				1344.4				1825	9725.4
78+00.00 R1	1	12	950.8	950.8	1	13	1443.2	1443.2	
Station Total:				950.8				1443.2	9233.1
79+00.00 R1	1	15	1399.4	1399.4	1	13	1286.3	1286.3	
Station Total:				1399.4				1286.3	9346.2
80+00.00 R1	1	18	1677.3	1677.3	1	14	1378.4	1378.4	
Station Total:				1677.3				1378.4	9645.1
81+00.00 R1	1	27	2237.1	2237.1	1	21	1749.5	1749.5	
Station Total:				2237.1				1749.5	10132.7
82+00.00 R1	1	78	5228.9	5228.9	1	0	1025.5	1025.5	
Station Total:				5228.9				1025.5	14336.2
83+00.00 R1	1	25	5143.2	5143.2	1	16	803.6	803.6	
Station Total:				5143.2				803.6	18675.9
84+00.00 R1	1	24	2441.2	2441.2	1	17	1665.1	1665.1	
Station Total:				2441.2				1665.1	19452
85+00.00 R1	1	27	2554.8	2554.8	1	21	1890.7	1890.7	
Station Total:				2554.8				1890.7	20116.2
86+00.00 R1	1	29	2797.7	2797.7	1	23	2188.7	2188.7	
Station Total:				2797.7				2188.7	20725.2
87+00.00 R1	1	31	2991.3	2991.3	1	24	2352.4	2352.4	
Station Total:				2991.3				2352.4	21364
88+00.00 R1	1	31	3100	3100	1	21	2261.8	2261.8	
Station Total:				3100				2261.8	22202.2
89+00.00 R1	1	31	3106.4	3106.4	1	17	1918	1918	
Station Total:				3106.4				1918	23390.6
90+00.00 R1	1	24	2779.2	2779.2	1	10	1370.2	1370.2	
Station Total:				2779.2				1370.2	24799.6
91+00.00 R1	1	23	2377.9	2377.9	1	23	1692	1692	
Station Total:				2377.9				1692	25485.5
92+00.00 R1	1	24	2360	2360	1	16	1977.7	1977.7	
Station Total:				2360				1977.7	25867.8
93+00.00 R1	1	20	2189.4	2189.4	1	17	1674.7	1674.7	
Station Total:				2189.4				1674.7	26382.5
94+00.00 R1	1	17	1842	1842	1	11	1436.7	1436.7	
Station Total:				1842				1436.7	26787.8
95+00.00 R1	1	20	1827.4	1827.4	1	10	1058.6	1058.6	
Station Total:				1827.4				1058.6	27556.6
96+00.00 R1	1	27	2307.3	2307.3	1	9	922.9	922.9	
Station Total:				2307.3				922.9	28941
97+00.00 R1	1	24	2538	2538	1	8	822	822	
Station Total:				2538				822	30657
98+00.00 R1	1	29	2631.6	2631.6	1	6	689.9	689.9	
Station Total:				2631.6				689.9	32598.7
99+00.00 R1	1	27	2752.6	2752.6	1	10	820.5	820.5	
Station Total:				2752.6				820.5	34530.7
100+00.00 R1	1	46	3640.9	3640.9	1	2	625.4	625.4	
Station Total:				3640.9				625.4	37546.2
101+00.00 R1	1	0	2313.4	2313.4	1	0	105.8	105.8	
Station Total:				2313.4				105.8	39753.8
102+00.00 R1	1	84	4212.7	4212.7	1	1	33.4	33.4	
Station Total:				4212.7				33.4	43933.1
103+00.00 R1	1	35	5956.3	5956.3	1	6	328	328	
Station Total:				5956.3				328	49561.4
104+00.00 R1	1	35	3488	3488	1	0	308.5	308.5	
Station Total:				3488				308.5	52740.9

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STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846
EARTHWORK SUMMARY SHEET

SHEET 3 OF 4

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	CAMERON		41

Baseline Station	Cut Shrink/ Swell	Station Cut Area	Station Cut Volume	Adjusted Station Cut	Fill Shrink/ Swell	Station Fill Area	Station Fill Volume	Adjusted Station Fill	Mass Ordinate
105+00.00 R1	1	26	3042.8	3042.8	1	1	44.5	44.5	
Station Total:				3042.8				44.5	55739.2
106+00.00 R1	1	52	3895.6	3895.6	1	2	153.8	153.8	
Station Total:				3895.6				153.8	59480.9
107+00.00 R1	1	78	6521.3	6521.3	1	5	394.6	394.6	
Station Total:				6521.3				394.6	65607.7
107+27.00 R1	1	1	1076.1	1076.1	1	8	187.6	187.6	
Station Total:				1076.1				187.6	66496.2
Grand Total:			**149031.3 CF 5519.7 CY**				**82535.1 CF 3056.9 CY**		

STATE OF TEXAS
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PROFESSIONAL ENGINEER

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FM 1846 EARTHWORK SUMMARY SHEET

SHEET 4 OF 4

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	CAMERON		42

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 1065-02-039 **DISTRICT** Pharr **COUNTY** Cameron
HIGHWAY FM 1846

			CONTROL SECTION JOB		**1065-02-039**	TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00127953**		
			COUNTY		**Cameron**		
			HIGHWAY		**FM 1846**		
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	100-6002	PREPARING ROW	STA	86.000		86.000	
	104-6017	REMOVING CONC (DRIVEWAYS)	SY	429.000		429.000	
	104-6029	REMOVING CONC (CURB OR CURB & GUTTER)	LF	31.000		31.000	
	104-6054	REMOVING CONCRETE(MOW STRIP)	LF	1,120.000		1,120.000	
	105-6105	REMOVING STAB BASE AND ASPH PAV(15")	SY	47,677.000		47,677.000	
	110-6001	EXCAVATION (ROADWAY)	CY	7,350.000		7,350.000	
	132-6006	EMBANKMENT (FINAL)(DENS CONT)(TY C)	CY	3,146.000		3,146.000	
	160-6005	FURNISHING AND PLACING TOPSOIL	CY	50.000		50.000	
	164-6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	44,780.000		44,780.000	
	164-6041	DRILL SEEDING (TEMP) (WARM)	SY	44,780.000		44,780.000	
	166-6001	FERTILIZER	AC	9.240		9.240	
	168-6001	VEGETATIVE WATERING	MG	10.200		10.200	
	204-6003	SPRINKLING (DUST CONTROL)	MG	938.000		938.000	
	216-6001	PROOF ROLLING	HR	13.000		13.000	
	247-6041	FL BS (CMP IN PLC)(TYA GR1-2)(FNAL POS)	CY	3,797.000		3,797.000	
	251-6159	REWORK BS MATL (TY B)(10")(DC)(ORG POS)	CY	1,586.000		1,586.000	
	251-6206	REWORK BS MATL (TY B) (11")(DENS CONT)	CY	8,075.000		8,075.000	
	260-6043	LIME (HYD, COM OR QK)(SLURRY)	TON	927.000		927.000	
	260-6054	LIME TRT (NEW BASE)(10")	SY	5,735.000		5,735.000	
	260-6084	LIME TRT (SUBGRADE)(12")	SY	46,887.000		46,887.000	
	275-6001	CEMENT	TON	431.000		431.000	
	275-6012	CEMENT TRT (MX EXST MTL & NW BS)(10")	SY	45,954.000		45,954.000	
	305-6043	SALV, HAUL & STKPL RCL ASPH PAV (3"-5")	SY	44,630.000		44,630.000	
	310-6009	PRIME COAT (MC-30)	GAL	9,191.000		9,191.000	
	316-6005	ASPH (TIER II)	GAL	13,786.000		13,786.000	
	316-6486	AGGR (TY-D GR-4P)(SAC-B)	CY	383.000		383.000	
	354-6041	PLANE ASPH CONC PAV (1.5")	SY	300.000		300.000	
	354-6051	PLANE ASPH CONC PAV (0" TO 1 1/2")	SY	890.000		890.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	28.000		28.000	
	464-6038	RC PIPE (CL III)(18 IN)(SPL)	LF	1,042.000		1,042.000	
	464-6060	RC PIPE (CL IV) (24 IN) (SPL)	LF	158.000		158.000	
	464-6061	RC PIPE (CL IV) (30 IN) (SPL)	LF	171.000		171.000	
	464-6062	RC PIPE (CL IV) (36 IN) (SPL)	LF	400.000		400.000	
	465-6126	INLET (COMPL)(PSL)(FG)(3FTX3FT-3FTX3FT)	EA	5.000		5.000	
	465-6140	INLET (COMPL)(PSL)(FG)(6FTX6FT-3FTX3FT)	EA	1.000		1.000	
	467-6363	SET (TY II) (18 IN) (RCP) (6: 1) (P)	EA	42.000		42.000	
	496-6002	REMOV STR (INLET)	EA	2.000		2.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 1065-02-039 **DISTRICT** Pharr **COUNTY** Cameron
HIGHWAY FM 1846

							TOTAL EST.	TOTAL FINAL
			CONTROL SECTION JOB		**1065-02-039**			
			PROJECT ID		**A00127953**			
			COUNTY		**Cameron**			
			HIGHWAY		**FM 1846**			
ALT	**BID CODE**	**DESCRIPTION**		**UNIT**	EST.	FINAL		
	496-6004	REMOV STR (SET)		EA	47.000		47.000	
	496-6007	REMOV STR (PIPE)		LF	1,076.000		1,076.000	
	500-6001	MOBILIZATION		LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING		MO	13.000		13.000	
	506-6021	CONSTRUCTION EXITS (INSTALL) (TY 2)		SY	468.000		468.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)		SY	468.000		468.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)		LF	100.000		100.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)		LF	100.000		100.000	
	506-6041	BIODEG EROSN CONT LOGS (INSTL) (12")		LF	1,120.000		1,120.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)		LF	1,120.000		1,120.000	
	508-6001	CONSTRUCTING DETOURS		SY	5,735.000		5,735.000	
	510-6003	ONE-WAY TRAF CONT (PORT TRAF SIG)		MO	1.000		1.000	
	512-6001	PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)		LF	1,410.000		1,410.000	
	512-6025	PORT CTB (MOVE)(SGL SLP)(TY 1)		LF	1,290.000		1,290.000	
	512-6049	PORT CTB (REMOVE)(SGL SLP)(TY 1)		LF	1,410.000		1,410.000	
	530-6004	DRIVEWAYS (CONC)		SY	543.000		543.000	
	530-6005	DRIVEWAYS (ACP)		SY	1,431.000		1,431.000	
	530-6008	TURNOUTS (ACP)		SY	635.000		635.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)		LF	300.000		300.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE		LF	300.000		300.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)		EA	4.000		4.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)		EA	4.000		4.000	
	545-6003	CRASH CUSH ATTEN (MOVE & RESET)		EA	4.000		4.000	
	545-6005	CRASH CUSH ATTEN (REMOVE)		EA	6.000		6.000	
	545-6019	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)		EA	6.000		6.000	
	560-6014	MAILBOX INSTALL-S (TWG-POST) TY 4		EA	4.000		4.000	
	618-6016	CONDT (PVC) (SCH 40) (1")		LF	277.000		277.000	
	618-6023	CONDT (PVC) (SCH 40) (2")		LF	1,105.000		1,105.000	
	618-6059	CONDT (PVC) (SCH 80) (4") (BORE)		LF	160.000		160.000	
	620-6007	ELEC CONDR (NO.8) BARE		LF	30.000		30.000	
	621-6005	TRAY CABLE (4 CONDR) (12 AWG)		LF	830.000		830.000	
	624-6002	GROUND BOX TY A (122311)W/APRON		EA	12.000		12.000	
	636-6001	ALUMINUM SIGNS (TY A)		SF	104.000		104.000	
	644-6027	IN SM RD SN SUP&AM TYS80(1)SA(P)		EA	7.000		7.000	
	644-6030	IN SM RD SN SUP&AM TYS80(1)SA(T)		EA	5.000		5.000	
	644-6076	REMOVE SM RD SN SUP&AM		EA	12.000		12.000	
	662-6050	WK ZN PAV MRK REMOV (REFL) TY II-A-A		EA	2,049.000		2,049.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 1065-02-039 **DISTRICT** Pharr **COUNTY** Cameron
HIGHWAY FM 1846

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**1065-02-039**			
		PROJECT ID		**A00127953**			
		COUNTY		**Cameron**			
		HIGHWAY		**FM 1846**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	662-6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	22,962.000		22,962.000	
	662-6069	WK ZN PAV MRK REMOV (W)8"(DOT)	LF	829.000		829.000	
	662-6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	60.000		60.000	
	662-6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	40,952.000		40,952.000	
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	1,200.000		1,200.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	1,355.000		1,355.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	700.000		700.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	532.000		532.000	
	666-6141	REFL PAV MRK TY I (Y)12"(SLD)(100MIL)	LF	1,028.000		1,028.000	
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	465.000		465.000	
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	2,676.000		2,676.000	
	666-6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	1,661.000		1,661.000	
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	17,253.000		17,253.000	
	666-6342	REF PROF PAV MRK TY I(W)4"(SLD)(100MIL)	LF	17,427.000		17,427.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	14.000		14.000	
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA	14.000		14.000	
	672-6007	REFL PAV MRKR TY I-C	EA	71.000		71.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	756.000		756.000	
	672-6017	TRAFFIC BUTTON TY Y	EA	756.000		756.000	
	672-6018	TRAFFIC BUTTON TY B	EA	1,531.000		1,531.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	20,141.000		20,141.000	
	677-6003	ELIM EXT PAV MRK & MRKS (8")	LF	700.000		700.000	
	677-6005	ELIM EXT PAV MRK & MRKS (12")	LF	420.000		420.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	39.000		39.000	
	677-6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	12.000		12.000	
	677-6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	6.000		6.000	
	680-6002	INSTALL HWY TRF SIG (ISOLATED)	EA	2.000		2.000	
	680-6004	REMOVING TRAFFIC SIGNALS	EA	2.000		2.000	
	681-6001	TEMP TRAF SIGNALS	EA	3.000		3.000	
	682-6001	VEH SIG SEC (12")LED(GRN)	EA	16.000		16.000	
	682-6002	VEH SIG SEC (12")LED(GRN ARW)	EA	6.000		6.000	
	682-6003	VEH SIG SEC (12")LED(YEL)	EA	20.000		20.000	
	682-6004	VEH SIG SEC (12")LED(YEL ARW)	EA	12.000		12.000	
	682-6005	VEH SIG SEC (12")LED(RED)	EA	18.000		18.000	
	682-6006	VEH SIG SEC (12")LED(RED ARW)	EA	6.000		6.000	
	682-6018	PED SIG SEC (LED)(COUNTDOWN)	EA	6.000		6.000	
	682-6049	BACKPLATE W/REFL BRDR(4 SEC)	EA	6.000		6.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 1065-02-039 **DISTRICT** Pharr **COUNTY** Cameron
HIGHWAY FM 1846

			CONTROL SECTION JOB		**1065-02-039**	TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00127953**		
			COUNTY		**Cameron**		
			HIGHWAY		**FM 1846**		
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	682-6060	BACKPLATE W/REFL BRDR(3 SEC)	EA	16.000		16.000	
	684-6007	TRF SIG CBL (TY A)(12 AWG)(2 CONDR)	LF	1,405.000		1,405.000	
	684-6010	TRF SIG CBL (TY A)(12 AWG)(5 CONDR)	LF	2,906.000		2,906.000	
	684-6012	TRF SIG CBL (TY A)(12 AWG)(7 CONDR)	LF	1,060.000		1,060.000	
	684-6080	TRF SIG CBL (TY C)(14 AWG)(2 CONDR)	LF	2,223.000		2,223.000	
	685-6004	INSTL RDSD FLSH BCN ASSM (SOLAR PWRD)	EA	2.000		2.000	
	685-6006	REMOV RDSD FLSH BCN AM (SOLAR PWRD)	EA	2.000		2.000	
	688-6001	PED DETECT PUSH BUTTON (APS)	EA	6.000		6.000	
	688-6003	PED DETECTOR CONTROLLER UNIT	EA	1.000		1.000	
	688-6004	VEH LP DETECT (SAWCUT)	LF	1,342.000		1,342.000	
	700-6001	POTHOLE REPAIR (STANDARD)	SY	200.000		200.000	
	1008-6002	PRSSR IRRIG PVC PIPE (24")	LF	300.000		300.000	
	3077-6065	SP MIXESSP-DSAC-A PG76-22	TON	7,959.000		7,959.000	
	3077-6075	TACK COAT	GAL	3,300.000		3,300.000	
	5001-6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	46,887.000		46,887.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	2.000		2.000	
	6185-6002	TMA (STATIONARY)	DAY	206.000		206.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	206.000		206.000	
	08	CONTRACTOR FORCE ACCOUNT WORK	LS	1.000		1.000	
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	

SEAL COAT MATERIAL SELECTION TABLE

Contractor:

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

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

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

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

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

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

[ ] Tier 3: Moderate Use (<500 ADT)

Use this materials or any selected Tier 1 or Tier 2 materials combinations of the allowed types

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

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

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

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

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

Texas Department of Transportation
Design Division (Roadway)

SEAL COAT MATERIAL SELECTION TABLE "UNDERSEAL"

FILE: sctable.dgn	DN: TxDOT	CK: AM	DW: BGD	CK:		
	DIST	FEDERAL AID PROJECT				SHEET
REVISIONS September 2020	PHR					47
	COUNTY	CONTROL	SECT	JOB	HIGHWAY	
	CAMERON	1065	02	039	FM 1846	

FILE: PHR\Design Projects\106502039\4 - Design\Plan Set\1. General\FM1846*SC*UNDERSEAL
DATE: 7/13/2021 9:59:32 AM

FM 1846 TRAFFIC CONTROL PLAN GENERAL NOTES & SEQUENCE OF CONSTRUCTION

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 SURFACE TREAT IN ORDER TO REMOVE EXISTING STRIPING.

DO NOT BLOCK DRAINAGE WHEN HANDLING & STOCKPILING EXCAVATED MATERIAL [ADD PLACE BMPs AS DIRECTED].

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

MAINTAIN POSITIVE DRAINAGE DURING ALL PHASES OF CONSTRUCTION.

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

TRAFFIC CONTROL DEVICES:

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

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

PHASE 1 STEP 1

1. INSTALL PROJECT LIMIT SIGNS AND ADVANCE WARNING SIGNS AS SHOWN ON THE TRAFFIC CONTROL PLANS (TCP) AND/OR AS DIRECTED BY THE ENGINEER. INSTALL CROSSROADS BARRICADES/SIGNS AS SHOWN ON THE TCP PLANS OR BC (2)-14. THESE SIGNS SHALL BE ERECTED AND PLACED PRIOR TO COMMENCING ANY CONSTRUCTION AND SHALL REMAIN IN PLACE FOR THE DURATION OF THE PROJECT AND FINAL ACCEPTANCE OF THE PROJECT BY TXDOT. RELOCATE MAILBOXES AND REGULATORY SIGNS AWAY FROM DETOUR TEMPORARILY.
2. ALL SIGNS SHOWN FOR CONSTRUCTION ARE SPACED AT MINIMUM AND MAY BE ADJUSTED DUE TO FIELD CONDITIONS.
3. EXISTING SIGNS THAT ARE IN CONFLICT WITH THE PROPOSED WORK ZONE SIGNS SHALL BE REMOVED OR COVERED.
4. EXISTING STRIPING THAT IS IN CONFLICT WITH THE PROPOSED WORK ZONE PAVEMENT MARKINGS SHALL BE REMOVED.
5. REFER TO THE PUBLIC AND PRIVATE DRIVEWAY TABLES, PLAN LAYOUT, AND SEQUENCE OF CONSTRUCTION FOR ADDITIONAL INFORMATION REGARDING PROPOSED DRIVEWAYS, RCP'S AND SET'S.
6. CONTRACTOR MUST MAINTAIN ACCESS TO PUBLIC/PRIVATE DRIVEWAYS AND CROSS STREETS DURING CONSTRUCTION USING ALL WEATHER MATERIALS AND MUST COORDINATE WITH AFFECTED PROPERTY OWNERS PRIOR TO INSTALLING CRASH CUSHION OPENINGS FOR ACCESS.
7. ALL DETOURS MUST BE CONSTRUCTED TO MATCH THE EXISTING ROADWAY CROSS SLOPE AND PROVIDE POSITIVE DRAINAGE. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING POSITIVE DRAINAGE AT ALL TIMES DURING CONSTRUCTION.
8. CONTRACTOR SHALL TEMPORARILY RELOCATE EXISTING MAILBOXES THAT WIL BE IN CONFLICT WITH TEMPORARY DETOUR AND PROPOSED ROADWAY. CONTRACTOR SHALL REMOVE MATERIAL AS NEEDED TO CONSTRUCT TEMPORARY DETOUR WITHIN THE SAME DAY OF PLACING DETOUR. TXDOT OR CONSTRUCTION PROJECT MANAGER SHALL COORDINATE WITH THE POSTAL SERVICE OFFICE PRIOR TO THE RELOCATION OF TEMPORARY MAILBOXES.
9. EXCESS SALVAGE MATERIAL WILL BE AVAILABLE TO BE USED FOR THE CORRECTION OF SOFT SPOTS ENCOUNTERED IN THE PROJECT LIMITS OR AS APPROVED BY THE ENGINEER.
10. TO ACCOMMODATE THE VARIOUS PHASES OF CONSTRUCTION, CONTRACTOR WILL BE RESPONISIBLE FOR THE TEMPORARY ADJUSTMENTS AND RELOCATION OF EXISTING SIGNAL HEADS, POLES, PRECAST CONCRETE TRAFFIC BARRIER, SIGNING AND ANY OTHER INCIDENTAL WORK NECESSARY TO PROVIDE FOR PROPER TRAFFIC SIGNAL OPERATION. THE ADJUSTMENTS AND RELOCATIONS WILL NOT BE PAID FOR DIRECTLY BUT SHALL BE CONSIDERED SUBSIDIARY TO ITEM 502: "BARRICADES, SIGNS AND TRAFFIC HANDLING".
11. NO PHASE OF CONSTRUCTION SHALL START UNTIL COMPLETION OF THE PREVIOUS PHASE, UNLESS OTHERWISE APPROVED BY THE ENGINEER.
12. INSTALLATION OF IRRIGATION AND CULVERT CROSSINGS SHALL OCCUR DURING OFF PEAK HOURS OR AT THE DISCRETION OF THE ENGINEER. ROADWAY MUST BE BACK IN SERVICE AT THE END OF EACH DAY.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH CAMERON COUNTY IRRIGATION DISTRICT #2 PRIOR TO WORK BEING DONE ON THE IRRIGATION STRUCTURE IMPROVEMENTS. MINIMUM OF ONE WEEK NOTICE.

THE PORTION OF THIS PROJECT WHICH COINCIDES WITH EXISTING ROADS AND/OR PRIVATE DRIVES SHALL BE KEPT OPEN TO TRAFFIC AT ALL TIMES, UNLESS OTHERWISE PROVIDED FOR OR APPROVED BY THE ENGINEER. THE CONTRACTOR WILL BE REQUIRED TO MAINTAIN, AT ALL TIMES, TWO LANES OF EASTBOUND AND WESTBOUND SURFACED MAINLANE ROADWAY, DURING MAINLANE RECONSTRUCTION, UNLESS OTHERWISE NOTED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

FOR THE PURPOSES OF THIS TRAFFIC CONTROL PLAN, THE FOLLOWING DEFINITIONS SHALL APPLY:

PEAK HOURS
MON.-FRI. 6:00 A.M. TO 8:30 A.M.
MON.-FRI. 4:00 P.M. TO 7:00 P.M.
OFF-PEAK HOURS
MON.-FRI. 9:00 A.M. TO 4:00 P.M.
NIGHTTIME HOURS
MON.-FRI. 7:00 P.M. TO 6:00 A.M.
WEEKEND HOURS
FRI. 9:00 A.M. TO MON. 6:00 A.M.

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED
PROFESSIONAL ENGINEER

09/02/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 TRAFFIC CONTROL PLAN GENERAL NOTES & SEQUENCE OF CONSTRUCTION

SHEET 1 OF 2

© 2021	CONT	SECT	JOB	HIGHWAY
DS: CK:	1065	02	039	FM 1846
DW: CK:	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		48

DATE: 9/2/2021 10:50:06 AM
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FM 1846 TRAFFIC CONTROL PLAN GENERAL NOTES & SEQUENCE OF CONSTRUCTION

PHASE 1 STEP 1 (DETOUR)

1. INSTALL PROJECT LIMIT SIGNS AND ADVANCE WARNING SIGNS AS SHOWN ON THE TRAFFIC CONTROL PLANS (TCP) FOR THIS PHASE AND/OR AS DIRECTED BY THE ENGINEER.
2. PLACE EROSION AND SEDIMENT CONTROL DEVICES BEFORE DETOUR CONSTRUCTION.
3. BEGIN WITH THE CONSTRUCTION OF THE PROPOSED DETOUR ON THE RIGHT (EAST) SIDE OF FM 1846 TO THE WIDTHS AND LIMITS SHOWN ON THE TCP TYPICAL SECTIONS AND LAYOUTS. WHEN CONSTRUCTING DETOUR AT RUSSELL LANE INTERSECTION, PROVIDE ADDITIONAL TRAFFIC HANDLING DEVICES AND A MESSAGE BOARD DURING WORK HOURS FOR LANE SHIFTS AND REMOVE AT THE END OF THE DAY TO RETURN TRAFFIC TO NORMAL OPERATION. SEE ALTERNATIVE TRAFFIC CONTROL PLAN FOR WORKING HOURS AT RUSSELL LANE.
4. INSTALL TEMPORARY PIPE AT CROSS CULVERT LOCATIONS AND AS NEEDED TO COMPENSATE FOR DETOURED AREA IN ORDER TO MAINTAIN CROSS DRAINAGE. REMOVE AND RELAY ANY DRIVEWAY RCP IN CONFLICT WITH DETOUR. REGRADE DITCHES TO MAINTAIN EXITING DRAINAGE PATTERS, THE CONTRACTOR WILL BE RESPONSIBLE FOR HANDLING DRAINAGE DURING ALL PHASES OF CONSTRUCTION.

PHASE 1 STEP 2

1. INSTALL TEMPORARY TRAFFIC SIGNALS AND SIGNS AS SHOWN IN THE TCP LAYOUT FOR THIS PHASE AND/OR AS DIRECTED BY THE ENGINEER. IN THIS PHASE, BRIDGE APPROACHES WILL BE RECONSTRUCTED TO MATCH PROPOSED LIMITS AND WIDTHS AS SHOWN IN PHASE 1 STEP 2 TCP. NO WORK TO BE PERFORMED ON THE RCPs OR APRONS AROUND SETs.
2. EXISTING SIGNS THAT ARE CONFLICTING WITH PROPOSED TCP SHALL BE COVERED, ADJUSTED OR REMOVED.
3. INSTALL TEMPORARY TRAFFIC CONTROL CHANNELIZING DEVICES, AND PRECAST CONCRETE TRAFFIC BARRIERS TY I AS CALLED FOR IN THE TCP PLAN SHEETS.
4. INSTALL EROSION AND SEDIMENT CONTROL DEVICES FOR THIS PHASE AS SHOWN IN SW3P LAYOUTS.
5. CONSTRUCT SAN JOSE RANCH ROAD FROM STA. 106+00 TO 107+27 IN ITS ENTIRETY INCLUDING SUBGRADE, BASE, AND FIRST LIFT OF PROPOSED ACP PRIOR TO CONTINUING WITH STEP 2 PROPOSED ACTIVITIES. REFER TO PHASE 1 DETOUR MAP FOR TRAFFIC HANDLING. WORK TO BE COMPLETED DURING NIGHT HOURS TO MINIMIZE DISRUPTION OF TRAFFIC.
6. REMOVE ALL EXISTING CONFLICTING STRIPING AND RAISED REFLECTIVE PAVEMENT MARKERS ON EXISTING ROADWAY WHICH ARE NOT USED AND INSTALL PAVEMENT MARKINGS AS SHOWN ON PHASE 1 STEP 2 TCP LAYOUTS.
7. EXISTING SINGLE GUARDRAIL TERMINAL, METAL BEAM GUARD FENCE, AND THRIE BEAM ARE TO BE REMOVED AND RELOCATED TO THE SAN BENITO MAINTAINANCE OFFICE. BRIDGE IS TO BE MILLED 1.5 INCHES AND OVERLAYED WITH 1.5 INCHES OF SP-D PG76-22 SAC-A ACP FOR THIS PHASE. CONCRETE MOW STRIP IS TO BE REMOVED AND REPLACED BY THE CONTRACTOR UNDER ITEM 432. MATT THICKNESS SHOULD EQUAL THE EXISTING THICKINESS AND RAIL HEIGHT SHOULD REMAIN TO TXDOT STANDARDS.
8. COMMENCE WITH CONSTRUCTION AS SHOWN ON TCP PLAN LAYOUTS FOR THIS PHASE.
9. CONSTRUCT DRIVEWAYS AND THEIR RESPECTIVE DRAINAGE STRUCTURES SHOWN IN PHASE 1 STEP 2 TCP LAYOUTS. SEE PUBLIC AND PRIVATE DRIVEWAY TABLES AND PLAN LAYOUTS FOR MORE INFORMATION.
10. APPLY TEMPORARY SEEDING FOR PHASE 1 STEP 2 LIMITS (SEE SW3P LAYOUTS).
11. STRIPE TRAVEL LANES FOR TRAFFIC AS SHOWN IN THE TCP LAYOUTS FOR PHASE 2.
12. INSTALL EROSION AND SEDIMENT CONTROL DEVICES FOR PHASE 2.
13. CONTRACTOR MUST COMPLETE THIS CURRENT STEP BEFORE PROCEEDING TO PHASE 2.

PHASE 2

1. REMOVE ALL EXISTING CONFLICTING STRIPING AND RAISED REFLECTIVE PAVEMENT MARKERS ON EXISTING ROADWAY WHICH ARE NOT BEING USED AND INSTALL PAVEMENT MARKINGS AS SHOWN ON TCP TYPICAL SECTIONS AND LAYOUTS.
2. INSTALL TEMPORARY TRAFFIC CONTROL CHANNELIZING DEVICES AS SHOWN IN TCP TYPICAL SECTIONS AND LAYOUTS FOR PHASE 2.
3. EXISTING SIGNS THAT ARE CONFLICTING WITH PROPOSED TCP SHALL BE COVERED, ADJUSTED OR REMOVED.

PHASE 2 (CONTINUED)

4. SHIFT TRAFFIC TO RIGHT (EAST) SIDE OF ROADWAY AS PER PHASE 2 LAYOUTS.
5. REMOVE AND SALVAGE PARTS OF EXISTING PAVEMENT WHICH WILL NO LONGER BE REQUIRED FOR HANDLING TRAFFIC.
6. COMMENCE WITH CONSTRUCT OF PROPOSED LEFT (WEST) SIDE OF ROADWAY UP TO 1.5 INCHES OF SP-D PG76-22 SAC-A ACP. PERFORM EARTHWORK OPERATIONS IN CONFORMITY WITH PROPOSED CROSS SECTIONS, LINES, GRADES AND DEPTHS AS SPECIFIED IN THE PLANS FOR THIS PHASE.
7. CONSTRUCT CROSS-DRAINAGE STRUCTURES AS SHOWN ON CROSS CULVERT LAYOUT SHEETS AND AS PER PROPOSED CONSTRUCTION OF ROADWAY.
8. CONSTRUCT THE WEST SIDE OF RUSSELL LANE INTERSECTION DURING NIGHT HOURS TO MINIMIZE DISRUPTION OF TRAFFIC. REFER TO PHASE 2 DETOUR MAP FOR TRAFFIC HANDLING.
9. CONSTRUCT DRIVEWAYS AND THEIR RESPECTIVE DRAINAGE STRUCTURES INCLUDING PIPES AND SETs AS SHOWN ON PHASE 2 LAYOUTS. SEE PUBLIC AND PRIVATE DRIVEWAY TABLES AND PLAN LAYOUTS FOR MORE INFORMATION.
10. APPLY TEMPORARY SEEDING FOR PHASE 2 LIMITS.
11. ONCE PHASE 2 IS COMPLETE, STRIPE WITH WORK ZONE PAVEMENT MARKINGS AND INSTALL EROSION AND SEDIMENT CONTROL DEVICES AS SHOWN IN THE PLANS FOR PHASE 3.
12. ONCE WORK IS COMPLETE AND APPROVED BY THE ENGINEER, REMOVE THE DETOUR SIGNS USED FOR THE INTERSECTION CLOSURE FOR THIS PHASE AND OPEN THE INTERSECTION TO TRAFFIC.

PHASE 3

1. INSTALL TEMPORARY TRAFFIC CONTROL CHANNELIZING DEVICES AS SHOWN IN TCP TYPICAL SECTIONS AND LAYOUTS FOR PHASE 3.
2. EXISTING SIGNS THAT ARE CONFLICTING WITH PROPOSED TCP SHALL BE COVERED, ADJUSTED OR REMOVED.
3. SHIFT TRAFFIC TO NEWLY CONSTRUCTED SIDE OF FM 1846 AS SHOWN IN THE TCP LAYOUTS FOR PHASE 3.
4. REMOVE AND SALVAGE REMAINING PORTIONS OF DETOUR WIDENING WHICH WILL NO LONGER BE REQUIRED FOR HANDLING TRAFFIC AND INCORPORATE INTO THE PROPOSED FLEXBASE. CONSTRUCT THE PROPOSED ROADWAY UP TO 1.5 INCHES OF SP-D PG76-22 SAC-A ACP. PERFORM EARTHWORK OPERATIONS IN CONFORMITY WITH PROPOSED CROSS SECTIONS, LINES, GRADES AND DEPTHS SHOWN IN THE PLANS.
5. CONSTRUCT REMAINING CROSS-DRAINAGE STRUCTURES AS SHOWN ON CROSS CULVERT LAYOUT SHEETS.
6. CONSTRUCT REMAINING DRIVEWAYS AND THEIR RESPECTIVE STRUCTURES INCLUDING PIPES AND SETs AS SHOWN IN PHASE 3 LAYOUTS. SEE PUBLIC AND PRIVATE DRIVEWAY TABLES AND PLAN LAYOUTS FOR MORE INFORMATION.
7. CONSTRUCT THE EAST SIDE OF RUSSELL LANE INTERSECTION DURING NIGHT HOURS TO MINIMIZE DISRUPTION OF TRAFFIC. REFER TO PHASE 3 DETOUR MAP FOR TRAFFIC HANDLING.
8. APPLY TEMPORARY SEEDING FOR PHASE 3 LIMITS.
9. ONCE PHASE 3 IS COMPLETE, STRIPE WITH WORK ZONE PAVEMENT MARKINGS.
10. ONCE WORK IS COMPLETE AND APPROVED BY THE ENGINEER, REMOVE THE DETOUR SIGNS USED FOR THE INTERSECTION CLOSURE FOR THIS PHASE AND OPEN THE INTERSECTION TO TRAFFIC.

PHASE 4

1. PERFORM MILLING/PLANING AS SHOWN ON P&P LAYOUTS AND TEMPORARY STRIPE MILL/PLANED SECTIONS.
2. PLACE FINAL COURSE OF 1.5 INCHES OF SP-D PG76-22 SAC-A ACP TO THE PROPOSED ROADWAY.
3. COMPLETED ROADWAY SECTION SHALL BE DELINEATED WITH GUIDE MARKER TABS AND/OR SHORT-TERM TABS AND SHALL BE PAID FOR UNDER ITEM 662 "WORK ZONE PAVEMENT MARKINGS".
4. INSTALL FINAL STRIPING, SIGNING, AND MAILBOXES.
5. PERMANENT STRIPING SHALL BE DONE AS SPECIFIED ON PLANS AND SHALL BE THERMOPLASTIC (100 MIL.).
6. RAISED PAVEMENT MARKERS AND PERMANENT SIGNING SHALL BE PLACED IN ACCORDANCE WITH PLANS AND SPECIFICATIONS.
7. PRIOR TO FINAL WRITING ACCEPTANCE, THE CONTRACTOR SHALL REMOVE ALL TEMPORARY STRIPING, BARRICADES, AND SIGNS AND OPEN ALL TRAVEL LANES TO TRAFFIC BUT MUST LEAVE IN PLACE THE PROJECT ADVANCE WARNING SIGNS.
8. PROJECT ADVANCE WARNING SIGNS TO BE REMOVED ONLY AFTER FINAL WRITING ACCEPTANCE.
9. APPLY FINAL PERMANENT SEEDING AND PERFORM FINAL CLEANUP.

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED
PROFESSIONAL ENGINEER

09/02/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 TRAFFIC CONTROL PLAN GENERAL NOTES & SEQUENCE OF CONSTRUCTION

SHEET 2 OF 2

© 2021		CONT	SECT	JOB	HIGHWAY
DS:	CK:	1065	02	039	FM 1846
		DIST	COUNTY		SHEET NO.
DW:	CK:	PHR	CAMERON		49

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R20-3T
48" X 42"

1

G20-10T
60" X 48"

2

G20-9TP
24" X 24"

R20-5T
24" X 30"

R20-5aTP
24" X 12"

3

CW20-1D
48" X 48"

4

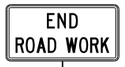
G20-5T
48" X 24"

G20-6T
48" X 30"

5

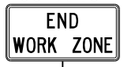
R4-1
24" X 30"

6



G20-2
36"x18"

7



G20-2bT
36" X 18"

8

R10-6L
24" X 36"

9


CW1-4L
36" X 36"

10


CW1-4R
36" X 36"

10A

CW3-4
36" X 36"

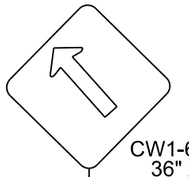
11

R3-5R
30" X 36"

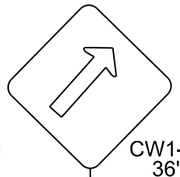
12

R6-1R
36" X 12"

13


CW1-6aT(LT)
36" X 36"

14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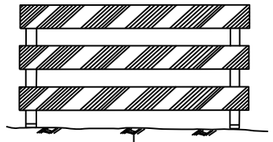
15


TY 3 (C) BARRICADE

16


R3-1
36"x36"

20


R3-2
36"x36"

21

R11-2
48"x30"

22

R11-2
48"x30"

M4-10L
48"x18"

23

CW20-2D
48"x48"

24

CW20-3D
48"x48"

25

CW20-3C
48"x48"

26

CW20-3B
48"x48"

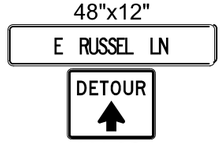
27

M4-9S
30"x24"

28

M4-8a
24"x18"

29



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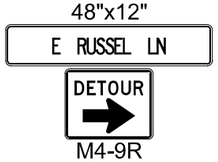
48"x12"

M4-9S
30"x24"

30



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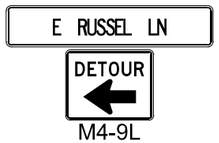
M4-9R
30"x24"

31



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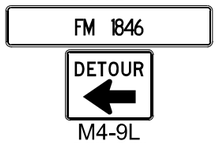
M4-9L
30"x24"

32



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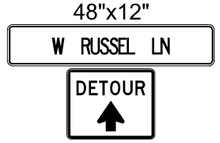
M4-9L
30"x24"

32A



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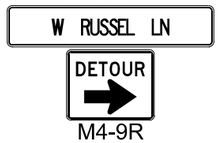
M4-9S
30"x24"

33



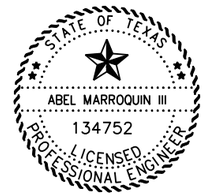
M4-12T
48"x12"

M4-9R
30"x24"

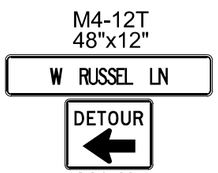
34

NOTES:

1. SIGN NUMBERS 17-19 ARE OMITTED



09/02/2021



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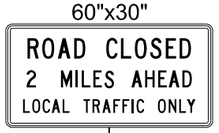
48"x12"

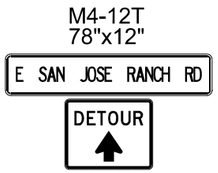
M4-9L
30"x24"

35



R11-3a
60"x30"

36



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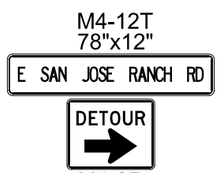
78"x12"

M4-9S
30"x24"

37



M4-12T
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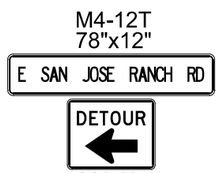
M4-9R
30"x24"

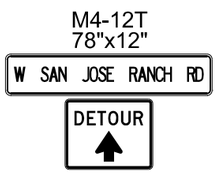
38



M4-12T
78"x12"

M4-9L
30"x24"

39



M4-12T
78"x12"

M4-9S
30"x24"

40

M4-12T
78"x12"

M4-9R
30"x24"

41

M4-12T
78"x12"

M4-9L
30"x24"

42

Pharr District Central Design

Texas Department of Transportation

FM 1846
TRAFFIC CONTROL PLAN - SIGN SUMMARY SHEET

NOT TO SCALE — SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		50

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LOC NO.	TCP PHASE	PLAN SHEET NUMBER	LOCATION	STA	TEST LEVEL	DIRECTION OF TRAFFIC (UNI/BI)	FOUNDATION PAD		BACKUP SUPPORT			AVAILABLE SITE LENGTH	CRASH CUSHION									
															MOVE / RESET		L	L	R	R	S	S
							PROPOSED MATERIAL	PROPOSED THICKNESS	DESCRIPTION	WIDTH	HEIGHT		INSTALL	REMOVE	MOVE/ RESET	FROM LOC.#	N	W	N	W	N	W
1	PHASE 1 STEP 2	68	FM 1846 EASTBOUND	91+81	3	BI	NOTE 1	NOTE 1	PCTB	24"	3'-6"	25'-3"	1								X	
2	PHASE 1 STEP 2	68	FM 1846 WESTBOUND	93+91	3	BI	NOTE 1	NOTE 1	PCTB	24"	3'-6"	25'-3"	1								X	
3	PHASE 1 STEP 2	68	FM 1846 EASTBOUND	95+11	3	BI	NOTE 1	NOTE 1	PCTB	24"	3'-6"	25'-3"	1								X	
4	PHASE 1 STEP 2	68	FM 1846 WESTBOUND	105+92	3	BI	NOTE 1	NOTE 1	PCTB	24"	3'-6"	25'-3"	1								X	
5	PHASE 2	83	FM 1846 EASTBOUND	91+14	3	BI	NOTE 1	NOTE 1	PCTB	24"	3'-6"	25'-3"			1	1						
6	PHASE 2	83	FM 1846 WESTBOUND	94+14	3	BI	NOTE 1	NOTE 1	PCTB	24"	3'-6"	25'-3"			1	2					X	
7	PHASE 2	83	FM 1846 EASTBOUND	95+34	3	BI	NOTE 1	NOTE 1	PCTB	24"	3'-6"	25'-3"			1	3					X	
8	PHASE 2	83	FM 1846 WESTBOUND	105+24	3	BI	NOTE 1	NOTE 1	PCTB	24"	3'-6"	25'-3"			1	4					X	
9	PHASE 2	83	FM 1846 EASTBOUND	106+14	3	BI	NOTE 1	NOTE 1	PCTB	24"	3'-6"	25'-3"	1								X	
10	PHASE 2	83	FM 1846 WESTBOUND	107+34	3	BI	NOTE 1	NOTE 1	PCTB	24"	3'-6"	25'-3"	1									
11	PHASE 3		FM 1846 EASTBOUND	90+93	3	BI	NOTE 1	NOTE 1	PCTB	24"	3'-6"	25'-3"		1		5						
12	PHASE 3		FM 1846 WESTBOUND	94+14	3	BI	NOTE 1	NOTE 1	PCTB	24"	3'-6"	25'-3"		1		6						
13	PHASE 3		FM 1846 EASTBOUND	95+13	3	BI	NOTE 1	NOTE 1	PCTB	24"	3'-6"	25'-3"		1		7						
14	PHASE 3		FM 1846 WESTBOUND	105+24	3	BI	NOTE 1	NOTE 1	PCTB	24"	3'-6"	25'-3"		1		8						
15	PHASE 3		FM 1846 EASTBOUND	105+93	3	BI	NOTE 1	NOTE 1	PCTB	24"	3'-6"	25'-3"		1		9						
16	PHASE 3		FM 1846 WESTBOUND	107+34	3	BI	NOTE 1	NOTE 1	PCTB	24"	3'-6"	25'-3"		1		10						
												TOTALS	6	6	4							

LEGEND:
L=LOW MAINTENANCE
R=REUSABLE
S=SACRIFICIAL
N=NARROW
W=WIDE

NOTE 1: SEE STANDADARD OPTIONS.
FOR DEFINITIONS SEE THE "CRASH CUSHION CATEGORIZATION CHART.PDF" AT THE DESIGN DIVISION (ROADWAY STANDARDS) WEBSITE. USE QUICK LINKS TO ACCESS ATTENUATORS / CRASH CUSHIONS SECTION.
http://www.dot.state.tx.us/insdtdot/orgchart/cmd/cserve/standard/rdwyise.htm

CRASH CUSHION SUMMARY SHEET

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© TxDOT	CONT	SECT	JOB	HIGHWAY
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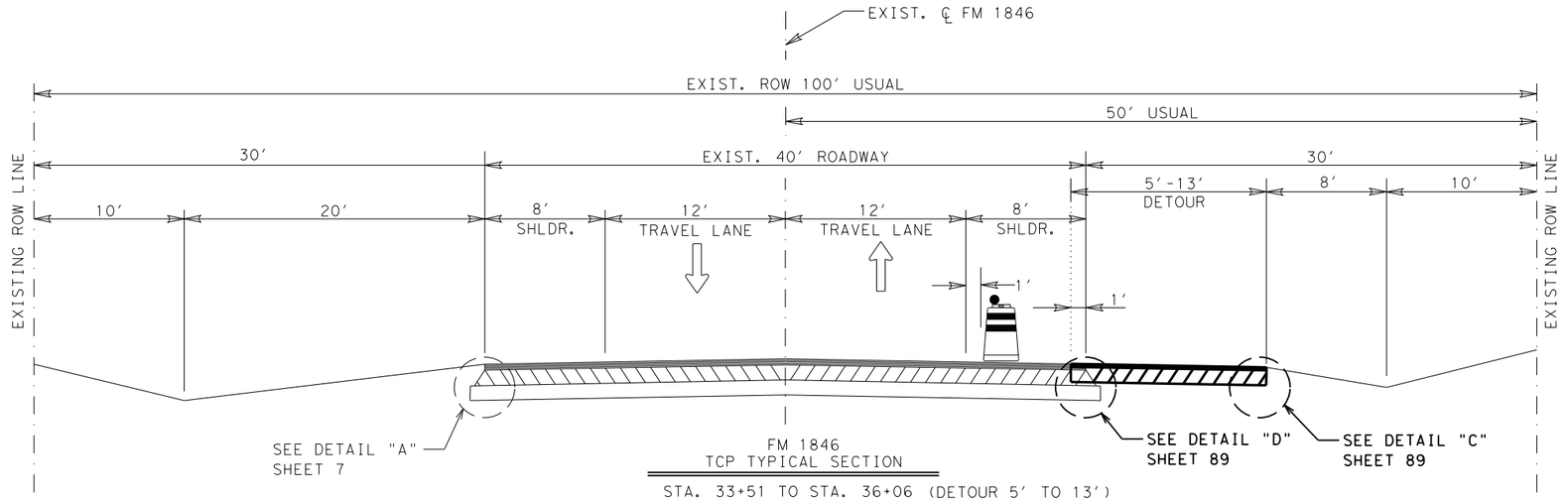
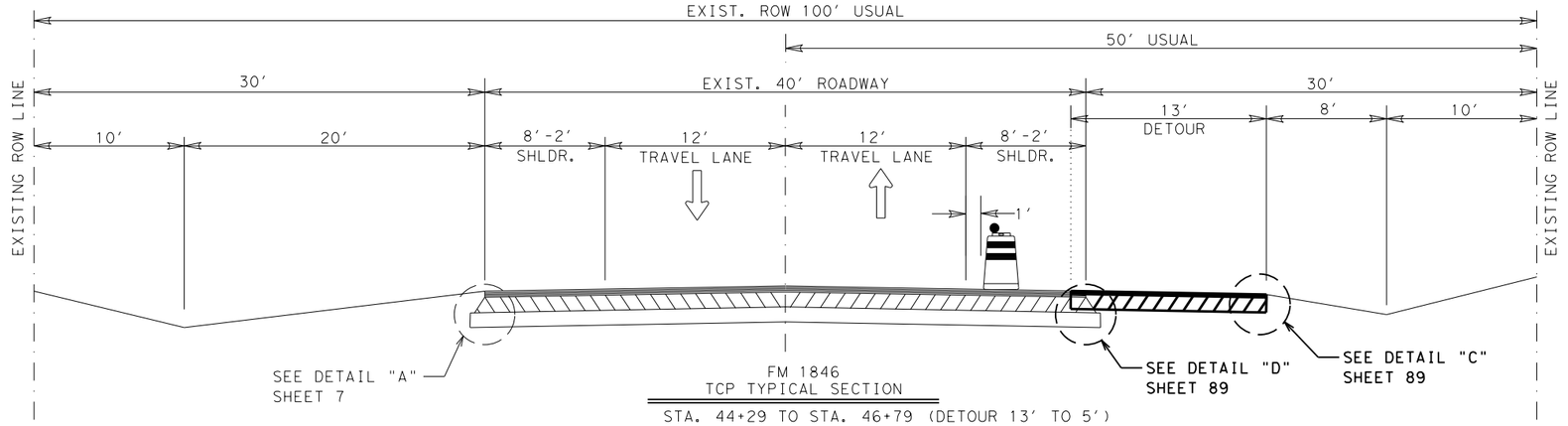
	DIST	COUNTY	
	PHR	CAMERON	
	FEDERAL AID PROJECT		SHEET NO.
			51



FM 1846
TCP TYPICAL SECTION

STA. 33+51 TO STA. 36+06 (DETOUR 5' TO 13')
STA. 36+06 TO STA. 44+29 (DETOUR 13')
STA. 50+83 TO STA. 54+08 (DETOUR 5' TO 13')
STA. 54+08 TO STA. 74+92 (DETOUR 13')



FM 1846
TCP TYPICAL SECTION

STA. 44+29 TO STA. 46+79 (DETOUR 13' TO 5')

LEGEND:

(3) PROPOSED 1.5" SP-D PG76-22 (SAC-A) ACP (1ST LIFT)
(4) PROPOSED 1 COURSE UNDER SEAL
(5) PROPOSED MC-30 (0.2 GAL/SY)
(6) PROPOSED 10.0" TY-A GR-1/2 BASE W/2% CEMENT BY WEIGHT
(7) PROPOSED 1-TYII GEOGRID
(8) PROPOSED 12.0" STABILIZED SUBGRADE W/4% LIME BY WEIGHT

BZ - BUFFER ZONE
CA - CONSTRUCTION AREA
ACP - ASPHALT CONCRETE PAVEMENT
CONS - CONSTRUCTION
RDWY - ROADWAY
TRANS - TRANSITION
P.C. - PREVIOUSLY CONSTRUCTED
#% - EXISTING CROSS SLOPE
#% - PROPOSED CROSS SLOPE
- PLASTIC BARREL W/REFLECTOR
- CONCRETE TRAFFIC BARRIER W/REFLECTORS

* ALTERNATE TRAFFIC CONTROL PLAN DURING WORKING HOURS SHEETS 56 AND 62

NOTES:

1. SEE PROPOSED TRAFFIC CONTROL PLAN LAYOUTS FOR LANE STRIPING DIMENSIONS, STATIONING AND TRANSITIONS.
2. DETOUR TO TIE-IN 1 FOOT TO EXISTING PAVEMENT.
3. AREAS WHERE DETOUR IS 5 FEET IN TOTAL WIDTH, THE TIE-IN TO EXISTING PAVEMENT WILL BE 3 FEET.
4. MILLING FOR DETOUR TIE-IN WILL BE SUBSIDIARY TO ITEM 508.

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 TRAFFIC CONTROL PLAN - TYPICAL SECTIONS PHASE 1 STEP 1

NOT TO SCALE — SHEET 1 OF 3

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	CAMERON		52

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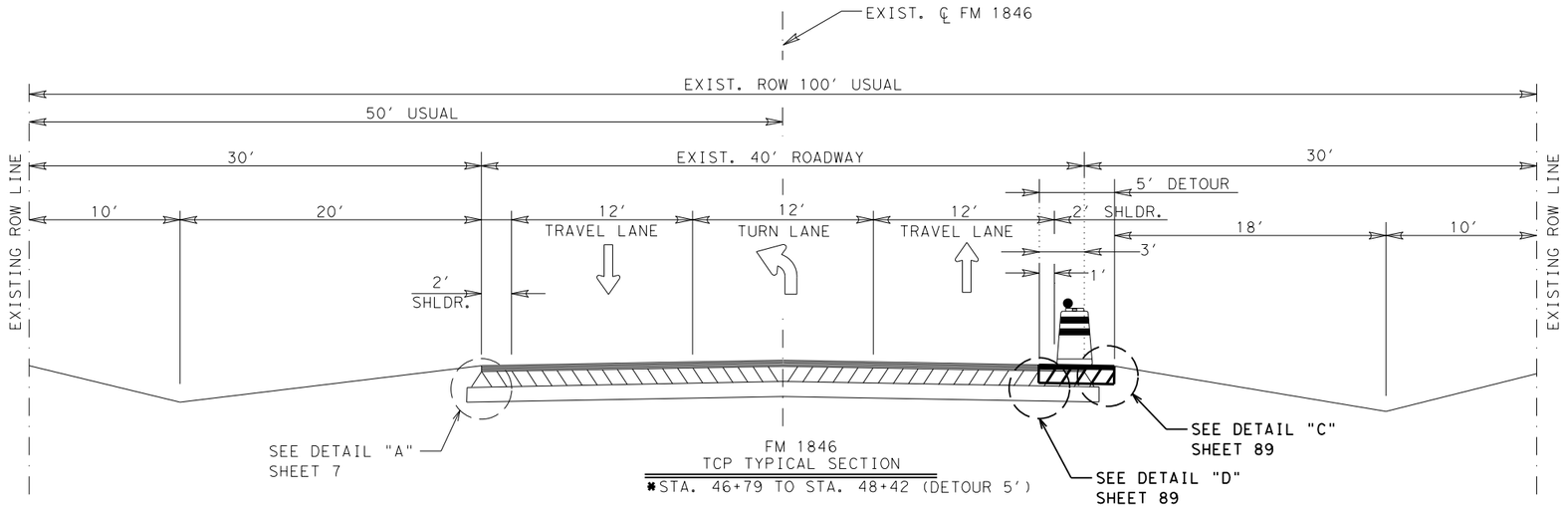
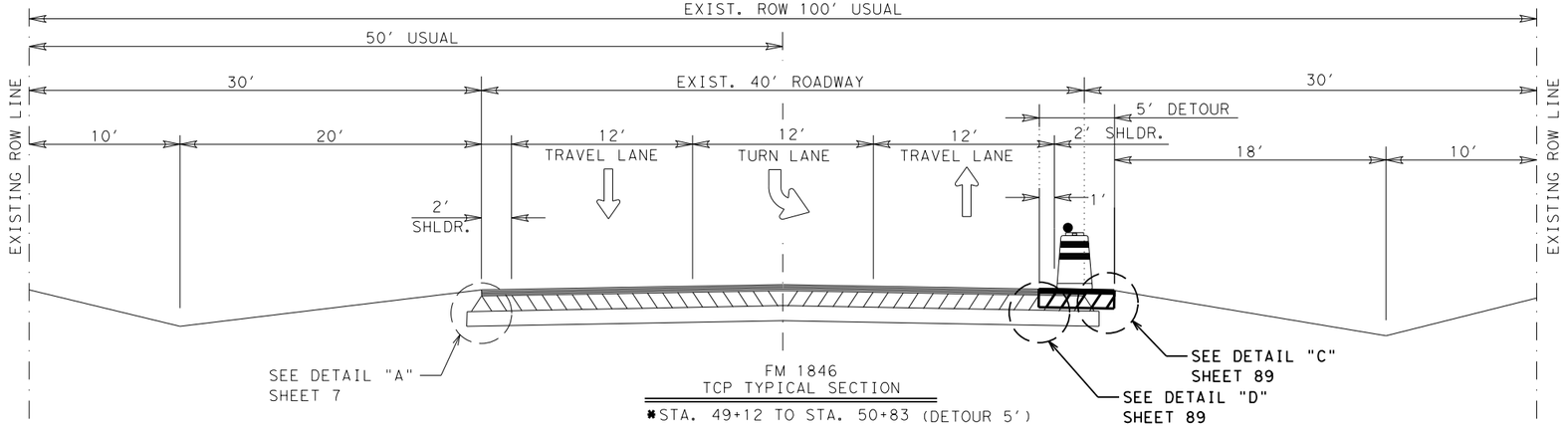


FM 1846
TCP TYPICAL SECTION
*STA. 46+79 TO STA. 48+42 (DETOUR 5')



FM 1846
TCP TYPICAL SECTION
*STA. 49+12 TO STA. 50+83 (DETOUR 5')

LEGEND:

(3) PROPOSED 1.5" SP-D PG76-22 (SAC-A) ACP (1ST LIFT)
(4) PROPOSED 1 COURSE UNDER SEAL
(5) PROPOSED MC-30 (0.2 GAL/SY)
(6) PROPOSED 10.0" TY-A GR-1/2 BASE W/2% CEMENT BY WEIGHT
(7) PROPOSED 1-TYII GEOGRID
(8) PROPOSED 12.0" STABILIZED SUBGRADE W/4% LIME BY WEIGHT

BZ - BUFFER ZONE
CA - CONSTRUCTION AREA
ACP - ASPHALT CONCRETE PAVEMENT
CONS - CONSTRUCTION
RDWY - ROADWAY
TRANS - TRANSITION
P.C. - PREVIOUSLY CONSTRUCTED
#% - EXISTING CROSS SLOPE
#% - PROPOSED CROSS SLOPE

- PLASTIC BARREL W/REFLECTOR
- CONCRETE TRAFFIC BARRIER W/REFLECTORS

* ALTERNATE TRAFFIC CONTROL PLAN DURING WORKING HOURS SHEETS 56 AND 62

NOTES:

1. SEE PROPOSED TRAFFIC CONTROL PLAN LAYOUTS FOR LANE STRIPING DIMENSIONS, STATIONING AND TRANSITIONS.
2. DETOUR TO TIE-IN 1 FOOT TO EXISTING PAVEMENT.
3. AREAS WHERE DETOUR IS 5 FEET IN TOTAL WIDTH, THE TIE-IN TO EXISTING PAVEMENT WILL BE 3 FEET.
4. MILLING FOR DETOUR TIE-IN WILL BE SUBSIDIARY TO ITEM 508.

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 TRAFFIC CONTROL PLAN - TYPICAL SECTIONS PHASE 1 STEP 1

NOT TO SCALE — SHEET 2 OF 3

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	CAMERON		53

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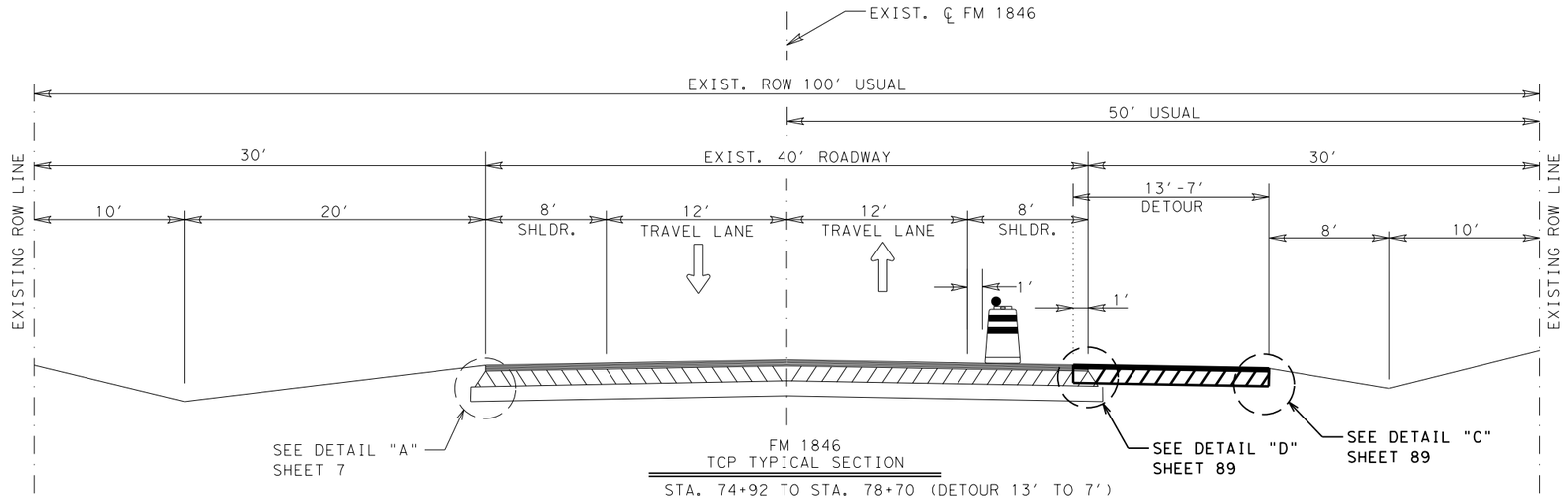
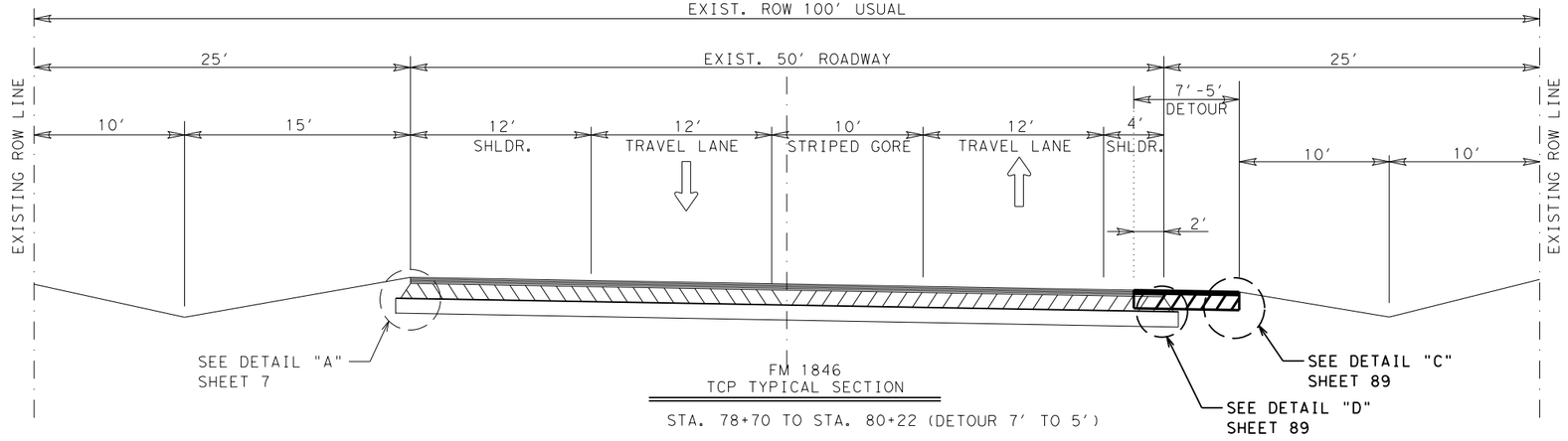


FM 1846
TCP TYPICAL SECTION

STA. 74+92 TO STA. 78+70 (DETOUR 13' TO 7')



FM 1846
TCP TYPICAL SECTION

STA. 78+70 TO STA. 80+22 (DETOUR 7' TO 5')

LEGEND:

(3) PROPOSED 1.5" SP-D PG76-22 (SAC-A) ACP (1ST LIFT)
(4) PROPOSED 1 COURSE UNDER SEAL
(5) PROPOSED MC-30 (0.2 GAL/SY)
(6) PROPOSED 10.0" TY-A GR-1/2 BASE W/2% CEMENT BY WEIGHT
(7) PROPOSED 1-TYII GEOGRID
(8) PROPOSED 12.0" STABILIZED SUBGRADE W/4% LIME BY WEIGHT

BZ - BUFFER ZONE
CA - CONSTRUCTION AREA
ACP - ASPHALT CONCRETE PAVEMENT
CONS - CONSTRUCTION
RDWY - ROADWAY
TRANS - TRANSITION
P.C. - PREVIOUSLY CONSTRUCTED
#% - EXISTING CROSS SLOPE
#% - PROPOSED CROSS SLOPE
- PLASTIC BARREL W/REFLECTOR
- CONCRETE TRAFFIC BARRIER W/REFLECTORS

* ALTERNATE TRAFFIC CONTROL PLAN DURING WORKING HOURS SHEETS 56 AND 62

NOTES:

1. SEE PROPOSED TRAFFIC CONTROL PLAN LAYOUTS FOR LANE STRIPING DIMENSIONS, STATIONING AND TRANSITIONS.
2. DETOUR TO TIE-IN 1 FOOT TO EXISTING PAVEMENT.
3. AREAS WHERE DETOUR IS 5 FEET IN TOTAL WIDTH, THE TIE-IN TO EXISTING PAVEMENT WILL BE 3 FEET.
4. MILLING FOR DETOUR TIE-IN WILL BE SUBSIDIARY TO ITEM 508.

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 TRAFFIC CONTROL PLAN - TYPICAL SECTIONS PHASE 1 STEP 1

NOT TO SCALE — SHEET 3 OF 3

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	CAMERON		54

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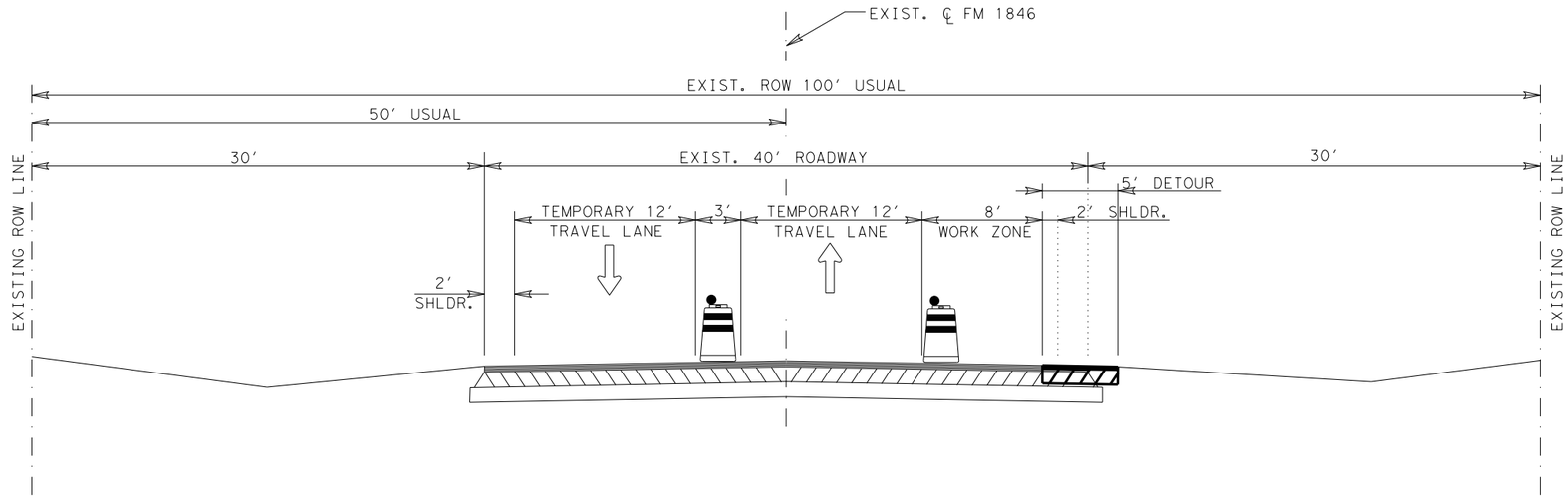

FM 1846
TEMPORARY TYPICAL SECTION
(DURING WORK HOURS)

LEGEND:

(3) PROPOSED 1.5" SP-D PG76-22 (SAC-A) ACP (1ST LIFT)
(4) PROPOSED 1 COURSE UNDER SEAL
(5) PROPOSED MC-30 (0.2 GAL/SY)
(6) PROPOSED 10.0" TY-A GR-1/2 BASE W/2% CEMENT BY WEIGHT
(7) PROPOSED 1-TYII GEOGRID
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BZ - BUFFER ZONE
CA - CONSTRUCTION AREA
ACP - ASPHALT CONCRETE PAVEMENT
CONS - CONSTRUCTION
RDWY - ROADWAY
TRANS - TRANSITION
P.C. - PREVIOUSLY CONSTRUCTED
#% - EXISTING CROSS SLOPE
#% - PROPOSED CROSS SLOPE

- PLASTIC BARREL W/REFLECTOR
- CONCRETE TRAFFIC BARRIER W/REFLECTORS

* ALTERNATE TRAFFIC CONTROL PLAN DURING WORKING HOURS SHEETS 56 AND 62

NOTES:

1. SEE PROPOSED TRAFFIC CONTROL PLAN LAYOUTS FOR LANE STRIPING DIMENSIONS, STATIONING AND TRANSITIONS.

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FM 1846 TRAFFIC CONTROL PLAN - TEMPORARY TYPICAL SECTION

NOT TO SCALE — SHEET 1 OF 1

© 2021	CONT	SECT	JOB	HIGHWAY
DS: CK:	1065	02	039	FM 1846
	DIST	COUNTY		SHEET NO.
DW: CK:	PHR	CAMERON		55

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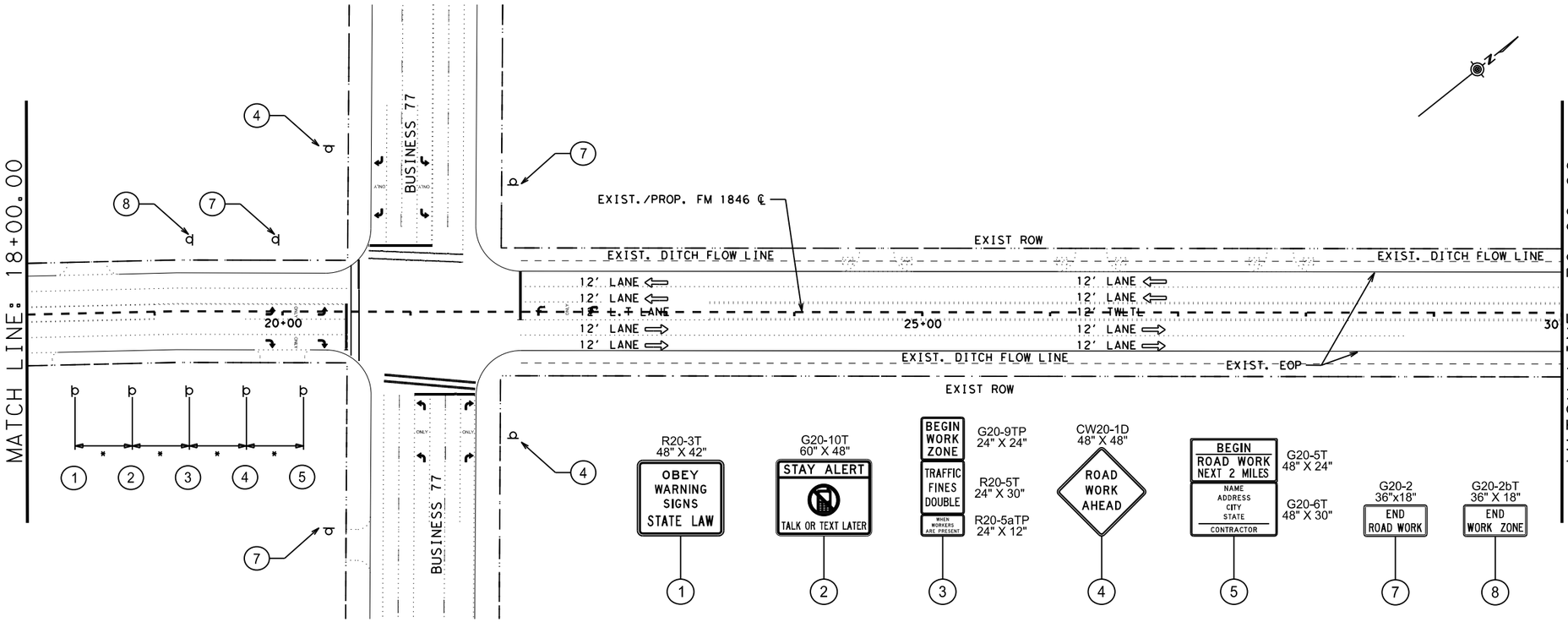
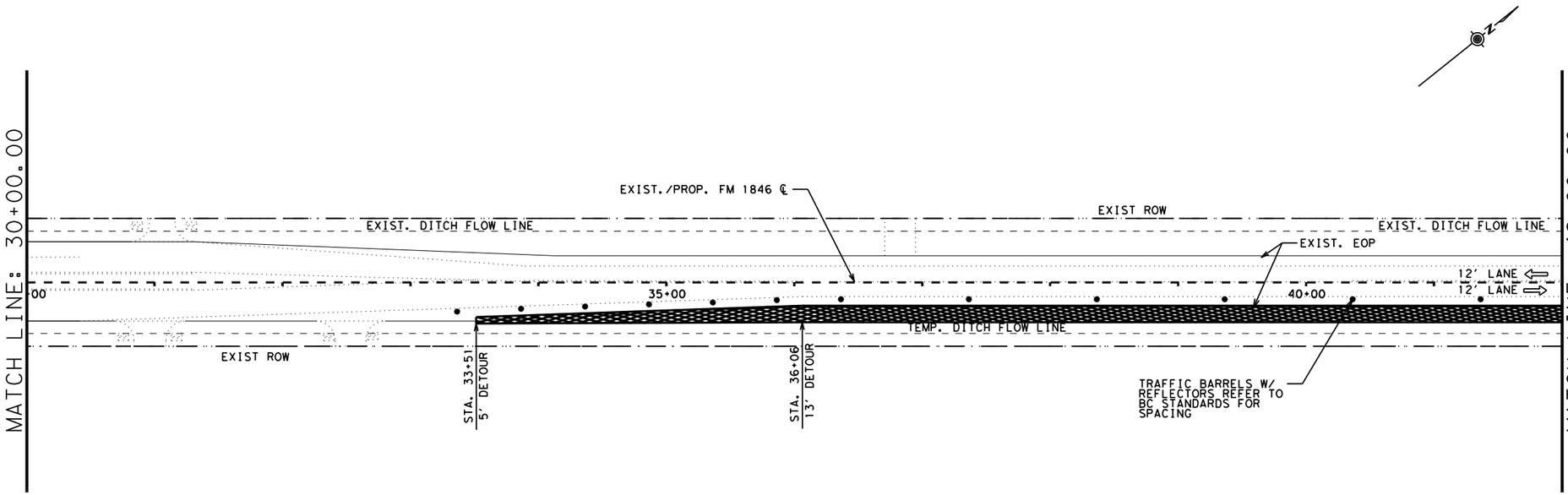


LEGEND

- CONSTRUCTION AREA
- BRIDGE CONSTRUCTION
- PROPOSED DETOUR
- PREVIOUSLY CONSTRUCTED
- [A] WK ZN PVMT MARK (REM) 4" WHITE SOLID
- [B] WK ZN PVMT MARK (REM) 4" YELLOW SOLID
- [C] WK ZN PVMT MARK (REM) 4" WHITE BROKEN
- [D] WK ZN PVMT MARK (REM) 4" YELLOW BROKEN
- [E] WK ZN PVMT MARK (REM) (REFL) TY II-A-A
- [F] WK ZN PVMT MARK (REM) (REFL) TY I-C
- [G] WK ZN PVMT MARK (NON-REM) 4" WHITE SOLID
- [H] WK ZN PVMT MARK (NON-REM) 4" YELLOW SOLID
- [I] WK ZN PVMT MARK (REM) 8" WHITE SOLID
- [J] WK ZN PVMT MARK (REM) 24" WHITE SOLID
- [K] WK ZN PAMT MARK (REM) 8" WHITE DOT
- * REFER TO BC(2)-14 STANDARDS FOR SIGN SPACING
- DIRECTION OF TRAFFIC FLOW
- d PROPOSED SIGN
- PROPOSED TYPE 3 (C) BARRICADES
- PLASTIC DRUM W/REFLECTORS
- PORTABLE CONCRETE TRAFFIC BARRIER W/REFLECTORS (PTCB)
- CRASH CUSHION ATTENUATOR-TL3
- TEMPORARY SIGNAL

NOTES:

1. PROJECT LIMITS AND ADVANCE WARNING SIGNS SHALL BE IN PLACE BEFORE COMMENCING CONSTRUCTION AND SHALL REMAIN IN PLACE THROUGHOUT THE DURATION OF CONSTRUCTION UNTIL THE PROJECT IS COMPLETED AND ACCEPTED BY TXDOT.
2. ALL SIGNS SHOWN FOR CONSTRUCTION ARE SPACED AT MINIMUM AND MAY BE ADJUSTED DUE TO FIELD CONDITIONS.
3. ALL STATIONING/ALIGNMENTS ARE FOR REFERENCE PURPOSES ONLY.
4. EXISTING STRIPING THAT IS IN CONFLICT WITH THE PROPOSED WK ZN PAVEMENT MARKINGS SHALL BE REMOVED.
5. EXISTING SIGNS THAT ARE IN CONFLICT WITH THE PROPOSED WK ZN SIGNS SHALL BE REMOVED OR COVERED.



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134752
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07/13/2021

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Texas Department of Transportation

FM 1846 TRAFFIC CONTROL PLAN LAYOUT PHASE 1 STEP 1 (DETOUR)

1" = 100' SHEET 1 OF 5

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	CAMERON		56

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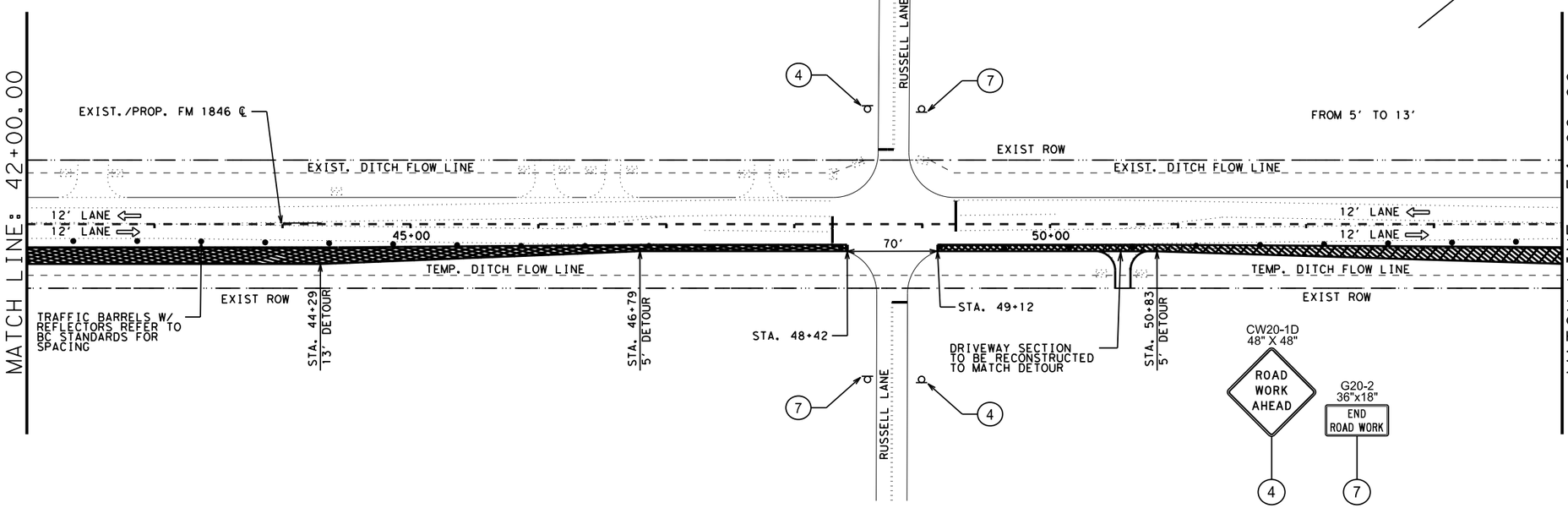

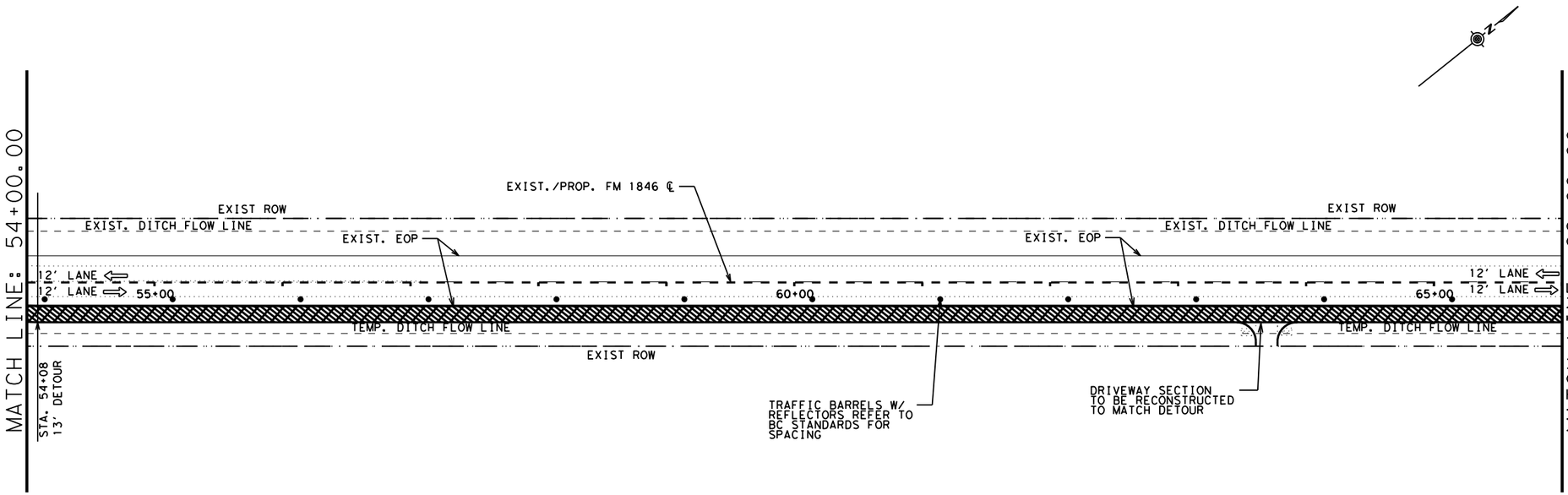

LEGEND

- CONSTRUCTION AREA
- BRIDGE CONSTRUCTION
- PROPOSED DETOUR
- PREVIOUSLY CONSTRUCTED
- [A] WK ZN PVMT MARK (REM) 4" WHITE SOLID
- [B] WK ZN PVMT MARK (REM) 4" YELLOW SOLID
- [C] WK ZN PVMT MARK (REM) 4" WHITE BROKEN
- [D] WK ZN PVMT MARK (REM) 4" YELLOW BROKEN
- [E] WK ZN PVMT MARK (REM) (REFL) TY II-A-A
- [F] WK ZN PVMT MARK (REM) (REFL) TY I-C
- [G] WK ZN PVMT MARK (NON-REM) 4" WHITE SOLID
- [H] WK ZN PVMT MARK (NON-REM) 4" YELLOW SOLID
- [I] WK ZN PVMT MARK (REM) 8" WHITE SOLID
- [J] WK ZN PVMT MARK (REM) 24" WHITE SOLID
- [K] WK ZN PAMT MARK (REM) 8" WHITE DOT
- * REFER TO BC(2)-14 STANDARDS FOR SIGN SPACING
- DIRECTION OF TRAFFIC FLOW
- PROPOSED SIGN
- PROPOSED TYPE 3 (C) BARRICADES
- PLASTIC DRUM W/REFLECTORS
- PORTABLE CONCRETE TRAFFIC BARRIER W/REFLECTORS (PTCB)
- CRASH CUSHION ATTENUATOR-TL3
- TEMPORARY SIGNAL

NOTES:

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2. ALL SIGNS SHOWN FOR CONSTRUCTION ARE SPACED AT MINIMUM AND MAY BE ADJUSTED DUE TO FIELD CONDITIONS.
3. ALL STATIONING/ALIGNMENTS ARE FOR REFERENCE PURPOSES ONLY.
4. EXISTING STRIPING THAT IS IN CONFLICT WITH THE PROPOSED WK ZN PAVEMENT MARKINGS SHALL BE REMOVED.
5. EXISTING SIGNS THAT ARE IN CONFLICT WITH THE PROPOSED WK ZN SIGNS SHALL BE REMOVED OR COVERED.

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Texas Department of Transportation

FM 1846 TRAFFIC CONTROL PLAN LAYOUT PHASE 1 STEP 1 (DETOUR)

1" = 100' SHEET 2 OF 5

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
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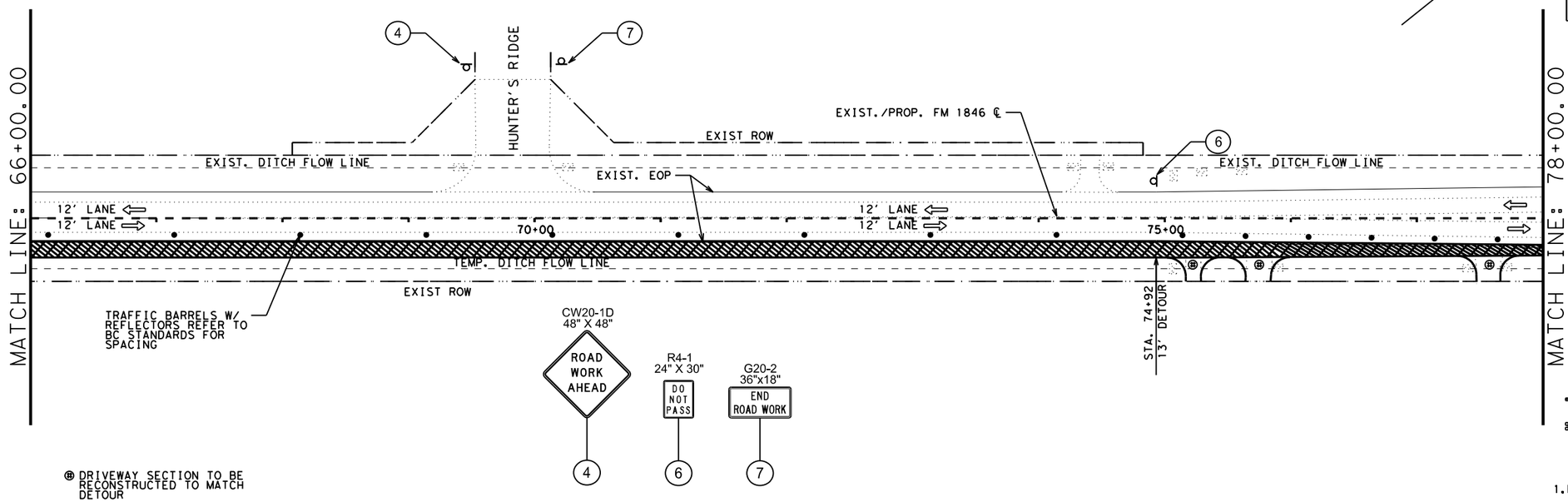
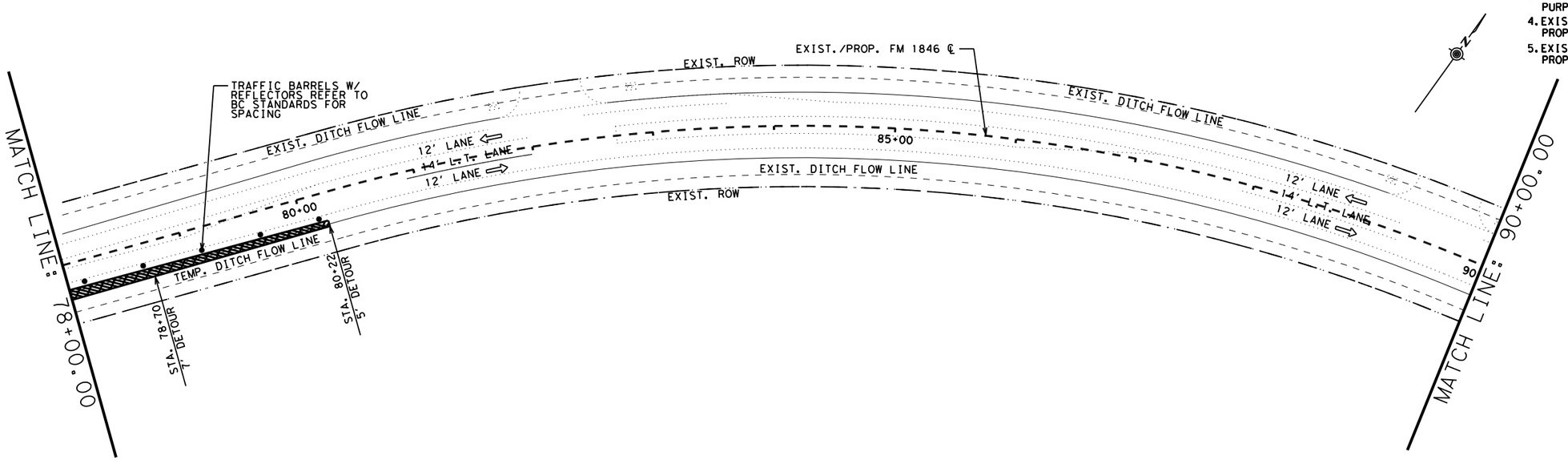


LEGEND

- CONSTRUCTION AREA
- BRIDGE CONSTRUCTION
- PROPOSED DETOUR
- PREVIOUSLY CONSTRUCTED
- [A] WK ZN PVMT MARK (REM) 4" WHITE SOLID
- [B] WK ZN PVMT MARK (REM) 4" YELLOW SOLID
- [C] WK ZN PVMT MARK (REM) 4" WHITE BROKEN
- [D] WK ZN PVMT MARK (REM) 4" YELLOW BROKEN
- [E] WK ZN PVMT MARK (REM) (REFL) TY II-A-A
- [F] WK ZN PVMT MARK (REM) (REFL) TY I-C
- [G] WK ZN PVMT MARK (NON-REM) 4" WHITE SOLID
- [H] WK ZN PVMT MARK (NON-REM) 4" YELLOW SOLID
- [I] WK ZN PVMT MARK (REM) 8" WHITE SOLID
- [J] WK ZN PVMT MARK (REM) 24" WHITE SOLID
- [K] WK ZN PAMT MARK (REM) 8" WHITE DOT
- * REFER TO BC(2)-14 STANDARDS FOR SIGN SPACING
- DIRECTION OF TRAFFIC FLOW
- PROPOSED SIGN
- PROPOSED TYPE 3 (C) BARRICADES
- PLASTIC DRUM W/REFLECTORS
- PORTABLE CONCRETE TRAFFIC BARRIER W/REFLECTORS (PTCB)
- CRASH CUSHION ATTENUATOR-TL3
- TEMPORARY SIGNAL

NOTES:

1. PROJECT LIMITS AND ADVANCE WARNING SIGNS SHALL BE IN PLACE BEFORE COMMENCING CONSTRUCTION AND SHALL REMAIN IN PLACE THROUGHOUT THE DURATION OF CONSTRUCTION UNTIL THE PROJECT IS COMPLETED AND ACCEPTED BY TXDOT.
2. ALL SIGNS SHOWN FOR CONSTRUCTION ARE SPACED AT MINIMUM AND MAY BE ADJUSTED DUE TO FIELD CONDITIONS.
3. ALL STATIONING/ALIGNMENTS ARE FOR REFERENCE PURPOSES ONLY.
4. EXISTING STRIPING THAT IS IN CONFLICT WITH THE PROPOSED WK ZN PAVEMENT MARKINGS SHALL BE REMOVED.
5. EXISTING SIGNS THAT ARE IN CONFLICT WITH THE PROPOSED WK ZN SIGNS SHALL BE REMOVED OR COVERED.



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07/13/2021

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FM 1846 TRAFFIC CONTROL PLAN LAYOUT PHASE 1 STEP 1 (DETOUR)

1" = 100' SHEET 3 OF 5

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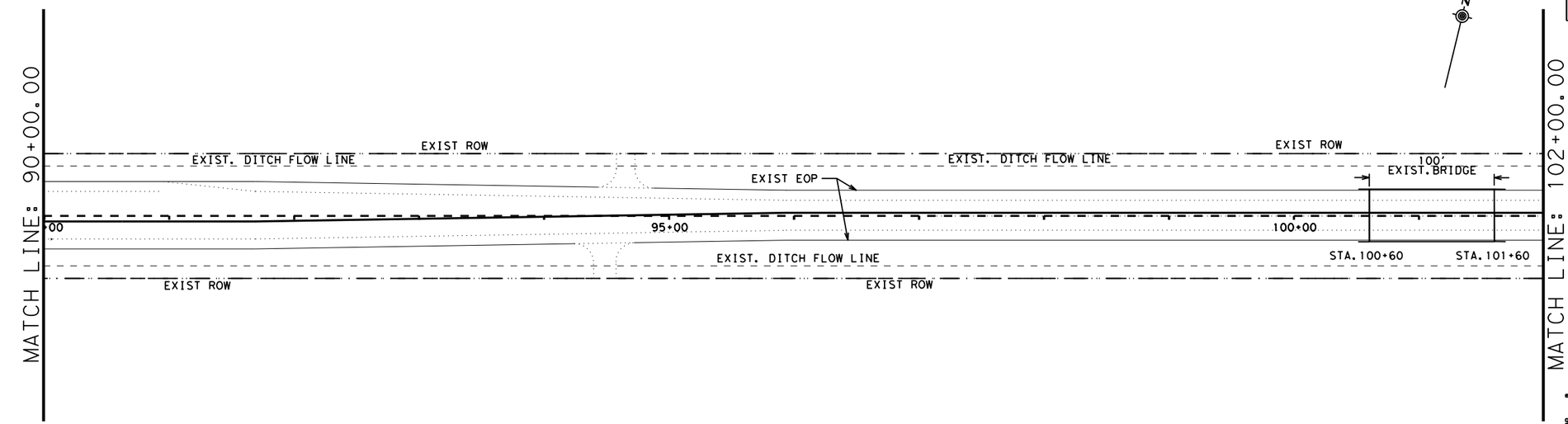

LEGEND

- CONSTRUCTION AREA
- BRIDGE CONSTRUCTION
- PROPOSED DETOUR
- PREVIOUSLY CONSTRUCTED
- [A] WK ZN PVMT MARK (REM) 4" WHITE SOLID
- [B] WK ZN PVMT MARK (REM) 4" YELLOW SOLID
- [C] WK ZN PVMT MARK (REM) 4" WHITE BROKEN
- [D] WK ZN PVMT MARK (REM) 4" YELLOW BROKEN
- [E] WK ZN PVMT MARK (REM) (REFL) TY II-A-A
- [F] WK ZN PVMT MARK (REM) (REFL) TY I-C
- [G] WK ZN PVMT MARK (NON-REM) 4" WHITE SOLID
- [H] WK ZN PVMT MARK (NON-REM) 4" YELLOW SOLID
- [I] WK ZN PVMT MARK (REM) 8" WHITE SOLID
- [J] WK ZN PVMT MARK (REM) 24" WHITE SOLID
- [K] WK ZN PAMT MARK (REM) 8" WHITE DOT
- * REFER TO BC(2)-14 STANDARDS FOR SIGN SPACING
- DIRECTION OF TRAFFIC FLOW
- PROPOSED SIGN
- PROPOSED TYPE 3 (C) BARRICADES
- PLASTIC DRUM W/REFLECTORS
- PORTABLE CONCRETE TRAFFIC BARRIER W/REFLECTORS (PTCB)
- CRASH CUSHION ATTENUATOR-TL3
- TEMPORARY SIGNAL

NOTES:

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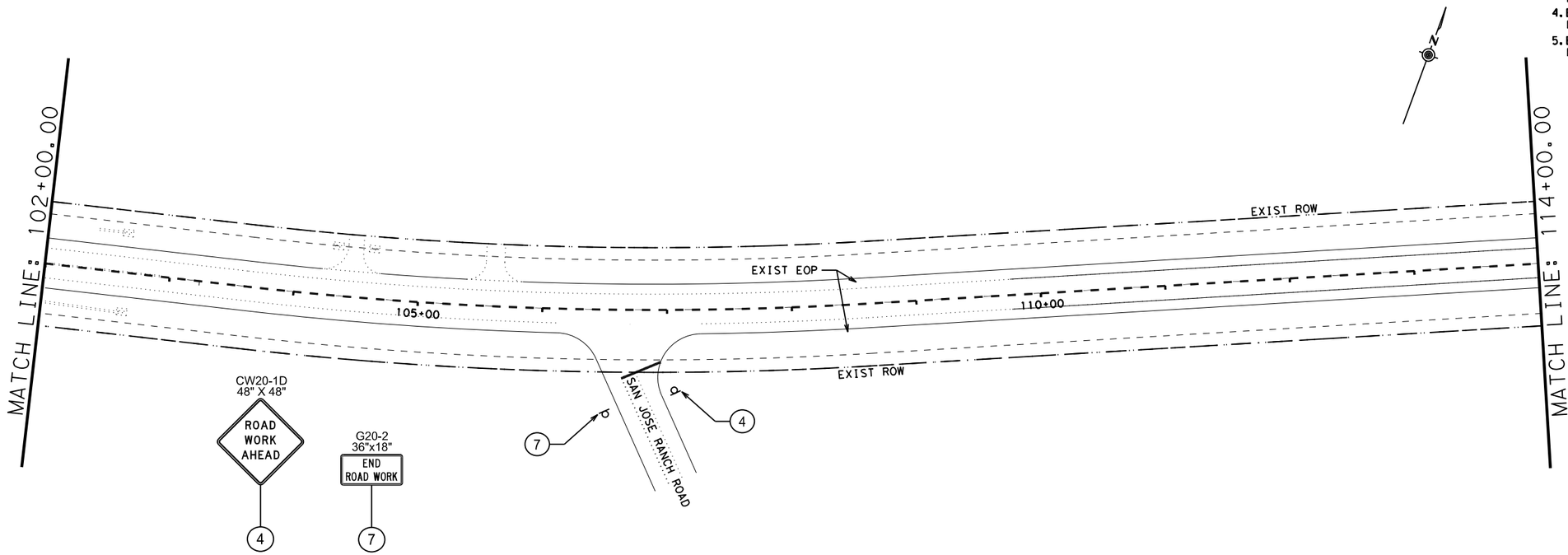

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FM 1846 TRAFFIC CONTROL PLAN LAYOUT PHASE 1 STEP 1 (DETOUR)

1" = 100' SHEET 4 OF 5

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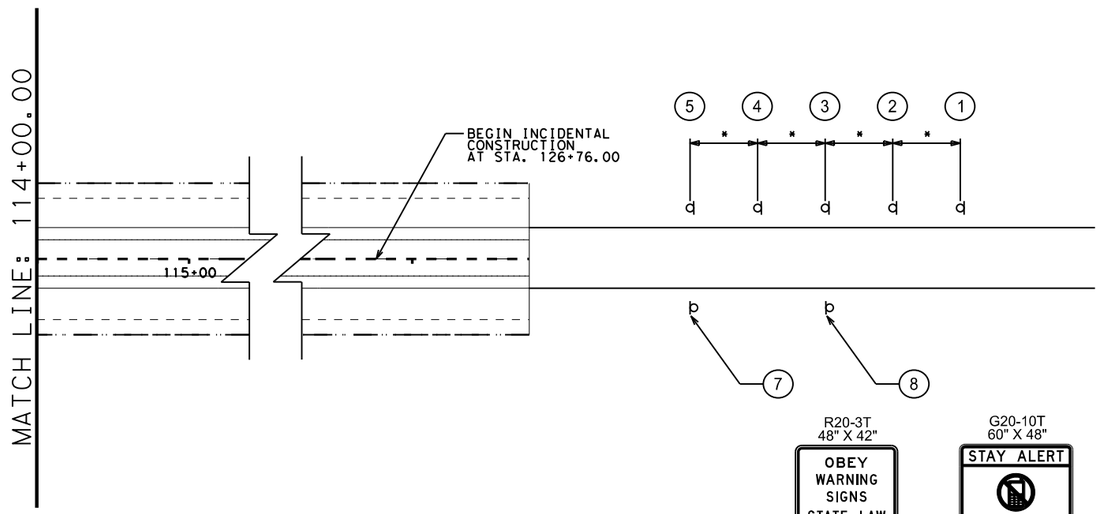

R20-3T
48" X 42"
OBEY WARNING SIGNS STATE LAW
1

G20-10T
60" X 48"
STAY ALERT
TALK OR TEXT LATER
2

BEGIN WORK ZONE — G20-9TP 24" X 24"
TRAFFIC FINES DOUBLE — R20-5T 24" X 30"
WHEN WORKERS ARE PRESENT — R20-5aTP 24" X 12"
3

CW20-1D
48" X 48"
ROAD WORK AHEAD
4

BEGIN ROAD WORK NEXT 2 MILES — G20-5T 48" X 24"
NAME ADDRESS CITY STATE CONTRACTOR — G20-6T 48" X 30"
5

G20-2
36"x18"
END ROAD WORK
7

G20-2bT
36" X 18"
END WORK ZONE
8

LEGEND

- CONSTRUCTION AREA
- BRIDGE CONSTRUCTION
- PROPOSED DETOUR
- PREVIOUSLY CONSTRUCTED
- [A] WK ZN PVMT MARK (REM) 4" WHITE SOLID
- [B] WK ZN PVMT MARK (REM) 4" YELLOW SOLID
- [C] WK ZN PVMT MARK (REM) 4" WHITE BROKEN
- [D] WK ZN PVMT MARK (REM) 4" YELLOW BROKEN
- [E] WK ZN PVMT MARK (REM) (REFL) TY II-A-A
- [F] WK ZN PVMT MARK (REM) (REFL) TY I-C
- [G] WK ZN PVMT MARK (NON-REM) 4" WHITE SOLID
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- [I] WK ZN PVMT MARK (REM) 8" WHITE SOLID
- [J] WK ZN PVMT MARK (REM) 24" WHITE SOLID
- [K] WK ZN PAMT MARK (REM) 8" WHITE DOT
- * REFER TO BC(2)-14 STANDARDS FOR SIGN SPACING
- DIRECTION OF TRAFFIC FLOW
- a PROPOSED SIGN
- I PROPOSED TYPE 3 (C) BARRICADES
- PLASTIC DRUM W/REFLECTORS
- PORTABLE CONCRETE TRAFFIC BARRIER W/REFLECTORS (PTCB)
- CRASH CUSHION ATTENUATOR-TL3
- TEMPORARY SIGNAL

MATCH LINE: 126+00.00

NOTES:

1. PROJECT LIMITS AND ADVANCE WARNING SIGNS SHALL BE IN PLACE BEFORE COMMENCING CONSTRUCTION AND SHALL REMAIN IN PLACE THROUGHOUT THE DURATION OF CONSTRUCTION UNTIL THE PROJECT IS COMPLETED AND ACCEPTED BY TXDOT.
2. ALL SIGNS SHOWN FOR CONSTRUCTION ARE SPACED AT MINIMUM AND MAY BE ADJUSTED DUE TO FIELD CONDITIONS.
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Texas Department of Transportation

FM 1846 TRAFFIC CONTROL PLAN LAYOUT PHASE 1 STEP 1 (DETOUR)

1" = 100' SHEET 5 OF 5

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	CAMERON		60

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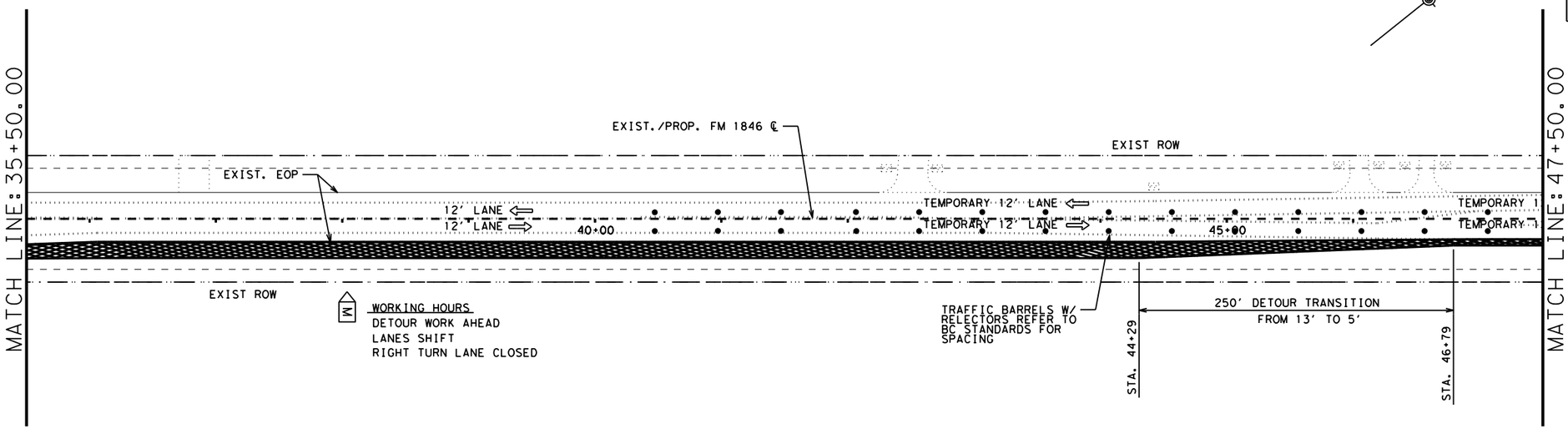

LEGEND

- CONSTRUCTION AREA
- BRIDGE CONSTRUCTION
- PROPOSED DETOUR
- PREVIOUSLY CONSTRUCTED
- [A] WK ZN PVMT MARK (REM) 4" WHITE SOLID
- [B] WK ZN PVMT MARK (REM) 4" YELLOW SOLID
- [C] WK ZN PVMT MARK (REM) 4" WHITE BROKEN
- [D] WK ZN PVMT MARK (REM) 4" YELLOW BROKEN
- [E] WK ZN PVMT MARK (REM) (REFL) TY II-A-A
- [F] WK ZN PVMT MARK (REM) (REFL) TY I-C
- [G] WK ZN PVMT MARK (NON-REM) 4" WHITE SOLID
- [H] WK ZN PVMT MARK (NON-REM) 4" YELLOW SOLID
- [I] WK ZN PVMT MARK (REM) 8" WHITE SOLID
- [J] WK ZN PVMT MARK (REM) 24" WHITE SOLID
- [K] WK ZN PAMT MARK (REM) 8" WHITE DOT
- [M] PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
- DIRECTION OF TRAFFIC FLOW
- PROPOSED SIGN
- PROPOSED TYPE 3 (C) BARRICADES
- PLASTIC DRUM W/REFLECTORS
- PORTABLE CONCRETE TRAFFIC BARRIER W/REFLECTORS (PTCB)
- CRASH CUSHION ATTENUATOR-TL3
- TEMPORARY SIGNAL

NOTES:

1. PROJECT LIMITS AND ADVANCE WARNING SIGNS SHALL BE IN PLACE BEFORE COMMENCING CONSTRUCTION AND SHALL REMAIN IN PLACE THROUGHOUT THE DURATION OF CONSTRUCTION UNTIL THE PROJECT IS COMPLETED AND ACCEPTED BY TXDOT.
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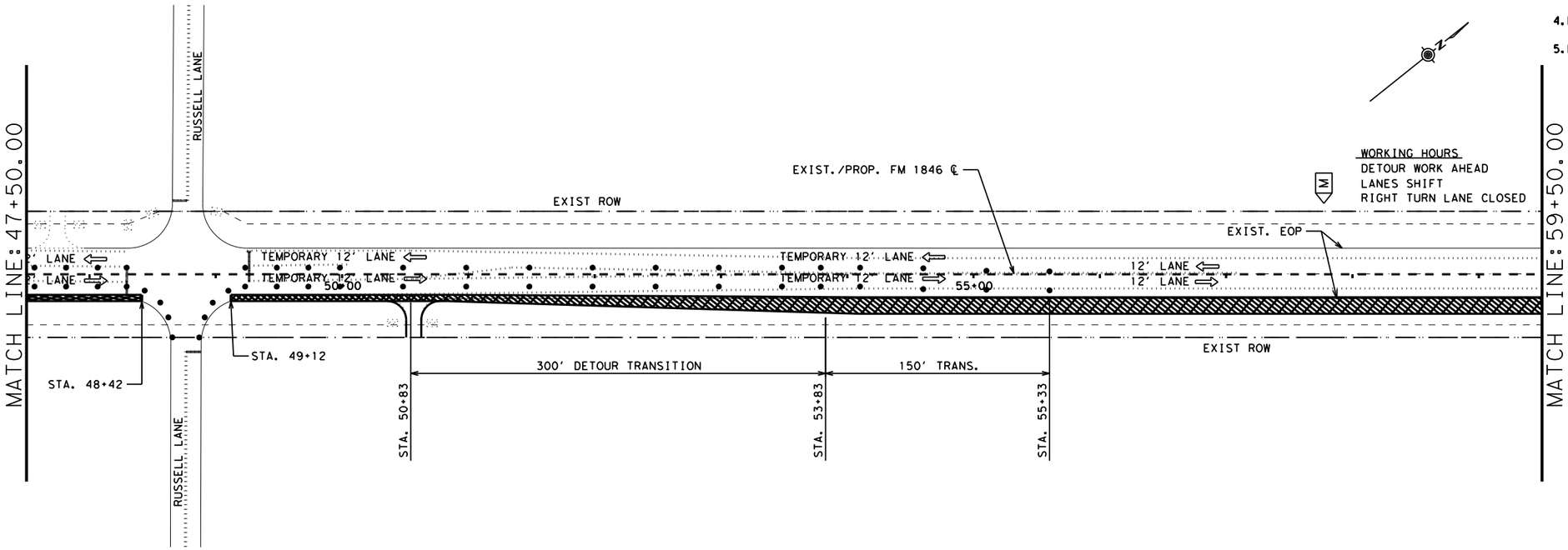

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FM 1846 TRAFFIC CONTROL PLAN - ALTERNATIVE PLAN (DURING WORK HOURS)

1" = 100' SHEET 1 OF 1

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	CAMERON		61

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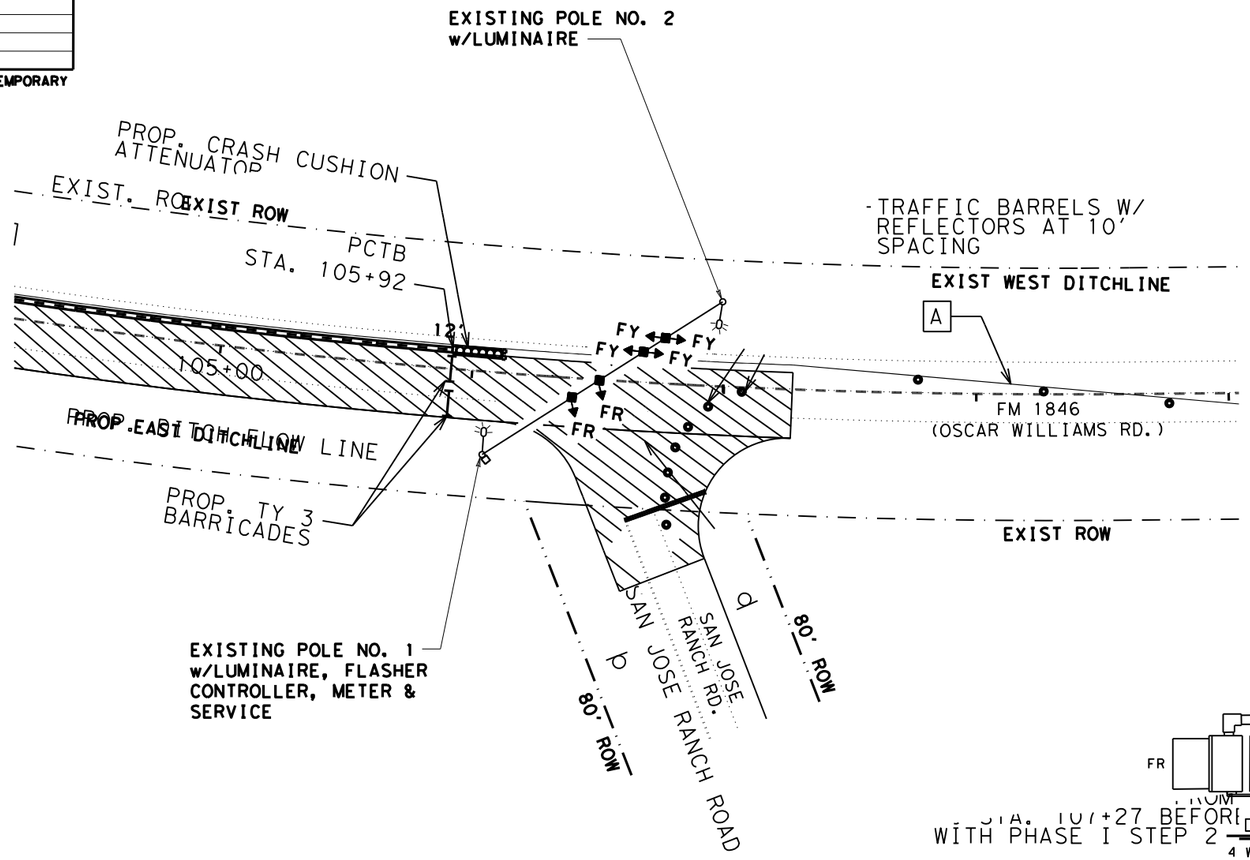
TEMPORARY TRAFFIC SIGNAL HARDWARE TO BE FURNISHED, INSTALLED & MAINTAINED BY THE CONTRACTOR

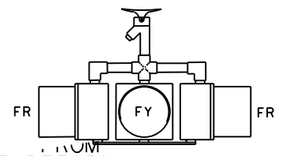
ITEM	UNIT	QUANTITY
5/C #12 SIGNAL CABLE	FT.	100'

ALL ITEMS ARE SUBSIDIARY TO ITEM 681 - TEMPORARY TRAFFIC SIGNALS.

NOTES:

1. WHEN CONSTRUCTING THE ASSIGNED PART OF THE INTERSECTION, SIGNAL HEAD POSITIONS SHOULD BE SHIFTED TO FACE THE APPROACHING TRAFFIC AS NECESSARY.
2. THE CONTRACTOR MAY USE THE EXISTING OR TEMPORARY SIGNAL HARDWARE DURING THE DIFFERENT TCP PHASES OF CONSTRUCTION AS LONG AS SIGNALS ARE OPERATIONAL AT ALL TIMES. "PERMANENT PROPOSED" SIGNAL HEAD ASSEMBLIES SHALL NOT BE USED DURING THE TCP PHASES.
3. THE CONTRACTOR IS RESPONSIBLE FOR THE TEMPORARY TRAFFIC SIGNAL COMPONENTS AND IF DAMAGED, SHALL REPAIR AT HIS OWN EXPENSE.
4. THE CONTRACTOR MAY CHOOSE TO USE TEMPORARY WOOD POLES IF HE ENCOUNTERS CONFLICTS USING THE EXISTING OR PROPOSED PERMANENT SIGNAL POLES.





WITH PHASE I STEP 2 DETAIL

4 WAY-1 SEC.
12" FLASHING BEACON HEAD
(OR AS SHOWN)
(UTILIZE EXISTING BEACON HEADS, RELOCATE AS SHOWN)

LEGEND

- PROPOSED OR RELOCATED 12" VERTICAL SPAN MOUNTED WIRE MOUNTED FLASHING BEACON HEADS
- EXISTING POLE MOUNTED CONTROLLER
- PROPOSED LUMINAIRE
- EXIST. LUMINAIRE
- PP — EXIST. POWER POLE (PP)
- EXIST. SIGN
- SS — EXIST. STORM SEWER
- FOC — FIBER OPTIC CABLE
- G — GAS
- W — WATER
- M — WATER METER
- MH — STORM SEWER MANHOLE (MH)
- RCP — REINF. CONC. PIPE
- FR — FLASHING RED
- FY — FLASHING YELLOW

TEMPORARY SIGNAL DIAGRAM

INTERSECTION OF
FM 1846/SAN JOSE RANCH RD.
CAMERON COUNTY
CSJ: 1065-02-039

STATE OF TEXAS
ELIGIO ALVAREZ
107123
LICENSED
PROFESSIONAL ENGINEER

Eligio Alvarez, P.E
7-15-2021

Pharr District Central Design

Texas Department of Transportation

③

TEMPORARY SIGNAL
TCP PHASE 1 STEP 2
FM 1846 @ SAN JOSE RANCH

SCALE: 1" = 60' SHEET 1 OF 1

© 2021		CONT	SECT	JOB	HIGHWAY
DS:	CK:	1065	02	039	FM 1846
		DIST	COUNTY		SHEET NO.
DW:	CK:	PHR	CAMERON		62

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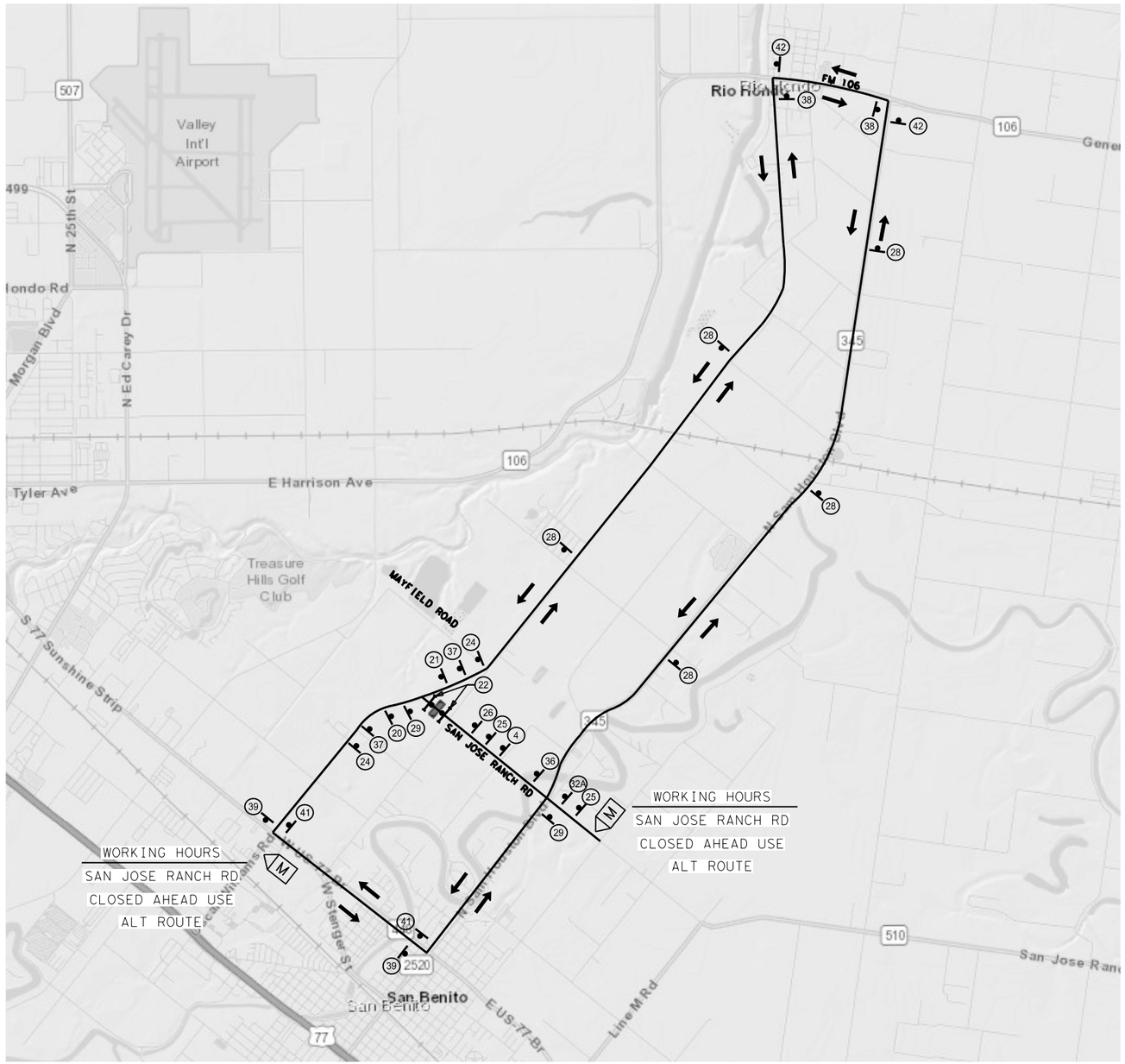

LEGEND

- TRAFFIC SIGN I.D.
- PROP. SIGN
- PROP. CONSTRUCTION
- PROP. TY 3 BARRICADES
- PROP. TRAFFIC BARRELS
- M — PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

GENERAL NOTES:

1. REFER TO "BC" AND "TCP STANDARDS" FOR SIGN SPACING AND ADDITIONAL SIGNING.

CW20-1D 48"x48" — ROAD WORK AHEAD — 4

R3-1 36"x36" — 20

R3-2 36"x36" — 21

R11-2 48"x30" — ROAD CLOSED — 22

ROAD CLOSED / DETOUR — R11-2 48"x30" / M4-10L 48"x18" — 23

CW20-2D 48"x48" — DETOUR AHEAD — 24

CW20-3D 48"x48" — ROAD CLOSED AHEAD — 25

CW20-3C 48"x48" — ROAD CLOSED 500 FT — 26

CW20-3B 48"x48" — ROAD CLOSED 1000 FT — 27

R11-3a 60"x30" — ROAD CLOSED 2 MILES AHEAD LOCAL TRAFFIC ONLY — 36

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09/02/2021

M4-9S 30"x24" — DETOUR — 28

M4-8a 24"x18" — END DETOUR — 29

M4-12T 48"x12" — FM 1846 / DETOUR / M4-9L 30"x24" — 32A

M4-12T 78"x12" — E SAN JOSE RANCH RD / DETOUR / M4-9S 30"x24" — 37

M4-12T 78"x12" — E SAN JOSE RANCH RD / DETOUR / M4-9R 30"x24" — 38

M4-12T 78"x12" — E SAN JOSE RANCH RD / DETOUR / M4-9L 30"x24" — 39

M4-12T 78"x12" — W SAN JOSE RANCH RD / DETOUR / M4-9S 30"x24" — 40

M4-12T 78"x12" — W SAN JOSE RANCH RD / DETOUR / M4-9R 30"x24" — 41

M4-12T 78"x12" — W SAN JOSE RANCH RD / DETOUR / M4-9L 30"x24" — 42

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FM 1846
PHASE 1 STEP 2
DETOUR LAYOUT
SAN JOSE RANCH ROAD

NOT TO SCALE — SHEET 1 OF 1

© 2021	CONT	SECT	JOB	HIGHWAY
	1065	02	039	FM 1846
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		63

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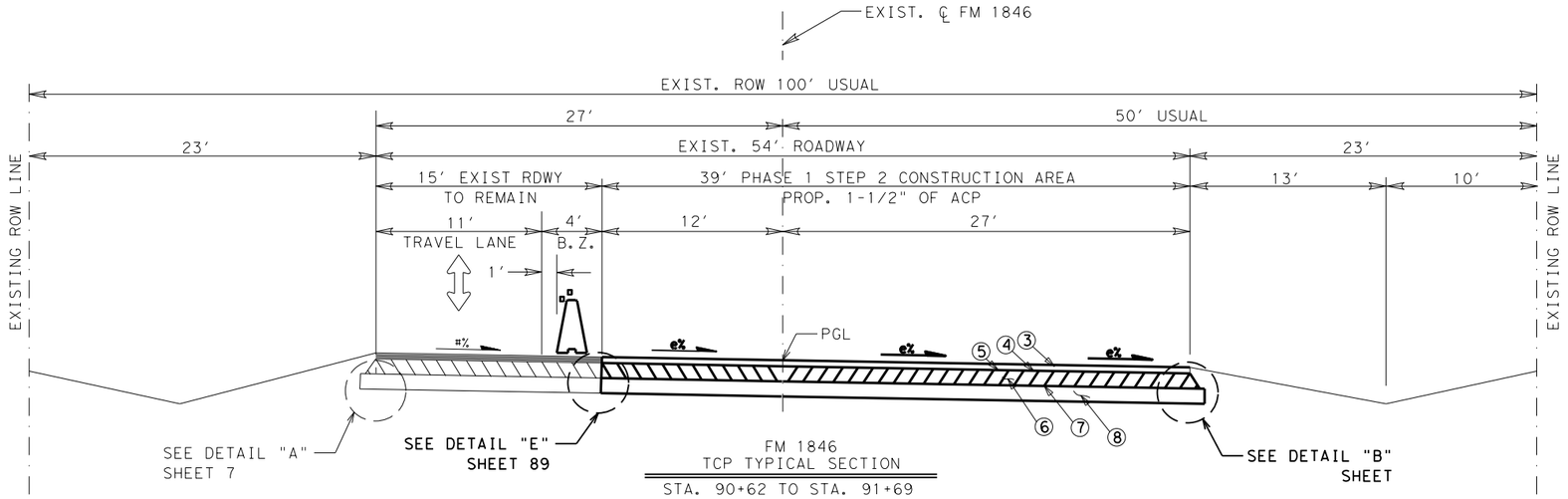

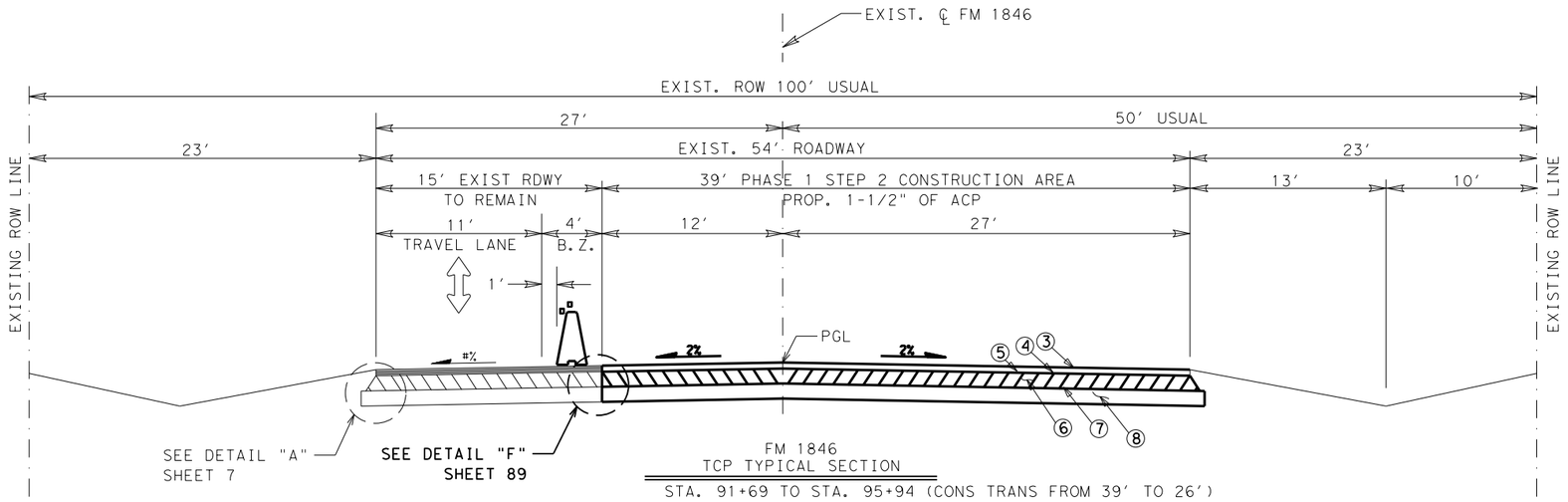

LEGEND:

(3) PROPOSED 1.5" SP-D PG76-22 (SAC-A) ACP (1ST LIFT)
(4) PROPOSED 1 COURSE UNDER SEAL
(5) PROPOSED MC-30 (0.2 GAL/SY)
(6) PROPOSED 10.0" TY-A GR-1/2 BASE W/2% CEMENT BY WEIGHT
(7) PROPOSED 1-TYII GEOGRID
(8) PROPOSED 12.0" STABILIZED SUBGRADE W/4% LIME BY WEIGHT

BZ - BUFFER ZONE
CA - CONSTRUCTION AREA
ACP - ASPHALT CONCRETE PAVEMENT
CONS - CONSTRUCTION
RDWY - ROADWAY
TRANS - TRANSITION
P.C. - PREVIOUSLY CONSTRUCTED
#% - EXISTING CROSS SLOPE
e% - PROPOSED CROSS SLOPE
- PLASTIC BARREL W/REFLECTOR
- CONCRETE TRAFFIC BARRIER W/REFLECTORS
* ALTERNATE TRAFFIC CONTROL PLAN DURING WORKING HOURS SHEETS 56 AND 62

NOTES:

1. SEE PROPOSED TRAFFIC CONTROL PLAN LAYOUTS FOR LANE STRIPING DIMENSIONS, STATIONING AND TRANSITIONS.

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ABEL MARROQUIN III
134752
LICENSED
PROFESSIONAL ENGINEER

07/13/2021

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FM 1846 TRAFFIC CONTROL PLAN - TYPICAL SECTIONS PHASE 1 STEP 2

NOT TO SCALE — SHEET 1 OF 3

© 2021		CONT	SECT	JOB	HIGHWAY
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		DIST	COUNTY		SHEET NO.
DW:	CK:	PHR	CAMERON		64

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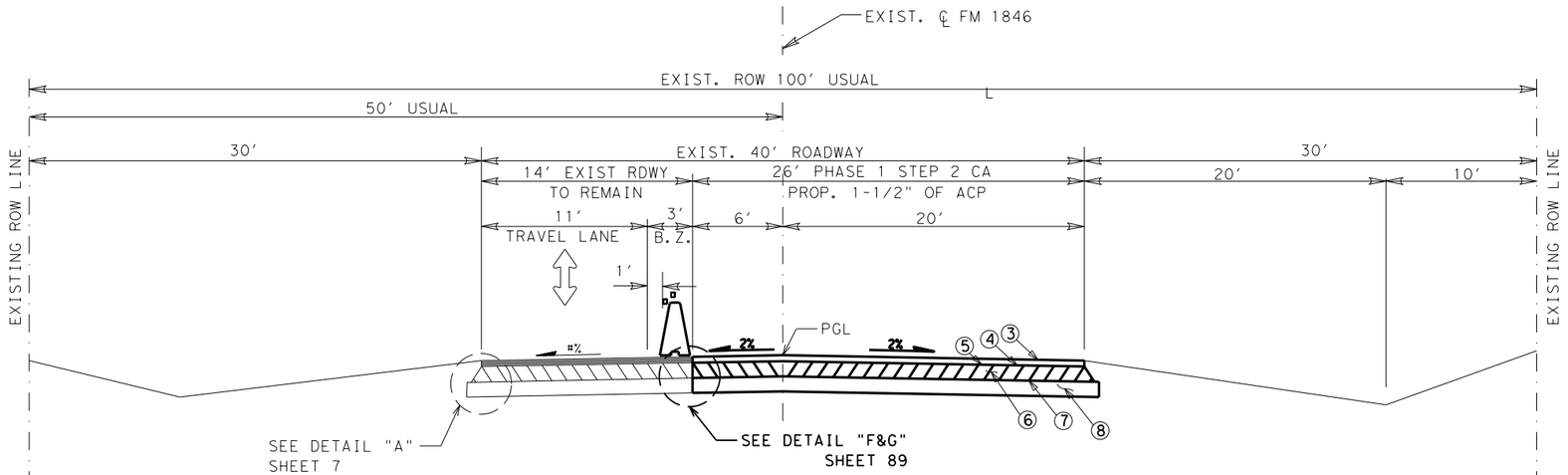
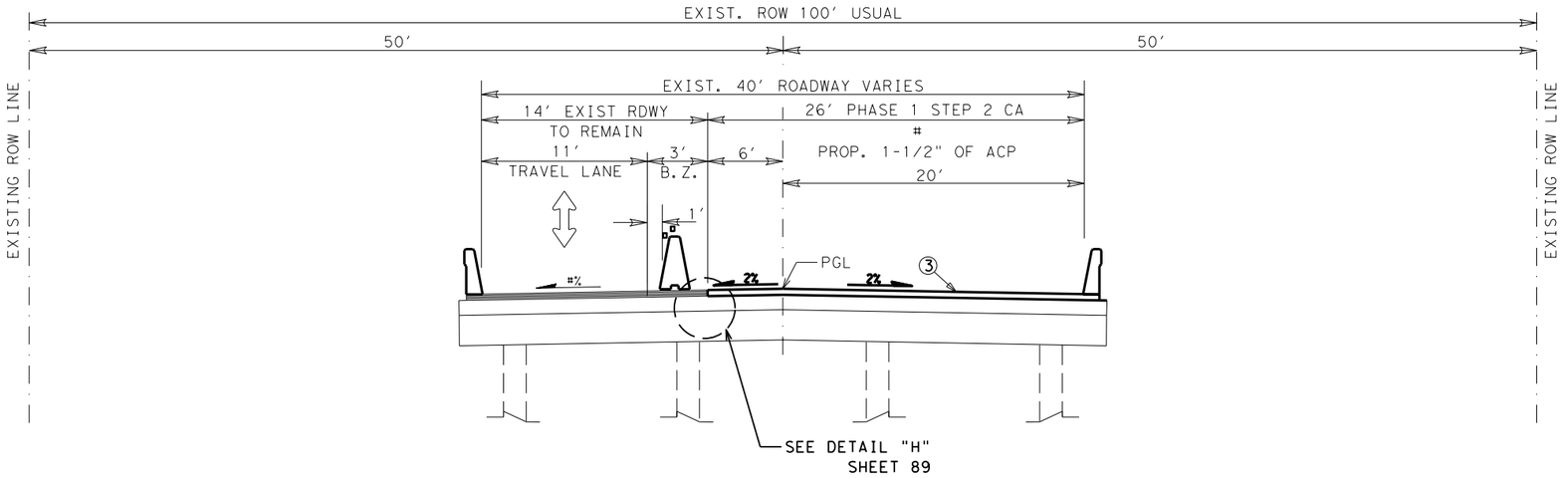


FM 1846
TCP TYPICAL SECTION

STA. 95+94 TO STA. 100+60
STA. 101+60 TO STA. 102+42



FM 1846
TCP TYPICAL SECTION

STA. 100+60 TO 101+60

BRIDGE TO BE MILLED 3"

LEGEND:

③ PROPOSED 1.5" SP-D PG76-22 (SAC-A) ACP (1ST LIFT)
④ PROPOSED 1 COURSE UNDER SEAL
⑤ PROPOSED MC-30 (0.2 GAL/SY)
⑥ PROPOSED 10.0" TY-A GR-1/2 BASE W/2% CEMENT BY WEIGHT
⑦ PROPOSED 1-TYII GEOGRID
⑧ PROPOSED 12.0" STABILIZED SUBGRADE W/4% LIME BY WEIGHT

BZ - BUFFER ZONE
CA - CONSTRUCTION AREA
ACP - ASPHALT CONCRETE PAVEMENT
CONS - CONSTRUCTION
RDWY - ROADWAY
TRANS - TRANSITION
P.C. - PREVIOUSLY CONSTRUCTED
#% - EXISTING CROSS SLOPE
#% - PROPOSED CROSS SLOPE
- PLASTIC BARREL W/REFLECTOR
- CONCRETE TRAFFIC BARRIER W/REFLECTORS
* ALTERNATE TRAFFIC CONTROL PLAN DURING WORKING HOURS SHEETS 56 AND 62

NOTES:

1. SEE PROPOSED TRAFFIC CONTROL PLAN LAYOUTS FOR LANE STRIPING DIMENSIONS, STATIONING AND TRANSITIONS.

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED PROFESSIONAL ENGINEER

07/13/2021

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FM 1846 TRAFFIC CONTROL PLAN - TYPICAL SECTIONS PHASE 1 STEP 2

NOT TO SCALE — SHEET 2 OF 3

© 2021		CONT	SECT	JOB	HIGHWAY
DS:	CK:	1065	02	039	FM 1846
		DIST	COUNTY		SHEET NO.
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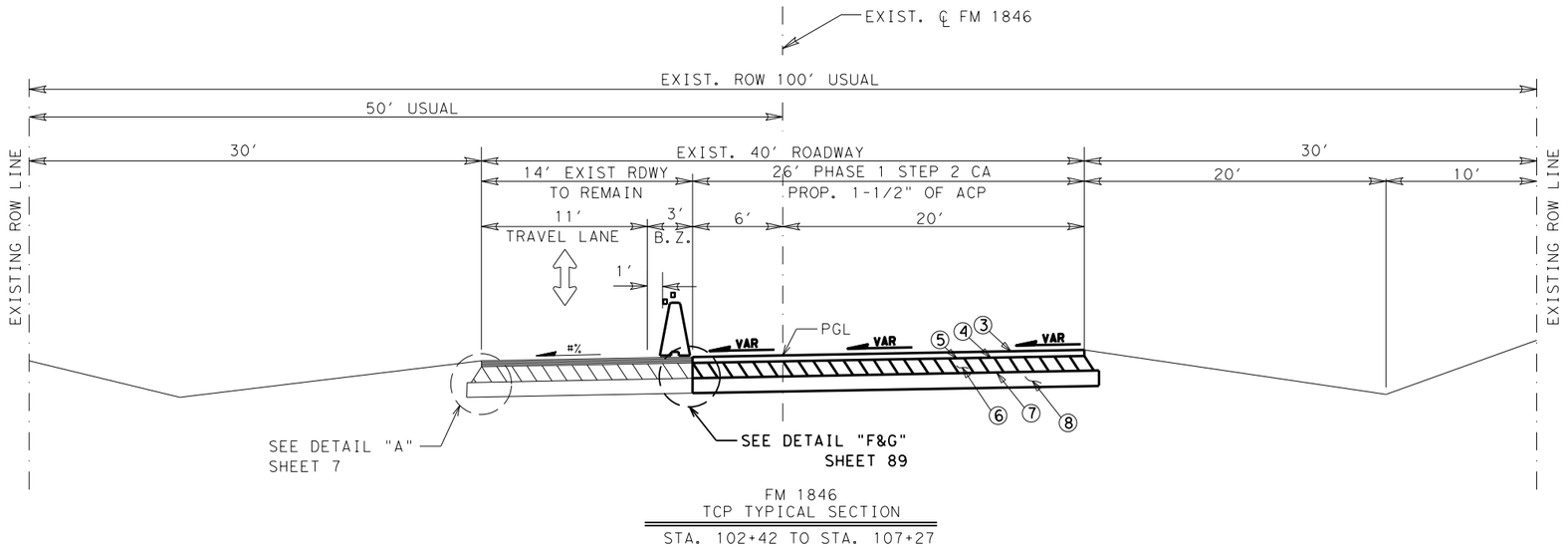

FM 1846
TCP TYPICAL SECTION

STA. 102+42 TO STA. 107+27

LEGEND:

(3) PROPOSED 1.5" SP-D PG76-22 (SAC-A) ACP (1ST LIFT)
(4) PROPOSED 1 COURSE UNDER SEAL
(5) PROPOSED MC-30 (0.2 GAL/SY)
(6) PROPOSED 10.0" TY-A GR-1/2 BASE W/2% CEMENT BY WEIGHT
(7) PROPOSED 1-TYII GEOGRID
(8) PROPOSED 12.0" STABILIZED SUBGRADE W/4% LIME BY WEIGHT

BZ - BUFFER ZONE
CA - CONSTRUCTION AREA
ACP - ASPHALT CONCRETE PAVEMENT
CONS - CONSTRUCTION
RDWY - ROADWAY
TRANS - TRANSITION
P.C. - PREVIOUSLY CONSTRUCTED
#% - EXISTING CROSS SLOPE
#% - PROPOSED CROSS SLOPE

- PLASTIC BARREL W/REFLECTOR
- CONCRETE TRAFFIC BARRIER W/REFLECTORS

* ALTERNATE TRAFFIC CONTROL PLAN DURING WORKING HOURS SHEETS 56 AND 62

NOTES:

1. SEE PROPOSED TRAFFIC CONTROL PLAN LAYOUTS FOR LANE STRIPING DIMENSIONS, STATIONING AND TRANSITIONS.

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FM 1846 TRAFFIC CONTROL PLAN - TYPICAL SECTIONS PHASE 1 STEP 2

NOT TO SCALE — SHEET 3 OF 3

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
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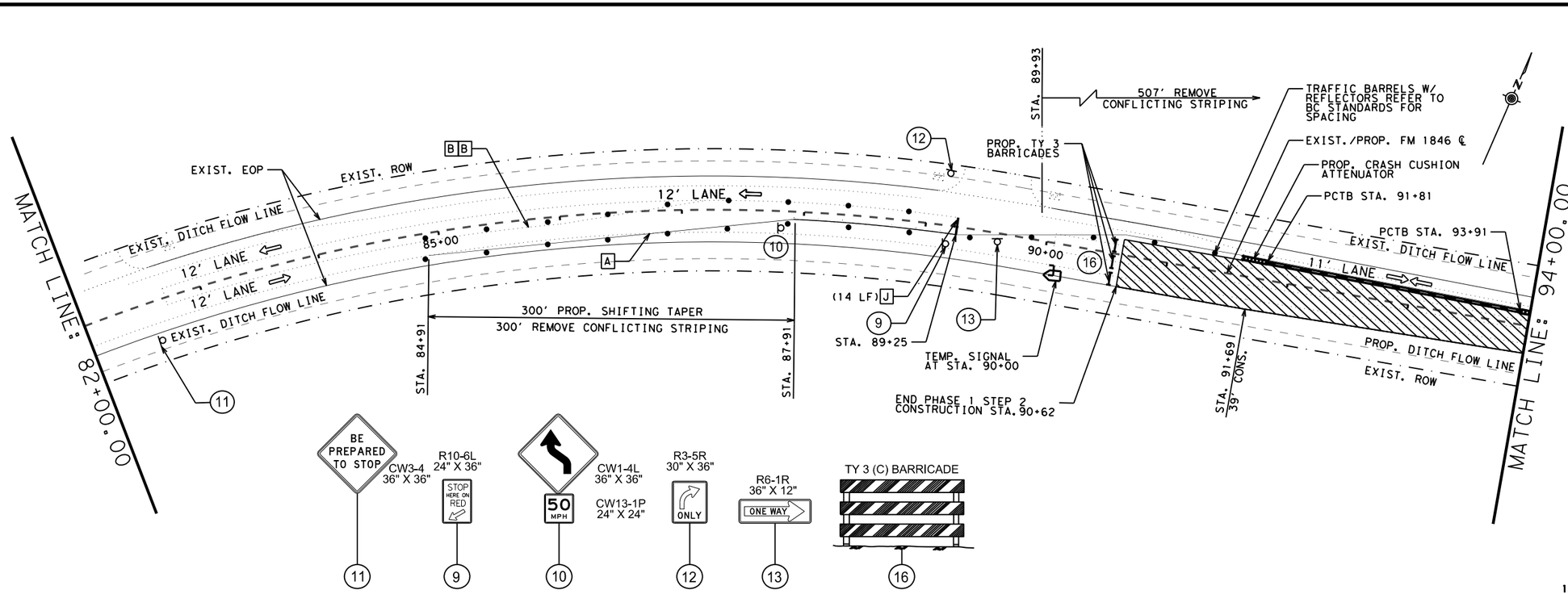
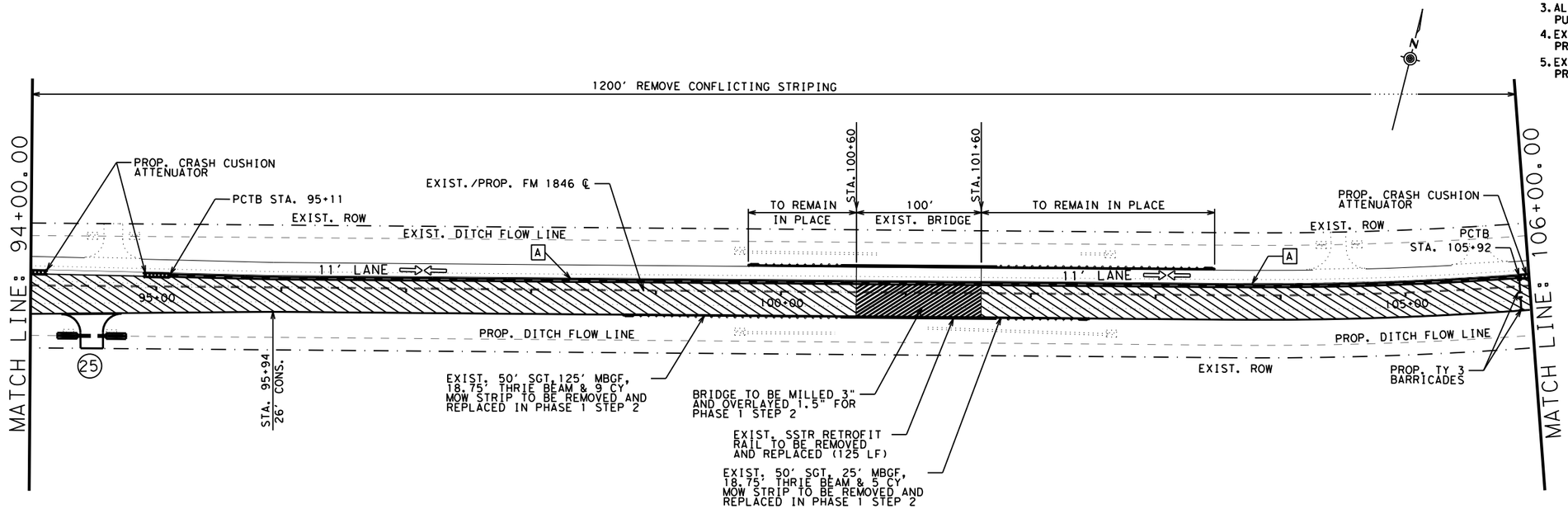


LEGEND

- CONSTRUCTION AREA
- BRIDGE CONSTRUCTION
- PROPOSED DETOUR
- PREVIOUSLY CONSTRUCTED
- A WK ZN PVMT MARK (REM) 4" WHITE SOLID
- B WK ZN PVMT MARK (REM) 4" YELLOW SOLID
- C WK ZN PVMT MARK (REM) 4" WHITE BROKEN
- D WK ZN PVMT MARK (REM) 4" YELLOW BROKEN
- E WK ZN PVMT MARK (REM) (REFL) TY II-A-A
- F WK ZN PVMT MARK (REM) (REFL) TY I-C
- G WK ZN PVMT MARK (NON-REM) 4" WHITE SOLID
- H WK ZN PVMT MARK (NON-REM) 4" YELLOW SOLID
- I WK ZN PVMT MARK (REM) 8" WHITE SOLID
- J WK ZN PVMT MARK (REM) 24" WHITE SOLID
- K WK ZN PAMT MARK (REM) 8" WHITE DOT
- * REFER TO BC(2)-14 STANDARDS FOR SIGN SPACING
- DIRECTION OF TRAFFIC FLOW
- PROPOSED SIGN
- PROPOSED TYPE 3 (C) BARRICADES
- PLASTIC DRUM W/REFLECTORS
- PORTABLE CONCRETE TRAFFIC BARRIER W/REFLECTORS (PCTB)
- CRASH CUSHION ATTENUATOR-TL3
- TEMPORARY SIGNAL

NOTES:

1. PROJECT LIMITS AND ADVANCE WARNING SIGNS SHALL BE IN PLACE BEFORE COMMENCING CONSTRUCTION AND SHALL REMAIN IN PLACE THROUGHOUT THE DURATION OF CONSTRUCTION UNTIL THE PROJECT IS COMPLETED AND ACCEPTED BY TXDOT.
2. ALL SIGNS SHOWN FOR CONSTRUCTION ARE SPACED AT MINIMUM AND MAY BE ADJUSTED DUE TO FIELD CONDITIONS.
3. ALL STATIONING/ALIGNMENTS ARE FOR REFERENCE PURPOSES ONLY.
4. EXISTING STRIPING THAT IS IN CONFLICT WITH THE PROPOSED WK ZN PAVEMENT MARKINGS SHALL BE REMOVED.
5. EXISTING SIGNS THAT ARE IN CONFLICT WITH THE PROPOSED WK ZN SIGNS SHALL BE REMOVED OR COVERED.



STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED PROFESSIONAL ENGINEER

09/02/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 TRAFFIC CONTROL PLAN LAYOUT PHASE 1 STEP 2

1" = 100' SHEET 1 OF 2

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	CAMERON		67

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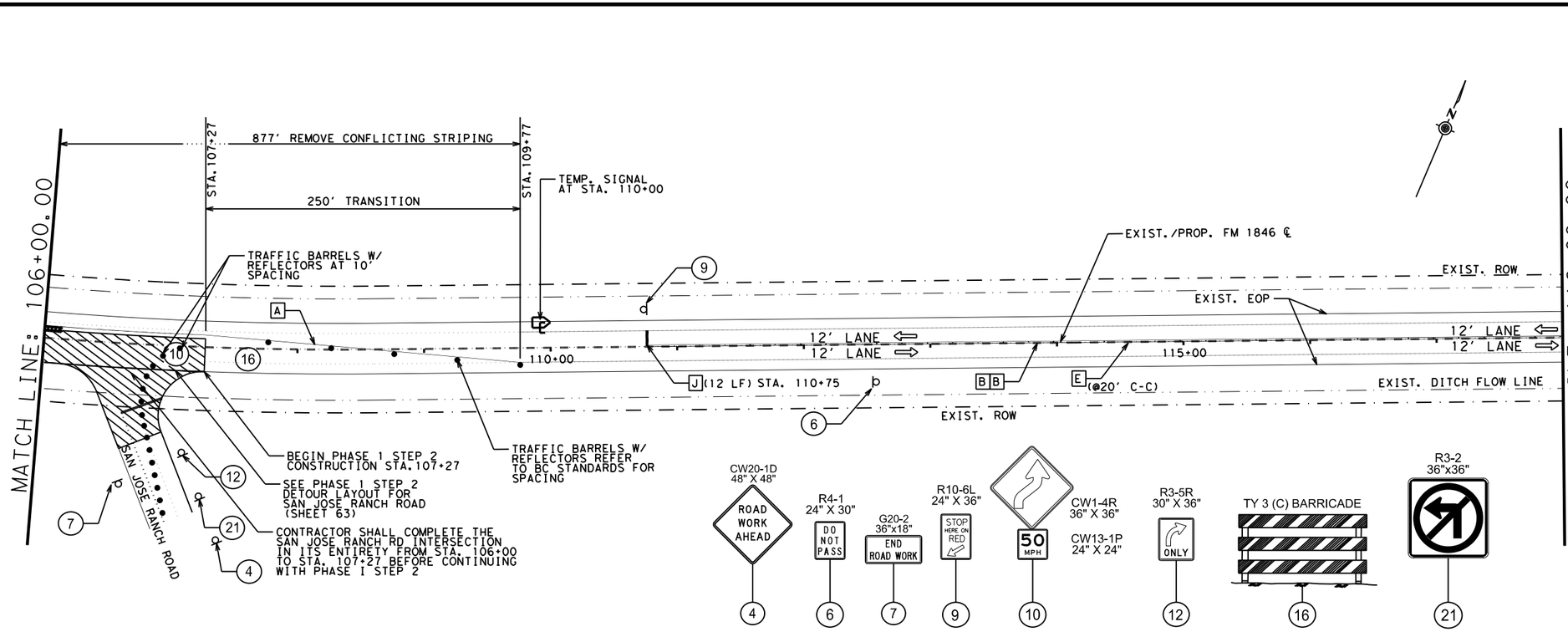

LEGEND

- CONSTRUCTION AREA
- BRIDGE CONSTRUCTION
- PROPOSED DETOUR
- PREVIOUSLY CONSTRUCTED
- A WK ZN PVMT MARK (REM) 4" WHITE SOLID
- B WK ZN PVMT MARK (REM) 4" YELLOW SOLID
- C WK ZN PVMT MARK (REM) 4" WHITE BROKEN
- D WK ZN PVMT MARK (REM) 4" YELLOW BROKEN
- E WK ZN PVMT MARK (REM) (REFL) TY II-A-A
- F WK ZN PVMT MARK (REM) (REFL) TY I-C
- G WK ZN PVMT MARK (NON-REM) 4" WHITE SOLID
- H WK ZN PVMT MARK (NON-REM) 4" YELLOW SOLID
- I WK ZN PVMT MARK (REM) 8" WHITE SOLID
- J WK ZN PVMT MARK (REM) 24" WHITE SOLID
- K WK ZN PAMT MARK (REM) 8" WHITE DOT
- * REFER TO BC(2)-14 STANDARDS FOR SIGN SPACING
- DIRECTION OF TRAFFIC FLOW
- PROPOSED SIGN
- PROPOSED TYPE 3 (C) BARRICADES
- PLASTIC DRUM W/REFLECTORS
- PORTABLE CONCRETE TRAFFIC BARRIER W/REFLECTORS (PCTB)
- CRASH CUSHION ATTENUATOR-TL3
- TEMPORARY SIGNAL

NOTES:

1. PROJECT LIMITS AND ADVANCE WARNING SIGNS SHALL BE IN PLACE BEFORE COMMENCING CONSTRUCTION AND SHALL REMAIN IN PLACE THROUGHOUT THE DURATION OF CONSTRUCTION UNTIL THE PROJECT IS COMPLETED AND ACCEPTED BY TXDOT.
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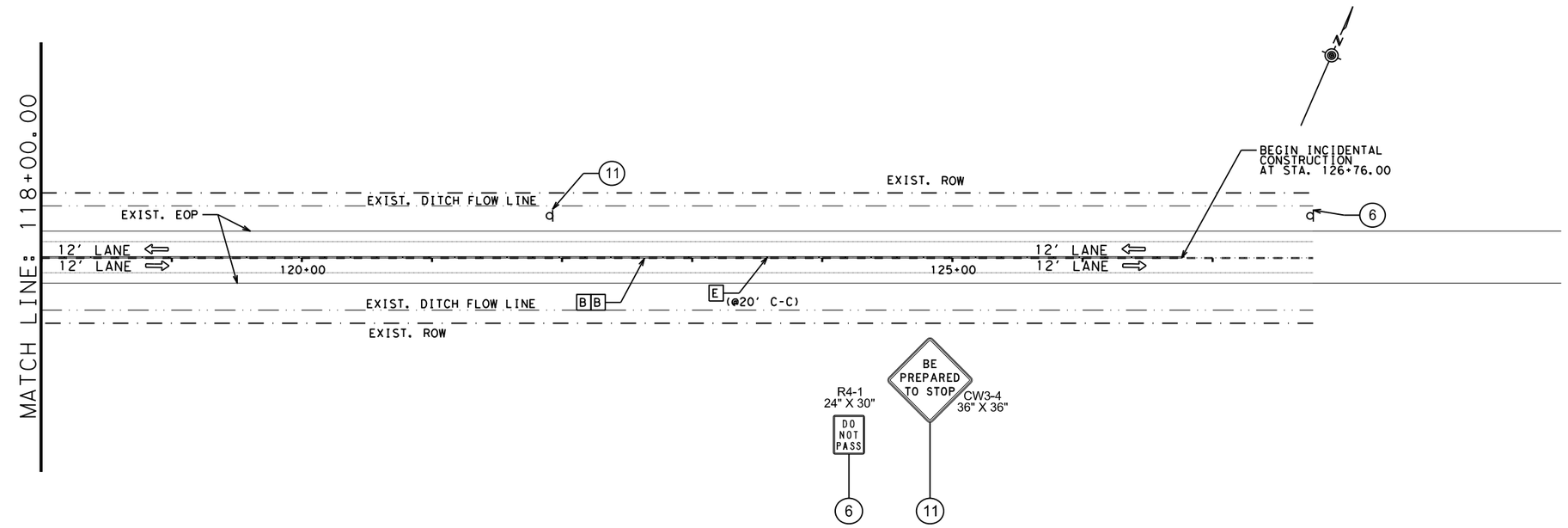

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED PROFESSIONAL ENGINEER

09/29/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 TRAFFIC CONTROL PLAN LAYOUT PHASE 1 STEP 2

1" = 100' SHEET 2 OF 2

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	CAMERON		68

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TEMPORARY TRAFFIC SIGNAL HARDWARE TO BE FURNISHED, INSTALLED & MAINTAINED BY THE CONTRACTOR

ITEM	UNIT	QUANTITY
5/C #12 SIGNAL CABLE	FT.	150'

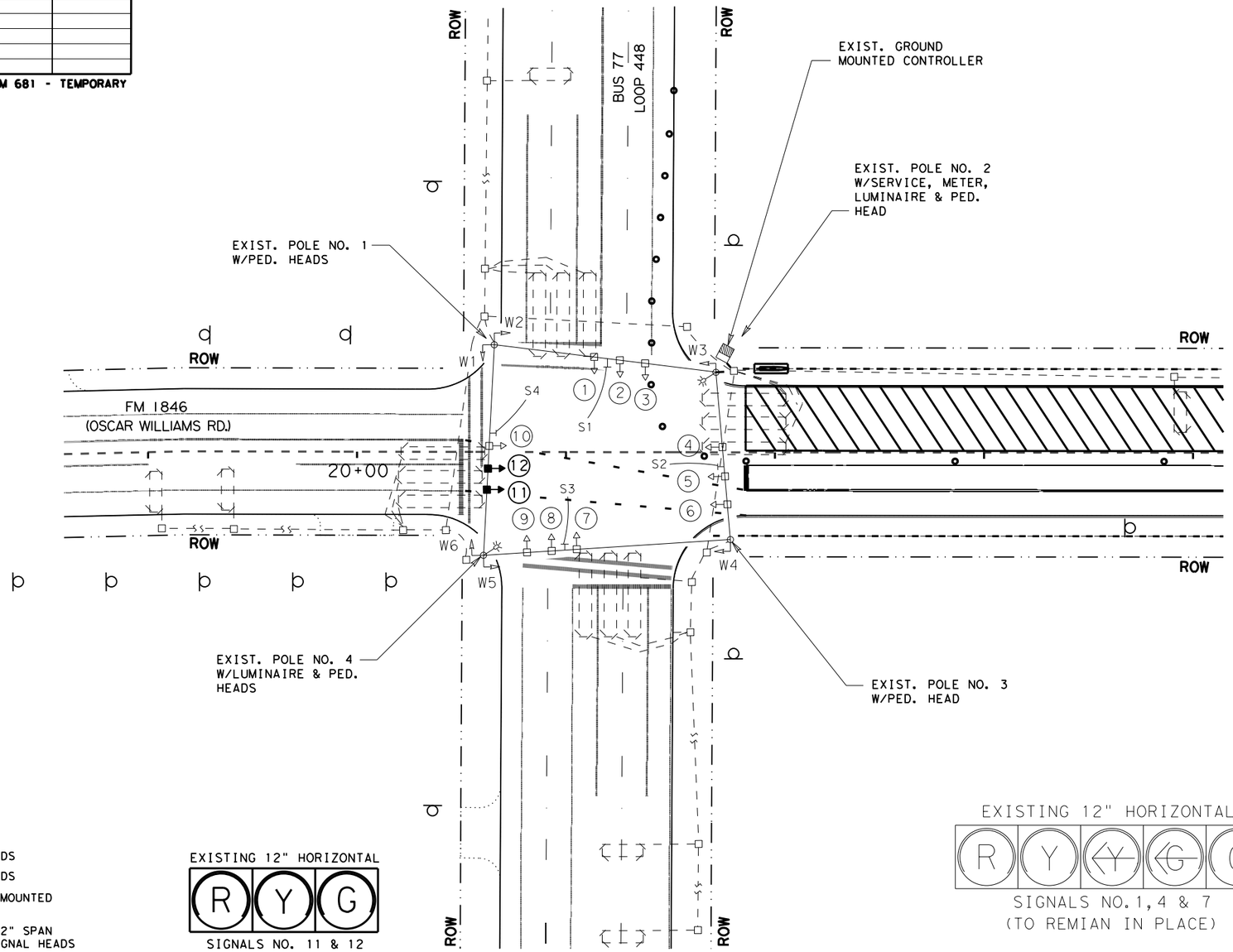
ALL ITEMS ARE SUBSIDIARY TO ITEM 681 - TEMPORARY TRAFFIC SIGNALS.

NOTES:

1. WHEN CONSTRUCTING THE ASSIGNED PART OF THE INTERSECTION, SIGNAL HEAD POSITIONS SHOULD BE SHIFTED TO FACE THE APPROACHING TRAFFIC AS NECESSARY.
2. THE CONTRACTOR MAY USE THE EXISTING OR TEMPORARY SIGNAL HARDWARE DURING THE DIFFERENT TCP PHASES OF CONSTRUCTION AS LONG AS SIGNALS ARE OPERATIONAL AT ALL TIMES. "PERMANENT PROPOSED" SIGNAL HEAD ASSEMBLIES SHALL NOT BE USED DURING THE TCP PHASES.
3. THE CONTRACTOR IS RESPONSIBLE FOR THE TEMPORARY TRAFFIC SIGNAL COMPONENTS AND IF DAMAGED, SHALL REPAIR AT HIS OWN EXPENSE.
4. THE CONTRACTOR MAY CHOOSE TO USE TEMPORARY WOOD POLES IF HE ENCOUNTERS CONFLICTS USING THE EXISTING OR PROPOSED PERMANENT SIGNAL POLES.

EXISTING
PROTECTED LEFT ON GREEN ARROW
S1, S2 & S3
(TO REMAIN IN PLACE)

EXISTING
PROTECTED LEFT ON GREEN ARROW
S4
(TO BE REMOVED)



LEGEND

- EXISTING PEDESTRIAN HEADS
- PROPOSED PEDESTRIAN HEADS
- EXISTING 12" SPAN WIRE MOUNTED TRAFFIC SIGNAL HEADS
- PROPOSED OR RELOCATED 12" SPAN WIRE MOUNTED TRAFFIC SIGNAL HEADS
- EXISTING LUMINAIRE
- PROPOSED LUMINAIRE
- EXISTING GROUND BOX
- PROPOSED GROUND BOX
- EXISTING LOOP DETECTOR
- EXISTING FULL TRAFFIC ACTUATED GROUND MOUNTED CONTROLLER
- EXISTING CONDUIT (SIZE & TYPE AS SPECIFIED)
- EXISTING CONDUIT BORE (SIZE & TYPE AS SPECIFIED)

EXISTING 12" HORIZONTAL
R Y G
SIGNALS NO. 11 & 12
(UTILIZE EXISTING SIGNAL HEADS, RELOCATE AS SHOWN)

EXISTING 12" HORIZONTAL
R Y G
SIGNALS NO. 2, 3, 5, 6, 8 & 9
(TO REMAIN IN PLACE)

TEMPORARY SIGNAL DIAGRAM

INTERSECTION OF FM 1846/BUS 77 CAMERON COUNTY CSJ: 1065-02-039

EXISTING 12" HORIZONTAL
R Y Y G G
SIGNALS NO. 1, 4 & 7
(TO REMIAN IN PLACE)

EXISTING 12" HORIZONTAL
R Y Y G G
SIGNAL NO. 10
(TO BE REMOVED)

STATE OF TEXAS
ELIGIO ALVAREZ
107123
LICENSED
PROFESSIONAL ENGINEER

Eligio Alvarez, P.E
7-15-2021

Pharr District Central Design

Texas Department of Transportation

①

TEMPORARY SIGNAL
TCP PHASE 2
FM 1846 @ BUS 77

SCALE: 1" = 60' SHEET 1 OF 1

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	CAMERON		69

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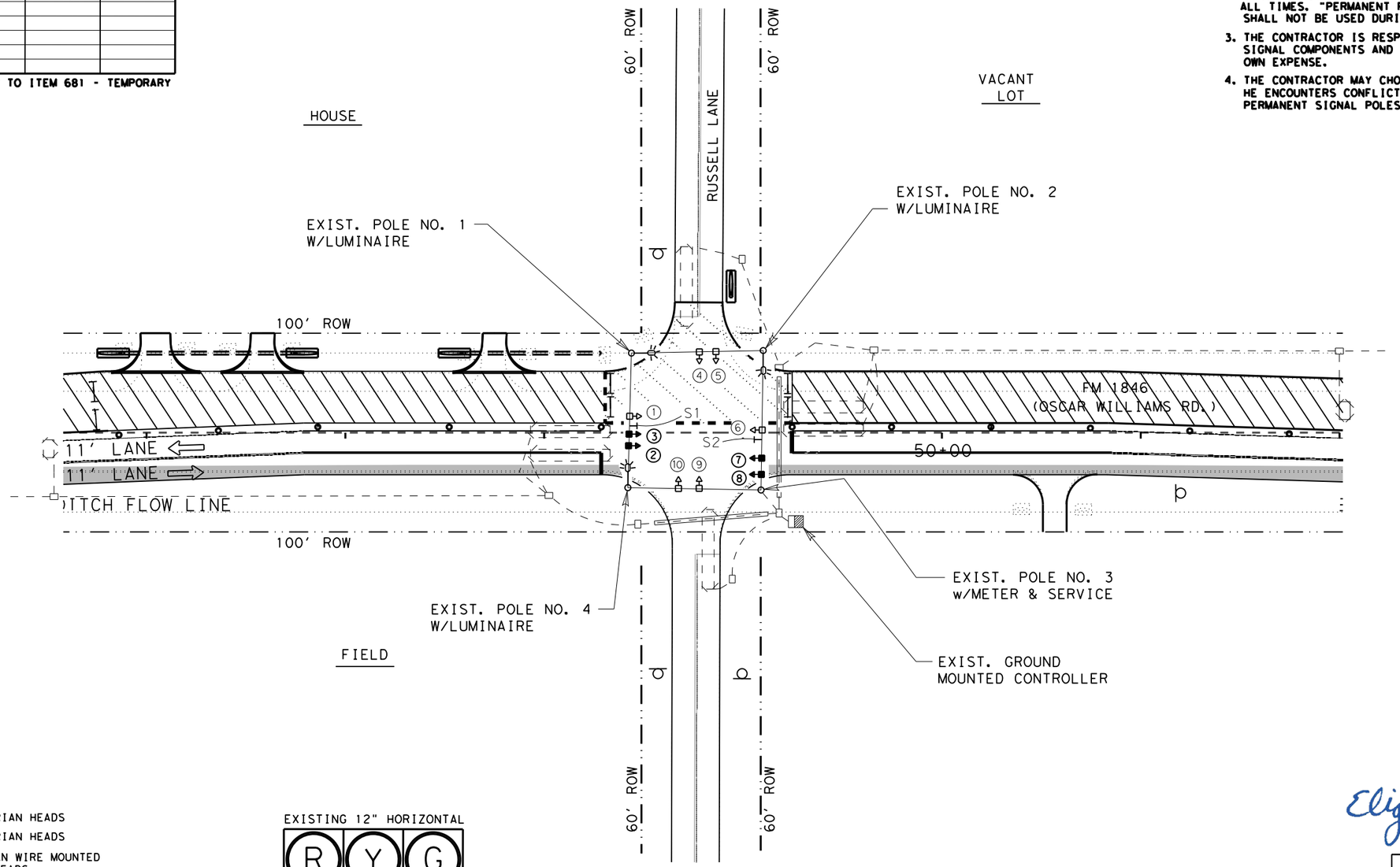
TEMPORARY TRAFFIC SIGNAL HARDWARE TO BE FURNISHED, INSTALLED & MAINTAINED BY THE CONTRACTOR

ITEM	UNIT	QUANTITY
5/C #12 SIGNAL CABLE	FT.	150'

ALL ITEMS ARE SUBSIDIARY TO ITEM 681 - TEMPORARY TRAFFIC SIGNALS.

NOTES:

1. WHEN CONSTRUCTING THE ASSIGNED PART OF THE INTERSECTION, SIGNAL HEAD POSITIONS SHOULD BE SHIFTED TO FACE THE APPROACHING TRAFFIC AS NECESSARY.
2. THE CONTRACTOR MAY USE THE EXISTING OR TEMPORARY SIGNAL HARDWARE DURING THE DIFFERENT TCP PHASES OF CONSTRUCTION AS LONG AS SIGNALS ARE OPERATIONAL AT ALL TIMES. "PERMANENT PROPOSED" SIGNAL HEAD ASSEMBLIES SHALL NOT BE USED DURING THE TCP PHASES.
3. THE CONTRACTOR IS RESPONSIBLE FOR THE TEMPORARY TRAFFIC SIGNAL COMPONENTS AND IF DAMAGED, SHALL REPAIR AT HIS OWN EXPENSE.
4. THE CONTRACTOR MAY CHOOSE TO USE TEMPORARY WOOD POLES IF HE ENCOUNTERS CONFLICTS USING THE EXISTING OR PROPOSED PERMANENT SIGNAL POLES.



EXISTING

LEFT TURN YIELD ON GREEN

R10-12 (30"X 36") S1 & S2 (TO BE REMOVED)

LEGEND

- EXISTING PEDESTRIAN HEADS
- PROPOSED PEDESTRIAN HEADS
- EXISTING 12" SPAN WIRE MOUNTED TRAFFIC SIGNAL HEADS
- PROPOSED OR RELOCATED 12" SPAN WIRE MOUNTED TRAFFIC SIGNAL HEADS
- EXISTING LUMINAIRE
- PROPOSED LUMINAIRE
- EXISTING GROUND BOX
- PROPOSED GROUND BOX
- EXISTING LOOP DETECTOR
- EXISTING FULL TRAFFIC ACTUATED GROUND MOUNTED CONTROLLER
- EXISTING CONDUIT (SIZE & TYPE AS SPECIFIED)
- EXISTING CONDUIT BORE (SIZE & TYPE AS SPECIFIED)

EXISTING 12" HORIZONTAL

R Y G

SIGNALS NO. 2, 3, 7 & 8
(UTILIZE EXISTING SIGNAL HEADS, RELOCATE AS SHOWN)

EXISTING 12" HORIZONTAL

R Y G

SIGNALS NO. 4, 5, 9 & 10
(TO REMAIN IN PLACE)

TEMPORARY SIGNAL DIAGRAM

INTERSECTION OF FM 1846/RUSSELL LANE CAMERON COUNTY CSJ: 1065-02-039

EXISTING 12" HORIZONTAL

R Y Y G G

SIGNALS NO. 1 & 6
(TO BE REMOVED)

STATE OF TEXAS
ELIGIO ALVAREZ
107123
LICENSED PROFESSIONAL ENGINEER

Eligio Alvarez, P.E
7-15-2021

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Texas Department of Transportation

②

TEMPORARY SIGNAL
TCP PHASE 2
FM 1846 @ RUSSELL LANE

SCALE: 1" = 60' SHEET 1 OF 1

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DS:	CK:	1065	02	039	FM 1846
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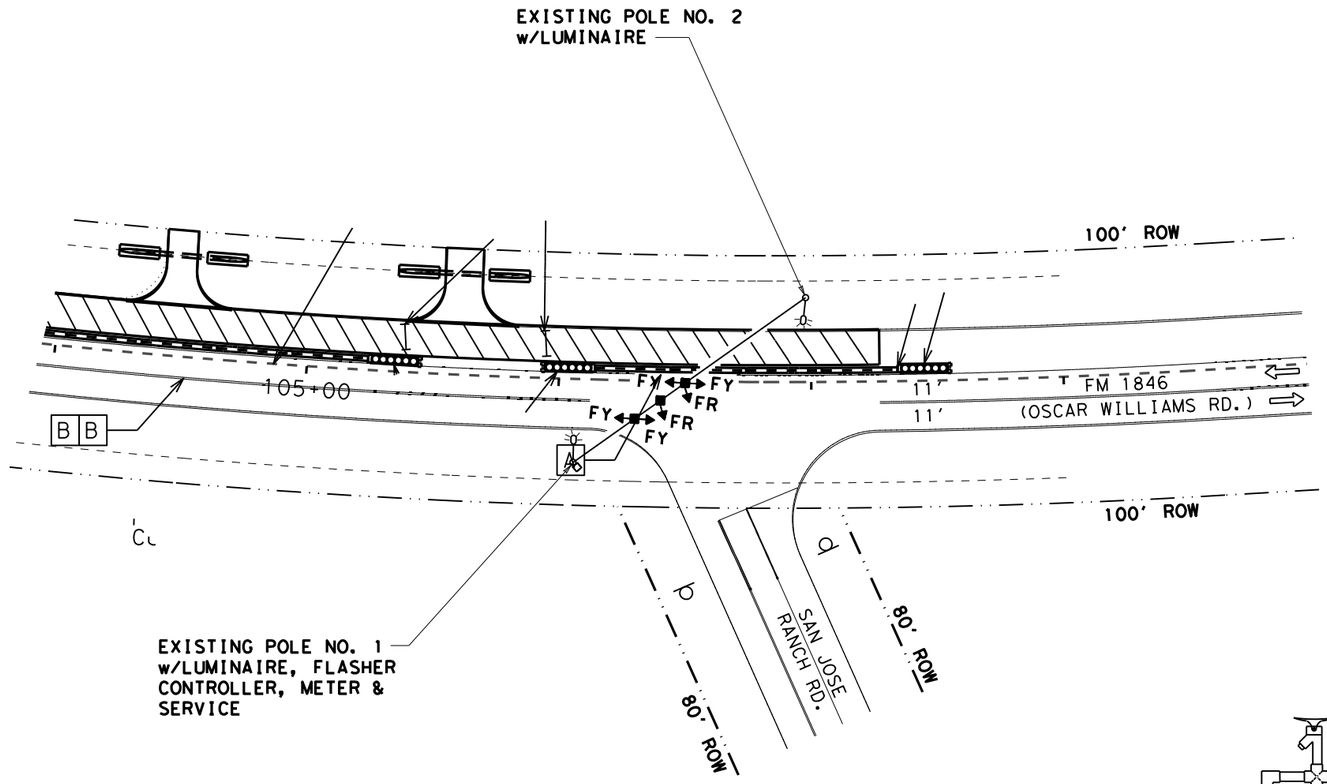
TEMPORARY TRAFFIC SIGNAL HARDWARE TO BE FURNISHED, INSTALLED & MAINTAINED BY THE CONTRACTOR

ITEM	UNIT	QUANTITY
5/C #12 SIGNAL CABLE	FT.	SEE
		PREVIOUS
		TCP
		PHASE

ALL ITEMS ARE SUBSIDIARY TO ITEM 681 - TEMPORARY TRAFFIC SIGNALS.

NOTES:

1. WHEN CONSTRUCTING THE ASSIGNED PART OF THE INTERSECTION, SIGNAL HEAD POSITIONS SHOULD BE SHIFTED TO FACE THE APPROACHING TRAFFIC AS NECESSARY.
2. THE CONTRACTOR MAY USE THE EXISTING OR TEMPORARY SIGNAL HARDWARE DURING THE DIFFERENT TCP PHASES OF CONSTRUCTION AS LONG AS SIGNALS ARE OPERATIONAL AT ALL TIMES. "PERMANENT PROPOSED" SIGNAL HEAD ASSEMBLIES SHALL NOT BE USED DURING THE TCP PHASES.
3. THE CONTRACTOR IS RESPONSIBLE FOR THE TEMPORARY TRAFFIC SIGNAL COMPONENTS AND IF DAMAGED, SHALL REPAIR AT HIS OWN EXPENSE.
4. THE CONTRACTOR MAY CHOOSE TO USE TEMPORARY WOOD POLES IF HE ENCOUNTERS CONFLICTS USING THE EXISTING OR PROPOSED PERMANENT SIGNAL POLES.

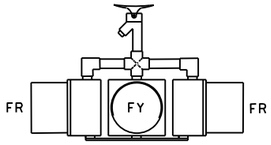


LEGEND

- PROPOSED OR RELOCATED 12" VERTICAL SPAN MOUNTED WIRE MOUNTED FLASHING BEACON HEADS
- EXISTING POLE MOUNTED CONTROLLER
- PROPOSED LUMINAIRE
- EXIST. LUMINAIRE
- PP - EXIST. POWER POLE (PP)
- EXIST. SIGN
- SS - EXIST. STORM SEWER
- FOC - FIBER OPTIC CABLE
- G - GAS
- W - WATER
- M - WATER METER
- MH - STORM SEWER MANHOLE (MH)
- RCP - REINF. CONC. PIPE
- FR - FLASHING RED
- FY - FLASHING YELLOW

TEMPORARY SIGNAL DIAGRAM

INTERSECTION OF
FM 1846/SAN JOSE RANCH RD.
CAMERON COUNTY
CSJ: 1065-02-039



DETAIL
4 WAY-1 SEC.
12" FLASHING BEACON HEAD
(OR AS SHOWN)
(UTILIZE EXISTING BEACON HEADS, RELOCATE AS SHOWN)

STATE OF TEXAS
ELIGIO ALVAREZ
107123
LICENSED
PROFESSIONAL ENGINEER

Eligio Alvarez, P.E
7-15-2021

Pharr District Central Design

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③

TEMPORARY SIGNAL
TCP PHASE 2
FM 1846 @ SAN JOSE RANCH

SCALE: 1" = 60' SHEET 1 OF 1

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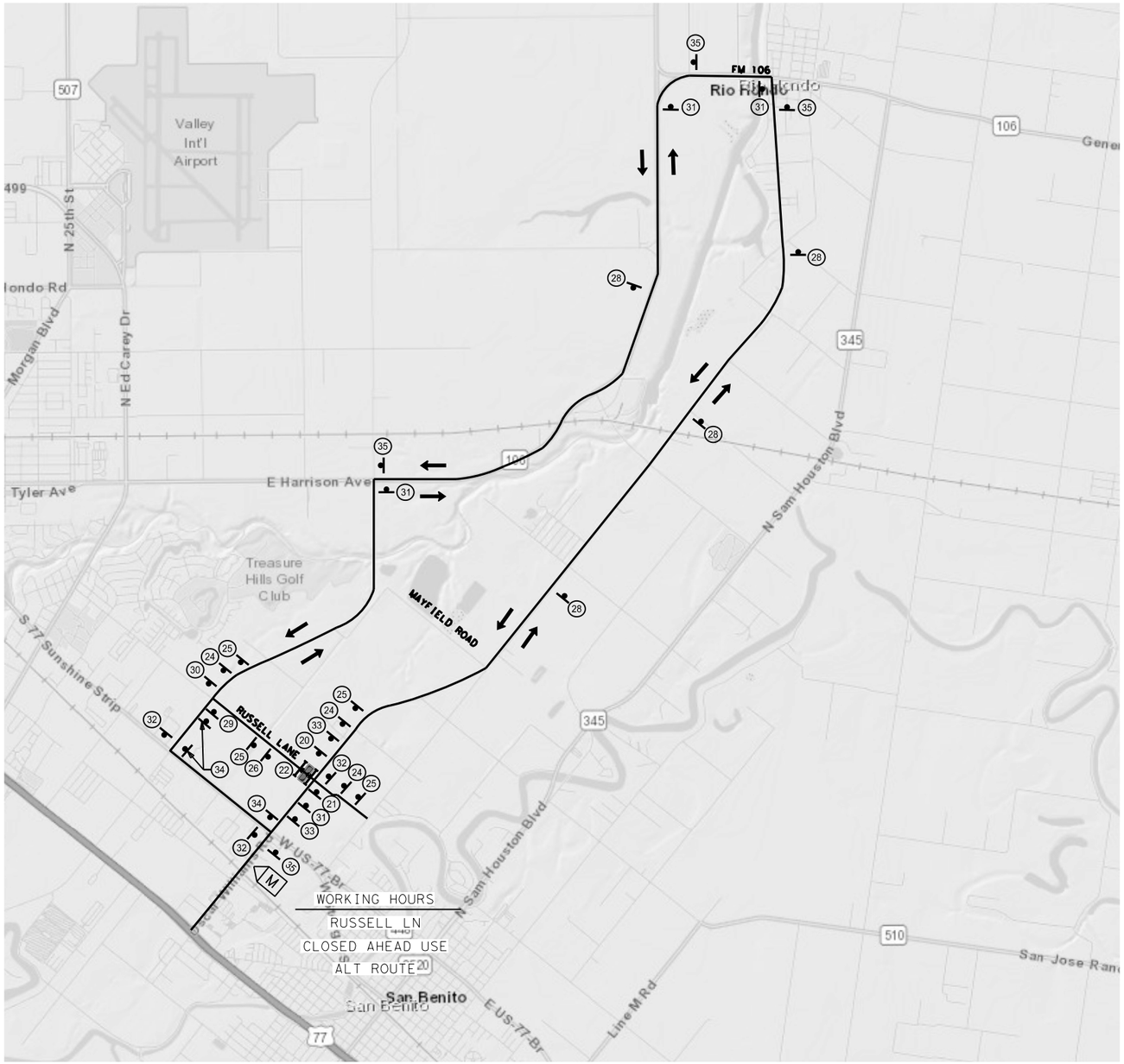

LEGEND

- TRAFFIC SIGN I.D.
- PROP. SIGN
- PROP. CONSTRUCTION
- PROP. TY 3 BARRICADES
- PROP. TRAFFIC BARRELS
- M — PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

GENERAL NOTES:

1. REFER TO "BC" AND "TCP STANDARDS" FOR SIGN SPACING AND ADDITIONAL SIGNING.

CW20-1D 48"x48" — ROAD WORK AHEAD — 4

R3-1 36"x36" — 20

R3-2 36"x36" — 21

R11-2 48"x30" — ROAD CLOSED — 22

ROAD CLOSED / DETOUR — R11-2 48"x30" / M4-10L 48"x18" — 23

CW20-2D 48"x48" — DETOUR AHEAD — 24

CW20-3D 48"x48" — ROAD CLOSED AHEAD — 25

CW20-3C 48"x48" — ROAD CLOSED 500 FT — 26

CW20-3B 48"x48" — ROAD CLOSED 1000 FT — 27

M4-9S 30"x24" — DETOUR — 28

M4-8a 24"x18" — END DETOUR — 29

M4-12T 48"x12" — E RUSSEL LN / DETOUR ↑ — M4-9S 30"x24" — 30

M4-12T 48"x12" — E RUSSEL LN / DETOUR → — M4-9R 30"x24" — 31

M4-12T 48"x12" — E RUSSEL LN / DETOUR ← — M4-9L 30"x24" — 32

M4-12T 48"x12" — W RUSSEL LN / DETOUR ↑ — M4-9S 30"x24" — 33

M4-12T 48"x12" — W RUSSEL LN / DETOUR → — M4-9R 30"x24" — 34

M4-12T 48"x12" — W RUSSEL LN / DETOUR ← — M4-9L 30"x24" — 35

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED PROFESSIONAL ENGINEER

07/13/2021

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FM 1846
PHASE 2
DETOUR LAYOUT
WEST RUSSELL LANE

NOT TO SCALE — SHEET 1 OF 1

© 2021	CONT	SECT	JOB	HIGHWAY
	1065	02	039	FM 1846
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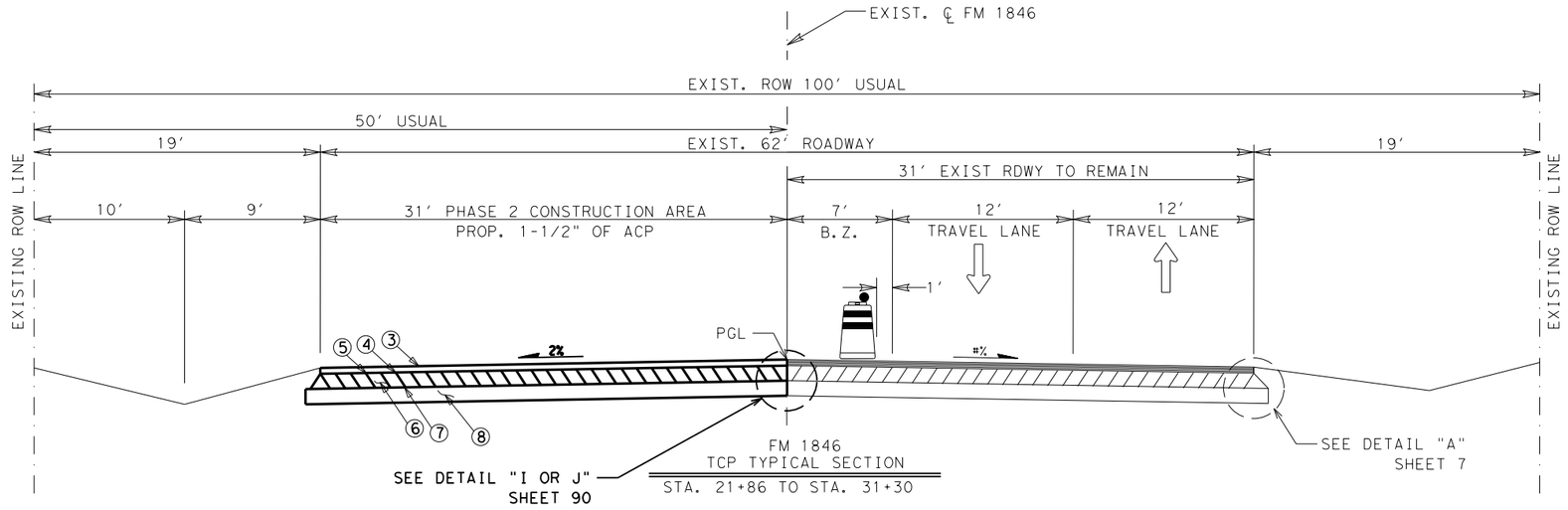
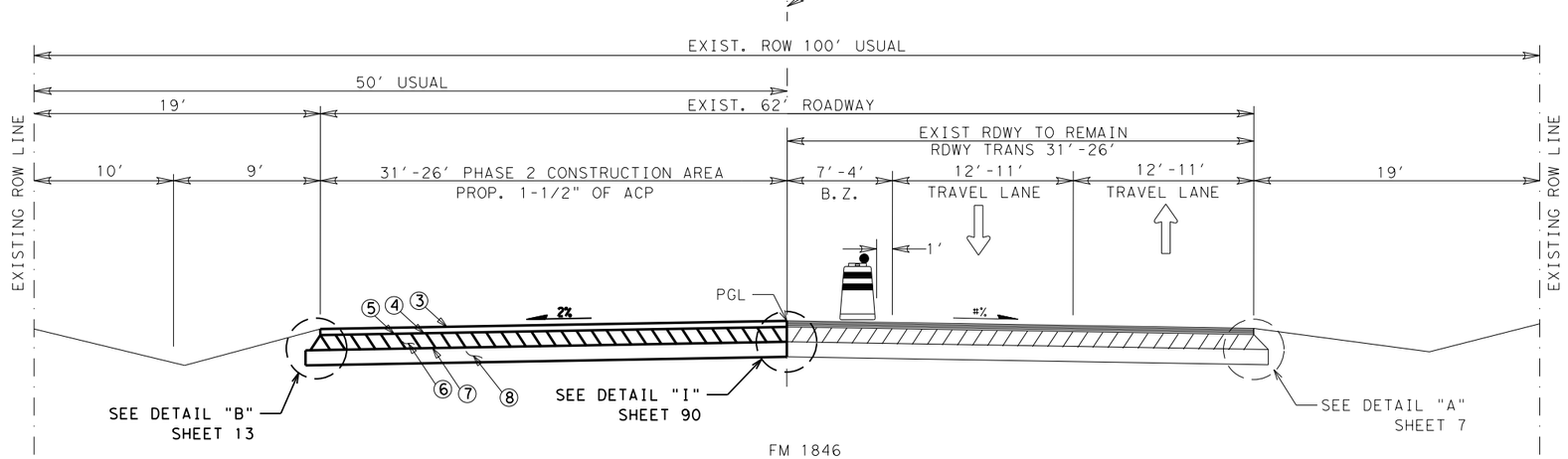


FM 1846
TCP TYPICAL SECTION
STA. 21+86 TO STA. 31+30



FM 1846
TCP TYPICAL SECTION
STA. 31+30 TO STA. 34+10
(CONS. TRANS. 31′ TO 26′)

LEGEND:

③ PROPOSED 1.5" SP-D PG76-22 (SAC-A) ACP (1ST LIFT)
④ PROPOSED 1 COURSE UNDER SEAL
⑤ PROPOSED MC-30 (0.2 GAL/SY)
⑥ PROPOSED 10.0" TY-A GR-1/2 BASE W/2% CEMENT BY WEIGHT
⑦ PROPOSED 1-TYII GEOGRID
⑧ PROPOSED 12.0" STABILIZED SUBGRADE W/4% LIME BY WEIGHT

BZ - BUFFER ZONE
CA - CONSTRUCTION AREA
ACP - ASPHALT CONCRETE PAVEMENT
CONS - CONSTRUCTION
RDWY - ROADWAY
TRANS - TRANSITION
P.C. - PREVIOUSLY CONSTRUCTED
#% - EXISTING CROSS SLOPE
#% - PROPOSED CROSS SLOPE

- PLASTIC BARREL W/REFLECTOR
- CONCRETE TRAFFIC BARRIER W/REFLECTORS

✱ ALTERNATE TRAFFIC CONTROL PLAN DURING WORKING HOURS SHEETS 56 AND 62

NOTES:

1. SEE PROPOSED TRAFFIC CONTROL PLAN LAYOUTS FOR LANE STRIPING DIMENSIONS, STATIONING AND TRANSITIONS.

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FM 1846 TRAFFIC CONTROL PLAN - TYPICAL SECTIONS PHASE 2

NOT TO SCALE — SHEET 1 OF 6

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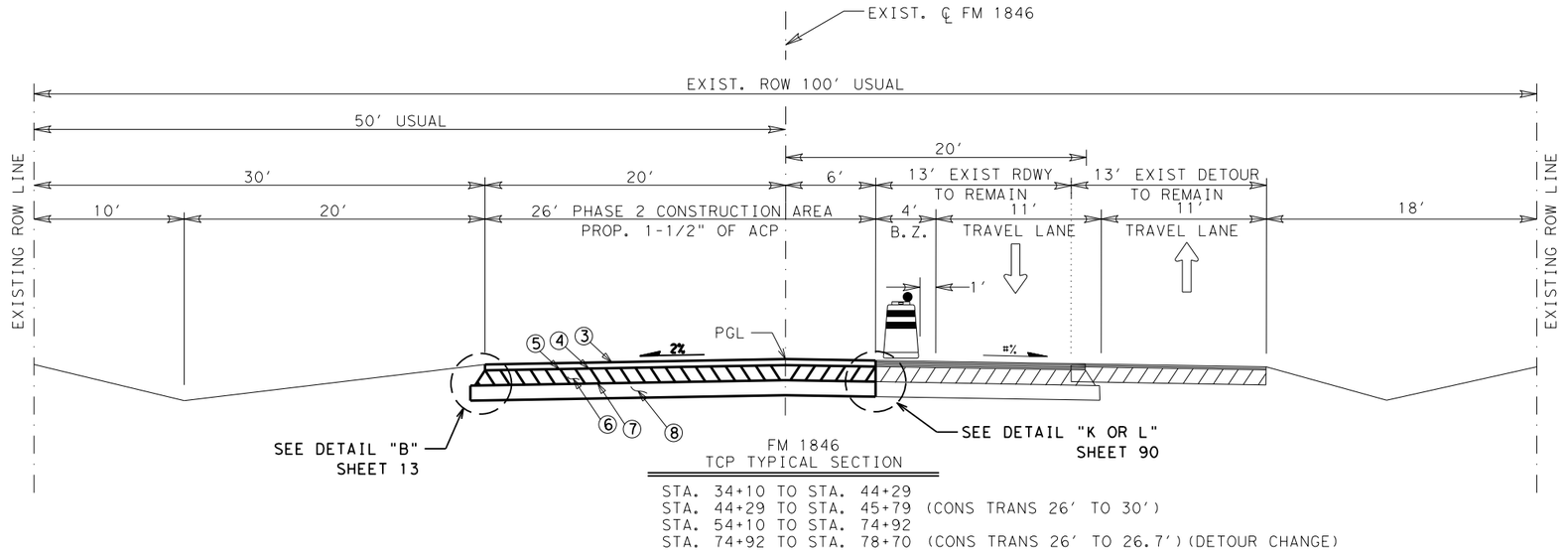
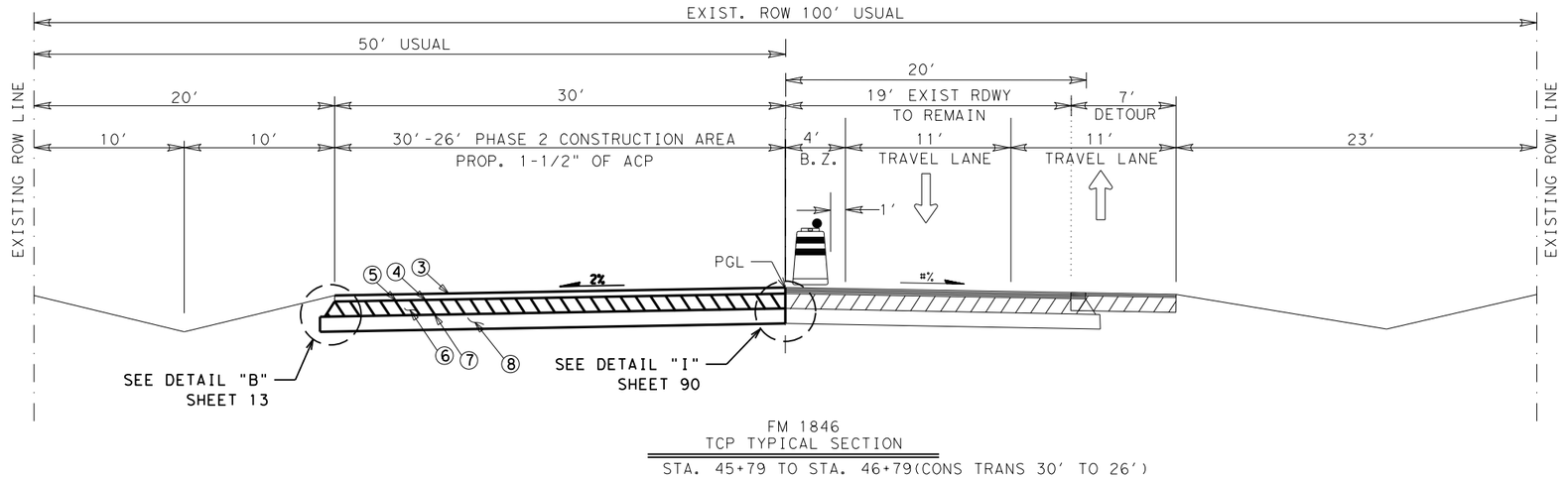


FM 1846
TCP TYPICAL SECTION

STA. 34+10 TO STA. 44+29
STA. 44+29 TO STA. 45+79 (CONS TRANS 26' TO 30')
STA. 54+10 TO STA. 74+92
STA. 74+92 TO STA. 78+70 (CONS TRANS 26' TO 26.7')(DETOUR CHANGE)



FM 1846
TCP TYPICAL SECTION

STA. 45+79 TO STA. 46+79(CONS TRANS 30' TO 26')

LEGEND:

③ PROPOSED 1.5" SP-D PG76-22 (SAC-A) ACP (1ST LIFT)
④ PROPOSED 1 COURSE UNDER SEAL
⑤ PROPOSED MC-30 (0.2 GAL/SY)
⑥ PROPOSED 10.0" TY-A GR-1/2 BASE W/2% CEMENT BY WEIGHT
⑦ PROPOSED 1-TYII GEOGRID
⑧ PROPOSED 12.0" STABILIZED SUBGRADE W/4% LIME BY WEIGHT

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- CONCRETE TRAFFIC BARRIER W/REFLECTORS
* ALTERNATE TRAFFIC CONTROL PLAN DURING WORKING HOURS SHEETS 56 AND 62

NOTES:

1. SEE PROPOSED TRAFFIC CONTROL PLAN LAYOUTS FOR LANE STRIPING DIMENSIONS, STATIONING AND TRANSITIONS.

STATE OF TEXAS
ABEL MARROQUIN III
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FM 1846 TRAFFIC CONTROL PLAN - TYPICAL SECTIONS PHASE 2

NOT TO SCALE — SHEET 2 OF 6

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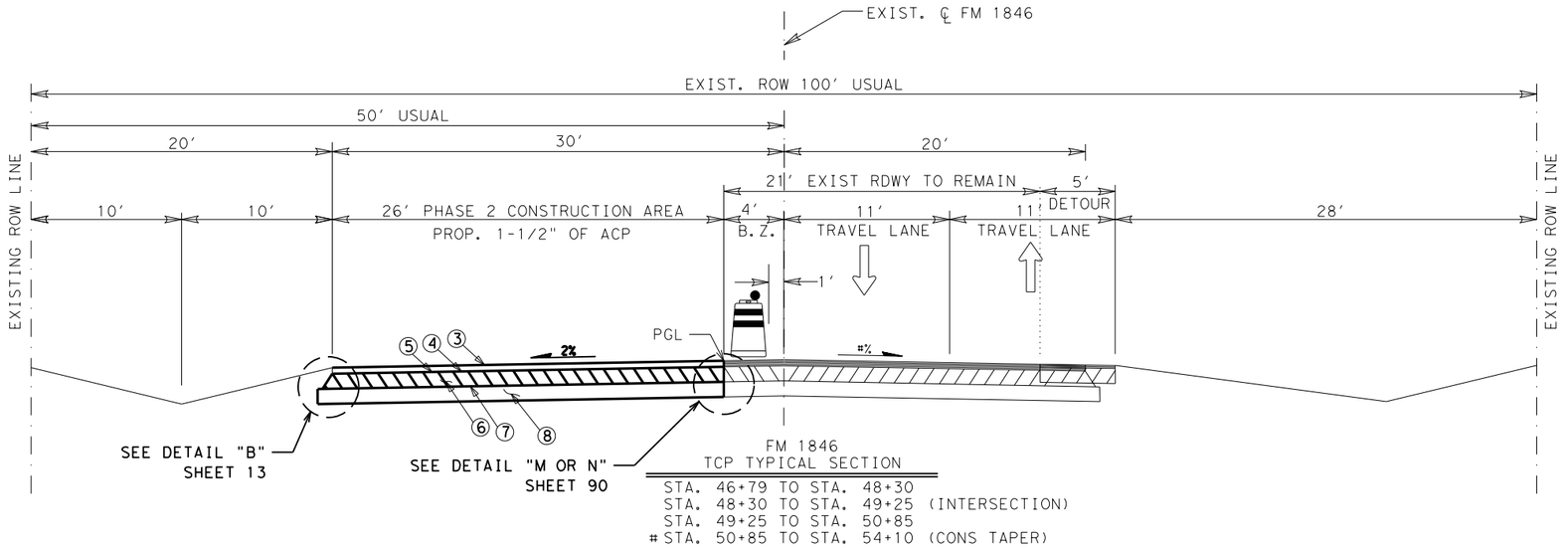
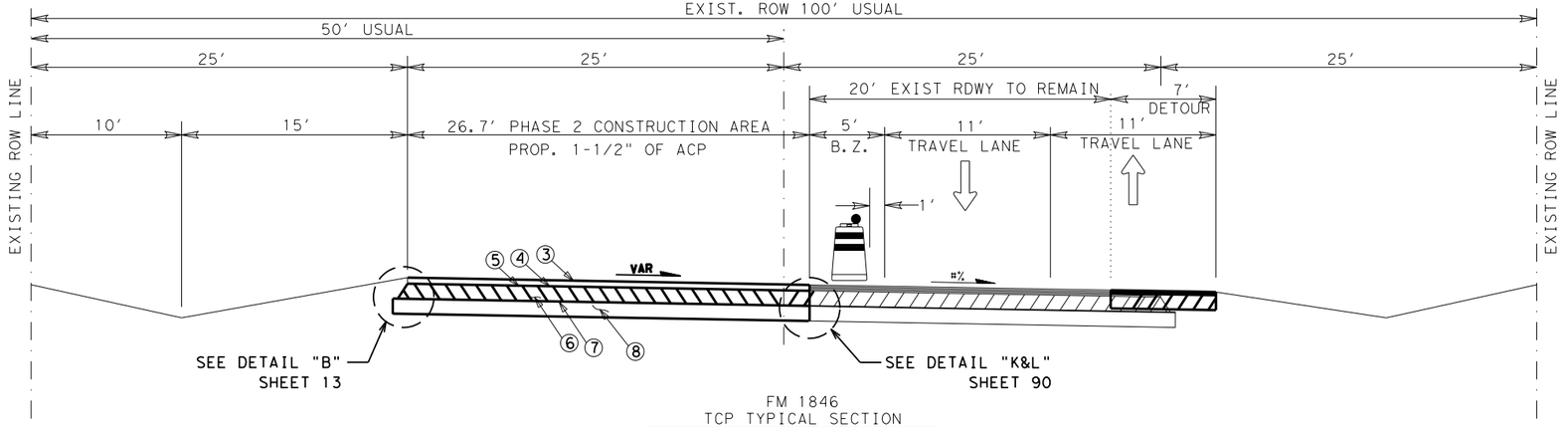


FM 1846
TCP TYPICAL SECTION

STA. 46+79 TO STA. 48+30
STA. 48+30 TO STA. 49+25 (INTERSECTION)
STA. 49+25 TO STA. 50+85
STA. 50+85 TO STA. 54+10 (CONS TAPER)

- CONSTRUCTION TO REMAIN AT 26'



FM 1846
TCP TYPICAL SECTION

STA. 78+70 TO STA. 80+22 (CONS 26.7' TO 27')

LEGEND:

③ PROPOSED 1.5" SP-D PG76-22 (SAC-A) ACP (1ST LIFT)
④ PROPOSED 1 COURSE UNDER SEAL
⑤ PROPOSED MC-30 (0.2 GAL/SY)
⑥ PROPOSED 10.0" TY-A GR-1/2 BASE W/2% CEMENT BY WEIGHT
⑦ PROPOSED 1-TYII GEOGRID
⑧ PROPOSED 12.0" STABILIZED SUBGRADE W/4% LIME BY WEIGHT

BZ - BUFFER ZONE
CA - CONSTRUCTION AREA
ACP - ASPHALT CONCRETE PAVEMENT
CONS - CONSTRUCTION
RDWY - ROADWAY
TRANS - TRANSITION
P.C. - PREVIOUSLY CONSTRUCTED

#% - EXISTING CROSS SLOPE
#% - PROPOSED CROSS SLOPE

- PLASTIC BARREL W/REFLECTOR
- CONCRETE TRAFFIC BARRIER W/REFLECTORS

* ALTERNATE TRAFFIC CONTROL PLAN DURING WORKING HOURS SHEETS 56 AND 62

NOTES:

1. SEE PROPOSED TRAFFIC CONTROL PLAN LAYOUTS FOR LANE STRIPING DIMENSIONS, STATIONING AND TRANSITIONS.

STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER

07/13/2021

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FM 1846 TRAFFIC CONTROL PLAN - TYPICAL SECTIONS PHASE 2

NOT TO SCALE — SHEET 3 OF 6

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		75

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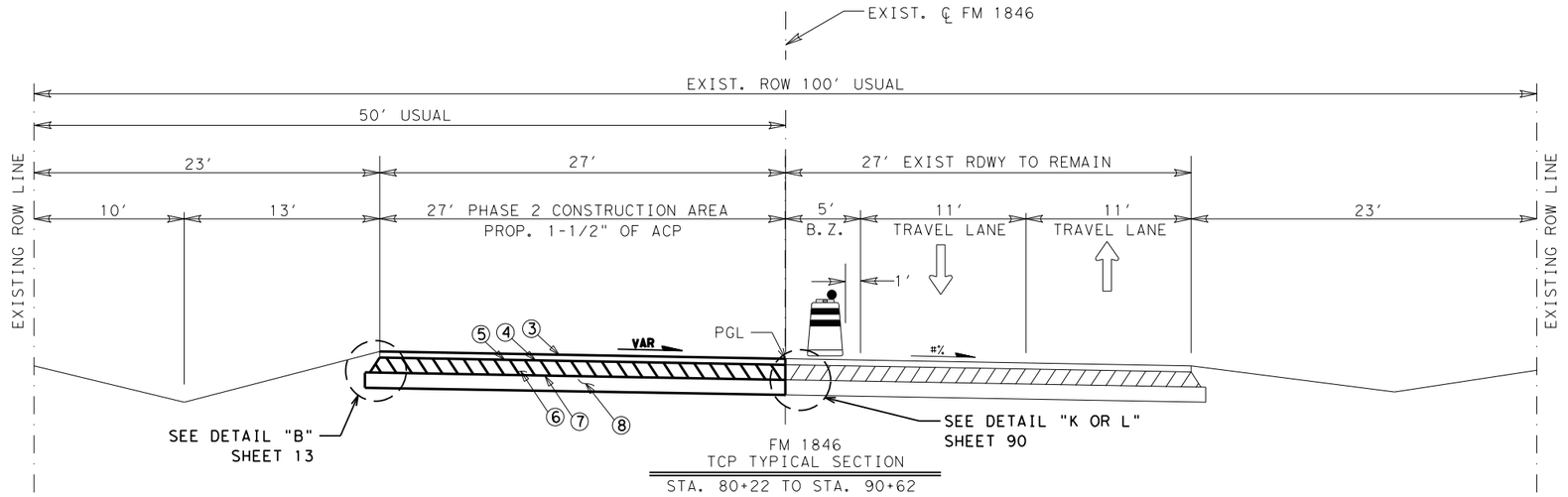

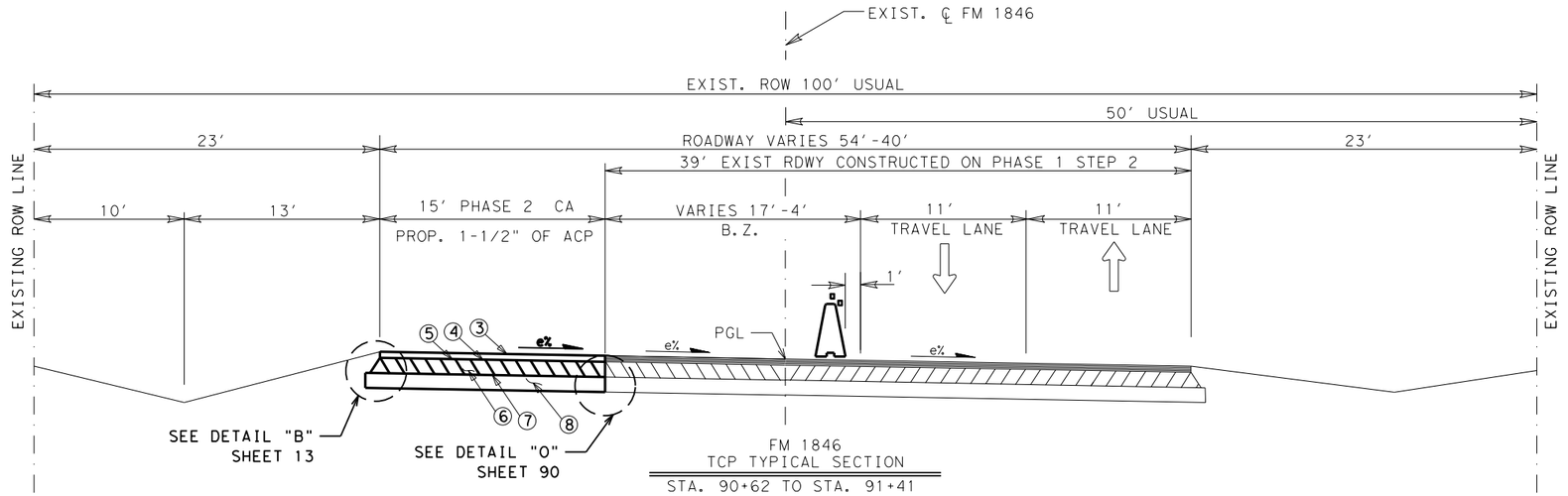

LEGEND:

③ PROPOSED 1.5" SP-D PG76-22 (SAC-A) ACP (1ST LIFT)
④ PROPOSED 1 COURSE UNDER SEAL
⑤ PROPOSED MC-30 (0.2 GAL/SY)
⑥ PROPOSED 10.0" TY-A GR-1/2 BASE W/2% CEMENT BY WEIGHT
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- PLASTIC BARREL W/REFLECTOR
- CONCRETE TRAFFIC BARRIER W/REFLECTORS

✱ ALTERNATE TRAFFIC CONTROL PLAN DURING WORKING HOURS SHEETS 56 AND 62

NOTES:

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STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED
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FM 1846 TRAFFIC CONTROL PLAN - TYPICAL SECTIONS PHASE 2

NOT TO SCALE — SHEET 4 OF 6

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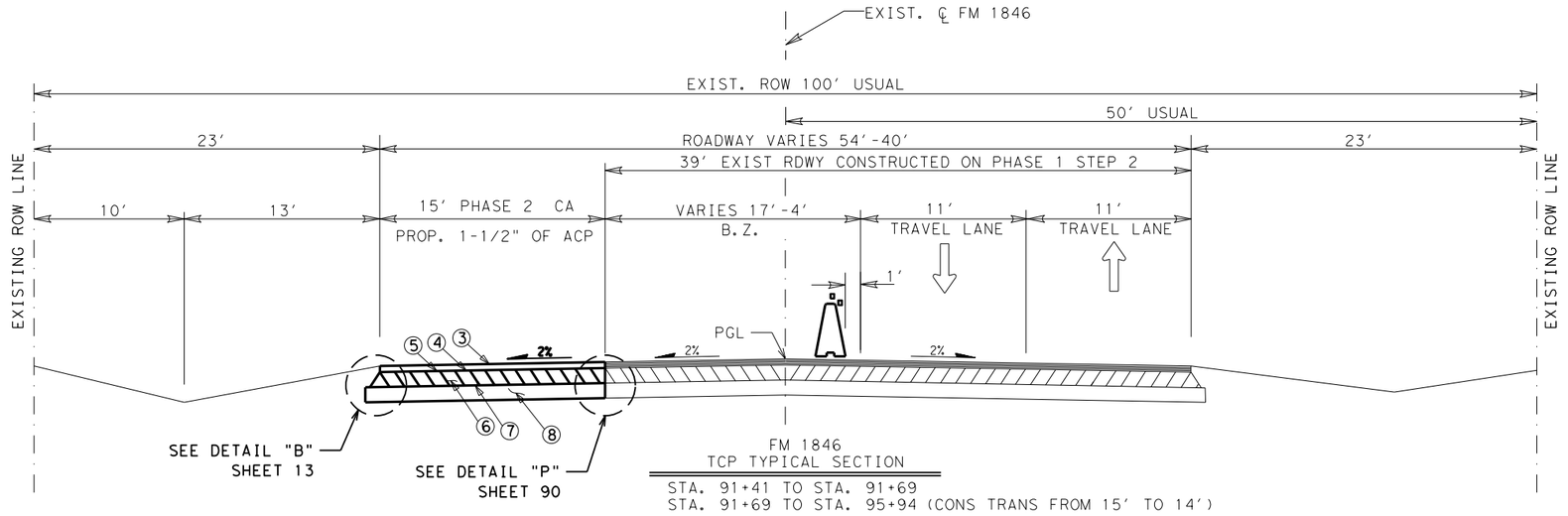

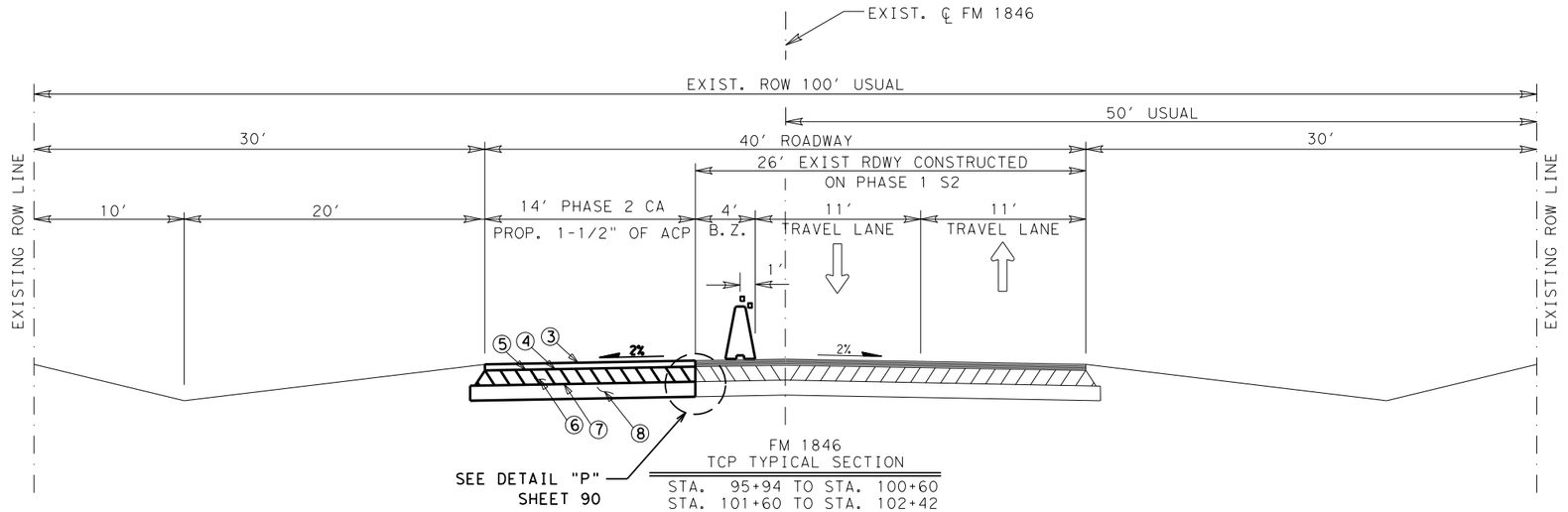

LEGEND:

(3) PROPOSED 1.5" SP-D PG76-22 (SAC-A) ACP (1ST LIFT)
(4) PROPOSED 1 COURSE UNDER SEAL
(5) PROPOSED MC-30 (0.2 GAL/SY)
(6) PROPOSED 10.0" TY-A GR-1/2 BASE W/2% CEMENT BY WEIGHT
(7) PROPOSED 1-TYII GEOGRID
(8) PROPOSED 12.0" STABILIZED SUBGRADE W/4% LIME BY WEIGHT

BZ - BUFFER ZONE
CA - CONSTRUCTION AREA
ACP - ASPHALT CONCRETE PAVEMENT
CONS - CONSTRUCTION
RDWY - ROADWAY
TRANS - TRANSITION
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#% - EXISTING CROSS SLOPE
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- PLASTIC BARREL W/REFLECTOR
- CONCRETE TRAFFIC BARRIER W/REFLECTORS
* ALTERNATE TRAFFIC CONTROL PLAN DURING WORKING HOURS SHEETS 56 AND 62

NOTES:

1. SEE PROPOSED TRAFFIC CONTROL PLAN LAYOUTS FOR LANE STRIPING DIMENSIONS, STATIONING AND TRANSITIONS.

STATE OF TEXAS
ABEL MARROQUIN III
134752
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FM 1846 TRAFFIC CONTROL PLAN - TYPICAL SECTIONS PHASE 2

NOT TO SCALE — SHEET 5 OF 6

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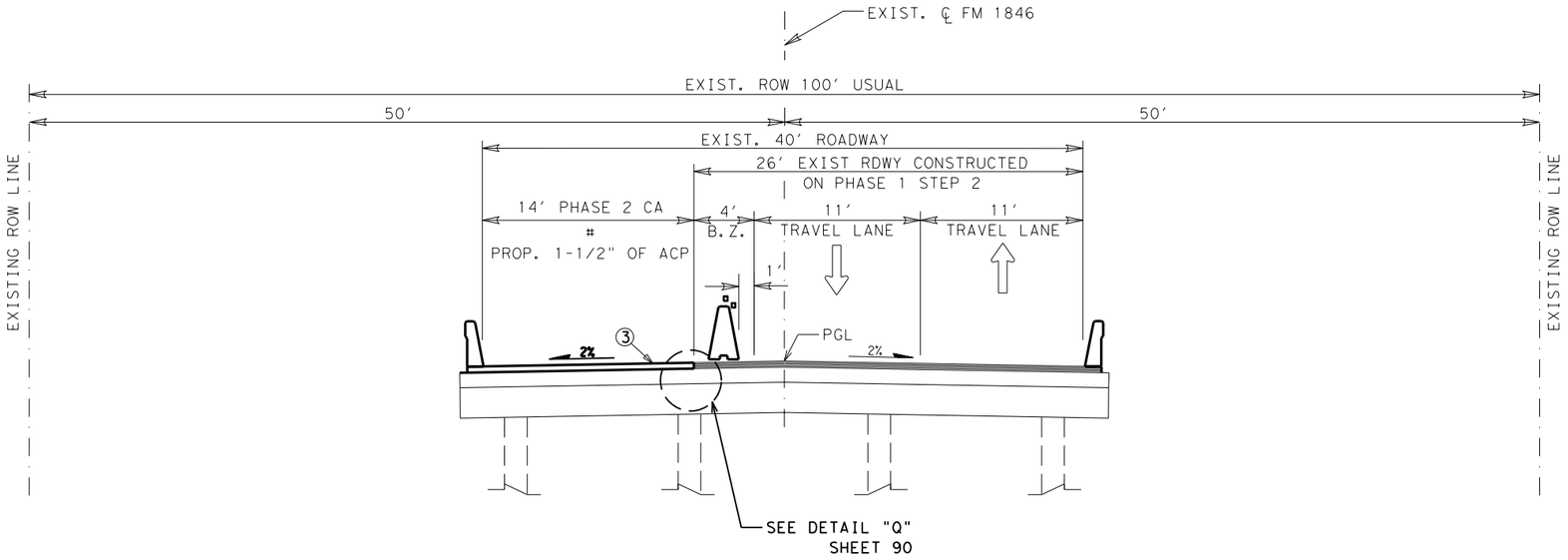
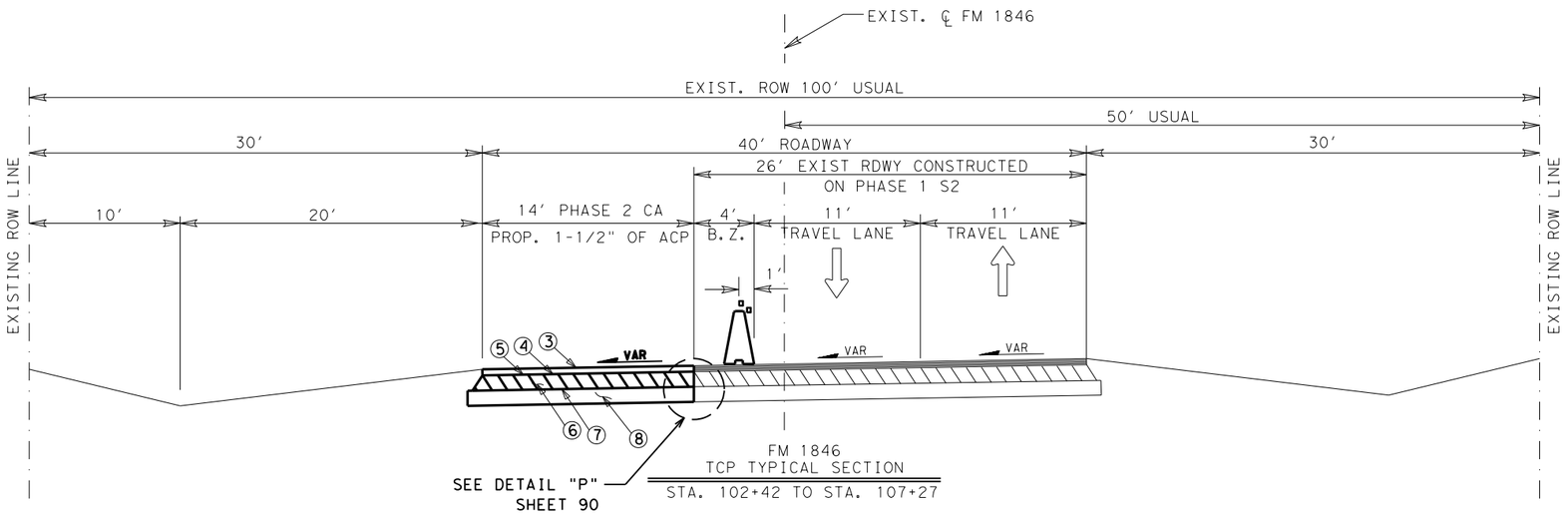


FM 1846
TCP TYPICAL SECTION

STA. 100+60 TO 101+60

BRIDGE TO BE MILLED 3"



FM 1846
TCP TYPICAL SECTION

STA. 102+42 TO STA. 107+27

LEGEND:

(3) PROPOSED 1.5" SP-D PG76-22 (SAC-A) ACP (1ST LIFT)
(4) PROPOSED 1 COURSE UNDER SEAL
(5) PROPOSED MC-30 (0.2 GAL/SY)
(6) PROPOSED 10.0" TY-A GR-1/2 BASE W/2% CEMENT BY WEIGHT
(7) PROPOSED 1-TYII GEOGRID
(8) PROPOSED 12.0" STABILIZED SUBGRADE W/4% LIME BY WEIGHT

BZ - BUFFER ZONE
CA - CONSTRUCTION AREA
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CONS - CONSTRUCTION
RDWY - ROADWAY
TRANS - TRANSITION
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#% - PROPOSED CROSS SLOPE
- PLASTIC BARREL W/REFLECTOR
- CONCRETE TRAFFIC BARRIER W/REFLECTORS

* ALTERNATE TRAFFIC CONTROL PLAN DURING WORKING HOURS SHEETS 56 AND 62

NOTES:

1. SEE PROPOSED TRAFFIC CONTROL PLAN LAYOUTS FOR LANE STRIPING DIMENSIONS, STATIONING AND TRANSITIONS.

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED
PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 TRAFFIC CONTROL PLAN - TYPICAL SECTIONS PHASE 2

NOT TO SCALE — SHEET 6 OF 6

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		78

DS: CK: DW: CK:

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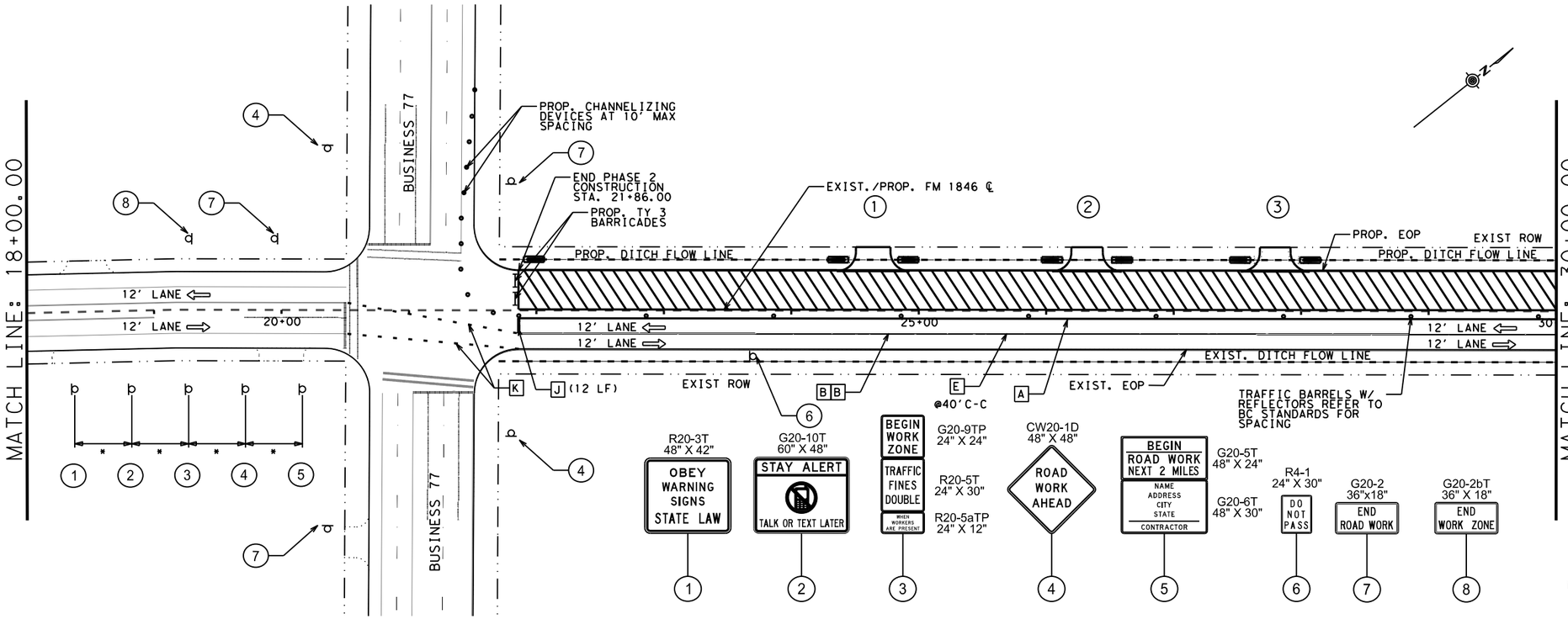
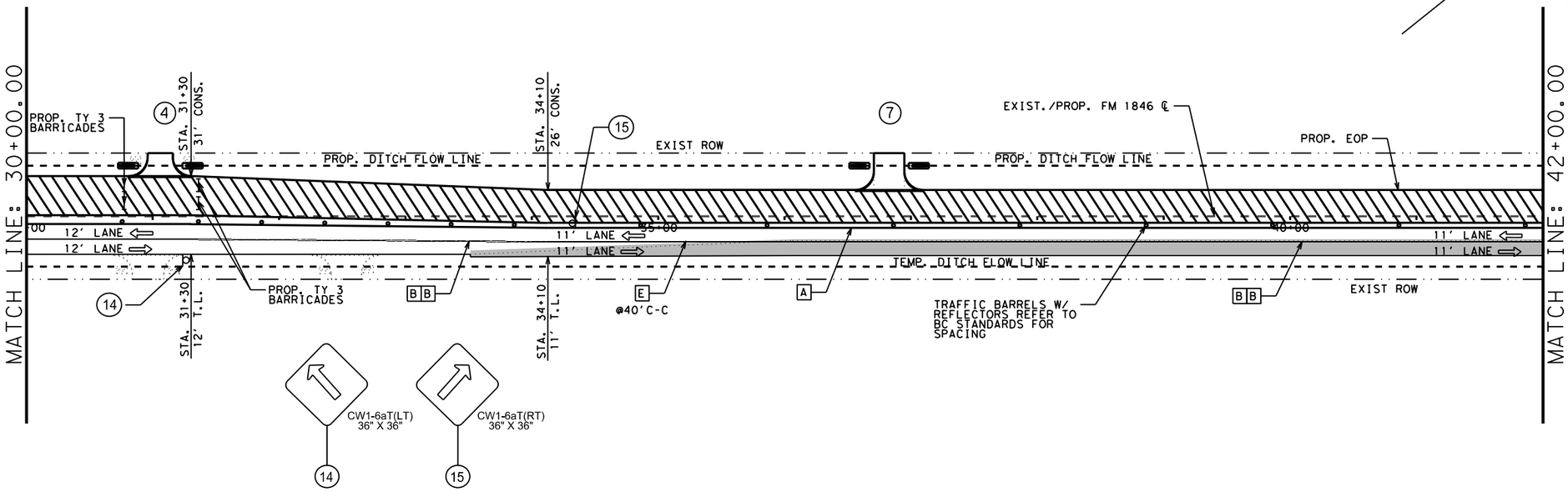


LEGEND

- CONSTRUCTION AREA
- BRIDGE CONSTRUCTION
- PROPOSED DETOUR
- PREVIOUSLY CONSTRUCTED
- A WK ZN PVMT MARK (REM) 4" WHITE SOLID
- B WK ZN PVMT MARK (REM) 4" YELLOW SOLID
- C WK ZN PVMT MARK (REM) 4" WHITE BROKEN
- D WK ZN PVMT MARK (REM) 4" YELLOW BROKEN
- E WK ZN PVMT MARK (REM) (REFL) TY II-A-A
- F WK ZN PVMT MARK (REM) (REFL) TY I-C
- G WK ZN PVMT MARK (NON-REM) 4" WHITE SOLID
- H WK ZN PVMT MARK (NON-REM) 4" YELLOW SOLID
- I WK ZN PVMT MARK (REM) 8" WHITE SOLID
- J WK ZN PVMT MARK (REM) 24" WHITE SOLID
- K WK ZN PAMT MARK (REM) 8" WHITE DOT
- * REFER TO BC(2)-14 STANDARDS FOR SIGN SPACING
- DIRECTION OF TRAFFIC FLOW
- d PROPOSED SIGN
- PROPOSED TYPE 3 (C) BARRICADES
- PLASTIC DRUM W/REFLECTORS
- PORTABLE CONCRETE TRAFFIC BARRIER W/REFLECTORS (PTCB)
- CRASH CUSHION ATTENUATOR-TL3
- TEMPORARY SIGNAL

NOTES:

1. PROJECT LIMITS AND ADVANCE WARNING SIGNS SHALL BE IN PLACE BEFORE COMMENCING CONSTRUCTION AND SHALL REMAIN IN PLACE THROUGHOUT THE DURATION OF CONSTRUCTION UNTIL THE PROJECT IS COMPLETED AND ACCEPTED BY TXDOT.
2. ALL SIGNS SHOWN FOR CONSTRUCTION ARE SPACED AT MINIMUM AND MAY BE ADJUSTED DUE TO FIELD CONDITIONS.
3. ALL STATIONING/ALIGNMENTS ARE FOR REFERENCE PURPOSES ONLY.
4. EXISTING STRIPING THAT IS IN CONFLICT WITH THE PROPOSED WK ZN PAVEMENT MARKINGS SHALL BE REMOVED.
5. EXISTING SIGNS THAT ARE IN CONFLICT WITH THE PROPOSED WK ZN SIGNS SHALL BE REMOVED OR COVERED.



STATE OF TEXAS
ABEL MARROQUIN III
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LICENSED PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 TRAFFIC CONTROL PLAN LAYOUT PHASE 2

1" = 100' SHEET 1 OF 5

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	CAMERON		79

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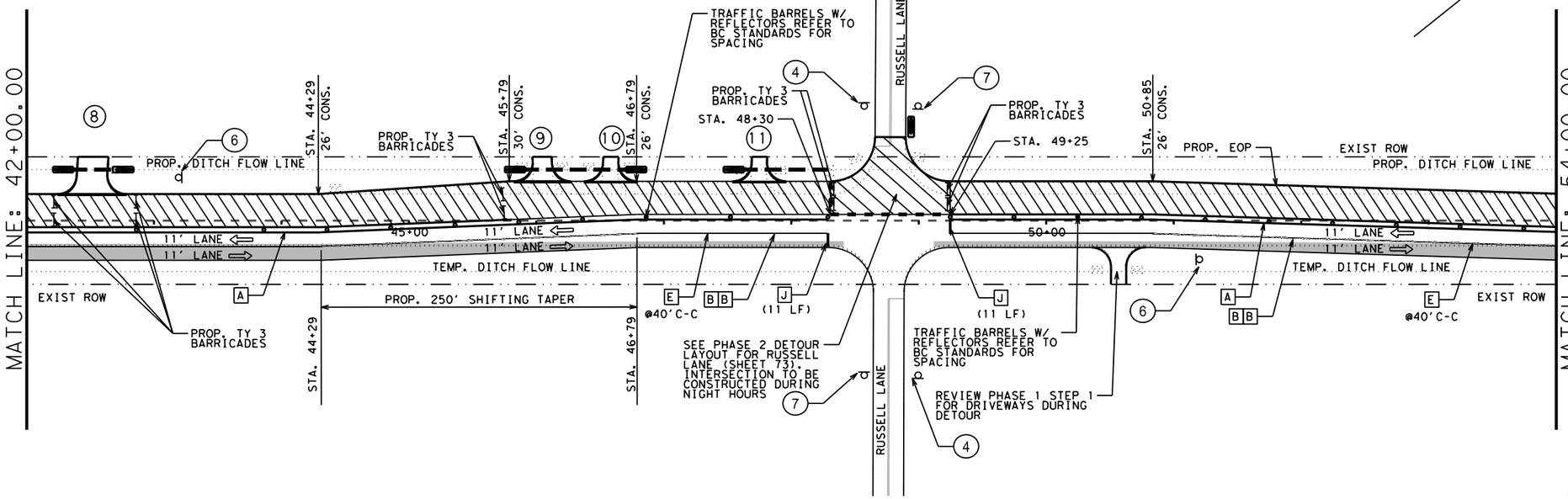

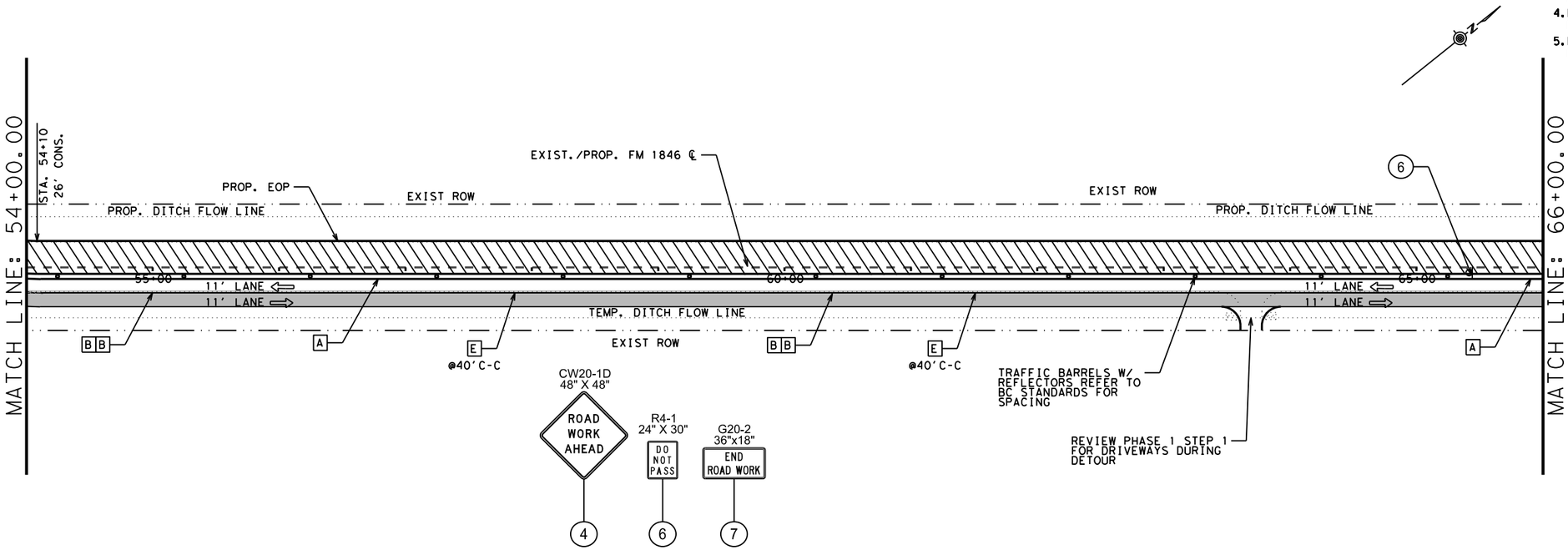

LEGEND

- CONSTRUCTION AREA
- BRIDGE CONSTRUCTION
- PROPOSED DETOUR
- PREVIOUSLY CONSTRUCTED
- [A] WK ZN PVMT MARK (REM) 4" WHITE SOLID
- [B] WK ZN PVMT MARK (REM) 4" YELLOW SOLID
- [C] WK ZN PVMT MARK (REM) 4" WHITE BROKEN
- [D] WK ZN PVMT MARK (REM) 4" YELLOW BROKEN
- [E] WK ZN PVMT MARK (REM) (REFL) TY II-A-A
- [F] WK ZN PVMT MARK (REM) (REFL) TY I-C
- [G] WK ZN PVMT MARK (NON-REM) 4" WHITE SOLID
- [H] WK ZN PVMT MARK (NON-REM) 4" YELLOW SOLID
- [I] WK ZN PVMT MARK (REM) 8" WHITE SOLID
- [J] WK ZN PVMT MARK (REM) 24" WHITE SOLID
- [K] WK ZN PAMT MARK (REM) 8" WHITE DOT
- * REFER TO BC(2)-14 STANDARDS FOR SIGN SPACING
- ⇨ DIRECTION OF TRAFFIC FLOW
- d PROPOSED SIGN
- I PROPOSED TYPE 3 (C) BARRICADES
- •• PLASTIC DRUM W/REFLECTORS
- PORTABLE CONCRETE TRAFFIC BARRIER W/REFLECTORS (PTCB)
- CRASH CUSHION ATTENUATOR-TL3
- TEMPORARY SIGNAL

NOTES:

1. PROJECT LIMITS AND ADVANCE WARNING SIGNS SHALL BE IN PLACE BEFORE COMMENCING CONSTRUCTION AND SHALL REMAIN IN PLACE THROUGHOUT THE DURATION OF CONSTRUCTION UNTIL THE PROJECT IS COMPLETED AND ACCEPTED BY TXDOT.
2. ALL SIGNS SHOWN FOR CONSTRUCTION ARE SPACED AT MINIMUM AND MAY BE ADJUSTED DUE TO FIELD CONDITIONS.
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STATE OF TEXAS
ABEL MARROQUIN III
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09/29/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 TRAFFIC CONTROL PLAN LAYOUT PHASE 2

1" = 100' SHEET 2 OF 5

© 2021	CONT	SECT	JOB	HIGHWAY
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	PHR	CAMERON		80

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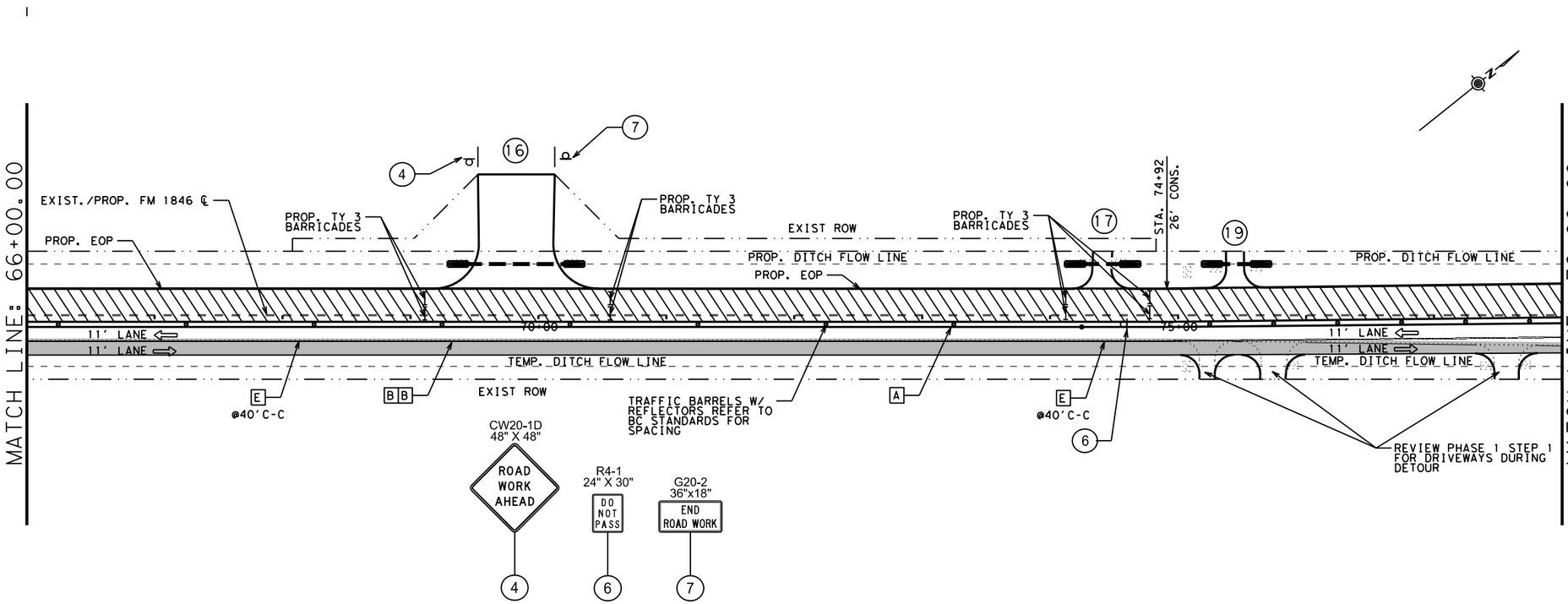

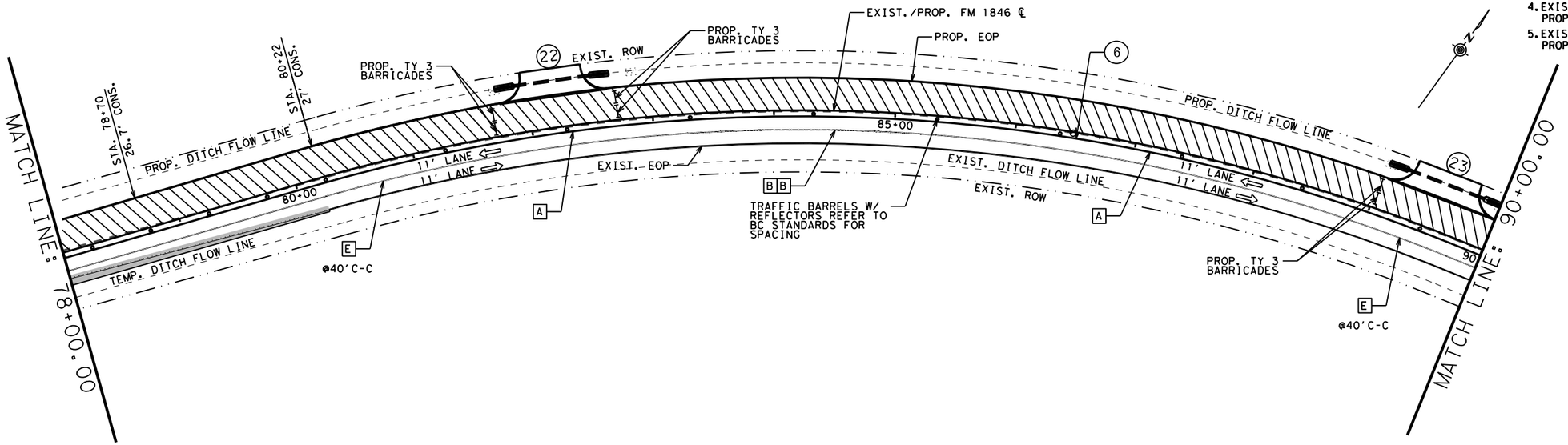

LEGEND

- CONSTRUCTION AREA
- BRIDGE CONSTRUCTION
- PROPOSED DETOUR
- PREVIOUSLY CONSTRUCTED
- [A] WK ZN PVMT MARK (REM) 4" WHITE SOLID
- [B] WK ZN PVMT MARK (REM) 4" YELLOW SOLID
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- [D] WK ZN PVMT MARK (REM) 4" YELLOW BROKEN
- [E] WK ZN PVMT MARK (REM) (REFL) TY II-A-A
- [F] WK ZN PVMT MARK (REM) (REFL) TY I-C
- [G] WK ZN PVMT MARK (NON-REM) 4" WHITE SOLID
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- [J] WK ZN PVMT MARK (REM) 24" WHITE SOLID
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- * REFER TO BC(2)-14 STANDARDS FOR SIGN SPACING
- DIRECTION OF TRAFFIC FLOW
- PROPOSED SIGN
- PROPOSED TYPE 3 (C) BARRICADES
- PLASTIC DRUM W/REFLECTORS
- PORTABLE CONCRETE TRAFFIC BARRIER W/REFLECTORS (PTCB)
- CRASH CUSHION ATTENUATOR-TL3
- TEMPORARY SIGNAL

NOTES:

1. PROJECT LIMITS AND ADVANCE WARNING SIGNS SHALL BE IN PLACE BEFORE COMMENCING CONSTRUCTION AND SHALL REMAIN IN PLACE THROUGHOUT THE DURATION OF CONSTRUCTION UNTIL THE PROJECT IS COMPLETED AND ACCEPTED BY TXDOT.
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STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 TRAFFIC CONTROL PLAN LAYOUT PHASE 2

1" = 100' SHEET 3 OF 5

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
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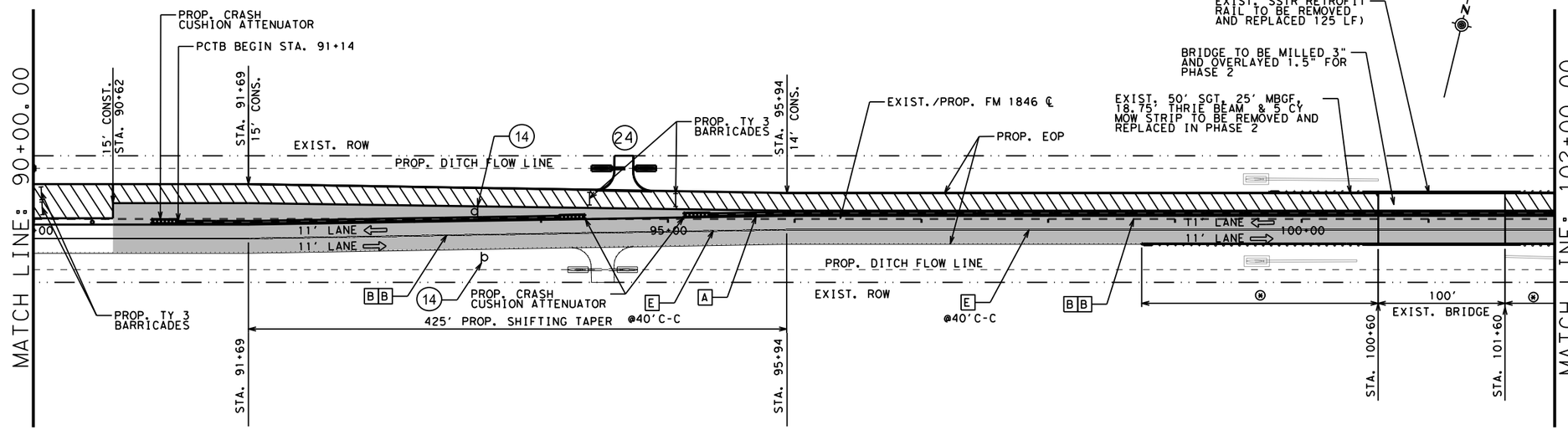

Ⓜ MBGF PREVIOSLY INSTALLED IN PHASE 1 STEP 2

NOTES:

1. PROJECT LIMITS AND ADVANCE WARNING SIGNS SHALL BE IN PLACE BEFORE COMMENCING CONSTRUCTION AND SHALL REMAIN IN PLACE THROUGHOUT THE DURATION OF CONSTRUCTION UNTIL THE PROJECT IS COMPLETED AND ACCEPTED BY TXDOT.
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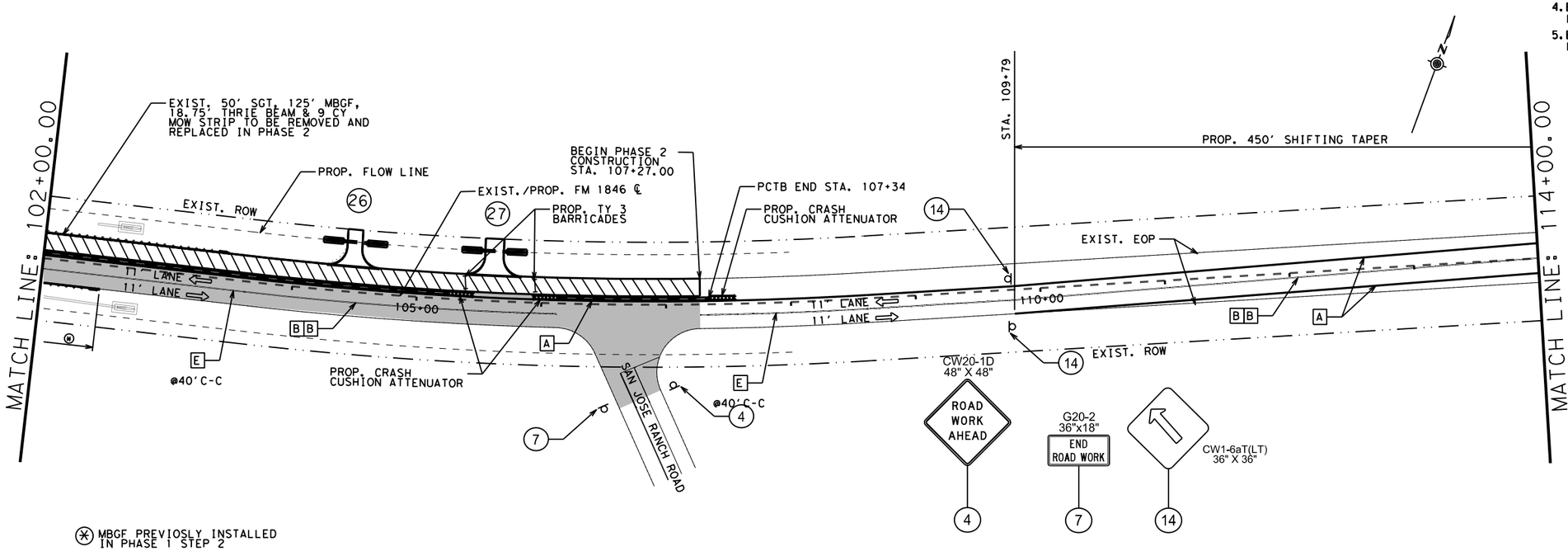

Ⓜ MBGF PREVIOSLY INSTALLED IN PHASE 1 STEP 2

STATE OF TEXAS
ABEL MARROQUIN III
134752
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FM 1846 TRAFFIC CONTROL PLAN LAYOUT PHASE 2

1" = 100' SHEET 4 OF 5

© 2021	CONT	SECT	JOB	HIGHWAY
DS: CK:	1065	02	039	FM 1846
DW: CK:	DIST	COUNTY		SHEET NO.
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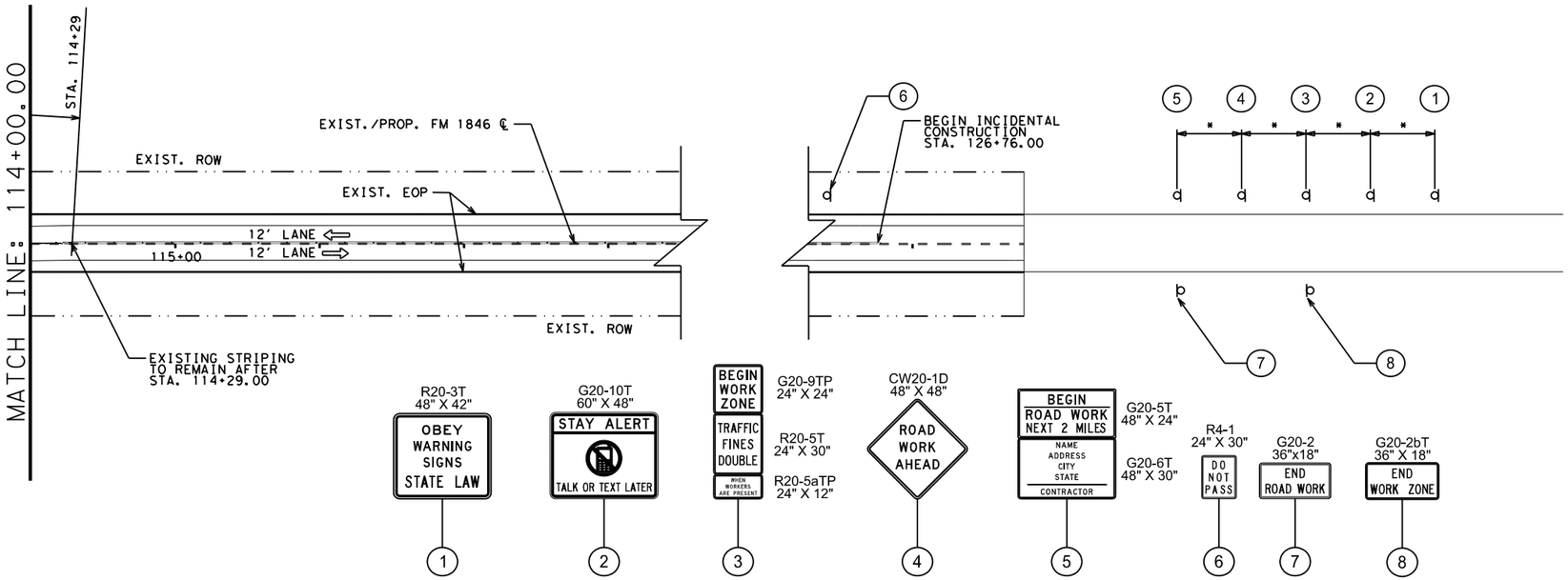

LEGEND

- CONSTRUCTION AREA
- BRIDGE CONSTRUCTION
- PROPOSED DETOUR
- PREVIOUSLY CONSTRUCTED
- [A] WK ZN PVMT MARK (REM) 4" WHITE SOLID
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- ⇨ DIRECTION OF TRAFFIC FLOW
- d PROPOSED SIGN
- I PROPOSED TYPE 3 (C) BARRICADES
- •• PLASTIC DRUM W/REFLECTORS
- PORTABLE CONCRETE TRAFFIC BARRIER W/REFLECTORS (PTCB)
- CRASH CUSHION ATTENUATOR-TL3
- TEMPORARY SIGNAL

NOTES:

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STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 TRAFFIC CONTROL PLAN LAYOUT PHASE 2

1" = 100' SHEET 5 OF 5

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
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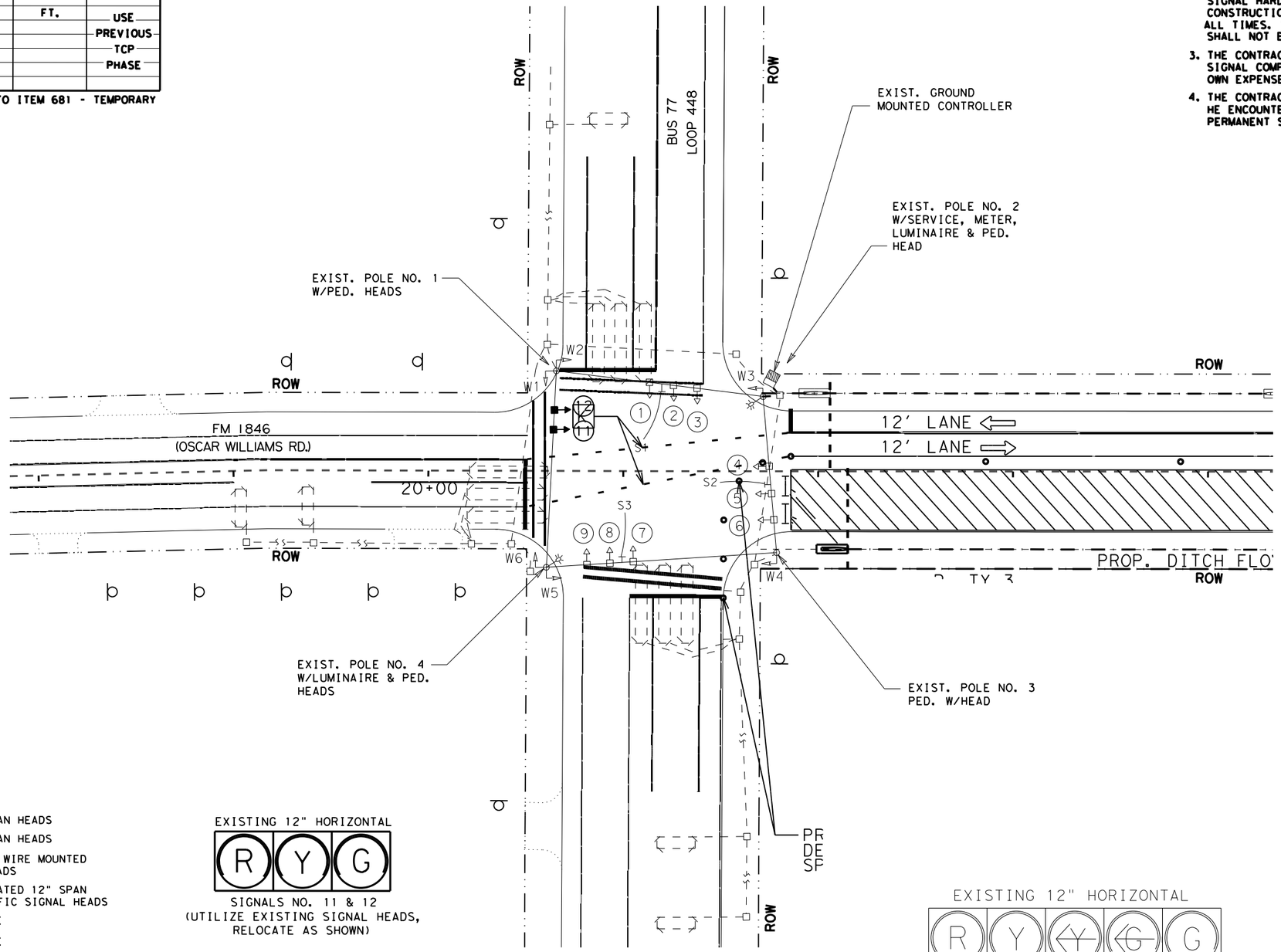
TEMPORARY TRAFFIC SIGNAL HARDWARE TO BE FURNISHED, INSTALLED & MAINTAINED BY THE CONTRACTOR

ITEM	UNIT	QUANTITY
5/C #12 SIGNAL CABLE	FT.	USE PREVIOUS TCP PHASE

ALL ITEMS ARE SUBSIDIARY TO ITEM 681 - TEMPORARY TRAFFIC SIGNALS.

NOTES:

1. WHEN CONSTRUCTING THE ASSIGNED PART OF THE INTERSECTION, SIGNAL HEAD POSITIONS SHOULD BE SHIFTED TO FACE THE APPROACHING TRAFFIC AS NECESSARY.
2. THE CONTRACTOR MAY USE THE EXISTING OR TEMPORARY SIGNAL HARDWARE DURING THE DIFFERENT TCP PHASES OF CONSTRUCTION AS LONG AS SIGNALS ARE OPERATIONAL AT ALL TIMES. "PERMANENT PROPOSED" SIGNAL HEAD ASSEMBLIES SHALL NOT BE USED DURING THE TCP PHASES.
3. THE CONTRACTOR IS RESPONSIBLE FOR THE TEMPORARY TRAFFIC SIGNAL COMPONENTS AND IF DAMAGED, SHALL REPAIR AT HIS OWN EXPENSE.
4. THE CONTRACTOR MAY CHOOSE TO USE TEMPORARY WOOD POLES IF HE ENCOUNTERS CONFLICTS USING THE EXISTING OR PROPOSED PERMANENT SIGNAL POLES.



EXISTING
PROTECTED LEFT ON GREEN ARROW
S1, S2 & S3
(TO REMAIN IN PLACE)

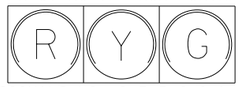
LEGEND

- EXISTING PEDESTRIAN HEADS
- PROPOSED PEDESTRIAN HEADS
- EXISTING 12" SPAN WIRE MOUNTED TRAFFIC SIGNAL HEADS
- PROPOSED OR RELOCATED 12" SPAN WIRE MOUNTED TRAFFIC SIGNAL HEADS
- EXISTING LUMINAIRE
- PROPOSED LUMINAIRE
- EXISTING GROUND BOX
- PROPOSED GROUND BOX
- EXISTING LOOP DETECTOR
- EXISTING FULL TRAFFIC ACTUATED GROUND MOUNTED CONTROLLER
- EXISTING CONDUIT (SIZE & TYPE AS SPECIFIED)
- EXISTING CONDUIT BORE (SIZE & TYPE AS SPECIFIED)

EXISTING 12" HORIZONTAL

SIGNALS NO. 11 & 12
(UTILIZE EXISTING SIGNAL HEADS, RELOCATE AS SHOWN)

EXISTING 12" HORIZONTAL



SIGNALS NO. 2, 3, 5, 6, 8 & 9
(TO REMAIN IN PLACE)

TEMPORARY SIGNAL DIAGRAM

INTERSECTION OF FM 1846/BUS 77 CAMERON COUNTY CSJ: 1065-02-039

EXISTING 12" HORIZONTAL

SIGNALS NO. 1, 4 & 7
(TO REMIAN IN PLACE)

STATE OF TEXAS
ELIGIO ALVAREZ
107123
LICENSED
PROFESSIONAL ENGINEER

Eligio Alvarez, P.E
7-15-2021

Pharr District Central Design

Texas Department of Transportation

①

TEMPORARY SIGNAL
TCP PHASE 3
FM 1846 @ BUS 77

SCALE: 1" = 60' SHEET 1 OF 1

© 2021	CONT	SECT	JOB	HIGHWAY
DS: CK:	1065	02	039	FM 1846
DW: CK:	DIST	COUNTY		SHEET NO.
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TEMPORARY TRAFFIC SIGNAL HARDWARE TO BE FURNISHED, INSTALLED & MAINTAINED BY THE CONTRACTOR

ITEM	UNIT	QUANTITY
5/C #12 SIGNAL CABLE	FT.	
		FROM
		PREVIOUS
		TCP
		PHASE

ALL ITEMS ARE SUBSIDIARY TO ITEM 681 - TEMPORARY TRAFFIC SIGNALS.

NOTES:

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3. THE CONTRACTOR IS RESPONSIBLE FOR THE TEMPORARY TRAFFIC SIGNAL COMPONENTS AND IF DAMAGED, SHALL REPAIR AT HIS OWN EXPENSE.
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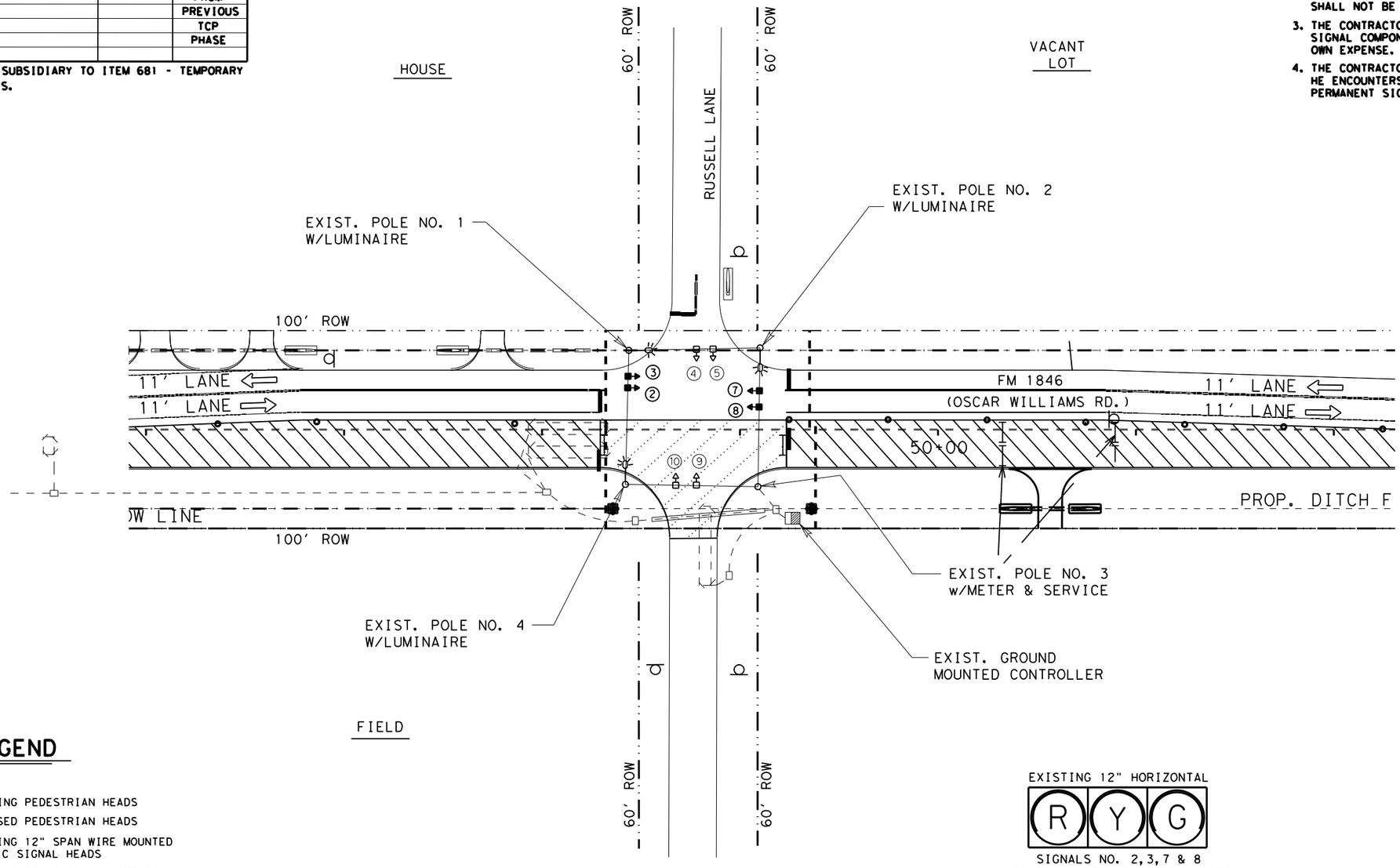

LEGEND

- EXISTING PEDESTRIAN HEADS
- PROPOSED PEDESTRIAN HEADS
- EXISTING 12" SPAN WIRE MOUNTED TRAFFIC SIGNAL HEADS
- PROPOSED OR RELOCATED 12" SPAN WIRE MOUNTED TRAFFIC SIGNAL HEADS
- EXISTING LUMINAIRE
- PROPOSED LUMINAIRE
- EXISTING GROUND BOX
- PROPOSED GROUND BOX
- EXISTING LOOP DETECTOR
- EXISTING FULL TRAFFIC ACTUATED GROUND MOUNTED CONTROLLER
- EXISTING CONDUIT (SIZE & TYPE AS SPECIFIED)
- EXISTING CONDUIT BORE (SIZE & TYPE AS SPECIFIED)

TEMPORARY SIGNAL DIAGRAM

INTERSECTION OF FM 1846/RUSSELL LANE
CAMERON COUNTY
CSJ: 1065-02-039

EXISTING 12" HORIZONTAL

R Y G

SIGNALS NO. 2,3,7 & 8
(UTILIZE EXISTING SIGNAL HEADS, RELOCATE AS SHOWN)

EXISTING 12" HORIZONTAL

R Y G

SIGNALS NO. 4,5,9 & 10
(TO REMAIN IN PLACE)

STATE OF TEXAS
ELIGIO ALVAREZ
107123
LICENSED
PROFESSIONAL ENGINEER

Eligio Alvarez, P.E
7-15-2021

Pharr District Central Design

Texas Department of Transportation

②

TEMPORARY SIGNAL
TCP PHASE 3
FM 1846 @ RUSSELL LANE

SCALE: 1" = 60' SHEET 1 OF 1

© 2021	CONT	SECT	JOB	HIGHWAY
DS: CK:	1065	02	039	FM 1846
DW: CK:	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		85

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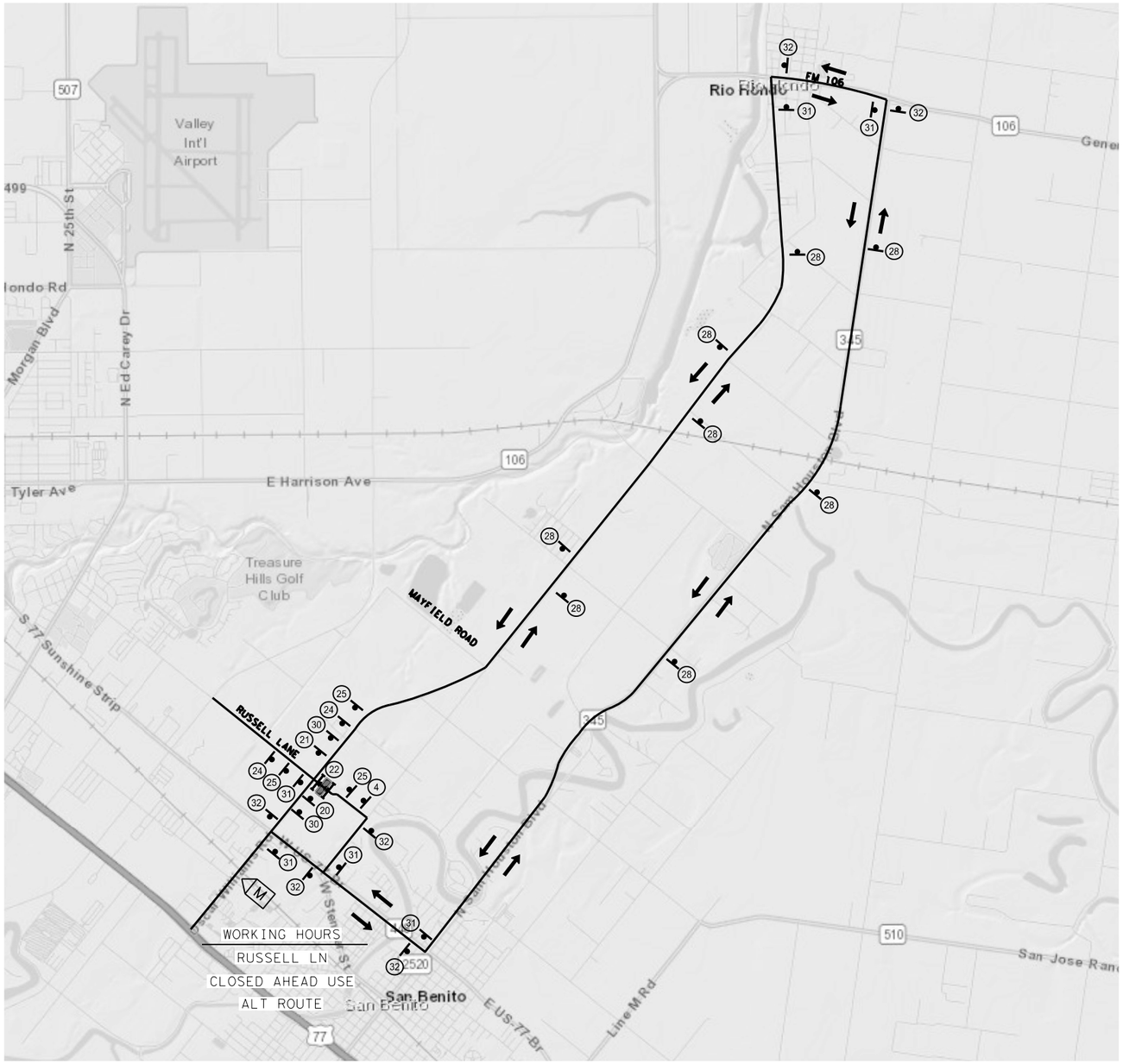

LEGEND

- TRAFFIC SIGN I.D.
- PROP. SIGN
- PROP. CONSTRUCTION
- PROP. TY 3 BARRICADES
- PROP. TRAFFIC BARRELS
- M — PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

GENERAL NOTES:

1. REFER TO "BC" AND "TCP STANDARDS" FOR SIGN SPACING AND ADDITIONAL SIGNING.

CW20-1D 48"x48" — ROAD WORK AHEAD — 4

R3-1 36"x36" — 20

R3-2 36"x36" — 21

R11-2 48"x30" — ROAD CLOSED — 22

ROAD CLOSED / DETOUR — R11-2 48"x30" / M4-10L 48"x18" — 23

CW20-2D 48"x48" — DETOUR AHEAD — 24

CW20-3D 48"x48" — ROAD CLOSED AHEAD — 25

CW20-3C 48"x48" — ROAD CLOSED 500 FT — 26

CW20-3B 48"x48" — ROAD CLOSED 1000 FT — 27

M4-9S 30"x24" — DETOUR — 28

M4-8a 24"x18" — END DETOUR — 29

M4-12T 48"x12" — E RUSSEL LN / DETOUR — M4-9S 30"x24" — 30

M4-12T 48"x12" — E RUSSEL LN / DETOUR — M4-9R 30"x24" — 31

M4-12T 48"x12" — E RUSSEL LN / DETOUR — M4-9L 30"x24" — 32

M4-12T 48"x12" — W RUSSEL LN / DETOUR — M4-9S 30"x24" — 33

M4-12T 48"x12" — W RUSSEL LN / DETOUR — M4-9R 30"x24" — 34

M4-12T 48"x12" — W RUSSEL LN / DETOUR — M4-9L 30"x24" — 35

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846
PHASE 3
DETOUR LAYOUT
EAST RUSSELL LANE

NOT TO SCALE — SHEET 1 OF 1

© 2021	CONT	SECT	JOB	HIGHWAY
	1065	02	039	FM 1846
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		86

DATE: 7/12/2021 3:43:22 PM
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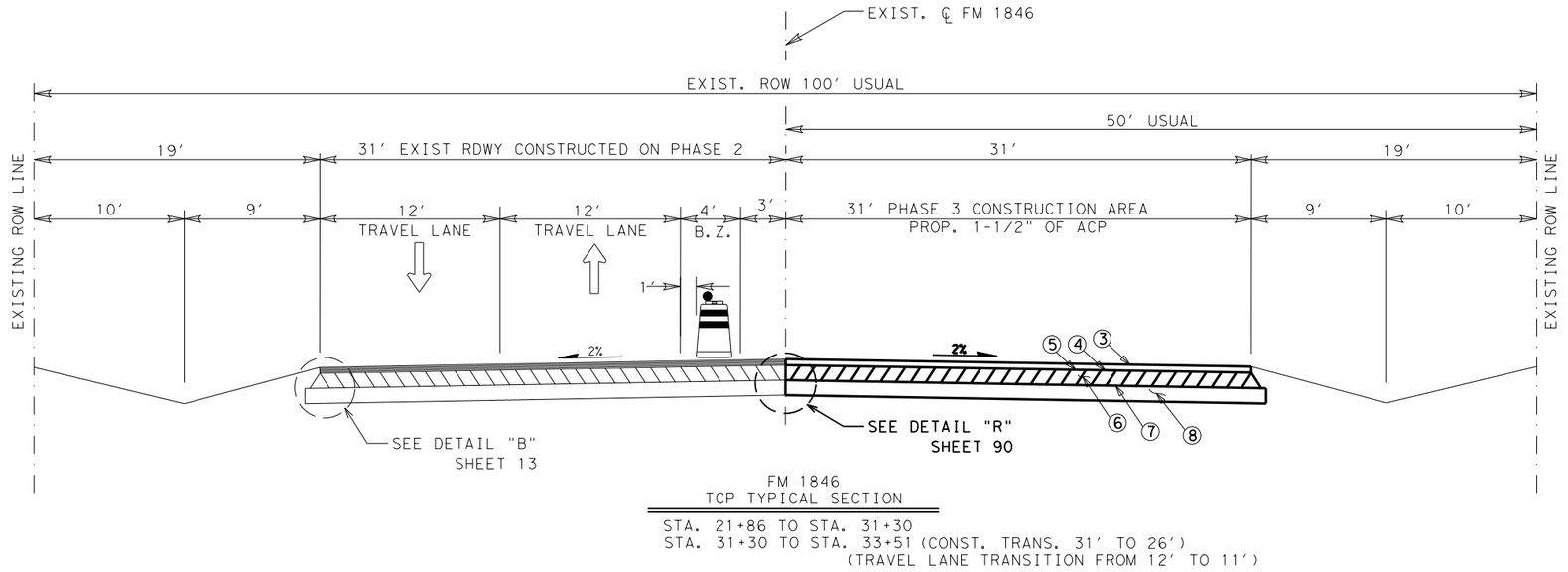
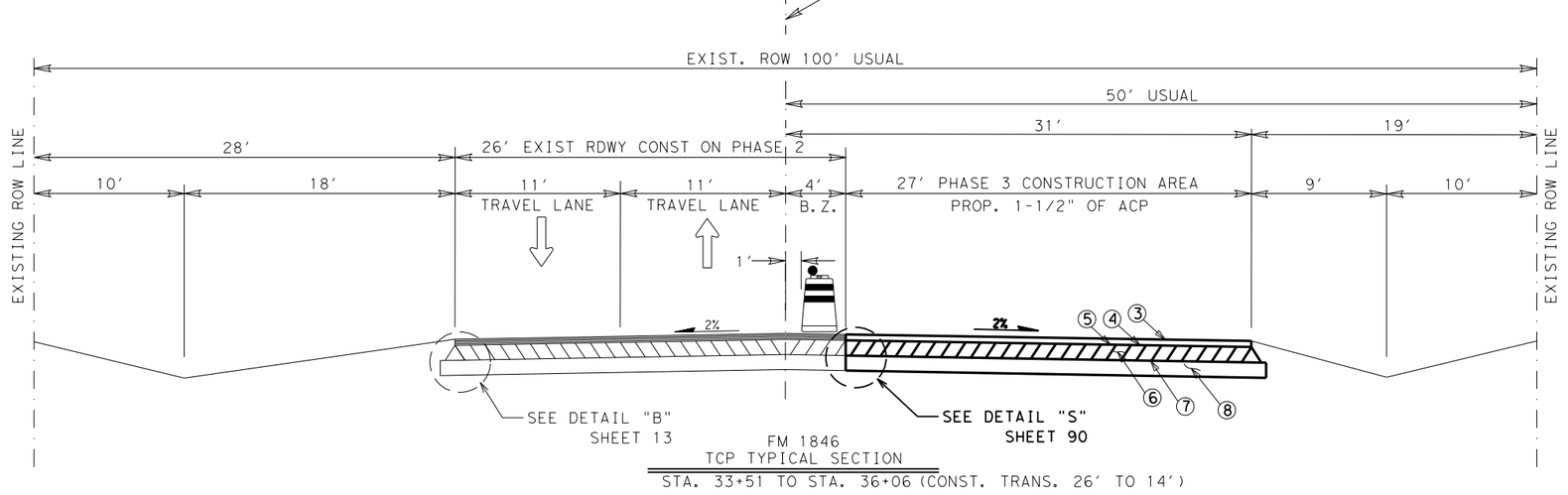


FM 1846
TCP TYPICAL SECTION

STA. 21+86 TO STA. 31+30
STA. 31+30 TO STA. 33+51 (CONST. TRANS. 31' TO 26')
(TRAVEL LANE TRANSITION FROM 12' TO 11')



FM 1846
TCP TYPICAL SECTION

STA. 33+51 TO STA. 36+06 (CONST. TRANS. 26' TO 14')

LEGEND:

(3) PROPOSED 1.5" SP-D PG76-22 (SAC-A) ACP (1ST LIFT)
(4) PROPOSED 1 COURSE UNDER SEAL
(5) PROPOSED MC-30 (0.2 GAL/SY)
(6) PROPOSED 10.0" TY-A GR-1/2 BASE W/2% CEMENT BY WEIGHT
(7) PROPOSED 1-TYII GEOGRID
(8) PROPOSED 12.0" STABILIZED SUBGRADE W/4% LIME BY WEIGHT

BZ - BUFFER ZONE
CA - CONSTRUCTION AREA
ACP - ASPHALT CONCRETE PAVEMENT
CONS - CONSTRUCTION
RDWY - ROADWAY
TRANS - TRANSITION
P.C. - PREVIOUSLY CONSTRUCTED
#% - EXISTING CROSS SLOPE
#% - PROPOSED CROSS SLOPE
- PLASTIC BARREL W/REFLECTOR
- CONCRETE TRAFFIC BARRIER W/REFLECTORS

* ALTERNATE TRAFFIC CONTROL PLAN DURING WORKING HOURS SHEETS 56 AND 62

NOTES:

1. SEE PROPOSED TRAFFIC CONTROL PLAN LAYOUTS FOR LANE STRIPING DIMENSIONS, STATIONING AND TRANSITIONS.

STATE OF TEXAS
ABEL MARROQUIN III
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LICENSED PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 TRAFFIC CONTROL PLAN - TYPICAL SECTIONS PHASE 3

NOT TO SCALE — SHEET 1 OF 3

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	CAMERON		87

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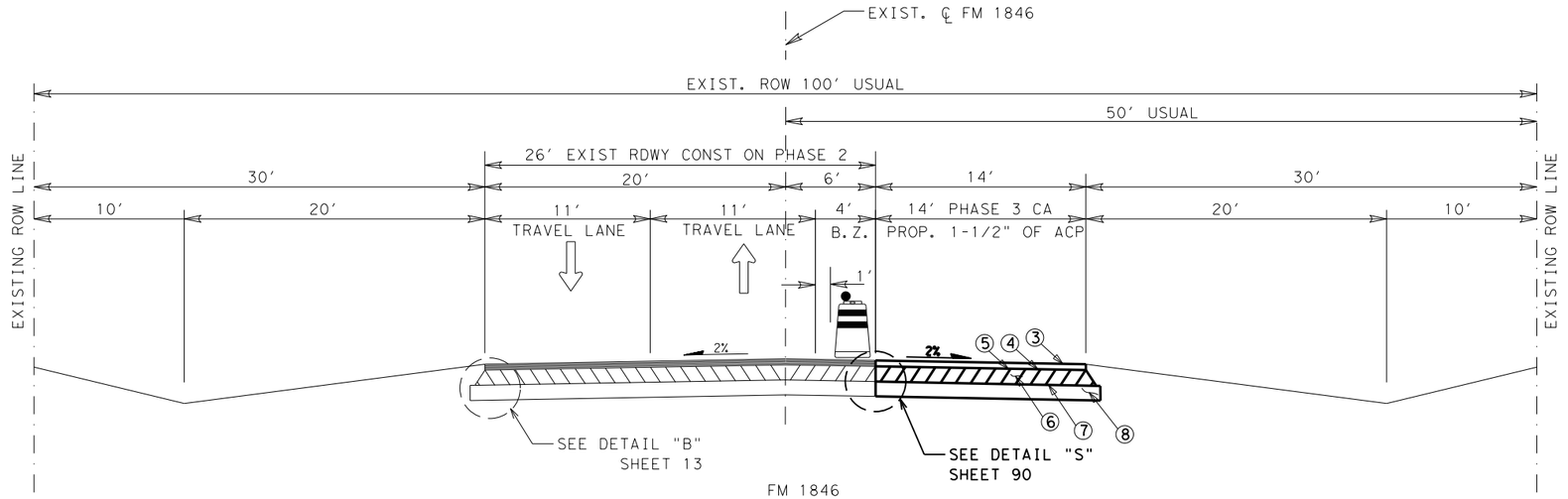
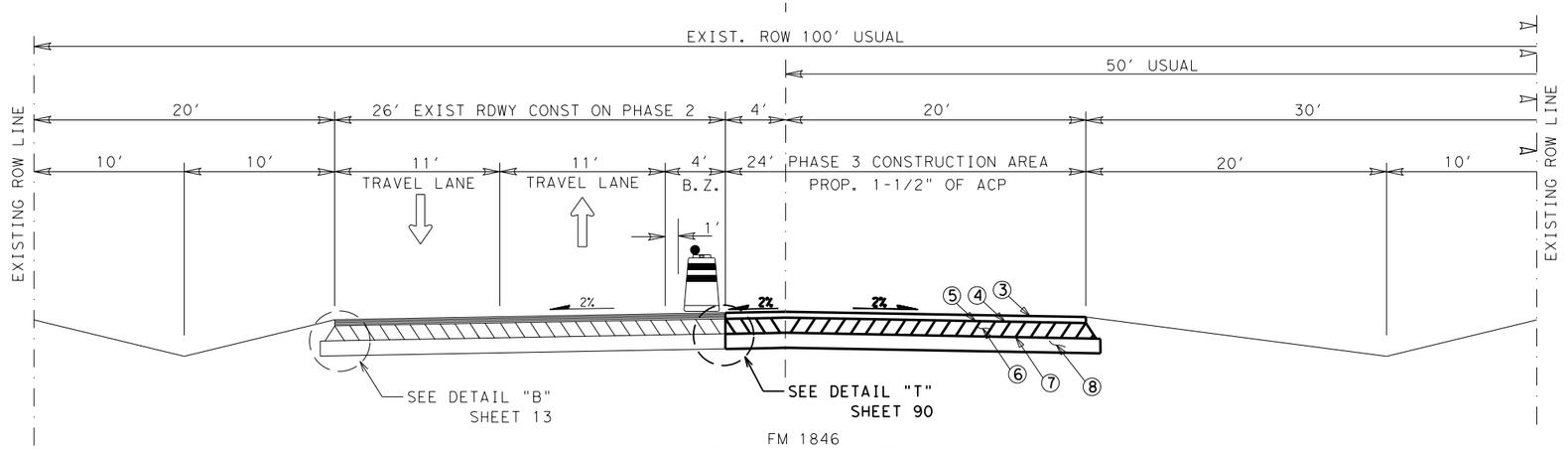


FM 1846
TCP TYPICAL SECTION

STA. 36+06 TO STA. 44+29
STA. 44+29 TO STA. 46+79 (CONSTRUCTION 14'-24')
STA. 54+10 TO STA. 74+92
STA. 74+92 TO STA. 78+70 (CONSTRUCTION 14'-23.3')



FM 1846
TCP TYPICAL SECTION

STA. 46+79 TO STA. 48+29
STA. 48+29 TO STA. 49+23 (INTERSECTION)
STA. 49+23 TO STA. 50+85
STA. 50+85 TO STA. 54+10 (CONSTRUCTION 24'-14')

LEGEND:

(3) PROPOSED 1.5" SP-D PG76-22 (SAC-A) ACP (1ST LIFT)
(4) PROPOSED 1 COURSE UNDER SEAL
(5) PROPOSED MC-30 (0.2 GAL/SY)
(6) PROPOSED 10.0" TY-A GR-1/2 BASE W/2% CEMENT BY WEIGHT
(7) PROPOSED 1-TYII GEOGRID
(8) PROPOSED 12.0" STABILIZED SUBGRADE W/4% LIME BY WEIGHT

BZ - BUFFER ZONE
CA - CONSTRUCTION AREA
ACP - ASPHALT CONCRETE PAVEMENT
CONS - CONSTRUCTION
RDWY - ROADWAY
TRANS - TRANSITION
P.C. - PREVIOUSLY CONSTRUCTED
#% - EXISTING CROSS SLOPE
#% - PROPOSED CROSS SLOPE
- PLASTIC BARREL W/REFLECTOR
- CONCRETE TRAFFIC BARRIER W/REFLECTORS
* ALTERNATE TRAFFIC CONTROL PLAN DURING WORKING HOURS SHEETS 56 AND 62

NOTES:

1. SEE PROPOSED TRAFFIC CONTROL PLAN LAYOUTS FOR LANE STRIPING DIMENSIONS, STATIONING AND TRANSITIONS.

STATE OF TEXAS
ABEL MARROQUIN III
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LICENSED PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 TRAFFIC CONTROL PLAN - TYPICAL SECTIONS PHASE 3

NOT TO SCALE — SHEET 2 OF 3

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		88

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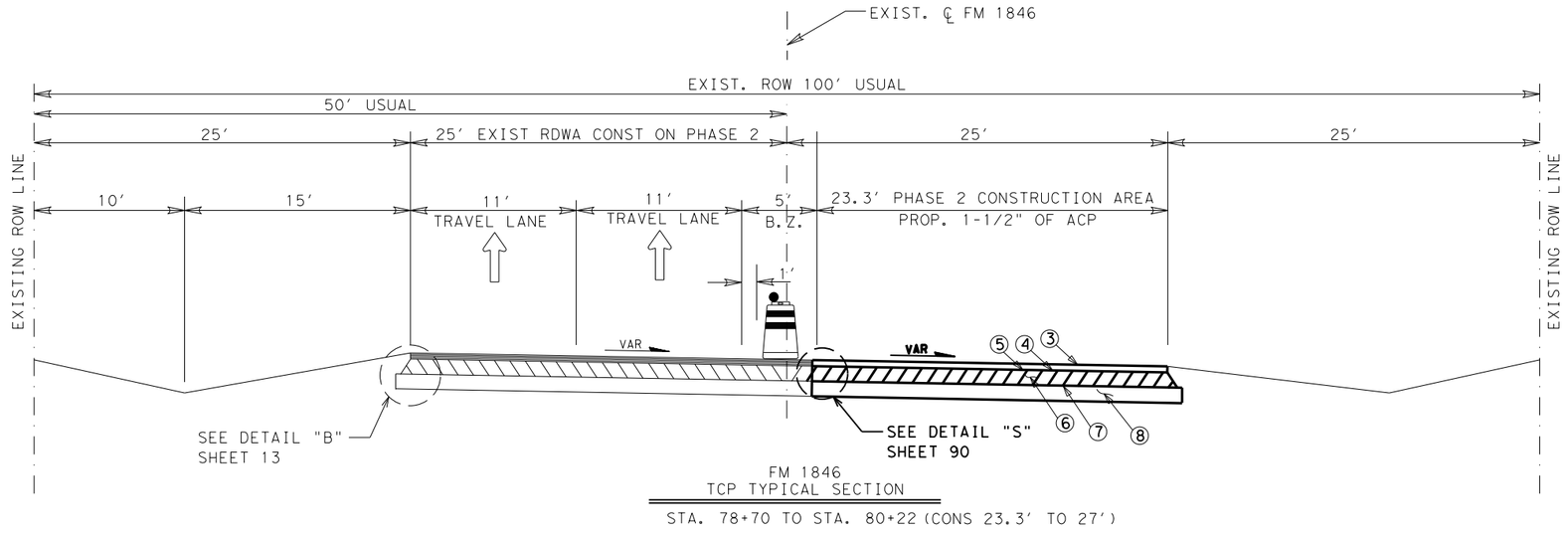
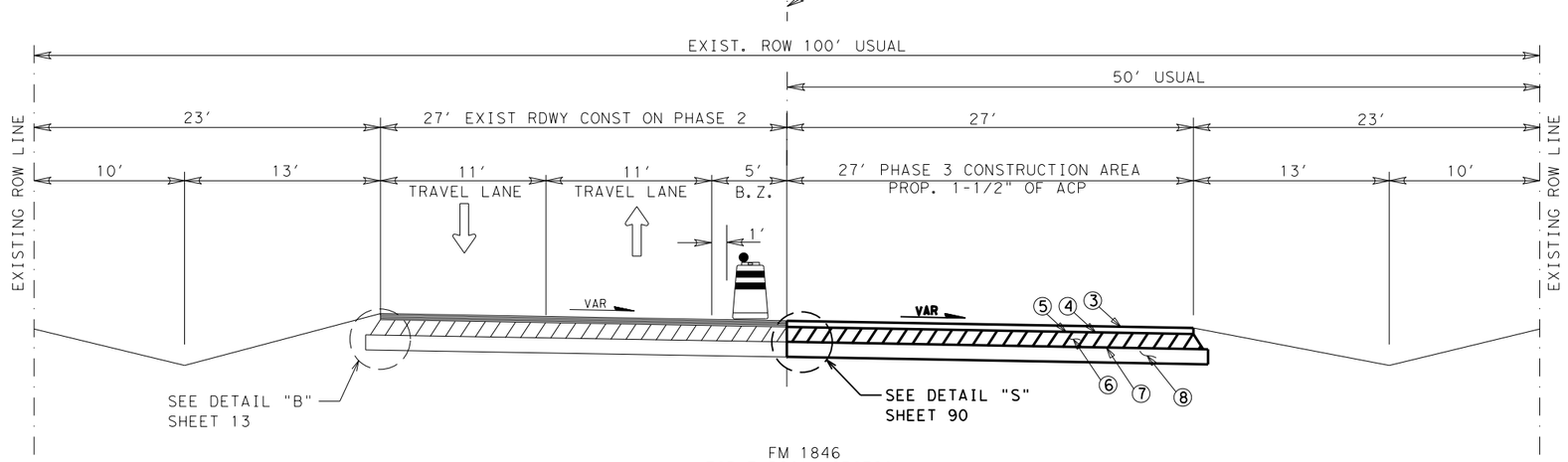


FM 1846
TCP TYPICAL SECTION

STA. 78+70 TO STA. 80+22 (CONS 23.3' TO 27')



FM 1846
TCP TYPICAL SECTION

STA. 80+22 TO STA. 90+62

LEGEND:

③ PROPOSED 1.5" SP-D PG76-22 (SAC-A) ACP (1ST LIFT)
④ PROPOSED 1 COURSE UNDER SEAL
⑤ PROPOSED MC-30 (0.2 GAL/SY)
⑥ PROPOSED 10.0" TY-A GR-1/2 BASE W/2% CEMENT BY WEIGHT
⑦ PROPOSED 1-TYII GEOGRID
⑧ PROPOSED 12.0" STABILIZED SUBGRADE W/4% LIME BY WEIGHT

BZ - BUFFER ZONE
CA - CONSTRUCTION AREA
ACP - ASPHALT CONCRETE PAVEMENT
CONS - CONSTRUCTION
RDWY - ROADWAY
TRANS - TRANSITION
P.C. - PREVIOUSLY CONSTRUCTED
#% - EXISTING CROSS SLOPE
#% - PROPOSED CROSS SLOPE
- PLASTIC BARREL W/REFLECTOR
- CONCRETE TRAFFIC BARRIER W/REFLECTORS

✱ ALTERNATE TRAFFIC CONTROL PLAN DURING WORKING HOURS SHEETS 56 AND 62

NOTES:

1. SEE PROPOSED TRAFFIC CONTROL PLAN LAYOUTS FOR LANE STRIPING DIMENSIONS, STATIONING AND TRANSITIONS.

STATE OF TEXAS
ABEL MARROQUIN III
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FM 1846 TRAFFIC CONTROL PLAN - TYPICAL SECTIONS PHASE 3

NOT TO SCALE — SHEET 3 OF 3

© 2021		CONT	SECT	JOB	HIGHWAY
DS: ___	CK: ___	1065	02	039	FM 1846
		DIST	COUNTY		SHEET NO.
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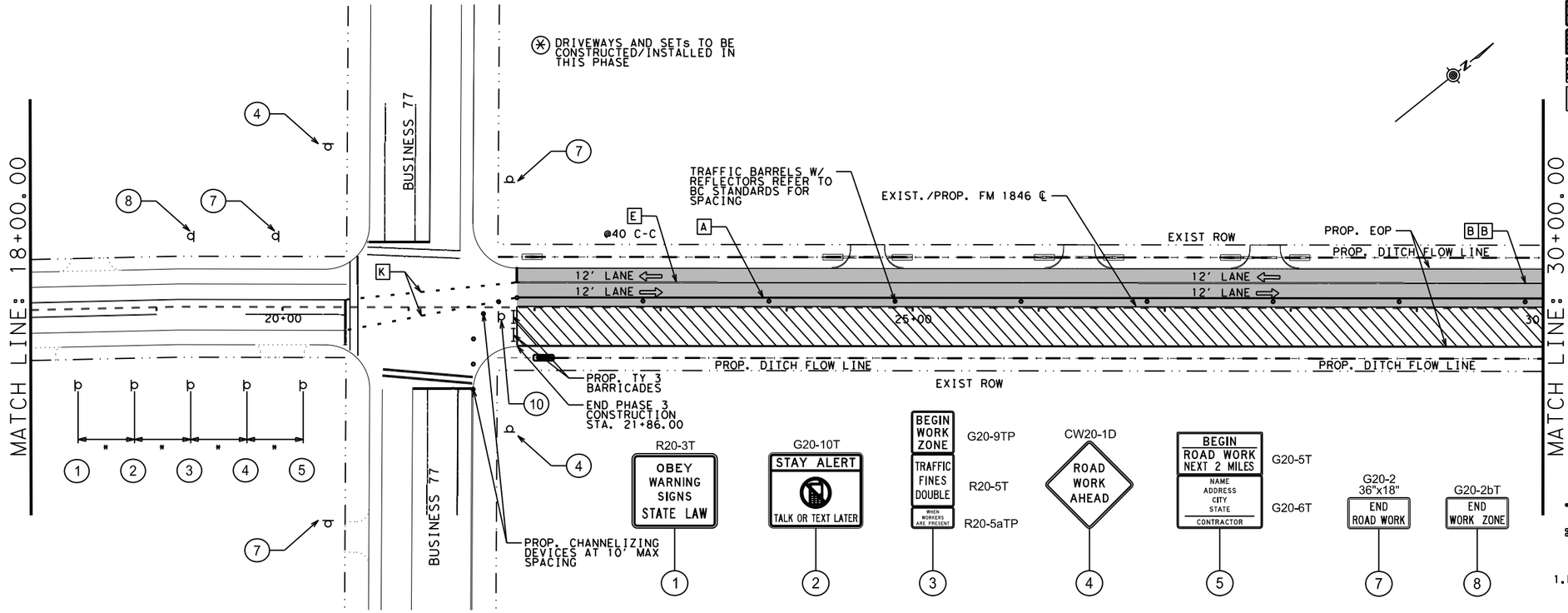
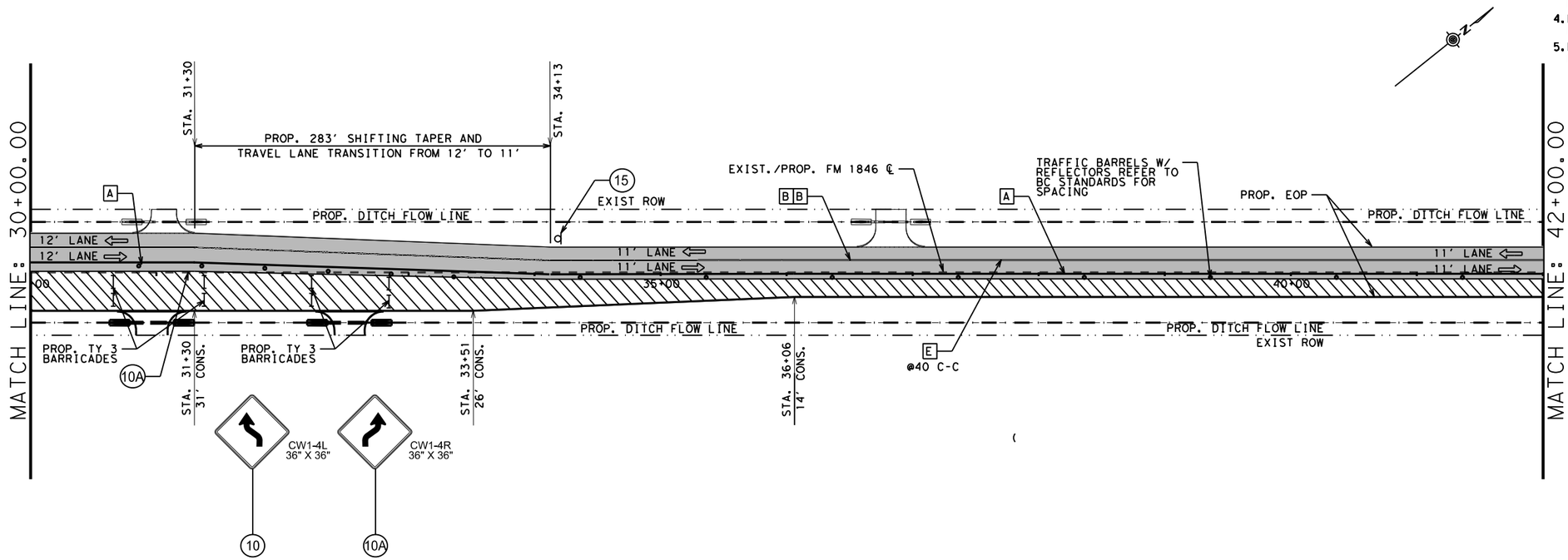


LEGEND

- CONSTRUCTION AREA
- BRIDGE CONSTRUCTION
- PROPOSED DETOUR
- PREVIOUSLY CONSTRUCTED
- A WK ZN PVMT MARK (REM) 4" WHITE SOLID
- B WK ZN PVMT MARK (REM) 4" YELLOW SOLID
- C WK ZN PVMT MARK (REM) 4" WHITE BROKEN
- D WK ZN PVMT MARK (REM) 4" YELLOW BROKEN
- E WK ZN PVMT MARK (REM) (REFL) TY II-A-A
- F WK ZN PVMT MARK (REM) (REFL) TY I-C
- G WK ZN PVMT MARK (NON-REM) 4" WHITE SOLID
- H WK ZN PVMT MARK (NON-REM) 4" YELLOW SOLID
- I WK ZN PVMT MARK (REM) 8" WHITE SOLID
- J WK ZN PVMT MARK (REM) 24" WHITE SOLID
- K WK ZN PAMT MARK (REM) WHITE ARROW
- L WK ZN PVMT MARK (REM) WHITE WORD
- # REFER TO BC(2)-14 STANDARDS FOR SIGN SPACING
- ⇨ DIRECTION OF TRAFFIC FLOW
- q PROPOSED SIGN
- I PROPOSED TYPE 3 (C) BARRICADES
- •• PLASTIC DRUM W/REFLECTORS
- PORTABLE CONCRETE TRAFFIC BARRIER W/REFLECTORS (PTCB)
- CRASH CUSHION ATTENUATOR-TL3
- TEMPORARY SIGNAL

NOTES:

1. PROJECT LIMITS AND ADVANCE WARNING SIGNS SHALL BE IN PLACE BEFORE COMMENCING CONSTRUCTION AND SHALL REMAIN IN PLACE THROUGHOUT THE DURATION OF CONSTRUCTION UNTIL THE PROJECT IS COMPLETED AND ACCEPTED BY TXDOT.
2. ALL SIGNS SHOWN FOR CONSTRUCTION ARE SPACED AT MINIMUM AND MAY BE ADJUSTED DUE TO FIELD CONDITIONS.
3. ALL STATIONING/ALIGNMENTS ARE FOR REFERENCE PURPOSES ONLY.
4. EXISTING STRIPING THAT IS IN CONFLICT WITH THE PROPOSED WK ZN PAVEMENT MARKINGS SHALL BE REMOVED.
5. EXISTING SIGNS THAT ARE IN CONFLICT WITH THE PROPOSED WK ZN SIGNS SHALL BE REMOVED OR COVERED.



07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 TRAFFIC CONTROL PLAN LAYOUT PHASE 3

1" = 100' SHEET 1 OF 5

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
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		PHR	CAMERON		90

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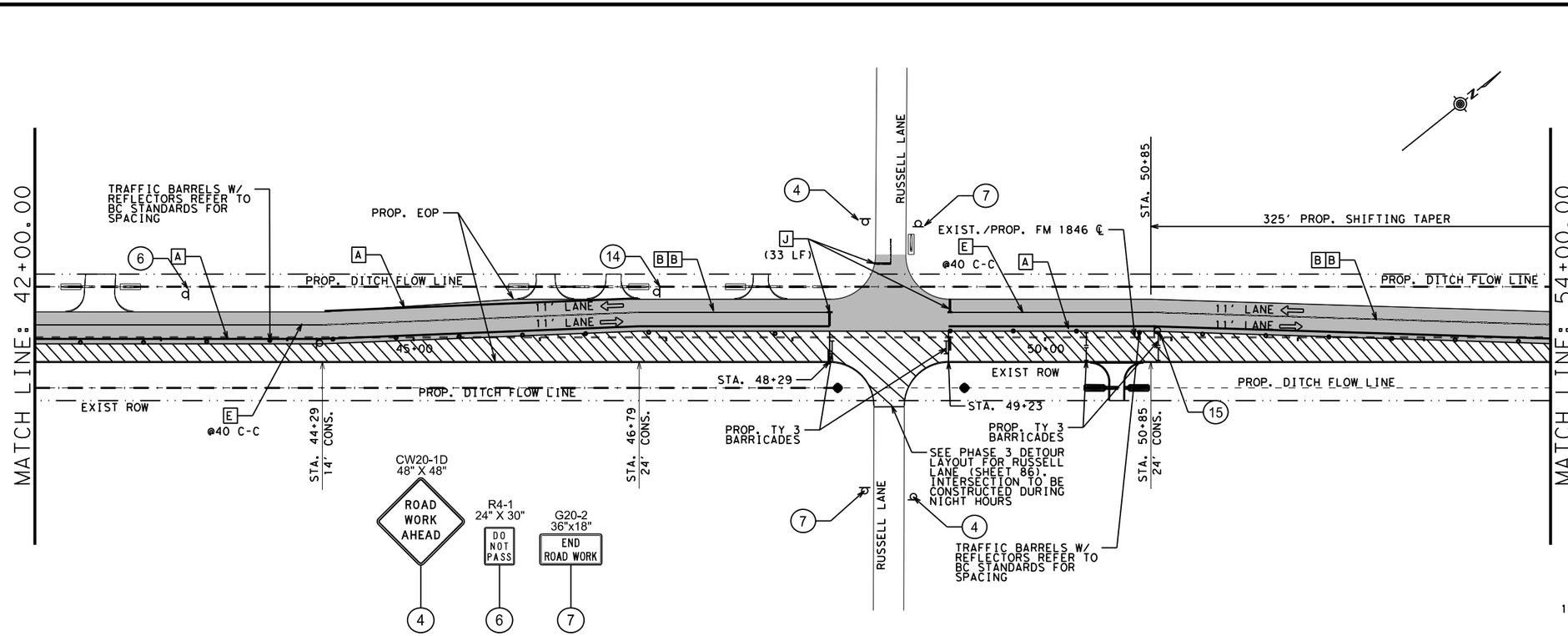
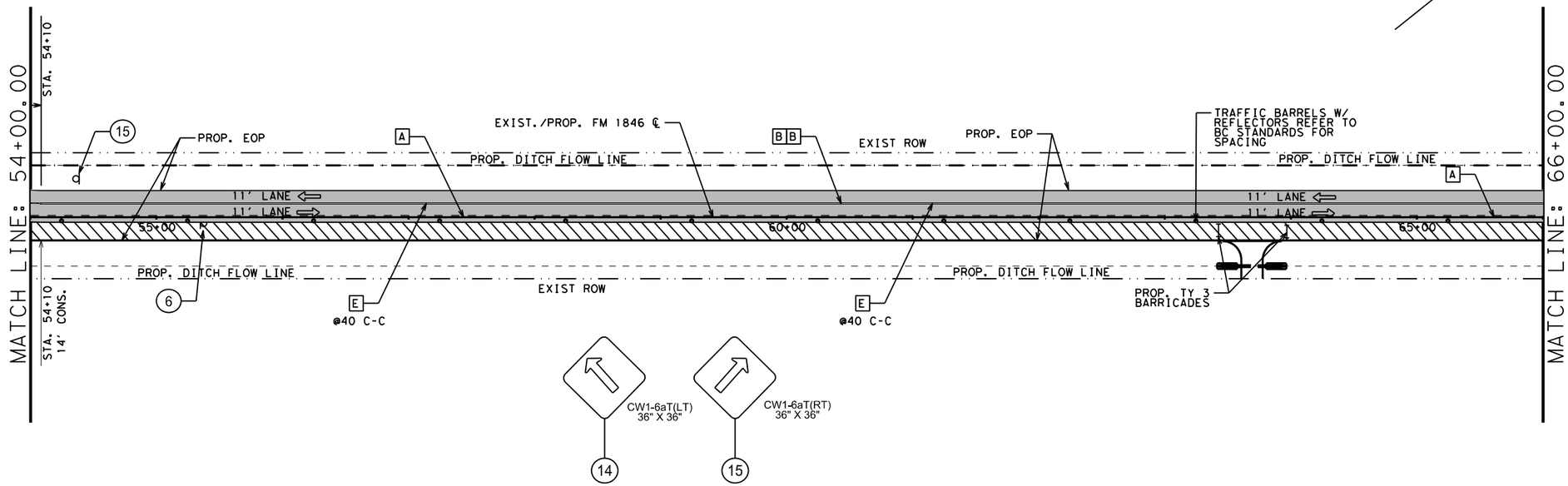


LEGEND

- CONSTRUCTION AREA
- BRIDGE CONSTRUCTION
- PROPOSED DETOUR
- PREVIOUSLY CONSTRUCTED
- A WK ZN PVMT MARK (REM) 4" WHITE SOLID
- B WK ZN PVMT MARK (REM) 4" YELLOW SOLID
- C WK ZN PVMT MARK (REM) 4" WHITE BROKEN
- D WK ZN PVMT MARK (REM) 4" YELLOW BROKEN
- E WK ZN PVMT MARK (REM) (REFL) TY II-A-A
- F WK ZN PVMT MARK (REM) (REFL) TY I-C
- G WK ZN PVMT MARK (NON-REM) 4" WHITE SOLID
- H WK ZN PVMT MARK (NON-REM) 4" YELLOW SOLID
- I WK ZN PVMT MARK (REM) 8" WHITE SOLID
- J WK ZN PVMT MARK (REM) 24" WHITE SOLID
- K WK ZN PAMT MARK (REM) WHITE ARROW
- L WK ZN PVMT MARK (REM) WHITE WORD
- # REFER TO BC(2)-14 STANDARDS FOR SIGN SPACING
- DIRECTION OF TRAFFIC FLOW
- PROPOSED SIGN
- PROPOSED TYPE 3 (C) BARRICADES
- PLASTIC DRUM W/REFLECTORS
- PORTABLE CONCRETE TRAFFIC BARRIER W/REFLECTORS (PTCB)
- CRASH CUSHION ATTENUATOR-TL3
- TEMPORARY SIGNAL

NOTES:

1. PROJECT LIMITS AND ADVANCE WARNING SIGNS SHALL BE IN PLACE BEFORE COMMENCING CONSTRUCTION AND SHALL REMAIN IN PLACE THROUGHOUT THE DURATION OF CONSTRUCTION UNTIL THE PROJECT IS COMPLETED AND ACCEPTED BY TXDOT.
2. ALL SIGNS SHOWN FOR CONSTRUCTION ARE SPACED AT MINIMUM AND MAY BE ADJUSTED DUE TO FIELD CONDITIONS.
3. ALL STATIONING/ALIGNMENTS ARE FOR REFERENCE PURPOSES ONLY.
4. EXISTING STRIPING THAT IS IN CONFLICT WITH THE PROPOSED WK ZN PAVEMENT MARKINGS SHALL BE REMOVED.
5. EXISTING SIGNS THAT ARE IN CONFLICT WITH THE PROPOSED WK ZN SIGNS SHALL BE REMOVED OR COVERED.



STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED PROFESSIONAL ENGINEER

09/29/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 TRAFFIC CONTROL PLAN LAYOUT PHASE 3

1" = 100' SHEET 2 OF 5

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
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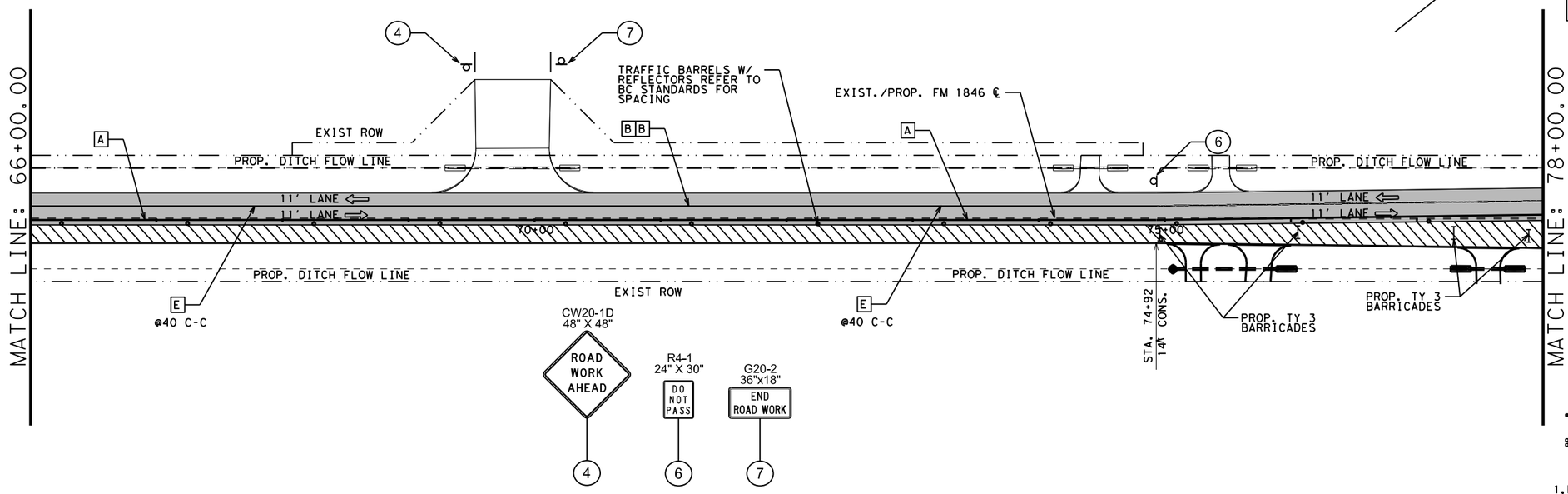
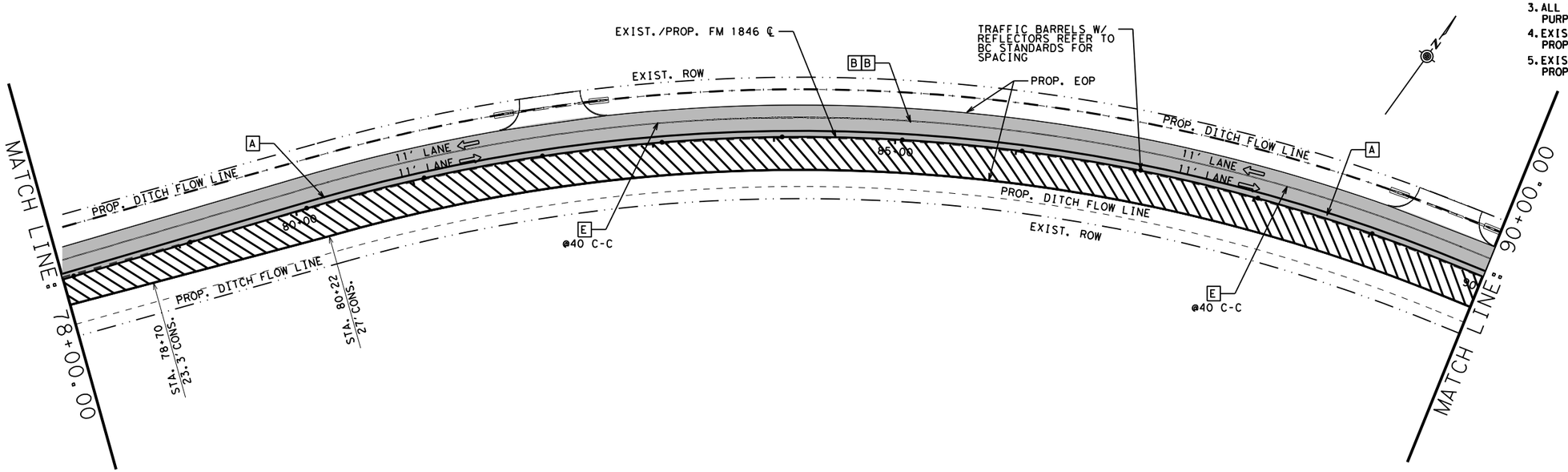


LEGEND

- CONSTRUCTION AREA
- BRIDGE CONSTRUCTION
- PROPOSED DETOUR
- PREVIOUSLY CONSTRUCTED
- [A] WK ZN PVMT MARK (REM) 4" WHITE SOLID
- [B] WK ZN PVMT MARK (REM) 4" YELLOW SOLID
- [C] WK ZN PVMT MARK (REM) 4" WHITE BROKEN
- [D] WK ZN PVMT MARK (REM) 4" YELLOW BROKEN
- [E] WK ZN PVMT MARK (REM) (REFL) TY II-A-A
- [F] WK ZN PVMT MARK (REM) (REFL) TY I-C
- [G] WK ZN PVMT MARK (NON-REM) 4" WHITE SOLID
- [H] WK ZN PVMT MARK (NON-REM) 4" YELLOW SOLID
- [I] WK ZN PVMT MARK (REM) 8" WHITE SOLID
- [J] WK ZN PVMT MARK (REM) 24" WHITE SOLID
- [K] WK ZN PAMT MARK (REM) WHITE ARROW
- [L] WK ZN PVMT MARK (REM) WHITE WORD
- # REFER TO BC(2)-14 STANDARDS FOR SIGN SPACING
- DIRECTION OF TRAFFIC FLOW
- PROPOSED SIGN
- PROPOSED TYPE 3 (C) BARRICADES
- PLASTIC DRUM W/REFLECTORS
- PORTABLE CONCRETE TRAFFIC BARRIER W/REFLECTORS (PTCB)
- CRASH CUSHION ATTENUATOR-TL3
- TEMPORARY SIGNAL

NOTES:

1. PROJECT LIMITS AND ADVANCE WARNING SIGNS SHALL BE IN PLACE BEFORE COMMENCING CONSTRUCTION AND SHALL REMAIN IN PLACE THROUGHOUT THE DURATION OF CONSTRUCTION UNTIL THE PROJECT IS COMPLETED AND ACCEPTED BY TXDOT.
2. ALL SIGNS SHOWN FOR CONSTRUCTION ARE SPACED AT MINIMUM AND MAY BE ADJUSTED DUE TO FIELD CONDITIONS.
3. ALL STATIONING/ALIGNMENTS ARE FOR REFERENCE PURPOSES ONLY.
4. EXISTING STRIPING THAT IS IN CONFLICT WITH THE PROPOSED WK ZN PAVEMENT MARKINGS SHALL BE REMOVED.
5. EXISTING SIGNS THAT ARE IN CONFLICT WITH THE PROPOSED WK ZN SIGNS SHALL BE REMOVED OR COVERED.



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Pharr District Central Design

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FM 1846 TRAFFIC CONTROL PLAN LAYOUT PHASE 3

1" = 100' SHEET 3 OF 5

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	CAMERON		92

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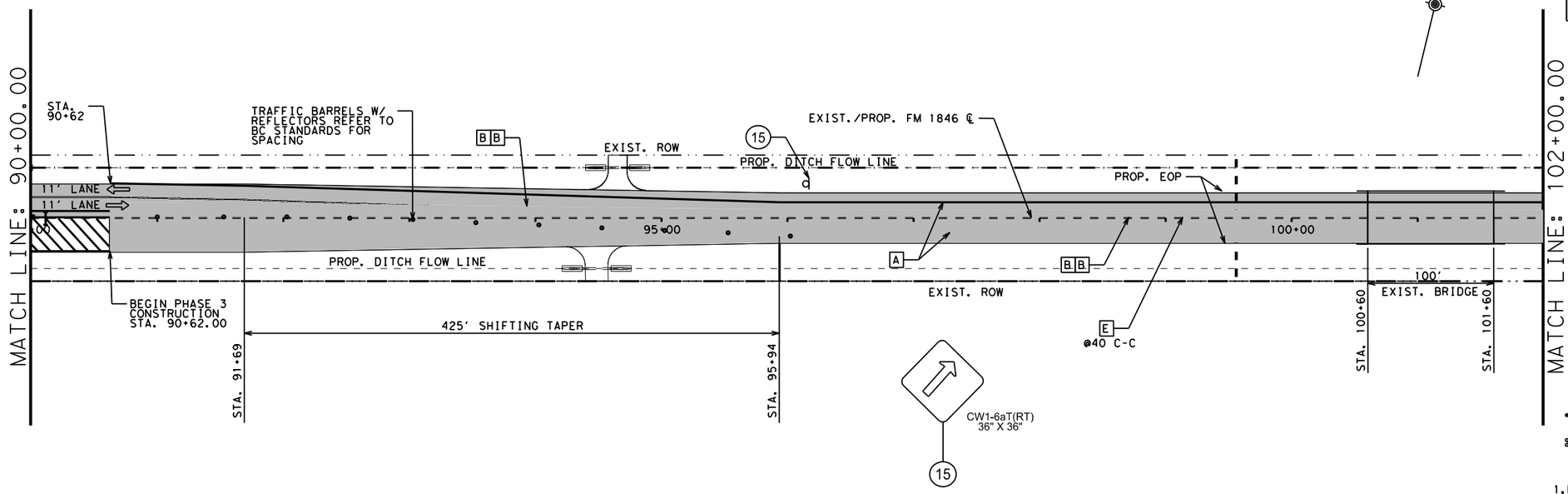
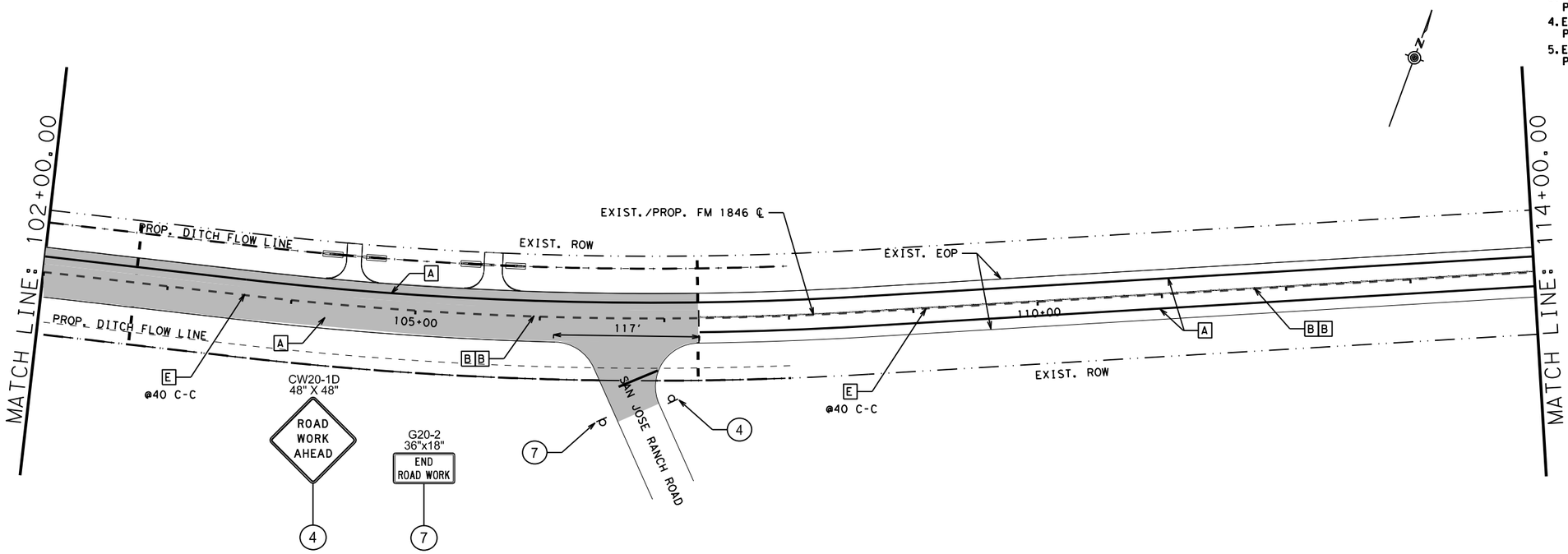


LEGEND

- CONSTRUCTION AREA
- BRIDGE CONSTRUCTION
- PROPOSED DETOUR
- PREVIOUSLY CONSTRUCTED
- [A] WK ZN PVMT MARK (REM) 4" WHITE SOLID
- [B] WK ZN PVMT MARK (REM) 4" YELLOW SOLID
- [C] WK ZN PVMT MARK (REM) 4" WHITE BROKEN
- [D] WK ZN PVMT MARK (REM) 4" YELLOW BROKEN
- [E] WK ZN PVMT MARK (REM) (REFL) TY II-A-A
- [F] WK ZN PVMT MARK (REM) (REFL) TY I-C
- [G] WK ZN PVMT MARK (NON-REM) 4" WHITE SOLID
- [H] WK ZN PVMT MARK (NON-REM) 4" YELLOW SOLID
- [I] WK ZN PVMT MARK (REM) 8" WHITE SOLID
- [J] WK ZN PVMT MARK (REM) 24" WHITE SOLID
- [K] WK ZN PAMT MARK (REM) WHITE ARROW
- [L] WK ZN PVMT MARK (REM) WHITE WORD
- # REFER TO BC(2)-14 STANDARDS FOR SIGN SPACING
- DIRECTION OF TRAFFIC FLOW
- PROPOSED SIGN
- PROPOSED TYPE 3 (C) BARRICADES
- PLASTIC DRUM W/REFLECTORS
- PORTABLE CONCRETE TRAFFIC BARRIER W/REFLECTORS (PTCB)
- CRASH CUSHION ATTENUATOR-TL3
- TEMPORARY SIGNAL

NOTES:

1. PROJECT LIMITS AND ADVANCE WARNING SIGNS SHALL BE IN PLACE BEFORE COMMENCING CONSTRUCTION AND SHALL REMAIN IN PLACE THROUGHOUT THE DURATION OF CONSTRUCTION UNTIL THE PROJECT IS COMPLETED AND ACCEPTED BY TXDOT.
2. ALL SIGNS SHOWN FOR CONSTRUCTION ARE SPACED AT MINIMUM AND MAY BE ADJUSTED DUE TO FIELD CONDITIONS.
3. ALL STATIONING/ALIGNMENTS ARE FOR REFERENCE PURPOSES ONLY.
4. EXISTING STRIPING THAT IS IN CONFLICT WITH THE PROPOSED WK ZN PAVEMENT MARKINGS SHALL BE REMOVED.
5. EXISTING SIGNS THAT ARE IN CONFLICT WITH THE PROPOSED WK ZN SIGNS SHALL BE REMOVED OR COVERED.



ABEL MARROQUIN III
134752
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

07/13/2021

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FM 1846 TRAFFIC CONTROL PLAN LAYOUT PHASE 3

1" = 100'

SHEET 4 OF 5

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
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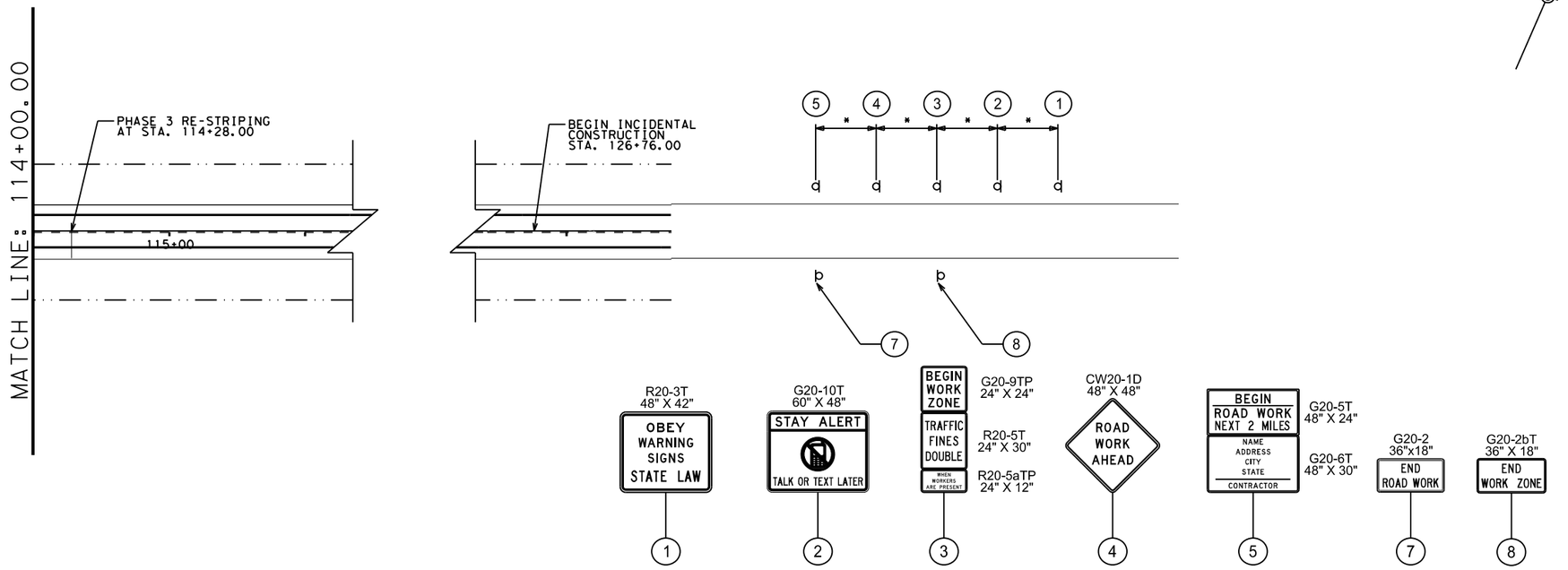

LEGEND

- CONSTRUCTION AREA
- BRIDGE CONSTRUCTION
- PROPOSED DETOUR
- PREVIOUSLY CONSTRUCTED
- [A] WK ZN PVMT MARK (REM) 4" WHITE SOLID
- [B] WK ZN PVMT MARK (REM) 4" YELLOW SOLID
- [C] WK ZN PVMT MARK (REM) 4" WHITE BROKEN
- [D] WK ZN PVMT MARK (REM) 4" YELLOW BROKEN
- [E] WK ZN PVMT MARK (REM) (REFL) TY II-A-A
- [F] WK ZN PVMT MARK (REM) (REFL) TY I-C
- [G] WK ZN PVMT MARK (NON-REM) 4" WHITE SOLID
- [H] WK ZN PVMT MARK (NON-REM) 4" YELLOW SOLID
- [I] WK ZN PVMT MARK (REM) 8" WHITE SOLID
- [J] WK ZN PVMT MARK (REM) 24" WHITE SOLID
- [K] WK ZN PAMT MARK (REM) WHITE ARROW
- [L] WK ZN PVMT MARK (REM) WHITE WORD
- # REFER TO BC(2)-14 STANDARDS FOR SIGN SPACING
- DIRECTION OF TRAFFIC FLOW
- q PROPOSED SIGN
- I PROPOSED TYPE 3 (C) BARRICADES
- •• PLASTIC DRUM W/REFLECTORS
- PORTABLE CONCRETE TRAFFIC BARRIER W/REFLECTORS (PTCB)
- CRASH CUSHION ATTENUATOR-TL3
- TEMPORARY SIGNAL

NOTES:

1. PROJECT LIMITS AND ADVANCE WARNING SIGNS SHALL BE IN PLACE BEFORE COMMENCING CONSTRUCTION AND SHALL REMAIN IN PLACE THROUGHOUT THE DURATION OF CONSTRUCTION UNTIL THE PROJECT IS COMPLETED AND ACCEPTED BY TXDOT.
2. ALL SIGNS SHOWN FOR CONSTRUCTION ARE SPACED AT MINIMUM AND MAY BE ADJUSTED DUE TO FIELD CONDITIONS.
3. ALL STATIONING/ALIGNMENTS ARE FOR REFERENCE PURPOSES ONLY.
4. EXISTING STRIPING THAT IS IN CONFLICT WITH THE PROPOSED WK ZN PAVEMENT MARKINGS SHALL BE REMOVED.
5. EXISTING SIGNS THAT ARE IN CONFLICT WITH THE PROPOSED WK ZN SIGNS SHALL BE REMOVED OR COVERED.

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 TRAFFIC CONTROL PLAN LAYOUT PHASE 3

1" = 100' SHEET 5 OF 5

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	CAMERON		94

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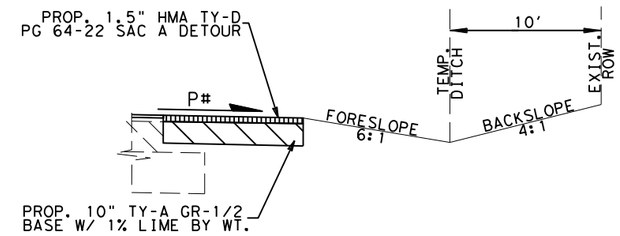

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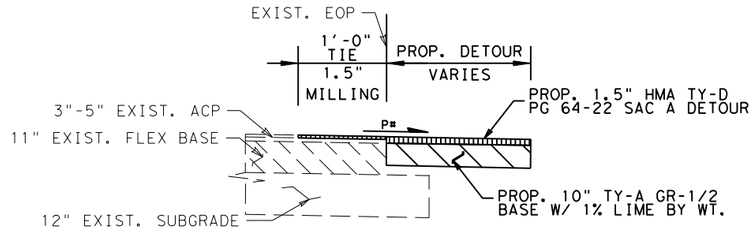

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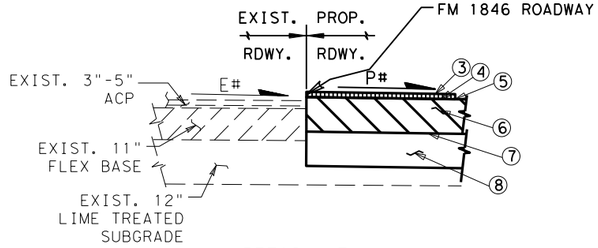
SEE NOTE 2 & 3



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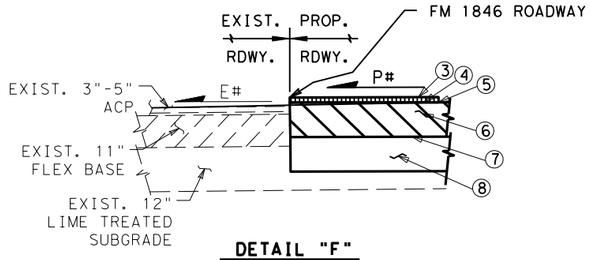

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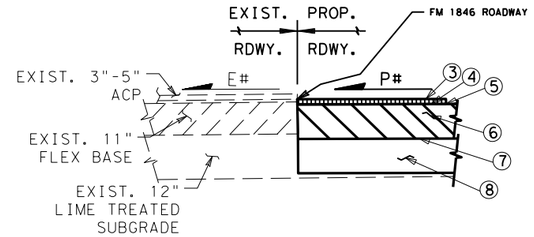
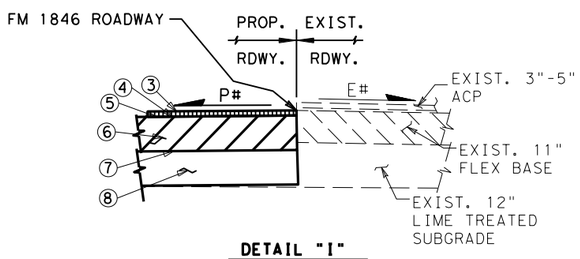


DETAIL "G"

DETAIL "H"



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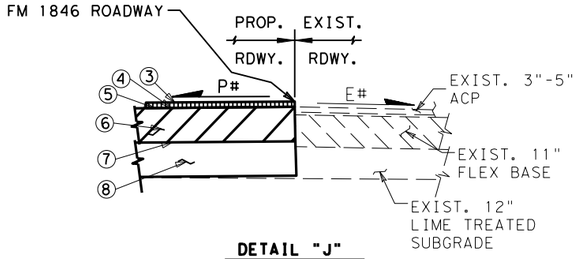

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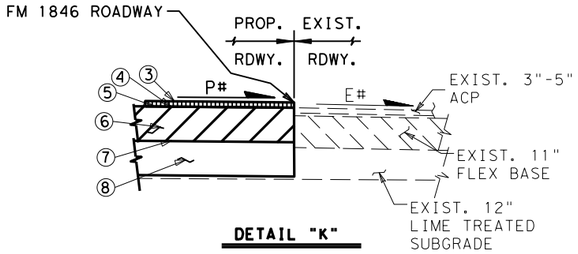

DETAIL "K"

LEGEND:

- (3) PROPOSED 1.5" SP-D PG76-22 (SAC-A) ACP (1ST LIFT)
- (4) PROPOSED 1 COURSE UNDER SEAL
- (5) PROPOSED MC-30 (0.2 GAL/SY)
- (6) PROPOSED 10.0" TY-A GR-1/2 BASE W/2% CEMENT BY WEIGHT
- (7) PROPOSED 1-TYII GEOGRID
- (8) PROPOSED 12.0" STABILIZED SUBGRADE W/4% LIME BY WEIGHT

BZ - BUFFER ZONE
CA - CONSTRUCTION AREA
ACP - ASPHALT CONCRETE PAVEMENT
CONS - CONSTRUCTION
RDWY - ROADWAY
TRANS - TRANSITION
P.C. - PREVIOUSLY CONSTRUCTED
#% - EXISTING CROSS SLOPE
#% - PROPOSED CROSS SLOPE

- PLASTIC BARREL W/REFLECTOR
- CONCRETE TRAFFIC BARRIER W/REFLECTORS

* ALTERNATE TRAFFIC CONTROL PLAN DURING WORKING HOURS SHEETS 56 AND 62

NOTES:

1. SEE PROPOSED TRAFFIC CONTROL PLAN LAYOUTS FOR LANE STRIPING DIMENSIONS, STATIONING AND TRANSITIONS.
2. DETOUR TO TIE-IN 1 FOOT TO EXISTING PAVEMENT.
3. AREAS WHERE DETOUR IS 5 FEET IN TOTAL WIDTH, THE TIE-IN TO EXISTING PAVEMENT WILL BE 3 FEET.
4. MILLING FOR DETOUR TIE-IN WILL BE SUBSIDIARY TO ITEM 508.

STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER

07/13/2021

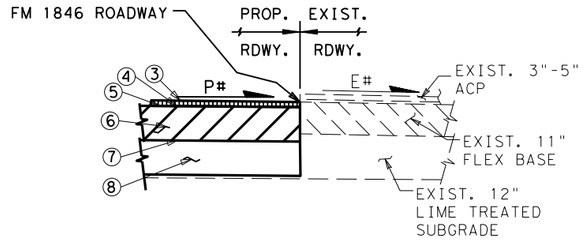
Pharr District Central Design

Texas Department of Transportation

FM 1846 TRAFFIC CONTROL PLAN - DETAIL SHEET

NOT TO SCALE — SHEET 1 OF 2

© 2021	CONT	SECT	JOB	HIGHWAY
DS: CK:	1065	02	039	FM 1846
	DIST	COUNTY		SHEET NO.
DW: CK:	PHR	CAMERON		95



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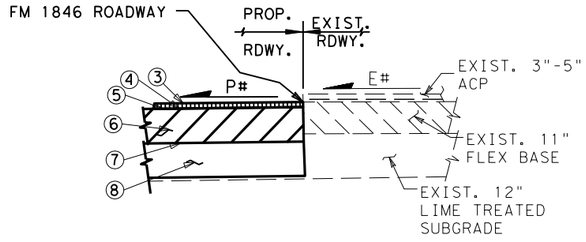

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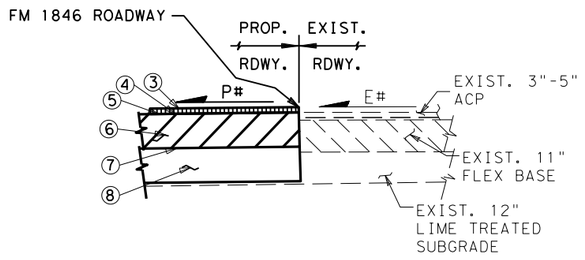

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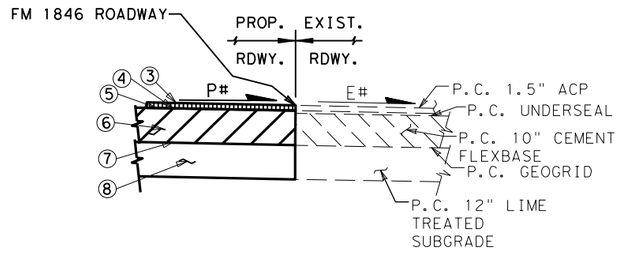

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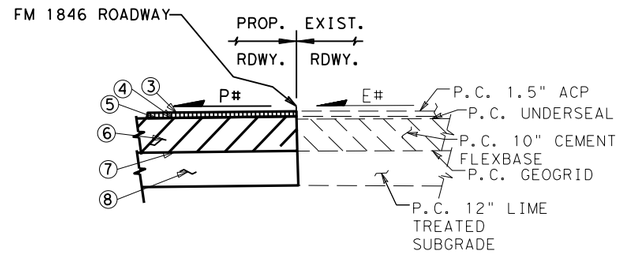

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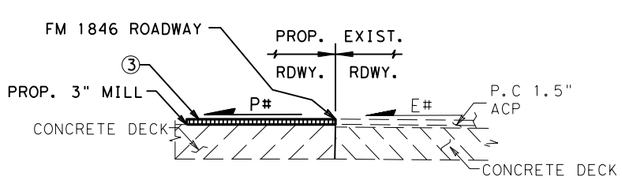

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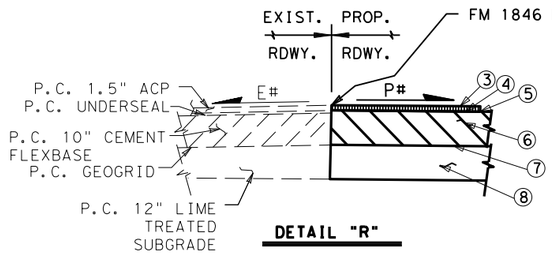

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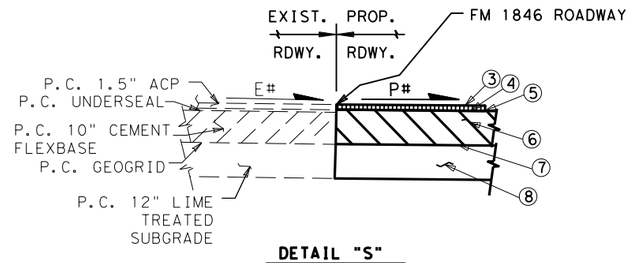

DETAIL "S"

LEGEND:

(3) PROPOSED 1.5" SP-D PG76-22 (SAC-A) ACP (1ST LIFT)
(4) PROPOSED 1 COURSE UNDER SEAL
(5) PROPOSED MC-30 (0.2 GAL/SY)
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* ALTERNATE TRAFFIC CONTROL PLAN DURING WORKING HOURS SHEETS 56 AND 62

NOTES:

1. SEE PROPOSED TRAFFIC CONTROL PLAN LAYOUTS FOR LANE STRIPING DIMENSIONS, STATIONING AND TRANSITIONS.
2. DETOUR TO TIE-IN 1 FOOT TO EXISTING PAVEMENT.
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4. MILLING FOR DETOUR TIE-IN WILL BE SUBSIDIARY TO ITEM 508.

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07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 TRAFFIC CONTROL PLAN - DETAIL SHEET

NOT TO SCALE — SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		96

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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

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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1065	02	039	FM 1846
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	PHR	CAMERON		97
5-10 5-21				

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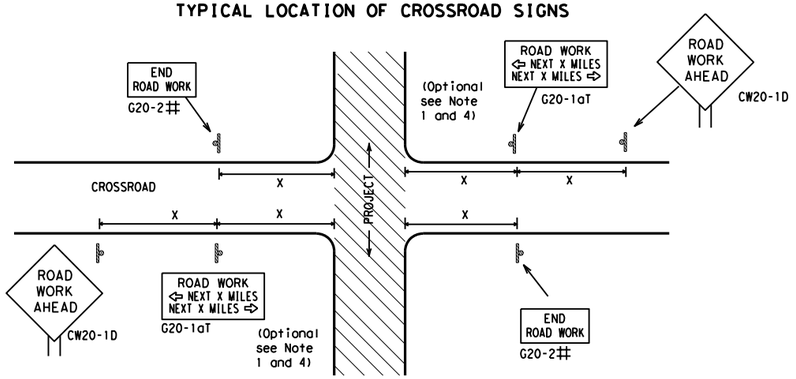
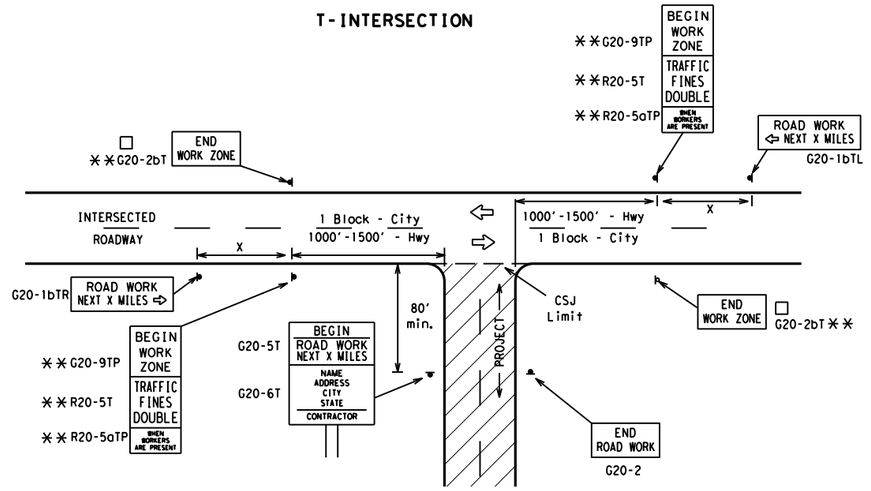
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

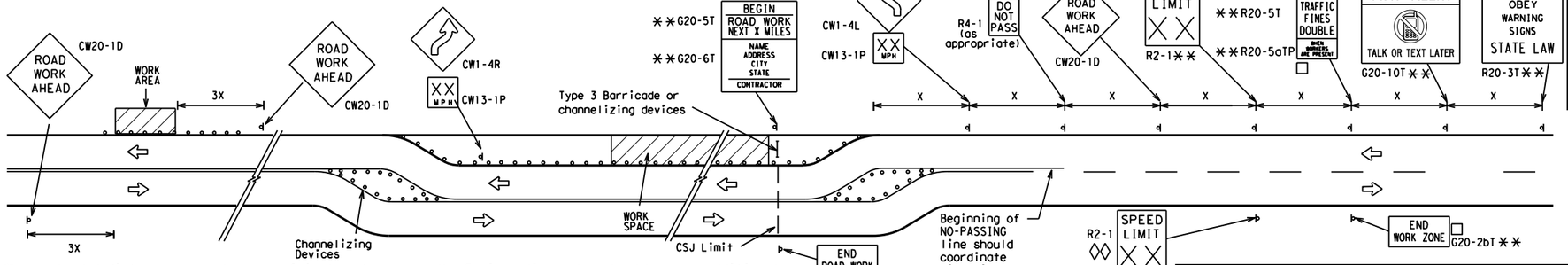
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

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

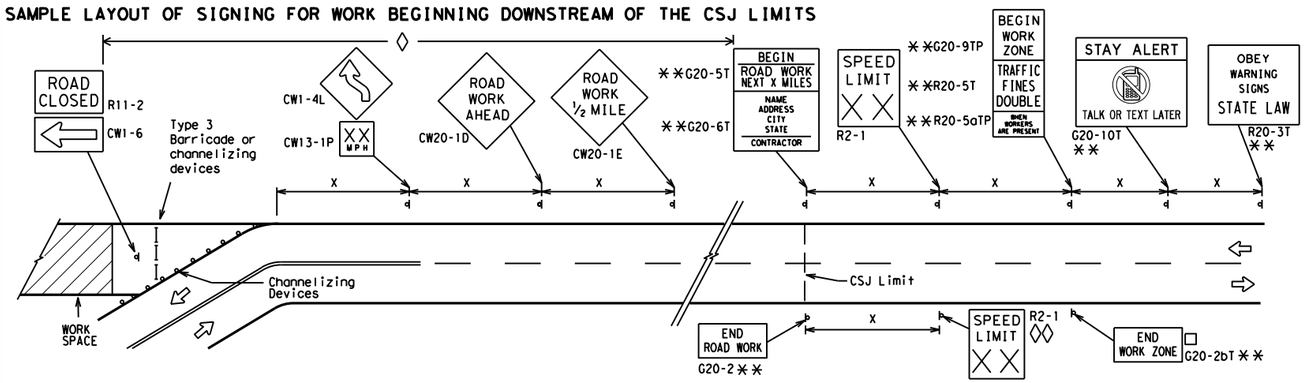
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING 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
©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		98

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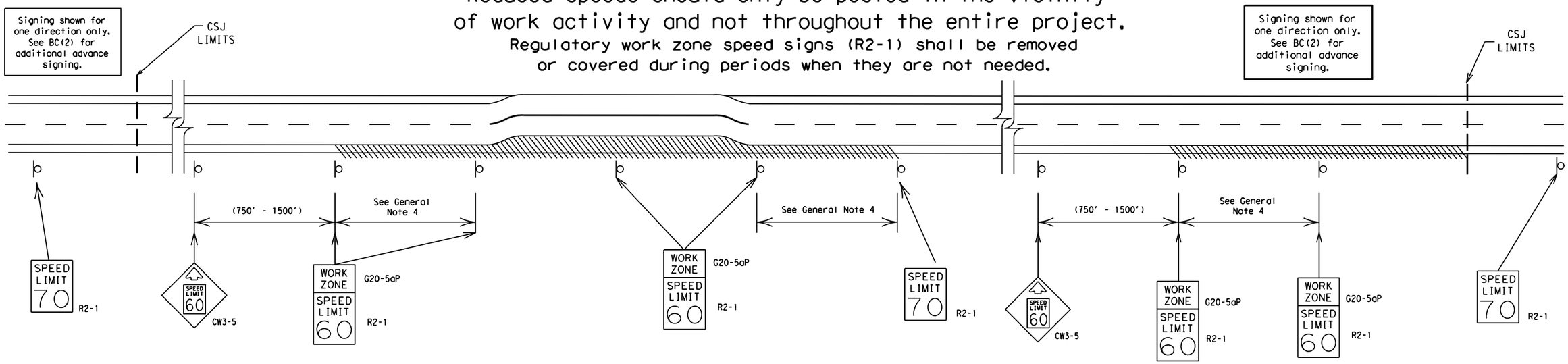
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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
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REVISIONS 9-07 8-14 7-13 5-21	1065	02	039	FM 1846
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		99

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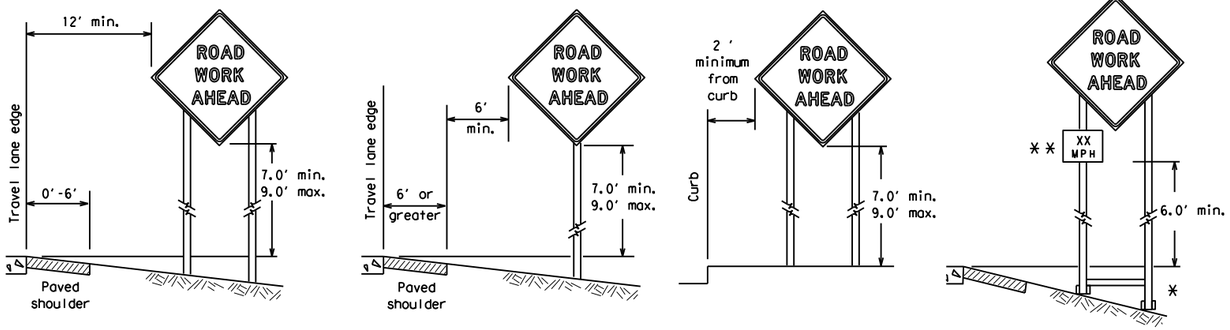
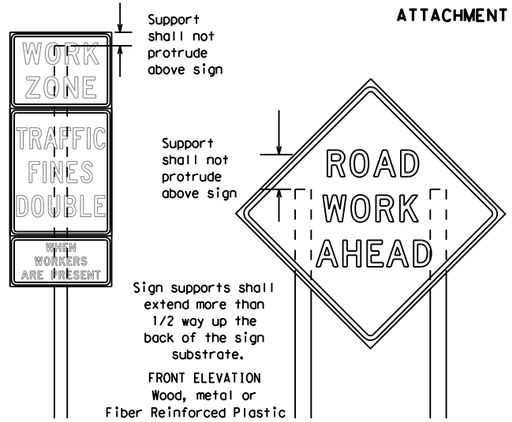
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

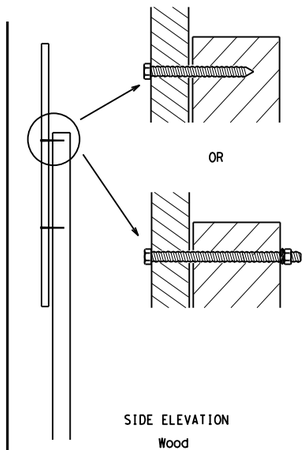


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.

ATTACHMENT FOR SIGN SUPPORTS





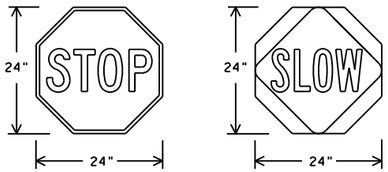
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

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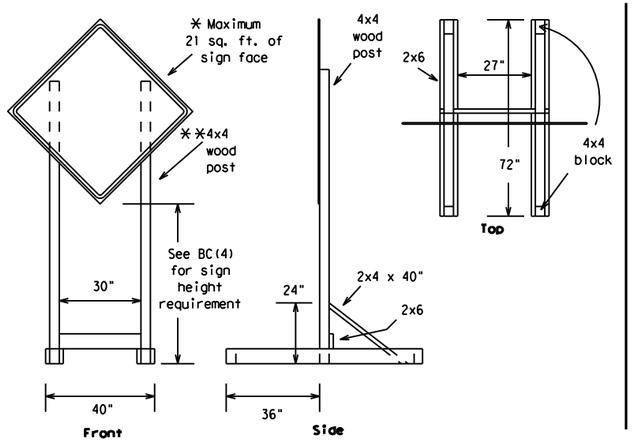
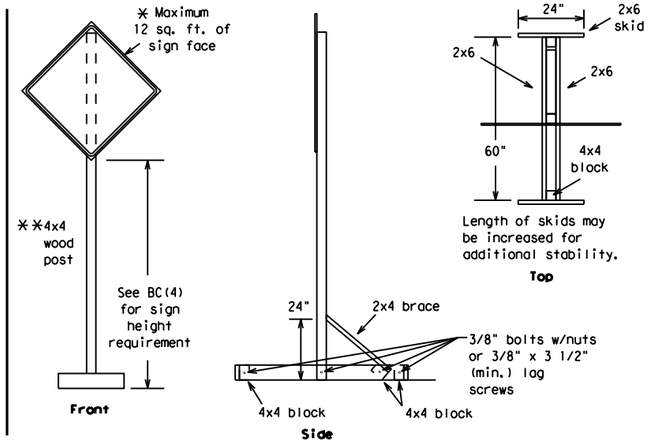
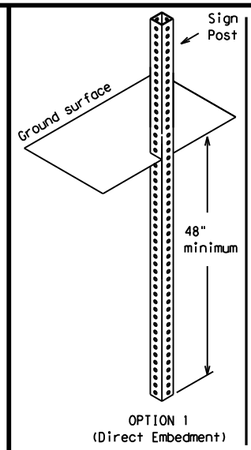
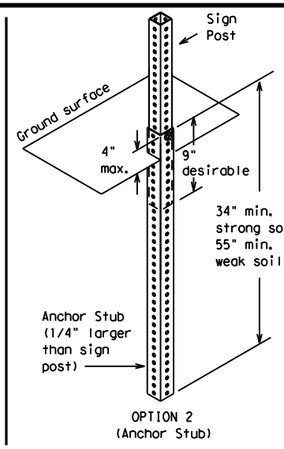


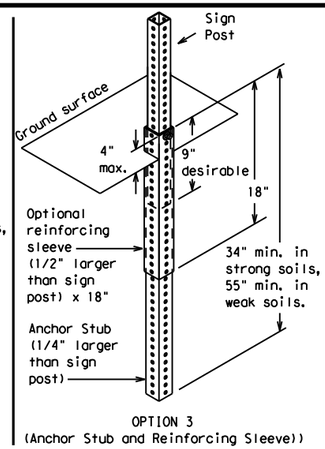


SKID MOUNTED WOOD SIGN SUPPORTS

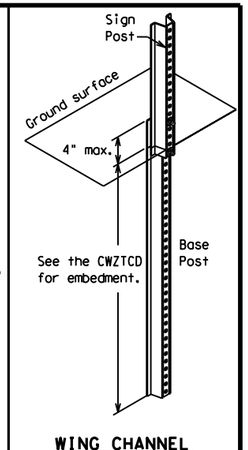
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS







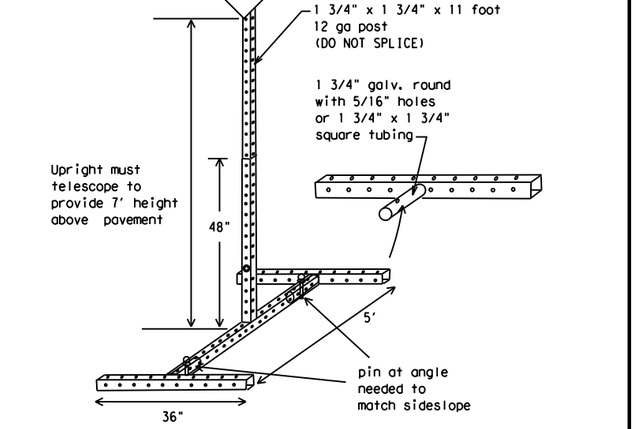
PERFORATED SQUARE METAL TUBING

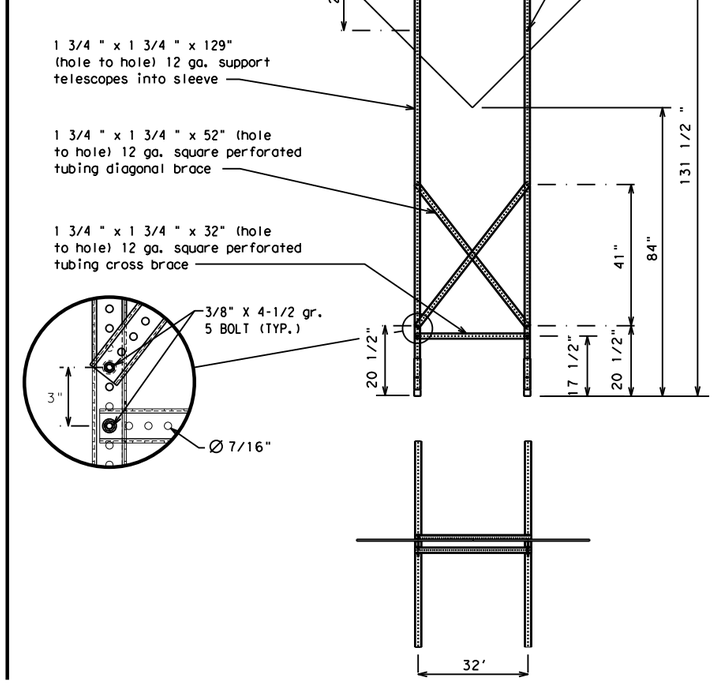


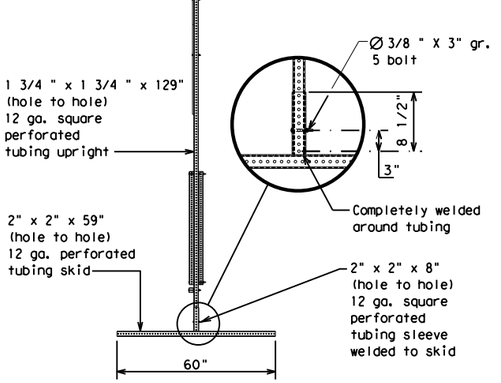
WING CHANNEL
Lap-splice/base bolted anchor

GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

SHEET 5 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1065	02	039	FM 1846
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	CAMERON		102

100

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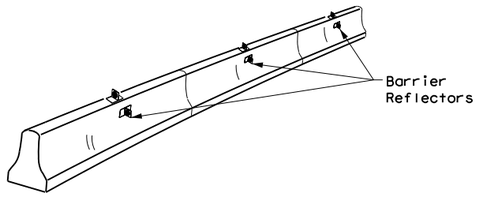
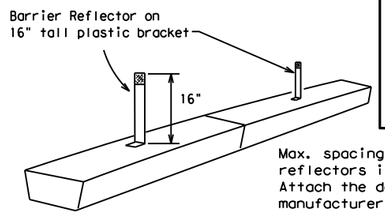
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



CONCRETE TRAFFIC BARRIER (CTB)

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

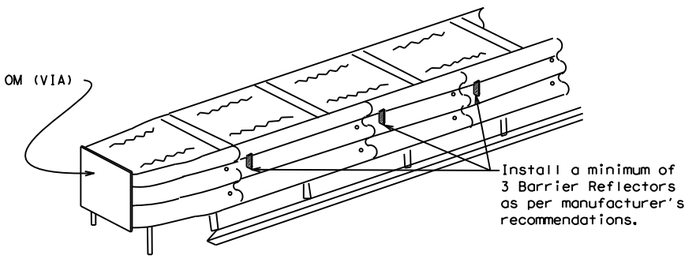


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) 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.

LOW PROFILE CONCRETE BARRIER (LPCB)

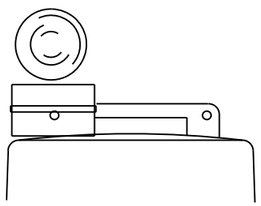


DELINEATION OF END TREATMENTS

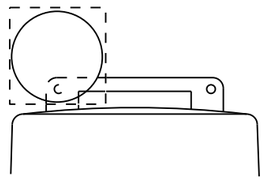
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

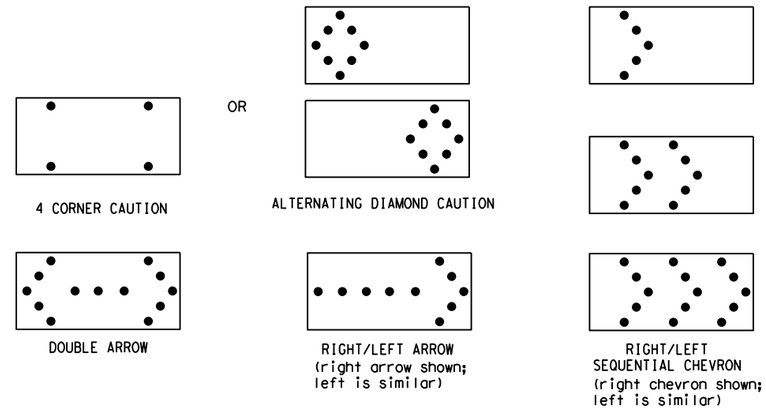
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation — Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1065	02	039	FM 1846
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	CAMERON		103

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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:

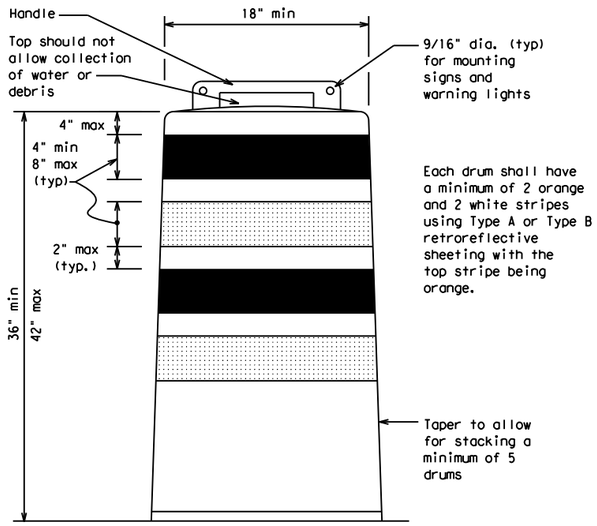
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents 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.

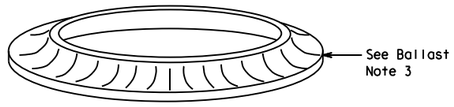
RETROREFLECTIVE SHEETING

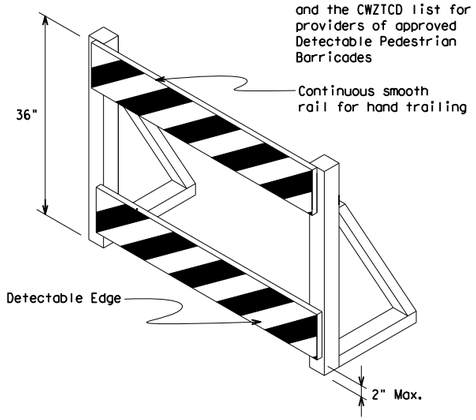
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

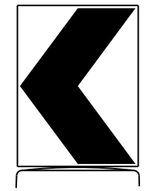




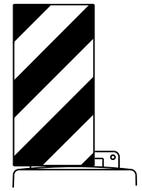


DETECTABLE PEDESTRIAN BARRICADES

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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4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	PHR	CAMERON		104
7-13				

102

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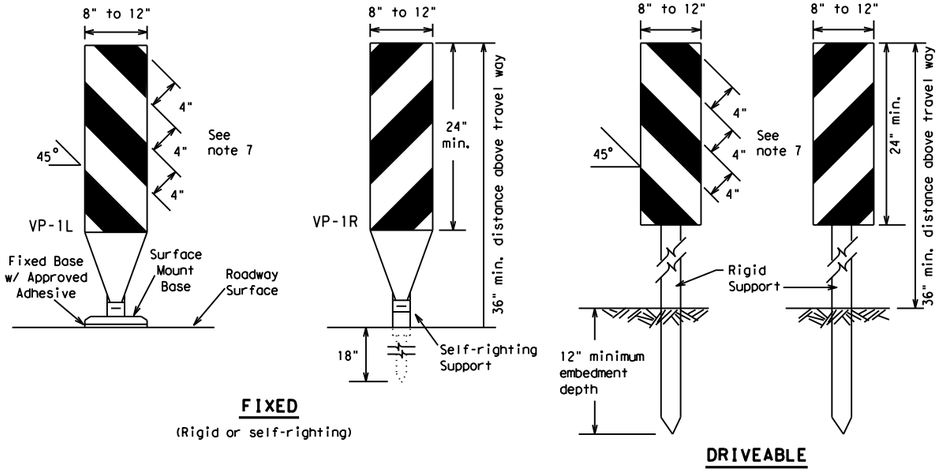
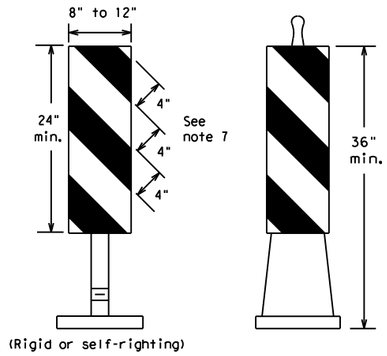


FIXED
(Rigid or self-righting)

DRIVEABLE

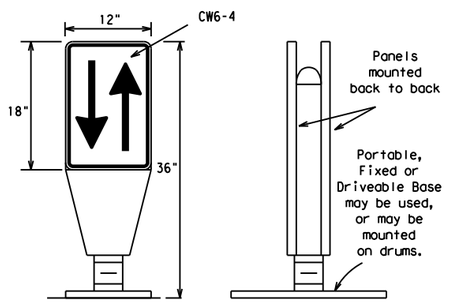


(Rigid or self-righting)

PORTABLE

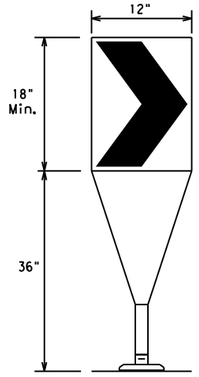
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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



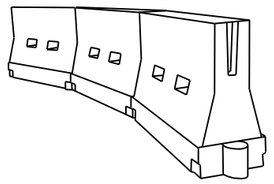
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

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Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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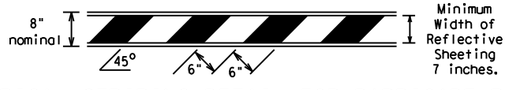
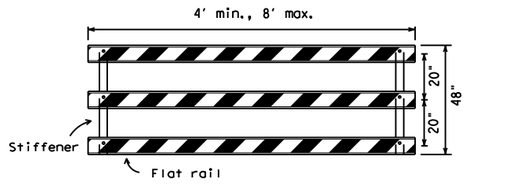
TYPE 3 BARRICADES

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.



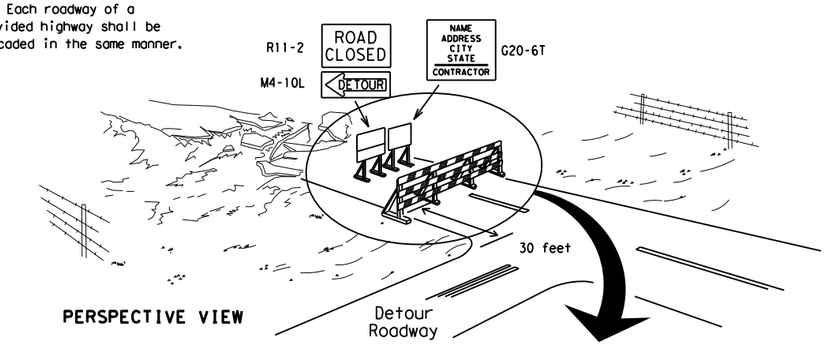
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

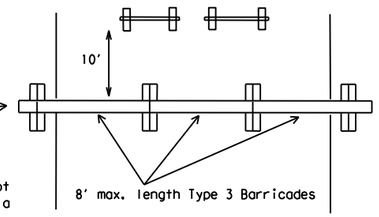
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

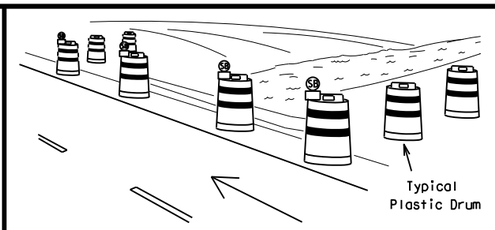
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

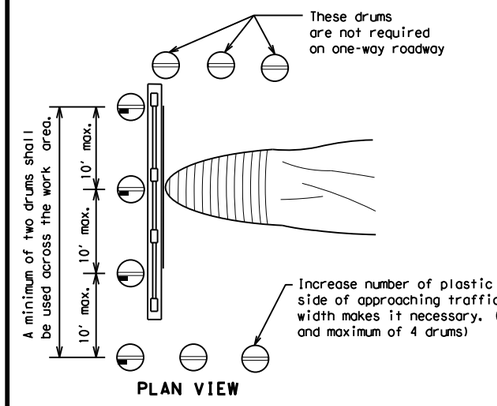
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

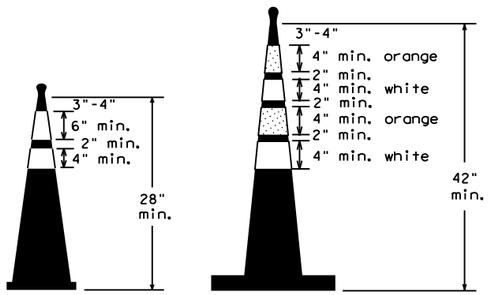
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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

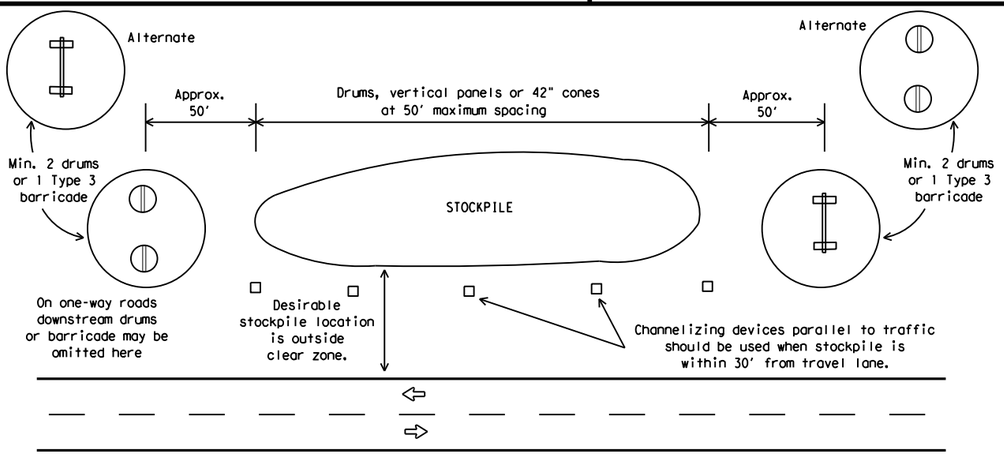
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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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7-13 5-21	PHR	CAMERON		106

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.

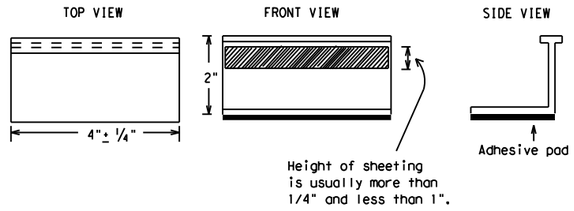
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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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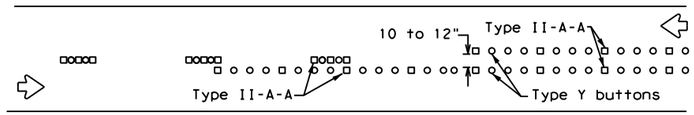
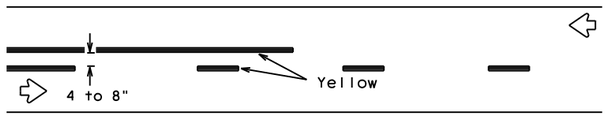
PAVEMENT MARKING PATTERNS

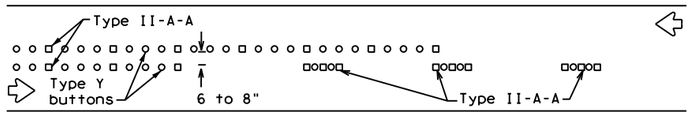
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



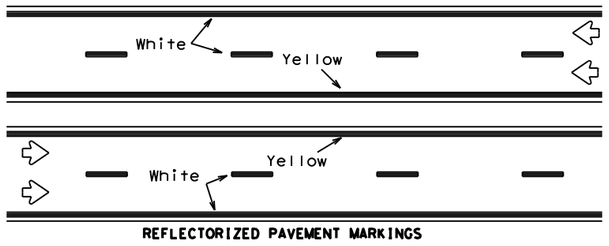
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



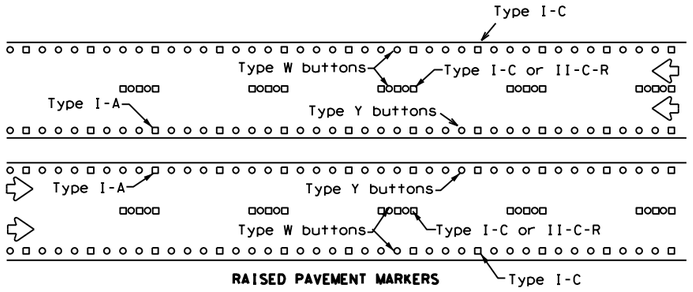
RAISED PAVEMENT MARKERS - PATTERN B

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



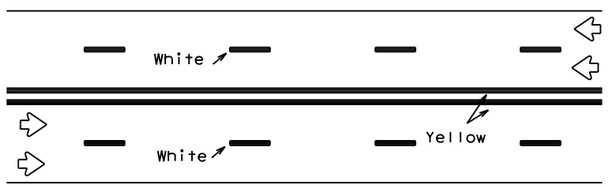
REFLECTORIZED PAVEMENT MARKINGS



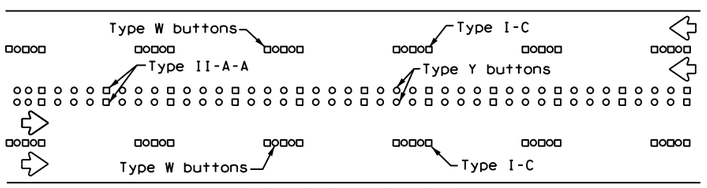
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



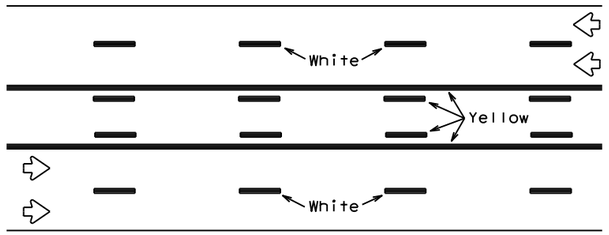
REFLECTORIZED PAVEMENT MARKINGS



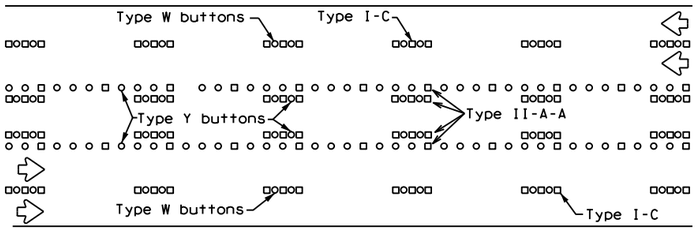
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

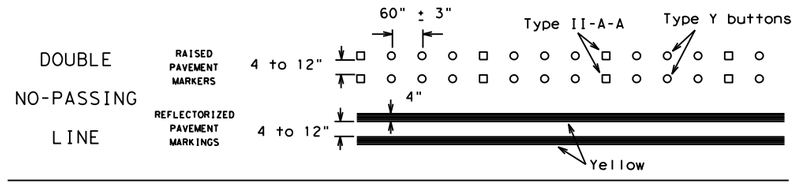
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

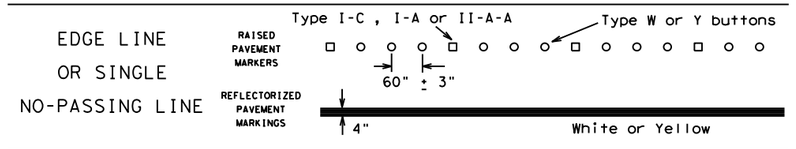
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

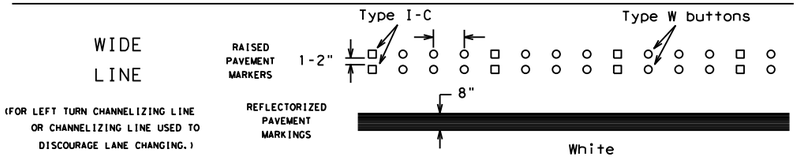


EDGE LINE OR SINGLE NO-PASSING LINE



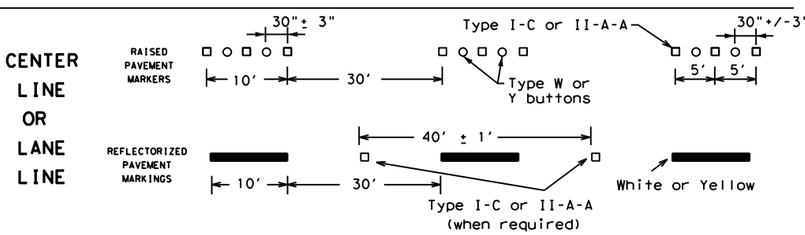
WIDE LINE

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

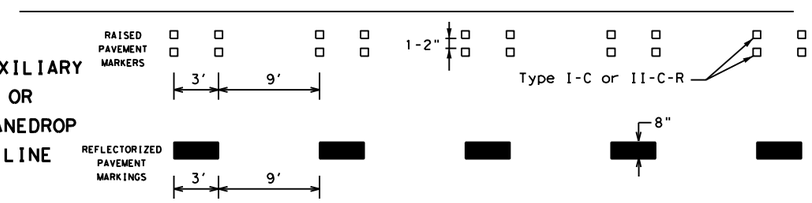


BROKEN LINES

CENTER LINE OR LANE LINE

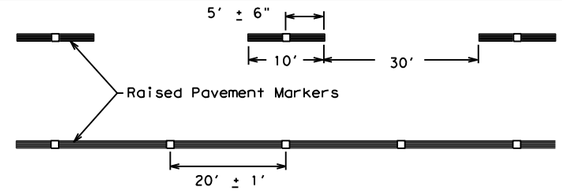


AUXILIARY OR LANEDROP LINE



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."

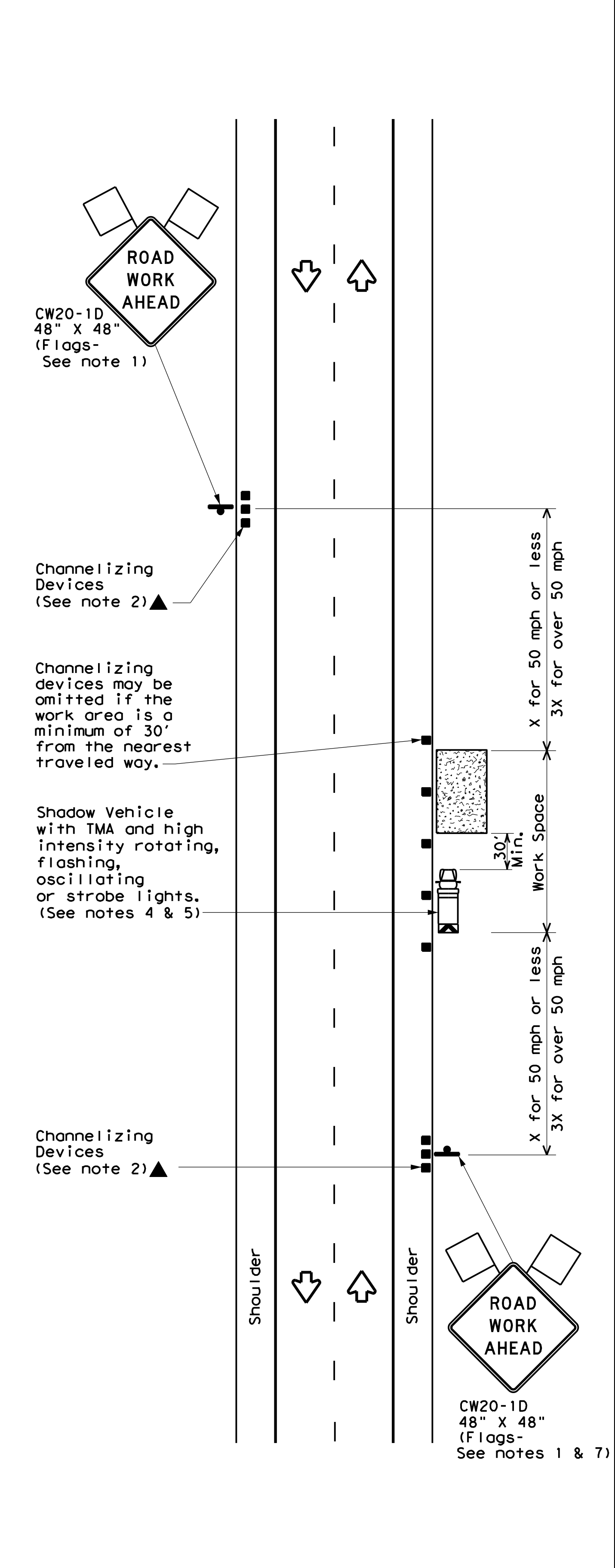
Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

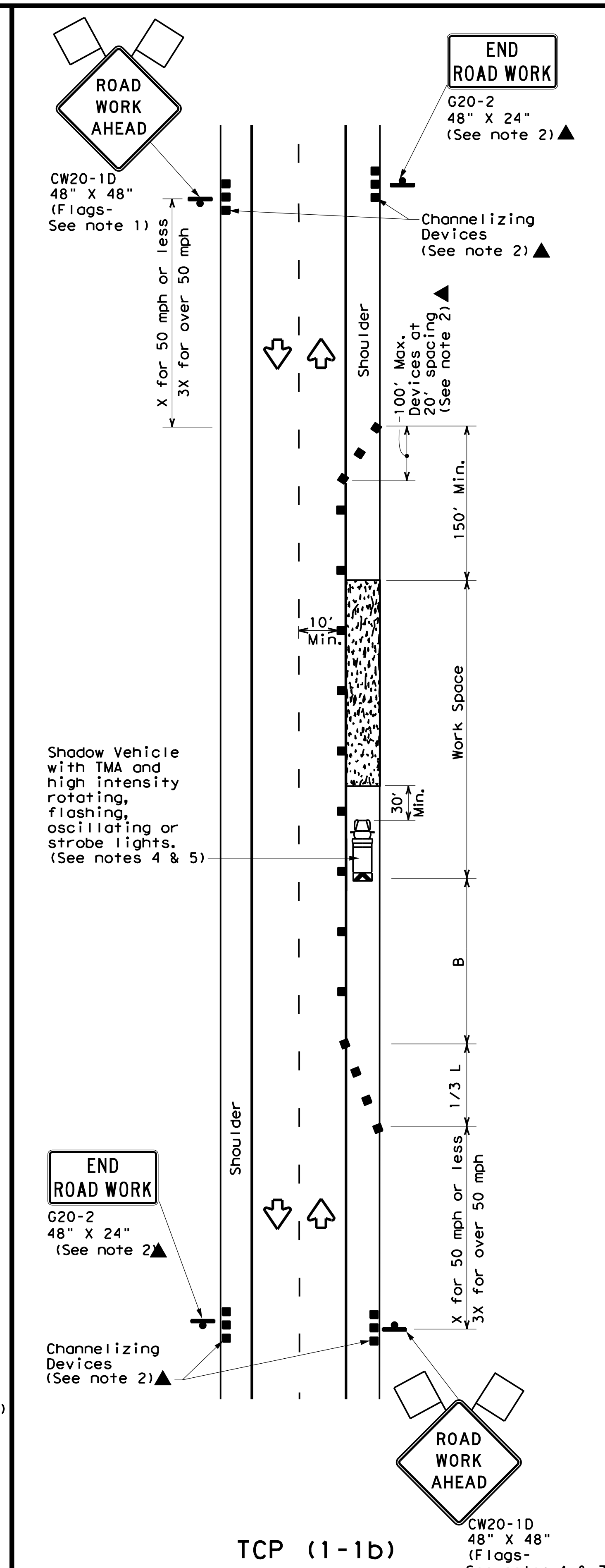
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	1065	02	039	FM 1846
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		108



TCP (1-1a)

WORK SPACE NEAR SHOULDER

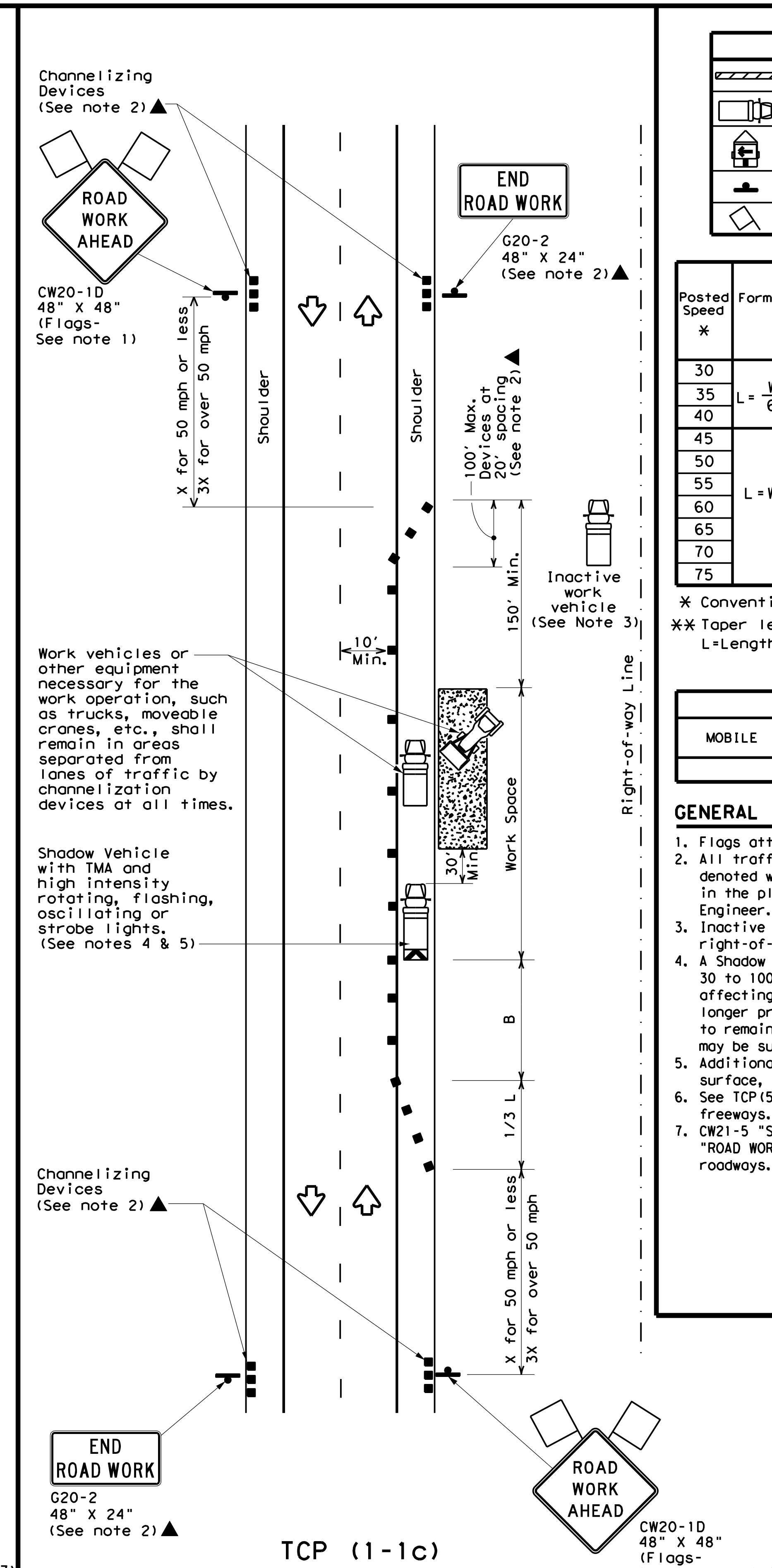
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER

Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER

Conventional Roads

LEGEND

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(1-1)-18

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	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	1065	02	039	FM 1846
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		109

151

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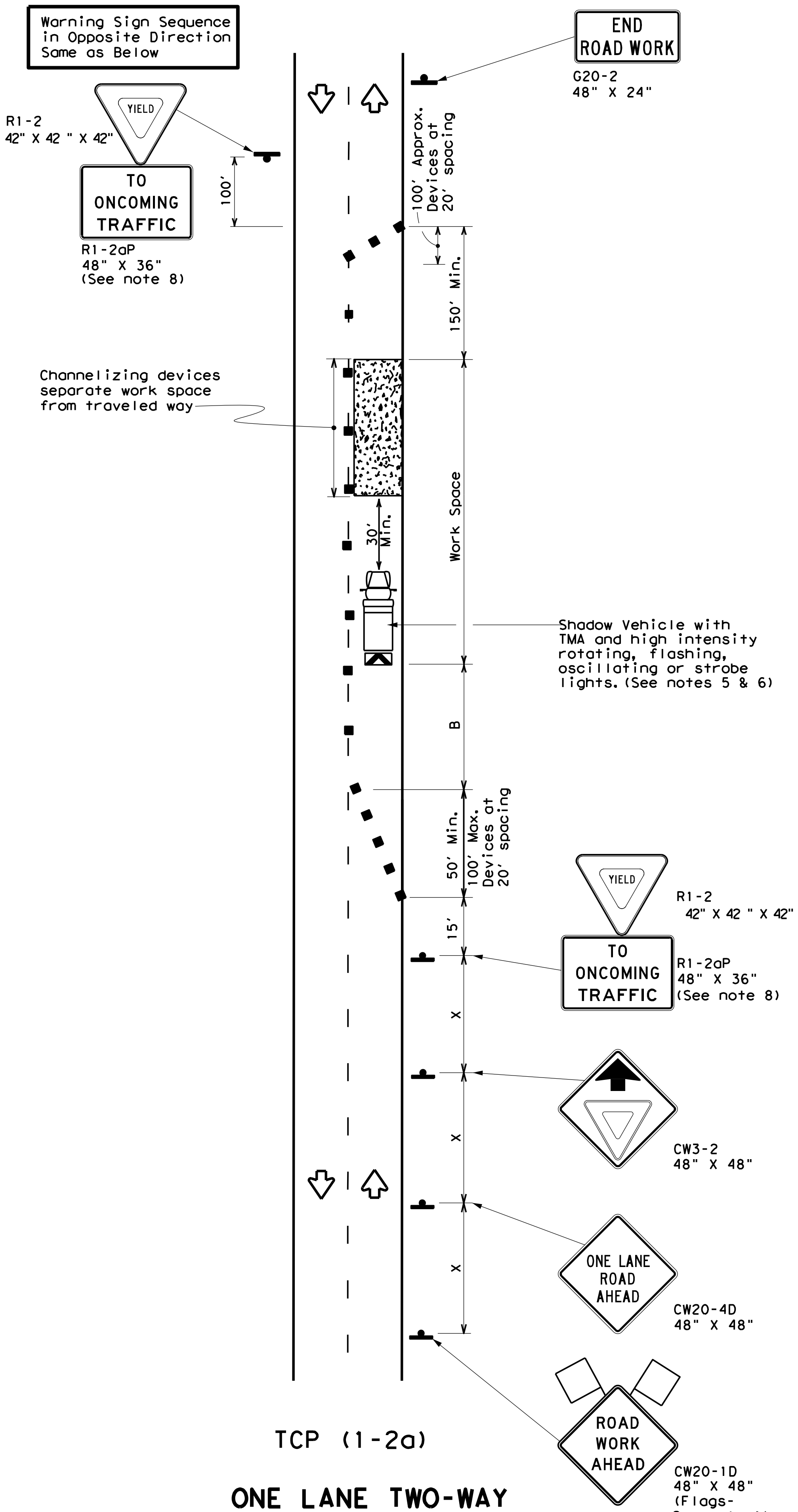
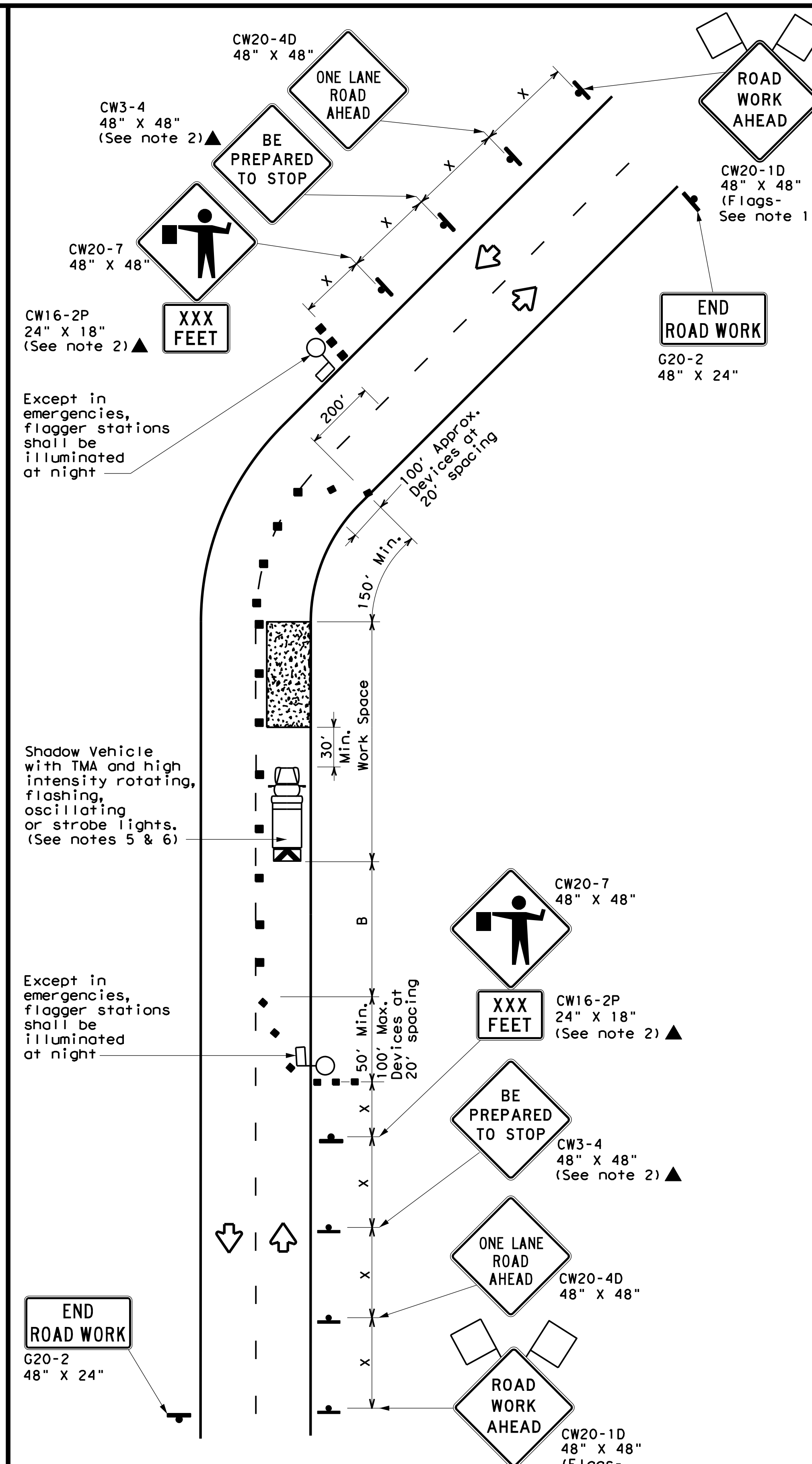


TCP (1-2a)

ONE LANE TWO-WAY CONTROL WITH YIELD SIGNS

(Less than 2000 ADT - See note 7)



TCP (1-2b)

ONE LANE TWO-WAY CONTROL WITH FLAGGERS

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
4. Sign spacing may be increased or an additional CW20-1D "ROAD WORK AHEAD" sign may be used if advance warning ahead of the flagger or R1-2 "YIELD" sign is less than 1500 feet.
5. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
6. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-2a)

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

TCP (1-2b)

9. Flaggers should use two-way radios or other methods of communication to control traffic.
10. Length of work space should be based on the ability of flaggers to communicate.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain adequate stopping sight distance to the flagger and a queue of stopped vehicles (see table above).
12. Channelizing devices on the center-line may be omitted when a pilot car is leading traffic and approved by the Engineer.
13. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(1-2)-18

FILE: tcp1-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT 1065	SECT 02	JOB 039	HIGHWAY FM 1846
REVISIONS 4-90 4-98 2-94 2-12 1-97 2-18	DIST PHR		COUNTY CAMERON	SHEET NO. 110

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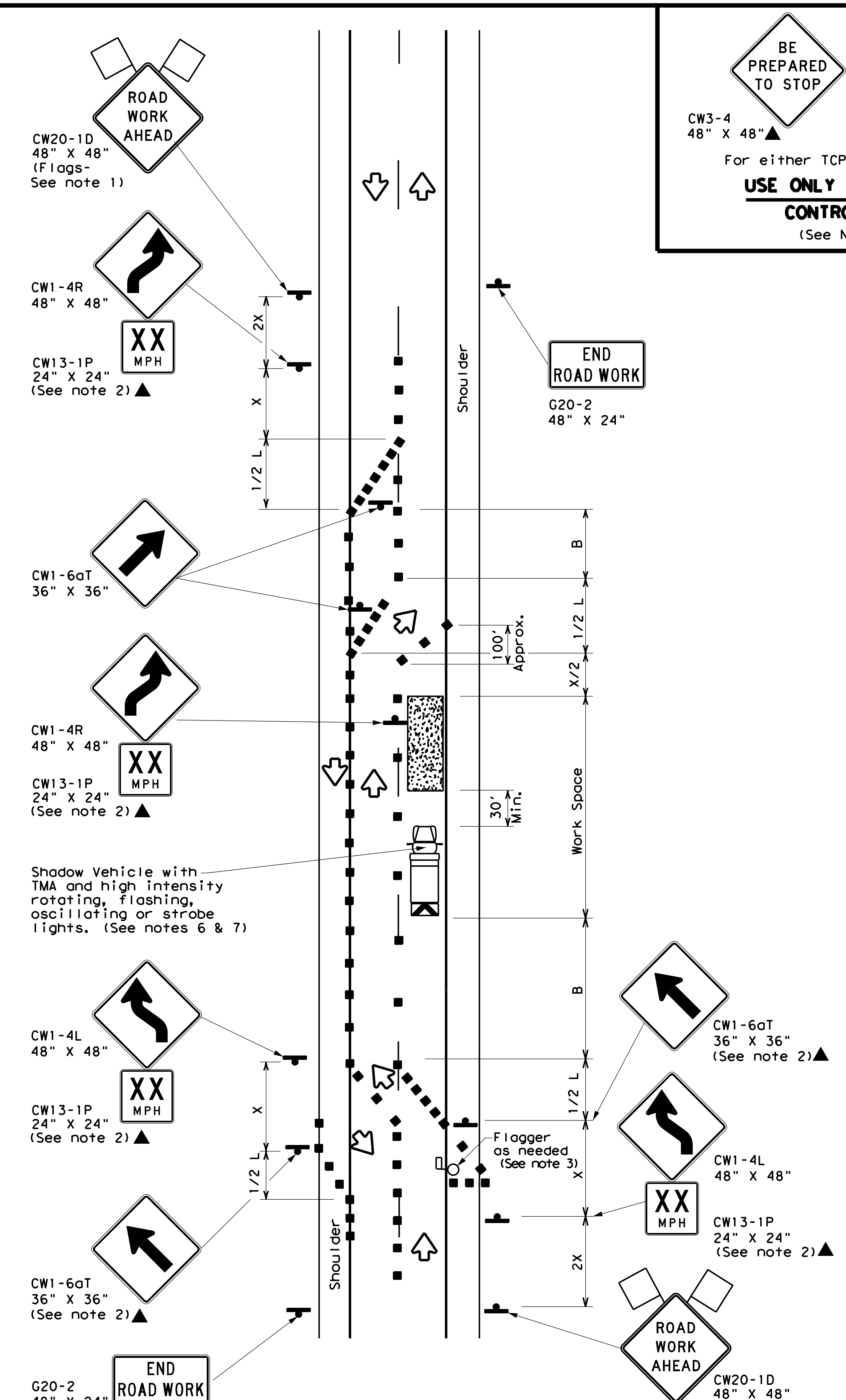
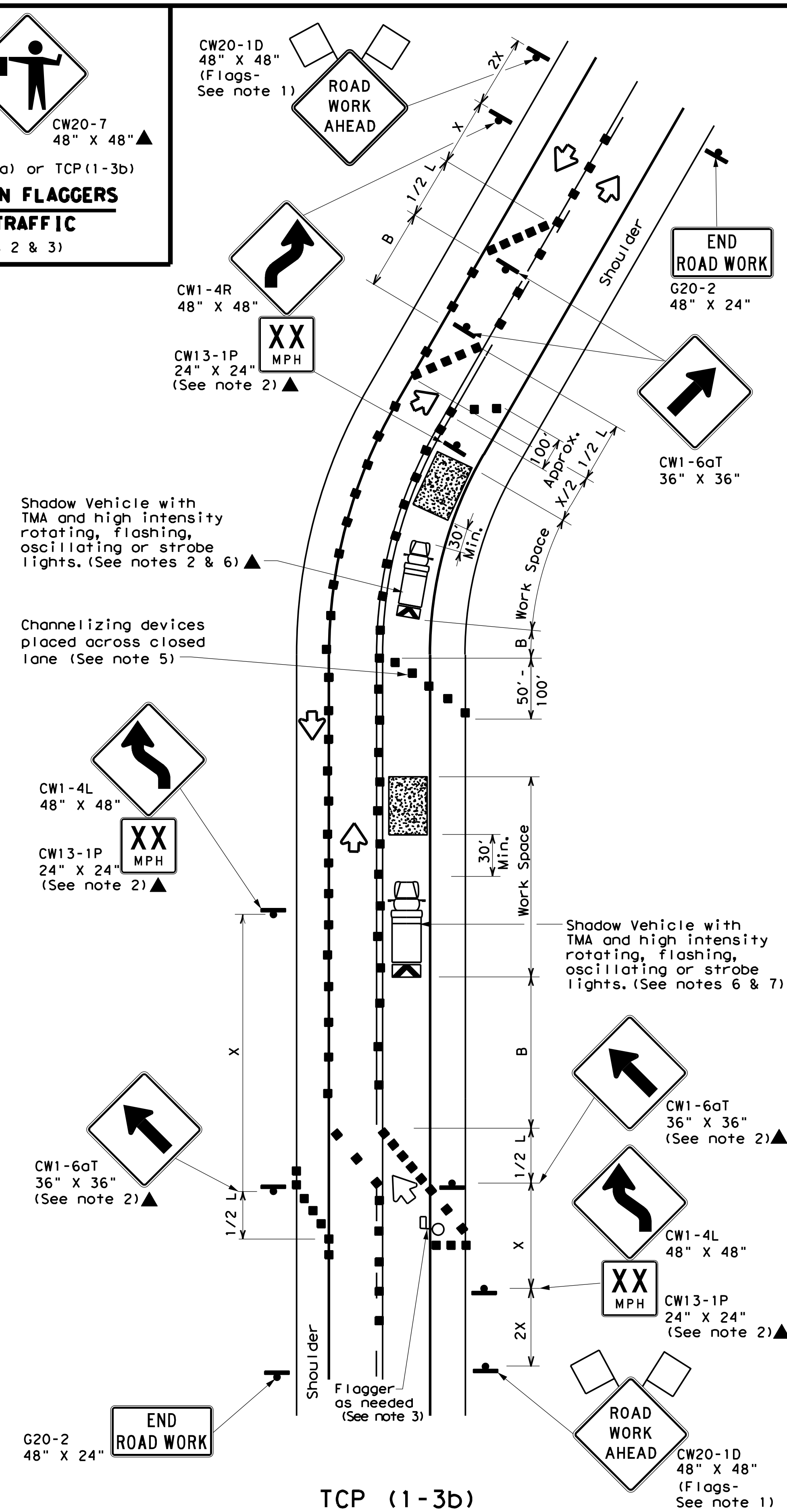


TCP (1-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW

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

USE ONLY WHEN FLAGGERS
CONTROL TRAFFIC
(See Notes 2 & 3)



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

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

LEGEND

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

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

* Conventional Roads Only

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

TYPICAL USAGE

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

GENERAL NOTES

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

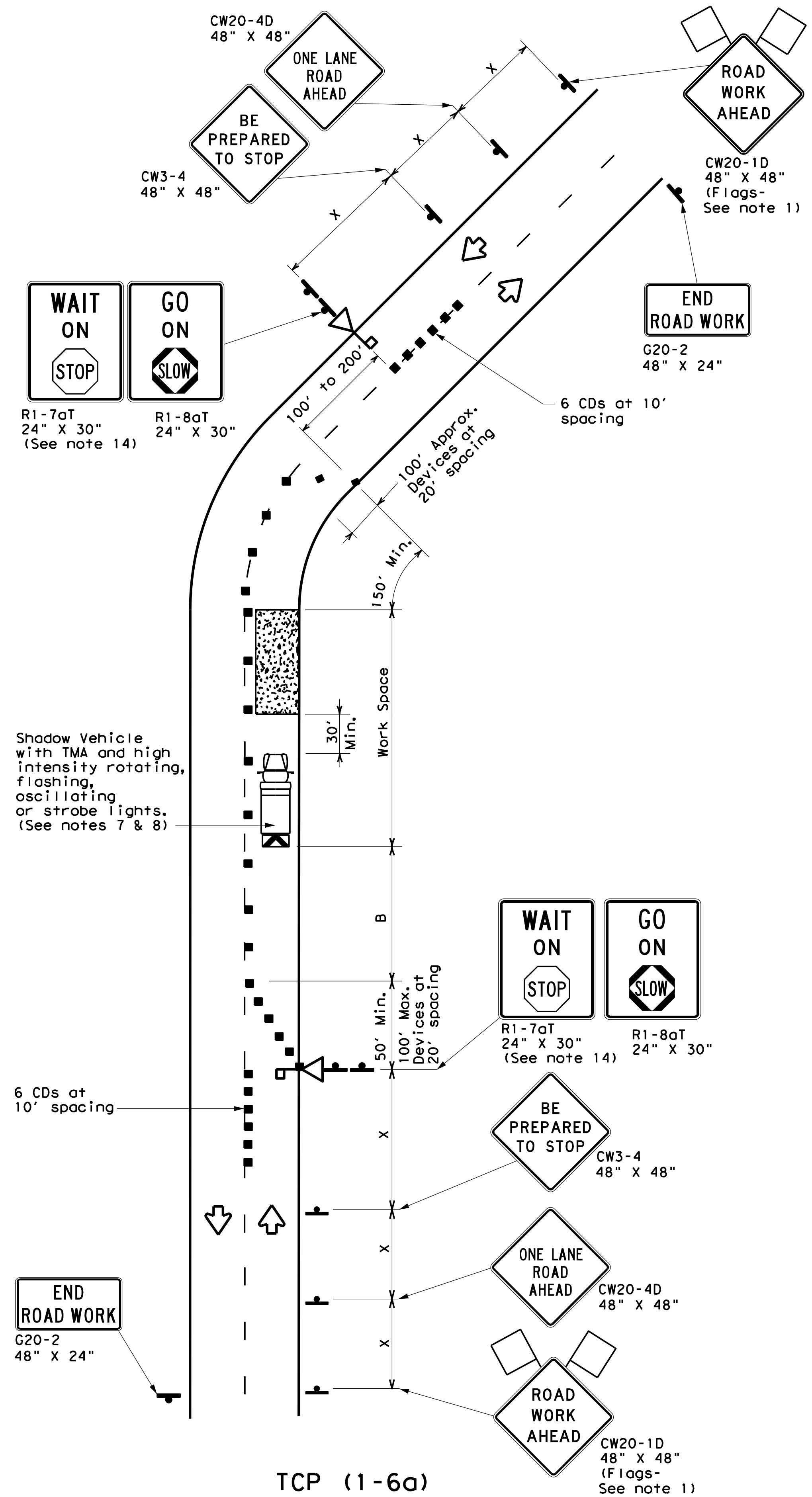
Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO LANE ROADS

TCP(1-3)-18

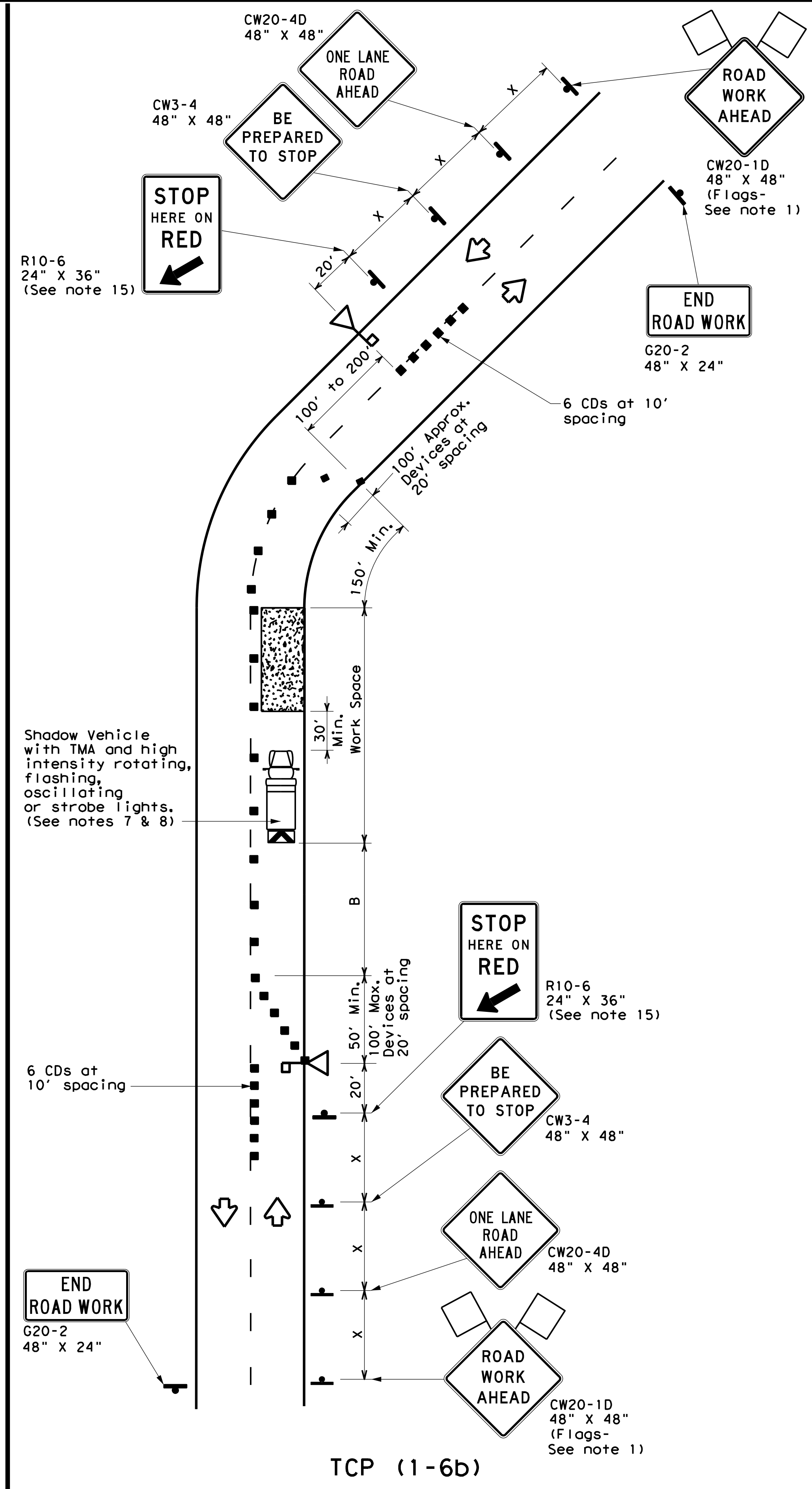
FILE: tcp1-3-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT 1065	SECT 02	JOB 039	HIGHWAY FM 1846
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	DIST PHR	COUNTY CAMERON		SHEET NO. 111

153



TCP (1-6a)

ONE LANE TWO-WAY CONTROL WITH STOP/SLOW AFADs



TCP (1-6b)

ONE LANE TWO-WAY CONTROL WITH RED/YELLOW LENS AFADs

LEGEND

	Type 3 Barricade		Channelizing Devices (CDs)
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Automated Flagger Assistance Device (AFAD)		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

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

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

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. AFADs shall only be used in situations where there is one lane of approaching traffic in the direction to be controlled.
3. Adequate stopping sight distance must be provided to each AFAD location for approaching traffic. (See table above).
4. Each AFAD shall be operated by a qualified/certified flagger. Flaggers operating AFADs shall not leave them unattended while they are in use.
5. One flagger may operate two AFADs only when the flagger has an unobstructed view of both AFADs and of the approaching traffic in both directions.
6. When pilot cars are used, a flagger controlling traffic shall be located on each approach. AFADs shall not be operated by the pilot car operator.
7. All AFADs shall be equipped with gate arms with an orange or fluorescent red-orange flag attached to the end of the gate arm. The flag shall be a minimum of 16" square.
8. 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.
9. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
10. Flaggers should use two-way radios or other methods of communication to control traffic.
11. Length of work space should be based on the ability of flaggers to communicate.
12. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the AFAD.
13. Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
14. The R1-7aT "WAIT ON STOP" sign and the R1-8aT "GO ON SLOW" sign shall be installed at the AFAD location on separate supports or they may be fabricated as one 48" x 30" sign. They shall not obscure the face of the STOP/SLOW AFAD.
15. The R10-6 "STOP HERE ON RED" arrow sign shall be offset so as not to obscure the lenses of the AFAD.

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
AUTOMATED FLAGGER ASSISTANCE DEVICES (AFADS)
TCP(1-6)-18

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© TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-18	1065	02	039	FM 1846
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		112

156

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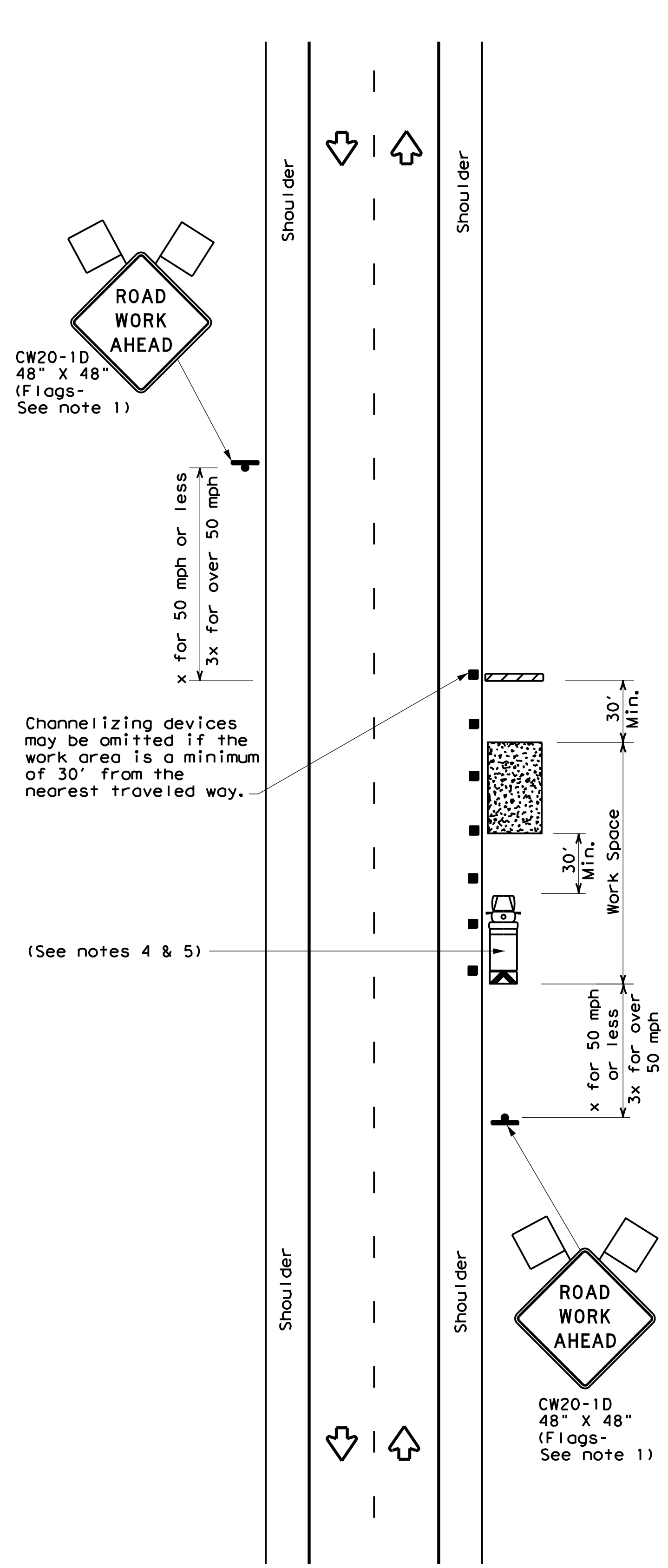
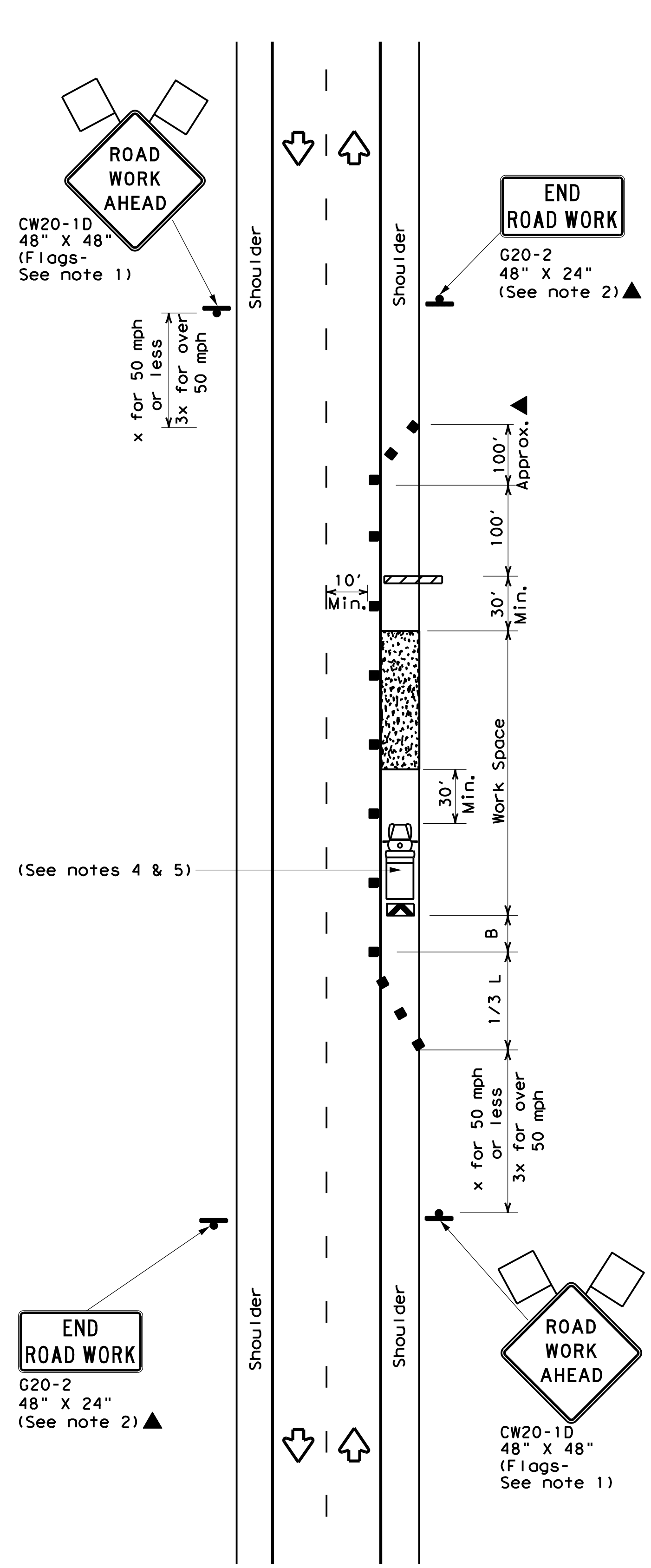


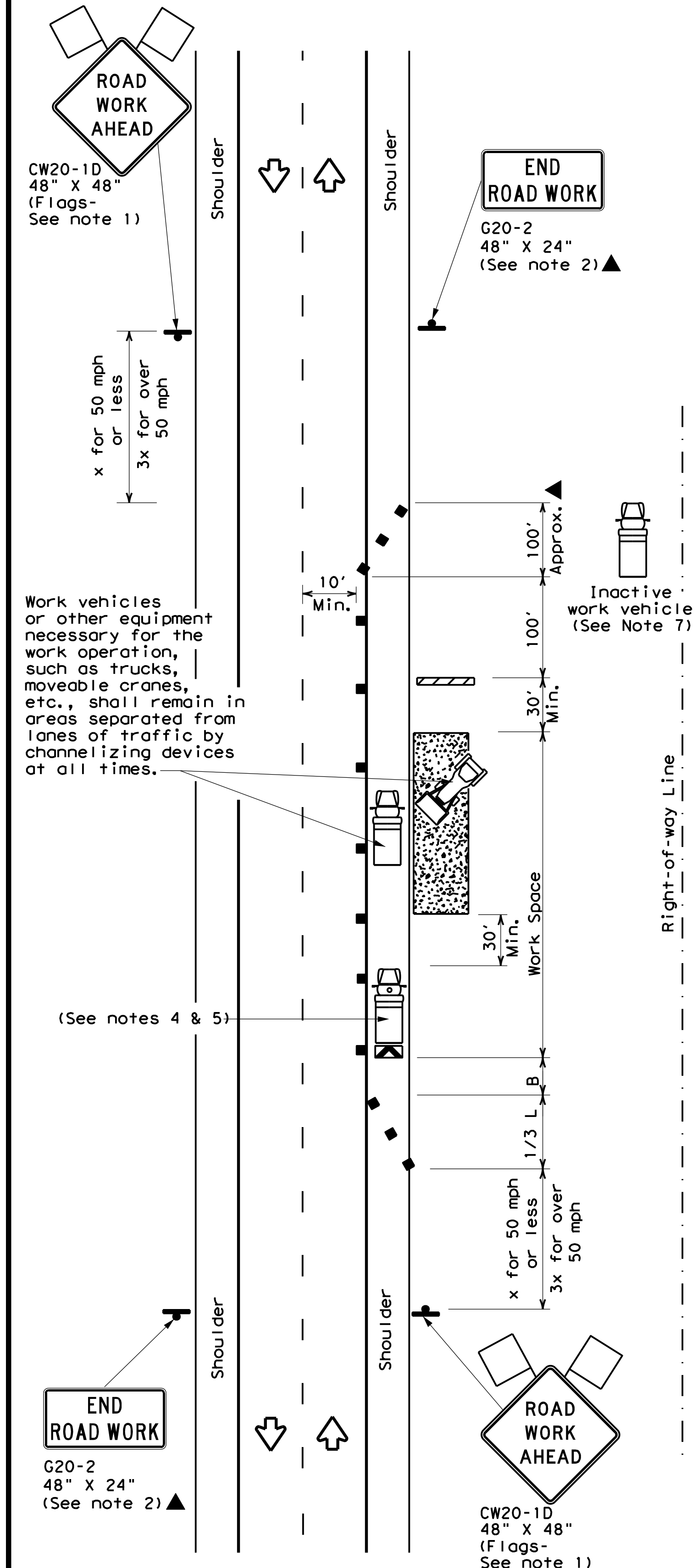
TCP (2-1a)

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

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

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

* Conventional Roads Only

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

TYPICAL USAGE

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

GENERAL NOTES

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

Texas Department of Transportation

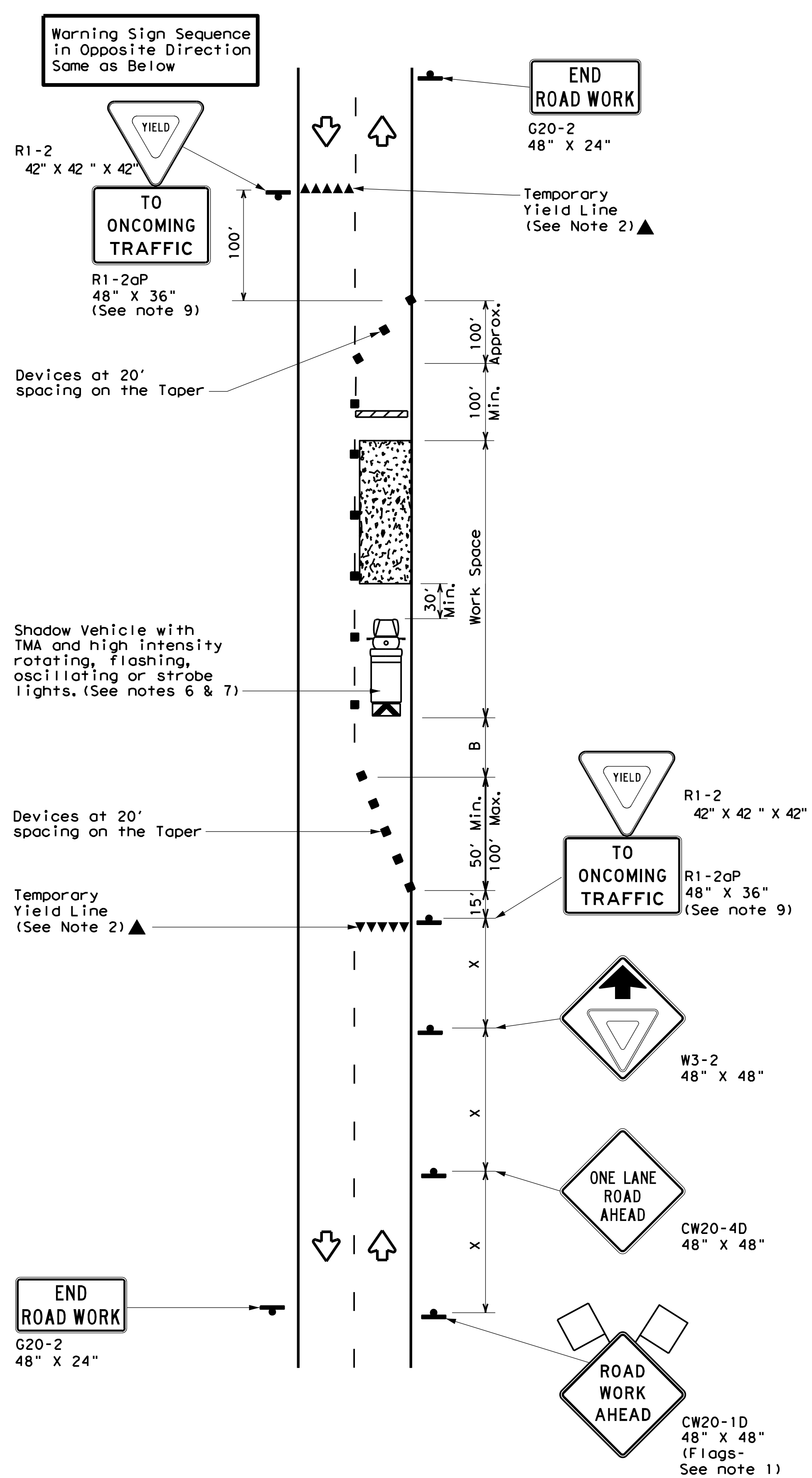
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

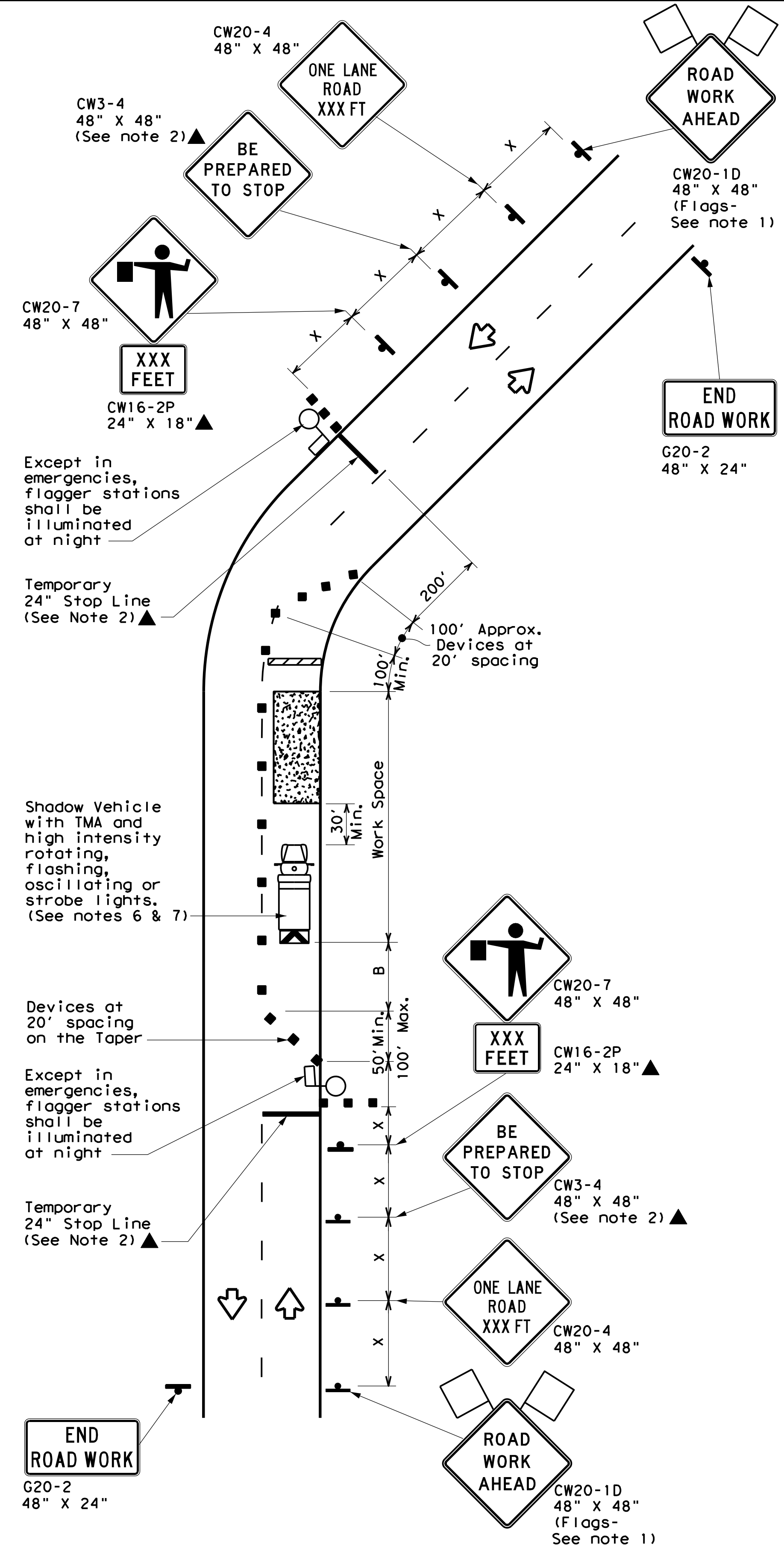
TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	1065	02	039	FM 1846
2-94 4-98 / 8-95 2-12 / 1-97 2-18	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	113

161



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



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

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

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

TCP (2-2a)

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

TCP (2-2b)

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(2-2)-18

FILE: tcp2-2-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT 1065	SECT 02	JOB 039	HIGHWAY FM 1846
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	DIST PHR		COUNTY CAMERON	SHEET NO. 114

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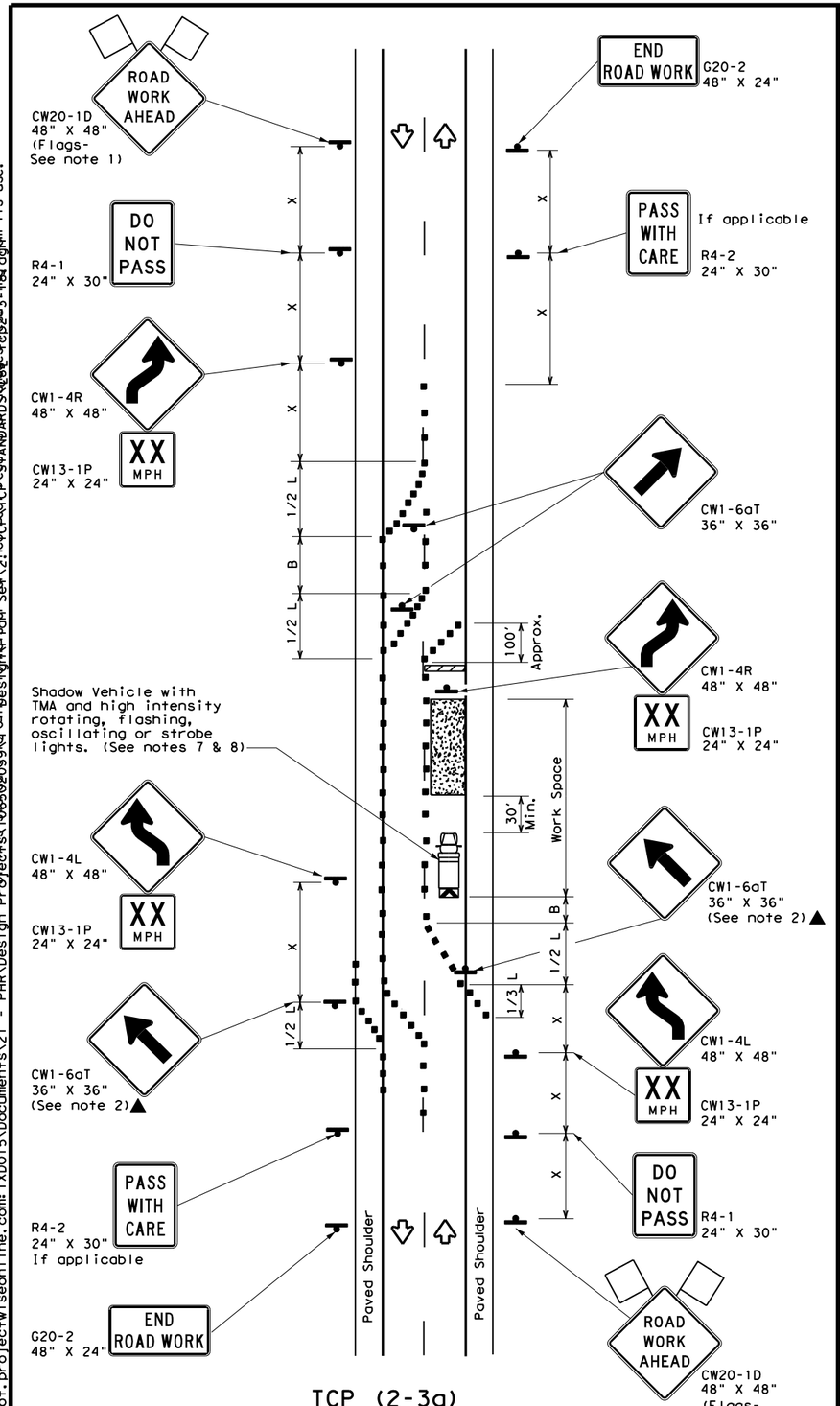
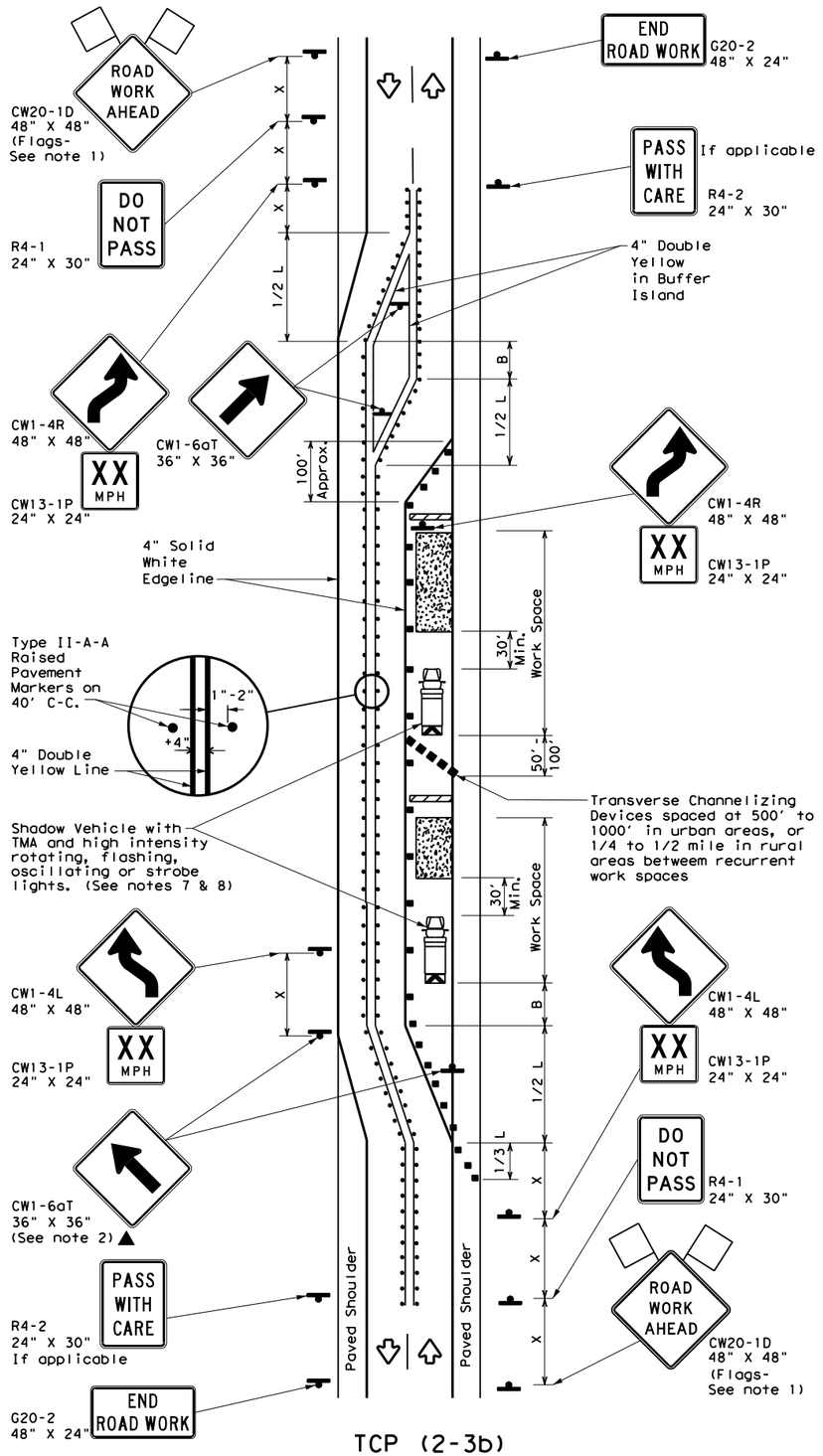


TCP (2-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

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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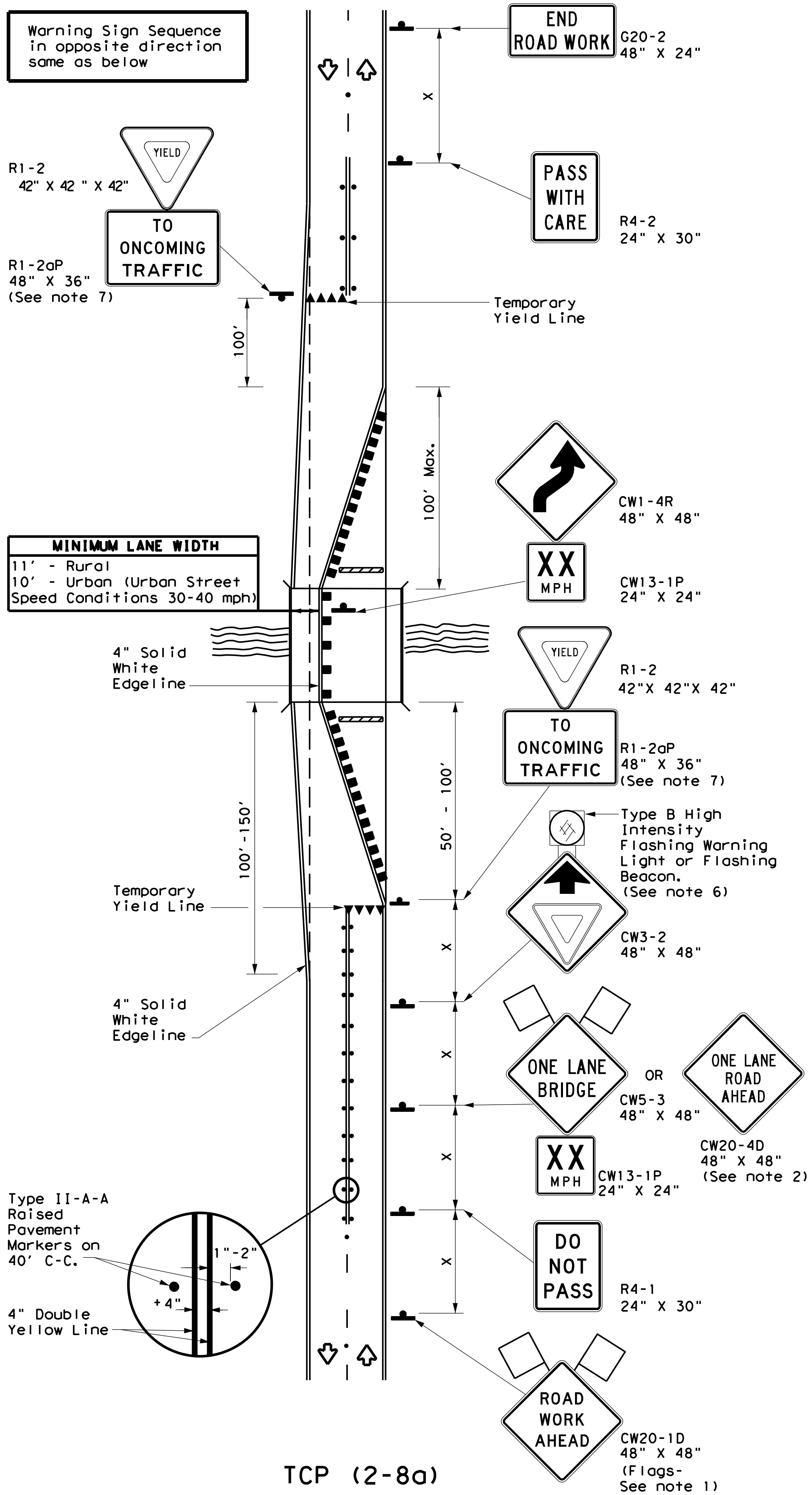
8-95 3-03	DIST	COUNTY		SHEET NO.
1-97 2-12	PHR	CAMERON		115
4-98 2-18				

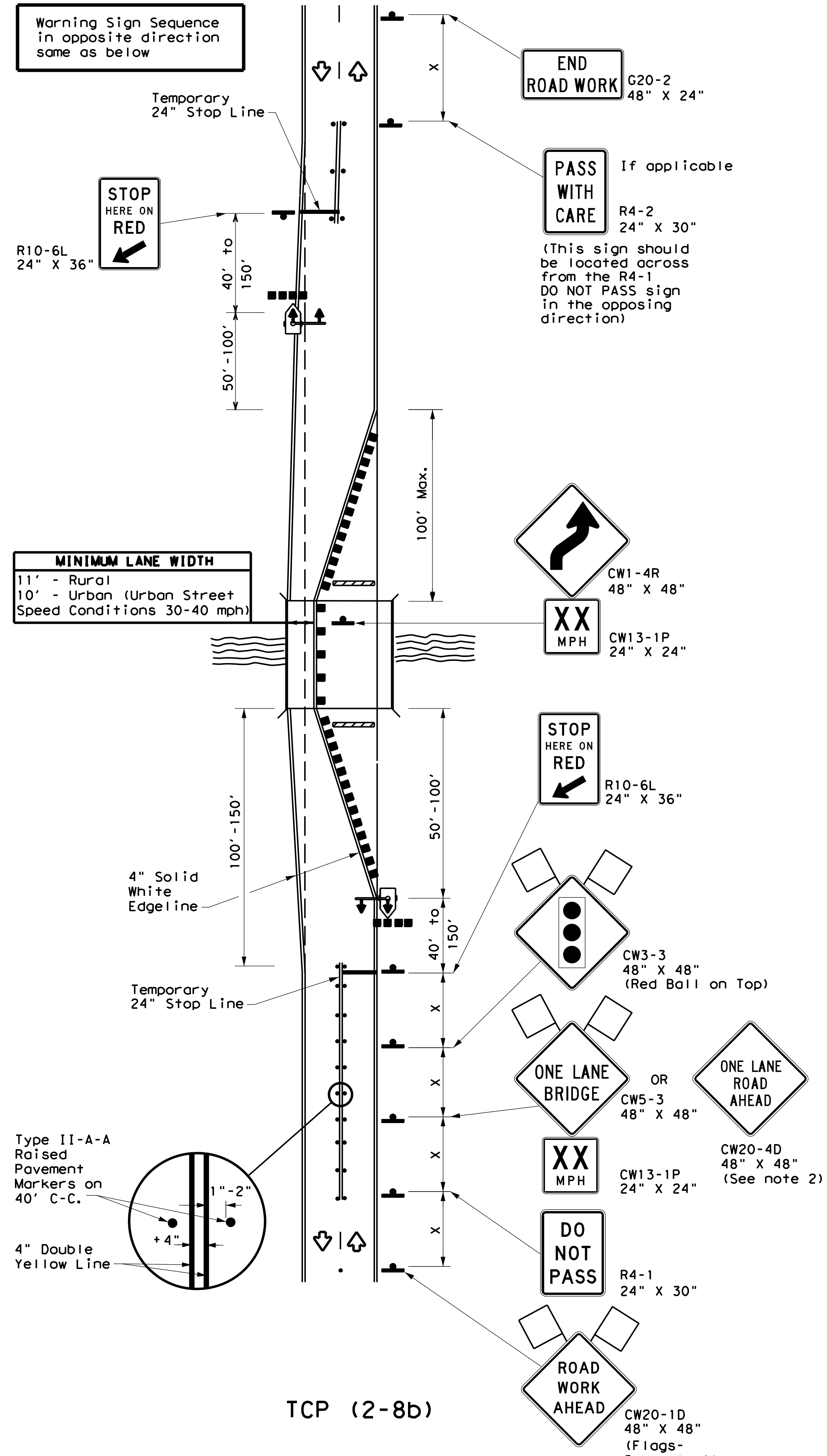


TCP (2-8a)

ONE LANE TWO-WAY

TRAFFIC CONTROL WITH YIELD SIGNS

(Less Than 2000 ADT-See Note 5)



TCP (2-8b)

ONE LANE TWO-WAY

TRAFFIC CONTROL WITH TRAFFIC SIGNAL

LEGEND

Symbol	Description	Symbol	Description
	Type 3 Barricade		Channelizing Devices
	Sign		Traffic Flow
	Flag		Flagger
••••	Raised Pavement Markers Ty II-AA		Temporary or Portable Traffic Signal

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. When this TCP is used at a location which does not involve a bridge, a 48" x 48" CW20-4D "ONE LANE ROAD AHEAD" signs should be used in lieu of the CW5-3 "ONE LANE BRIDGE" signs. The CW13-1P Advisory Speed Plaque is required with either warning sign.
3. Raised pavement markers shall be placed 40 feet c-c on centerline between DO NOT PASS signs and stop or yield lines.
4. For intermediate term situations, when it is not feasible to remove and restore pavement markings, the channelization must be made dominant by using a very close spacing. This is especially important in locations of conflicting information, such as where traffic is directed over a double yellow centerline. In such locations a maximum channelizing device spacing of 20 feet is recommended. The 20 foot channelizing device spacing recommendation is intended for the area of conflicting information and not the entire work zone.

TCP (2-8a)

5. Traffic control by CW3-2 "YIELD AHEAD" symbol signs for one lane two-way traffic control operations should be limited to work spaces less than 400 feet long and roadways with less than 2000 ADT. Otherwise, portable traffic signals should be used.
6. If power is available, a flashing beacon should be attached to the CW3-2 "YIELD AHEAD" symbol sign for emphasis.
7. The R1-2 "YIELD" and R1-2aP "TO ONCOMING TRAFFIC" signs and other regulatory signs shall be installed at 7 foot minimum mounting height.

TCP (2-8b)

8. A list of approved Portable Traffic Signals can be found in the "Compliant Work Zone Traffic Control Devices" list.
9. Portable traffic signals should be located to provide adequate stopping sight distance for approaching motorist (See table above).

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LONG TERM ONE-LANE TWO-WAY CONTROL

TCP(2-8)-18

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	1065	02	039	FM 1846
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	PHR	CAMERON		116

168

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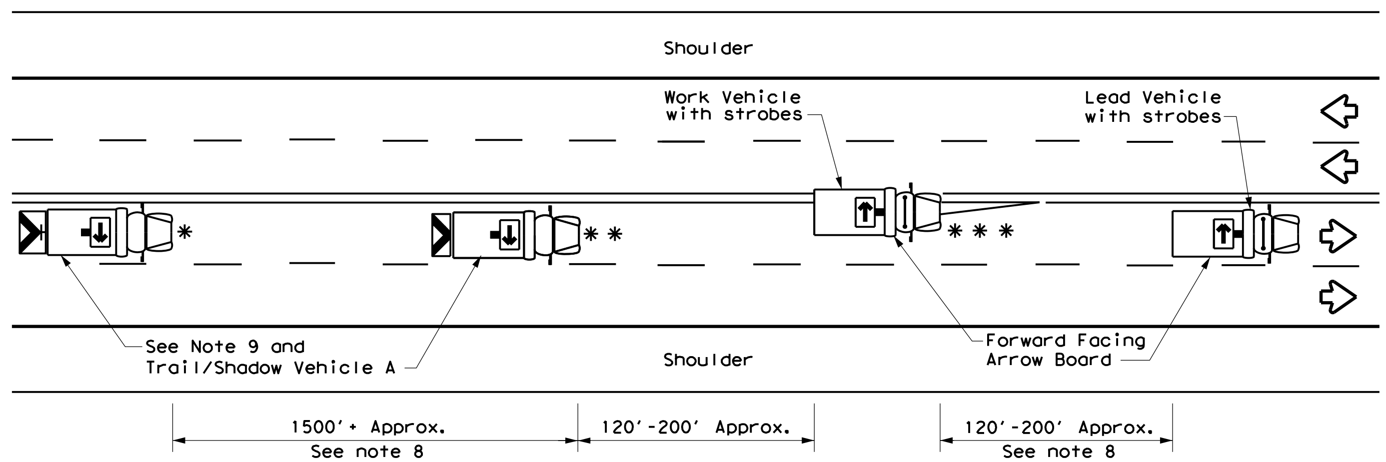
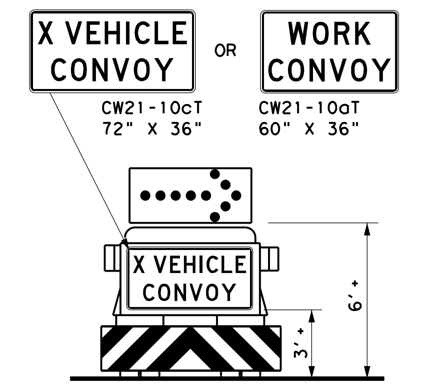


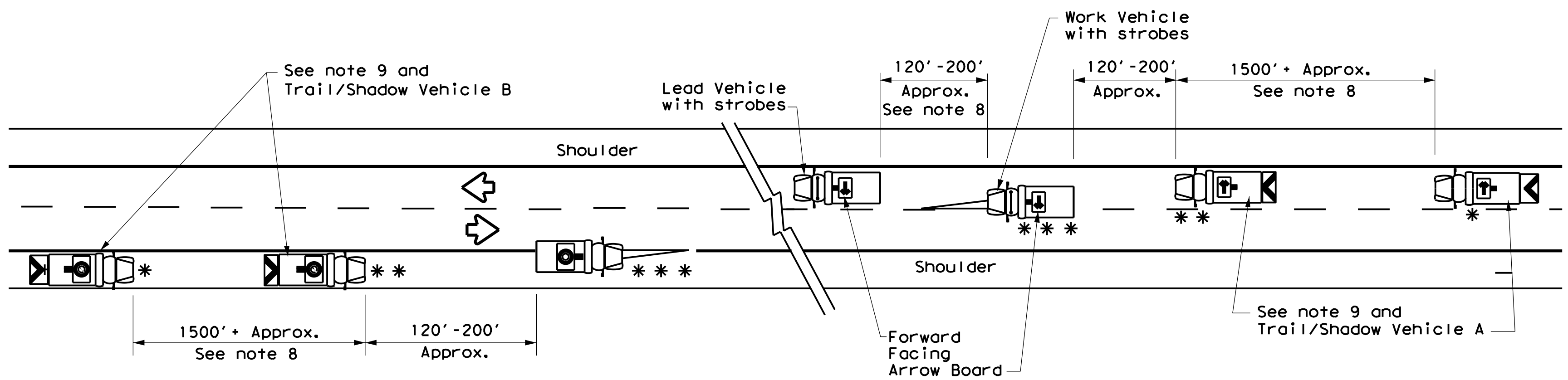
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

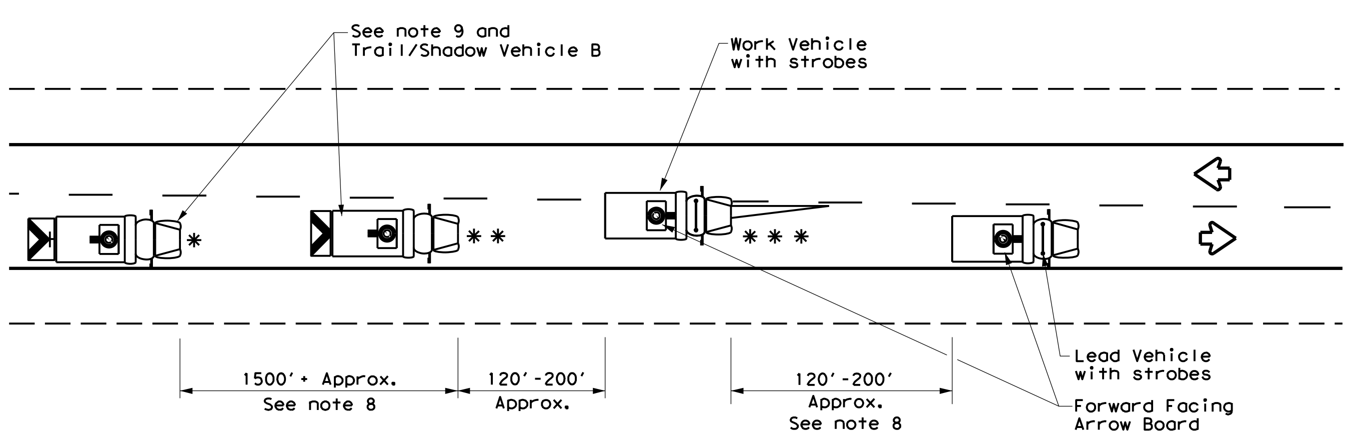


WORK ON SHOULDER

WORK ON TRAVEL LANE

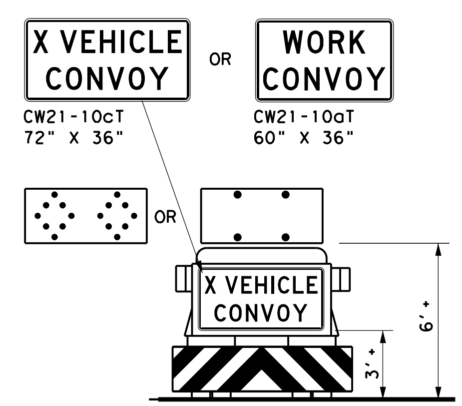
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board in CAUTION display

LEGEND

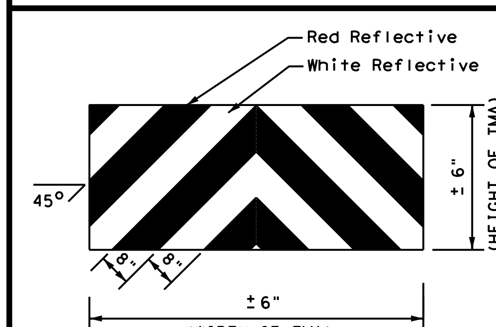
Symbol	Description	Arrow Board Symbol	ARROW BOARD DISPLAY
*	Trail Vehicle		
**	Shadow Vehicle		
***	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

TYPICAL USAGE

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

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©TxDOT	December 1985	CONT	SECT	JOB	HIGHWAY
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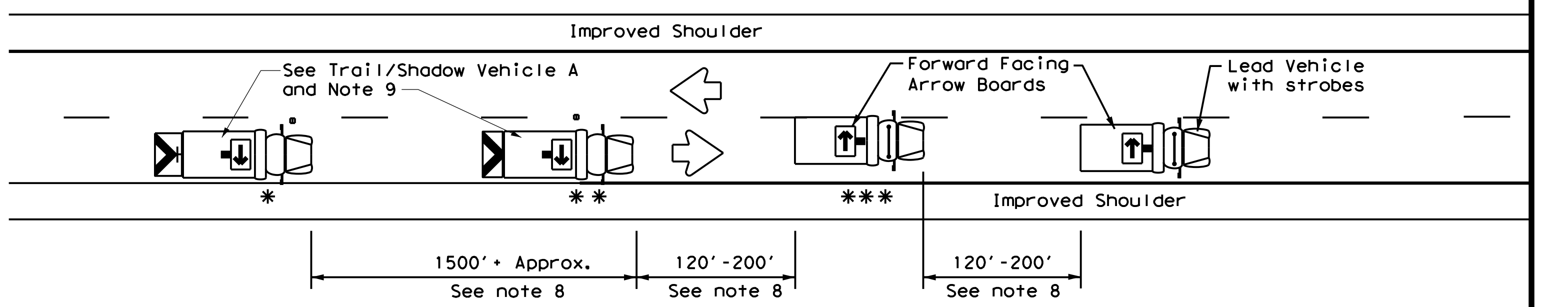
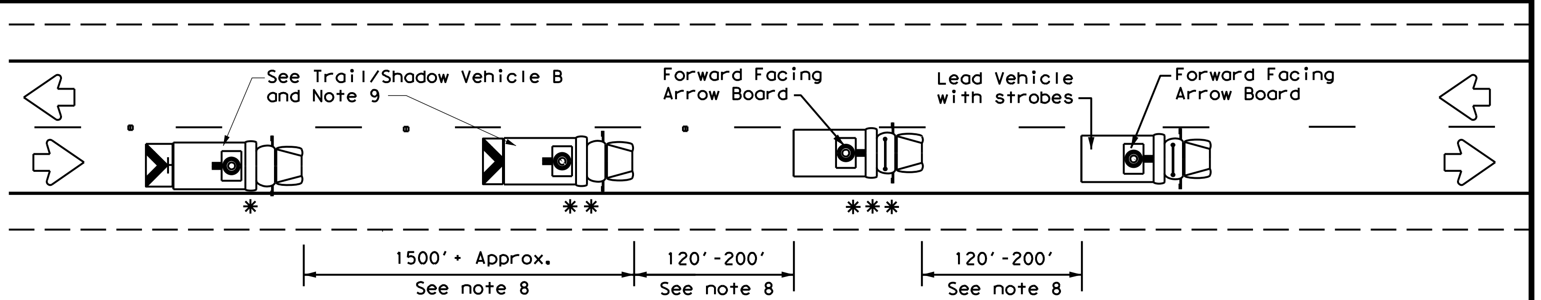


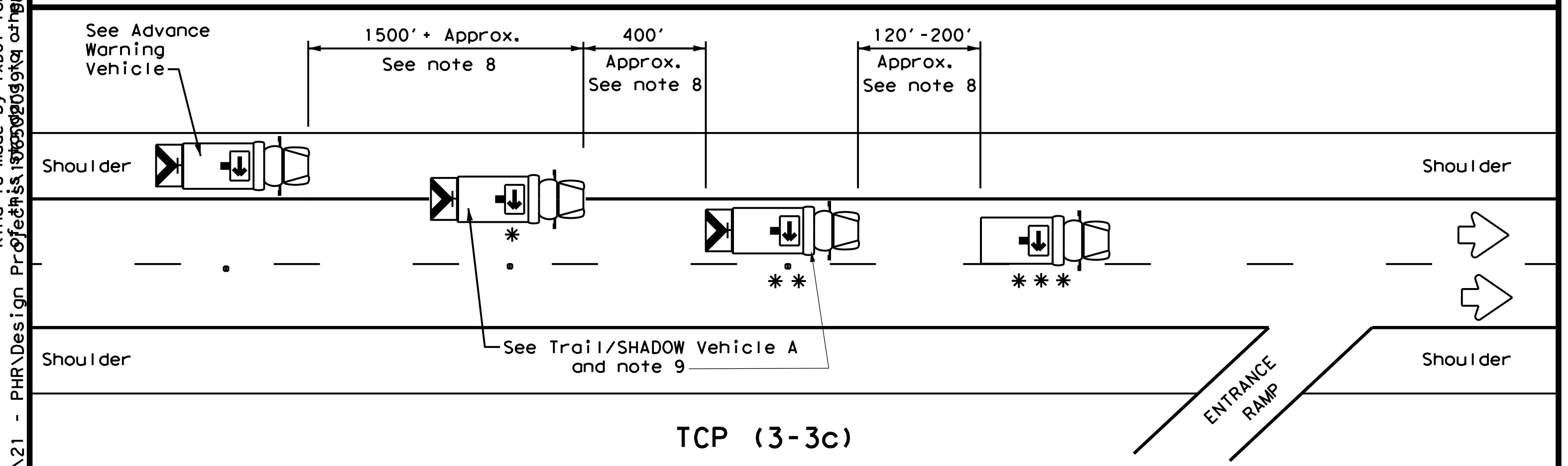
TCP (3-3a)

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



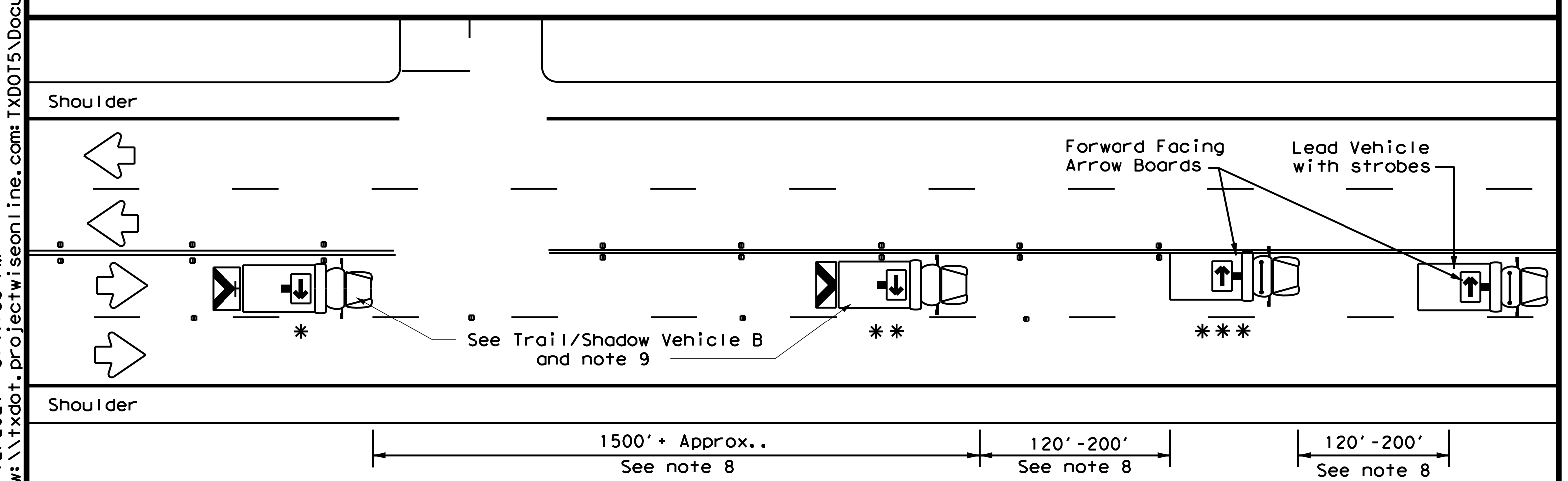
TCP (3-3b)

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



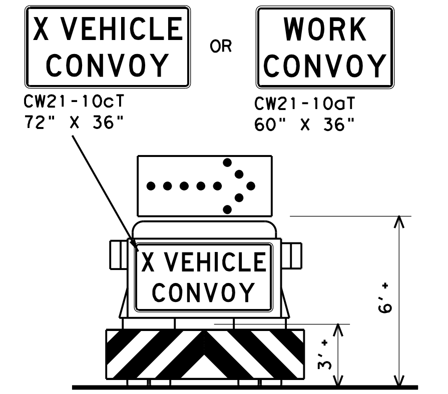
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



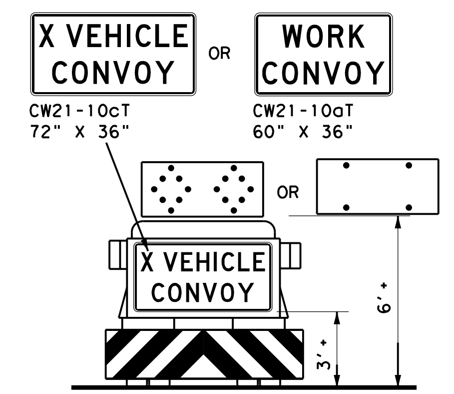
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



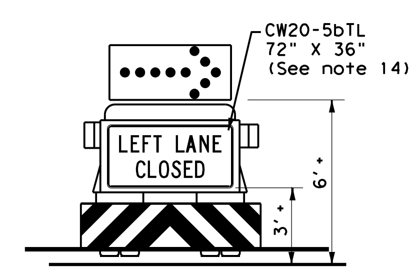
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

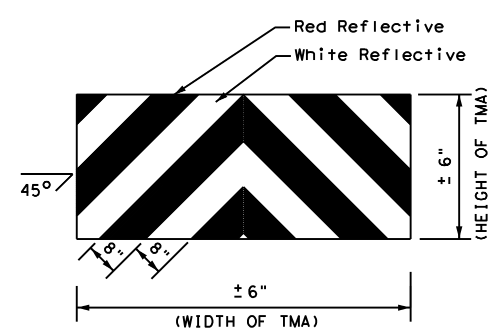


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

LEGEND

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

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

GENERAL NOTES

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

Texas Department of Transportation

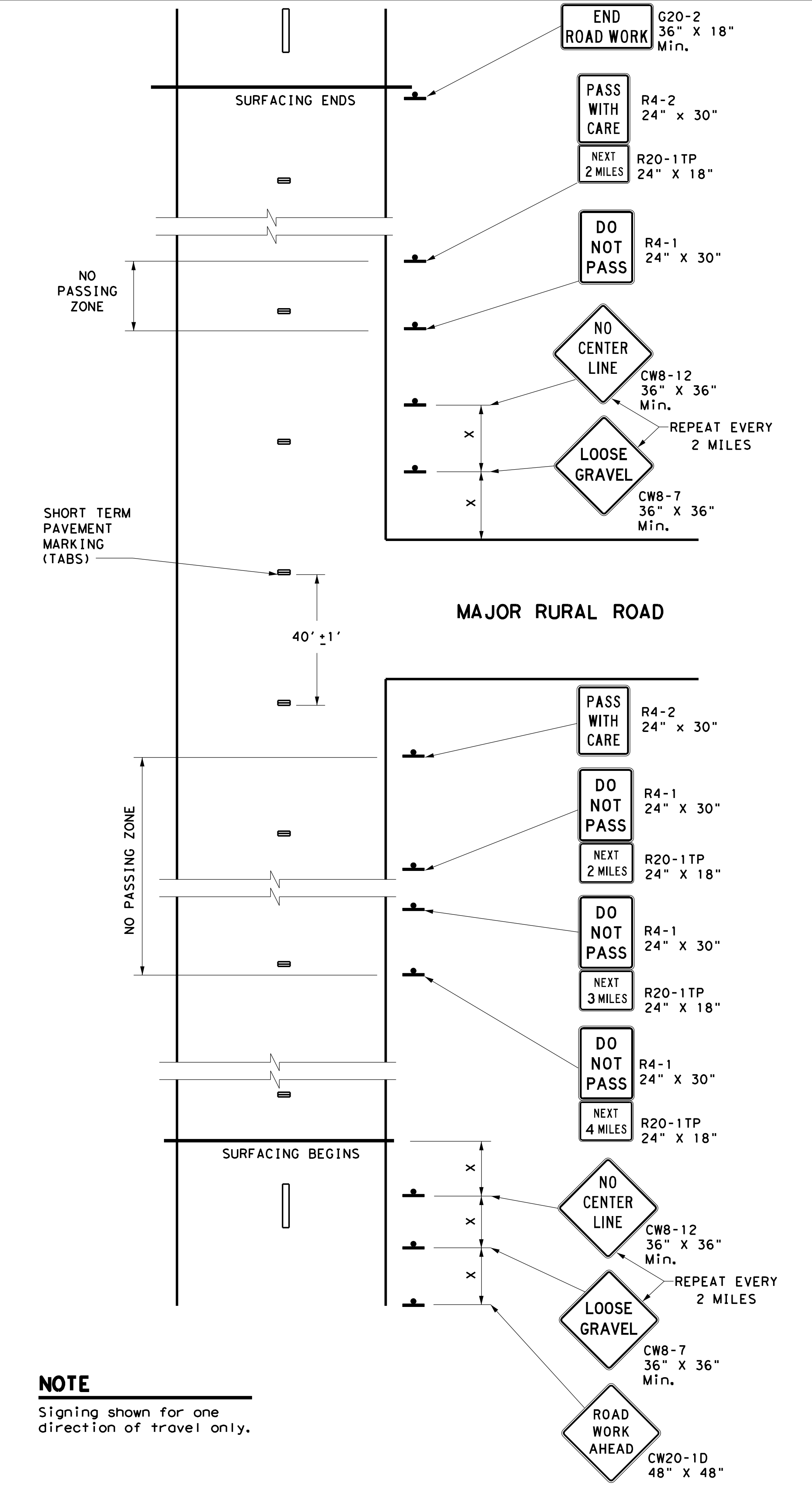
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL

TCP(3-3)-14

FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT 1065	SECT 02	JOB 039	HIGHWAY FM 1846
REVISIONS: 2-94 4-98, 8-95 7-13, 1-97 7-14	DIST PHR		COUNTY CAMERON	SHEET NO. 118

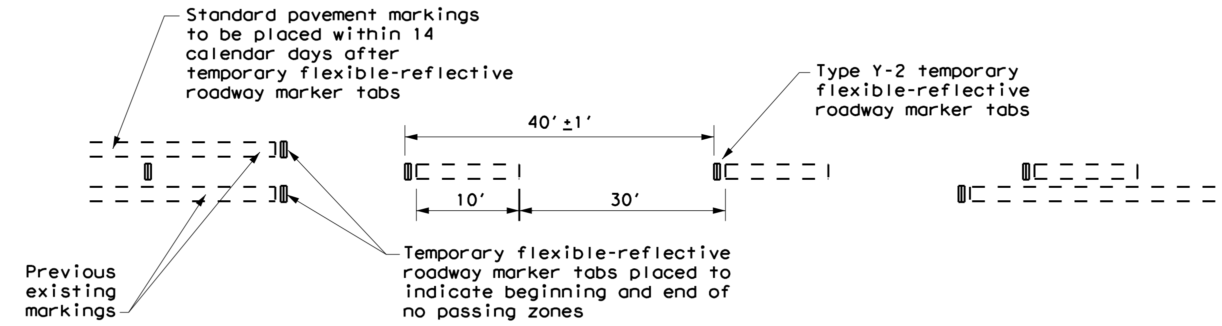
177



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 1065	SECT 02	JOB 039	HIGHWAY FM 1846
REVISIONS 4-92 4-98 1-97 7-13	DIST PHR		COUNTY CAMERON	SHEET NO. 119

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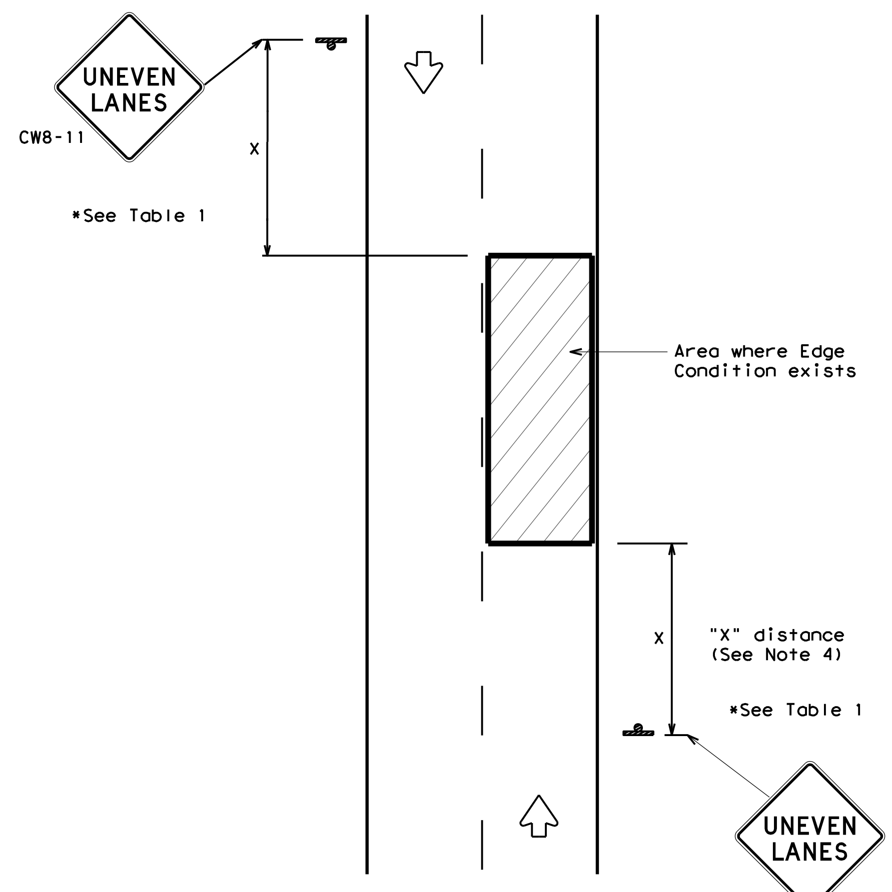
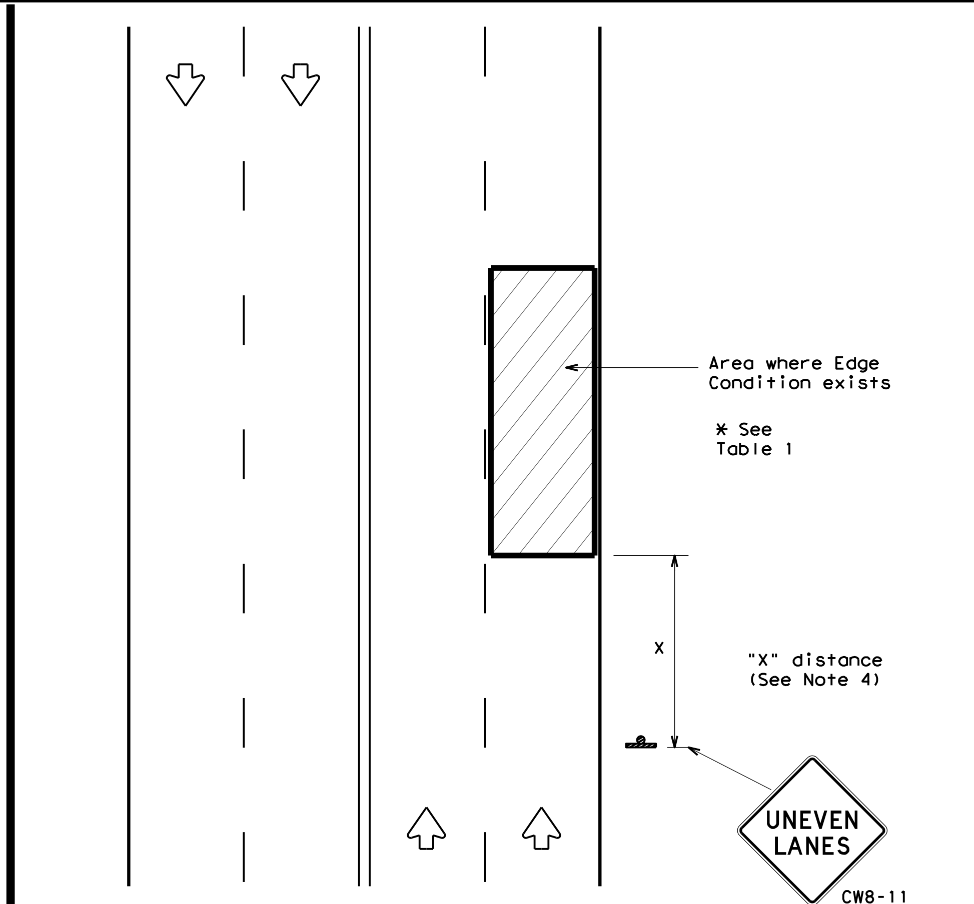
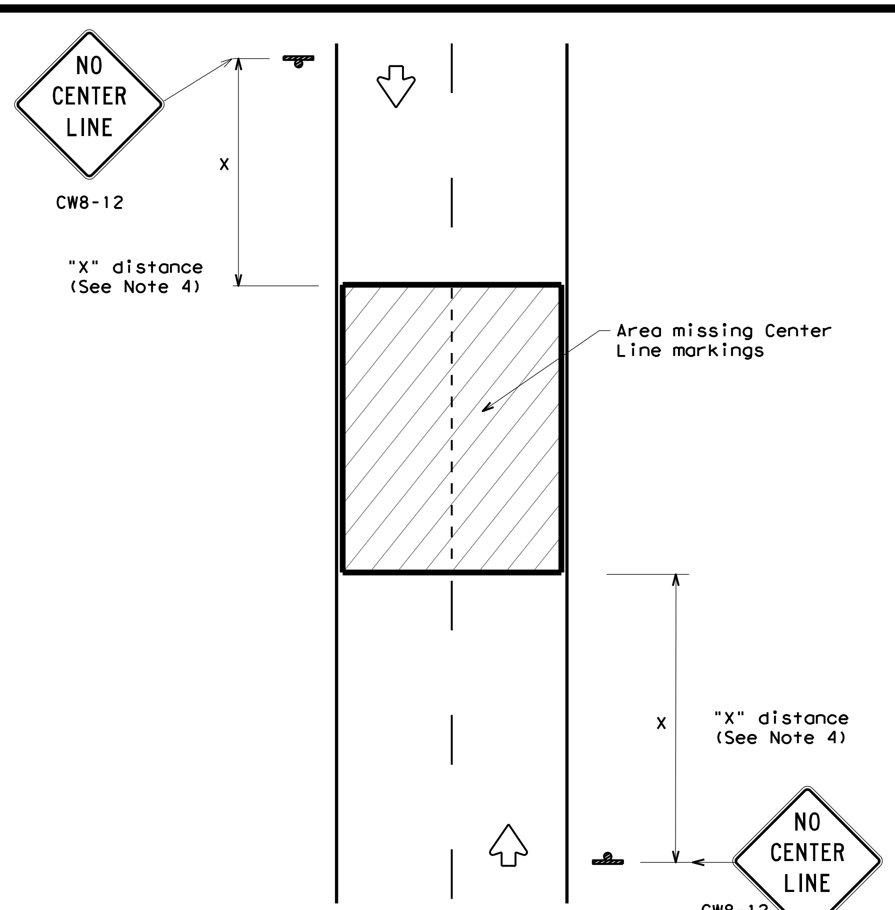


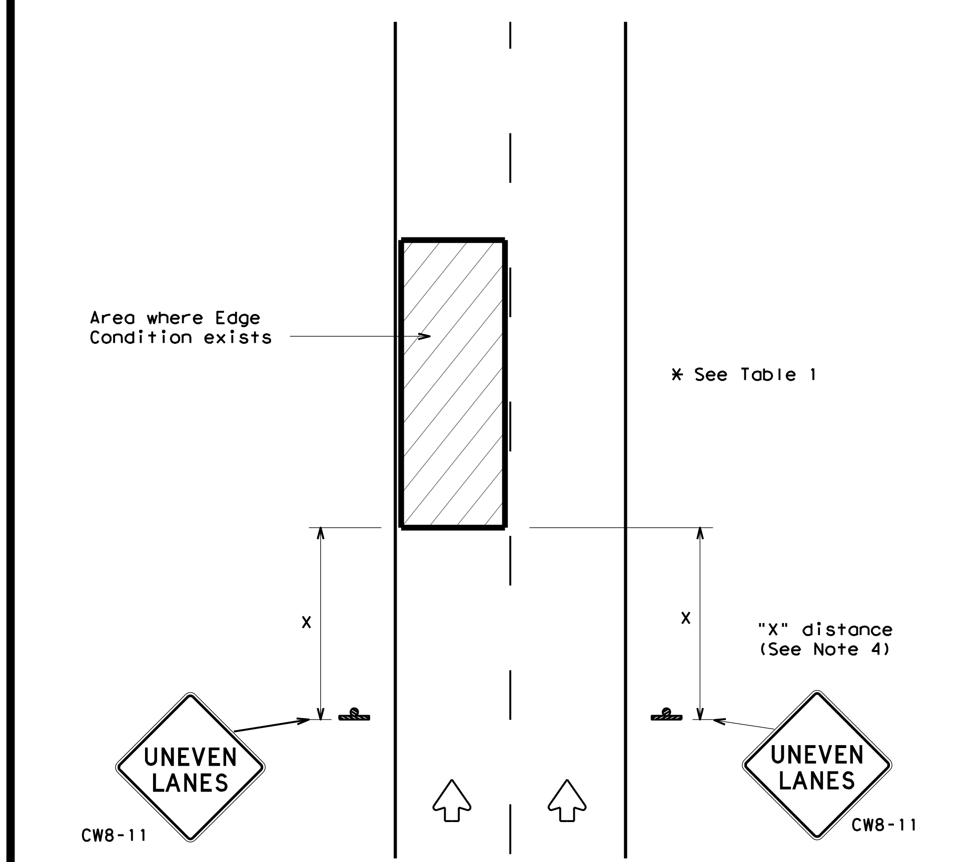
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



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 (D)	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 (>3, 1, D)	Less than or equal to 3"	Sign: CW8-11
③ (0" to 3/4", D, 12") Notched Wedge Joint	Distance "D" may be a maximum of 3" if uneven lanes with edge condition 2 or 3 are open to traffic after work operations cease. Uneven lanes should not be open to traffic when "D" is greater than 3".	

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

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

Texas Department of Transportation
Traffic Operations Division Standard

SIGNING FOR UNEVEN LANES

WZ(UL)-13

FILE: wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	1065	02	039	FM 1846
8-95 2-98 7-13	DIST		COUNTY	SHEET NO.
1-97 3-03	PHR		CAMERON	120

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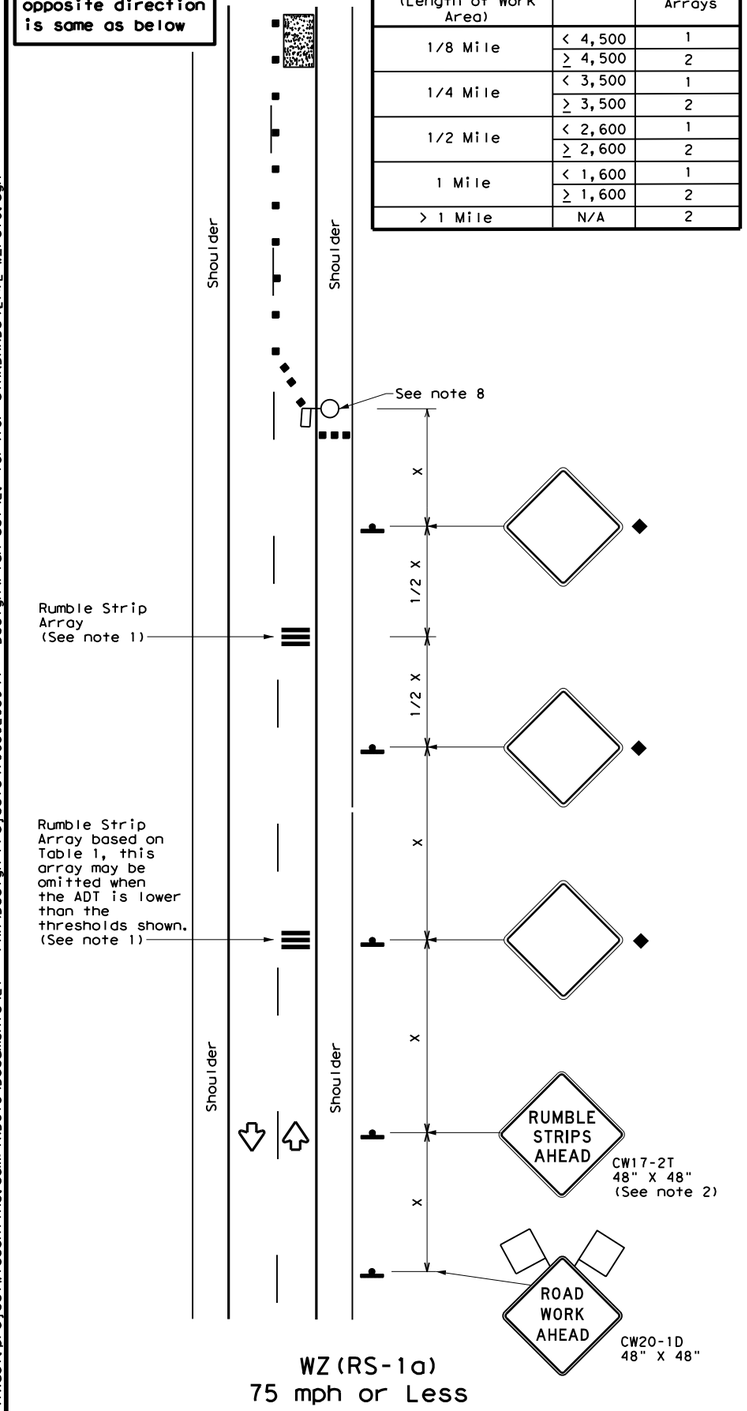
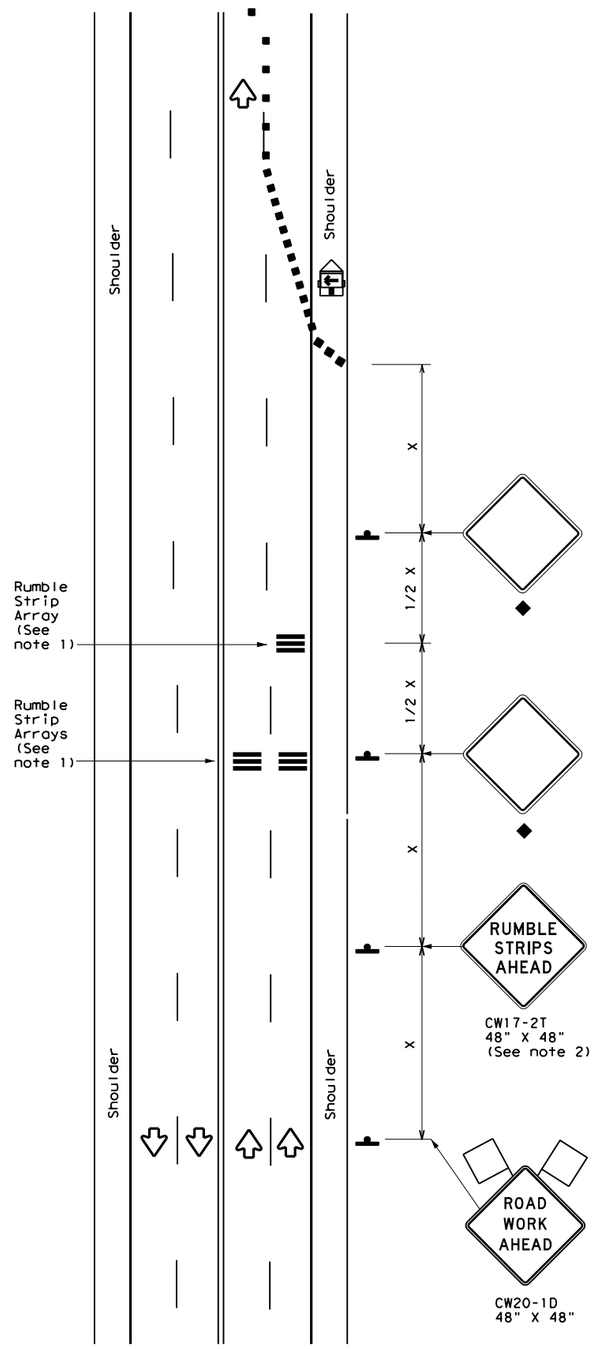
Warning sign and rumble strip sequence in opposite direction is same as below

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)
75 mph or Less

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)
75 mph or Less

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. Removal of the Temporary Rumble Strips should be accomplished before removing the advance 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 AFAD or a portable traffic signal.
9. Temporary Rumble Strips may be used on freeways or expressways based on engineering judgment.

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.**

TABLE 2	
Speed	Approximate distance between strips in an Array
≤ 40 MPH	10'
> 40 MPH & ≤ 55 MPH	15'
> 55 MPH	20'

Texas Department of Transportation

Traffic Operations Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-16

FILE: wzrs16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
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4-16	PHR	CAMERON		121

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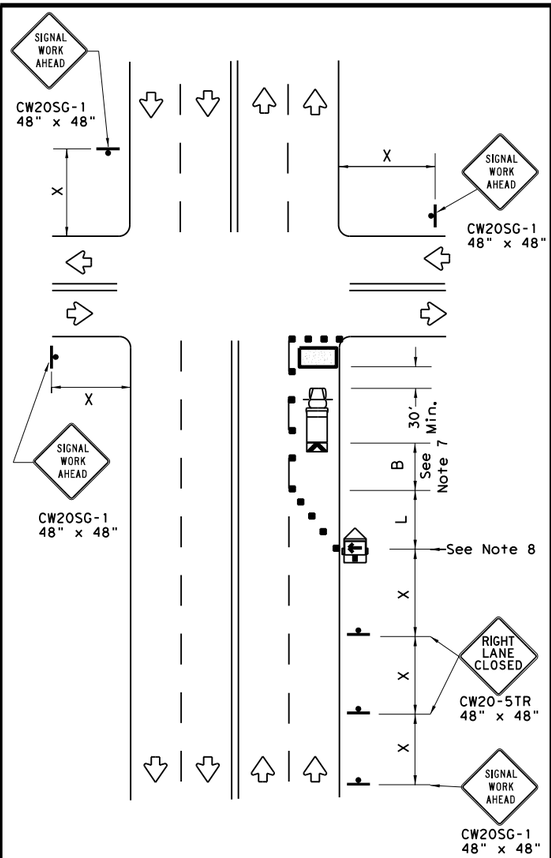
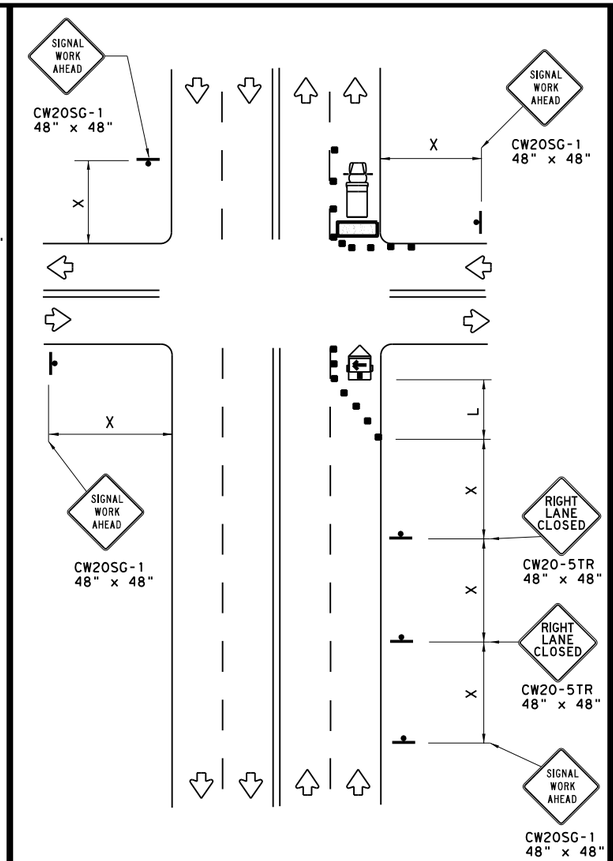


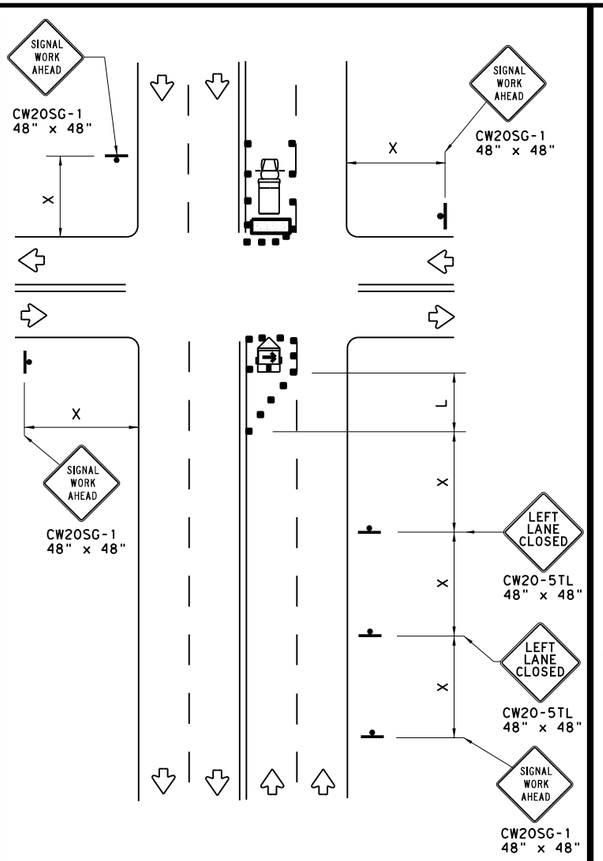
NEAR SIDE LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE RIGHT LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE LEFT LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY

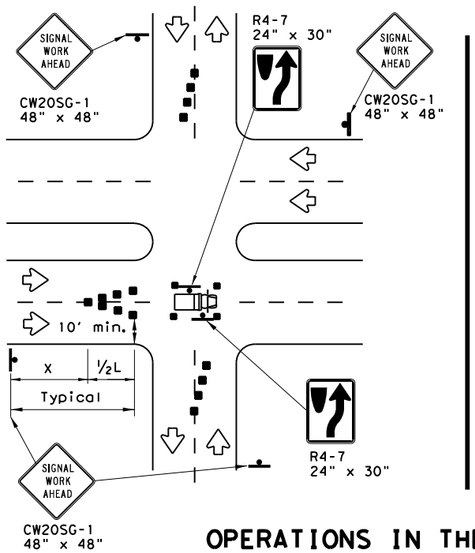
LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

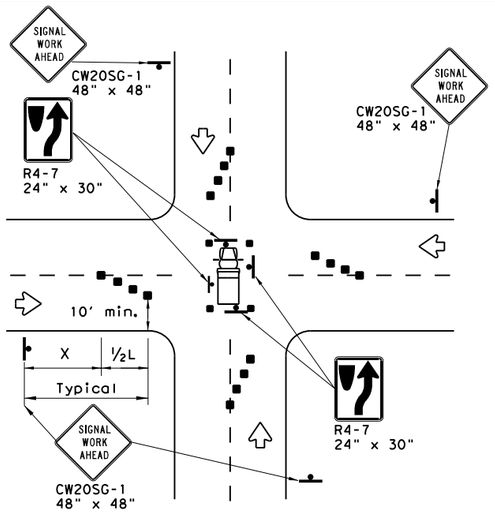
Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	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)

WORKERS IN BUCKET TRUCKS SHALL NOT WORK ABOVE OPEN LANES OF TRAFFIC.





OPERATIONS IN THE INTERSECTION

SHORT DURATION

GENERAL NOTES

1. The minimum size channelizing device is the 28" cone. 42" Two-piece cones, drums, vertical panels or barricades will be required when the device must be left unattended at night.
2. Obstructions or hazards at the work area shall be clearly marked and delineated at all times.
3. Flaggers and Flagger Symbol (CW20-7) signs may be required according to field conditions.
4. Vehicles parked in roadway shall be equipped with at least two high intensity rotating, flashing, oscillating or strobe type lights.
5. High level warning devices (flag trees) may be used at corners of the vehicle.
6. When work operations are performed on existing signals, the signals may be placed in flashing red mode when approved by the engineer. If existing signals do not have power, All-Way Stop (R1-1 and R1-3P) signs may be implemented when approved by the engineer.
7. For Short-Term Stationary work the buffer space "B" from the above table should be used if field conditions permit. For Short Duration (less than 1 hour) any buffer space provided will enhance the safety of the setup.
8. The arrow board at this location may be omitted for Short Duration work if the work vehicle has an arrow board in operation. As an option, the arrow board may be placed at the end of the taper in the closed lane if space is not available at the beginning of the taper.
9. Signs and devices for the NEAR SIDE LANE CLOSURE may be altered for a left lane closure by using a LEFT LANE CLOSED (CW20-5TL) and adding channelizing devices on the centerline to protect the work space from opposing traffic.

Texas Department of Transportation | Traffic Operations Division Standard

TRAFFIC SIGNAL WORK TYPICAL DETAILS

WZ(BTS-1)-13

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©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
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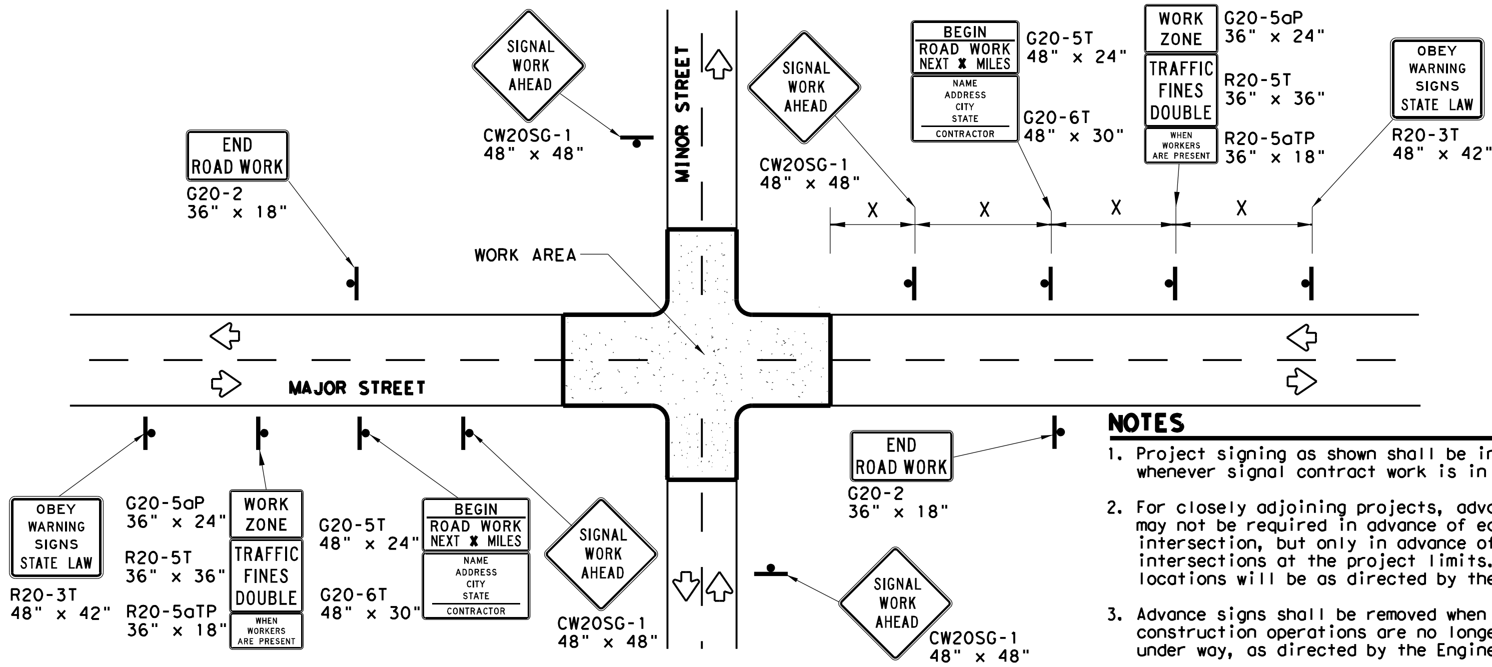
4-98 3-03	PHR	CAMERON		122

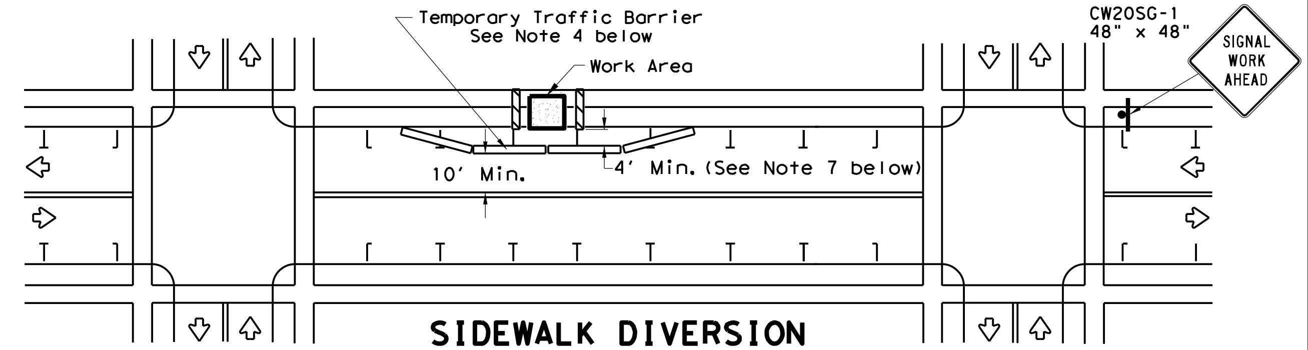


TYPICAL ADVANCE SIGNAL PROJECT SIGNING

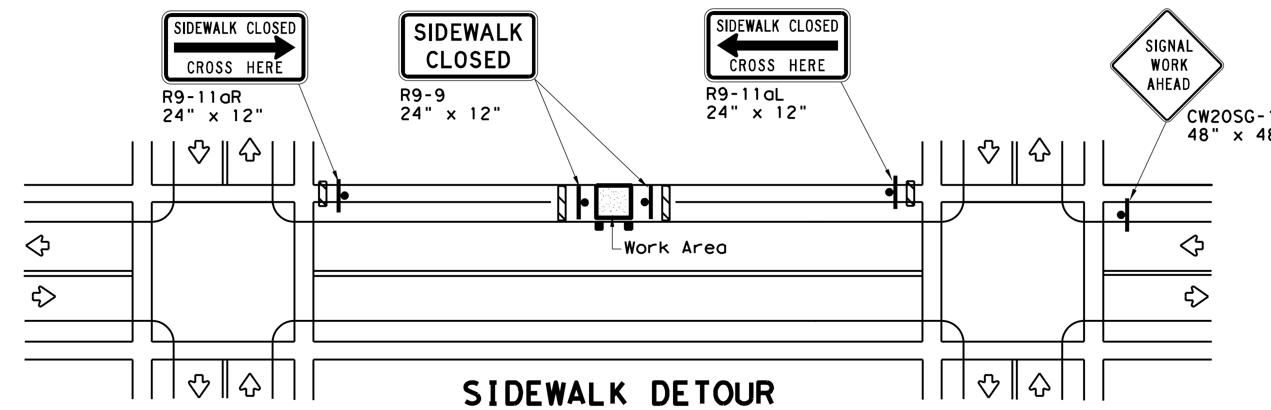
FOR LONG TERM and INTERMEDIATE-TERM STATIONARY WORK OPERATIONS

NOTES

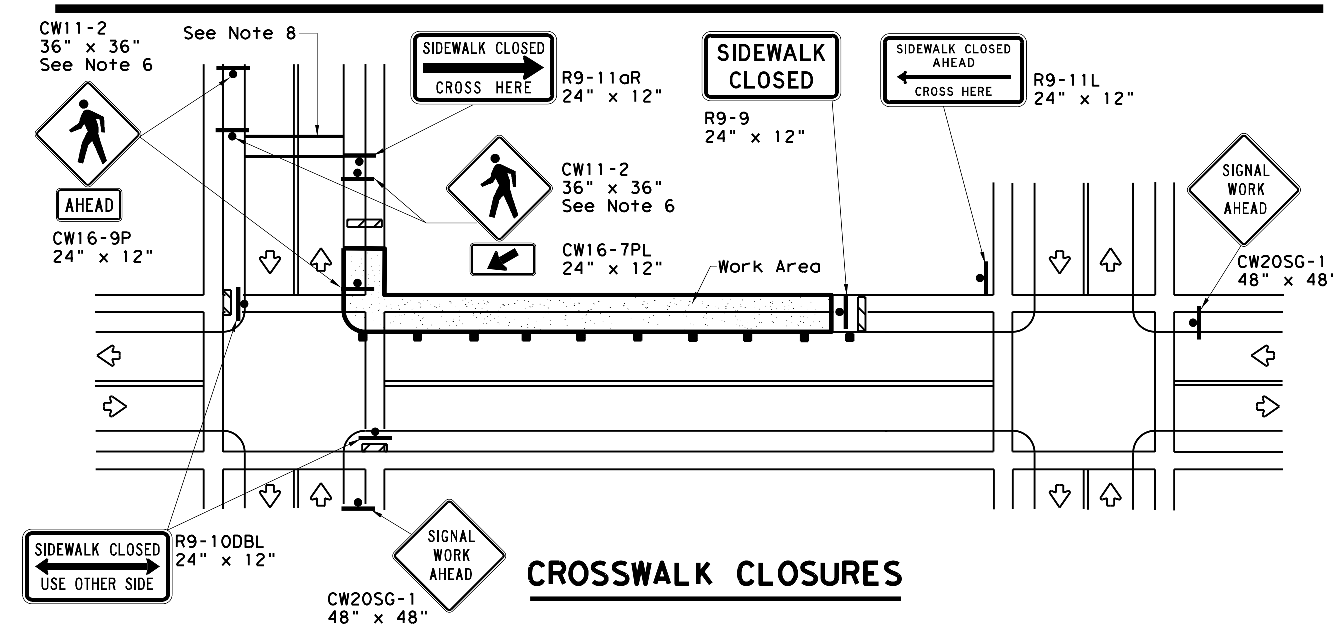
1. Project signing as shown shall be in place whenever signal contract work is in progress.
2. For closely adjoining projects, advance signing may not be required in advance of each intersection, but only in advance of the intersections at the project limits. Actual locations will be as directed by the Engineer.
3. Advance signs shall be removed when signal construction operations are no longer under way, as directed by the Engineer.
4. Warning sign spacing shown is typical for both directions.
5. See the Table on sheet 1 of 2 for Typical warning sign spacing.



SIDEWALK DIVERSION



SIDEWALK DETOUR



CROSSWALK CLOSURES

GENERAL NOTES FOR WORK ZONE SIGNS

1. Signs shall be installed and maintained in a straight and plumb condition.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. Nails shall NOT be used to attach signs to any support.
5. All signs shall be installed in accordance with the plans or as directed by the Engineer.
6. The Contractor shall furnish the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD).
7. The Contractor shall furnish sign supports and substrates listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD), installed as per the manufacturer's recommendations.
8. Temporary signs that have damaged or cracked substrates and/or damaged or marred reflective sheeting shall be replaced as directed by the Engineer.
9. 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".
10. Damaged wood posts shall be replaced. Splicing wood posts will not be allowed.

DURATION OF WORK

1. Work zone durations are defined in Part 6, Section 6G.02 of the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

SIGN MOUNTING HEIGHT

1. Sign height of Long-term/Intermediate-term warning signs shall be as shown on Figure 6F-1 of the TMUTCD.
2. Sign height of Short-term/Short Duration warning signs shall be as shown on Figure 6F-2 of the TMUTCD.
3. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered, unless otherwise approved by the Engineer.
2. 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. Burlap, or heavy materials such as plywood or aluminum shall not be used to cover signs.
3. Duct tape or other adhesive material shall NOT be affixed to a sign face.
4. Signs and anchor stubs shall be removed and holes back filled upon completion of the work.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the requirements of the DMS and color usage table shown on this sheet.

SIGN SUPPORT WEIGHTS

1. Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
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 will 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 fastners. 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.

LEGEND	
(symbol)	Sign
(symbol)	Channelizing Devices
(symbol)	Type 3 Barricade

DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
FLEXIBLE ROLL-UP REFLECTIVE SIGNS	DMS-8310

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

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/txdot_library/publications/construction.htm

PEDESTRIAN CONTROL

1. Holes, trenches or other hazards shall be adequately protected by covering, delineating or surrounding the hazard with orange plastic pedestrian fencing or longitudinal channelizing devices, or as directed by the Engineer.
2. "CROSSWALK CLOSURES" as detailed above will require the Engineer's approval prior to installation.
3. R9 series signs shown may be placed on supports detailed on the BC standards or CWZTCD list, or when fabricated from approved lightweight plastic substrates, they may be mounted on top of a plastic drum at or near the location shown.
4. For speeds less than 45 mph longitudinal channelizing devices may be used instead of traffic barriers when approved by the Engineer. Attenuation of blunt ends and installation of water filled devices shall be as per BC(9) and manufacturer's recommendations.
5. Location of devices are for general guidance. Actual device spacing and location must be field adjusted to meet actual conditions.
6. Where pedestrians with visual disabilities normally use the closed sidewalk Detectable Pedestrian Barricades should be used instead of the Type 3 Barricades shown.
7. The width of existing sidewalk should be maintained if practical.
8. Pavement markings for mid-block crosswalks shall be paid for under the appropriate bid items.
9. When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.

SHEET 2 OF 2

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC SIGNAL WORK BARRICADES AND SIGNS

WZ(BTS-2)-13

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© TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
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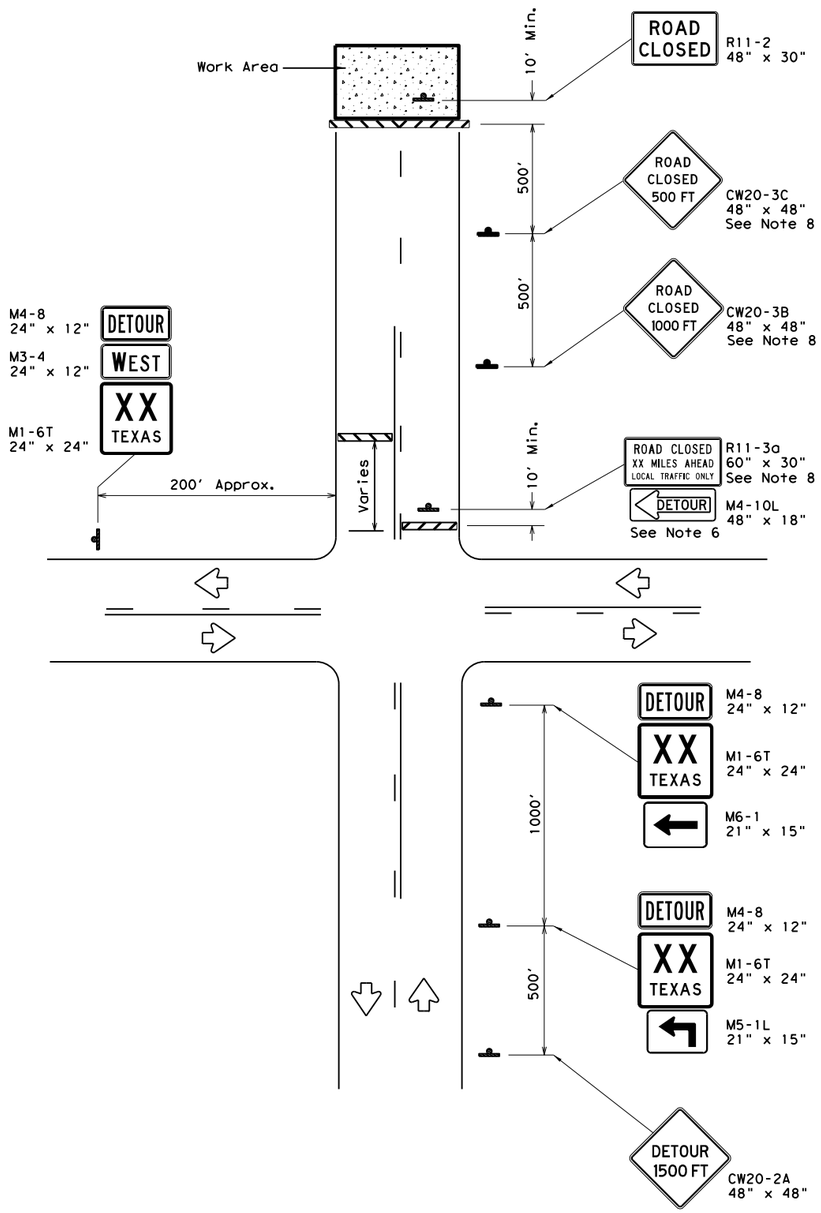
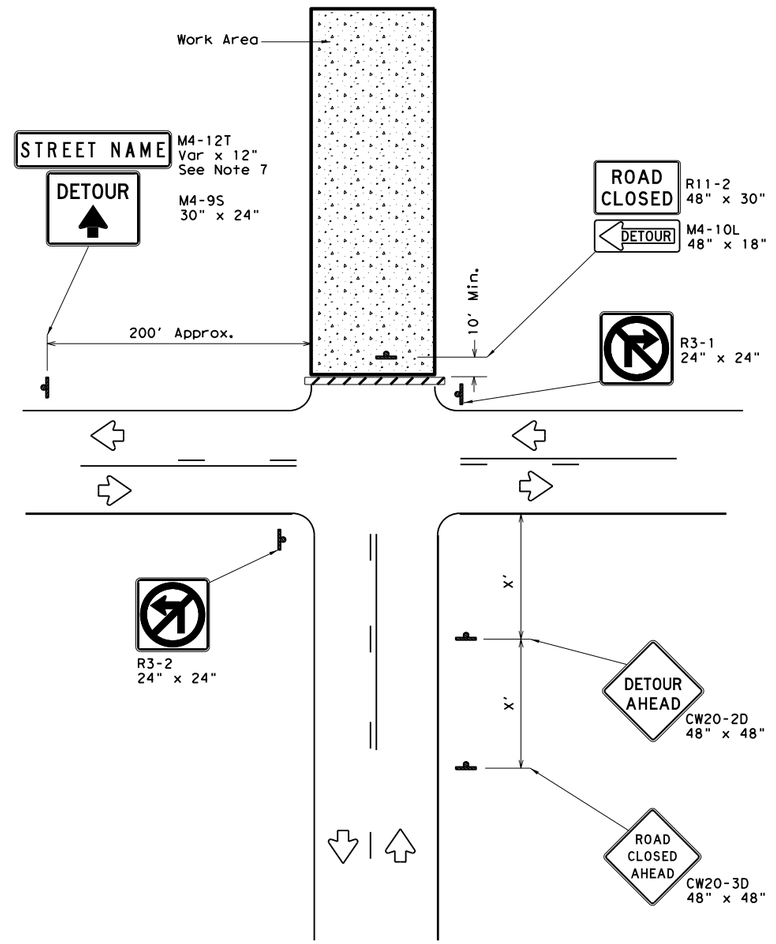


ROAD CLOSURE BEYOND THE INTERSECTION

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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©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
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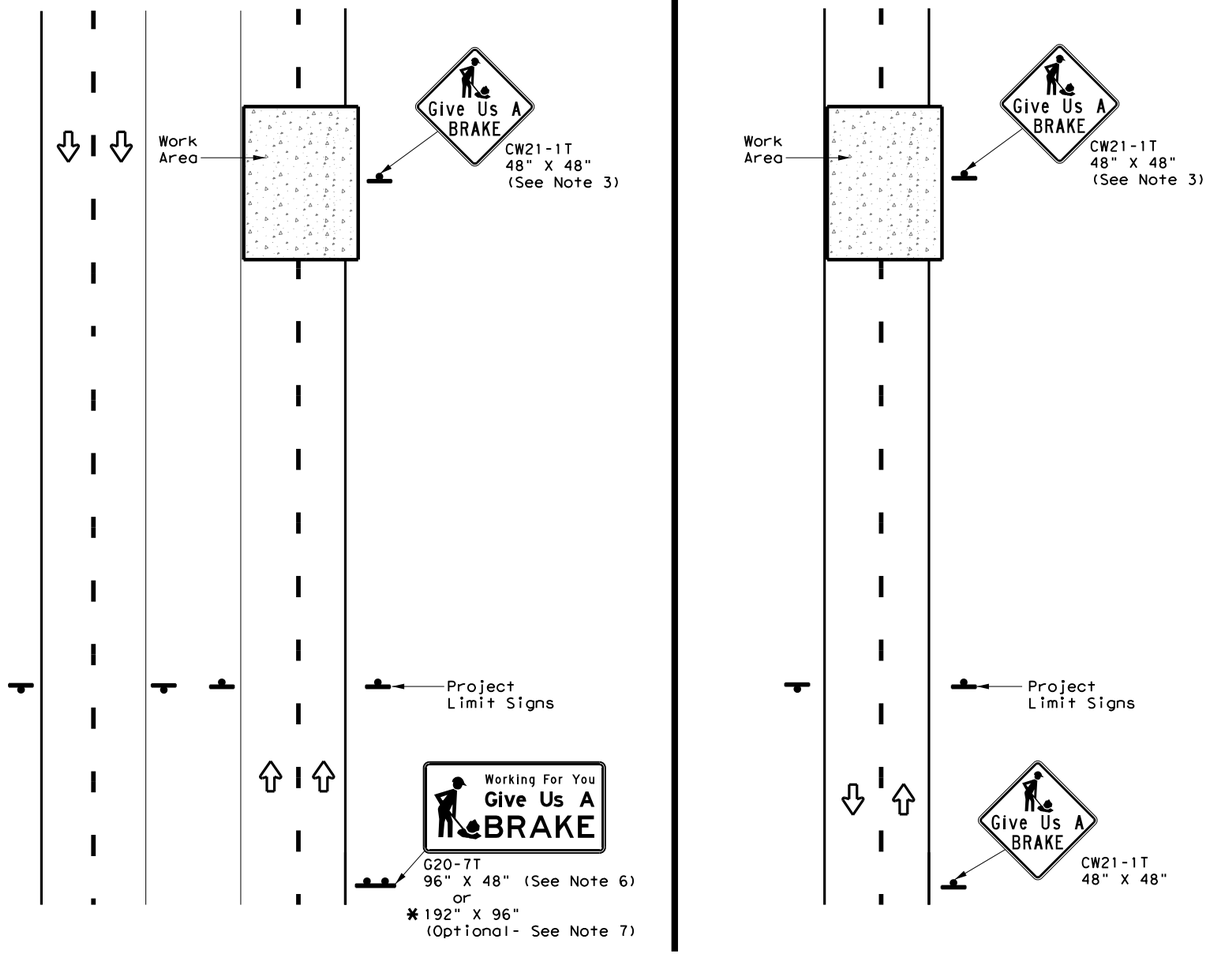

DIVIDED HIGHWAY

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

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©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
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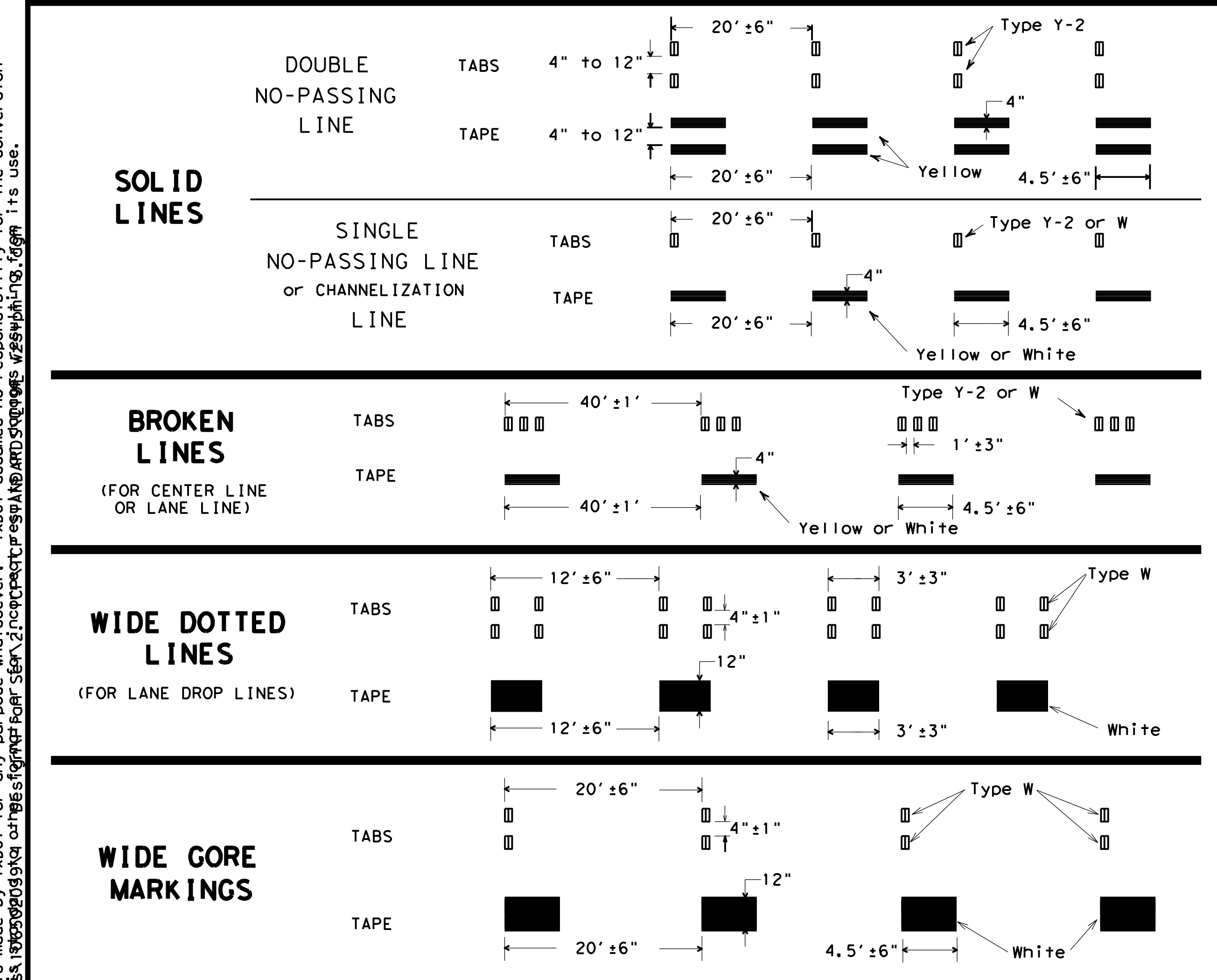
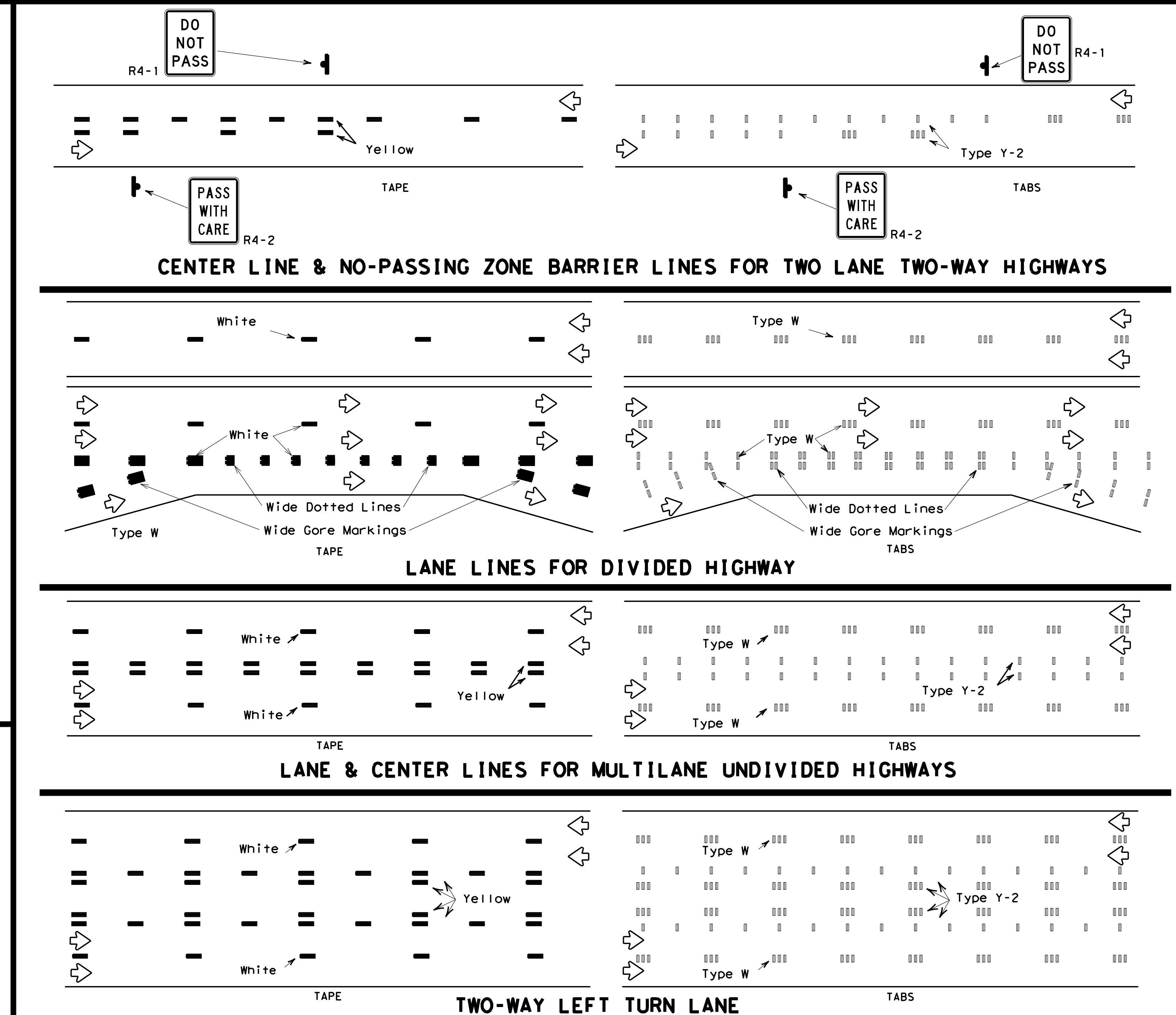
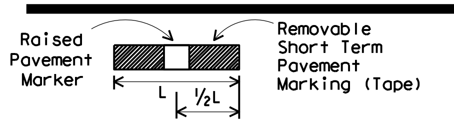
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS





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.

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.

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

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

Texas Department of Transportation — Traffic Operations Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-13

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© TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
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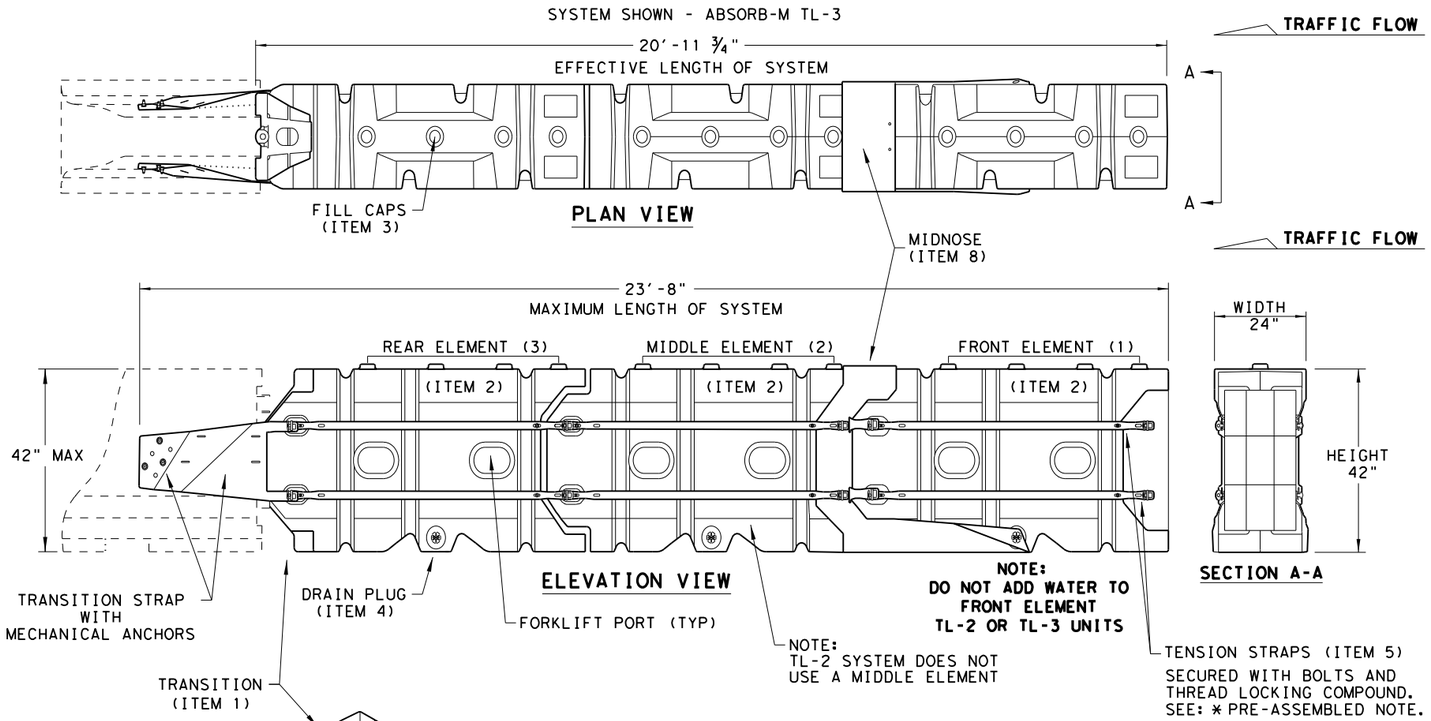
SYSTEM SHOWN - ABSORB-M TL-3



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

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

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

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

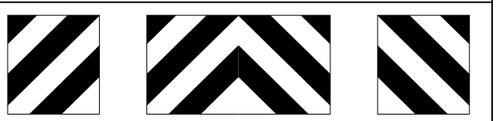
GENERAL NOTES

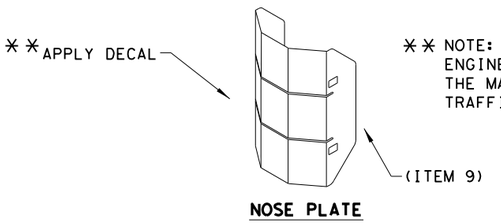
1. FOR SPECIFIC INFORMATION REGARDING THE INSTALLATION AND TECHNICAL GUIDANCE, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800. 180 RIVER ROAD, RIO VISTA, CA 94571
2. THE ABSORB-M SYSTEM IS ONLY APPROVED FOR USE IN (TEMPORARY WORK ZONE) LOCATIONS.
3. THE ABSORB-M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

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

*COMPONENTS PRE-ASSEMBLED WITH ELEMENT ASSEMBLY

DELINEATION DECAL PLACEMENT GUIDE





NOSE PLATE

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

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

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

SACRIFICIAL

Texas Department of Transportation — Design Division Standard

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

FILE: absorbm19	DN: TxDOT	CK: KM	DW: VP	CK:
© TxDOT: JULY 2019	CONT	SECT	JOB	HIGHWAY
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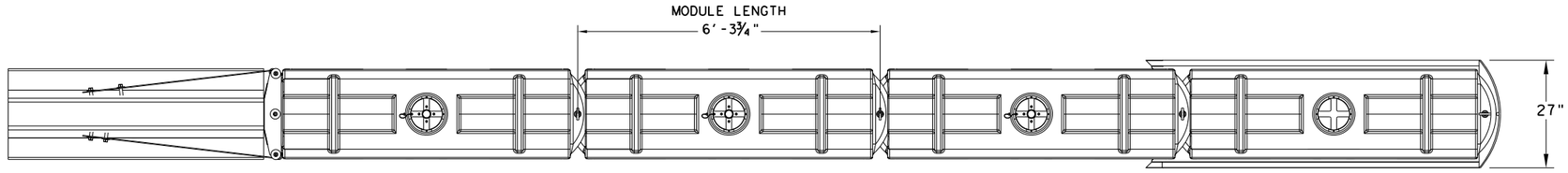
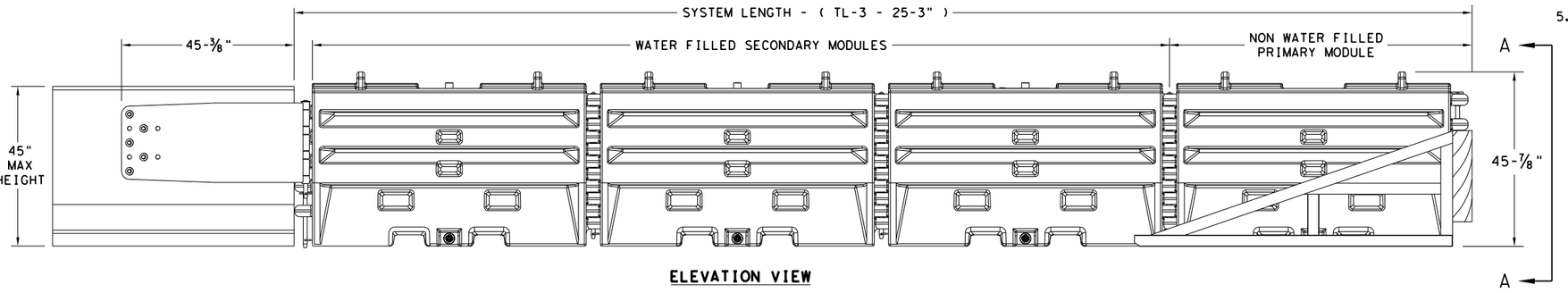


PLAN VIEW



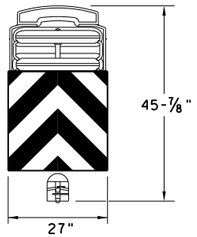
ELEVATION VIEW

GENERAL NOTES

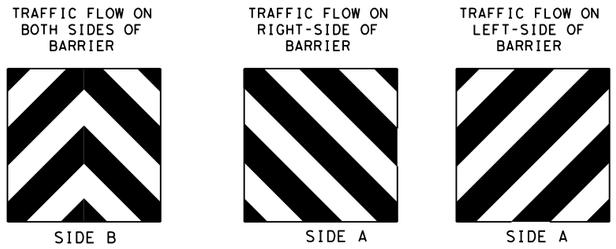
1. REFER TO THE INSTALLATION MANUAL FOR SPECIFIC SYSTEM ASSEMBLY AND MODULE ORIENTATION. FOR ADDITIONAL INFORMATION, CONTACT TRAFFIX, INC. AT (949) 361-5663.
2. THE SLED SYSTEM IS A MASH APPROVED TEST LEVEL 3 (TL-3) CRASH CUSHION APPROVED FOR USE IN TEMPORARY WORK ZONES. THE SLED SYSTEM IS A NON-REDIRECTIVE,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

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

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

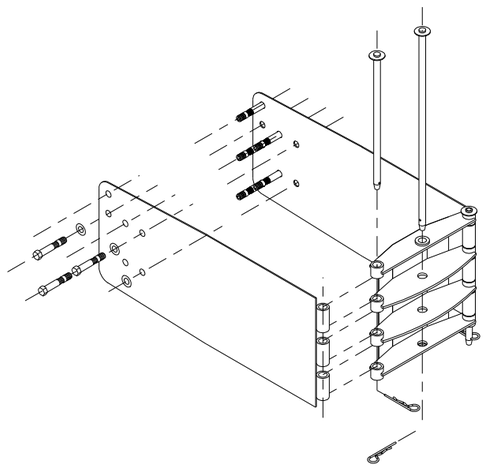


SECTION A-A



NOSE SHEETING PANEL DELINEATION

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



SLED TRANSITION COMPONENTS FOR ATTACHMENT TO CMB

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

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

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

SACRIFICIAL

BILL OF MATERIAL

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

Texas Department of Transportation — Design Division Standard

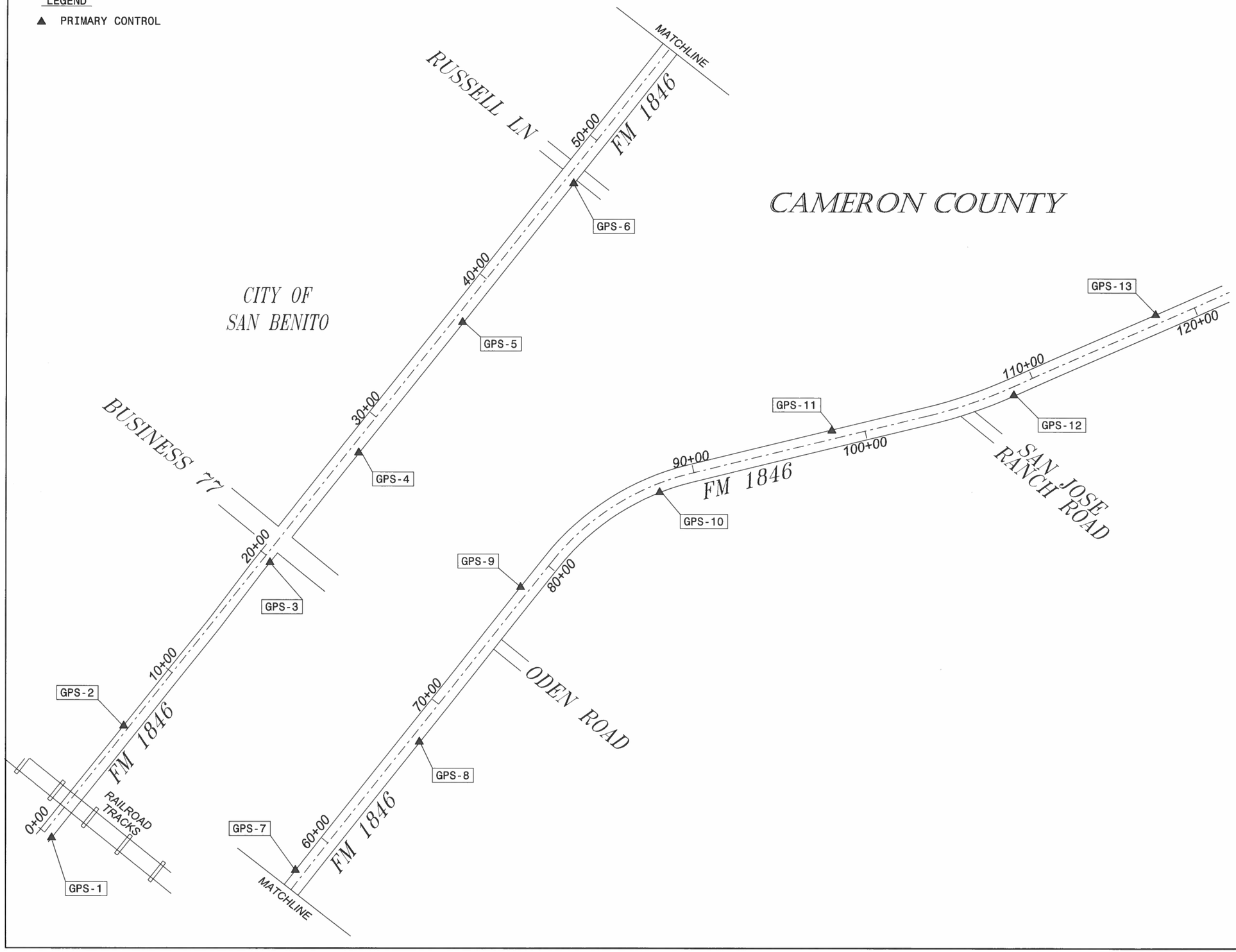
SLED
CRASH CUSHION
TL-3 MASH COMPLIANT
(TEMPORARY, WORK ZONE)
SLED-19

FILE: sled19.dgn	DN: TxDOT	CK: KM	DW: VP	CK:
©TxDOT: DECEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	1065	02	039	FM 1846
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		128

DATE: 7/12/2021
FILE: pw:\\txdot.projectwiseonline.com:TXDOT5\Documents\21 - PHR\Design Projects\1065020394 - Design\Plan Set\2. TCP\TCP STANDARDS\621ft sled19.dgn

LEGEND

▲ PRIMARY CONTROL



NOTES:

1. THE COORDINATES SHOWN HEREON ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH ZONE, NAD 83 (2011, EPOCH 2010.00). THE PROJECT'S VERTICAL DATUM IS NAVD 88 (GEOID 18). THE COORDINATES AND DISTANCES PROVIDED HEREON HAVE BEEN SCALED (SCALING ORIGIN N 0.00, E 0.00) FROM GRID COORDINATES USING THE TxDOT COUNTY WIDE SURFACE ADJUSTMENT FACTOR OF 0.99996 FOR CAMERON COUNTY, TEXAS. THE UNITS ARE U.S. SURVEY FEET.

2. THE HORIZONTAL AND VERTICAL CONTROL VALUES FOR THIS PROJECT WERE ESTABLISHED UTILIZING GPS (STATIC AND RTK) OBSERVATIONS.

PUBLISHED NGS CORS STATIONS TXRM, TXSD, TXPR, TXRV AND TXLN WERE USED IN A LEAST SQUARES ADJUSTMENT, YIELDING ACCEPTABLE RESULTS.

3. DIFFERENTIAL LEVELING WAS PERFORMED FOR THIS PROJECT, AND YIELDED ACCEPTABLE RESULTS.

N

NOT TO SCALE

STATE OF TEXAS
REGISTERED
JOHN W. McCOWN
5135
PROFESSIONAL
LAND SURVEYOR

DATE:
1/20/2020

SHEET 1
SURVTEX #
2019-0036

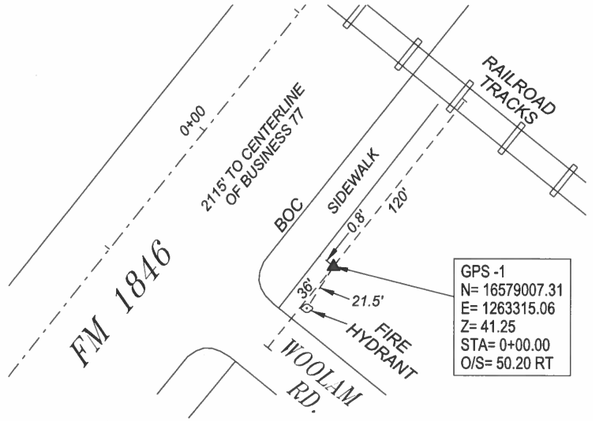
REVISIONS

SURVTEX LLC
PROFESSIONAL SURVEYING AND MAPPING SERVICES
600 W. Whitestone Blvd.
Cedar Park, Texas 78613
(512) 249-8875
Fax (512) 249-5040
TBPLS FIRM NO. 10084600

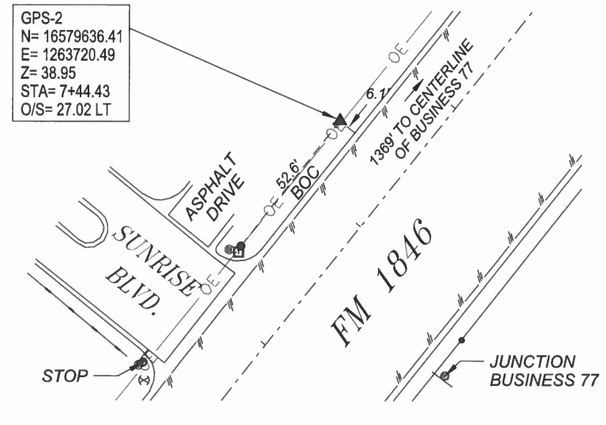
Texas Department of Transportation

FM 1846 PRIMARY CONTROL INDEX SHEET

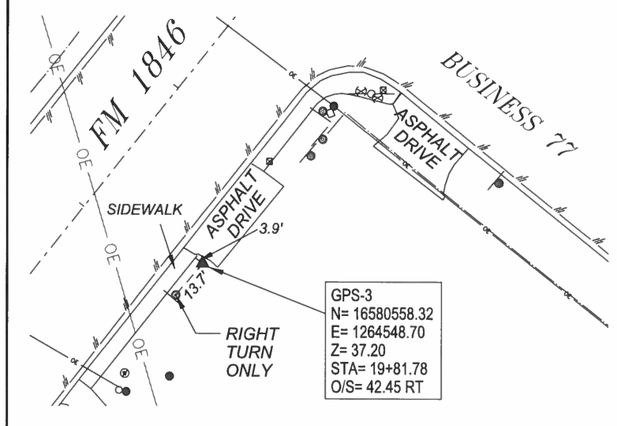
FHWA TEXAS DIVISION	FEDERAL AID PROJECT NO.		SHEET NO.
			129
STATE	DISTRICT	COUNTY	
TEXAS	PHARR	CAMERON	
CONTROL	SECTION	JOB	HIGHWAY NO.
1065-02-039			FM 1846



CONCRETE MONUMENT WITH ALUMINUM DISK (TYPE II SIMILAR) STAMPED "FM 1846 BM-1"



CONCRETE MONUMENT WITH ALUMINUM DISK (TYPE II SIMILAR) STAMPED "FM 1846 BM-2"



CONCRETE MONUMENT WITH ALUMINUM DISK (TYPE II SIMILAR) STAMPED "FM 1846 BM-3"

NOTES:

1. THE COORDINATES SHOWN HEREON ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH ZONE, NAD 83 (2011, EPOCH 2010.00). THE PROJECT'S VERTICAL DATUM IS NAVD 88 (GEOID 18). THE COORDINATES AND DISTANCES PROVIDED HEREON HAVE BEEN SCALED (SCALING ORIGIN N 0.00, E 0.00) FROM GRID COORDINATES USING THE TxDOT COUNTY WIDE SURFACE ADJUSTMENT FACTOR OF 0.99996 FOR CAMERON COUNTY, TEXAS. THE UNITS ARE U.S. SURVEY FEET.

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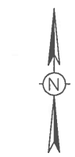
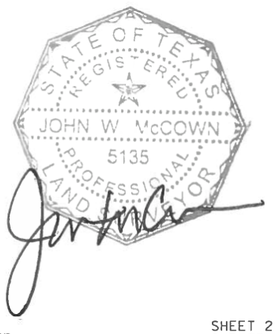


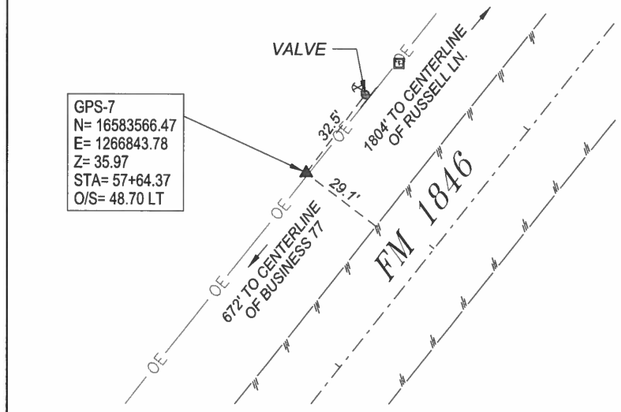
SCALE = 1" : 50'



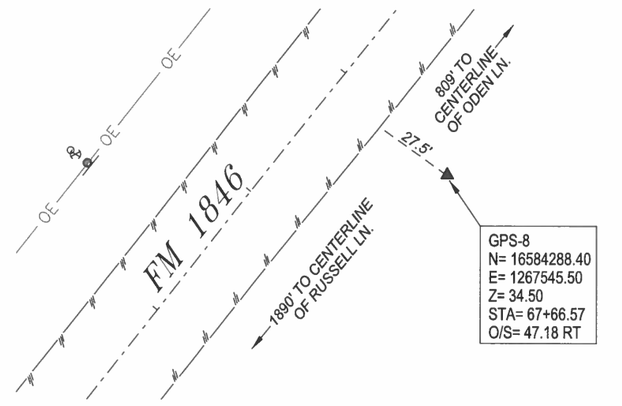
DATE: 1/20/2020

SHEET 2
SURVTEX # 2019-0036

REVISIONS



CONCRETE MONUMENT WITH ALUMINUM DISK (TYPE II SIMILAR) STAMPED "FM 1846 BM-4"



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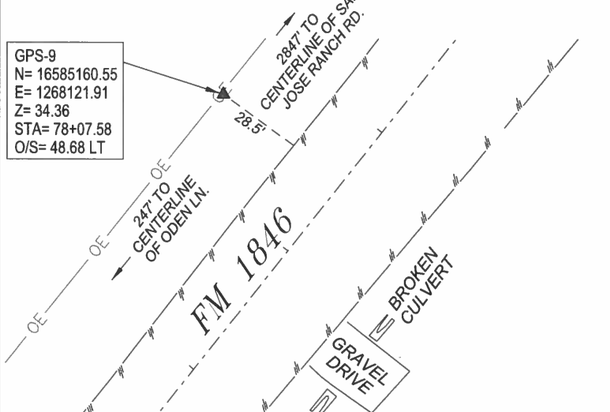

CONCRETE MONUMENT WITH ALUMINUM DISK (TYPE II SIMILAR) STAMPED "FM 1846 BM-6"

CONCRETE MONUMENT WITH ALUMINUM DISK (TYPE II SIMILAR) STAMPED "FM 1846 BM-7"

CONCRETE MONUMENT WITH ALUMINUM DISK (TYPE II SIMILAR) STAMPED "FM 1846 BM-8"

CONCRETE MONUMENT WITH ALUMINUM DISK (TYPE II SIMILAR) STAMPED "FM 1846 BM-9"

SURVTEX LLC
PROFESSIONAL SURVEYING AND MAPPING SERVICES
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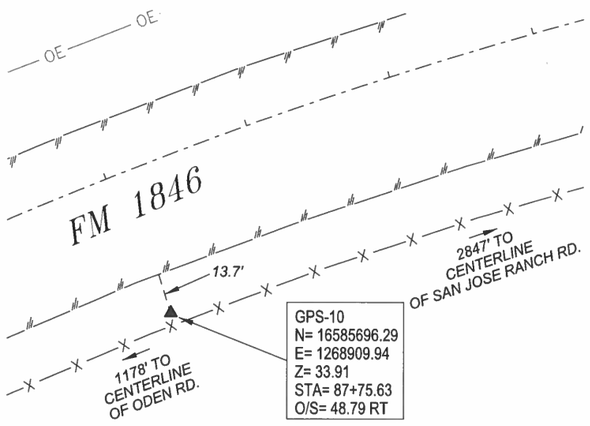
Cedar Park, Texas 78613
(512) 249-8875
Fax (512) 249-5040
TBPLS FIRM NO. 10084600

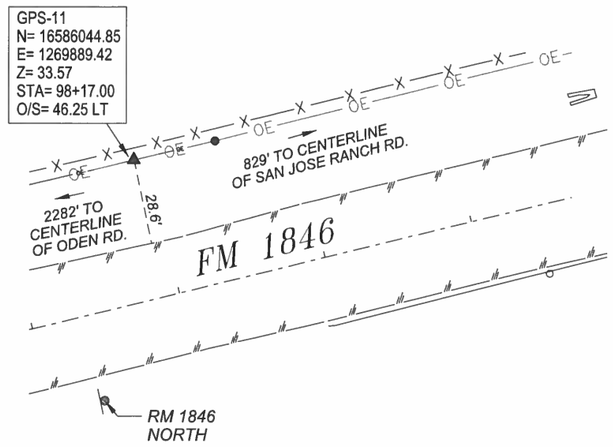
Texas Department of Transportation

FM 1846 PRIMARY CONTROL SHEET

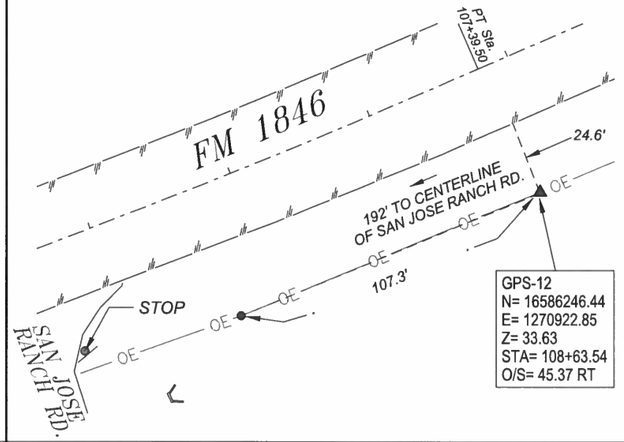
FHWA TEXAS DIVISION	FEDERAL AID PROJECT NO.		SHEET NO.
			130
STATE	DISTRICT	COUNTY	
TEXAS	PHARR	CAMERON	
CONTROL	SECTION	JOB	HIGHWAY NO.
1065-02-039			FM 1846



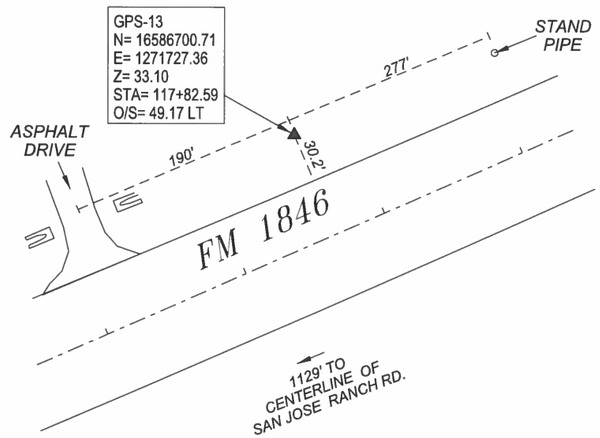
CONCRETE MONUMENT WITH ALUMINUM DISK
(TYPE II SIMILAR) STAMPED "FM 1846 BM-10"



CONCRETE MONUMENT WITH ALUMINUM DISK
(TYPE II SIMILAR) STAMPED "FM 1846 BM-11"



CONCRETE MONUMENT WITH ALUMINUM DISK
(TYPE II SIMILAR) STAMPED "FM 1846 BM-12"



CONCRETE MONUMENT WITH ALUMINUM DISK
(TYPE II SIMILAR) STAMPED "FM 1846 BM-13"

NOTES:

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3. DIFFERENTIAL LEVELING WAS PERFORMED FOR THIS PROJECT, AND YIELDED ACCEPTABLE RESULTS.

N

SCALE = 1" : 50'

STATE OF TEXAS
REGISTERED
JOHN W. McCOWN
5135
PROFESSIONAL
LAND SURVEYOR

DATE:
1/20/2020

SHEET 3
SURVTEX #
2019-0036

REVISIONS

SURVTEX LLC
PROFESSIONAL SURVEYING AND MAPPING SERVICES
600 W. Whitestone Blvd.
Cedar Park, Texas 78613
(512) 249-8875
Fax (512) 249-5040
TBPLS FIRM NO. 10084600

Texas Department of Transportation

FM 1846
PRIMARY
CONTROL SHEET

FHWA TEXAS DIVISION	FEDERAL AID PROJECT NO.		SHEET NO. 131
STATE	DISTRICT	COUNTY	
TEXAS	PHARR	CAMERON	
CONTROL	SECTION	JOB	HIGHWAY NO.
1065-02-039			FM 1846

FM 1846 PROPOSED ALIGNMNET (FM 1846)

Chain FM1846 contains:

1 2 3 4 5 CUR FM18461 CUR FM18462 6

Beginning chain FM1846 description

==========

Point 1 N 16,579,032.4751 E 1,263,283.5675 Sta 0+00.00

Course from 1 to 2 N 38° 46′ 24.03" E Dist 1,517.3636

Point 2 N 16,580,215.4564 E 1,264,233.8030 Sta 15+17.36

Course from 2 to 3 N 37° 20′ 19.32" E Dist 400.1200

Point 3 N 16,580,533.5774 E 1,264,476.4860 Sta 19+17.48

Course from 3 to 4 N 38° 46′ 24.03" E Dist 173.1825

Point 4 N 16,580,668.5955 E 1,264,584.9400 Sta 20+90.67

Course from 4 to 5 N 38° 47′ 03.42" E Dist 30.0002

Point 5 N 16,580,691.9810 E 1,264,603.7318 Sta 21+20.67

Course from 5 to PC FM18461 N 38° 42′ 18.42" E Dist 5,911.2999

Curve Data

Curve FM18461 (Chord Definition)

P.I. Station 85+20.76 N 16,585,686.4480 E 1,268,605.7867

Delta = 37° 41′ 00.00" (RT)

Degree = 4° 00′ 02.93"

Tangent = 488.7895

Length = 941.8920

Radius = 1,432.3945

External = 81.1012

Long Chord = 925.1952

Mid. Ord. = 76.7554

P.C. Station 80+31.97 N 16,585,305.0091 E 1,268,300.1405

P.T. Station 89+73.86 N 16,585,801.4788 E 1,269,080.8479

C.C. N 16,584,409.3151 E 1,269,417.9448

Back = N 38° 42′ 18.42" E

Ahead = N 76° 23′ 18.42" E

Chord Bear = N 57° 32′ 48.42" E

FM 1846 PROPOSED ALIGNMNET (FM 1846)

Continue chain FM1846 description

==========

Course from PT FM18461 to PC FM18462 N 76° 23′ 18.42" E Dist 1,388.9000

Curve Data

Curve FM18462 (Chord Definition)

P.I. Station 106+12.55 N 16,586,187.1265 E 1,270,673.5196

Delta = 9° 58′ 00.00" (LT)

Degree = 2° 00′ 00.37"

Tangent = 249.7969

Length = 498.3080

Radius = 2,864.7890

External = 10.8700

Long Chord = 497.7053

Mid. Ord. = 10.8289

P.C. Station 103+62.76 N 16,586,128.3398 E 1,270,430.7386

P.T. Station 108+61.07 N 16,586,287.0454 E 1,270,902.4621

C.C. N 16,588,912.6672 E 1,269,756.5448

Back = N 76° 23′ 18.42" E

Ahead = N 66° 25′ 18.42" E

Chord Bear = N 71° 24′ 18.42" E

Course from PT FM18462 to 6 N 66° 25′ 18.42" E Dist 1,916.2000

Point 6 N 16,587,053.5266 E 1,272,658.6879 Sta 127+77.27

==========

Ending chain FM1846 description

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED
PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 ALIGNMENT DATA

SHEET 1 OF 1

© 2021	CONT	SECT	JOB	HIGHWAY
DS: CK:	1065	02	039	FM 1846
	DIST	COUNTY		SHEET NO.
DW: CK:	PHR	CAMERON		132

DATE: 7/13/2021 4:21:01 PM
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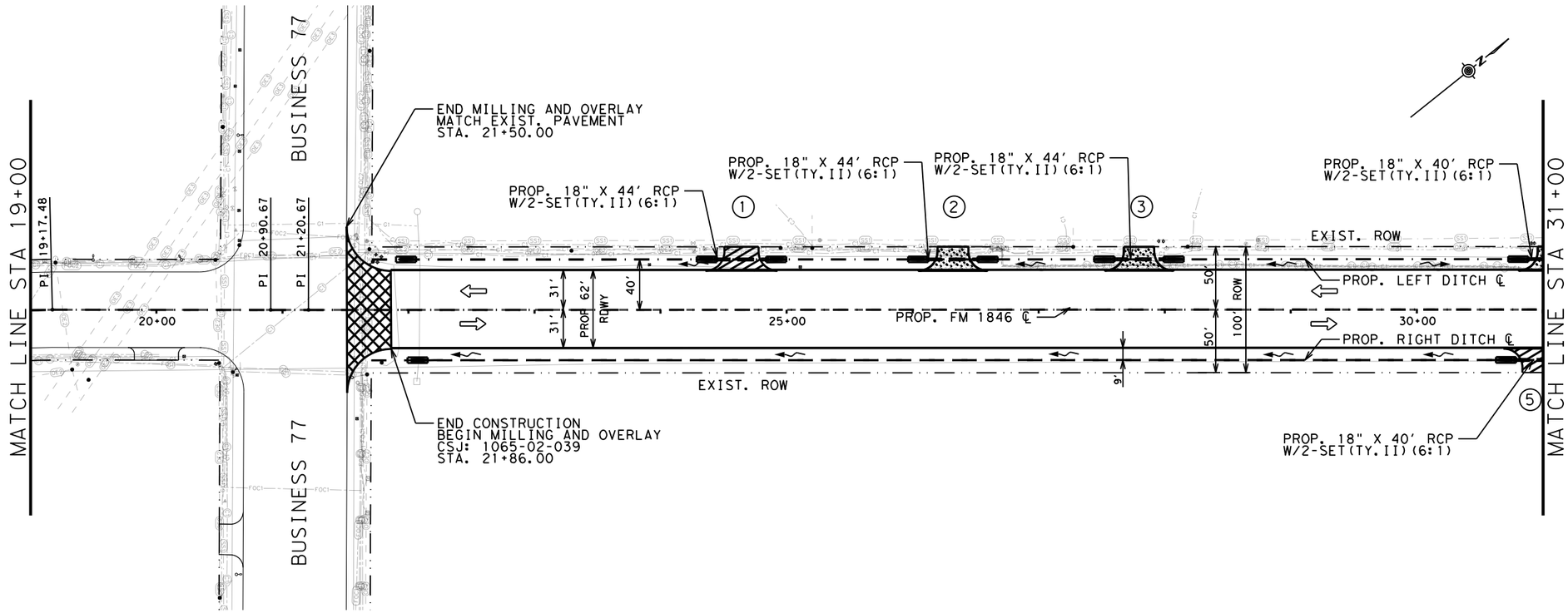

LEGEND:

- PROP. ASPHALT DRIVEWAY
- PROP. CONCRETE DRIVEWAY
- PROP. MILLING/OVERLAY
- DIRECTION OF TRAFFIC FLOW
- (#) DRIVEWAY I.D. (SEE DRIVEWAY TABLES)
- MAILBOX (MB)
- —OE— EXISTING OVERHEAD POWER LINE
- —SS— EXISTING SANITARY SEWER
- —FM— EXISTING FORCE MAIN
- — C — EXISTING ATT TELEPHONE CABLE
- — W — EXISTING WATERLINE
- — G — EXISTING GAS LINE
- —FOC— EXISTING FIBER OPTIC CABLE
- BM LOCATIONS
- OBJECT MARKERS(OM-2Z)
- DELINEATOR
- DELINEATOR (OM-2Z)(BI)

GENERAL NOTES:

1. ALL STATIONS ARE BASED ON FM 1846 ALIGNMENT
2. ALL EXISTING INFORMATION ON PLANS IS FOR INFORMATION PURPOSES ONLY. CONTRACTOR TO VERIFY ALL EXISTING INFORMATION PER "AS BUILT CONDITION".
3. EXIST./PROP. RCP UNDERNEATH THE EXIST/ PROP. DRIVEWAYS ARE ITEMIZED IN THE DRIVEWAY DETAIL SHEETS.
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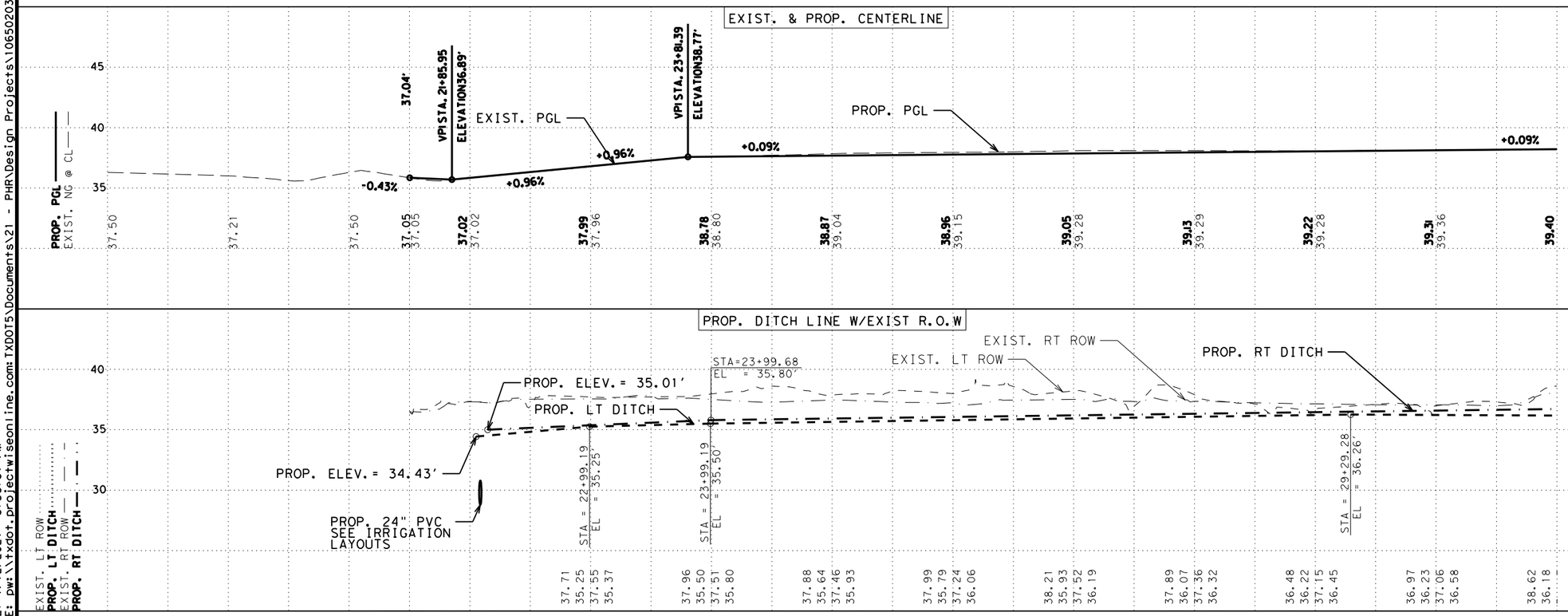

ABEL MARROQUIN III
134752
PROFESSIONAL ENGINEER
STATE OF TEXAS

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846
PLAN & PROFILE

V: 1" = 10'
H: 1" = 100'

SHEET 1 OF 9

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		133

DATE: 7/12/2021 3:56:31 PM
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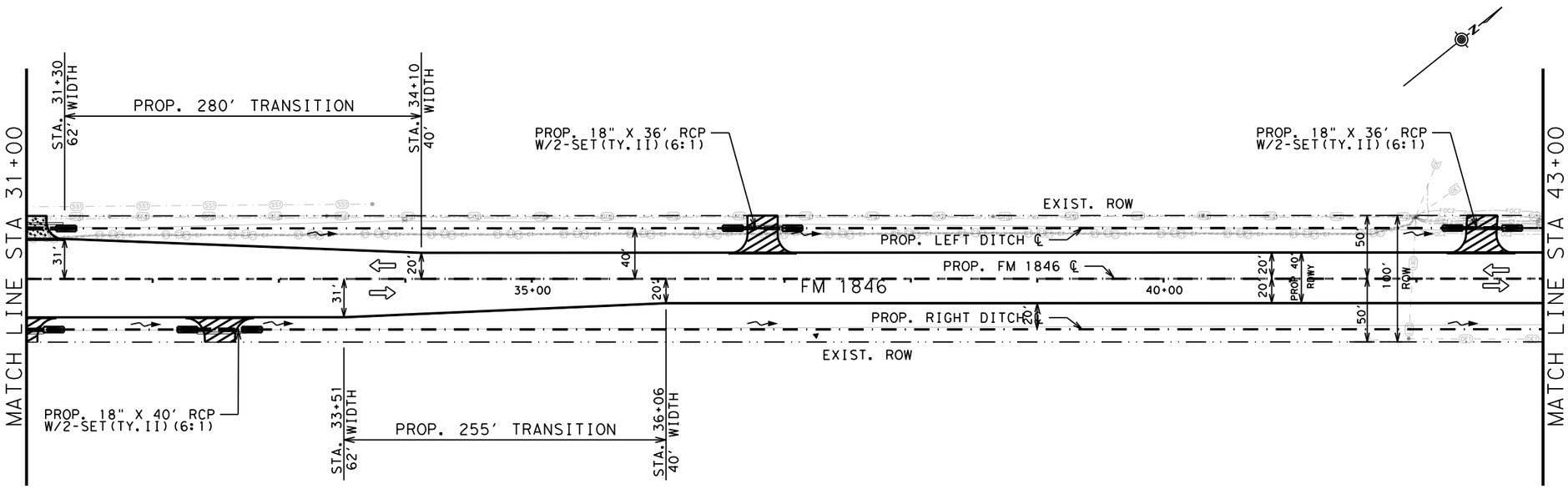

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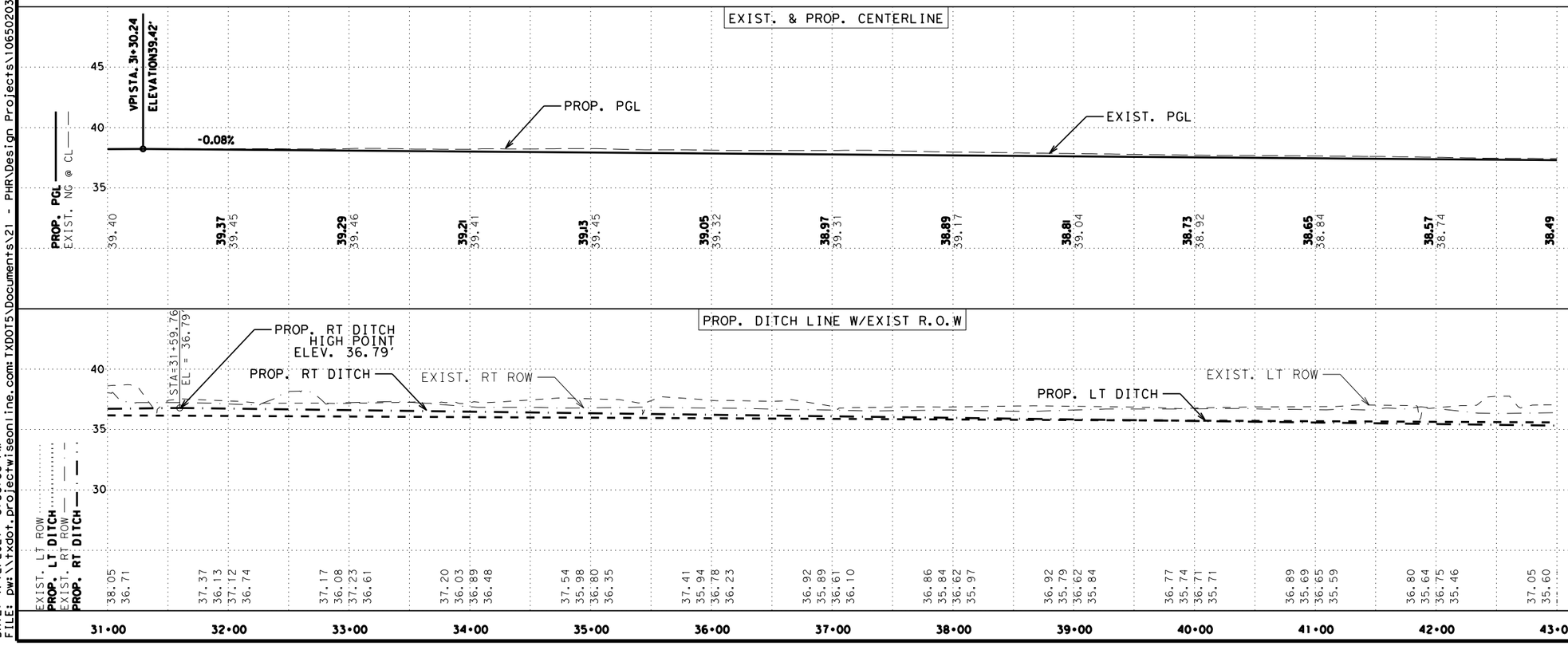

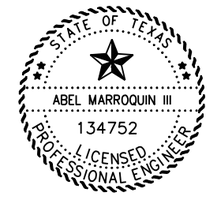

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846
PLAN & PROFILE

V: 1" = 10'
H: 1" = 100'

SHEET 2 OF 9

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		134

DATE: 7/12/2021 3:56:38 PM
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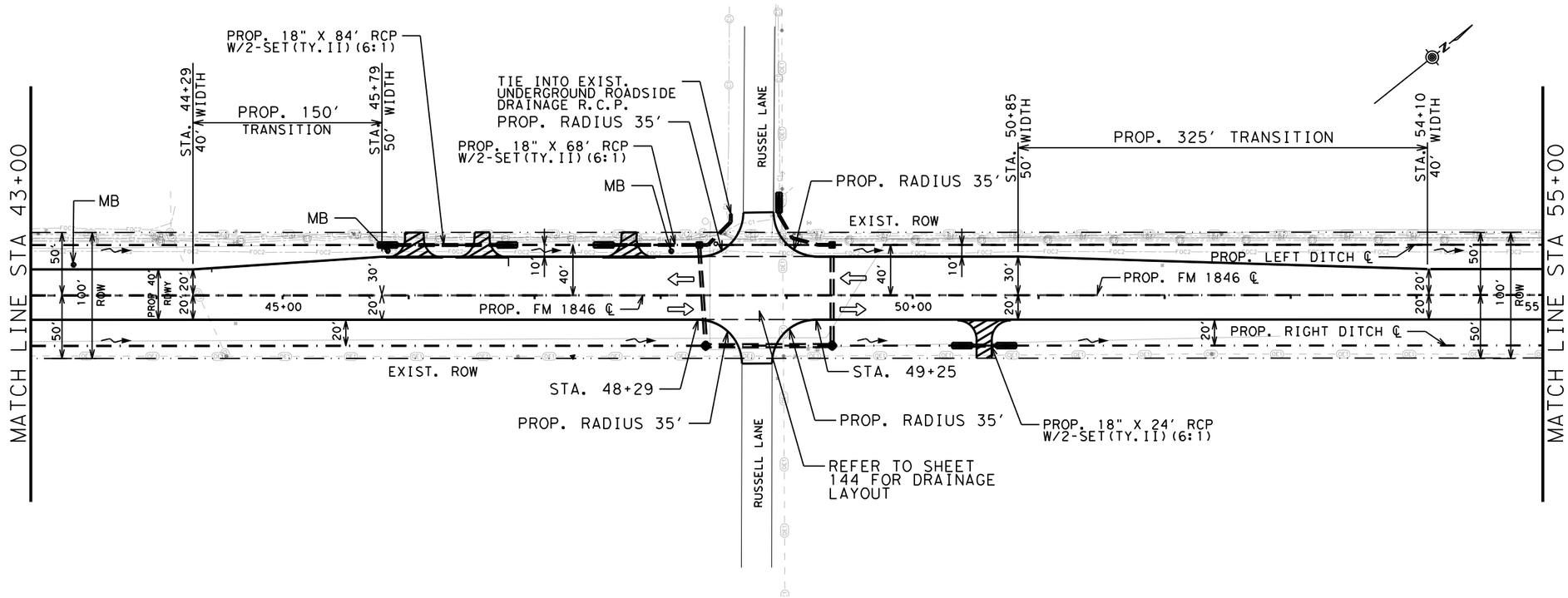

LEGEND:

- PROP. ASPHALT DRIVEWAY
- PROP. CONCRETE DRIVEWAY
- PROP. MILLING/OVERLAY
- DIRECTION OF TRAFFIC FLOW
- (#) DRIVEWAY I.D. (SEE DRIVEWAY TABLES)
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- DELINEATOR (OM-2Z)(BI)

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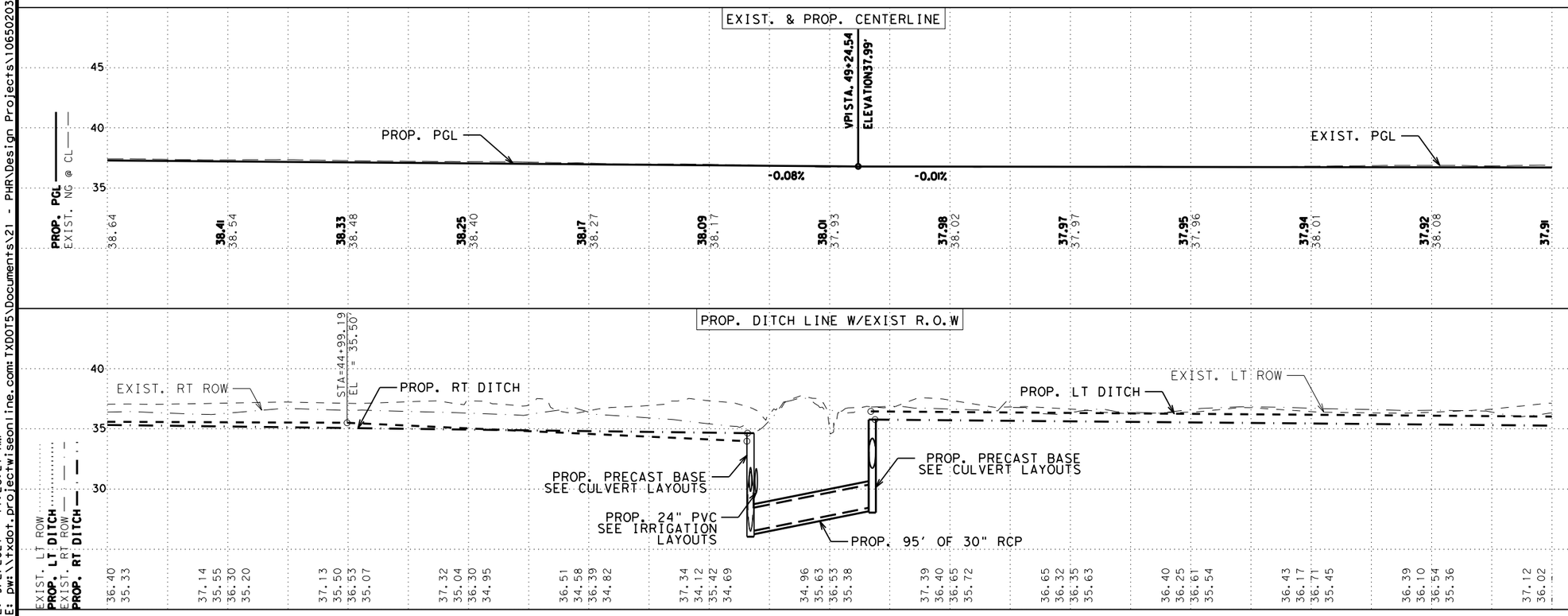

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED PROFESSIONAL ENGINEER

09/02/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846
PLAN & PROFILE

V: 1" = 10'
H: 1" = 100'

SHEET 3 OF 9

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		135

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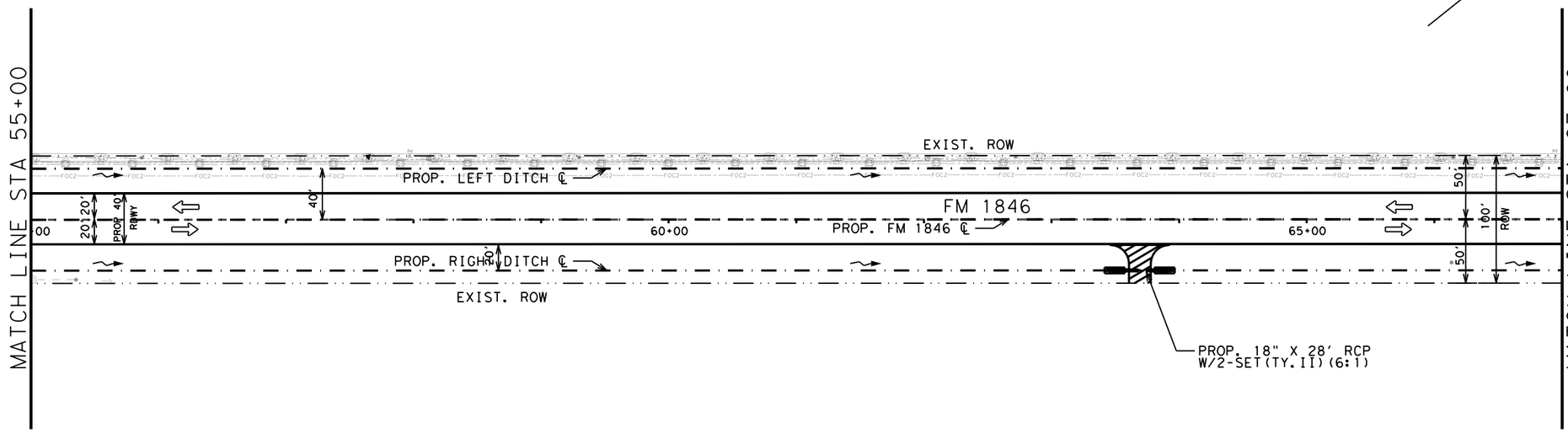

LEGEND:

- PROP. ASPHALT DRIVEWAY
- PROP. CONCRETE DRIVEWAY
- PROP. MILLING/OVERLAY
- DIRECTION OF TRAFFIC FLOW
- DRIVEWAY I.D. (SEE DRIVEWAY TABLES)
- MAILBOX (MB)
- —OE— EXISTING OVERHEAD POWER LINE
- —SS— EXISTING SANITARY SEWER
- —FM— EXISTING FORCE MAIN
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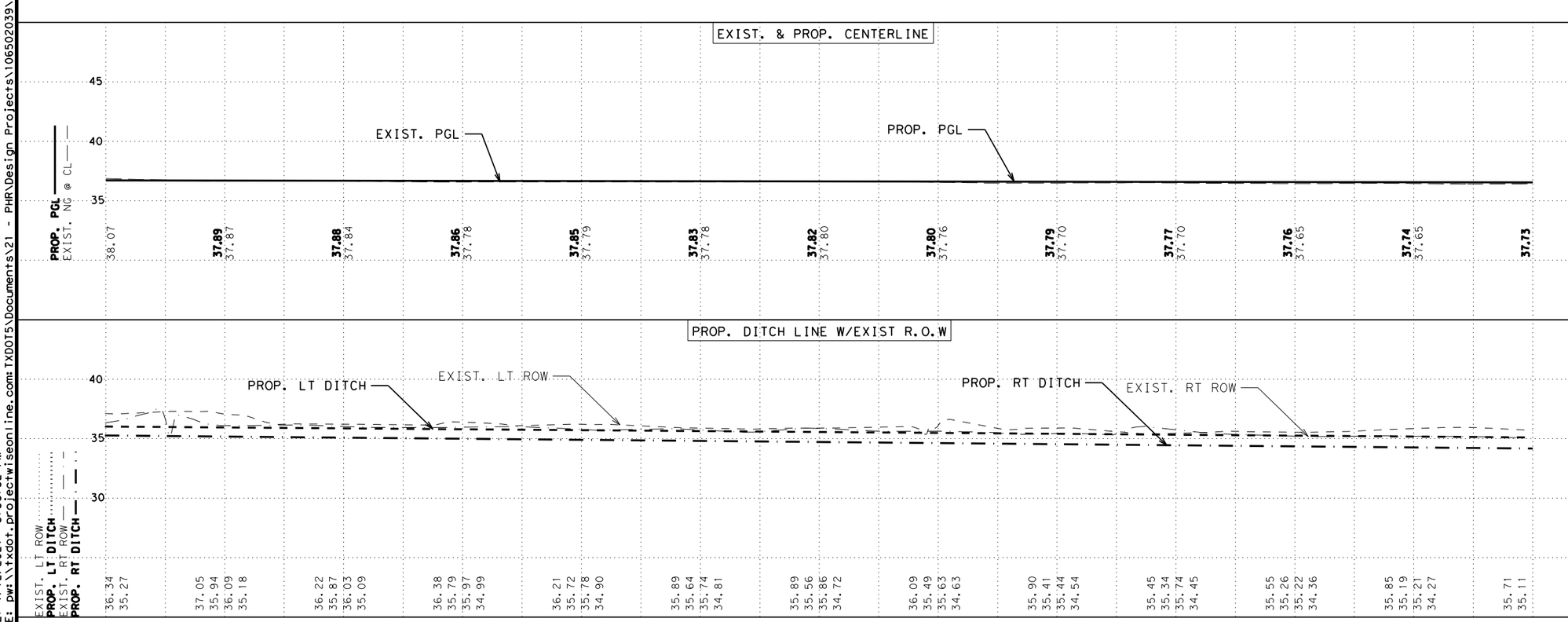

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SHEET 4 OF 9

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		136

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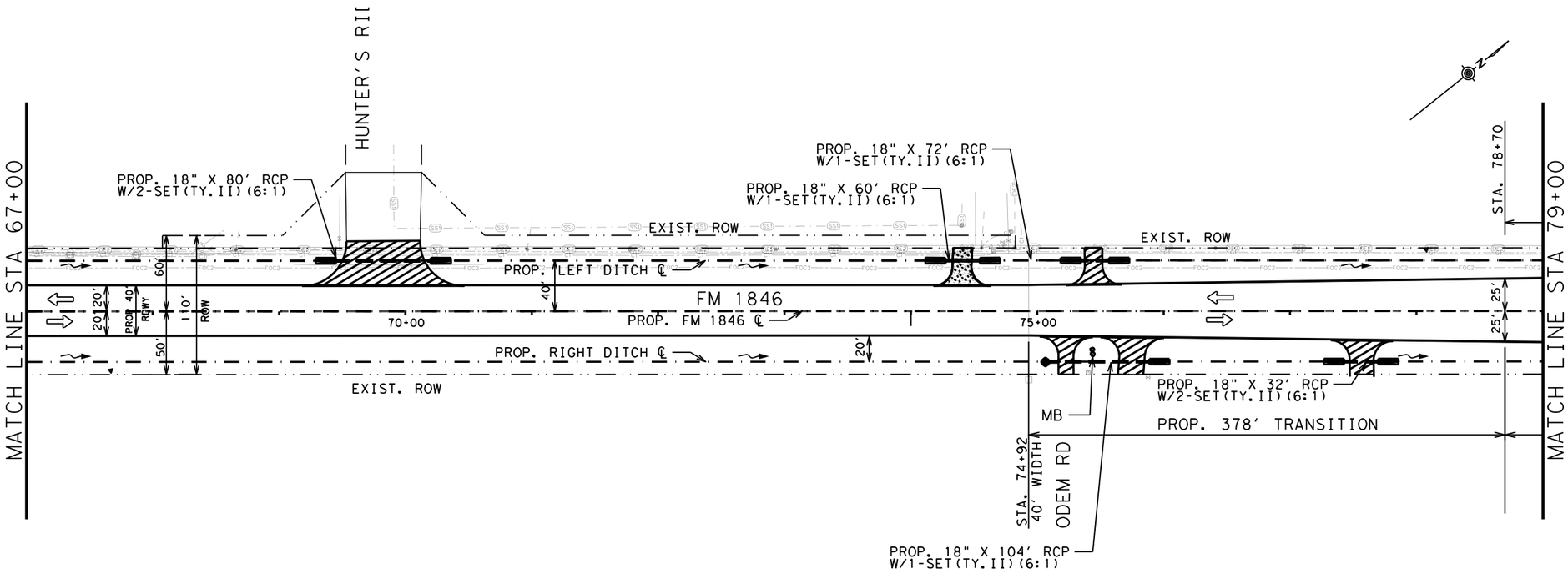

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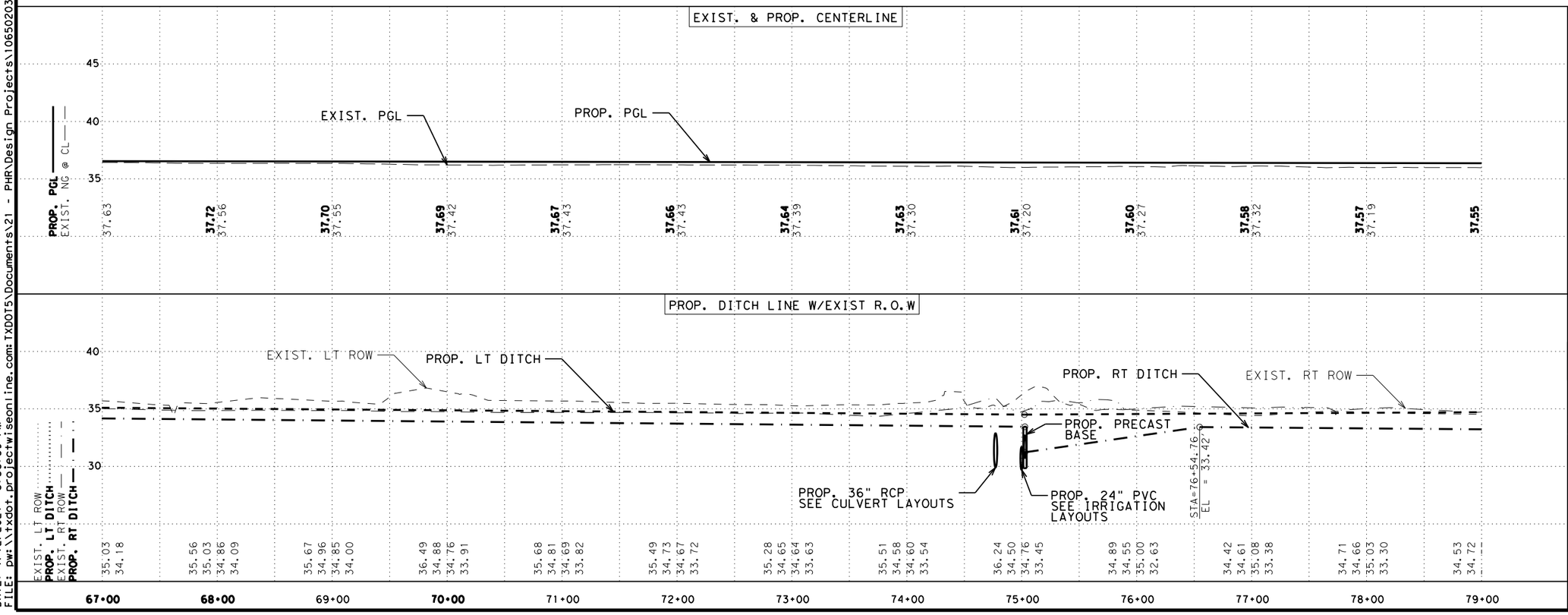

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SHEET 5 OF 9

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		137

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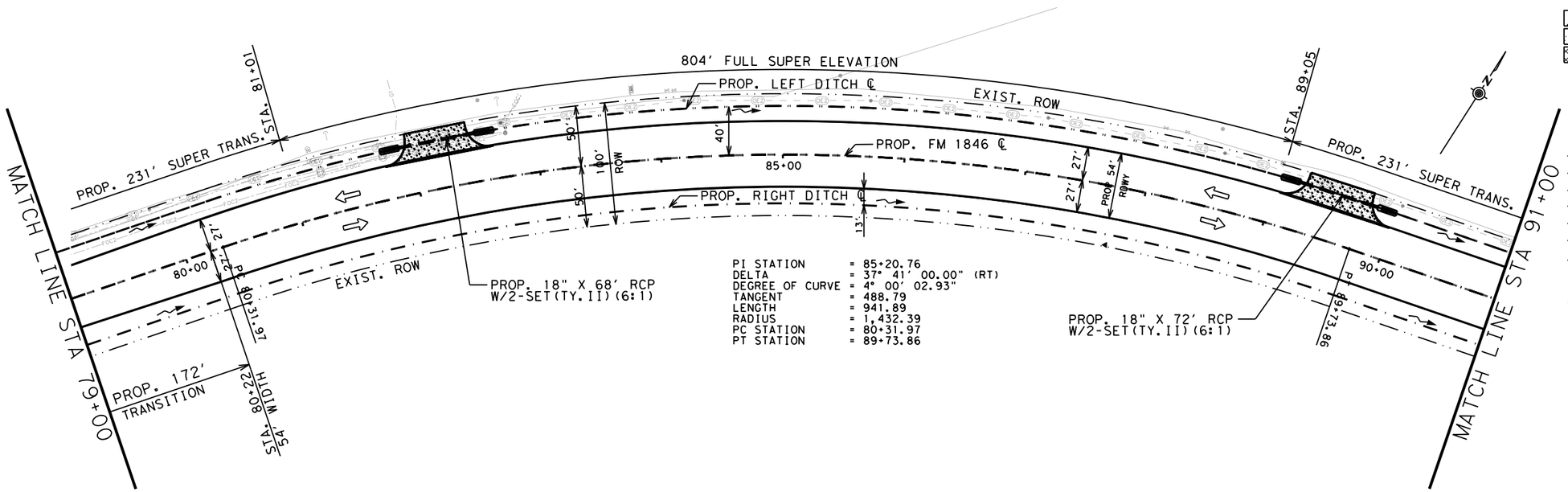

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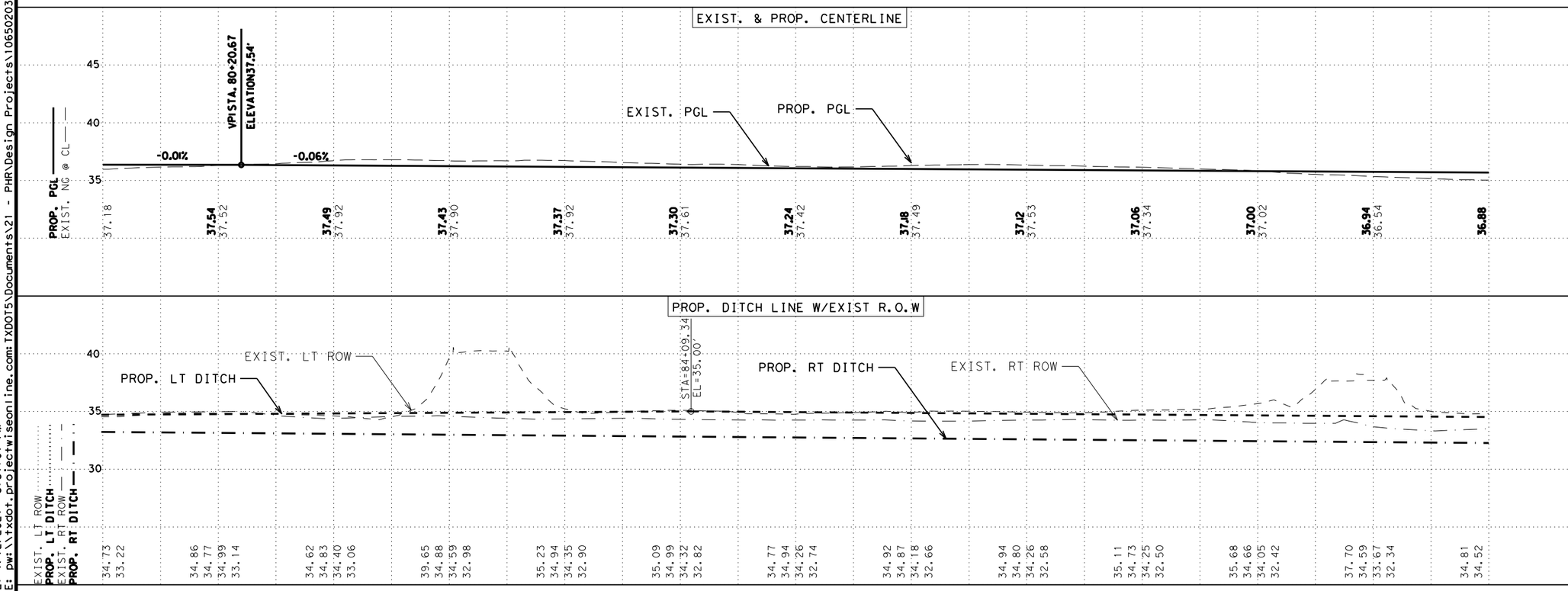

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FM 1846
PLAN & PROFILE

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SHEET 6 OF 9

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		138

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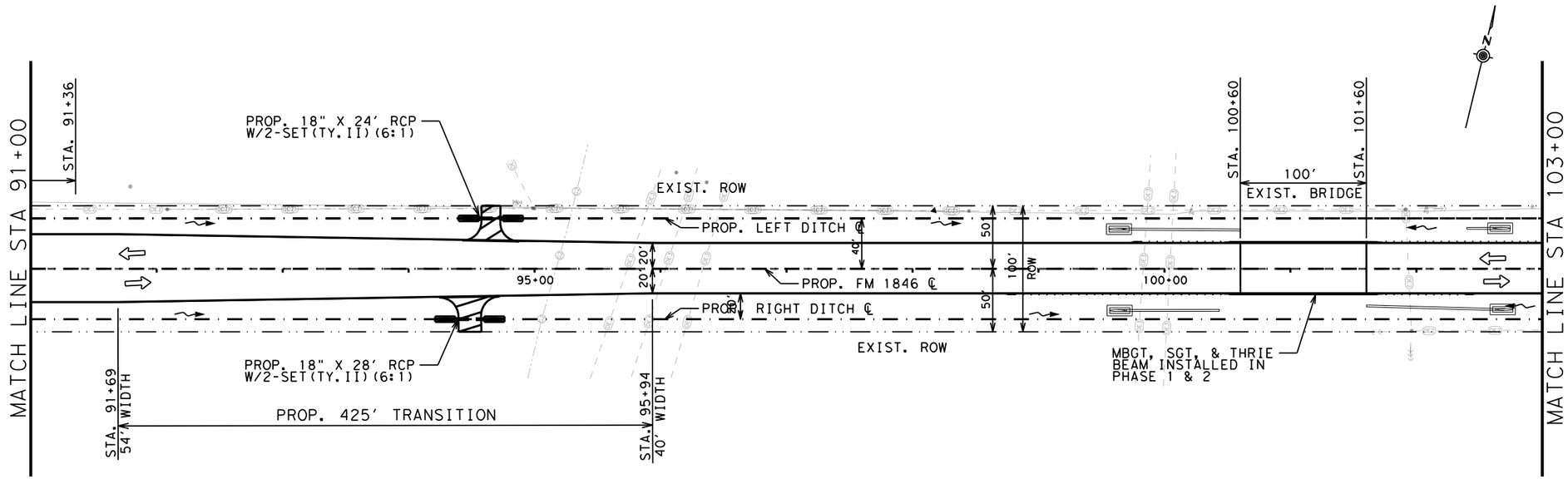

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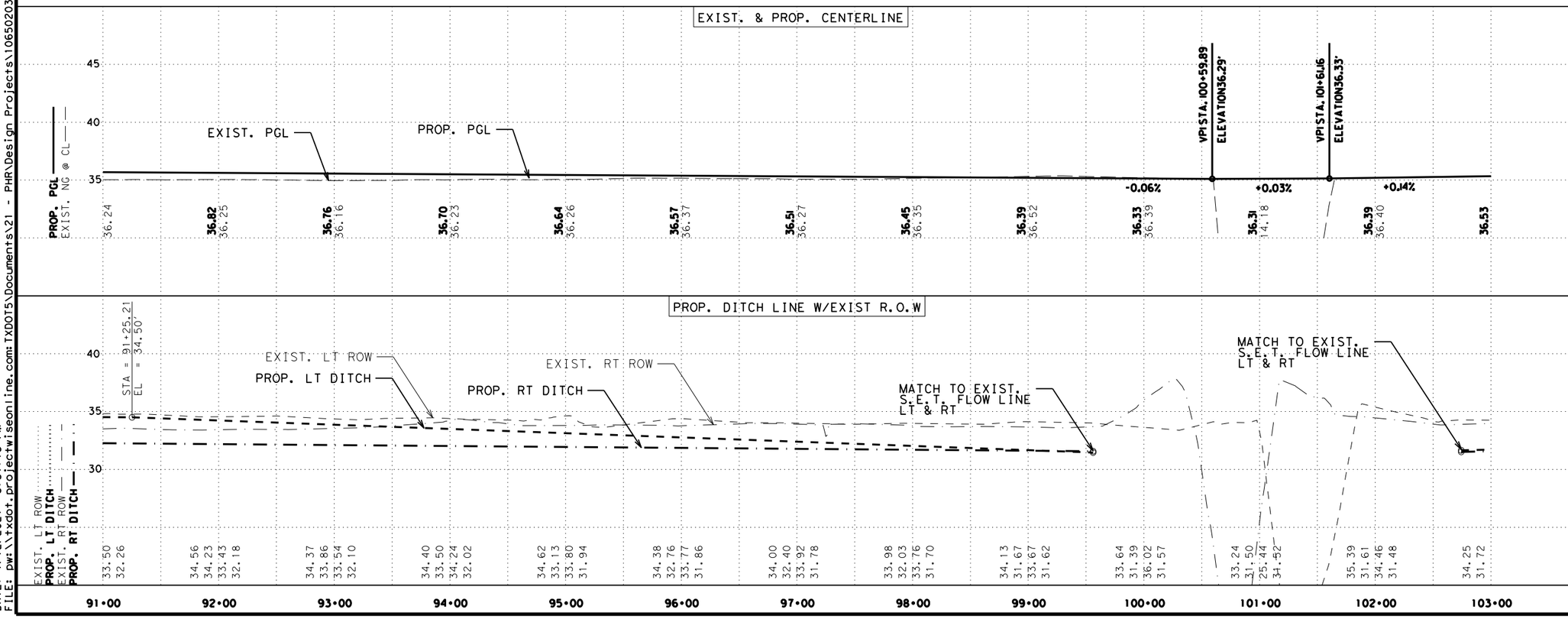

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SHEET 7 OF 9

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		139

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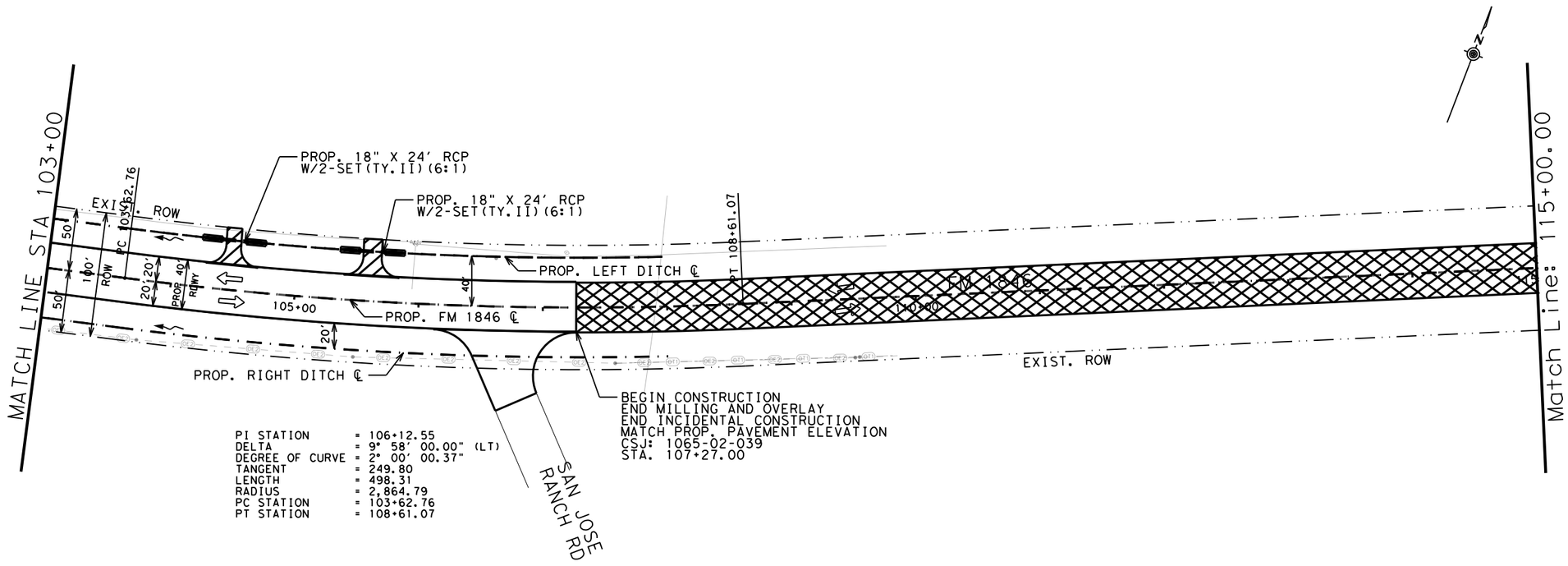

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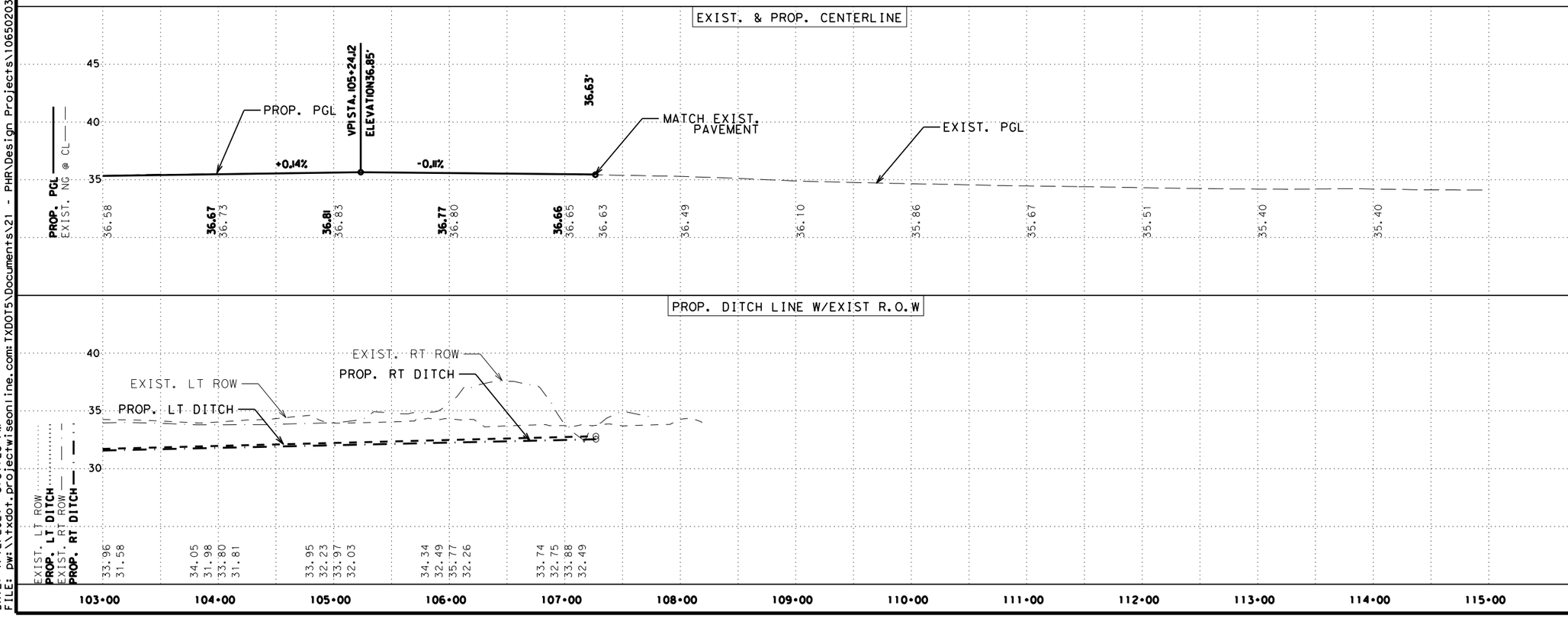

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SHEET 8 OF 9

© 2021	CONT	SECT	JOB	HIGHWAY
DS: CK:	1065	02	039	FM 1846
	DIST	COUNTY		SHEET NO.
DW: CK:	PHR	CAMERON		140

DATE: 7/12/2021 3:57:23 PM
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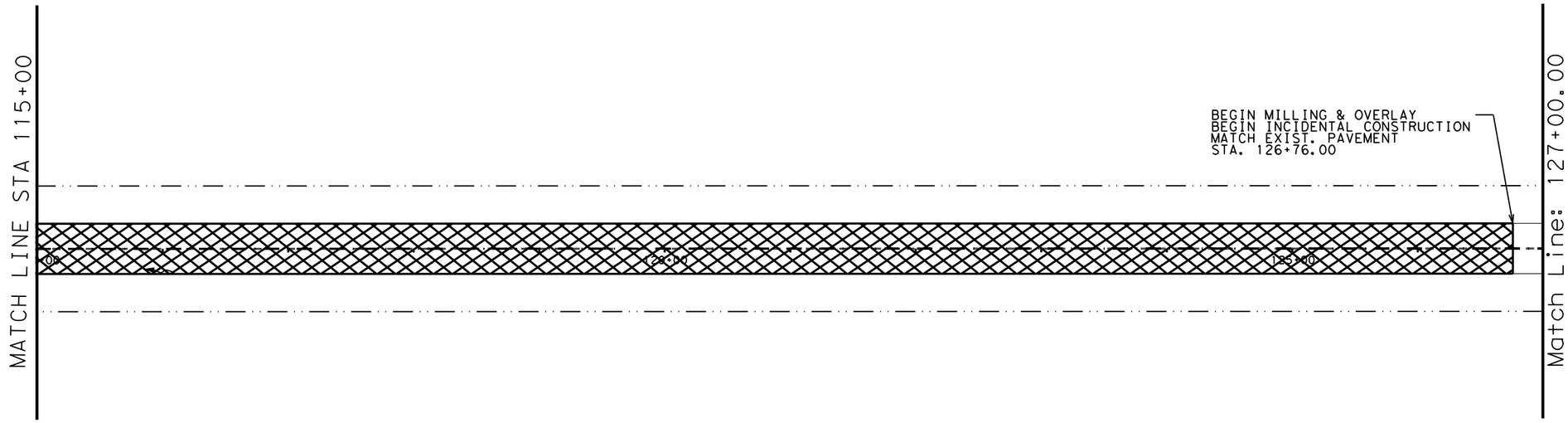

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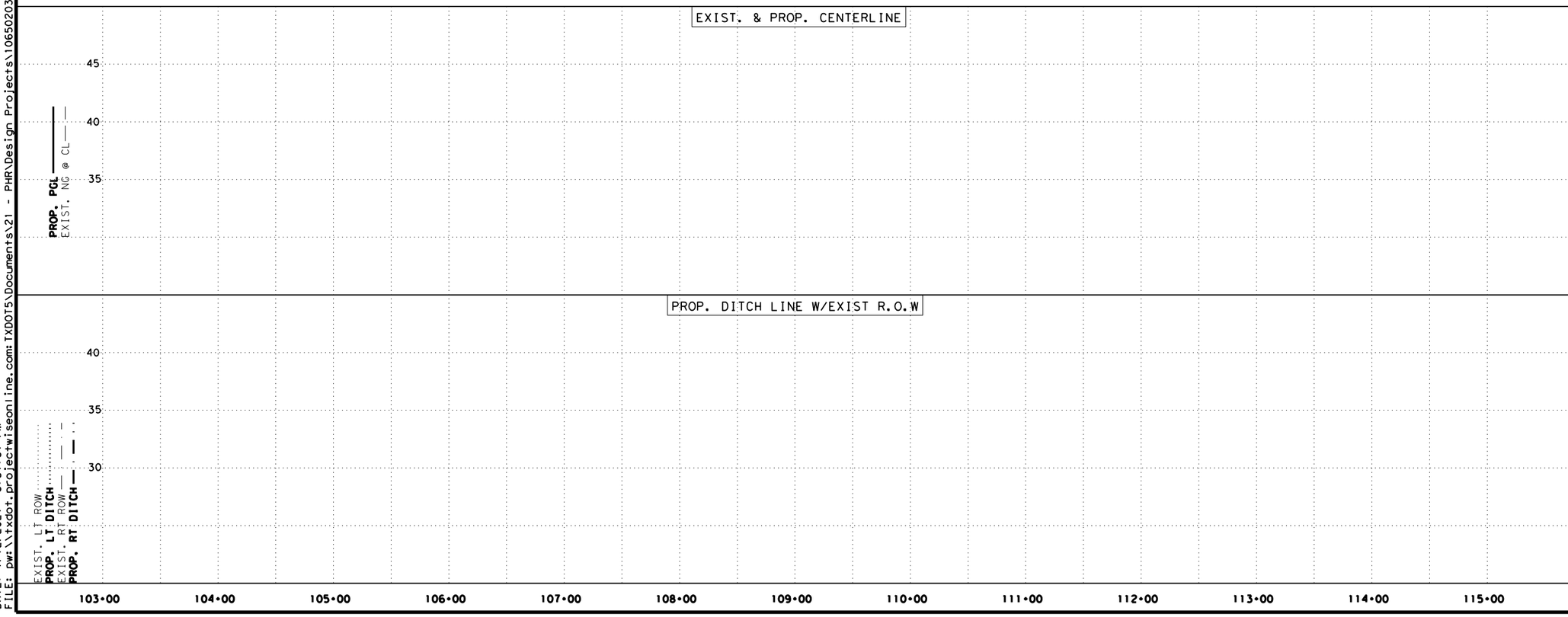

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SHEET 9 OF 9

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		141

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PRIVATE DRIVEWAYS

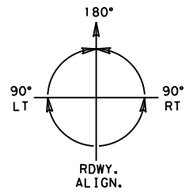
PRIVATE DRIVEWAYS

DWY. ID #	STATION	OFFSET	EXIST. DRVWY WIDTH (FT.)	PROP. WIDTH @ EDGE OF PAVEMENT (FT.)	PROP. WIDTH @ R.O.W. LINE (FT.)	# PROP. DRIVEWAY ANGLE TO ROADWAY (DEG.)	PROP. RAD. (FT)	ITEM 530		ITEM 464	ITEM 467	ITEM 496			ITEM 496	ITEM 104	ITEM 104
								6005			6362	6007			6004	6017	6022
								ACP DRWY AREA	CONC DRWY AREA	RC PIPE (CL III) (SPL)	PROP. S.E.T. (TY II)	REMOVE STR. (PIPE) (LF)			REMOVE STR. (S.E.T.)	REMOVING CONC (DRIVEWAYS)	REMOVING CONC (CURB & GUTTER)
								(SY)	(SY)	(LF)	(EA)	(LF)			(EA)	(SY)	(SY)
								PB-1	6"	18"	18"	18"	24"	36"			
1	24+64	LT	27	57	27	90	15	68	-	44	2	44	-	-	2	-	-
2	26+32	LT	24	55	24	90	15	-	63	44	2	43	-	-	2	63	-
3	27+80	LT	21	54	24	90	15	-	61	44	2	43	-	-	2	-	13
4	31+06	LT	20	50	20	90	15	-	53	40	2	43	-	-	2	-	18
5	30+96	RT	25	55	25	90	15	64	-	40	2	35	-	-	2	-	-
6	32+54	RT	23	54	24	90	15	62	-	40	2	35	-	-	2	-	-
7	36+83	LT	24	54	24	90	15	91	-	36	2	28	-	-	2	-	-
8	42+52	LT	21	54	24	90	15	91	-	36	2	36	-	-	2	-	-
9	46+05	LT	15	45	15	90	15	44	-	84	1	25	-	-	2	-	-
10	46+59	LT	9	42	12	90	15	37	-	-	1	27	-	-	2	-	-
11	47+75	LT	12	42	12	90	15	37	-	68	1	27	-	-	2	-	-
14	50+56	RT	10	42	12	90	15	51	-	24	2	27	-	-	2	-	-
15	63+68	RT	17	47	17	90	15	69	-	26	2	26	-	-	2	-	-
16	69+83	LT	60	128	58	90	35	289	-	80	2	84	-	-	2	-	-
17	74+40	LT	15	45	15	90	15	-	61	32	2	23	-	-	2	61	-
18	75+23	RT	12	42	12	89	15	50	-	-	-	75	-	-	1	-	-
19	75+45	LT	14	44	14	89	15	57	-	72	2	27	-	-	2	-	-
20	75+75	RT	20	50	20	89	15	75	-	104	1	-	-	-	1	-	-
21	77+57	RT	19	49	19	89	15	67	-	32	2	27	-	-	2	-	-
22	82+21	LT	50	90	50	82	20	-	147	68	2	108	-	-	2	147	-
23	89+53	LT	55	94	55	53	20	-	158	72	2	92	-	-	2	158	-
24	94+65	LT	15	45	15	59	15	56	-	24	2	27	-	-	2	-	-
25	94+49	RT	18	48	18	53	15	66	-	28	2	26	-	-	2	-	-
26	104+45	LT	11	42	12	54	20	51	-	24	2	27	-	-	2	-	-
27	105+61	LT	15	45	17	66	15	60	-	24	2	27	-	-	-	-	-
	TOTAL							**1385**	**543**	**1086**	**44**	**982**	**0**	**0**	**46**	**429**	**31**

NOTE :

1. LOCATIONS LISTED ON THE TABLE ARE APPROXIMATE. THE EXACT LOCATIONS, DIMENSIONS, AND TYPE OF DRIVEWAY IS TO BE ESTABLISHED DURING CONSTRUCTION BY THE ENGINEER AS REQUIRED. ALL STATIONING BASED ON THE EXIST. & PROP. BASELINE ALIGNMENT.

2. CONTRACTOR TO COORDINATE WITH PROPERTY OWNER OR BUSINESS PRIOR TO CONSTRUCTION OF DRIVEWAYS.



#- DRIVEWAY ANGLE ORIENTATION

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FM 1846
PRIVATE DRIVEWAY TABLES

SHEET 1 OF 2

© 2021		CONT	SECT	JOB	HIGHWAY
DS:	CK:	1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	CAMERON		142

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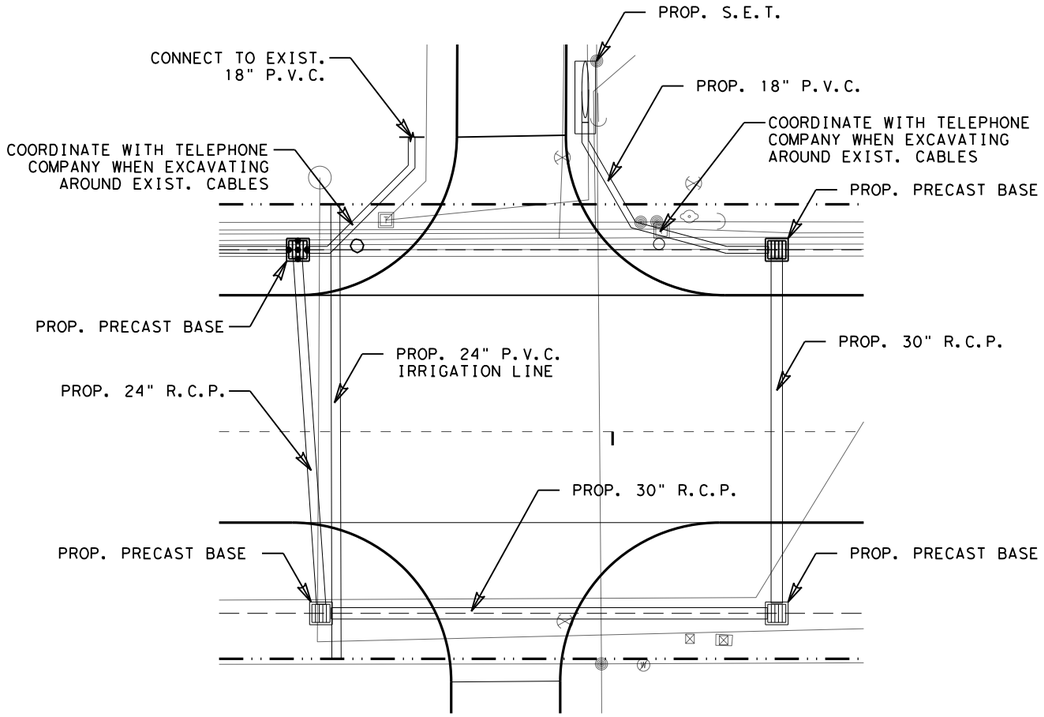
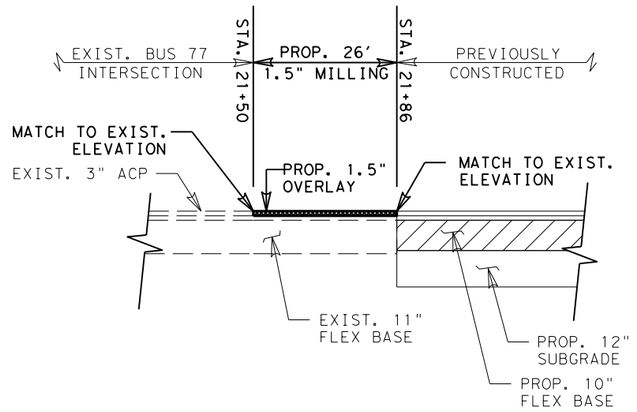


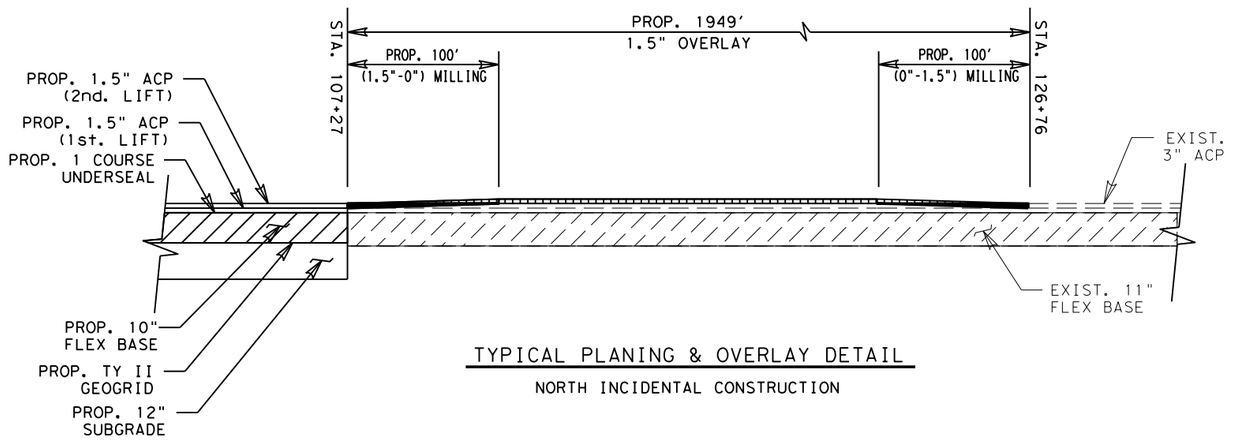
DRAINAGE LAYOUT

INTERSECTION AT RUSSELL LN.
(SEE CULVERT LAYOUTS FOR DETAILED INFO.)



TYPICAL MILL & OVERLAY DETAIL

TURNOUT NEAR BUS 77



TYPICAL PLANING & OVERLAY DETAIL

NORTH INCIDENTAL CONSTRUCTION

LEGEND:

- PROP. MILLING
- PROP. OVERLAY
- ACP - ASPHALT CONCRETE PAVEMENT
- PROP. - PROPOSED
- EXIST. - EXISTING
- STA. - STATION

GENERAL NOTES

A STATION EQUALS 100 FT.
114 LBS/SY IS EQUIVALENT TO 1" OF ACP
PRIME COAT - 0.2 GAL/SY (APPROX)
FLEXIBLE BASE WT. - 3375 LB/CY (APPROX)

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FM 1846 MISCELLANEOUS ROADWAY DETAILS

NOT TO SCALE — SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		144

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DW: ____ CK: ____

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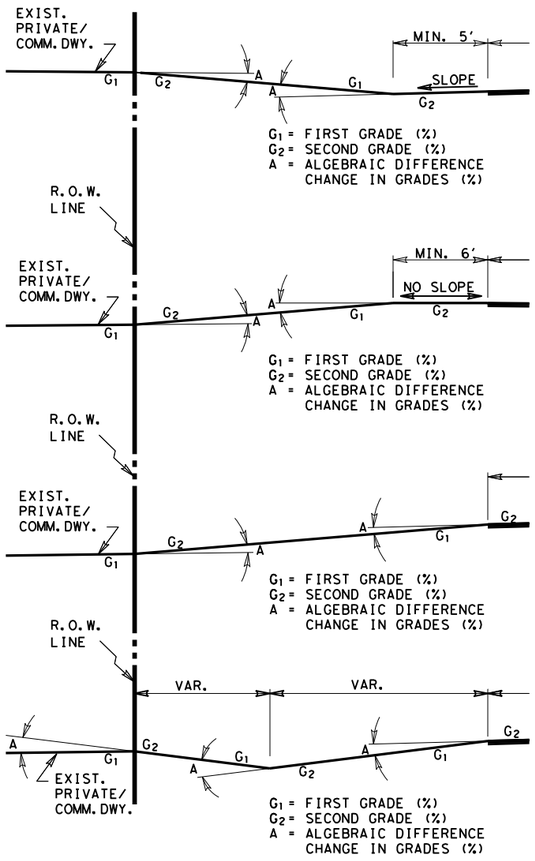
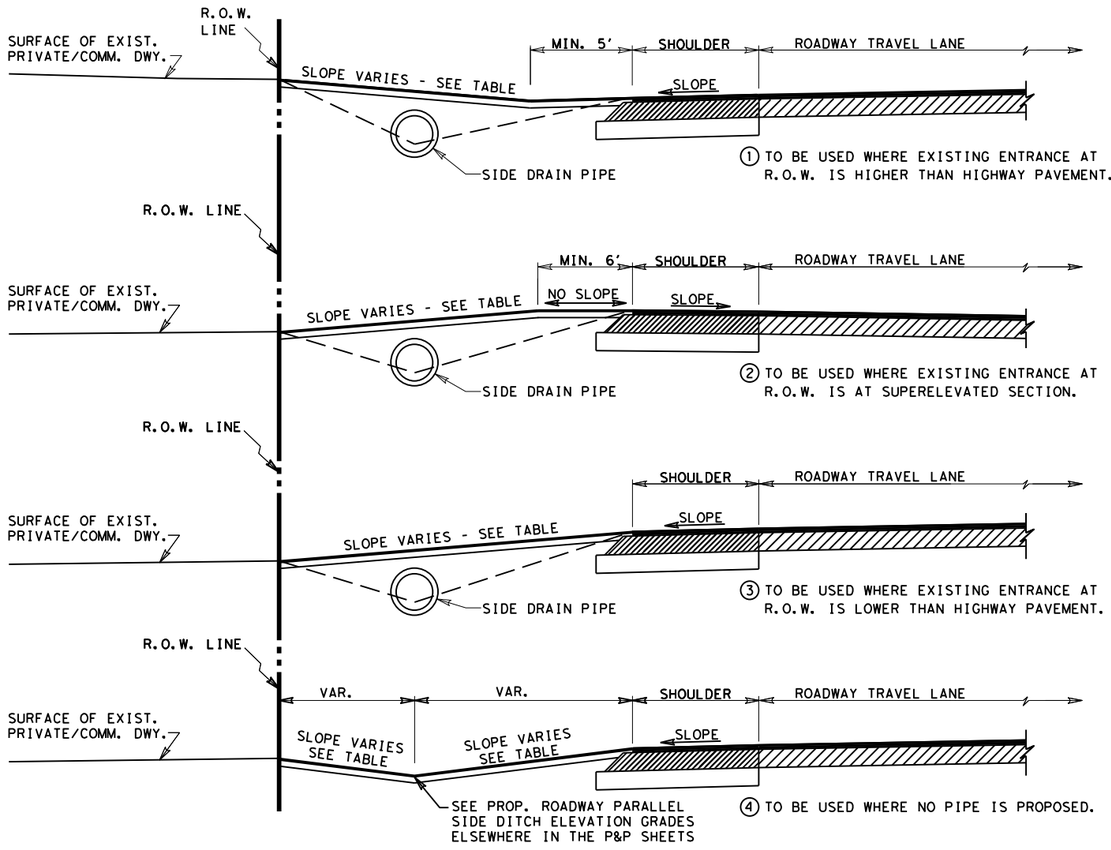
FILE: pw:\\txdot.projectwiseonline.com:TXDOT5\Documents\21 - PHR\Design Projects\1065020394 - Design\Plan Set\3. Roadway\FM1846_MISC. RDWY DETAILS.dgn

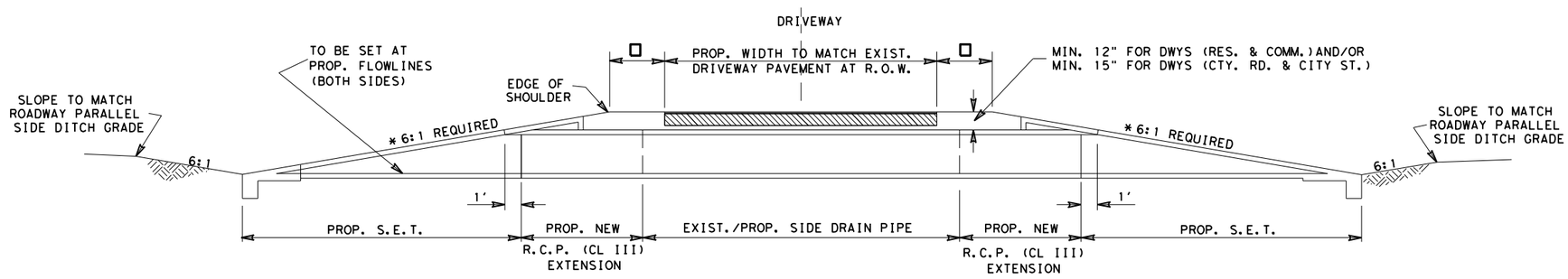




TYPICAL ENTRANCE PROFILE FOR DRIVEWAYS W/OUT C&G

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

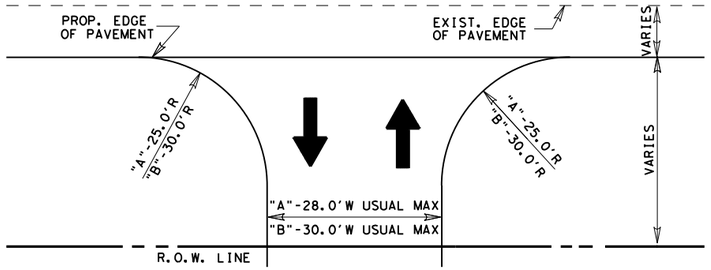
DRIVEWAY PROFILE DETAILS

REV. 3/2020

DRIVEWAY1.DGN

FED. RD. DIV. NO.	STATE AID PROJECT NO.		FILE NO.			SHEET NO.
6						145
STATE	STATE DIST. NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TEXAS	PHR	CAMERON	1065	02	039	FM 1846

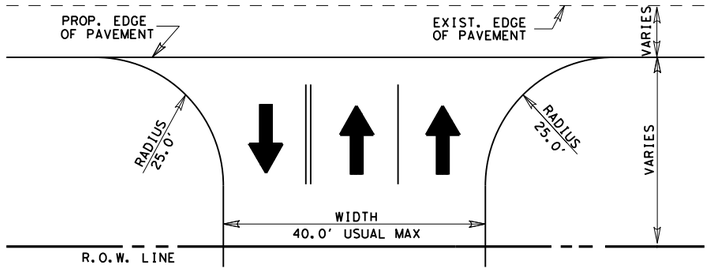
DESIGNS FOR TWO-WAY COMMERCIAL DRIVEWAYS



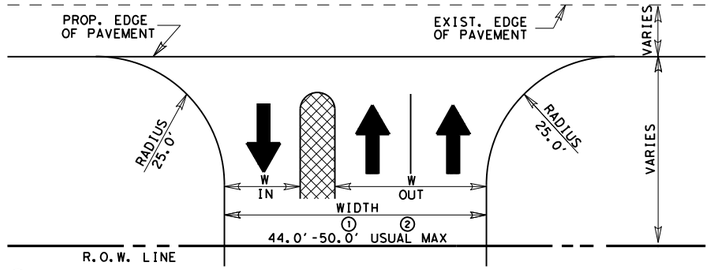
"A"- ONE ENTRY LANE AND ONE EXIT LANE, FEWER THAN 4 LARGE VEHICLES PER HOUR

"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*

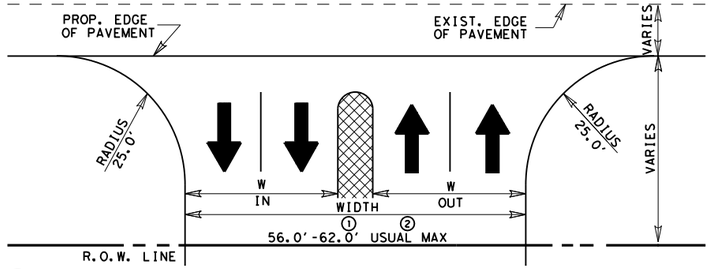


ONE ENTRY LANE AND TWO EXIT LANES (WITHOUT DIVIDERS)



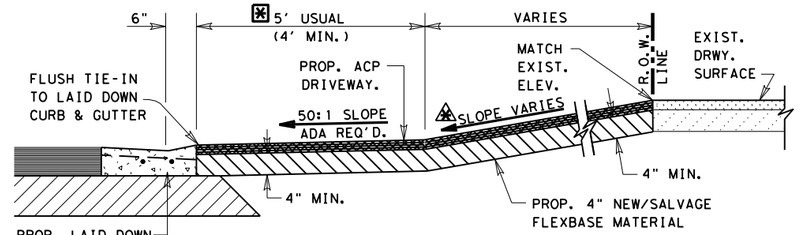
① - *4.0' WIDE DIVIDER, FACE-TO-FACE CURBS*
② - *10.0' WIDE DIVIDER, FACE-TO-FACE-CURBS*

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



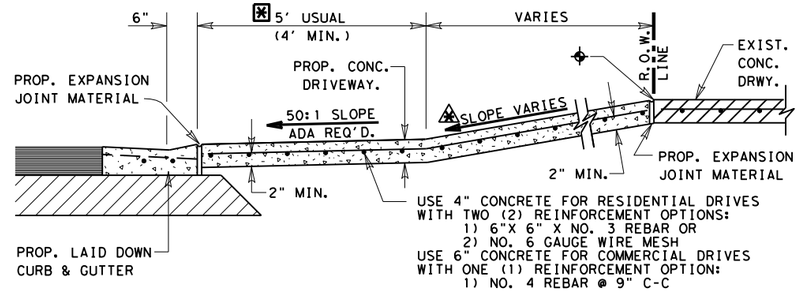
① - *4.0' WIDE DIVIDER, FACE-TO-FACE CURBS*
② - *10.0' WIDE DIVIDER, FACE-TO-FACE-CURBS*

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.

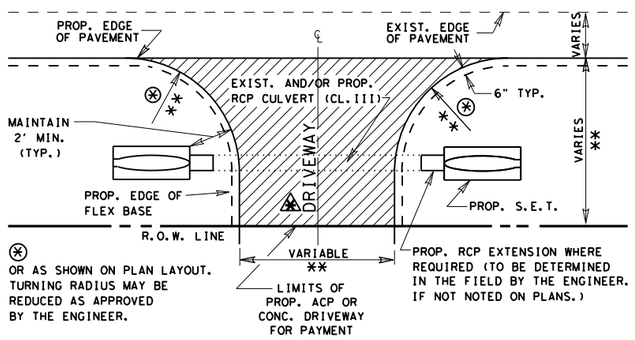
⊠ PROP./FUTURE SIDEWALK CROSSING LOCATION UNLESS SHOWN ELSEWHERE ON P&P SHEETS. SEE P&P SHEETS FOR PROP. SIDEWALK LOCATION IF SIDEWALKS ARE INCLUDED AS PART OF PROJECT. REFER TO STATE STANDARDS - PEDESTRIAN FACILITIES - FOR ADDITIONAL REQUIREMENTS.

⚠ 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



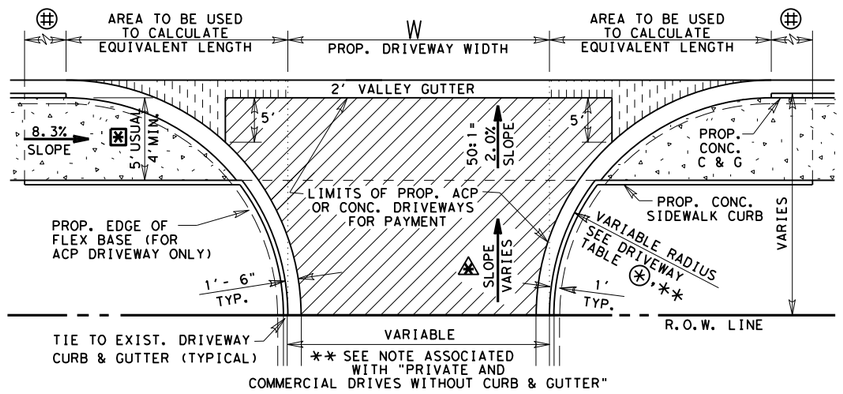
⊛ OR AS SHOWN ON PLAN LAYOUT. TURNING RADIUS MAY BE REDUCED AS APPROVED BY THE ENGINEER.

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 114#/SY ACP.

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

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

PHARR DISTRICT STANDARD

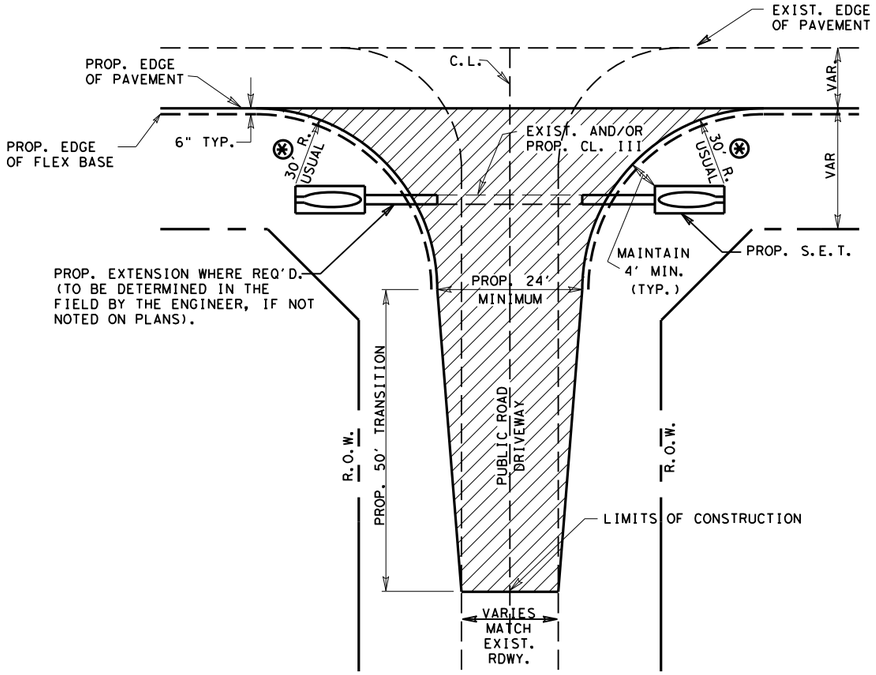
TEXAS DEPARTMENT OF TRANSPORTATION

DRIVEWAY DETAILS PRIVATE (RESIDENTIAL-COMMERCIAL)

REV. 01/17

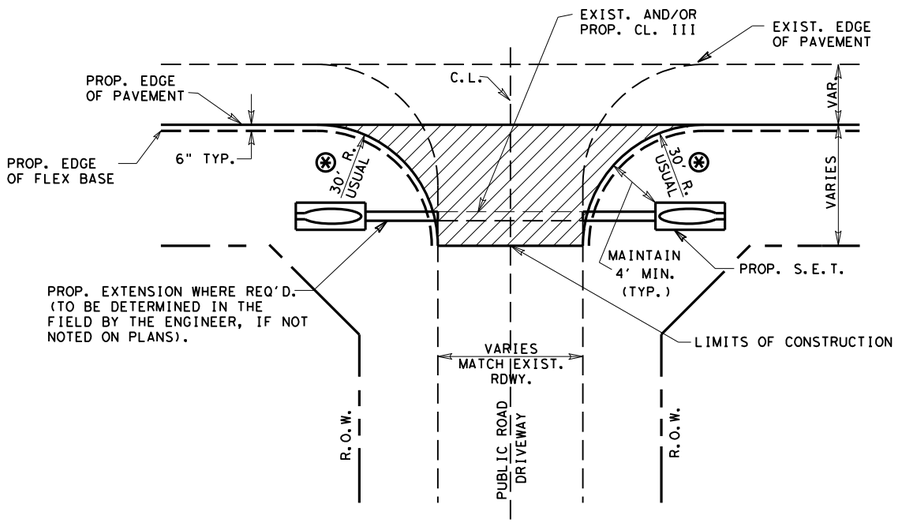
DRIVEWAY2.DGN

FED. RD. DIV. NO.	PROJECT NO.		FILE NO.			SHEET NO.
6						146
STATE	STATE DIST. NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TEXAS	21	CAMERON	1065	02	039	FM 1846



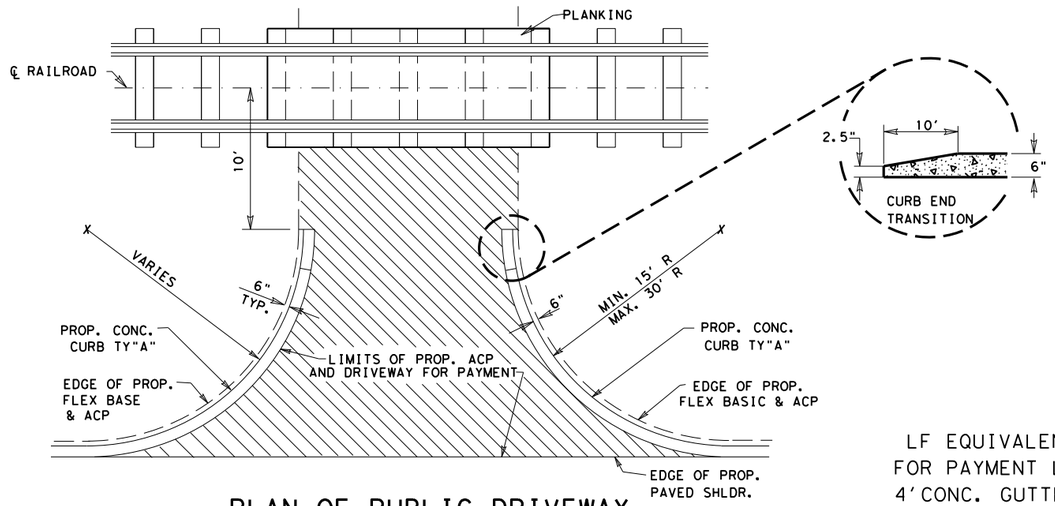
TYPICAL DETAIL

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

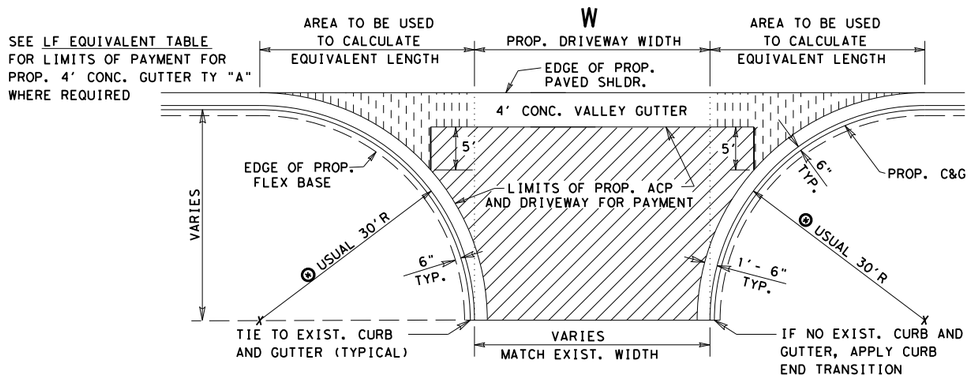


TYPICAL DETAIL

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



PLAN OF PUBLIC DRIVEWAY ADJACENT TO R.R. CROSSING



PLAN OF PUBLIC DRIVEWAY

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

LF OF VALLEY GUTTER= W + X1 + X2

WHERE X1 AND X2 MAY VARY DEPENDING ON RADIUS

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

TY PBS1

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

TY PBS2

EXIST. DRIVEWAY TO BE CONSTRUCTED SAME AS PROPOSED ROADWAY.

GENERAL NOTES:

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

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

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

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

PHARR DISTRICT STANDARD

TEXAS DEPARTMENT OF TRANSPORTATION

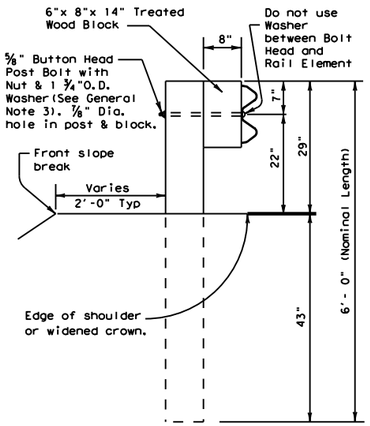
DRIVEWAY DETAILS PUBLIC (COUNTY ROAD-CITY STREET)

REV. 8/19

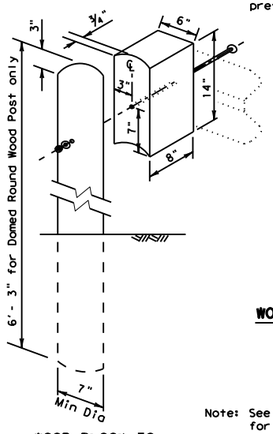
DRIVEWAY3.DGN

FED.RD. DIV.NO.	STATE AID PROJECT NO.		FILE NO.			SHEET NO.
6						147
STATE	STATE DIST.NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TEXAS	21	CAMERON	1065	02	039	FM 1846

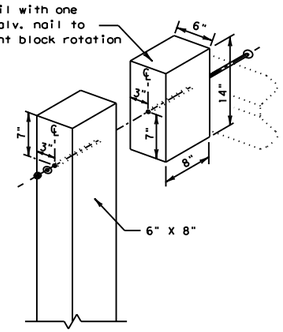
DATE: 7/13/2021
FILE: pw:\\txdot.projectwiseonline.com:TXDOT5\Documents\21 - PHR\Design Projects\106502039\4 - Design\Plan Set\3. Roadway\ROADWAY STANDARDS\mbgf19.dgn



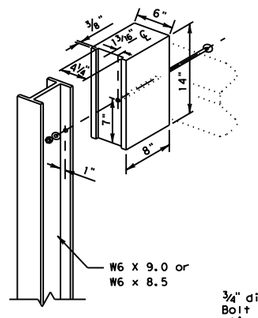
TYPICAL POST



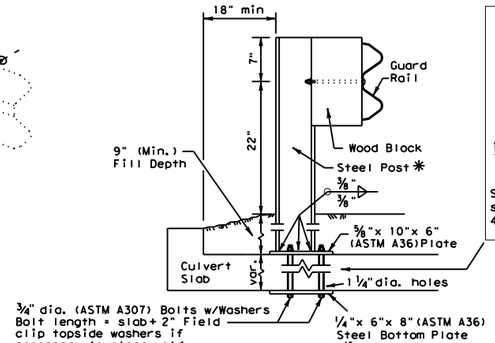
WOOD BLOCK TO ROUND WOOD POST



WOOD BLOCK TO RECTANGULAR WOOD POST

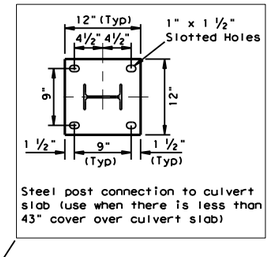


WOOD BLOCK TO STEEL POST

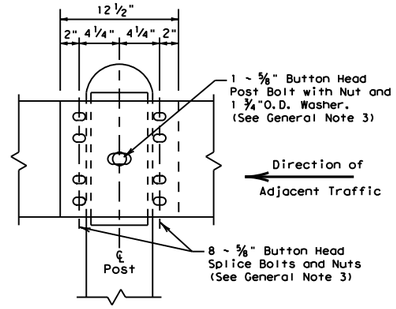


*** LOW FILL CULVERT POST**

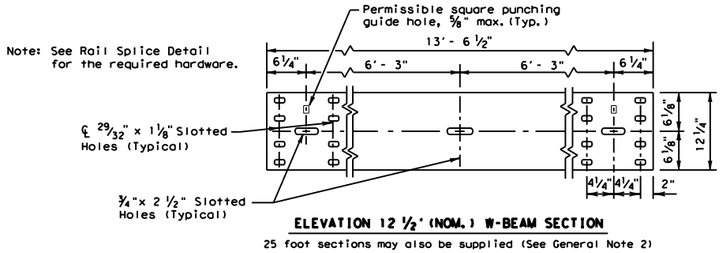
FOR USE ON NON-BRIDGE CLASS CULVERTS ONLY



* Post(s) may require field modifications to ensure proper guardrail height.



RAIL SPLICE DETAIL

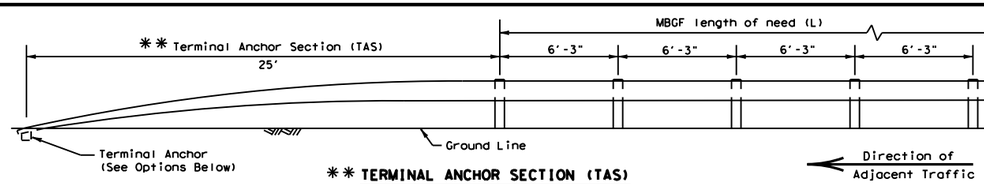


ELEVATION 12½' (NOM.) W-BEAM SECTION

25 foot sections may also be supplied (See General Note 2)

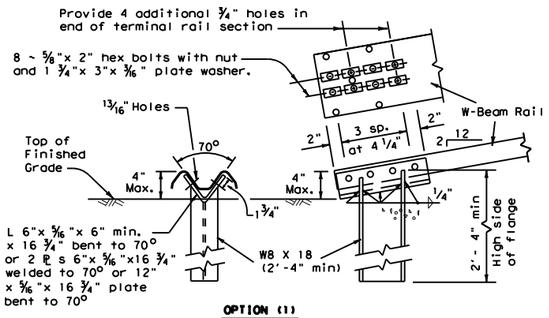
GENERAL NOTES

1. The type of post (round wood post, rectangular wood post, or steel post) will be shown elsewhere in the plans. The exact position of MBGF shall be shown elsewhere in the plans or as directed by the Engineer. Steel posts to be galvanized in accordance with Item 445, "Galvanizing."
2. Rail element shall meet the requirements of Item 540, "Metal Beam Guard Fence" except as modified on the plans. The Contractor may furnish rail elements of 12½ or 25 foot nominal lengths.
3. Button head "post" bolts (ASTM A307) shall be of sufficient length to extend through the full thickness of the nut (ASTM A563) and Type A (1¾" O.D.) washer and not more than 1" beyond it. Button head "splice" bolts (ASTM A307) are ⅝" x 1¼" (or 2" long at triple rail splices) with a ⅝" double recessed nut (ASTM A563).
4. Fittings (bolts, nuts, and washers) shall be galvanized in accordance with Item 445, "Galvanizing." Fittings shall be subsidiary to the bid item.
5. Crown shall be widened to accommodate the Metal Beam Guard Fence.
6. The lateral approach to the guard fence, shall have a slope rate of not more than 1V:10H.
7. Unless otherwise shown in the plans, guard fence placed in the vicinity of curbs shall be positioned so that the face of curb is located directly below or behind the face of the block. Rail placed over curbs shall be installed so that the post bolt is located approximately 21 inches above the gutter pan or roadway surface.
8. If solid rock is encountered within 0 to 18" of the finished grade, drill a 22" dia. hole, 24" into the rock, or drill two 12" dia. front to back overlapping holes, 24" into the rock. If solid rock is encountered below 18", drill a 12" dia. hole, 12" into the rock or to the standard embedment depth, whichever is less. Any excess post length, after meeting these depths, may be field cut to ensure proper guardrail mounting height. Backfill with a cohesionless material.
9. Posts shall not be set in concrete, of any depth.
10. Special fabrication will be required at installations having a curvature of less than 150 ft. radius.
11. The terminal anchor section (TAS) post shall be set in Class A concrete (unless otherwise shown in the plans) in accordance with Item 421, "Hydraulic Cement Concrete." Concrete shall be subsidiary to the bid item requiring construction of the terminal anchor section (TAS). Terminal anchor post to be galvanized in accordance with Item 445, "Galvanizing."
12. Unless otherwise shown in the plans, a composite material post and/or block that meets the requirements of DMS-7210, "Composite Material Posts and Blocks for Metal Beam Guard Fence" may be substituted for posts and/or blocks of similar dimensions. The Construction Division, TxDOT maintains a Material Producer List (MPL) for producers of materials conforming to DMS-7210. Only producers on the MPL can furnish composite material posts and/or blocks.



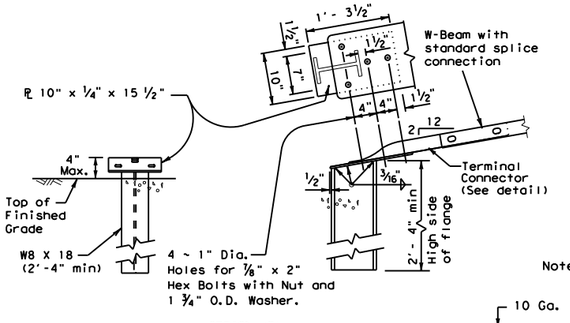
**** TERMINAL ANCHOR SECTION (TAS)**

Terminal anchor sections are only for downstream use, when located outside the horizontal clearance area of opposing traffic.



OPTION (1)

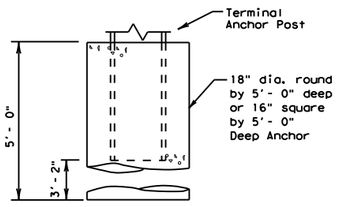
Note: This anchor post requires four additional ¾" holes (shop or field) in the rail member with eight ⅝" hex bolts with nut and plate washer.



OPTION (2)

Note: This anchor post requires the use of the 10 ga. terminal connector with four ⅞" hex bolts with nut and washer.

TERMINAL ANCHOR POST OPTIONS
(See General Note 11)



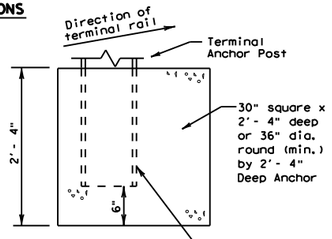
Notes:

Either concrete anchor may be used with either post option above.

No construction joint is allowed in the concrete anchor.

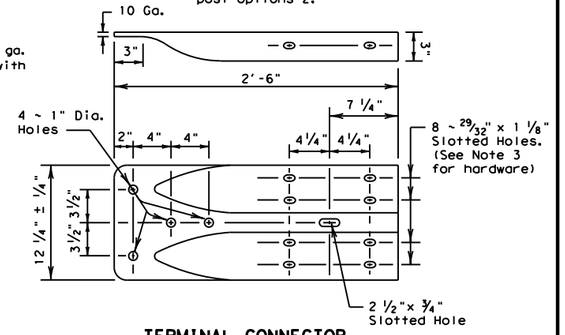
Terminal rail may be bolted to post and in twist position prior to placing concrete anchor.

If concrete anchor is precast, the area should be compacted as directed by the Engineer, when placed in the field.



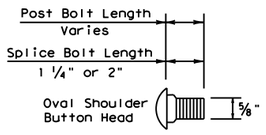
TERMINAL CONCRETE ANCHOR OPTIONS
(See General Note 11)

Note: Terminal Connector to be used with terminal anchor post options 2.



TERMINAL CONNECTOR

For connection hardware to concrete rails, see the MBGF transition standards.



BUTTON HEAD BOLT

Post and Splice Bolts
(See General Note 3)

ONLY FOR USE IN MAINTENANCE REPAIRS OR HIGHLY CONSTRAINED SITE CONDITIONS.

Texas Department of Transportation

Design Division Standard

METAL BEAM GUARD FENCE

MBGF-19

FILE: mbgf19.dgn	DN: TxDOT	CK: KM	DW: BD	CK: VP
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REVISIONS	1065	02	039	FM 1846
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		148

DATE: 7/12/2021
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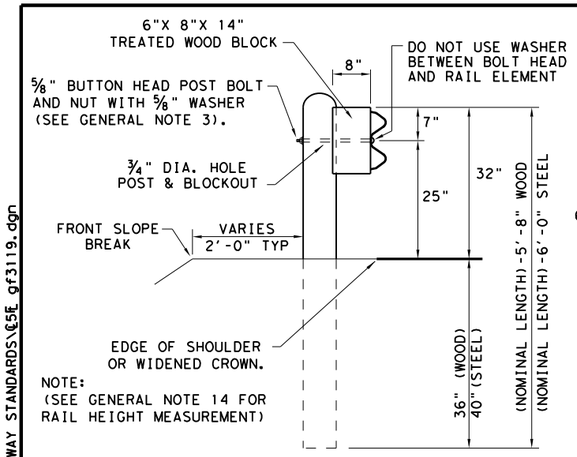
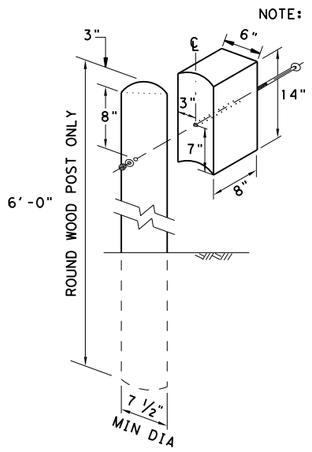
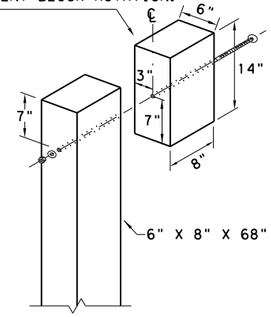


TYPICAL POST PLACEMENT

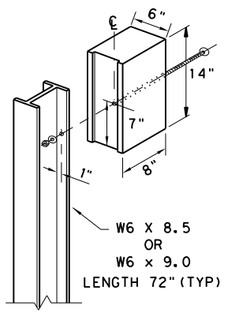


WOOD BLOCK TO ROUND WOOD POST

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

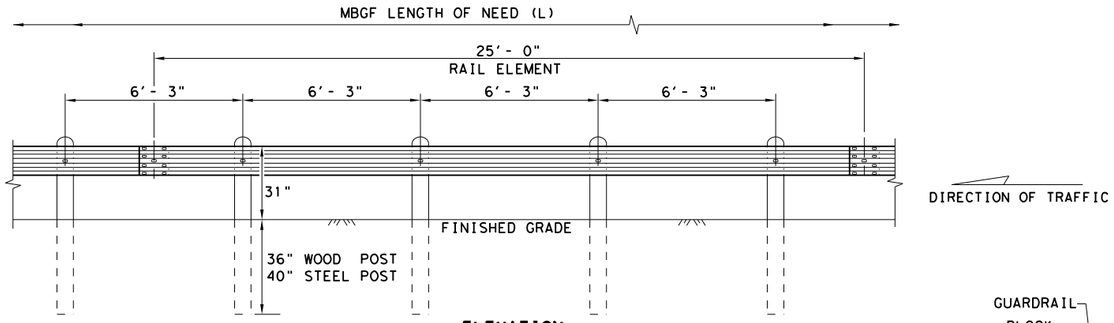


WOOD BLOCK TO RECTANGULAR WOOD POST



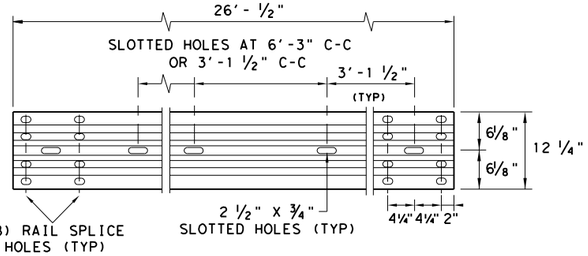
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

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



ELEVATION
MID-SPAN RAIL SPLICE

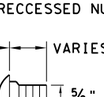
SHOWING A 25'- 0" SECTION OF W-BEAM RAIL. (SEE GENERAL NOTE 2)



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

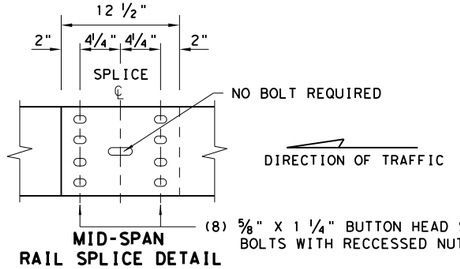
NOTES: SEE GENERAL NOTE 2 FOR ALLOWABLE RAIL TYPES.
SEE RAIL SPLICE DETAIL FOR REQUIRED HARDWARE.

NOTE:
FOUR TYPES OF BUTTON-HEAD GUARD RAIL BOLTS COME WITH A RECCESSED NUT.



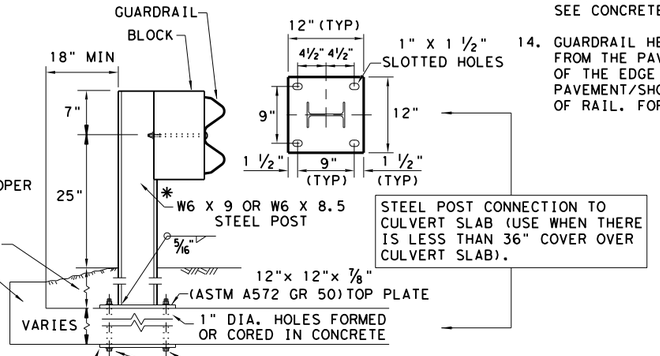
BUTTON HEAD BOLT

NOTE: SEE GENERAL NOTE 3 FOR SPLICE & POST BOLT DETAILS.



MID-SPAN RAIL SPLICE DETAIL

NOTE: GF(31), MID-SPAN RAIL SPLICES ARE REQUIRED WITH 6'-3" POST SPACINGS.



*POST(S) MAY REQUIRE FIELD MODIFICATION TO ENSURE PROPER GUARDRAIL HEIGHT.

STEEL POST CONNECTION TO CULVERT SLAB (USE WHEN THERE IS LESS THAN 36" COVER OVER CULVERT SLAB).

LOW FILL CULVERT POST

NOTE: TWO INSTALLATION OPTIONS.

1. BOLT-THROUGH OPTION: REQUIRES A 6" MIN. SLAB THICKNESS. ⅞" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS.
   NOTE: BOLT LENGTH = SLAB PLUS 2 ¼" MIN.

2. EPOXY ANCHOR OPTION: THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE ⅞" DIA. ASTM A449 OR A193 GRADE B7 WITH HEAVY HEX NUT, AND ONE HARDENED WASHER EACH. EMBED ANCHOR RODS 6" WITH HILTI HIT RE 500 EPOXY ADHESIVE. OTHER TYPE III CLASS C EPOXY ADHESIVES MEETING THE REQUIREMENTS OF DMS-6100, "EPOXIES AND ADHESIVES", MAY BE USED IF IT CAN BE DEMONSTRATED THAT THEY MEET OR EXCEED THE STRENGTH OF HILTI HIT RE 500 WITH THE SAME EMBEDMENT DEPTH AND THREADED ROD DIA. FOLLOW THE MANUFACTURER'S REQUIREMENTS FOR INSTALLING EPOXIED THREADED RODS. EXTEND RODS ¼" MIN. BEYOND NUT.

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

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

GENERAL NOTES

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

Texas Department of Transportation

Design Division Standard

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

FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
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	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		149

DATE: 7/12/2021
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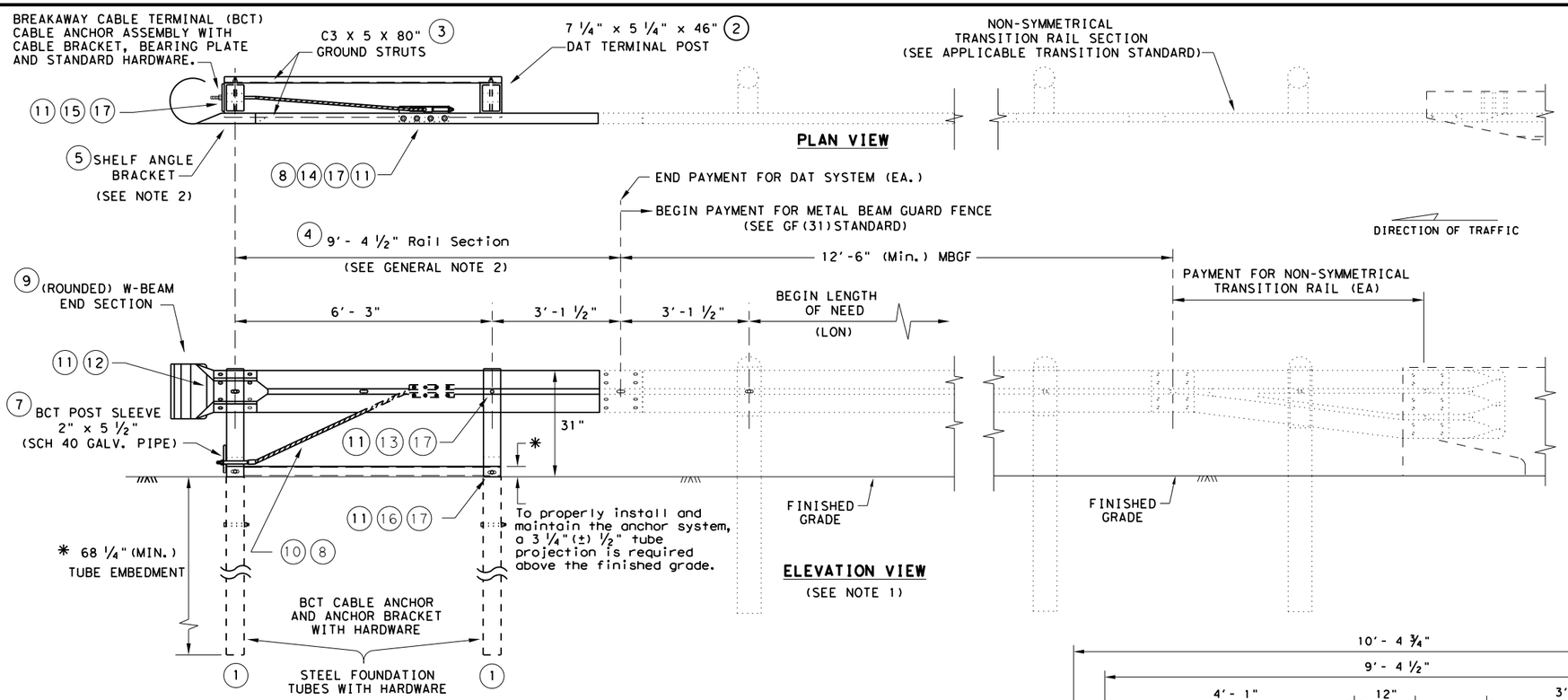


DOWNSTREAM ANCHOR TERMINAL (DAT)

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

GENERAL NOTES

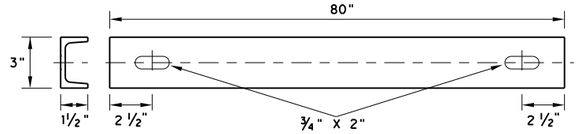
1. THE DETAIL SHOWN IS THE MINIMUM LENGTH OF NEED (LON) FOR A DOWNSTREAM ANCHOR TERMINAL (DAT) CONNECTED TO A CONCRETE RAIL.
2. THE RAIL SECTION AT THE END POST IS SUPPORTED BY THE SHELF ANGLE BRACKET. THE RAIL ELEMENT IS NOT ATTACHED TO THE END POST.
3. THE FOUNDATION TUBES SHALL NOT PROJECT MORE THAN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

MOW STRIP INSTALLATION

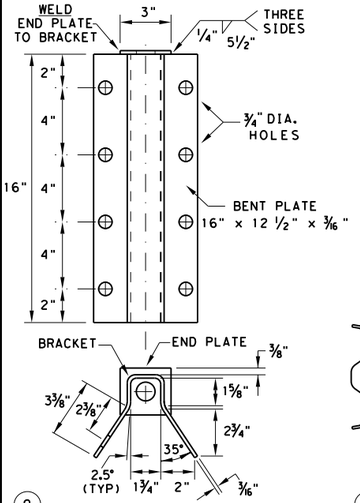
IF A MOW STRIP IS REQUIRED WITH THE DAT INSTALLATION THE LEAVE-OUT AREA AROUND THE STEEL FOUNDATION TUBES AND THE TWO CHANNEL STRUTS MAY BE OMITTED. THIS WILL REQUIRE A FULL POUR AT THE FOUNDATION TUBES.

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

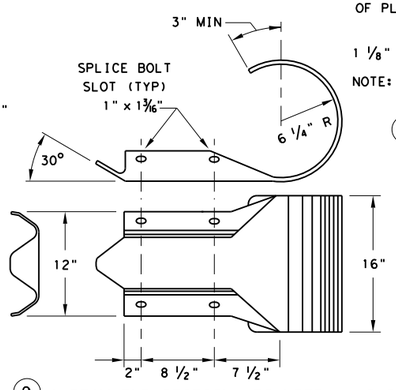
(4) TERMINAL RAIL ELEMENT FOR DAT



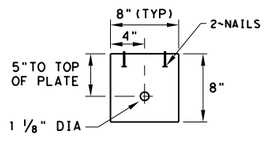
(3) CHANNEL STRUT
C3 X 5 X 80", GRADE A36



(8) GUARDRAIL ANCHOR BRACKET

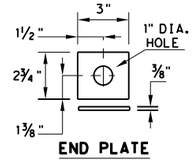


(9) W-BEAM END SECTION (ROUNDED) (12 GA.)

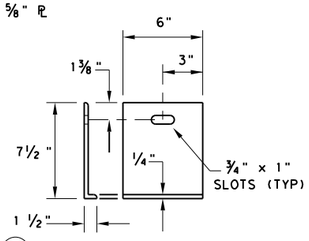


NOTE: DRIVE NAILS AND BEND OVER TO PREVENT PLATE ROTATION

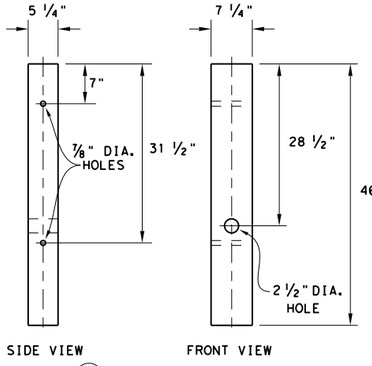
(6) BEARING PLATE
8"x 8"x 5/8" PL



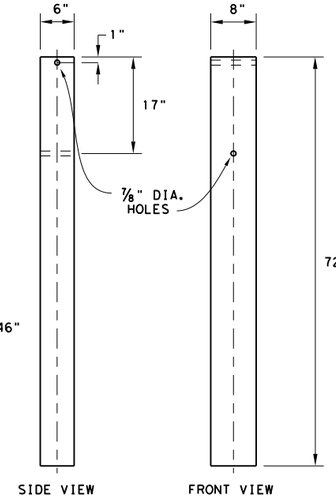
END PLATE



(5) SHELF ANGLE BRACKET



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



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

Texas Department of Transportation

Design Division Standard

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

GF(31)DAT-19

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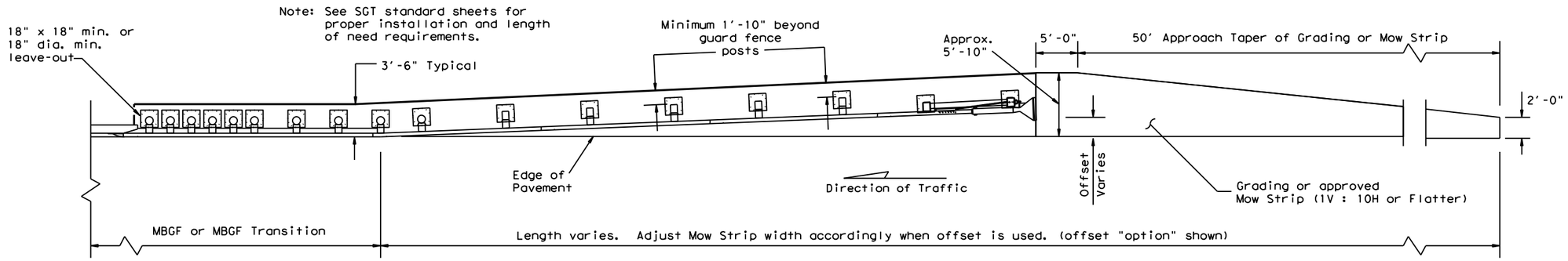
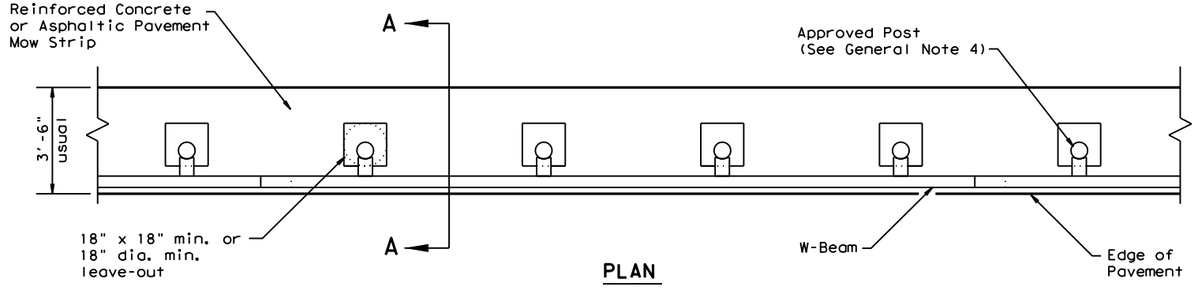
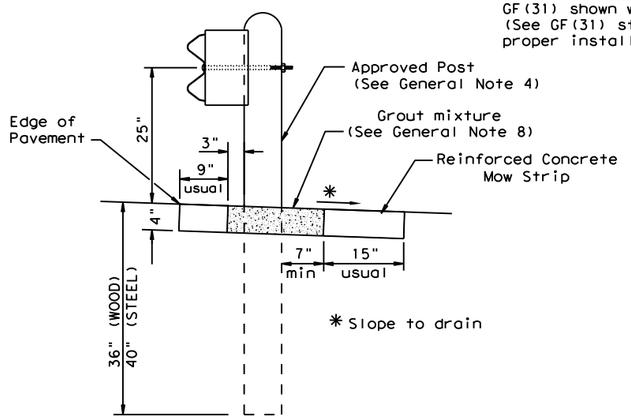


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



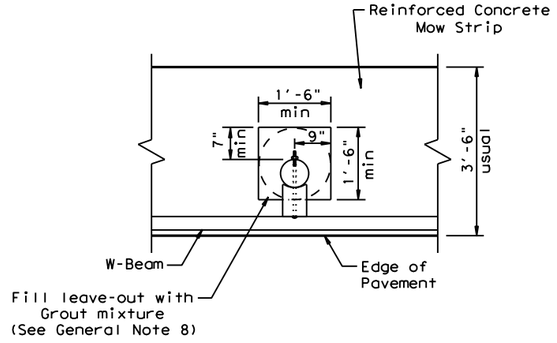
PLAN

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



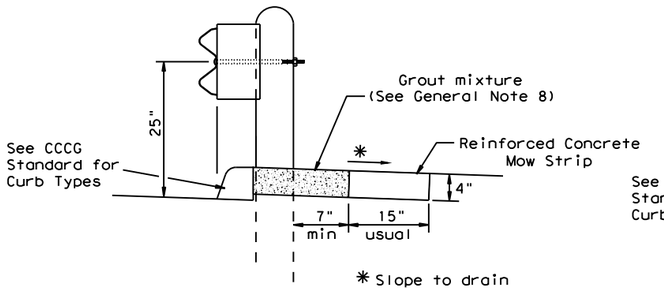
SECTION A-A

Typical



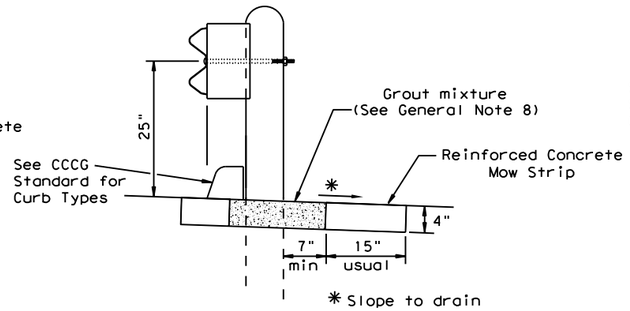
MOW STRIP DETAIL

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



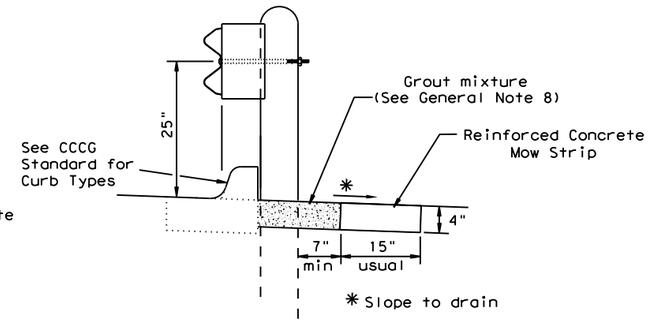
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

Note: Site Condition(s)

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

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

GENERAL NOTES

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

Texas Department of Transportation

Design Division Standard

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

GF(31)MS-19

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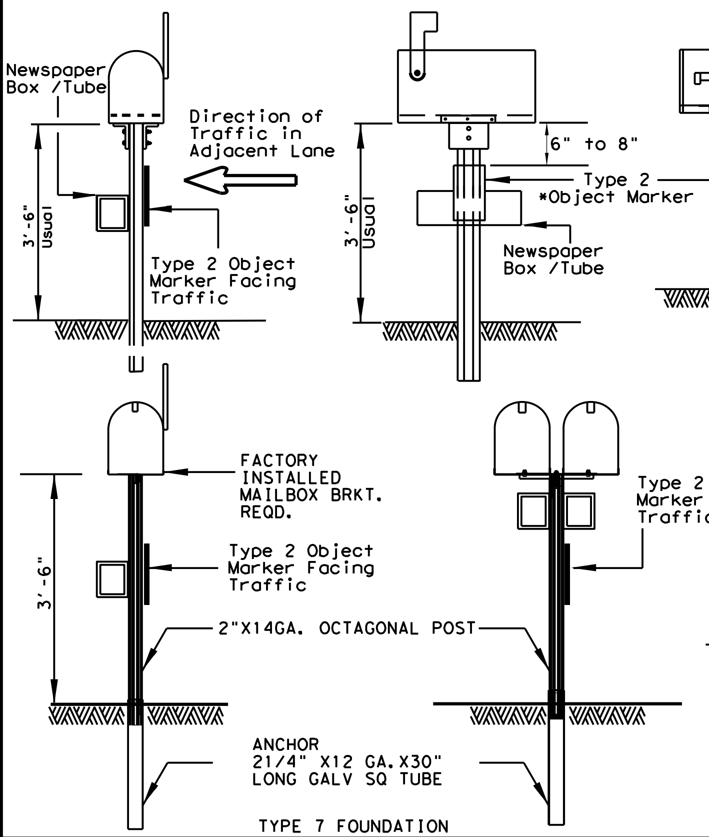
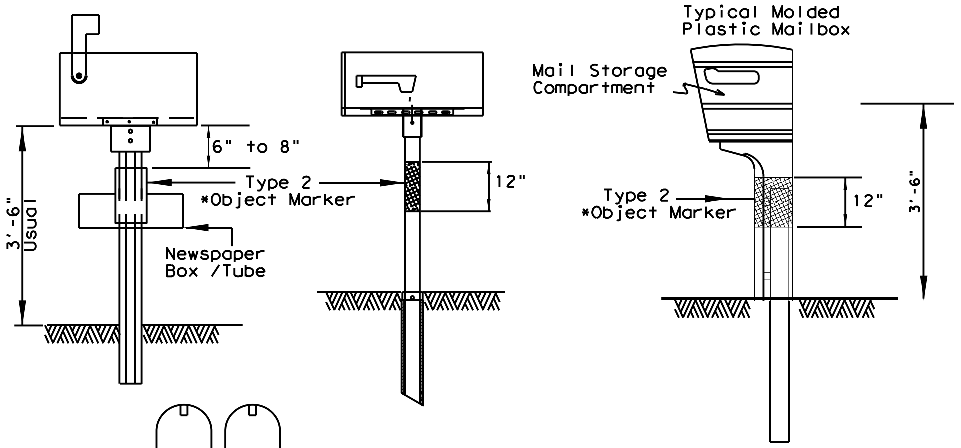




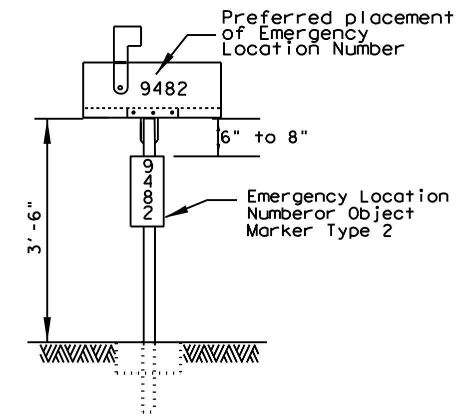
SINGLE AND DOUBLE MAILBOX MOUNT

FOR SUPPORT/FOUNDATION DETAILS SEE SHEET 3 OF 4

* Type 2 object marker in accordance with Traffic Engineering standard Delineators & Object Markers - Installation D&OM (1) or tube type post wrapped with 12 " Conformable Reflective Sheeting in accordance with DMS 8300 for tubular post needed to produce a smooth wrap around tube, DHT 161812 or 3 each of 3" x 4" Conformable Reflective Sheeting tabs (DHT 165382) or 1 each of 3" x 12" Reflective Sheeting.

Note: Mailbox installations in sidewalk areas shall be in accordance with the latest TxDOT Pedestrian Facilities Curb ramps standard *PED-XX for pedestrian facilities.

*PED-XX: XX is the standard year for example PED- 12 , PED-13,etc.



PLACEMENT OF EMERGENCY LOCATION NUMBER

Location Number shall be placed on: 1. A yellow, type A plate with class 1 flat surface reflective sheeting in accordance with DMS 8600. The color of numbers shall be black. or 2: A green or blue plate with white numbers attached to post beside the object marker. Other contrasting color configuration, as approved , may be used. (Use Same type plate as used for the type 2 Object Marker. Recommended sign size is 6" by 15")

TYPICAL MAILBOX SIZE				LIGHT WEIGHT MATERIAL	
				SHEET METAL	**PLASTIC
	LENGTH	WIDTH	HEIGHT	MAXIMUM WEIGHT	
SIZE	INCHES			POUNDS	
SMALL	19 1/2	6	7	5	5
MEDIUM	22 1/2	8	11 1/2	7	7
LARGE	23 1/2*	11 1/2*	13 1/2*	10	10

* Maximum allowed dimensions for mailbox
** Excluding Molded Plastic on 4 X 4 Post

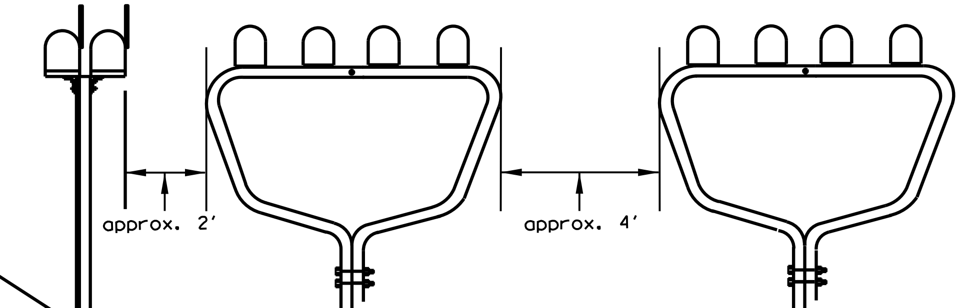
LOCKABLE ARCHITECTURAL MAILBOX SIZE (INCHES)					
VIEW	TOP	BOTTOM	FRONT SIDE	BACK SIDE	WEIGHT
SIDE	18	15	18.3	15	(POUNDS)
BACK	11 1/2	11 1/2		15	22.4

SEE TOP RIGHT CORNER OF SHEET 2 OF 4

MAILBOX SIZES

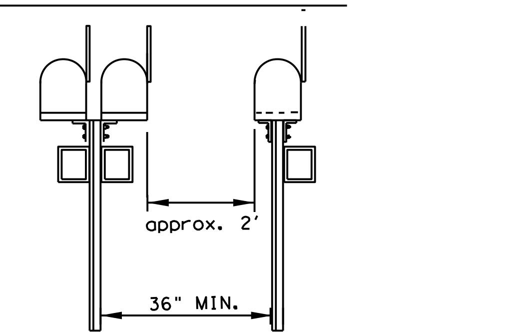
Mailboxes shall be made of light weight sheet metal or light weight plastic.
Lockable architectural mailboxes shall meet the requirements of the above table.

Heavy steel, cast iron or decorative mailboxes shall not be used on the state highway system.



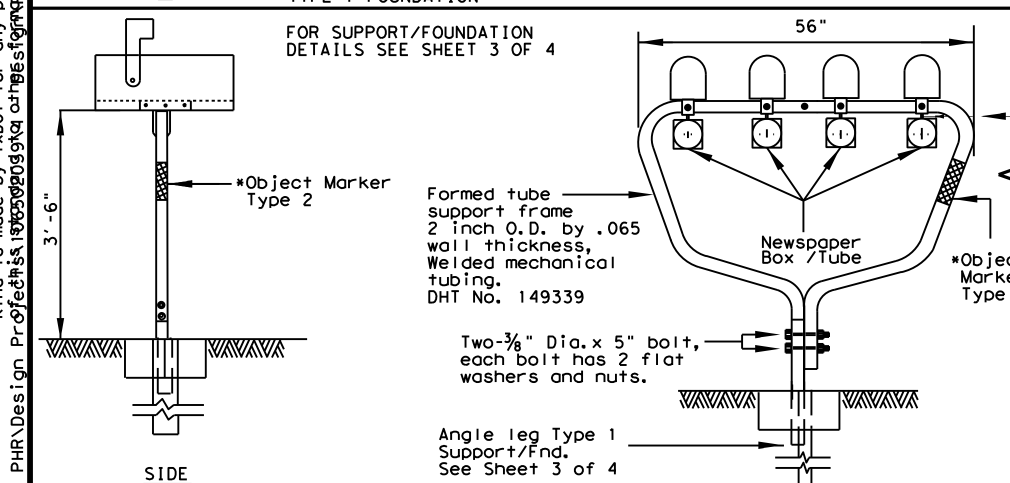
4' Clear Distance between multiple installations and 2' clearance between double or single installations and the multiple installation. DHT #'s 164116 or 149339.

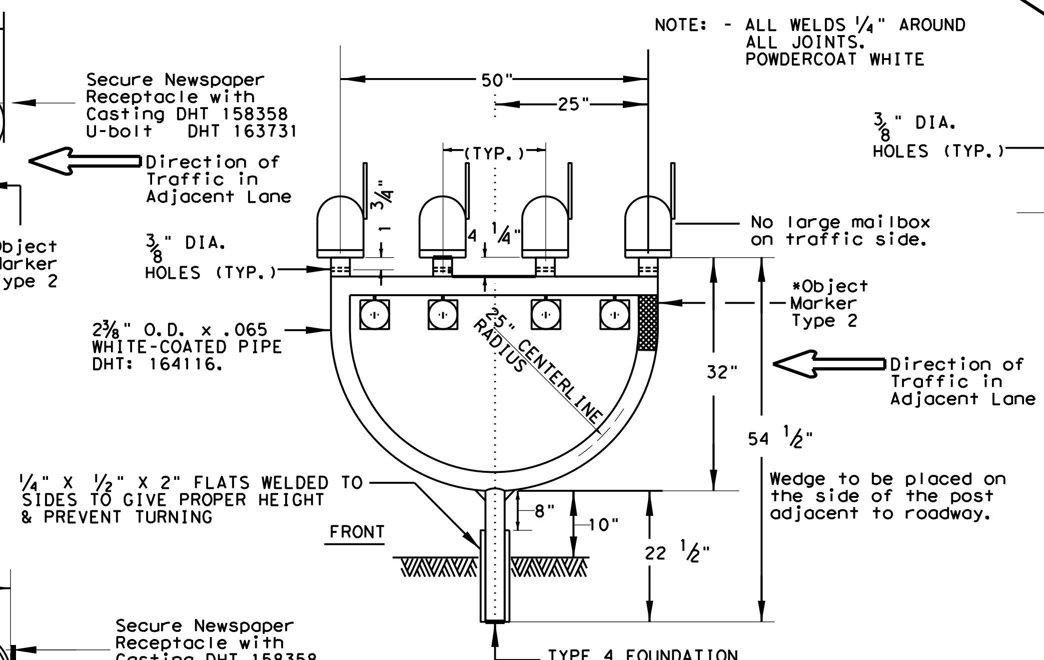
MULTIPLE MAILBOX PLACEMENT

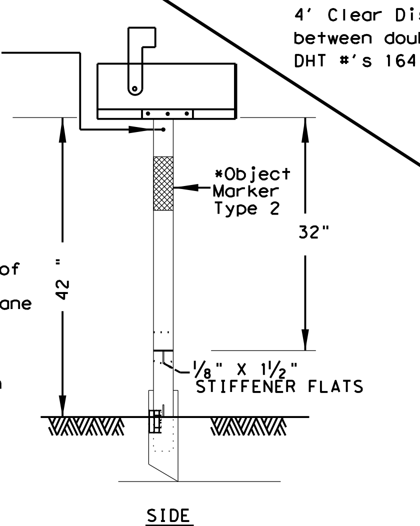


Clear Distance between single or double mounted posts. (Normally when 3 or more mailboxes are in one location, a multiple support is used).

SINGLE & DOUBLE MAILBOX PLACEMENT

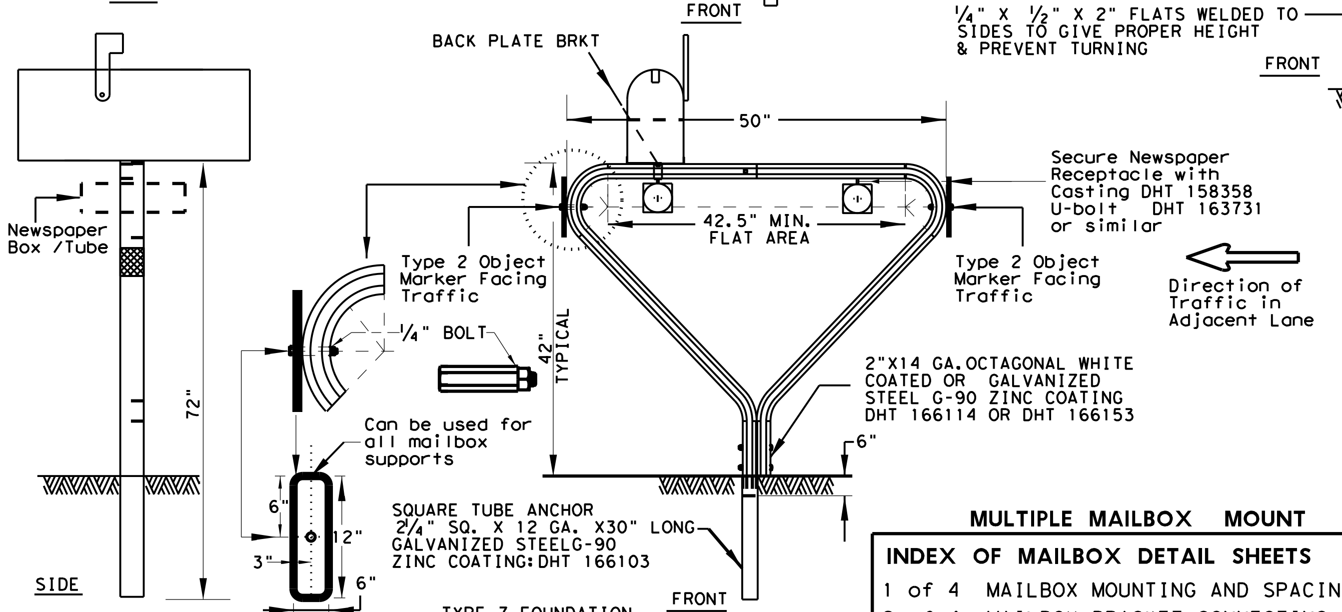






DOUBLE AND MULTIPLE MAILBOX MOUNT

FOR SUPPORT/FOUNDATION DETAILS SEE SHEET 3 OF 4
FOR DHT NUMBERS SEE SHEET 4 OF 4



MULTIPLE MAILBOX MOUNT

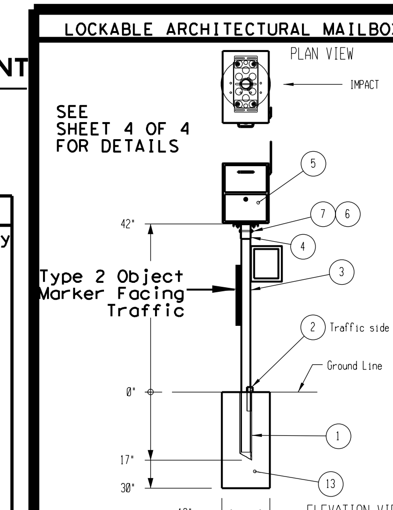
INDEX OF MAILBOX DETAIL SHEETS

NEWSPAPER RECEPTACLE

A light weight receptacle for newspaper delivery can be attached to mailbox posts as shown on this page if the receptacle:

- Does not touch the mailbox.
- Does not present a hazard to traffic or delivery of the mail.
- Does not extend beyond the front of the mailbox.
- Does not display advertising, except the publication title.
- Newspaper receptacles on separate supports are prohibited.

LOCKABLE ARCHITECTURAL MAILBOX



SHEET 1 OF 4

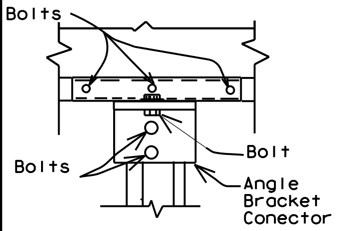
Texas Department of Transportation | Maintenance Division Standard

MAILBOX MOUNTING AND SPACING

MB-15(1)

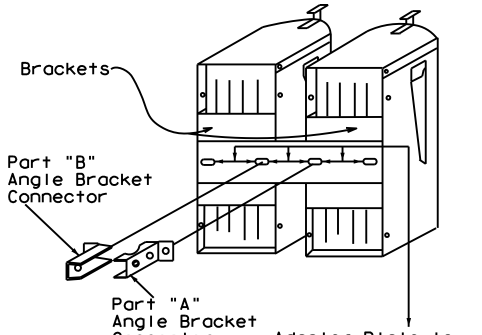
FILE: MB14(1).DGN	DN: JEO	CK: JEO	DW:	CK:
© TxDOT APRIL 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS: Added additional newspaper receptacle for double mailbox support	1065	02	039	FM 1846
	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	152

7/12/2021 3:59:48 PM
pw:\\txdot.projectwiseonline.com:TXDOT5\Documents\21 - PHR\Design Projects\...



For bolt sizes see details below for "SMALL MAILBOX" and "MEDIUM AND LARGE MAILBOXES"

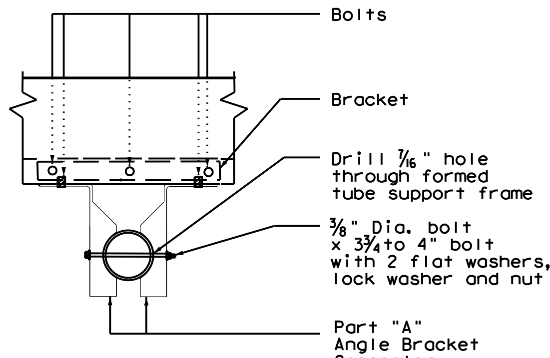
SINGLE MAILBOX



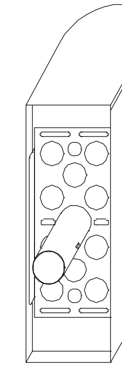
Adapter Plate to Bracket Attachment, 4 - 3/8" Dia. x 3/4" bolt; each bolt has 2 flat washers, lock washer and nut per each bolt

(Not permitted for Large Mailboxes)

DOUBLE MAILBOX

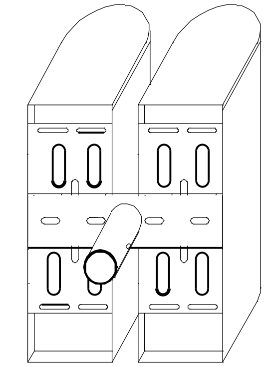


MULTIPLE MAILBOX



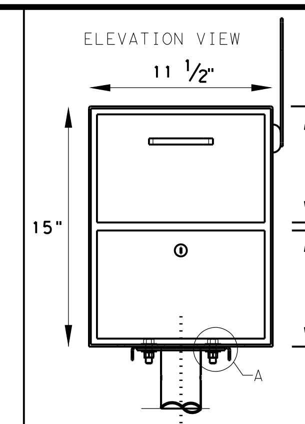
To be used with 2 3/8" OD RR or thinwall Steel posts.

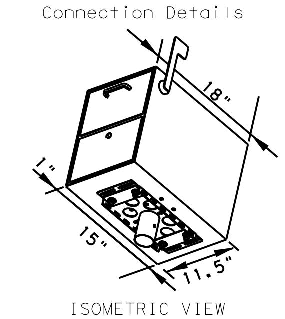
WELDED SINGLE MAILBOXBRACKET

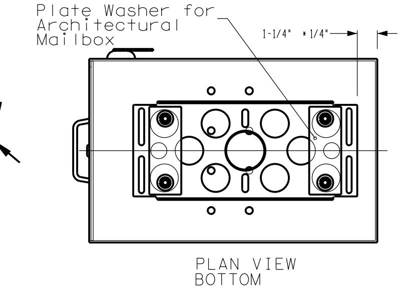


To be used with thinwall Steel posts. Not to be used with RR posts.

WELDED DOUBLE MAILBOX BRACKET WITHADAPTER PLATE







Preferred placement of Emergency Location Number

X~5.25" min; Y~5.75" min

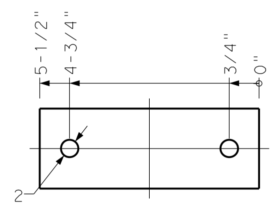
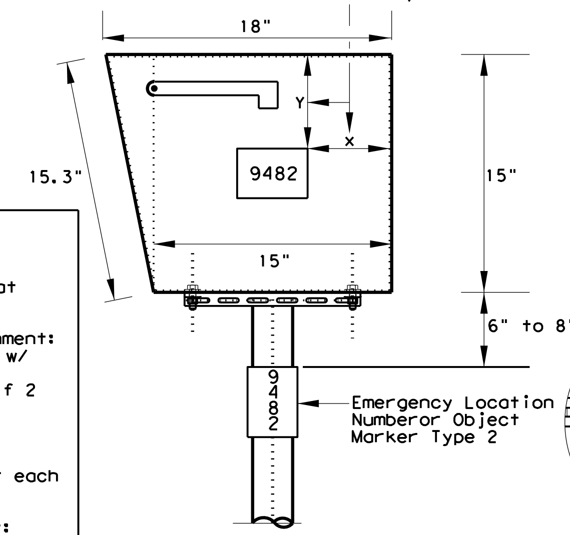
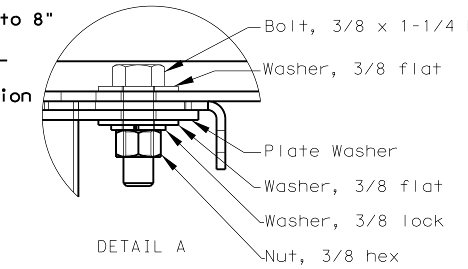
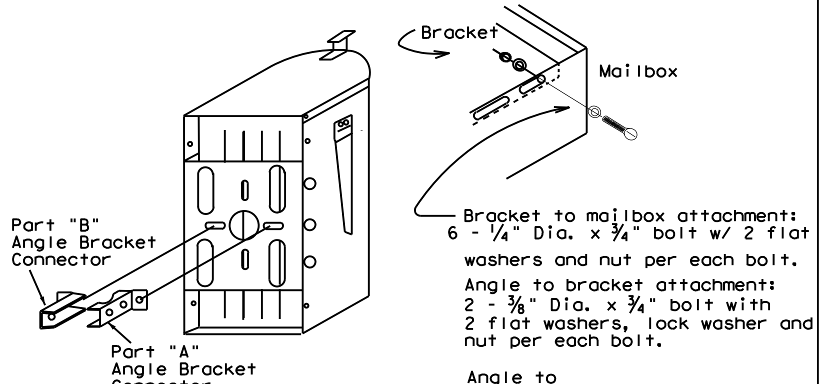


Plate Washer for Architectural Mailbox Plate, 2" x 1/8" ASTM A36 Steel





LOCKABLE ARCHITECTURAL MAILBOX CONNECTION DETAILS

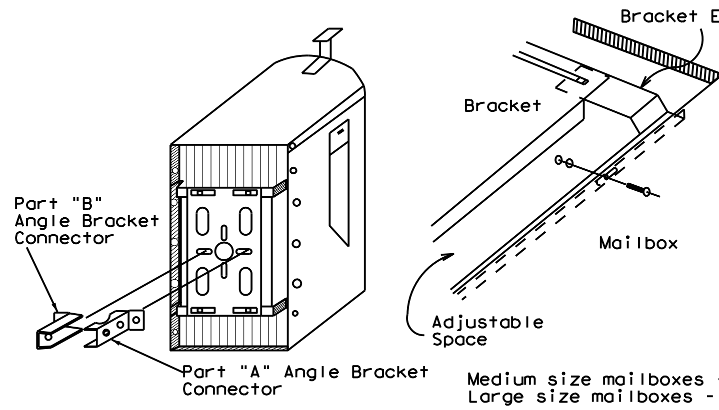


Bracket to mailbox attachment: 6 - 1/4" Dia. x 3/4" bolt w/ 2 flat washers and nut per each bolt.

Angle to bracket attachment: 2 - 3/8" Dia. x 3/4" bolt with 2 flat washers, lock washer and nut per each bolt.

Angle to 2 - 3/8" Dia. x 2 1/2" bolt with 2 flat washers, lock washer and nut per each bolt.

SMALL MAILBOX



Use both Parts "A" and "B" Angle Bracket Connectors for Winged Channel Posts

Bracket to mailbox attachment: 6 - 1/4" Dia. x 3/4" bolt w/2 flat washers and nut per each bolt.

Bracket to bracket extension attachment: 2 - 1/4" Dia. x 3/4" carriage bolt w/ flat washer, lock washer and nut per bolt (4 bolts required if 2 bracket extensions are used).

Angle to bracket attachment: 2 - 3/8" Dia. x 3/4" bolt w/2 flat washers, lock washer and nut per each bolt.

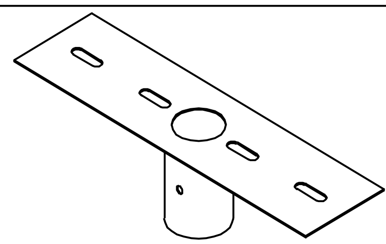
Angle to mailbox support attachment: 2 - 3/8" Dia. x 2 1/2" bolt w/2 flat washers, lock washer, and nut per each bolt.

Medium size mailboxes - one extension bracket
Large size mailboxes - two extension brackets

MEDIUM AND LARGE MAILBOXES

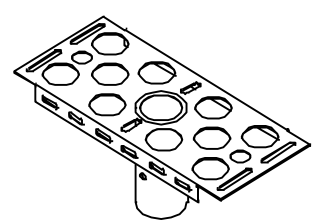
GENERAL NOTES

1. Connecting hardware detailed on this sheet is for the hardware that the Department stocks at the Regional Warehouses. This hardware is available to the contractor only when so stated elsewhere in the plans or specification.
2. Hardware for mounting mailboxes to the support/foundation furnished by industry should be used when shown on the Maintenance Divisions "Approved Products List." Only mailbox hardware that have been crash tested in accordance with NCHRP Report 350, will be on the approved list.
3. Hardware furnished by industry shall be erected in accordance with the manufacturer's recommendation.
4. Bracket and bracket extension shall be constructed of 14 gauge galvanized steel sheet metal.
5. The angles, brackets and adapter plates shall be constructed of 12 gauge galvanized steel sheet metal.
6. Items with evidence of damage to the galvanized coating or wet storage stains (white rust) will not be accepted.



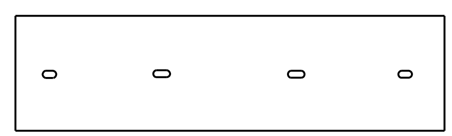
DHT 162323

For use with galvanized thinwall steel posts DHT # 143426 or powder-coated thinwall steel post DHT # 162911.



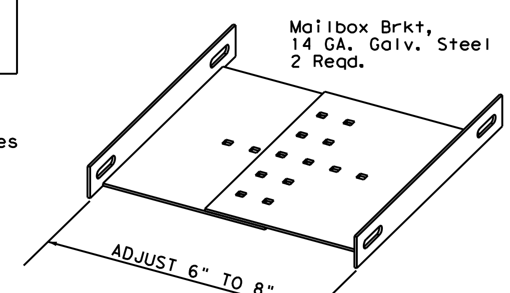
DHT 161443

For use with RCR post DHT # 161442 or galvanized thinwall steel post DHT # 143426 or powder-coated thinwall steel post. DHT # 162911.

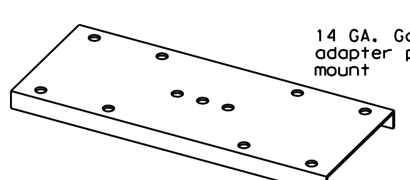


DHT #3789

Used for mounting two Mailboxes on the same post.



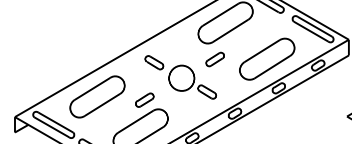
DHT 166105



DHT 166108

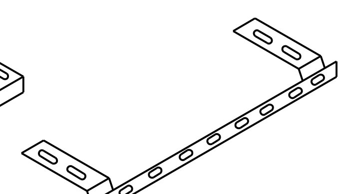
HARDWARE AT TXDOT REGIONAL WAREHOUSES

Brackets and adapter plate shown in this section should be available to the Contractor when stated elsewhere in plans or specifications.



DHT 148939

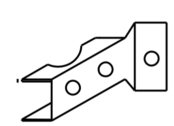
Mailbox Bracket



DHT 148938

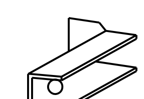
Used for extending 6" wide bracket to attach larger mailboxes.

Bracket Extension



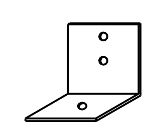
DHT 159489

Part "A" Angle Bracket Connector



DHT 159490

Part "B" Angle Bracket Connector



DHT 2917

Angle Bracket For Temporary Mailbox

See Table of Applicable DHT Numbers on sheet 4 of 4 for DHT description and unit of measure.

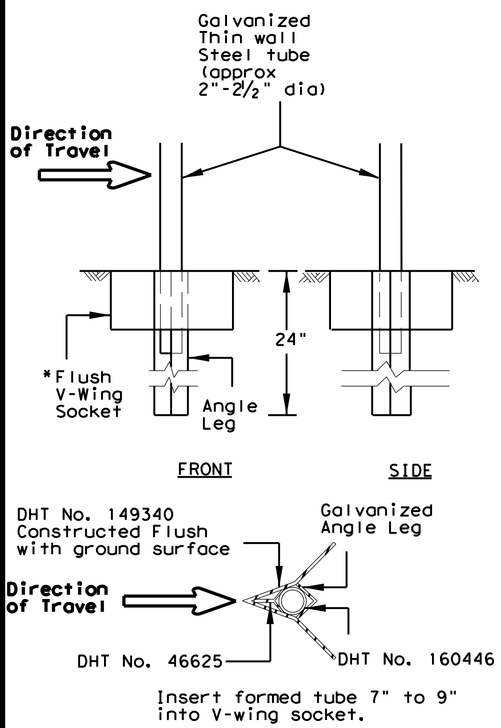
SHEET 2 OF 4

Texas Department of Transportation — Maintenance Division Standard

MAILBOX BRACKET CONNECTING DETAILS

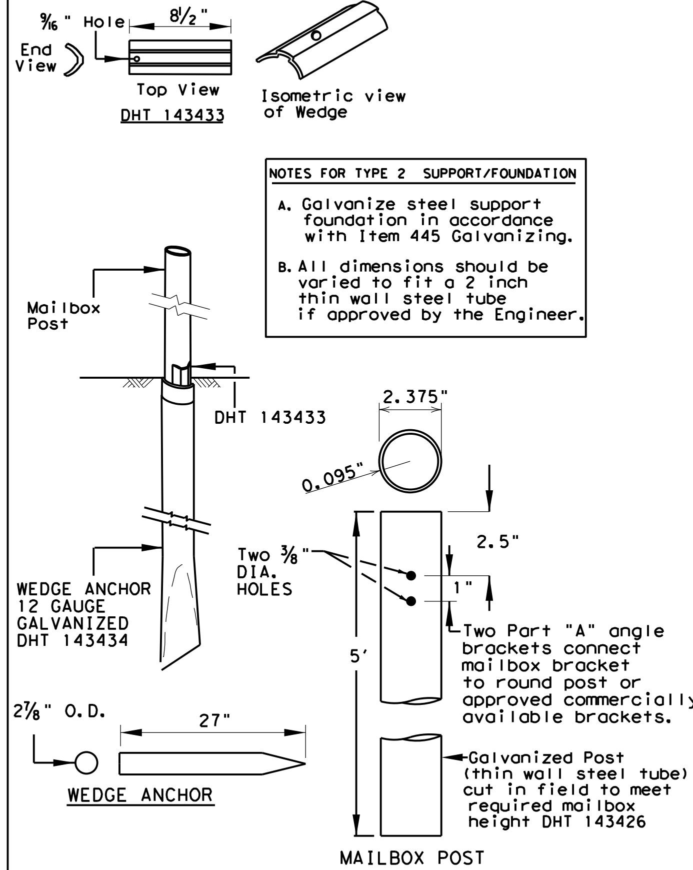
MB-15(1)

FILE: MB14(1).DGN	DN: JEO	CK:	DW: JEO	CK:
© TxDOT APRIL 2015	CONT 1065	SECT 02	JOB 039	HIGHWAY FM 1846
REVISIONS: ADDED DHT 163730	DIST PHR		COUNTY CAMERON	SHEET NO. 153



TYPE 1 SUPPORT/FOUNDATION

THIN WALL STEEL TUBE w/ V-LOC ANCHORAGE



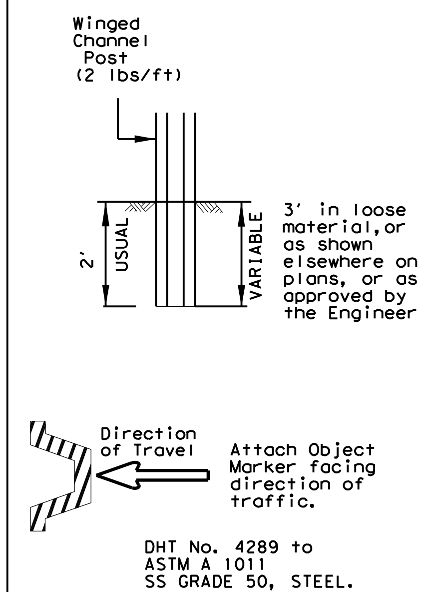
NOTES FOR TYPE 2 SUPPORT/FOUNDATION

A. Galvanize steel support foundation in accordance with Item 445 Galvanizing.

B. All dimensions should be varied to fit a 2 inch thin wall steel tube if approved by the Engineer.

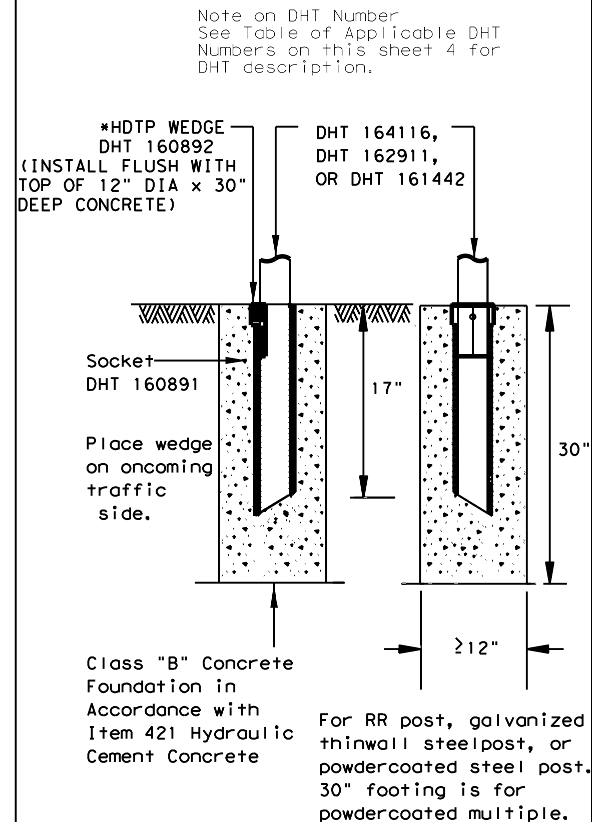
TYPE 2 SUPPORT/FOUNDATION

THIN WALL STEEL TUBE w/ WEDGE ANCHOR SYSTEM



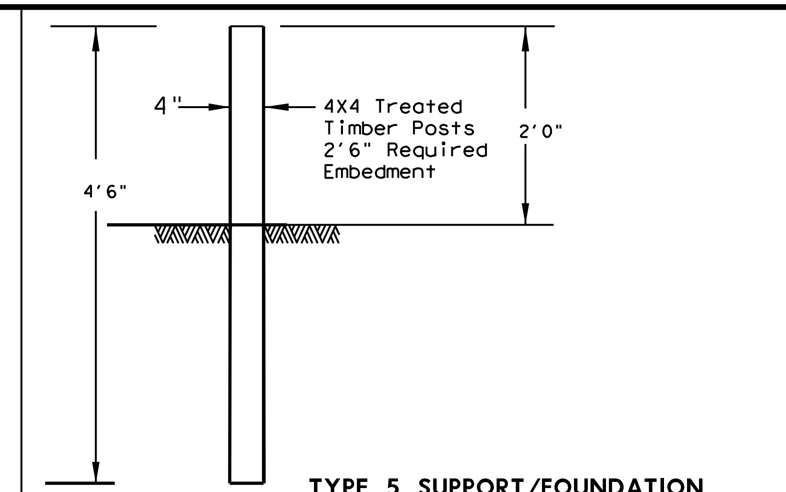
TYPE 3 SUPPORT/FOUNDATION

WINGED CHANNEL POST



TYPE 4 SUPPORT/FOUNDATION

FOR WHITECOATED STEEL POST, MULTIPLE POST, AND RECYCLED RUBBER.

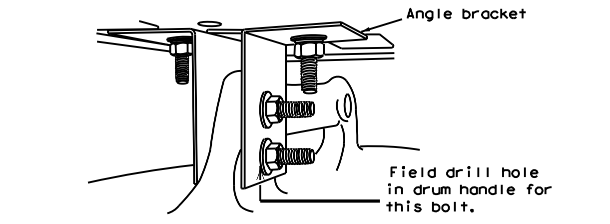


TYPE 5 SUPPORT/FOUNDATION

FOR ONE PIECE MOLDED PLASTIC MAILBOX

ONE PIECE MOLDED PLASTIC MAILBOXES

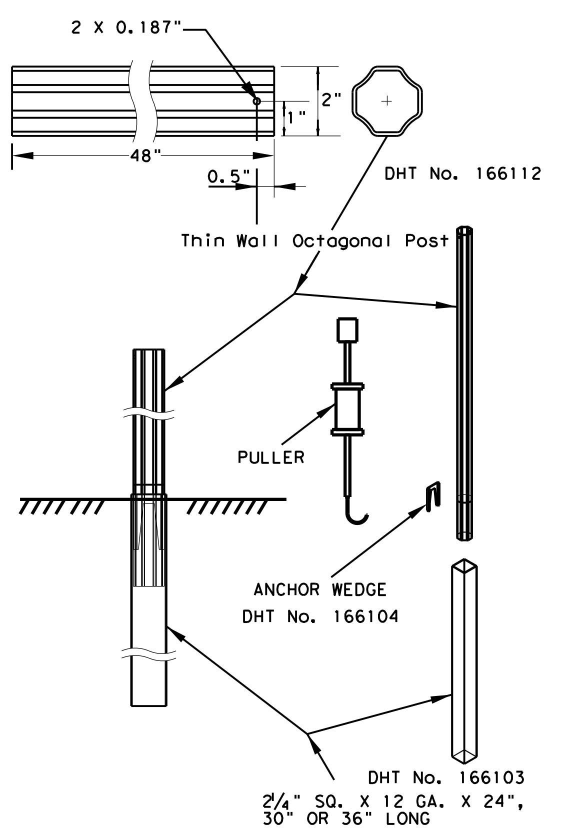
Molded Plastic Mailboxes shall be installed on 4"x4" treated timber posts only. The use of steel pipe or structural tubing in place of timber post is prohibited.



Placed on approved plastic drum as shown in the Compliant Work Zone Traffic Control Devices (CWZTCD).
Existing attachment hardware shall be used unless damaged. Damaged hardware shall be replaced.

TYPE 6 TEMPORARY MAILBOX SUPPORT

CONNECTION DETAIL



TYPE 7 MAILBOX SUPPORT/FOUNDATION

CONNECTION DETAIL

MB-(X) ASSM TY (XXX) (X) (XX) (OPTIONAL)

Type of Mailbox
- S = Single
- D = Double
- M = Multiple
- SP = Single 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
- Ty 7 = Wedge Anchor

Type of Bracket
- AB = Angle Bracket.
- TB = 2.375" Tube Bracket

GENERAL NOTES

1. Erect post plumb or vertical.
2. When galvanized part is required galvanize in accordance with Item 445.
3. type 1, 2, 3, 4 or 7 supports or foundation can be used for single or double mailbox installations. The RCR post should be used only for a single installation with a small mailbox. The Type 5 support/foundation is used for the single molded plastic mailbox. The Type 4 support/foundation is used for the 2.375" O.D. RR post, thin wall steel post, and white multiple mailbox post.
4. The Type 1 or type 7 support/foundation can be used for a multiple mailbox mount.
5. The Type 4 support should be used with thin wall steel pipe for the medium, large and double mailbox installations.
6. 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.

DOUBLE AND LARGE MAILBOXES MUST BE ON STEEL POST.

*HDTP: High density thermoplastic polyesters

Texas Department of Transportation

Maintenance Division Standard

MAILBOX SUPPORT AND FOUNDATION

MB-15(1)

FILE: MB14(1).DGN	DN: JEO	CK:	DW: JEO	CK:
©TxDOT APRIL 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	1065	02	039	FM 1846
	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	154

LOCKABLE ARCHITECTURAL MAILBOX

#	PART NAME	PART/DHT #	QTY
	SINGLE-MOUNT INSTALLATION PARTS		
1	SOCKET, TYPE 4 FOUNDATION	160891	1
2	WEDGE FOR TYPE 4 FOUNDATION	160892	1
3	THIN-WALL WHITE STEEL TUBE 2.375 OD	162911	1
4	BRACKET FOR ATTACHING MAILBOX	161443	1
5	ARCHITECTURAL MAILBOX	SEE NOTE	1
6	NUT, 5/16" HEX	NUT, 5/16" HEX	1
7	BOLT, 5/16 X 3 HEX	GRADE 5	1
8	PLATE WASHER FOR ARCHITECTURAL MAILBOX	SEE SEE SHEET 2	2
9	WASHER, 3/8 FLAT		8
10	WASHER, 3/8 LOCK		4
11	NUT, 3/8 HEX		4
12	BOLT, 3/8 X 1-1/4 HEX	GRADE 5	4
13	CONCRETE, CLASS B (2000 PSI)		1

LOCKABLE ARCHITECTURAL MAILBOX DETAILS

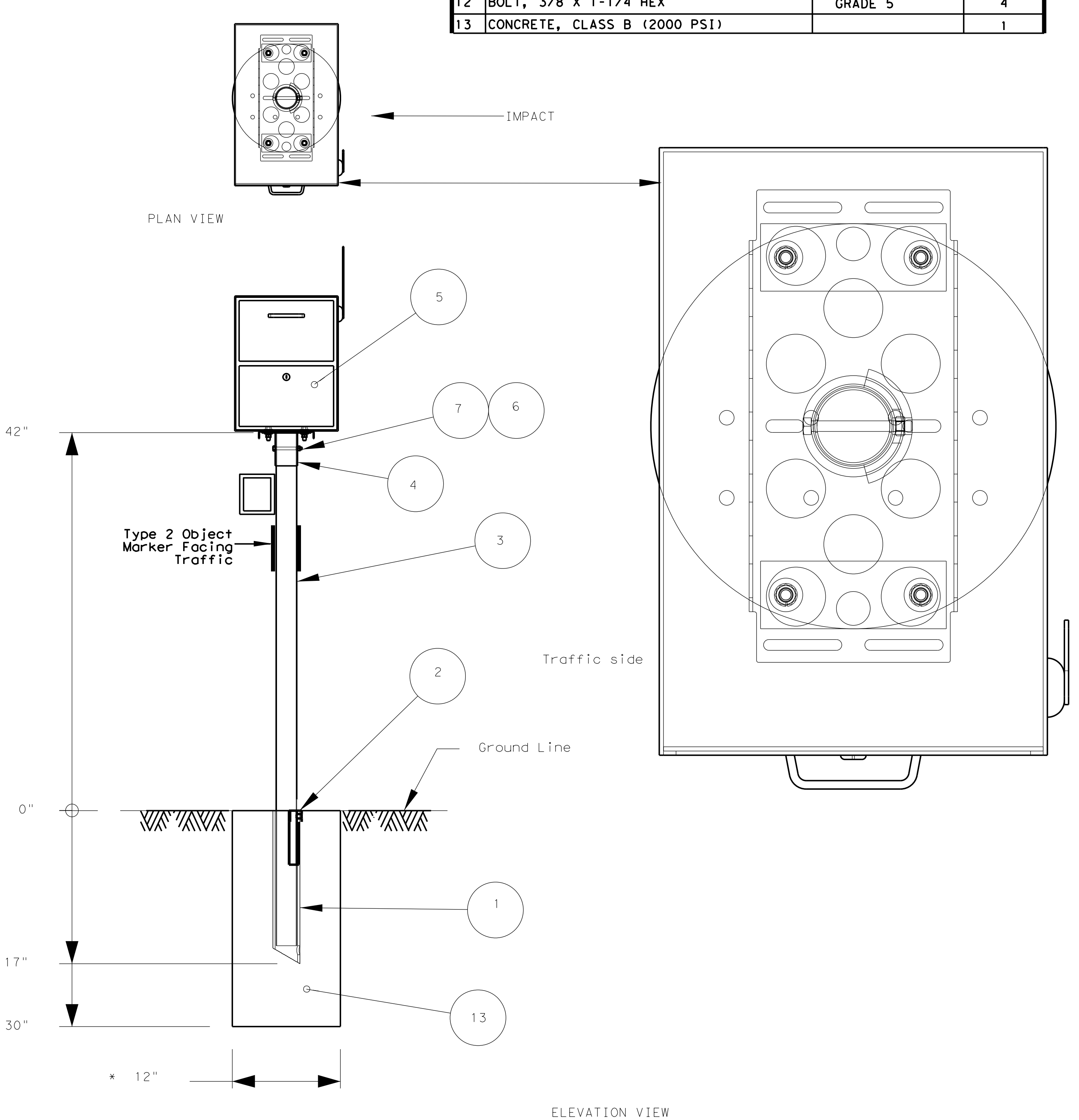


TABLE OF APPLICABLE DHT NUMBERS

DHT NUMBER	DESCRIPTION
	FOUNDATIONS
46625	WEDGE FOR V-WING SOCKET FOR TYPE 1 FOUNDATION
149340	V-WING SOCKET FOR TYPE 1 FOUNDATION
143433	WEDGE FOR TYPE 2 FOUNDATION
143434	ANCHOR FOR TYPE 2 FOUNDATION
166103	ANCHOR FOR TYPE 7 FOUNDATION
160891	SOCKET FOR TYPE 4 FOUNDATION
160892	WEDGE FOR TYPE 4 FOUNDATION
166104	WEDGE FOR TYPE 7 FOUNDATION
	POSTS
4289	WINGED CHANNEL MAILBOX POST
149339	MULTIPLE MAILBOX POST (GALVANIZED TUBING)
164116	MULTIPLE MAILBOX POST (WHITE COATED)
166114	MULTIPLE MAILBOX POST (WHITE COATED OCTAGONAL)
166153	MULTIPLE MAILBOX POST (GALVANIZED OCTAGONAL)
161442	RECYCLED RUBBER POST. FOR SMALL MAILBOX ONLY
143426	THIN-WALL GALVANIZED STEEL TUBE 2.375" OUTER DIAMETER
162911	THINWALL WHITE STEEL TUBE 2.375" OUTER DIAMETER
166152	SINGLE OR DOUBLE THIN-WALL MAILBOX POST GALVANIZED 2" OCTAGONAL
166112	SINGLE OR DOUBLE THIN-WALL MAILBOX POST WHITECOATED 2" OCTAGONAL
	REFLECTIVE SHEETING
161812	REFLECTIVE SHEETING FOR EMERGENCY LOCATION NUMBER PANEL
	CONNECTING HARDWARE
2917	ANGLE BRACKET USED FOR TEMPORARY MAILBOX SUPPORT
166105	BRACKET FOR SINGLE MOUNTING OF MAILBOXES (MOUNTING KIT)
3789	PLATE FOR DOUBLE MOUNTING OF MAILBOXES
166108	BRACKET FOR DOUBLE MOUNTING OF MAILBOXES (MOUNTING KIT)
166111	BRACKET FOR MULTIPLE MOUNTING OF MAILBOXES (MOUNTING KIT)
148939	BRACKET FOR ATTACHING SMALL OR MEDIUM SIZE MAIL BOX
148938	EXTENDER TO BRACKET FOR ATTACHING LARGE MAILBOX
159489	ANGLE BRACKET PART A
159490	ANGLE BRACKET PART B
162323	BRACKET FOR DOUBLE MOUNTING OF MAILBOXES ON THINWALL STEEL POST, GALVANIZED OR POWDERCOATED.
161443	BRACKET FOR ATTACHING MAILBOX TO RECYCLED RUBBER POST AND TO MULTIPLE WHITE MAILBOX POST
158358	CASTING (NEWSPAPER RECEPTACLE BRACKET)
163731	U-BOLT (NEWSPAPER RECEPTACLE BRACKET)
160698	BOLT;HEX HEAD, GALV;3/8"DIA X 3/4"L HD, W/2-FLAT WASHERS
163750	BOLT;HEX HEAD, GALV;3/8" X 1-1/2, 16 NC, W/WASHERS
160701	BOLT;HEX HEAD, GALV;3/8"DIA X 2-1/2"L, HD, W/2-FLAT WASHERS
163730	BOLT;HEX HEAD, GALV;3/8" X 3-1/2", NC, W/NUT, 2 FLAT WASHERS
160699	BOLT;HEX HEAD, GALV;3/8"DIA X 3-3/4"L HD, W/2-FLAT WASHERS
160700	BOLT;HEX HEAD, GALV;3/8"DIA X 4"L HD, W/2-FLAT WASHERS

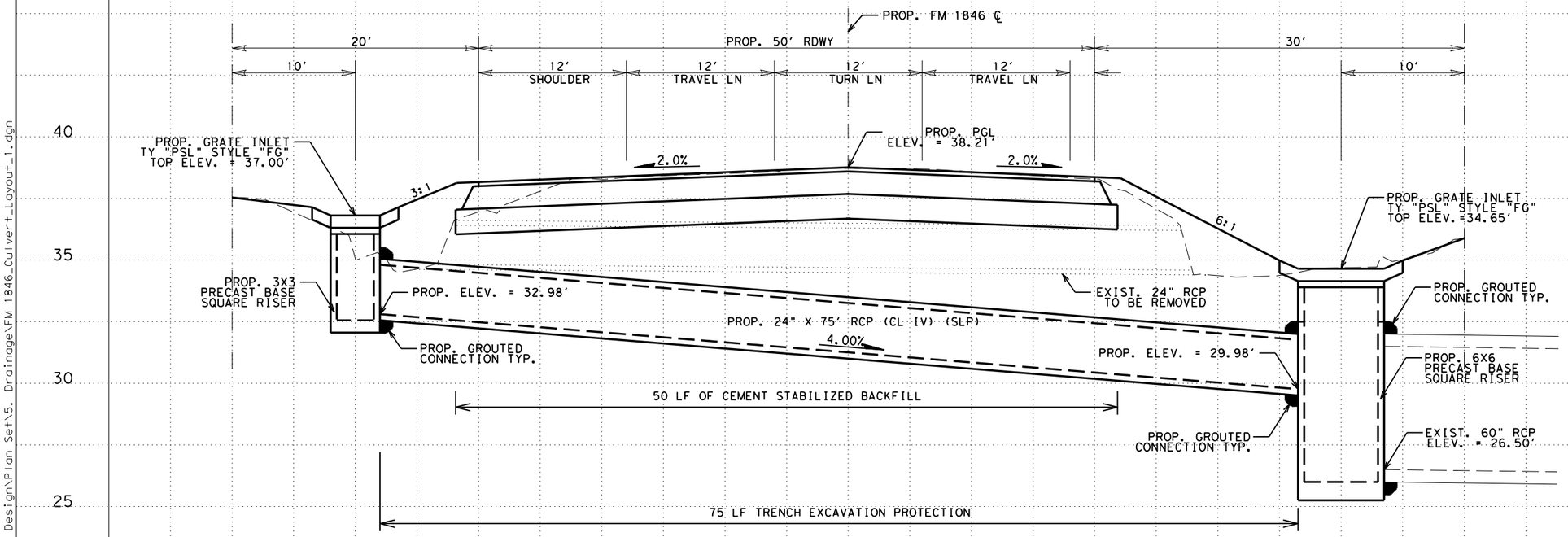
SHEET 4 OF 4

Texas Department of Transportation — Maintenance Division Standard

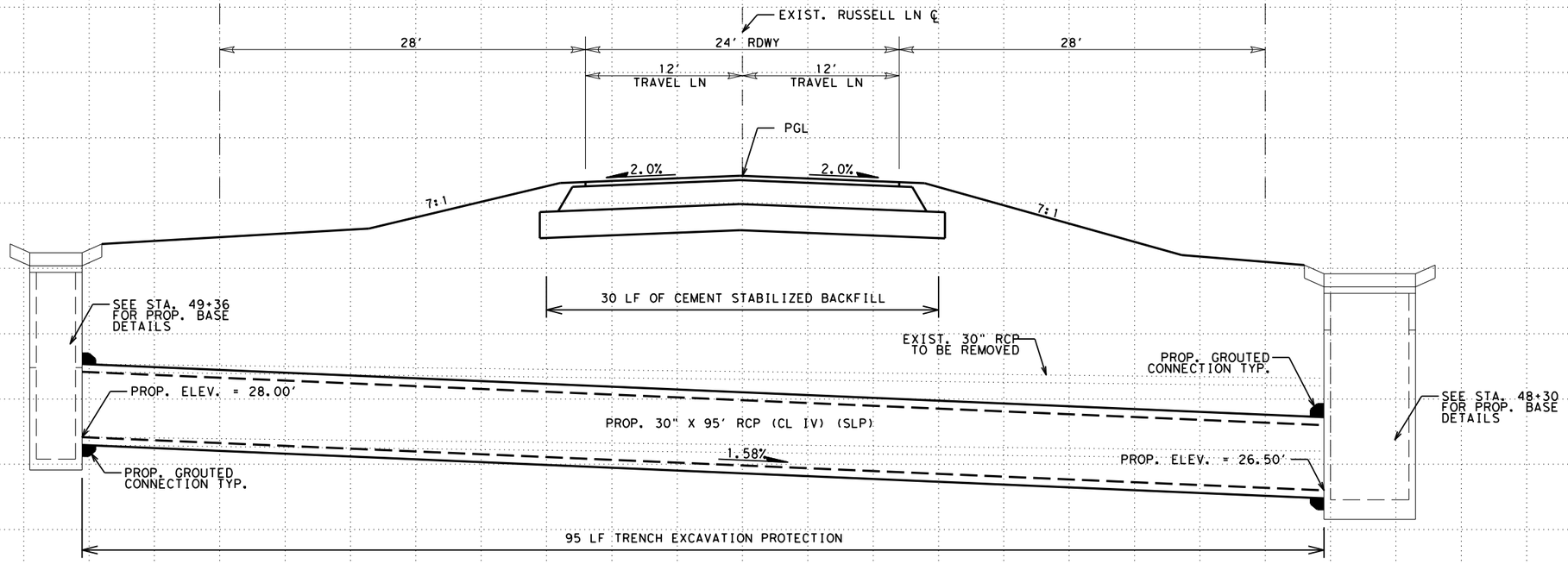
DHT NUMBERS TABLE

MB-15(1)

FILE: MB14(1).DGN	DN:	CK:	DW:	CK:
©TxDOT APRIL 2015	CONT 1065	SECT 02	JOB 039	HIGHWAY FM 1846
REVISIONS	DIST PHR	COUNTY CAMERON		SHEET NO. 155



STA. 48+30



CULVERT CROSSING RUSSELL LN

LEGEND

⇦	DIRECTION OF TRAFFIC FLOW
EXIST.	EXISTING
PROP.	PROPOSED
N.G.	NATURAL GROUND
SHLDR.	SHOULDER
CONC.	CONCRETE
RDWY.	ROADWAY
ELEV.	ELEVATION
ROW	RIGHT OF WAY
EOP	EDGE OF PAVEMENT
SET	SAFETY END TREATMENT
TYP.	TYPICAL
TY	TYPE
LF	LINEAR FOOT
FL.	FLOW LINE

NOTES:

1. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL UTILITIES PRIOR TO ANY EXCAVATION.

2. 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.

3. THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CASUED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED PROFESSIONAL ENGINEER

09/02/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 CROSS CULVERT DETAIL SHEET

V: 1" = 5'
H: 1" = 10'

SHEET 1 OF 3

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		156

DATE: 9/2/2021 11:39:06 AM
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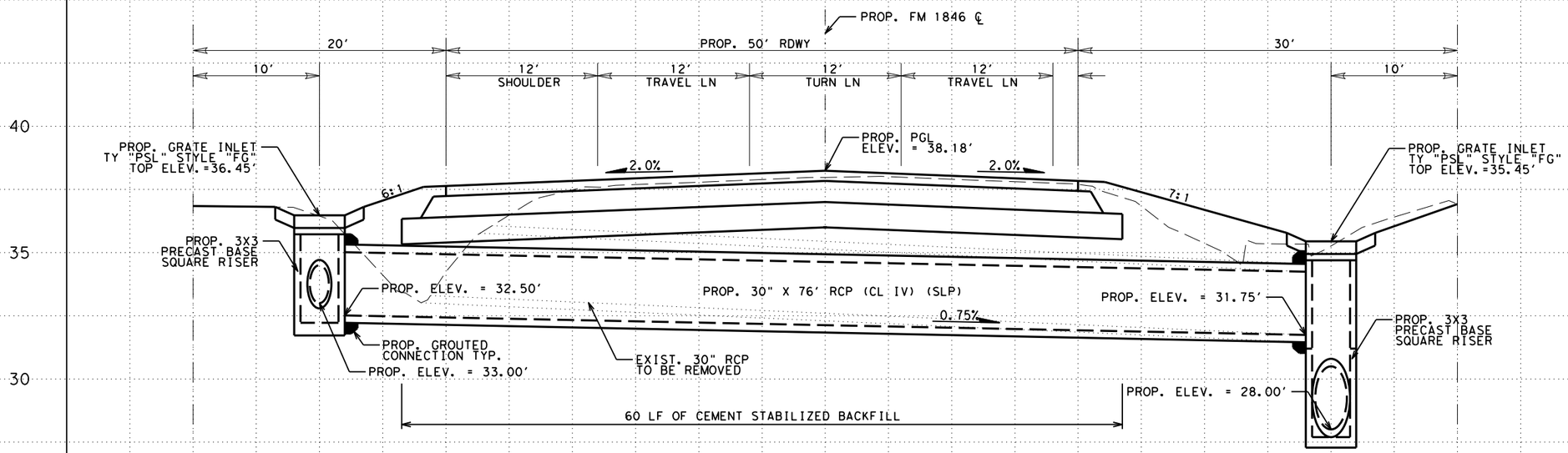
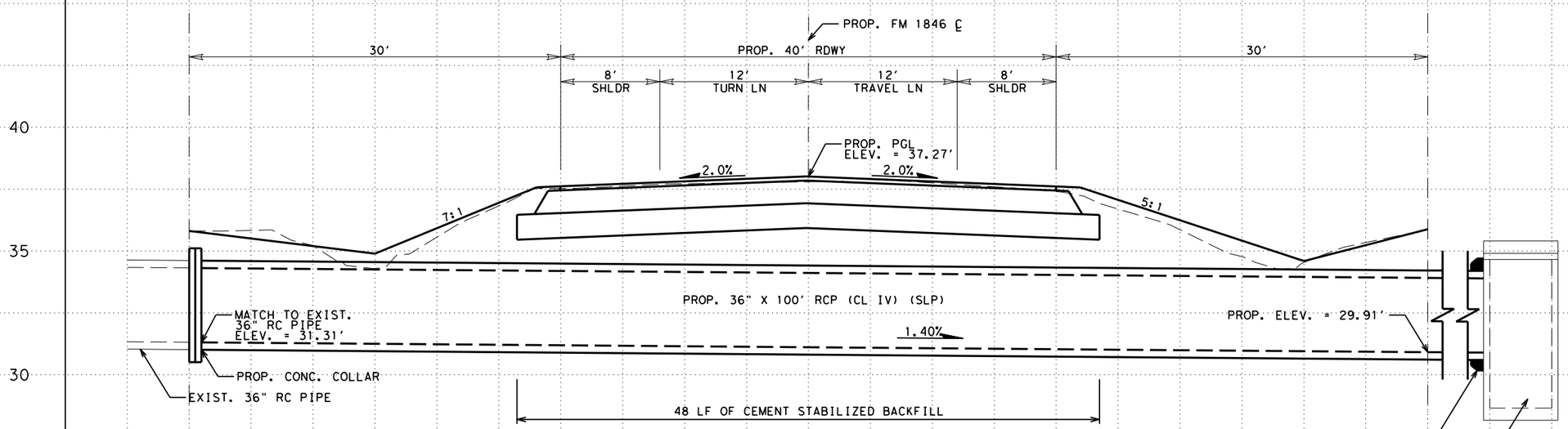


STA. 49+36



STA. 74+85

LEGEND

⟸	DIRECTION OF TRAFFIC FLOW
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PROP.	PROPOSED
N.G.	NATURAL GROUND
SHLDR.	SHOULDER
CONC.	CONCRETE
RDWY.	ROADWAY
ELEV.	ELEVATION
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EOP	EDGE OF PAVEMENT
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TYP.	TYPICAL
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FM 1846 CROSS CULVERT DETAIL SHEET

V: 1" = 5'
H: 1" = 10'

SHEET 2 OF 3

CONT	SECT	JOB	HIGHWAY
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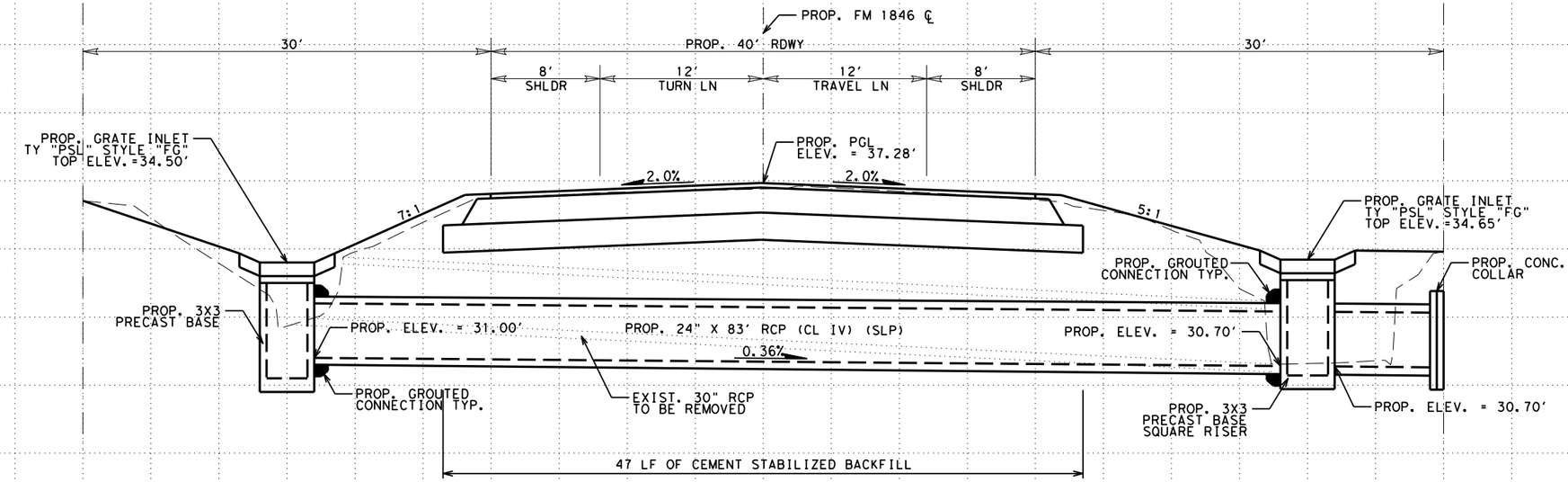

STA. 75+06

LEGEND

⟸	DIRECTION OF TRAFFIC FLOW
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PROP.	PROPOSED
N.G.	NATURAL GROUND
SHLDR.	SHOULDER
CONC.	CONCRETE
RDWY.	ROADWAY
ELEV.	ELEVATION
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EOP	EDGE OF PAVEMENT
SET	SAFETY END TREATMENT
TYP.	TYPICAL
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STATE OF TEXAS
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LICENSED
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09/02/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 CROSS CULVERT DETAIL SHEET

V: 1" = 5'
H: 1" = 10'

SHEET 3 OF 3

CONT	SECT	JOB	HIGHWAY
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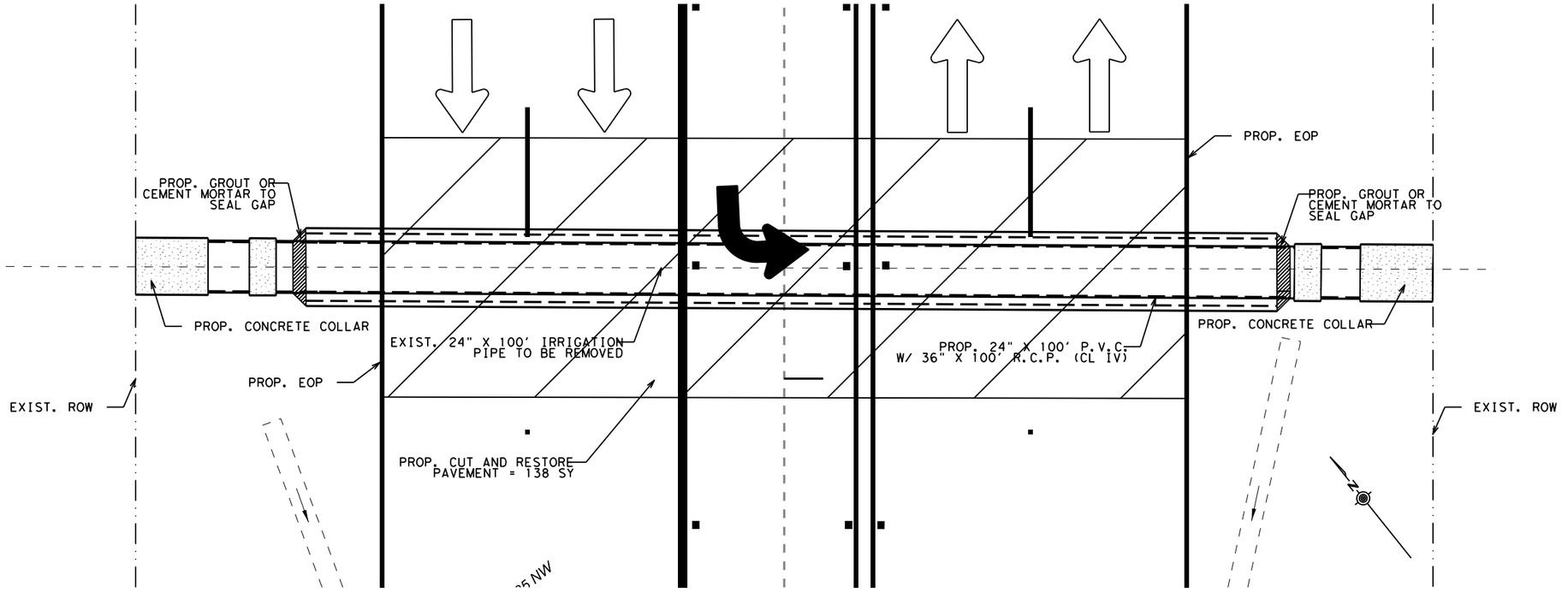

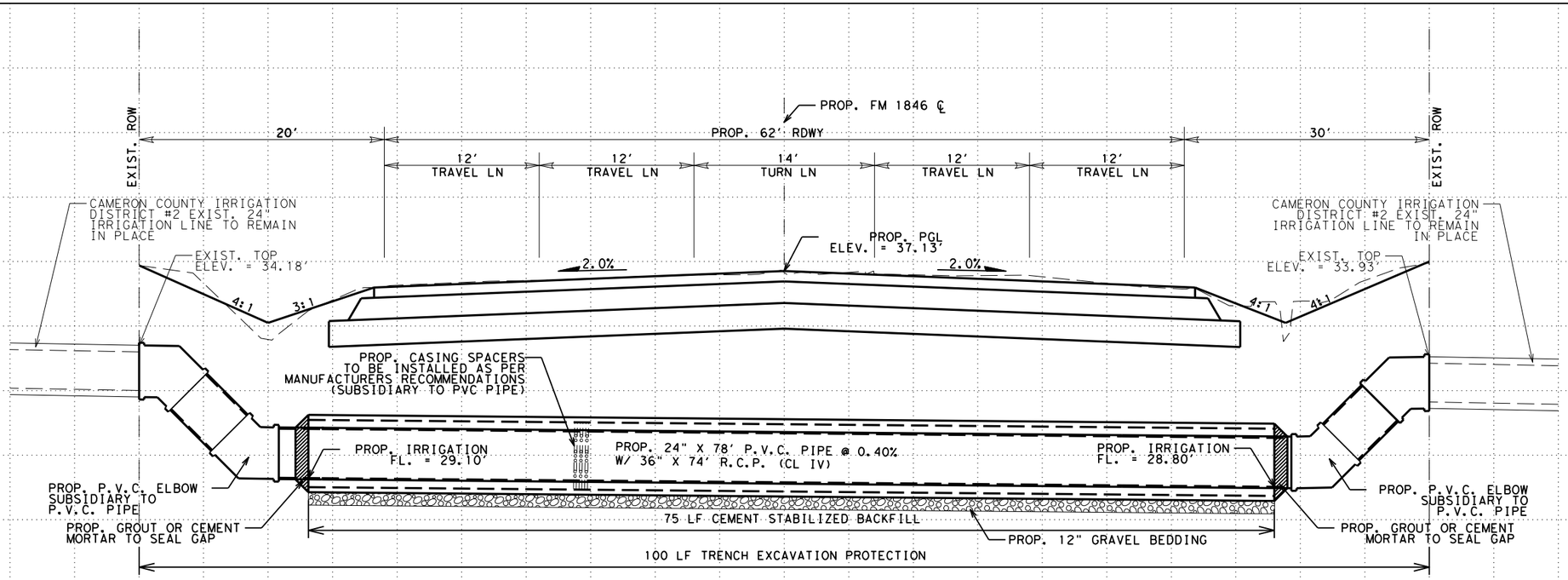

STA. 22+08

LEGEND

⇐	DIRECTION OF TRAFFIC FLOW
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SHLDR.	SHOULDER
CONC.	CONCRETE
RDWY.	ROADWAY
ELEV.	ELEVATION
ROW	RIGHT OF WAY
EOP	EDGE OF PAVEMENT
SET	SAFETY END TREATMENT
LF	LINEAR FOOT
FL.	FLOW LINE

NOTE:

ALL STATIONS ARE BASED ON FM 1846 ALIGNMENT.

ALL UTILITIES ARE SHOWN FOR INFORMATION PURPOSES ONLY AND SHALL BE THE REPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH UTILITY COMPANIES TO VERIFY INFORMATION.

SPACERS WITHIN THE PROPOSED PRESSURED IRRIGATION PVC PIPE AND RCP SHALL BE SUBSIDIARY TO PERTINENT BID ITEMS. SPACING SHALL BE AS PER MANUFACTURERS RECOMMENDATION.

CONTRACTOR TO COORDINATE WITH CAMERON COUNTY IRRIGATION DISTRICT #2 GENERAL MANAGER PRIOR TO ANY DRAINAGE OR IRRIGATION STRUCTURE IMPROVEMENTS. SEE TCP GENERAL NOTES FOR MORE DETAILS.

STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER

09/02/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 IRRIGATION CROSSING

V: 1" = 5'
H: 1" = 10'

SHEET 1 OF 3

© 2021	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
DW: CK:	PHR	CAMERON		159

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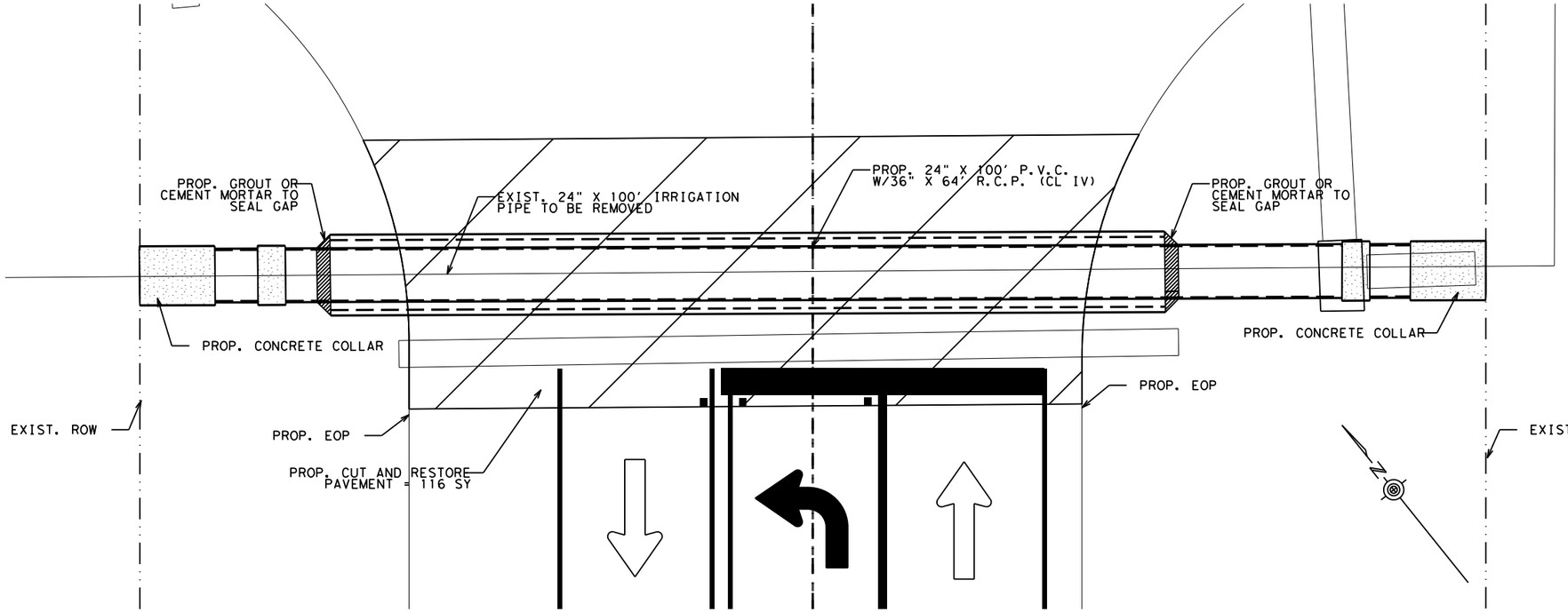

LEGEND

⇐	DIRECTION OF TRAFFIC FLOW
EXIST.	EXISTING
PROP.	PROPOSED
N.G.	NATURAL GROUND
SHLDR.	SHOULDER
CONC.	CONCRETE
RDWY.	ROADWAY
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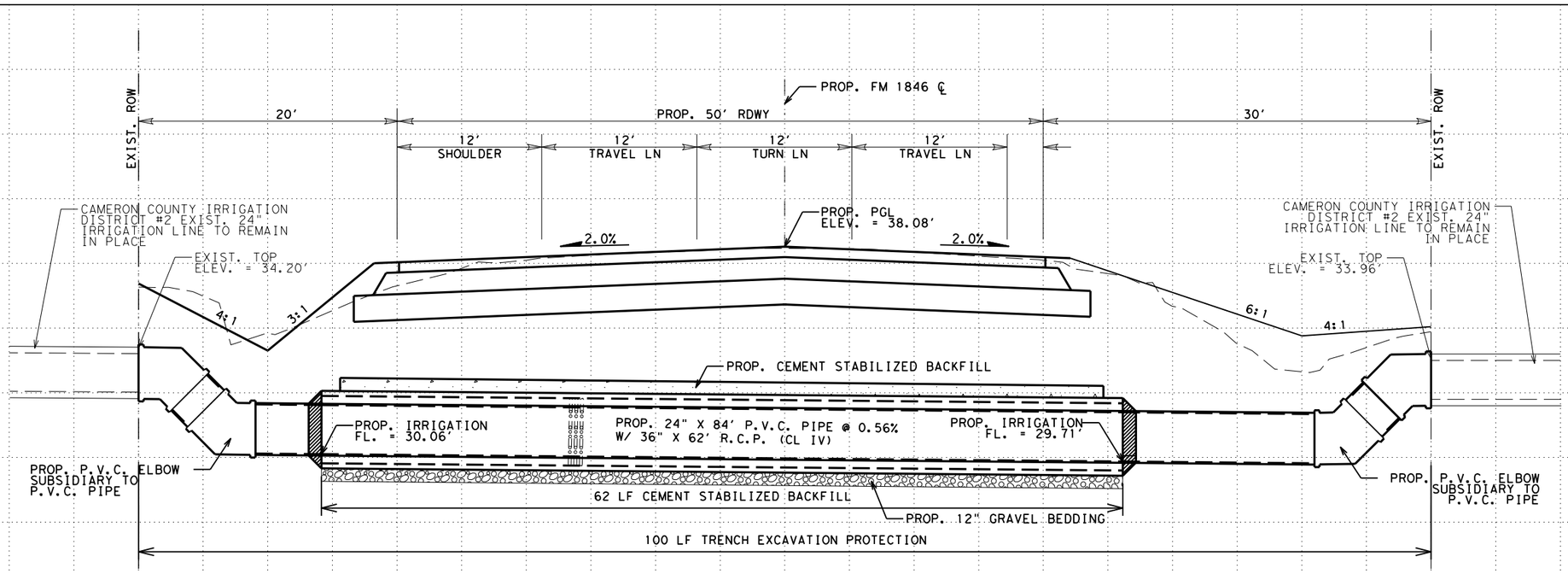

STA. 48+39

STATE OF TEXAS
ABEL MARROQUIN III
134752
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09/02/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 IRRIGATION CROSSING

V: 1" = 5'
H: 1" = 10'

SHEET 2 OF 3

DS:	CK:	CONT	SECT	JOB	HIGHWAY
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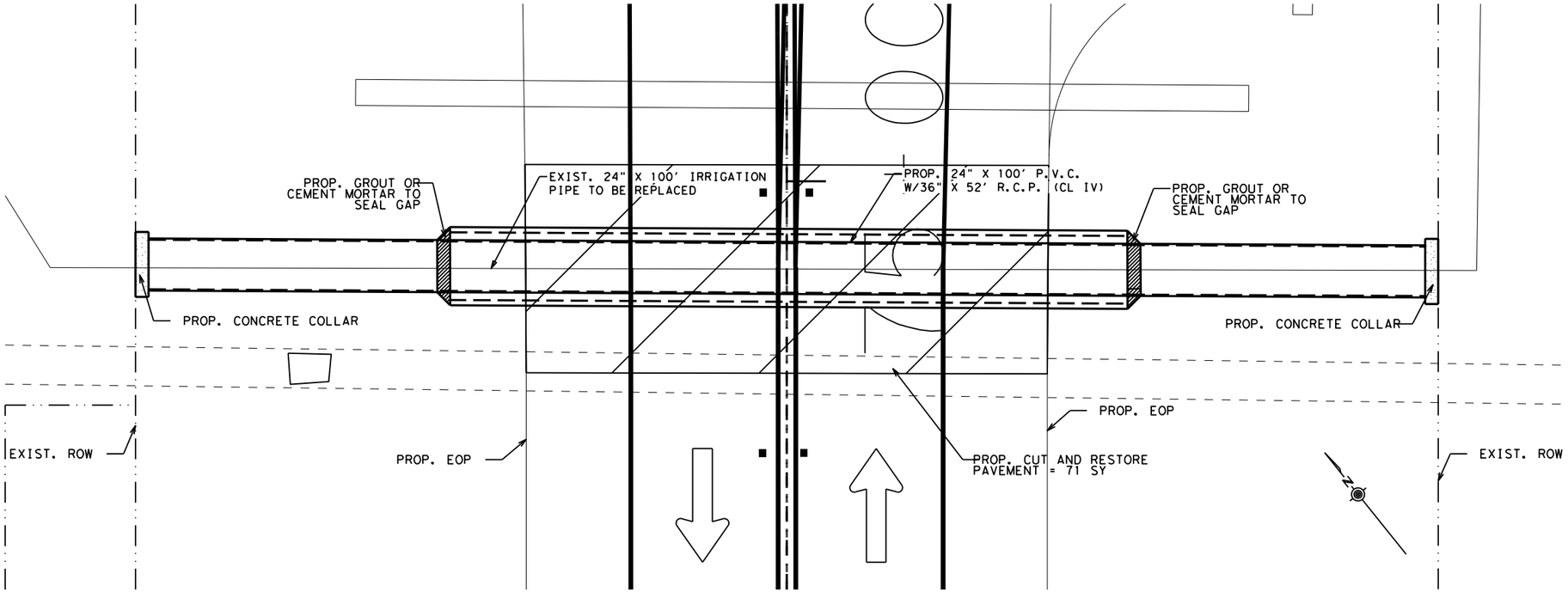

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⇐	DIRECTION OF TRAFFIC FLOW
EXIST.	EXISTING
PROP.	PROPOSED
N.G.	NATURAL GROUND
SHLDR.	SHOULDER
CONC.	CONCRETE
RDWY.	ROADWAY
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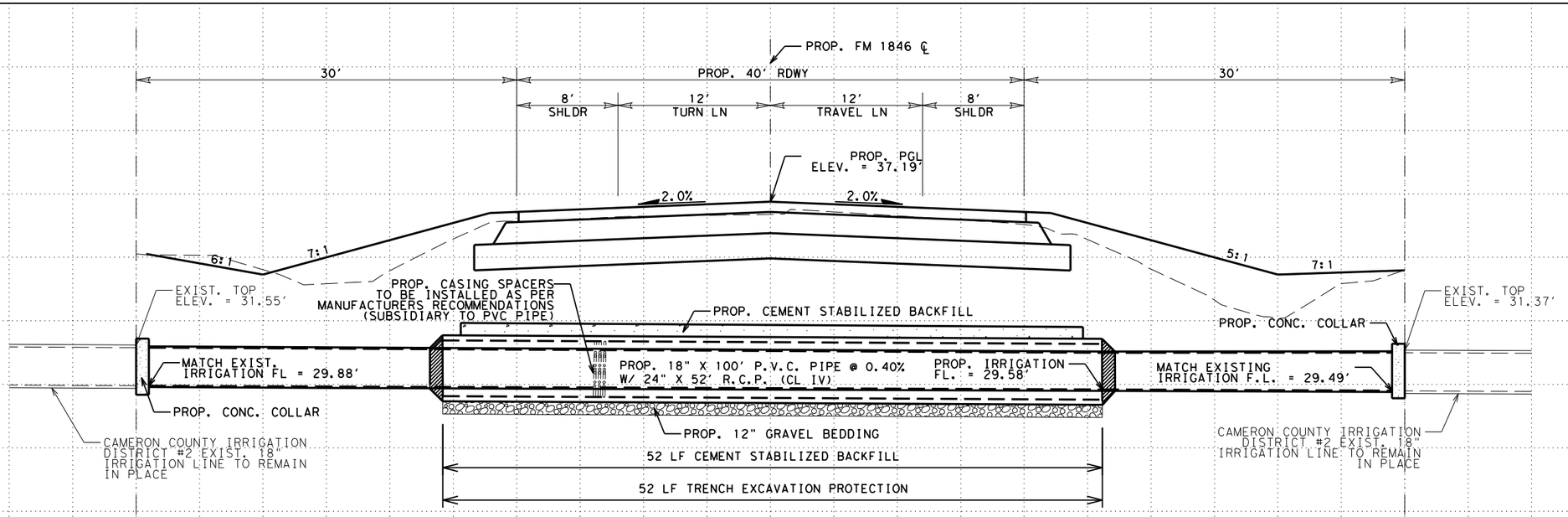

STA. 74+92

STATE OF TEXAS
ABEL MARROQUIN III
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LICENSED PROFESSIONAL ENGINEER

09/02/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 IRRIGATION CROSSING

V: 1" = 5'
H: 1" = 10'

SHEET 3 OF 3

DS:	CK:	CONT	SECT	JOB	HIGHWAY
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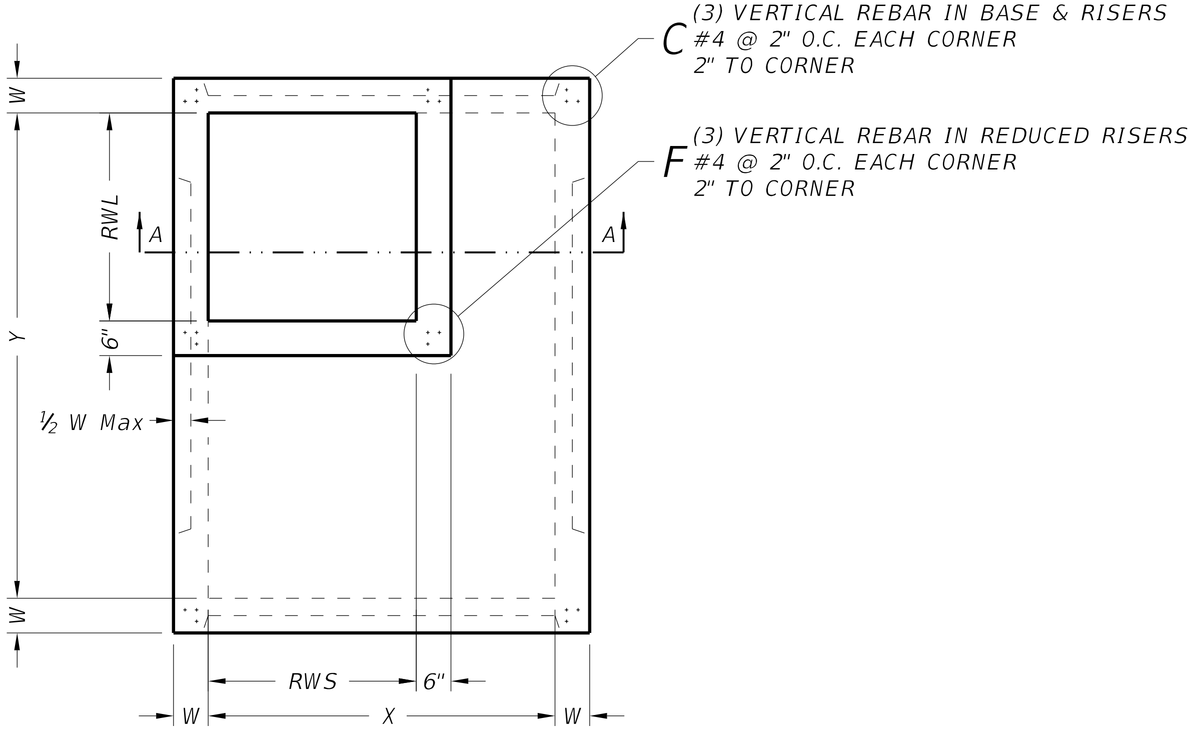
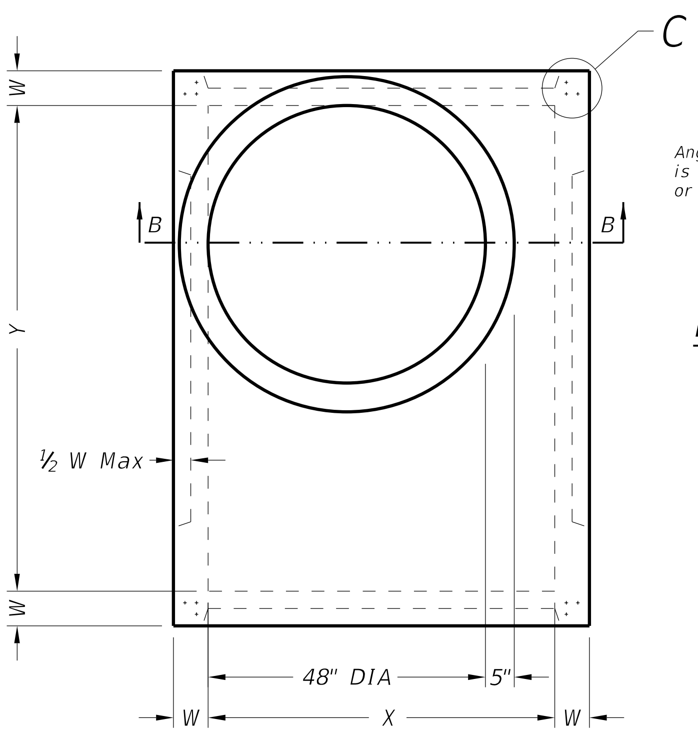


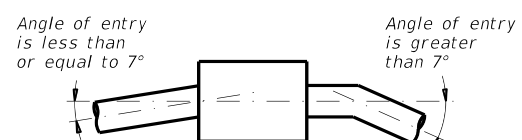
PLAN VIEW "A"

SQUARE REDUCED RISER OPTION



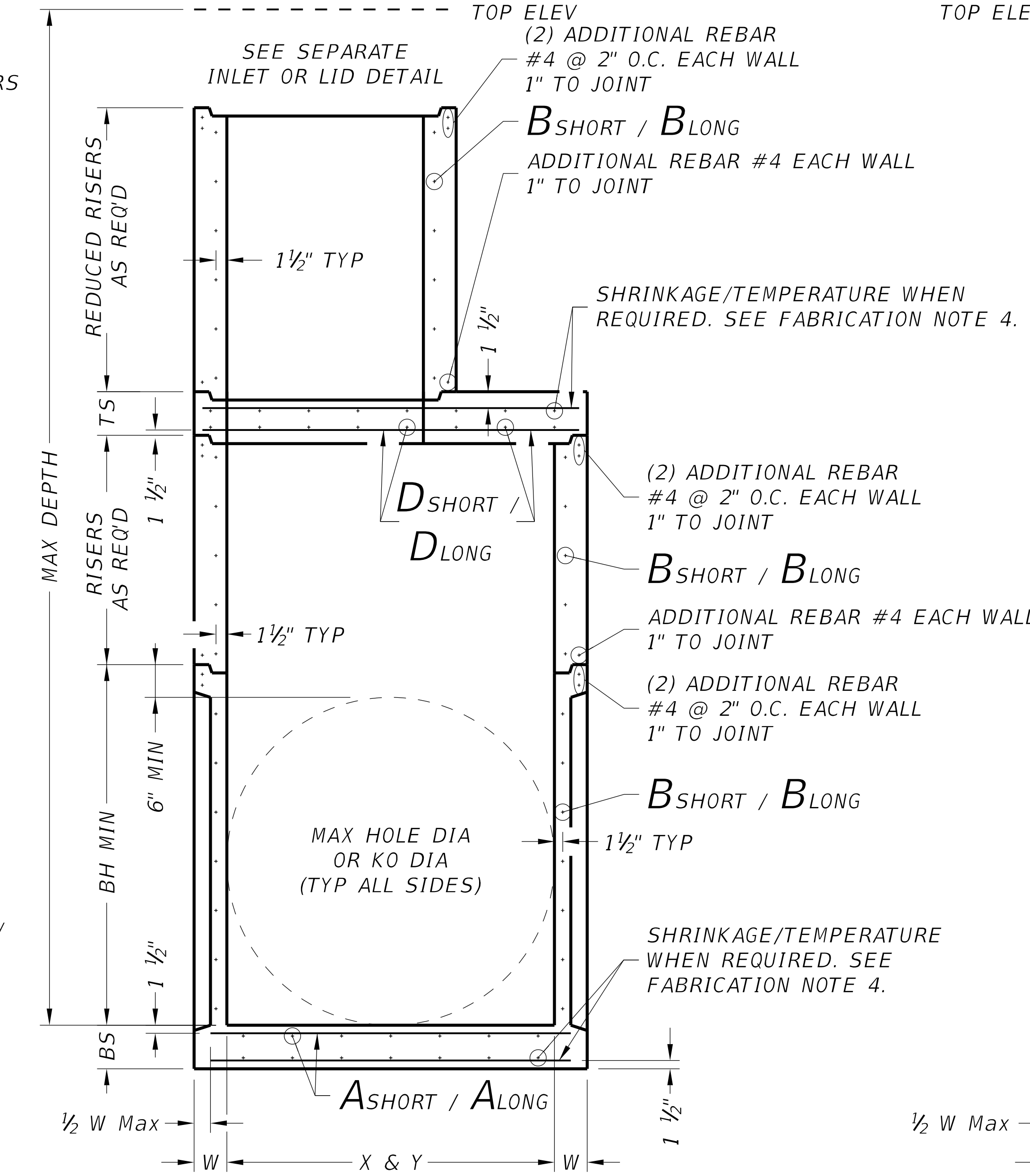
PLAN VIEW "B"

ROUND REDUCED RISER OPTION



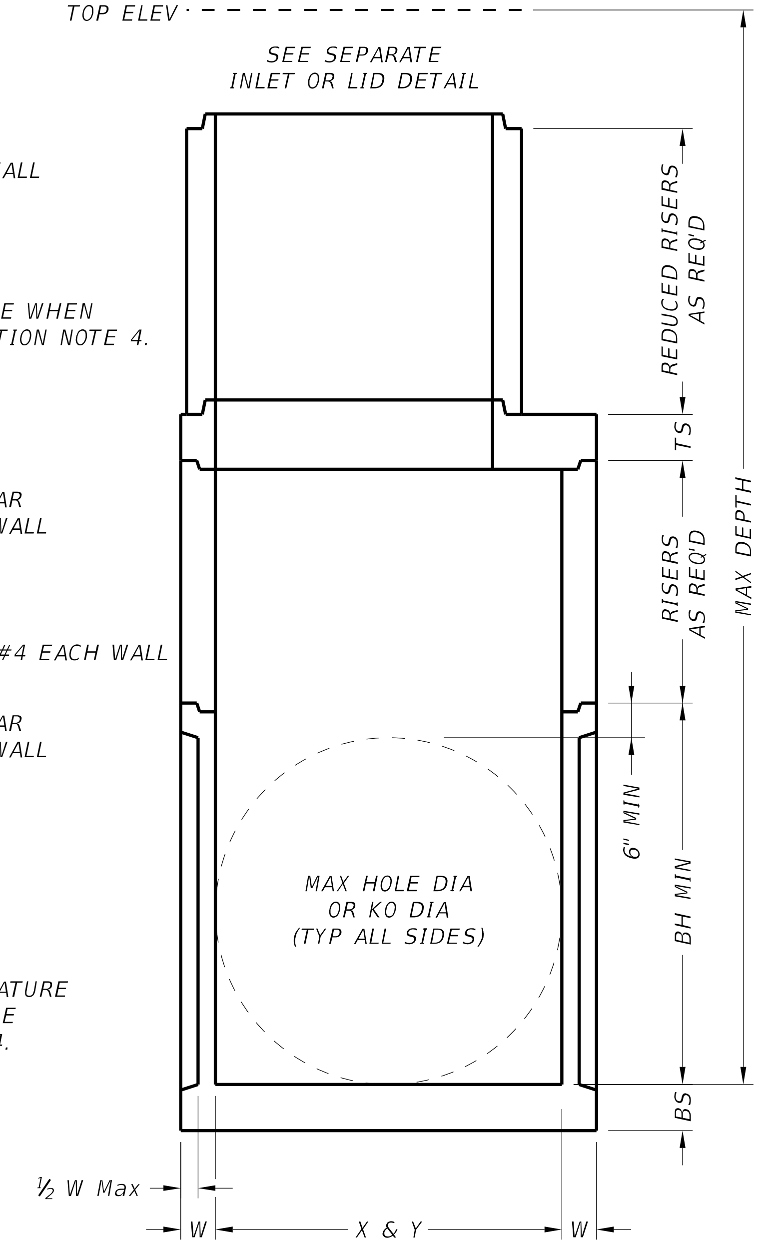
PIPE CONNECTION DETAIL

Connect pipes within 7° of normal to PB wall.
If necessary, use pipe elbow or curved
approach alignment to stay within this limit.



SECTION A-A

SQUARE REDUCED RISER OPTION



SECTION B-B

ROUND REDUCED RISER OPTION

Cover dimensions are clear dimensions, unless noted otherwise.

FABRICATION NOTES:

1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Provide typical clear cover of 1 ½" to reinforcing steel at interior or exterior walls.
4. Walls or slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing steel. Provide steel area = 0.11 in^2/ft each way.
5. No substitution is allowed for vertical and horizontal #4 bars in corners.
6. Manufacture base and risers to nearest 3" increment.
7. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
8. Provide lifting devices in conformance with Manufacturer's recommendations.
9. See sheet PDD for sizes, dimensions, and reinforcing steel not shown.

INSTALLATION NOTES:

1. If required elsewhere. Inverts (benching) to be provided by Contractor. Concrete or mortar used for invert is subsidiary to specified inlet or manhole.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. For rigid pipe, cut hole in thin wall panel (KO) 4" Max, 2" Min larger than pipe OD.
5. For flexible pipe, consult boot/seal Manufacturer's specification for placement tolerance and hole size. Center pipe in hole and install boot/seal per Manufacturer's specification.

GENERAL NOTES:

1. Precast Base consists of base slab, base unit, risers (as required), reducing slab (as required), and reduced risers (as required). See sheet PDD for sizes.
2. Designed according to ASTM C913.
3. Payment for precast base is subsidiary to the specified inlet, per Item 465, "Junction Boxes, Manholes, and Inlets."

HL93 LOADING

Texas Department of Transportation | Bridge Division Standard

PRECAST BASE

PB

FILE: prestd01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1065	02	039	FM 1846
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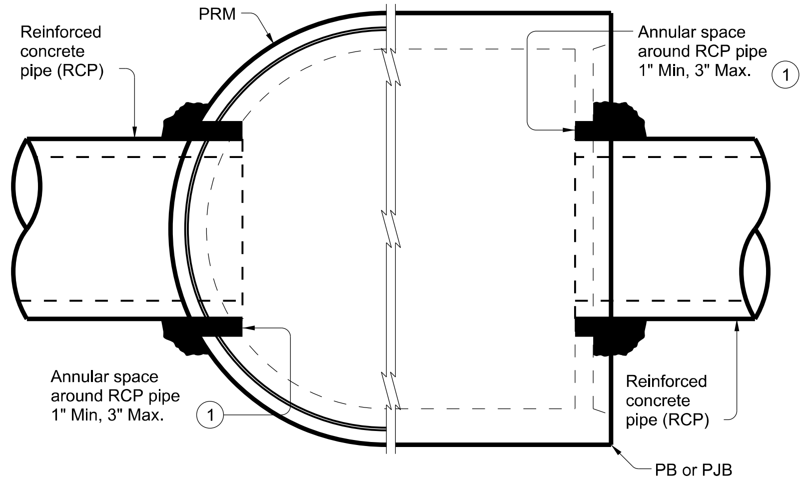
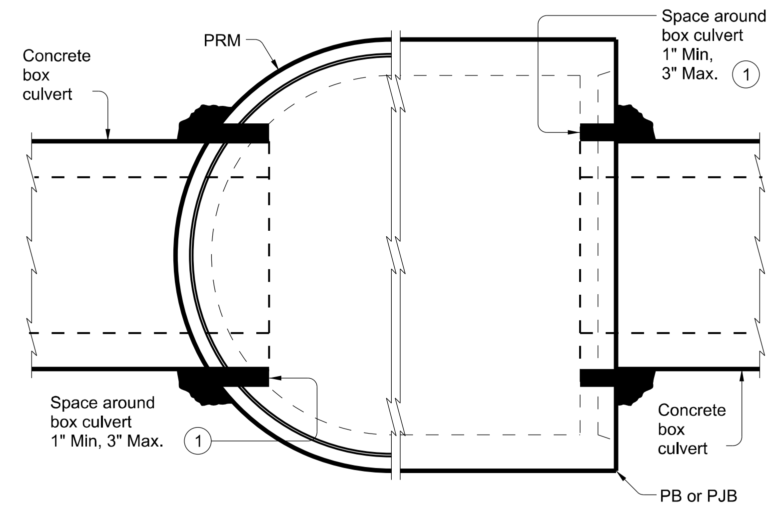
	PHR	CAMERON		162



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

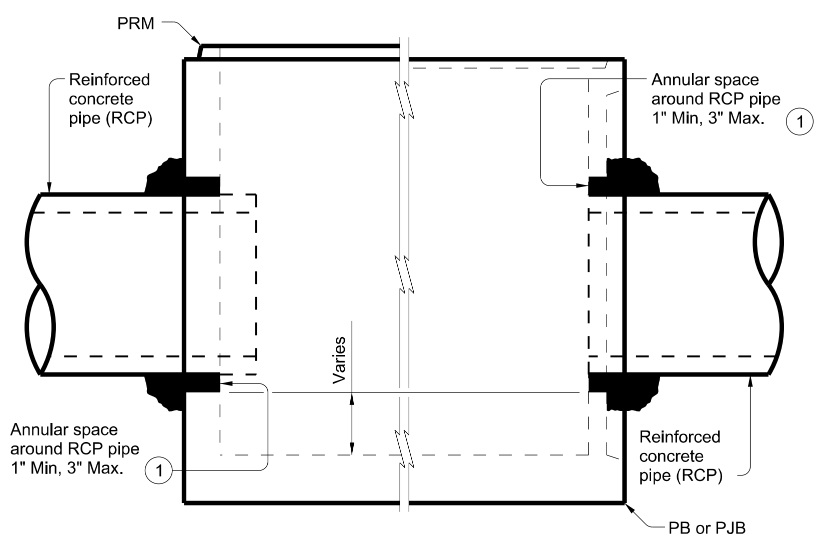
TYPICAL HALF PLAN



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

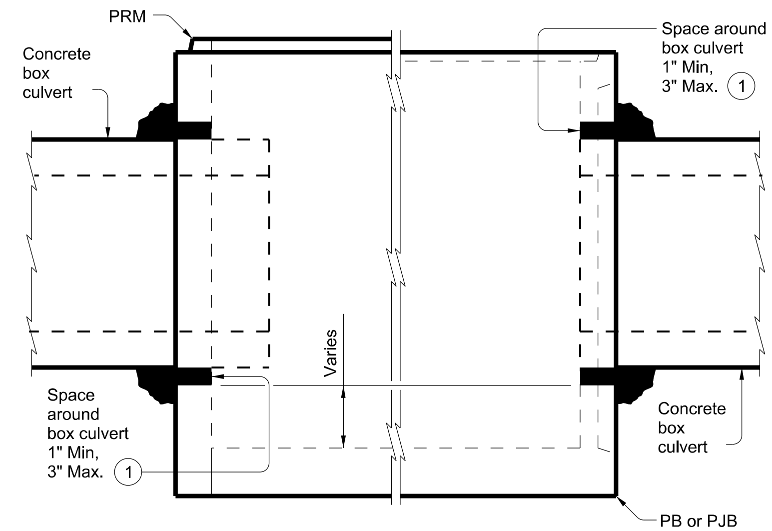
TYPICAL HALF PLAN



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

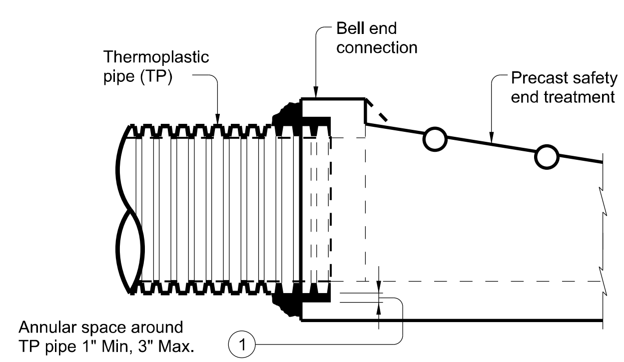
TYPICAL HALF ELEVATION



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

TYPICAL HALF ELEVATION



TYPICAL PARTIAL ELEVATION OF PRECAST SAFETY END TREATMENTS

Showing square PSET for parallel drainage, cross drainage shown similar.

(1) Completely fill the void between the precast structure and the connecting pipe or box with cementitious grouts and mortars in accordance with DMS-4675 "Cementitious Grouts and Mortars for Miscellaneous Application".

CONSTRUCTION NOTES:
Do not grout rubber gasket joints without Manufacturer's recommendations.
Do not use bricks, masonry blocks, native stone, or similar materials in conjunction with grouted connections when filling void spaces around pipes or box culverts.

MATERIAL NOTES:
Provide grouted connections in accordance with DMS-4675 "Cementitious Grouts and Mortars for Miscellaneous Application".

GENERAL NOTES:
See applicable standards for notes and details not shown:
- Precast Base (PB)
- Precast Junction Box (PJB)
- Precast Round Manhole (PRM)
- Precast Safety End Treatments C/D Square (PSET-SC)
- Precast Safety End Treatments P/D Square (PSET-SP)

Provide Concrete Box Culverts in accordance with Item 462 "Concrete Box Culverts and Drains".
Provide Reinforced Concrete Pipe (RCP) in accordance with Item 464 "Reinforced Concrete Pipe".
Provide Thermoplastic Pipe (TP) in accordance with Special Specification Thermoplastic Pipe.
Payment for grouted connections is considered subsidiary to other bid Items.

DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion

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Texas Department of Transportation | Bridge Division Standard

PIPE AND BOX GROUTED CONNECTIONS FOR PRECAST STRUCTURES

PBGC

FILE: pbgcstd1-20.dgn	DN: TxDOT	CK: TAR	DW: JTR	CK: TAR
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REVISIONS	1065	02	039	FM 1846
	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	163

Type	Size	MAX DEPTH = 15 ft. to top of BASE SLAB: Base Slab: Short Span Steel Reinf Area	Base Slab: Long Span Reinf Steel Area	Base Slab: Thickness	Base Unit or Riser Walls: Short Span Steel Reinf Area	Base Unit or Riser Walls: Long Span Reinf Steel Area	Base Unit or Riser Walls: Thickness	Below Grade Slab (w/PJB) Reducing Slab (w/PB): Reduced Riser Size	Below Grade Slab (w/PJB) Reducing Slab (w/PB): Short Span Reinf Steel Area	Below Grade Slab (w/PJB) Reducing Slab (w/PB): Long Span Reinf Steel Area	Below Grade Slab (w/PJB) Reducing Slab (w/PB): Thickness	MAX DEPTH = 25 ft. to top of BASE SLAB: Base Slab: Short Span Steel Reinf Area	Base Slab: Long Span Reinf Steel Area	Base Slab: Thickness	Base Unit or Riser Walls: Short Span Steel Reinf Area	Base Unit or Riser Walls: Long Span Reinf Steel Area	Base Unit or Riser Walls: Thickness	Below Grade Slab (w/PJB) Reducing Slab (w/PB): Reduced Riser Size	Below Grade Slab (w/PJB) Reducing Slab (w/PB): Short Span Reinf Steel Area	Below Grade Slab (w/PJB) Reducing Slab (w/PB): Long Span Reinf Steel Area	Below Grade Slab (w/PJB) Reducing Slab (w/PB): Thickness	Min Height (See Gen Note 3)	Max HOLE DIA (See Fab Note 2)	Max KO DIA (See Fab Note 2)
	X x Y	Ashort	Along	BS	Bshort	Blong	W	RWSxRWL or ID	Dshort	Dlong	TS	Ashort	Along	BS	Bshort	Blong	W	RWSxRWL or ID	Dshort	Dlong	TS	BH MIN	HOLE DIA	KO DIA
	ft.	in^2/ft	in^2/ft	in.	in^2/ft	in^2/ft	in.	ft. **	in^2/ft	in^2/ft	in.	in^2/ft	in^2/ft	in.	in^2/ft	in^2/ft	in.	ft. **	in^2/ft	in^2/ft	in.	ft.	in.	in.
Precast Junction Box (PJB)	3x3	0.23	0.23	6	0.19	0.19	6	N/A	0.37	0.37	9	0.29	0.29	6	0.24	0.24	6	N/A	0.37	0.37	9	3.5	36	36
	4x4	0.29	0.29	6	0.24	0.24	6	N/A	0.41	0.41	9	0.47	0.47	6	0.38	0.38	6	N/A	0.41	0.41	9	4.5	48	48
	3x5	0.29	0.18	6	0.19	0.35	6	N/A	0.48	0.48	9	0.39	0.18	6	0.23	0.59	6	N/A	0.48	0.48	9	3.5	36/60	36/60
	4x5	0.36	0.18	6	0.22	0.34	6	N/A	0.42	0.42	9	0.53	0.26	6	0.39	0.59	6	N/A	0.42	0.42	9	4.5	48/60	48/60
	5x5	0.36	0.36	6	0.34	0.34	6	N/A	0.43	0.43	9	0.62	0.62	6	0.59	0.59	6	N/A	0.43	0.43	9	5.5	60	60
	5x6	0.27	0.27	9	0.34	0.45	6	N/A	0.48	0.48	9	0.47	0.45	9	0.38	0.54	8	N/A	0.48	0.48	9	5.5	60/72	60/72
	6x6	0.27	0.27	9	0.45	0.45	6	N/A	0.56	0.56	9	0.52	0.52	9	0.54	0.54	8	N/A	0.56	0.56	9	6.5	72	72
	8x8	0.46	0.46	9	0.51	0.51	8	N/A	0.45	0.45	12	0.87	0.87	9	0.59	0.59	10	N/A	0.45	0.45	12	8.5	96	72
Precast Base (PB)	3x3	0.23	0.23	6	0.19	0.19	6	N/A	N/A	N/A	N/A	0.29	0.29	6	0.24	0.24	6	N/A	N/A	N/A	N/A	3.5	36	36
	4x4	0.29	0.29	6	0.24	0.24	6	N/A	N/A	N/A	N/A	0.47	0.47	6	0.38	0.38	6	N/A	N/A	N/A	N/A	4.5	48	48
	3x5	0.29	0.18	6	0.19	0.35	6	3x3	0.30	0.34	9	0.39	0.18	6	0.23	0.59	6	3x3	0.40	0.40	9	3.5	36/60	36/60
	4x5	0.36	0.18	6	0.22	0.34	6	3x3	0.30	0.30	9	0.53	0.26	6	0.39	0.59	6	3x3	0.46	0.37	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	4x4	0.30	0.30	9	0.53	0.26	6	0.39	0.59	6	4x4	0.39	0.39	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	48"	0.39	0.39	9	0.53	0.26	6	0.39	0.59	6	48"	0.47	0.47	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	3x5	0.33	0.40	9	0.53	0.26	6	0.39	0.59	6	3x5	0.48	0.48	9	4.5	48/60	48/60
	5x5	0.36	0.36	6	0.34	0.34	6	3x3	0.34	0.34	9	0.62	0.62	6	0.59	0.59	6	3x3	0.53	0.53	9	5.5	60	60
	5x5	0.36	0.36	6	0.34	0.34	6	4x4	0.36	0.36	9	0.62	0.62	6	0.59	0.59	6	4x4	0.64	0.64	9	5.5	60	60
	5x5	0.38	0.38	6	0.34	0.34	6	48"	0.36	0.36	9	0.62	0.62	6	0.59	0.59	6	48"	0.64	0.64	9	5.5	60	60
	5x5	0.36	0.36	6	0.34	0.34	6	3x5	0.34	0.40	9	0.62	0.62	6	0.59	0.59	6	3x5	0.53	0.53	9	5.5	60	60
	5x6	0.31	0.31	9	0.34	0.45	6	3x3	0.34	0.34	9	0.47	0.45	9	0.38	0.54	8	3x3	0.61	0.50	9	5.5	60/72	60/72
	5x6	0.27	0.27	9	0.34	0.45	6	4x4	0.36	0.45	9	0.47	0.45	9	0.38	0.54	8	4x4	0.74	0.57	9	5.5	60/72	60/72
	5x6	0.29	0.29	9	0.34	0.45	6	48"	0.36	0.45	9	0.47	0.45	9	0.38	0.54	8	48"	0.74	0.57	9	5.5	60/72	60/72
	5x6	0.29	0.29	9	0.34	0.45	6	3x5	0.45	0.45	9	0.47	0.45	9	0.38	0.54	8	3x5	0.61	0.61	9	5.5	60/72	60/72
	6x6	0.29	0.29	9	0.45	0.45	6	3x3	0.41	0.41	9	0.52	0.52	9	0.54	0.54	8	3x3	0.74	0.74	9	6.5	72	72
	6x6	0.27	0.27	9	0.45	0.45	6	4x4	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	4x4	0.87	0.87	9	6.5	72	72
	6x6	0.29	0.29	9	0.45	0.45	6	48"	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	48"	0.87	0.87	9	6.5	72	72
	6x6	0.29	0.29	9	0.45	0.45	6	3x5	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	3x5	0.87	0.87	9	6.5	72	72
	8x8	0.52	0.52	9	0.51	0.51	8	3x3	0.61	0.61	12	0.91	0.91	9	0.70	0.70	10	3x3	0.85	0.85	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	4x4	0.70	0.70	12	0.87	0.87	9	0.70	0.70	10	4x4	1.01	1.01	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	48"	0.70	0.70	12	0.87	0.87	9	0.70	0.70	10	48"	1.01	1.01	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	3x5	0.70	0.85	12	0.87	0.87	9	0.70	0.70	10	3x5	1.01	1.01	12	8.5	96	72

** Unless otherwise indicated.

FABRICATION NOTES:
1. Maximum spacing of reinforcement is 8".
2. At manufacturer's option, provide cast or cored holes or thin wall panels (KO) to the maximum diameter shown for each. When no penetration is required, it is acceptable to provide a wall with no sectional reduction.

GENERAL NOTES:
1. Precast Junction Box consists of base slab, base unit, risers (as required), and below grade slab. See sheet PJB for details.
2. Precast Base consists of base slab, base unit, risers (as required), reducing slab (as required), and reduced risers (as required). See sheet PB for details.
3. Min Height shown is for stock base units. Use stock base units whenever practical. Smaller height base units can be used in special installation circumstances, when noted elsewhere in the plans. Absolute minimum height of base units is 2'-6".

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

DESIGN DATA FOR PRECAST BASE AND JUNCTION BOX

PDD

FILE: prestd10-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT 1065	SECT 02	JOB 039	HIGHWAY FM 1846
REVISIONS	DIST PHR	COUNTY CAMERON		SHEET NO. 164

DATE: 7/12/2021 4:04:34 PM
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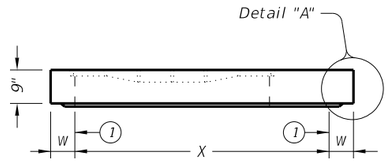
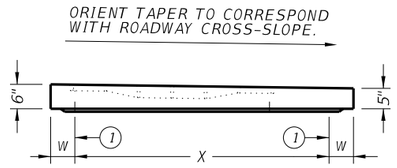
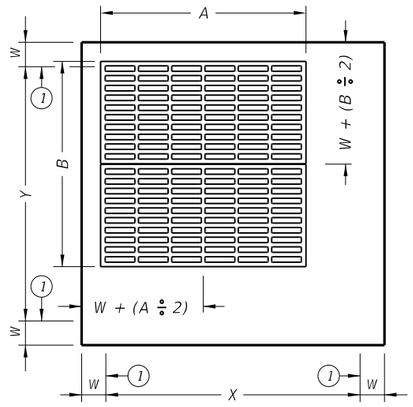


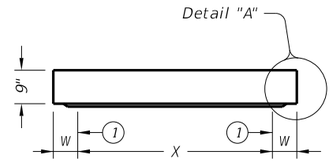
STYLE 'FG'



STYLE 'SFG'
ELEVATION VIEW

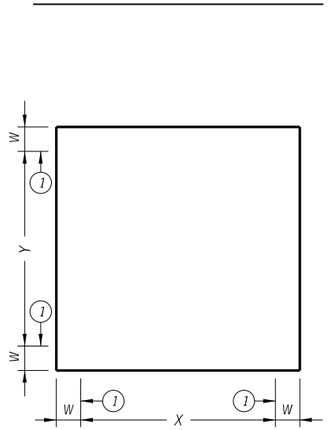


PLAN VIEW
CAST-IN FRAME & GRATE
STYLES 'FG' & 'SFG'

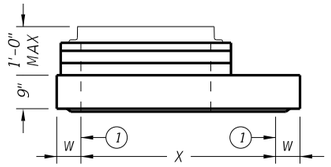


ELEVATION VIEW

STYLE 'SL'

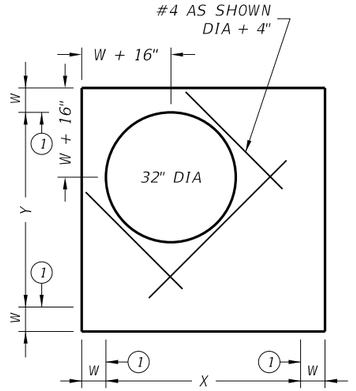


PLAN VIEW
NO OPENINGS



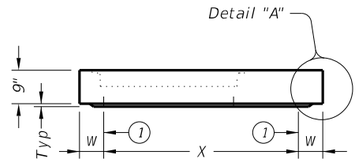
ELEVATION VIEW

STYLE 'RH'



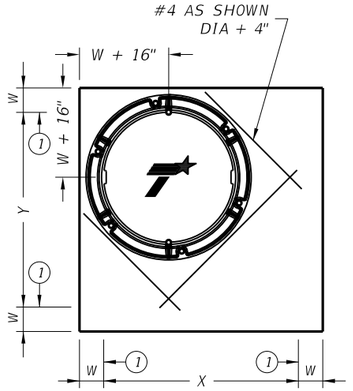
PLAN VIEW
SHIP LOOSE RING & COVER

STYLE 'RH'



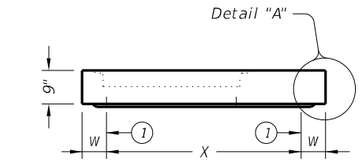
ELEVATION VIEW

STYLE 'RC'



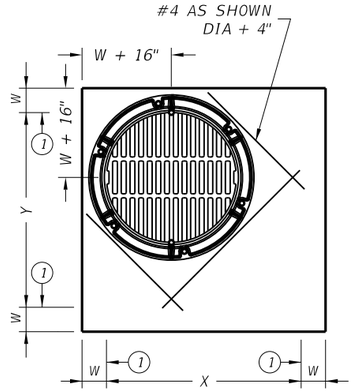
PLAN VIEW
32" DIA CAST-IN RING & COVER

STYLE 'RC'



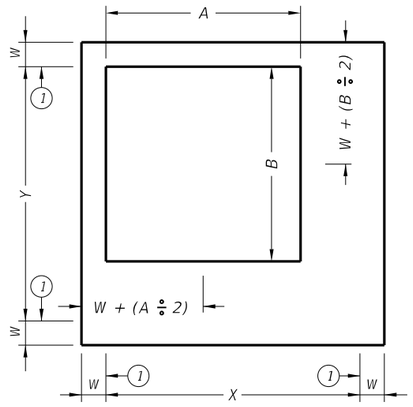
ELEVATION VIEW

STYLE 'RG'



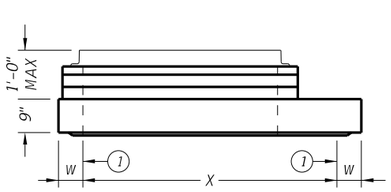
PLAN VIEW
32" DIA CAST-IN RING & GRATE

STYLE 'RG'

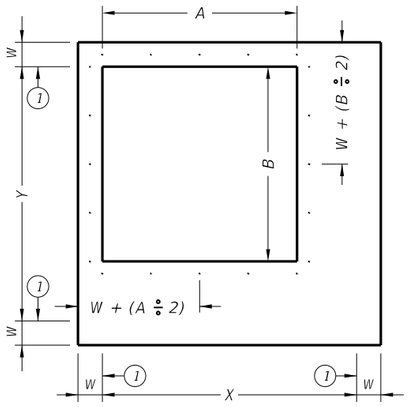


PLAN VIEW
SHIP LOOSE FRAME & GRATE

STYLE 'SH'

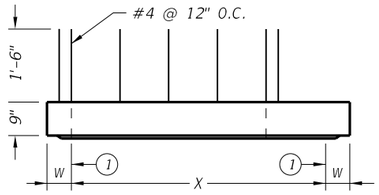


ELEVATION VIEW



PLAN VIEW
EXPOSED REBAR

STYLE 'S1'



ELEVATION VIEW

(1) Matches inside face of wall of precast base or riser below inlet.

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation
Bridge Division Standard

PRECAST SLAB LID

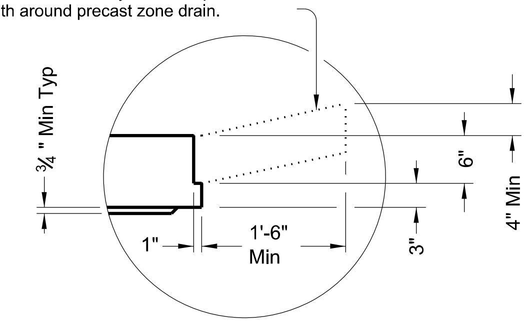
PSL

FILE: prestd05-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1065	02	039	FM 1846
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		165

Style	Size (X x Y)	W (2)	A x B (nominal)	Short Span Reinf Steel Area	Long Span Reinf Steel Area
SL	3'x3'	6"	n/a	0.37 in□/ft	0.37 in□/ft
RH,RC,RG,SH,S1,FG	3'x3'	6"	3'x3' or 32" Dia	0.37 in□/ft	0.37 in□/ft
SFG	3'x3'	6"	3'x3'	0.32 in□/ft	0.32 in□/ft
SL	4'x4'	6"	n/a	0.34 in□/ft	0.34 in□/ft
RH,RC,RG,SH,S1,FG	4'x4'	6"	3'x3' or 32" Dia	0.41 in□/ft	0.41 in□/ft
SH,S1,FG	4'x4'	6"	4'x4'	0.41 in□/ft	0.41 in□/ft
SFG	4'x4'	6"	4'x4'	0.32 in□/ft	0.32 in□/ft
SL	3'x5'	6"	n/a	0.39 in□/ft	0.39 in□/ft
RH,RC,RG,SH,S1,FG	3'x5'	6"	3'x3' or 32" Dia	0.48 in□/ft	0.48 in□/ft
SH,S1,FG	3'x5'	6"	3'x5'	0.48 in□/ft	0.48 in□/ft
SFG	3'x5'	6"	3'x5'	0.32 in□/ft	0.32 in□/ft
SL	4'x5'	6"	n/a	0.42 in□/ft	0.42 in□/ft
RH,RC,RG,SH,S1,FG	4'x5'	6"	3'x3' or 32" Dia	0.42 in□/ft	0.42 in□/ft
SH,S1,FG	4'x5'	6"	4'x4'	0.63 in□/ft	0.63 in□/ft
SH,S1,FG	4'x5'	6"	3'x5'	0.66 in□/ft	0.66 in□/ft
SL	5'x5'	6"	n/a	0.36 in□/ft	0.36 in□/ft
RH,RC,RG,SH,S1,FG	5'x5'	6"	3'x3' or 32" Dia	0.43 in□/ft	0.43 in□/ft
SH,S1,FG	5'x5'	6"	4'x4'	0.63 in□/ft	0.63 in□/ft
SH,S1,FG	5'x5'	6"	3'x5'	0.63 in□/ft	0.63 in□/ft
SL	5'x6'	6"/8"	n/a	0.48 in□/ft	0.48 in□/ft
RH,RC,RG,SH,S1,FG	5'x6'	6"/8"	3'x3' or 32" Dia	0.48 in□/ft	0.48 in□/ft
SH,S1,FG	5'x6'	6"/8"	4'x4'	0.60 in□/ft	0.60 in□/ft
SH,S1,FG	5'x6'	6"/8"	3'x5'	0.60 in□/ft	0.60 in□/ft
SL	6'x6'	6"/8"	n/a	0.43 in□/ft	0.43 in□/ft
RH,RC,RG,SH,S1,FG	6'x6'	6"/8"	3'x3' or 32" Dia	0.56 in□/ft	0.56 in□/ft
SH,S1,FG	6'x6'	6"/8"	4'x4'	0.56 in□/ft	0.56 in□/ft
SH,S1,FG	6'x6'	6"/8"	3'x5'	0.59 in□/ft	0.59 in□/ft
SL	8'x8'	8"/10"	n/a	0.45 in□/ft	0.45 in□/ft
RH,RC,RG,SH,S1,FG	8'x8'	8"/10"	3'x3' or 32" Dia	0.45 in□/ft	0.45 in□/ft
SH,S1,FG	8'x8'	8"/10"	4'x4'	0.45 in□/ft	0.45 in□/ft
SH,S1,FG	8'x8'	8"/10"	3'x5'	0.45 in□/ft	0.45 in□/ft

(2) See sheet PDD for corresponding wall thickness (W) of base unit or riser.

Construct cast-in-place reinforced concrete apron, when shown elsewhere in plans. Use Class "A" concrete. Apron is subsidiary to PSL. Apron is 1'-6" Min width around precast zone drain.



DETAIL "A"

(Reinforcing not shown for clarity)

When an apron is to be cast around PSL, use detail above to create an apron ledge on all 4 sides.

FABRICATION NOTES:

1. Locate penetration (Style 'RH'), ring and cover (Style 'RC'), ring and grate (Style 'RG'), and frame and grate (Style 'FG') in a corner. Only one penetration is allowed per slab lid.
2. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
3. Provide Grade 60 reinforcing steel or equivalent area of WWR.
4. Provide clear cover of ¾" to reinforcing from lower outside shoulder of slab for structural reinforcement, and 2" from top of slab for shrinkage and temperature reinforcement. Place short span reinforcing closest to surface.
5. Slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing. Provide steel area = 0.11 in^2/ft each way.
6. No substitution is allowed for diagonal #4 bars around openings.
7. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
8. Provide lifting devices in conformance with Manufacturer's recommendations.

INSTALLATION NOTES:

1. Precast slab lids are intended for direct traffic and may be placed in roadway.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. Initial installation of grade adjustment rings for Styles 'RH' and 'SH' is limited to 1'-0" Max as shown.
5. Grade adjustment rings for Styles 'RH' and 'SH' may be increased to 2'-0" Max when future construction affects final grade of structure. Make adjustments greater than 2'-0" with additional risers. Adjustments can be made up to Max depth shown on sheet PDD. Structure must be evaluated if Max depth will be exceeded.
6. Orient long dimension of grate slots perpendicular to traffic, unless noted otherwise on plans

GENERAL NOTES:

1. Designed according to ASTM C913.
2. Payment for lid is per Item 465, "Junction Boxes, Manholes, and Inlets" by type, style, size, and opening size (when applicable).

Cover dimensions are clear dimensions, unless noted otherwise.

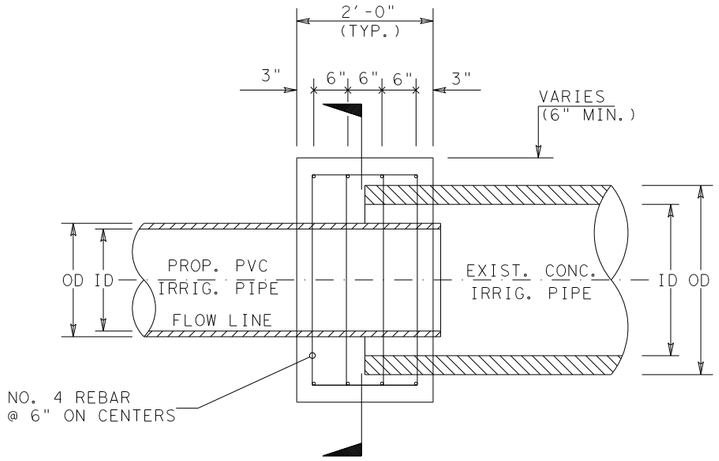
Texas Department of Transportation

Bridge Division Standard

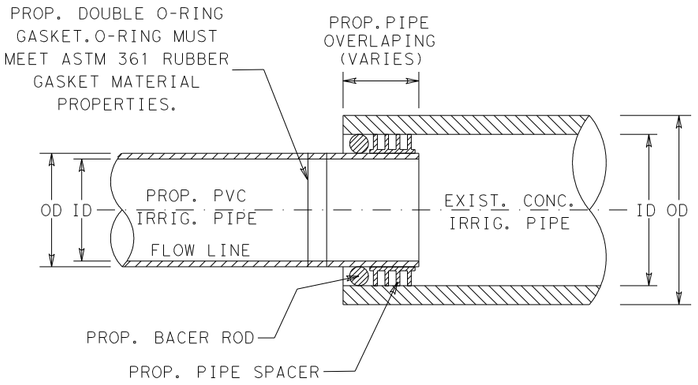
PRECAST SLAB LID

PSL

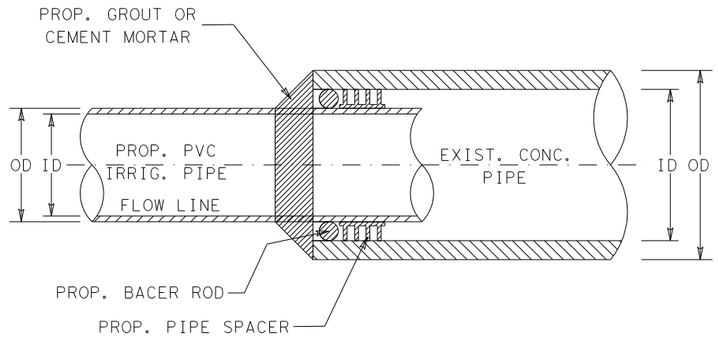
FILE: prestd05-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1065	02	039	FM 1846
	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	166



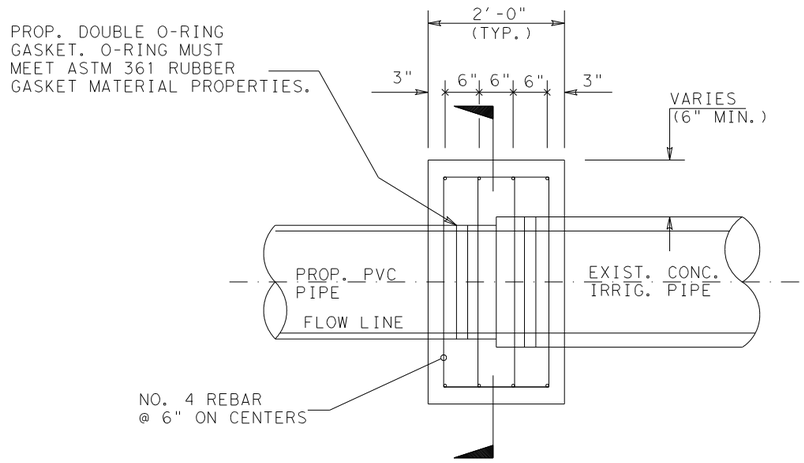
CONCRETE COLLAR DETAIL
(PVC INTO EXIST. CONCRETE PIPE)



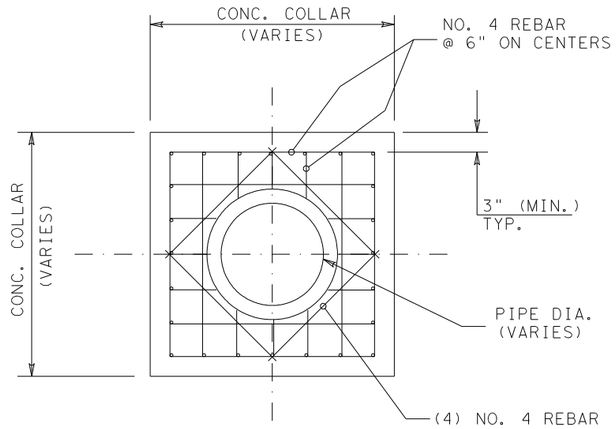
PIPE JOINT DETAILS
(PVC INTO EXIST. CONCRETE PIPE)



PIPE JOINT SEAL DETAILS
(PVC INTO EXIST. CONCRETE PIPE)



PIPE JOINT DETAILS
(PVC INTO EXIST. CONCRETE PIPE)



STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED
PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

MISCELLANEOUS DRAINAGE STRUCTURE DETAILS

NTS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846

DIST	COUNTY	SHEET NO.
PHR	CAMERON	167

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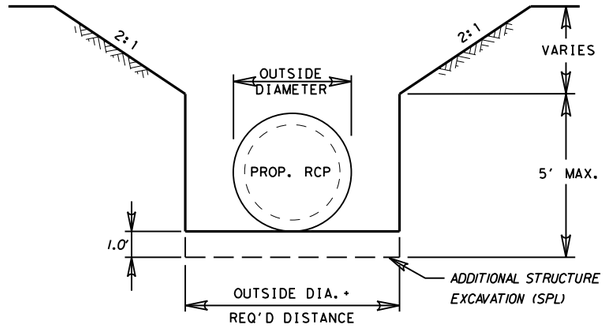
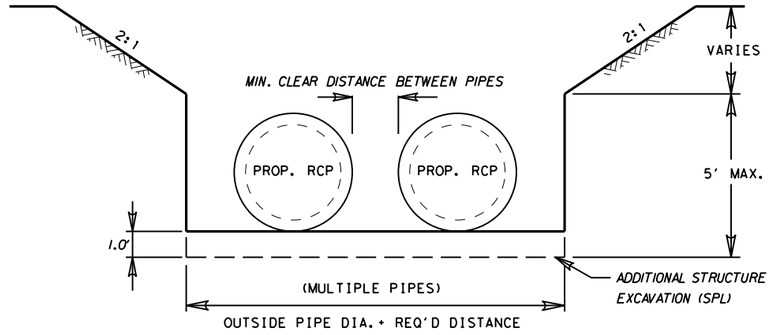
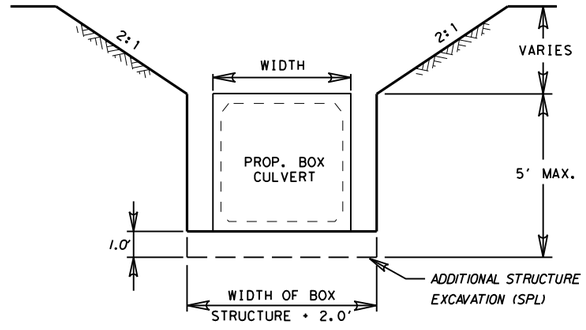
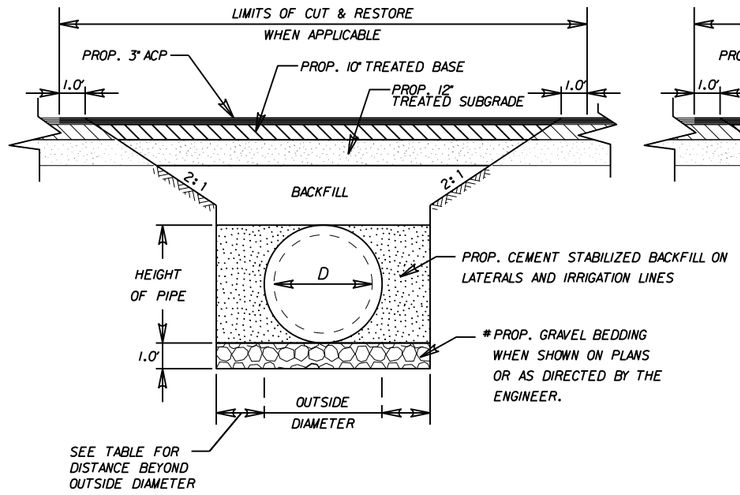


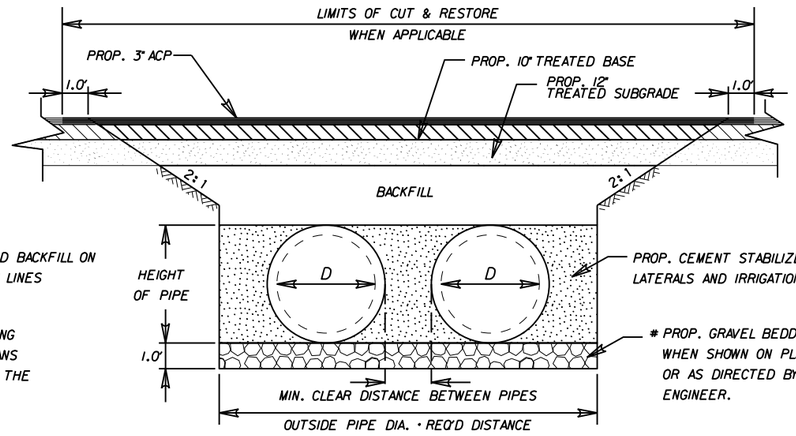


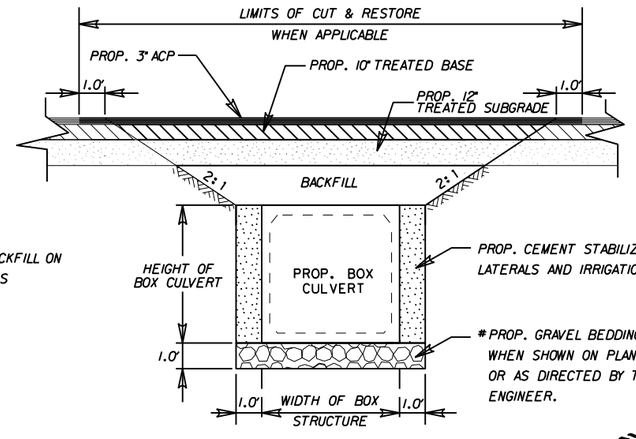


TYPICAL TRENCH EXCAVATION PROTECTION DETAIL

TYPICAL TRENCH EXCAVATION PROTECTION DETAIL







TYPICAL EXCAVATION AND BACKFILL DETAIL FOR SINGLE/MULTIPLE STRUCTURES

TYPICAL EXCAVATION AND BACKFILL DETAIL FOR SINGLE BOX CULVERT

BOUNDARIES OF STRUCTURAL EXCAVATION	
PIPE DIAMETER	DIST. BEYOND & PARALLEL TO OUTSIDE PIPE DIAMETER
18 in.	1 ft.
24 in.	1 ft.
30 in.	1 ft.
36 in.	1 ft.
42 in.	1 ft.
48 in.	2 ft.
54 in.	2 ft.
60 to 84 in.	2 ft.

MINIMUM CLEAR DISTANCE BETWEEN PIPES	
EQUIVALENT DIAMETER	MIN. CLEAR DISTANCE
18 in.	9 in.
24 in.	11 in.
30 in.	1 ft. 1 in.
36 in.	1 ft. 3 in.
42 in.	1 ft. 5 in.
48 in.	1 ft. 7 in.
54 in.	1 ft. 11 in.
60 to 84 in.	2 ft.

NOTE: THE EXCAVATION/BACKFILL SHALL EXTEND TO EACH SIDE BASED ON THE SIZE OF PIPE (SEE TABLE FOR DISTANCE BEYOND & PARALLEL TO OUTSIDE PIPE DIAMETER) THE SAND BACKFILL SHALL EXTEND 2.0' BEYOND THE OUTSIDE EDGE OF THE PROP. PAVEMENT/BEND.

"PROVIDE BEDDING MATERIAL IN LIEU OF THE USE OF FILTER FABRIC. THE ENGINEER MAY WAIVE GRADATION REQUIREMENTS OF TABLES 2 AND 3 IF AGGREGATE MATERIAL PROPERTIES ARE IN ACCORDANCE WITH ARTICLE 432.2.3"

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

BACKFILL DETAILS

NTS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		168

DATE: 7/13/2021 3:33:46 PM
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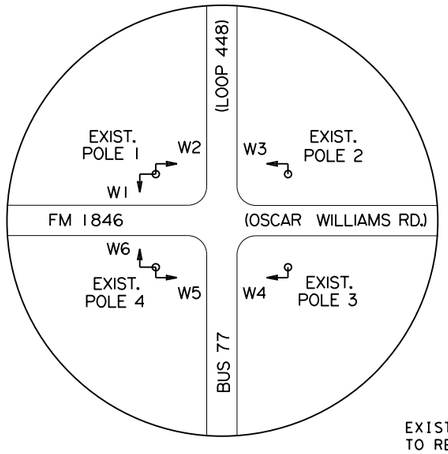
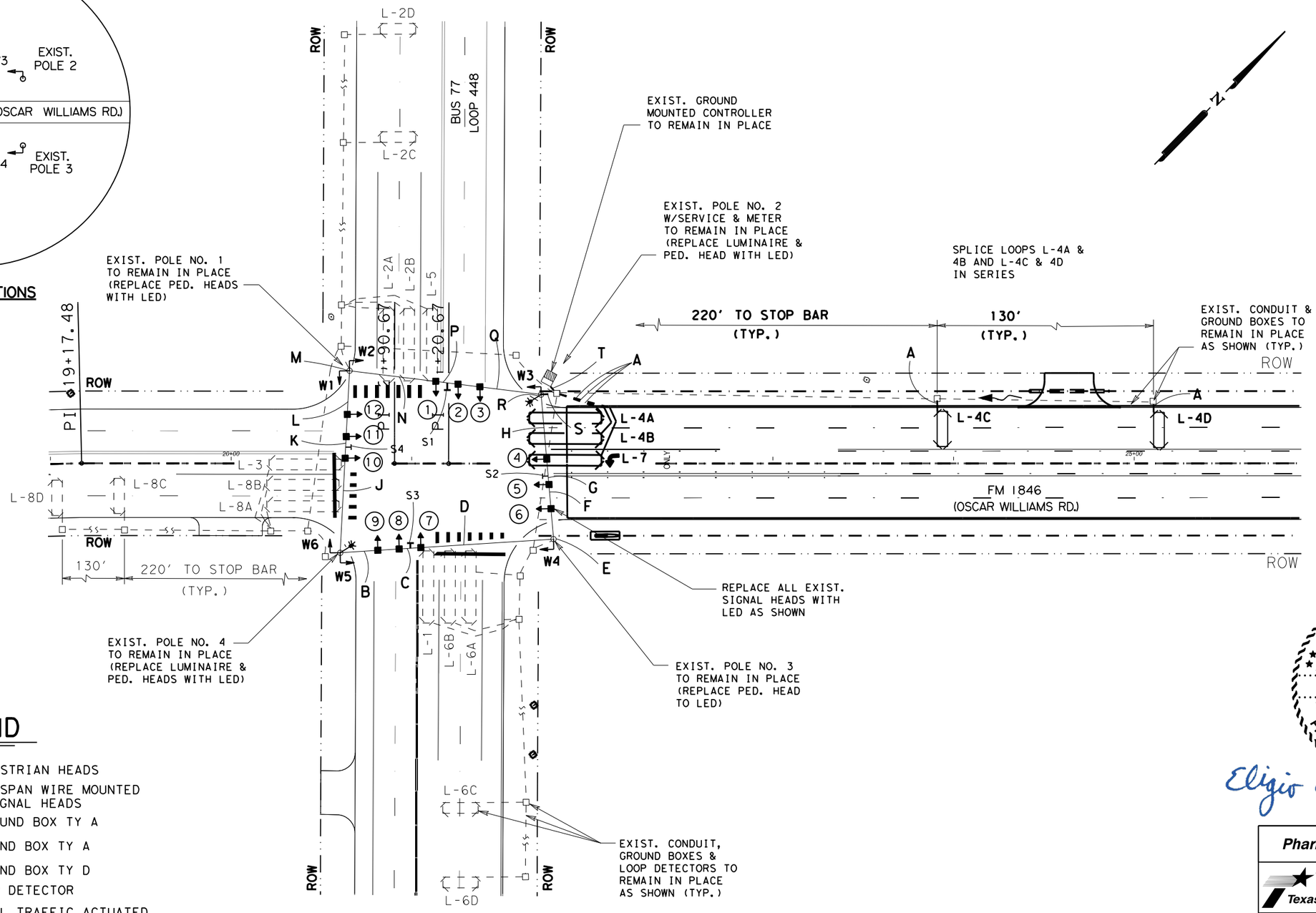


POLE LOCATIONS



LEGEND

- PROP. PEDESTRIAN HEADS
- PROP. 12" SPAN WIRE MOUNTED TRAFFIC SIGNAL HEADS
- EXIST. GROUND BOX TY A
- PROP. GROUND BOX TY A
- PROP. GROUND BOX TY D
- PROP. LOOP DETECTOR
- EXIST. FULL TRAFFIC ACTUATED GROUND MOUNTED CONTROLLER
- EXIST. CONDUIT (SIZE & TYPE AS SPECIFIED)
- PROP. CONDUIT (SIZE & TYPE AS SPECIFIED)
- PROP. LUMINAIRE
- PROP. CONDUIT BORE (SIZE & TYPE AS SPECIFIED)

PROPOSED UP-GRADE TO EXISTING SIGNAL

INTERSECTION OF
FM 1846/BUS 77
CAMERON COUNTY
CSJ: 1065-02-039

STATE OF TEXAS
ELIGIO ALVAREZ
107123
LICENSED
PROFESSIONAL ENGINEER

Eligio Alvarez, P.E
7-15-2021

Pharr District Central Design

Texas Department of Transportation

①

TRAFFIC SIGNAL LAYOUT
PROPOSED INSTALLATION
FM 1846 @ BUS 77

SCALE: 1" = 60' SHEET 1 OF 2

© 2021	CONT	SECT	JOB	HIGHWAY
DS: CK:	1065	02	039	FM 1846
	DIST	COUNTY		SHEET NO.
DW: CK:	PHR	CAMERON		169

DATE: 7/13/2021 10:32:58 AM
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LOOP DETECTOR CHART

	LOOP	SIZE	WIRE LENGTH	SAW CUT	AMPLIFIER NO.	SETTING	FUNCTION
✳	L-1	6' x40'			1	PRESENCE	CALL & EXTEND Ø 1
✳	L-2A,B	6' x40'			2	PRESENCE	CALL & EXTEND Ø 2
✳	L-2C,D	6' x20'			9	PRESENCE	CALL & EXTEND Ø 2
✳	L-3	6' x40'			3	PRESENCE	CALL & EXTEND Ø 3
	L-4A,B	**6' x40'**	**410'**	**205'**	**4**	**PRESENCE**	**CALL & EXTEND Ø 4**
	L-4C,D	**6' x20'**	**232'**	**116'**	**10**	**PRESENCE**	**CALL & EXTEND Ø 4**
✳	L-5	6' x40'			5	PRESENCE	CALL & EXTEND Ø 5
✳	L-6A,B	6' x40'			6	PRESENCE	CALL & EXTEND Ø 6
✳	L-6C,D	6' x20'			11	PRESENCE	CALL & EXTEND Ø 6
	L-7	**6' x40'**	**252'**	**126'**	**7**	**PRESENCE**	**CALL & EXTEND Ø 7**
✳	L-8A,B	6' x40'			8	PRESENCE	CALL & EXTEND Ø 8
✳	L-8C,D	6' x20'			12	PRESENCE	CALL & EXTEND Ø 8
	TOTAL:		894'	447'			

✳ EXISTING LOOP DETECTORS TO REMAIN IN PLACE

ELECTRICAL CHART

ITEM	TOTAL QTY.	RUN NUMBER	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
		RUN LENGTH(FT)	89	60	35	85	25	40	20	40	75	20	45	25	60	20	55	45	15	15
POWER		1/C-#6																		
	370'	4/C-#12 LUM. TRAY		1	1	1		1	1	1								2		
GROUND		1/C-#6 BARE																		
		1/C-#8 BARE																		
SIGNAL CABLE	1405'	2/C-#12		1	1	1	1	2	2	2	1	1	1	2	3	3	3	5	6	6
	2220'	5/C-#12		1	2	2	1	3	4	4	1	1	2	2	4	4	5	9	10	10
	800'	7/C-#12				1		1	1	2		1	1		1	2	2	4	4	4
		COAXIAL CABLE																		
LOOP	178'	1/C-#14 LOOP WIRE	2																	
		2/C-#14 (SHIELD)																		
CONDUIT	89'	1" PVC	1																	
		2" PVC																		
		2" PVC BORE																		
		4" PVC																	①	①
		4" PVC BORE																		

ALL WIRES & CONDUITS NOT AFFECTED BY CONSTRUCTION TO REMAIN IN PLACE UNLESS OTHERWISE NOTED.

ⓟ DENOTES EXISTING CONDUIT TO REMAIN IN PLACE

TRAFFIC SIGNAL POLES

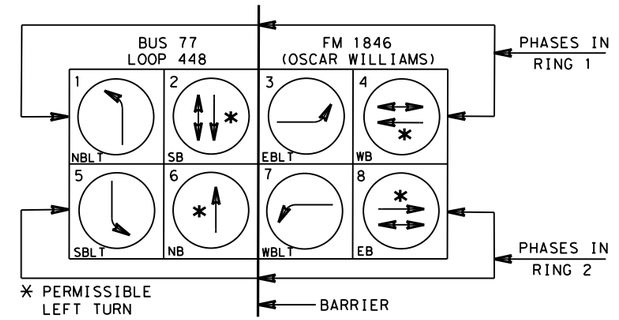
POLE NUMBER	QUANTITY	SIGNAL POLE DESIGNATION	FOUNDATION TYPE	FOUNDATION DEPTH
✳ P1	1	SP-30B-100	36(TY A)	
✳ P2	1	SPL-30B-100	36(TY A)	
✳ P3	1	SP-30B-100	36(TY A)	
✳ P4	1	SPL-30B-100	36(TY A)	

✳ EXISTING SIGNAL POLES TO REMAIN IN PLACE

EXISTING TIMING CHART

PHASE	1	2	3	4	5	6	7	8
STREET	BUS 77 LOOP 448		FM 1846 (WILLIAMS)		BUS 77 LOOP 448		FM 1846 (WILLIAMS)	
MOVEMENT	NBLT	SB	EBLT	WB	SBLT	NB	WBLT	EB
INITIAL								
EXTENSION								
MAXIMUM			EXISTING TIMING					
YELLOW			TO REMAIN					
ALL RED			THE SAME					
WALK								
DON'T WALK								
RECALL	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
MEMORY	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

✳ EXISTING TIMING TO REMAIN IN PLACE



EXISTING
PHASING DIAGRAM
(TO REMAIN THE SAME)

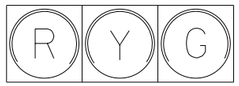
NOTES:

1. THE CONTRACTOR SHALL FURNISH & INSTALL LUMINAIRES, SIGNAL HEADS, CONDUIT, CABLES & LOOP DETECTORS.
2. THE LOCATION SHOWN FOR THE LOOP DETECTORS, CONDUIT RUNS & GROUND BOXES IS APPROXIMATE. THE EXACT LOCATION WILL BE DETERMINED IN THE FIELD BY THE ENGINEER IN COORDINATION WITH THE PHARR DISTRICT TRAFFIC SECTION.
3. ALL SIGNAL CABLE SHALL BE #12 AWG, SERVICE CABLE SHALL BE #6 AWG, 2/C LOOP LEAD-IN CABLE SHALL BE #14 AWG SHIELDED AND LOOP WIRES IN STREET SHALL BE #14 AWG.
4. THE CONTRACTOR SHALL FURNISH NEW LED TRAFFIC SIGNAL HEADS.
5. ALL TRAFFIC SIGNAL HEADS SHALL HAVE BACKPLATES.
6. THE LUMINAIRES SHALL BE OPERATED UNDER THEIR OWN PHOTO ELECTRIC CONTROL.
7. THE CONTRACTOR SHALL VERIFY WITH THE UTILITY COMPANIES AS TO THE EXACT LOCATION OF THE EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION TO AVOID CONFLICT WITH OR DAMAGE TO THESE UTILITIES.
8. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES TO MAKE ANY ADJUSTMENTS, DUE TO UTILITY CONFLICTS, AS DEFINED IN THE SPECIFICATIONS OR DEEMED NECESSARY BY THE ENGINEER.

EXISTING

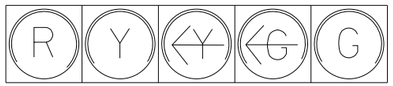
S1 THRU S4
TO BE REMOVED

EXISTING 12" HORIZONTAL



SIGNALS NO.
2,3,5,6,8,9,11 & 12
W/BACKPLATES
TO BE REMOVED

EXISTING 12" HORIZONTAL

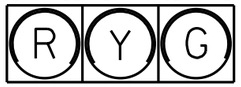


SIGNALS NO. 1,4,7 & 10
W/BACKPLATES
TO BE REMOVED

INSTALL

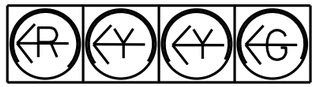
R10-17T
(30"x30")
S1 THRU S4

INSTALL 12" HORIZONTAL



SIGNALS NO.
2,3,5,6,8,9,11 & 12
W/BACKPLATES

INSTALL 12" HORIZONTAL

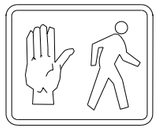


SIGNALS NO. 1,4,7 & 10

EXISTING

R10-4B SIGN WITH
PEDESTRIAN PUSH
BUTTON ON
SIGNAL POLES
FOR W1 THRU W6
(TO BE REMOVED)

EXISTING
18" x 16"



PEDESTRIAN SIGNALS
W1 THRU W6
(TO BE REMOVED)

INSTALL

R10-3eR SIGN w/
PEDESTRIAN PUSH BUTTON
INSTALLED ON SIGNAL POLES
(W2,W4 & W6)

INSTALL

R10-3eL SIGN w/
PEDESTRIAN PUSH BUTTON
INSTALLED ON SIGNAL POLES
(W1,W3 & W5)

Eligio Alvarez, P.E
7-15-2021

Pharr District Central Design

Texas Department of Transportation

①

TRAFFIC SIGNAL LAYOUT
PROPOSED INSTALLATION
FM 1846 @ BUS 77

SCALE: 1" = 60' SHEET 2 OF 2

© 2021		CONT	SECT	JOB	HIGHWAY
DS:	CK:	1065	02	039	FM 1846
		DIST	COUNTY		SHEET NO.
DW:	CK:	PHR	CAMERON		170

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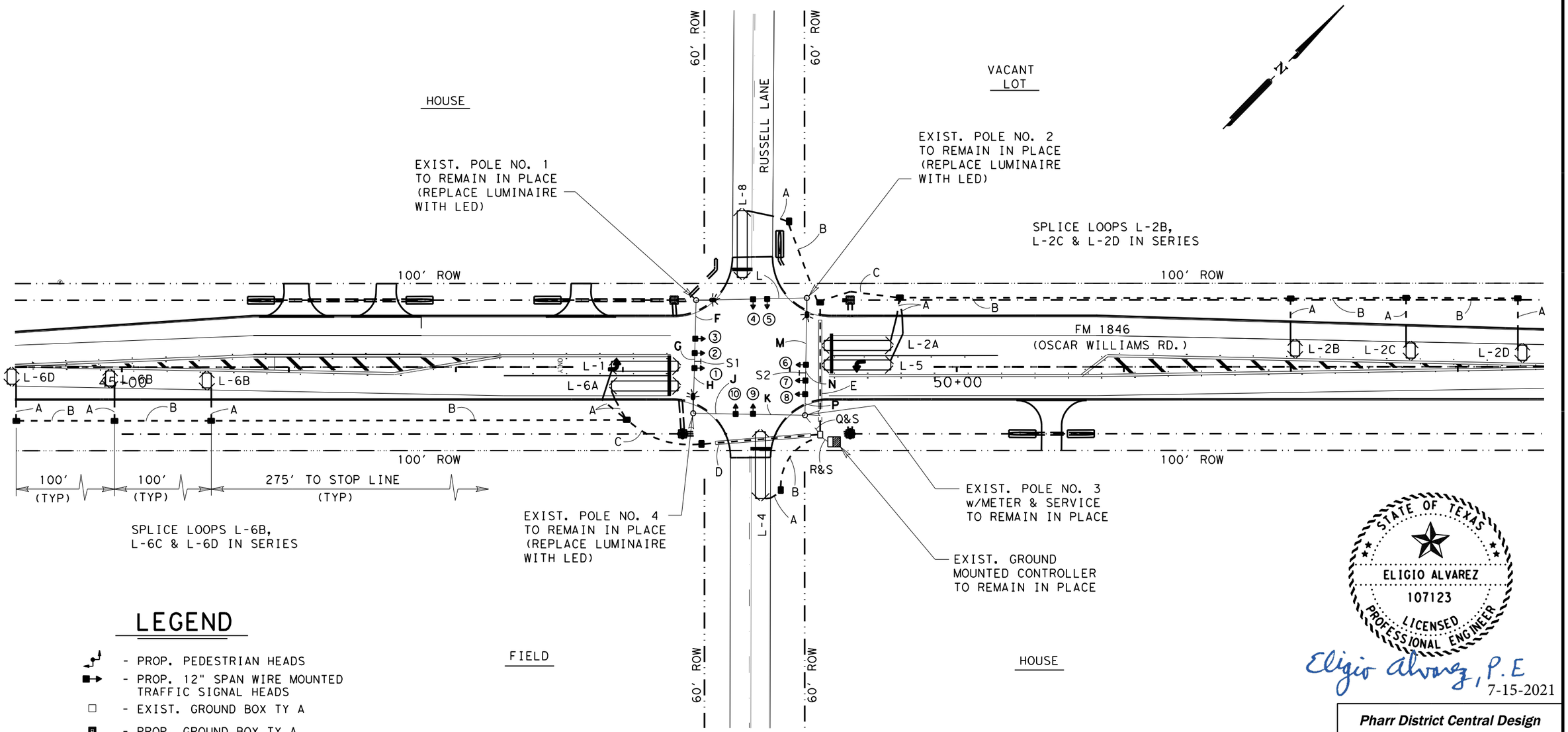

LEGEND

- PROP. PEDESTRIAN HEADS
- PROP. 12" SPAN WIRE MOUNTED TRAFFIC SIGNAL HEADS
- EXIST. GROUND BOX TY A
- PROP. GROUND BOX TY A
- PROP. GROUND BOX TY D
- PROP. LOOP DETECTOR
- EXIST. FULL TRAFFIC ACTUATED GROUND MOUNTED CONTROLLER
- EXIST. CONDUIT (SIZE & TYPE AS SPECIFIED)
- PROP. CONDUIT (SIZE & TYPE AS SPECIFIED)
- PROP. LUMINAIRE
- PROP. CONDUIT BORE (SIZE & TYPE AS SPECIFIED)

PROPOSED SIGNAL

INTERSECTION OF
FM 1846/RUSSELL LANE
CAMERON COUNTY
CSJ: 1065-02-039

STATE OF TEXAS
ELIGIO ALVAREZ
107123
LICENSED PROFESSIONAL ENGINEER

Eligio Alvarez, P.E
7-15-2021

Pharr District Central Design

Texas Department of Transportation

②

TRAFFIC SIGNAL LAYOUT
PROPOSED INSTALLATION
FM 1846 @ RUSSELL LANE

SCALE: 1" = 60'

SHEET 1 OF 3

© 2021	CONT	SECT	JOB	HIGHWAY
DS: CK:	1065	02	039	FM 1846
DW: CK:	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		171

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LOOP DETECTOR CHART

LOOP	SIZE	WIRE LENGTH	SAW CUT	AMPLIFIER NO.	SETTING	FUNCTION
L-1	6' x40'	224'	112'	1	PRESENCE	CALL & EXTEND Ø 1
L-2A	6' x40'	220'	110'	2	PRESENCE	CALL & EXTEND Ø 2
L-2B	6' x10'	120'	44'	9	PRESENCE	CALL & EXTEND Ø 2
L-2C	6' x10'	120'	44'	9	PRESENCE	CALL & EXTEND Ø 2
L-2D	6' x10'	120'	44'	9	PRESENCE	CALL & EXTEND Ø 2
L-4	6' x40'	192'	96'	4	PRESENCE	CALL & EXTEND Ø 4
L-5	6' x40'	238'	119'	5	PRESENCE	CALL & EXTEND Ø 5
L-6A	6' x40'	196'	98'	6	PRESENCE	CALL & EXTEND Ø 6
L-6B	6' x10'	112'	40'	11	PRESENCE	CALL & EXTEND Ø 6
L-6C	6' x10'	112'	40'	11	PRESENCE	CALL & EXTEND Ø 6
L-6D	6' x10'	112'	40'	11	PRESENCE	CALL & EXTEND Ø 6
L-8	6' x40'	216'	108'	8	PRESENCE	CALL & EXTEND Ø 8
TOTAL:		1,982'	895'			

ELECTRICAL CHART

ITEM	TOTAL QTY.	RUN NUMBER	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
		RUN LENGTH(FT)	188	1025	125	75	85	55	30	35	55	50	41	70	15	45	20	10	30							
POWER		1/C-#6																	②							
	460'	4/C-#12 LUM. TRAY						1	1	1	2	2		1	1	1										
GROUND		1/C-#6 BARE																	①							
	30'	1/C-#8 BARE															1	1								
SIGNAL CABLE		2/C-#12																								
	556'	5/C-#12							1	1	1	2	1	1	1	2	4	4								
	260'	7/C-#12								1	1	1			1	1	2	2								
		COAXIAL CABLE																								
LOOP	376'	1/C-#14 LOOP WIRE	2																							
	2045'	2/C-#14 (SHIELD)		1	3	3	4											8								
CONDUIT	188'	1" PVC	1																							
	1150'	2" PVC		1	1														①							
		2" PVC BORE																								
		4" PVC															①	①								
	160'	4" PVC BORE				1	1																			

ALL WIRES & CONDUITS NOT AFFECTED BY CONSTRUCTION TO REMAIN IN PLACE UNLESS OTHERWISE NOTED.

(?) DENOTES EXISTING CONDUIT TO REMAIN IN PLACE

EXISTING TRAFFIC SIGNAL POLES

	POLE NUMBER	QUANTITY	SIGNAL POLE DESIGNATION	FOUNDATION TYPE	FOUNDATION DEPTH
*	P1, P2, P4	3	SPL-34D-100	36(TY B)	
*	P3	1	SP-34D-100	36(TY B)	

* EXISTING POLES TO REMAIN IN PLACE

REFERENCE EXISTING TIMING CHART

PHASE	1	2	3	4	5	6	7	8
STREET	FM 1846 (WILLIAMS)		RUSSELL LANE		FM 1846 (WILLIAMS)		RUSSELL LANE	
MOVEMENT	EBLT	WB	SBLT	NB	WBLT	EB	NBLT	SB
INITIAL	10	10		8	10	10		8
EXTENSION	2	2		2	2	2		2
MAXIMUM	14	36	NOT USED	14	14	36	NOT USED	14
YELLOW	4	4		4	4	4		4
ALL RED	1	1		1	1	1		1
WALK								
DON'T WALK								
RECALL	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
MEMORY	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

(TO REMAIN IN PLACE)

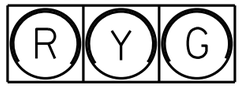
NOTES:

1. THE CONTRACTOR SHALL FURNISH & INSTALL LUMINAIRES, SIGNAL HEADS, CONDUIT, CABLES, LOOP DETECTORS & GROUND BOXES.
2. THE LOCATION SHOWN FOR THE LOOP DETECTORS, CONDUIT RUNS & GROUND BOXES IS APPROXIMATE. THE EXACT LOCATION WILL BE DETERMINED IN THE FIELD BY THE ENGINEER IN COORDINATION WITH THE PHARR DISTRICT TRAFFIC SECTION.
3. ALL SIGNAL CABLE SHALL BE #12 AWG, SERVICE CABLE SHALL BE #6 AWG, 2/C LOOP LEAD-IN CABLE SHALL BE #14 AWG SHIELDED AND LOOP WIRES IN STREET SHALL BE #14 AWG.
4. THE CONTRACTOR SHALL FURNISH NEW LED TRAFFIC SIGNAL HEADS.
5. ALL TRAFFIC SIGNAL HEADS SHALL HAVE BACKPLATES.
6. THE LUMINAIRES SHALL BE OPERATED UNDER THEIR OWN PHOTO ELECTRIC CONTROL.
7. THE CONTRACTOR SHALL VERIFY WITH THE UTILITY COMPANIES AS TO THE EXACT LOCATION OF THE EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION TO AVOID CONFLICT WITH OR DAMAGE TO THESE UTILITIES.
8. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES TO MAKE ANY ADJUSTMENTS, DUE TO UTILITY CONFLICTS, AS DEFINED IN THE SPECIFICATIONS OR DEEMED NECESSARY BY THE ENGINEER.

INSTALL

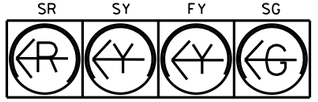
R10-17T
(30"x30")
S1 & S2

INSTALL 12" HORIZONTAL

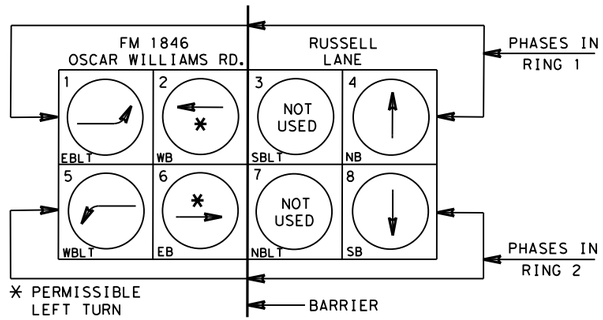


SIGNALS NO.
2, 3, 4, 5, 7, 8, 9 & 10
W/BACKPLATES

INSTALL 12" HORIZONTAL



SIGNALS NO. 1 & 6
W/BACKPLATES



EXISTING
PHASING DIAGRAM

(TO REMAIN IN PLACE)

STATE OF TEXAS
ELIGIO ALVAREZ
107123
LICENSED
PROFESSIONAL ENGINEER

Eligio Alvarez, P.E
7-15-2021

Pharr District Central Design

Texas Department of Transportation

②

TRAFFIC SIGNAL LAYOUT
PROPOSED INSTALLATION
FM 1846 @ RUSSELL LANE

SCALE: 1" = 60'

SHEET 2 OF 3

DS:	CK:	CONT	SECT	JOB	HIGHWAY
DW:	CK:	1065	02	039	FM 1846
		DIST	COUNTY		SHEET NO.
		PHR	CAMERON		172

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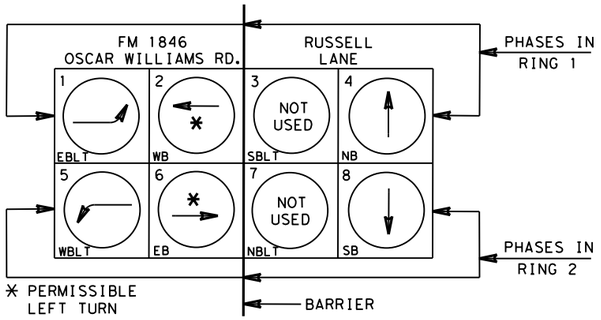
EXISTING TIMING CHART

PHASE	1	2	3	4	5	6	7	8
STREET	FM 1846 (WILLIAMS)		RUSSELL LANE		FM 1846 (WILLIAMS)		RUSSELL LANE	
MOVEMENT	EBLT	WB	SBLT	NB	WBLT	EB	NBLT	SB
INITIAL	10	10		8	10	10		8
EXTENSION	2	2	NOT USED	2	2	2	NOT USED	2
MAXIMUM	14	36		14	14	36		14
YELLOW	4	4		4	4	4		4
ALL RED	1	1		1	1	1		1
WALK								
DON'T WALK								
RECALL	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
MEMORY	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF



LOOP DETECTOR CHART

LOOP	SIZE	WIRE LENGTH	SAW CUT	AMPLIFIER NO.	SETTING	FUNCTION
L-1	6' x40'			1	PRESENCE	CALL & EXTEND Ø 1
L-2A	6' x40'			2	PRESENCE	CALL & EXTEND Ø 2
L-2B	6' x10'			9	PRESENCE	CALL & EXTEND Ø 2
L-2C	6' x10'			9	PRESENCE	CALL & EXTEND Ø 2
L-2D	6' x10'			9	PRESENCE	CALL & EXTEND Ø 2
L-4	6' x40'			4	PRESENCE	CALL & EXTEND Ø 4
L-5	6' x40'			5	PRESENCE	CALL & EXTEND Ø 5
L-6A	6' x40'			6	PRESENCE	CALL & EXTEND Ø 6
L-6B	6' x10'			11	PRESENCE	CALL & EXTEND Ø 6
L-6C	6' x10'			11	PRESENCE	CALL & EXTEND Ø 6
L-6D	6' x10'			11	PRESENCE	CALL & EXTEND Ø 6
L-8	6' x40'			8	PRESENCE	CALL & EXTEND Ø 8
TOTAL:						

PHASING DIAGRAM

EXISTING 12" HORIZONTAL

SIGNALS NO.1 & 6
(TO BE REMOVED)

EXISTING 12" HORIZONTAL

SIGNALS NO.
2, 3, 4, 5, 7, 8, 9 & 10
(TO BE REMOVED)

EXISTING

R10-12
(30"X 36")
S1 & S2
(TO BE REMOVED)

TRAFFIC SIGNAL POLES

POLE NUMBER	QUANTITY	SIGNAL POLE DESIGNATION	FOUNDATION TYPE	FOUNDATION DEPTH
P1, P2, P4	3	SPL-34D-100	36(TY B)	15'
P3	1	SP-34D-100	36(TY B)	15'

EXISTING CONDITION

INTERSECTION OF
FM 1846/RUSSELL LANE
CAMERON COUNTY
CSJ: 1065-02-039

LEGEND

- EXISTING 12" SPAN WIRE MOUNTED TRAFFIC SIGNAL HEADS
- EXISTING GROUND BOX
- EXISTING LOOP DETECTOR
- EXISTING FULL TRAFFIC ACTUATED GROUND MOUNTED CONTROLLER
- EXISTING CONDUIT (SIZE & TYPE AS SPECIFIED)
- EXISTING CONDUIT & BORE (SIZE & TYPE AS SPECIFIED)
- EXISTING LUMINAIRE

STATE OF TEXAS
ELIGIO ALVAREZ
107123
LICENSED
PROFESSIONAL ENGINEER

Eligio Alvarez, P.E
7-15-2021

Pharr District Central Design

Texas Department of Transportation

②

TRAFFIC SIGNAL LAYOUT
EXISTING CONDITION
FM 1846 @ RUSSELL LANE

SCALE: 1" = 60'

SHEET 3 OF 3

© 2021	CONT	SECT	JOB	HIGHWAY
DS: CK:	1065	02	039	FM 1846
	DIST	COUNTY		SHEET NO.
DW: CK:	PHR	CAMERON		173

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SUMMARY OF TRAFFIC SIGNAL ITEMS

ITEM	DESC CODE	ITEM DESCRIPTION	UNIT	(1) FM 1846 AT BUS 77	(2) FM 1846 AT RUSSELL	(3) FM 1846 AT SAN JOSE						TOTALS
				EST	EST	EST						
416	**6030**	DRILL SHAFT (TRF SIG POLE) (24 IN)	LF									
416	**6032**	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF									
618	**6016**	CONDT (PVC)(SCH 40)(1")	LF	89	188							277
618	**6023**	CONDT (PVC)(SCH 40)(2")	LF		1150							1150
618	**6033**	CONDT (PVC)(SCH 40)(4")	LF									
618	**6059**	CONDT (PVC)(SCH 80)(4")(BORE)	LF		160							160
620	**6007**	ELEC CONDR (NO. 8) BARE	LF		30							30
620	**6009**	ELEC CONDR (NO.6) BARE	LF									
620	**6010**	ELEC CONDR (NO.6) INSULATED	LF									
621	**6005**	TRAY CABLE (4 CONDR)(12 AWG)	LF	370	460							830
624	**6002**	GROUND BOX TY A (122311)W/APRON	EA		12							12
624	**6010**	GROUND BOX TY D (162922W/APRON	EA		1							1
625	**6003**	ZINC-COAT STL WIRE STRAND (3/8 IN)	LF									
628	**6301**	ELC SRV TY T 120/240 000(NS)GS(L)TS(O)	EA									
680	**6001**	INSTALL HWY TRF SIG(FLASH BEACON)	EA									
✱680		FLASHER CONTROLLER	EA									
680	**6002**	INSTALL HWY TRF SIG (ISOLATED)	EA	1	1							2
✱680		LUMINAIRE W/LED (250W EQ)	EA	2	3							5
✱680		TS2-TYPE 1 CABINET (FULLY ACTUATED)	EA									
✱680		SIGN "LT TRN YIELD FL YEL ARR"R10-17T 30"x30"	EA	4	2							6
✱680		SIGN "STREET NAME"	EA									
680	**6004**	REMOVING TRAFFIC SIGNALS	EA	1	1							2
681	**6001**	TEMP TRAF SIGNALS	EA	1	1	1						3
682	**6001**	VEH SIG SEC (12") LED (GRN)	EA	8	8							16
682	**6002**	VEH SIG SEC (12") LED (GRN ARW)	EA	4	2							6
682	**6003**	VEH SIG SEC (12") LED (YEL)	EA	8	8	4						20
682	**6004**	VEH SIG SEC (12") LED (YEL ARW)	EA	8	4							12
682	**6005**	VEH SIG SEC (12") LED (RED)	EA	8	8	2						18
682	**6006**	VEH SIG SEC (12") LED (RED ARW)	EA	4	2							6
682	**6018**	PED SIG SEC (LED)(COUNTDOWN)	EA	6								6
682	**6060**	BACKPLATE W/REFL BRDR(3 SEC)	EA	8	8							16
682	**6049**	BACKPLATE W/REFL BRDR(4 SEC)	EA	4	2							6
682	**6050**	BACKPLATE W/REFL BRDR(5 SEC)	EA									
684	**6007**	TRF SIG CBL (TY A)(12 AWG)(2 CONDR)	LF	1405								1405
684	**6010**	TRF SIG CBL (TY A)(12 AWG)(5 CONDR)	LF	2220	556	130						2906
684	**6012**	TRF SIG CBL (TY A)(12 AWG)(7 CONDR)	LF	800	260							1060
684	**6080**	TRF SIG CBL (TY C)(14 AWG)(2 CONDR)SHIELDED LOOP LEAD-IN	LF	178	2045							2223
685	**6001**	INSTALL RDSD FLASH BEACON ASSEMBLY	EA									
685	**6003**	REMOVE RDSD FLASH BEACON ASSEMBLY	EA									
686	**6008**	INS TRF SIG PL AM(S) STR(TY B) LUM										
686	**6020**	INS TRF SIG PL AM(S) STR(TY D) LUM	EA									
687	**6001**	PED POLE ASSEMBLY	EA									
688	**6001**	PED DETECT PUSH BUTTON (APS)	EA	6								6
688	**6003**	PED DETECTER CONTROLER UNIT	EA	1								1
688	**6004**	VEH LP DETECT (SAW CUT)	LF	447	895							1342
✱688		1/C #14 AWG LOOP WIRE (XHHW)	LF	894	1982							2876

✱ QUANTITIES SHOWN ARE FOR THE CONTRACTORS INFORMATION ONLY. THESE ITEMS ARE SUBSIDIARY TO VARIOUS OTHER ITEMS.

STATE OF TEXAS
ELIGIO ALVAREZ
107123
LICENSED
PROFESSIONAL ENGINEER

Eligio Alvarez, P.E

7-15-2021

Pharr District Central Design

Texas Department of Transportation

SUMMARY OF MATERIALS TRAFFIC SIGNAL

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		175

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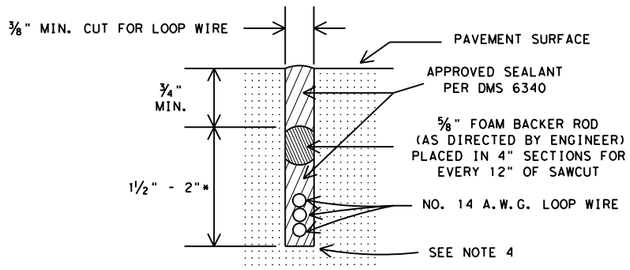
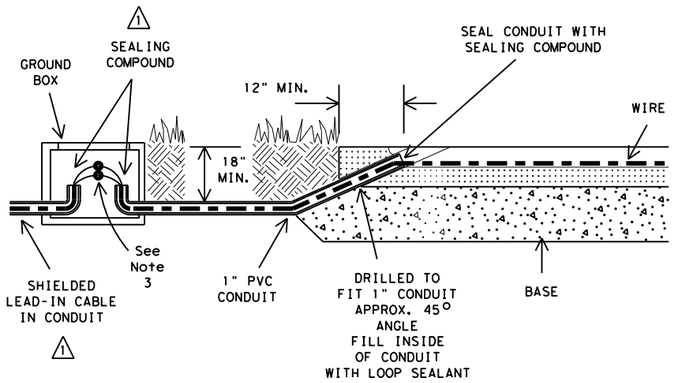
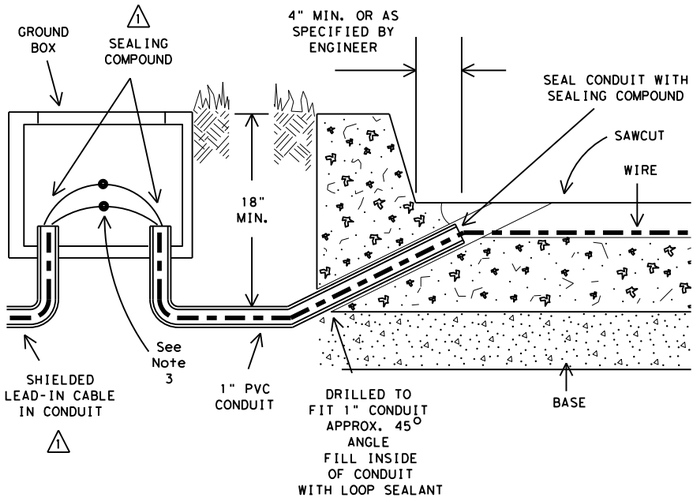


LOOP SAW CUT CROSS-SECTION

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



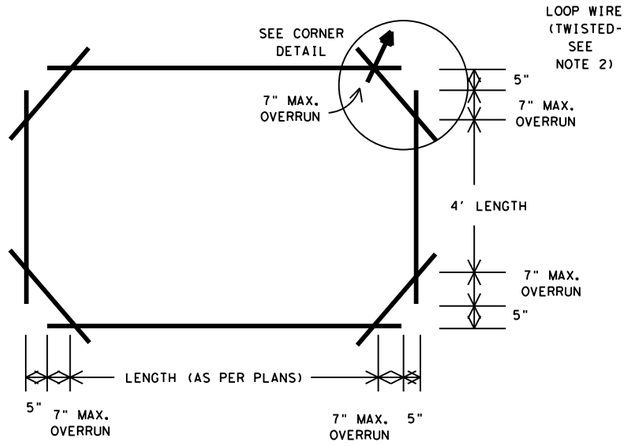
TYPICAL LEAD IN CONFIGURATION (WITHOUT CURBING)



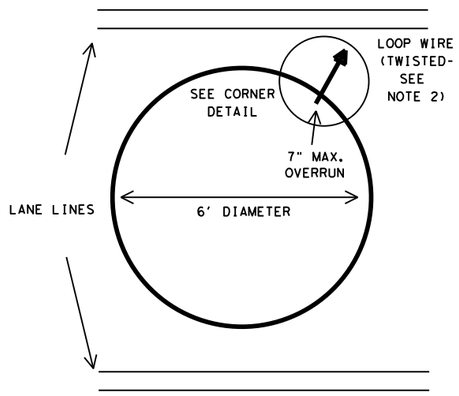
TYPICAL LEAD IN CONFIGURATION (WITH CURBING)

TYPICAL LOOP DETECTOR LAYOUTS

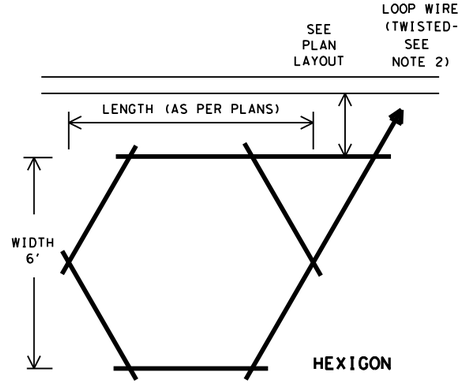
(AS SPECIFIED IN PLANS)



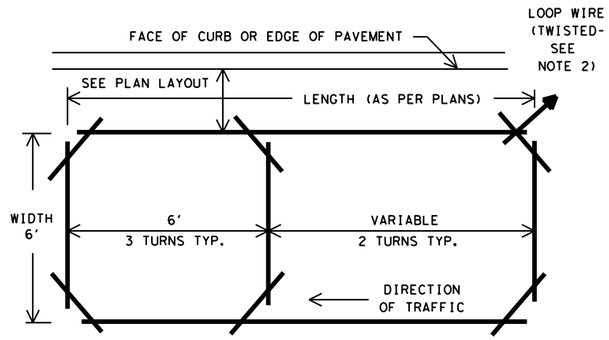
RECTANGULAR



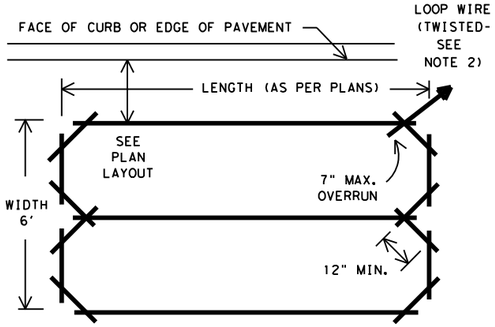
CIRCULAR



HEXIGON



POWER HEADER



QUADRAPOLE

GENERAL NOTES:

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

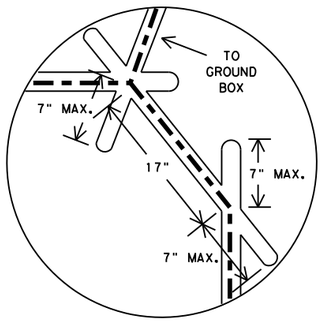
Recommended Number of Turns for Loop Detectors

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

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

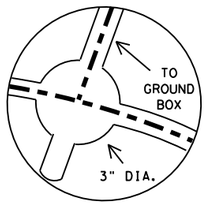
For additionhal information refer to "Texas Traffic Signal Detector" manual, TTI Report 1163-1.

TYPICAL CORNER DETAILS

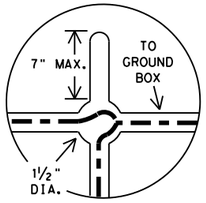


RECTANGULAR & HEXIGON LOOP
SAWCUT CORNER DETAIL

7" OVERRUN BASED ON 24" DIAMETER SAW BLADE



CIRCULAR LOOP
DRILLED CORNER DETAIL



RECTANGULAR & HEXIGON LOOP (ALT.)
DRILLED CORNER DETAIL

Texas Department of Transportation
Traffic Operations Division

LOOP DETECTOR INSTALLATION DETAILS

LD(1)-03

REVISIONS
2-99
1-03

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

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846

DIST	COUNTY	SHEET NO.
PHR	CAMERON	176

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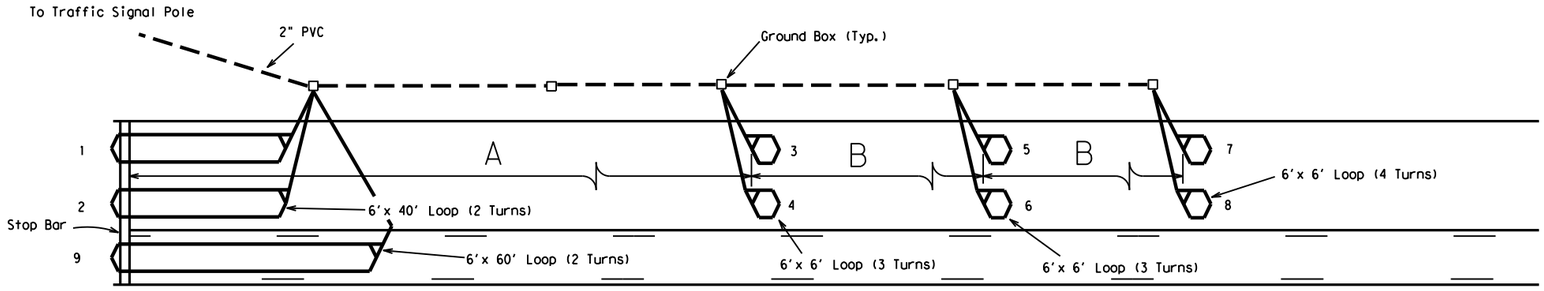
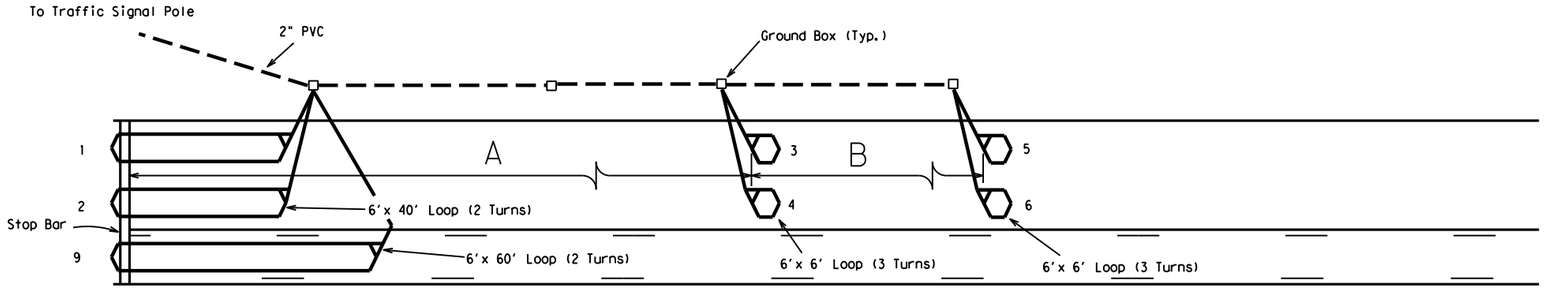
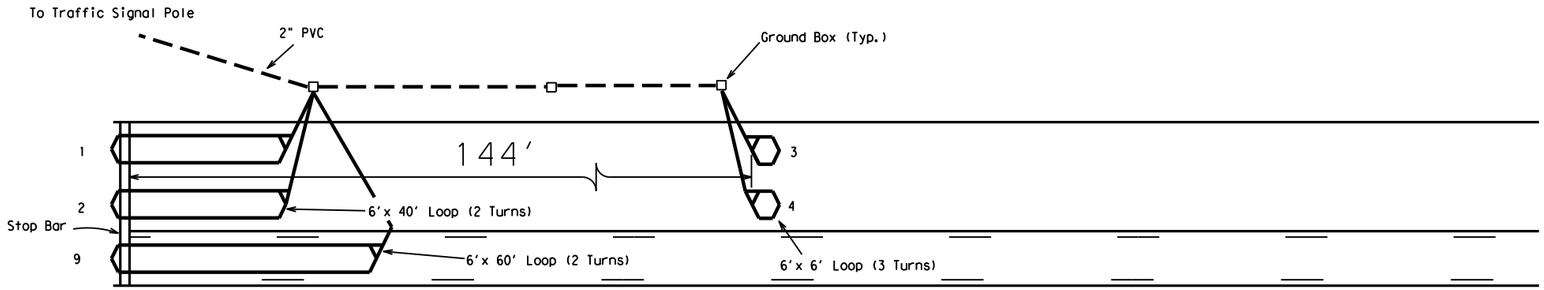


55 MPH (A=225', B=95') 60 MPH (A=275', B=100')
65 MPH (A=320', B=110') 70 MPH (A=350', B=125')



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



30 MPH

GENERAL NOTES:

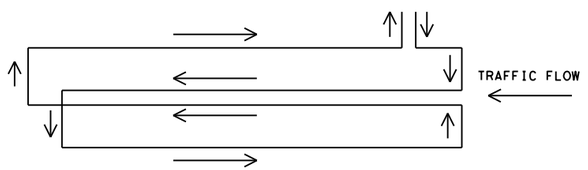
Loops 1 and 2 shall be connected to the controller cabinet by means of the same loop lead-in (2/C #14 AWG).

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

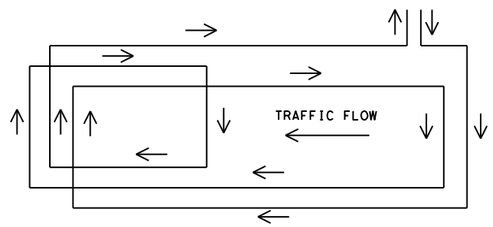
Loops 7 and 8 shall be connected to the controller cabinet by means of the same loop lead-in (2/C #14 AWG).

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

LOOP WINDING DETAILS



QUADRAPOLE LOOP



POWER HEADER LOOP

Texas Department of Transportation
Traffic Operations Division

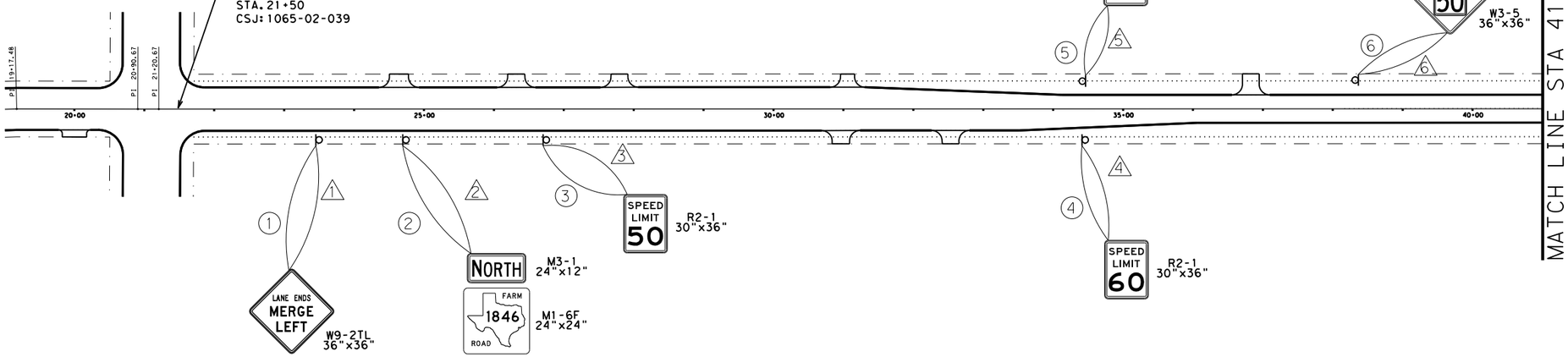
LOOP DETECTOR PLACEMENT DETAILS

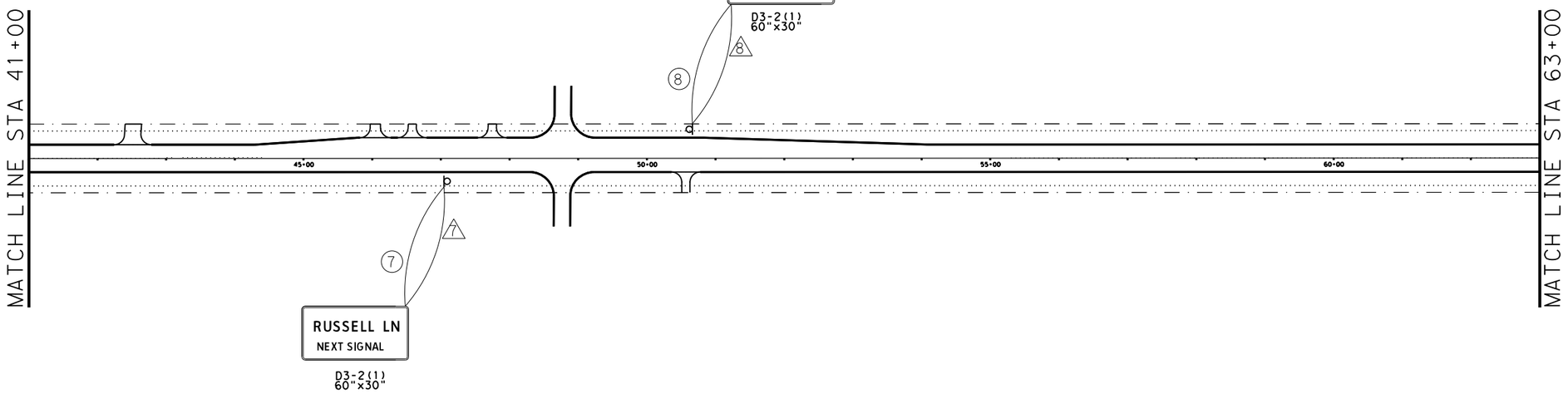
LD(2)-03

REVISIONS

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

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		177





LEGEND:

- # SIGNS TO BE RELOCATED (ITEM 685)
- SIGNS TO BE RELOCATED (ITEM 644)
- SIGNS TO BE REMOVED (ITEM 644)
- SIGNS TO BE INSTALLED (ITEM 644)
- SIGNS TO REMAIN IN PLACE
- EXISTING SIGNS TO BE RELOCATED BY OTHERS

GENREAL NOTES:

1.) ALL SIGNS IN WORKING AREAS DESIGNATED TO BE RELOCATED CAN BE REMOVED AND STORED AT THE MISSION MAINTANCE YARD TO PREVENT DAMAGE DURING CONSTRUCTION.

2.) CONTRACTOR IS RESPONSEABLE FOR ALL SIGNS DAMAGED DURING CONSTRUCTION. THIS DAMAGED SIGNS WILL BE REPLACED BY THE CONTRACTOR AT HIS EXPENSE.

3.) ANY EXISTING SIGN DESIGNATED TO BE RELOCATED CAN BE REPLACED IF IT DOES NOT MEET THE ATTACHED SIGN STANDARDS OR IF DIRECTED BY THE ENGINEER.

4.) CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES TO WAKE ANY ADJUSTMENTS, DUE TO CONFLICTS ON ANY SIGNS THAT ARE TO BE RELOCATED.

5.) EXISTING SIGNS THAT ARE PROPOSED TO BE REPLACED, BUT MEET THE STANDARDS AND ARE IN GOOD CONDITION, CAN REMAIN IN PLACE IF APPROVED BY THE ENGINEER. A FIELD INSPECTION BEFORE & AFTER THE CONSTRUCTION OF THIS PROJECT SHALL BE DONE.

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED
PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846
SIGNING LAYOUT

NOT TO SCALE — SHEET 1 OF 2

© 2021		CONT	SECT	JOB	HIGHWAY
DS:	CK:	1065	02	039	FM 1846
		DIST	COUNTY		SHEET NO.
DW:	CK:	PHR	CAMERON		178

DATE: 7/13/2021 9:39:34 AM
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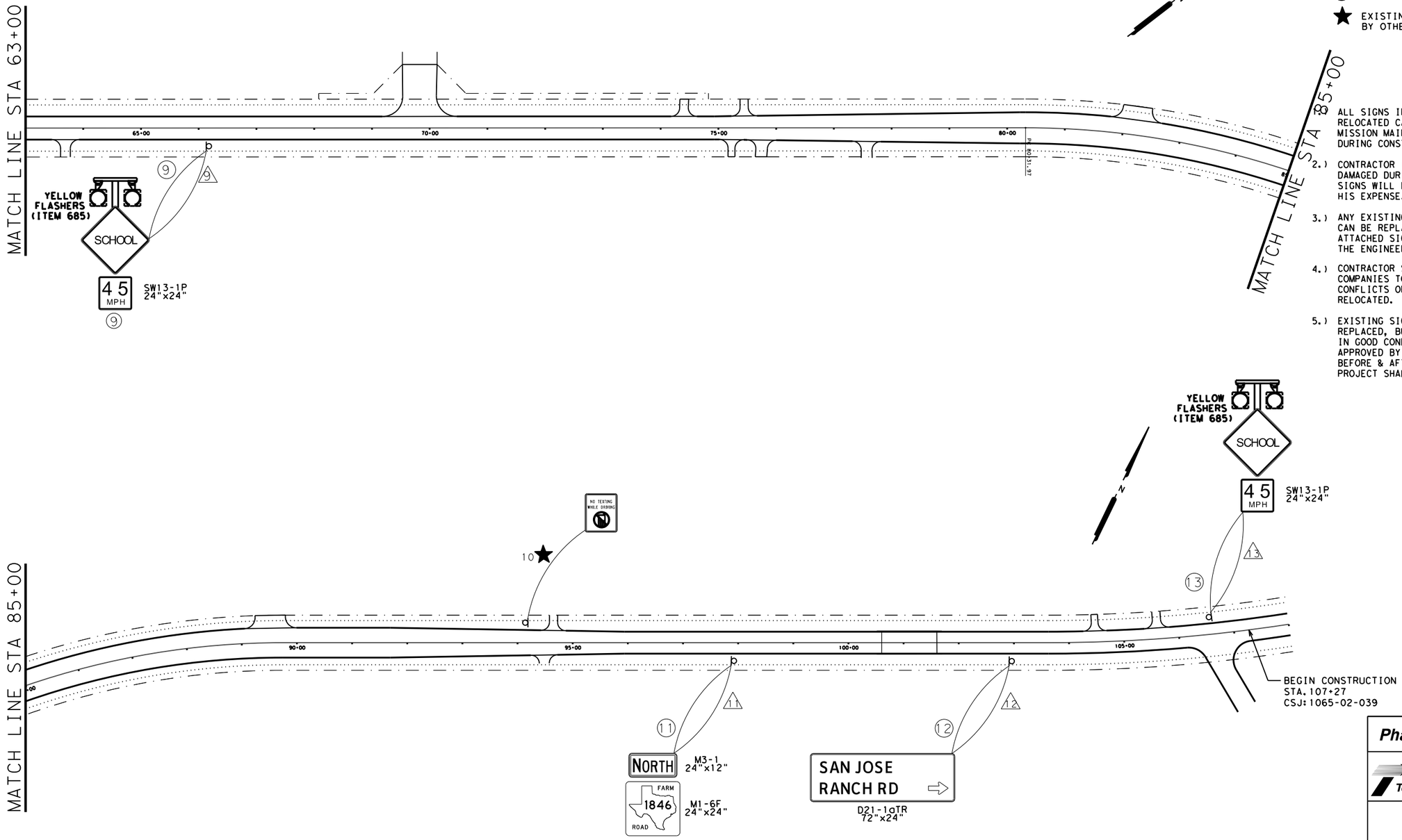


LEGEND:

- # SIGNS TO BE RELOCATED (ITEM 685)
- SIGNS TO BE RELOCATED (ITEM 644)
- SIGNS TO BE REMOVED (ITEM 644)
- SIGNS TO BE INSTALLED (ITEM 644)
- SIGNS TO REMAIN IN PLACE
- EXISTING SIGNS TO BE RELOCATED BY OTHERS

GENREAL NOTES:

1.) ALL SIGNS IN WORKING AREAS DESIGNATED TO BE RELOCATED CAN BE REMOVED AND STORED AT THE MISSION MAINTANCE YARD TO PREVENT DAMAGE DURING CONSTRUCTION.

2.) CONTRACTOR IS RESPONSEABLE FOR ALL SIGNS DAMAGED DURING CONSTRUCTION. THIS DAMAGED SIGNS WILL BE REPLACED BY THE CONTRACTOR AT HIS EXPENSE.

3.) ANY EXISTING SIGN DESIGNATED TO BE RELOCATED CAN BE REPLACED IF IT DOES NOT MEET THE ATTACHED SIGN STANDARDS OR IF DIRECTED BY THE ENGINEER.

4.) CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES TO WAKE ANY ADJUSTMENTS, DUE TO CONFLICTS ON ANY SIGNS THAT ARE TO BE RELOCATED.

5.) EXISTING SIGNS THAT ARE PROPOSED TO BE REPLACED, BUT MEET THE STANDARDS AND ARE IN GOOD CONDITION, CAN REMAIN IN PLACE IF APPROVED BY THE ENGINEER. A FIELD INSPECTION BEFORE & AFTER THE CONSTRUCTION OF THIS PROJECT SHALL BE DONE.

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 SIGNING LAYOUT

NOT TO SCALE — SHEET 2 OF 2

© 2021		CONT	SECT	JOB	HIGHWAY
DS:	CK:	1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	CAMERON		179

DATE: 7/12/2021 4:05:56 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT5\Documents\21 - PHR\Design Projects\1065020394\4 - Design\Plan Set\15. Signing\FM 1846_SIGNING.dgn

SUMMARY OF SMALL SIGNS TO BE REMOVED & RELOCATED UNDER ITEM (644)

PLAN SHT. NO.	SIGN NO.	SIGN TYPE	SIGN TEXT	SIGN DIMENS. (INCHES)	REMOVE SMALL SIGN ASSM. (EA)	RELOCATE SM RD SN SUP & AM TY S80 (EA)
1of2	1	W9-2TL	LANE ENDS MERGE LEFT	36x36	X	
	2	M3-1	NORTH	24x12	X	
		M1-6F	FM 1846	24x24		
	3	R2-1	SPEED LIMIT 50	30x36	X	
	4	R2-1	SPEED LIMIT 60	30x36	X	
	5	R2-1	SPEED LIMIT 50	30x36	X	
	6	W3-5	REDUCE SPEED LIMIT 50	36x36	X	
	7	D3-2(1)	RUSSELL LN NEXT SIGNAL	60x30	X	
	8	D3-2(1)	RUSSELL LN NEXT SIGNAL	60x30	X	
2of2						
	9		SCHOOL	36x36	X	
		SW13-1P	45 MPH	24x24		
	10		NO TEXTING WHILE DRIVING	(SIGN TO BE REMOVED AND		
				RELOCATED BY LOCAL ENTITY)		
	11	M3-1	NORTH	24x12	X	
		M1-6F	FM 1846	24x24		
	12	D21-1aTR	SAN JOSE RANCH RD	72x24	X	
	13		SCHOOL	36x36	X	
		SW13-1P	45 MPH	24x24		

SUMMARY OF SMALL SIGNS TO BE REMOVED & RELOCATED UNDER ITEM (644)

PLAN SHT. NO.	SIGN NO.	SIGN TYPE	SIGN TEXT	SIGN DIMENS. (INCHES)	REMOVE SMALL SIGN ASSM. (EA)	RELOCATE SM RD SN SUP & AM TY S80 (EA)

SUMMARY OF SMALL SIGNS REMOVAL

FED. RD. DIV. NO.	PROJECT NO.		SHEET 1 OF 1			SHEET NO.
6						180
STATE	STATE DIST.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TEXAS	PHR	CAMERON	1065	02	039	FM 1846

SUMMARY OF SMALL SIGNS

SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)

PLAN SHEET NO.	STATION	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	23+46 (RT)	1	W9-2TL	LANE ENDS MERGE LEFT	36x36	✓		S80	1	SA	P		
1	24+71 (RT)	2	M3-1 M1-6F	NORTH / FARM 1846 ROAD	24x12 24x24	✓		S80	1	SA	P		
1	26+72 (RT)	3	R2-1	SPEED LIMIT 50	30x36	✓		S80	1	SA	P		
1	34+42 (RT)	4	R2-1	SPEED LIMIT 60	30x36	✓		S80	1	SA	P		
1	34+45 (LT)	5	R2-1	SPEED LIMIT 50	30x36	✓		S80	1	SA	P		
1	38+35 (LT)	6	W3-5	SPEED LIMIT 50	36x36	✓		S80	1	SA	P		
1	47+06(RT)	7	D3-2(1)	RUSSELL LN NEXT SIGNAL	60x30	✓		S80	1	SA	T		
1	50+65 (LT)	8	D3-2(1)	RUSSELL LN NEXT SIGNAL	60x30	✓		S80	1	SA	T		
2	66+14 (RT)	9	SW13-1P	YELLOW (SOLAR) FLASHERS (TO BE PAID UNDER ITEM 685) / SCHOOL / 45 MPH	36x36 24x24	✓		(TO BE PAID UNDER ITEM 685)					
2	97+89(RT)	11	M3-1 M1-6F	NORTH / FARM 1846 ROAD	24x12 24x24	✓		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/

NOTES:

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).

SHEET 1 OF 2

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

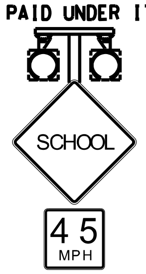
SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	1065	02	039	FM 1846
4-16 8-16	DIST	COUNTY		SHEET NO.
	21	CAMERON		181

18

SUMMARY OF SMALL SIGNS

SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)

PLAN SHEET NO.	STATION	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"	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
2	102+93(RT)	12	D21-1aTR		72x24			S80	1	SA	T		
2	106+61(LT)	13	 SW13-1P	YELLOW (SOLAR) FLASHERS (TO BE PAID UNDER ITEM 685) 	36x36 24x24	✓		(TO BE PAID UNDER ITEM 685)					

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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NOTES:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.

2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS) Standard Sheet.

3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

Texas Department of Transportation — Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

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© TxDOT May 1987	CONT 1065	SECT 02	JOB 039	HIGHWAY FM 1846
REVISIONS 4-16 8-16	DIST 21	COUNTY CAMERON		SHEET NO. 182

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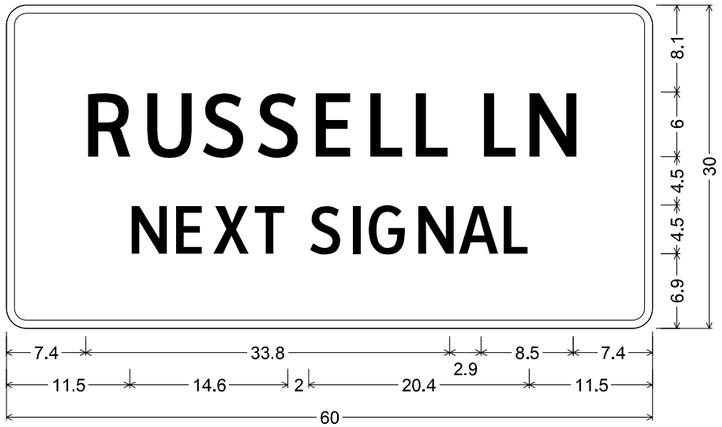

TABLE OF LETTERS AND OBJECTS

R	U	S	S	E	L	L
7.4	12.9	18.1	23.2	28.5	33.5	37.8
L	N					
44.1	48.3					
N	E	X	T			
11.5	15.6	19.0	22.9			
S	I	G	N	A	L	
28.1	32.1	33.5	38.4	41.8	46.0	

D3-2(1)_VARx30;
1.9" Radius, 0.8" Border, White on, Green;
"RUSSELL LN", ClearviewHwy-3-W; "NEXT SIGNAL", ClearviewHwy-3-W;

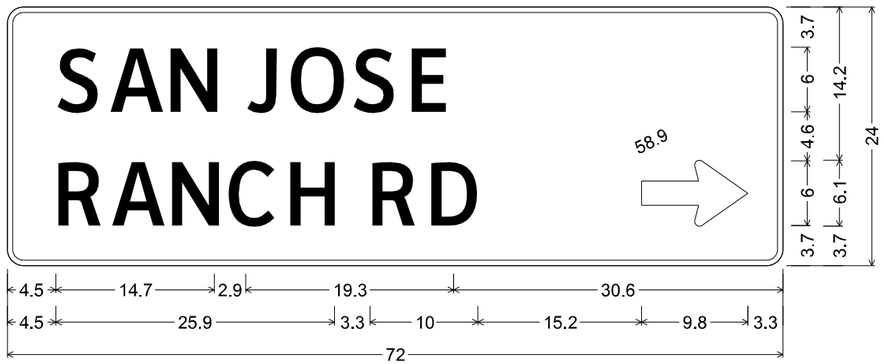

TABLE OF LETTERS AND OBJECTS

S	A	N		
4.5	9.2	14.9		
J	O	S	E	
22.1	26.1	32.0	37.3	
R	A	N	C	H
4.5	9.4	15.0	20.3	26.1
R	D			
33.7	39.1			

D21-1aTR_VARx24;
1.5" Radius, 0.5" Border, White on, Green;
"SAN JOSE", ClearviewHwy-3-W; "RANCH RD", ClearviewHwy-3-W;
Standard Arrow Custom 9.9" X 6.1" 0';

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED
PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 SIGN PANEL DETAILS

NOT TO SCALE — SHEET 1 OF 1

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
DW:	CK:	DIST	COUNTY		SHEET NO.
		PHR	CAMERON		183

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DATE: 7/13/2021 9:53:38 AM
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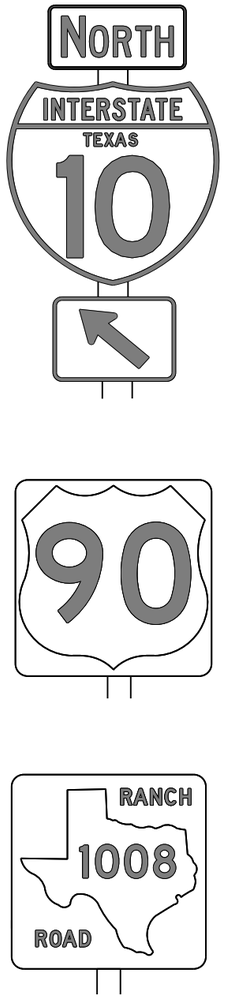
REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

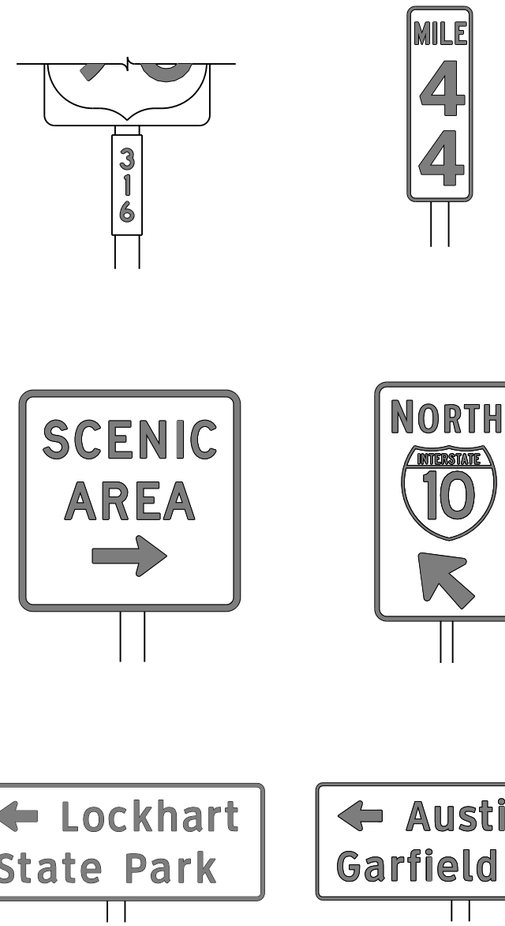
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



TYPICAL EXAMPLES

REQUIREMENTS FOR BLUE, BROWN & GREEN D AND I SERIES GUIDE SIGNS

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE D SHEETING
LEGEND, SYMBOLS & BORDERS	ALL OTHERS	TYPE B OR C SHEETING



TYPICAL EXAMPLES

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).

2. White legend shall use the Clearview Alphabet. The following Clearview fonts shall be used to replace the existing white Federal Highway Administration (FHWA) Standard Highway Alphabets, when not specified in the SHSD, or in the plans.

B	CV-1W
C	CV-2W
D	CV-3W
E	CV-4W
Emod	CV-5WR
F	CV-6W

3. Route sign legend (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets B, C, D, E, Emod or F).

4. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.

5. Independent mounted route sign with white or colored legend and borders shall be applied by screening process with transparent color ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof. White legend, symbols and borders on all other signs shall be cut-out white sheeting applied to colored background sheeting.

6. Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius should be trimmed or rounded.

7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.

8. Mounting details of roadside signs are shown in the "SMD series" Standard Plan Sheets.

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

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

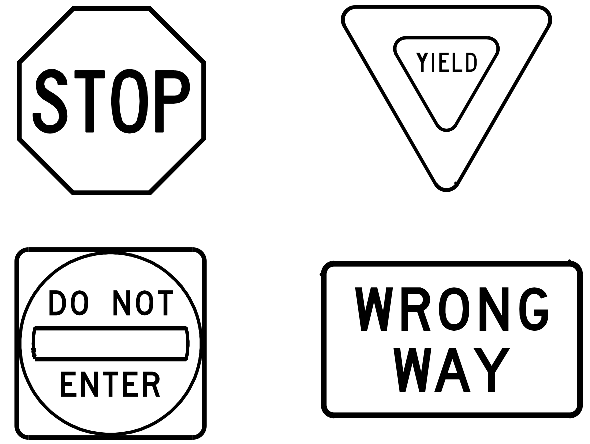
TSR(3)-13

FILE:	tsr3-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS		1065	02	039	FM 1846
12-03 7-13		DIST	COUNTY		SHEET NO.
9-08		PHR	CAMERON		184

3

DATE: 7/12/2021 4:08:46 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT5\Documents\21 - PHR\Design Projects\1065020039\a other Design Files\SER\15. SIGNING STANDARDS\21tsr4-13.dgn

REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS
(STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

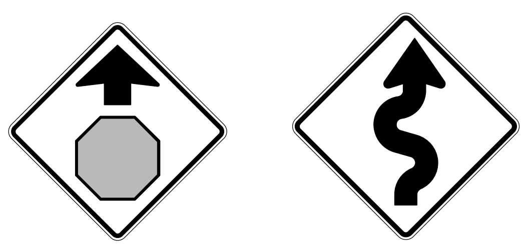
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	WHITE	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE B OR C SHEETING
LEGEND	RED	TYPE B OR C SHEETING

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

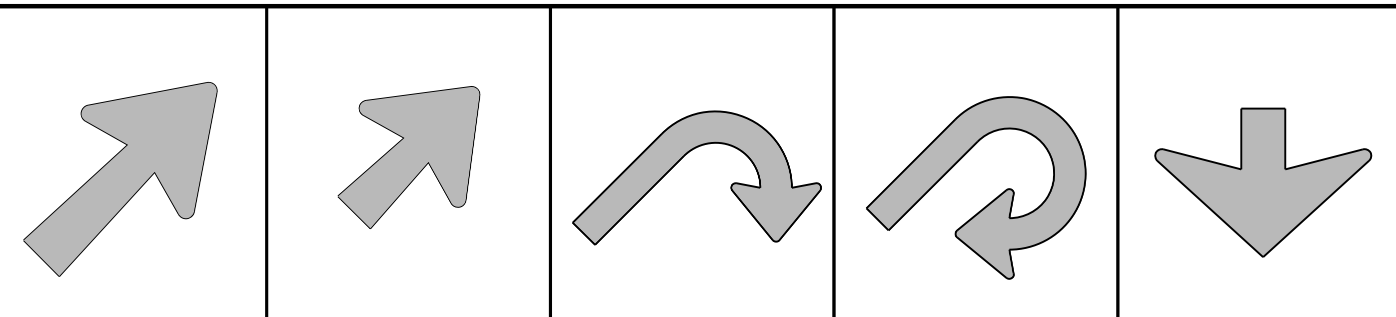
TYPICAL SIGN REQUIREMENTS

TSR(4)-13

FILE:	tsr4-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS		1065	02	039	FM 1846
12-03 7-13 9-08		DIST		COUNTY	SHEET NO.
		PHR		CAMERON	185

ARROW DETAILS

for Large Ground-Mounted and Overhead Guide Signs



Type A | Type B | E-3 | E-4 | Down Arrow

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

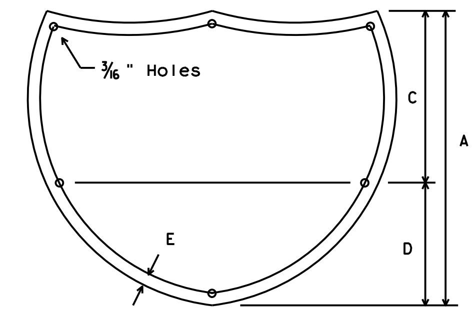
NOTE

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.

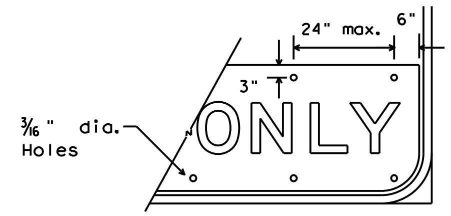
http://www.txdot.gov/

SIGN BLANK PUNCHING DETAILS FOR ATTACHMENTS WHEN SPECIFIED TO BE TYPE A ALUMINUM SIGNS (FOR MOUNTING TO GUIDE SIGN FACE)

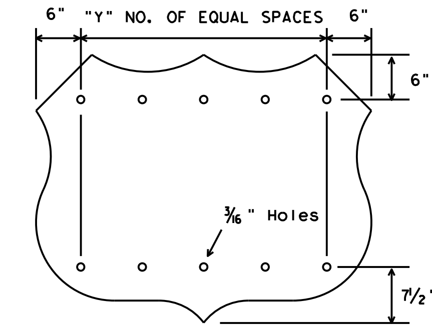


INTERSTATE ROUTE MARKERS

A	C	D	E
36	21	15	1 1/2
48	28	20	1 3/4

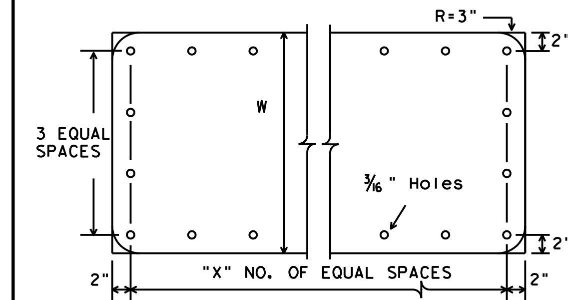


EXIT ONLY PANEL



U.S. ROUTE MARKERS

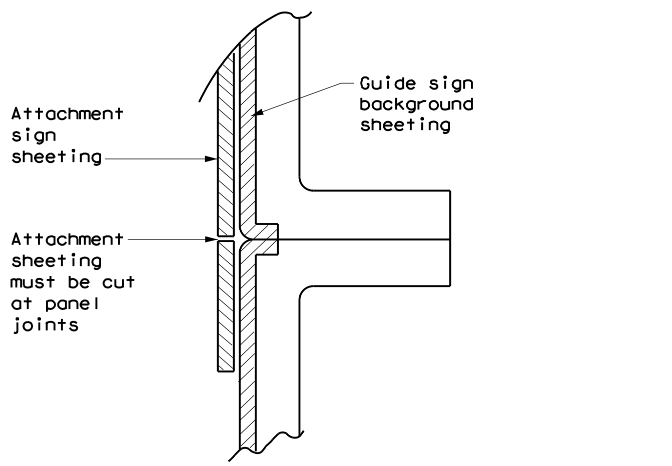
Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



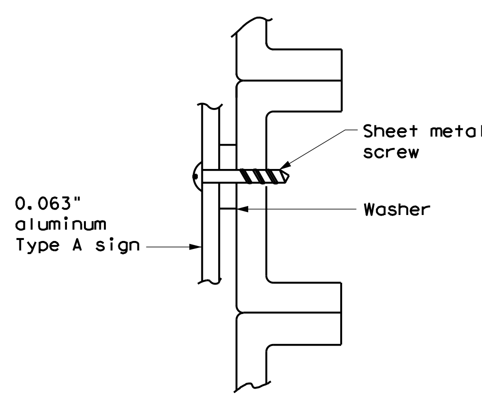
STATE ROUTE MARKERS

No. of Digits	W	X
4	24	4
4	36	5
4	48	6
3	24	3
3	36	4
3	48	5

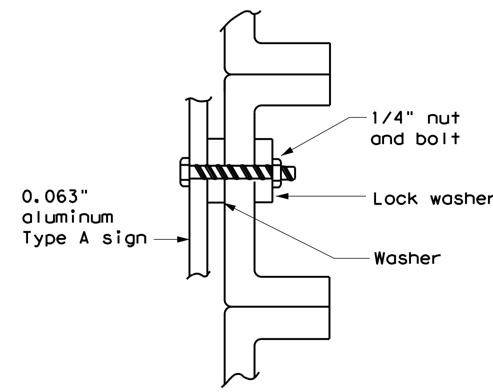
MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



DIRECT APPLIED ATTACHMENT



SCREW ATTACHMENT



NUT/BOLT ATTACHMENT

NOTE:

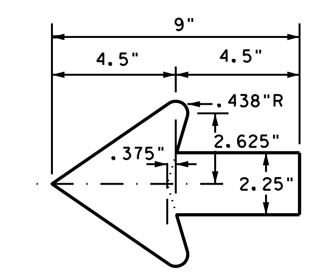
1. Sheeting for legend, symbols, and borders must be cut at panel joints.
2. Direct applied attachment signs will be subsidiary to "Aluminum Signs" or "Fiberglass Signs".

NOTE:

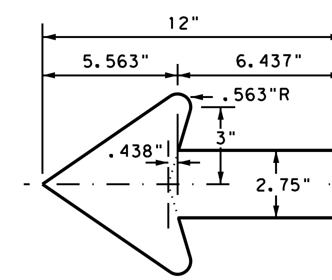
Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

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 1065	SECT 02	JOB 039	HIGHWAY FM 1846
REVISIONS 12-03 7-13 9-08	DIST PHR	COUNTY CAMERON		SHEET NO. 186

DATE: 7/12/2021 4:08:52 PM
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FILE: pw:\\txdot.projectwiseonline.com:TXDOT5\Documents\21 - PHR\Design Projects\1065020394 - Design\Plan Set\15. Signing\SIGNING STANDARDS\41 smdgen.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)

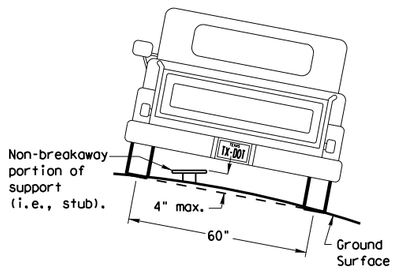
Anchor Type

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))

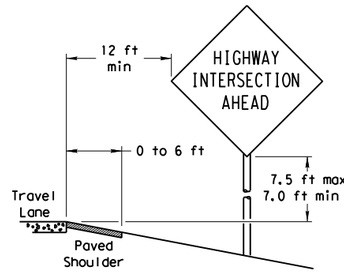
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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).

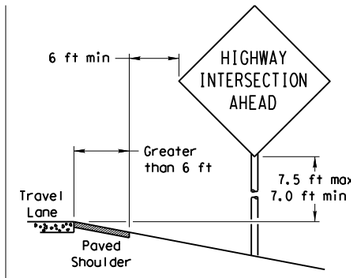
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

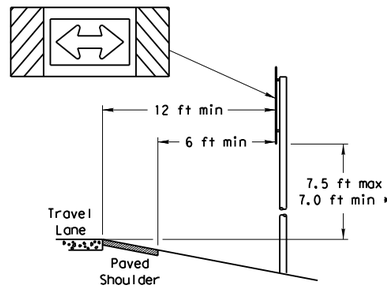
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



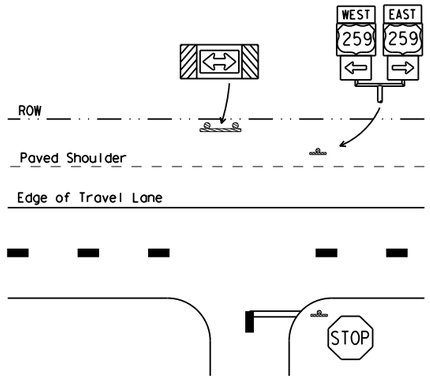
GREATER THAN 6 FT. WIDE

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.

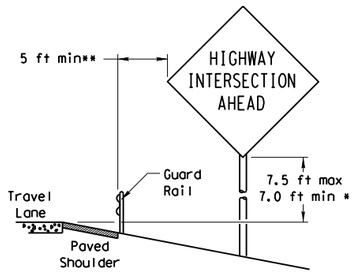
T-INTERSECTION



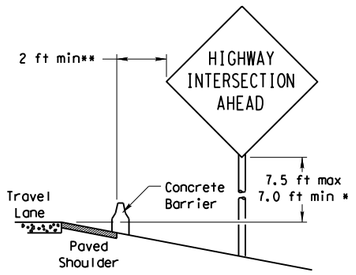
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



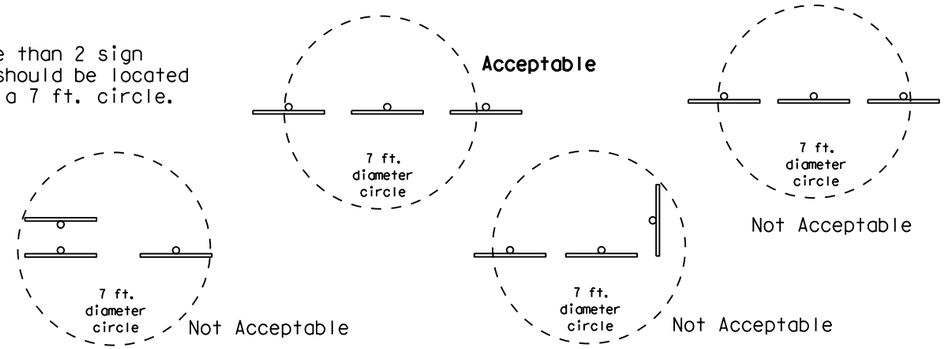
BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

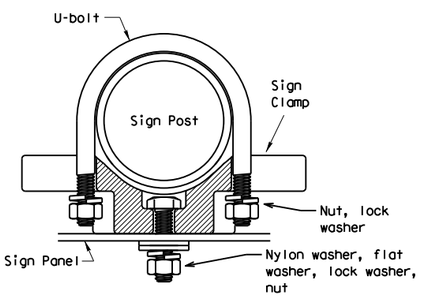
**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

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



TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

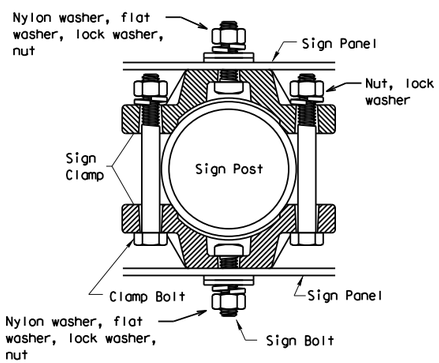


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

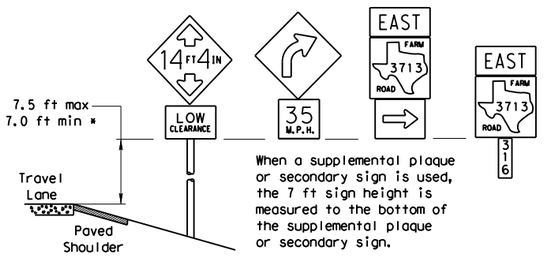
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



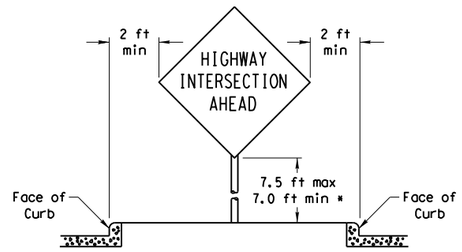
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



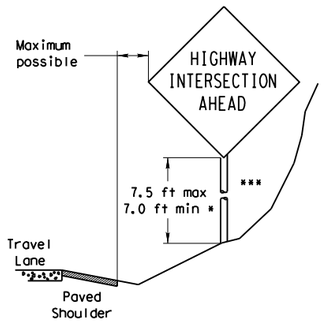
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

* Signs shall be mounted using the following condition that results in the greatest sign elevation:

(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website address is:
http://www.txdot.gov/publications/traffic.htm

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

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

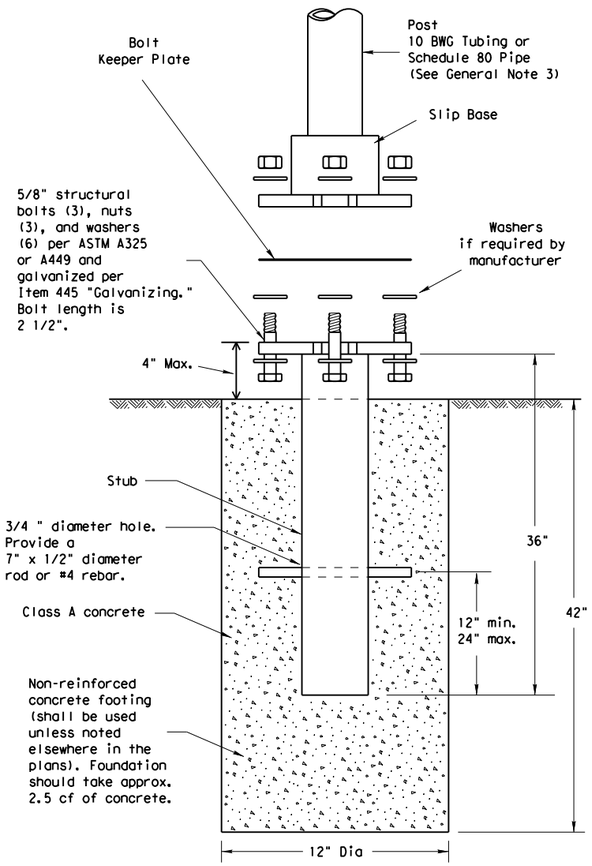
9-08 REVISIONS

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846

DIST	COUNTY	SHEET NO.
PHR	CAMERON	187

DATE: 7/12/2021 4:09:06 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT5\Documents\21 - PHR\Design Projects\0650203\4 - Design\Plan Set\15. Signing\SIGNING STANDARDS\15] smds1.dgn

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



SM RD SGN ASSM TY XXXXX(X)SA(X-XXXX)

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   - 0.134" nominal wall thickness
   - Seamless or electric-resistance welded steel tubing or pipe
   - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   - Other steels may be used if they meet the following:
     - 55,000 PSI minimum yield strength
     - 70,000 PSI minimum tensile strength
     - 20% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.

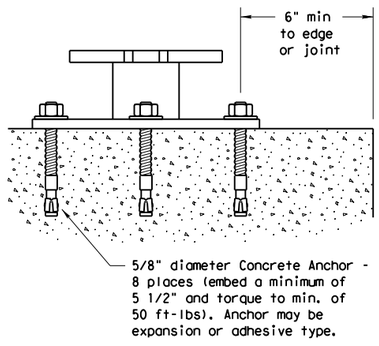
   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum yield strength
     - 62,000 PSI minimum tensile strength
     - 21% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   - Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support
1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



SM RD SGN ASSM TY XXXXX(X)SB(X-XXXX)

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

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

REVISIONS
9-08

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846

DIST	COUNTY	SHEET NO.
PHR	CAMERON	188

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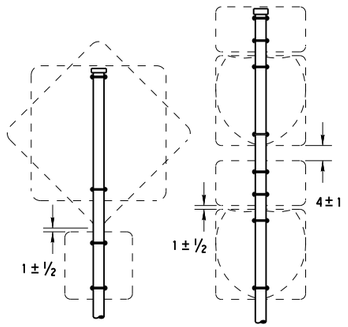
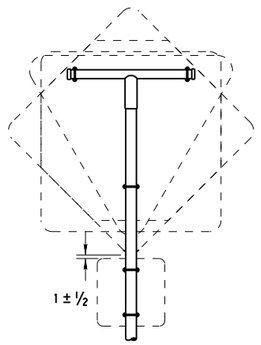
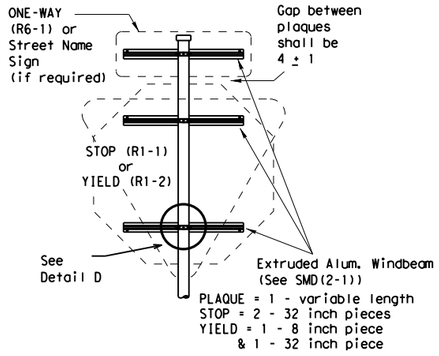


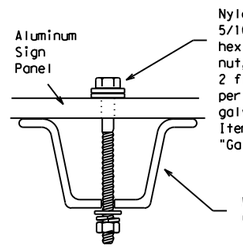
SM RD SGN ASSM TY XXXXX(1)XX(P)



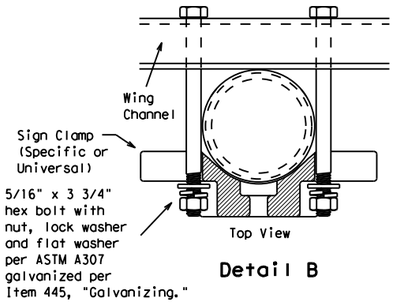
SM RD SGN ASSM TY XXXXX(1)XX(T)



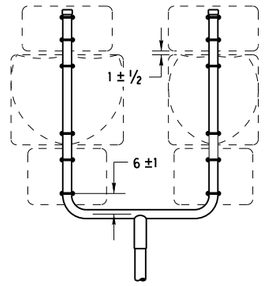
SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



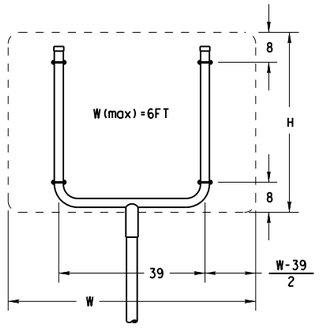
Detail A



Detail B



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



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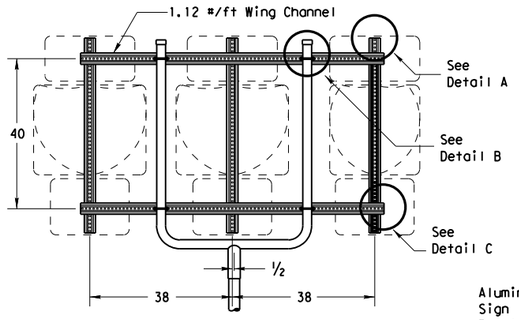
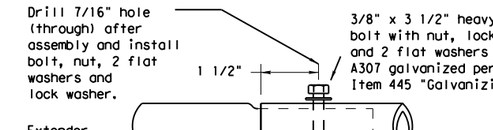
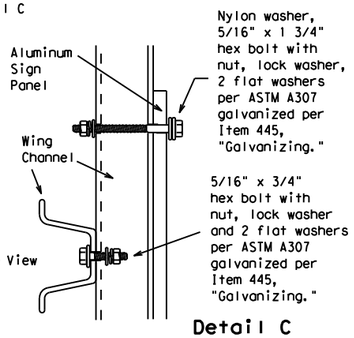


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

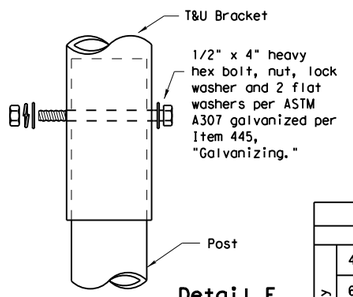


Detail F

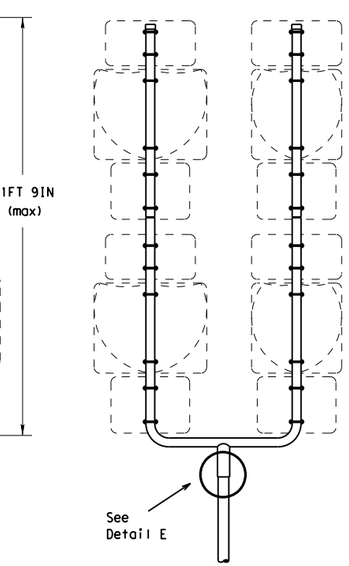
Splices shall only be allowed behind the sign substrate.



Detail C

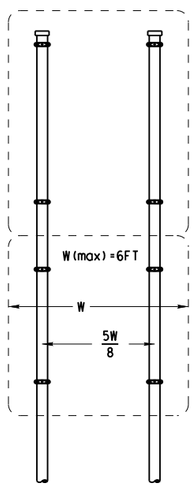


Detail E



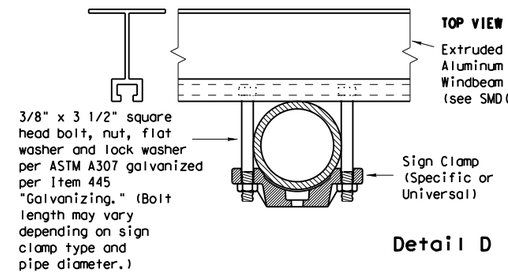
SM RD SGN ASSM TY S80(1)XX(U-1EXT)

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

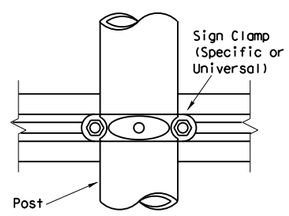


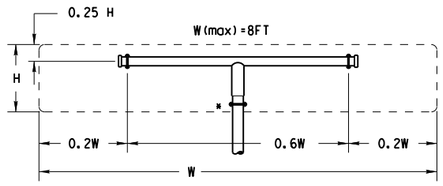
SM RD SGN ASSYM TY XXXXX(2)XX(P)

SIDE VIEW



Detail D

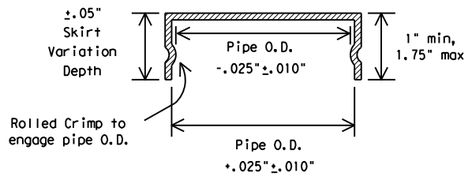




SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

All dimensions are in english unless detailed otherwise.

FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

GENERAL NOTES:

1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.

REQUIRED SUPPORT

	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

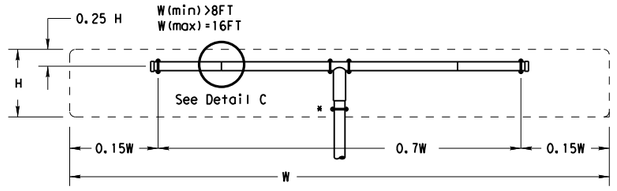
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

9-08 REVISIONS

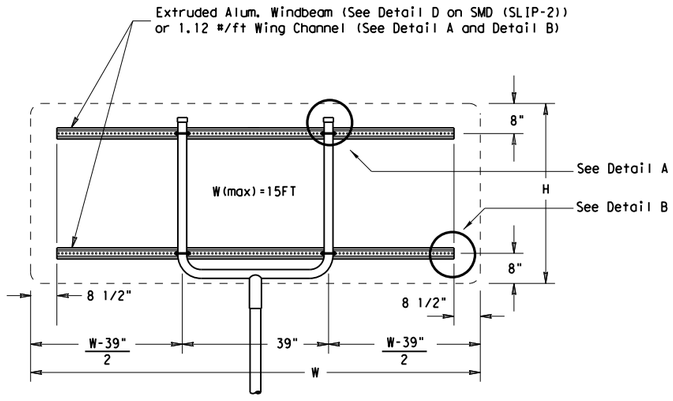
CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846

DIST	COUNTY	SHEET NO.
PHR	CAMERON	189

DATE: 7/12/2021 4:09:19 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT5\Documents\21 - PHR\Design Projects\1065020394 - Design\Plan Set\15. Signing\SIGNING STANDARDS\17] smds3.dgn



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



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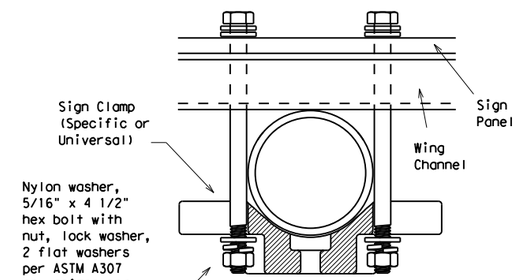
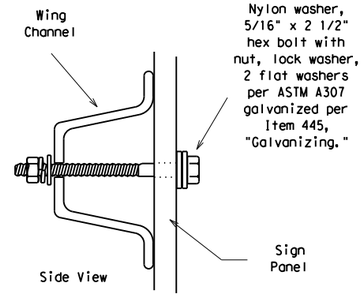
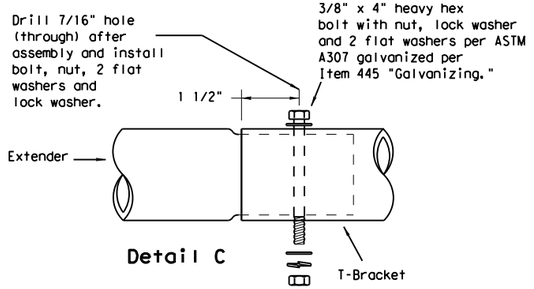


Detail A



Detail B



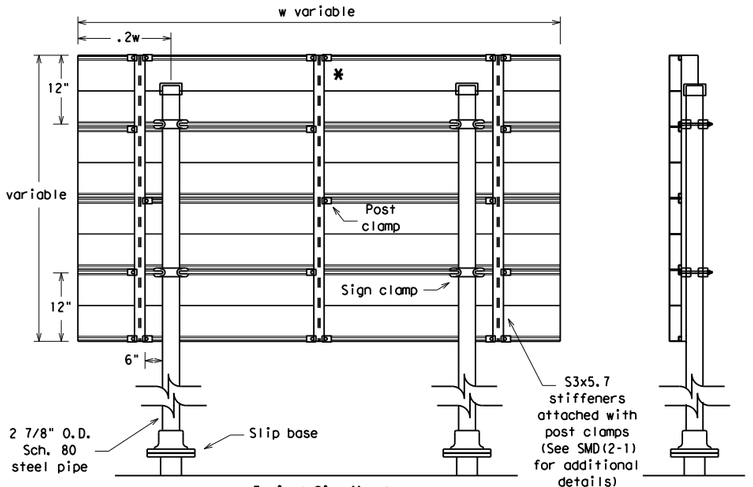
Detail C

Splices shall only be allowed behind the sign substrate.

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. See table above.
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Sign blanks shall be the sizes and shapes shown on the plans.
11. Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.

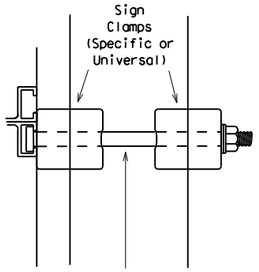


Typical Sign Mount

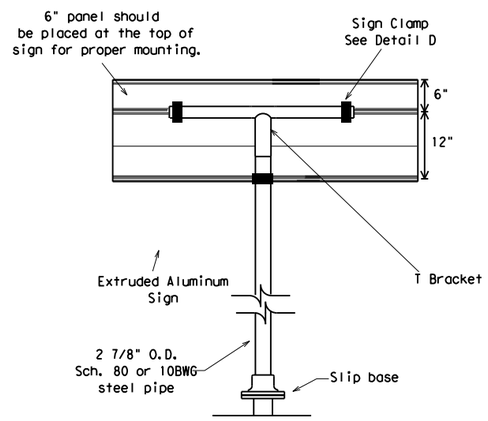
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

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

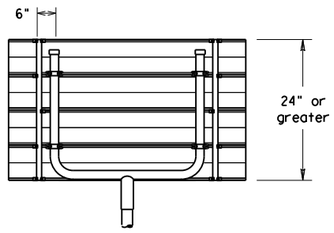
See Detail E
for clamp installation



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

Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET

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

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

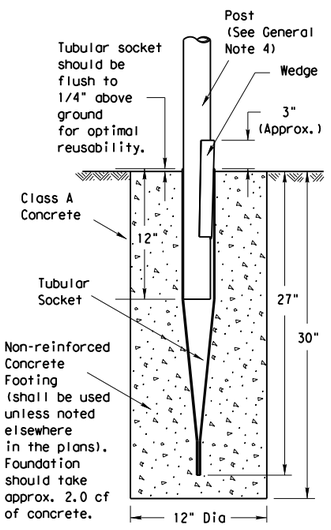
REVISIONS
9-08

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846

DIST	COUNTY	SHEET NO.
PHR	CAMERON	190

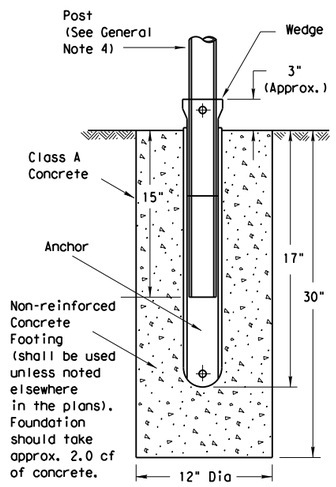
DATE: 7/12/2021 4:09:25 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT5\Documents\21 - PHR\Design Projects\1065020394 - Design\Plan Set\15. Signing\SIGNING STANDARDS\18] smdtwt.dgn

Wedge Anchor Steel System



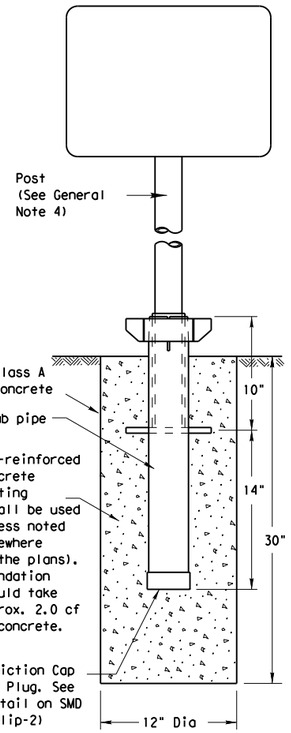
SM RD SGN ASSM TY TWT(X)WS(X)

Wedge Anchor High Density Polyethylene (HDPE) System

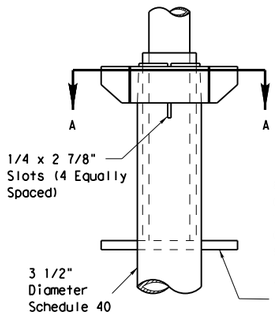


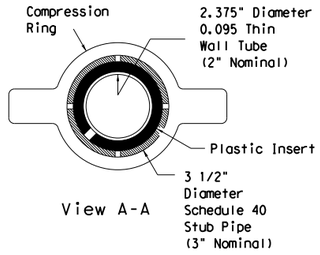
SMD RD SGN ASSM TY TWT(X)WP(X)

Universal Anchor System with Thin-Walled Tubing Post



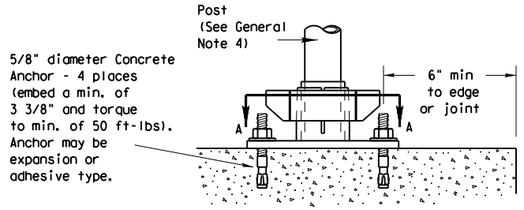
SM RD SGN ASSM TY TWT(X)UA(P)



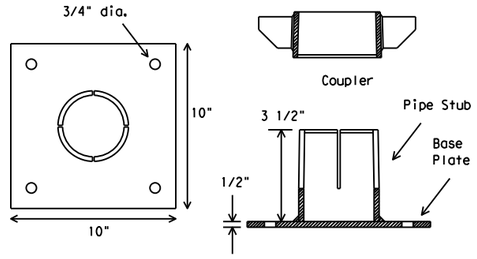


View A-A

Plastic insert must be used when using the TWT with either the Universal Anchor System or the Bolt Down Universal Anchor System. The insert should be approx. 10" long and cover the tubing from just above the top of the stub pipe to the bottom of the sign post when using the Universal Anchor System. The insert should be cut to approx. 4 1/2" when used with the Bolt Down Universal Anchor System.

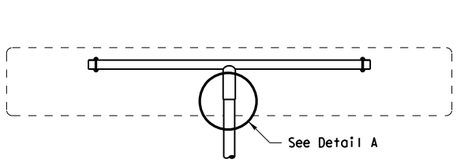


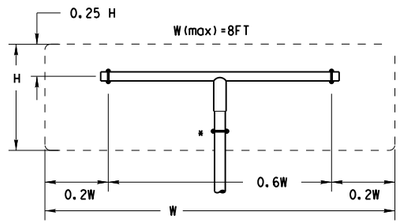
Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Top of bolt shall extend at least flush with top of nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 3 3/8" minimum embedment, shall have a minimum allowable tension and shear of 2450 and 1525 psi, respectively. 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.



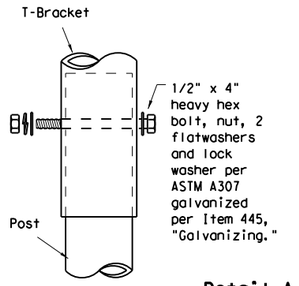
SM RD SGN ASSM TY TWT(X)UB(P)

Sign Installation Using a Prefabricated T-Bracket for Thin-Wall Tubing Post





SM RD SGN ASSM TY TWT(X)XX(T)
(* - See General Note 6)



Detail A

9/16" hole may need to be drilled through post to accommodate bolt.

NOTE

The devices shall be installed per manufacturer's recommendations.
Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. The Wedge Anchor System and the Universal Anchor System with thin wall tubing post may be used to support up to 10 square feet of sign area.
2. The tubular socket, wedge and prefabricated T-bracket shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to the approval of the TxDOT Traffic Standards Engineer.
3. Except for posts (13 BWG Tubing), clamps, nuts and bolts, all components shall be prequalified. A list of prequalified vendors may be obtained from the Material Producer List web page. The website address is: http://www.txdot.gov/business/producer list.htm
4. Material used as post with this system shall conform to the following specifications:
   13 BWG Tubing (2.375" outside diameter) (TWT)
   0.095" nominal wall thickness
   Seamless or electric-resistance welded steel tubing
   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
   18% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of .083" to .099"
   Outside diameter (uncoated) shall be within the range of 2.369" to 2.381"
   Galvanization per ASTM 123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
5. Sign blanks shall be the sizes and shapes shown on the plans.
6. Additional sign clamp required on the "T-bracket" post for 24" high signs. Place clamp at least 3" above bottom of sign when possible.
7. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
8. See the Traffic Operations Division website for detailed drawings of sign clamps and Wedge Anchor System components. The website address is: http://www.txdot.gov/publications/traffic.htm

WEDGE ANCHOR SYSTEM INSTALLATION PROCEDURE

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
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. Place concrete into hole until it is approximately flush with the ground. Concrete shall be Class A.
3. Insert tubular socket into concrete until top of socket is approximaely 1/4 " above the concrete footing.
4. Plumb the socket. Allow a minimum 4 days for concrete to set, unless otherwise directed by Engineer..
5. Attach the sign to the sign post.
6. Insert the sign post into socket and align sign face with roadway.
7. Drive the wedge into the socket to secure post. This will leave approximately 3 inches of the wedge exposed.

UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURE

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. Insert base post in hole to depths shown and backfill hole with concrete.
3. Level and plumb the base post using a torpedo level and allow concrete adequate time to set. The bottom of the slots provided in the stub pipe shall remain above the top of the concrete foundation.
4. Attach the sign to the sign post.
5. Install plastic insert around bottom of post.
6. Insert sign post into base post. Lower until the post comes to rest on steel rod.
7. Seat compression ring using a hammer. Typically, the top of compression ring will be approximately level with top of stub post when optimally installed.
8. Check sign post by hand to ensure it is unable to turn. If loose, increase the tightening of the compression ring.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS WEDGE & UNIVERSAL ANCHOR WITH THIN WALL TUBING POST

SMD(TWT)-08

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

9-08 REVISIONS

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846

DIST	COUNTY	SHEET NO.
PHR	CAMERON	191

26E

DATE: 7/12/2021 4:09:31 PM
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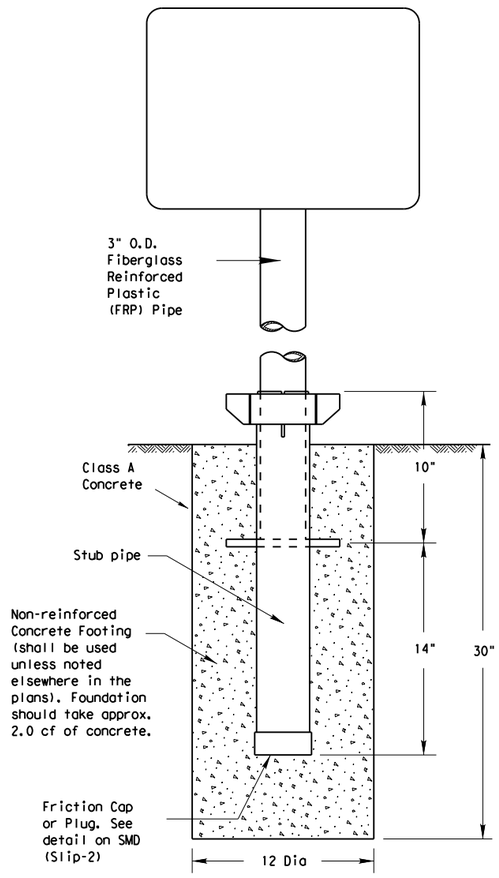
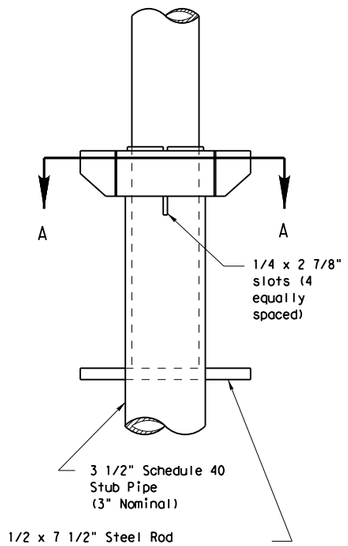
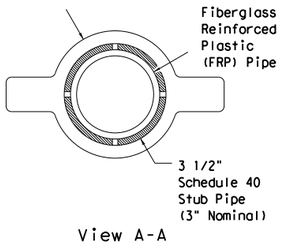
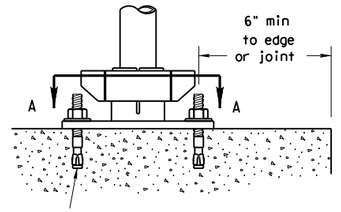
Universal Anchor System with Fiberglass Reinforced Plastic (FRP) Post





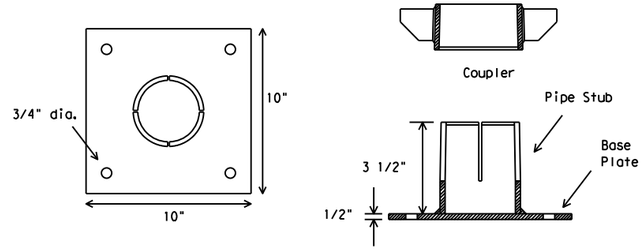


SM RD SGN ASSM TY FRP(X)UA(P)



Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Top of bolt shall extend at least flush with top of nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 3 3/8" minimum embedment, shall have a minimum allowable tension and shear of 2450 and 1525 psi, respectively. 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.

BOLT-DOWN DETAILS



SM RD SGN ASSM TY FRP(X)UB(P)

GENERAL NOTES:

1. FRP sign supports for a single type sign support may be used for signs up to and including 16 square feet. Dual post installation may be used for signs up to and including 32 square feet.
2. All nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing."
3. See the Traffic Operations Division website for detailed drawings of sign clamps. The website address is: http://www.txdot.gov/publications/traffic.htm

FRP POST REQUIREMENTS

1. Materials shall conform to the requirements of Departmental Material Specification DMS-4410 and will be furnished in a yellow or gray color as specified elsewhere in the plans.
2. Thickness of FRP sign support is 0.125" + 0.031", - 0.0".
3. FRP sign supports are prequalified by the Traffic Operations Division. Prequalification procedures are obtained by writing:
   Texas Department of Transportation
   Traffic Operations Division
   125 East 11th Street
   Austin, Texas 78701-2483

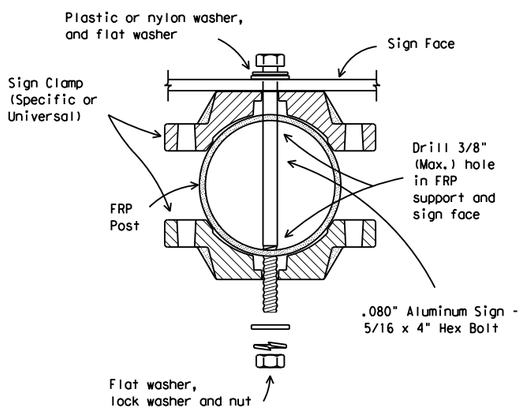
UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURES

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
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. Insert base post in foundation hole to depths shown and fill hole with concrete. Cut base post from bottom and ensure a minimum of 18" embedment if installed in solid rock.
4. Level and plumb the base post with coupler using a torpedo level and let concrete set a minimum of 4 days, unless otherwise directed by Engineer. Bottom of base post slots shall be above the concrete footing.
5. Attach sign to FRP post.
6. Insert sign post into base post. Lower until the post comes to rest on the steel rod.
7. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
8. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

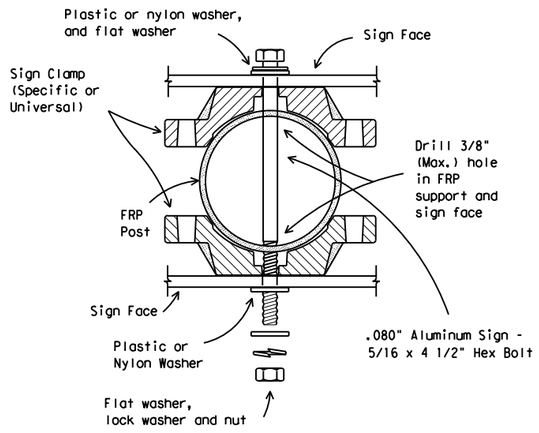
BOLT DOWN SIGN SUPPORT

1. Position base plate with coupler on existing concrete.
2. Drill holes into concrete and insert the 5/8" diameter bolts with wedge anchors, and tighten nuts.
3. Attach sign to FRP post.
4. Insert bottom of sign post into pipe stub.
5. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
6. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

Typical Sign Mounting Detail for FRP Support with Single Sign



Typical Sign Mounting Detail for FRP Support with Back-to-Back Signs



Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS UNIVERSAL ANCHOR SYSTEM WITH FRP POST

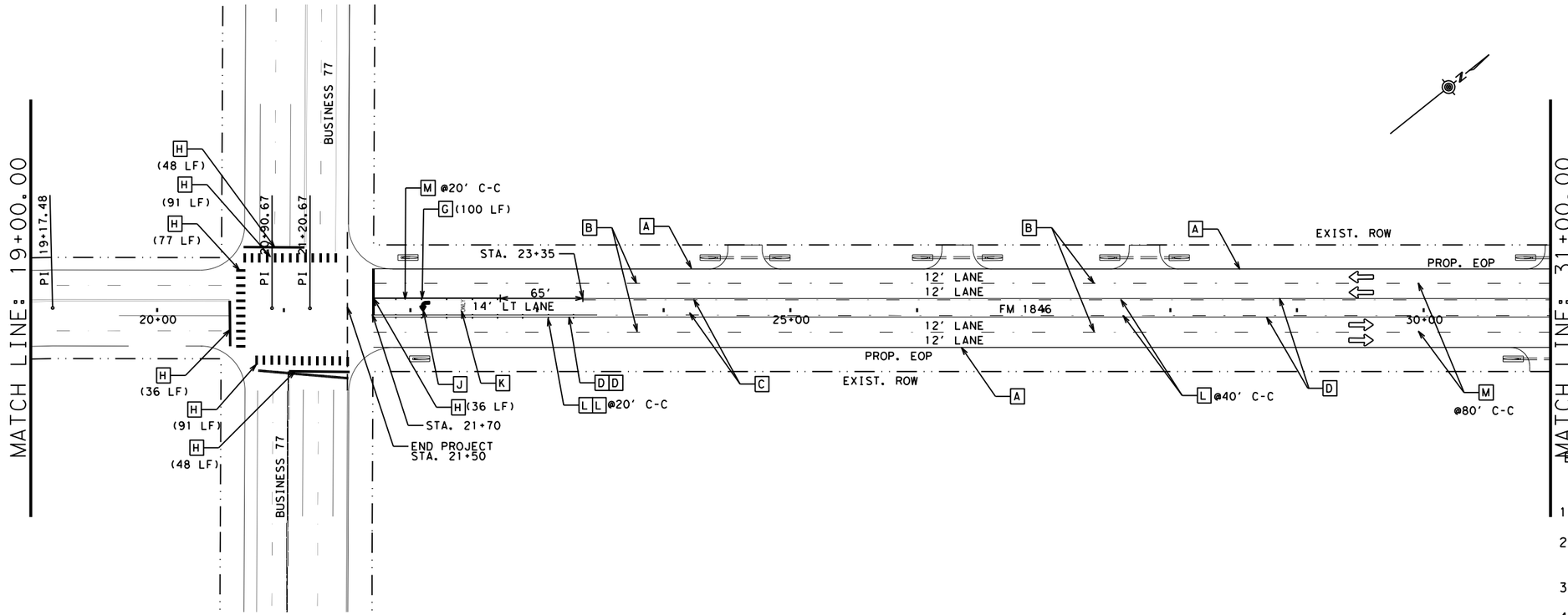
SMD(FRP)-08

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

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846

DIST	COUNTY	SHEET NO.
PHR	CAMERON	192

9-08 REVISIONS



LEGEND

- A - 4" SOLID WHITE LINE (TYP.)
- B - 4" BROKEN WHITE LINE (TYP.)
- C - 4" BROKEN YELLOW LINE (TYP.)
- D - 4" SOLID YELLOW LINE (TYP.)
- E - 12" SOLID YELLOW LINE (TYP.)
- F - 12" SOLID WHITE LINE (TYP.)
- G - 8" SOLID WHITE LINE (TYP.)
- H - 24" SOLID WHITE LINE (TYP.)
- I - 24" SOLID YELLOW LINE (TYP.)
- J - SINGLE DIRECTIONAL ARROW (TYP.)
- K - WORD (TYP.)
- L - TYPE II-A-A (TYP.)
- M - TYPE I-C (TYP.)

⇦ - DIRECTION OF TRAFFIC FLOW (TYP.)
C-C - CENTER TO CENTER
@ - AT
℄ - CENTER LINE
EOP - EDGE OF PAVEMENT
PROP. - PROPOSED
SHLDR - SHOULDER
EXIST. - EXISTING

NOTE:

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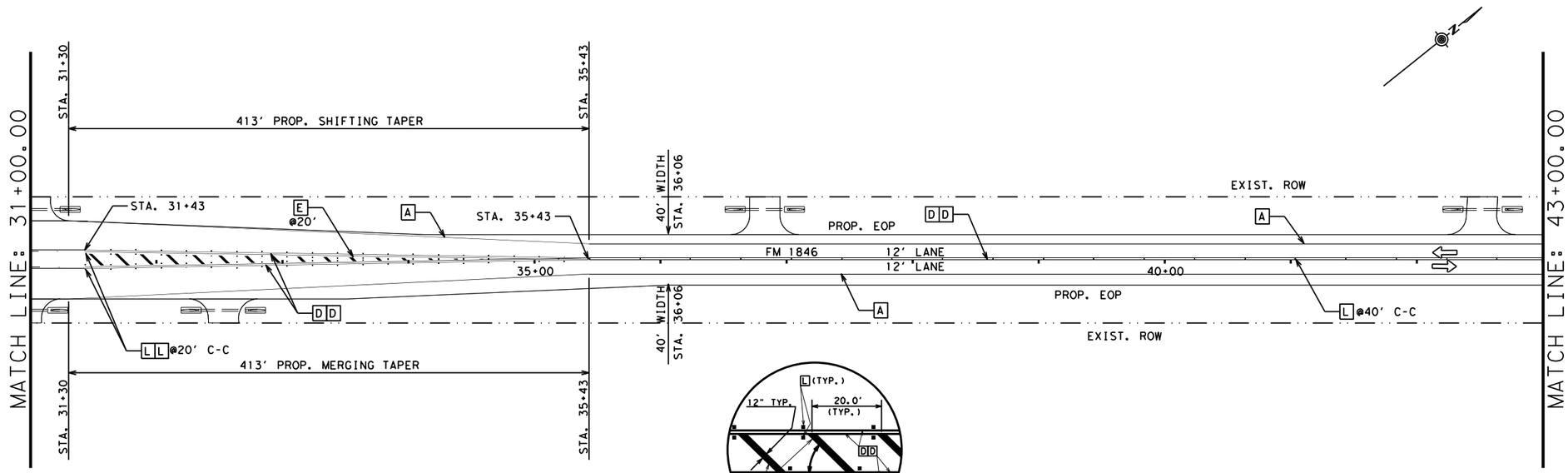
2. CONTRACTOR SHALL FIELD VERIFY EXISTING ROADWAY CONSTRUCTION JOINTS FOR LIMITS OF PROJECT.
3. RAISED CENTERLINE RUMBLE STRIPS SHALL BE INSTALLED.
4. ALL 4" SOLID WHITE SRIPE SHALL HAVE PROFILE EDGELINE MARKINGS. PLEASE REFER TO RUMBLE STRIPS STANDARD SHEET.



STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846 PAVEMENT MARKINGS LAYOUT

1" = 100' SHEET 1 OF 4

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		193

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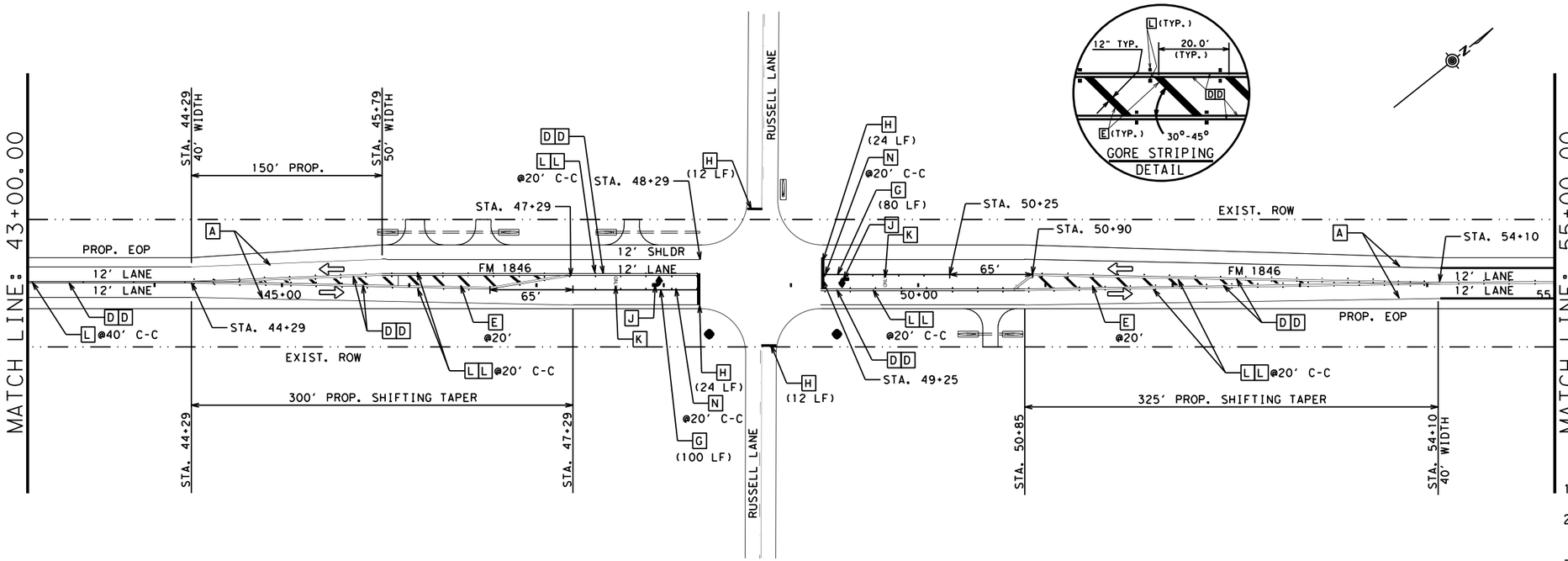

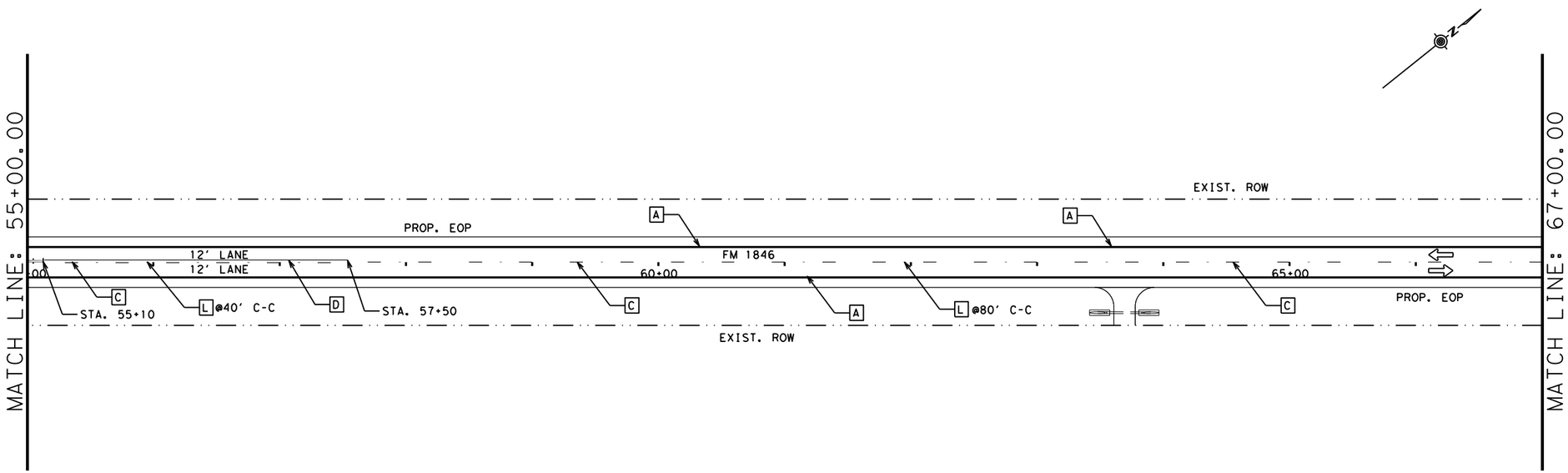

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- K - WORD (TYP.)
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4. ALL 4" SOLID WHITE SRIPE SHALL HAVE PROFILE EDGELINE MARKINGS. PLEASE REFER TO RUMBLE STRIPS STANDARD SHEET.

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED
PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846
PAVEMENT MARKINGS LAYOUT

1" = 100'

SHEET 2 OF 4

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
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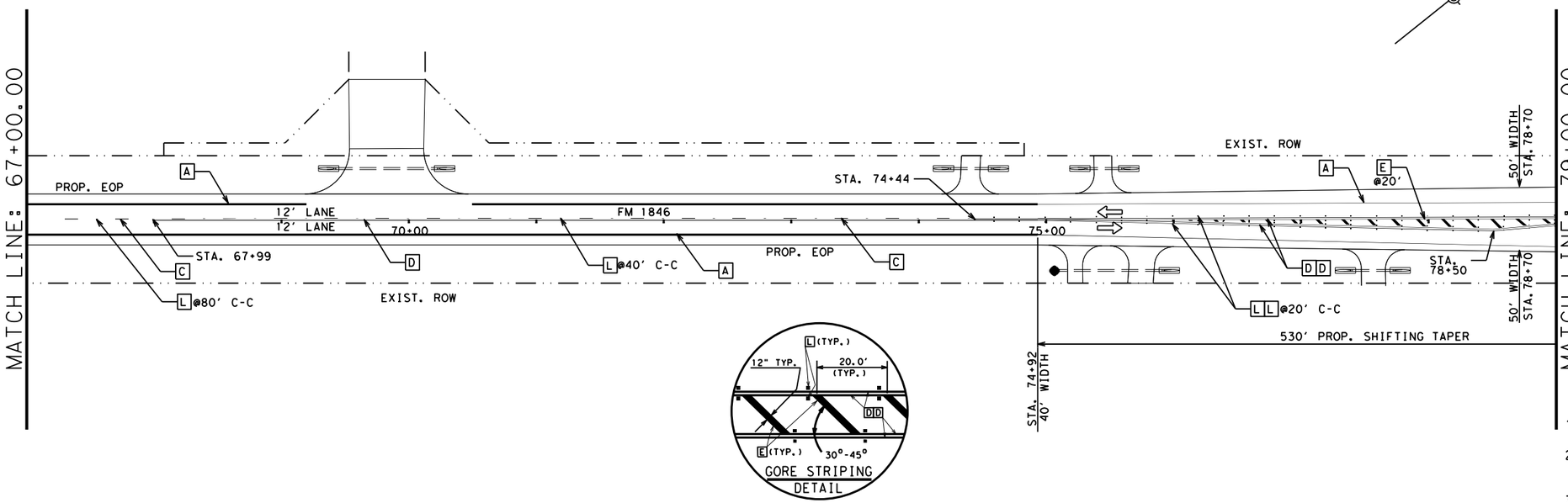

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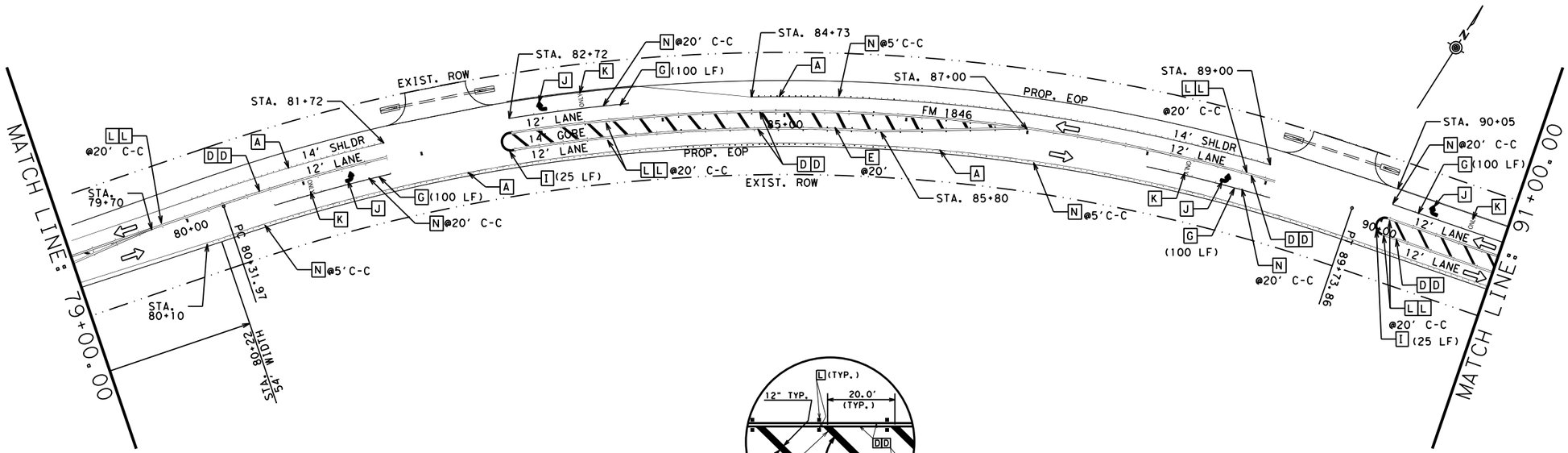

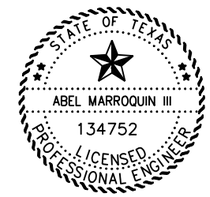

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Pharr District Central Design

Texas Department of Transportation

FM 1846 PAVEMENT MARKINGS LAYOUT

1" = 100' SHEET 3 OF 4

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	DIST	COUNTY		SHEET NO.
DW: CK:	PHR	CAMERON		195

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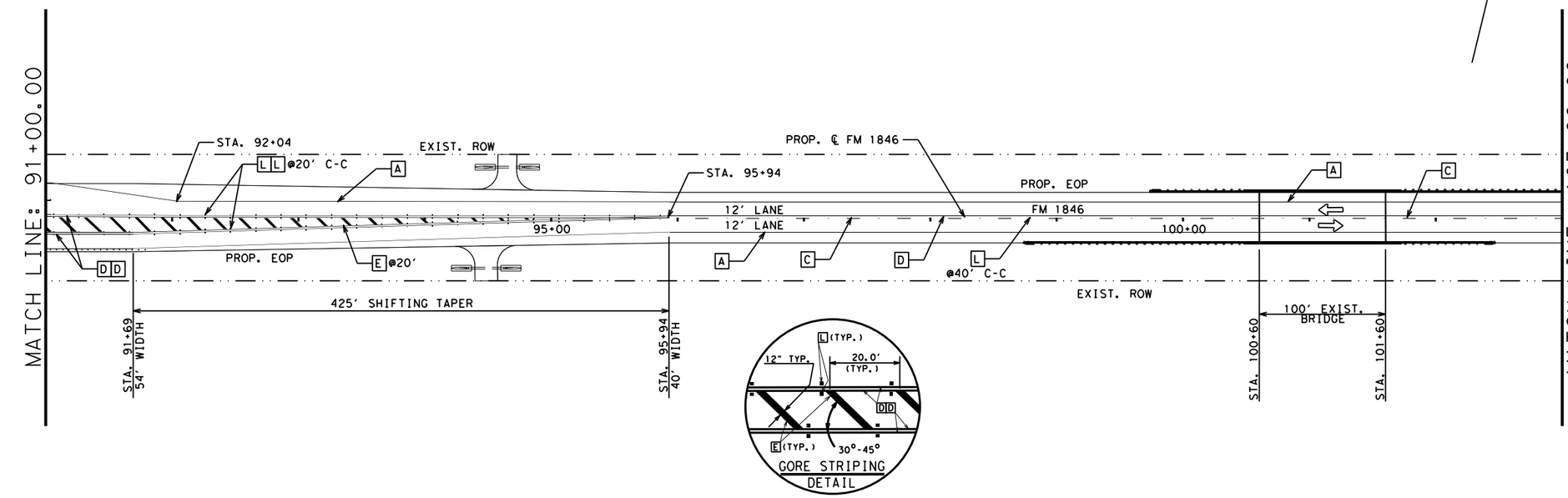

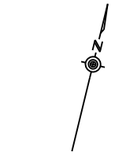

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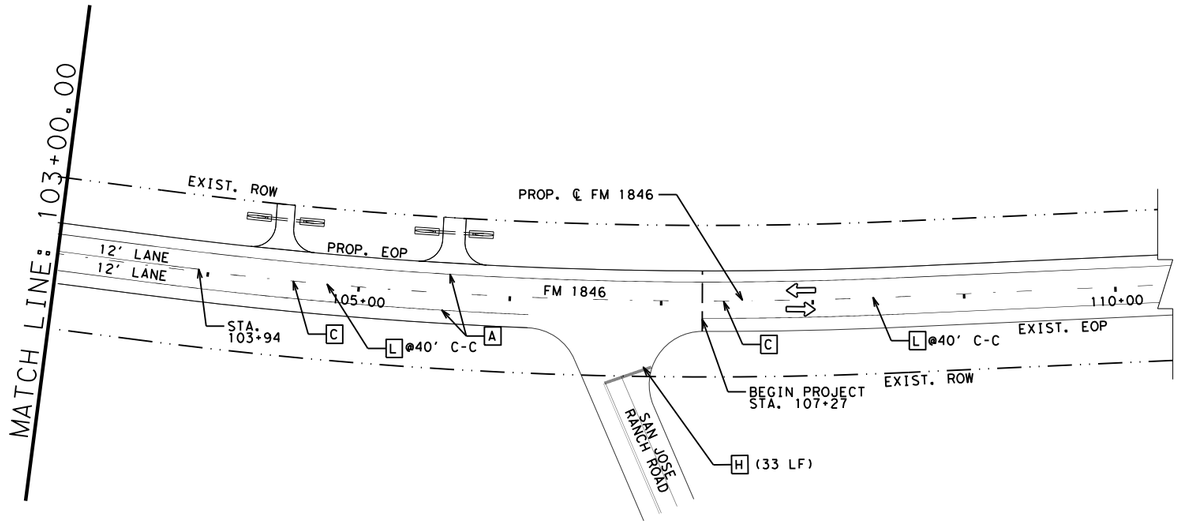

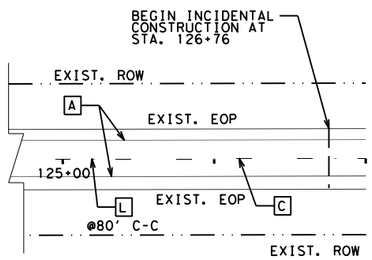

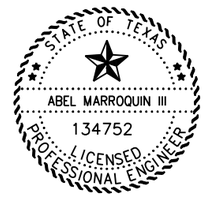

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Pharr District Central Design

Texas Department of Transportation

FM 1846 PAVEMENT MARKINGS LAYOUT

1" = 100' SHEET 4 OF 4

© 2021	CONT	SECT	JOB	HIGHWAY
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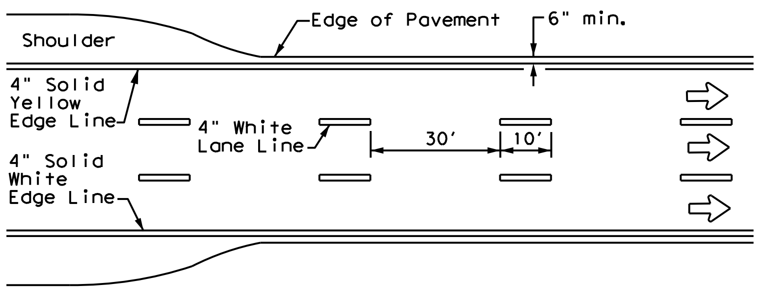
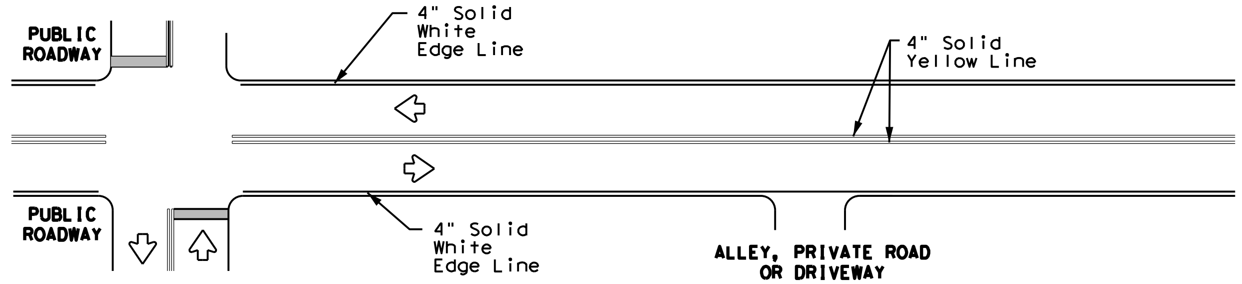
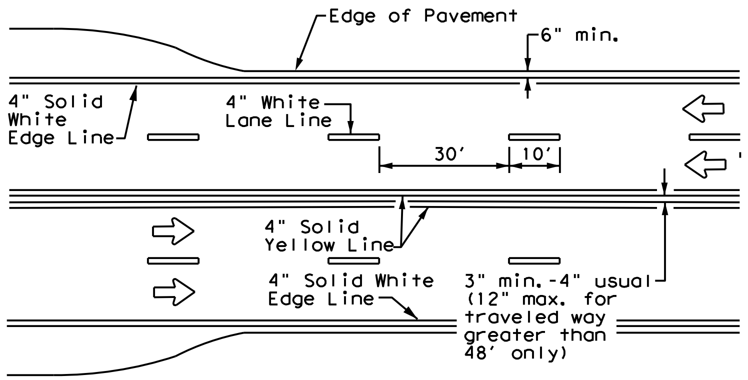


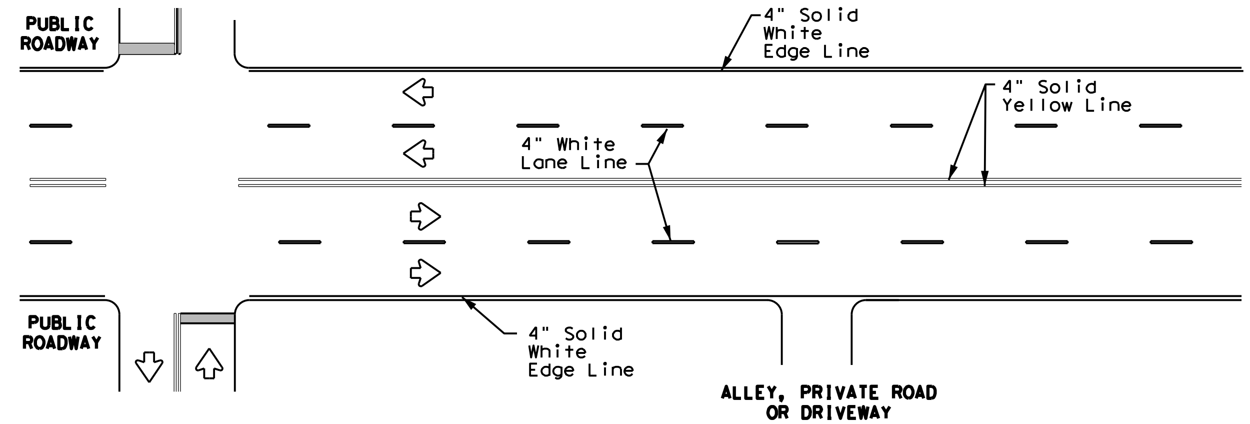
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



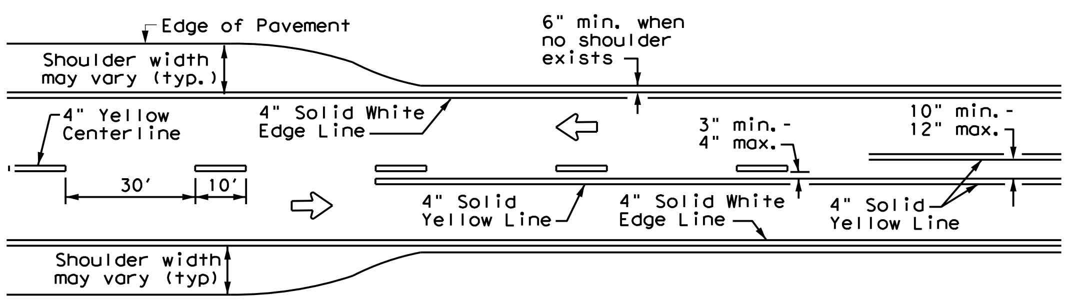
TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



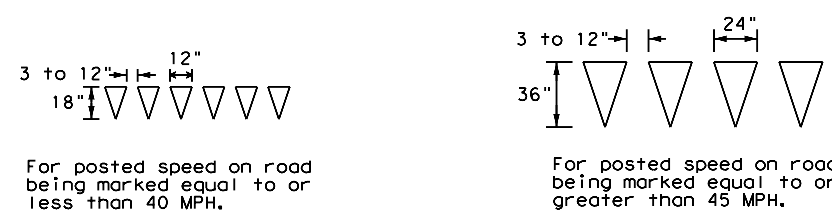
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



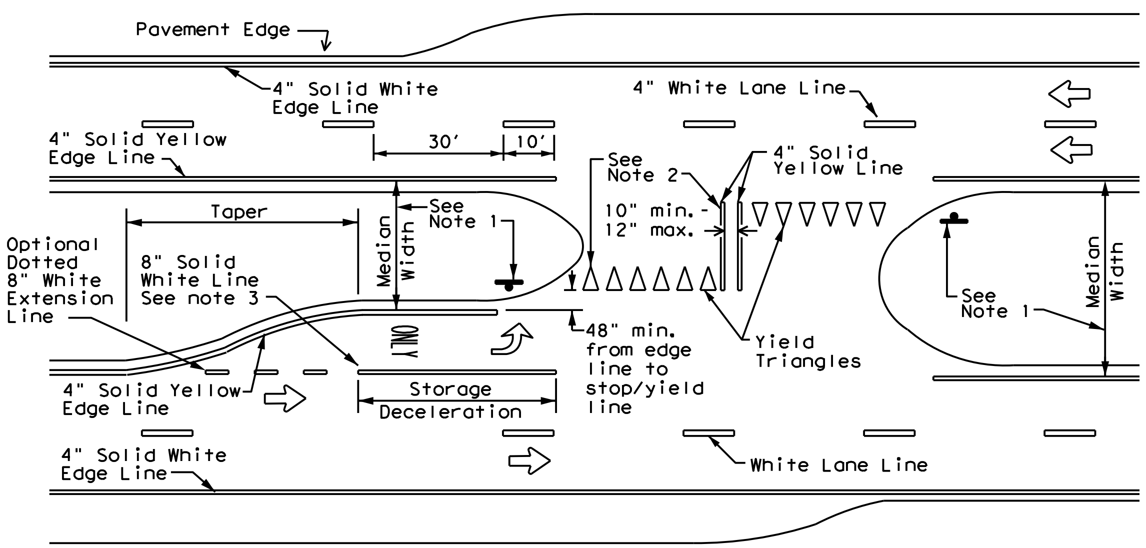
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs are optional as determined by the Engineer.

2. Install median striping (double yellow centerlines and stop bars/yield triangles) when a 50' or greater median centerline can be placed. Stop bars shall only be used with stop signs. Yield troingles shall only be used with yield signs.

3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

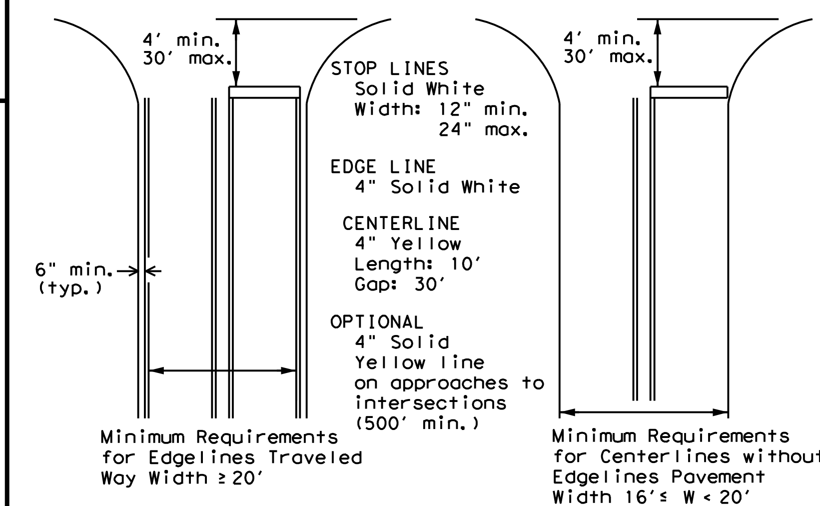
GENERAL NOTES

1. Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should not be placed less less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edgelines are not required in curb and gutter sections of roadways.

2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the inside of edgeline to the inside of edgeline of a two lane roadway.

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

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



GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Highways

Texas Department of Transportation — Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-20

FILE: pm1-20.dgn	DN:	CK:	DW:	CK:
© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	1065	02	039	FM 1846
5-00 2-12	DIST		COUNTY	SHEET NO.
8-00 6-20	PHR		CAMERON	197

22A

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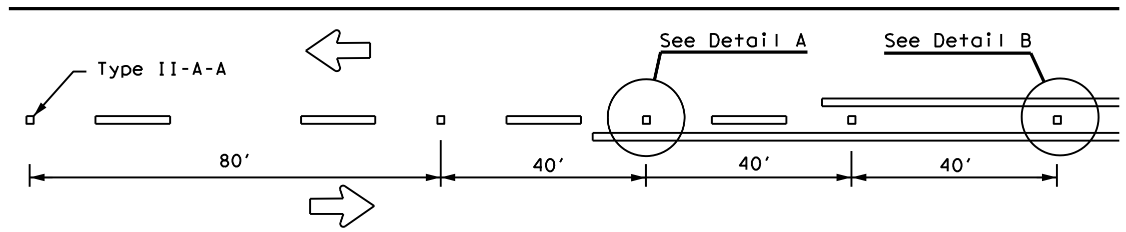
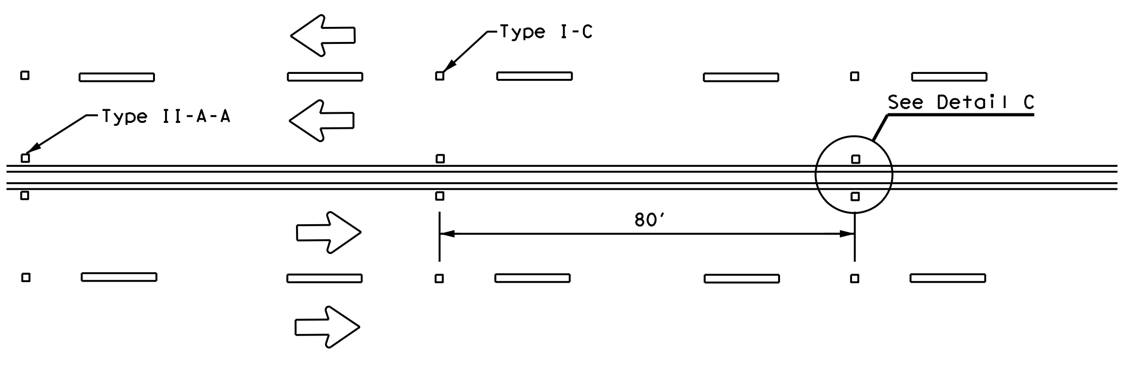
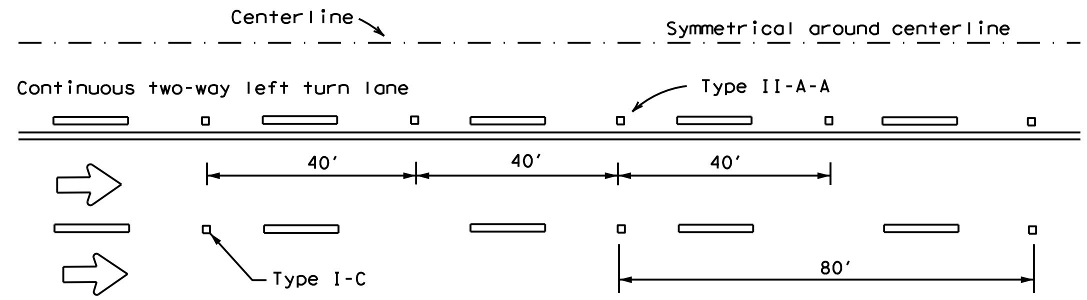
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



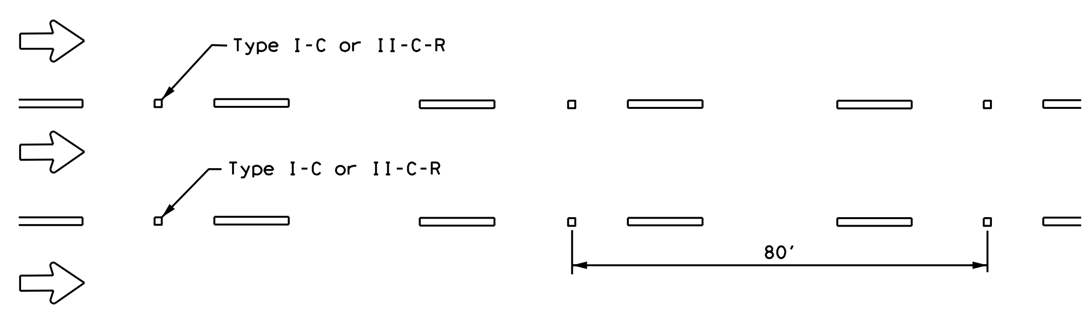
CENTERLINE FOR ALL TWO LANE ROADWAYS



CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS

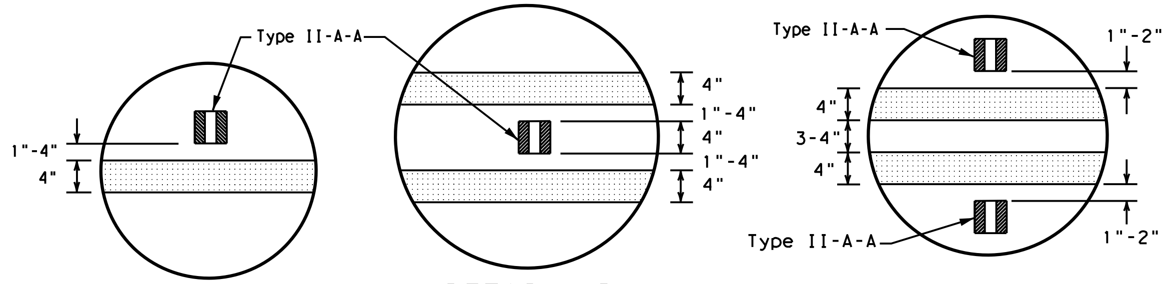


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



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.



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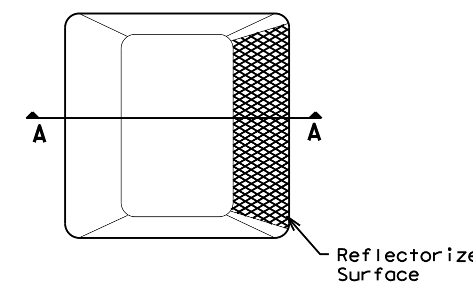
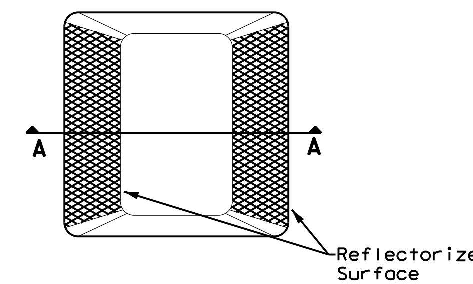
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

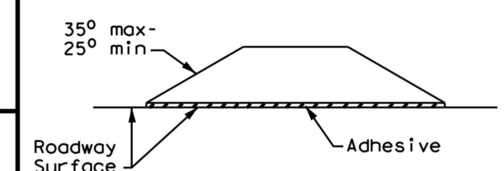
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

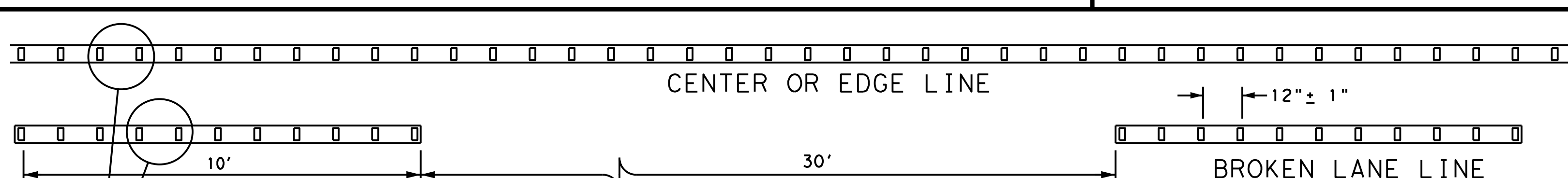


Type II (Top View)



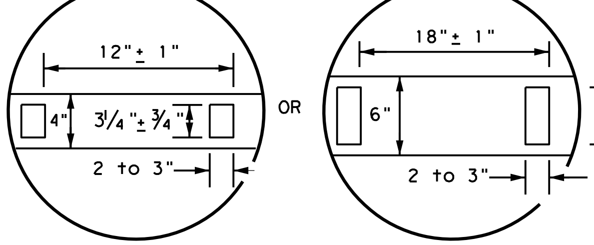
SECTION A

RAISED PAVEMENT MARKERS



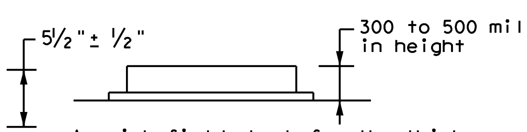
REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS



4" EDGE LINE, CENTER LINE OR LANE LINE

OPTIONAL 6" EDGE LINE, CENTER LINE OR LANE LINE



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

NOTE

Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

1. All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

Texas Department of Transportation

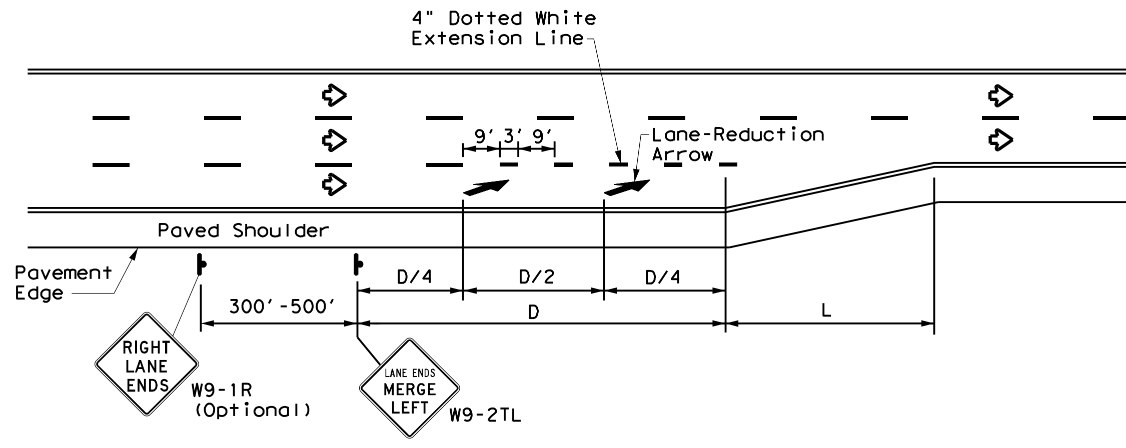
Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-20

FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
© TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-92 2-10 5-00 2-12 8-00 6-20	1065	02	039	FM 1846
	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	198

22B

DATE: 7/12/2021 4:13:44 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT5\Documents\21 - PHR\Design Pr[illegible]



LANE REDUCTION

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

NOTES

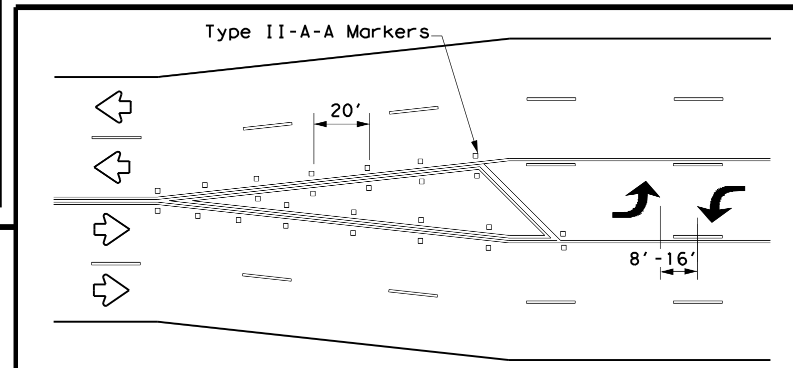
1. Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
2. On divided highways, an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

GENERAL NOTES

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

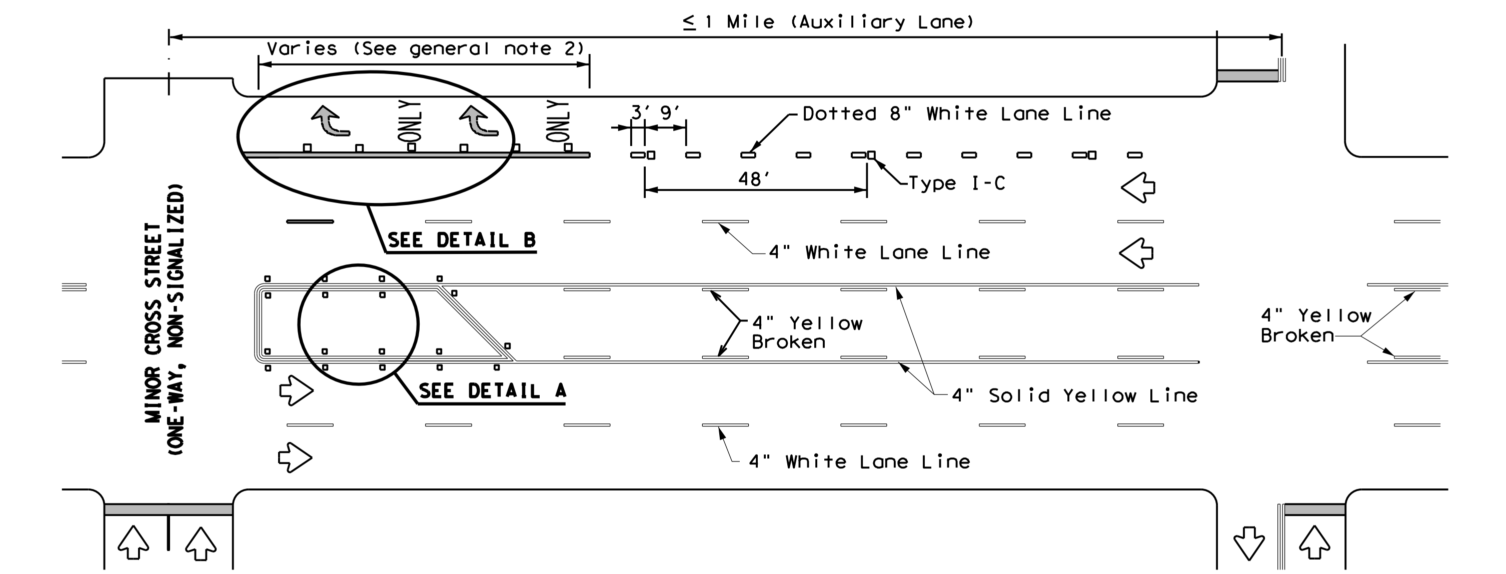
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

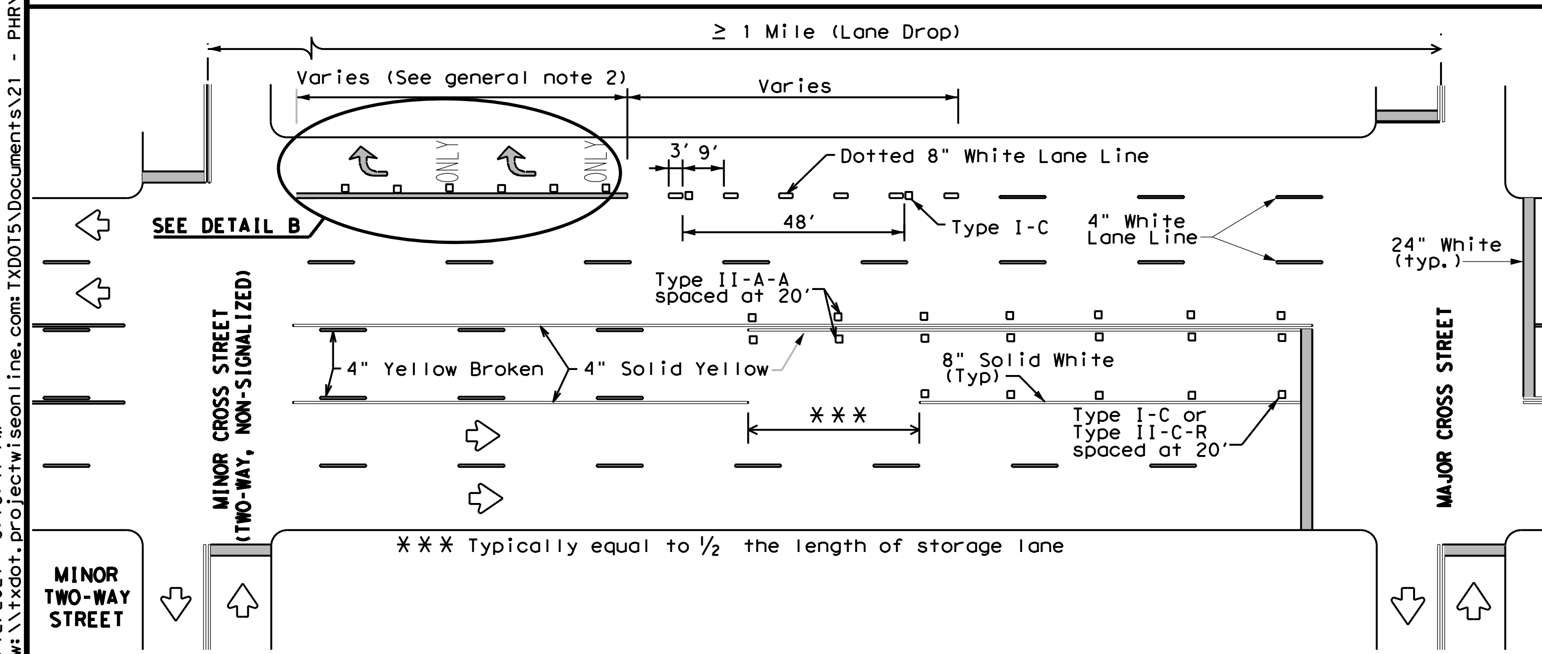


A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

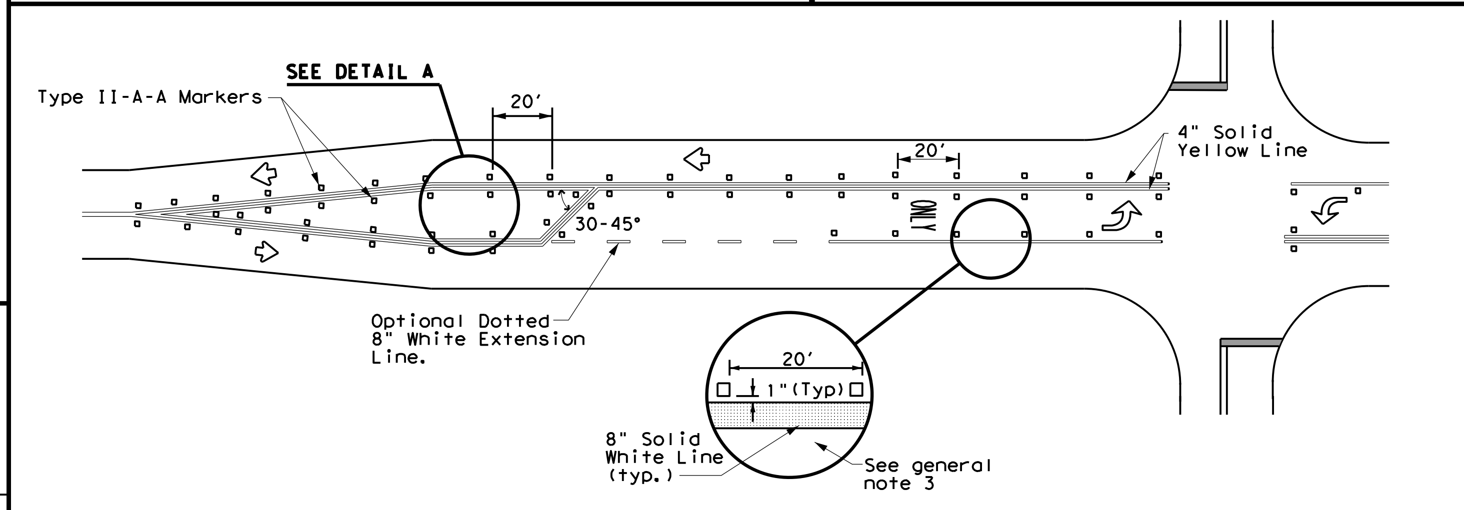
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY



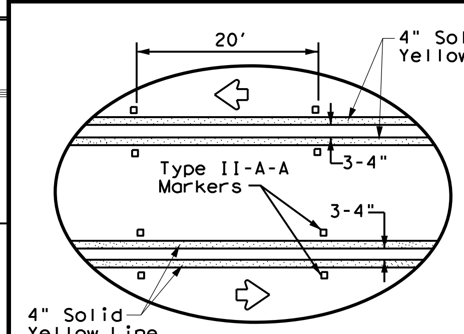
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



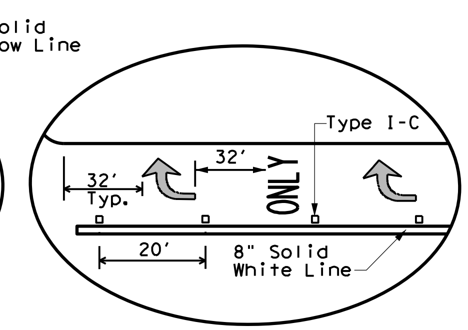
TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



DETAIL A



DETAIL B

Texas Department of Transportation

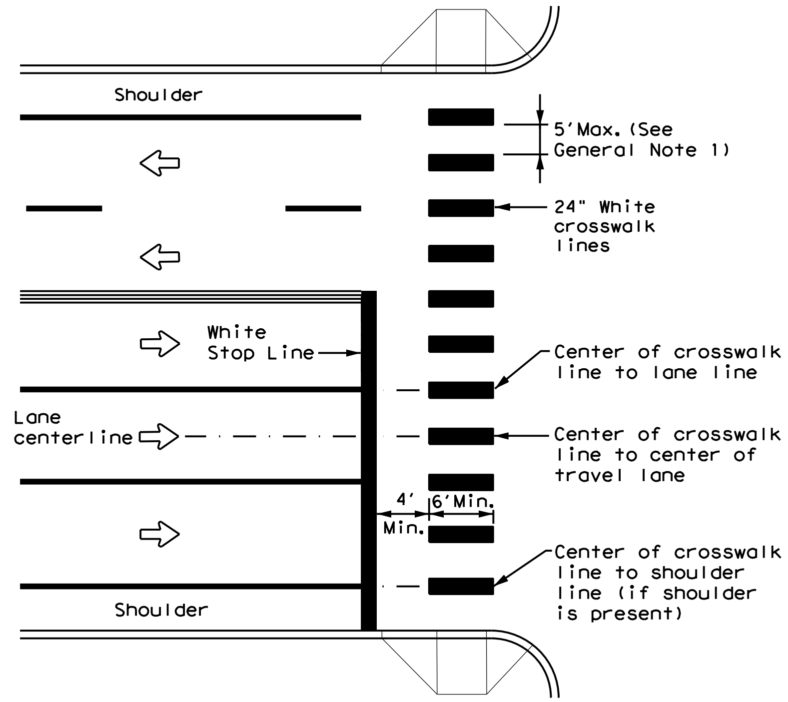
Traffic Safety Division Standard

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

PM(3)-20

FILE: pm3-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1998	CONT 1065	SECT 02	JOB 039	HIGHWAY FM 1846
REVISIONS 5-00 2-10 / 8-00 2-12 / 3-03 6-20	DIST PHR		COUNTY CAMERON	SHEET NO. 199

22C



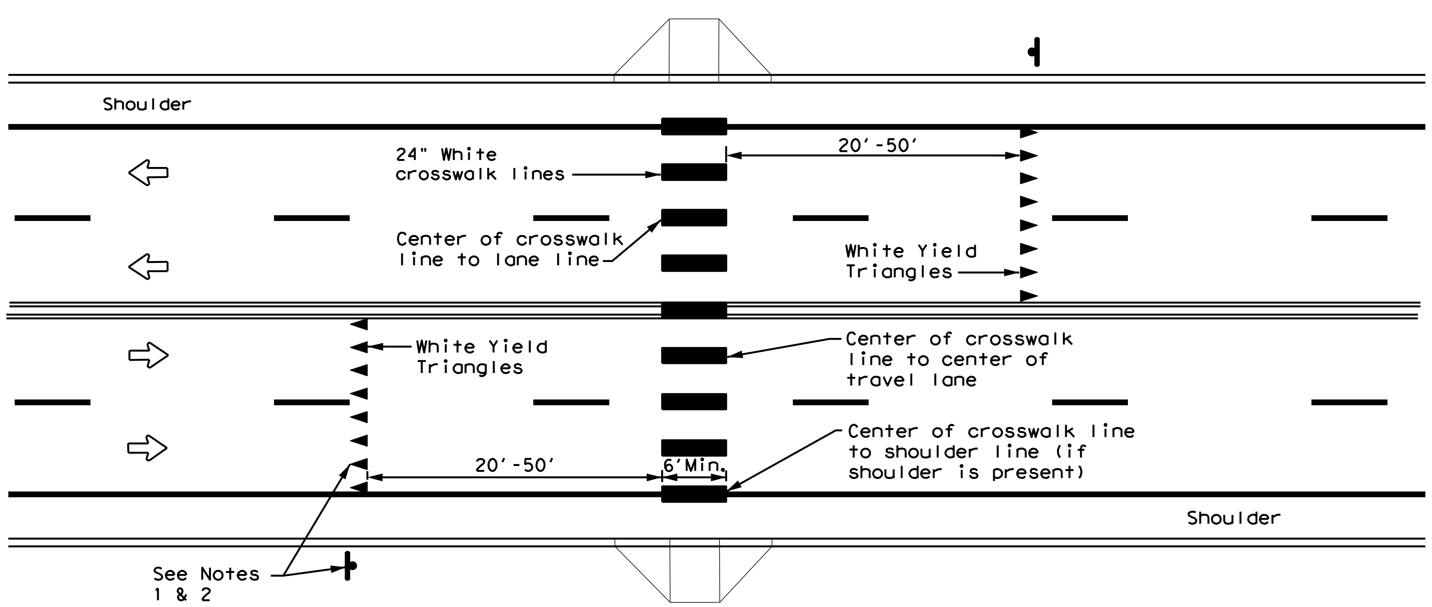
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

GENERAL NOTES

1. Longitudinal crosswalk lines should not be placed in the wheel path of vehicles. Center the crosswalk lines on travel lanes, lane lines, and shoulder lines (if present).
2. A minimum 6" clear distance shall be provided to the curb face. If the last crosswalk line falls into this distance it must be omitted.
3. For divided roadways, adjustments in spacing of the crosswalk lines should be made in the median so that the crosswalk lines are maintained in their proper location across the travel portion of the roadway.
4. At skewed crosswalks, the crosswalk lines are to remain parallel to the lane lines.
5. Each crosswalk shall be a minimum of 6' wide.
6. The High-Visibility Longitudinal Crosswalk is the preferred crosswalk pattern on State Highways. Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used. All crosswalk designs and dimension shall comply with the "Texas Manual on Uniform Traffic Control Devices."
7. Final placement of Stop Bar/Yield Triangles and Crosswalk shall be approved by the Engineer in the field.

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

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



UNSIGNALIZED MID BLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

NOTES

1. Use yield triangles with "Yield Here to Pedestrians" signs at unsignalized mid block crosswalks.
2. Use stop bars with "Stop Here on Red" signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

Texas Department of Transportation

Traffic Safety Division Standard

CROSSWALK PAVEMENT MARKINGS

PM(4)-20

FILE: pm4-20.dgn	DN:	CK:	DW:	CK:
© TxDOT June 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1065	02	039	FM 1846
	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	200

220

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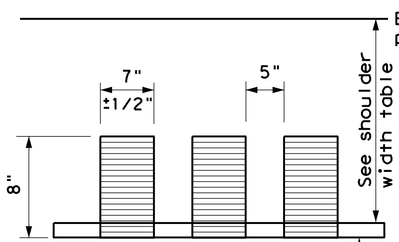
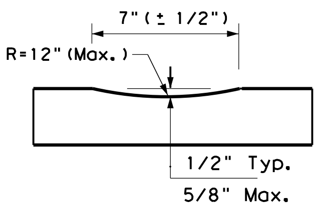


Edgeline
See Note 3

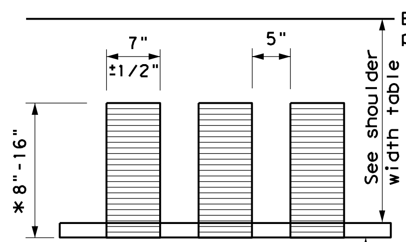
PLAN VIEW



PROFILE VIEW

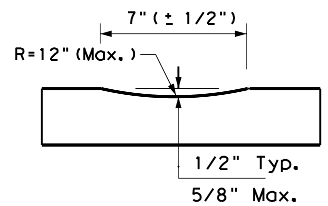
OPTION 1

CONTINUOUS MILLED DEPRESSIONS
(Rumble Stripes)



Edgeline
See Note 3

PLAN VIEW

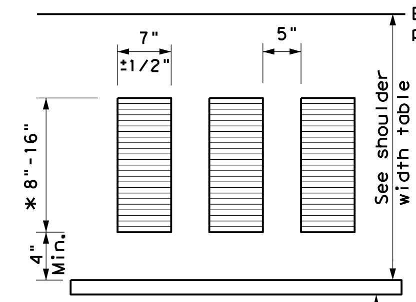


* This distance may vary based on width of shoulder

PROFILE VIEW

OPTION 2

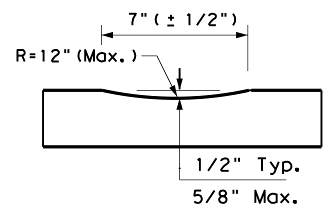
CONTINUOUS MILLED DEPRESSIONS
(Rumble Stripes)



Edgeline
See Note 3

PLAN VIEW

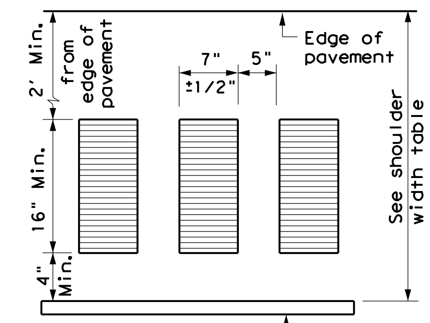
* This distance may vary based on width of shoulder



PROFILE VIEW

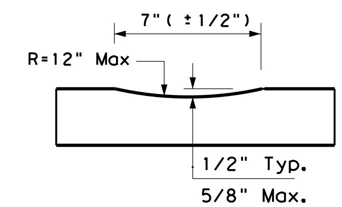
OPTION 3

CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)



Edgeline
See Note 3

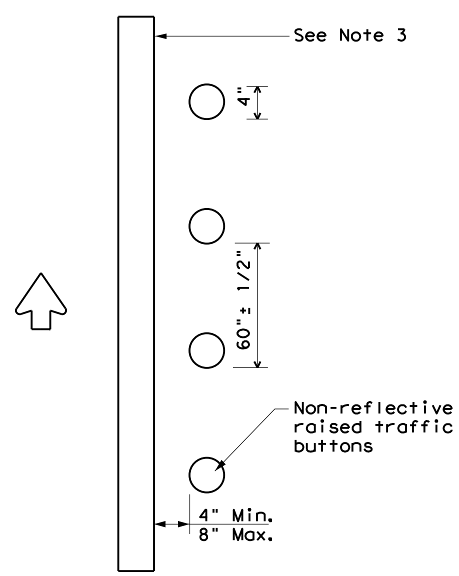
PLAN VIEW



PROFILE VIEW

OPTION 4

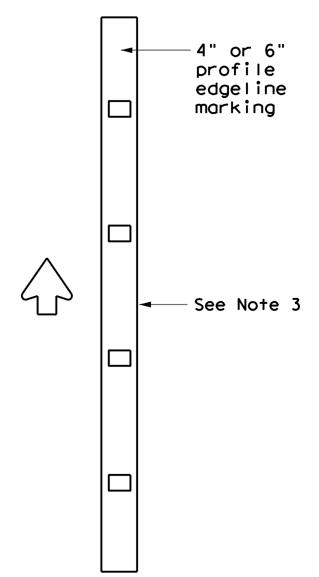
CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)



PLAN VIEW

OPTION 5

RAISED EDGELINE RUMBLE STRIPS



PLAN VIEW

OPTION 6

PROFILE EDGELINE MARKINGS

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

GENERAL NOTES

1. Rumble strips and profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
2. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
3. Use Standard Sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings, and profile markings.
4. See the table below for determining what options may be used for edgeline rumble strips.

WHEN INSTALLING MILLED DEPRESSION EDGELINE RUMBLE STRIPS:

5. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Operations Division.
6. Pavement markings can be applied over milled shoulder rumble strips to create an edgeline rumble stripe.
7. Breaks in edgeline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections and driveways with high usage of large trucks when installed on conventional highways.
8. Rumble strips shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
9. Consideration should be given to noise levels when edgeline rumble strips are installed near residential areas, schools, churches, etc. A minimum of 3/8 inches depth of milled rumble strip may be considered in these areas.
10. On roadways with high bicycle activity, consideration should be given before the installation of edgeline rumble strips. Things to consider include size of rumble strips, rumble strip material and location of rumble strips on the shoulder. If the designer determines that gaps are needed in the rumble strips due to bicycle use of the road, then follow the requirement shown in FHWA Technical Advisory T5040.39, or latest version. A detail of the spacing shall be included in the plans.

WHEN INSTALLING RAISED OR PROFILE EDGELINE RUMBLE STRIPS:

11. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per the manufacturer's recommendations.
12. Non-reflective traffic buttons shall be placed adjacent to the pavement marking delineating the edgeline when used as a rumble strip. The color of the button should match the color of the adjacent edgeline marking (white or yellow). The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
13. Non-reflective traffic buttons shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
14. Breaks in edgeline rumble strips using raised traffic buttons shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossing, intersections and driveways with high usage of large trucks when installed on conventional highways.
15. The minimum distance between the edgeline and the buttons should be used if the shoulder is less than 8 feet in width.
16. Raised profile thermoplastic markings used as edgelines may substitute for buttons.

Texas Department of Transportation

Traffic Operations Division Standard

EDGELINE RUMBLE STRIPS ON UNDIVIDED OR TWO LANE HIGHWAYS RS(4)-13

FILE: rs(4)-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2013	CONT 1065	SECT 02	JOB 039	HIGHWAY FM 1846
REVISIONS	DIST PHR	COUNTY CAMERON		SHEET NO. 201

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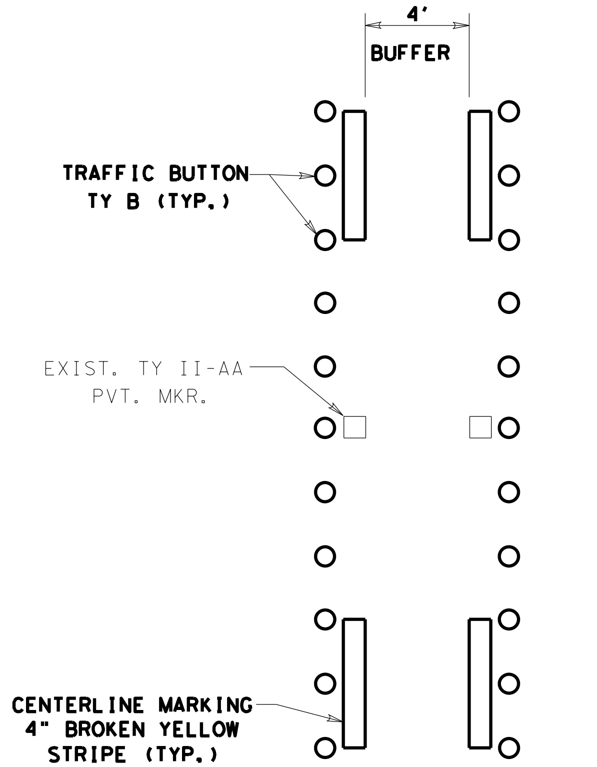
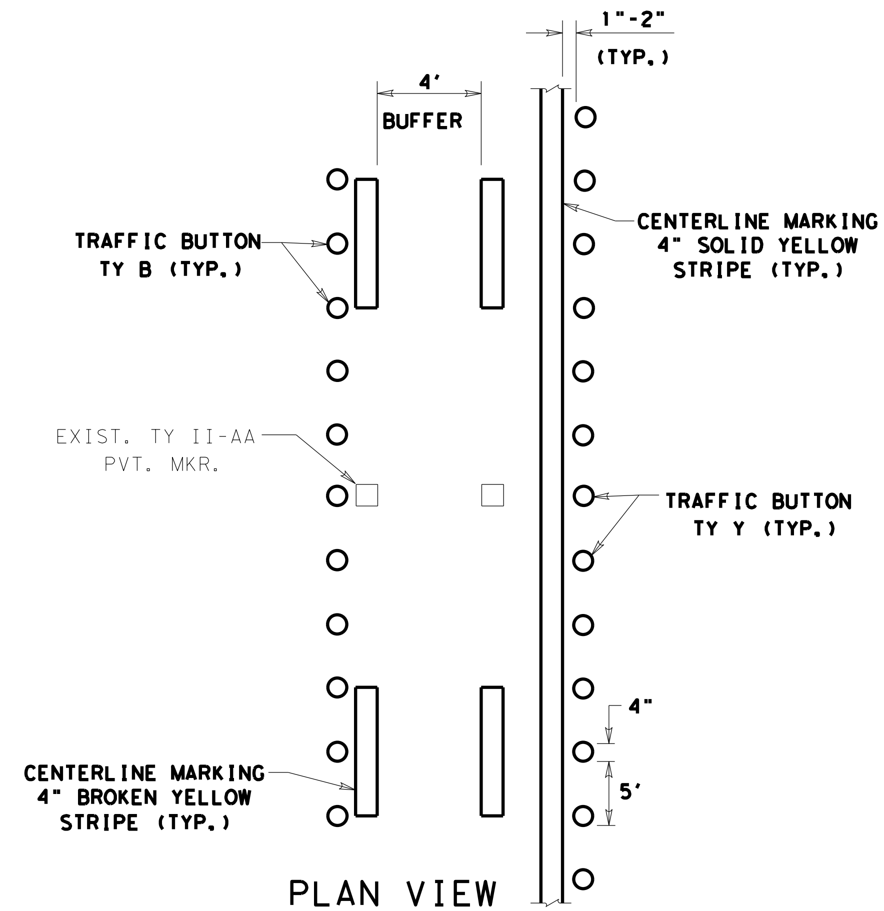
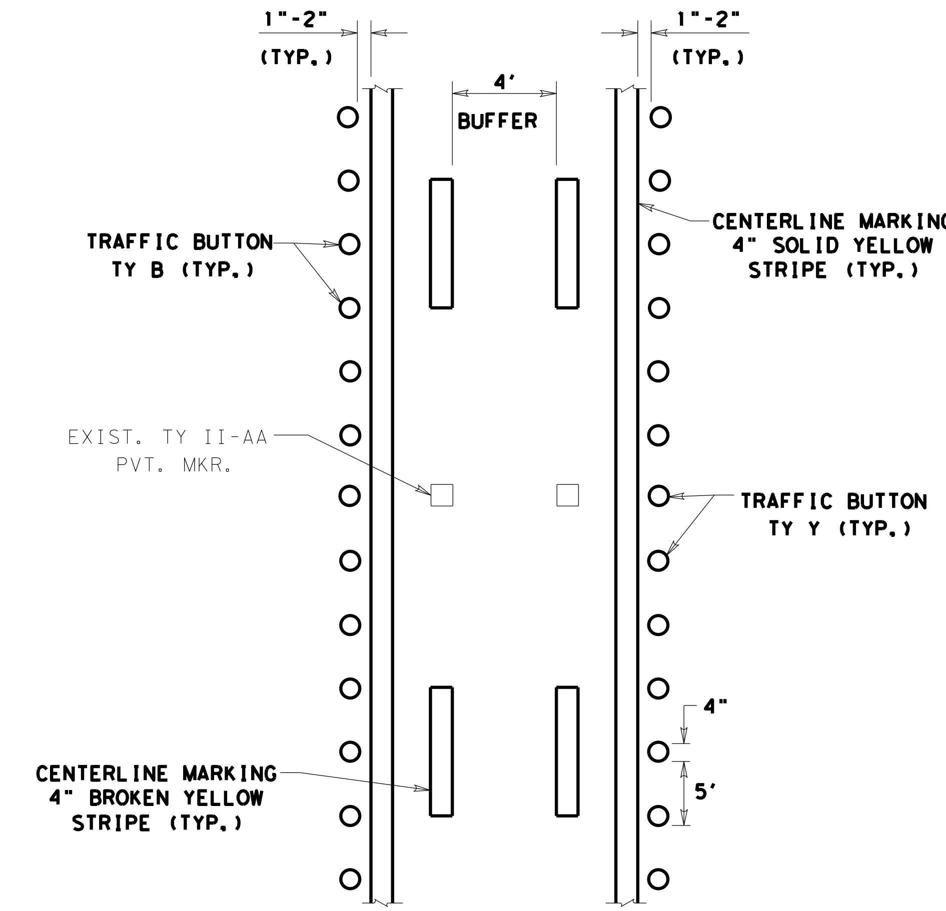


PLAN VIEW
(RUMBLE STRIPS)



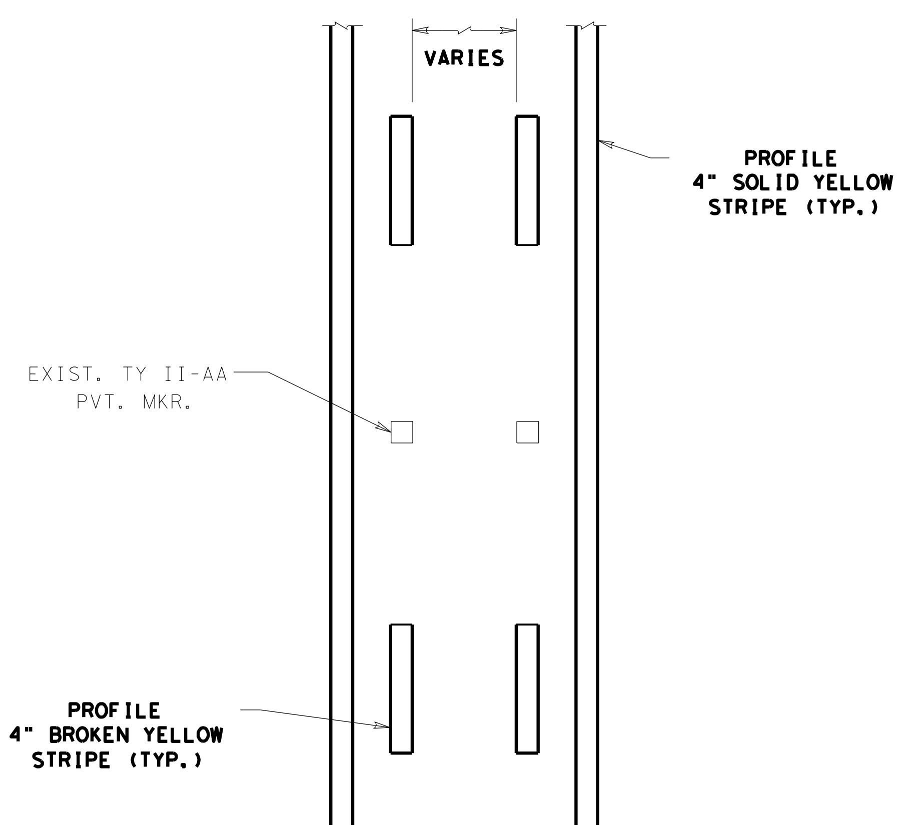
PLAN VIEW
(RUMBLE STRIPS)



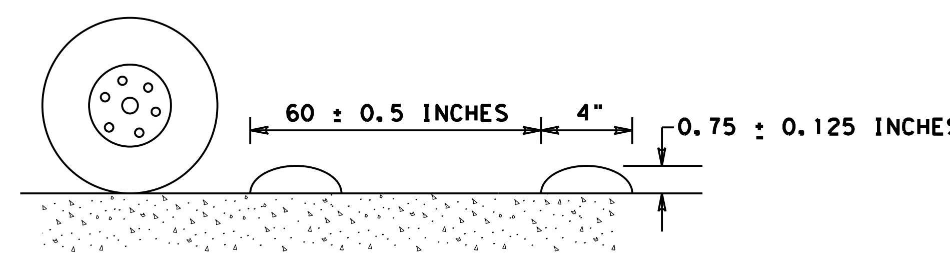
PLAN VIEW
(RUMBLE STRIPS)

GENERAL NOTES:

1. CENTERLINE RUMBLE STRIPS ARE PRIMARILY INTENDED TO ALERT DRIVERS THAT THEY ARE IN THE PROCESS OF OR HAVE LEFT THEIR ORIGINAL LANE OF TRAVEL. THESE TYPES OF RUMBLE STRIPS ARE INTENDED TO GIVE A VIBRATORY AND AUDITORY WARNING.
2. CENTERLINE RUMBLE STRIPS ARE NOT DESIGNED TO PHYSICALLY DECREASE THE SPEED OF THE VEHICLE.
3. RAISED RUMBLE STRIPS CONSISTING OF NON-REFLECTIVE RAISED PAVEMENT BUTTONS SHALL BE USED. RAISED RUMBLE STRIPS CAN BE AFFIXED TO ASPHALT OR CONCRETE WITH BITUMINOUS OR ADHESIVES, AS PER THE MANUFACTURER'S RECOMMENDATIONS.
4. RAISED NON-REFLECTIVE TRAFFIC BUTTONS SHALL BE PLACED ADJACENT TO THE PAVEMENT MARKING DELINEATING THE CENTERLINE WHEN USED AS A RAISED RUMBLE STRIP. THE COLOR OF THE BUTTON SHOULD BE TYPE Y (YELLOW) FOR A CONTINUOUS NO PASSING ROADWAY. HOWEVER, THE COLOR OF THE BUTTON SHOULD BE TYPE B (BLACK) ON ROADWAYS WHICH HAVE PASSING CONDITIONS. THE BUTTON WILL BE PAID FOR UNDER ITEM 672, "RAISED PAVEMENT MARKERS."
5. THE DIMENSIONS OF NON-REFLECTIVE, RAISED PAVEMENT BUTTONS (TRAFFIC BUTTONS) FOR USE AS RAISED RUMBLE STRIP SHALL BE 4 INCHES IN LENGTH AND WIDTH, AND ¾ INCH IN HEIGHT PRIOR TO ADHERING TO THE PAVEMENT SURFACE.
6. THE SPACING SHALL BE MEASURED FROM LEADING EDGE TO LEADING EDGE OR ON-CENTERS OF ADJECT RUMBLE STRIPS. THE SPACING REQUIREMENT SHALL BE 60 INCHES FOR THE RAISED CENTERLINE RUMBLE STRIPS. RUMBLE STRIPS SHALL NOT BE MILLED OR DEPRESSED INTO BRIDGE DECKS OR INTO PAVEMENT.
7. USE STANDARD PM(2&3)-12, RS(3&4)-13 AND THIS SHEET FOR POSITIONING GUIDANCE.



PLAN VIEW (PROFILE MRKS)



PROFILE VIEW
(RUMBLE STRIPS)

NOT TO SCALE

PHARR DISTRICT STANDARD

TEXAS DEPARTMENT OF TRANSPORTATION

CENTERLINE RUMBLE STRIPS SUPPLEMENTAL DETAILS (PHARR)

SHEET 1 OF 1

DN: NP	DRAWING	DATE	FED. RD. DIV. NO.	STATE	FEDERAL PROJECT NO.		SHEET NO.
CK DN: GIG	ORIGINAL	SEPT. 2017	6	TEXAS			202
DW: NP			STATE DIST. NO.	COUNTY	CONTROL NO. / SECTION NO. / JOB NO.		HIGHWAY NO.
CK DW: GIG			PHR	CAMERON	1065 / 02 / 039		FM1846

SITE DESCRIPTION

PROJECT LIMITS: From: San Jose Ranch Rd.
To: Business 77

PROJECT SITE MAPS:
- Project Location Map: Title Sheet (Sheet 1)
- Approx. Slopes Anticipated After Major Gradings and Areas of Soil Distrubance: Typ Sects (Sheets 14-21)
- Major Controls and Locations of Stabilization Practices: SW3P Site Map Sheets (Sheets 209-212)
- Project Specific Locations: To be specified by Project Field Office and located in the Project SW3P File
- Surface Waters and Discharge Locations: Drainage and Culvert Layout Sheets (Sheets 157-159)

PROJECT DESCRIPTION: Consisting of a full depth reconstruction of existing asphalt roadway, grading, lime treatment subgrade, cement treatment flexible base, asphalt & concrete driveways, S.E.T.'s, striping, and raised pavement markers.

MAJOR SOIL DISTURBING ACTIVITIES:
Installation of culvert crossings, junction boxes, and irrigation crossings

TOTAL PROJECT AREA: 19.60 Acres

TOTAL AREA TO BE DISTURBED: Roadway Total = 9.6 Acres (49%) and Soil Total = 10 Acres (51%)

WEIGHTED RUNOFF COEFFICIENT: Not changing runoff coefficient
Before Construction: Not Calculated
After Construction: Same as Before

EXISTING CONDITION OF SOIL & VEGETATIVE
Mercedes Clay, 0 to 1 percent slopes

NAME OF RECEIVING WATERS:
Runoff is directed via roadside ditches to existing drainage canals that will ultimately discharge into the Laguna Madre and the Gulf of Mexico.

ENDANGERED SPECIES, DESIGNATED CRITICAL HABITAT AND HISTORICAL PROPERTY: See EPIC Sheet

A. Endangered Species. South Texas Siren (Large Form), Black-spotted Newt, Buckley's Spiderwort, Large Selenia, Lila De Los Llanos, Mexican Mud-plantain, Texas Ayenia, Runyon's Water-willow, Shinner's Rocket, Mexican Treefrog, Siler's Huaco, Tharp's Dropseed, South Texas Ambrosia, Plains Gumweed, Vasey's Adelia, Bailey's Ballmoss, Sheep Frog, Texas Ebony Snake Eyes, Texas Indigo Snake, Black-striped Snake.

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

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

EROSION AND SEDIMENT CONTROLS

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

- ___ TEMPORARY SEEDING
- ___ MULCHING (Hay or Straw)
- ___ BUFFER ZONES
- ___ PLANTING
- ___ SEEDING
- ___ SODDING
- ___ OTHER: (Specify Practice)
- ___ PRESERVATION OF NATURAL RESOURCES
- ___ FLEXIBLE CHANNEL LINER
- ___ RIGID CHANNEL LINER
- ___ SOIL RETENTION BLANKET
- ___ COMPOST MANUFACTURED COMPOST
- T BIODEGRADABLE EROSION CONTROL SOCKS

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

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

STORM WATER MANAGEMENT:
Storm water drainage will be provided by storm cross culverts and roadside ditches which will carry drainage within the row to low points in the highway where cross drainage may occur and ultimately to the designated outfall.

STORM WATER MANAGEMENT ACTIVITIES: (Sequence of Construction)

The order of activities will be as follows:
1.- Install perimeter controls, clear R.O.W. on side where construction will take place, and make required utility adjustments
2. Install Proposed culverts and junction boxes, Install silt fence along roadway storm sewer network outfalls as shown on Plan & Profile Sheets.
3. Construct proposed roadway.
4. Construct roadway section up to TY "D" stage as shown on TCP.
5. Seed each section completed with temp. seeding from sidewalk to right of way.
6. Once all construction activity is complete, permanent seeding on proposed areas shall be done according to plans or as instructed by the engineer.

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

OTHER REQUIREMENTS & PRACTICES

OTHER EROSION AND SEDIMENT CONTROLS:

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

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

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

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

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

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

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

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

STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED
PROFESSIONAL ENGINEER

P.E.
09/29/2021
Signature of Registrant & Date

Texas Department of Transportation

TxDOT STORM WATER POLLUTION PREVENTION PLAN (SW3P)

REV. 2-20-14 SW3P.DGN

FED.RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			203
STATE	DIST.	COUNTY	
TEXAS	PHARR	CAMERON	
CONT.	SECT.	JOB	HIGHWAY NO.
1065	02	039	FM 1846

DATE: 9/29/2021 10:07:15 AM
FILE: pw:\\tx.dot.projectwiseonline.com:TX0075\Documents\21 - PHR\Design Projects\1065020394 - Design\Plan Set\9. Environmental\SW3P.dgn

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

I. Clean Water Act, Section 402; Stormwater Pollution Prevention

Action Items Required : ☐ No Action Required

1. ☒ The contractor must implement the SW3P by installing Best Management Practices (BMPs) as indicated in the construction plans and maintained appropriately throughout construction. BMPs must be in place prior to the start of construction. The SW3P may need to be revised as necessary as construction progresses.
2. ☒ For all construction PSL's off the ROW, the contractor must certify compliance with all applicable laws, rules and regulations pertaining to the preservation of cultural resources, natural resources and the environment.
3. ☒ Based on the acreage of impact, select the appropriate box below:
   - ☐ This project will disturb less than 1 acre of soil and is not part of a larger common plan of development; therefore, a NOI and TPDES Site Notice are not required for this project.

   or
   - ☐ This project will disturb equal to or more than 1 acre of soil but less than 5 acres; therefore a NOI is not required but a TPDES Site Notice is required. The Construction Site Notice (CSN) is required to be posted at the construction site in a publicly accessible location for review by the public, TCEQ, EPA and other Inspectors.

   or
   - ☒ This project will disturb equal to or more than 5 acres of soil and will require a NOI and TPDES Site Notice. The NOI and Site Notice are required to be posted at the construction site in a publicly accessible location.
4. ☒ Need to address MS4 requirements (Cameron County Locations 6, 8, 11 & 12) ☐ MS4 requirements not needed (Locations 1-5, 7, 9 & 10)

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 and remove loose aggregate 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 2014 TxDOT Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges, Item 7.7.1., in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.
2. ☐ Other Project Specific Actions:
   XXXXXXXXXX

IV. Vegetation Resources

Action Items Required : ☐ No Action Required

1. ☒ In accordance with the 2014 TxDOT Standard Specifications; Item 164 - Seeding For Erosion Control; provide and install temporary or permanent seeding for erosion control as shown on the plans or as directed by the Engineer for all seeding and replanting of right of way where possible. (Required for Urban Settings)
2. ☒ In accordance with Executive Order 13112 on invasive species and the Executive Memorandum on Beneficial Landscaping, native species of plants shall be used for all seeding and replanting of right of way where possible for rural roadways. (Required for Rural Settings)
3. ☒ Preserve vegetation where possible throughout the project and minimize clearing, grubbing and excavation within stream banks, bed and approach sections.
4. ☒ Other Project Specific Actions:
   1. Vegitation clearing activities would be avoided during the general bird nesting season, Feb. 1 - Oct. 1 to minimize adverse impacts to birds.

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

List of Abbreviations

BMP: Best Management Practice	NWP: Nationwide Permit
CGP: Construction General Permit	PCN: Pre-Construction Notification
CRPe: Contractor Responsible Person Environmental	PSL: Project Specific Location
DSHS: Texas Department of State Health Services	SPCC: Spill Prevention Control and Countermeasure
FEMA: Federal Emergency Management Agency	SW3P: Storm Water Pollution Prevention Plan
FHWA: Federal Highway Administration	TCEQ: Texas Commission on Environmental Quality
MOA: Memorandum of Agreement	THC: Texas Historical Commission
MOU: Memorandum of Understanding	TPDES: Texas Pollutant Discharge Elimination System
MS4: Municipal Separate Stormwater Sewer System	TPWD: Texas Parks and Wildlife Department
MSAT: Mobile Source Air Toxic	TxDOT: Texas Department of Transportation
MBTA: Migratory Bird Treaty Act	T&E: Threatened and Endangered Species
NOI: Notice of Intent	USACE: U.S. Army Corp of Engineers
NOT: Notice of Termination	USFWS: U.S. Fish and Wildlife Service

Texas Department of Transportation

PHARR DISTRICT

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6			FM 1846
STATE	DISTRICT	COUNTY	
TEXAS	PHR	CAMERON	
CONTROL	SECTION	JOB	SHEET NO.
1065	02	039	204

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. The removal of unoccupied, inactive nest would be avoided, where practicable.
   2. The establishment of active nest during the nesting season on TxDOT owned and operated facilitates and structures proposed for replacement or repair would be prevented.
   3. The collection, capture, relocation, or transportation of birds, eggs, young, or active nests without a permit would be prohibited.
   4. Due to increased activity (mating) of reptiles during the spring, construction activities such as clearing and grading, where practicable, would be scheduled outside of the spring (April-May) season.
   5. Ground-disturbing activities, where practicable, would be scheduled before October when reptiles become less active and may be using burrows within the project area.

4. See EPIC sheet supplementals for TPWD BMP's.

VI. Hazardous Materials on Contamination Issues

Action Items Required : ☒ No Action Required

General (applies to all projects):

Comply with the Hazard Communication Act (HCA) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the HCA.

Maintain an adequate supply of on-site spill response materials as indicated in the MSDS. In the event of a spill, take immediate action to mitigate the spill as indicated in the MSDS and in accordance with safe work practices. Contact the TxDOT Pharr District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

- Dead or distressed vegetation (identified as not normal)
- Trash piles, drums, canisters, barrels, etc.
- Undesirable smells or odors
- Evidence of leaching or seepage of contaminant substances

Any other evidence indicating possible hazardous materials or contamination discovered on site.

1. ☒ If potentially hazardous material and/or contaminated media (i.e.: soil, groundwater, surface water, sediment, building materials) are unexpectedly encountered during construction, assure that such materials and contamination are handled according to applicable federal and state regulations, cease work in the immediate area and contact the Engineer immediately.

VI. Hazardous Materials on Contamination Issues - Continued:

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

   ☐ Yes ☒ No

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

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

   ☐ Yes ☒ No

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

   If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

4. ☐ The Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and an Asbestos Consultant in order to minimize construction delays and subsequent claims.

VII. Other Environmental Issues

Action Items Required : ☐ No Action Required

1. ☒ Noise

   Contractor shall make every reasonable effort to minimize construction noise through abatement measures such as work hour controls and proper maintenance of equipment mufflers.

2. ☒ Air

   Contractor shall practice common dust control techniques such as surface chemical treatment or watering of unpaved road surfaces and vehicle speed reduction shall be implemented to minimize and prevent airborne dust during construction.

   Contractor should minimize MSAT by utilizing measures to encourage use of EPA required cleaner diesel fuels, limits on idling, increase use of cleaner burning diesel engines, and other emission limitation techniques, as appropriate.

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

List of Abbreviations

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Texas Department of Transportation

PHARR DISTRICT

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6			FM 1846
STATE	DISTRICT	COUNTY	
TEXAS	PHR	CAMERON	
CONTROL	SECTION	JOB	SHEET NO.
1065	02	039	205

TPWD BMPs

The Programmatic Agreement defines Best Management Practices (BMPs) to be implemented by Texas Department of Transportation (TxDOT) per §2.213 (Programmatic Agreements) of the 2017 Memorandum of Understanding (MOU) between TxDOT and Texas Parks and Wildlife Department (TPWD). These BMPs are measures that TxDOT and TPWD agree will result in avoidance and minimization of potential impacts to natural resources and in some cases apply to particular types of TxDOT projects.

The purpose of this section is to provide BMPs to minimize impacts to species or groups of species. Implementation of these BMPs by TxDOT eliminates the need for coordination under §2.206(1)of the MOU, except as noted.

Due diligence should be used to avoid killing or harming any wildlife species in the implementation of TxDOT projects.

☒ Bird BMPs (Required)

In addition to complying with the Migratory Bird Treaty Act (MBTA) perform the following BMPs:

- ☒ Prior to construction, perform daytime surveys for nests including under bridges and in culverts to determine if they are active before removal. Nests that are active should not be disturbed.
- ☒ Do not disturb, destroy, or remove active nests, including ground nesting birds, during the nesting season.
- ☒ Avoid the removal of unoccupied, inactive nests, as practicable.
- ☒ Prevent the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair.
- ☒ Do not collect, capture, relocate, or transport birds, eggs, young, or active nests without a permit.

☐ Bald Eagle *(Haliaeetus leucocephalus)*

- ☐ Bird BMPs and Bald and Golden Eagle Protection Act compliance

☐ Reddish Egret *(Egretta rufescens)* or
☐ White-faced Ibis *(Plegadis chihi)*

- ☐ Bird BMPs unless project is within 300 meters (984 feet)of a known colonial water bird rookery then coordinate with TPWD.

☐ Rookeries (Recommendations)

In general, nesting dates for herons and egrets range from early February to late August in Texas, depending on the species. Great Blue Herons (GBHE) are usually the first to nest. When GBHE get disrupted from the nest and abandon nesting, then the other species of herons and egrets may not attempt to nest at the colony that year. Breeding dates for rookery species are approximately as follows:

Species	Dates
Cattle Egret	Early April to late October
Little Blue Heron	Late March to late July
Snowy Egret	Late March to early August
Great Egret	Early March to early August
Black-crowned Night Heron	Early February to late July
Great Blue Heron	February to late August

☐ Rookeries (Recommendations) (Continued)

- ☐ Vegetation clearing in a primary buffer area of 300 meters (984 feet) from a heronry periphery should be avoided. Utilizing areas that have already been cleared within this buffer area may be acceptable depending on site-specific characteristics. Additionally, human foot-traffic or machinery use should not occur within this buffer area during the nesting season.
- ☐ Clearing activities or construction using heavy machinery in a secondary buffer area of 1,000 meters (3,281 feet) from the heronry periphery should be avoided during the breeding season (courting and nesting).

☐ Bat BMPs (Required)

To determine the appropriate BMP to avoid or minimize impacts to bats, review the habitat description for the species of interest on the TPWD Rare, Threatened, and Endangered Species of Texas by County List or other trusted resources. All bat surveys and other activities that include direct contact with bats shall comply with TPWD' recommended white-nose syndrome protocols located on the TPWD Wildlife Habitat Assessment Program website under "Project Design and Construction".

The following survey and exclusion protocols should be followed prior to commencement of construction activities. For the purposes of this document, structures are defined as bridges, culverts (concrete or metal), wells, and buildings.

- ☐ For activities that have the potential to impact structures, cliffs or caves, or trees; a qualified biologist will perform a habitat assessment and occupancy survey of the feature(s) with roost potential as early in the planning process as possible or within one year before project letting.
- ☐ For roosts where occupancy is strongly suspected but unconfirmed during the initial survey, revisit feature(s) at most four weeks prior to scheduled disturbance to confirm absence of bats.
- ☐ If bats are present or recent signs of occupation (i.e., piles of guano, distinct musky odor, or staining and rub marks at potential entry points) are observed, take appropriate measures to ensure that bats are not harmed, such as implementing non-lethal exclusion activities or timing or phasing of construction.
- ☐ Exclusion devices can be installed by a qualified individual between September 1 and March 31. Exclusion devices should be used for a minimum of seven days when minimum nighttime temperatures are above 50°F and minimum daytime temperatures are above 70°F. Prior to exclusion, ensure that alternate roosting habitat is available in the immediate area. If no suitable roosting habitat is available, installation of alternate roosts is recommended to replace the loss of an occupied roost. If alternate roost sites are not provided, bats may seek shelter in other inappropriate sites, such as buildings, in the surrounding area. See Additional Bat BMPs (Recommendations) for recommended acceptable methods for excluding bats from structures.
- ☐ If feature(s) used by bats are removed as a result of construction, replacement structures should incorporate bat-friendly design or artificial roosts should be constructed to replace these features, as practicable.
- ☐ Conversion of property containing cave or cliff features to transportation purposes should be avoided where feasible.

Pharr District Contact No. 956-702-6100

☐ Bat BMPs (Required)(Continued)

- ☐ Avoid unnecessary removal of dead fronds on native and ornamental palm trees in south Texas (Cameron, Hidalgo, Willacy, Kenedy, Brooks, Kleberg, Nueces, and San Patricio counties) from April 1st through October 31st. If removal of dead fronds is necessary at other times of the year, limit frond removal to extended warm periods (nighttime temperatures: 55°F for at least two consecutive nights), so bats can move away from the disturbance and find new roosts.
- ☐ Large hollow trees, snags (dead standing trees), and trees with shaggy bark should be surveyed for colonies and, if found, should not be disturbed until the bats are no longer occupying these features. Post-occupancy surveys should be conducted by a qualified biologist prior to tree removal from the landscape.
- ☐ Retain mature, large diameter hardwood forest species and native/ornamental palm trees where feasible.
- ☐ In all instances, avoid harm or death to bats. Bats should only be handled as a last resort and after communication with TPWD.

☐ Mexican Long-tongues Bat *(Choeronycteris mexicana)*

- ☐ Avoid unnecessary impacts to cacti and agave species.
- ☐ Bat BMPs.

☐ Additional Bat BMPs (Recommendations)

- ☐ Bat surveys of structures should include visual inspections of structural fissures (cracked or spalled concrete, damaged or split beams, split or damaged timber railings), crevices (expansion joints, space between parallel beams, spaces above supports piers), and alternative structures (drainage pipes, bolt cavities, open sections between support beams, swallow nests) for the presence of bats.
- ☐ Before excluding bats from any occupied structure, bat species, weather, temperature, season, and geographic location must be incorporated into any exclusion plans to avoid unnecessary harm or death to bats. Winter exclusion must entail a survey to confirm either, 1) bats are absent or 2) present but active (i.e. continuously active - not intermittently active due to arousals from hibernation).
- ☐ Avoid using materials that degrade quickly, like paper, steel wool or rags, to close holes.
- ☐ Avoid using products or making structural modifications that may block natural ventilation, like hanging plastic sheeting over an active roost entrance, thereby altering roost microclimate.
- ☐ Avoid using chemical and ultrasonic repellents.
- ☐ Avoid use of silicone, polyurethane or similar non-water-based caulk products.
- ☐ Avoid use of expandable foam products at occupied sites.
- ☐ Avoid the use of flexible netting attached with duct tape.

Revised 07/12/2017

List of Abbreviations

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TxDOT: Texas Department of Transportation
T&E: Threatened and Endangered Species
USACE: U.S. Army Corp of Engineers
USFWS: U.S. Fish and Wildlife Service

Texas Department of Transportation

PHARR DISTRICT

EPIC SHEET SUPPLEMENTALS

TPWD BMPs

SHEET 1 OF 3

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6			FM 1846
STATE	DISTRICT	COUNTY	
TEXAS	PHR	CAMERON	SHEET NO.
CONTROL	SECTION	JOB	
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☐ Additional Bat BMPs (Recommendations) (Continued)

☐ In order to avoid entombing bats, exclusion activities should be only implemented by a qualified individual. A qualified individual or company should possess at least the following minimum qualifications:

- Experience in bat exclusion (the individual, not just the company).
- Proof of rabies pre-exposure vaccinations.
- Demonstrated knowledge of the relevant bat species, including maternity season date range and habitat requirements.
- Demonstrated knowledge of rabies and histoplasmosis in relation to bat roosts.

☐ Contact TPWD for additional resources and information to assist in executing successful bat exclusions that will avoid unnecessary harm or death in bats.

☐ Fossorial Mammal BMPs (Required)

☐ If black-tailed prairie dog (BTPD) burrows or pocket gopher mounds are to be excavated/directly impacted coordinate with TPWD WHAB.
☐ When a construction zone is adjacent to active BTPD burrows or pocket gopher mounds, erect barriers to discourage individuals moving through or into the construction area.
☐ When seeding or revegetation is planned in an area adjacent to BTPD burrows or pocket gopher mounds, a vegetative barrier should be considered in the planting to discourage dispersal into the ROW.

☐ Coues' Rice Rat *(Oryzomys couesi)*

☐ Minimize impacts to wetland, Resaca, oxbow lakes, and marsh habitats.
☐ Contractors will be advised of potential occurrence in the project area and to avoid harming the species if encountered.
☐ Water Quality BMPs.

☐ Plains Spotted Skunk *(Spilogale putorius interrupta)* or
☐ Swift Fox *(Vulpes velox)*

☒ Contractor will be advised of potential occurrence in the project area and to avoid harming the species if encountered and to avoid unnecessary impacts to dens.

☐ White nosed Coati *(Nasua narica)*/
☐ Yellow nosed Cotton Rat *(Sigmodon ochrognathus)*

☐ Contractors will be advised of potential occurrence in the project area and to avoid harming the species if encountered.

☒ Terrestrial Reptile BMPs (Required)

☒ Apply hydro mulching and/or hydro seeding in areas for soil stabilization and/or revegetation of disturbed areas where feasible. If hydro mulching and/or hydro seeding are not feasible due to site conditions, utilize erosion control blankets or mats that contain no netting or contain loosely woven, natural fiber netting is preferred. Plastic netting should be avoided to the extent practicable.
☒ For open trenches and excavated pits, install escape ramps at an angle of less than 45 degrees (1 :1) in areas left uncovered. Visually inspect excavation areas for trapped wildlife prior to backfilling.
☒ Inform contractors that if reptiles are found on project site allow species to safely leave the project area.
☒ Avoid or minimize disturbing or removing downed trees, rotting stumps, and leaf litter where feasible.
☒ Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered.

☐ Texas Tortoise *(Gopherus berlandieri)*

☐ Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered.
☐ Utility trenches should be covered overnight or visually inspected before filling to avoid burial of the species.
☐ Terrestrial Reptile BMPs.

☐ Texas Horned Lizard *(Phrynosoma cornutum)*

☐ Avoid harvester ant mounds in the selection of Project Specific Locations (PSLs) where feasible.
☐ Terrestrial Reptile BMPs.

☒ Additional Reptile BMPs (Recommendations)

☒ Due to increased activity (mating) of reptiles during the spring, construction activities like clearing or grading should attempt to be scheduled outside of the spring (April-May) season. Also, timing ground disturbing activities before October when reptiles become less active and may be using burrows in the project area is also encouraged.
☒ When designing roadways with curbs, consider using Type I or Type III curbs to provide a gentle slope to enable turtles and small animals to get out of roadways.
☒ If Texas Tortoises are present in a project area, they should be removed from the area. After removal of the tortoises, the area that will be disturbed during active construction and project specific locations should be fenced off to exclude tortoises and other reptiles. The exclusion fence should be constructed and maintained as follows:

a. The exclusion fence should be constructed with metal flashing or drift fence material.
b. Rolled erosion control mesh material should not be used.
c. The exclusion fence should be buried at least 6 inches deep and be at least 24 inches high.
d. The exclusion fence should be maintained for the life of the project and only removed after the construction is completed and the disturbed site has been revegetated.

☒ Amphibian and Aquatic Reptile BMPs (Required)

Unless absence of the species can be demonstrated, assume presence in suitable habitat and implement the following BMPs. Absence can only be demonstrated using TPWD-approved survey efforts (contact TPWD for minimum survey protocols for species and project site conditions).

☐ For projects within one mile of a known occupied location or observation of the species recorded from 1980 until the current year and suitable habitat is present, coordinate with TPWD.
☐ For new location roadway projects, coordinate with TPWD.
☐ For projects within existing right-of-way (ROW) when work is in water or will permanently impact a water feature and potential habitat exists for the target species complete the following:

a) Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered.
b) Minimize impacts to wetland, temporary and permanent open water features, including depressions, and riverine habitats.
c) Maintain hydrologic regime and connections between wetlands and other aquatic features.

Pharr District Contact No. 956-702-6100

☒ Amphibian and Aquatic Reptile BMPs (Continued)

d) Use barrier fencing to direct animal movements away from construction activities and areas of potential wildlife-vehicle collisions in construction areas directly adjacent, or that may directly impact, potential habitat for the target species.
e) Apply hydromulching and/or hydroseeding in areas for soil stabilization and/or revegetation of disturbed areas where feasible. If hydromulching and/or hydroseeding are not feasible due to site conditions, using erosion control blankets or mats that contain no netting, or only contain loosely woven natural fiber netting is preferred. Plastic netting should be avoided to the extent practicable.
f) Project specific locations (PSLs) proposed within state-owned ROW should be located in uplands away from aquatic features.
g) When work is directly adjacent to the water, minimize impacts to shoreline basking sites (e.g., downed trees, sand bars, exposed bedrock) and overwinter sites (e.g., brush and debris piles, crayfish burrows) where feasible.
h) Avoid or minimize disturbing or removing downed trees, rotting stumps, and leaf litter, which may be refugia for terrestrial amphibians, where feasible.
i) If gutters and curbs are part of the roadway design, where feasible install gutters that do not include the side box inlet and include sloped (i.e. mountable) curbs to allow small animals to leave roadway. If this modification to the entire curb system is not possible, install sections of sloped curb on either side of the storm water drain for several feet to allow small animals to leave the roadway. Priority areas for these design recommendations are those with nearby wetlands or other aquatic features.

☐ For projects that require acquisition of additional ROW and work within that new ROW is in water or will permanently impact a water feature, implement a) - i) above plus j) -l) below, where applicable:

j) For sections of roadway adjacent to wetlands or other aquatic features, install wildlife barriers that prevent climbing. Barriers should terminate at culvert openings in order to funnel animals under the road. The barriers should be of the same length as the adjacent feature or 80 feet long in each direction, or whichever is the lesser of the two.
k) For culvert extensions and culvert replacement/installation, incorporate measures to funnel animals toward culverts such as concrete wingwalls and barrier walls with overhangs.
l) When riprap or other bank stabilization devices are necessary, their placement should not impede the movement of terrestrial or aquatic wildlife through the water feature. Where feasible, biotechnical streambank stabilization methods using live native vegetation or a combination of vegetative and structural materials should be used.

Revised 07/12/2017

List of Abbreviations

BMP: Best Management Practice	MSAT: Mobile Source Air Toxic	TCEQ: Texas Commission on Environmental Quality
CGP: Construction General Permit	MBTA: Migratory Bird Treaty Act	THC: Texas Historical Commission
CRPe: Contractor Responsible Person Environmental	NOI: Notice of Intent	TPDES: Texas Pollutant Discharge Elimination System
DSHS: Texas Department of State Health Services	NOT: Notice of Termination	TPWD: Texas Parks and Wildlife Department
FEMA: Federal Emergency Management Agency	NWP: Nationwide Permit	TxDOT: Texas Department of Transportation
FHWA: Federal Highway Administration	PCN: Pre-Construction Notification	T&E: Threatened and Endangered Species
MOA: Memorandum of Agreement	PSL: Project Specific Location	USACE: U.S. Army Corp of Engineers
MOU: Memorandum of Understanding	SPCC: Spill Prevention Control and Countermeasure	USFWS: U.S. Fish and Wildlife Service
MS4: Municipal Separate Stormwater Sewer System	SW3P: Storm Water Pollution Prevention Plan	

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PHARR DISTRICT

EPIC SHEET SUPPLEMENTALS

TPWD BMPs

SHEET 2 OF 3

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6			FM 1846
STATE	DISTRICT	COUNTY	
TEXAS	PHR	CAMERON	SHEET NO.
CONTROL	SECTION	JOB	
1065	02	039	207

☒ Sheep Frog *(Hypopachus variolosus)*

- ☒ Minimize disturbance to burrows or downed woody debris.
- ☐ Water Quality BMPs.
- ☐ Amphibian BMPs.

☒ South Texas Siren (Large Form) *(Siren sp 1)*

- ☒ Minimize impacts to warm, shallow waters with vegetative cover such as ponds and ditches.
- ☐ Water Quality BMPs.
- ☐ Amphibian BMPs.

☐ Freshwater Mussel BMPs (Required)

- ☐ When work is in the water; survey project footprints for state listed species where appropriate habitat exists.
- ☐ When work is in the water and mussels are discovered during surveys; relocate state listed and SGCN mussels under TPWD authorization and implement Water Quality BMPs.
- ☐ When work is adjacent to the water; Water Quality BMPs implemented as part of the SWPPP for a construction general permit or any conditions of the Section 401 water quality certification for the project will be implemented.

☐ Fish BMPs (Required)

- ☐ For projects within the range of a SGCN or State-Listed fish and work is adjacent to water: Use Water Quality BMPs. No TPWD Coordination required.
- ☐ For projects within the range of a SGCN or State-Listed fish, and work is in the water: TPWD coordination is required.

☐ Water Quality BMPs (Required)

In addition to BMPs required for a TCEQ Storm Water Pollution Prevention Plan and/or Section 401 water quality permit:

- ☐ Minimize the use of equipment in streams and riparian areas during construction. When possible, equipment access should be from banks, bridge decks, or barges.
- ☐ When temporary stream crossings are unavoidable, remove stream crossings once they are no longer needed and stabilize banks and soils around the crossing.

☐ Additional Water Quality BMPs (Recommendations)

- ☐ Wet-Bottomed detention ponds are recommended to benefit wildlife and downstream water quality. Consider potential wildlife-vehicle interactions when siting detention ponds.
- ☐ Rubbish found near bridges on TxDOT ROW should be removed and disposed of properly to minimize the risk of pollution. Rubbish does not include brush piles or snags.

☐ Aquatic Mitigation (Recommendations)

- ☐ In-kind compensatory mitigation should be considered for all unavoidable impacts to aquatic resources including, but not limited to streams, wetlands, oysters, seagrass and mudflats, regardless of their jurisdictional status.
- ☐ Compensatory mitigation plans should be developed in consultation with TPWD Transportation Conservation Coordinator.

☐ Stream Crossings (Recommendations)

- ☐ Use spanning bridges rather than culverts when feasible.
- ☐ If using a culvert, staggered culverts that concentrate low flows but provide conveyance of higher flows through staggered culverts placed at higher elevations is recommended.
- ☐ Bottomless culverts are recommended to allow for fish and other aquatic wildlife passage in the low flow channel. If bottomless culverts are not feasible, making a low flow channel for fish passage is recommended.
- ☐ Avoid placing riprap across stream channels and instead use alternative stabilization such as biotechnical stream bank stabilization methods including live native vegetation or a combination of vegetative and structural materials. When riprap or other bank stabilization devices are necessary, their placement should not impede the movement of aquatic and terrestrial wildlife underneath the bridge. In some instances, riprap may be buried, back-filled with topsoil and planted with native vegetation.
- ☐ Incorporate bat-friendly design into bridges and culverts.
- ☐ Design bridges for adequate vertical and horizontal clearances under the roadway to allow for terrestrial wildlife to safely pass under the road.
- ☐ A span wide enough to cross the stream and allow for dry ground and a natural surface path under the roadway is encouraged. For culverts, incorporation of an artificial ledge inside the culvert on one or both sides for use by terrestrial wildlife is recommended.
- ☐ Riparian buffer zones should remain undisturbed where possible.

☒ Vegetation BMPs (Recommendations)

- ☒ Minimize the amount of vegetation cleared. Removal of native vegetation, particularly mature native trees and shrubs should be avoided to the greatest extent practicable. Wherever practicable, impacted vegetation should be replaced with in-kind on-site replacement/restoration of native vegetation.
- ☒ To minimize adverse effects, activities should be planned to preserve mature trees, particularly acorn, nut or berry producing varieties. These types of vegetation have high value to wildlife as food and cover.
- ☒ It is strongly recommended that trees greater than 12 inches in diameter at breast height (dbh) that are removed be replaced. TPWD's experience indicates that for ecologically effective replacement, a ratio of three trees for every one (3:1) lost should be provided to the extent practicable either on-site or off-site. Trees less than 12 inches dbh should be replaced at a 1:1 ratio.
- ☒ Replacement trees should be of equal or better wildlife quality than those removed and be regionally adapted native species.
- ☒ When trees are planted, a maintenance plan that ensures at least an 85 percent survival rate after three (3) years should be developed for the replacement trees.
- ☒ The use of any non-native vegetation in landscaping and revegetation is discouraged. Locally adapted native species should be used.
- ☒ The use of seed mix that contains seeds from only locally adapted native species is recommended.
- ☒ Avoid vegetation clearing activities during the general bird nesting season, March through August, to minimize adverse impacts to birds.

☐ Invasive Species BMPs (Recommendations)

- ☐ For all work in waters listed in the distribution of Zebra mussels on http://texasinvasives .org/ as well as those waters specified in 31 TAC §57.972 and any TPWD emergency orders regarding prevention of the spread of Zebra mussels all machinery, equipment, or vehicles coming in contact with such waters should follow clean/drain/dry protocols to prevent the potential spread of invasive Zebra mussels.
- ☐ Care should be taken to avoid the spread of aquatic invasive plants (such as Giant Salvinia, Hydrilla, Hyacinth, Watermilfoil, Water Lettuce, and Alligatorweed) from infested water bodies into areas not currently infested. All machinery/equipment/vehicles coming in contact with waters containing aquatic invasive plant species should follow clean/drain/dry protocols to prevent the potential spread of invasive plants.
- ☐ Colonization by invasive plants should be actively prevented on disturbed sites in terrestrial habitats. Vegetation management should include removing invasive species as soon as practical while allowing the existing native plants to revegetate the disturbed areas. If using hay bales for sediment control, use locally grown weed-free hay to prevent the spread of invasive species. Leave the hay bales in place and allow them to break down, as this acts as mulch assisting in revegetation.

☐ Wildlife Crossings (Recommendations)

- ☐ Design roadways on new location to incorporate wildlife crossings, particularly in areas that bisect wildlife travel corridors or seasonal movement routes.
- ☐ Consider using cable median barrier instead of concrete traffic barrier when feasible to increase permeability for animals encountering barriers.

Pharr District Contact No. 956-702-6100

Revised 07/12/2017

List of Abbreviations

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MS4: Municipal Separate Stormwater Sewer System	SW3P: Storm Water Pollution Prevention Plan	

Texas Department of Transportation

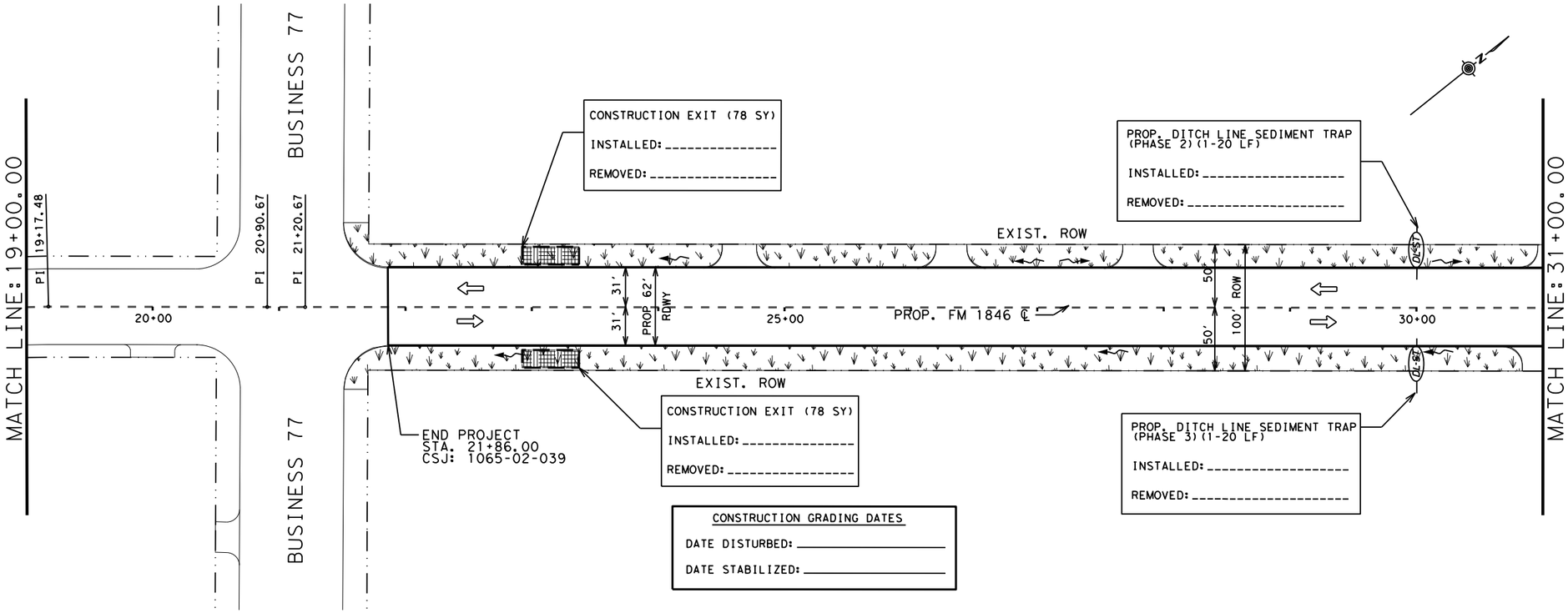
PHARR DISTRICT

EPIC SHEET SUPPLEMENTALS

TPWD BMPs

SHEET 3 OF 3

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6			FM 1846
STATE	DISTRICT	COUNTY	
TEXAS	PHR	CAMERON	SHEET NO.
CONTROL	SECTION	JOB	
1065	02	039	208



LEGEND

- CONSTRUCTION EXIT (TY II)
- SEEDING AREA
- DIRECTION OF FLOW
- DI-ST — DROP INLET SEDIMENT TRAP (LOGS)
- DL-ST — DITCH LINE SEDIMENT TRAP (LOGS)
- SCF — TEMPORARY SEDIMENT CONTROL FENCE
- TECL — TEMPORARY EROSION CONTROL LOGS

NOTES

1. 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 CONTINOUS USE BY THE CONTRACTOR DURING CONSTRUCTION.
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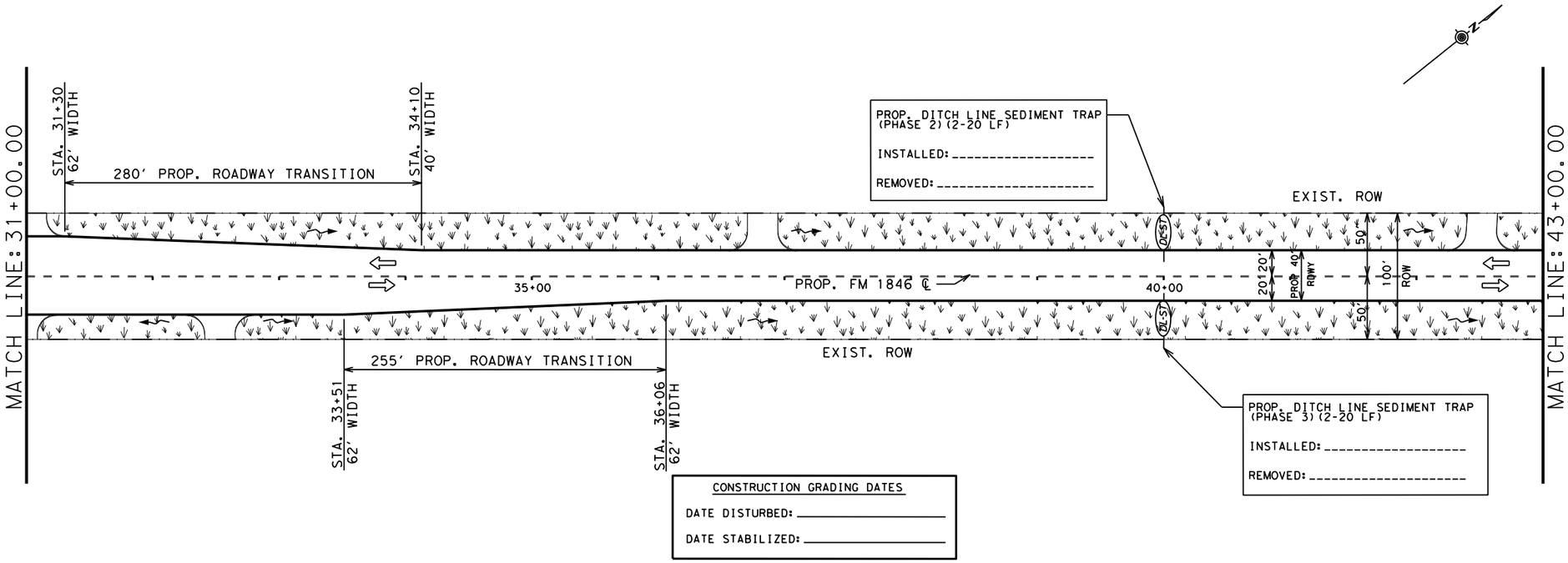
5. VEGETATIVE WATERING APPLICATION RATE = 88,300 GAL/AC @ 13 CYCLES.



STATE OF TEXAS
ABEL MARROQUIN III
134752
LICENSED PROFESSIONAL ENGINEER

07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846
SW3P LAYOUT

1" = 100'

SHEET 1 OF 4

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		1065	02	039	FM 1846
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		PHR	CAMERON		209

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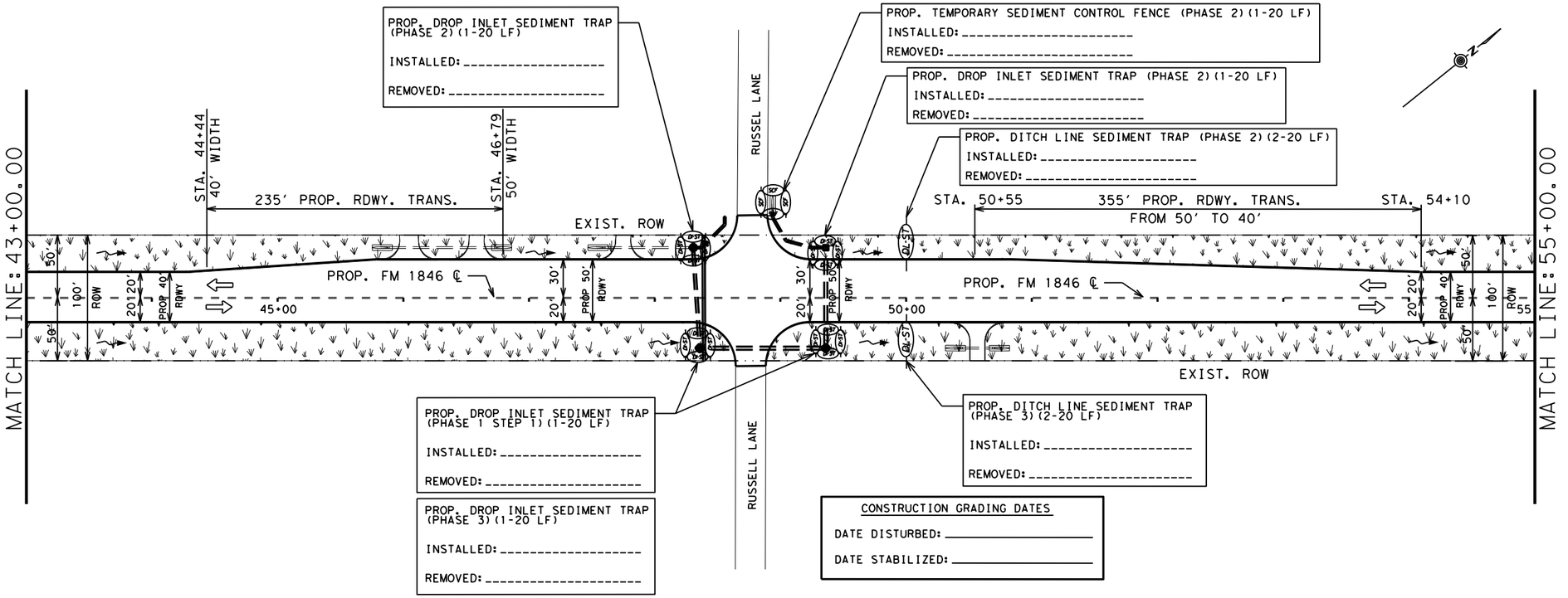

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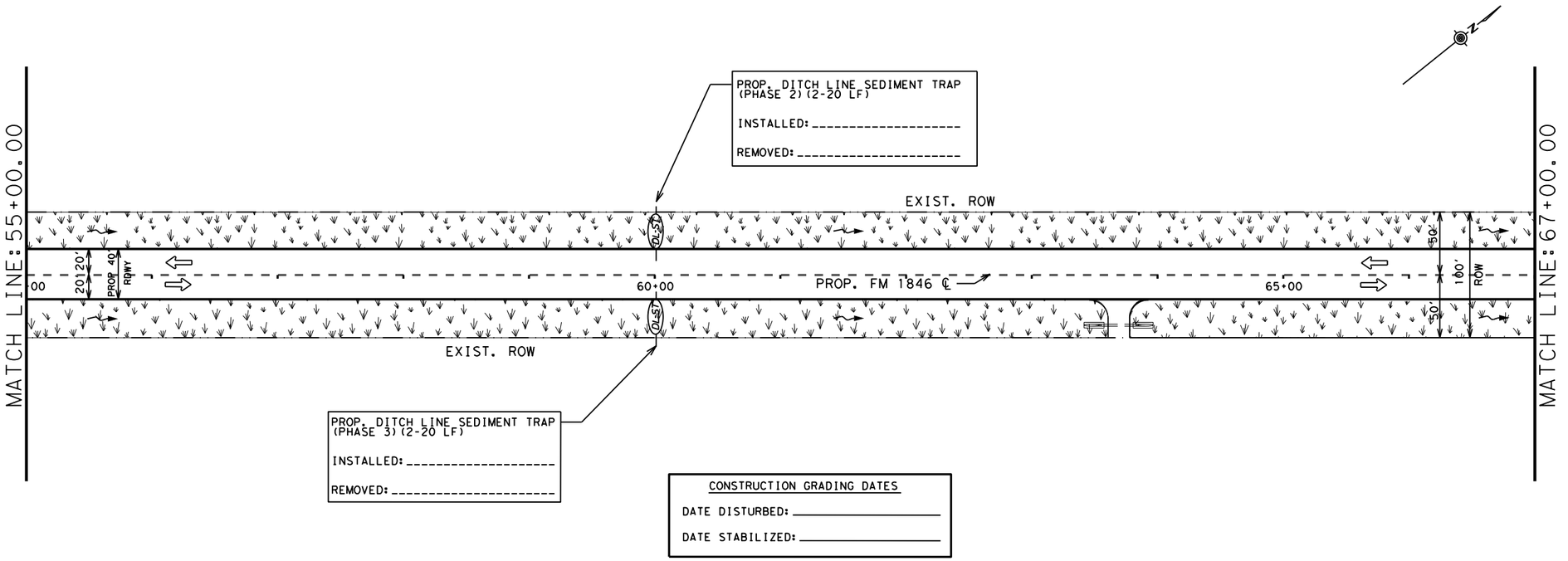

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Pharr District Central Design

Texas Department of Transportation

FM 1846
SW3P LAYOUT

1" = 100'

SHEET 2 OF 4

© 2021	CONT	SECT	JOB	HIGHWAY
DS: CK:	1065	02	039	FM 1846
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	PHR	CAMERON		210

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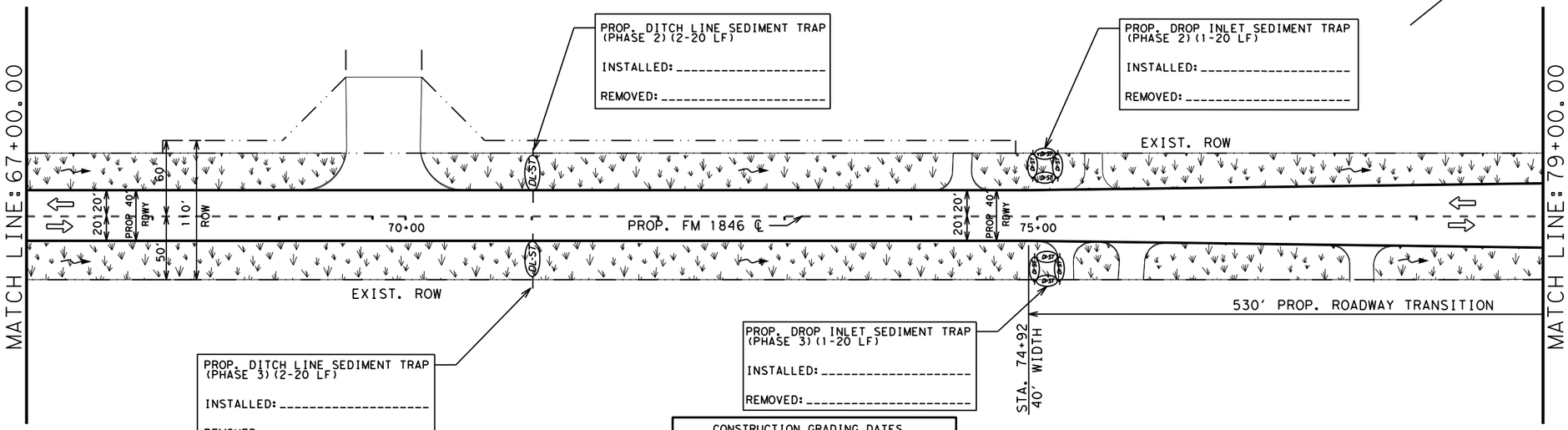

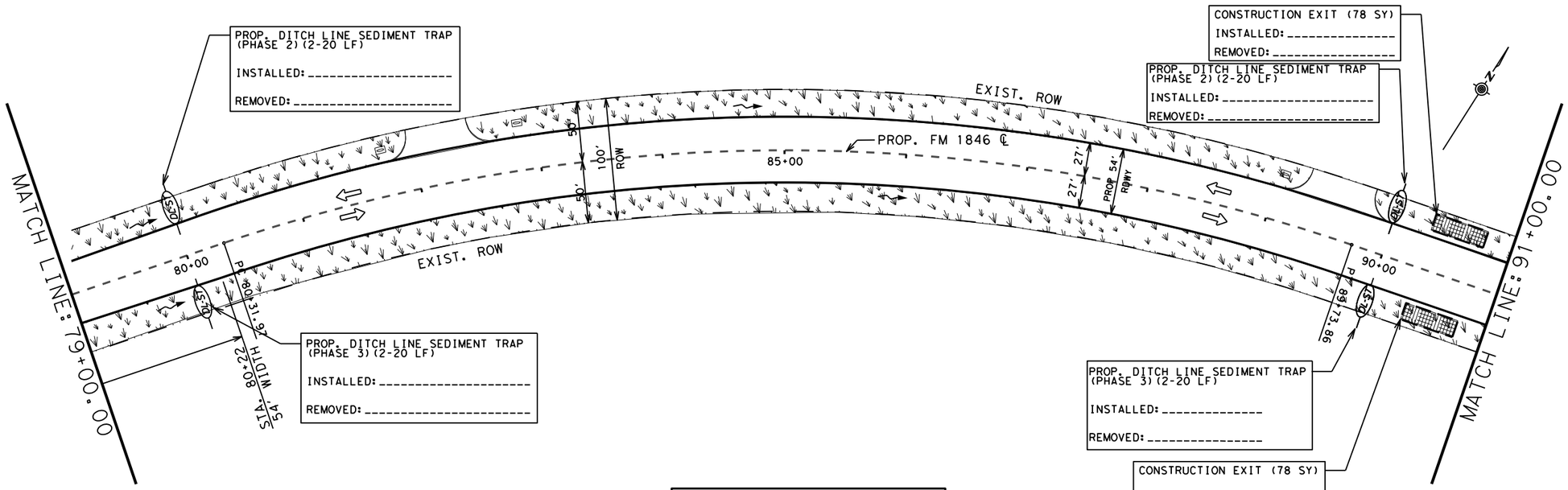

LEGEND

- CONSTRUCTION EXIT (TY II)
- SEEDING AREA
- DIRECTION OF FLOW
- (DI-ST) DROP INLET SEDIMENT TRAP (LOGS)
- (DL-ST) DITCH LINE SEDIMENT TRAP (LOGS)
- (SCF) TEMPORARY SEDIMENT CONTROL FENCE
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Pharr District Central Design

Texas Department of Transportation

FM 1846
SW3P LAYOUT

1" = 100' SHEET 3 OF 4

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
PHR	CAMERON		211

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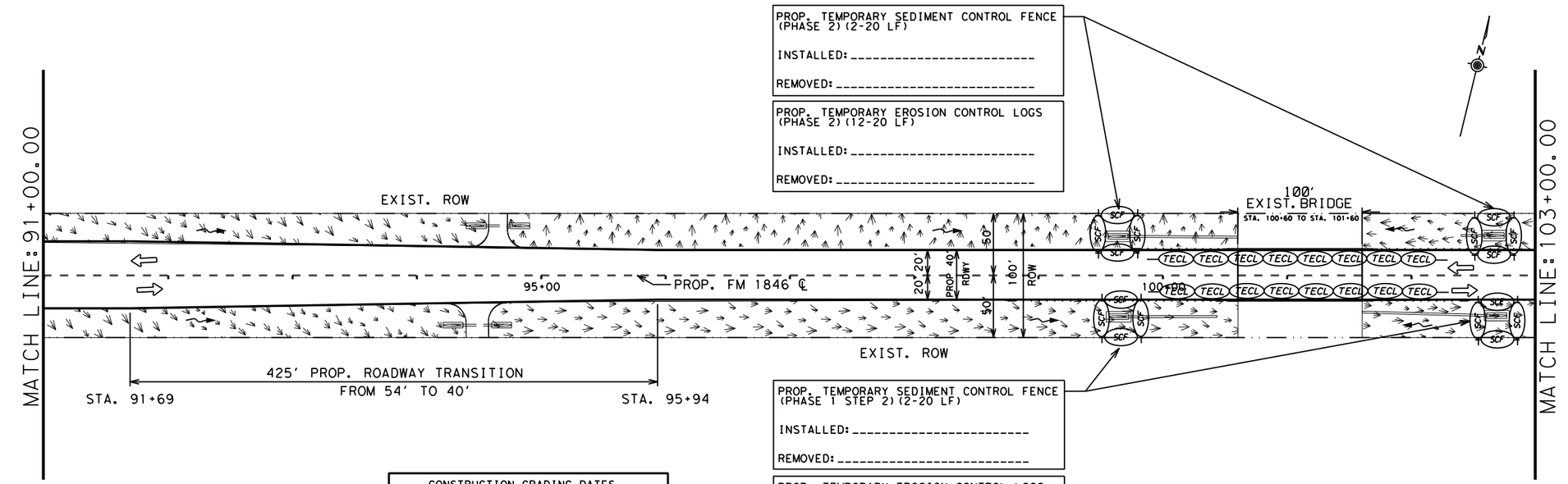

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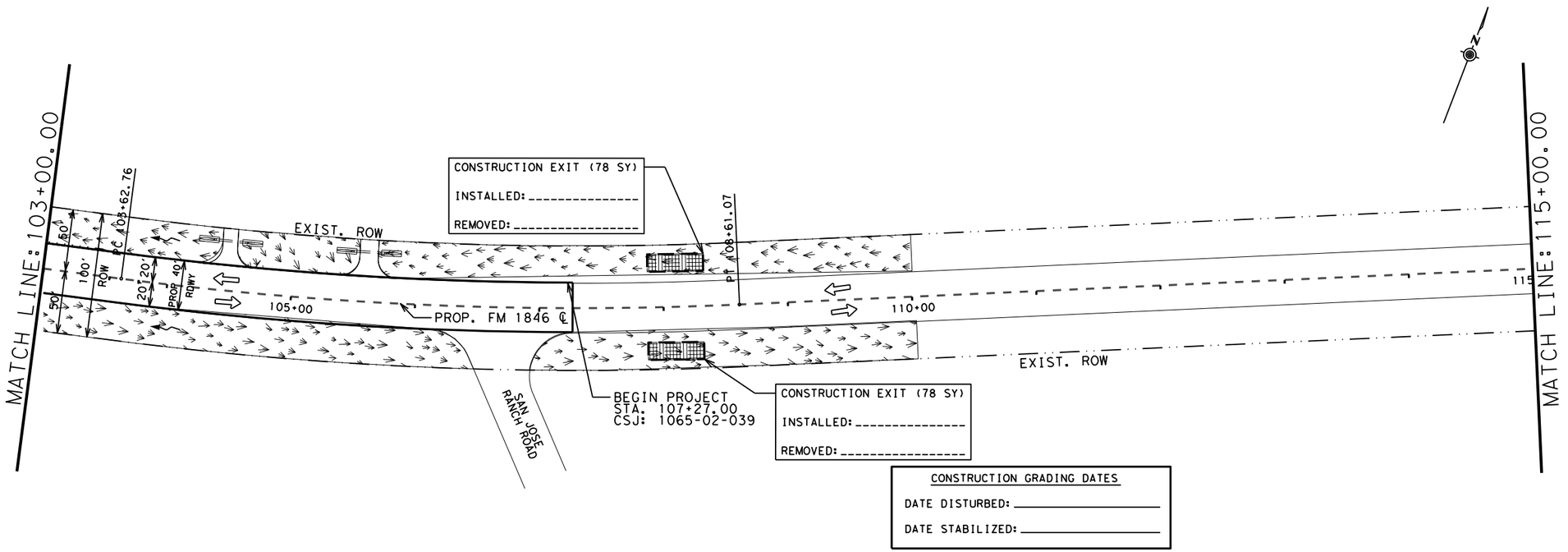

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07/13/2021

Pharr District Central Design

Texas Department of Transportation

FM 1846
SW3P LAYOUT

1" = 100'

SHEET 4 OF 4

CONT	SECT	JOB	HIGHWAY
1065	02	039	FM 1846
DIST	COUNTY		SHEET NO.
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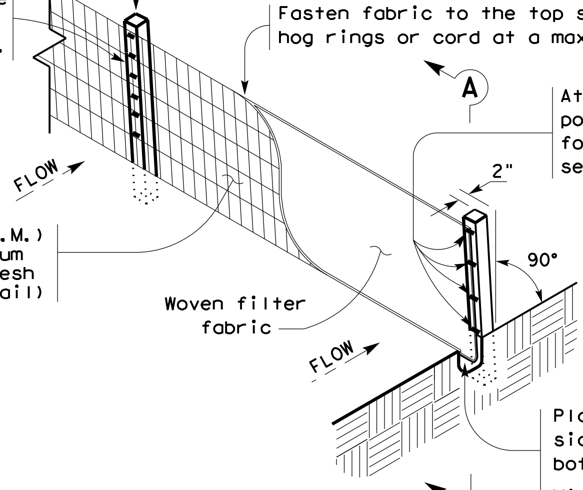
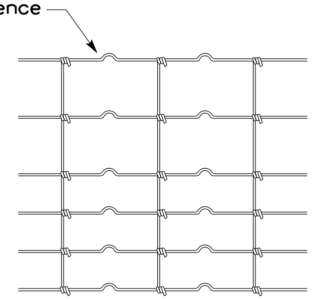
TEMPORARY SEDIMENT CONTROL FENCE



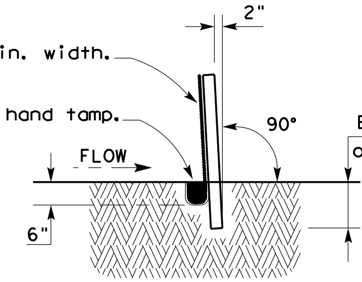
TEMPORARY SEDIMENT CONTROL FENCE

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.

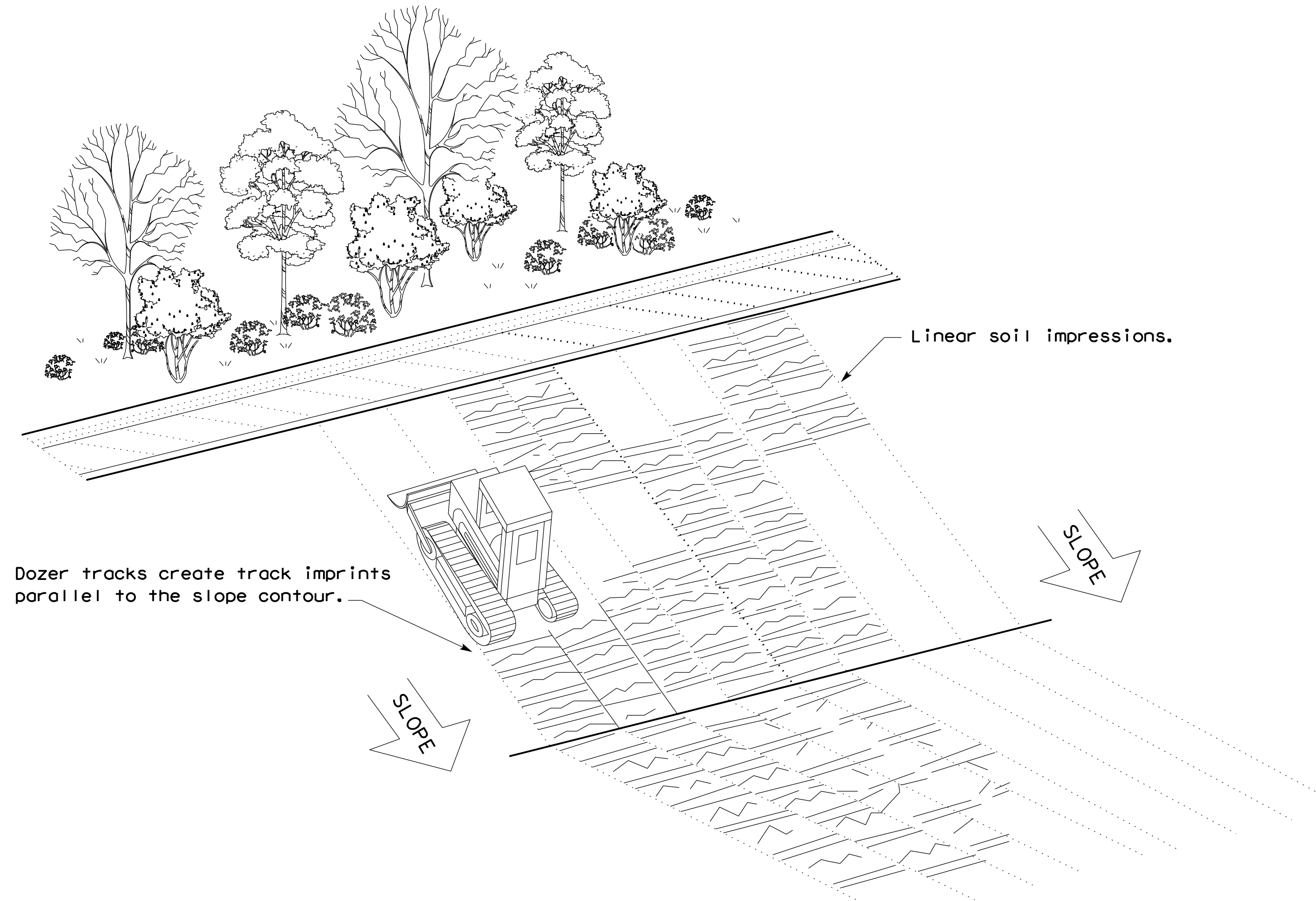
LEGEND

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	SECT	JOB	HIGHWAY
REVISIONS	1065	02	039	FM 1846
	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	213

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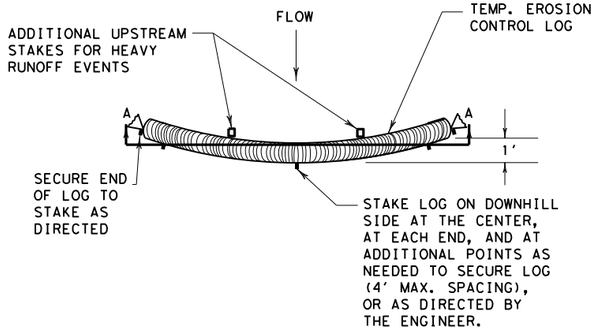
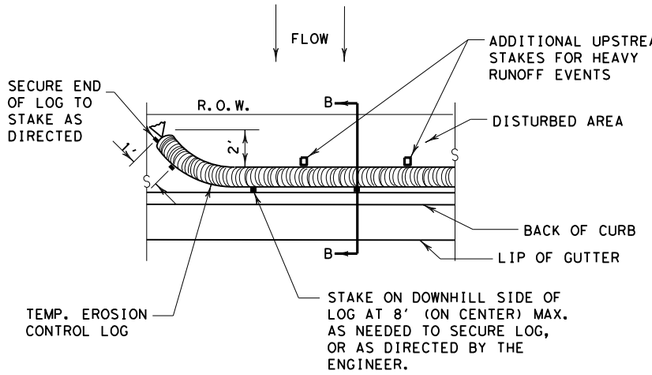
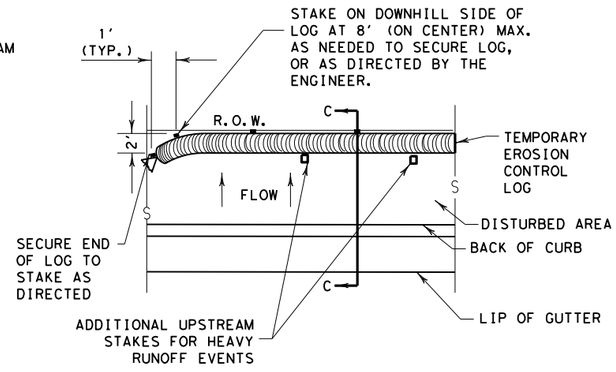


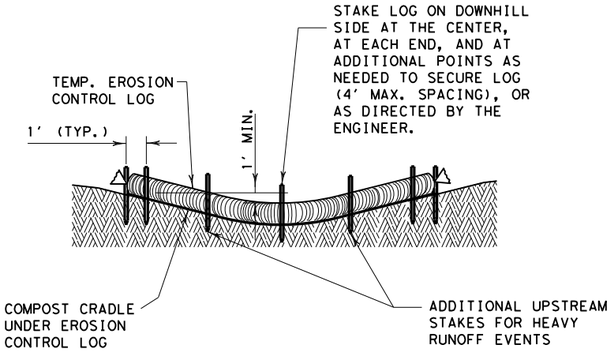
PLAN VIEW



PLAN VIEW



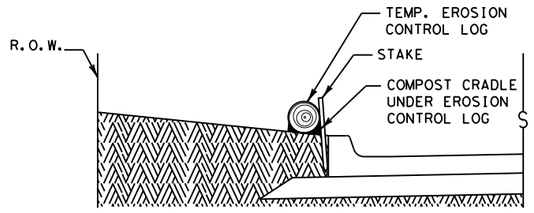
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

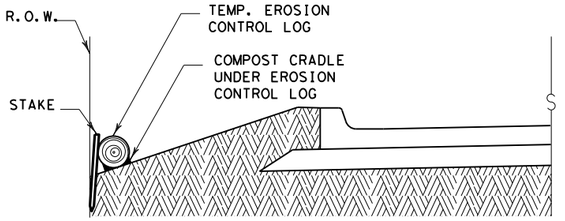
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

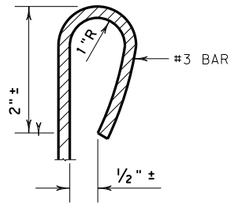
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



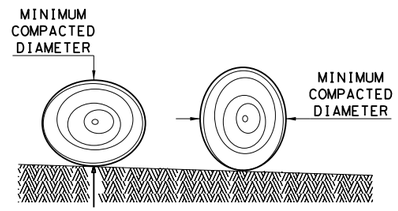
REBAR STAKE DETAIL

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	1065	02	039	FM 1846	
	DIST	COUNTY		SHEET NO.	
	PHR	CAMERON		214	

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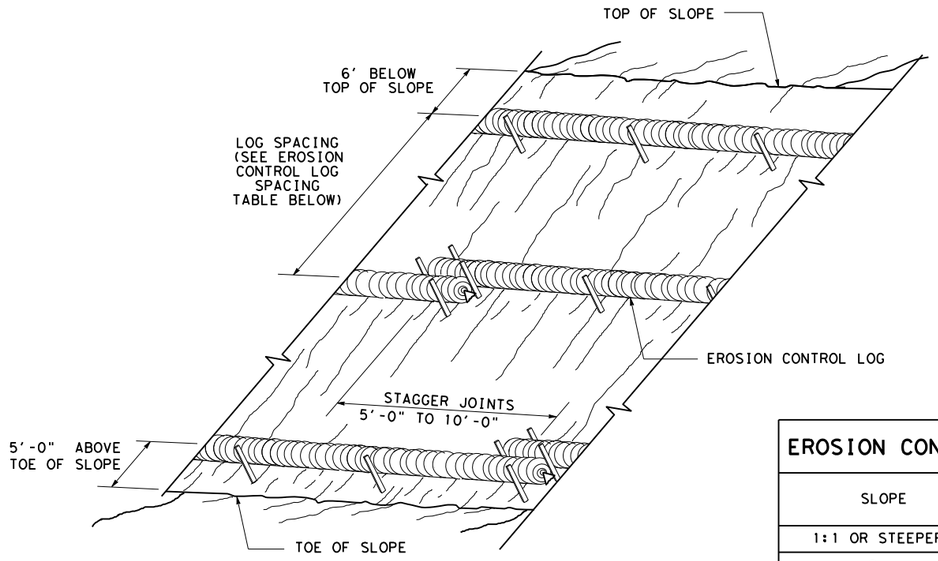
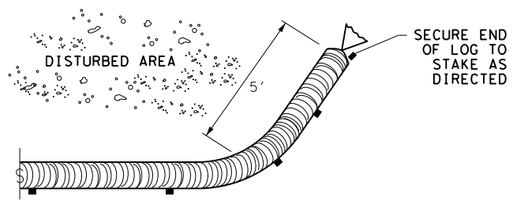


EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

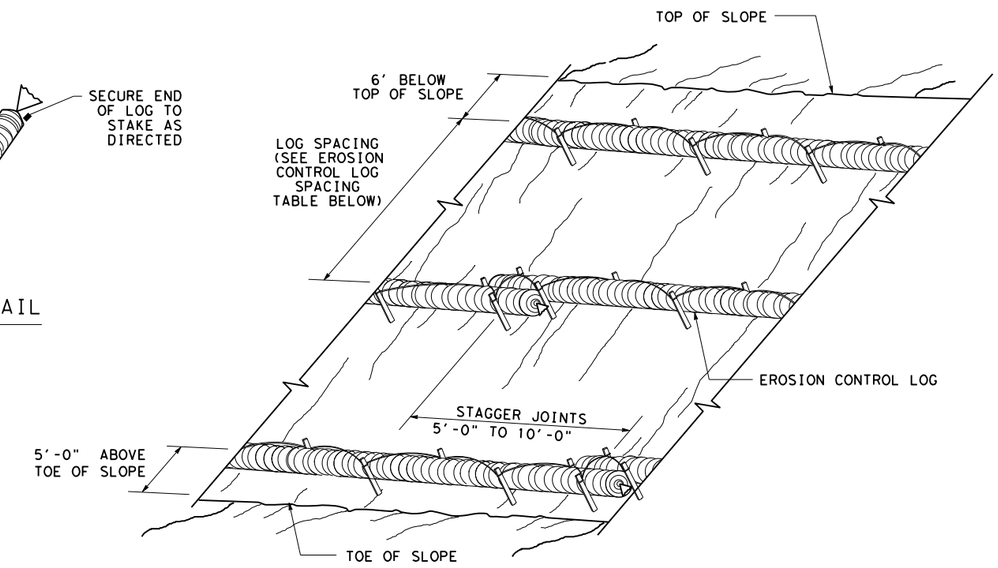
CL-SST



END SECTION RAP DETAIL

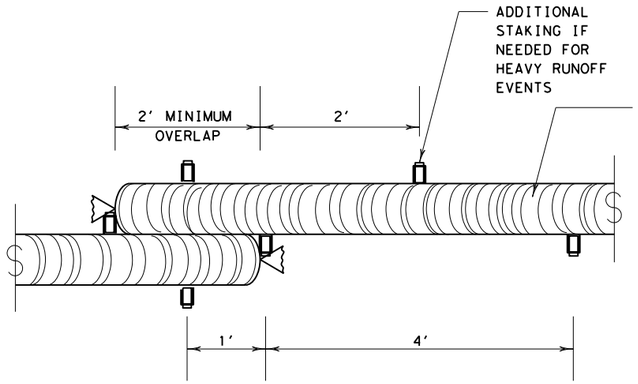
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

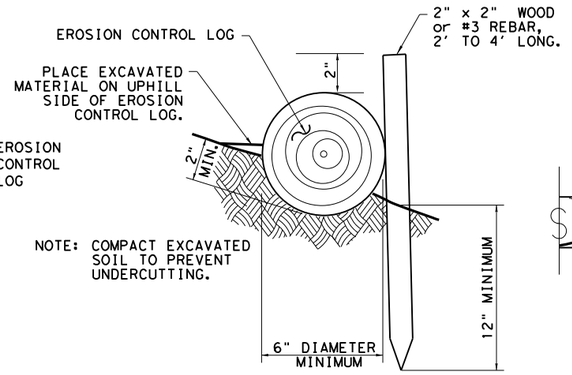
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

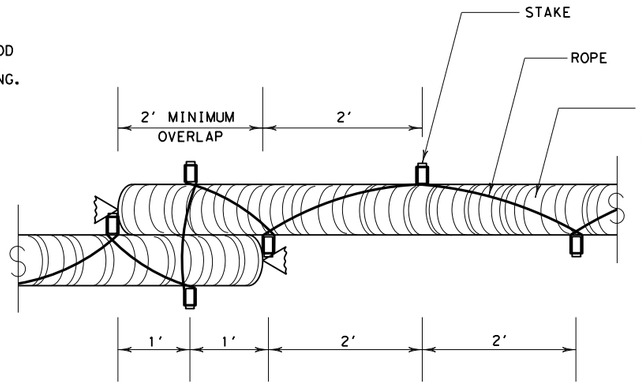


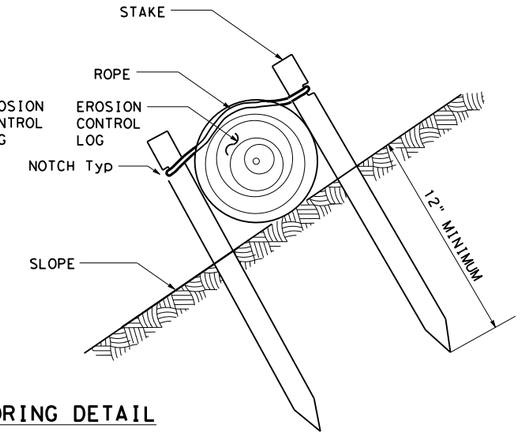


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

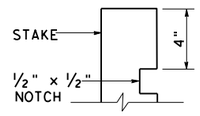
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

Texas Department of Transportation | Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
EROSION CONTROL LOG
EC(9)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	1065	02	039	FM 1846
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		215

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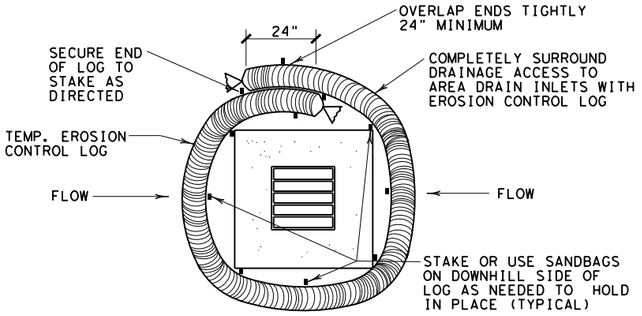
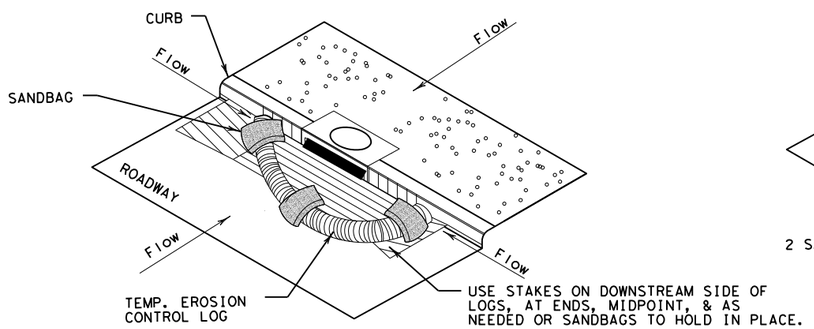


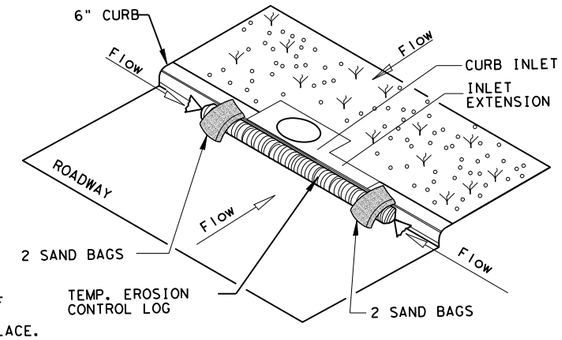
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

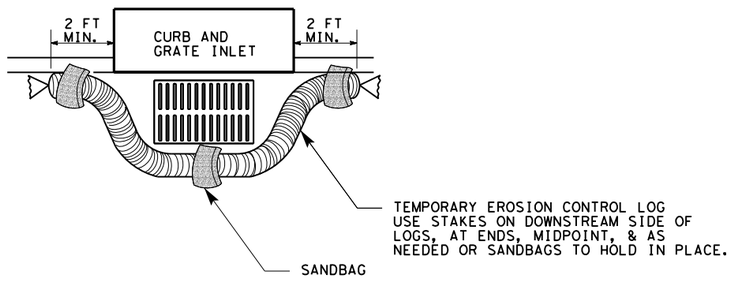
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

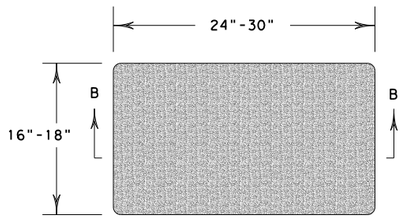
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation

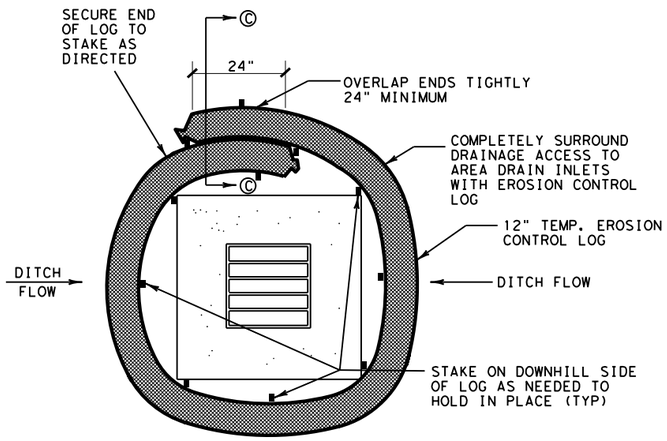
Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

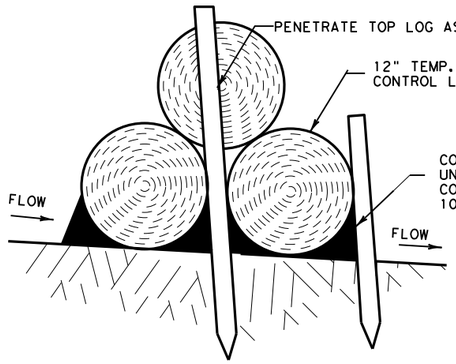
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	1065	02	039	FM 1846
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		216



DROP INLET SEDIMENT TRAP

NTS

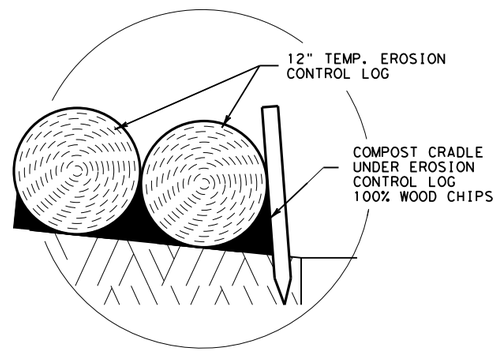
DI-ST



SECTION A-A

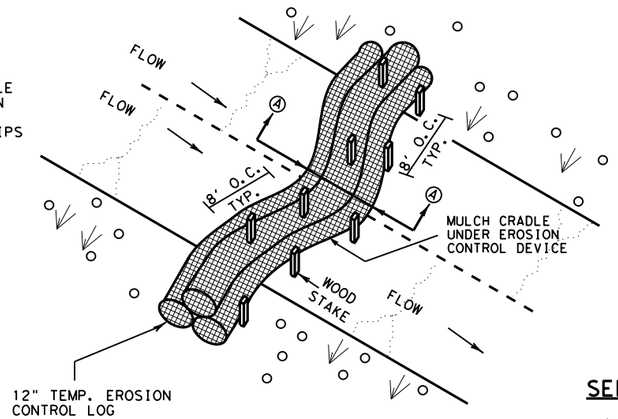
DITCH LINE SEDIMENT TRAP A-A

DL-ST



SECTION C-C

OVERLAP WITH COMPOST CRADLE



DITCH LINE SEDIMENT TRAP

DL-ST

PLANS SHEET LEGEND

DI-ST — DROP INLET SEDIMENT TRAP

DL-ST — DITCH LINE SEDIMENT TRAP

BOCI-ST — BACK OF CURB INLET SEDIMENT TRAP

ROW-ST — RIGHT OF WAY SEDIMENT TRAP

CI-ST — CURB INLET SEDIMENT TRAP

SEDIMENT BASIN & TRAP USAGE GUIDELINES

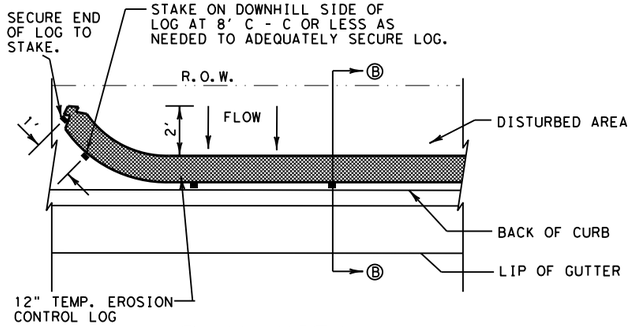
A sediment trap may be used to precipitate sediment out of runoff draining from an unstabilized area.

Traps: the drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Sediment traps should be placed in the following locations:

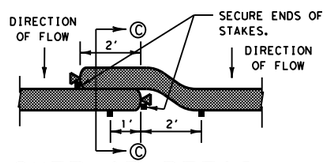
1. Immediately preceding drain inlets
2. Just before the drainage enters a water course
3. Just before the drainage leaves the right of way
4. Just before the drainage leaves the construction limits where drainage flows away from the project

The trap should be cleaned when the capacity has been reduced by ½ or the sediment has accumulated to a depth of 1', whichever is less. Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for seperately.



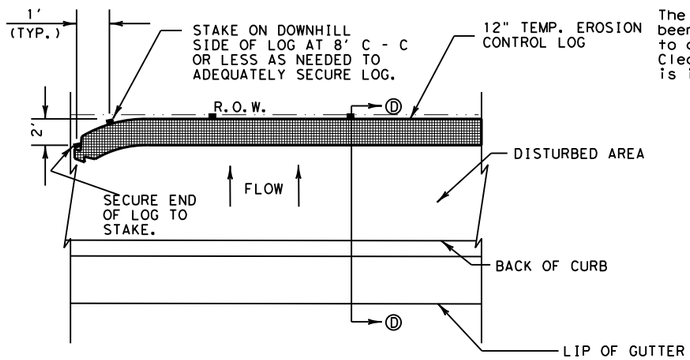
PLAN VIEW

NTS



OVERLAP DETAIL PLAN VIEW

NTS

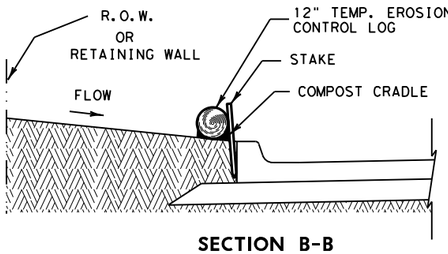


PLAN VIEW

NTS

GENERAL NOTES

1. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED. MAXIMUM LENGTH OF LOGS SHALL BE 30' FOR 12" DIAMETER LOGS.
2. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
3. STUFF LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE DENSITY THAT WILL HOLD SHAPE WITHOUT EXCESSIVE DEFORMATION.
4. STAKES SHALL BE 2" X 2" WOOD 4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG.
5. COMPOST CRADLE MATERIAL IS INCIDENTAL AND WILL NOT BE PAID FOR SEPARATELY.

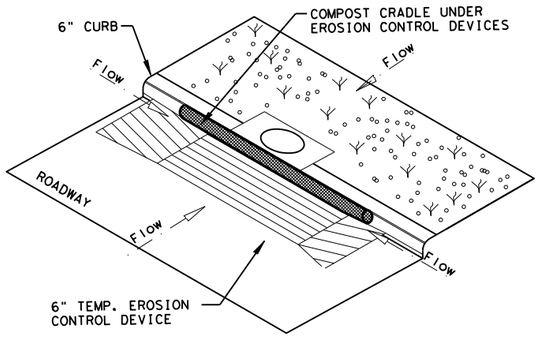


SECTION B-B

BACK OF CURB INLET SEDIMENT TRAP

NTS

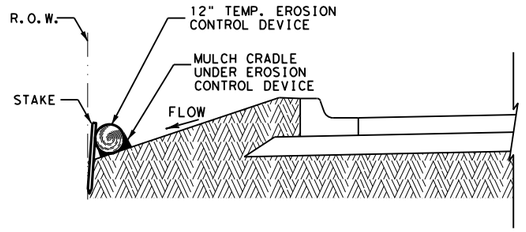
BOCI-ST



CURB INLET SEDIMENT TRAP

NTS

CI-ST



SECTION D-D

RIGHT-OF-WAY SEDIMENT TRAP

NTS

ROW-ST

PHARR DISTRICT STANDARD

Texas Department of Transportation

TEMPORARY EROSION CONTROL LOGS TECL-17 (PHR)

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6			FM 1846
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	PHARR	CAMERON	217
CONTROL	SECTION	JOB	
1065	02	039	

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		