

**INDEX OF SHEETS**

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**STATE OF TEXAS  
DEPARTMENT OF TRANSPORTATION**

**PLANS OF PROPOSED  
STATE HIGHWAY IMPROVEMENT**

FEDERAL AID PROJECT NUMBER  
STP 2024(690)HES  
CSJ: 0220-05-080

NET LENGTH OF PROJECT = 19,986 FEET = 3.78 MILES

**CAMERON COUNTY**

**SH 48**

FROM: SH 4 (BOCA CHICA BLVD.)  
TO: FM 511

FOR THE CONSTRUCTION OF: CONCRETE MEDIANS AND ROADWAY OVERLAY  
CONSISTING OF: SURFACE MILLING, ADDING RAISED CONCRETE MEDIANS, TURN-AROUND DRIVEWAY  
ADDITIONS, ROADWAY OVERLAY, ADDITION OF DRAINAGE STRUCTURES UNDER PROPOSED DRIVEWAYS,  
PAVEMENT MARKINGS AND SIGNING, AND REMOVAL OF DRAINAGE STRUCTURES AT PROPOSED DRIVEWAYS.

CONT	SECT	JOB	HIGHWAY
0220	05	080	SH 48
DIST	COUNTY		SHEET NO.
PHR	CAMERON		1

**DESIGN SPEED**

ROADWAY: 55 MPH

**POSTED SPEED**

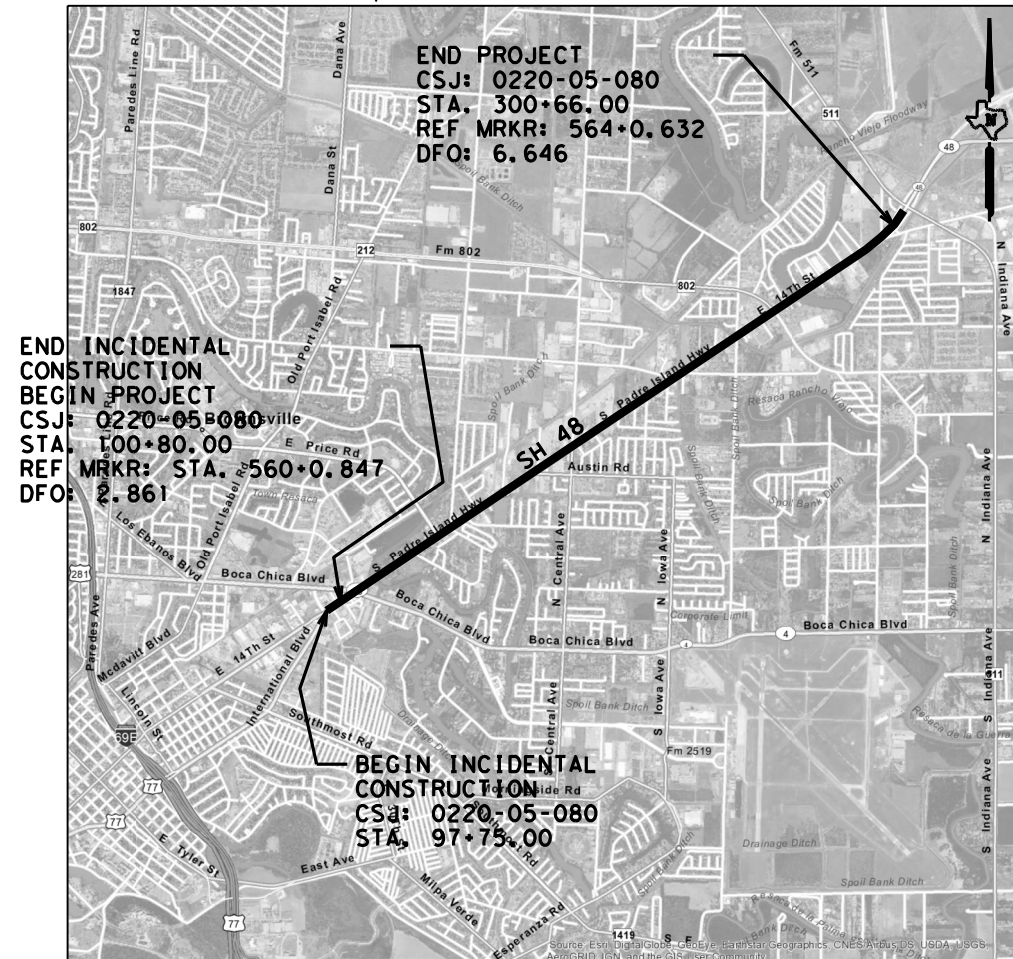
ROADWAY: 45 MPH, 55 MPH

**PROJECTED A. D. T.**

2022: 28,319  
2038: 37,052

**FINAL PLANS**

DATE OF LETTING: \_\_\_\_\_  
DATE WORK BEGAN: \_\_\_\_\_  
DATE WORK COMPLETED AND ACCEPTED: \_\_\_\_\_  
FINAL CONTRACT COST: \$ \_\_\_\_\_  
CONTRACTOR: \_\_\_\_\_  
LIST OF APPROVED FIELD CHANGES, CHANGE ORDERS &  
SUPPLEMENTAL AGREEMENTS:



LOCATION MAP NOT TO SCALE

EXCEPTIONS: NONE  
EQUATIONS: NONE  
RAILROAD CROSSINGS: NONE

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 A. ESPINOSA, P.E. \_\_\_\_\_ DATE \_\_\_\_\_  
SAN BENITO AREA ENGINEER

**TDLR INSPECTION NOT REQUIRED**

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF  
TRANSPORTATION ON NOVEMBER 1, 2014 AND SPECIFICATION ITEMS  
LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT:  
REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID  
CONSTRUCTION CONTRACTS (FORM FHWA 1273, OCTOBER 23, 2023).

RECOMMENDED FOR LETTING: DATE: 11/27/2023

SUBMITTED FOR LETTING: DATE: 11/27/2023

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

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

DATE: 11/21/2023 5:14:22 PM  
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THE STANDARD SHEETS SPECIFICALLY IDENTIFIED WITH A "&" HAVE BEEN ISSUED BY ME AND ARE APPLICABLE TO THIS PROJECT.



11/28/2023

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



11/21/2023

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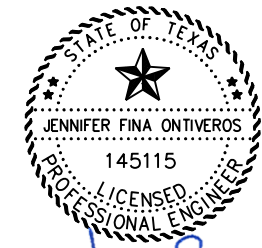
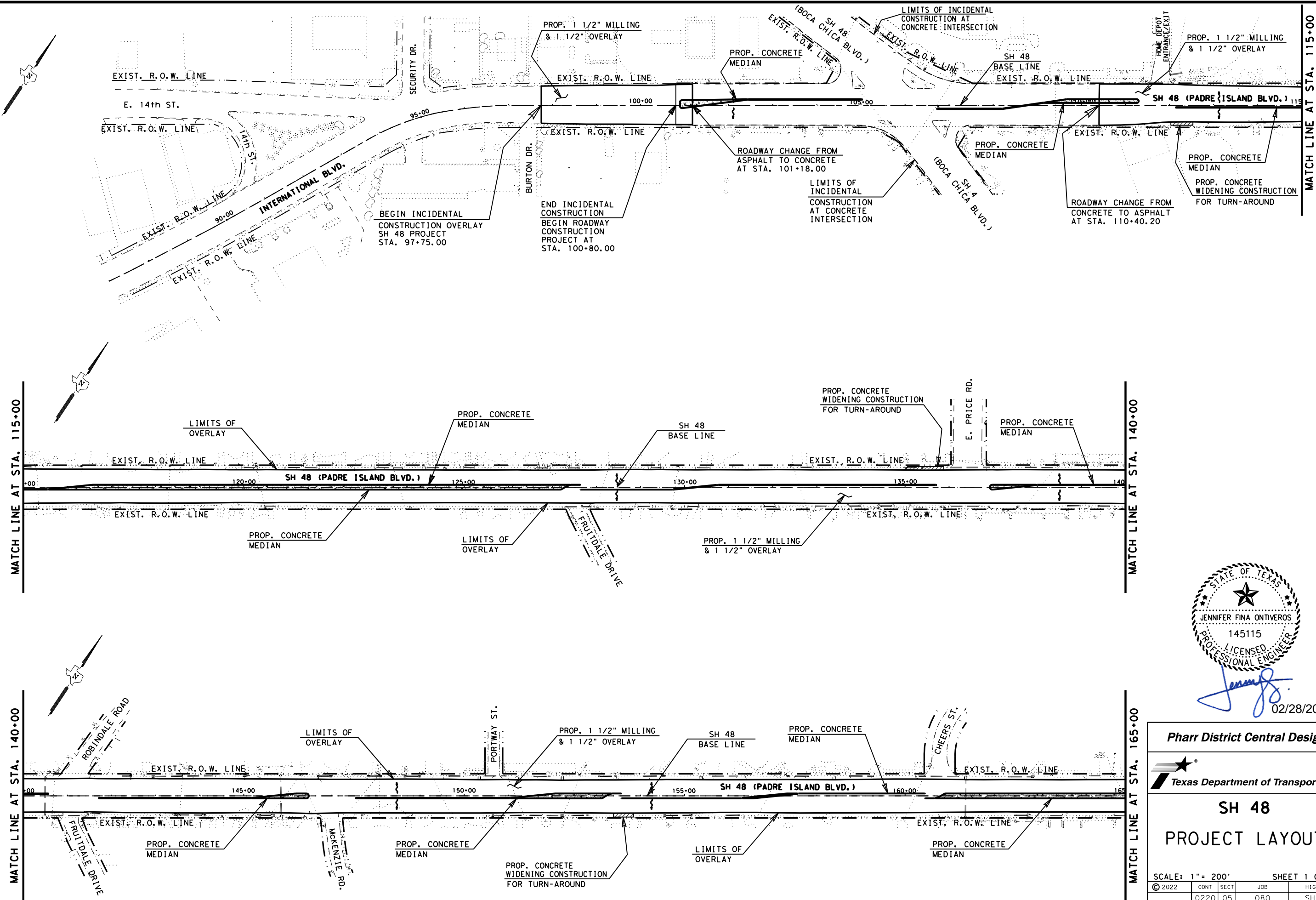
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**SH 48 INDEX OF SHEETS**

SHEET 1 OF 1

© 2022	CONT	SECT	JOB	HIGHWAY
DS:	CR:	0220	05	080
DW:	CR:	DIST		SH 48
		COUNTY		SHEET NO.
		PHR		CAMERON
				2

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*Jennifer Fina Ontiveros*  
 02/28/2023

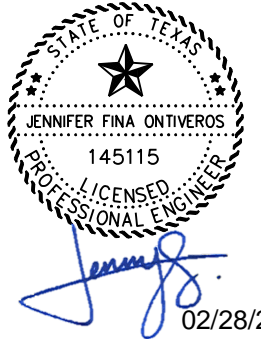
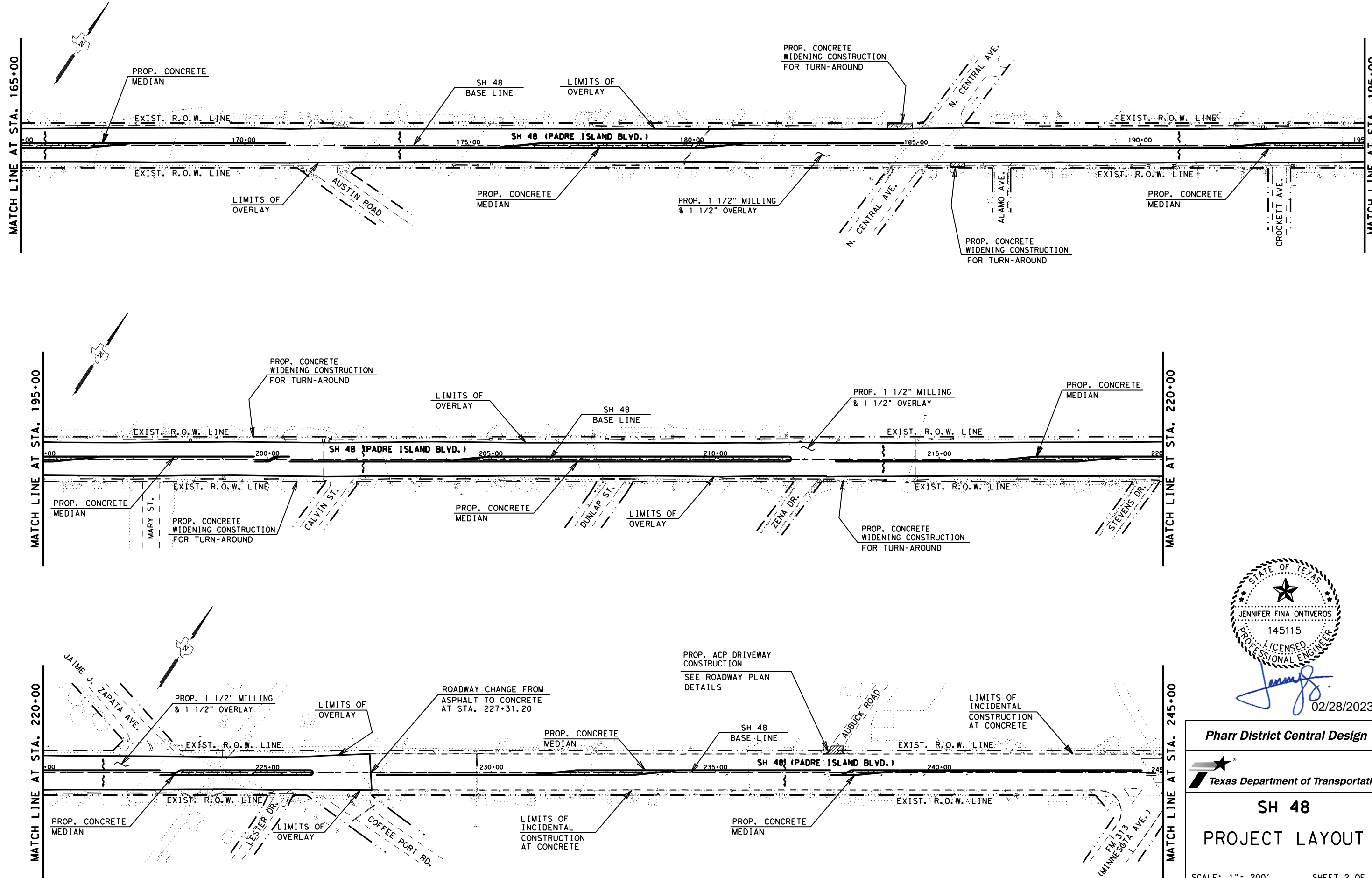
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**SH 48  
 PROJECT LAYOUT**

SCALE: 1" = 200' SHEET 1 OF 3

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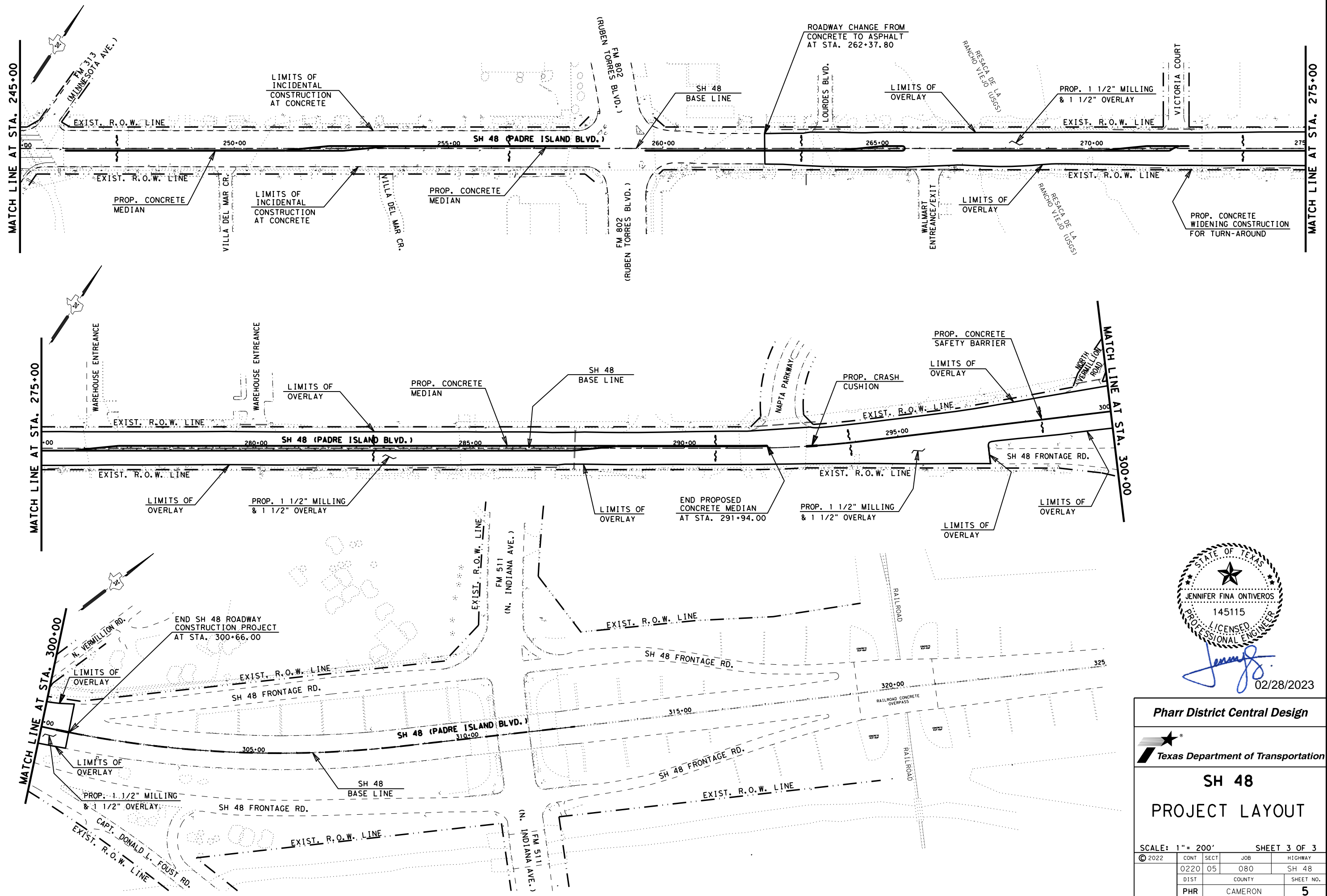
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**SH 48  
PROJECT LAYOUT**

SCALE: 1" = 200' SHEET 2 OF 3

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
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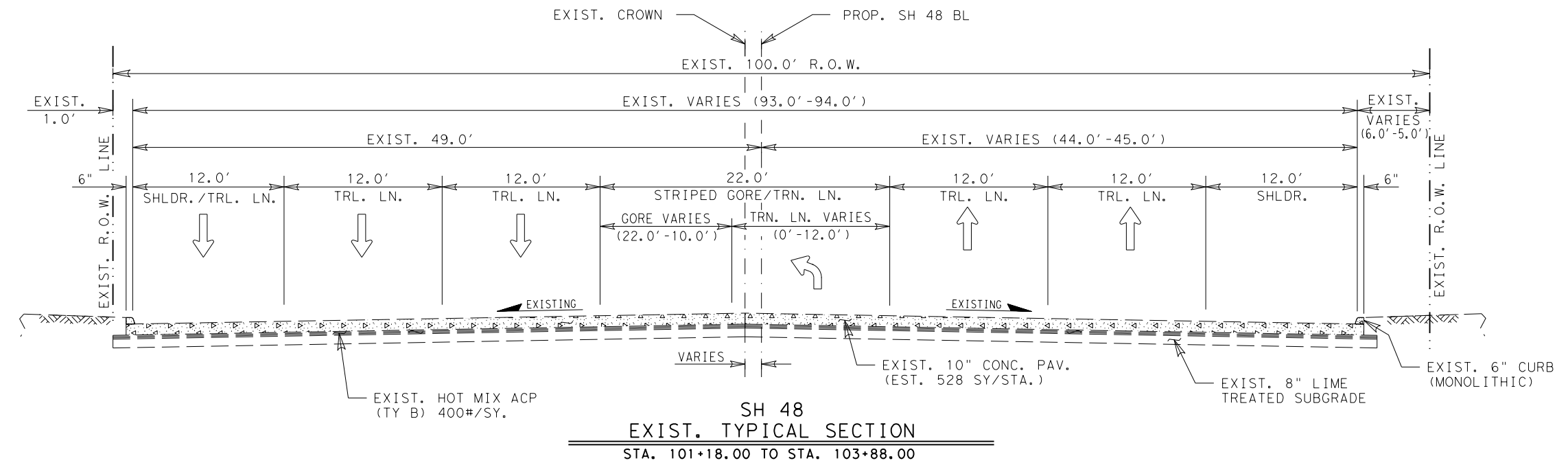
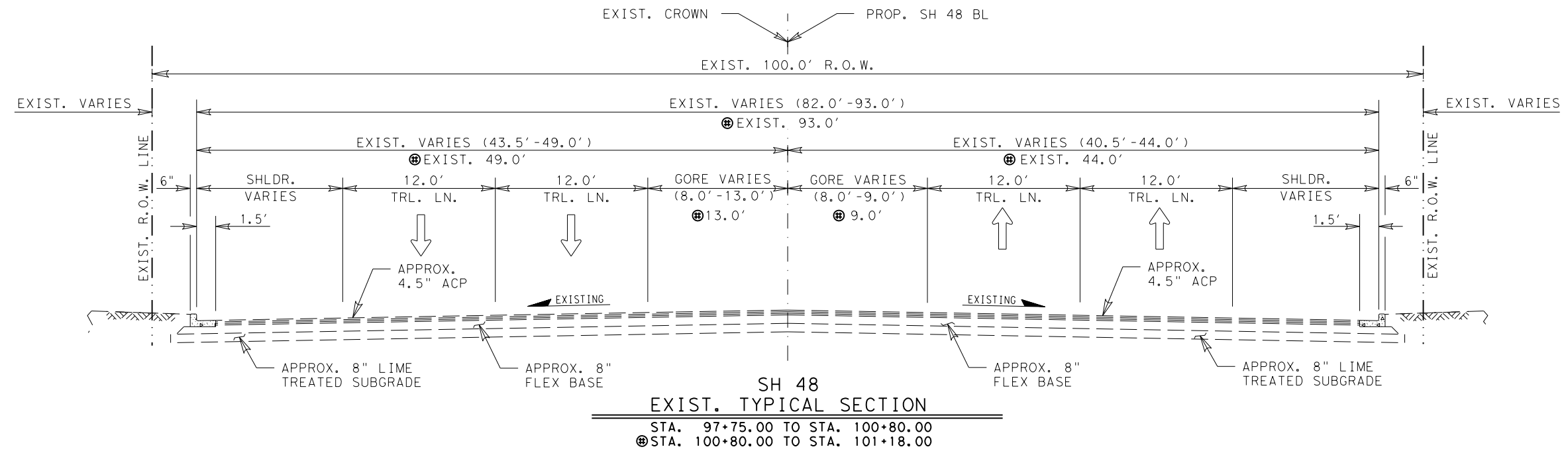
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**SH 48  
PROJECT LAYOUT**

SCALE: 1" = 200' SHEET 3 OF 3

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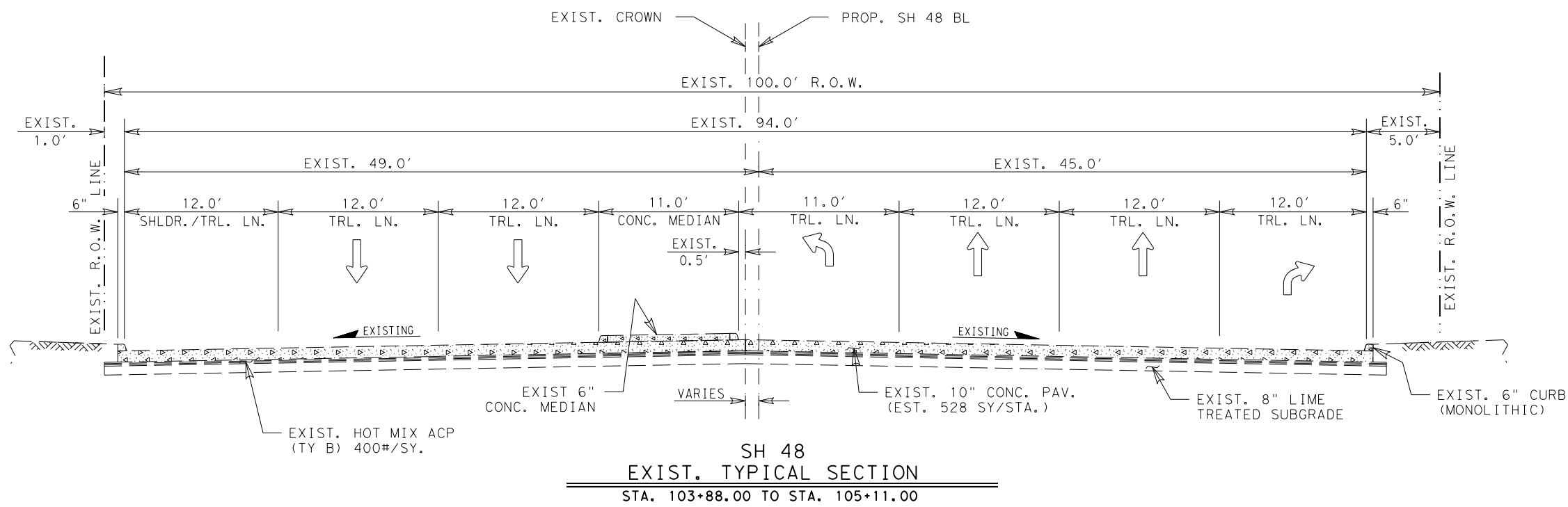
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SH 48 EXISTING TYPICAL SECTIONS

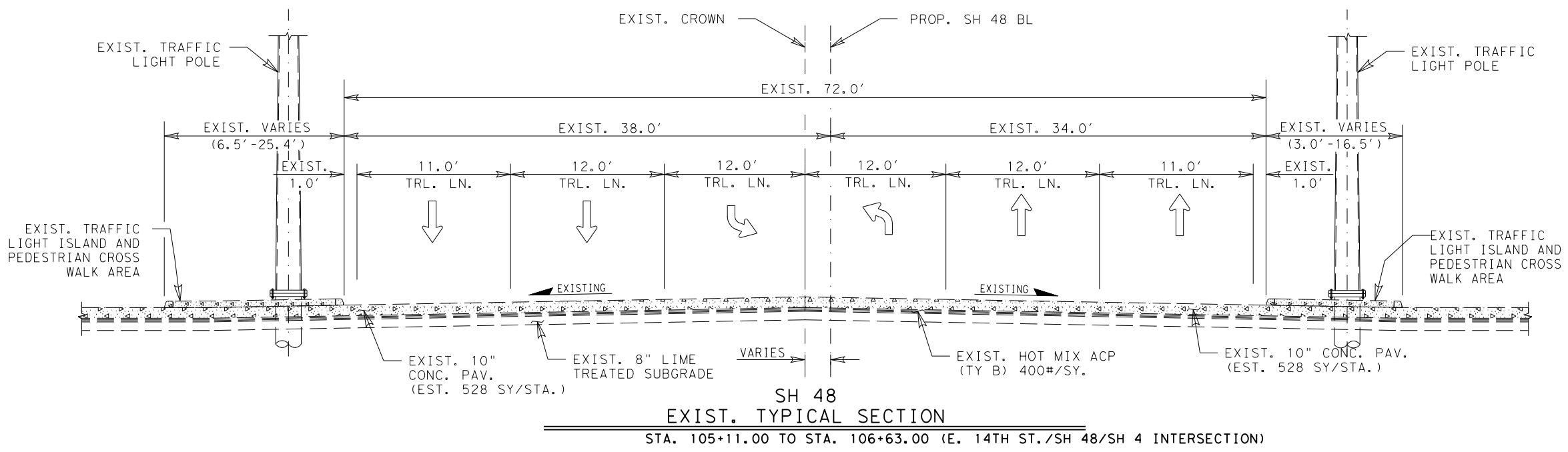
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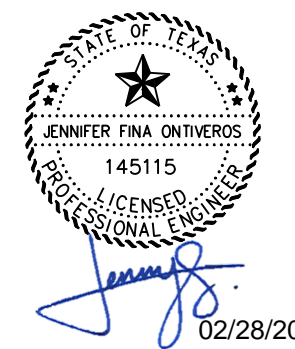
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SH 48  
 EXIST. TYPICAL SECTION  
 STA. 103+88.00 TO STA. 105+11.00



SH 48  
 EXIST. TYPICAL SECTION  
 STA. 105+11.00 TO STA. 106+63.00 (E. 14TH ST./SH 48/SH 4 INTERSECTION)



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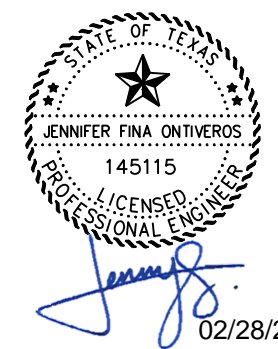
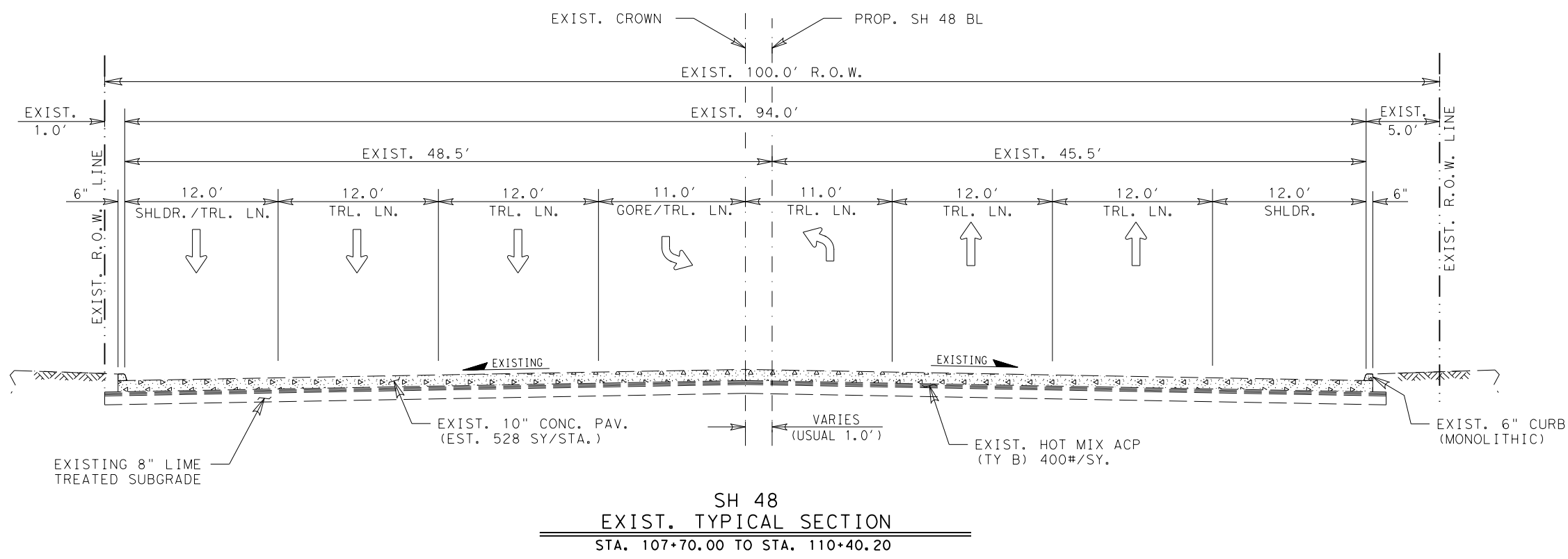
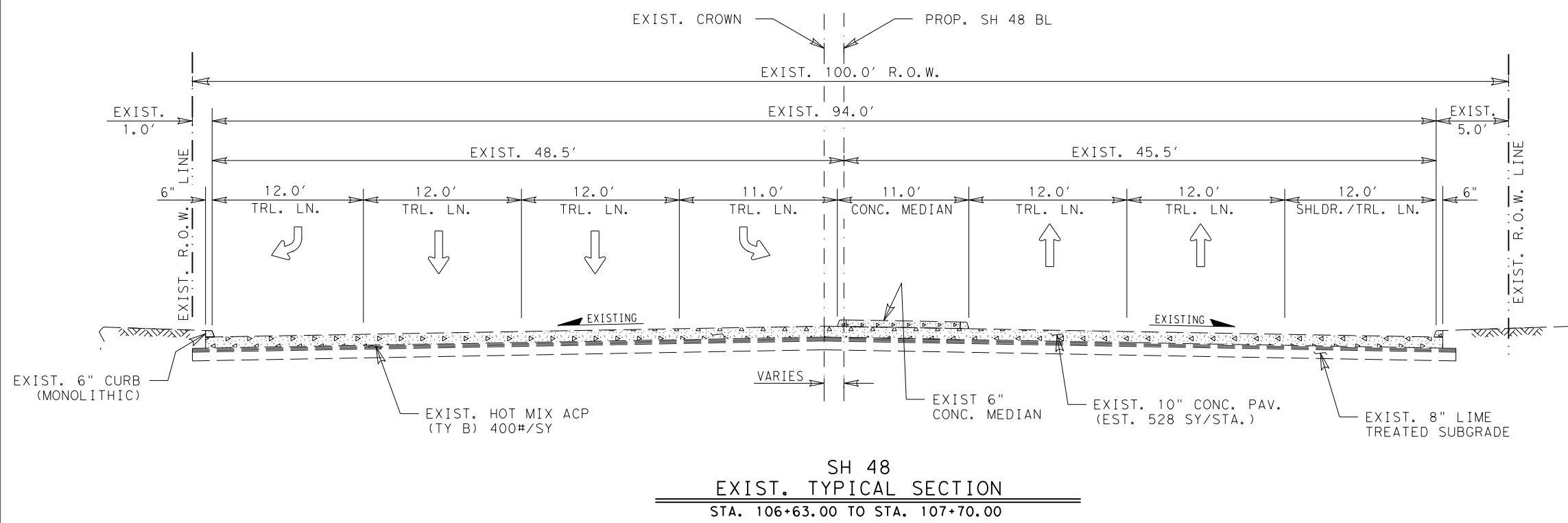
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SH 48  
 EXISTING  
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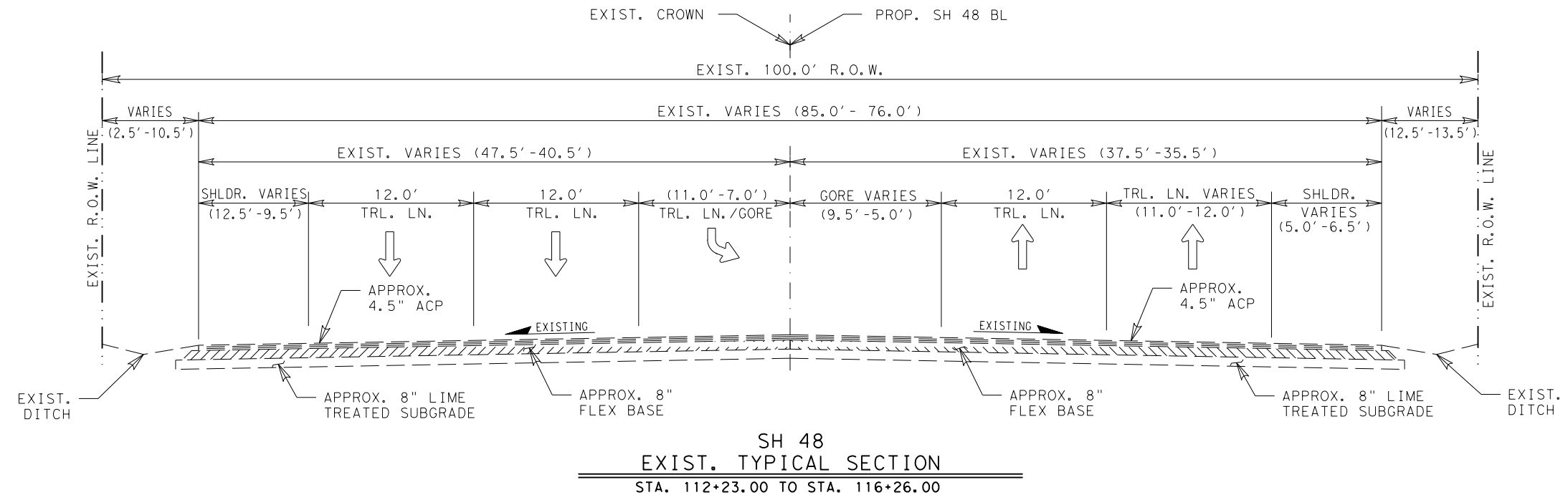
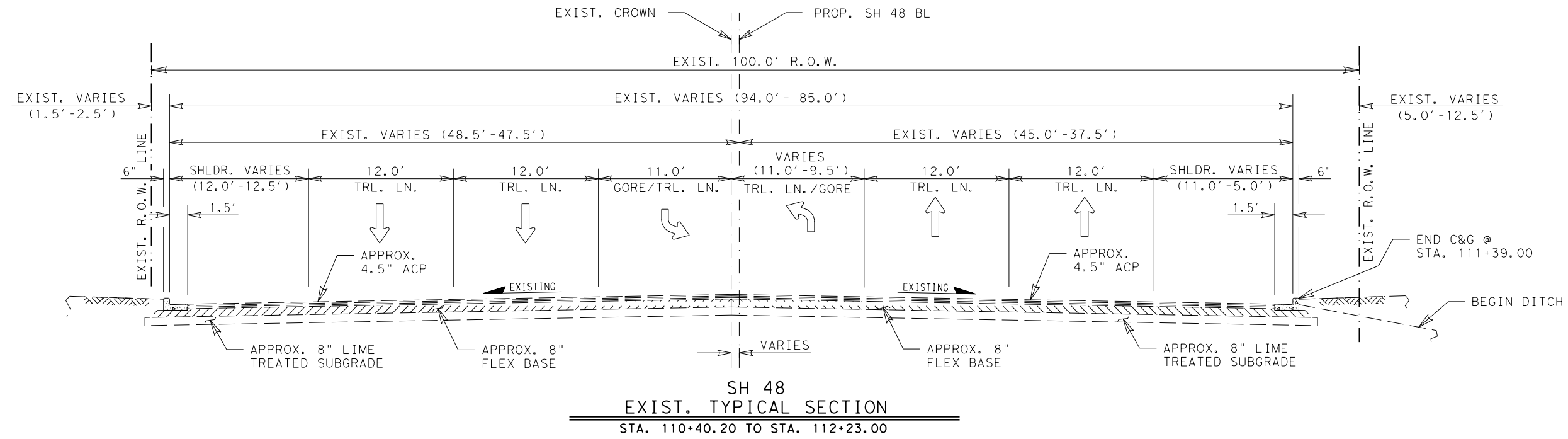
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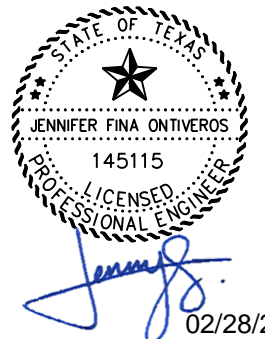
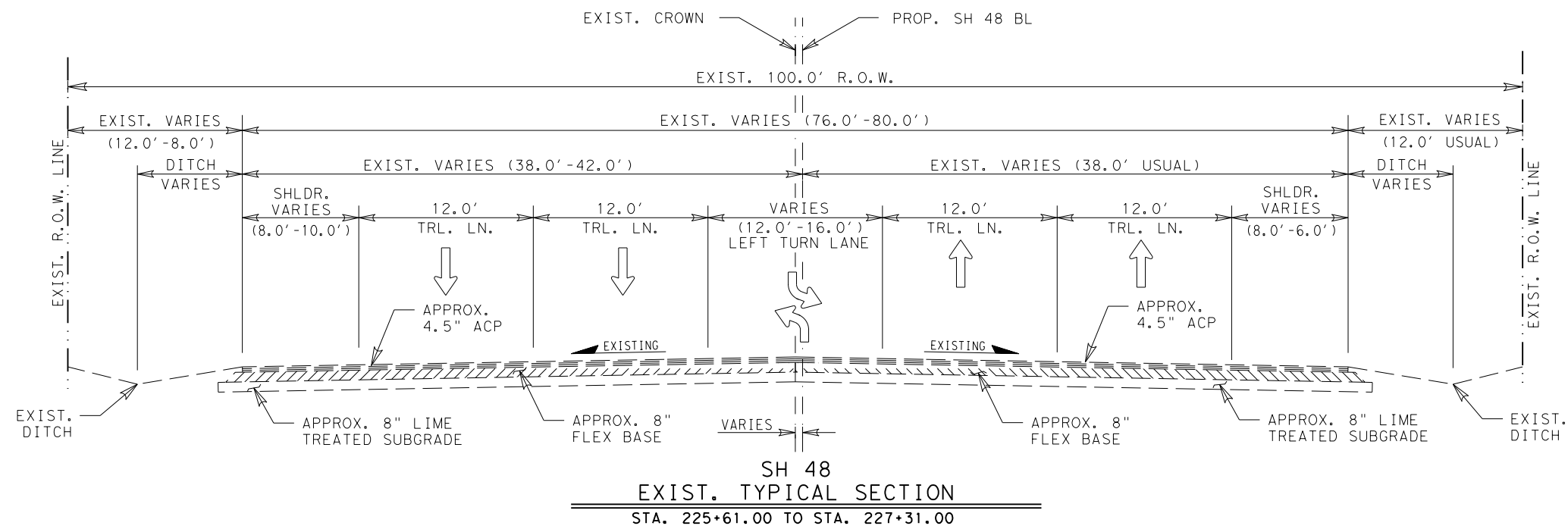
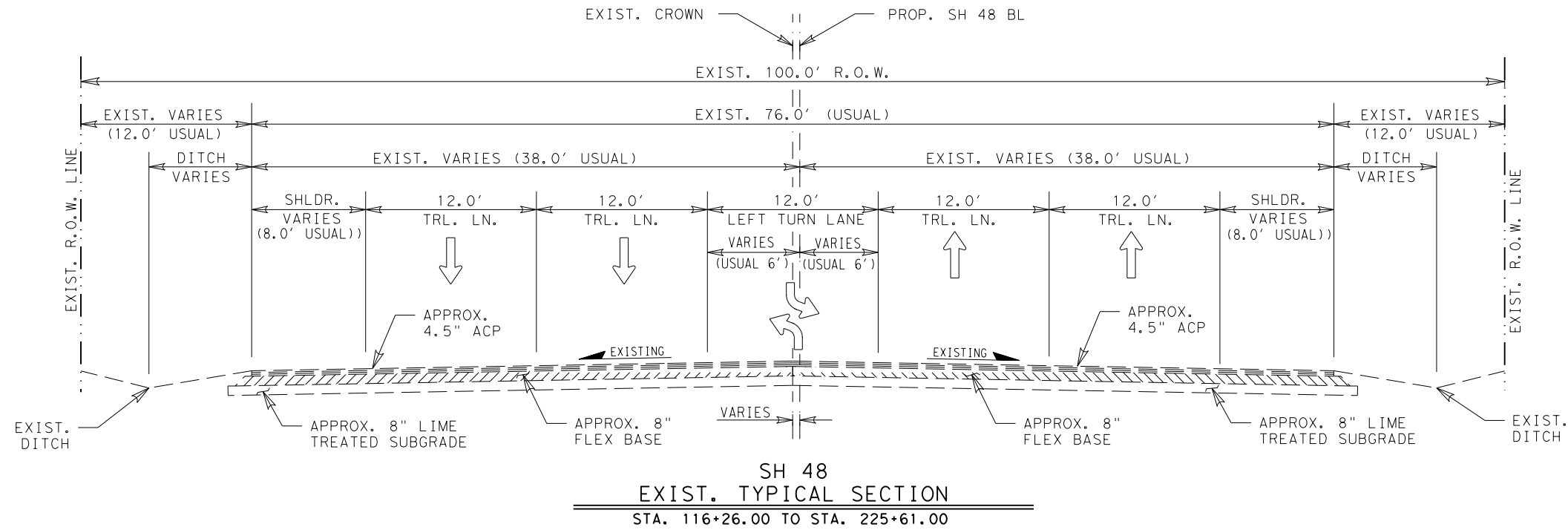
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**SH 48 EXISTING TYPICAL SECTIONS**

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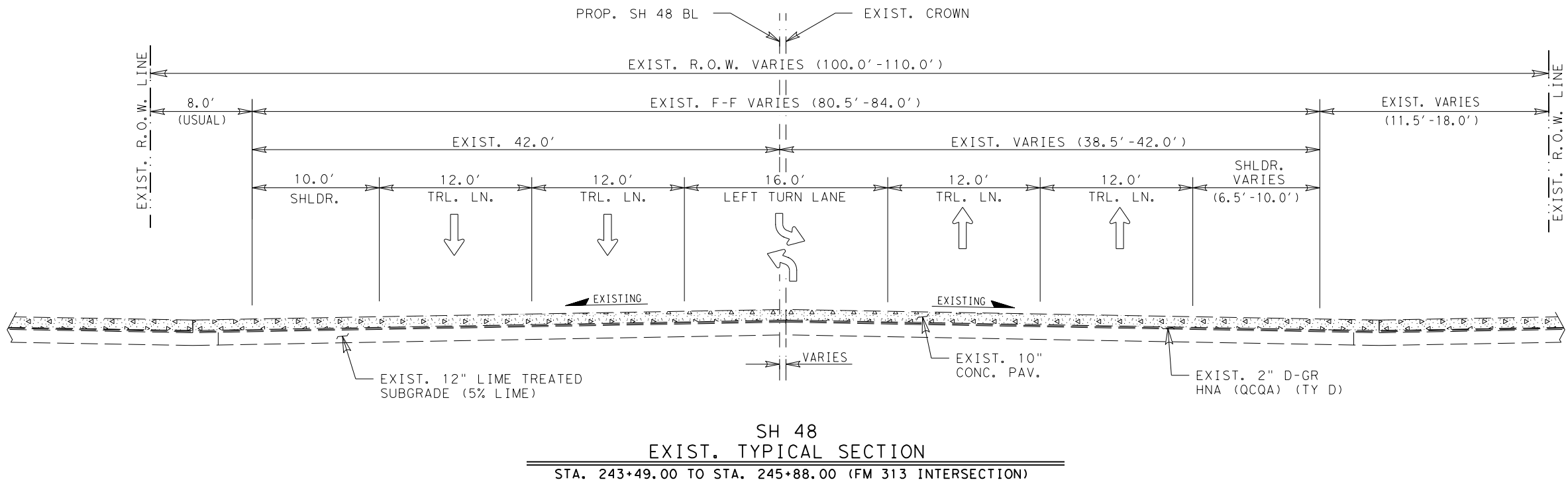
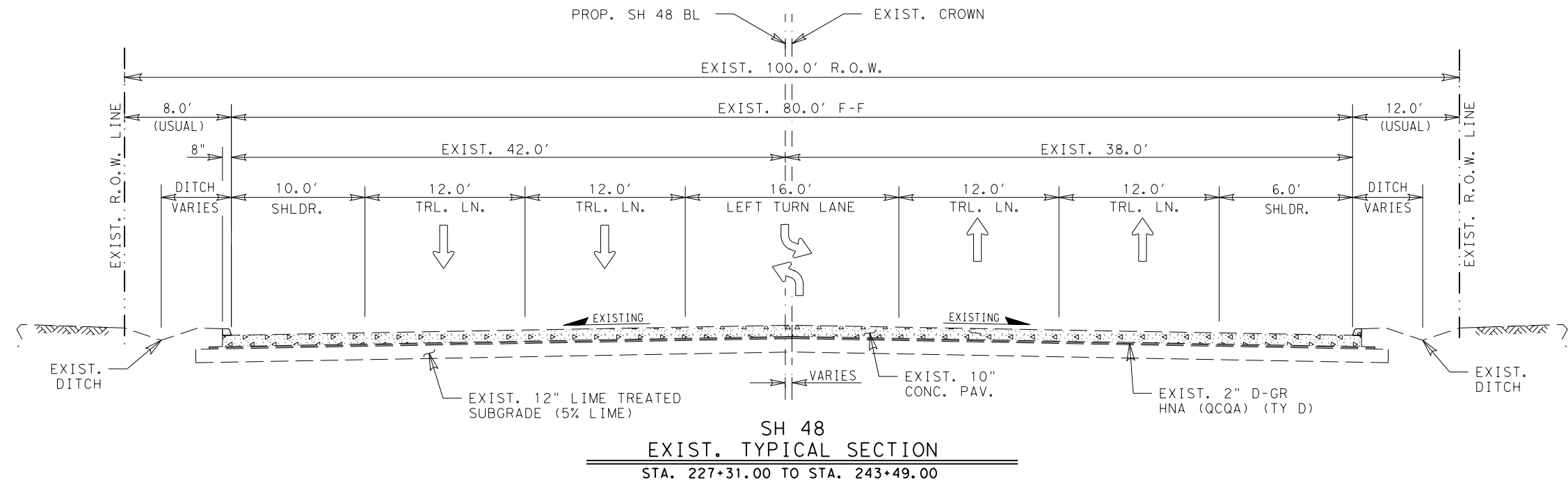


**SH 48  
EXISTING  
TYPICAL SECTIONS**

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CONT	SECT	JOB	HIGHWAY
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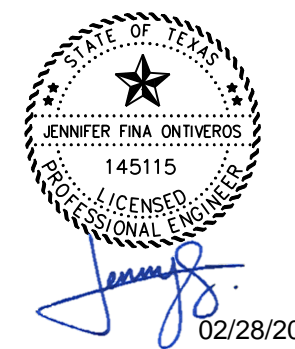
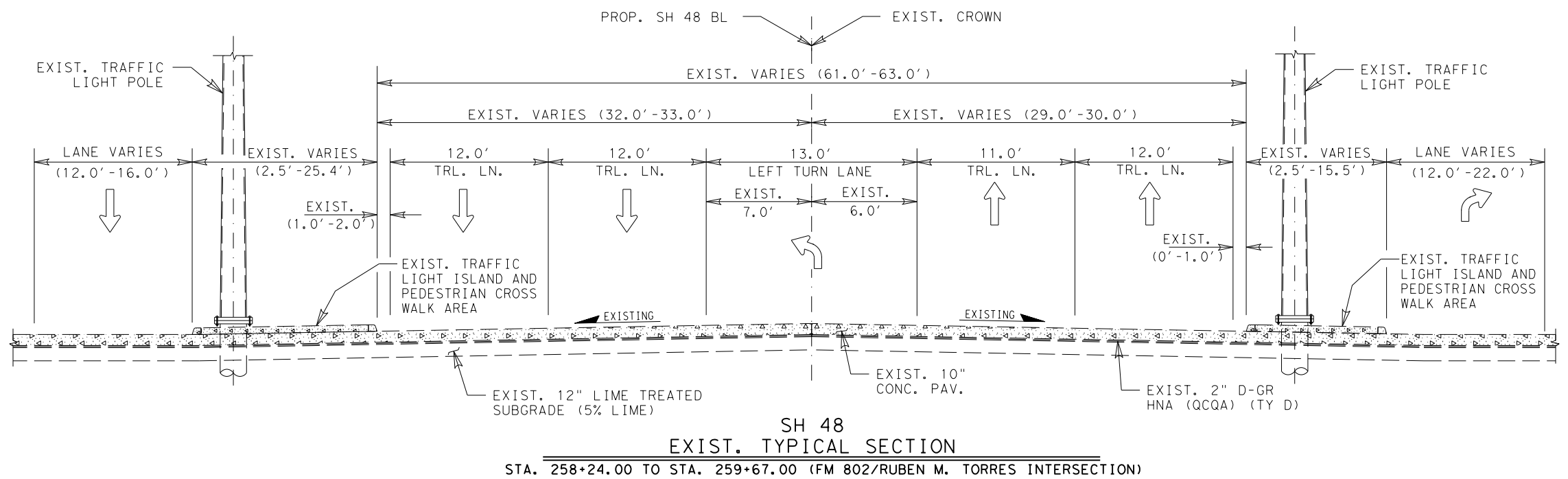
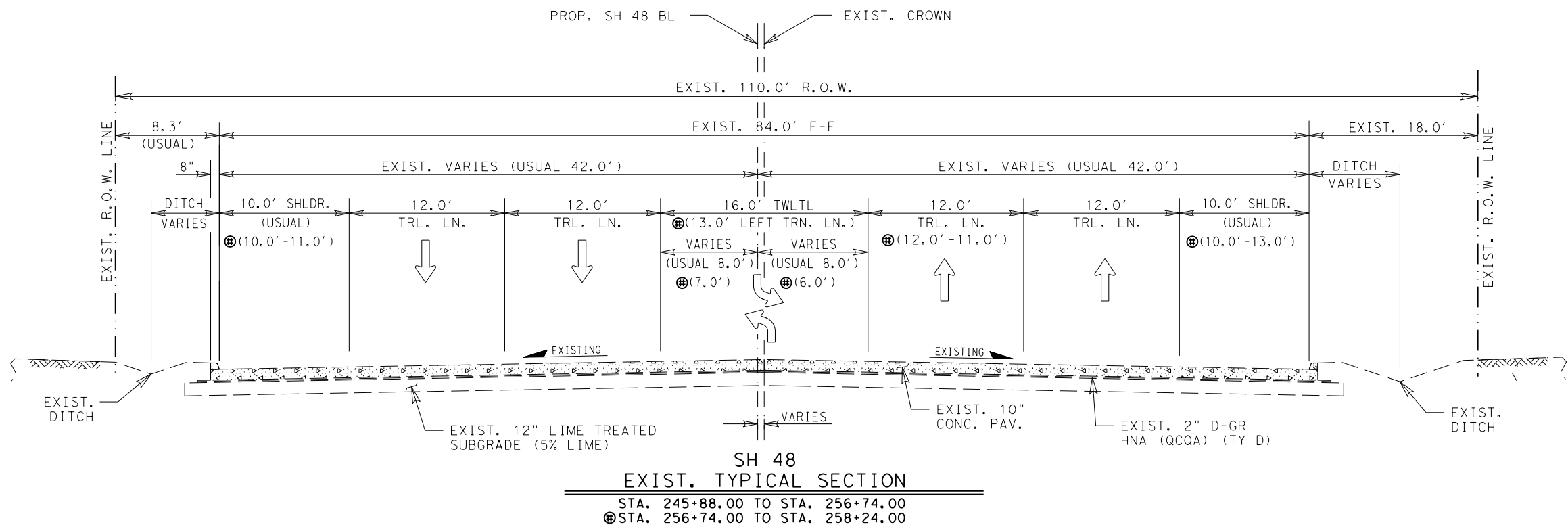
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**SH 48**  
**EXISTING**  
**TYPICAL SECTIONS**

NOT TO SCALE      SHEET 6 OF 11

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	0220	05	080	SH 48
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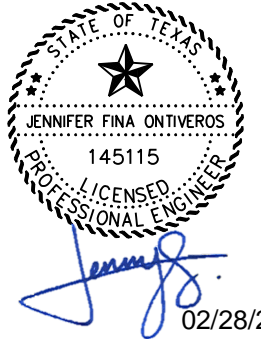
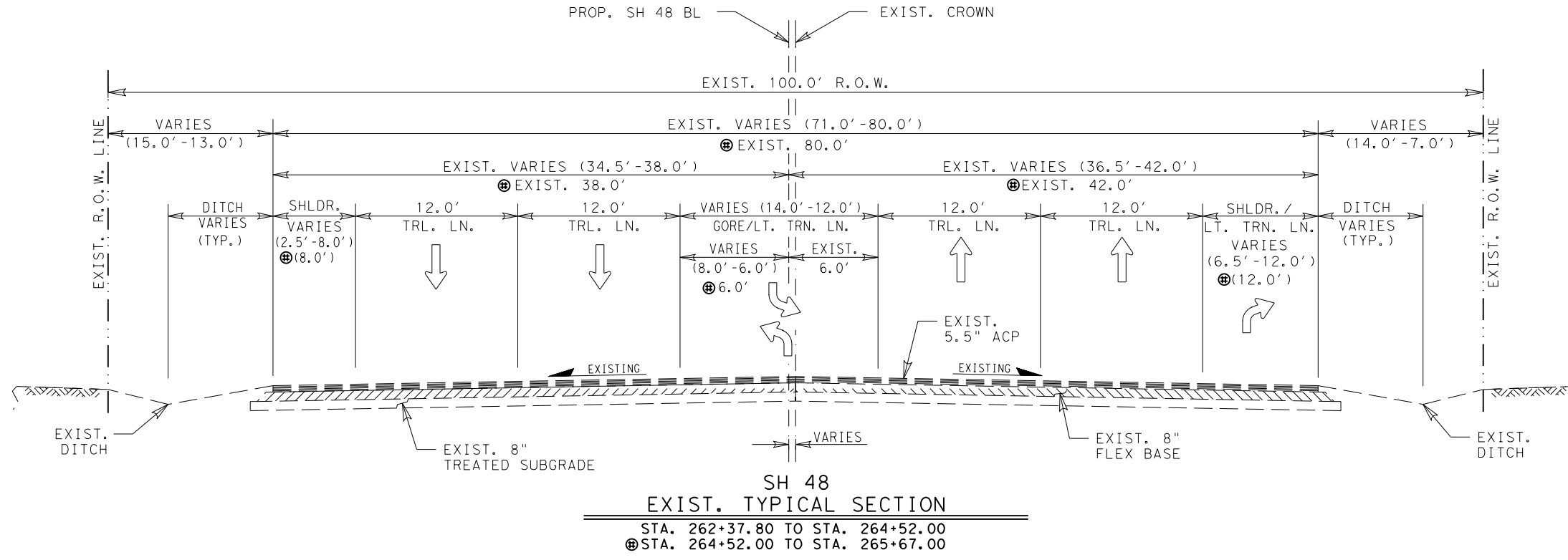
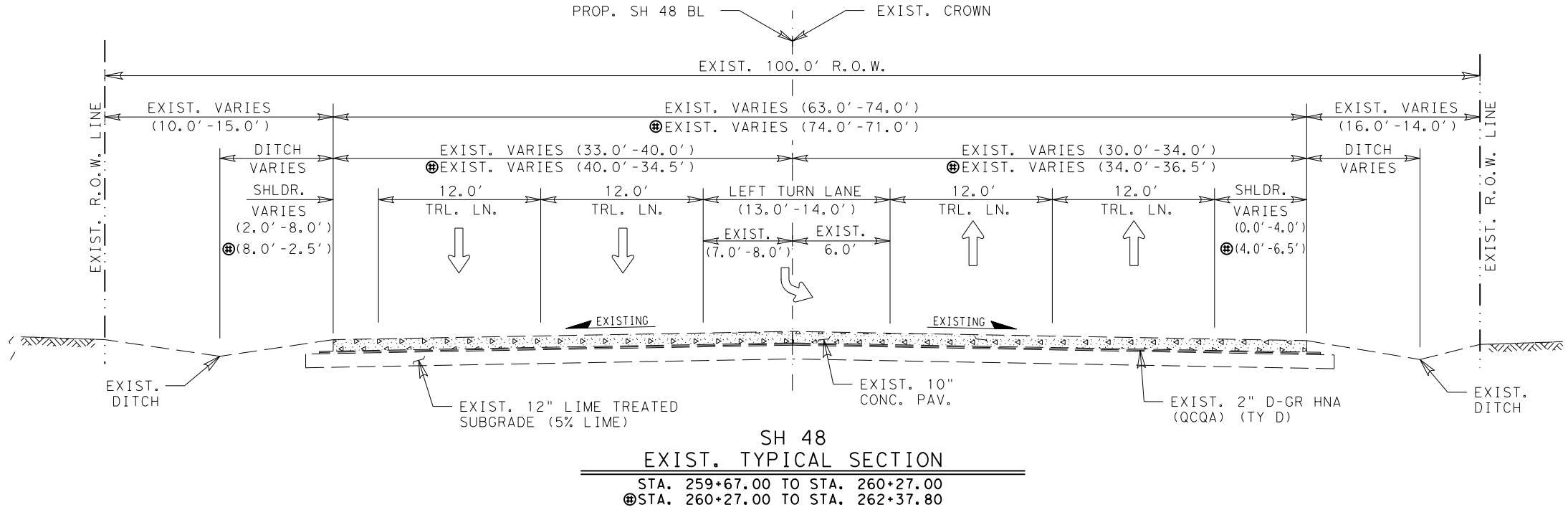
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**SH 48 EXISTING TYPICAL SECTIONS**

NOT TO SCALE SHEET 7 OF 11

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**Pharr District Central Design**

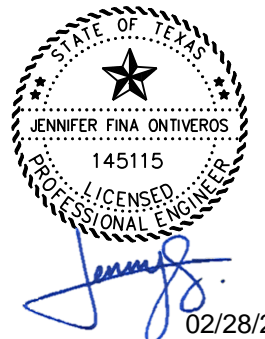
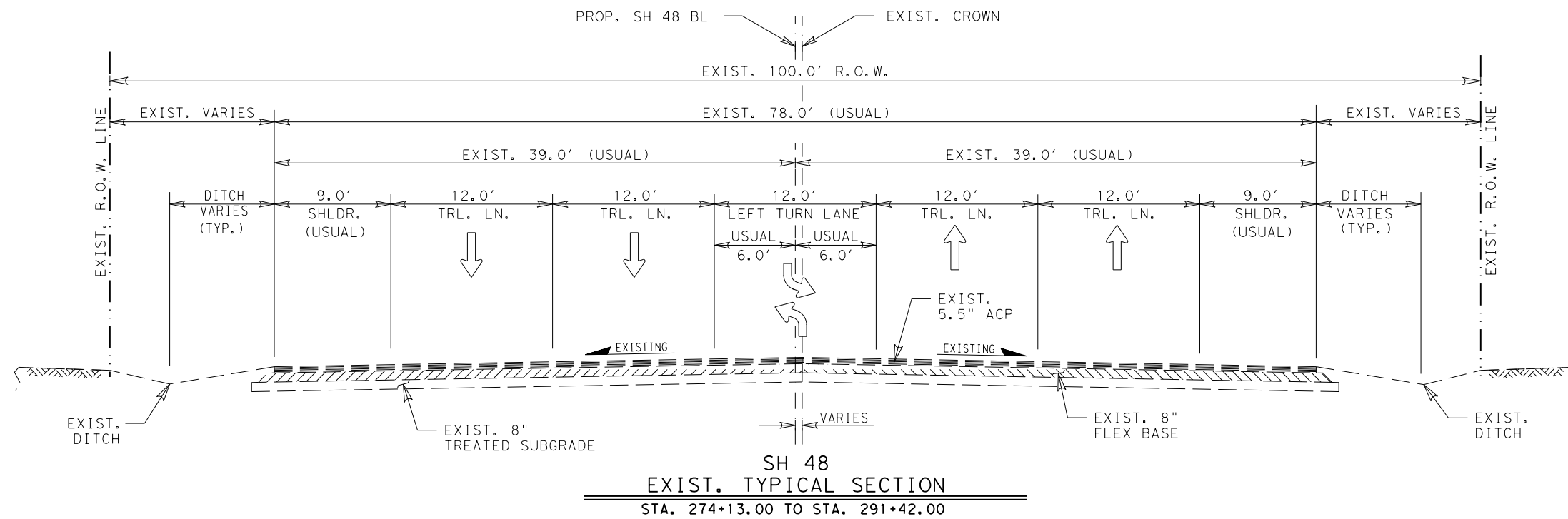
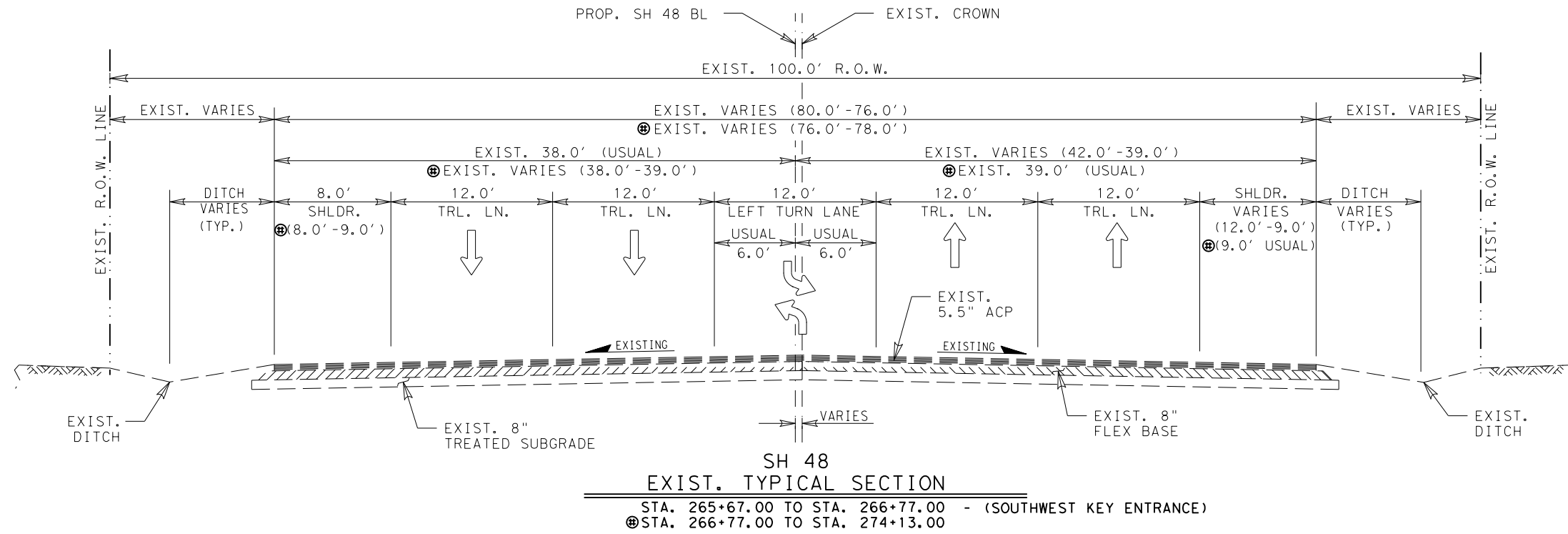
Texas Department of Transportation

**SH 48  
EXISTING  
TYPICAL SECTIONS**

NOT TO SCALE SHEET 8 OF 11

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	13

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Pharr District Central Design

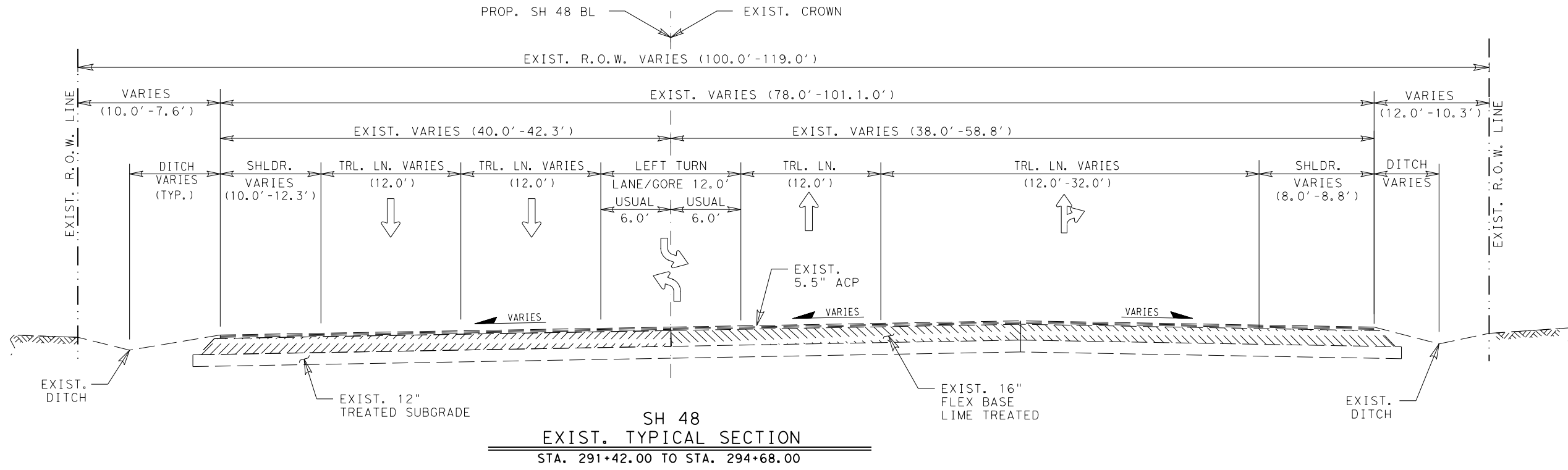
Texas Department of Transportation

**SH 48  
 EXISTING  
 TYPICAL SECTIONS**

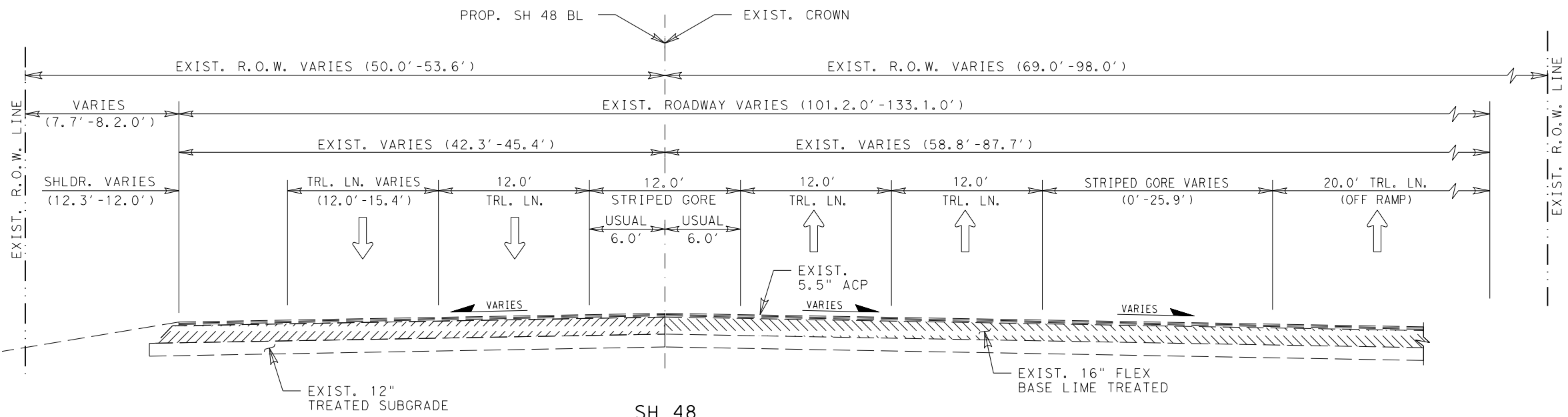
NOT TO SCALE      SHEET 9 OF 11

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	14	

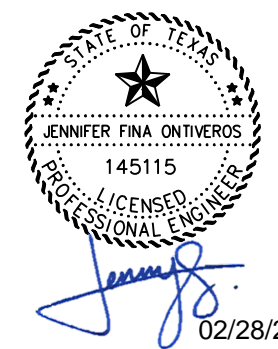
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SH 48  
 EXIST. TYPICAL SECTION  
 STA. 291+42.00 TO STA. 294+68.00



SH 48  
 EXIST. TYPICAL SECTION  
 STA. 294+68.00 TO STA. 297+07.00



Pharr District Central Design

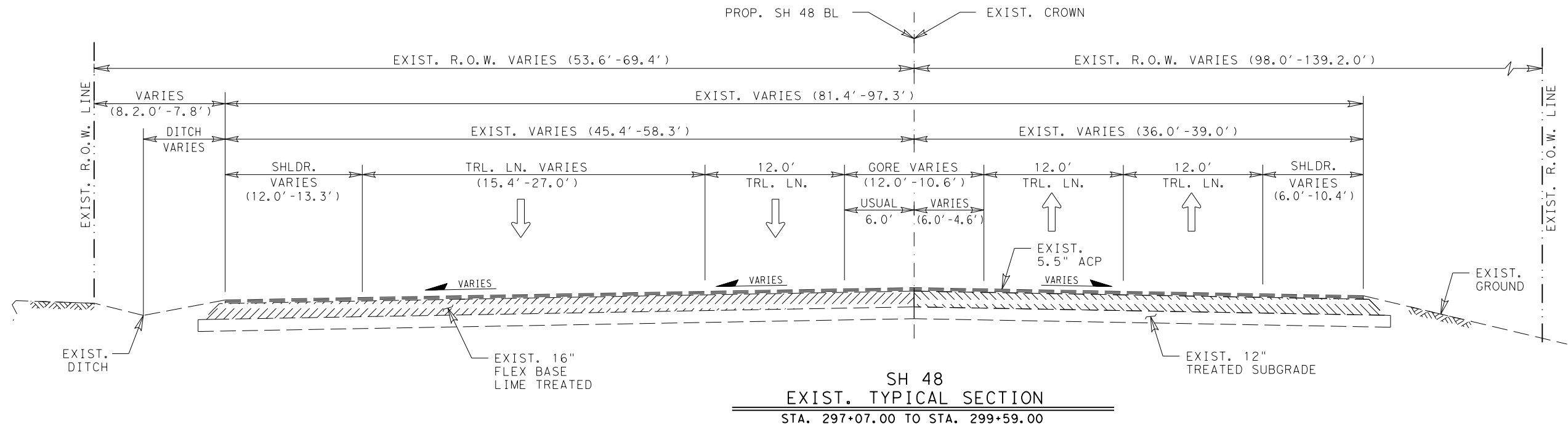
Texas Department of Transportation

SH 48  
 EXISTING  
 TYPICAL SECTIONS

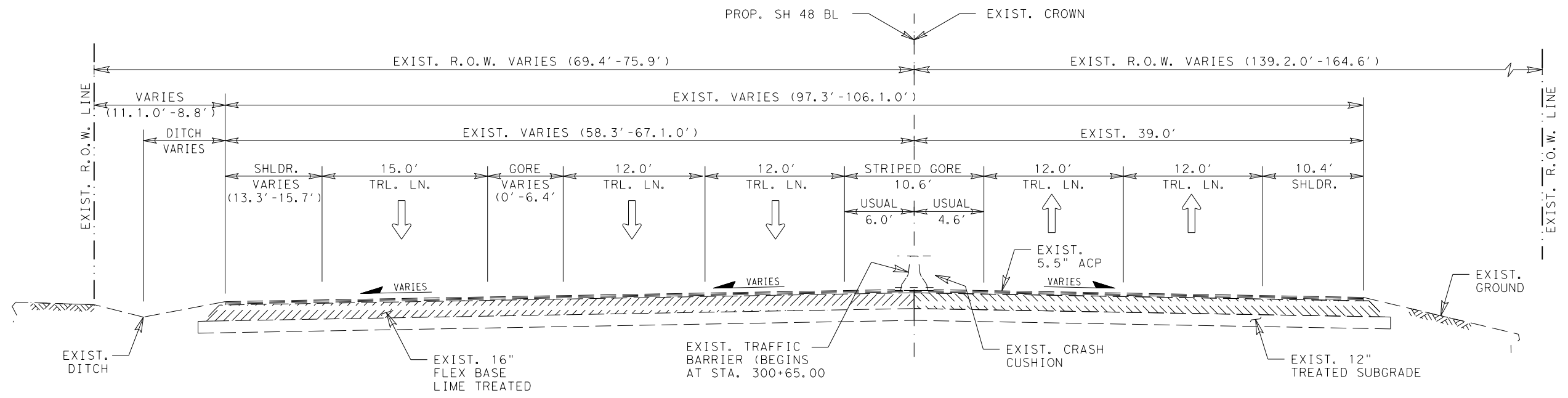
NOT TO SCALE SHEET 10 OF 11

CONT	SECT	JOB	HIGHWAY
0220	05	080	SH 48
DIST		COUNTY	SHEET NO.
PHR		CAMERON	15

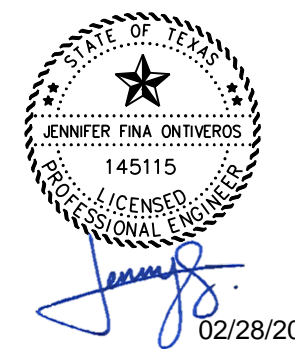
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SH 48  
 EXIST. TYPICAL SECTION  
 STA. 297+07.00 TO STA. 299+59.00



SH 48  
 EXIST. TYPICAL SECTION  
 STA. 299+59.00 TO STA. 300+66.00



Pharr District Central Design

Texas Department of Transportation

**SH 48**  
 EXISTING  
 TYPICAL SECTIONS

NOT TO SCALE SHEET 11 OF 11

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	16



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GENERAL NOTES

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

WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS, THE GOVERNING SLOPES MAY VARY AS DIRECTED BY THE ENGINEER.

PROPOSED TURNAROUNDS TO BE PAID UNDER ITEM 530. EXCAVATION, EMBANKMENT, BASE, AND PAVEMENT MATERIALS ARE SUBSIDIARY TO THIS ITEM.

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

A STATION IS EQUAL TO 100 FT.

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

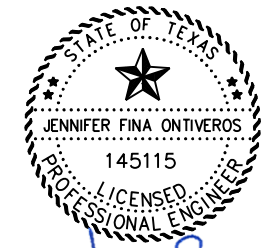
BONDING COURSE - 0.07 GAL/SY (APPROX)

FLEXIBLE BASE WT. - 3375 LB/CY (APPROX)

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

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

SEE PROPOSED PLAN LAYOUT FOR CONCRETE MEDIAN DETAILS.



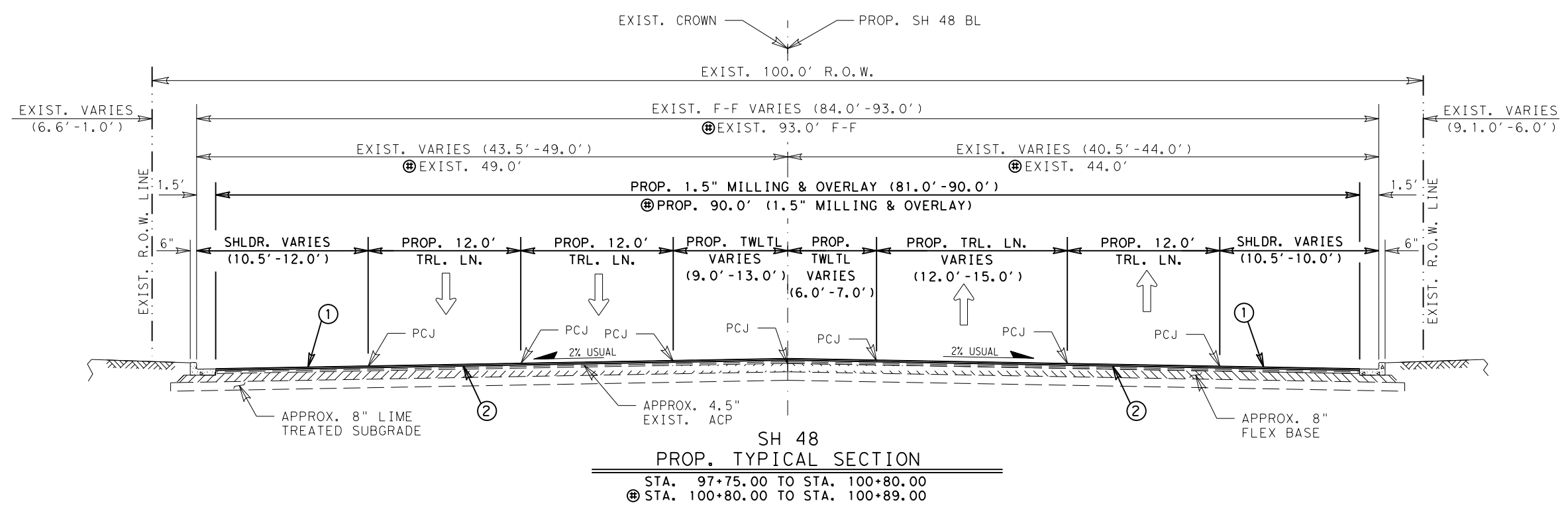
*Jennifer Fina Ontiveros*  
 02/28/2023

Pharr District Central Design

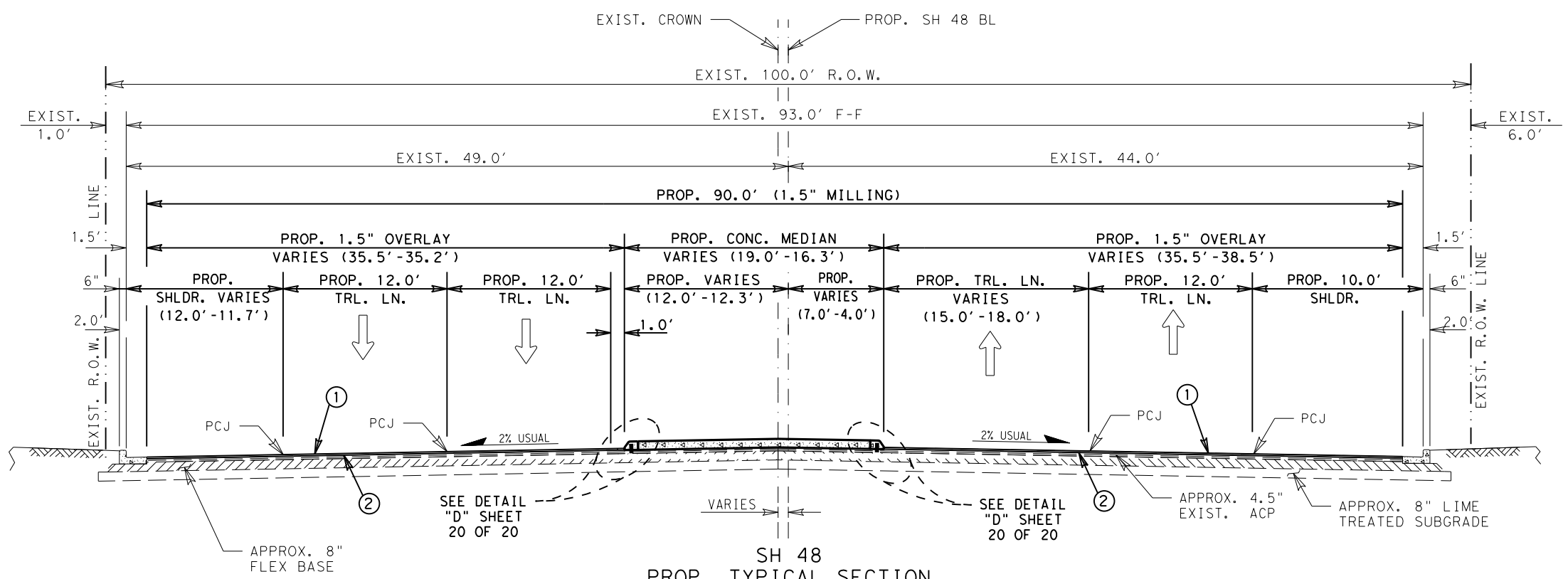


SH 48  
 PROPOSED  
 TYPICAL SECTIONS

NOT TO SCALE		SHEET 1 OF 20	
© 2022	CONT	SECT	JOB
	0220	05	080
	DIST	COUNTY	SH 48
	PHR	CAMERON	SHEET NO. 17



SH 48  
 PROP. TYPICAL SECTION  
 STA. 97+75.00 TO STA. 100+80.00  
 ⊕ STA. 100+80.00 TO STA. 100+89.00

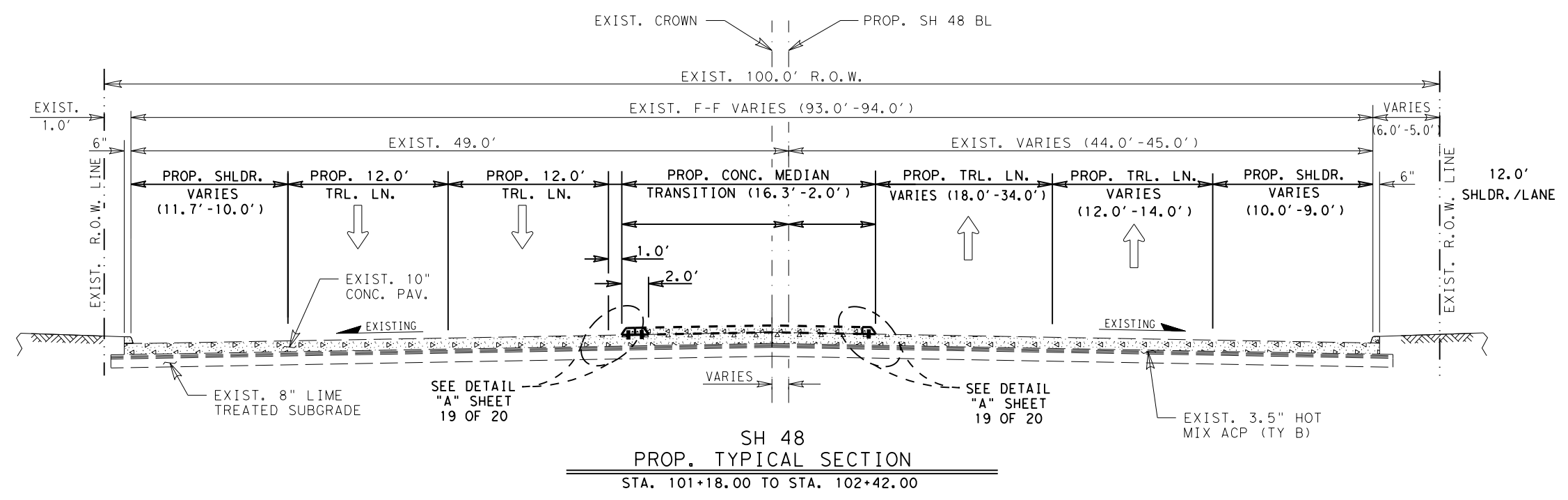


SH 48  
 PROP. TYPICAL SECTION  
 STA. 100+89.00 TO STA. 101+18.00

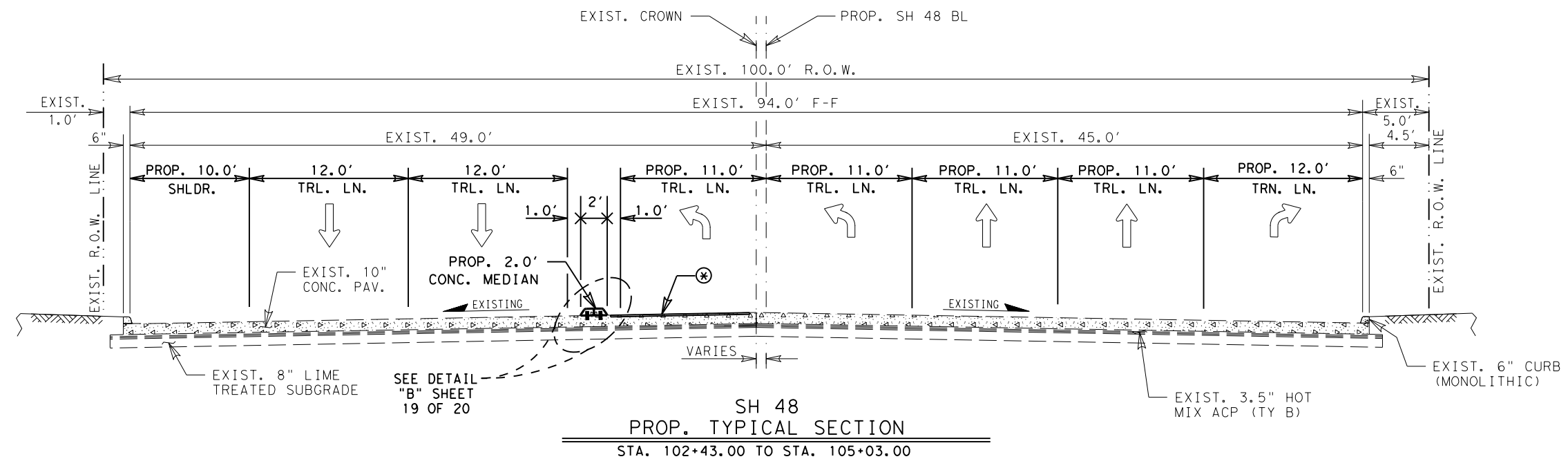
LEGEND:

- |  |   |                       |                        |                                      |
|--|---|-----------------------|------------------------|--------------------------------------|
| ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY) | ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT. | BL - BASE LINE        | TRL. LN. - TRAVEL LANE | PCJ - PREMISSABLE CONSTRUCTION JOINT |
| ② BONDING COURSE (TBWC) (MEMBRANE)                   | ⑤ PROOF ROLL SUBGRADE                                 | PROP. - PROPOSED      | SHLDR. - SHOULDER      | ACP - ASPHALT CONCRETE PAVEMENT      |
| ③ PROPOSED 6" CONC. (DRIVEWAY)                       | ⑥ EMBANKMENT (SUBSIDIARY TO DRIVEWAY ITEM)            | EXIST. - EXISTING     | WT. - WEIGHT           | STA. - STATION                       |
|  |   | R.O.W. - RIGHT OF WAY | CONC. - CONCRETE       | TRANS. - TRANSITION                  |
|  |   | RDWY. - ROADWAY       | PAV. - PAVEMENT        | APPROX. - APPROXIMATELY              |
|  |   | TRN. LN. - TURN LANE  | F-F - FACE TO FACE     | SHT. - SHEET                         |

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NOTE:  
PROP. 1.0' GAP FOR DRAINAGE BETWEEN  
STA. 102+42.00 TO STA. 102+43.00.

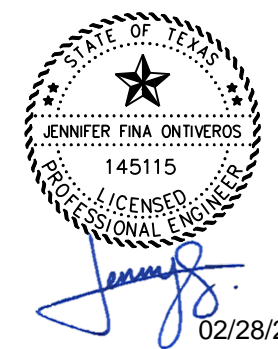


LEGEND:

- |  |   |                       |                        |                                      |
|--|---|-----------------------|------------------------|--------------------------------------|
| ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY) | ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT. | BL - BASE LINE        | TRL. LN. - TRAVEL LANE | PCJ - PREMISSABLE CONSTRUCTION JOINT |
| ② BONDING COURSE (TBWC) (MEMBRANE)                   | ⑤ PROOF ROLL SUBGRADE                                 | PROP. - PROPOSED      | SHLDR. - SHOULDER      | ACP - ASPHALT CONCRETE PAVEMENT      |
| ③ PROPOSED 6" CONC. (DRIVEWAY)                       | ⑥ EMBANKMENT (SUBSIDIARY TO DRIVEWAY ITEM)            | EXIST. - EXISTING     | WT. - WEIGHT           | STA. - STATION                       |
|  |   | R.O.W. - RIGHT OF WAY | CONC. - CONCRETE       | TRANS. - TRANSITION                  |
|  |   | RDWY. - ROADWAY       | PAV. - PAVEMENT        | APPROX. - APPROXIMATELY              |
|  |   | TRN. LN. - TURN LANE  | F-F - FACE TO FACE     | SHT. - SHEET                         |

GENERAL NOTES

- WHERE POSSIBLE, AND UNLESS OTHERWISE DIRECTED BY THE ENGINEER, PERMISSIBLE CONSTRUCTION JOINTS SHALL FALL ON STRIPING LINES AS SHOWN ON PAVEMENT MARKINGS LAYOUT.
- WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS, THE GOVERNING SLOPES MAY VARY AS DIRECTED BY THE ENGINEER.
- PROPOSED TURNAROUNDS TO BE PAID UNDER ITEM 530. EXCAVATION, EMBANKMENT, BASE, AND PAVEMENT MATERIALS ARE SUBSIDIARY TO THIS ITEM.
- THE SUBGRADE SHALL BE SHAPED, BLADED, ROLLED AND PROOF ROLLED A MINIMUM DISTANCE OF 24" BEYOND THE EDGE OF THE PROPOSED BASE COURSE.
- A STATION IS EQUAL TO 100 FT.
- 114 LBS/SY IS EQUIVALENT TO 1" OF ACP.
- BONDING COURSE - 0.07 GAL/SY (APPROX)
- FLEXIBLE BASE WT. - 3375 LB/CY (APPROX)
- ALL GRADING SHALL BE WITHIN THE R.O.W. LIMITS.
- A 3:1 MAX SLOPE SHALL BE PROVIDED AT THE END OF EACH WORKING DAY ON ALL EXPOSED EDGES OF ROADWAY CONSTRUCTION OR EXCAVATION.
- SEE PROPOSED PLAN LAYOUT FOR CONCRETE MEDIAN DETAILS.
- ⊛ EXISTING RAISED CONCRETE MEDIAN TO BE REMOVED. EXISTING REINFORCED CONCRETE PAVEMENT ANCHOR REBARS TO BE CUT OFF AND EPOXY SEALED. SUBSIDIARY TO ITEM 104. STA. 103+88.00 TO STA. 105+11.00 STA. 106+63.00 TO STA. 107+70.00

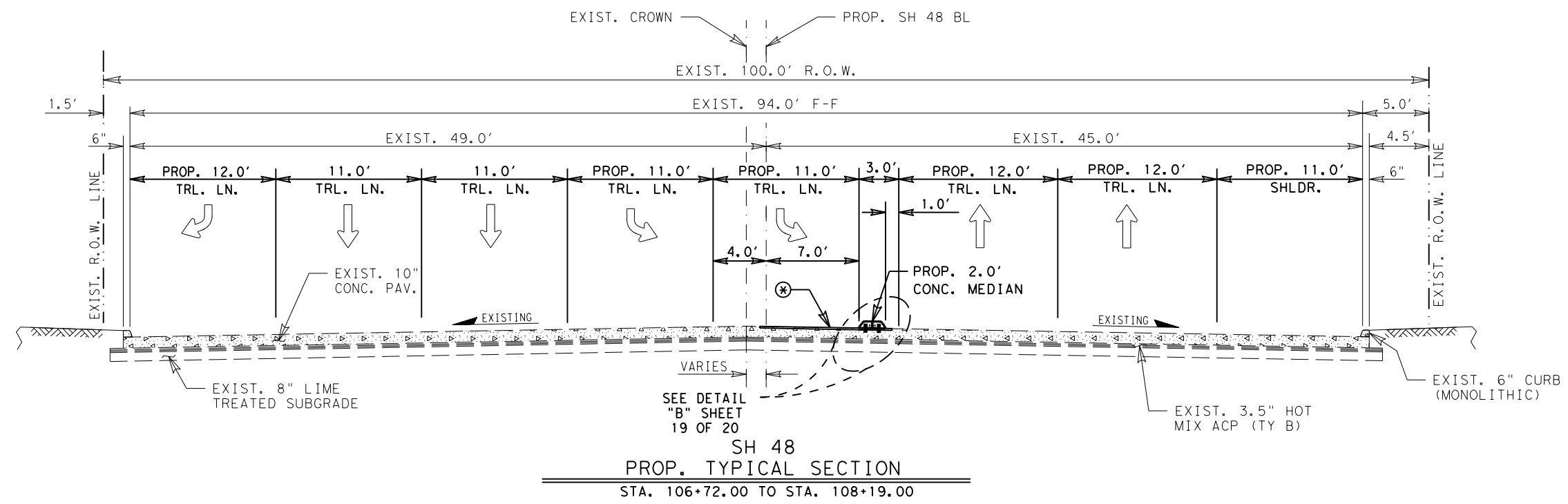
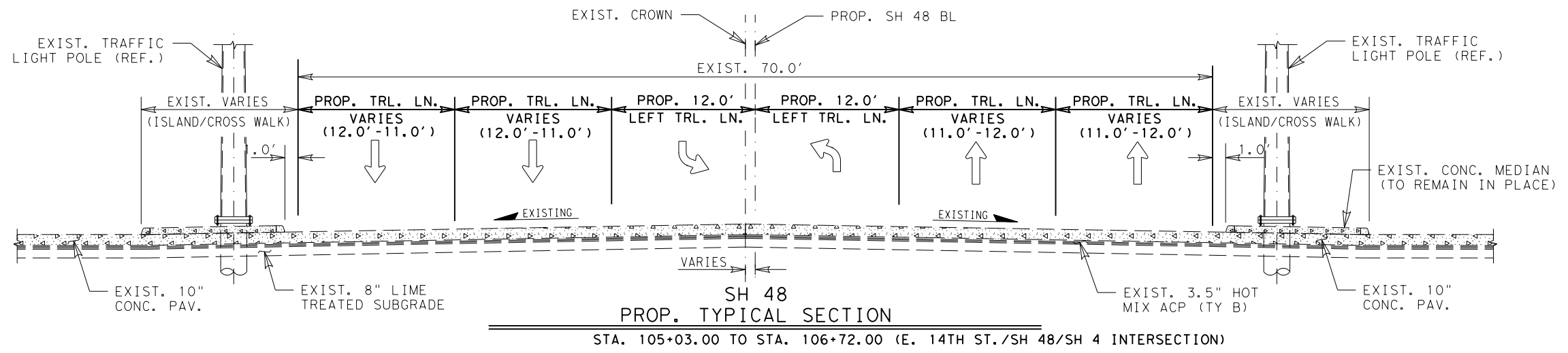


Pharr District Central Design  
Texas Department of Transportation

SH 48  
PROPOSED  
TYPICAL SECTIONS

NOT TO SCALE		SHEET 2 OF 20	
© 2022	CONT	SECT	JOB
	0220	05	080
	DIST	COUNTY	SH 48
	PHR	CAMERON	SHEET NO. 18

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**GENERAL NOTES**

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

WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS, THE GOVERNING SLOPES MAY VARY AS DIRECTED BY THE ENGINEER.

PROPOSED TURNAROUNDS TO BE PAID UNDER ITEM 530. EXCAVATION, EMBANKMENT, BASE, AND PAVEMENT MATERIALS ARE SUBSIDIARY TO THIS ITEM.

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

A STATION IS EQUAL TO 100 FT.  
 114 LBS/SY IS EQUIVALENT TO 1" OF ACP.

BONDING COURSE - 0.07 GAL/SY (APPROX)

FLEXIBLE BASE WT. - 3375 LB/CY (APPROX)

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

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

SEE PROPOSED PLAN LAYOUT FOR CONCRETE MEDIAN DETAILS.

⊗ EXISTING RAISED CONCRETE MEDIAN TO BE REMOVED. EXISTING REINFORCED CONCRETE PAVEMENT ANCHOR REBARS TO BE CUT OFF AND EPOXY SEALED. SUBSIDIARY TO ITEM 104.  
 STA. 103+88.00 TO STA. 105+11.00  
 STA. 106+63.00 TO STA. 107+70.00



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 Texas Department of Transportation

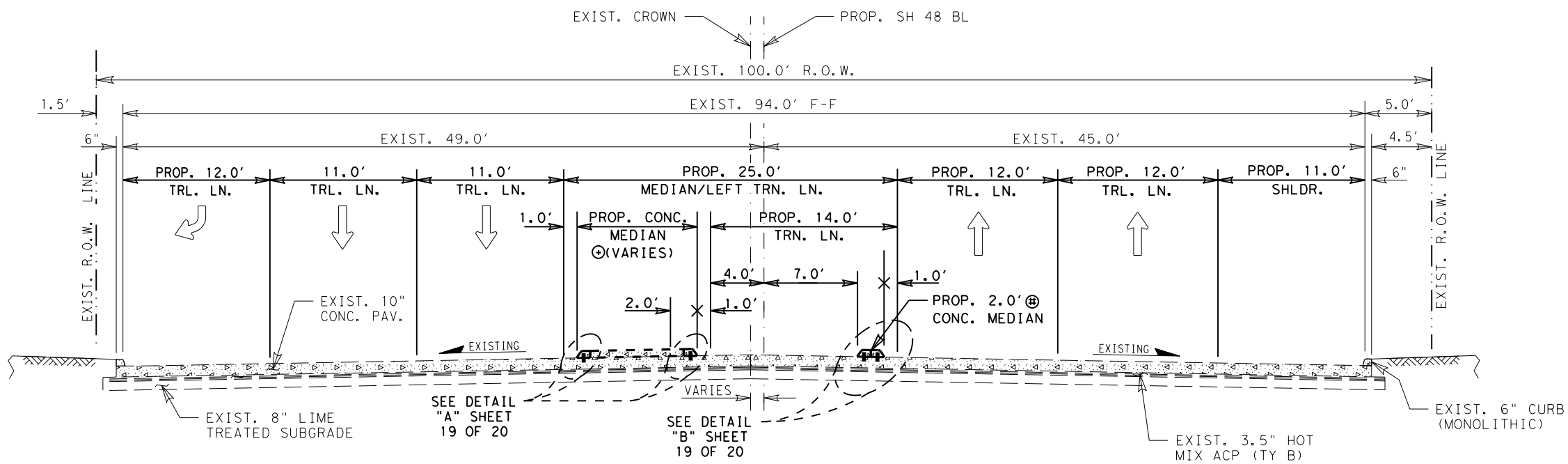
**SH 48  
 PROPOSED  
 TYPICAL SECTIONS**

NOT TO SCALE		SHEET 3 OF 20	
© 2022	CONT	SECT	JOB
	0220	05	080
	DIST	COUNTY	SH 48
	PHR	CAMERON	SHEET NO. 19

**LEGEND:**

- |  |   |                       |                        |                                      |
|--|---|-----------------------|------------------------|--------------------------------------|
| ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY) | ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT. | BL - BASE LINE        | TRL. LN. - TRAVEL LANE | PCJ - PREMISSABLE CONSTRUCTION JOINT |
| ② BONDING COURSE (TBWC) (MEMBRANE)                   | ⑤ PROOF ROLL SUBGRADE                                 | PROP. - PROPOSED      | SHLDR. - SHOULDER      | ACP - ASPHAT CONCRETE PAVEMENT       |
| ③ PROPOSED 6" CONC. (DRIVEWAY)                       | ⑥ EMBANKMENT (SUBSIDIARY TO DRIVEWAY ITEM)            | EXIST. - EXISTING     | WT. - WEIGHT           | STA. - STATION                       |
|  |   | R.O.W. - RIGHT OF WAY | CONC. - CONCRETE       | TRANS. - TRANSITION                  |
|  |   | RDWY. - ROADWAY       | PAV. - PAVEMENT        | APPROX. - APPROXIMATELY              |
|  |   | TRN. LN. - TURN LANE  | F-F - FACE TO FACE     | SHT. - SHEET                         |

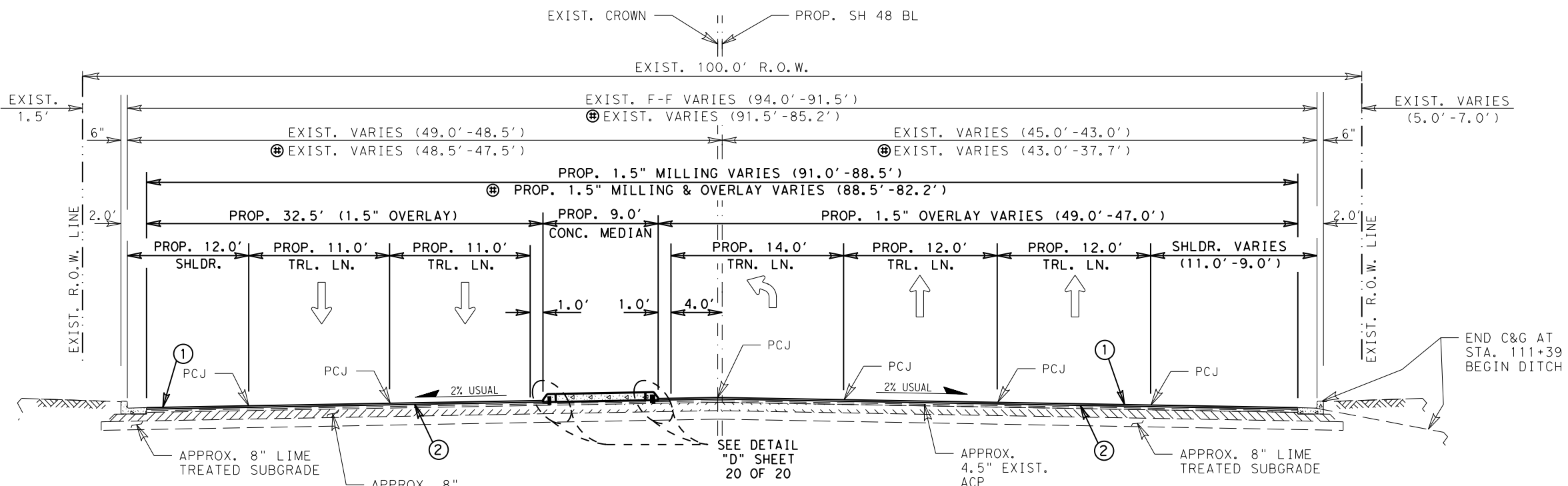
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SH 48  
 PROP. TYPICAL SECTION

- ⊕ STA. 108+20.00 TO STA. 109+15.00 - 2.0' MEDIAN TRANSITION
- ⊕ STA. 109+16.00 TO STA. 109+66.00 - MEDIAN (2.0'-9.0')
- ⊕ STA. 109+66.00 TO STA. 110+40.20 - 9.0' MEDIAN

NOTE:  
 PROP. 1.0' GAP FOR DRAINAGE BETWEEN  
 STA. 108+19.00 TO STA. 108+20.00.  
 STA. 109+15.00 TO STA. 109+16.00.



SH 48  
 PROP. TYPICAL SECTION

- ⊕ STA. 110+40.20 TO STA. 111+30.00
- ⊕ STA. 111+30.00 TO STA. 112+14.00 - NO RAISED MEDIAN

⊕ SH 48 AND HOME DEPOT INTERSECTION.  
 STATIONINGS AND ROADWAY WIDTHS FOR  
 MILLING AND OVERLAY INFORMATION ONLY.

GENERAL NOTES

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

WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS, THE GOVERNING SLOPES MAY VARY AS DIRECTED BY THE ENGINEER.

PROPOSED TURNAROUNDS TO BE PAID UNDER ITEM 530. EXCAVATION, EMBANKMENT, BASE, AND PAVEMENT MATERIALS ARE SUBSIDIARY TO THIS ITEM.

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

A STATION IS EQUAL TO 100 FT.

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

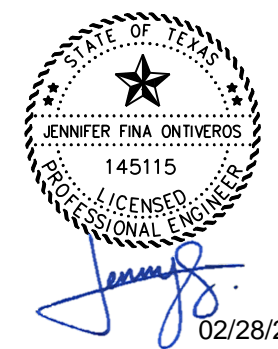
BONDING COURSE - 0.07 GAL/SY (APPROX)

FLEXIBLE BASE WT. - 3375 LB/CY (APPROX)

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

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

SEE PROPOSED PLAN LAYOUT FOR CONCRETE MEDIAN DETAILS.



Pharr District Central Design



SH 48  
 PROPOSED  
 TYPICAL SECTIONS

LEGEND:

- |  |   |                       |                        |                                      |
|--|---|-----------------------|------------------------|--------------------------------------|
| ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY) | ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT. | BL - BASE LINE        | TRL. LN. - TRAVEL LANE | PCJ - PREMISSABLE CONSTRUCTION JOINT |
| ② BONDING COURSE (TBWC) (MEMBRANE)                   | ⑤ PROOF ROLL SUBGRADE                                 | PROP. - PROPOSED      | SHLDR. - SHOULDER      | ACP - ASPHALT CONCRETE PAVEMENT      |
| ③ PROPOSED 6" CONC. (DRIVEWAY)                       | ⑥ EMBANKMENT (SUBSIDIARY TO DRIVEWAY ITEM)            | EXIST. - EXISTING     | WT. - WEIGHT           | STA. - STATION                       |
|  |   | R.O.W. - RIGHT OF WAY | CONC. - CONCRETE       | TRANS. - TRANSITION                  |
|  |   | RDWY. - ROADWAY       | PAV. - PAVEMENT        | APPROX. - APPROXIMATELY              |
|  |   | TRN. LN. - TURN LANE  | F-F - FACE TO FACE     | SHT. - SHEET                         |

NOT TO SCALE		SHEET 4 OF 20	
© 2022	CONT	SECT	JOB
	0220	05	080
	DIST	COUNTY	SH 48
	PHR	CAMERON	SHEET NO. 20

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**GENERAL NOTES**

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

WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS, THE GOVERNING SLOPES MAY VARY AS DIRECTED BY THE ENGINEER.

PROPOSED TURNAROUNDS TO BE PAID UNDER ITEM 530. EXCAVATION, EMBANKMENT, BASE, AND PAVEMENT MATERIALS ARE SUBSIDIARY TO THIS ITEM.

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

A STATION IS EQUAL TO 100 FT.

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

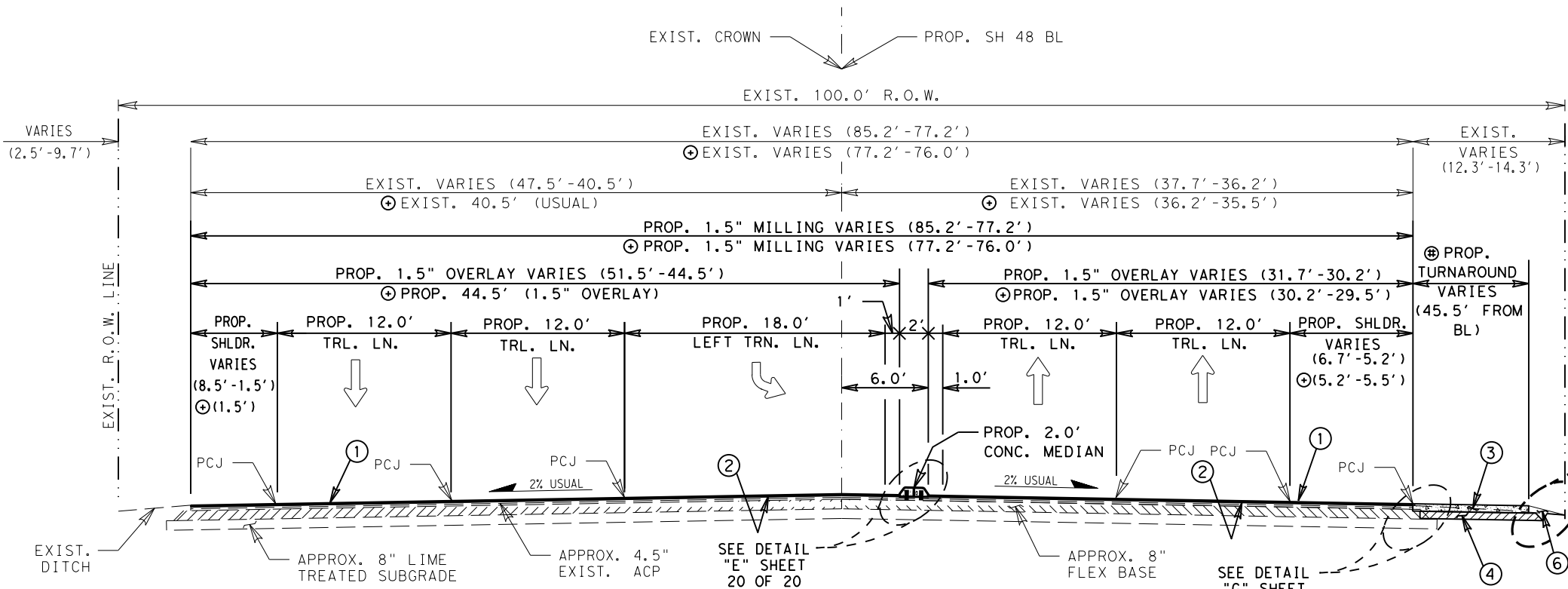
BONDING COURSE - 0.07 GAL/SY (APPROX)

FLEXIBLE BASE WT. - 3375 LB/CY (APPROX)

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

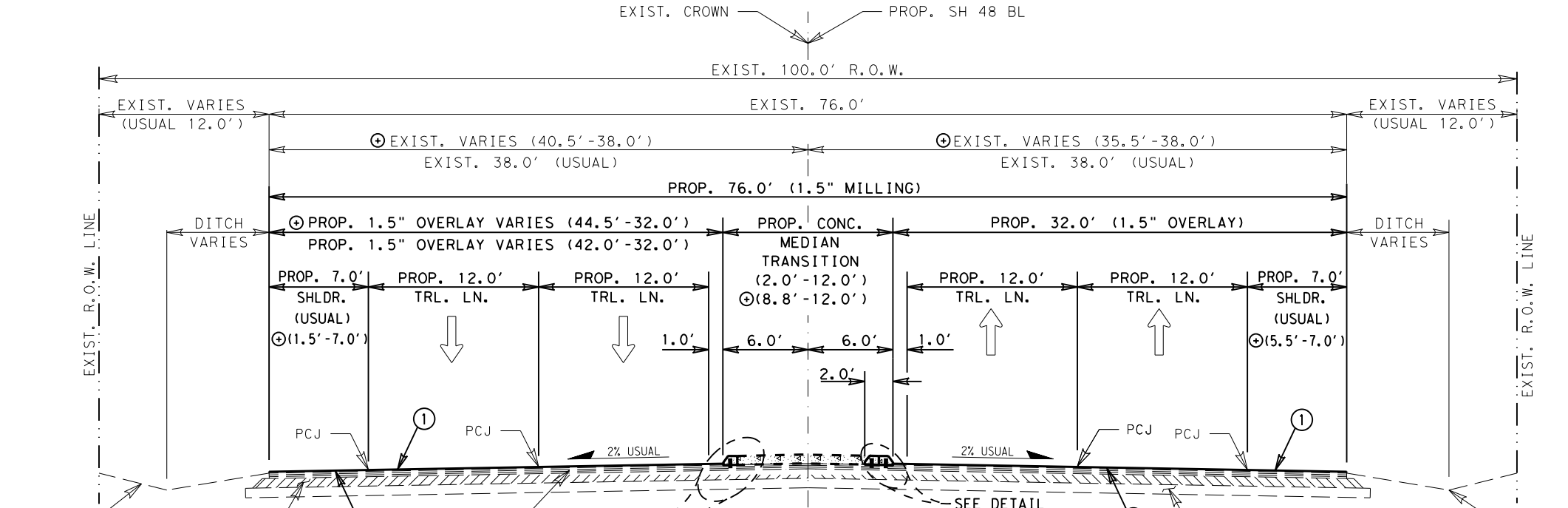
A 3:1 MAX SLOPE SHALL BE PROVIDED AT THE END OF EACH WORKING DAY ON ALL EXPOSED EDGES OF ROADWAY CONSTRUCTION OR EXCAVATION.

SEE PROPOSED PLAN LAYOUT FOR CONCRETE MEDIAN DETAILS.



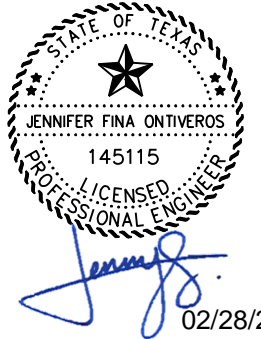
NOTE:  
 PROP. 1.0' GAP FOR DRAINAGE BETWEEN STA. 115+56.00 TO STA. 115+57.00.

**SH 48  
 PROP. TYPICAL SECTION**  
 ⊕ STA. 112+03.00 TO STA. 112+53.00 - SLOPE 2% RIGHT  
 STA. 112+14.00 TO STA. 115+56.00 - 2.0' MEDIAN  
 ⊕ STA. 115+57.00 TO STA. 116+26.00 - MEDIAN (2.0' - 8.8')



**SH 48  
 PROP. TYPICAL SECTION**  
 ⊕ STA. 116+26.00 TO STA. 116+58.00  
 STA. 145+17.00 TO STA. 146+18.00  
 STA. 151+05.00 TO STA. 152+06.00  
 STA. 160+68.00 TO STA. 160+92.00  
 STA. 175+66.00 TO STA. 176+67.00  
 STA. 191+88.00 TO STA. 192+89.00  
 STA. 203+95.00 TO STA. 204+96.00  
 STA. 216+17.00 TO STA. 217+18.00  
 STA. 222+83.00 TO STA. 223+07.00

- LEGEND:**
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② BONDING COURSE (TBWC) (MEMBRANE)
  - ③ PROPOSED 6" CONC. (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROOF ROLL SUBGRADE
  - ⑥ EMBANKMENT (SUBSIDIARY TO DRIVEWAY ITEM)
  - BL - BASE LINE
  - PROP. - PROPOSED
  - EXIST. - EXISTING
  - R.O.W. - RIGHT OF WAY
  - RDWY. - ROADWAY
  - TRN. LN. - TURN LANE
  - TRL. LN. - TRAVEL LANE
  - SHLDR. - SHOULDER
  - WT. - WEIGHT
  - CONC. - CONCRETE
  - PAV. - PAVEMENT
  - F-F - FACE TO FACE
  - PCJ - PREMISSABLE CONSTRUCTION JOINT
  - ACP - ASPHALT CONCRETE PAVEMENT
  - STA. - STATION
  - TRANS. - TRANSITION
  - APPROX. - APPROXIMATELY
  - SHT. - SHEET



**Pharr District Central Design**

**Texas Department of Transportation**

**SH 48  
 PROPOSED  
 TYPICAL SECTIONS**

NOT TO SCALE SHEET 5 OF 20

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	21	

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**GENERAL NOTES**

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

WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS, THE GOVERNING SLOPES MAY VARY AS DIRECTED BY THE ENGINEER.

PROPOSED TURNAROUNDS TO BE PAID UNDER ITEM 530. EXCAVATION, EMBANKMENT, BASE, AND PAVEMENT MATERIALS ARE SUBSIDIARY TO THIS ITEM.

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

A STATION IS EQUAL TO 100 FT.

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

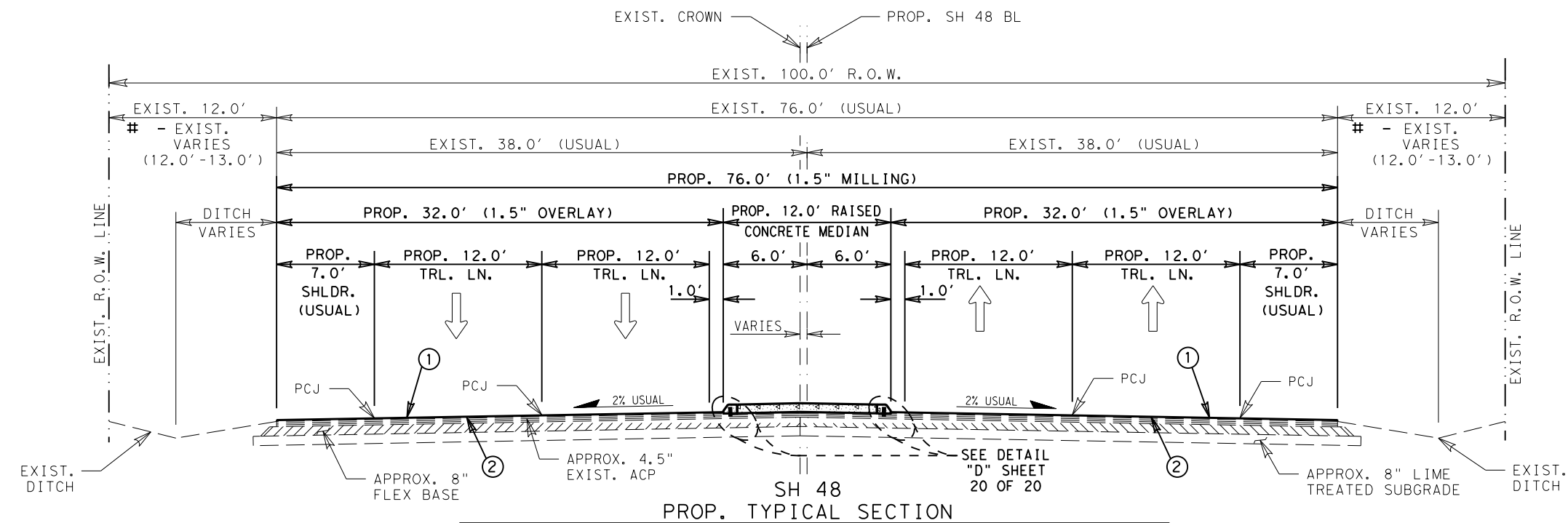
BONDING COURSE - 0.07 GAL/SY (APPROX)

FLEXIBLE BASE WT. - 3375 LB/CY (APPROX)

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

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

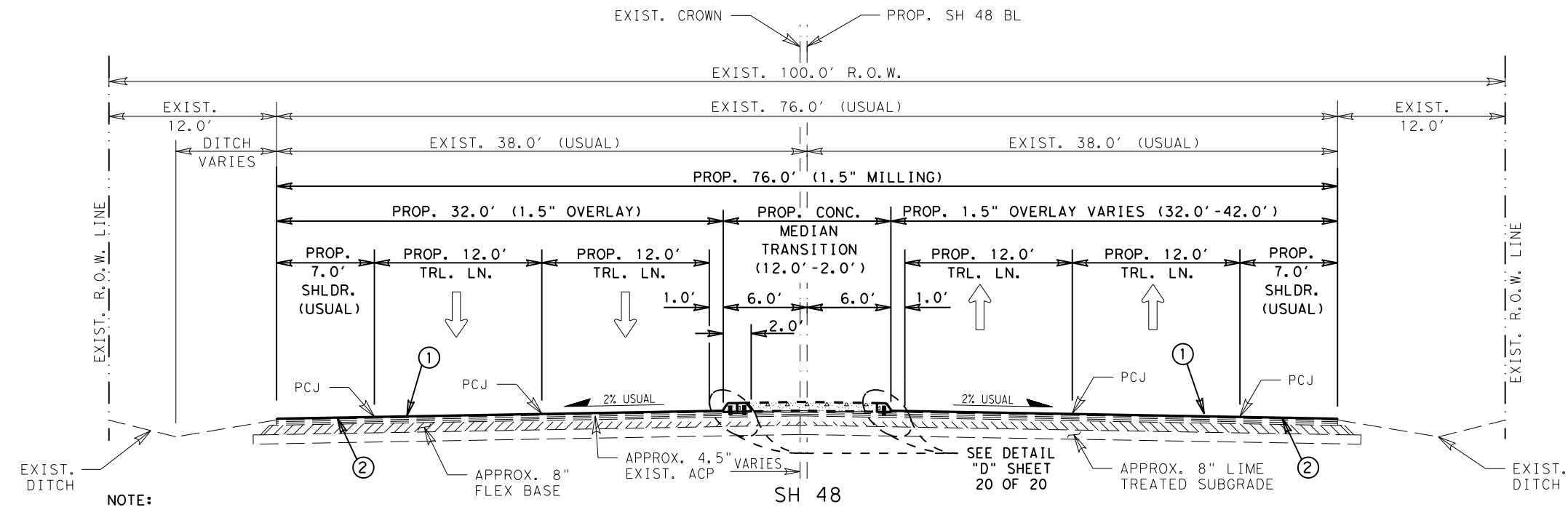
SEE PROPOSED PLAN LAYOUT FOR CONCRETE MEDIAN DETAILS.



**SH 48  
PROP. TYPICAL SECTION**

STA. 116+58.00 TO STA. 127+17.00	STA. 192+89.00 TO STA. 195+21.00
STA. 146+18.00 TO STA. 146+48.00	STA. 204+96.00 TO STA. 211+70.00
STA. 152+06.00 TO STA. 153+10.00	STA. 217+18.00 TO STA. 218+10.00
STA. 160+92.00 TO STA. 166+44.00	STA. 223+07.00 TO STA. 225+60.00
STA. 176+67.00 TO STA. 180+17.00	

**NOTE:**  
 NO RAISED CONCRETE MEDIAN AT INTERSECTIONS:  
 STA. 146+48.00 TO STA. 147+54.00 - MCKENZIE RD.  
 STA. 211+70.00 TO STA. 212+69.00 - ZENA DR.

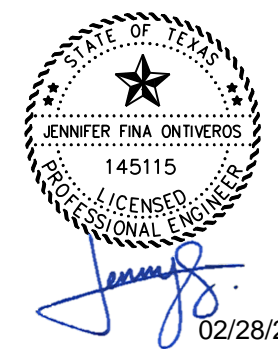


**SH 48  
PROP. TYPICAL SECTION**

**NOTE:**  
 1.0' GAP OPENING AT RAISED CONCRETE MEDIAN FOR DRAINAGE ACCESS.

STA. 127+41.00 TO STA. 127+42.00	STA. 137+98.00 TO STA. 137+99.00	STA. 153+34.00 TO STA. 153+35.00	STA. 167+45.00 TO STA. 167+46.00	STA. 181+18.00 TO STA. 181+19.00	STA. 196+22.00 TO STA. 196+23.00	STA. 219+11.00 TO STA. 219+12.00
----------------------------------	----------------------------------	----------------------------------	----------------------------------	----------------------------------	----------------------------------	----------------------------------

- LEGEND:**
- |  |   |                       |                        |                                      |
|--|---|-----------------------|------------------------|--------------------------------------|
| ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY) | ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT. | BL - BASE LINE        | TRL. LN. - TRAVEL LANE | PCJ - PREMISSABLE CONSTRUCTION JOINT |
| ② BONDING COURSE (TBWC) (MEMBRANE)                   | ⑤ PROOF ROLL SUBGRADE                                 | PROP. - PROPOSED      | SHLDR. - SHOULDER      | ACP - ASPHAT CONCRETE PAVEMENT       |
| ③ PROPOSED 6" CONC. (DRIVEWAY)                       | ⑥ EMBANKMENT (SUBSIDIARY TO DRIVEWAY ITEM)            | EXIST. - EXISTING     | WT. - WEIGHT           | STA. - STATION                       |
|  |   | R.O.W. - RIGHT OF WAY | CONC. - CONCRETE       | TRANS. - TRANSITION                  |
|  |   | RDWY. - ROADWAY       | PAV. - PAVEMENT        | APPROX. - APPROXIMATELY              |
|  |   | TRN. LN. - TURN LANE  | F-F - FACE TO FACE     | SHT. - SHEET                         |



**Pharr District Central Design**

**Texas Department of Transportation**

**SH 48  
PROPOSED  
TYPICAL SECTIONS**

NOT TO SCALE SHEET 6 OF 20

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	22	

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**GENERAL NOTES**

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

WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS, THE GOVERNING SLOPES MAY VARY AS DIRECTED BY THE ENGINEER.

PROPOSED TURNAROUNDS TO BE PAID UNDER ITEM 530. EXCAVATION, EMBANKMENT, BASE, AND PAVEMENT MATERIALS ARE SUBSIDIARY TO THIS ITEM.

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

A STATION IS EQUAL TO 100 FT.

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

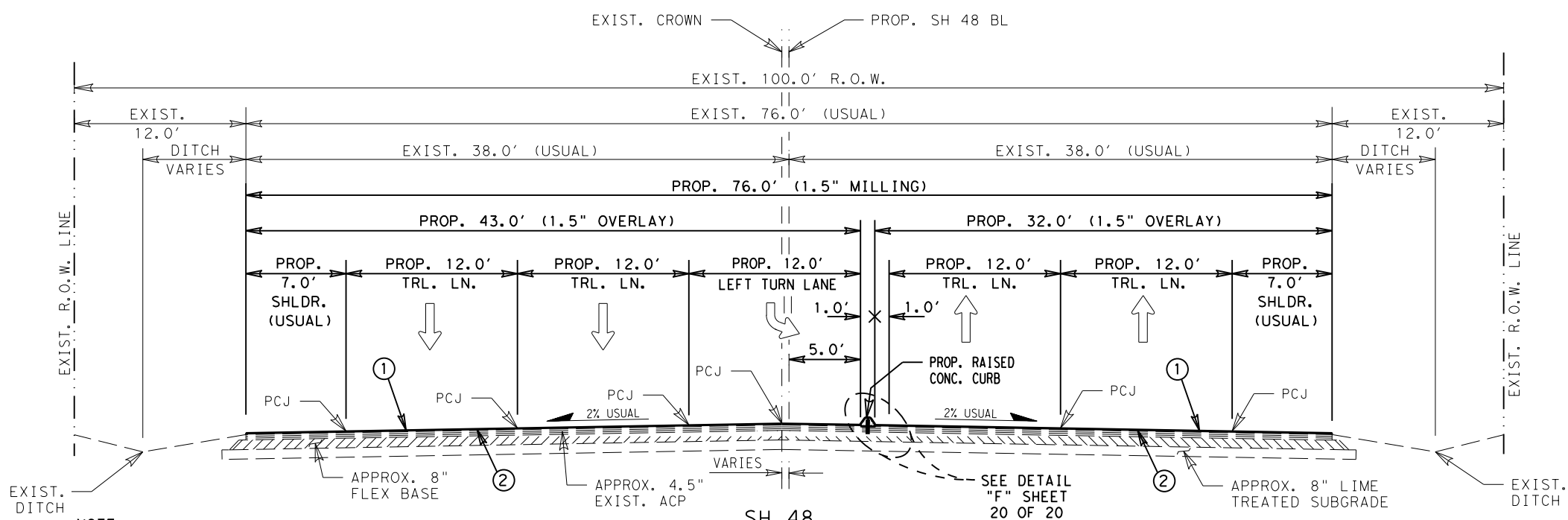
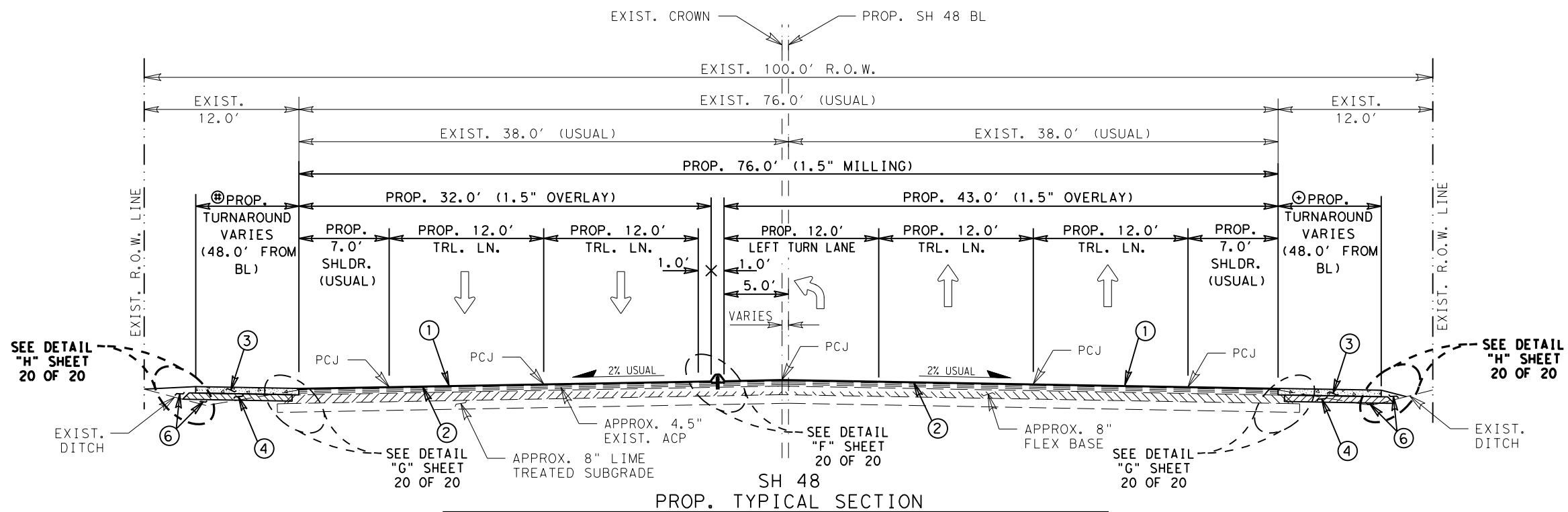
BONDING COURSE - 0.07 GAL/SY (APPROX)

FLEXIBLE BASE WT. - 3375 LB/CY (APPROX)

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

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

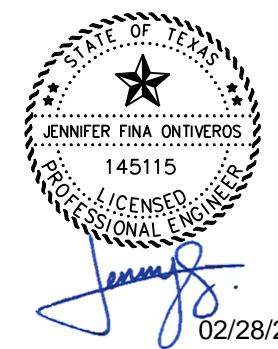
SEE PROPOSED PLAN LAYOUT FOR CONCRETE MEDIAN DETAILS.



**NOTE:**  
 1.0' GAP OPENING AT RAISED CONCRETE MEDIAN FOR DRAINAGE ACCESS.

- LEGEND:**
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② BONDING COURSE (TBWC) (MEMBRANE)
  - ③ PROPOSED 6" CONC. (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROOF ROLL SUBGRADE
  - ⑥ EMBANKMENT (SUBSIDIARY TO DRIVEWAY ITEM)

- BL - BASE LINE
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRN. LN. - TURN LANE
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- WT. - WEIGHT
- CONC. - CONCRETE
- PAV. - PAVEMENT
- F-F - FACE TO FACE
- PCJ - PREMISSABLE CONSTRUCTION JOINT
- ACP - ASPHAT CONCRETE PAVEMENT
- STA. - STATION
- TRANS. - TRANSITION
- APPROX. - APPROXIMATELY
- SHT. - SHEET



**Pharr District Central Design**

Texas Department of Transportation

**SH 48  
PROPOSED  
TYPICAL SECTIONS**

NOT TO SCALE SHEET 7 OF 20

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	23	

GENERAL NOTES

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

WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS, THE GOVERNING SLOPES MAY VARY AS DIRECTED BY THE ENGINEER.

PROPOSED TURNAROUNDS TO BE PAID UNDER ITEM 530. EXCAVATION, EMBANKMENT, BASE, AND PAVEMENT MATERIALS ARE SUBSIDIARY TO THIS ITEM.

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

A STATION IS EQUAL TO 100 FT.

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

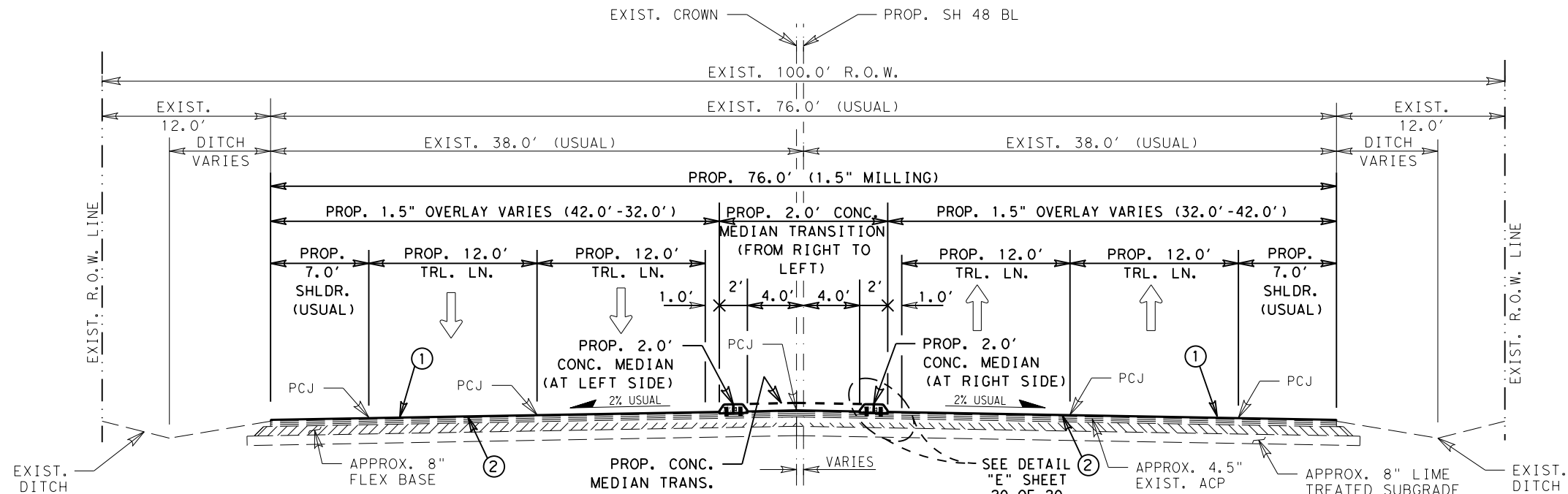
BONDING COURSE - 0.07 GAL/SY (APPROX)

FLEXIBLE BASE WT. - 3375 LB/CY (APPROX)

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

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

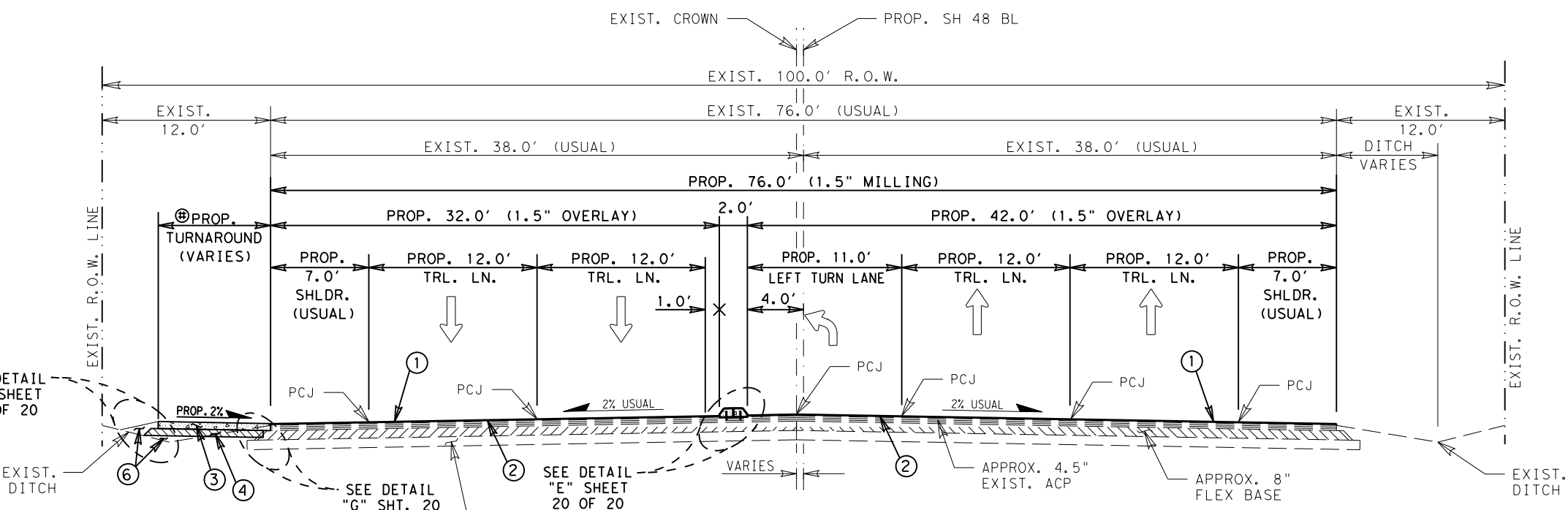
SEE PROPOSED PLAN LAYOUT FOR CONCRETE MEDIAN DETAILS.



SH 48  
PROP. TYPICAL SECTION

STA. 129+73.50 TO STA. 130+75.00  
 STA. 156+31.00 TO STA. 157+56.00  
 STA. 199+94.00 TO STA. 200+27.00

NOTE:  
 1.0' GAP OPENING AT RAISED CONCRETE MEDIAN FOR DRAINAGE ACCESS.  
 STA. 130+75.00 TO STA. 130+76.00  
 STA. 157+56.00 TO STA. 157+57.00  
 STA. 200+27.00 TO STA. 200+28.00



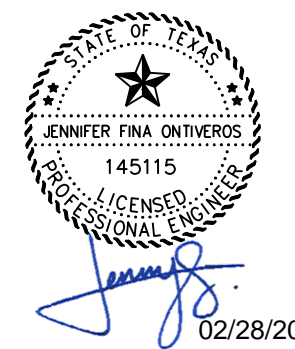
SH 48  
PROP. TYPICAL SECTION

STA. 130.76.00 TO STA. 135+83.00  
 STA. 137+99.00 TO STA. 140+57.00  
 STA. 167+46.00 TO STA. 170+91.00  
 STA. 181+19.00 TO STA. 184+71.00  
 STA. 134+96.00 TO STA. 135+88.00 - (47.0' FROM SH 48 BL)  
 STA. 184+35.00 TO STA. 184+90.00 - (48.0' FROM SH 48 BL)

NOTE:  
 NO RAISED CONCRETE MEDIAN AT INTERSECTIONS:  
 STA. 135+83.00 TO STA. 136+92.00 - E. PRICE RD.  
 STA. 140+57.00 TO STA. 141+71.00 - ROBINDALE/FRUITDALE DR.  
 STA. 170+91.00 TO STA. 172+21.00 - AUSTIN RD.  
 STA. 184+71.00 TO STA. 185+85.00 - N. CENTRAL AVE.

LEGEND:

- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
- ② BONDING COURSE (TBWC) (MEMBRANE)
- ③ PROPOSED 6" CONC. (DRIVEWAY)
- ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
- ⑤ PROOF ROLL SUBGRADE
- ⑥ EMBANKMENT (SUBSIDIARY TO DRIVEWAY ITEM)
- BL - BASE LINE
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRN. LN. - TURN LANE
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- WT. - WEIGHT
- CONC. - CONCRETE
- PAV. - PAVEMENT
- F-F - FACE TO FACE
- PCJ - PREMISSABLE CONSTRUCTION JOINT
- ACP - ASPHAT CONCRETE PAVEMENT
- STA. - STATION
- TRANS. - TRANSITION
- APPROX. - APPROXIMATELY
- SHT. - SHEET



Pharr District Central Design

Texas Department of Transportation

SH 48  
PROPOSED  
TYPICAL SECTIONS

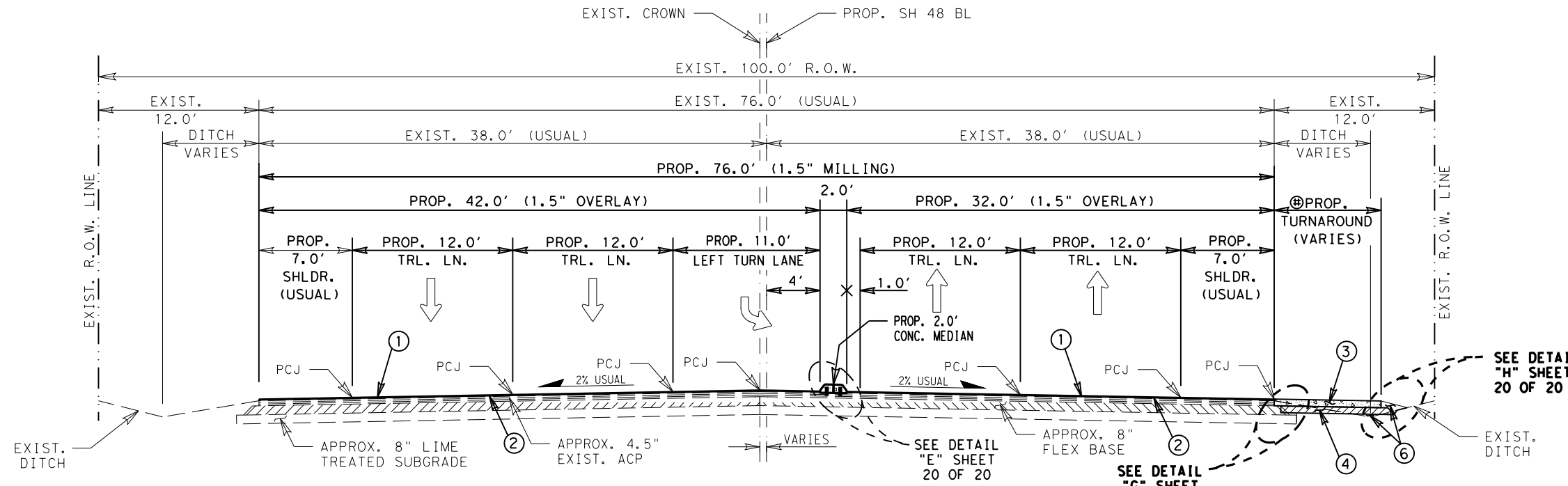
NOT TO SCALE SHEET 8 OF 20

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	24	

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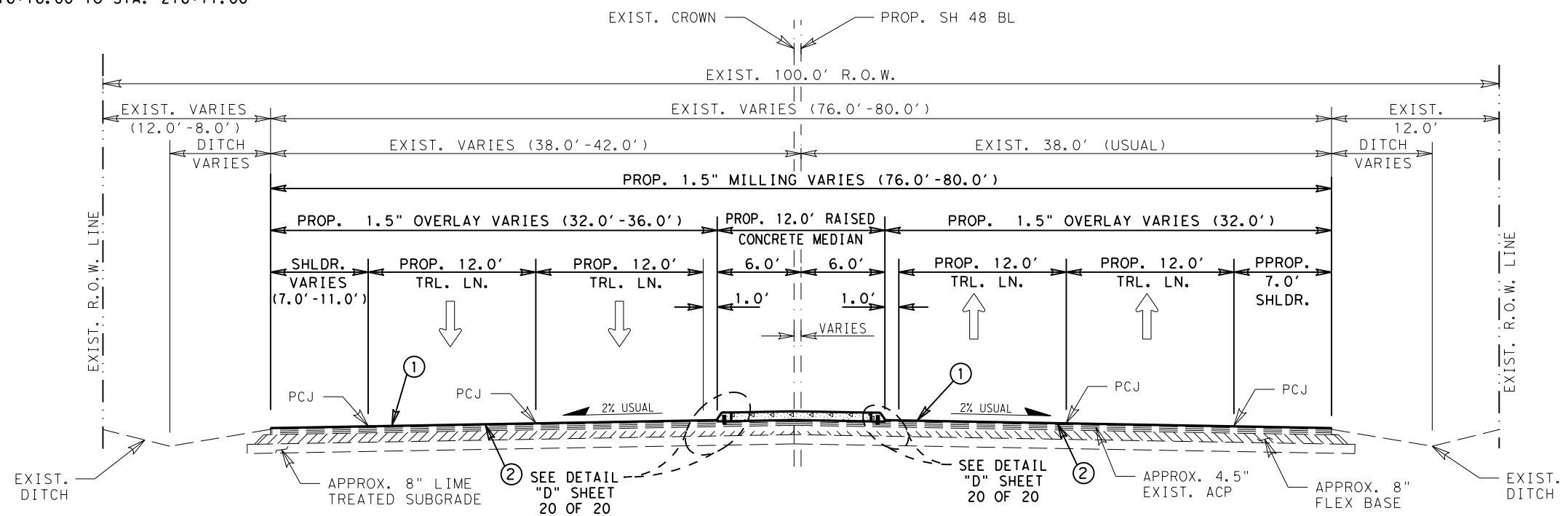
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**SH 48  
PROP. TYPICAL SECTION**

**NOTE:**  
 1.0' GAP OPENING AT RAISED CONCRETE MEDIAN FOR DRAINAGE ACCESS.  
 STA. 145+16.00 TO STA. 145+17.00  
 STA. 151+04.00 TO STA. 151+05.00  
 STA. 175+65.00 TO STA. 175+66.00  
 STA. 191+87.00 TO STA. 191+88.00  
 STA. 216+16.00 TO STA. 216+17.00

STA. 141+71.00 TO STA. 145+16.00	STA. 212+69.00 TO STA. 216+16.00
STA. 147+54.00 TO STA. 151+04.00	⊕ STA. 185+75.00 TO STA. 186+06.00 - SLOPE 2% RIGHT (48.0' FROM BL)
STA. 172+21.00 TO STA. 175+65.00	⊕ STA. 212+55.00 TO STA. 213+22.00 - SLOPE 2% LEFT (46.0' FROM BL)
STA. 185+85.00 TO STA. 191+87.00	



**SH 48  
PROP. TYPICAL SECTION**

STA. 225+60.00 TO STA. 226+02.00  
 STA. 226+02.00 TO STA. 227+31.20 - NO RAISED MEDIAN (COFFEE PORT RD.)

**GENERAL NOTES**

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

WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS, THE GOVERNING SLOPES MAY VARY AS DIRECTED BY THE ENGINEER.

PROPOSED TURNAROUNDS TO BE PAID UNDER ITEM 530. EXCAVATION, EMBANKMENT, BASE, AND PAVEMENT MATERIALS ARE SUBSIDIARY TO THIS ITEM.

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

A STATION IS EQUAL TO 100 FT.

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

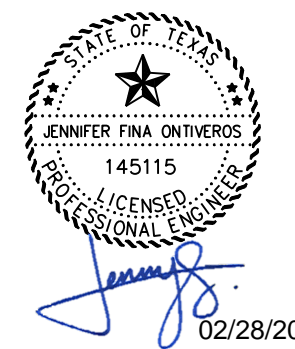
BONDING COURSE - 0.07 GAL/SY (APPROX)

FLEXIBLE BASE WT. - 3375 LB/CY (APPROX)

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

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

SEE PROPOSED PLAN LAYOUT FOR CONCRETE MEDIAN DETAILS.



**Pharr District Central Design**

**Texas Department of Transportation**

**SH 48  
PROPOSED  
TYPICAL SECTIONS**

NOT TO SCALE SHEET 9 OF 20

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	25	

**LEGEND:**

① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)	④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.	BL - BASE LINE	TRL. LN. - TRAVEL LANE	PCJ. - PREMISSABLE CONSTRUCTION JOINT
② BONDING COURSE (TBWC) (MEMBRANE)	⑤ PROOF ROLL SUBGRADE	PROP. - PROPOSED	SHLDR. - SHOULDER	ACP - ASPHAT CONCRETE PAVEMENT
③ PROPOSED 6" CONC. (DRIVEWAY)	⑥ EMBANKMENT (SUBSIDIARY COMBINATION ITEM) (TY C)	EXIST. - EXISTING	WT. - WEIGHT	STA. - STATION
		R.O.W. - RIGHT OF WAY	CONC. - CONCRETE	TRANS. - TRANSITION
		RDWY. - ROADWAY	PAV. - PAVEMENT	APPROX. - APPROXIMATELY
		TRR. LN. - TURNPIKELANE	F-F - FACE TO FACE	SHT. - SHEET

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**GENERAL NOTES**

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

WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS, THE GOVERNING SLOPES MAY VARY AS DIRECTED BY THE ENGINEER.

PROPOSED TURNAROUNDS TO BE PAID UNDER ITEM 530. EXCAVATION, EMBANKMENT, BASE, AND PAVEMENT MATERIALS ARE SUBSIDIARY TO THIS ITEM.

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

A STATION IS EQUAL TO 100 FT.

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

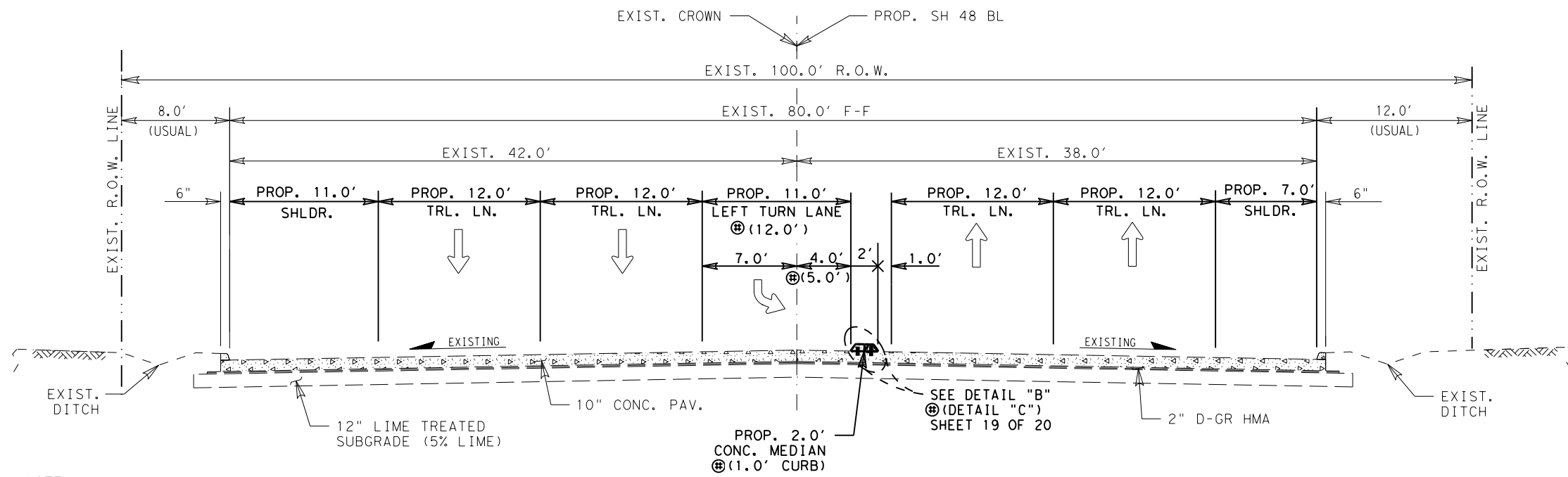
BONDING COURSE - 0.07 GAL/SY (APPROX)

FLEXIBLE BASE WT. - 3375 LB/CY (APPROX)

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

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

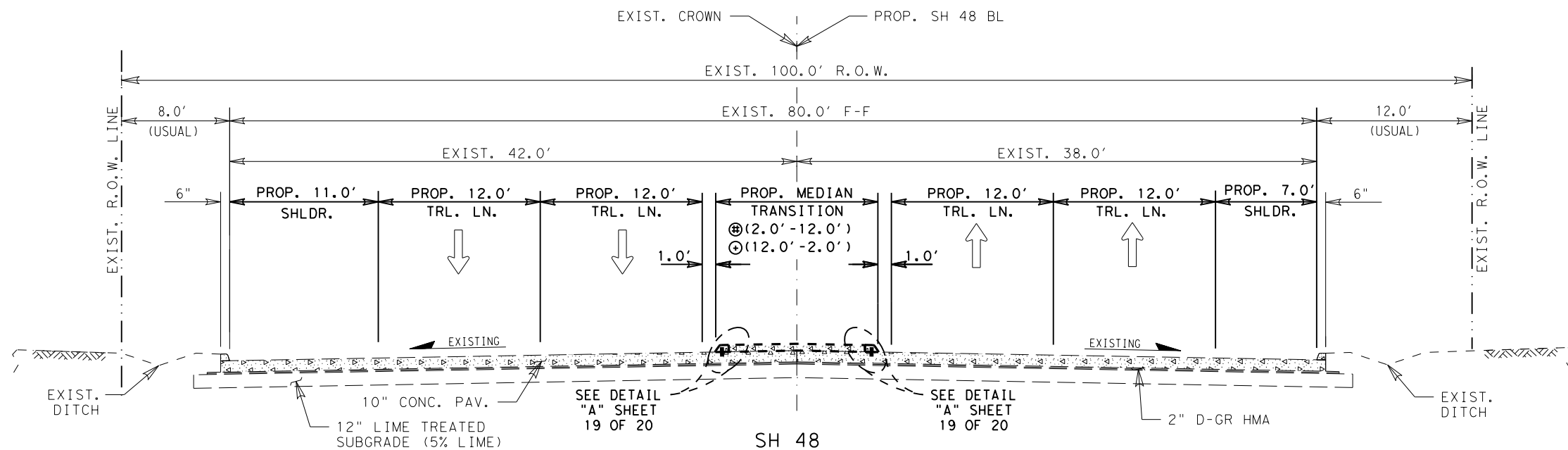
SEE PROPOSED PLAN LAYOUT FOR CONCRETE MEDIAN DETAILS.



**NOTE:**  
 1.0' GAP OPENING AT RAISED CONCRETE MEDIAN FOR DRAINAGE ACCESS.  
 STA. 230+94.00 TO STA. 230+95.00  
 STA. 237+79.00 TO STA. 237+80.00

**SH 48  
 PROP. TYPICAL SECTION**

⊕ STA. 227+31.20 TO STA. 227+44.00 - NO CONCRETE MEDIAN (COFFEE PORT RD.)  
 ⊕ STA. 227+44.00 TO STA. 230+94.00  
 ⊕ STA. 237+57.50 TO STA. 237+79.00



**NOTE:**  
 1.0' GAP OPENING AT RAISED CONCRETE MEDIAN FOR DRAINAGE ACCESS.  
 STA. 234+13.00 TO STA. 234+14.00  
 STA. 239+12.00 TO STA. 239+13.00

**SH 48  
 PROP. TYPICAL SECTION**

⊕ STA. 230+95.00 TO STA. 231+96.00  
 ⊕ STA. 233+12.00 TO STA. 234+13.00  
 ⊕ STA. 237+80.00 TO STA. 238+04.00  
 ⊕ STA. 238+11.00 TO STA. 239+12.00



**Pharr District Central Design**



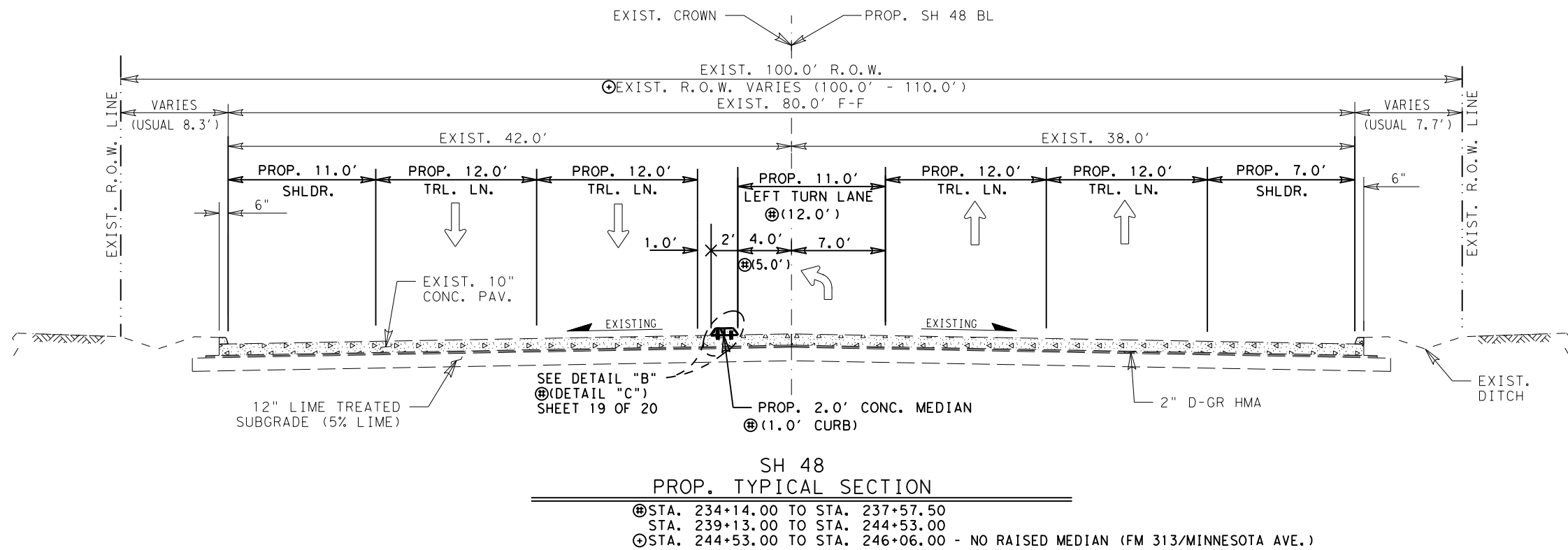
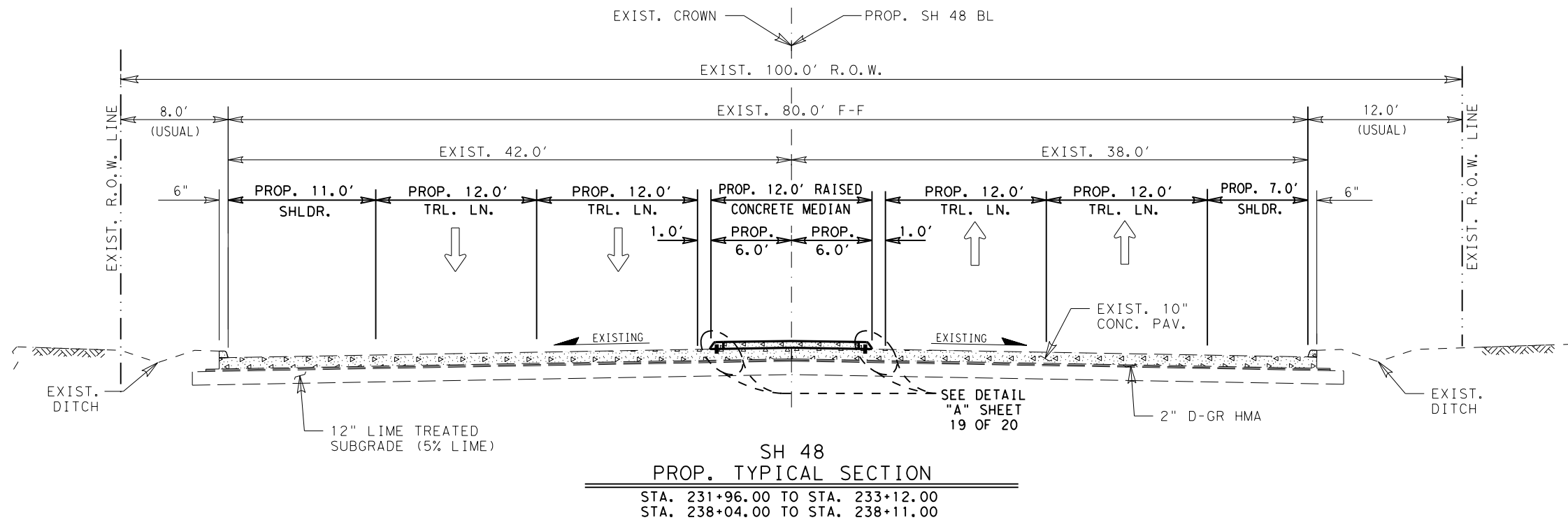
**SH 48  
 PROPOSED  
 TYPICAL SECTIONS**

**LEGEND:**

- |  |   |                       |                        |                                      |
|--|---|-----------------------|------------------------|--------------------------------------|
| ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY) | ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT. | BL - BASE LINE        | TRL. LN. - TRAVEL LANE | PCJ - PREMISSABLE CONSTRUCTION JOINT |
| ② BONDING COURSE (TBWC) (MEMBRANE)                   | ⑤ PROOF ROLL SUBGRADE                                 | PROP. - PROPOSED      | SHLDR. - SHOULDER      | ACP - ASPHAT CONCRETE PAVEMENT       |
| ③ PROPOSED 6" CONC. (DRIVEWAY)                       | ⑥ EMBANKMENT (SUBSIDIARY TO DRIVEWAY ITEM)            | EXIST. - EXISTING     | WT. - WEIGHT           | STA. - STATION                       |
|  |   | R.O.W. - RIGHT OF WAY | CONC. - CONCRETE       | TRANS. - TRANSITION                  |
|  |   | RDWY. - ROADWAY       | PAV. - PAVEMENT        | APPROX. - APPROXIMATELY              |
|  |   | TRN. LN. - TURN LANE  | F-F - FACE TO FACE     | SHT. - SHEET                         |

NOT TO SCALE				SHEET 10 OF 20	
© 2022	CONT	SECT	JOB	HIGHWAY	
	0220	05	080	SH 48	
	DIST		COUNTY	SHEET NO.	
	PHR		CAMERON	26	

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GENERAL NOTES

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

WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS, THE GOVERNING SLOPES MAY VARY AS DIRECTED BY THE ENGINEER.

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

A STATION IS EQUAL TO 100 FT.

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

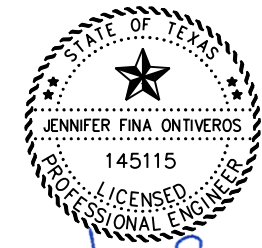
BONDING COURSE - 0.07 GAL/SY (APPROX)

FLEXIBLE BASE WT. - 3375 LB/CY (APPROX)

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

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

SEE PROPOSED PLAN LAYOUT FOR CONCRETE MEDIAN DETAILS.



*Jennifer Fina Ontiveros*  
 02/28/2023

**Pharr District Central Design**

Texas Department of Transportation

**SH 48  
 PROPOSED  
 TYPICAL SECTIONS**

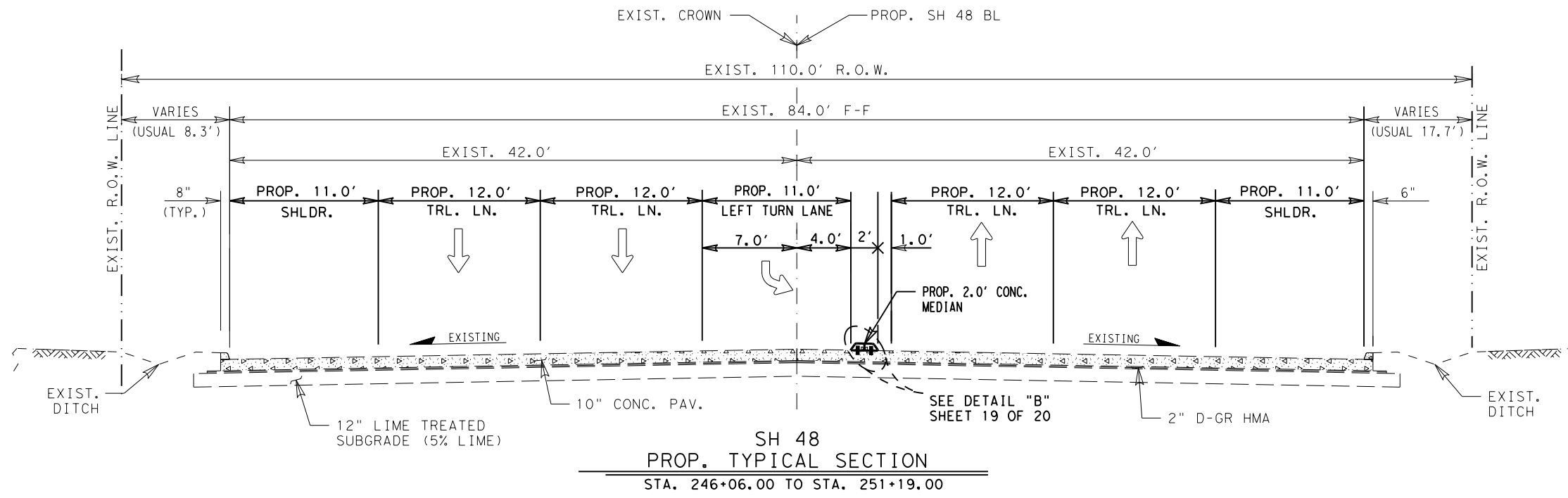
- LEGEND:
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② BONDING COURSE (TBWC) (MEMBRANE)
  - ③ PROPOSED 6" CONC. (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROOF ROLL SUBGRADE
  - ⑥ EMBANKMENT (SUBSIDIARY TO DRIVEWAY ITEM)

- BL - BASE LINE
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRN. LN. - TURN LANE
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- WT. - WEIGHT
- CONC. - CONCRETE
- PAV. - PAVEMENT
- F-F - FACE TO FACE
- PCJ - PREMISSABLE CONSTRUCTION JOINT
- ACP - ASPHAT CONCRETE PAVEMENT
- STA. - STATION
- TRANS. - TRANSITION
- APPROX. - APPROXIMATELY
- SHT. - SHEET

NOT TO SCALE SHEET 11 OF 20

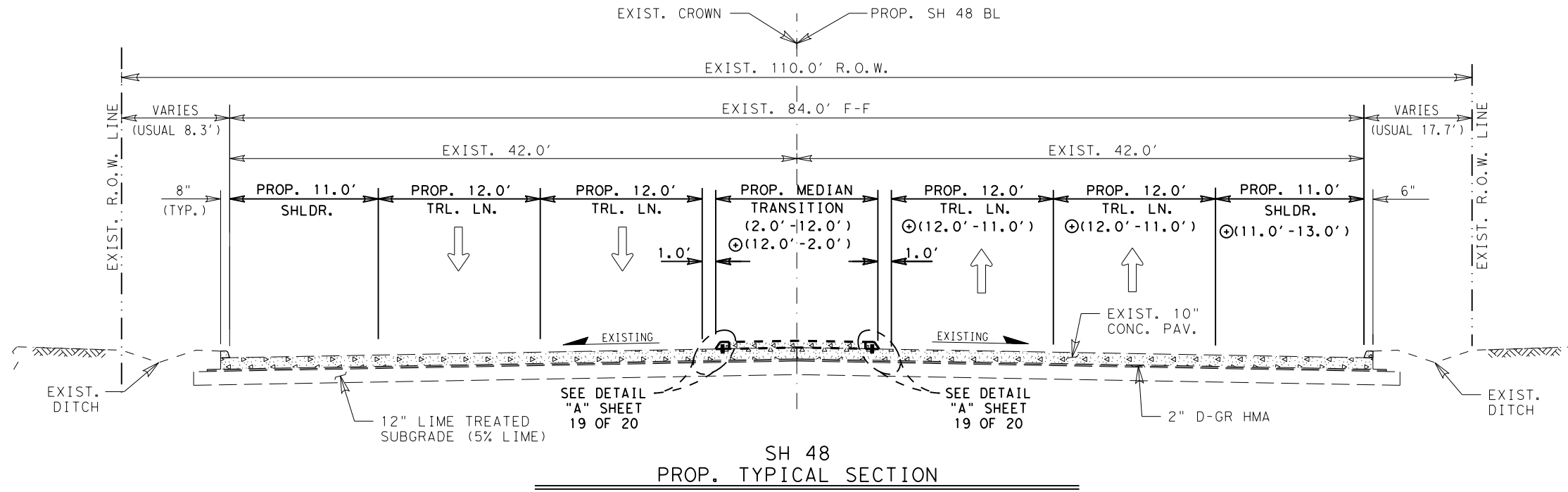
CONT	SECT	JOB	HIGHWAY
0220	05	080	SH 48
DIST		COUNTY	SHEET NO.
PHR		CAMERON	27

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**SH 48  
 PROP. TYPICAL SECTION**  
 STA. 246+06.00 TO STA. 251+19.00

**NOTE:**  
 1.0' GAP OPENING AT RAISED CONCRETE  
 MEDIAN FOR DRAINAGE ACCESS.  
 STA. 251+19.00 TO STA. 251+20.00



**SH 48  
 PROP. TYPICAL SECTION**  
 STA. 251+20.00 TO STA. 252+21.00  
 ⊙ STA. 252+55.00 TO STA. 253+56.00

**NOTE:**  
 1.0' GAP OPENING AT RAISED CONCRETE  
 MEDIAN FOR DRAINAGE ACCESS.  
 STA. 253+56.00 TO STA. 253+57.00

- LEGEND:**
- |  |   |
|--|---|
| ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY) | ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT. |
| ② BONDING COURSE (TBWC) (MEMBRANE)                   | ⑤ PROOF ROLL SUBGRADE                                 |
| ③ PROPOSED 6" CONC. (DRIVEWAY)                       | ⑥ EMBANKMENT (SUBSIDIARY TO DRIVEWAY ITEM)            |

- |                       |                        |                                      |
|-----------------------|------------------------|--------------------------------------|
| BL - BASE LINE        | TRL. LN. - TRAVEL LANE | PCJ - PREMISSABLE CONSTRUCTION JOINT |
| PROP. - PROPOSED      | SHLDR. - SHOULDER      | ACP - ASPHAT CONCRETE PAVEMENT       |
| EXIST. - EXISTING     | WT. - WEIGHT           | STA. - STATION                       |
| R.O.W. - RIGHT OF WAY | CONC. - CONCRETE       | TRANS. - TRANSITION                  |
| R.WY. - ROADWAY       | PAV. - PAVEMENT        | APPROX. - APPROXIMATELY              |
| TRN. LN. - TURN LANE  | F-F - FACE TO FACE     | SHT. - SHEET                         |

**GENERAL NOTES**

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

WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS, THE GOVERNING SLOPES MAY VARY AS DIRECTED BY THE ENGINEER.

PROPOSED TURNAROUNDS TO BE PAID UNDER ITEM 530. EXCAVATION, EMBANKMENT, BASE, AND PAVEMENT MATERIALS ARE SUBSIDIARY TO THIS ITEM.

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

A STATION IS EQUAL TO 100 FT.

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

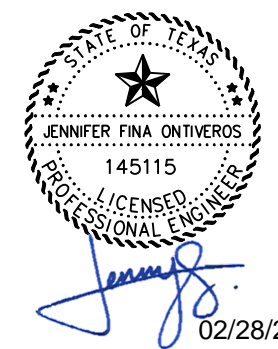
BONDING COURSE - 0.07 GAL/SY (APPROX)

FLEXIBLE BASE WT. - 3375 LB/CY (APPROX)

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

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

SEE PROPOSED PLAN LAYOUT FOR CONCRETE MEDIAN DETAILS.



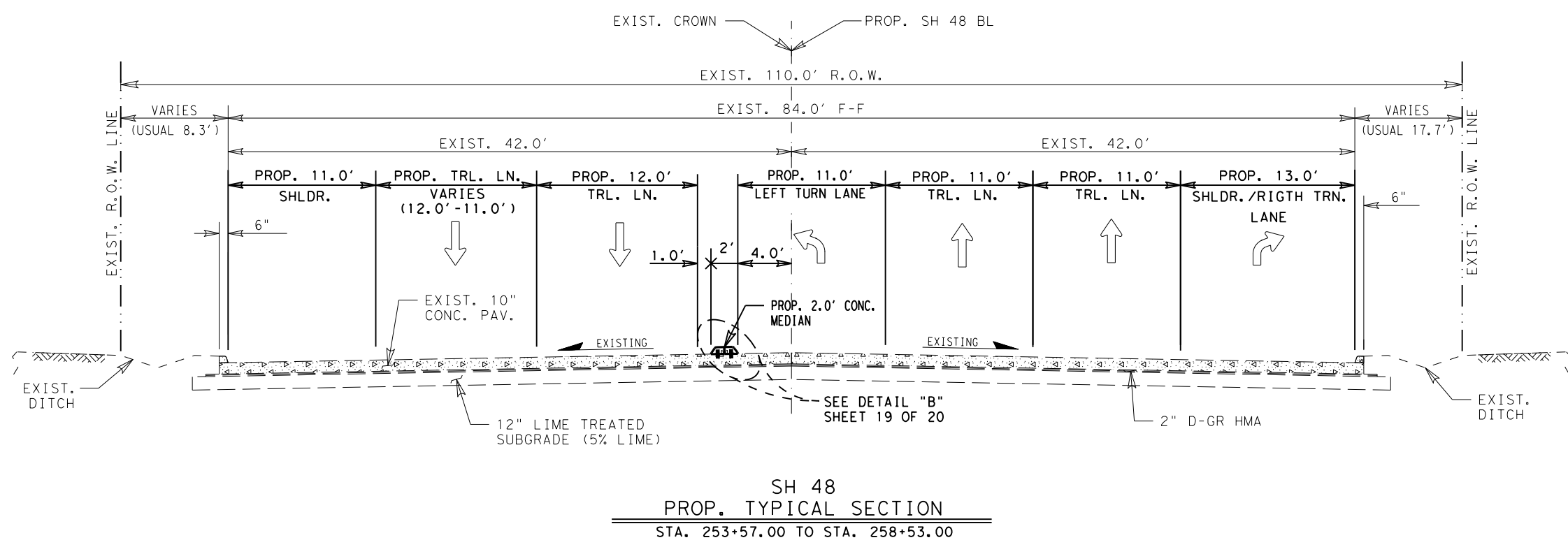
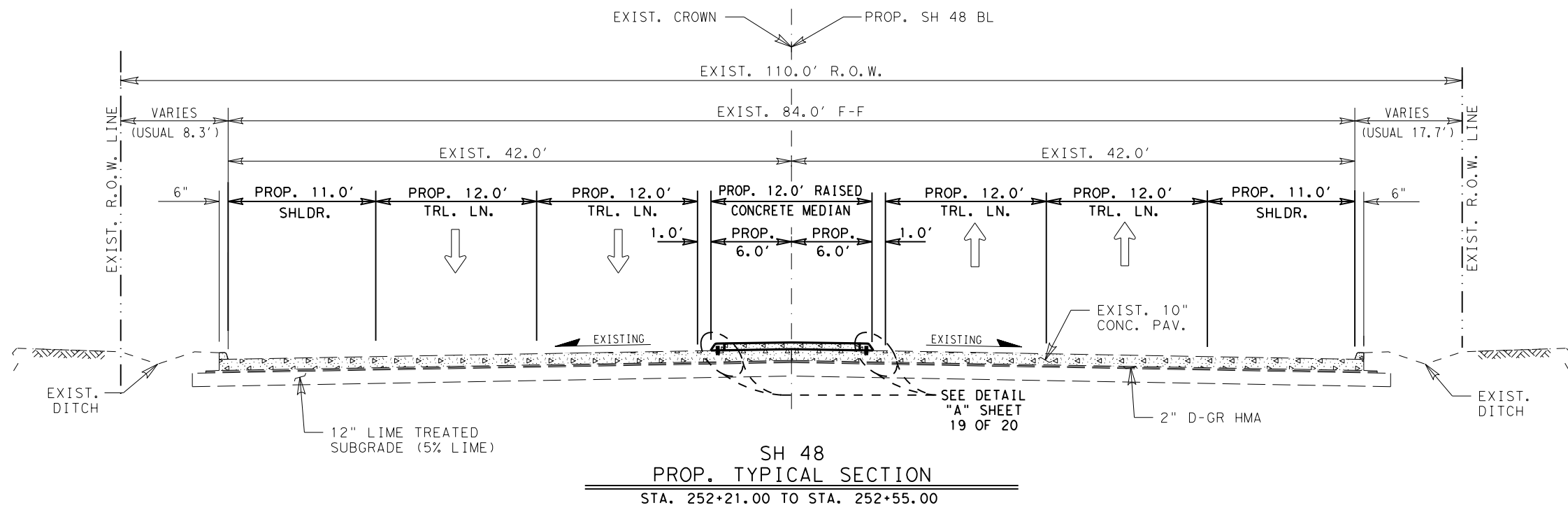
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**Texas Department of Transportation**

**SH 48  
 PROPOSED  
 TYPICAL SECTIONS**

NOT TO SCALE		SHEET 12 OF 20	
© 2022	CONT	SECT	JOB
	0220	05	080
	DIST	COUNTY	SH 48
	PHR	CAMERON	SHEET NO.
			28

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**GENERAL NOTES**

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

WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS, THE GOVERNING SLOPES MAY VARY AS DIRECTED BY THE ENGINEER.

PROPOSED TURNAROUNDS TO BE PAID UNDER ITEM 530. EXCAVATION, EMBANKMENT, BASE, AND PAVEMENT MATERIALS ARE SUBSIDIARY TO THIS ITEM.

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

A STATION IS EQUAL TO 100 FT.

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

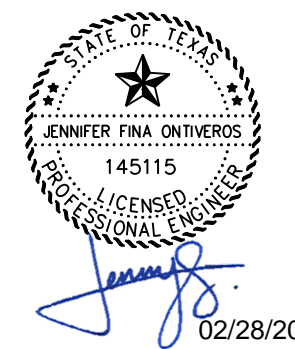
BONDING COURSE - 0.07 GAL/SY (APPROX)

FLEXIBLE BASE WT. - 3375 LB/CY (APPROX)

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

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

SEE PROPOSED PLAN LAYOUT FOR CONCRETE MEDIAN DETAILS.



**Pharr District Central Design**

**Texas Department of Transportation**

**SH 48  
PROPOSED  
TYPICAL SECTIONS**

NOT TO SCALE SHEET 13 OF 20

CONT	SECT	JOB	HIGHWAY
0220	05	080	SH 48
DIST		COUNTY	SHEET NO.
PHR		CAMERON	29

**LEGEND:**

① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)	④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.	BL - BASE LINE	TRL. LN. - TRAVEL LANE	PCJ - PREMISSABLE CONSTRUCTION JOINT
② BONDING COURSE (TBWC) (MEMBRANE)	⑤ PROOF ROLL SUBGRADE	PROP. - PROPOSED	SHLDR. - SHOULDER	ACP - ASPHAT CONCRETE PAVEMENT
③ PROPOSED 6" CONC. (DRIVEWAY)	⑥ EMBANKMENT (SUBSIDIARY TO DRIVEWAY ITEM)	EXIST. - EXISTING	WT. - WEIGHT	STA. - STATION
		R.O.W. - RIGHT OF WAY	CONC. - CONCRETE	TRANS. - TRANSITION
		RDWY. - ROADWAY	PAV. - PAVEMENT	APPROX. - APPROXIMATELY
		TRN. LN. - TURN LANE	F-F - FACE TO FACE	SHT. - SHEET

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GENERAL NOTES

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

WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS, THE GOVERNING SLOPES MAY VARY AS DIRECTED BY THE ENGINEER.

PROPOSED TURNAROUNDS TO BE PAID UNDER ITEM 530. EXCAVATION, EMBANKMENT, BASE, AND PAVEMENT MATERIALS ARE SUBSIDIARY TO THIS ITEM.

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

A STATION IS EQUAL TO 100 FT.

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

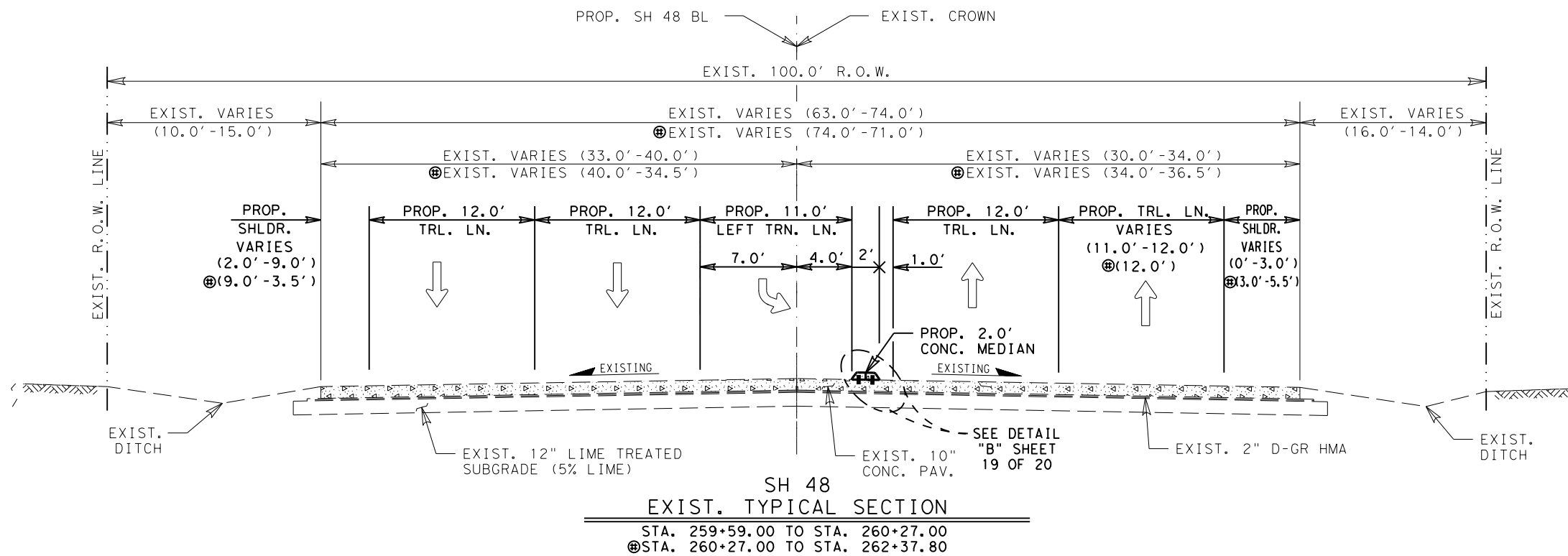
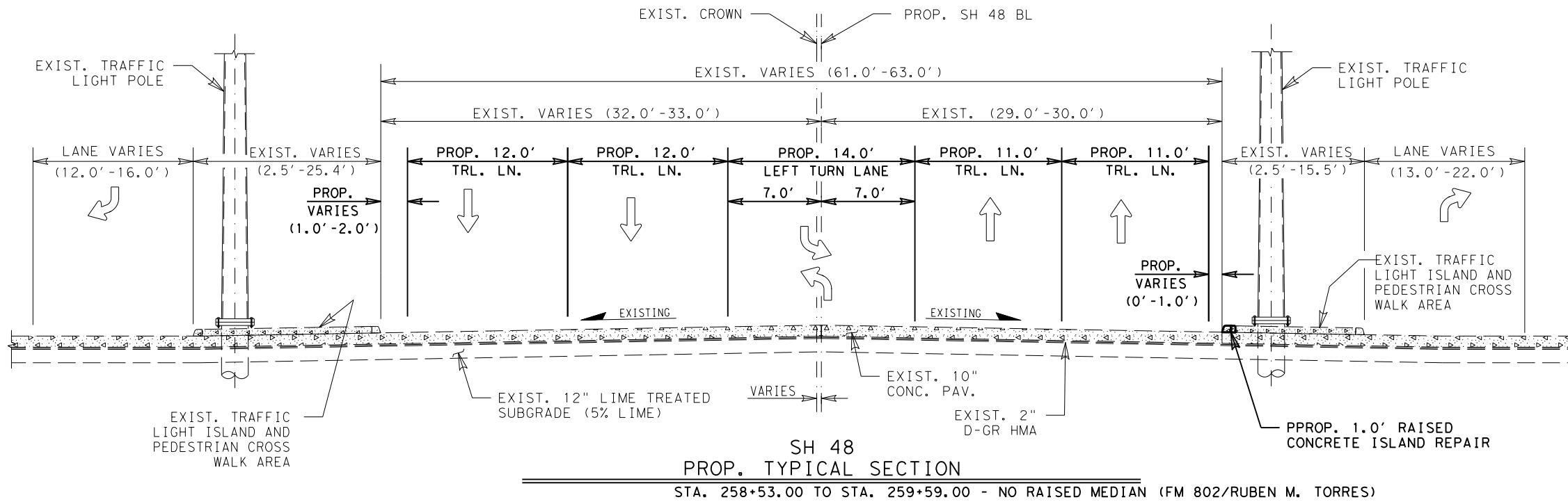
BONDING COURSE - 0.07 GAL/SY (APPROX)

FLEXIBLE BASE WT. - 3375 LB/CY (APPROX)

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

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

SEE PROPOSED PLAN LAYOUT FOR CONCRETE MEDIAN DETAILS.



Pharr District Central Design



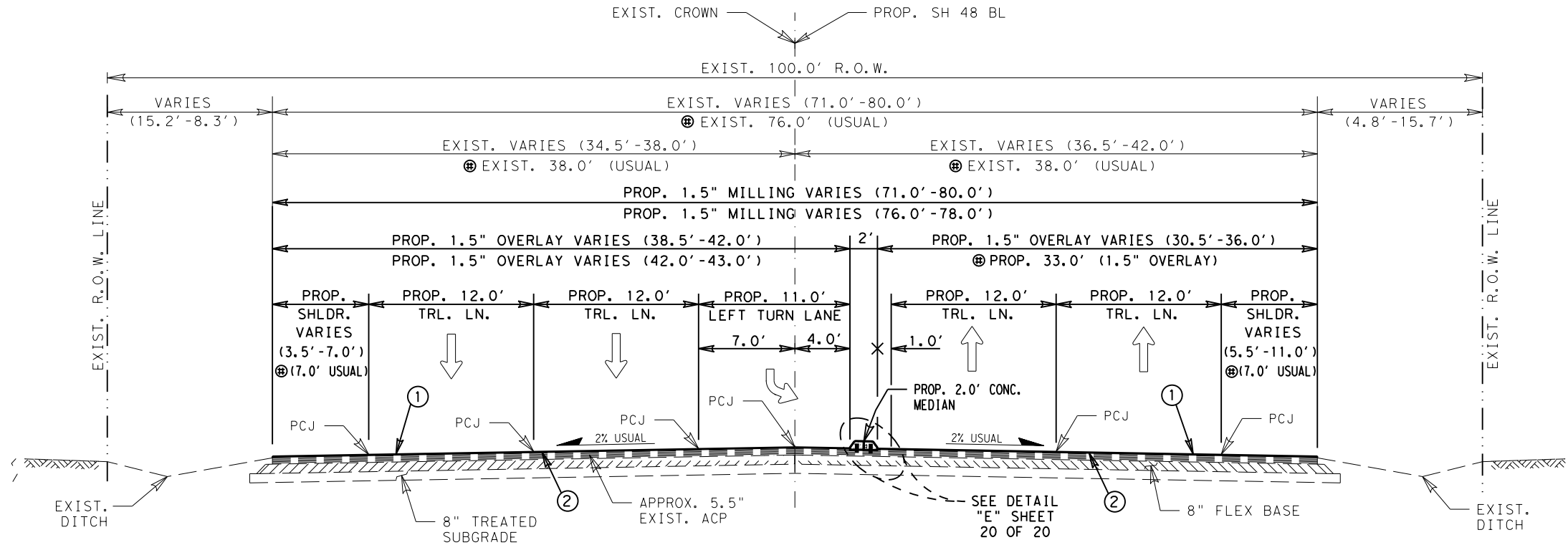
SH 48  
 PROPOSED  
 TYPICAL SECTIONS

- LEGEND:
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② BONDING COURSE (TBWC) (MEMBRANE)
  - ③ PROPOSED 6" CONC. (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROOF ROLL SUBGRADE
  - ⑥ EMBANKMENT (SUBSIDIARY TO DRIVEWAY ITEM)

BL	- BASE LINE	TRL. LN.	- TRAVEL LANE	PCJ	- PREMISSABLE CONSTRUCTION JOINT
PROP.	- PROPOSED	SHLDR.	- SHOULDER	ACP	- ASPHAT CONCRETE PAVEMENT
EXIST.	- EXISTING	WT.	- WEIGHT	STA.	- STATION
R.O.W.	- RIGHT OF WAY	CONC.	- CONCRETE	TRANS.	- TRANSITION
RDWY.	- ROADWAY	PAV.	- PAVEMENT	APPROX.	- APPROXIMATELY
TRN. LN.	- TURN LANE	F-F	- FACE TO FACE	SHT.	- SHEET

NOT TO SCALE		SHEET 14 OF 20	
© 2022	CONT	SECT	JOB
	0220	05	080
	DIST		SH 48
	COUNTY		SHEET NO.
	CAMERON		30

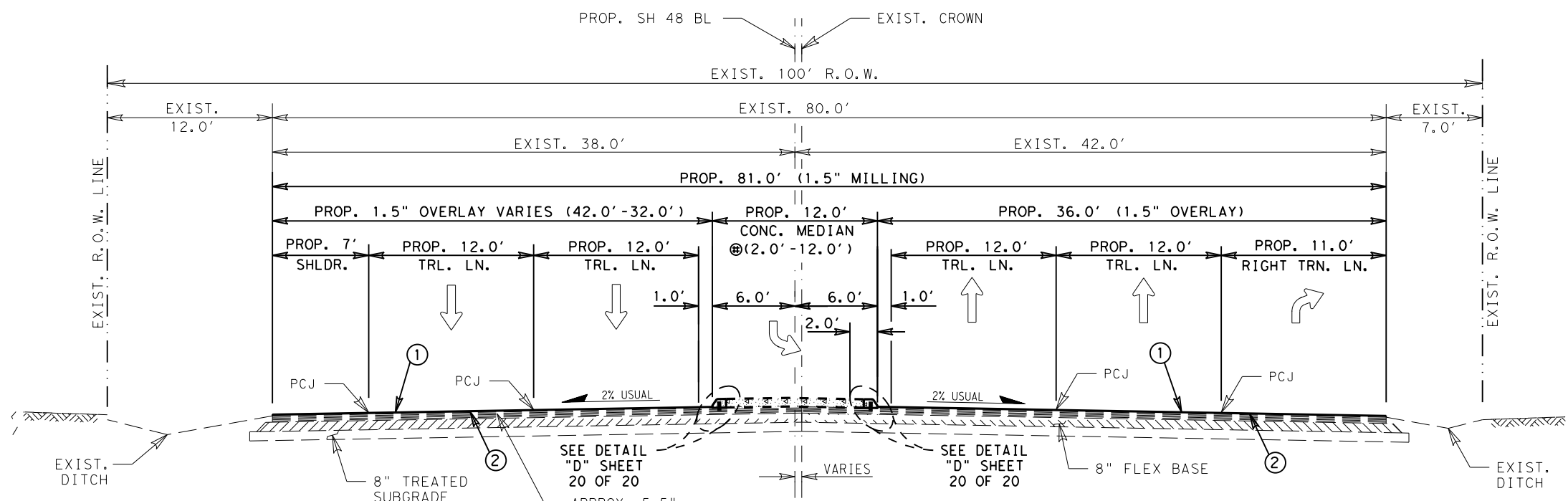
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**SH 48  
PROP. TYPICAL SECTION**

STA. 262+37.80 TO STA. 264+12.00  
⊕ STA. 266+77.00 TO STA. 270+27.00

**NOTE:**  
1.0' GAP OPENING AT RAISED CONCRETE  
MEDIAN FOR DRAINAGE ACCESS.  
STA. 264+12.00 TO STA. 264+13.00



**SH 48  
PROP. TYPICAL SECTION**

⊕ STA. 264+13.00 TO STA. 265+14.00  
STA. 265+14.00 TO STA. 265+65.00  
STA. 265+65.00 TO STA. 266+77.00 - NO RAISED MEDIAN (SOUTHWEST KEY ENTRANCE/EXIT)

**LEGEND:**

- |  |   |                       |                        |                                      |
|--|---|-----------------------|------------------------|--------------------------------------|
| ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY) | ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT. | BL - BASE LINE        | TRL. LN. - TRAVEL LANE | PCJ - PREMISSABLE CONSTRUCTION JOINT |
| ② BONDING COURSE (TBWC) (MEMBRANE)                   | ⑤ PROOF ROLL SUBGRADE                                 | PROP. - PROPOSED      | SHLDR. - SHOULDER      | ACP - ASPHAT CONCRETE PAVEMENT       |
| ③ PROPOSED 6" CONC. (DRIVEWAY)                       | ⑥ EMBANKMENT (SUBSIDIARY TO DRIVEWAY ITEM)            | EXIST. - EXISTING     | WT. - WEIGHT           | STA. - STATION                       |
|  |   | R.O.W. - RIGHT OF WAY | CONC. - CONCRETE       | TRANS. - TRANSITION                  |
|  |   | RDWY. - ROADWAY       | PAV. - PAVEMENT        | APPROX. - APPROXIMATELY              |
|  |   | TRN. LN. - TURN LANE  | F-F - FACE TO FACE     | SHT. - SHEET                         |

**GENERAL NOTES**

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

WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS, THE GOVERNING SLOPES MAY VARY AS DIRECTED BY THE ENGINEER.

PROPOSED TURNAROUNDS TO BE PAID UNDER ITEM 530. EXCAVATION, EMBANKMENT, BASE, AND PAVEMENT MATERIALS ARE SUBSIDIARY TO THIS ITEM.

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

A STATION IS EQUAL TO 100 FT.  
114 LBS/SY IS EQUIVALENT TO 1" OF ACP.

BONDING COURSE - 0.07 GAL/SY (APPROX)

FLEXIBLE BASE WT. - 3375 LB/CY (APPROX)

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

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

SEE PROPOSED PLAN LAYOUT FOR CONCRETE MEDIAN DETAILS.



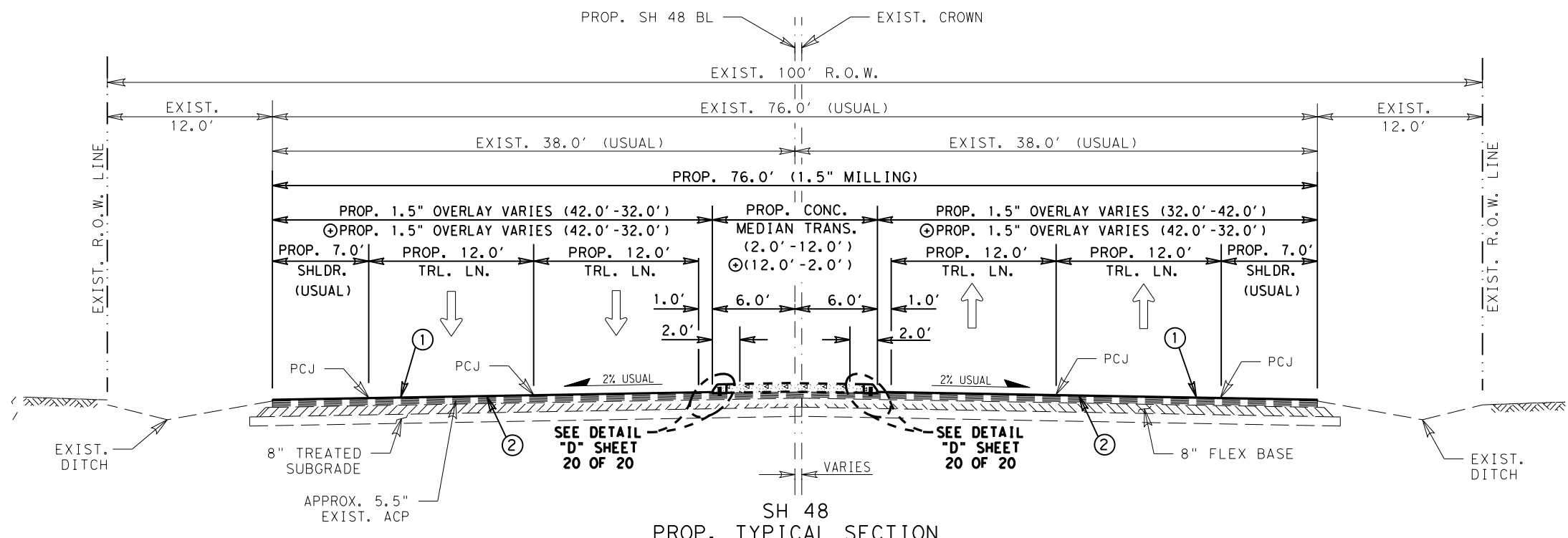
**Pharr District Central Design**



**SH 48  
PROPOSED  
TYPICAL SECTIONS**

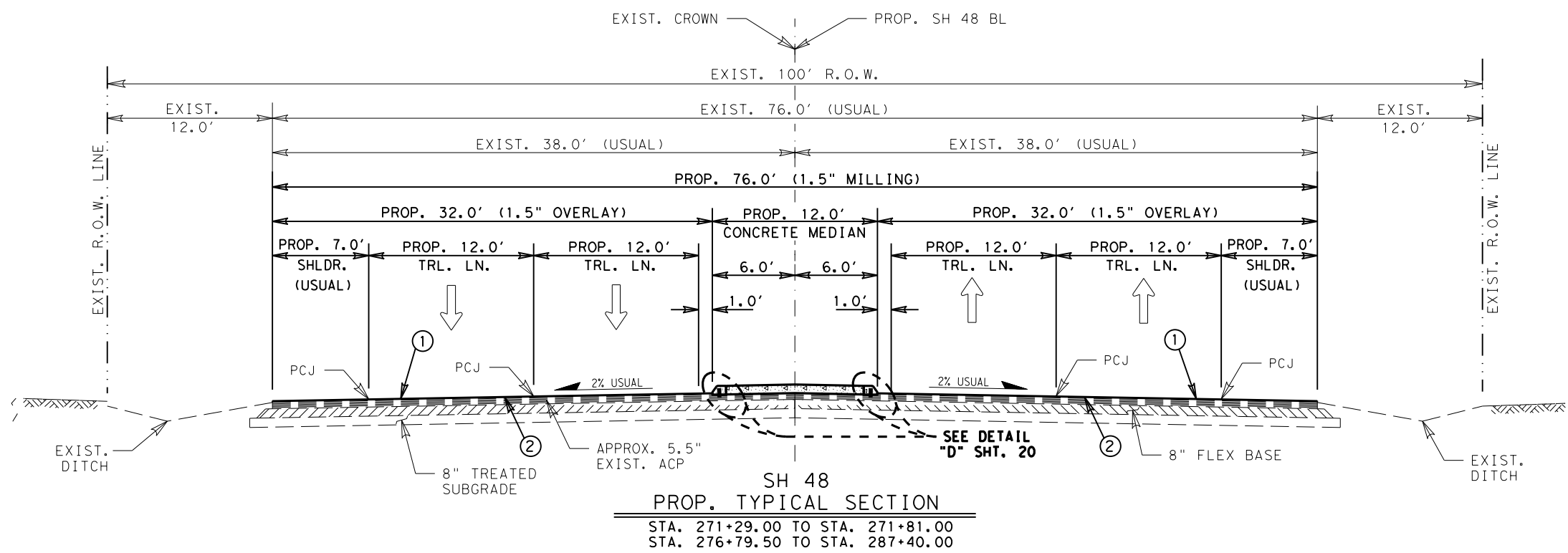
NOT TO SCALE		SHEET 15 OF 20	
0220	05	080	SH 48
DIST		COUNTY	SHEET NO.
PHR		CAMERON	31

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**NOTE:**  
 1.0' GAP OPENING AT RAISED CONCRETE  
 MEDIAN FOR DRAINAGE ACCESS.

STA. 270+27.00 TO STA. 270+28.00  
 STA. 272+05.00 TO STA. 272+06.00  
 STA. 288+41.00 TO STA. 288+42.00



**LEGEND:**

① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)	④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.	BL - BASE LINE	TRL. LN. - TRAVEL LANE	PCJ - PREMISSABLE CONSTRUCTION JOINT
② BONDING COURSE (TBWC) (MEMBRANE)	⑤ PROOF ROLL SUBGRADE	PROP. - PROPOSED	SHLDR. - SHOULDER	ACP - ASPHAT CONCRETE PAVEMENT
③ PROPOSED 6" CONC. (DRIVEWAY)	⑥ EMBANKMENT (SUBSIDIARY TO DRIVEWAY ITEM)	EXIST. - EXISTING	WT. - WEIGHT	STA. - STATION
		R.O.W. - RIGHT OF WAY	CONC. - CONCRETE	TRANS. - TRANSITION
		RWDY. - ROADWAY	PAV. - PAVEMENT	APPROX. - APPROXIMATELY
		TRN. LN. - TURN LANE	F-F - FACE TO FACE	SHT. - SHEET

**GENERAL NOTES**

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

WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS, THE GOVERNING SLOPES MAY VARY AS DIRECTED BY THE ENGINEER.

PROPOSED TURNAROUNDS TO BE PAID UNDER ITEM 530. EXCAVATION, EMBANKMENT, BASE, AND PAVEMENT MATERIALS ARE SUBSIDIARY TO THIS ITEM.

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

A STATION IS EQUAL TO 100 FT.

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

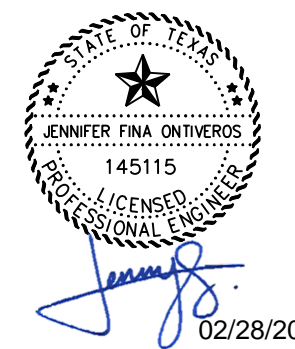
BONDING COURSE - 0.07 GAL/SY (APPROX)

FLEXIBLE BASE WT. - 3375 LB/CY (APPROX)

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

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

SEE PROPOSED PLAN LAYOUT FOR CONCRETE MEDIAN DETAILS.



**Pharr District Central Design**

**Texas Department of Transportation**

**SH 48  
PROPOSED  
TYPICAL SECTIONS**

NOT TO SCALE		SHEET 16 OF 20	
© 2022	CONT	SECT	JOB
0220	05	080	SH 48
DIST	COUNTY		SHEET NO.
PHR	CAMERON		32



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GENERAL NOTES

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

WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS, THE GOVERNING SLOPES MAY VARY AS DIRECTED BY THE ENGINEER.

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A STATION IS EQUAL TO 100 FT.

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

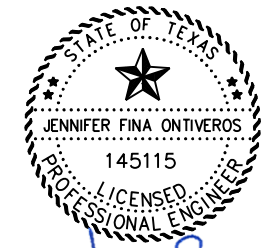
BONDING COURSE - 0.07 GAL/SY (APPROX)

FLEXIBLE BASE WT. - 3375 LB/CY (APPROX)

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

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

SEE PROPOSED PLAN LAYOUT FOR CONCRETE MEDIAN DETAILS.



*Jennifer Fina Ontiveros*  
 02/28/2023

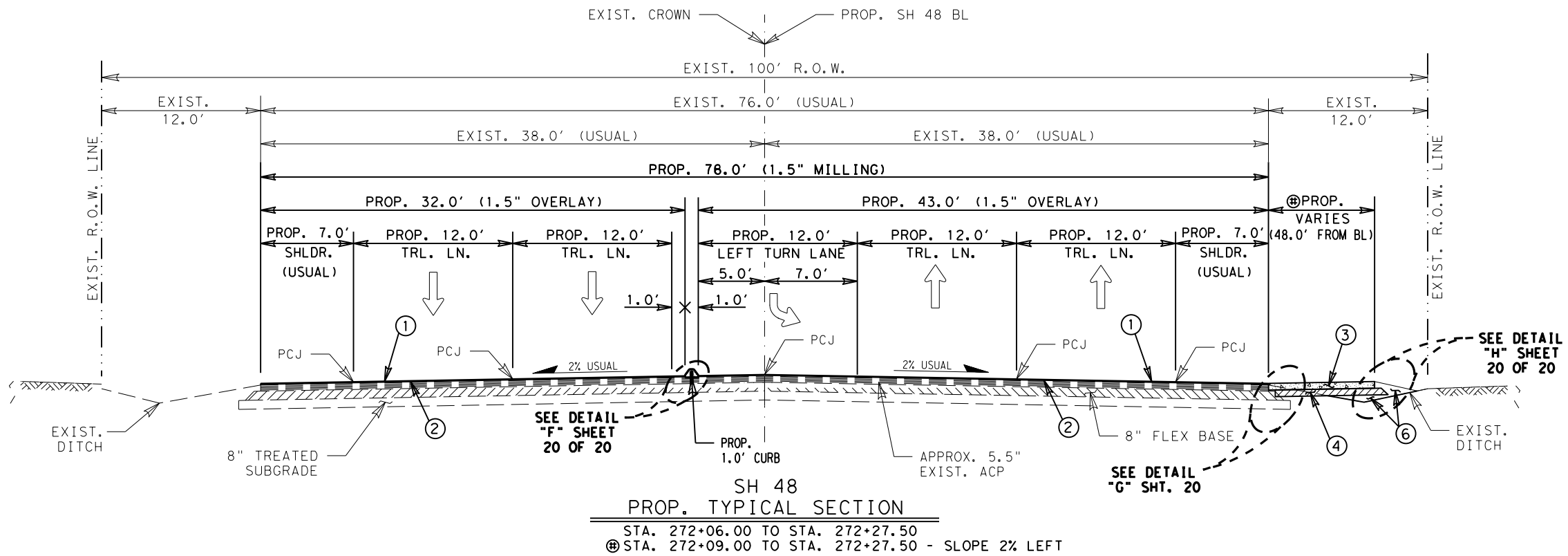
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Texas Department of Transportation

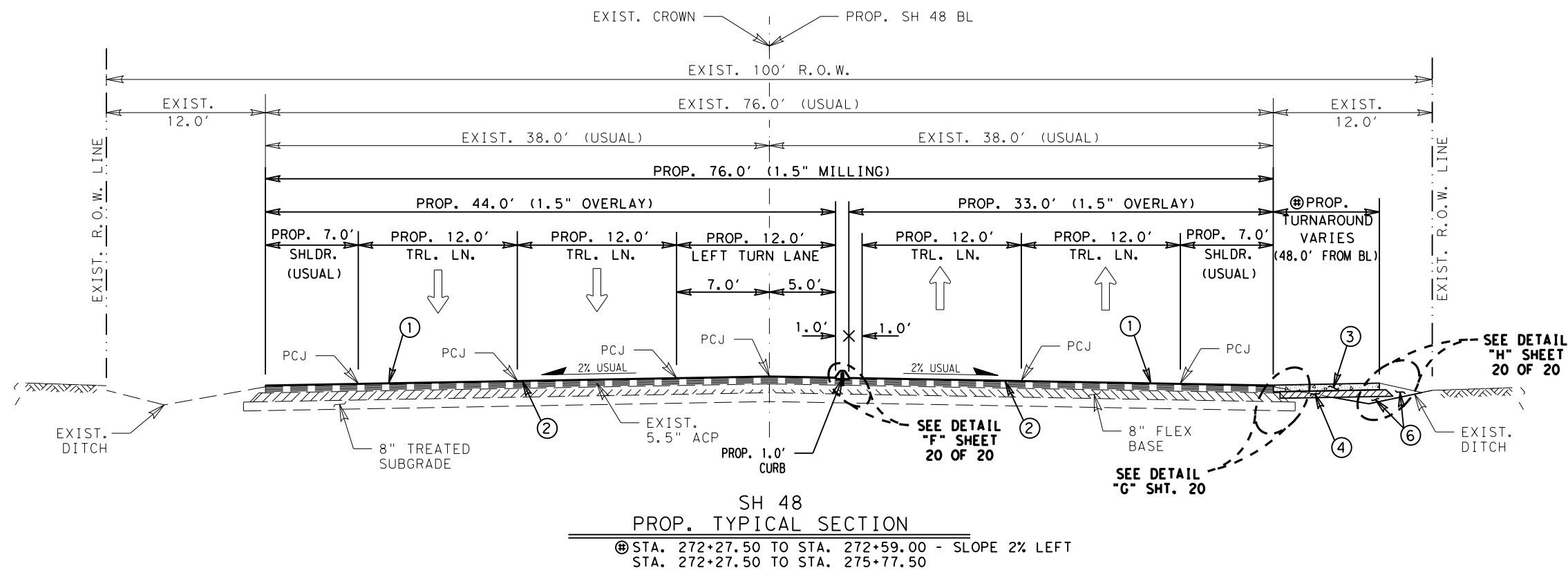
**SH 48  
 PROPOSED  
 TYPICAL SECTIONS**

NOT TO SCALE SHEET 17 OF 20

CONT	SECT	JOB	HIGHWAY
0220	05	080	SH 48
DIST		COUNTY	SHEET NO.
PHR		CAMERON	33



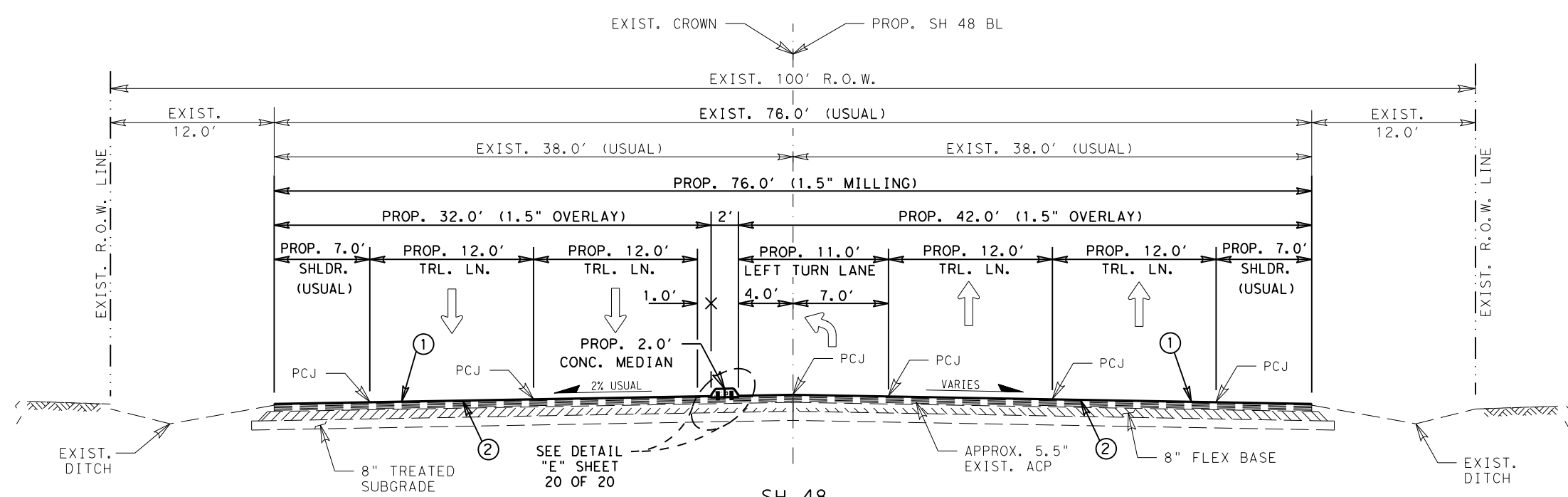
NOTE:  
 1.0' GAP OPENING AT RAISED CONCRETE MEDIAN FOR DRAINAGE ACCESS.  
 STA. 275+77.50 TO STA. 275+78.50



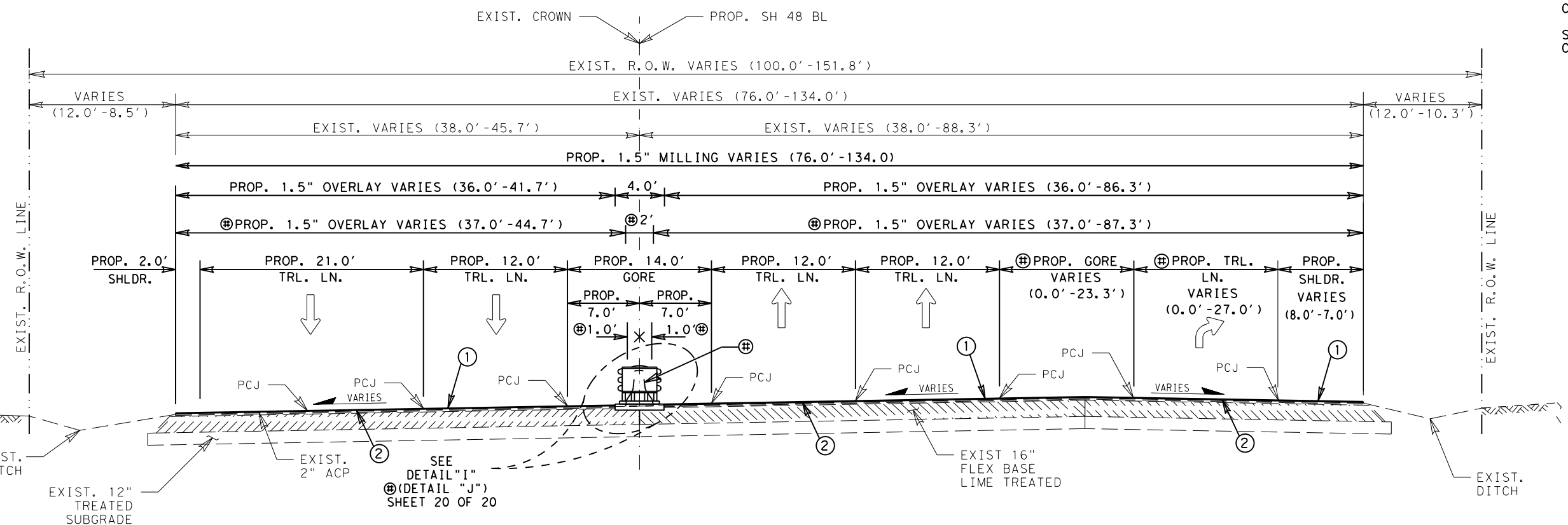
- LEGEND:
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② BONDING COURSE (TBWC) (MEMBRANE)
  - ③ PROPOSED 6" CONC. (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROOF ROLL SUBGRADE
  - ⑥ EMBANKMENT (SUBSIDIARY TO DRIVEWAY ITEM)

- BL - BASE LINE
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRN. LN. - TURN LANE
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- WT. - WEIGHT
- CONC. - CONCRETE
- PAV. - PAVEMENT
- F-F - FACE TO FACE
- PCJ - PREMISSABLE CONSTRUCTION JOINT
- ACP - ASPHAT CONCRETE PAVEMENT
- STA. - STATION
- TRANS. - TRANSITION
- APPROX. - APPROXIMATELY
- SHT. - SHEET

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**SH 48  
 PROP. TYPICAL SECTION**  
 STA. 288+42.00 TO STA. 291+94.00  
 STA. 291+94.00 TO STA. 292+84.00 - NO RAISED MEDIAN (NAFTA PARKWAY)



**SH 48  
 EXIST. TYPICAL SECTION**  
 STA. 292+84.00 TO STA. 293+11.00 - PROP. CRASH CUSHION  
 STA. 293+11.00 TO STA. 297+07.00 - PROP. CONCRETE BARRIER

**GENERAL NOTES**

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

WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS, THE GOVERNING SLOPES MAY VARY AS DIRECTED BY THE ENGINEER.

PROPOSED TURNAROUNDS TO BE PAID UNDER ITEM 530. EXCAVATION, EMBANKMENT, BASE, AND PAVEMENT MATERIALS ARE SUBSIDIARY TO THIS ITEM.

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

A STATION IS EQUAL TO 100 FT.

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

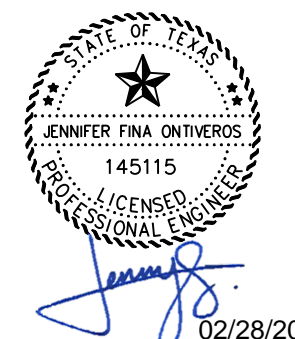
BONDING COURSE - 0.07 GAL/SY (APPROX)

FLEXIBLE BASE WT. - 3375 LB/CY (APPROX)

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

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

SEE PROPOSED PLAN LAYOUT FOR CONCRETE MEDIAN DETAILS.



**Pharr District Central Design**

Texas Department of Transportation

**SH 48  
 PROPOSED  
 TYPICAL SECTIONS**

NOT TO SCALE SHEET 18 OF 20

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	34

**LEGEND:**

① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)	④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.	BL - BASE LINE	TRL. LN. - TRAVEL LANE	PCJ - PREMISSABLE CONSTRUCTION JOINT
② BONDING COURSE (TBWC) (MEMBRANE)	⑤ PROOF ROLL SUBGRADE	PROP. - PROPOSED	SHLDR. - SHOULDER	ACP - ASPHAT CONCRETE PAVEMENT
③ PROPOSED 6" CONC. (DRIVEWAY)	⑥ EMBANKMENT (SUBSIDIARY TO DRIVEWAY ITEM)	EXIST. - EXISTING	WT. - WEIGHT	STA. - STATION
		R.O.W. - RIGHT OF WAY	CONC. - CONCRETE	TRANS. - TRANSITION
		RDWY. - ROADWAY	PAV. - PAVEMENT	APPROX. - APPROXIMATELY
		TRN. LN. - TURN LANE	F-F - FACE TO FACE	SHT. - SHEET

**GENERAL NOTES**

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

WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS, THE GOVERNING SLOPES MAY VARY AS DIRECTED BY THE ENGINEER.

PROPOSED TURNAROUNDS TO BE PAID UNDER ITEM 530. EXCAVATION, EMBANKMENT, BASE, AND PAVEMENT MATERIALS ARE SUBSIDIARY TO THIS ITEM.

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

A STATION IS EQUAL TO 100 FT.

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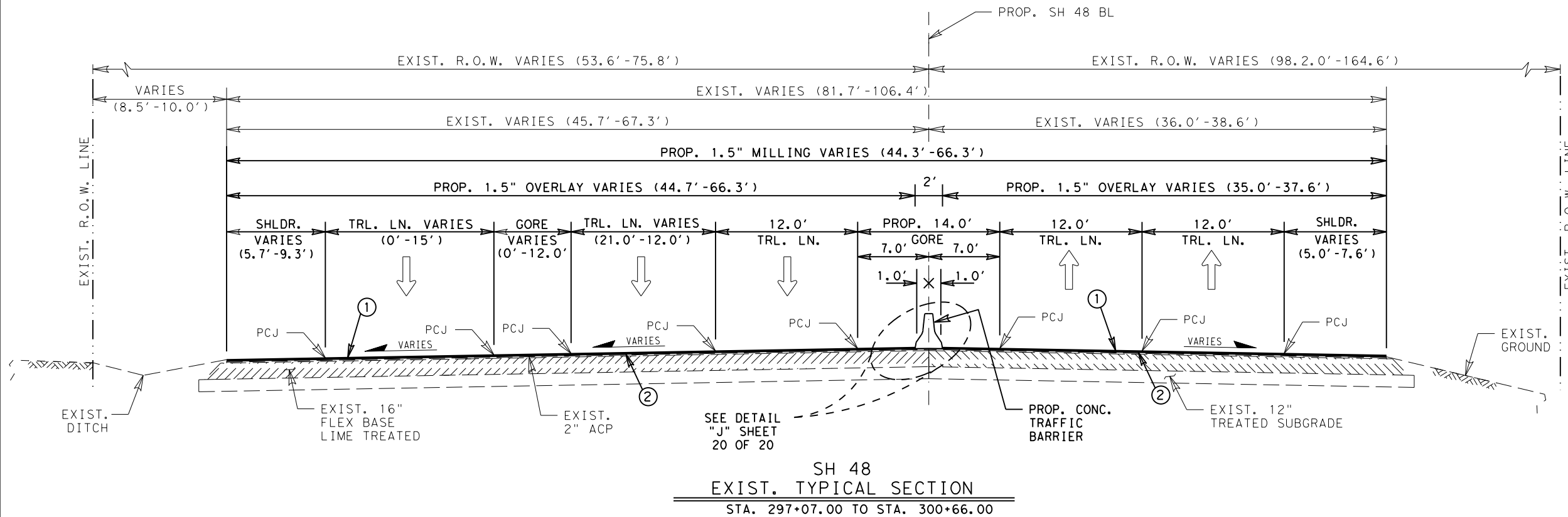
BONDING COURSE - 0.07 GAL/SY (APPROX)

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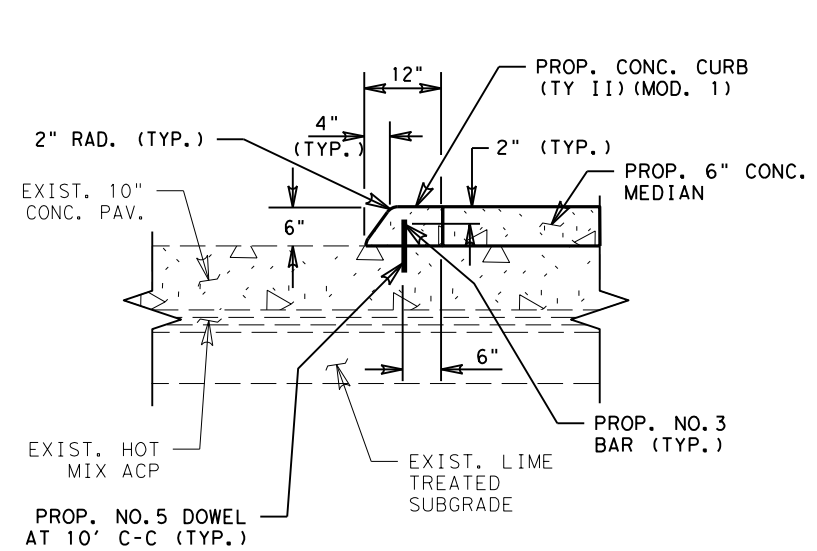
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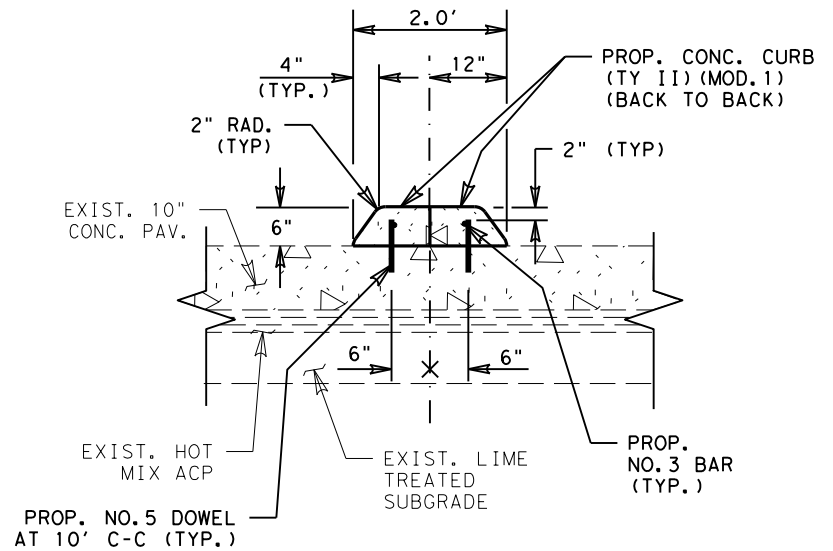
SEE PROPOSED PLAN LAYOUT FOR CONCRETE MEDIAN DETAILS.



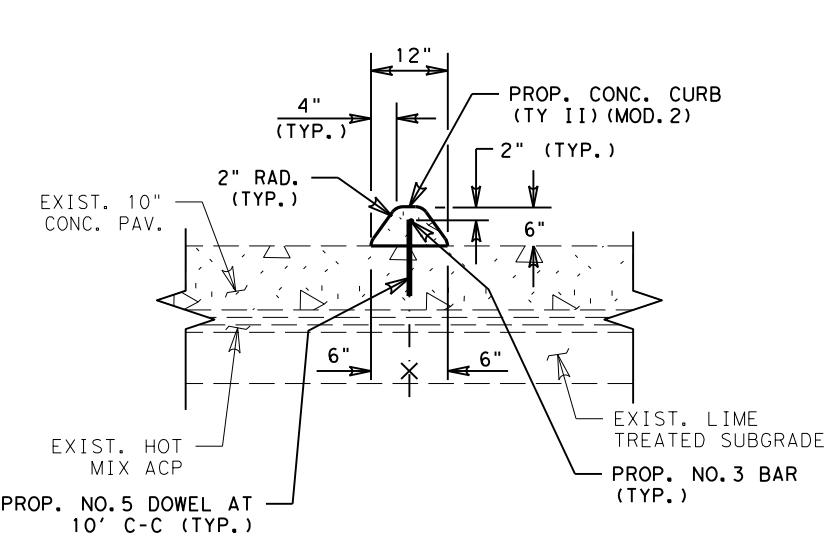
**NOTE:**  
SEE STANDARD "CCCG-22" GENERAL NOTES FOR ADDITIONAL INFORMATION REGARDING CONC. CURB (TY II) PLACEMENT ON EXISTING CONCRETE PAVEMENT.



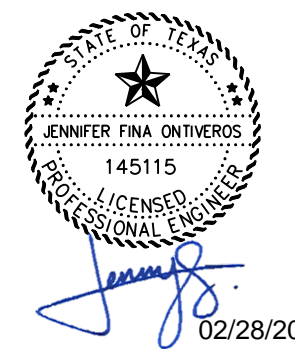
**DETAIL "A"**



**DETAIL "B"**



**DETAIL "C"**



**Pharr District Central Design**  
Texas Department of Transportation

**SH 48  
PROPOSED  
TYPICAL SECTIONS**

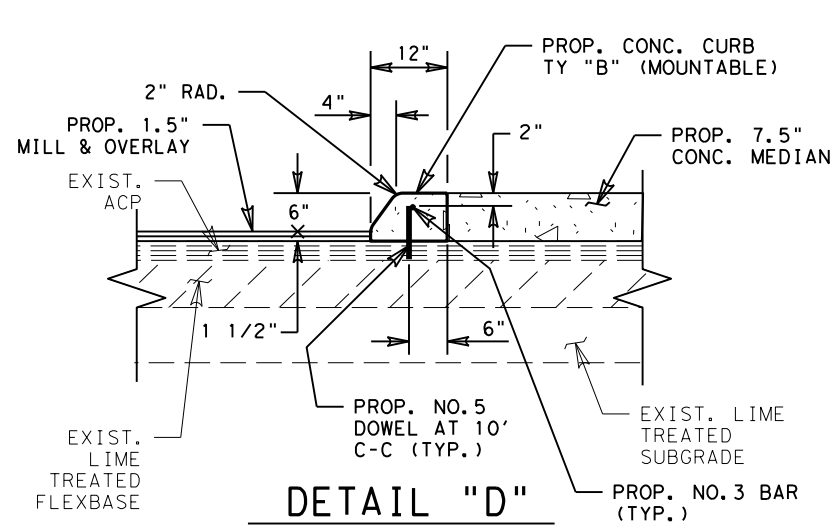
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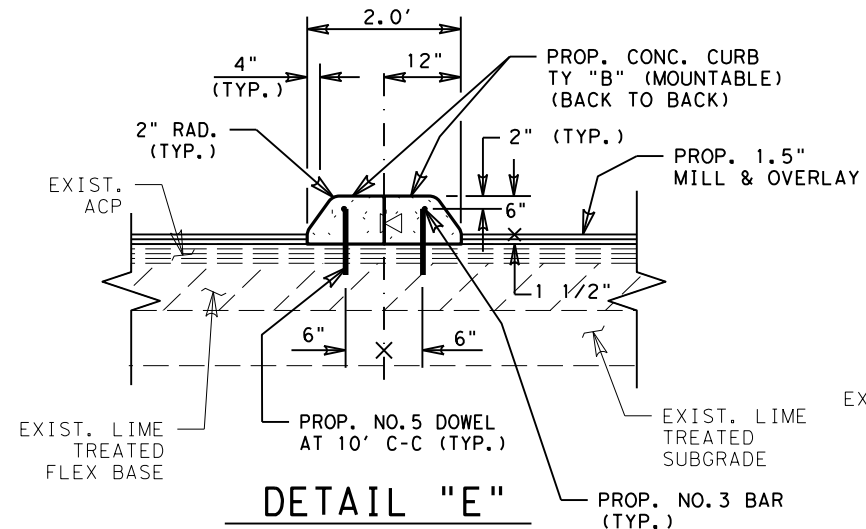
NOT TO SCALE				SHEET 19 OF 20	
© 2022	CONT	SECT	JOB	HIGHWAY	
	0220	05	080	SH 48	
	DIST		COUNTY	SHEET NO.	
	PHR		CAMERON	35	

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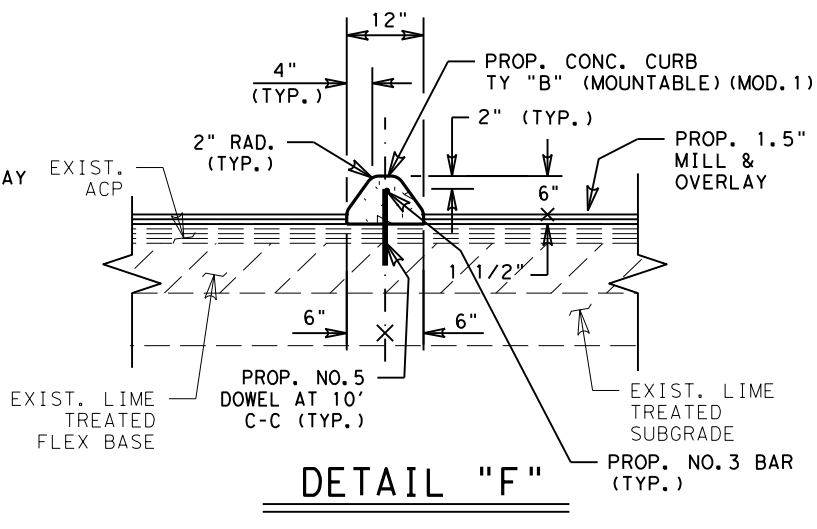
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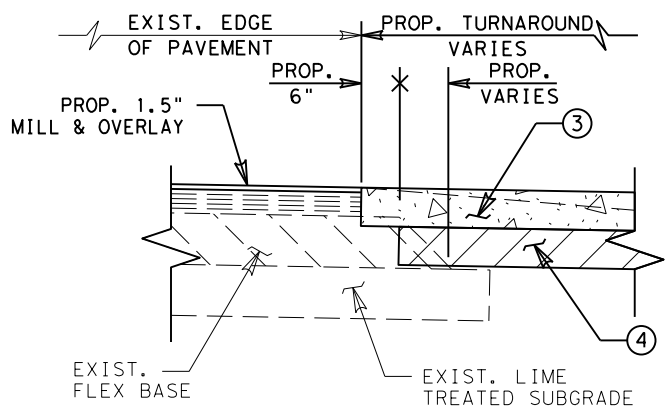
**DETAIL "D"**



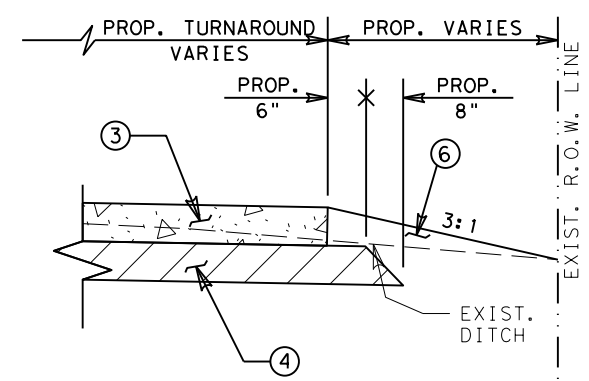
**DETAIL "E"**



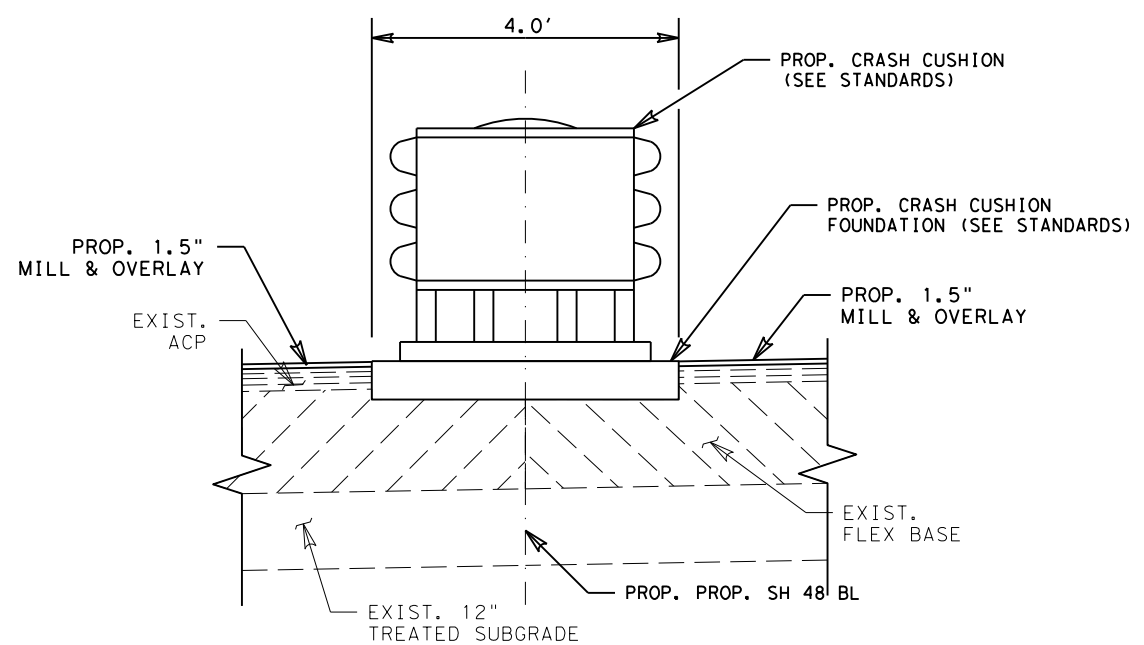
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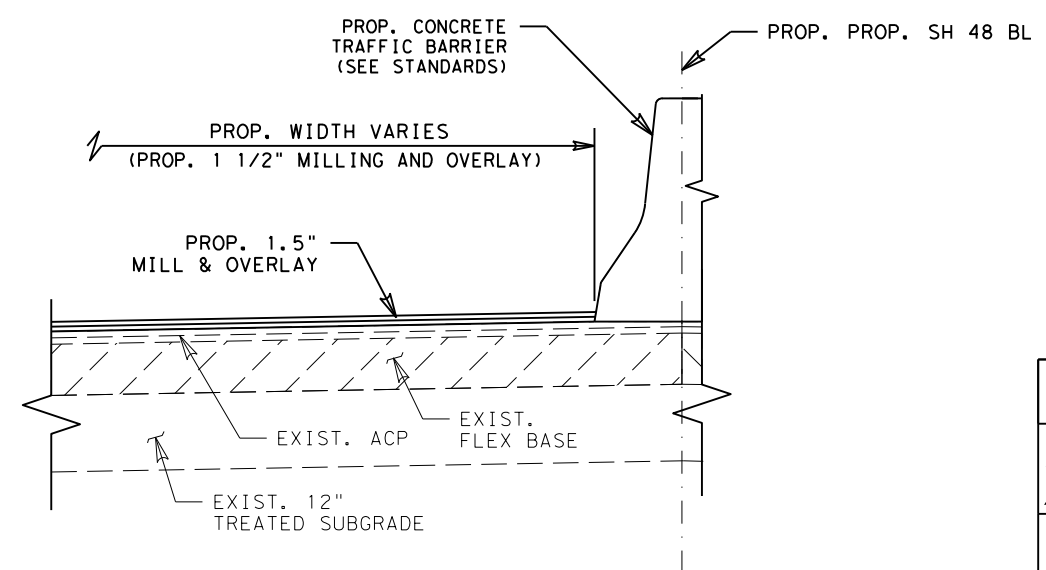
**DETAIL "G"**



**DETAIL "H"**



**DETAIL "I"**



**DETAIL "J"**

**GENERAL NOTES**

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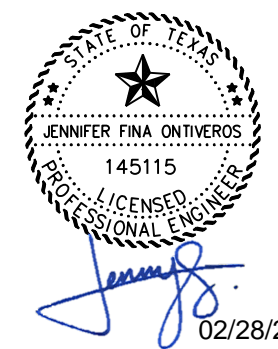
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**Texas Department of Transportation**

**SH 48 PROPOSED TYPICAL SECTIONS**

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	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	36

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**2014 SPECS GENERAL NOTES:**

\*\*\*\*\*

General Requirements and Covenants to ITEMS 1 thru 9:

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

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

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

ITEM 2: Instructions to Bidders

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

Andres Espinoza, P.E., San Benito Area Engineer; [Andres.Espinoza@txdot.gov](mailto:Andres.Espinoza@txdot.gov)  
Gabriel Villarreal, P.E., Assist. Area Engineer; [Gabriel.Villarreal@txdot.gov](mailto:Gabriel.Villarreal@txdot.gov)

Questions may be submitted via the Letting Pre-Bid Q&A web page. This webpage can be accessed from the Notice to Contractors dashboard located at the following Address:

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

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

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

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

ITEM 5: Control of the Work

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

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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 addition to, or instead of the electronic files are requested, they will be available at the Engineer’s office for borrowing by copying companies for the purpose of making copies for the bidder at the bidder’s expense.

ITEM 6: Control of Materials

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

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

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

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

ITEM 7: Legal Relations and Responsibilities

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

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

ITEM 8: Prosecution and Progress

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

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

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ITEM 100: Preparing Right of Way

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

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

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 164: Seeding for Erosion Control

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

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

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

Seed mixture shall be as specified under Item 164.

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ITEM 166: Fertilizer

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

Fertilizer shall be homogenized.

ITEM 247: Flexible Base

Flexible base TY A GR 4 Gravel Bedding material shall be used where soft subgrade material is encountered or as directed by the Engineer.

Flexible base TY A will be composed of a 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.

Flexible base TY A GR 4 shall conform to the following gradation shown below:

Aggregate Gradation	
Maximum Nominal Size	Percent Passing Each Sieve
1-1/2"	100
1"	95-100
1/2"	25-60
#4	0-10
#8	0-5

Compaction of bedding material will be considered subsidiary to this Item. Proof roll constructed bedding material in accordance with Item 216, "Proof Rolling." Correct soft spots as directed.

ITEM 3096: Asphalts, Oils, and Emulsions

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

ITEM 301: Asphalt Antistripping Agents

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

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ITEM 3080: Stone-Matrix Asphalt

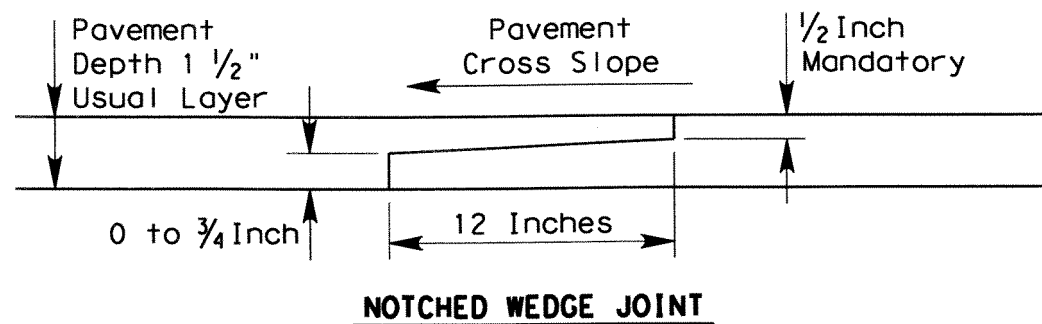
The Contractor shall exercise diligence in the application of "Bonding Course" by the use of flagging and rolling procedures to keep from spraying or splattering the traveling public with asphaltic material.

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

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

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

All unconfined longitudinal joints shall be constructed with a joint maker providing a maximum 1/2-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.



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 3080.

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

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may reject trucks that contain any foreign material and suspend production if the pavement is contaminated by any pollutants mentioned above.

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

ITEM 3084 – Bonding Course

The minimum application rates are listed in Table BC.

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

**Table BC**

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

**Table BCS (For Informational Tests)**

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

ITEM 354: Planing and Texturing Pavement

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

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

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

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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.

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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.

Fiber Reinforced Concrete is not permitted.

ITEM 432: Riprap

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

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

ITEM 464: Reinforced Concrete Pipe

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

Do not use mortar joints.

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



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ITEM 465: Junction Boxes, Manholes, and Inlets

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

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

ITEM 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 496: Removing Structures

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

ITEM 502: Barricades, Signs, and Traffic Handling

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

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

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

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

These signs shall be relocated to a location in accordance with the Latest Version of the "Texas Manual on Uniform Traffic Control Devices". In no case will a sign be removed without a

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replacement sign and support(s) being readily available and a location established. Removal and relocation of these signs required for traffic control will not be paid for directly but shall be considered subsidiary to Item 502.

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

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

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

ITEM 504: Field Office and Laboratory

Furnish (1) Field Office (Type C).

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

Laboratory room:

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

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

ITEM 506: Temporary Erosion, Sedimentation, and Environmental Controls

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

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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 512: Portable Traffic Barrier

Maintain the concrete median barrier in first class condition and, when no longer needed for traffic control, return the concrete median barriers to the TxDOT office in Pharr, Texas. Any concrete median barrier damaged beyond reasonable repair shall be replaced at the Contractor's expense.

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

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

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

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

ITEM 530: Intersections, Driveways, and Turnouts

Prime coat shall meet the requirements of Item 310.

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

ITEM 540: Metal Beam Guard Fence

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

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

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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 3 to evaluate ride quality of the travel lanes in accordance with Item 585, "Ride Quality for Pavement Surfaces." This includes ramps and service road travel lanes.

ITEM 610: Roadway Illumination Assemblies

Luminaires shown on the proposed Traffic Signal installation layout sheets may be shown at an angle for clarity. All luminaires shown shall be installed perpendicular to the main roadway under construction.

In addition to ED (3)-14, each cable for luminaires shall be identified in each ground box, pole base, or other accessible location with yellow electrical tape wrapped around the cable. The tape marking shall be at least 2 inches.

All luminaires on traffic signal poles shall be rated for 240 vac. All safety lighting poles shall be serviced for 480 vac.

Luminaires installed on traffic signal poles will not be paid for directly but shall be considered subsidiary to the various bid Items of the project.

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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 Producer List as shown on the Texas Department of Transportation (TxDOT) - Construction Division's (CST) Material Producer List. Category is "Roadway Illumination and Electrical Supplies."

ITEM 620: Electrical Conductors

For Flashing Beacons (Item 685) and Ped poles (Item 687) within the project, provide single-pole breakaway disconnects.

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.

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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.

ITEM 628: Electrical Services

Arrange for and cooperate with the utility company to provide electrical power for the service(s) shown and as required by the plans. A meter will be required on all electrical services.

ITEMS 636: Signs

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

ITEM 644: Small Roadside Sign Assemblies

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

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

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

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

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

Signs shown to be removed shall include the complete sign installation and separate the sign post at the concrete foundation. The concrete foundation shall be disposed in accordance with this bid

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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.

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-stripped 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.

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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 either steel mast arm poles, or steel strain poles and span wire and pedestal poles (as shown on plans), electrical service, luminaires, signal heads, signal cables, pedestrian heads and pedestrian push buttons with signs that meet the "Americans with Disabilities Act" Standards, loop detectors, ground boxes, conduit runs and controller concrete foundations.
3. Removal and disposal of existing signal material specified in the plans.
4. 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 cabinet shall contain 16-phase conflict monitor which display the "R-Y-G" and "Walk" phases. In addition to detecting phasing conflicts, the conflict monitor shall also be able to detect multiple signal head indications within every phase. The conflict monitor 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 controller shall meet N.E.M.A. Specifications.

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.

Existing utilities

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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.

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

Handling of Traffic

Roads and streets shall always be kept open to traffic. The setting of loop detectors shall be arranged so as to close only one lane of a roadway at a time. 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".

Sequence of work

1. The existing traffic signal installations shall always remain in operation during construction of the proposed traffic signal installations or modifications.
2. The complete removal of the specified existing traffic signals or specified Items will be required when the proposed traffic signal 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 be considered subsidiary to the various items of work.
4. Final inspection shall be conducted 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. LEDs shall be furnished for all traffic signal heads.

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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 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 686: Traffic Signal Pole Assemblies (Steel)

The locations for the proposed traffic signal poles are approximate. The exact locations will be determined in the field in coordination with the District Signal Shop.

Erection and/or removal of poles and luminaries located near any overhead electrical power lines shall be accomplished using established industry and utility safety practices. The appropriate utility company shall be consulted with prior to beginning such work.

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 (1-4) -18 as detailed on General Note 5 of this standard sheet; or as per TCP (2-4) -18 as detailed on General Note 6 of this standard sheet; or as per TCP (2-5) -18 as detailed on General Note 4 of this standard sheet.

Therefore, 3 total shadow vehicles with TMA will be required on this project for the type of work as shown on the plans. The Contractor will be responsible for determining if one or more of his construction operations will be ongoing at the same time and thus determine the total number of TMAs needed for the project.

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LOCATION	SUMMARY OF ROADWAY ITEMS													
	104 6067	361 6004	400 6001	420 6009	432 6045	432 6006	464 6003	464 6005	465 6005	467 6363	467 6395	480 6001	514 6041	514 6013
	REMOVING CONC (SAWCUT)	FULL - DEPTH REPAIR CRCP (10")	STRUCT EXCAV	CL A CONC (COLLAR)	RIPRAP (MOW STRIP) (4 IN)	RIPRAP (CONC) (CL B)	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	JCTBOX (COM PL) (PJB) (3 FTX3FT)	SET (TY II) (18 IN) (RCP) (6: 1) (P)	SET (TY II) (24 IN) (RCP) (6: 1) (P)	CLEAN EXIST CULVERTS	PERM CTB (F-SHAPE) (SPL)	PERM CTB (F-SHAPE) (TY 1)
LF	SY	CY	EA	CY	CY	LF	LF	EA	EA	EA	EA	EA	LF	LF
PROPOSED ROADWAY PLAN LAYOUT														
SHEET 1 OF 17		50												
SHEET 2 OF 17														
SHEET 3 OF 17														
SHEET 4 OF 17														
SHEET 5 OF 17														
SHEET 6 OF 17														
SHEET 7 OF 17														
SHEET 8 OF 17														
SHEET 9 OF 17														
SHEET 10 OF 17														
SHEET 11 OF 17														
SHEET 12 OF 17														
SHEET 13 OF 17														
SHEET 14 OF 17														
SHEET 15 OF 17														
SHEET 16 OF 17														
SHEET 17 OF 17													5	750
PROPOSED ROADWAY PLAN DETAILS														
SHEET 1 OF 3	5		50	4				31	106	1	1	1	3	
SHEET 2 OF 3				1				60		2		1		
SHEET 3 OF 3				1				60		1		1		
<b>PROJECT TOTALS</b>	<b>5</b>	<b>50</b>	<b>50</b>	<b>6</b>	<b>27.4</b>	<b>1216</b>	<b>279</b>	<b>106</b>	<b>1</b>	<b>8</b>	<b>1</b>	<b>5</b>	<b>5</b>	<b>750</b>

LOCATION	SUMMARY OF ROADWAY ITEMS									
	529 6024	529 6002	540 6001	540 6016	540 6002	540 6006	544 6001	545 6019	713 6006	780 6002
	CONC CURB (MOUNTABL E)	CONC CURB (TY II)	MTL W-BEAM GD FEN (TIM POST)	DOWNSTREAM ANCHOR TERMINAL SECTION	MTL W-BEAM GD FEN (STEEL POST)	MTL BEAM GD FEN TRANS (THRIE-BE AM)	GUARDRAIL END TREATMENT (INSTALL)	CRASH CUSH ATTEN (INSTL) (S ) (N) (TL3)	CRACK CLEANING AND SEALING (CRCP)	CNC CRACK REPAIR (DISCRETE ) (INJECT)
LF	LF	LF	EA	LF	EA	EA	EA	LF	LF	
PROPOSED ROADWAY PLAN LAYOUT										
SHEET 1 OF 17	73	1432							100	100
SHEET 2 OF 17	2161	80								
SHEET 3 OF 17	2169									
SHEET 4 OF 17	1942									
SHEET 5 OF 17	1841									
SHEET 6 OF 17	2135									
SHEET 7 OF 17	2144									
SHEET 8 OF 17	2175									
SHEET 9 OF 17	1665									
SHEET 10 OF 17	2110									
SHEET 11 OF 17	1243	513	200	2			2			
SHEET 12 OF 17		2037								
SHEET 13 OF 17		2097		2	125	2				
SHEET 14 OF 17	662	1466								
SHEET 15 OF 17	1776			1	125		1			
SHEET 16 OF 17	2400									
SHEET 17 OF 17	389							1		
<b>PROJECT TOTALS</b>	<b>24885</b>	<b>7625</b>	<b>200</b>	<b>5</b>	<b>250</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>100</b>	<b>100</b>

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**TEXAS DEPARTMENT OF TRANSPORTATION**

**SH 48  
QUANTITY SUMMARY  
SHEETS**

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6	STP 2024 (690) HES	46	SHEET 1 OF 4
STATE	STATE DIST. NO.	COUNTY	CONT. SECT. JOB HIGHWAY NO.
TEXAS	PHR	CAMERON	0220 05 080 SH 48


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SUMMARY OF ROADWAY ITEMS					
LOCATION	3080 6013	354 6041	3084 6001	530 6005	530 6004
	STONE-MTRX -ASPH SMA-F SAC-A PG76-22	PLANE ASPH CONC PAV (1.5")	BONDING COURSE	DRIVEWAYS (ACP)	DRIVEWAYS (CONC)
	TON	SY	GAL	SY	SY
TRAFFIC CONTROL PLAN					
PHASE 1 STEP 1					308
PHASE 1 STEP 2				61.1	222
PHASE 2 STEP 1		6104			
PHASE 2 STEP 2	1990.4	19171	1630		
PHASE 3 STEP 1		10386			
PHASE 3 STEP 2	3285.1	30474	2690		
PHASE 4 STEP 1		9181			
PHASE 4 STEP 2	2820.7	26642	2310		
PHASE 5 STEP 1		7174			
PHASE 6 STEP 1		7174			
PHASE 6 STEP 2	2790.8	27562	2285		
<b>PROJECT TOTALS</b>					
	<b>10887</b>	<b>136694</b>	<b>8915</b>	<b>61.1</b>	<b>530</b>

SUMMARY OF REMOVAL ITEMS						
LOCATION	677 6001	677 6003	677 6005	677 6007	677 6008	677 6012
	ELIM EXT PAV MRK & MRKS (4")	ELIM EXT PAV MRK & MRKS (8")	ELIM EXT PAV MRK & MRKS (12")	ELIM EXT PAV MRK & MRKS (24")	ELIM EXT PAV MRK & MRKS (ARROW)	ELIM EXT PAV MRK & MRKS (WORD)
	LF	LF	LF	LF	EA	EA
STRUCTURE REMOVAL LAYOUT						
SHEET 1 OF 11	2146	1080	460	104	10	6
SHEET 2 OF 11				22		
SHEET 3 OF 11				17		
SHEET 4 OF 11			112	66		
SHEET 5 OF 11			97	17		
SHEET 6 OF 11	7184	104			2	1
SHEET 7 OF 11	8126	1163	244	252	18	15
SHEET 8 OF 11				24		
SHEET 9 OF 11						
SHEET 10 OF 11	1336	1737	450	116	6	4
SHEET 11 OF 11	1546	498	360	128	9	5
TCP SUMMARY TABLE						
	56572	685		50	14	8
<b>PROJECT TOTALS</b>						
	<b>76910</b>	<b>5267</b>	<b>1723</b>	<b>796</b>	<b>59</b>	<b>39</b>

SUMMARY OF REMOVAL ITEMS													
LOCATION	104 6011	104 6014	104 6021	496 6004	496 6006	496 6007	542 6001	542 6002	542 6003	544 6003	545 6005	560 6025	479 6004
	REMOVING CONC (MEDIANS)	REMOVING CONC (FOUNDATI ONS)	REMOVING CONC (CURB)	REMOV STR (SET)	REMOV STR (HEADWALL)	REMOV STR (PIPE)	REMOVE METAL BEAM GUARD FENCE	REMOVE TERMINAL ANCHOR SECTION	REMOVE DOWNSTREAM ANCHOR TERMINAL	GUARDRAIL END TREATMENT (REMOVE)	CRASH CUSH ATTEN (REMOVE)	RELOCATE EXISTING MAILBOX	ADJUSTING MANHOLES (SANITARY)
	SY	CY	LF	EA	EA	LF	LF	EA	EA	EA	EA	EA	EA
STRUCTURE REMOVAL LAYOUT													
SHEET 1 OF 11	258												3
SHEET 2 OF 11				3		40							
SHEET 3 OF 11													1
SHEET 4 OF 11				2	1								
SHEET 5 OF 11				5		26						1	
SHEET 6 OF 11			5				225		1	3			1
SHEET 7 OF 11							150	2		1			3
SHEET 8 OF 11							125	1	1				
SHEET 9 OF 11		5.5									1		
SHEET 10 OF 11													
SHEET 11 OF 11													
<b>PROJECT TOTALS</b>													
	<b>258</b>	<b>5.5</b>	<b>5</b>	<b>10</b>	<b>1</b>	<b>66</b>	<b>500</b>	<b>3</b>	<b>2</b>	<b>4</b>	<b>1</b>	<b>1</b>	<b>8</b>

SUMMARY OF MOBILIZATION ITEMS		
LOCATION	500 6001	502 6001
	MOBILIZATION	BARRICADES, SIGNS AND TRAFFIC HANDLING
	LS	MO
<b>PROJECT TOTALS</b>		
	<b>1</b>	<b>13</b>



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 TEXAS DEPARTMENT OF TRANSPORTATION

**SH 48  
 QUANTITY SUMMARY  
 SHEETS**


FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6	STP 2024 (690) HES	47	SHEET 2 OF 4
STATE	STATE DIST. NO.	COUNTY	CONT. SECT. JOB HIGHWAY NO.
TEXAS	PHR	CAMERON	0220 05 080 SH 48

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SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS																	
LOCATION	512 6009	512 6010	512 6033	512 6034	512 6057	512 6058	6001 6002	662 6048	662 6052	662 6060	662 6061	662 6063	662 6071	662 6075	662 6095	6185 6002	6185 6005
	PORT CTB (FUR & INST) (LOW PROF) (TY 1)	PORT CTB (FUR & INST) (LOW PROF) (TY 2)	PORT CTB (MOVE) (LOW PROF) (TY 1)	PORT CTB (MOVE) (LOW PROF) (TY 2)	PORT CTB (REMOVE) (LOW PROF) (TY 1)	PORT CTB (REMOVE) (LOW PROF) (TY 2)	PORTABLE CHANGEABLE MESSAGE SIGN	WK ZN PAV MRK REMOV (REFL) TY I-C	WK ZN PAV MRK REMOV (REFL) TY II-C-R	WK ZN PAV MRK REMOV (W) 4" (BRK)	WK ZN PAV MRK REMOV (W) 4" (DOT)	WK ZN PAV MRK REMOV (W) 4" (SLD)	WK ZN PAV MRK REMOV (W) 8" (SLD)	WK ZN PAV MRK REMOV (W) 24" (SL D)	WK ZN PAV MRK REMOV (Y) 4" (SLD)	TMA (STATIONA RY)	TMA (MOBILE OPERATION)
	LF	LF	LF	LF	LF	LF	EA	EA	EA	LF	LF	LF	LF	LF	LF	DAY	DAY
TCP SUMMARY TABLE	8160	560	24320	1280	8160	560	2	28	1696	16270	1190	64100	140	374	61830	251	201
<b>PROJECT TOTALS</b>	<b>8160</b>	<b>560</b>	<b>24320</b>	<b>1280</b>	<b>8160</b>	<b>560</b>	<b>2</b>	<b>28</b>	<b>1696</b>	<b>16270</b>	<b>1190</b>	<b>64100</b>	<b>140</b>	<b>374</b>	<b>61830</b>	<b>251</b>	<b>201</b>

SUMMARY OF TRAFFIC SIGNAL ITEMS																								
LOCATION	416 6032	618 6033	620 6007	621 6005	680 6002	680 6004	682 6001	682 6002	682 6003	682 6004	682 6005	682 6006	682 6049	682 6050	682 6060	684 6007	684 6010	684 6012	686 6037	686 6043	686 6045	686 6047	618 6059	
	DRILL SHAFT (TRF SIG POLE) (36 IN)	CONDT (PVC) (SCH 40) (4")	ELEC CONDR (NO. 8) BARE	TRAY CABLE (4 CONDR) (12 AWG)	INSTALL HWY TRF SIG (ISOLAT ED)	REMOVING TRAFFIC SIGNALS	VEH SIG SEC (12")LE D(GRN)	VEH SIG SEC (12")LE D(GRN ARW)	VEH SIG SEC (12")LE D(YEL)	VEH SIG SEC (12")LE D(YEL ARW)	VEH SIG SEC (12")LE D(RED)	VEH SIG SEC (12")LE D(RED ARW)	BACKPLAT E W/REFL BRDR (4 SEC)	BACKPLAT E W/REFL BRDR (5 SEC)	BACKPLAT E W/REFL BRDR (3 SEC)	TRF SIG CBL (TY A) (12 AWG) (2 CONDR)	TRF SIG CBL (TY A) (12 AWG) (5 CONDR)	TRF SIG CBL (TY A) (12 AWG) (7 CONDR)	INS TRF SIG PL AM(S) 1 ARM (36')	INS TRF SIG PL AM(S) 1 ARM (40' LUM)	INS TRF SIG PL AM(S) 1 ARM (44' LUM)	INS TRF SIG PL AM(S) 1 ARM (44' LUM)	CONDT (PVC) (SCH 80) (4") (BORE)	
	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	LF	LF	LF	EA	EA	EA	EA	EA	LF
SUMMARY OF MATERIALS TRAFFIC SIGNAL	95	70	662	437	4	4	14	6	14	10	14	4	4	2	12	1264	2411	897	1	1	2	2	182	
<b>PROJECT TOTALS</b>	<b>95</b>	<b>70</b>	<b>662</b>	<b>437</b>	<b>4</b>	<b>4</b>	<b>14</b>	<b>6</b>	<b>14</b>	<b>10</b>	<b>14</b>	<b>4</b>	<b>4</b>	<b>2</b>	<b>12</b>	<b>1264</b>	<b>2411</b>	<b>897</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>182</b>	

SUMMARY OF SIGNING ITEMS			
LOCATION	644 6027	644 6030	644 6076
	IN SM RD SN SUP&AM TYS80 (1) SA (P)	IN SM RD SN SUP&AM TYS80 (1) SA (T)	REMOVE SM RD SN SUP&AM
	EA	EA	EA
SUMMARY OF SIGN REMOVAL AND RELOCATION			32
SUMMARY OF SMALL SIGNS			
SHEET 1 OF 7	7	1	
SHEET 2 OF 7	6	1	
SHEET 3 OF 7	6	2	
SHEET 4 OF 7	3	5	
SHEET 5 OF 7	5	3	
SHEET 6 OF 7	5	3	
SHEET 7 OF 7	5	3	
<b>PROJECT TOTALS</b>	<b>37</b>	<b>18</b>	<b>32</b>



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 TEXAS DEPARTMENT OF TRANSPORTATION

**SH 48  
 QUANTITY SUMMARY  
 SHEETS**

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	STP 2024 (690) HES	48
STATE	COUNTY	CONTRACT
TEXAS	PHR CAMERON	0220
SECTION	JOB	HIGHWAY NO.
05	080	SH 48



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SUMMARY OF PAVEMENT MARKING ITEMS																
LOCATION	666 6036	666 6042	666 6048	666 6141	666 6306	666 6309	666 6318	666 6321	668 6077	668 6085	668 6094	668 6096	672 6007	672 6009	672 6010	678 6001
	REFL PAV MRK TY I (W) 8" (SLD ) (100MIL)	REFL PAV MRK TY I (W) 12" (SL D) (100MIL)	REFL PAV MRK TY I (W) 24" (SL D) (100MIL)	REFL PAV MRK TY I (Y) 12" (SL D) (100MIL)	RE PM W/RET REQ TY I (W) 6" (BRK ) (100MIL)	RE PM W/RET REQ TY I (W) 6" (SLD ) (100MIL)	RE PM W/RET REQ TY I (Y) 6" (BRK ) (100MIL)	RE PM W/RET REQ TY I (Y) 6" (SLD ) (100MIL)	PREFAB PAV MRK TY C (W) (ARROW)	PREFAB PAV MRK TY C (W) (WORD)	PREFAB PAV MRK TY C (W) (BIKE ARROW)	PREFAB PAV MRK TY C (W) (BIKE SYMBOL)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R	PAV SURF PREP FOR MRK (4")
	LF	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
PAVEMENT MARKINGS LAYOUT																
SHEET 1 OF 11	780		190		700	2751	160	2770	3	3			8	16	118	
SHEET 2 OF 11	1295		230		1070	4242		1996	8	8					124	
SHEET 3 OF 11	1148		175		1180	4688		3310	7	7					118	
SHEET 4 OF 11	1366		538		1080	4324		2015	7	7					125	
SHEET 5 OF 11	1041		166		1150	4523		3227	6	6					114	
SHEET 6 OF 11	348		133		430	1557		1135	2	2					115	
SHEET 7 OF 11	318		53		170	326		360	2	2					141	
SHEET 8 OF 11	855		76		1180	4635		3736	5	5					104	
SHEET 9 OF 11	835	175	45	28	540	1868		1815	1	1					38	
SHEET 10 OF 11													96	16	38	
SHEET 11 OF 11											1	1	48	46	38	
TCP SUMMARY TABLE																3918
<b>PROJECT TOTALS</b>	<b>7986</b>	<b>175</b>	<b>1606</b>	<b>28</b>	<b>7500</b>	<b>28914</b>	<b>160</b>	<b>20364</b>	<b>41</b>	<b>41</b>	<b>1</b>	<b>1</b>	<b>152</b>	<b>78</b>	<b>1073</b>	<b>3918</b>

SUMMARY OF PAVEMENT MARKING ITEMS															
LOCATION	678 6002	678 6004	678 6008	678 6009	678 6016	6038 6004	6038 6005	6038 6006	6038 6007	6038 6013	6038 6017	6038 6025	6038 6027	662 6109	662 6111
	PAV SURF PREP FOR MRK (6")	PAV SURF PREP FOR MRK (8")	PAV SURF PREP FOR MRK (24")	PAV SURF PREP FOR MRK (ARROW)	PAV SURF PREP FOR MRK (WORD)	MULTIPOLYMER PAV MRK (W) (6") (S LD)	MULTIPOLYMER PAV MRK (W) (6") (B RK)	MULTIPOLYMER PAV MRK (W) (6") (D OT)	MULTIPOLYMER PAV MRK (W) (8") (S LD)	MULTIPOLYMER PAV MRK (W) (24") (S LD)	MULTIPOLYMER PAV MRK (Y) (6") (S LD)	MULTIPOLYMER PAV MRK (W) (ARROW)	MULTIPOLYMER PAV MRK (W) (WORD)	WK ZN PAV MRK SHT TERM (TAB) TY W	WK ZN PAV MRK SHT TERM (TAB) TY Y-2
	LF	LF	LF	EA	EA	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA
PAVEMENT MARKINGS LAYOUT															
SHEET 1 OF 11	3663	2751	160	16	16	936	430	102	1258	383	1284	9	9		
SHEET 2 OF 11															
SHEET 3 OF 11															
SHEET 4 OF 11															
SHEET 5 OF 11															
SHEET 6 OF 11	1700	1557				2857	978		634	47	1376	5	5		
SHEET 7 OF 11	585	326				2955	900		2069	751	2560	8	8		
SHEET 8 OF 11															
SHEET 9 OF 11															
SHEET 10 OF 11						322	400		1505	314	928	4	4		
SHEET 11 OF 11						700	240		463	298	906	6	4		
<b>PROJECT TOTALS</b>	<b>5948</b>	<b>4634</b>	<b>160</b>	<b>16</b>	<b>16</b>	<b>7770</b>	<b>2948</b>	<b>102</b>	<b>5929</b>	<b>1793</b>	<b>7054</b>	<b>32</b>	<b>30</b>	<b>9500</b>	<b>1000</b>

SUMMARY OF EROSION CONTROL ITEMS												
LOCATION	100 6002	164 6035	164 6041	168 6001	204 6003	506 6021	506 6024	506 6038	506 6039	506 6041	506 6043	506 6045
	PREPARING ROW	DRILL SEEDING (PERM) (RURAL) (CLAY)	DRILL SEEDING (TEMP) (WARM)	VEGETATIVE WATERING	SPRINKLING (DUST CONTROL)	CONSTRUCTI ON EXITS (INSTALL) (TY 2)	CONSTRUCTI ON EXITS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	BIODEG EROSN CONT LOGS (INSTL) (12")	BIODEG EROSN CONT LOGS (REMOVE)	BIODEG EROSN CONT LOGS (INSTL) (6")
	STA	SY	SY	MG	MG	SY	SY	LF	LF	LF	LF	LF
SW3P LAYOUT												
SHEET 1 OF 9		255	255	0.06		156	156	360	360	102	136	34
SHEET 2 OF 9		138	138	0.03		156	156			210	210	
SHEET 3 OF 9		202	202	0.05		78	78			180	180	
SHEET 4 OF 9		314	314	0.07		156	156			332	332	
SHEET 5 OF 9		570	570	0.14		78	78			294	294	
SHEET 6 OF 9		57	57	0.01		156	156			144	526	382
SHEET 7 OF 9						156	156			144	284	140
SHEET 8 OF 9		155	155	0.04		78	78			796	956	160
SHEET 9 OF 9						156	156			84	84	
PROJECT TOTAL	199				100							
<b>PROJECT TOTALS</b>	<b>199</b>	<b>1691</b>	<b>1691</b>	<b>0.4</b>	<b>100</b>	<b>1170</b>	<b>1170</b>	<b>360</b>	<b>360</b>	<b>2286</b>	<b>3002</b>	<b>716</b>

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**TEXAS DEPARTMENT OF TRANSPORTATION**

**SH 48  
QUANTITY SUMMARY  
SHEETS**

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	STP 2024 (690) HES	49
STATE DIST. NO.	COUNTY	CONT. SECT. JOB HIGHWAY NO.
TEXAS PHR	CAMERON	0220 05 080 SH 48



# Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0220-05-080

DISTRICT Pharr  
HIGHWAY SH 48

COUNTY Cameron

CONTROL SECTION JOB				0220-05-080		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00128152			
COUNTY				Cameron			
HIGHWAY				SH 48			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	100-6002	PREPARING ROW	STA	199.000		199.000	
	104-6011	REMOVING CONC (MEDIANS)	SY	258.000		258.000	
	104-6014	REMOVING CONC (FOUNDATIONS)	CY	5.500		5.500	
	104-6021	REMOVING CONC (CURB)	LF	5.000		5.000	
	104-6067	REMOVING CONC (SAWCUT)	LF	5.000		5.000	
	164-6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	1,691.000		1,691.000	
	164-6041	DRILL SEEDING (TEMP) (WARM)	SY	1,691.000		1,691.000	
	168-6001	VEGETATIVE WATERING	MG	0.400		0.400	
	204-6003	SPRINKLING (DUST CONTROL)	MG	100.000		100.000	
	354-6041	PLANE ASPH CONC PAV (1.5")	SY	136,694.000		136,694.000	
	361-6004	FULL - DEPTH REPAIR CRCP (10")	SY	50.000		50.000	
	400-6001	STRUCT EXCAV	CY	50.000		50.000	
	416-6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	95.000		95.000	
	420-6009	CL A CONC (COLLAR)	EA	6.000		6.000	
	432-6006	RIPRAP (CONC)(CL B)	CY	1,216.000		1,216.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	27.400		27.400	
	464-6003	RC PIPE (CL III)(18 IN)	LF	279.000		279.000	
	464-6005	RC PIPE (CL III)(24 IN)	LF	106.000		106.000	
	465-6005	JCTBOX(COMPL)(PJB)(3FTX3FT)	EA	1.000		1.000	
	467-6363	SET (TY II) (18 IN) (RCP) (6: 1) (P)	EA	8.000		8.000	
	467-6395	SET (TY II) (24 IN) (RCP) (6: 1) (P)	EA	1.000		1.000	
	479-6004	ADJUSTING MANHOLES (SANITARY)	EA	8.000		8.000	
	480-6001	CLEAN EXIST CULVERTS	EA	5.000		5.000	
	496-6004	REMOV STR (SET)	EA	10.000		10.000	
	496-6006	REMOV STR (HEADWALL)	EA	1.000		1.000	
	496-6007	REMOV STR (PIPE)	LF	66.000		66.000	
	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	1,170.000		1,170.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY	1,170.000		1,170.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	360.000		360.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	360.000		360.000	
	506-6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	2,286.000		2,286.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	3,002.000		3,002.000	
	506-6045	BIODEG EROSN CONT LOGS (INSTL) (6")	LF	716.000		716.000	
	512-6009	PORT CTB (FUR & INST)(LOW PROF)(TY 1)	LF	8,160.000		8,160.000	
	512-6010	PORT CTB (FUR & INST)(LOW PROF)(TY 2)	LF	560.000		560.000	

DISTRICT	COUNTY	CCSJ	SHEET
Pharr	Cameron	0220-05-080	51



# Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0220-05-080

DISTRICT Pharr  
HIGHWAY SH 48

COUNTY Cameron

CONTROL SECTION JOB				0220-05-080		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00128152			
COUNTY				Cameron			
HIGHWAY				SH 48			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	512-6033	PORT CTB (MOVE)(LOW PROF)(TY 1)	LF	24,320.000		24,320.000	
	512-6034	PORT CTB (MOVE)(LOW PROF)(TY 2)	LF	1,280.000		1,280.000	
	512-6057	PORT CTB (REMOVE)(LOW PROF)(TY 1)	LF	8,160.000		8,160.000	
	512-6058	PORT CTB (REMOVE)(LOW PROF)(TY 2)	LF	560.000		560.000	
	514-6013	PERM CTB (F-SHAPE) (TY 1)	LF	750.000		750.000	
	514-6041	PERM CTB (F-SHAPE)(SPL)	LF	5.000		5.000	
	529-6002	CONC CURB (TY II)	LF	7,625.000		7,625.000	
	529-6024	CONC CURB (MOUNTABLE)	LF	24,885.000		24,885.000	
	530-6004	DRIVEWAYS (CONC)	SY	530.000		530.000	
	530-6005	DRIVEWAYS (ACP)	SY	61.100		61.100	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	200.000		200.000	
	540-6002	MTL W-BEAM GD FEN (STEEL POST)	LF	250.000		250.000	
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	2.000		2.000	
	540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	5.000		5.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF	500.000		500.000	
	542-6002	REMOVE TERMINAL ANCHOR SECTION	EA	3.000		3.000	
	542-6003	REMOVE DOWNSTREAM ANCHOR TERMINAL	EA	2.000		2.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	3.000		3.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA	4.000		4.000	
	545-6005	CRASH CUSH ATTEN (REMOVE)	EA	1.000		1.000	
	545-6019	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	EA	1.000		1.000	
	560-6025	RELOCATE EXISTING MAILBOX	EA	1.000		1.000	
	618-6033	CONDT (PVC) (SCH 40) (4")	LF	70.000		70.000	
	618-6059	CONDT (PVC) (SCH 80) (4") (BORE)	LF	182.000		182.000	
	620-6007	ELEC CONDR (NO.8) BARE	LF	662.000		662.000	
	621-6005	TRAY CABLE (4 CONDR) (12 AWG)	LF	437.000		437.000	
	644-6027	IN SM RD SN SUP&AM TYS80(1)SA(P)	EA	37.000		37.000	
	644-6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	18.000		18.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	32.000		32.000	
	662-6048	WK ZN PAV MRK REMOV (REFL) TY I-C	EA	28.000		28.000	
	662-6052	WK ZN PAV MRK REMOV (REFL) TY II-C-R	EA	1,696.000		1,696.000	
	662-6060	WK ZN PAV MRK REMOV (W)4"(BRK)	LF	16,270.000		16,270.000	
	662-6061	WK ZN PAV MRK REMOV (W)4"(DOT)	LF	1,190.000		1,190.000	
	662-6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	64,100.000		64,100.000	
	662-6071	WK ZN PAV MRK REMOV (W)8"(SLD)	LF	140.000		140.000	
	662-6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	374.000		374.000	
	662-6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	61,830.000		61,830.000	

DISTRICT	COUNTY	CCSJ	SHEET
Pharr	Cameron	0220-05-080	52



# Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0220-05-080

DISTRICT Pharr  
HIGHWAY SH 48

COUNTY Cameron

CONTROL SECTION JOB				0220-05-080		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00128152			
COUNTY				Cameron			
HIGHWAY				SH 48			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	9,500.000		9,500.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	1,000.000		1,000.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	7,986.000		7,986.000	
	666-6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	175.000		175.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	1,606.000		1,606.000	
	666-6141	REFL PAV MRK TY I (Y)12"(SLD)(100MIL)	LF	28.000		28.000	
	666-6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	7,500.000		7,500.000	
	666-6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	28,914.000		28,914.000	
	666-6318	RE PM W/RET REQ TY I (Y)6"(BRK)(100MIL)	LF	160.000		160.000	
	666-6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	20,364.000		20,364.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	41.000		41.000	
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA	41.000		41.000	
	668-6094	PREFAB PAV MRK TY C (W)(BIKE ARROW)	EA	1.000		1.000	
	668-6096	PREFAB PAV MRK TY C (W)(BIKE SYMBOL)	EA	1.000		1.000	
	672-6007	REFL PAV MRKR TY I-C	EA	152.000		152.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	78.000		78.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	1,073.000		1,073.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	76,910.000		76,910.000	
	677-6003	ELIM EXT PAV MRK & MRKS (8")	LF	5,267.000		5,267.000	
	677-6005	ELIM EXT PAV MRK & MRKS (12")	LF	1,723.000		1,723.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	796.000		796.000	
	677-6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	59.000		59.000	
	677-6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	39.000		39.000	
	678-6001	PAV SURF PREP FOR MRK (4")	LF	3,918.000		3,918.000	
	678-6002	PAV SURF PREP FOR MRK (6")	LF	5,948.000		5,948.000	
	678-6004	PAV SURF PREP FOR MRK (8")	LF	4,634.000		4,634.000	
	678-6008	PAV SURF PREP FOR MRK (24")	LF	160.000		160.000	
	678-6009	PAV SURF PREP FOR MRK (ARROW)	EA	16.000		16.000	
	678-6016	PAV SURF PREP FOR MRK (WORD)	EA	16.000		16.000	
	680-6002	INSTALL HWY TRF SIG (ISOLATED)	EA	4.000		4.000	
	680-6004	REMOVING TRAFFIC SIGNALS	EA	4.000		4.000	
	682-6001	VEH SIG SEC (12")LED(GRN)	EA	14.000		14.000	
	682-6002	VEH SIG SEC (12")LED(GRN ARW)	EA	6.000		6.000	
	682-6003	VEH SIG SEC (12")LED(YEL)	EA	14.000		14.000	
	682-6004	VEH SIG SEC (12")LED(YEL ARW)	EA	10.000		10.000	
	682-6005	VEH SIG SEC (12")LED(RED)	EA	14.000		14.000	
	682-6006	VEH SIG SEC (12")LED(RED ARW)	EA	4.000		4.000	

DISTRICT	COUNTY	CCSJ	SHEET
Pharr	Cameron	0220-05-080	53



# Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0220-05-080

DISTRICT Pharr  
HIGHWAY SH 48

COUNTY Cameron

CONTROL SECTION JOB				0220-05-080		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00128152			
COUNTY				Cameron			
HIGHWAY				SH 48			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	682-6049	BACKPLATE W/REFL BRDR(4 SEC)	EA	4.000		4.000	
	682-6050	BACKPLATE W/REFL BRDR(5 SEC)	EA	2.000		2.000	
	682-6060	BACKPLATE W/REFL BRDR(3 SEC)	EA	12.000		12.000	
	684-6007	TRF SIG CBL (TY A)(12 AWG)(2 CONDR)	LF	1,264.000		1,264.000	
	684-6010	TRF SIG CBL (TY A)(12 AWG)(5 CONDR)	LF	2,411.000		2,411.000	
	684-6012	TRF SIG CBL (TY A)(12 AWG)(7 CONDR)	LF	897.000		897.000	
	686-6037	INS TRF SIG PL AM(S)1 ARM(36')	EA	1.000		1.000	
	686-6043	INS TRF SIG PL AM(S)1 ARM(40')LUM	EA	1.000		1.000	
	686-6045	INS TRF SIG PL AM(S)1 ARM(44')	EA	2.000		2.000	
	686-6047	INS TRF SIG PL AM(S)1 ARM(44')LUM	EA	2.000		2.000	
	713-6006	CRACK CLEANING AND SEALING (CRCP)	LF	100.000		100.000	
	780-6002	CNC CRACK REPAIR (DISCRETE)(INJECT)	LF	100.000		100.000	
	3080-6013	STONE-MTRX-ASPH SMA-F SAC-A PG76-22	TON	10,887.000		10,887.000	
	3084-6001	BONDING COURSE	GAL	8,915.000		8,915.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	2.000		2.000	
	6038-6004	MULTIPOLYMER PAV MRK (W)(6")(SLD)	LF	7,770.000		7,770.000	
	6038-6005	MULTIPOLYMER PAV MRK (W)(6")(BRK)	LF	2,948.000		2,948.000	
	6038-6006	MULTIPOLYMER PAV MRK (W)(6")(DOT)	LF	102.000		102.000	
	6038-6007	MULTIPOLYMER PAV MRK (W)(8")(SLD)	LF	5,929.000		5,929.000	
	6038-6013	MULTIPOLYMER PAV MRK (W)(24")(SLD)	LF	1,793.000		1,793.000	
	6038-6017	MULTIPOLYMER PAV MRK (Y)(6")(SLD)	LF	7,054.000		7,054.000	
	6038-6025	MULTIYPOLYMER PAV MRK (W) (ARROW)	EA	32.000		32.000	
	6038-6027	MULTIPOLYMER PAV MRK (W) (WORD)	EA	30.000		30.000	
	6185-6002	TMA (STATIONARY)	DAY	251.000		251.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	201.000		201.000	
18		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	

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# TRAFFIC CONTROL PLAN

*Pharr District Central Design*



**COVER SHEET**

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		55

**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.

ONLY SURFACE TREATMENT METHOD WILL BE ALLOWED TO REMOVE EXISTING STRIPING. GRINDING METHODS ARE NOT ALLOWED.

DO NOT BLOCK DRAINAGE WHEN HANDLING & STOCKPILING EXCAVATED MATERIAL.

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 CONTRACTOR IN WRITING(E-MAIL IS ACCEPTABLE) TO PROCEED WITH THE WORK.

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

PROVIDE ADDITIONAL SIGNS AND BARRICADES AS NECESSARY TO ADDRESS FIELD 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.

**PROJECT SPECIFIC NOTES:**

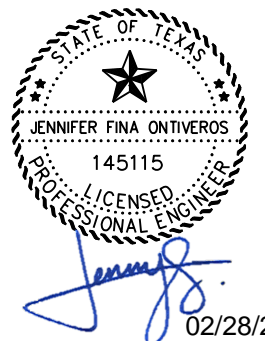
1. INSTALL PROJECT LIMITS AND ADVANCE WARNING SIGNS, CROSSROADS BARRICADES/SIGNS AS SHOWN ON THE TRAFFIC CONTROL PLAN (TCP) AND IN ACCORDANCE WITH THE TMUTCD AND BC STANDARDS AND/OR AS DIRECTED BY THE ENGINEER. THESE SIGNS SHALL BE ERECTED AND PLACED PRIOR TO COMMENCING ANY PROPOSED ROADWAY CONSTRUCTION AND SHALL REMAIN IN PLACE FOR THE DURATION OF THE PROJECT UNTIL COMPLETION AND ACCEPTANCE OF THE PROJECT BY TxDOT.
2. CHANGES TO MESSAGES ON PORTABLE CHANGEABLE MESSAGE SIGNS ARE PERMITTED WITH APPROVAL BY AREA ENGINEER. CONTRACTOR MUST MAKE USE OF TCP STANDARDS, BC STANDARDS AND WORKZONE STANDARDS FOR THIS OPERATION.
3. LOW PROFILE TRAFFIC BARRIER STATIONINGS ARE APPROXIMATED AND MAY BE ADJUSTED DUE TO FIELD CONDITIONS WITH APPROVAL FROM THE ENGINEER.
4. ALL SIGNS SHOWN FOR CONSTRUCTION ARE SPACED AT MINIMUM AND MAY BE ADJUSTED DUE TO FIELD CONDITIONS.
5. EXISTING SIGNS THAT ARE IN CONFLICT WITH THE PROPOSED WK ZN SIGNS SHALL BE REMOVED OR COVERED.
6. EXISTING STRIPING THAT IS IN CONFLICT WITH THE PROPOSED WK ZN PAVEMENT MARKINGS SHALL BE REMOVED.
7. CONTRACTOR MUST MAINTAIN ACCESS TO PUBLIC/PRIVATE DRIVEWAYS & CROSS STREETS DURING CONSTRUCTION USING ALL WEATHER MATERIALS, AND MUST COORDINATE WITH AFFECTED PROPERTY OWNERS REGARDING ACCESS 3 DAYS PRIOR TO CONSTRUCTION.
8. CONTRACTOR SHALL MINIMIZE UNEVEN LANE DIFFERENTIAL WHEN SHIFTING TRAFFIC BETWEEN PHASING ACCORDING TO "WZ(UL)-13."
9. TO ACCOMMODATE THE VARIOUS PHASES OF CONSTRUCTION, CONTRACTOR WILL BE RESPONSIBLE FOR THE TEMPORARY ADJUSTMENTS AND RELOCATION OF EXISTING SIGNAL HEADS, POLES, LOW-PROFILE CONCRETE TRAFFIC BARRIER, PRECAST CONCRETE SAFETY 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."
10. NO PHASE OF CONSTRUCTION SHALL START UNTIL COMPLETION OF THE PREVIOUS PHASE INCLUDING DRIVEWAYS, UNLESS OTHERWISE APPROVED BY THE ENGINEER.
11. CONTRACTOR MUST COORDINATE WITH BROWNSVILLE PUBLIC TRANSPORTATION SYSTEM FOR CONTINUED BUS ACCESS THROUGH THE CONSTRUCTION OF THE CORRIDOR.

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 ROADWAYS, DURING RECONSTRUCTION, UNLESS OTHERWISE NOTED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

CONSTRUCTION REQUIRING TEMPORARY LANE CLOSURES OF MAIN LANES RESULTING IN LESS THAN THE MINIMUM NUMBER OF LANES AS SPECIFIED IN PREVIOUS NOTE, SHALL BE DURING OFF-PEAK HOURS. DURING THE PEAK HOURS THE CONTRACTOR SHALL MAINTAIN THE MINIMUM REQUIRED NUMBER OF LANES OPEN TO TRAFFIC.

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. 8:00 P.M. TO 6:00 A.M.
- WEEKEND HOURS
  - FRI. 9:00 P.M. TO MON. 6:00 A.M.



Pharr District Central Design



SH 48  
**TRAFFIC CONTROL  
 PLAN -  
 GENERAL NOTES**

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DW:	CK:	DIST		COUNTY	SHEET NO.
		PHR		CAMERON	56

# SH 48 SEQUENCE OF CONSTRUCTION

## PHASE 1 STEP 1

1. INSTALL ADVANCE WARNING SIGNS AS SHOWN ON THE TRAFFIC CONTROL PLANS (TCP) AND/OR AS DIRECTED BY THE ENGINEER. THESE SIGNS SHALL BE ERECTED AND PLACED PRIOR TO COMMENCING ANY CONSTRUCTION AND SHALL REMAIN IN PLACE FOR THE DURATION OF THE CONSTRUCTION PHASE.
2. ALL EXISTING SIGNS THAT ARE CONFLICTING WITH PROPOSED TCP SHALL BE COVERED, ADJUSTED, OR REMOVED.
3. INSTALL TEMPORARY TRAFFIC CONTROL CHANNELIZING DEVICES AS SHOWN ON TCP TYPICAL SECTIONS AND TCP LAYOUT SHEETS.
4. INSTALL EROSION CONTROL DEVICES AS SHOWN IN SW3P LAYOUTS.
5. CONTRACTOR SHALL CONSTRUCT THE EASTBOUND ROADWAY WIDENING AS SHOWN ON THE TCP TYPICAL SECTIONS AND TCP LAYOUTS.
6. INSTALL TEMPORARY SEEDING (SEE SW3P LAYOUTS).
7. CONTRACTOR MUST COMPLETE CURRENT STEP BEFORE PROCEEDING TO NEXT STEP.

## PHASE 1 STEP 2

1. INSTALL TEMPORARY TRAFFIC CONTROL CHANNELIZING DEVICES AS SHOWN ON TCP TYPICAL SECTIONS AND TCP LAYOUT SHEETS.
2. INSTALL EROSION CONTROL DEVICES AS SHOWN IN SW3P LAYOUTS.
3. CONTRACTOR SHALL CONSTRUCT THE WESTBOUND ROADWAY WIDENINGS AS SHOWN ON THE TCP TYPICAL SECTIONS AND TCP LAYOUTS.
4. INSTALL TEMPORARY SEEDING (SEE SW3P LAYOUTS).
5. CONTRACTOR MUST COMPLETE CURRENT STEP BEFORE PROCEEDING TO NEXT PHASE.

## PHASE 2 STEP 1

1. NIGHT WORK FOR THIS PHASE WILL BE ALLOWED, ONLY IF APPROVED BY THE ENGINEER.
2. INSTALL TRAFFIC CONTROL STRIPING AS SHOWN IN PHASE 2 STEP 1 LAYOUTS. REMOVE ANY CONFLICTING STRIPING.
3. INSTALL TEMPORARY TRAFFIC CONTROL CHANNELIZING DEVICES AS SHOWN ON TCP TYPICAL SECTIONS AND TCP LAYOUT SHEETS.
4. INSTALL EROSION CONTROL DEVICES AS SHOWN IN SW3P LAYOUTS FOR THIS PHASE.
5. CONTRACTOR SHALL MILL 1.5\* THE CONSTRUCTION AREA FROM STA. 100+80 TO STA. 135+86 EXCLUDING THE CONCRETE PAVEMENT AS SHOWN ON THE TCP TYPICAL SECTIONS AND TCP LAYOUTS.
6. REMOVE EXISTING CONCRETE MEDIAN WITHIN THE CONSTRUCTION AREA.
7. CONTRACTOR SHALL CONSTRUCT THE RAISED CONCRETE MEDIAN FROM STA. 100+80 TO STA. 135+86 AS SHOWN ON THE TCP TYPICAL SECTIONS AND TCP LAYOUTS.
8. CONTRACTOR MUST MAINTAIN ACCESS TO EXISTING DRIVEWAYS.
9. CONTRACTOR MUST COMPLETE CURRENT STEP BEFORE PROCEEDING TO NEXT STEP.

## PHASE 2 STEP 2

1. NIGHT WORK FOR THIS PHASE WILL BE ALLOWED, ONLY IF APPROVED BY THE ENGINEER.
2. MAINTAIN TRAFFIC CONTROL STRIPING AS SHOWN IN PHASE 2 STEP 1 LAYOUTS.
3. REMOVE TEMPORARY TRAFFIC CONTROL CHANNELIZING DEVICES FROM PHASE 2 STEP 1.
4. CONTRACTOR SHALL MILL 1.5\* THE REMAINING ROADWAY WIDTH FROM STA. 97+75 TO STA. 135+86 EXCLUDING THE CONCRETE PAVEMENT AS SHOWN ON THE TCP TYPICAL SECTIONS AND TCP LAYOUTS.
5. CONTRACTOR SHALL OVERLAY PREVIOUSLY MILLED AREAS WITH 1.5\* ACP AS SHOWN ON THE TCP TYPICAL SECTIONS AND TCP LAYOUTS.
6. CONTRACTOR SHALL STRIPE NEWLY OVERLAYED AND CONCRETE PAVEMENT IN THIS PHASE WITH PROPOSED STRIPING AS SHOWN IN THE PAVEMENT MARKING LAYOUTS.

7. CONTRACTOR MUST MAINTAIN ACCESS TO EXISTING DRIVEWAYS.
8. CONTRACTOR MUST COMPLETE CURRENT STEP BEFORE PROCEEDING TO NEXT PHASE.

## PHASE 3 STEP 1

1. NIGHT WORK FOR THIS PHASE WILL BE ALLOWED, ONLY IF APPROVED BY THE ENGINEER.
2. INSTALL TRAFFIC CONTROL STRIPING AS SHOWN IN PHASE 3 STEP 1 LAYOUTS. REMOVE ANY CONFLICTING STRIPING.
3. INSTALL TEMPORARY TRAFFIC CONTROL CHANNELIZING DEVICES AS SHOWN ON TCP TYPICAL SECTIONS AND TCP LAYOUT SHEETS.
4. INSTALL EROSION CONTROL DEVICES AS SHOWN IN SW3P LAYOUTS FOR THIS PHASE.
5. CONTRACTOR SHALL MILL 1.5\* THE CONSTRUCTION AREA FROM STA. 136+92 TO STA. 184+71 AS SHOWN ON THE TCP TYPICAL SECTIONS AND TCP LAYOUTS.
6. CONTRACTOR SHALL CONSTRUCT THE RAISED CONCRETE MEDIAN FROM STA. 136+92 TO STA. 184+71 AS SHOWN ON THE TCP TYPICAL SECTIONS AND TCP LAYOUTS.
7. CONTRACTOR MUST MAINTAIN ACCESS TO EXISTING DRIVEWAYS.
8. CONTRACTOR MUST COMPLETE CURRENT STEP BEFORE PROCEEDING TO NEXT STEP.

## PHASE 3 STEP 2

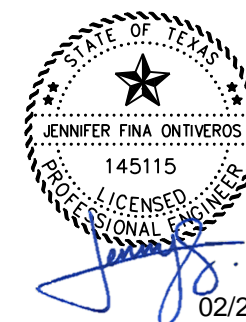
1. NIGHT WORK FOR THIS PHASE WILL BE ALLOWED, ONLY IF APPROVED BY THE ENGINEER.
2. MAINTAIN TRAFFIC CONTROL STRIPING AS SHOWN IN PHASE 3 STEP 1 LAYOUTS.
3. REMOVE TEMPORARY TRAFFIC CONTROL CHANNELIZING DEVICES FROM PHASE 3 STEP 1.
4. CONTRACTOR SHALL MILL 1.5\* THE REMAINING ROADWAY WIDTH FROM STA. 135+86 TO STA. 184+71 AS SHOWN ON THE TCP TYPICAL SECTIONS AND TCP LAYOUTS.
5. CONTRACTOR SHALL OVERLAY PREVIOUSLY MILLED AREAS WITH 1.5\* ACP AS SHOWN ON THE TCP TYPICAL SECTIONS AND TCP LAYOUTS.
6. CONTRACTOR SHALL STRIPE NEWLY OVERLAYED PAVEMENT IN THIS PHASE WITH PROPOSED STRIPING AS SHOWN IN THE PAVEMENT MARKING LAYOUTS.
7. CONTRACTOR MUST MAINTAIN ACCESS TO EXISTING DRIVEWAYS.
8. CONTRACTOR MUST COMPLETE CURRENT STEP BEFORE PROCEEDING TO NEXT PHASE.

## PHASE 4 STEP 1

1. NIGHT WORK FOR THIS PHASE WILL BE ALLOWED, ONLY IF APPROVED BY THE ENGINEER.
2. INSTALL TRAFFIC CONTROL STRIPING AS SHOWN IN PHASE 4 STEP 1 LAYOUTS. REMOVE ANY CONFLICTING STRIPING.
3. INSTALL TEMPORARY TRAFFIC CONTROL CHANNELIZING DEVICES AS SHOWN ON TCP TYPICAL SECTIONS AND TCP LAYOUT SHEETS.
4. INSTALL EROSION CONTROL DEVICES AS SHOWN IN SW3P LAYOUTS FOR THIS PHASE.
5. CONTRACTOR SHALL MILL 1.5\* THE CONSTRUCTION AREA FROM STA. 185+85 TO STA. 226+20 AS SHOWN ON THE TCP TYPICAL SECTIONS AND TCP LAYOUTS.
6. CONTRACTOR SHALL CONSTRUCT THE RAISED CONCRETE MEDIAN FROM STA. 185+85 TO STA. 226+20 AS SHOWN ON THE TCP TYPICAL SECTIONS AND TCP LAYOUTS.
7. CONTRACTOR MUST MAINTAIN ACCESS TO EXISTING DRIVEWAYS.
8. CONTRACTOR MUST COMPLETE CURRENT STEP BEFORE PROCEEDING TO NEXT STEP.

## PHASE 4 STEP 2

1. NIGHT WORK FOR THIS PHASE WILL BE ALLOWED, ONLY IF APPROVED BY THE ENGINEER.
2. MAINTAIN TRAFFIC CONTROL STRIPING AS SHOWN IN PHASE 4 STEP 1 LAYOUTS.



**Pharr District Central Design**



**SH 48  
TRAFFIC CONTROL  
PLAN - SEQUENCE OF  
CONSTRUCTION**

SHEET 1 OF 2

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# SH 48 SEQUENCE OF CONSTRUCTION

3. REMOVE TEMPORARY TRAFFIC CONTROL CHANNELIZING DEVICES FROM PHASE 4 STEP 1.
4. CONTRACTOR SHALL MILL 1.5\* THE REMAINING ROADWAY WIDTH FROM STA. 184+71 TO STA. 227+31 AS SHOWN ON THE TCP TYPICAL SECTIONS AND TCP LAYOUTS.
5. CONTRACTOR SHALL OVERLAY PREVIOUSLY MILLED AREAS WITH 1.5\* ACP AS SHOWN ON THE TCP TYPICAL SECTIONS AND TCP LAYOUTS.
6. CONTRACTOR SHALL STRIPE NEWLY OVERLAYED PAVEMENT IN THIS PHASE WITH PROPOSED STRIPING AS SHOWN IN THE PAVEMENT MARKING LAYOUTS.
7. CONTRACTOR MUST MAINTAIN ACCESS TO EXISTING DRIVEWAYS.
8. CONTRACTOR MUST COMPLETE CURRENT STEP BEFORE PROCEEDING TO NEXT PHASE.

## PHASE 5 STEP 1

1. NIGHT WORK FOR THIS PHASE WILL BE ALLOWED, ONLY IF APPROVED BY THE ENGINEER.
2. INSTALL TRAFFIC CONTROL STRIPING AS SHOWN IN PHASE 5 STEP 1 LAYOUTS. REMOVE CONFLICTING STRIPING.
3. INSTALL TEMPORARY TRAFFIC CONTROL CHANNELIZING DEVICES AS SHOWN ON TCP TYPICAL SECTIONS AND TCP LAYOUT SHEETS.
4. INSTALL EROSION CONTROL DEVICES AS SHOWN IN SW3P LAYOUTS FOR THIS PHASE.
5. CONTRACTOR SHALL CONSTRUCT THE RAISED CONCRETE MEDIAN FROM STA. 227+31 TO STA. 258+53 AS SHOWN ON THE TCP TYPICAL SECTIONS AND TCP LAYOUTS.
6. CONTRACTOR MUST MAINTAIN ACCESS TO EXISTING DRIVEWAYS.
7. CONTRACTOR MUST COMPLETE CURRENT STEP BEFORE PROCEEDING TO NEXT PHASE.

## PHASE 6 STEP 1

1. NIGHT WORK FOR THIS PHASE WILL BE ALLOWED, ONLY IF APPROVED BY THE ENGINEER.
2. INSTALL TRAFFIC CONTROL STRIPING AS SHOWN IN PHASE 6 STEP 1 LAYOUTS. REMOVE CONFLICTING STRIPING.
3. REMOVE 1' WIDE BREAK-BACK EXISTING RAISED CONCRETE ISLAND FROM STA. 259+45 TO STA. 259+67.
4. INSTALL TEMPORARY TRAFFIC CONTROL CHANNELIZING DEVICES AS SHOWN ON TCP TYPICAL SECTIONS AND TCP LAYOUT SHEETS.
5. INSTALL EROSION CONTROL DEVICES AS SHOWN IN SW3P LAYOUTS FOR THIS PHASE.
6. CONTRACTOR SHALL MILL 1.5\* THE CONSTRUCTION AREA FROM STA. 262+37.80 TO STA. 292+97 AS SHOWN ON THE TCP TYPICAL SECTIONS AND TCP LAYOUTS.
7. CONTRACTOR SHALL CONSTRUCT THE RAISED CONCRETE MEDIAN FROM STA. 259+59 TO STA. 292+97 AS SHOWN ON THE TCP TYPICAL SECTIONS AND TCP LAYOUTS.
8. CONTRACTOR MUST MAINTAIN ACCESS TO EXISTING DRIVEWAYS.
9. CONTRACTOR MUST COMPLETE CURRENT STEP BEFORE PROCEEDING TO NEXT STEP.

## PHASE 6 STEP 2

1. NIGHT WORK FOR THIS PHASE WILL BE ALLOWED, ONLY IF APPROVED BY THE ENGINEER.
2. MAINTAIN TRAFFIC CONTROL STRIPING AS SHOWN IN PHASE 6 STEP 1 LAYOUTS.
3. REMOVE TEMPORARY TRAFFIC CONTROL CHANNELIZING DEVICES FROM PHASE 6 STEP 1.
4. CONTRACTOR SHALL MILL 1.5\* THE REMAINING ROADWAY WIDTH FROM STA. 262+37.80 TO STA. 300+66 AS SHOWN ON THE TCP TYPICAL SECTIONS AND TCP LAYOUTS.
5. CONTRACTOR SHALL REMOVE EXISTING CRASH CUSHION AND INSTALL PRECAST TRAFFIC CONCRETE BARRIER ON MILLED SURFACE FROM STA. 293+11 TO STA. 300+66 ALONG WITH PROPOSED CRASH CUSHION.
6. CONTRACTOR SHALL OVERLAY PREVIOUSLY MILLED AREAS WITH 1.5\* ACP AS SHOWN ON THE TCP TYPICAL SECTIONS AND TCP LAYOUTS.

7. CONTRACTOR SHALL STRIPE NEWLY OVERLAYED PAVEMENT IN THIS PHASE WITH PROPOSED STRIPING AS SHOWN IN THE PAVEMENT MARKING LAYOUTS.
8. CONTRACTOR MUST MAINTAIN ACCESS TO EXISTING DRIVEWAYS.
9. INSTALL PERMANENT SEEDING (SEE SW3P LAYOUTS).
10. PRIOR TO FINAL ACCEPTANCE OF THE PROJECT, CONTRACTOR SHALL REMOVE TEMPORARY STRIPING, BARRICADES AND SIGNS, AND OPEN ALL TRAVEL LANES TO TRAFFIC BUT MUST LEAVE ADVANCE WARNING SIGNS IN PLACE UNTIL FINAL ACCEPTANCE OF THE ENGINEER.

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**Pharr District Central Design**

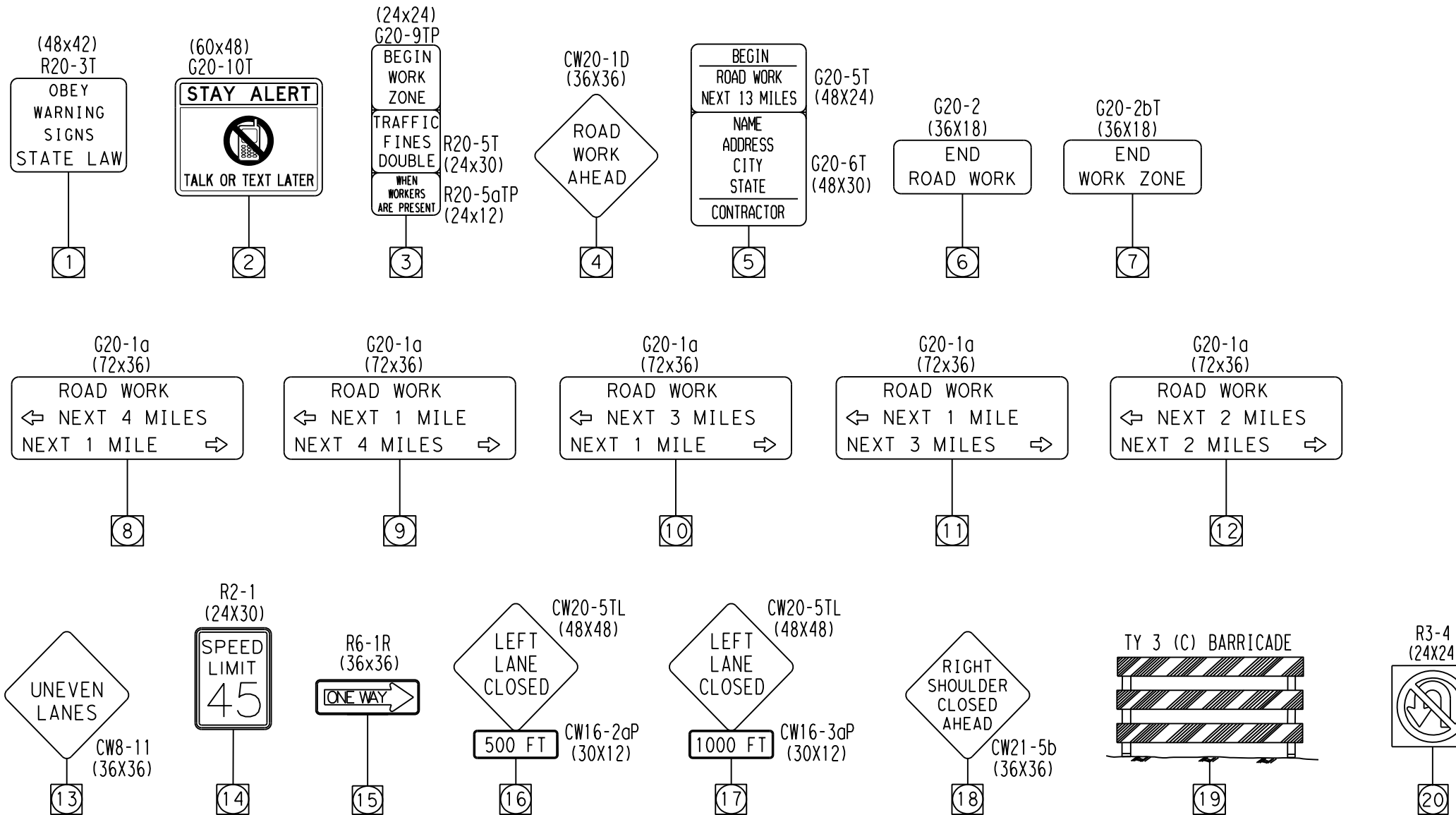


**SH 48  
TRAFFIC CONTROL  
PLAN - SEQUENCE OF  
CONSTRUCTION**

SHEET 2 OF 2

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	PHR		CAMERON	<b>58</b>

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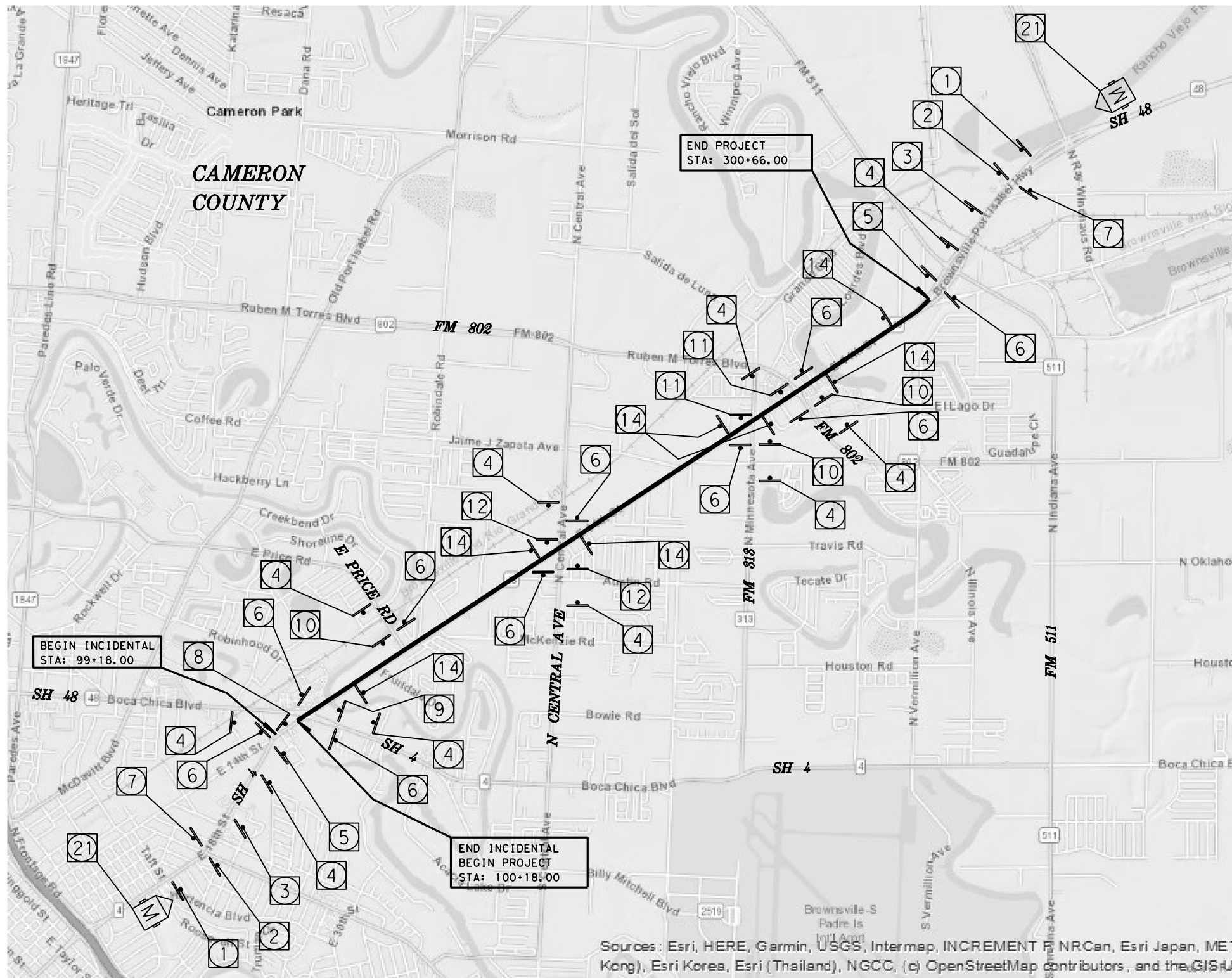
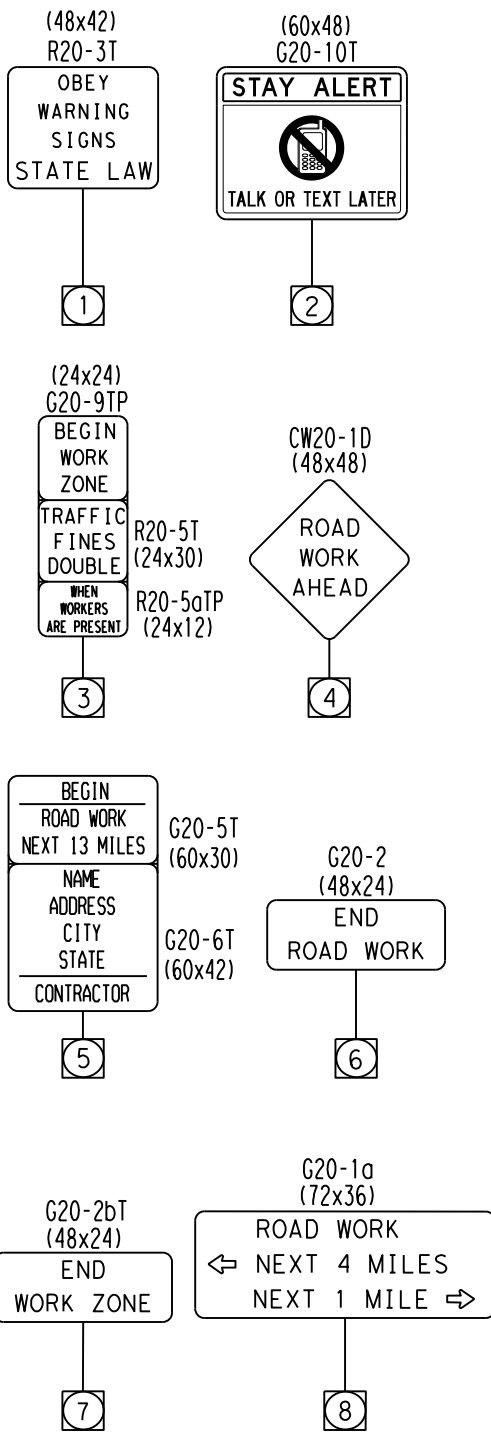


**Pharr District Central Design**

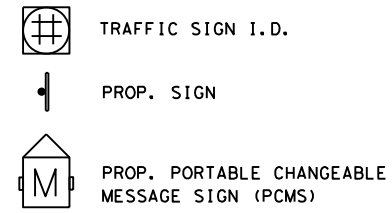
**SH 48  
 TRAFFIC CONTROL  
 PLAN - SIGNS  
 SUMMARY SHEET**

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DIST	COUNTY	HIGHWAY	
PHR	CAMERON	SH 48	
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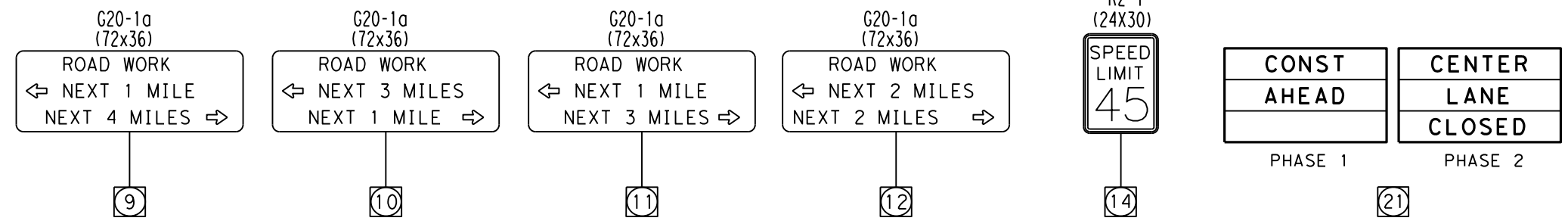
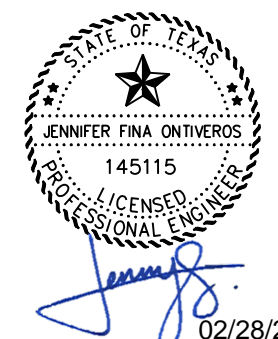
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LEGEND



- NOTES:
1. THIS LAYOUT ONLY SHOWS THE RELATIVE LOCATION OF PROPOSED SIGNAGE. SPACING BETWEEN SIGNS SHALL FOLLOW REQUIREMENTS SET OUT BY TXDOT BC(1)-21 THROUGH BC(12)-21 AND TCP STANDARDS.
  2. REFER TO THE SEQUENCE OF CONSTRUCTION AND GENERAL NOTES FOR ADDITIONAL INFORMATION.
  3. ADVANCE WARNING SIGNS SHALL BE IN PLACE BEFORE COMMENCEMENT OF CONSTRUCTION AND SHALL BE REMOVED ONCE THE PROJECT IS COMPLETED AND ACCEPTED BY TXDOT.
  4. PORTABLE CHANGEABLE MESSAGE SIGNS TO BE USED IN ACCORDANCE WITH BC(6)-21 STANDARD. LOCATION CHANGES AND MESSAGE CHANGES ON PCMS ARE PERMITTED WITH APPROVAL BY AREA ENGINEER.



Pharr District Central Design

Texas Department of Transportation

SH 48  
 TRAFFIC CONTROL  
 PLAN - ADVANCE  
 WARNING SIGNS

NOT TO SCALE SHEET 1 OF 1


© 2022	CONT	SECT	JOB	HIGHWAY
DS: CK:	0220	05	080	SH 48
DW: CK:	DIST		COUNTY	SHEET NO.
PHR		CAMERON		60

DATE: 2/27/2023 4:21:10 PM  
 FILE: \\txdot\projectwiseonline.com\TxDOT\Projects\022005080\4 - Design\Plan Set\2 - TCP\SH 48 TCP SUMMARY TABLE.dgn

LOCATION	SHEET	FROM STATION	TO STATION	SUMMARY OF LOW PROFILE CONCRETE TRAFFIC BARRIER						SUMMARY OF WORK ZONE PAVEMENT MARKINGS									SUMMARY OF ELIMINATING EXISTING MARKINGS AND MARKERS					6001 6002	6185 6002
				512						678	662						677								
				6009 PORT CTB (FUR & INST) (LOW PROF) (TY 1)	6010 PORT CTB (FUR & INST) (LOW PROF) (TY 2)	6033 PORT CTB (MOVE) (LOW PROF) (TY 1)	6034 PORT CTB (MOVE) (LOW PROF) (TY 2)	6057 PORT CTB (REMOV E) (LOW PROF) (TY 1)	6058 PORT CTB (REMOV E) (LOW PROF) (TY 2)	6001 PAV SURF PREP FOR MRK (4")	6048 WK ZN PAV MRK (REFL) TY I-C	6052 WK ZN PAV MRK REMOV (REFL) TY I-C-R	6060 WK ZN PAV MRK REMOV (W) 4" (BRK)	6061 WK ZN PAV MRK REMOV (W) 4" (DOT)	6063 WK ZN PAV MRK REMOV (W) 4" (SLD)	6071 WK ZN PAV MRK REMOV (W) 8" (SLD)	6075 WK ZN PAV MRK REMOV (W) 24" (SLD)	6095 WK ZN PAV MRK REMOV (Y) 4" (SLD)	6001 ELIM EXT PAV MRK & MRKS (4")	6003 ELIM EXT MRK & MRKS (8")	6007 ELIM EXT MRK & MRKS (24")	6008 ELIM EXT PAV MRK & MRKS (ARROW)	6012 ELIM EXT PAV MRK & MRKS (WORD)		
LF	LF	LF	LF	LF	LF	LF	EA	EA	LF	LF	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	DAY			
PHASE 1																									
STEP 1	1 OF 3	105+00	159+00																						
	2 OF 3	182+00	206+00																						
	3 OF 3	206+00	278+00																						
STEP 2	1 OF 2	131+00	192+00																						
	2 OF 2	192+00	246+00																						
PHASE 1 TOTAL				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
PHASE 2																									
STEP 1	1 OF 2	95+00	119+00	3,000	200					3,918	14	103	960		3,198	140	44	3,810	5,708	146	50	6	3		
	2 OF 2	121+00	13+30	3,040	120							83	830	160	3,282		22	3,160	4,222						
STEP 2	1 OF 2	95+00	119+00			*3000	*200				14	54	540		2,142		44	2,032							
	2 OF 2	121+00	133+00			*3040	*120					83	830	160	3,282		22	3,160							
PHASE 2 TOTAL				6,040	320	6,040	320	0	0	3,918	28	323	3,160	320	11,904	140	132	12,162	9,930	146	50	6	3	0	0
PHASE 3																									
STEP 1	1 OF 3	131+00	155+00			2,880	280					91	910	84	4,500		22	3,160	4,272						
	2 OF 3	155+00	179+00	1,000	120	3,160	40					105	1,050		3,980			4,320	5,700						
	3 OF 3	179+00	203+00	1,120	40							29	290	96	1,160		22	1,160	1,432						
STEP 2	1 OF 3	131+00	155+00			*2880	*280					91	910	84	4,500		22	3,160							
	2 OF 3	155+00	179+00			*3720	*160	440				105	1,050		3,980			4,320							
	3 OF 3	179+00	203+00			*40	1,120					91	290	96	1,160		22	1,160							
PHASE 3 TOTAL				2,120	160	12,640	800	1,560	0	0	0	512	4,500	360	19,280	0	88	17,280	11,404	0	0	0	0	0	0
PHASE 4																									
STEP 1	1 OF 2	183+00	207+00			3,760	200					99	990	90	3,964		22	3,960	5,290						
	2 OF 2	207+00	231+00		80	2,840	280					88	880	84	3,425			3,200	4,800						
STEP 2	1 OF 2	183+00	207+00			*3760	*200					99	990	90	3,964		22	3,960							
	2 OF 2	207+00	231+00			*2560	*360	280	240			88	880	84	3,425			3,200							
PHASE 4 TOTAL				0	80	12,920	1,040	280	240	0	0	374	3,740	348	14,778	0	44	14,320	10,090	0	0	0	0	0	0
PHASE 5																									
STEP 1	1 OF 2	219+00	243+00			2,820	120					76	760	102	3,166			2,940	7,856	103		2	1		
	2 OF 2	243+00	267+00			2,540	200					72	720		2,184		66	2,740	7,772	180		6	4		
PHASE 5 TOTAL				0	0	5,360	320	0	0	0	0	148	1,480	102	5,350	0	66	5,680	15,628	283	0	8	5	0	0
PHASE 6																									
STEP 1	1 OF 3	257+00	281+00			3,960	120		160			103	1,030	60	3,783		22	4,086	6,219	256					
	2 OF 3	281+00	305+00			2,360	40					74	740		2,781			2,394	3,301						
	3 OF 3	305+00	329+00																						
STEP 2	1 OF 3	257+00	281+00					3,960	120			88	880		3,443		22	3,514							
	2 OF 3	281+00	305+00					2,360	40			74	740		2,781			2,394							
	3 OF 3	305+00	329+00																						
PHASE 6 TOTAL				0	0	6,320	160	6,320	320	0	0	339	3,390	60	12,788	0	44	12,388	9,520	256	0	0	0	2	3
PROJECT TOTAL				8,160	560	43,280	2,640	8,160	560	3,918	28	1,696	16,270	1,190	64,100	140	374	61,830	56,572	685	50	14	8	2	3

\* TEMPORARILY MOVE TO STOCKPILE

**Pharr District Central Design**

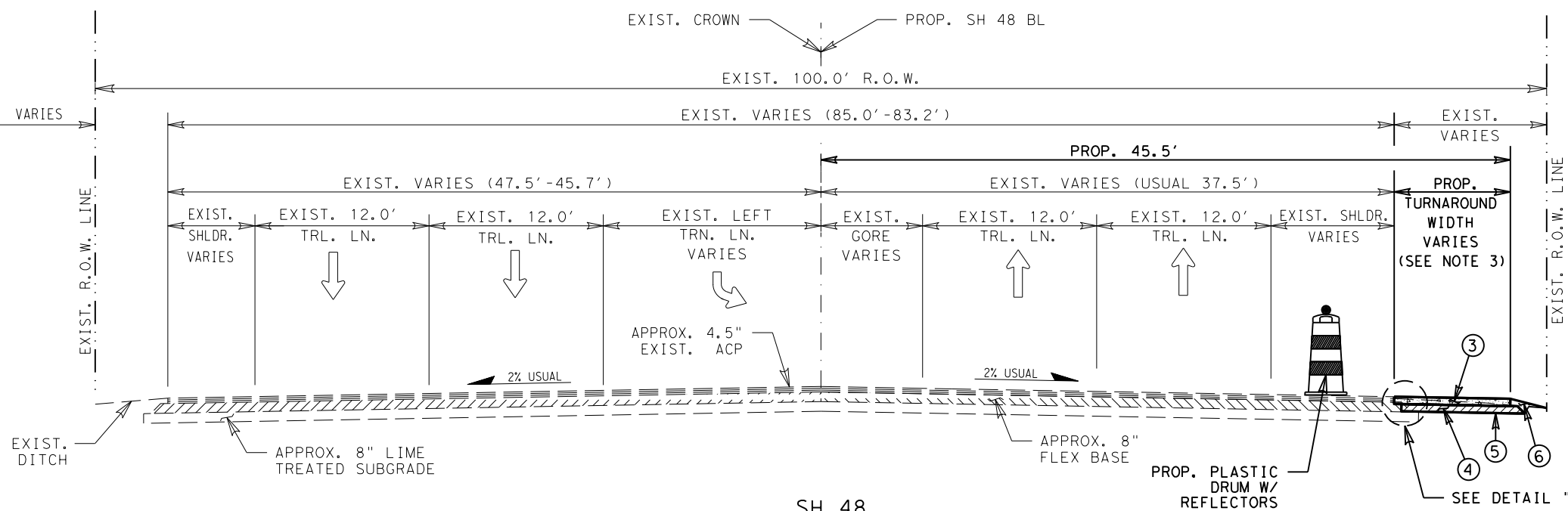


**SH 48  
TRAFFIC CONTROL  
PLAN -  
SUMMARY TABLE**

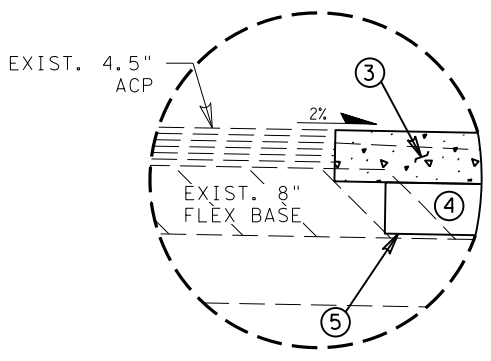
SHEET 1 OF 1

© 2022	CONT	SECT	JOB	HIGHWAY
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DW: _____	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	61

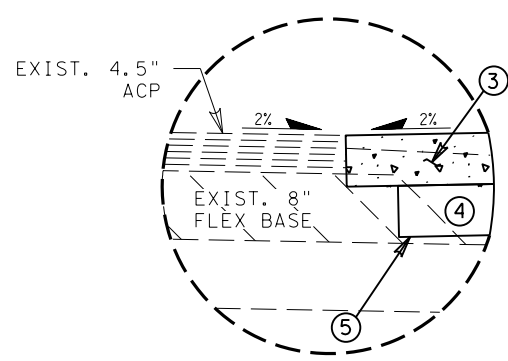
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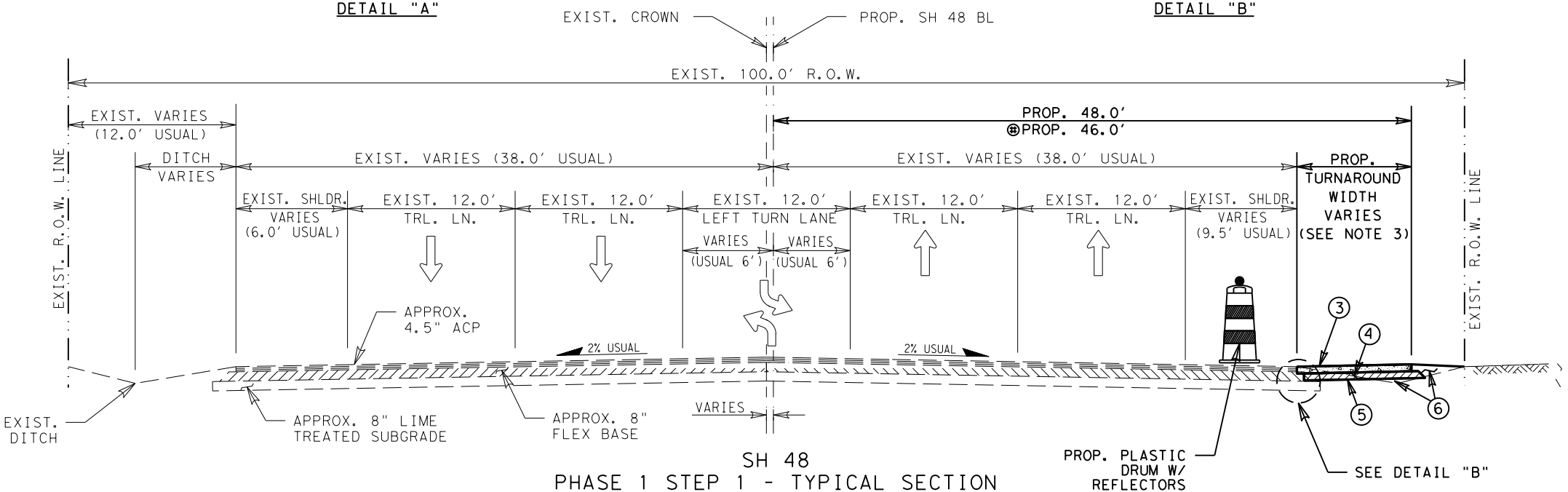
SH 48  
 PHASE 1 STEP 1 - TYPICAL SECTION  
 STA. 112+03.00 TO STA. 112+53.00



DETAIL "A"



DETAIL "B"



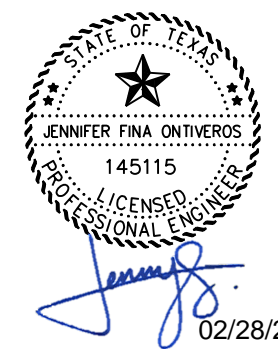
SH 48  
 PHASE 1 STEP 1 - TYPICAL SECTION  
 STA. 153+39.00 TO STA. 153+84.00  
 @STA. 212+55.00 TO STA. 213+22.00  
 STA. 272+09.00 TO STA. 272+59.00

- LEGEND:**
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② PROPOSED BONDING COURSE
  - ③ PROPOSED 6" CONCRETE (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROPOSED PROOF ROLL SUBGRADE
  - ⑥ PROPOSED EMBANKMENT (FINAL) (ORD COMP) (TY C) (SUBSIDIARY TO ITEM 530)

- BL - BASE LINE
- RT - RIGHT
- LT - LEFT
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- REMOV. - REMOVEABLE
- EQ. - EQUAL
- TYP. - TYPICAL
- B.Z. - BUFFER ZONE
- TCP - TRAFFIC CONTROL PLAN
- C-C - CENTER TO CENTER
- ☑ - PLASTIC DRUM W/ REFLECTOR

- A WK ZN PAV MRK REMOV (Y) 4" (SLD)
- B WK ZN PAV MRK REMOV (W) 4" (SLD)
- C WK ZN PAV MRK REMOV (W) 4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
- E WK ZN PAV MRK REMOV (W) 8" (SLD)
- G TYPE II-C-R (REFL) AT 20' C-C

- NOTES:**
- SEE PROPOSED TYPICAL SECTIONS AND ROADWAY PLAN LAYOUT FOR ADDITIONAL DETAILS REGARDING RAISED MEDIAN CONSTRUCTION, TRANSITIONS, AND LIMITS.
  - SEE TCP LAYOUTS FOR CONSTRUCTION AREA WIDTHS, LIMITS, AND TRANSITIONS.
  - SEE PROPOSED TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.



Pharr District Central Design

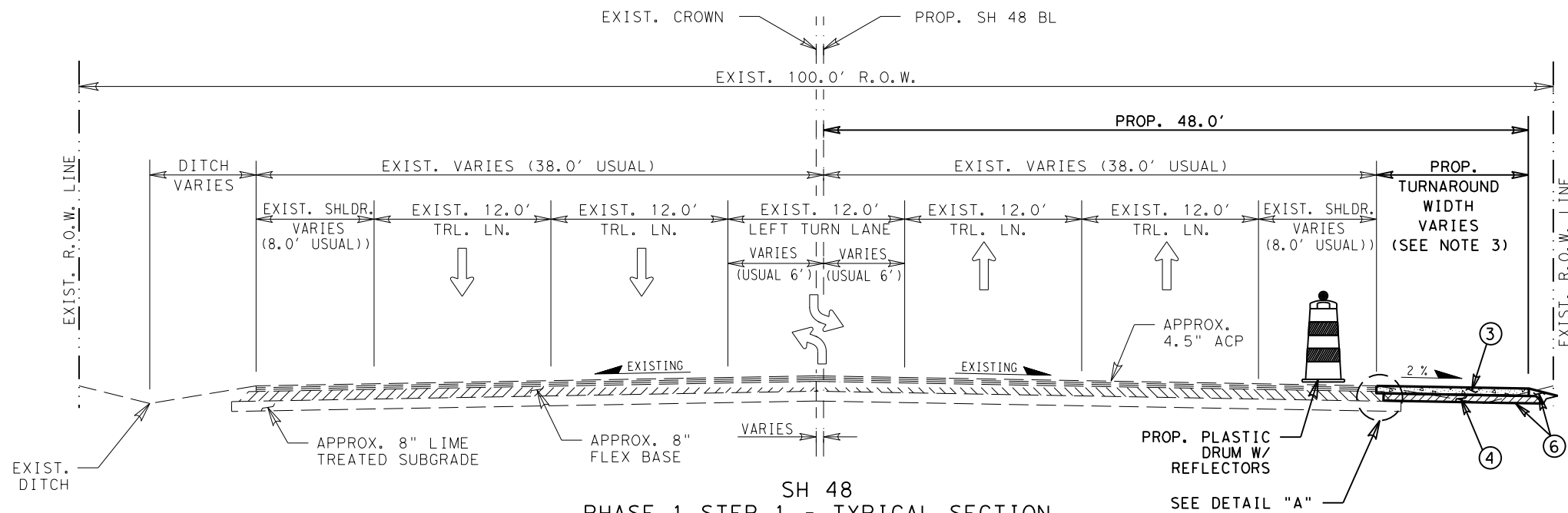
Texas Department of Transportation

SH 48  
 TCP PHASE 1 STEP 1  
 - TYPICAL SECTIONS

NOT TO SCALE SHEET 1 OF 2

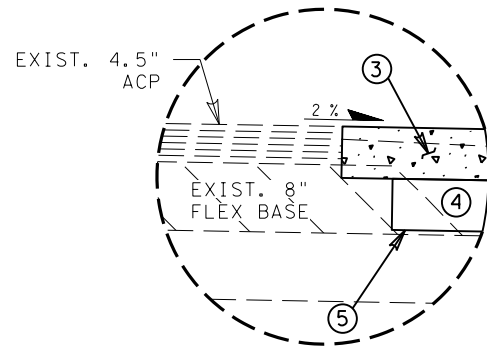
© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
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	PHR	CAMERON	62	

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**SH 88  
 PHASE 1 STEP 1 - TYPICAL SECTION**

STA. 185+75.00 TO STA. 186+06.00  
 STA. 199+96.00 TO STA. 200+81.00



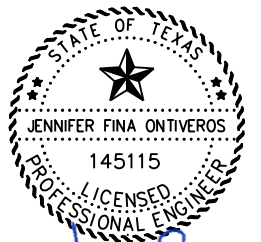
**DETAIL "A"**

- LEGEND:**
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② PROPOSED BONDING COURSE
  - ③ PROPOSED 6" CONCRETE (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROPOSED PROOF ROLL SUBGRADE
  - ⑥ PROPOSED EMBANKMENT (FINAL) (ORD COMP) (TY C) (SUBSIDIARY TO ITEM 530)

- BL - BASE LINE
- RT - RIGHT
- LT - LEFT
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- REMOV - REMOVEABLE
- EQU. - EQUAL
- TYP. - TYPICAL
- B.Z. - BUFFER ZONE
- TCP - TRAFFIC CONTROL PLAN
- C-C - CENTER TO CENTER
- ☐ - PLASTIC DRUM W/ REFLECTOR

- A WK ZN PAV MRK REMOV (Y) 4" (SLD)
- B WK ZN PAV MRK REMOV (W) 4" (SLD)
- C WK ZN PAV MRK REMOV (W) 4" (BRK) W/TYP II-C-R (REFL) AT 40' C-C
- E WK ZN PAV MRK REMOV (W) 8" (SLD)
- G TYPE II-C-R (REFL) AT 20' C-C

- NOTES:**
- SEE PROPOSED TYPICAL SECTIONS AND ROADWAY PLAN LAYOUT FOR ADDITIONAL DETAILS REGARDING RAISED MEDIAN CONSTRUCTION, TRANSITIONS, AND LIMITS.
  - SEE TCP LAYOUTS FOR CONSTRUCTION AREA WIDTHS, LIMITS, AND TRANSITIONS.
  - SEE PROPOSED TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.



*Jennifer Fina Ontiveros*  
 02/28/2023

**Pharr District Central Design**

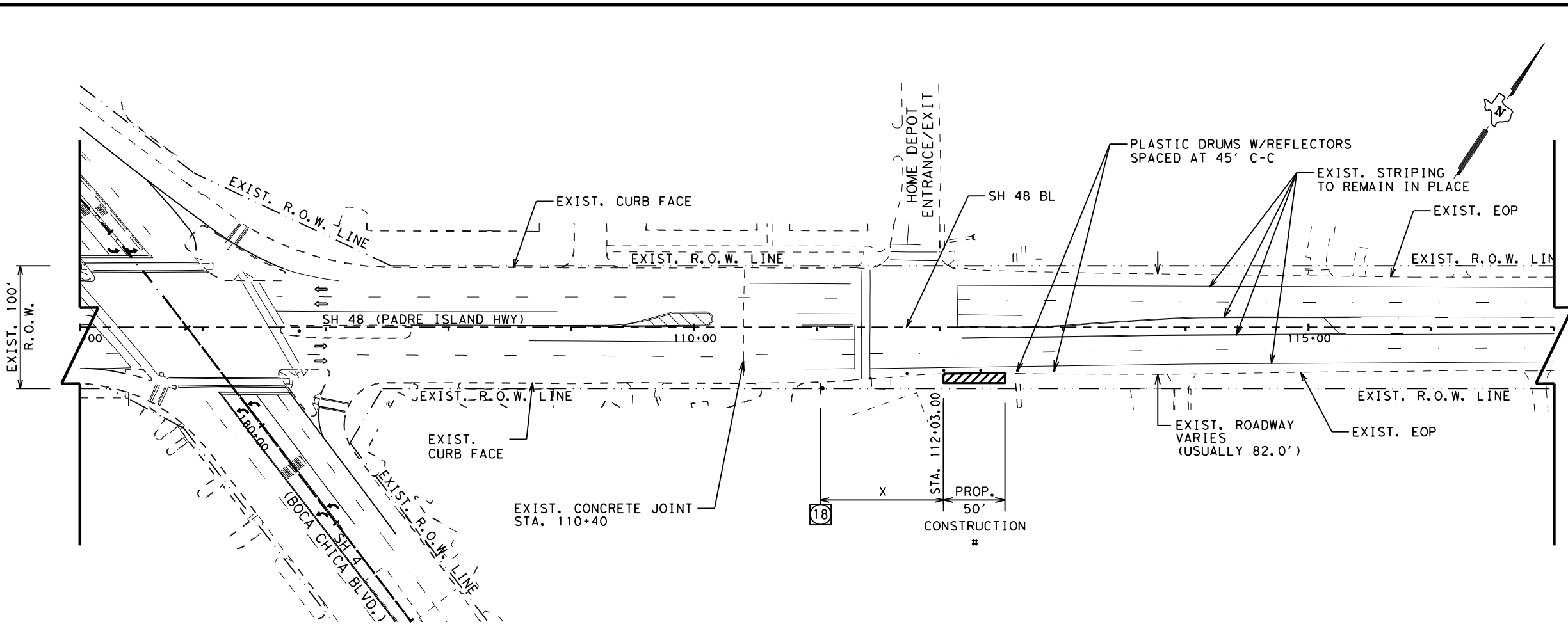


**SH 88  
 TCP PHASE 1 STEP 1  
 - TYPICAL SECTIONS**

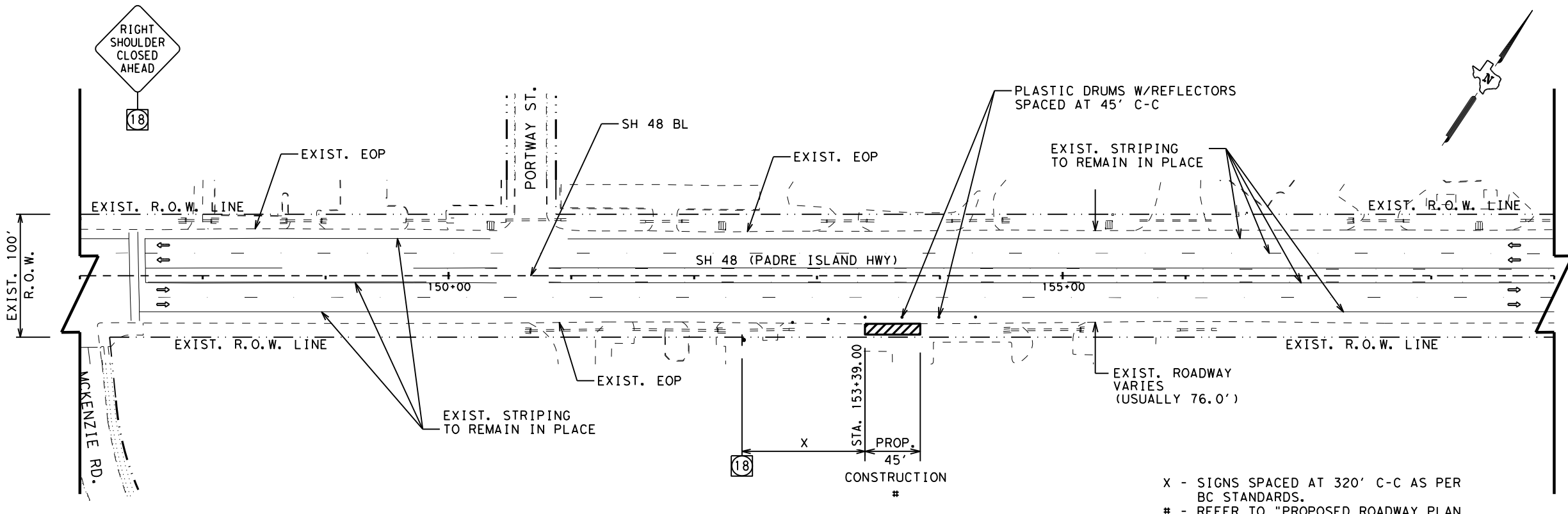
NOT TO SCALE SHEET 2 OF 2

© 2022	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	63	

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- LEGEND**
- CONSTRUCTION AREA
  - REMOVE EXISTING CONCRETE
  - PREVIOUSLY CONSTRUCTED
  - A** WK ZN PAV MRK REMOV (W)4" (SLD)
  - B** WK ZN PAV MRK REMOV (W)4" (SLD)
  - C** WK ZN PAV MRK REMOV (W)4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
  - D** WK ZN PAV MRK REMOV (W)4" (DOT)
  - E** WK ZN PAV MRK REMOV (W)8" (SLD)
  - F** WK ZN PAV MRK REMOV (W)24" (SLD)
  - G** TYPE II-C-R (REFL) AT 20' C-C
  - EXIST. EXISTING
  - PROP. PROPOSED
  - LPCB LOW PROFILE CONCRETE BARRIER
  - R.O.W. RIGHT OF WAY
  - WK ZN WORK ZONE
  - EOP EDGE OF PAVEMENT
  - BL BASELINE
  - C-C CENTER TO CENTER
  - W/ WITH
  - DIRECTION OF TRAFFIC FLOW
  - PROPOSED SIGN
  - PROPOSED TYPE 3 (C) BARRICADES
  - PLASTIC DRUMS W/REFLECTORS
  - LOW PROFILE CONCRETE BARRIER W/REFLECTORS



X - SIGNS SPACED AT 320' C-C AS PER BC STANDARDS.  
 # - REFER TO "PROPOSED ROADWAY PLAN LAYOUT" FOR MORE INFORMATION.



**Pharr District Central Design**

**Texas Department of Transportation**

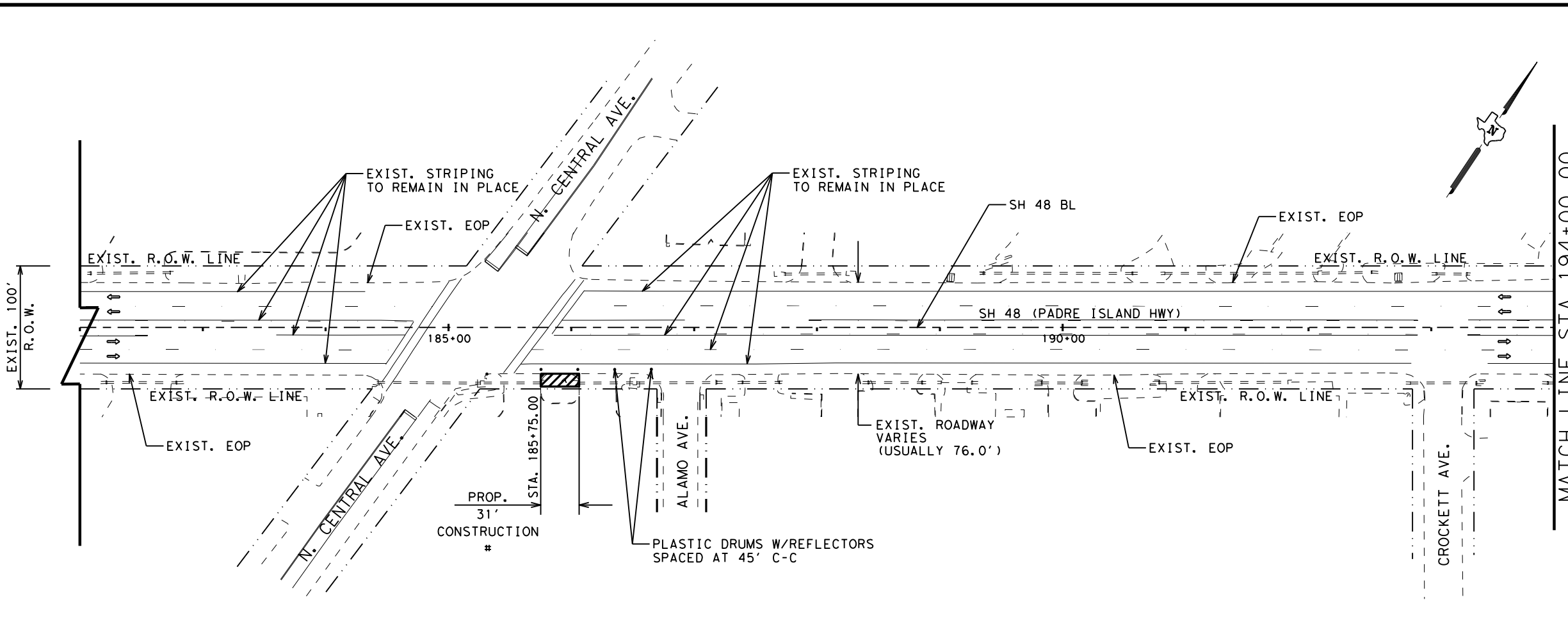
**SH 48  
 TCP PHASE 1 STEP 1  
 - LAYOUT**

SHEET 1 OF 3

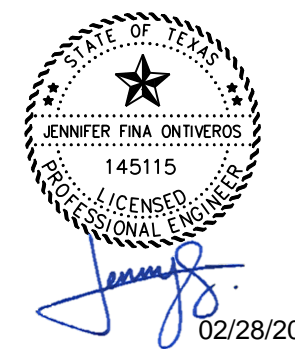
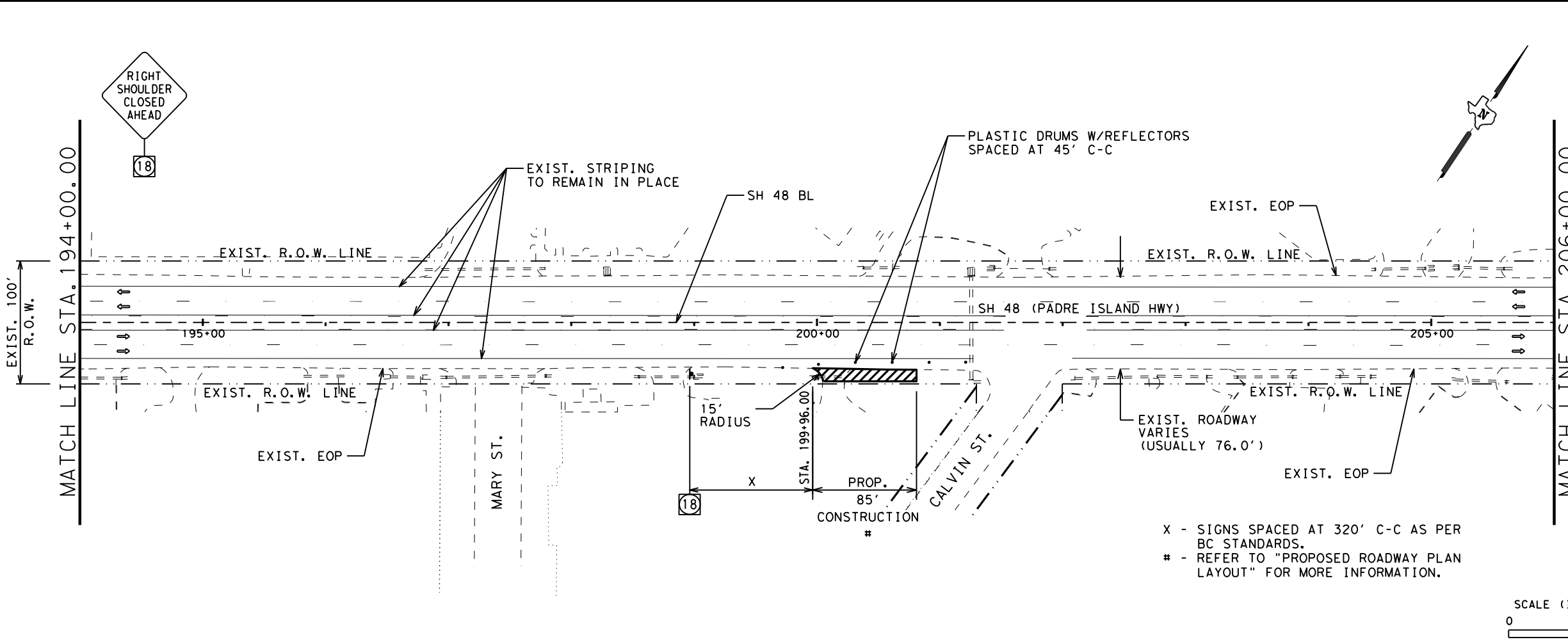
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	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	64	



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- LEGEND**
- CONSTRUCTION AREA
  - REMOVE EXISTING CONCRETE
  - PREVIOUSLY CONSTRUCTED
  - A** WK ZN PAV MRK REMOV (W)4" (SLD)
  - B** WK ZN PAV MRK REMOV (W)4" (SLD)
  - C** WK ZN PAV MRK REMOV (W)4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
  - D** WK ZN PAV MRK REMOV (W)4" (DOT)
  - E** WK ZN PAV MRK REMOV (W)8" (SLD)
  - F** WK ZN PAV MRK REMOV (W)24" (SLD)
  - G** TYPE II-C-R (REFL) AT 20' C-C
  - EXIST. EXISTING
  - PROP. PROPOSED
  - LPCB LOW PROFILE CONCRETE BARRIER
  - R.O.W. RIGHT OF WAY
  - WK ZN WORK ZONE
  - EOP EDGE OF PAVEMENT
  - BL BASELINE
  - C-C CENTER TO CENTER
  - W/ WITH
  - DIRECTION OF TRAFFIC FLOW
  - PROPOSED SIGN
  - PROPOSED TYPE 3 (C) BARRICADES
  - PLASTIC DRUMS W/REFLECTORS
  - LOW PROFILE CONCRETE BARRIER W/REFLECTORS



**Pharr District Central Design**

Texas Department of Transportation

**SH 48  
 TCP PHASE 1 STEP 1  
 - LAYOUT**

SHEET 2 OF 3

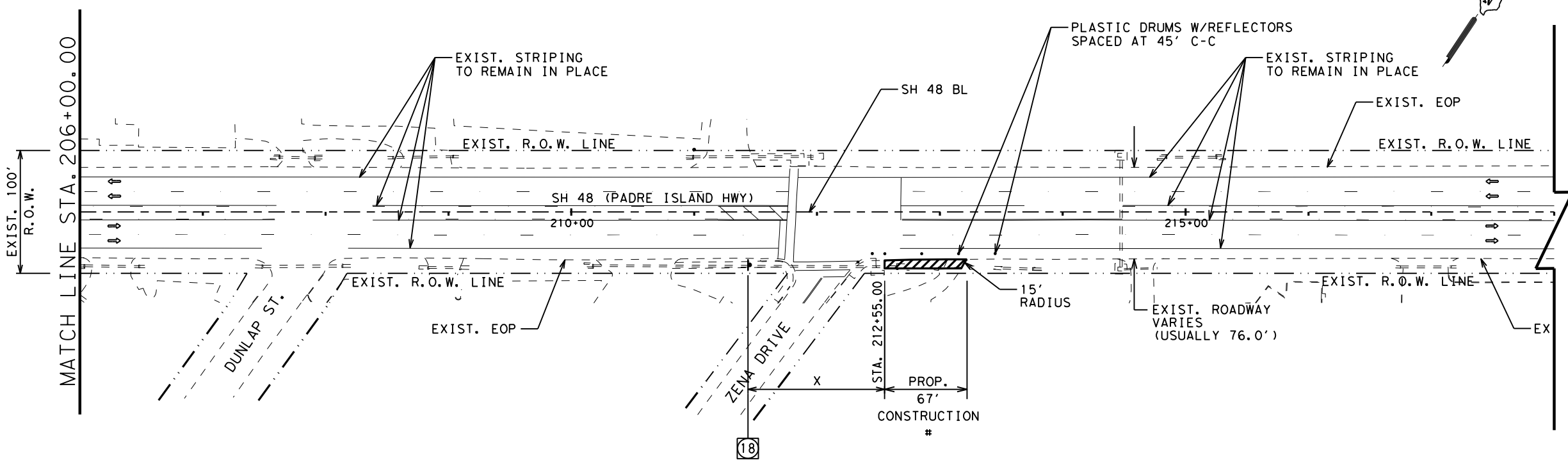
© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	65	

X - SIGNS SPACED AT 320' C-C AS PER BC STANDARDS.  
 \* - REFER TO "PROPOSED ROADWAY PLAN LAYOUT" FOR MORE INFORMATION.

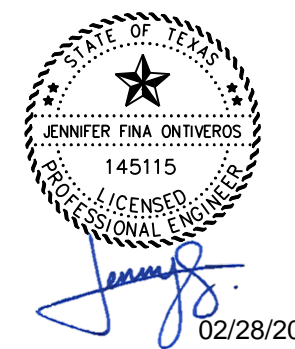
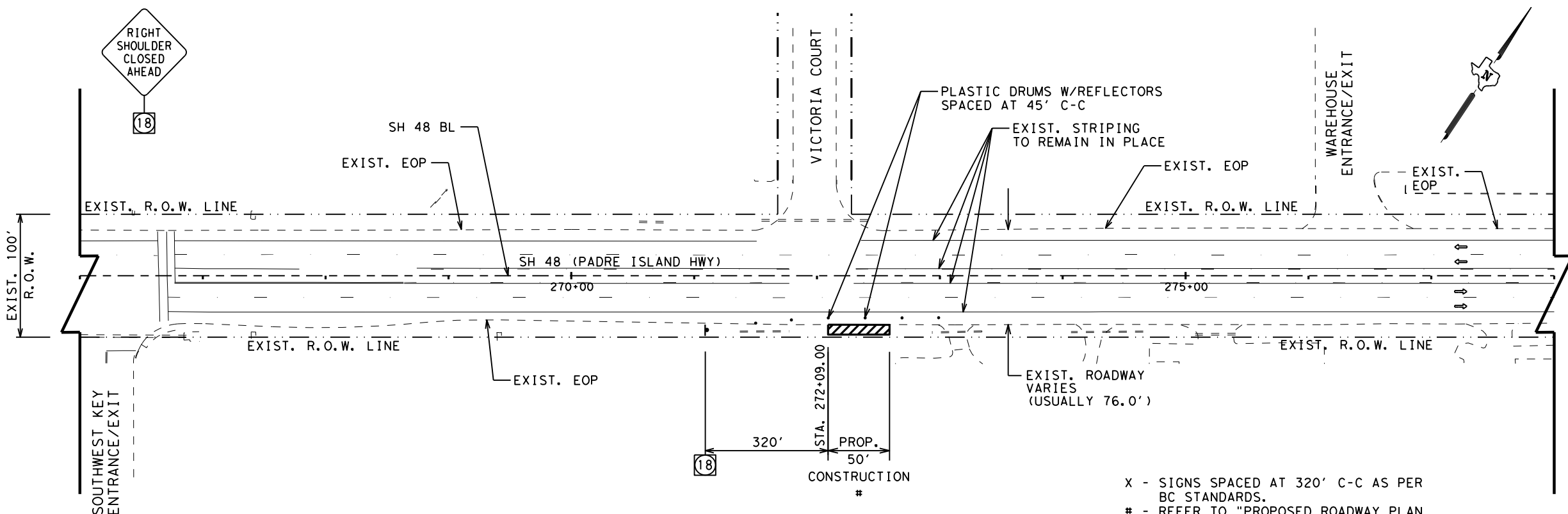




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- LEGEND**
- CONSTRUCTION AREA
  - REMOVE EXISTING CONCRETE
  - PREVIOUSLY CONSTRUCTED
  - A** WK ZN PAV MRK REMOV (W)4" (SLD)
  - B** WK ZN PAV MRK REMOV (W)4" (SLD)
  - C** WK ZN PAV MRK REMOV (W)4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
  - D** WK ZN PAV MRK REMOV (W)4" (DOT)
  - E** WK ZN PAV MRK REMOV (W)8" (SLD)
  - F** WK ZN PAV MRK REMOV (W)24" (SLD)
  - G** TYPE II-C-R (REFL) AT 20' C-C
  - EXIST. EXISTING
  - PROP. PROPOSED
  - LPCB LOW PROFILE CONCRETE BARRIER
  - R.O.W. RIGHT OF WAY
  - WK ZN WORK ZONE
  - EOP EDGE OF PAVEMENT
  - BL BASELINE
  - C-C CENTER TO CENTER
  - W/ WITH
  - DIRECTION OF TRAFFIC FLOW
  - PROPOSED SIGN
  - PROPOSED TYPE 3 (C) BARRICADES
  - PLASTIC DRUMS W/REFLECTORS
  - LOW PROFILE CONCRETE BARRIER W/REFLECTORS



**Pharr District Central Design**

Texas Department of Transportation

**SH 48  
 TCP PHASE 1 STEP 1  
 - LAYOUT**

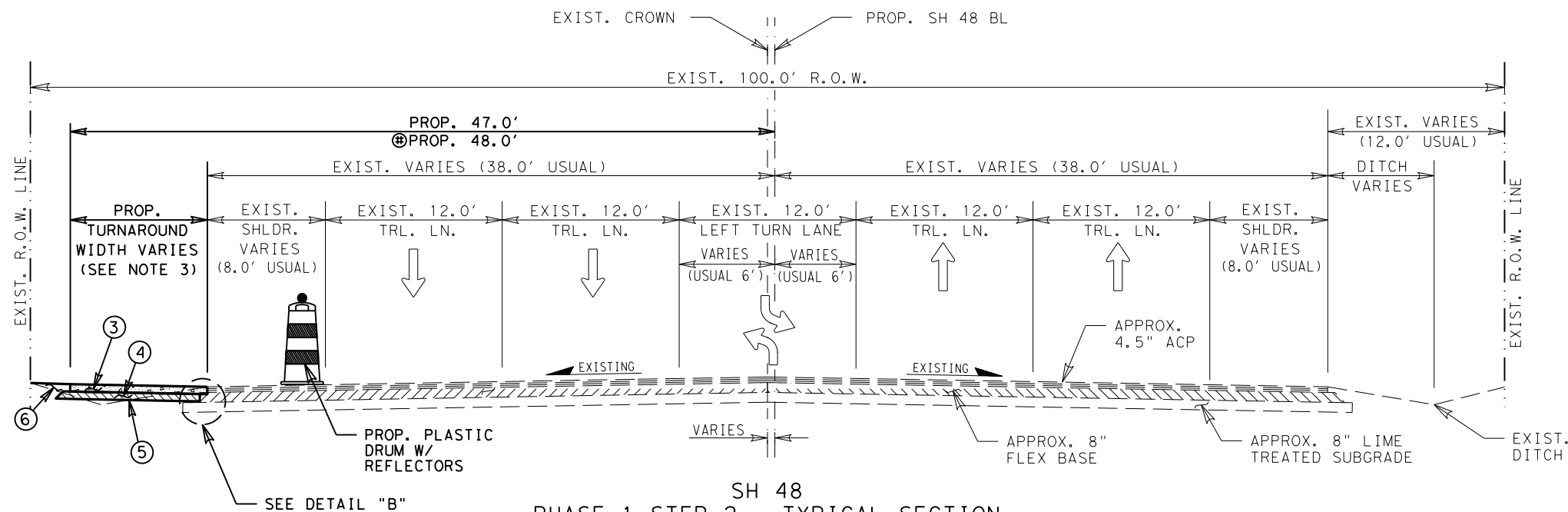
SHEET 3 OF 3

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	66	

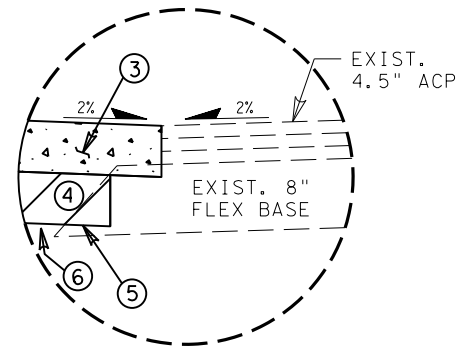
X - SIGNS SPACED AT 320' C-C AS PER BC STANDARDS.  
 \* - REFER TO "PROPOSED ROADWAY PLAN LAYOUT" FOR MORE INFORMATION.



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SH 48  
 PHASE 1 STEP 2 - TYPICAL SECTION  
 STA. 134+96.00 TO STA. 135+88.00  
 ⊕ STA. 184+35.00 TO STA. 184+90.00  
 ⊕ STA. 199+38.00 TO STA. 199+93.00



- LEGEND:**
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② PROPOSED BONDING COURSE
  - ③ PROPOSED 6" CONCRETE (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROPOSED PROOF ROLL SUBGRADE
  - ⑥ PROPOSED EMBANKMENT (FINAL) (ORD COMP) (TY C) (SUBSIDIARY TO ITEM 530)

- BL - BASE LINE
- RT - RIGHT
- LT - LEFT
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- REMOV - REMOVEABLE
- EQ. - EQUAL
- TYP. - TYPICAL
- B.Z. - BUFFER ZONE
- TCP - TRAFFIC CONTROL PLAN
- C-C - CENTER TO CENTER
- 🚧 - PLASTIC DRUM W/ REFLECTOR

- A WK ZN PAV MRK REMOV (Y) 4" (SLD)
- B WK ZN PAV MRK REMOV (W) 4" (SLD)
- C WK ZN PAV MRK REMOV (W) 4" (BRK) W/TYP II-C-R (REFL) AT 40' C-C
- E WK ZN PAV MRK REMOV (W) 8" (SLD)
- G TYPE II-C-R (REFL) AT 20' C-C

- NOTES:**
- SEE PROPOSED TYPICAL SECTIONS AND ROADWAY PLAN LAYOUT FOR ADDITIONAL DETAILS REGARDING RAISED MEDIAN CONSTRUCTION, TRANSITIONS, AND LIMITS.
  - SEE TCP LAYOUTS FOR CONSTRUCTION AREA WIDTHS, LIMITS, AND TRANSITIONS.
  - SEE PROPOSED TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.



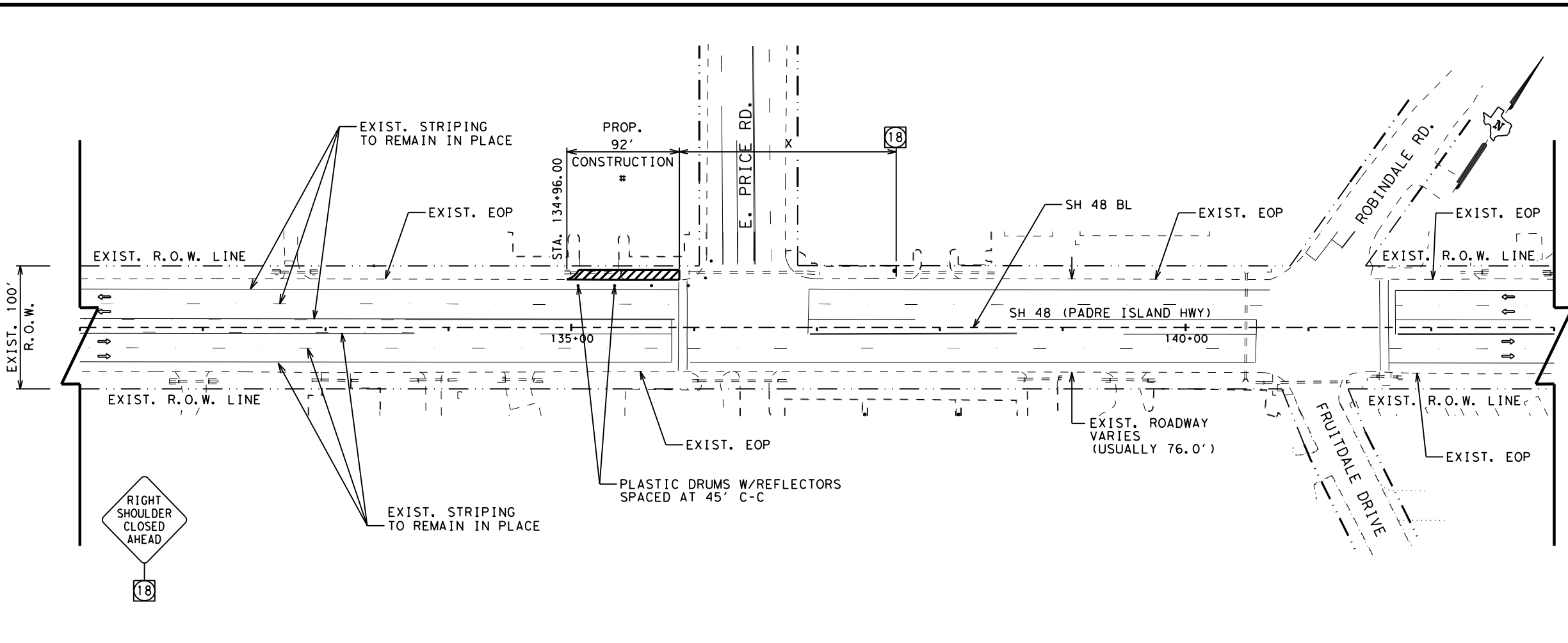
**Pharr District Central Design**

**SH 48  
 TCP PHASE 1 STEP 2  
 - TYPICAL SECTIONS**

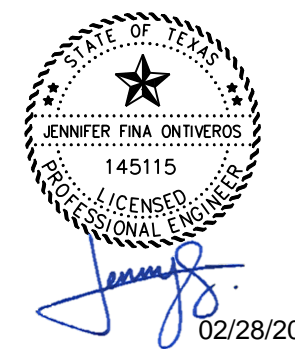
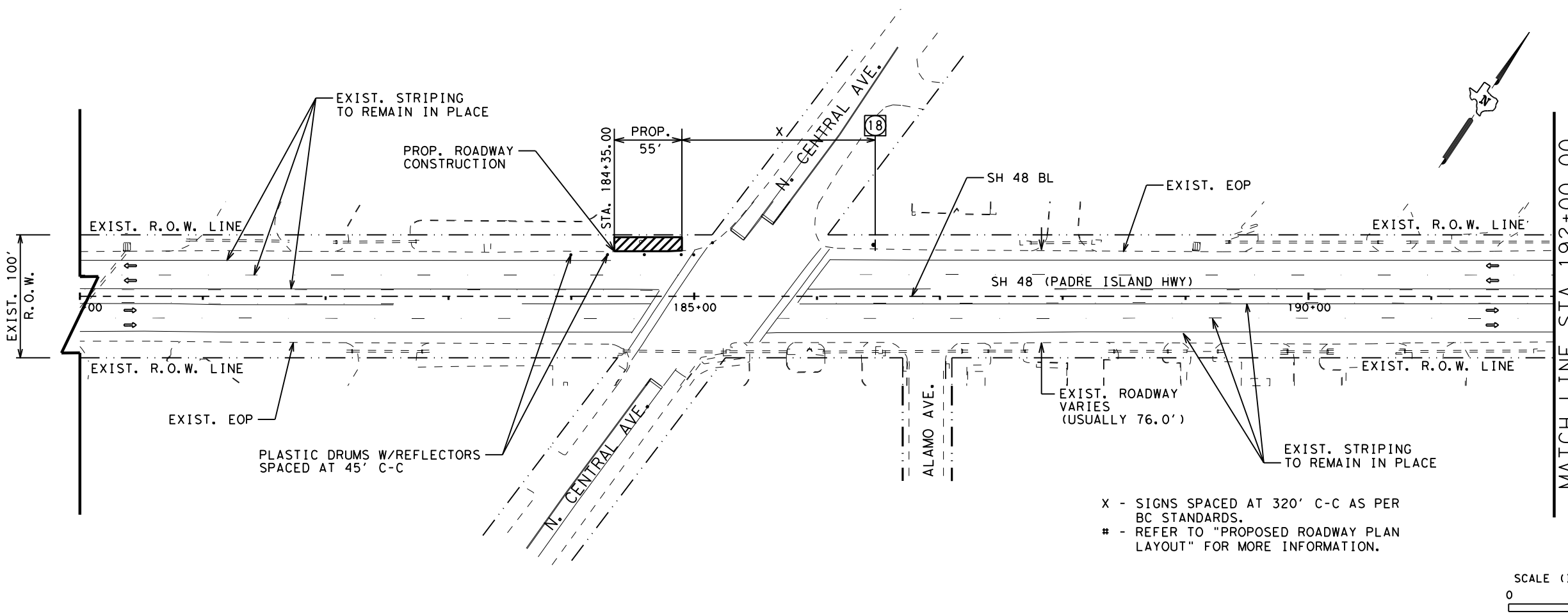
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© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	67	

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- LEGEND**
- CONSTRUCTION AREA
  - REMOVE EXISTING CONCRETE
  - PREVIOUSLY CONSTRUCTED
  - A** WK ZN PAV MRK REMOV (Y)4" (SLD)
  - B** WK ZN PAV MRK REMOV (W)4" (SLD)
  - C** WK ZN PAV MRK REMOV (W)4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
  - D** WK ZN PAV MRK REMOV (W)4" (DOT)
  - E** WK ZN PAV MRK REMOV (W)8" (SLD)
  - F** WK ZN PAV MRK REMOV (W)24" (SLD)
  - G** TYPE II-C-R (REFL) AT 20' C-C
  - EXIST. EXISTING
  - PROP. PROPOSED
  - LPCB LOW PROFILE CONCRETE BARRIER
  - R.O.W. RIGHT OF WAY
  - WK ZN WORK ZONE
  - EOP EDGE OF PAVEMENT
  - BL BASELINE
  - C-C CENTER TO CENTER
  - W/ WITH
  - DIRECTION OF TRAFFIC FLOW
  - PROPOSED SIGN
  - PROPOSED TYPE 3 (C) BARRICADES
  - PLASTIC DRUMS W/REFLECTORS
  - LOW PROFILE CONCRETE BARRIER W/REFLECTORS



**Pharr District Central Design**

**Texas Department of Transportation**

**SH 48  
 TCP PHASE 1 STEP 2  
 - LAYOUT**

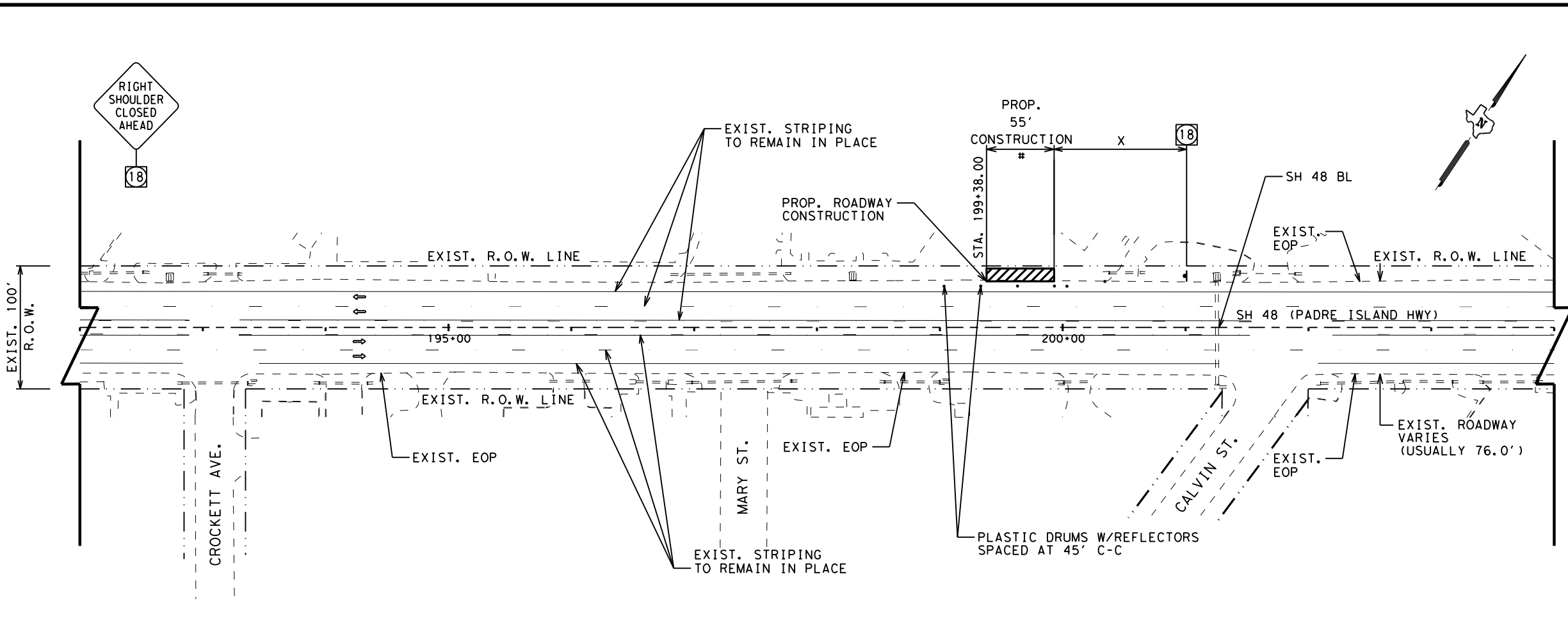
SHEET 1 OF 2

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	68	

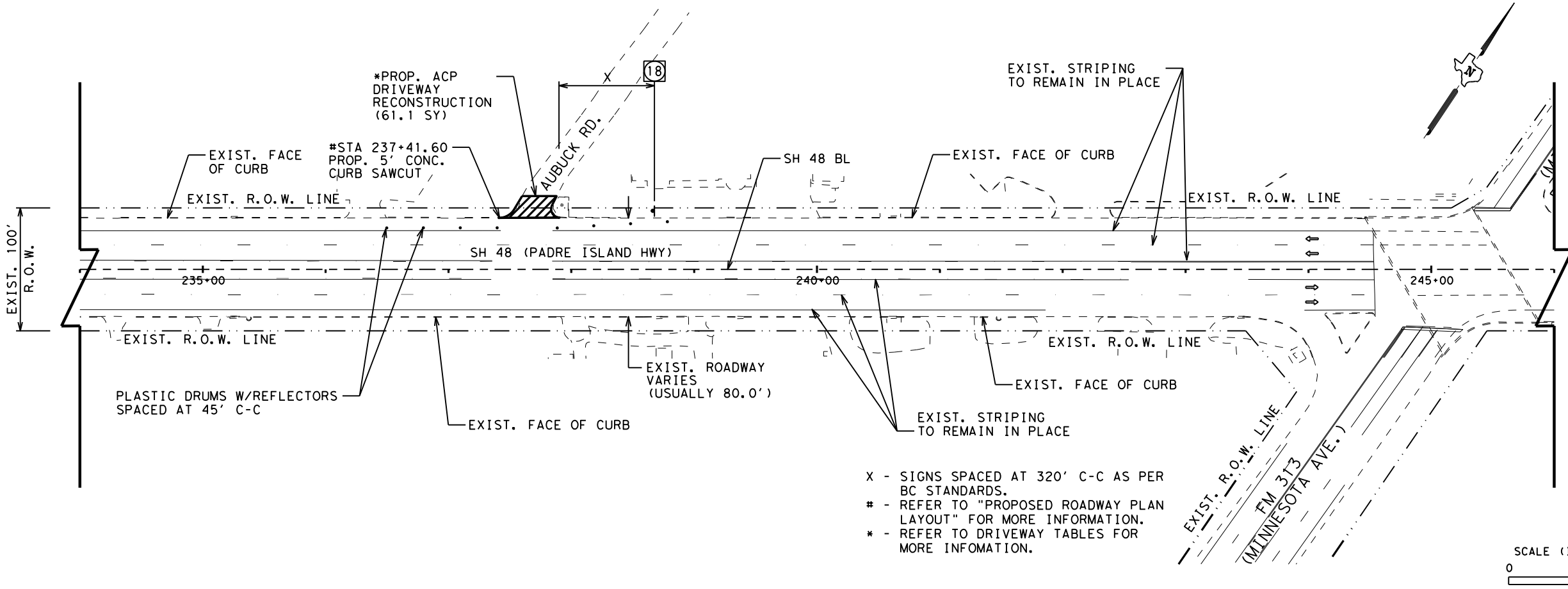
X - SIGNS SPACED AT 320' C-C AS PER BC STANDARDS.  
 # - REFER TO "PROPOSED ROADWAY PLAN LAYOUT" FOR MORE INFORMATION.



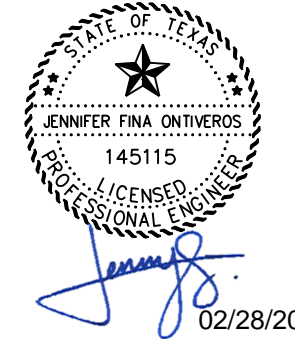
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- LEGEND**
- CONSTRUCTION AREA
  - REMOVE EXISTING CONCRETE
  - PREVIOUSLY CONSTRUCTED
  - A** WK ZN PAV MRK REMOV (W)4" (SLD)
  - B** WK ZN PAV MRK REMOV (W)4" (SLD)
  - C** WK ZN PAV MRK REMOV (W)4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
  - D** WK ZN PAV MRK REMOV (W)4" (DOT)
  - E** WK ZN PAV MRK REMOV (W)8" (SLD)
  - F** WK ZN PAV MRK REMOV (W)24" (SLD)
  - G** TYPE II-C-R (REFL) AT 20' C-C
  - EXIST. EXISTING
  - PROP. PROPOSED
  - LPCB LOW PROFILE CONCRETE BARRIER
  - R.O.W. RIGHT OF WAY
  - WK ZN WORK ZONE
  - EOP EDGE OF PAVEMENT
  - BL BASELINE
  - C-C CENTER TO CENTER
  - W/ WITH
  - DIRECTION OF TRAFFIC FLOW
  - PROPOSED SIGN
  - PROPOSED TYPE 3 (C) BARRICADES
  - PLASTIC DRUMS W/REFLECTORS
  - LOW PROFILE CONCRETE BARRIER W/REFLECTORS



X - SIGNS SPACED AT 320' C-C AS PER BC STANDARDS.  
 # - REFER TO "PROPOSED ROADWAY PLAN LAYOUT" FOR MORE INFORMATION.  
 \* - REFER TO DRIVEWAY TABLES FOR MORE INFORMATION.



**Pharr District Central Design**

**Texas Department of Transportation**

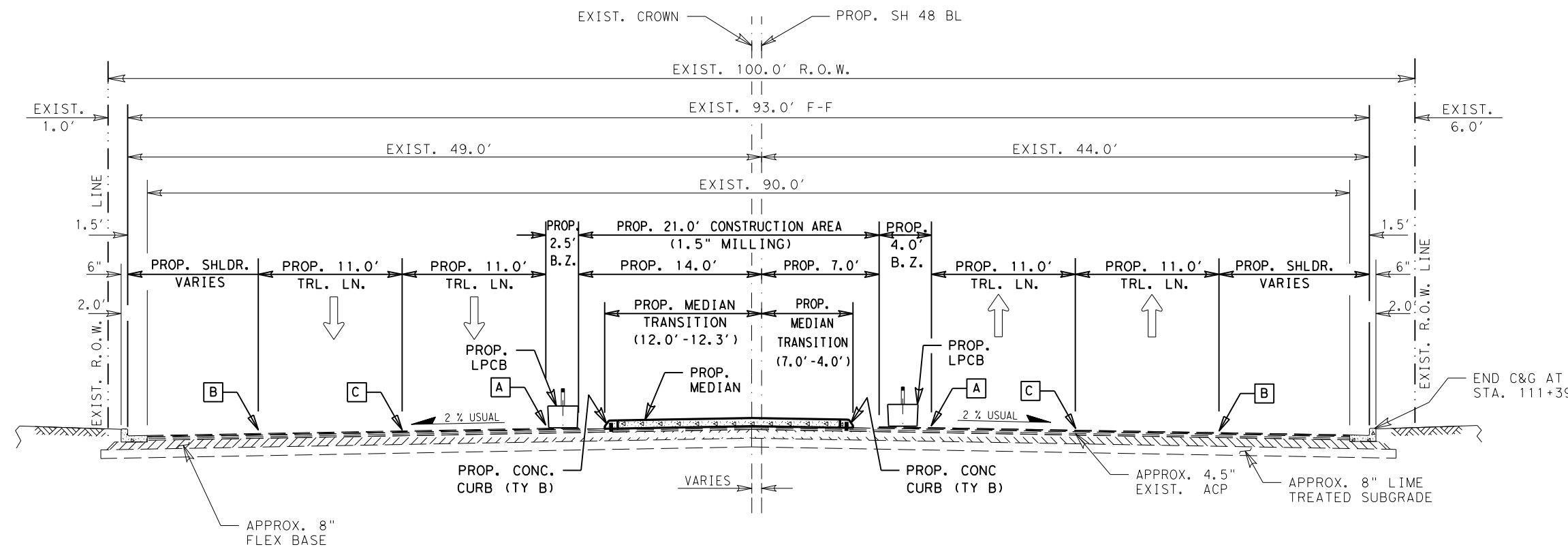
**SH 48  
 TCP PHASE 1 STEP 2  
 - LAYOUT**

SHEET 2 OF 2

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	69	



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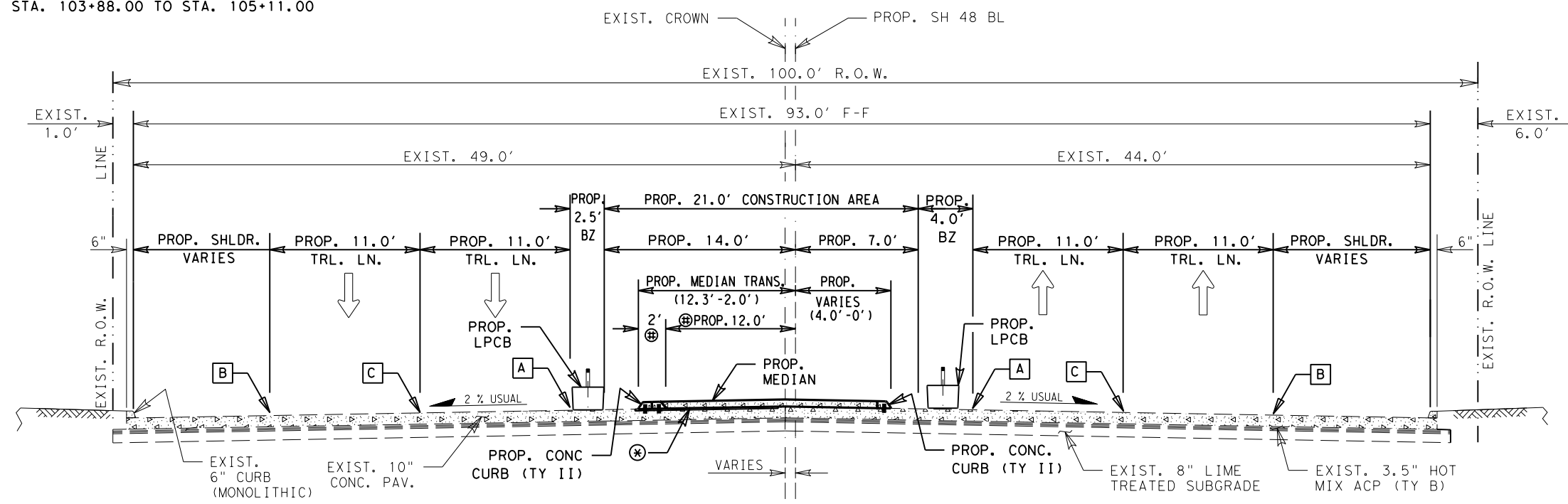


SH 48  
 PHASE 2 STEP 1 - TYPICAL SECTION

STA. 100+80.00 TO STA. 100+89.00 - NO MEDIAN  
 STA. 100+89.00 TO STA. 101+18.00 - MEDIAN (19.0' -16.3')

NOTE:  
 1.0' GAP OPENING AT RAISED CONCRETE  
 MEDIAN FOR DRAINAGE ACCESS.  
 STA. 102+42.00 TO STA. 102+43.00

⊗ EXISTING RAISED CONCRETE MEDIAN TO BE REMOVED.  
 EXISTING REINFORCED CONCRETE PAVEMENT ANCHOR  
 REBARS TO BE CUT OFF AND EPOXY SEALED.  
 SUBSIDIARY TO ITEM 104.  
 STA. 103+88.00 TO STA. 105+11.00



SH 48  
 PHASE 2 STEP 1 - TYPICAL SECTION

STA. 101+18.00 TO STA. 102+42.00 - MEDIAN (16.3' -2.0')  
 ⊗ STA. 102+43.00 TO STA. 105+03.00 - 2.0' MEDIAN  
 STA. 105+03.00 TO STA. 106+72.00 - NO RAISED MEDIAN (BOCA CHICA BLVD.)

- LEGEND:**
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② PROPOSED BONDING COURSE
  - ③ PROPOSED 6" CONCRETE (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROPOSED PROOF ROLL SUBGRADE
  - ⑥ PROPOSED EMBANKMENT (FINAL) (ORD COMP) (TY C) (SUBSIDIARY TO ITEM 530)

- BL - BASE LINE
- RT - RIGHT
- LT - LEFT
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- REMOV - REMOVEABLE
- EQ. - EQUAL
- TYP. - TYPICAL
- B.Z. - BUFFER ZONE
- TCP - TRAFFIC CONTROL PLAN
- C-C - CENTER TO CENTER
- Ⓜ - PLASTIC DRUM W/ REFLECTOR

- A WK ZN PAV MRK REMOV (Y) 4" (SLD)
- B WK ZN PAV MRK REMOV (W) 4" (SLD)
- C WK ZN PAV MRK REMOV (W) 4" (BRK) W/TYP II-C-R (REFL) AT 40' C-C
- E WK ZN PAV MRK REMOV (W) 8" (SLD)
- G TYPE II-C-R (REFL) AT 20' C-C

- NOTES:**
- SEE PROPOSED TYPICAL SECTIONS AND ROADWAY PLAN LAYOUT FOR ADDITIONAL DETAILS REGARDING RAISED MEDIAN CONSTRUCTION, TRANSITIONS, AND LIMITS.
  - SEE TCP LAYOUTS FOR CONSTRUCTION AREA WIDTHS, LIMITS, AND TRANSITIONS.
  - SEE PROPOSED TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.



Pharr District Central Design

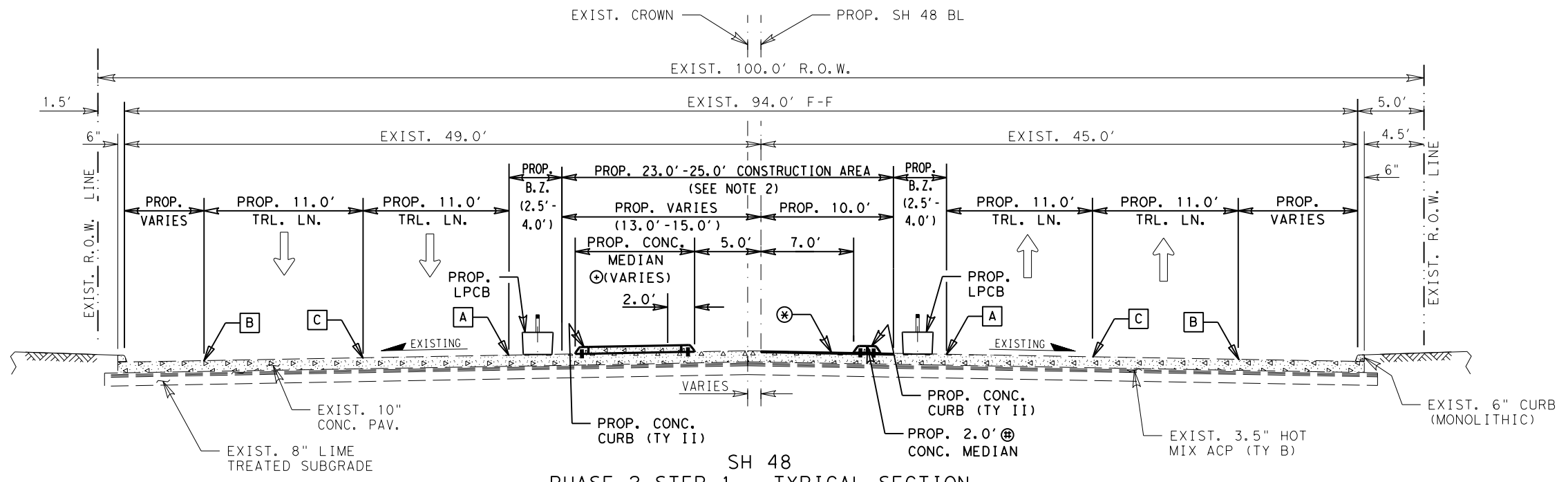
Texas Department of Transportation

SH 48  
 TCP PHASE 2 STEP 1  
 - TYPICAL SECTIONS

NOT TO SCALE SHEET 1 OF 3

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	70	

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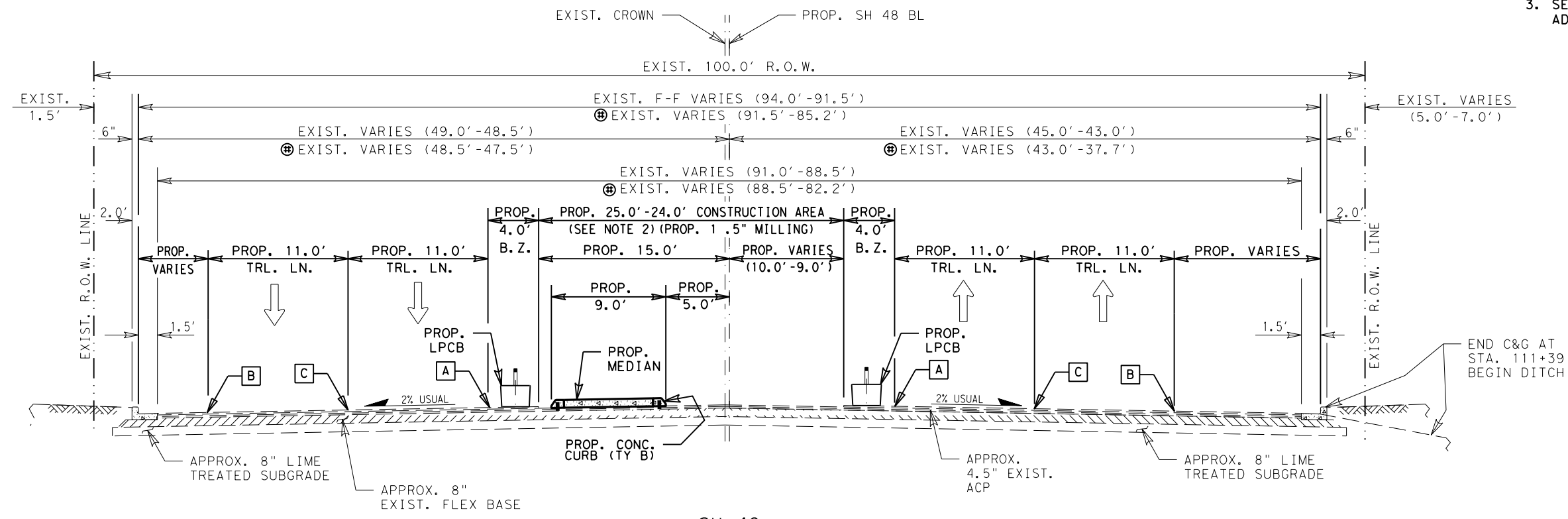


**SH 88  
 PHASE 2 STEP 1 - TYPICAL SECTION**

- ⊕ STA. 106+72.00 TO STA. 108+19.00 - 2.0' MEDIAN
- ⊕ STA. 108+20.00 TO STA. 109+15.00 - 2.0' MEDIAN TRANSITION
- ⊕ STA. 109+16.00 TO STA. 109+66.00 - MEDIAN (2.0'-9.0')
- ⊕ STA. 109+66.00 TO STA. 110+40.20 - 9.0' MEDIAN

**NOTE:**  
 1.0' GAP OPENING AT RAISED CONCRETE MEDIAN FOR DRAINAGE ACCESS.  
 STA. 108+19.00 TO STA. 108+20.00  
 STA. 109+15.00 TO STA. 109+16.00

⊗ EXISTING RAISED CONCRETE MEDIAN TO BE REMOVED. EXISTING REINFORCED CONCRETE PAVEMENT ANCHOR REBARS TO BE CUT OFF AND EPOXY SEALED. SUBSIDIARY TO ITEM 104.  
 STA. 106+63.00 TO STA. 107+70.00



**SH 88  
 PHASE 2 STEP 1 - TYPICAL SECTION**

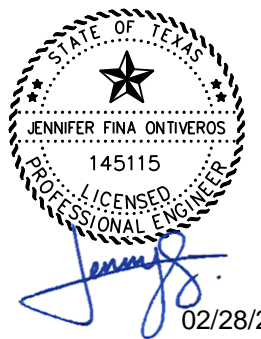
- ⊕ STA. 110+40.20 TO STA. 111+30.00
- ⊕ STA. 111+30.00 TO STA. 112+14.00 - NO RAISED MEDIAN (HOME DEPOT ENTRANCE)

- LEGEND:**
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② PROPOSED BONDING COURSE
  - ③ PROPOSED 6" CONCRETE (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROPOSED PROOF ROLL SUBGRADE
  - ⑥ PROPOSED EMBANKMENT (FINAL) (ORD COMP) (TY C) (SUBSIDIARY TO ITEM 530)

- BL - BASE LINE
- RT - RIGHT
- LT - LEFT
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- REMOV - REMOVEABLE
- EQ. - EQUAL
- TYP. - TYPICAL
- B.Z. - BUFFER ZONE
- TCP - TRAFFIC CONTROL PLAN
- C-C - CENTER TO CENTER
- Ⓜ - PLASTIC DRUM W/ REFLECTOR

- A WK ZN PAV MRK REMOV (Y) 4" (SLD)
- B WK ZN PAV MRK REMOV (W) 4" (SLD)
- C WK ZN PAV MRK REMOV (W) 4" (BRK) W/TY II-C-R (REFL) AT 40' C-C
- E WK ZN PAV MRK REMOV (W) 8" (SLD)
- G TYPE II-C-R (REFL) AT 20' C-C

- NOTES:**
- SEE PROPOSED TYPICAL SECTIONS AND ROADWAY PLAN LAYOUT FOR ADDITIONAL DETAILS REGARDING RAISED MEDIAN CONSTRUCTION, TRANSITIONS, AND LIMITS.
  - SEE TCP LAYOUTS FOR CONSTRUCTION AREA WIDTHS, LIMITS, AND TRANSITIONS.
  - SEE PROPOSED TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.



**Pharr District Central Design**

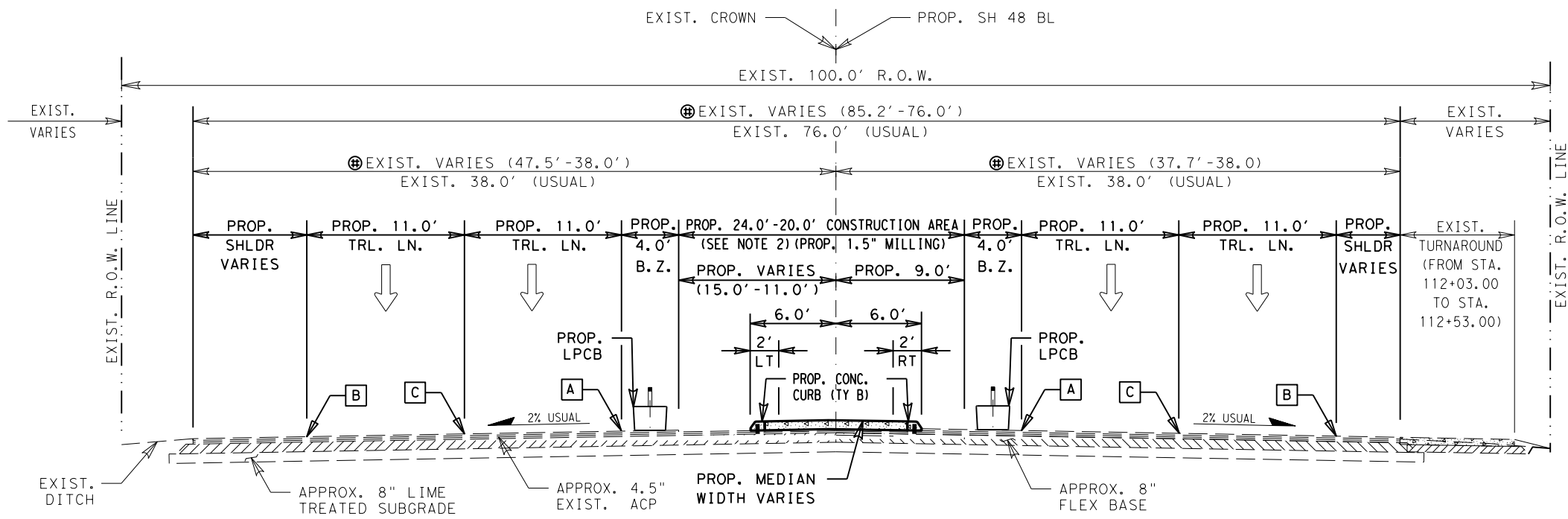
**Texas Department of Transportation**

**SH 88  
 TCP PHASE 2 STEP 1  
 - TYPICAL SECTIONS**

NOT TO SCALE SHEET 2 OF 3

CONT	SECT	JOB	HIGHWAY
0220	05	080	SH 88
DIST		COUNTY	SHEET NO.
PHR		CAMERON	71

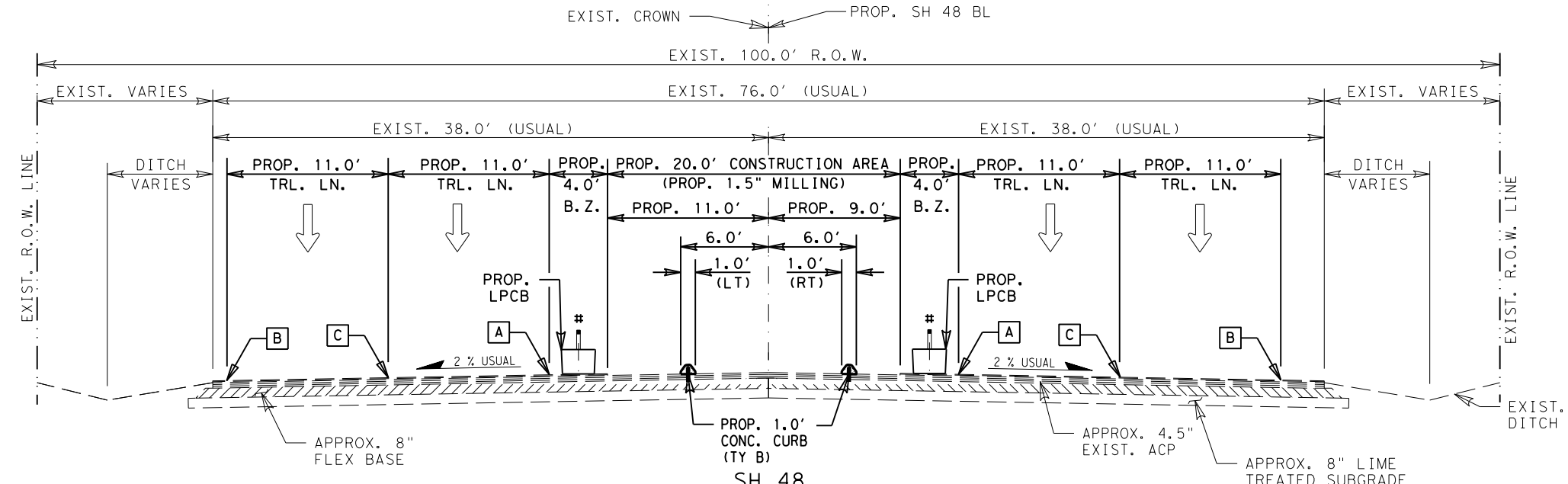
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SH 48  
 PHASE 2 STEP 1 - TYPICAL SECTION

⊕	STA. 112+14.00 TO STA. 115+56.00	- 2.0' MEDIAN (RIGHT)
⊕	STA. 115+57.00 TO STA. 116+58.00	- MEDIAN (2.0' - 12.0')
	STA. 116+58.00 TO STA. 127+17.00	- 12.0' MEDIAN
	STA. 127+17.00 TO STA. 127+41.00	- MEDIAN (12.0' - 2.0')
	STA. 129+73.50 TO STA. 130+75.00	- 2.0' MEDIAN TRANSITION
	STA. 130+76.00 TO STA. 135+71.00	- 2.0' MEDIAN (LEFT)

NOTE:  
 PROP. 1.0' GAP FOR DRAINAGE BETWEEN  
 STA. 115+56.00 TO STA. 115+57.00  
 STA. 127+41.00 TO STA. 127+42.00  
 STA. 129+72.50 TO STA. 129+73.50  
 STA. 130+75.00 TO STA. 130+76.00



SH 48  
 PHASE 2 STEP 1 - TYPICAL SECTION

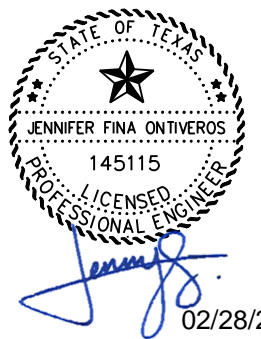
	STA. 127+42.00 TO STA. 127+63.50	- 1.0' MEDIAN (LEFT)
	STA. 127+63.50 TO STA. 129+72.50	- 1.0' MEDIAN (RIGHT)

- LEGEND:**
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② PROPOSED BONDING COURSE
  - ③ PROPOSED 6" CONCRETE (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROPOSED PROOF ROLL SUBGRADE
  - ⑥ PROPOSED EMBANKMENT (FINAL) (ORD COMP) (TY C) (SUBSIDIARY TO ITEM 530)

- BL - BASE LINE
- RT - RIGHT
- LT - LEFT
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- REMOV - REMOVEABLE
- EQ. - EQUAL
- TYP. - TYPICAL
- B.Z. - BUFFER ZONE
- TCP - TRAFFIC CONTROL PLAN
- C-C - CENTER TO CENTER
- # - PLASTIC DRUM W/ REFLECTOR

- A WK ZN PAV MRK REMOV (Y) 4" (SLD)
- B WK ZN PAV MRK REMOV (W) 4" (SLD)
- C WK ZN PAV MRK REMOV (W) 4" (BRK) W/TYP II-C-R (REFL) AT 40' C-C
- E WK ZN PAV MRK REMOV (W) 8" (SLD)
- G TYPE II-C-R (REFL) AT 20' C-C

- NOTES:**
- SEE PROPOSED TYPICAL SECTIONS AND ROADWAY PLAN LAYOUT FOR ADDITIONAL DETAILS REGARDING RAISED MEDIAN CONSTRUCTION, TRANSITIONS, AND LIMITS.
  - SEE TCP LAYOUTS FOR CONSTRUCTION AREA WIDTHS, LIMITS, AND TRANSITIONS.
  - SEE PROPOSED TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.



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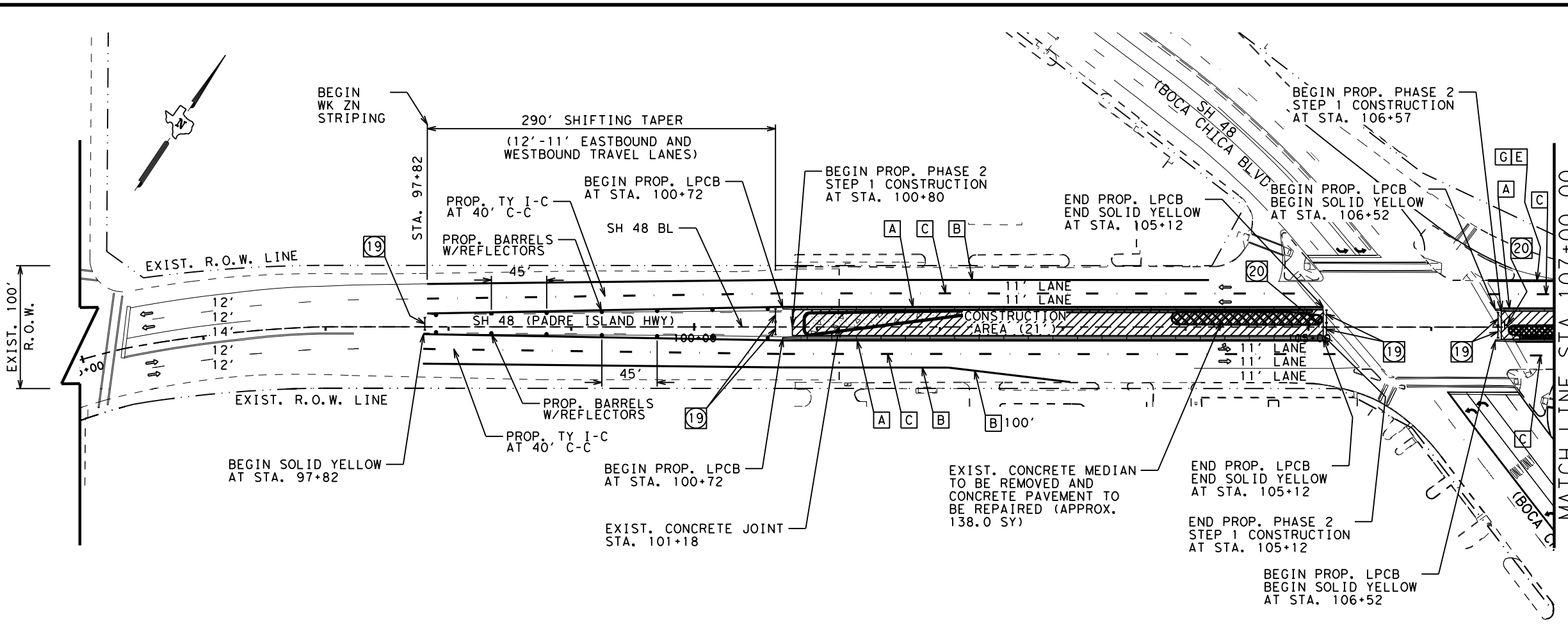
Texas Department of Transportation

SH 48  
 TCP PHASE 2 STEP 1  
 - TYPICAL SECTIONS

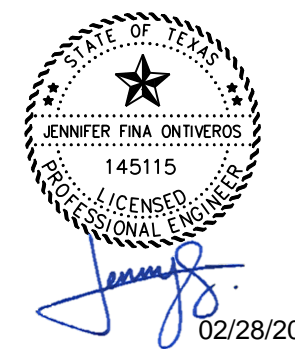
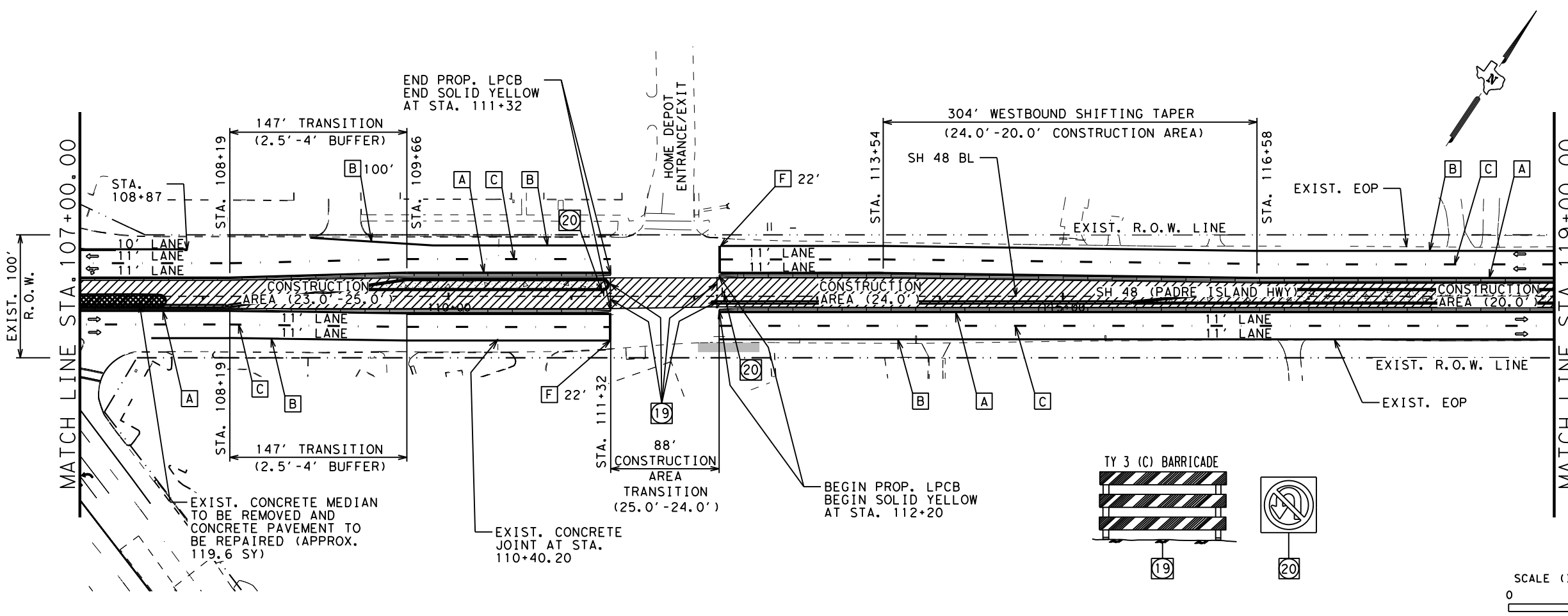
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	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	72	

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- LEGEND**
- CONSTRUCTION AREA
  - REMOVE EXISTING CONCRETE
  - PREVIOUSLY CONSTRUCTED
  - A** WK ZN PAV MRK REMOV (W)4" (SLD)
  - B** WK ZN PAV MRK REMOV (W)4" (BRK)
  - C** WK ZN PAV MRK REMOV (W)4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
  - D** WK ZN PAV MRK REMOV (W)4" (DOT)
  - E** WK ZN PAV MRK REMOV (W)8" (SLD)
  - F** WK ZN PAV MRK REMOV (W)24" (SLD)
  - G** TYPE II-C-R (REFL) AT 20' C-C
  - EXIST. EXISTING
  - PROP. PROPOSED
  - LPCB LOW PROFILE CONCRETE BARRIER
  - R.O.W. RIGHT OF WAY
  - WK ZN WORK ZONE
  - EOP EDGE OF PAVEMENT
  - BL BASELINE
  - C-C CENTER TO CENTER
  - W/ WITH
  - DIRECTION OF TRAFFIC FLOW
  - PROPOSED SIGN
  - PROPOSED TYPE 3 (C) BARRICADES
  - PLASTIC DRUMS W/REFLECTORS
  - LOW PROFILE CONCRETE BARRIER W/REFLECTORS



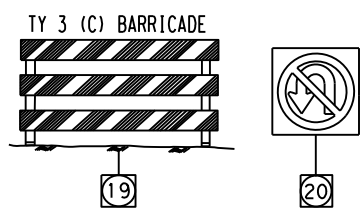
**Pharr District Central Design**

**Texas Department of Transportation**

**SH 48  
TCP PHASE 2 STEP 1  
- LAYOUT**

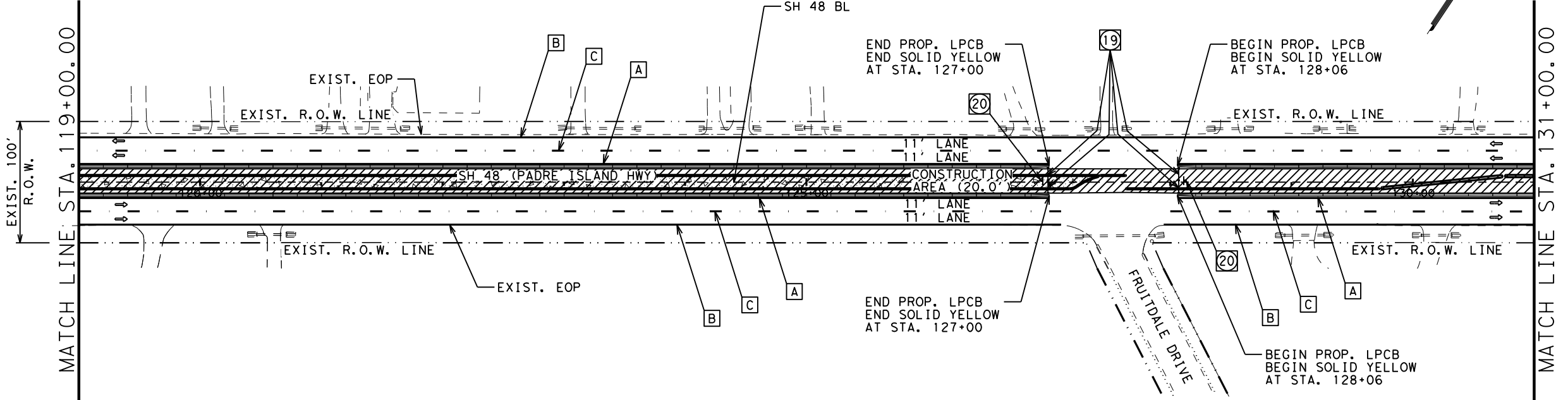
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© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	73	

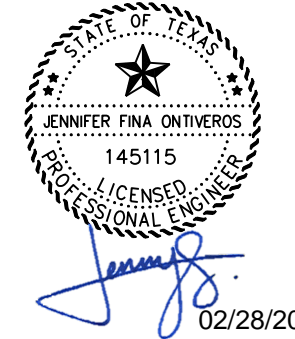
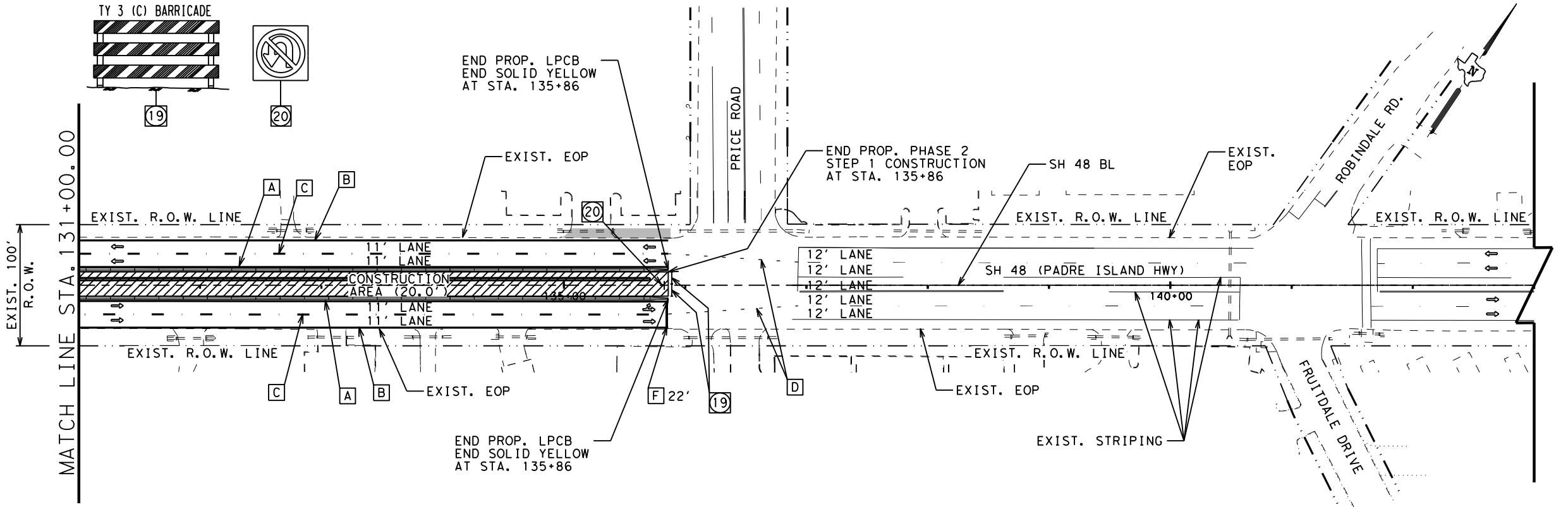




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- LEGEND**
- CONSTRUCTION AREA
  - REMOVE EXISTING CONCRETE
  - PREVIOUSLY CONSTRUCTED
  - A** WK ZN PAV MRK REMOV (W)4" (SLD)
  - B** WK ZN PAV MRK REMOV (W)4" (SLD)
  - C** WK ZN PAV MRK REMOV (W)4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
  - D** WK ZN PAV MRK REMOV (W)4" (DOT)
  - E** WK ZN PAV MRK REMOV (W)8" (SLD)
  - F** WK ZN PAV MRK REMOV (W)24" (SLD)
  - G** TYPE II-C-R (REFL) AT 20' C-C
  - EXIST. EXISTING
  - PROP. PROPOSED
  - LPCB LOW PROFILE CONCRETE BARRIER
  - R.O.W. RIGHT OF WAY
  - WK ZN WORK ZONE
  - EOP EDGE OF PAVEMENT
  - BL BASELINE
  - C-C CENTER TO CENTER
  - W/ WITH
  - DIRECTION OF TRAFFIC FLOW
  - PROPOSED SIGN
  - PROPOSED TYPE 3 (C) BARRICADES
  - PLASTIC DRUMS W/REFLECTORS
  - LOW PROFILE CONCRETE BARRIER W/REFLECTORS



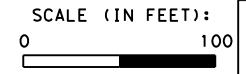
**Pharr District Central Design**

**Texas Department of Transportation**

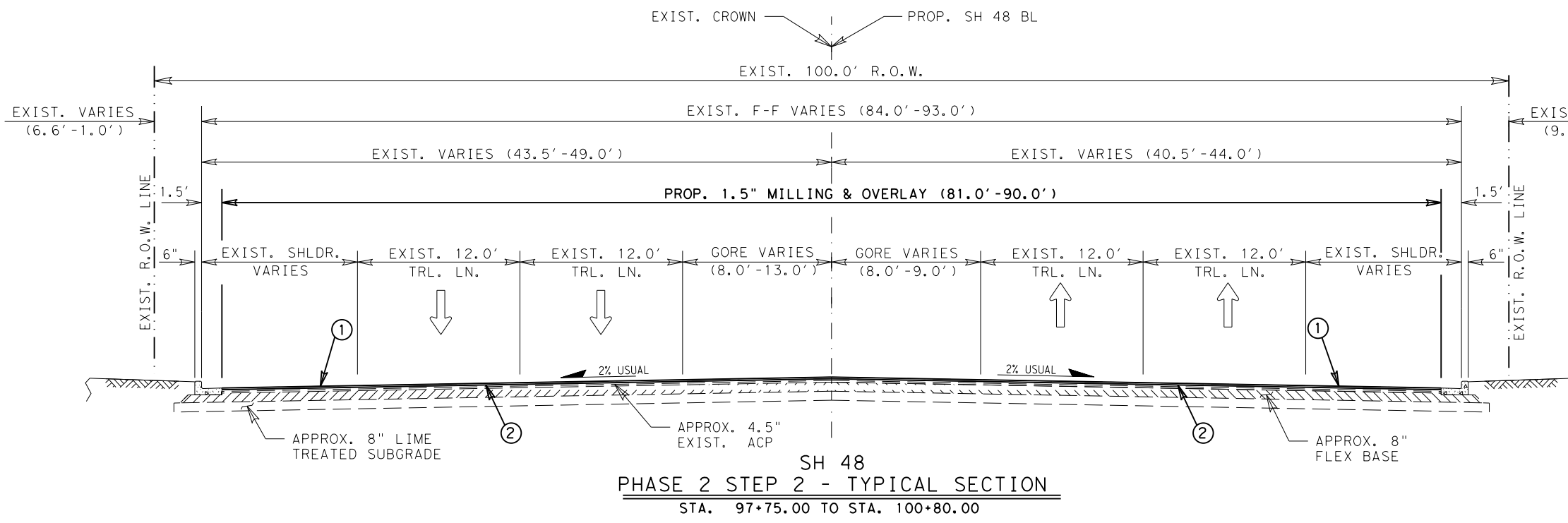
**SH 48  
TCP PHASE 2 STEP 1  
- LAYOUT**

SHEET 2 OF 2

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	74	



DATE: 2/27/2023 4:23:09 PM  
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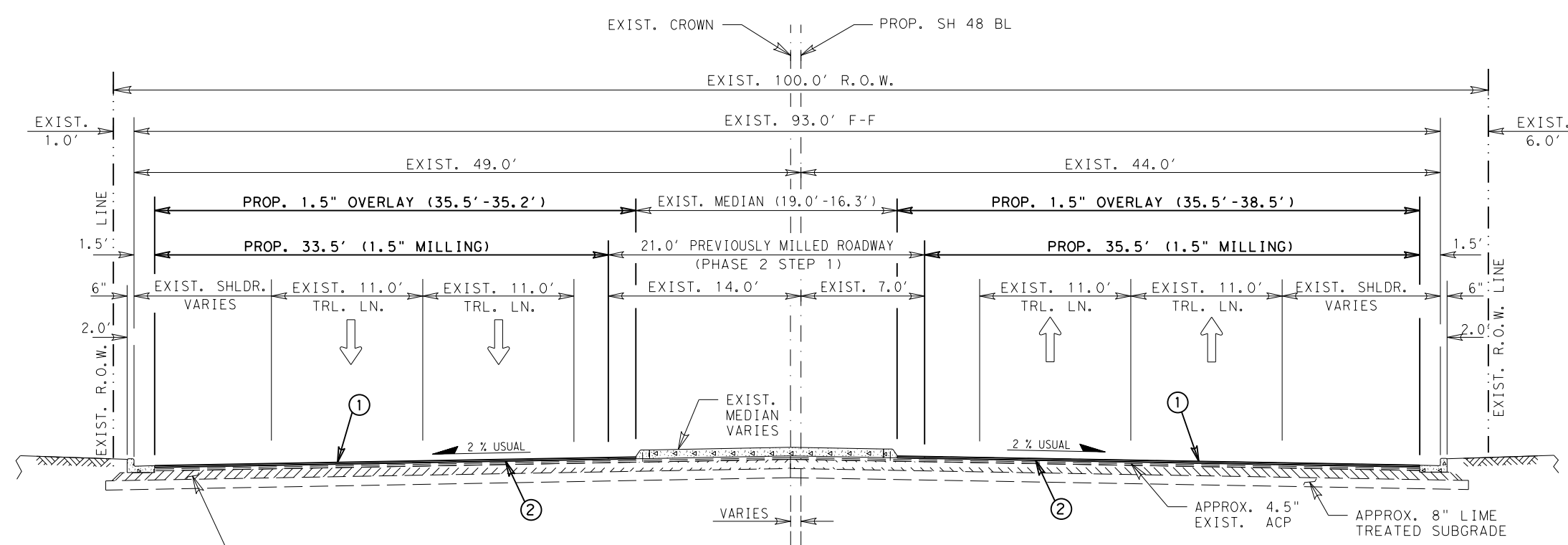
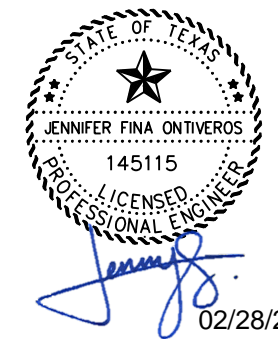
SH 48  
 PHASE 2 STEP 2 - TYPICAL SECTION  
 STA. 97+75.00 TO STA. 100+80.00

- LEGEND:**
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② PROPOSED BONDING COURSE
  - ③ PROPOSED 6" CONCRETE (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROPOSED PROOF ROLL SUBGRADE
  - ⑥ PROPOSED EMBANKMENT (FINAL) (ORD COMP) (TY C) (SUBSIDIARY TO ITEM 530)

- BL - BASE LINE
- RT - RIGHT
- LT - LEFT
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- REMOV - REMOVEABLE
- EQ. - EQUAL
- TYP. - TYPICAL
- B.Z. - BUFFER ZONE
- TCP - TRAFFIC CONTROL PLAN
- C-C - CENTER TO CENTER
- ☐ - PLASTIC DRUM W/ REFLECTOR

- A WK ZN PAV MRK REMOV (Y) 4" (SLD)
- B WK ZN PAV MRK REMOV (W) 4" (SLD)
- C WK ZN PAV MRK REMOV (W) 4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
- E WK ZN PAV MRK REMOV (W) 8" (SLD)
- G TYPE II-C-R (REFL) AT 20' C-C

- NOTES:**
- SEE PROPOSED TYPICAL SECTIONS AND ROADWAY PLAN LAYOUT FOR ADDITIONAL DETAILS REGARDING RAISED MEDIAN CONSTRUCTION, TRANSITIONS, AND LIMITS.
  - SEE TCP LAYOUTS FOR CONSTRUCTION AREA WIDTHS, LIMITS, AND TRANSITIONS.
  - SEE PROPOSED TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.



SH 48  
 PHASE 2 STEP 2 - TYPICAL SECTION  
 STA. 100+80.00 TO STA. 100+89.10 - NO MEDIAN  
 STA. 100+89.00 TO STA. 101+18.00 - MEDIAN (19.0' - 16.3')

Pharr District Central Design

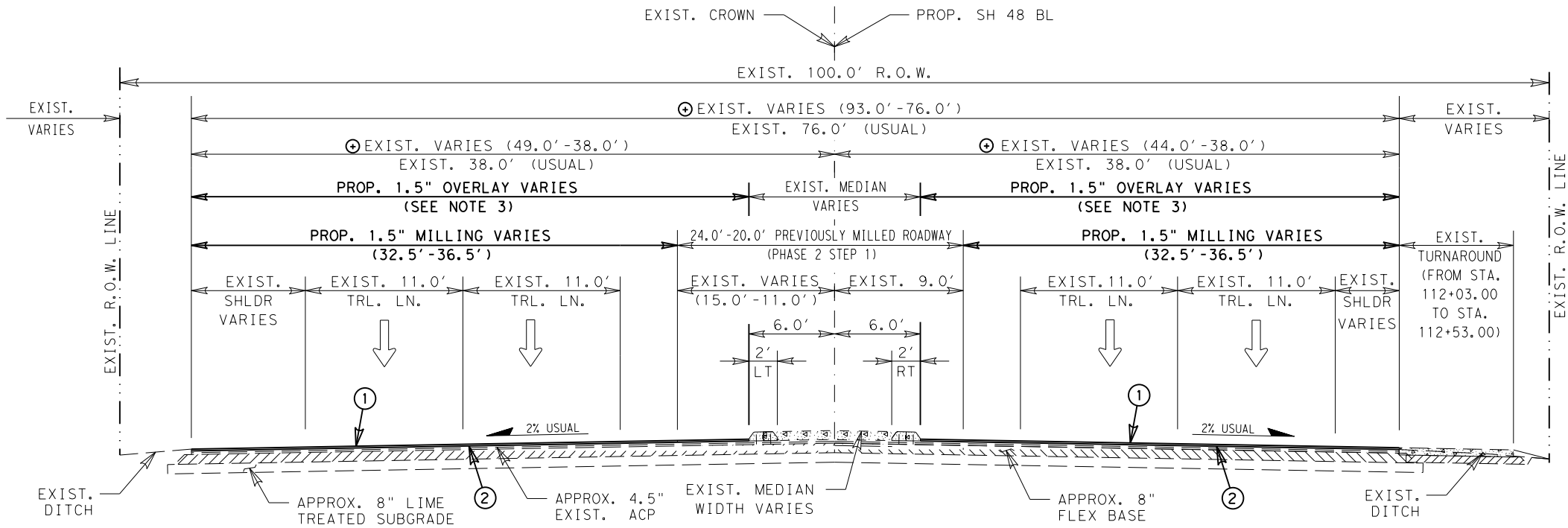
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**SH 48  
 TCP PHASE 2 STEP 2  
 - TYPICAL SECTIONS**

NOT TO SCALE SHEET 1 OF 2

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	75	

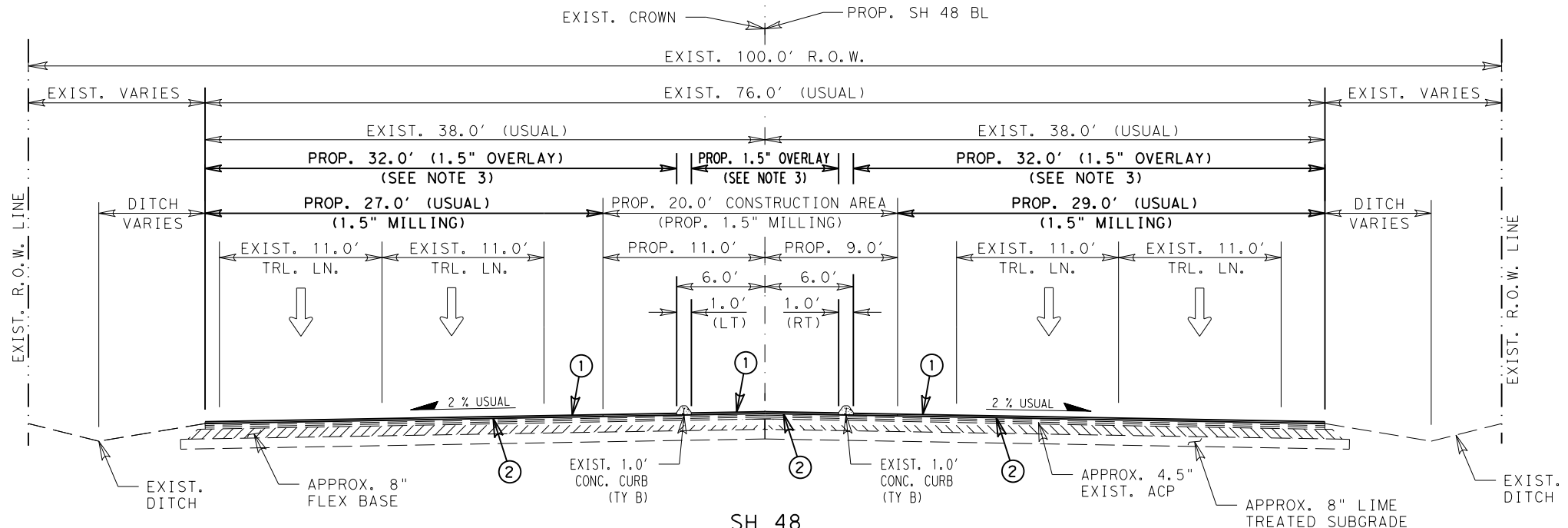
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SH 48  
 PHASE 2 STEP 2 - TYPICAL SECTION

NOTE:  
 PROP. 1.0' GAP FOR DRAINAGE BETWEEN  
 STA. 115+56.00 TO STA. 115+57.00  
 STA. 127+41.00 TO STA. 127+42.00  
 STA. 129+72.50 TO STA. 129+73.50  
 STA. 130+75.00 TO STA. 130+76.00

- ⊕ STA. 110+40.20 TO STA. 111+30.00 - 12.0' MEDIAN
- ⊕ STA. 111+30.00 TO STA. 112+14.00 - NO MEDIAN
- ⊕ STA. 112+14.00 TO STA. 115+56.00 - 2.0' MEDIAN (RIGHT)
- ⊕ STA. 115+57.00 TO STA. 116+58.00 - MEDIAN (2.0'-12.0')
- STA. 116+58.00 TO STA. 127+17.00 - 12.0' MEDIAN
- STA. 127+17.00 TO STA. 127+41.00 - MEDIAN (12.0'-2.0')
- STA. 129+73.50 TO STA. 130+75.00 - 2.0' MEDIAN TRANSITION
- STA. 130+76.00 TO STA. 135+71.00 - 2.0' MEDIAN (LEFT)
- STA. 135+71.00 TO STA. 135+86.00 - NO MEDIAN



SH 48  
 PHASE 2 STEP 2 - TYPICAL SECTION

- STA. 127+42.00 TO STA. 127+63.50 - 1.0' MEDIAN (LEFT)
- STA. 127+63.50 TO STA. 129+72.50 - 1.0' MEDIAN (RIGHT)

- LEGEND:**
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② PROPOSED BONDING COURSE
  - ③ PROPOSED 6" CONCRETE (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROPOSED PROOF ROLL SUBGRADE
  - ⑥ PROPOSED EMBANKMENT (FINAL) (ORD COMP) (TY C) (SUBSIDIARY TO ITEM 530)

- BL - BASE LINE
- RT - RIGHT
- LT - LEFT
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- REMOV. - REMOVEABLE
- EQ. - EQUAL
- TYP. - TYPICAL
- B.Z. - BUFFER ZONE
- TCP - TRAFFIC CONTROL PLAN
- C-C - CENTER TO CENTER
- Ⓜ - PLASTIC DRUM W/ REFLECTOR

- A WK ZN PAV MRK REMOV (Y) 4" (SLD)
- B WK ZN PAV MRK REMOV (W) 4" (SLD)
- C WK ZN PAV MRK REMOV (W) 4" (BRK) W/TYP II-C-R (REFL) AT 40' C-C
- E WK ZN PAV MRK REMOV (W) 8" (SLD)
- G TYPE II-C-R (REFL) AT 20' C-C

- NOTES:**
1. SEE PROPOSED TYPICAL SECTIONS AND ROADWAY PLAN LAYOUT FOR ADDITIONAL DETAILS REGARDING RAISED MEDIAN CONSTRUCTION, TRANSITIONS, AND LIMITS.
  2. SEE TCP LAYOUTS FOR CONSTRUCTION AREA WIDTHS, LIMITS, AND TRANSITIONS.
  3. SEE PROPOSED TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.



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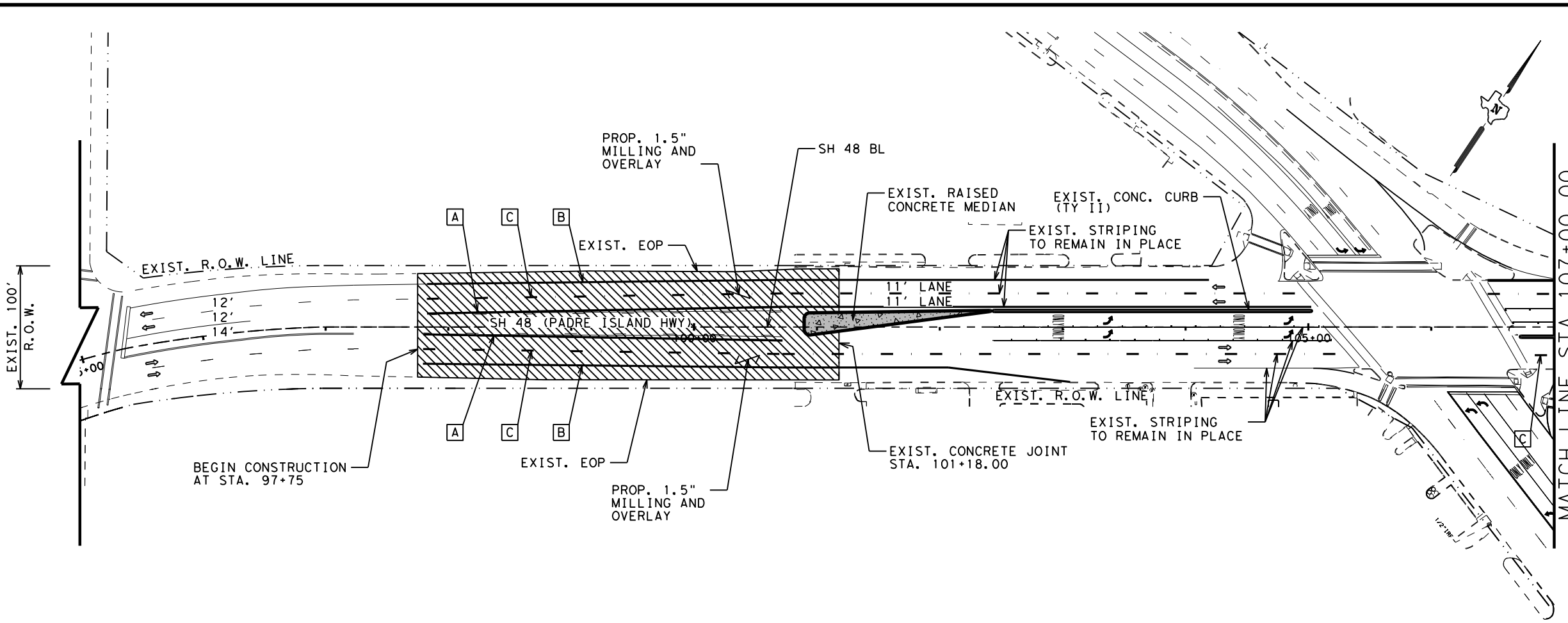
Texas Department of Transportation

SH 48  
 TCP PHASE 2 STEP 2  
 - TYPICAL SECTIONS

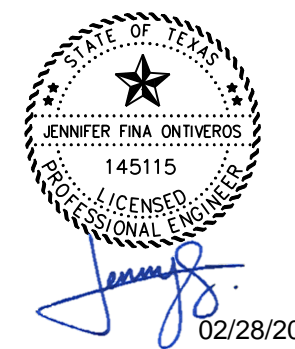
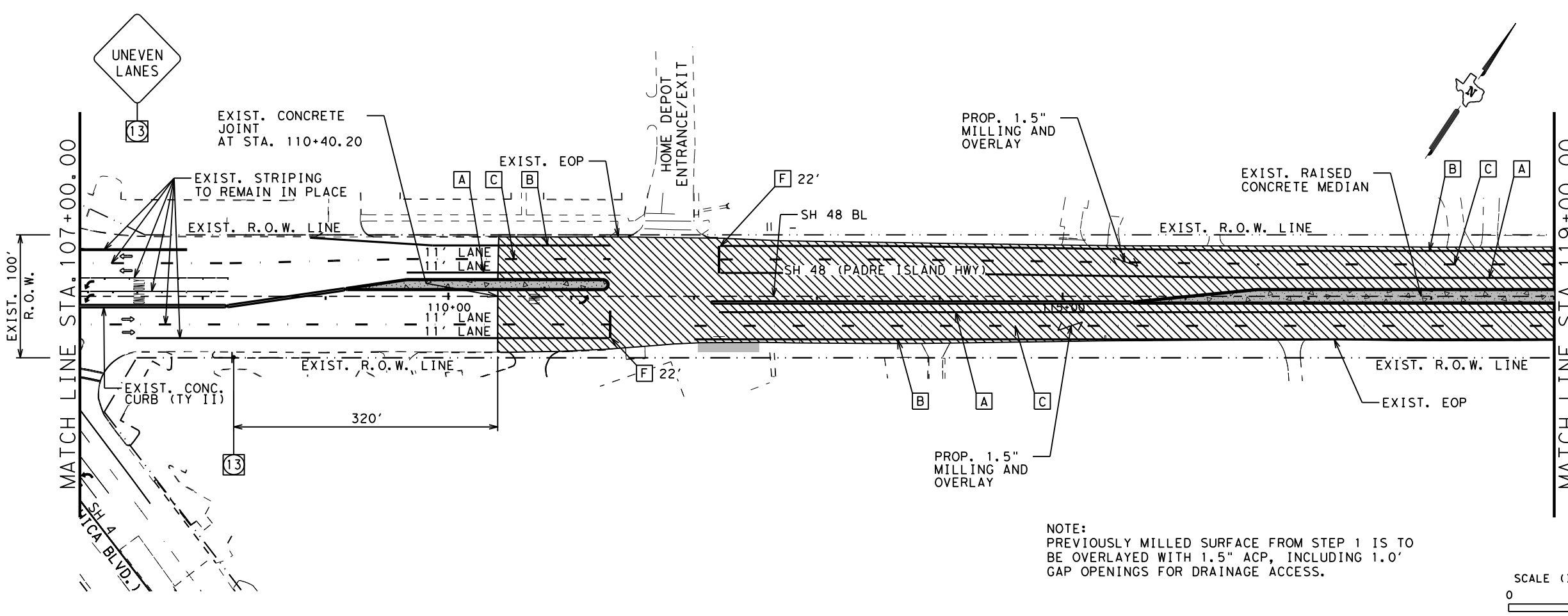
NOT TO SCALE SHEET 2 OF 2

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	76	

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- LEGEND**
- CONSTRUCTION AREA
  - REMOVE EXISTING CONCRETE
  - PREVIOUSLY CONSTRUCTED
  - A** WK ZN PAV MRK REMOV (W)4" (SLD)
  - B** WK ZN PAV MRK REMOV (W)4" (SLD)
  - C** WK ZN PAV MRK REMOV (W)4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
  - D** WK ZN PAV MRK REMOV (W)4" (DOT)
  - E** WK ZN PAV MRK REMOV (W)8" (SLD)
  - F** WK ZN PAV MRK REMOV (W)24" (SLD)
  - G** TYPE II-C-R (REFL) AT 20' C-C
  - EXIST. EXISTING
  - PROP. PROPOSED
  - LPCB LOW PROFILE CONCRETE BARRIER
  - R.O.W. RIGHT OF WAY
  - WK ZN WORK ZONE
  - EOP EDGE OF PAVEMENT
  - BL BASELINE
  - C-C CENTER TO CENTER
  - W/ WITH
  - DIRECTION OF TRAFFIC FLOW
  - PROPOSED SIGN
  - PROPOSED TYPE 3 (C) BARRICADES
  - PLASTIC DRUMS W/REFLECTORS
  - LOW PROFILE CONCRETE BARRIER W/REFLECTORS



**Pharr District Central Design**

Texas Department of Transportation

**SH 48  
 TCP PHASE 2 STEP 2  
 - LAYOUT**

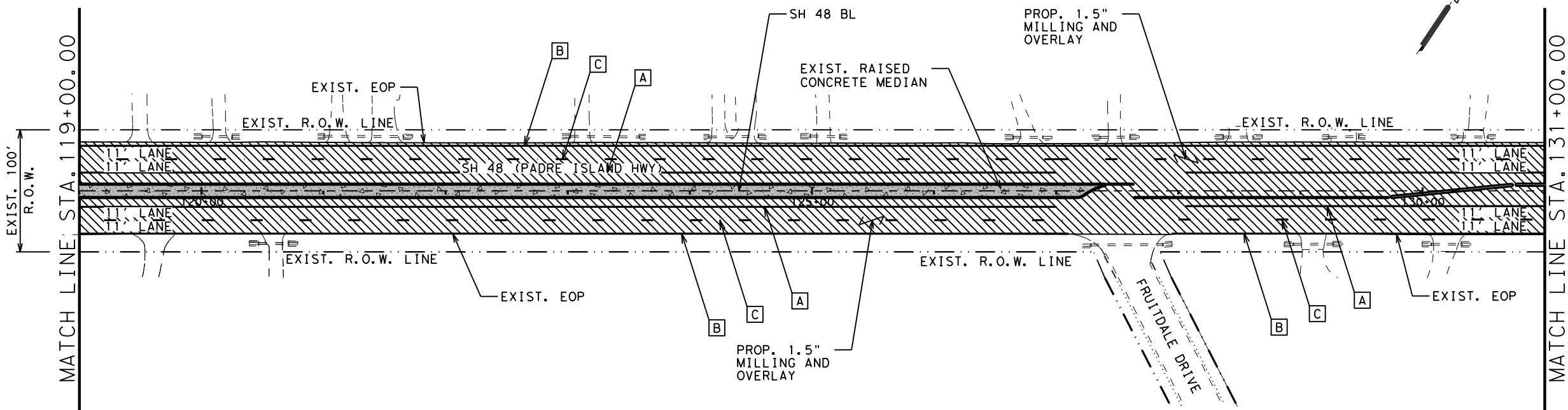
SHEET 1 OF 2

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	77	

NOTE:  
 PREVIOUSLY MILLED SURFACE FROM STEP 1 IS TO BE OVERLAYED WITH 1.5" ACP, INCLUDING 1.0' GAP OPENINGS FOR DRAINAGE ACCESS.

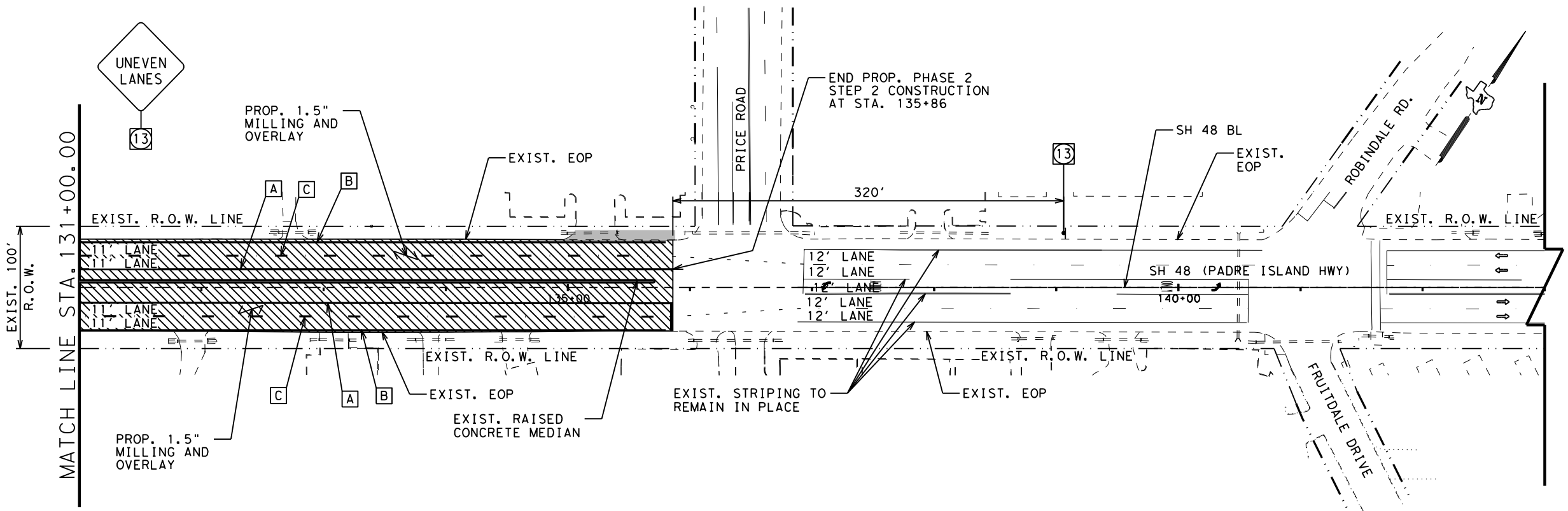


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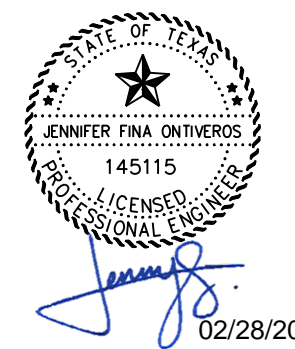
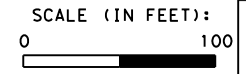


**LEGEND**

- CONSTRUCTION AREA
- REMOVE EXISTING CONCRETE
- PREVIOUSLY CONSTRUCTED
- A** WK ZN PAV MRK REMOV (W)4" (SLD)
- B** WK ZN PAV MRK REMOV (W)4" (SLD)
- C** WK ZN PAV MRK REMOV (W)4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
- D** WK ZN PAV MRK REMOV (W)4" (DOT)
- E** WK ZN PAV MRK REMOV (W)8" (SLD)
- F** WK ZN PAV MRK REMOV (W)24" (SLD)
- G** TYPE II-C-R (REFL) AT 20' C-C
- EXIST. EXISTING
- PROP. PROPOSED
- LPCB LOW PROFILE CONCRETE BARRIER
- R.O.W. RIGHT OF WAY
- WK ZN WORK ZONE
- EOP EDGE OF PAVEMENT
- BL BASELINE
- C-C CENTER TO CENTER
- W/ WITH
- DIRECTION OF TRAFFIC FLOW
- PROPOSED SIGN
- PROPOSED TYPE 3 (C) BARRICADES
- PLASTIC DRUMS W/REFLECTORS
- LOW PROFILE CONCRETE BARRIER W/REFLECTORS



NOTE:  
 PREVIOUSLY MILLED SURFACE FROM STEP 1 IS TO BE OVERLAYED WITH 1.5" ACP, INCLUDING 1.0' GAP OPENINGS FOR DRAINAGE ACCESS.



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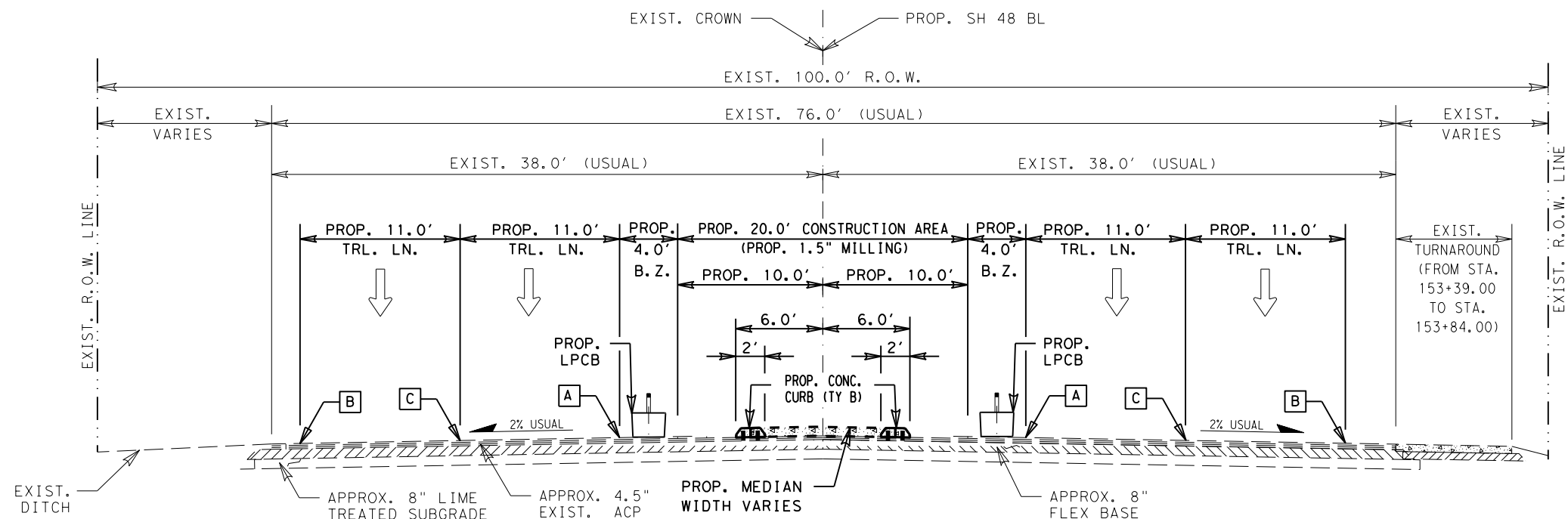
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**SH 48  
 TCP PHASE 2 STEP 2  
 - LAYOUT**

SHEET 2 OF 2

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	78	

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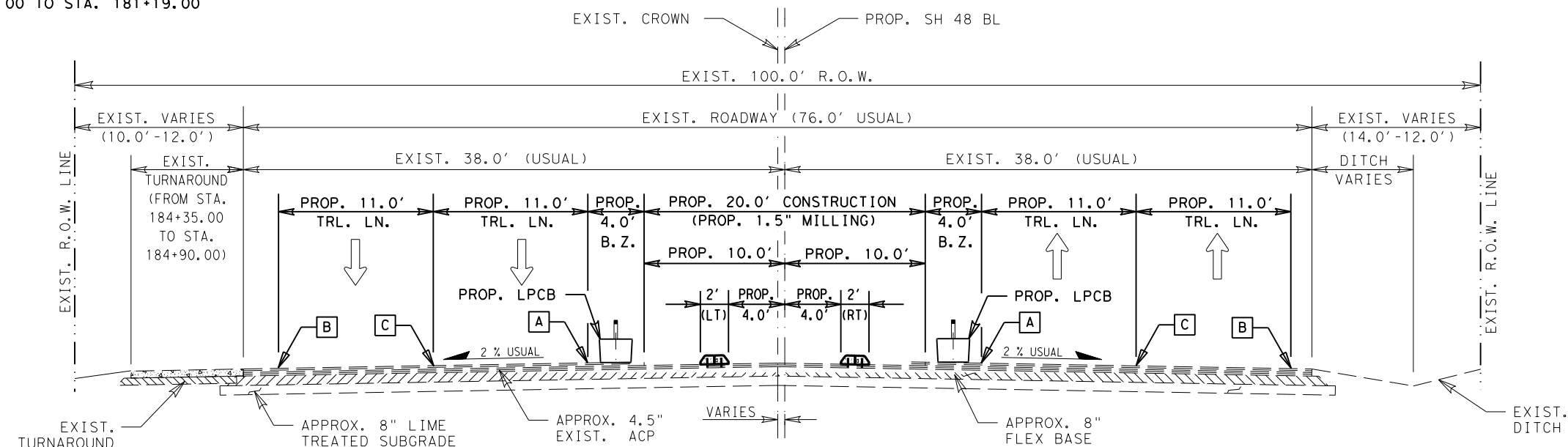


**SH 48  
 PHASE 3 STEP 1 - TYPICAL SECTION**

STA. 136+92.00 TO STA. 137+98.00	-	MEDIAN (12.0' - 2.0')
STA. 145+17.00 TO STA. 146+18.00	-	MEDIAN (2.0' - 12.0')
STA. 146+18.00 TO STA. 146+48.00	-	12.0' MEDIAN
STA. 151+05.00 TO STA. 152+06.00	-	MEDIAN (2.0' - 12.0')
STA. 152+06.00 TO STA. 153+10.00	-	12.0' MEDIAN
STA. 153+10.00 TO STA. 153+34.00	-	MEDIAN (12.0' - 2.0')
STA. 156+31.00 TO STA. 157+56.00	-	2.0' MEDIAN TRANSITION
STA. 160+68.00 TO STA. 160+92.00	-	MEDIAN (2.0' - 12.0')
STA. 160+92.00 TO STA. 166+44.00	-	12.0' MEDIAN
STA. 166+44.00 TO STA. 167+45.00	-	MEDIAN (12.0' - 2.0')
STA. 175+66.00 TO STA. 176+67.00	-	MEDIAN (2.0' - 12.0')
STA. 176+67.00 TO STA. 180+17.00	-	12.0' MEDIAN
STA. 180+17.00 TO STA. 181+18.00	-	MEDIAN (12.0' - 2.0')

**NOTE:**  
 NO RAISED CONCRETE MEDIAN AT INTERSECTIONS:  
 STA. 140+57.00 TO STA. 141+71.00 - ROBINDALE/FRUITDALE DR.  
 STA. 146+48.00 TO STA. 147+54.00 - MCKENZIE RD.  
 STA. 170+91.00 TO STA. 172+21.00 - AUSTIN RD.  
 STA. 184+71.00 TO STA. 185+85.00 - N. CENTRAL AVE.

1.0' GAP OPENING AT RAISED CONCRETE MEDIAN FOR DRAINAGE ACCESS.  
 STA. 137+98.00 TO STA. 137+99.00  
 STA. 145+16.00 TO STA. 145+17.00  
 STA. 151+04.00 TO STA. 151+05.00  
 STA. 167+45.00 TO STA. 167+46.00  
 STA. 175+65.00 TO STA. 176+66.00  
 STA. 181+18.00 TO STA. 181+19.00



**SH 48  
 PHASE 3 STEP 1 - TYPICAL SECTION**

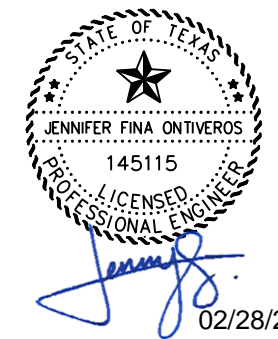
STA. 137+99.00 TO STA. 140+57.00	-	2.0' MEDIAN (LEFT)
STA. 141+71.00 TO STA. 145+16.00	-	2.0' MEDIAN (RIGHT)
STA. 147+54.00 TO STA. 151+04.00	-	2.0' MEDIAN (RIGHT)
STA. 167+46.00 TO STA. 170+91.00	-	2.0' MEDIAN (LEFT)
STA. 172+21.00 TO STA. 175+65.00	-	2.0' MEDIAN (RIGHT)
STA. 181+19.00 TO STA. 184+71.00	-	2.0' MEDIAN (LEFT)

- LEGEND:**
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② PROPOSED BONDING COURSE
  - ③ PROPOSED 6" CONCRETE (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROPOSED PROOF ROLL SUBGRADE
  - ⑥ PROPOSED EMBANKMENT (FINAL) (ORD COMP) (TY C) (SUBSIDIARY TO ITEM 530)

- BL - BASE LINE
- RT - RIGHT
- LT - LEFT
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- REMOV - REMOVEABLE
- EQ. - EQUAL
- TYP. - TYPICAL
- B.Z. - BUFFER ZONE
- TCP - TRAFFIC CONTROL PLAN
- C-C - CENTER TO CENTER
- Ⓜ - PLASTIC DRUM W/ REFLECTOR

- A WK ZN PAV MRK REMOV (Y) 4" (SLD)
- B WK ZN PAV MRK REMOV (W) 4" (SLD)
- C WK ZN PAV MRK REMOV (W) 4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
- E WK ZN PAV MRK REMOV (W) 8" (SLD)
- G TYPE II-C-R (REFL) AT 20' C-C

- NOTES:**
- SEE PROPOSED TYPICAL SECTIONS AND ROADWAY PLAN LAYOUT FOR ADDITIONAL DETAILS REGARDING RAISED MEDIAN CONSTRUCTION, TRANSITIONS, AND LIMITS.
  - SEE TCP LAYOUTS FOR CONSTRUCTION AREA WIDTHS, LIMITS, AND TRANSITIONS.
  - SEE PROPOSED TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.



**Pharr District Central Design**

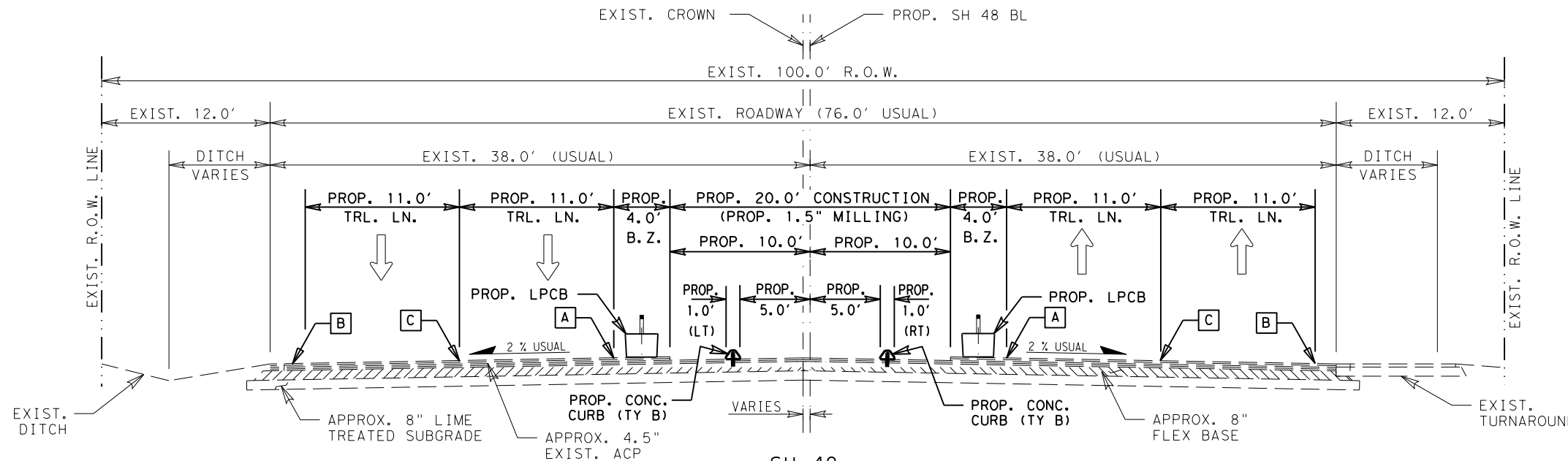
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**SH 48  
 TCP PHASE 3 STEP 1  
 - TYPICAL SECTIONS**

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	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	79	

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SH 48  
 PHASE 3 STEP 1 - TYPICAL SECTION

- STA. 153+35.00 TO STA. 153+56.50 - 1.0' MEDIAN (LEFT)
- STA. 153+56.50 TO STA. 156+30.00 - 1.0' MEDIAN (RIGHT)
- STA. 157+57.00 TO STA. 160+45.50 - 1.0' MEDIAN (LEFT)
- STA. 160+45.50 TO STA. 160+67.00 - 1.0' MEDIAN (RIGHT)

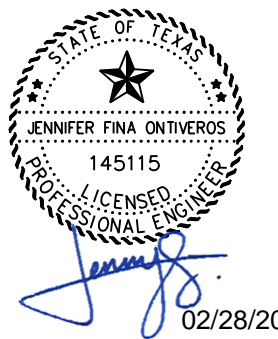
NOTE:  
 OVERLAY 1.0' GAP OPENING AT RAISED CONCRETE MEDIAN FOR DRAINAGE ACCESS.  
 STA. 153+34.00 TO STA. 153+35.00  
 STA. 156+30.00 TO STA. 156+31.00  
 STA. 157+56.00 TO STA. 157+57.00  
 STA. 160+67.00 TO STA. 160+68.00

- LEGEND:**
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② PROPOSED BONDING COURSE
  - ③ PROPOSED 6" CONCRETE (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROPOSED PROOF ROLL SUBGRADE
  - ⑥ PROPOSED EMBANKMENT (FINAL) (ORD COMP) (TY C) (SUBSIDIARY TO ITEM 530)

- BL - BASE LINE
- RT - RIGHT
- LT - LEFT
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- REMOV - REMOVEABLE
- EQ. - EQUAL
- TYP. - TYPICAL
- B.Z. - BUFFER ZONE
- TCP - TRAFFIC CONTROL PLAN
- C-C - CENTER TO CENTER
- ⬮ - PLASTIC DRUM W/ REFLECTOR

- A WK ZN PAV MRK REMOV (Y) 4" (SLD)
- B WK ZN PAV MRK REMOV (W) 4" (SLD)
- C WK ZN PAV MRK REMOV (W) 4" (BRK) W/TYP II-C-R (REFL) AT 40' C-C
- E WK ZN PAV MRK REMOV (W) 8" (SLD)
- G TYPE II-C-R (REFL) AT 20' C-C

- NOTES:
1. SEE PROPOSED TYPICAL SECTIONS AND ROADWAY PLAN LAYOUT FOR ADDITIONAL DETAILS REGARDING RAISED MEDIAN CONSTRUCTION, TRANSITIONS, AND LIMITS.
  2. SEE TCP LAYOUTS FOR CONSTRUCTION AREA WIDTHS, LIMITS, AND TRANSITIONS.
  3. SEE PROPOSED TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.



**Pharr District Central Design**

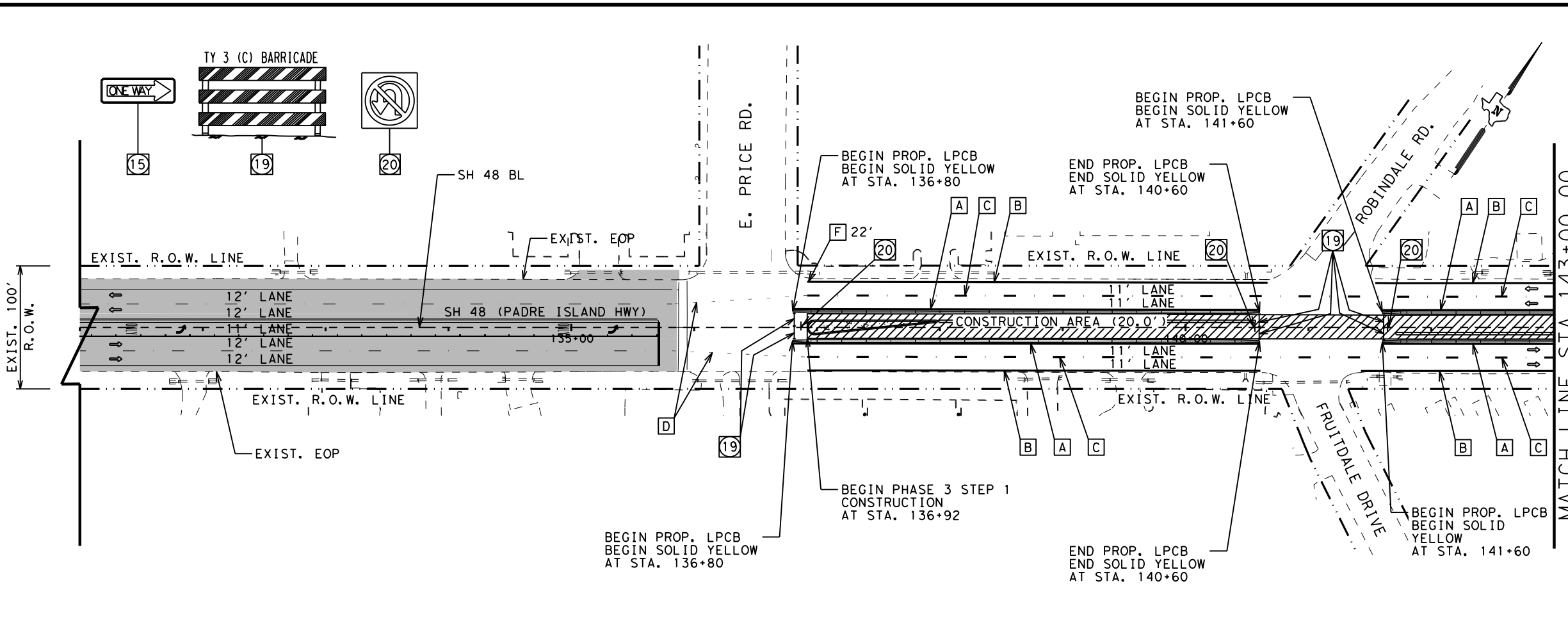
Texas Department of Transportation

**SH 48  
 TCP PHASE 3 STEP 1  
 - TYPICAL SECTIONS**

NOT TO SCALE SHEET 2 OF 2

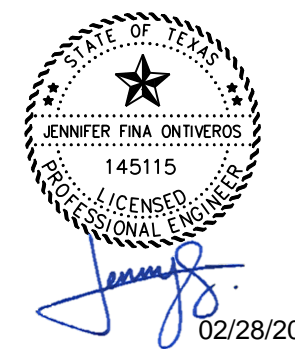
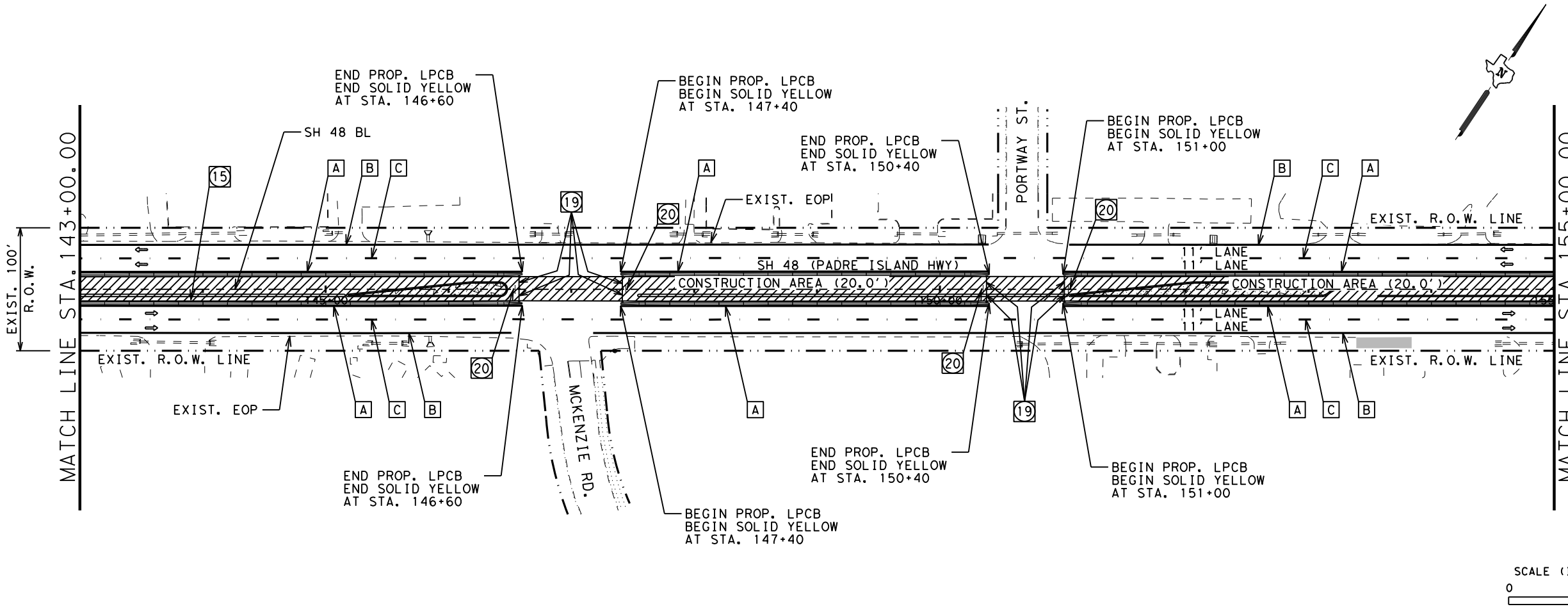
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	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	80	

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**LEGEND**

- CONSTRUCTION AREA
- REMOVE EXISTING CONCRETE
- PREVIOUSLY CONSTRUCTED
- A** WK ZN PAV MRK REMOV (W)4" (SLD)
- B** WK ZN PAV MRK REMOV (W)4" (SLD)
- C** WK ZN PAV MRK REMOV (W)4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
- D** WK ZN PAV MRK REMOV (W)4" (DOT)
- E** WK ZN PAV MRK REMOV (W)8" (SLD)
- F** WK ZN PAV MRK REMOV (W)24" (SLD)
- G** TYPE II-C-R (REFL) AT 20' C-C
- EXIST. EXISTING
- PROP. PROPOSED
- LPCB LOW PROFILE CONCRETE BARRIER
- R.O.W. RIGHT OF WAY
- WK ZN WORK ZONE
- EOP EDGE OF PAVEMENT
- BL BASELINE
- C-C CENTER TO CENTER
- W/ WITH
- DIRECTION OF TRAFFIC FLOW
- PROPOSED SIGN
- PROPOSED TYPE 3 (C) BARRICADES
- PLASTIC DRUMS W/REFLECTORS
- LOW PROFILE CONCRETE BARRIER W/REFLECTORS



**Pharr District Central Design**

**Texas Department of Transportation**

**SH 48  
TCP PHASE 3 STEP 1  
- LAYOUT**

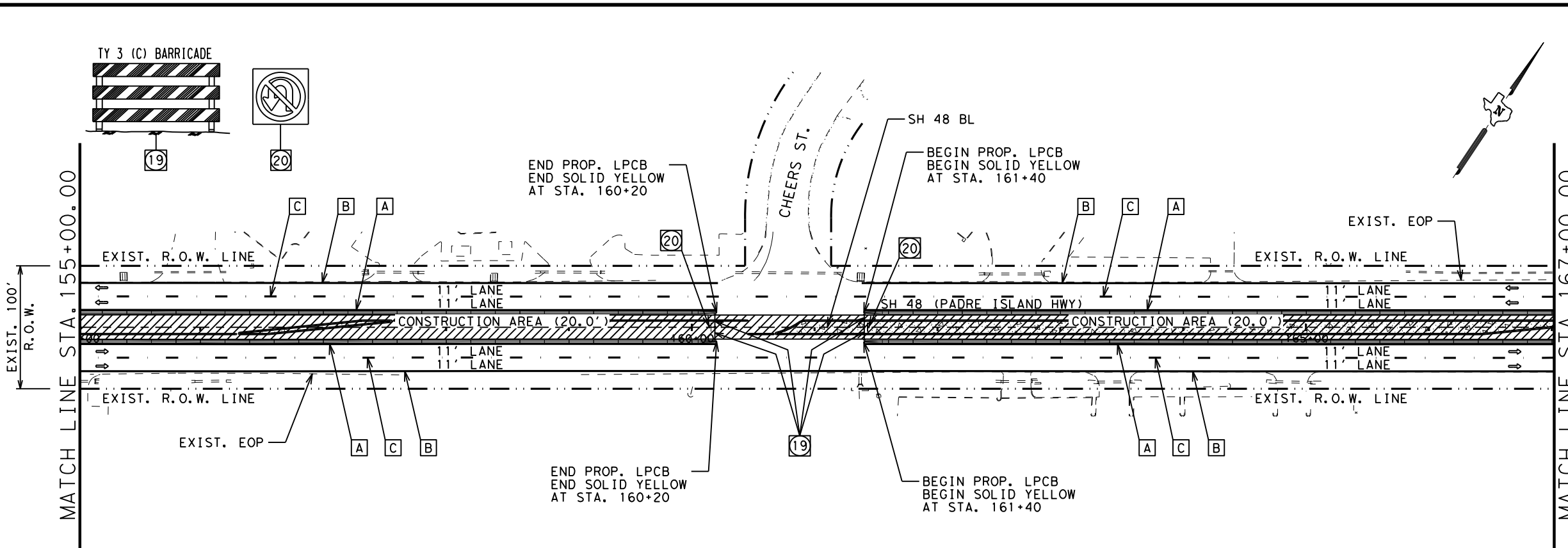
SHEET 1 OF 3

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	81	



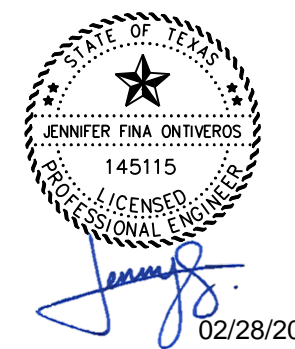
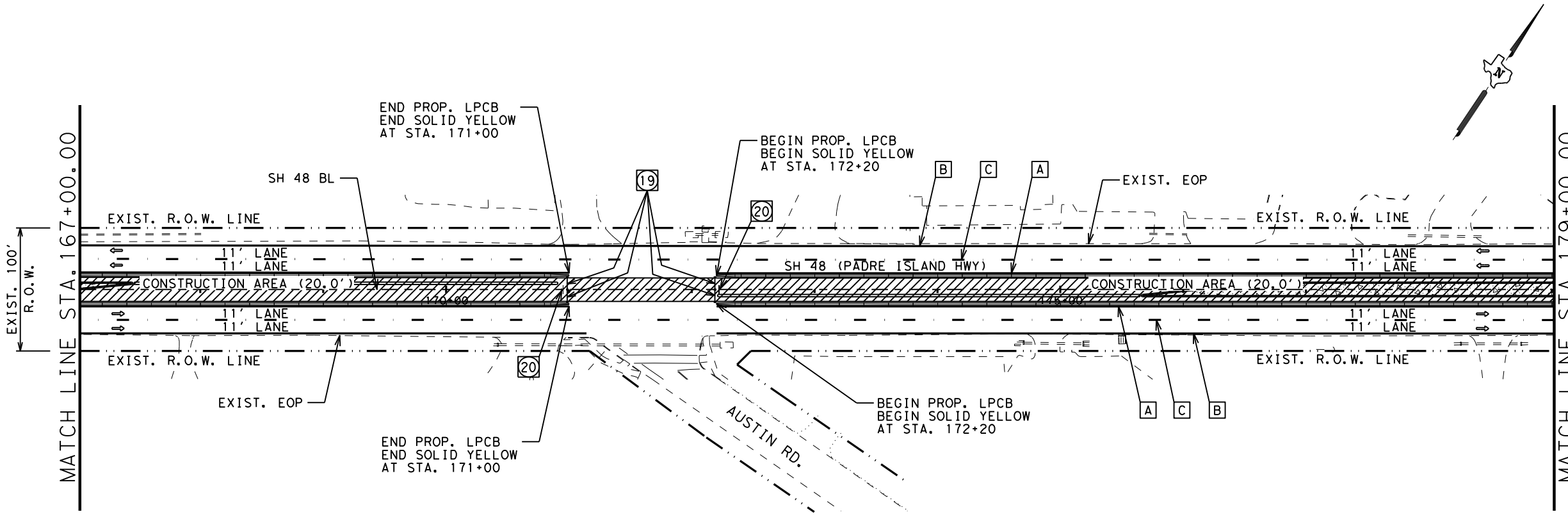


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**LEGEND**

- CONSTRUCTION AREA
- REMOVE EXISTING CONCRETE
- PREVIOUSLY CONSTRUCTED
- A** WK ZN PAV MRK REMOV (Y)4" (SLD)
- B** WK ZN PAV MRK REMOV (W)4" (SLD)
- C** WK ZN PAV MRK REMOV (W)4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
- D** WK ZN PAV MRK REMOV (W)4" (DOT)
- E** WK ZN PAV MRK REMOV (W)8" (SLD)
- F** WK ZN PAV MRK REMOV (W)24" (SLD)
- G** TYPE II-C-R (REFL) AT 20' C-C
- EXIST. EXISTING
- PROP. PROPOSED
- LPCB LOW PROFILE CONCRETE BARRIER
- R.O.W. RIGHT OF WAY
- WK ZN WORK ZONE
- EOP EDGE OF PAVEMENT
- BL BASELINE
- C-C CENTER TO CENTER
- W/ WITH
- DIRECTION OF TRAFFIC FLOW
- PROPOSED SIGN
- PROPOSED TYPE 3 (C) BARRICADES
- PLASTIC DRUMS W/REFLECTORS
- LOW PROFILE CONCRETE BARRIER W/REFLECTORS



**Pharr District Central Design**

**Texas Department of Transportation**

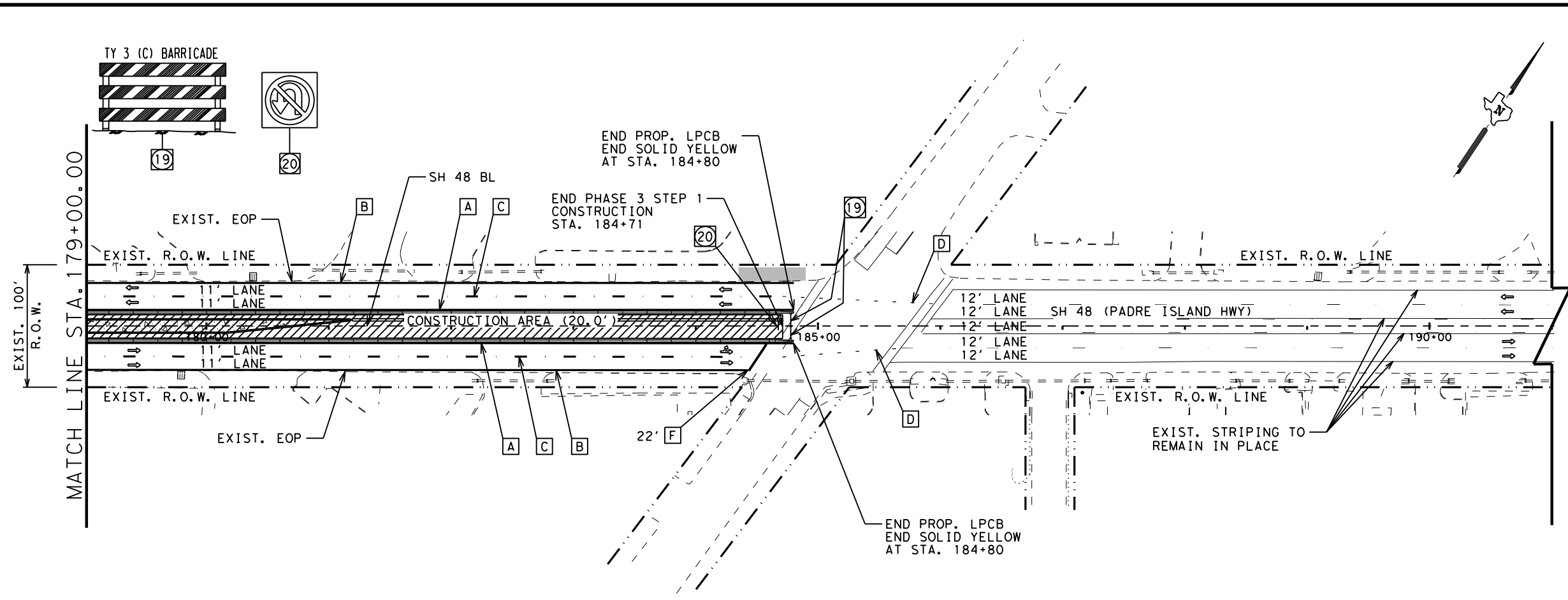
**SH 48  
TCP PHASE 3 STEP 1  
- LAYOUT**

SHEET 2 OF 3

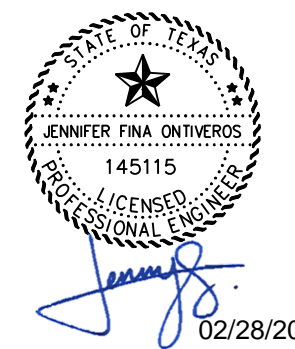
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	0220	05	080	SH 48
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	PHR	CAMERON	82	



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- LEGEND**
- CONSTRUCTION AREA
  - REMOVE EXISTING CONCRETE
  - PREVIOUSLY CONSTRUCTED
  - A** WK ZN PAV MRK REMOV (W)4" (SLD)
  - B** WK ZN PAV MRK REMOV (W)4" (SLD)
  - C** WK ZN PAV MRK REMOV (W)4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
  - D** WK ZN PAV MRK REMOV (W)4" (DOT)
  - E** WK ZN PAV MRK REMOV (W)8" (SLD)
  - F** WK ZN PAV MRK REMOV (W)24" (SLD)
  - G** TYPE II-C-R (REFL) AT 20' C-C
- EXIST. EXISTING  
 PROP. PROPOSED  
 LPCB LOW PROFILE CONCRETE BARRIER  
 R.O.W. RIGHT OF WAY  
 WK ZN WORK ZONE  
 EOP EDGE OF PAVEMENT  
 BL BASELINE  
 C-C CENTER TO CENTER  
 W/ WITH  
 DIRECTION OF TRAFFIC FLOW  
 PROPOSED SIGN  
 PROPOSED TYPE 3 (C) BARRICADES  
 PLASTIC DRUMS W/REFLECTORS  
 LOW PROFILE CONCRETE BARRIER W/REFLECTORS



**Pharr District Central Design**

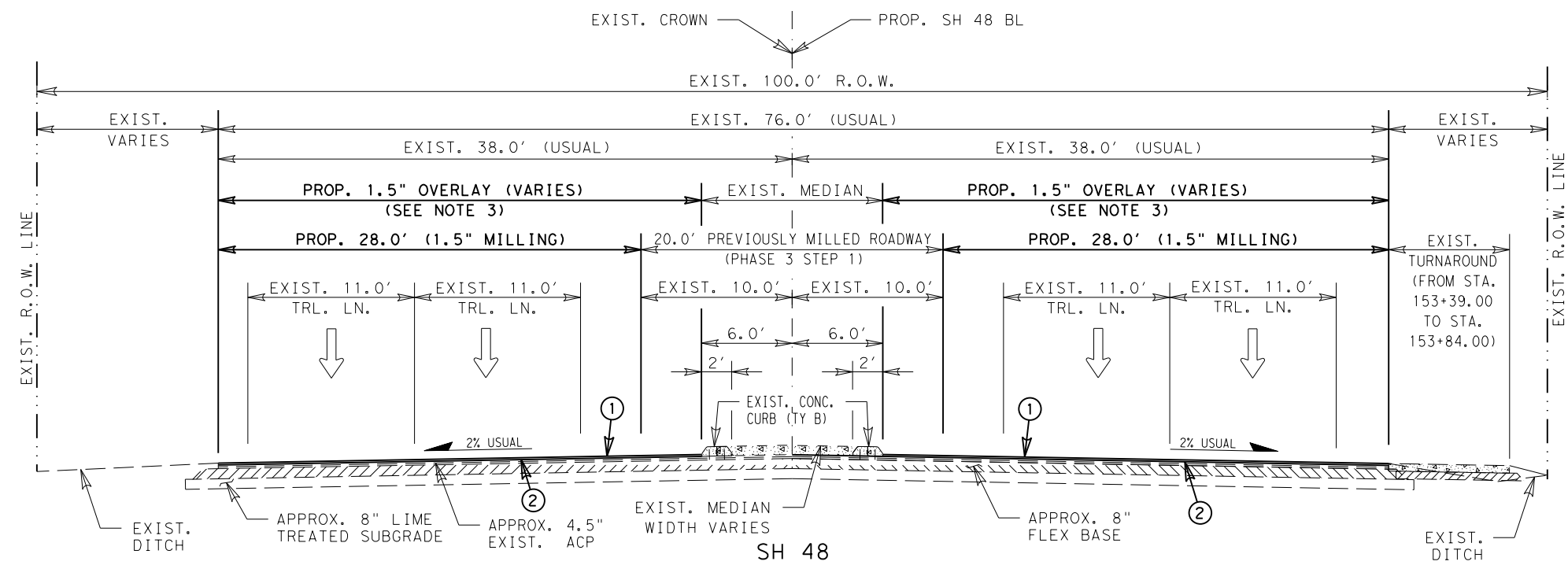
**SH 48  
 TCP PHASE 3 STEP 1  
 - LAYOUT**

SHEET 3 OF 3

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	<b>83</b>	



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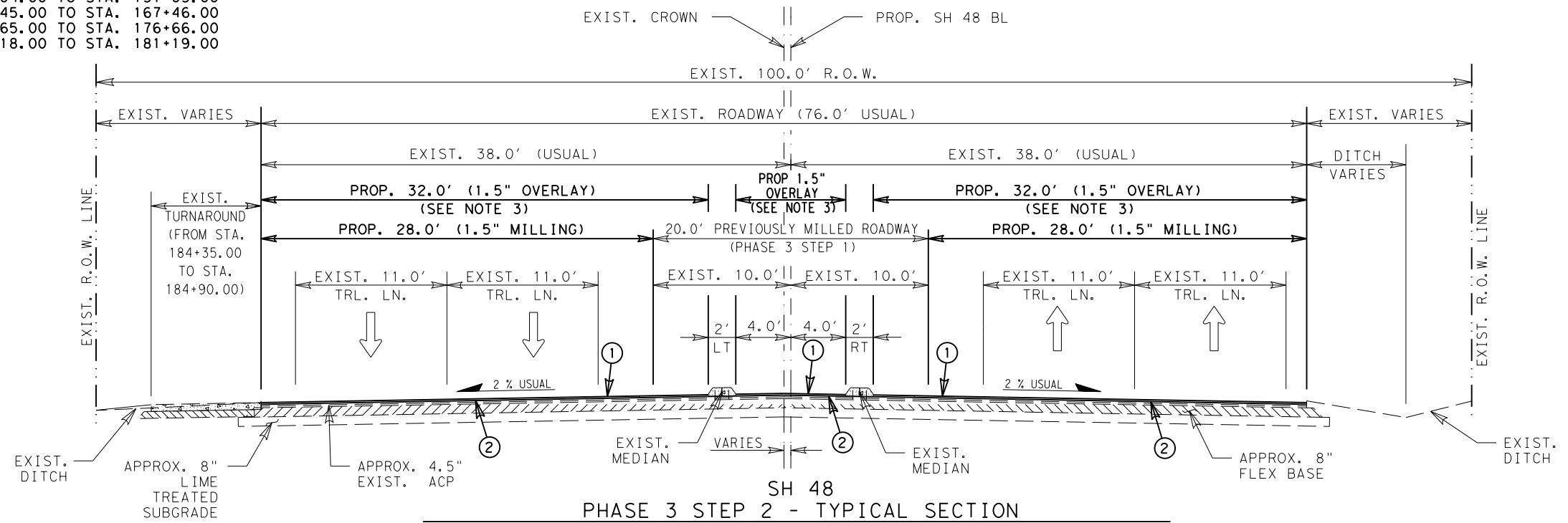


SH 48  
 PHASE 3 STEP 2 - TYPICAL SECTION

STA. 136+92.00 TO STA. 137+98.00	-	MEDIAN (12.0'-2.0')
STA. 145+17.00 TO STA. 146+18.00	-	MEDIAN (2.0'-12.0')
STA. 146+18.00 TO STA. 146+48.00	-	12.0' MEDIAN
STA. 151+05.00 TO STA. 152+06.00	-	MEDIAN (2.0'-12.0')
STA. 152+06.00 TO STA. 153+10.00	-	12.0' MEDIAN
STA. 153+10.00 TO STA. 153+34.00	-	MEDIAN (12.0'-2.0')
STA. 156+31.00 TO STA. 157+56.00	-	2.0' MEDIAN TRANSITION
STA. 160+68.00 TO STA. 160+92.00	-	MEDIAN (2.0'-12.0')
STA. 160+92.00 TO STA. 166+44.00	-	12.0' MEDIAN
STA. 166+44.00 TO STA. 167+45.00	-	MEDIAN (12.0'-2.0')
STA. 175+66.00 TO STA. 176+67.00	-	MEDIAN (2.0'-12.0')
STA. 176+67.00 TO STA. 180+17.00	-	12.0' MEDIAN
STA. 180+17.00 TO STA. 181+18.00	-	MEDIAN (12.0'-2.0')

NOTE:  
 NO RAISED CONCRETE MEDIAN AT INTERSECTIONS:  
 STA. 135+86.00 TO STA. 136+92.00 - E PRICE RD.  
 STA. 140+57.00 TO STA. 141+71.00 - ROBINDALE/FRUITDALE DR.  
 STA. 146+48.00 TO STA. 147+54.00 - MCKENZIE RD.  
 STA. 170+91.00 TO STA. 172+21.00 - AUSTIN RD.

1.0' GAP OPENING AT RAISED CONCRETE MEDIAN FOR DRAINAGE ACCESS.  
 STA. 137+98.00 TO STA. 137+99.00  
 STA. 145+16.00 TO STA. 145+17.00  
 STA. 151+04.00 TO STA. 151+05.00  
 STA. 167+45.00 TO STA. 167+46.00  
 STA. 175+65.00 TO STA. 176+66.00  
 STA. 181+18.00 TO STA. 181+19.00



SH 48  
 PHASE 3 STEP 2 - TYPICAL SECTION

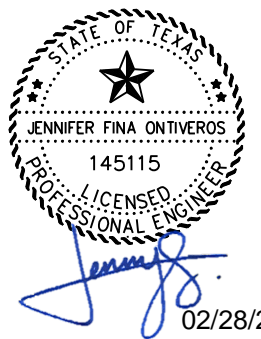
STA. 137+99.00 TO STA. 140+57.00	-	2.0' MEDIAN (LEFT)
STA. 141+71.00 TO STA. 145+16.00	-	2.0' MEDIAN (RIGHT)
STA. 147+54.00 TO STA. 151+04.00	-	2.0' MEDIAN (RIGHT)
STA. 167+46.00 TO STA. 170+91.00	-	2.0' MEDIAN (LEFT)
STA. 172+21.00 TO STA. 175+65.00	-	2.0' MEDIAN (RIGHT)
STA. 181+19.00 TO STA. 184+71.00	-	2.0' MEDIAN (LEFT)

- LEGEND:**
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② PROPOSED BONDING COURSE
  - ③ PROPOSED 6" CONCRETE (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROPOSED PROOF ROLL SUBGRADE
  - ⑥ PROPOSED EMBANKMENT (FINAL) (ORD COMP) (TY C) (SUBSIDIARY TO ITEM 530)

- BL - BASE LINE
- RT - RIGHT
- LT - LEFT
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- REMOVE - REMOVEABLE
- EQU. - EQUAL
- TYP. - TYPICAL
- B.Z. - BUFFER ZONE
- TCP - TRAFFIC CONTROL PLAN
- C-C - CENTER TO CENTER
- REFL - PLASTIC DRUM W/ REFLECTOR

- A WK ZN PAV MRK REMOV (Y) 4" (SLD)
- B WK ZN PAV MRK REMOV (W) 4" (SLD)
- C WK ZN PAV MRK REMOV (W) 4" (BRK) W/TYP II-C-R (REFL) AT 40' C-C
- E WK ZN PAV MRK REMOV (W) 8" (SLD)
- G TYPE II-C-R (REFL) AT 20' C-C

- NOTES:**
- SEE PROPOSED TYPICAL SECTIONS AND ROADWAY PLAN LAYOUT FOR ADDITIONAL DETAILS REGARDING RAISED MEDIAN CONSTRUCTION, TRANSITIONS, AND LIMITS.
  - SEE TCP LAYOUTS FOR CONSTRUCTION AREA WIDTHS, LIMITS, AND TRANSITIONS.
  - SEE PROPOSED TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.



**Pharr District Central Design**

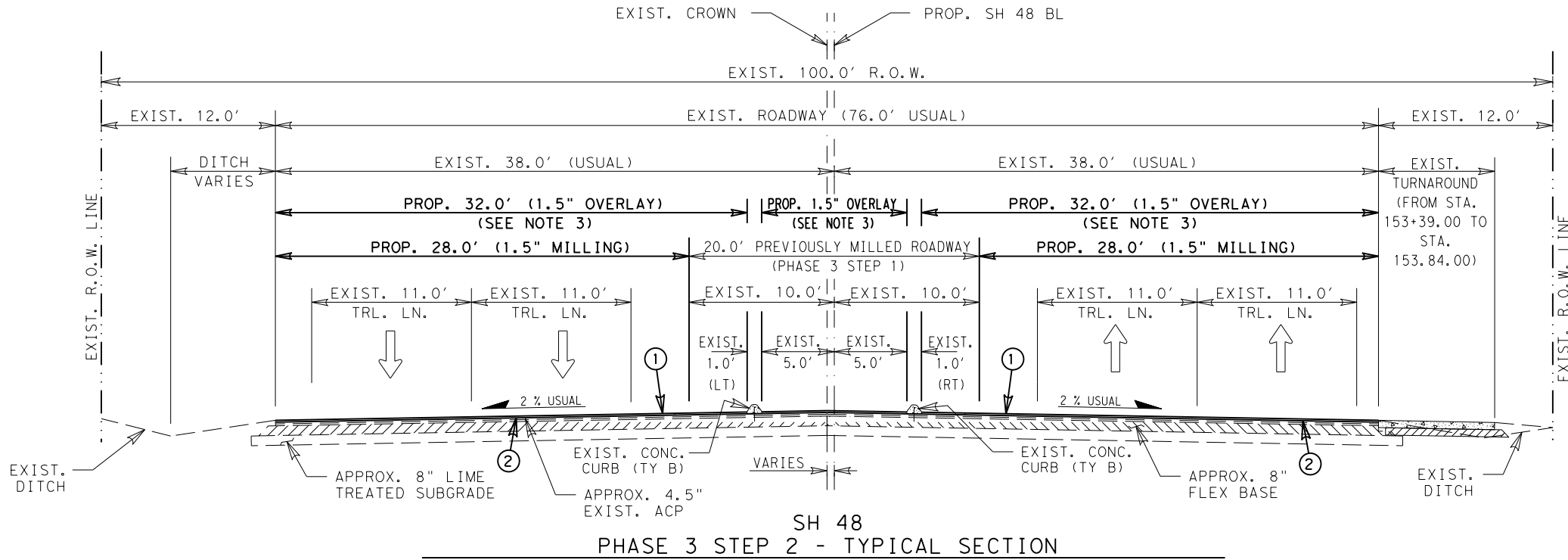
Texas Department of Transportation

**SH 48  
 TCP PHASE 3 STEP 2  
 - TYPICAL SECTIONS**

NOT TO SCALE SHEET 1 OF 2

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	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	84	

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**SH 48**  
**PHASE 3 STEP 2 - TYPICAL SECTION**

STA. 153+35.00 TO STA. 153+56.50 - 1.0' MEDIAN (LEFT)  
 STA. 153+56.50 TO STA. 156+30.00 - 1.0' MEDIAN (RIGHT)  
 STA. 157+57.00 TO STA. 160+45.50 - 1.0' MEDIAN (LEFT)  
 STA. 160+45.50 TO STA. 160+67.00 - 1.0' MEDIAN (RIGHT)

**NOTE:**  
 OVERLAY 1.0' GAP OPENING AT RAISED CONCRETE MEDIAN FOR DRAINAGE ACCESS.

STA. 153+34.00 TO STA. 153+35.00  
 STA. 156+30.00 TO STA. 156+31.00  
 STA. 157+56.00 TO STA. 157+57.00  
 STA. 160+67.00 TO STA. 160+68.00

- LEGEND:**
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② PROPOSED BONDING COURSE
  - ③ PROPOSED 6" CONCRETE (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROPOSED PROOF ROLL SUBGRADE
  - ⑥ PROPOSED EMBANKMENT (FINAL) (ORD COMP) (TY C) (SUBSIDIARY TO ITEM 530)

- BL - BASE LINE
- RT - RIGHT
- LT - LEFT
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- REMOV - REMOVEABLE
- EQ. - EQUAL
- TYP. - TYPICAL
- B.Z. - BUFFER ZONE
- TCP - TRAFFIC CONTROL PLAN
- C-C - CENTER TO CENTER
- Ⓜ - PLASTIC DRUM W/ REFLECTOR

- A WK ZN PAV MRK REMOV (Y) 4" (SLD)
- B WK ZN PAV MRK REMOV (W) 4" (SLD)
- C WK ZN PAV MRK REMOV (W) 4" (BRK) W/TYP II-C-R (REFL) AT 40' C-C
- E WK ZN PAV MRK REMOV (W) 8" (SLD)
- G TYPE II-C-R (REFL) AT 20' C-C

- NOTES:**
- SEE PROPOSED TYPICAL SECTIONS AND ROADWAY PLAN LAYOUT FOR ADDITIONAL DETAILS REGARDING RAISED MEDIAN CONSTRUCTION, TRANSITIONS, AND LIMITS.
  - SEE TCP LAYOUTS FOR CONSTRUCTION AREA WIDTHS, LIMITS, AND TRANSITIONS.
  - SEE PROPOSED TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.



**Pharr District Central Design**

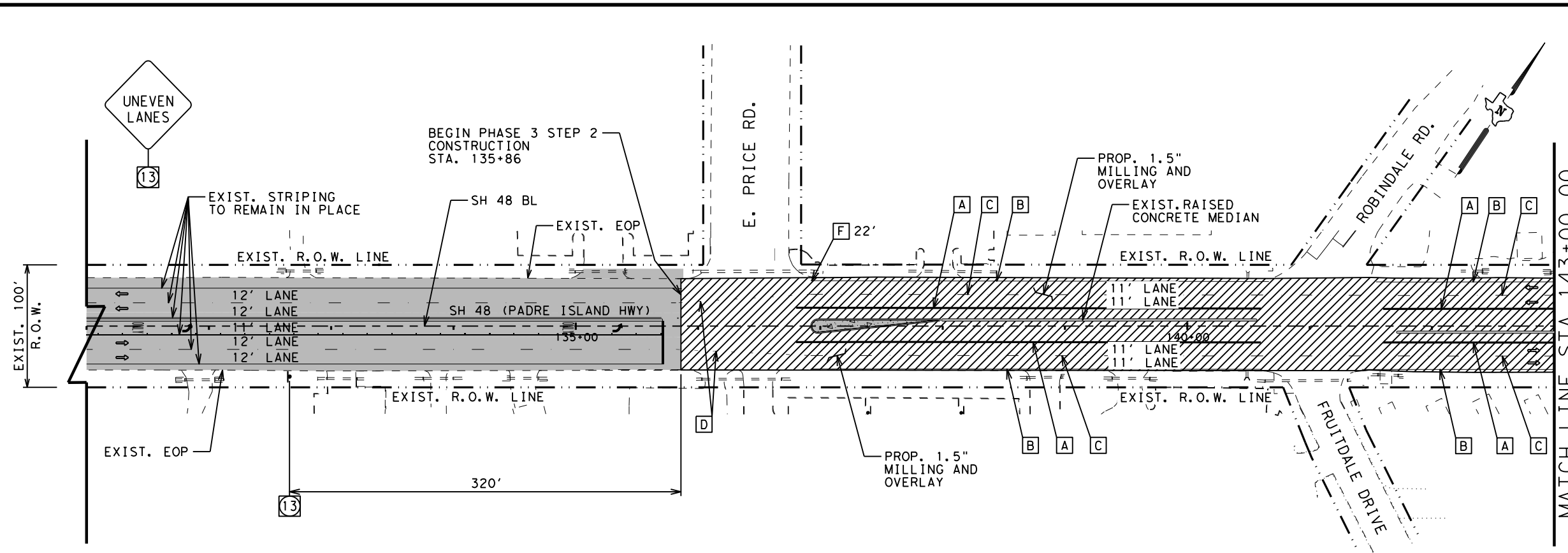
**Texas Department of Transportation**

**SH 48**  
**TCP PHASE 3 STEP 2**  
**- TYPICAL SECTIONS**

NOT TO SCALE SHEET 2 OF 2

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	85

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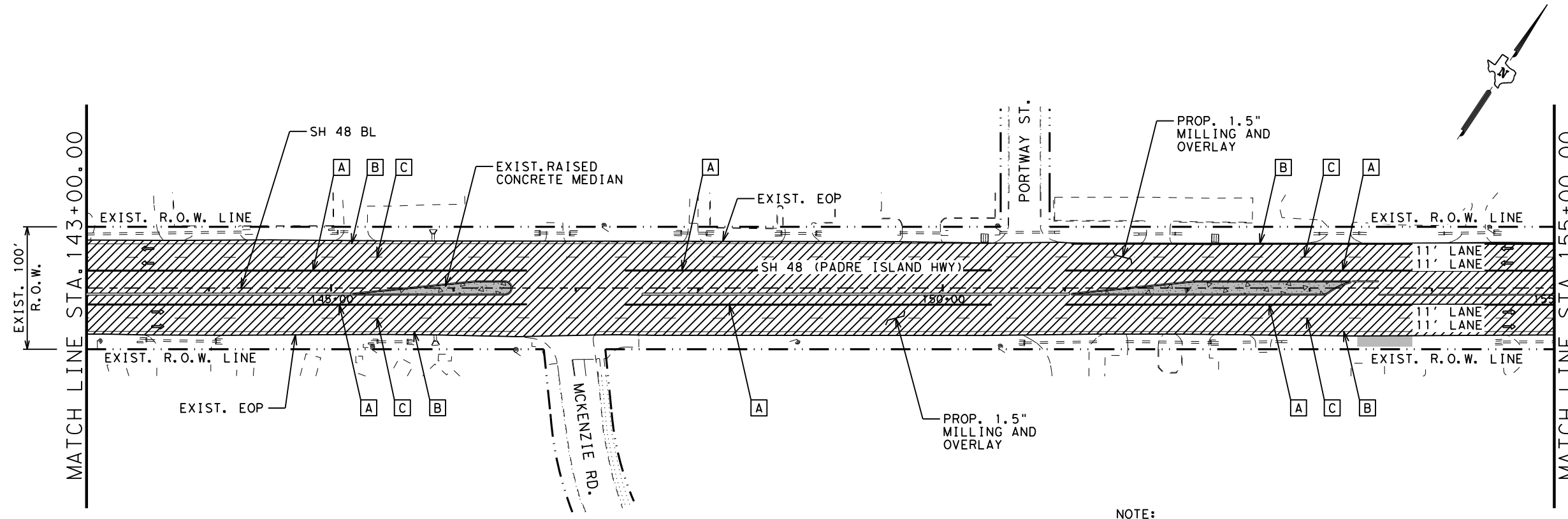


**LEGEND**

CONSTRUCTION AREA  
 REMOVE EXISTING CONCRETE  
 PREVIOUSLY CONSTRUCTED

A	WK ZN PAV MRK REMOV (W)4" (SLD)
B	WK ZN PAV MRK REMOV (W)4" (SLD)
C	WK ZN PAV MRK REMOV (W)4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
D	WK ZN PAV MRK REMOV (W)4" (DOT)
E	WK ZN PAV MRK REMOV (W)8" (SLD)
F	WK ZN PAV MRK REMOV (W)24" (SLD)
G	TYPE II-C-R (REFL) AT 20' C-C

EXIST. EXISTING  
 PROP. PROPOSED  
 LPCB LOW PROFILE CONCRETE BARRIER  
 R.O.W. RIGHT OF WAY  
 WK ZN WORK ZONE  
 EOP EDGE OF PAVEMENT  
 BL BASELINE  
 C-C CENTER TO CENTER  
 W/ WITH  
 DIRECTION OF TRAFFIC FLOW  
 PROPOSED SIGN  
 PROPOSED TYPE 3 (C) BARRICADES  
 PLASTIC DRUMS W/REFLECTORS  
 LOW PROFILE CONCRETE BARRIER W/REFLECTORS



STATE OF TEXAS  
 JENNIFER FINA ONTIVEROS  
 145115  
 LICENSED PROFESSIONAL ENGINEER  
  
 02/28/2023

**Pharr District Central Design**

Texas Department of Transportation

**SH 48  
 TCP PHASE 3 STEP 2  
 - LAYOUT**

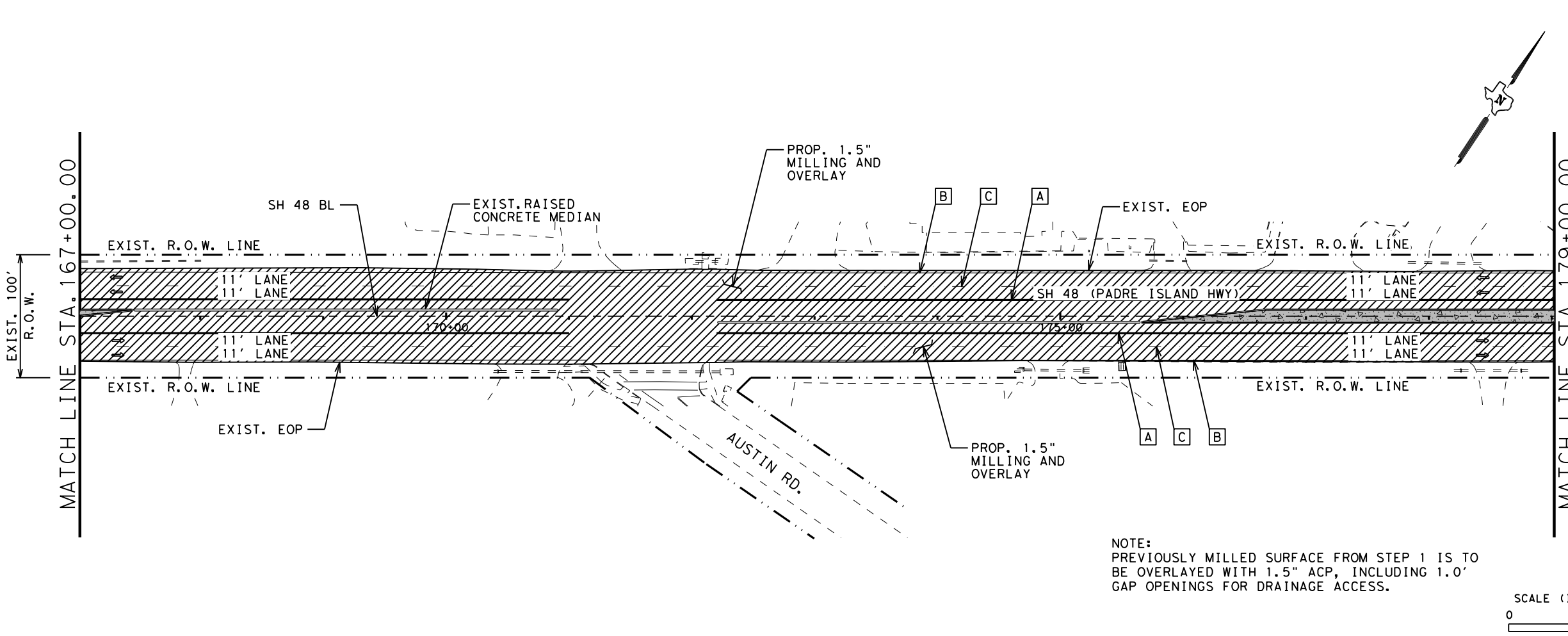
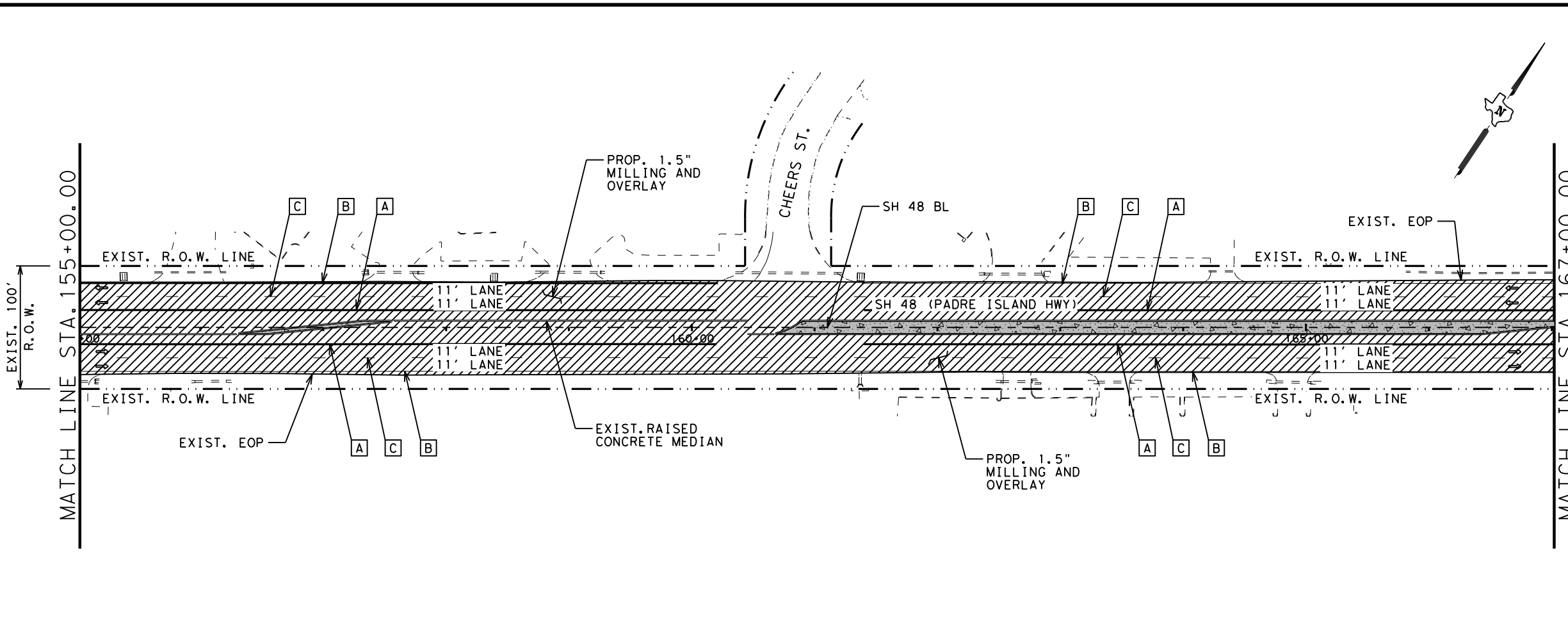
SHEET 1 OF 3

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	0220	05	080	SH 48
	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	86

NOTE:  
 PREVIOUSLY MILLED SURFACE FROM STEP 1 IS TO  
 BE OVERLAYED WITH 1.5" ACP, INCLUDING 1.0'  
 GAP OPENINGS FOR DRAINAGE ACCESS.



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- LEGEND**
- CONSTRUCTION AREA
  - REMOVE EXISTING CONCRETE
  - PREVIOUSLY CONSTRUCTED
  - A** WK ZN PAV MRK REMOV (W)4" (SLD)
  - B** WK ZN PAV MRK REMOV (W)4" (SLD)
  - C** WK ZN PAV MRK REMOV (W)4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
  - D** WK ZN PAV MRK REMOV (W)4" (DOT)
  - E** WK ZN PAV MRK REMOV (W)8" (SLD)
  - F** WK ZN PAV MRK REMOV (W)24" (SLD)
  - G** TYPE II-C-R (REFL) AT 20' C-C
  - EXIST. EXISTING
  - PROP. PROPOSED
  - LPCB LOW PROFILE CONCRETE BARRIER
  - R.O.W. RIGHT OF WAY
  - WK ZN WORK ZONE
  - EOP EDGE OF PAVEMENT
  - BL BASELINE
  - C-C CENTER TO CENTER
  - W/ WITH
  - DIRECTION OF TRAFFIC FLOW
  - PROPOSED SIGN
  - PROPOSED TYPE 3 (C) BARRICADES
  - PLASTIC DRUMS W/REFLECTORS
  - LOW PROFILE CONCRETE BARRIER W/REFLECTORS



**Pharr District Central Design**

**Texas Department of Transportation**

**SH 48  
TCP PHASE 3 STEP 2  
- LAYOUT**

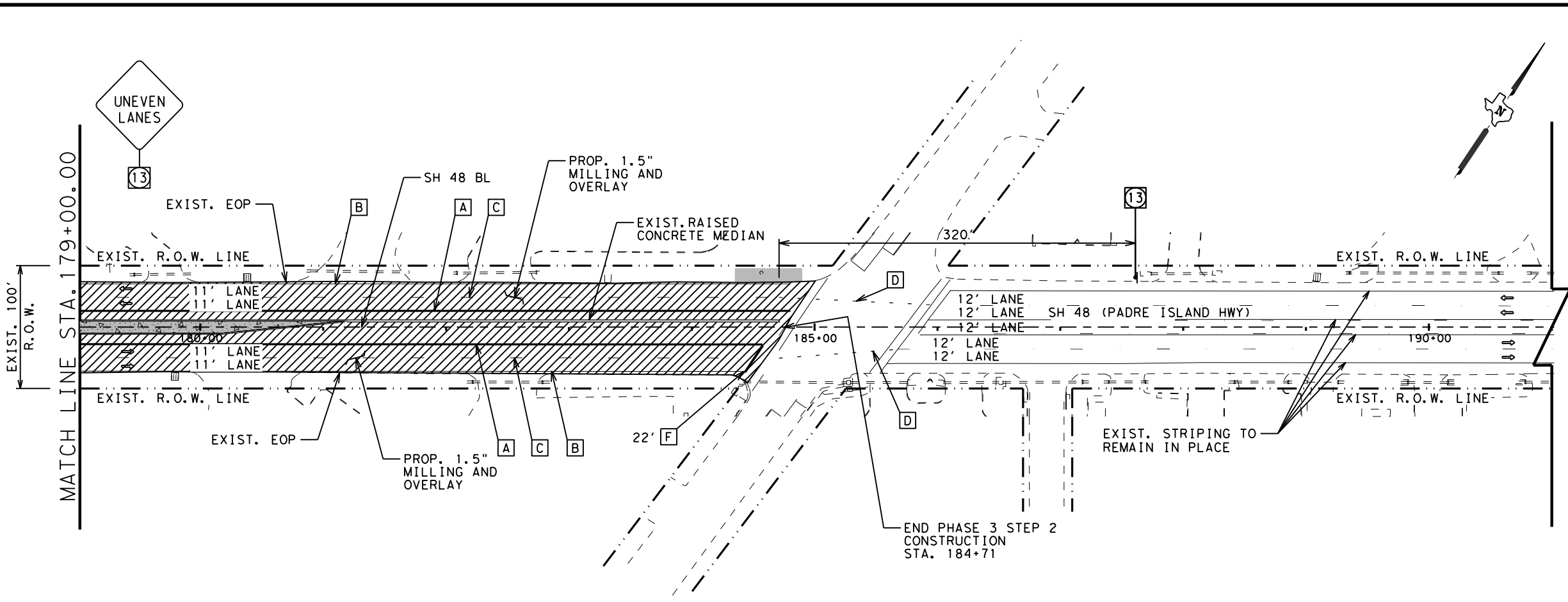
SHEET 2 OF 3

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	DIST	COUNTY	SHEET NO.	
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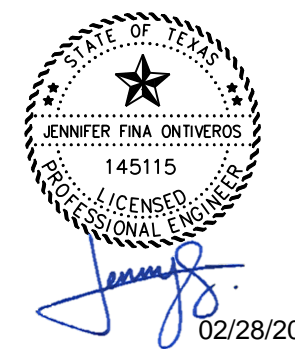
NOTE:  
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 GAP OPENINGS FOR DRAINAGE ACCESS.



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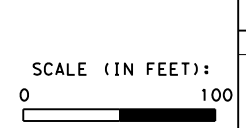
- LEGEND**
- CONSTRUCTION AREA
  - REMOVE EXISTING CONCRETE
  - PREVIOUSLY CONSTRUCTED
  - A** WK ZN PAV MRK REMOV (W)4" (SLD)
  - B** WK ZN PAV MRK REMOV (W)4" (SLD)
  - C** WK ZN PAV MRK REMOV (W)4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
  - D** WK ZN PAV MRK REMOV (W)4" (DOT)
  - E** WK ZN PAV MRK REMOV (W)8" (SLD)
  - F** WK ZN PAV MRK REMOV (W)24" (SLD)
  - G** TYPE II-C-R (REFL) AT 20' C-C
- EXIST. EXISTING  
 PROP. PROPOSED  
 LPCB LOW PROFILE CONCRETE BARRIER  
 R.O.W. RIGHT OF WAY  
 WK ZN WORK ZONE  
 EOP EDGE OF PAVEMENT  
 BL BASELINE  
 C-C CENTER TO CENTER  
 W/ WITH  
 DIRECTION OF TRAFFIC FLOW  
 PROPOSED SIGN  
 PROPOSED TYPE 3 (C) BARRICADES  
 PLASTIC DRUMS W/REFLECTORS  
 LOW PROFILE CONCRETE BARRIER W/REFLECTORS



Pharr District Central Design



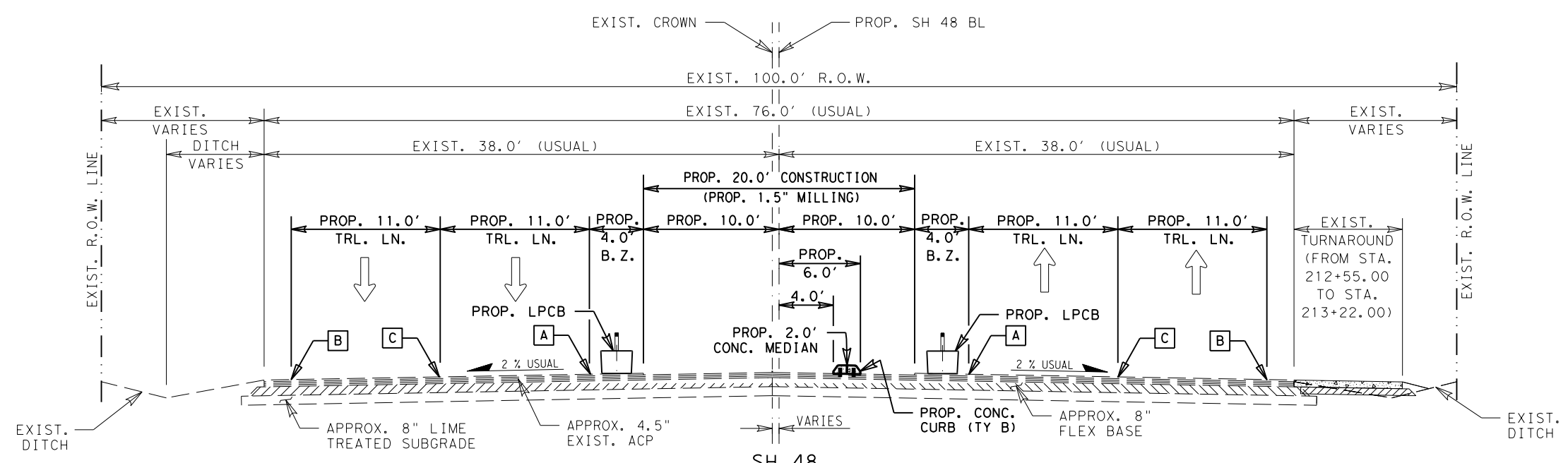
SH 48  
 TCP PHASE 3 STEP 2  
 - LAYOUT



SHEET 3 OF 3

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
			COUNTY	SHEET NO.
	PHR		CAMERON	88

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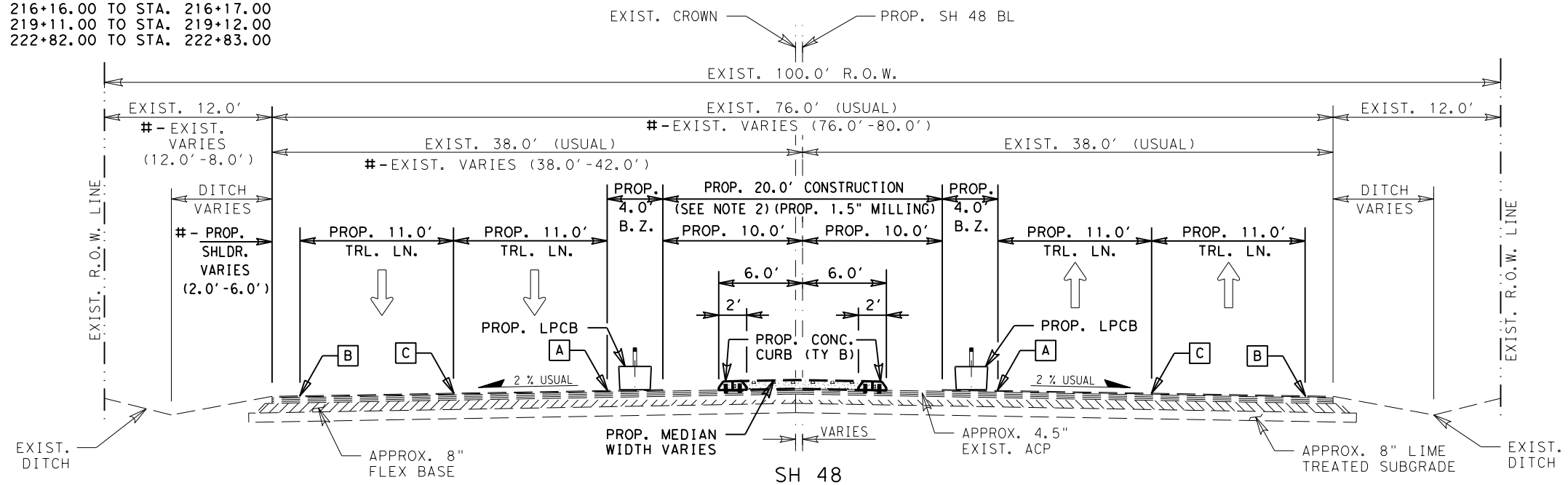


SH 48  
 PHASE 4 STEP 1 - TYPICAL SECTION

STA. 185+85.00 TO STA. 191+87.00  
 STA. 212+69.00 TO STA. 216+16.00

NOTE:  
 NO RAISED CONCRETE MEDIAN AT INTERSECTIONS:  
 STA. 211+70.00 TO STA. 212+69.00 - ZENA DR.  
 STA. 226+02.00 TO STA. 227+44.00 - COFFEE PORT RD.

1.0' GAP OPENING AT RAISED CONCRETE  
 MEDIAN FOR DRAINAGE ACCESS.  
 STA. 191+87.00 TO STA. 191+88.00  
 STA. 196+22.00 TO STA. 196+23.00  
 STA. 199+93.00 TO STA. 199+94.00  
 STA. 200+27.00 TO STA. 200+28.00  
 STA. 203+94.00 TO STA. 203+95.00  
 STA. 216+16.00 TO STA. 216+17.00  
 STA. 219+11.00 TO STA. 219+12.00  
 STA. 222+82.00 TO STA. 222+83.00



SH 48  
 PHASE 4 STEP 1 - TYPICAL SECTION

STA. 191+88.00 TO STA. 192+89.00 - MEDIAN (2.0' - 12.0')  
 STA. 192+89.00 TO STA. 195+21.00 - 12.0' MEDIAN  
 STA. 195+21.00 TO STA. 196+22.00 - MEDIAN (12.0' - 2.0')  
 STA. 199+94.00 TO STA. 200+27.00 - MEDIAN TRANSITION  
 STA. 203+95.00 TO STA. 204+96.00 - MEDIAN (2.0' - 12.0')  
 STA. 204+96.00 TO STA. 211+70.00 - 12.0' MEDIAN  
 STA. 216+17.00 TO STA. 217+18.00 - MEDIAN (2.0' - 12.0')  
 STA. 217+18.00 TO STA. 218+10.00 - 12.0' MEDIAN  
 STA. 218+10.00 TO STA. 219+11.00 - MEDIAN (12.0' - 2.0')  
 STA. 222+83.00 TO STA. 223+07.00 - MEDIAN (2.0' - 12.0')  
 STA. 223+07.00 TO STA. 225+60.00 - 12.0' MEDIAN  
 # - STA. 225+60.00 TO STA. 226+02.00 - 12.0' MEDIAN

- LEGEND:**
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② PROPOSED BONDING COURSE
  - ③ PROPOSED 6" CONCRETE (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROPOSED PROOF ROLL SUBGRADE
  - ⑥ PROPOSED EMBANKMENT (FINAL) (ORD COMP) (TY C) (SUBSIDIARY TO ITEM 530)

- BL - BASE LINE
- RT - RIGHT
- LT - LEFT
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- REMOV. - REMOVEABLE
- EQ. - EQUAL
- TYP. - TYPICAL
- B.Z. - BUFFER ZONE
- TCP - TRAFFIC CONTROL PLAN
- C-C - CENTER TO CENTER
- Ⓜ - PLASTIC DRUM W/ REFLECTOR

- A WK ZN PAV MRK REMOV (Y) 4" (SLD)
- B WK ZN PAV MRK REMOV (W) 4" (SLD)
- C WK ZN PAV MRK REMOV (W) 4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
- E WK ZN PAV MRK REMOV (W) 8" (SLD)
- G TYPE II-C-R (REFL) AT 20' C-C

- NOTES:**
1. SEE PROPOSED TYPICAL SECTIONS AND ROADWAY PLAN LAYOUT FOR ADDITIONAL DETAILS REGARDING RAISED MEDIAN CONSTRUCTION, TRANSITIONS, AND LIMITS.
  2. SEE TCP LAYOUTS FOR CONSTRUCTION AREA WIDTHS, LIMITS, AND TRANSITIONS.
  3. SEE PROPOSED TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.



**Pharr District Central Design**

Texas Department of Transportation

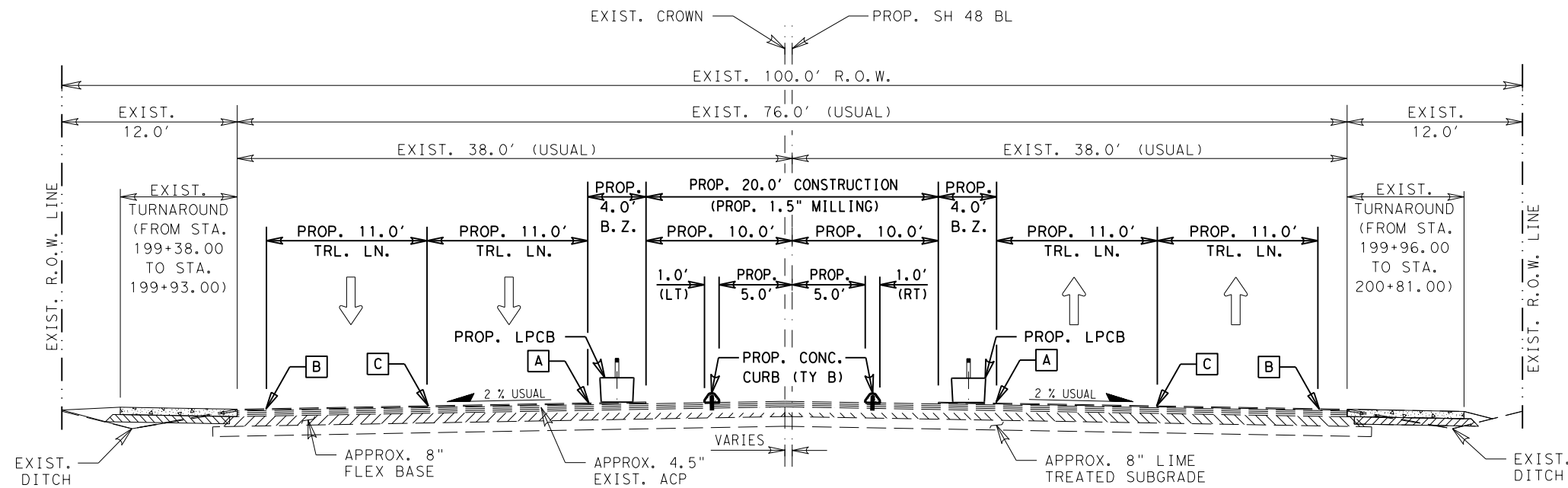
**SH 48  
 TCP PHASE 4 STEP 1  
 - TYPICAL SECTIONS**

NOT TO SCALE SHEET 1 OF 2

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	89	



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**SH 48  
 PHASE 4 STEP 1 - TYPICAL SECTION**

STA. 196+23.00 TO STA. 199+71.50	- 1.0'	MEDIAN (LEFT)
STA. 199+71.50 TO STA. 199+93.00	- 1.0'	MEDIAN (RIGHT)
STA. 200+28.00 TO STA. 200+49.50	- 1.0'	MEDIAN (LEFT)
STA. 200+49.50 TO STA. 203+94.00	- 1.0'	MEDIAN (RIGHT)
STA. 219+12.00 TO STA. 222+60.50	- 1.0'	MEDIAN (LEFT)
STA. 222+60.50 TO STA. 222+82.00	- 1.0'	MEDIAN (RIGHT)

- LEGEND:**
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② PROPOSED BONDING COURSE
  - ③ PROPOSED 6" CONCRETE (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROPOSED PROOF ROLL SUBGRADE
  - ⑥ PROPOSED EMBANKMENT (FINAL) (ORD COMP) (TY C) (SUBSIDIARY TO ITEM 530)

- BL - BASE LINE
- RT - RIGHT
- LT - LEFT
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- REMOV - REMOVEABLE
- EQ. - EQUAL
- TYP. - TYPICAL
- B.Z. - BUFFER ZONE
- TCP - TRAFFIC CONTROL PLAN
- C-C - CENTER TO CENTER
- Ⓜ - PLASTIC DRUM W/ REFLECTOR

- A WK ZN PAV MRK REMOV (Y) 4" (SLD)
- B WK ZN PAV MRK REMOV (W) 4" (SLD)
- C WK ZN PAV MRK REMOV (W) 4" (BRK) W/TYP II-C-R (REFL) AT 40' C-C
- E WK ZN PAV MRK REMOV (W) 8" (SLD)
- G TYPE II-C-R (REFL) AT 20' C-C

- NOTES:**
- SEE PROPOSED TYPICAL SECTIONS AND ROADWAY PLAN LAYOUT FOR ADDITIONAL DETAILS REGARDING RAISED MEDIAN CONSTRUCTION, TRANSITIONS, AND LIMITS.
  - SEE TCP LAYOUTS FOR CONSTRUCTION AREA WIDTHS, LIMITS, AND TRANSITIONS.
  - SEE PROPOSED TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.



**Pharr District Central Design**

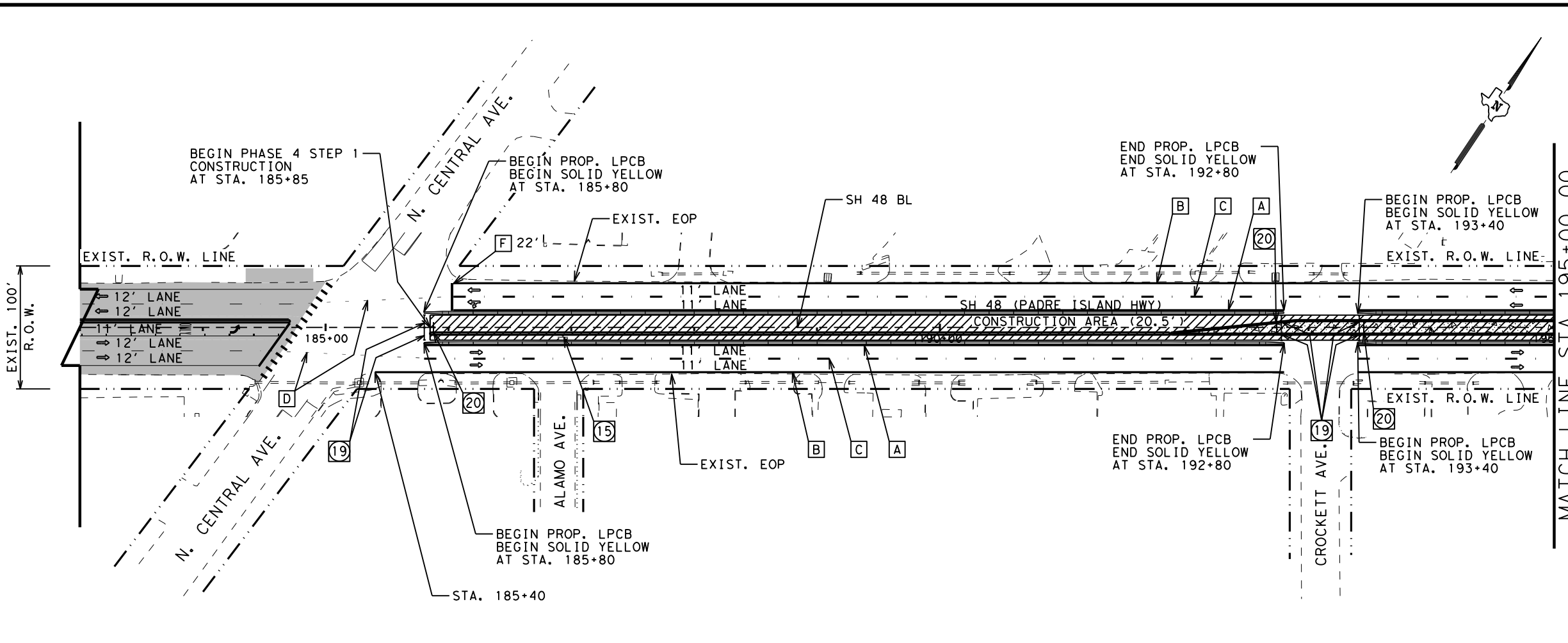
**Texas Department of Transportation**

**SH 48  
 TCP PHASE 4 STEP 1  
 - TYPICAL SECTIONS**

NOT TO SCALE SHEET 2 OF 2

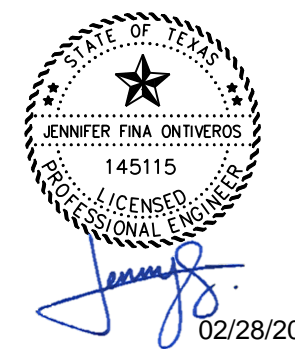
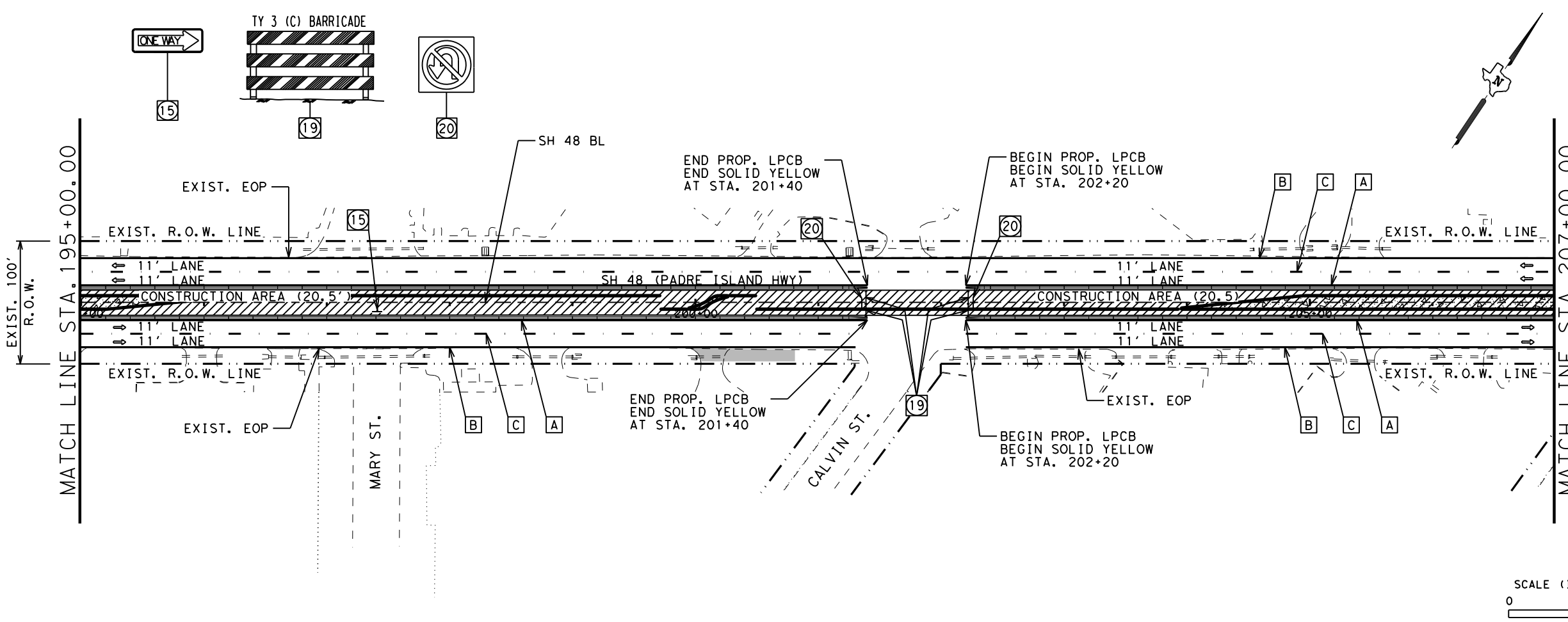
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	0220	05	080	SH 48
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	PHR	CAMERON	90	

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**LEGEND**

- CONSTRUCTION AREA
- REMOVE EXISTING CONCRETE
- PREVIOUSLY CONSTRUCTED
- A** WK ZN PAV MRK REMOV (W)4" (SLD)
- B** WK ZN PAV MRK REMOV (W)4" (SLD)
- C** WK ZN PAV MRK REMOV (W)4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
- D** WK ZN PAV MRK REMOV (W)4" (DOT)
- E** WK ZN PAV MRK REMOV (W)8" (SLD)
- F** WK ZN PAV MRK REMOV (W)24" (SLD)
- G** TYPE II-C-R (REFL) AT 20' C-C
- EXIST. EXISTING
- PROP. PROPOSED
- LPCB LOW PROFILE CONCRETE BARRIER
- R.O.W. RIGHT OF WAY
- WK ZN WORK ZONE
- EOP EDGE OF PAVEMENT
- BL BASELINE
- C-C CENTER TO CENTER
- W/ WITH
- DIRECTION OF TRAFFIC FLOW
- PROPOSED SIGN
- PROPOSED TYPE 3 (C) BARRICADES
- PLASTIC DRUMS W/REFLECTORS
- LOW PROFILE CONCRETE BARRIER W/REFLECTORS



**Pharr District Central Design**

**Texas Department of Transportation**

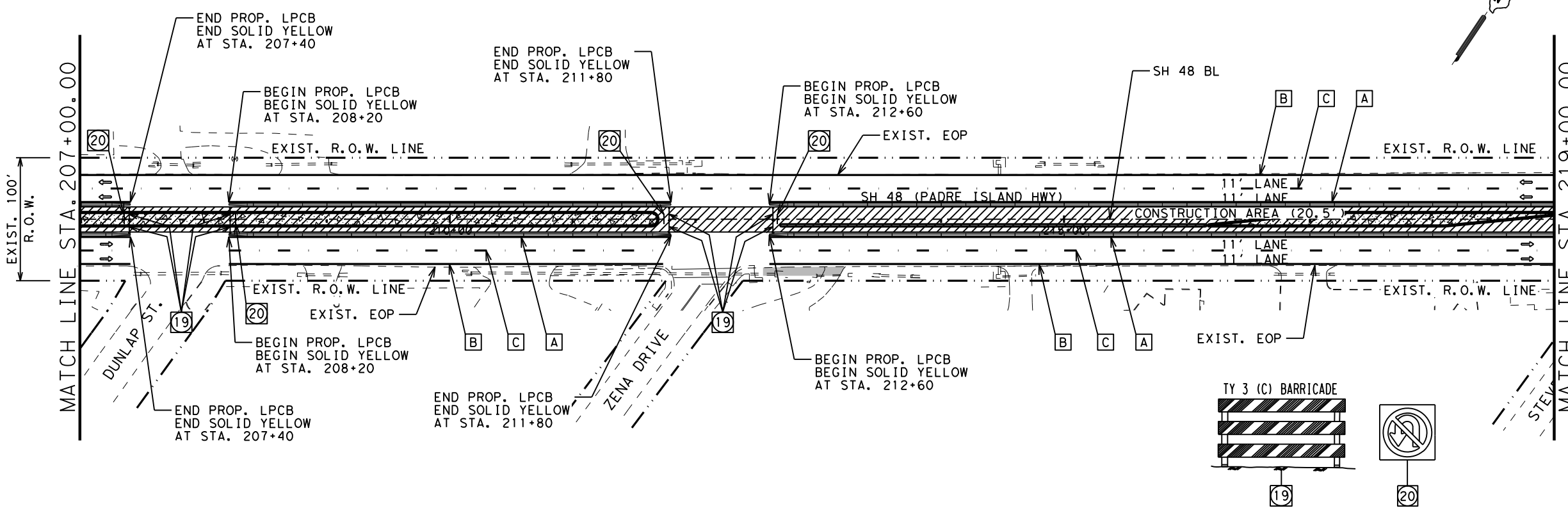
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 TCP PHASE 4 STEP 1  
 - LAYOUT**

SHEET 1 OF 2

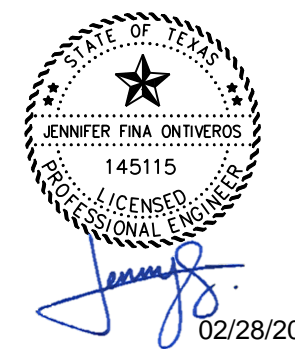
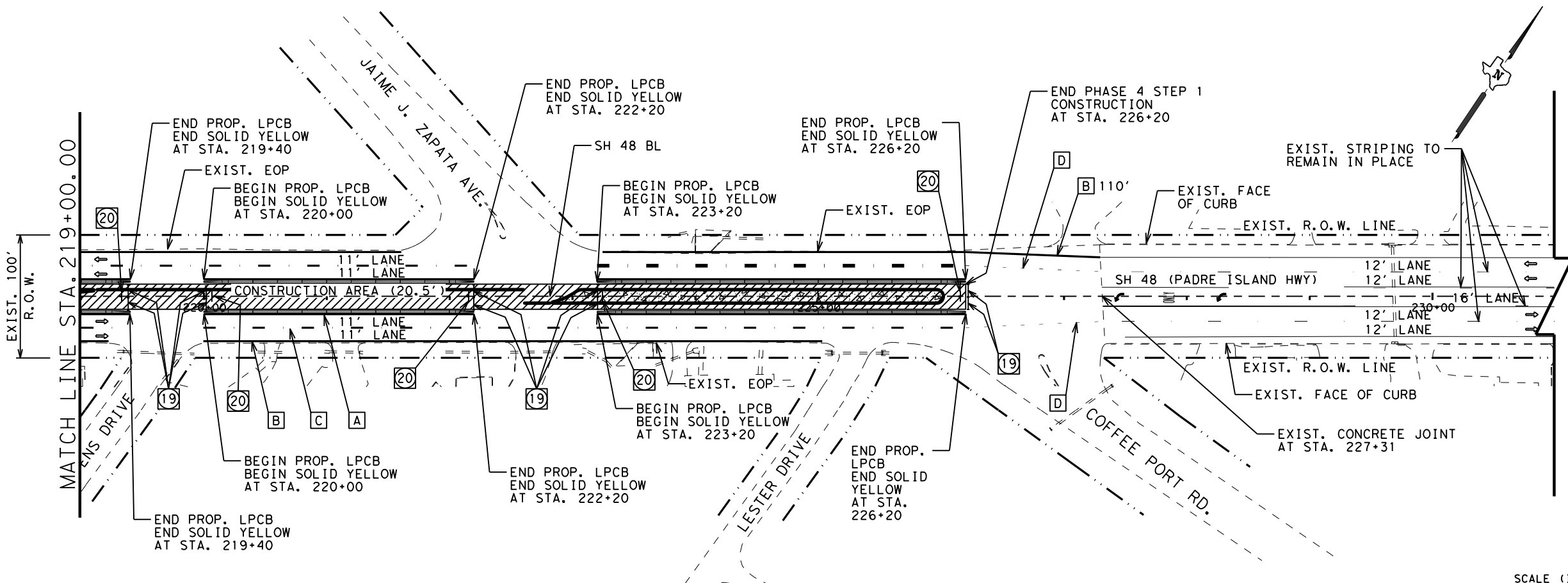
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- LEGEND**
- CONSTRUCTION AREA
  - REMOVE EXISTING CONCRETE
  - PREVIOUSLY CONSTRUCTED
  - A** WK ZN PAV MRK REMOV (Y)4" (SLD)
  - B** WK ZN PAV MRK REMOV (W)4" (SLD)
  - C** WK ZN PAV MRK REMOV (W)4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
  - D** WK ZN PAV MRK REMOV (W)4" (DOT)
  - E** WK ZN PAV MRK REMOV (W)8" (SLD)
  - F** WK ZN PAV MRK REMOV (W)24" (SLD)
  - G** TYPE II-C-R (REFL) AT 20' C-C
  - EXIST. EXISTING
  - PROP. PROPOSED
  - LPCB LOW PROFILE CONCRETE BARRIER
  - R.O.W. RIGHT OF WAY
  - WK ZN WORK ZONE
  - EOP EDGE OF PAVEMENT
  - BL BASELINE
  - C-C CENTER TO CENTER
  - W/ WITH
  - DIRECTION OF TRAFFIC FLOW
  - PROPOSED SIGN
  - PROPOSED TYPE 3 (C) BARRICADES
  - PLASTIC DRUMS W/REFLECTORS
  - LOW PROFILE CONCRETE BARRIER W/REFLECTORS



**Pharr District Central Design**

**Texas Department of Transportation**

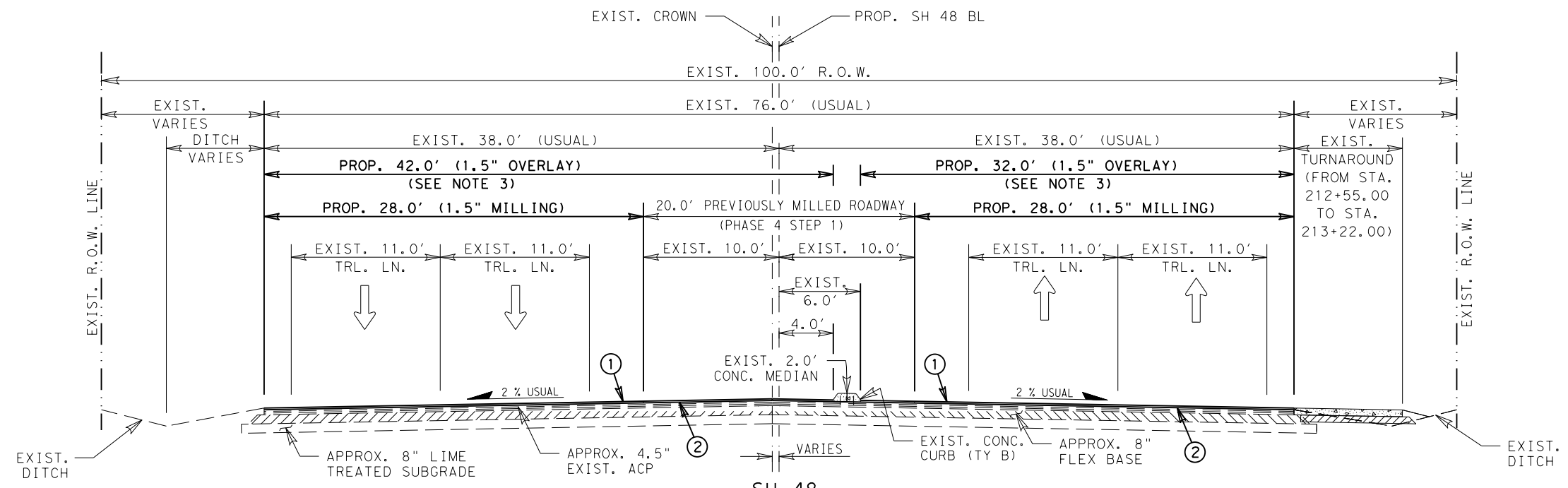
**SH 48  
TCP PHASE 4 STEP 1  
- LAYOUT**

SHEET 2 OF 2

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	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	92	



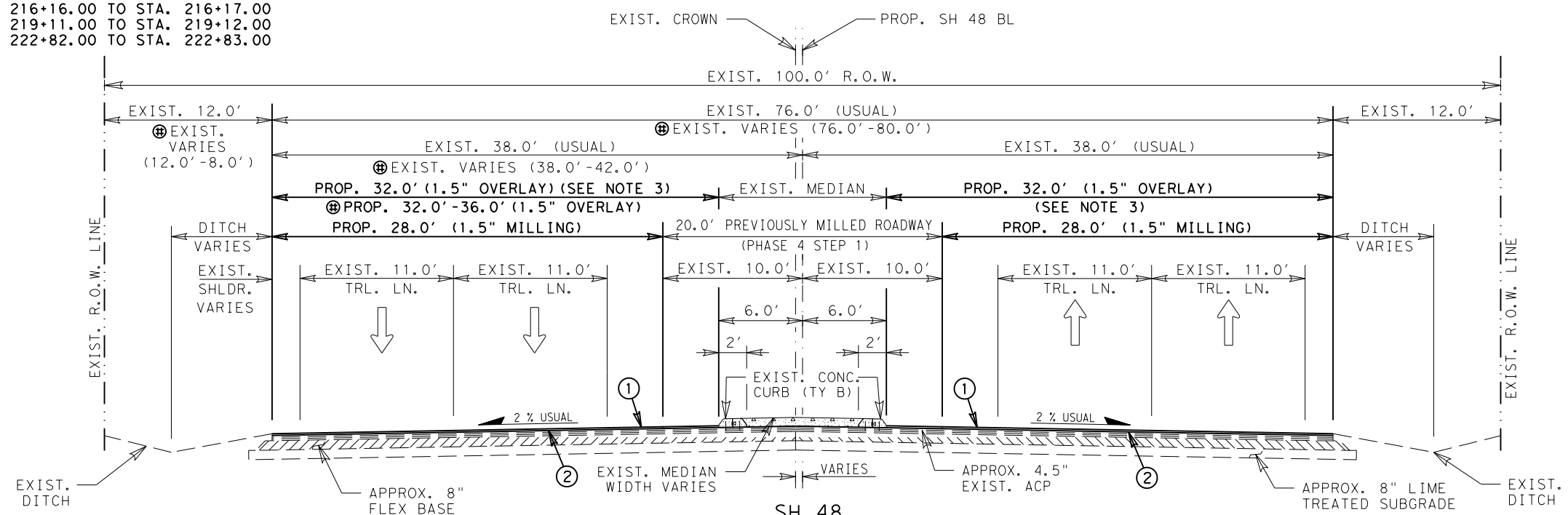
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SH 48  
 PHASE 4 STEP 2 - TYPICAL SECTION

STA. 184+71.00 TO STA. 185+85.00 - NO MEDIAN (N CENTRAL AVE.)  
 STA. 185+85.00 TO STA. 191+87.00  
 STA. 211+70.00 TO STA. 212+69.00 - NO MEDIAN (ZENA DR.)  
 STA. 212+69.00 TO STA. 216+16.00

NOTE:  
 1.0' GAP OPENING AT RAISED CONCRETE MEDIAN FOR DRAINAGE ACCESS.  
 STA. 191+87.00 TO STA. 191+88.00  
 STA. 196+22.00 TO STA. 196+23.00  
 STA. 199+93.00 TO STA. 199+94.00  
 STA. 200+27.00 TO STA. 200+28.00  
 STA. 203+94.00 TO STA. 203+95.00  
 STA. 216+16.00 TO STA. 216+17.00  
 STA. 219+11.00 TO STA. 219+12.00  
 STA. 222+82.00 TO STA. 222+83.00



SH 48  
 PHASE 4 STEP 2 - TYPICAL SECTION

STA. 191+88.00 TO STA. 192+89.00 - MEDIAN (2.0'-12.0')  
 STA. 192+89.00 TO STA. 195+21.00 - 12.0' MEDIAN  
 STA. 195+21.00 TO STA. 196+22.00 - MEDIAN (12.0'-2.0')  
 STA. 199+94.00 TO STA. 200+27.00 - MEDIAN TRANSITION  
 STA. 203+95.00 TO STA. 204+96.00 - MEDIAN (2.0'-12.0')  
 STA. 204+96.00 TO STA. 211+70.00 - 12.0' MEDIAN  
 STA. 216+17.00 TO STA. 217+18.00 - MEDIAN (2.0'-12.0')  
 STA. 217+18.00 TO STA. 218+10.00 - 12.0' MEDIAN  
 STA. 218+10.00 TO STA. 219+11.00 - MEDIAN (12.0'-2.0')  
 STA. 222+83.00 TO STA. 223+07.00 - MEDIAN (2.0'-12.0')  
 STA. 223+07.00 TO STA. 225+60.00 - 12.0' MEDIAN  
 STA. 225+60.00 TO STA. 226+02.00 - 12.0' MEDIAN  
 STA. 226+02.00 TO STA. 227+31.00 - NO MEDIAN (COFFEE PORT RD.)

- LEGEND:
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② PROPOSED BONDING COURSE
  - ③ PROPOSED 6" CONCRETE (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROPOSED PROOF ROLL SUBGRADE
  - ⑥ PROPOSED EMBANKMENT (FINAL) (ORD COMP) (TY C) (SUBSIDIARY TO ITEM 530)

- BL - BASE LINE
- RT - RIGHT
- LT - LEFT
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- REMOV - REMOVEABLE
- EQ. - EQUAL
- TYP. - TYPICAL
- B.Z. - BUFFER ZONE
- TCP - TRAFFIC CONTROL PLAN
- C-C - CENTER TO CENTER
- Ⓜ - PLASTIC DRUM W/ REFLECTOR

- A WK ZN PAV MRK REMOV (Y) 4" (SLD)
- B WK ZN PAV MRK REMOV (W) 4" (SLD)
- C WK ZN PAV MRK REMOV (W) 4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
- E WK ZN PAV MRK REMOV (W) 8" (SLD)
- G TYPE II-C-R (REFL) AT 20' C-C

- NOTES:
1. SEE PROPOSED TYPICAL SECTIONS AND ROADWAY PLAN LAYOUT FOR ADDITIONAL DETAILS REGARDING RAISED MEDIAN CONSTRUCTION, TRANSITIONS, AND LIMITS.
  2. SEE TCP LAYOUTS FOR CONSTRUCTION AREA WIDTHS, LIMITS, AND TRANSITIONS.
  3. SEE PROPOSED TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.



Pharr District Central Design

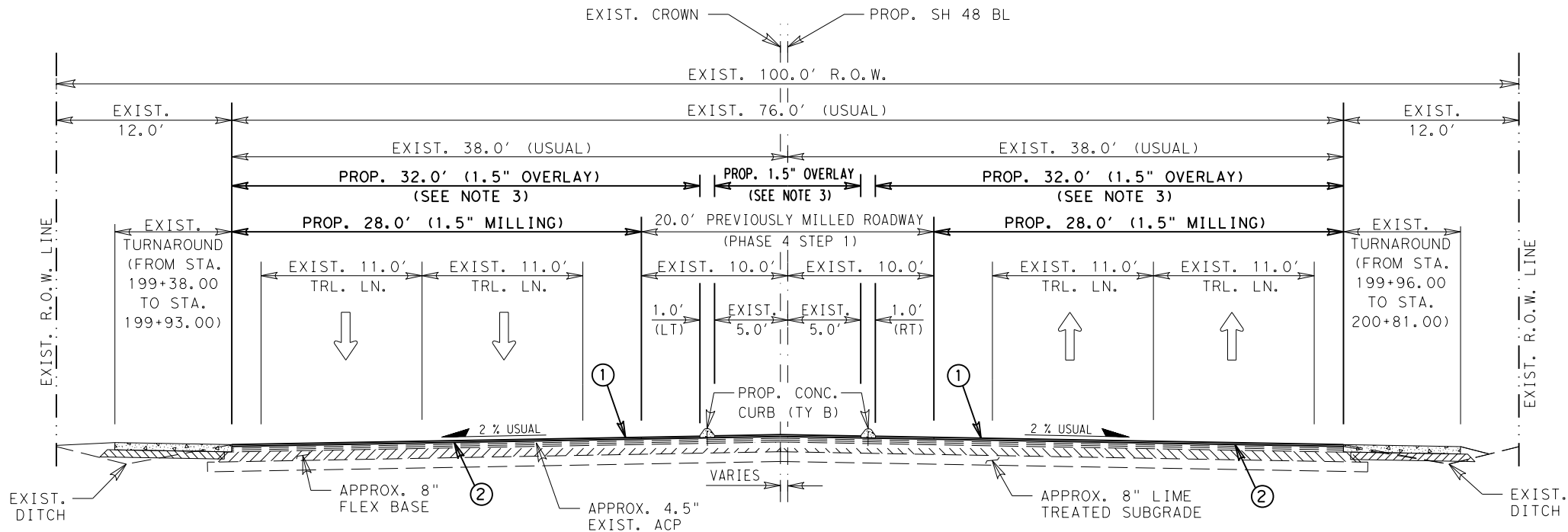
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SH 48  
 TCP PHASE 4 STEP 2  
 - TYPICAL SECTIONS

NOT TO SCALE SHEET 1 OF 2

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	93	

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SH 48  
 PHASE 4 STEP 2 - TYPICAL SECTION

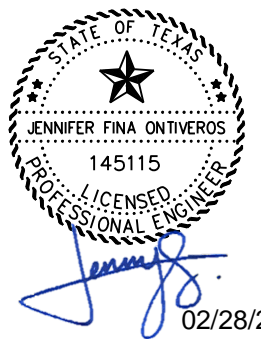
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STA. 199+71.50 TO STA. 199+93.00	- 1.0'	MEDIAN (RIGHT)
STA. 200+28.00 TO STA. 200+49.50	- 1.0'	MEDIAN (LEFT)
STA. 200+49.50 TO STA. 203+94.00	- 1.0'	MEDIAN (RIGHT)
STA. 219+12.00 TO STA. 222+60.50	- 1.0'	MEDIAN (LEFT)
STA. 222+60.50 TO STA. 222+82.00	- 1.0'	MEDIAN (RIGHT)

- LEGEND:**
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② PROPOSED BONDING COURSE
  - ③ PROPOSED 6" CONCRETE (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROPOSED PROOF ROLL SUBGRADE
  - ⑥ PROPOSED EMBANKMENT (FINAL) (ORD COMP) (TY C) (SUBSIDIARY TO ITEM 530)

- BL - BASE LINE
- RT - RIGHT
- LT - LEFT
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- REMOV - REMOVEABLE
- EQU. - EQUAL
- TYP. - TYPICAL
- B.Z. - BUFFER ZONE
- TCP - TRAFFIC CONTROL PLAN
- C-C - CENTER TO CENTER
- REFL - PLASTIC DRUM W/ REFLECTOR

- A WK ZN PAV MRK REMOV (Y) 4" (SLD)
- B WK ZN PAV MRK REMOV (W) 4" (SLD)
- C WK ZN PAV MRK REMOV (W) 4" (BRK) W/TYP II-C-R (REFL) AT 40' C-C
- E WK ZN PAV MRK REMOV (W) 8" (SLD)
- G TYPE II-C-R (REFL) AT 20' C-C

- NOTES:**
- SEE PROPOSED TYPICAL SECTIONS AND ROADWAY PLAN LAYOUT FOR ADDITIONAL DETAILS REGARDING RAISED MEDIAN CONSTRUCTION, TRANSITIONS, AND LIMITS.
  - SEE TCP LAYOUTS FOR CONSTRUCTION AREA WIDTHS, LIMITS, AND TRANSITIONS.
  - SEE PROPOSED TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.



**Pharr District Central Design**

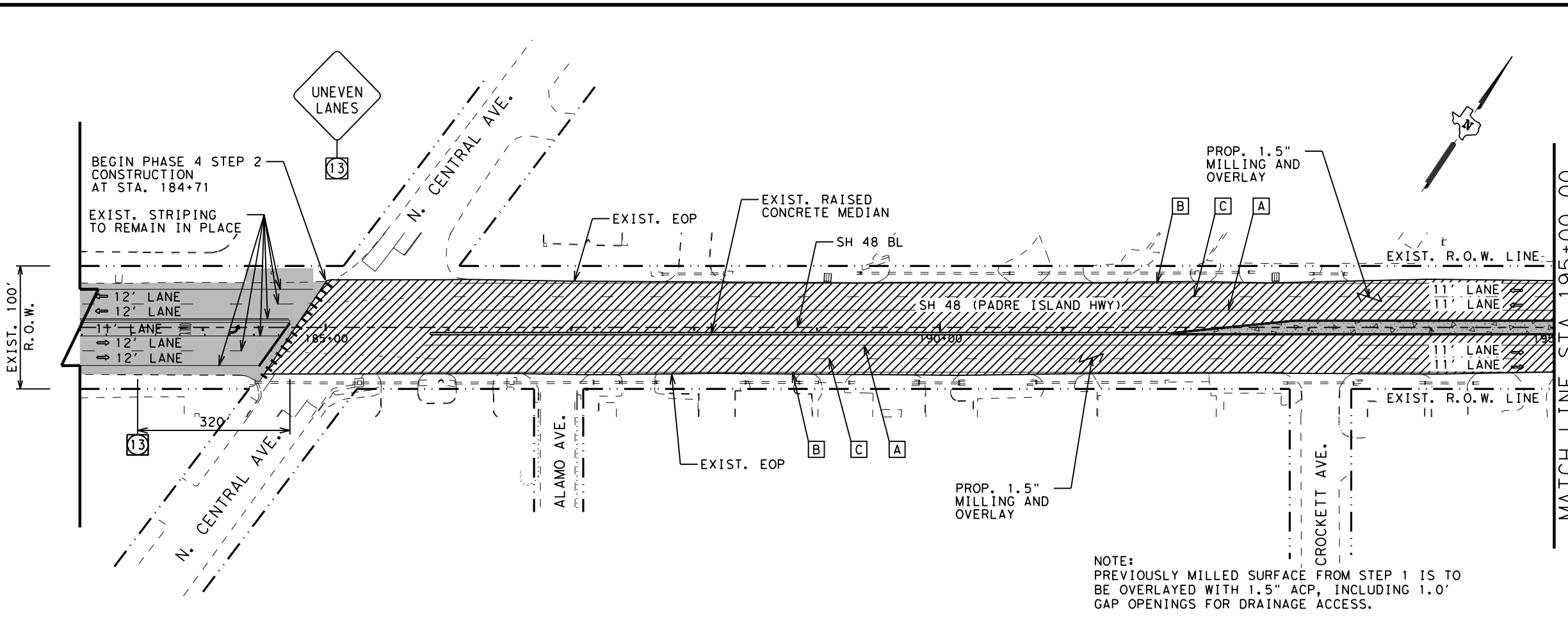
Texas Department of Transportation

**SH 48  
 TCP PHASE 4 STEP 2  
 - TYPICAL SECTIONS**

NOT TO SCALE SHEET 2 OF 2

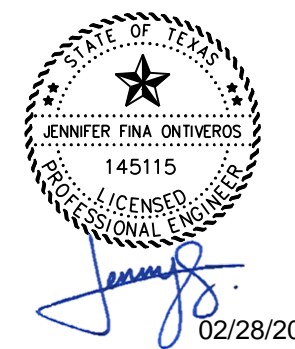
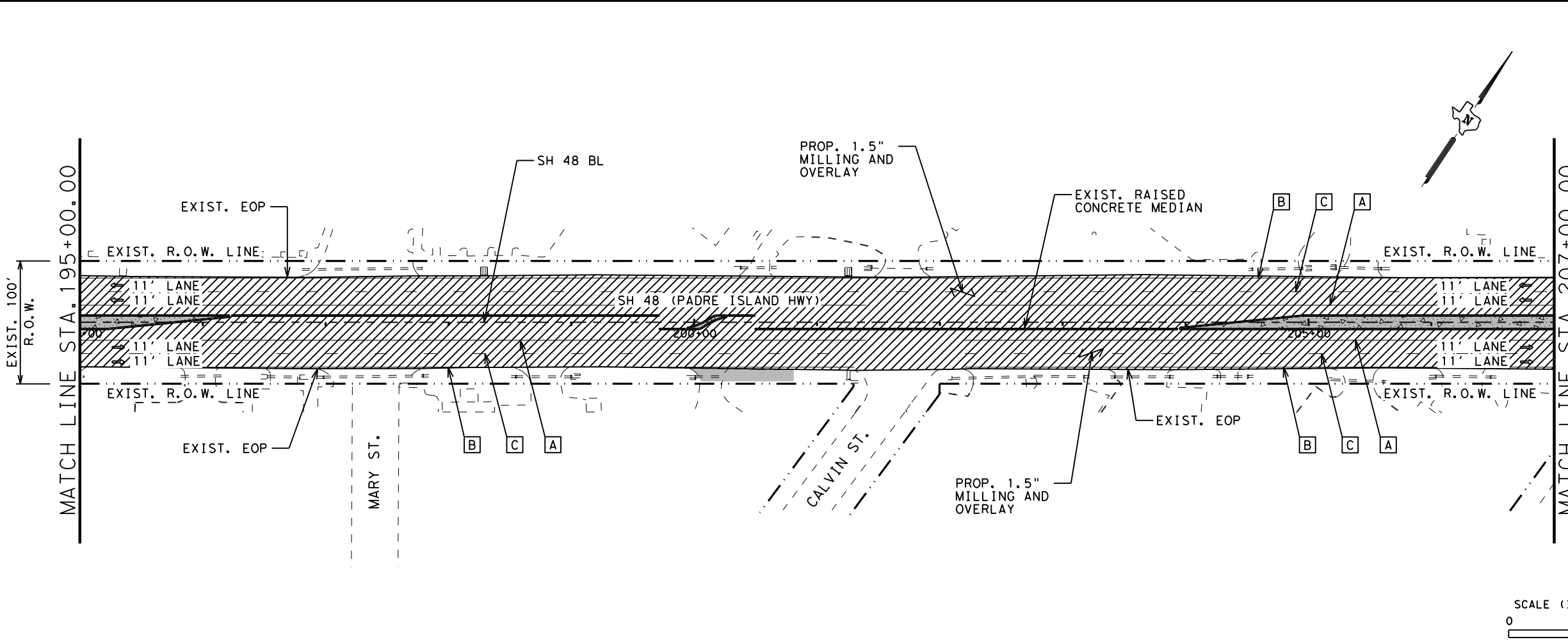
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- LEGEND**
- CONSTRUCTION AREA
  - REMOVE EXISTING CONCRETE
  - PREVIOUSLY CONSTRUCTED
  - A** WK ZN PAV MRK REMOV (W)4" (SLD)
  - B** WK ZN PAV MRK REMOV (W)4" (SLD)
  - C** WK ZN PAV MRK REMOV (W)4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
  - D** WK ZN PAV MRK REMOV (W)4" (DOT)
  - E** WK ZN PAV MRK REMOV (W)8" (SLD)
  - F** WK ZN PAV MRK REMOV (W)24" (SLD)
  - G** TYPE II-C-R (REFL) AT 20' C-C
  - EXIST. EXISTING
  - PROP. PROPOSED
  - LPCB LOW PROFILE CONCRETE BARRIER
  - R.O.W. RIGHT OF WAY
  - WK ZN WORK ZONE
  - EOP EDGE OF PAVEMENT
  - BL BASELINE
  - C-C CENTER TO CENTER
  - W/ WITH
  - DIRECTION OF TRAFFIC FLOW
  - PROPOSED SIGN
  - PROPOSED TYPE 3 (C) BARRICADES
  - PLASTIC DRUMS W/REFLECTORS
  - LOW PROFILE CONCRETE BARRIER W/REFLECTORS

NOTE:  
 PREVIOUSLY MILLED SURFACE FROM STEP 1 IS TO BE OVERLAYED WITH 1.5" ACP, INCLUDING 1.0' GAP OPENINGS FOR DRAINAGE ACCESS.



**Pharr District Central Design**

**Texas Department of Transportation**

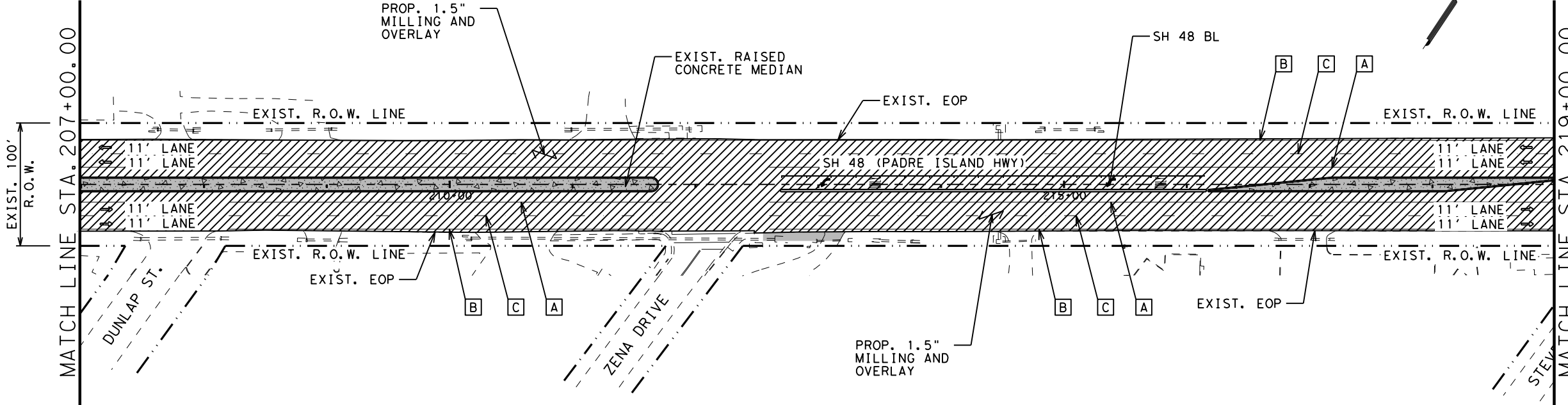
**SH 48  
 TCP PHASE 4 STEP 2  
 - LAYOUT**

SHEET 1 OF 2

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	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
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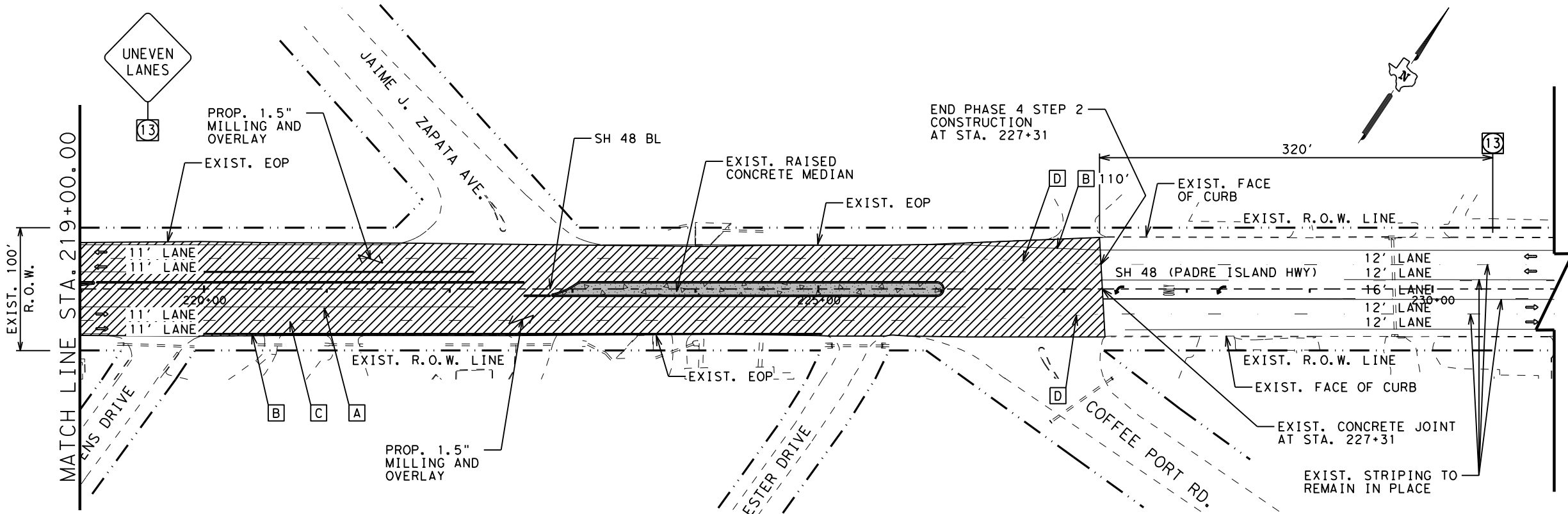


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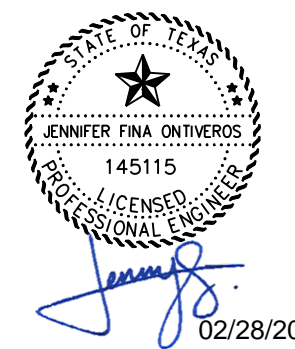


- LEGEND**
- CONSTRUCTION AREA
  - REMOVE EXISTING CONCRETE
  - PREVIOUSLY CONSTRUCTED
  - A** WK ZN PAV MRK REMOV (W)4" (SLD)
  - B** WK ZN PAV MRK REMOV (W)4" (SLD)
  - C** WK ZN PAV MRK REMOV (W)4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
  - D** WK ZN PAV MRK REMOV (W)4" (DOT)
  - E** WK ZN PAV MRK REMOV (W)8" (SLD)
  - F** WK ZN PAV MRK REMOV (W)24" (SLD)
  - G** TYPE II-C-R (REFL) AT 20' C-C
  - EXIST. EXISTING
  - PROP. PROPOSED
  - LPCB LOW PROFILE CONCRETE BARRIER
  - R.O.W. RIGHT OF WAY
  - WK ZN WORK ZONE
  - EOP EDGE OF PAVEMENT
  - BL BASELINE
  - C-C CENTER TO CENTER
  - W/ WITH
  - DIRECTION OF TRAFFIC FLOW
  - PROPOSED SIGN
  - PROPOSED TYPE 3 (C) BARRICADES
  - PLASTIC DRUMS W/REFLECTORS
  - LOW PROFILE CONCRETE BARRIER W/REFLECTORS

NOTE:  
 PREVIOUSLY MILLED SURFACE FROM STEP 1 IS TO BE OVERLAYED WITH 1.5" ACP, INCLUDING 1.0' GAP OPENINGS FOR DRAINAGE ACCESS.



NOTE:  
 PREVIOUSLY MILLED SURFACE FROM STEP 1 IS TO BE OVERLAYED WITH 1.5" ACP, INCLUDING 1.0' GAP OPENINGS FOR DRAINAGE ACCESS.



**Pharr District Central Design**

Texas Department of Transportation

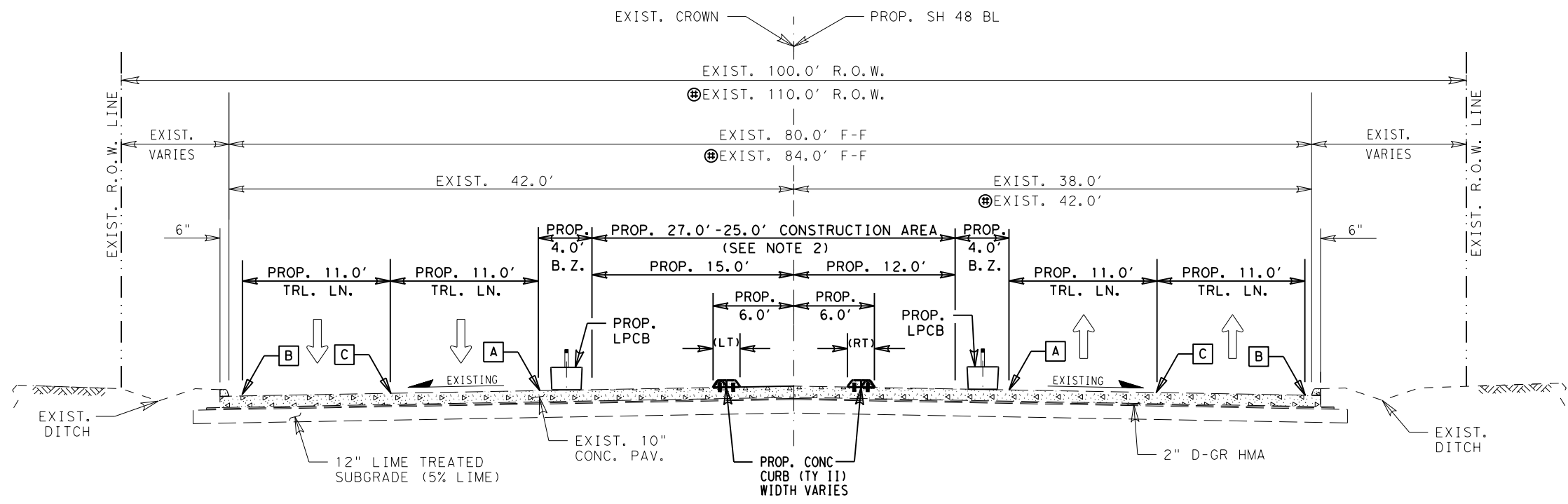
**SH 48  
 TCP PHASE 4 STEP 2  
 - LAYOUT**

SHEET 2 OF 2

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	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	<b>96</b>	



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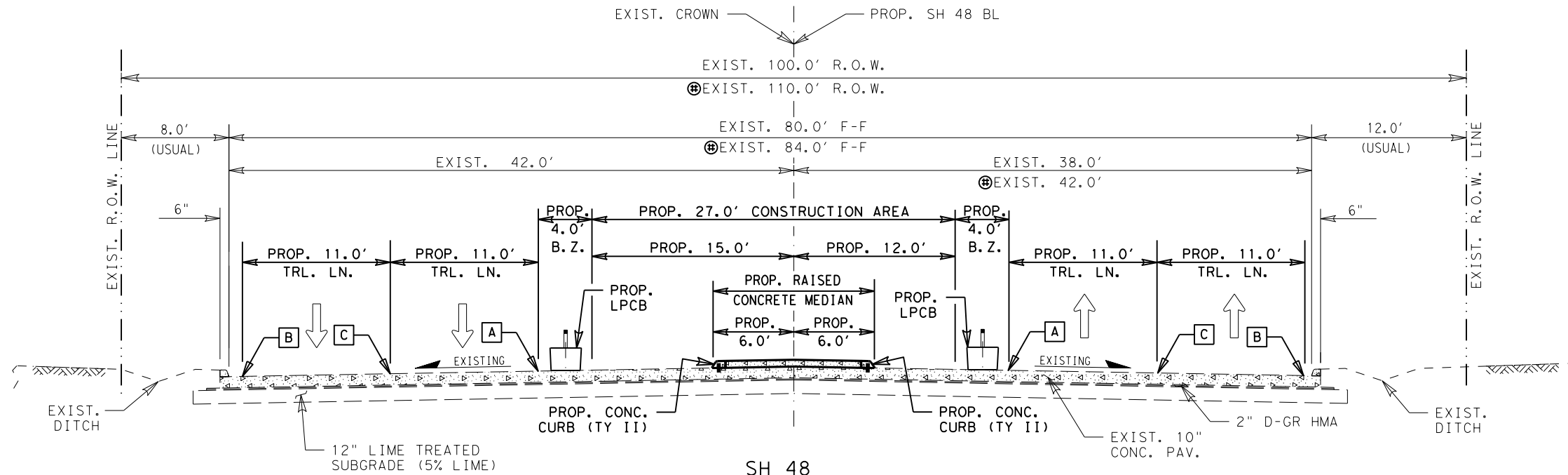


SH 88  
 PHASE 5 STEP 1 - TYPICAL SECTION

NOTE:  
 1.0' GAP OPENING AT RAISED CONCRETE  
 MEDIAN FOR DRAINAGE ACCESS.

STA. 230+94.00 TO STA. 230+95.00  
 STA. 234+13.00 TO STA. 234+14.00  
 STA. 237+79.00 TO STA. 237+80.00  
 STA. 239+12.00 TO STA. 239+13.00  
 STA. 251+19.00 TO STA. 251+20.00  
 STA. 253+56.00 TO STA. 253+57.00

STA. 227+31.20 TO STA. 227+44.00 - NO MEDIAN (COFFEE PORT RD.)  
 STA. 227+44.00 TO STA. 230+94.00 - 2.0' MEDIAN (RIGHT)  
 STA. 234+14.00 TO STA. 237+57.50 - 1.0' MEDIAN (LEFT)  
 STA. 237+57.50 TO STA. 237+79.00 - 1.0' MEDIAN (RIGHT)  
 STA. 239+13.00 TO STA. 244+53.00 - 2.0' MEDIAN (LEFT)  
 STA. 244+53.00 TO STA. 246+06.00 - NO MEDIAN (FM 313/MINNESOTA AVE.)  
 ⊕ STA. 246+06.00 TO STA. 251+19.00 - 2.0' MEDIAN (RIGHT)  
 ⊕ STA. 253+57.00 TO STA. 254+74.00 - 2.0' MEDIAN (LEFT)



SH 88  
 PHASE 5 STEP 1 - TYPICAL SECTION

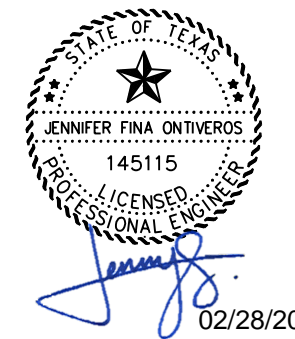
STA. 230+95.00 TO STA. 231+96.00 - MEDIAN (2.0'-12.0')  
 STA. 231+96.00 TO STA. 233+12.00 - 12.0' MEDIAN  
 STA. 233+12.00 TO STA. 234+13.00 - MEDIAN (12.0'-2.0')  
 STA. 237+80.00 TO STA. 238+04.00 - MEDIAN (2.0'-12.0')  
 STA. 238+04.00 TO STA. 238+11.00 - 12.0' MEDIAN  
 STA. 238+11.00 TO STA. 239+12.00 - MEDIAN (12.0'-2.0')  
 ⊕ STA. 251+20.00 TO STA. 252+21.00 - MEDIAN (2.0'-12.0')  
 ⊕ STA. 252+21.00 TO STA. 252+55.00 - 12.0' MEDIAN  
 ⊕ STA. 252+55.00 TO STA. 253+56.00 - MEDIAN (12.0'-2.0')

- LEGEND:**
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② PROPOSED BONDING COURSE
  - ③ PROPOSED 6" CONCRETE (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROPOSED PROOF ROLL SUBGRADE
  - ⑥ PROPOSED EMBANKMENT (FINAL) (ORD COMP) (TY C) (SUBSIDIARY TO ITEM 530)

- BL - BASE LINE
- RT - RIGHT
- LT - LEFT
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- REMOV. - REMOVE
- EQ. - EQUAL
- TYP. - TYPICAL
- B.Z. - BUFFER ZONE
- TCP - TRAFFIC CONTROL PLAN
- C-C - CENTER TO CENTER
- Ⓜ - PLASTIC DRUM W/ REFLECTOR

- Ⓐ WK ZN PAV MRK REMOV (Y) 4" (SLD)
- Ⓑ WK ZN PAV MRK REMOV (W) 4" (SLD)
- Ⓒ WK ZN PAV MRK REMOV (W) 4" (BRK) W/TYP II-C-R (REFL) AT 40' C-C
- Ⓔ WK ZN PAV MRK REMOV (W) 8" (SLD)
- Ⓘ TYPE II-C-R (REFL) AT 20' C-C

- NOTES:**
1. SEE PROPOSED TYPICAL SECTIONS AND ROADWAY PLAN LAYOUT FOR ADDITIONAL DETAILS REGARDING RAISED MEDIAN CONSTRUCTION, TRANSITIONS, AND LIMITS.
  2. SEE TCP LAYOUTS FOR CONSTRUCTION AREA WIDTHS, LIMITS, AND TRANSITIONS.
  3. SEE PROPOSED TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.



**Pharr District Central Design**

**Texas Department of Transportation**

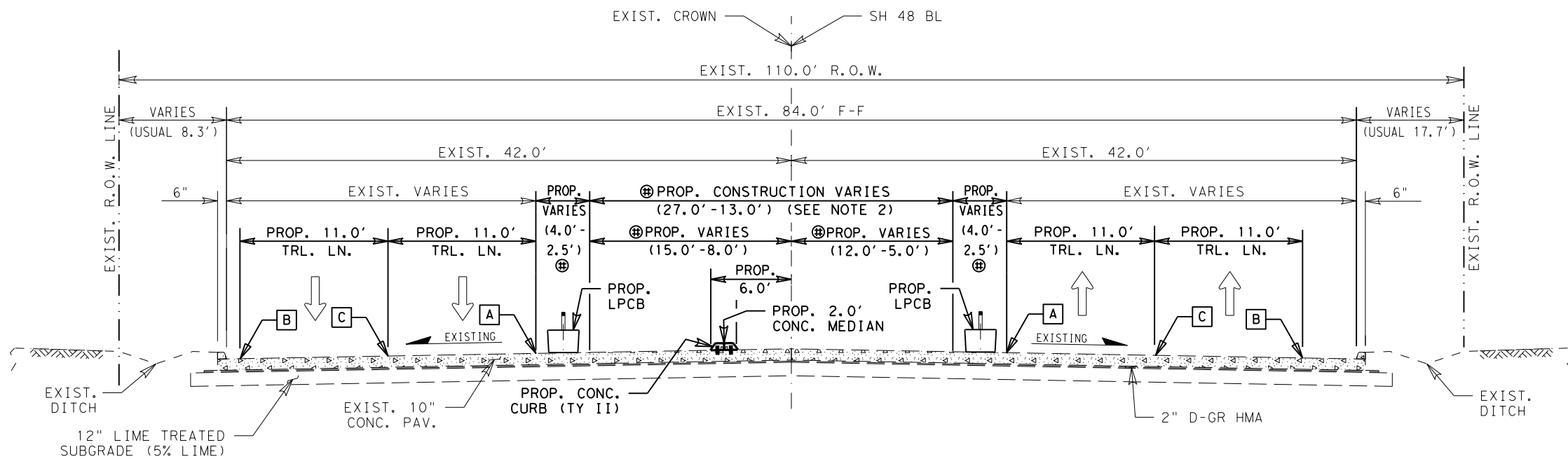
**SH 88  
 TCP PHASE 5 STEP 1  
 - TYPICAL SECTIONS**

NOT TO SCALE SHEET 1 OF 2

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 88
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	97	



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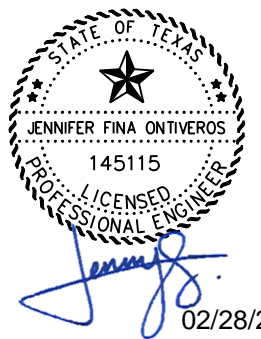
SH 48  
 PHASE 5 STEP 1 - TYPICAL SECTION  
 ⊕ - STA. 254+74.00 TO STA. 256+74.00  
 STA. 256+74.00 TO STA. 258+53.00

- LEGEND:**
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② PROPOSED BONDING COURSE
  - ③ PROPOSED 6" CONCRETE (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROPOSED PROOF ROLL SUBGRADE
  - ⑥ PROPOSED EMBANKMENT (FINAL) (ORD COMP) (TY C) (SUBSIDIARY TO ITEM 530)

- BL - BASE LINE
- RT - RIGHT
- LT - LEFT
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- REMOV - REMOVEABLE
- EQ. - EQUAL
- TYP. - TYPICAL
- B.Z. - BUFFER ZONE
- TCP - TRAFFIC CONTROL PLAN
- C-C - CENTER TO CENTER
- Ⓜ - PLASTIC DRUM W/ REFLECTOR

- A WK ZN PAV MRK REMOV (Y) 4" (SLD)
- B WK ZN PAV MRK REMOV (W) 4" (SLD)
- C WK ZN PAV MRK REMOV (W) 4" (BRK) W/TYP II-C-R (REFL) AT 40' C-C
- E WK ZN PAV MRK REMOV (W) 8" (SLD)
- G TYPE II-C-R (REFL) AT 20' C-C

- NOTES:**
1. SEE PROPOSED TYPICAL SECTIONS AND ROADWAY PLAN LAYOUT FOR ADDITIONAL DETAILS REGARDING RAISED MEDIAN CONSTRUCTION, TRANSITIONS, AND LIMITS.
  2. SEE TCP LAYOUTS FOR CONSTRUCTION AREA WIDTHS, LIMITS, AND TRANSITIONS.
  3. SEE PROPOSED TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.



**Pharr District Central Design**

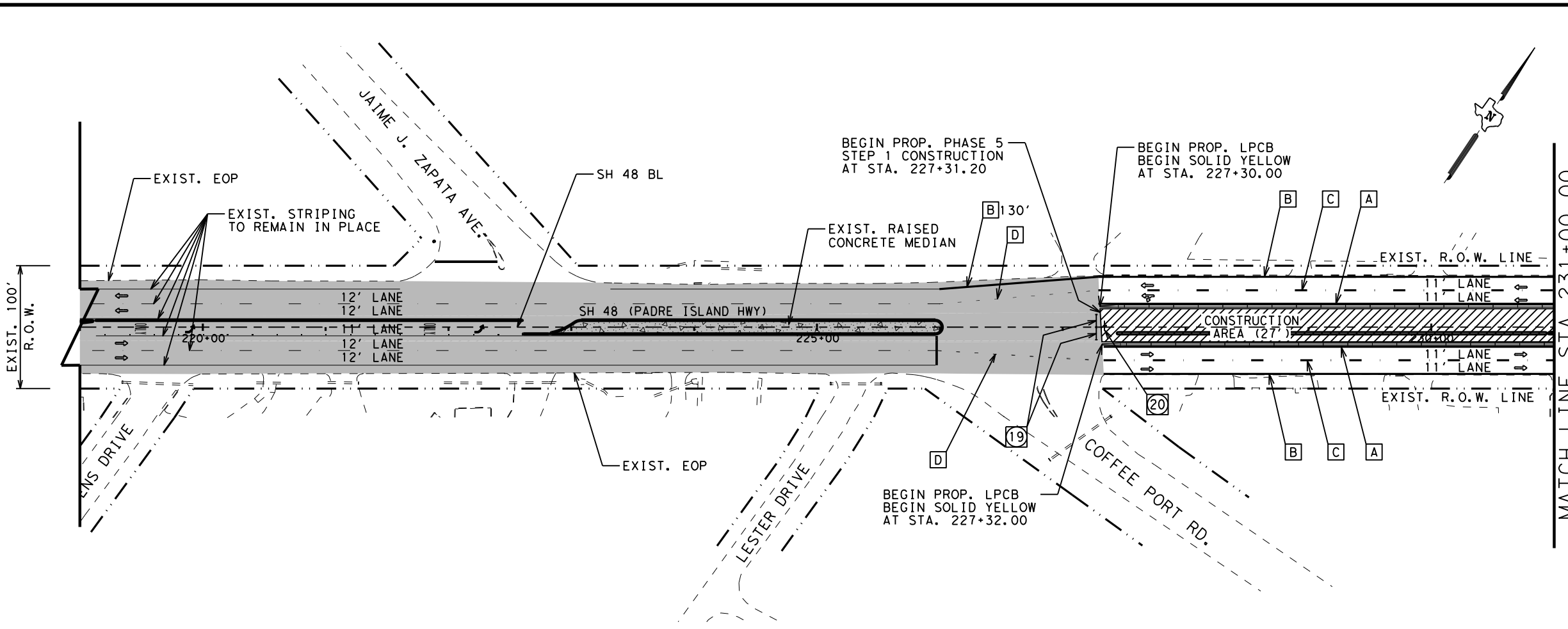
Texas Department of Transportation

**SH 48  
 TCP PHASE 5 STEP 1  
 - TYPICAL SECTIONS**

NOT TO SCALE SHEET 2 OF 2

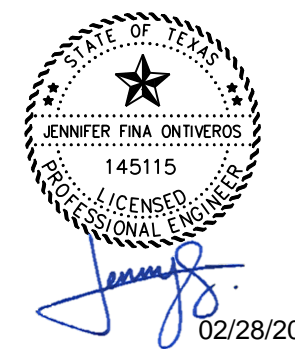
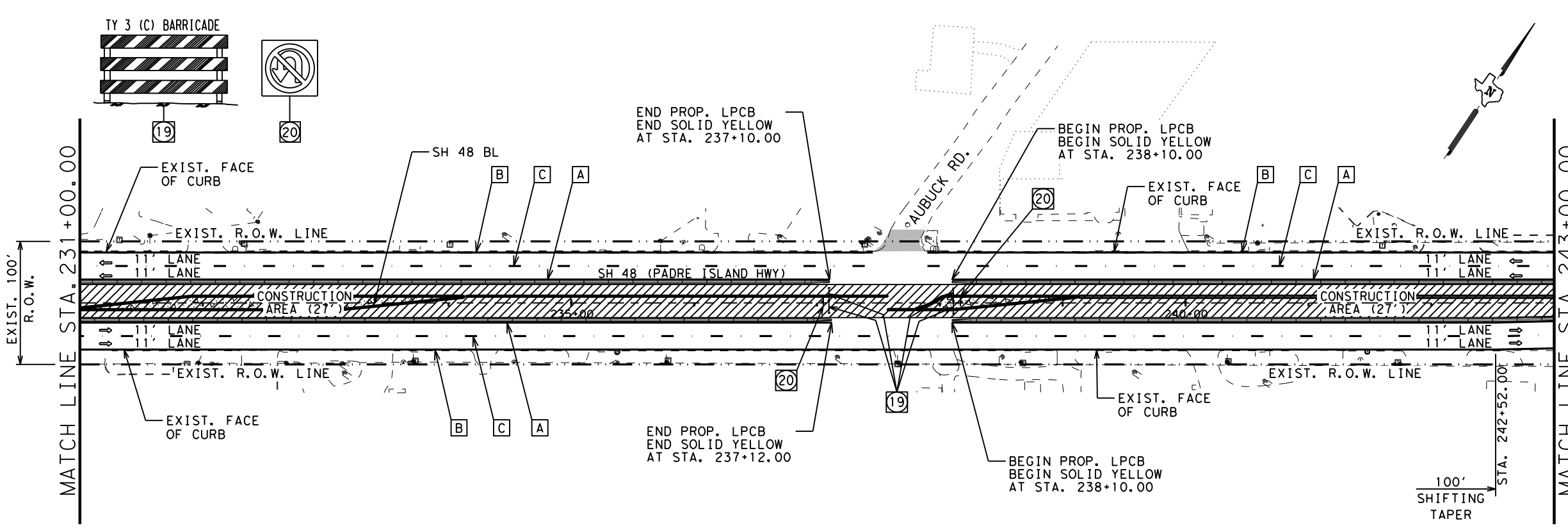
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	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	98	

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**LEGEND**

- CONSTRUCTION AREA
- REMOVE EXISTING CONCRETE
- PREVIOUSLY CONSTRUCTED
- A** WK ZN PAV MRK REMOV (Y)4" (SLD)
- B** WK ZN PAV MRK REMOV (W)4" (SLD)
- C** WK ZN PAV MRK REMOV (W)4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
- D** WK ZN PAV MRK REMOV (W)4" (DOT)
- E** WK ZN PAV MRK REMOV (W)8" (SLD)
- F** WK ZN PAV MRK REMOV (W)24" (SLD)
- G** TYPE II-C-R (REFL) AT 20' C-C
- EXIST. EXISTING
- PROP. PROPOSED
- LPCB LOW PROFILE CONCRETE BARRIER
- R.O.W. RIGHT OF WAY
- WK ZN WORK ZONE
- EOP EDGE OF PAVEMENT
- BL BASELINE
- C-C CENTER TO CENTER
- W/ WITH
- DIRECTION OF TRAFFIC FLOW
- PROPOSED SIGN
- PROPOSED TYPE 3 (C) BARRICADES
- PLASTIC DRUMS W/REFLECTORS
- LOW PROFILE CONCRETE BARRIER W/REFLECTORS



**Pharr District Central Design**

**Texas Department of Transportation**

**SH 48**  
**TCP PHASE 5 STEP 1**  
**- LAYOUT**

SHEET 1 OF 2

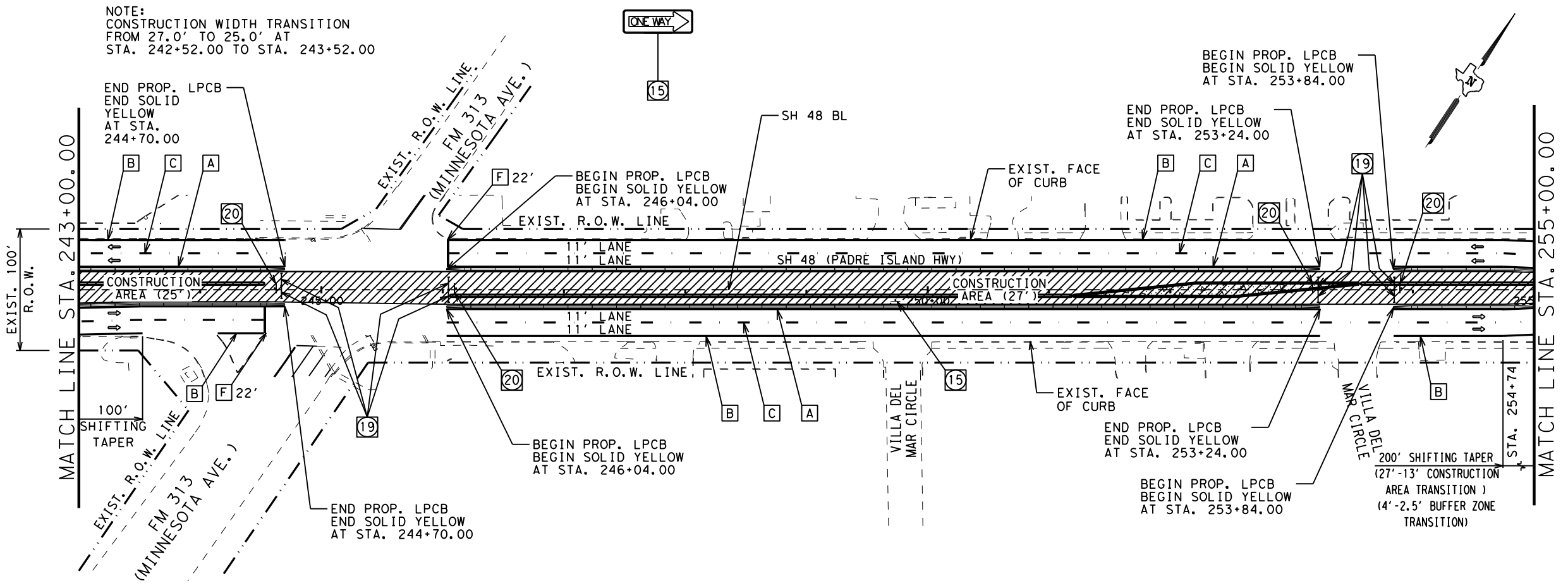
© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	99	

NOTE:  
 CONSTRUCTION WIDTH TRANSITION  
 FROM 27.0' TO 25.0' AT  
 STA. 242+52.00 TO STA. 243+52.00



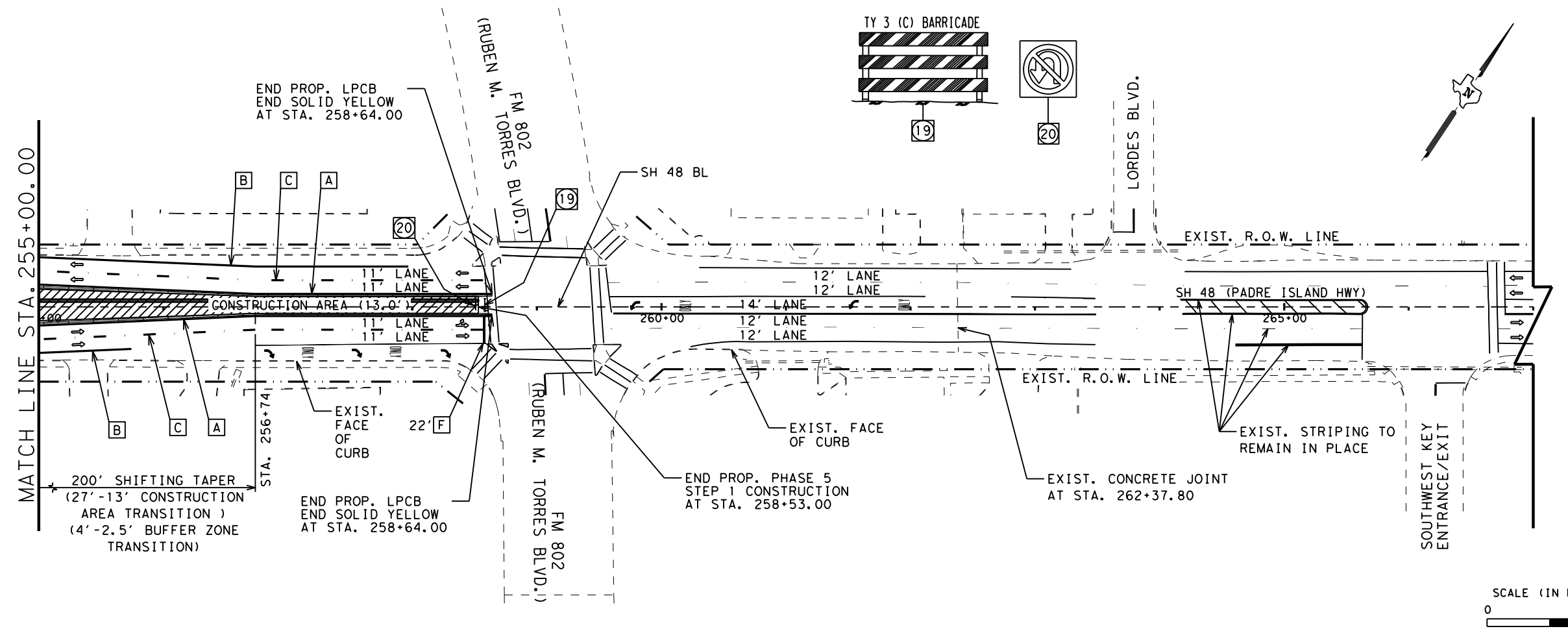
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NOTE:  
 CONSTRUCTION WIDTH TRANSITION  
 FROM 27.0' TO 25.0' AT  
 STA. 242+52.00 TO STA. 243+52.00



**LEGEND**

- CONSTRUCTION AREA
- REMOVE EXISTING CONCRETE
- PREVIOUSLY CONSTRUCTED
- A** WK ZN PAV MRK REMOV (W)4" (SLD)
- B** WK ZN PAV MRK REMOV (W)4" (SLD)
- C** WK ZN PAV MRK REMOV (W)4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
- D** WK ZN PAV MRK REMOV (W)4" (DOT)
- E** WK ZN PAV MRK REMOV (W)8" (SLD)
- F** WK ZN PAV MRK REMOV (W)24" (SLD)
- G** TYPE II-C-R (REFL) AT 20' C-C
- EXIST. EXISTING
- PROP. PROPOSED
- LPCB LOW PROFILE CONCRETE BARRIER
- R.O.W. RIGHT OF WAY
- WK ZN WORK ZONE
- EOP EDGE OF PAVEMENT
- BL BASELINE
- C-C CENTER TO CENTER
- W/ WITH
- DIRECTION OF TRAFFIC FLOW
- PROPOSED SIGN
- PROPOSED TYPE 3 (C) BARRICADES
- PLASTIC DRUMS W/REFLECTORS
- LOW PROFILE CONCRETE BARRIER W/REFLECTORS



STATE OF TEXAS  
 JENNIFER FINA ONTIVEROS  
 145115  
 LICENSED PROFESSIONAL ENGINEER  
  
 02/28/2023

**Pharr District Central Design**

Texas Department of Transportation

**SH 48  
 TCP PHASE 5 STEP 1  
 - LAYOUT**

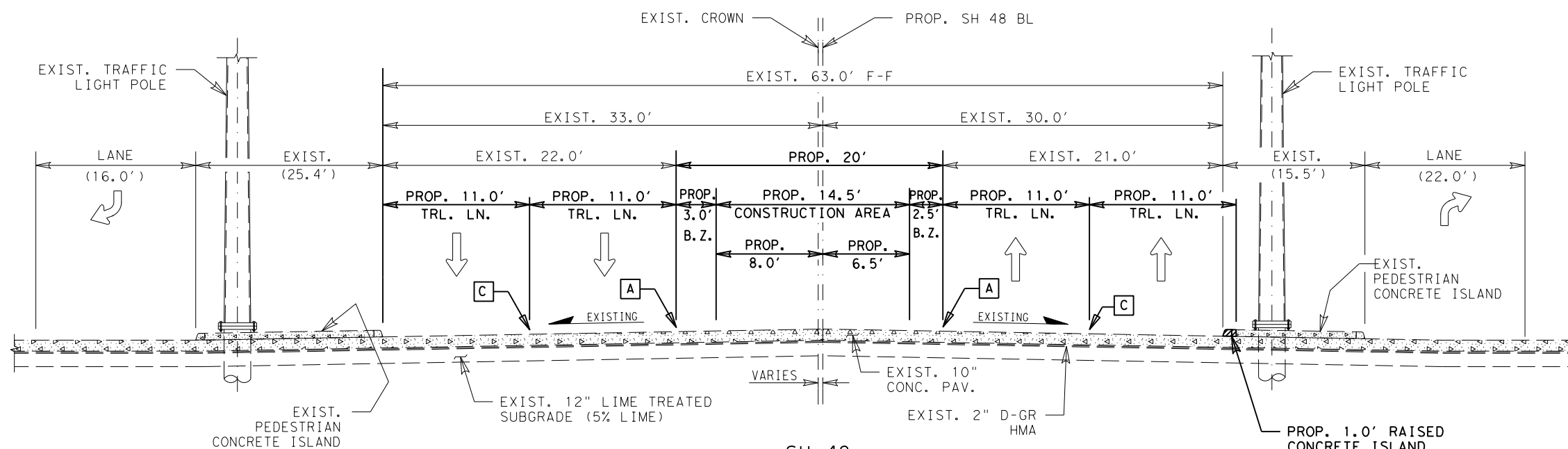
SHEET 2 OF 2

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	100	



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NOTE:  
 SOUTHWEST KEY ENTRANCE/EXIT ACCESS FROM  
 STA. 265+72.00 TO STA. 266+77.00



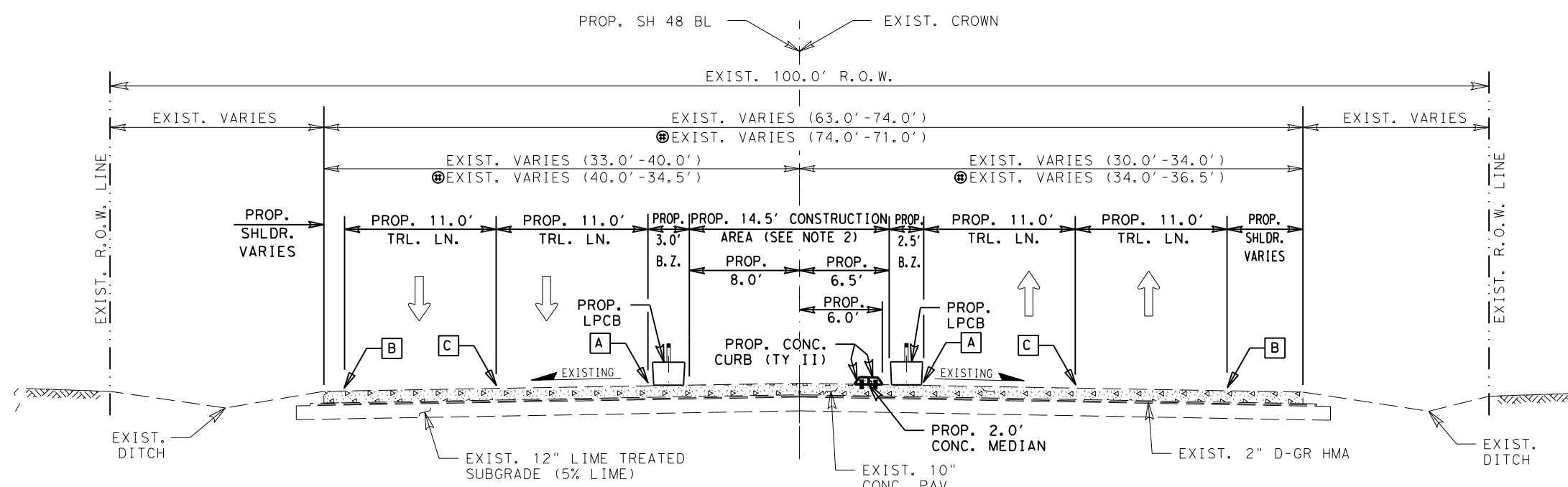
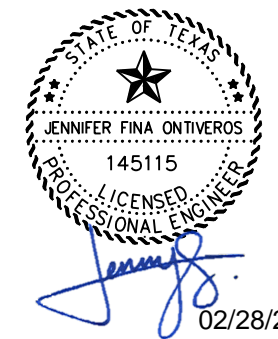
SH 48  
 PHASE 6 STEP 1 - TYPICAL SECTION  
 STA. 258+53.00 TO STA. 259+59.00 - (RUBEN M. TORRES INTERSECTION)

- LEGEND:**
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② PROPOSED BONDING COURSE
  - ③ PROPOSED 6" CONCRETE (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROPOSED PROOF ROLL SUBGRADE
  - ⑥ PROPOSED EMBANKMENT (FINAL) (ORD COMP) (TY C) (SUBSIDIARY TO ITEM 530)

- BL - BASE LINE
- RT - RIGHT
- LT - LEFT
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- REMOV - REMOVEABLE
- EQ. - EQUAL
- TYP. - TYPICAL
- B.Z. - BUFFER ZONE
- TCP - TRAFFIC CONTROL PLAN
- C-C - CENTER TO CENTER
- Ⓜ - PLASTIC DRUM W/ REFLECTOR

- A WK ZN PAV MRK REMOV (Y) 4" (SLD)
- B WK ZN PAV MRK REMOV (W) 4" (SLD)
- C WK ZN PAV MRK REMOV (W) 4" (BRK) W/TY II-C-R (REFL) AT 40' C-C
- E WK ZN PAV MRK REMOV (W) 8" (SLD)
- G TYPE II-C-R (REFL) AT 20' C-C

- NOTES:**
- SEE PROPOSED TYPICAL SECTIONS AND ROADWAY PLAN LAYOUT FOR ADDITIONAL DETAILS REGARDING RAISED MEDIAN CONSTRUCTION, TRANSITIONS, AND LIMITS.
  - SEE TCP LAYOUTS FOR CONSTRUCTION AREA WIDTHS, LIMITS, AND TRANSITIONS.
  - SEE PROPOSED TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.



SH 48  
 PHASE 6 STEP 1 - TYPICAL SECTION  
 STA. 259+59.00 TO STA. 260+27.00  
 @STA. 260+27.00 TO STA. 262+37.80

**Pharr District Central Design**

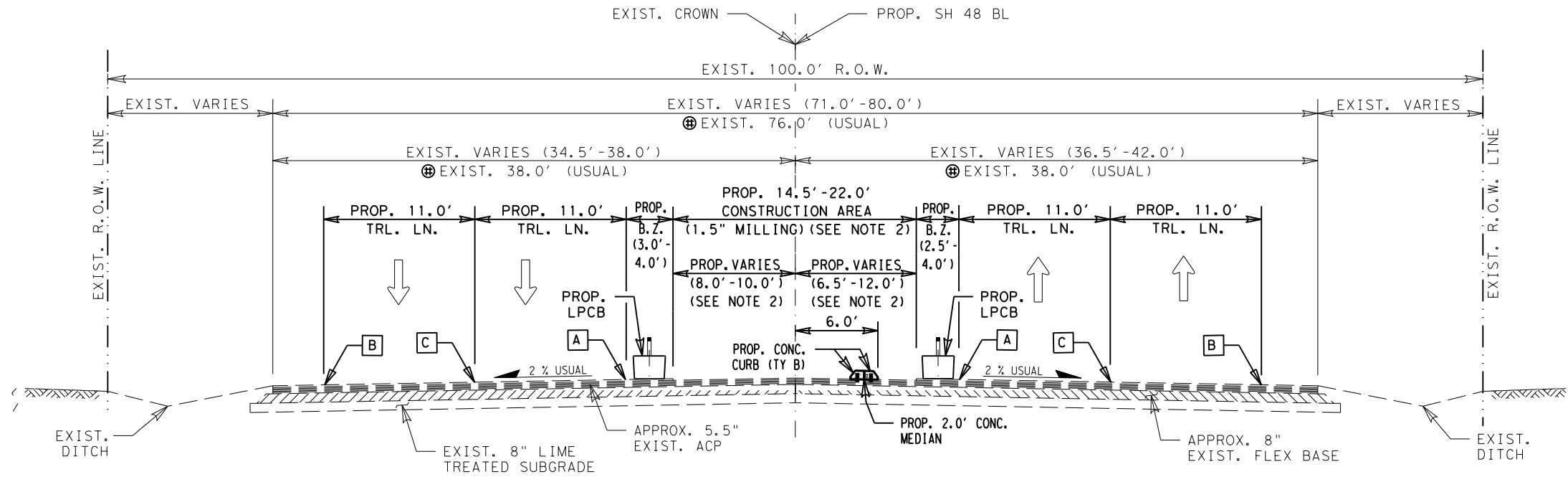
Texas Department of Transportation

**SH 48  
 TCP PHASE 6 STEP 1  
 - TYPICAL SECTIONS**

NOT TO SCALE SHEET 1 OF 3

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	101	

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- LEGEND:**
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② PROPOSED BONDING COURSE
  - ③ PROPOSED 6" CONCRETE (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROPOSED PROOF ROLL SUBGRADE
  - ⑥ PROPOSED EMBANKMENT (FINAL) (ORD COMP) (TY C) (SUBSIDIARY TO ITEM 530)

- BL - BASE LINE
- RT - RIGHT
- LT - LEFT
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- REMOV - REMOVEABLE
- EQ. - EQUAL
- TYP. - TYPICAL
- B.Z. - BUFFER ZONE
- TCP - TRAFFIC CONTROL PLAN
- C-C - CENTER TO CENTER
- Ⓜ - PLASTIC DRUM W/ REFLECTOR

- A WK ZN PAV MRK REMOV (Y) 4" (SLD)
- B WK ZN PAV MRK REMOV (W) 4" (SLD)
- C WK ZN PAV MRK REMOV (W) 4" (BRK) W/TYPER II-C-R (REFL) AT 40' C-C
- E WK ZN PAV MRK REMOV (W) 8" (SLD)
- G TYPE II-C-R (REFL) AT 20' C-C

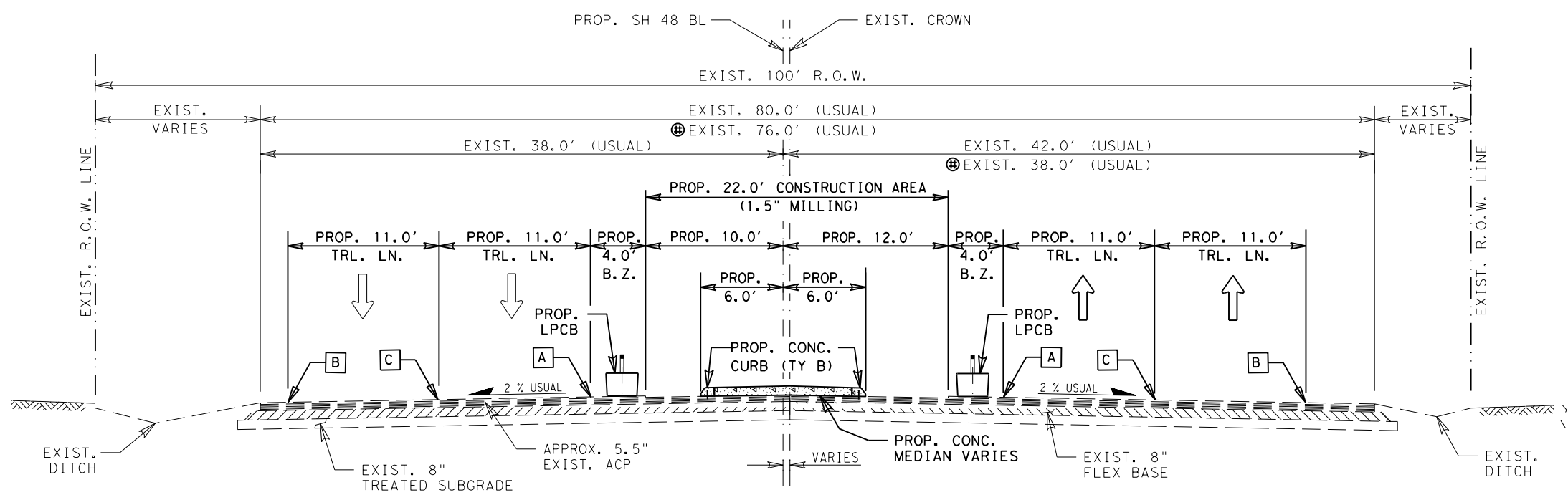
- NOTES:**
- SEE PROPOSED TYPICAL SECTIONS AND ROADWAY PLAN LAYOUT FOR ADDITIONAL DETAILS REGARDING RAISED MEDIAN CONSTRUCTION, TRANSITIONS, AND LIMITS.
  - SEE TCP LAYOUTS FOR CONSTRUCTION AREA WIDTHS, LIMITS, AND TRANSITIONS.
  - SEE PROPOSED TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.

**NOTE:**  
 1.0' GAP OPENING AT RAISED CONCRETE MEDIAN FOR DRAINAGE ACCESS.

STA. 264+12.00 TO STA. 264+13.00  
 STA. 270+27.00 TO STA. 270+28.00  
 STA. 272+05.00 TO STA. 272+06.00  
 STA. 275+77.50 TO STA. 275+78.50  
 STA. 288+41.00 TO STA. 288+42.00

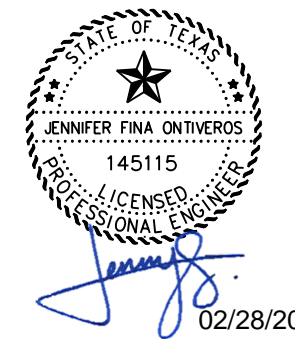
**SH 48  
 PHASE 6 STEP 1 - TYPICAL SECTION**

STA. 262+37.80 TO STA. 264+12.00  
 ⊕ STA. 266+77.00 TO STA. 270+27.00



**SH 48  
 PHASE 6 STEP 1 - TYPICAL SECTION**

STA. 264+13.00 TO STA. 265+14.00 - MEDIAN (2.0'-12.0')  
 STA. 265+14.00 TO STA. 265+65.00 - 12.0' MEDIAN  
 STA. 265+65.00 TO STA. 266+77.00 - NO MEDIAN (SOUTHWEST KEY ENTRANCE/EXIT)  
 ⊕ STA. 270+28.00 TO STA. 271+29.00 - MEDIAN (2.0'-12.0')  
 ⊕ STA. 271+29.00 TO STA. 271+81.00 - 12.0' MEDIAN  
 ⊕ STA. 271+81.00 TO STA. 272+05.00 - MEDIAN (12.0'-2.0')  
 ⊕ STA. 275+78.50 TO STA. 276+79.50 - MEDIAN (2.0'-12.0')  
 ⊕ STA. 276+79.50 TO STA. 287+40.00 - 12.0' MEDIAN  
 ⊕ STA. 287+40.00 TO STA. 288+41.00 - MEDIAN (12.0'-2.0')



**Pharr District Central Design**

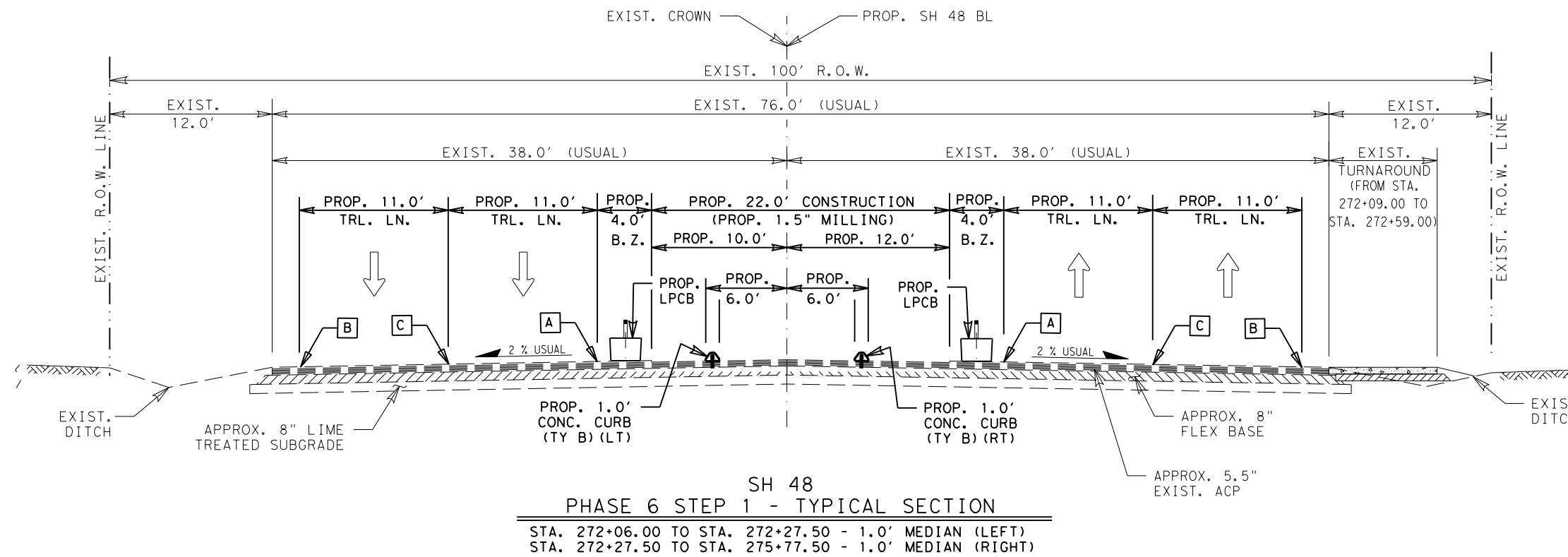
**Texas Department of Transportation**

**SH 48  
 TCP PHASE 6 STEP 1  
 - TYPICAL SECTIONS**

NOT TO SCALE SHEET 2 OF 3

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	102

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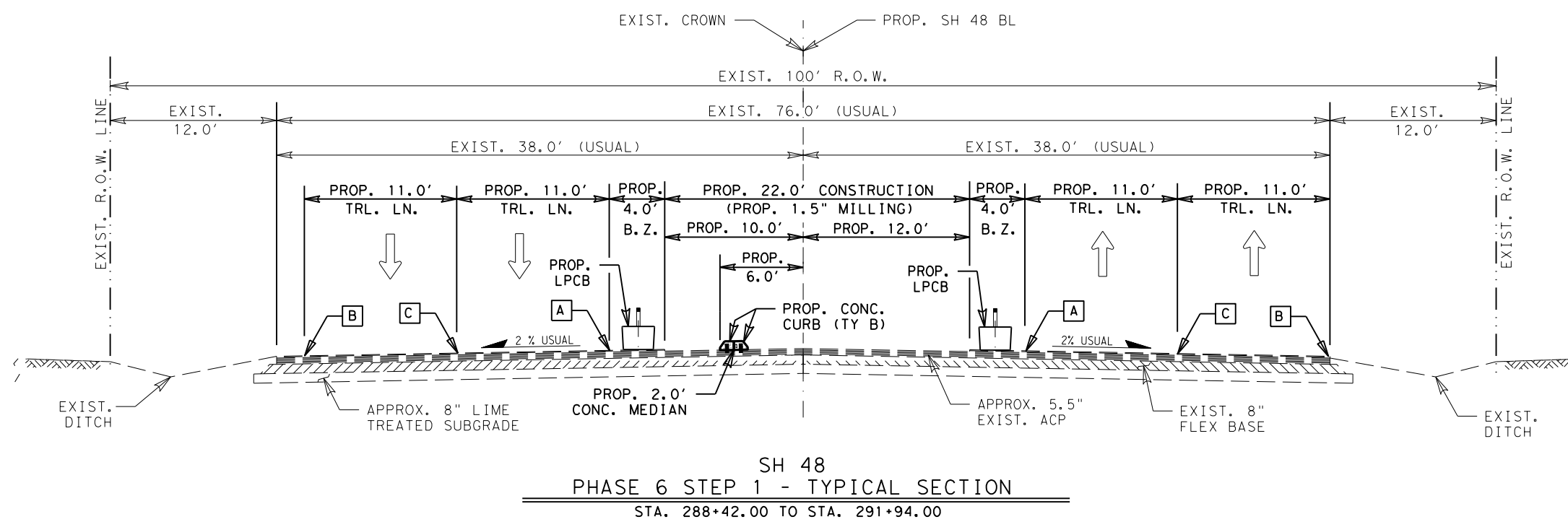
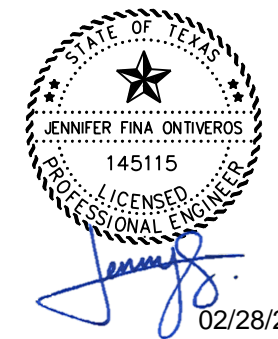


- LEGEND:**
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② PROPOSED BONDING COURSE
  - ③ PROPOSED 6" CONCRETE (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROPOSED PROOF ROLL SUBGRADE
  - ⑥ PROPOSED EMBANKMENT (FINAL) (ORD COMP) (TY C) (SUBSIDIARY TO ITEM 530)

- BL - BASE LINE
- RT - RIGHT
- LT - LEFT
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- REMOV - REMOVEABLE
- EQ. - EQUAL
- TYP. - TYPICAL
- B.Z. - BUFFER ZONE
- TCP - TRAFFIC CONTROL PLAN
- C-C - CENTER TO CENTER
- Ⓜ - PLASTIC DRUM W/ REFLECTOR

- A WK ZN PAV MRK REMOV (Y) 4" (SLD)
- B WK ZN PAV MRK REMOV (W) 4" (SLD)
- C WK ZN PAV MRK REMOV (W) 4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
- E WK ZN PAV MRK REMOV (W) 8" (SLD)
- G TYPE II-C-R (REFL) AT 20' C-C

- NOTES:**
1. SEE PROPOSED TYPICAL SECTIONS AND ROADWAY PLAN LAYOUT FOR ADDITIONAL DETAILS REGARDING RAISED MEDIAN CONSTRUCTION, TRANSITIONS, AND LIMITS.
  2. SEE TCP LAYOUTS FOR CONSTRUCTION AREA WIDTHS, LIMITS, AND TRANSITIONS.
  3. SEE PROPOSED TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.



**Pharr District Central Design**

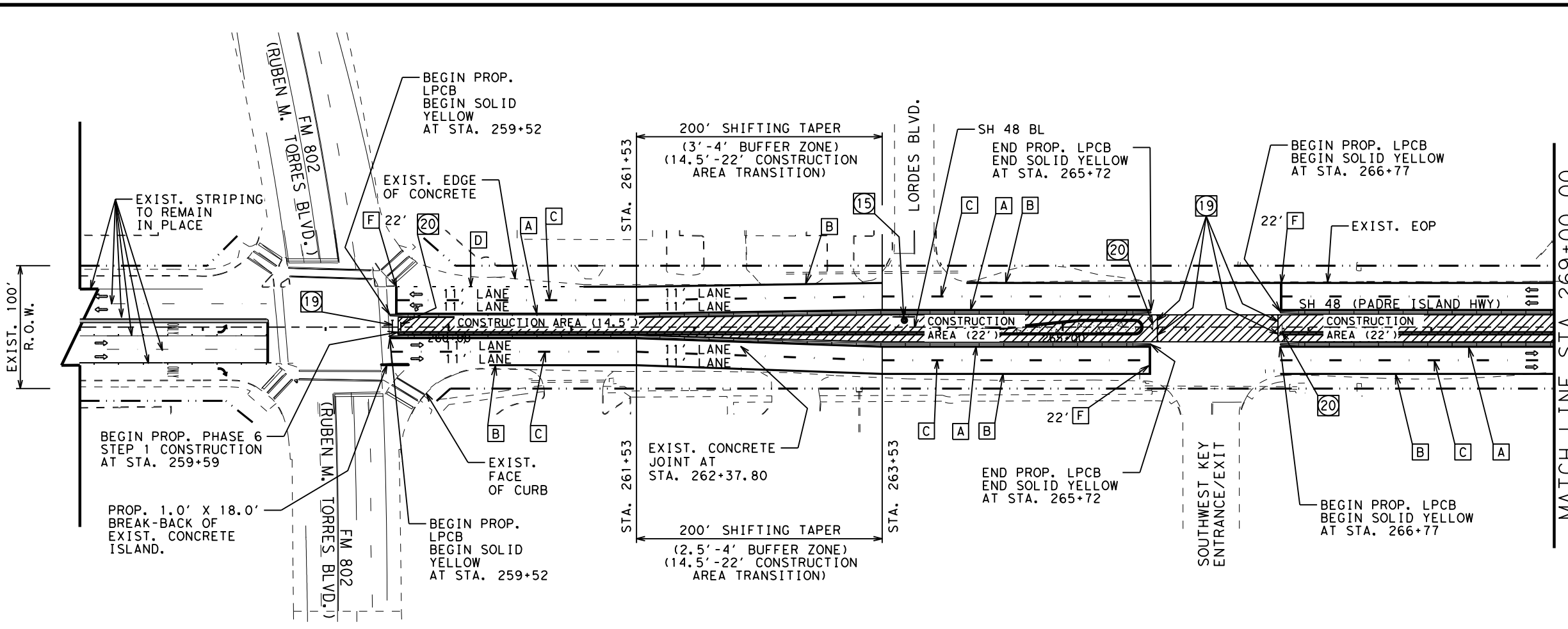
**Texas Department of Transportation**

**SH 48  
 TCP PHASE 6 STEP 1  
 - TYPICAL SECTIONS**

NOT TO SCALE SHEET 3 OF 3

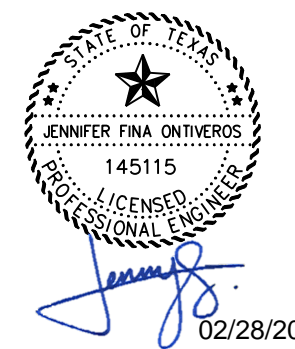
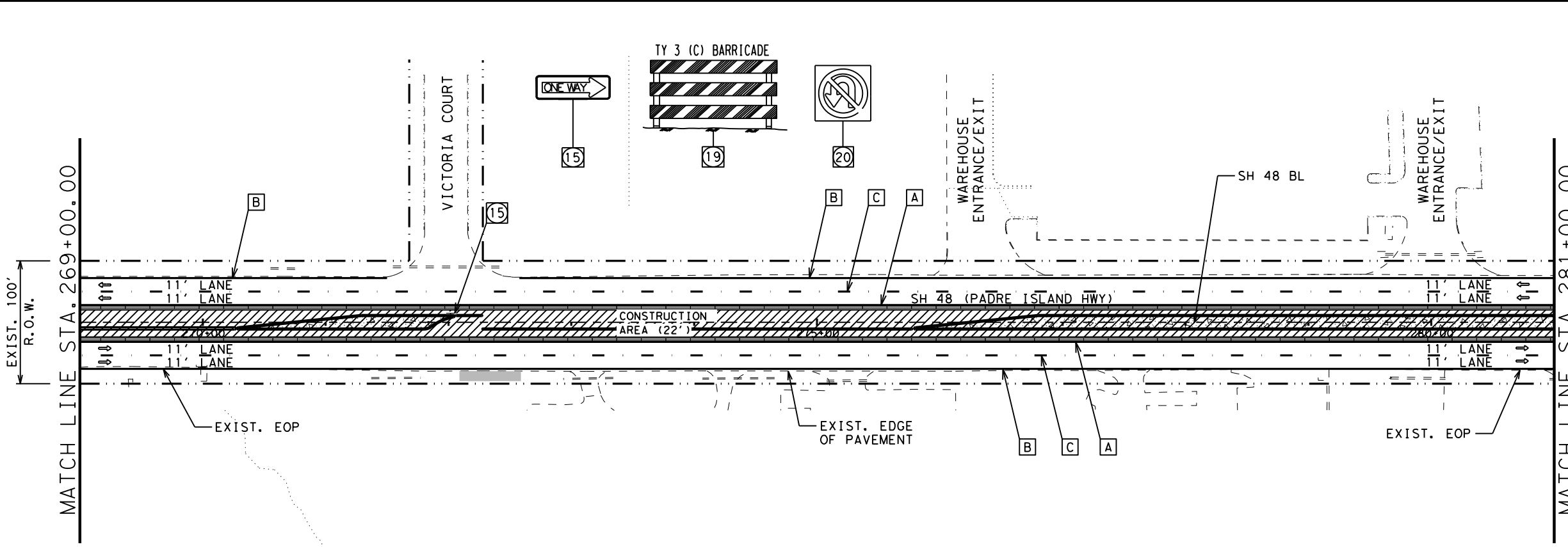
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**LEGEND**

- CONSTRUCTION AREA
- REMOVE EXISTING CONCRETE
- PREVIOUSLY CONSTRUCTED
- A** WK ZN PAV MRK REMOV (W)4" (SLD)
- B** WK ZN PAV MRK REMOV (W)4" (BRK)
- C** WK ZN PAV MRK REMOV (W)4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
- D** WK ZN PAV MRK REMOV (W)4" (DOT)
- E** WK ZN PAV MRK REMOV (W)8" (SLD)
- F** WK ZN PAV MRK REMOV (W)24" (SLD)
- G** TYPE II-C-R (REFL) AT 20' C-C
- EXIST. EXISTING
- PROP. PROPOSED
- LPCB LOW PROFILE CONCRETE BARRIER
- R.O.W. RIGHT OF WAY
- WK ZN WORK ZONE
- EOP EDGE OF PAVEMENT
- BL BASELINE
- C-C CENTER TO CENTER
- W/ WITH
- DIRECTION OF TRAFFIC FLOW
- PROPOSED SIGN
- PROPOSED TYPE 3 (C) BARRICADES
- PLASTIC DRUMS W/REFLECTORS
- LOW PROFILE CONCRETE BARRIER W/REFLECTORS



**Pharr District Central Design**

**Texas Department of Transportation**

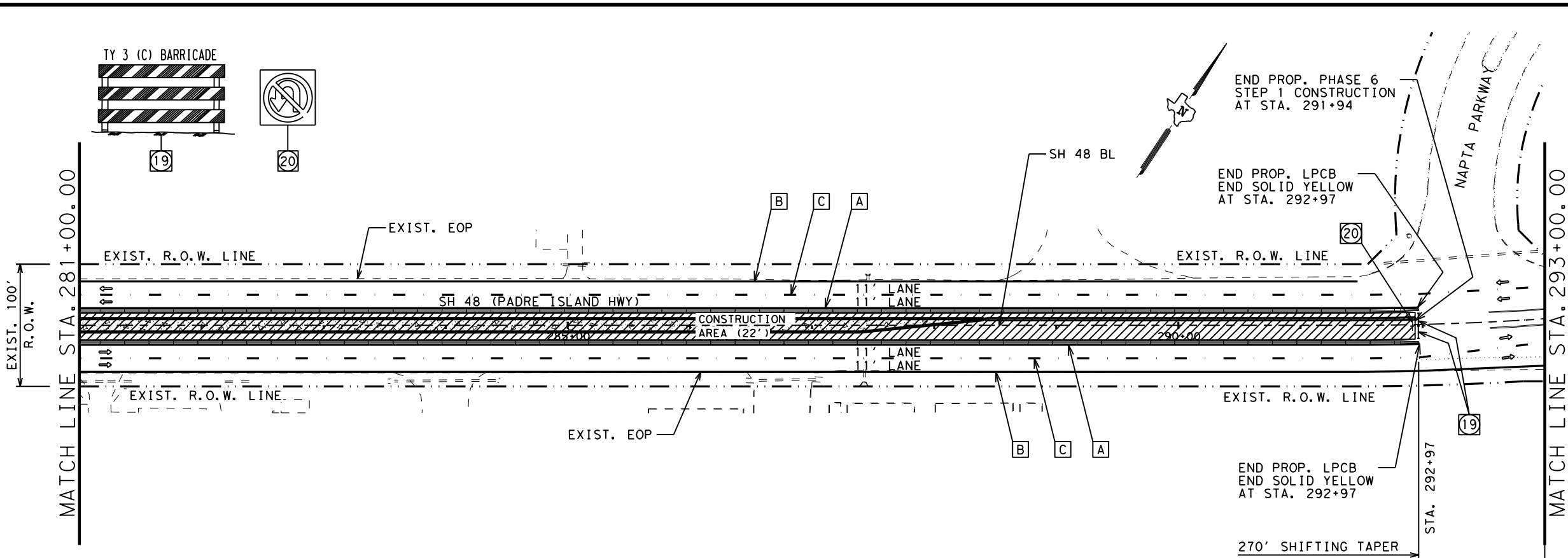
**SH 48  
TCP PHASE 6 STEP 1  
- LAYOUT**

SHEET 1 OF 2

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	PHR	CAMERON	104	

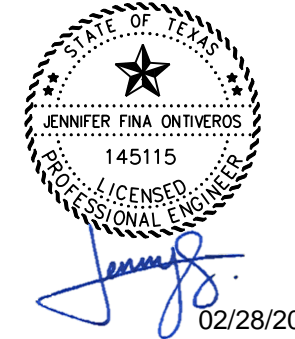
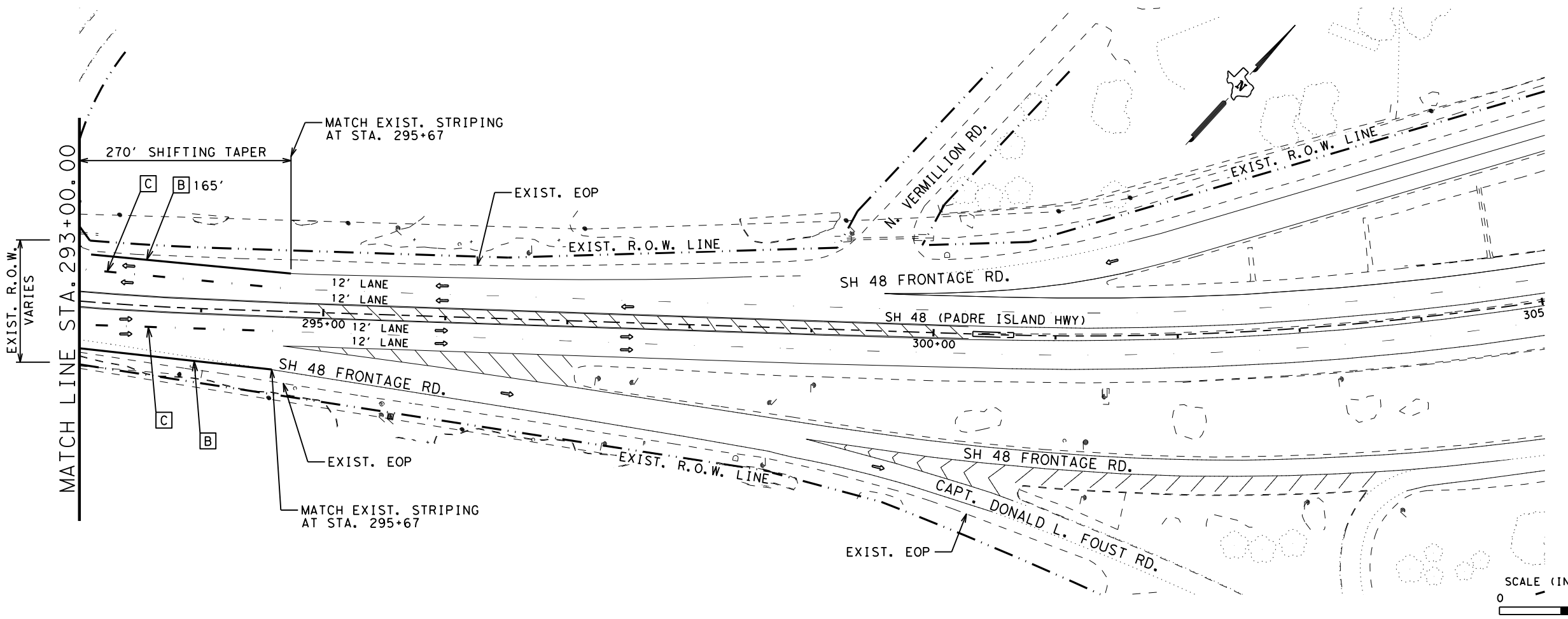


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**LEGEND**

- CONSTRUCTION AREA
- REMOVE EXISTING CONCRETE
- PREVIOUSLY CONSTRUCTED
- A** WK ZN PAV MRK REMOV (Y)4" (SLD)
- B** WK ZN PAV MRK REMOV (W)4" (SLD)
- C** WK ZN PAV MRK REMOV (W)4" (BRK) W/TYP II-C-R (REFL) AT 40' C-C
- D** WK ZN PAV MRK REMOV (W)4" (DOT)
- E** WK ZN PAV MRK REMOV (W)8" (SLD)
- F** WK ZN PAV MRK REMOV (W)24" (SLD)
- G** TYPE II-C-R (REFL) AT 20' C-C
- EXIST. EXISTING
- PROP. PROPOSED
- LPCB LOW PROFILE CONCRETE BARRIER
- R.O.W. RIGHT OF WAY
- WK ZN WORK ZONE
- EOP EDGE OF PAVEMENT
- BL BASELINE
- C-C CENTER TO CENTER
- W/ WITH
- DIRECTION OF TRAFFIC FLOW
- PROPOSED SIGN
- PROPOSED TYPE 3 (C) BARRICADES
- PLASTIC DRUMS W/REFLECTORS
- LOW PROFILE CONCRETE BARRIER W/REFLECTORS



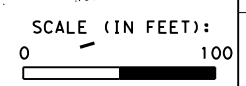
**Pharr District Central Design**

**Texas Department of Transportation**

**SH 48  
 TCP PHASE 6 STEP 1  
 - LAYOUT**

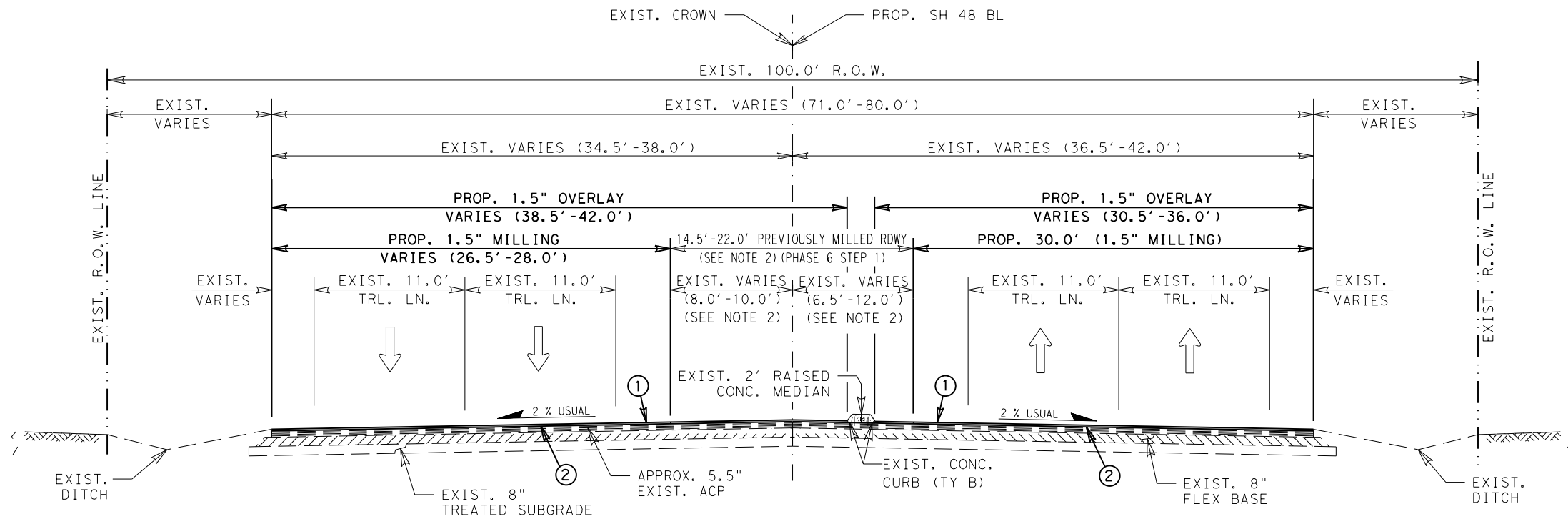
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	PHR	CAMERON	105	





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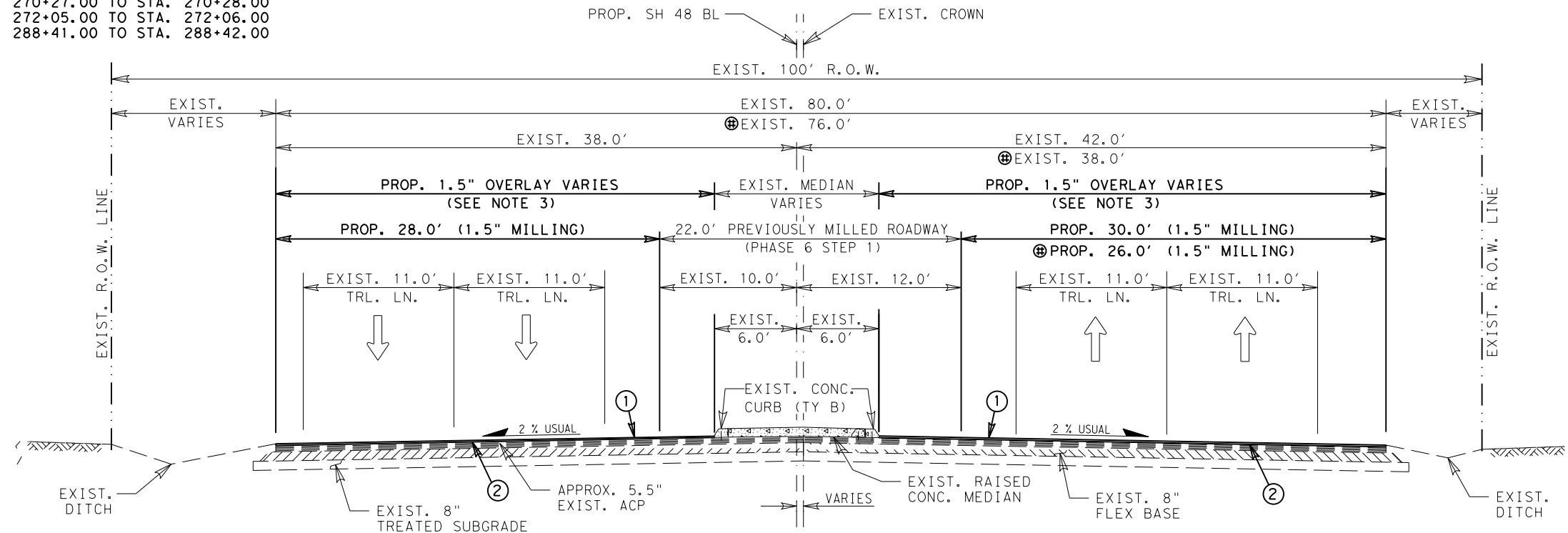


**SH 48  
 PHASE 6 STEP 2 - TYPICAL SECTION**

STA. 262+37.80 TO STA. 264+12.00  
 STA. 266+77.00 TO STA. 270+27.00

**NOTE:**  
 1.0' GAP OPENING AT RAISED CONCRETE  
 MEDIAN FOR DRAINAGE ACCESS.

STA. 264+12.00 TO STA. 264+13.00  
 STA. 270+27.00 TO STA. 270+28.00  
 STA. 272+05.00 TO STA. 272+06.00  
 STA. 288+41.00 TO STA. 288+42.00



**SH 48  
 PHASE 6 STEP 2 - TYPICAL SECTION**

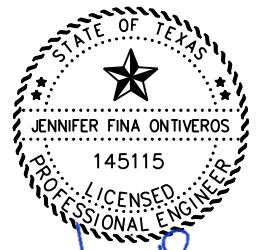
STA. 264+13.00 TO STA. 265+14.00 - MEDIAN (2.0'-12.0')  
 STA. 265+14.00 TO STA. 265+65.00 - 12.0' MEDIAN  
 STA. 265+65.00 TO STA. 266+77.00 - NO MEDIAN (SOUTHWEST KEY ENTRANCE/EXIT)  
 ⊕ STA. 270+28.00 TO STA. 271+29.00 - MEDIAN (2.0'-12.0')  
 ⊕ STA. 271+29.00 TO STA. 271+81.00 - 12.0' MEDIAN  
 ⊕ STA. 271+81.00 TO STA. 272+05.00 - MEDIAN (12.0'-2.0')  
 ⊕ STA. 275+78.50 TO STA. 276+79.50 - MEDIAN (2.0'-12.0')  
 ⊕ STA. 276+79.50 TO STA. 284+40.00 - 12.0' MEDIAN  
 ⊕ STA. 287+40.00 TO STA. 288+41.00 - MEDIAN (12.0'-2.0')

- LEGEND:**
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② PROPOSED BONDING COURSE
  - ③ PROPOSED 6" CONCRETE (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROPOSED PROOF ROLL SUBGRADE
  - ⑥ PROPOSED EMBANKMENT (FINAL) (ORD COMP) (TY C) (SUBSIDIARY TO ITEM 530)

- BL - BASE LINE
- RT - RIGHT
- LT - LEFT
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- REMOV - REMOVEABLE
- EQ. - EQUAL
- TYP. - TYPICAL
- B.Z. - BUFFER ZONE
- TCP - TRAFFIC CONTROL PLAN
- C-C - CENTER TO CENTER
- Ⓜ - PLASTIC DRUM W/ REFLECTOR

- A WK ZN PAV MRK REMOV (Y) 4" (SLD)
- B WK ZN PAV MRK REMOV (W) 4" (SLD)
- C WK ZN PAV MRK REMOV (W) 4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
- E WK ZN PAV MRK REMOV (W) 8" (SLD)
- G TYPE II-C-R (REFL) AT 20' C-C

- NOTES:**
- SEE PROPOSED TYPICAL SECTIONS AND ROADWAY PLAN LAYOUT FOR ADDITIONAL DETAILS REGARDING RAISED MEDIAN CONSTRUCTION, TRANSITIONS, AND LIMITS.
  - SEE TCP LAYOUTS FOR CONSTRUCTION AREA WIDTHS, LIMITS, AND TRANSITIONS.
  - SEE PROPOSED TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.



02/28/2023

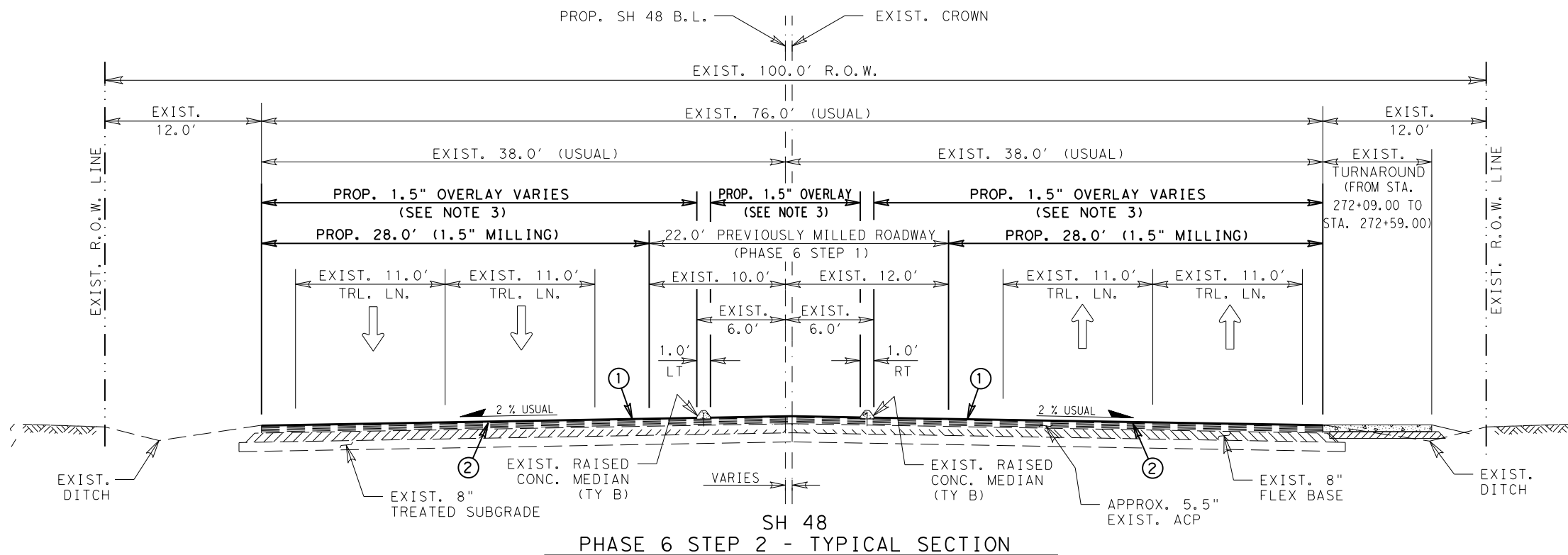
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**SH 48  
 TCP PHASE 6 STEP 2  
 - TYPICAL SECTIONS**

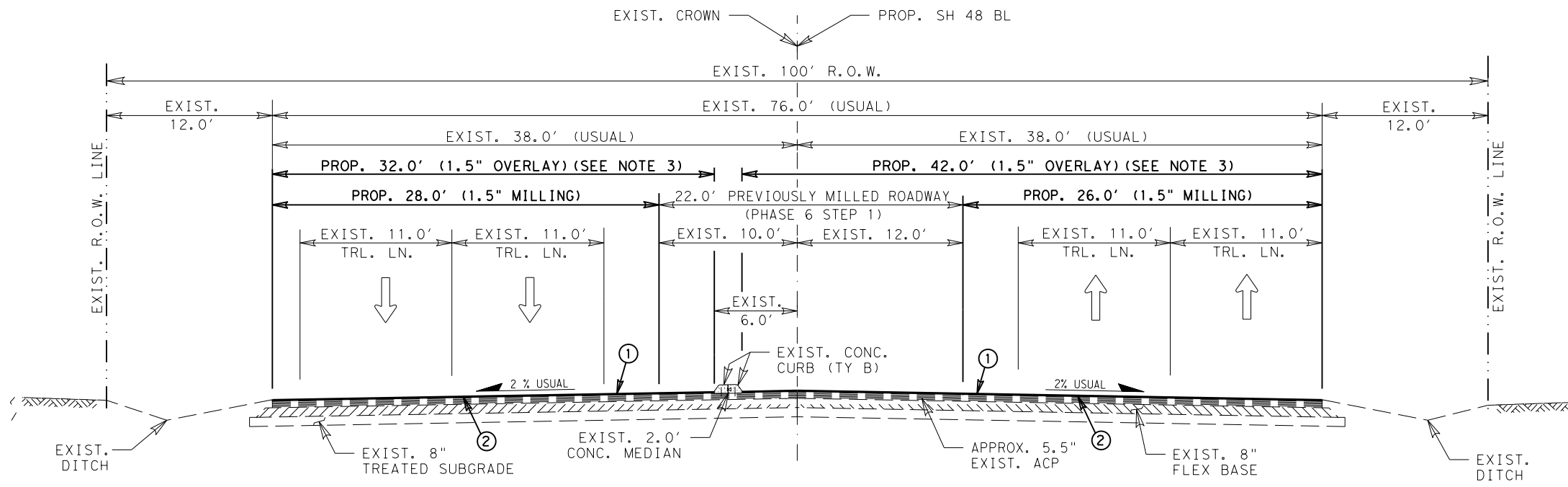
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	0220	05	080 SH 48
	DIST	COUNTY	SHEET NO.
	PHR	CAMERON	106

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SH 48  
 PHASE 6 STEP 2 - TYPICAL SECTION  
 STA. 272+06.00 TO STA. 272+27.50 - 1.0' MEDIAN (LEFT)  
 STA. 272+27.50 TO STA. 275+77.50 - 1.0' MEDIAN (RIGHT)

NOTE:  
 1.0' GAP OPENING AT RAISED CONCRETE  
 MEDIAN FOR DRAINAGE ACCESS:  
 STA. 275+77.50 TO STA. 275+78.50



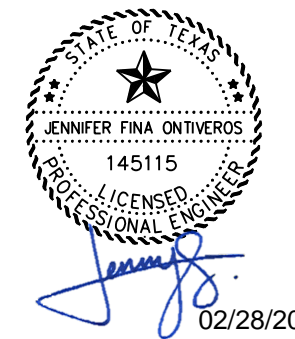
SH 48  
 PHASE 6 STEP 2 - TYPICAL SECTION  
 STA. 288+42.00 TO STA. 291+94.00  
 STA. 291+94.00 TO STA. 292+84.00 - NO RAISED MEDIAN (NAFTA PARKWAY)

- LEGEND:**
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② PROPOSED BONDING COURSE
  - ③ PROPOSED 6" CONCRETE (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROPOSED PROOF ROLL SUBGRADE
  - ⑥ PROPOSED EMBANKMENT (FINAL) (ORD COMP) (TY C) (SUBSIDIARY TO ITEM 530)

- BL - BASE LINE
- RT - RIGHT
- LT - LEFT
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- REMOVE - REMOVEABLE
- EQ. - EQUAL
- TYP. - TYPICAL
- B.Z. - BUFFER ZONE
- TCP - TRAFFIC CONTROL PLAN
- C-C - CENTER TO CENTER
- REFL - PLASTIC DRUM W/ REFLECTOR

- A WK ZN PAV MRK REMOV (Y) 4" (SLD)
- B WK ZN PAV MRK REMOV (W) 4" (SLD)
- C WK ZN PAV MRK REMOV (W) 4" (BRK) W/TYP II-C-R (REFL) AT 40' C-C
- E WK ZN PAV MRK REMOV (W) 8" (SLD)
- G TYPE II-C-R (REFL) AT 20' C-C

- NOTES:**
- SEE PROPOSED TYPICAL SECTIONS AND ROADWAY PLAN LAYOUT FOR ADDITIONAL DETAILS REGARDING RAISED MEDIAN CONSTRUCTION, TRANSITIONS, AND LIMITS.
  - SEE TCP LAYOUTS FOR CONSTRUCTION AREA WIDTHS, LIMITS, AND TRANSITIONS.
  - SEE PROPOSED TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.



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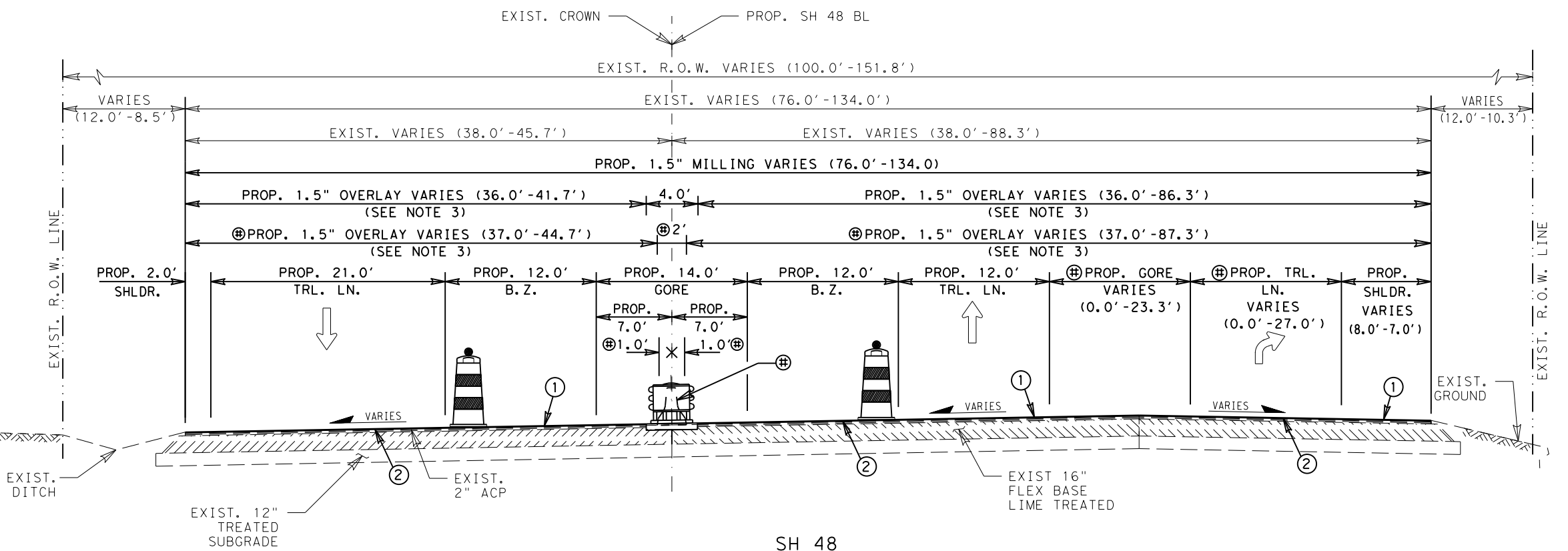
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**SH 48  
 TCP PHASE 6 STEP 2  
 - TYPICAL SECTIONS**

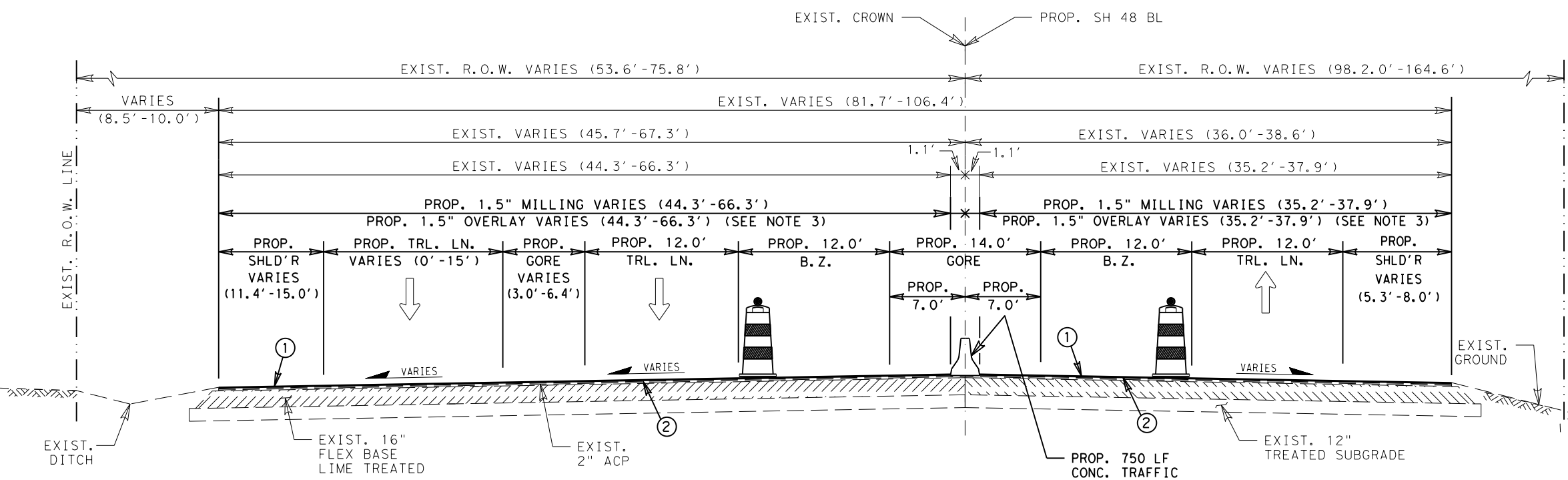
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SH 48  
 PHASE 6 STEP 2 - TYPICAL SECTION  
 STA. 292+84.00 TO STA. 293+11.00 - PROP. CRASH CUSHION  
 ⊕ STA. 293+11.00 TO STA. 297+07.00 - PROP. CONCRETE BARRIER



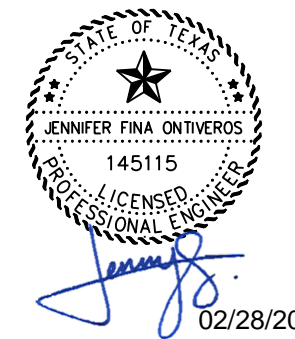
SH 48  
 PHASE 6 STEP 2 - TYPICAL SECTION  
 STA. 297+07.00 TO STA. 300+66.00

- LEGEND:**
- ① PROPOSED 1.5" SMA-F (SAC-A) PG 76-22 ACP (OVERLAY)
  - ② PROPOSED BONDING COURSE
  - ③ PROPOSED 6" CONCRETE (DRIVEWAY)
  - ④ PROPOSED 8" FLEX BASE TY A GR 1-2 W/ 1% LIME BY WT.
  - ⑤ PROPOSED PROOF ROLL SUBGRADE
  - ⑥ PROPOSED EMBANKMENT (FINAL) (ORD COMP) (TY C) (SUBSIDIARY TO ITEM 530)

- BL - BASE LINE
- RT - RIGHT
- LT - LEFT
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY
- TRL. LN. - TRAVEL LANE
- SHLDR. - SHOULDER
- REMOV - REMOVEABLE
- EQ. - EQUAL
- TYP. - TYPICAL
- B.Z. - BUFFER ZONE
- TCP - TRAFFIC CONTROL PLAN
- C-C - CENTER TO CENTER
- Ⓜ - PLASTIC DRUM W/ REFLECTOR

- A WK ZN PAV MRK REMOV (Y) 4" (SLD)
- B WK ZN PAV MRK REMOV (W) 4" (SLD)
- C WK ZN PAV MRK REMOV (W) 4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
- E WK ZN PAV MRK REMOV (W) 8" (SLD)
- G TYPE II-C-R (REFL) AT 20' C-C

- NOTES:**
1. SEE PROPOSED TYPICAL SECTIONS AND ROADWAY PLAN LAYOUT FOR ADDITIONAL DETAILS REGARDING RAISED MEDIAN CONSTRUCTION, TRANSITIONS, AND LIMITS.
  2. SEE TCP LAYOUTS FOR CONSTRUCTION AREA WIDTHS, LIMITS, AND TRANSITIONS.
  3. SEE PROPOSED TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.



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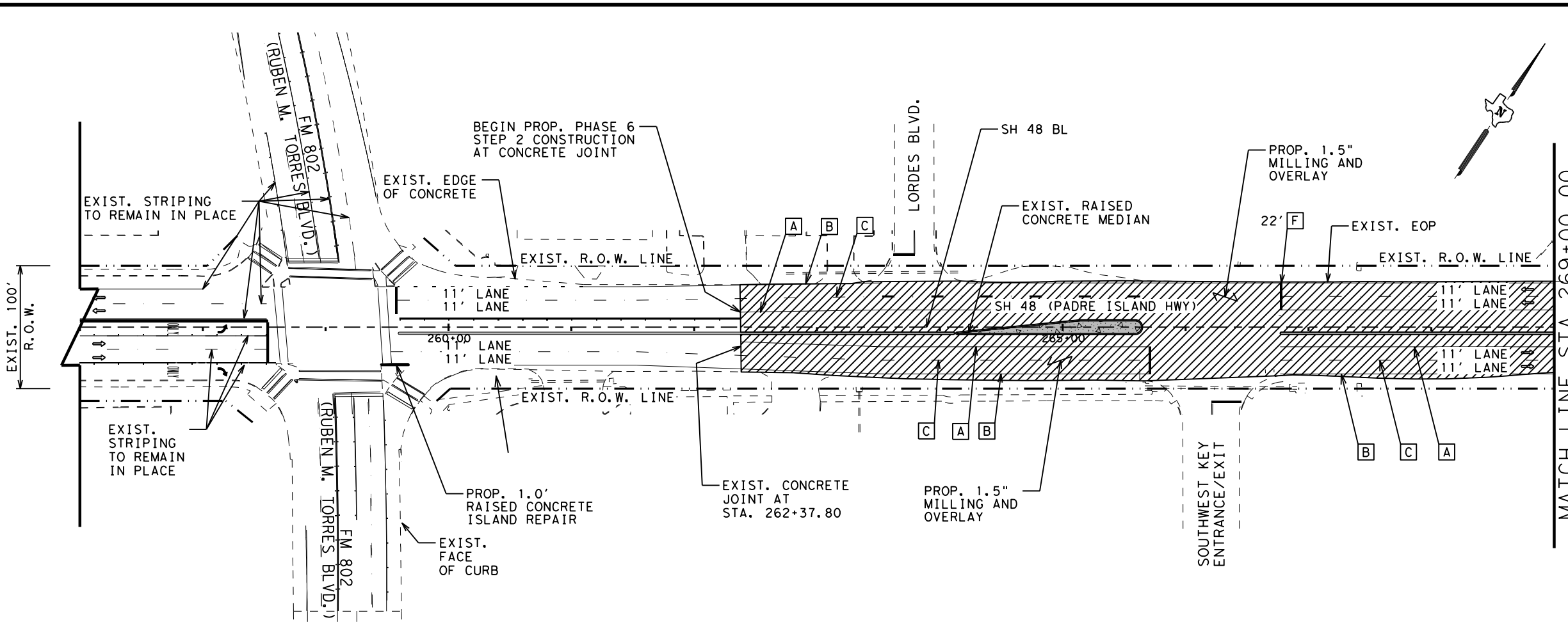
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**SH 48  
 TCP PHASE 6 STEP 2  
 - TYPICAL SECTIONS**

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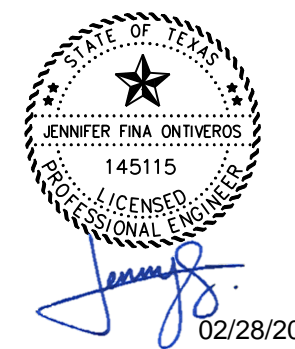
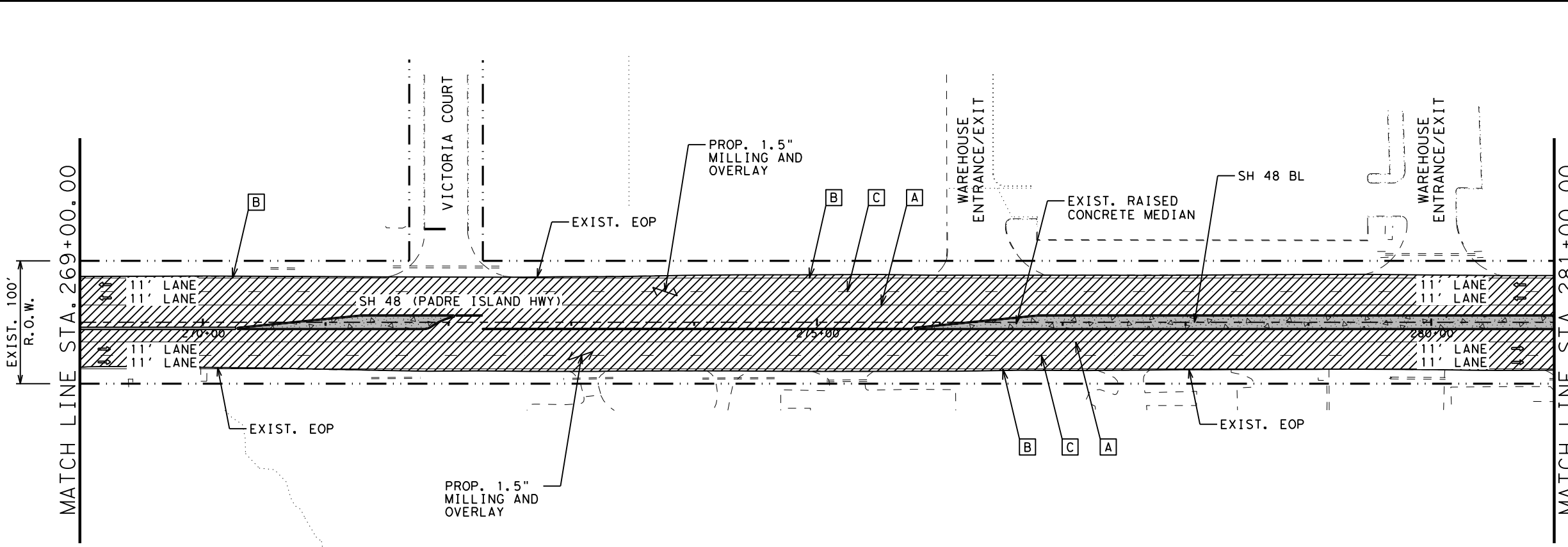
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**LEGEND**

- CONSTRUCTION AREA
- REMOVE EXISTING CONCRETE
- PREVIOUSLY CONSTRUCTED
- A** WK ZN PAV MRK REMOV (Y)4" (SLD)
- B** WK ZN PAV MRK REMOV (W)4" (SLD)
- C** WK ZN PAV MRK REMOV (W)4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
- D** WK ZN PAV MRK REMOV (W)4" (DOT)
- E** WK ZN PAV MRK REMOV (W)8" (SLD)
- F** WK ZN PAV MRK REMOV (W)24" (SLD)
- G** TYPE II-C-R (REFL) AT 20' C-C
- EXIST. EXISTING
- PROP. PROPOSED
- LPCB LOW PROFILE CONCRETE BARRIER
- R.O.W. RIGHT OF WAY
- WK ZN WORK ZONE
- EOP EDGE OF PAVEMENT
- BL BASELINE
- C-C CENTER TO CENTER
- W/ WITH
- DIRECTION OF TRAFFIC FLOW
- PROPOSED SIGN
- PROPOSED TYPE 3 (C) BARRICADES
- PLASTIC DRUMS W/REFLECTORS
- LOW PROFILE CONCRETE BARRIER W/REFLECTORS



**Pharr District Central Design**

**Texas Department of Transportation**

**SH 48  
TCP PHASE 6 STEP 2  
- LAYOUT**

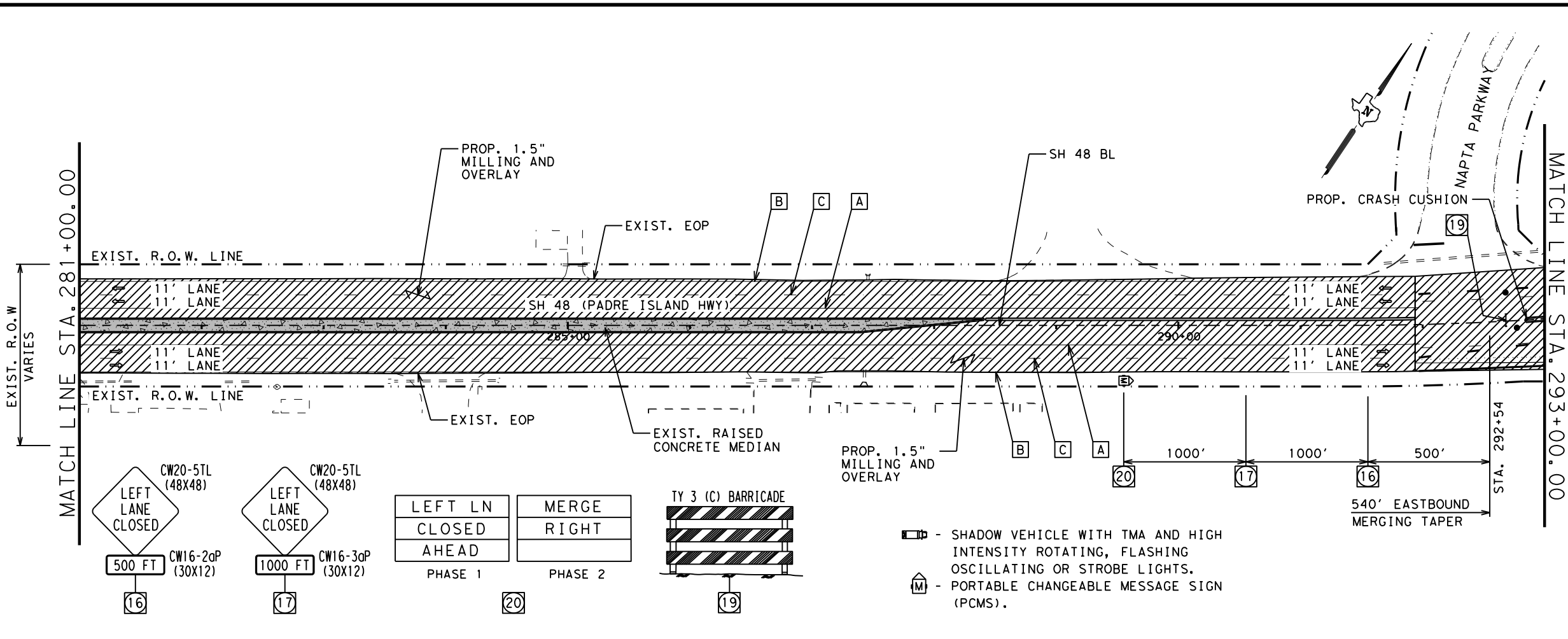
SHEET 1 OF 3

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	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	109	

**NOTE:**  
 PREVIOUSLY MILLED SURFACE FROM STEP 1 IS TO BE OVERLAYED WITH 1.5" ACP, INCLUDING 1.0' GAP OPENINGS FOR DRAINAGE ACCESS.

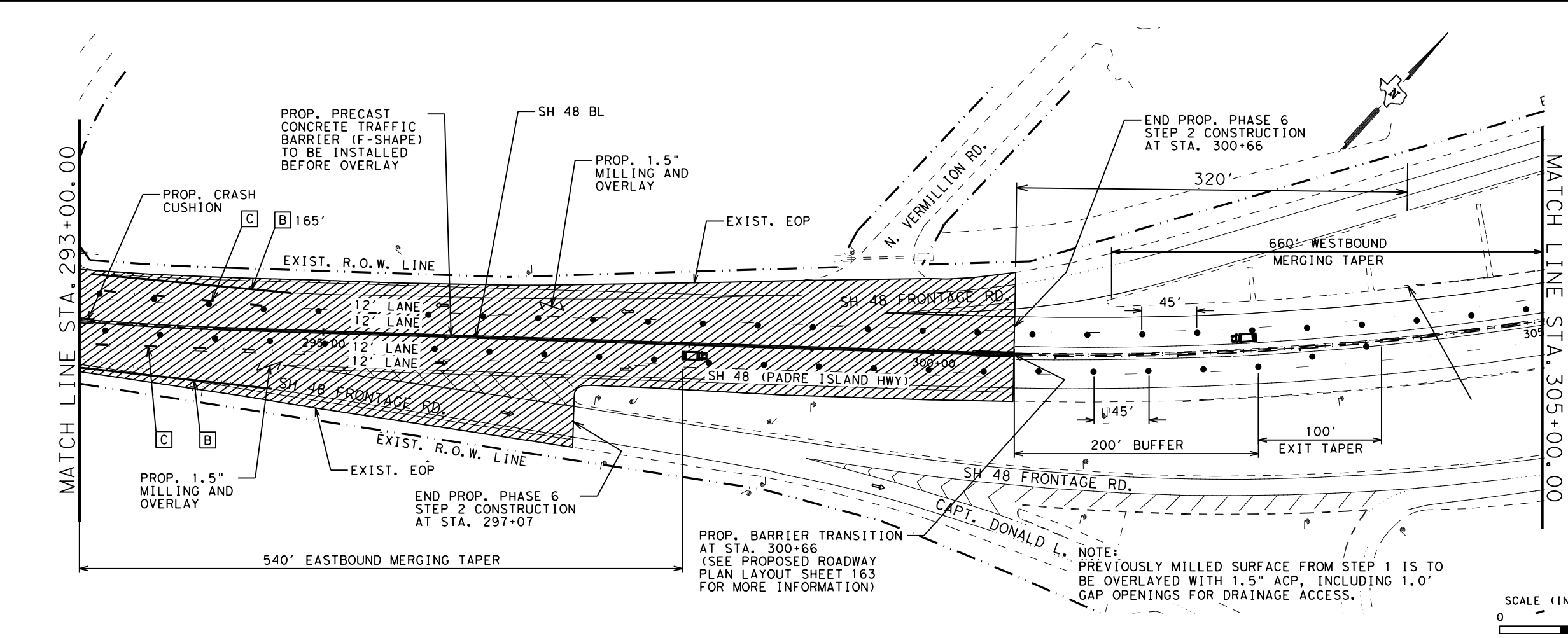


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**LEGEND**

- CONSTRUCTION AREA
- REMOVE EXISTING CONCRETE
- PREVIOUSLY CONSTRUCTED
- A** WK ZN PAV MRK REMOV (W)4" (SLD)
- B** WK ZN PAV MRK REMOV (W)4" (SLD)
- C** WK ZN PAV MRK REMOV (W)4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
- D** WK ZN PAV MRK REMOV (W)4" (DOT)
- E** WK ZN PAV MRK REMOV (W)8" (SLD)
- F** WK ZN PAV MRK REMOV (W)24" (SLD)
- G** TYPE II-C-R (REFL) AT 20' C-C
- EXIST. EXISTING
- PROP. PROPOSED
- LPCB LOW PROFILE CONCRETE BARRIER
- R.O.W. RIGHT OF WAY
- WK ZN WORK ZONE
- EOP EDGE OF PAVEMENT
- BL BASELINE
- C-C CENTER TO CENTER
- W/ WITH
- DIRECTION OF TRAFFIC FLOW
- PROPOSED SIGN
- PROPOSED TYPE 3 (C) BARRICADES
- PLASTIC DRUMS W/REFLECTORS
- LOW PROFILE CONCRETE BARRIER W/REFLECTORS



**Pharr District Central Design**

**Texas Department of Transportation**

**SH 48  
TCP PHASE 6 STEP 2  
- LAYOUT**

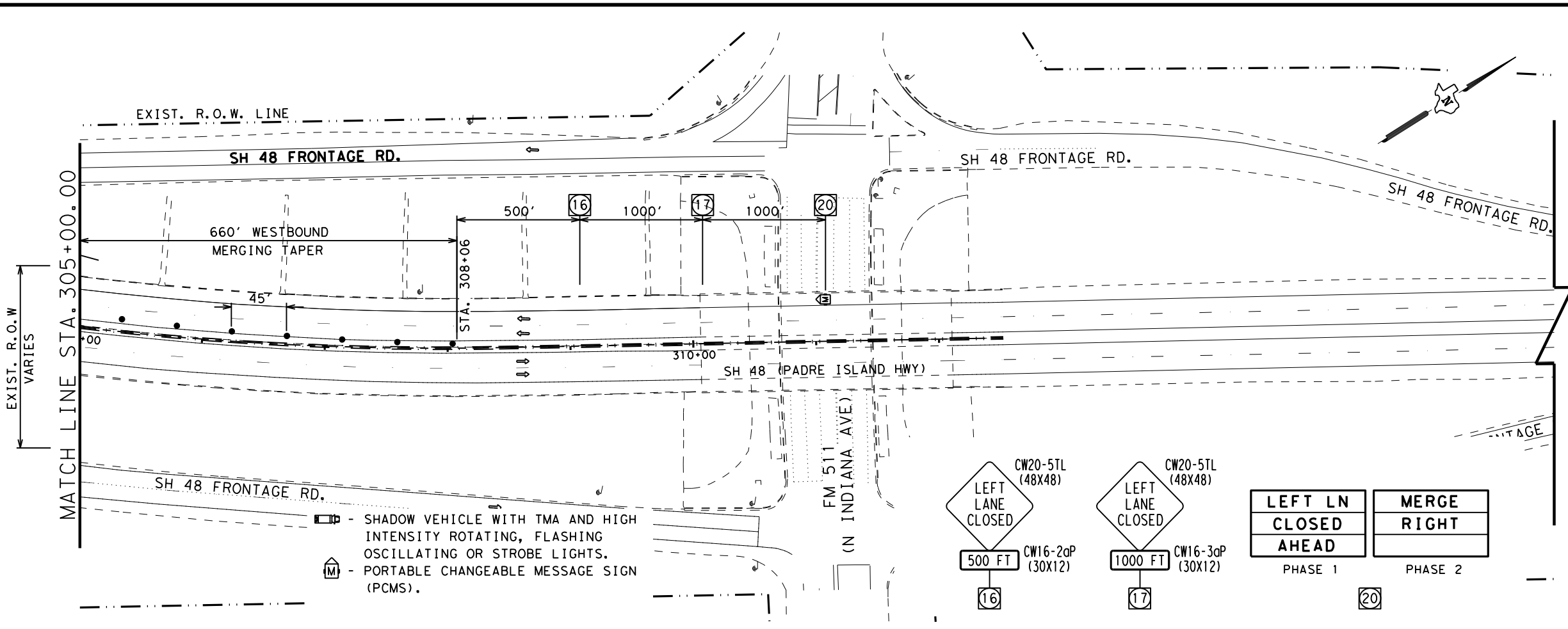
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	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	110	



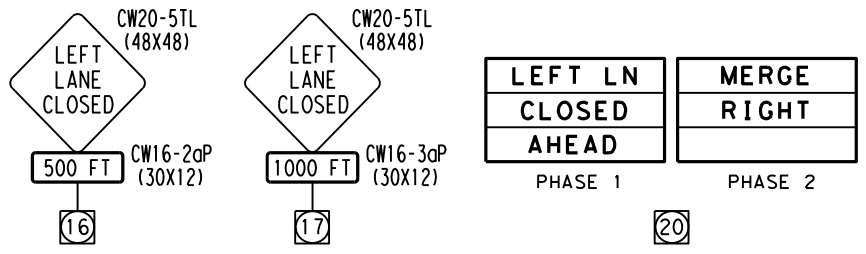
NOTE: PREVIOUSLY MILLED SURFACE FROM STEP 1 IS TO BE OVERLAYED WITH 1.5" ACP, INCLUDING 1.0' GAP OPENINGS FOR DRAINAGE ACCESS.

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- LEGEND**
- CONSTRUCTION AREA
  - REMOVE EXISTING CONCRETE
  - PREVIOUSLY CONSTRUCTED
  - A** WK ZN PAV MRK REMOV (W)4" (SLD)
  - B** WK ZN PAV MRK REMOV (W)4" (SLD)
  - C** WK ZN PAV MRK REMOV (W)4" (BRK) W/TYPE II-C-R (REFL) AT 40' C-C
  - D** WK ZN PAV MRK REMOV (W)4" (DOT)
  - E** WK ZN PAV MRK REMOV (W)8" (SLD)
  - F** WK ZN PAV MRK REMOV (W)24" (SLD)
  - G** TYPE II-C-R (REFL) AT 20' C-C
  - EXIST. EXISTING
  - PROP. PROPOSED
  - LPCB LOW PROFILE CONCRETE BARRIER
  - R.O.W. RIGHT OF WAY
  - WK ZN WORK ZONE
  - EOP EDGE OF PAVEMENT
  - BL BASELINE
  - C-C CENTER TO CENTER
  - W/ WITH
  - DIRECTION OF TRAFFIC FLOW
  - PROPOSED SIGN
  - I** PROPOSED TYPE 3 (C) BARRICADES
  - PLASTIC DRUMS W/REFLECTORS
  - LOW PROFILE CONCRETE BARRIER W/REFLECTORS

- SHADOW VEHICLE WITH TMA AND HIGH INTENSITY ROTATING, FLASHING OSCILLATING OR STROBE LIGHTS.  
 - PORTABLE CHANGEABLE MESSAGE SIGN (PCMS).



**Pharr District Central Design**

Texas Department of Transportation

**SH 48  
 TCP PHASE 6 STEP 2  
 - LAYOUT**

SHEET 3 OF 3

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	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	111	



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**BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:**

- 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).
- The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- Traffic control devices should be in place only while work is actually in progress or a definite need exists.
- The Engineer has the final decision on the location of all traffic control devices.
- 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:**


- 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.
- Except in emergency situations, flagger stations shall be illuminated when flagging is used at night.

**COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES**

- Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.
- Work zone traffic control devices shall be compliant with the Manual for Assessing safety Hardware (MASH).

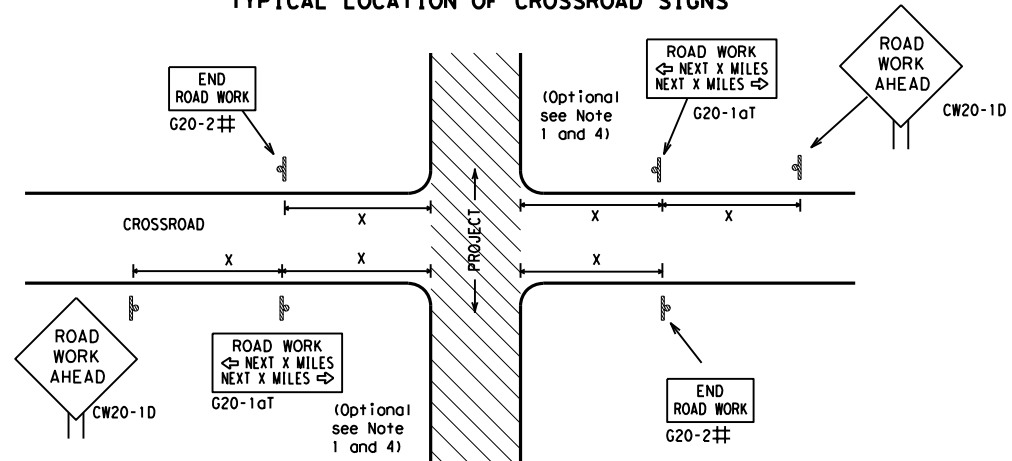
<b>THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT</b> <a href="http://www.txdot.gov">http://www.txdot.gov</a>
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS) "
STANDARD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

SHEET 1 OF 12

 Texas Department of Transportation		Traffic Safety Division Standard	
<b>BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS</b>			
<b>BC (1) - 21</b>			
FILE:	bc-21.dgn	DN:	TxDOT
© TxDOT	November 2002	CK:	TxDOT
		DW:	TxDOT
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CONT	SECT	JOB	HIGHWAY
0220	05	080	SH 48
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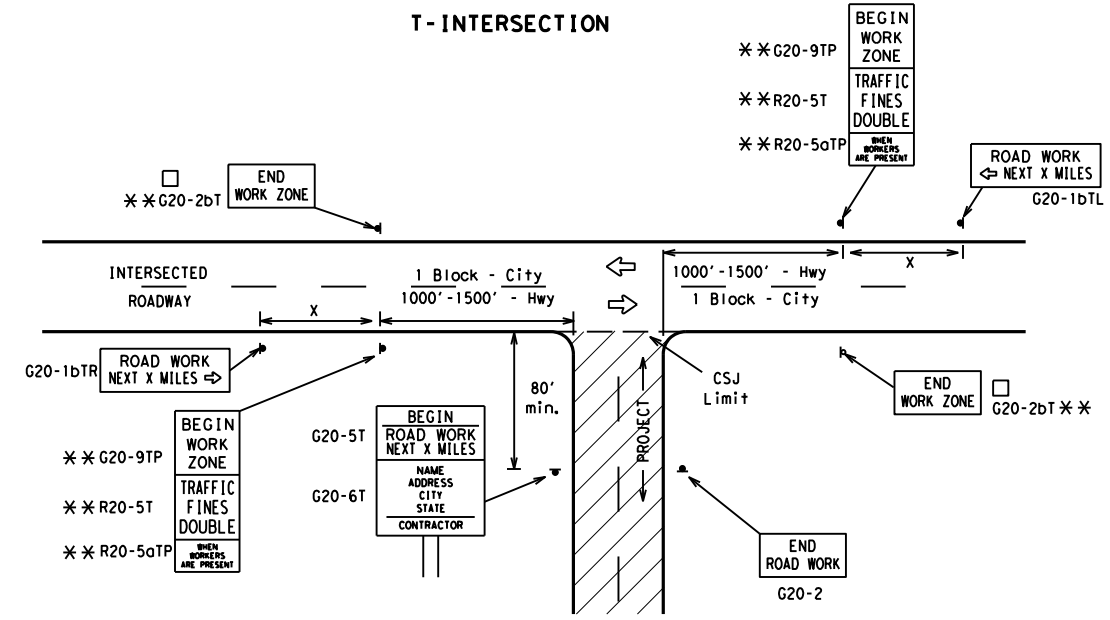
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**TYPICAL LOCATION OF CROSSROAD SIGNS**



- ## May be mounted on back of "ROAD WORK AHEAD" (CW20-1D) sign with approval of Engineer. (See note 2 below)
- 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.
  - 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.
  - 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.
  - 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.
  - Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
  - 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**

- 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.
- 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<sup>1,5,6</sup>**

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

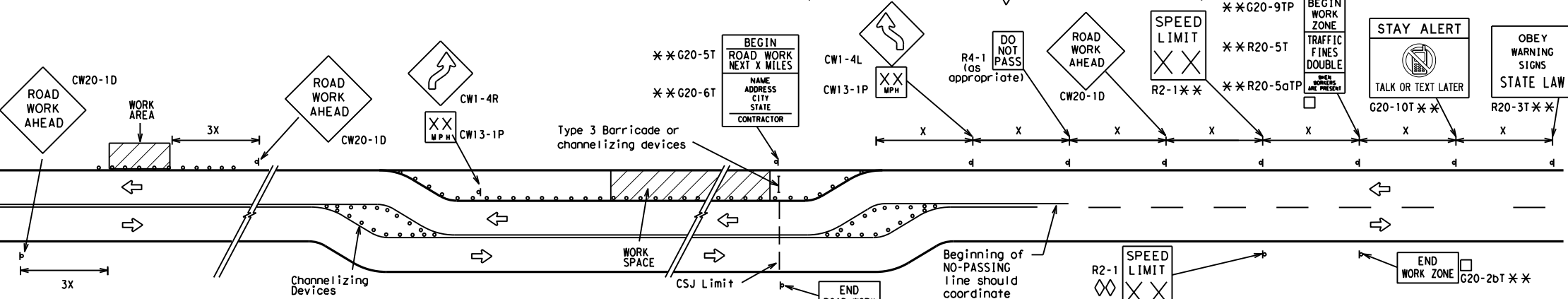
\* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

**GENERAL NOTES**

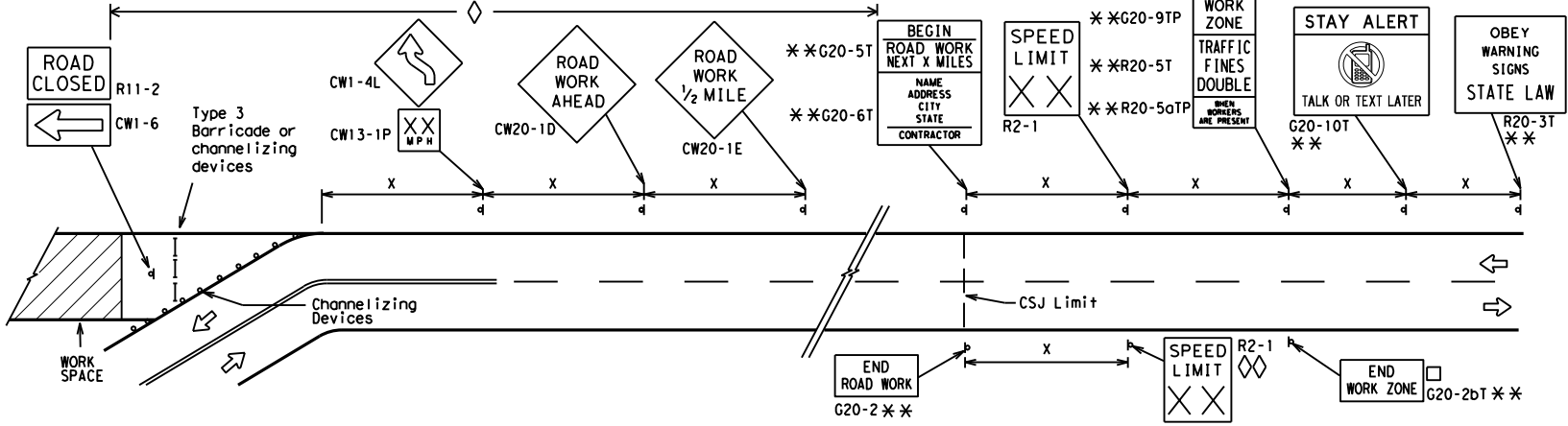
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be 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".
- Only diamond shaped warning sign sizes are indicated.
- See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

**WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS**

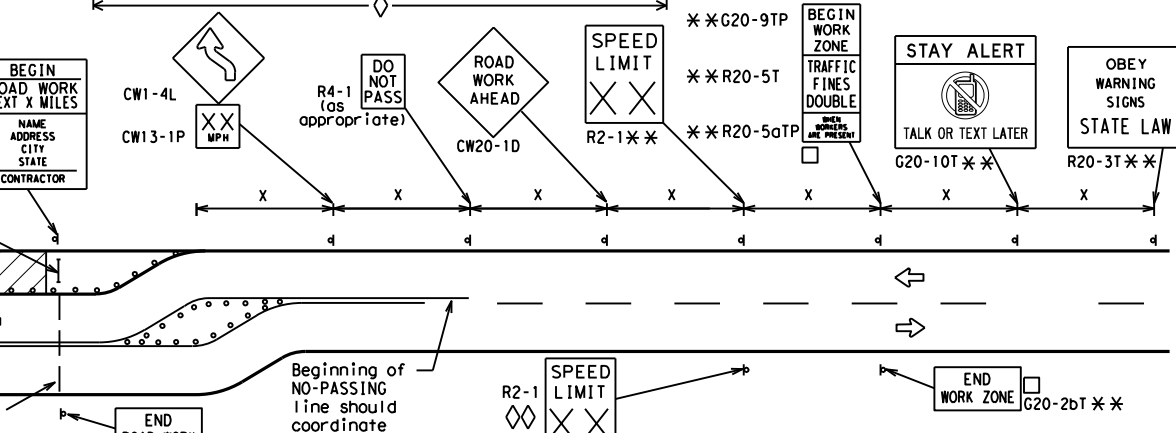


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD" (CW20-1D) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

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



**SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS**



**NOTES**

- The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES" (G20-5T) sign for each specific project. This distance shall replace the "x" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.
- The "BEGIN WORK ZONE" (G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.
  - CSJ limit signing is required for highway construction and maintenance work, with the exception of mobile operations.
  - Area for placement of "ROAD WORK AHEAD" (CW20-1D) sign and other signs or devices as called for on the Traffic Control Plan.
  - Contractor will install a regulatory speed limit sign at the end of the work zone.

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

SHEET 2 OF 12



**BARRICADE AND CONSTRUCTION PROJECT LIMIT**

**BC(2)-21**

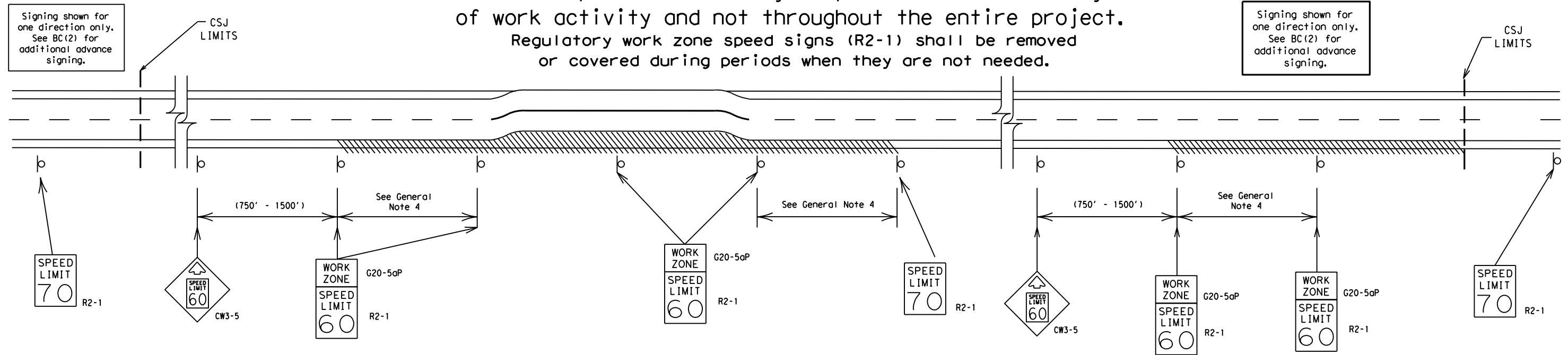
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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	PHR	CAMERON	113	



# 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:

- rough road or damaged pavement surface
- substantial alteration of roadway geometrics (diversions)
- construction detours
- grade
- width
- 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

- Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
- Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
- Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
- 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
- Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
- 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.
- Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
- Techniques that may help reduce traffic speeds include but are not limited to:
  - Law enforcement.
  - Flagger stationed next to sign.
  - Portable changeable message sign (PCMS).
  - Low-power (drone) radar transmitter.
  - Speed monitor trailers or signs.
- Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
- 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.

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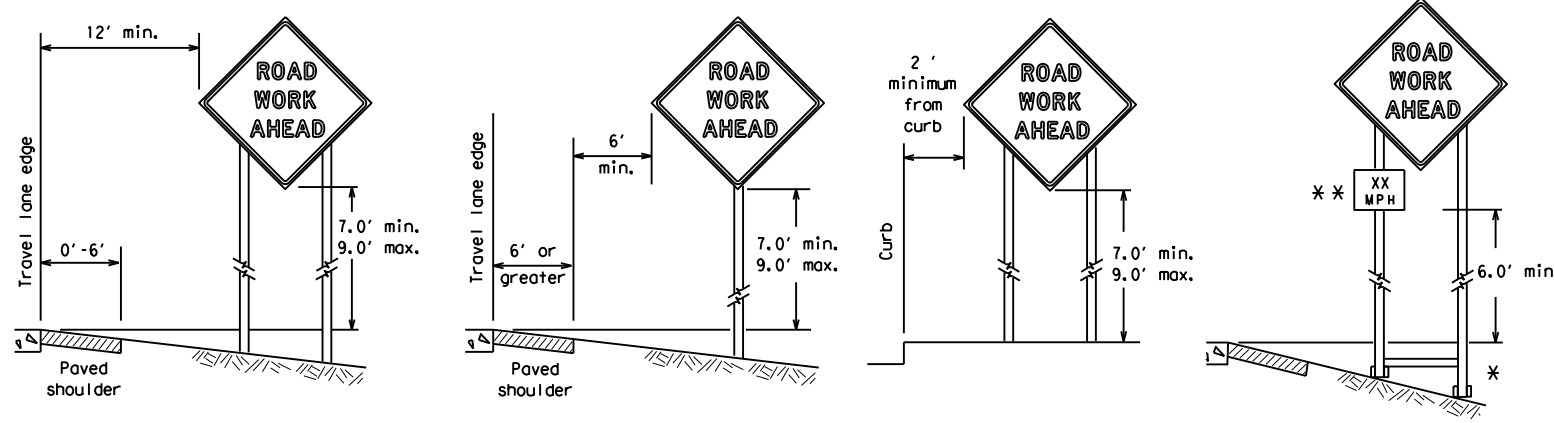
SHEET 3 OF 12

		Traffic Safety Division Standard	
<h2>BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT</h2>			
<h3>BC (3) - 21</h3>			
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9-07	8-14	HIGHWAY:	SH 48
7-13	5-21	DIST:	CAMERON
		COUNTY:	
		SHEET NO.:	114

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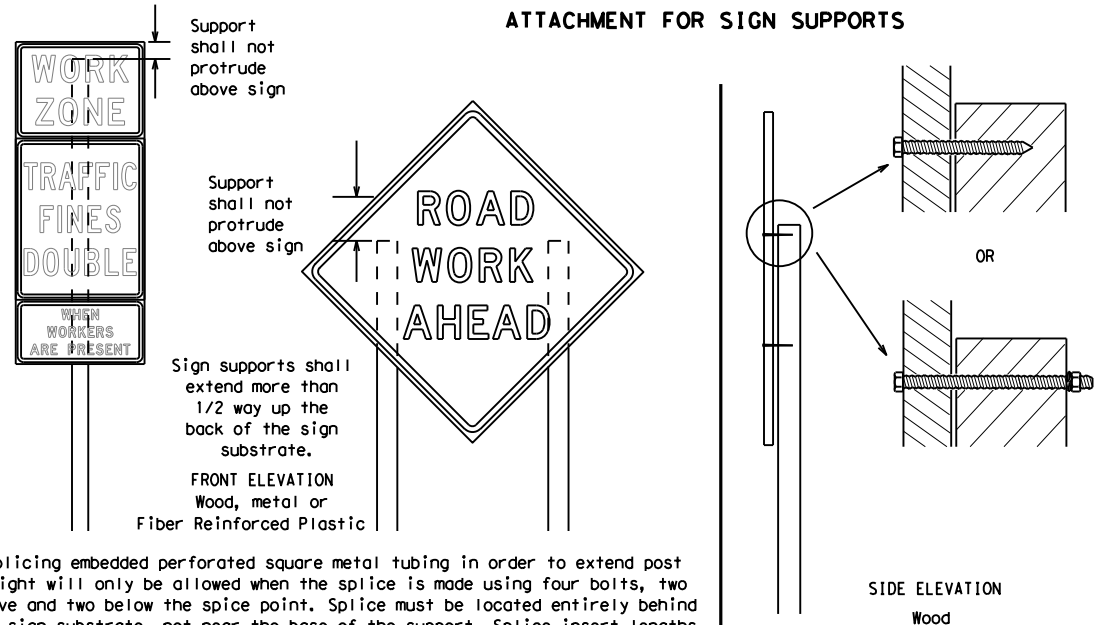
**TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS**



\* 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**



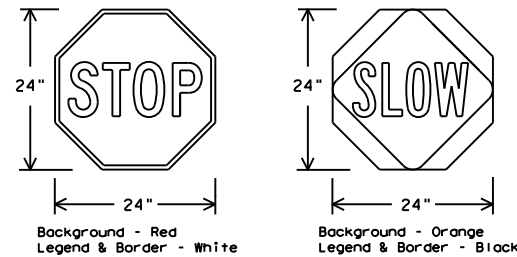
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

**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 splice 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 <sub>FL</sub> OR C <sub>FL</sub> 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<sub>FL</sub> or Type C<sub>FL</sub>, 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.

SHEET 4 OF 12



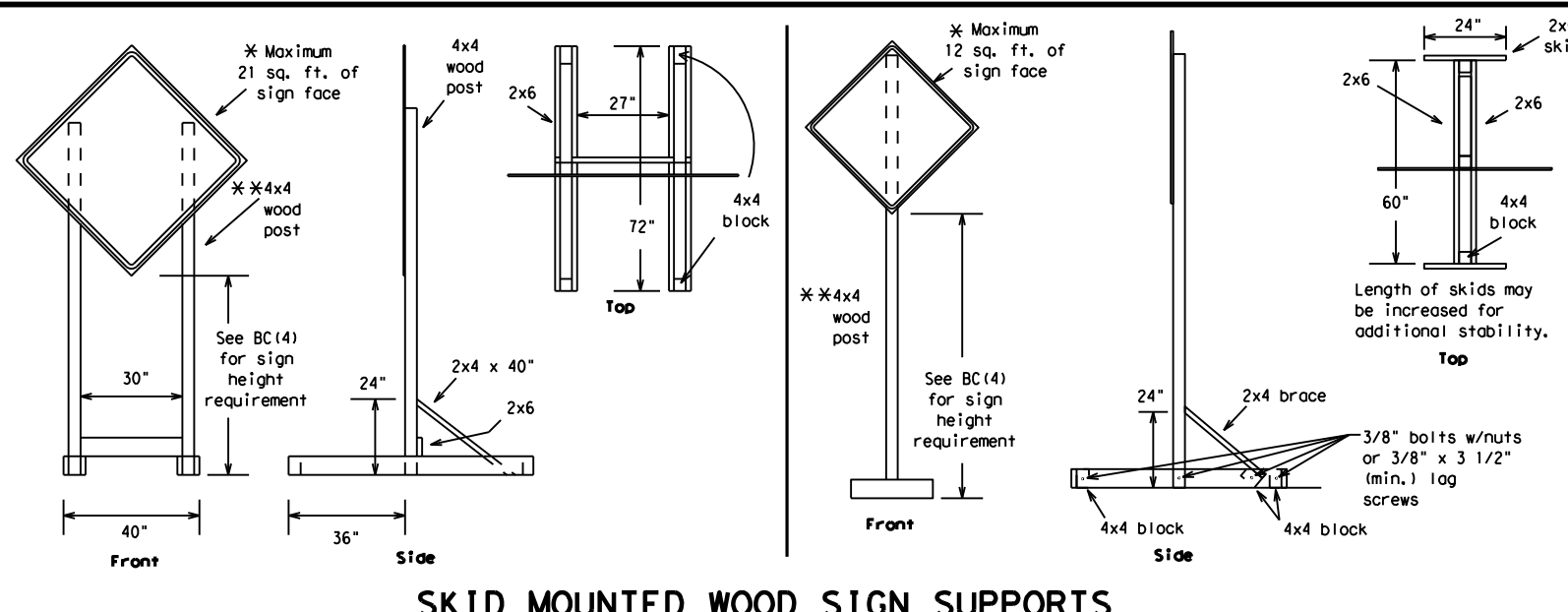
**BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES**

BC (4) - 21

FILE: bc-21.dgn	DN: TxDOT	CR: TxDOT	OW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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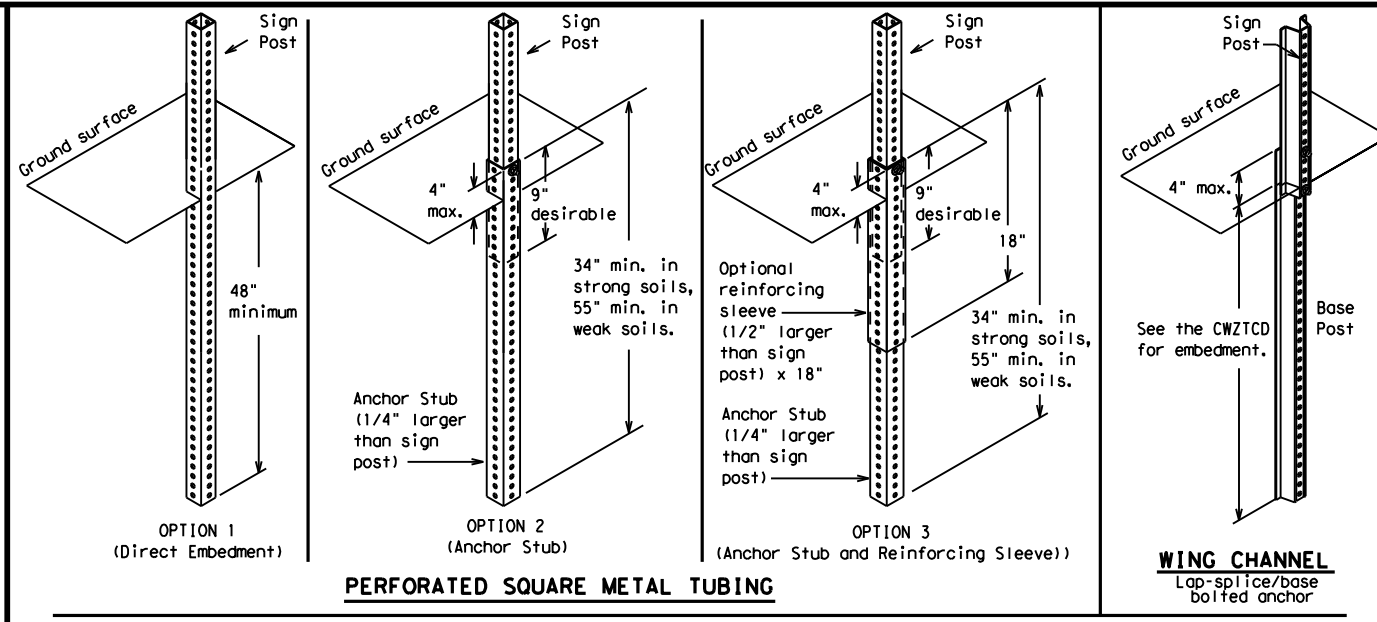
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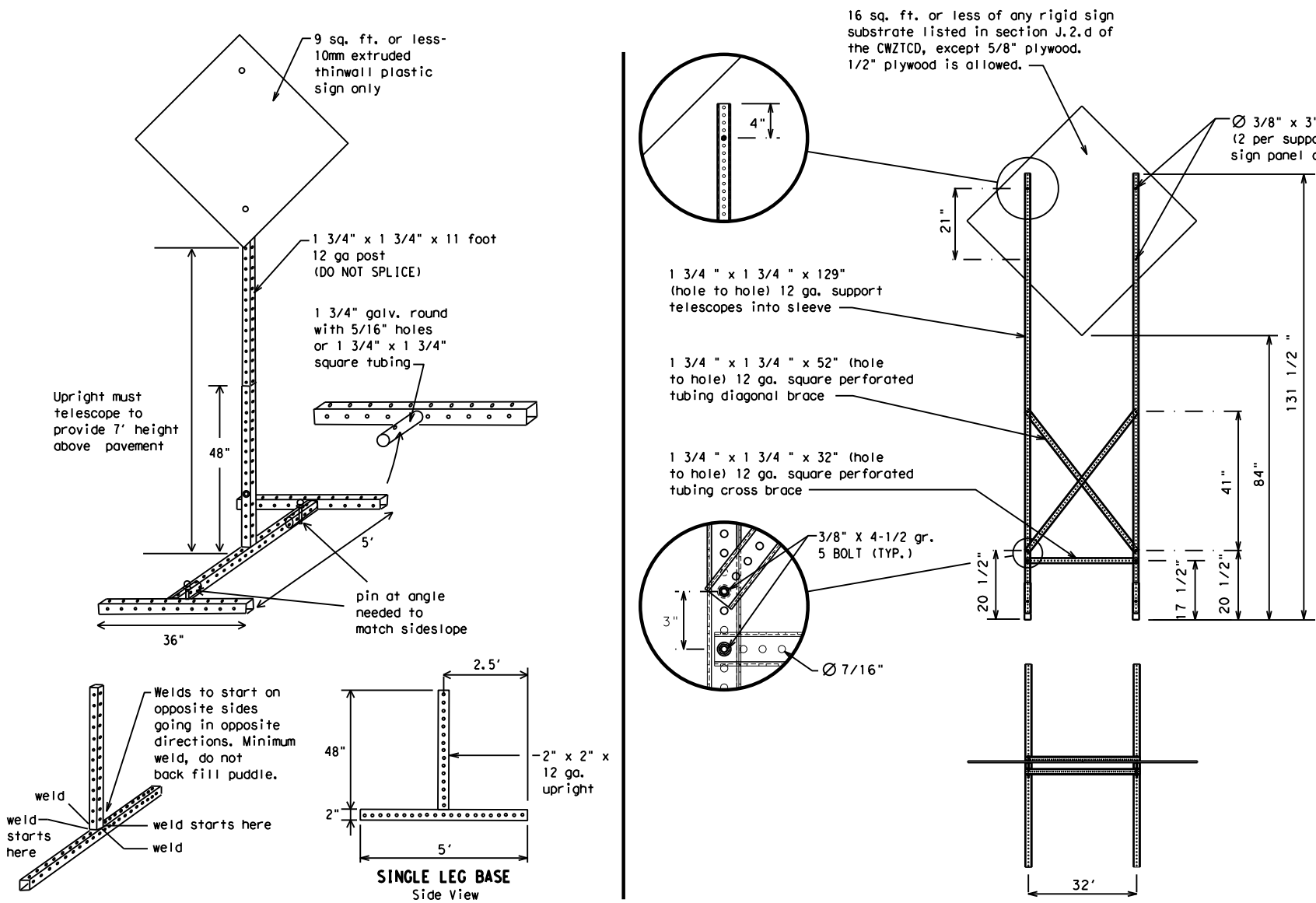
**SKID MOUNTED WOOD SIGN SUPPORTS**

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



**GROUND MOUNTED SIGN SUPPORTS**

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



**SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS**

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

**WEDGE ANCHORS**

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

**OTHER DESIGNS**

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

**GENERAL NOTES**

- 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.
- No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
- When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.

- \* See BC(4) for definition of "Work Duration."
- \*\* Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.
- ☐ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

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**BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT**

**BC(5) - 21**

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REVISIONS		0220	05	080	SH 48				
9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13	5-21	PHR	CAMERON	116					

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

# RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

## PORTABLE CHANGEABLE MESSAGE SIGNS

- The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
- 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.
- 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.
- Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
- Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
- When in use, the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
- 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.
- 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.
- Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
- 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.
- Do not use the word "Danger" in message.
- Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
- Do not display messages that scroll horizontally or vertically across the face of the sign.
- 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.
- 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.
- Each line of text should be centered on the message board rather than left or right justified.
- 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.

## 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
XXXXXXXXX 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
XXXXXXXXX TO XXXXXXXX
US XXX TO FM XXXX

### Warning List

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

### \*\* Advance Notice List

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

\*\* See Application Guidelines Note 6.

## APPLICATION GUIDELINES

- Only 1 or 2 phases are to be used on a PCMS.
- The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
- A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
- A Location Phase is necessary only if a distance or location is not included in the first phase selected.
- 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.
- 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

- The words RIGHT, LEFT and ALL can be interchanged as appropriate.
- Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
- EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
- Highway names and numbers replaced as appropriate.
- ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
- AHEAD may be used instead of distances if necessary.
- FT and MI, MILE and MILES interchanged as appropriate.
- AT, BEFORE and PAST interchanged as needed.
- 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

- 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.
- 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.
- 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.
- 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.

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WORD OR PHRASE	ABBREVIATION	WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD	Major	MAJ
Alternate	ALT	Miles	MI
Avenue	AVE	Miles Per Hour	MPH
Best Route	BEST RTE	Minor	MNR
Boulevard	BLVD	Monday	MON
Bridge	BRDG	Normal	NORM
Canot	CANT	North	N
Center	CTR	Northbound	(route) N
Construction Ahead	CONST AHD	Parking	PKING
CROSSING	XING	Road	RD
Detour Route	DETOUR RTE	Right Lane	RT LN
Do Not	DONT	Saturday	SAT
East	E	Service Road	SERV RD
Eastbound	(route) E	Shoulder	SHLDR
Emergency	EMER	Slippery	SLIP
Emergency Vehicle	EMER VEH	South	S
Entrance, Enter	ENT	Southbound	(route) S
Express Lane	EXP LN	Speed	SPD
Expressway	EXPWY	Street	ST
XXXX Feet	XXXX FT	Sunday	SUN
Fog Ahead	FOG AHD	Telephone	PHONE
Freeway	FRWY, FWY	Temporary	TEMP
Freeway Blocked	FWY BLKD	Thursday	THURS
Friday	FRI	To Downtown	TO DWNTN
Hazardous Driving	HAZ DRIVING	Traffic	TRAF
Hazardous Material	HAZMAT	Travelers	TRVLR
High-Occupancy Vehicle	HOV	Tuesday	TUES
Highway	HWY	Time Minutes	TIME MIN
Hour(s)	HR, HRS	Upper Level	UPR LEVEL
Information	INFO	Vehicles (s)	VEH, VEHS
It Is	ITS	Warning	WARN
Junction	JCT	Wednesday	WED
Left	LFT	Weight Limit	WT LIMIT
Left Lane	LFT LN	West	W
Lane Closed	LN CLOSED	Westbound	(route) W
Lower Level	LWR LEVEL	Wet Pavement	WET PVMT
Maintenance	MAINT	Will Not	WONT

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



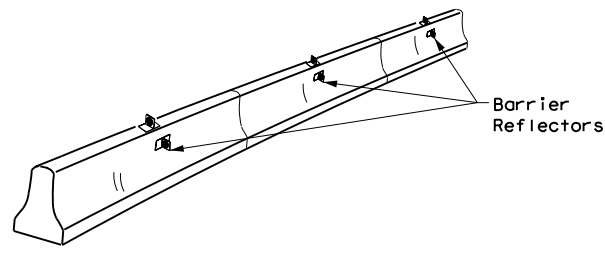
## BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC (6) - 21

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9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	PHR	CAMERON	117	

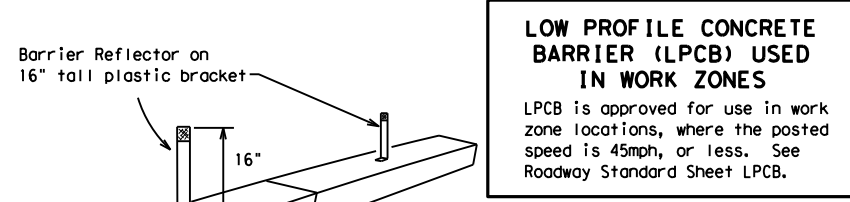
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors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



**CONCRETE TRAFFIC BARRIER (CTB)**

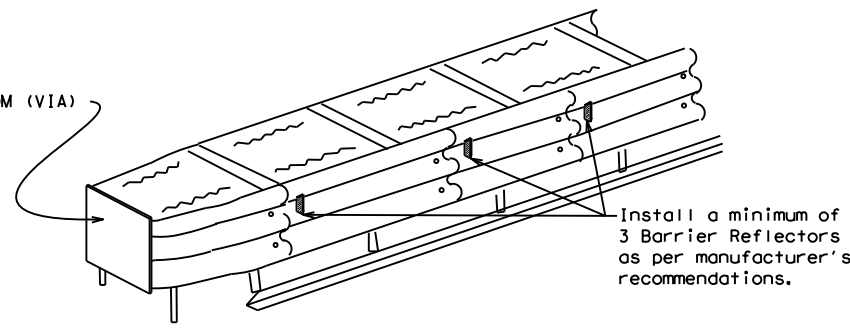
- Where traffic is on one side of the CTB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB. An alternate mounting location is uniformly spaced at one end of each CTB. This will allow for attachment of a barrier grapple without damaging the reflector.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



**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.

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

**LOW PROFILE CONCRETE BARRIER (LPCB)**



**DELINEATION OF END TREATMENTS**

**END TREATMENTS FOR CTB'S USED IN WORK ZONES**  
 End treatments used on CTB's in work zones shall meet the appropriate 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**

**WARNING LIGHTS**

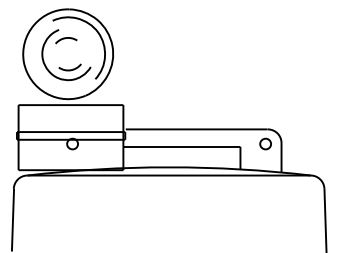
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet 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<sub>FL</sub> or C<sub>FL</sub> Sheeting meeting the requirements of Departmental Material Specification DMS-8300.
- 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".
- The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
- 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.
- 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.
- The location of warning lights and warning reflectors on drums shall be as shown elsewhere in the plans.

**WARNING LIGHTS MOUNTED ON PLASTIC DRUMS**

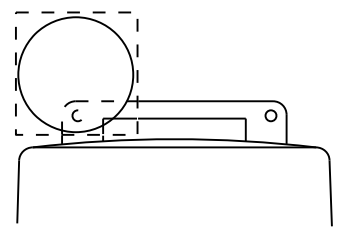
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing 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.
- 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.
- Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
- Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
- 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**

- 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.
- 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.
- The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
- Round reflectors shall be fully reflectorized, including the area where attached to the drum.
- 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.
- 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.
- When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
- The warning reflector should be mounted on the side of the handle nearest approaching traffic.
- The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.



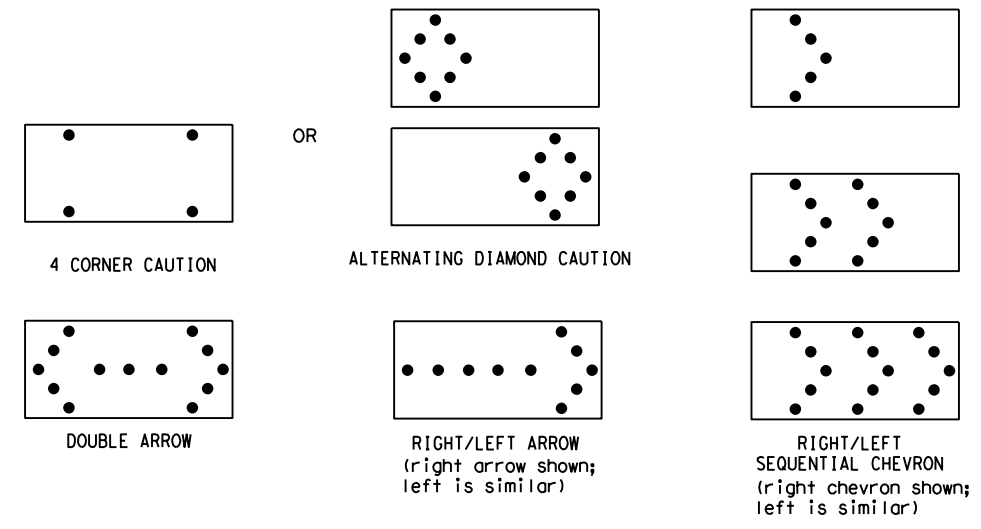
Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



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

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.

- 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.
- 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.
- 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.
- The Flashing Arrow Board should be able to display the following symbols:



- The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
- The straight line caution display is NOT ALLOWED.
- 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.
- 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.
- The sequential arrow display is NOT ALLOWED.
- The flashing arrow display is the TxDOT standard; however, the sequential chevron display may be used during daylight operations.
- The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
- A Flashing Arrow Board SHALL NOT BE USED to laterally shift traffic.
- 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.
- 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**

SHEET 7 OF 12

**TRUCK-MOUNTED ATTENUATORS**

- Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the Manual for Assessing Safety Hardware (MASH).
- Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
- Refer to the CWZTCD for a list of approved TMAs.
- TMAs are required on freeways unless otherwise noted in the plans.
- 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.
- 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.



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

**BC (7) -21**

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**GENERAL NOTES**

- For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
- 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.
- 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.
- 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).
- 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.
- 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**

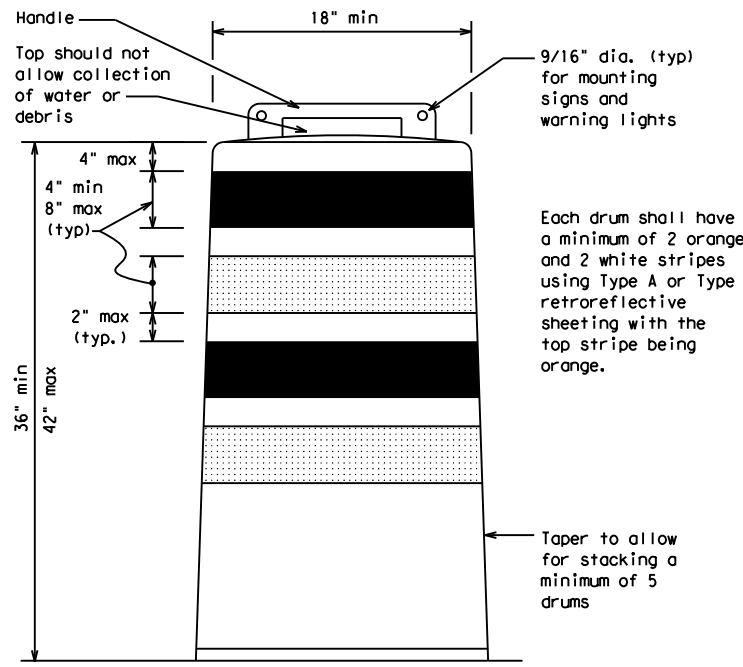
- Pre-qualified plastic drums shall meet the following requirements:
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
  - The body and base shall lock together in such a manner that the body separates from the base when impacted 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.
  - 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.
  - 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.
  - 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.
  - 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.
  - 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.
  - Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
  - Drum body shall have a maximum unballasted weight of 11 lbs.
  - Drum and base shall be marked with manufacturer's name and model number.

**RETROREFLECTIVE SHEETING**

- 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.
- 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.

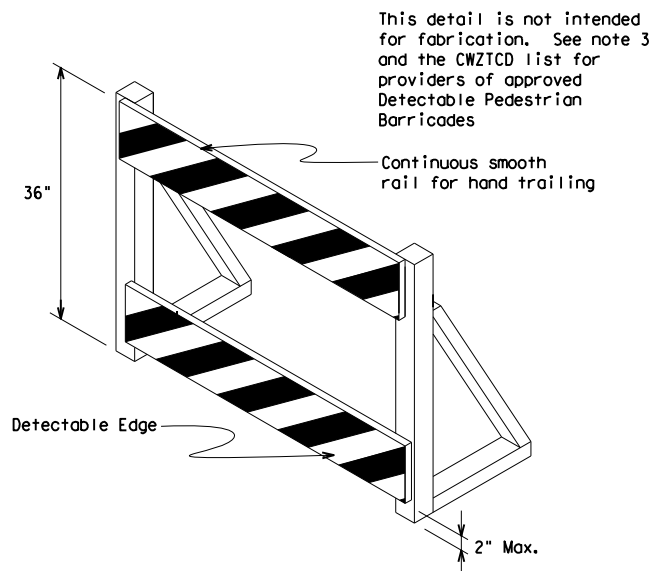
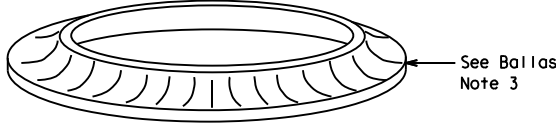
**BALLAST**

- 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.
- 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.
- Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
- 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.
- 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.
- Ballast shall not be placed on top of drums.
- Adhesives may be used to secure base of drums to pavement.



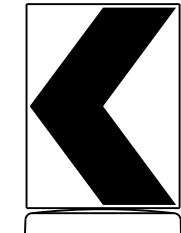
Each drum shall have a minimum of 2 orange and 2 white stripes using Type A or Type B retroreflective sheeting with the top stripe being orange.

Taper to allow for stacking a minimum of 5 drums

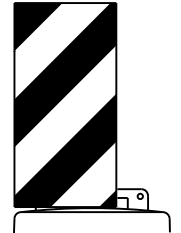


**DETECTABLE PEDESTRIAN BARRICADES**

- 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.
- 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.
- 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.
- 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.
- Warning lights shall not be attached to detectable pedestrian barricades.
- 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**

- Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
- Chevrons and other work zone signs with an orange background shall be manufactured with Type B<sub>FL</sub> or Type C<sub>FL</sub> Orange sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless otherwise specified in the plans.
- 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.
- 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.
- Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
- Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
- 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.
- 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.

SHEET 8 OF 12



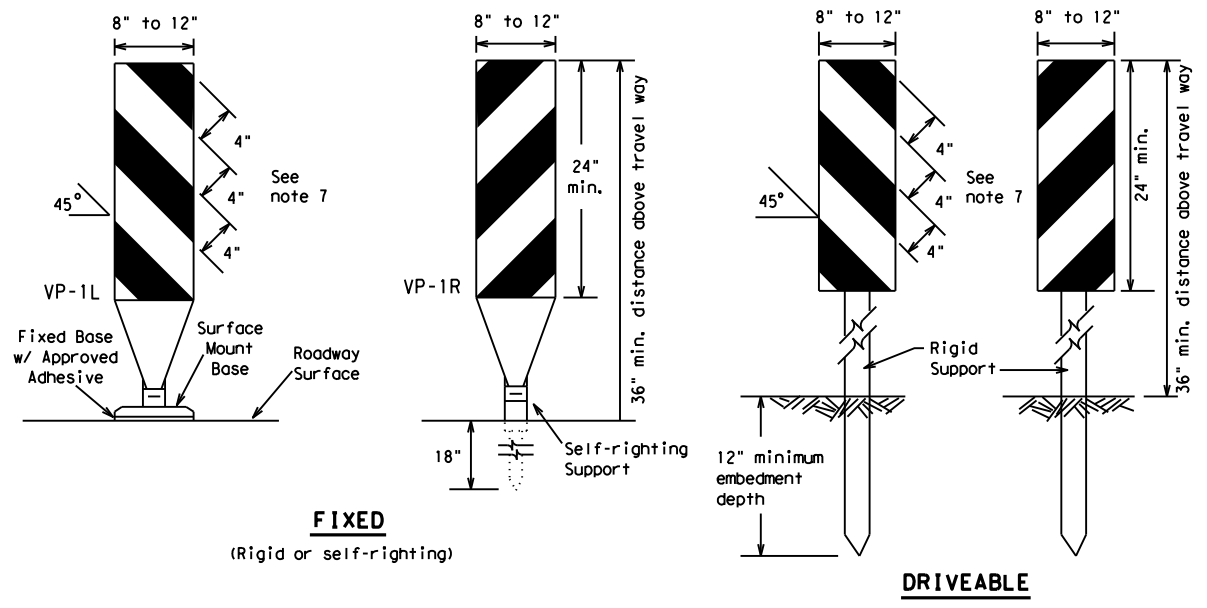
**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

**BC (8) - 21**

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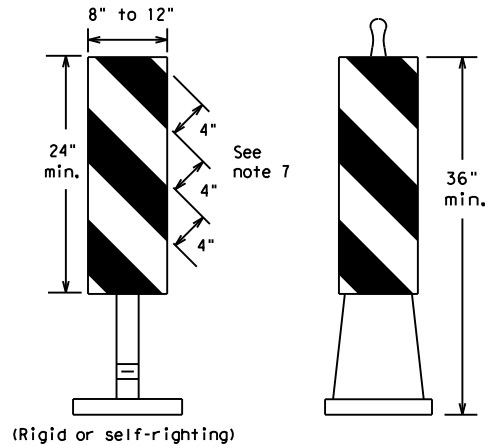
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**FIXED**  
(Rigid or self-righting)

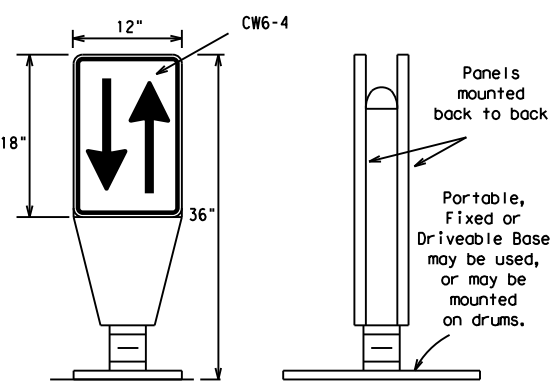
**DRIVEABLE**



**PORTABLE**

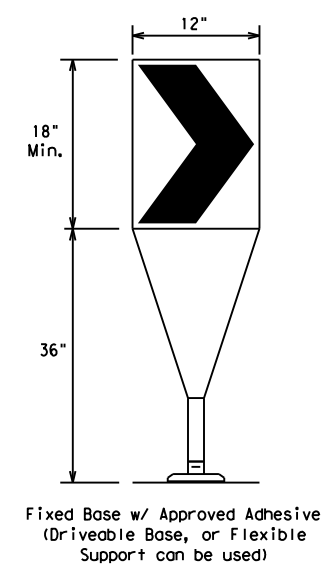
**VERTICAL PANELS (VPs)**

- Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
- 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.
- 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.
- VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
- Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
- Sheeting for the VP's shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
- Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.



**OPPOSING TRAFFIC LANE DIVIDERS (OTLD)**

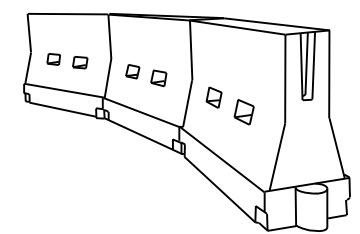
- Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base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



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

- The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
- 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.
- 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.
- To be effective, the chevron should be visible for at least 500 feet.
- Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type B<sub>FL</sub> or Type C<sub>FL</sub> conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.
- For Long Term Stationary use on tapers or transitions on freeways and divided highways, self-righting chevrons may be used to supplement plastic drums but not to replace plastic drums.

**CHEVRONS**



**LONGITUDINAL CHANNELIZING DEVICES (LCD)**

- 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.
- LCDs may be used instead of a line of cones or drums.
- LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
- LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
- LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
- 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**

- 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.
- 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.
- 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.
- 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.
- When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

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

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

**GENERAL NOTES**

- 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).
- 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.
- 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).
- 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.
- Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
- 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.
- The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.

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

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

**SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS**

SHEET 9 OF 12



**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

**BC (9) - 21**

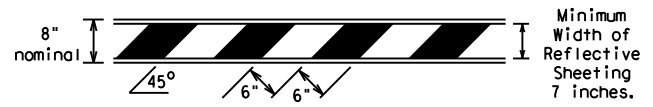
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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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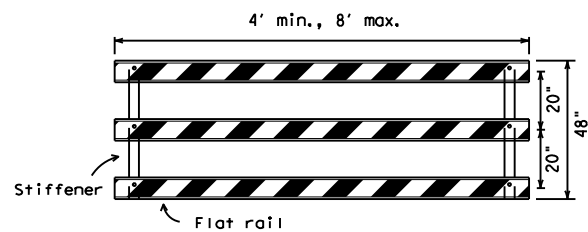
**TYPE 3 BARRICADES**

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.

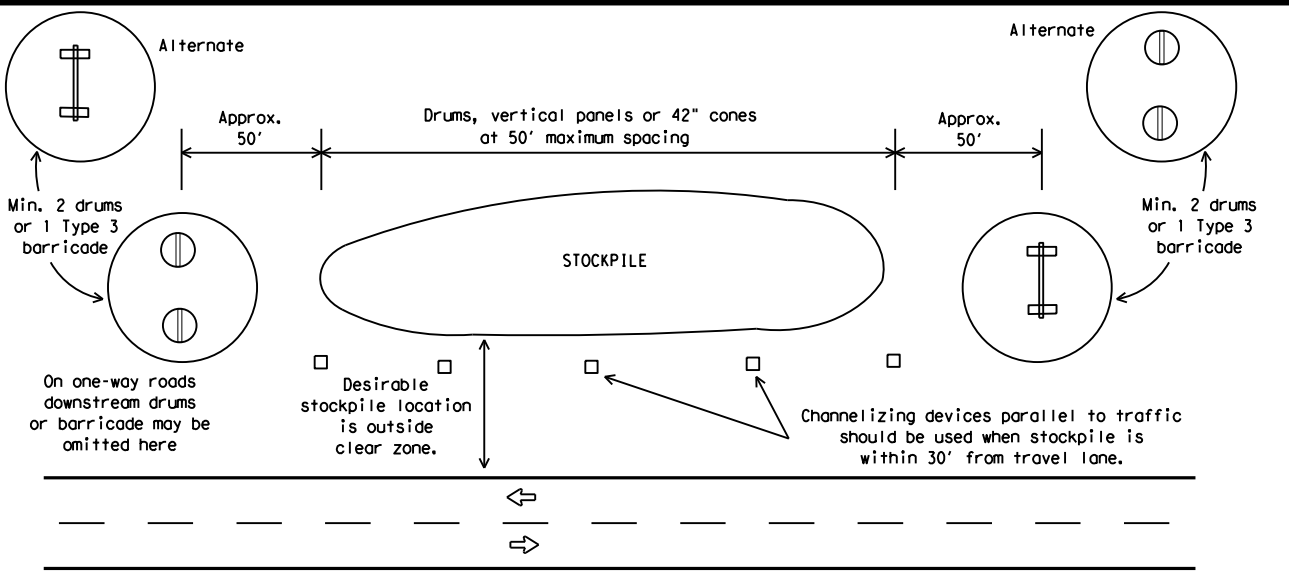


**TYPICAL STRIPING DETAIL FOR BARRICADE RAIL**



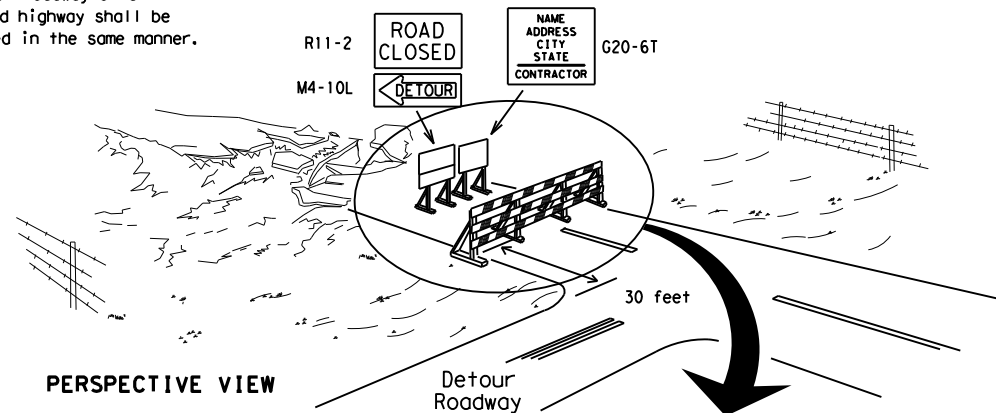
Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

**TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES**



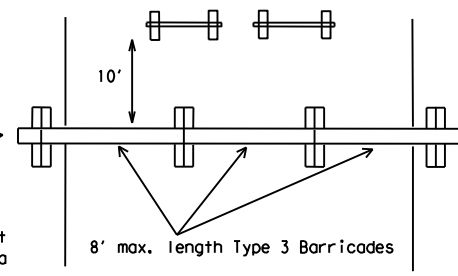
**TRAFFIC CONTROL FOR MATERIAL STOCKPILES**

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



PERSPECTIVE VIEW

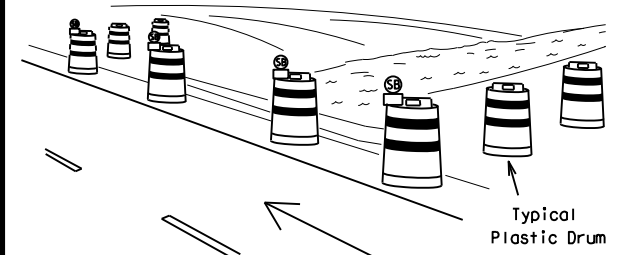
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



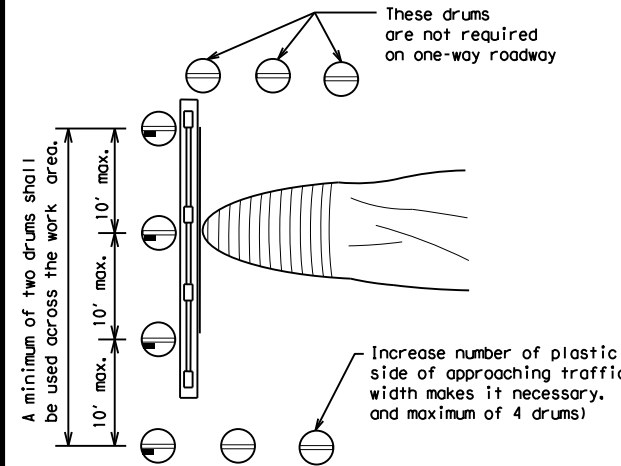
PLAN VIEW

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

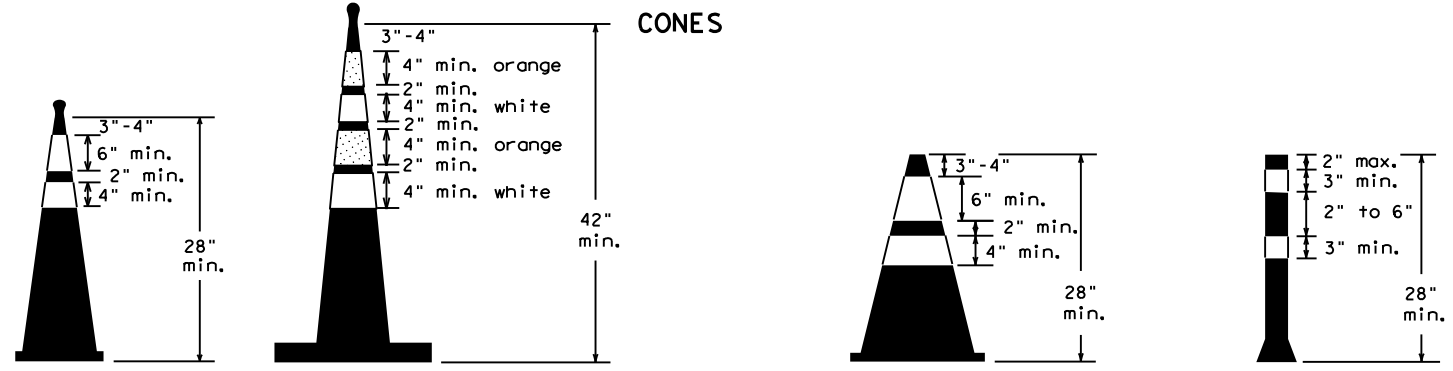


PLAN VIEW

**CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS**

1. Where positive redirection 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
	Steady burn warning light or yellow warning reflector



Two-Piece cones

One-Piece cones

Tubular Marker

28" Cones shall have a minimum weight of 9 1/2 lbs.  
 42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

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



**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

**BC (10) - 21**

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7-13 5-21	PHR	CAMERON	121	



## WORK ZONE PAVEMENT MARKINGS

### GENERAL

- 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.
- Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
- Additional supplemental pavement marking details may be found in the plans or specifications.
- Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
- 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).
- 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.
- All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

### RAISED PAVEMENT MARKERS

- Raised pavement markers are to be placed according to the patterns on BC(12).
- 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

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

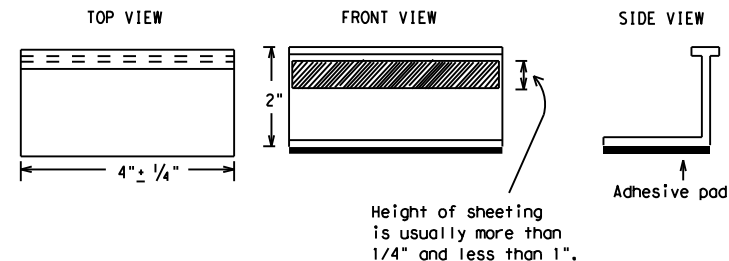
### MAINTAINING WORK ZONE PAVEMENT MARKINGS

- The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
- 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.
- 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.
- 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

- 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.
- 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.
- 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".
- The removal of pavement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
- Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
- Blast cleaning may be used but will not be required unless specifically shown in the plans.
- Over-painting of the markings SHALL NOT BE permitted.
- Removal of raised pavement markers shall be as directed by the Engineer.
- 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.
- 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**

- Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
- 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.
  - 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.
  - 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.
- Small design variances may be noted between tab manufacturers.
- 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

- Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
- All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
- 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).

SHEET 11 OF 12



## BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

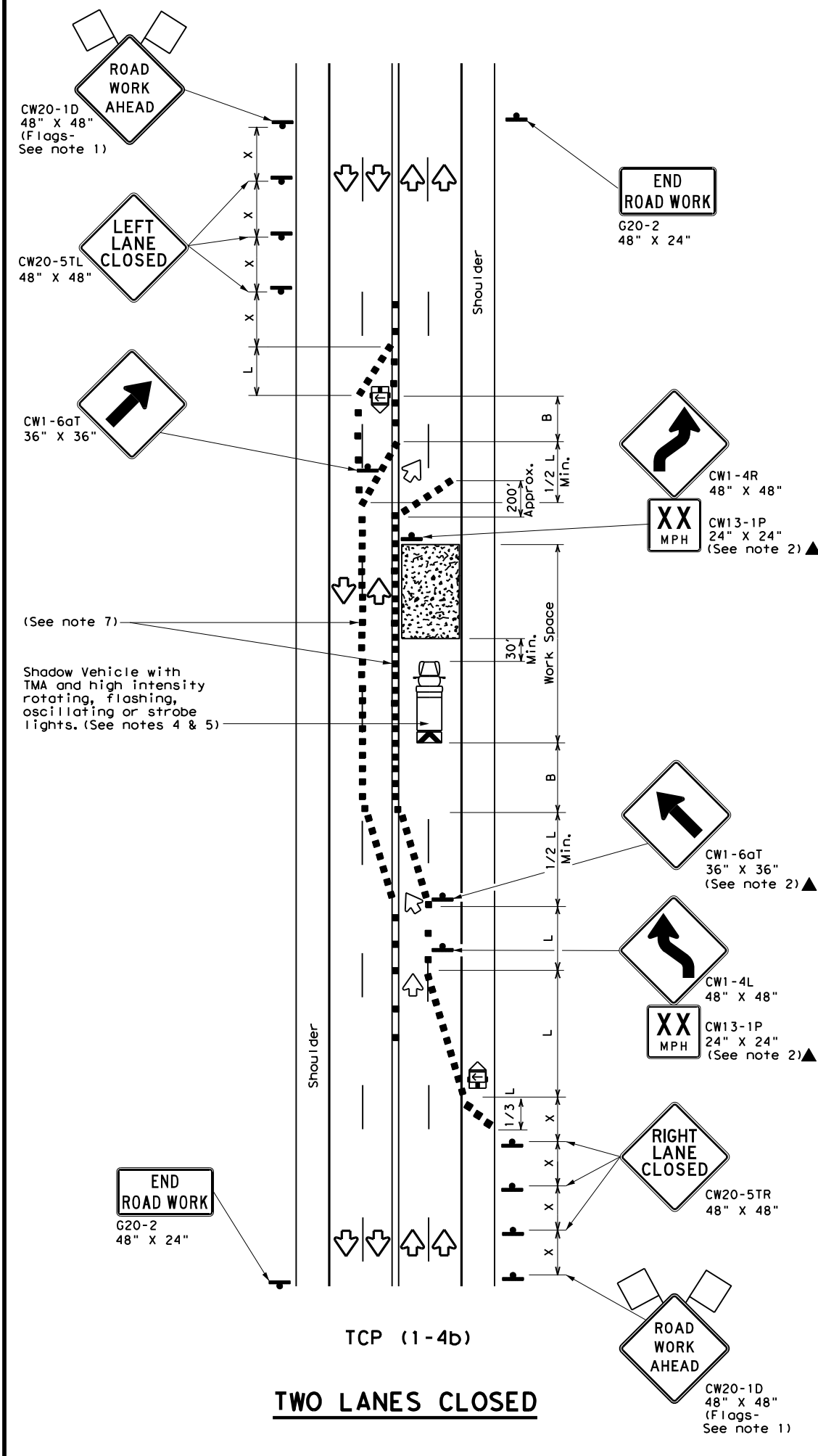
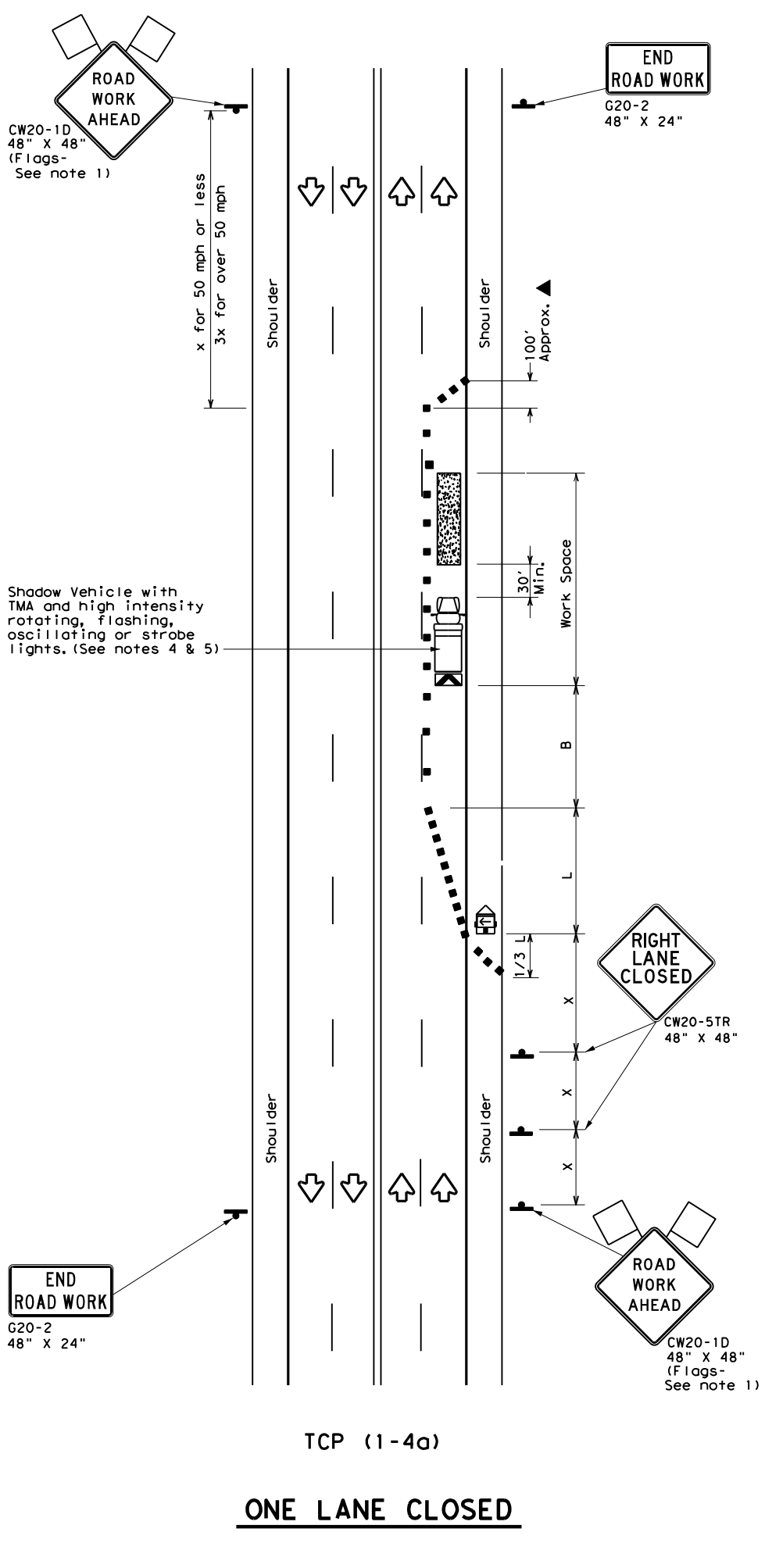
**BC(11)-21**

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© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
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2-98 9-07 5-21	DIST	COUNTY	SHEET NO.	
1-02 7-13	PHR	CAMERON	122	
11-02 8-14				

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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"
		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**
- Flags attached to signs where shown are REQUIRED.
  - 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.
  - The CW20-1D "ROAD WORK AHEAD" sign may be repeated if the visibility of the work zone is less than 1500 feet.
  - 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.
  - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
- TCP (1-4a)**
- If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline where needed to protect the work space from opposing traffic with the arrow panel placed in the closed lane near the end of the merging taper.
- TCP (1-4b)**
- Where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is intended for the areas of conflicting markings, not the entire work zone.

Texas Department of Transportation

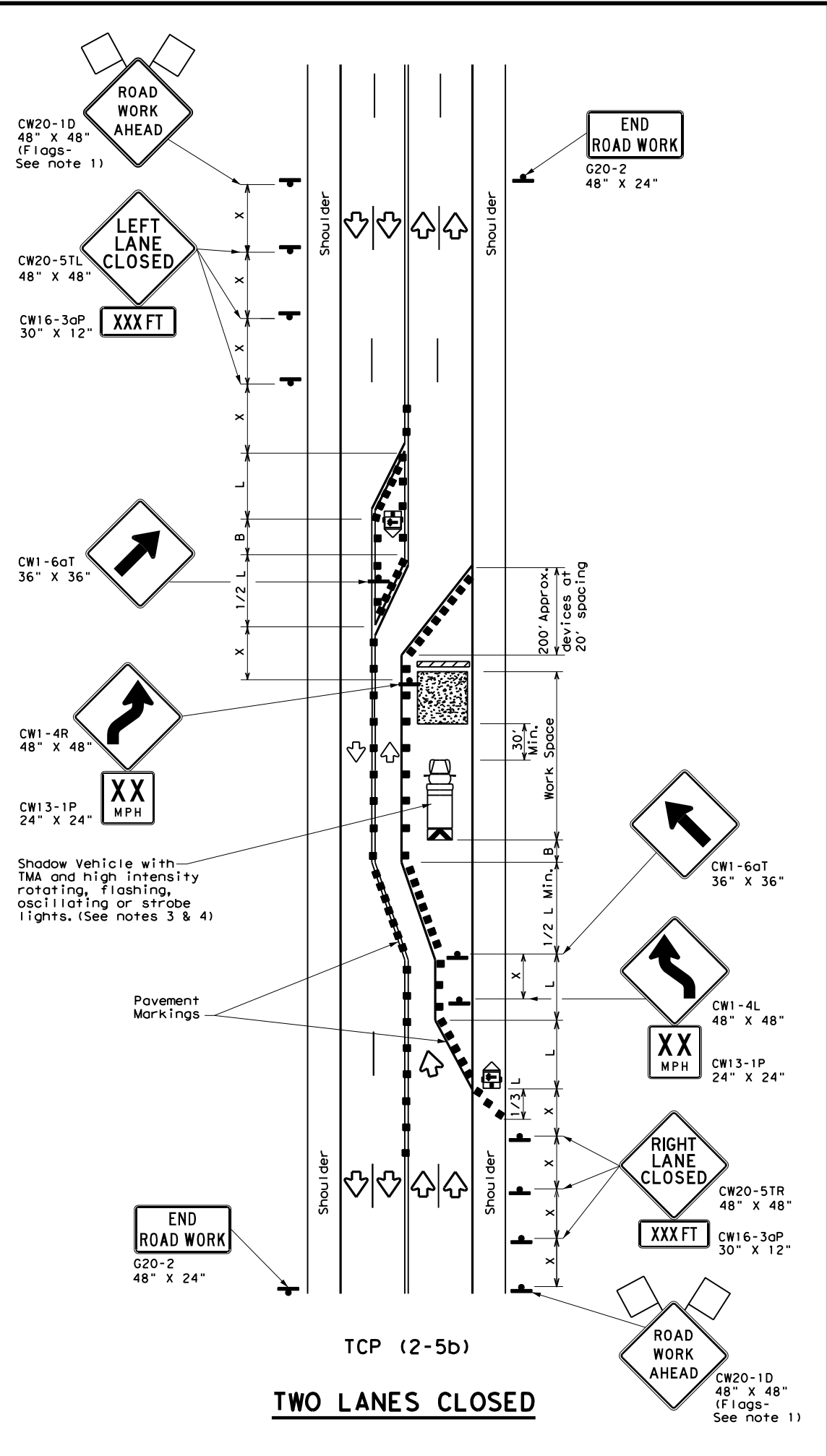
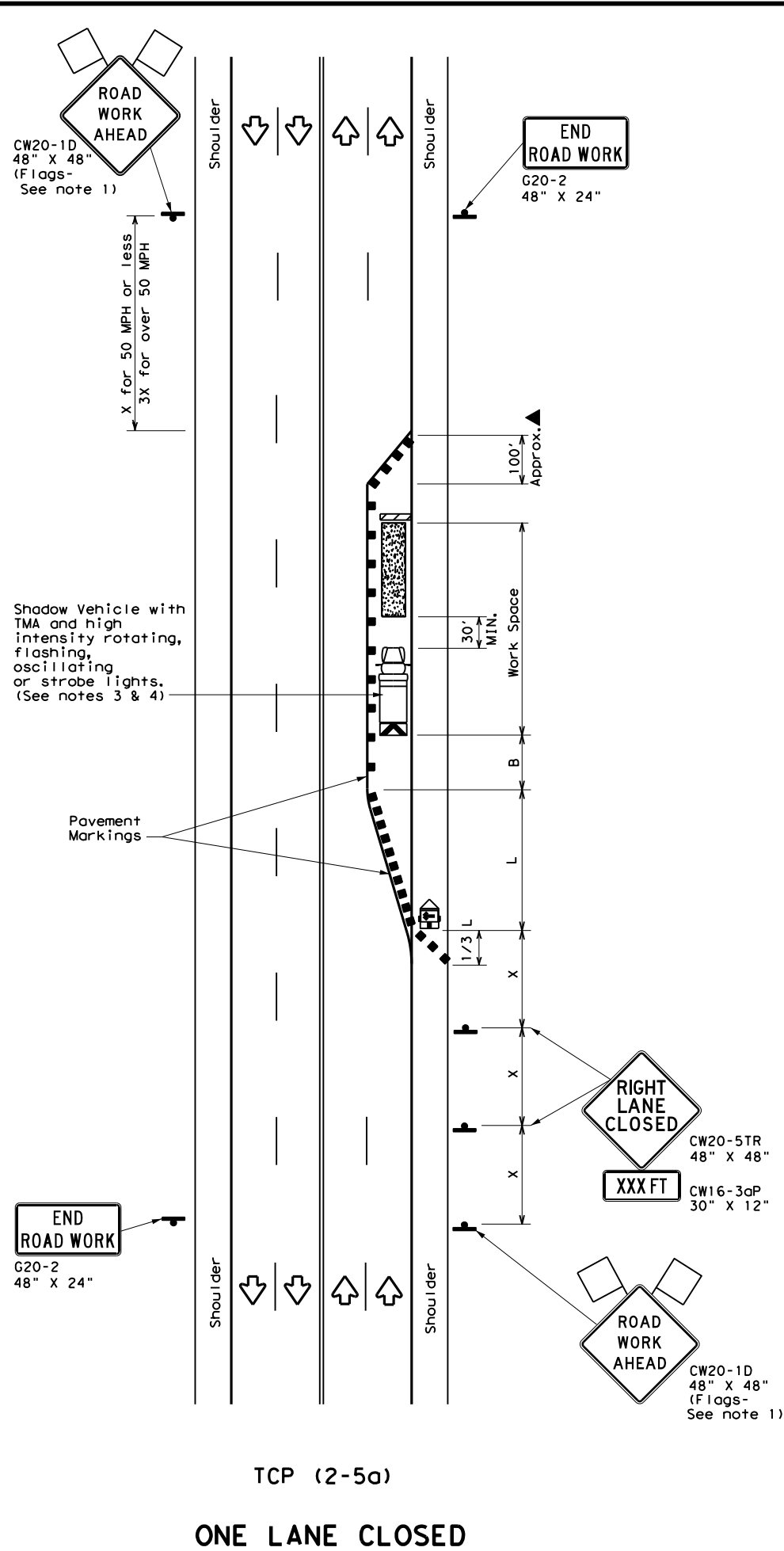
Traffic Operations Division Standard

## TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

### TCP (1-4) - 18

FILE: tcp1-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0220	05	080	SH 48
2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 2-12	PHR	CAMERON	124	
1-97 2-18				





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"
		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**
- Flags attached to signs where shown, are REQUIRED.
  - 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.
  - 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.
  - Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.
  - The downstream taper is optional. When used, it should be 100 feet approximately per lane, with channelizing devices spaced at 20 feet.

- TCP (2-5a)**
- If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline to protect the work space from opposing traffic, with the arrow board placed in the closed lane near the end of the merging taper.
- TCP (2-5b)**
- Conflicting pavement markings shall be removed for long-term projects.

Texas Department of Transportation  
Traffic Operations Division Standard

**TRAFFIC CONTROL PLAN**  
**LONG TERM LANE CLOSURES**  
**MULTILANE CONVENTIONAL RDS.**

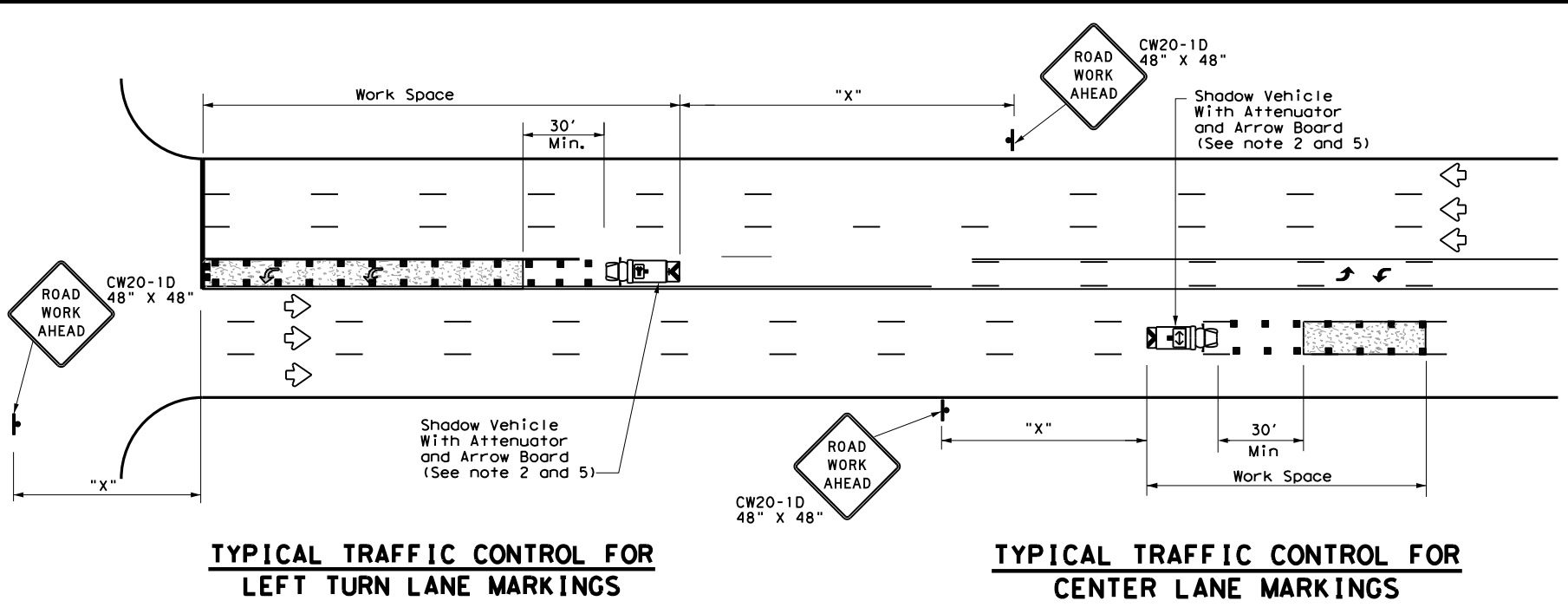
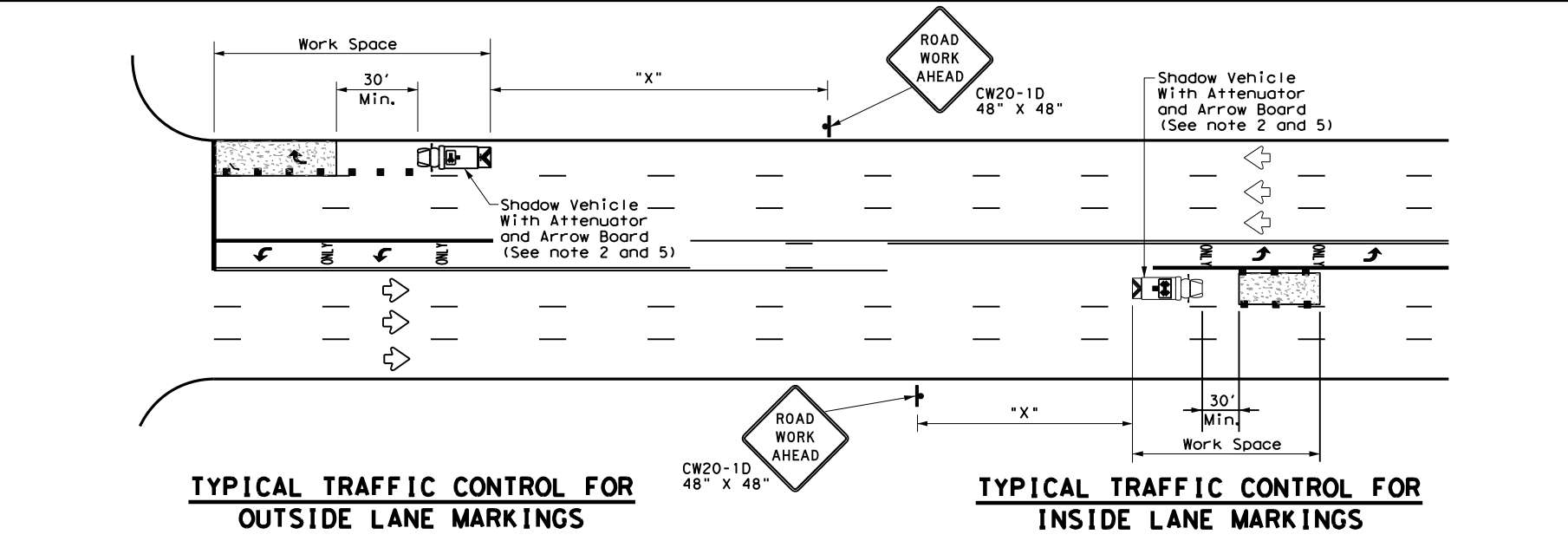
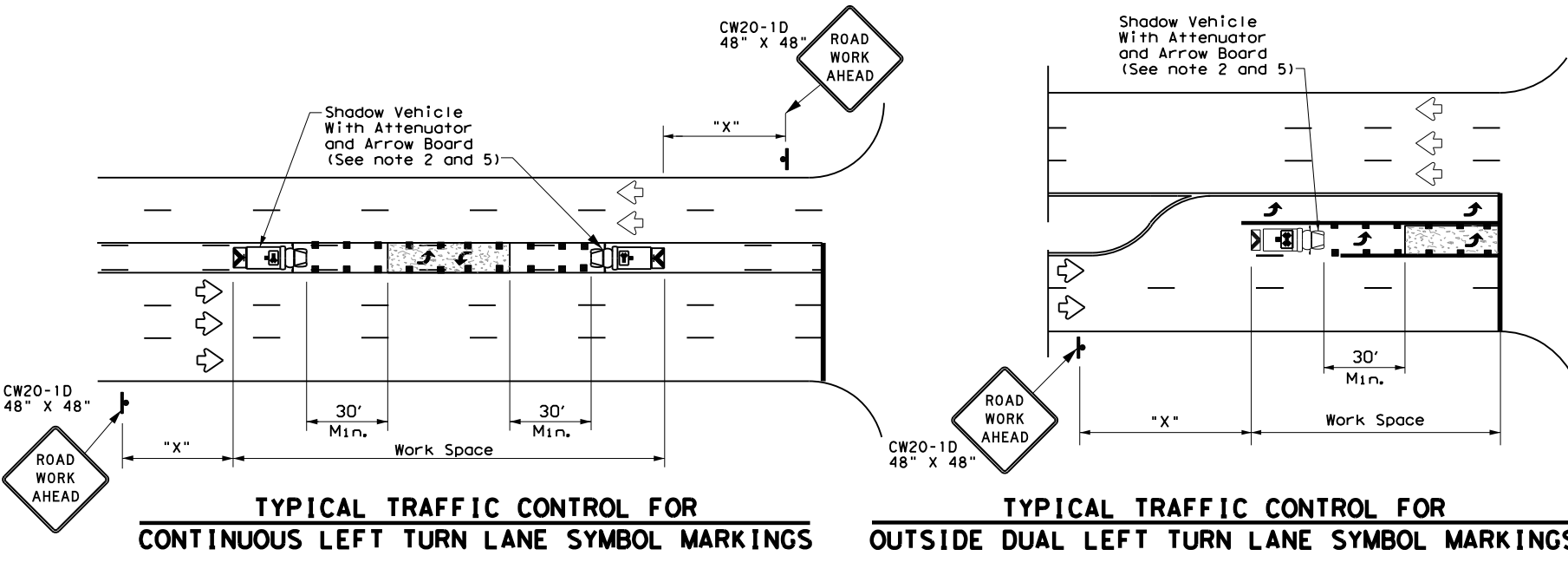
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8-95 2-12	1-97 3-03	DIST: _____	COUNTY: _____	SHEET NO.:
4-98 2-18	PHR	CAMERON		126

1165

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**LEGEND**

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			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 = WS <sup>2</sup> /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'
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60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

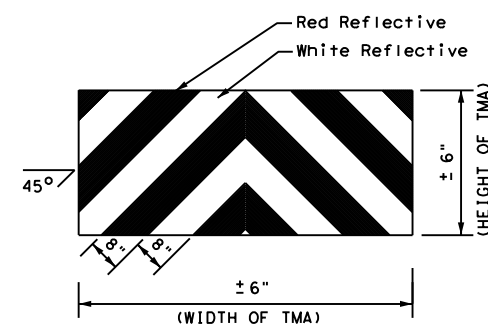
\* Conventional Roads Only  
 \*\* Taper lengths have been rounded off.  
 L=Length of Taper (FT) W=Width of Offset (FT) S=Posted Speed (MPH)

**TYPICAL USAGE**

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

**GENERAL NOTES**

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



**Texas Department of Transportation**  
 Traffic Operations Division Standard

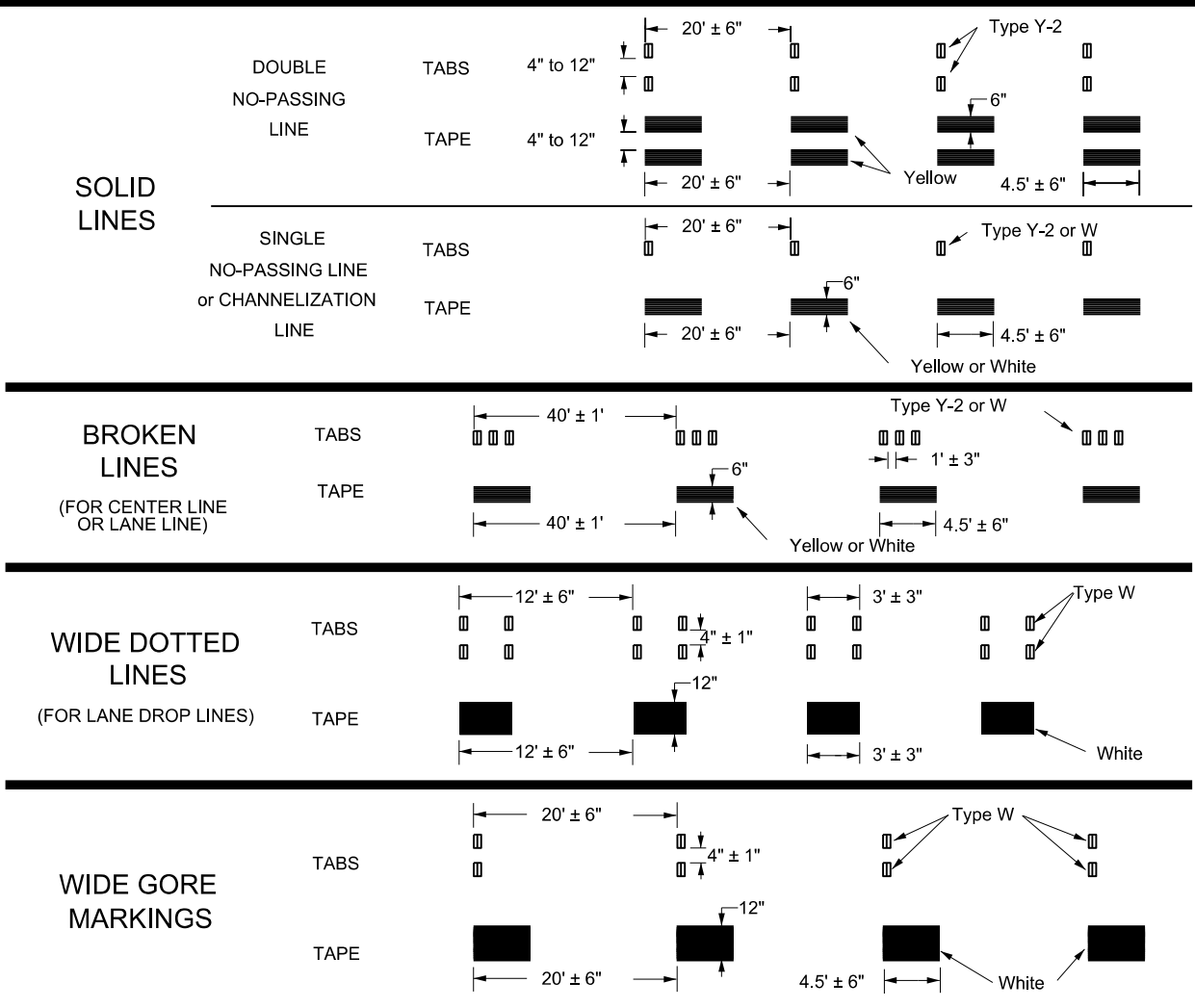
**TRAFFIC CONTROL PLAN  
 MOBILE OPERATIONS FOR  
 ISOLATED WORK AREAS  
 UNDIVIDED HIGHWAYS  
 TCP(3-4)-13**

FILE:	tcp3-4.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
©TxDOT	July, 2013	CONT:	SECT	JOB:	HIGHWAY	REVISIONS:			
		0220	05	080	SH 48				
		DIST:	COUNTY:	SHEET NO.					
		PHR	CAMERON	127					

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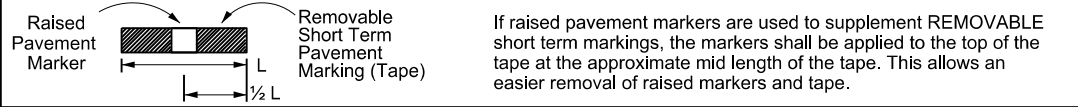
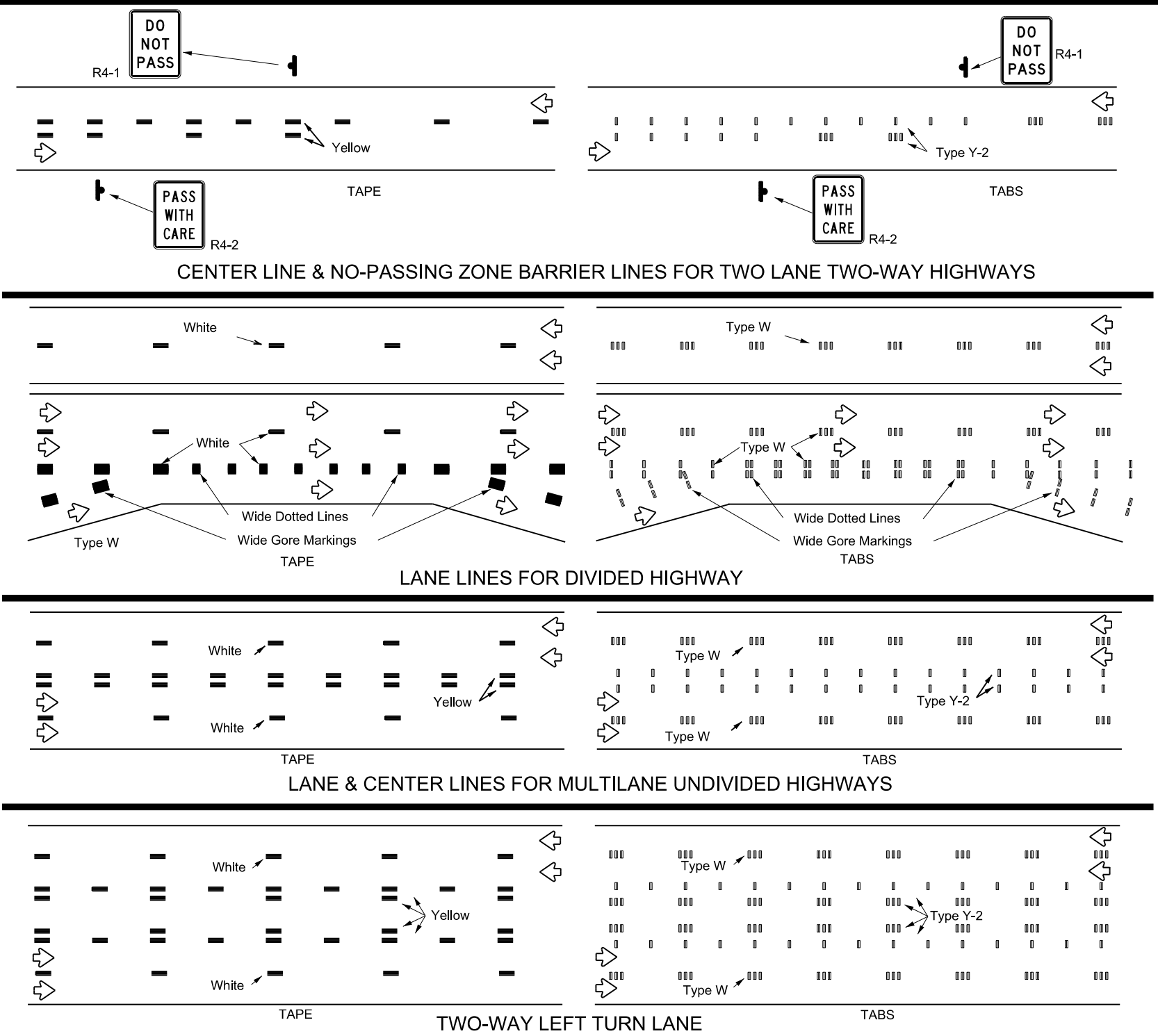
## WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



- NOTES:**
- Short term pavement markings may be prefabricated markings (stick down tape) or temporary flexible reflective roadway marker tabs unless otherwise specified elsewhere in plans.
  - Short term pavement markings shall NOT be used to simulate edge lines.
  - 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.
  - 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.
  - 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.
  - 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.
  - 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).
  - 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)**
- 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).
  - Tabs shall meet requirements of Departmental Material Specification DMS-8242.
  - 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.
  - No two consecutive tabs nor four tabs per 1000 feet of line shall be missing or fail to meet the visual performance requirements of Note 3.

## WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



- PREFABRICATED PAVEMENT MARKINGS**
- Temporary Removable Prefabricated Pavement Markings shall meet the requirements of DMS-8241.
  - Non-removable Prefabricated Pavement Markings shall meet the requirements of either DMS-8240 "Permanent Prefabricated Pavement Markings" or DMS-8243 "Temporary Construction-Grade Prefabricated Pavement Markings."
- RAISED PAVEMENT MARKERS**
- 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)**
- 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](http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm)

Texas Department of Transportation  
 Traffic Safety Division Standard

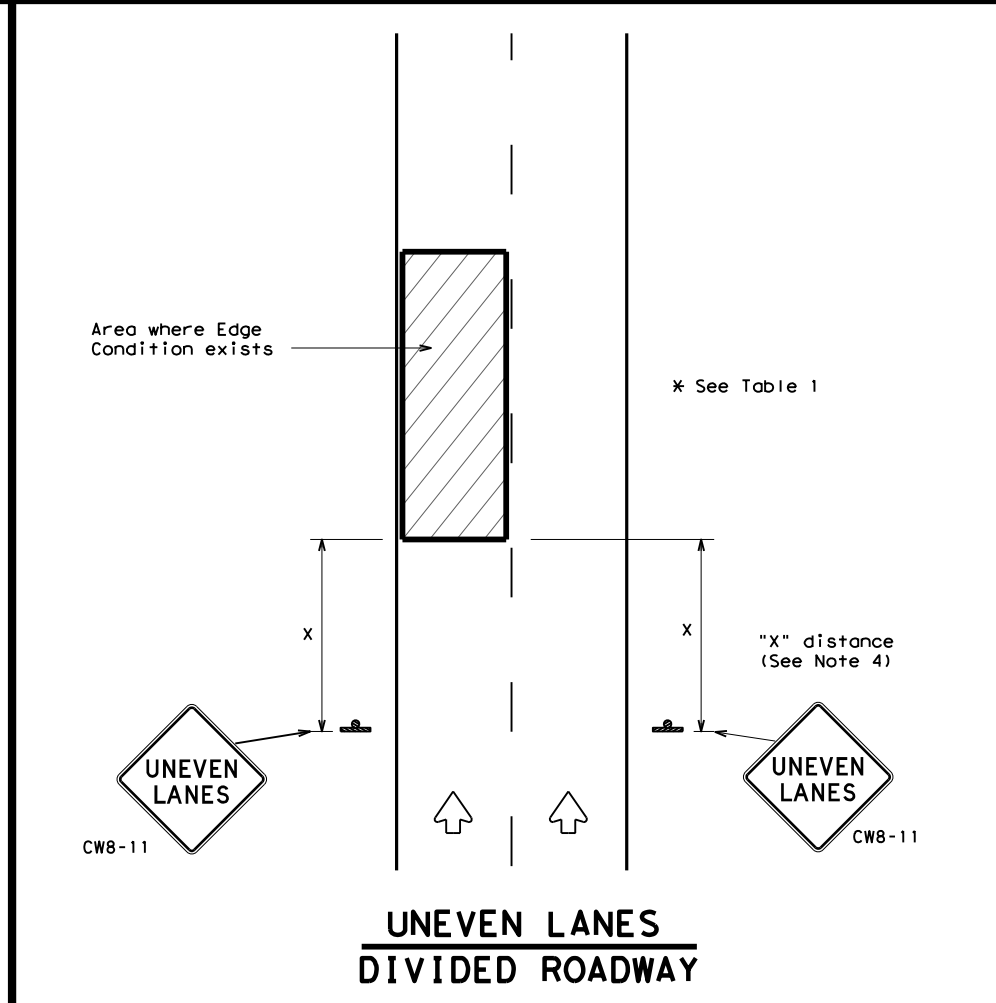
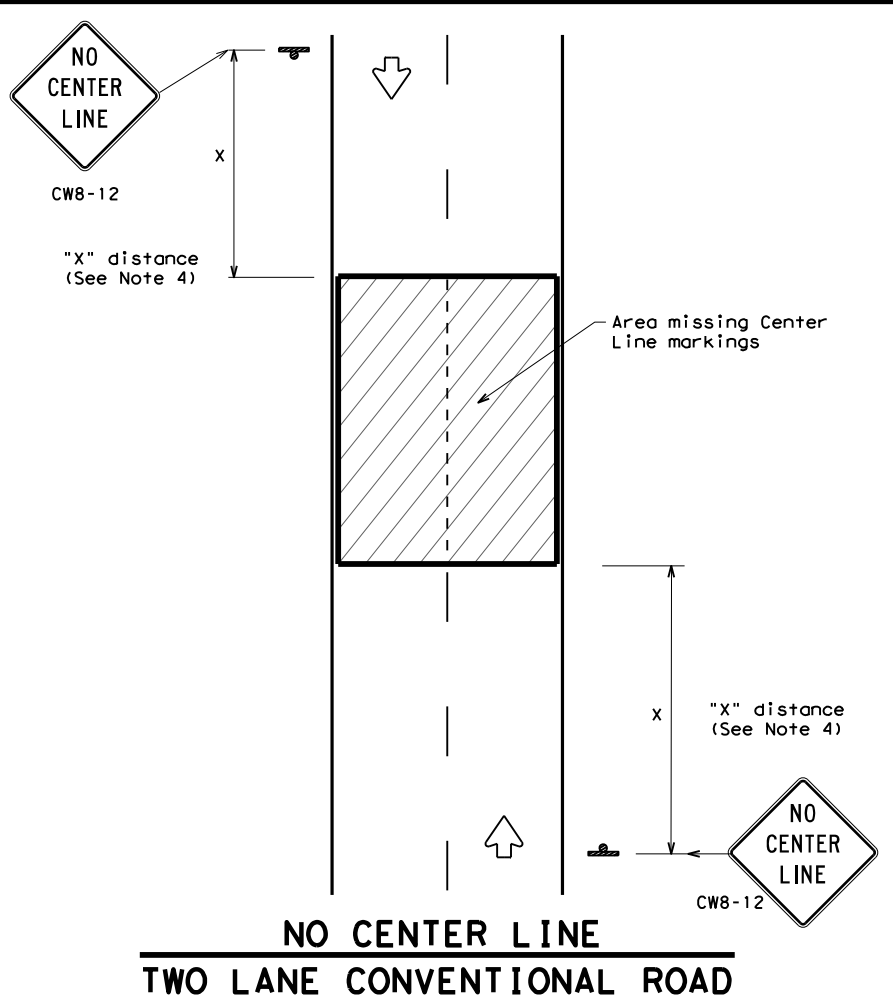
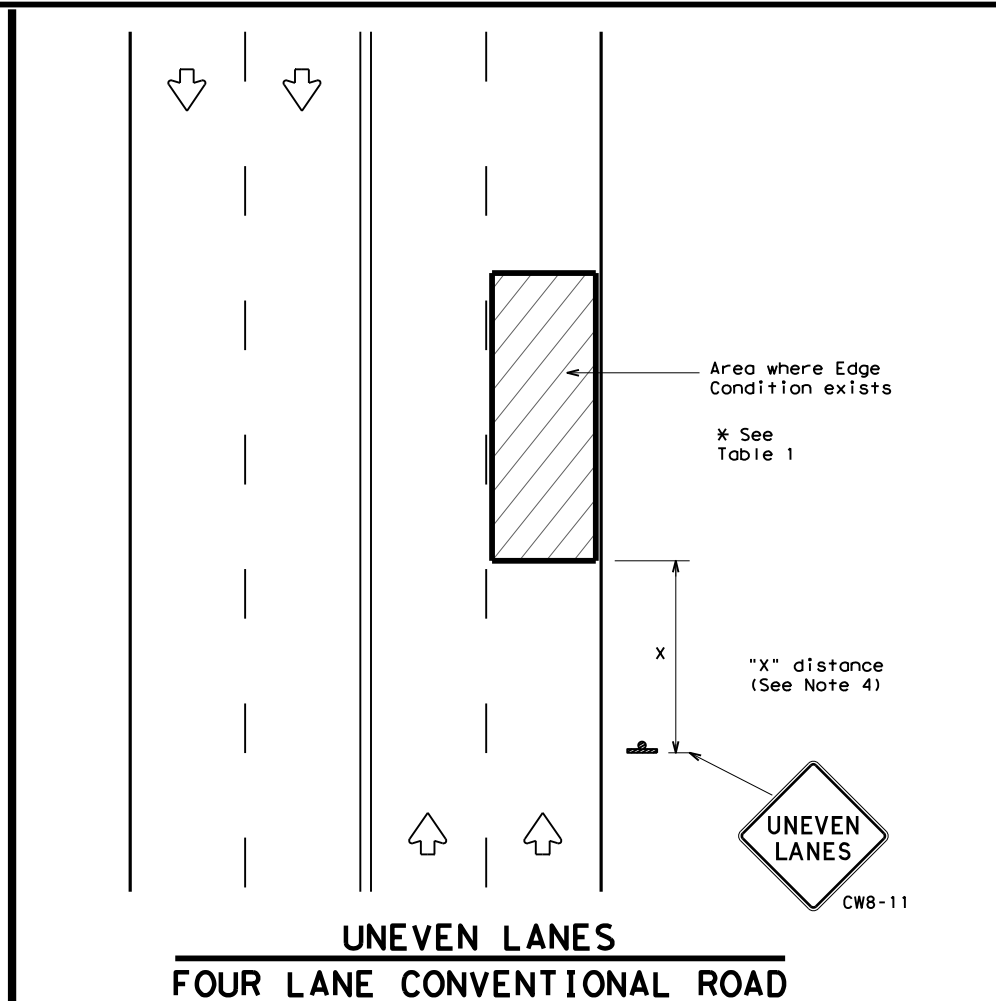
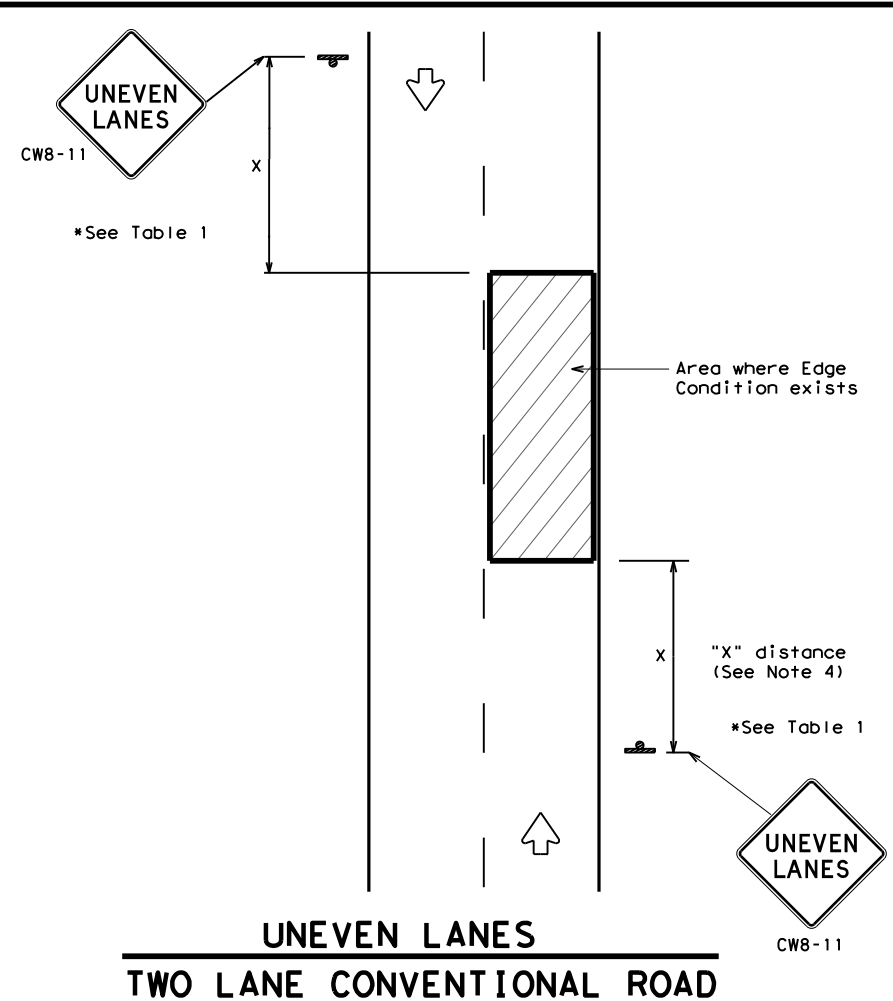
### WORK ZONE SHORT TERM PAVEMENT MARKINGS

## WZ(STPM)-23

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© TxDOT February 2023	CONT: 0220	SECT: 05	JOB: 080	HIGHWAY: SH 48
4-92 7-13 1-97 2-23 3-03	REVISIONS	DIST: PHR	COUNTY: CAMERON	SHEET NO.: 128

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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 <sub>FL</sub> OR TYPE C <sub>FL</sub> SHEETING
BLACK	LEGEND & BORDERS	ACRYLIC NON-REFLECTIVE SHEETING

**GENERAL NOTES**

- 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.
- 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.
- 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.
- Signs shall be spaced at the distances recommended as per BC standards.
- 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."
- 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.
- Short term markings shall not be used to simulate edge lines.
- All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition.

TABLE 1		
Edge Condition	Edge Height (D)	* Warning Devices
①	Less than or equal to: 1/4" (maximum-planing) 1 1/2" (typical-overlay)	Sign: CW8-11
②	Less than or equal to 3"	Sign: CW8-11
③	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

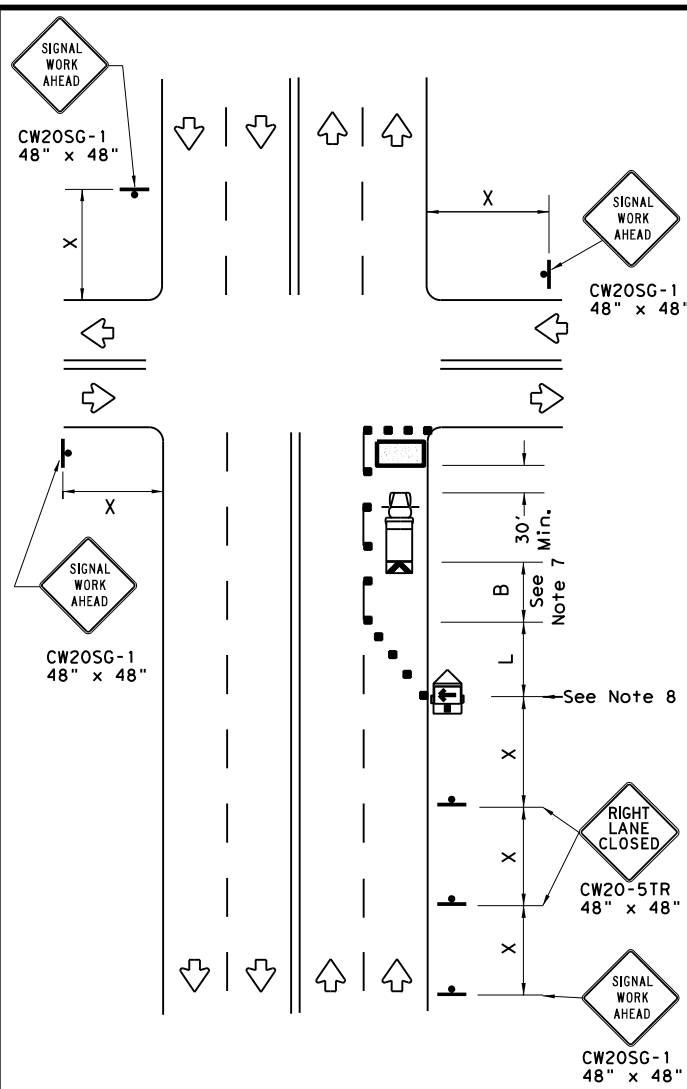
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1-97	3-03			
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	PHR	CAMERON		129

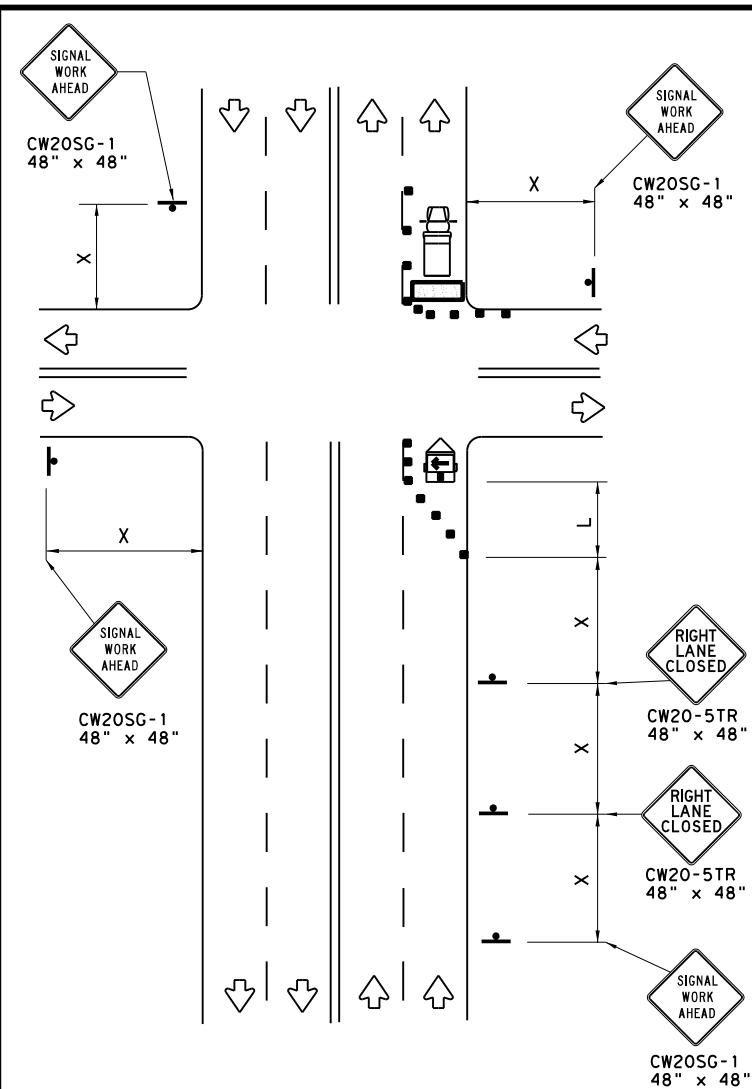


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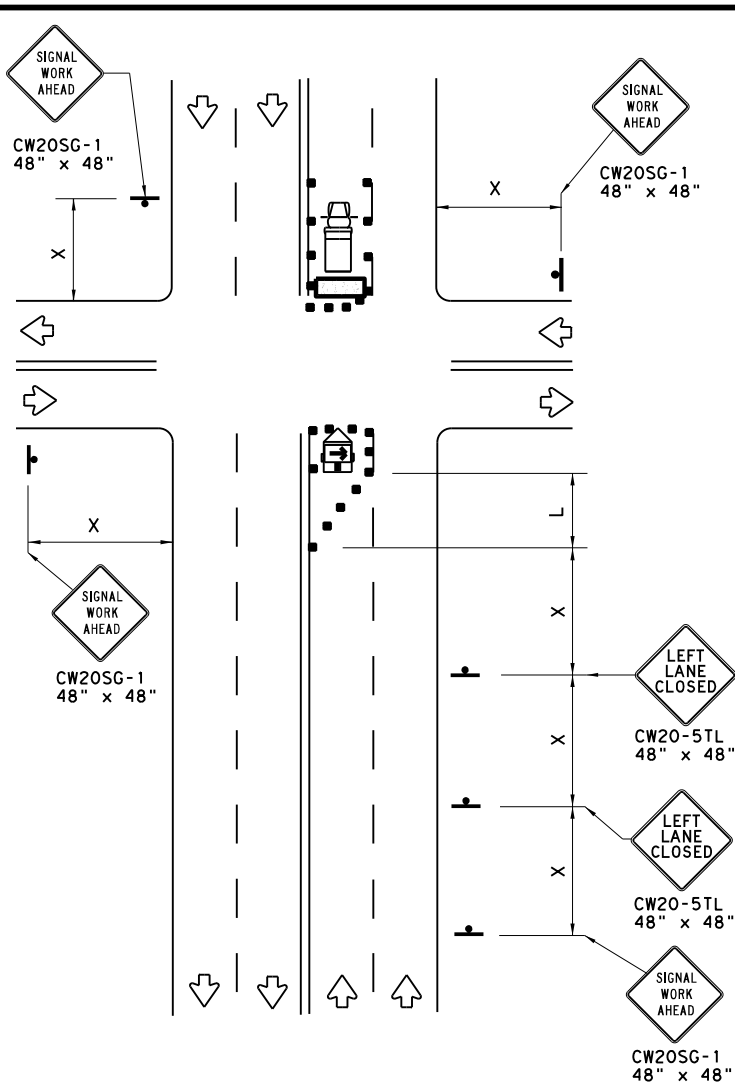
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**NEAR SIDE LANE CLOSURE**  
 SHORT DURATION OR SHORT TERM STATIONARY



**FAR SIDE RIGHT LANE CLOSURE**  
 SHORT DURATION OR SHORT TERM STATIONARY



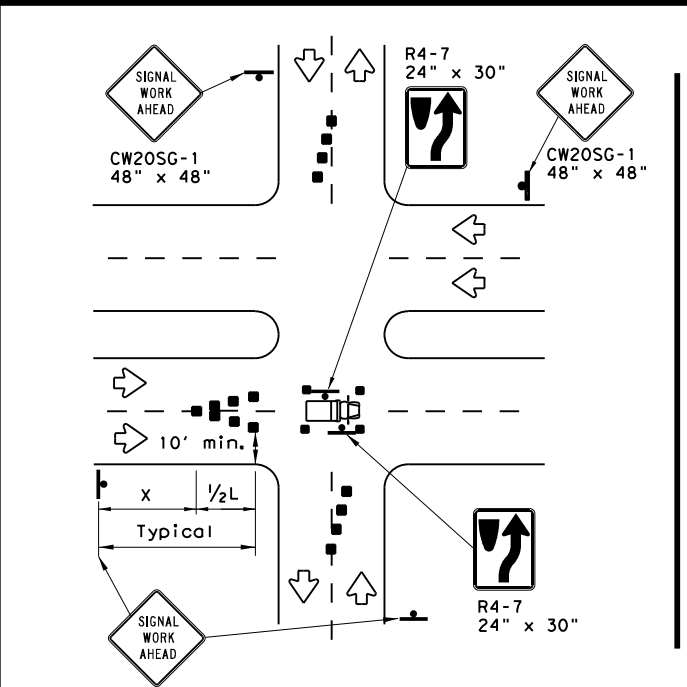
**FAR SIDE LEFT LANE CLOSURE**  
 SHORT DURATION OR SHORT TERM STATIONARY

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

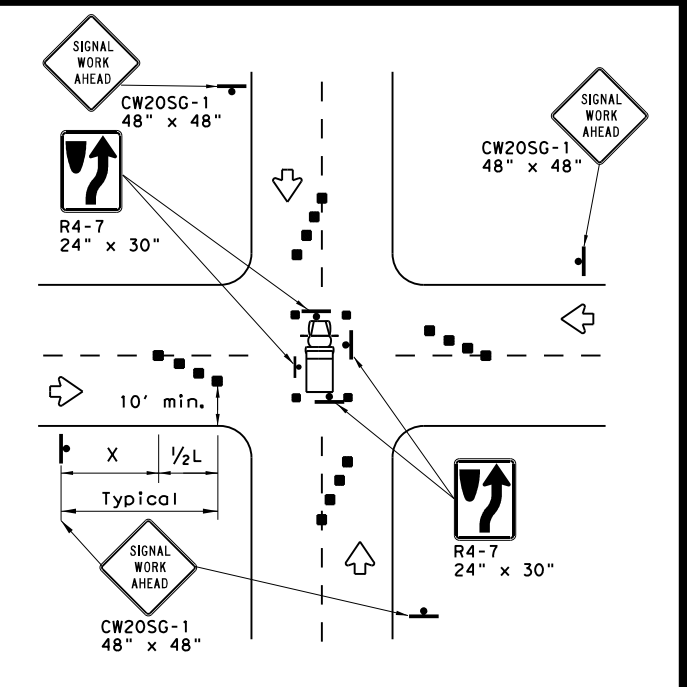
Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'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

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



**OPERATIONS IN THE INTERSECTION**  
 SHORT DURATION



**GENERAL NOTES**

- 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.
- Obstructions or hazards at the work area shall be clearly marked and delineated at all times.
- Flaggers and Flagger Symbol (CW20-7) signs may be required according to field conditions.
- Vehicles parked in roadway shall be equipped with at least two high intensity rotating, flashing, oscillating or strobe type lights.
- High level warning devices (flag trees) may be used at corners of the vehicle.
- 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.
- 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.
- 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.
- 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.

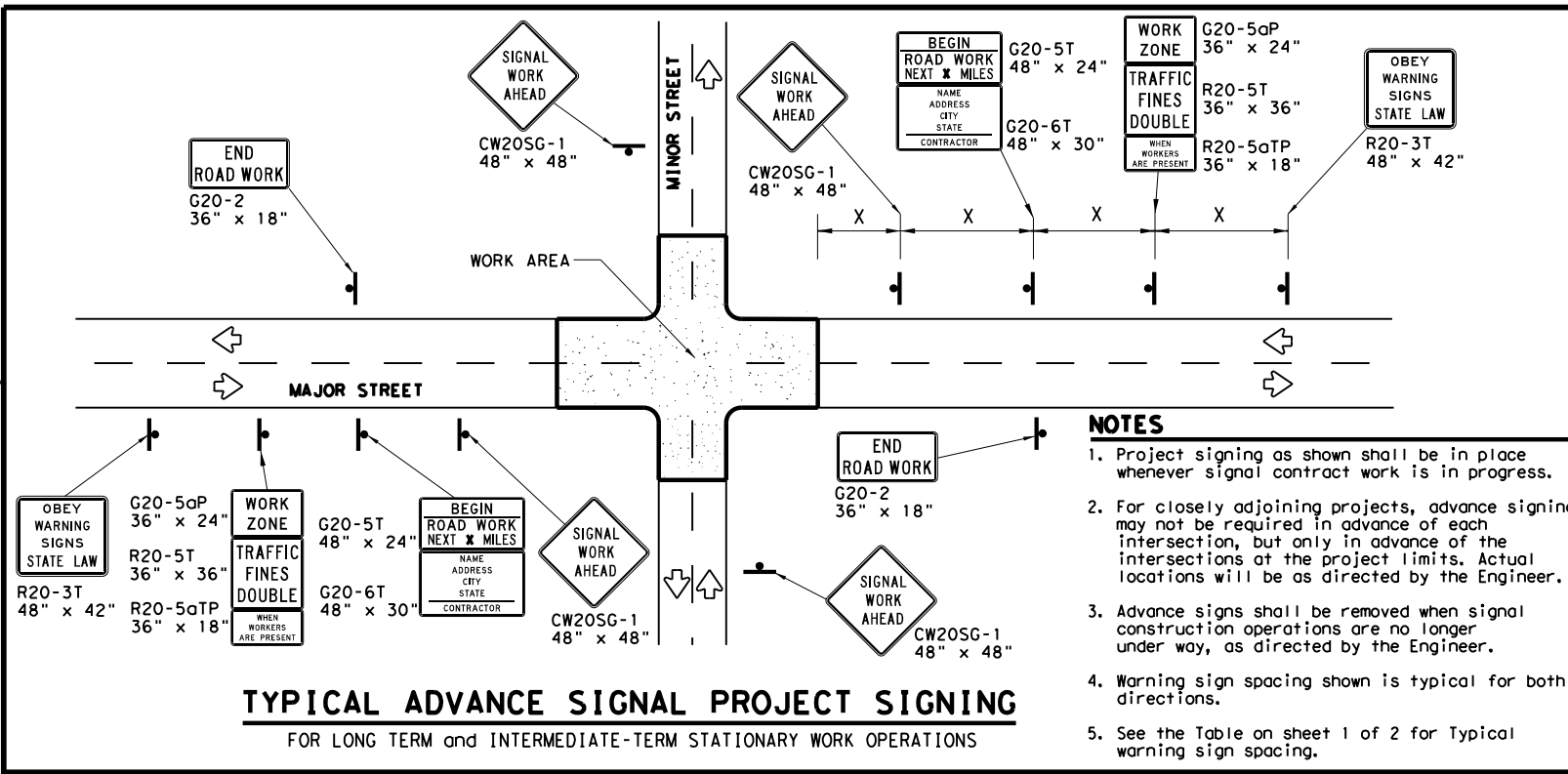


**TRAFFIC SIGNAL WORK TYPICAL DETAILS**

**WZ(BTS-1)-13**

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**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.

**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 60.02 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 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.

**LEGEND**

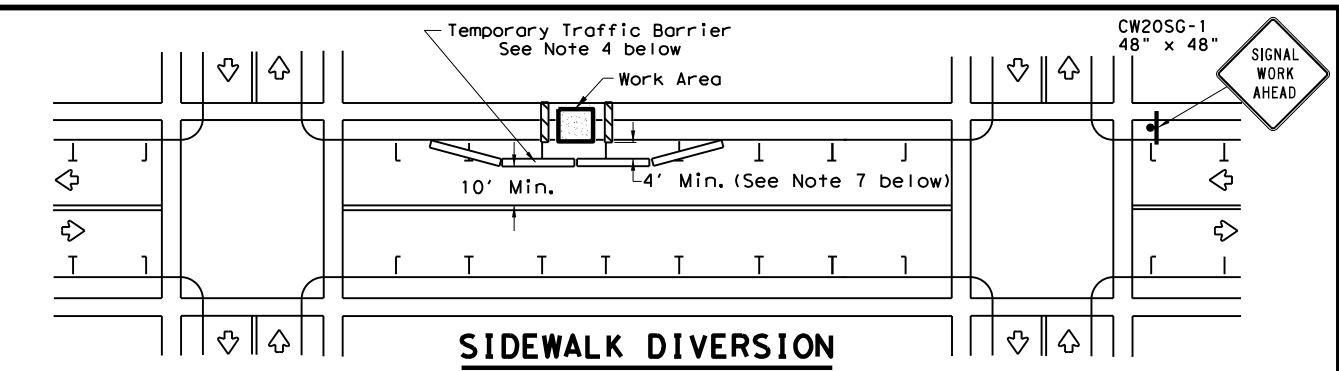
	Sign
	Channelizing Devices
	Type 3 Barricade

**DEPARTMENTAL MATERIAL SPECIFICATIONS**

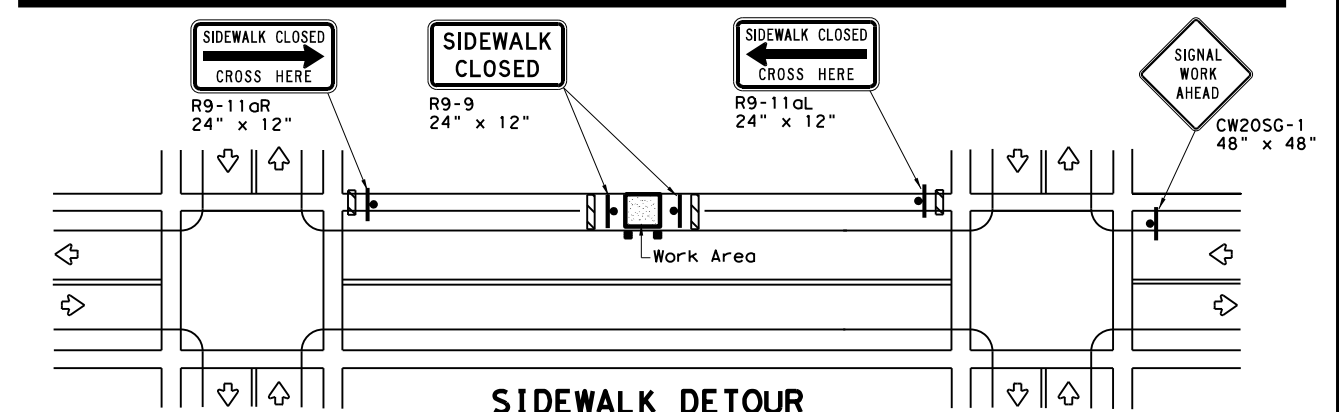
SIGN FACE MATERIALS	DMS-8300
FLEXIBLE ROLL-UP REFLECTIVE SIGNS	DMS-8310

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B <sub>FL</sub> OR TYPE C <sub>FL</sub> SHEETING
WHITE	BACKGROUND	TYPE A SHEETING
BLACK	LEGEND & BORDERS	ACRYLIC NON-REFLECTIVE SHEETING

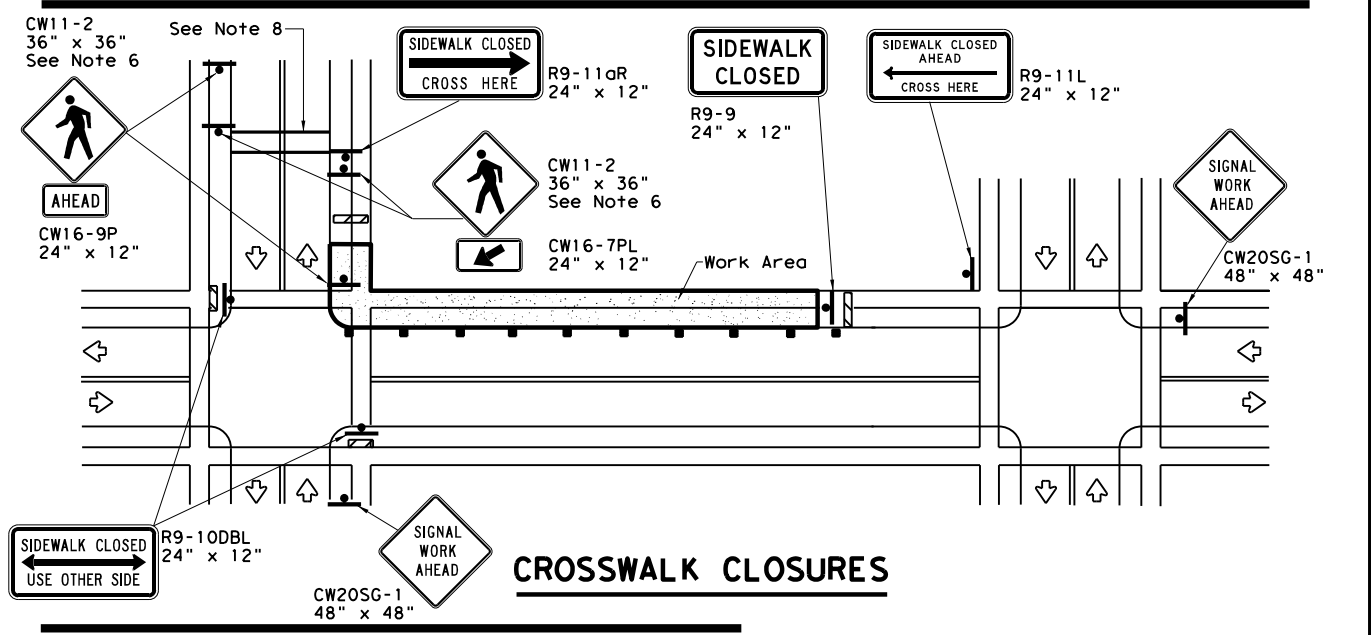
Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:  
[http://www.txdot.gov/txdot\\_library/publications/construction.htm](http://www.txdot.gov/txdot_library/publications/construction.htm)



**SIDEWALK DIVERSION**



**SIDEWALK DETOUR**



**CROSSWALK CLOSURES**

**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

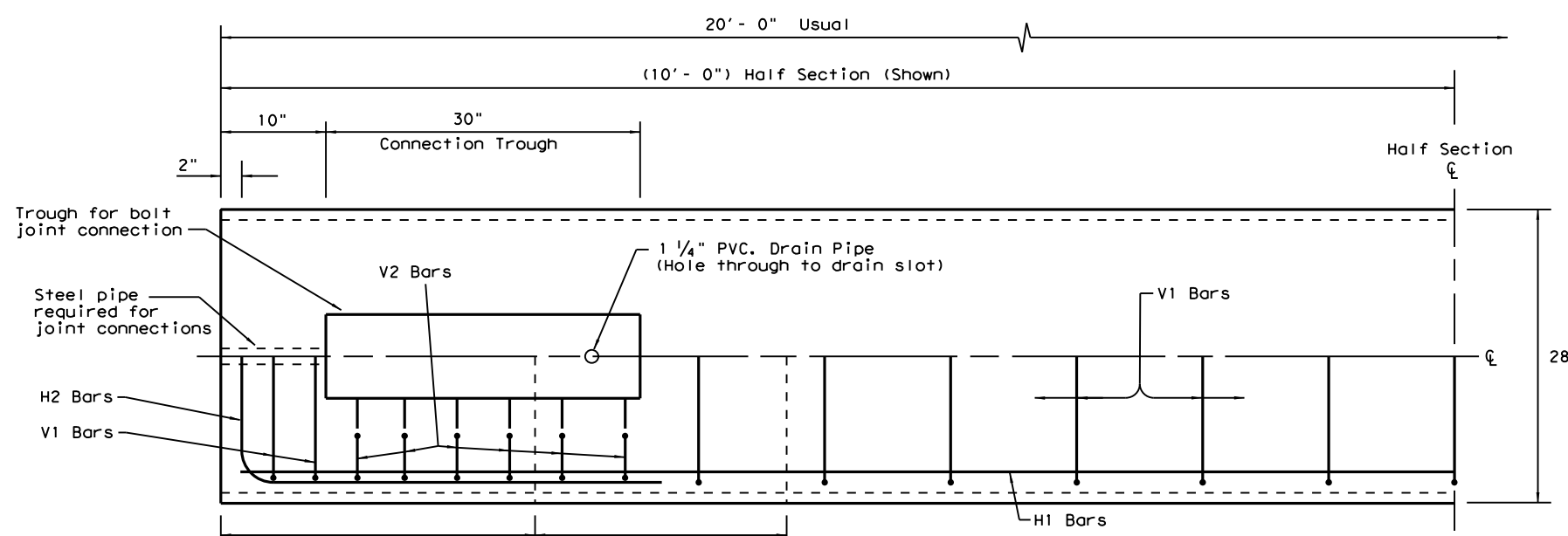
**TRAFFIC SIGNAL WORK BARRICADES AND SIGNS**

**WZ (BTS-2) - 13**

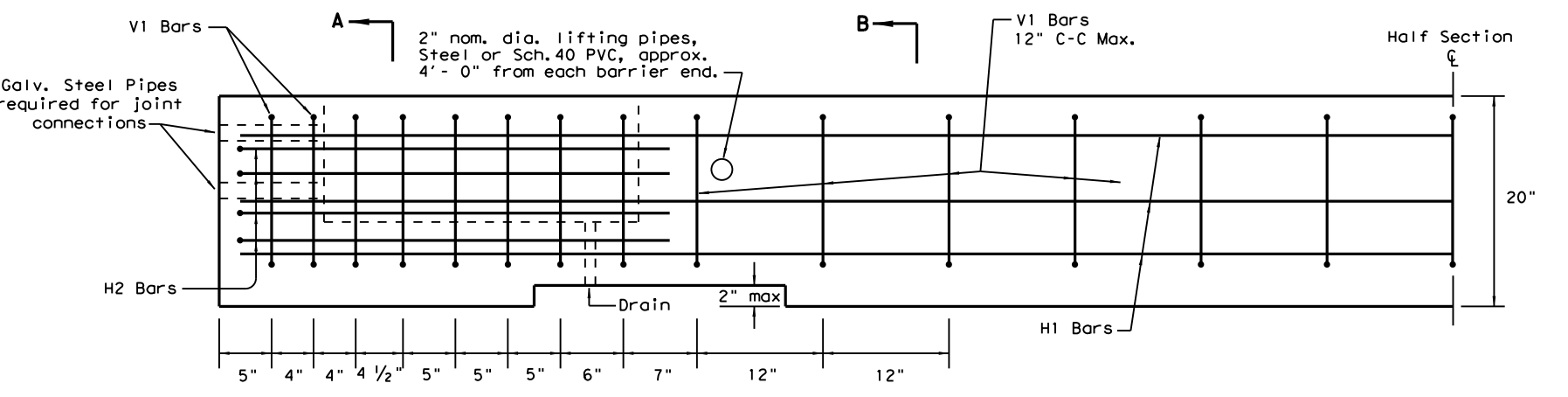
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© TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
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2-98 10-99 7-13	DIST	COUNTY	SHEET NO.	
4-98 3-03	PHR	CAMERON	131	

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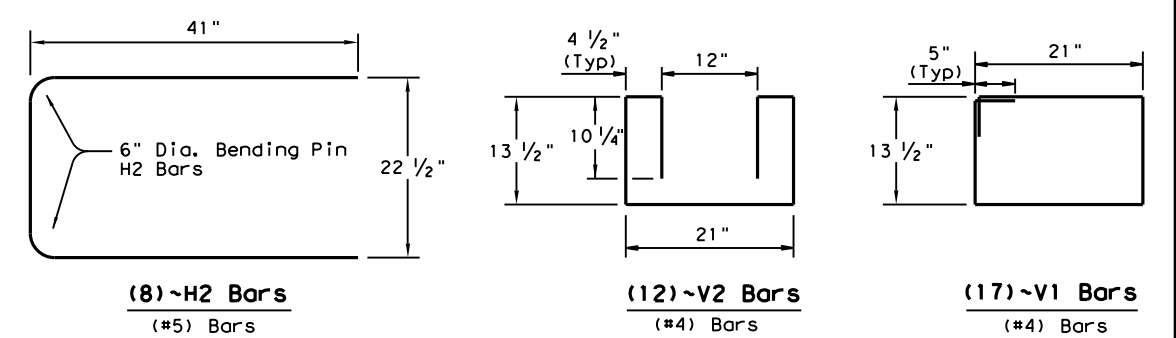
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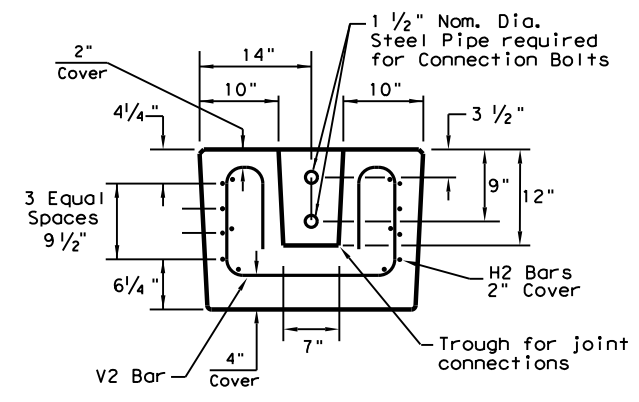
**PLAN**  
**(TYPE 1) BARRIER SEGMENT**  
 (SYMMETRICAL ABOUT CENTER LINES)



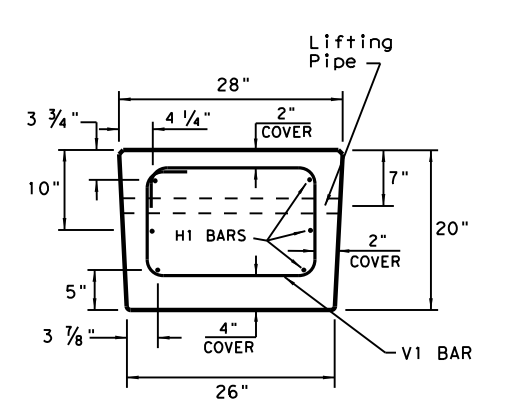
**ELEVATION**  
**(TYPE 1) BARRIER SEGMENT**  
 (SYMMETRICAL ABOUT CENTER LINES)



**REINFORCING STEEL DETAILS**  
 TYPE 1 - BARRIER SEGMENT  
 Note: Use 2" Dia. Bending Pin, unless otherwise shown



**SECTION A-A**



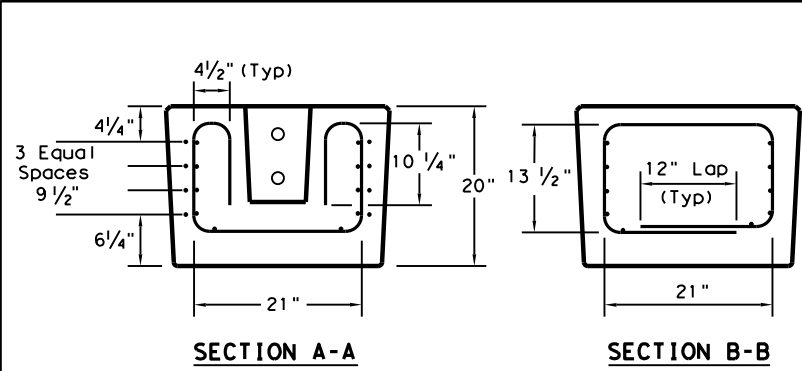
**SECTION B-B**

**GENERAL NOTES**

1. Low Profile Concrete Barrier (LPCB), is approved for use in temporary work zone locations, where the posted speed is 45 mph, or less.
2. Concrete shall be Class H for precast barrier with a minimum compressive strength of 3,600 psi.
3. Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
4. Precast LPCB barrier length shall be 20 ft.
5. All barrier edges shall have 3/4" chamfer or a tooling radius.
6. Joint connection hardware shall be in accordance with Item 449, "Anchor Bolts," and is considered subsidiary.
7. Steel pipe required for joint connection bolts shall be galvanized in accordance with Item 445, "Galvanizing."
8. Welded wire reinforcement (WWR) may be used in lieu of conventional reinforcement for Type 1 barrier, and shall meet the requirements shown.

**FOR CONTRACTORS INFORMATION ONLY**

(TYPE 1) APPROX. QUANTITIES 20 FT. SECTION		
CONCRETE	CY	2.6
REINFORCING STEEL	LBS	330
TOTAL BARRIER WT.	LBS	11000



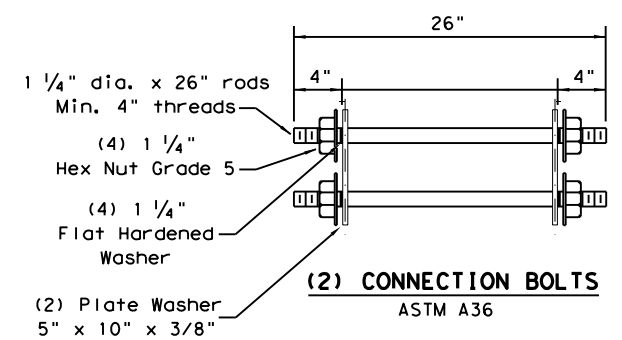
**WELDED WIRE REINFORCEMENT (WWR) - OPTIONAL REINFORCING**

**(WWR) GENERAL NOTES**

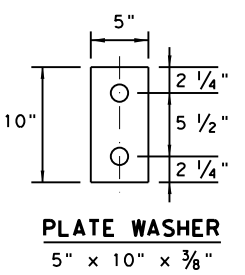
1. Deformed Welded Wire Reinforcement shall conform to ASTM A497.
2. Welded wire cage may be cut or bent, if necessary, but must be approved by the Engineer.
3. Combinations of reinforcing steel and WWR are permitted, as directed by the Engineer. The dimensions from the end of the barrier section to the first wire shall not exceed 3".

**REQUIRED (WWR) WIRE DESIGN**

- 8 ~ (D31) Horizontal Wires (Equally spaced)
- 10 ~ (D20) Horizontal Wires (Equally spaced)
- 29 ~ (D20) Vertical Wires (Spaced as shown in Elevation View)



**(2) CONNECTION BOLTS**  
 ASTM A36



**PLATE WASHER**  
 5" x 10" x 3/8"

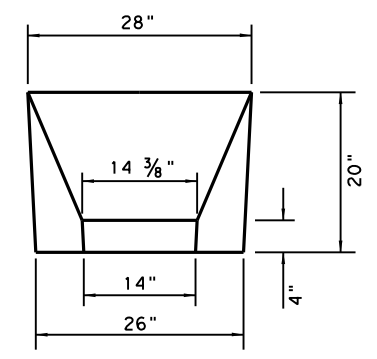
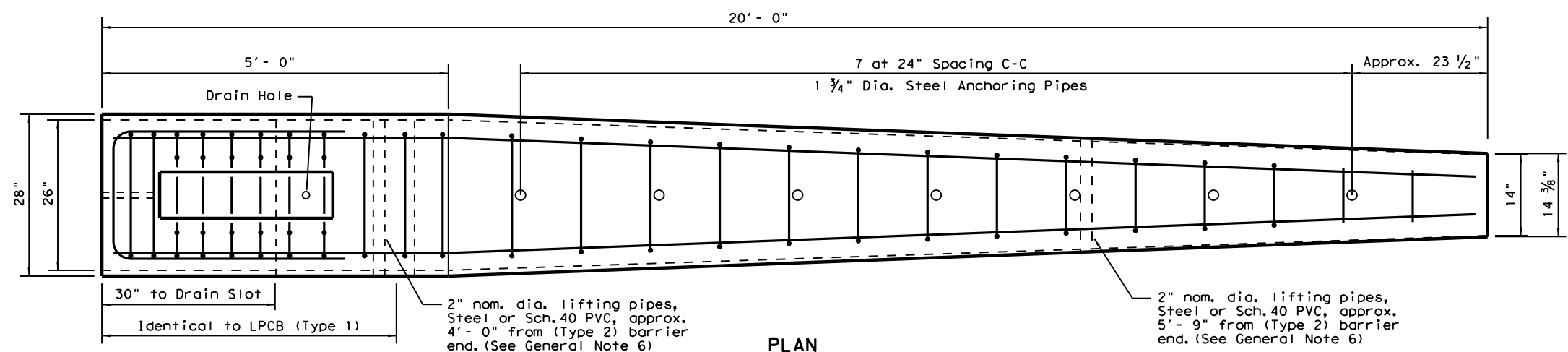
Note: Rods, Hex nuts and Washers shall be Galvanized.

Texas Department of Transportation  
 Design Division Standard

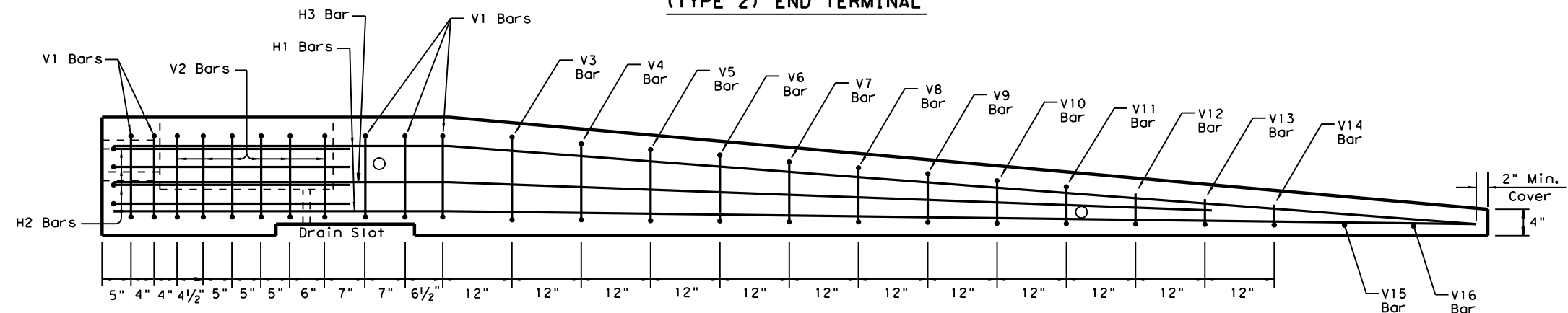
**LOW PROFILE CONCRETE BARRIER PRECAST BARRIER (TYPE 1) LPCB-13**

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DIST	COUNTY	SHEET NO.		
PHR	CAMERON	132		

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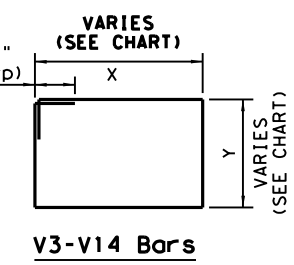


APPROACH VIEW

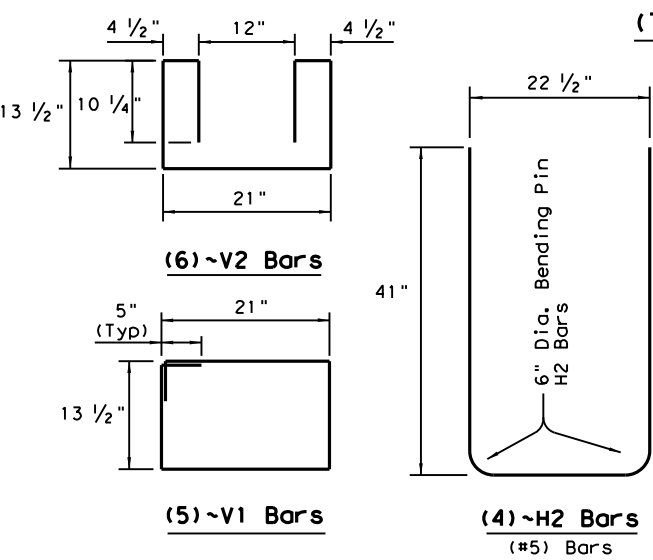


PLAN (TYPE 2) END TERMINAL

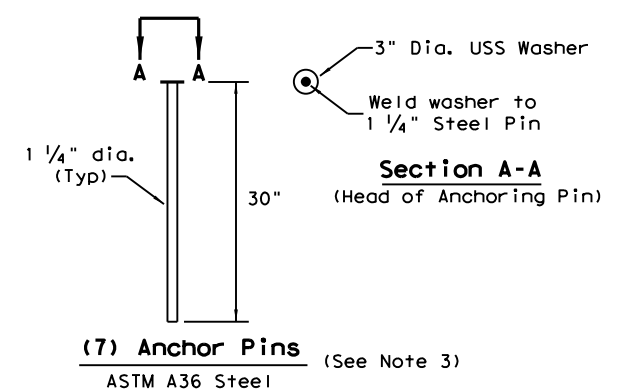
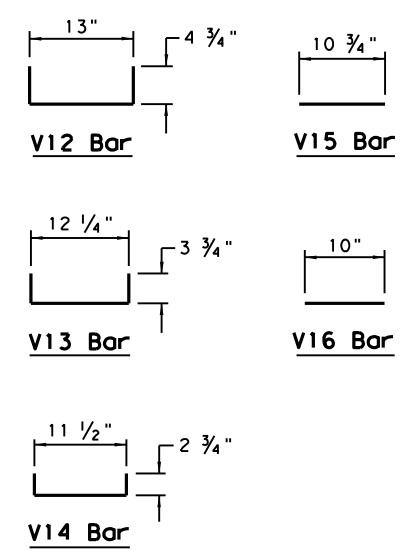
ELEVATION (TYPE 2) END TERMINAL



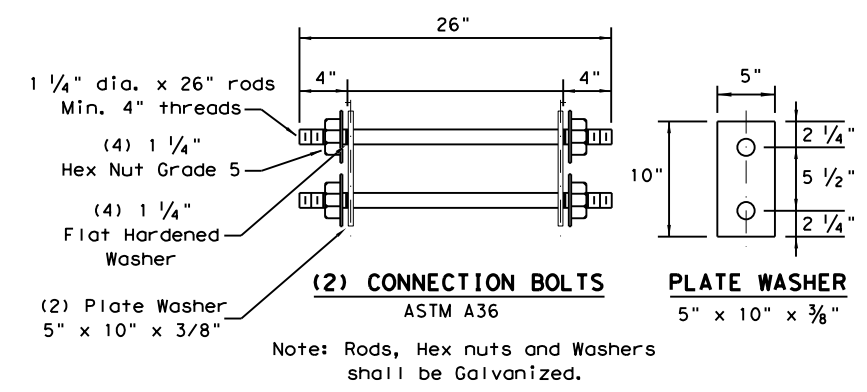
BAR (#4)	X (IN.)	Y (IN.)
V3 BAR	20 1/4	14 1/2
V4 BAR	19 1/2	13 1/2
V5 BAR	18 1/2	12 1/4
V6 BAR	17 1/2	11 1/4
V7 BAR	17	10 1/4
V8 BAR	16 1/4	9
V9 BAR	15 1/2	8
V10 BAR	14 1/2	7
V11 BAR	13 3/4	6



REINFORCING STEEL DETAILS  
TYPE 2 - END TERMINAL

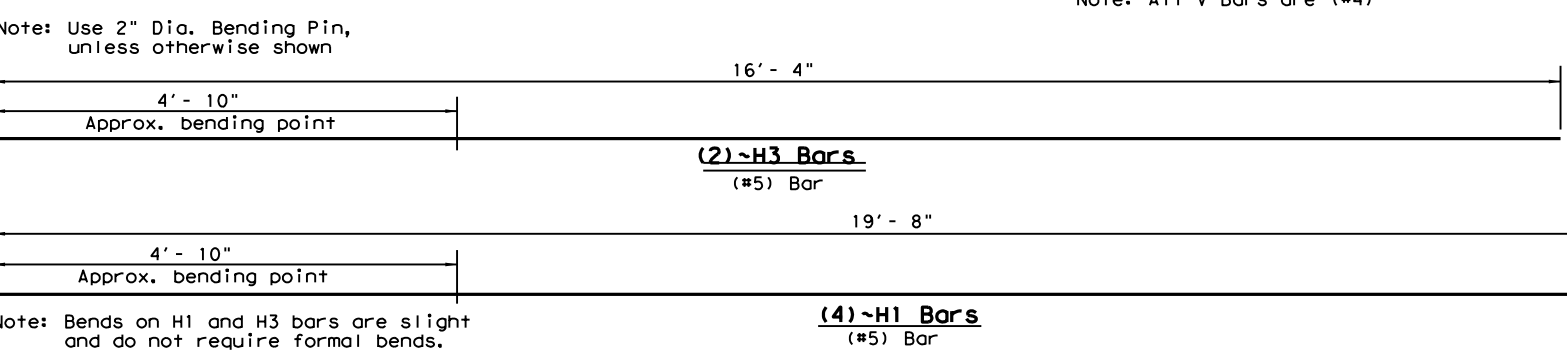


(7) Anchor Pins  
ASTM A36 Steel



FOR CONTRACTORS INFORMATION ONLY

(TYPE 2)		APPROX. QUANTITIES 20 FT. SECTION	
CONCRETE	CY	1.65	
REINFORCING STEEL	LBS	240	
TOTAL BARRIER WT.	LBS	7000	



Note: Use 2" Dia. Bending Pin, unless otherwise shown.  
 Note: Bends on H1 and H3 bars are slight and do not require formal bends.

TYPE 2 - NOTES

1. Welded wire reinforcement (WWR) is "not" an option for Type 2 Barrier.
2. Type 2 Barrier shall be used as an end treatment for the Type 1 barrier segments, when applicable.
3. The end treatment can be used without the anchor pins in locations that can accommodate approximately 4 ft. of lateral displacement of the end treatment. The use of non-pinned end treatment does not affect the performance or the deflection of the Low-Profile barrier system.
4. The anchor pins are all the same length and are to be driven flush with the top of the (Type 2) barrier surface.
5. The bends in the H3 and H1 bars are slight, no formal bend is necessary.
6. The Type 2 barrier segment must be lifted from the rear first, to prevent cracking of sloped section.
7. See LPCB sheet 1 for additional information.

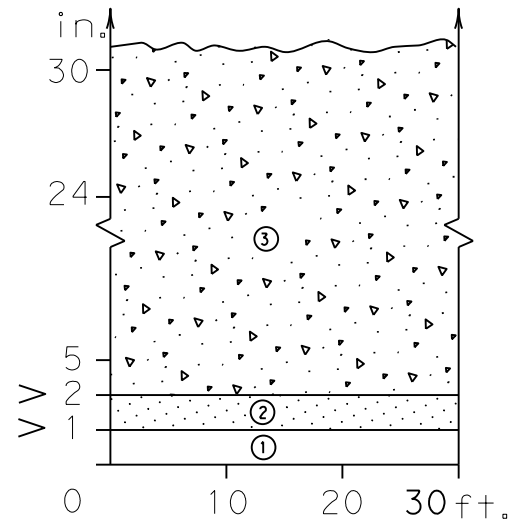
Texas Department of Transportation  
 Design Division Standard

**LOW PROFILE CONCRETE BARRIER PRECAST BARRIER (TYPE 2) LPCB-13**

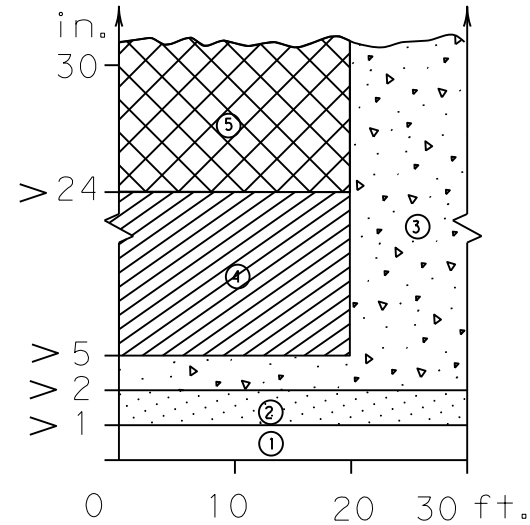
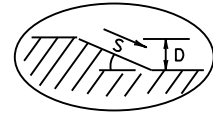
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© TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
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PHR	CAMERON	133		

# DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

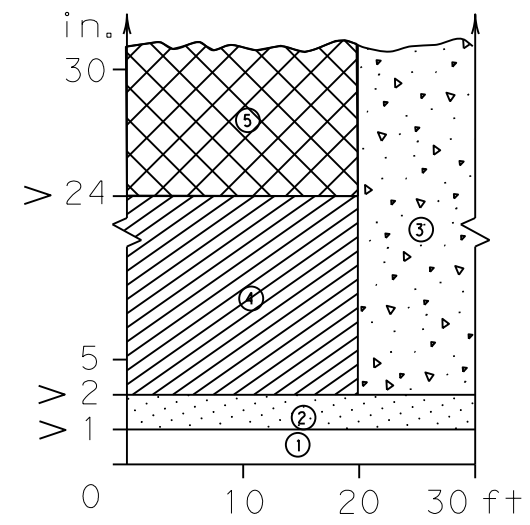
Edge Height (D) in Inches versus Lateral Clearance (Y) in Feet



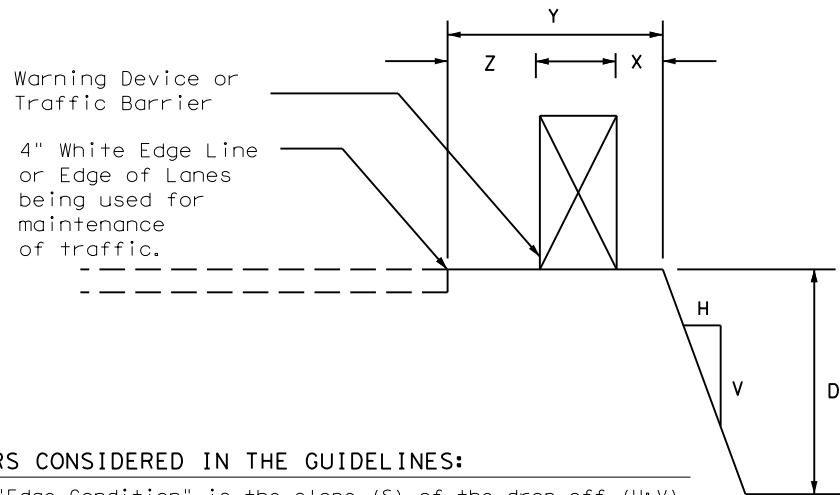
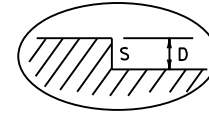
Edge Condition I  
S = (3:1) (or flatter)



Edge Condition II  
S = ((2.99):1) to (1:1)



Edge Condition III  
S is steeper than (1:1)

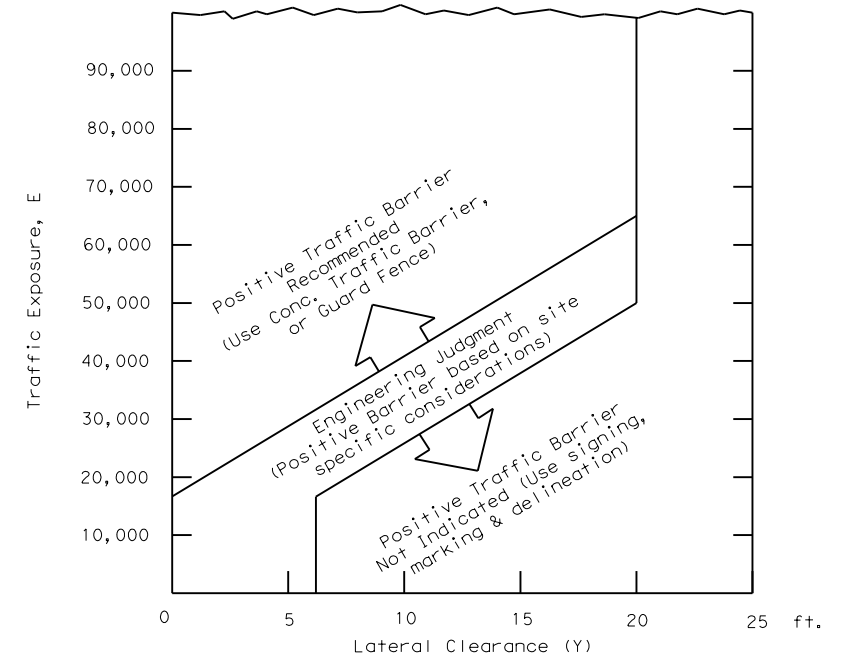


Zone	Treatment Types Guidelines:
①	No treatment
②	CW 8-11 "Uneven Lanes" signs.
③	CW 8-9a Shoulder Drop-Off" or CW 8-11 signs plus vertical panels.
④	CW8-9a or CW 8-11, signs plus drums. Where restricted space precludes the use of drums, use vertical panels. An edge slope to that of the profered Edge Condition I.
⑤	Check indications (Figure-1) for possitive barrier. Where positive barrier is not indicated, the treatment shown above for Zone-4 may be used after consideration of other applicable factors.

### Edge Condition Notes:

- Edge Condition I: Most vehicles are able to traverse an edge condition with a slope rate of (3 to 1) or flatter. The slope must be constructed with a compacted material capable of supporting vehicles.
- Edge Condition II: Most vehicles are able to traverse an edge condition with a slope between (2.99 to 1) and (1 to 1) so long as "D" does not exceed 5 inches. Under-carriage drag on most automobiles will occur when "D" exceeds 6 inches. As "D" exceeds 24 inches, the possibility for rollover is greater in most vehicles.
- Edge Condition III: When slopes are greater than (1 to 1) and where "D" is greater than 2 inches, a more difficult control factor may exist for some vehicles, if not properly treated. For example, where "D" is greater than 2 inches and up to 24 inches different types of vehicles may experience different steering control at different edge heights. Automobiles might experience more steering control differential when "D" is greater than 2 inches and up to 5 inches. Trucks, particularly those with high loads, have more steering control differential when "D" is greater than 5 inches and up to 24 inches. When "D" exceeds 24 inches, the possibility of rollover is greater for most vehicles.
- Milling or overlay operations that result in Edge Condition III should not be in place without appropriate warning treatments, and these conditions should not be left in place for extended periods of time.

# FIGURE-1: CONDITIONS INDICATING USE OF POSITIVE BARRIER FOR ZONE 5 ( [Cross-hatched] )



- $E = ADT \times T$   
Where ADT is that portion of the average daily traffic volume traveling within 20 feet (generally two adjacent lanes) of the edge dropoff condition; and, T is the duration time in years of the dropoff condition.
- Figure-1 provides a practical approach to the use of positive barriers for the protection of vehicles from pavement drop-offs. Other factors, such as the presence of heavy machinery, construction workers, or the mix and volume of traffic may make the use of positive barriers appropriate, even when the edge condition alone may not justify the use of a barrier.
- An approved end treatment should be provided for any positive barrier end located within the clear zone.

These guidelines apply to temporary traffic control areas or work zones where continuous pavement edges or drop-offs exists parallel and adjacent to a lane used by traffic. The edge conditions may be present between shoulders and travel lanes, between adjacent or opposing travel lanes, or at intermediate points across the width of the paved surface. Due to the variability in construction operations, tolerances in the variables may be allowed by the engineer. These guidelines do not apply to short term operations. These guidelines do not constitute a rigid standard or policy; rather, they are guidance to be used in conjunction with engineering judgement. These guidelines may be updated on the Design Division's on-line manuals.

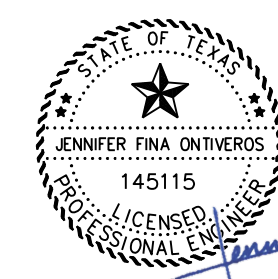
### FACTORS CONSIDERED IN THE GUIDELINES:

- The "Edge Condition" is the slope (S) of the drop-off (H:V). The "Edge Height" is the depth of the drop-off "D".
- Distance "X" is to be the maximum practical under job conditions. Two feet minimum for high speed conditions. Distance "Y" is the lateral clearance from edge of travel lane to edge of dropoff. Distance "Z" does not have a minimum.
- In addition to the factors considered in the guidelines, each construction zone drop-off situation should be analyzed individually, taking into account other variables, such as: traffic mix, posted speed in the construction zone, horizontal curvature, and the practicality of the treatment options.
- The conditions for indicating the use of positive or protective barriers are given by Zone-5 and Figure-1. Traffic barriers are primarily applicable for high speed conditions. Urban areas with speeds of 30 mph or less may have a lesser need for signing, delineation, and barriers. Right-angled edges, however, with "D" greater than 2 inches and located within a lateral offset of 6 feet, may indicate a higher level of treatment.
- If the distance "Y" must be less than 3 feet, the use of a positive barrier may not be feasible. In such a case, consider either: 1) narrowing the lanes to a desired 11 to 12 feet or 10 foot minimum (see CW20-8 sign), or 2) provide an edge slope such as Edge Condition I.

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DATE: \$DATES \$TIME\$  
FILE: \$FILES

Engineer's Seal



11/20/23

Date



## TREATMENT FOR VARIOUS EDGE CONDITIONS

FILE: edgecon.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 2000	CONT	SECT	JOB	HIGHWAY
REVISIONS	<b>0220 05</b>	<b>080</b>	<b>SH 48</b>	
03-01 08-01 9-21	DIST	COUNTY	SHEET NO.	
	<b>PHR</b>	<b>CAMERON</b>	<b>134</b>	

DATE: 2/27/2023 4:16:54 PM  
FILE: P:\txdot\projectwiseonline.com\txdot\Documents\21 - PHR\Design Projects\022005080\4 - Design\Plan Set\1. General\INDEX OF SHEETS\SH 48\_COVERSHT.dgn

# ROADWAY DETAILS

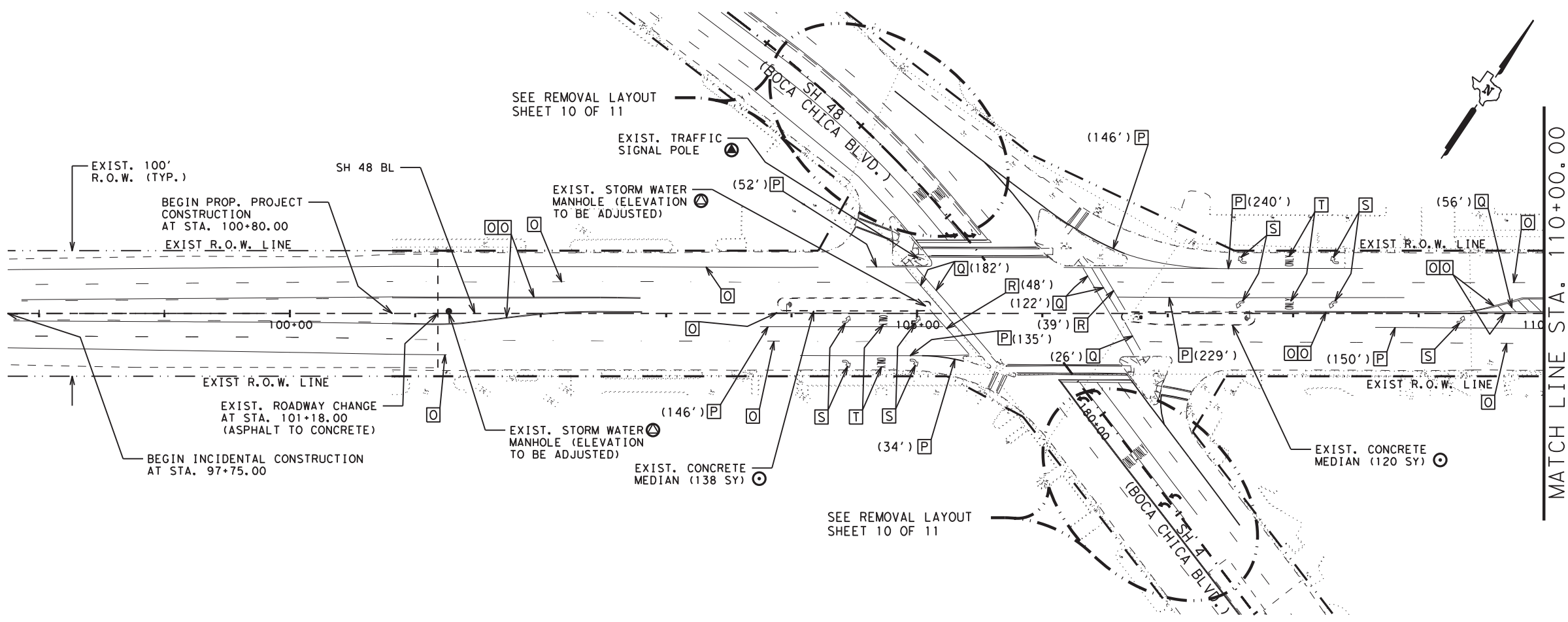
*Pharr District Central Design*



**COVER SHEET**

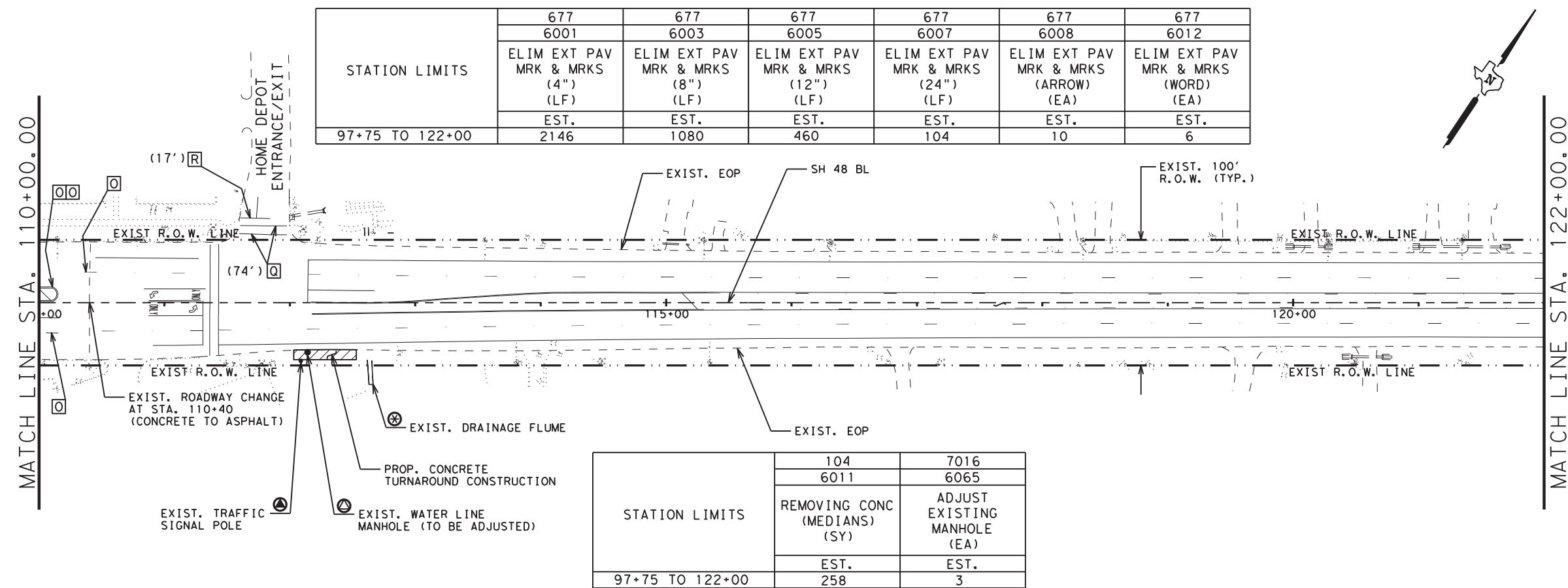
© 2022	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		135

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- LEGEND:**
- ⊙ EXIST STRUCTURE TO BE REMOVED
  - ⊕ EXIST STRUCTURE TO BE RELOCATED
  - ⊖ EXIST STRUCTURE TO BE ADJUSTED (BY OTHERS)
  - ⊗ EXIST STRUCTURE TO BE REMAIN IN PLACE
  - ⓪ - ELIMATE EXISTING PAV. MRKS (4")
  - Ⓟ - ELIMATE EXISTING PAV. MRKS (8")
  - Ⓠ - ELIMATE EXISTING PAV. MRKS (12")
  - Ⓡ - ELIMATE EXISTING PAV. MRKS (24")
  - Ⓢ - ELIMATE EXISTING PAV. MRKS (ARROW)
  - Ⓣ - ELIMATE EXISTING PAV. MRKS (WORD)
- PROP.** - PROPOSED  
**EXIST.** - EXISTING  
**R.O.W.** - RIGHT OF WAY  
**BL** - BASE LINE  
**RDWY.** - ROADWAY  
**STA.** - STATION  
**EOP** - EDGE OF PAVEMENT  
**SET** - SAFETY END TREATMENT  
**EA.** - EACH  
**RCP** - REINFORCE CONCRETE PIPE  
**TYP.** - TYPICAL  
**RD.** - ROAD  
**F-F** - FACE TO FACE  
**MBGF** - METAL BEAM GUARD FENCE  
**DAT** - DOWNSTREAM ANCHOR TERMINAL  
**TAS** - TERMINAL ANCHOR SECTION

- GENREAL NOTES:**
- SEE SIGN LAYOUT FOR SIGN REMOVAL QUANTITIES.
  - SEE DRIVEWAY TABLE FOR DRIVEWAY REMOVAL QUANTITIES.
  - SEE SUMMARY OF MATERIALS TRAFFIC SIGNALS FOR SIGNAL QUANTITIES.



STATION LIMITS	677 6001	677 6003	677 6005	677 6007	677 6008	677 6012
	ELIM EXT PAV MRK & MRKS (4") (LF)	ELIM EXT PAV MRK & MRKS (8") (LF)	ELIM EXT PAV MRK & MRKS (12") (LF)	ELIM EXT PAV MRK & MRKS (24") (LF)	ELIM EXT PAV MRK & MRKS (ARROW) (EA)	ELIM EXT PAV MRK & MRKS (WORD) (EA)
97+75 TO 122+00	EST. 2146	EST. 1080	EST. 460	EST. 104	EST. 10	EST. 6

STATION LIMITS	104 6011	7016 6065
	REMOVING CONC (MEDIANS) (SY)	ADJUST EXISTING MANHOLE (EA)
97+75 TO 122+00	EST. 258	EST. 3



**Pharr District Central Design**

**Texas Department of Transportation**

**SH 48  
STRUCTURE REMOVAL  
LAYOUT**

PLAN SCALE: 1"=100' SHEET 1 OF 11

© 2022	CONT	SECT	JOB	HIGHWAY
DS:	CK:	0220	05 080	SH 48
DW:	CK:	PHR	CAMERON	SHEET NO. 136

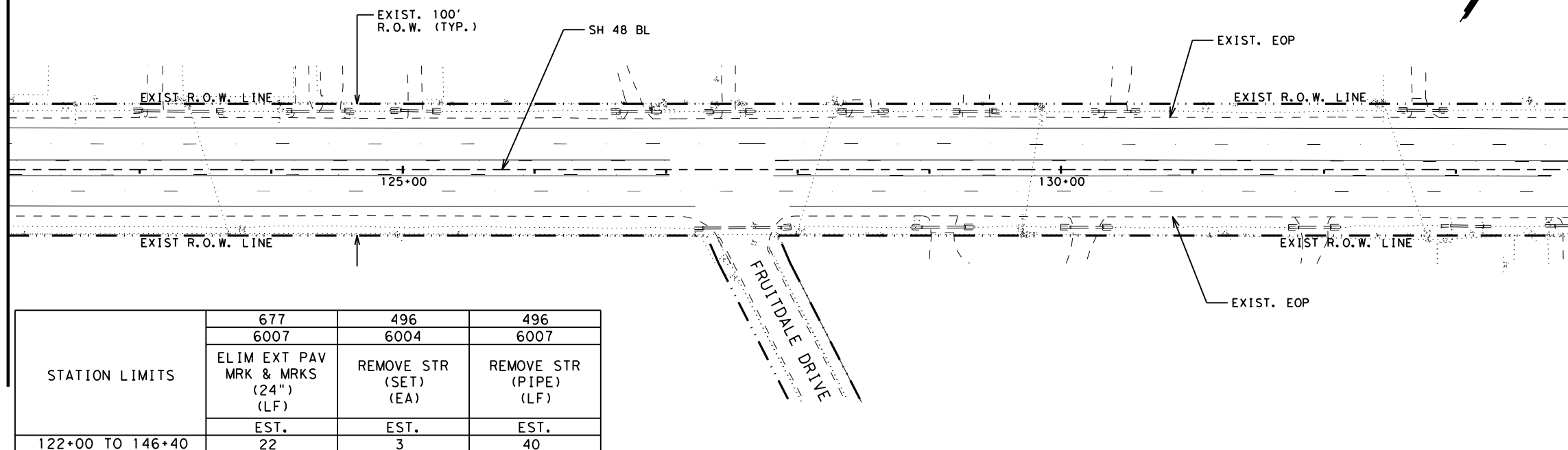
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MATCH LINE STA. 122+00.00

MATCH LINE STA. 134+00.00

MATCH LINE STA. 134+00.00

MATCH LINE STA. 146+00.00

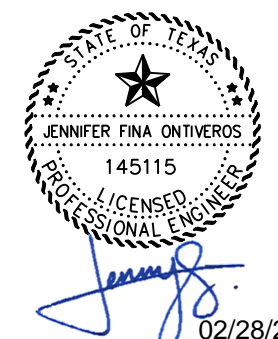
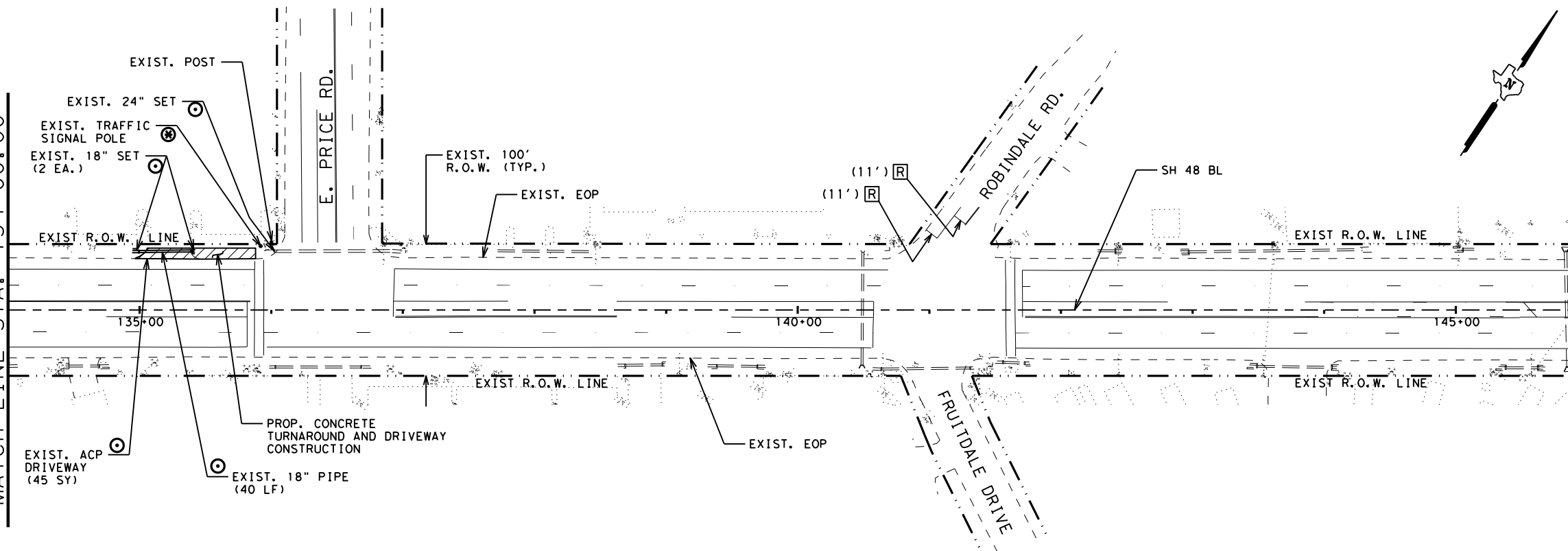


STATION LIMITS	677	496	496
	6007	6004	6007
	ELIM EXT PAV MRK & MRKS (24") (LF)	REMOVE STR (SET) (EA)	REMOVE STR (PIPE) (LF)
	EST.	EST.	EST.
122+00 TO 146+40	22	3	40

- LEGEND:**
- ⊙ EXIST STRUCTURE TO BE REMOVED
  - ⊕ EXIST STRUCTURE TO BE RELOCATED
  - ⊗ EXIST STRUCTURE TO BE ADJUSTED (BY OTHERS)
  - ⊛ EXIST STRUCTURE TO BE REMAIN IN PLACE
  - ⓪ - ELIMATE EXISTING PAV. MRKS (4")
  - Ⓟ - ELIMATE EXISTING PAV. MRKS (8")
  - Ⓠ - ELIMATE EXISTING PAV. MRKS (12")
  - Ⓡ - ELIMATE EXISTING PAV. MRKS (24")
  - Ⓢ - ELIMATE EXISTING PAV. MRKS (ARROW)
  - Ⓣ - ELIMATE EXISTING PAV. MRKS (WORD)

- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- BL - BASE LINE
- RDWY. - ROADWAY
- STA. - STATION
- EOP - EDGE OF PAVEMENT
- SET - SAFETY END TREATMENT
- EA. - EACH
- RCP - REINFORCE CONCRETE PIPE
- TYP. - TYPICAL
- RD. - ROAD
- F-F - FACE TO FACE
- MBGF - METAL BEAM GUARD FENCE
- DAT - DOWNSTREAM ANCHOR TERMINAL
- TAS - TERMINAL ANCHOR SECTION

- GENREAL NOTES:**
- SEE SIGN LAYOUT FOR SIGN REMOVAL QUANTITIES.
  - SEE DRIVEWAY TABLE FOR DRIVEWAY REMOVAL QUANTITIES.
  - SEE SUMMARY OF MATERIALS TRAFFIC SIGNALS FOR SIGNAL QUANTITIES.



**Pharr District Central Design**  
 Texas Department of Transportation

**SH 48  
 STRUCTURE REMOVAL  
 LAYOUT**

PLAN SCALE: 1"=100' SHEET 2 OF 11

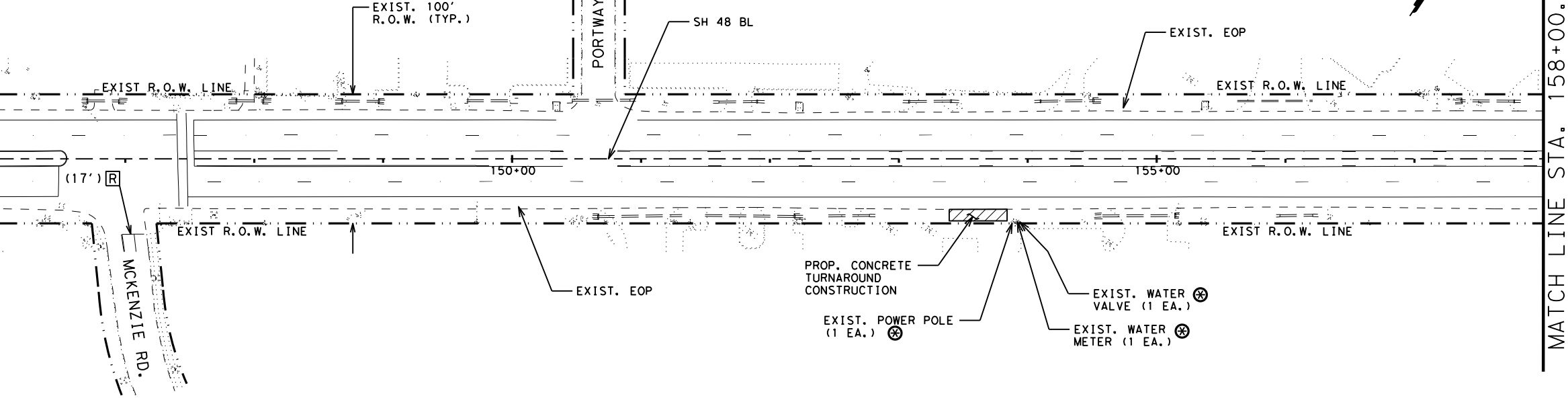
© 2022	CONT	SECT	JOB	HIGHWAY
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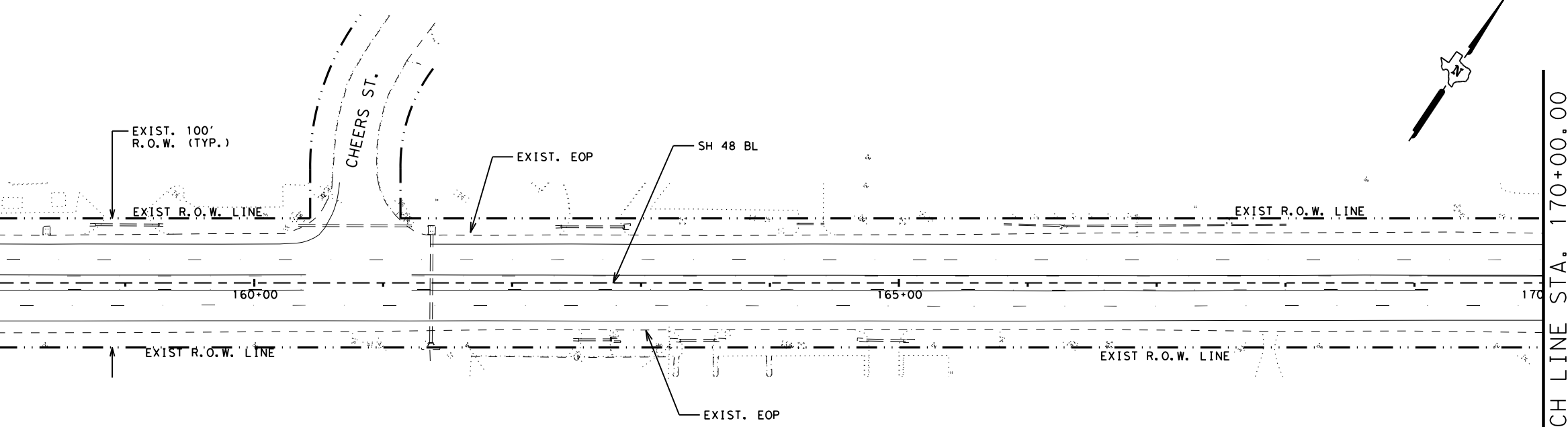
STATION LIMITS	677
	6007
	ELIM EXT PAV MRK & MRKS (24") (LF)
146+00 TO 170+00	EST. 17



- LEGEND:**
- ⊙ EXIST STRUCTURE TO BE REMOVED
  - ⊕ EXIST STRUCTURE TO BE RELOCATED
  - ⊖ EXIST STRUCTURE TO BE ADJUSTED (BY OTHERS)
  - ⊗ EXIST STRUCTURE TO BE REMAIN IN PLACE
  - ⓪ - ELIMATE EXISTING PAV. MRKS (4")
  - Ⓟ - ELIMATE EXISTING PAV. MRKS (8")
  - Ⓠ - ELIMATE EXISTING PAV. MRKS (12")
  - Ⓡ - ELIMATE EXISTING PAV. MRKS (24")
  - Ⓢ - ELIMATE EXISTING PAV. MRKS (ARROW)
  - Ⓣ - ELIMATE EXISTING PAV. MRKS (WORD)
  - PROP. - PROPOSED
  - EXIST. - EXISTING
  - R.O.W. - RIGHT OF WAY
  - BL - BASE LINE
  - RDWY. - ROADWAY
  - STA. - STATION
  - EOP - EDGE OF PAVEMENT
  - SET - SAFETY END TREATMENT
  - EA. - EACH
  - RCP - REINFORCE CONCRETE PIPE
  - TYP. - TYPICAL
  - RD. - ROAD
  - F-F - FACE TO FACE
  - MBGF - METAL BEAM GUARD FENCE
  - DAT - DOWNSTREAM ANCHOR TERMINAL
  - TAS - TERMINAL ANCHOR SECTION

- GENREAL NOTES:**
- SEE SIGN LAYOUT FOR SIGN REMOVAL QUANTITIES.
  - SEE DRIVEWAY TABLE FOR DRIVEWAY REMOVAL QUANTITIES.
  - SEE SUMMARY OF MATERIALS TRAFFIC SIGNALS FOR SIGNAL QUANTITIES.

MATCH LINE STA. 158+00.00



**Pharr District Central Design**

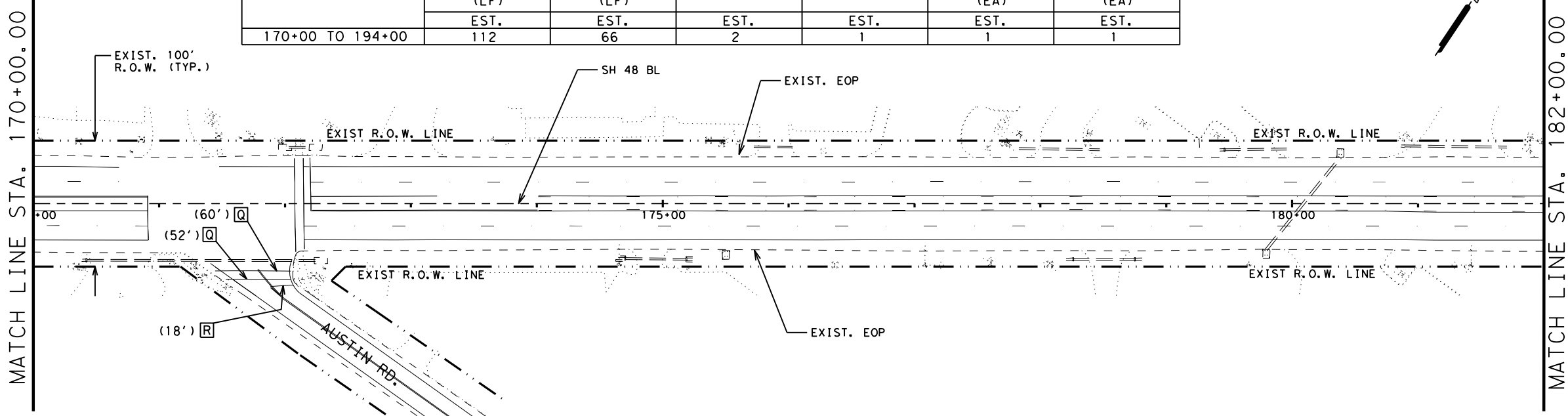
**SH 48  
STRUCTURE REMOVAL  
LAYOUT**

PLAN SCALE: 1"=100' SHEET 3 OF 11

© 2022	CONT	SECT	JOB	HIGHWAY
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DW:	CK:	DIST		COUNTY
		PHR		CAMERON
				SHEET NO.
				138

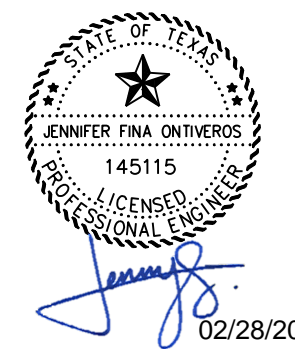
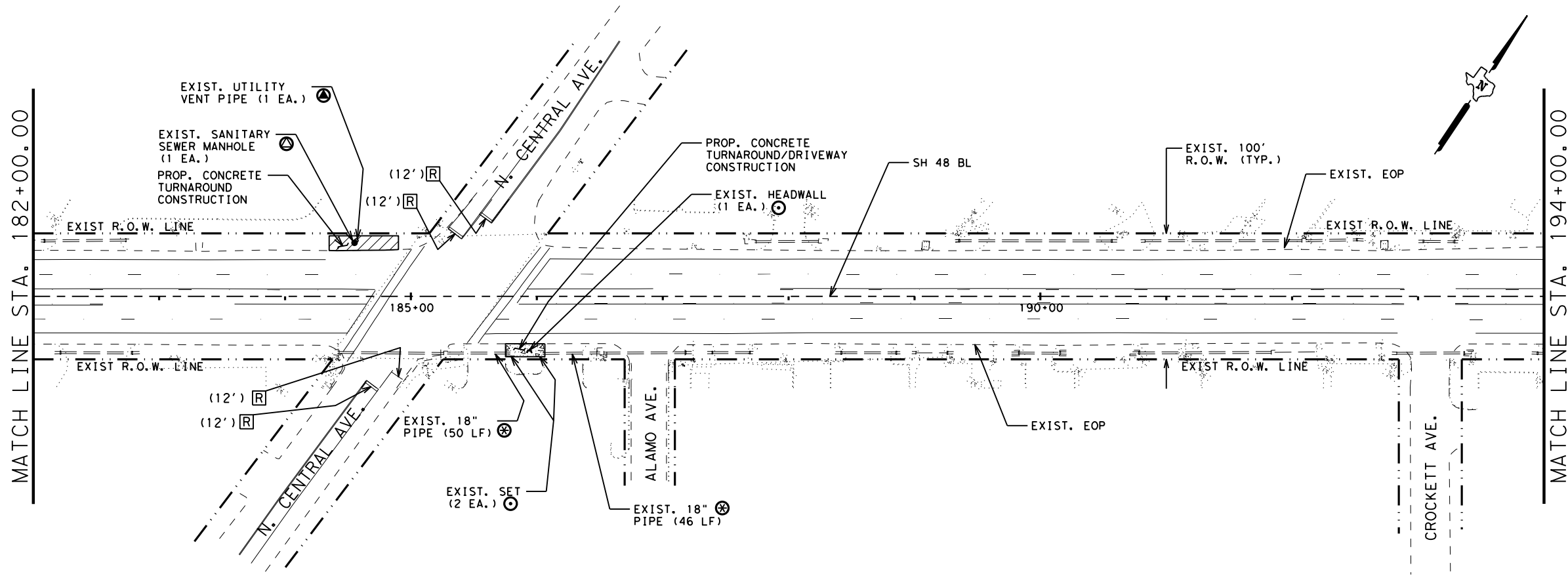
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STATION LIMITS	677	677	496	496	7016	7177
	6005	6007	6004	6006	6065	6005
	ELIM EXT PAV MRK & MRKS (12") (LF)	ELIM EXT PAV MRK & MRKS (24") (LF)	REMOVE STR (SET) (EA)	REMOVE STR (HEADWALL) (EA)	ADJUST EXISTING MANHOLE (EA)	RELOC AIR RELEASE & VENT PIPE ASSM (EA)
170+00 TO 194+00	EST. 112	EST. 66	EST. 2	EST. 1	EST. 1	EST. 1



- LEGEND:**
- ⊙ EXIST STRUCTURE TO BE REMOVED
  - ⊕ EXIST STRUCTURE TO BE RELOCATED
  - ⊖ EXIST STRUCTURE TO BE ADJUSTED (BY OTHERS)
  - ⊗ EXIST STRUCTURE TO BE REMAIN IN PLACE
  - ⓪ - ELIMATE EXISTING PAV. MRKS (4")
  - Ⓟ - ELIMATE EXISTING PAV. MRKS (8")
  - Ⓠ - ELIMATE EXISTING PAV. MRKS (12")
  - Ⓡ - ELIMATE EXISTING PAV. MRKS (24")
  - Ⓢ - ELIMATE EXISTING PAV. MRKS (ARROW)
  - Ⓣ - ELIMATE EXISTING PAV. MRKS (WORD)

- GENREAL NOTES:**
- SEE SIGN LAYOUT FOR SIGN REMOVAL QUANTITIES.
  - SEE DRIVEWAY TABLE FOR DRIVEWAY REMOVAL QUANTITIES.
  - SEE SUMMARY OF MATERIALS TRAFFIC SIGNALS FOR SIGNAL QUANTITIES.



**Pharr District Central Design**

Texas Department of Transportation

**SH 48  
STRUCTURE REMOVAL  
LAYOUT**

PLAN SCALE: 1"=100' SHEET 4 OF 11

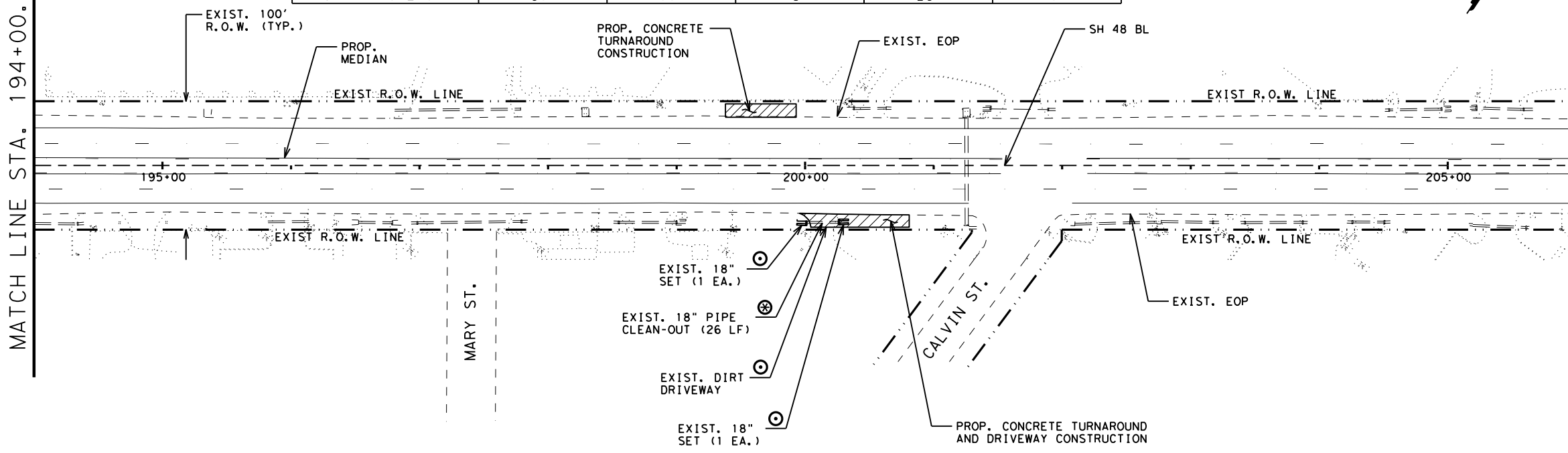
© 2022	CONT	SECT	JOB	HIGHWAY
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				139

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STATION LIMITS	677	677	496	496	560
	6005	6007	6004	6007	6025
	ELIM EXT PAV MRK & MRKS (12") (LF)	ELIM EXT PAV MRK & MRKS (24") (LF)	REMOVE STR (SET) (EA)	REMOVE STR (PIPE) (LF)	RELOCATE EXISTING MAILBOX (EA)
194+00 TO 218+00	EST. 97	EST. 17	EST. 5	EST. 26	EST. 1

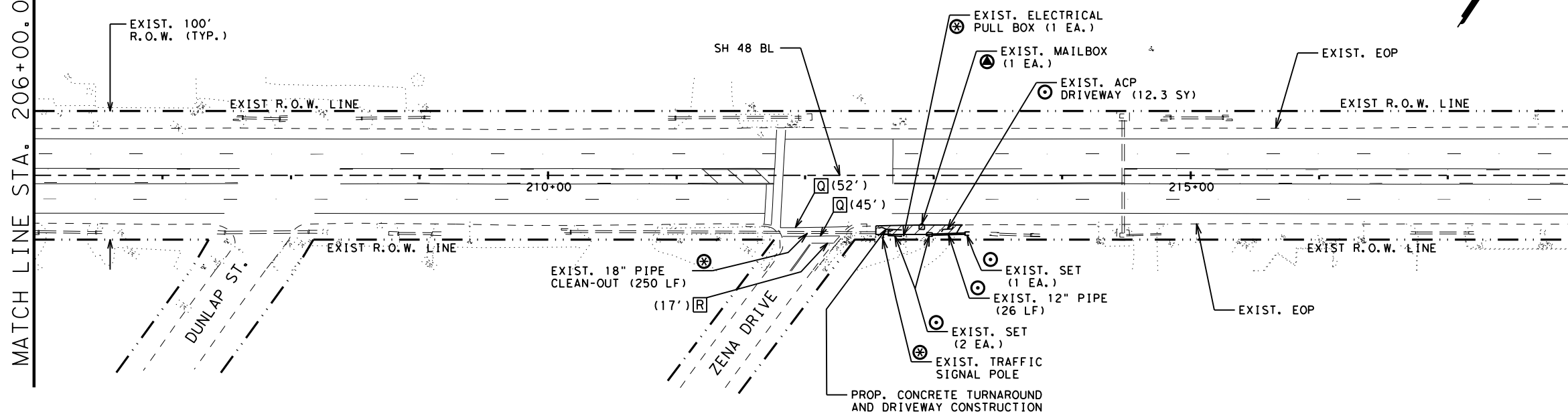
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MATCH LINE STA. 206+00.00



MATCH LINE STA. 206+00.00

MATCH LINE STA. 218+00.00



- LEGEND:**
- ⊙ EXIST STRUCTURE TO BE REMOVED
  - ⊕ EXIST STRUCTURE TO BE RELOCATED
  - ⊖ EXIST STRUCTURE TO BE ADJUSTED (BY OTHERS)
  - ⊗ EXIST STRUCTURE TO BE REMAIN IN PLACE
  - ⓪ - ELIMATE EXISTING PAV. MRKS (4")
  - ⓐ - ELIMATE EXISTING PAV. MRKS (8")
  - ⓑ - ELIMATE EXISTING PAV. MRKS (12")
  - ⓓ - ELIMATE EXISTING PAV. MRKS (24")
  - ⓔ - ELIMATE EXISTING PAV. MRKS (ARROW)
  - ⓕ - ELIMATE EXISTING PAV. MRKS (WORD)

- PROP.** - PROPOSED  
**EXIST.** - EXISTING  
**R.O.W.** - RIGHT OF WAY  
**BL** - BASE LINE  
**RDWY.** - ROADWAY  
**STA.** - STATION  
**EOP** - EDGE OF PAVEMENT  
**SET** - SAFETY END TREATMENT  
**EA.** - EACH  
**RCP** - REINFORCE CONCRETE PIPE  
**TYP.** - TYPICAL  
**RD.** - ROAD  
**F-F** - FACE TO FACE  
**MBGF** - METAL BEAM GUARD FENCE  
**DAT** - DOWNSTREAM ANCHOR TERMINAL  
**TAS** - TERMINAL ANCHOR SECTION

- GENREAL NOTES:**
1. SEE SIGN LAYOUT FOR SIGN REMOVAL QUANTITIES.
  2. SEE DRIVEWAY TABLE FOR DRIVEWAY REMOVAL QUANTITIES.
  3. SEE SUMMARY OF MATERIALS TRAFFIC SIGNALS FOR SIGNAL QUANTITIES.



**Pharr District Central Design**

**Texas Department of Transportation**

**SH 48  
STRUCTURE REMOVAL  
LAYOUT**

PLAN SCALE: 1"=100' SHEET 5 OF 11

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DS: CK:	0220	05	080	SH 48
DW: CK:	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	140

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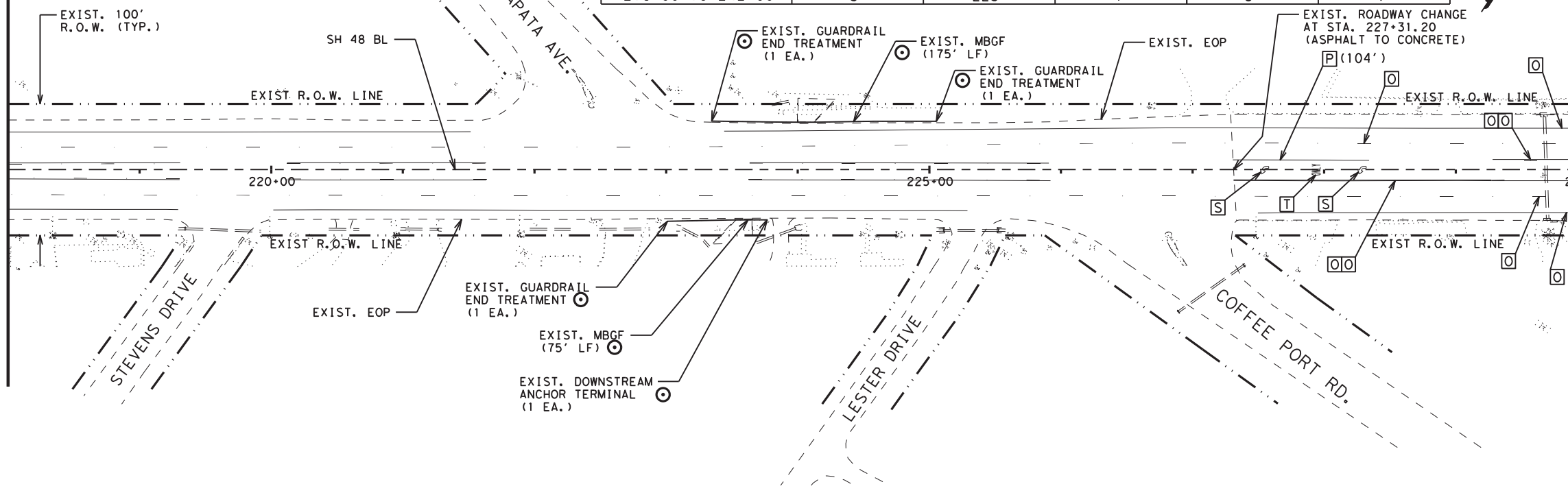
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MATCH LINE STA. 230+00.00

MATCH LINE STA. 230+00.00

MATCH LINE STA. 242+00.00

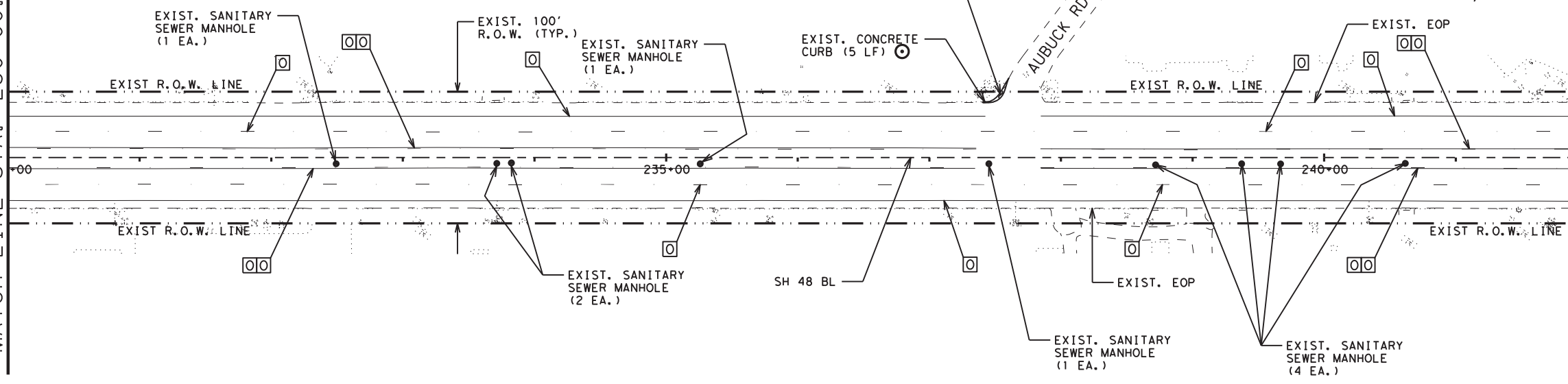
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	6021	6001	6003	6003	6065
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218+00 TO 242+00	EST. 5	EST. 225	EST. 1	EST. 3	EST. 1



- LEGEND:**
- ⊙ EXIST STRUCTURE TO BE REMOVED
  - ⊕ EXIST STRUCTURE TO BE RELOCATED
  - ⊖ EXIST STRUCTURE TO BE ADJUSTED (BY OTHERS)
  - ⊗ EXIST STRUCTURE TO BE REMAIN IN PLACE
  - ⓪ - ELIMATE EXISTING PAV. MRKS (4")
  - Ⓟ - ELIMATE EXISTING PAV. MRKS (8")
  - Ⓠ - ELIMATE EXISTING PAV. MRKS (12")
  - Ⓡ - ELIMATE EXISTING PAV. MRKS (24")
  - Ⓢ - ELIMATE EXISTING PAV. MRKS (ARROW)
  - Ⓣ - ELIMATE EXISTING PAV. MRKS (WORD)
- PROP. - PROPOSED**  
**EXIST. - EXISTING**  
**R.O.W. - RIGHT OF WAY**  
**BL - BASE LINE**  
**RDWY. - ROADWAY**  
**STA. - STATION**  
**EOP - EDGE OF PAVEMENT**  
**SET - SAFETY END TREATMENT**  
**EA. - EACH**  
**RCP - REINFORCE CONCRETE PIPE**  
**TYP. - TYPICAL**  
**RD. - ROAD**  
**F-F - FACE TO FACE**  
**MBGF - METAL BEAM GUARD FENCE**  
**DAT - DOWNSTREAM ANCHOR TERMINAL**  
**TAS - TERMINAL ANCHOR SECTION**

- GENERAL NOTES:**
- SEE SIGN LAYOUT FOR SIGN REMOVAL QUANTITIES.
  - SEE DRIVEWAY TABLE FOR DRIVEWAY REMOVAL QUANTITIES.
  - SEE SUMMARY OF MATERIALS TRAFFIC SIGNALS FOR SIGNAL QUANTITIES.

STATION LIMITS	677	677	677	677
	6001	6003	6008	6012
	ELIM EXT PAV MRK & MRKS (4") (LF)	ELIM EXT PAV MRK & MRKS (8") (LF)	ELIM EXT PAV MRK & MRKS (ARROW) (EA)	ELIM EXT PAV MRK & MRKS (WORD) (EA)
218+00 TO 242+00	EST. 7184	EST. 104	EST. 2	EST. 1



**Pharr District Central Design**

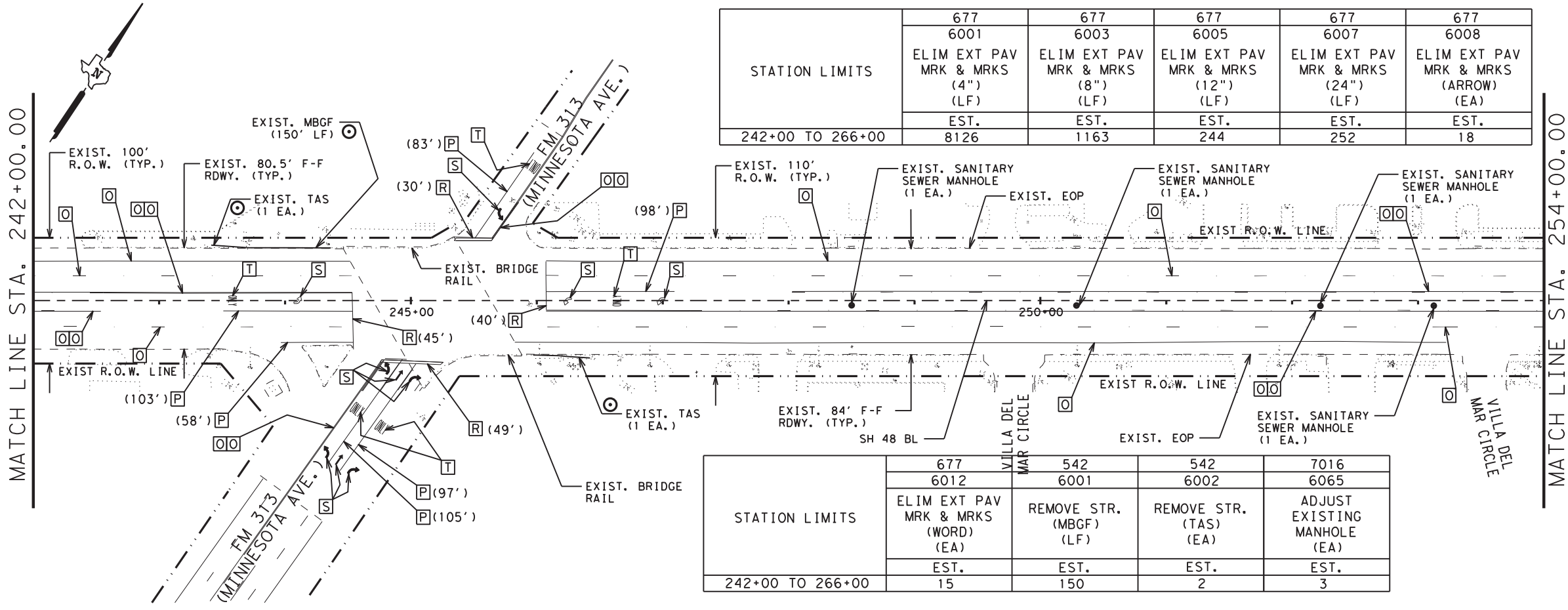
**Texas Department of Transportation**

**SH 48 STRUCTURE REMOVAL LAYOUT**

PLAN SCALE: 1"=100' SHEET 6 OF 11

© 2022	CONT	SECT	JOB	HIGHWAY
DS:	CR:	0220	05	080
DW:	CR:	DIST		COUNTY
		PHR		CAMERON
				SHEET NO.
				141

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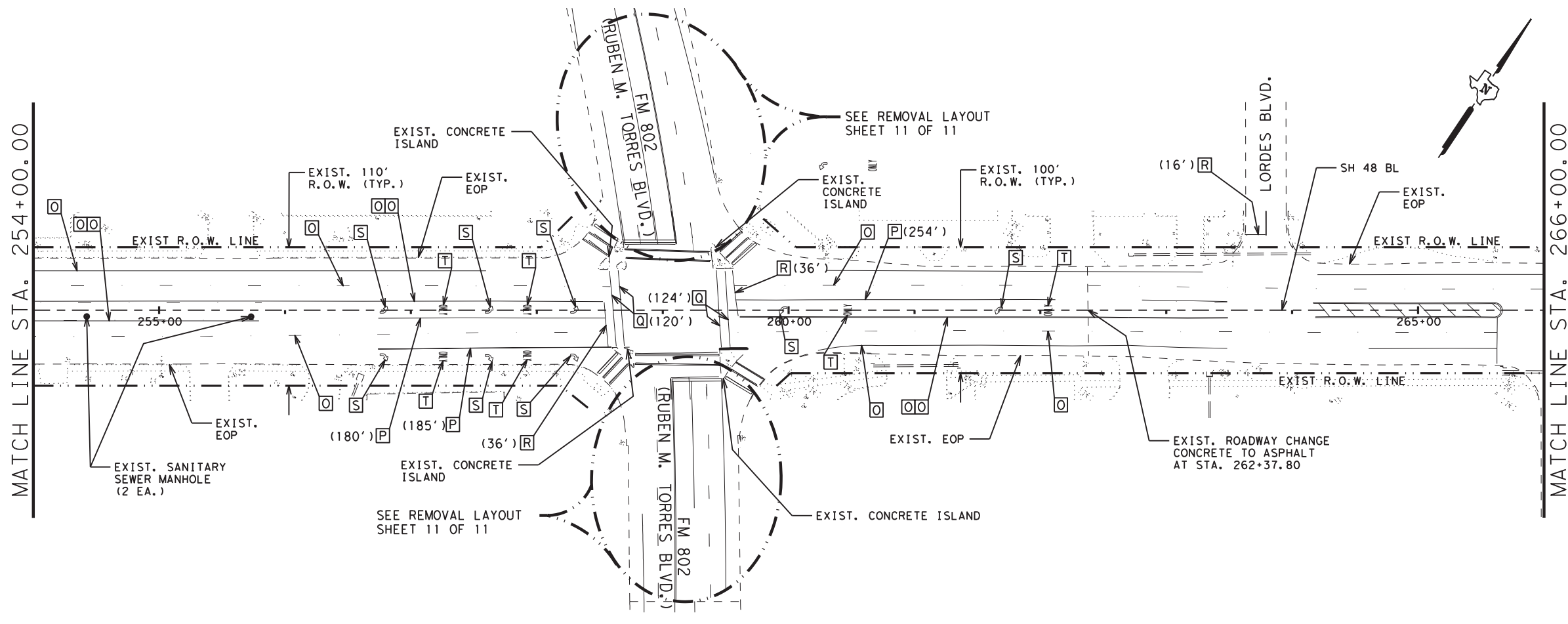


STATION LIMITS	677 6001 ELIM EXT PAV MRK & MRKS (4") (LF)	677 6003 ELIM EXT PAV MRK & MRKS (8") (LF)	677 6005 ELIM EXT PAV MRK & MRKS (12") (LF)	677 6007 ELIM EXT PAV MRK & MRKS (24") (LF)	677 6008 ELIM EXT PAV MRK & MRKS (ARROW) (EA)
242+00 TO 266+00	EST. 8126	EST. 1163	EST. 244	EST. 252	EST. 18

STATION LIMITS	677 6012 ELIM EXT PAV MRK & MRKS (WORD) (EA)	542 6001 REMOVE STR. (MBGF) (LF)	542 6002 REMOVE STR. (TAS) (EA)	7016 6065 ADJUST EXISTING MANHOLE (EA)
242+00 TO 266+00	EST. 15	EST. 150	EST. 2	EST. 3

- LEGEND:**
- ⊙ EXIST STRUCTURE TO BE REMOVED
  - ⊕ EXIST STRUCTURE TO BE RELOCATED
  - ⊖ EXIST STRUCTURE TO BE ADJUSTED (BY OTHERS)
  - ⊗ EXIST STRUCTURE TO BE REMAIN IN PLACE
  - ⓪ - ELIMATE EXISTING PAV. MRKS (4")
  - Ⓟ - ELIMATE EXISTING PAV. MRKS (8")
  - Ⓠ - ELIMATE EXISTING PAV. MRKS (12")
  - Ⓡ - ELIMATE EXISTING PAV. MRKS (24")
  - Ⓢ - ELIMATE EXISTING PAV. MRKS (ARROW)
  - Ⓣ - ELIMATE EXISTING PAV. MRKS (WORD)
  - PROP. - PROPOSED
  - EXIST. - EXISTING
  - R.O.W. - RIGHT OF WAY
  - BL - BASE LINE
  - RDWY. - ROADWAY
  - STA. - STATION
  - EOP - EDGE OF PAVEMENT
  - SET - SAFETY END TREATMENT
  - EA. - EACH
  - RCP - REINFORCE CONCRETE PIPE
  - TYP. - TYPICAL
  - RD. - ROAD
  - F-F - FACE TO FACE
  - MBGF - METAL BEAM GUARD FENCE
  - DAT - DOWNSTREAM ANCHOR TERMINAL
  - TAS - TERMINAL ANCHOR SECTION

- GENREAL NOTES:**
- SEE SIGN LAYOUT FOR SIGN REMOVAL QUANTITIES.
  - SEE DRIVEWAY TABLE FOR DRIVEWAY REMOVAL QUANTITIES.
  - SEE SUMMARY OF MATERIALS TRAFFIC SIGNALS FOR SIGNAL QUANTITIES.



**Pharr District Central Design**

Texas Department of Transportation

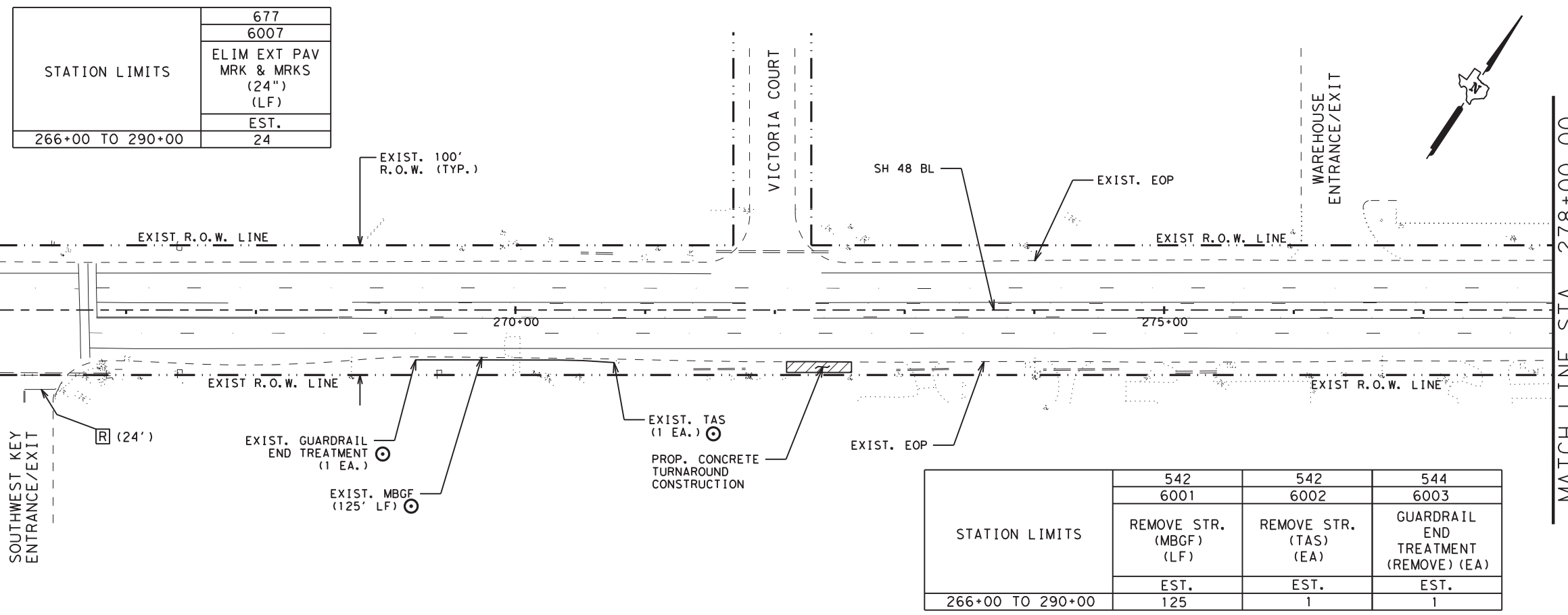
**SH 48  
STRUCTURE REMOVAL  
LAYOUT**

PLAN SCALE: 1"=100' SHEET 7 OF 11

DS:	CK:	0220	05	080	SH 48
DW:	CK:	PHR		CAMERON	142

DATE: 2/20/2023 9:26:12 AM  
 FILE: \\phr\dot\project\wiseon\line.com:fxdot5\Documents\21 - PHR\Design Projects\022005080\4 - Design\Plan Set\3. Roadway\1) Structure Removal\Layout\Layout sheets\Removal

MATCH LINE STA. 266+00.00



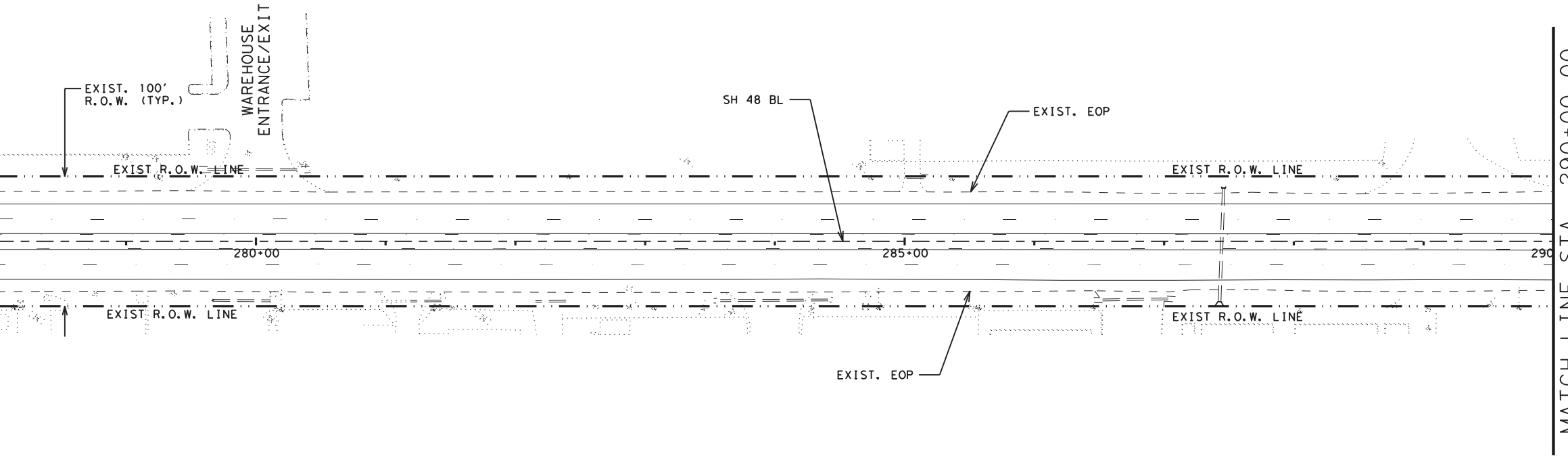
STATION LIMITS	677
	6007
	ELIM EXT PAV MRK & MRKS (24") (LF)
266+00 TO 290+00	EST. 24

STATION LIMITS	542	542	544
	6001	6002	6003
	REMOVE STR. (MBGF) (LF)	REMOVE STR. (TAS) (EA)	GUARDRAIL END TREATMENT (REMOVE) (EA)
266+00 TO 290+00	EST. 125	EST. 1	EST. 1

- LEGEND:**
- ⊙ EXIST STRUCTURE TO BE REMOVED
  - ⊕ EXIST STRUCTURE TO BE RELOCATED
  - ⊖ EXIST STRUCTURE TO BE ADJUSTED (BY OTHERS)
  - ⊗ EXIST STRUCTURE TO BE REMAIN IN PLACE
  - ⓪ - ELIMATE EXISTING PAV. MRKS (4")
  - Ⓟ - ELIMATE EXISTING PAV. MRKS (8")
  - Ⓠ - ELIMATE EXISTING PAV. MRKS (12")
  - Ⓡ - ELIMATE EXISTING PAV. MRKS (24")
  - Ⓢ - ELIMATE EXISTING PAV. MRKS (ARROW)
  - Ⓣ - ELIMATE EXISTING PAV. MRKS (WORD)
- PROP.** - PROPOSED  
**EXIST.** - EXISTING  
**R.O.W.** - RIGHT OF WAY  
**BL** - BASE LINE  
**RDWY.** - ROADWAY  
**STA.** - STATION  
**EOP** - EDGE OF PAVEMENT  
**SET** - SAFETY END TREATMENT  
**EA.** - EACH  
**RCP** - REINFORCE CONCRETE PIPE  
**TYP.** - TYPICAL  
**RD.** - ROAD  
**F-F** - FACE TO FACE  
**MBGF** - METAL BEAM GUARD FENCE  
**DAT** - DOWNSTREAM ANCHOR TERMINAL  
**TAS** - TERMINAL ANCHOR SECTION

- GENREAL NOTES:**
- SEE SIGN LAYOUT FOR SIGN REMOVAL QUANTITIES.
  - SEE DRIVEWAY TABLE FOR DRIVEWAY REMOVAL QUANTITIES.
  - SEE SUMMARY OF MATERIALS TRAFFIC SIGNALS FOR SIGNAL QUANTITIES.

MATCH LINE STA. 278+00.00



MATCH LINE STA. 290+00.00



**Pharr District Central Design**

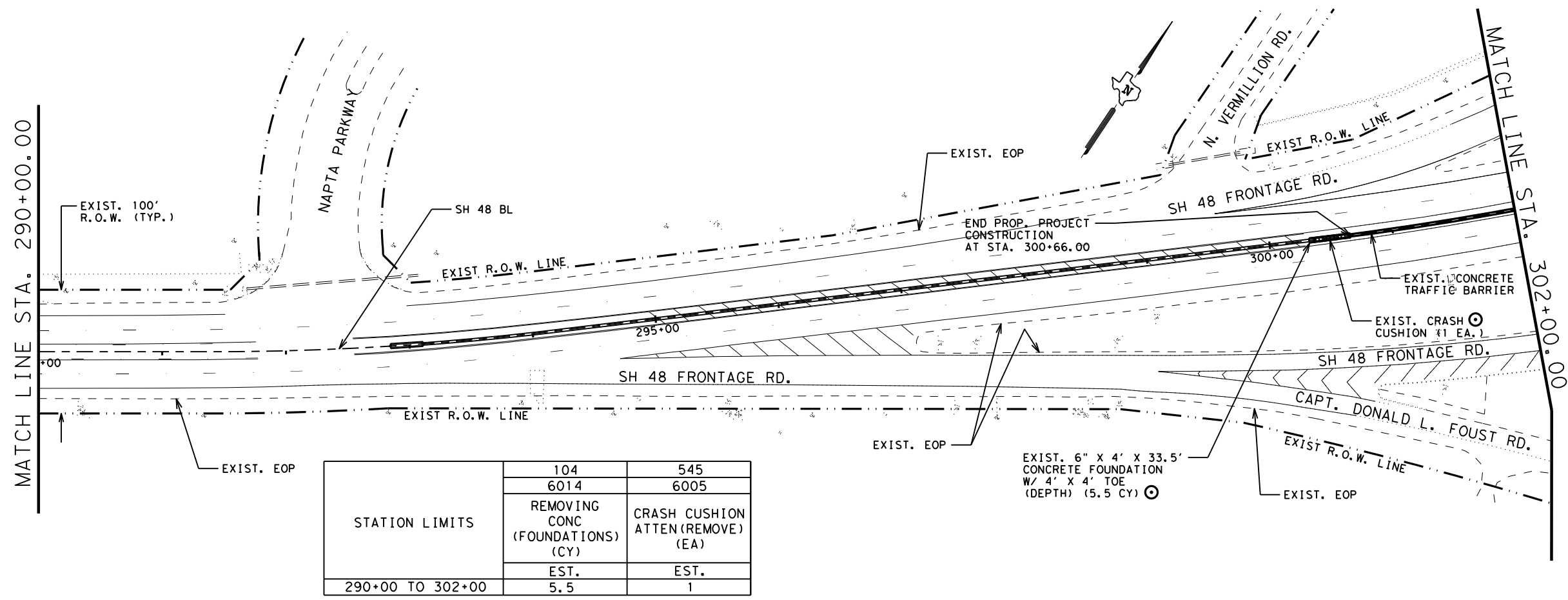
**Texas Department of Transportation**

**SH 48 STRUCTURE REMOVAL LAYOUT**

PLAN SCALE: 1"=100' SHEET 8 OF 11

© 2022	CONT	SECT	JOB	HIGHWAY
DS:	CK:	0220	05	080
DW:	CK:	DIST		COUNTY
		PHR		CAMERON
				SHEET NO.
				143

DATE: 2/27/2023 4:18:17 PM  
 FILE: \\txdot.projectwiseonline.com:txdot\Projects\022005080\4 - Design\Plan Set\3. Roadway\1) Structure Removal\Layout sheets\Removal



- LEGEND:**
- ⊙ EXIST STRUCTURE TO BE REMOVED
  - ⊕ EXIST STRUCTURE TO BE RELOCATED
  - ⊖ EXIST STRUCTURE TO BE ADJUSTED (BY OTHERS)
  - ⊗ EXIST STRUCTURE TO BE REMAIN IN PLACE

- ⓪ - ELIMATE EXISTING PAV. MRKS (4")
- Ⓟ - ELIMATE EXISTING PAV. MRKS (8")
- Ⓠ - ELIMATE EXISTING PAV. MRKS (12")
- Ⓡ - ELIMATE EXISTING PAV. MRKS (24")
- Ⓢ - ELIMATE EXISTING PAV. MRKS (ARROW)
- Ⓣ - ELIMATE EXISTING PAV. MRKS (WORD)

- PROP. - PROPOSED  
 EXIST. - EXISTING  
 R.O.W. - RIGHT OF WAY  
 BL - BASE LINE  
 RDWY. - ROADWAY  
 STA. - STATION  
 EOP - EDGE OF PAVEMENT  
 SET - SAFETY END TREATMENT  
 EA. - EACH  
 RCP - REINFORCE CONCRETE PIPE  
 TYP. - TYPICAL  
 RD. - ROAD  
 F-F - FACE TO FACE  
 MBGF - METAL BEAM GUARD FENCE  
 DAT - DOWNSTREAM ANCHOR TERMINAL  
 TAS - TERMINAL ANCHOR SECTION

- GENREAL NOTES:**
- SEE SIGN LAYOUT FOR SIGN REMOVAL QUANTITIES.
  - SEE DRIVEWAY TABLE FOR DRIVEWAY REMOVAL QUANTITIES.
  - SEE SUMMARY OF MATERIALS TRAFFIC SIGNALS FOR SIGNAL QUANTITIES.



Pharr District Central Design

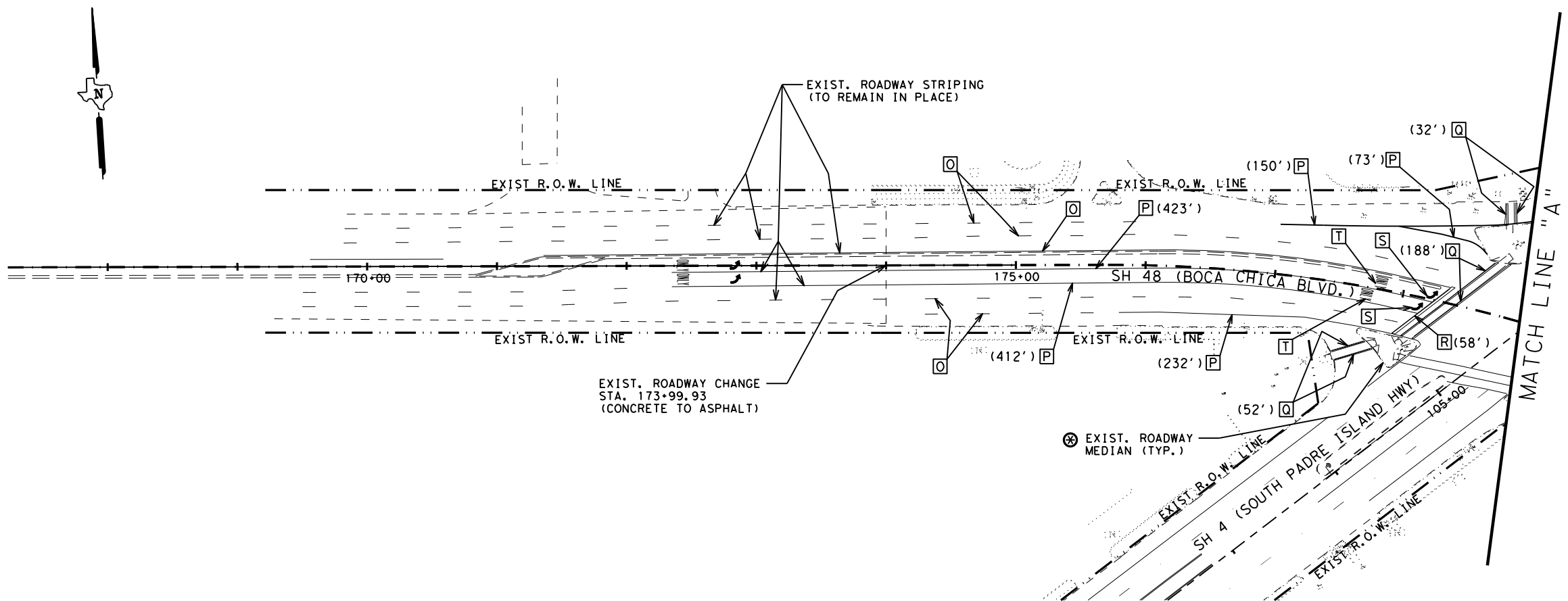


## SH 48 STRUCTURE REMOVAL LAYOUT

PLAN SCALE: 1"=100' SHEET 9 OF 11

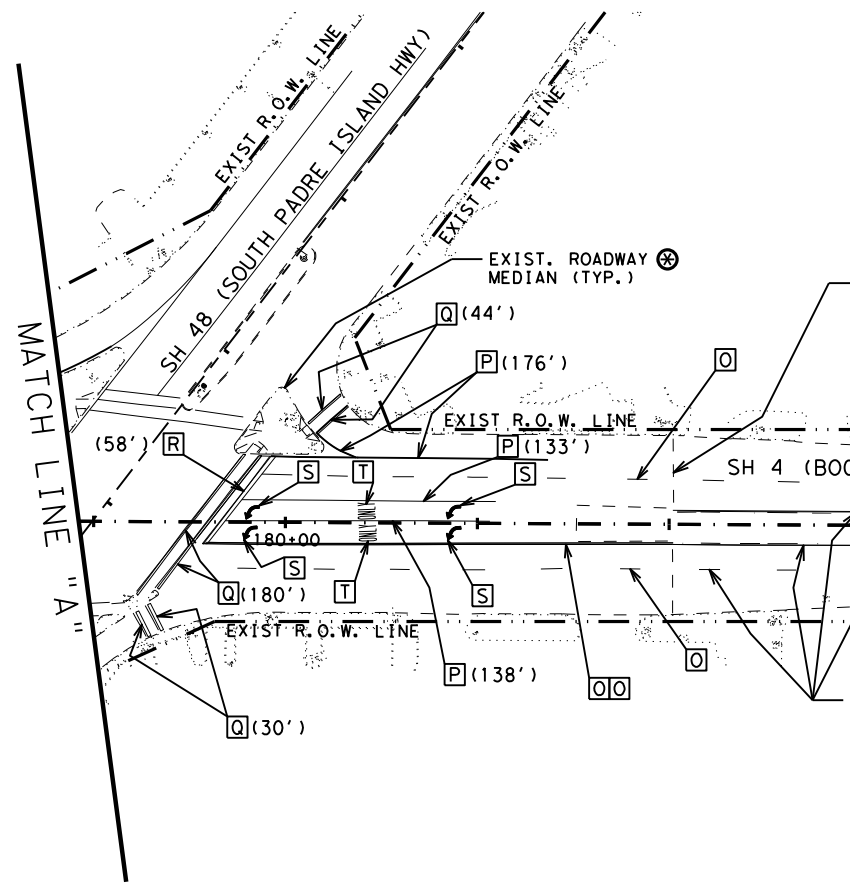
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- LEGEND:**
- ⊙ EXIST STRUCTURE TO BE REMOVED
  - ⊕ EXIST STRUCTURE TO BE RELOCATED
  - ⊖ EXIST STRUCTURE TO BE ADJUSTED (BY OTHERS)
  - ⊗ EXIST STRUCTURE TO BE REMAIN IN PLACE
  - Q - ELIMATE EXISTING PAV. MRKS (4")
  - P - ELIMATE EXISTING PAV. MRKS (8")
  - Q - ELIMATE EXISTING PAV. MRKS (12")
  - R - ELIMATE EXISTING PAV. MRKS (24")
  - S - ELIMATE EXISTING PAV. MRKS (ARROW)
  - T - ELIMATE EXISTING PAV. MRKS (WORD)
  - PROP. - PROPOSED
  - EXIST. - EXISTING
  - R.O.W. - RIGHT OF WAY
  - BL - BASE LINE
  - RDWY. - ROADWAY
  - STA. - STATION
  - EOP - EDGE OF PAVEMENT
  - SET - SAFETY END TREATMENT
  - EA. - EACH
  - RCP - REINFORCE CONCRETE PIPE
  - TYP. - TYPICAL
  - RD. - ROAD
  - F-F - FACE TO FACE
  - MBGF - METAL BEAM GUARD FENCE
  - DAT - DOWNSTREAM ANCHOR TERMINAL
  - TAS - TERMINAL ANCHOR SECTION

- GENREAL NOTES:**
- SEE SIGN LAYOUT FOR SIGN REMOVAL QUANTITIES.
  - SEE DRIVEWAY TABLE FOR DRIVEWAY REMOVAL QUANTITIES.
  - SEE SUMMARY OF MATERIALS TRAFFIC SIGNALS FOR SIGNAL QUANTITIES.



STATION LIMITS	677	677	677	677	677	677
	6001	6003	6005	6007	6008	6012
	ELIM EXT PAV MRK & MRKS (4") (LF)	ELIM EXT PAV MRK & MRKS (8") (LF)	ELIM EXT PAV MRK & MRKS (12") (LF)	ELIM EXT PAV MRK & MRKS (24") (LF)	ELIM EXT PAV MRK & MRKS (ARROW) (EA)	ELIM EXT PAV MRK & MRKS (WORD) (EA)
173+99.93 TO 182+01.99	EST. 1336	EST. 1737	EST. 450	EST. 116	EST. 6	EST. 4



**Pharr District Central Design**

Texas Department of Transportation

**SH 48  
STRUCTURE REMOVAL  
LAYOUT**

PLAN SCALE: 1"=100' SHEET 10 OF 11

DS:	CK:	0220	05	080	SH 48
DW:	CK:	PHR	CAMERON	145	



DATE: 2/27/2023 4:18:36 PM  
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**LEGEND:**

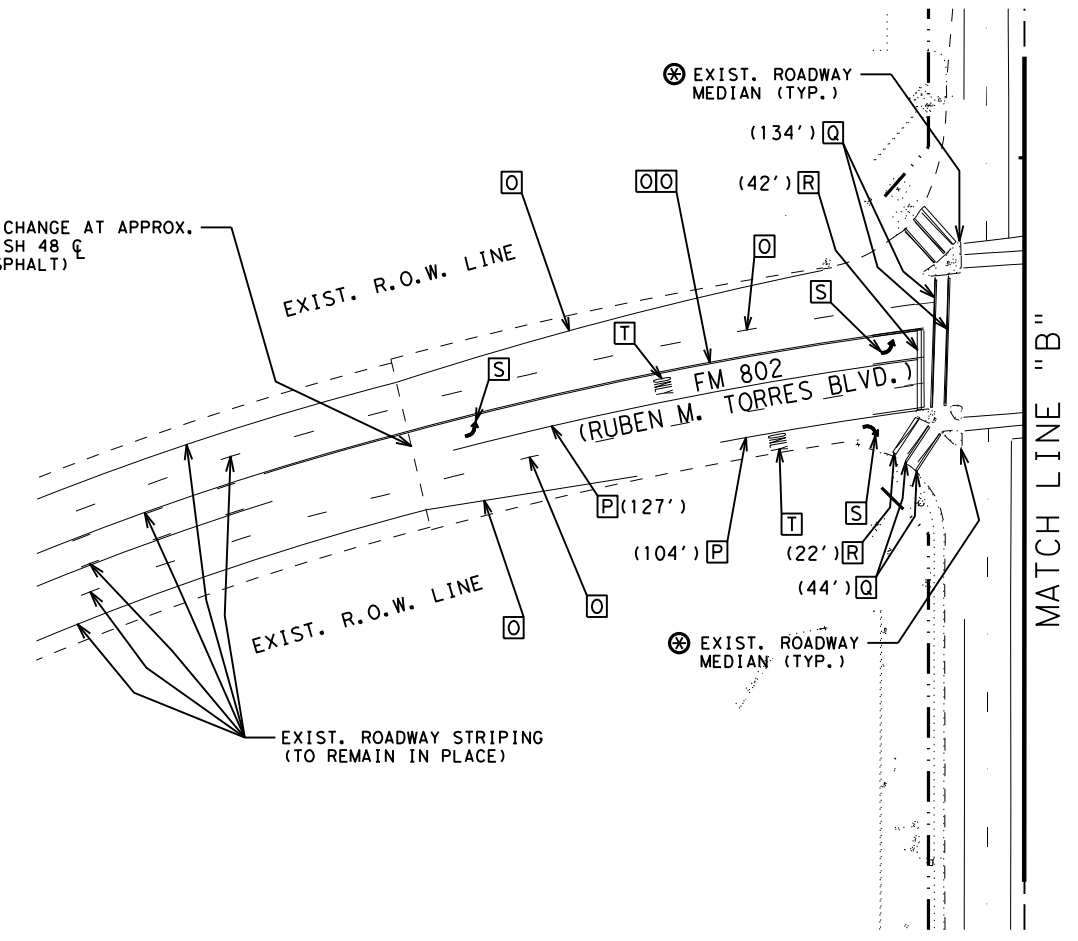
- ⊙ EXIST STRUCTURE TO BE REMOVED
- ⊕ EXIST STRUCTURE TO BE RELOCATED
- ⊖ EXIST STRUCTURE TO BE ADJUSTED (BY OTHERS)
- ⊗ EXIST STRUCTURE TO BE REMAIN IN PLACE
- ⓪ - ELIMATE EXISTING PAV. MRKS (4")
- Ⓟ - ELIMATE EXISTING PAV. MRKS (8")
- Ⓠ - ELIMATE EXISTING PAV. MRKS (12")
- Ⓡ - ELIMATE EXISTING PAV. MRKS (24")
- Ⓢ - ELIMATE EXISTING PAV. MRKS (ARROW)
- Ⓣ - ELIMATE EXISTING PAV. MRKS (WORD)

- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- BL - BASE LINE
- RDWY. - ROADWAY
- STA. - STATION
- EOP - EDGE OF PAVEMENT
- SET - SAFETY END TREATMENT
- EA. - EACH
- RCP - REINFORCE CONCRETE PIPE
- TYP. - TYPICAL
- RD. - ROAD
- F-F - FACE TO FACE
- MBGF - METAL BEAM GUARD FENCE
- DAT - DOWNSTREAM ANCHOR TERMINAL
- TAS - TERMINAL ANCHOR SECTION

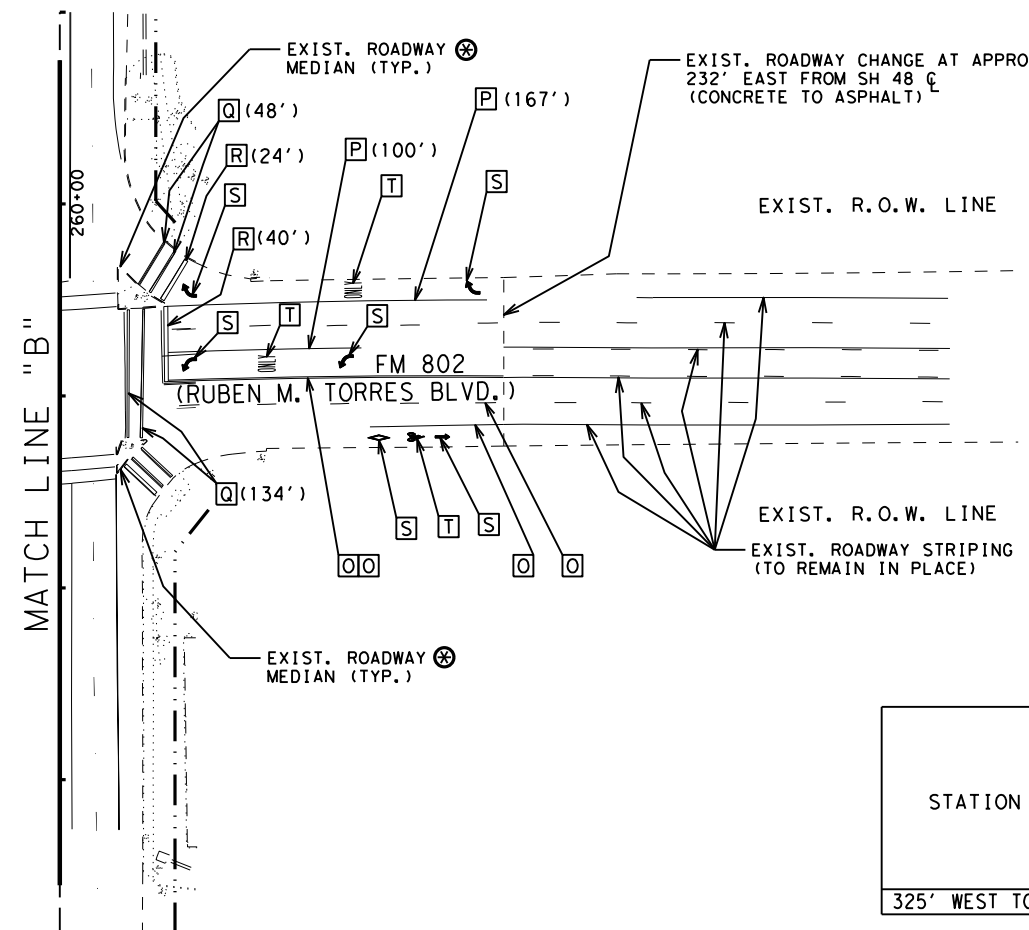
**GENREAL NOTES:**

1. SEE SIGN LAYOUT FOR SIGN REMOVAL QUANTITIES.
2. SEE DRIVEWAY TABLE FOR DRIVEWAY REMOVAL QUANTITIES.
3. SEE SUMMARY OF MATERIALS TRAFFIC SIGNALS FOR SIGNAL QUANTITIES.

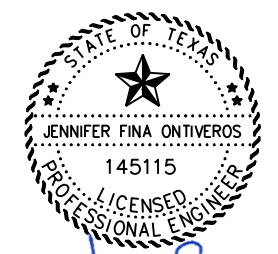
EXIST. ROADWAY CHANGE AT APPROX. 325' WEST FROM SH 48 CL (CONCRETE TO ASPHALT)



EXIST. ROADWAY CHANGE AT APPROX. 232' EAST FROM SH 48 CL (CONCRETE TO ASPHALT)



STATION LIMITS	677	677	677	677	677	677
	6001	6003	6005	6007	6008	6012
	ELIM EXT PAV MRK & MRKS (4") (LF)	ELIM EXT PAV MRK & MRKS (8") (LF)	ELIM EXT PAV MRK & MRKS (12") (LF)	ELIM EXT PAV MRK & MRKS (24") (LF)	ELIM EXT PAV MRK & MRKS (ARROW) (EA)	ELIM EXT PAV MRK & MRKS (WORD) (EA)
EST.	EST.	EST.	EST.	EST.	EST.	EST.
325' WEST TO 232' EAST	1546	498	360	128	9	5



*Jennifer Fina Ontiveros*  
 02/28/2023

**Pharr District Central Design**

Texas Department of Transportation







**SH 48  
 STRUCTURE REMOVAL  
 LAYOUT**

PLAN SCALE: 1"=100' SHEET 11 OF 11

© 2022	CONT	SECT	JOB	HIGHWAY
DS: CR:	0220	05	080	SH 48
DW: CR:	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	146

DATE: 2/20/2023 9:27:32 AM  
 FILE: \\txdot\project\wiseonline.com\txdot\Documents\21 - PHR\Design Projects\022005080\4 - Design\Plan Set\3. Roadway\2) Prop Rdwy Plans\1) Prop Roadway Plan Layouts\ROADWAY PLAN

**LEGEND**

-  - PROPOSED MILLING AND OVERLAY
-  - PROPOSED CONCRETE TURNAROUND
-  - PROPOSED RAISED CONCRETE MEDIAN
-  - DIRECTIONAL OF TRAFFIC FLOW
-  - TO BE ADJUSTED BY OTHERS
-  - DIRECTION OF RUNOFF FLOW
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- BL - BASELINE
- STA. - STATION
- EOP - EDGE OF PAVEMENT
- FOC - FACE OF CURB
- SET - SAFETY END TREATMENT
- GET - GUARDRAIL END TREATMENT
- DAT - DOWNSTREAM ANCHOR TERMINAL
- TY - TYPE
- RCP - REINFORCE CONCRETE PIPE
- CONC. - CONCRETE
- TYP. - TYPICAL
- RAD. - RADIUS
- LT. - LEFT
- RT. - RIGHT

NOTE:  
 ALL STATIONS ARE BASED ON SH 48 BASELINE AND ALL OFFSETS ARE TO NOMINAL FACE OF CURB OR EDGE OF PAVEMENT.

SHEET TOTALS			
ITEM	EST.	UNIT	DESCRIPTION
432	6006	35	CY RIPRAP (CONC) (CL B)
529	6002	1432	LF CONC CURB (TY II)
529	6024	73	LF CONC CURB TY B (MOUNTABLE)
713	6006	100	LF CRCK CLEAN AND SEAL (CRCP)
780	6002	100	LF CNC CRCK RPR (DISCRT) (INJCT)
361	6004	50	SY FULL DEPTH REPAIR CRCP (10")

\*REPAIR CRCP IF NEEDED, AS DIRECTED BY ENGINEER.

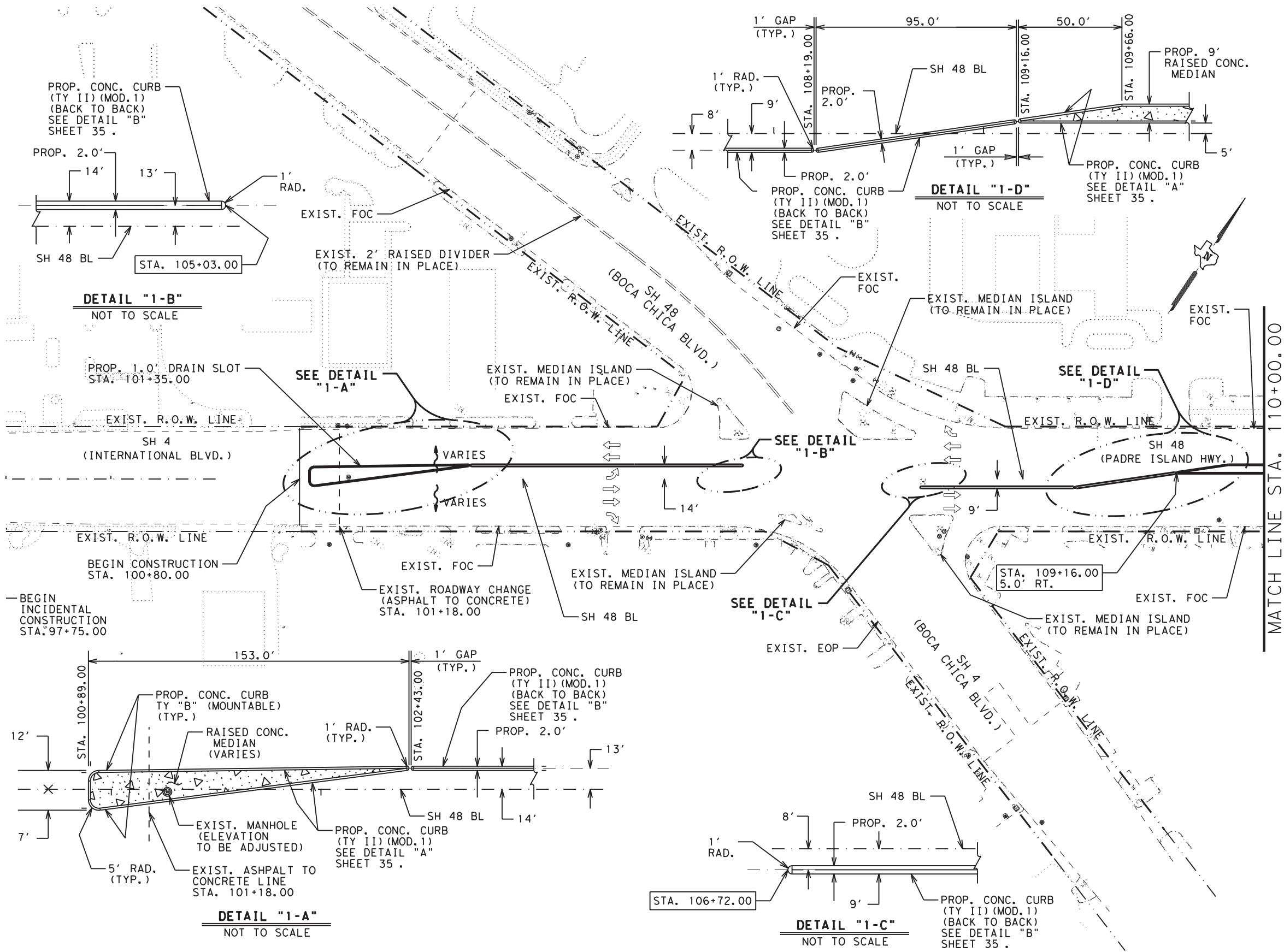


**Pharr District Central Design**  
 Texas Department of Transportation

**SH 48 PROPOSED ROADWAY PLAN LAYOUT**

SCALE: 1" = 50' SHEET 1 OF 17

© 2022	CONT	SECT	JOB	HIGHWAY
DS:	0220	05	080	SH 48
DW:	DIST	COUNTY	SHEET NO.	
PHR	CAMERON	147		



**DETAIL "1-B"**  
NOT TO SCALE

**DETAIL "1-D"**  
NOT TO SCALE

**SEE DETAIL "1-A"**

**SEE DETAIL "1-B"**

**SEE DETAIL "1-D"**

**SEE DETAIL "1-C"**

**DETAIL "1-A"**  
NOT TO SCALE

**DETAIL "1-C"**  
NOT TO SCALE

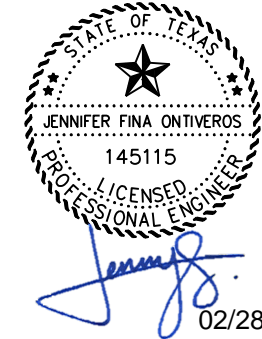
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 FILE: \\txdot\project\wiseonline.com:txdot\Documents\21 - PHR\Design Projects\0220050804 - Design\Plan Set\3. Roadway\2. Prop Rdwy Plans\1) Prop Roadway Plan Layouts\ROADWAY PLAN

**LEGEND**

- PROPOSED MILLING AND OVERLAY
- PROPOSED CONCRETE TURNAROUND
- PROPOSED RAISED CONCRETE MEDIAN
- DIRECTIONAL OF TRAFFIC FLOW
- TO BE ADJUSTED BY OTHERS
- DIRECTION OF RUNOFF FLOW
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- BL - BASELINE
- STA. - STATION
- EOP - EDGE OF PAVEMENT
- FOC - FACE OF CURB
- SET - SAFETY END TREATMENT
- GET - GUARDRAIL END TREATMENT
- DAT - DOWNSTREAM ANCHOR TERMINAL
- TY - TYPE
- RCP - REINFORCE CONCRETE PIPE
- CONC. - CONCRETE
- TYP. - TYPICAL
- RAD. - RADIUS
- LT. - LEFT
- RT. - RIGHT

NOTE:  
 ALL STATIONS ARE BASED ON SH 48 BASELINE AND ALL OFFSETS ARE TO NOMINAL FACE OF CURB OR EDGE OF PAVEMENT.

SHEET TOTALS			
ITEM	EST.	UNIT	DESCRIPTION
432 6006	157	CY	RIPRAP (CONC) (CL B)
529 6002	80	LF	CONC CURB (TY II)
529 6024	2161	LF	CONC CURB TY B (MOUNTABLE)

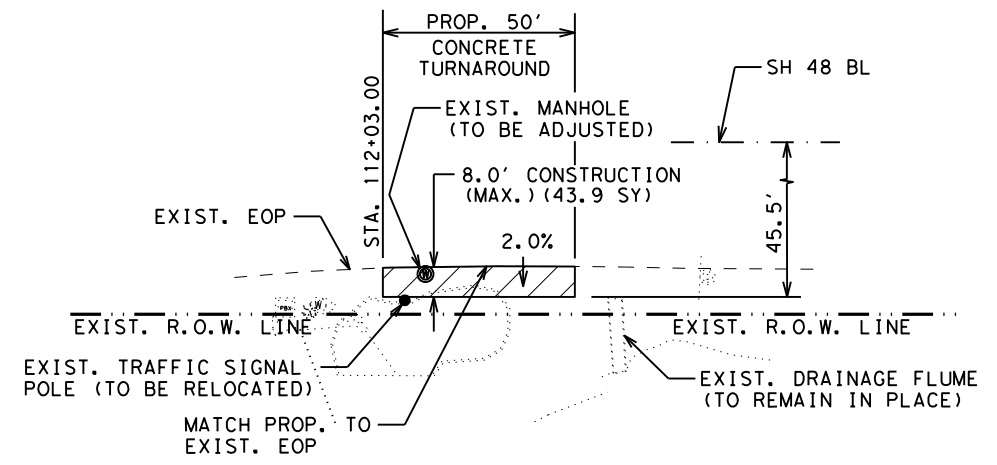
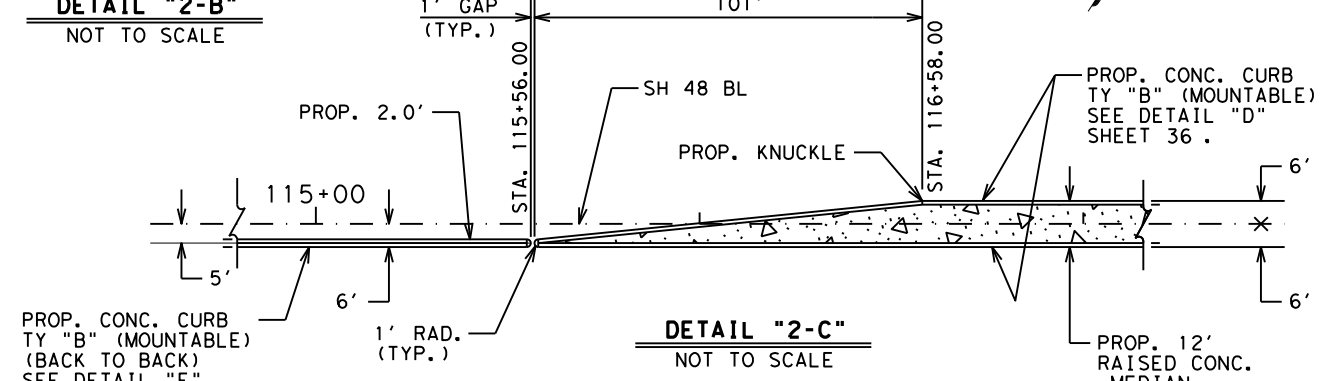
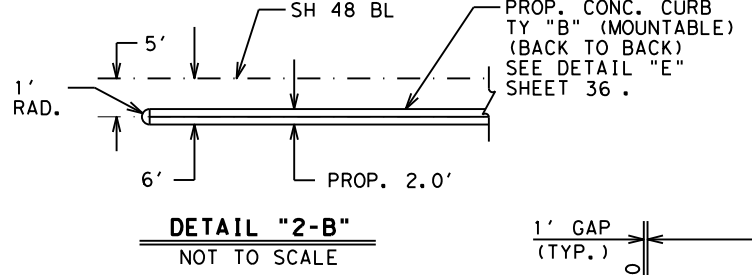
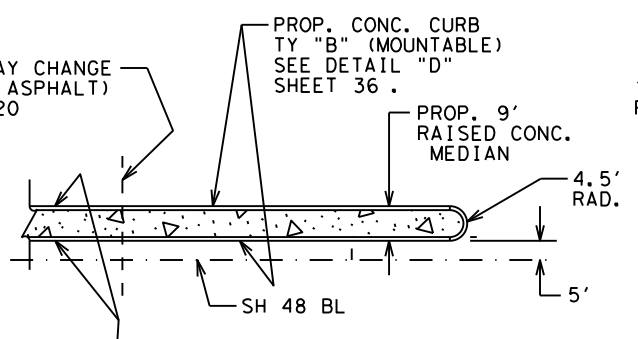
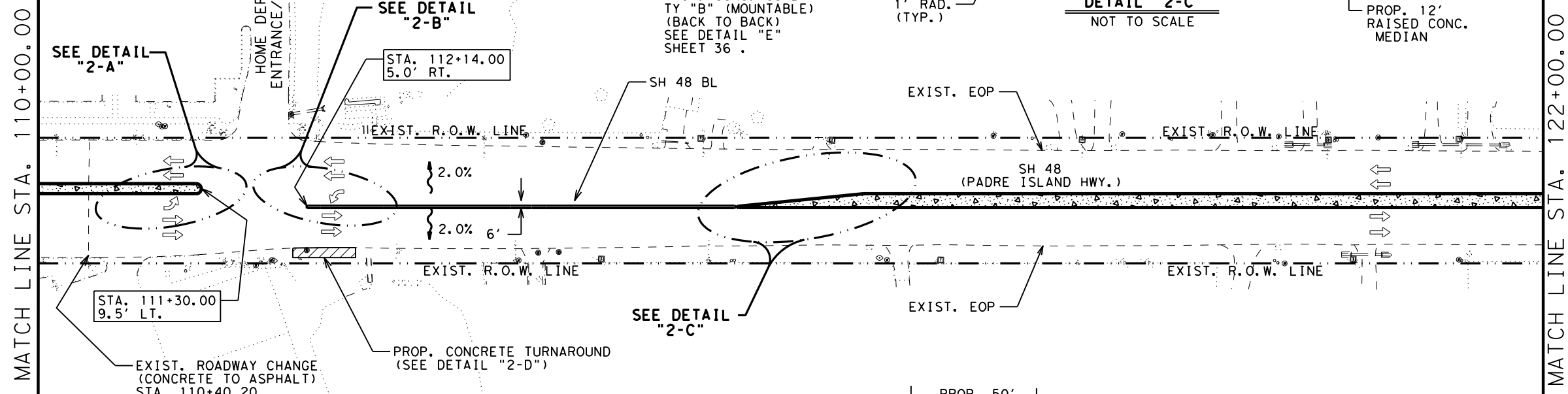


**Pharr District Central Design**  
 Texas Department of Transportation

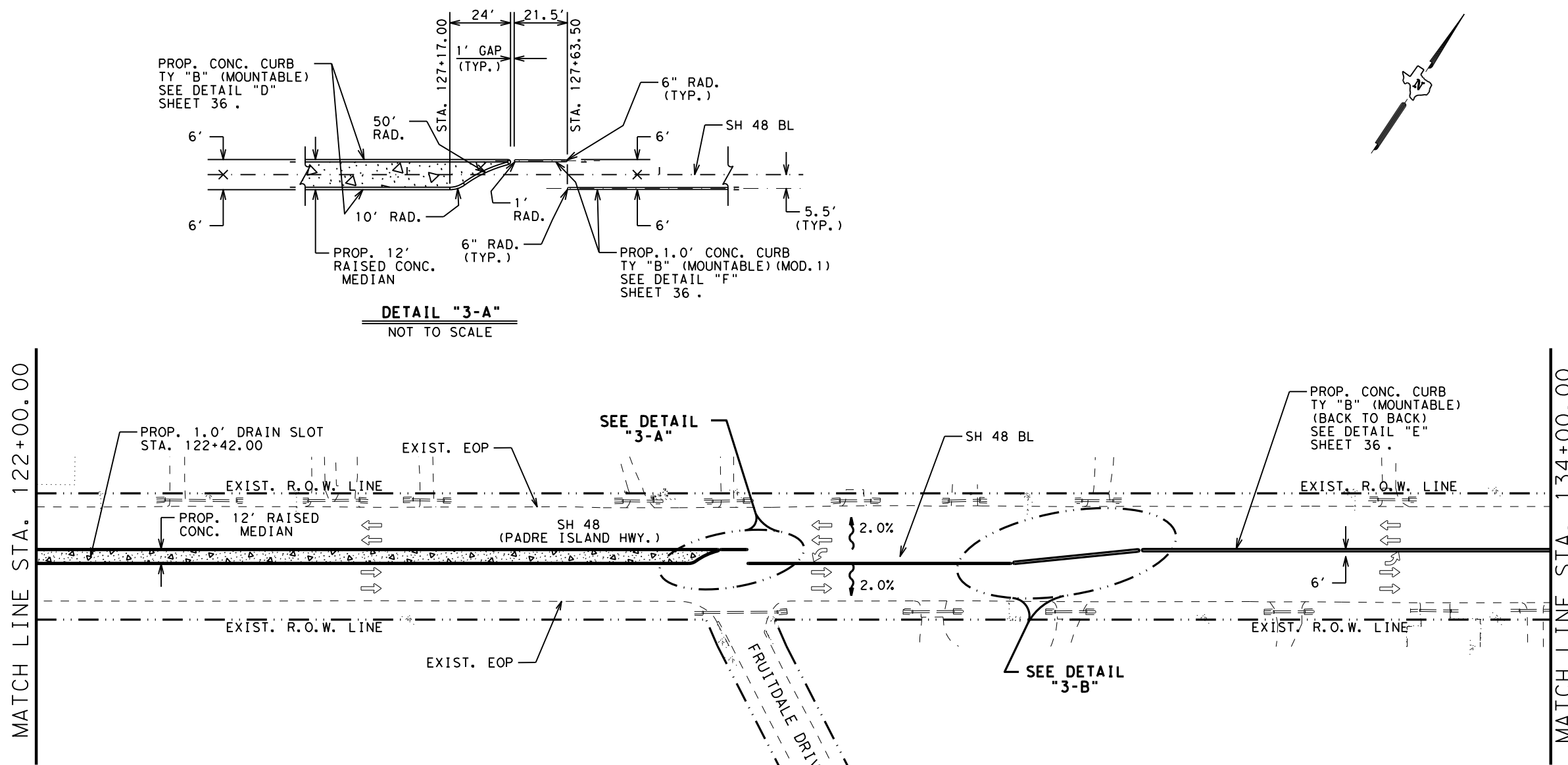
**SH 48  
 PROPOSED ROADWAY  
 PLAN LAYOUT**

SCALE: 1" = 50'      SHEET 2 OF 17

© 2022	CONT	SECT	JOB	HIGHWAY
DS:    CK:	0220	05	080	SH 48
DW:    CK:	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	148	



PHR\Design Projects\0220050804 - Design\Plan Set\3. Roadway\2. Prop Rdwy Plans\1) Prop Roadway Plan Layouts\ROADWAY PLAN



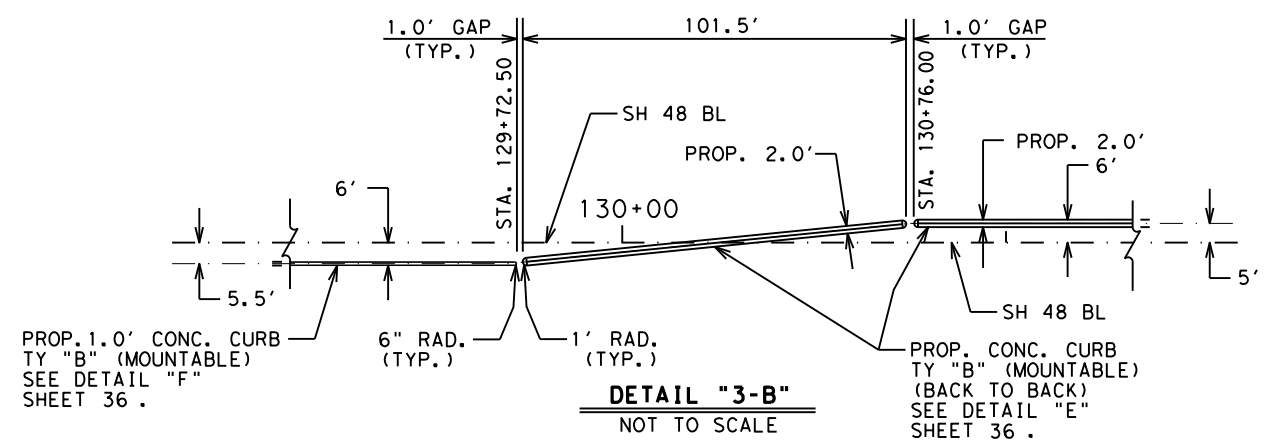
**LEGEND**

- PROPOSED MILLING AND OVERLAY
- PROPOSED CONCRETE TURNAROUND
- PROPOSED RAISED CONCRETE MEDIAN
- DIRECTIONAL OF TRAFFIC FLOW
- TO BE ADJUSTED BY OTHERS
- DIRECTION OF RUNOFF FLOW

PROP. - PROPOSED  
EXIST. - EXISTING  
R.O.W. - RIGHT OF WAY  
BL - BASELINE  
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EOP - EDGE OF PAVEMENT  
FOC - FACE OF CURB  
SET - SAFETY END TREATMENT  
GET - GUARDRAIL END TREATMENT  
DAT - DOWNSTREAM ANCHOR TERMINAL  
TY - TYPE  
RCP - REINFORCE CONCRETE PIPE  
CONC. - CONCRETE  
TYP. - TYPICAL  
RAD. - RADIUS  
LT. - LEFT  
RT. - RIGHT

NOTE:  
ALL STATIONS ARE BASED ON SH 48 BASELINE AND ALL OFFSETS ARE TO NOMINAL FACE OF CURB OR EDGE OF PAVEMENT.

SHEET TOTALS			
ITEM	EST.	UNIT	DESCRIPTION
432	6006	123 CY	RIPRAP (CONC) (CL B)
529	6024	2169 LF	CONC CURB TY B (MOUNTABLE)



**Pharr District Central Design**

**SH 48  
PROPOSED ROADWAY  
PLAN LAYOUT**

SCALE: 1" = 50'

SHEET 3 OF 17

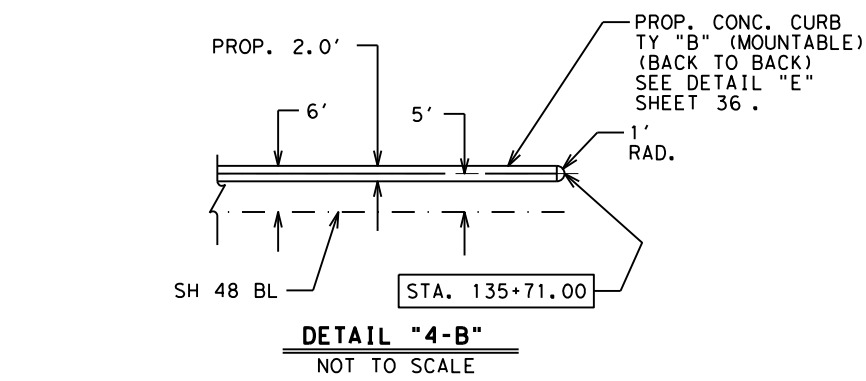
© 2022		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0220	05	080	SH 48
DW:	CK:	DIST		COUNTY	SHEET NO.
PHR		CAMERON			149

DATE: 2/27/2023 4:19:19 PM  
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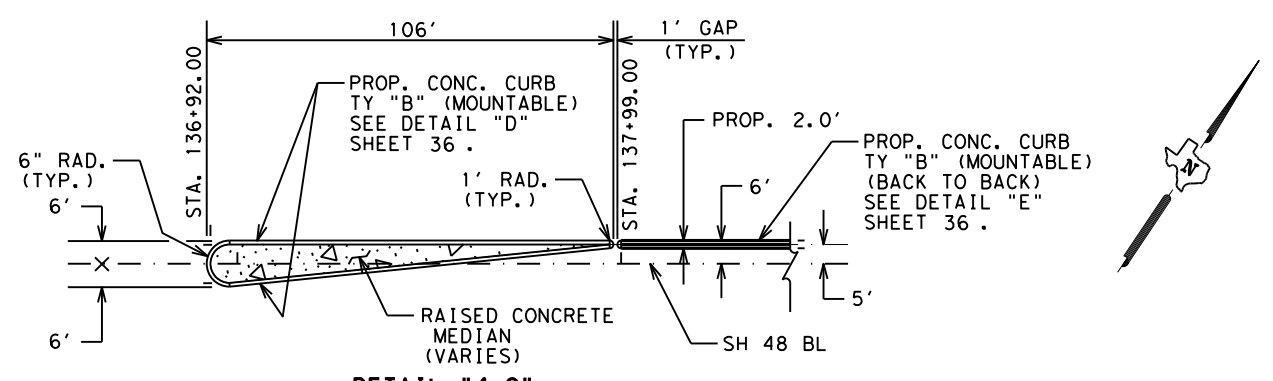
- LEGEND**
- PROPOSED MILLING AND OVERLAY
  - PROPOSED CONCRETE TURNAROUND
  - PROPOSED RAISED CONCRETE MEDIAN
  - DIRECTIONAL OF TRAFFIC FLOW
  - TO BE ADJUSTED BY OTHERS
  - DIRECTION OF RUNOFF FLOW
  - PROP. - PROPOSED
  - EXIST. - EXISTING
  - R.O.W. - RIGHT OF WAY
  - BL - BASELINE
  - STA. - STATION
  - EOP - EDGE OF PAVEMENT
  - FOC - FACE OF CURB
  - SET - SAFETY END TREATMENT
  - GET - GUARDRAIL END TREATMENT
  - DAT - DOWNSTREAM ANCHOR TERMINAL
  - TY - TYPE
  - RCP - REINFORCE CONCRETE PIPE
  - CONC. - CONCRETE
  - TYP. - TYPICAL
  - RAD. - RADIUS
  - LT. - LEFT
  - RT. - RIGHT

**NOTE:**  
 ALL STATIONS ARE BASED ON SH 48 BASELINE  
 AND ALL OFFSETS ARE TO NOMINAL FACE OF  
 CURB OR EDGE OF PAVEMENT.

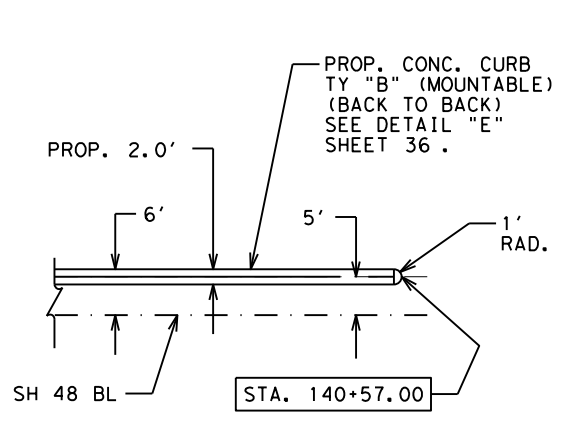
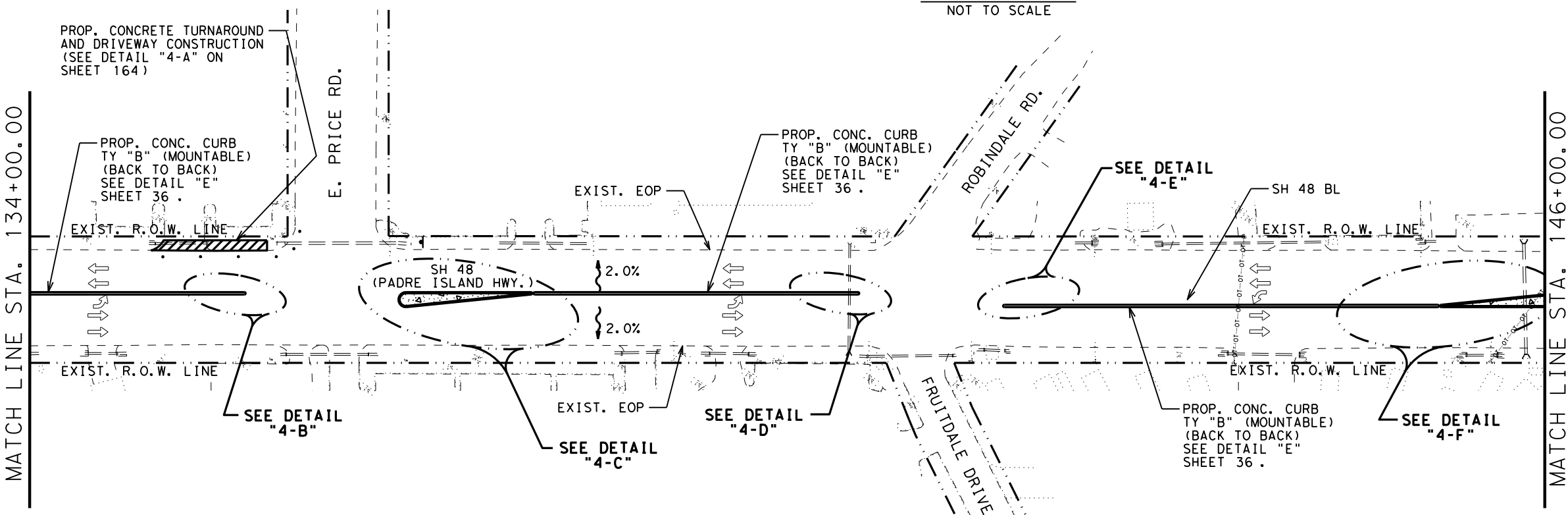
SHEET TOTALS			
ITEM	EST.	UNIT	DESCRIPTION
432 6006	21	CY	RIPRAP (CONC) (CL B)
529 6024	1942	LF	CONC CURB TY B (MOUNTABLE)



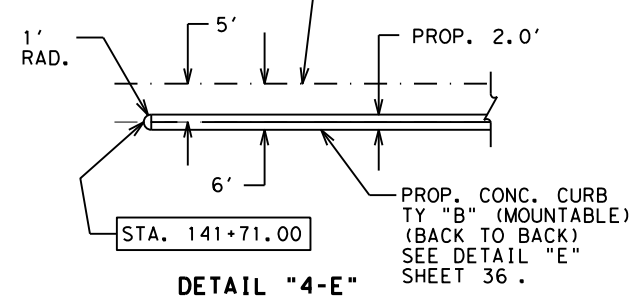
**DETAIL "4-B"**  
 NOT TO SCALE



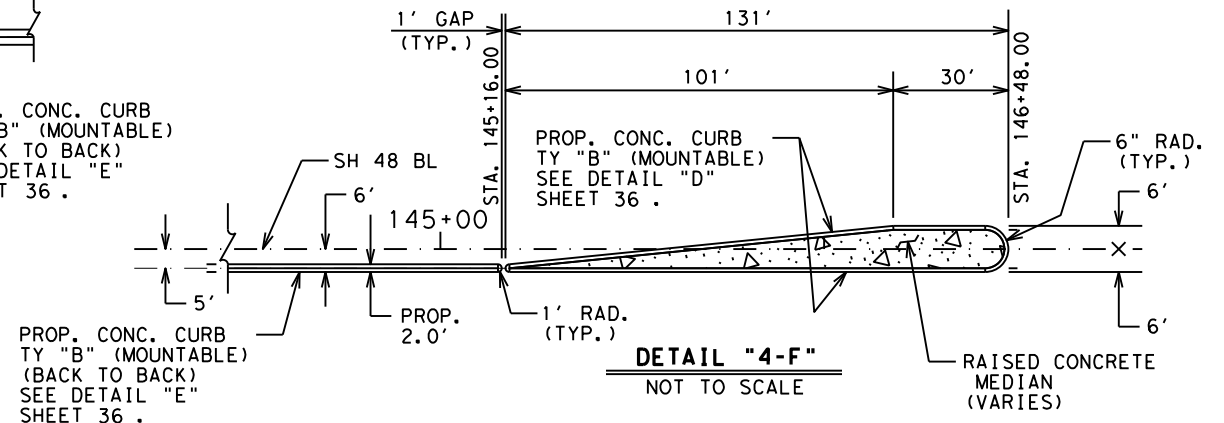
**DETAIL "4-C"**  
 NOT TO SCALE



**DETAIL "4-D"**  
 NOT TO SCALE



**DETAIL "4-E"**  
 NOT TO SCALE



**DETAIL "4-F"**  
 NOT TO SCALE



Pharr District Central Design  
 Texas Department of Transportation

**SH 48  
 PROPOSED ROADWAY  
 PLAN LAYOUT**







SCALE: 1" = 50'

DS:	0220	05	080	SH 48
DW:	PHR	CAMERON	150	

SHEET 4 OF 17

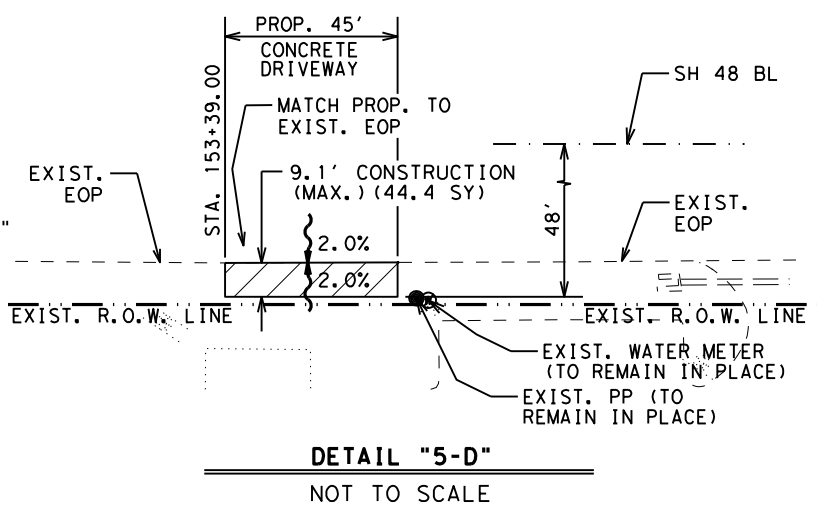
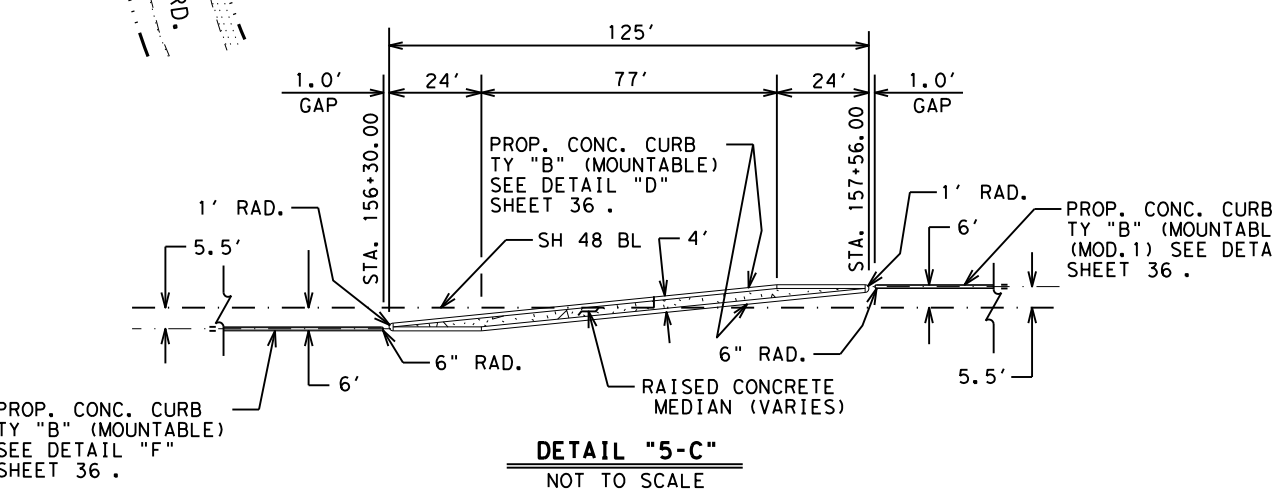
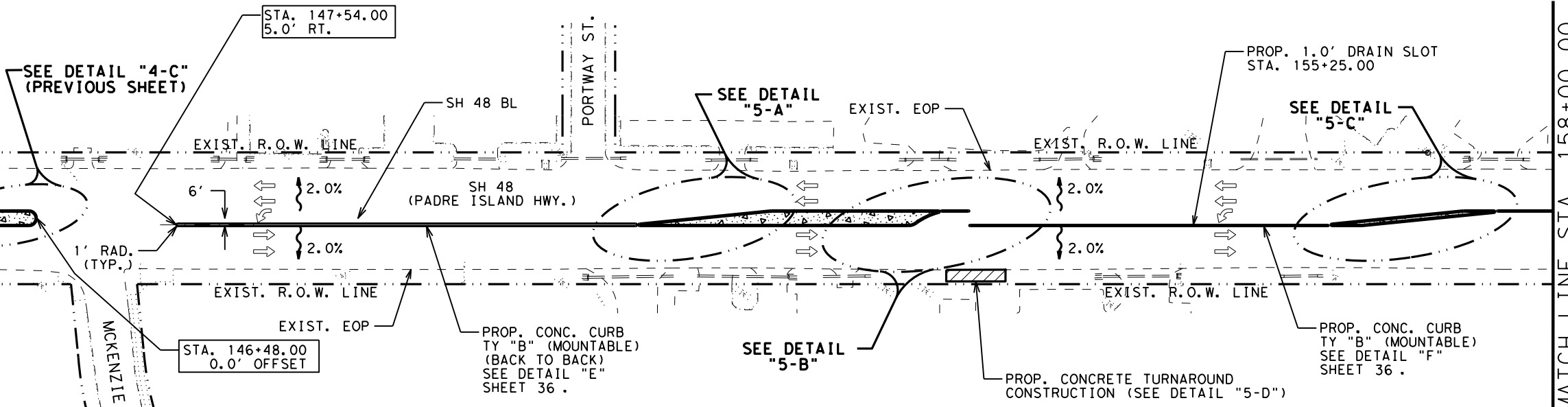
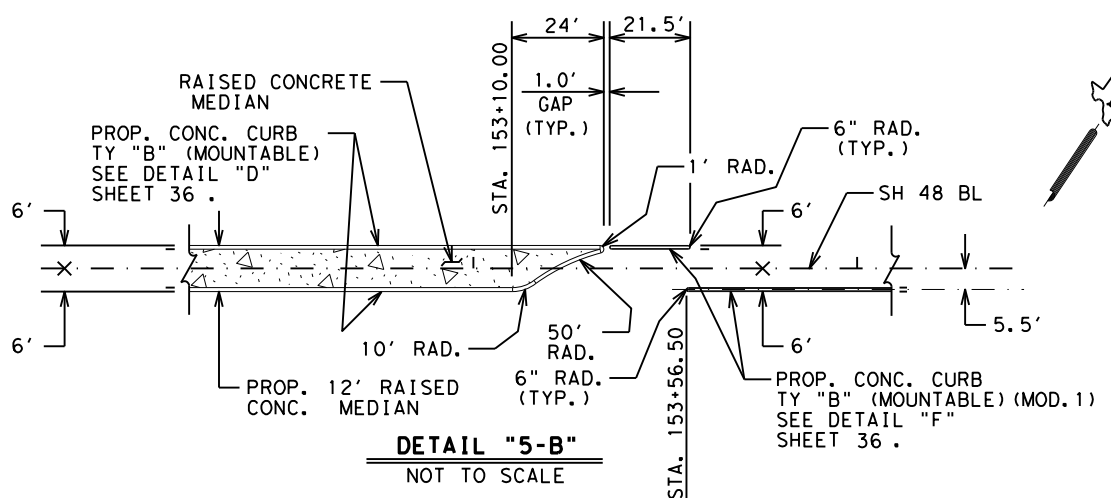
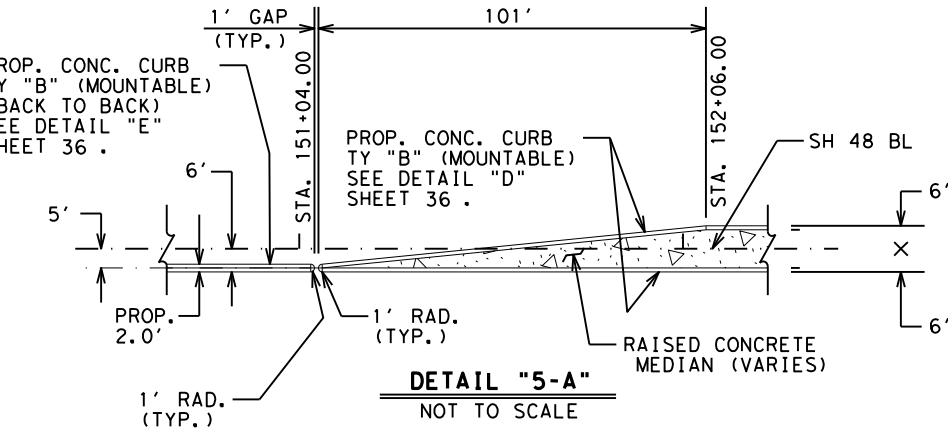
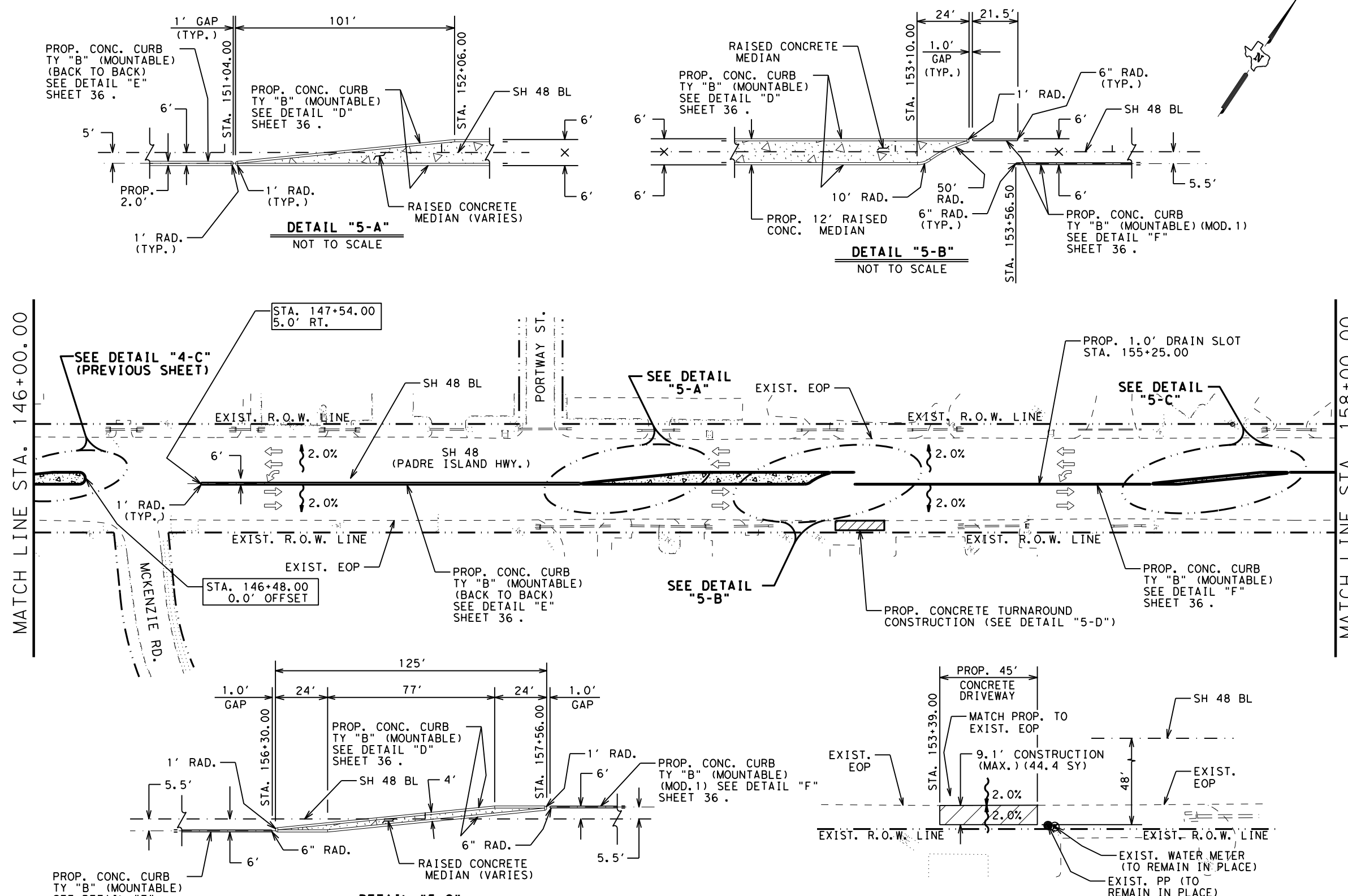
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**LEGEND**

-  - PROPOSED MILLING AND OVERLAY
-  - PROPOSED CONCRETE TURNAROUND
-  - PROPOSED RAISED CONCRETE MEDIAN
-  - DIRECTIONAL OF TRAFFIC FLOW
-  - TO BE ADJUSTED BY OTHERS
-  - DIRECTION OF RUNOFF FLOW
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- BL - BASELINE
- STA. - STATION
- EOP - EDGE OF PAVEMENT
- FOC - FACE OF CURB
- SET - SAFETY END TREATMENT
- GET - GUARDRAIL END TREATMENT
- DAT - DOWNSTREAM ANCHOR TERMINAL
- TY - TYPE
- RCP - REINFORCE CONCRETE PIPE
- CONC. - CONCRETE
- TYP. - TYPICAL
- RAD. - RADIUS
- LT. - LEFT
- RT. - RIGHT

NOTE:  
 ALL STATIONS ARE BASED ON SH 48 BASELINE  
 AND ALL OFFSETS ARE TO NOMINAL FACE OF  
 CURB OR EDGE OF PAVEMENT.

SHEET TOTALS				
ITEM	EST.	UNIT	DESCRIPTION	
432	6006	54	CY	RIPRAP (CONC) (CL B)
529	6024	1841	LF	CONC CURB TY B (MOUNTABLE)



STATE OF TEXAS  
 JENNIFER FINA ONTIVEROS  
 145115  
 LICENSED PROFESSIONAL ENGINEER  
 02/28/2023

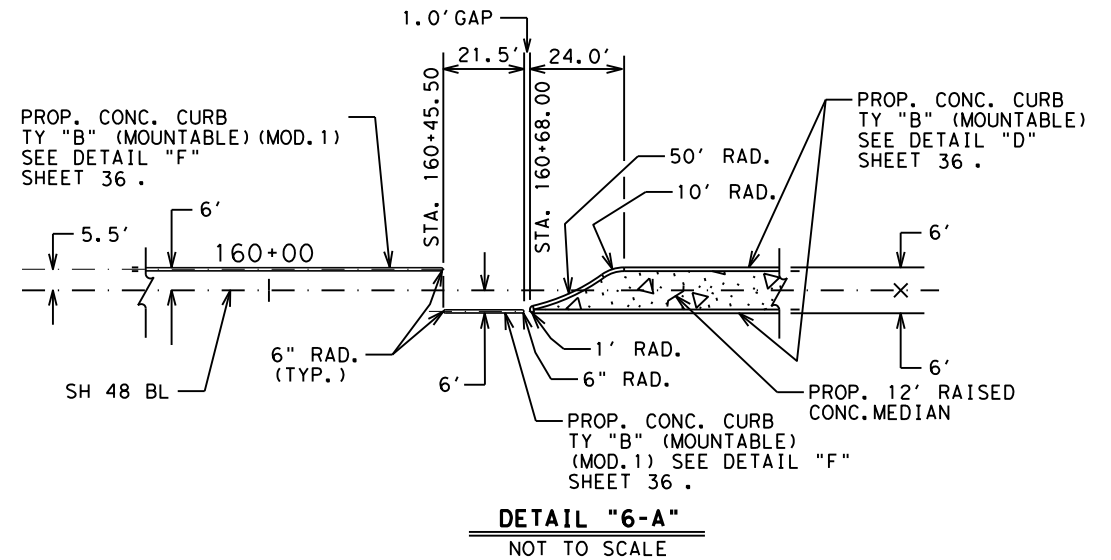
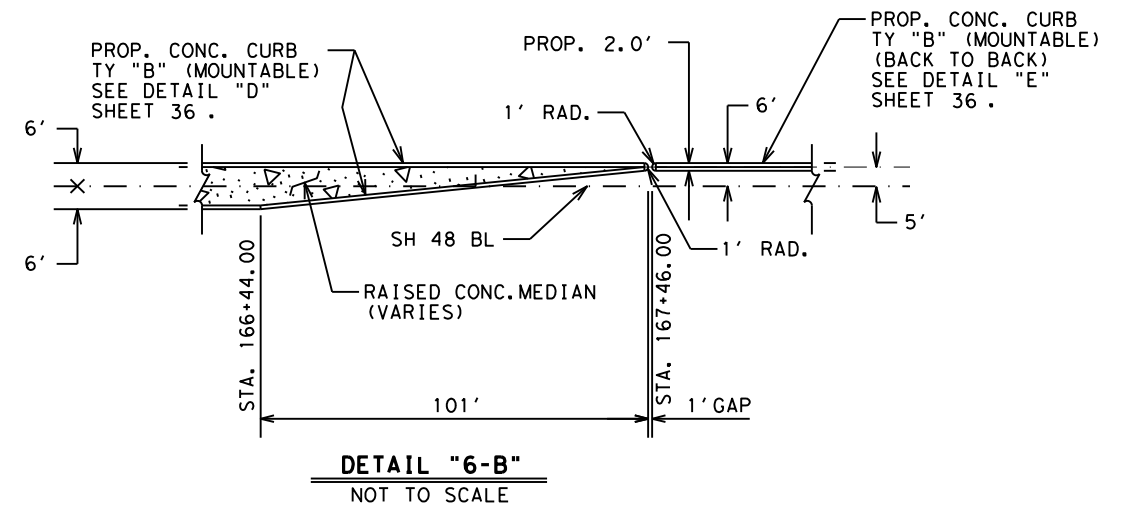
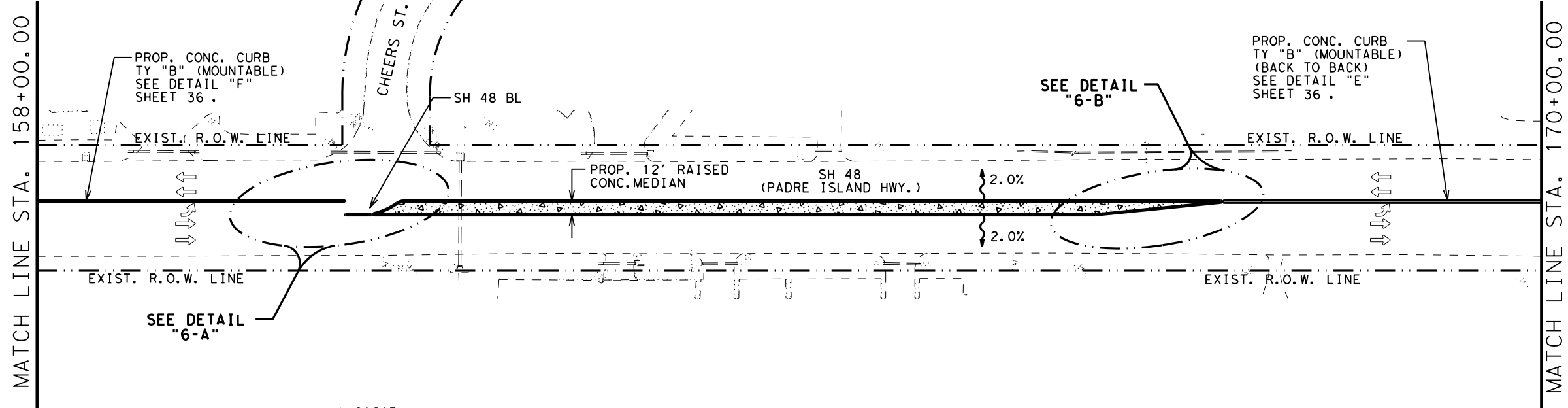
Pharr District Central Design  
 Texas Department of Transportation

**SH 48  
 PROPOSED ROADWAY  
 PLAN LAYOUT**

SCALE: 1"=50' SHEET 5 OF 17

© 2022	CONT	SECT	JOB	HIGHWAY
DS: CK:	0220	05	080	SH 48
DW: CK:	DIST		COUNTY	SHEET NO.
	PHR	CAMERON		151

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- LEGEND**
- PROPOSED MILLING AND OVERLAY
  - PROPOSED CONCRETE TURNAROUND
  - PROPOSED RAISED CONCRETE MEDIAN
  - DIRECTIONAL OF TRAFFIC FLOW
  - TO BE ADJUSTED BY OTHERS
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  - R.O.W. - RIGHT OF WAY
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  - CONC. - CONCRETE
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NOTE:  
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 AND ALL OFFSETS ARE TO NOMINAL FACE OF  
 CURB OR EDGE OF PAVEMENT.

SHEET TOTALS			
ITEM	EST.	UNIT	DESCRIPTION
432	6006	142	CY RIPRAP (CONC) (CL B)
529	6024	2135	LF CONC CURB TY B (MOUNTABLE)



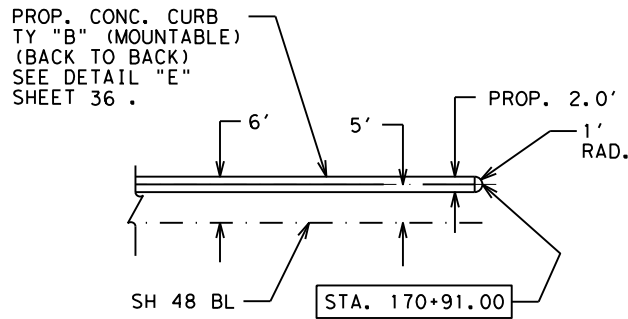
**Pharr District Central Design**

**Texas Department of Transportation**

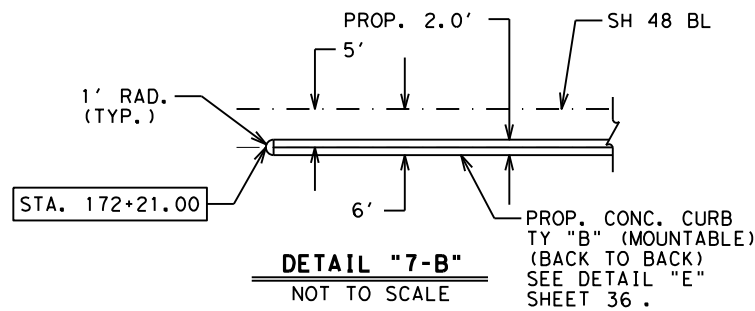
## SH 48 PROPOSED ROADWAY PLAN LAYOUT

SCALE: 1" = 50' SHEET 6 OF 17

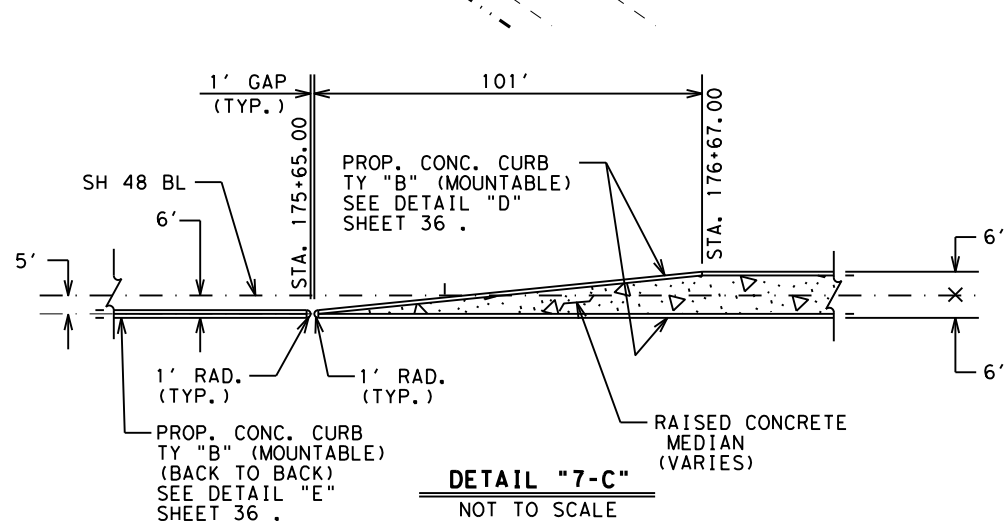
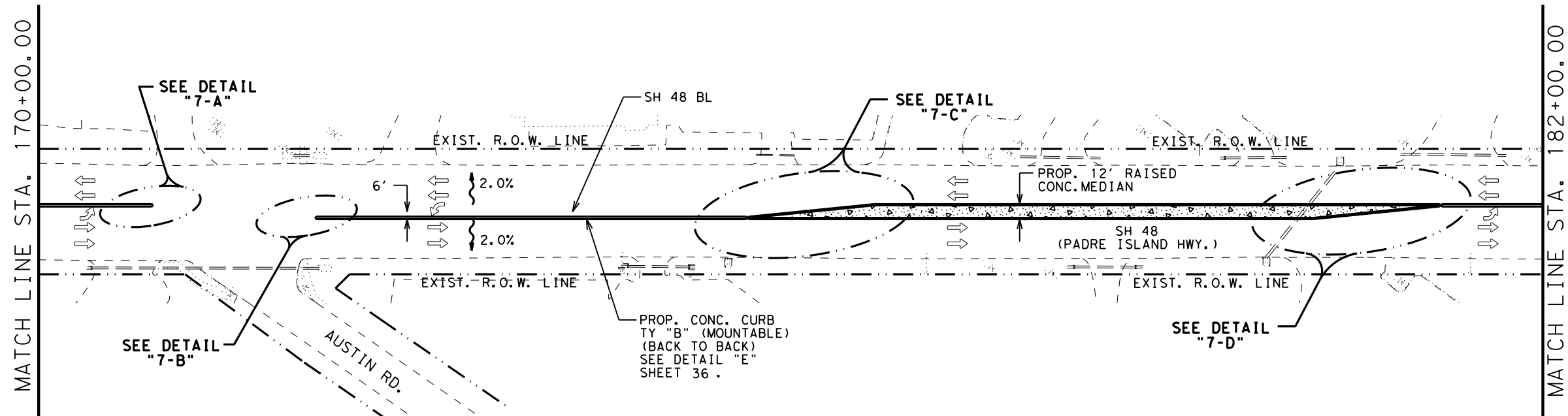
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DW: PHR	DIST: CAMERON	COUNTY: CAMERON	SHEET NO.: 152



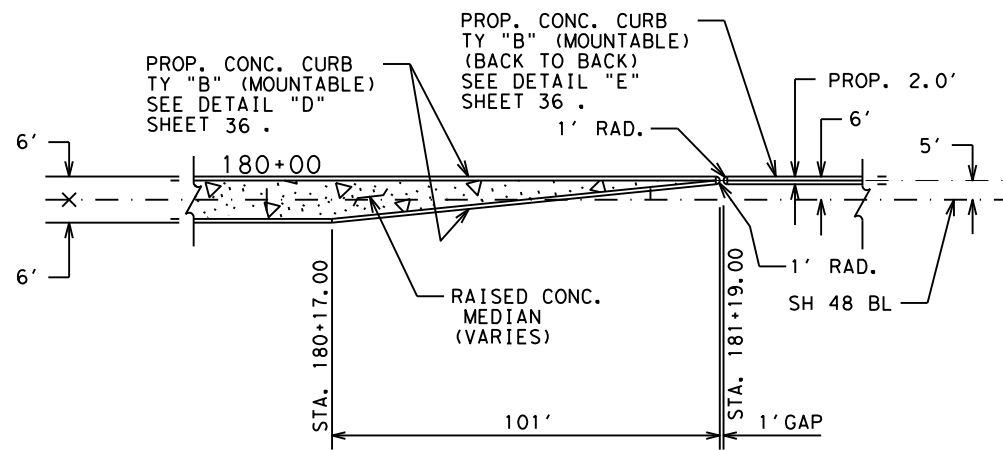
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**DETAIL "7-B"**  
NOT TO SCALE



**DETAIL "7-C"**  
NOT TO SCALE



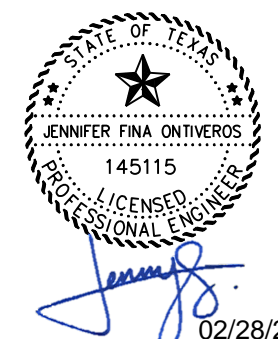
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**LEGEND**

- PROPOSED MILLING AND OVERLAY
- PROPOSED CONCRETE TURNAROUND
- PROPOSED RAISED CONCRETE MEDIAN
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- DIRECTION OF RUNOFF FLOW
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- TY - TYPE
- RCP - REINFORCE CONCRETE PIPE
- CONC. - CONCRETE
- TYP. - TYPICAL
- RAD. - RADIUS
- LT. - LEFT
- RT. - RIGHT

NOTE:  
ALL STATIONS ARE BASED ON SH 48 BASELINE AND ALL OFFSETS ARE TO NOMINAL FACE OF CURB OR EDGE OF PAVEMENT.

SHEET TOTALS				
ITEM	EST.	UNIT	DESCRIPTION	
432	6006	105	CY	RIPRAP (CONC) (CL B)
529	6024	2144	LF	CONC CURB TY B (MOUNTABLE)



**Pharr District Central Design**

Texas Department of Transportation

**SH 48  
PROPOSED ROADWAY  
PLAN LAYOUT**

SCALE: 1"=50'      SHEET 7 OF 17

© 2022	CONT	SECT	JOB	HIGHWAY
DS: 0220	CK: 05		080	SH 48
DW:	CK:	DIST	COUNTY	SHEET NO.
		PHR	CAMERON	153



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**LEGEND**

- PROPOSED MILLING AND OVERLAY
- PROPOSED CONCRETE TURNAROUND
- PROPOSED RAISED CONCRETE MEDIAN
- DIRECTIONAL OF TRAFFIC FLOW
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- DIRECTION OF RUNOFF FLOW
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- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
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- CONC. - CONCRETE
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NOTE:  
 ALL STATIONS ARE BASED ON SH 48 BASELINE AND ALL OFFSETS ARE TO NOMINAL FACE OF CURB OR EDGE OF PAVEMENT.

SHEET TOTALS			
ITEM	EST.	UNIT	DESCRIPTION
432	6006	38	CY RIPRAP (CONC) (CL B)
529	6024	2175	LF CONC CURB TY B (MOUNTABLE)

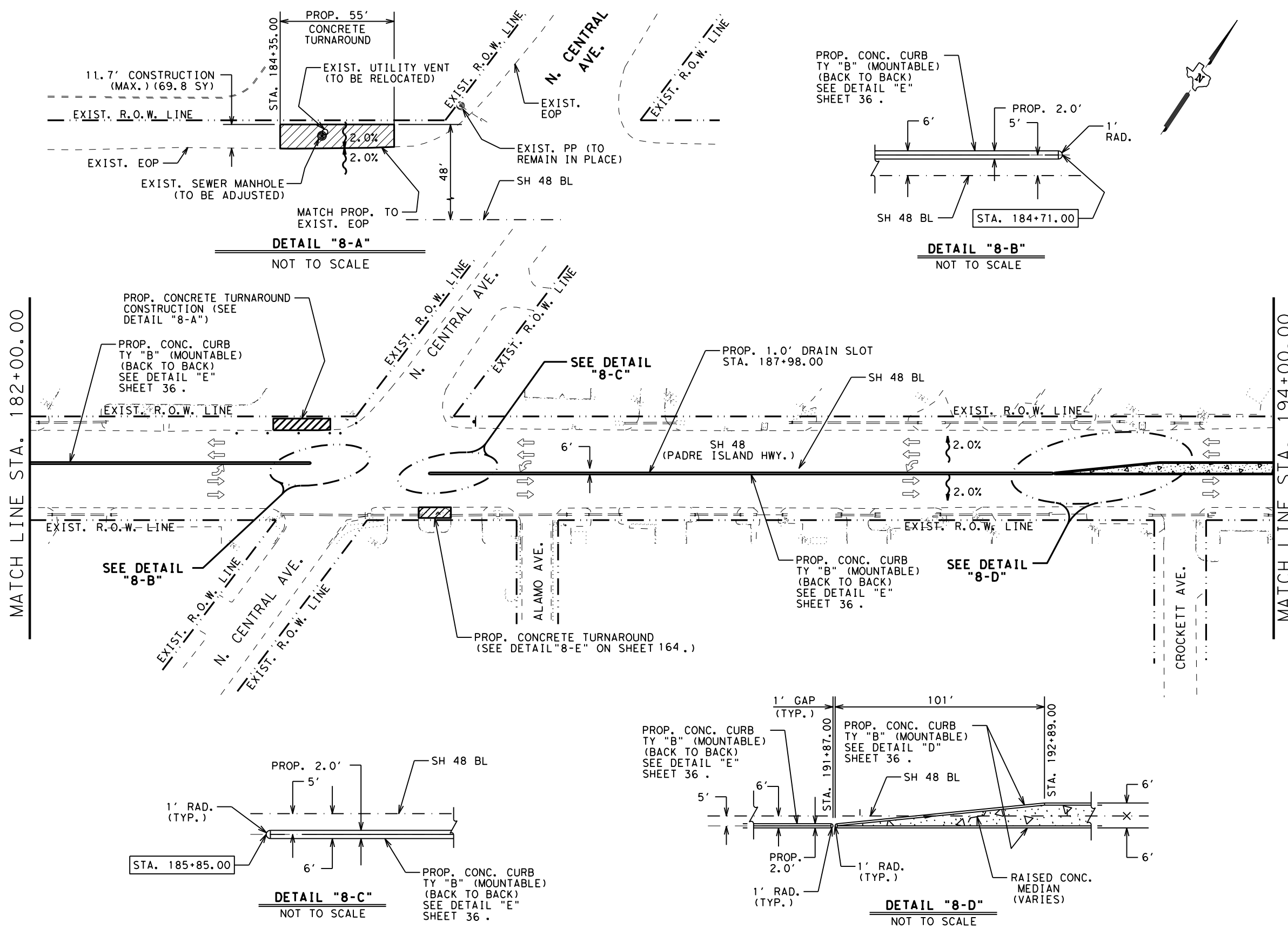


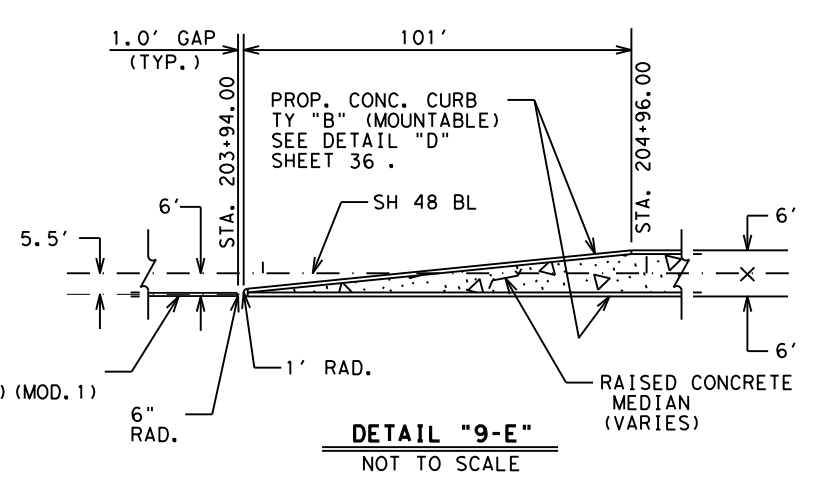
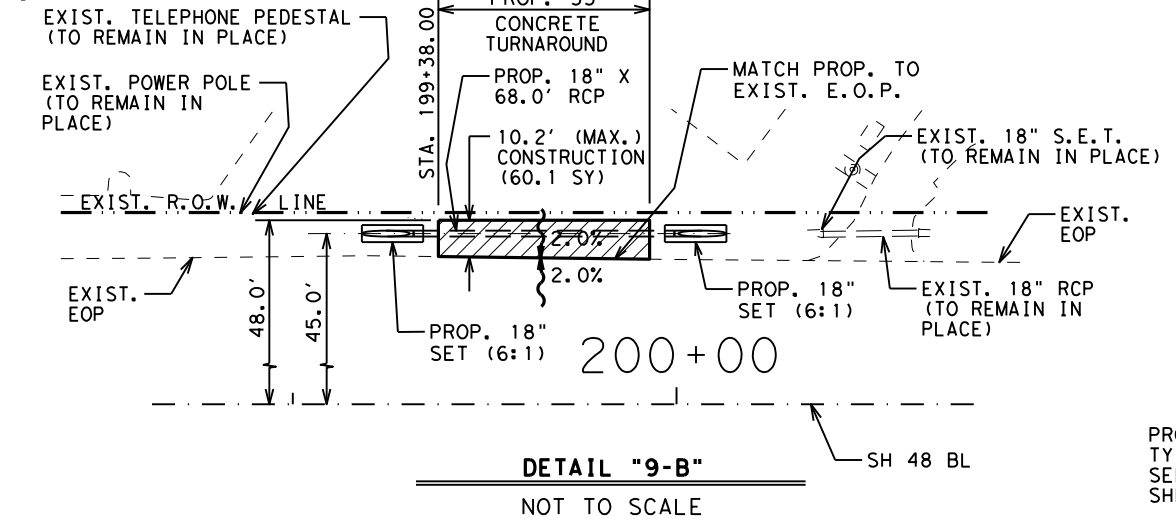
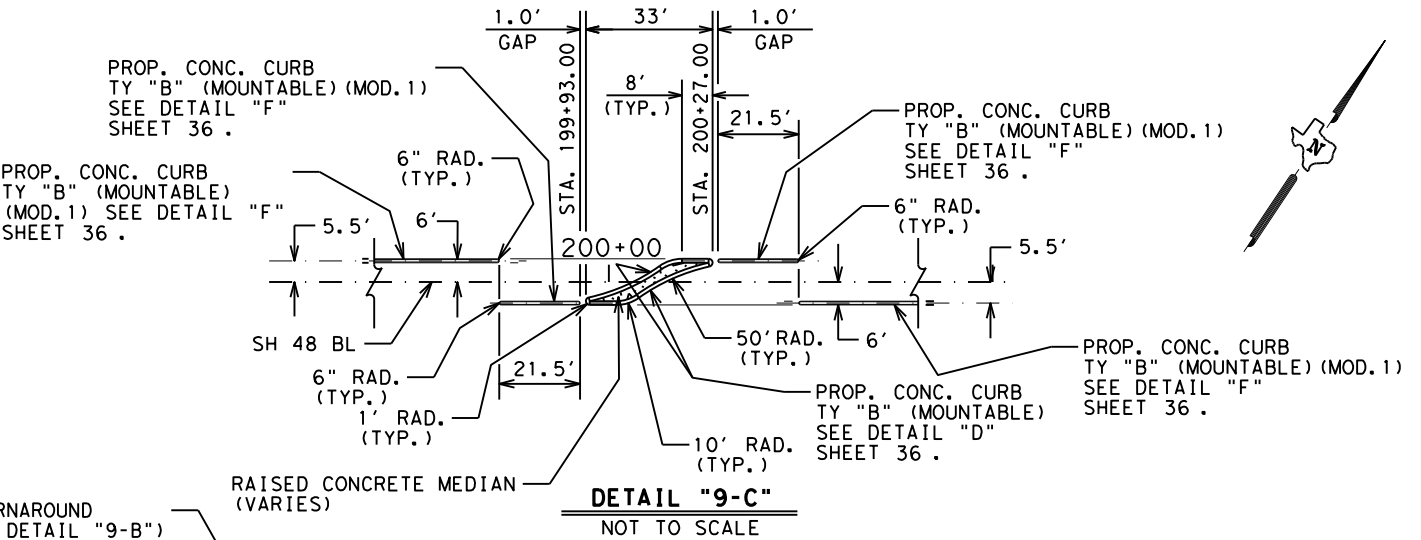
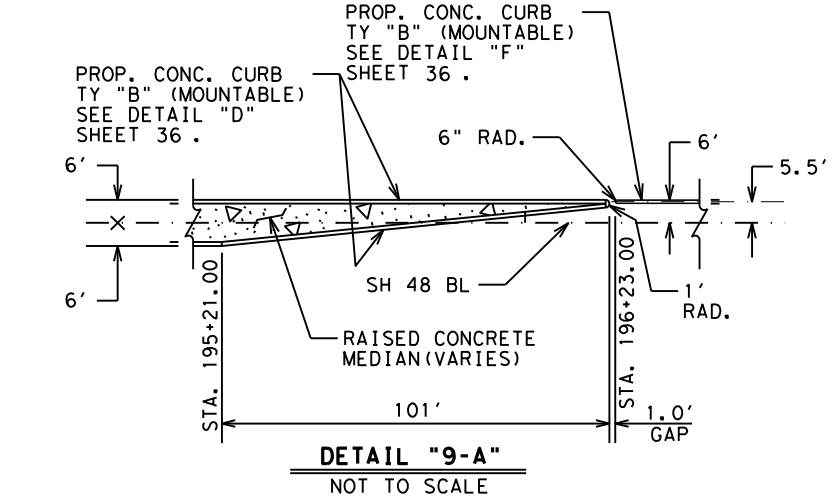
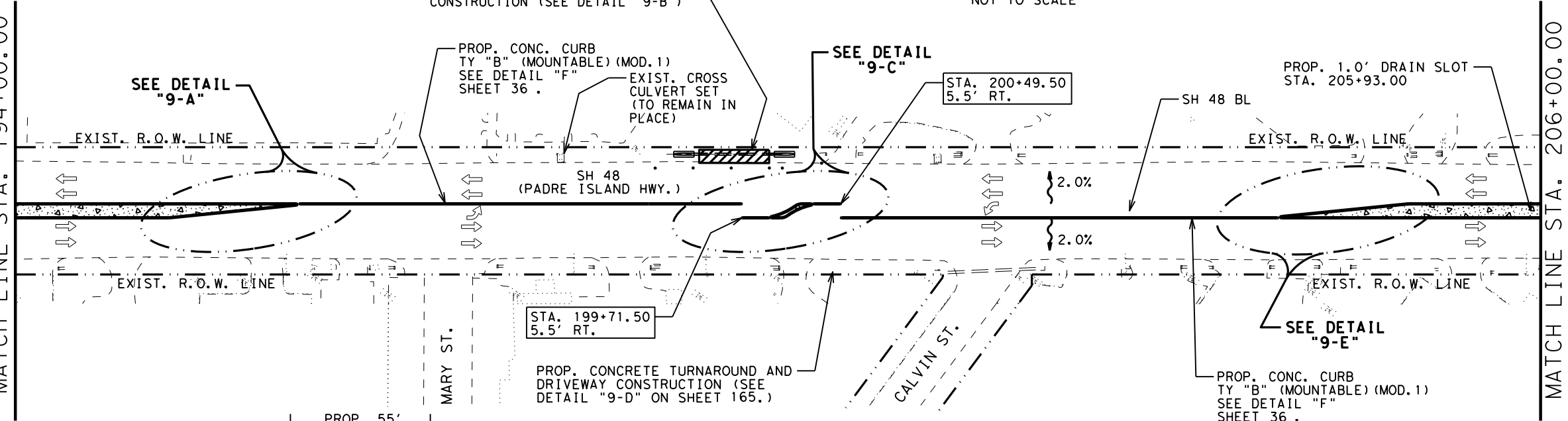
**Pharr District Central Design**  
 Texas Department of Transportation

**SH 48  
 PROPOSED ROADWAY  
 PLAN LAYOUT**

SCALE: 1" = 50' SHEET 8 OF 17

© 2022	CONT	SECT	JOB	HIGHWAY
DS: CK:	0220	05	080	SH 48
DW: CK:	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	154	





- LEGEND**
- PROPOSED MILLING AND OVERLAY
  - PROPOSED CONCRETE TURNAROUND
  - PROPOSED RAISED CONCRETE MEDIAN
  - DIRECTIONAL OF TRAFFIC FLOW
  - TO BE ADJUSTED BY OTHERS
  - DIRECTION OF RUNOFF FLOW
  - PROP. - PROPOSED
  - EXIST. - EXISTING
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  - RCP - REINFORCE CONCRETE PIPE
  - CONC. - CONCRETE
  - TYP. - TYPICAL
  - RAD. - RADIUS
  - LT. - LEFT
  - RT. - RIGHT
- NOTE:**  
 ALL STATIONS ARE BASED ON SH 48 BASELINE AND ALL OFFSETS ARE TO NOMINAL FACE OF CURB OR EDGE OF PAVEMENT.

**SHEET TOTALS**

ITEM	EST.	UNIT	DESCRIPTION
464 6003	68	LF	RC PIPE (CL III) (18")
467 6363	2	EA	SET (TY II) (18IN) (6:1) (P)
529 6024	1665	LF	CONC CURB TY B (MOUNTABLE)
432 6006	77	CY	RIPRAP (CONC) (CL B)



**Pharr District Central Design**

Texas Department of Transportation

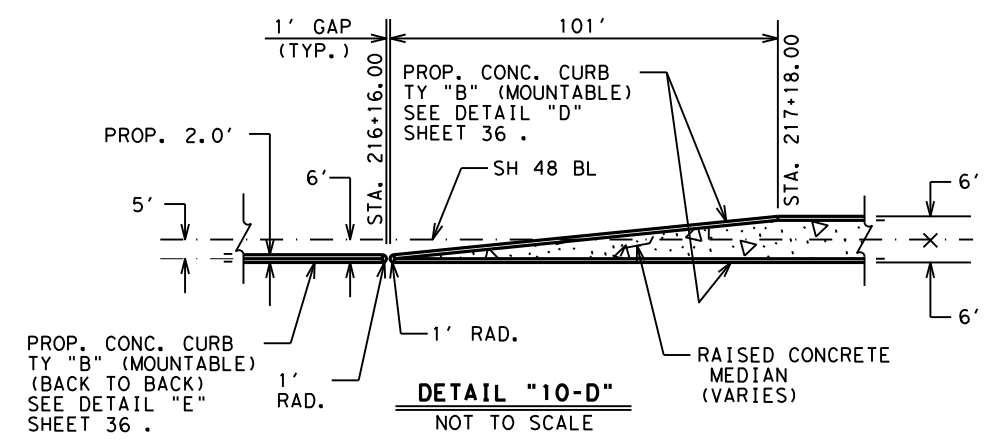
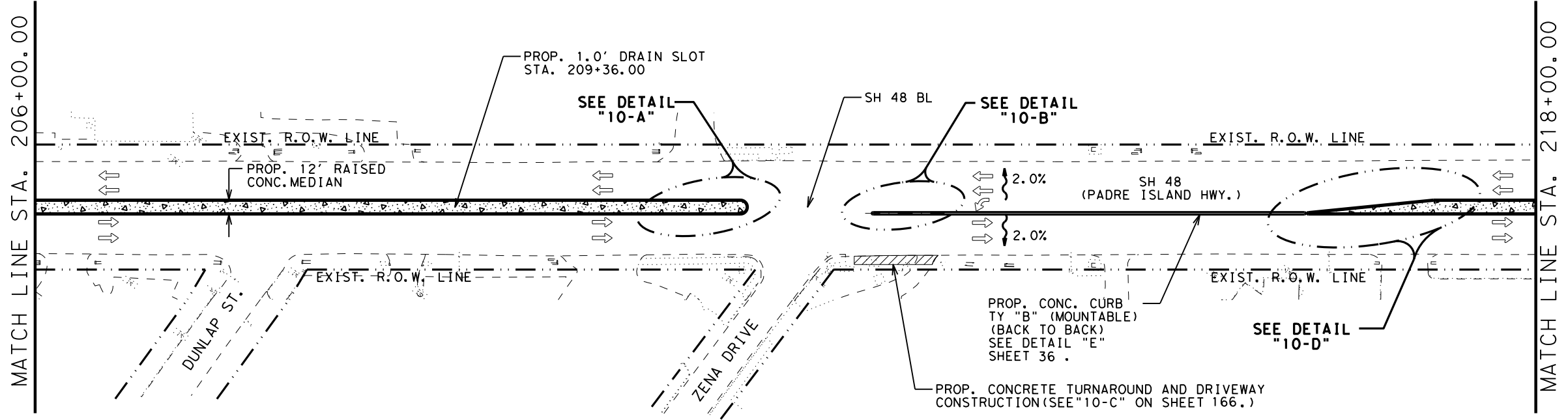
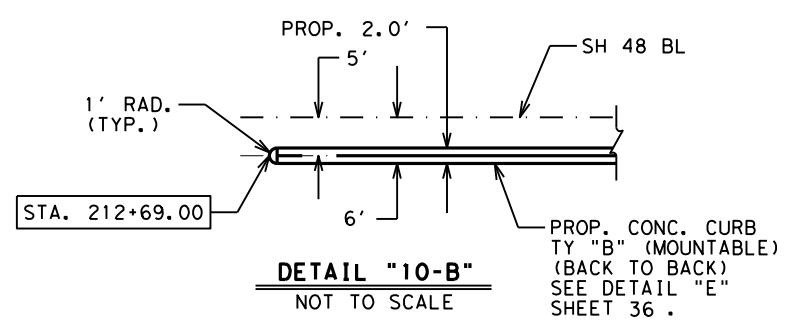
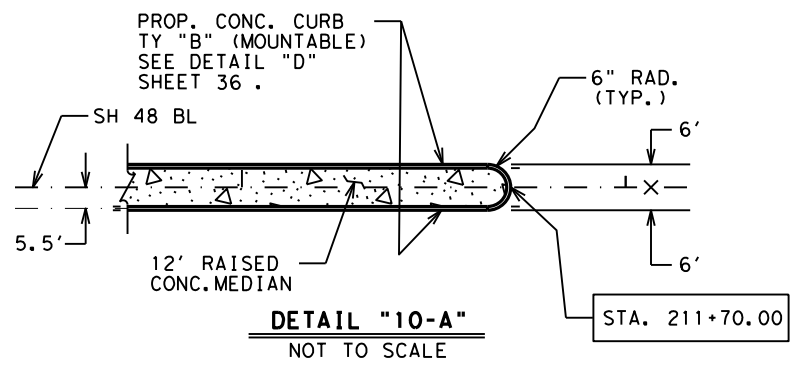
**SH 48  
 PROPOSED ROADWAY  
 PLAN LAYOUT**

SCALE: 1"=50'

SHEET 9 OF 17

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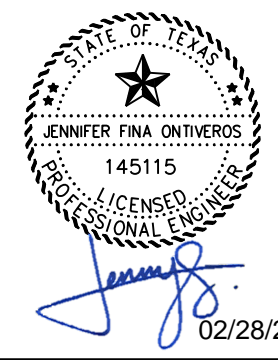
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- LEGEND**
- PROPOSED MILLING AND OVERLAY
  - PROPOSED CONCRETE TURNAROUND
  - PROPOSED RAISED CONCRETE MEDIAN
  - ← - DIRECTIONAL OF TRAFFIC FLOW
  - - TO BE ADJUSTED BY OTHERS
  - ~ - DIRECTION OF RUNOFF FLOW
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  - RT. - RIGHT

**NOTE:**  
ALL STATIONS ARE BASED ON SH 48 BASELINE AND ALL OFFSETS ARE TO NOMINAL FACE OF CURB OR EDGE OF PAVEMENT.

SHEET TOTALS			
ITEM	EST.	UNIT	DESCRIPTION
432	6006	163	CY RIPRAP (CONC) (CL B)
529	6024	2110	LF CONC CURB TY B (MOUNTABLE)



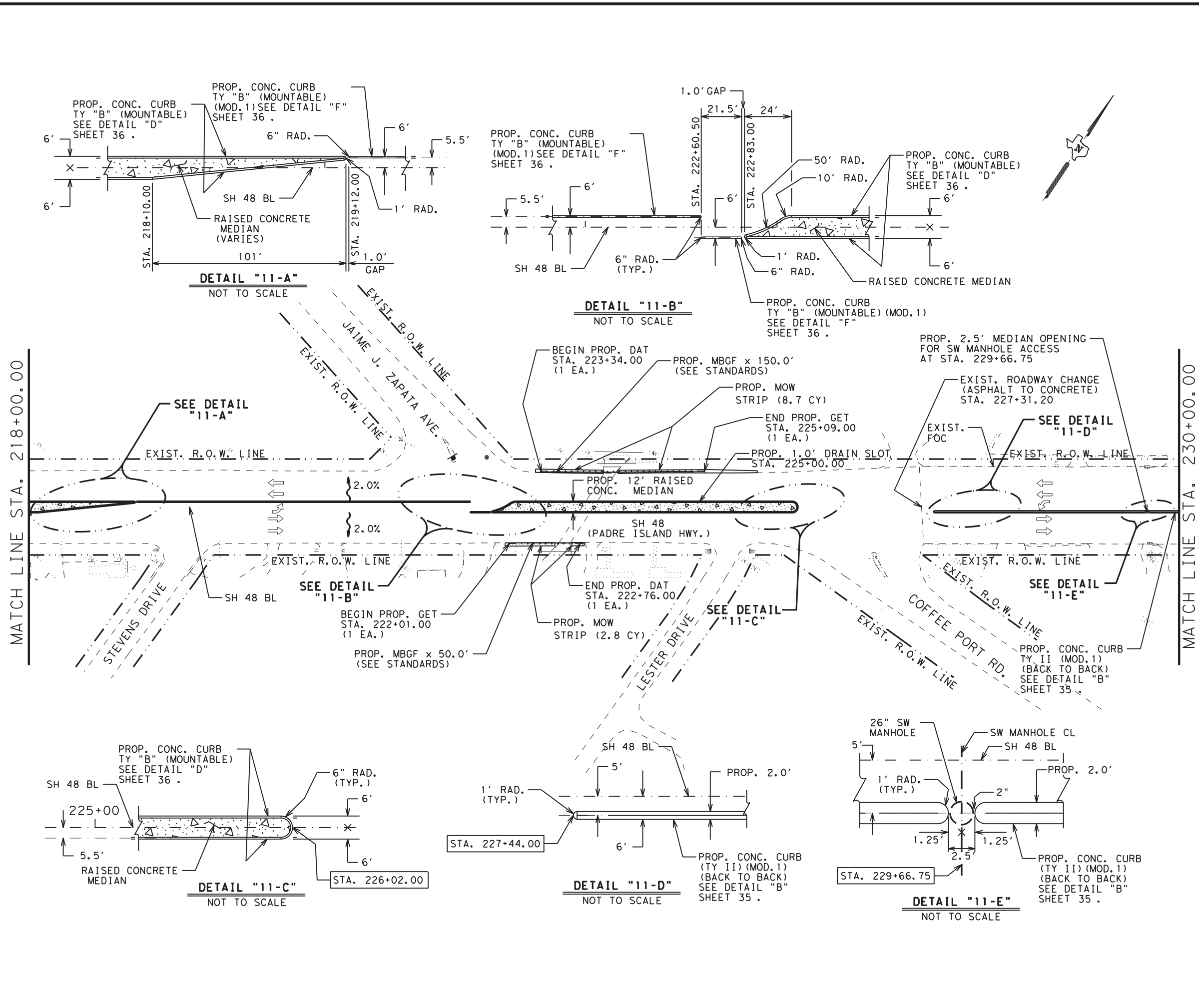
**Pharr District Central Design**  
 Texas Department of Transportation

## SH 48 PROPOSED ROADWAY PLAN LAYOUT

SCALE: 1"=50'      SHEET 10 OF 17

© 2022	CONT	SECT	JOB	HIGHWAY
DS:	0220	05	080	SH 48
DW:	PHR	COUNTY	CAMERON	SHEET NO.
				<b>156</b>

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**LEGEND**

- PROPOSED MILLING AND OVERLAY
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NOTE:  
 ALL STATIONS ARE BASED ON SH 48 BASELINE AND ALL OFFSETS ARE TO NOMINAL FACE OF CURB OR EDGE OF PAVEMENT.

SHEET TOTALS			
ITEM	EST.	UNIT	DESCRIPTION
432 6006	85	CY	RIPRAP (CONC) (CL B)
529 6002	513	LF	CONC CURB (TY II)
529 6024	1243	LF	CONC CURB TY B (MOUNTABLE)
432 6045	11.5	CY	RIPRAP (MOW STRIP) (4IN)
540 6001	200	LF	MTL BM GD FEN (TIM POST)
540 6016	2	EA	DOWNSTREAM ANCHOR TERMINAL
544 6001	2	EA	GUARDRAIL END TRMNT (INSTL)



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 Texas Department of Transportation







**SH 48  
 PROPOSED ROADWAY  
 PLAN LAYOUT**

SCALE: 1" = 50'      SHEET 11 OF 17

© 2022	CONT	SECT	JOB	HIGHWAY
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DW:	CR:	DIST	COUNTY	SHEET NO.
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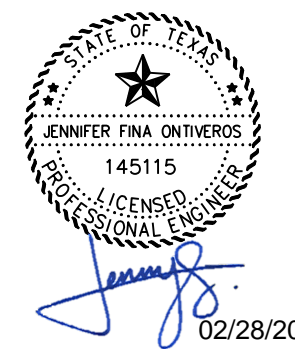
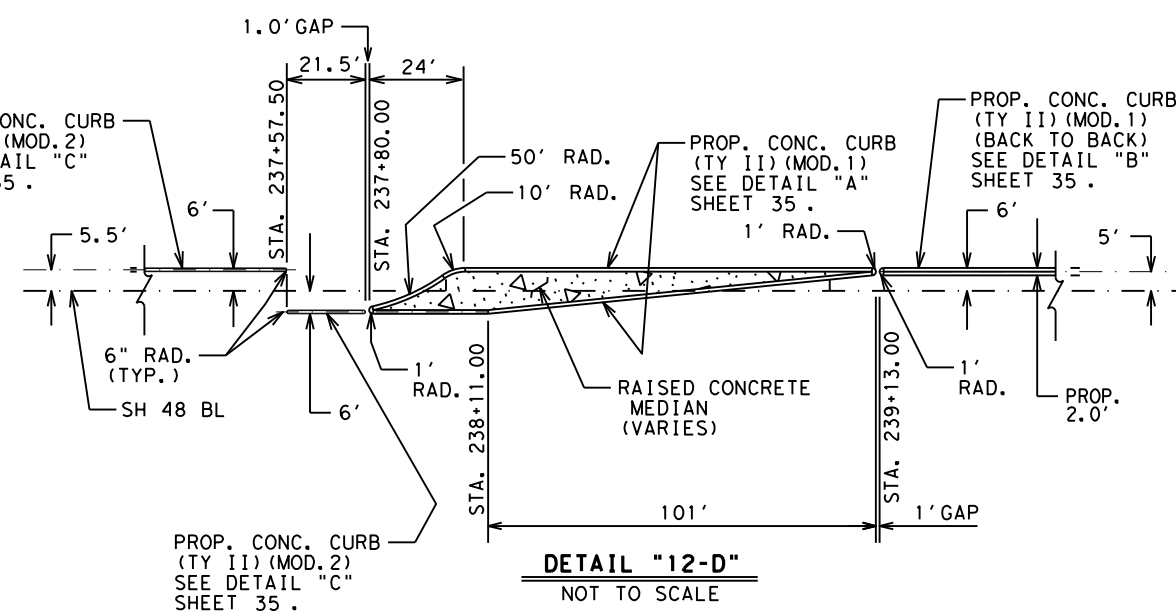
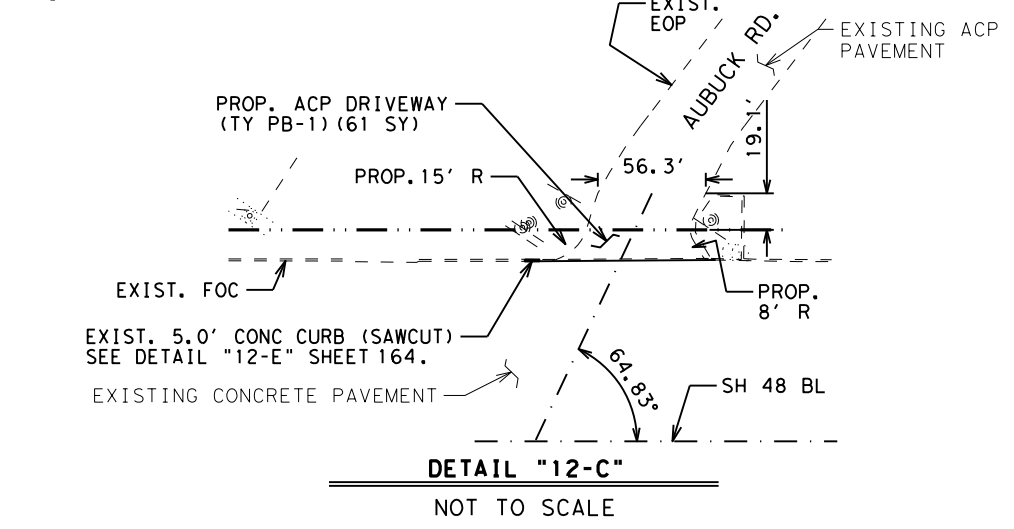
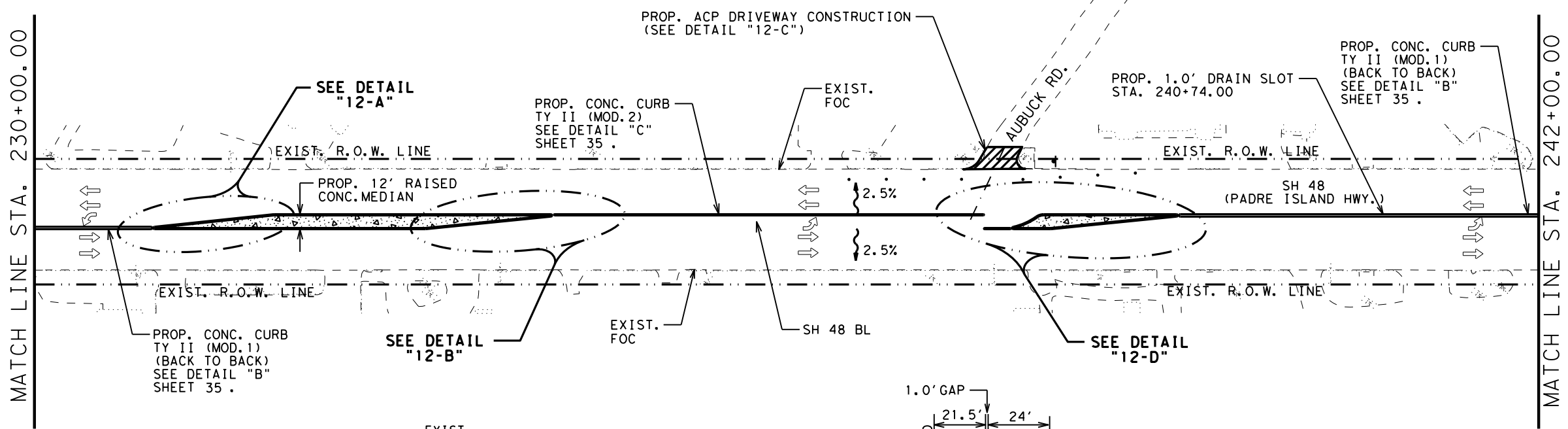
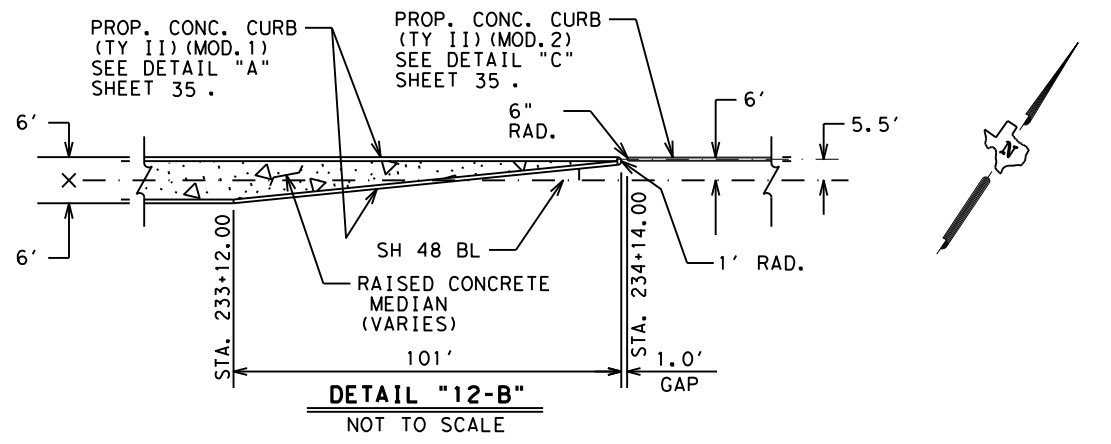
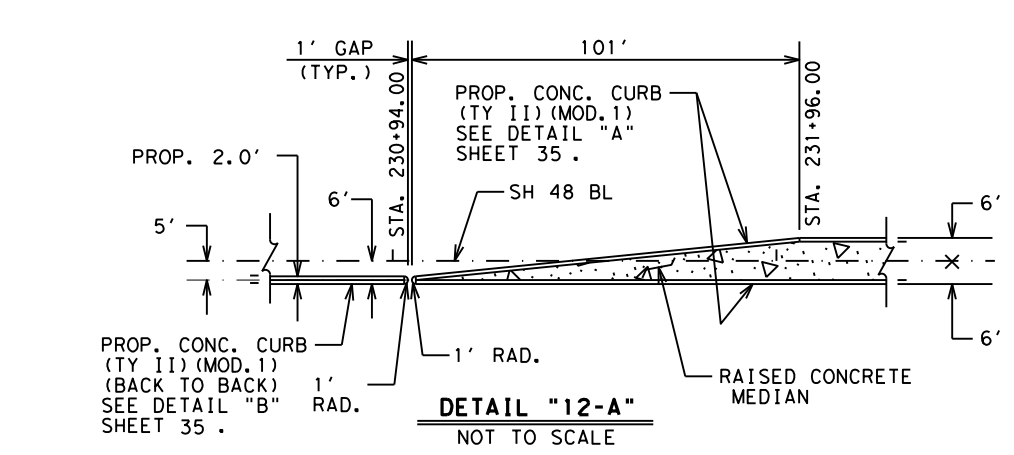
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**LEGEND**

-  - PROPOSED MILLING AND OVERLAY
-  - PROPOSED CONCRETE TURNAROUND
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SHEET TOTALS				
ITEM	EST.	UNIT	DESCRIPTION	
432	6006	54	CY	RIPRAP (CONC) (CL B)
529	6002	2037	LF	CONC CURB (TY II)



**Pharr District Central Design**  
 Texas Department of Transportation

**SH 48  
 PROPOSED ROADWAY  
 PLAN LAYOUT**

SCALE: 1" = 50' SHEET 12 OF 17

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0220	05	080	SH 48
DW:	CK:	DIST	COUNTY	SHEET NO.	
		PHR	CAMERON	158	

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**LEGEND**

- PROPOSED MILLING AND OVERLAY
- PROPOSED CONCRETE TURNAROUND
- PROPOSED RAISED CONCRETE MEDIAN
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- RT. - RIGHT

NOTE:  
 ALL STATIONS ARE BASED ON SH 48 BASELINE AND ALL OFFSETS ARE TO NOMINAL FACE OF CURB OR EDGE OF PAVEMENT.

SHEET TOTALS			
ITEM	EST.	UNIT	DESCRIPTION
432	6006	25	CY RIPRAP (CONC) (CL B)
529	6002	2097	LF CONC CURB (TY II)
432	6045	7.5	CY RIPRAP (MOW STRIP) (4IN)
540	6002	125	LF MTL BM GD FEN (STEEL POST)
540	6006	2	EA MBGF TRANS (THRIE-BEAM)
540	6016	2	EA DOWNSTREAM ANCHOR TERMINAL

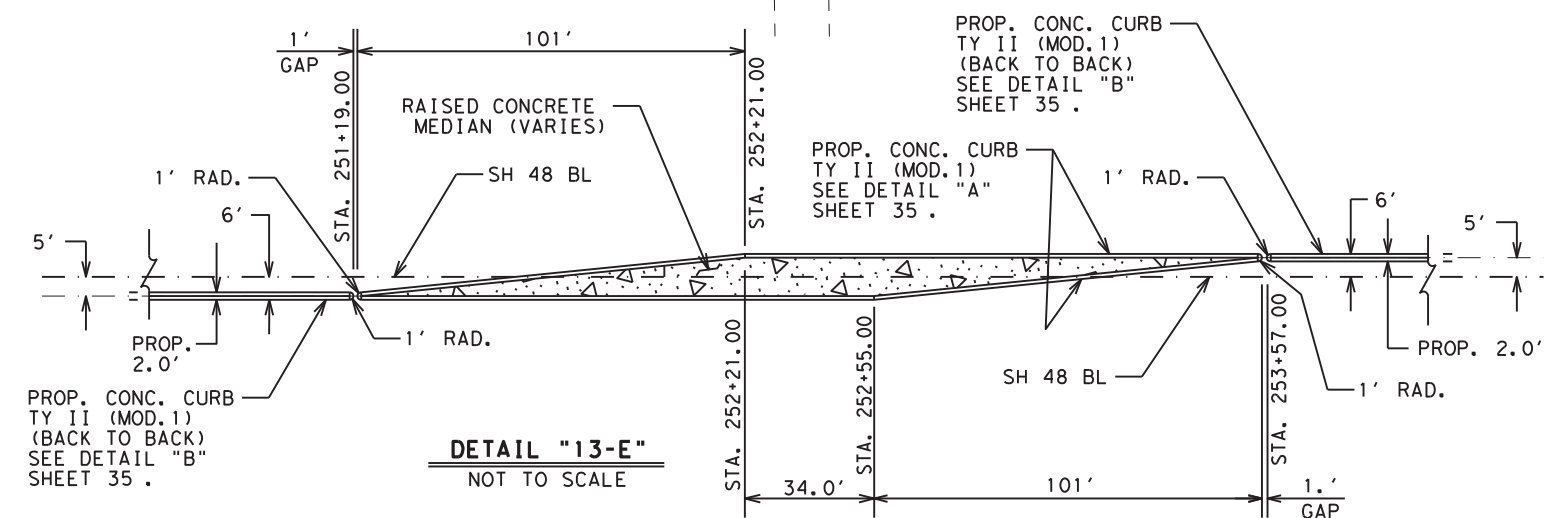
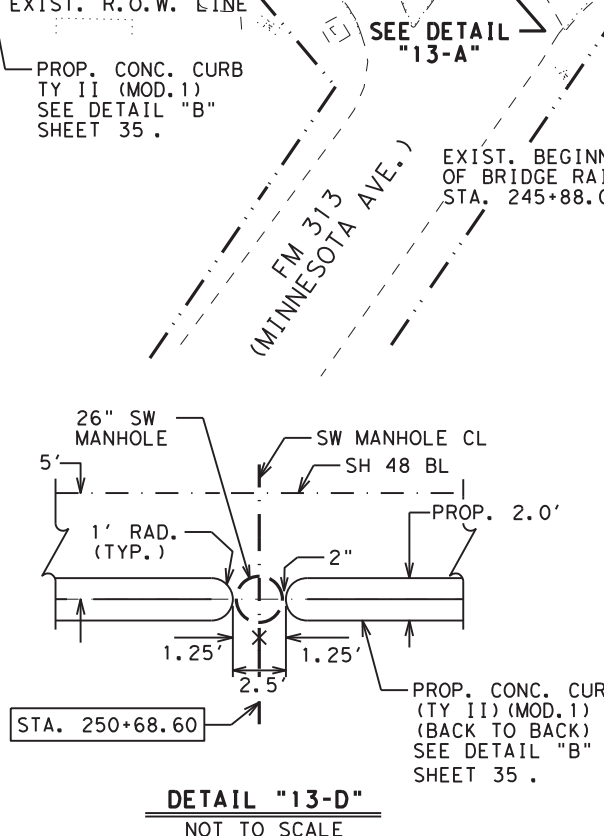
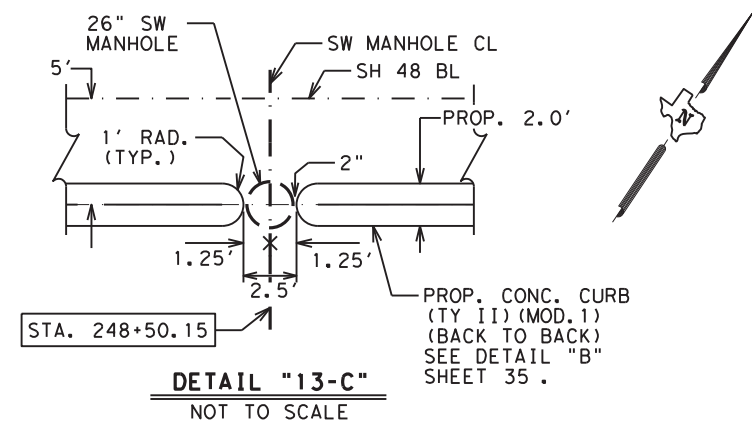
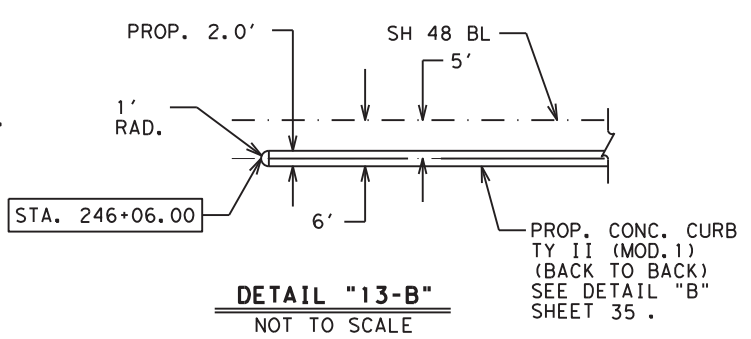
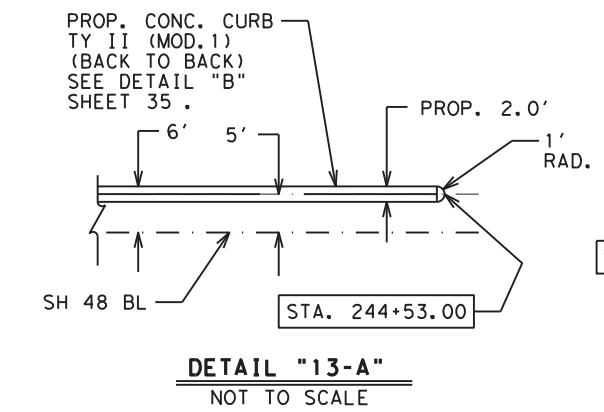
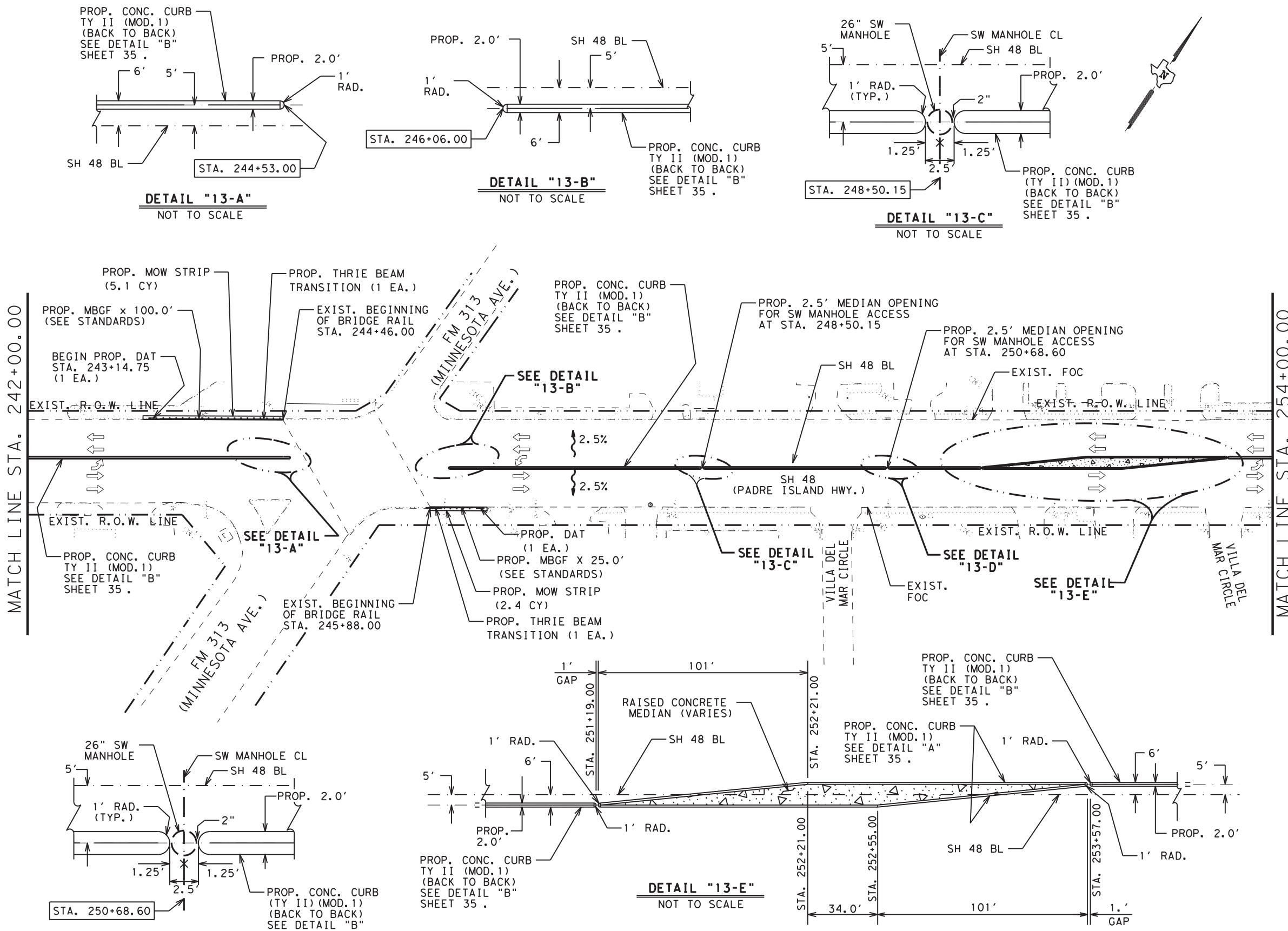


**Pharr District Central Design**  
 Texas Department of Transportation







**SH 48  
 PROPOSED ROADWAY  
 PLAN LAYOUT**

SCALE: 1" = 50' SHEET 13 OF 17

DS:	CK:	0220	05	080	SH 48
DW:	CR:	PHR	CAMERON	SHEET NO. 159	

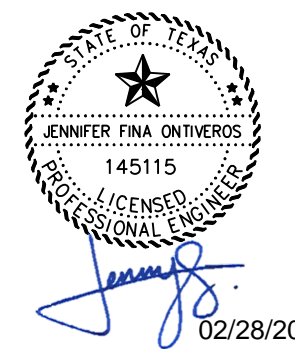



**LEGEND**

-  - PROPOSED MILLING AND OVERLAY
-  - PROPOSED CONCRETE TURNAROUND
-  - PROPOSED RAISED CONCRETE MEDIAN
-  - DIRECTIONAL OF TRAFFIC FLOW
-  - TO BE ADJUSTED BY OTHERS
-  - DIRECTION OF RUNOFF FLOW
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- BL - BASELINE
- STA. - STATION
- EOP - EDGE OF PAVEMENT
- FOC - FACE OF CURB
- SET - SAFETY END TREATMENT
- GET - GUARDRAIL END TREATMENT
- DAT - DOWNSTREAM ANCHOR TERMINAL
- TY - TYPE
- RCP - REINFORCE CONCRETE PIPE
- CONC. - CONCRETE
- TYP. - TYPICAL
- RAD. - RADIUS
- LT. - LEFT
- RT. - RIGHT

NOTE:  
 ALL STATIONS ARE BASED ON SH 48 BASELINE AND ALL OFFSETS ARE TO NOMINAL FACE OF CURB OR EDGE OF PAVEMENT.

SHEET TOTALS			
ITEM	EST.	UNIT	DESCRIPTION
432	6006	23	CY RIPRAP (CONC) (CL B)
529	6002	1466	LF CONC CURB (TY II)
529	6024	662	LF CONC CURB TY B (MOUNTABLE)

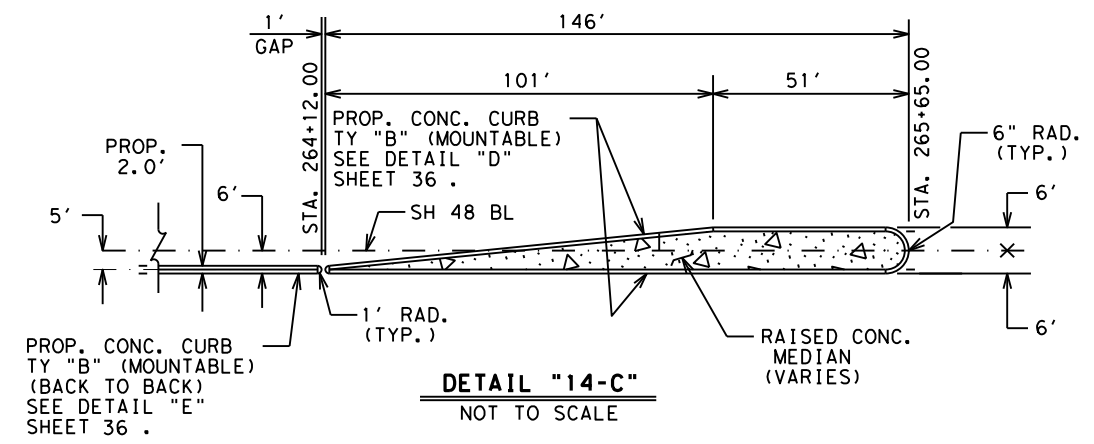
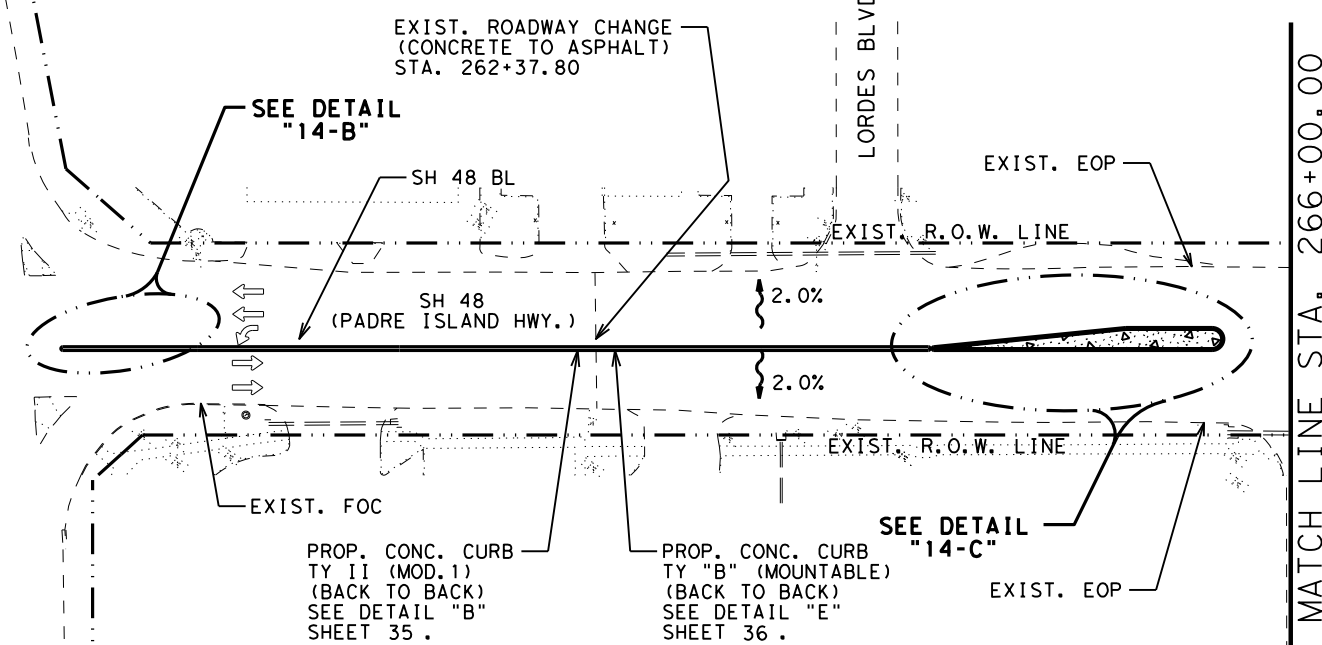
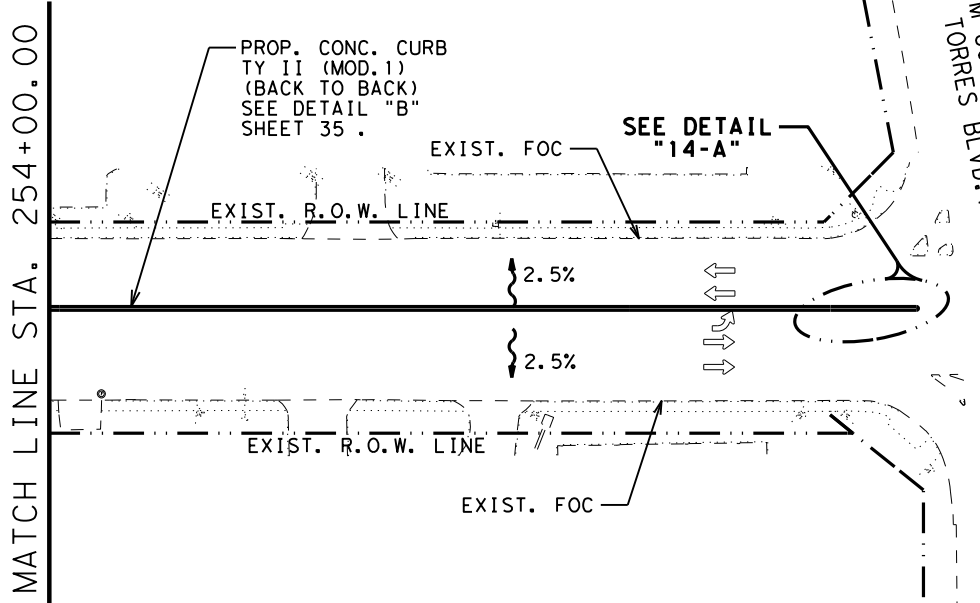
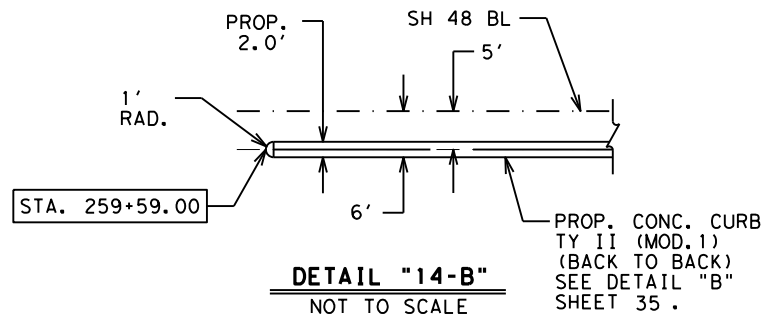
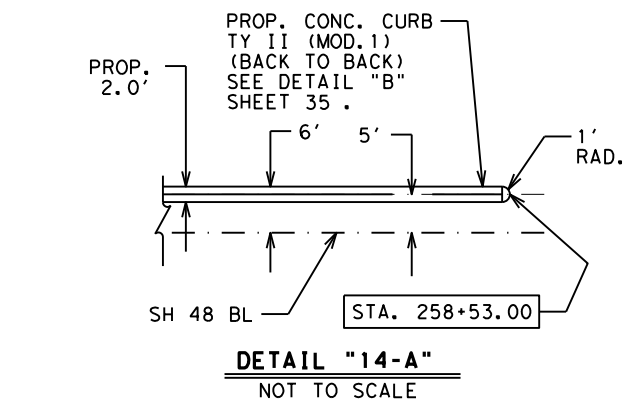


**Pharr District Central Design**  
  
 Texas Department of Transportation

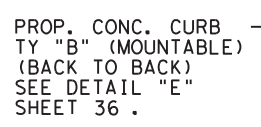
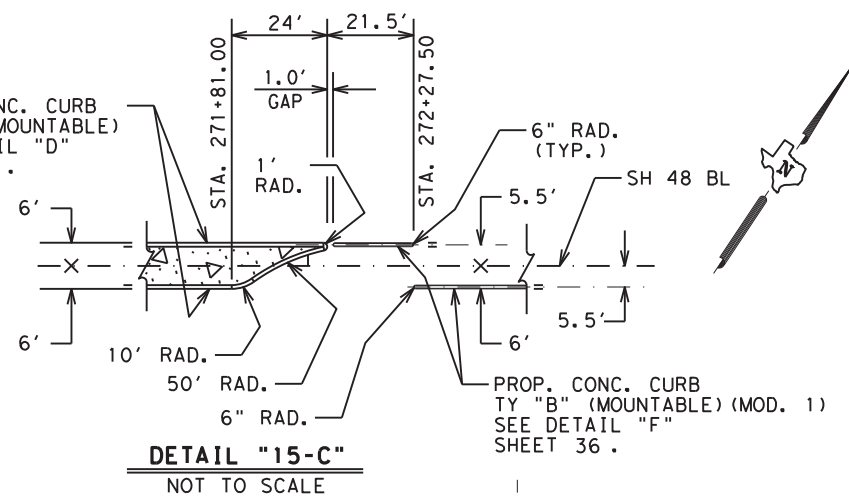
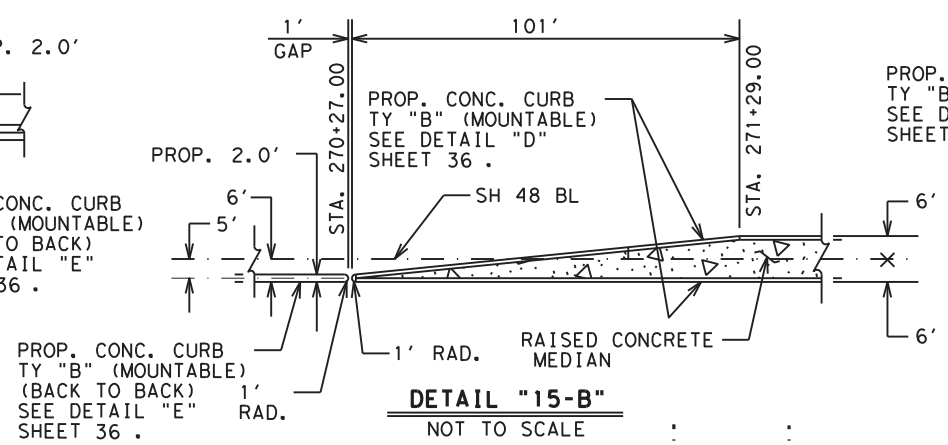
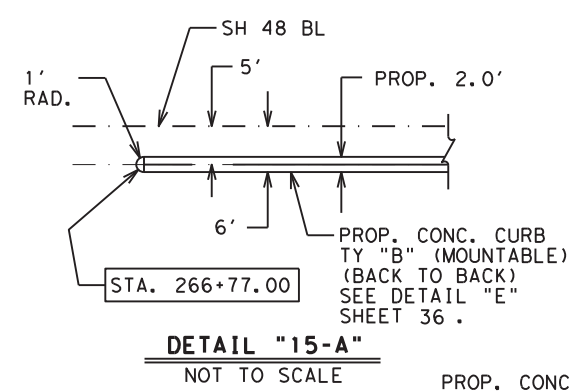
**SH 48  
 PROPOSED ROADWAY  
 PLAN LAYOUT**

SCALE: 1" = 50' SHEET 14 OF 17

© 2022	CONT	SECT	JOB	HIGHWAY
DS:	0220	05	080	SH 48
DW:	DIST COUNTY			SHEET NO.
	PHR CAMERON			160



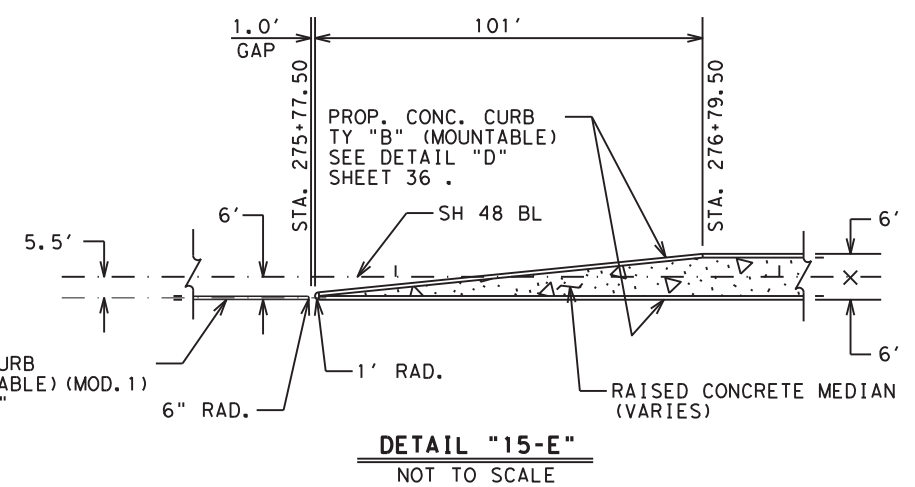
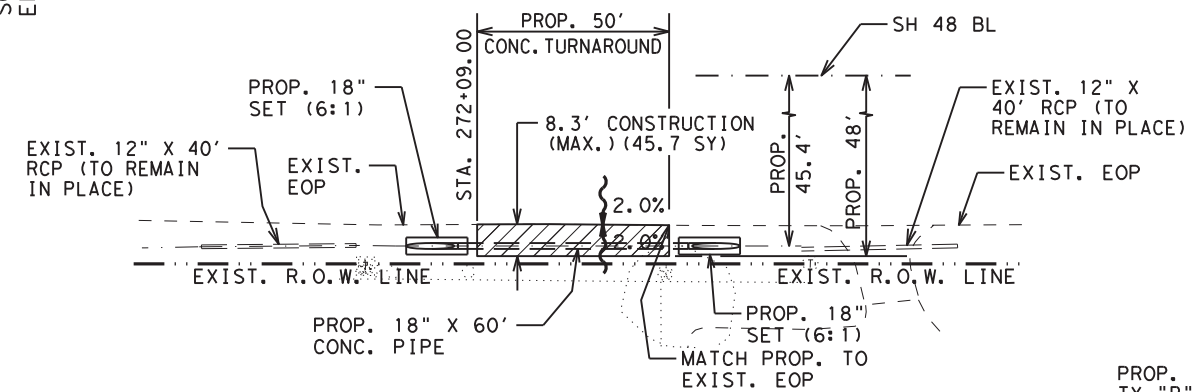
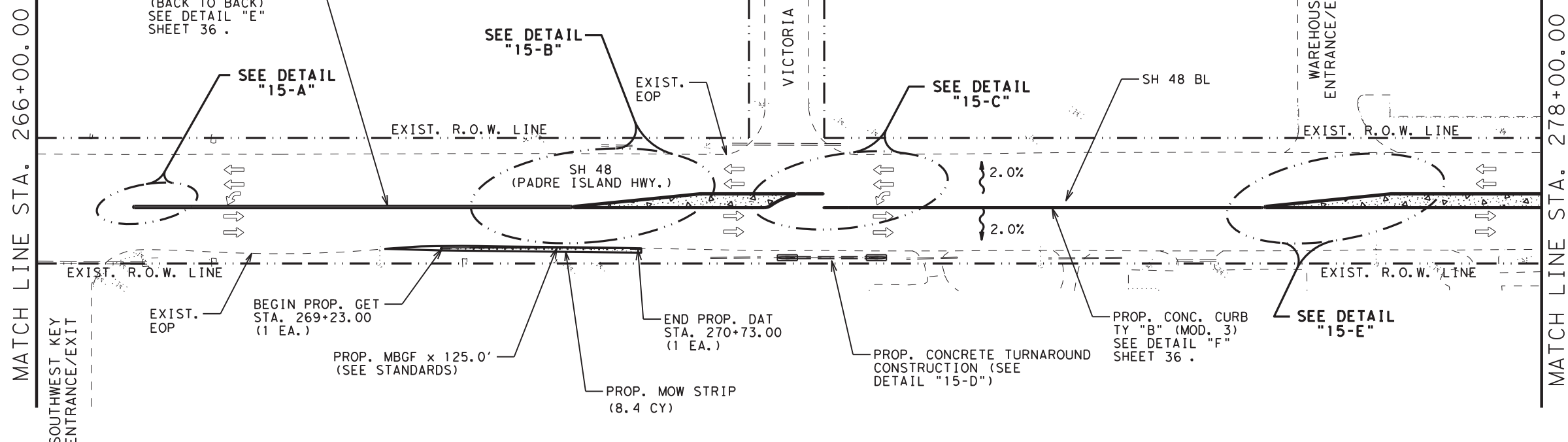
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SEE DETAIL "15-B"

SEE DETAIL "15-C"

SEE DETAIL "15-E"



- LEGEND**
- PROPOSED MILLING AND OVERLAY
  - PROPOSED CONCRETE TURNAROUND
  - PROPOSED RAISED CONCRETE MEDIAN
  - DIRECTIONAL OF TRAFFIC FLOW
  - TO BE ADJUSTED BY OTHERS
  - DIRECTION OF RUNOFF FLOW
  - PROP. - PROPOSED
  - EXIST. - EXISTING
  - R.O.W. - RIGHT OF WAY
  - BL - BASELINE
  - STA. - STATION
  - EOP - EDGE OF PAVEMENT
  - FOC - FACE OF CURB
  - SET - SAFETY END TREATMENT
  - GET - GUARDRAIL END TREATMENT
  - DAT - DOWNSTREAM ANCHOR TERMINAL
  - TY - TYPE
  - RCP - REINFORCE CONCRETE PIPE
  - CONC. - CONCRETE
  - TYP. - TYPICAL
  - RAD. - RADIUS
  - LT. - LEFT
  - RT. - RIGHT

NOTE:  
 ALL STATIONS ARE BASED ON SH 48 BASELINE AND ALL OFFSETS ARE TO NOMINAL FACE OF CURB OR EDGE OF PAVEMENT.

SHEET TOTALS			
ITEM	EST.	UNIT	DESCRIPTION
464 6003	60	LF	RC PIPE (CL III) (24")
467 6363	2	EA	SET (TY II) (18IN) (6:1) (P)
432 6006	66	CY	RIPRAP (CONC) (CL B)
529 6024	1776	LF	CONC CURB TY B (MOUNTABLE)
432 6045	8.4	CY	RIPRAP (MOW STRIP) (4IN)
540 6002	125	LF	MTL BM GD FEN (STEEL POST)
540 6016	1	EA	DOWNSTREAM ANCHOR TERMINAL
544 6001	1	EA	GUARDRAIL END TRTMT (INSL)



**Pharr District Central Design**  
 Texas Department of Transportation

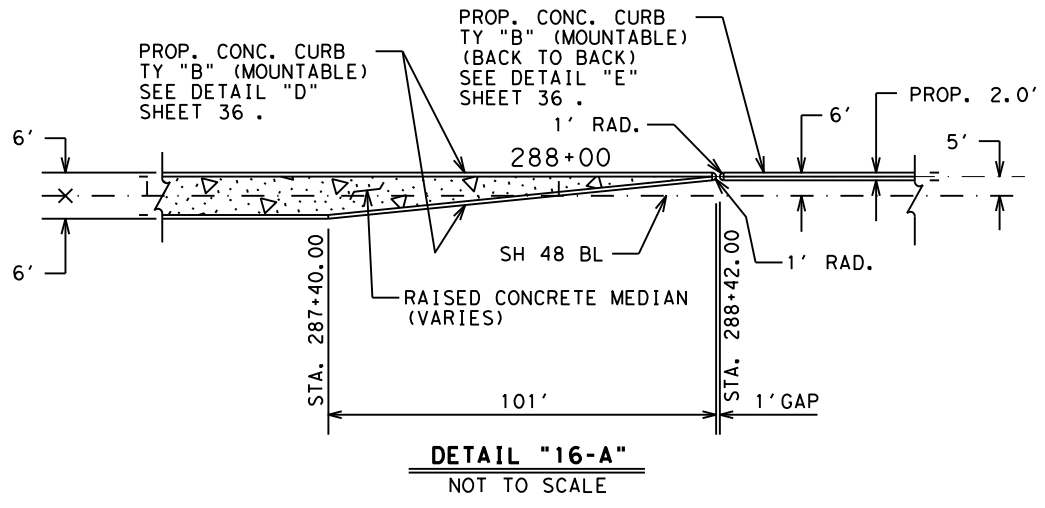
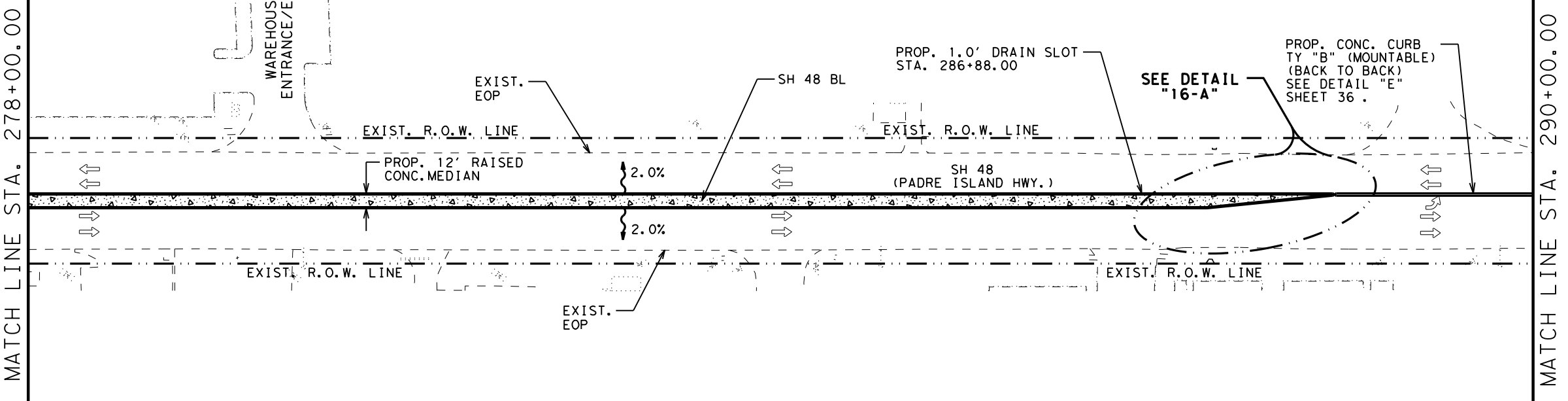
## SH 48 PROPOSED ROADWAY PLAN LAYOUT

SCALE: 1"=50' SHEET 15 OF 17

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0220	05	080	SH 48
DW:	CK:	DIST		COUNTY	SHEET NO.
		PHR		CAMERON	161



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- LEGEND**
- PROPOSED MILLING AND OVERLAY
  - PROPOSED CONCRETE TURNAROUND
  - PROPOSED RAISED CONCRETE MEDIAN
  - DIRECTIONAL OF TRAFFIC FLOW
  - TO BE ADJUSTED BY OTHERS
  - DIRECTION OF RUNOFF FLOW
  - PROP. - PROPOSED
  - EXIST. - EXISTING
  - R.O.W. - RIGHT OF WAY
  - BL - BASELINE
  - STA. - STATION
  - EOP - EDGE OF PAVEMENT
  - FOC - FACE OF CURB
  - SET - SAFETY END TREATMENT
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  - RCP - REINFORCE CONCRETE PIPE
  - CONC. - CONCRETE
  - TYP. - TYPICAL
  - RAD. - RADIUS
  - LT. - LEFT
  - RT. - RIGHT

NOTE:  
 ALL STATIONS ARE BASED ON SH 48 BASELINE  
 AND ALL OFFSETS ARE TO NOMINAL FACE OF  
 CURB OR EDGE OF PAVEMENT.

SHEET TOTALS				
ITEM	EST.	UNIT	DESCRIPTION	
432	6006	48	CY	RIPRAP (CONC) (CL B)
529	6024	2400	LF	CONC CURB TY B (MOUNTABLE)

Jennifer Fina Ontiveros  
 145115  
 PROFESSIONAL ENGINEER

*Jennifer Fina Ontiveros*  
 02/28/2023

**Pharr District Central Design**

**Texas Department of Transportation**

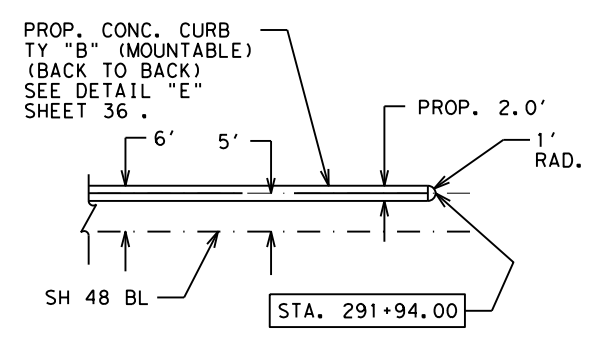
## SH 48 PROPOSED ROADWAY PLAN LAYOUT

SCALE: 1" = 50'      SHEET 16 OF 17

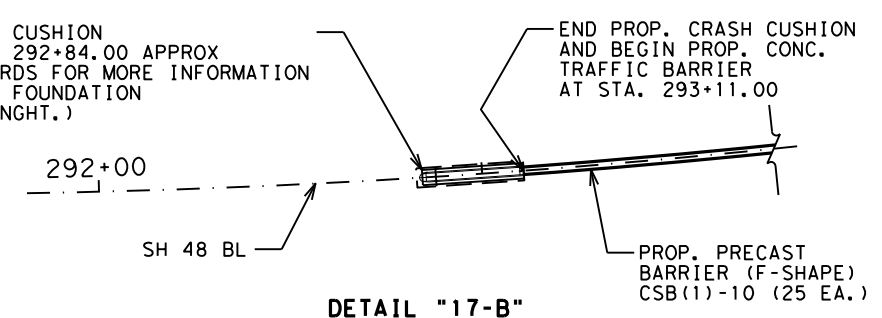
© 2022	CONT	SECT	JOB	HIGHWAY
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- ### LEGEND
- PROPOSED MILLING AND OVERLAY
  - PROPOSED CONCRETE TURNAROUND
  - PROPOSED RAISED CONCRETE MEDIAN
  - DIRECTIONAL OF TRAFFIC FLOW
  - TO BE ADJUSTED BY OTHERS
  - DIRECTION OF RUNOFF FLOW
  - PROP. - PROPOSED
  - EXIST. - EXISTING
  - R.O.W. - RIGHT OF WAY
  - BL - BASELINE
  - STA. - STATION
  - EOP - EDGE OF PAVEMENT
  - FOC - FACE OF CURB
  - SET - SAFETY END TREATMENT
  - GET - GUARDRAIL END TREATMENT
  - DAT - DOWNSTREAM ANCHOR TERMINAL
  - TY - TYPE
  - RCP - REINFORCE CONCRETE PIPE
  - CONC. - CONCRETE
  - TYP. - TYPICAL
  - RAD. - RADIUS
  - LT. - LEFT
  - RT. - RIGHT



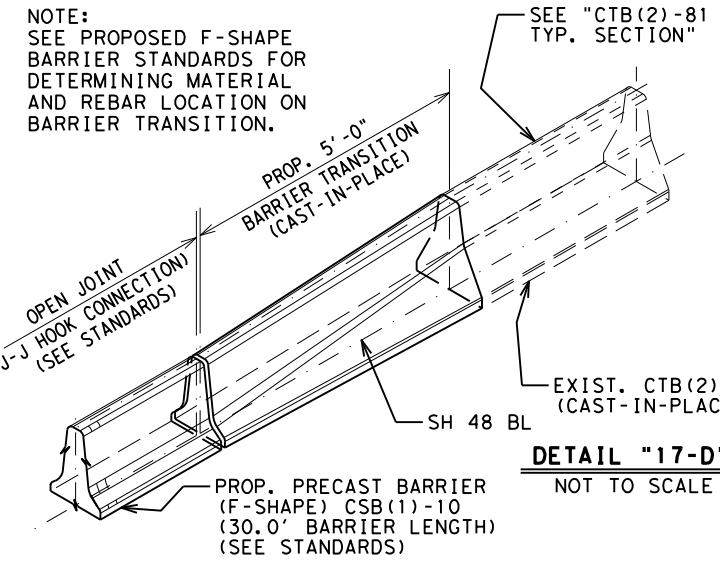
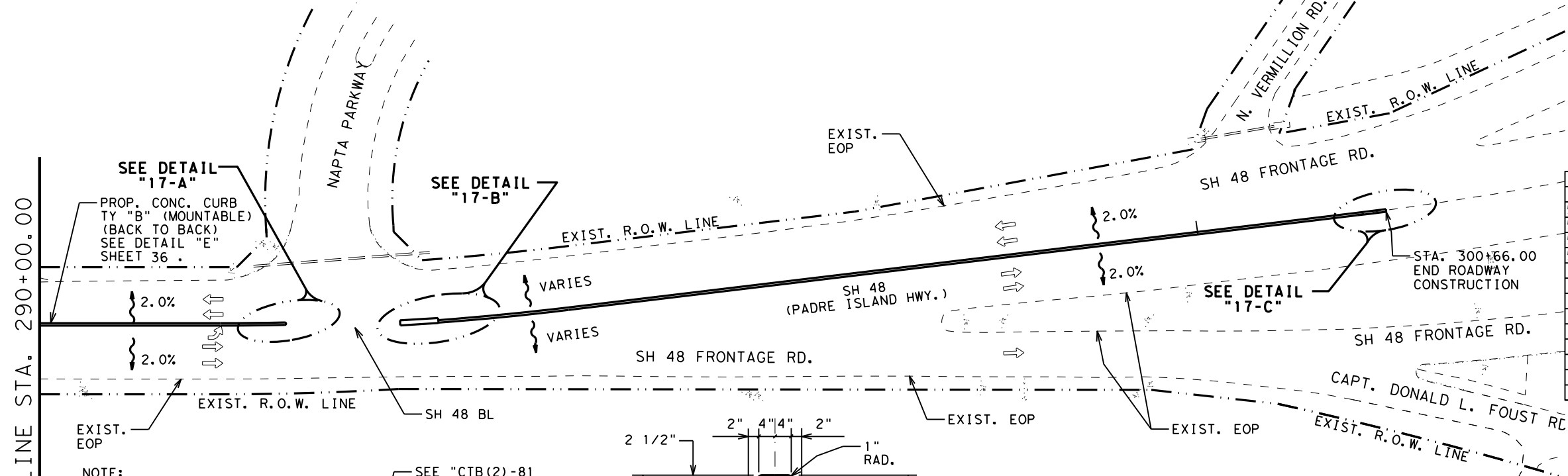
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NOT TO SCALE



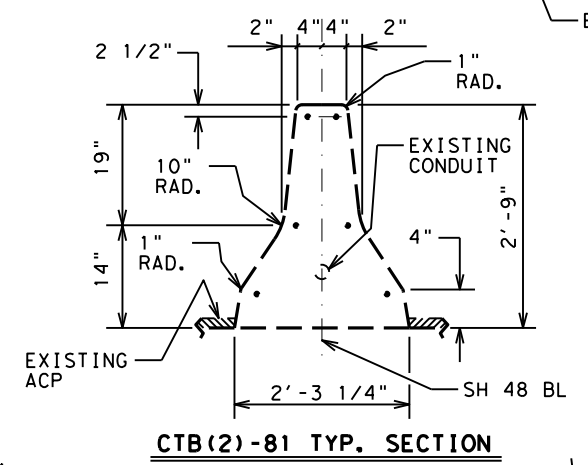
**DETAIL "17-B"**  
NOT TO SCALE

SHEET TOTALS			
ITEM	EST.	UNIT	DESCRIPTION
529 6024	389	LF	CONC CURB TY B (MOUNTABLE)
514 6013	750	LF	PERM CTB (F-SHAPE) (TY1)
514 6041	5	LF	PERM CTB CAST-IN-PLACE (F-SHAPE) (SPL)
545 6019	1	EA	CRASH CUSH ATTEN (INSTR) (R) (N) (TL3)

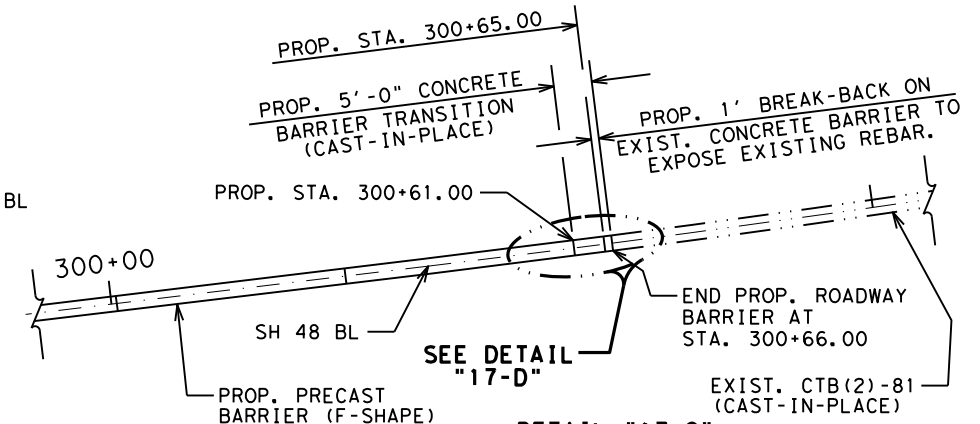
NOTE:  
ALL STATIONS ARE BASED ON SH 48 BASELINE AND ALL OFFSETS ARE TO NOMINAL FACE OF CURB OR EDGE OF PAVEMENT.



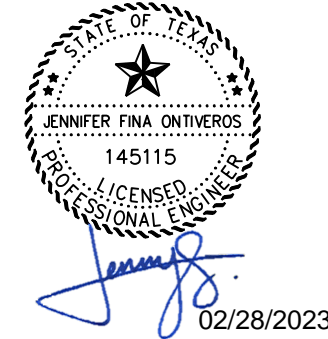
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NOT TO SCALE



**CTB(2)-81 TYP. SECTION**  
NOT TO SCALE



**DETAIL "17-C"**  
NOT TO SCALE



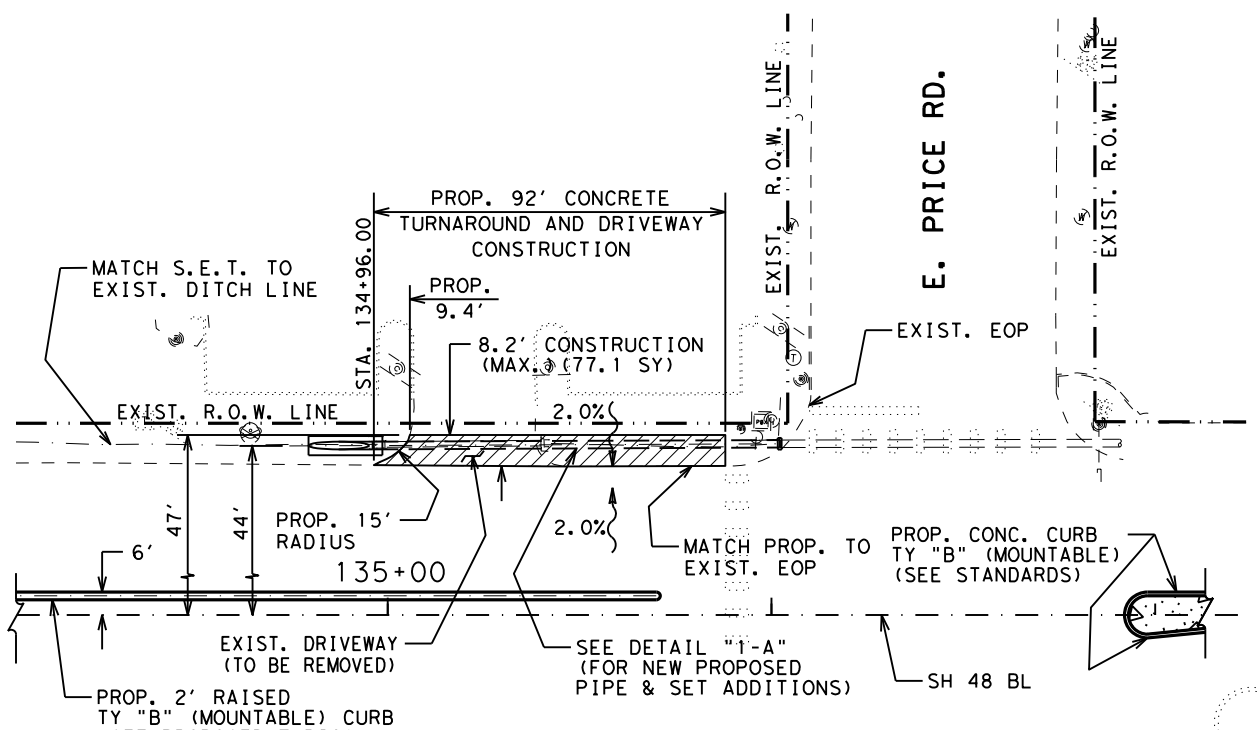
**Pharr District Central Design**  
  
 Texas Department of Transportation

## SH 48 PROPOSED ROADWAY PLAN LAYOUT

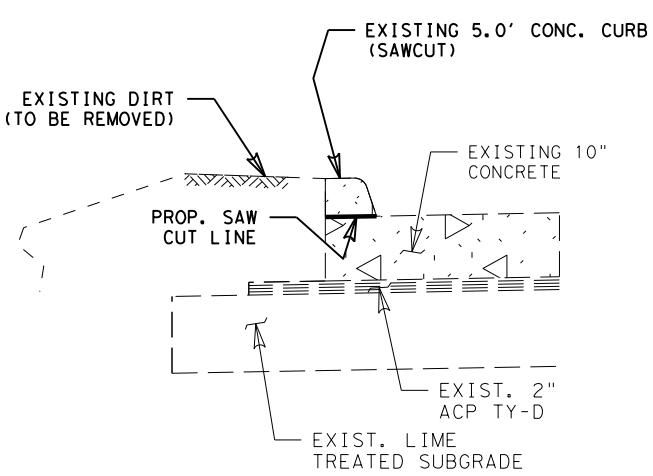
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DS:	CK:	0220	05	080	SH 48
DW:	CK:	PHR	CAMERON		163

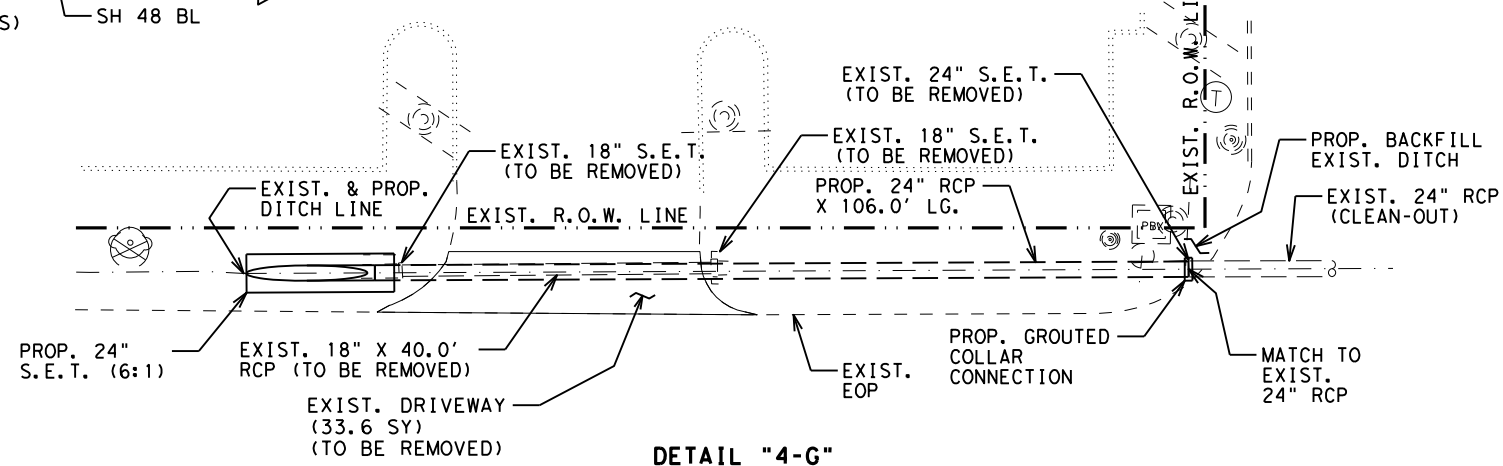
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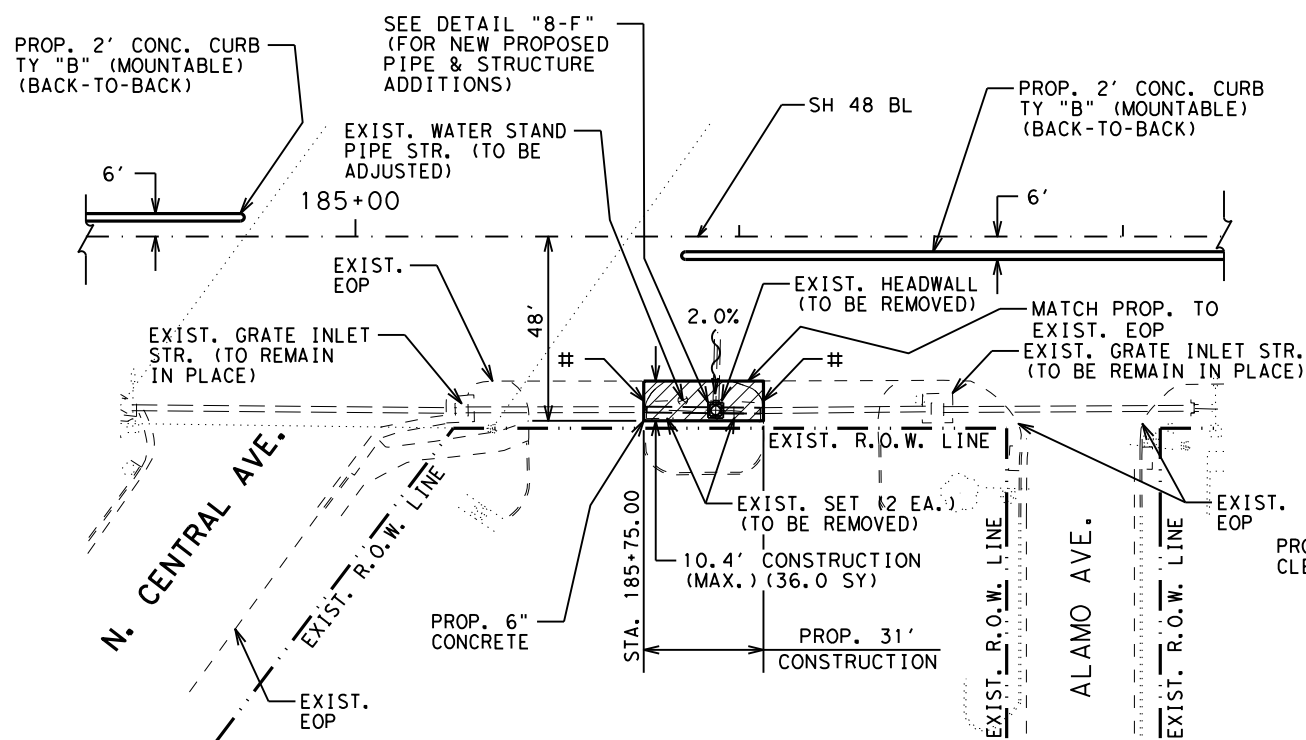
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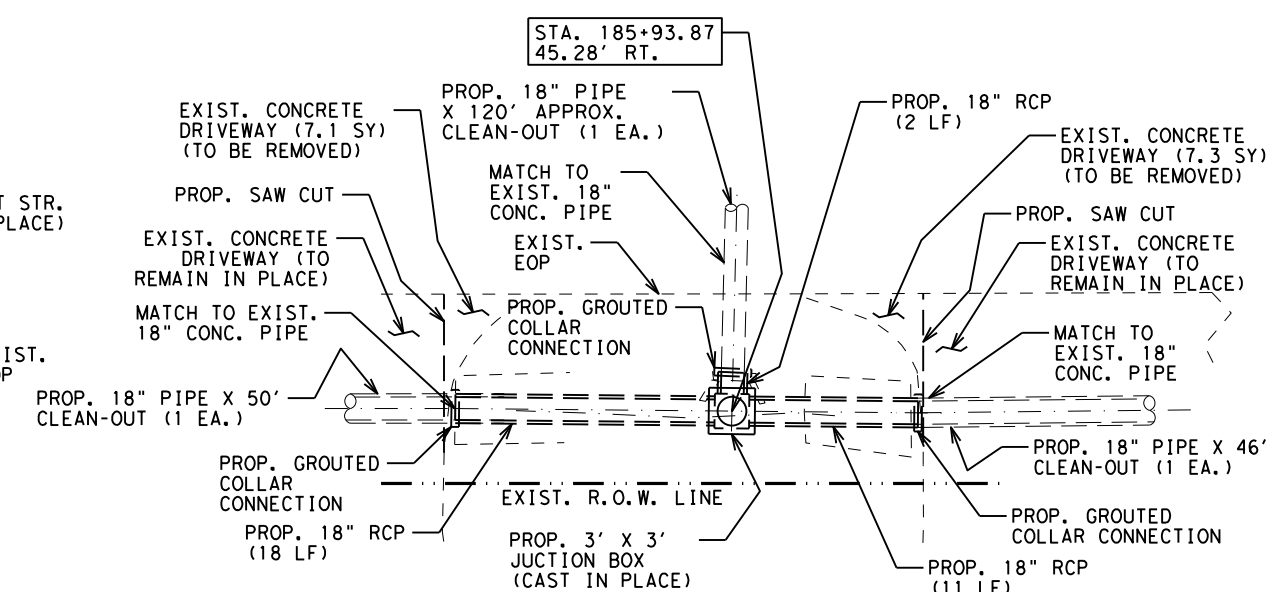
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**DETAIL "4-G"**  
NOT TO SCALE



**DETAIL "8-E"**  
NOT TO SCALE



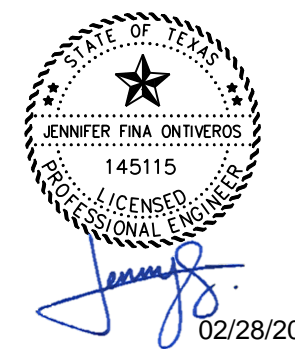
**DETAIL "8-F"**  
NOT TO SCALE

- LEGEND**
- - - - - EXISTING ROW
  - [Hatched Box] PROPOSED ROADWAY CONSTRUCTION
  - [Dotted Box] PROPOSED RAISED CONCRETE MEDIAN
  - [Arrow] DIRECTIONAL OF TRAFFIC FLOW
  - [Circle with Arrow] TO BE ADJUSTED BY OTHERS
  - [Wavy Arrow] DIRECTION OF RUNOFF FLOW

- BL - BASELINE
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- EL. - ELEVATION
- STA. - STATION
- EOP - EDGE OF PAVEMENT
- FOC - FACE OF CURB
- BOC - BACK OF CURB
- RAD. - RADIUS
- LT. - LEFT
- RT. - RIGHT
- RCP - REINFORCED CONCRETE PIPE
- S.E.T. - SAFETY END TREATMENT
- MAX. - MAXIMUM
- SY - SQUARE YARD

NOTE:  
1. ALL STATIONS ARE BASED ON SH 48 BASELINE AND ALL OFFSETS ARE TO NOMINAL FACE OF CURB OR EDGE OF PAVEMENT.

SHEET TOTALS				
ITEM	EST.	UNIT	DESCRIPTION	
420	6009	4	EA	CL A CONC (COLLAR)
465	6005	1	EA	JCTBOX (COMPL) (PJB) (3FTX3FT)
480	6001	3	EA	CLEAN EXISTING CULVERTS
464	6003	31	LF	RC PIPE (CL III) (18')
464	6005	106	LF	RC PIPE (CL III) (24')
467	6363	1	EA	SET (TY II) (18") (6:1) (P)
467	6395	1	EA	SET (TY II) (24") (6:1) (P)
104	6067	5	LF	REMOVING CONC (SAWCUT)



**Pharr District Central Design**  
Texas Department of Transportation

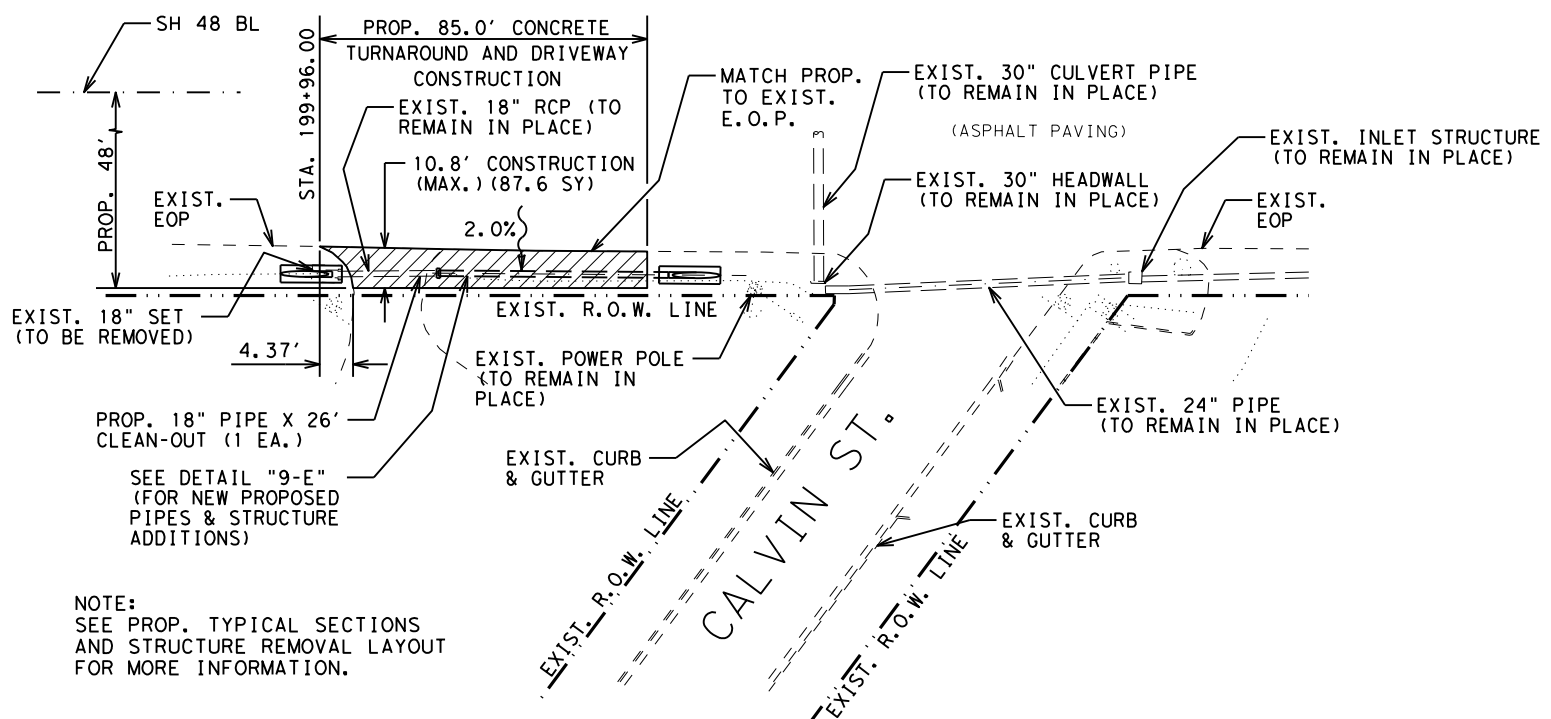
**SH 48  
PROPOSED ROADWAY  
PLAN DETAILS**

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

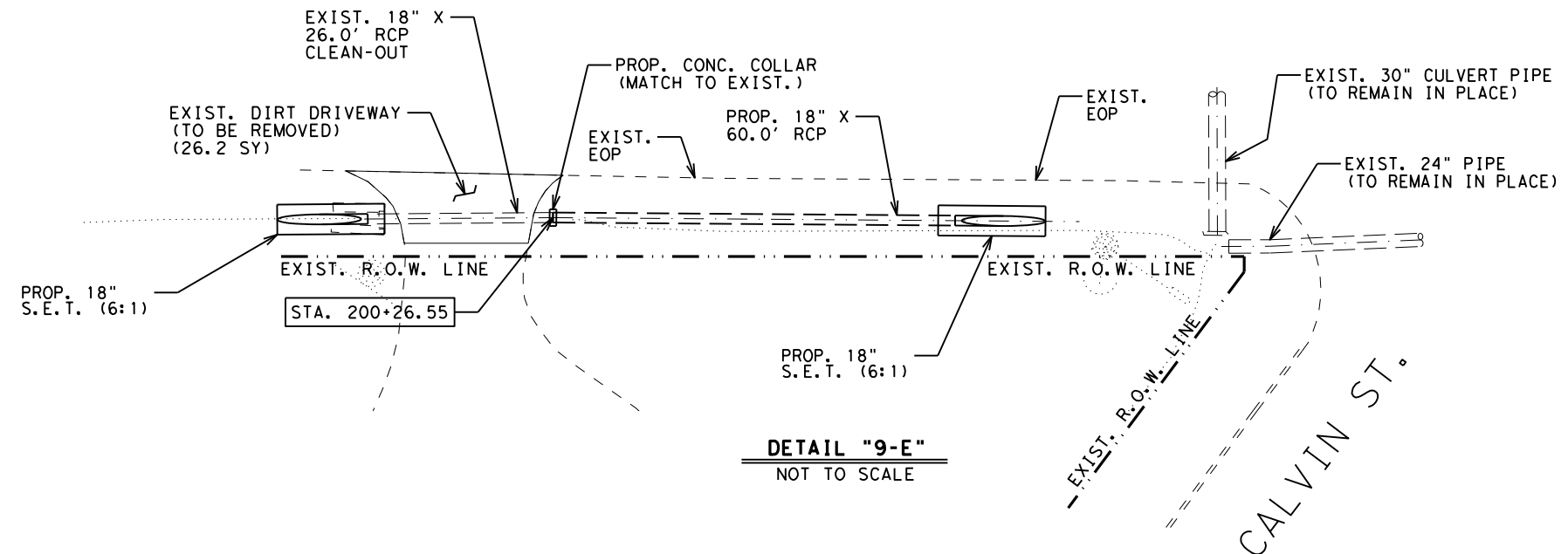
© 2022	CONT	SECT	JOB	HIGHWAY
0220	05	080	SH 48	
PHR		CAMERON		SHEET NO. 164

NOTE:  
SEE JUNCTION BOX STANDARDS FOR MORE INFORMATION.

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**DETAIL "9-D"**  
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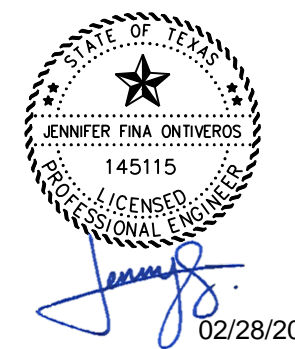
**DETAIL "9-E"**  
NOT TO SCALE

- LEGEND**
- - - - - EXISTING ROW
  - [Hatched Box] PROPOSED ROADWAY CONSTRUCTION
  - [Dotted Box] PROPOSED RAISED CONCRETE MEDIAN
  - [Arrow] DIRECTIONAL OF TRAFFIC FLOW
  - [Circle with Arrow] TO BE ADJUSTED BY OTHERS
  - [Wavy Arrow] DIRECTION OF RUNOFF FLOW

- BL - BASELINE
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- EL. - ELEVATION
- STA. - STATION
- EOP - EDGE OF PAVEMENT
- FOC - FACE OF CURB
- BOC - BACK OF CURB
- RAD. - RADIUS
- LT. - LEFT
- RT. - RIGHT
- RCP - REINFORCED CONCRETE PIPE
- S.E.T. - SAFETY END TREATMENT
- MAX. - MAXIMUM
- SY - SQUARE YARD

NOTE:  
 1. ALL STATIONS ARE BASED ON SH 48 BASELINE AND ALL OFFSETS ARE TO NOMINAL FACE OF CURB OR EDGE OF PAVEMENT.

SHEET TOTALS				
ITEM	EST.	UNIT	DESCRIPTION	
480	6001	1	EA	CLEAN EXISTING CULVERTS
464	6003	60	LF	RC PIPE (CL III) (18')
467	6363	2	EA	SET (TY II) (18") (6:1) (P)
420	6009	1	EA	CL A CONC (COLLAR)



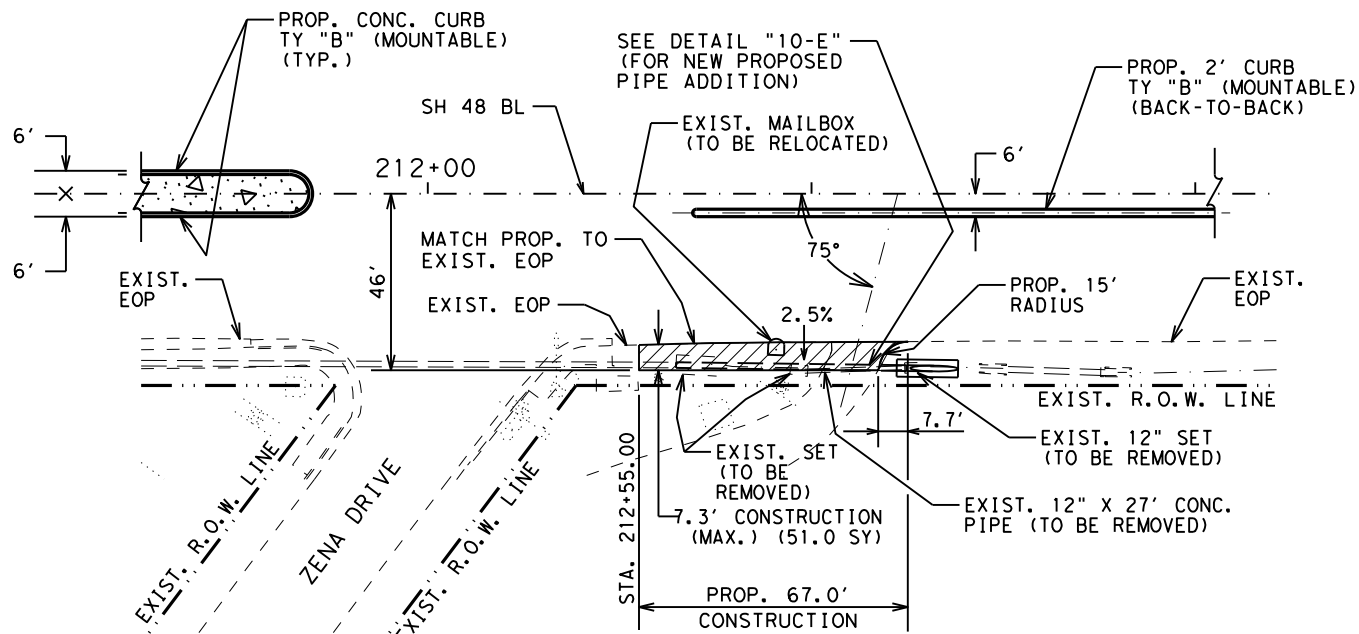
**Pharr District Central Design**  
 Texas Department of Transportation

**SH 48  
 PROPOSED ROADWAY  
 PLAN DETAILS**

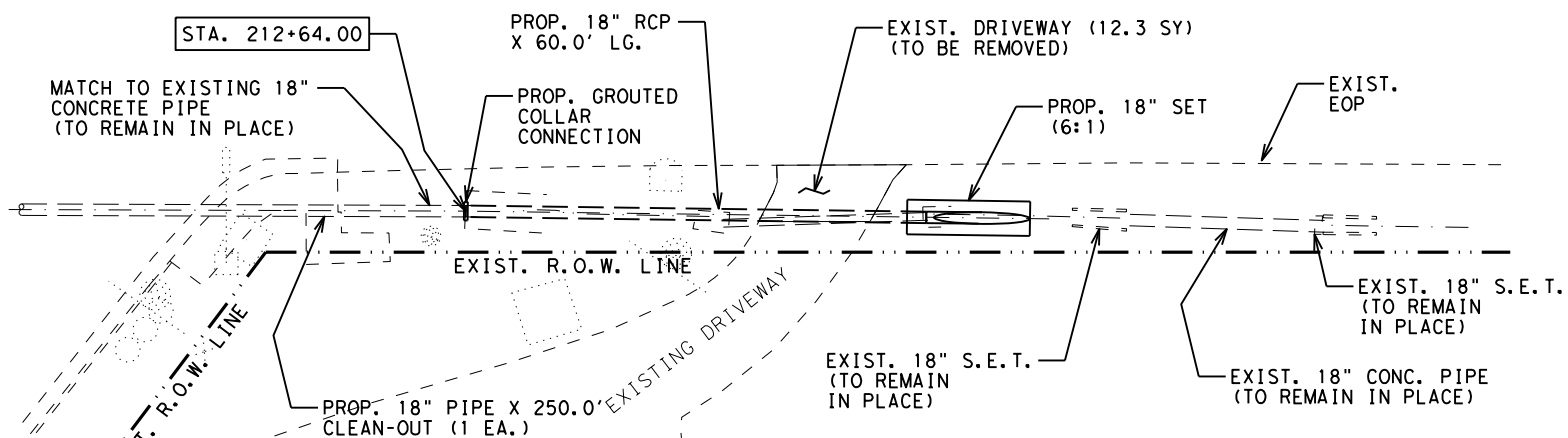
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© 2022	CONT	SECT	JOB	HIGHWAY
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DW: CK:	DIST		COUNTY	SHEET NO.
	PHR	CAMERON		165

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**DETAIL "10-C"**  
NOT TO SCALE



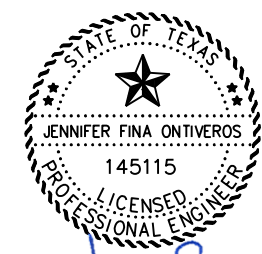
**DETAIL "10-E"**  
NOT TO SCALE

**LEGEND**

- - - - - EXISTING ROW
- [Hatched Box] PROPOSED ROADWAY CONSTRUCTION
- [Dotted Box] PROPOSED RAISED CONCRETE MEDIAN
- [Arrow] DIRECTIONAL OF TRAFFIC FLOW
- [Circle with Arrow] TO BE ADJUSTED BY OTHERS
- [Wavy Arrow] DIRECTION OF RUNOFF FLOW
- BL - BASELINE
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- EL. - ELEVATION
- STA. - STATION
- EOP - EDGE OF PAVEMENT
- FOC - FACE OF CURB
- BOC - BACK OF CURB
- RAD. - RADIUS
- LT. - LEFT
- RT. - RIGHT
- RCP - REINFORCED CONCRETE PIPE
- S.E.T. - SAFETY END TREATMENT
- MAX. - MAXIMUM
- SY - SQUARE YARD

NOTE:  
 1. ALL STATIONS ARE BASED ON SH 48 BASELINE AND ALL OFFSETS ARE TO NOMINAL FACE OF CURB OR EDGE OF PAVEMENT.

SHEET TOTALS				
ITEM	EST.	UNIT	DESCRIPTION	
480	6001	1	EA	CLEAN EXISTING CULVERTS
464	6003	60	LF	RC PIPE (CL III) (18")
467	6363	1	EA	SET (TY II) (18") (6:1) (P)
420	6009	1	EA	CL A CONC (COLLAR)



*Jennifer Fina Ontiveros*  
 02/28/2023

**Pharr District Central Design**

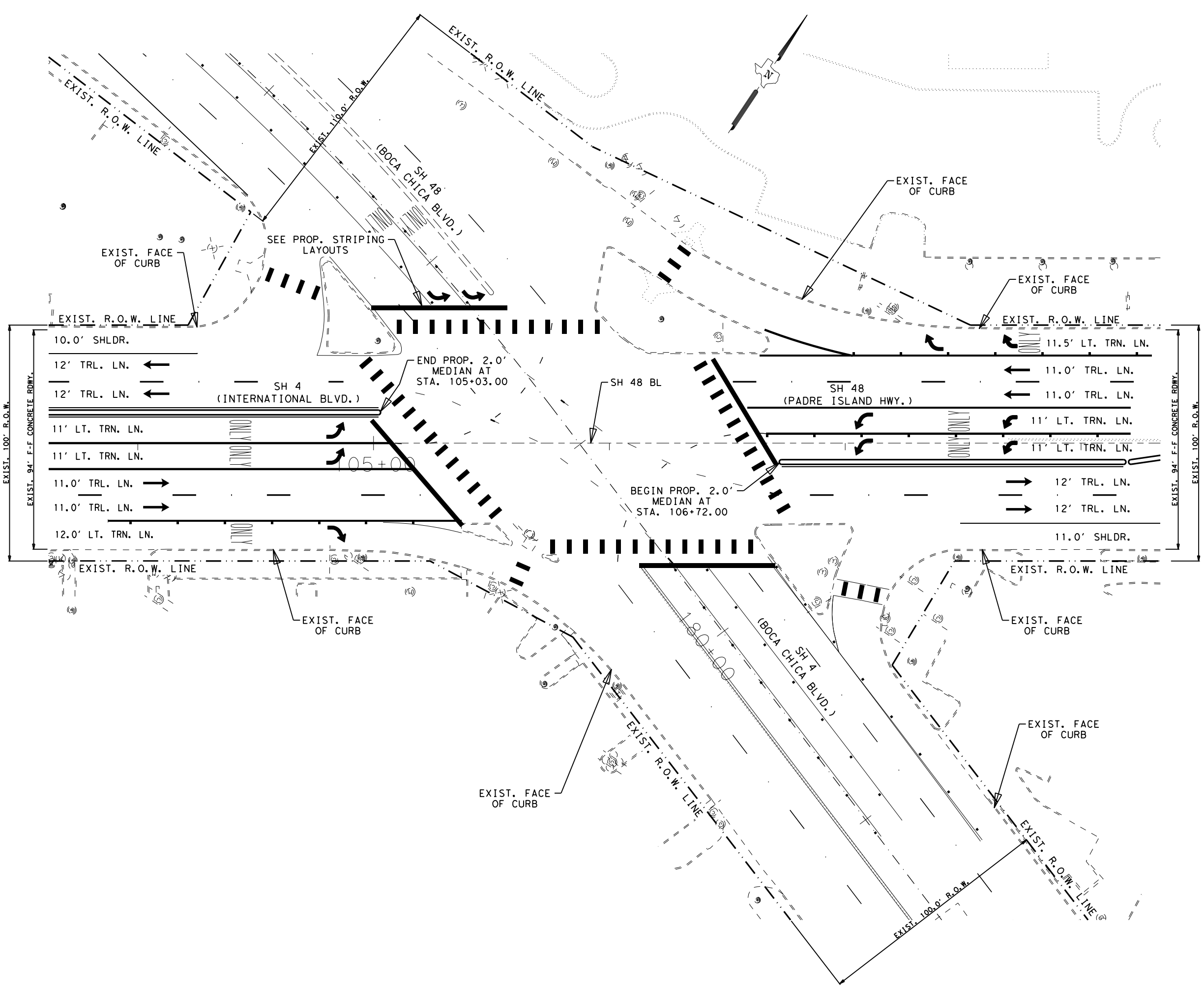


**SH 48  
 PROPOSED ROADWAY  
 PLAN DETAILS**

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

© 2022	CONT	SECT	JOB	HIGHWAY
DS: CK: 0220	05	080	SH 48	
DW: CK: PHR	DIST COUNTY		SHEET NO.	
	CAMERON		166	

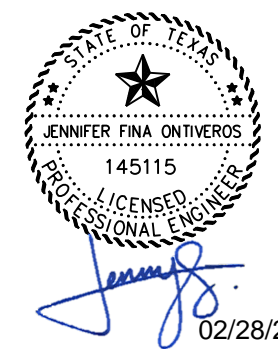
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**LEGEND**

- PROPOSED RAISED MEDIAN
- DIRECTION OF TRAFFIC FLOW
- TO BE ADJUSTED BY OTHERS
- SPOT ELEVATION
- EXIST. GUTTER ELEVATION
- PROP. GUTTER ELEVATION
- DIRECTION OF RUNOFF FLOW
- EXIST OVERHEAD ELECTRIC LINE
- EXIST UNDERGROUND TELEPHONE LINE
- EXIST WATER LINE
- EXIST FIBER OPTIC CABLE

**NOTE:**  
 1. ALL STATIONS ARE BASED ON SH 48 BASELINE AND ALL OFFSETS ARE TO NOMINAL FACE OF CURB OR EDGE OF PAVEMENT.  
 2. SEE PAVEMENT MARKINGS LAYOUT SHEETS FOR PROPOSED STRIPING, CROSS WALK, STOP BAR AND ADDITIONAL INFORMATION NOT SHOWN IN THIS DRAWING.



**Pharr District Central Design**

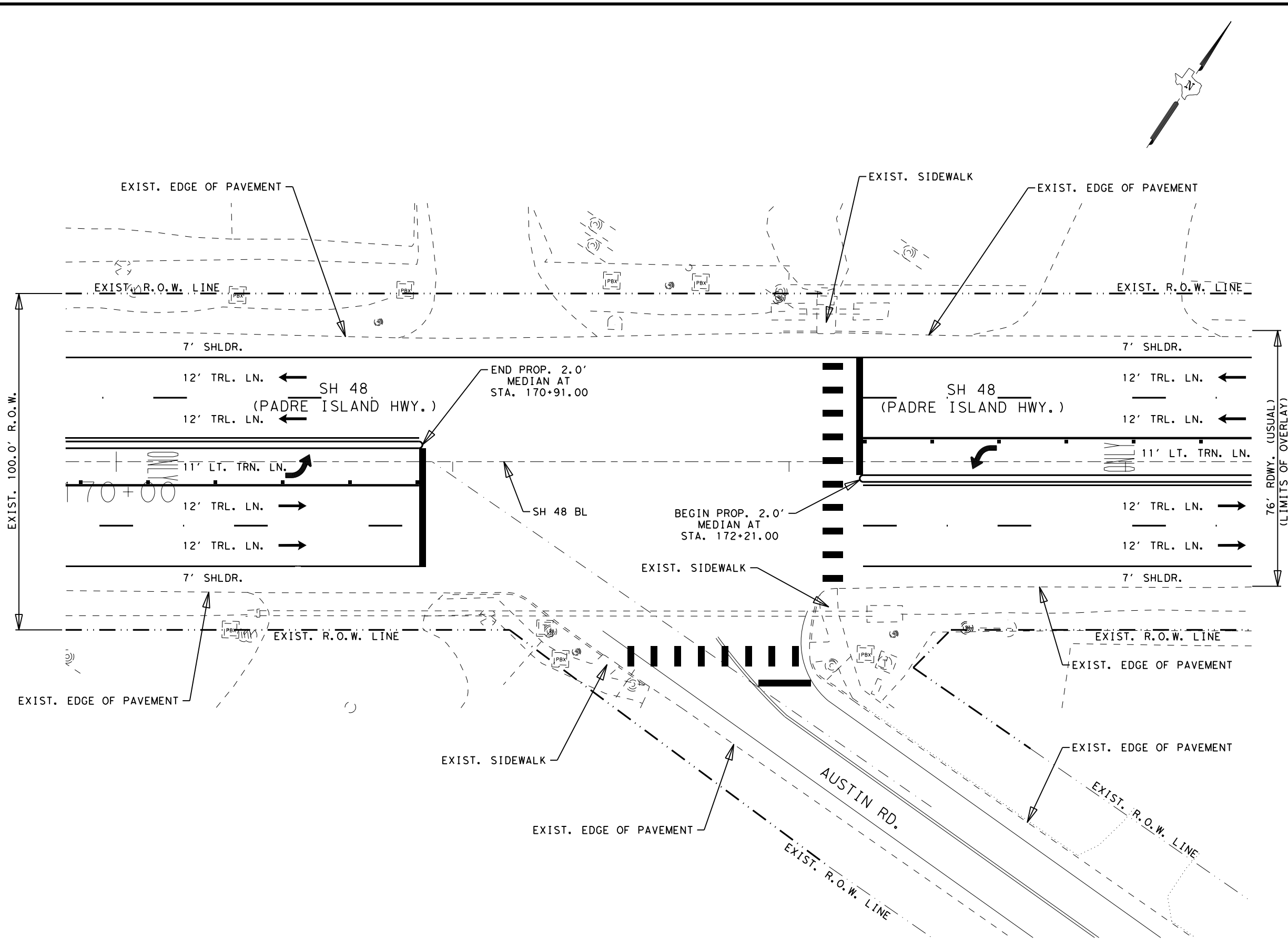
Texas Department of Transportation

**SH 48  
 INTERSECTION LAYOUT  
 - SH 48 AT SH 4**

SCALE: 1" = 40' SHEET 1 OF 1

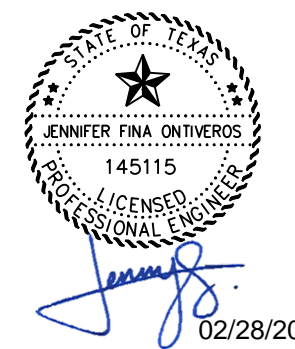
© 2022	CONT	SECT	JOB	HIGHWAY
DS:	CK:	0220 05	080	SH 48
DW:	CK:	DIST	COUNTY	SHEET NO.
		PHR	CAMERON	167

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- LEGEND**
- PROPOSED RAISED MEDIAN
  - DIRECTION OF TRAFFIC FLOW
  - TO BE ADJUSTED BY OTHERS
  - SPOT ELEVATION
  - EXIST. GUTTER ELEVATION
  - PROP. GUTTER ELEVATION
  - DIRECTION OF RUNOFF FLOW
  - EXIST OVERHEAD ELECTRIC LINE
  - EXIST UNDERGROUND TELEPHONE LINE
  - EXIST WATER LINE
  - EXIST FIBER OPTIC CABLE

**NOTE:**  
 1. ALL STATIONS ARE BASED ON SH 48 BASELINE AND ALL OFFSETS ARE TO NOMINAL FACE OF CURB OR EDGE OF PAVEMENT.  
 2. SEE PAVEMENT LAYOUT SHEETS FOR PROPOSED STRIPING, CROSS WALK, STOP BAR AND ADDITIONAL INFORMATION NOT SHOWN IN THIS DRAWING.



**Pharr District Central Design**

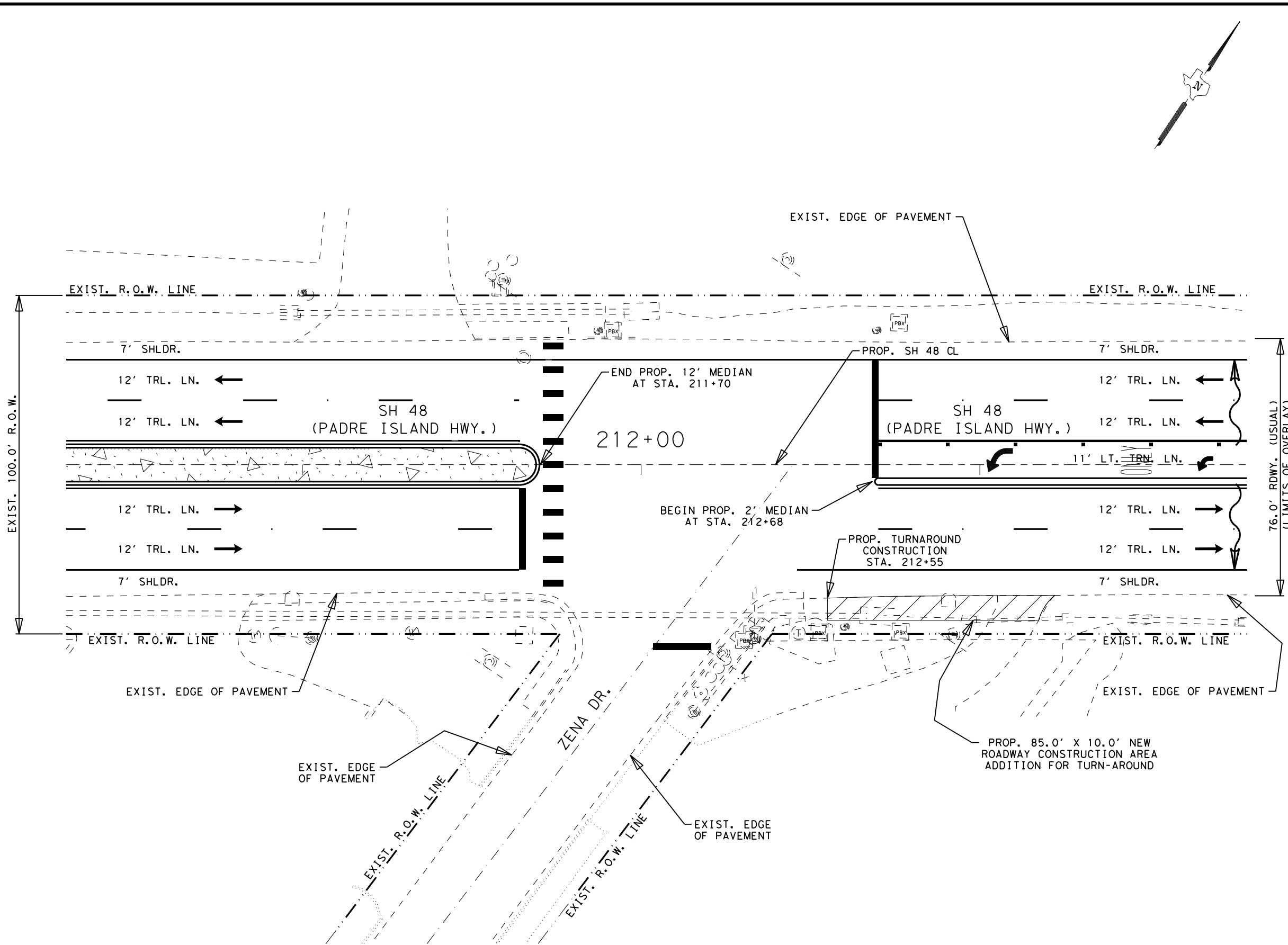
Texas Department of Transportation

**SH 48  
 INTERSECTION LAYOUT  
 - SH 48 AT AUSTIN RD.**

SCALE: 1" = 30' SHEET 1 OF 1

© 2022	CONT	SECT	JOB	HIGHWAY
DS:	CK:	0220 05	080	SH 48
DW:	CK:	DIST	COUNTY	SHEET NO.
		PHR	CAMERON	168

DATE: 2/27/2023 4:21:51 PM  
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- LEGEND**
- PROPOSED RAISED MEDIAN
  - DIRECTION OF TRAFFIC FLOW
  - TO BE ADJUSTED BY OTHERS
  - SPOT ELEVATION
  - EXIST. GUTTER ELEVATION
  - PROP. GUTTER ELEVATION
  - DIRECTION OF RUNOFF FLOW
  - EXIST OVERHEAD ELECTRIC LINE
  - EXIST UNDERGROUND TELEPHONE LINE
  - EXIST WATER LINE
  - EXIST FIBER OPTIC CABLE

**NOTE:**

- ALL STATIONS ARE BASED ON SH 48 BASELINE AND ALL OFFSETS ARE TO NOMINAL FACE OF CURB OR EDGE OF PAVEMENT.
- SEE PAVEMENT MARKINGS LAYOUT SHEETS FOR PROPOSED STRIPING, CROSS WALK, STOP BAR AND ADDITIONAL INFORMATION NOT SHOWN IN THIS DRAWING.



**Pharr District Central Design**

Texas Department of Transportation

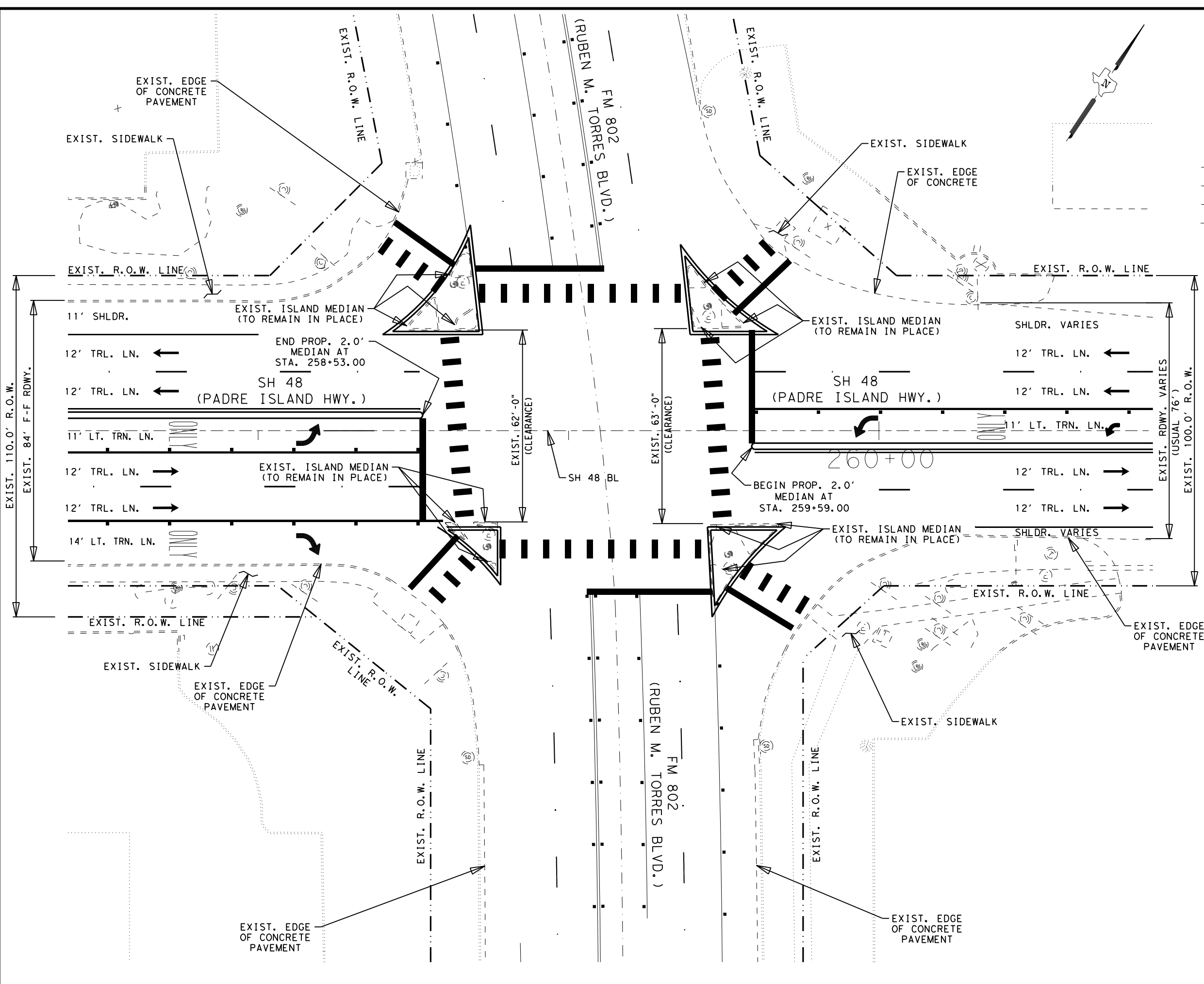
**SH 48  
 INTERSECTION LAYOUT  
 - SH 48 AT ZENA DR.**

SCALE: 1" = 30' SHEET 1 OF 1

© 2022	CONT	SECT	JOB	HIGHWAY
DS:	0220	05	080	SH 48
DW:	CR:	DIST	COUNTY	SHEET NO.
		PHR	CAMERON	169



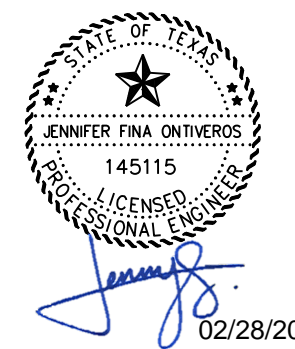
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**LEGEND**

- PROPOSED RAISED MEDIAN
- DIRECTION OF TRAFFIC FLOW
- TO BE ADJUSTED BY OTHERS
- SPOT ELEVATION
- EXIST. GUTTER ELEVATION
- PROP. GUTTER ELEVATION
- DIRECTION OF RUNOFF FLOW
- EXIST OVERHEAD ELECTRIC LINE
- EXIST UNDERGROUND TELEPHONE LINE
- EXIST WATER LINE
- EXIST FIBER OPTIC CABLE

**NOTE:**  
 1. ALL STATIONS ARE BASED ON SH 48 BASELINE AND ALL OFFSETS ARE TO NOMINAL FACE OF CURB OR EDGE OF PAVEMENT.  
 2. SEE PAVEMENT MARKINGS LAYOUT SHEETS FOR PROPOSED STRIPING, CROSS WALK, STOP BAR AND ADDITIONAL INFORMATION NOT SHOWN IN THIS DRAWING.



**Pharr District Central Design**

**Texas Department of Transportation**

**SH 48 INTERSECTION LAYOUT - SH 48 AT FM 802**

SCALE: 1" = 30' SHEET 1 OF 1

© 2022	CONT	SECT	JOB	HIGHWAY
0220	05	080	SH 48	
DIST	COUNTY		SHEET NO.	
PHR	CAMERON		170	

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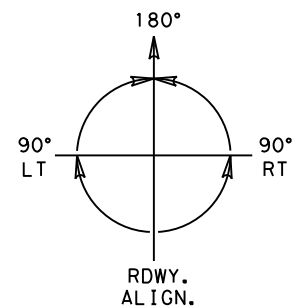
**GENERAL NOTES :**

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.
2. STATIONING IS BASED ON THE PROPOSED BASELINE ALIGNMENT.
3. THE PROP. FLOW FOR ALL DRIVEWAY SIDEDRAINS SHALL BE 3" BELOW PROPOSED DITCH GRADELINE.
4. FOR REMOVAL ITEMS ASSOCIATED WITH PROPOSED DRIVEWAYS, SEE REMOVAL LAYOUT PLANS FOR LOCATIONS, DESCRIPTIONS, AND QUANTITIES.

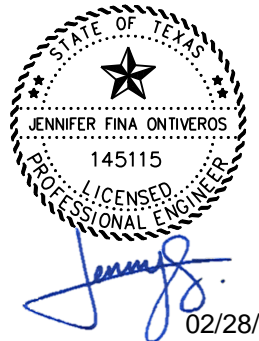
**PUBLIC DRIVEWAYS**

LOCATION	EXIST. WIDTH AT EDGE OF PAVEMENT (FT.)	PROP. WIDTH AT EDGE OF PAVEMENT (FT.)	PROP. WIDTH AT BACK OF DRIVEWAY (FT.)	PROP. RAD. (FT) LT/RT	# PROP. DRIVEWAY ANGLE TO ROADWAY (DEG.)	CONC DRWY AREA (SY)		★ ITEM 464 PROP. RCP (III) (FT.)		★ ITEM 467 PROP. S.E.T. 18" (TY II) (6:1) (EA.)	★ ITEM 467 PROP. S.E.T. 24" (TY II) (6:1) (EA.)
						6" CONC.	PBS1	18"	24"		
STA. 134+96.00 TO STA. 135+88.00 (LT)	50	92	82.6	15/-	90°	77.1	-	-	106	-	1
STA. 199+96.00 TO STA. 200+81.00 (RT)	32.5	85	76.6	15/-	90°	88.0	-	60	-	1	-
STA. 212+55.00 TO STA. 213+22.00 (RT)	16.9	70	62.3	-/15	75°	51.0	-	60	-	1	-
STA. 237+41.00 TO STA. 237+91.00 (LT)	44.5	50	56.3	15/8	64.83°	-	61	-	-	-	-
<b>PROJECT TOTAL :</b>						<b>216.1</b>	<b>61</b>	<b>120</b>	<b>106</b>	<b>2</b>	<b>1</b>

★ - ITEM IS FOR INFORMATION ONLY



# - DRIVEWAY ANGLE ORIENTATION



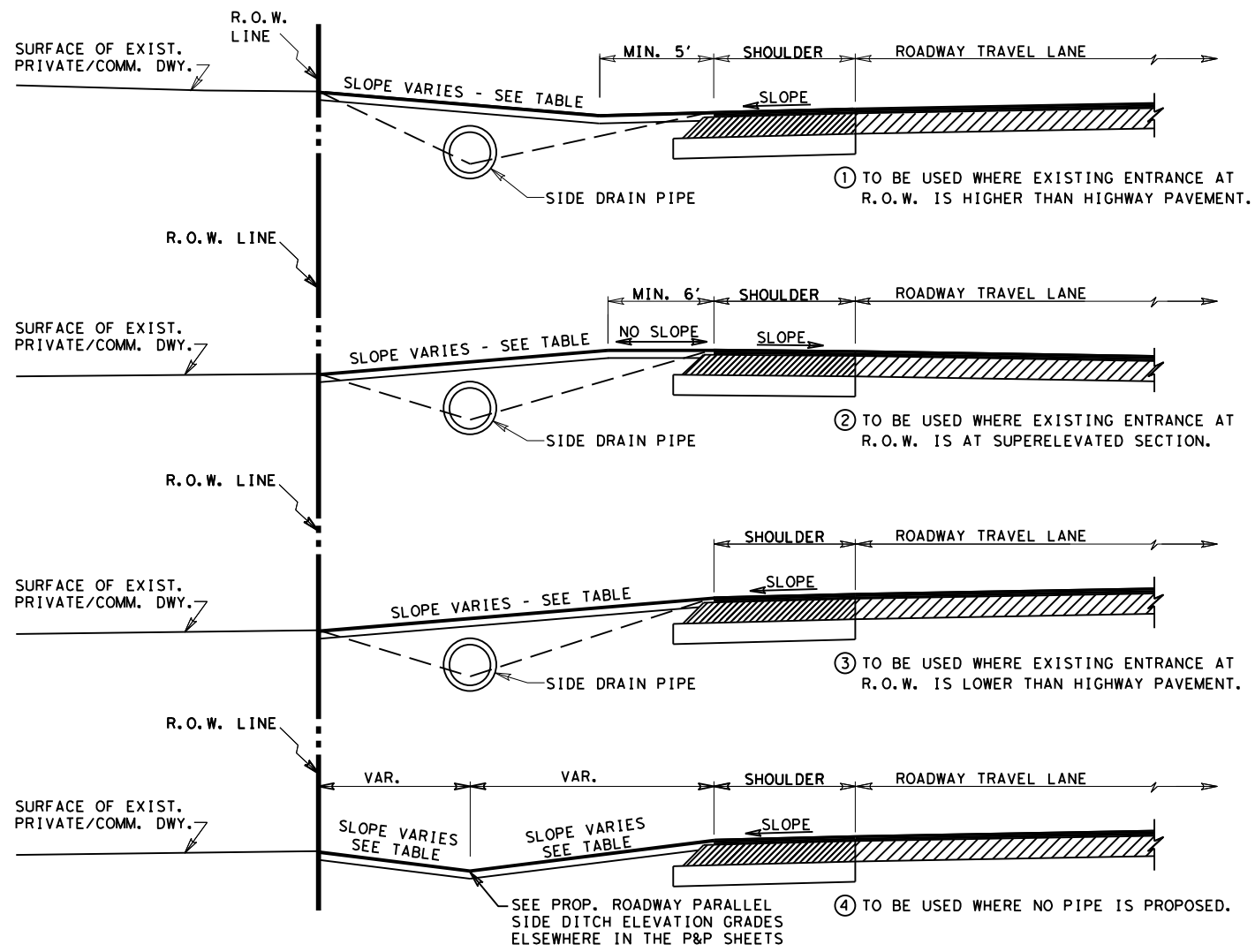
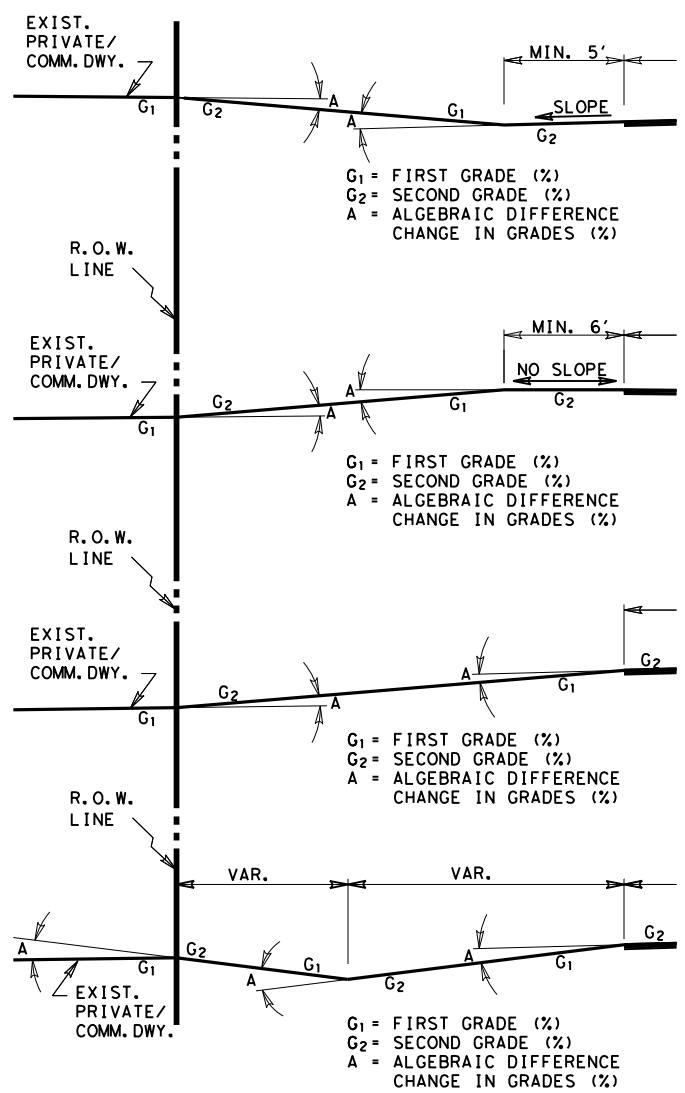
Pharr District Central Design



**SH 48  
PUBLIC  
DRIVEWAY TABLE**

SHEET 1 OF 1

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
DIST	COUNTY	SHEET NO.		
PHR	CAMERON	171		



**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, $A = G_2 - G_1$

**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 1 1/2 IN. DEPTH.

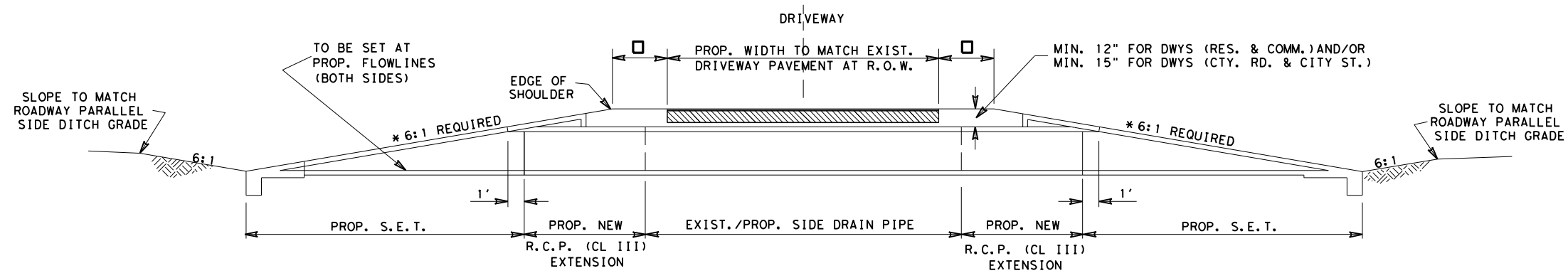
SIDE DRAIN PIPES TO BE INSTALLED WHERE ROADWAY DITCH DRAINAGE IS NECESSARY, AS INDICATED ON PLANS AND/OR AS DIRECTED BY THE ENGINEER.

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.



- - 1' MIN. ON DRIVEWAYS (RES. & COMM.)  
2' MIN. ON DRIVEWAYS (COUNTY RD. & CITY ST.)
- \* - 6:1 SLOPE REQUIRED

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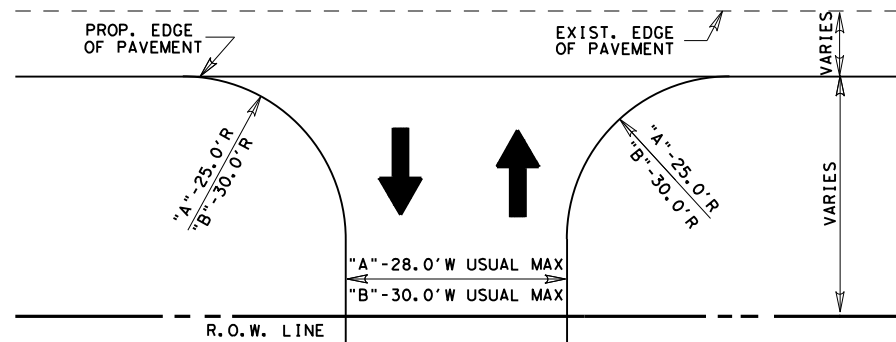
**TEXAS DEPARTMENT OF TRANSPORTATION**

**DRIVEWAY PROFILE DETAILS**

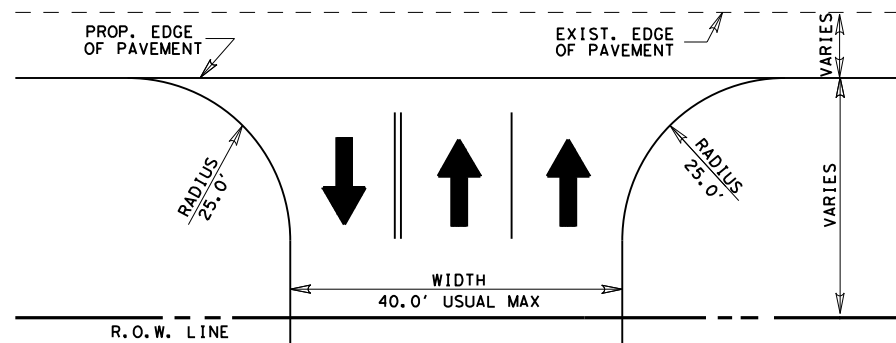
REV. 3/2020 DRIVEWAY1.DGN

FED. RD. DIV. NO.		STATE AID PROJECT NO.		FILE NO.		SHEET NO.	
6						172	
STATE	STATE DIST. NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.	
TEXAS	PHR	CAMERON	0220	05	080	SH 48	

## DESIGNS FOR TWO-WAY COMMERCIAL DRIVEWAYS

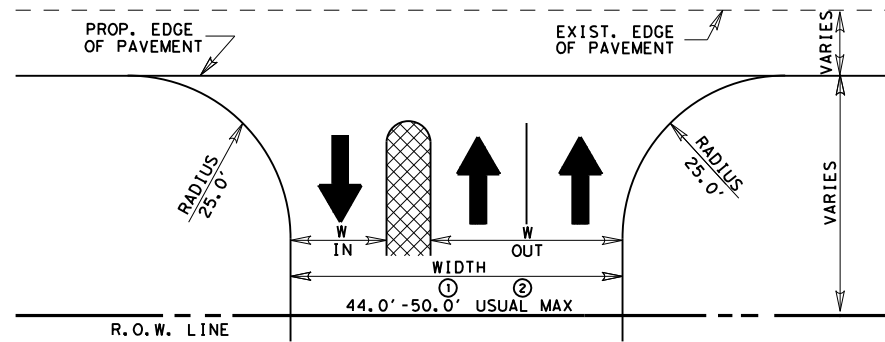


"A"- ONE ENTRY LANE AND ONE EXIT LANE, FEWER THAN 4 LARGE VEHICLES PER HOUR  
 "B"- ONE ENTRY LANE AND ONE EXIT LANE, 4 OR MORE SINGLE UNIT VEHICLES<sup>①</sup> PER HOUR  
 ① - DRIVEWAY DESIGNS FOR LARGER VEHICLES WILL BE CONSIDERED ON A CASE BY CASE BASIS

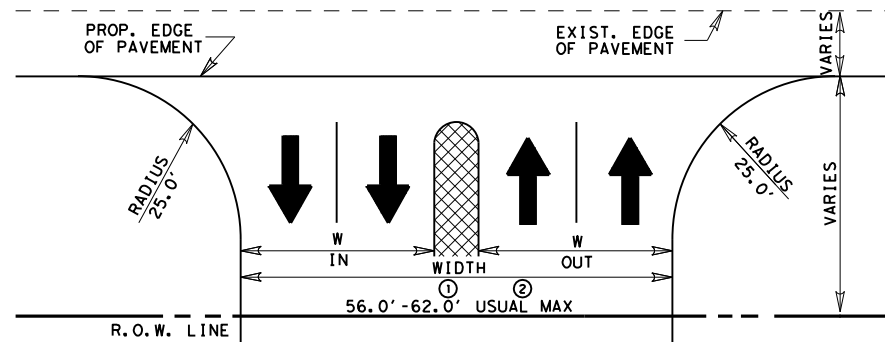


ONE ENTRY LANE AND TWO EXIT LANES (WITHOUT DIVIDERS)

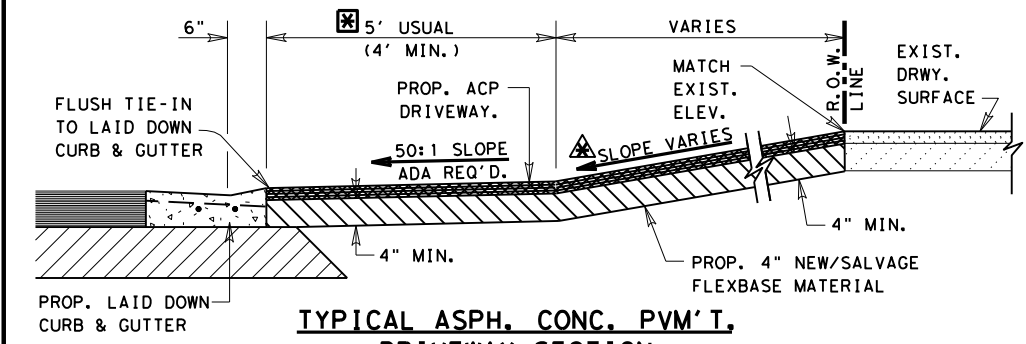
## DESIGNS FOR TWO-WAY COMMERCIAL DRIVEWAYS



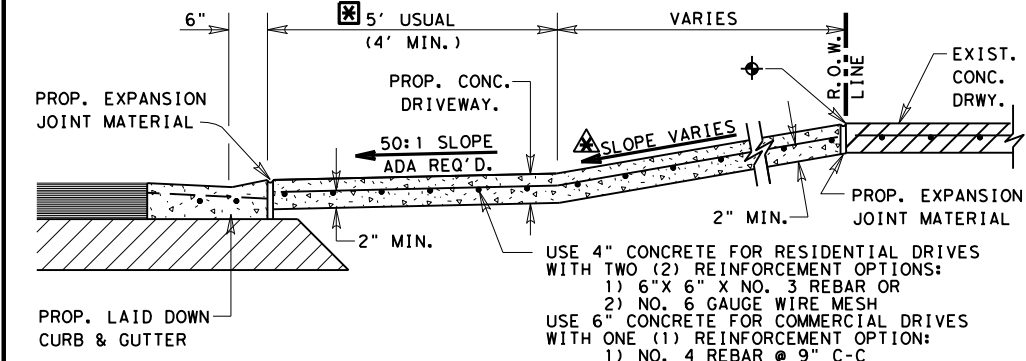
① - 4.0' WIDE DIVIDER, FACE-TO-FACE CURBS  
 ② - 10.0' WIDE DIVIDER, FACE-TO-FACE CURBS  
 ONE ENTRY LANE AND TWO EXIT LANES (WITH A DIVIDER)



① - 4.0' WIDE DIVIDER, FACE-TO-FACE CURBS  
 ② - 10.0' WIDE DIVIDER, FACE-TO-FACE CURBS  
 TWO ENTRY LANES AND TWO EXIT LANES (WITH A DIVIDER)



TYPICAL ASPH. CONC. PVM'T. DRIVEWAY SECTION  
 N.T.S.



TYPICAL CONCRETE DRIVEWAY SECTION  
 N.T.S.

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

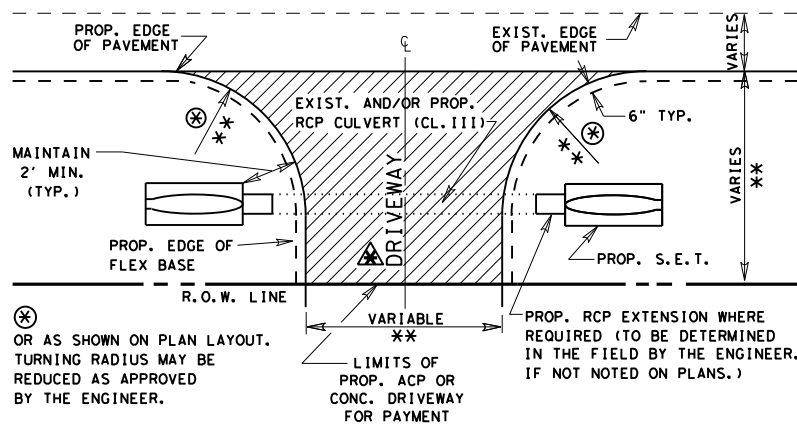
PROF./FUTURE SIDEWALK CROSSING LOCATION UNLESS SHOWN ELSEWHERE ON P&P SHEETS. SEE P&P SHEETS FOR PROP. SIDEWALK LOCATION IF SIDEWALKS ARE INCLUDED AS PART OF PROJECT. REFER TO STATE STANDARDS - PEDESTRIAN FACILITIES - FOR ADDITIONAL REQUIREMENTS.

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

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

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

## PRIVATE AND COMMERCIAL DRIVES WITHOUT CURB & GUTTER

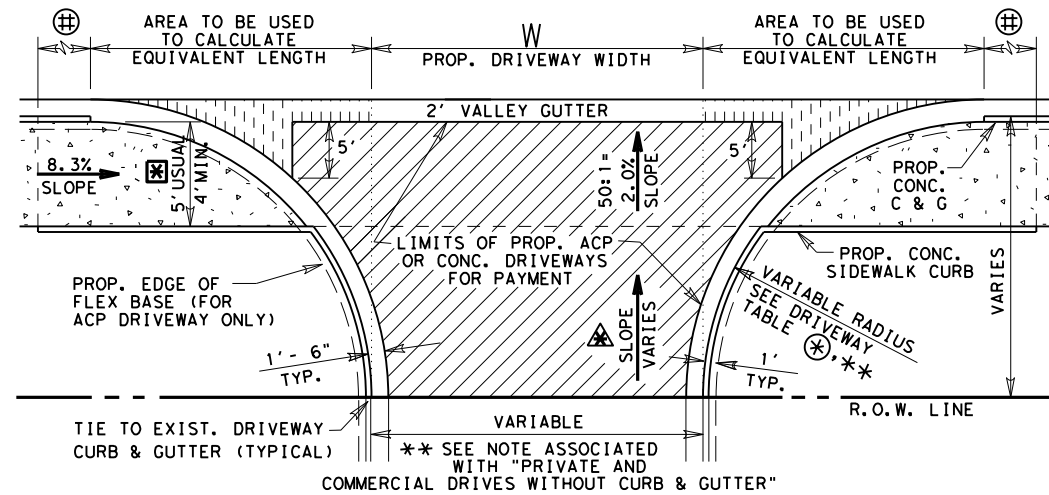


PLAN OF PRIVATE AND COMMERCIAL DRIVES

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

SEE TYPICAL DRIVEWAY SECTIONS NOTES FOR DRIVEWAY SLOPE CRITERIA.

## PRIVATE AND COMMERCIAL DRIVES WITH CURB & GUTTER



PLAN OF PRIVATE AND COMMERCIAL DRIVES

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

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

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

SEE TYPICAL DRIVEWAY SECTIONS NOTES FOR DRIVEWAY SLOPE CRITERIA.

## LF EQUIVALENT TABLE FOR PAYMENT LIMITS OF 2' VALLEY GUTTER

LF OF VALLEY GUTTER = W + X1 + X2		
WHERE X1 AND X2 MAY VARY DEPENDING ON RADIUS		
Prop. Driveway Radius	X1 or X2 (Sq Ft Area / 2')	Equivalent LF Length
5'	1	
8'	2	
10'	4	
12'	6	
15'	9	
18'	12	
20'	15	
22'	18	
25'	24	
28'	30	
30'	34	

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

## DRIVEWAY TYPES

TY PB-1  
 EXIST. PRIVATE OR COMMERCIAL DRIVEWAYS TO BE CONSTRUCTED AS SHOWN WITH 4" NEW AND/OR SALVAGE FLEX. BASE, PRIMED AND SURFACED WITH 171#/SY ACP. (HMA-D PG 64-22 SAC B MEETING ITEM 340)

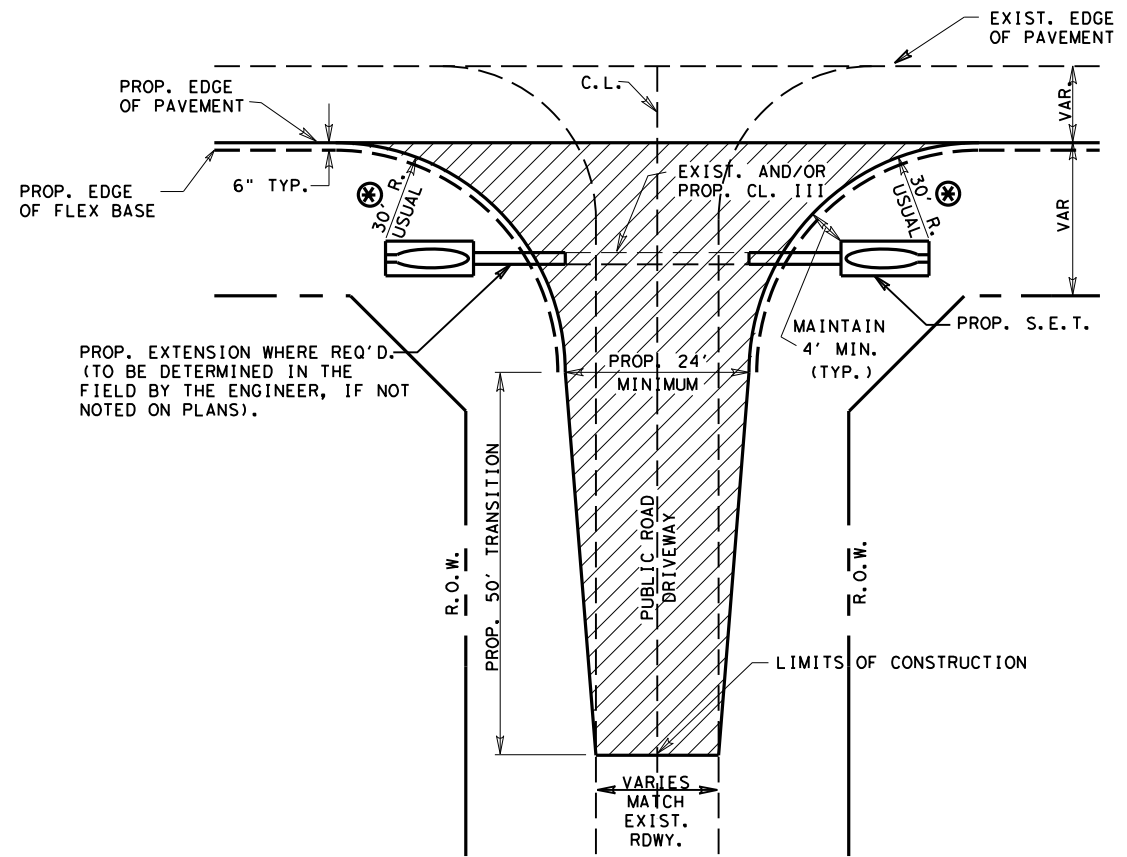
CONCRETE (RESIDENTIAL)  
 EXIST. PRIVATE DRIVEWAYS TO BE CONSTRUCTED AS SHOWN WITH 4" CONCRETE. TO BE PAID FOR BY THE SQ. YD.

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

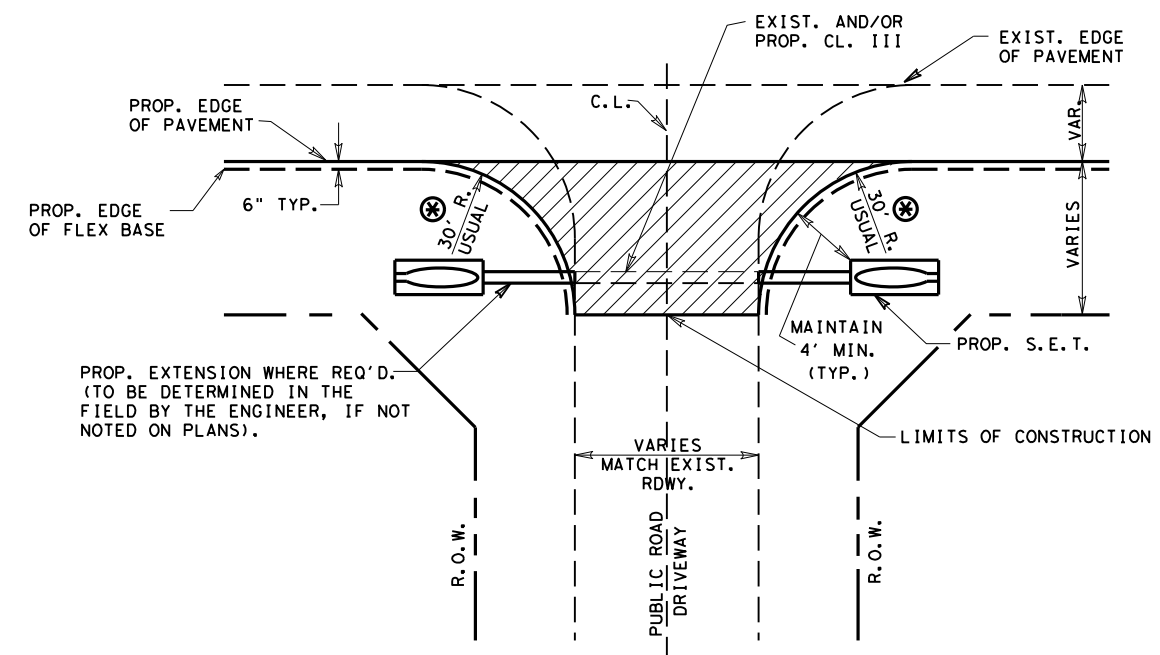
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TEXAS DEPARTMENT OF TRANSPORTATION  
**DRIVEWAY DETAILS**  
 PRIVATE  
 (RESIDENTIAL-COMMERCIAL)

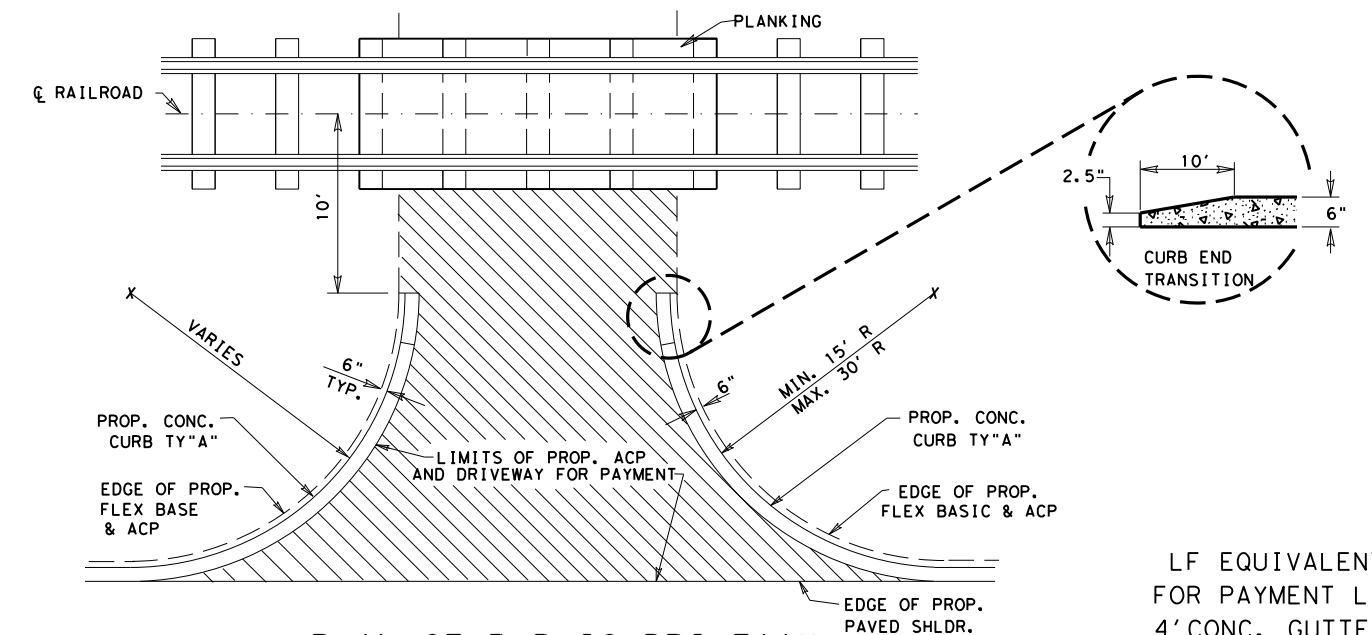
REV. 08/22		DRIVEWAY2.DGN	
FED. RD. DIV. NO.	PROJECT NO.	FILE NO.	SHEET NO.
6			173
STATE	STATE DIST. NO.	COUNTY	CONT. SECT. JOB HIGHWAY NO.
TEXAS	21	CAMERON	0220 05 080 SH 48



**TYPICAL DETAIL**  
(WHEN EXIST. ROADWAY WIDTH LESS THAN 24'.)

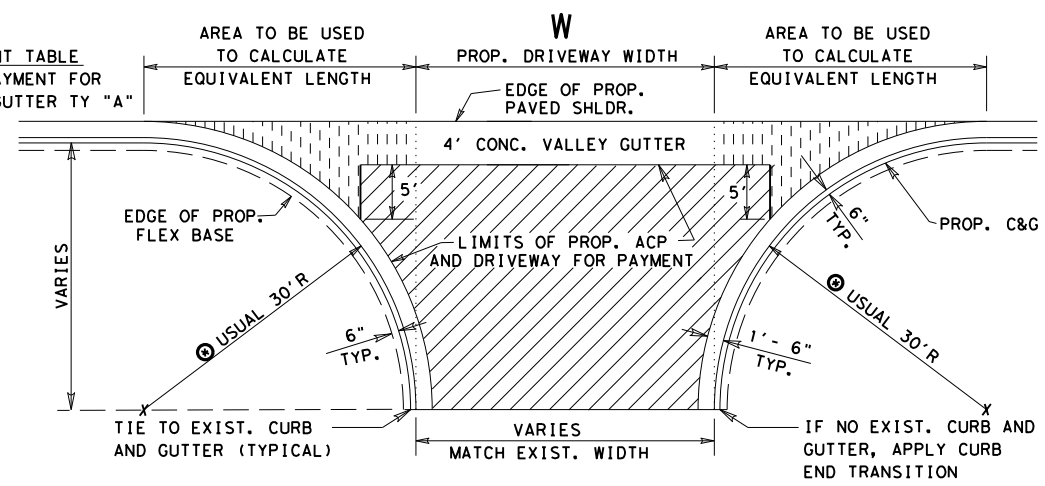


**TYPICAL DETAIL**  
(WHEN EXIST. ROADWAY WIDTH EQUAL TO OR GREATER THAN 24'.)



**PLAN OF PUBLIC DRIVEWAY ADJACENT TO R.R. CROSSING**

SEE LF EQUIVALENT TABLE FOR LIMITS OF PAYMENT FOR PROP. 4' CONC. GUTTER TY "A" WHERE REQUIRED



**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')
10	3
15	7
20	12
25	19
30	27
35	37
40	48
45	61
50	75
55	91
60	109
65	127
70	148
75	170

**GENERAL NOTES:**

- AVERAGE DIMENSIONS SHOWN ON TABLE OF DRIVEWAYS ARE FOR ESTIMATING PURPOSES ONLY.
- LOCATIONS LISTED ON THE TABLE ARE APPROXIMATE, EXACT LOCATIONS, DIMENSIONS, AND TYPE TO BE ESTABLISHED DURING CONSTRUCTION BY THE ENGINEER AS REQUIRED.
- ⊗ SEE DRIVEWAY TABLE, TURNING RADIUS MAY BE REDUCED AS APPROVED BY THE ENGINEER.
- SEE TABLE OF DRIVEWAYS FOR TOTAL LENGTH OF PROP. 4' CONC. VALLEY GUTTER FOR EACH LOCATION.

**TY PBS1**

EXIST. UNPAVED PUBLIC DRIVEWAYS TO BE CONSTRUCTED AS SHOWN WITH 12" LIME TREAT. SUBGRADE, 8" FLEX. BASE 1% LIME, THEN PRIMED AND SURFACED WITH 171#/SY ACP. (HMA-D PG 64-22 SAC B MEETING ITEM 340)

**TY PBS2**

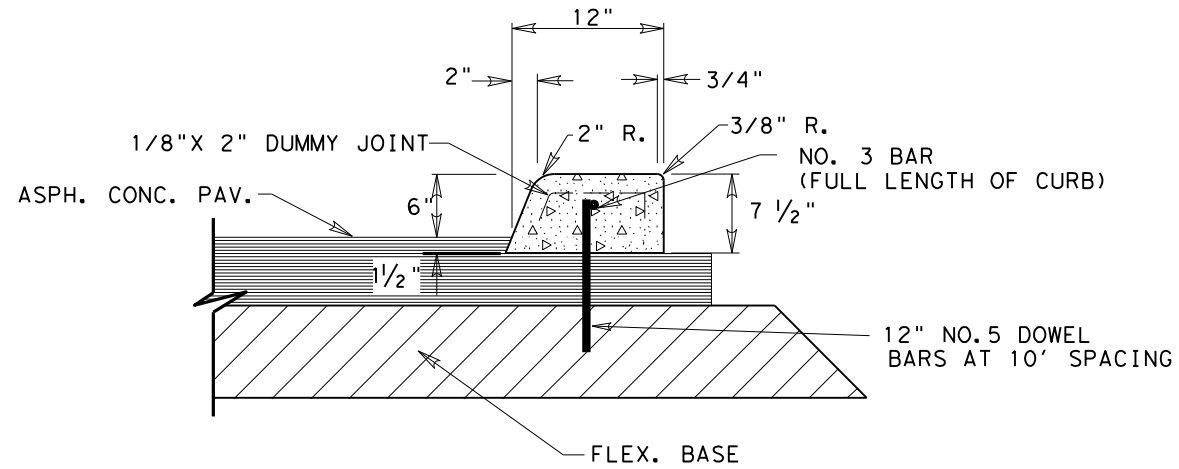
EXIST. DRIVEWAY TO BE CONSTRUCTED SAME AS PROPOSED ROADWAY.

**TEXAS DEPARTMENT OF TRANSPORTATION**

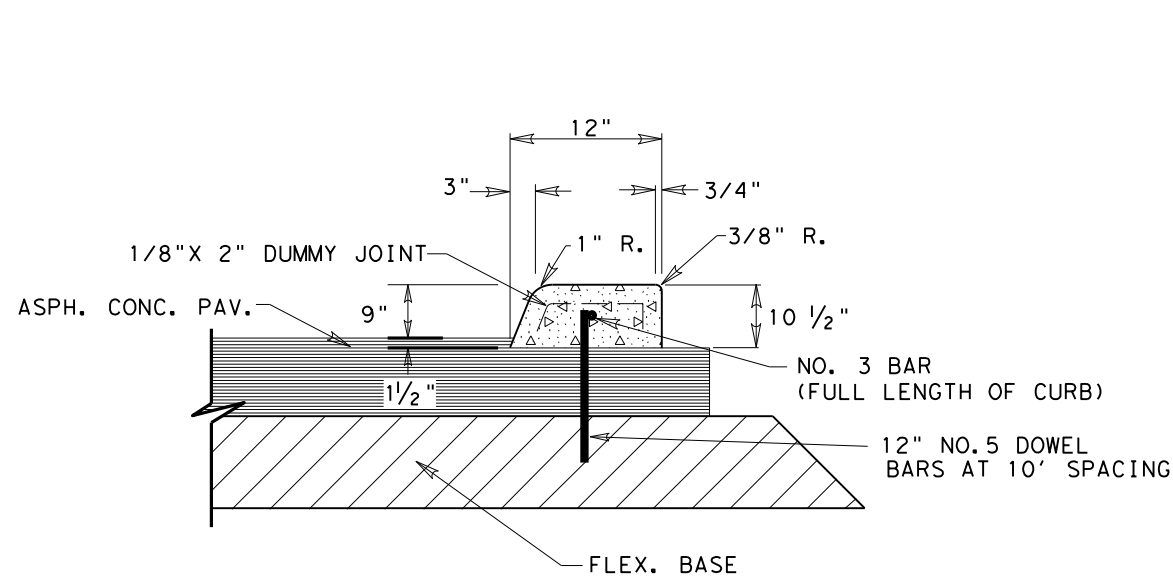
**DRIVEWAY DETAILS PUBLIC (COUNTY ROAD-CITY STREET)**

REV. 8/22 DRIVEWAY3.DGN

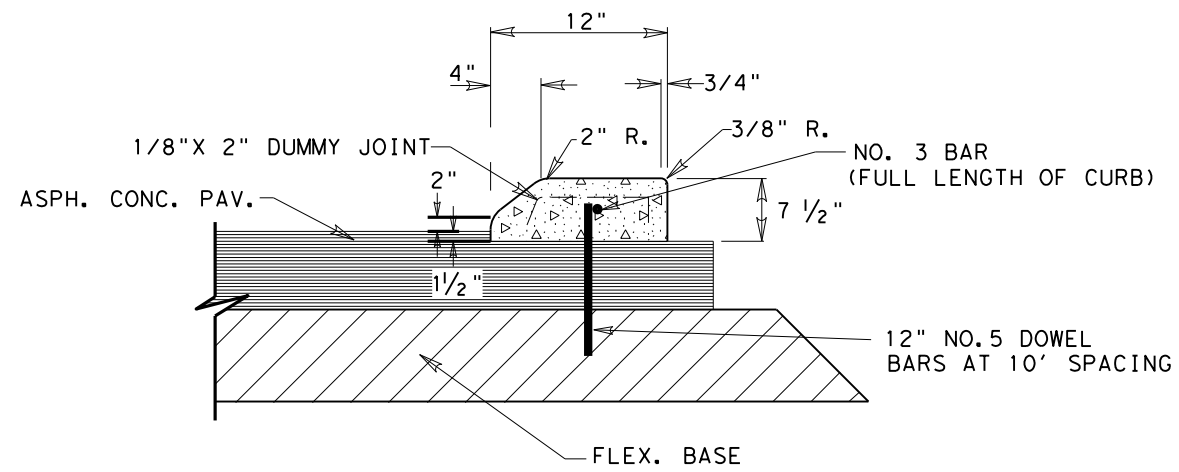
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6			174
STATE	STATE DIST. NO.	COUNTY	CONT. SECT. JOB HIGHWAY NO.
TEXAS	21	CAMERON	0220 05 080 SH 48



CONC. CURB TY "A" (BARRIER)



CONC. CURB  
TY "C" (BARRIER)



CONC. CURB TY "B" (MOUNTABLE)

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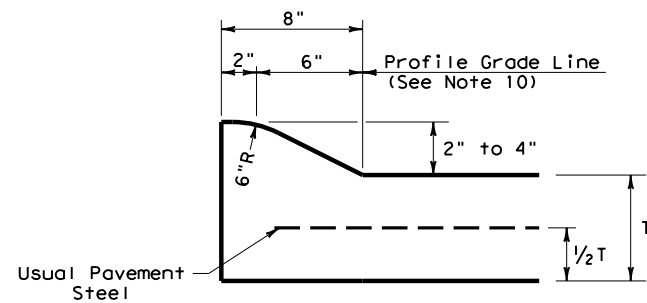
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**CONCRETE CURB**  
**DETAILS**

REV. 6/04 CURB.DGN

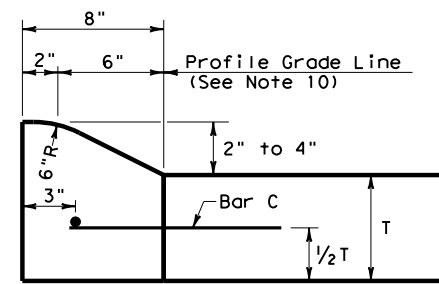
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TEXAS	21	CAMERON	0220 05 080 SH 48

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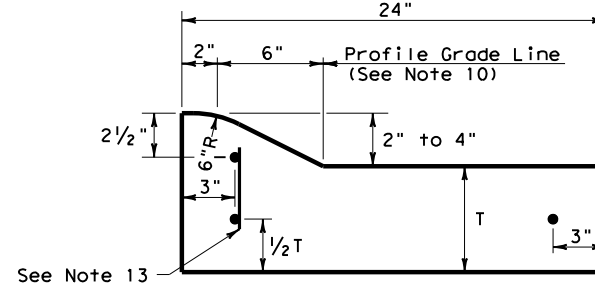
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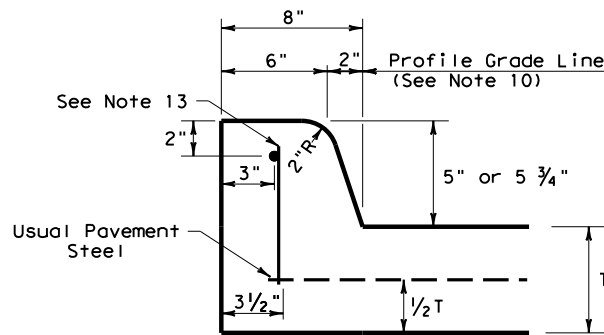
**TYPE I CURB (MONOLITHIC)  
2" - 4" HEIGHT**



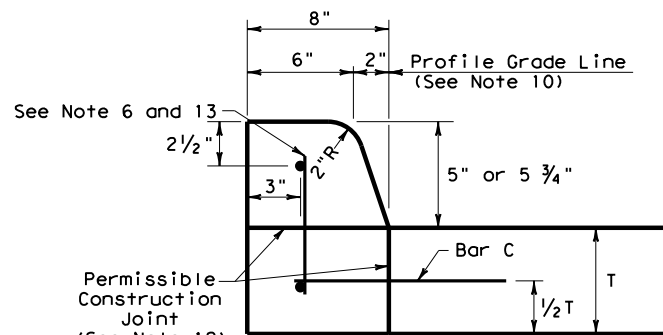
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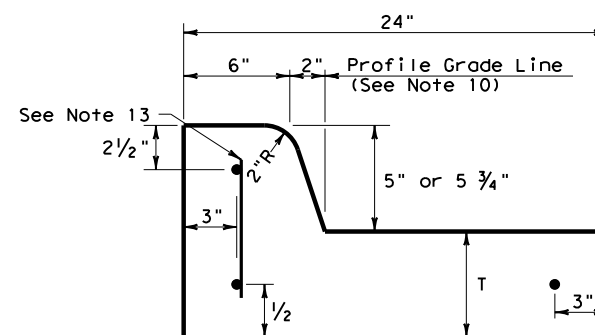
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2" - 4" HEIGHT**



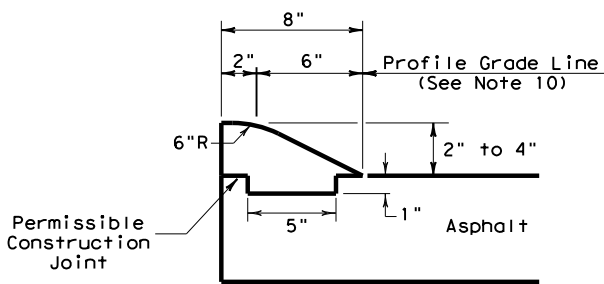
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5" - 5 3/4" HEIGHT**



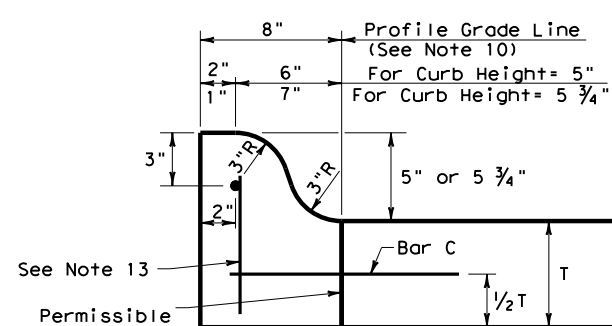
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5" - 5 3/4" HEIGHT**



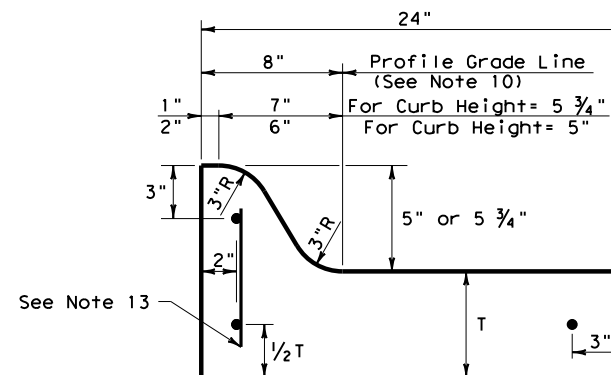
**TYPE II CURB AND GUTTER  
5" - 5 3/4" HEIGHT**



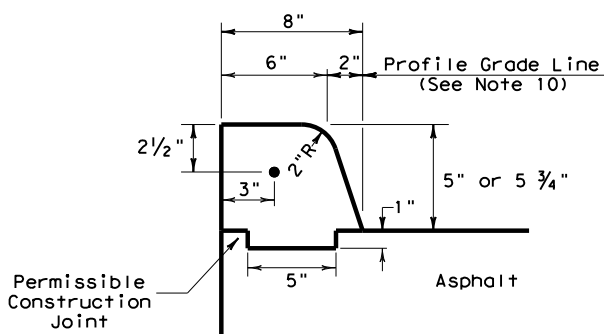
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2" - 4" HEIGHT**



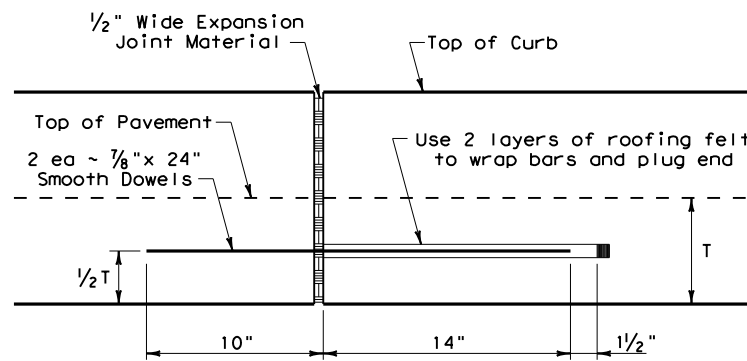
**TYPE IIa CURB  
5" - 5 3/4" HEIGHT**



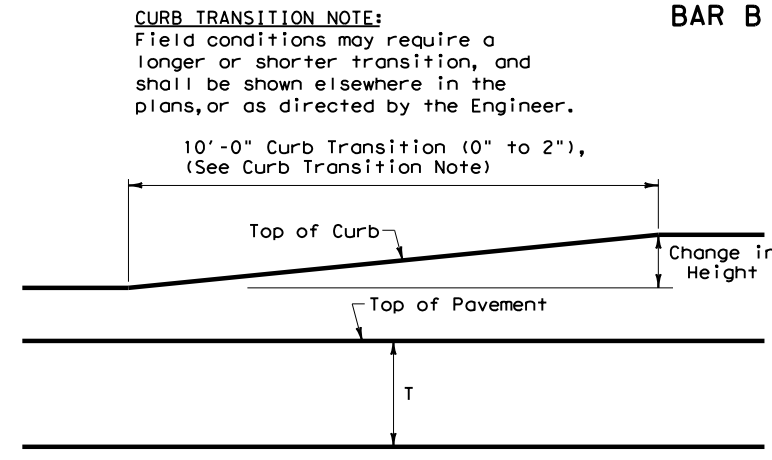
**TYPE IIa CURB AND GUTTER  
5" - 5 3/4" HEIGHT**



**TYPE IV CURB (KEYED)  
5" - 5 3/4" HEIGHT**



**EXPANSION JOINT DETAIL**

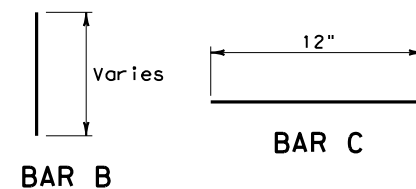


**CURB TRANSITION**

Note: To be paid for as Highest Curb

**GENERAL NOTES**

- All materials and construction shall be in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
- Concrete shall be Class A.
- When reinforcing bars are used, they shall be No.4 unless otherwise shown. The use of fiber reinforced concrete in lieu of reinforcing steel is acceptable. Use fibers meeting the requirements of DMS 4550, "Fibers for Concrete," and dose fibers in accordance with Material Producers List (MPL) "Fibers for Class A and B Concrete Applications."
- Round exposed sharp edges with a rounding tool, to a minimum radius of 1/4 inch.
- All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
- Where concrete curb is to be placed on existing concrete pavement, Bar B may be drilled and grouted in place, or may be inserted into fresh concrete.
- Expansion and contraction joints shall be constructed to match pavement joints in all curbs and curb and gutter adjacent to jointed concrete pavement. Where placement of curb or curb and gutter is not adjacent to concrete pavement, expansion joints shall be provided at structures, curb returns at streets, and at locations directed by The Engineer.
- Vertical and horizontal dowel bars and transverse reinforcing bars shall be placed at four feet C-C.
- Dimension 'T' shown is the thickness of concrete pavement. When curb is installed adjacent to flexible pavement dimension 'T' is 8" maximum.
- Usual profile grade line. Refer to typical sections and plan-profile sheets for exact locations.
- One-half inch expansion joint material shall be provided where curb or curb and gutter is adjacent to sidewalk or riprap.
- When horizontal permissible construction joints are used, the longitudinal pavement steel shall be placed in accordance with pavement details shown elsewhere in the plans. Reinforcing steel for curb section shall then conform to that required for concrete curb.
- Bar B placement as needed (typically at four ft. C-C) to support curb reinforcing steel during concrete placement.

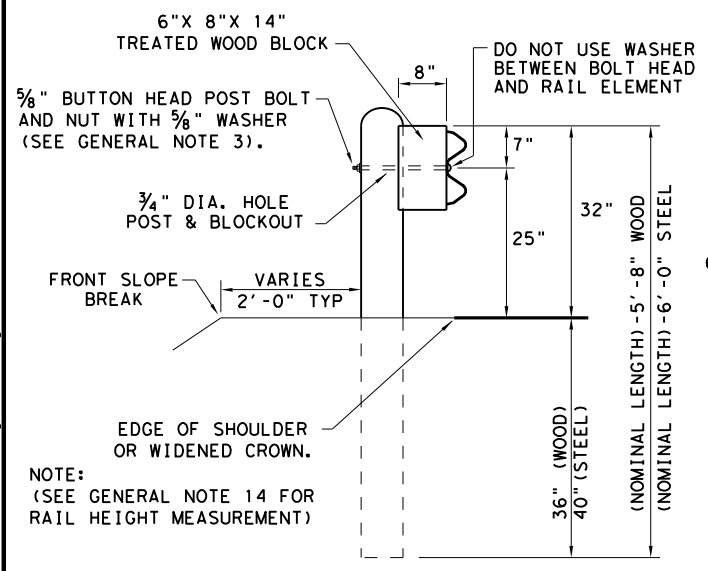


**BAR B**

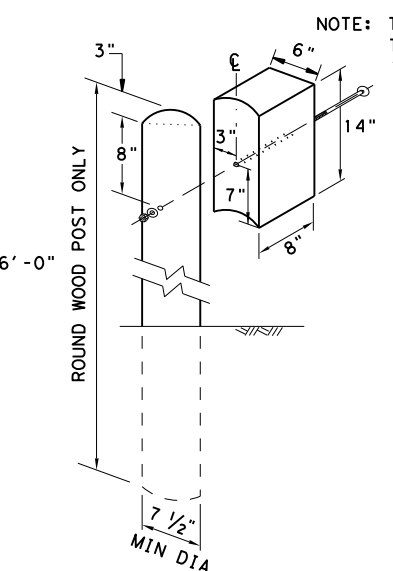
**BAR C**

				Design Division Standard	
<b>CONCRETE CURB AND GUTTER</b>					
<b>CCCG-22</b>					
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REVISIONS	0220	05	080	SH 48	
	DIST	COUNTY		SHEET NO.	
	PHR	CAMERON		176	

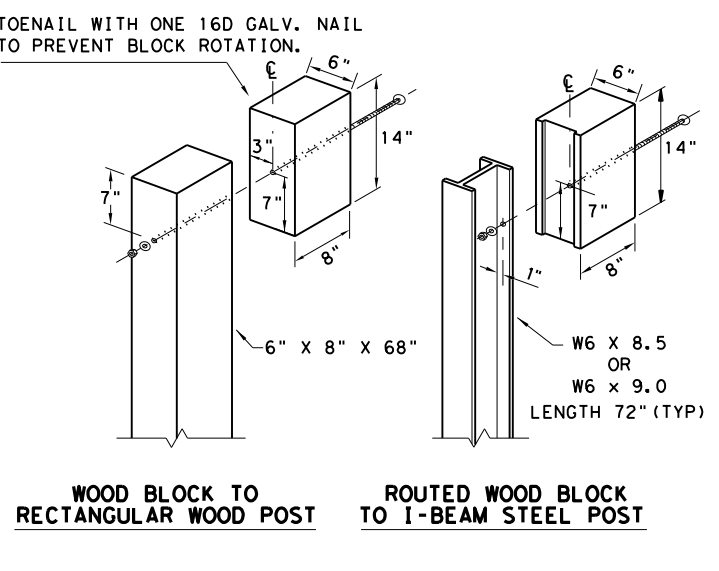
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**TYPICAL POST PLACEMENT**



**WOOD BLOCK TO ROUND WOOD POST**

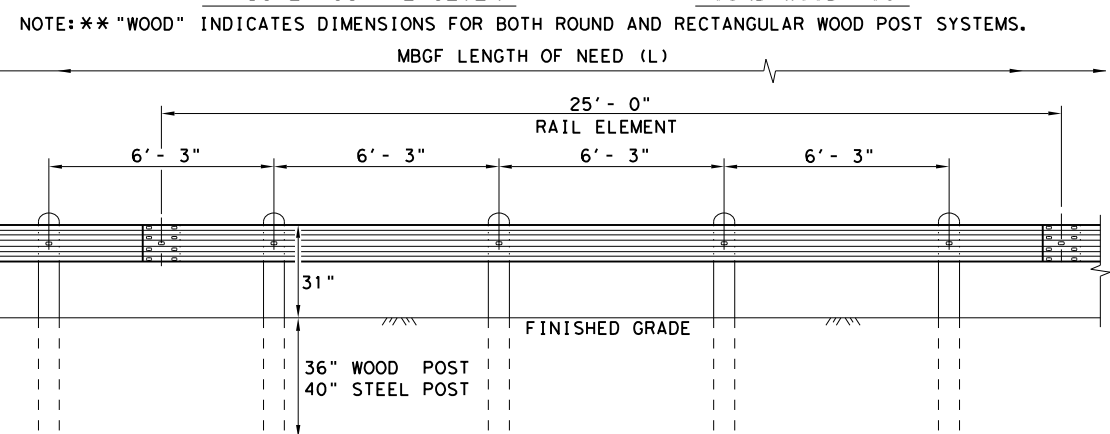


**WOOD BLOCK TO RECTANGULAR WOOD POST**

**ROUTED WOOD BLOCK TO I-BEAM STEEL POST**

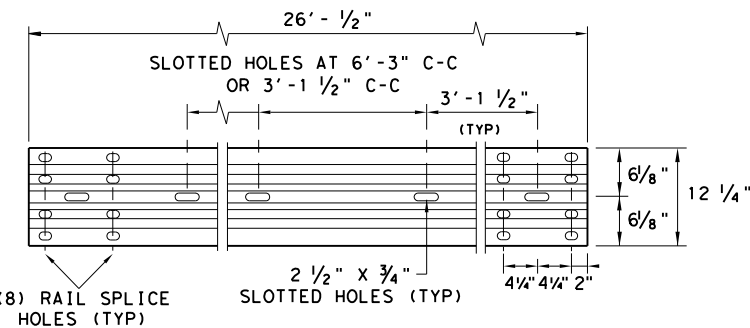
**GENERAL NOTES**

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 1/2" 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 5/8" WASHER (FWC16G) 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.



**ELEVATION MID-SPAN RAIL SPLICE**

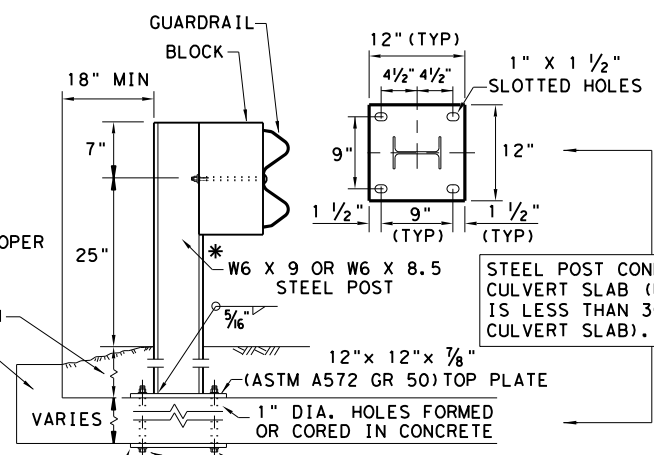
SHOWING A 25'-0" SECTION OF W-BEAM RAIL. (SEE GENERAL NOTE 2)



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

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

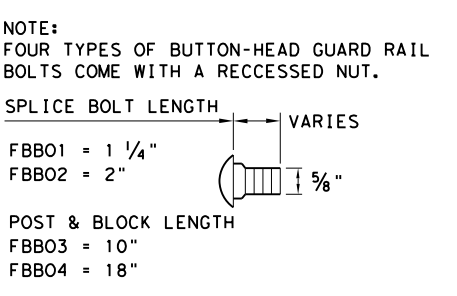
\* POST(S) MAY REQUIRE FIELD MODIFICATION TO ENSURE PROPER GUARDRAIL HEIGHT.



**LOW FILL CULVERT POST**

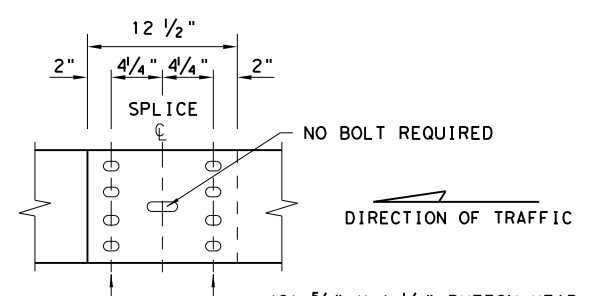
- NOTE: TWO INSTALLATION OPTIONS.
1. **BOLT-THROUGH OPTION:** REQUIRES A 6" MIN. SLAB THICKNESS. 7/8" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS. NOTE: BOLT LENGTH = SLAB PLUS 2 1/4" MIN.
  2. **EPOXY ANCHOR OPTION:** THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE 7/8" 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 1/4" MIN. BEYOND NUT.

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



**BUTTON HEAD BOLT**

NOTE: SEE GENERAL NOTE 3 FOR SPLICE & POST BOLT DETAILS.



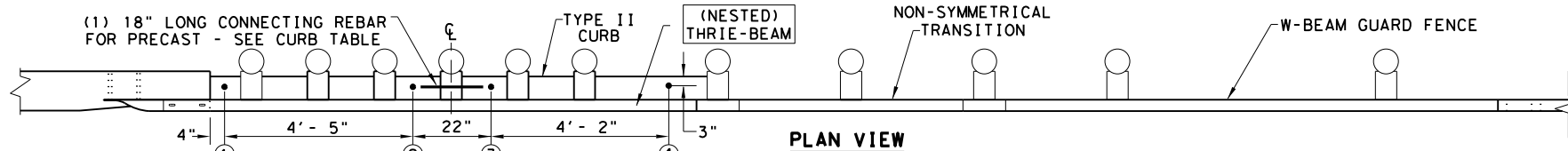
**MID-SPAN RAIL SPLICE DETAIL**

NOTE: GF(31), MID-SPAN RAIL SPLICES ARE REQUIRED WITH 6'-3" POST SPACINGS.

		<b>Design Division Standard</b>	
<b>METAL BEAM GUARD FENCE</b> <b>TL-3 MASH COMPLIANT</b> <b>GF(31)-19</b>			
FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP
© TxDOT: NOVEMBER 2019	CONT	SECT	JOB
REVISIONS	0220	05	080
DIST	COUNTY	SHEET NO.	
PHR	CAMERON	177	



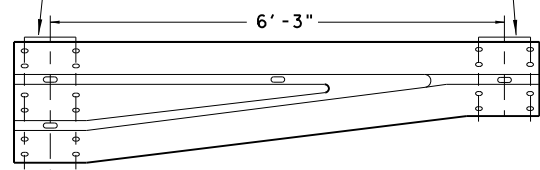
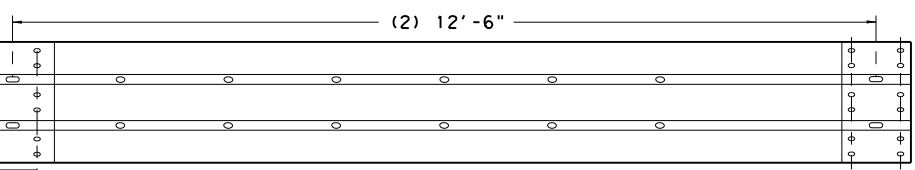
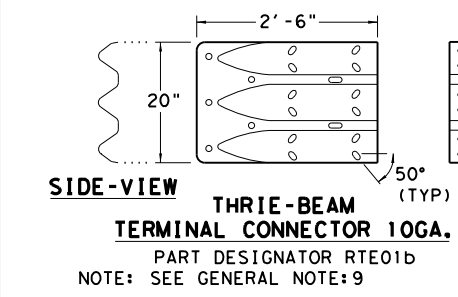
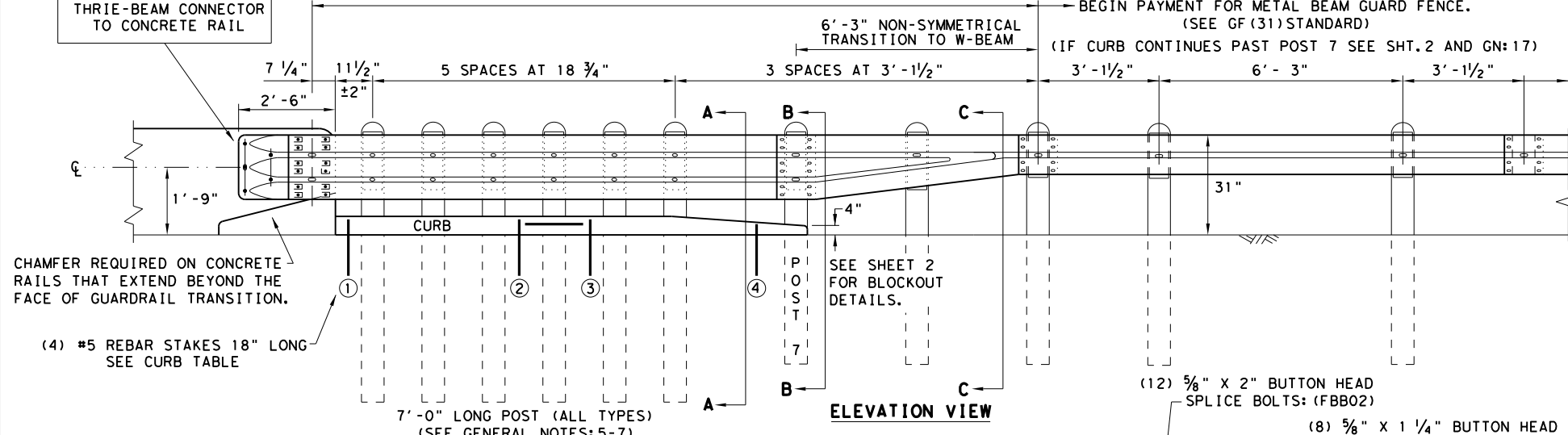
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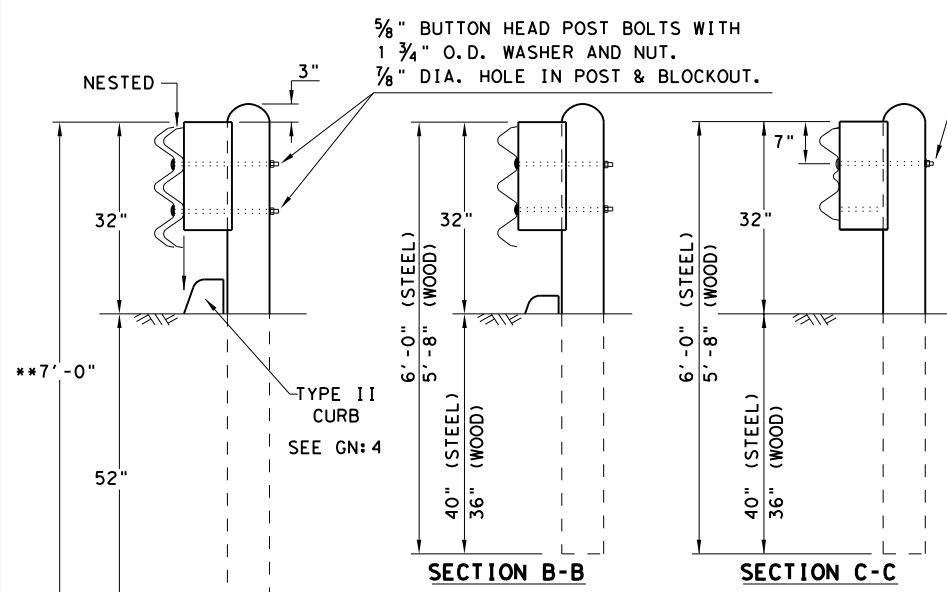
- (5) 1" DIA. HOLES.
- (5) 7/8" DIA. HEAVY HEX HEAD BOLTS (FACING TRAFFIC SIDE) (ASTM F3125 GR A325 OR A449).
- (10) 1 3/4" O.D. WASHER UNDER EACH HEX BOLT HEAD AND NUT.
- (5) 7/8" DIA. HEAVY HEX NUTS (ASTM A194 OR A563).

NOTE:  
HEAVY HEX BOLT LENGTH WILL VARY DEPENDING ON WIDTH CONCRETE RAIL, LEAVE 1" OF BOLT LENGTH PAST THE 7/8" HEX NUT. TRIM AS REQUIRED.

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

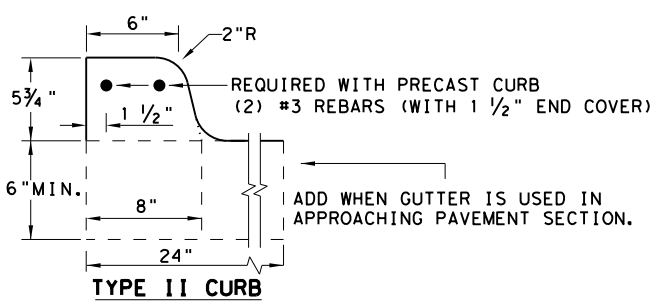


BRIDGE APPROACH - UPSTREAM: THE NESTED RAIL LAPS OVER THE TERMINAL CONNECTOR. PLATE WASHERS ARE INSTALLED UNDER THE SPLICE NUTS AGAINST INSIDE OF CONNECTOR.  
 BRIDGE EXIT - DOWNSTREAM: THE TERMINAL CONNECTOR LAPS OVER THE NESTED RAIL. PLATE WASHERS ARE INSTALLED UNDER THE BOLT HEAD AGAINST OUTSIDE OF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



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

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



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

**GENERAL NOTES**

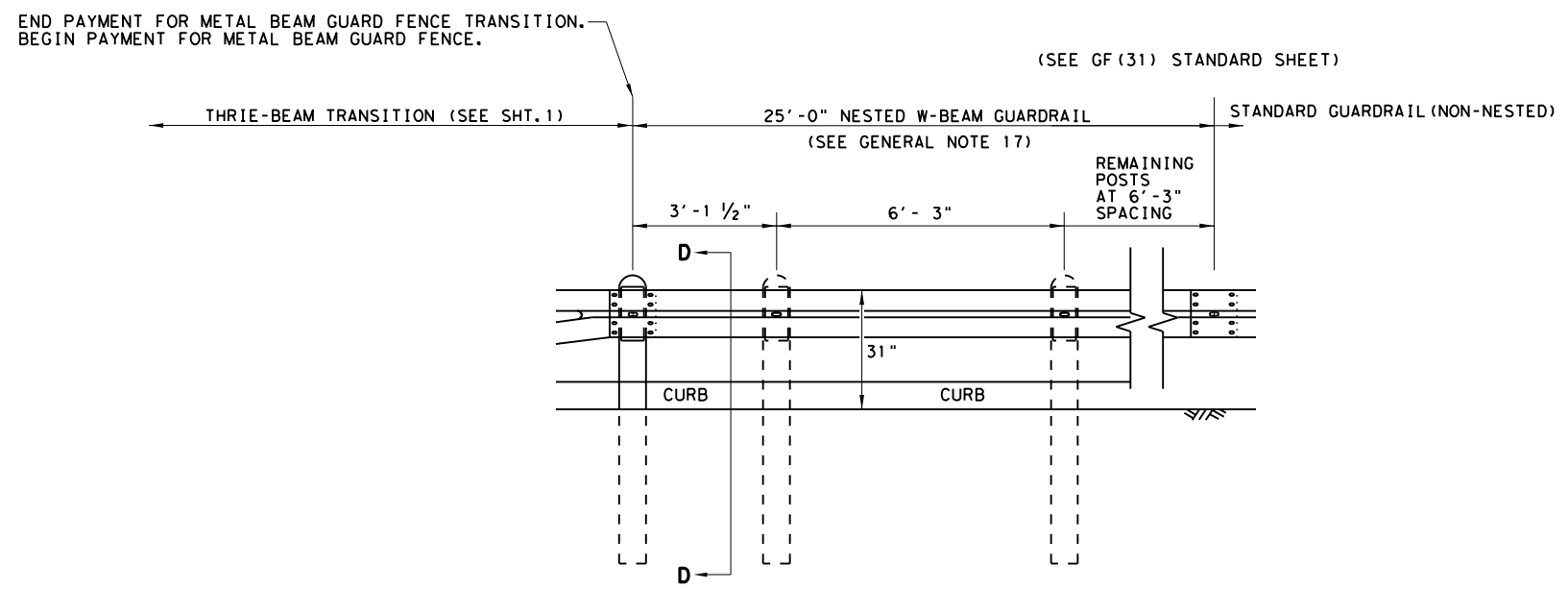
1. CONTACT THE DESIGN DIVISION FOR DRAINAGE CUT OUT OPTIONS NEEDED WITHIN THE CURB SECTION OF THE THRIE-BEAM TRANSITION. (512) 416-2678
2. CONCRETE CURB MAY BE CAST-IN-PLACE OR PRECAST AS SHOWN ON THIS SHEET. WHEN USED IN CONJUNCTION WITH THE THRIE-BEAM TRANSITIONS, CURB SHALL BE TYPE II (5- 3/4" HEIGHT); SEE CURRENT CCGG STANDARD SHEET FOR FURTHER DETAILS. IF OTHER CURB HEIGHTS ARE SHOWN IN THE PLANS IN CONJUNCTION WITH THE TRANSITION, THE CURB HEIGHT MAY BE FROM 4" TO 8" WITH A RELATIVELY VERTICAL FACE. CONCRETE CURB SHALL BE CONTINUOUS TO THE SEVENTH POST UNLESS OTHERWISE SHOWN IN THE PLANS. SEE GENERAL NOTE:17 FOR CIRCUMSTANCES WHERE CURB CONTINUES PAST POST 7.
3. CONCRETE CURB TYPE II SUBSIDIARY TO "METAL BEAM GUARD FENCE TRANSITION". IF NO ADDITIONAL CURB IS INDICATED BEYOND THE TRANSITION, THEN ANY CURB HEIGHT GREATER THAN 4" WILL BE TAPERED DOWN BEGINNING AT THE LAST 7 FT. POST TO A MAXIMUM HEIGHT OF 4" AT POST 7. IF SHOWN ELSEWHERE IN THE PLANS, ADDITIONAL CURB UNDERNEATH GUARDRAIL WILL BE PAID FOR BY THE LINEAR FOOT.
4. UNLESS OTHERWISE SHOWN IN THE PLANS, TRANSITIONS SHALL BE PLACED WITH THE BLOCKOUT FACE IN FRONT OF OR DIRECTLY ABOVE THE CURB FACE. SEE SECTION A-A.
5. FOR ROUND WOOD POST SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 1/2" DIA. MINIMUM THROUGHOUT THE THRIE-BEAM TRANSITION.
6. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. REFER TO GF (31) STANDARD SHEET.
7. THE POST LENGTH SHALL BE MARKED ON ALL 7'- 0" LONG POSTS BY THE MANUFACTURER. THE MARK SHALL BE LOCATED WITHIN THE TOP 1 FT. REGION OF THE POST, AT LEAST 5/8" IN HEIGHT, AND VISIBLE AFTER INSTALLATION. WOODEN POSTS SHALL BE MARKED WITH A BRAND, AND STEEL POSTS WITH A STENCIL BEFORE GALVANIZING.
8. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
9. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED ON THE PLANS. THE THRIE-BEAM TERMINAL CONNECTOR AND THE THRIE-BEAM TRANSITION TO W-BEAM SHALL BE OF THE SAME MATERIAL, BUT SHALL NOT BE LESS THAN 10 GAUGE. CONTRACTOR SHALL VERIFY THAT THE LOCATIONS OF BOLT HOLES MATCH THOSE IN THE THRIE-BEAM TERMINAL CONNECTOR PRIOR TO ORDERING MATERIALS.
10. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND 5/8" WASHER (FWC16G) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
11. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
12. CROWN SHALL BE WIDENED TO ACCOMMODATE TRANSITIONS.
13. WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
14. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. TXDOT'S MATERIALS AND TESTS DIVISION MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210. ONLY PRODUCERS ON THE MPL CAN FURNISH COMPOSITE MATERIAL BLOCKS.
15. REFER TO GF (31) STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
16. THE INSTALLATION OF THE TYPE II CURB IS CRITICAL FOR THE PERFORMANCE OF THE THRIE-BEAM TRANSITION SYSTEM. THE CURB PREVENTS (VEHICLE WHEEL SNAGGING) AT THE CONCRETE RAIL AND IS REQUIRED TO MEET MASH CRASH TEST CRITERIA.
17. IF CURB EXTENDS BEYOND POST 7, 25' OF NESTED W-BEAM GUARDRAIL SHALL BE INSTALLED BEYOND THE PAY LIMITS OF THRIE-BEAM TRANSITION SECTION, (SEE SHT.2). PAYMENT FOR THIS 25' SECTION WILL BE BY LINEAR FOOT, PAY ITEM "0540 6XXX MTL W-BEAM GD FEN (NESTED) (TIM POST)" OR "540 6XXX MTL W-BEAM GD FEN (NESTED) (STEEL POST)" AS APPLICABLE FOR POST TYPE. SEE SHT.2 FOR ADDITIONAL INFORMATION.

**HIGH-SPEED TRANSITION**  
**SHEET 1 OF 2**

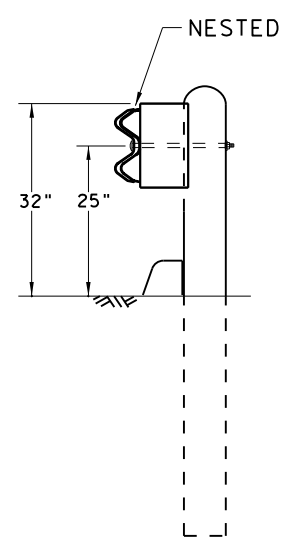
		Design Division Standard
<b>METAL BEAM GUARD FENCE</b> <b>THRIE-BEAM TRANSITION</b> <b>TL-3 MASH COMPLIANT</b> <b>GF (31) TR TL3-20</b>		
FILE: gf31tr+1320.dgn	DN: TxDOT	CK: KM
© TXDOT: NOVEMBER 2020	CONT: 0220	SECT: 05
REVISIONS	JOB: 080	SH: 48
DIST: PHR	COUNTY: CAMERON	SHEET NO.: 178

DATE: 2/24/2023  
 FILE: \\txdot.projectwiseonline.com:txdot5\Documents\21 - PHR\Design Projects\022005080\4 - Design\Plan Set\3. Roadway\4. Standard\07\_gf31trt1320.dgn  
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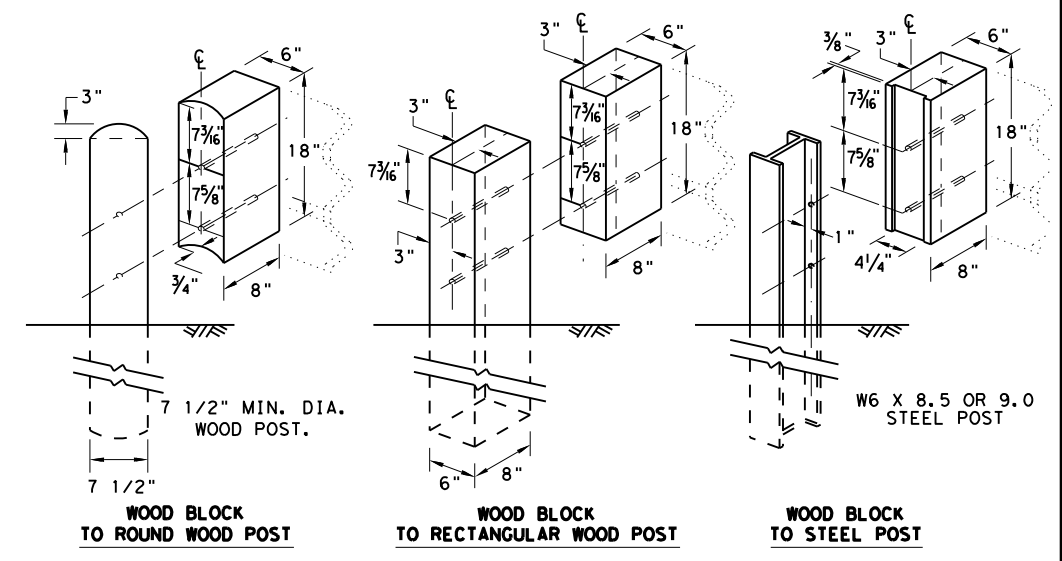
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



ELEVATION VIEW



SECTION D-D



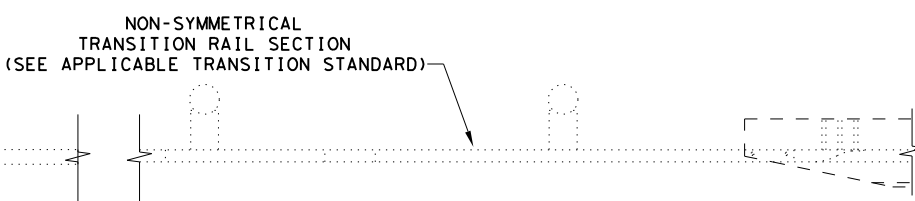
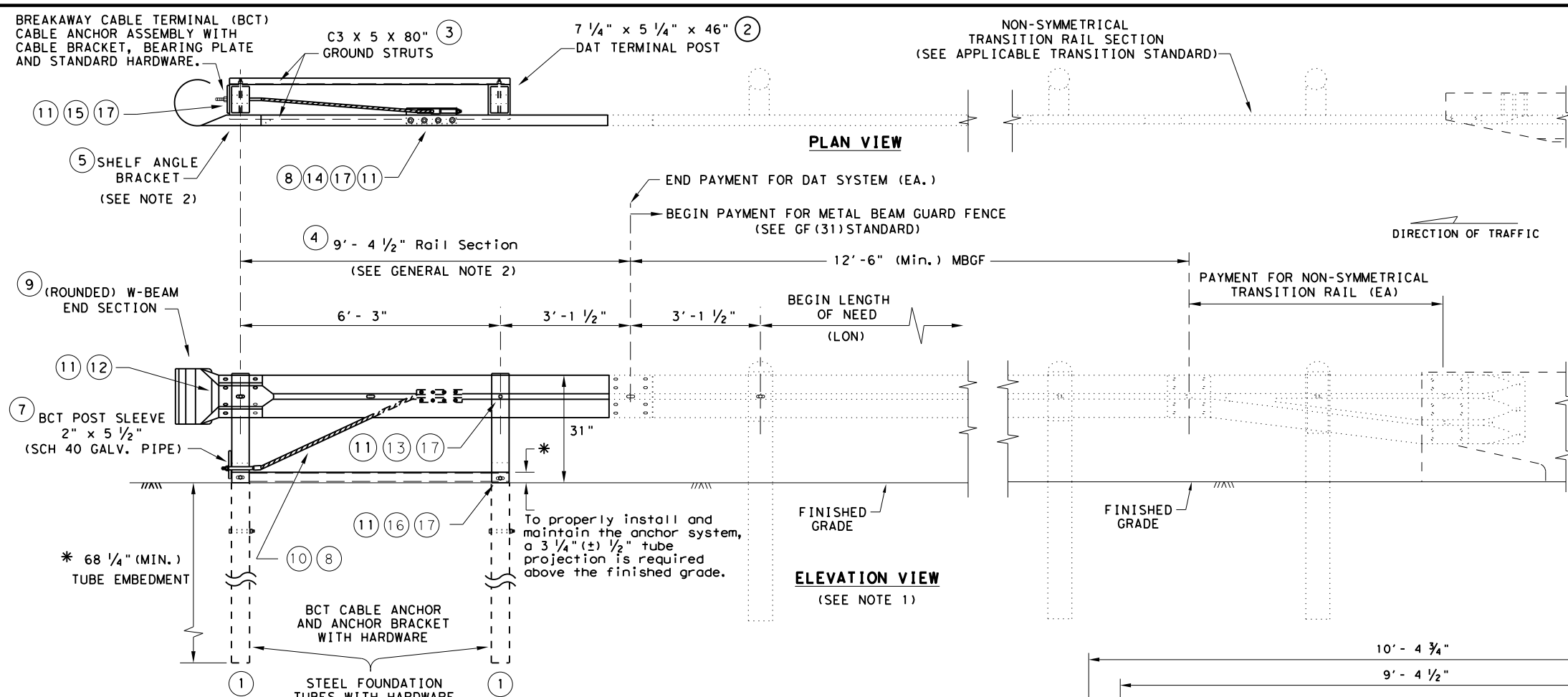
THREE BEAM TRANSITION BLOCKOUT DETAILS

HIGH-SPEED TRANSITION

SHEET 2 OF 2

		Design Division Standard	
<b>METAL BEAM GUARD FENCE THREE-BEAM TRANSITION TL-3 MASH COMPLIANT</b>			
<b>GF (31) TR TL3-20</b>			
FILE: gf31trt1320.dgn	DN: TXDOT	CK: KM	DW: KM
©TXDOT: NOVEMBER 2020	CONT	SECT	JOB
REVISIONS		0220	05
		080	SH 48
DIST	COUNTY	SHEET NO.	
PHR	CAMERON	179	

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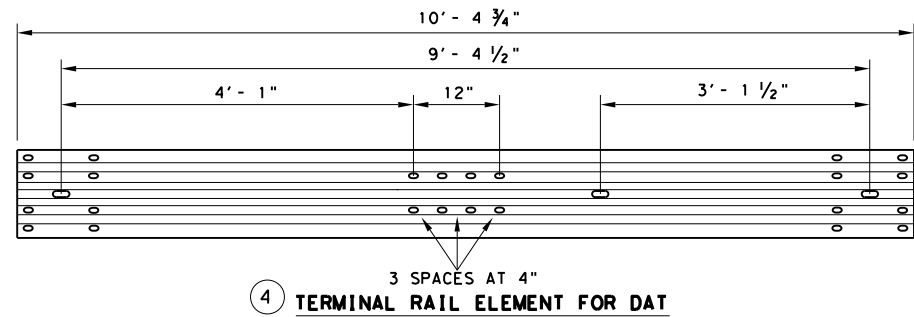


- GENERAL NOTES**
1. THE DETAIL SHOWN IS THE MINIMUM LENGTH OF NEED (LON) FOR A DOWNSTREAM ANCHOR TERMINAL (DAT) CONNECTED TO A CONCRETE RAIL.
  2. THE RAIL SECTION AT THE END POST IS SUPPORTED BY THE SHELF ANGLE BRACKET. THE RAIL ELEMENT IS NOT ATTACHED TO THE END POST.
  3. THE FOUNDATION TUBES SHALL 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.

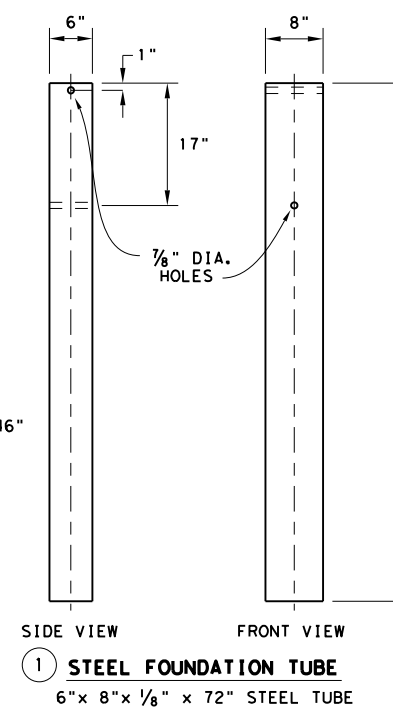
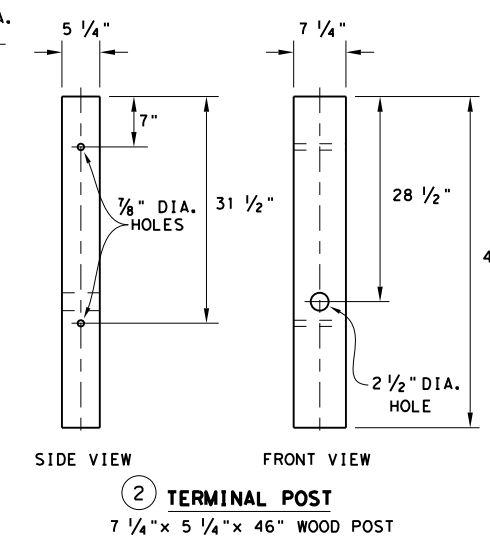
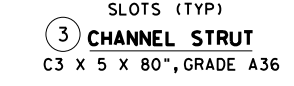
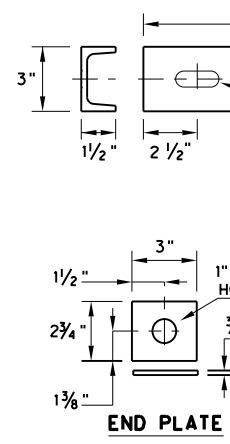
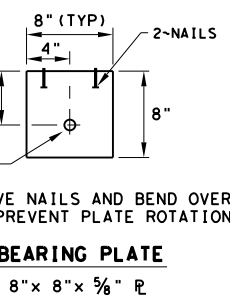
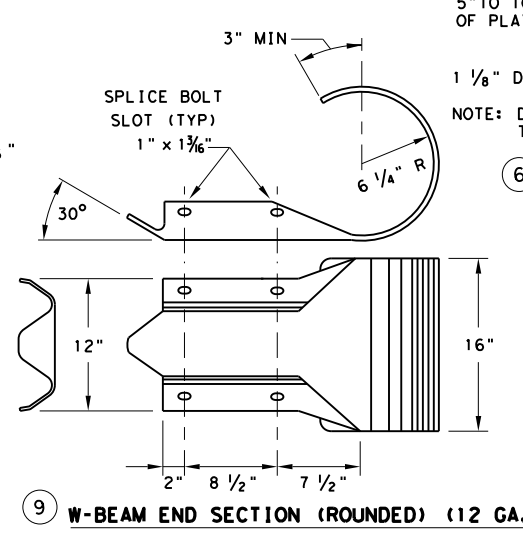
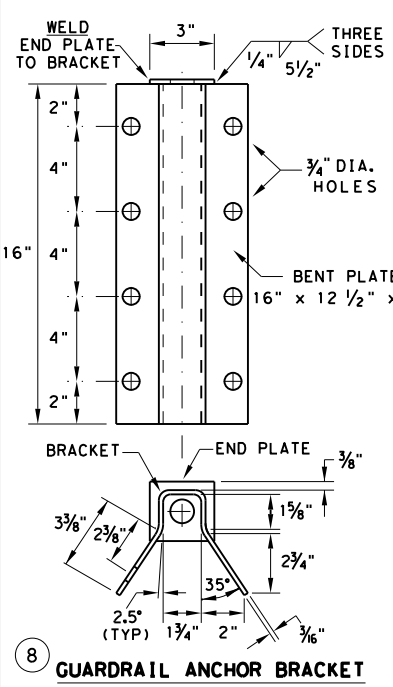
**MOW STRIP INSTALLATION**  
 IF A MOW STRIP IS REQUIRED WITH THE DAT INSTALLATION THE LEAVE-OUT AREA AROUND THE STEEL FOUNDATION TUBES AND THE TWO CHANNEL STRUTS MAY BE OMITTED. THIS WILL REQUIRE A FULL POUR AT THE FOUNDATION TUBES.

**DOWNSTREAM ANCHOR TERMINAL (DAT)**

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



#	(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

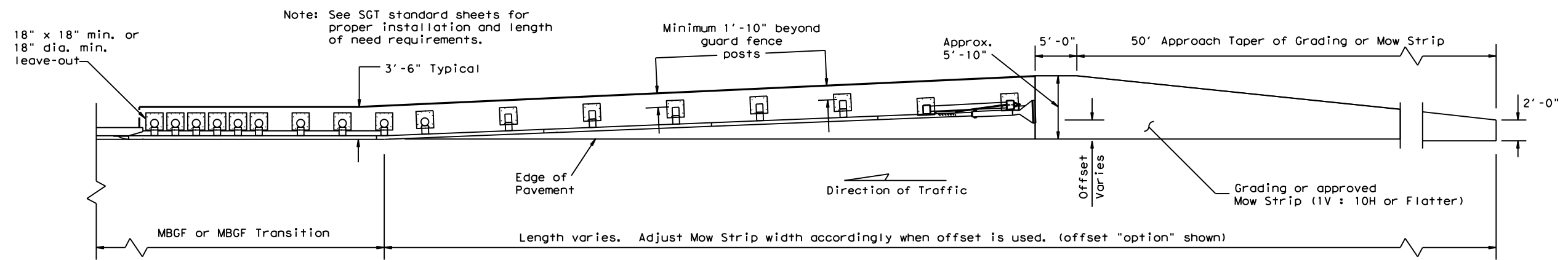


Design Division Standard

**METAL BEAM GUARD FENCE  
 (DOWNSTREAM ANCHOR TERMINAL)  
 TL-3 MASH COMPLIANT  
 GF(31)DAT-19**

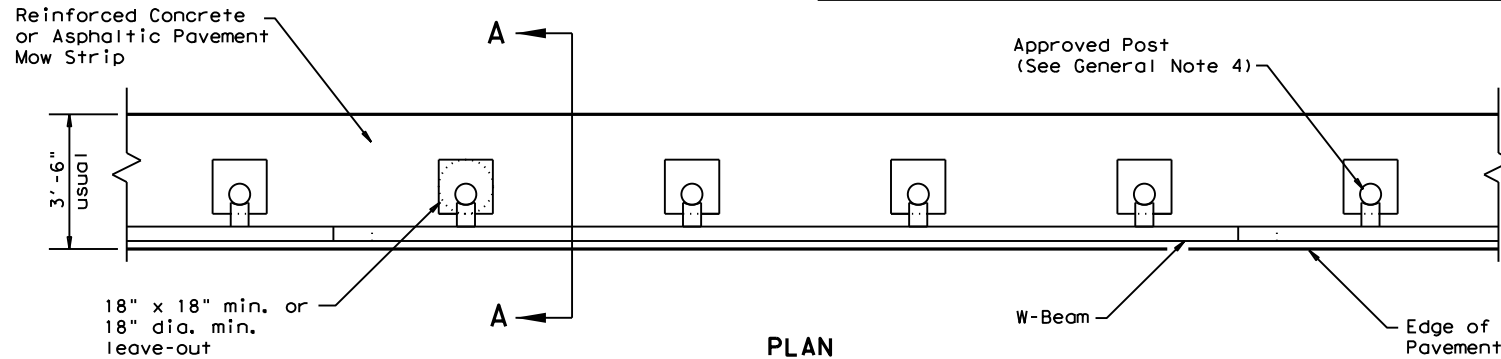
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© TXDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0220	05	080	SH 48
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	PHR	CAMERON	180	

DATE: 2/24/2023  
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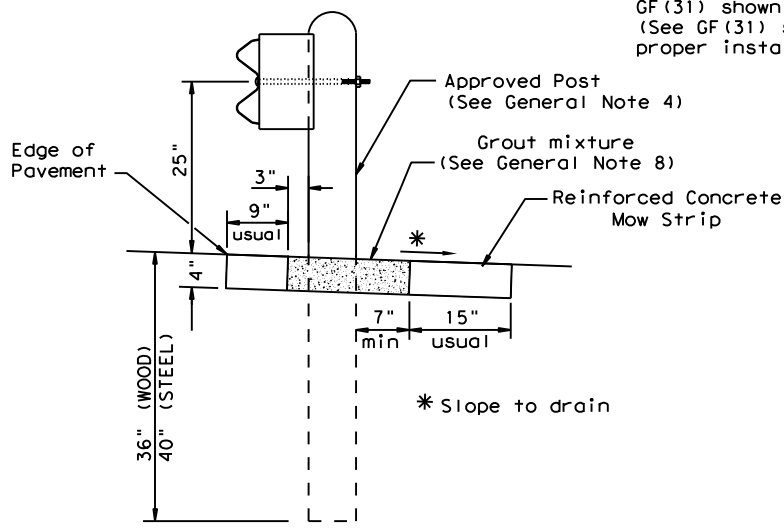
**GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS**

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.



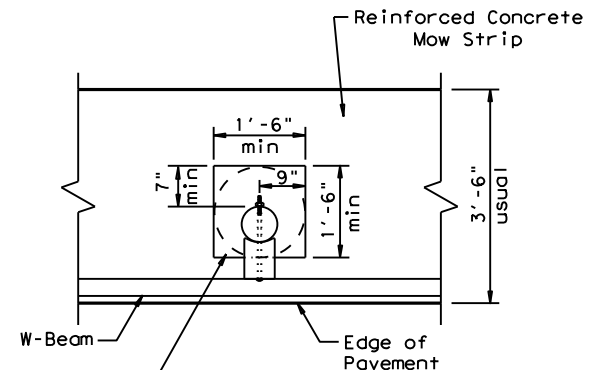
**PLAN**

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



**SECTION A-A**

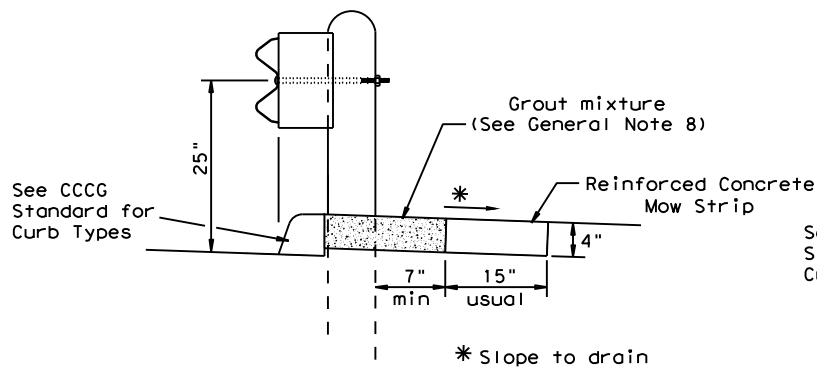
Typical



**MOW STRIP DETAIL**

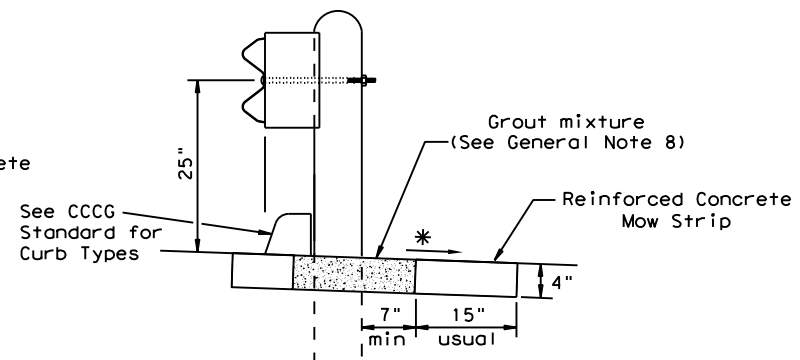
Reinforced Concrete Mow Strip with 18" x 18" Square or 18" Dia. minimum leave-out.

- 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 1/2" 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 I 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.



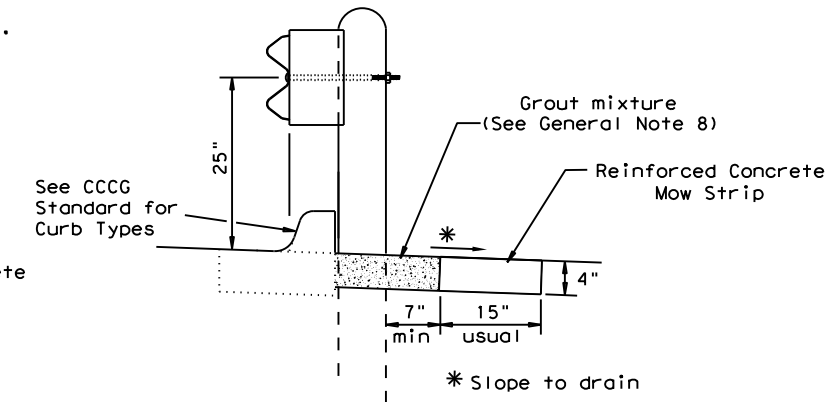
**CURB OPTION (1)**

This option will increase the post embedment throughout the system.



**CURB OPTION (2)**

Curb shown on top of mow strip

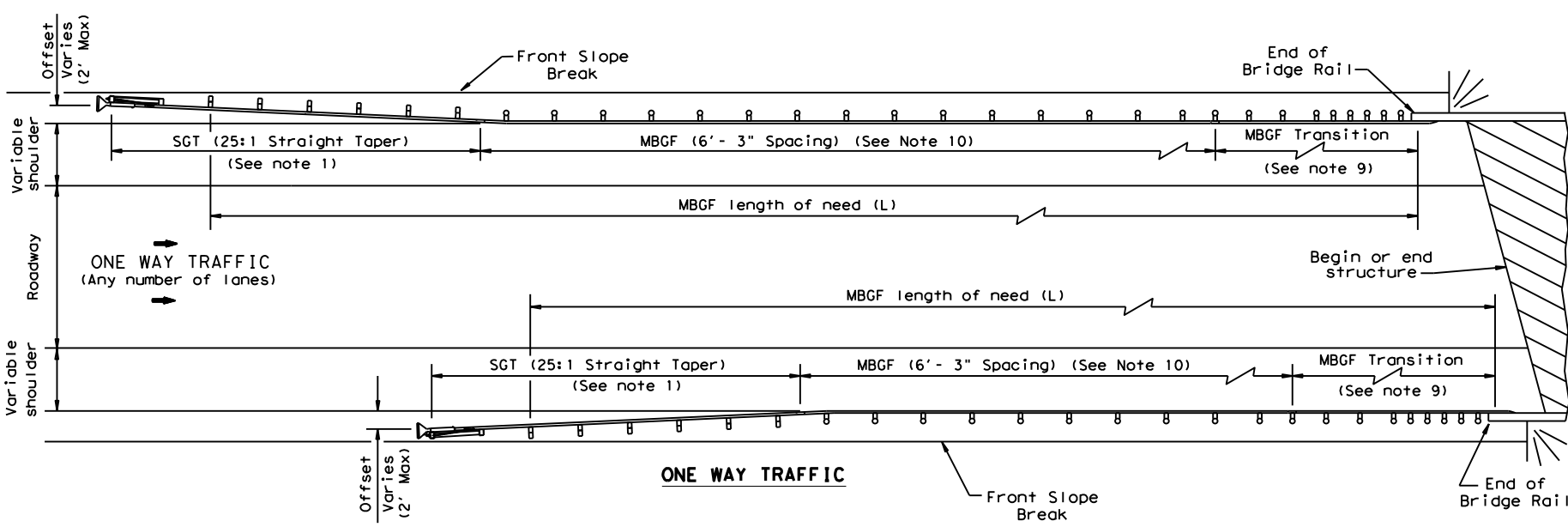
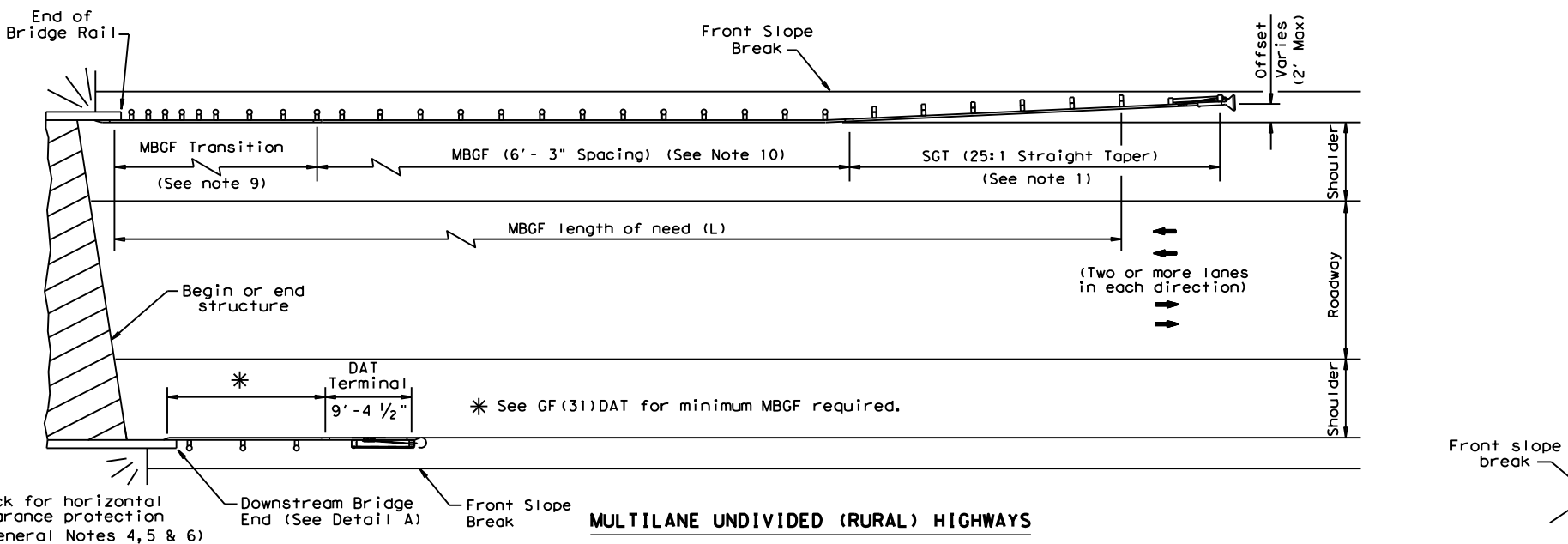
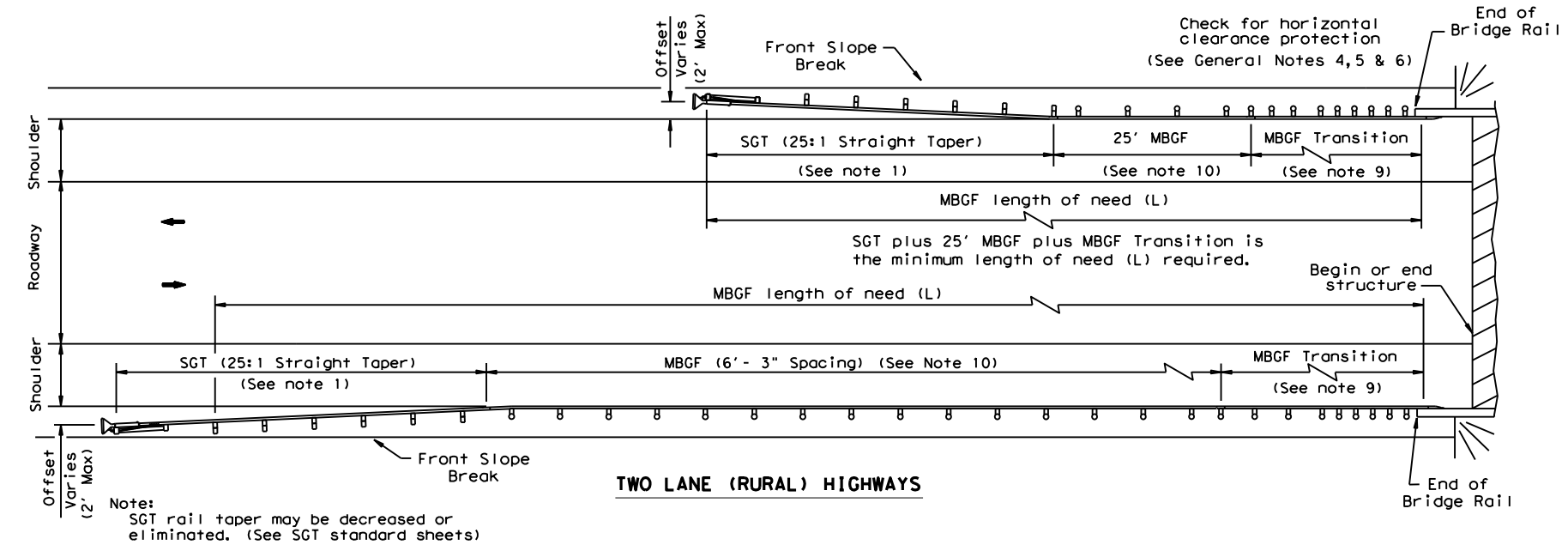


**CURB OPTION (3)**

		Design Division Standard	
<b>METAL BEAM GUARD FENCE (MOW STRIP)</b> <b>TL-3 MASH COMPLIANT</b> <b>GF(31)MS-19</b>			
FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: VP
© TxDOT: NOVEMBER 2019	CONT	SECT	JOB
REVISIONS	0220	05	080
DIST	COUNTY	SHEET NO.	
PHR	CAMERON	181	

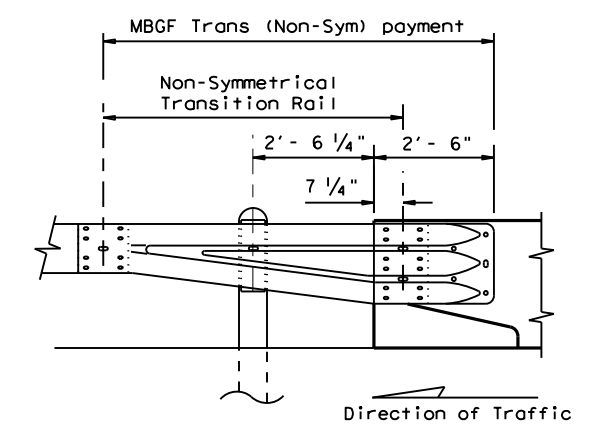
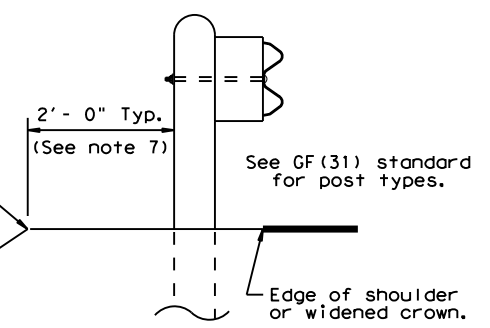
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**GENERAL NOTES**

1. For more detail: See GF(31), SGT( )31, GF(31)TR, and GF(31)TL2 standard sheets.
2. Quantities of metal beam guard fence (MBGF) at individual bridge ends are as shown in the plans.
3. Use average daily traffic (ADT) for the current year to determine MBGF length of need in accordance with the Roadway Design Manual unless otherwise specified. Where significant traffic volume growth is anticipated on low volume (0-750 ADT) highways, use length determinations for the higher volume category.
4. MBGF may not be required to shield departure end of bridge unless other obstacles within the horizontal clearance limits or opposing traffic indicate a MBGF consideration.
5. Downstream anchor terminals (DAT) are only for downstream end anchorage use, outside the horizontal clearance area of opposing traffic.
6. Direct connection of MBGF to concrete rails are only for downstream rail connections outside the horizontal clearance area of opposing traffic. (This requires a minimum of three standard line posts plus the DAT terminal, See Detail A)
7. The crown shall be widened to accommodate MBGF. Typically the "front slope" break should be 2'-0" from the back of the MBGF post. This applies to new construction on new alignment or where existing roadway cross section is to be widened to increase roadway width. This does not apply to rehabilitation work where existing roadway crown width is to be retained (See Typical Cross Section at MBGF).
8. For restrictive bridge widths: The MBGF should be properly transitioned from the existing bridge rail to the adjoining MBGF (See MBGF Transition Standards). Metal beam guard fence at these bridge locations shall be flared at the rate of 25:1 or flatter, and be of the length necessary to locate the terminal end at the 2 ft. "maximum" offset from the shoulder edge in the approach direction.
9. Transition length and post spacing will vary depending on the transition type. Transition type will be shown elsewhere in the plans.
10. A minimum 25' length of MBGF will be required.



Note: All rail elements shall be lapped in the direction of adjacent traffic.

Texas Department of Transportation  
 Design Division Standard

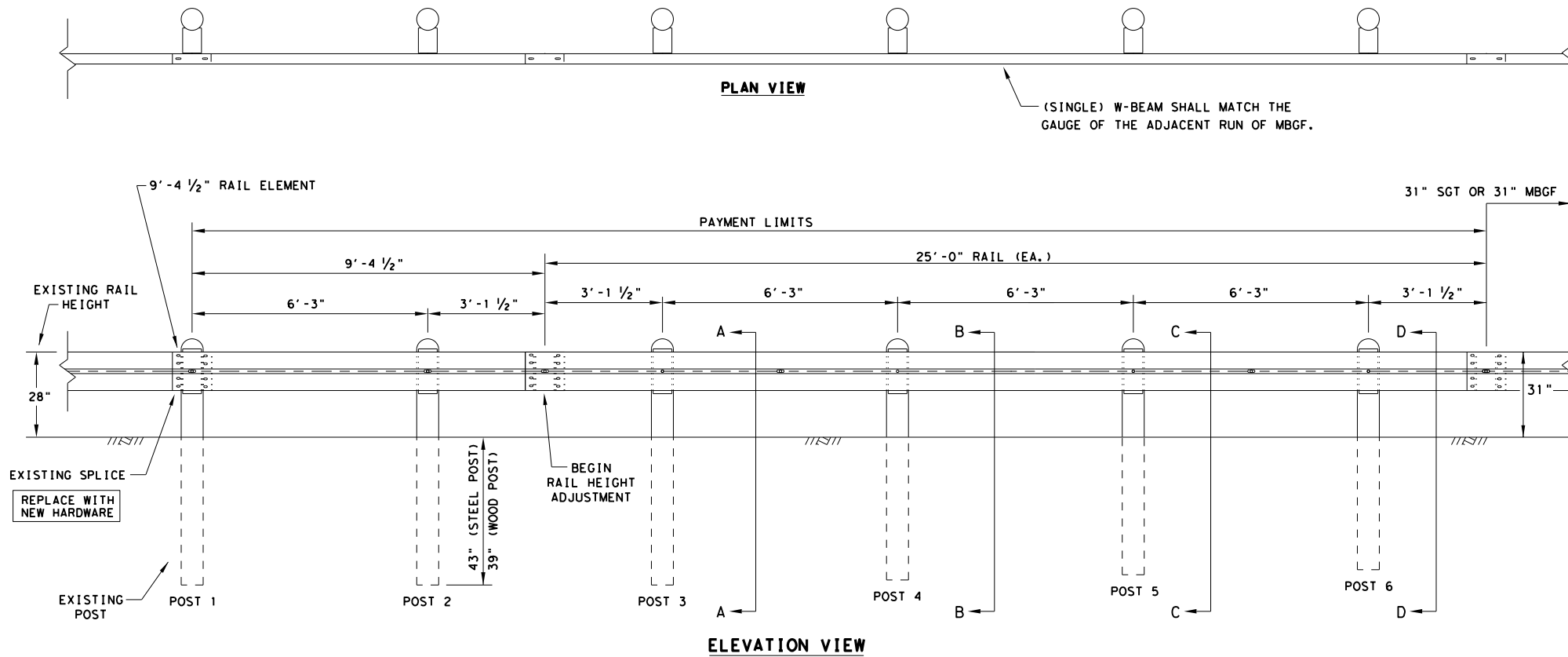
**BRIDGE END DETAILS**  
 (METAL BEAM GUARD FENCE APPLICATIONS TO RIGID RAILS)

**BED-14**

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© TxDOT: December 2011	CONT	SECT	JOB	HIGHWAY
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REVISED APRIL 2014 SEE (MEMO 0414)	DIST	COUNTY	SHEET NO.	
PHR	CAMERON	182		

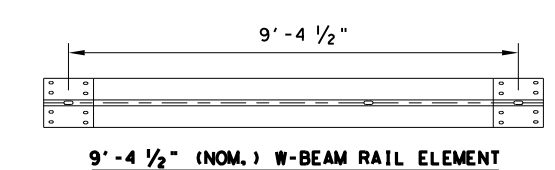
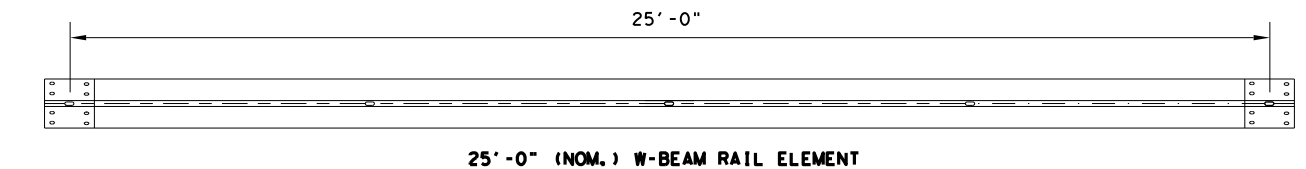
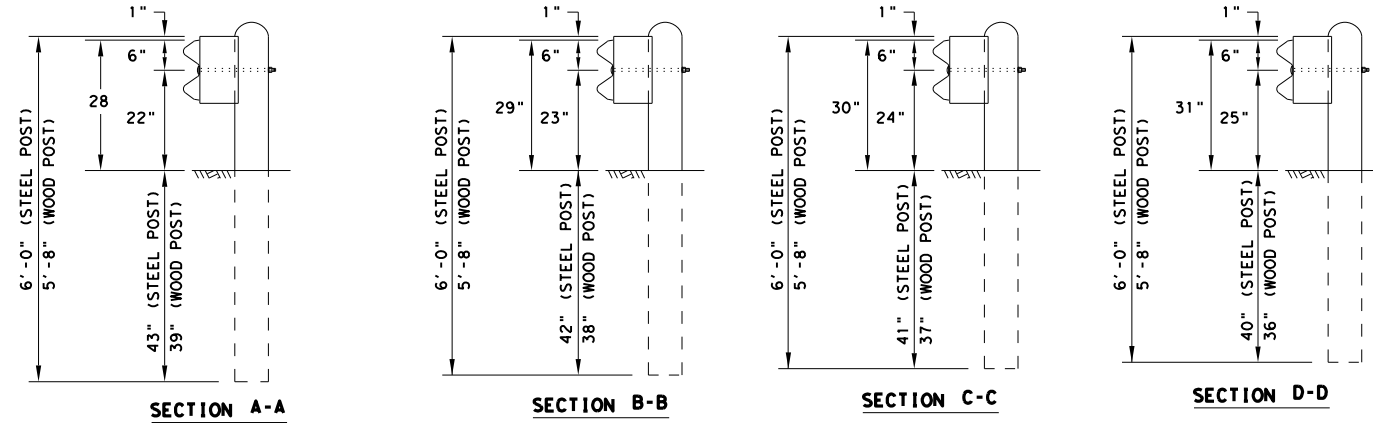
**GENERAL NOTES**

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 AS SHOWN 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 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 1/2" C-C OR 6'-3" C-C. A SPECIAL LENGTH OF RAIL MAY BE MANUFACTURED TO ACCOMMODATE THE TRANSITION SECTIONS OF GUARDRAIL.
3. BUTTON HEAD "POST" BOLTS (ASTM A307) SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT (ASTM A563) AND 3/8" ROUND WASHER (ASTM F436) AND NOT MORE THAN 1" BEYOND IT. BUTTON HEAD "SPLICE" BOLTS (ASTM A307) ARE 5/8" X 1-1/4" WITH 3/8" NUTS (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 REQUIRING CONSTRUCTION OF THE TRANSITION.
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. APPLICATIONS IN SOLID ROCK ARE ONLY ALLOWED WITH STEEL POSTS. SEE GF(31) STANDARD FOR INSTALLATION GUIDANCE.
9. POSTS SHALL NOT BE SET IN CONCRETE.
10. 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.
11. REFER TO STANDARD GF(31) FOR ADDITIONAL DETAILS.
12. RAIL HEIGHT ADJUSTMENT IS ASSESSED AT TL-3 MASH COMPLIANT FOR STEEL POST HEIGHT TRANSITION TO 28" STEEL POST GUARDRAIL.



**ELEVATION VIEW**

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

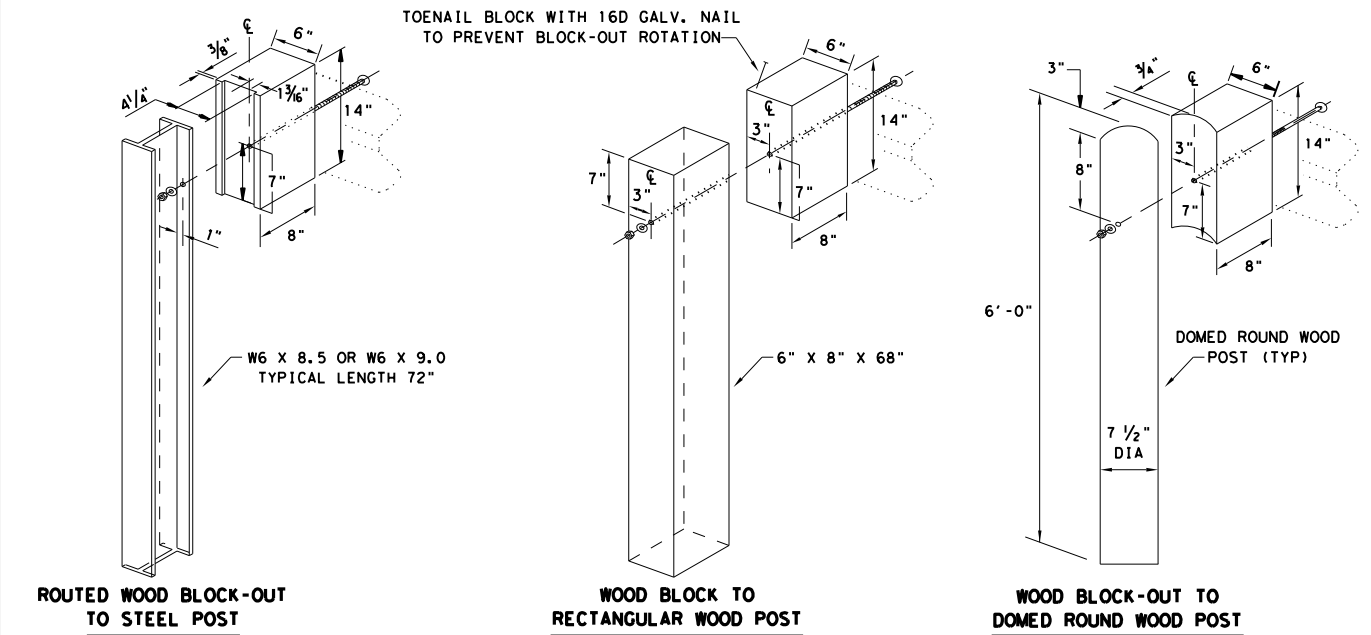


HARDWARE LIST	
QTY	DESCRIPTION
1	9'-4 1/2" W-BEAM RAIL ELEMENT 12GA.
1	25'-0" W-BEAM RAIL ELEMENT 12GA. (TYP)
6	7 1/2" DIA X 6'-0" DOMED ROUND WOOD POSTS (TYP)
6	6" X 8" X 68" RECTANGULAR WOOD POSTS (TYP)
6	W6 X 8.5 OR W6 X 9 X 72" STEEL POSTS (TYP)
6	6" X 8" X 14" WOOD BLOCKS OR COMPOSITE (TYP)
6	5/8" X 18" GUARDRAIL BOLTS WITH NUTS (FBB04)
6	5/8" ROUND WASHERS (ASTM F436) (FWC16a)
6	5/8" X 10" GUARDRAIL BOLTS WITH NUTS (FBB03)
24	5/8" X 1-1/4" GUARDRAIL SPLICE BOLTS WITH DOUBLE RECESSED NUTS (ASTM A563) (FBB01)

POST AND BLOCK-OUT TYPES AVAILABLE

FOR WOOD POST

FOR STEEL POST



NOTE: HARDWARE SHALL MEET THE FOLLOWING REQUIREMENTS.

GUARDRAIL POST BOLTS (ASTM A307 GR. A)  
 GUARDRAIL ROUND WASHERS (ASTM F436)  
 GUARDRAIL DOUBLE RECESSED NUTS (ASTM A563)  
 GUARDRAIL SPLICE BOLTS (ASTM A307 GR. A)  
 GUARDRAIL SPLICE NUTS (ASTM A563)

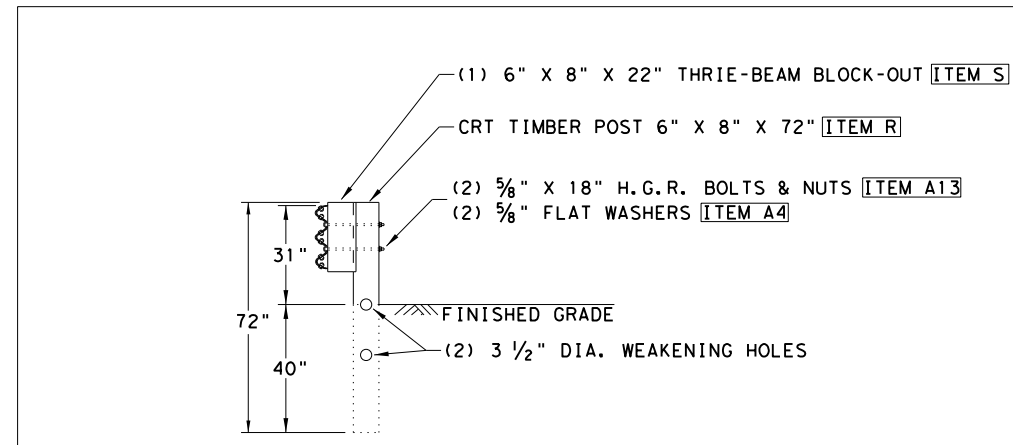
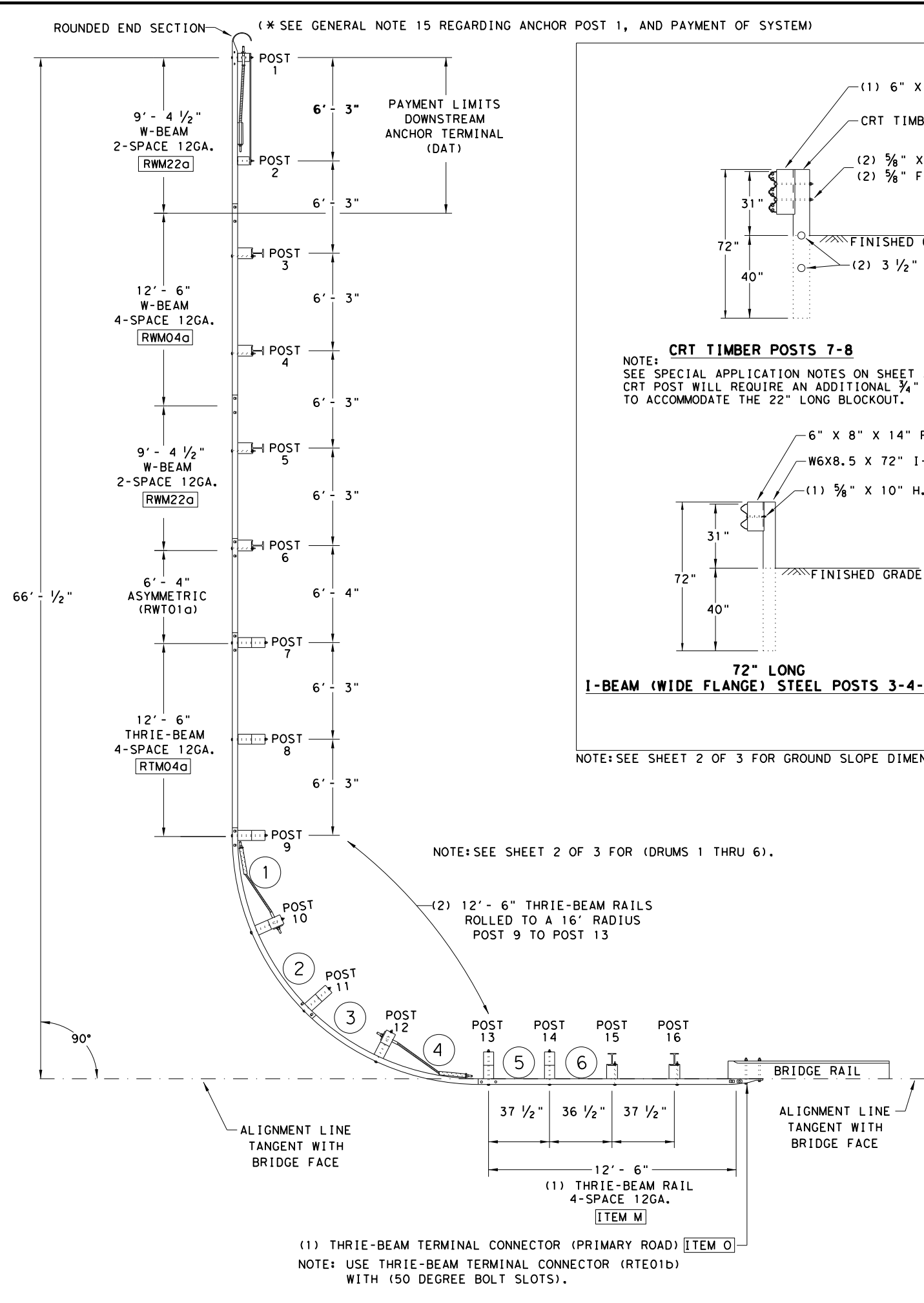
**Texas Department of Transportation** Design Division Standard

**METAL BEAM GUARD FENCE  
 RAIL HEIGHT ADJUSTMENT  
 (28" TO 31")  
 TL-3 MASH COMPLIANT  
 RAIL-ADJ(A)-19**

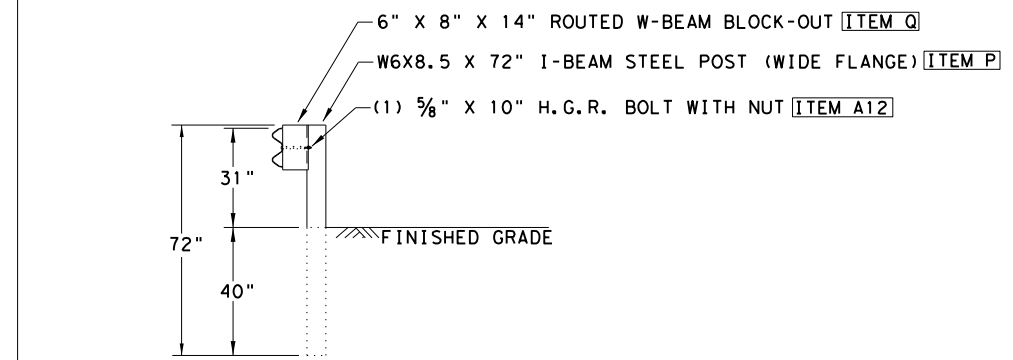
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© TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	183	

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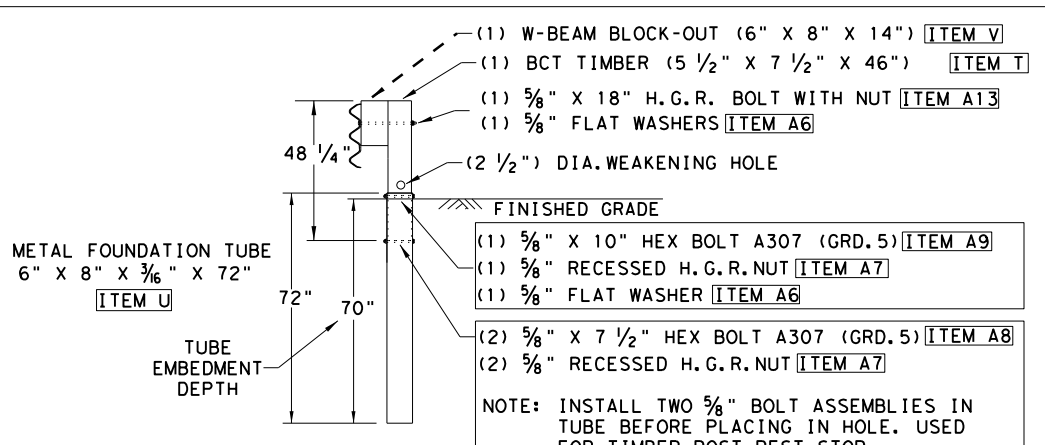


**CRT TIMBER POSTS 7-8**  
 NOTE: SEE SPECIAL APPLICATION NOTES ON SHEET 3 OF 3. CRT POST WILL REQUIRE AN ADDITIONAL 3/4" HOLE TO ACCOMMODATE THE 22" LONG BLOCKOUT.

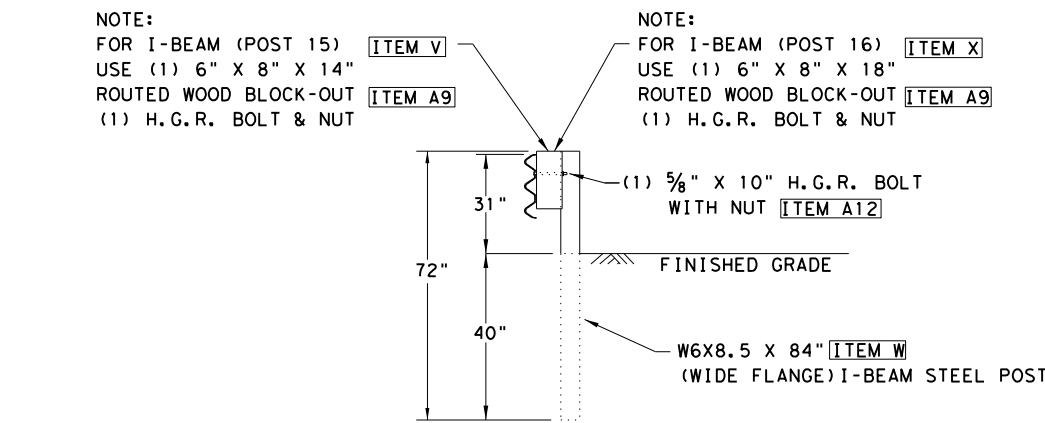


**72" LONG I-BEAM (WIDE FLANGE) STEEL POSTS 3-4-5-6**

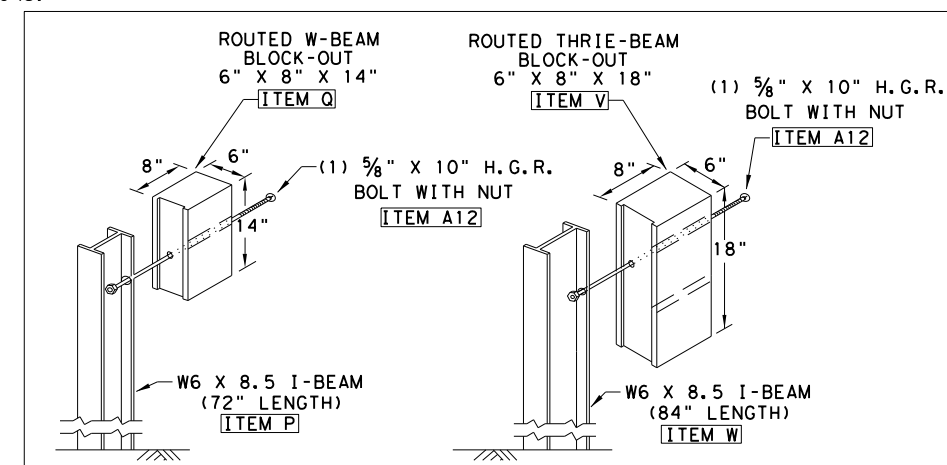
NOTE: SEE SHEET 2 OF 3 FOR GROUND SLOPE DIMENSIONS.



**BCT TIMBER POSTS WITH METAL FOUNDATION TUBES**  
 9-10-11-12-13-14



**84" LONG I-BEAM WIDE FLANGE STEEL POSTS 15-16**



**INSTALLATION DETAIL ROUTED WOOD BLOCK-OUT WITH WIDE FLANGE STEEL POST**

NOTE: POST SYSTEM USES TWO TYPES OF 14" WOOD BLOCK-OUTS. FOR CRT & BCT WOOD POSTS USE: (PDB01a) FOR I-BEAM STEEL POSTS USE: (PDB01b)

POST (3-4-5-6) USE: 14" BLOCK-OUT (PDB01b)  
 POST (7-8) USE: 22" BLOCK-OUT (PDB02)  
 POST (9 THRU 14) USE: 14" BLOCK-OUT (PDB01a)  
 POST (15) USE: 14" BLOCK-OUT (PDB01b)  
 POST (16) USE: 18" BLOCK-OUT (PDB01)

(MASH TL-2 COMPLIANT)  
 TESTED TO MASH TL-2 WITH A 3:1 SLOPE  
 SHEET 1 OF 3

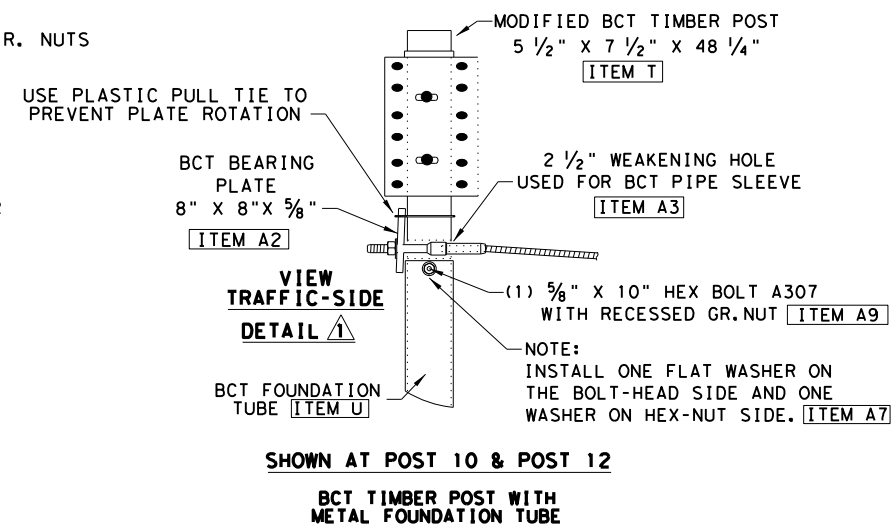
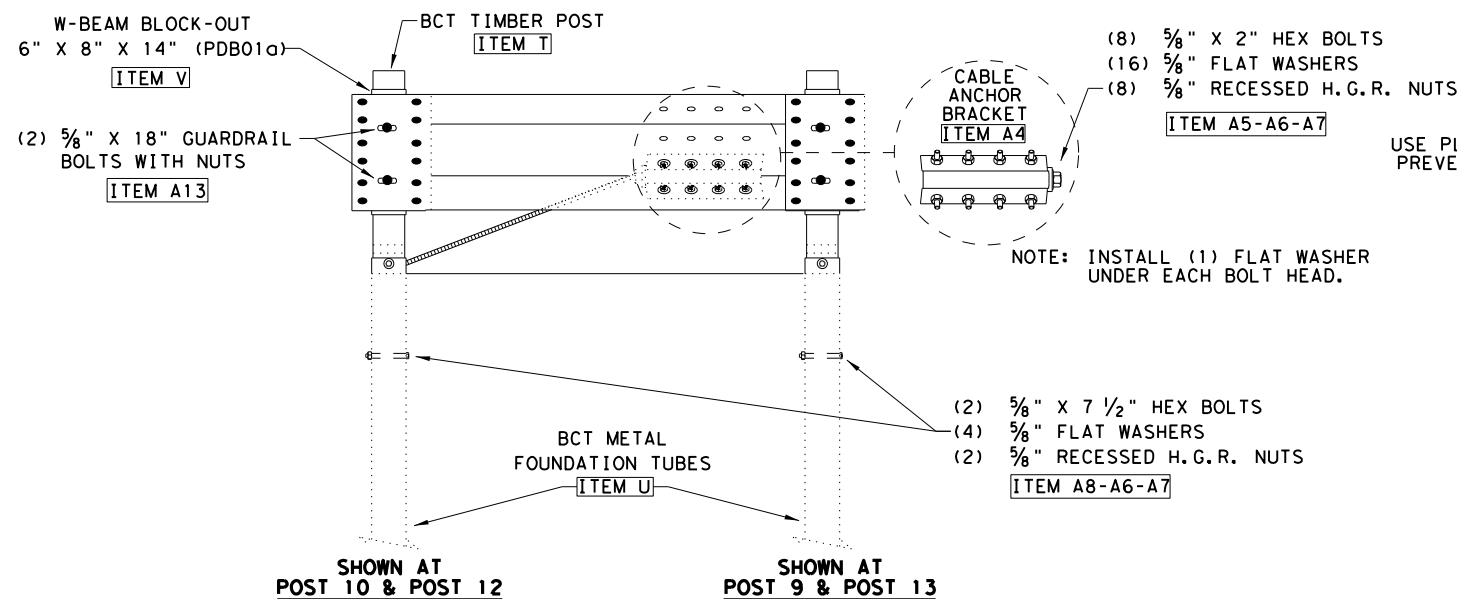
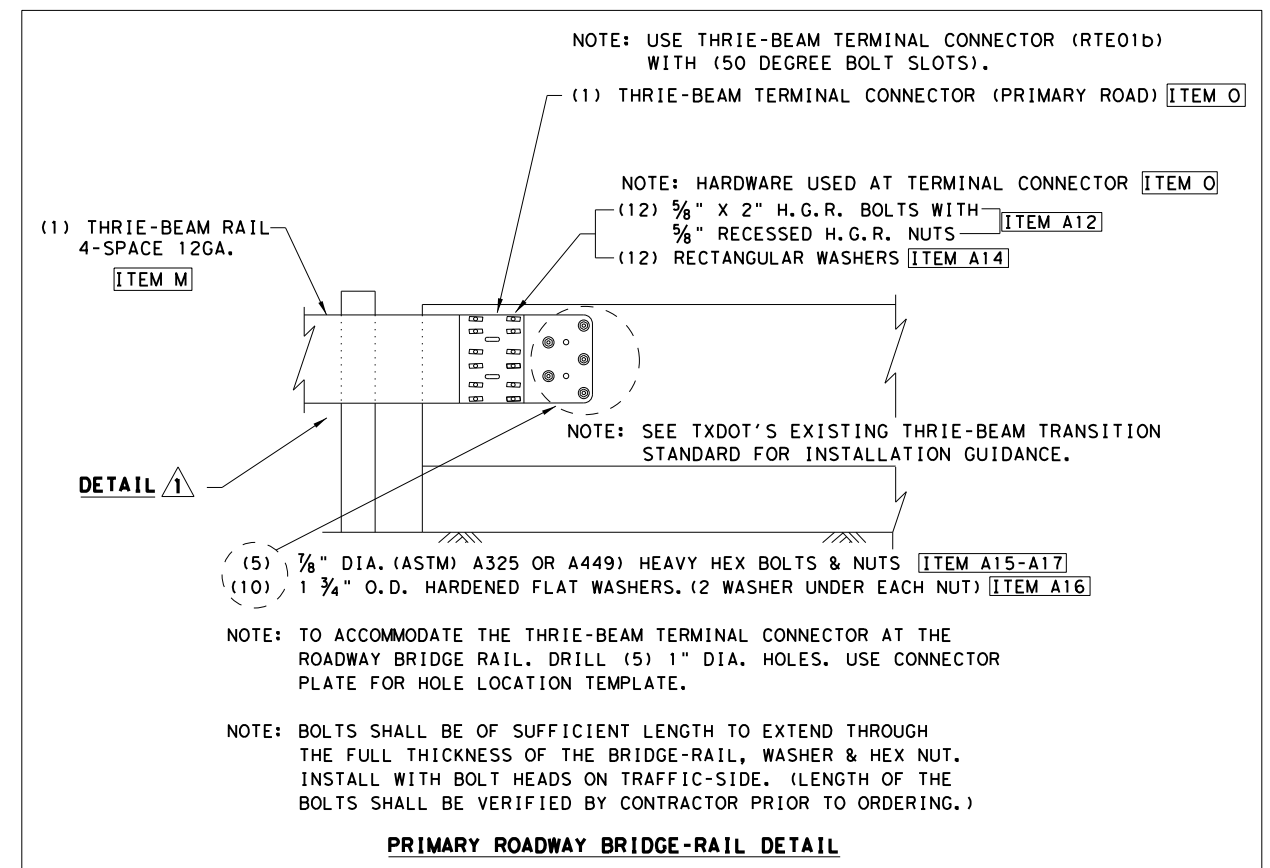
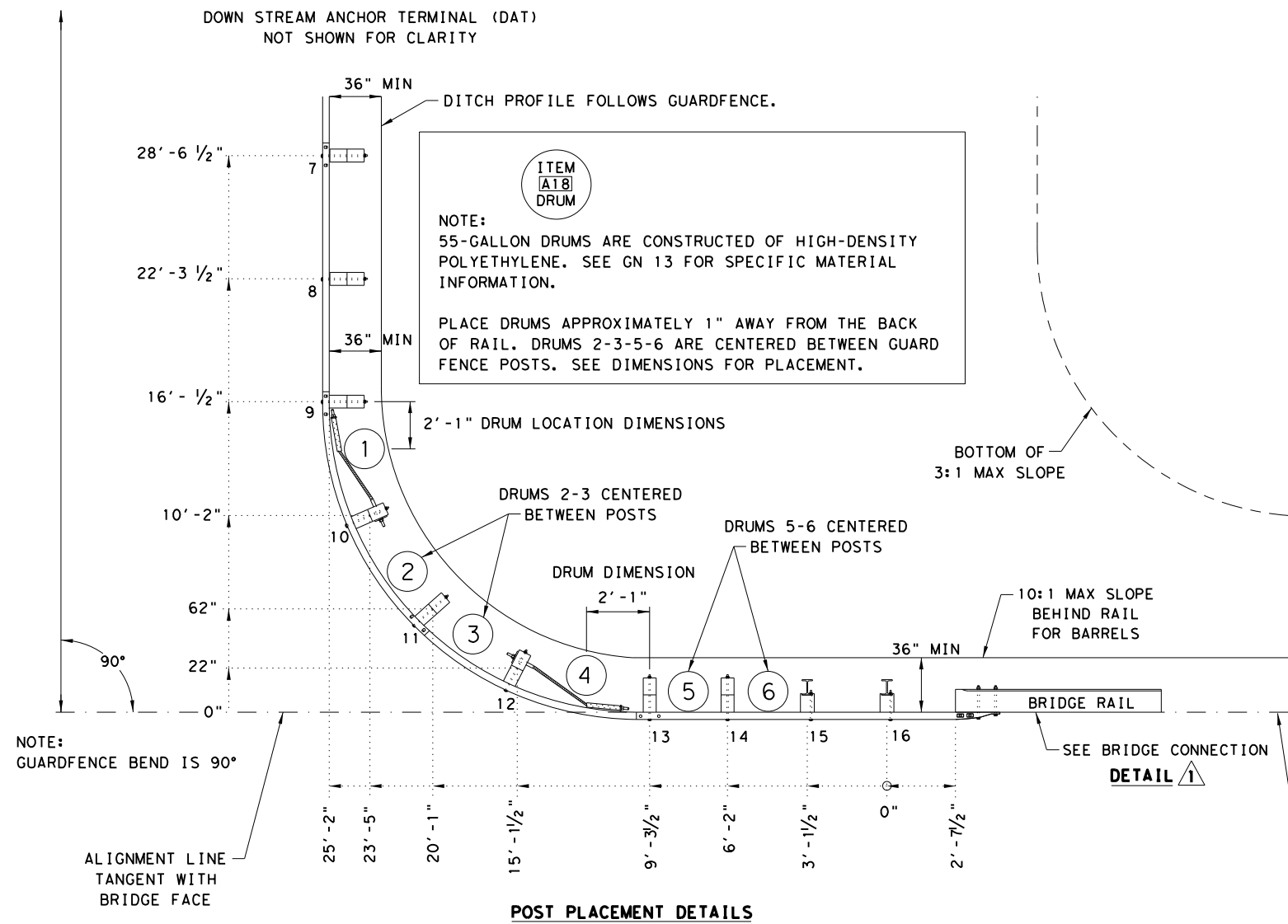
Texas Department of Transportation  
 Design Division Standard

**TL-2 SHORT RADIUS GUARDRAIL MASH COMPLIANT SRG (TL-2) -21**

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	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	184	

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(MASH TL-2 COMPLIANT)  
TESTED TO MASH TL-2 WITH A 3:1 SLOPE

SHEET 2 OF 3

		Design Division Standard	
<b>TL-2</b> <b>SHORT RADIUS GUARDFEEL</b> <b>MASH COMPLIANT</b> <b>SRG (TL-2) -21</b>			
FILE: srgt1221	TxDOT	CK:KM	DN:VP
© TxDOT: FEBRUARY 2021	CONT	SECT	JOB
REVISIONS	0220	05	080
	DIST	COUNTY	SHEET NO.
	PHR	CAMERON	185



DATE: 2/24/2023  
 FILE: \\txdot\project\wiseonline.com\txdot\Documents\21 - PHR\Design Projects\022005080\4 - Design\Plan Set\3 - Roadway\12 - srgt1221.dgn  
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ITEM	ALL LARGE & SMALL COMPONENT DESCRIPTIONS	TL-2 DOWNSTREAM ANCHOR TERMINAL (DAT) <input type="checkbox"/> (PAYABLE BY EA.)		TL-2 SHORT RADIUS GUARDRAIL COMPLETE SYSTEM (INCL DAT) <input type="checkbox"/> (ALL PAY ITEMS)	
		ITEM	QTY	ITEM	TOTAL QTY
A	POST 1 & 2 BCT TIMBER (5 1/2" X 7 1/2" X 48 1/4") (PDF01)	A	2	A	2
B	POST 1 & 2 BCT TUBE (6" X 8" X 3/8" X 72" LENGTH) (PTE05)	B	2	B	2
C	POST 1 & 2 CHANNEL STRUTS (C3 X 5 X 80") A36	C	2	C	2
D	POST 1 SHELF ANGLE BRACKET (6" X 7 1/2" X 1/4") SEE DAT DETAIL	D	1	D	1
E	POST 1 BCT POST SLEEVE (FM020)	E	1	E	1
F	POST 1 BCT CABLE BEARING PLATE (5/8" X 8" X 8") (FPB01)	F	1	F	1
G	BCT CABLE ANCHOR ASSEMBLIES (3/4" X 6'-6 3/4" LENGTH) (FCA01)	G	1	G	1
H	W-BEAM RAIL (ROUNDED END ANCHOR-TYPE) 12GA. (RWE030)	H	1	H	1
I	W-BEAM RAIL (LENGTH 9'-4 1/2") 12GA. (RWM220)	I	2	I	2
J	W-BEAM RAIL (LENGTH 12'-6") 12GA. (4 SPACE) (RWM040)			J	1
K	W-BEAM RAIL (LENGTH 9'-4 1/2") 12GA. (RWM220)			K	1
L	W-BEAM TO THRIE-BEAM ASYMMETRIC RAIL (RWT010). (LENGTH 6'-4")			L	1
M	THRIE-BEAM RAIL (LENGTH 12'-6") 12GA. (4 SPACE) (RTM040)			M	1
N	THRIE-BEAM RAIL (LENGTH 12'-6") 12GA. (16' RADIUS) (RTM020)			N	2
O	THRIE BEAM RAIL (TERMINAL CONNECTOR) (BRIDGE-RAIL) (RTE01B)			O	1
P	POSTS 3,4,5,6 I-BEAM POSTS (LENGTH W6X8.5 X 72") (PWE01)			P	4
Q	POSTS 3,4,5,6,15 ROUTED W-BEAM BLOCK-OUTS (6" X 8" X 14") (PDB01B)			Q	5
R	POSTS 7,8 CRT TIMBER POSTS (LENGTH 6" X 8" X 72") (PDE09)			R	2
S	POSTS 7,8 THRIE-BEAM BLOCK-OUTS (6" X 8" X 22") (PDB020)			S	2
T	POSTS 9,10,11,12,13,14 BCT TIMBER (5 1/2" X 7 1/2" X 46") (PDF04)			T	6
U	POSTS 9,10,11,12,13,14 BCT TUBE (6" X 8" X 3/8" X 72") (PTE05)			U	6
V	POSTS 9,10,11,12,13,14, W-BEAM BLOCK-OUTS (6" X 8" X 14") (PDB010)			V	6
W	POSTS 15,16 I-BEAM POSTS (LENGTH W6X8.5 X 84") (PWE07)			W	2
X	POSTS 16 ROUTED THRIE-BEAM BLOCK-OUT (6" X 8" X 18") (PDB01)			X	1
A1	MODIFIED BCT CABLE ANCHOR ASSEMBLIES (3/4" X LENGTH 5'-5")			A1	2
A2	BCT CABLE BEARING PLATE (5/8" X 8" X 8") (POST 10 & POST 12) (FPB01)			A2	2
A3	BCT CABLE POST SLEEVE (POST 10 & POST 12) (FM020)			A3	2
A4	BCT CABLE ANCHOR BRACKET (AT POST 9 & POST 13) (FPA01)			A4	2
A5	5/8" X 2" HEX BOLTS A307 GRD.5 (FOR CABLE ANCHOR BRACKETS)	A5	8	A5	24
A6	5/8" FLAT WASHER A307 GRD.5 (1 WASHER UNDER BOLT & 1 WASHER UNDER NUT)	A6	18	A6	48
A7	5/8" RECESSED H.G.R. NUTS (FOR ALL 5/8" BOLTS)	A7	20	A7	152
A8	5/8" X 7 1/2" HEX BOLTS A307 GRD.5 BCT POSTS (9-10-11-12-13-14)	A8	4	A8	12
A9	5/8" X 10" HEX BOLTS A307 GRD.5 BCT POSTS (9-10-11-12-13-14)	A9	2	A9	6
A10	5/8" X 1 1/4" H.G.R. BOLTS SPLICES AT POST (2-3-4-5-6-7-9-11-13) (FBB01)	A10	4	A10	72
A11	5/8" X 2" H.G.R. BOLTS (ROUND TERM-POST 10-END SPLICE) (FBB02)			A11	18
A12	5/8" X 10" H.G.R. BOLTS (I-BEAM POSTS RAIL & BLOCKOUT) (FBB03)	A12	2	A12	10
A13	5/8" X 18" H.G.R. BOLTS (POSTS 9,10,11,12,13,14) (FBB04)			A13	10
A14	RECTANGULAR WASHERS (FWRO3) (FOR TERMINAL CONNECTOR RTE01B)			A14	12
A15	7/8" X (LENGTH VARIES) HEX BOLTS A325 OR A449 GR.5			A15	5
A16	1 3/4" O.D. HARDENED FLAT WASHER A325			A16	10
A17	7/8" HEX NUT GR.5 A325			A17	5
A18	55 GALLON DRUM - FILLED WITH SAND 700-715lbs.			A18	6

**GENERAL NOTES**

- FOR ADDITIONAL INSTALLATION INFORMATION AND GUIDANCE CONTACT: TEXAS DEPARTMENT OF TRANSPORTATION, (TXDOT'S DESIGN DIVISION). (512) 416-2678. THE EXACT POSITION OF MGBF SHALL BE SHOWN ELSEWHERE IN THE PLANS OR AS DIRECTED BY THE ENGINEER. THE SIGHT DISTANCE OF THE INSTALLATION WILL NEED TO BE VERIFIED WITH RESPECT TO THE SPECIFIC SITE PLACEMENT.
- STEEL POSTS ARE NOT PERMITTED AT CRT OR BCT POST POSITIONS.
- 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 12 1/2" OR 25 FOOT NOMINAL LENGTHS.
- 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 (1 3/4" O.D.) WASHER AND NOT MORE THAN 1" BEYOND IT. BUTTON HEAD "SPlice" BOLTS (ASTM A307) ARE 5/8" X 1 1/4" OR 2" LONG AT TRIPLE RAIL SPLICES WITH A DOUBLE RECESSED NUT (ASTM A563).
- FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
- CROWN SHALL BE WIDENED TO ACCOMMODATE THE METAL BEAM GUARD FENCE.
- THE LATERAL APPROACH TO THE GUARD FENCE, SHALL HAVE A SLOPE RATE OF NOT MORE THAN 1V:10H.
- IT IS NOT RECOMMENDED THAT GUARD FENCE BE PLACED IN THE VICINITY OF CURBS.
- GUARDRAIL POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
- SPECIAL RAIL FABRICATION WILL BE REQUIRED FOR THRIE BEAM RAIL RADIUS (ITEM J).
- ALL MATERIAL AND WORK INVOLVED IS SUBSIDIARY TO SHORT RADIUS BID ITEM, INCLUDING, BUT NOT LIMITED TO FOUNDATIONS, GRADING, THRIE BEAM RAIL, SAND DRUMS, AND OTHER PARTS.
- ALL CABLE ASSEMBLIES SHOULD BE TAUT AFTER INSTALLATION. WHEN CABLES ARE MANIPULATED BY HAND THE CABLES SHOULD NOT MOVE MORE THAN 1" IN ANY DIRECTION PERPENDICULAR TO THE CABLE.
- THE DRUMS ARE EAGLE MODEL 1656 FILLED WITH 715 LB (+/-15) SAND WITH THE PLASTIC LEVER-LOCK; OR AN APPROVED EQUIVALENT. THE APPROXIMATE HEIGHT OF THE DRUM IS 37" (+/-).
- WHEN THE SHORT RADIUS SYSTEM IS TERMINATED BY A DAT, REFER TO THE LATEST DAT STANDARD FOR INSTALLATION OF THE DAT SYSTEM. IF THE SYSTEM IS TERMINATED BY ANOTHER END TERMINAL SYSTEM, REFER TO THE CORRESPONDING END TERMINAL STANDARD.
- WHEN THE PLANNED LOCATION OF POST (I) IS WITHIN THE RIGHT-OF-WAY AND WITHIN THE CLEAR ZONE OF THE DIRECTION OF THE OPPOSING TRAFFIC, AN APPROPRIATE CRASHWORTHY END TERMINAL SHALL BE INSTALLED IN PLACE OF THE DOWNSTREAM ANCHOR TERMINAL (DAT). THE PAYMENT OF THE COMPLETE SHORT RADIUS SYSTEM WITH A DAT AT THE TERMINUS WILL BE WITH BID ITEMS: 540 6016 DOWNSTREAM ANCHOR TERMINAL SECTION, AND 540 6046 TL-2 31" SHORT RADIUS (W/O DAT). THE PAYMENT OF THE SYSTEM TERMINATED BY A CRASHWORTHY END TERMINAL (IN LIEU OF THE DAT) WILL BE WITH BID ITEMS: 540 6046 TL-2 31" SHORT RADIUS (W/O DAT), AND 544 6001 GUARDRAIL END TREATMENT (INSTALL).
- TESTED TO MASH WITH A 3:1 SLOPE OR SHALLOWER IS PREFERABLE IN THE LIMITS OF THE TOP AND BOTTOM OF THE SLOPE AS SHOWN IN THE PLAN VIEW. IF FIELD CONDITIONS REQUIRE A STEEPER SLOPE, THIS MAY BE ALLOWABLE UP TO A 2:1 SLOPE. CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE.


\* NOTE: SEE SHEET 1 OF 3.

**SPECIAL APPLICATION NOTES.**

- THIS IS A MASH COMPLIANT TL-2 SHORT RADIUS GUARDRAIL SYSTEM 31 INCHES TALL. THE SYSTEM REQUIRES A MINIMUM PLACEMENT FOOTPRINT OF 35' ALONG THE PRIMARY ROAD AND 30' ALONG THE SECONDARY DRIVEWAY.
- THE SYSTEM ALSO REQUIRES A MINIMUM 3' WIDE (WORK ZONE) DIRECTLY BEHIND THE GUARDRAIL SYSTEM, WITH A SLOPE AT 1V:10H, FROM THERE A 3:1 SLOPE IS RECOMMENDED. SEE SHEET 2 OF 3 FOR SLOPE DETAILS.
- NOTE FOR INSTALLER: THE TWO (2) CRT POSTS ITEM (R), AT POST LOCATIONS 7 & 8., WILL REQUIRE THE FOLLOWING FIELD ADJUSTMENT. USING A 3/4" X 10" LONG SPADE BIT DRILL ONE (1) ADDITIONAL HOLE 7-7/8" DIRECTLY BELOW THE EXISTING TOP HOLE TO ACCOMMODATE THE HARDWARE FOR THE 22" LONG BLOCKOUT.  
  
OPTION FOR ADDITIONAL 3/4" HOLE. THE 22" LONG BLOCKOUT (PDB010) IS MANUFACTURED WITH TWO 3/4" DRILLED HOLES FOR THE POST HARDWARE, THEREFORE THE BLOCKOUT CAN BE USED AS A TEMPLATE GUIDE FOR THE BOTTOM 3/4" HOLE. AFTER INSTALLING THE CRT POST USE THE TOP HOLE TO MOUNT THE 22" LONG BLOCKOUT TO POST, USE THE BLOCKOUT'S PRE-DRILLED HOLE AS A GUIDE FOR THE BOTTOM 3/4" HOLE.

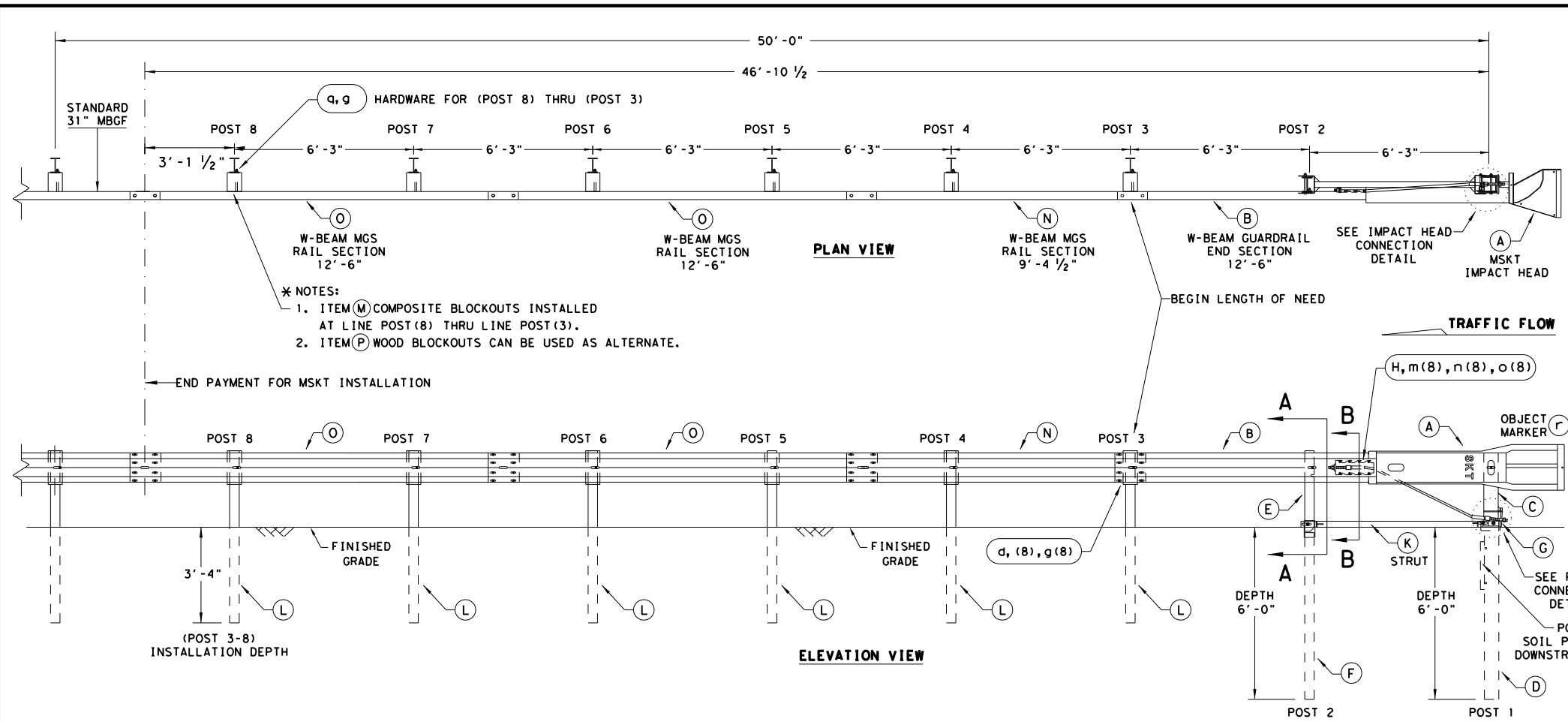
(MASH TL-2 COMPLIANT)  
TESTED TO MASH TL-2 WITH A 3:1 SLOPE

SHEET 3 OF 3

		Design Division Standard	
<b>TL-2 SHORT RADIUS GUARDRAIL MASH COMPLIANT SRG (TL-2) -21</b>			
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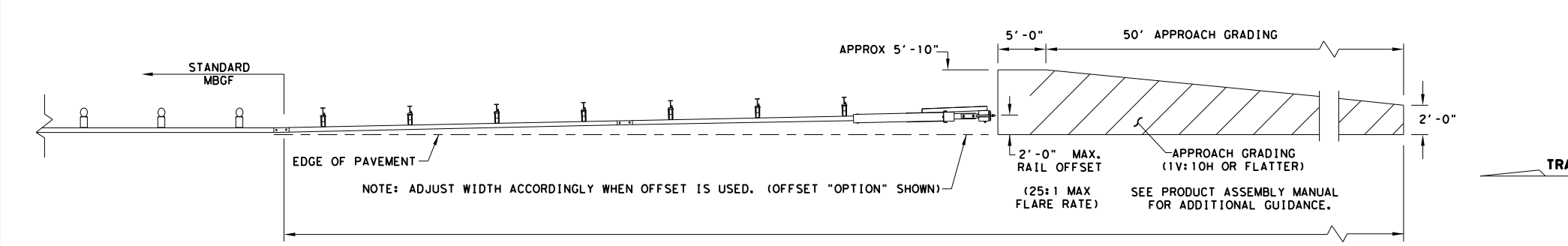
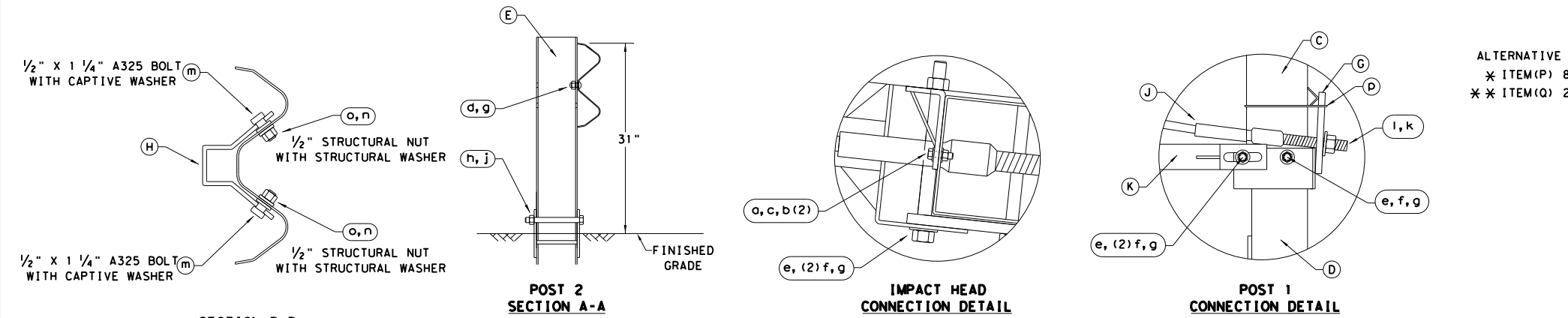
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- GENERAL NOTES**
- FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: ROAD SYSTEMS, INC. (432)263-2435. 3616 OLD HOWARD COUNTY AIRPORT, BIG SPRING, TX 79720
  - FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE: MSKT END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL (PUBLICATION-062717).
  - APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
  - FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
  - HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
  - SYSTEM SHOWN USING STEEL WIDE FLANGE POSTS WITH COMPOSITE BLOCKOUTS.
  - A COMPOSITE MATERIAL BLOCKOUTS THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
  - IF SOLID ROCK IS ENCOUNTERED IN THE AREA OF (POST 1) AND / OR (POST 2) CONTACT THE MANUFACTURER, & REFER TO THE LATEST ROADWAY MOW STRIP STANDARD FOR INSTALLATION GUIDANCE.
  - POSTS SHALL NOT BE SET IN CONCRETE.
  - SYSTEM MUST BE ATTACHED TO STANDARD 31" MBGF.
  - UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE MSKT SYSTEM BE CURVED.
  - A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCRANCHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.
  - THE SYSTEM IS SHOWN WITH TWO 12'-6" MBGF PANELS, ONE 25'-0" MBGF PANEL IS ALSO ALLOWED IN ITS PLACE.
  - A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POSTS 3-8 TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST. SPECIAL DRIVING CAP TO BE USED ON LOWER POSTS 1 & 2 TO PREVENT DAMAGE TO THE WELDED PLATES.

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM NUMBERS
A	1	MSKT IMPACT HEAD	MS3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 Go.	SF1303
C	1	POST 1 - TOP (6" X 6" X 1/8" TUBE)	MTPHP1A
D	1	POST 1 - BOTTOM (6' W6X15)	MTPHP1B
E	1	POST 2 - ASSEMBLY TOP	UHP2A
F	1	POST 2 - ASSEMBLY BOTTOM (6' W6X9)	HP2B
G	1	BEARING PLATE	E750
H	1	CABLE ANCHOR BOX	S760
J	1	BCT CABLE ANCHOR ASSEMBLY	E770
K	1	GROUND STRUT	MS785
L	6	W6X9 OR W6X8.5 STEEL POST	P621
M	6	COMPOSITE BLOCKOUTS	CBSP-14
N	1	W-BEAM MGS RAIL SECTION (9'-4 1/2")	G12025
O	2	W-BEAM MGS RAIL SECTION (12'-6")	G1203A
P	6	WOOD BLOCKOUT 6" X 8" X 14"	P675
Q	1	W-BEAM MGS RAIL SECTION (25'-0")	G1209
SMALL HARDWARE			
o	2	5/8" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	5/8" WASHER	W0516
c	2	5/8" HEX NUT	N0516
d	25	5/8" Dia. x 1 1/4" SPLICE BOLT (POST 2)	B580122
e	2	5/8" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	5/8" WASHER	W050
g	33	5/8" Dia. H.G.R NUT	N050
h	1	3/4" Dia. x 8 1/2" HEX BOLT (GRD A449)	B340854A
j	1	3/4" Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	1/2" x 1 1/4" A325 BOLT WITH CAPTIVE WASHER	SB12A
n	8	1/2" STRUCTURAL NUTS	N012A
o	8	1 1/8" O.D. x 3/8" I.D. STRUCTURAL WASHERS	W012A
p	1	BEARING PLATE RETAINER TIE	CT-100ST
q	6	5/8" x 10" H.G.R. BOLT	B581002
r	1	OBJECT MARKER 18" X 18"	E3151



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

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

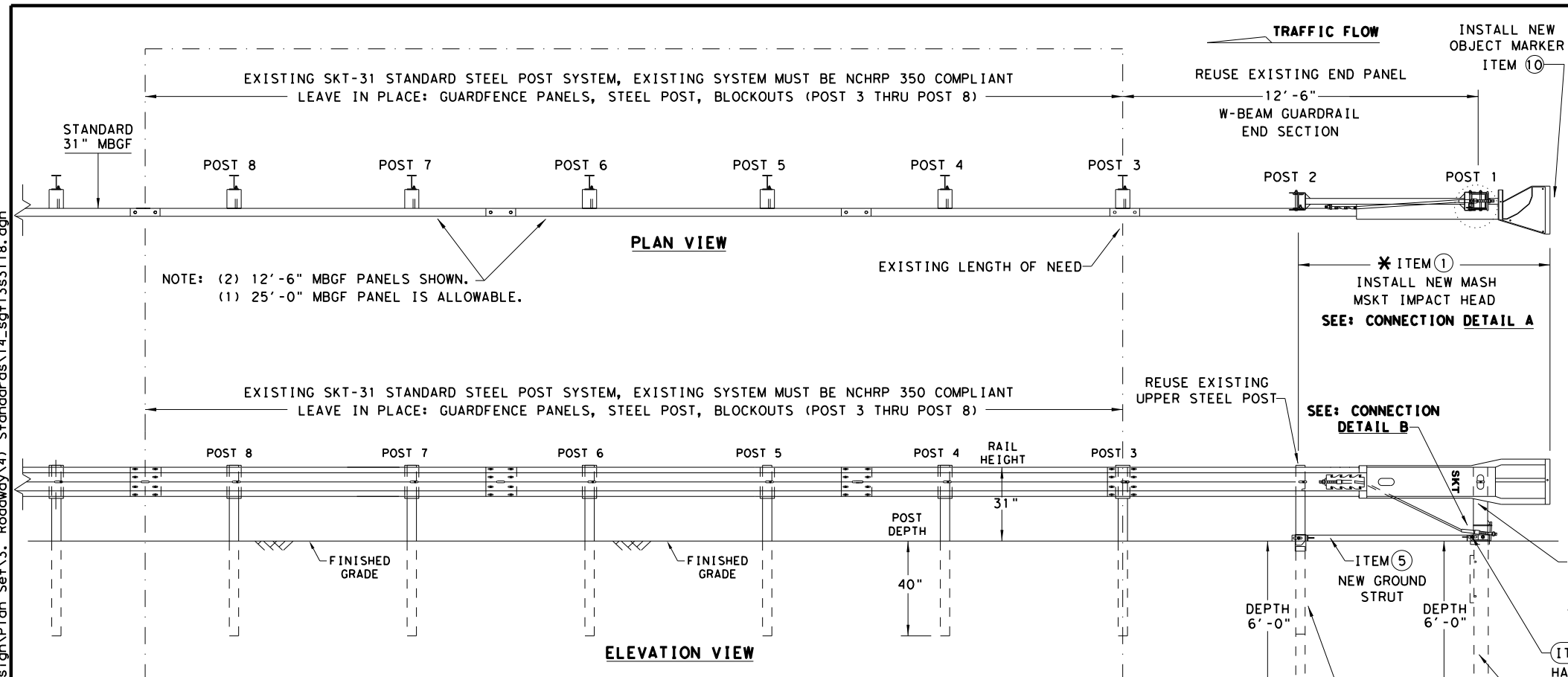
Texas Department of Transportation  
 Design Division Standard

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

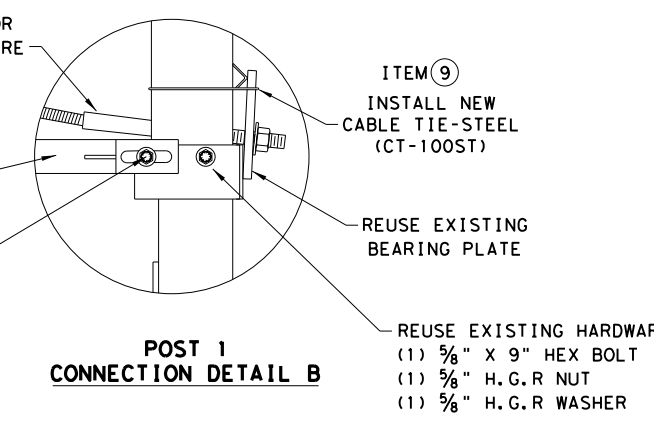
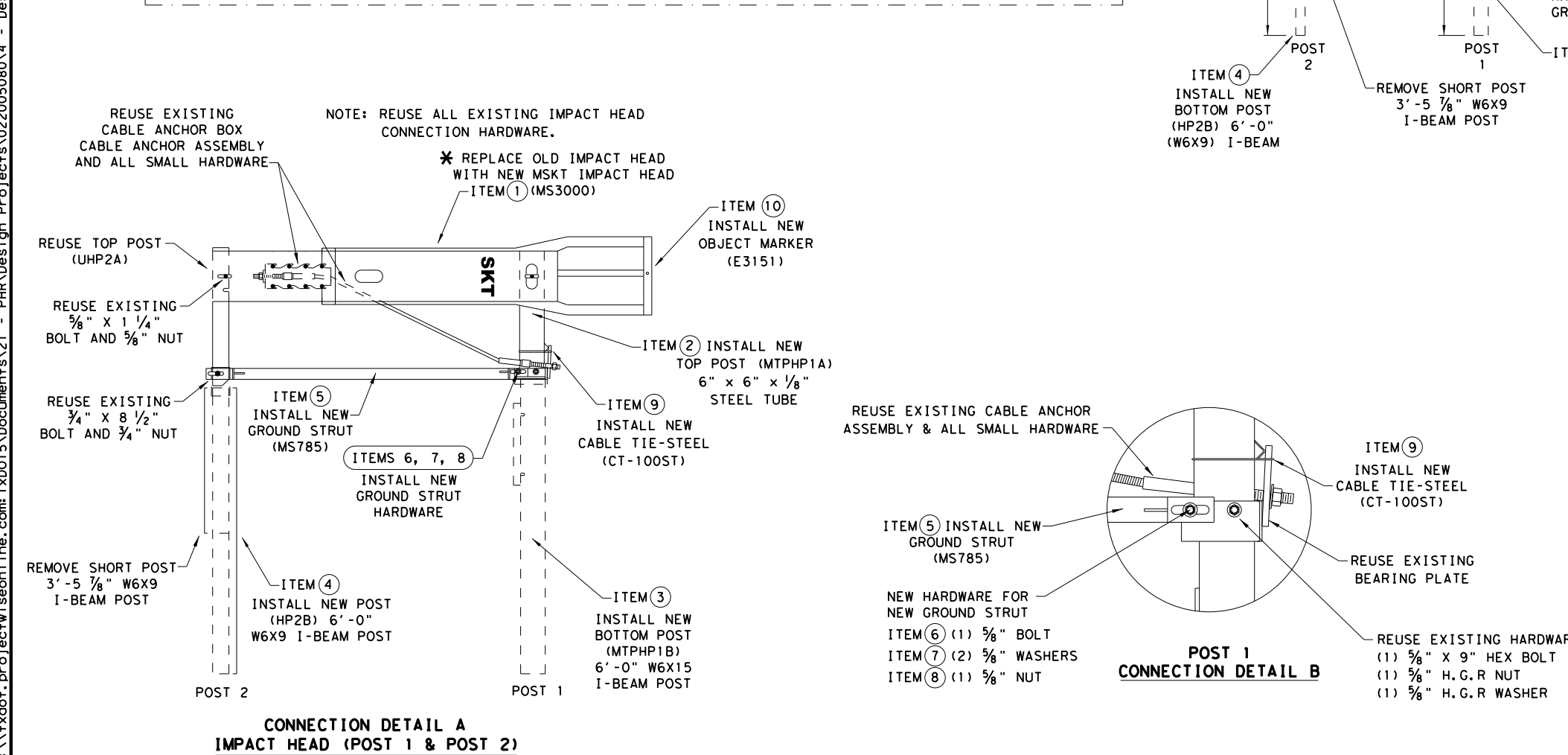
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  - FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
  - HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
  - IF SOLID ROCK IS ENCOUNTERED IN THE AREA OF (POST 1) AND / OR (POST 2) CONTACT THE MANUFACTURER, AND REFER TO THE LATEST ROADWAY MBSG STANDARD FOR INSTALLATION GUIDANCE.
  - POSTS SHALL NOT BE SET IN CONCRETE.
  - THE EXISTING SKT 31" STANDARD STEEL POST SYSTEM MUST BE THOROUGHLY INSPECTED, AND DETERMINED TO BE INTACT, AND FREE OF ANY DAMAGE OR DEFECTS BEFORE RETROFITTING. THIS INSPECTION INCLUDES COMPLETING THE MSKT RETROFIT INSPECTION CHECKLIST FOR THE EXISTING SKT 31" STEEL POST NCHRP 350 SYSTEM. ALL EXISTING, AND REUSABLE PARTS MUST BE FREE OF ANY DAMAGE FOR A MASH COMPLIANT RETROFIT.
  - UNDER NO CIRCUMSTANCES SHALL THE GUARDFENCE WITHIN THE MSKT SYSTEM BE CURVED.
  - A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCRoACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.
  - SPECIAL DRIVING CAP TO BE USED WHEN DRIVING (LOWER POSTS 1 & 2) TO PREVENT DAMAGE TO THE WELDED PLATES.



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

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

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

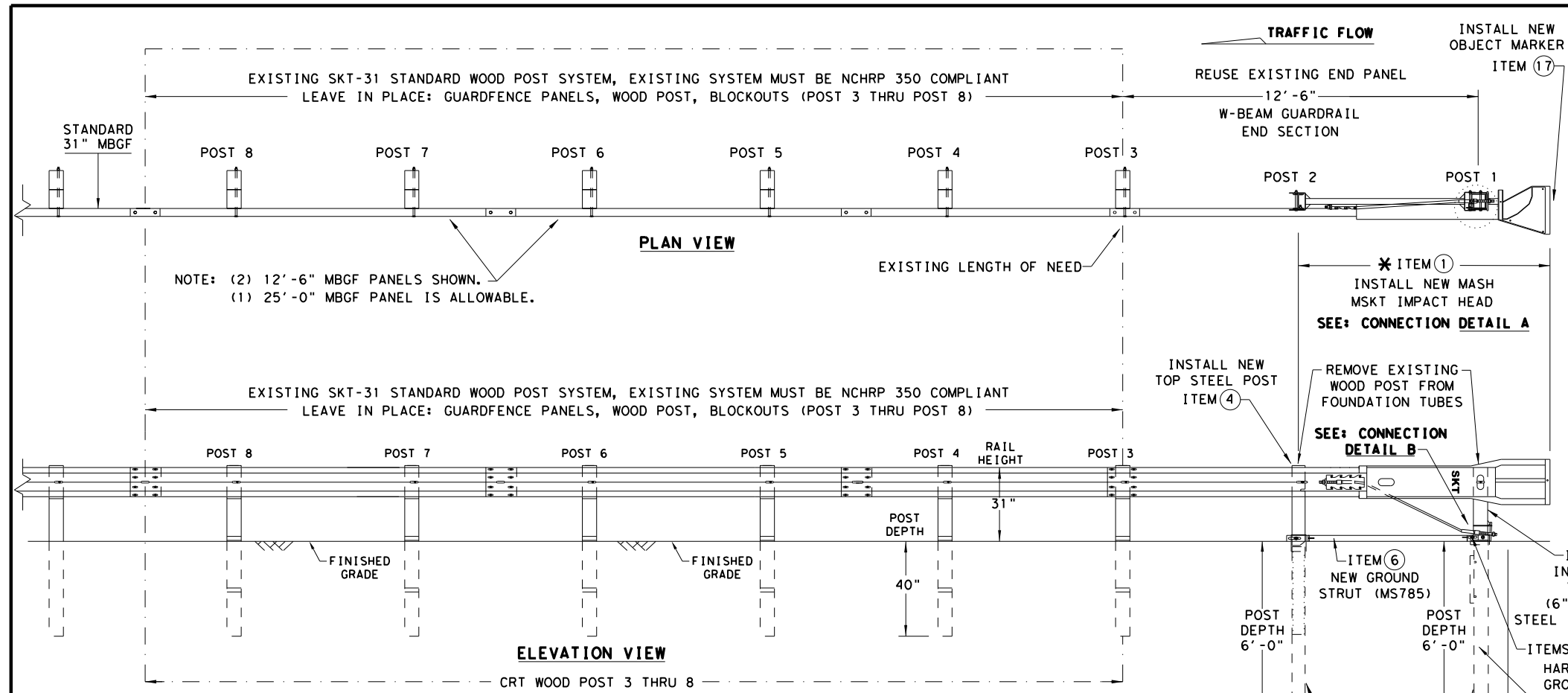
**Texas Department of Transportation**  
 Design Division Standard

## RETROFIT STANDARD SKT 31" STEEL POST SYSTEM TO MASH MSKT SGT (13S) 31-18

FILE: sgt13s3118.dgn	DN: TXDOT	CK: KM	DW: VP	CK: CL
© TXDOT: APRIL 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	188	

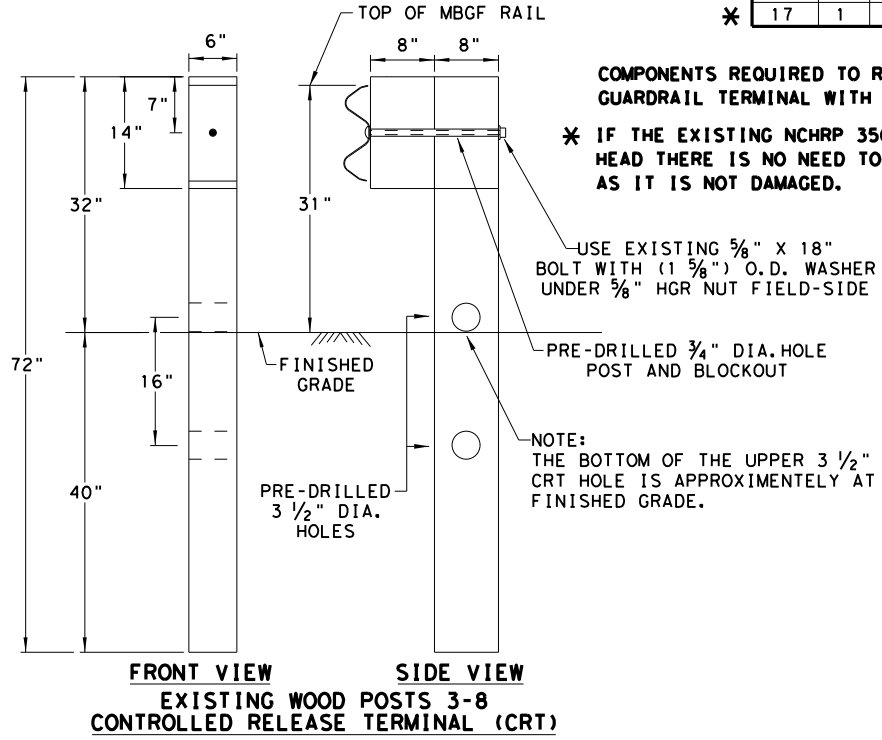
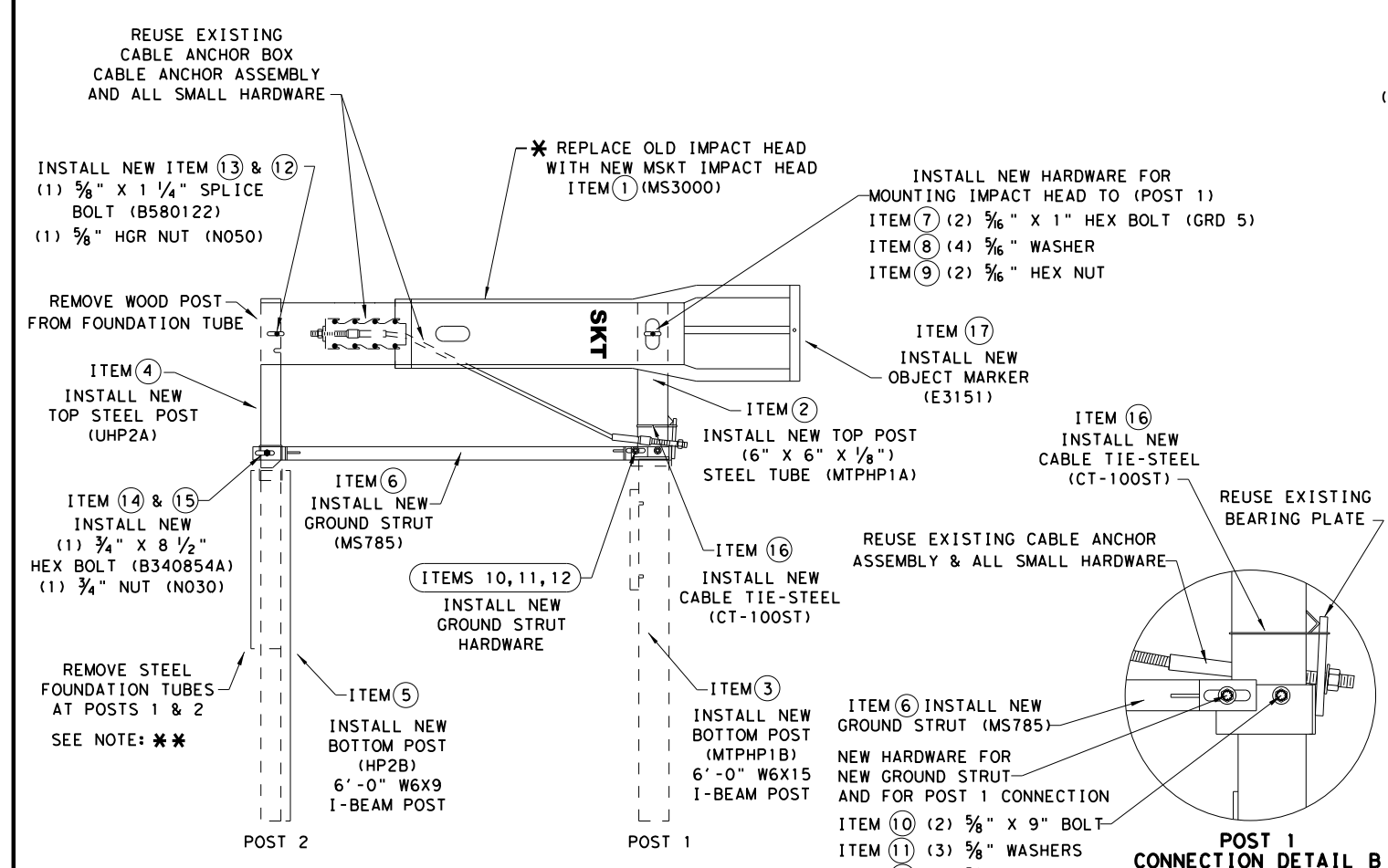
NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE EXISTING; SKT END TERMINAL RETROFITTED TO THE MSKT MASH COMPLIANT TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

DISCLAIMER: THE USE OF THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TXDOT FOR ANY PURPOSE WHATSOEVER. TXDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.



- ### GENERAL NOTES
- FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: ROAD SYSTEMS, INC. (432) 263-2435. 3616 OLD HOWARD COUNTY AIRPORT, BIG SPRING, TX 79720
  - FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO: MSKT END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL (PUBLICATION-062717).
  - APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
  - FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
  - HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
  - IF SOLID ROCK IS ENCOUNTERED IN THE AREA OF (POST 1) AND / OR (POST 2) CONTACT THE MANUFACTURER, AND REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
  - POSTS SHALL NOT BE SET IN CONCRETE.
  - THE EXISTING SKT 31" STANDARD WOOD POST SYSTEM MUST BE THOROUGHLY INSPECTED, AND DETERMINED TO BE INTACT, AND FREE OF ANY DAMAGE OR DEFECTS BEFORE RETROFITTING. THIS INSPECTION INCLUDES COMPLETING THE MSKT RETROFIT INSPECTION CHECKLIST FOR THE EXISTING SKT 31" WOOD POST NCHRP 350 SYSTEM. ALL EXISTING, AND REUSABLE PARTS MUST BE FREE OF ANY DAMAGE FOR A MASH COMPLIANT RETROFIT.
  - UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE MSKT SYSTEM BE CURVED.
  - A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCRANCHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.
  - SPECIAL DRIVING CAP TO BE USED WHEN DRIVING (LOWER POSTS 1 & 2) TO PREVENT DAMAGE TO THE WELDED PLATES.

ITEMS	QTY	MAIN SYSTEM COMPONENTS	PART NUMBERS
1	1	MSKT IMPACT HEAD	MS3000
2	1	POST 1 - TOP (6" X 6" X 1/8" TUBE)	MTPHP1A
3	1	POST 1 - BOTTOM (6' W6X15)	MTPHP1B
4	1	POST 2 - ASSEMBLY TOP	UHP2A
5	1	POST 2 - ASSEMBLY BOTTOM (6' W6X9)	HP2B
6	1	GROUND STRUT	MS785
7	2	5/16" X 1" HEX BOLT (GRD 5)	B516014A
8	4	5/16" WASHERS	W0516
9	2	5/8" HEX NUT	N0516
10	2	5/8" X 9" HEX BOLT (GRD A449)	B580904A
11	3	5/8" WASHERS	W050
12	3	5/8" H.G.R NUT	N050
13	1	5/8" X 1 1/4" SPLICE BOLT	B580122
14	1	3/4" X 8 1/2" HEX BOLT (GRD 5)	B340854A
15	1	3/4" HEX NUT	N030
16	1	CABLE TIE-STEEL	CT-100ST
17	1	OBJECT MARKER 18" X 18"	E3151



**RETRFIT STANDARD**  
**SKT 31" WOOD POST SYSTEM**  
**TO MASH MSKT**  
**SGT (14W) 31-18**

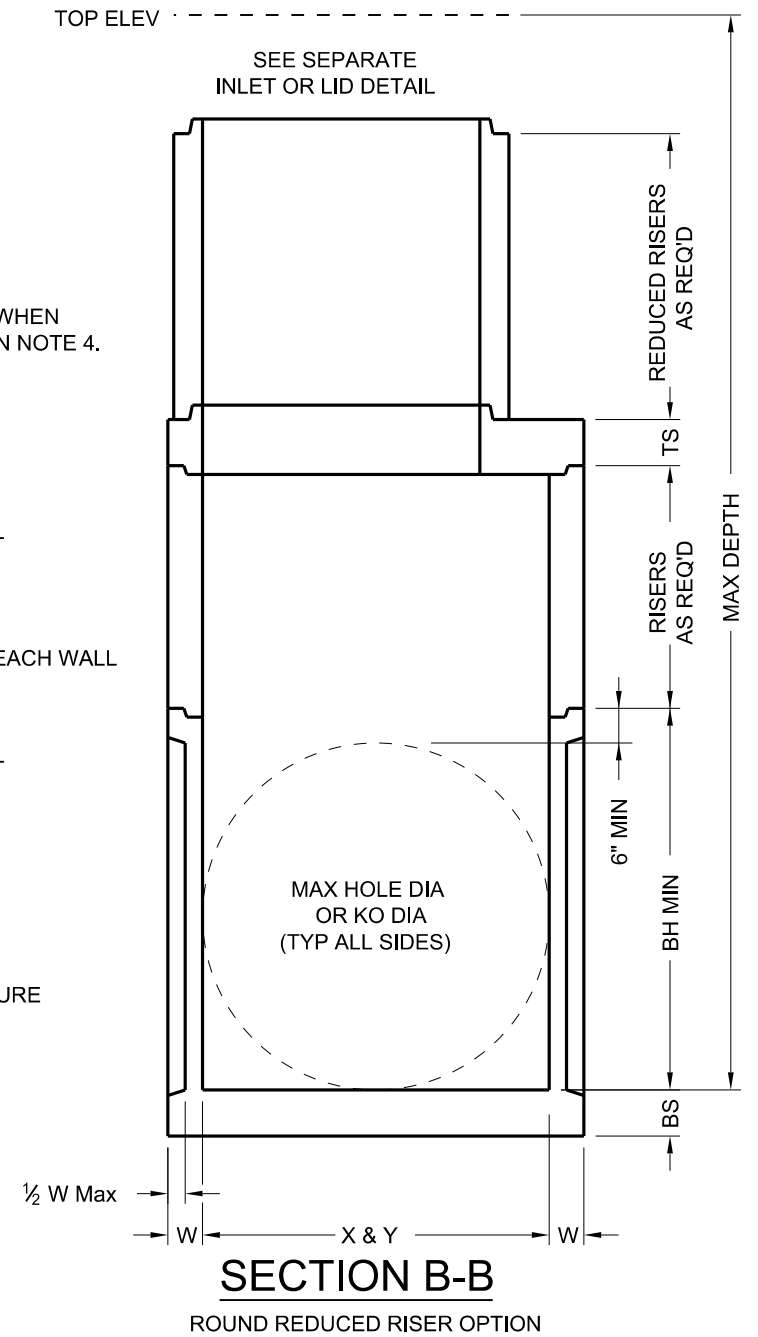
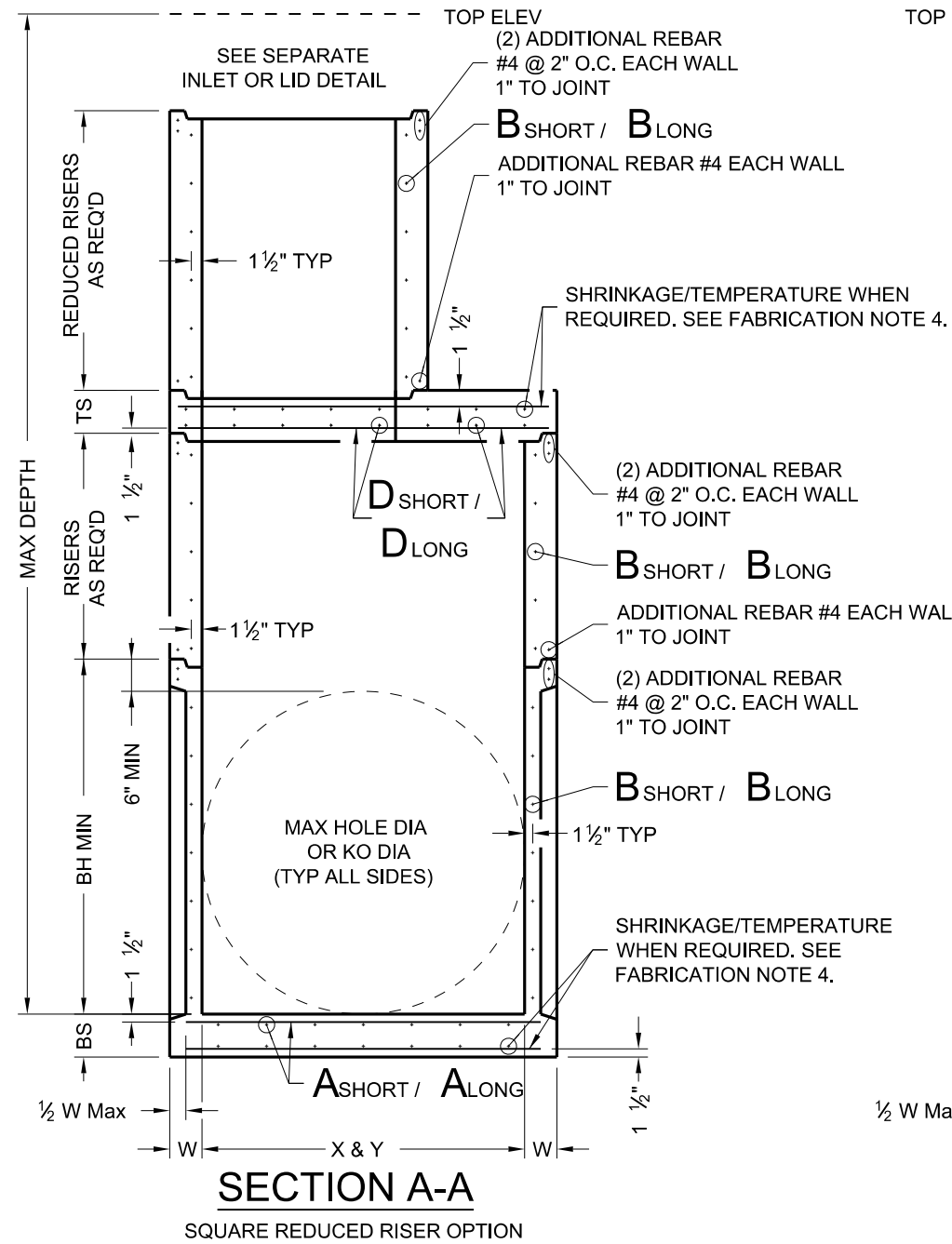
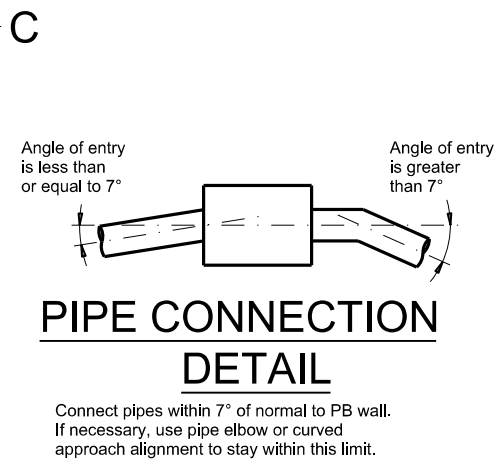
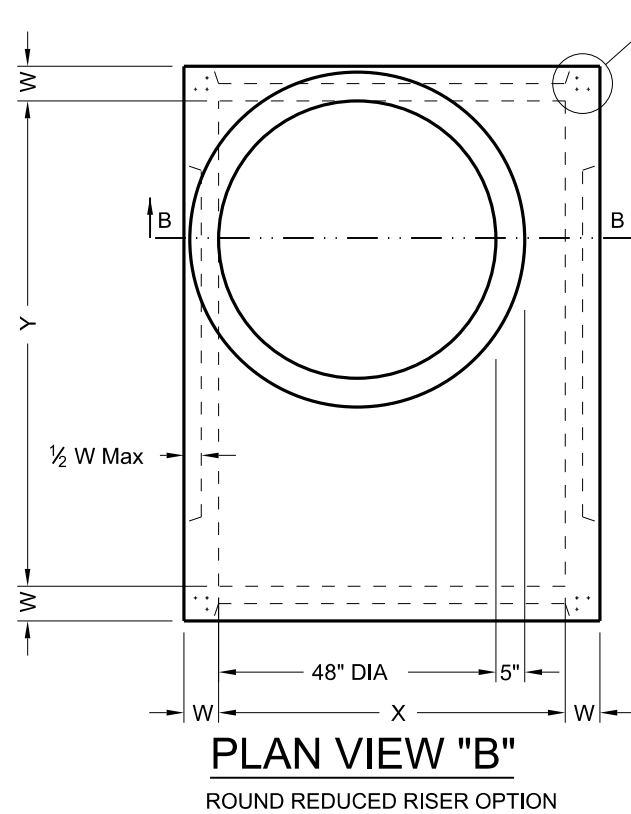
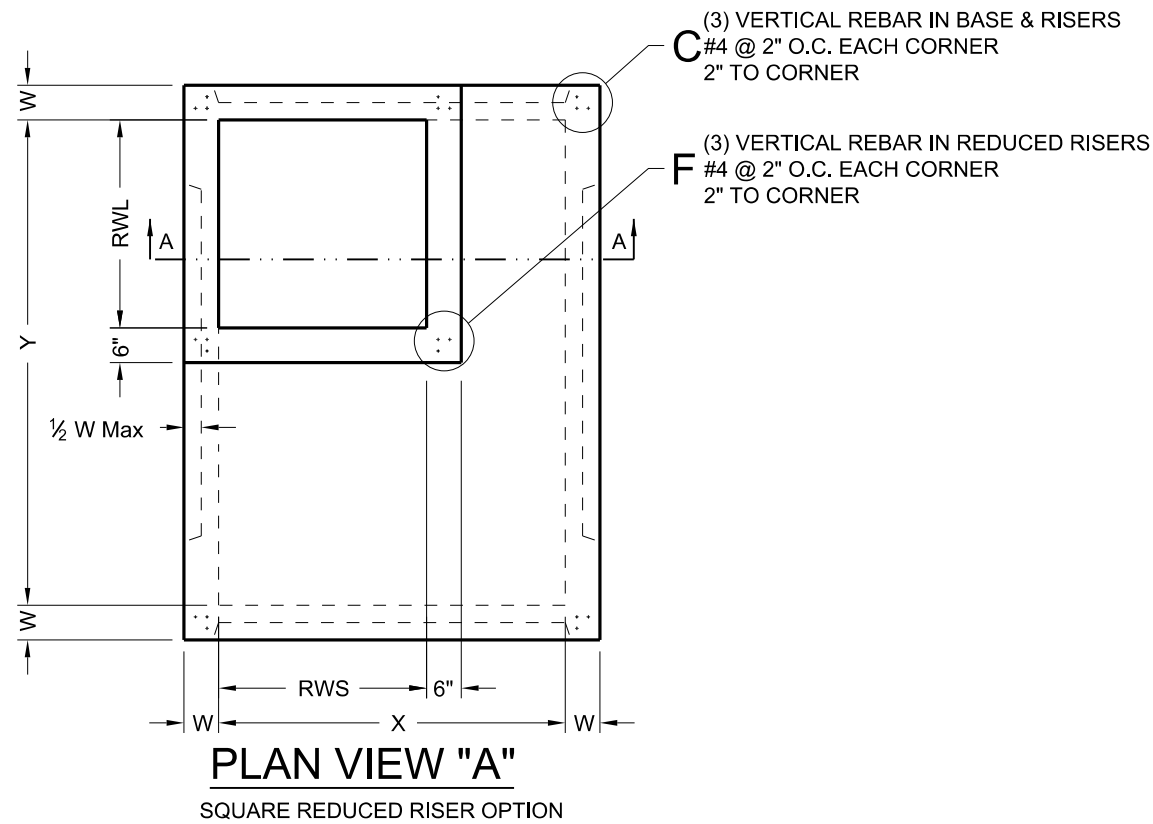
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© TXDOT: APRIL 2018	CONT: 0220	SECT: 05	JOB: O80	HIGHWAY: SH 48
REVISIONS	DIST: PHR	COUNTY: CAMERON	SHEET NO. 189	

DATE: FILE:

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

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**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 1/2" 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<sup>2</sup>/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 3/4".
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 1/2 the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. For rigid pipe, cut hole in thin wall panel (KO) 4" Max, 2" Min larger than pipe OD.
5. For flexible pipe, consult boot/seal Manufacturer's specification for placement tolerance and hole size. Center pipe in hole and install boot/seal per Manufacturer's specification.

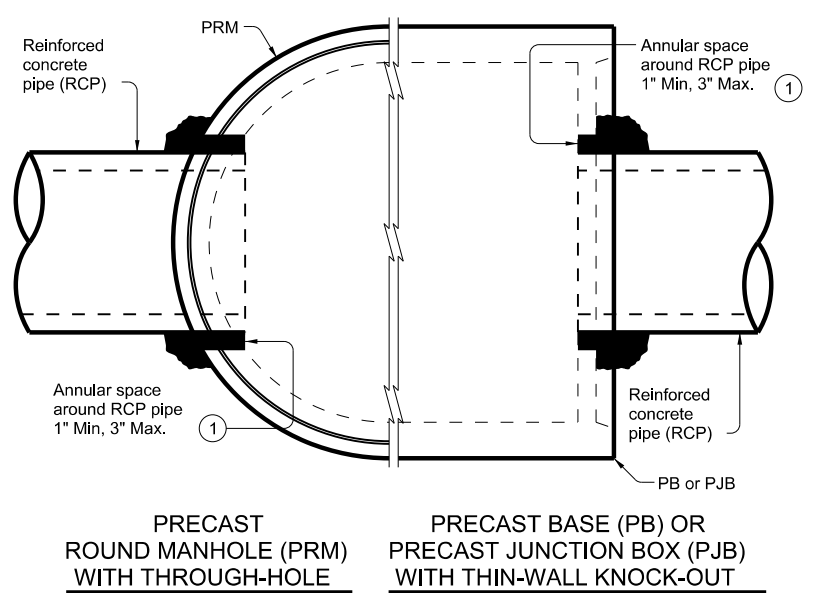
**GENERAL NOTES:**

1. Precast Base consists of base slab, base unit, risers (as required), reducing slab (as required), and reduced risers (as required). See sheet PDD for sizes.
2. Designed according to ASTM C913.
3. Payment for precast base is subsidiary to the specified inlet, per Item 465, "Junction Boxes, Manholes, and Inlets."

Cover dimensions are clear dimensions, unless noted otherwise.

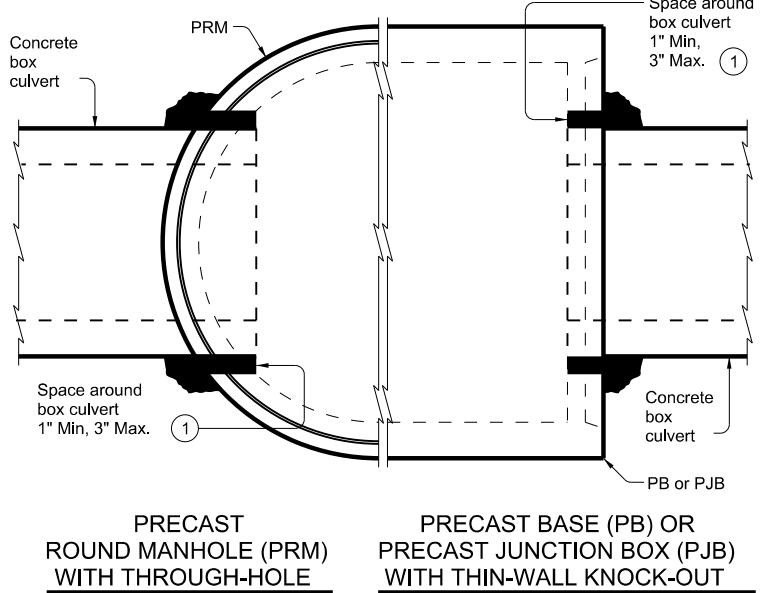
HL93 LOADING				 Bridge Division Standard
<b>PRECAST BASE</b>				
<b>PB</b>				
FILE: presto01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020		CONT	SECT	HIGHWAY
REVISIONS		0220	05	080 SH 48
		DIST	COUNTY	SHEET NO.
		PHR	CAMERON	190

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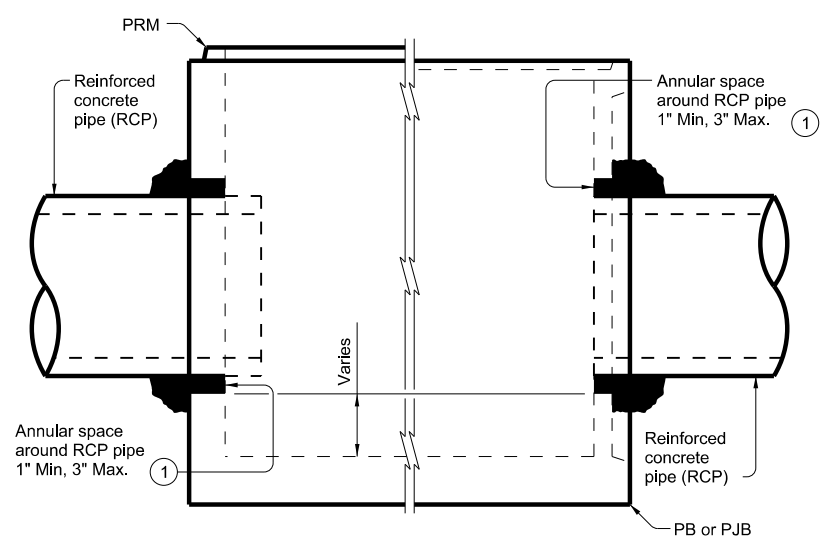
PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE  
 PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

TYPICAL HALF PLAN



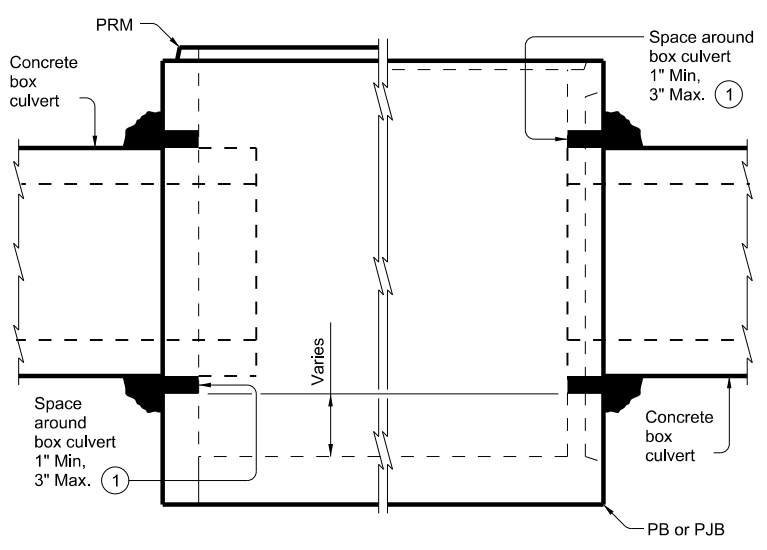
PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE  
 PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

TYPICAL HALF PLAN



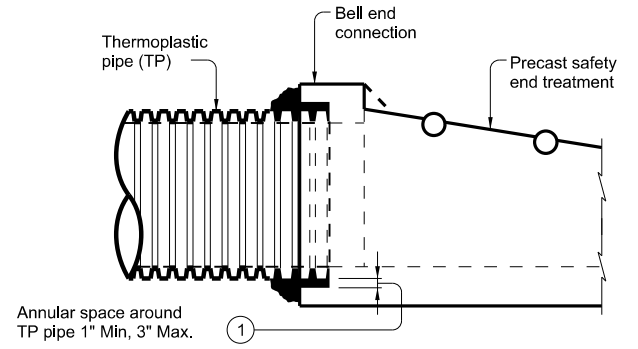
PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE  
 PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

TYPICAL HALF ELEVATION



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE  
 PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

TYPICAL HALF ELEVATION



TYPICAL PARTIAL ELEVATION OF PRECAST SAFETY END TREATMENTS  
 Showing square PSET for parallel drainage, cross drainage shown similar.

① Completely fill the void between the precast structure and the connecting pipe or box with cementitious grouts and mortars in accordance with DMS-4675 "Cementitious Grouts and Mortars for Miscellaneous Application".

**CONSTRUCTION NOTES:**  
 Do not grout rubber gasket joints without Manufacturer's recommendations.  
 Do not use bricks, masonry blocks, native stone, or similar materials in conjunction with grouted connections when filling void spaces around pipes or box culverts.

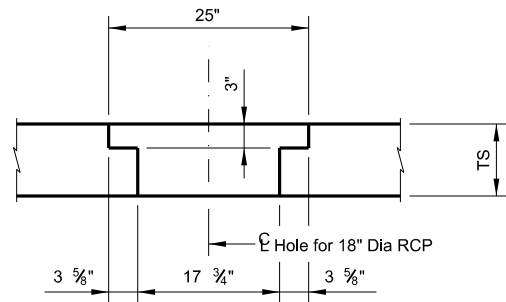
**MATERIAL NOTES:**  
 Provide grouted connections in accordance with DMS-4675 "Cementitious Grouts and Mortars for Miscellaneous Application".

**GENERAL NOTES:**  
 See applicable standards for notes and details not shown:  
 Precast Base (PB)  
 Precast Junction Box (PJB)  
 Precast Round Manhole (PRM)  
 Precast Safety End Treatments C/D Square (PSET-SC)  
 Precast Safety End Treatments P/D Square (PSET-SP)  
 Provide Concrete Box Culverts in accordance with Item 462 "Concrete Box Culverts and Drains".  
 Provide Reinforced Concrete Pipe (RCP) in accordance with Item 464 "Reinforced Concrete Pipe".  
 Provide Thermoplastic Pipe (TP) in accordance with Special Specification Thermoplastic Pipe.  
 Payment for grouted connections is considered subsidiary to other bid items.

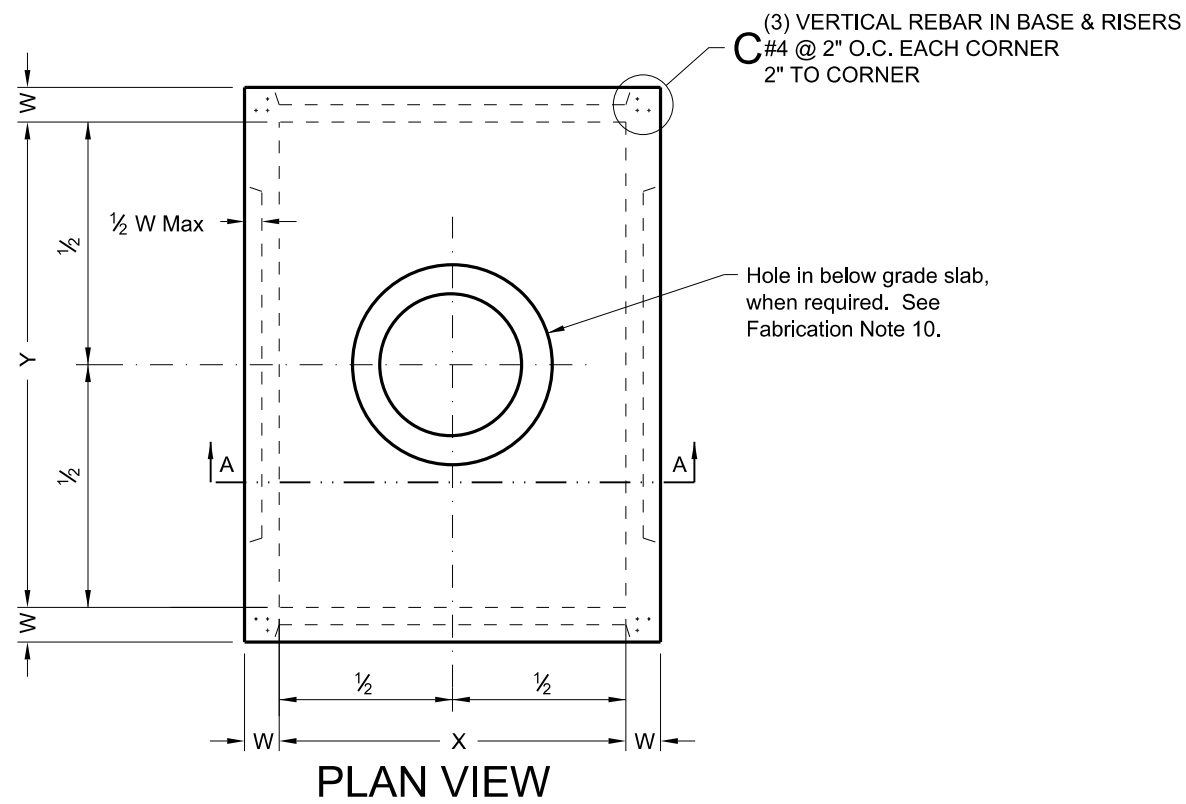
		Bridge Division Standard	
<b>PIPE AND BOX GROUTED CONNECTIONS FOR PRECAST STRUCTURES</b>			
<b>PBGC</b>			
FILE: pbgsstd1-20.dgn	DN: TxDOT	CK: TAR	DW: JTR
©TxDOT February 2020	CONT: 0220	SECT: 05	JOB: 080
REVISIONS	DIST: PHR		COUNTY: CAMERON
			SHEET NO. SH 48
			191

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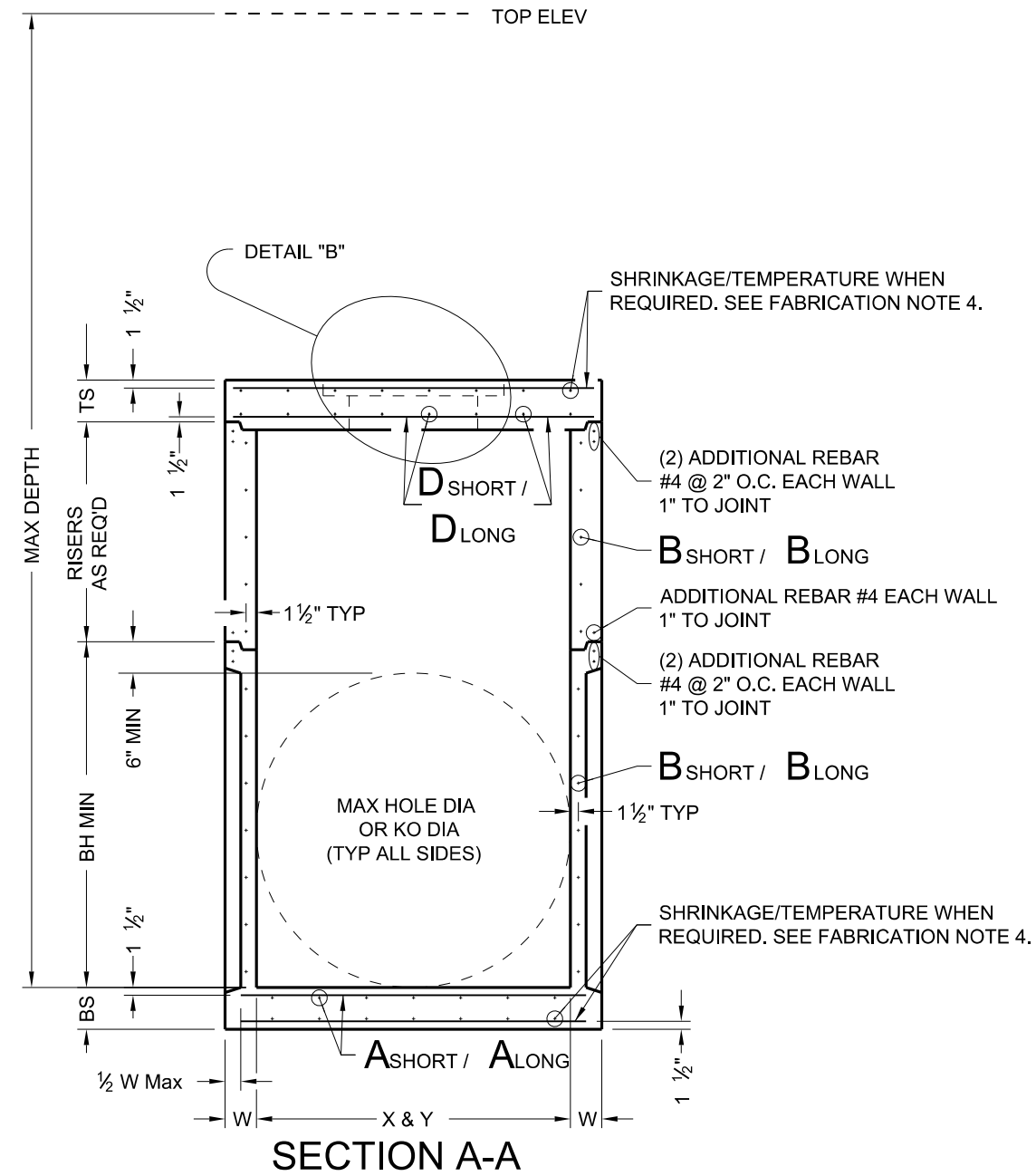
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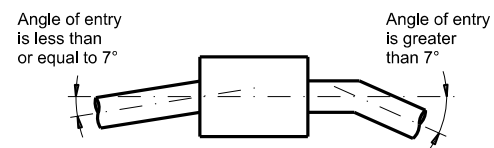
**DETAIL "B"**



**PLAN VIEW**



**SECTION A-A**



**PIPE CONNECTION DETAIL**

Connect pipes within 7° of normal to PJB wall. If necessary, use pipe elbow or curved approach alignment to stay within this limit.

**FABRICATION NOTES:**

1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWWR.
3. Provide typical clear cover of 1 1/2" 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<sup>2</sup>/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 3/4".
8. Provide lifting devices in conformance with Manufacturer's recommendations.
9. See sheet PDD for sizes, dimensions, and reinforcing steel not shown.
10. Provide hole in below grade slab only when PJB is installed with inlet type POD.

**INSTALLATION NOTES:**

1. Inverts (benching) to be provided by Contractor. Concrete or mortar used for invert is subsidiary to junction box.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or 1/2 the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. For rigid pipe, cut hole in thin wall panel (KO) 4" Max, 2" Min larger than pipe OD.
5. For flexible pipe, consult boot/seal Manufacturer's specification for placement tolerance and hole size. Center pipe in hole and install boot/seal per Manufacturer's specification.

**GENERAL NOTES:**

1. Precast Junction Box consists of base slab, base unit, risers (as required), and below grade slab. See sheet PDD for sizes.
2. Designed according to ASTM C913.
3. Payment for junction box is per Item 465 "Junction Boxes, Manholes, and Inlets" by type and size.

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING



**PRECAST JUNCTION BOX**

**PJB**

FILE: prestd09-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	192	

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Size	MAXDEPTH = 15 ft. to top of BASE SLAB											MAXDEPTH = 25 ft. to top of BASE SLAB											Min Height (See Gen Note 3)	Max HOLE DIA (See Fab Note 2)	Max KO DIA (See Fab Note 2)
	Base Slab			Base Unit or Riser Walls			Below Grade Slab (w/PJB) Reducing Slab (w/PB)				Base Slab			Base Unit or Riser Walls			Below Grade Slab (w/PJB) Reducing Slab (w/PB)								
	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Reduced Riser Size	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Reduced Riser Size	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	BH MIN	HOLE DIA			
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	KODIA		
ft.	in <sup>2</sup> /ft	in <sup>2</sup> /ft	in.	in <sup>2</sup> /ft	in <sup>2</sup> /ft	in.	ft. **	in <sup>2</sup> /ft	in <sup>2</sup> /ft	in.	in <sup>2</sup> /ft	in <sup>2</sup> /ft	in.	in <sup>2</sup> /ft	in <sup>2</sup> /ft	in.	ft. **	in <sup>2</sup> /ft	in <sup>2</sup> /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	4x4	0.46	0.37	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:**

- Maximum spacing of reinforcement is 8".
- 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:**

- Precast Junction Box consists of base slab, base unit, risers (as required), and below grade slab. See sheet PJB for details.
- 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.
- 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".

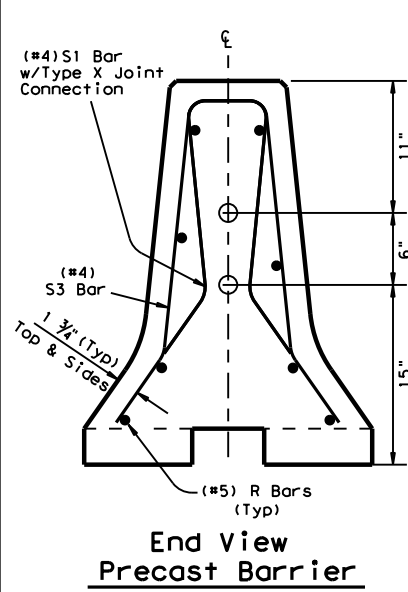
HL93 LOADING

<b>Texas Department of Transportation</b>					<b>Bridge Division Standard</b>				
<h2 style="margin: 0;">DESIGN DATA FOR PRECAST BASE AND JUNCTION BOX</h2> <p style="margin: 0;">PDD</p>									
FILE: prest10-20.dgn		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT				
©TxDOT February 2020		COMT	SECT	JOB	HIGHWAY				
REVISIONS		0220	05	080	SH 48				
DIST		COUNTY			SHEET NO.				
PHR		CAMERON			193				

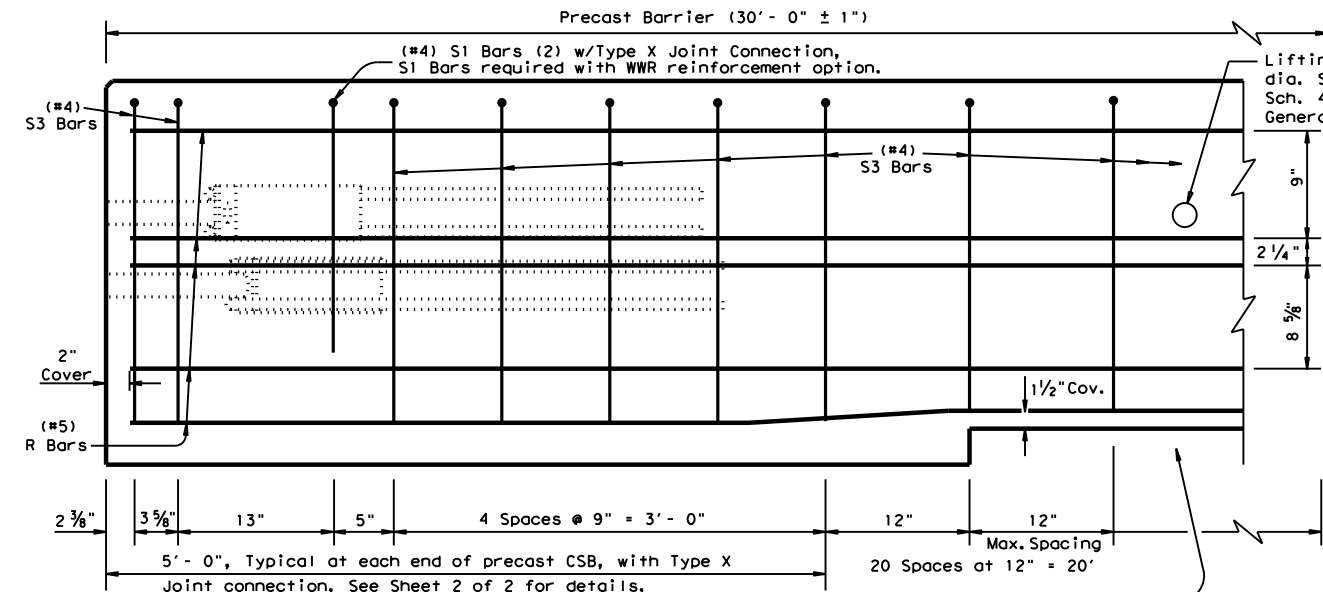


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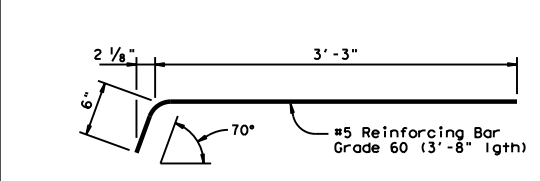
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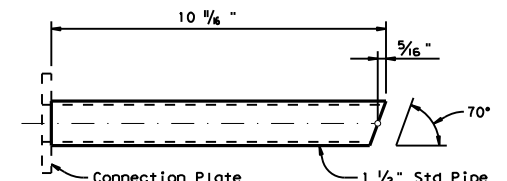
**End View Precast Barrier**  
 See sheet 2 of 3 for Joint connection Type X



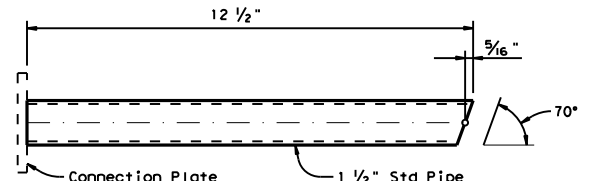
**Reinforcement for Precast (CSB) Concrete Safety Barrier (Type 1)**  
 Showing reinforcement for Joint Type X



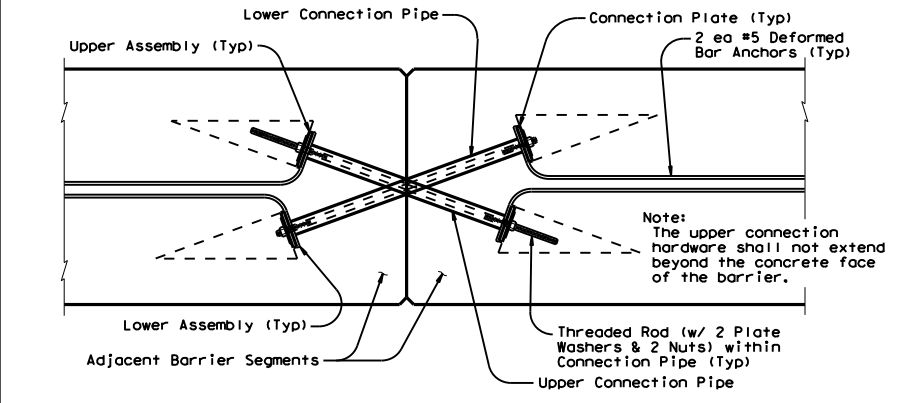
**DEFORMED BAR ANCHOR DETAILS**  
 Two (2) Bars required per assembly. Eight (8) required per joint.



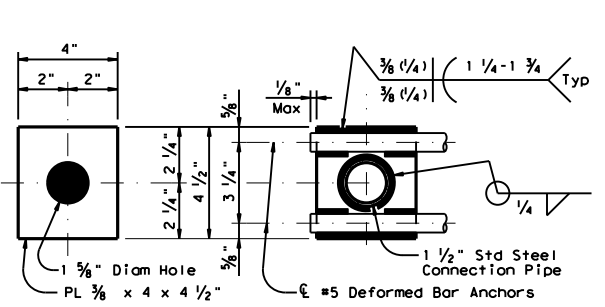
**UPPER CONNECTION PIPE DETAILS**  
 One (1) Steel Pipe required per Upper Assembly. Two (2) required per joint.



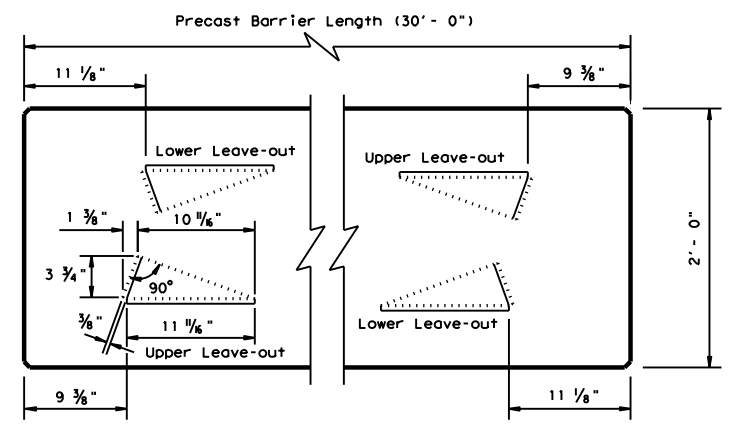
**LOWER CONNECTION PIPE DETAILS**  
 One (1) Steel Pipe required per Lower Assembly. Two (2) required per joint.



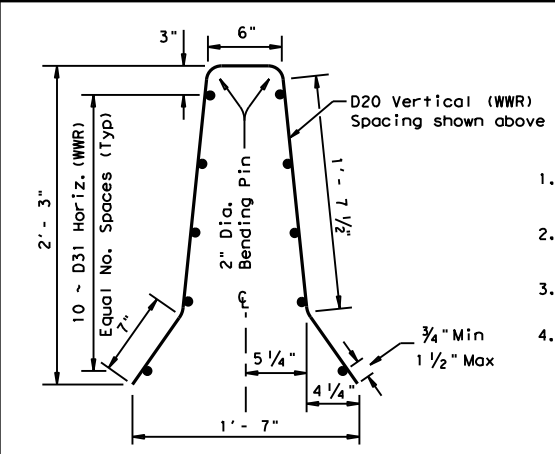
**TYPE X JOINT INSTALLATION DETAIL**  
 Barrier reinforcing and Type X Joint Leave-Out dimensions not shown for clarity.



**CONNECTION PLATE DETAILS**  
 One (1) Plate required per assembly. Four (4) required per joint. All steel fittings for joint Type X shall be galvanized after fabrication in accordance with Item 445.

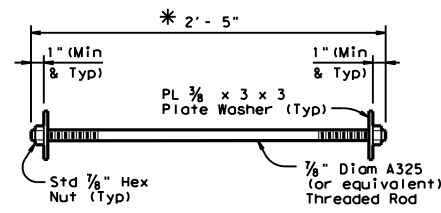


**BARRIER PLAN AT END JOINTS**

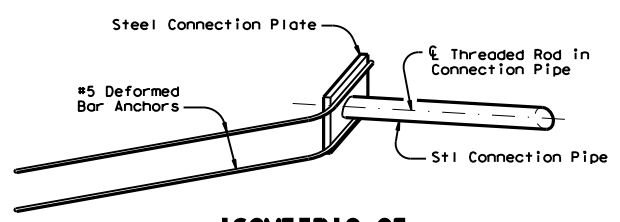


**Welded Wire Reinforcement (WWR) Option for Bars R and S3**  
 (WWR) General Notes

1. Deformed Welded Wire Reinforcement (WWR) shall conform to ASTM A497.
2. Welded wire cage may be cut or bent to accommodate the Type X joint connection and drainage slots, as directed by the Engineer.
3. All reinforcement shall comply with Item 440, "Reinforcing Steel."
4. Combinations of reinforcing steel and WWR will be permitted, as directed by the Engineer. The dimension from the end of the barrier section to the first wire shall not exceed 3".

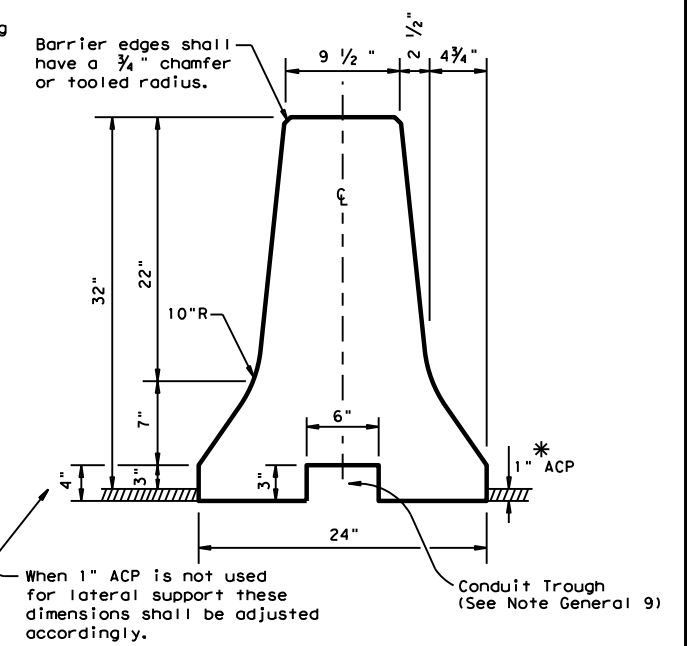
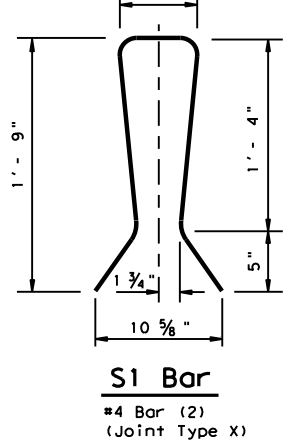
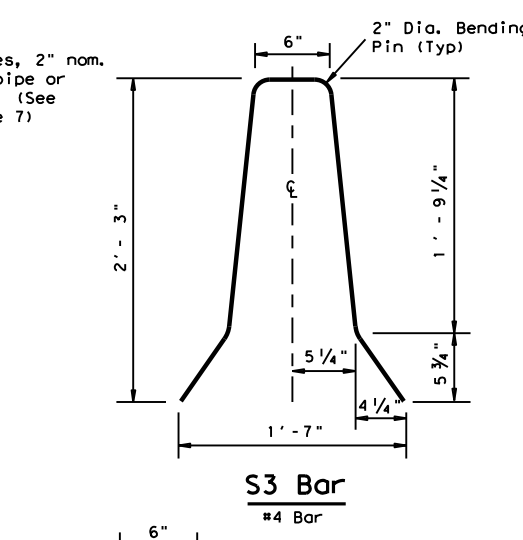


**CONNECTION BOLT OR THREADED ROD DETAIL**  
 Two (2) Threaded Rods (or Equivalent Hex Hd. Bolts) (w/ Two (2) PL 3/8 x 3 x 3 Plate Washers & Two (2) Std Hex Nuts) required per joint.



**ISOMETRIC OF TYPICAL WELDED ASSEMBLY**  
 Four (4) [2 Upper & 2 Lower] Assemblies required per joint.

Weight of one Precast 30 ft. (CSB) segment = Approx. 6.5 Tons or 440 lbs per ft.



**Concrete Safety Barrier**

\* When 1" ACP is "not" used as lateral support for permanent barrier placement. A permissible method of attaining the equivalent lateral support may be used, See CSB(6) sheet.

**GENERAL NOTES**

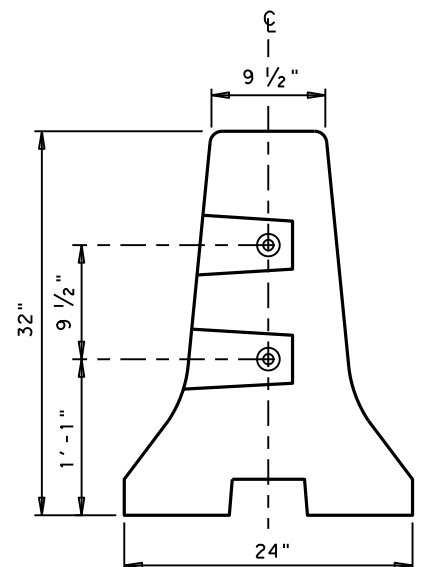
1. Concrete shall be Class H with a minimum compressive strength of 3,600 psi.
2. Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
3. Precast barrier length shall be 30 ft. unless otherwise specified on the plans.
4. All precast barrier edges shall have a 3/4 inch chamfer or tooled radius.
5. All concrete, reinforcement, joint connection systems, grout etc. as shown, are considered as part of the barrier payment.
6. All steel assemblies for joint shall be galvanized after fabrication in accordance with Item 445, "Galvanizing."
7. Regardless of the method of handling, barrier lifting points shall be approx. 7.5 feet from the ends of the barrier. Lifting devices and attachments to barrier sections shall be approved by the Engineer.
8. Surface finishing and grouting (where required) shall be two parts sand one part cement with enough water to make the mixture plastic. Grouting shall be done in a manner that will assure a smooth surface. Surface finishing shall be considered subsidiary to the various bid items involved.
9. Conduit trough when required shall be shown elsewhere on the plans, or as directed by the Engineer.

SHEET 1 OF 2

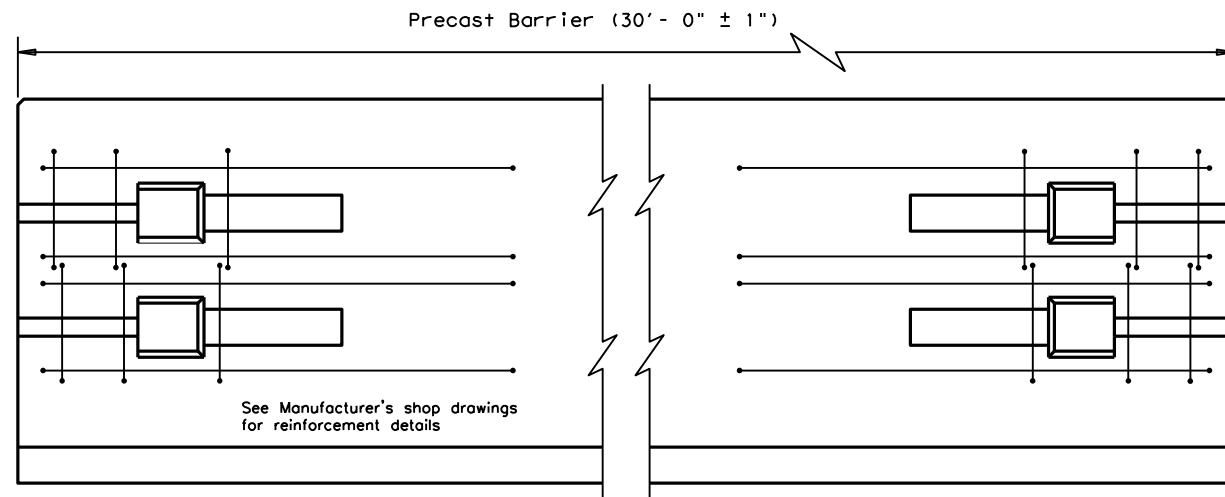
		Design Division Standard	
<b>CONCRETE SAFETY BARRIER (F-SHAPE)</b>			
PRECAST BARRIER (TYPE 1)			
<b>CSB(1)-10</b>			
FILE: csb110.dgn	DN: TxDOT	CK: AM	DW: BD
©TxDOT December 2010	CONT	SECT	JOB
REVISIONS	0220	05	080
DIST	COUNTY	SHEET NO.	
PHR	CAMERON	194	

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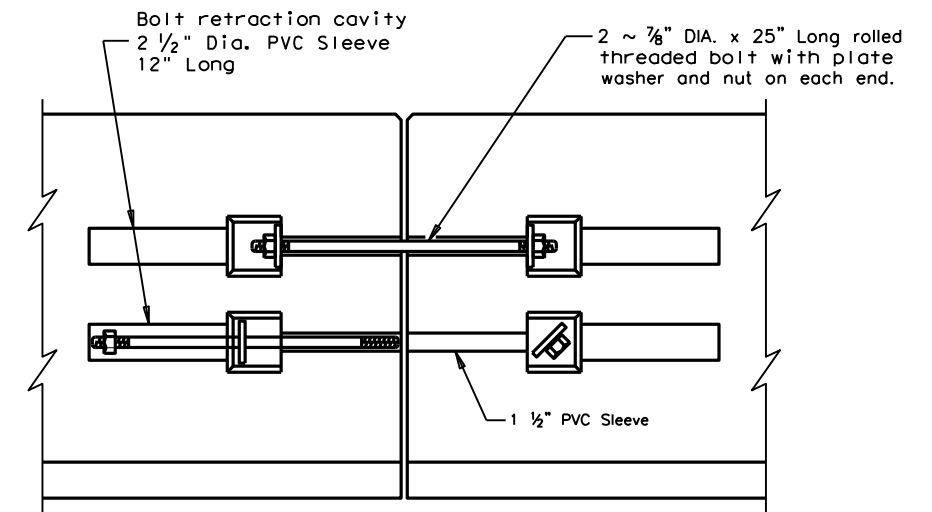
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**END VIEW (CSB) QUICK-BOLT**  
 QUICK-BOLT POCKET LOCATIONS

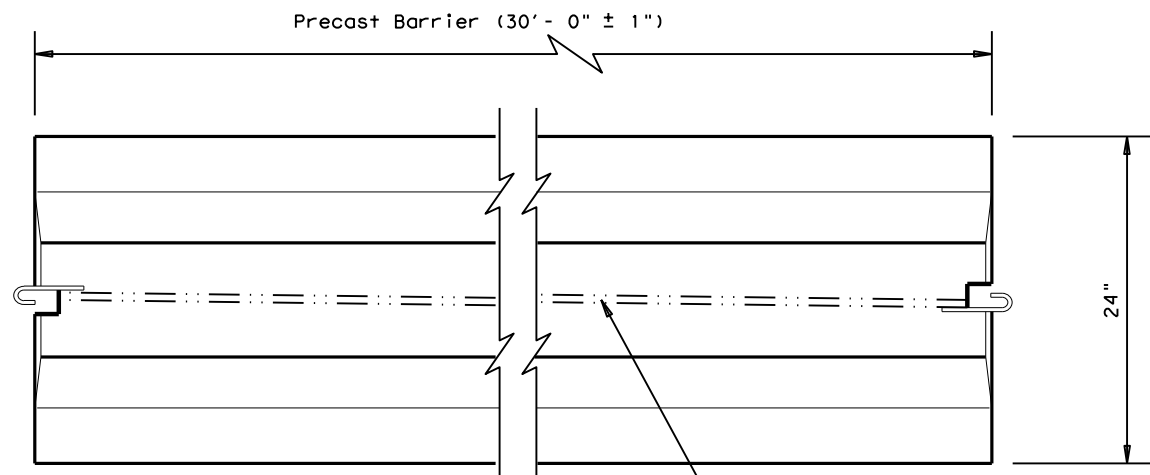


**ELEVATION (CSB) QUICK-BOLT**  
 See Manufacturer's shop drawing for additional details

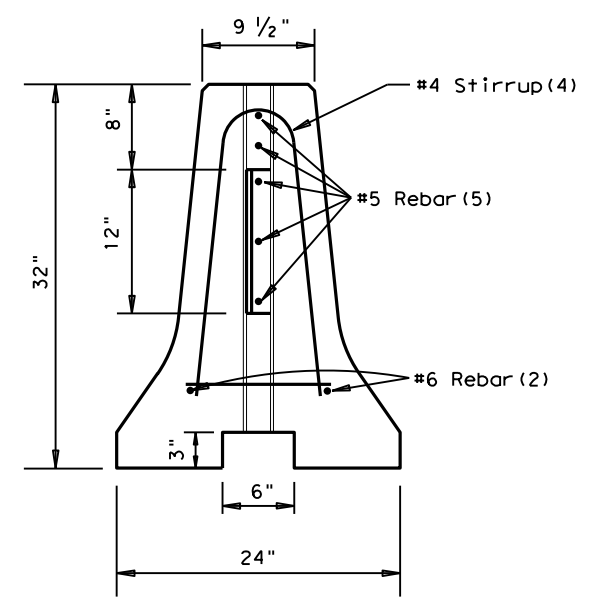


**ELEVATION VIEW SHOWING JOINT CONNECTION**  
 "QUICK-BOLT"

**Joint Connection (Type Q)**

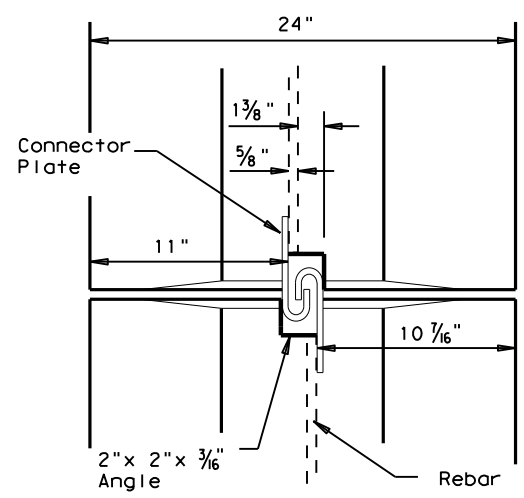


**TOP VIEW**  
**PRECAST (CSB) WITH J-J HOOKS**  
 See Manufacturer's shop drawing for additional details



**END VIEW**  
**J-J HOOK CONNECTION**

**Joint Connection (Type J)**



**VIEW FROM ABOVE**  
**J-J HOOK CONNECTION**

**Proprietary Joint Connections (CSB)**

Two proprietary joint connections are acceptable as alternates to the (Type X) connection shown, here on. These joint connections types are:

J-J Hooks by Easi-Set Industries, (800)547-4045  
 Quick-Bolt by Bexar Concrete, (210)497-3773

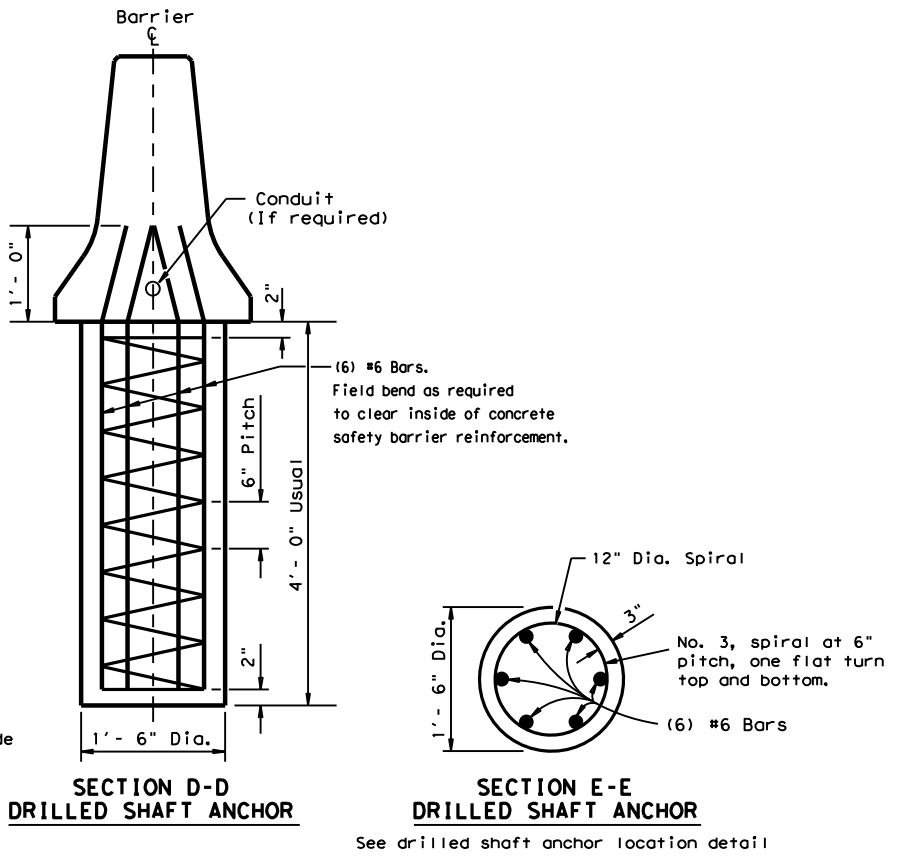
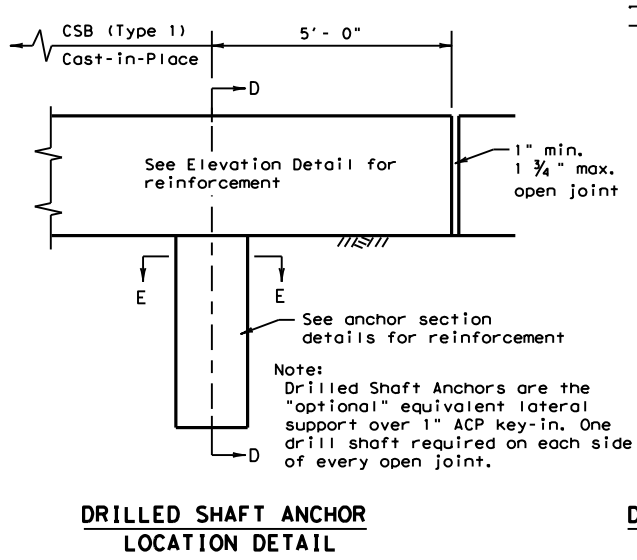
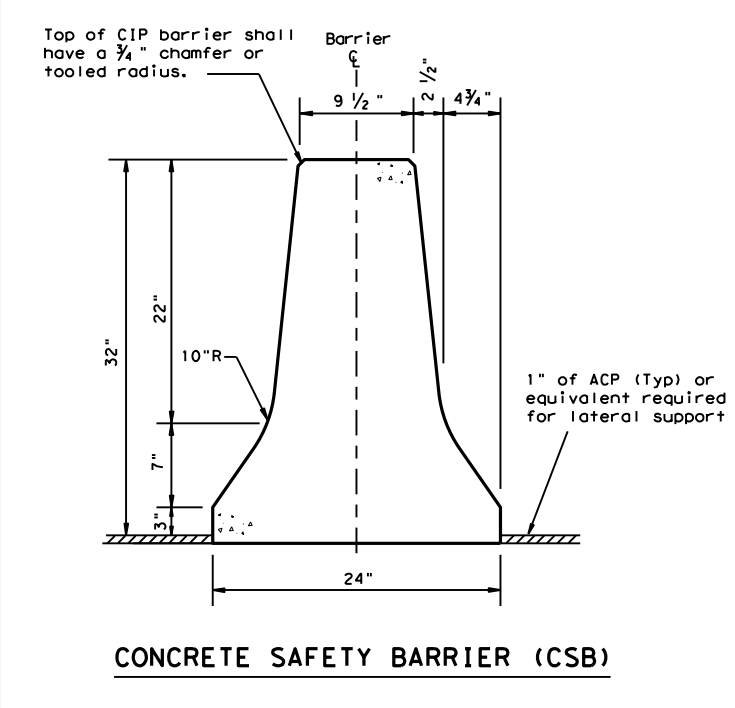
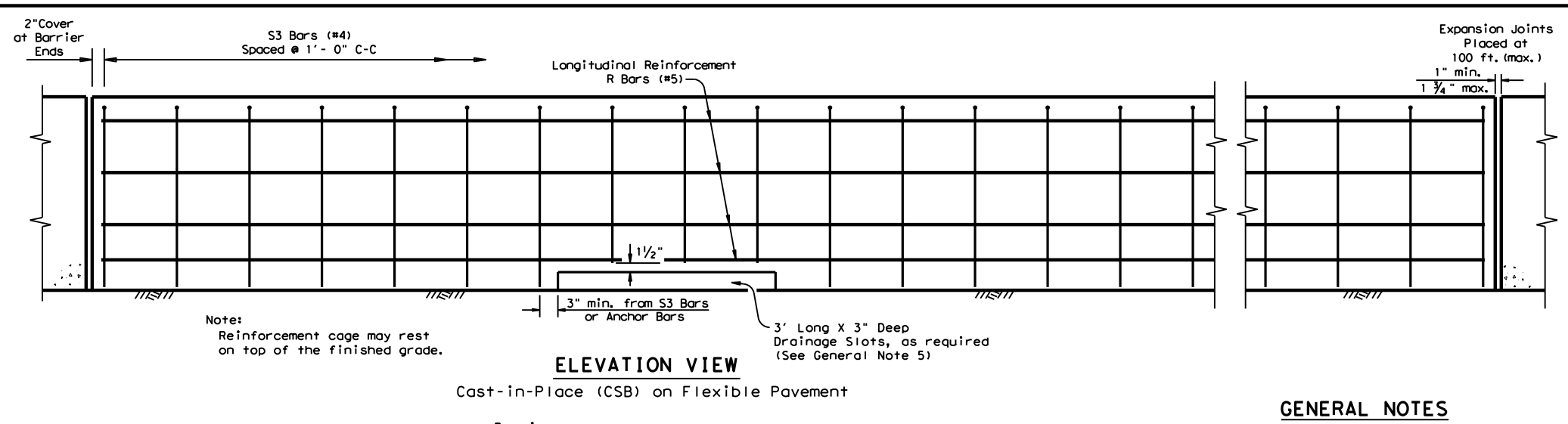
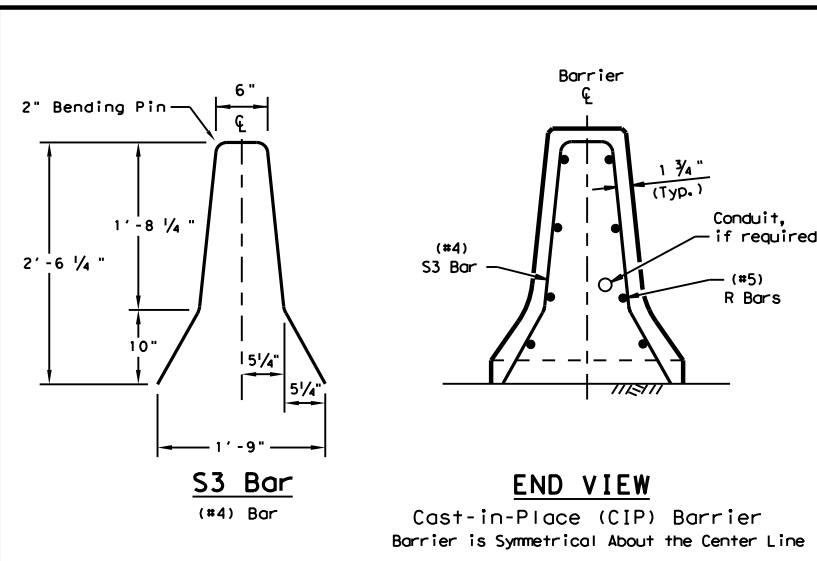
If one of these connection systems are exclusively specified in the plans, prior approval for sole source use must be obtained. Details of the connection components and barrier reinforcement for these systems, will be shown on the manufacturer's shop drawing(s) furnished to the Engineer.

SHEET 2 OF 2

		<i>Design Division Standard</i>	
<b>CONCRETE SAFETY BARRIER (F-SHAPE)</b> <b>PRECAST BARRIER (TYPE 1)</b> <b>CSB(1)-10</b>			
FILE: csb110.dgn	DN: TxDOT	CK: AM	DW: BD
© TxDOT December 2010	CONT SECT	JOB	HIGHWAY
REVISIONS	0220 05	080	SH 48
DIST	COUNTY	SHEET NO.	
PHR	CAMERON	195	

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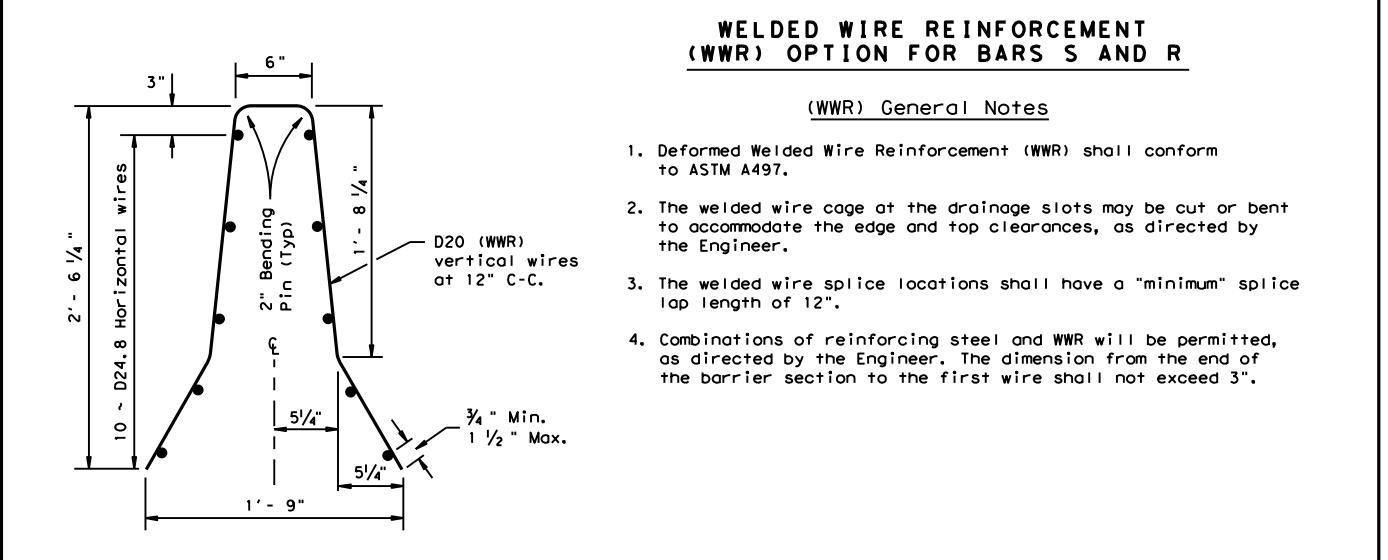
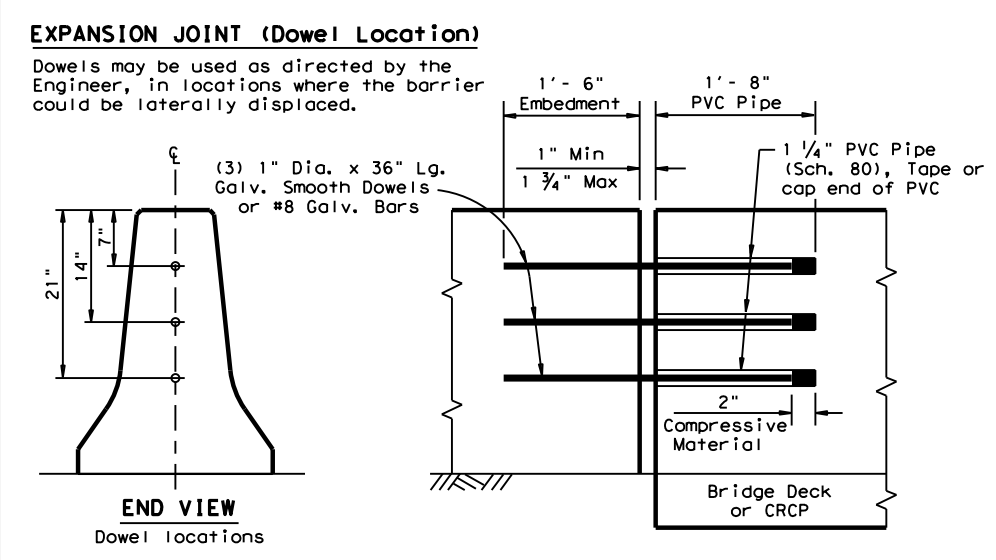


- GENERAL NOTES**
- Concrete shall be Class C, unless otherwise specified in the plans.
  - Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
  - Axis of cast-in-place barrier shall be vertical, except where roadway is superelevated, then axis is normal to roadway surface.
  - Top edges of cast-in-place barrier shall have a 3/4" chamfer or tooled radius.
  - Drainage slot depths may be increased 1" to accommodate ACP. Slot locations (12'-0", C-C Min. Spacing) are shown elsewhere, or as directed by the Engineer.
  - Cast-in-place barrier may be slip formed. Bracing may be tied or tack welded to the reinforcement cage to provide cage stability. Do not weld to anchor bars. The reinforcement cage may rest on top of the finished grade.
  - For locations where lighting is required, see the CSB(4) sheet for the proper reinforcement and anchorage.

**Cast-In-Place or Slip-Formed (CSB)**

Cast-in-Place barrier may be connected to precast CSB. Joint connection "Types" may be used in Cast-in-Place barrier, to match the precast barrier connection. (See required connection "Type" elsewhere in the plans)

The weight of Cast-in-Place (CSB) (F-Shape) is approx. 440 lbs per ft.

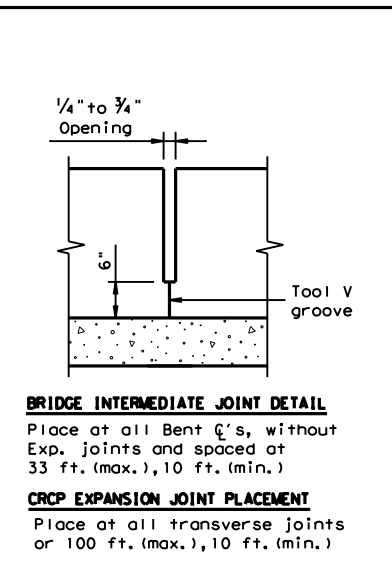
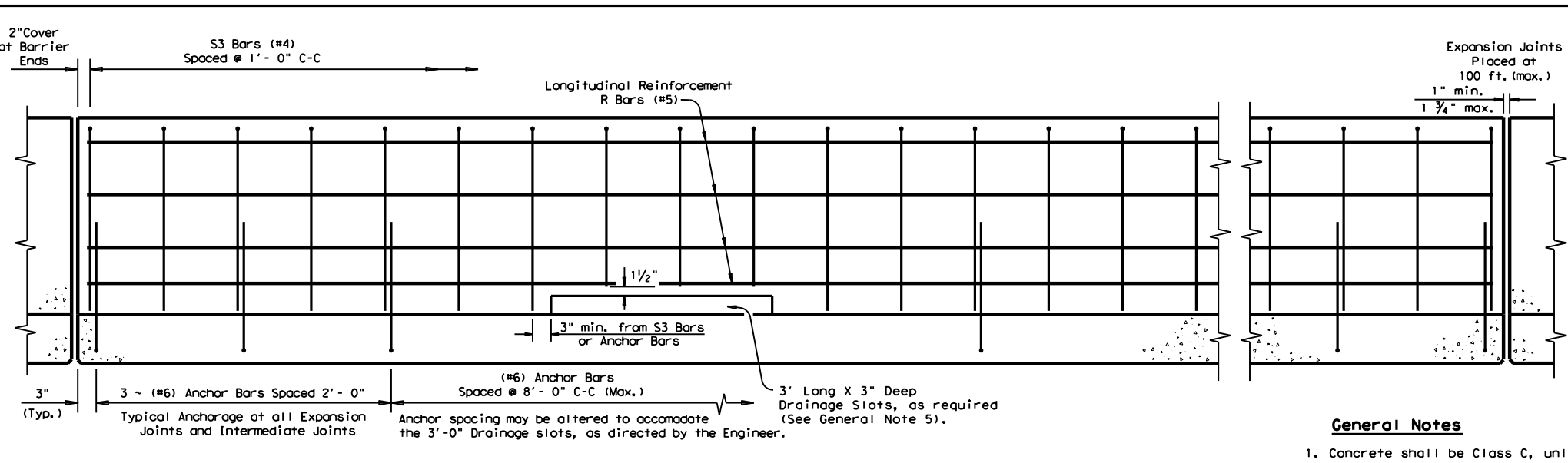
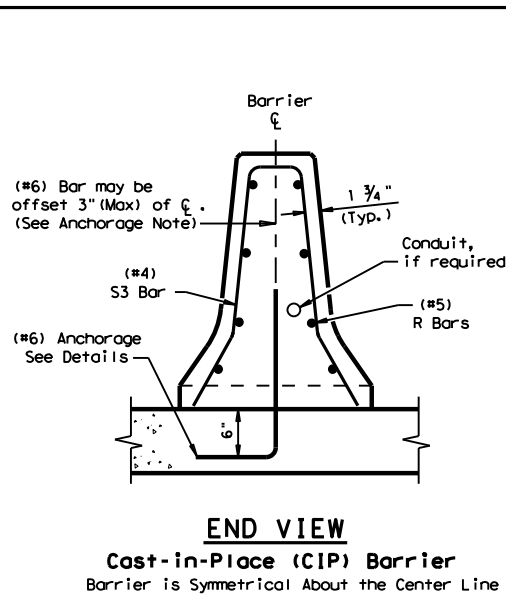


Texas Department of Transportation  
 Design Division Standard

**CONCRETE SAFETY BARRIER (F-SHAPE) CAST-IN-PLACE (TYPE 1) (FLEXIBLE PAVEMENT) CSB (2) - 13**

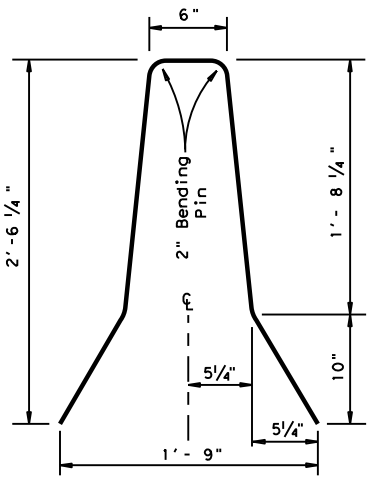
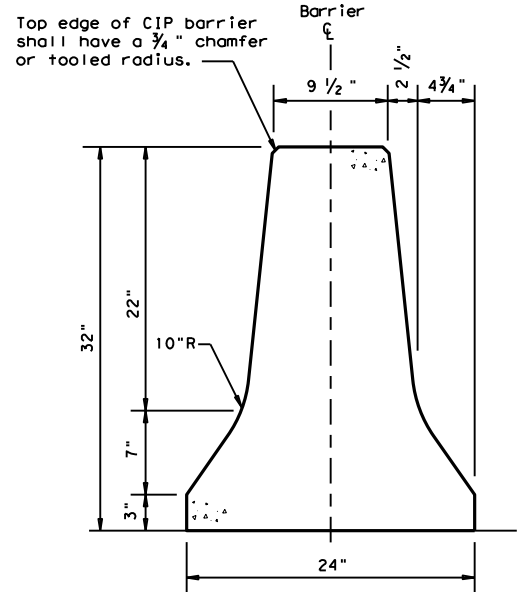
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©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
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PHR	CAMERON	196		

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**General Notes**

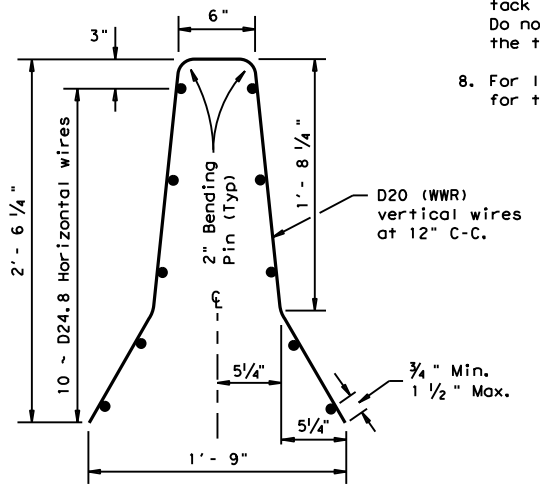
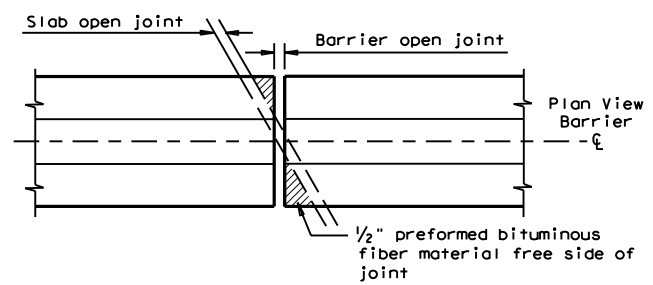
- Concrete shall be Class C, unless otherwise specified in the plans.
- Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615. If the bridge deck requires epoxy "coated" reinforcement, the barrier and/or anchorage may require the same, as shown elsewhere in the plans.
- Axis of cast-in-place barrier shall be vertical, except where the roadway is superelevated, then axis shall be normal to roadway surface.
- Top edges of cast-in-place barrier shall have a 3/4" chamfer or tooled radius.
- Anchorage: The "Optional" Anchor system shall be embedded 6" into fresh concrete or using a Type III, Class C Epoxy anchorage system. Follow the manufacturer's directions for installing the expoxied anchor bars. All anchorage shown is the minimum required, and considered subsidiary to the bid item.
- Drainage slot depths may be increased 1" to accommodate ACP. Slot locations (12'-0", C-C Min. Spacing) are shown elsewhere, or as directed by the Engineer.
- Cast-in-place barrier may be slip formed. Bracing may be tied or tack welded to the reinforcement cage to provide cage stability. Do not weld to anchor bars. The reinforcement cage may rest on the top of the finished grade.
- For locations where lighting is required, see the CSB(4) sheet for the proper reinforcement and anchorage.



Note: Reinforcement cage may rest on top of the finished grade.

**BARRIER PLACEMENT OVER (CRCP) JOINTS**

Barrier may be cast over a "Longitudinal" CRCP joint.  
 CRCP Joints (with or without tiebars): Two layers of 30# roofing felt or 1/2" preformed bituminous fiber material.  
 Barrier Anchorage Note: Anchorage must be located at least 3" from a longitudinal joint.



**Welded Wire Reinforcement (WWR) Option for Bars S and R**

**(WWR) General Notes**

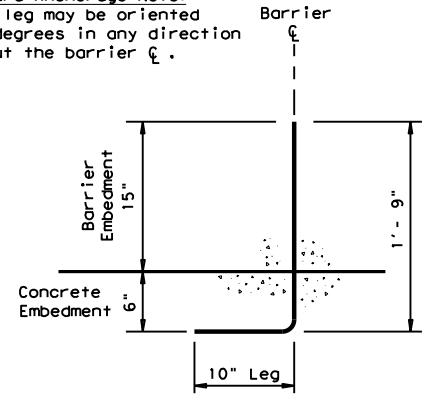
- Deformed Welded Wire Reinforcement (WWR) shall conform to ASTM A497.
- The welded wire cage at the drainage slots may be cut or bent to accommodate the edge and top clearances, as directed by the Engineer.
- The welded wire splice locations shall have a "minimum" splice lap length of 12".
- Combinations of reinforcing steel and WWR will be permitted, as directed by the Engineer. The dimension from the end of the barrier section to the first wire shall not exceed 3".

**Cast-In-Place or Slip-Formed (CSB)**

Cast-in-Place barrier may be connected to precast CSB. Joint connection "Types" may be used in Cast-in-Place barrier, to match the precast barrier connection. (See required connection "Type" elsewhere in the plans)

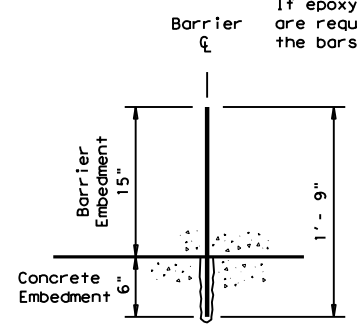
The weight of Cast-in-Place (CSB) (F-Shape) is approx. 440 lbs per ft.

**Standard Anchorage Note:**  
 10" leg may be oriented 90 degrees in any direction about the barrier centerline.

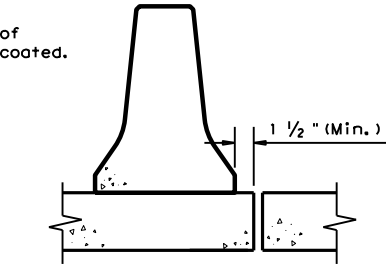


Concrete Pavement / Bridge Deck Anchorage:  
 Cast-in-Place or Slip-Formed Barrier  
 (See General Note 2)

**Epoxy Note:**  
 If epoxy coated anchor bars are required, the lower 6" of the bars must not be epoxy coated.



Fresh insertion method or Type III, Class C Epoxy Method  
 Concrete Pavement / Bridge Deck Anchorage:  
 Cast-in-Place or Slip-Formed Barrier  
 (See General Notes 2 & 5)



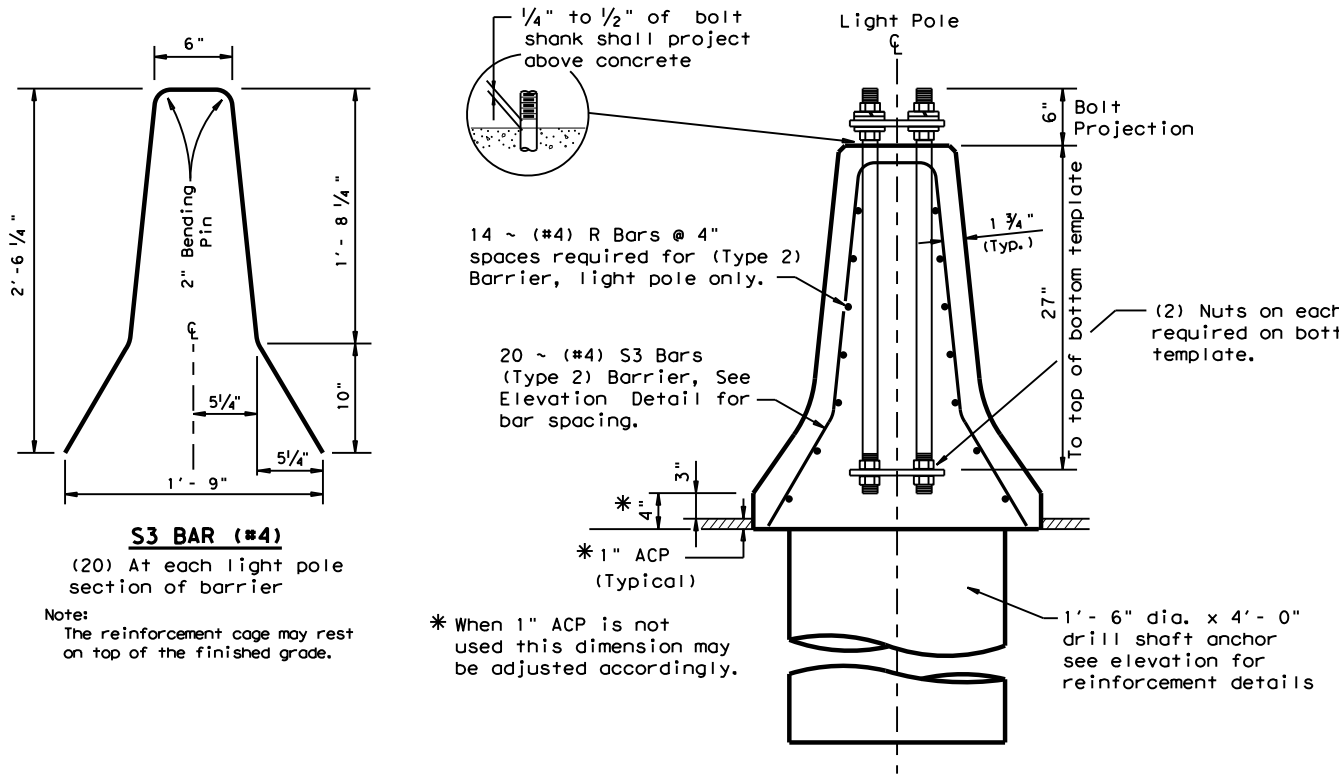
**Minimum Edge Distance From Longitudinal Joint**

Placement over a longitudinal bridge joint is not recommended.

		<b>Design Division Standard</b>	
<b>CONCRETE SAFETY BARRIER (F-SHAPE) CAST-IN-PLACE (TYPE 1) (BRIDGE DECK or CRCP) CSB(3) - 16</b>			
FILE: csb316.dgn	DW: TxDOT	CK: HC/AN	CK: KM
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	0220	05	080
CST 01-2016	DIST	COUNTY	SHEET NO.
	PHR	CAMERON	197

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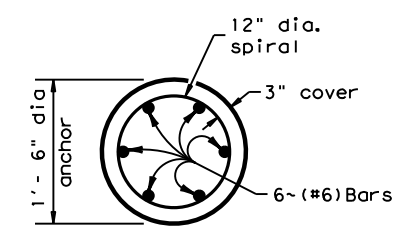


**(ROADWAY) SECTION AT LIGHT POLE**  
 Symmetrical about center line

Schedule of reinforcement for each 10 foot cast-in-place section at light poles (excluding anchorage)

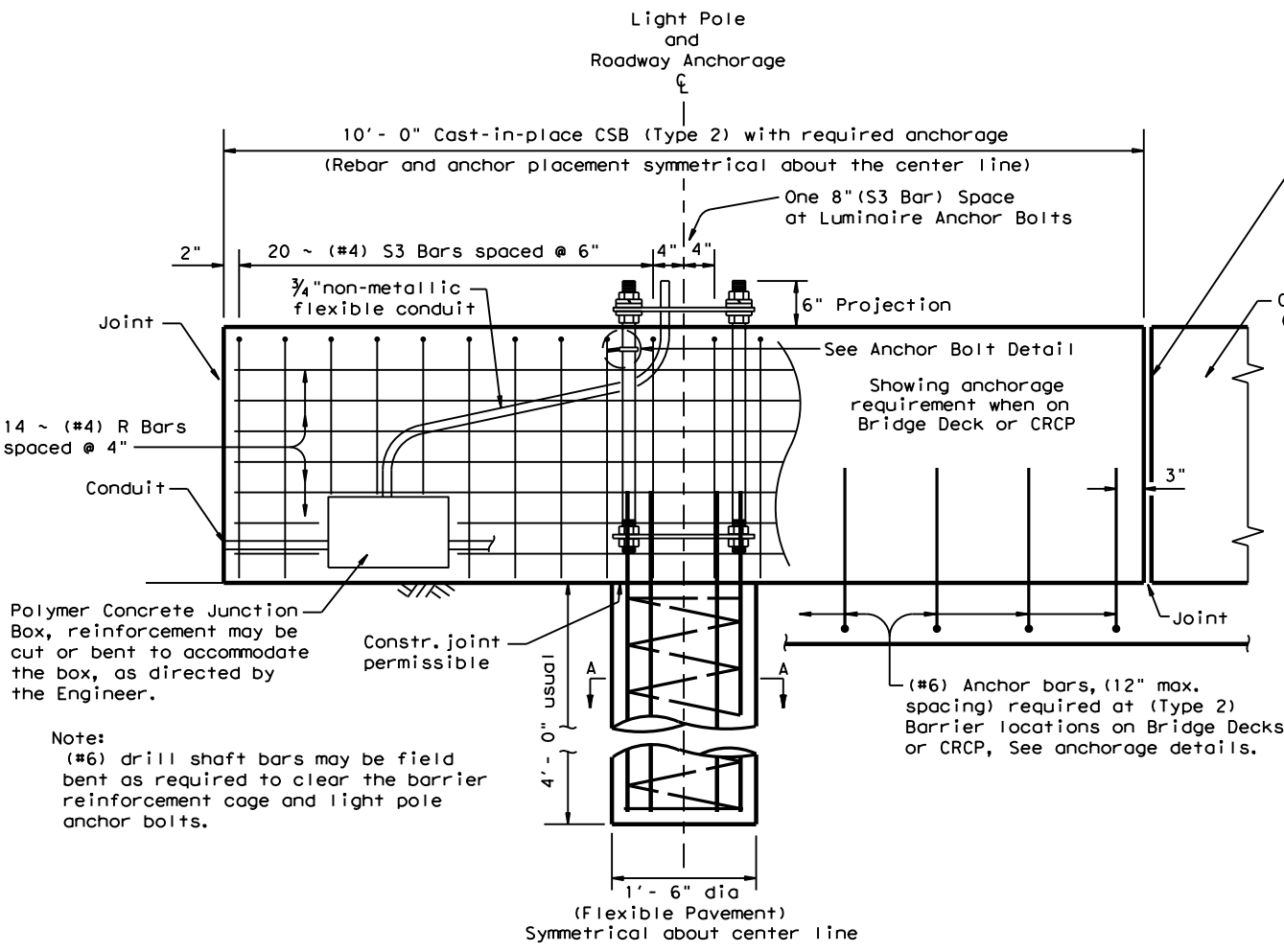
BAR	SIZE	QUANTITY
S3	#4	20
R	#4	14

**Welded Wire Reinforcement (WWR) IS NOT APPROVED FOR USE WITH (TYPE 2) BARRIER.**



No.3 spiral at 6" pitch (one flat turn top and bottom)

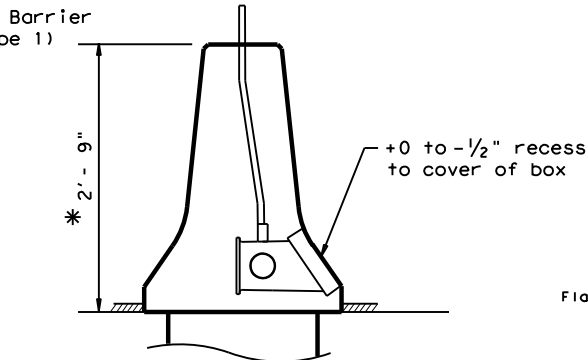
**SECTION A-A**



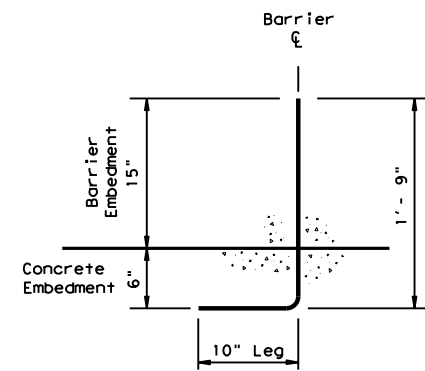
**ELEVATION SHOWING THE REQUIRED REINFORCEMENT AND ANCHORAGE OF (TYPE 2) BARRIER**

The "Drilled Shaft Anchor" is the required anchorage for (Type 2) barrier on roadways with Flexible Pavement. The #6 Anchor Bars (Shown) is the required anchorage for (Type 2) barrier on Bridge Decks and CRCP.

Each end of cast-in-place light pole section shall be formed to mate with the adjacent precast (Type 1) roadway barrier. The cast-in-place section shall be connected at each end to the precast sections in the same manner that precast sections are connected at joints as shown elsewhere.



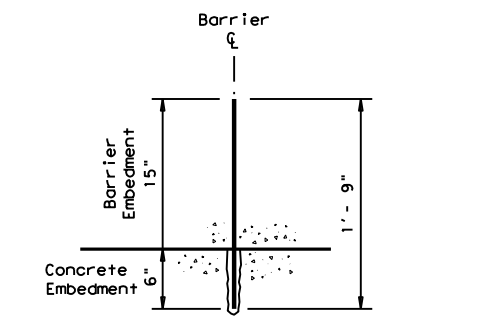
**SECTION SHOWING JUNCTION BOX CONCRETE SAFETY BARRIER (TYPE 2)**



**STANDARD "CONCRETE" ANCHORAGE**

(#6) Bar  
 Concrete Pavement / Bridge Deck Anchorage: Cast-in-Place or Slip-Formed Barrier

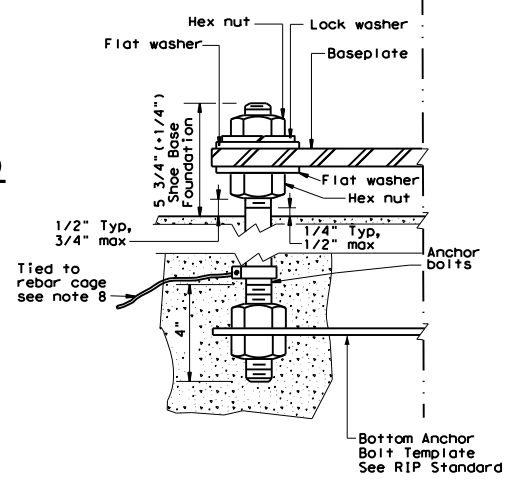
**Standard Anchorage Note:**  
 10" leg may be oriented 90 degrees in any direction about the barrier centerline.



**"OPTIONAL" EPOXY ANCHORAGE**

(#6) Bar  
 Type III, Class C Epoxy  
 Concrete Pavement / Bridge Deck Anchorage: Cast-in-Place or Slip-Formed Barrier

**Epoxy Note:**  
 If epoxy coated anchor bars are required, the lower 6" of the bars must not be epoxy coated.



**ANCHOR BOLT DETAIL**

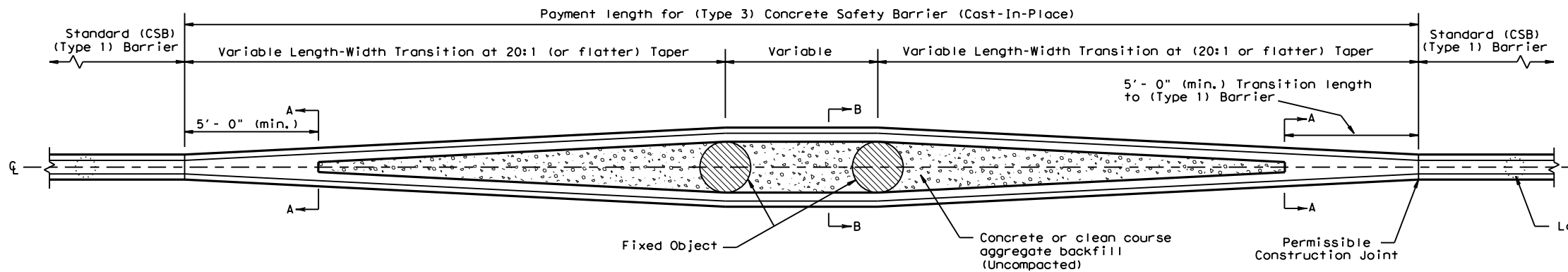
Texas Department of Transportation  
 Design Division Standard

**CONCRETE SAFETY BARRIER (F-SHAPE) CAST-IN-PLACE (TYPE 2) AT LIGHT POLE TL-3 MASH COMPLIANT CSB(4) - 19**

FILE: csb419.dgn	DN: TxDOT	CK: KM	DW: BD	CK:
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DIST	COUNTY	SHEET NO.		
PHR	CAMERON	198		

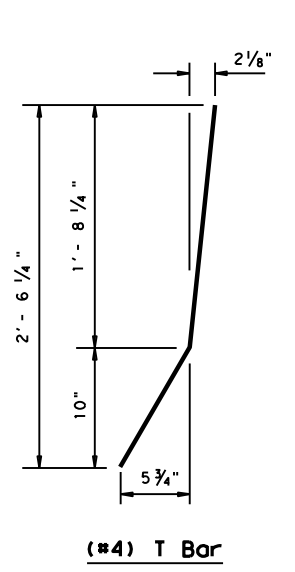
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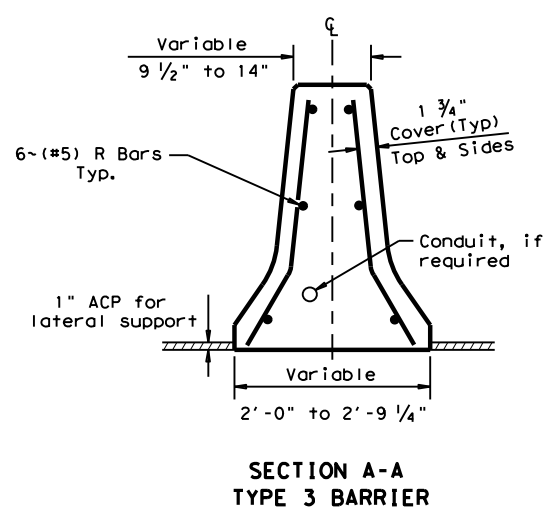


PLAN (TYPE 3) BARRIER

Lateral Support Options:  
 a) 1" ACP, both sides of barrier, or  
 b) 18" dia x 48" deep Drill Shaft, See CSB(2) sheet, or  
 c) Rebar Anchorage, See CSB(3) sheet.

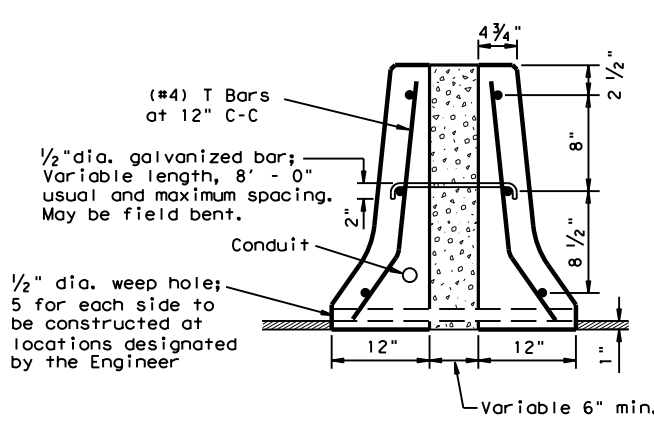


(#4) T Bar



SECTION A-A  
TYPE 3 BARRIER

Note:  
 Bottom of the reinforcement cage shall rest on top of the finished grade.



SECTION B-B  
TYPE 3 BARRIER

Note:  
 Outside face dimensions and slopes for (Type 3) CSB are the same as for (Type 1) CSB.

GENERAL NOTES

- Axis of concrete barrier shall be vertical, except where roadway is superelevated, then axis shall be normal to roadway surface.
- All steel that requires galvanizing shall be in accordance with Item 445, "Galvanizing."
- Unless otherwise shown in the plans the contractor has the option of placing either precast or cast-in-place (Type 1) CSB.
- Bid price per liner foot of (Type 1) CSB and (Type 3) CSB, including terminal and anchor sections, shall include all of the concrete, reinforcement, drilled shaft foundations and aggregate backfill.
- All concrete shall be Class C.
- Longitudinal and vertical bars for roadway barrier shall conform to ASTM A615 (Grade 60), unless otherwise specified.
- At construction joints the longitudinal bars shall extend beyond the joint so that bar splices will be a minimum of two feet from the construction joint.
- Welded wire reinforcement (WWR) may be used as an option to conventional reinforcement and shall meet area requirement for the (Type 3) R and T bars.
- Any method devised by the contractor and approved by the Engineer that will assure the longitudinal steel for (Type 1) CSB and (Type 3) CSB will be positioned  $\pm 1/2$  inch as dimensioned will be satisfactory.
- Conduit to be provided only when called for elsewhere in the plans. Position of conduit may be adjusted to facilitate construction subject to the approval of the Engineer.
- See CSB(4) standard for barrier with illumination.

**Welded Wire Reinforcement (WWR) Option  
for Bars T and H1 (Type 3) Barrier**

**(WWR) General Notes**

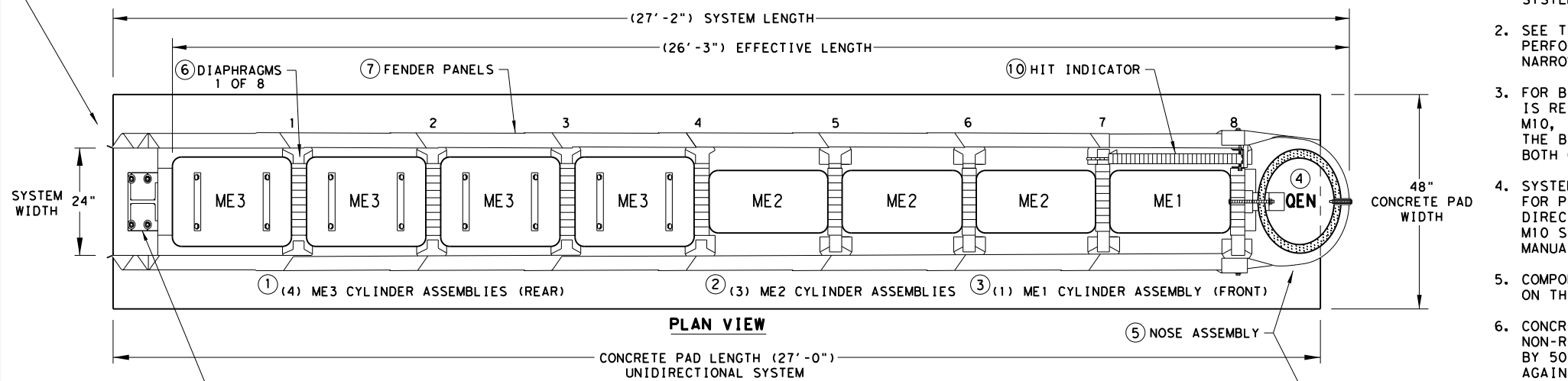
- WWR design required for (Type 3) CSB barrier: D20 vertical (12" C-C) x D31 horizontal wires spaced as shown in Section B-B.
- Deformed Welded Wire Reinforcement (WWR) shall conform to ASTM A497.
- Welded wire cage may be cut and bent to accommodate the drainage slots, as directed by the Engineer.
- Welded wire splice locations shall have a "minimum" splice lap length of 12".
- Combinations of reinforcing steel and WWR will be permitted, as directed by the Engineer. The dimension from the end of the barrier section to the first wire shall not exceed 3".

				Design Division Standard	
<b>CONCRETE SAFETY BARRIER (F-SHAPE) CAST-IN-PLACE (TYPE 3) AT FIXED OBJECTS CSB(6) - 10</b>					
FILE: csb610.dgn	DN: TxDOT	CK: AM	DW: BD	CK:	
© TxDOT December 2010	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0220	05	080	SH 48	
DIST	COUNTY		SHEET NO.		
PHR	CAMERON		199		

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NOTE:  
 A TRANSITION MAY BE REQUIRED TO INSTALL THE QUADGUARD ELITE M10 TO THE OBJECT BEING SHIELDED.

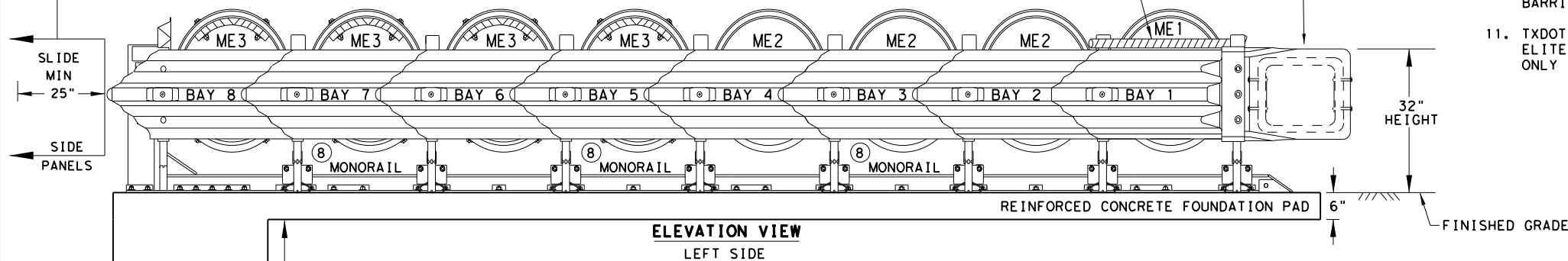
### QUADGUARD ELITE M10 24" WIDE (8 BAY) SYSTEM



KEY		KEY	
①	ME3 CYLINDER ASSEMBLIES	⑥	DIAPHRAGMS
②	ME2 CYLINDER ASSEMBLIES	⑦	FENDER PANELS
③	ME1 CYLINDER ASSEMBLY	⑧	MONORAILS
④	QEN CYLINDER	⑨	TYPE OF BACKUP
⑤	NOSE BELT ASSEMBLY	⑩	HIT INDICATOR

NOTE:  
 HIT INDICATOR WILL RAISE UPON IMPACT.

NOTE:  
 PROVISION SHALL BE MADE FOR REAR FENDER SIDE PANELS TO SLIDE REARWARD UPON IMPACT, 25" MIN.



NOTES:  
 CONTACT THE MANUFACTURER WITH SITE SPECIFIC DATA (SSD) FOR CONCRETE PAD AND ANCHOR BLOCK INSTALLATION REQUIREMENTS.

A MANUFACTURER'S DRAWING PACKAGE UNIQUE AND SPECIFIC FOR THE QUADGUARD ELITE M10 FIELD INSTALLATION AND INFORMATION REGARDING THE TYPE OF BACKUP ASSEMBLY REQUIRED FOR THE TRANSITION WILL BE PROVIDED BY THE MANUFACTURER TO THE ENGINEER AND INSTALLER.

6" REINFORCED CONCRETE PAD REQUIRES THE INSTALLATION OF AN ANCHOR BLOCK AS SHOWN ON THE MANUFACTURER'S DRAWING PACKAGE.

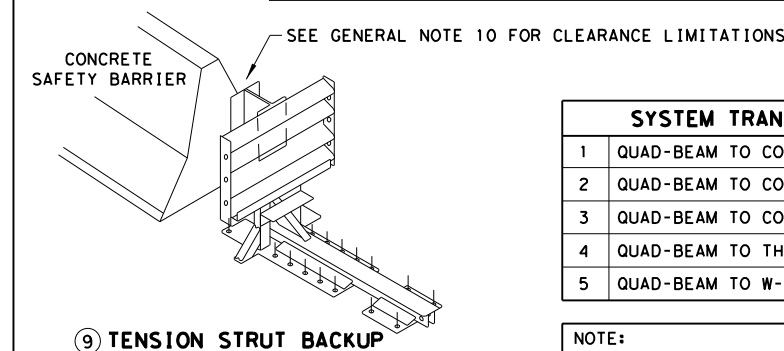
8" NON-REINFORCED CONCRETE PAD MAY NOT REQUIRE AN ANCHOR BLOCK, IF THE PAD IS INSTALLED AGAINST AN IMMOVABLE CONCRETE BACKUP.

CONCRETE PAD AND ANCHOR BLOCK COMBINATIONS SHALL BE CONFIRMED WITH THE MANUFACTURER BASED UPON SITE SPECIFIC DATA (SSD).

NOTE:  
 THE QUADGUARD ELITE M10 8-BAY, 24" WIDE - NARROW SYSTEM TESTED TO MASH TEST LEVEL 3.

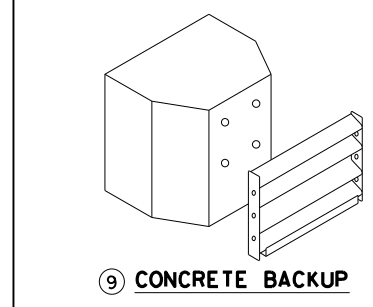
TL-3 MODEL #	QM10024E	CYLINDER TYPES IN BAYS			
BAYS	8	TYPE-ME3	TYPE-ME2	TYPE-ME1	TYPE-QEN
DIAPHRAGMS	8	4	3	1	1
WIDTH	24"	REAR	FRONT		NOSE

#### BACKUP ASSEMBLY TYPES FOR SYSTEM TRANSITIONS



SYSTEM TRANSITIONS TYPES	
1	QUAD-BEAM TO CONCRETE SAFETY BARRIER
2	QUAD-BEAM TO CONCRETE BRIDGE RAIL
3	QUAD-BEAM TO CONCRETE END SHOE
4	QUAD-BEAM TO THRIE-BEAM RAIL
5	QUAD-BEAM TO W-BEAM RAIL

NOTE:  
 TRANSITION ASSEMBLIES FOR THE QUADGUARD ELITE M10 TO THRIE-BEAM OR W-BEAM FENCE REQUIRES I-BEAM POSTS:  
 ALL POSTS W6X8.5/9 I-BEAMS (78" LONG).



NOTES:  
 CONTACT THE MANUFACTURER WITH SITE SPECIFIC DATA (SSD) FOR THE CORRECT BACKUP ASSEMBLY AND TRANSITION PANELS OR SIDE PANELS USED FOR STANDARD AND BI-DIRECTIONAL INSTALLATIONS: AT DIVIDED-HIGHWAY MEDIANS OR UNDIVIDED ROADWAYS WHERE THE SYSTEM IS EXPOSED TO IMPACTS FROM ONE OR TWO DIFFERENT DIRECTIONS OF TRAFFIC FLOW.

### GENERAL NOTES

- FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: TRINITY HIGHWAY - ENERGY ABSORPTION INC. AT 1(888)323-6374.
- SEE THE RECENT QUADGUARD ELITE M10 PRODUCT DESCRIPTION ASSEMBLY MANUAL FOR IMPACT PERFORMANCE CHARACTERISTICS AND DESIGN LIMITATIONS AND THE DRAWING PACKAGE FOR THE NARROW 24" SYSTEM BEFORE INSTALLING THE QUADGUARD ELITE M10 AT ANY GIVEN LOCATION.
- FOR BI-DIRECTIONAL TRAFFIC: THE LOCATION AND OR WIDTH OF THE QUADGUARD ELITE M10 IS RESTRICTED. AS BI-DIRECTIONAL TRAFFIC APPROACHES THE REAR OF THE QUADGUARD ELITE M10, THE QUADGUARD ELITE M10 SHOULD NOT EXTEND FURTHER INTO THE TRAFFIC-SIDE OF THE BARRIER THAN THE OBSTACLE. ANY TRANSITION INSTALLED MUST EITHER BE TANGENT TO BOTH QUADGUARD ELITE M10 AND OBSTACLE OR MUST ANGLE TOWARD FIELD SIDE OF THE BARRIER.
- SYSTEM TRANSITION: APPROPRIATE TRANSITION PANELS OR SIDE PANELS WILL BE REQUIRED FOR PROPER IMPACT PERFORMANCE. THE CORRECT PANEL(S) TO USE WILL DEPEND ON THE DIRECTION OF TRAFFIC FLOW AND WHAT TYPE OF BARRIER OR ROAD FEATURE THE QUADGUARD ELITE M10 SYSTEM IS SHIELDING. SEE THE QUADGUARD ELITE M10 PRODUCT DESCRIPTION & ASSEMBLY MANUAL FOR FURTHER DETAILS.
- COMPONENTS FOR THE QUADGUARD ELITE (M10) BACKUP AND REINFORCING DETAILS ARE SHOWN ON THE QUADGUARD ELITE M10 PRODUCT DESCRIPTION & ASSEMBLY MANUAL.
- CONCRETE PAD SHALL BE 6" MIN. REINFORCED 28MPa [4,000 PSI] (P.C.) OR 8" MIN. NON-REINFORCED 28MPa [4,000 PSI] CONCRETE ROADWAY MEASURING AT LEAST 12'-0" WIDE BY 50'-0" LONG. ANCHOR BLOCK IS NOT REQUIRED WHEN USING 8" CONCRETE PAD INSTALLED AGAINST AN IMMOVABLE STRUCTURE, E.G. CONCRETE WALL.
- IF THE CROSS-SLOPE VARIES MORE THAN 2% OVER THE LENGTH OF THE SYSTEM, THE CONCRETE PAD WILL REQUIRE LEVELING. MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%.
- THE INSTALLATION AREA SHOULD BE FREE OF CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
- THE QUADGUARD ELITE M10 SYSTEM SHOULD BE INSTALLED APPROXIMATELY PARALLEL WITH THE BARRIER.
- FOR THE TENSION STRUT BACKUP THE DISTANCE BETWEEN THE BACK OF BACKUP AND THE BARRIER WALL SHOULD NOT EXCEED 7" IN ANY CASE.
- TXDOT HAS ONLY APPROVED THE 24" WIDE QUADGUARD ELITE M10 SYSTEM. THE QUADGUARD ELITE M10 PRODUCT DESCRIPTION AND ASSEMBLY MANUAL INCLUDES SYSTEM WIDTH OF 24". ONLY THE 24" SYSTEM IS ALLOWED TO BE INSTALLED ON TEXAS ROADWAYS.

#### FOUNDATION & ANCHORING REQUIREMENTS FOUNDATION TYPES: A, B, C, & D

FOUNDATION TYPE: A	REINFORCED CONCRETE PAD OR ROADWAY
FOUNDATION:	6" MINIMUM DEPTH (P.C.C.)
ANCHORAGE:	7" STUDS EMBEDDED 5 1/2" - APPROVED ADHESIVE
FOUNDATION TYPE: B	ASPHALT OVER P.C.C.
FOUNDATION:	3" MIN. (A.C.) OVER 3" MIN. (P.C.C.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 1/2" - APPROVED ADHESIVE
FOUNDATION TYPE: C	ASPHALT OVER SUBBASE
FOUNDATION:	6" MIN. (A.C.) OVER 6" MIN. (C.S.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 1/2" - APPROVED ADHESIVE
FOUNDATION TYPE: D	ASPHALT ONLY
FOUNDATION:	8" MIN. (A.C.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 1/2" - APPROVED ADHESIVE

KEY:  
 ASPHALT CONCRETE (A.C.)  
 COMPACTED SUBBASE (C.S.)  
 PORTLAND CEMENT CONCRETE (P.C.C.)

NOTE: SEE TRINITY'S PRODUCT DESCRIPTION ASSEMBLY MANUAL FOR THE APPROVED ADHESIVE.  
 IF THE UNIT IS ANCHORED TO ASPHALTIC CONCRETE, IT SHOULD BE RELOCATED TO FRESH, UNDISTURBED ASPHALT AND RE-ANCHORED AFTER EACH IMPACT TO ENSURE ADEQUATE FUTURE PERFORMANCE.

TENSION STRUT BACKUP MAY BE USED IN CONSTRUCTION ZONES ON ASPHALT CONCRETE (A.C.) FOR TEMPORARY USE ONLY.

Design Division Standard

## TRINITY HIGHWAY ENERGY ABSORPTION QUADGUARD ELITE M10 (MASH TL-3)

### QGUARD ELITE (M10) (N) -20

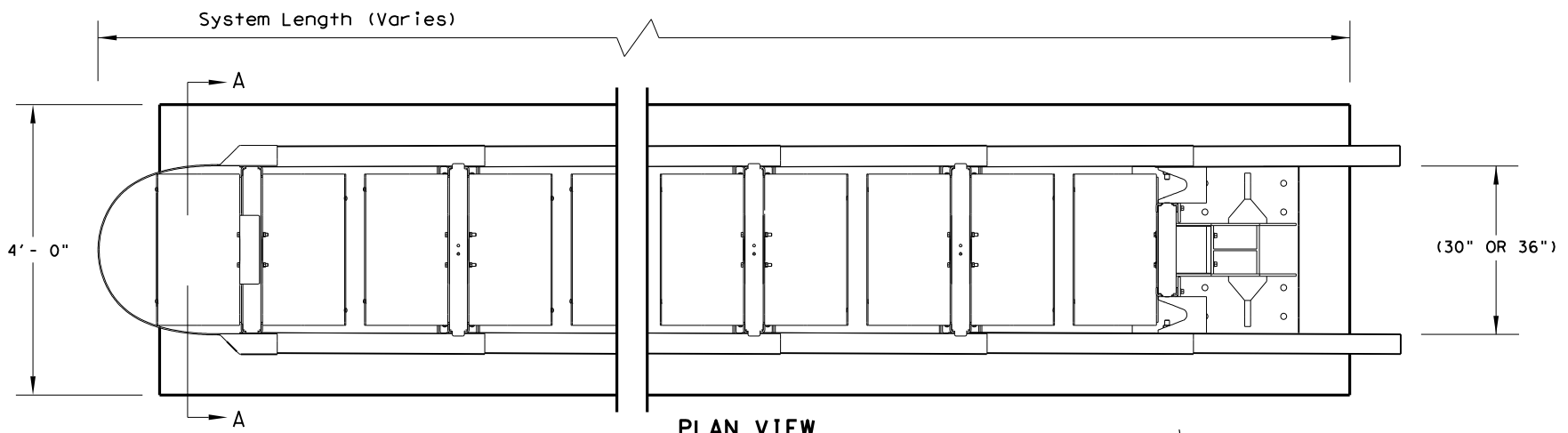
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© TXDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	200	

NOTE:  
 THIS STANDARD IS A BASIC REPRESENTATION OF THE QUADGUARD ELITE M10 SYSTEM AND IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

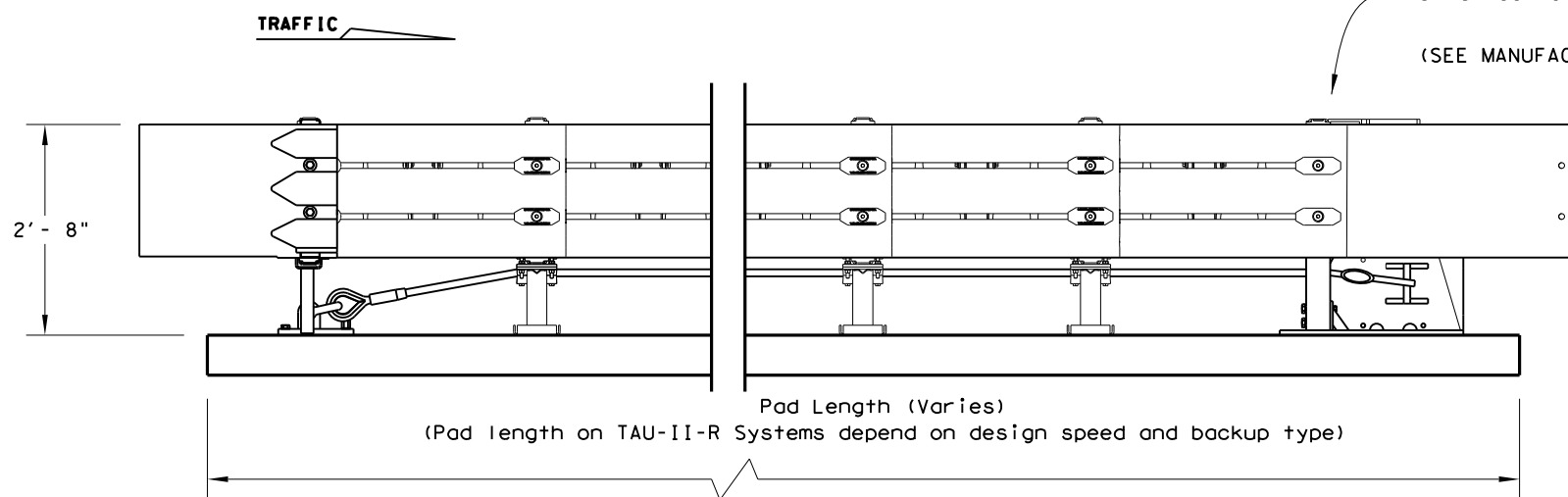
LOW MAINTENANCE

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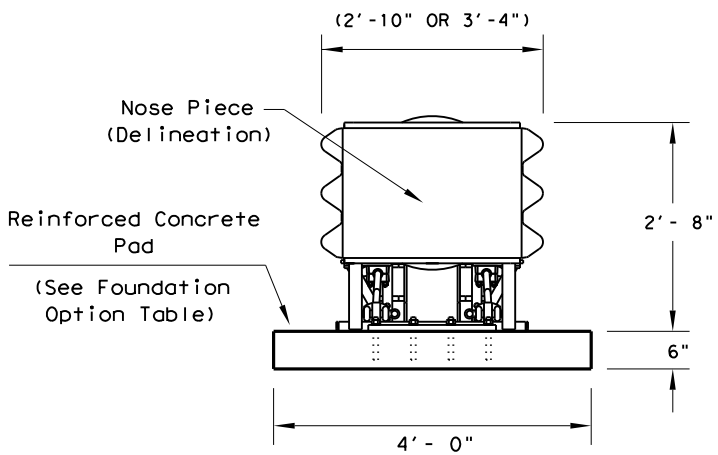


PLAN VIEW



ELEVATION VIEW

Attachments and transitions to various barrier shapes, barrier railings and bi-directional traffic flows are available.  
 (SEE MANUFACTURER'S PRODUCT MANUAL)



SECTION A-A

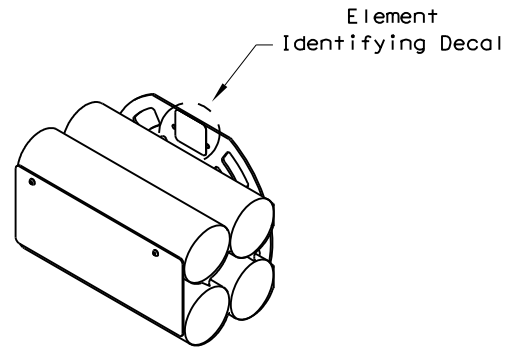
Nose Piece delineation orientation, is shown elsewhere on the plans.

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

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

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

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



ENERGY ABSORBING ELEMENTS (EAE)

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

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

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

Note: System lengths are ± 2"

**GENERAL NOTES**

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

**BILL OF MATERIAL**

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

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

(See manufacturer's product manual for details)



**LTS-BARRIER SYSTEMS  
 CRASH CUSHION  
 (R-NARROW)  
 TAU-II-R(N)-16**

**LOW MAINTENANCE**

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REVISED 06, 2013 (VP)	DIST	COUNTY	SHEET NO.	
REVISED 03, 2016 (VP)	PHR	CAMERON	201	



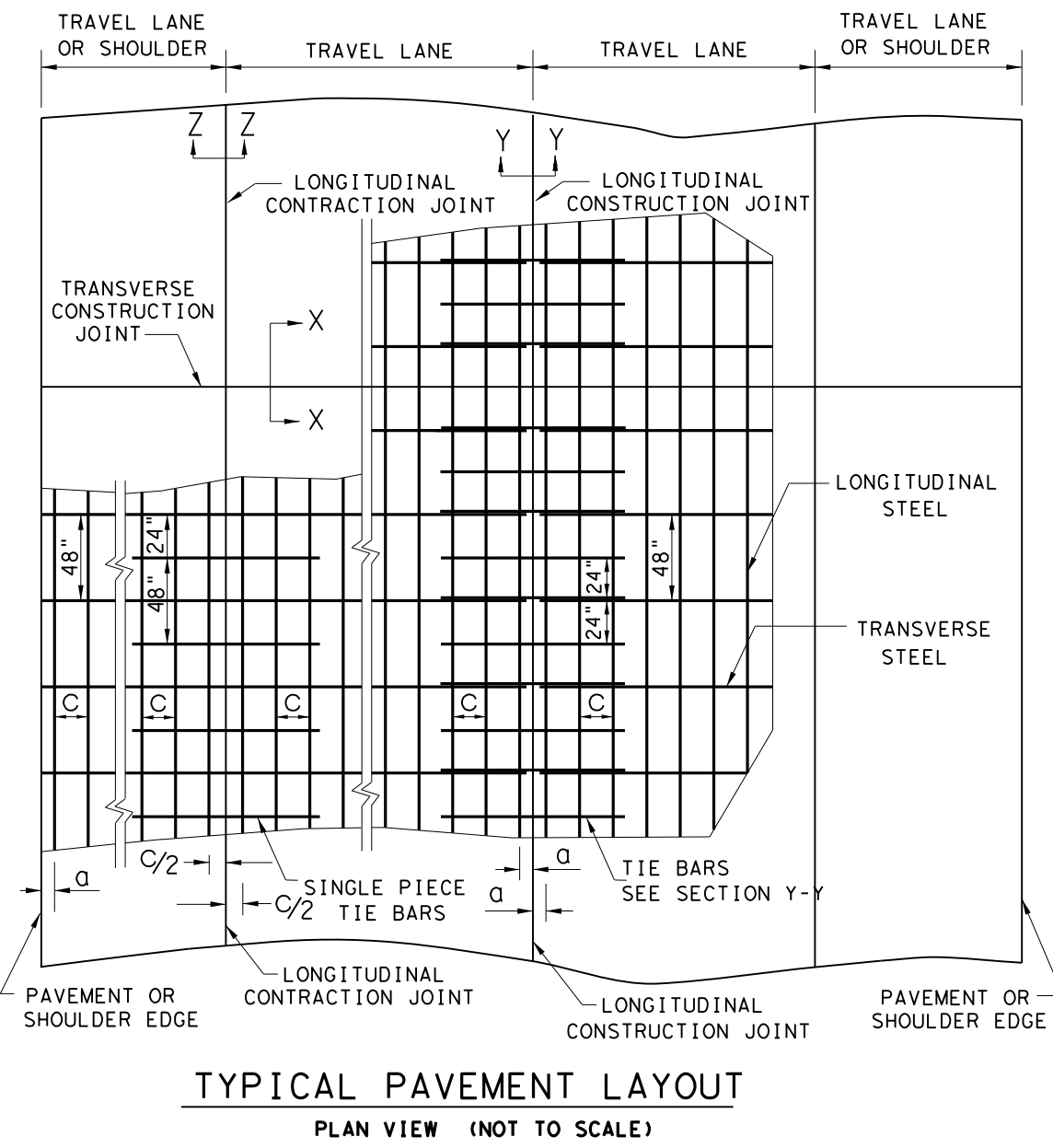
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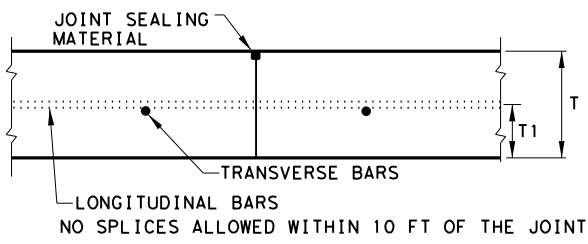
SLAB THICKNESS AND BAR SIZE		LONGITUDINAL STEEL BARS	FIRST SPACING AT EDGE OR JOINT	LONG. STEEL VERTICAL POSITION FROM BOTTOM OF PAVEMENT
T (IN.)	BAR SIZE	SPACING C (IN.)	SPACING $\phi$ (IN.)	T1 (IN.)
7.0	#5	6.5	3 TO 4	3.5
7.5	#5	6.0	3 TO 4	3.75
8.0	#6	9.0	3 TO 4	4.0
8.5	#6	8.5	3 TO 4	4.25
9.0	#6	8.0	3 TO 4	4.5
9.5	#6	7.5	3 TO 4	4.75
10.0	#6	7.0	3 TO 4	5.0
10.5	#6	6.75	3 TO 4	5.5
11.0	#6	6.5	3 TO 4	6.0
11.5	#6	6.25	3 TO 4	6.5
12.0	#6	6.0	3 TO 4	7.0
12.5	#6	5.75	3 TO 4	7.5
13.0	#6	5.5	3 TO 4	8.0

SLAB THICKNESS (IN.)	TRANSVERSE STEEL		TIE BARS AT LONGITUDINAL CONTRACTION JOINT (SECTION Z-Z)		TIE BARS AT LONGITUDINAL CONSTRUCTION JOINT (SECTION Y-Y)	
	BAR SIZE	SPACING (IN.)	BAR SIZE	SPACING (IN.)	BAR SIZE	SPACING (IN.)
7.0 - 7.5	#5	48	#5	48	#5	24
8.0 - 13.0	#5	48	#6	48	#6	24

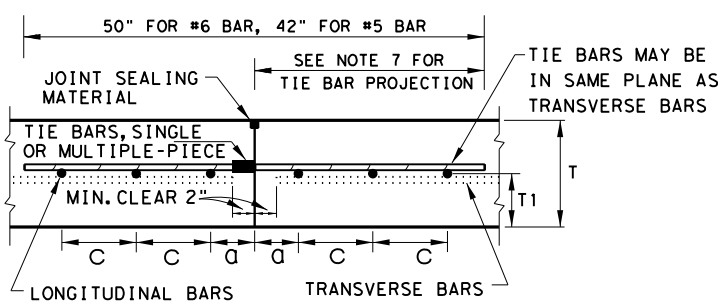
\*CONTRACTOR MAY USE #6 REINFORCING STEEL INSTEAD OF #5 REINFORCING STEEL OR COMBINATION OF EACH SIZE



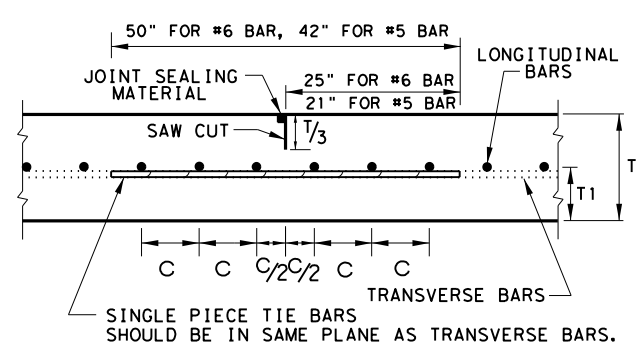
- GENERAL NOTES**
1. DETAILS FOR PAVEMENT WIDTH, PAVEMENT THICKNESS AND THE CROWN CROSS-SLOPE SHALL BE SHOWN ELSEWHERE IN THE PLANS. FOR PAVEMENTS WIDER THAN 100 FT. WITHOUT A FREE LONGITUDINAL JOINT, ADDITIONAL DETAIL MAY BE SHOWN ELSEWHERE IN THE PLANS.
  2. USE COARSE AGGREGATES WITH A RATED COEFFICIENT OF THERMAL EXPANSION (COTE) OF NOT MORE THAN  $5.5 \times 10^{-6}$  IN/IN/°F AS LISTED IN THE CONCRETE RATED SOURCE QUALITY CATALOG (CRSQC).
  3. ALL THE REINFORCING STEEL AND TIE BARS SHALL BE DEFORMED STEEL BARS CONFORMING TO ASTM A 615 (GRADE 60) OR ASTM A 996 (GRADE 60) OR ABOVE. STEEL BAR SIZES AND SPACINGS SHALL CONFORM TO TABLE NO.1 AND TABLE NO.2.
  4. STEEL BAR PLACEMENT TOLERANCE SHALL BE +/- 1 IN. HORIZONTALLY AND +/- 0.5 IN. VERTICALLY. CALCULATED AVERAGE BAR SPACING (CONCRETE PLACEMENT WIDTH / NUMBER OF LONGITUDINAL BARS) SHALL CONFORM TO TABLE NO.1.
  5. ADJUST REINFORCING STEEL VERTICALLY USING SHIMS OR OTHER METHODS, AS APPROVED, TO MEET VERTICAL TOLERANCES PRIOR TO CONCRETE PLACEMENT.
  6. PAVEMENT WIDTHS OF MORE THAN 15 FT. SHALL HAVE A LONGITUDINAL JOINT (SECTION Z-Z OR SECTION Y-Y). THESE JOINTS SHALL BE LOCATED WITHIN 6 IN. OF THE LANE LINE UNLESS THE JOINT LOCATION IS SHOWN ELSEWHERE ON THE PLANS.
  7. THE MINIMUM PROJECTION OF TIE BARS INTO THE ADJACENT PLACEMENT IS 22.5 IN. FOR #6 BARS AND 18.5 IN. FOR #5 BARS.
  8. SEE STANDARD SHEET "CONCRETE CURB AND CURB AND GUTTER," FOR DETAILS WHEN TYING CONCRETE CURB OR CURB GUTTER AT A LONGITUDINAL JOINT.
  9. REPLACE MISSING OR DAMAGED TIE BARS WITHOUT ADDITIONAL COMPENSATION BY DRILLING MIN. 10 IN. DEEP AND GROUTING TIE BARS WITH TYPE III, CLASS C EPOXY. MEET THE PULL-OUT TEST REQUIREMENTS IN ITEM 361.
  10. OMIT TIE BARS LOCATED WITHIN 18-IN. OF THE TRANSVERSE CONSTRUCTION JOINTS (SECTION X-X). USE HAND-OPERATED IMMERSION VIBRATORS TO CONSOLIDATE THE CONCRETE ADJACENT TO ALL FORMED JOINTS.
  11. THE DETAIL FOR THE JOINT SEALANT AND RESERVOIR IS SHOWN ON STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."



TRANSVERSE CONSTRUCTION JOINT  
SECTION X - X



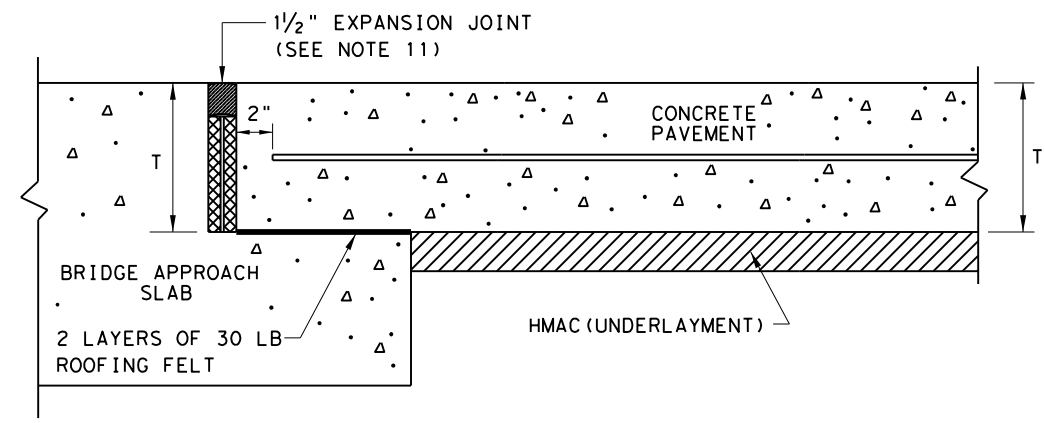
LONGITUDINAL CONSTRUCTION JOINT  
SECTION Y - Y



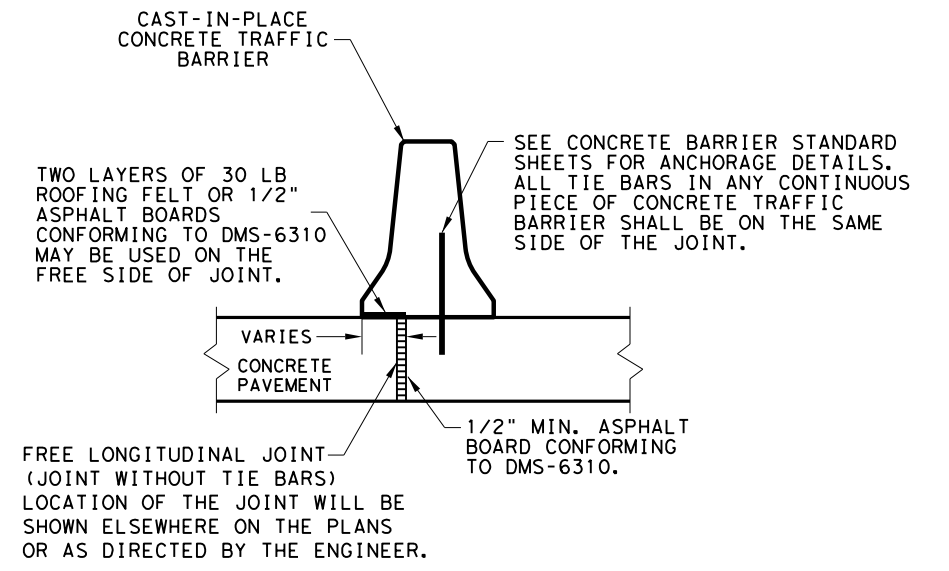
LONGITUDINAL CONTRACTION JOINT  
SECTION Z - Z

		Design Division Standard	
<b>CONTINUOUSLY REINFORCED CONCRETE PAVEMENT</b> <b>ONE LAYER STEEL BAR PLACEMENT</b> <b>T - 7 TO 13 INCHES</b> <b>CRCP(1)-23</b>			
FILE: crcp123.dgn	DN: TxDOT	CK: KM	DW: CES
© TxDOT: APRIL 2023	CONT	SECT	JOB
APRIL 2023	0220	05	080
REVISED LONG. STEEL VERTICAL LOCATION	DIST	COUNTY	SHEET NO.
REVISED TIE BAR AT TRANSVERSE	PHR	CAMERON	203

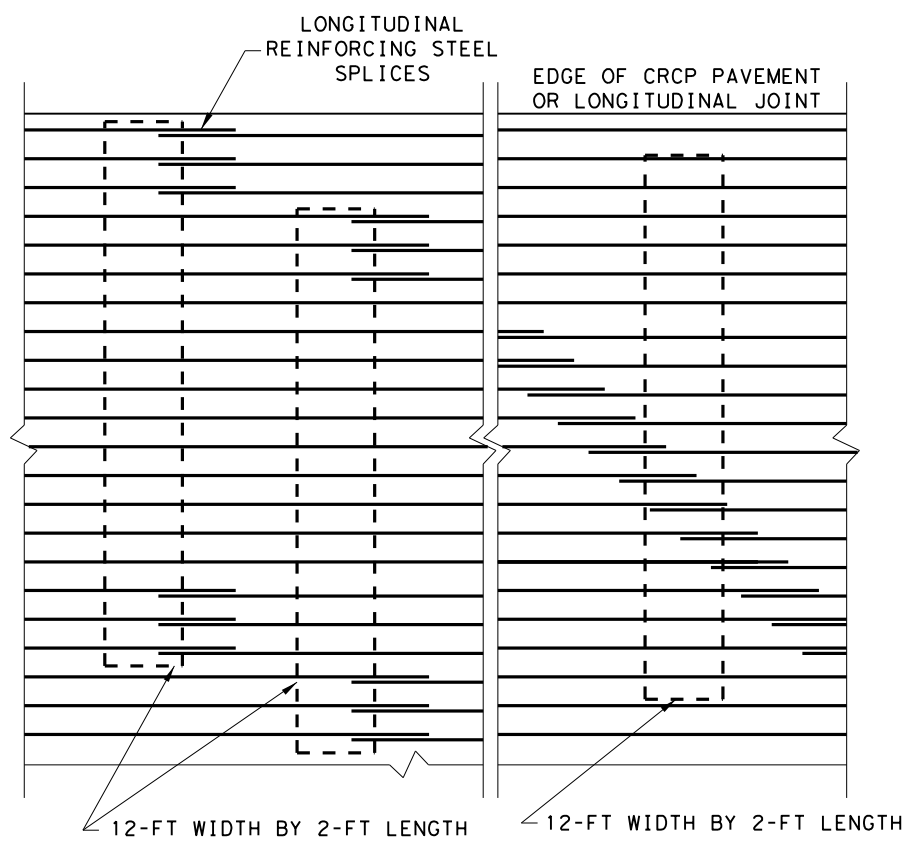
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**TRANSVERSE EXPANSION JOINT DETAIL  
AT BRIDGE APPROACH**

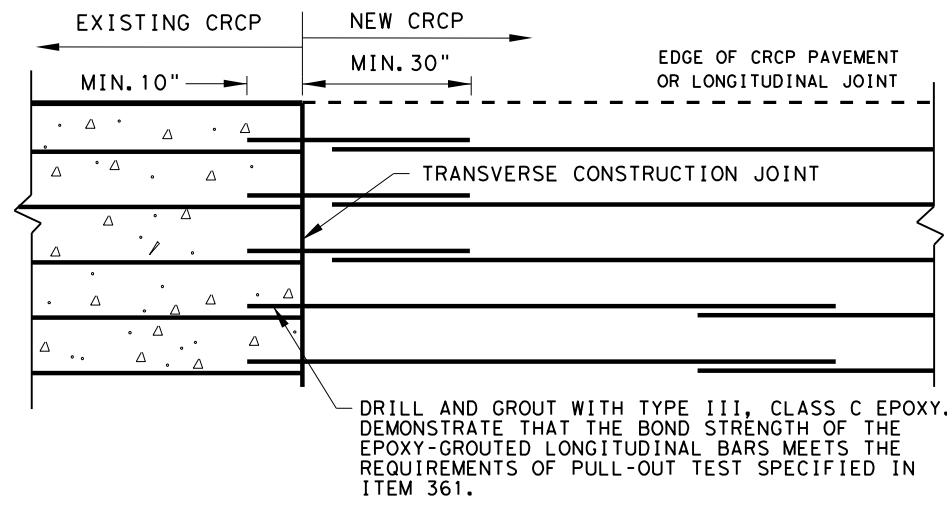


**CENTERLINE FREE LONGITUDINAL JOINT DETAIL**

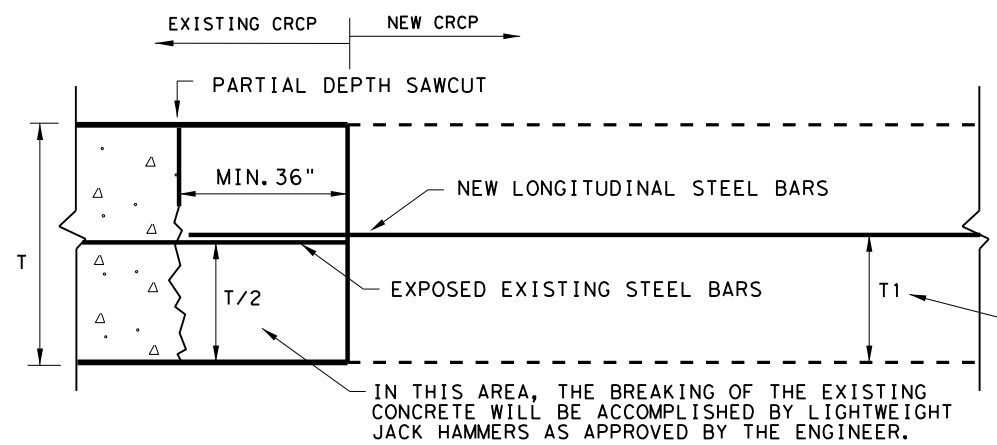


STAGGER THE LAP LOCATIONS SO THAT NO MORE THAN 1/3 OF THE LONGITUDINAL STEEL IS SPLICED IN ANY GIVEN 12-FT. WIDTH AND 2-FT. LENGTH OF THE PAVEMENT. ANY OTHER LAP CONFIGURATION MEETING THIS REQUIREMENT WILL BE ALLOWED.

**EXAMPLES OF LAP CONFIGURATION  
PLAN VIEW (NOT TO SCALE)**

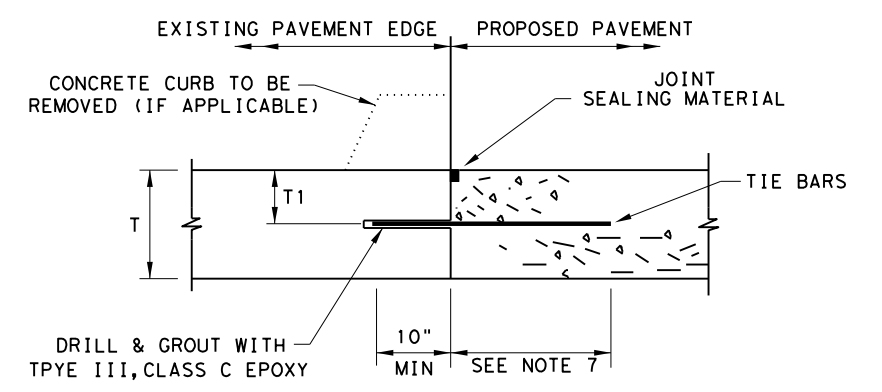


**OPTION A: DRILL AND EPOXY  
PLAN VIEW (NOT TO SCALE)**



**OPTION B: BREAKBACK AND LAP**

**TRANSVERSE TIE JOINT DETAIL  
NEW CRCP TO EXISTING CRCP**



- BEFORE CONCRETE PLACEMENT, PERFORM PULL-OUT TESTS ON EPOXY-GROUTED TIE BARS IN ACCORDANCE WITH ITEM 360.
- SPACE TIE BARS AT 24" SPACING. USE #6 TIE BARS FOR 8" AND THICKER PAVEMENTS, USE #5 TIE BARS FOR LESS THAN 8" THICK PAVEMENTS.

**LONGITUDINAL WIDENING JOINT DETAIL**

SHEET 2 OF 2

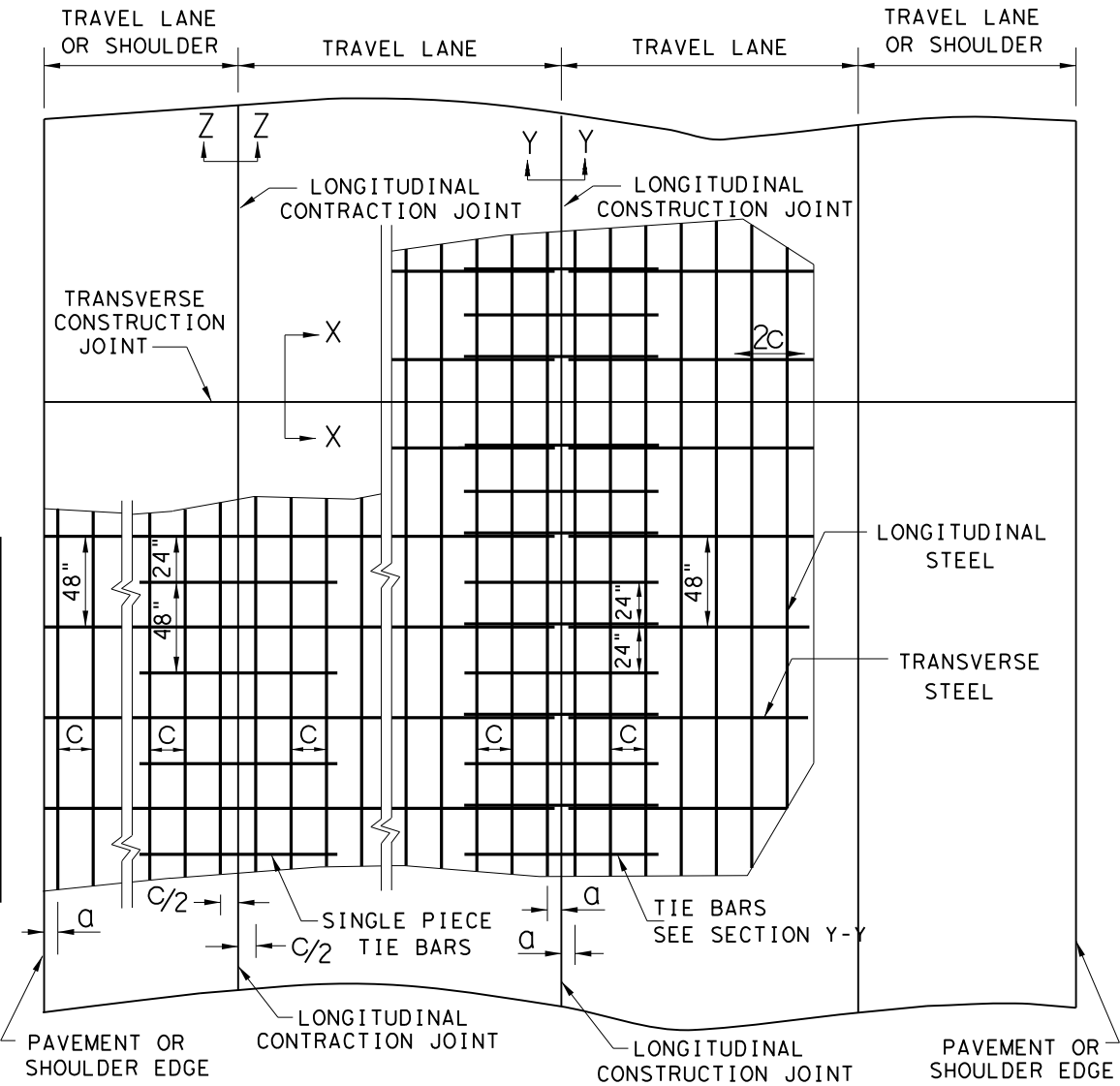
		Design Division Standard	
<b>CONTINUOUSLY REINFORCED CONCRETE PAVEMENT</b>			
<b>ONE LAYER STEEL BAR PLACEMENT</b>			
<b>T - 7 to 13 INCHES</b>			
<b>CRCP (1) - 23</b>			
FILE: crcp123.dgn	DN: TxDOT	CK: KM	DW: CES
© TxDOT: APRIL 2023	CONT SECT	JOB	HIGHWAY
APRIL 2023: MODIFIED EXPANSION JOINT DETAIL AT BRIDGE APPROACH	0220 05	080	SH 48
DIST	COUNTY	SHEET NO.	
PHR	CAMERON	204	

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TABLE NO.1 LONGITUDINAL STEEL					
SLAB THICKNESS AND BAR SIZE		FOR BOTH STEEL MATS		LOWER STEEL MAT HEIGHT	TOP STEEL MAT HEIGHT
		LONGITUDINAL STEEL BARS	FIRST SPACING AT EDGE OR JOINT		
T (IN.)	BAR SIZE	SPACING C (IN.)	SPACING a (IN.)	T1 (IN.)	T2 (IN.)
14	#6	9.5	3 TO 4	4.5	8.0
15	#6	8.5	3 TO 4	5.0	8.5

TABLE NO.2 TRANSVERSE STEEL AND TIE BARS						
SLAB THICKNESS T (IN.)	FOR BOTH STEEL MATS		FOR LOWER STEEL MAT ONLY		FOR BOTH STEEL MATS	
	TRANSVERSE STEEL		TIE BARS AT LONGITUDINAL CONTRACTION JOINT (SECTION Z-Z)		TIE BARS AT LONGITUDINAL CONTRACTION JOINT (SECTION Y-Y)	
	BAR SIZE	SPACING (IN.)	BAR SIZE	SPACING (IN.)	BAR SIZE	SPACING (IN.)
14 - 15	#5	48	#6	48	#6	24

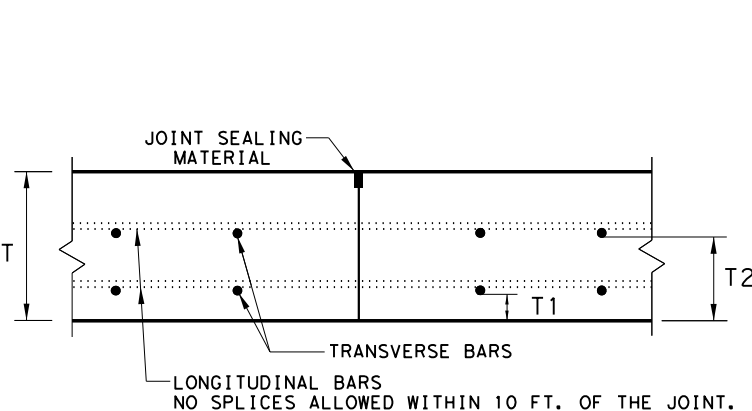
\*CONTRACTOR MAY USE #6 REINFORCING STEEL INSTEAD OF #5 REINFORCING STEEL OR COMBINATION OF EACH SIZE



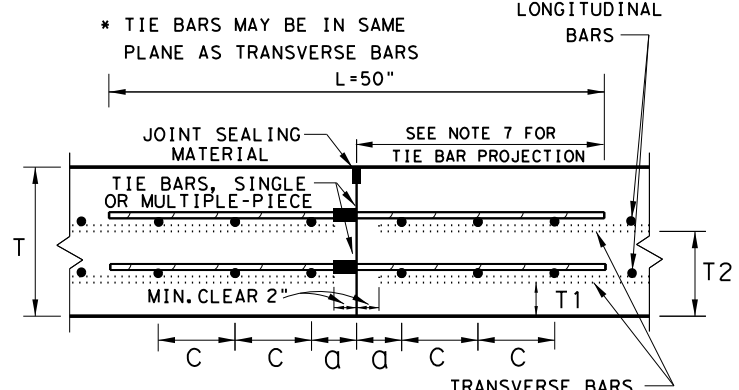
**TYPICAL PAVEMENT LAYOUT**

PLAN VIEW (NOT TO SCALE)

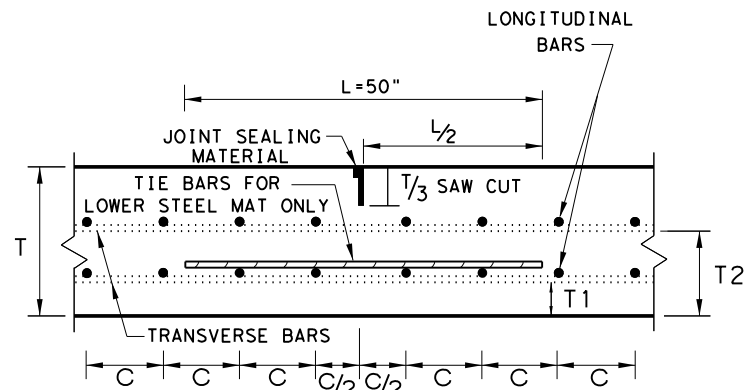
- GENERAL NOTES**
1. DETAILS FOR PAVEMENT WIDTH, PAVEMENT THICKNESS AND THE CROWN CROSS-SLOPE SHALL BE SHOWN ELSEWHERE IN THE PLANS. FOR PAVEMENTS WIDER THAN 100 FT. WITHOUT A FREE LONGITUDINAL JOINT, ADDITIONAL DETAIL MAY BE SHOWN ELSEWHERE IN THE PLANS.
  2. USE COARSE AGGREGATES WITH A RATED COEFFICIENT OF THERMAL EXPANSION (CoTE) OF NOT MORE THAN  $5.5 \times 10^{-6}$  IN/IN/°F AS LISTED IN THE CONCRETE RATED SOURCE QUALITY CATALOG (CRSQC).
  3. ALL THE REINFORCING STEEL AND TIE BARS SHALL BE DEFORMED STEEL BARS CONFORMING TO ASTM A 615 (GRADE 60) OR ASTM A 996 (GRADE 60) OR ABOVE. STEEL BAR SIZES AND SPACINGS SHALL CONFORM TO TABLE NO.1 AND TABLE NO.2.
  4. STEEL BAR PLACEMENT TOLERANCE SHALL BE +/- 1 IN. HORIZONTALLY AND +/- 0.5 IN. VERTICALLY. CALCULATED AVERAGE BAR SPACING (CONCRETE PLACEMENT WIDTH / NUMBER OF LONGITUDINAL BARS IN A SINGLE LAYER) SHALL CONFORM TO TABLE NO.1.
  5. ADJUST REINFORCING STEEL VERTICALLY USING SHIMS OR OTHER METHODS, AS APPROVED, TO MEET VERTICAL TOLERANCES PRIOR TO CONCRETE PLACEMENT.
  6. PAVEMENT WIDTHS OF MORE THAN 15 FT. SHALL HAVE A LONGITUDINAL JOINT (SECTION Z-Z OR SECTION Y-Y). THESE JOINTS SHALL BE LOCATED WITHIN 6 IN. OF THE LANE LINE UNLESS THE JOINT LOCATION IS SHOWN ELSEWHERE ON THE PLANS.
  7. THE MINIMUM PROJECTION OF TIE BARS INTO THE ADJACENT PLACEMENT IS 22.5 IN. FOR #6 BARS AND 18.5 IN. FOR #5 BARS.
  8. SEE STANDARD SHEET "CONCRETE CURB AND CURB AND GUTTER," FOR DETAILS WHEN TYING CONCRETE CURB OR CURB GUTTER AT A LONGITUDINAL JOINT.
  9. REPLACE MISSING OR DAMAGED TIE BARS WITHOUT ADDITIONAL COMPENSATION BY DRILLING MIN. 10 IN. DEEP AND GROUTING TIE BARS WITH TYPE III, CLASS C EPOXY. MEET THE PULL-OUT TEST REQUIREMENTS IN ITEM 361.
  10. OMIT TIE BARS LOCATED WITHIN 18-IN. OF THE TRANSVERSE CONSTRUCTION JOINTS (SECTION X-X). USE HAND-OPERATED IMMERSION VIBRATORS TO CONSOLIDATE THE CONCRETE ADJACENT TO ALL FORMED JOINTS.
  11. THE DETAIL FOR THE JOINT SEALANT AND RESERVOIR IS SHOWN ON STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."



**TRANSVERSE CONSTRUCTION JOINT**  
SECTION X - X



**LONGITUDINAL CONSTRUCTION JOINT**  
SECTION Y - Y



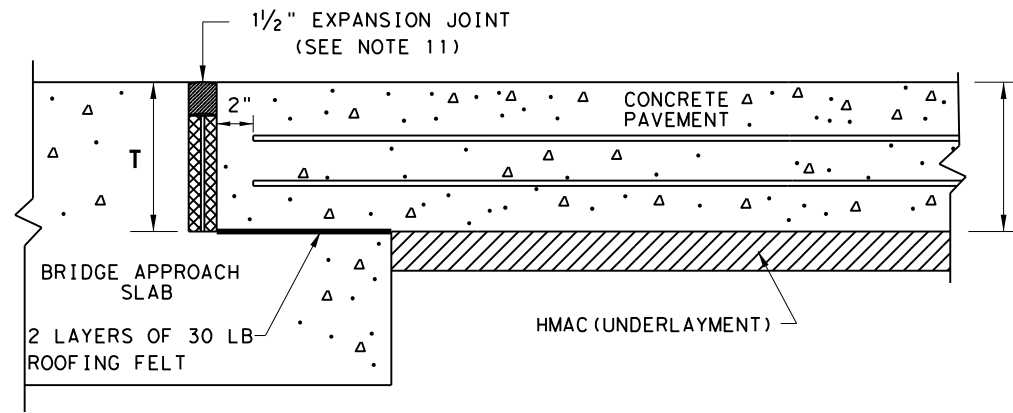
**LONGITUDINAL CONTRACTION JOINT**  
SECTION Z - Z

SHEET 1 OF 2

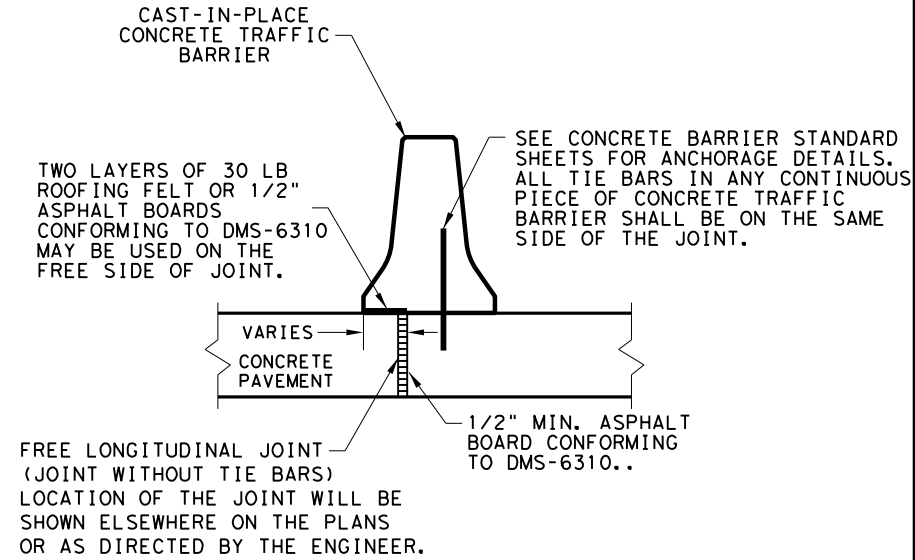
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<b>CONTINUOUSLY REINFORCED CONCRETE PAVEMENT</b> <b>TWO LAYER STEEL BAR PLACEMENT</b> <b>T - 14 &amp; 15 INCHES</b> <b>CRCP (2) - 23</b>			
FILE: crcp223.dgn	DN: TxDOT	CK: KM	DW: CES
© TxDOT: APRIL 2023	CONT	SECT	JOB
APRIL 2023	0220	05	080
REVISIONS	DIST		COUNTY
REMOVED ADDITIONAL TIEBAR AT TRANSVERSE CONSTRUCTION JOINTS	PHR		CAMERON
			SH 48
			SHEET NO.
			205

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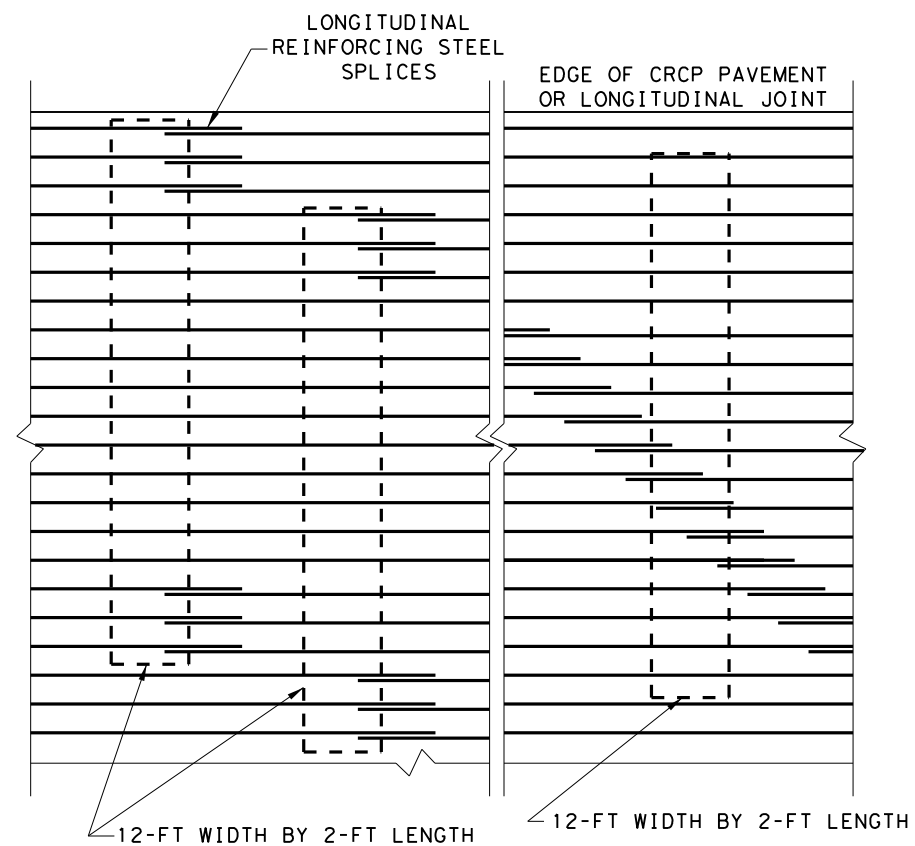
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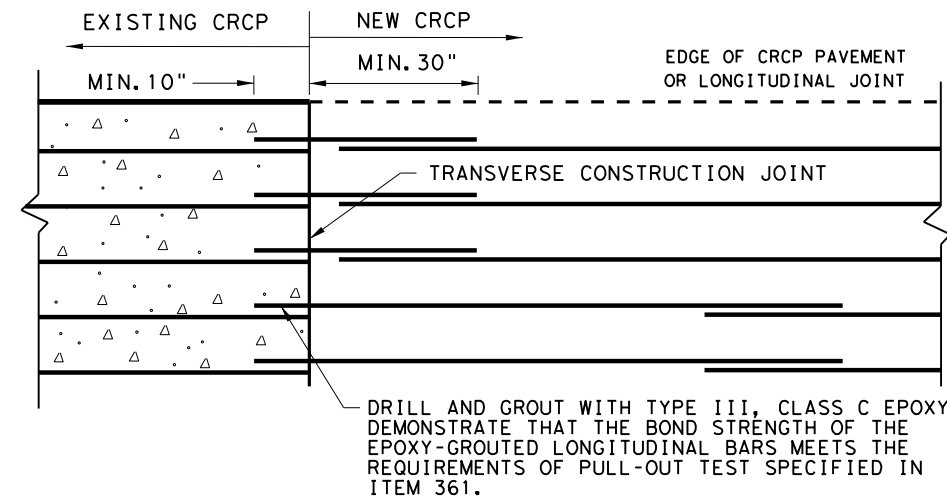
**TRANSVERSE EXPANSION JOINT DETAIL  
 AT BRIDGE APPROACH**



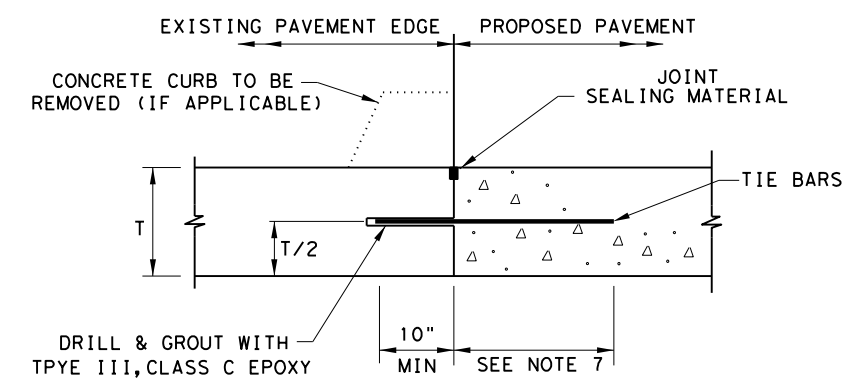
**CENTERLINE FREE LONGITUDINAL JOINT DETAIL**



**EXAMPLES OF LAP CONFIGURATION  
 PLAN VIEW ( NOT TO SCALE)**

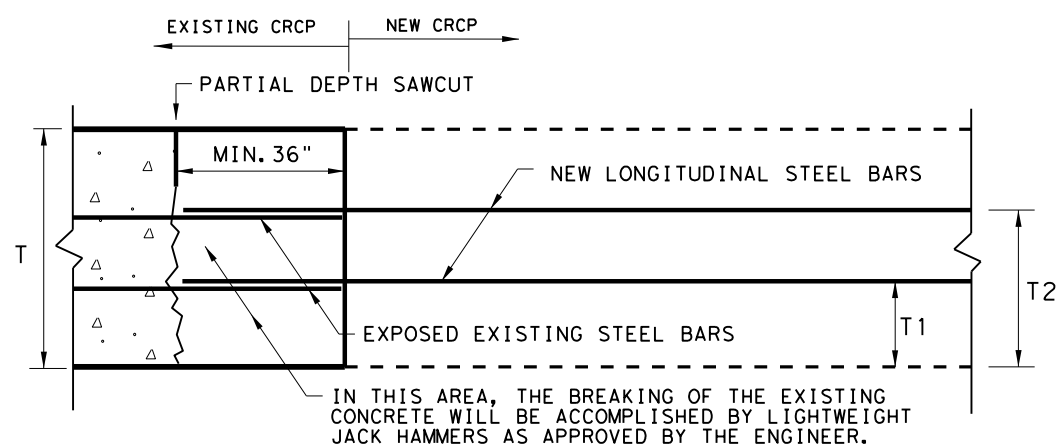


**OPTION A: DRILL AND EPOXY  
 PLAN VIEW ( NOT TO SCALE)**



1. BEFORE CONCRETE PLACEMENT, PERFORM PULL-OUT TESTS ON EPOXY-GROUTED TIE BARS IN ACCORDANCE WITH ITEM 360.
2. SPACE TIE BARS AT 24" SPACING.

**LONGITUDINAL WIDENING JOINT DETAIL**



**OPTION B: BREAKBACK AND LAP**

**TRANSVERSE TIE JOINT DETAIL  
 NEW CRCP TO EXISTING CRCP**

SHEET 2 OF 2

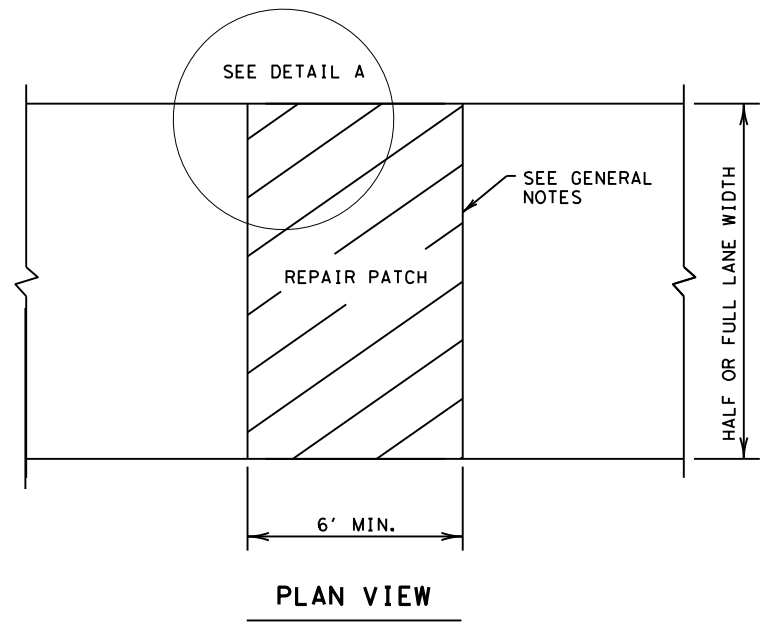
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<b>CONTINUOUSLY REINFORCED          CONCRETE PAVEMENT</b>			
<b>TWO LAYER STEEL BAR PLACEMENT</b>			
<b>T - 14 &amp; 15 INCHES</b>			
<b>CRCP (2) - 23</b>			
FILE: crcp223.dgn	DN: TxDOT	CK: KM	DW: CES
© TxDOT: APRIL 2023	CONT	SECT	JOB
APRIL 2023: MODIFIED EXPANSION JOINT DETAIL AT BRIDGE APPROACH SLAB	0220	05	080
	DIST	COUNTY	SHEET NO.
	PHR	CAMERON	206

DATE: 2/24/2023  
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TABLE NO.1 STEEL BAR SIZE AND SPACING						
TYPE PAVEMENT	SLAB THICKNESS AND BAR SIZE		LONGITUDINAL*		TRANSVERSE*	
			REGULAR BARS	TIEBARS	BARS	TIEBARS
	T (IN.)	BAR SIZE	SPACING (IN.)	SPACING (IN.)	SPACING (IN.)	SPACING (IN.)
CRCP	6.0	#5	7.5	7.5	24	24
	6.5		7.0	7.0		
	7.0		6.5	6.5		
	7.5		6.0	6.0		
	8.0	#6	9.0	9.0	24	24
	8.5		8.5	8.5		
	9.0		8.0	8.0		
	9.5		7.5	7.5		
	10.0		7.0	7.0		
	10.5		6.75	6.75		
11.0	6.5	6.5				
11.5	6.25	6.25				
≥12.0	6.0	6.0				
JRCP	<8.0	#5	24.0	12.0	24	24
	≥8.0	#6	24.0	12.0	24	24
CPCD	<8.0	#5	NONE	12.0	NONE	24
	≥8.0	#6	NONE	12.0	NONE	24

\* USE 12" SPACING AS FIRST AND LAST SPACING AT END OR SIDE FOR ALL BARS.

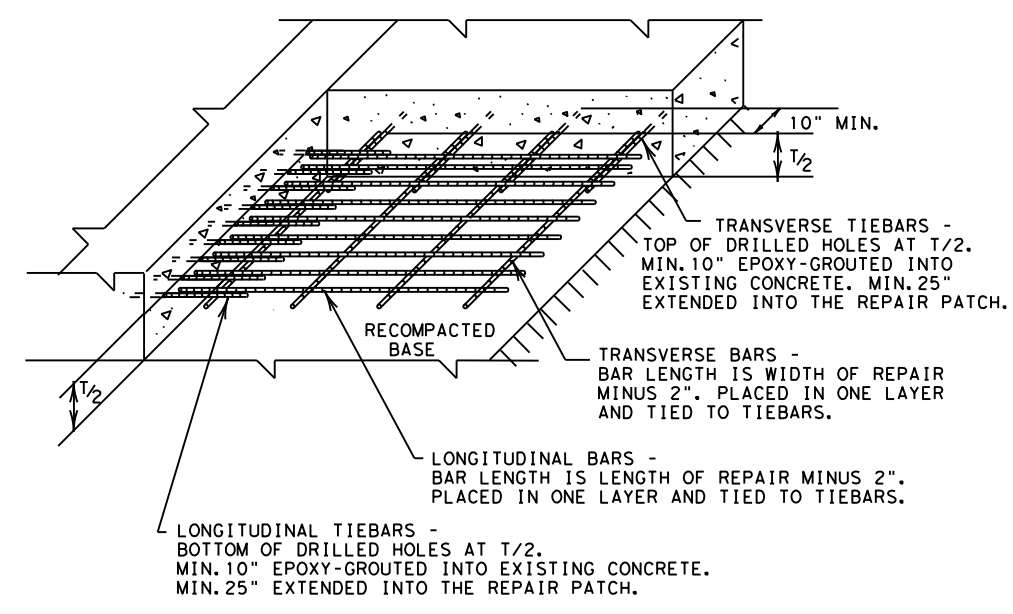


PLAN VIEW

FULL-DEPTH REPAIR OF CRCP, JRCP, AND CPCD

GENERAL NOTES

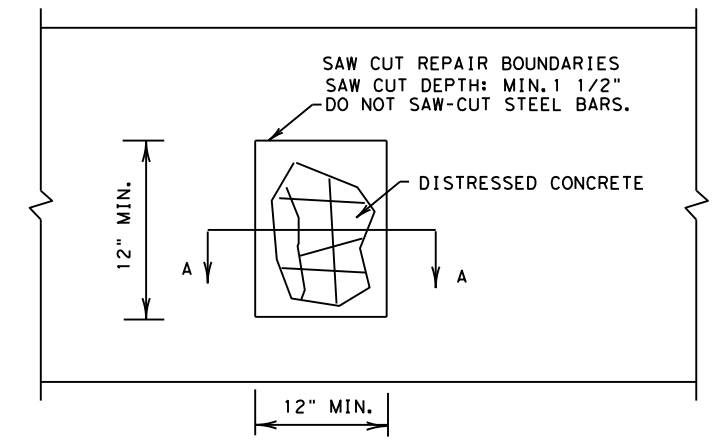
- ITEM 361, "REPAIR OF CONCRETE PAVEMENT" SHALL GOVERN FOR THIS WORK.
- MULTIPLE PIECE TIEBARS SHALL BE USED WHEN THE REPAIR AREA MUST BE PLACED IN TWO STAGES DUE TO SEQUENCE OF CONSTRUCTION.
- FULL DEPTH SAW CUTS SHALL BE MADE AROUND THE PERIMETER OF THE AREA TO BE REPAIRED. THE CUT SHALL BE MADE AT A RIGHT ANGLE TO THE PAVEMENT EDGE AND TO THE CENTER LINE OF THE PAVEMENT.
- AT LEAST ONE LONGITUDINAL FULL DEPTH SAW CUT SHALL BE AT AN EXISTING LONGITUDINAL JOINT.
- ADDITIONAL SAW CUTS MAY BE REQUIRED WITHIN THE AREA OF THE REPAIR TO FACILITATE REMOVAL OF THE CONCRETE OR TO ALLEVIATE BINDING OF THE FULL DEPTH SAW CUT AT THE REPAIR EDGE.
- THE SAW CUTS WHICH EXTEND OUTSIDE THE AREA OF THE REPAIR WILL BE CLEANED AND FILLED WITH A CEMENTITIOUS GROUT APPROVED BY THE ENGINEER.
- EXISTING LONGITUDINAL AND TRANSVERSE JOINTS REMOVED DUE TO REPAIR OPERATION SHOULD BE RESTORED IN ACCORDANCE WITH STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."



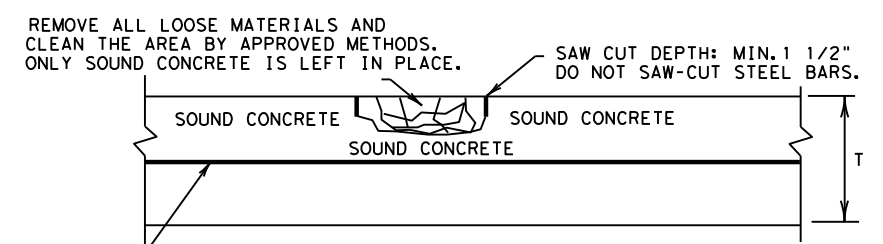
DETAIL A  
 GROUDED TIEBARS & REINFORCEMENT

GENERAL NOTES

- ITEM 361, "REPAIR OF CONCRETE PAVEMENT" SHALL GOVERN FOR THIS WORK.
- THE SAW CUTS WHICH EXTEND OUTSIDE THE AREA OF THE REPAIR WILL BE CLEANED AND FILLED WITH A CEMENTITIOUS GROUT APPROVED BY THE ENGINEER.
- EXISTING LONGITUDINAL AND TRANSVERSE JOINTS REMOVED DUE TO REPAIR OPERATION SHOULD BE RESTORED IN ACCORDANCE WITH STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."



PLAN VIEW



- REMOVE ALL LOOSE MATERIALS AND CLEAN THE AREA BY APPROVED METHODS. ONLY SOUND CONCRETE IS LEFT IN PLACE.
- LONGITUDINAL STEEL BARS:  
 \*REPAIR AREAS MAY BE ADJUSTED AFTER REMOVING DISTRESSED CONCRETE. SWITCH THE HALF-DEPTH REPAIR TO FULL-DEPTH REPAIR IF EXPOSED EXISTING LONGITUDINAL BARS ARE DEFICIENT, AS APPROVED. COMPENSATION WILL BE MADE FOR UNEXPECTED VOLUMES OF REPAIR AREAS OR CHANGES IN SCOPE OF WORK.
- \*INCREASE THE REPAIR AREA AND PERFORM A FULL-DEPTH REPAIR AS DIRECTED IF LONGITUDINAL STEEL BARS WERE DAMAGED BY THE REMOVAL OPERATIONS. NO ADDITIONAL COMPENSATION WILL BE MADE.

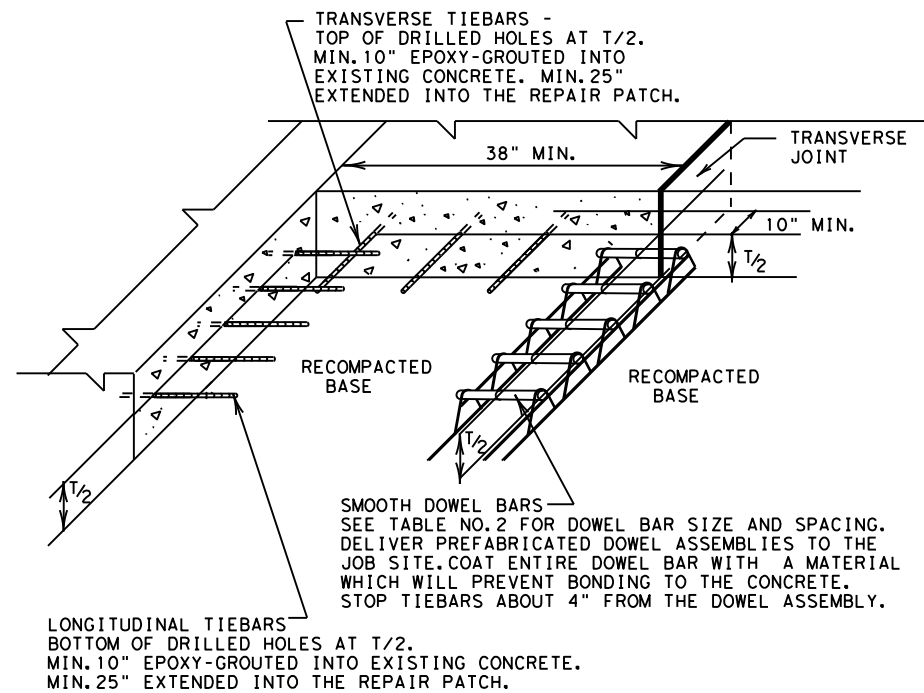
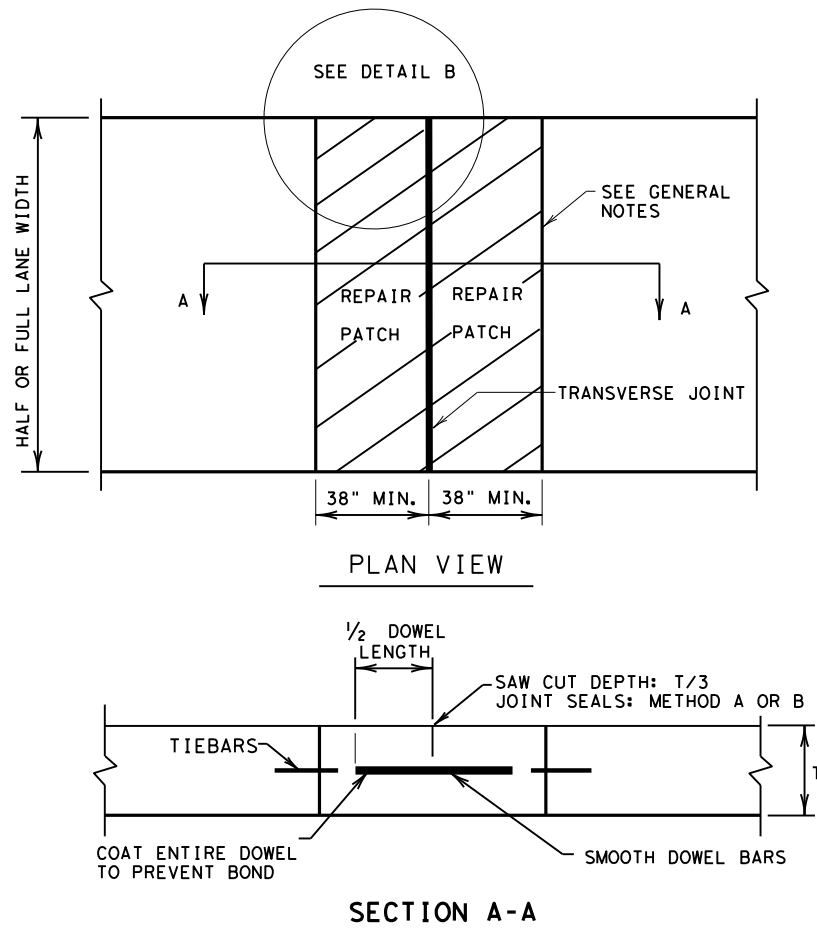
SECTION A-A  
 HALF-DEPTH REPAIR

SHEET 1 OF 2

				Design Division Standard	
<b>REPAIR OF CONCRETE PAVEMENT</b>					
<b>REPCP-14</b>					
FILE: repcp14.dgn	DN: TxDOT	DN: HC	DW: HC	CK: AN	
© TxDOT: DECEMBER 2014	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0220	05	080	SH 48	
	DIST	COUNTY		SHEET NO.	
	PHR	CAMERON		207	

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**DETAIL B**  
**GROUTED TIEBARS & DOWELS**

**REPAIR OF TRANSVERSE JOINT OF CPCD**

**GENERAL NOTES**

1. ITEM 361, "REPAIR OF CONCRETE PAVEMENT" SHALL GOVERN FOR THIS WORK.
2. MULTIPLE PIECE TIEBARS SHALL BE USED WHEN THE REPAIR AREA MUST BE PLACED IN TWO STAGES DUE TO SEQUENCE OF CONSTRUCTION.
3. FULL DEPTH SAW CUTS SHALL BE MADE AROUND THE PERIMETER OF THE AREA TO BE REPAIRED. THE CUT SHALL BE MADE AT A RIGHT ANGLE TO THE PAVEMENT EDGE AND TO THE CENTER LINE OF THE PAVEMENT.
4. AT LEAST ONE LONGITUDINAL FULL DEPTH SAW CUT SHALL BE AT AN EXISTING LONGITUDINAL JOINT.
5. ADDITIONAL SAW CUTS MAY BE REQUIRED WITHIN THE AREA OF THE REPAIR TO FACILITATE REMOVAL OF THE CONCRETE OR TO ALLEVIATE BINDING OF THE FULL DEPTH SAW CUT AT THE REPAIR EDGE.
6. THE SAW CUTS WHICH EXTEND OUTSIDE THE AREA OF THE REPAIR WILL BE CLEANED AND FILLED WITH A CEMENTITIOUS GROUT APPROVED BY THE ENGINEER.
7. EXISTING LONGITUDINAL AND TRANSVERSE JOINTS REMOVED DUE TO REPAIR OPERATION SHOULD BE RESTORED IN ACCORDANCE WITH STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."
8. DOWEL BAR PLACEMENT TOLERANCE SHALL BE +/- 1/4 IN. HORIZONTALLY AND VERTICALLY UNLESS OTHERWISE SPECIFIED. WHERE DOWEL BAR BASKETS ARE USED, REMOVE THE SHIPPING WIRES.

PAVEMENT THICKNESS (INCHES)	SIZE AND DIA.	LENGTH (IN.)	SPACING (IN.)
<10	#8 (1 IN.)	18.0	12.0
≥10	#10 (1 1/4 IN.)		

SHEET 2 OF 2



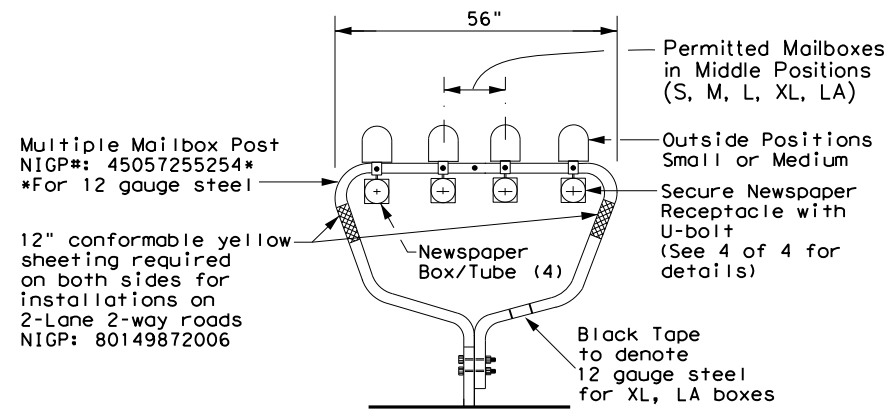
**REPAIR OF CONCRETE PAVEMENT**

**REPCP-14**

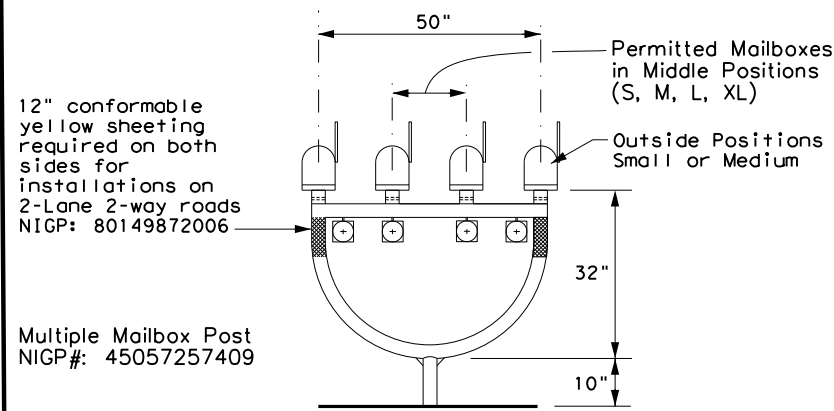
FILE: repcp14.dgn	DN: TxDOT	DN: HC	DW: HC	CK: AN
© TxDOT: DECEMBER 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	208	

DATE: 2/24/2023 8:44:16 AM  
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 PROJECT: 0220050105  
 DRAWING: 0220050105.dwg  
 TITLE: MAILBOX MOUNTING AND ASSEMBLY  
 SHEET: SH 48  
 SHEET NO.: 209  
 The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for any errors or omissions in this drawing.

### TYPE 1 - MULTIPLE



### TYPE 4 - MULTIPLE



### MAILBOX SIZES

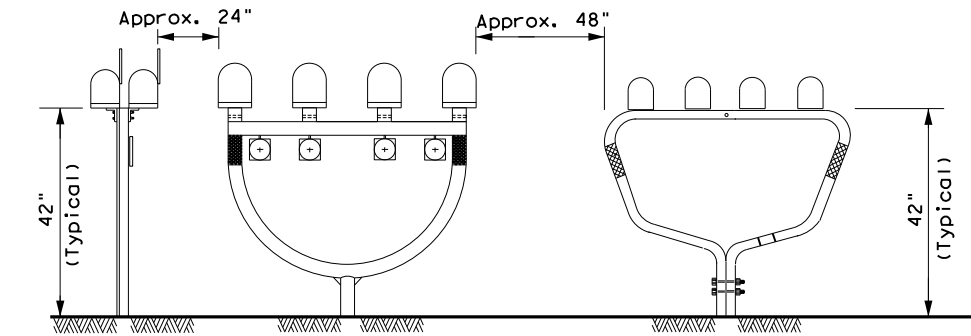
MAILBOX SIZE	TYPICAL DIMENSIONS			MAX **
	LENGTH	WIDTH	HEIGHT	
SMALL	19 1/2"	6"	7"	6 LBS
MEDIUM	22 1/2" *	8" *	11 1/2" *	8 LBS
LARGE	23 1/2"	11 1/2"	13 1/2"	11 LBS
EXTRA LARGE	18"	14"	12"	13 LBS
LOCKABLE	18"	11 1/2"	15"	23 LBS

#### GENERAL NOTES:

- Dimensions shown (length, width, and height) are typical, not maximums. However, anytime a medium size mailbox is mounted on a single/double mount or on the outside position on a multi mount, the dimensions shown are maximums.
- Mailboxes shall be made of light weight sheet metal or light weight plastic. Heavy steel, cast iron or decorative mailboxes shall not be used on the state highway system.

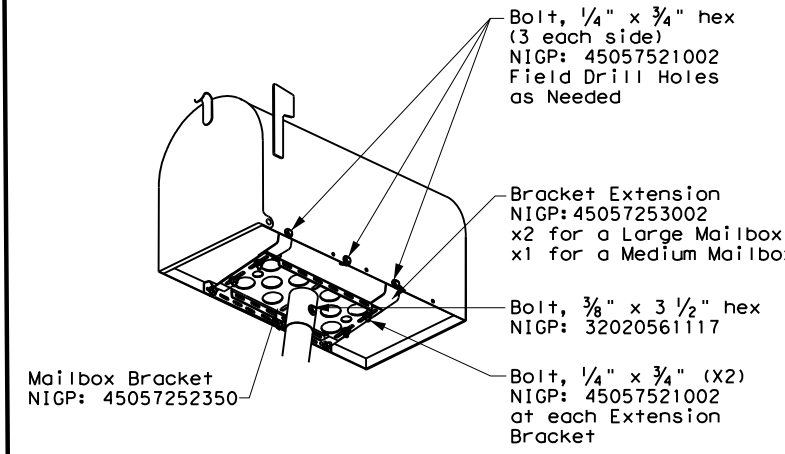
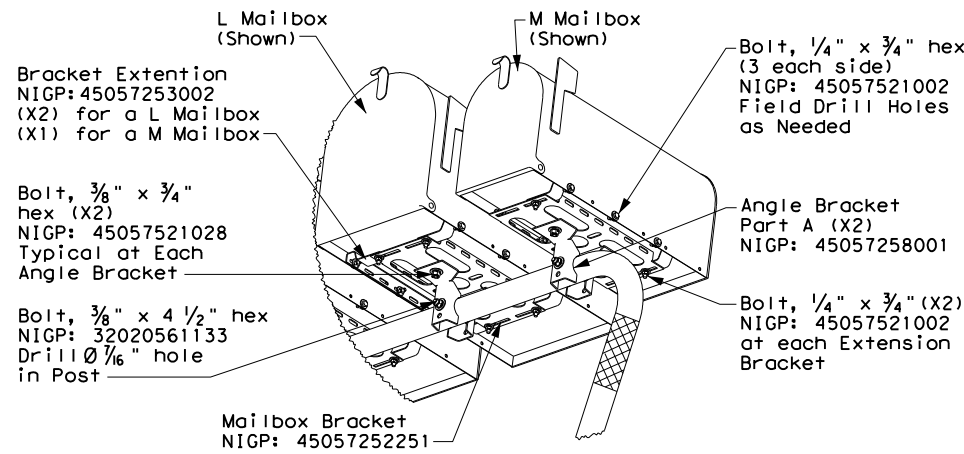
\* See Note 1.  
\*\* Excluding Molded Plastic on 4 X 4 Post

### TYPICAL INSTALLATION MEASUREMENTS

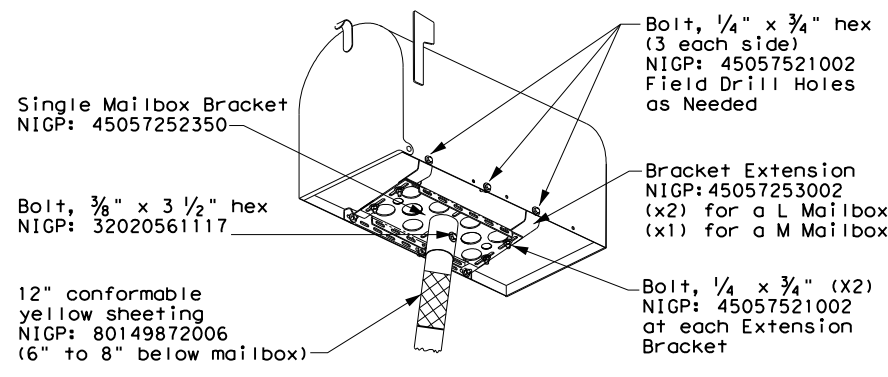


#### NOTE:

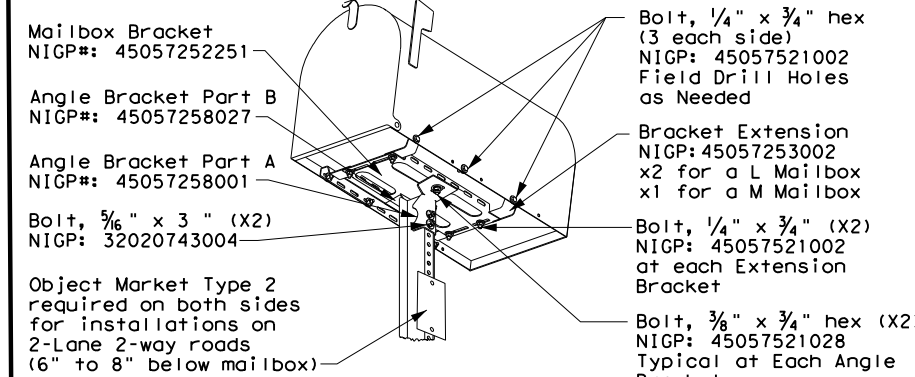
Mailbox installations in sidewalk areas shall be in accordance with the latest TxDOT Design Standard sheets PED-Pedestrian Facilities Curb Ramps.



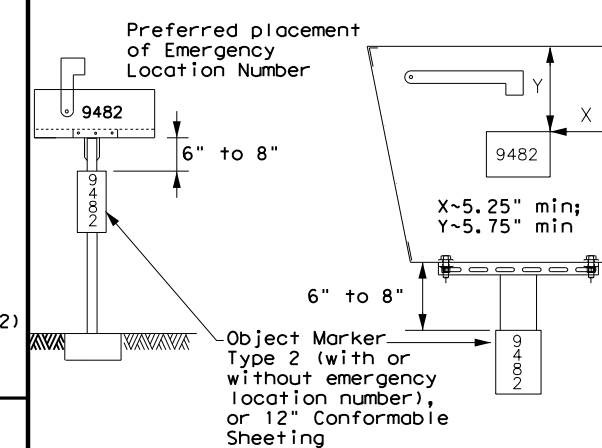
### TYPE 2 and 4 - SINGLE/DOUBLE



### TYPE 3 - SINGLE/DOUBLE

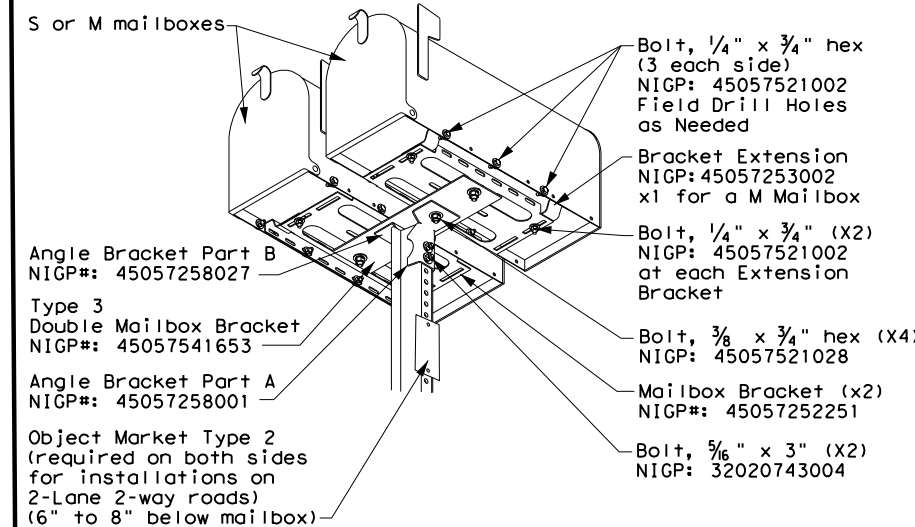
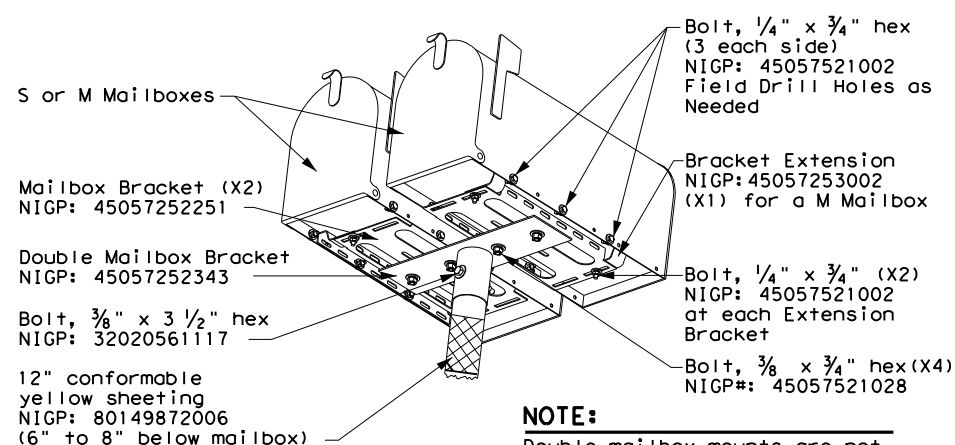


### PLACEMENT OF EMERGENCY LOCATION NUMBER

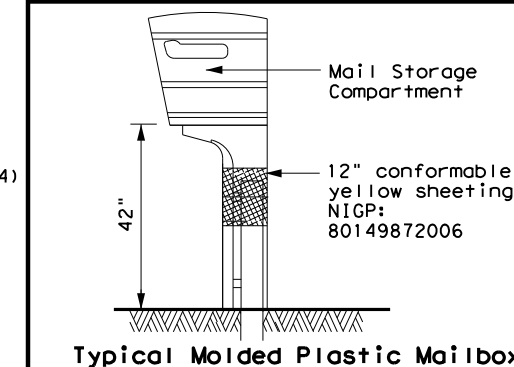


#### NOTES:

- Location numbers are provided by homeowner. Minimum size 1" height.
- Location number is typically placed on the mailbox in a contrasting color.
- Black numbers may be placed on the Type 2 object marker if the numbers cannot be placed on the mailbox.
- Alternatively, a green or blue plate with white numbers attached may be mounted below the object marker. Other contrasting color configuration, as approved, may be used.
- See 3 of 4 for Foundation details.
- See 4 of 4 for Hardware details.



### TYPE 5



SHEET 1 OF 4



Texas Department of Transportation

Maintenance Division Standard

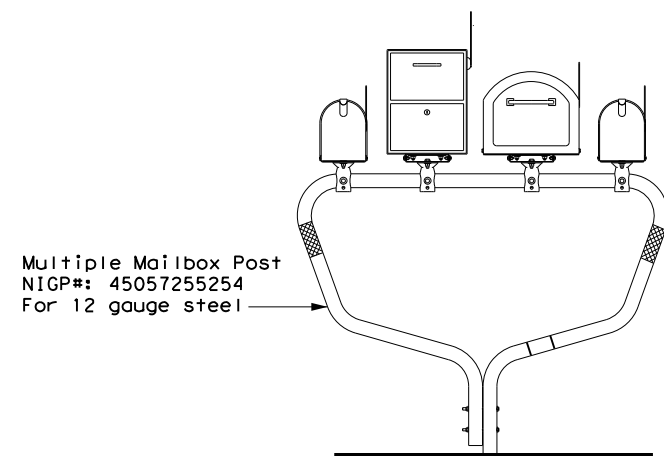
## MAILBOX MOUNTING AND ASSEMBLY

### MB (1) - 21

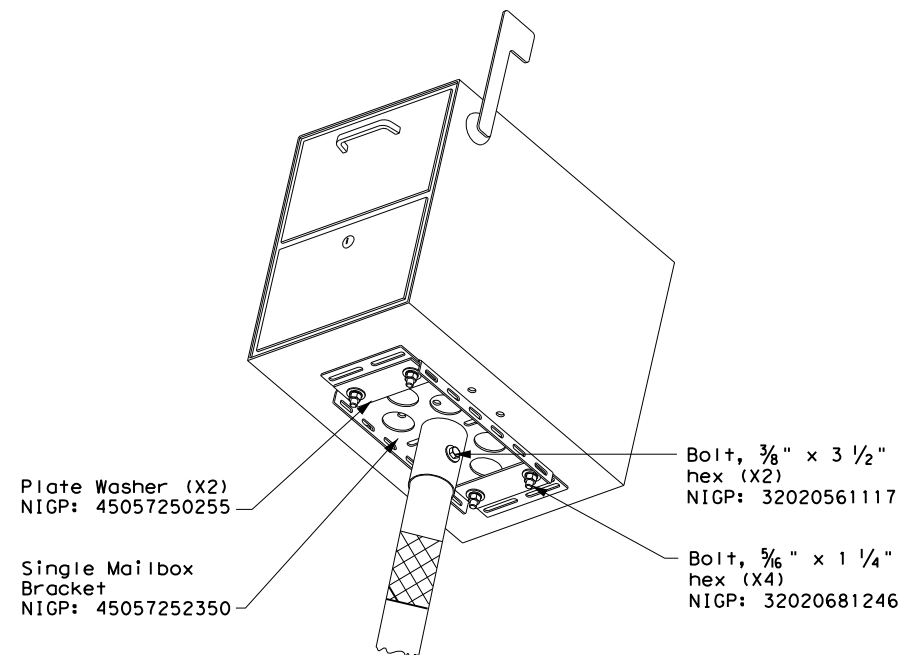
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© TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0220	05	080	SH 48
2/2005				
6/2005				
11/2009				
4/2015				
DIST	COUNTY		SHEET NO.	
PHR	CAMERON		209	

DATE: 2/24/2023 8:44:17 AM  
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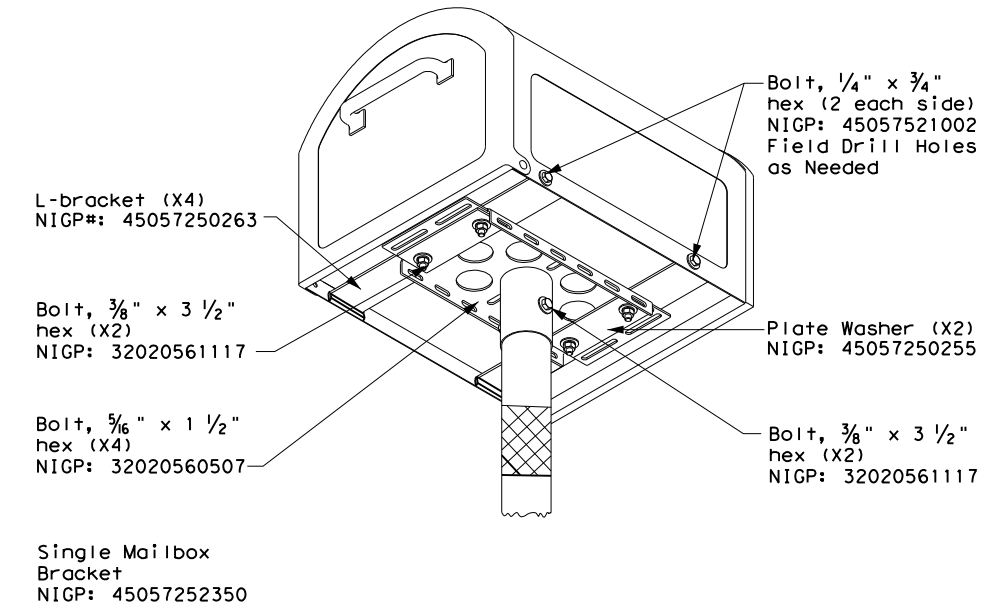
**TYPE 1 - MULTI LOCKABLE AND XL MAILBOX**



**TYPE 2/4 - SINGLE LOCKABLE MAILBOX**

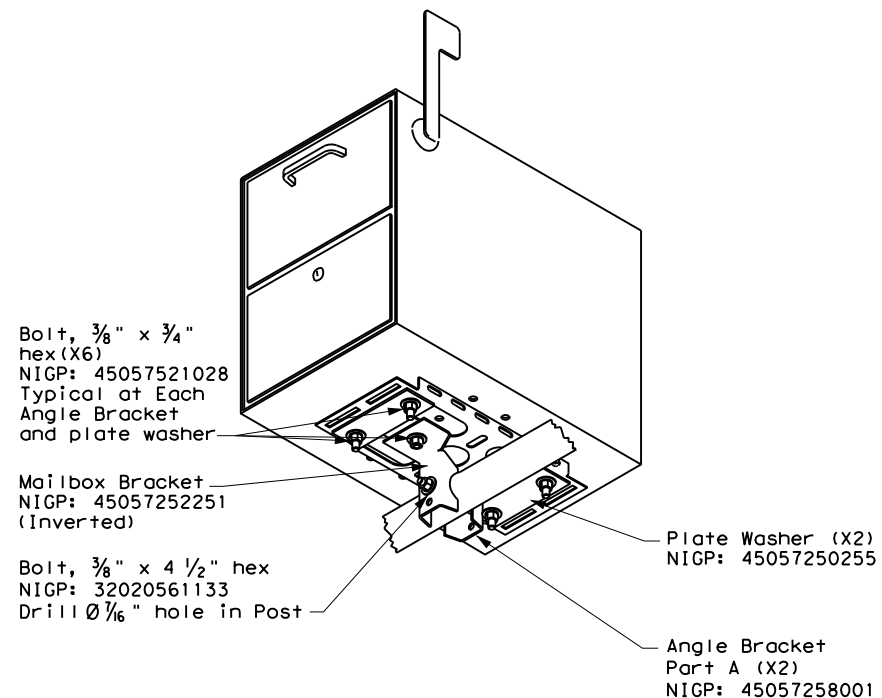


**TYPE 2/4 - SINGLE XL MAILBOX**

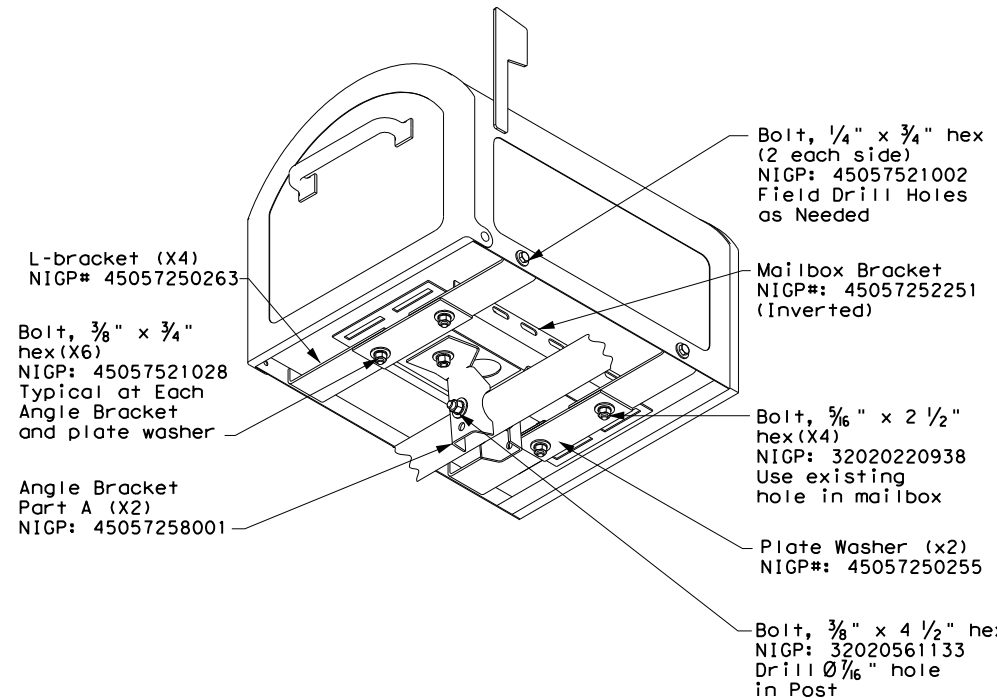


**NOTE:**  
Follow same configuration when mounting an XL mailbox on a Type 4 multi post.

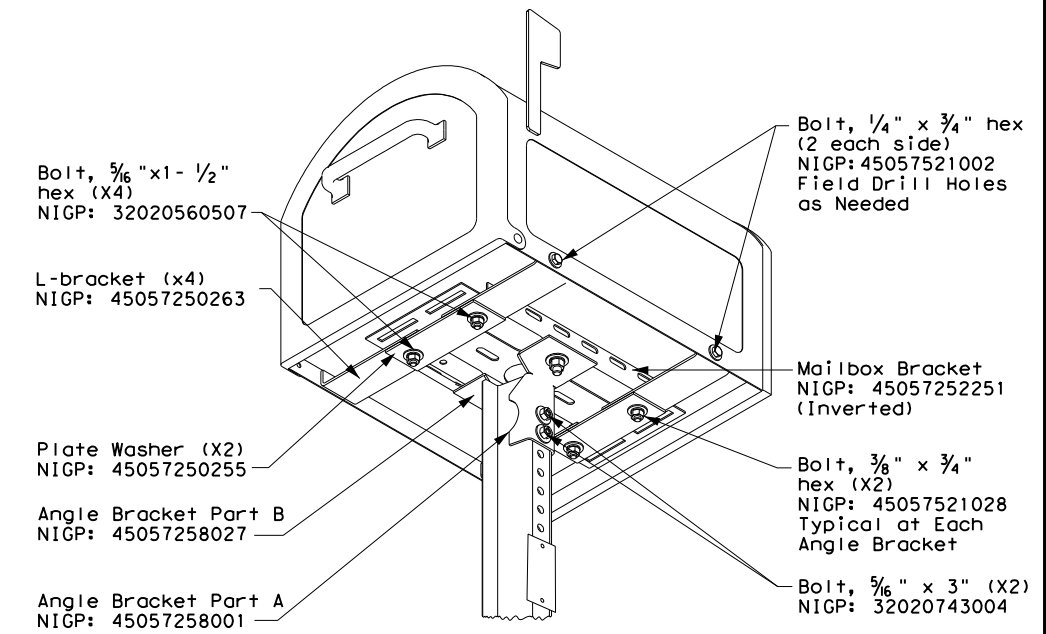
**TYPE 1 MULTI - LOCKABLE ARCHITECTURAL (LA)**



**TYPE 1 MULTI - XL MAILBOX**



**TYPE 3 - XL MAILBOX MOUNTING**



SHEET 2 OF 4

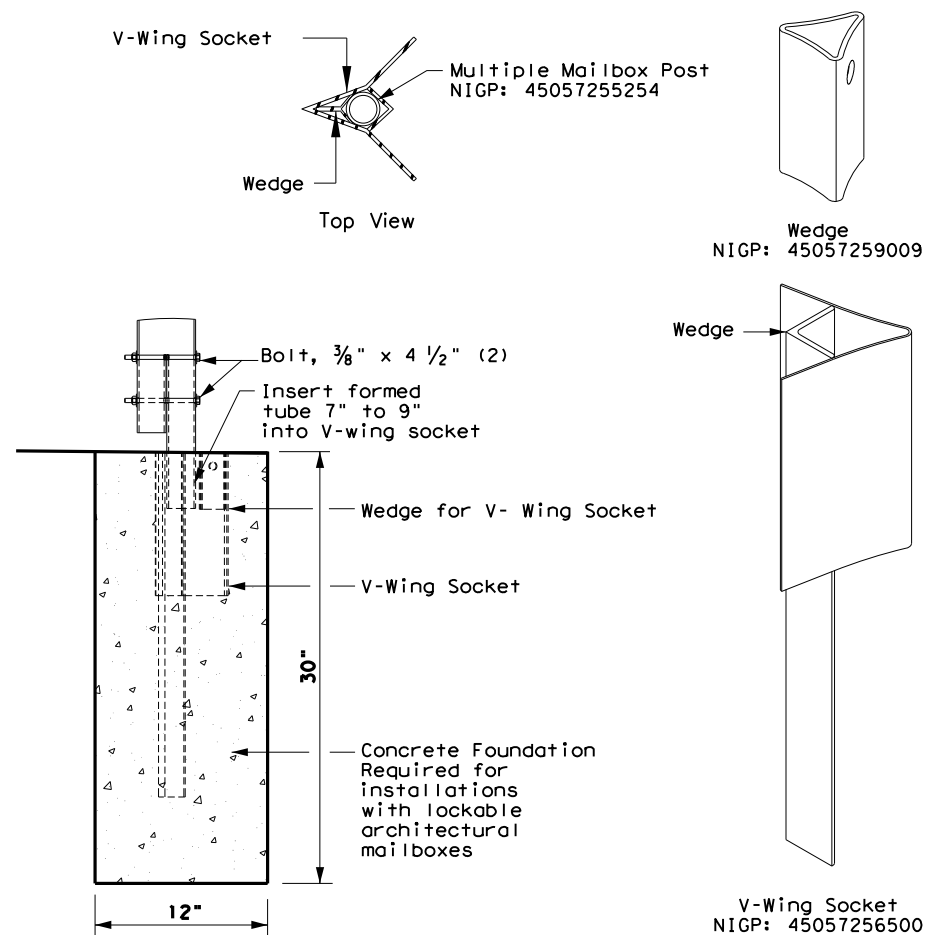
		Maintenance Division Standard	
<h2>XL AND LOCKABLE ARCHITECTURAL MAILBOX ASSEMBLY</h2> <h3>MB (2) - 21</h3>			
FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT March 2004	CONT	SECT	JOB
2/2005	0220	05	080
6/2005	DIST	COUNTY	SHEET NO.
11/2006	PHR	CAMERON	210



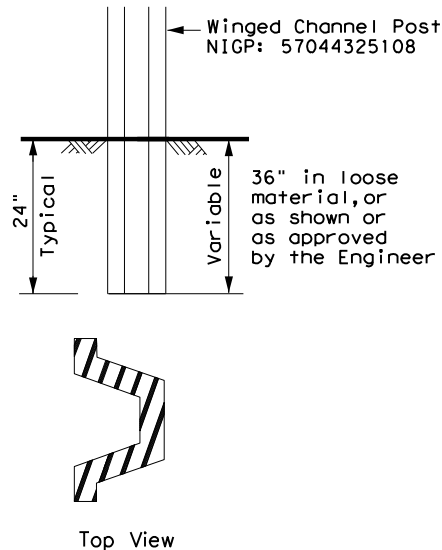
DATE: 2/24/2023 8:44:18 AM  
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 The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of any information into a digital format.

### TYPE 1 - SUPPORT/FOUNDATION

Thin Wall Tube w/ V-LOC Anchorage



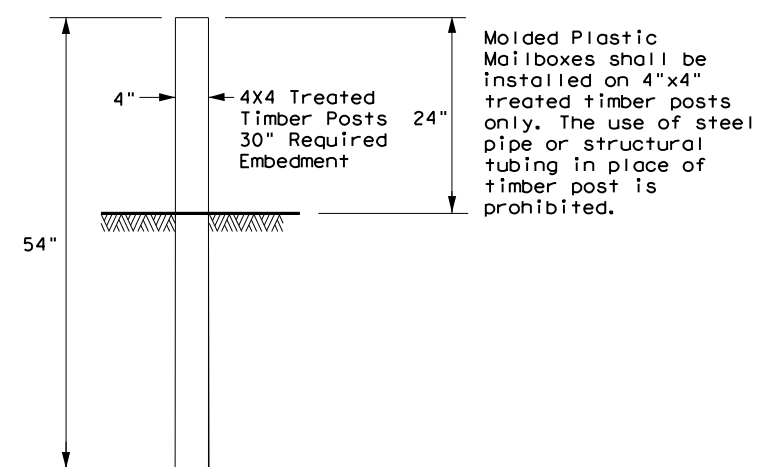
### TYPE 3 - SUPPORT/FOUNDATION



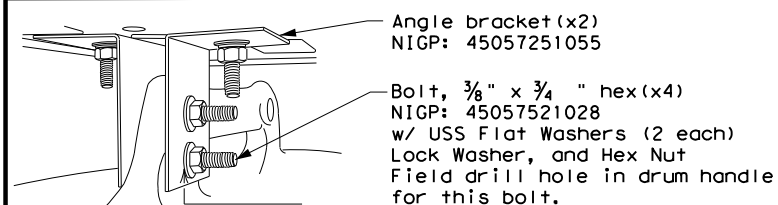
#### NOTES:

1. Attach Object Marker (OM) facing direction of traffic.
2. OM will also be required on opposite side if installed on a 2-Lane, 2-Way roadway.

### TYPE 5 - SUPPORT/FOUNDATION



### TYPE 6 - TEMPORARY MAILBOX SUPPORT



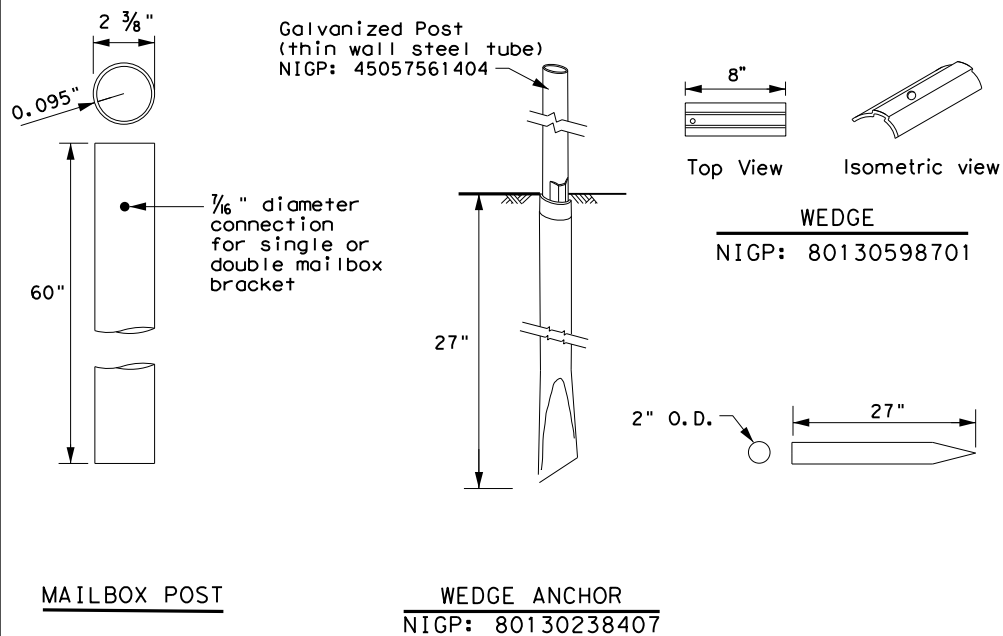
Plastic Drum NIGP: 55093383655  
 Rubber Collar NIGP: 55093387102

#### NOTES:

1. Place on approved plastic drum as shown in the Compliant Work Zone Traffic Control Devices (CWZTCD).
2. Existing attachment hardware shall be used unless damaged. Damaged hardware shall be replaced.

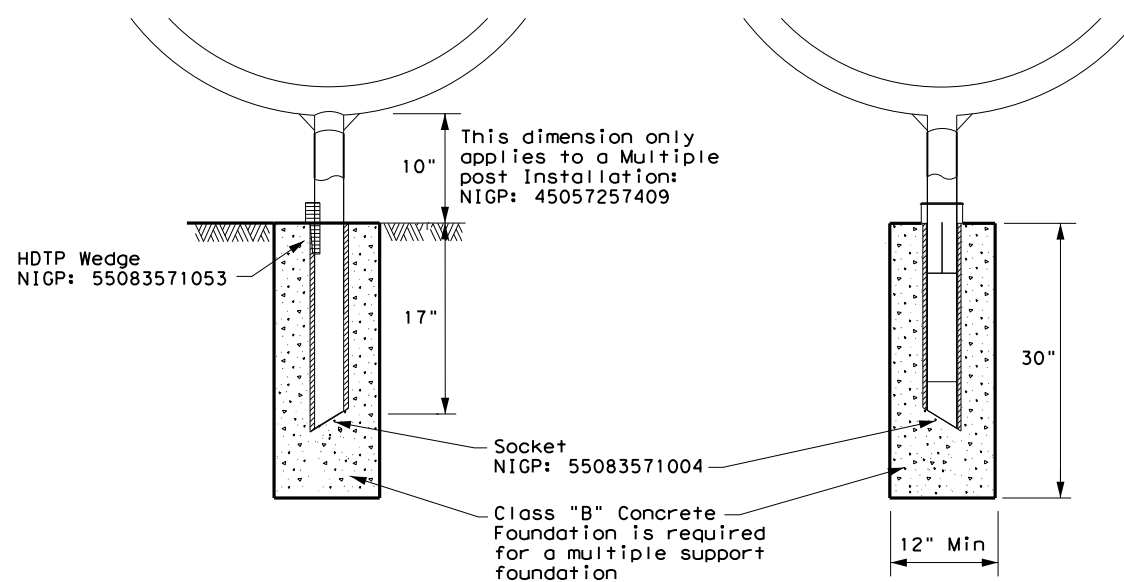
### TYPE 2 - SUPPORT/FOUNDATION

Thin Wall Steel Tube w/Wedge Anchor System



### TYPE 4 - SUPPORT/FOUNDATION

Whitecoated steel post NIGP: 45057561107  
 Multiple post NIGP: 45057257409  
 Recycled Rubber post (RR) NIGP: 45057561057



#### GENERAL NOTES:

1. Erect post plumb or vertical.
2. When galvanized part is required galvanize in accordance with Item 445.
3. Use a concrete footing as shown or when directed. Concrete footing will be required when soils do not hold the support/foundations in a stable condition, only on Type 1, Type 2, and Type 4

SHEET 3 OF 4



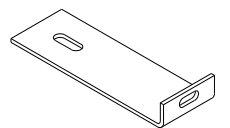
## MAILBOX SUPPORT AND FOUNDATION

MB (3) - 21

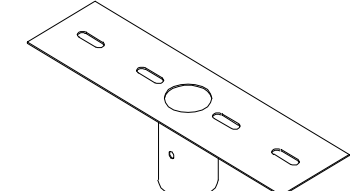
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© TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0220	05	080	SH 48
2/2005	11/2009	4/2015	DIST	COUNTY
6/2005	1/2011		PHR	CAMERON
11/2006	7/2014			SHEET NO. 211

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 The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of any information into a digital format or for any errors or omissions that may appear in this document.

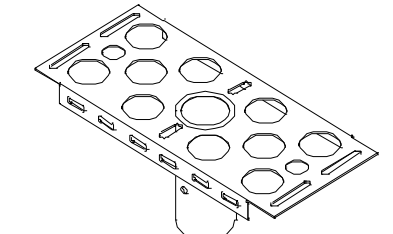
TYPE	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TYPE 6
Configuration	Multiple	Single or Double	Single or Double	Single	Double	Multiple
Mailbox Size NIGP #	Outside Position: S or M Inside Position: S, M, L, XL, or LA	Single: S, M, L, XL, or LA Double: SS, SM, MM	Single: S, M, L, or XL Double: SS, SM, MM	S, M, L, XL, or LA	SS, SM, or MM	Outside Position: S or M Inside Position: S, M, L, or XL
Mailbox Post NIGP #	45057255254 (Galvanized Multiple)	45057561404 (Thin Walled Govanize)	57044325108 (Wing Channel Post)	45057561107 (Thin walled white powder coated) 45057561057 (Recycled Rubber Post: S or M only)	45057561107 (Thin Walled White Powder Coated)	45057257409 (White Powder Coated Multiple)
Post and Mailbox Hardware NIGP #	45057259009 (Wedge) 45057256500 (V-Wing Socket) 45057253002 (Bracket Extension) 45057252251 (Mailbox Bracket) 45057258001 (Part A Angle Bracket x2) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	80130598701 (Wedge) 80130238407 (Wedge Anchor) 45057253002 (Bracket Extension) 45057252343 (Double MB Bracket) 45057252350 (S. Mailbox Bracket) 45057252251 (Mailbox Bracket) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	45057541653 (Type 3 Double Mailbox Bracket) 45057252251 (Mailbox Bracket) 45057253002 (Bracket Extension) 45057258001 (Part A Angle Bracket) 45057258027 (Part B Angle Bracket) 45057250255 (Plate Washer for XL x2) 45057250263 (L-Bracket for XL x4)	55083571053 (Wedge) 55083571004 (Socket) 45057252350 (Single Mailbox Bracket) 45057253002 (Bracket Extension) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	55083571053 (Wedge) 55083571004 (Socket) 45057253002 (Bracket Extension) 45057252343 (Double Mount Bracket) 45057252251 (Mailbox Bracket x2)	55083571053 (Wedge) 55083571004 (Socket) 45057253002 (Bracket Extension) 45057252350 (Single Mount Bracket) 45057250255 (Plate Washer for XL x2) 45057250263 (L-Bracket for XL x4)
Foundation Used	Class B Concrete (Required for LA Mailboxes)	Class B Concrete (Required for LA Mailboxes)	None	Class B Concrete (not used with recycled rubber post, required for LA Mailboxes)	Class B Concrete (not required)	Class B Concrete



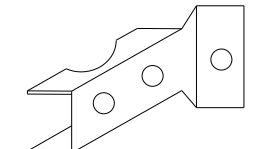
NIGP: 45057250263  
L-Bracket x4 for XL sized mailboxes



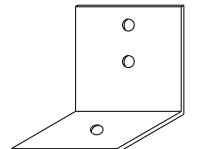
NIGP: 45057252343  
Double Mailbox Bracket For Type 2 and Type 4 double mount



NIGP: 45057252350  
Single Mailbox Bracket For Type 2 single and for Type 4 single and multi mount



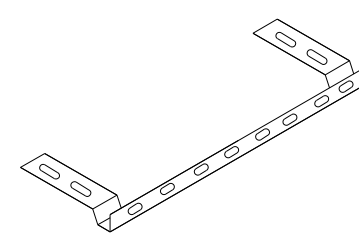
NIGP: 45057258001  
Part "A" Angle Bracket For Type 1 multi (2 per mailbox) and Type 3 single and double



NIGP: 45057251055  
Type 6 Angle Bracket (2 per mailbox)



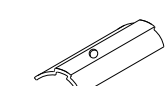
NIGP: 45057252251  
Mailbox Bracket For Type 1 multi and any double mount (use 2)




NIGP: 45057253002  
Bracket Extension Use 1 for a medium Mailbox Use 2 for a Large Mailbox



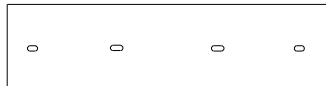
NIGP: 45057258027  
Part "B" Angle Bracket For Type 3 single and double



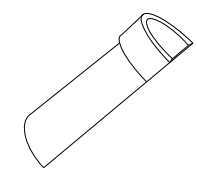
NIGP: 80130598701  
Wedge for Type 2



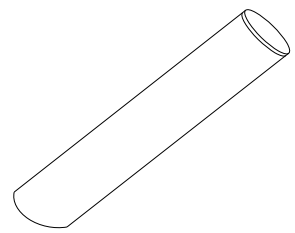
NIGP: 45057250255  
Plate Washer for Architecural and XL Mailboxes




NIGP: 45057541653  
Type 3 double mailbox bracket



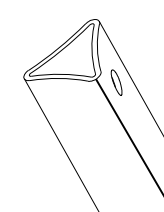
NIGP: 55083571053  
Type 4 Mailbox Wedge



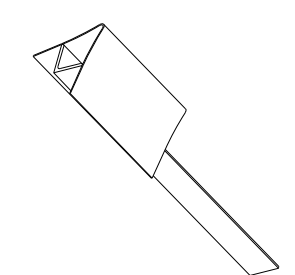
NIGP: 55083571004  
Type 4 Mailbox Socket



NIGP: 80130238407  
Type 2 Wedge Anchor



NIGP: 45057259009  
Wedge for Type 1 V-wing Socket



NIGP: 45057256500  
V-wing Socket for Type 1 Foundation

NIGP #	OBJECT MARKERS AND CONFORMABLE SHEETING
55008311759	Type 2 OM 4"x4" (3 Needed) for Type 3 Wing Channel Post
55008312906	Type 2 OM 6"x12" (1 needed) for Type 3 Wing Channel Post
80149872006	12" Conformable Reflective Yellow Sheeting for Flexible Posts

**NOTES:**

- Type 2 object marker in accordance with Traffic Engineering Standard Delineators & Object Markers.
- A light weight receptacle for newspaper delivery can be attached to mailbox posts if the receptacle does not touch the mailbox, present a hazard to traffic or delivery of the mail, extend beyond the front of the mailbox, or display advertising, except the publication title.

**BID CODES FOR CONTRACTS**

MB-(X) ASSM TY (XXX) (X)

Type of Mailbox \_\_\_\_\_

S = Single  
D = Double  
M = Multiple  
MP = Molded Plastic


Type of Post \_\_\_\_\_

WC = Winged Channel Post  
RR = Recycled Rubber  
TWW = Thin Walled White Tubing  
TWG = Thin Walled Galvanized Tubing  
TIM = Timber

Type of Foundation \_\_\_\_\_

Ty 1 = V-Loc  
Ty 2 = Wedge Anchor Steel System  
Ty 3 = Winged Channel post  
Ty 4 = Wedge Anchor Plastic System  
Ty 5 = 4 X 4 Post

SHEET 4 OF 4

 Texas Department of Transportation				Maintenance Division Standard	
<h2>NIGP PARTS LIST AND COMPATIBILITY</h2> <h3>MB(4)-21</h3>					
FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT	
©TxDOT March 2004	CONT	SECT	JOB	HIGHWAY	
2/2005	0220	05	080	SH 48	
6/2005	DIST	COUNTY	SHEET NO.		
11/2006	PHR	CAMERON	212		

DATE: 2/24/2023 9:23:32 AM  
FILE: P:\txdot\projectwiseonline.com\txdot\Documents\21 - PHR\Design Projects\022005080\4 - Design\Plan Set\1. General\INDEX OF SHEETS\SH 48\_COVERSHT.dgn

# TRAFFIC SIGNAL

*Pharr District Central Design*




## COVER SHEET

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		213

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

ITEM	DESC CODE	SUMMARY OF TRAFFIC SIGNAL ITEMS		①	②	③	④	TOTALS			
				SH 48 AT SH 4 EST	SH 48 AT HOME DEPOT EST	SH 48 AT PRICE EST	SH 48 AT ZENA EST				
		ITEM DESCRIPTION	UNIT	EST	EST	EST	EST				
416	6030	DRILL SHAFT (TRF SIG POLE) (24 IN)	LF								
416	6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	32	32	16	15	95			
618	6016	CONDT (PVC) (SCH 40) (1")	LF								
618	6023	CONDT (PVC) (SCH 40) (2")	LF								
618	6033	CONDT (PVC) (SCH 40) (4")	LF		15	20	35	70			
618	6059	CONDT (PVC) (SCH 80) (4") (BORE)	LF	182				182			
620	6007	ELEC CONDR (NO. 8) BARE	LF	227	240	135	60	662			
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	342			95	437			
624	6002	GROUND BOX TY A (122311)W/APRON	EA								
624	6010	GROUND BOX TY D (162922W/APRON	EA								
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	1	1	4			
*680		LUMINAIRE W/LED (250W EQ)	EA	2				2			
*680		TS2-TYPE 1 CABINET (FULLY ACTUATED)	EA								
*680		SIGN "LT TRN YIELD FL YEL ARR"R10-17T 30"x30"	EA								
*680		SIGN "STREET NAME"	EA								
680	6004	REMOVING TRAFFIC SIGNALS	EA	1	1	1	1	4			
681	6001	TEMP TRAF SIGNALS	EA								
682	6001	VEH SIG SEC (12") LED (GRN)	EA	4	6	2	2	14			
682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	4	2			6			
682	6003	VEH SIG SEC (12") LED (YEL)	EA	4	6	2	2	14			
682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	8	2			10			
682	6005	VEH SIG SEC (12") LED (RED)	EA	4	6	2	2	14			
682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	4				4			
682	6018	PED SIG SEC (LED) (COUNTDOWN)	EA								
682	6060	BACKPLATE w/REFL BRDR (3 SEC)	EA	4	4	2	2	12			
682	6049	BACKPLATE w/REFL BRDR (4 SEC)	EA	4				4			
682	6050	BACKPLATE w/REFL BRDR (5 SEC)	EA		2			2			
684	6007	TRF SIG CBL (TY A) (12 AWG) (2 CONDR)	LF	544	450	270		1264			
684	6010	TRF SIG CBL (TY A) (12 AWG) (5 CONDR)	LF	946	850	480	135	2411			
684	6012	TRF SIG CBL (TY A) (12 AWG) (7 CONDR)	LF	462	435			897			
684	6013	TRF SIG CBL (TY A) (12 AWG) (8 CONDR)	LF								
684	6080	TRF SIG CBL (TY C) (14 AWG) (2 CONDR) SHIELDED LOOP LEAD-IN	LF								
685	6001	INSTALL RDS FLASH BEACON ASSEMBLY	EA								
685	6003	REMOVE RDS FLASH BEACON ASSEMBLY	EA								
686	6047	INS TRF SIG PL AM(S)1 ARM (44') LUM	EA	2				2			
686	6045	INS TRF SIG PL AM(S)1 ARM (44')	EA		2			2			
686	6037	INS TRF SIG PL AM(S)1 ARM (36')	EA				1	1			
686	6043	INS TRF SIG PL AM(S)1 ARM (40')	EA			1		1			
687	6001	PED POLE ASSEMBLY	EA								
688	6001	PED DETECT PUSH BUTTON (APS)	EA								
688	6003	PED DETECTOR CONTROLLER UNIT	EA								
688	6004	VEH LP DETECT (SAW CUT)	LF								
*688		1/C #14 AWG LOOP WIRE (XHHW)	LF								
*6306	6007	VIVDS CABLING	LF	462			135	597			

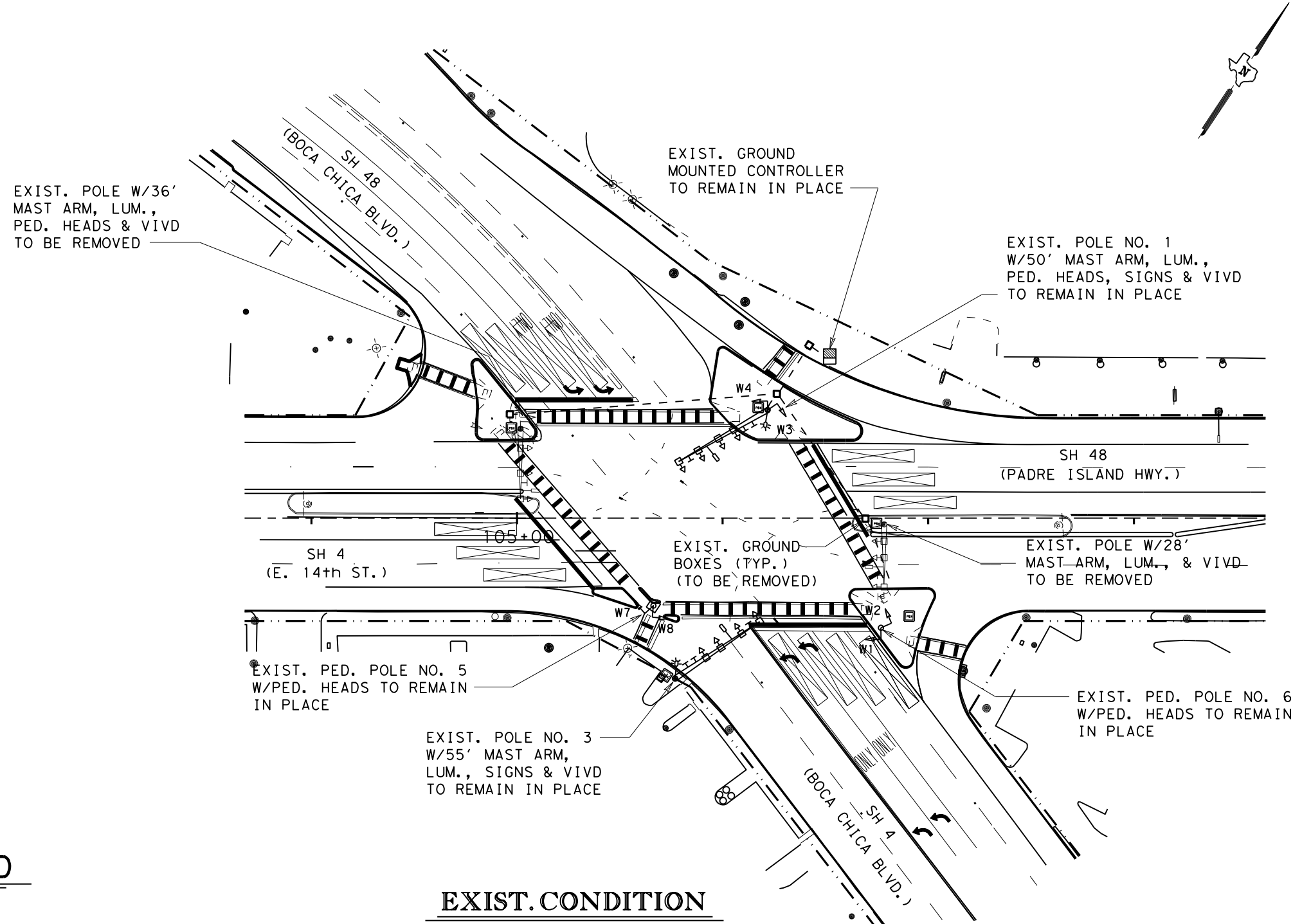
**Pharr District Central Design**



**SH 48**  
SUMMARY OF MATERIALS  
TRAFFIC SIGNAL

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		214

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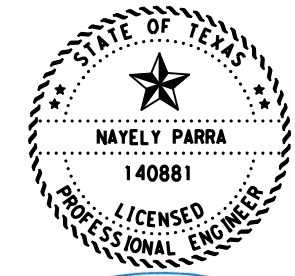


**LEGEND**

- EXIST. PEDESTRIAN HEADS
- EXIST. 12" TRAFFIC SIGNAL HEADS
- EXIST. GROUND BOX
- EXIST. VIVD DETECTION ZONE
- EXIST. FULL TRAFFIC ACTUATED GROUND MOUNTED CONTROLLER
- EXIST. CONDUIT (SIZE & TYPE AS SPECIFIED)
- EXIST. LUMINAIRE
- EXIST. VIVD
- EXIST. ANTENNA
- EXIST. MAST ARM

**EXIST. CONDITION**

INTERSECTION OF  
 SH 48 & SH 4  
 IN CAMERON COUNTY  
 CSJ: 0220-05-080



*Nayely Parra*  
 04/28/2023

**Pharr District Central Design**

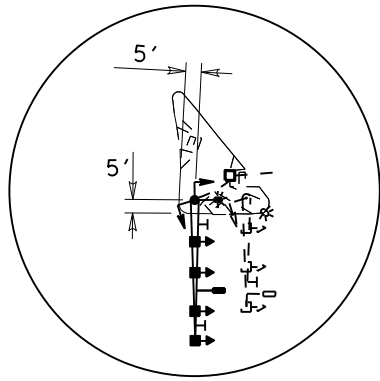
Texas Department of Transportation

①  
**TRAFFIC SIGNAL LAYOUT  
 EXIST. CONDITION  
 SH 48 @ SH 4**

SCALE: 1" = 60' SHEET 1 OF 1

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	215

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POLE NO. 2  
LOCATION

EXIST. POLE W/36'  
MAST ARM, LUM.,  
PED. HEADS & VIVD  
TO BE REMOVED

PROP. POLE NO. 2  
W/44' MAST ARM  
& LUM. (SALVAGE &  
RE-USE PED. HEADS  
& VIVD)

EXIST. GROUND  
MOUNTED CONTROLLER  
TO REMAIN IN PLACE

EXIST. POLE NO. 1  
W/50' MAST ARM, LUM.,  
PED. HEADS, SIGNS & VIVD  
TO REMAIN IN PLACE

PROP. POLE NO. 4  
W/44' MAST ARM  
& LUM. (SALVAGE &  
RE-USE PED. HEADS  
& VIVD)

EXIST. POLE W/28'  
MAST ARM, LUM.,  
PED. HEADS & VIVD  
TO BE REMOVED

EXIST. PED. POLE NO. 6  
W/PED. HEADS TO REMAIN  
IN PLACE

EXIST. PED. POLE NO. 5  
W/PED. HEADS TO REMAIN  
IN PLACE

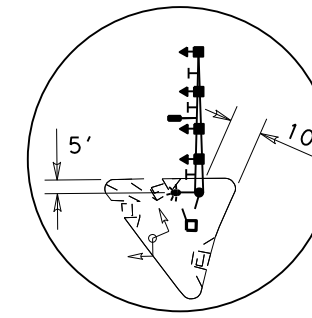
EXIST. POLE NO. 3  
W/55' MAST ARM,  
LUM., SIGNS & VIVD  
TO REMAIN IN PLACE

### LEGEND

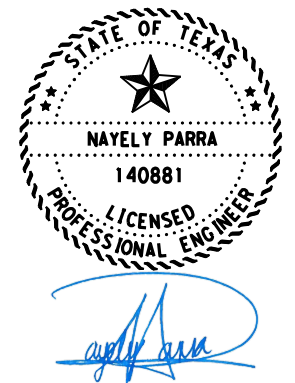
- PROP. PEDESTRIAN HEADS
- EXIST. PEDESTRIAN HEADS
- PROP. 12" TRAFFIC SIGNAL HEADS
- EXIST. 12" TRAFFIC SIGNAL HEADS
- PROP. GROUND BOX
- EXIST. GROUND BOX
- PROP. VIVD DETECTION ZONE
- EXIST. VIVD DETECTION ZONE
- EXIST. FULL TRAFFIC ACTUATED GROUND MOUNTED CONTROLLER
- PROP. CONDUIT (SIZE & TYPE AS SPECIFIED)
- EXIST. CONDUIT (SIZE & TYPE AS SPECIFIED)
- PROP. CONDUIT BORE (SIZE & TYPE AS SPECIFIED)
- PROP. LUMINAIRE
- EXIST. LUMINAIRE
- PROP. OR RELOCATED VIVD
- EXIST. VIVD
- EXIST. ANTENNA
- PROP. MAST ARM
- EXIST. MAST ARM

### PROPOSED DIAGRAM

INTERSECTION OF  
SH 48 & SH 4  
IN CAMERON COUNTY  
CSJ: 0220-05-080



POLE NO. 4  
LOCATION



04/28/2023

Pharr District Central Design



①  
TRAFFIC SIGNAL LAYOUT  
PROPOSED INSTALLATION  
SH 48 @ SH 4

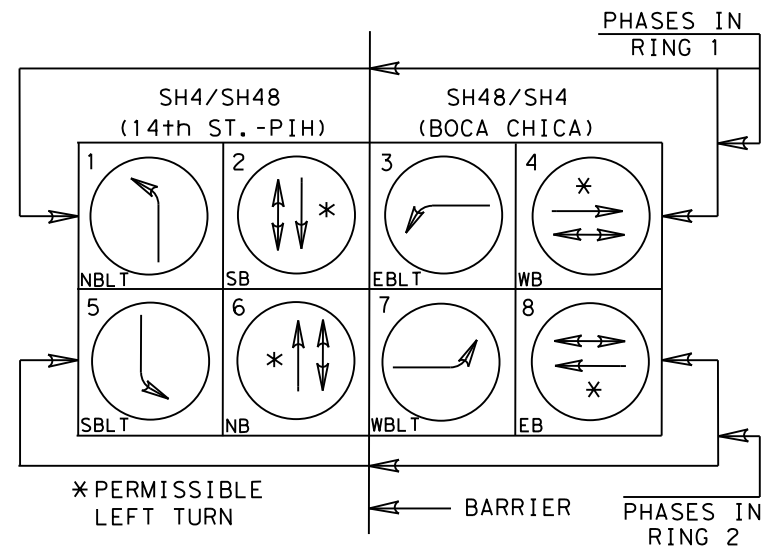
SCALE: 1" = 60' SHEET 1 OF 2

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	216	

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ELECTRICAL CHART													
ITEM	TOTAL QTY.	RUN NUMBER	RUN LENGTH (FT)					A	B	C	D	E	F
			60	60	70	182	45						
POWER		1/C-#6											
		1/C-#8											
GROUND		1/C-#6 BARE											
	227'	1/C-#8 BARE								1	1		
SIGNAL CABLE	544'	2/C-#12									2	4	
	342'	4/C-#12 TRAY								1	1	2	
	946'	5/C-#12							1	1	3	6	
	462'	7/C-#12							1	1	1	2	
	462'	8/C-#12											
LOOP		1/C-#14 LOOP WIRE											
		2/C-#14 (SHIELDED)											
CONDUIT		1" PVC											
		2" PVC											
		2" PVC BORE											
	182'	4" PVC BORE										1	*

\* EXISTING CONDUIT TO REMAIN IN PLACE



EXISTING PHASING DIAGRAM  
(TO REMAIN IN PLACE)

EXISTING TIMING CHART								
PHASE	1	2	3	4	5	6	7	8
STREET	SH4/SH48 (14th-PIH)		SH48/SH4 (BOCA CHICA)		SH4/SH48 (14th-PIH)		SH48/SH4 (BOCA CHICA)	
MOVEMENT	WBLT	WB	SBLT	NB	EBLT	WB	NBLT	SB
MIN GREEN								
EXTENSION								
MAXIMUM I								
MAXIMUM II								
YELLOW								
ALL RED								
WALK								
DON'T WALK								
RECALL								
MEMORY								

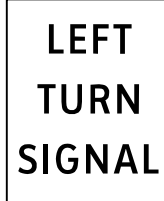
(TO REMAIN IN PLACE - BY CITY OF BROWNSVILLE)



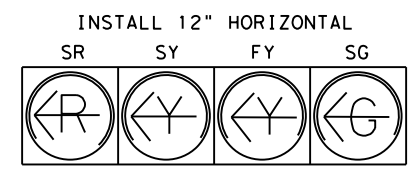
EXISTING R10-4b SIGN & PEDESTRIAN PUSH BUTTON  
 W1, W2, W3, W4, W7 & W8  
 (TO REMAIN IN PLACE)  
 W5 & W6  
 (SALVAGED, TO BE RE-USED)



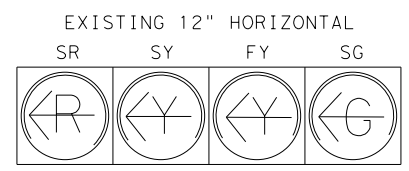
EXISTING PEDESTRIAN SIGNALS  
 W1, W2, W3, W4, W7 & 8  
 (TO REMAIN IN PLACE)  
 W5 & W6  
 (SALVAGED, TO BE RE-USED)



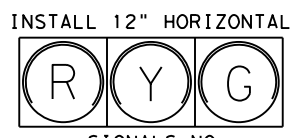
EXISTING SIGN (SALVAGED, TO BE RE-USED)  
 S3 & S6



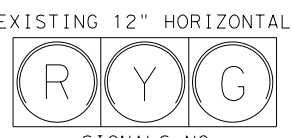
SIGNALS NO. 1, 2, 11 & 12  
 W/BACKPLATES



SIGNALS NO. 7, 8, 15 & 16  
 (TO REMAIN IN PLACE)



SIGNALS NO. 3, 4, 9 & 10  
 W/BACKPLATES



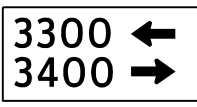
SIGNALS NO. 5, 6, 13 & 14  
 (TO REMAIN IN PLACE)

NOTES

- THE CONTRACTOR SHALL FURNISH & INSTALL SIGNAL HEADS, SIGNAL POLES, LUMINAIRES, CONDUITS & CABLES AS SHOWN.
- THE LOCATION SHOWN FOR POLES & CONDUIT RUNS IS APPROXIMATE. THE EXACT LOCATIONS WILL BE DETERMINED IN THE FIELD BY THE ENGINEER IN COORDINATION WITH THE PHARR DISTRICT TRAFFIC SECTION.
- ALL SIGNAL CABLE SHALL BE #12 AWG & SERVICE CABLE SHALL BE #6 AWG.
- ALL PROPOSED TRAFFIC SIGNAL HEADS SHALL HAVE BACKPLATES.
- THE LUMINAIRES SHALL BE OPERATED UNDER THEIR OWN PHOTO ELECTRIC CONTROL, IF APPLICABLE.
- 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.
- 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 SIGN (SALVAGED, TO BE RE-USED)  
 S1 & S4



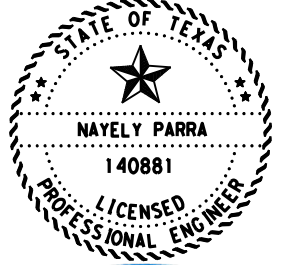
EXISTING SIGN (SALVAGED, TO BE RE-USED)  
 S2 & S5

VIVDS DETECTOR CHART				
VIVD/ DETECTION ZONE	DETECTOR RACK NO.	SETTING	FUNCTION	DELAY TIMING
* V-1/Z-1, Z-6	1/2	PRESENCE	CALL & EXTEND Ø 1 & Ø 6	
* V-2/Z-8	3/4	PRESENCE	CALL & EXTEND Ø 3 & Ø 8	
* V-3/Z-2, Z-5	5/6	PRESENCE	CALL & EXTEND Ø 2 & Ø 5	
* V-4/Z-4	7/8	PRESENCE	CALL & EXTEND Ø 4 & Ø 7	

\* EXISTING VIVDS TO REMAIN IN PLACE

TRAFFIC SIGNAL POLES					
POLE NUMBER	QUANTITY	SIGNAL POLE DESIGNATION	MAST ARM DESIGNATION	FOUNDATION TYPE	FOUNDATION DEPTH
* 1	1	SMA 50L-100	50 III-100		
* 2	1	SMA 44L-100	44 III-100	36 (TY B)	16'
* 3	1	SMA 55L-100	55 III-100		
* 4	1	SMA 44L-100	44 III-100	36 (TY B)	16'
* 5	1	PEDESTAL	N/A		
* 6	1	PEDESTAL	N/A		

\* EXISTING POLES TO REMAIN IN PLACE



*Nayely Parra*  
 04/28/2023

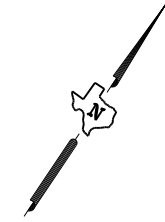
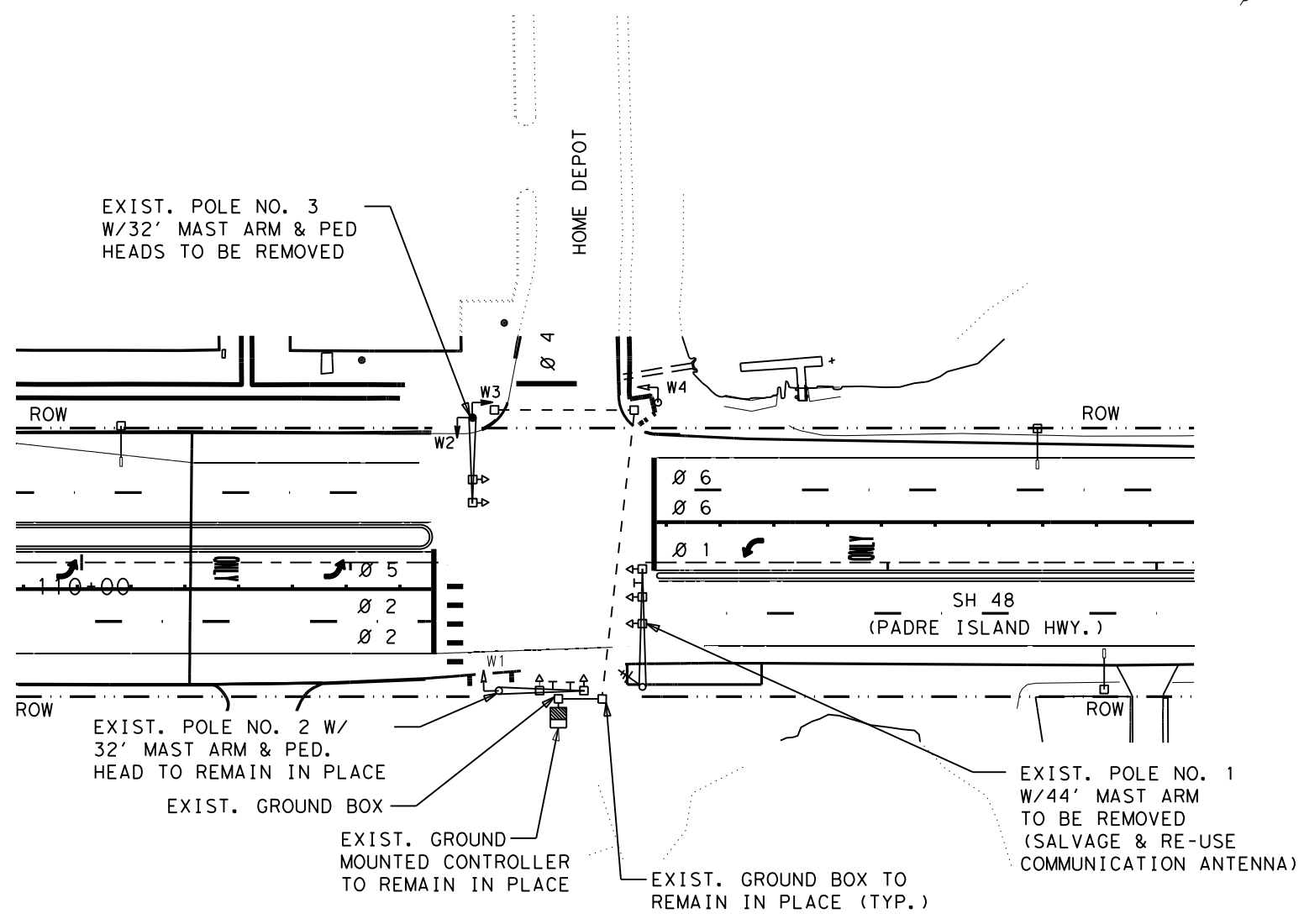
Pharr District Central Design  
 Texas Department of Transportation

TRAFFIC SIGNAL LAYOUT  
 PROPOSED INSTALLATION  
 SH 48 @ SH 4

SCALE: 1"=60' SHEET 2 OF 2

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	217	

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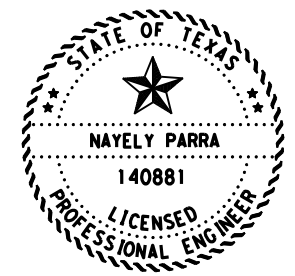


**LEGEND**

- EXIST. PEDESTRIAN HEADS
- EXIST. 12" TRAFFIC SIGNAL HEADS
- EXIST. GROUND BOX
- EXIST. VIVD DETECTION ZONE
- EXIST. FULL TRAFFIC ACTUATED GROUND MOUNTED CONTROLLER
- EXIST. CONDUIT (SIZE & TYPE AS SPECIFIED)
- EXIST. LUMINAIRE
- EXIST. VIVD
- EXIST. ANTENNA
- EXIST. MAST ARM

**EXISTING CONDITION**

INTERSECTION OF  
 SH 48 & HOME DEPOT DR.  
 IN CAMERON COUNTY  
 CSJ: 0220-05-080



*Nayely Parra*  
 03/14/2023

**Pharr District Central Design**

Texas Department of Transportation

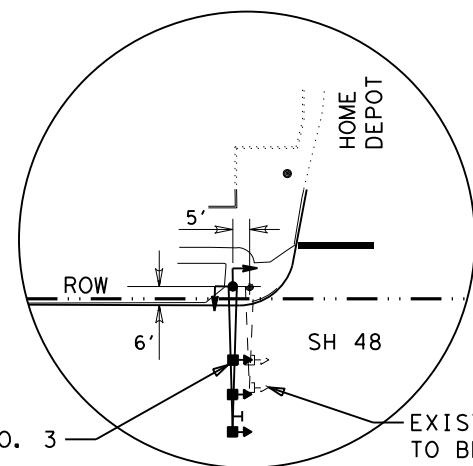
②  
**TRAFFIC SIGNAL LAYOUT  
 EXISTING CONDITION  
 SH 48 @ HOME DEPOT DR.**

SCALE: 1" = 60' SHEET 1 OF 1

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	218	

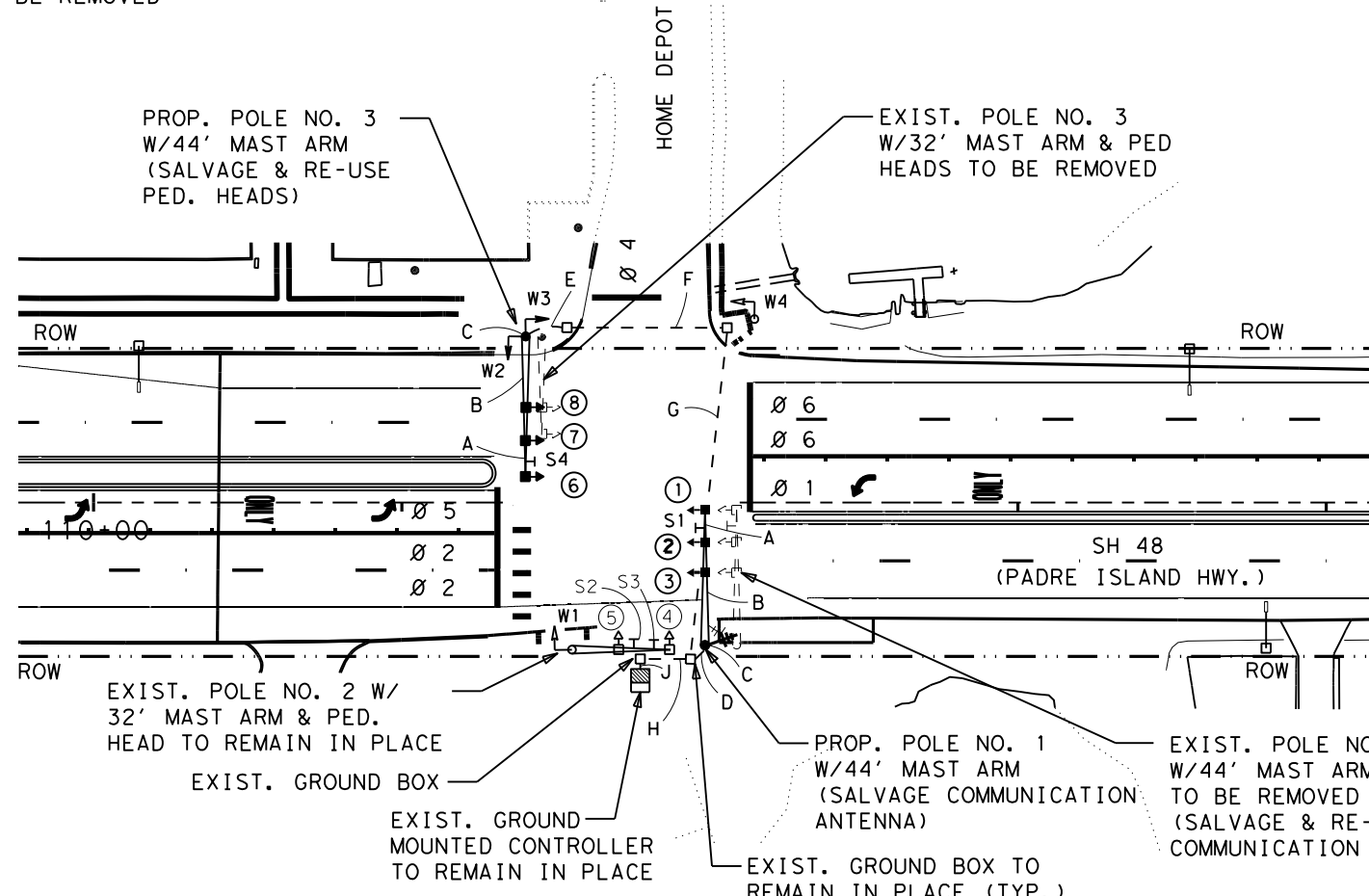


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PROP. POLE NO. 3  
 EXIST. POLE NO. 3 TO BE REMOVED

POLE NO. 3 LOCATION

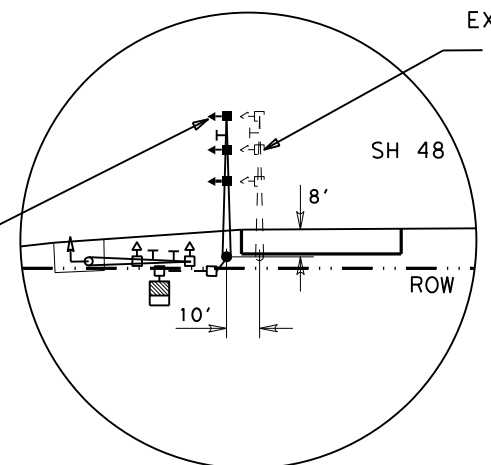


**LEGEND**

- PROP. PEDESTRIAN HEADS
- PROP. 12" SPAN WIRE MOUNTED TRAFFIC SIGNAL HEADS
- EXIST. 12" SPAN WIRE MOUNTED TRAFFIC SIGNAL HEADS
- PROP. GROUND BOX
- EXIST. GROUND BOX
- PROP. VIVID DETECTION ZONE
- EXIST. FULL TRAFFIC ACTUATED GROUND MOUNTED CONTROLLER
- PROP. CONDUIT (SIZE & TYPE AS SPECIFIED)
- EXIST. CONDUIT (SIZE & TYPE AS SPECIFIED)
- PROP. LUMINAIRE
- EXIST. LUMINAIRE
- PROP. CONDUIT BORE (SIZE & TYPE AS SPECIFIED)
- EXIST. VIVID
- EXIST. ANTENNA
- PROP. MAST ARM
- EXIST. MAST ARM

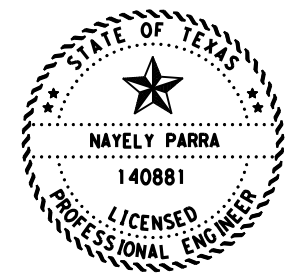
**PROPOSED DIAGRAM**

INTERSECTION OF  
 SH 48 & HOME DEPOT DR.  
 IN CAMERON COUNTY  
 CSJ: 0220-05-080



PROP. POLE NO. 1

POLE NO. 1 LOCATION



*Nayely Parra*  
 03/14/2023

**Pharr District Central Design**

**Texas Department of Transportation**

②  
**TRAFFIC SIGNAL LAYOUT  
 PROPOSED INSTALLATION  
 SH 48 @ HOME DEPOT DR.**

SCALE: 1" = 60' SHEET 1 OF 2

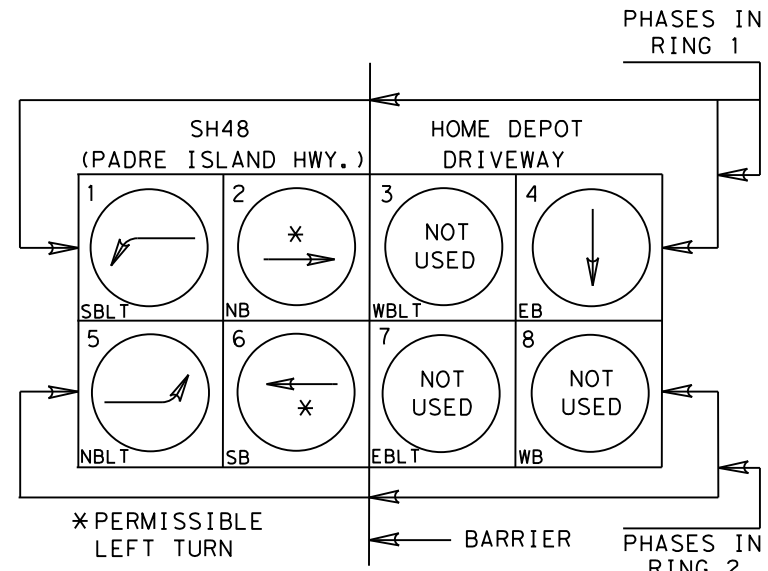
© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	219

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### ELECTRICAL CHART

ITEM	TOTAL QTY.	RUN NUMBER	RUN LENGTH (FT)											
			A	B	C	D	E	F	G	H	J			
POWER		1/C-#6	35	80	50	15	25	60	110	20	10			
		1/C-#8												
GROUND		1/C-#6 BARE												
	240'	1/C-#8 BARE				1	1	1	1	1	1			
SIGNAL CABLE	450'	2/C-#12					2	2	2	2	2			
		4/C-#12 TRAY												
	850'	5/C-#12		1	1	1	3	3	3	4	4			
	435'	7/C-#12	1	1	1	1	1	1	2	2	2			
		8/C-#12												
LOOP		1/C-#14 LOOP WIRE												
		2/C-#14 (SHIELDED)												
CONDUIT		1" PVC												
		2" PVC												
		2" PVC BORE												
	15'	4" PVC				1	⊗	⊗	⊗	⊗	⊗			
	4" PVC BORE													

⊗ EXISTING CONDUIT TO REMAIN IN PLACE



### EXISTING PHASING DIAGRAM

(TO REMAIN IN PLACE)

### EXISTING TIMING CHART

PHASE	1	2	3	4	5	6	7	8
STREET	SH 48 PADRE ISLAND HWY		HOME DEPOT ROAD		SH 48 PADRE ISLAND HWY		HOME DEPOT ROAD	
MOVEMENT	SBLT	NB	WBLT	EB	NBLT	SB	EBLT	WB
MIN GREEN								
EXTENSION								
MAXIMUM I								
MAXIMUM II								
YELLOW								
ALL RED								
WALK								
DON'T WALK								
RECALL								
MEMORY								

(TO REMAIN IN PLACE - BY CITY OF BROWNSVILLE)

EXISTING 18" x 16"

PEDESTRIAN SIGNAL  
W1 & W4  
(TO REMAIN IN PLACE)  
W2 & W3  
(SALVAGED, TO BE RE-USED)

EXISTING

R10-4b SIGN & PEDESTAL PUSH BUTTON  
W1 & W4  
(TO REMAIN IN PLACE)  
W2 & W3  
(SALVAGED, TO BE RE-USED)

EXISTING SIGN

PROTECTED LEFT ON GREEN ARROW  
S1  
(SALVAGED, TO BE RE-USED)

INSTALL 12" HORIZONTAL

SIGNALS NO. 1 & 6  
W/BACKPLATES

INSTALL 12" HORIZONTAL

SIGNALS NO. 2, 3, 7 & 8  
W/BACKPLATES

EXISTING 12" HORIZONTAL

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

### NOTES

1. THE CONTRACTOR SHALL FURNISH & INSTALL SIGNAL HEADS, SIGNAL POLES, LUMINAIRES, CONDUITS & CABLES AS SHOWN.
2. THE LOCATION SHOWN FOR POLES & CONDUIT RUNS IS APPROXIMATE. THE EXACT LOCATIONS 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.
4. ALL PROPOSED TRAFFIC SIGNAL HEADS SHALL HAVE BACKPLATES.
5. THE LUMINAIRES SHALL BE OPERATED UNDER THEIR OWN PHOTO ELECTRIC CONTROL, IF APPLICABLE.
6. 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.
7. 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 SIGN

Padre Island Hwy  
S2  
(TO REMAIN IN PLACE)

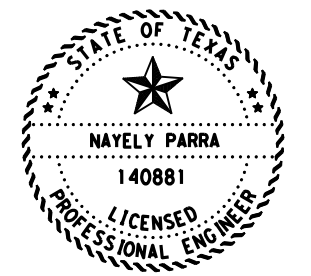
EXISTING SIGN

4600 →  
← 4700  
S3  
(TO REMAIN IN PLACE)

### TRAFFIC SIGNAL POLES

POLE NUMBER	QUANTITY	SIGNAL POLE DESIGNATION	MAST ARM DESIGNATION	FOUNDATION TYPE	FOUNDATION DEPTH
1	1	SMA-44-100	44 III-100	36 (TY B)	16'
2	1	SMA-32-100	32 II-100	36 (TY A)	
3	1	SMA-44-100	44 III-100	36 (TY B)	16'

\* EXISTING POLES TO REMAIN IN PLACE



*Nayely Parra*  
03/14/2023

**Pharr District Central Design**

**Texas Department of Transportation**

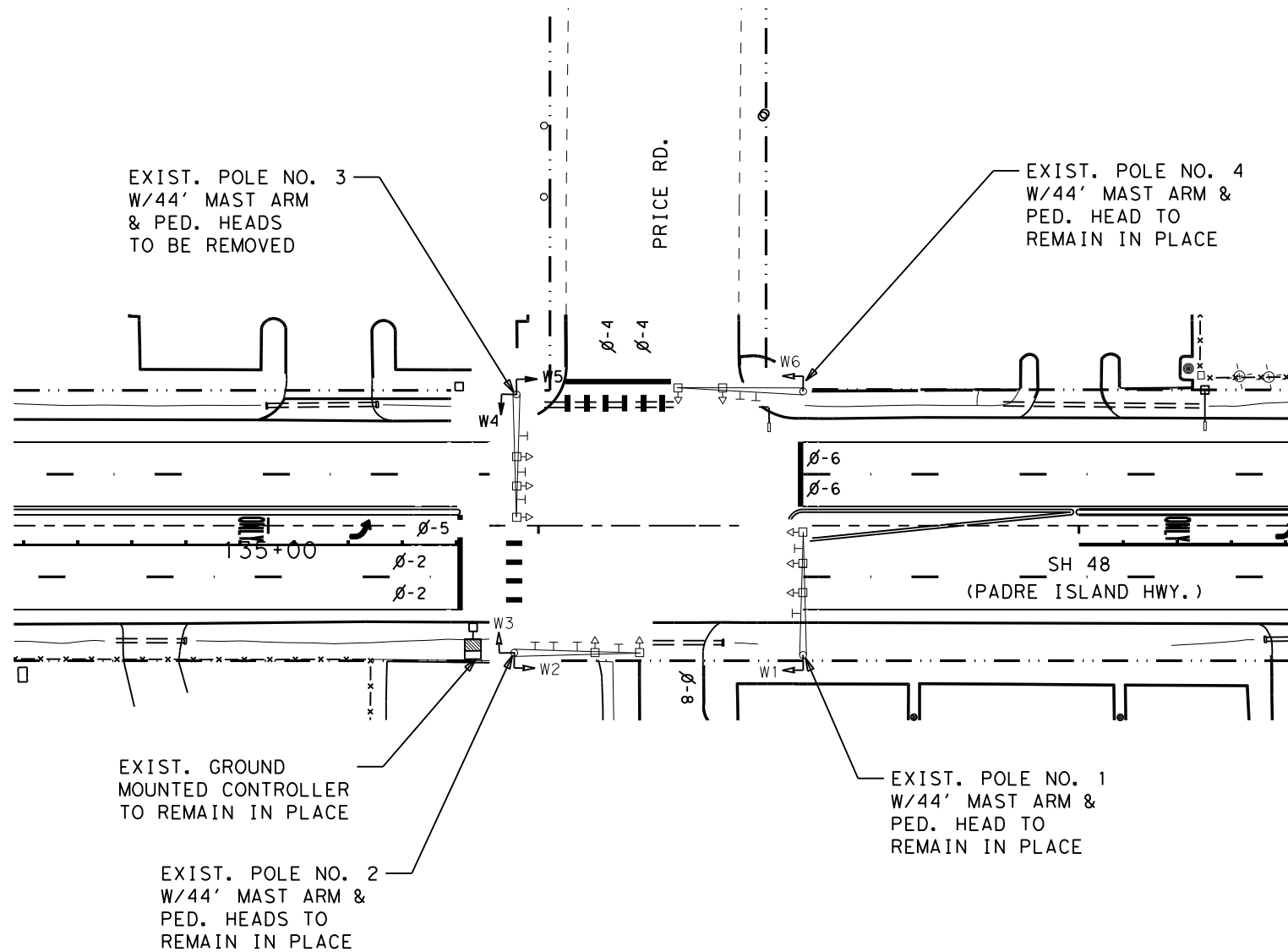
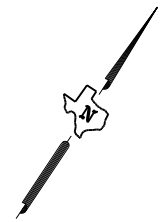
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### TRAFFIC SIGNAL LAYOUT PROPOSED INSTALLATION SH 48 @ HOME DEPOT DR.

SCALE: 1" = 60' SHEET 2 OF 2

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	220	

DATE: 2/27/2023 4:50:43 PM  
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### LEGEND

- EXIST. PEDESTRIAN HEADS
- EXIST. 12" TRAFFIC SIGNAL HEADS
- EXIST. GROUND BOX
- EXIST. VIVD DETECTION ZONE
- EXIST. FULL TRAFFIC ACTUATED GROUND MOUNTED CONTROLLER
- EXIST. CONDUIT (SIZE & TYPE AS SPECIFIED)
- EXIST. LUMINAIRE
- EXIST. VIVD
- EXIST. ANTENNA
- EXIST. MAST ARM

### EXISTING CONDITION

INTERSECTION OF  
 SH 48 & PRICE RD.  
 IN CAMERON COUNTY  
 CSJ: 0220-05-080



03/14/2023

Pharr District Central Design

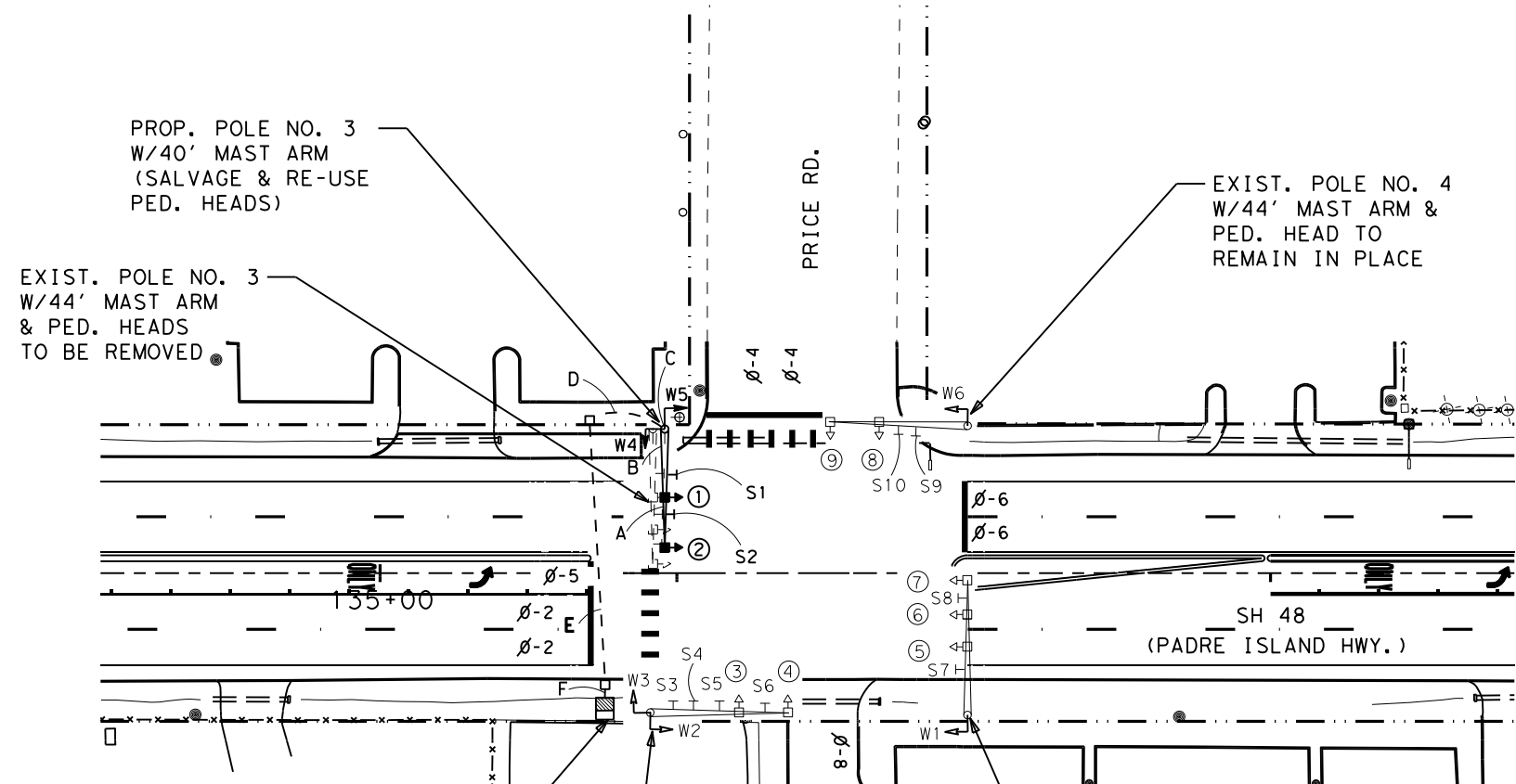
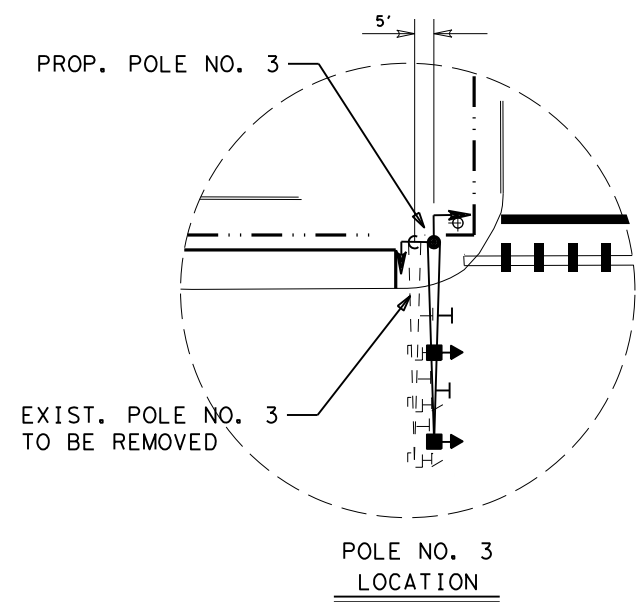


③  
 TRAFFIC SIGNAL LAYOUT  
 EXISTING CONDITION  
 SH 48 @ PRICE RD.

SCALE: 1" = 60' SHEET 1 OF 1

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	221	

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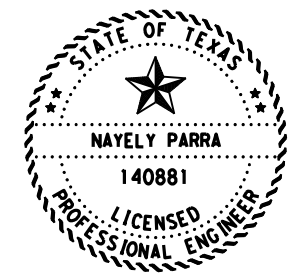
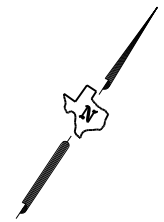


**LEGEND**

- PROP. PEDESTRIAN HEADS
- PROP. 12" SPAN WIRE MOUNTED TRAFFIC SIGNAL HEADS
- EXIST. 12" SPAN WIRE MOUNTED TRAFFIC SIGNAL HEADS
- PROP. GROUND BOX
- EXIST. GROUND BOX
- PROP. RADAR DETECTOR ZONE
- EXIST. FULL TRAFFIC ACTUATED GROUND MOUNTED CONTROLLER
- PROP. CONDUIT (SIZE & TYPE AS SPECIFIED)
- EXIST. CONDUIT (SIZE & TYPE AS SPECIFIED)
- PROP. LUMINAIRE
- PROP. CONDUIT BORE (SIZE & TYPE AS SPECIFIED)
- EXIST. VVD
- EXIST. ANTENNA
- EXIST. EMERGENCY VEHICLE SENSOR
- EXIST. RADAR PRESENCE DETECTOR (STOP BAR)

**PROPOSED DIAGRAM**

INTERSECTION OF  
 SH 48 & PRICE RD.  
 IN CAMERON COUNTY  
 CSJ: 0220-05-080



*Nayely Parra*  
 03/14/2023

**Pharr District Central Design**

**Texas Department of Transportation**

③  
**TRAFFIC SIGNAL LAYOUT  
 PROPOSED INSTALLATION  
 SH 48 @ PRICE RD.**

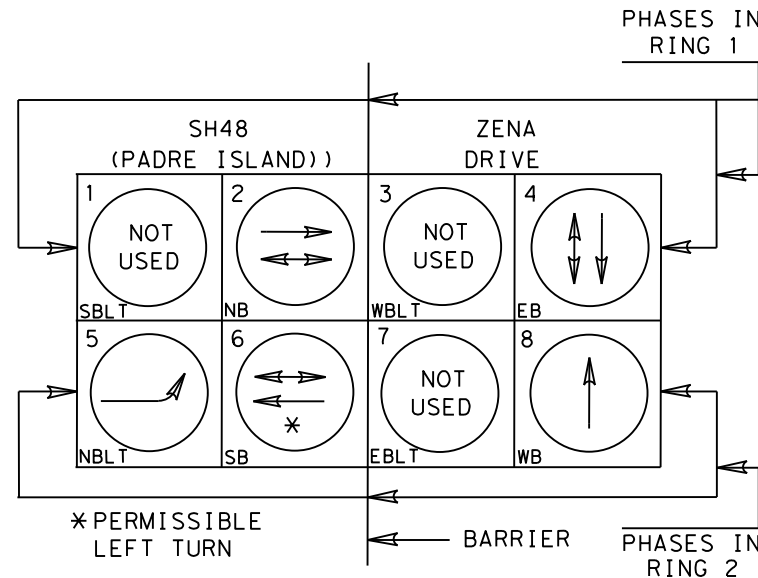
SCALE: 1" = 60' SHEET 1 OF 2

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	222

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ELECTRICAL CHART									
ITEM	TOTAL QTY.	RUN NUMBER	A	B	C	D	E	F	
			20	30	25	20	100	15	
POWER		1/C-#6							
		1/C-#8							
GROUND		1/C-#6 BARE							
	135'	1/C-#8 BARE				1	1	1	
SIGNAL CABLE	270'	2/C-#12				2	2	2	
		4/C-#12 TRAY							
	480'	5/C-#12	1	1	1	3	3	3	
		7/C-#12							
		8/C-#12							
	RVDS CABLE								
LOOP		1/C-#14 LOOP WIRE							
		2/C-#14 (SHIELDED)							
CONDUIT		1" PVC							
		2" PVC							
		2" PVC BORE							
	20'	4" PVC				1	⊗	⊗	
		4" PVC BORE							

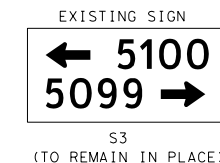
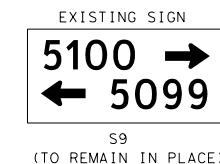
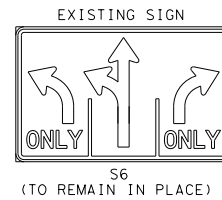
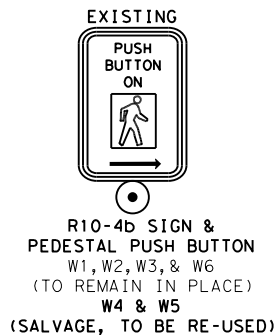
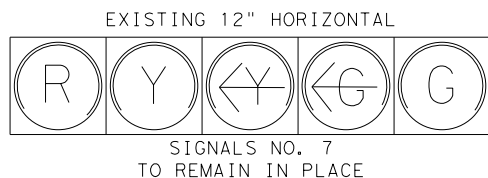
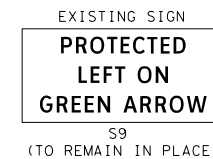
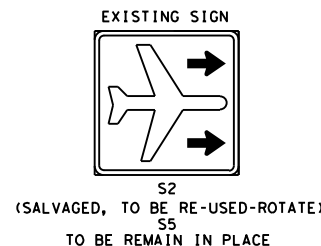
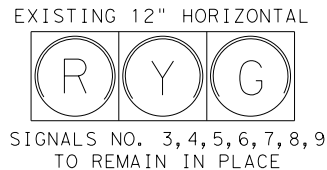
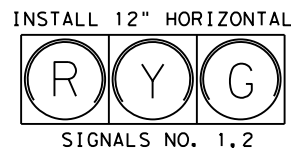
⊗ EXISTING CONDUIT TO REMAIN IN PLACE



**EXISTING PHASING DIAGRAM**  
(TO REMAIN IN PLACE)

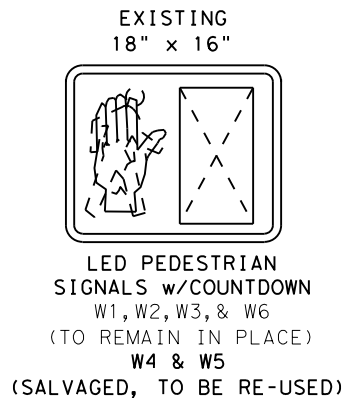
EXISTING TIMING CHART								
PHASE	1	2	3	4	5	6	7	8
STREET	SH 48 PADRE ISLAND HWY		PRICE ROAD		SH 48 PADRE ISLAND HWY		PRICE ROAD	
MOVEMENT	SBLT	NB	WBLT	EB	NBLT	SB	EBLT	WB
MIN GREEN								
EXTENSION								
MAXIMUM I								
MAXIMUM II								
YELLOW								
ALL RED								
WALK								
DON'T WALK								
RECALL								
MEMORY								

(TO REMAIN IN PLACE - BY CITY OF BROWNSVILLE)



**NOTES**

- THE CONTRACTOR SHALL FURNISH & INSTALL SIGNAL HEADS, SIGNAL POLES, LUMINAIRES, CONDUITS & CABLES AS SHOWN.
- THE LOCATION SHOWN FOR POLES & CONDUIT RUNS IS APPROXIMATE. THE EXACT LOCATIONS WILL BE DETERMINED IN THE FIELD BY THE ENGINEER IN COORDINATION WITH THE PHARR DISTRICT TRAFFIC SECTION.
- ALL SIGNAL CABLE SHALL BE #12 AWG & SERVICE CABLE SHALL BE #6 AWG.
- ALL PROPOSED TRAFFIC SIGNAL HEADS SHALL HAVE BACKPLATES.
- THE LUMINAIRES SHALL BE OPERATED UNDER THEIR OWN PHOTO ELECTRIC CONTROL, IF APPLICABLE.
- 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.
- 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.



TRAFFIC SIGNAL POLES						
POLE NUMBER	QUANTITY	SIGNAL POLE DESIGNATION	MAST ARM DESIGNATION	FOUNDATION TYPE	FOUNDATION DEPTH	
* 1	1	SMA 44-100	44 III-100			
* 2	1	SMA 44-100	44 II-100			
* 3	1	SMA 40-100	40 II-100	36 (TY B)	16'	
* 4	1	SMA 44-100	44 II-100			

\* EXISTING POLES TO REMAIN IN PLACE

**Pharr District Central Design**

Texas Department of Transportation

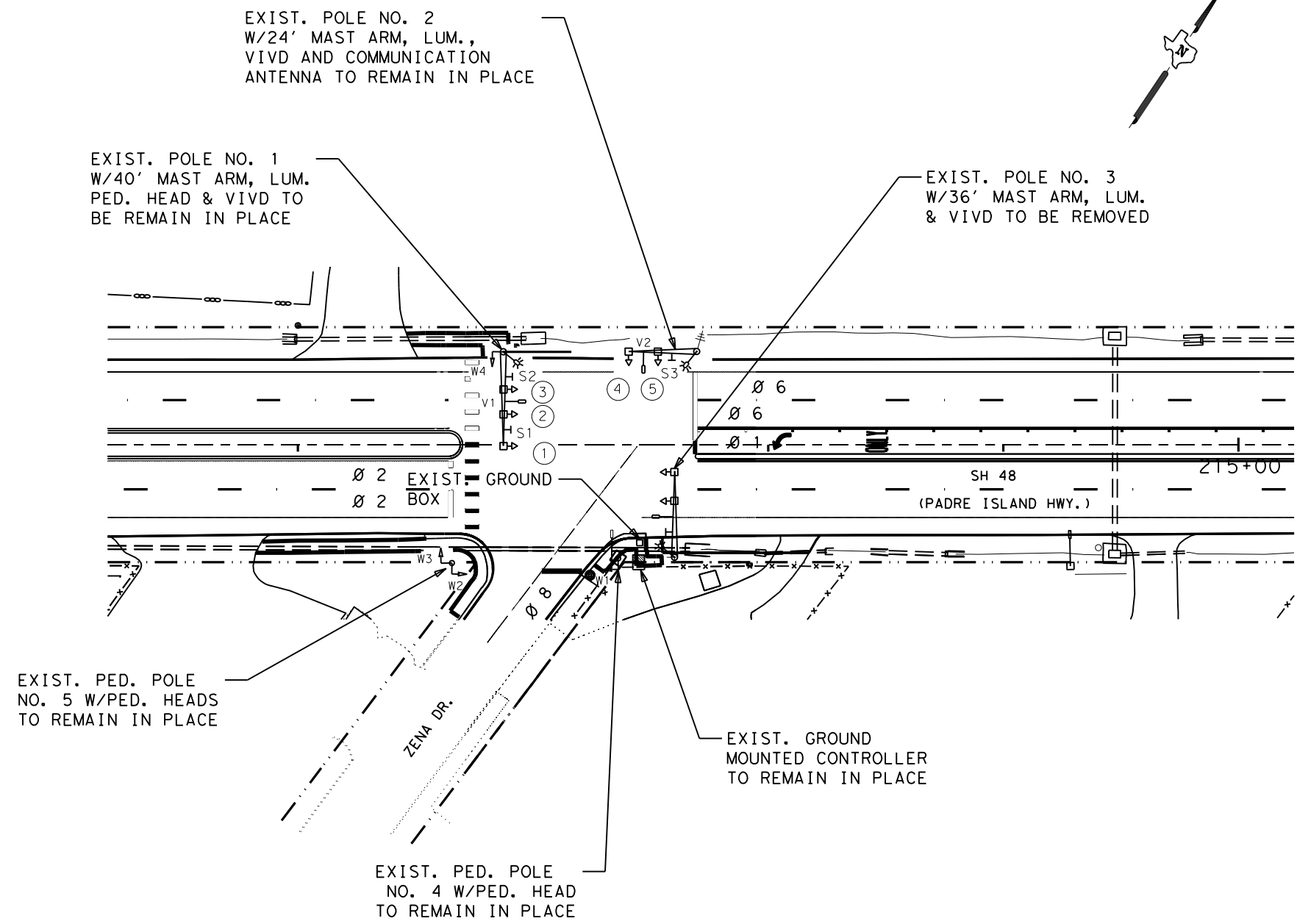
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**TRAFFIC SIGNAL LAYOUT PROPOSED INSTALLATION SH 48 @ PRICE RD.**

SCALE: 1"=60' SHEET 2 OF 2

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		223

DATE: 2/24/2023 9:24:32 AM  
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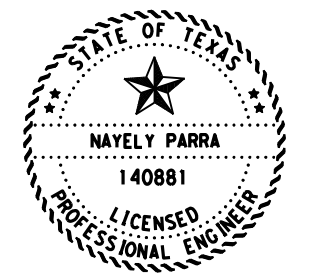


**LEGEND**

- EXIST. PEDESTRIAN HEADS
- EXIST. 12" TRAFFIC SIGNAL HEADS
- EXIST. GROUND BOX
- EXIST. VIDD DETECTION ZONE
- EXIST. FULL TRAFFIC ACTUATED GROUND MOUNTED CONTROLLER
- EXIST. CONDUIT (SIZE & TYPE AS SPECIFIED)
- EXIST. LUMINAIRE
- EXIST. VIDD
- EXIST. ANTENNA
- EXIST. MAST ARM

**EXISTING CONDITION**

INTERSECTION OF  
 SH 48 & ZENA DR.  
 IN CAMERON COUNTY  
 CSJ: 0220-05-080



*Nayely Parra*  
 03/14/2023

Pharr District Central Design

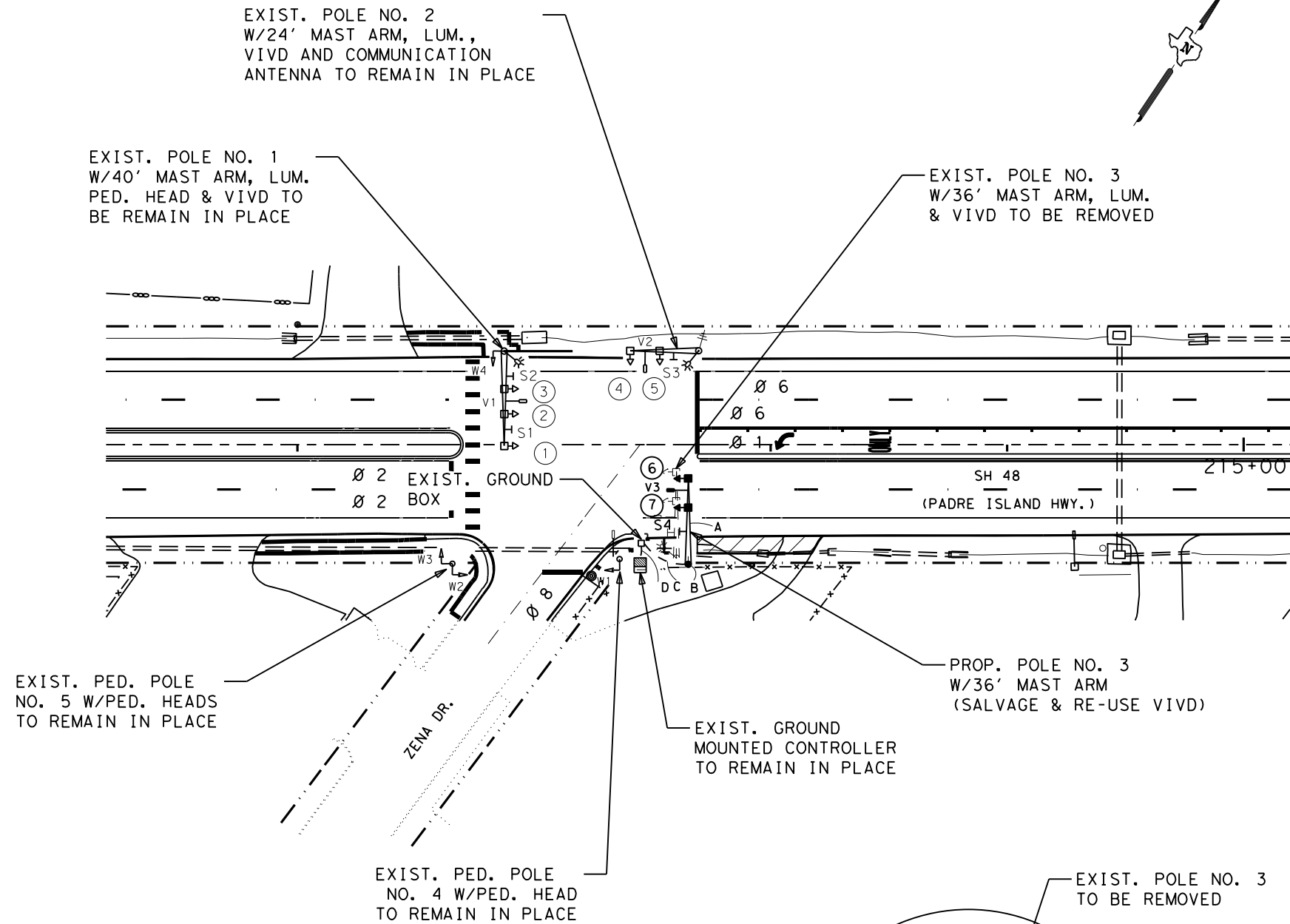


④  
 TRAFFIC SIGNAL LAYOUT  
 EXISTING CONDITION  
 SH 48 @ ZENA DR.

SCALE: 1" = 60' SHEET 1 OF 1

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	224

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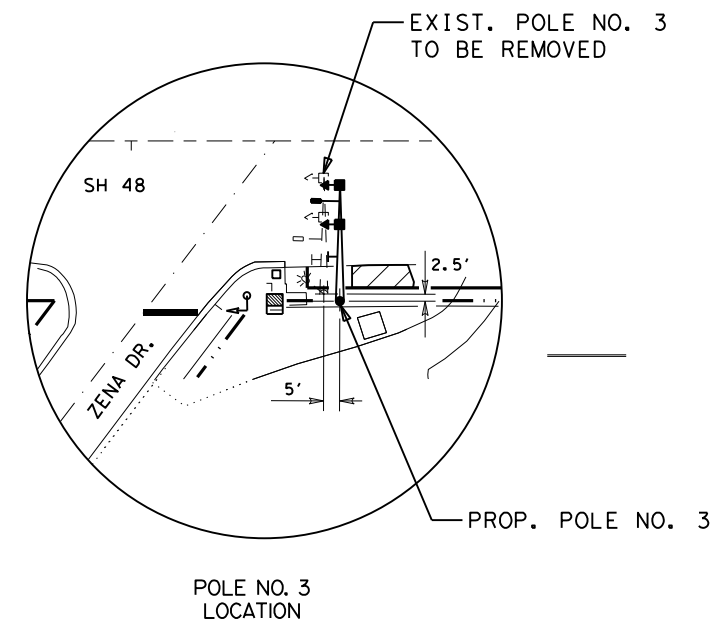


### LEGEND

- PROP. PEDESTRIAN HEADS
- PROP. 12" SPAN WIRE MOUNTED TRAFFIC SIGNAL HEADS
- EXIST. 12" SPAN WIRE MOUNTED TRAFFIC SIGNAL HEADS
- PROP. GROUND BOX
- EXIST. GROUND BOX
- PROP. VIVID DETECTION ZONE
- EXIST. FULL TRAFFIC ACTUATED GROUND MOUNTED CONTROLLER
- PROP. CONDUIT (SIZE & TYPE AS SPECIFIED)
- EXIST. CONDUIT (SIZE & TYPE AS SPECIFIED)
- PROP. LUMINAIRE
- EXIST. LUMINAIRE
- PROP. CONDUIT BORE (SIZE & TYPE AS SPECIFIED)
- PROP. VIVD
- EXIST. VIVD
- EXIST. ANTENNA
- PROP. MAST ARM
- EXIST. MAST ARM

### PROPOSED DIAGRAM

INTERSECTION OF  
 SH 48 & ZENA DR.  
 IN CAMERON COUNTY  
 CSJ: 0220-05-080



Pharr District Central Design



④  
 TRAFFIC SIGNAL LAYOUT  
 PROPOSED INSTALLATION  
 SH 48 @ ZENA DR.

SCALE: 1" = 60' SHEET 1 OF 2

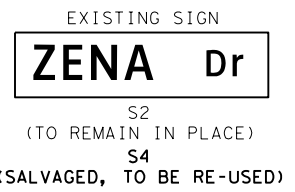
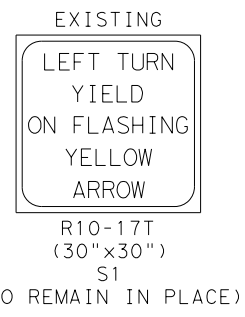
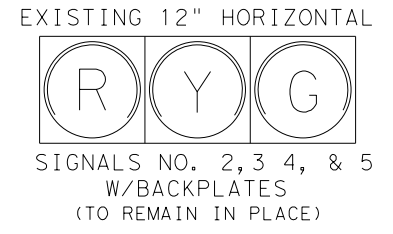
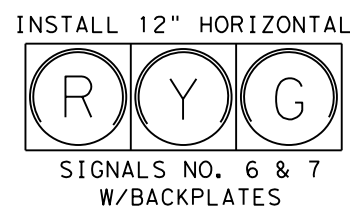
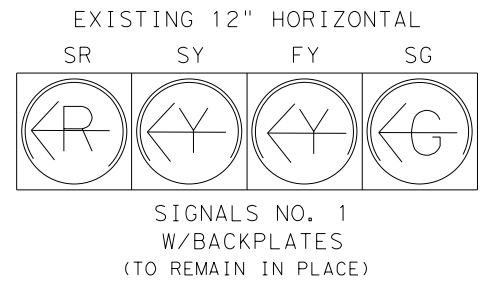
© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	225	

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### ELECTRICAL CHART

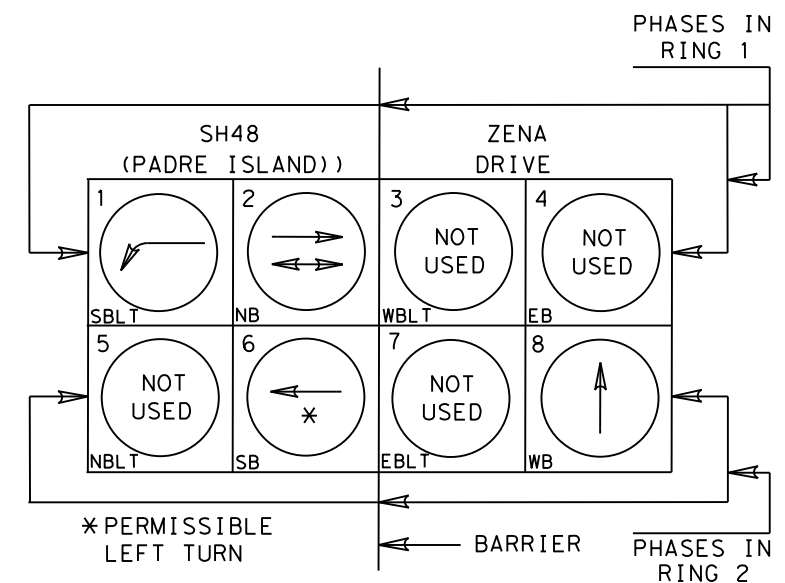
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			RUN LENGTH(FT)														
POWER		1/C-#6															
		1/C-#8															
GROUND		1/C-#6 BARE															
	60'	1/C-#8 BARE				1	1										
SIGNAL CABLE	95'	2/C-#12															
	135'	4/C-#12 TRAY															
		5/C-#12	1	1	1	1											
		7/C-#12															
135'	8/C-#12																
	VIVDS CABLING	1	1	1	1												
LOOP		1/C-#14 LOOP WIRE															
		2/C-#14 (SHIELDED)															
CONDUIT		1" PVC															
		2" PVC															
		2" PVC BORE															
	35'	4" PVC				1	⊗										
		4" PVC BORE															

⊗ EXISTING CONDUIT TO REMAIN IN PLACE



**NOTES**

1. THE CONTRACTOR SHALL FURNISH & INSTALL SIGNAL HEADS, SIGNAL POLES, CONDUITS & CABLES AS SHOWN.
2. THE LOCATION SHOWN FOR POLES & CONDUIT RUNS IS APPROXIMATE. THE EXACT LOCATIONS WILL BE DETERMINED IN THE FIELD BY THE ENGINEER IN COORDINATION WITH THE PHARR DISTRICT TRAFFIC SECTION.
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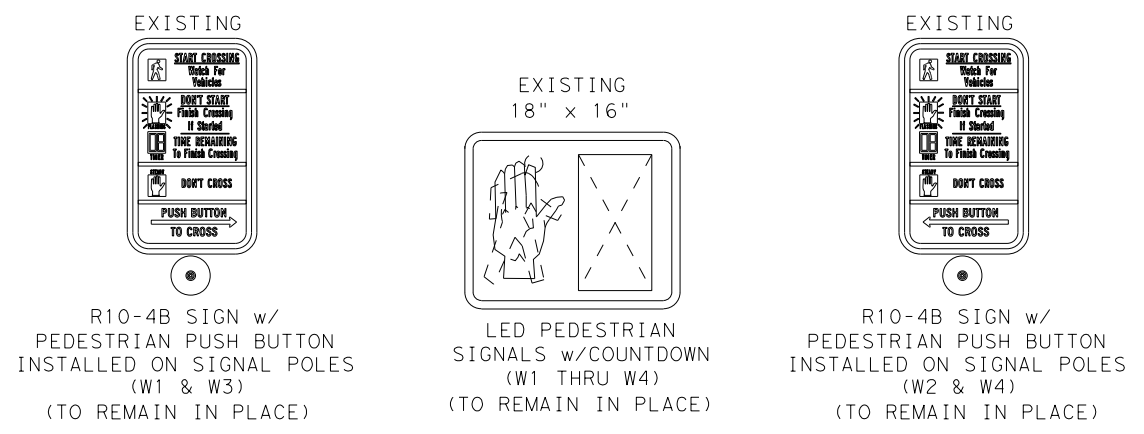


**EXISTING PHASING DIAGRAM**  
(TO REMAIN IN PLACE)

### EXISTING TIMING CHART

PHASE	1	2	3	4	5	6	7	8
STREET	SH 48 PADRE ISLAND HWY		ZENA DRIVE		SH 48 PADRE ISLAND HWY		ZENA DRIVE	
MOVEMENT	SBLT	NB	WBLT	EB	NBLT	SB	EBLT	WB
MIN GREEN								
EXTENSION								
MAXIMUM I								
MAXIMUM II								
YELLOW								
ALL RED								
WALK								
DON'T WALK								
RECALL								
MEMORY								

(TO REMAIN IN PLACE - BY CITY OF BROWNSVILLE)



### VIVDS DETECTOR CHART

RADAR/ DETECTION ZONE	DETECTOR RACK NO.	SETTING	FUNCTION	DELAY TIMING
* V-1/Z-1, Z-6	1/2	PRESENCE	CALL & EXTEND Ø 1 & Ø 6	
* V-2/Z-8	3/4	PRESENCE	CALL & EXTEND Ø 8	
V-3/Z-2	5/6	PRESENCE	CALL & EXTEND Ø 2	

\* EXISTING VIVDS TO REMAIN IN PLACE

### TRAFFIC SIGNAL POLES

POLE NUMBER	QUANTITY	SIGNAL POLE DESIGNATION	MAST ARM DESIGNATION	FOUNDATION TYPE	FOUNDATION DEPTH
* 1	1	SMA-40-100	40 III-100	36 (TY B)	
* 2	1	SMA-24-100	24 II-100	36 (TY A)	
* 3	1	SMA-36-100	36L II-100	36 (TY A)	15'
* 4	1	PEDESTAL POLE		24 (TY A)	
* 5	1	PEDESTAL POLE		24 (TY A)	

\* EXISTING POLES TO REMAIN IN PLACE



**Pharr District Central Design**

**Texas Department of Transportation**

④

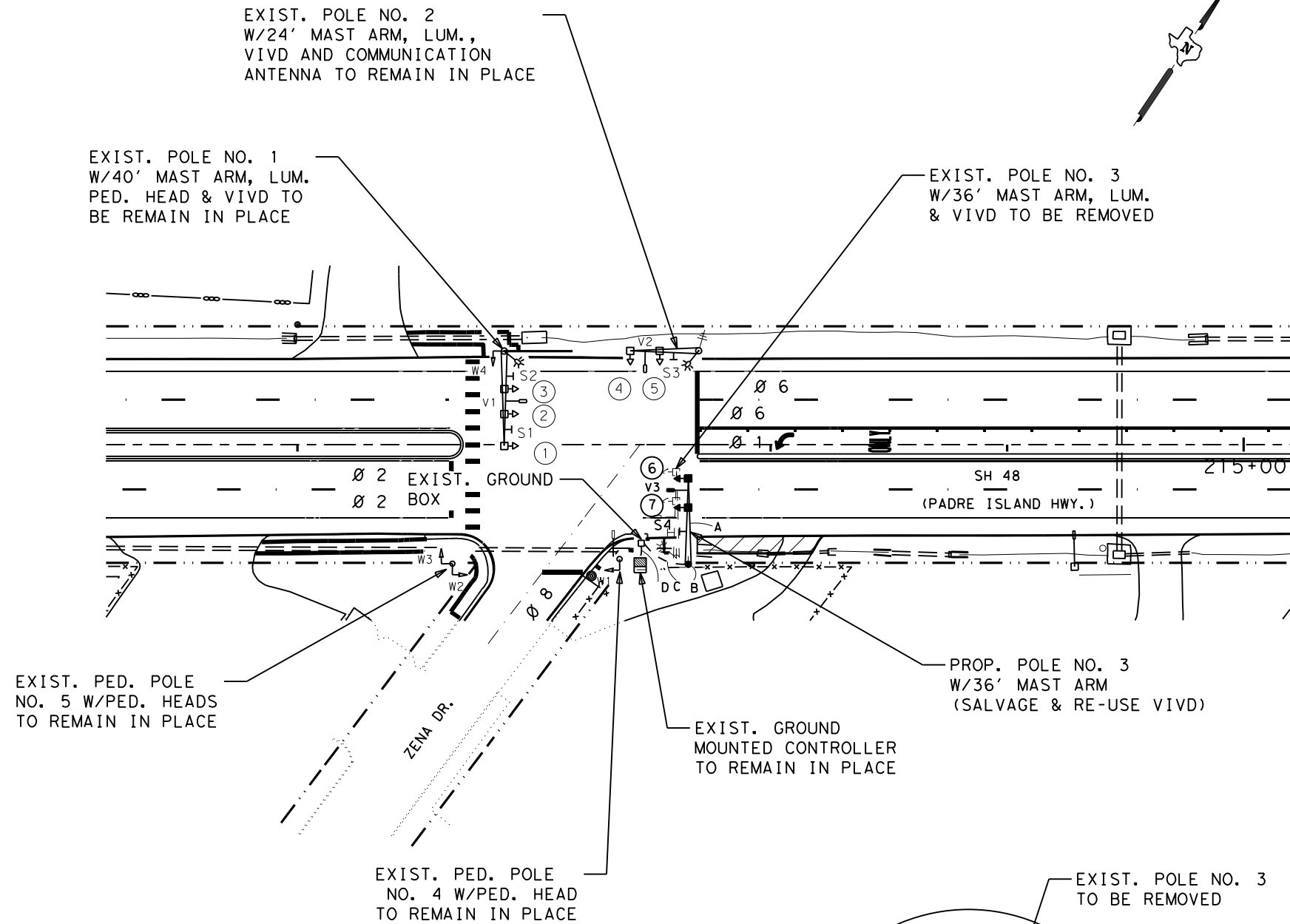
### TRAFFIC SIGNAL LAYOUT PROPOSED INSTALLATION SH 48 @ ZENA DR.

SCALE: 1" = 60' SHEET 2 OF 2

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	226	



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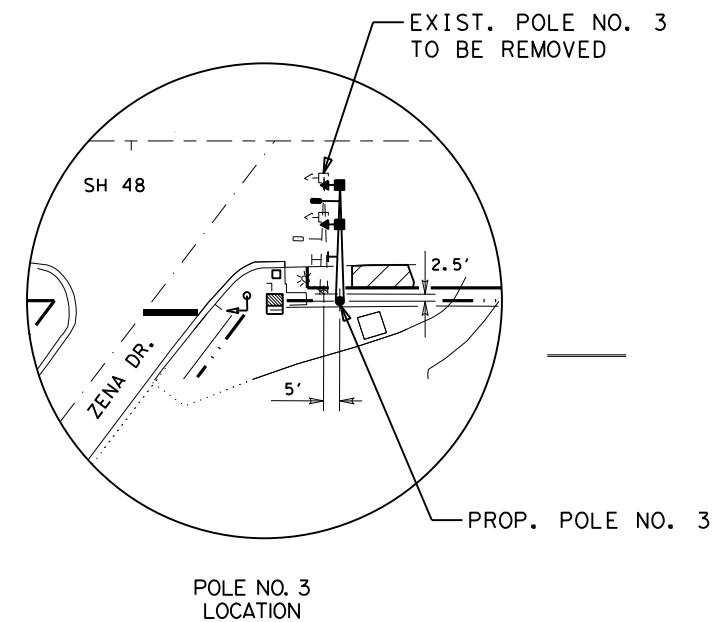


### LEGEND

- PROP. PEDESTRIAN HEADS
- PROP. 12" SPAN WIRE MOUNTED TRAFFIC SIGNAL HEADS
- EXIST. 12" SPAN WIRE MOUNTED TRAFFIC SIGNAL HEADS
- PROP. GROUND BOX
- EXIST. GROUND BOX
- PROP. VIVID DETECTION ZONE
- EXIST. FULL TRAFFIC ACTUATED GROUND MOUNTED CONTROLLER
- PROP. CONDUIT (SIZE & TYPE AS SPECIFIED)
- EXIST. CONDUIT (SIZE & TYPE AS SPECIFIED)
- PROP. LUMINAIRE
- EXIST. LUMINAIRE
- PROP. CONDUIT BORE (SIZE & TYPE AS SPECIFIED)
- PROP. VIVD
- EXIST. VIVD
- EXIST. ANTENNA
- PROP. MAST ARM
- EXIST. MAST ARM

### PROPOSED DIAGRAM

INTERSECTION OF  
 SH 48 & ZENA DR.  
 IN CAMERON COUNTY  
 CSJ: 0220-05-080



Pharr District Central Design



④  
 TRAFFIC SIGNAL LAYOUT  
 PROPOSED INSTALLATION  
 SH 48 @ ZENA DR.

SCALE: 1" = 60' SHEET 1 OF 2

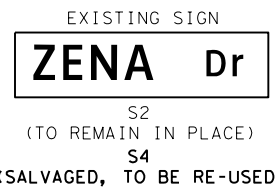
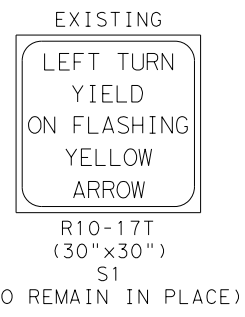
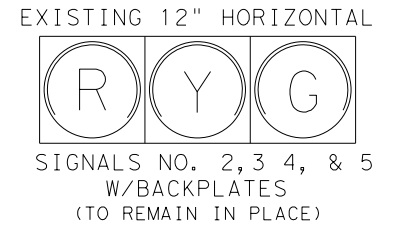
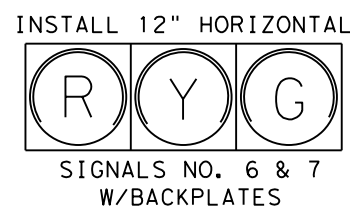
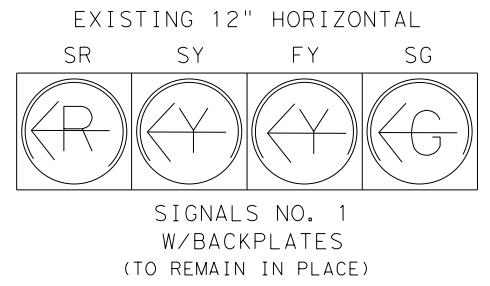
© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	225	

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### ELECTRICAL CHART

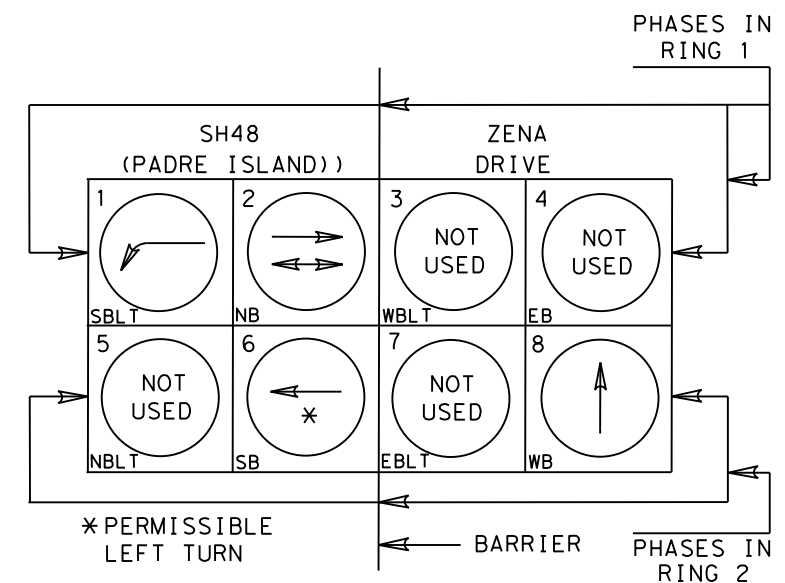
ITEM	TOTAL QTY.	RUN NUMBER	A B C D E F G H J K															
			RUN LENGTH(FT)															
POWER		1/C-#6																
		1/C-#8																
GROUND		1/C-#6 BARE																
	60'	1/C-#8 BARE				1	1											
SIGNAL CABLE	95'	2/C-#12																
	135'	4/C-#12 TRAY																
		5/C-#12	1	1	1	1												
		7/C-#12																
LOOP		8/C-#12																
	135'	VIVDS CABLING	1	1	1	1												
CONDUIT		1" PVC																
		2" PVC																
		2" PVC BORE																
	35'	4" PVC				1	⊗											
		4" PVC BORE																

⊗ EXISTING CONDUIT TO REMAIN IN PLACE



**NOTES**

1. THE CONTRACTOR SHALL FURNISH & INSTALL SIGNAL HEADS, SIGNAL POLES, CONDUITS & CABLES AS SHOWN.
2. THE LOCATION SHOWN FOR POLES & CONDUIT RUNS IS APPROXIMATE. THE EXACT LOCATIONS 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.
4. ALL PROPOSED TRAFFIC SIGNAL HEADS SHALL HAVE BACKPLATES.
5. THE LUMINAIRES SHALL BE OPERATED UNDER THEIR OWN PHOTO ELECTRIC CONTROL, IF APPLICABLE.
6. 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.
7. 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.

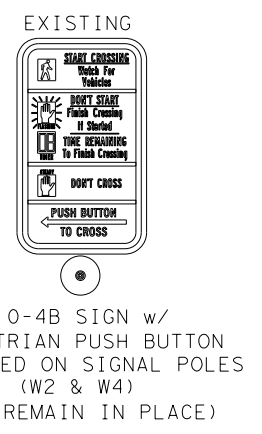
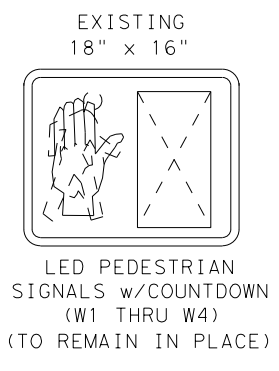
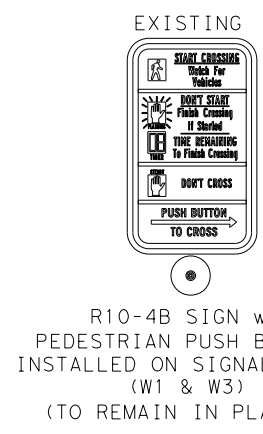


**EXISTING PHASING DIAGRAM**  
(TO REMAIN IN PLACE)

### EXISTING TIMING CHART

PHASE	1	2	3	4	5	6	7	8
STREET	SH 48 PADRE ISLAND HWY		ZENA DRIVE		SH 48 PADRE ISLAND HWY		ZENA DRIVE	
MOVEMENT	SBLT	NB	WBLT	EB	NBLT	SB	EBLT	WB
MIN GREEN								
EXTENSION								
MAXIMUM I								
MAXIMUM II								
YELLOW								
ALL RED								
WALK								
DON'T WALK								
RECALL								
MEMORY								

(TO REMAIN IN PLACE - BY CITY OF BROWNSVILLE)



### VIVDS DETECTOR CHART

RADAR/ DETECTION ZONE	DETECTOR RACK NO.	SETTING	FUNCTION	DELAY TIMING
* V-1/Z-1, Z-6	1/2	PRESENCE	CALL & EXTEND Ø 1 & Ø 6	
* V-2/Z-8	3/4	PRESENCE	CALL & EXTEND Ø 8	
V-3/Z-2	5/6	PRESENCE	CALL & EXTEND Ø 2	

\* EXISTING VIVDS TO REMAIN IN PLACE

### TRAFFIC SIGNAL POLES

POLE NUMBER	QUANTITY	SIGNAL POLE DESIGNATION	MAST ARM DESIGNATION	FOUNDATION TYPE	FOUNDATION DEPTH
* 1	1	SMA-40-100	40 III-100	36(TY B)	
* 2	1	SMA-24-100	24 II-100	36(TY A)	
* 3	1	SMA-36-100	36L II-100	36(TY A)	15'
* 4	1	PEDESTAL POLE		24(TY A)	
* 5	1	PEDESTAL POLE		24(TY A)	

\* EXISTING POLES TO REMAIN IN PLACE



**Pharr District Central Design**

**Texas Department of Transportation**

④

### TRAFFIC SIGNAL LAYOUT PROPOSED INSTALLATION SH 48 @ ZENA DR.

SCALE: 1" = 60' SHEET 2 OF 2

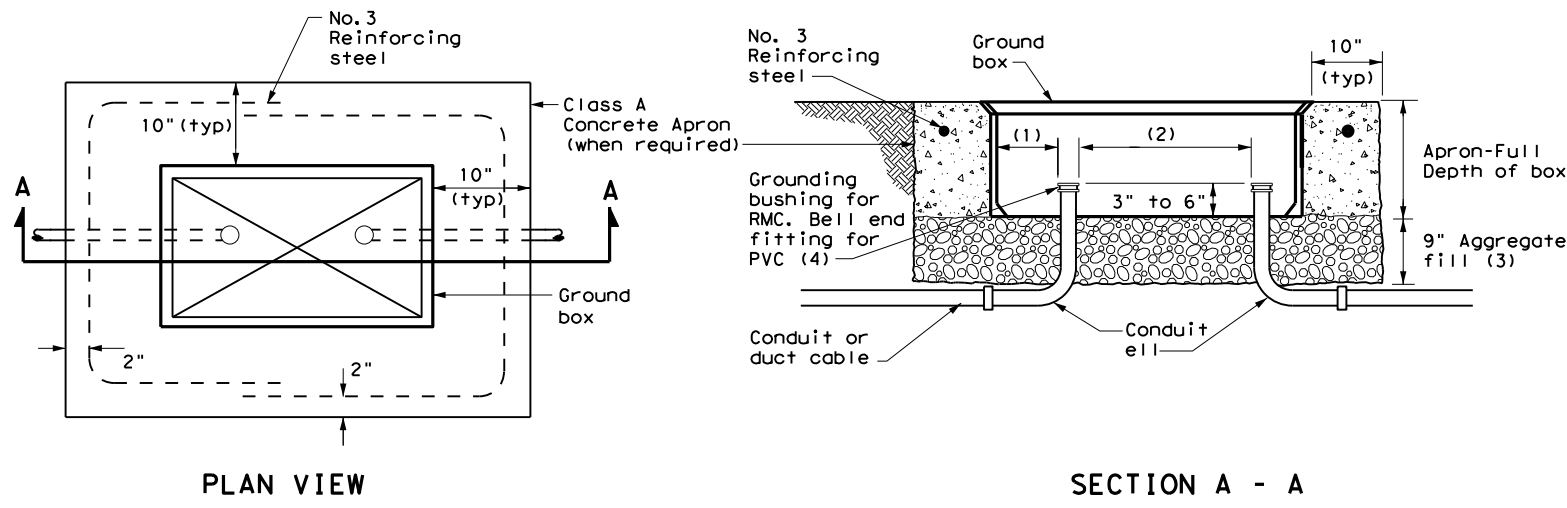
© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	226	





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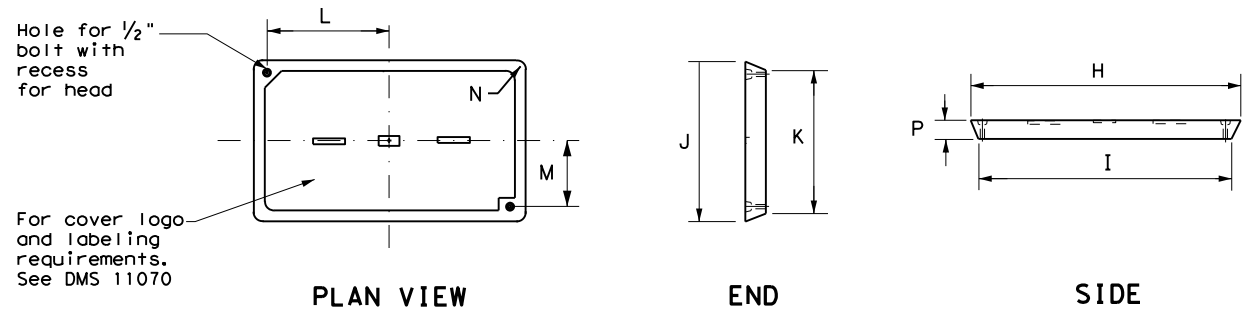


**APRON FOR GROUND BOX**

- (1) Uniformly space ends of conduits within the ground box. Position ends of conduits so that ground box walls do not interfere with the installation of grounding bushings or bell end fittings.
- (2) Maintain sufficient space between conduits to allow for proper installation of bushing.
- (3) Place aggregate under the box, not in the box. Aggregate should not encroach on the interior volume of the box.
- (4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

GROUND BOX DIMENSIONS	
TYPE	OUTSIDE DIMENSIONS (INCHES) (Width x Length X Depth)
A	12 X 23 X 11
B	12 X 23 X 22
C	16 X 29 X 11
D	16 X 29 X 22
E	12 X 23 X 17

GROUND BOX COVER DIMENSIONS								
TYPE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2



**GROUND BOX COVER**

**GROUND BOXES**

**A. MATERIALS**

1. Provide polymer concrete ground boxes measuring 16x30x24 in. (WxLxD) or smaller in accordance with Departmental Material Specification (DMS) 11070 "Ground Boxes" and Item 624 "Ground Boxes."
2. Provide Type A, B, C, D, and E ground boxes as shown in the plans, and as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 624.
3. Ensure ground box cover is correctly labeled in accordance with DMS 11070.
4. Provide larger ground boxes in accordance with Item 624 and as shown in the plans.

**B. CONSTRUCTION METHODS**

1. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure aggregate bed is in place and at least 9 inches deep, prior to setting the ground box. Install ground box on top of aggregate.
2. Cast ground box aprons in place. Reinforcing steel may be field bent. Ensure the depth of concrete for the apron extends from finished grade to the top of the aggregate bed under the box. Ground box aprons, including concrete and reinforcing steel, are subsidiary to ground boxes when called for by descriptive code.
3. Keep bolt holes in the box clear of dirt. Bolt covers down when not working in ground boxes.
4. Install all conduits and ells in a neat and workmanlike manner. Uniformly space conduits so grounding bushings and bell end fittings can easily be installed.
5. Temporarily seal all conduits in the ground box until conductors are installed.
6. Permanently seal conduits immediately after the completion of conductor installation and pull tests. Permanently seal the ends of all conduits with duct seal, expandable foam, or other method as approved. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a sealant.
7. When a ground rod is present in a ground box, bond all equipment grounding conductors together and to the ground rod with listed connectors.
8. When a type B or D ground box is stacked to meet volume requirements, it is allowable to cut an appropriately sized hole for conduit entry in the side wall at least 18 inches below grade.
9. If an existing ground box in the contract has a metal cover, bond the cover to the equipment grounding conductor with a 3 ft. long stranded bonding jumper the same size as the grounding conductor. The bonding jumper is subsidiary to various bid items. Verify existing ground boxes with metal covers are shown on the plans, with notes fully describing the work required.
10. If other ground boxes with metal covers are within the project limits but are not part of the contract, the Engineer may direct the Contractor to bond the metal covers, identifying the specific boxes in writing. This work will be paid for separately.
11. Bond metal ground box covers to the grounding conductor with a tank ground type lug.

				Traffic Operations Division Standard	
<h2>ELECTRICAL DETAILS</h2> <h3>GROUND BOXES</h3> <h4>ED(4) - 14</h4>					
FILE:	ed4-14.dgn	DN:	TxDOT	CK:	TxDOT
© TxDOT	October 2014	CONT:	0220	SECT:	05
REVISIONS:		JOB:	080	HIGHWAY:	SH 48
		DIST:	CAMERON	COUNTY:	
				SHEET NO.:	229

**ELECTRICAL SERVICES NOTES**

- Provide new materials. Ensure installation and materials comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards. Ensure material is Underwriters Laboratories (UL) listed. Provide and install electrical service conduits, conductors, disconnects, contactors, circuit breaker panels, and branch circuit breakers as shown on the Electrical Service Data chart in the plans. Faulty fabrication or poor workmanship in material, equipment, or installation is justification for rejection. Where manufacturers provide warranties and guarantees as a customary trade practice, furnish these to the State.
- Provide electrical services in accordance with Electrical Details standard sheets, Departmental Material Specification (DMS) 11080 "Electrical Services," DMS 11081 "Electrical Services-Type A," DMS 11082 "Electrical Services-Type C," DMS 11083 "Electrical Services-Type D," DMS 11084 "Electrical Services-Type T," DMS 11085 "Electrical Services-Pedestal (PS)", and Item 628 "Electrical Services" of the Standard Specifications. Provide electrical service types A, C, and D, as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 628. Provide other service types as detailed on the plans.
- Provide all work, materials, services, and any incidentals needed to install a complete electrical service as specified in the plans.
- Coordinate with the Engineer and the utility provider for metering and compliance with utility requirements. Primary line extensions, connection charges, meter charges, and other charges by the utility company to provide power to the location are paid for in accordance with Item 628. Get approval for the costs associated with these charges prior to engaging the utility company to do the work. Consult with the utility provider to determine costs and requirements, and coordinate the work as approved.
- The enclosure manufacturer will provide Master Lock Type 2 with brass tumblers keyed #2195 for all custom electrical enclosures. Installing Contractor is to provide Master Lock #2195 Type 2 with brass tumblers for "off the shelf" enclosures. Master Lock #2195 keys and locks become property of the State. Unless otherwise approved, do not energize electrical service equipment until locks are installed.
- Enclosures with external disconnects that de-energize all equipment inside the enclosure do not need a dead front trim. Protect incoming line terminations from incidental contact as required by the NEC.
- When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used.
- Provide wiring and electrical components rated for 75°C. Provide red, black, and white colored XHHW service entrance conductors of minimum size 6 American Wire Gauge (AWG). Identify size 6 AWG conductors by continuous color jacket. Identify electrical conductors sized 4 AWG and larger by continuous color jacket or by colored tape. Mark at least 6 inches of the conductor's insulation with half laps of colored tape, when identifying conductors. Ensure each service entrance conductor exits through a separately bushed non-metallic opening in the weatherhead. The lengths of the conductors outside the weatherhead are to be 12 inches minimum, 18 inches maximum, or as required by utility.
- All electrical service conduit and conductors attached to the electrical service including the riser or the elbow below ground are subsidiary to the electrical service. For an underground utility feed, all service conduit and conductors after the elbow, including service conduit and conductors for the utility pole riser when furnished by the Contractor, will be paid for separately.
- Provide rigid metal conduit (RMC) for all conduits on service, except for the 1/2 in. PVC conduit containing the electrical service grounding electrode conductor. Size the service entrance conduit as shown in the plans. Ensure conduit for branch circuit entry to enclosure is the same size as that shown on the layout sheets for branch circuit conduit. Extend all rigid metal conduits a minimum of 6 inches underground and then couple to the type and schedule of the conduit shown on the layout for that particular branch circuit. Install a grounding bushing on the RMC where it terminates in the service enclosure.
- Use of liquidtight flexible metal conduit (LFMC) is allowed between the meter and service enclosure when they are mounted 90 to 180 degrees to each other. Size the LFMC the same size as service entrance conduit. LFMC must not exceed 3 feet in length. Strap LFMC within 1 foot of each end. LFMC less than 12 inches in length need not be strapped. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. The LFMC must contain a grounded (neutral) conductor. Ensure any bend in LFMC never exceeds 180 degrees. A pull test is required on all installed conductors, with at least six inches of free conductor movement demonstrated to the satisfaction of the Engineer.
- Ensure all mounting hardware and installation details of services conform to utility company specifications.
- For all electrical service enclosures listed under Item 628 on the MPL, the UL 508 enclosure manufacturers will prepare and submit a schematic drawing unique to each service. Before shipment to the job site, place the applicable laminated schematic drawings and the laminated plan sheet showing the electrical service data chart used to build the enclosure in the enclosure's data pocket. The installing contractor will copy and laminate the actual project plan sheets detailing all equipment and branch circuits supplied by that service. The laminated plan sheets are to be placed in the service enclosure's document pocket. Reduce 11 in. x 17 in. plan sheets to 8 1/2 in. x 11 in. before laminating. If the installation differs from the plan sheets, the installing contractor is to redline plan sheets before laminating.
- When providing an "Off The Shelf" Type D or Type T service, provide laminated plan sheets detailing equipment and branch circuits supplied by that service. Reduce 11 in. x 17 in. plan sheets to 8 1/2 in. x 11 in. before laminating. Deliver these drawings before completion of the work to the Engineer, instead of placing in enclosure that has no door pocket.
- Do not install conduit in the back wall of a service enclosure where it would penetrate the equipment mounting panel inside the enclosure. Provide grounding bushings on all metal conduits, and terminate bonding jumpers to grounding bus. Grounding bushings are not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss, such as a meter base hub.

**SERVICE ASSEMBLY ENCLOSURE**

- Provide threaded hub for all conduit entries into the top of enclosure.
- Type galvanized steel (GS) enclosures may be used for Type C panelboards and for Type D and T services that do not use an enclosure mounted photoceII or lighting contactor. Provide GS enclosures in accordance with DMS 11080, 11082, 11083, and 11084.
- Provide aluminum (AL) and stainless steel (SS) enclosures for Types A, C, and D in accordance with DMS 11080, 11081, 11082, 11083, and 11084. Do not paint stainless steel.
- Provide pedestal service (PS) enclosures in accordance with ED(9) and DMS 11080 and 11085. Do not provide GS pedestal services. If GS is shown in the PS descriptive code, provide an AL enclosure.

**MAIN DISCONNECT & BRANCH CIRCUIT BREAKERS**

- Field drill flange-mounted remote operator handle if needed, to ensure handle is lockable in both the "On" and "Off" positions.
- When the utility company provides a transformer larger than 50 KVA, verify that the available fault current is less than the circuit breaker's ampere interrupting capacity (AIC) rating and provide documentation from the electric utility provider to the Engineer.

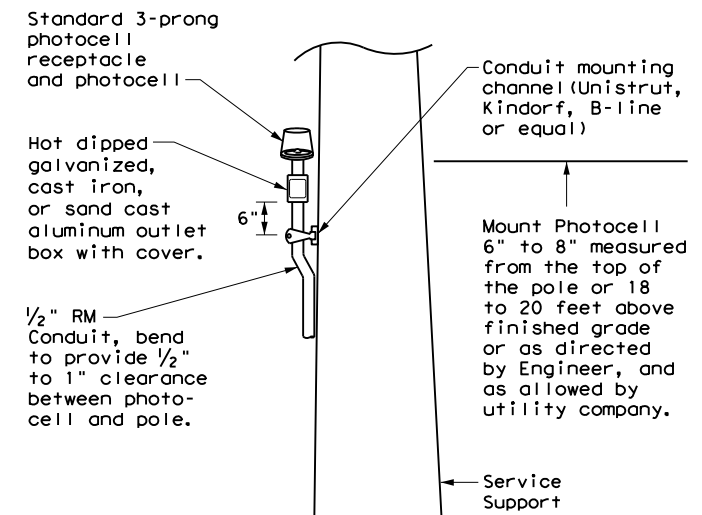
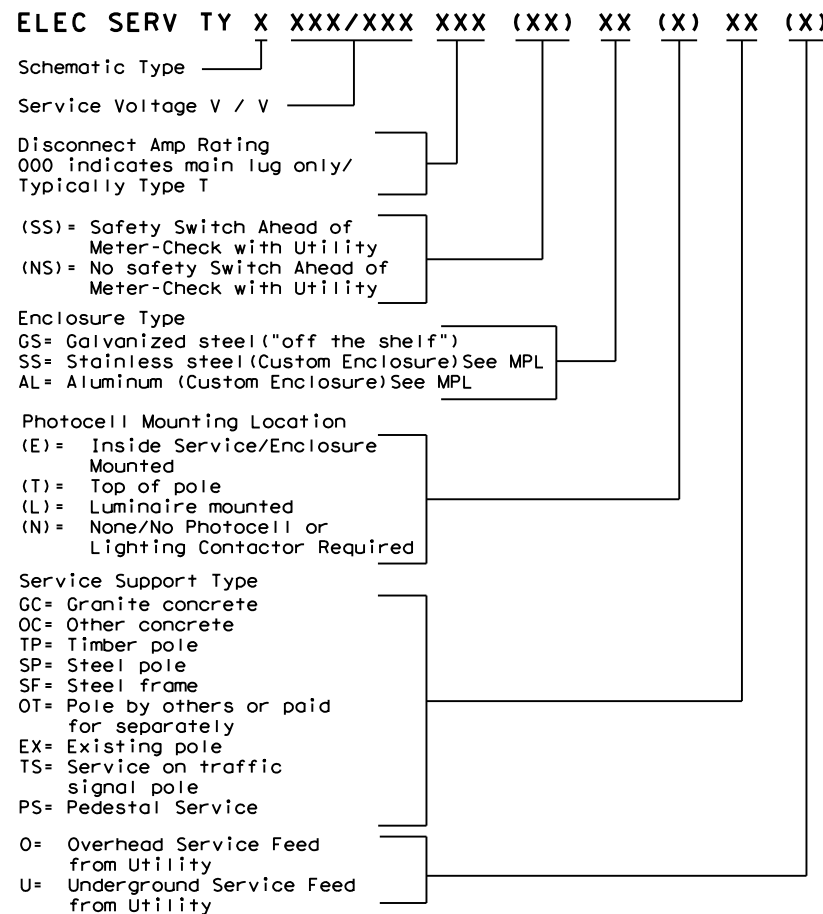
**PHOTOELECTRIC CONTROL**

- Provide photocell as listed on the MPL. Move, adjust, or shield the photocell from stray or ambient night time light to ensure proper operation. Mount photocell facing north when practical. Mount top of pole photocells as shown on Top Mounted Photocell Detail.

* ELECTRICAL SERVICE DATA												
Elec. Service ID	Plan Sheet Number	Electrical Service Description	Service Conduit *xSize	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amps	Two-Pole Contractor Amps	Panelbd/ Loadcenter Amp Rating	Branch Circuit ID	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
SB 183	289	ELC SRV TY A 240/480 100(SS)AL(E)SF(U)	2"	3/#2	100	2P/100	100	N/A	Lighting NB	2P/40	26	28.1
									Lighting SB	2P/40	25	
									Underpass	1P/20	15	
NB Access	30	ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	1 1/4"	3/#6	N/A	2P/60		100	Sig. Controller	1P/30	23	5.3
							30		Luminaires	2P/20	9	
									CCTV	1P/20	3	
2nd & Main	58	ELC SRV TY T 120/240 000(NS)GS(N)SP(O)	1 1/4"	3/#6	N/A	N/A	N/A	70	Flashing Beacon 1	1P/20	4	1.0
									Flashing Beacon 2	1P/20	4	

\* Example only, not for construction. All new electrical services must have electrical service data chart specific to that service as shown in the plans.  
 \*\* Verify service conduit size with utility. Size may change due to utility meter requirements. Ensure conduit size meets the National Electrical Code.

**EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE**



**TOP MOUNTED PHOTOCELL**

Install conduit strap maximum 3 feet from box. 5 foot maximum spacing between straps supporting conduit.

Texas Department of Transportation Traffic Operations Division Standard

**ELECTRICAL DETAILS SERVICE NOTES & DATA**

**ED(5) - 14**

FILE: ed5-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
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REVISIONS	0220	05	080	SH 48
DIST	COUNTY		SHEET NO.	
PHR	CAMERON		230	

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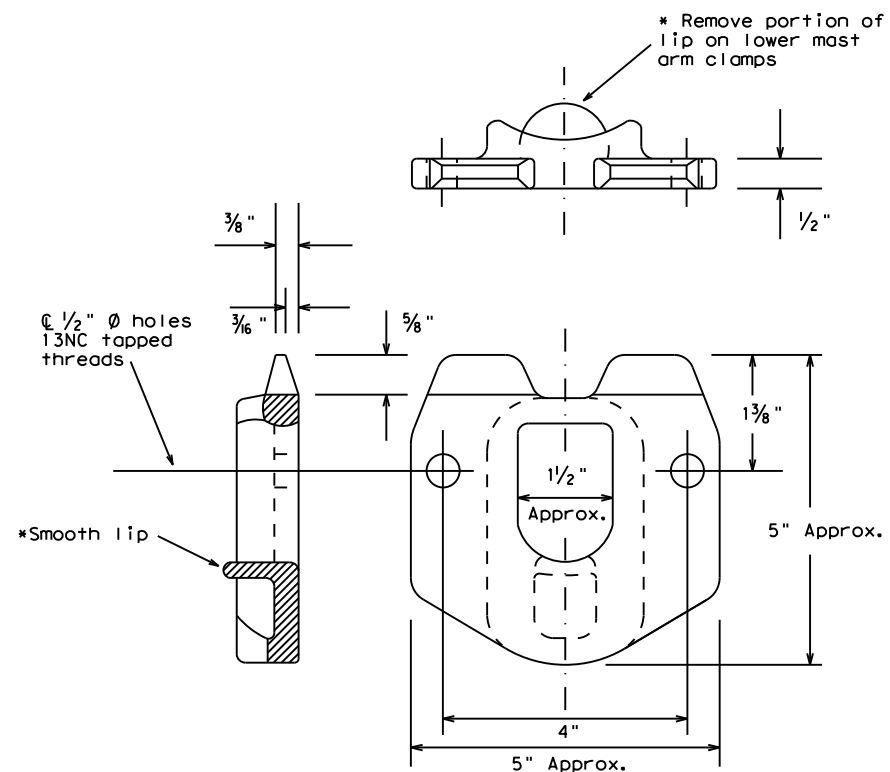




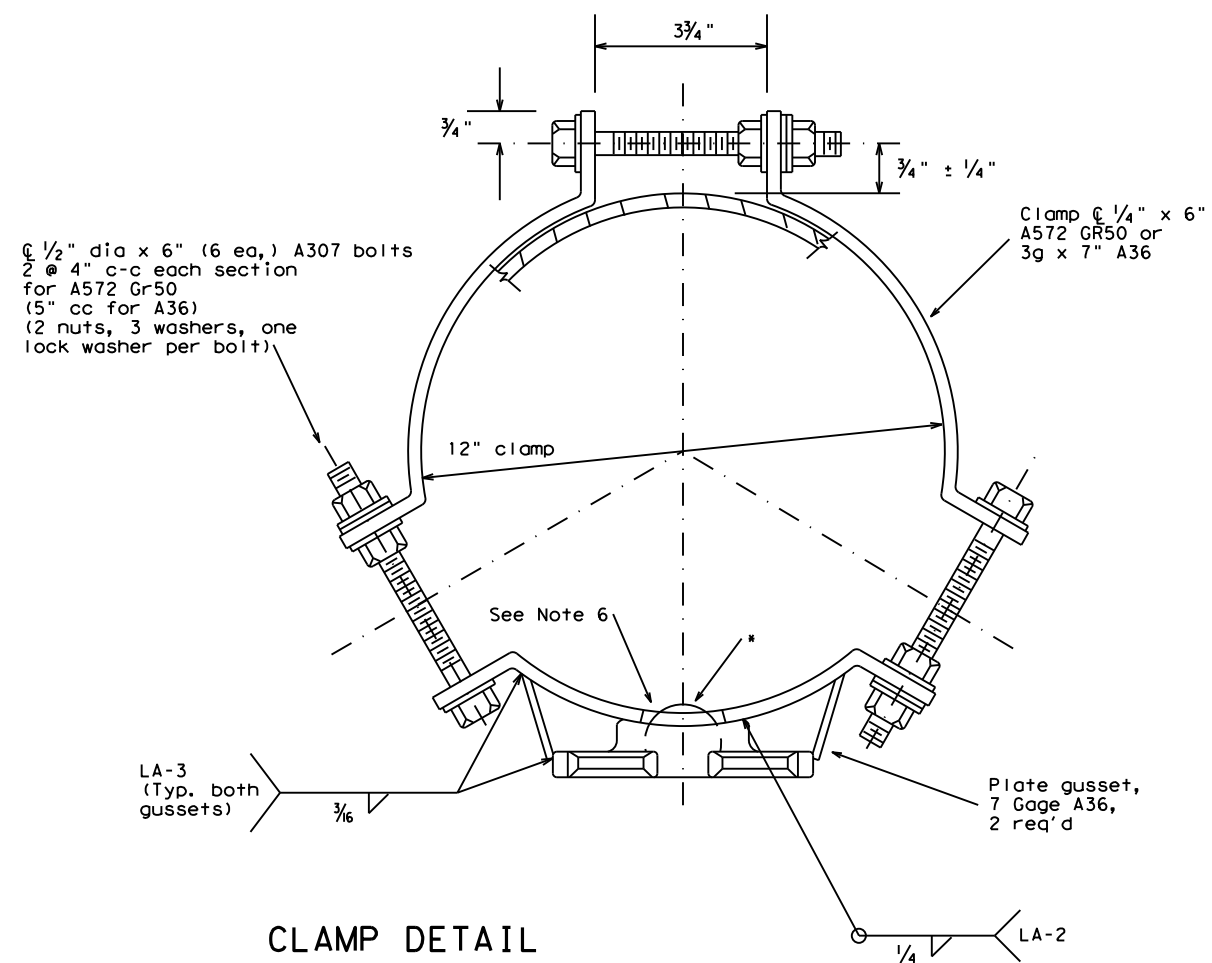


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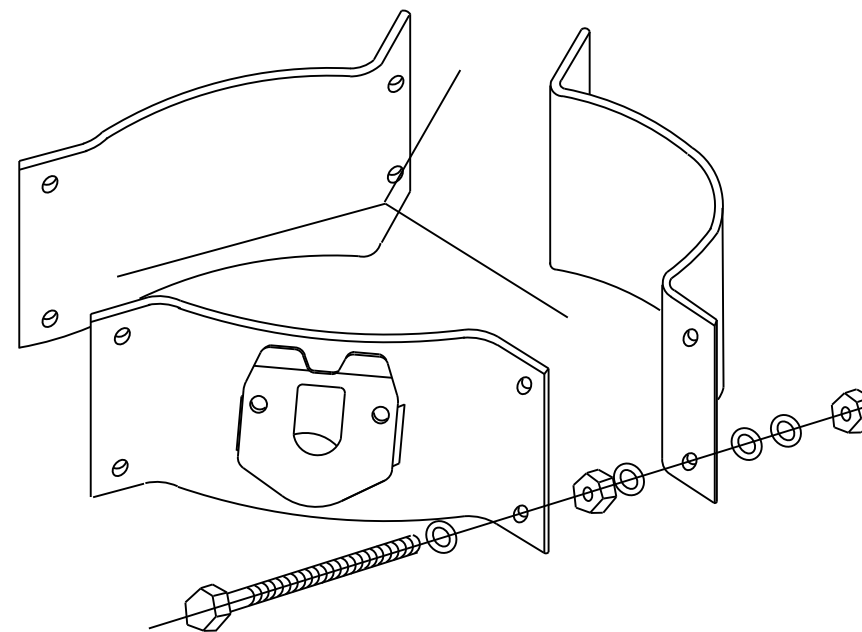
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POLE SIMPLEX DETAILS



CLAMP DETAIL



PROJECTION

For 8.9 - 12 inch diameter Signal Poles  
 (Two req'd for each mast arm)

OTHER MATERIALS:

1. Pole simplex shall be ASTM A27 GR65-35 or A148 GR80-50 or A576 GR1021. ASTM A576 must be suitable for forging and also meet minimum tensile of 65ksi, minimum yield of 35ksi, and a minimum elongation of 22 percent in 2 inches.
2. Welded tabs and backplates shall be ASTM A-36 steel or better.
3. Nylon insert locknuts shall conform to ASTM A563.

GENERAL NOTES:

1. Materials and fabrication shall be in accordance with Standard Sheet "MA-C" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. In the absence of specified fabrication tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.
2. All parts shall be galvanized after fabrication in accordance with Item 445, "Galvanizing". The throat of the Simplex shall be made free of all rough or sharp edges resulting from the galvanizing process.
3. Each simplex fitting shall be supplied with 2 ASTM A325 bolts, 1/2 in. x 1 1/2 in. and 2 lock washers. The bolts and lock washers shall be secured to the clamp with the other hardware items. The Fabricator shall ship clamp assembly together in a single package, including all bolts, nuts, and washers required for the clamp and simplex fitting.
4. Design conforms to 1994 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals" and interim revisions thereto. Design Wind Speed equals 80 mph plus a 1.3 gust factor. Clamps are designed to support a 60 lb. luminaire having an effective projected area (actual area times drag coefficient) of 1.6 sq. ft., 12 ft. maximum arm length.
5. Each assembly shall consist of one upper piece simplex fitting having a smooth lip and one lower piece simplex fitting with the lip removed.
6. Approximately 2 in. diameter hole in upper mast arm clamp.

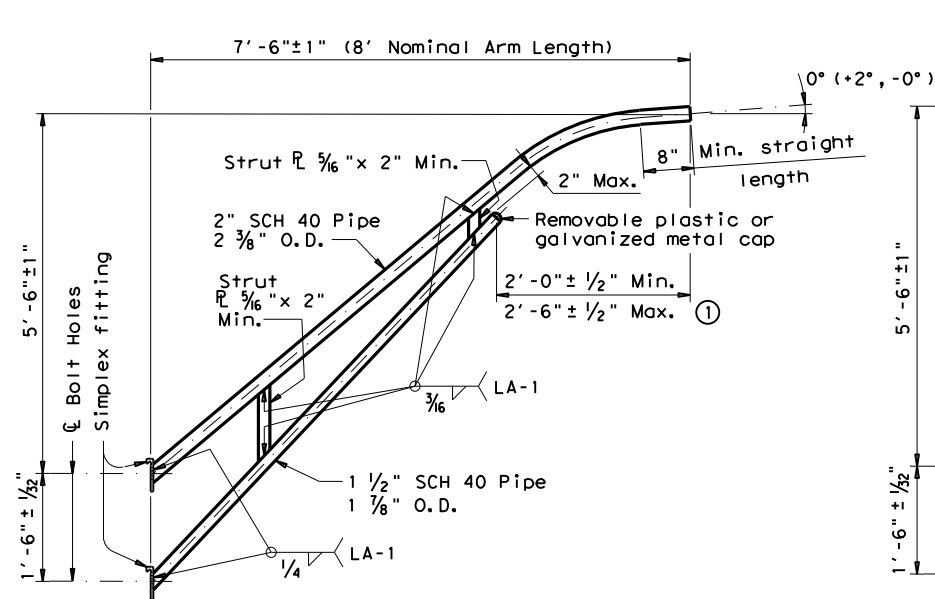
Texas Department of Transportation  
 Traffic Operations Division

CLAMP ON  
 FITTING ASSEMBLY FOR  
 LUMINAIRE MAST ARM

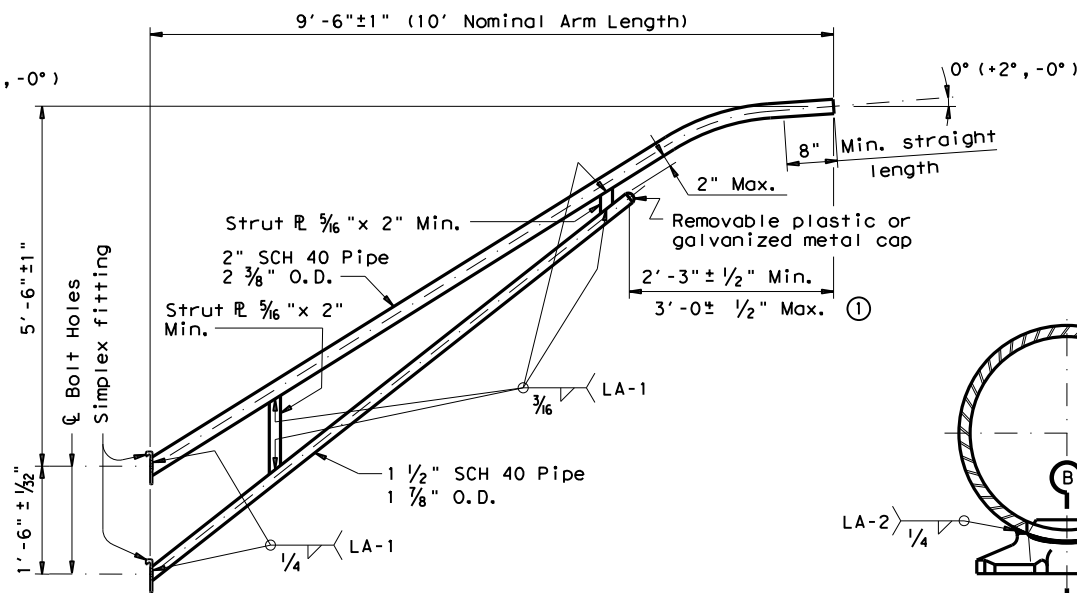
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		PHR	CAMERON	233	

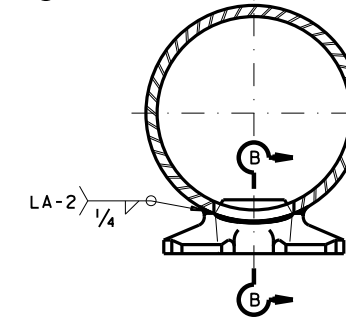
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**8-FOOT LUMINAIRE ARM**



**10-FOOT LUMINAIRE ARM**



**DIRECT ATTACHMENT DETAIL**

MATERIALS	
Pole or Arm Simplex	ASTM A27 Gr. 65-35 or A148 Gr. 80-50, A576 Gr. 1021 (3), or A36 (Arm only)
Arm Pipes	ASTM A53 Gr. B, A501, A1008 HSLAS-F Gr. 50 (4), or A1011 HSLAS-F Gr. 50 (4)
Arm Strut Plates (2)	ASTM A36, A572 Gr. 50 (4), or A588
Misc.	ASTM designations as noted

- ① Dimensional limits are given to show acceptable variation in design. All of a Fabricator's production of a particular arm length shall have the same dimensions within specified tolerances.
- ② Any of the materials listed for plates may be used where the drawings do not specify a particular ASTM designation.
- ③ A576 must be suitable for forging and also meet minimum tensile strength of 65 ksi, minimum yield of 35 ksi, and elongation in 2 inches of 22 percent.
- ④ ASTM A572, A1008 HSLAS-F, and A1011 HSLAS-F may have higher yield strengths but shall not have less elongation than the grade indicated.

**GENERAL NOTES:**

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Revisions thereto. Design Wind Speed equals 90 mph plus a 1.3 gust factor. Arms are designed to support a 60 lb. luminaire having an effective projected area (actual area times drag coefficient) of 1.6 sq. ft.

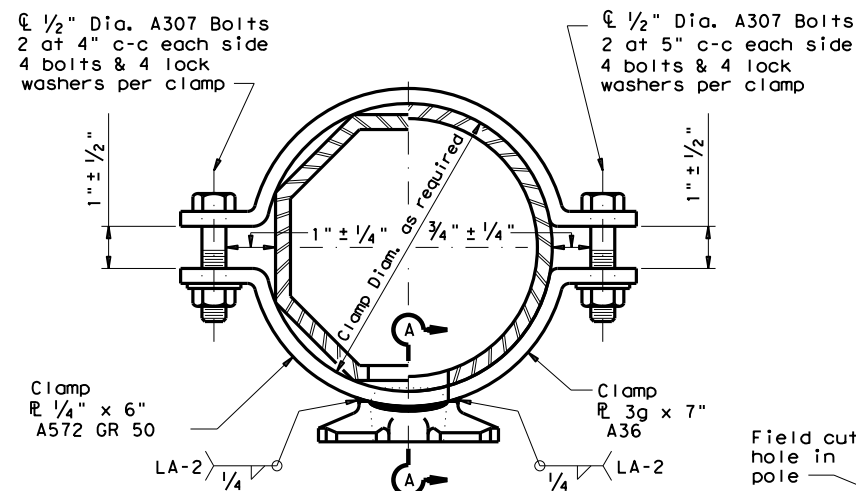
Materials and fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. In the absence of specified Fabricator tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.

Unless otherwise noted, all parts shall be galvanized after fabrication in accordance with Item 445, "Galvanizing".

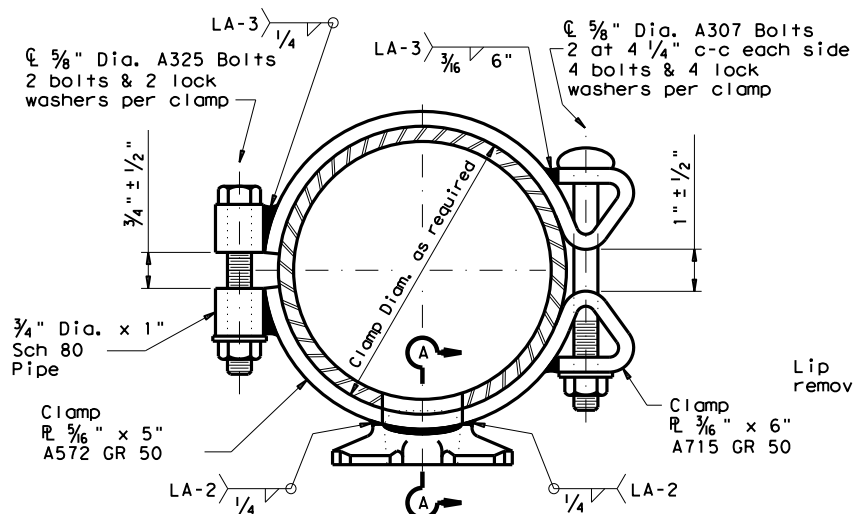
Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.

Each pole simplex fitting shall be supplied with 2 ASTM A325 bolts and 2 lock washers of the size specified. The bolts and lock washers shall be secured to the pole with the other hardware items called for in the plans. When clamp attachment is specified, the Fabricator shall ship the clamp assembly securely attached to the pole at the location shown on the plans.

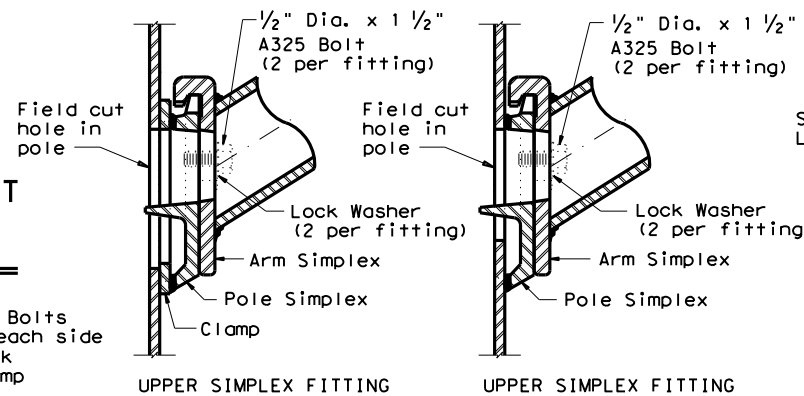
If clamp assemblies are ordered without poles, the Fabricator shall ship one upper and one lower clamp assembly together in a single package, including all nuts and washers required for the clamps and simplex fittings.



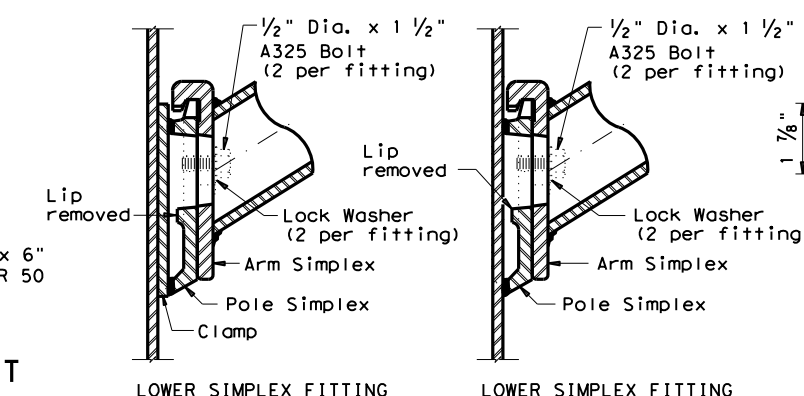
**CLAMP ATTACHMENT DETAIL NO. 1 (HALF SECTION)**  
**CLAMP ATTACHMENT DETAIL NO. 2 (HALF SECTION)**



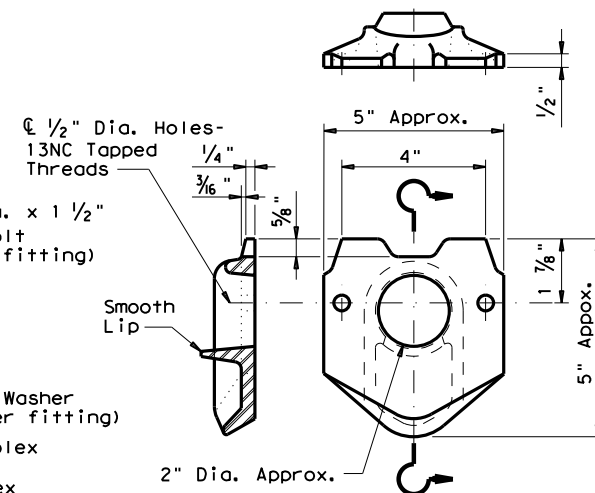
**CLAMP ATTACHMENT DETAIL NO. 3 (HALF SECTION)**  
**CLAMP ATTACHMENT DETAIL NO. 4 (HALF SECTION)**



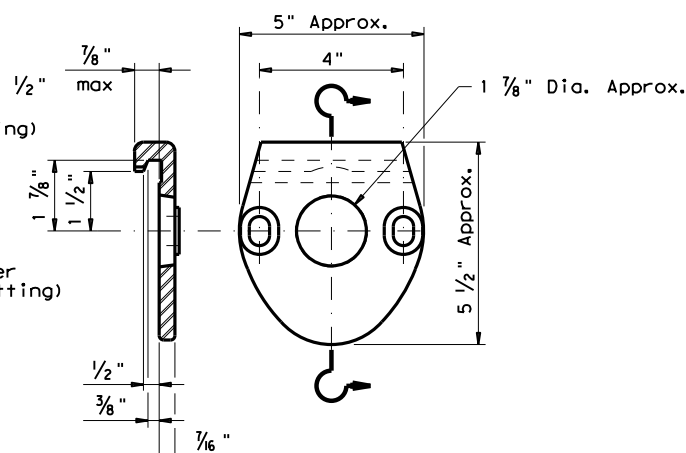
**UPPER SIMPLEX FITTING**  
**UPPER SIMPLEX FITTING**  
**LOWER SIMPLEX FITTING**  
**LOWER SIMPLEX FITTING**



**SECTION A-A**  
**SECTION B-B**



**POLE SIMPLEX DETAIL**

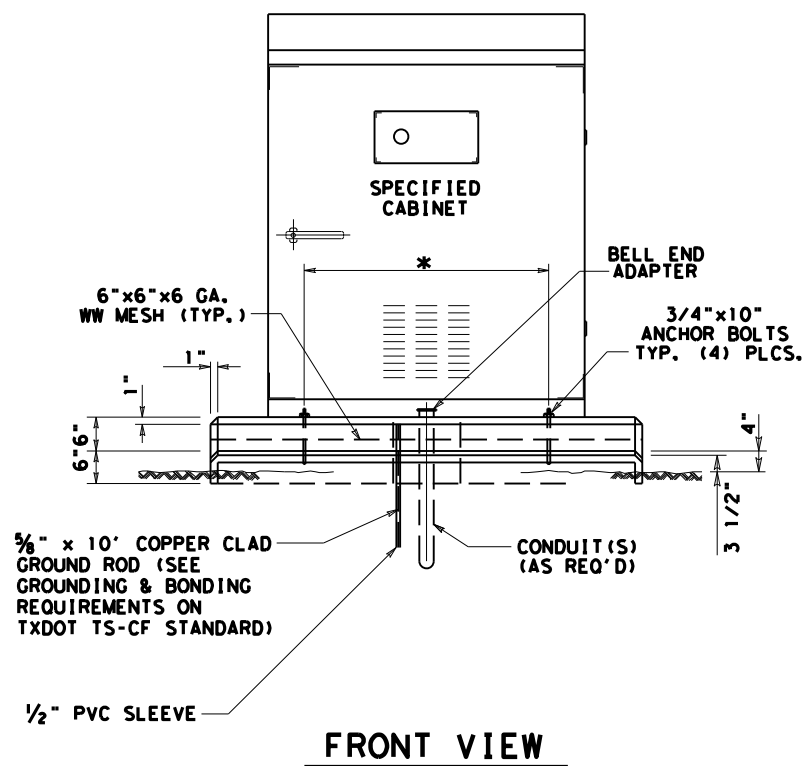


**ARM SIMPLEX DETAIL**

Texas Department of Transportation  
 Traffic Operations Division  
**STANDARD ASSEMBLY DRAWINGS FOR LUMINAIRE SUPPORT STRUCTURES**  
**ARM DETAILS**  
**LUM-A-12**

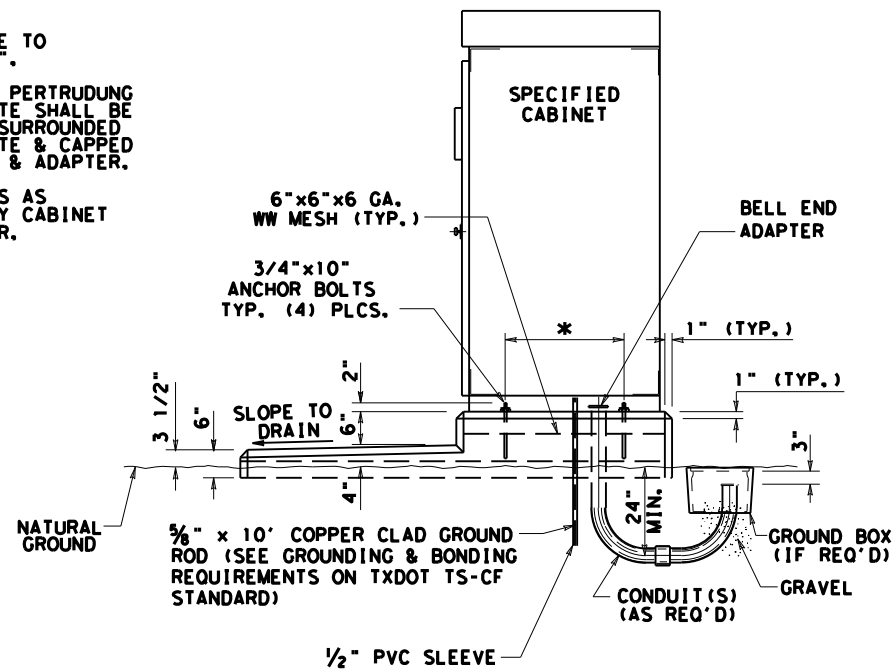
© TxDOT August 1995		DN: LEH	CK: JSY	DW: LTT	CK: TEB
5-96	REVISIONS	CONT	SECT	JOB	HIGHWAY
1-99		0220	05	080	SH 48
1-12		DIST	COUNTY		SHEET NO.
		PHR	CAMERON		234



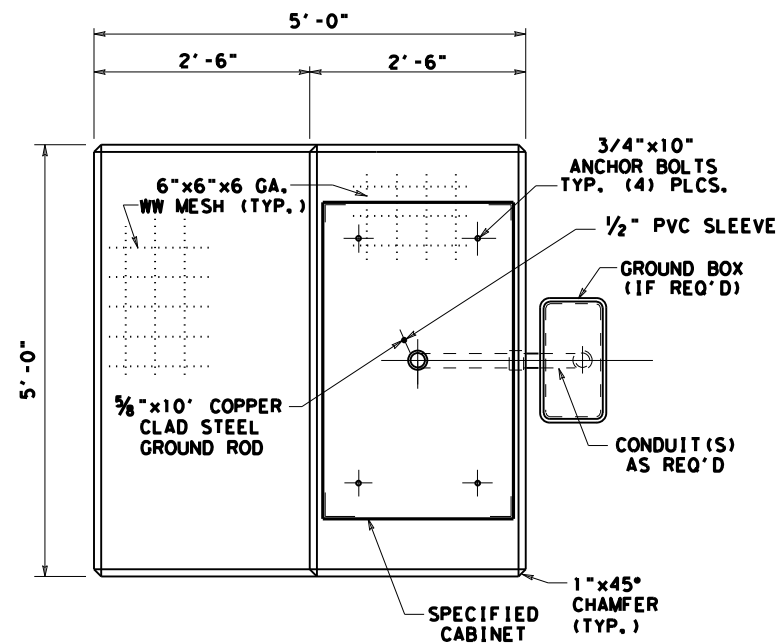


**FRONT VIEW**

- NOTES:**
1. ALL CONCRETE TO BE CLASS "A".
  2. ALL CONDUIT PERTRUDING THRU CONCRETE SHALL BE COMPLETELY SURROUNDED WITH CONCRETE & CAPPED WITH A BELL & ADAPTER.
  - \* 3. ANCHOR BOLTS AS SPECIFIED BY CABINET MANUFACTURER.

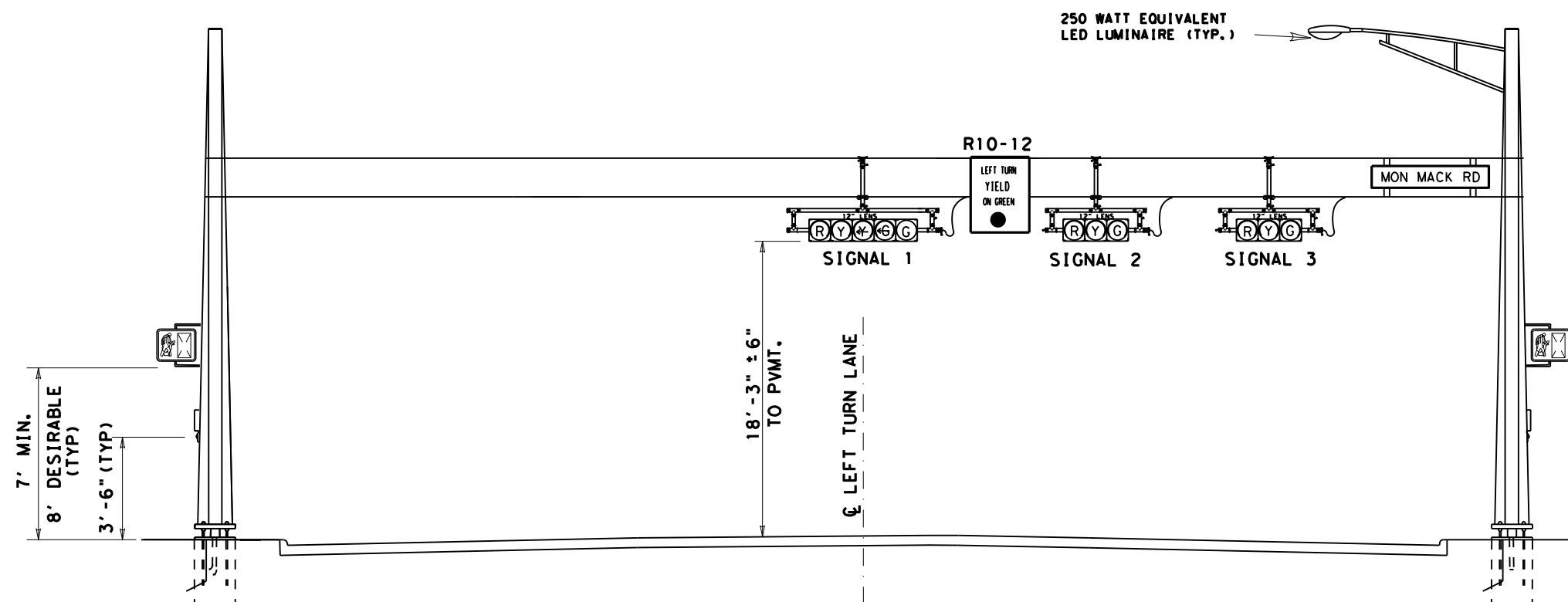


**SIDE VIEW**



**TOP VIEW**

**DETAIL OF BASE MOUNT CABINET FOUNDATION**

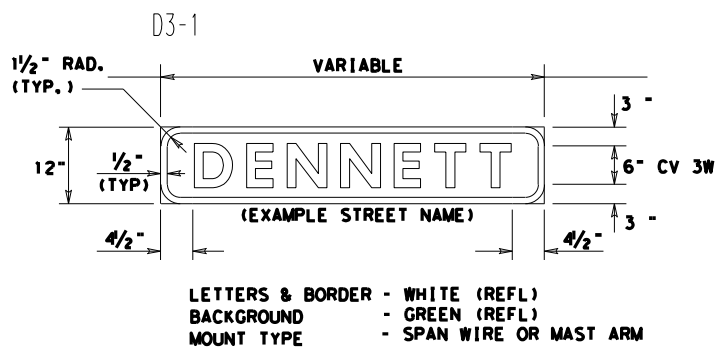


**ELEVATION VIEW**

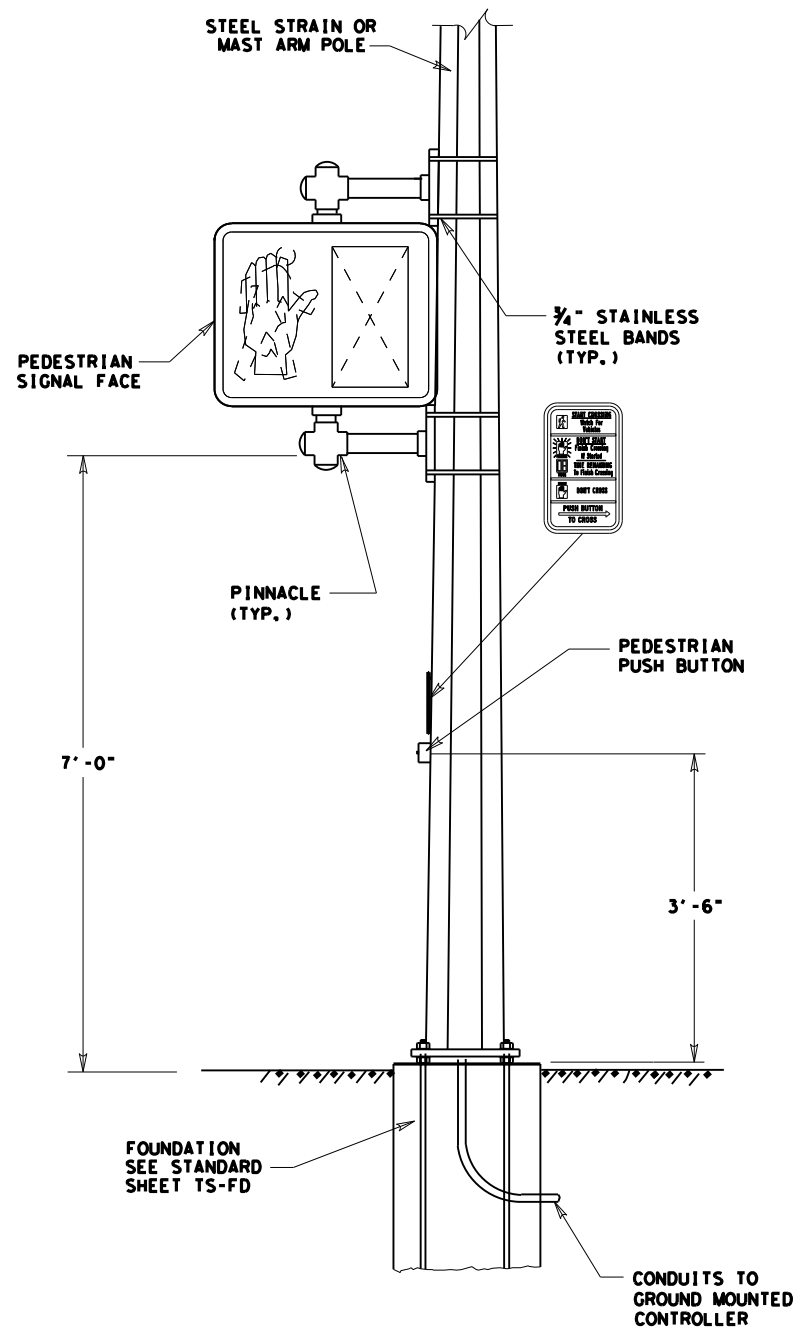
DISTRICT STANDARD PLANS  
**TEXAS DEPARTMENT OF TRANSPORTATION**  
 PHARR DISTRICT STANDARD  
**TRAFFIC SIGNAL CONSTRUCTION DETAILS**  
**CONTROLLER FOUNDATION & LOOP DETECTOR INSTALLATION**

DN: GV	DRAWING ORIGINAL	DATE APR. 2010	FILE NO. 6	STATE TEXAS	PROJECT NO.	SHEET NO. 236
CK DN: JSL	REV. JUL 2015	AUG 2016	FEB 2020	STATE DIST. NO. PHARR	COUNTY CAMERON	CONTROL NO. 0220
DW: GV					SECTION NO. 05	JOB NO. 080
CK DW: JSL						HIGHWAY NO. SH 48

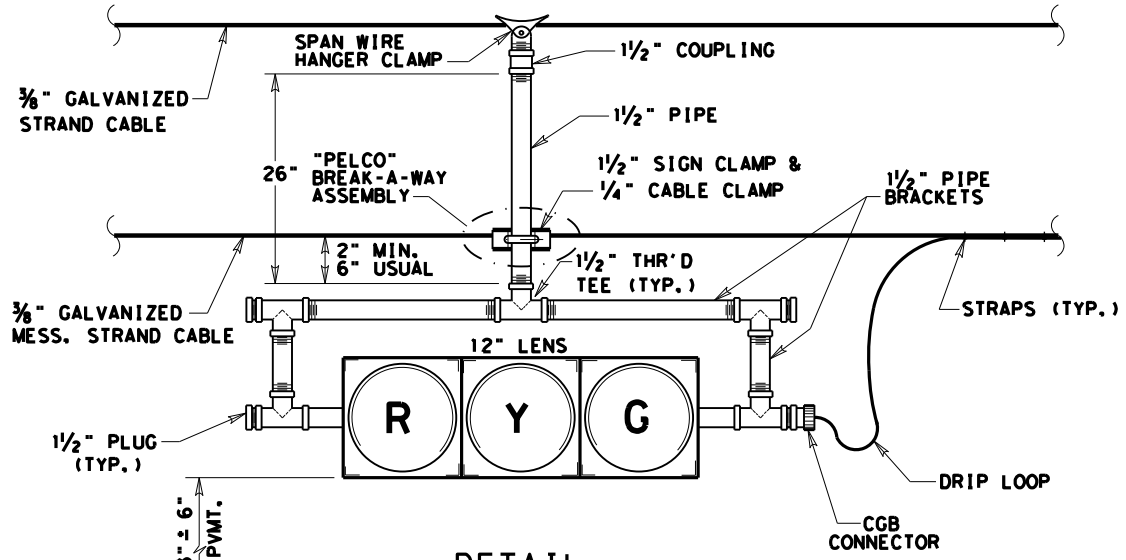
© 2020 TxDOT SHEET 1 OF 3



**STREET NAME SIGN**

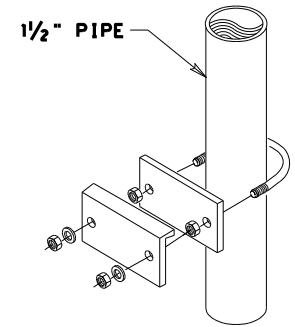


**DETAIL-PEDESTRIAN SIGNALS**

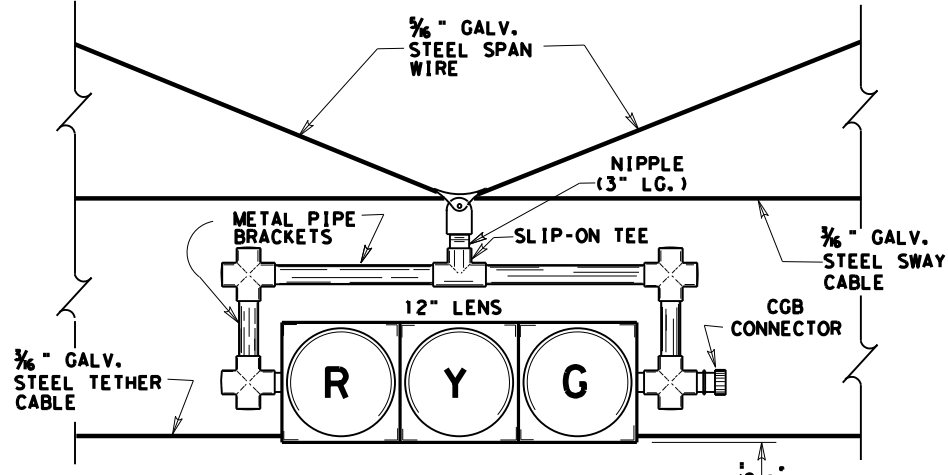


**DETAIL**

1 WAY-3 SEC. HORIZONTAL SIGNAL HEAD  
ALL SIGNALS TO BE POLYCARBONATE  
(TO BE USED ON SKEWED INTERSECTIONS OR WHEN SIGNAL POLES ARE NOT SQUARED TO EACH OTHER)

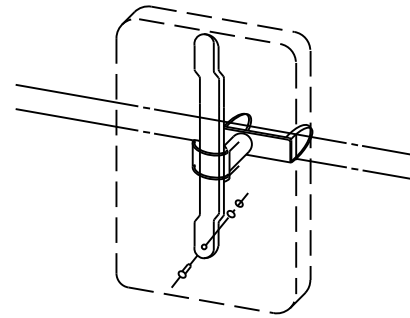


**DETAIL - "PELCO" BREAK-A-WAY ASSEMBLY**



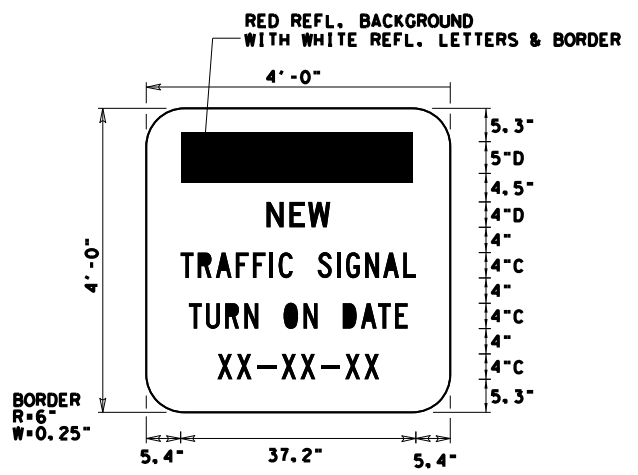
**DETAIL**

1 WAY-3 SEC. HORIZONTAL SIGNAL HEAD  
ALL SIGNALS TO BE POLYCARBONATE

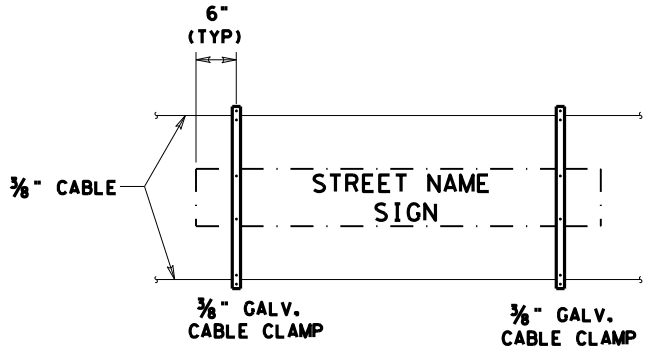


**SIGN BRACKET**

NOTE: THESE BRACKETS, USED IN PAIRS FOR LONGER SIGN, OR IN SINGLE UNITS FOR SMALLER SIGNS.



**SPECIAL SIGN DETAIL**

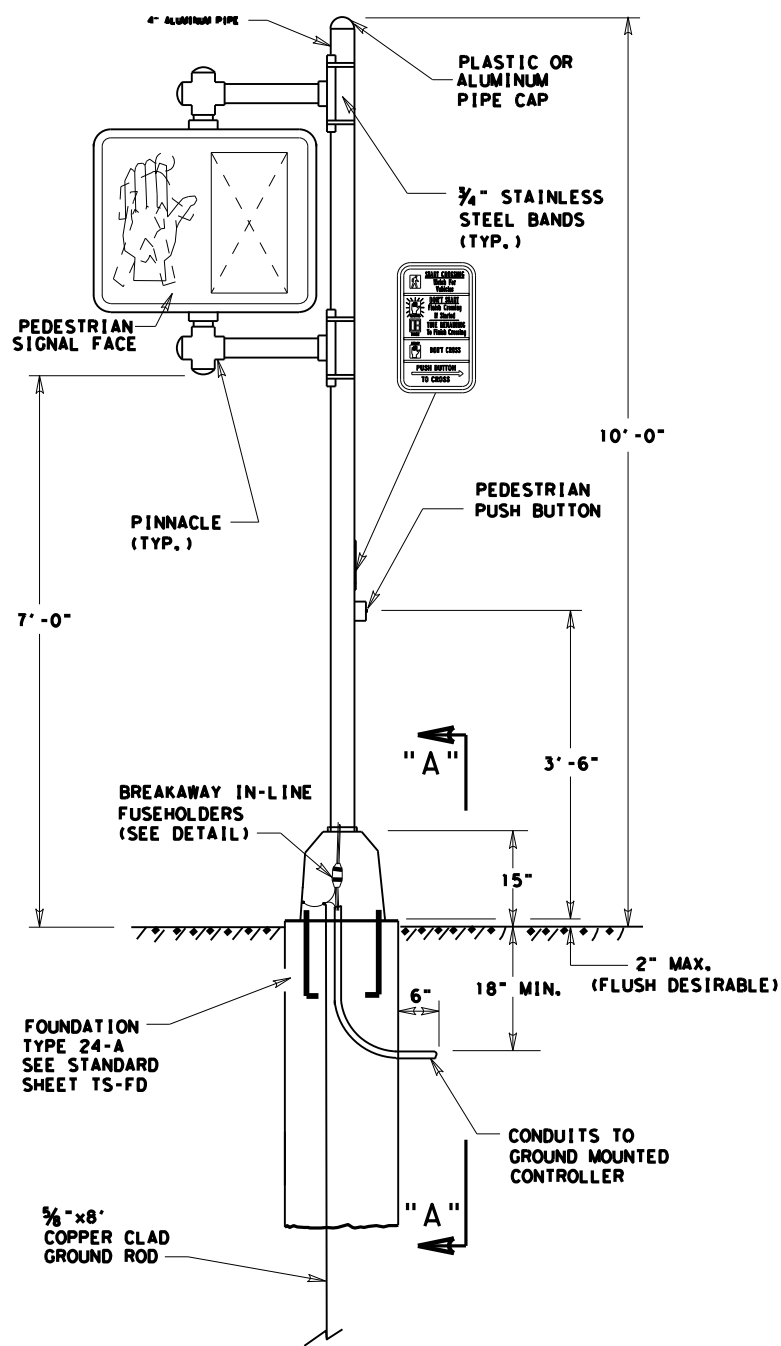


**STREET NAME SIGN MOUNTING DETAIL**

DISTRICT STANDARD PLANS  
**TEXAS DEPARTMENT OF TRANSPORTATION**  
PHARR DISTRICT STANDARD

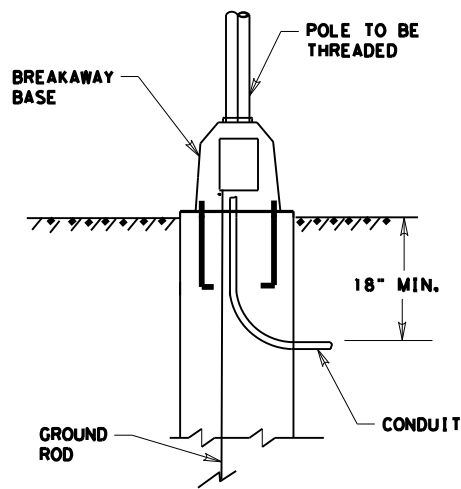
**TRAFFIC SIGNAL CONSTRUCTION DETAILS**  
MISCELLANEOUS DETAILS

© 2020 TxDOT		SHEET 2 OF 3	
DN: OG	DRAWING DATE	FILE NO. STATE	PROJECT NO.
CK DN: JSL	ORIGINAL APR. 2010	6 TEXAS	237
DW: OG	REV. MAY 2016	STATE DIST. NO.	COUNTY
CK DN: JSL	AUG 2016	PHARR CAMERON	0220 05 080 SH 48

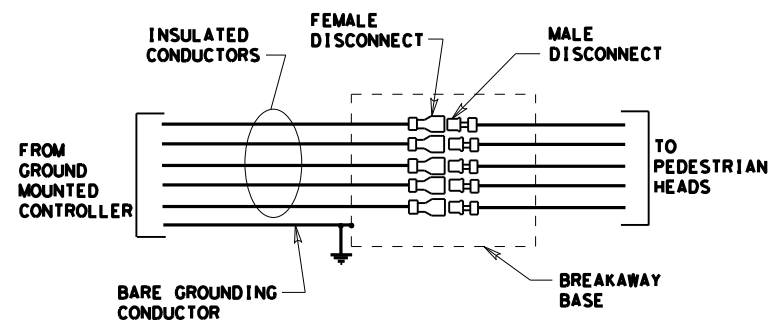


**PEDESTAL POLE DETAIL**

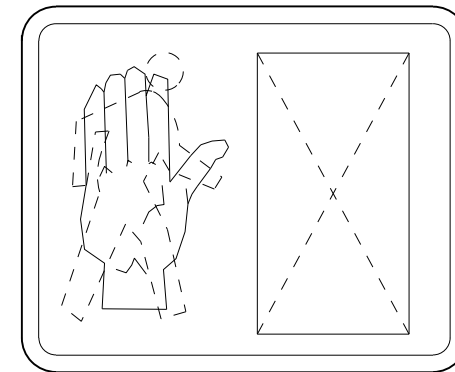
- NOTES:**
1. BREAKAWAY ELECTRICAL QUICK-DISCONNECTS SHALL BE WATERTIGHT BUSSMANN HEB SERIES OR EQUAL.
  2. DRILL POLE FOR WIRE ENTRY. USE BUSHING OR RUBBER GROMMET TO PROTECT CONDUCTORS.
  3. POLE SHAFT SHALL BE ONE PIECE SCHEDULE 40 ALUMINUM PIPE, ASTM B429 OR B221 (ALLOY 6601-T6), DO NOT USE ALUMINUM CONDUIT.



**SECTION "A A"**



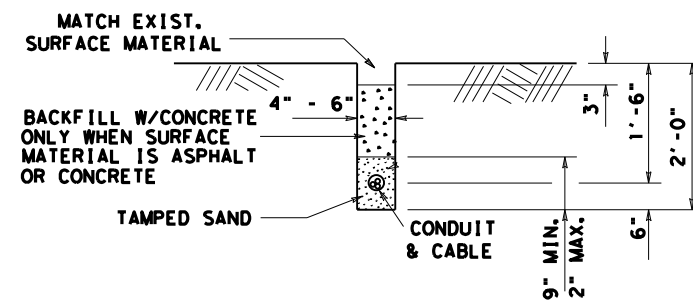
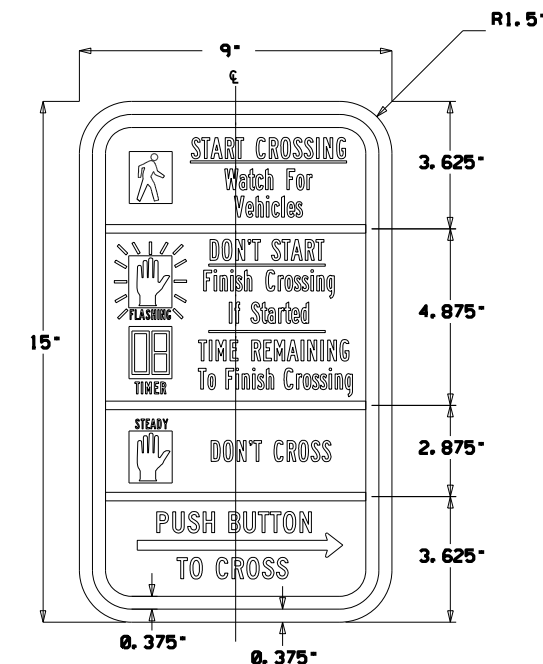
**BREAKAWAY IN-LINE FUSEHOLDERS**



**18"x16" LED PEDESTRIAN SIGNAL HEAD w/COUNTDOWN**

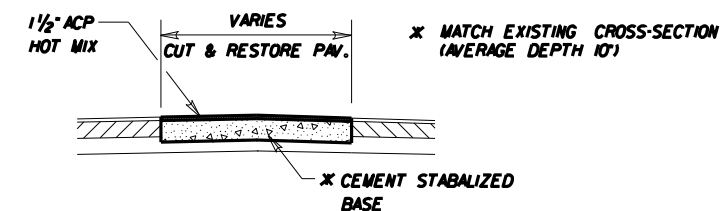
- LEGEND:**  
**BLACK**  
**- BACKGROUND:**  
 WHITE (RETROREFLECTIVE)  
**- OB. HAND SYMBOL:**  
 ORANGE (RETROREFLECTIVE)  
 ON BLACK  
**- PEDESTRIAN SYMBOL:**  
 WHITE (RETROREFLECTIVE)  
 ON BLACK

**NOTE:**  
 REFER TO THE STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD) FOR MORE DETAILS AND DIMENSIONS REGARDING SIGN R10-3e

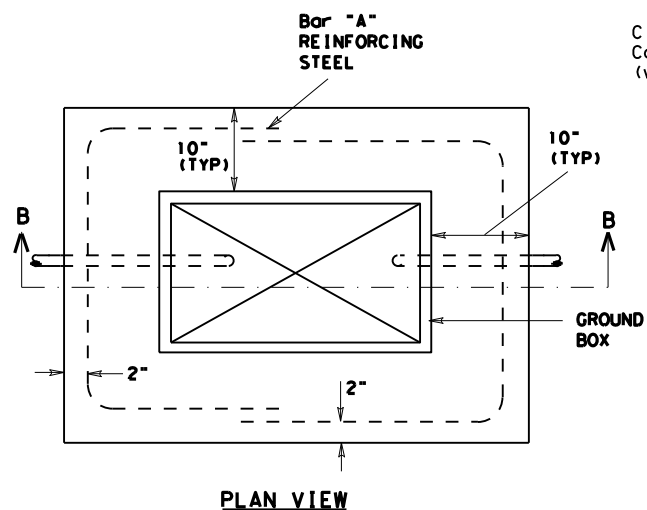


**DETAIL - TRENCH LAY CONDUIT**

**NOTE:**  
 ALL TRENCHES ARE TO BE MADE ONLY PARALLEL TO THE STREET. ALL CONDUIT RUNS CROSSING THE STREET SHALL BE PUSHED AND NO CUTS MADE IN THE SURFACE.



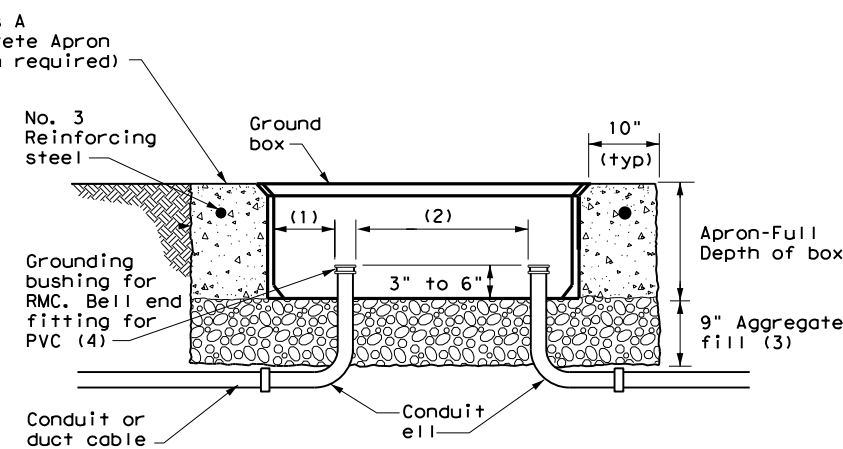
**DETAIL - CUT AND RESTORE PAVEMENT**



**PLAN VIEW**

**APRON FOR GROUND BOXES**

(Where required)



**SECTION B-B**

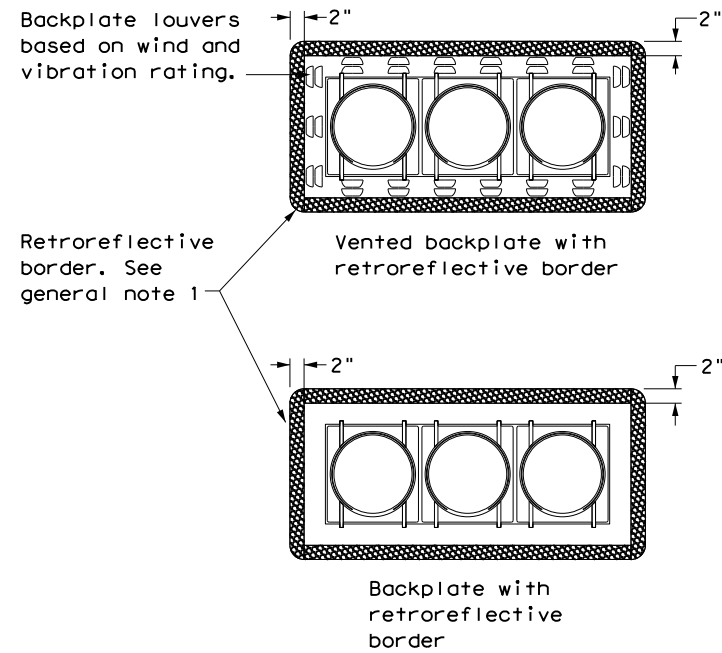
DISTRICT STANDARD PLANS  
**TEXAS DEPARTMENT OF TRANSPORTATION**  
 PHARR DISTRICT STANDARD

**TRAFFIC SIGNAL CONSTRUCTION DETAILS**  
 MISCELLANEOUS DETAILS

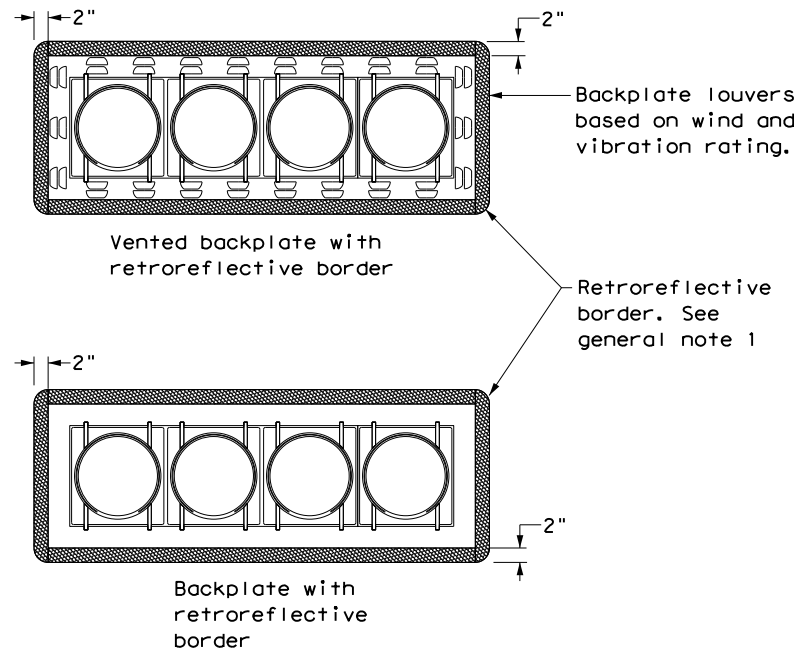
© 2020 TxDOT		SHEET 3 OF 3	
DN: OG	DRAWING DATE	FILE NO. STATE	PROJECT NO.
CK DN: JSL	ORIGINAL APR. 2010	6 TEXAS	238
DW: OG	REV. JUL. 2015	STATE COUNTY	CONTROL NO. SECTION NO. JOB NO. HIGHWAY NO.
CK DN: JSL	MAY 2016 AUG 2016 APR 2017	PHARR CAMERON	0220 05 080 SH 48

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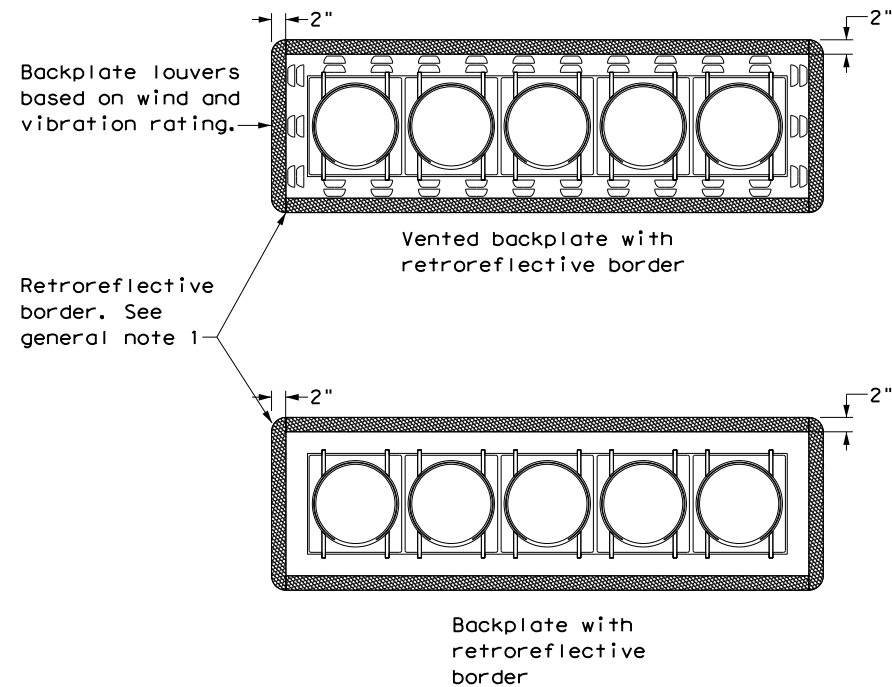
DATE: 2/23/2023 5:53:52 PM  
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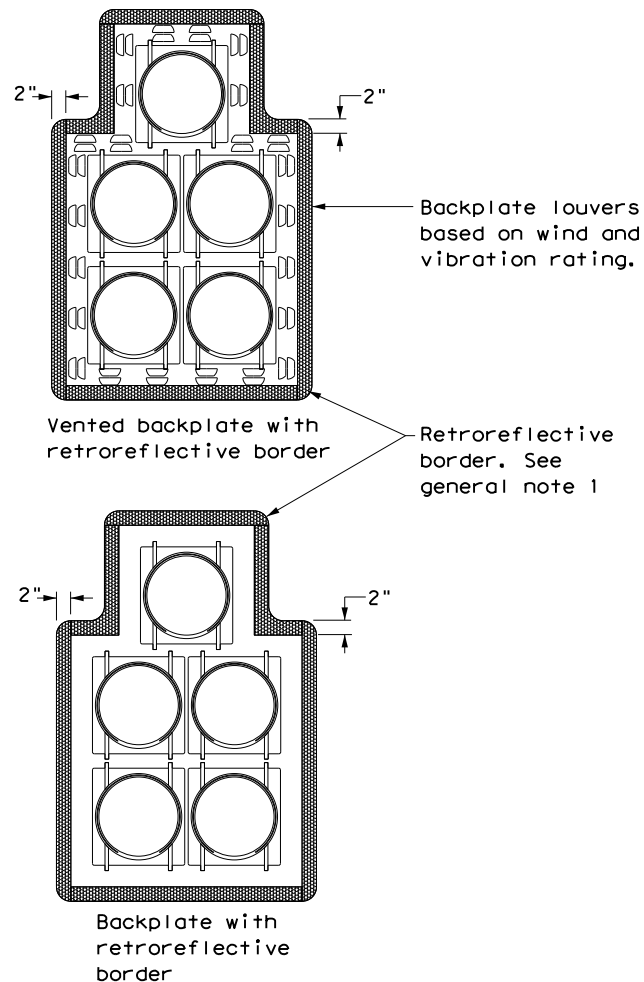
**THREE-SECTION HEAD**  
 HORIZONTAL OR VERTICAL



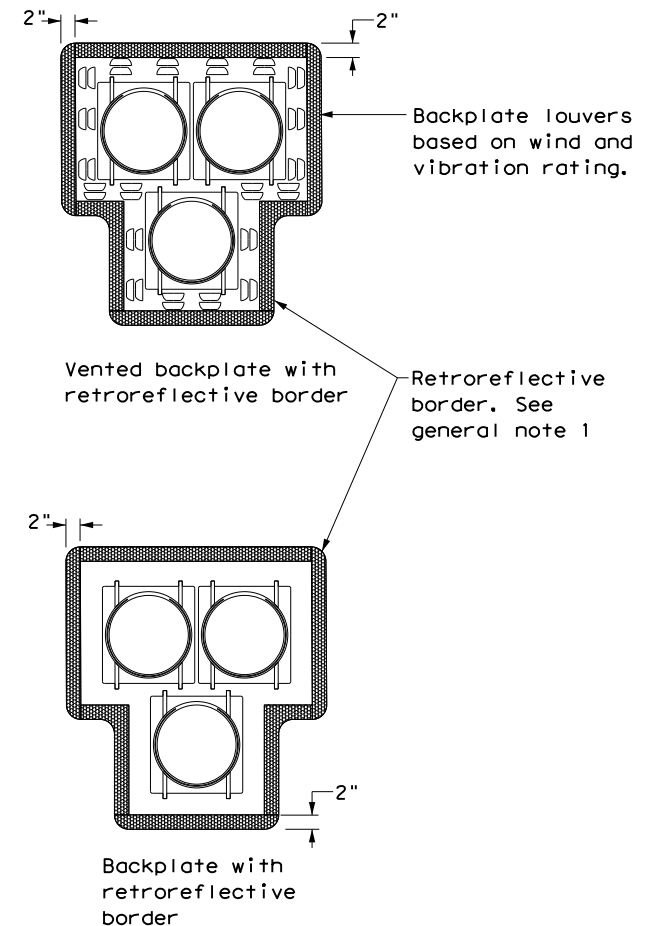
**FOUR-SECTION HEAD**  
 HORIZONTAL OR VERTICAL



**FIVE-SECTION HEAD**  
 HORIZONTAL OR VERTICAL



**FIVE-SECTION HEAD**  
 CLUSTER



**PEDESTRIAN HYBRID**  
 BEACON

**GENERAL NOTES:**

1. Backplates are optional for traffic signals and pedestrian hybrid beacons. When backplates are used, a 2-inch wide fluorescent yellow AASHTO Type B<sub>FL</sub> or C<sub>FL</sub> retroreflective border conforming to TxDOT DMS-8300 is required. Place on all approaches when used.
2. Signal head and backplate compatibility must be verified by the contractor prior to installation.
3. When using backplates on signal heads, venting is preferred to reduce cyclic vibration stress.
4. When a vented backplate is used, the retroreflective border must not be placed over the louvers.
5. This standard sheet applies to all signal heads with backplates, including but not limited to:
  - Pole mounted
  - Overhead mounted
  - Span wire mounted
  - Mast arm mounted
  - Vertical signal heads
  - Horizontal signal heads
  - Clustered signal heads
  - Pedestrian hybrid beacons

		<b>Texas Department of Transportation</b>		<b>Traffic Safety Division Standard</b>	
<b>TRAFFIC SIGNAL HEAD WITH BACKPLATE</b>					
<b>TS-BP-20</b>					
FILE: ts-bp-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	
© TxDOT June 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0220	05	080	SH 48	
	DIST	COUNTY	SHEET NO.		
	PHR	CAMERON			<b>239</b>

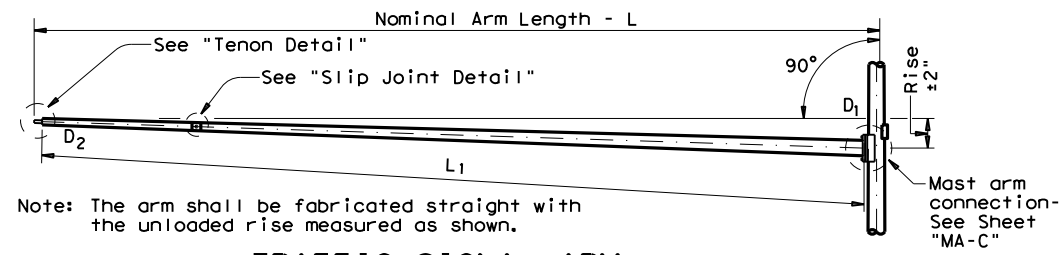
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 FILE: \\txdot.projectwiseonline.com:txdot\Projects\022005080\4 - PHR\Design Projects\022005080\4 - Design\Traffic\SH48\*TRAFFIC\*SIGNAL\*STANDARDS\12 sma-100.dgn  
 DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

Arm Length ft.	ROUND POLES					POLYGONAL POLES					Foundation Type
	D <sub>B</sub> in.	D <sub>19</sub> in.	D <sub>24</sub> in.	D <sub>30</sub> in.	① thk in.	D <sub>B</sub> in.	D <sub>19</sub> in.	D <sub>24</sub> in.	D <sub>30</sub> in.	① thk in.	
20	12.0	9.3	8.6	7.8	.239	12.5	9.5	8.7	7.8	.239	36-A
24	12.0	9.3	8.6	7.8	.239	13.0	10.0	9.2	8.3	.239	36-A
28	12.0	9.3	8.6	7.8	.239	13.5	10.5	9.7	8.8	.239	36-A
32	13.0	10.3	9.6	8.8	.239	14.0	11.0	10.2	9.3	.239	36-A
36	13.5	10.8	10.1	9.3	.239	15.0	12.0	11.2	10.3	.239	36-A
40	14.0	11.3	10.6	9.8	.239	16.0	13.0	12.2	11.3	.239	36-B
44	14.5	11.8	11.1	10.3	.239	16.5	13.5	12.7	11.8	.239	36-B

Arm Length ft.	ROUND ARMS					POLYGONAL ARMS				
	L <sub>1</sub> ft.	D <sub>1</sub> in.	D <sub>2</sub> in.	① thk in.	Rise	L <sub>1</sub> ft.	D <sub>1</sub> in.	② D <sub>2</sub> in.	① thk in.	Rise
20	19.1	8.0	5.3	.179	1'-8"	19.1	8.0	3.5	.179	1'-7"
24	23.1	9.0	5.8	.179	1'-9"	23.1	9.0	3.5	.179	1'-8"
28	27.1	9.5	5.7	.179	1'-10"	27.1	10.0	3.5	.179	1'-9"
32	31.0	9.5	5.2	.239	1'-11"	31.0	9.5	3.5	.239	1'-10"
36	35.0	10.0	5.1	.239	2'-0"	35.0	10.0	3.5	.239	1'-11"
40	39.0	10.5	5.1	.239	2'-3"	39.0	11.0	3.5	.239	2'-1"
44	43.0	11.0	5.1	.239	2'-8"	43.0	11.5	4.0	.239	2'-3"

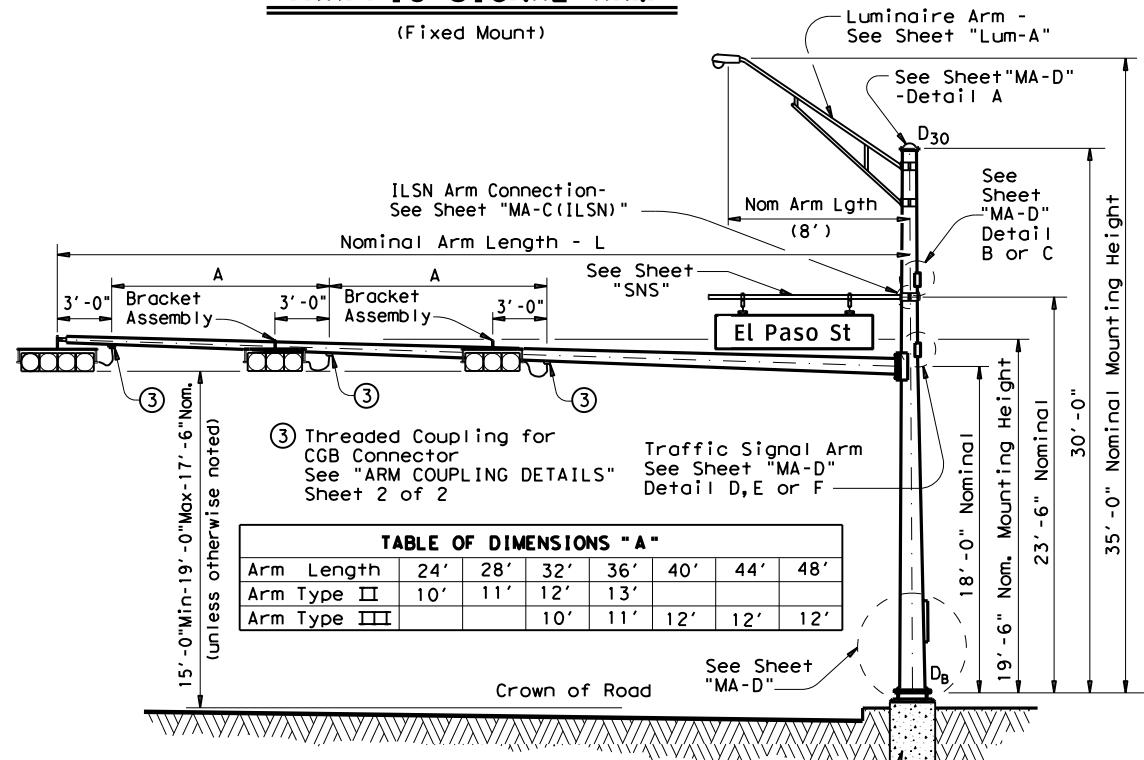
D<sub>B</sub> = Pole Base O.D.  
 D<sub>19</sub> = Pole Top O.D. with no Luminaire and no ILSN  
 D<sub>24</sub> = Pole Top O.D. with ILSN w/out Luminaire  
 D<sub>30</sub> = Pole Top O.D. with Luminaire  
 D<sub>1</sub> = Arm Base O.D.  
 D<sub>2</sub> = Arm End O.D.  
 L<sub>1</sub> = Shaft Length  
 L = Nominal Arm Length

- ① Thickness shown are minimums, thicker materials may be used.
- ② D<sub>2</sub> may be increased by up to 1" for polygonal arms.



Note: The arm shall be fabricated straight with the unloaded rise measured as shown.

**TRAFFIC SIGNAL ARM**  
(Fixed Mount)



Arm Length	24'	28'	32'	36'	40'	44'	48'
Arm Type II	10'	11'	12'	13'			
Arm Type III			10'	11'	12'	12'	12'

**STRUCTURE ASSEMBLY**

**SHIPPING PARTS LIST**

Ship each pole with the following attached: enlarged hand hole, pole cap, fixed-arm connection bolts and washers and any additional hardware listed in the table.

Nominal Arm Length ft.	30' Poles With Luminaire		24' Poles With ILSN		19' Poles With No Luminaire and No ILSN	
	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20L-100		20S-100		20-100	
24	24L-100		24S-100		24-100	
28	28L-100		28S-100		28-100	
32	32L-100		32S-100		32-100	
36	36L-100		36S-100		36-100	
40	40L-100		40S-100		40-100	
44	44L-100		44S-100		44-100	

Traffic Signal Arms (1 per pole) Ship each arm with the listed equipment attached

Nominal Arm Length ft.	Type I Arm (1 Signal)		Type II Arm (2 Signals)		Type III Arm (3 Signals)	
	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-100					
24	24I-100		24II-100			
28	28I-100		28II-100			
32			32II-100		32III-100	
36			36II-100		36III-100	
40					40III-100	
44					44III-100	

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	

ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers


Nominal Arm Length	Quantity
7' Arm	
9' Arm	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
1 1/2"	3'-4"	
1 3/4"	3'-10"	
2"	4'-3"	

Each anchor bolt assembly consists of the following: Top and Bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers, and 4 nut anchor devices (Type 2) per Standard Drawing "TS-FD".

Templates may be removed for shipment.

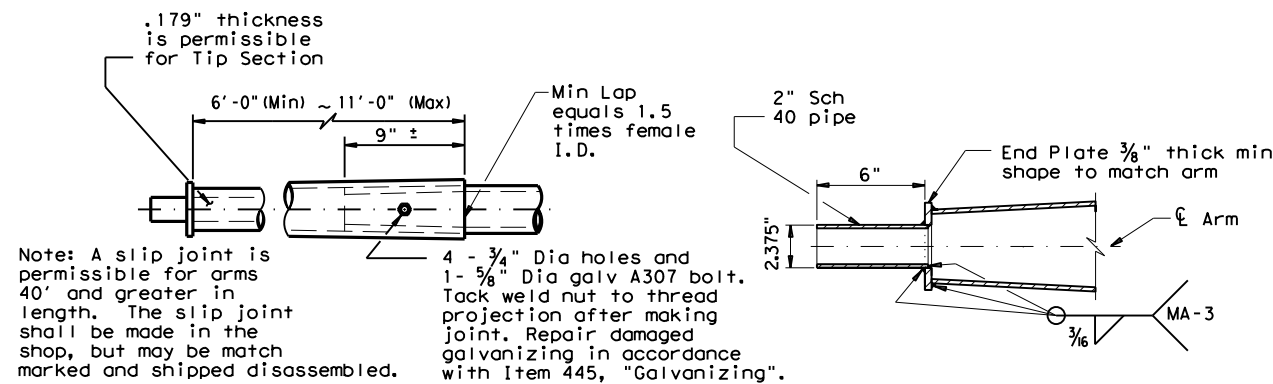

**Texas Department of Transportation**  
 Traffic Operations Division  
**TRAFFIC SIGNAL SUPPORT STRUCTURES**  
**SINGLE MAST ARM ASSEMBLY**  
**(100 MPH WIND ZONE)**  
**SMA-100(1)-12**

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REVISIONS		CONT	SECT	JOB	HIGHWAY
5-96	0220	05		080	SH 48
11-99					
1-12					
DIST		COUNTY		SHEET NO.	
PHR		CAMERON		240	



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DATE: 2/23/2023 5:53:58 PM  
 FILE: \\twdot\project\wiseon\line.com:TxDOT5\Documents\21 - PHR\Design Projects\022005080\4 - Design\Traffic\SH48\*TRAFFIC\*SIGNAL\*STANDARDS\12 sma-100.dgn



**SLIP JOINT DETAIL**

**TENON DETAIL**

**VIBRATION WARNING**

Mast Arms of SMA and DMA structures and clamp-on Arms of LMA structures of approximately 40 ft or longer are subject to harmonic vertical vibrations in light wind conditions due to the aeroelastic characteristics of a few of the myriads of possible combinations of the following: signal numbers, weights and positions; existence/solidity of backplates; presence of additional attachments to the arm, such as signs and cameras; arm-wind orientation; and arm-pole stiffness.

Such vibrations may cause fatigue damage to the structure and may lead to galloping in moderate wind conditions which may further damage the structure and alarm the public. Tests have indicated that when wind is blowing toward the back side of signal heads having un-vented backplates attached the probability of unacceptable harmonic vibration and/or galloping is rather high.

If backplates are not required for improved visibility they should not be applied to the signal heads or, if they must be applied, they should be vented as a first and inexpensive measure to mitigate vibrations.

The traffic signal mast arms shall be visually inspected in 5 to 20 mph wind conditions after installation of signal heads and any attachments, including any required backplates. If vertical movements with a total excursion (maximum upward excursion to maximum downward excursion) of more than approximately 8" are observed at the arm tip, a damping plate shall be fitted to the arm. See "Damping Plate Mounting Details" on standard sheet, MA-DP-10.

This visual inspection shall be repeated after each modification of the structure that could affect its aeroelastic response. Excessive vibrations shall not be allowed to continue for more than two days.

Stainless steel bands (or Cables) and cast bracket as in "Astro-Brac", "Sky Bracket" or "Easy Bracket" with 1 1/2" Dia Threaded Coupling.

**BRACKET ASSEMBLY**

**GENERAL NOTES:**

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed equals 100 mph plus a 1.3 gust factor.

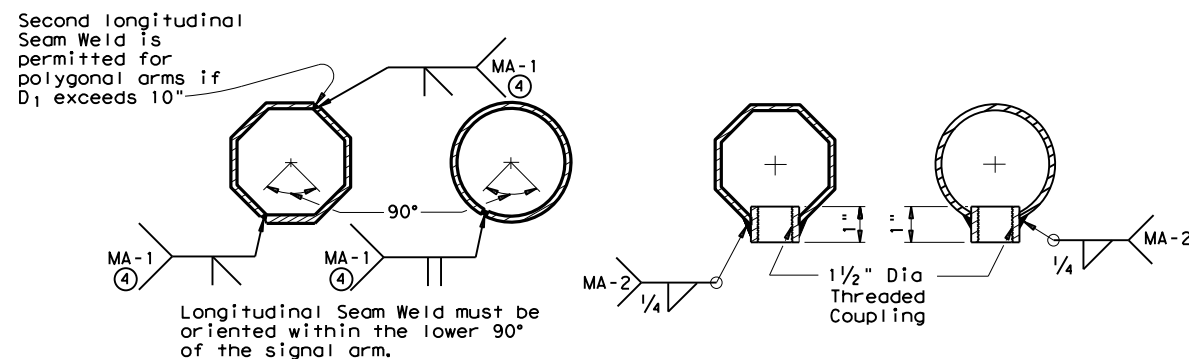
Poles are designed to support one 8'-0" luminaire arm, one 9'-0" internally lighted street name sign and one traffic signal arm with a length as tabulated. The specified luminaire load applied at the end of the luminaire arm equals 60 lbs vertical dead load plus the horizontal wind load on an effective projected area of 1.6 sq ft. The specified internally lighted street name sign load applied 4.5 ft from the centerline of the pole equals 85 lbs vertical dead load plus horizontal wind load on an effective projected area of 11.5 sq ft. The specified signal load applied at the end of the traffic signal arm equals 180 lbs vertical dead load plus the horizontal wind load on an effective projected area of 32.4 sq ft (actual area times drag coefficient).

See Standard Sheet "MA-D" for pole details, "MA-C" for traffic signal arm connection details, "MA-C (ILSN)" for internally lighted street name sign arm connection details, "LUM-A" for luminaire arm and connection details, "SNS" for internally lighted street name sign details, and "TS-FD" for anchor bolt and foundation details. See "MA-C" for material specifications.

Fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Materials, fabrication tolerances, and shipping practices shall meet the requirements of this sheet and Item 686, "Traffic Signal Pole Assemblies (Steel)".

Unless otherwise noted, all parts shall be galvanized in accordance with Item 445, "Galvanizing", after fabrication.

Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.



**ARM WELD DETAIL**

**ARM COUPLING DETAILS**

④ 60% Min. penetration  
100% penetration within 6" of circumferential base welds.

Texas Department of Transportation  
 Traffic Operations Division  
**TRAFFIC SIGNAL SUPPORT STRUCTURES**  
**SINGLE MAST ARM ASSEMBLY**  
**(100 MPH WIND ZONE)**  
**SMA-100(2)-12**

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1-12					
		DIST	COUNTY	SHEET NO.	
		PHR	CAMERON	241	



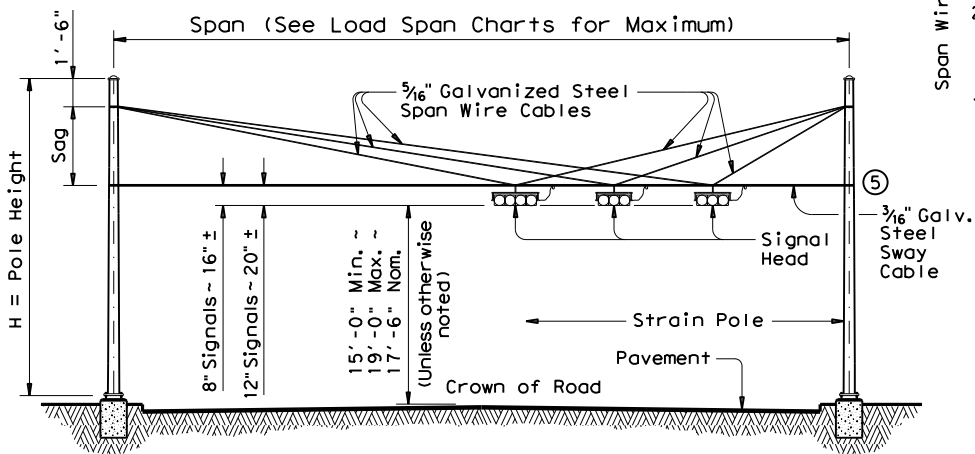


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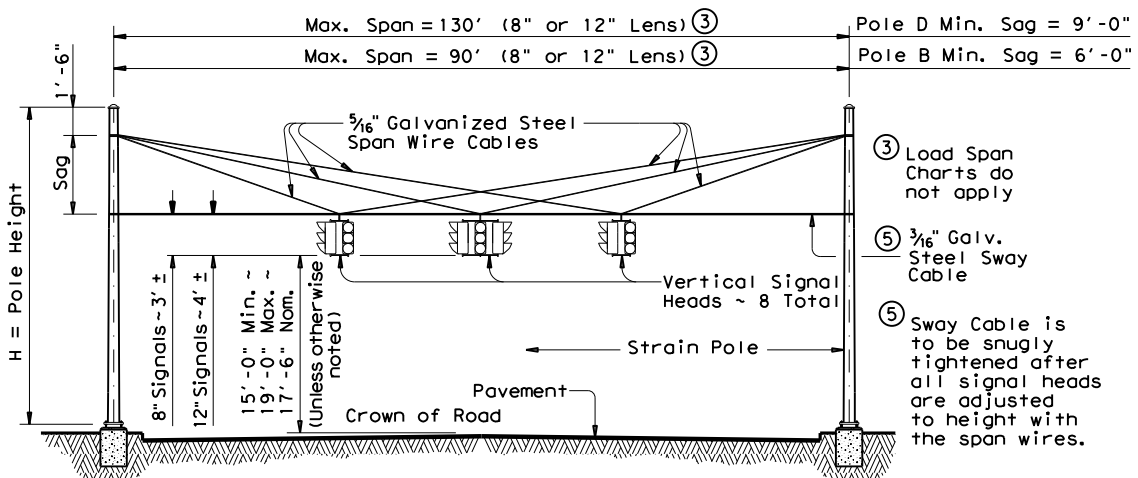
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STRAIN POLE DESCRIPTION	Pole Type	Foundation Type	Maximum Permissible Span Wire Load (lbs.)
26' Pole	A	36-A	4900
30' Pole	B	36-A	4300
30' Pole with Lum.	B	36-A	4000
30' Pole with 20' Mast Arm	C	36-B	4400
30' Pole with 24' Mast Arm	C	36-B	4000
30' Pole with 28' Mast Arm	C	36-B	3600
30' Pole with 32' Mast Arm	C	36-B	3300
30' Pole with 36' Mast Arm	C	36-B	2900
30' Pole with 20' Mast Arm & Lum.	C	36-B	4100
30' Pole with 24' Mast Arm & Lum.	C	36-B	3800
30' Pole with 28' Mast Arm & Lum.	C	36-B	3400
30' Pole with 32' Mast Arm & Lum.	C	36-B	3000
30' Pole with 36' Mast Arm & Lum.	C	36-B	2500
34' Pole	D	36-B	5200
34' Pole with Lum.	D	36-B	4900

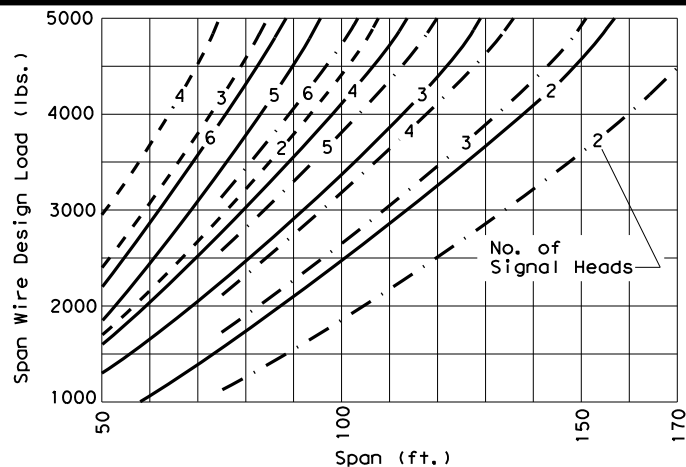
② Numbers on Load Span Charts indicate the number of signal heads on the span. The total span wire design load is based on one 5-section head and one or more additional 3-section head(s). Design wind pressures on cables are assumed as 1.6 lb/ft. Weight of span wire cables (one per signal head) is assumed as 0.65 lb/ft which includes an allowance for conductor cables and miscellaneous hardware. The effect of the sway cable on load distribution is ignored as it is assumed to break at design wind conditions. When a pole supports 2 spans, the span wire design loads for both spans should be added vectorially to determine the design load for that pole.



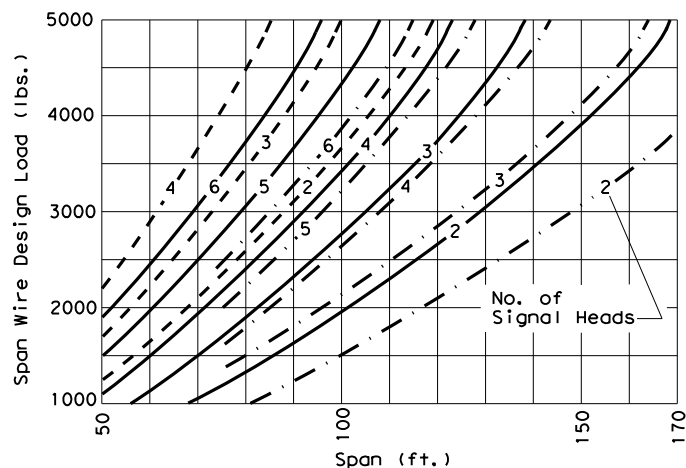
**STRAIN POLE ELEVATIONS HORIZONTAL SIGNALS**



**STRAIN POLE ELEVATIONS VERTICAL SIGNALS**  
 (Mast arms are not used with vertical signals)



② **SIGNALS WITH 12-INCH LENS**



② **SIGNALS WITH 8-INCH LENS**

Signal Head Type	Wt. Per Head	Wind Area
5-Section, 12" Lens	125 lbs	9.6 sq. ft.
5-Section, 8" Lens	70 lbs	4.8 sq. ft.
3-Section, 12" Lens	75 lbs	5.64 sq. ft.
3-Section, 8" Lens	45 lbs	3.0 sq. ft.

◆ Effective projected design wind area (actual area times drag coefficient)

- Sag = 4'-6" (26' or 30' Pole)
- Sag = 8'-0" (30' or 34' Pole)
- - - - - Sag = 11'-6" (34' Pole)

Pole Type	ROUND POLES				POLYGONAL POLES			
	D <sub>B</sub> in.	D <sub>T</sub> in.	(4)thk in.	H ft.	D <sub>B</sub> in.	D <sub>T</sub> in.	(4)thk in.	H ft.
A	12.5	8.9	.239	26	13.0	9.0	.239	26
B	13.5	9.3	.239	30	14.0	9.0	.239	30
C	15.5	11.3	.239	30	16.0	11.0	.239	30
D	15.5	10.7	.239	34	16.0	11.0	.239	34

D<sub>B</sub> = Pole Base O.D. D<sub>T</sub> = Pole Top O.D. H = Pole Height

④ Thickness shown are minimum, thicker materials may be used.

**SHIPPING PARTS LIST**

Poles (Without Traffic Signal Arm)						
Pole Type	Strain poles with Luminaire			Strain poles without Luminaire		
	Description	Designation	Quantity	Description	Designation	Quantity
A				26' Strain Pole	SP 26 A-100	
B	30' Strain Pole	SPL 30 B-100		30' Strain Pole	SP 30 B-100	
D	34' Strain Pole	SPL 34 D-100		34' Strain Pole	SP 34 D-100	

Poles (With Traffic Signal Arm)						
Pole Type	Strain poles with Luminaire			Strain poles without Luminaire		
	Description	Designation	Quantity	Description	Designation	Quantity
C	30' SPw/TS Arm	SPL 30 C-100		30' SPw/TS Arm	SP 30 C-100	

Traffic Signal Arms (For Type C poles)						
Nominal Arm Length	Type I Arm (1 Signal)		Type II Arm (2 Signals)		Type III Arm (3 Signals)	
	Description	Quantity	Description	Quantity	Description	Quantity
20	20I-100					
24	24I-100		24 II-100			
28	28I-100		28 II-100			
32			32 II-100		32 III-100	
36			36 II-100		36 III-100	

**Anchor Bolt Assemblies (1 per pole)**

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
1 3/4"	3'-10"	
2"	4'-3"	

**Luminaire Arms**

Nominal Arm Length	Quantity
8' Arm	

Each Anchor Bolt Assembly consists of the following: Top and Bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers, and 4 nut anchor devices (Type 2) per Standard Drawing "TS-FD".

① See Sheet "DMA-100"

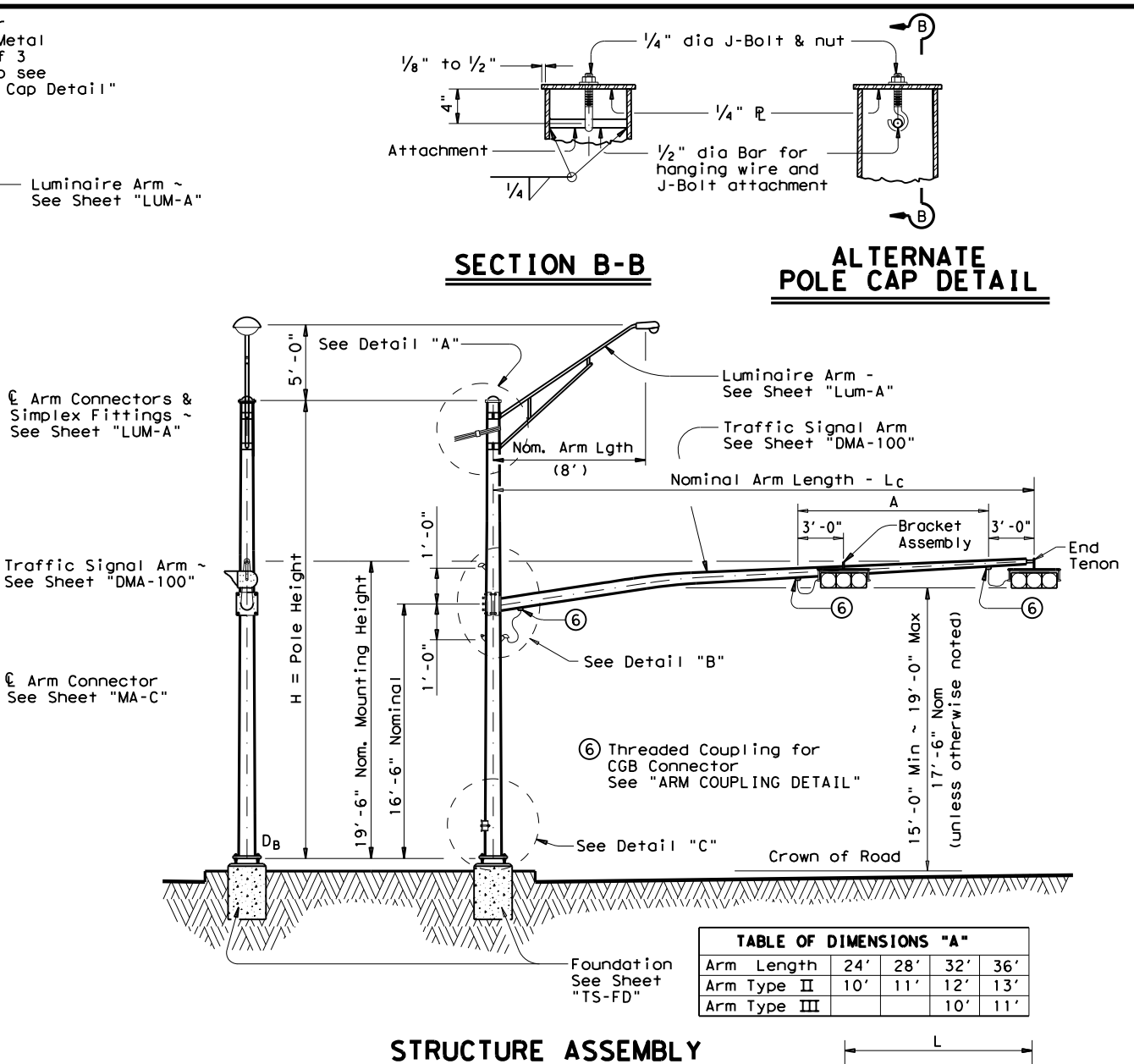
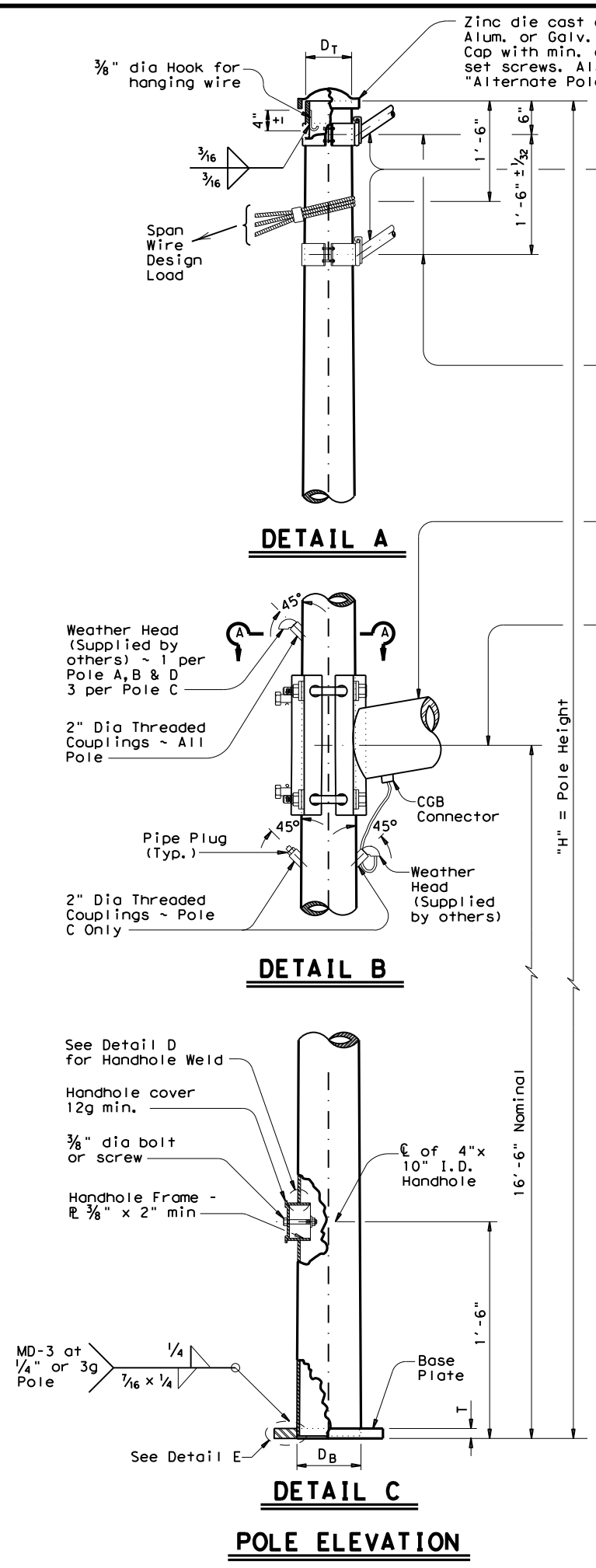


**TRAFFIC SIGNAL SUPPORT STRUCTURES STRAIN POLE ASSEMBLIES (100 MPH WIND ZONE) SP-100(1)-12**

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**TABLE OF DIMENSIONS "A"**

Arm Length	24'	28'	32'	36'
Arm Type II	10'	11'	12'	13'
Arm Type III			10'	11'

**MATERIALS**

Round Shafts or Polygonal Shafts <sup>9</sup>	ASTM A595 Gr.A, A588, A1008 HSLAS Gr.50 Class 2, A1011 HSLAS Gr.50 Class 2, A572 Gr.50 or A1011 SS Gr.50 <sup>10</sup>
Plates <sup>9</sup>	ASTM A36, A588, or A572 Gr.50
Connection Bolts	ASTM A325 except where noted
Pin Bolts	ASTM A325
Pipe <sup>9</sup>	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50, A1011 HSLAS-F Gr.50
Steel Cable	ASTM A475, 7 Wire Utilities Grade
Misc. Hardware	Galvanized steel or stainless steel or as noted

<sup>9</sup> ASTM A572, A1008 HSLAS, A1011 HSLAS, A1008 HSLAS-F, A1011 HSLAS-F, or A1011 SS may have higher yield strengths but shall not have less elongation than the grade indicated.

<sup>10</sup> ASTM A1011 SS Gr.50 shall also have a minimum elongation of 18 percent in 8 inches or 23 percent in 2 inches. Material thickness in excess of those stipulated under A1011 SS will be acceptable providing the material meets all other A1011 SS requirements and the requirements of this item.

**GENERAL NOTES**

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed equals 100 mph plus a 1.3 gust factor. The maximum permissible span wire design loads tabulated are calculated at a stress load of 1.4 times the basic allowable stress. A simultaneous wind on the pole, mast arm, and luminaire is also included.

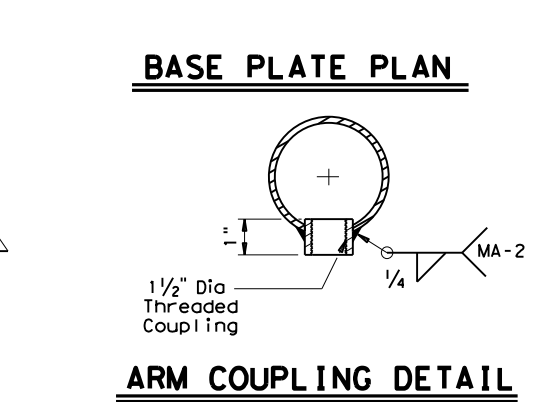
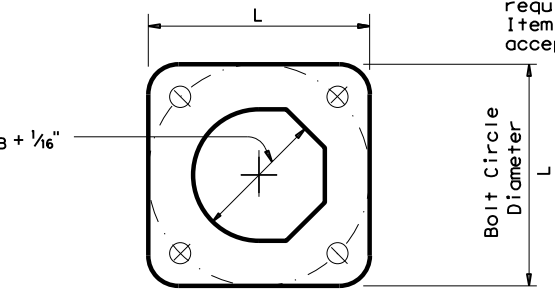
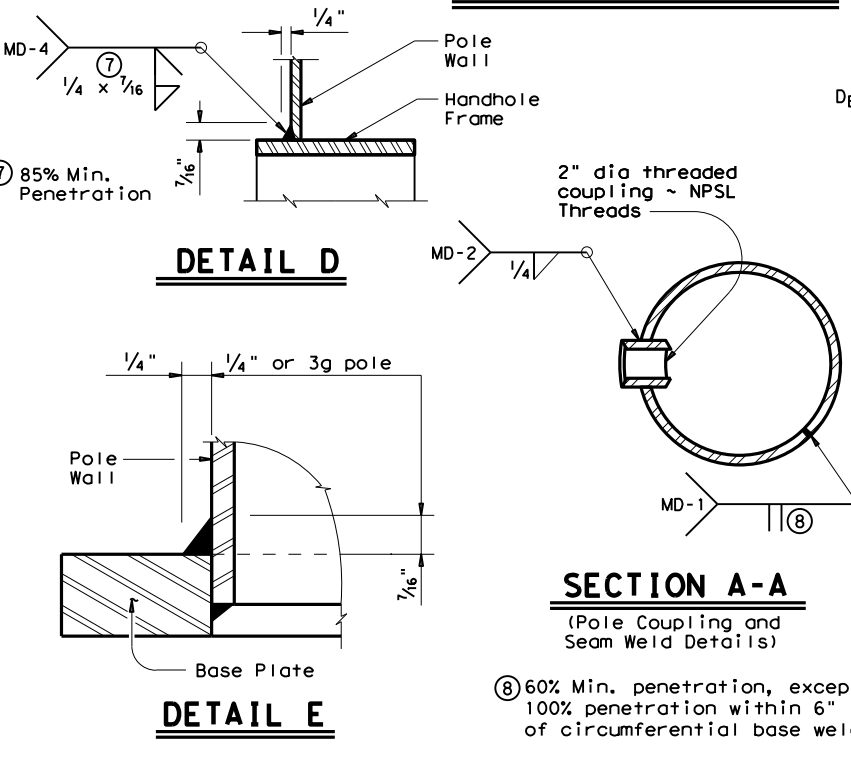
See standard sheet "DMA-100" for details of clamp-on traffic signal arms, sheet "MA-C" for traffic signal arm connection details, sheet "LUM-A" for luminaire arm and connection details, and sheet "TS-FD" for anchor bolt and foundation details.

Fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Materials, fabrication tolerances, and shipping practices shall meet the requirements of this sheet and Item 686, "Traffic Signal Pole Assemblies (Steel)".

Unless otherwise noted, all parts shall be galvanized in accordance with Item 445, "Galvanizing", after fabrication.

Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.

Foundation Type	Anchor Bolt Diameter	Bolt Hole Diameter	Bolt Circle Diameter	Base R Dim. L x T
36-A	1 3/4"	2"	19"	19" x 1 3/4"
36-B	2"	2 1/4"	21"	21" x 2"



<sup>8</sup> 60% Min. penetration, except 100% penetration within 6" of circumferential base welds.

**Texas Department of Transportation**  
 Traffic Operations Division

**TRAFFIC SIGNAL SUPPORT STRUCTURES STRAIN POLE ASSEMBLIES**  
 (100 MPH WIND ZONE)  
 SP-100(2)-12

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# SIGNING

*Pharr District Central Design*



## COVER SHEET

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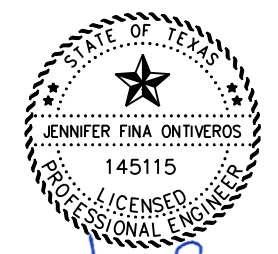
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**LEGEND:**

- △ SIGNS TO BE REMOVED (ITEM 644)
- SIGNS TO BE INSTALLED (ITEM 644)
- ⊕ SIGNS TO BE RELOCATED (ITEM 644)
- ⊗ SIGNS TO REMAIN IN PLACE
- ★ EXISTING STREET NAME SIGNS TO BE REINSTALLED ON PROPOSED SIGN.
- ⬇ PROPOSED SIGN
- ⬆ EXISTING SIGN

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*Jennifer Fina Ontiveros*  
 02/28/2023

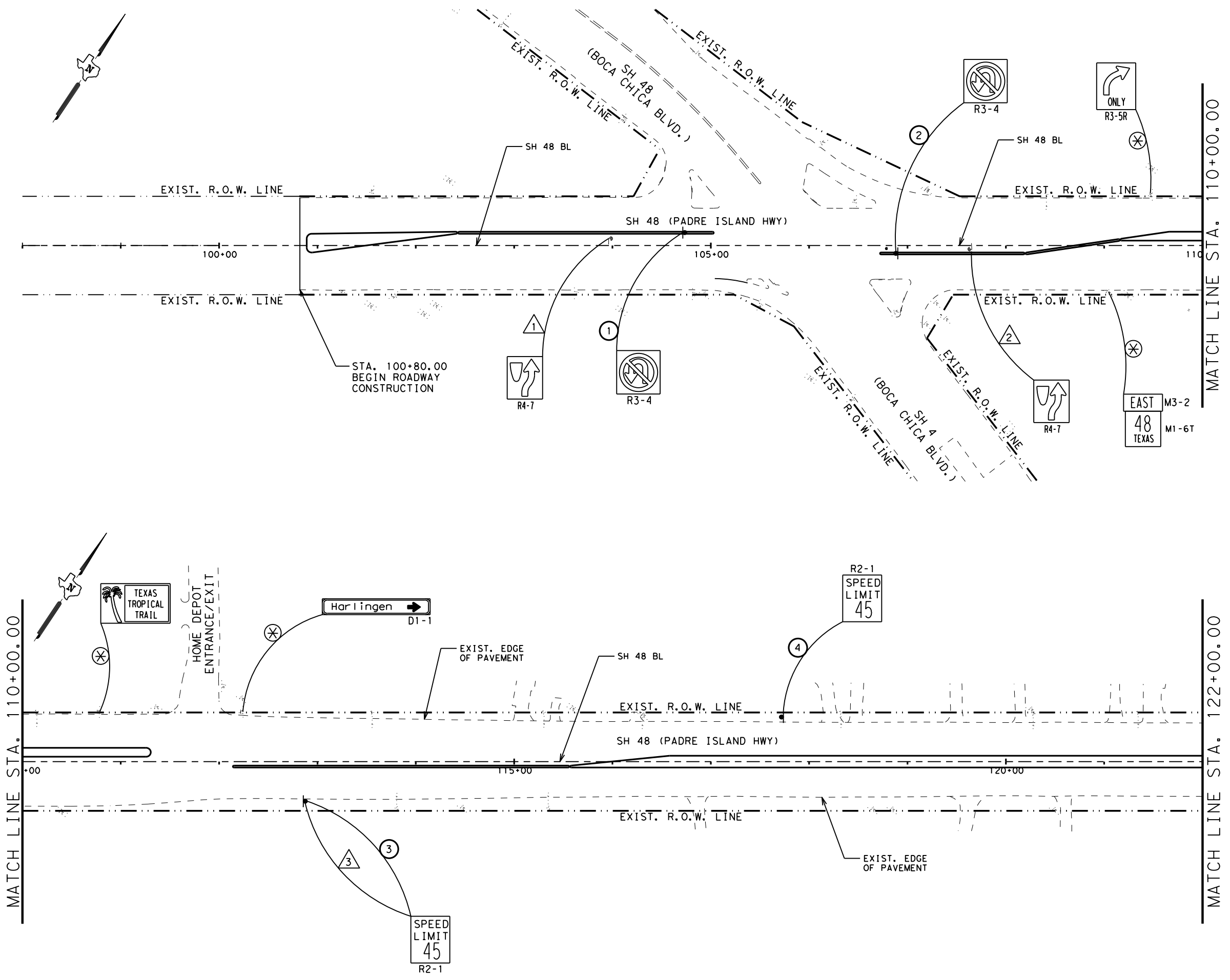
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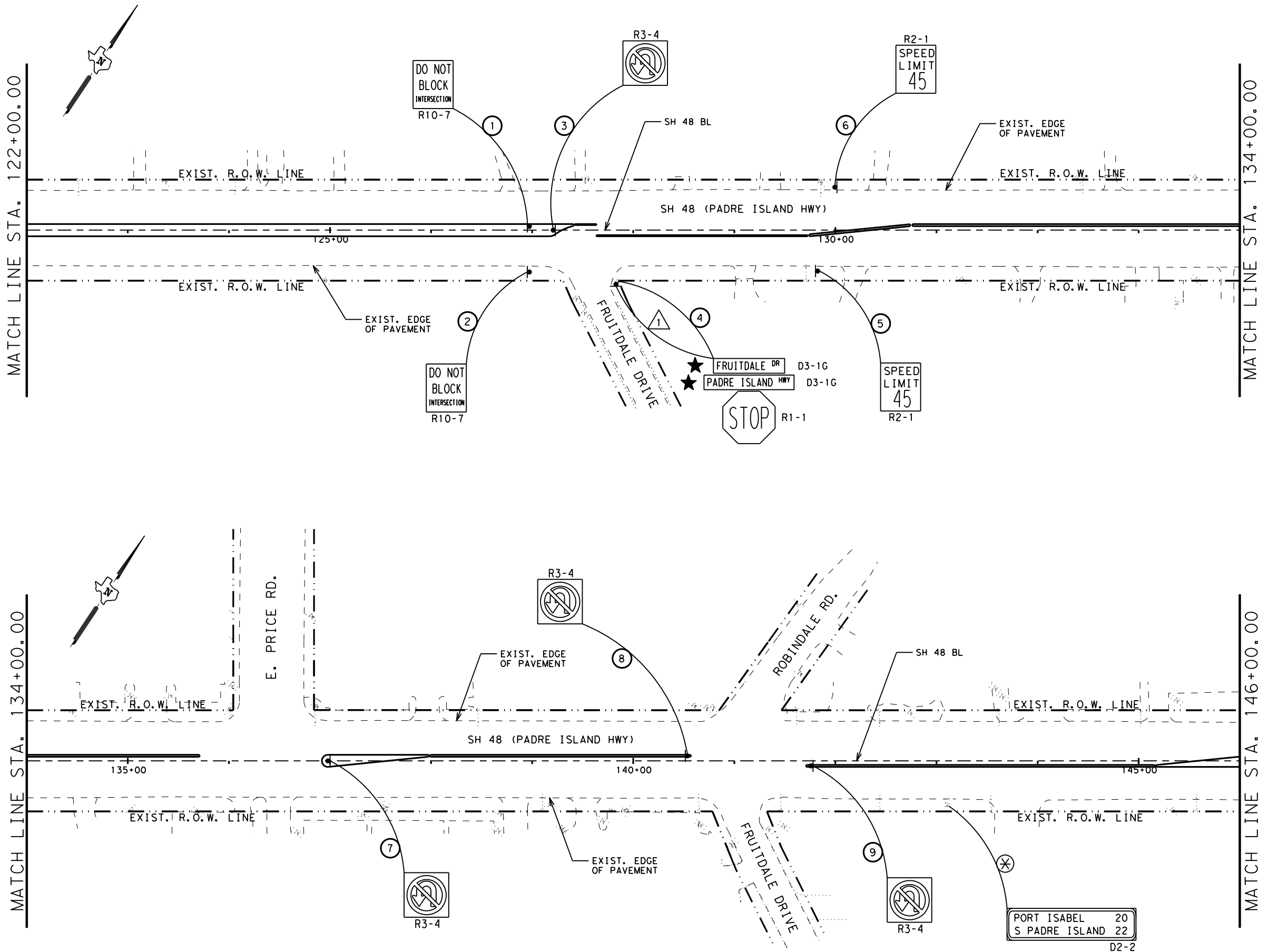
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SIGN LAYOUT**

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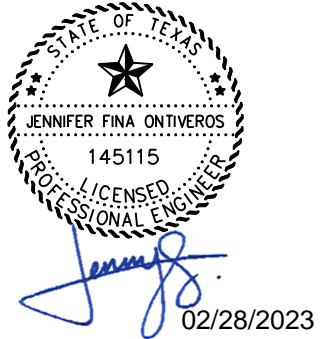
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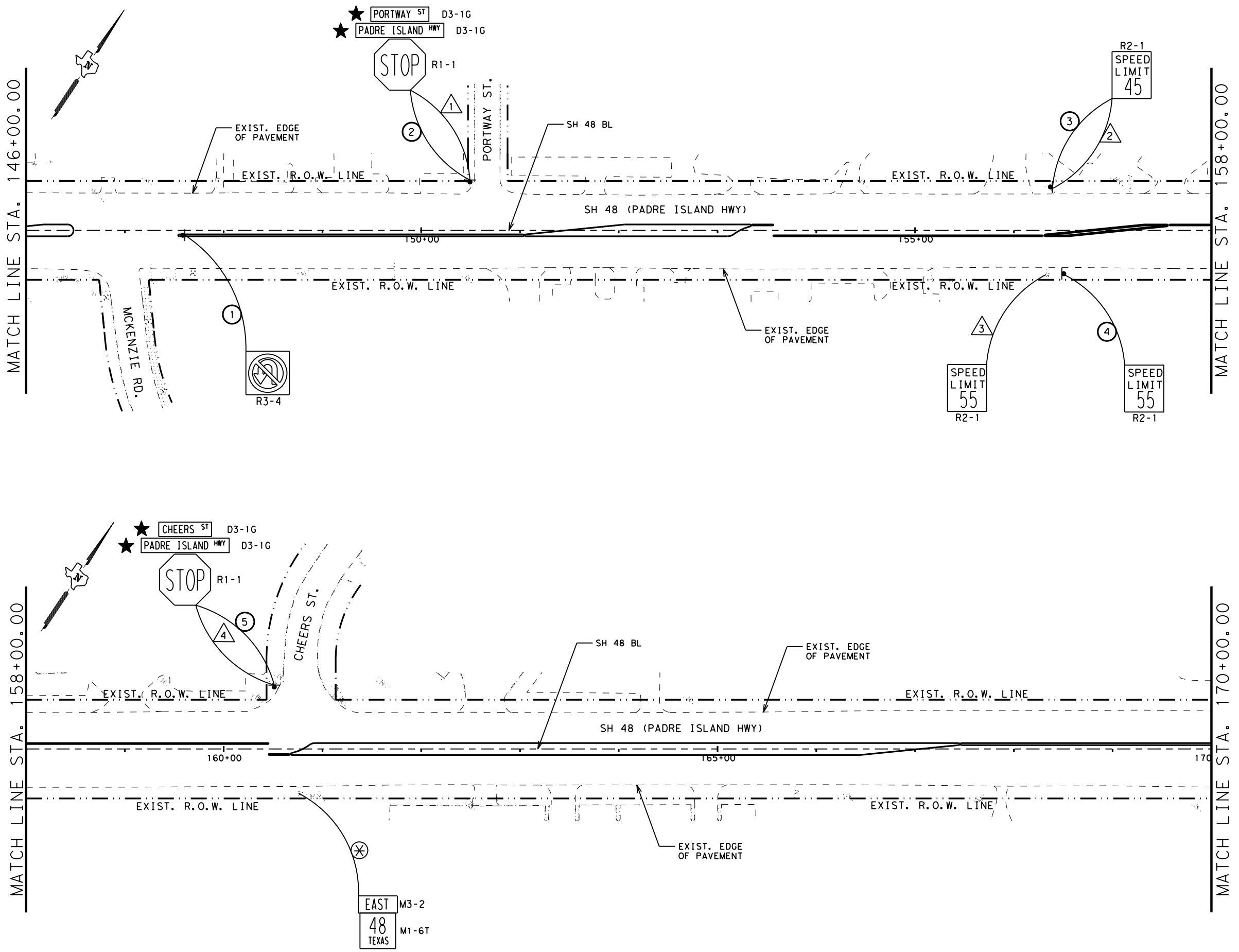
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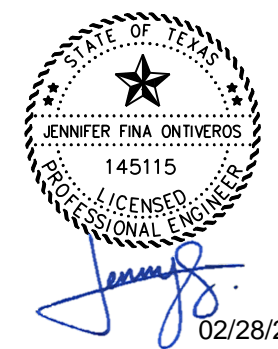


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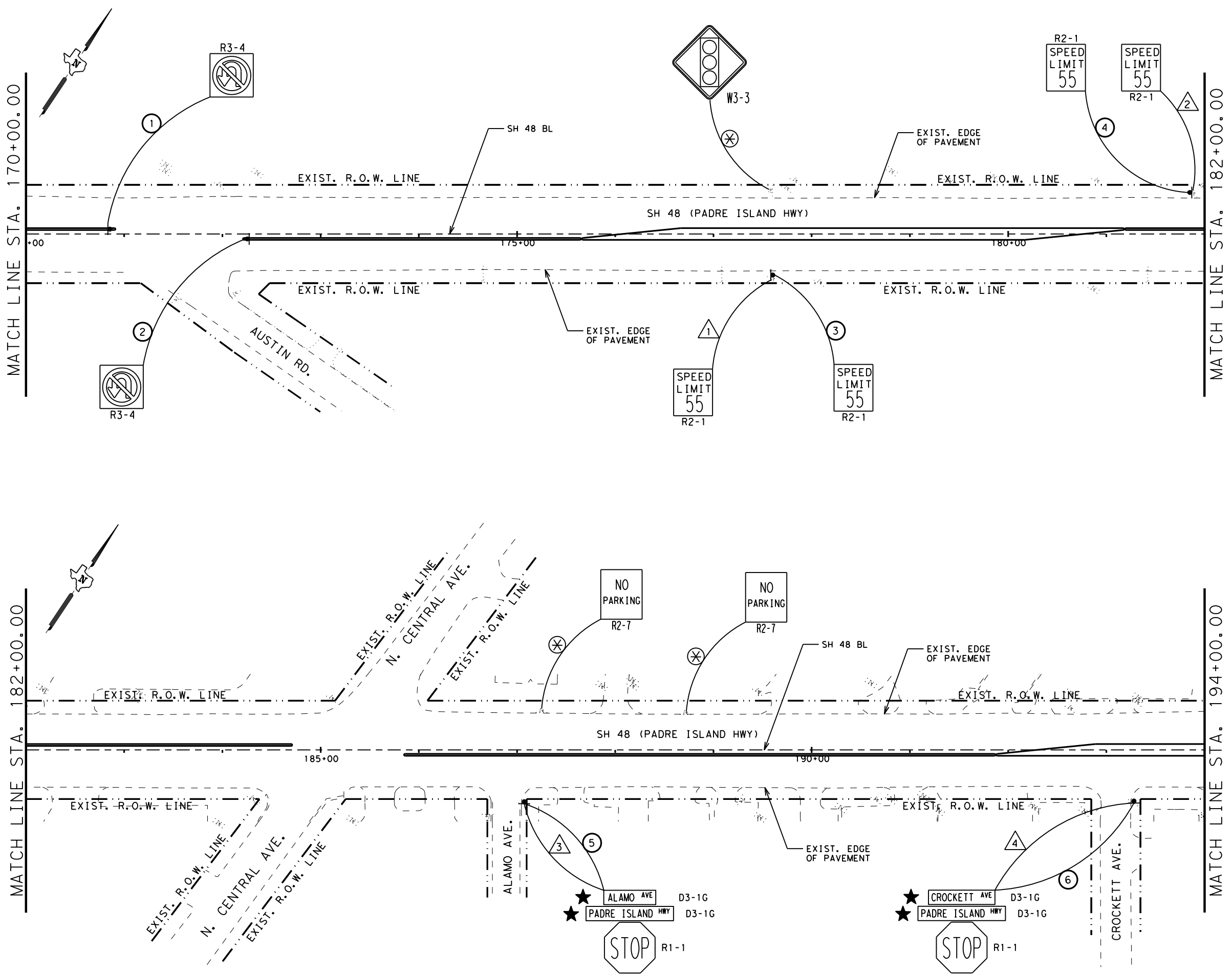
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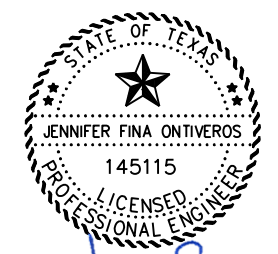


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*Jennifer Fina Ontiveros*  
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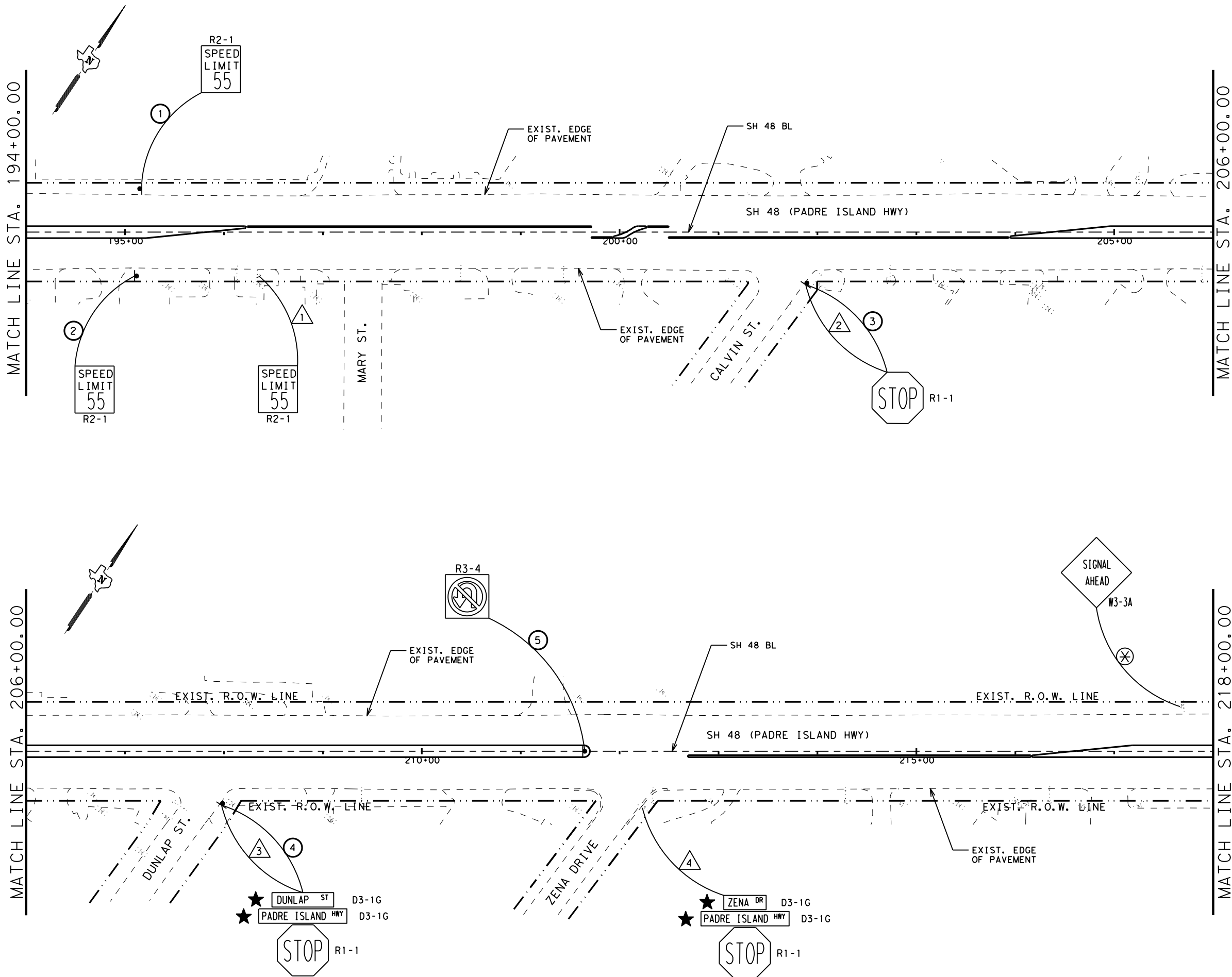
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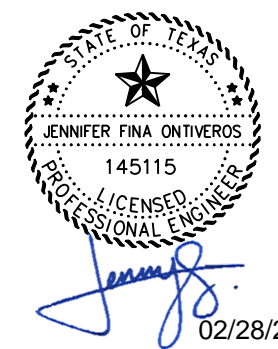


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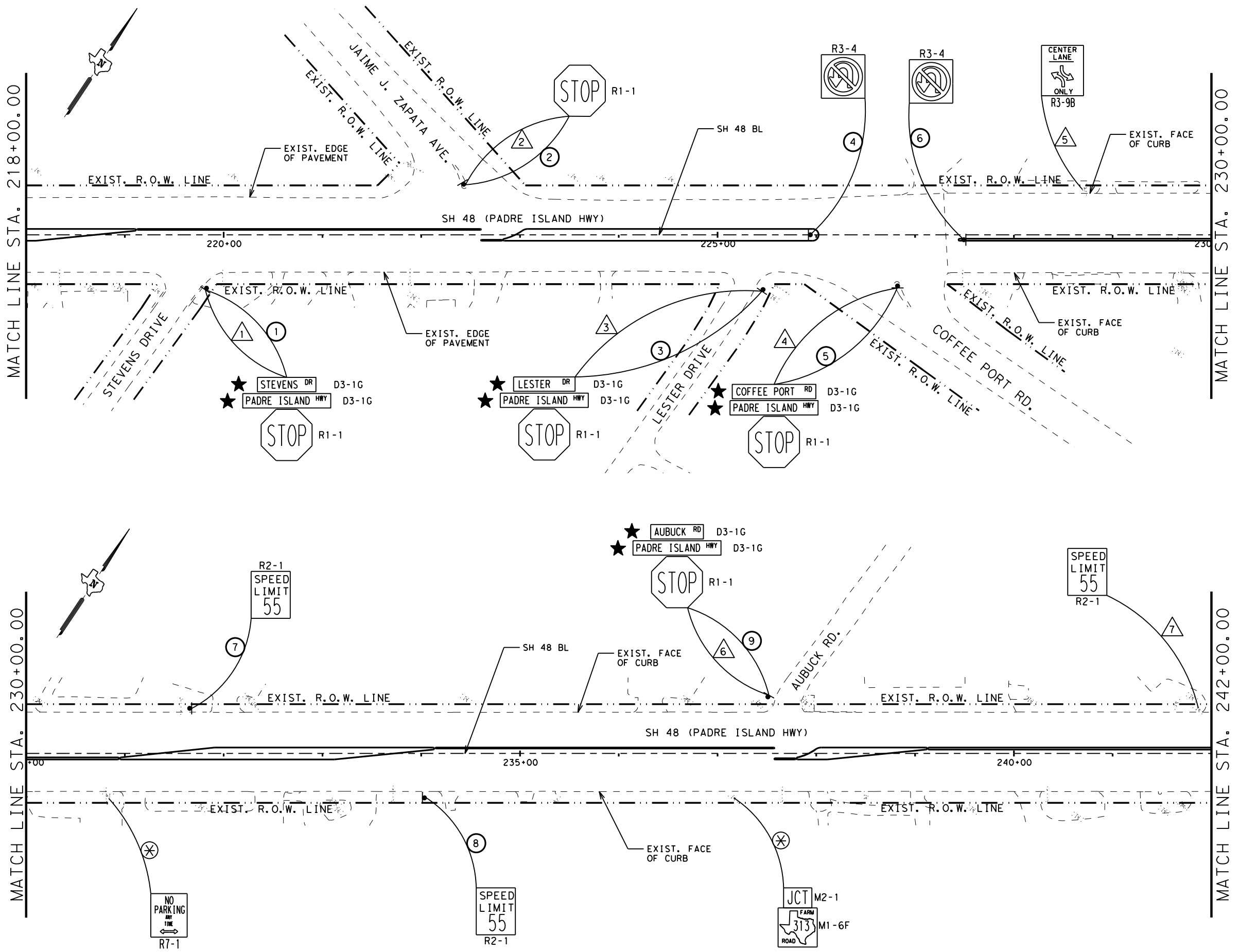
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  5. EXISTING SIGNS THAT ARE PROPOSED TO BE REPLACED, BUT MEET THE STANDARDS AND ARE IN GOOD CONDITION, MAY REMAIN IN PLACE IF APPROVED BY THE ENGINEER.
  6. A FIELD INSPECTION BEFORE & AFTER THE CONSTRUCTION OF THIS PROJECT SHALL BE DONE.



**Pharr District Central Design**

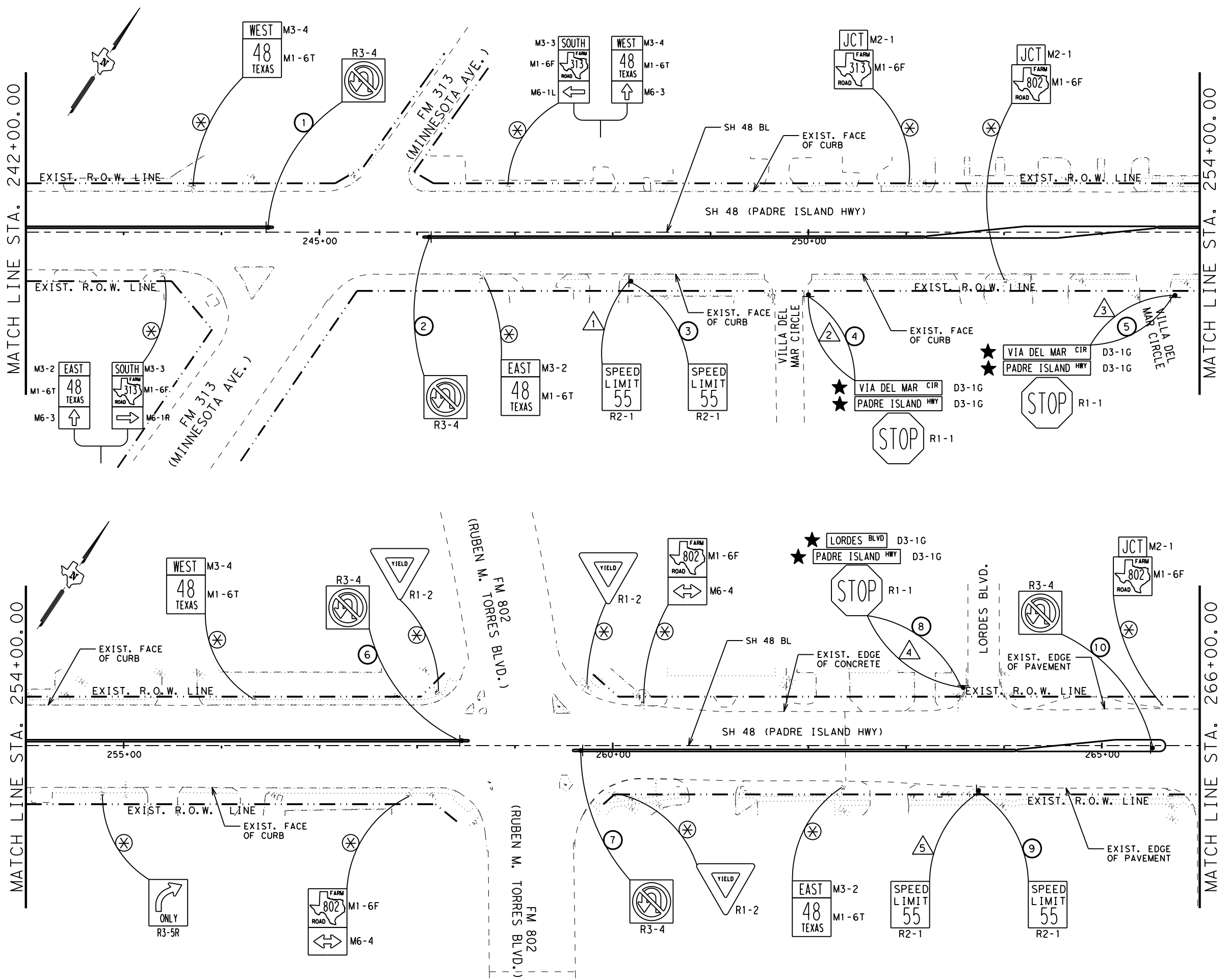
**Texas Department of Transportation**

**SH 48  
SIGN LAYOUT**

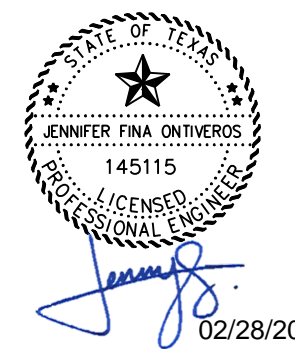
SCALE: 1" = 100' SHEET 6 OF 9

© 2022	CONT	SECT	JOB	HIGHWAY
DS:	CK:	0220	05	080
DIST	COUNTY	SHEET NO.		
PHR	CAMERON	252		

DATE: 2/27/2023 1:13:44 PM  
 FILE: \\txdot\projectwiseonline.com:TxDOT5\Documents\21 - PHR\Design Projects\022005080\4 - Design\Plan Set\8. Traffic\Sign Layout Sheets\SIGN\_LAYOUT\_7.dgn



- LEGEND:**
- △ SIGNS TO BE REMOVED (ITEM 644)
  - SIGNS TO BE INSTALLED (ITEM 644)
  - ⊗ SIGNS TO BE RELOCATED (ITEM 644)
  - ⊗ SIGNS TO REMAIN IN PLACE
  - ★ EXISTING STREET NAME SIGNS TO BE REINSTALLED ON PROPOSED SIGN.
  - ⬮ PROPOSED SIGN
  - ⬮ EXISTING SIGN
- GENERAL NOTES:**
1. ALL SIGNS DESIGNATED TO BE RELOCATED MAY BE STORED AT THE BROWNSVILLE MAINTENANCE YARD TO PREVENT DAMAGE DURING CONSTRUCTION OR AS DIRECTED BY ENGINEER.
  2. CONTRACTOR IS RESPONSIBLE FOR ALL SIGNS DAMAGED OR LOST DURING CONSTRUCTION. DAMAGED SIGNS SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
  3. ANY EXISTING SIGN DESIGNATED TO BE RELOCATED MAY BE REPLACED IF IT DOES NOT MEET STANDARDS AND AS DIRECTED BY THE ENGINEER.
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**Pharr District Central Design**

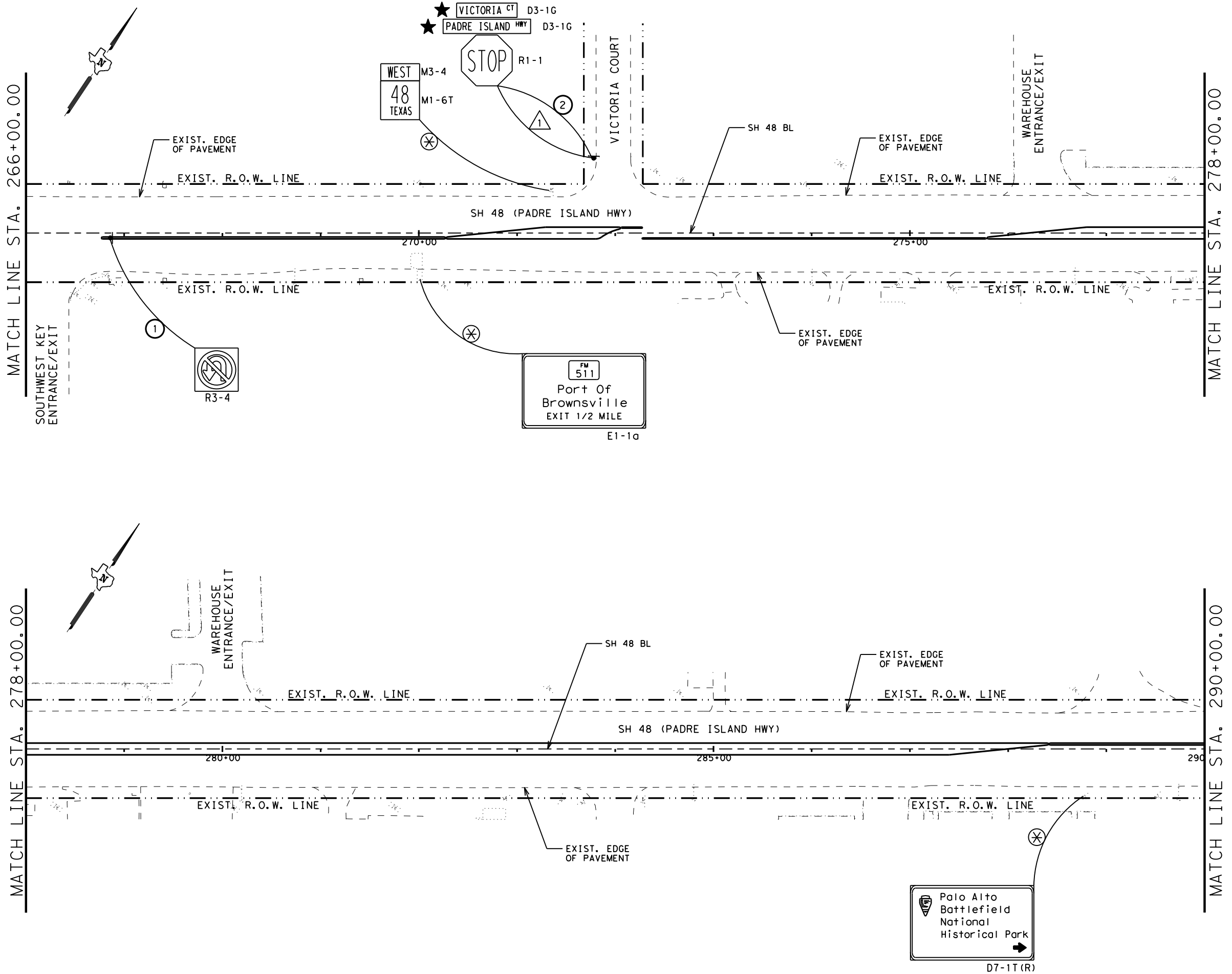
Texas Department of Transportation

## SH 48 SIGN LAYOUT

SCALE: 1" = 100' SHEET 7 OF 9

CONT	SECT	JOB	HIGHWAY
0220	05	080	SH 48
DIST	COUNTY	SHEET NO.	
PHR	CAMERON	253	

DATE: 2/27/2023 1:13:48 PM  
 FILE: \\fxdot\projectwiseonline.com\FxDOT5\Documents\21 - PHR\Design Projects\022005080\4 - Design\Plan Set\8. Traffic\Sign Layout Sheets\SIGN\_LAYOUT\_8.dgn



**LEGEND:**

- △ SIGNS TO BE REMOVED (ITEM 644)
- SIGNS TO BE INSTALLED (ITEM 644)
- ⊕ SIGNS TO BE RELOCATED (ITEM 644)
- ⊗ SIGNS TO REMAIN IN PLACE
- ★ EXISTING STREET NAME SIGNS TO BE REINSTALLED ON PROPOSED SIGN.
- ⬮ PROPOSED SIGN
- ⬮ EXISTING SIGN

**GENERAL NOTES:**

1. ALL SIGNS DESIGNATED TO BE RELOCATED MAY BE STORED AT THE BROWNSVILLE MAINTENANCE YARD TO PREVENT DAMAGE DURING CONSTRUCTION OR AS DIRECTED BY ENGINEER.
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6. A FIELD INSPECTION BEFORE & AFTER THE CONSTRUCTION OF THIS PROJECT SHALL BE DONE.



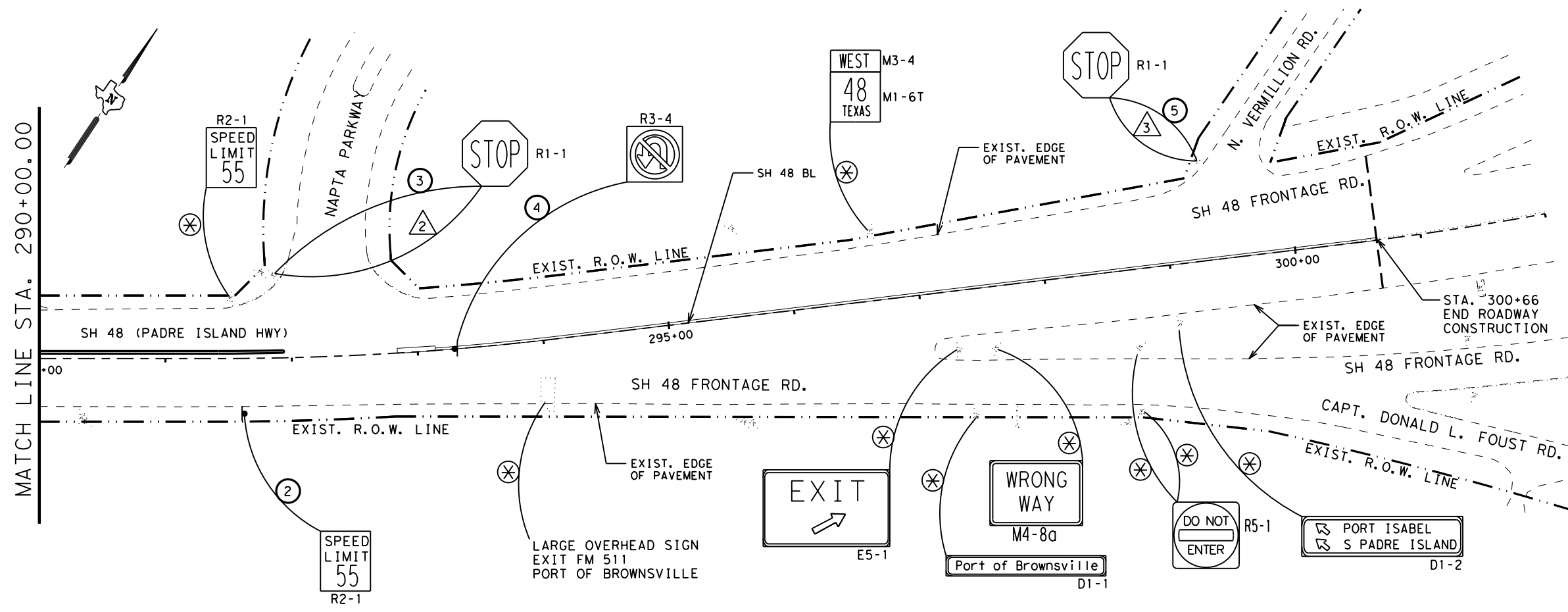
**Pharr District Central Design**  
 Texas Department of Transportation

**SH 48  
SIGN LAYOUT**

SCALE: 1" = 100' SHEET 8 OF 9

© 2022	CONT	SECT	JOB	HIGHWAY
DS:	0220	05	080	SH 48
DW:	PHR	CAMERON		SHEET NO. 254

DATE: 2/27/2023 1:13:53 PM  
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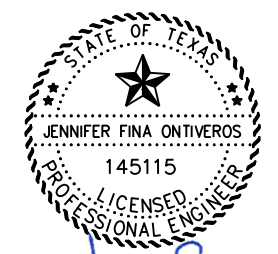


**LEGEND:**

- △ SIGNS TO BE REMOVED (ITEM 644)
- SIGNS TO BE INSTALLED (ITEM 644)
- ⊗ SIGNS TO BE RELOCATED (ITEM 644)
- ⊗ SIGNS TO REMAIN IN PLACE
- ★ EXISTING STREET NAME SIGNS TO BE REINSTALLED ON PROPOSED SIGN.
- ⬮ PROPOSED SIGN
- ⬮ EXISTING SIGN

**GENERAL NOTES:**

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6. A FIELD INSPECTION BEFORE & AFTER THE CONSTRUCTION OF THIS PROJECT SHALL BE DONE.



*Jennifer Fina Ontiveros*  
 02/28/2023

**Pharr District Central Design**



**SH 48  
SIGN LAYOUT**


SCALE: 1" = 100' SHEET 9 OF 9

© 2022	CONT	SECT	JOB	HIGHWAY
DS:	0220	05	080	SH 48
DW:	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	255	

DATE: 9/18/2023 1:46:25 PM  
 FILE: P:\txdot\projectwiseonline.com\txdot\Documents\21 - PHR\Design Projects\022005080\4 - Design\Plan Set\8. Traffic\Signing\SH 48 Remove & Relocate Summary.dgn

SUMMARY OF SMALL SIGNS TO BE REMOVED & RELOCATED UNDER ITEM (644)						
PLAN SHT. NO.	SIGN NO.	SIGN TYPE	SIGN TEXT	SIGN DIMENS. (INCHES)	644	644
					6070	6076
					RELOCATE SM RD SN SUP&AM TY S80 (EA)	REMOVE SM RD SN SUP&AM (EA)
1 of 9	1	R4-7	KEEP RIGHT	24 X 30		X
	2	R4-7	KEEP RIGHT	24 X 30		X
	3	R2-1	SPEED LIMIT 45	30 X 36		X
2 of 9	1	R1-1	STOP	36 X 36		X
3 of 9	1	R1-1	STOP	36 X 36		X
	2	R2-1	SPEED LIMIT 45	30 X 36		X
	3	R2-1	SPEED LIMIT 55	30 X 36		X
	4	R1-1	STOP	36 X 36		X
4 of 9	1	R2-1	SPEED LIMIT 55	30 X 36		X
	2	R2-1	SPEED LIMIT 55	30 X 36		X
	3	R1-1	STOP	36 X 36		X
	4	R1-1	STOP	36 X 36		X
5 of 9	1	R2-1	SPEED LIMIT 55	30 X 36		X
	2	R1-1	STOP	36 X 36		X
	3	R1-1	STOP	36 X 36		X
	4	R1-1	STOP	36 X 36		X
6 of 9	1	R1-1	STOP	36 X 36		X
	2	R1-1	STOP	36 X 36		X
	3	R1-1	STOP	36 X 36		X
	4	R1-1	STOP	36 X 36		X
	5	R3-9b	TWO-WAY LEFT TURN ONLY	24 X 36		X
	6	R1-1	STOP	36 X 36		X
	7	R2-1	SPEED LIMIT 55	30 X 36		X
7 of 9	1	R2-1	SPEED LIMIT 55	30 X 36		X
	2	R1-1	STOP	36 X 36		X
	3	R1-1	STOP	36 X 36		X
	4	R1-1	STOP	36 X 36		X
	5	R2-1	SPEED LIMIT 55	30 X 36		X
8 of 9	1	R1-1	STOP	36 X 36		X
9 of 9	1	R1-1	STOP	36 X 36		X
	2	R1-1	STOP	36 X 36		X
TOTAL:					0	32

**Pharr District Central Design**



**SH 48  
SUMMARY OF SIGN  
REMOVAL AND RELOCATION**

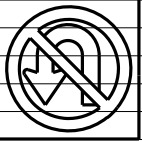
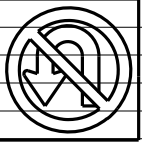
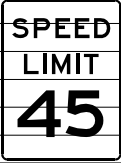

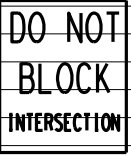
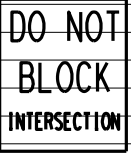
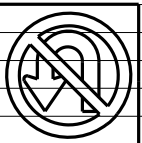
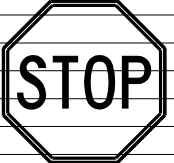
NOT TO SCALE SHEET 1 OF 1

© 2022	CONT	SECT	JOB	HIGHWAY
DS: 0220	CK: 05		080	SH 48
DW:	CK:	DIST	COUNTY	SHEET NO.
		PHR	CAMERON	256



# SUMMARY OF SMALL SIGNS

DATE: 2/27/2023 1:14:07 PM  
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PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)	
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		
										PREFABRICATED		1EXT or 2EXT = # of Ext
1 OF 9												
	1	R3-4		36 X 36	✓		S80	1	SA	P		
	2	R3-4		36 X 36	✓		S80	1	SA	P		
	3	R2-1		30 X 36	✓		S80	1	SA	P		
	4	R2-1		30 X 36	✓		S80	1	SA	P		
2 OF 9												
	1	R10-7		24 X 30	✓		S80	1	SA	P		
	2	R10-7		24 X 30	✓		S80	1	SA	P		
	3	R3-4		36 X 36	✓		S80	1	SA	P		
	4	R1-1		36 X 36	✓		S80	1	SA	T		

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website:  
<http://www.txdot.gov/>

- NOTE:**
- 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.
  - For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS) Standard Sheet.
  - For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

NOT TO SCALE SHEET 1 OF 7



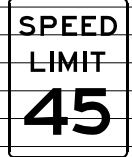
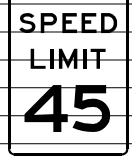


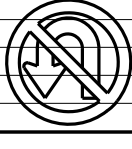


## SH 48 SUMMARY OF SMALL SIGNS

### SOSS

FILE: slums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0220	05	080	SH 48
4-16	DIST	COUNTY	SHEET NO.	
8-16	PHR	CAMERON	257	

# SUMMARY OF SMALL SIGNS

DATE: 2/27/2023 1:14:08 PM  
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PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)	
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		
										PREFABRICATED		1EXT or 2EXT = # of Ext
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"	BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY = TYPE TY N TY S
	5	R2-1		30 X 36	✓		S80	1	SA	P		
	6	R2-1		30 X 36	✓		S80	1	SA	P		
	7	R3-4		36 X 36	✓		S80	1	SA	P		
	8	R3-4		36 X 36	✓		S80	1	SA	P		
	9	R3-4		36 X 36	✓		S80	1	SA	P		
3 OF 9												
	1	R3-4		36 X 36	✓		S80	1	SA	P		
	2	R1-1		36 X 36	✓		S80	1	SA	T		

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
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NOT TO SCALE SHEET 2 OF 7



*Traffic Operations Division Standard*

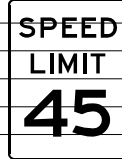
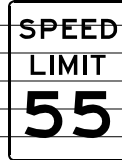
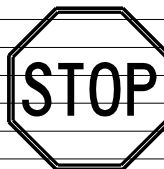
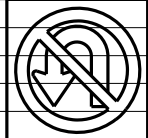

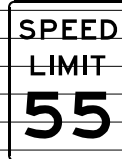
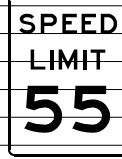

## SH 48 SUMMARY OF SMALL SIGNS

### SOSS

FILE: slums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0220	05	080	SH 48
4-16	DIST	COUNTY	SHEET NO.	
8-16	PHR	CAMERON	258	

# SUMMARY OF SMALL SIGNS

DATE: 2/27/2023 1:14:09 PM  
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PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)	
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		
										PREFABRICATED		1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels
	3	R2-1		30 X 36	✓		S80	1	SA	P		
	4	R2-1		30 X 36	✓		S80	1	SA	P		
	5	R1-1		36 X 36	✓		S80	1	SA	T		
<b>4 OF 9</b>												
	1	R3-4		36 X 36	✓		S80	1	SA	P		
	2	R3-4		36 X 36	✓		S80	1	SA	P		
	3	R2-1		30 X 36	✓		S80	1	SA	P		
	4	R2-1		30 X 36	✓		S80	1	SA	P		
	5	R1-1		36 X 36	✓		S80	1	SA	T		

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
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7.5 to 15	0.100"
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NOT TO SCALE SHEET 3 OF 7



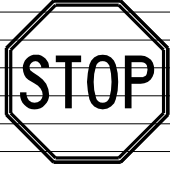

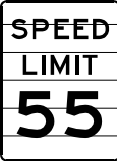
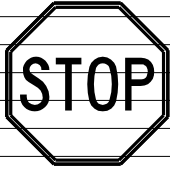

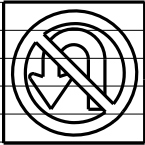
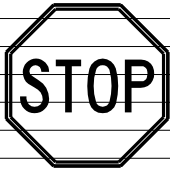
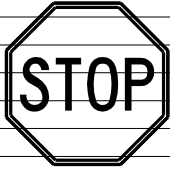
## SH 48 SUMMARY OF SMALL SIGNS

### SOSS

FILE: slums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0220	05	080	SH 48
4-16	DIST	COUNTY	SHEET NO.	
8-16	PHR	CAMERON	259	

# SUMMARY OF SMALL SIGNS

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PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED P = "Plain" T = "T" U = "U"	
	6	R1-1		36 X 36	✓		S80	1	SA	T	
5 OF 9											
	1	R2-1		30 X 36	✓		S80	1	SA	P	
	2	R2-1		30 X 36	✓		S80	1	SA	P	
	3	R1-1		36 X 36	✓		S80	1	SA	T	
	4	R1-1		36 X 36	✓		S80	1	SA	T	
	5	R3-4		36 X 36	✓		S80	1	SA	P	
6 OF 9											
	1	R1-1		36 X 36	✓		S80	1	SA	T	
	2	R1-1		36 X 36	✓		S80	1	SA	T	

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.  
<http://www.txdot.gov/>

- NOTE:**
- 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.
  - For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS) Standard Sheet.
  - For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

NOT TO SCALE SHEET 4 OF 7



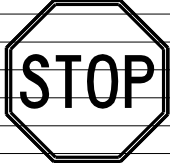
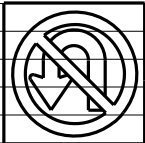
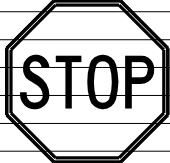
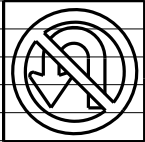


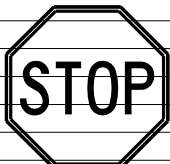
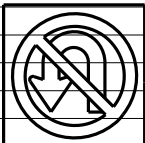
## SH 48 SUMMARY OF SMALL SIGNS

### SOSS

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REVISIONS	0220	05	080	SH 48
4-16	DIST	COUNTY	SHEET NO.	
8-16	PHR	CAMERON	260	

# SUMMARY OF SMALL SIGNS

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PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED P = "Plain" T = "T" U = "U"	
	3	R1-1		36 X 36	✓		S80	1	SA	T	
	4	R3-4		36 X 36	✓		S80	1	SA	P	
	5	R1-1		36 X 36	✓		S80	1	SA	T	
	6	R3-4		36 X 36	✓		S80	1	SA	P	
	7	R2-1		30 X 36	✓		S80	1	SA	P	
	8	R2-1		30 X 36	✓		S80	1	SA	P	
	9	R1-1		36 X 36	✓		S80	1	SA	T	
7 OF 9											
	1	R3-4		36 X 36	✓		S80	1	SA	P	

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

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  - For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

NOT TO SCALE SHEET 5 OF 7



## SH 48 SUMMARY OF SMALL SIGNS

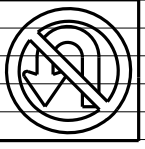



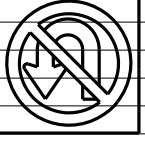
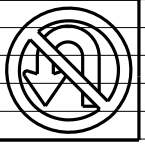

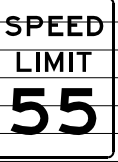
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# SUMMARY OF SMALL SIGNS

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PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)	
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		
										PREFABRICATED		1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels
	2	R3-4		36 X 36	✓		S80	1	SA	P		TY = TYPE TY N TY S
	3	R2-1		30 X 36	✓		S80	1	SA	P		
	4	R1-1		36 X 36	✓		S80	1	SA	T		
	5	R1-1		36 X 36	✓		S80	1	SA	T		
	6	R3-4		36 X 36	✓		S80	1	SA	P		
	7	R3-4		36 X 36	✓		S80	1	SA	P		
	8	R1-1		36 X 36	✓		S80	1	SA	T		
	9	R2-1		30 X 36	✓		S80	1	SA	P		

ALUMINUM SIGN BLANKS THICKNESS	
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NOT TO SCALE SHEET 6 OF 7



## SH 48 SUMMARY OF SMALL SIGNS

### SOSS

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4-16	DIST	COUNTY	SHEET NO.	
8-16	PHR	CAMERON	262	











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## SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

SM RD SGN ASSM TY XXXXX(X)XX(X-XXXX)

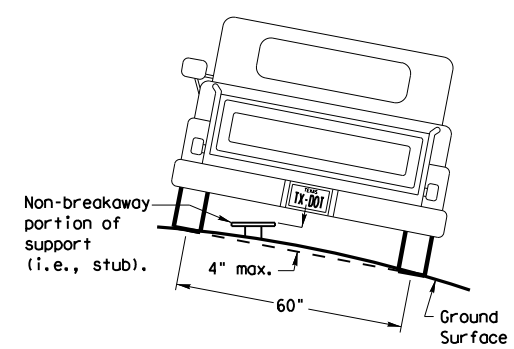
**Post Type**  
 FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))  
 TWT = Thin-Walled Tubing (see SMD(TWT))  
 10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))  
 S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

**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))

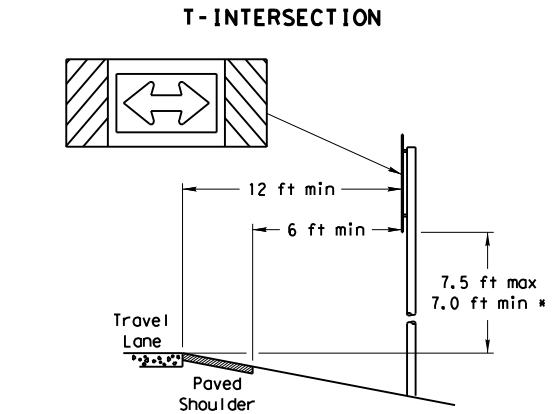
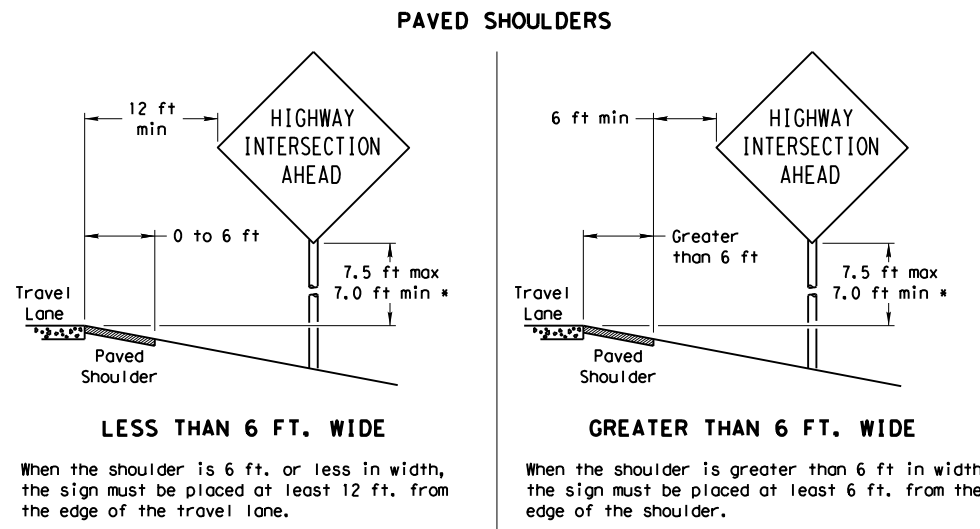
**Sign Mounting Designation**  
 P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))  
 T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))  
 U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))  
 IF REQUIRED  
 1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))  
 BM = 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-3))

## REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



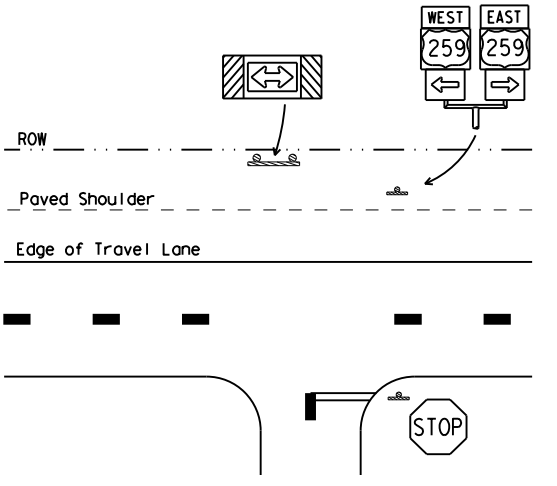
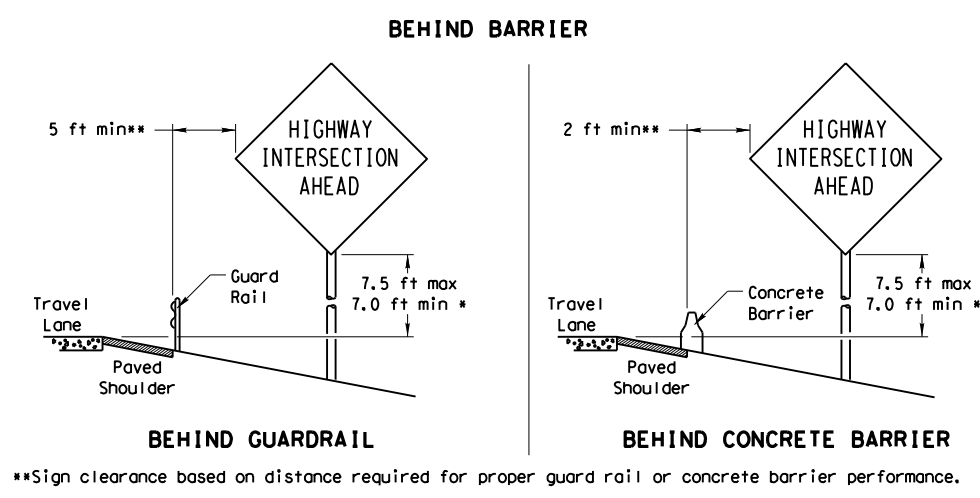
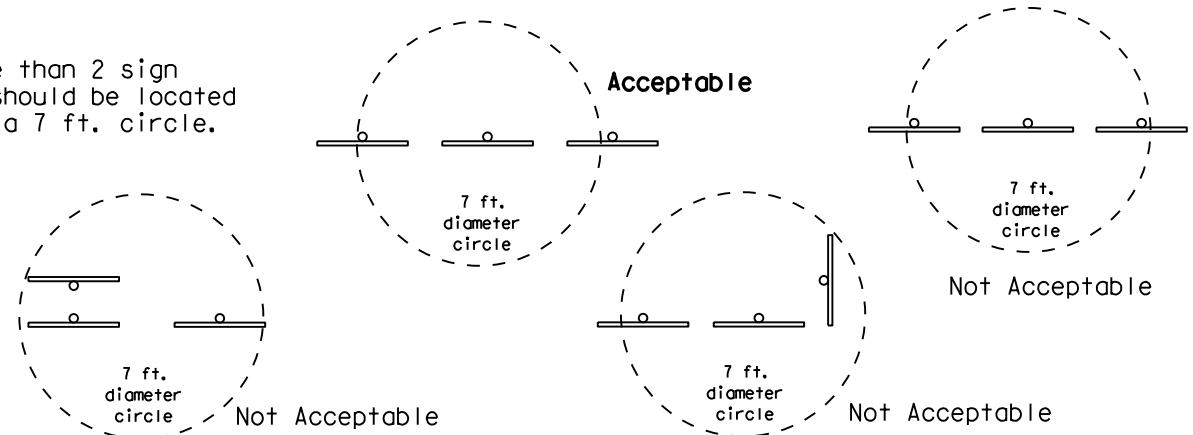
To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

## SIGN LOCATION



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.

No more than 2 sign posts should be located within a 7 ft. circle.



\* Signs shall be mounted using the following condition that results in the greatest sign elevation:

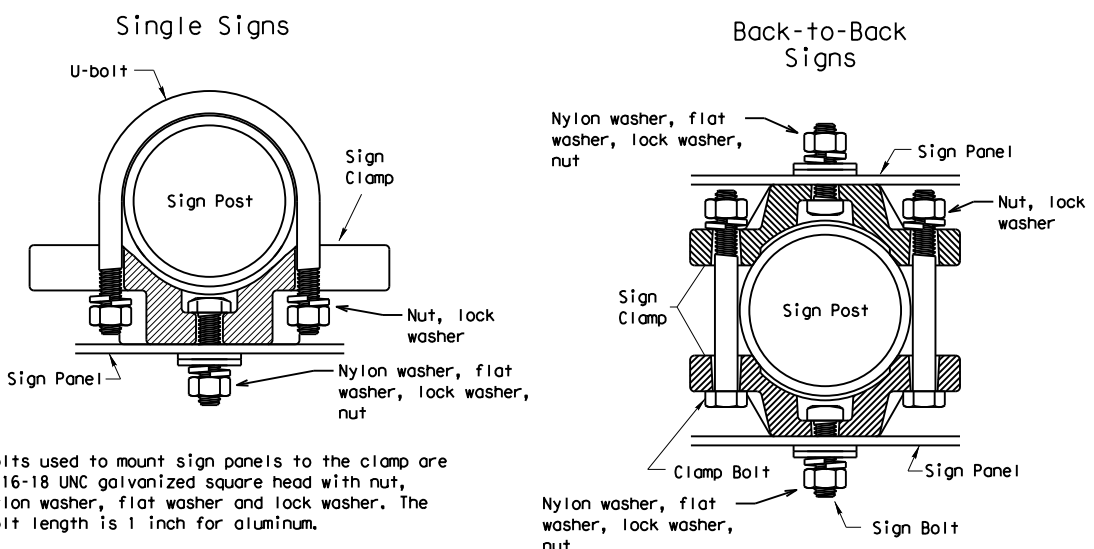
- (1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or
- (2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website address is:  
<http://www.txdot.gov/publications/traffic.htm>

## TYPICAL SIGN ATTACHMENT DETAIL



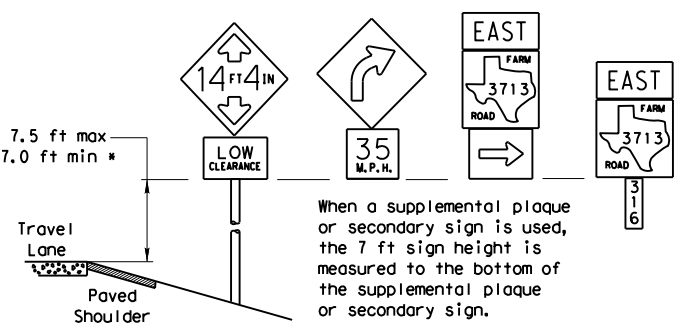
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

Sign clamps may be either the specific size clamp or the universal clamp.

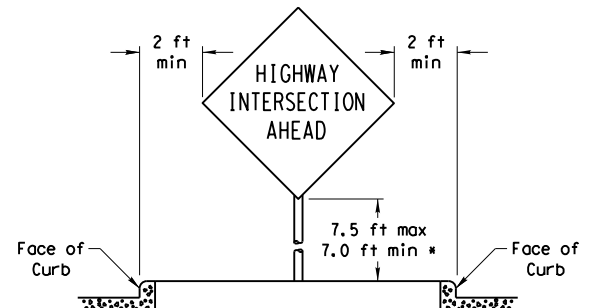
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

## SIGNS WITH PLAQUES

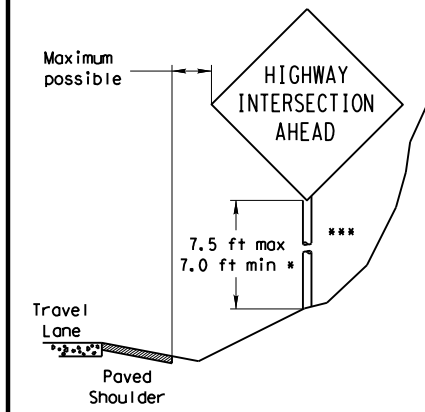


When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

## CURB & GUTTER OR RAISED ISLAND



## RESTRICTED RIGHT-OF-WAY (When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

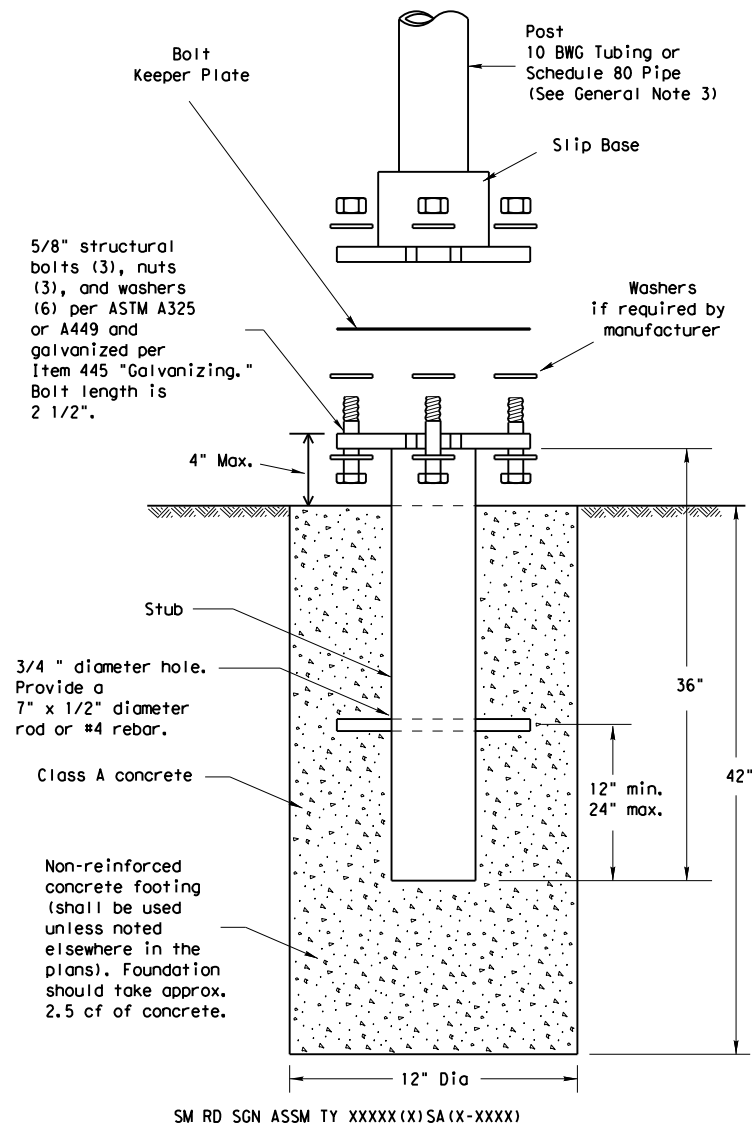
\*\*\* Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.



## SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS SMD (GEN) - 08

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		DIST	COUNTY		SHEET NO.
		PHR	CAMERON		267

# TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



## 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](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:

- 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.
- 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
- 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>
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

## ASSEMBLY PROCEDURE

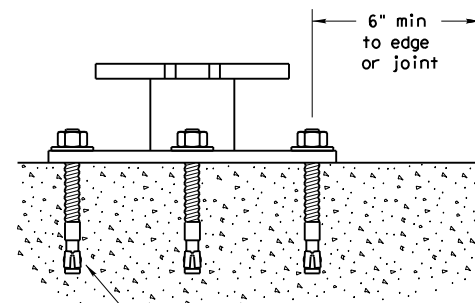
### Foundation

- 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.
- 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.
- 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.
- Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
- The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

### Support

- 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.
- 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



5/8" diameter Concrete Anchor - 8 places (embed a minimum of 5 1/2" and torque to min. of 50 ft-lbs). Anchor may be expansion or adhesive type.

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, "Epoxyes 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.

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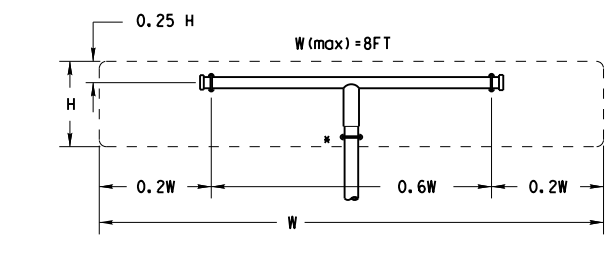
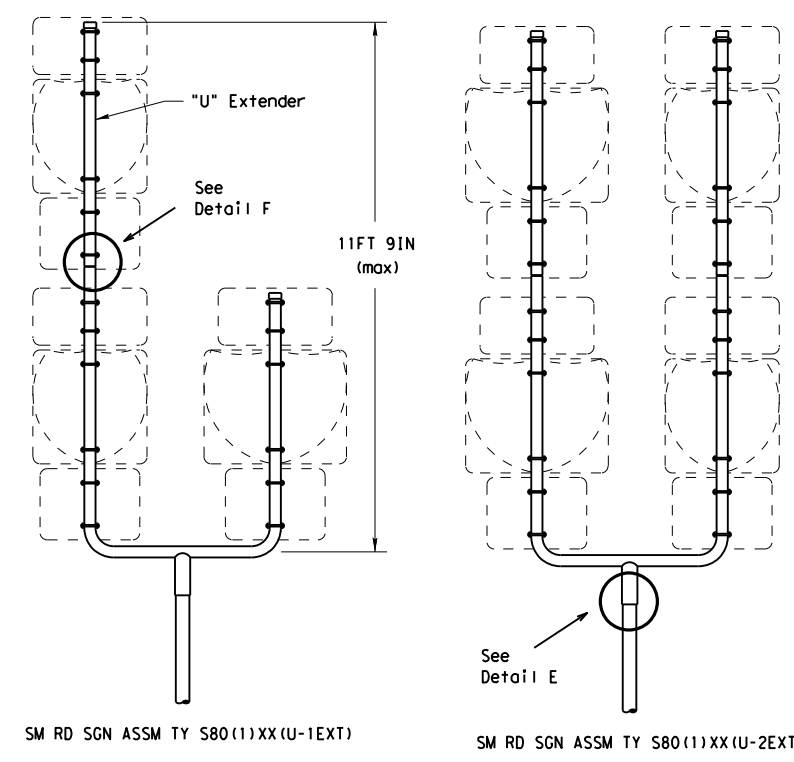
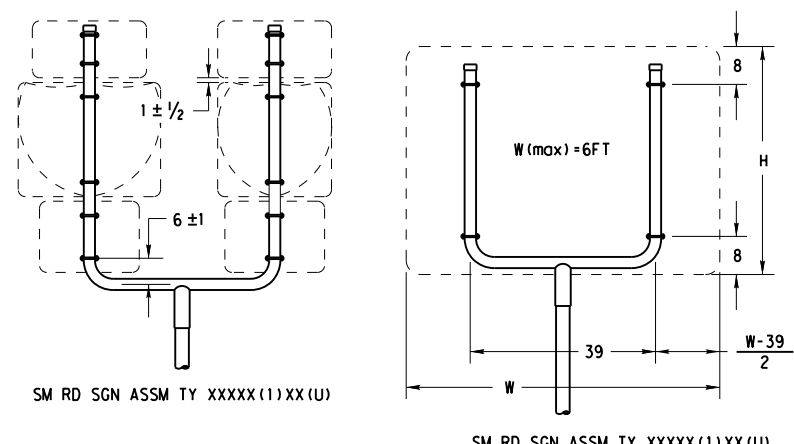
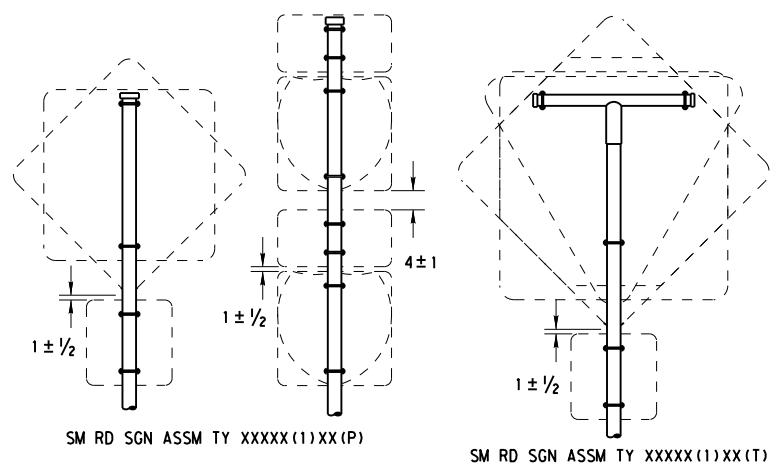
Texas Department of Transportation  
Traffic Operations Division

## SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM SMD(SLIP-1)-08

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		DIST	COUNTY	SHEET NO.	
		PHR	CAMERON	268	

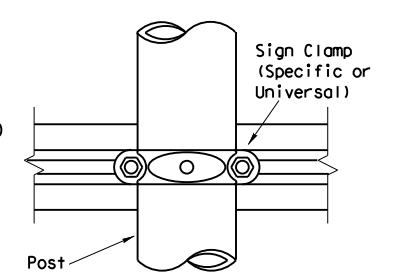
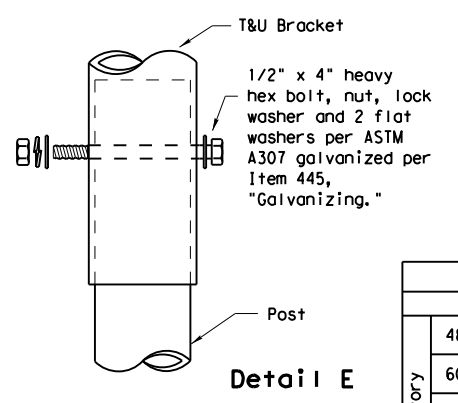
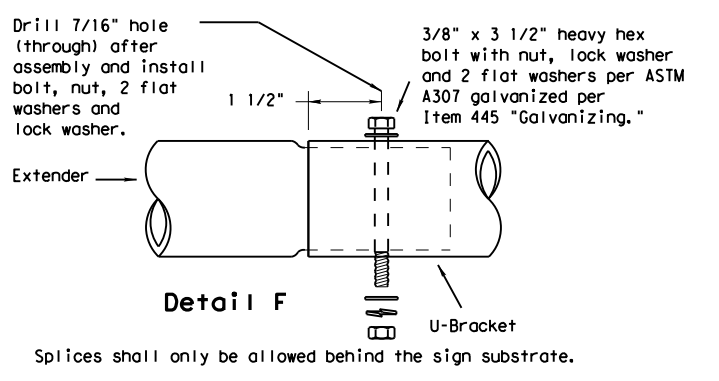
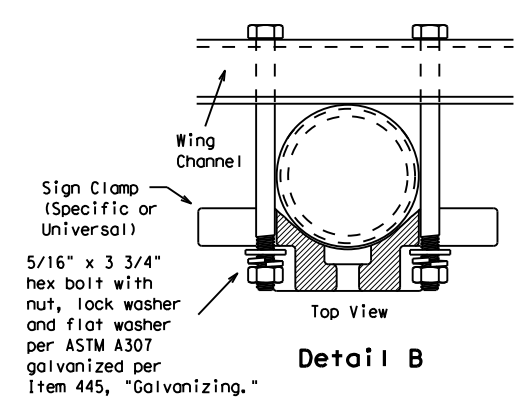
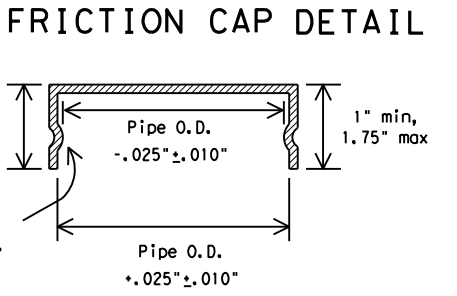
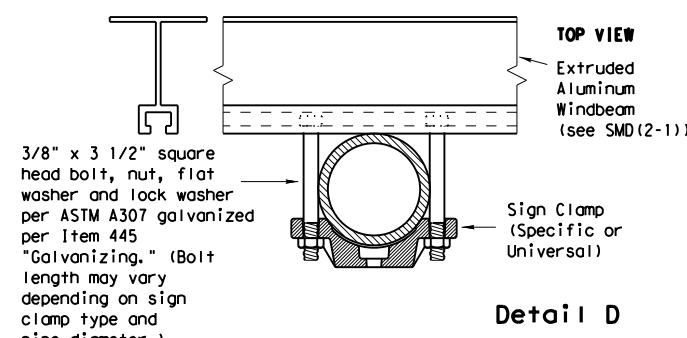
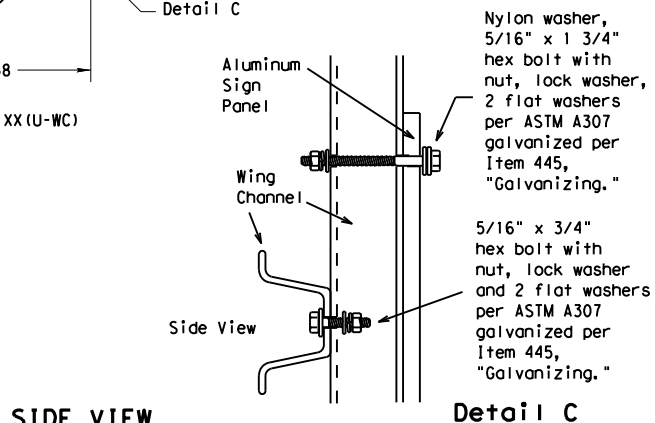
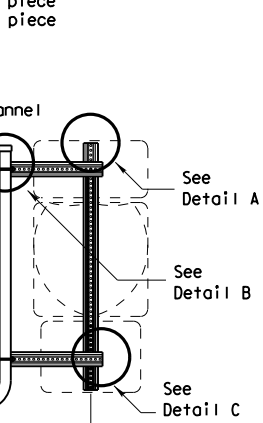
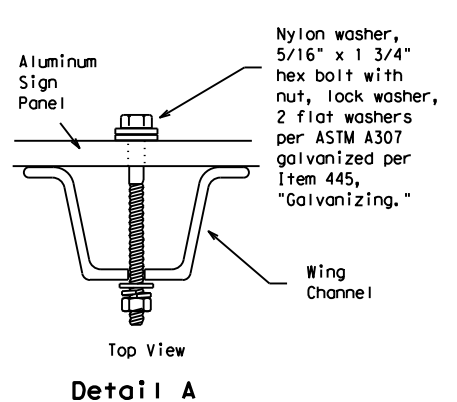
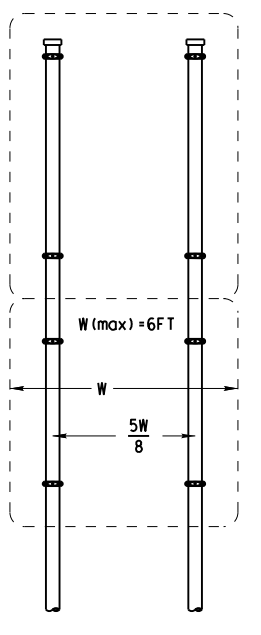
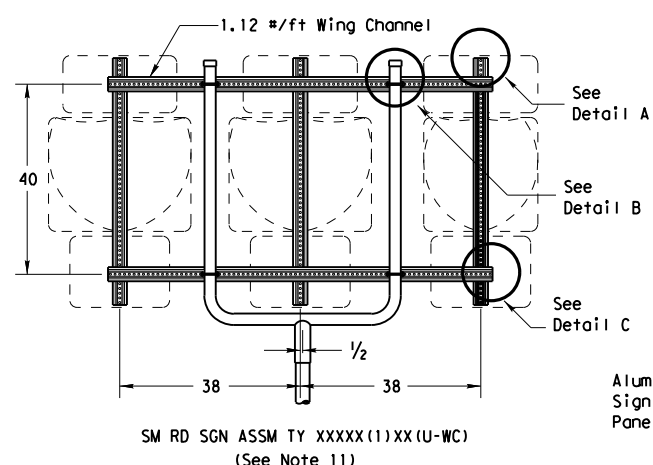
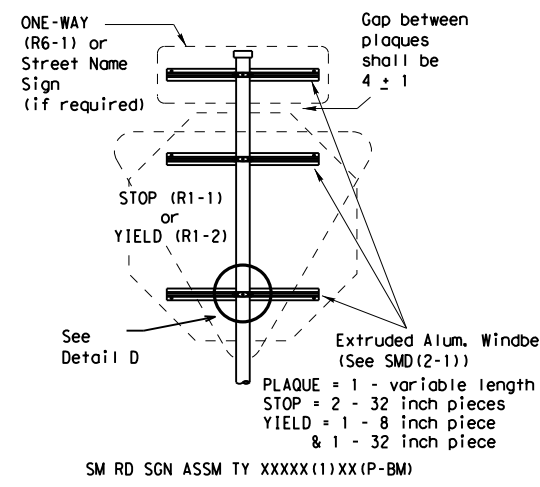
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All dimensions are in english unless detailed otherwise.

SM RD SGN ASSM TY XXXX(1)XX(T) (\* - See Note 12)



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)
Warning	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	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)	

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.

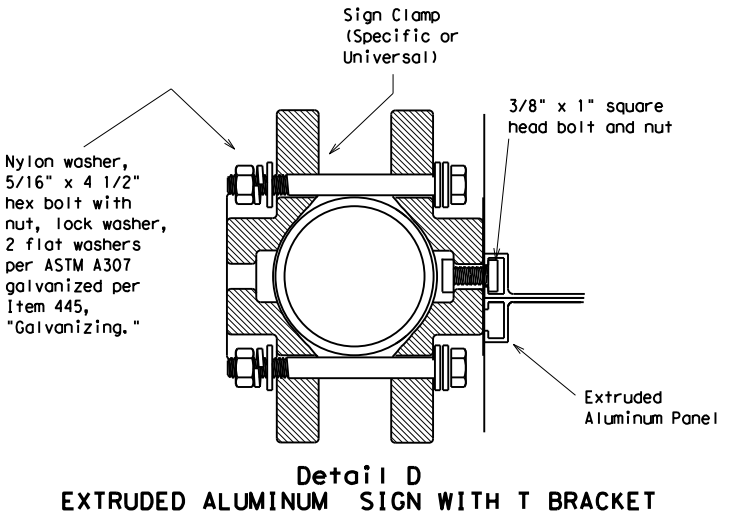
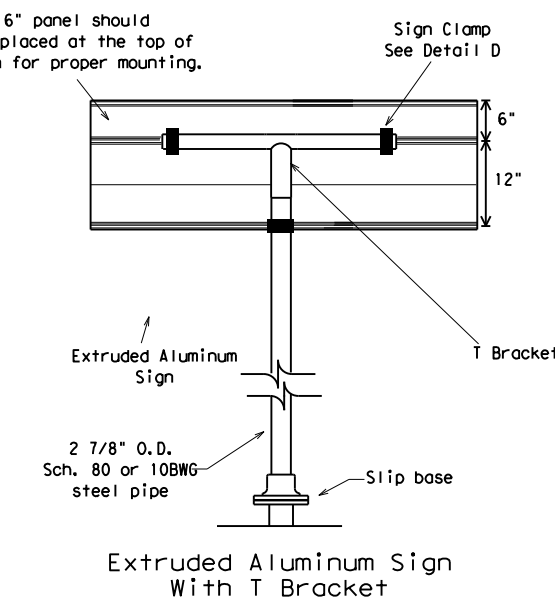
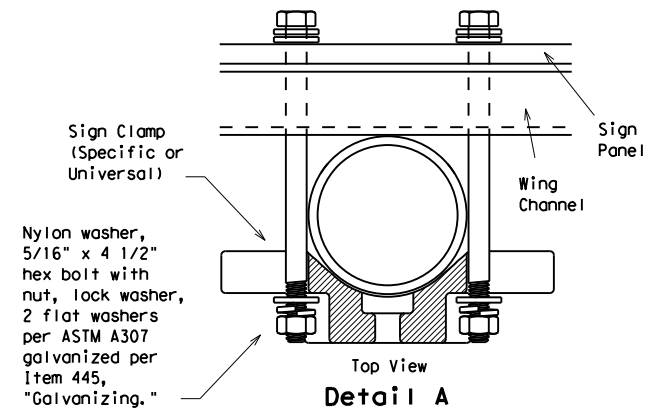
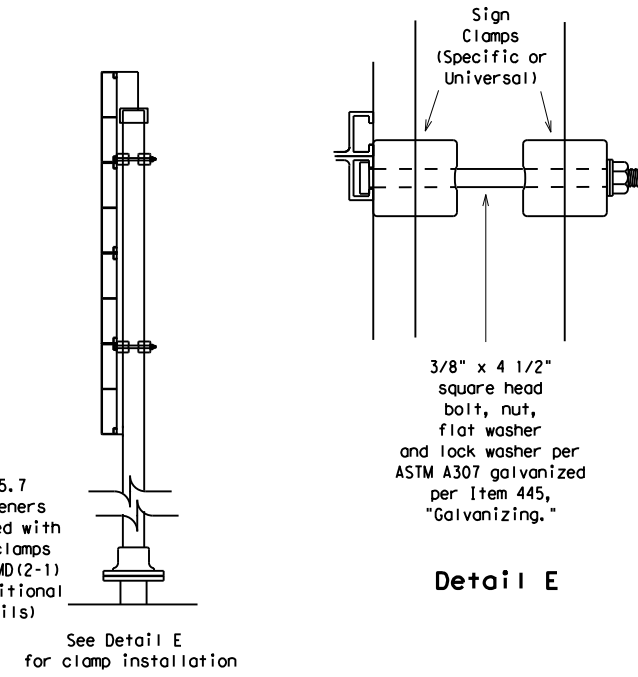
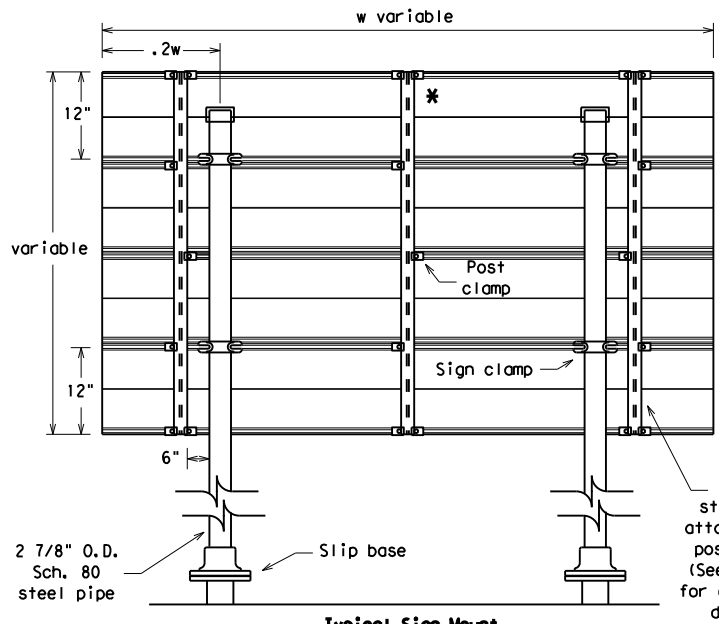
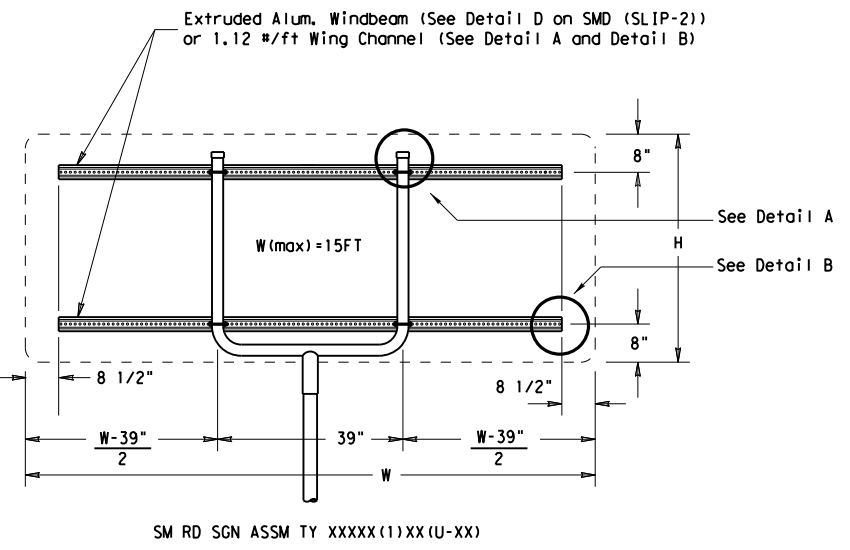
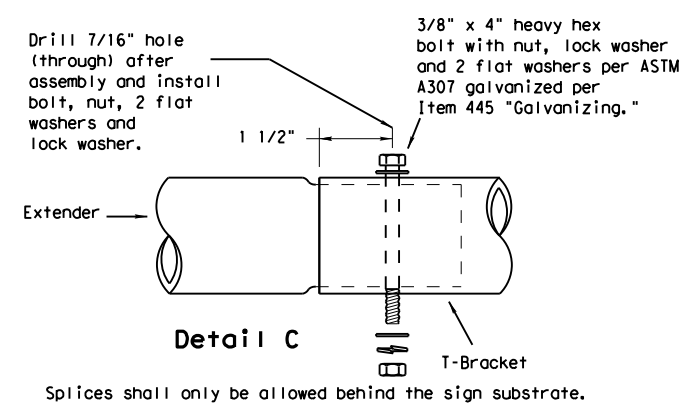
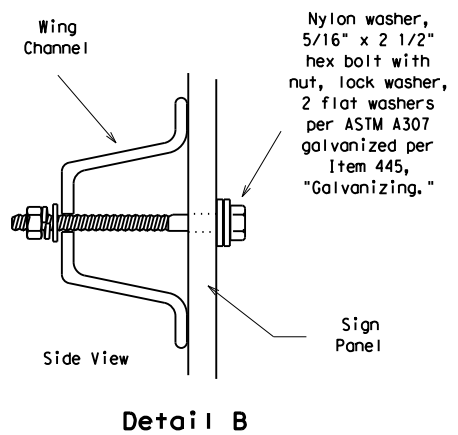
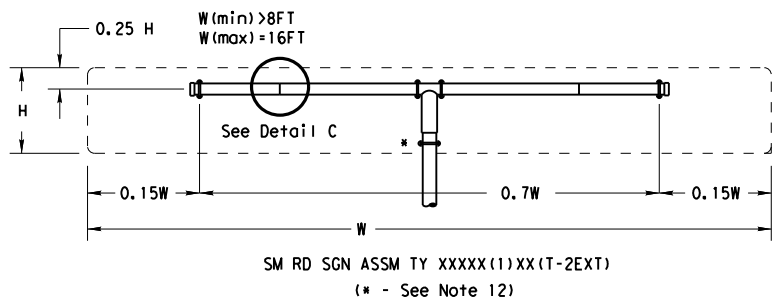


**SIGN MOUNTING DETAILS  
 SMALL ROADSIDE SIGNS  
 TRIANGULAR SLIPBASE SYSTEM  
 SMD(SLIP-2)-08**

© TxDOT July 2002		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
		0220	05	080	SH 48
		DIST	COUNTY	SHEET NO.	
		PHR	CAMERON	269	

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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          |
- 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.
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
- 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.
- Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
- 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.
- 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.
- Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
- 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."
- Sign blanks shall be the sizes and shapes shown on the plans.
- 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.
- Post open ends shall be fitted with Friction Caps.

REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)



**SIGN MOUNTING DETAILS  
 SMALL ROADSIDE SIGNS  
 TRIANGULAR SLIPBASE SYSTEM  
 SMD(SLIP-3)-08**

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9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
		0220	05	080	SH 48
		DIST	COUNTY		SHEET NO.
		PHR	CAMERON		270

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# PAVEMENT MARKINGS

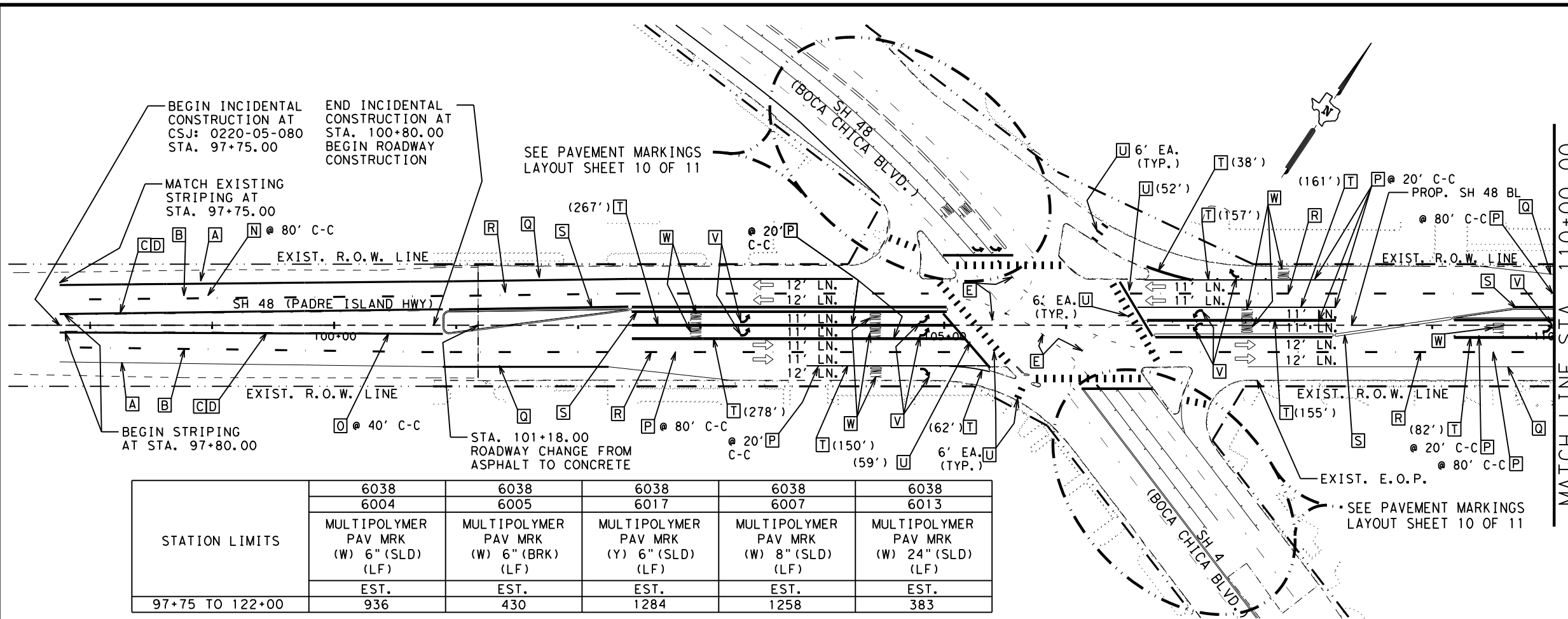
*Pharr District Central Design*



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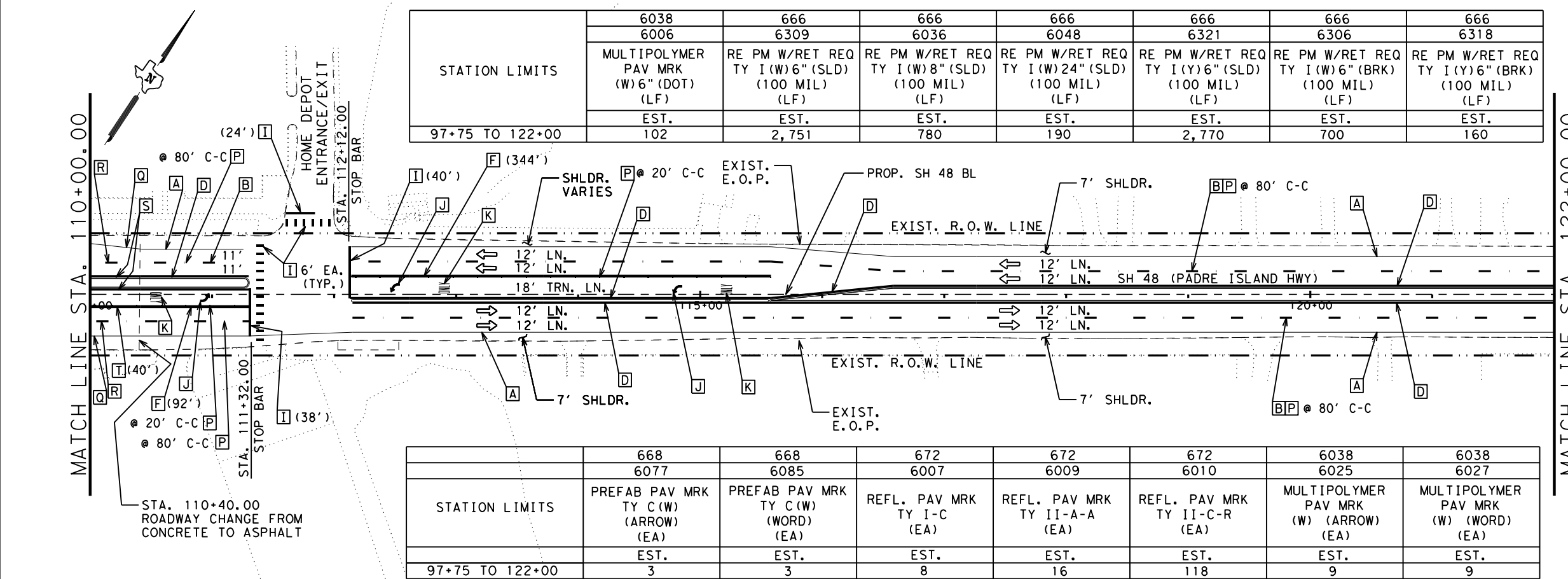
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STATION LIMITS	6038 6004	6038 6005	6038 6017	6038 6007	6038 6013
	MULTIPOLYMER PAV MRK (W) 6" (SLD) (LF)	MULTIPOLYMER PAV MRK (W) 6" (BRK) (LF)	MULTIPOLYMER PAV MRK (Y) 6" (SLD) (LF)	MULTIPOLYMER PAV MRK (W) 8" (SLD) (LF)	MULTIPOLYMER PAV MRK (W) 24" (SLD) (LF)
EST.	EST.	EST.	EST.	EST.	EST.
97+75 TO 122+00	936	430	1284	1258	383

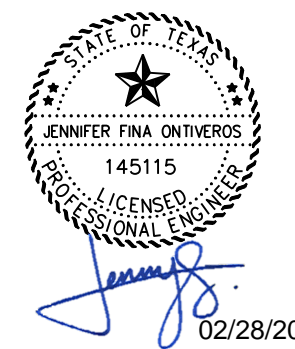
STATION LIMITS	6038 6006	666 6309	666 6036	666 6048	666 6321	666 6306	666 6318
	MULTIPOLYMER PAV MRK (W) 6" (DOT) (LF)	RE PM W/RET REQ TY I (W) 6" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I (W) 8" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I (W) 24" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I (Y) 6" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I (W) 6" (BRK) (100 MIL) (LF)	RE PM W/RET REQ TY I (Y) 6" (BRK) (100 MIL) (LF)
EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.
97+75 TO 122+00	102	2,751	780	190	2,770	700	160



STATION LIMITS	668 6077	668 6085	672 6007	672 6009	672 6010	6038 6025	6038 6027
	PREFAB PAV MRK TY C (W) (ARROW) (EA)	PREFAB PAV MRK TY C (W) (WORD) (EA)	REFL. PAV MRK TY I-C (EA)	REFL. PAV MRK TY II-A-A (EA)	REFL. PAV MRK TY II-C-R (EA)	MULTIPOLYMER PAV MRK (W) (ARROW) (EA)	MULTIPOLYMER PAV MRK (W) (WORD) (EA)
EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.
97+75 TO 122+00	3	3	8	16	118	9	9

- LEGEND**
- A - 6" SOLID WHITE LINE (TYP.)
  - B - 6" BROKEN WHITE LINE (TYP.)
  - C - 6" BROKEN YELLOW LINE (TYP.)
  - D - 6" SOLID YELLOW LINE (TYP.)
  - E - 6" DOTTED WHITE LINE (MPM)
  - F - 8" SOLID WHITE LINE (TYP.)
  - G - 12" SOLID WHITE LINE (TYP.)
  - H - 12" SOLID YELLOW LINE (TYP.)
  - I - 24" SOLID WHITE LINE (TYP.)
  - J - SINGLE DIRECTIONAL ARROW (TYP.)
  - K - WORD (TYP.)
  - L - BIKE ARROW (TYP.)
  - M - BIKE SYMBOL (TYP.)
  - N - TYPE I-C (TYP.)
  - O - TYPE II-A-A (TYP.)
  - P - TYPE II-C-R (TYP.)
  - Q - 6" SOLID WHITE LINE (MPM)
  - R - 6" BROKEN WHITE LINE (MPM)
  - S - 6" SOLID YELLOW LINE (MPM)
  - T - 24" SOLID WHITE LINE (MPM)
  - U - 24" SOLID WHITE LINE (MPM)
  - V - SINGLE DIRECTIONAL ARROW (MPM)
  - W - WORD (MPM)
  - ← - DIRECTION OF TRAFFIC FLOW (TYP.)
  - C-C - CENTER TO CENTER
  - EOP - EDGE OF PAVEMENT
  - @ - AT
  - EXIST. - EXISTING
  - PROP. - PROPOSED
  - BL - BASE LINE
  - EA - EACH
  - RDWY. - ROADWAY
  - TYP. - TYPICAL
  - R.O.W. - RIGHT OF WAY
  - SHLDR. - SHOULDER
  - LN. - LANE

**NOTE:**  
 USE 1 FOOT OFFSET FOR 6" SOLID YELLOW LINE (TYP.) FROM RAISED MEDIAN.



**Pharr District Central Design**

Texas Department of Transportation

**SH 48 PAVEMENT MARKINGS LAYOUT**

SCALE: 1" = 100' SHEET 1 OF 11

© 2022	CONT	SECT	JOB	HIGHWAY
0220	05	080	SH 48	
DIST	COUNTY	SHEET NO.		
PHR	CAMERON	272		

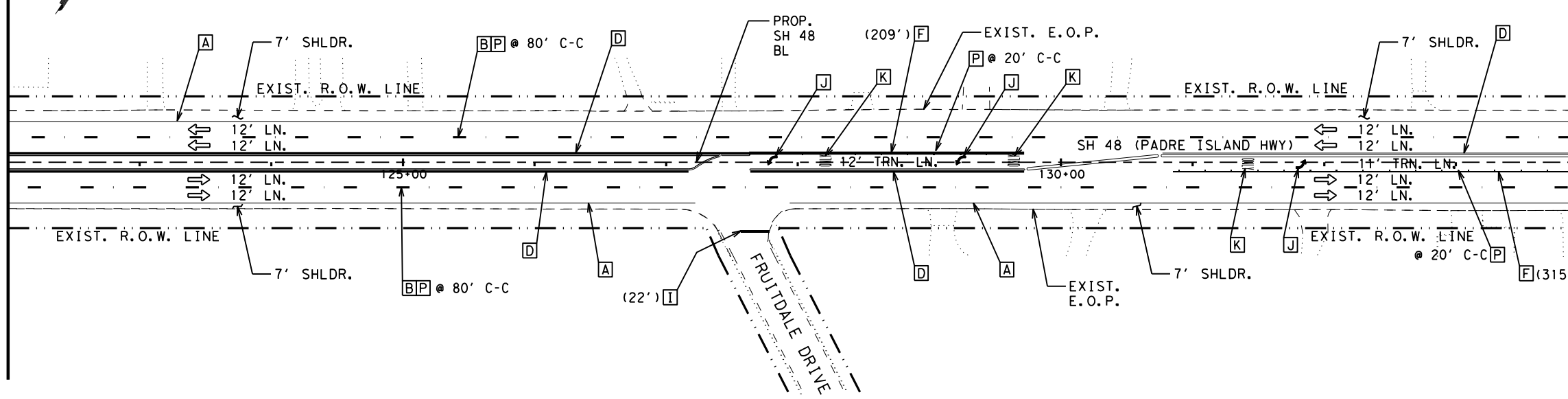


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STATION LIMITS	666	666	666	666	666	668	668	672
	6309	6036	6048	6321	6306	6077	6085	6010
	RE PM W/RET REQ TY I(W)6" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I(W)8" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I(W)24" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I(Y)6" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I(W)6" (BRK) (100 MIL) (LF)	PREFAB PAV MRK TY C(W) (ARROW) (EA)	PREFAB PAV MRK TY C(W) (WORD) (EA)	REFL. PAV MRK TY II-C-R (EA)
122+00 TO 146+00	EST. 4,242	EST. 1,295	EST. 230	EST. 1996	EST. 1,070	EST. 8	EST. 8	EST. 124

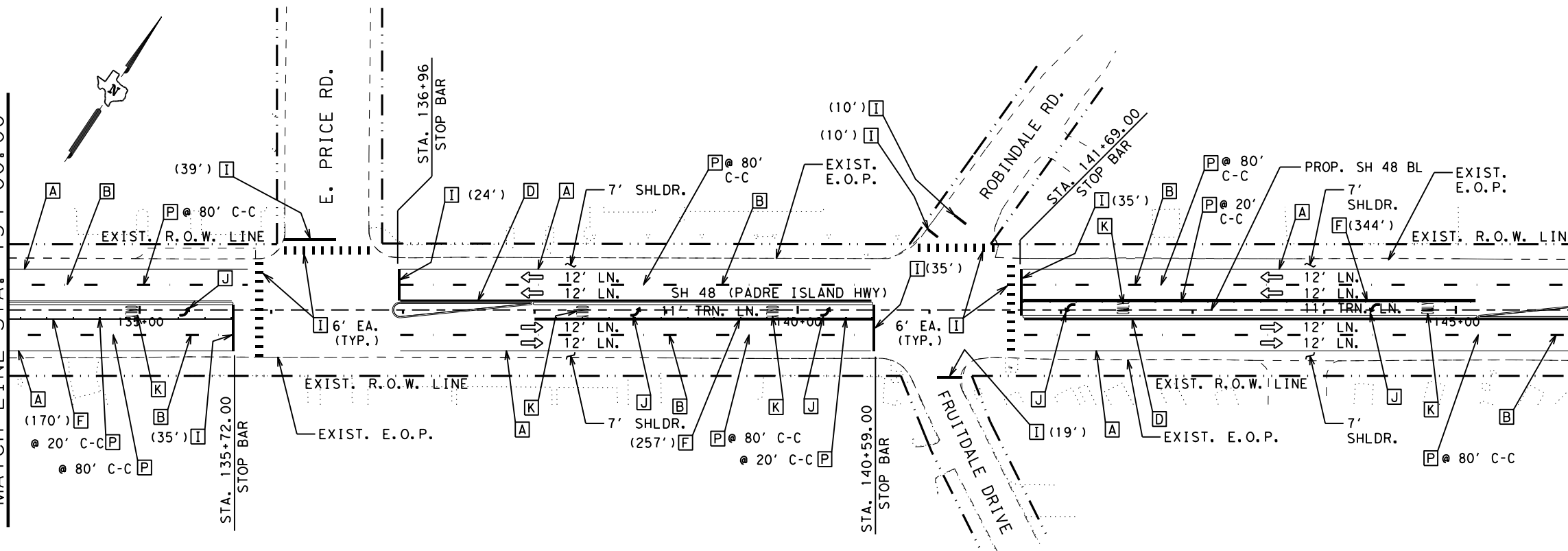
MATCH LINE STA. 122+00.00

MATCH LINE STA. 134+00.00



MATCH LINE STA. 134+00.00

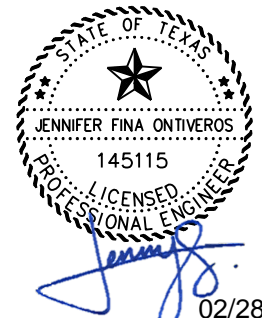
MATCH LINE STA. 146+00.00



**LEGEND**

- [A] - 6" SOLID WHITE LINE (TYP.)
- [B] - 6" BROKEN WHITE LINE (TYP.)
- [C] - 6" BROKEN YELLOW LINE (TYP.)
- [D] - 6" SOLID YELLOW LINE (TYP.)
- [E] - 6" DOTTED WHITE LINE (MPM)
- [F] - 8" SOLID WHITE LINE (TYP.)
- [G] - 12" SOLID WHITE LINE (TYP.)
- [H] - 12" SOLID YELLOW LINE (TYP.)
- [I] - 24" SOLID WHITE LINE (TYP.)
- [J] - SINGLE DIRECTIONAL ARROW (TYP.)
- [K] - WORD (TYP.)
- [L] - BIKE ARROW (TYP.)
- [M] - BIKE SYMBOL (TYP.)
- [N] - TYPE I-C (TYP.)
- [O] - TYPE II-A-A (TYP.)
- [P] - TYPE II-C-R (TYP.)
- [Q] - 6" SOLID WHITE LINE (MPM)
- [R] - 6" BROKEN WHITE LINE (MPM)
- [S] - 6" SOLID YELLOW LINE (MPM)
- [T] - 8" SOLID WHITE LINE (MPM)
- [U] - 24" SOLID WHITE LINE (MPM)
- [V] - SINGLE DIRECTIONAL ARROW (MPM)
- [W] - WORD (MPM)
- ↔ - DIRECTION OF TRAFFIC FLOW (TYP.)
- C-C - CENTER TO CENTER
- EOP - EDGE OF PAVEMENT
- @ - AT
- EXIST. - EXISTING
- PROP. - PROPOSED
- BL - BASE LINE
- EA - EACH
- RDWY. - ROADWAY
- TYP. - TYPICAL
- R.O.W. - RIGHT OF WAY
- SHLDR. - SHOULDER
- LN. - LANE

**NOTE:**  
 USE 1 FOOT OFFSET FOR 6" SOLID YELLOW LINE (TYP.) FROM RAISED MEDIAN.



02/28/2023

**Pharr District Central Design**

Texas Department of Transportation

**SH 48 PAVEMENT MARKINGS LAYOUT**

SCALE: 1"=100' SHEET 2 OF 11

© 2022	CONT	SECT	JOB	HIGHWAY
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DW: CK:	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	273

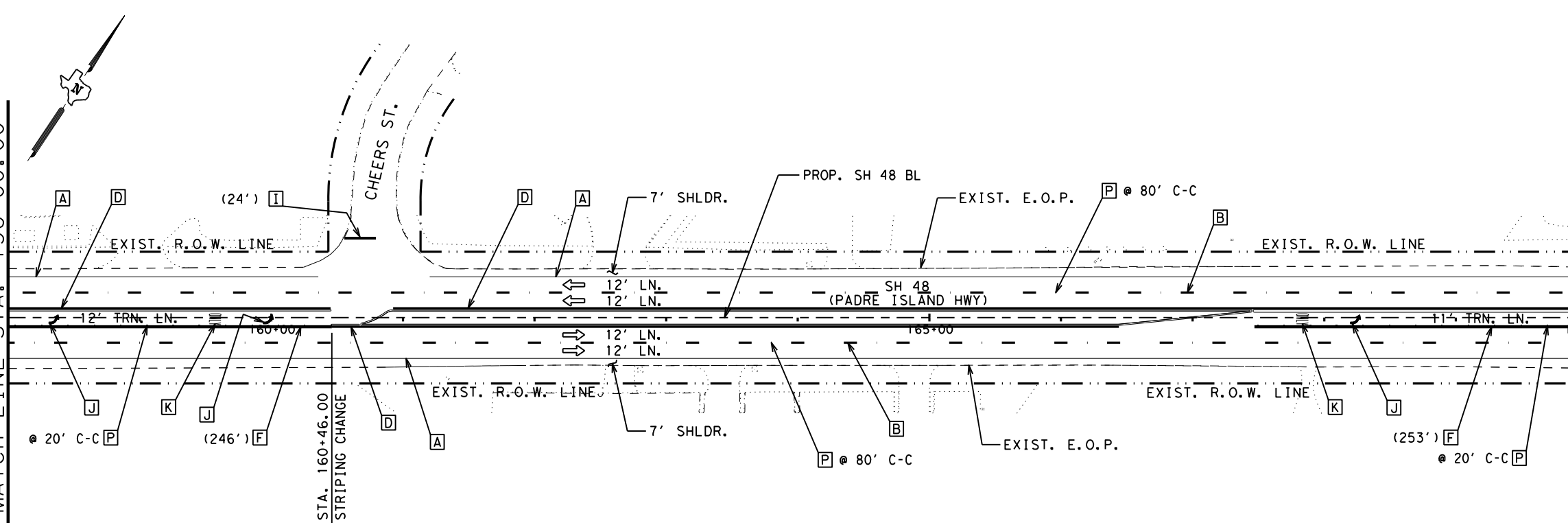
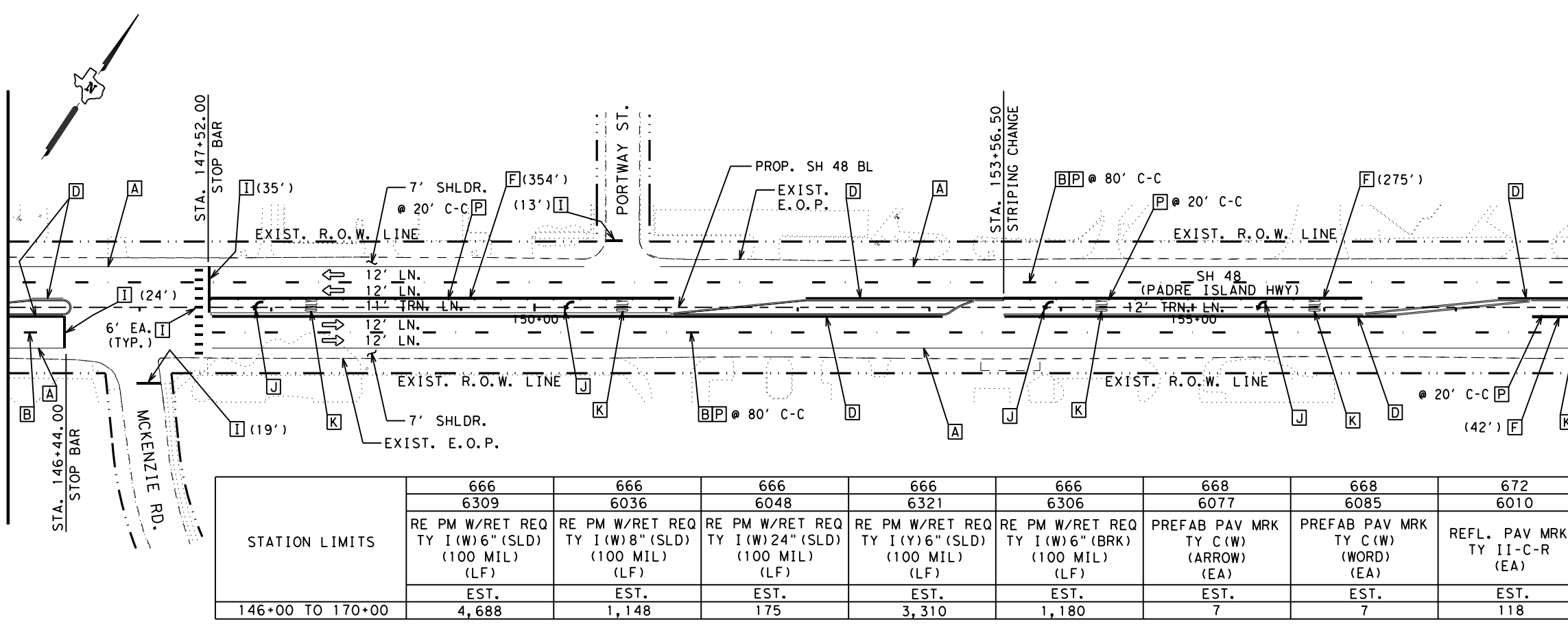
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MATCH LINE STA. 146+00.00

MATCH LINE STA. 158+00.00

MATCH LINE STA. 158+00.00

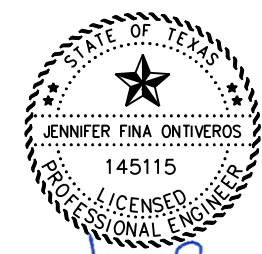
MATCH LINE STA. 170+00.00



STATION LIMITS	666 6309	666 6036	666 6048	666 6321	666 6306	668 6077	668 6085	672 6010
	RE PM W/RET REQ TY I(W)6" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I(W)8" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I(W)24" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I(Y)6" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I(W)6" (BRK) (100 MIL) (LF)	PREFAB PAV MRK TY C(W) (ARROW) (EA)	PREFAB PAV MRK TY C(W) (WORD) (EA)	REFL. PAV MRK TY II-C-R (EA)
	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.
146+00 TO 170+00	4,688	1,148	175	3,310	1,180	7	7	118

- LEGEND**
- [A] - 6" SOLID WHITE LINE (TYP.)
  - [B] - 6" BROKEN WHITE LINE (TYP.)
  - [C] - 6" BROKEN YELLOW LINE (TYP.)
  - [D] - 6" SOLID YELLOW LINE (TYP.)
  - [E] - 6" DOTTED WHITE LINE (MPM)
  - [F] - 8" SOLID WHITE LINE (TYP.)
  - [G] - 12" SOLID WHITE LINE (TYP.)
  - [H] - 12" SOLID YELLOW LINE (TYP.)
  - [I] - 24" SOLID WHITE LINE (TYP.)
  - [J] - SINGLE DIRECTIONAL ARROW (TYP.)
  - [K] - WORD (TYP.)
  - [L] - BIKE ARROW (TYP.)
  - [M] - BIKE SYMBOL (TYP.)
  - [N] - TYPE I-C (TYP.)
  - [O] - TYPE II-A-A (TYP.)
  - [P] - TYPE II-C-R (TYP.)
  - [Q] - 6" SOLID WHITE LINE (MPM)
  - [R] - 6" BROKEN WHITE LINE (MPM)
  - [S] - 6" SOLID YELLOW LINE (MPM)
  - [T] - 8" SOLID WHITE LINE (MPM)
  - [U] - 24" SOLID WHITE LINE (MPM)
  - [V] - SINGLE DIRECTIONAL ARROW (MPM)
  - [W] - WORD (MPM)
- ← - DIRECTION OF TRAFFIC FLOW (TYP.)
- C-C - CENTER TO CENTER
- EOP - EDGE OF PAVEMENT
- @ - AT
- EXIST. - EXISTING
- PROP. - PROPOSED
- BL - BASE LINE
- EA - EACH
- RDWY. - ROADWAY
- TYP. - TYPICAL
- R.O.W. - RIGHT OF WAY
- SHLDR. - SHOULDER
- LN. - LANE

**NOTE:**  
 USE 1 FOOT OFFSET FOR 6" SOLID YELLOW LINE (TYP.) FROM RAISED MEDIAN.



*Jennifer Fina Ontiveros*  
 02/28/2023

**Pharr District Central Design**

Texas Department of Transportation

**SH 48  
 PAVEMENT MARKINGS  
 LAYOUT**

SCALE: 1"=100' SHEET 3 OF 11

© 2022	CONT	SECT	JOB	HIGHWAY
DS: CK:	0220	05	080	SH 48
DW: CK:	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	274

DATE: 2/27/2023 11:38:48 AM  
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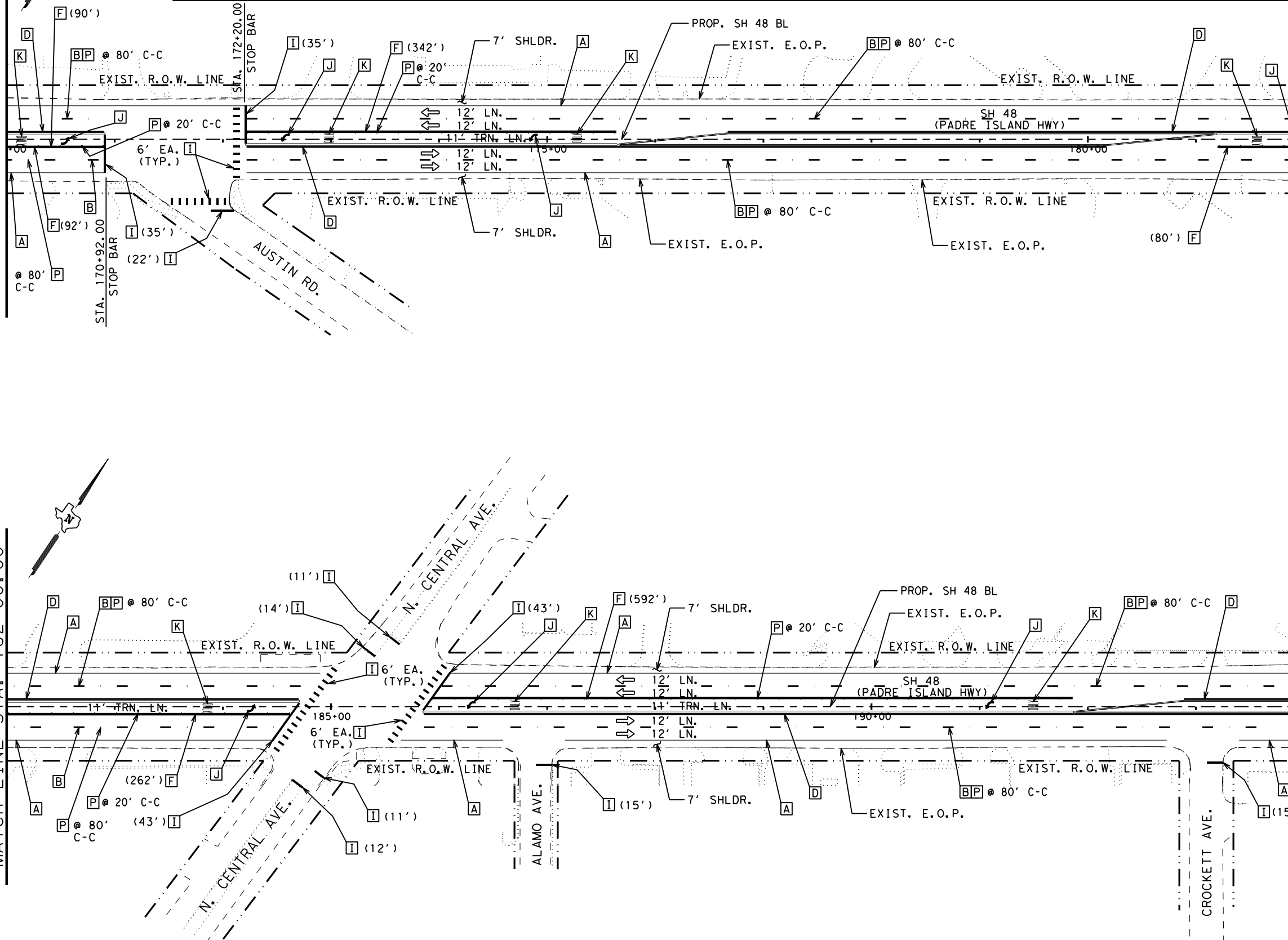
STATION LIMITS	666	666	666	666	666	668	668	672
	6309	6036	6048	6321	6306	6077	6085	6010
	RE PM W/RET REQ TY I(W)6" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I(W)8" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I(W)24" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I(Y)6" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I(W)6" (BRK) (100 MIL) (LF)	PREFAB PAV MRK TY C(W) (ARROW) (EA)	PREFAB PAV MRK TY C(W) (WORD) (EA)	REFL. PAV MRK TY II-C-R (EA)
170+00 TO 194+00	EST. 4,324	EST. 1,366	EST. 538	EST. 2,015	EST. 1,080	EST. 7	EST. 7	EST. 125

MATCH LINE STA. 170+00.00

MATCH LINE STA. 182+00.00

MATCH LINE STA. 182+00.00

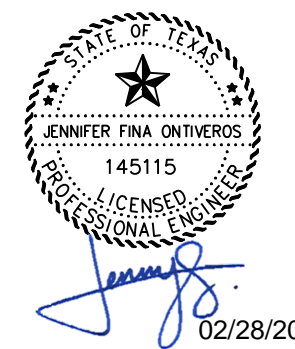
MATCH LINE STA. 194+00.00



**LEGEND**

- [A] - 6" SOLID WHITE LINE (TYP.)
- [B] - 6" BROKEN WHITE LINE (TYP.)
- [C] - 6" BROKEN YELLOW LINE (TYP.)
- [D] - 6" SOLID YELLOW LINE (TYP.)
- [E] - 6" DOTTED WHITE LINE (MPM)
- [F] - 8" SOLID WHITE LINE (TYP.)
- [G] - 12" SOLID WHITE LINE (TYP.)
- [H] - 12" SOLID YELLOW LINE (TYP.)
- [I] - 24" SOLID WHITE LINE (TYP.)
- [J] - SINGLE DIRECTIONAL ARROW (TYP.)
- [K] - WORD (TYP.)
- [L] - BIKE ARROW (TYP.)
- [M] - BIKE SYMBOL (TYP.)
- [N] - TYPE I-C (TYP.)
- [O] - TYPE II-A-A (TYP.)
- [P] - TYPE II-C-R (TYP.)
- [Q] - 6" SOLID WHITE LINE (MPM)
- [R] - 6" BROKEN WHITE LINE (MPM)
- [S] - 6" SOLID YELLOW LINE (MPM)
- [T] - 8" SOLID WHITE LINE (MPM)
- [U] - 24" SOLID WHITE LINE (MPM)
- [V] - SINGLE DIRECTIONAL ARROW (MPM)
- [W] - WORD (MPM)
- ↔ - DIRECTION OF TRAFFIC FLOW (TYP.)
- C-C - CENTER TO CENTER
- EOP - EDGE OF PAVEMENT
- @ - AT
- EXIST. - EXISTING
- PROP. - PROPOSED
- BL - BASE LINE
- EA. - EACH
- RDWY. - ROADWAY
- TYP. - TYPICAL
- R.O.W. - RIGHT OF WAY
- SHLDR. - SHOULDER
- LN. - LANE

**NOTE:**  
 USE 1 FOOT OFFSET FOR 6" SOLID YELLOW LINE (TYP.) FROM RAISED MEDIAN.



**Pharr District Central Design**

Texas Department of Transportation

**SH 48 PAVEMENT MARKINGS LAYOUT**

SCALE: 1" = 100' SHEET 4 OF 11

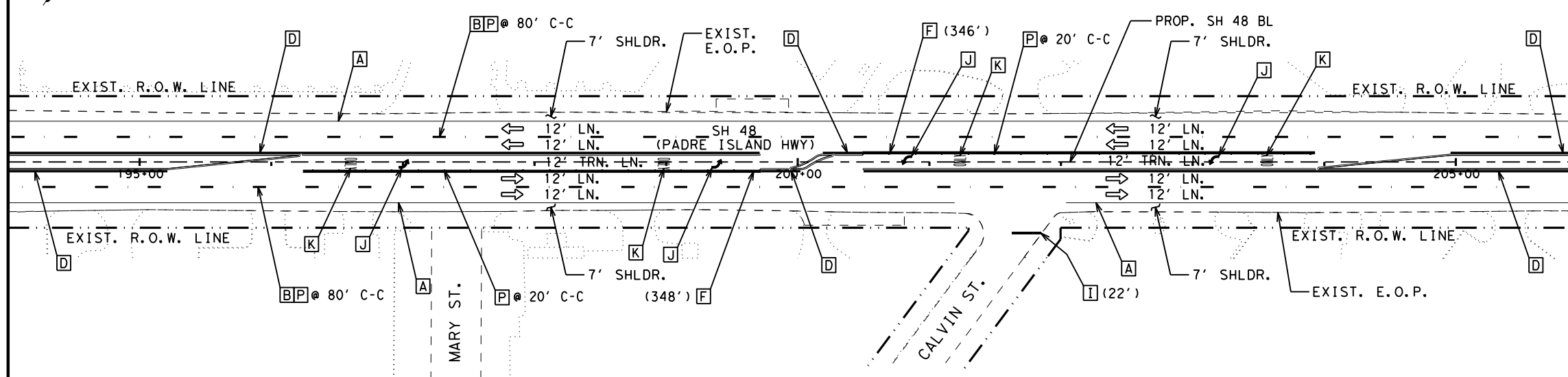
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STATION LIMITS	666	666	666	666	666	668	668	672
	6309	6036	6048	6321	6306	6077	6085	6010
	RE PM W/RET REQ TY I(W)6" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I(W)8" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I(W)24" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I(Y)6" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I(W)6" (BRK) (100 MIL) (LF)	PREFAB PAV MRK TY C(W) (ARROW) (EA)	PREFAB PAV MRK TY C(W) (WORD) (EA)	REFL. PAV MRK TY II-C-R (EA)
194+00 TO 218+00	EST. 4,523	EST. 1,041	EST. 166	EST. 3,227	EST. 1,150	EST. 6	EST. 6	EST. 114

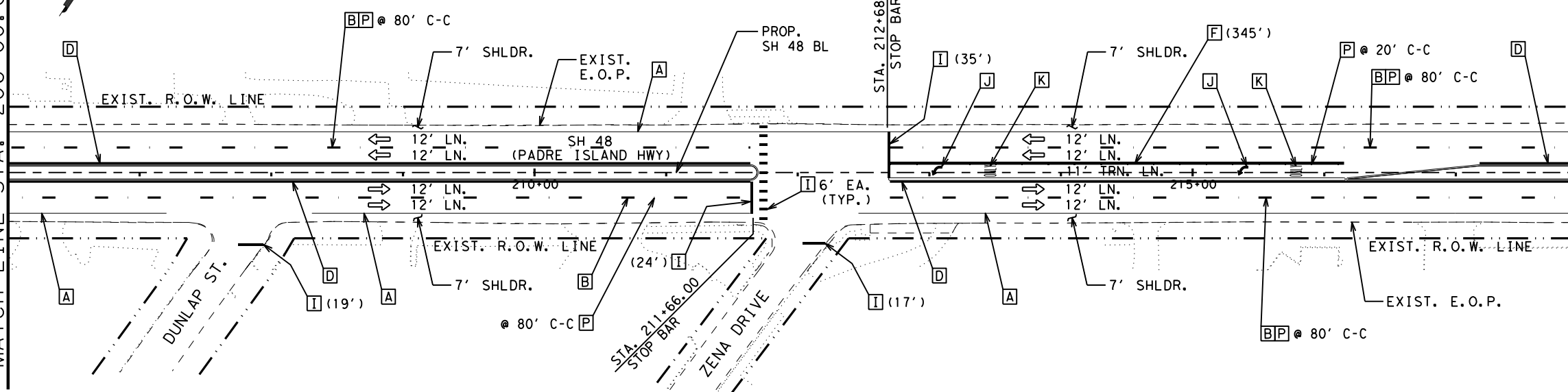
MATCH LINE STA. 194+00.00

MATCH LINE STA. 206+00.00



MATCH LINE STA. 206+00.00

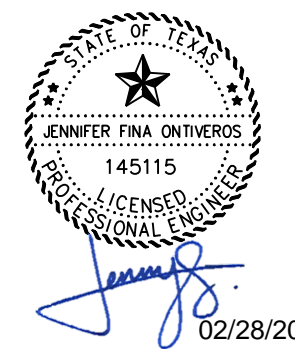
MATCH LINE STA. 218+00.00



**LEGEND**

- A - 6" SOLID WHITE LINE (TYP.)
- B - 6" BROKEN WHITE LINE (TYP.)
- C - 6" BROKEN YELLOW LINE (TYP.)
- D - 6" SOLID YELLOW LINE (TYP.)
- E - 6" DOTTED WHITE LINE (MPM)
- F - 8" SOLID WHITE LINE (TYP.)
- G - 12" SOLID WHITE LINE (TYP.)
- H - 12" SOLID YELLOW LINE (TYP.)
- I - 24" SOLID WHITE LINE (TYP.)
- J - SINGLE DIRECTIONAL ARROW (TYP.)
- K - WORD (TYP.)
- L - BIKE ARROW (TYP.)
- M - BIKE SYMBOL (TYP.)
- N - TYPE I-C (TYP.)
- O - TYPE II-A-A (TYP.)
- P - TYPE II-C-R (TYP.)
- Q - 6" SOLID WHITE LINE (MPM)
- R - 6" BROKEN WHITE LINE (MPM)
- S - 6" SOLID YELLOW LINE (MPM)
- T - 8" SOLID WHITE LINE (MPM)
- U - 24" SOLID WHITE LINE (MPM)
- V - SINGLE DIRECTIONAL ARROW (MPM)
- W - WORD (MPM)
- ↔ - DIRECTION OF TRAFFIC FLOW (TYP.)
- C-C - CENTER TO CENTER
- EOP - EDGE OF PAVEMENT
- @ - AT
- EXIST. - EXISTING
- PROP. - PROPOSED
- BL - BASE LINE
- EA. - EACH
- RDWY. - ROADWAY
- TYP. - TYPICAL
- R.O.W. - RIGHT OF WAY
- SHLDR. - SHOULDER
- LN. - LANE

**NOTE:**  
 USE 1 FOOT OFFSET FOR 6" SOLID YELLOW LINE (TYP.) FROM RAISED MEDIAN.



**Pharr District Central Design**  
 Texas Department of Transportation

**SH 48 PAVEMENT MARKINGS LAYOUT**

SCALE: 1" = 100' SHEET 5 OF 11

© 2022	CONT	SECT	JOB	HIGHWAY
OS: CK:	0220	05	080	SH 48
DW: CK:	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	276

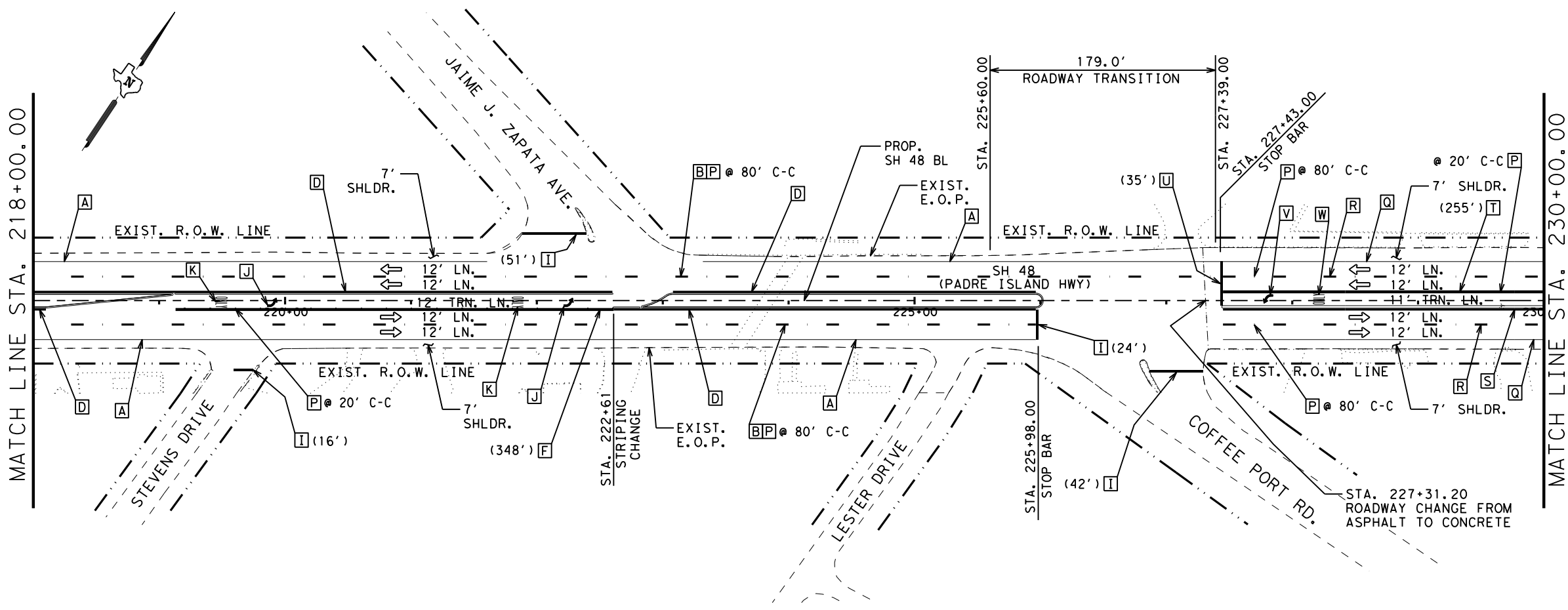
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MATCH LINE STA. 218+00.00

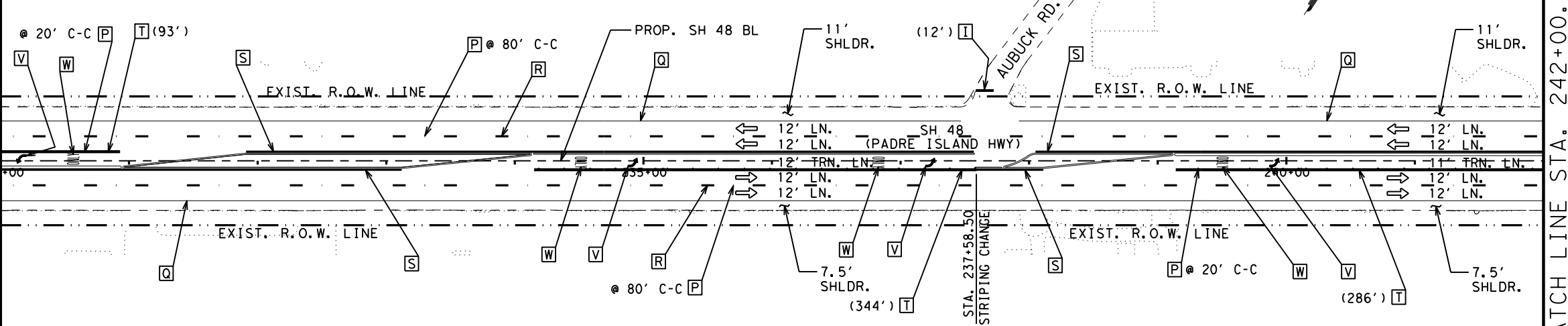
MATCH LINE STA. 230+00.00

MATCH LINE STA. 230+00.00

MATCH LINE STA. 242+00.00



STATION LIMITS	6038 6004	6038 6005	6038 6017	6038 6007	6038 6013	6038 6025	6038 6027
	MULTIPOLYMER PAV MRK (W) 6" (SLD) (LF)	MULTIPOLYMER PAV MRK (W) 6" (BRK) (LF)	MULTIPOLYMER PAV MRK (Y) 6" (SLD) (LF)	MULTIPOLYMER PAV MRK (W) 8" (SLD) (LF)	MULTIPOLYMER PAV MRK (W) 24" (SLD) (LF)	MULTIPOLYMER PAV MRK (W) (ARROW) (EA)	MULTIPOLYMER PAV MRK (W) (WORD) (EA)
218+00 TO 242+00	EST. 2,857	EST. 978	EST. 1,376	EST. 634	EST. 47	EST. 5	EST. 5

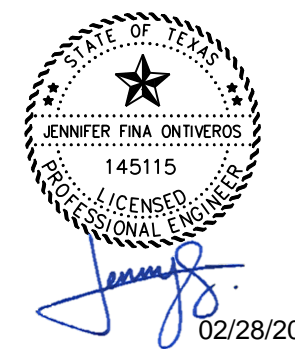


STATION LIMITS	666 6309	666 6036	666 6048	666 6321	666 6306	668 6077	668 6085	672 6010
	RE PM W/RET REQ TY I (W) 6" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I (W) 8" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I (W) 24" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I (Y) 6" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I (W) 6" (BRK) (100 MIL) (LF)	PREFAB PAV MRK TY C (W) (ARROW) (EA)	PREFAB PAV MRK TY C (W) (WORD) (EA)	REFL. PAV MRK TY II-C-R (EA)
218+00 TO 242+00	EST. 1,557	EST. 348	EST. 133	EST. 1,135	EST. 430	EST. 2	EST. 2	EST. 115

**LEGEND**

- [A] - 6" SOLID WHITE LINE (TYP.)
- [B] - 6" BROKEN WHITE LINE (TYP.)
- [C] - 6" BROKEN YELLOW LINE (TYP.)
- [D] - 6" SOLID YELLOW LINE (TYP.)
- [E] - 6" DOTTED WHITE LINE (MPM)
- [F] - 8" SOLID WHITE LINE (TYP.)
- [G] - 12" SOLID WHITE LINE (TYP.)
- [H] - 12" SOLID YELLOW LINE (TYP.)
- [I] - 24" SOLID WHITE LINE (TYP.)
- [J] - SINGLE DIRECTIONAL ARROW (TYP.)
- [K] - WORD (TYP.)
- [L] - BIKE ARROW (TYP.)
- [M] - BIKE SYMBOL (TYP.)
- [N] - TYPE I-C (TYP.)
- [O] - TYPE II-A-A (TYP.)
- [P] - TYPE II-C-R (TYP.)
- [Q] - 6" SOLID WHITE LINE (MPM)
- [R] - 6" BROKEN WHITE LINE (MPM)
- [S] - 6" SOLID YELLOW LINE (MPM)
- [T] - 8" SOLID WHITE LINE (MPM)
- [U] - 24" SOLID WHITE LINE (MPM)
- [V] - SINGLE DIRECTIONAL ARROW (MPM)
- [W] - WORD (MPM)
- ↔ - DIRECTION OF TRAFFIC FLOW (TYP.)
- C-C - CENTER TO CENTER
- EOP - EDGE OF PAVEMENT
- @ - AT
- EXIST. - EXISTING
- PROP. - PROPOSED
- BL - BASE LINE
- EA - EACH
- RDWY. - ROADWAY
- TYP. - TYPICAL
- R.O.W. - RIGHT OF WAY
- SHLDR. - SHOULDER
- LN. - LANE

**NOTE:**  
 USE 1 FOOT OFFSET FOR 6" SOLID YELLOW LINE (TYP.) FROM RAISED MEDIAN.



**Pharr District Central Design**  
 Texas Department of Transportation

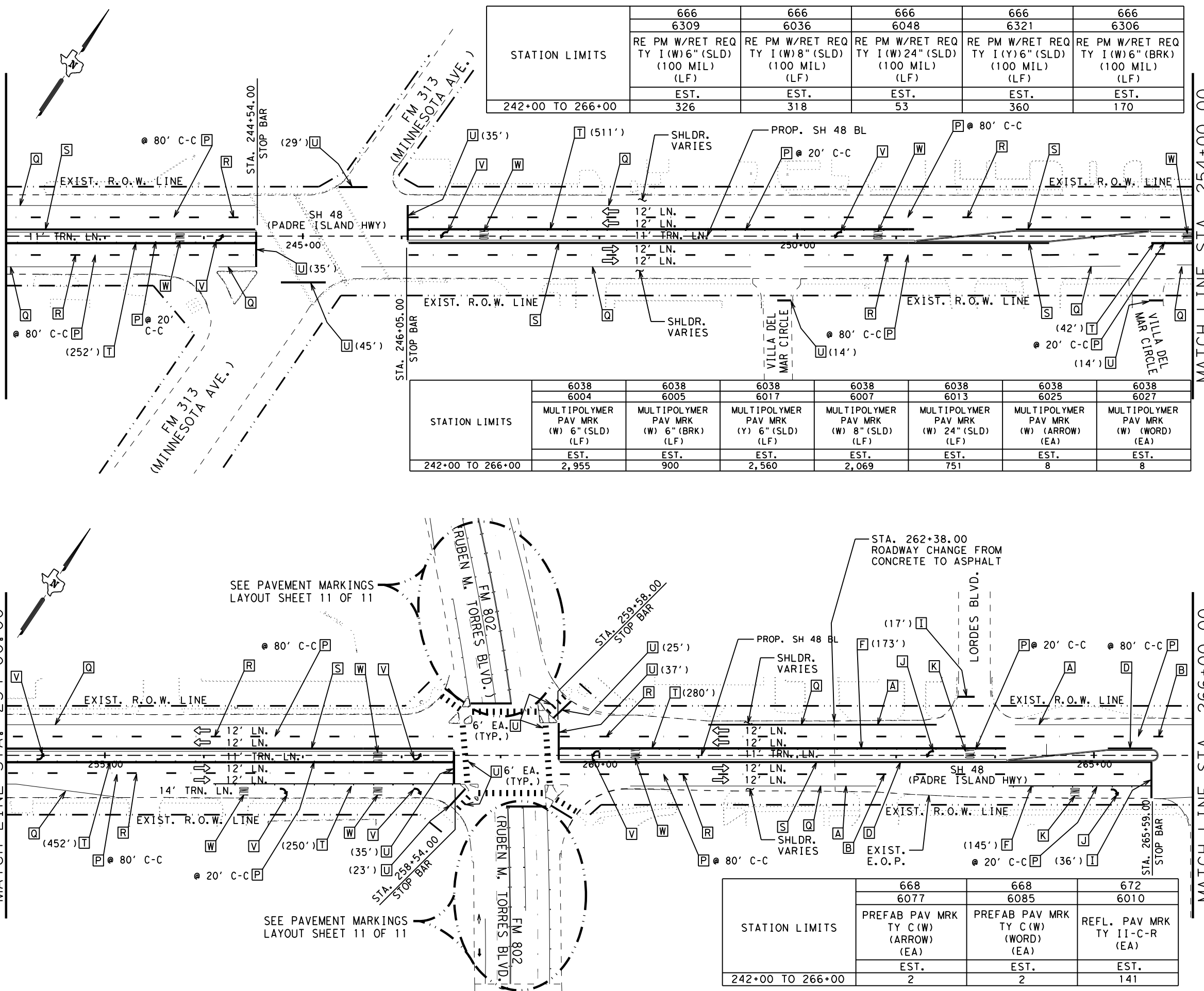
**SH 48  
 PAVEMENT MARKINGS  
 LAYOUT**

SCALE: 1" = 100' SHEET 6 OF 11

© 2022	CONT	SECT	JOB	HIGHWAY
0220	05	080	SH 48	
DIST	COUNTY	SHEET NO.		
PHR	CAMERON	277		

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MATCH LINE STA. 242+00.00  
 MATCH LINE STA. 254+00.00  
 MATCH LINE STA. 254+00.00  
 MATCH LINE STA. 266+00.00



STATION LIMITS	666	666	666	666	666
	6309	6036	6048	6321	6306
242+00 TO 266+00	RE PM W/RET REQ TY I (W) 6" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I (W) 8" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I (W) 24" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I (Y) 6" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I (W) 6" (BRK) (100 MIL) (LF)
	EST. 326	EST. 318	EST. 53	EST. 360	EST. 170

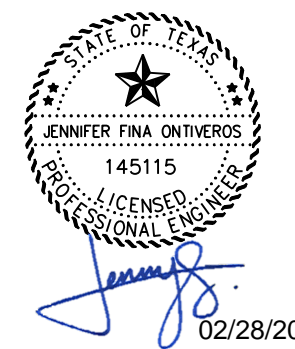
STATION LIMITS	6038	6038	6038	6038	6038	6038
	6004	6005	6017	6007	6013	6025
242+00 TO 266+00	MULTIPOLYMER PAV MRK (W) 6" (SLD) (LF)	MULTIPOLYMER PAV MRK (W) 6" (BRK) (LF)	MULTIPOLYMER PAV MRK (Y) 6" (SLD) (LF)	MULTIPOLYMER PAV MRK (W) 8" (SLD) (LF)	MULTIPOLYMER PAV MRK (W) 24" (SLD) (LF)	MULTIPOLYMER PAV MRK (W) (ARROW) (EA)
	EST. 2,955	EST. 900	EST. 2,560	EST. 2,069	EST. 751	EST. 8

STATION LIMITS	668	668	672
	6077	6085	6010
242+00 TO 266+00	PREFAB PAV MRK TY C (W) (ARROW) (EA)	PREFAB PAV MRK TY C (W) (WORD) (EA)	REFL. PAV MRK TY II-C-R (EA)
	EST. 2	EST. 2	EST. 141

**LEGEND**

- A - 6" SOLID WHITE LINE (TYP.)
- B - 6" BROKEN WHITE LINE (TYP.)
- C - 6" BROKEN YELLOW LINE (TYP.)
- D - 6" SOLID YELLOW LINE (TYP.)
- E - 6" DOTTED WHITE LINE (MPM)
- F - 8" SOLID WHITE LINE (TYP.)
- G - 12" SOLID WHITE LINE (TYP.)
- H - 12" SOLID YELLOW LINE (TYP.)
- I - 24" SOLID WHITE LINE (TYP.)
- J - SINGLE DIRECTIONAL ARROW (TYP.)
- K - WORD (TYP.)
- L - BIKE ARROW (TYP.)
- M - BIKE SYMBOL (TYP.)
- N - TYPE I-C (TYP.)
- O - TYPE II-A-A (TYP.)
- P - TYPE II-C-R (TYP.)
- Q - 6" SOLID WHITE LINE (MPM)
- R - 6" BROKEN WHITE LINE (MPM)
- S - 6" SOLID YELLOW LINE (MPM)
- T - 8" SOLID WHITE LINE (MPM)
- U - 24" SOLID WHITE LINE (MPM)
- V - SINGLE DIRECTIONAL ARROW (MPM)
- W - WORD (MPM)
- ↑ - DIRECTION OF TRAFFIC FLOW (TYP.)
- C-C - CENTER TO CENTER
- EOP - EDGE OF PAVEMENT
- @ - AT
- EXIST. - EXISTING
- PROP. - PROPOSED
- BL - BASE LINE
- EA - EACH
- RDWY. - ROADWAY
- TYP. - TYPICAL
- R.O.W. - RIGHT OF WAY
- SHLDR. - SHOULDER
- LN. - LANE

**NOTE:**  
 USE 1 FOOT OFFSET FOR 6" SOLID YELLOW LINE (TYP.) FROM RAISED MEDIAN.



**Pharr District Central Design**

Texas Department of Transportation

**SH 48 PAVEMENT MARKINGS LAYOUT**

SCALE: 1" = 100' SHEET 7 OF 11

© 2022	CONT	SECT	JOB	HIGHWAY
0220	05	080	SH 48	
DIST	COUNTY	SHEET NO.		
PHR	CAMERON	278		

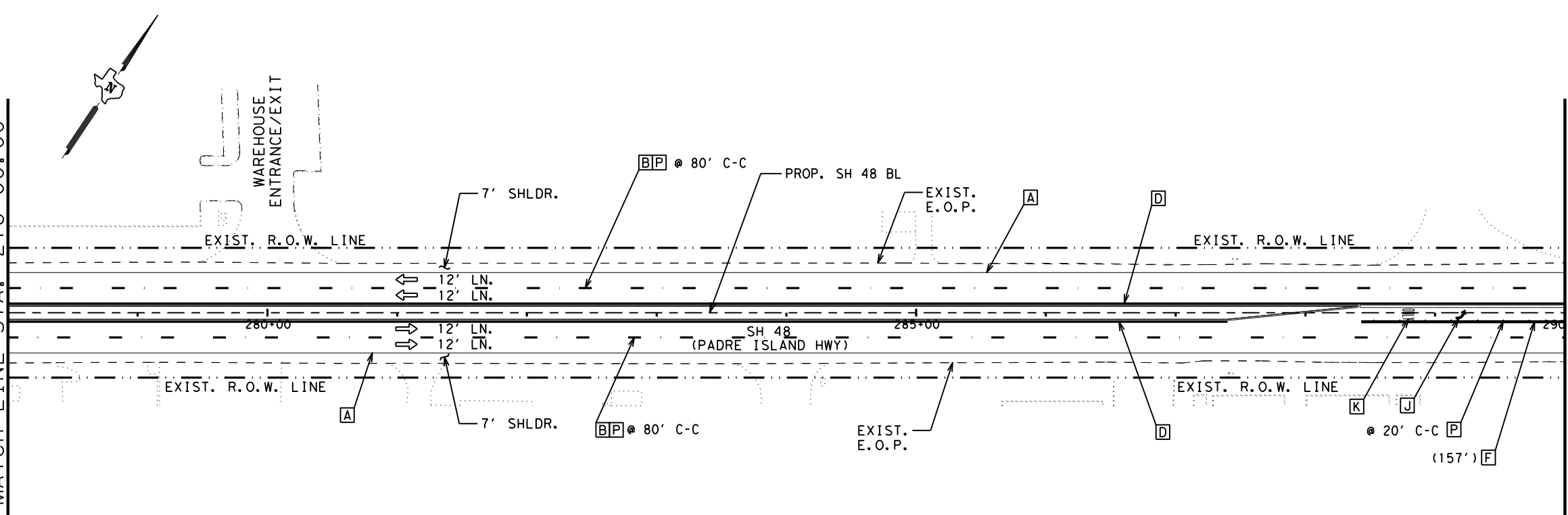
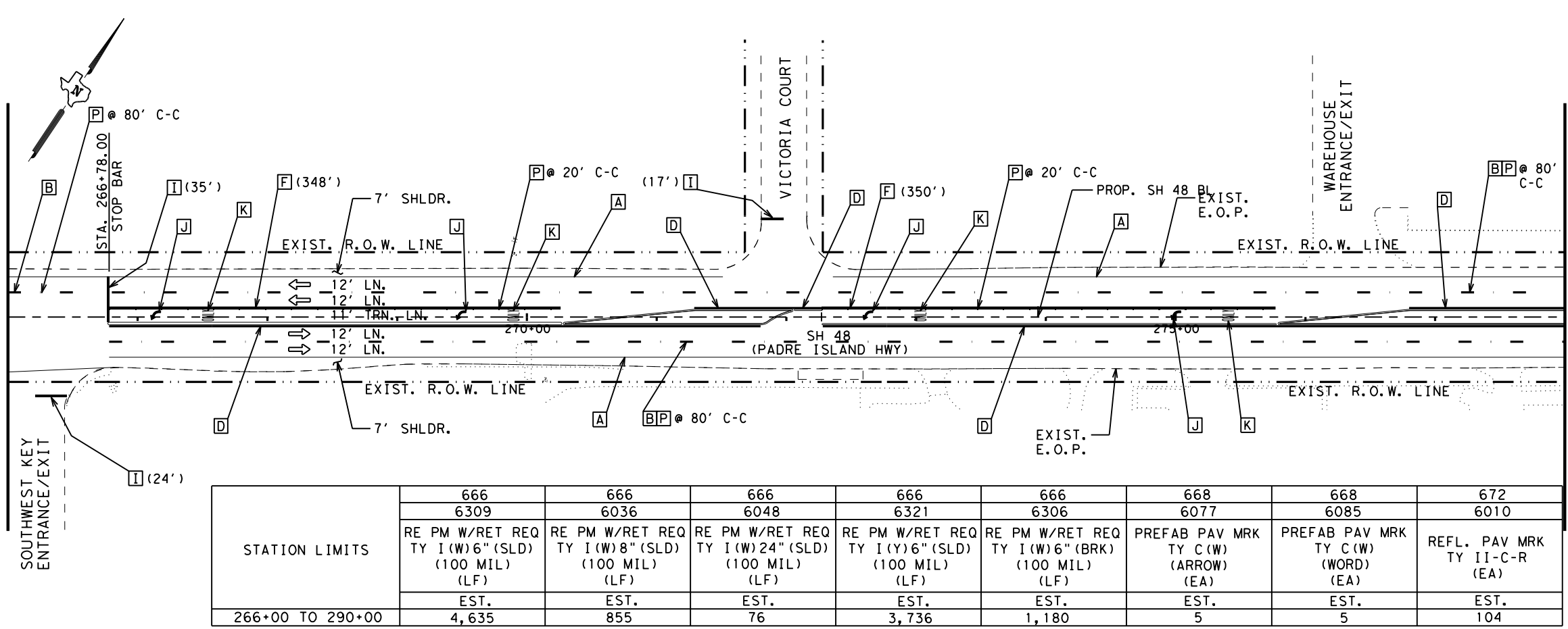
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MATCH LINE STA. 266+00.00

MATCH LINE STA. 278+00.00

MATCH LINE STA. 278+00.00

MATCH LINE STA. 290+00.00




STATION LIMITS	666	666	666	666	666	668	668	672
	6309	6036	6048	6321	6306	6077	6085	6010
	RE PM W/RET REQ TY I (W) 6" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I (W) 8" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I (W) 24" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I (Y) 6" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I (W) 6" (BRK) (100 MIL) (LF)	PREFAB PAV MRK TY C (W) (ARROW) (EA)	PREFAB PAV MRK TY C (W) (WORD) (EA)	REFL. PAV MRK TY II-C-R (EA)
266+00 TO 290+00	EST. 4,635	EST. 855	EST. 76	EST. 3,736	EST. 1,180	EST. 5	EST. 5	EST. 104

- LEGEND**
- A - 6" SOLID WHITE LINE (TYP.)
  - B - 6" BROKEN WHITE LINE (TYP.)
  - C - 6" BROKEN YELLOW LINE (TYP.)
  - D - 6" SOLID YELLOW LINE (TYP.)
  - E - 6" DOTTED WHITE LINE (MPM)
  - F - 8" SOLID WHITE LINE (TYP.)
  - G - 12" SOLID WHITE LINE (TYP.)
  - H - 12" SOLID YELLOW LINE (TYP.)
  - I - 24" SOLID WHITE LINE (TYP.)
  - J - SINGLE DIRECTIONAL ARROW (TYP.)
  - K - WORD (TYP.)
  - L - BIKE ARROW (TYP.)
  - M - BIKE SYMBOL (TYP.)
  - N - TYPE I-C (TYP.)
  - O - TYPE II-A-A (TYP.)
  - P - TYPE II-C-R (TYP.)
  - Q - 6" SOLID WHITE LINE (MPM)
  - R - 6" BROKEN WHITE LINE (MPM)
  - S - 6" SOLID YELLOW LINE (MPM)
  - T - 8" SOLID WHITE LINE (MPM)
  - U - 24" SOLID WHITE LINE (MPM)
  - V - SINGLE DIRECTIONAL ARROW (MPM)
  - W - WORD (MPM)
  - ↔ - DIRECTION OF TRAFFIC FLOW (TYP.)
  - C-C - CENTER TO CENTER
  - EOP - EDGE OF PAVEMENT
  - @ - AT
  - EXIST. - EXISTING
  - PROP. - PROPOSED
  - BL - BASE LINE
  - EA - EACH
  - RDWY. - ROADWAY
  - TYP. - TYPICAL
  - R.O.W. - RIGHT OF WAY
  - SHLDR. - SHOULDER
  - LN. - LANE

**NOTE:**  
 USE 1 FOOT OFFSET FOR 6" SOLID YELLOW LINE (TYP.) FROM RAISED MEDIAN.



**Pharr District Central Design**  
  
 Texas Department of Transportation

**SH 48  
 PAVEMENT MARKINGS  
 LAYOUT**

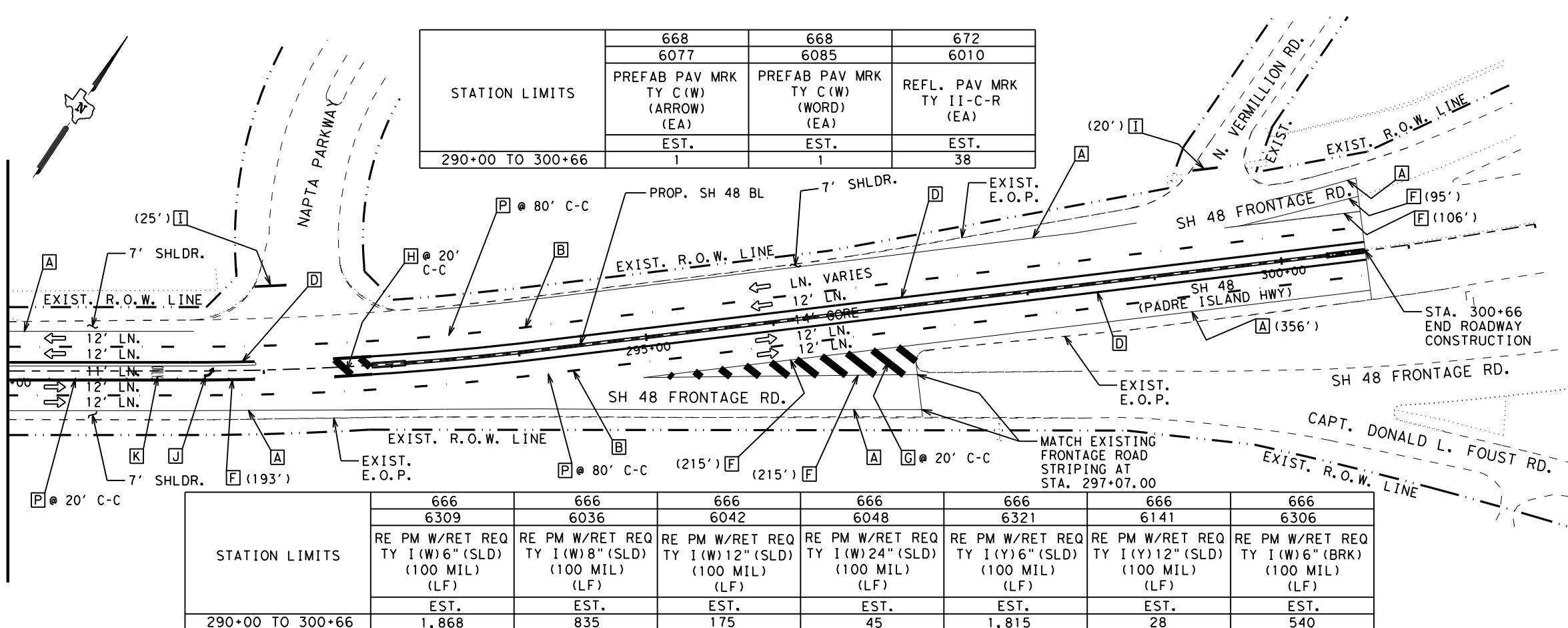
SCALE: 1" = 100' SHEET 8 OF 11

© 2022	CONT	SECT	JOB	HIGHWAY
OS:	CK:	0220	05	080
DIST	COUNTY	SHEET NO.		
PHR	CAMERON	279		

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MATCH LINE STA. 290+00.00

STATION LIMITS	668	668	672
	6077	6085	6010
	PREFAB PAV MRK TY C(W) (ARROW) (EA)	PREFAB PAV MRK TY C(W) (WORD) (EA)	REFL. PAV MRK TY II-C-R (EA)
290+00 TO 300+66	EST.	EST.	EST.
	1	1	38

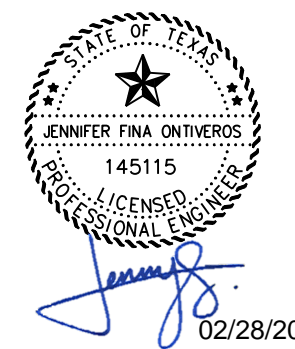


STATION LIMITS	666	666	666	666	666	666	666
	6309	6036	6042	6048	6321	6141	6306
	RE PM W/RET REQ TY I(W)6" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I(W)8" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I(W)12" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I(W)24" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I(Y)6" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I(Y)12" (SLD) (100 MIL) (LF)	RE PM W/RET REQ TY I(W)6" (BRK) (100 MIL) (LF)
290+00 TO 300+66	EST.	EST.	EST.	EST.	EST.	EST.	EST.
	1,868	835	175	45	1,815	28	540

**LEGEND**

- [A] - 6" SOLID WHITE LINE (TYP.)
- [B] - 6" BROKEN WHITE LINE (TYP.)
- [C] - 6" BROKEN YELLOW LINE (TYP.)
- [D] - 6" SOLID YELLOW LINE (TYP.)
- [E] - 6" DOTTED WHITE LINE (MPM)
- [F] - 8" SOLID WHITE LINE (TYP.)
- [G] - 12" SOLID WHITE LINE (TYP.)
- [H] - 12" SOLID YELLOW LINE (TYP.)
- [I] - 24" SOLID WHITE LINE (TYP.)
- [J] - SINGLE DIRECTIONAL ARROW (TYP.)
- [K] - WORD (TYP.)
- [L] - BIKE ARROW (TYP.)
- [M] - BIKE SYMBOL (TYP.)
- [N] - TYPE I-C (TYP.)
- [O] - TYPE II-A-A (TYP.)
- [P] - TYPE II-C-R (TYP.)
- [Q] - 6" SOLID WHITE LINE (MPM)
- [R] - 6" BROKEN WHITE LINE (MPM)
- [S] - 6" SOLID YELLOW LINE (MPM)
- [T] - 8" SOLID WHITE LINE (MPM)
- [U] - 24" SOLID WHITE LINE (MPM)
- [V] - SINGLE DIRECTIONAL ARROW (MPM)
- [W] - WORD (MPM)
- ← - DIRECTION OF TRAFFIC FLOW (TYP.)
- C-C - CENTER TO CENTER
- EOP - EDGE OF PAVEMENT
- @ - AT
- EXIST. - EXISTING
- PROP. - PROPOSED
- BL - BASE LINE
- EA - EACH
- RDWY. - ROADWAY
- TYP. - TYPICAL
- R.O.W. - RIGHT OF WAY
- SHLDR. - SHOULDER
- LN. - LANE

**NOTE:**  
 USE 1 FOOT OFFSET FOR 6" SOLID YELLOW LINE (TYP.) FROM RAISED MEDIAN.



Pharr District Central Design



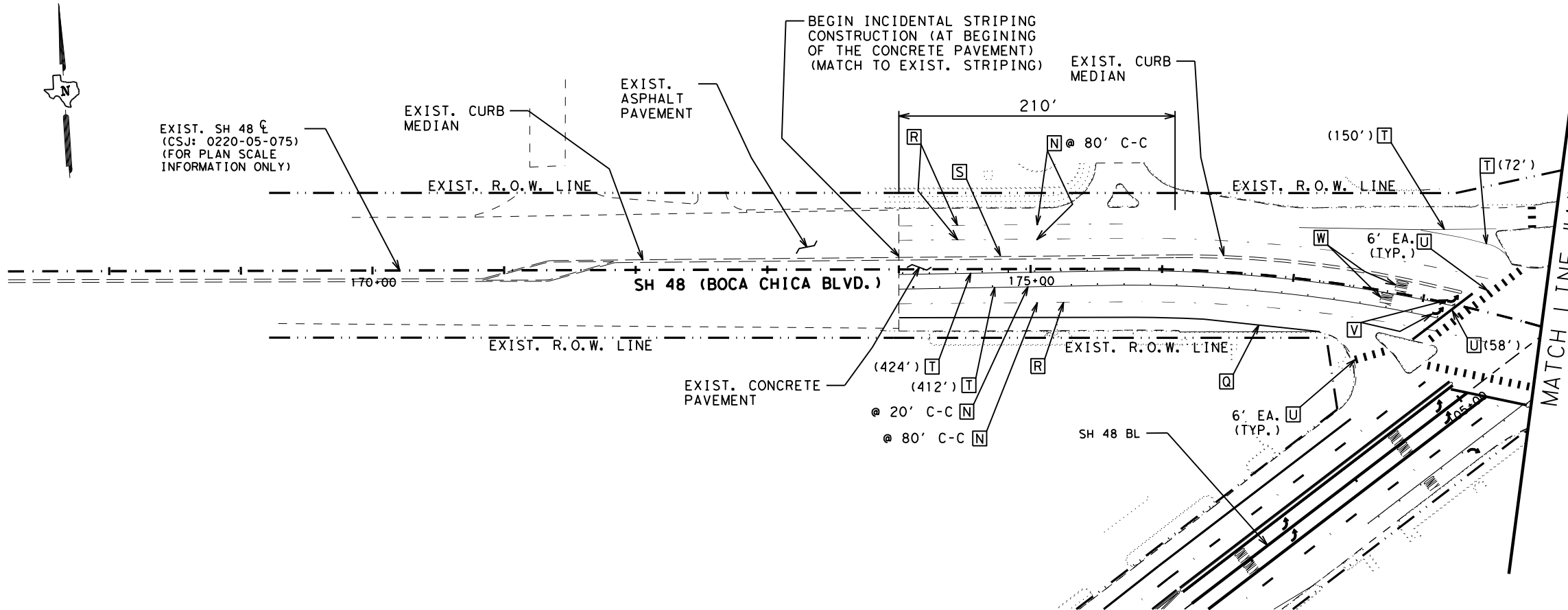
**SH 48  
 PAVEMENT MARKINGS  
 LAYOUT**

SCALE: 1" = 100' SHEET 9 OF 11

© 2022	CONT	SECT	JOB	HIGHWAY
DS: CK:	0220	05	080	SH 48
DW: CK:	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	280

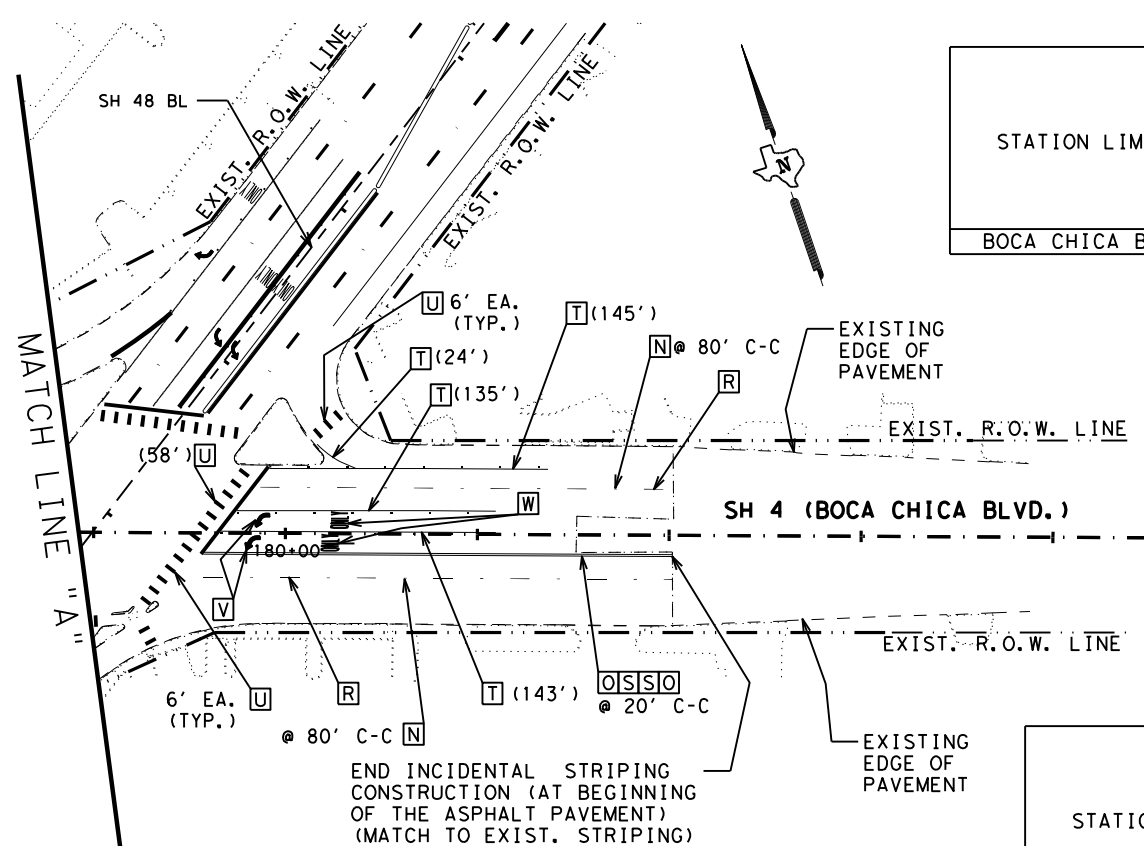
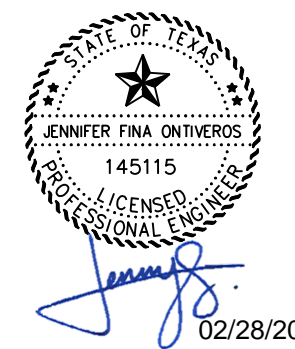


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- LEGEND**
- A - 6" SOLID WHITE LINE (TYP.)
  - B - 6" BROKEN WHITE LINE (TYP.)
  - C - 6" BROKEN YELLOW LINE (TYP.)
  - D - 6" SOLID YELLOW LINE (TYP.)
  - E - 6" DOTTED WHITE LINE (MPM)
  - F - 8" SOLID WHITE LINE (TYP.)
  - G - 12" SOLID WHITE LINE (TYP.)
  - H - 12" SOLID YELLOW LINE (TYP.)
  - I - 24" SOLID WHITE LINE (TYP.)
  - J - SINGLE DIRECTIONAL ARROW (TYP.)
  - K - WORD (TYP.)
  - L - BIKE ARROW (TYP.)
  - M - BIKE SYMBOL (TYP.)
  - N - TYPE I-C (TYP.)
  - O - TYPE II-A-A (TYP.)
  - P - TYPE II-C-R (TYP.)
  - Q - 6" SOLID WHITE LINE (MPM)
  - R - 6" BROKEN WHITE LINE (MPM)
  - S - 6" SOLID YELLOW LINE (MPM)
  - T - 8" SOLID WHITE LINE (MPM)
  - U - 24" SOLID WHITE LINE (MPM)
  - V - SINGLE DIRECTIONAL ARROW (MPM)
  - W - WORD (MPM)
  - ← - DIRECTION OF TRAFFIC FLOW (TYP.)
  - C-C - CENTER TO CENTER
  - EOP - EDGE OF PAVEMENT
  - @ - AT
  - EXIST. - EXISTING
  - PROP. - PROPOSED
  - BL - BASE LINE
  - EA. - EACH
  - RDWY. - ROADWAY
  - TYP. - TYPICAL
  - R.O.W. - RIGHT OF WAY
  - SHLDR. - SHOULDER
  - LN. - LANE

**NOTE:**  
 USE 1 FOOT OFFSET FOR 6" SOLID YELLOW LINE (TYP.) FROM RAISED MEDIAN.



STATION LIMITS	6038 6004	6038 6007	6038 6013	6038 6017	6038 6005
	MULTIPOLYMER PAV MRK (W) 6" (SLD) (LF)	MULTIPOLYMER PAV MRK (W) 8" (SLD) (LF)	MULTIPOLYMER PAV MRK (W) 24" (SLD) (LF)	MULTIPOLYMER PAV MRK (Y) 6" (SLD) (LF)	MULTIPOLYMER PAV MRK (W) 6" (BRK) (LF)
	EST.	EST.	EST.	EST.	EST.
BOCA CHICA BLVD.	322	1,505	314	928	400

STATION LIMITS	6038 6025	6038 6027	672 6007	672 6009
	MULTIPOLYMER PAV MRK (W) (ARROW) (EA)	MULTIPOLYMER PAV MRK (W) (WORD) (EA)	REFL. PAV MRK TY I-C (EA)	REFL. PAV MRK TY II-A-A (EA)
	EST.	EST.	EST.	EST.
BOCA CHICA BLVD.	4	4	96	16

**Pharr District Central Design**

Texas Department of Transportation

**SH 48  
PAVEMENT MARKINGS  
LAYOUT**

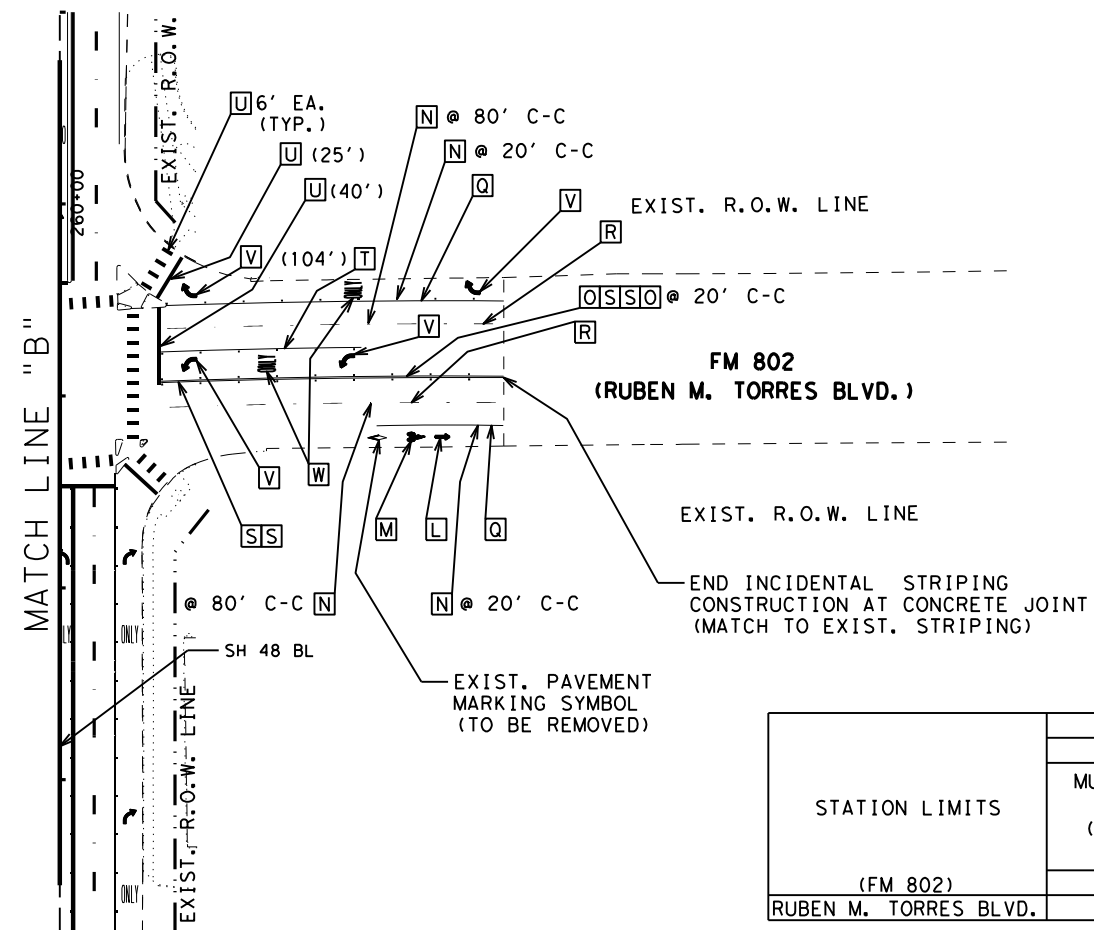
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DS: 0220	CK: 05	JOB: 080	HIGHWAY: SH 48
DW: PHR	CK:	COUNTY: CAMERON	SHEET NO.: 281

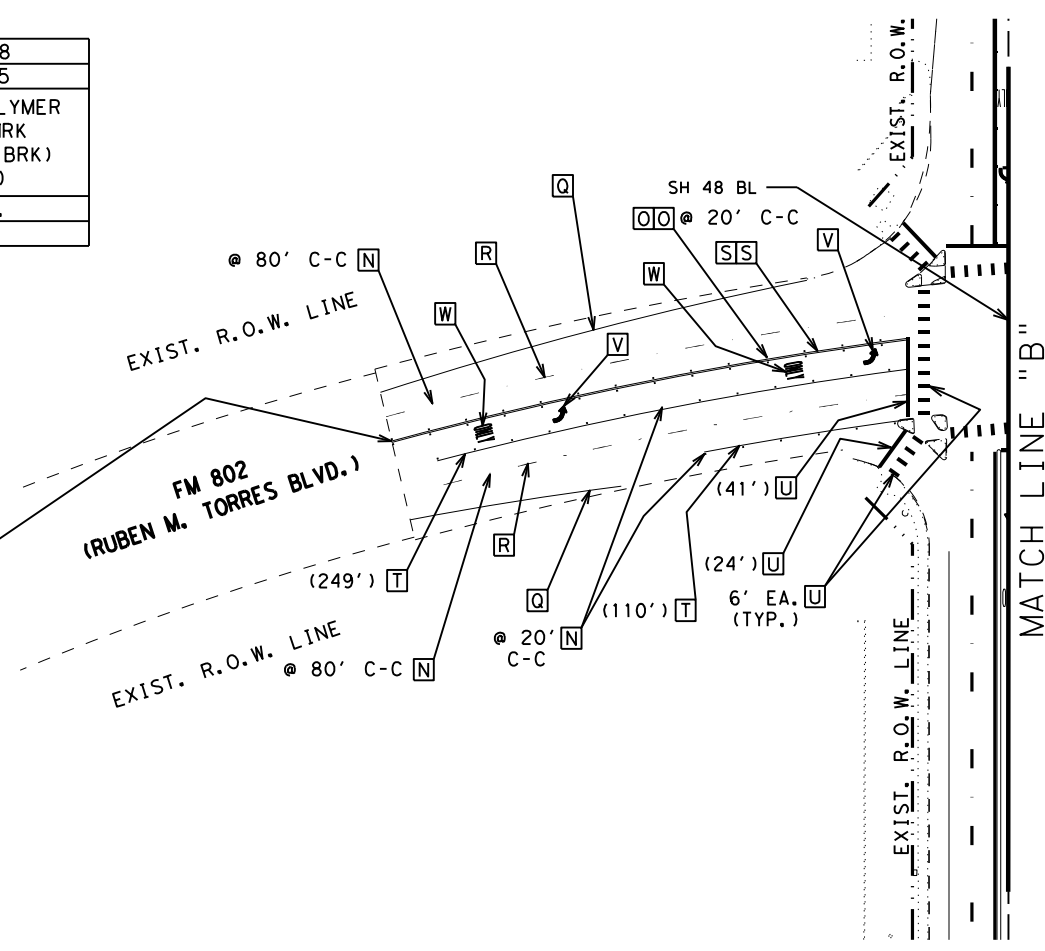
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STATION LIMITS  (FM 802) RUBEN M. TORRES BLVD.	6038 6004	6038 6007	6038 6013	6038 6017	6038 6005
	MULTIPOLYMER PAV MRK (W) 6" (SLD) (LF)	MULTIPOLYMER PAV MRK (W) 8" (SLD) (LF)	MULTIPOLYMER PAV MRK (W) 24" (SLD) (LF)	MULTIPOLYMER PAV MRK (Y) 6" (SLD) (LF)	MULTIPOLYMER PAV MRK (W) 6" (BRK) (LF)
	EST.	EST.	EST.	EST.	EST.

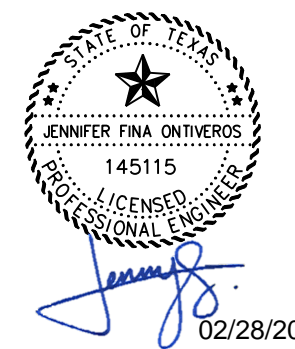
BEGIN INCIDENTAL STRIPING  
 CONSTRUCTION AT CONCRETE JOINT  
 (MATCH TO EXIST. STRIPING)



STATION LIMITS  (FM 802) RUBEN M. TORRES BLVD.	6038 6025	6038 6027	668 6094	668 6096	672 6007	672 6009
	MULTIPOLYMER PAV MRK (W) (ARROW) (EA)	MULTIPOLYMER PAV MRK (W) (WORD) (EA)	PREFAB PAV MRK TY C(W) (BIKE ARROW) (EA)	PREFAB PAV MRK TY C(W) (BIKE SYMBOL) (EA)	REFL. PAV MRK TY I-C (EA)	REFL. PAV MRK TY II-A-A (EA)
	EST.	EST.	EST.	EST.	EST.	EST.



- LEGEND**
- A - 6" SOLID WHITE LINE (TYP.)
  - B - 6" BROKEN WHITE LINE (TYP.)
  - C - 6" BROKEN YELLOW LINE (TYP.)
  - D - 6" SOLID YELLOW LINE (TYP.)
  - E - 6" DOTTED WHITE LINE (MPM)
  - F - 8" SOLID WHITE LINE (TYP.)
  - G - 12" SOLID WHITE LINE (TYP.)
  - H - 12" SOLID YELLOW LINE (TYP.)
  - I - 24" SOLID WHITE LINE (TYP.)
  - J - SINGLE DIRECTIONAL ARROW (TYP.)
  - K - WORD (TYP.)
  - L - BIKE ARROW (TYP.)
  - M - BIKE SYMBOL (TYP.)
  - N - TYPE I-C (TYP.)
  - O - TYPE II-A-A (TYP.)
  - P - TYPE II-C-R (TYP.)
  - Q - 6" SOLID WHITE LINE (MPM)
  - R - 6" BROKEN WHITE LINE (MPM)
  - S - 6" SOLID YELLOW LINE (MPM)
  - T - 8" SOLID WHITE LINE (MPM)
  - U - 24" SOLID WHITE LINE (MPM)
  - V - SINGLE DIRECTIONAL ARROW (MPM)
  - W - WORD (MPM)
  - ← - DIRECTION OF TRAFFIC FLOW (TYP.)
  - C-C - CENTER TO CENTER
  - EOP - EDGE OF PAVEMENT
  - @ - AT
  - EXIST. - EXISTING
  - PROP. - PROPOSED
  - BL - BASE LINE
  - EA. - EACH
  - RDWY. - ROADWAY
  - TYP. - TYPICAL
  - R.O.W. - RIGHT OF WAY
  - SHLDR. - SHOULDER
  - LN. - LANE
- NOTE:**  
 USE 1 FOOT OFFSET FOR 6" SOLID YELLOW LINE (TYP.) FROM RAISED MEDIAN.



**Pharr District Central Design**

Texas Department of Transportation

**SH 48  
 PAVEMENT MARKINGS  
 LAYOUT**

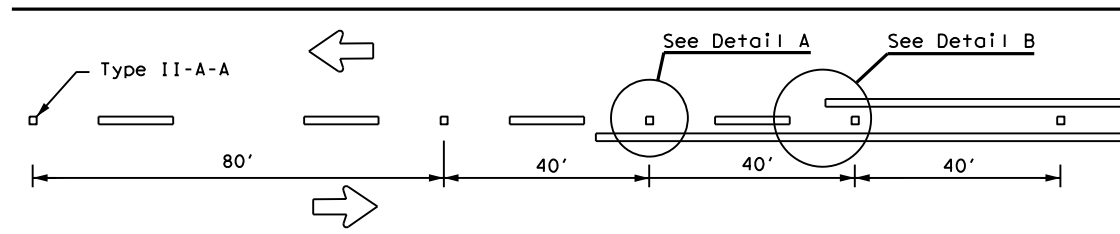
SCALE: 1"=100' SHEET 11 OF 11

© 2022	CONT	SECT	JOB	HIGHWAY
0220	05	080	SH 48	
DIST	COUNTY	SHEET NO.		
PHR	CAMERON	282		

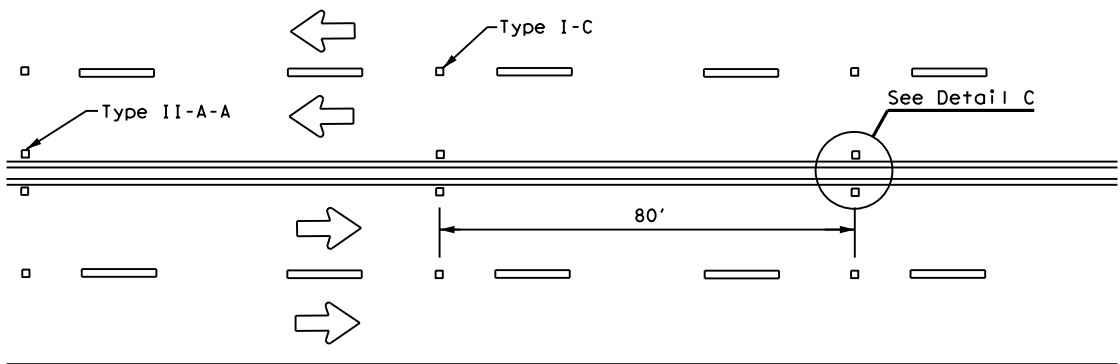


# REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

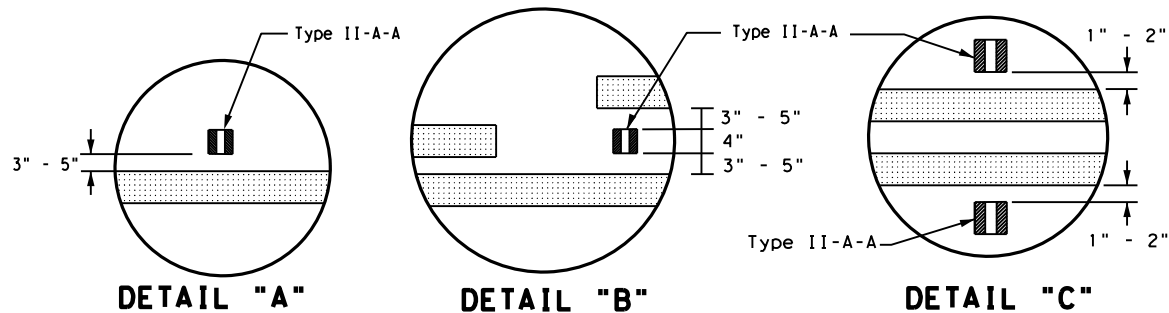
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of any information from a previous version of this standard to the current version. See the project file for the latest revision of this standard.



**CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS**



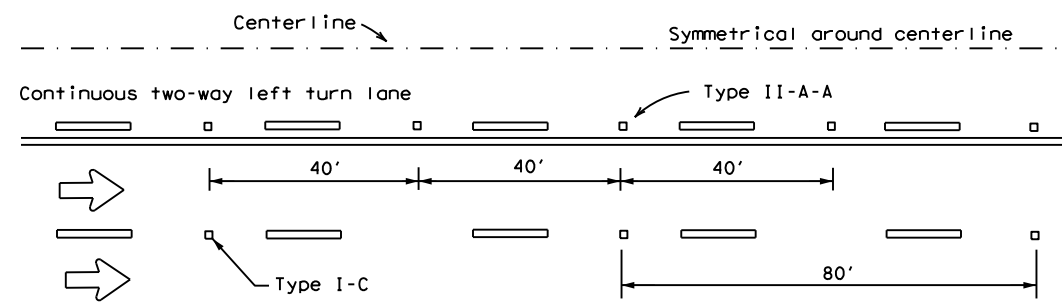
**CENTERLINE & LANE LINES  
FOR FOUR LANE TWO-WAY ROADWAYS**



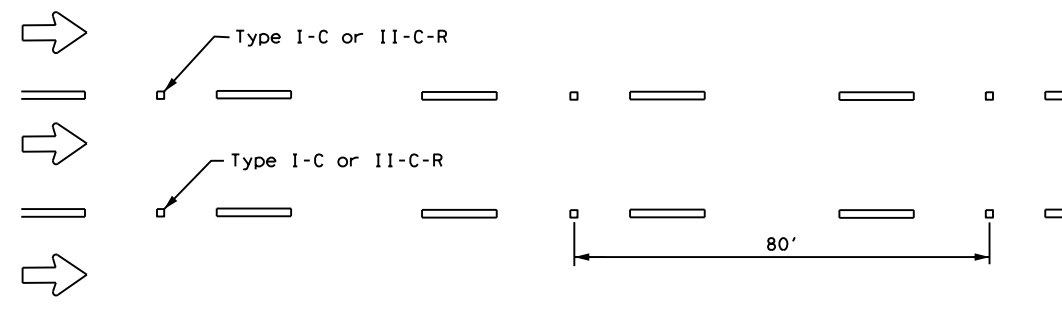
**DETAIL "A"**

**DETAIL "B"**

**DETAIL "C"**

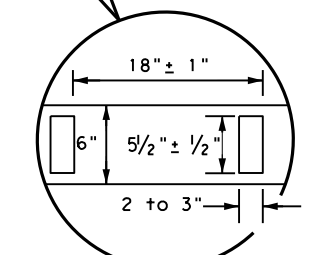
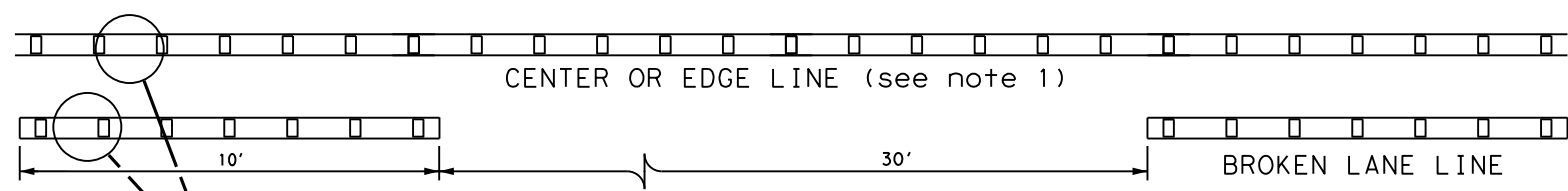


**CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE**



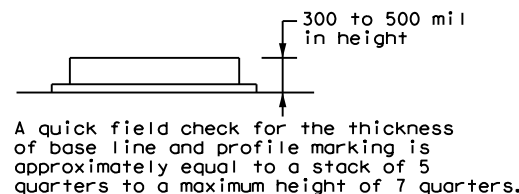
**LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)**

Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.  
 See Note 3.



**REFLECTORIZED PROFILE  
PATTERN DETAIL**

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

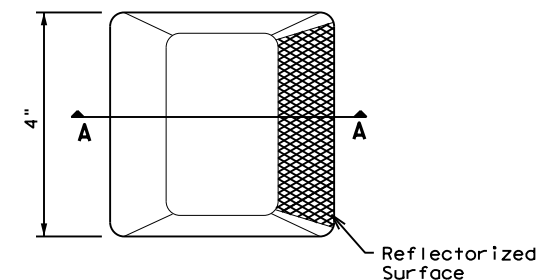


**NOTES**

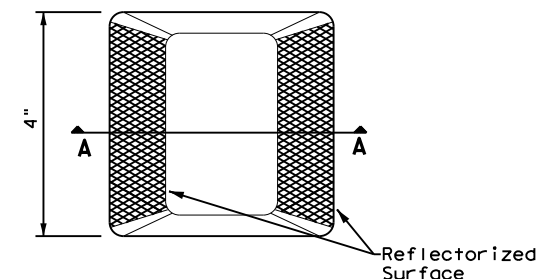
1. Edge lines should typically be 6" wide and the materials shall be specified in the plans.
2. Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

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

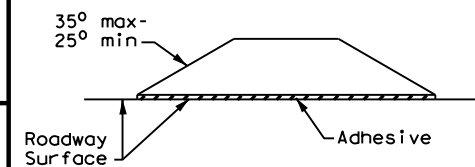
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



**Type I (Top View)**



**Type II (Top View)**



**SECTION A**

**RAISED PAVEMENT MARKERS**

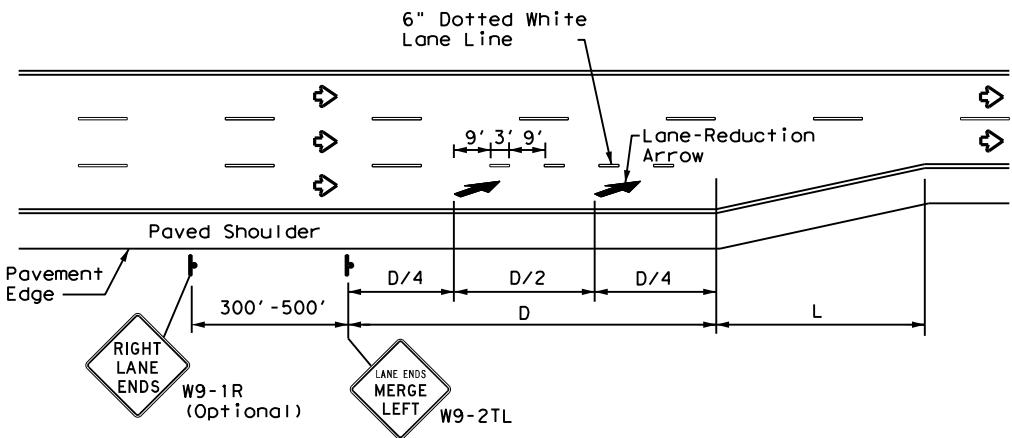


**POSITION GUIDANCE USING  
RAISED MARKERS  
REFLECTORIZED PROFILE  
MARKINGS  
PM(2) - 22**

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0220	05	080	SH 48
4-77 8-00 6-20	DIST	COUNTY	SHEET NO.	
4-92 2-10 12-22	PHR	CAMERON	284	
5-00 2-12				

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DATE: 2/23/2023 4:37:24 PM  
 FILE: \\txdot\project\wiseonline.com\TXDOTS\Documents\21 - PHR\Design Projects\PM(3)-22.dgn



**LANE REDUCTION**

**NOTES**

- 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.
- On divided highways, an additional RIGHT LANE ENDS (W9-1R) sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
- 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.
- For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.

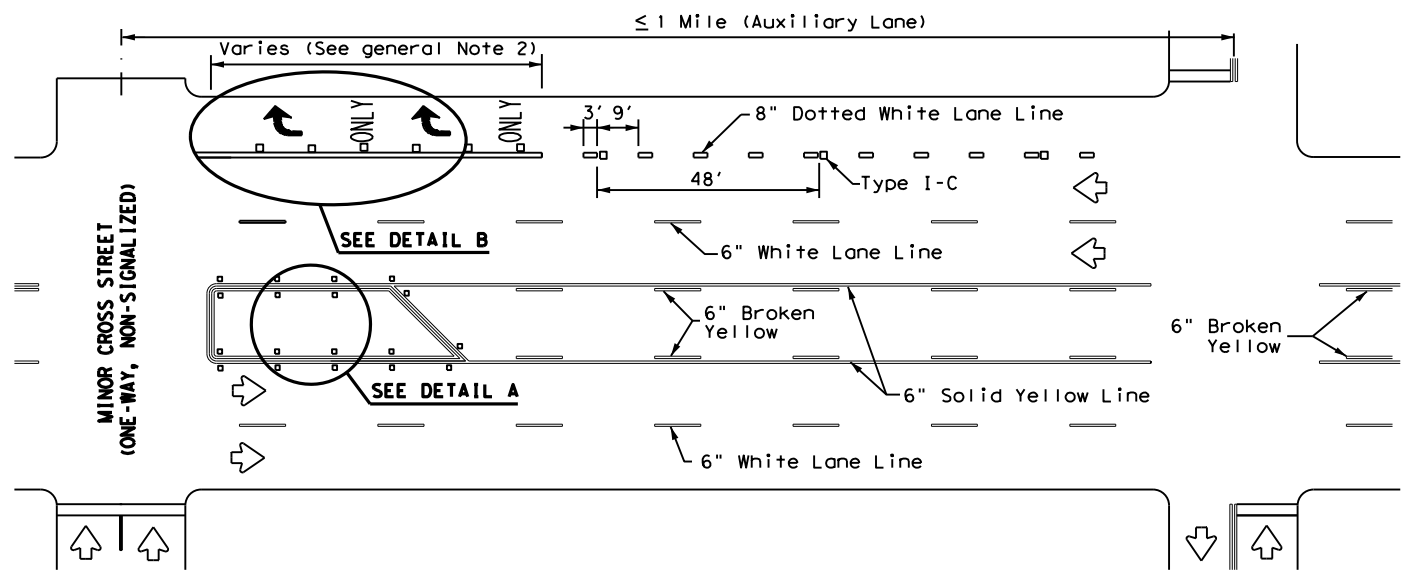
Posted Speed	D (ft)	L (ft)
30 MPH	460	$L = \frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	

**GENERAL NOTES**

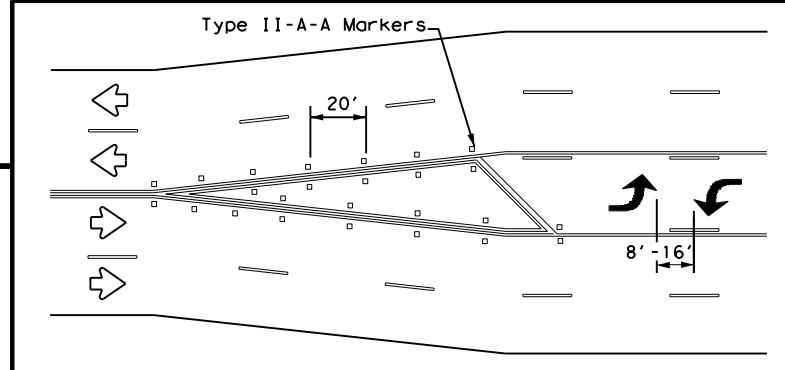
- Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
- 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.
- 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.
- Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer. See Chapter 3 of the Roadway Design Manual for additional information on turning lanes or storage lengths.

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

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

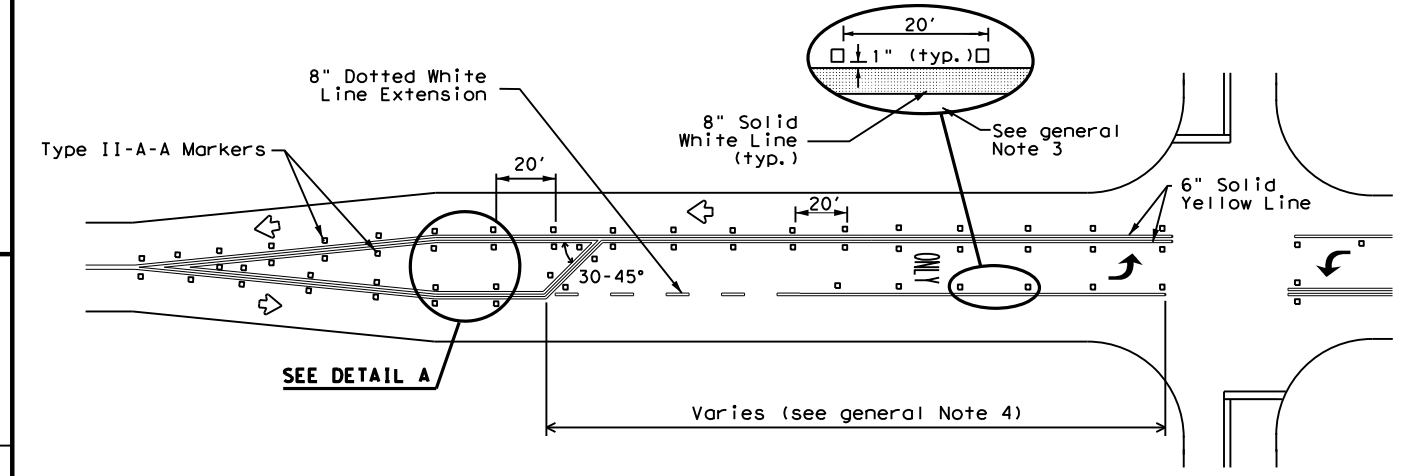


**TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE**

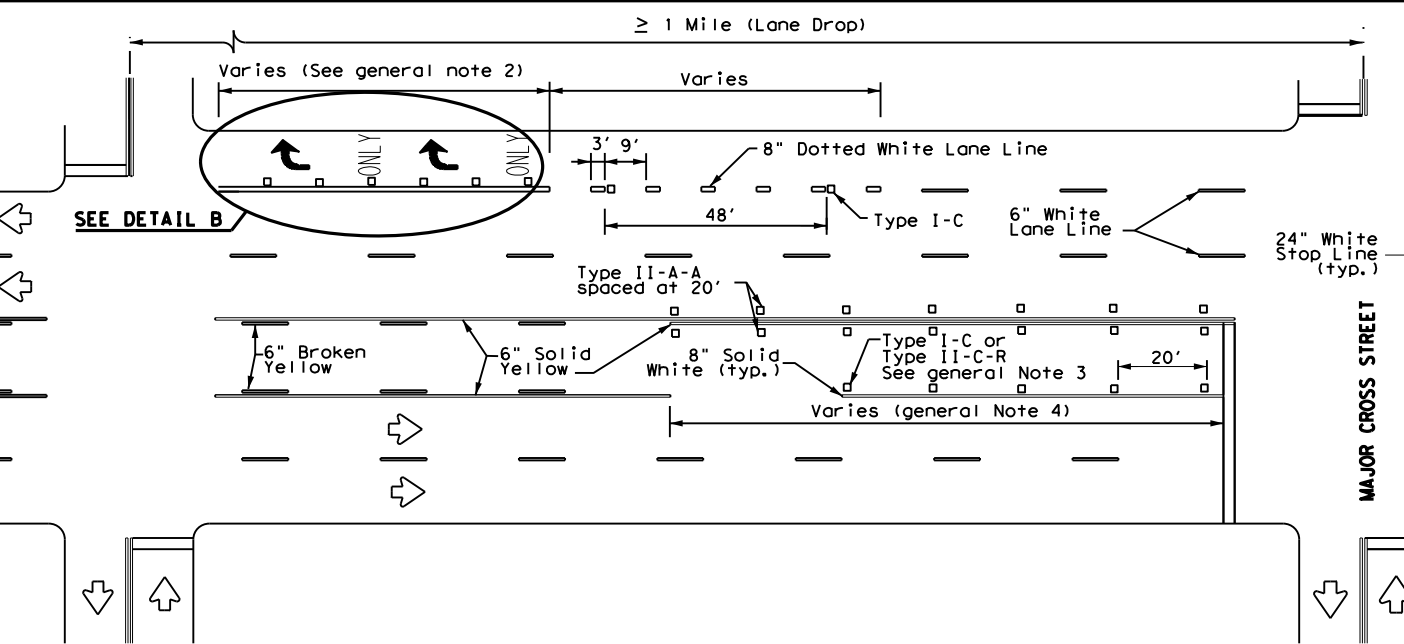


A two-way left-turn (TWLTL) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

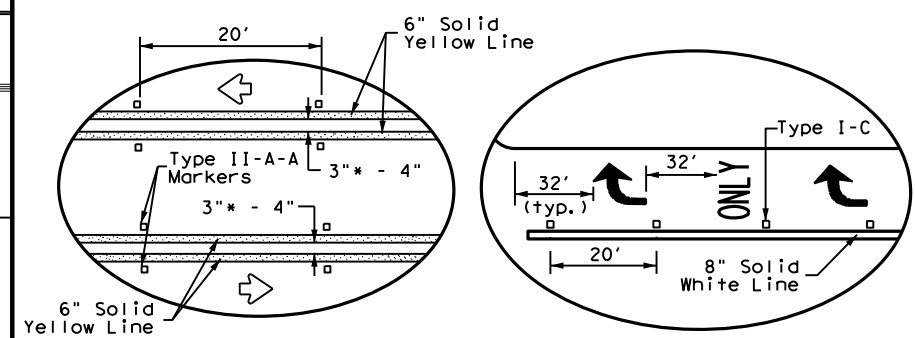
**TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY**



**TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS**



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



**DETAIL A**

**DETAIL B**

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

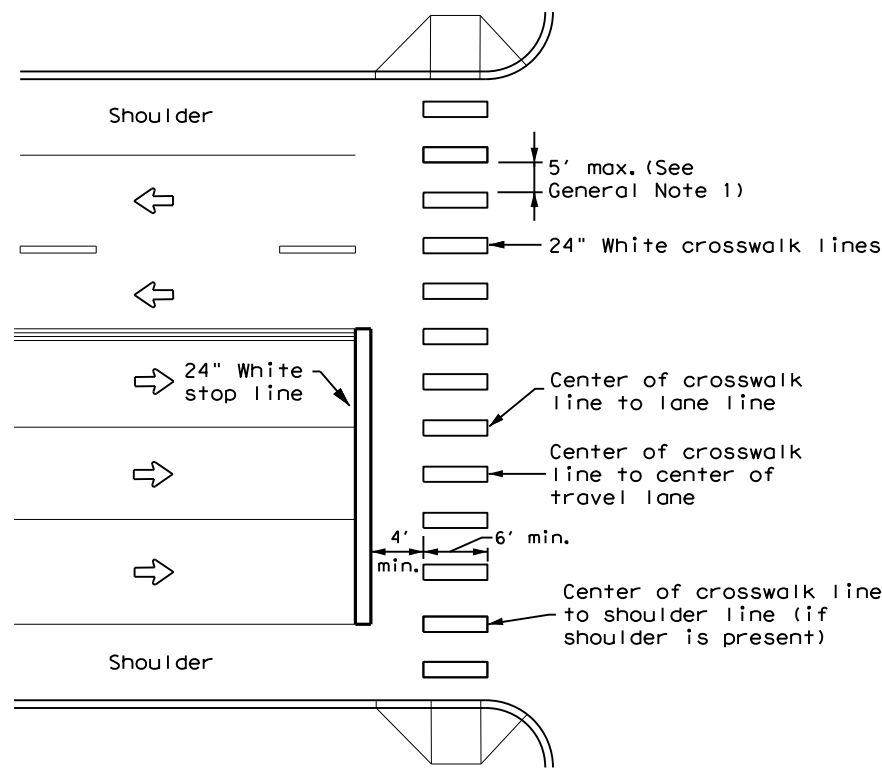
Traffic Safety Division Standard

**TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3) - 22**

FILE: pm3-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0220	05	080	SH 48
4-98 3-03 6-20	DIST	COUNTY	SHEET NO.	
5-00 2-10 12-22	PHR	CAMERON	285	
8-00 2-12				

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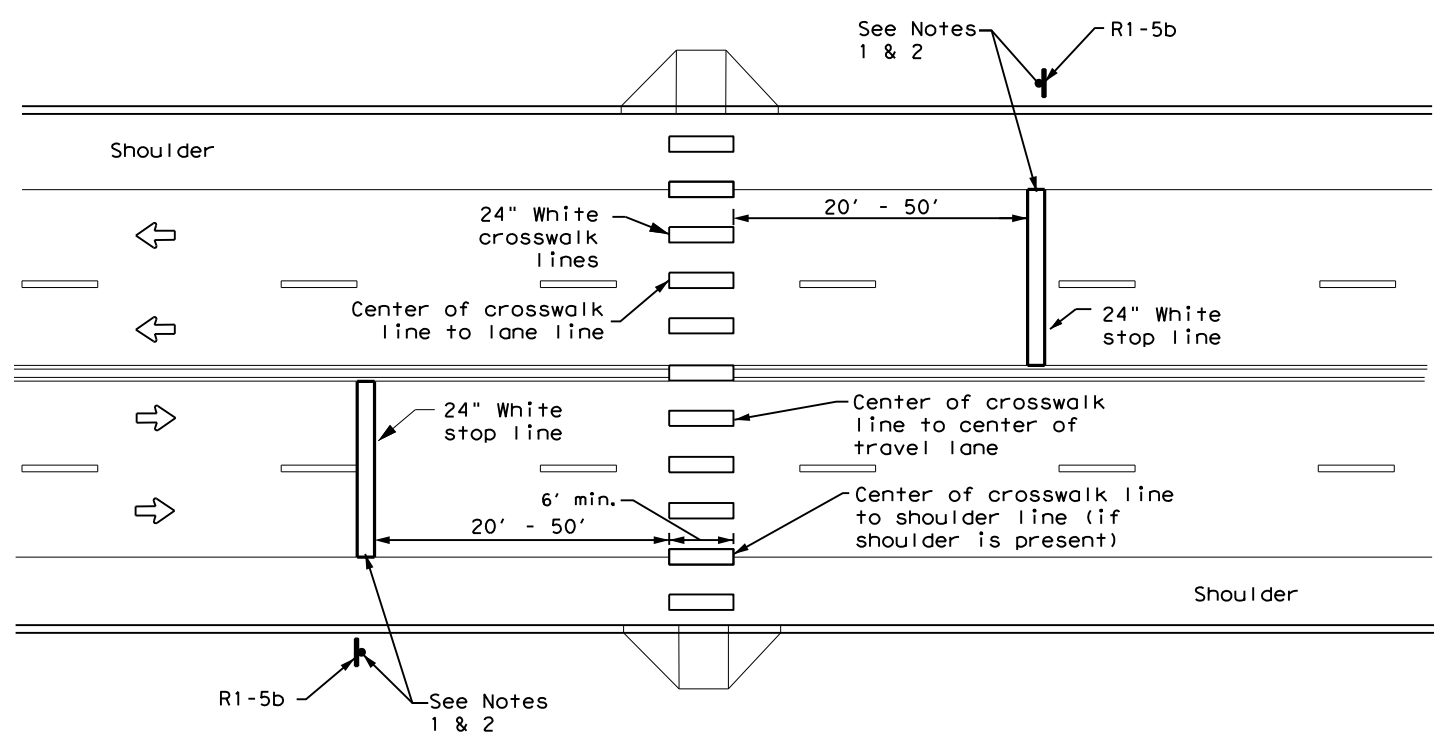
**HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH**

**GENERAL NOTES**

1. Longitudinal crosswalk lines should not be placed in the wheel path of vehicles. Center the crosswalk lines on travel lanes, lane lines, and shoulder lines (if present).
2. A minimum 6" clear distance shall be provided to the curb face. If the last crosswalk line falls into this distance it must be omitted.
3. For divided roadways, adjustments in spacing of the crosswalk lines should be made in the median so that the crosswalk lines are maintained in their proper location across the travel portion of the roadway.
4. At skewed crosswalks, the crosswalk lines are to remain parallel to the lane lines.
5. Each crosswalk shall be a minimum of 6' wide.
6. The High-Visibility Longitudinal Crosswalk is the preferred crosswalk pattern on State Highways. Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used. All crosswalk designs and dimension shall comply with the "Texas Manual on Uniform Traffic Control Devices."
7. Final placement of Stop Bar and Crosswalk shall be approved by the Engineer in the field.

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

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



**UNSIGNALIZED MIDBLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK**

**NOTES:**

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

<p><b>CROSSWALK PAVEMENT MARKINGS</b></p> <p><b>PM(4) - 22A</b></p>			
FILE: pm4-22a.dgn	DN:	CK:	DW:
© TxDOT December 2022	CONT	SECT	JOB
REVISIONS	0220	05	O80
6-20	DIST	COUNTY	SHEET NO.
6-22	PHR	CAMERON	286
12-22			



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**POST TYPE AND SUPPORT FOUNDATION DETAILS**

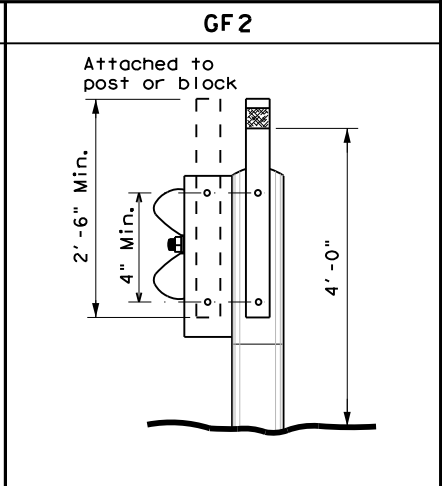
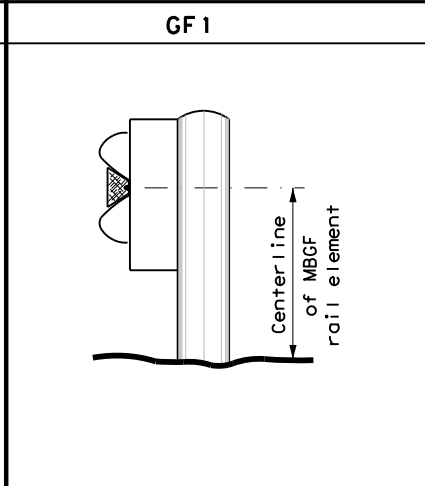
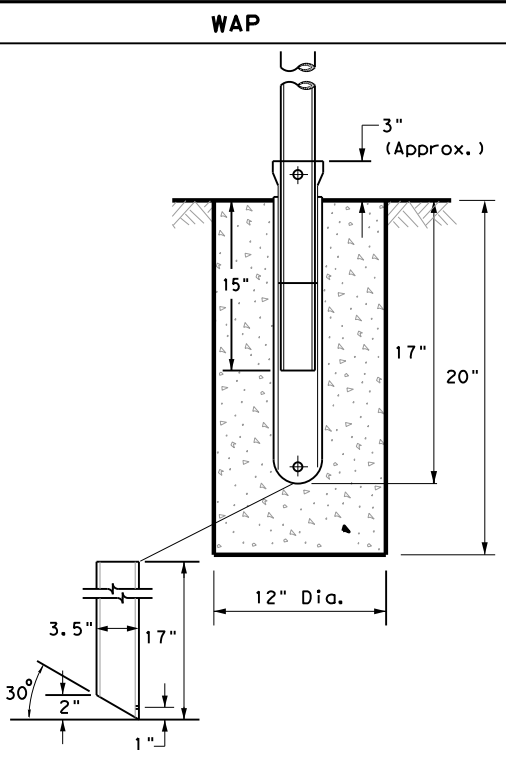
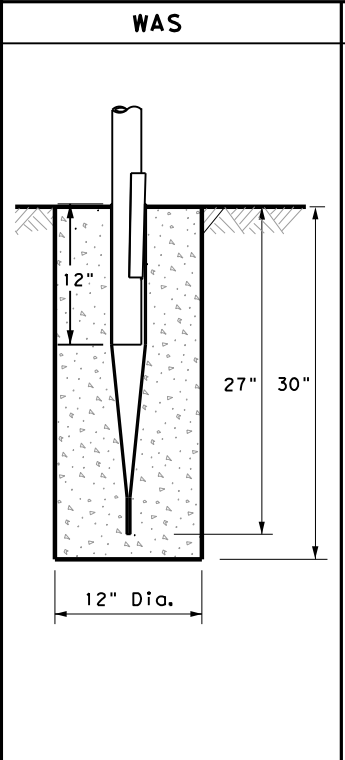
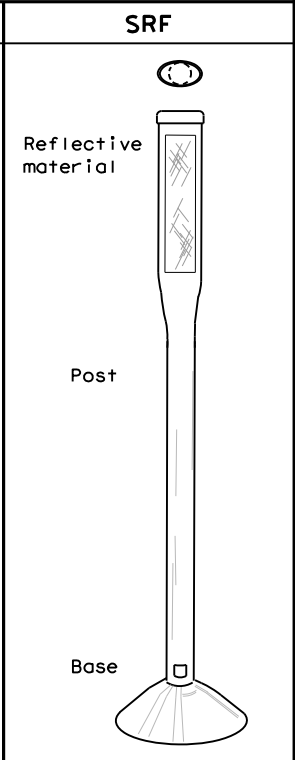
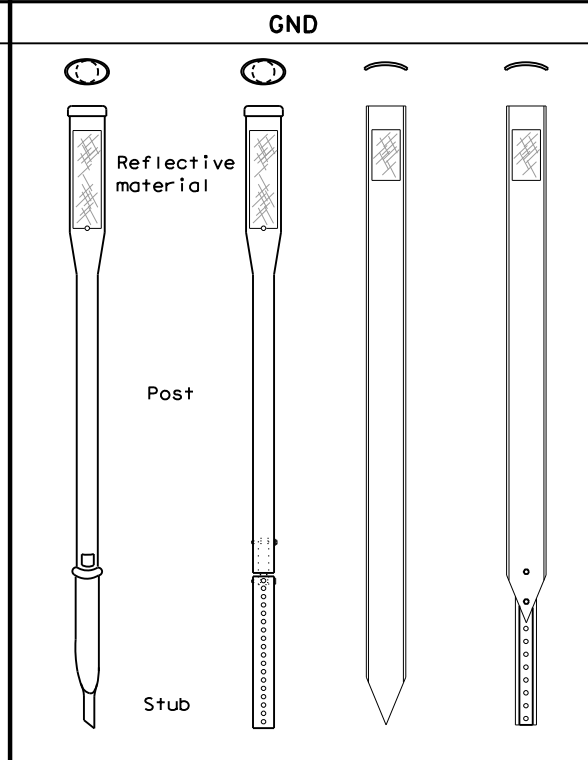
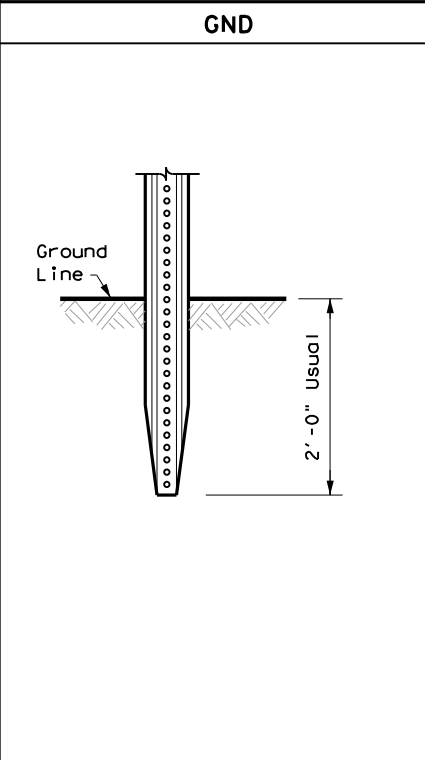
**TYPE OF BARRIER MOUNTS**

**WING CHANNEL (WC)**

**FLEXIBLE POSTS (YFLX, WFLX)**

**WEDGE ANCHOR SYSTEMS**

**GUARD FENCE ATTACHMENT**



**NOTES**

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

**EMBEDDED**      **SURFACE MOUNT**

**NOTES**

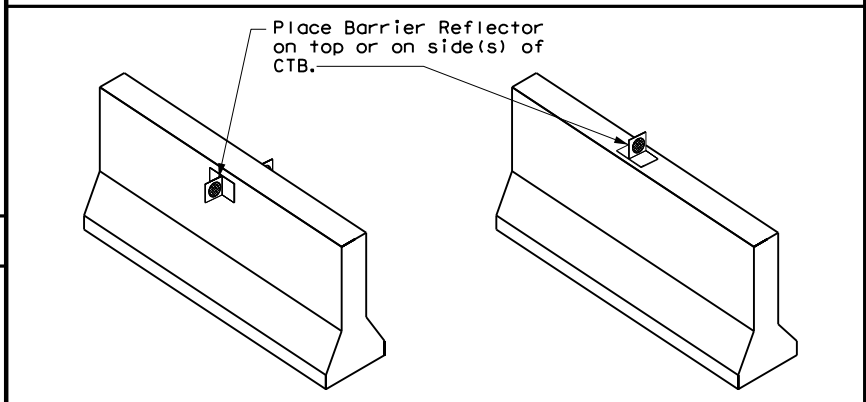
1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices.
2. Install per manufacturer's recommendations.
3. Post length may vary to meet field conditions.
4. When using yellow delineators with flexible posts to separate opposing direction of travel, such as centerline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

**STEEL**      **PLASTIC**

**NOTE**

1. Install per manufacturer's recommendations.

**CONCRETE TRAFFIC BARRIER (CTB)**



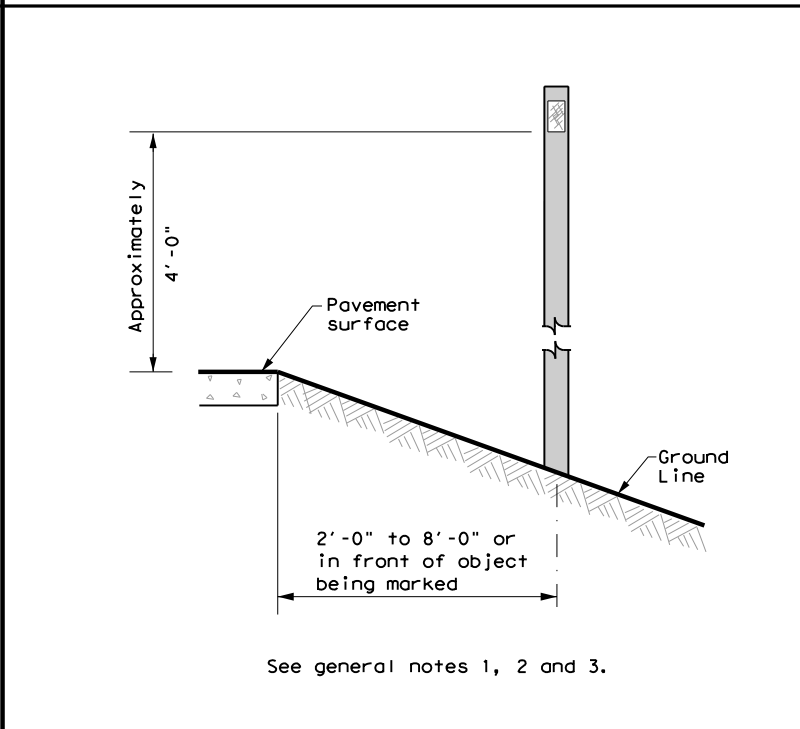
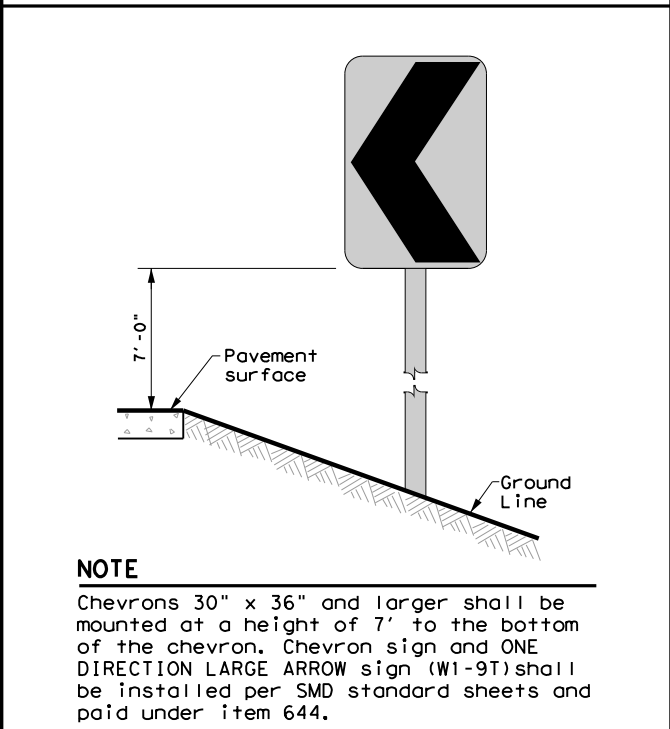
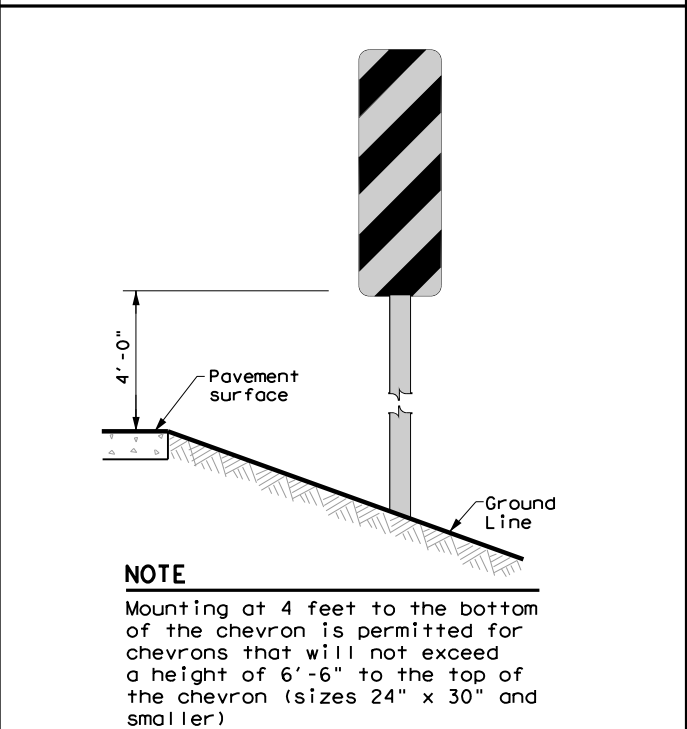
**GENERAL NOTES**

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

**TYPES 1,3, AND 4 OBJECT MARKERS AND CHEVRONS**

**CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN**

**DELINEATORS AND TYPE 2 OBJECT MARKERS**



Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

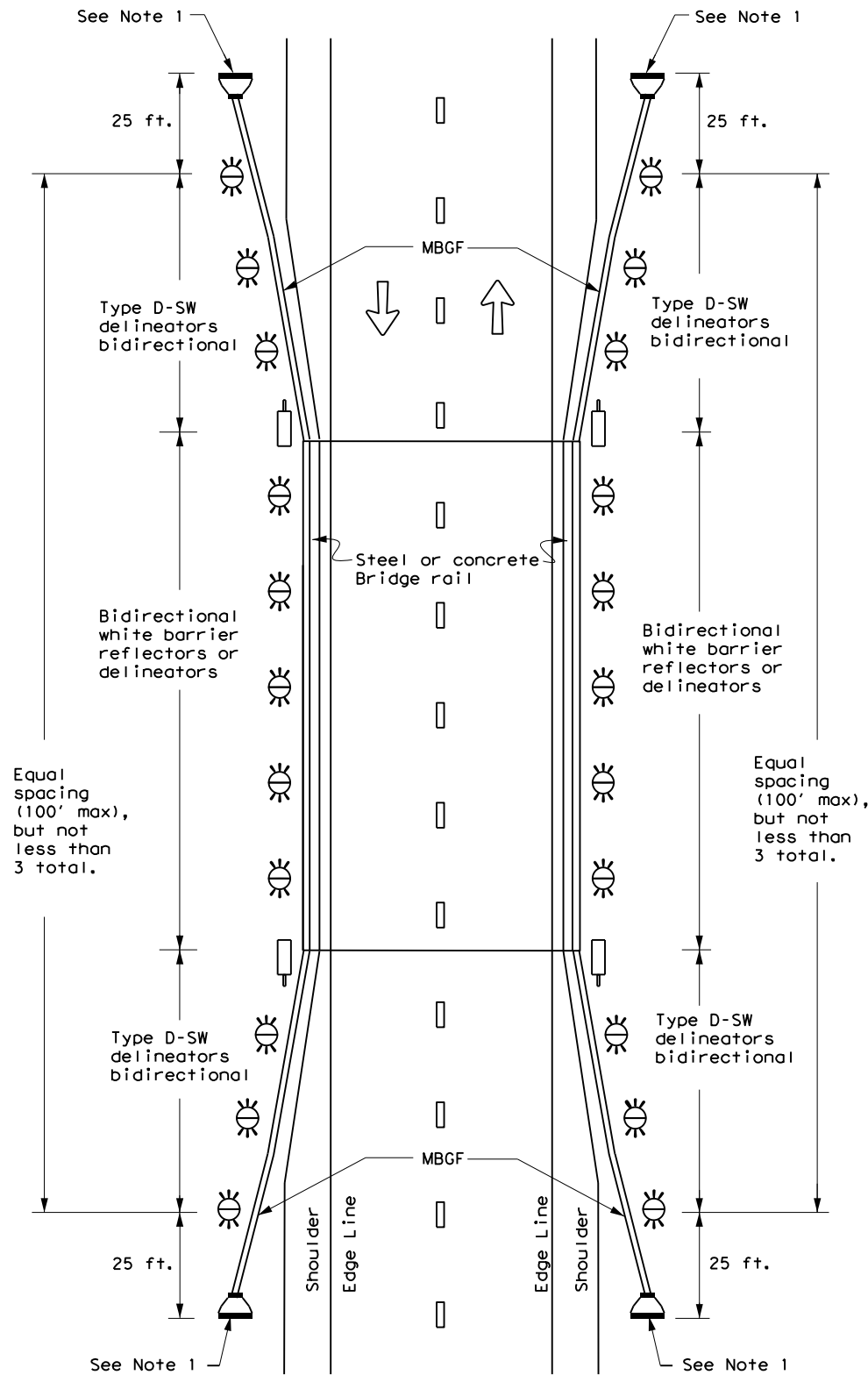
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© TXDOT August 2004	CONT	SECT	JOB	HIGHWAY
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10-09 3-15	DIST	COUNTY	SHEET NO.	
4-10 7-20	PHR	CAMERON	288	







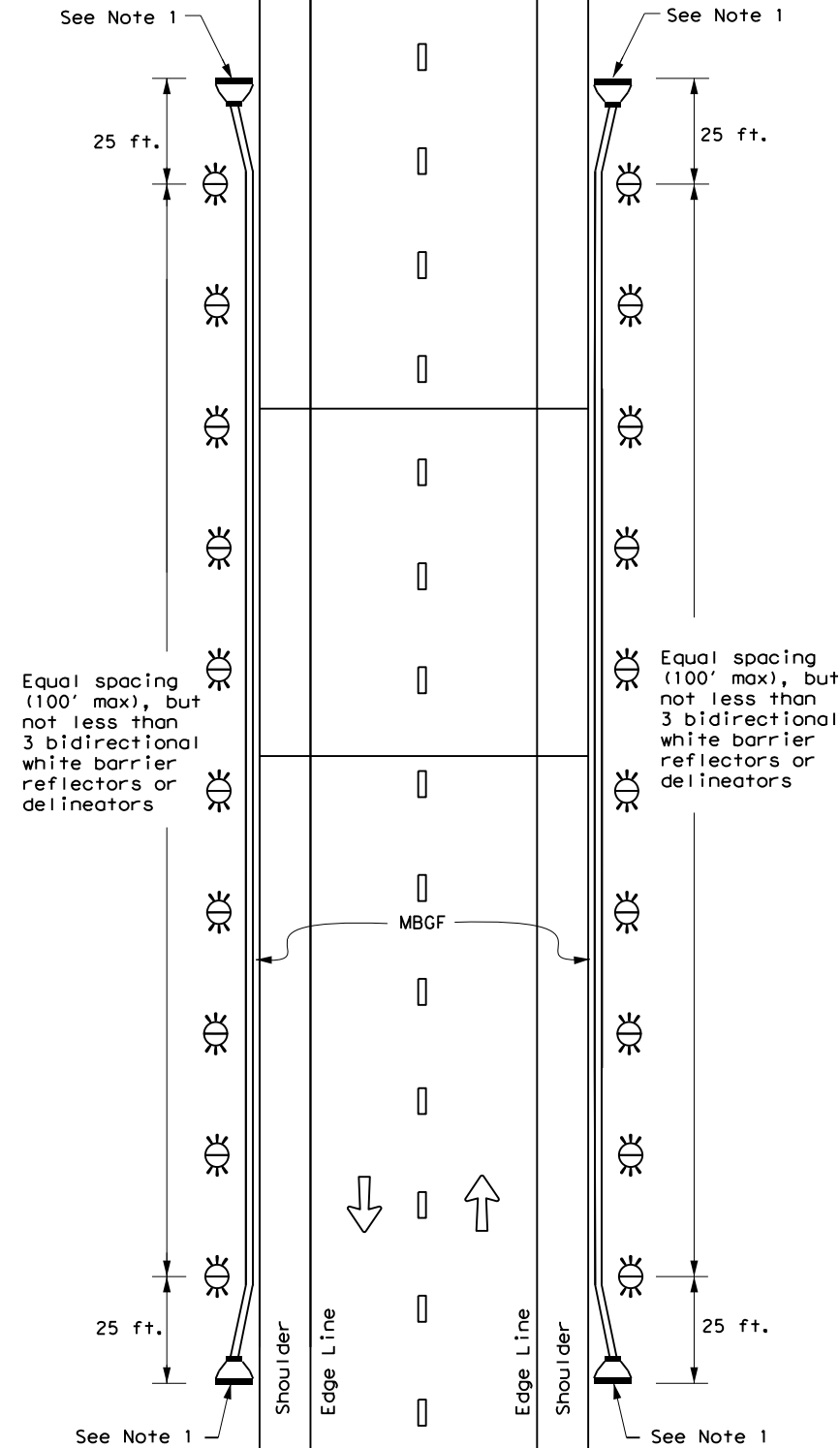
**TWO-WAY, TWO LANE ROADWAY  
WITH REDUCED WIDTH APPROACH RAIL**



**NOTE:**

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

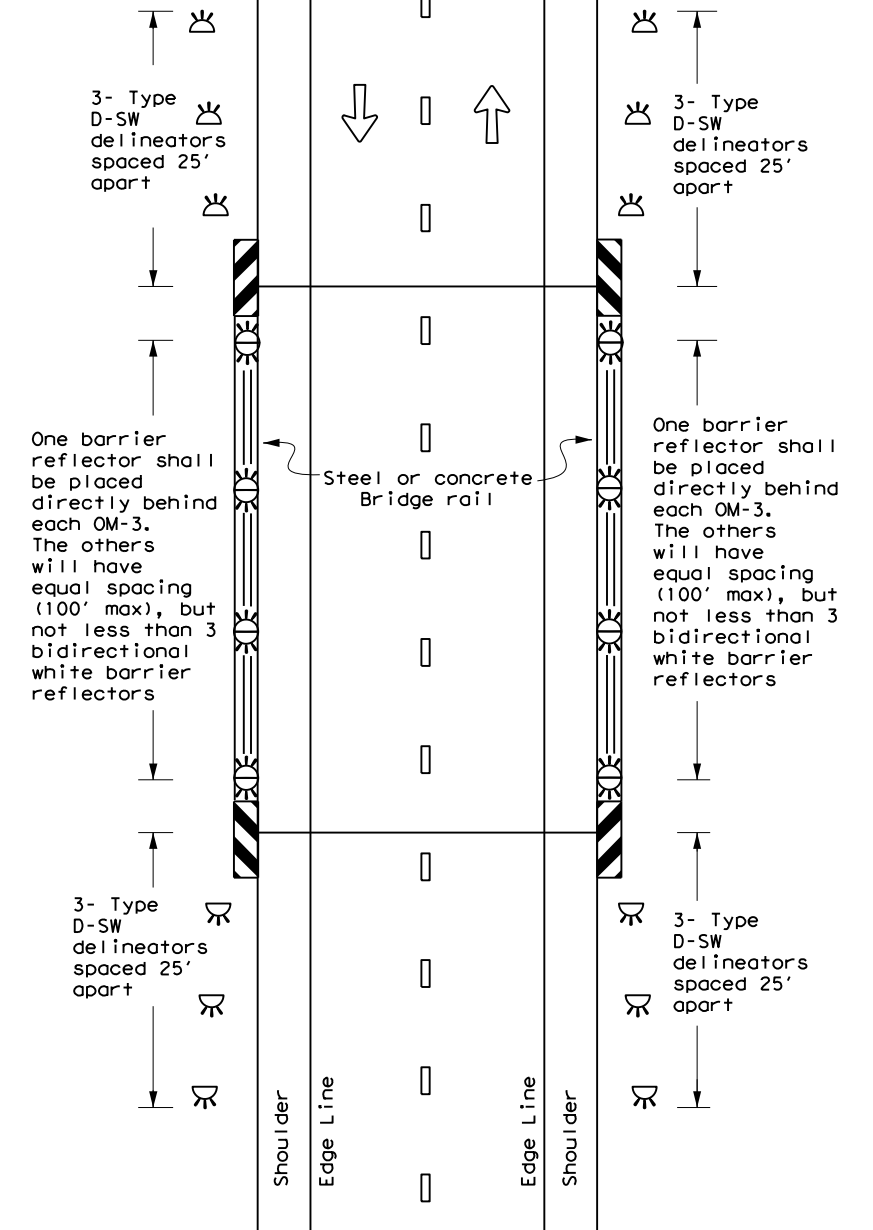
**TWO-WAY, TWO LANE ROADWAY  
WITH METAL BEAM GUARD FENCE (MBGF)**



**NOTE:**

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

**TWO-WAY, TWO LANE ROADWAY  
BRIDGE WITH NO APPROACH RAIL**



**LEGEND**

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



**DELINEATOR &  
OBJECT MARKER  
PLACEMENT DETAILS**

**D & OM(5) - 20**

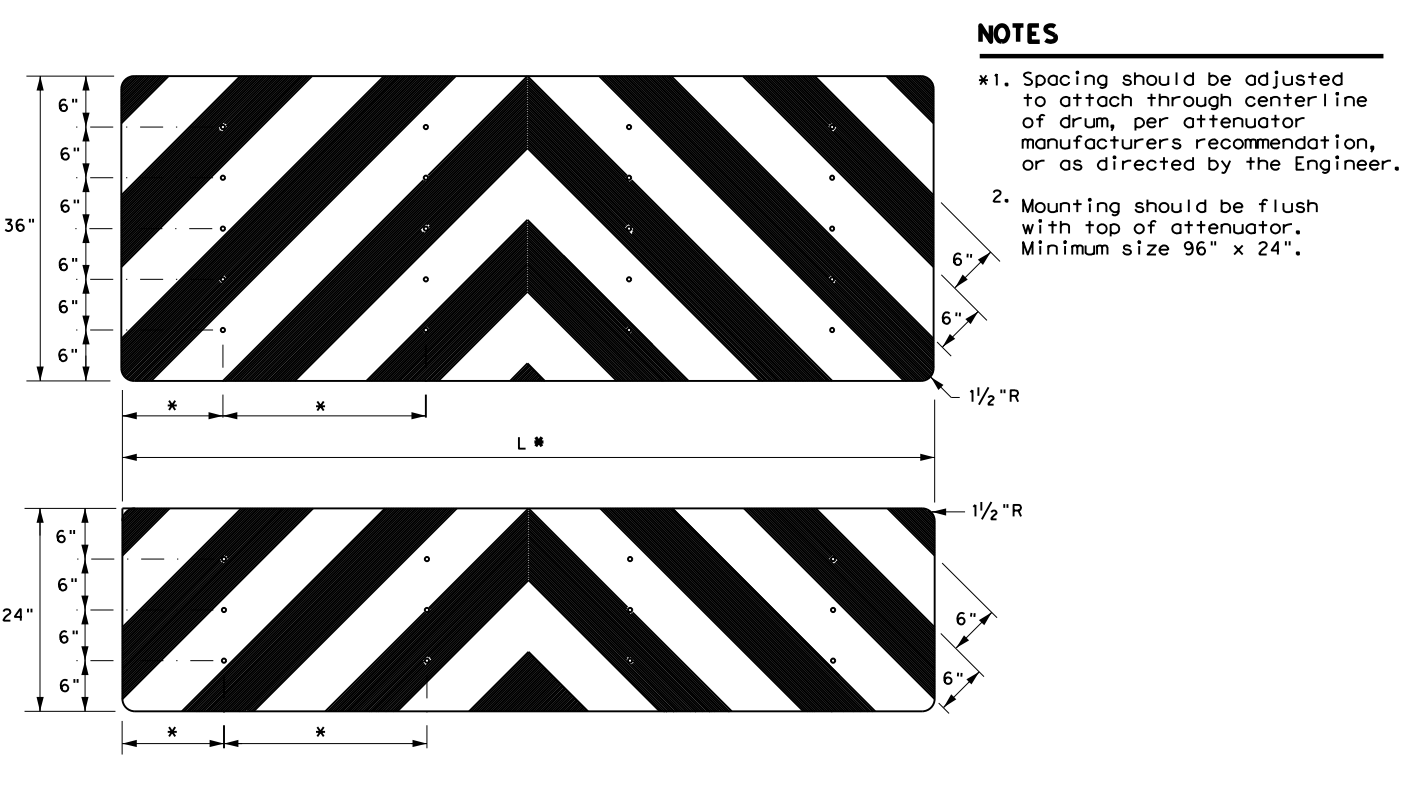
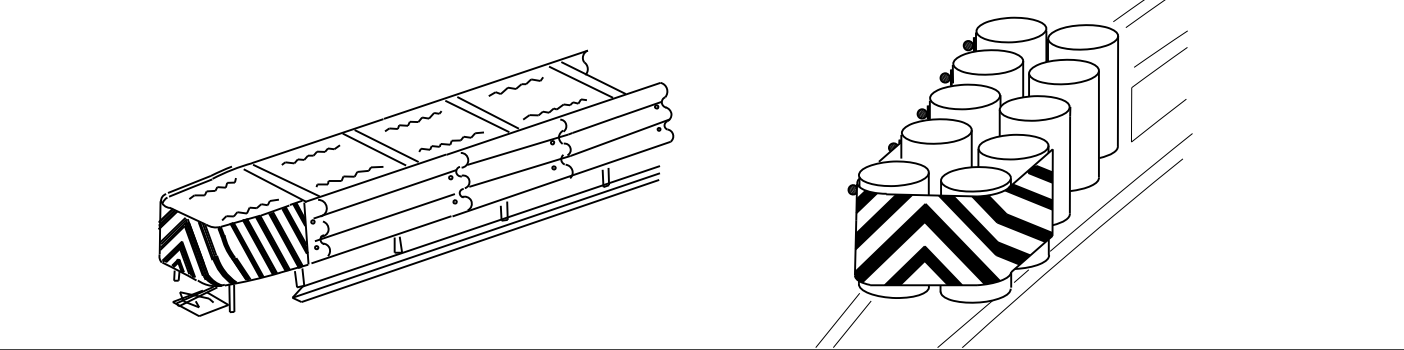
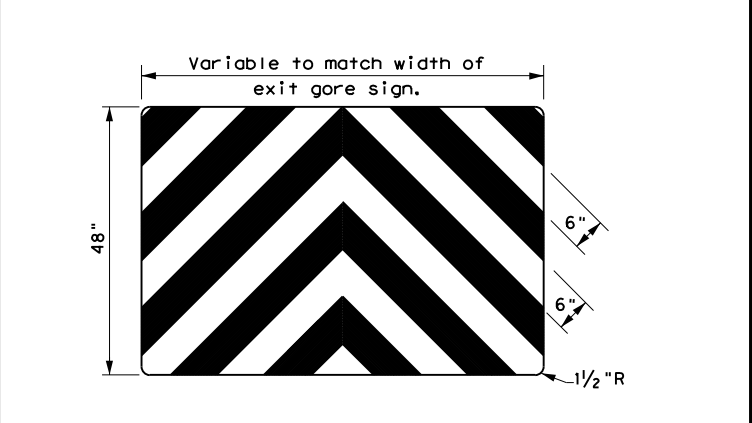
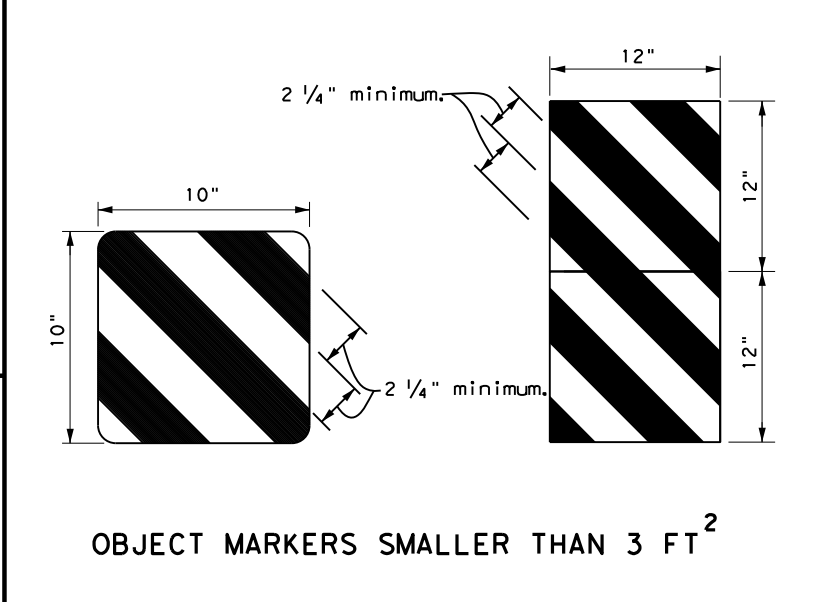
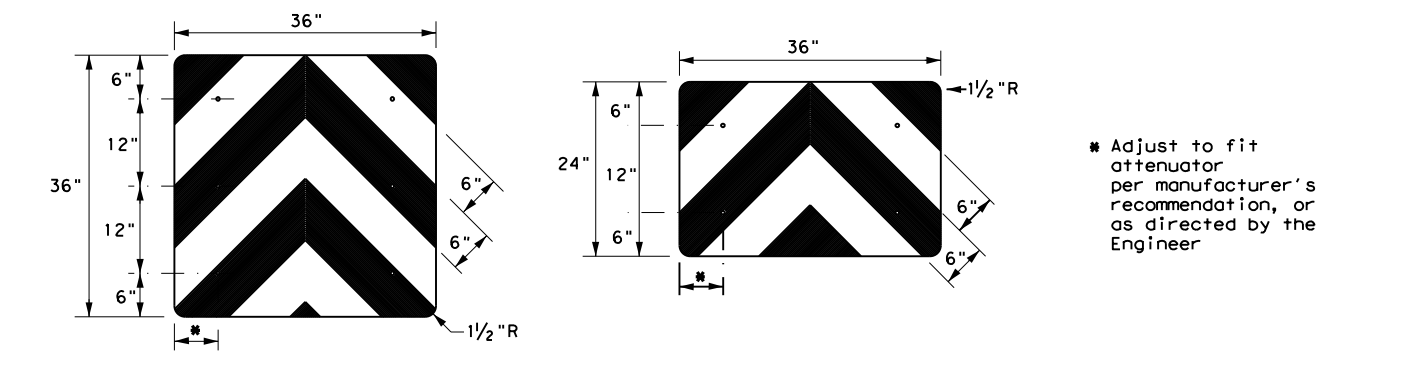
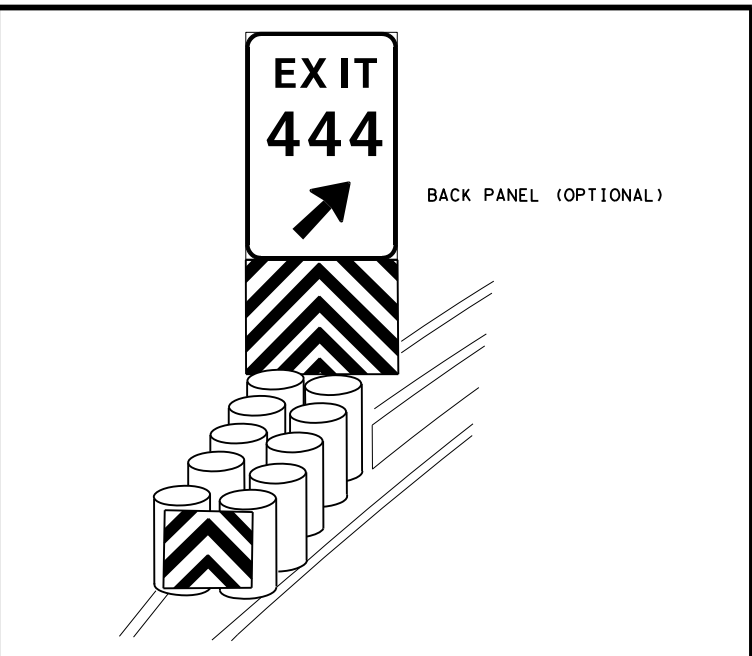
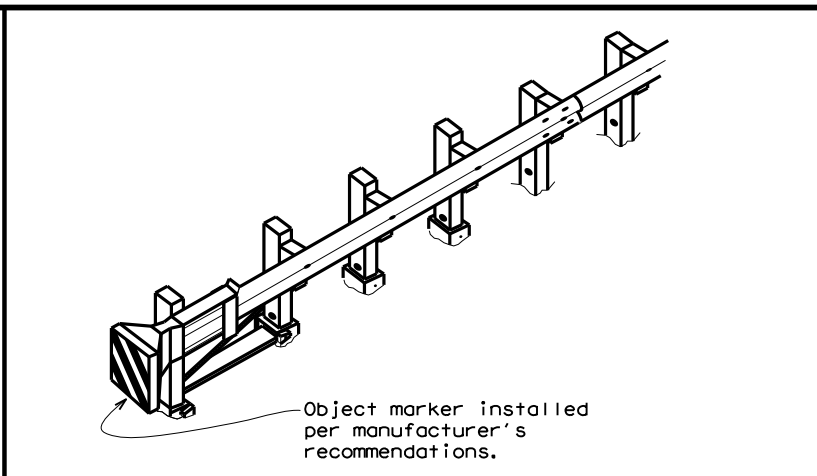
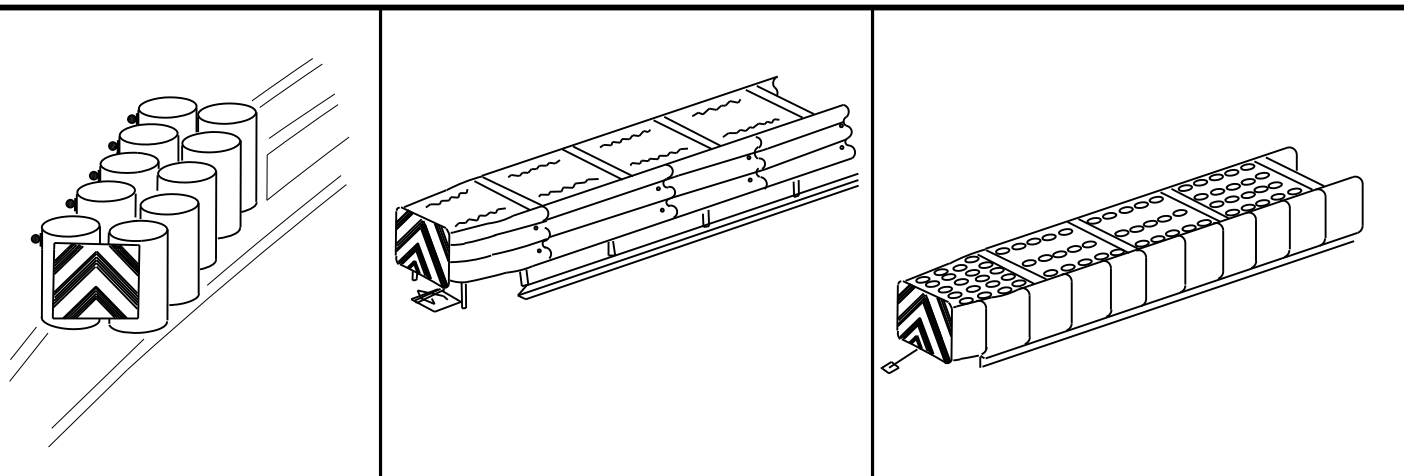
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© TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
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7-20	DIST	COUNTY	SHEET NO.	
	PHR	CAMERON	291	

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to any other format or for the use of this standard in any other project.

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 The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or the use of this standard in any other manner.



**NOTES**

- Object Markers shall conform to the Texas MUTCD and meet the color and reflectivity requirement of Department Material Specification DMS 8300. Background shall be yellow reflective sheeting (Type B or C) and Chevron shall be black.
- Object Markers may be fabricated from adhesive backed reflective sheeting applied directly to guardrail end treatment, or applied directly to an "end cap" as per the manufacturer's recommendation. Direct applied sheeting shall provide a smooth surface and have no wrinkles, air bubbles, cuts or tears. A radius at the corners is not required for direct applied sheeting.
- Object Marker size may be reduced to fit smaller devices. Width of alternating black and yellow stripes are typically 6". Object Markers smaller than 3ft may have reduced width stripes of a minimum of 2 1/4".
- Pop rivets, screws, or nuts and bolts may be used to attach object markers and reflectors. Holes, slots or other openings may be cut or drilled through object markers to allow cable or other attachments.
- Object Marker at nose of attenuator is subsidiary to the attenuator.
- See D & OM (1-4) for required barrier reflectors.

<b>DELINEATOR &amp; OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS</b> <b>D &amp; OM(VIA) -20</b>			
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© TXDOT December 1989	CONT	SECT	JOB
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	PHR	CAMERON	293

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# ENVIRONMENTAL ISSUES

*Pharr District Central Design*



**COVER SHEET**

© 2022	CONT	SECT	JOB	HIGHWAY
	0220	05	080	SH 48
	DIST	COUNTY		SHEET NO.
	PHR	CAMERON		294

**STORMWATER POLLUTION PREVENTION PLAN (SWP3):**

This SWP3 has been developed in accordance with the TPDES Construction General Permit TXR150000 (CGP). The Texas Department of Transportation (TxDOT) ensures that project specifications include adequate best management practices (BMPs) for this project.

For all projects with soil disturbing activity and for projects that have Environmental, Permits, Issues, and Commitments (EPICs) dependent on stormwater controls and water quality measures TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office, Area Office, or electronically.

This SWP3 is consistent with requirements specified in applicable stormwater plans and the projects environmental permits, issues, and commitments (EPICs). A copy of the CGP is included in Attachment 2.12 of the SWP3 binder.

**1.0 SITE/PROJECT DESCRIPTION**

**1.1 PROJECT CONTROL SECTION JOB (CSJ):**

0220-05-080

**1.2 PROJECT LIMITS:**

From: SH 4 (BOCA CHICA BLVD.)

To: FM 511

**1.3 PROJECT COORDINATES:**

BEGIN: (Lat) 25.9206962, (Long) -97.4663776

END: (Lat) 25.9524923, (Long) -97.4151503

**1.4 TOTAL PROJECT AREA (Acres):** 36.32

**1.5 TOTAL AREA TO BE DISTURBED (Acres):** 3.03

**1.6 NATURE OF CONSTRUCTION ACTIVITY:**

CONSTRUCTION OF RAISED CONCRETE MEDIAN AND ROADWAY OVERLAY.

**1.7 MAJOR SOIL TYPES:**

Soil Type	Description
BENITO CLAY	PONDED
BENITO URBAN LAND COMPLEX	PONDED
CHARGO SILTY CLAY	
HARLINGEN CLAY	
HARLINGEN URBAN LAND COMPLEX	
LAREDO SILTY CLAY LOAM	0 TO 1% SLOPES
LAREDO SILTY CLAY LOAM	SALINE
LAREDO URBAN LAND COMPLEX	
OLMITO SILTY CLAY	

**1.8 PROJECT SPECIFIC LOCATIONS (PSLs):**

PSLs must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. PSLs may be identified during preconstruction meetings or during the construction process. Please choose from the options below:

- PSLs determined during preconstruction meeting
- PSLs determined during construction
- No PSLs planned for construction

Type	Sheet #s

All off-ROW PSLs required by the Contractor are the Contractor's responsibility. The Contractor shall secure all permits required by local, state, federal laws for off-ROW PSLs. The contractor shall provide diagrams, areas of disturbance, acreage, and BMPs for all off-ROW PSLs within one mile of the project.

**1.9 CONSTRUCTION ACTIVITIES:**

(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.5.)

- Mobilization
- Install sediment and erosion controls
- Blade existing topsoil into windrows, prep ROW, clear and grub
- Remove existing pavement
- Grading operations, excavation, and embankment
- Excavate and prepare subgrade for proposed pavement widening
- Remove existing culverts, safety end treatments (SETs)
- Remove existing metal beam guard fence (MBGF), bridge rail
- Install proposed pavement per plans
- Install culverts, culvert extensions, SETs
- Install mow strip, MBGF, bridge rail
- Place flex base
- Rework slopes, grade ditches
- Blade windrowed material back across slopes
- Revegetation of unpaved areas
- Achieve site stabilization and remove sediment and erosion control measures

- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**1.10 POTENTIAL POLLUTANTS AND SOURCES:**

- Sediment laden stormwater from stormwater conveyance over disturbed area
- Fuels, oils, and lubricants from construction vehicles, equipment, and storage
- Solvents, paints, adhesives, etc. from various construction activities
- Transported soils from offsite vehicle tracking
- Construction debris and waste from various construction activities
- Contaminated water from excavation or dewatering pump-out water
- Sanitary waste from onsite restroom facilities
- Trash from various construction activities/receptacles
- Long-term stockpiles of material and waste
- Discharges from concrete washout activities, runoff from concrete cutting activities, and other concrete related activities.

- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**1.11 RECEIVING WATERS:**

Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody
DRAINAGE DITCHES FLOWING INTO SAN MARTIN LAKES	STREAM SEGMENT 2494B

\* Add (\*) for impaired waterbodies with pollutant in ( ).

**1.12 ROLES AND RESPONSIBILITIES: TxDOT**

- Development of plans and specifications
- Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
- Post Construction Site Notice
- Submit NOI/CSN to local MS4
- Perform SWP3 inspections
- Maintain SWP3 records and update to reflect daily operations
- Complete and submit Notice of Termination to TCEQ
- Maintain SWP3 records for 3 years

- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR**

- Day To Day Operational Control
- Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
- Post Construction Site Notice
- Submit NOI/CSN to local MS4
- Maintain schedule of major construction activities
- Install, maintain and modify BMPs
- Complete and submit Notice of Termination to TCEQ
- Maintain SWP3 records for 3 years

- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**1.14 LOCAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) OPERATOR COORDINATION:**

MS4 Entity
CITY OF BROWNSVILLE



**STORMWATER POLLUTION PREVENTION PLAN (SWP3)**

© 2023 July 2023 Sheet 1 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
6	STP 2024(690)HES			295
STATE	STATE DIST.	COUNTY		
TEXAS	PHARR	CAMERON		
CONT.	SECT.	JOB	HIGHWAY NO.	
0220	05	080	SH 48	

**STORMWATER POLLUTION PREVENTION PLAN (SWP3):**

**2.0 BEST MANAGEMENT PRACTICES (BMPs) AND CONTROLS, INSPECTION, AND MAINTENANCE**

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

**2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:**

**T / P**

- Protection of Existing Vegetation
- Vegetated Buffer Zones
- Soil Retention Blankets
- Geotextiles
- Mulching/ Hydromulching
- Soil Surface Treatments
- Temporary Seeding
- Permanent Planting, Sodding or Seeding
- Biodegradable Erosion Control Logs
- Rock Filter Dams/ Rock Check Dams
- Vertical Tracking
- Interceptor Swale
- Riprap
- Diversion Dike
- Temporary Pipe Slope Drain
- Embankment for Erosion Control
- Paved Flumes
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**2.2 SEDIMENT CONTROL BMPs:**

**T / P**

- Biodegradable Erosion Control Logs
- Dewatering Controls
- Inlet Protection
- Rock Filter Dams/ Rock Check Dams
- Sandbag Berms
- Sediment Control Fence
- Stabilized Construction Exit
- Floating Turbidity Barrier
- Vegetated Buffer Zones
- Vegetated Filter Strips
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

Sediment control BMPs requiring design capacity calculations (See SWP3 Attachment 1.3.):

**T / P**

- Sediment Trap
  - Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
  - 3,600 cubic feet of storage per acre drained
- Sedimentation Basin
  - Not required (<10 acres disturbed)
  - Required (>10 acres) and implemented.
    - Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
    - 3,600 cubic feet of storage per acre drained
  - Required (>10 acres), but not feasible due to:
    - Available area/Site geometry
    - Site slope/Drainage patterns
    - Site soils/Geotechnical factors
    - Public safety
    - Other: \_\_\_\_\_

**2.3 PERMANENT CONTROLS:**

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

**2.4 OFFSITE VEHICLE TRACKING CONTROLS:**

- Excess dirt/mud on road removed daily
- Haul roads dampened for dust control
- Loaded haul trucks to be covered with tarpaulin
- Stabilized construction exit
- Daily street sweeping

- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**2.5 POLLUTION PREVENTION MEASURES:**

- Chemical Management
- Concrete and Materials Waste Management
- Debris and Trash Management
- Dust Control
- Sanitary Facilities

- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**2.6 VEGETATED BUFFER ZONES:**

Natural vegetated buffers shall be maintained as feasible to protect adjacent surface waters. If vegetated natural buffer zones are not feasible due to site geometry, the appropriate additional sediment control measures have been incorporated into this SWP3.

Type	Stationing	
	From	To

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

**2.7 ALLOWABLE NON-STORMWATER DISCHARGES:**

- Fire hydrant flushings
- Irrigation drainage
- Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- Potable water sources
- Springs
- Uncontaminated groundwater
- Water used to wash vehicles or control dust
- Other allowable non-stormwater discharges as allowed by TPDES GP TXR150000.

**2.8 DEWATERING:**

Dewatering discharges of accumulated stormwater, groundwater, and surface water including discharges from dewatering of trenches, excavations, foundations, vaults, and other points of accumulation are prohibited unless managed by appropriate controls to prevent and minimize the offsite discharge of sediment and other pollutants.

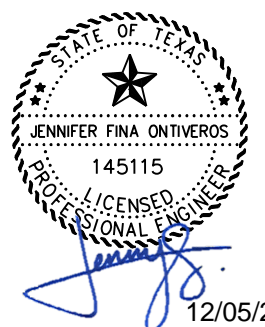
**2.9 INSPECTIONS:**

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3.

When dewatering activities are present, a daily inspection will be conducted once per day during those activities and documented in accordance with CGP and TxDOT requirements.

**2.10 MAINTENANCE:**

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3.



**STORMWATER POLLUTION PREVENTION PLAN (SWP3)**

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	STP 2024(690)HES		296
STATE	STATE DIST.	COUNTY	
TEXAS	PHARR	CAMERON	
CONT.	SECT.	JOB	HIGHWAY NO.
0220	05	080	SH 48



During the planning phase of project development, the following Environmental Permits, Issues and Commitments have been developed during coordination with resource agencies, local governmental entities and the general public. Any change orders and/or deviations from the final design must be reported to the Engineer prior to the commencement of construction activities as additional environmental clearances may be required.

**I. Clean Water Act, Section 402; Stormwater Pollution Prevention**

Action Items Required :  No Action Required

- 1.  The contractor must implement the SW3P by installing Best Management Practices (BMPs) as indicated in the construction plans and maintained appropriately throughout construction. BMPs must be in place prior to the start of construction. The SW3P may need to be revised as necessary as construction progresses.
- 2.  For all construction PSL's off the ROW, the contractor must certify compliance with all applicable laws, rules and regulations pertaining to the preservation of cultural resources, natural resources and the environment.
- 3.  Based on the acreage of impact, select the appropriate box below:
  - This project will disturb less than 1 acre of soil and is not part of a larger common plan of development; therefore, a NOI and TPDES Site Notice are not required for this project.
  - or
  - This project will disturb equal to or more than 1 acre of soil but less than 5 acres; therefore a NOI is not required but a TPDES Site Notice is required. The Construction Site Notice (CSN) is required to be posted at the construction site in a publicly accessible location for review by the public, TCEQ, EPA and other Inspectors.
  - or
  - This project will disturb equal to or more than 5 acres of soil and will require a NOI and TPDES Site Notice. The NOI and Site Notice are required to be posted at the construction site in a publicly accessible location.
- 4.  Need to address MS4 requirements (Cameron & Hidalgo Counties only)  MS4 requirements not needed

**II. Clean Water Act, Sections 401 and 404 Compliance**

Action Items Required :  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)

- |   |   |  |
|---|---|--|
| <input type="checkbox"/> Temporary Vegetation | <input type="checkbox"/> Interceptor Swale                  | <input type="checkbox"/> Mulch Filter Berms and/or Socks   |
| <input type="checkbox"/> Blankets, Matting    | <input type="checkbox"/> Diversion Dike                     | <input type="checkbox"/> Compost Filter Berms and/or Socks |
| <input type="checkbox"/> Mulch                | <input checked="" type="checkbox"/> Erosion Control Compost | <input type="checkbox"/> Compost Blankets                  |
| <input type="checkbox"/> Sodding              |   |  |

Category II (Sedimentation Control)

- |   |   |  |
|---|---|--|
| <input checked="" type="checkbox"/> Silt Fence  | <input type="checkbox"/> Hay (Straw) Bale Dike              | <input type="checkbox"/> Mulch Filter Berms and/or Socks   |
| <input checked="" type="checkbox"/> Rock Berm   | <input type="checkbox"/> Brush Berms                        | <input type="checkbox"/> Compost Filter Berms and/or Socks |
| <input type="checkbox"/> Triangular Filter Dike | <input type="checkbox"/> Sediment Basins                    | <input type="checkbox"/> Stone Outlet Sediment Traps       |
| <input type="checkbox"/> Sand Bag Berm          | <input checked="" type="checkbox"/> Erosion Control Compost |  |

**General Condition 21 - Category III BMPs required**

Category III (Post-Construction TSS Control)

- |   |   |  |
|---|---|--|
| <input type="checkbox"/> Vegetative Filter Strips | <input type="checkbox"/> Wet Basins                         | <input type="checkbox"/> Mulch Filter Berms and/or Socks   |
| <input type="checkbox"/> Retention/Irrigation     | <input type="checkbox"/> Grassy Swales                      | <input type="checkbox"/> Compost Filter Berms and/or Socks |
| <input type="checkbox"/> Extended Detention Basin | <input type="checkbox"/> Vegetation-Lined Ditches           | <input type="checkbox"/> Sand Filter Systems               |
| <input type="checkbox"/> Constructed Wetlands     | <input checked="" type="checkbox"/> Erosion Control Compost | <input type="checkbox"/> 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 ensure compliance with SW3P and TPDES General Permit TXR 150000. Daily Monitoring Reports shall be provided to TxDOT within 48 hours, in accordance with Item 506.3.1.
- 5.  Other Project Specific Actions:

**III. Cultural Resources**

Action Items Required :  No Action Required

- 1.  Refer to the 2014 TxDOT Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges, Item 7.7.1., in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.
- 2.  Other Project Specific Actions:

**IV. Vegetation Resources**

Action Items Required :  No Action Required

- 1.  In accordance with the 2014 TxDOT Standard Specifications; Item 164 - Seeding For Erosion Control; provide and install temporary or permanent seeding for erosion control as shown on the plans or as directed by the Engineer for all seeding and replanting of right of way where possible. (Required for Urban Settings)
- 2.  In accordance with Executive Order 13112 on invasive species and the Executive Memorandum on Beneficial Landscaping, native species of plants shall be used for all seeding and replanting of right of way where possible for rural roadways. (Required for Rural Settings)
- 3.  Preserve vegetation where possible throughout the project and minimize clearing, grubbing and excavation within stream banks, bed and approach sections.
- 4.  Other Project Specific Actions:

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Revised 02/19/2015

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**ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)**

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
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**V. Federal Listed, and Proposed Threatened and Endangered Species, Critical Habitat, State Listed Species, Candidate Species and Migratory Birds**

Action Items Required :  No Action Required

- 1.  Under the Migratory Bird Treaty Act of 1918 (MBTA), 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 15th. through October 1st.). If the Contractor needs to perform work within right of way during nesting season, a qualified Biologist shall conduct a survey to determine if nests are present. If present, Contractor shall maintain a minimum 25 foot buffer zone of vegetation around the nest until the young have fledged or the nest is not occupied. A MBTA Nest Survey Form may be obtained from the Pharr District Office Environmental Section.
- 2.  There is the potential for the presence of state-listed species & species of concern in the project area and state law prohibits the taking (incidental or otherwise) of state-listed species. Taking is defined as the collection, hooking, hunting, netting, shooting, or share by any means or devices. If any listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately.
- 3.  Other Project Specific Actions:

**VI. Hazardous Materials on Contamination Issues**

Action Items Required :  No Action Required

General (applies to all projects):

Comply with the Hazard Communication Act (HCA) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the HCA.

Maintain an adequate supply of on-site spill response materials as indicated in the MSDS. In the event of a spill, take immediate action to mitigate the spill as indicated in the MSDS and in accordance with safe work practices. Contact the TxDOT Pharr District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

- Dead or distressed vegetation (identified as not normal)
- Trash piles, drums, canisters, barrels, etc.
- Undesirable smells or odors
- Evidence of leaching or seepage of contaminant substances

Any other evidence indicating possible hazardous materials or contamination discovered on site.

- 1.  If potentially hazardous material and/or contaminated media (i.e.: soil, groundwater, surface water, sediment, building materials) are unexpectedly encountered during construction, assure that such materials and contamination are handled according to applicable federal and state regulations, cease work in the immediate area and contact the Engineer immediately.

**VI. Hazardous Materials on Contamination Issues - Continued:**

- 2. Does the project involve any bridge class structure rehabilitation or replacements (bridge class structures not including box culverts)?

Yes  No

If "No", then no further action required.  
If "Yes", then TxDOT is responsible for completing an asbestos assessment/inspection.

- 3. Are the results of the asbestos inspection positive (is asbestos present)?

Yes  No

If "Yes", then TxDOT must retain a Texas Department of State Health Services (DSHS) licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled abatement activities and/or demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

- 4.  The Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and an Asbestos Consultant in order to minimize construction delays and subsequent claims.

**VII. Other Environmental Issues**

Action Items Required :  No Action Required

- 1.  Noise

Contractor shall make every reasonable effort to minimize construction noise through abatement measures such as work hour controls and proper maintenance of equipment mufflers.

- 2.  Air

Contractor shall practice common dust control techniques such as surface chemical treatment or watering of unpaved road surfaces and vehicle speed reduction shall be implemented to minimize and prevent airborne dust during construction.

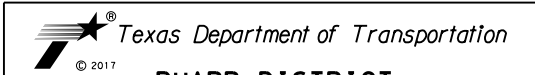
Contractor should minimize MSAT by utilizing measures to encourage use of EPA required cleaner diesel fuels, limits on idling, increase use of cleaner burning diesel engines, and other emission limitation techniques, as appropriate.

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Revised 02/19/2015

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PHARR DISTRICT

**ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)**

SHEET 2 OF 2

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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 wild-life 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 chihii*)

- 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's recommended white-nose syndrome protocols located on the TPWD Wildlife Habitat Assessment Program website under "Project Design and Construction".

The following survey and exclusion protocols should be followed prior to commencement of construction activities. For the purposes of this document, structures are defined as bridges, culverts (concrete or metal), wells, and buildings.

- For activities that have the potential to impact structures, cliffs or caves, or trees; a qualified biologist will perform a habitat assessment and occupancy survey of the feature(s) with roost potential as early in the planning process as possible or within one year before project letting.
- For roosts where occupancy is strongly suspected but unconfirmed during the initial survey, revisit feature(s) at most four weeks prior to scheduled disturbance to confirm absence of bats.
- If bats are present or recent signs of occupation (i.e., piles of guano, distinct musky odor, or staining and rub marks at potential entry points) are observed, take appropriate measures to ensure that bats are not harmed, such as implementing non-lethal exclusion activities or timing or phasing of construction.
- Exclusion devices can be installed by a qualified individual between September 1 and March 31. Exclusion devices should be used for a minimum of seven days when minimum nighttime temperatures are above 50°F and minimum daytime temperatures are above 70°F. Prior to exclusion, ensure that alternate roosting habitat is available in the immediate area. If no suitable roosting habitat is available, installation of alternate roosts is recommended to replace the loss of an occupied roost. If alternate roost sites are not provided, bats may seek shelter in other inappropriate sites, such as buildings, in the surrounding area. See Additional Bat BMPs (Recommendations) for recommended acceptable methods for excluding bats from structures.
- If feature(s) used by bats are removed as a result of construction, replacement structures should incorporate bat-friendly design or artificial roosts should be constructed to replace these features, as practicable.
- Conversion of property containing cave or cliff features to transportation purposes should be avoided where feasible.

Bat BMPs (Required) (Continued)

- Avoid unnecessary removal of dead fronds on native and ornamental palm trees in south Texas (Cameron, Hidalgo, Willacy, Kenedy, Brooks, Kleberg, Nueces, and San Patricio counties) from April 1st through October 31st. If removal of dead fronds is necessary at other times of the year, limit frond removal to extended warm periods (nighttime temperatures: 55°F for at least two consecutive nights), so bats can move away from the disturbance and find new roosts.
- Large hollow trees, snags (dead standing trees), and trees with shaggy bark should be surveyed for colonies and, if found, should not be disturbed until the bats are no longer occupying these features. Post-occupancy surveys should be conducted by a qualified biologist prior to tree removal from the landscape.
- Retain mature, large diameter hardwood forest species and native/ornamental palm trees where feasible.
- In all instances, avoid harm or death to bats. Bats should only be handled as a last resort and after communication with TPWD.

Mexican Long-tongues Bat (*Chaeronycteris 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 micro-climate.
- 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.

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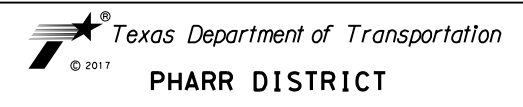
Revised 07/12/2017

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**EPIC SHEET SUPPLEMENTALS**  
**TPWD BMPs**

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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.

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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.



**PHARR DISTRICT**  
**EPIC SHEET SUPPLEMENTALS**  
**TPWD BMPs**

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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

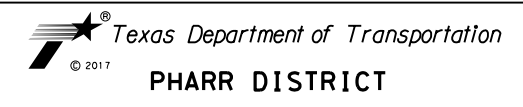
Revised 07/12/2017

**List of Abbreviations**

BMP: Best Management Practice  
 CGP: Construction General Permit  
 CRPe: Contractor Responsible Person Environmental  
 DSHS: Texas Department of State Health Services  
 FEMA: Federal Emergency Management Agency  
 FHWA: Federal Highway Administration  
 MOA: Memorandum of Agreement  
 MOU: Memorandum of Understanding  
 MS4: Municipal Separate Stormwater Sewer System

MSAT: Mobile Source Air Toxic  
 MBTA: Migratory Bird Treaty Act  
 NOI: Notice of Intent  
 NOT: Notice of Termination  
 NWP: Nationwide Permit  
 PCN: Pre-Construction Notification  
 PSL: Project Specific Location  
 SPCC: Spill Prevention Control and Countermeasure  
 SW3P: Storm Water Pollution Prevention Plan

TCEQ: Texas Commission on Environmental Quality  
 THC: Texas Historical Commission  
 TPDES: Texas Pollutant Discharge Elimination System  
 TPWD: Texas Parks and Wildlife Department  
 TxDOT: Texas Department of Transportation  
 T&E: Threatened and Endangered Species  
 USACE: U.S. Army Corp of Engineers  
 USFWS: U.S. Fish and Wildlife Service



**EPIC SHEET SUPPLEMENTALS  
 TPWD BMPs**

**SHEET 3 OF 3**

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6			SH 48
STATE	DISTRICT	COUNTY	
TEXAS	PHR	CAMERON	SHEET NO.
CONTROL	SECTION	JOB	
0220	05	080	301

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**LEGEND**

- SEEDING AREA
- CURB INLET SEDIMENT TRAP (6")
- DROP INLET SEDIMENT TRAP (12")
- DITCH LINE SEDIMENT TRAP (12")
- SEDIMENT CONTROL FENCE
- RIGHT OF WAY SEDIMENT TRAP (12")
- DIRECTION OF TRAFFIC FLOW
- BL - BASE LINE
- PROP. - PROPOSED
- EXIST. - EXISTING
- R.O.W. - RIGHT OF WAY
- RDWY. - ROADWAY

**GENERAL NOTES**

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2. EROSION CONTROL DEVICES SHALL ONLY BE PLACED DURING PHASE CONSTRUCTION. DEVICES SHALL NOT BE PLACED ALL AT THE SAME TIME.
3. EROSION CONTROL DEVICES MAY BE MODIFIED TO MEET FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER.
4. VEGETATIVE WATERING APPLICATION RATE = 88,300 GAL/AC/CYCLE @ 13 CYCLES.
5. FOR ESTIMATE ON SHEET TOTALS, SEE THE SW3P SUMMARY TABLE SHEET.
6. CONSTRUCTION EXITS ARE TO BE LOCATED AND INSTALLED BASED ON FIELD CONDITIONS AND AS APPROVED BY THE ENGINEER. THE LOCATION OF THE CONSTRUCTION EXIT SHOULD BE SUFFICIENT FOR CONTINUOUS USE BY THE CONTRACTOR DURING CONSTRUCTION.

ITEM	ESTIMATE	UNIT	DESCRIPTION
0164 6035	255	SY	DRILL SEEDING (PERM) (RURAL) (CLAY)
0164 6041	255	SY	DRILL SEEDING (TEMP) (WARM)
0168 6001	0.06	MG	VEGETATIVE WATERING
0506 6021	156	SY	CONSTRUCTION EXITS (INSTALL) (TY 2)
0506 6024	156	SY	CONSTRUCTION EXITS (REMOVE)
0506 6038	360	LF	TEMP SEDMT CONT FENCE (INSTL)
0506 6039	360	LF	TEMP SEDMT CONT FENCE (REMOVE)
0506 6041	102	LF	BIODEG EROSN CONT LOGS (INSTL) (12")
0506 6043	136	LF	BIODEG EROSN CONT LOGS (REMOVE)
0506 6045	34	LF	BIODEG EROSN CONT LOGS (INSTL) (6")

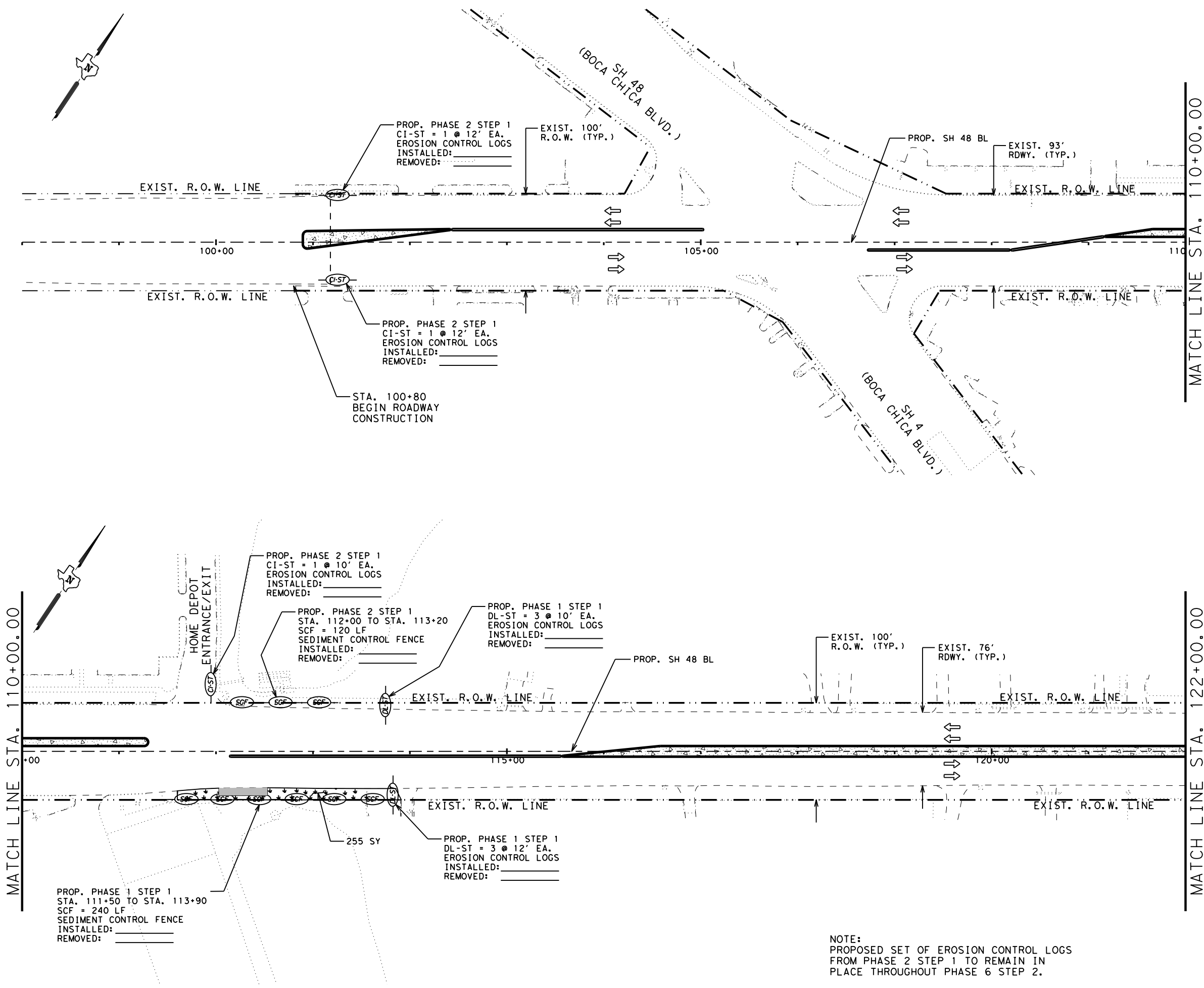


**Pharr District Central Design**  
 Texas Department of Transportation

**SH 48  
 SWP3 LAYOUT**

SCALE: 1" = 100' SHEET 1 OF 9

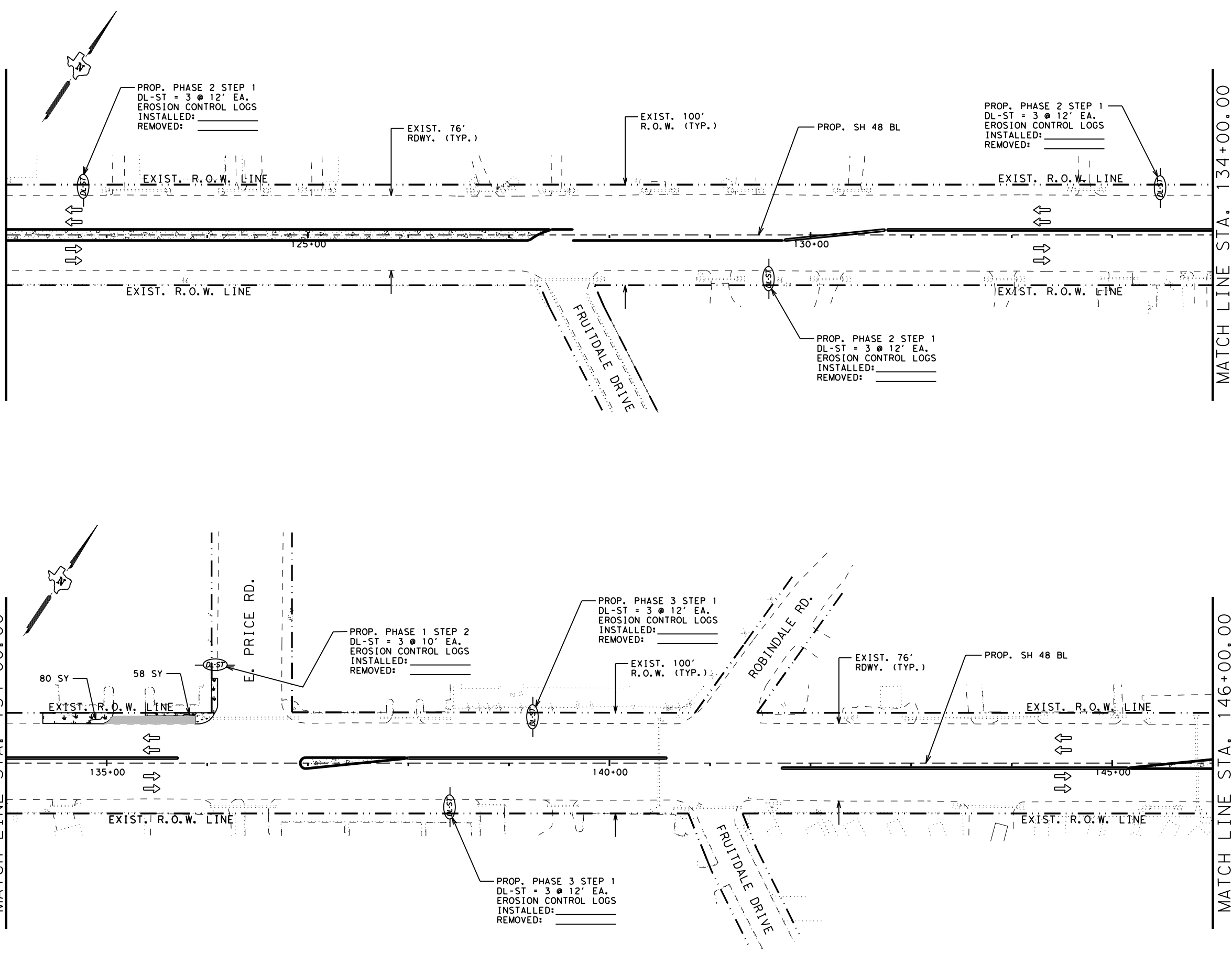
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DW: CK:	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	302



**NOTE:**  
 PROPOSED SET OF EROSION CONTROL LOGS FROM PHASE 2 STEP 1 TO REMAIN IN PLACE THROUGHOUT PHASE 6 STEP 2.

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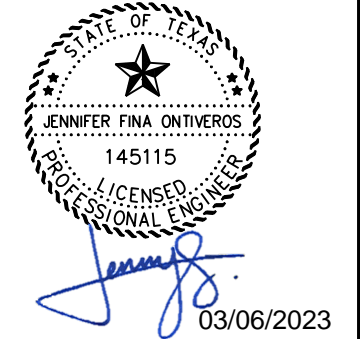
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 MATCH LINE STA. 146+00.00



- LEGEND**
- DL-ST CURB INLET SEDIMENT TRAP (6")
  - D-ST DROP INLET SEDIMENT TRAP (12")
  - DL-ST DITCH LINE SEDIMENT TRAP (12")
  - SCF SEDIMENT CONTROL FENCE
  - ROW-ST RIGHT OF WAY SEDIMENT TRAP (12")
  - DIRECTION OF TRAFFIC FLOW
  - BL - BASE LINE
  - PROP. - PROPOSED
  - EXIST. - EXISTING
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ITEM	ESTIMATE	UNIT	DESCRIPTION
0164 6035	138	SY	DRILL SEEDING (PERM) (RURAL) (CLAY)
0164 6041	138	SY	DRILL SEEDING (TEMP) (WARM)
0168 6001	0.03	MG	VEGETATIVE WATERING
0506 6021	156	SY	CONSTRUCTION EXITS (INSTALL) (TY 2)
0506 6024	156	SY	CONSTRUCTION EXITS (REMOVE)
0506 6041	210	LF	BIODEG EROSN CONT LOGS (INSTL) (12")
0506 6043	210	LF	BIODEG EROSN CONT LOGS (REMOVE)



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 Texas Department of Transportation

**SH 48  
 SWP3 LAYOUT**

SCALE: 1" = 100' SHEET 2 OF 9

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	PHR		CAMERON	303

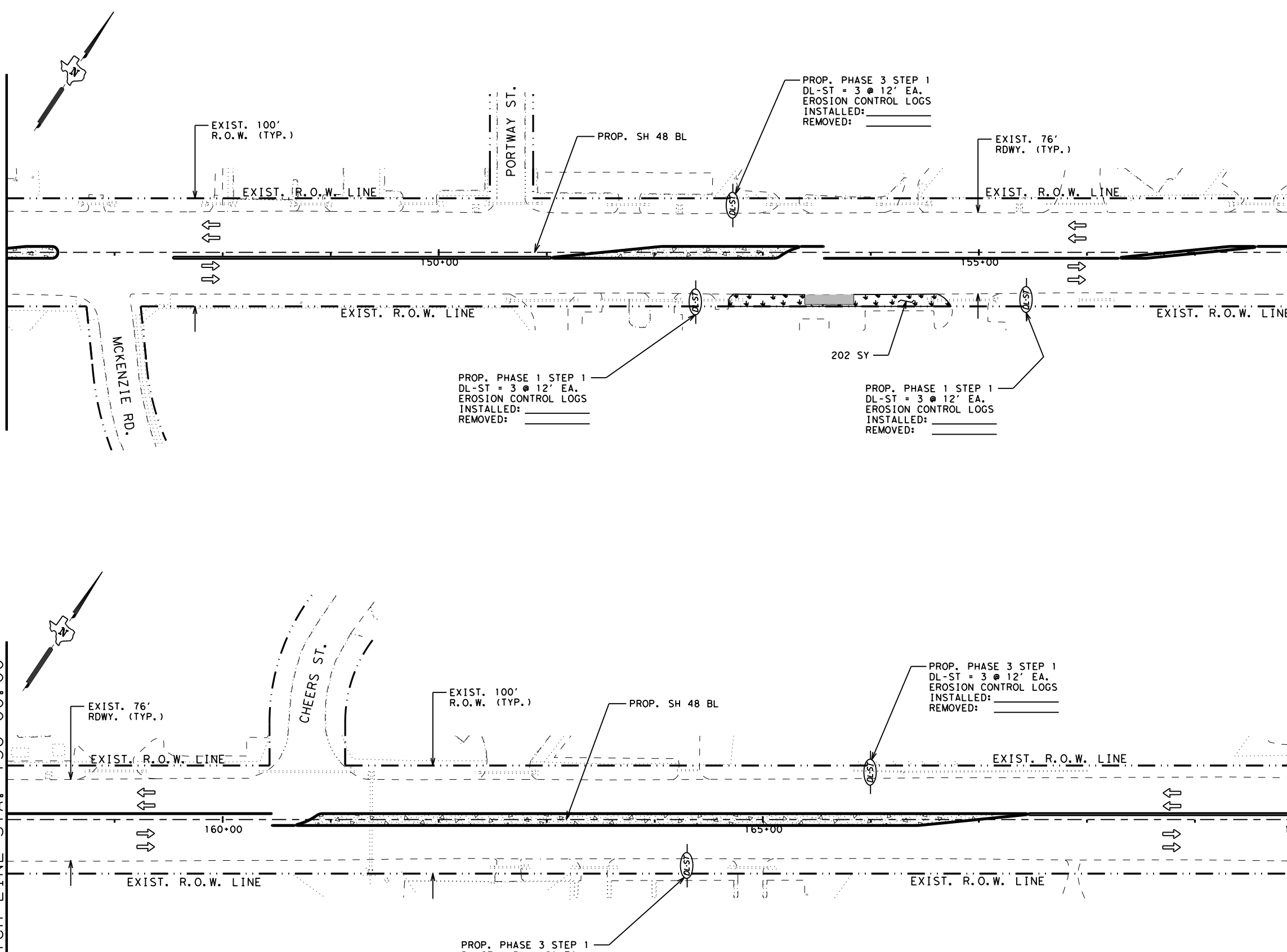
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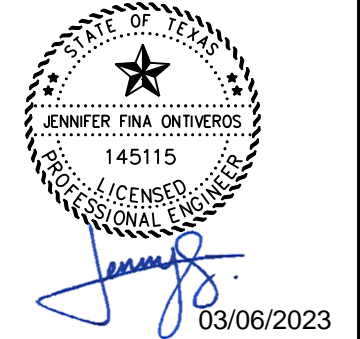


**LEGEND**

	SEEDING AREA
	CURB INLET SEDIMENT TRAP (6")
	DROP INLET SEDIMENT TRAP (12")
	DITCH LINE SEDIMENT TRAP (12")
	SEDIMENT CONTROL FENCE
	RIGHT OF WAY SEDIMENT TRAP (12")
	- DIRECTION OF TRAFFIC FLOW
	BL - BASE LINE
	PROP. - PROPOSED
	EXIST. - EXISTING
	R.O.W. - RIGHT OF WAY
	RDWY. - ROADWAY

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ITEM	ESTIMATE	UNIT	DESCRIPTION
0164 6035	202	SY	DRILL SEEDING (PERM) (RURAL) (CLAY)
0164 6041	202	SY	DRILL SEEDING (TEMP) (WARM)
0168 6001	0.05	MG	VEGETATIVE WATERING
0506 6021	78	SY	CONSTRUCTION EXITS (INSTALL) (TY 2)
0506 6024	78	SY	CONSTRUCTION EXITS (REMOVE)
0506 6041	180	LF	BIODEG EROSN CONT LOGS (INSTL) (12")
0506 6043	180	LF	BIODEG EROSN CONT LOGS (REMOVE)



**Pharr District Central Design**  
 Texas Department of Transportation

**SH 48  
SWP3 LAYOUT**

SCALE: 1" = 100' SHEET 3 OF 9

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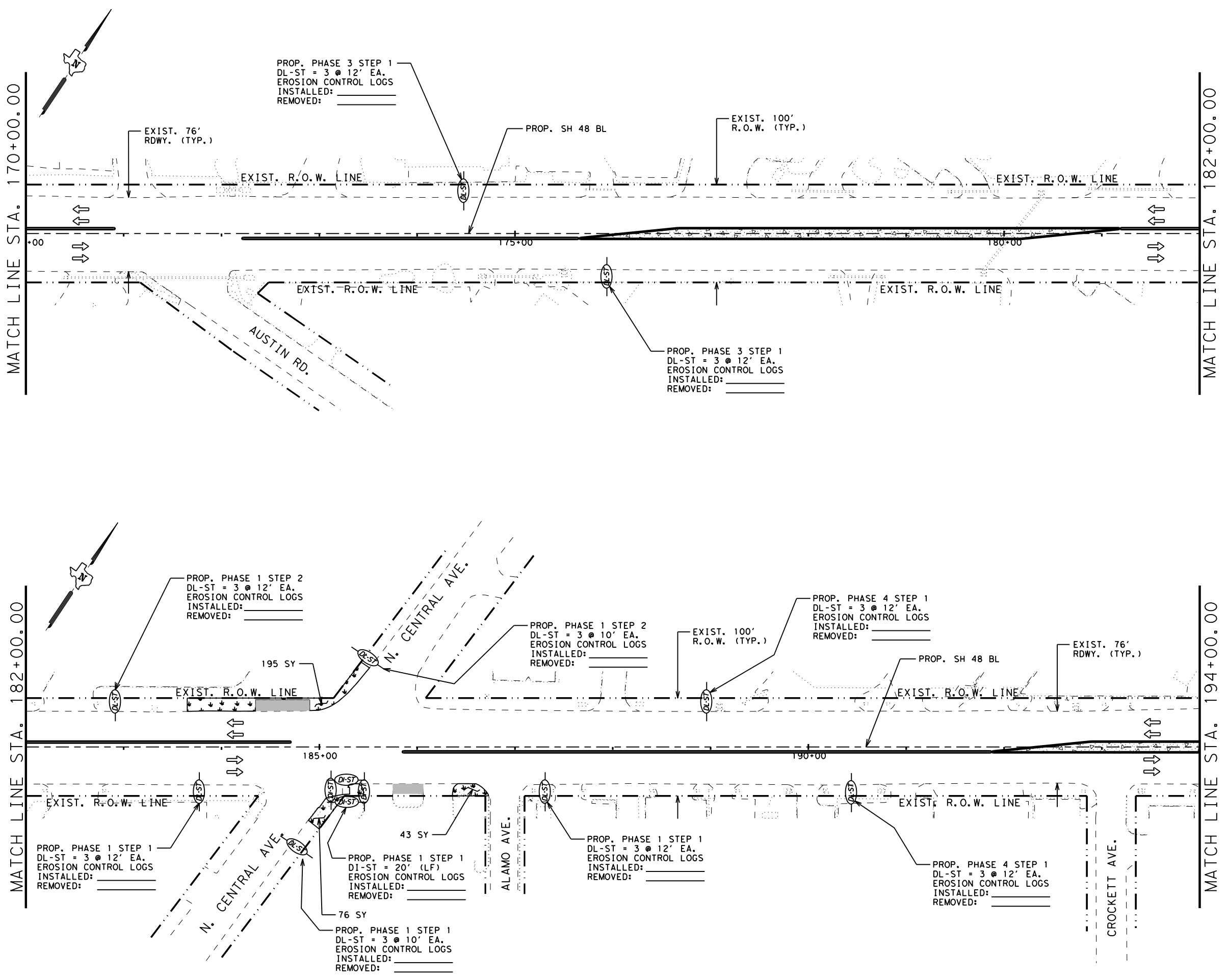
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- LEGEND**
- DL-ST CURB INLET SEDIMENT TRAP (6")
  - DI-ST DROP INLET SEDIMENT TRAP (12")
  - DLS-ST DITCH LINE SEDIMENT TRAP (12")
  - SCF SEDIMENT CONTROL FENCE
  - ROW-ST RIGHT OF WAY SEDIMENT TRAP (12")
  - DIRECTION OF TRAFFIC FLOW
  - BL - BASE LINE
  - PROP. - PROPOSED
  - EXIST. - EXISTING
  - R.O.W. - RIGHT OF WAY
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ITEM	ESTIMATE	UNIT	DESCRIPTION
0164 6035	314	SY	DRILL SEEDING (PERM) (RURAL) (CLAY)
0164 6041	314	SY	DRILL SEEDING (TEMP) (WARM)
0168 6001	0.07	MG	VEGETATIVE WATERING
0506 6021	156	SY	CONSTRUCTION EXITS (INSTALL) (TY 2)
0506 6024	156	SY	CONSTRUCTION EXITS (REMOVE)
0506 6041	332	LF	BIODEG EROSN CONT LOGS (INSTL) (12")
0506 6043	332	LF	BIODEG EROSN CONT LOGS (REMOVE)



**Pharr District Central Design**  
 Texas Department of Transportation

**SH 48  
SWP3 LAYOUT**

SCALE: 1" = 100' SHEET 4 OF 9

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**LEGEND**

- SEEDING AREA
- CURB INLET SEDIMENT TRAP (6")
- DROP INLET SEDIMENT TRAP (12")
- DITCH LINE SEDIMENT TRAP (12")
- SEDIMENT CONTROL FENCE
- RIGHT OF WAY SEDIMENT TRAP (12")
- DIRECTION OF TRAFFIC FLOW
- BL - BASE LINE
- PROP. - PROPOSED
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ITEM	ESTIMATE	UNIT	DESCRIPTION
0164 6035	570	SY	DRILL SEEDING (PERM) (RURAL) (CLAY)
0164 6041	570	SY	DRILL SEEDING (TEMP) (WARM)
0168 6001	0.14	MG	VEGETATIVE WATERING
0506 6021	78	SY	CONSTRUCTION EXITS (INSTALL) (TY 2)
0506 6024	78	SY	CONSTRUCTION EXITS (REMOVE)
0506 6041	294	LF	BIODEG EROSN CONT LOGS (INSTL) (12")
0506 6043	294	LF	BIODEG EROSN CONT LOGS (REMOVE)

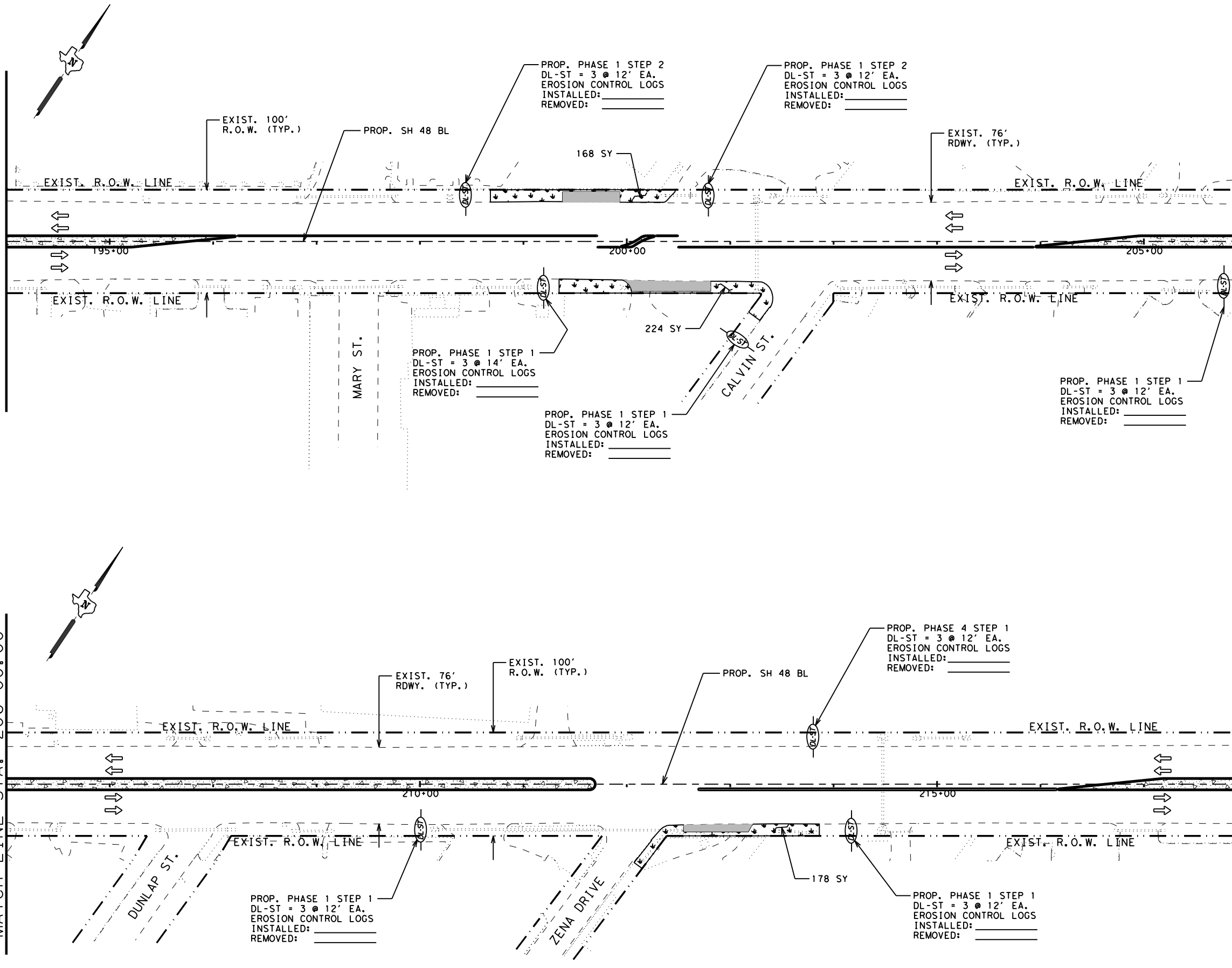


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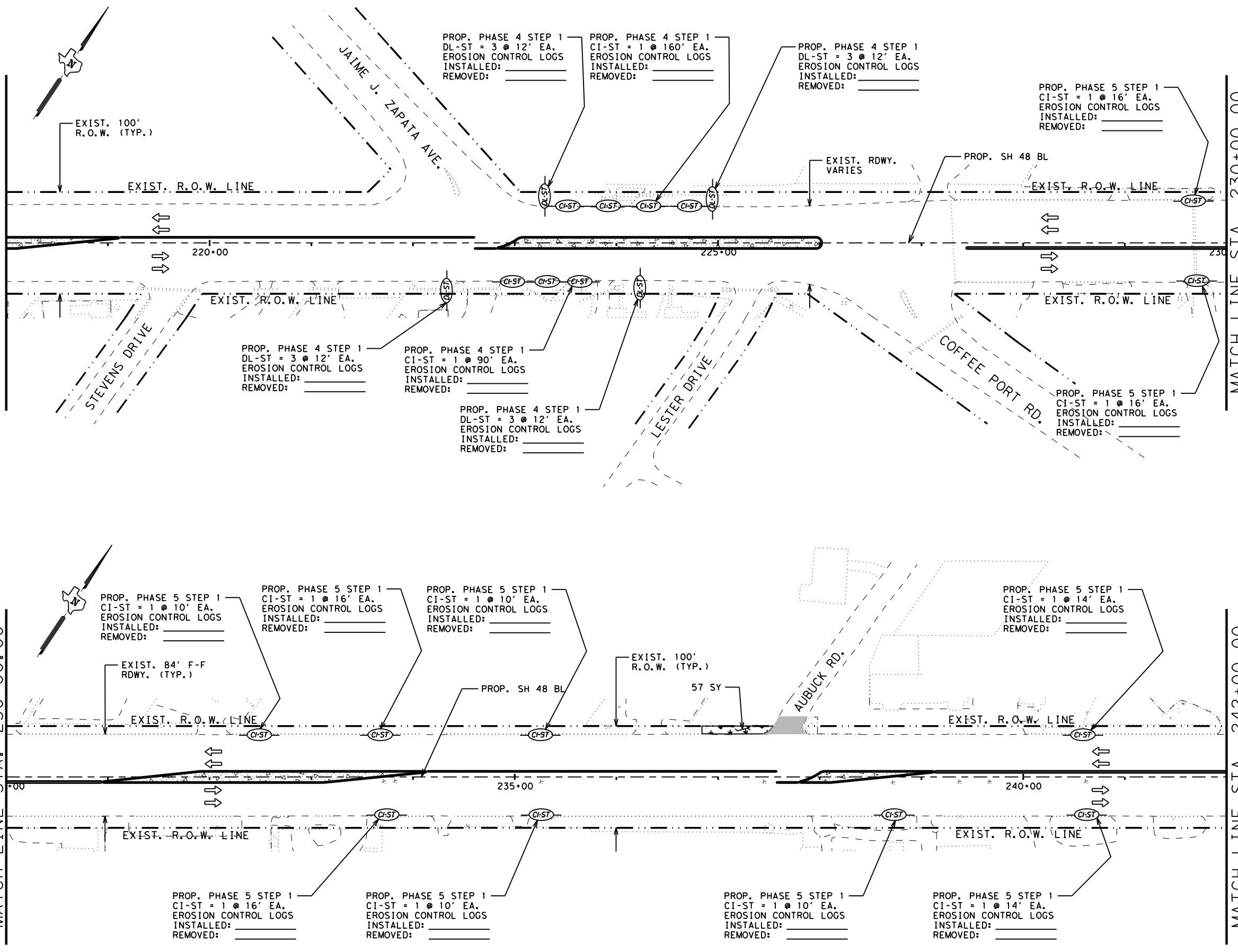
**SH 48  
 SWP3 LAYOUT**

SCALE: 1" = 100' SHEET 5 OF 9

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**LEGEND**

	SEEDING AREA
	CURB INLET SEDIMENT TRAP (6")
	DROP INLET SEDIMENT TRAP (12")
	DITCH LINE SEDIMENT TRAP (12")
	SEDIMENT CONTROL FENCE
	RIGHT OF WAY SEDIMENT TRAP (12")
	- DIRECTION OF TRAFFIC FLOW
	BL - BASE LINE
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0164 6035	57	SY	DRILL SEEDING (PERM) (RURAL) (CLAY)
0164 6041	57	SY	DRILL SEEDING (TEMP) (WARM)
0168 6001	0.01	MG	VEGETATIVE WATERING
0506 6021	156	SY	CONSTRUCTION EXITS (INSTALL) (TY 2)
0506 6024	156	SY	CONSTRUCTION EXITS (REMOVE)
0506 6041	144	LF	BIODEG EROSN CONT LOGS (INSTL) (12")
0506 6043	526	LF	BIODEG EROSN CONT LOGS (REMOVE)
0506 6045	382	LF	BIODEG EROSN CONT LOGS (INSTL) (6")



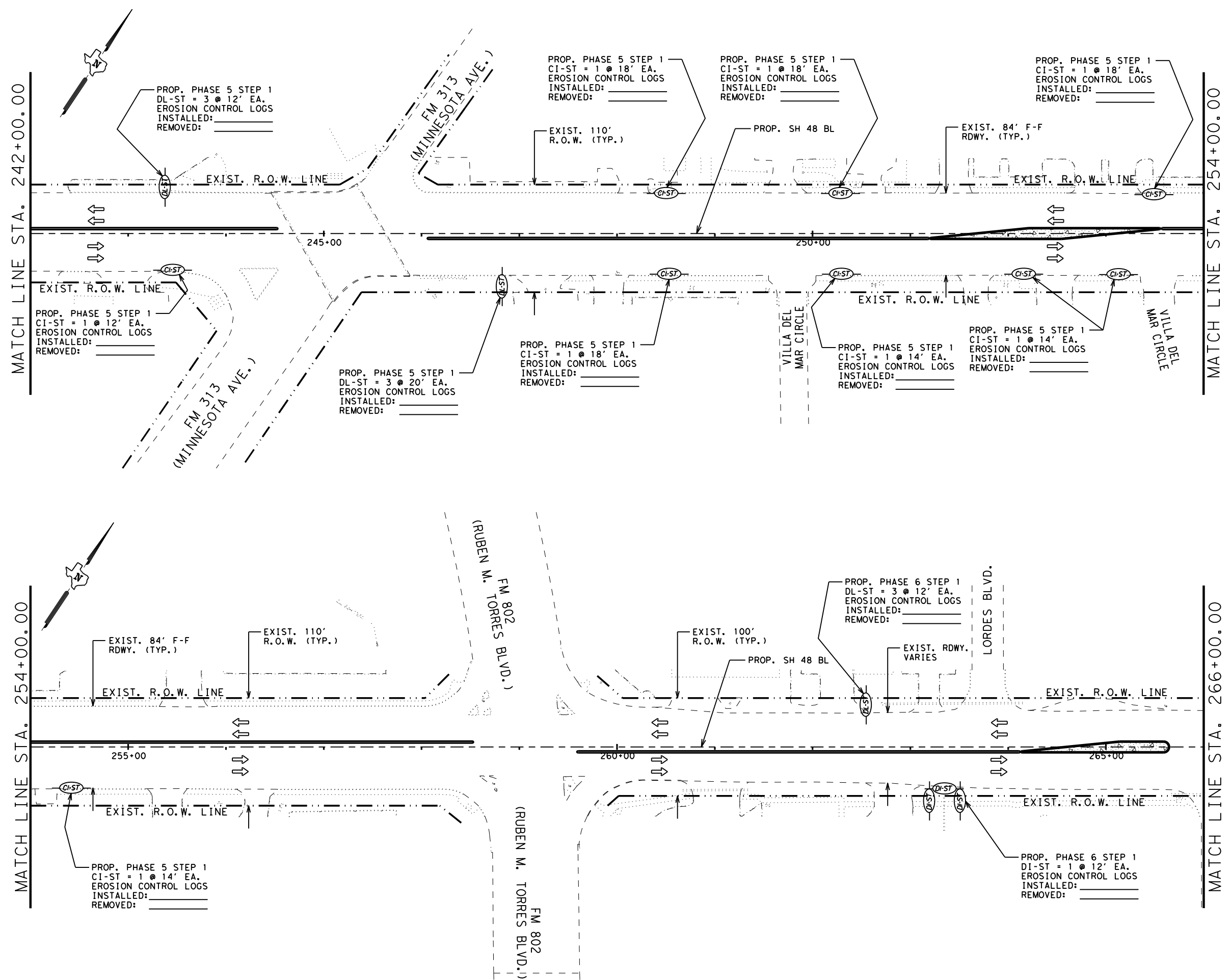
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 Texas Department of Transportation

**SH 48  
 SWP3 LAYOUT**

SCALE: 1"=100' SHEET 6 OF 9

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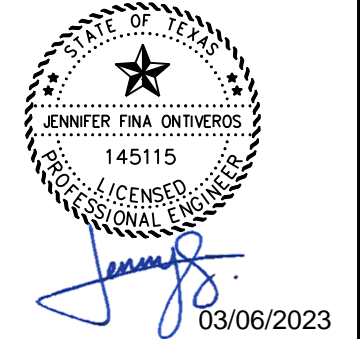
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- LEGEND**
- SEEDING AREA
  - CURB INLET SEDIMENT TRAP (6")
  - DROP INLET SEDIMENT TRAP (12")
  - DITCH LINE SEDIMENT TRAP (12")
  - SEDIMENT CONTROL FENCE
  - RIGHT OF WAY SEDIMENT TRAP (12")
  - DIRECTION OF TRAFFIC FLOW
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0506 6021	156	SY	CONSTRUCTION EXITS (INSTALL) (TY 2)
0506 6024	156	SY	CONSTRUCTION EXITS (REMOVE)
0506 6041	144	LF	BIODEG EROSN CONT LOGS (INSTR) (12")
0506 6043	284	LF	BIODEG EROSN CONT LOGS (REMOVE)
0506 6045	140	LF	BIODEG EROSN CONT LOGS (INSTR) (6")



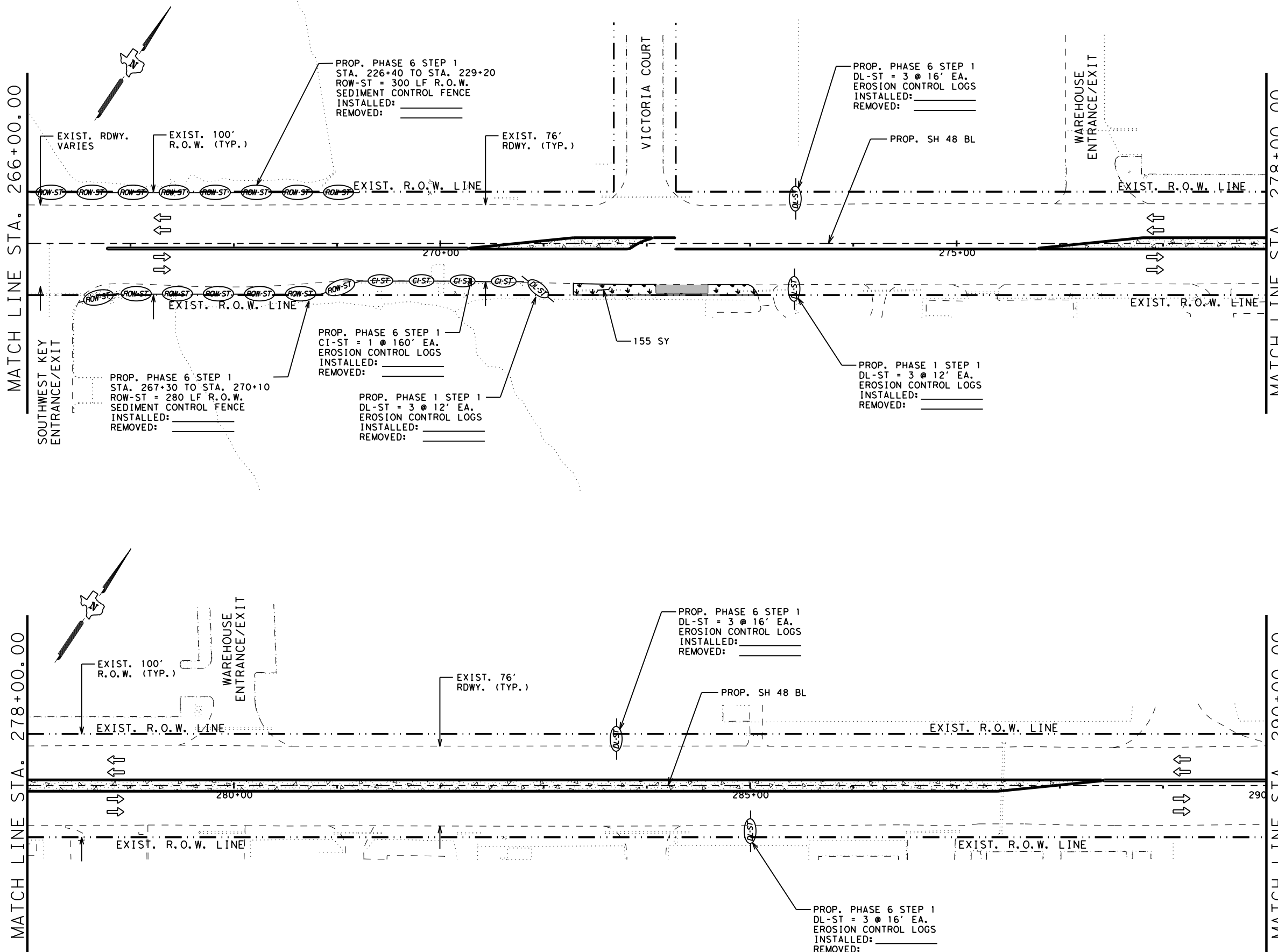
**Pharr District Central Design**  
 Texas Department of Transportation

**SH 48  
 SWP3 LAYOUT**

SCALE: 1" = 100' SHEET 7 OF 9

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DS: CK:	0220	05	080	SH 48
DW: CK:	DIST		COUNTY	SHEET NO.
	PHR		CAMERON	308

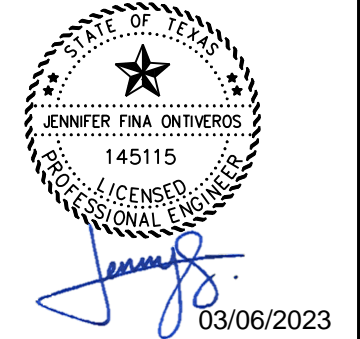
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- LEGEND**
- SEEDING AREA
  - CI-ST CURB INLET SEDIMENT TRAP (6")
  - DI-ST DROP INLET SEDIMENT TRAP (12")
  - DL-ST DITCH LINE SEDIMENT TRAP (12")
  - SCF SEDIMENT CONTROL FENCE
  - ROW-ST RIGHT OF WAY SEDIMENT TRAP (12")
  - DIRECTION OF TRAFFIC FLOW
  - BL - BASE LINE
  - PROP. - PROPOSED
  - EXIST. - EXISTING
  - R.O.W. - RIGHT OF WAY
  - RDWY. - ROADWAY

- GENERAL NOTES**
1. THE CONTRACTOR MUST CONTACT THE ENGINEER BEFORE PLACEMENT OF ANY EROSION CONTROL DEVICES.
  2. EROSION CONTROL DEVICES SHALL ONLY BE PLACED DURING PHASE CONSTRUCTION. DEVICES SHALL NOT BE PLACED ALL AT THE SAME TIME.
  3. EROSION CONTROL DEVICES MAY BE MODIFIED TO MEET FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER.
  4. VEGETATIVE WATERING APPLICATION RATE = 88,300 GAL/AC/CYCLE @ 13 CYCLES.
  5. FOR ESTIMATE ON SHEET TOTALS, SEE THE SW3P SUMMARY TABLE SHEET.
  6. CONSTRUCTION EXITS ARE TO BE LOCATED AND INSTALLED BASED ON FIELD CONDITIONS AND AS APPROVED BY THE ENGINEER. THE LOCATION OF THE CONSTRUCTION EXIT SHOULD BE SUFFICIENT FOR CONTINUOUS USE BY THE CONTRACTOR DURING CONSTRUCTION.

ITEM	ESTIMATE	UNIT	DESCRIPTION
0164 6035	155	SY	DRILL SEEDING (PERM) (RURAL) (CLAY)
0164 6041	155	SY	DRILL SEEDING (TEMP) (WARM)
0168 6001	0.04	MG	VEGETATIVE WATERING
0506 6021	78	SY	CONSTRUCTION EXITS (INSTALL) (TY 2)
0506 6024	78	SY	CONSTRUCTION EXITS (REMOVE)
0506 6041	796	LF	BIODEG EROSN CONT LOGS (INSL) (12")
0506 6043	956	LF	BIODEG EROSN CONT LOGS (REMOVE)
0506 6045	160	LF	BIODEG EROSN CONT LOGS (INSL) (6")



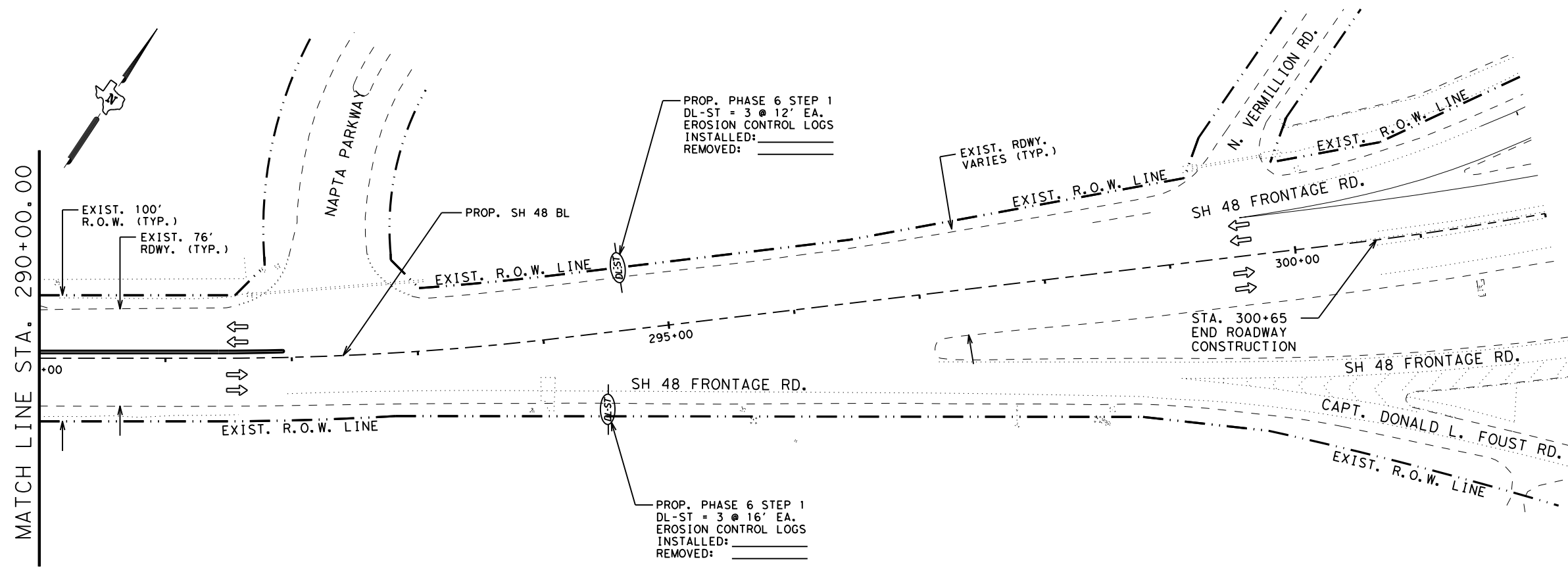
**Pharr District Central Design**  
 Texas Department of Transportation

**SH 48  
SWP3 LAYOUT**

SCALE: 1" = 100' SHEET 8 OF 9

© 2022	CONT	SECT	JOB	HIGHWAY
DS: CK:	0220	05	080	SH 48
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	PHR		CAMERON	309

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- LEGEND**
- DL-ST DITCH LINE SEDIMENT TRAP (12")
  - C-ST CURB INLET SEDIMENT TRAP (6")
  - D-ST DROP INLET SEDIMENT TRAP (12")
  - SCF SEDIMENT CONTROL FENCE
  - ROW-ST RIGHT OF WAY SEDIMENT TRAP (12")
  - DIRECTION OF TRAFFIC FLOW
  - BL - BASE LINE
  - PROP. - PROPOSED
  - EXIST. - EXISTING
  - R.O.W. - RIGHT OF WAY
  - RDWY. - ROADWAY

- GENERAL NOTES**
1. THE CONTRACTOR MUST CONTACT THE ENGINEER BEFORE PLACEMENT OF ANY EROSION CONTROL DEVICES.
  2. EROSION CONTROL DEVICES SHALL ONLY BE PLACED DURING PHASE CONSTRUCTION. DEVICES SHALL NOT BE PLACED ALL AT THE SAME TIME.
  3. EROSION CONTROL DEVICES MAY BE MODIFIED TO MEET FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER.
  4. VEGETATIVE WATERING APPLICATION RATE = 88,300 GAL/AC/CYCLE @ 13 CYCLES.
  5. FOR ESTIMATE ON SHEET TOTALS, SEE THE SW3P SUMMARY TABLE SHEET.
  6. CONSTRUCTION EXITS ARE TO BE LOCATED AND INSTALLED BASED ON FIELD CONDITIONS AND AS APPROVED BY THE ENGINEER. THE LOCATION OF THE CONSTRUCTION EXIT SHOULD BE SUFFICIENT FOR CONTINUOUS USE BY THE CONTRACTOR DURING CONSTRUCTION.

ITEM	ESTIMATE	UNIT	DESCRIPTION
0506 6021	156	SY	CONSTRUCTION EXITS (INSTALL) (TY 2)
0506 6024	156	SY	CONSTRUCTION EXITS (REMOVE)
0506 6041	84	LF	BIODEG EROSN CONT LOGS (INSTL) (12")
0506 6043	84	LF	BIODEG EROSN CONT LOGS (REMOVE)

JENNIFER FINA ONTIVEROS  
 145115  
 PROFESSIONAL ENGINEER  
  
 03/06/2023

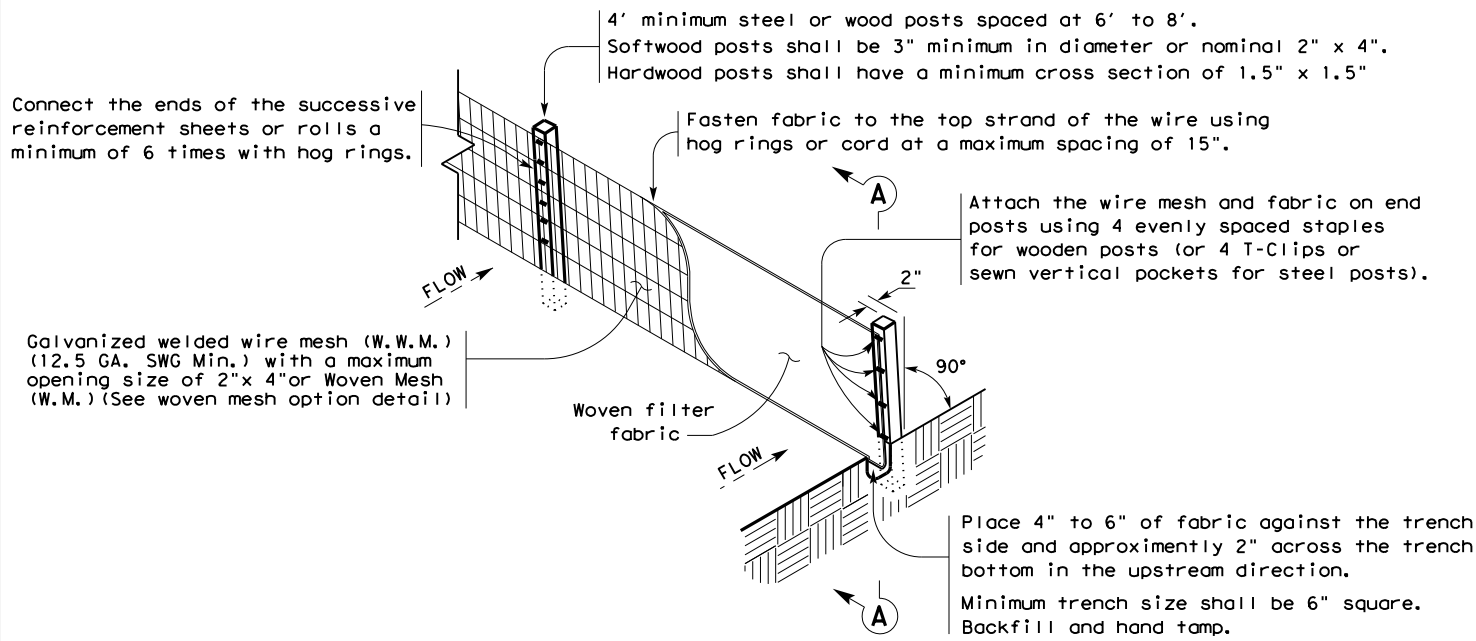
**Pharr District Central Design**  
  
 Texas Department of Transportation

## SH 48 SWP3 LAYOUT

SCALE: 1" = 100' SHEET 9 OF 9

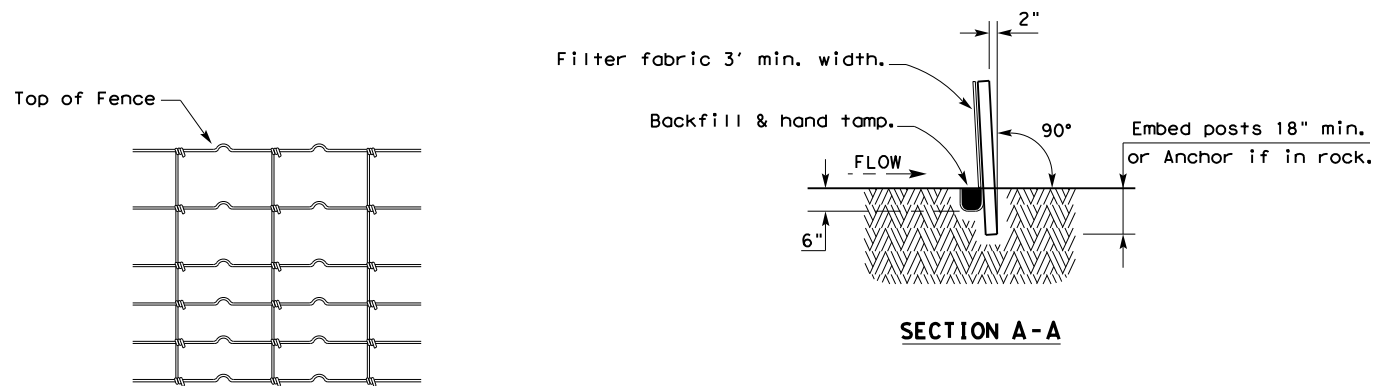
© 2022	CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY			SHEET NO.
PHR	CAMERON			310

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**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.

**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<sup>2</sup>. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

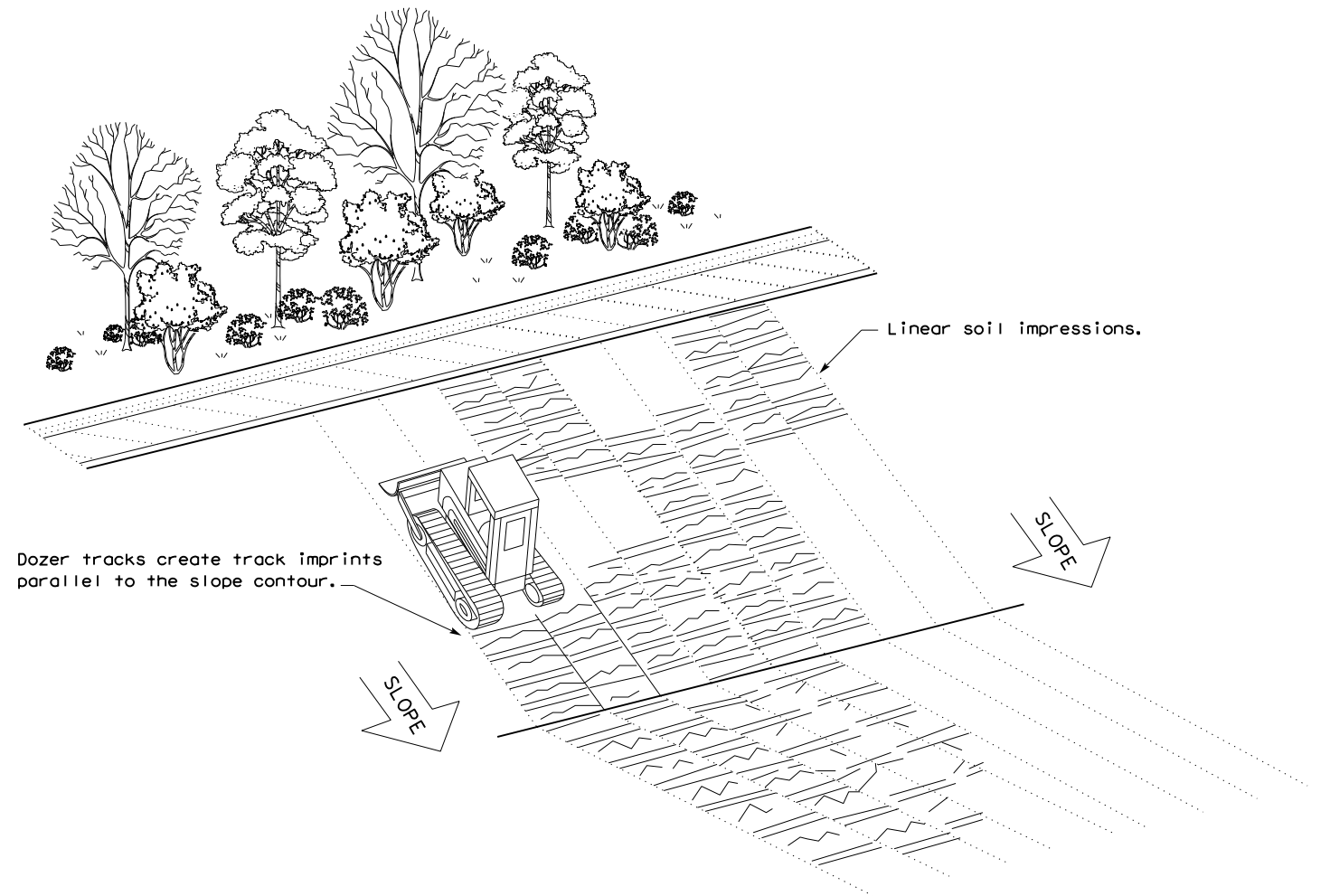
**LEGEND**

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 continuous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.

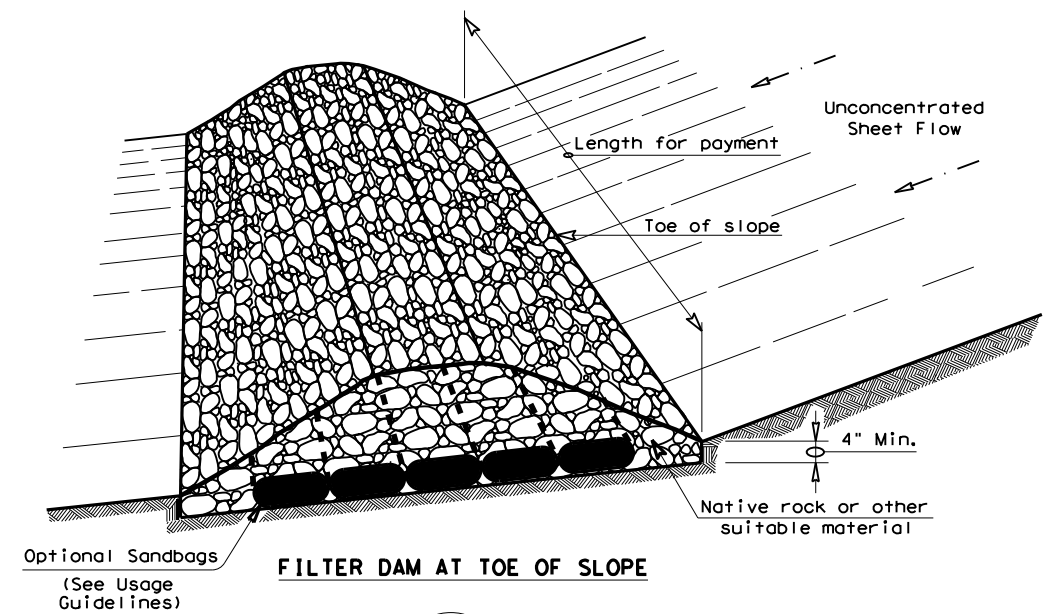


**VERTICAL TRACKING**

				Design Division Standard	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES FENCE &amp; VERTICAL TRACKING</b> <b>EC(1) - 16</b>					
FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS	
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0220	05	080	SH 48	
	DIST	COUNTY	SHEET NO.		
	PHR	CAMERON	311		

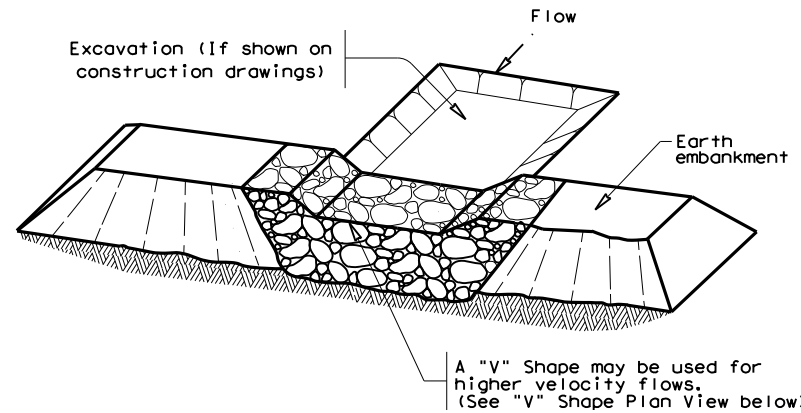
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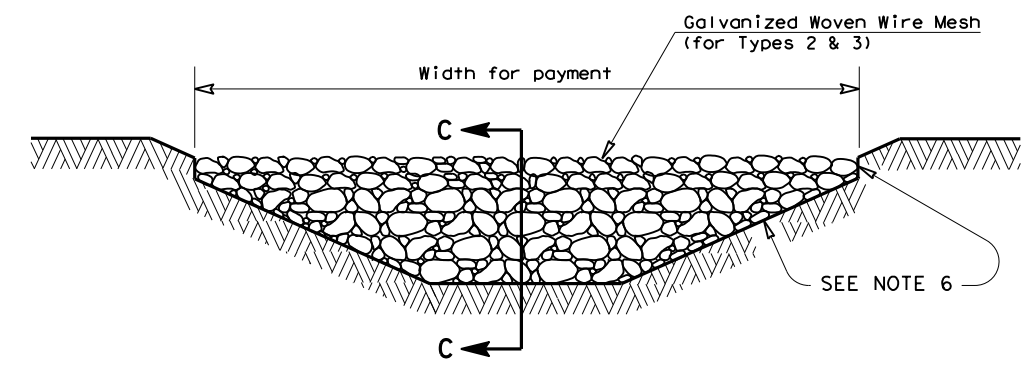
**FILTER DAM AT TOE OF SLOPE**

(RFD1)



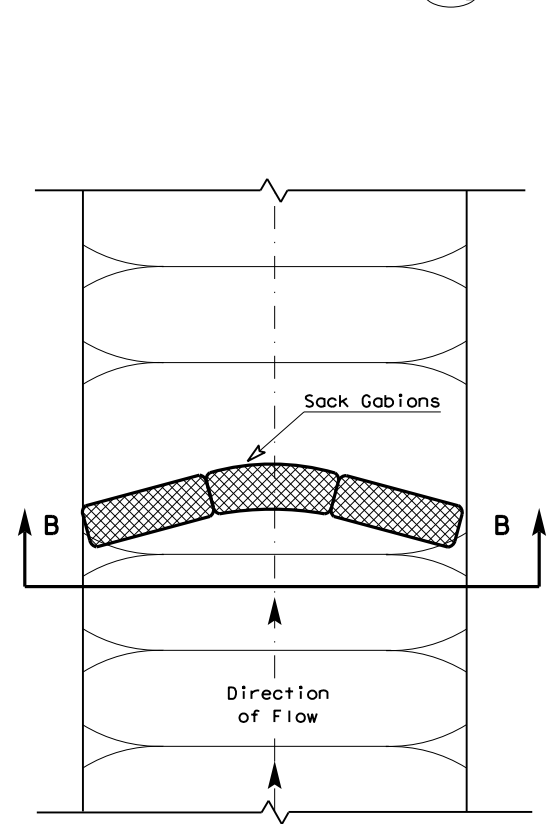
**FILTER DAM AT SEDIMENT TRAP**

(RFD1) OR (RFD2)

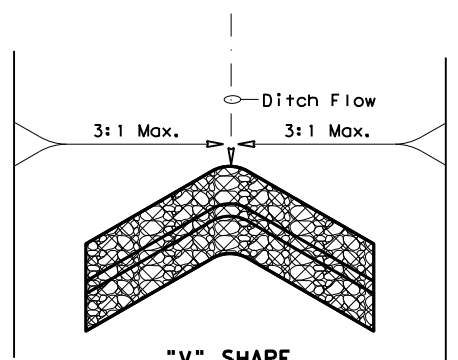


**FILTER DAM AT CHANNEL SECTIONS**

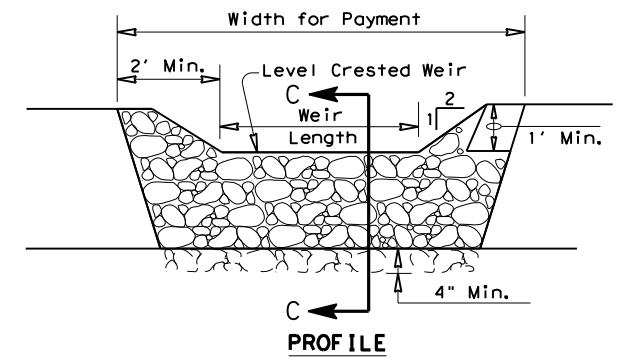
(RFD1) OR (RFD2) OR (RFD3)



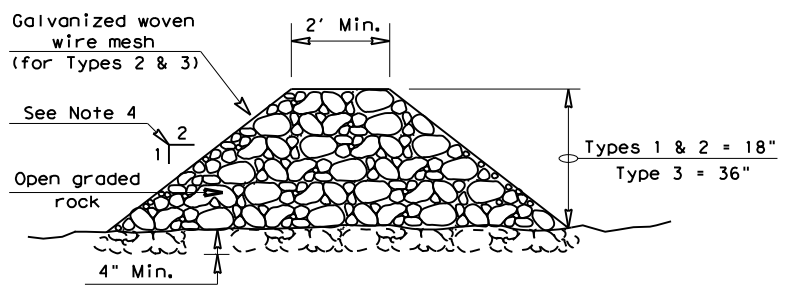
**PLAN VIEW**



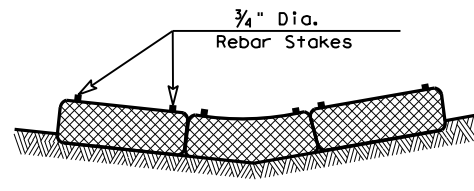
**"V" SHAPE PLAN VIEW**



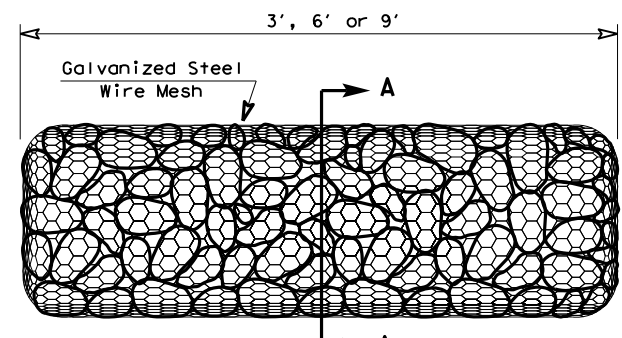
**PROFILE**



**SECTION C-C**

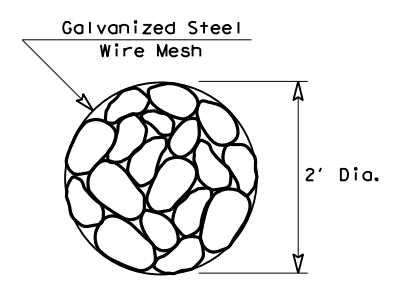


**SECTION B-B**



**TYPE 4 (SACK GABIONS)**

(RFD4)



**SECTION A-A**

**ROCK FILTER DAM USAGE GUIDELINES**

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT<sup>2</sup> of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximately 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh) (3" to 6" aggregate): Type 2 may be used in ditches and at dike or swale outlets.

Type 3 (36" high with wire mesh) (4" to 8" aggregate): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions) (3" to 6" aggregate): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

Type 5: Provide rock filter dams as shown on plans.

**GENERAL NOTES**

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with 3/4" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 1/2" x 3 1/4".
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

**PLAN SHEET LEGEND**

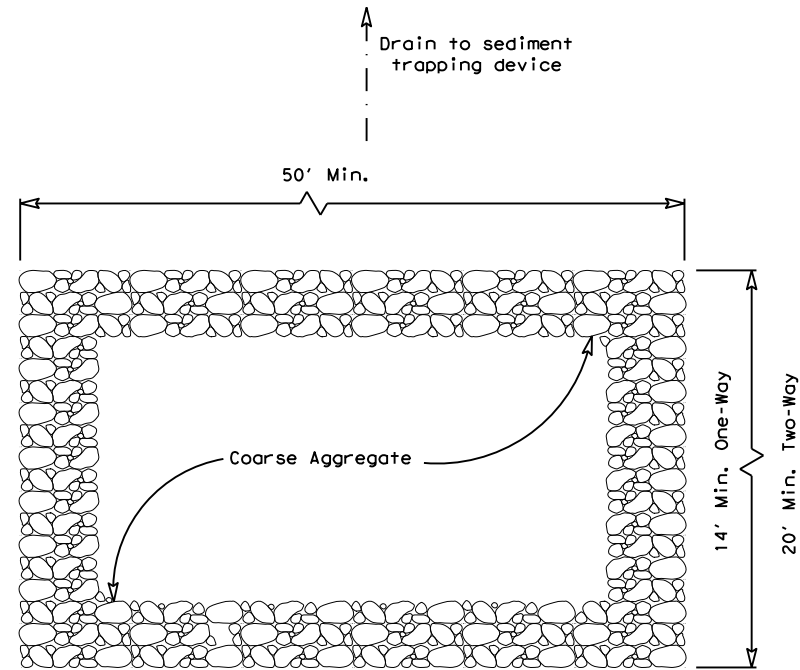
- Type 1 Rock Filter Dam (RFD1)
- Type 2 Rock Filter Dam (RFD2)
- Type 3 Rock Filter Dam (RFD3)
- Type 4 Rock Filter Dam (RFD4)

		Design Division Standard	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES</b> <b>ROCK FILTER DAMS</b> <b>EC(2) - 16</b>			
FILE: ec216	DN: TxDOT	CK: KM	DW: VP
© TxDOT: JULY 2016	CONT: 0220 05	SECT: 080	SH: 48
REVISIONS	DIST: PHR	COUNTY: CAMERON	SHEET NO.: 312

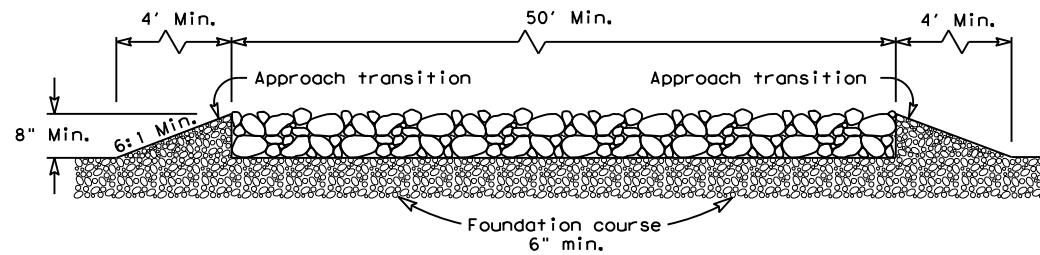


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PLAN VIEW

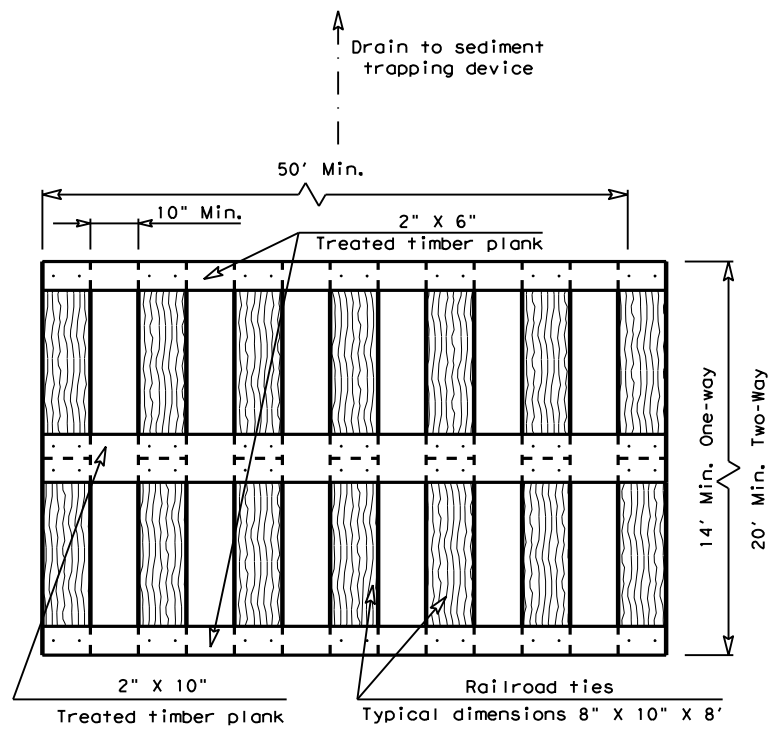


ELEVATION VIEW

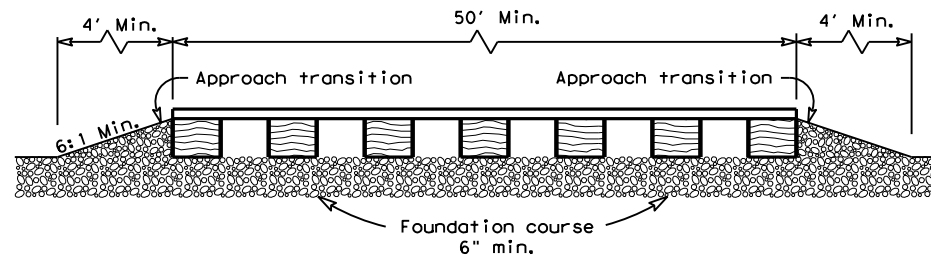
CONSTRUCTION EXIT (TYPE 1)  
 ROCK CONSTRUCTION (LONG TERM)

**GENERAL NOTES (TYPE 1)**

1. The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50'.
2. The coarse aggregate should be open graded with a size of 4" to 8".
3. The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
4. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other materials approved by the Engineer.
5. The construction exit shall be graded to allow drainage to a sediment trapping device.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
7. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.



PLAN VIEW

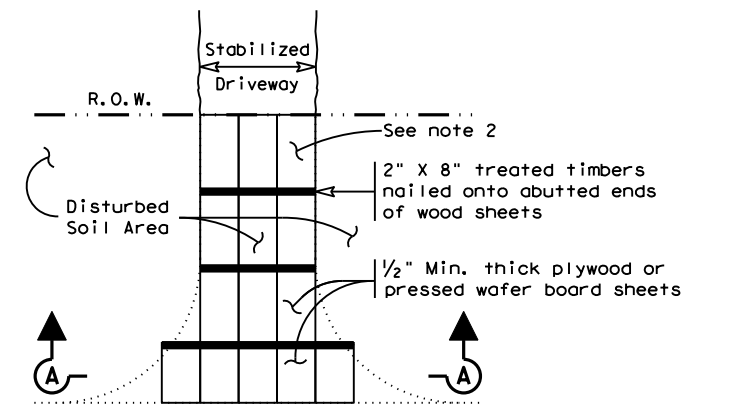


ELEVATION VIEW

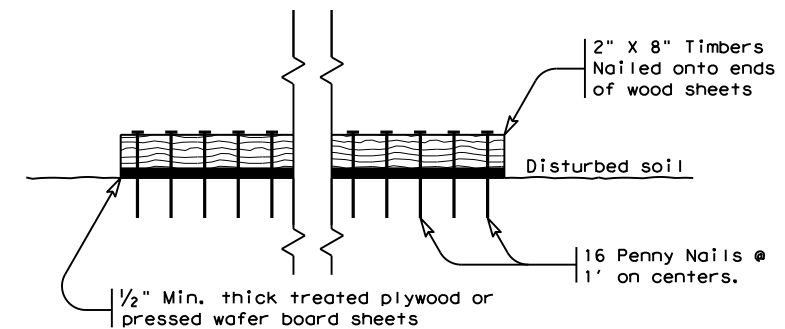
CONSTRUCTION EXIT (TYPE 2)  
 TIMBER CONSTRUCTION (LONG TERM)

**GENERAL NOTES (TYPE 2)**

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
2. The treated timber planks shall be attached to the railroad ties with 1/2" x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
8. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.



PLAN VIEW



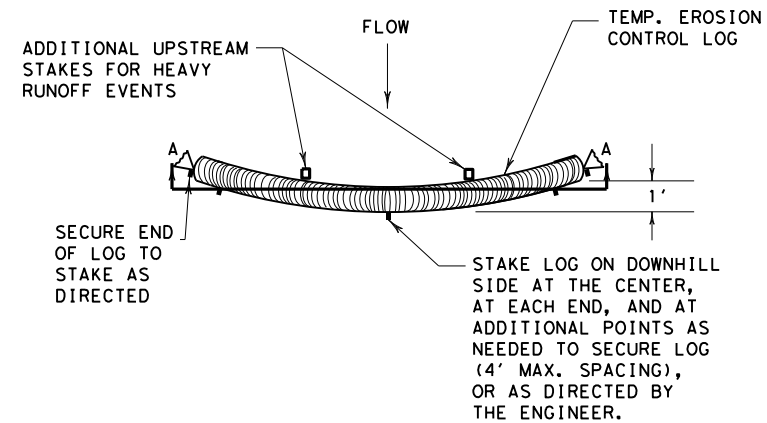
SECTION A-A  
 CONSTRUCTION EXIT (TYPE 3)  
 SHORT TERM

**GENERAL NOTES (TYPE 3)**

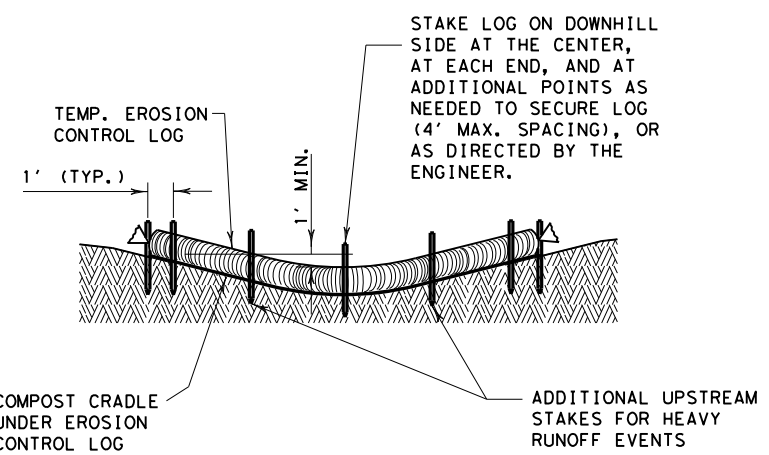
1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

		<i>Design Division Standard</i>	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES CONSTRUCTION EXITS EC(3)-16</b>			
FILE: ec316	DN: TxDOT	CK: KM	DW: VP
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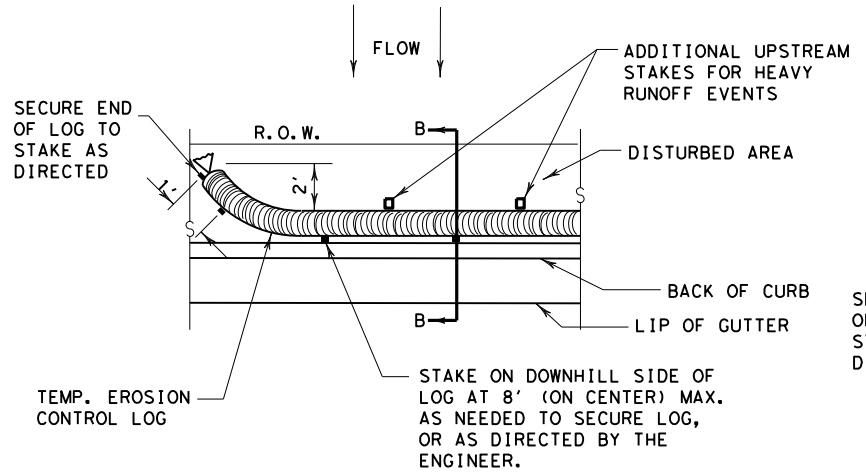


PLAN VIEW

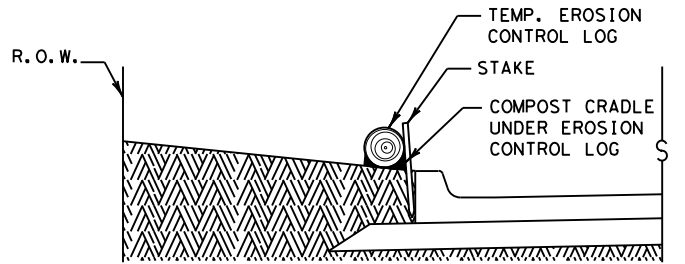


SECTION A-A  
 EROSION CONTROL LOG DAM

CL-D

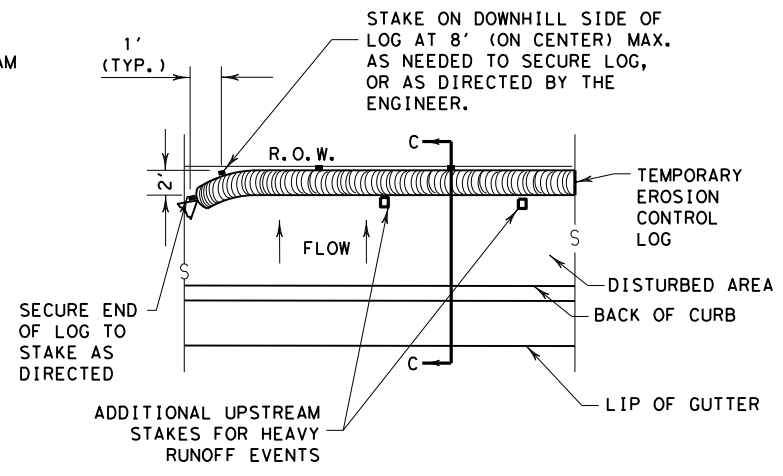


PLAN VIEW

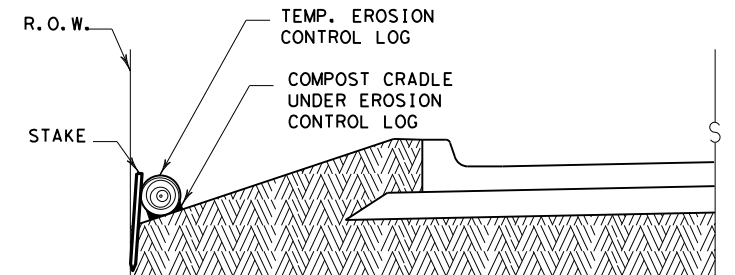


SECTION B-B  
 EROSION CONTROL LOG AT BACK OF CURB

CL-BOC



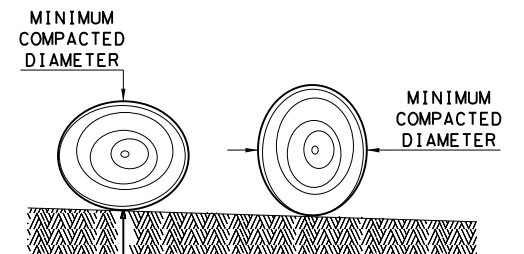
PLAN VIEW



SECTION C-C

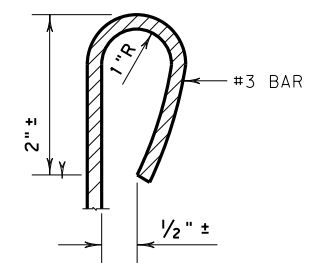
EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

- LEGEND**
- CL-D EROSION CONTROL LOG DAM
  - CL-BOC EROSION CONTROL LOG AT BACK OF CURB
  - CL-ROW EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
  - CL-SST EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
  - CL-SSL EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
  - CL-DI EROSION CONTROL LOG AT DROP INLET
  - CL-CI EROSION CONTROL LOG AT CURB INLET
  - CL-GI EROSION CONTROL LOG AT CURB & GRATE INLET



REBAR STAKE DETAIL

**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.

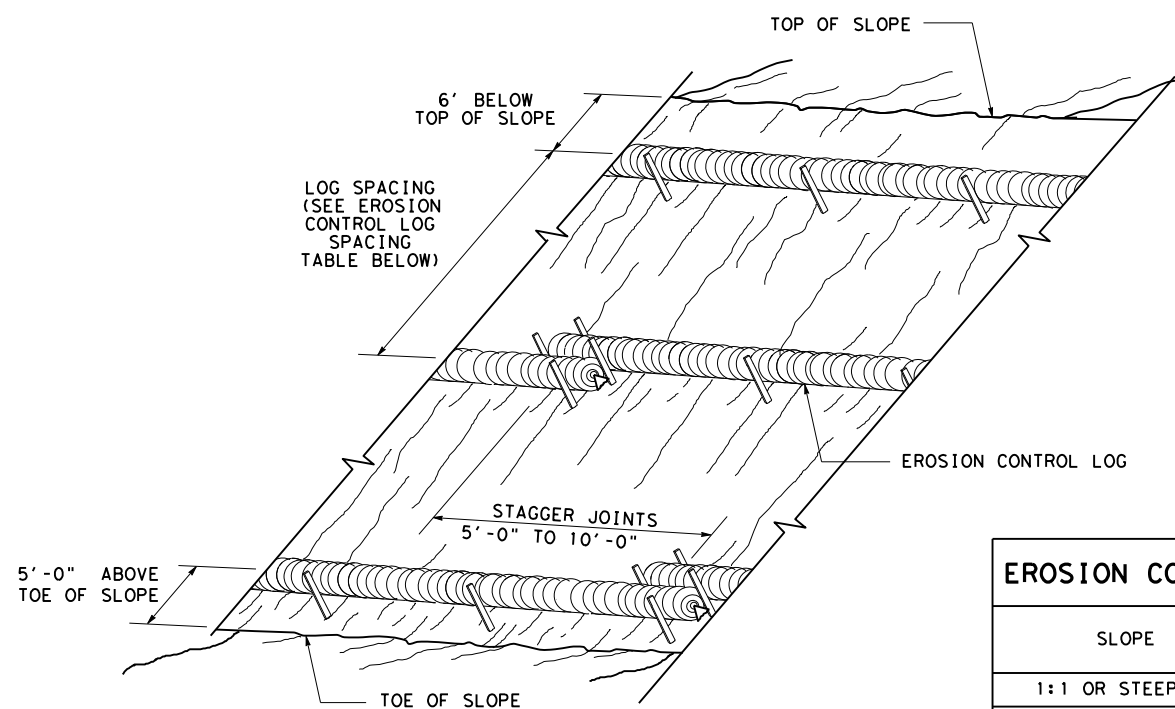
Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.

- GENERAL NOTES:**
1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'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.

SHEET 1 OF 3

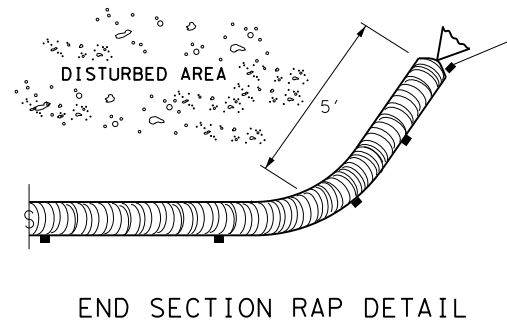
		<b>Design Division Standard</b>	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES</b>			
<b>EROSION CONTROL LOG</b>			
<b>EC (9) - 16</b>			
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT
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REVISIONS	0220	05	080
	DIST	COUNTY	SHEET NO.
	PHR	CAMERON	314

DATE: 3/6/2023  
 FILE: \\txdot\projectwise\online.com\txdot\Documents\21 - PHR\Design Projects\022005080\4 - Design\Plan Set\9. Environmental\Standards\4\_ec916.dgn  
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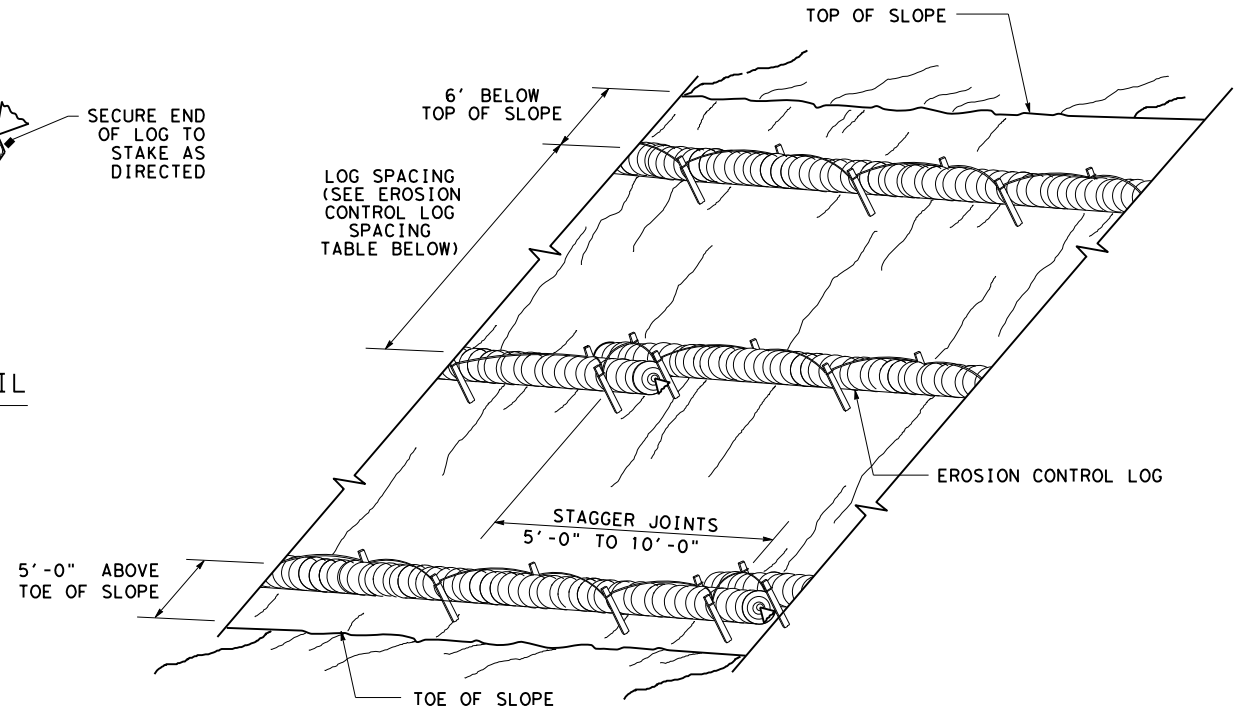
**EROSION CONTROL LOGS ON SLOPES  
STAKE AND TRENCHING ANCHORING**

CL-SST



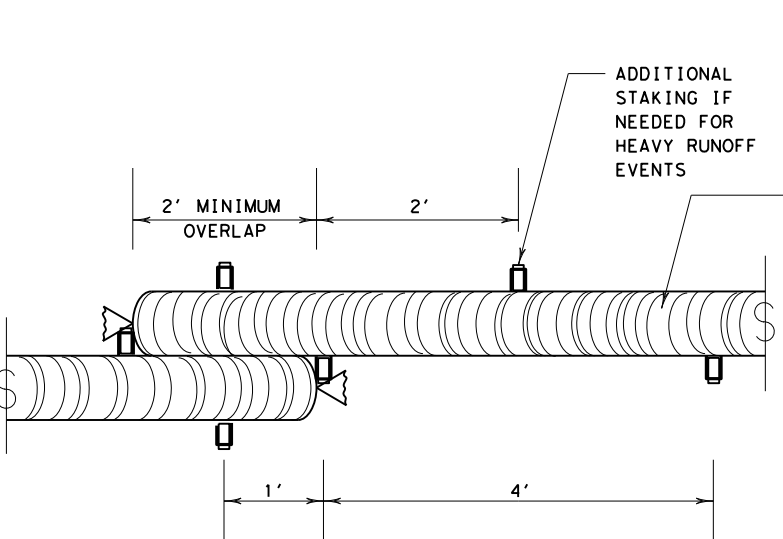
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

\* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:  
 SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;  
 HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



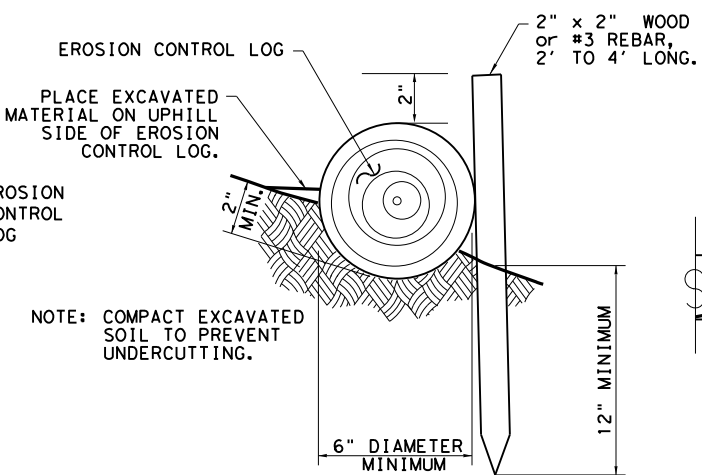
**EROSION CONTROL LOGS ON SLOPES  
STAKE AND LASHING ANCHORING**

CL-SSL



**STAKE AND TRENCHING ANCHORING DETAIL**

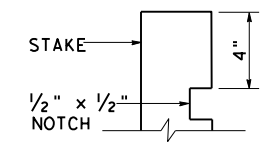
CL-SST



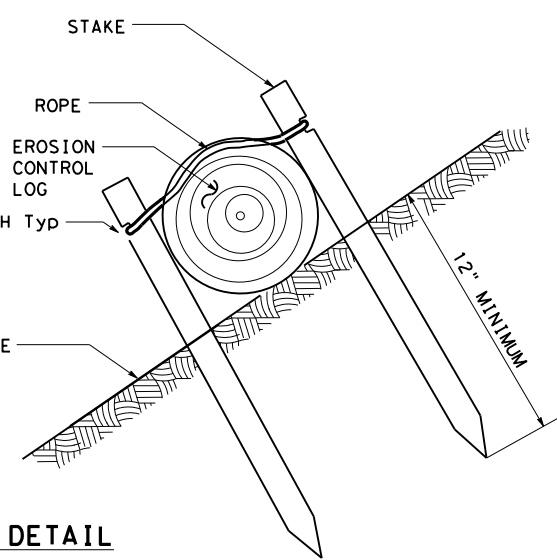
**STAKE AND LASHING ANCHORING DETAIL**

CL-SSL

LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"



**STAKE NOTCH DETAIL**

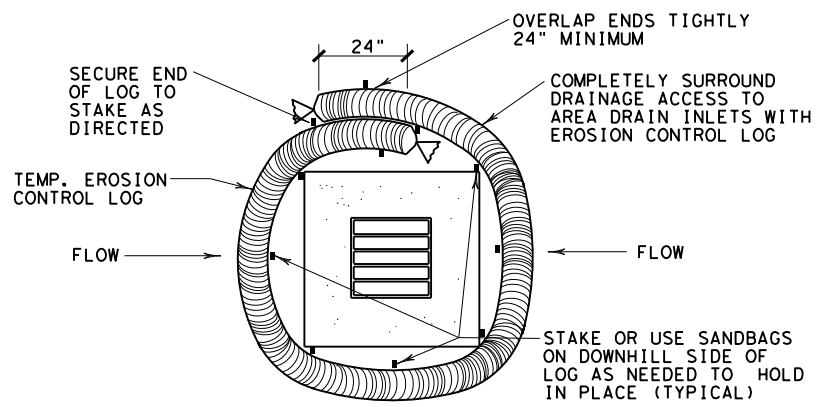


SHEET 2 OF 3

		Design Division Standard	
<b>TEMPORARY EROSION,          SEDIMENT AND WATER          POLLUTION CONTROL MEASURES          EROSION CONTROL LOG          EC (9) - 16</b>			
FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT
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DIST	COUNTY	SHEET NO.	
PHR	CAMERON	315	

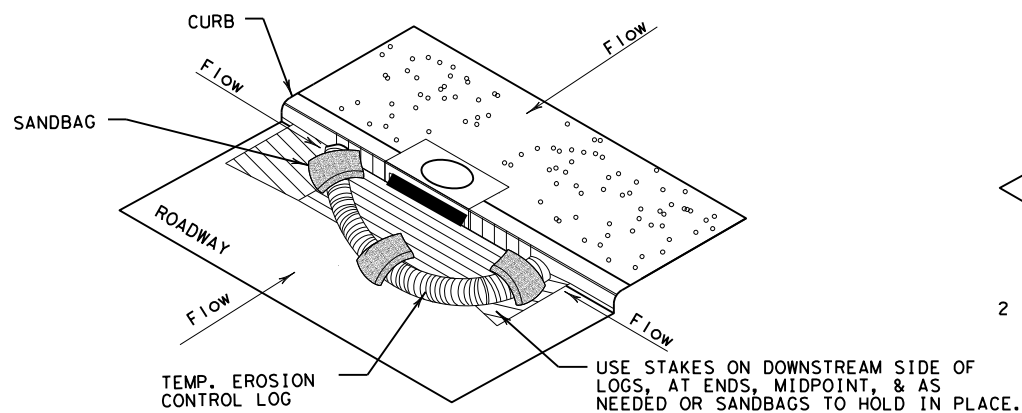
DATE: 3/6/2023  
 FILE: p:\t\txdot\projectwiseonline.com\txdot\Documents\21 - PHR\Design Projects\022005080\4 - Design\Plan Set\9. Environmental\Standards\4\_ec916.dgn

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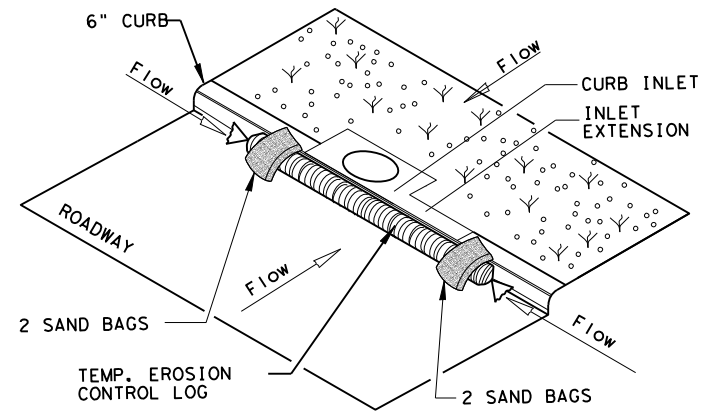
**EROSION CONTROL LOG AT DROP INLET**

CL-DI



**EROSION CONTROL LOG AT CURB INLET**

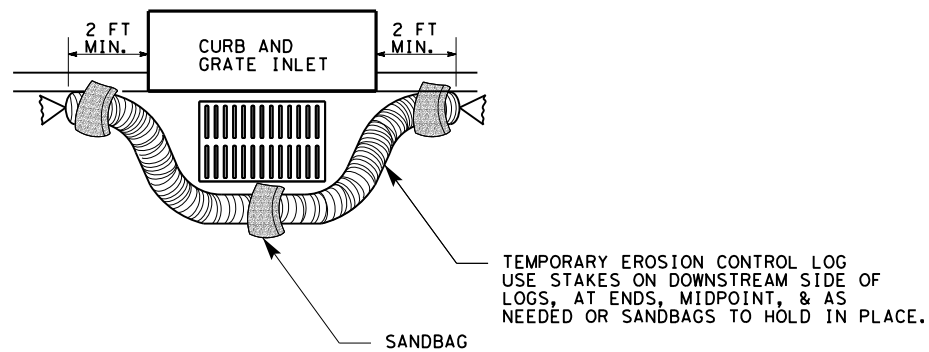
CL-CI



**EROSION CONTROL LOG AT CURB INLET**

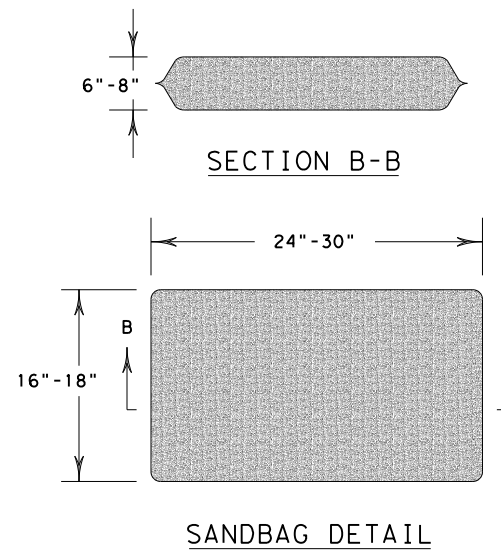
CL-CI

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



SHEET 3 OF 3

		<i>Design Division Standard</i>	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES</b> <b>EROSION CONTROL LOG</b> <b>EC (9) - 16</b>			
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT
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DIST	COUNTY	SHEET NO.	
PHR	CAMERON	316	