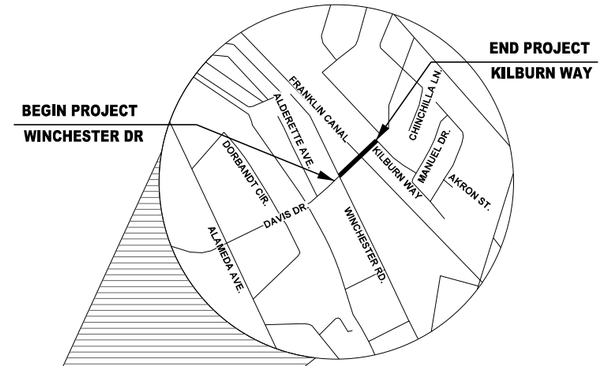
DESIGN SPEED=15 MPH
FUNCTIONAL CLASSIFICATION: MAJOR COLLECTOR
ADT: 4,909 (2017)
ADT: 6,870 (2037)
NEW NBI: 24-072-0-B188-00-002



LOCATION MAP DAVIS DR
SCALE :NTS

LIMITS FROM:

DAVIS DR BETWEEN WINCHESTER RD AND KILBURN WAY

LENGTH:

ROADWAY LENGTH: 308.27 LF= 0.091 MILES
BRIDGE LENGTH: 26.00 LF= 0.005 MILES
NET LENGTH: 506.27 LF= 0.096 MILES

DESCRIPTION:

ROADWAY AND BRIDGE RECONSTRUCTION

TDLR# TABS2020015271

FEDERAL AID PROJECT NO: BR 1902(135)

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACTS (FORM FHWA 1273, MAY 1, 2012)

CONSOR
1501 N. MESA, STE #200, EL PASO, TX 79902 F-12040
PHONE: (915) 313-3680

SEE INDEX ON SHEET 2

STATE OF TEXAS
RICARDO A PRIETO
91123
LICENSED
PROFESSIONAL ENGINEER

5/1/2020
DATE

RICARDO A. PRIETO, P.E.
PROJECT MANAGER
CONSOR ENGINEERS, LLC. -
FIRM REGISTRATION NUMBER: 12040

THE CITY OF EL PASO TEXAS

DAVIS BRIDGE REPLACEMENT

FUNDED BY: TXDOT

CSJ NO. 0924-06-419

CAPITAL IMPROVEMENT
CITY OF EL PASO

2018 N. Campbell Street, El Paso, TX.79901
Telephone: (915) 212-0065

238618
FILE NO.

DAVIS BRIDGE REPLACEMENT

INDEX OF SHEETS

STATE OF TEXAS · RICARDO A PRIETO · 91123 · LICENSED PROFESSIONAL ENGINEER
4/17/2020

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

STATE OF TEXAS · FRANCISCO A CASTRO · 109769 · LICENSED PROFESSIONAL ENGINEER
4/17/2020

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

STATE OF TEXAS · LEONARDO LEDESMA · 103621 · LICENSED PROFESSIONAL ENGINEER
4/17/2020

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

STATE OF TEXAS · ARLENE FRESQUEZ · 106510 · LICENSED PROFESSIONAL ENGINEER
4/17/2020

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

238618

REFERENCES – BENCHMARKS

DATE	REMARKS	BY

ENGINEER'S SEAL

SCALE HOR: NTS VER: NA
DATE 4/17/2020
DESIGN BY PG/RG/DN
DRAWN BY PG
CHKD. BY RP
APPD. BY RP

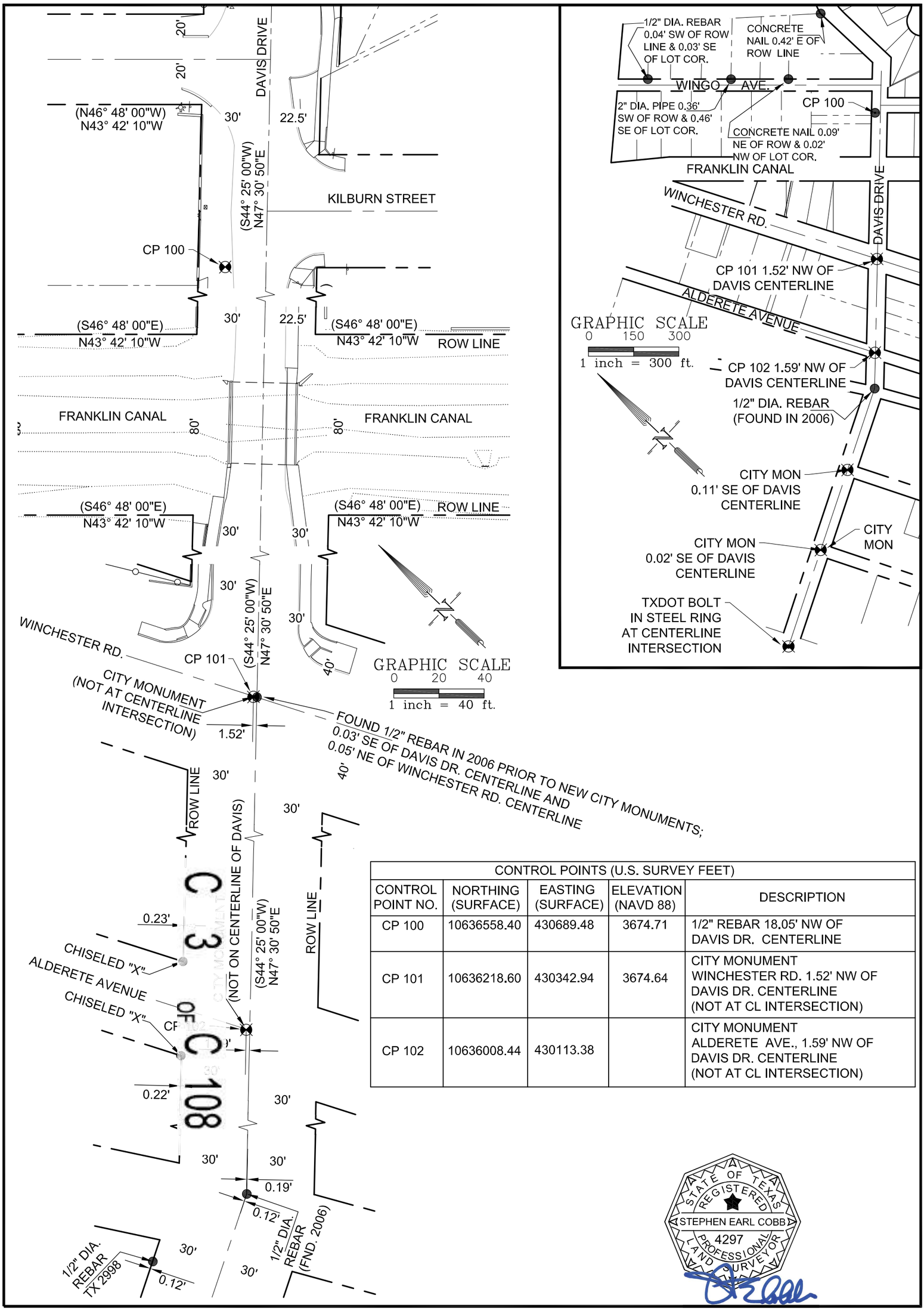
PROJECT NAME
DAVIS BRIDGE REPLACEMENT ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT — CITY OF EL PASO

CONSOR F-12040
1501 N. MESA, STE #200, EL PASO, TX 79902
PHONE (915) 315-3660

SHEET TITLE
INDEX OF SHEETS

SHEET
C 2 OF C 97



CONTROL POINTS (U.S. SURVEY FEET)				
CONTROL POINT NO.	NORTHING (SURFACE)	EASTING (SURFACE)	ELEVATION (NAVD 88)	DESCRIPTION
CP 100	10636558.40	430689.48	3674.71	1/2" REBAR 18.05' NW OF DAVIS DR. CENTERLINE
CP 101	10636218.60	430342.94	3674.64	CITY MONUMENT WINCHESTER RD. 1.52' NW OF DAVIS DR. CENTERLINE (NOT AT CL INTERSECTION)
CP 102	10636008.44	430113.38		CITY MONUMENT ALDERETE AVE., 1.59' NW OF DAVIS DR. CENTERLINE (NOT AT CL INTERSECTION)

STATE OF TEXAS
REGISTERED
STEPHEN EARL COBB
4297
PROFESSIONAL
LAND SURVEYOR

SURVEY
ROW
1 OF 1 SHEET
SHEET TITLE

CONSOR F-12040
1501 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-3680

HUITT-ZOLLARS INC.
ENGINEERING / SURVEYING
5822 CROMO DRIVE, SUITE 210
EL PASO, TEXAS 79912
PH. (915) 587-4339 / FAX (915) 587-5247
FIRM REGISTRATION F-761

PROJECT NAME
FRANKLIN CANAL AT DAVIS
ROW AND TOPOGRAPHIC SURVEY

SCALE
HOR: 1" = 40'
VER:
DATE JULY 24, 2019
DESIGN BY
DRAWN BY AP, JK, JZ
CHKD. BY COBB
APPD. BY

SURVEYOR'S SEAL

REFERENCES – BENCHMARKS
FILE:

DATE	REVISIONS	BY
02-10-2020	Two-Sheet layout for CONSOR plan set.	sec

C 3 of C 97

Attachment B

LEGEND

- TELEPHONE MAN HOLE
- SIGN
- POWER POLE
- PEDESTRIAN LIGHT
- LIGHT POLE
- TRANSFORMER
- TREES / BUSHES
- S — SEWER LINE
- W — WATER LINE
- GAS — GAS LINE
- OHE — OVERHEAD POWER LINE
- E — ELECTRICAL LINE
- CITY MONUMENT
- OTHER SURVEY MARKER
- GAS MARKER
- BOLLARD
- BACK-FLOW PREVENTOR
- SANITARY SEWER MAN HOLE
- STORM SEWER MAN HOLE
- GUY WIRE
- FIRE HYDRANT
- MAN HOLE
- JUNCTION BOX / PULL BOX
- WATER METER
- LIGHT POLE
- WV — WATER VALVE
- GV — GAS VALVE

GRAPHIC SCALE
0 20 40
1 inch = 40 ft.

CP 100
18.05' NW OF
DAVIS DR.
CENTERLINE

SURVEY DATUM NOTE: COORDINATES SHOWN WITHIN THIS DRAWING ARE SURFACE COORDINATES DERIVED FROM A SCALING OF TEXAS STATE PLANE GRID COORDINATES CENTRAL ZONE NAD 83 BY 1.000231. TO CONVERT FROM THIS GROUND COORDINATE SYSTEM BACK TO STATE PLANE GRID, MULTIPLY BY 0.99976905.

BEARINGS SHOWN HEREON (EXCEPT PARENTHETICAL RECORD BEARINGS) ARE TEXAS STATE PLANE GRID BEARINGS CENTRAL ZONE NAD 83.

ELEVATIONS SHOWN HEREON ARE NAVD 88, DERIVED FROM APPLICATION OF THE GEOID 12A MODEL TO GPS OBSERVATIONS MADE WITH RESPECT TO THE EL PASO ISLAND OF THE TEXAS RTK CO-OP (RTKNET .COM ADMINISTERED BY ALLTERRA CENTRAL)

GENERAL NOTES:

1. DRAWN UTILITIES ARE LOCATED FROM PAINT MARKS ON THE GROUND, VISIBLE PHYSICAL UTILITY FEATURES, AND RECORD UTILITY DATA.
2. WATER AND SEWER LINES ARE DRAWN FROM EPWU RECORD DATA, PAINT MARKS ON THE GROUND, AND VISIBLE PHYSICAL WATER UTILITY FEATURES.

STATE OF TEXAS · REGISTERED · STEPHEN EARL COBB · 4297 · PROFESSIONAL LAND SURVEYOR

ROW LINE (S46° 48' 00"E) N43° 42' 10"W (S44° 25' 00"W) N47° 30' 50"E

FRANKLIN CANAL 80'

BRICK WALL, ROCK WALL, CHAIN LINK FENCE, CONC. DRIVEWAY, SIDEWALK, CURB, EDGE OF ASPH., RAMP, GATE, OHE, ABUTMENT, CONC. BRIDGE DECK, IRRIGATION DITCH

8" AC (per EPWater 75-5124) W

8" AC (per EPWater 78-5103) W

6" C.I. W

24" V.C.P.

12" V.C.P.

SAN. SEWER M.H. RIM ELEV.=3678.58 INV ELEV.=3668.78

SAN. SEWER M.H. RIM ELEV.=3678.12 INV ELEV.=3661.82

SAN. SEWER M.H. RIM ELEV.=3677.98 INV ELEV.=3668.54

AT&T BOX

SECTION B–B

N.T.S.

B 6" MAIN SUSPENDED ON SIDE OF BRIDGE (PER EPWATER 65-5242)

TOP 6" PIPE ELEV.=3679.70
SW @ ABUTMENT ELEV.=3679.06
EDGE OF CONCRETE ELEV.=3679.01
EDGE OF CONCRETE ELEV.=3677.38
LOW CHORD ELEV.=3677.48
LOW CHORD ELEV.=3677.55
LOW CHORD ELEV.=3677.41
SW @ ABUTMENT ELEV.=3679.29
EDGE OF CONCRETE ELEV.=3678.83
TOE ELEV.=3672.78
TOE ELEV.=3672.54
BREAK ELEV.=3673.42

SECTION A–A

N.T.S.

A 6" SEWER LINE ANCHORED TO SIDE OF HEADWALL

TOP 6" PIPE ELEV.=3679.40
SW @ ABUTMENT ELEV.=3679.28
BREAK ELEV.=3673.99
LOW CHORD ELEV.=3677.43
LOW CHORD ELEV.=3677.55
LOW CHORD ELEV.=3677.42
EDGE OF CONCRETE ELEV.=3679.03
TOP 6" PIPE ELEV.=3679.40
SW @ ABUTMENT ELEV.=3679.28
EDGE OF CONCRETE ELEV.=3677.34
TOE ELEV.=3672.70
TOE ELEV.=3673.19

REFERENCES – BENCHMARKS

FILE:

BY	REVISIONS	DATE
COBB	Two-Sheet layout for CONSOR plan set.	10-10-2020

SURVEYOR'S SEAL

SCALE 1" = 40'
HOR.
VER.
DATE JULY 24, 2019
DESIGNED BY AP, JC, JT
DRAWN BY
CHKD. BY COBB
APPD. BY

PROJECT NAME

FRANKLIN CANAL AT DAVIS
ROW AND TOPOGRAPHIC SURVEY

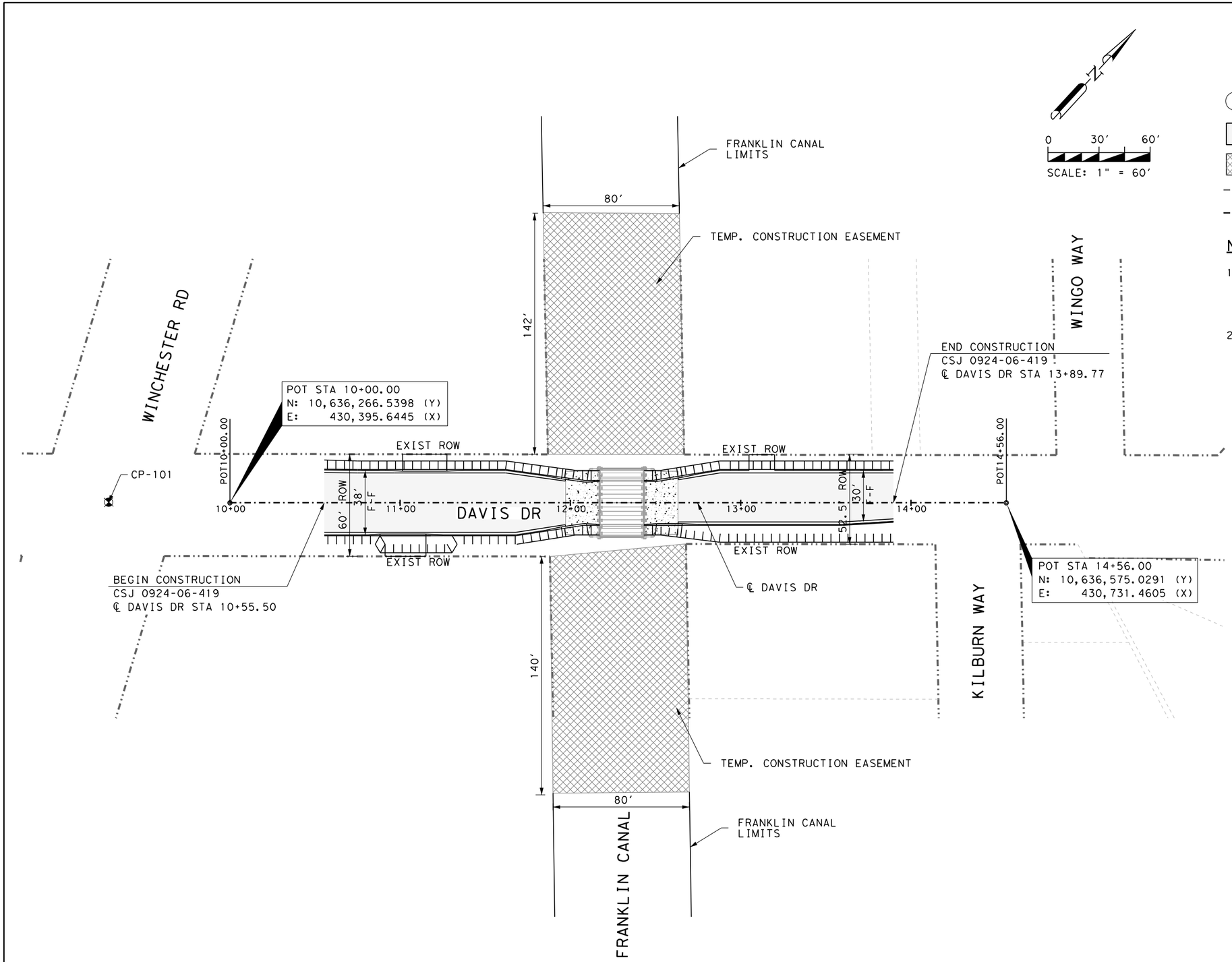
HUITT-ZOLLARS INC.
ENGINEERING / SURVEYING
5822 CROMO DRIVE, SUITE 210
EL PASO, TEXAS 79912
PH. (915) 587-4339 / FAX (915) 587-5247
FIRM REGISTRATION F-761

CONSOR F-12040
191 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-3880

SHEET TITLE

SURVEY
TOPOGRAPHY
1 OF 1

SHEET
C 4 OF C 97



LEGEND

- XX — CURVE LABEL
- PROPOSED ASPHALT PAVEMENT
- TEMP. CONSTRUCTION EASEMENT
- EXISTING ROW
- PROPOSED CENTERLINE/BASELINE

NOTES:

1. REFER TO HORIZONTAL CONTROL DATA SHEET FOR ADDITIONAL CENTERLINE & BASELINE INFORMATION.
2. REFER TO ROW & SURVEY CONTROL SHEETS FOR ADDITIONAL ROW INFORMATION.

REFERENCES – BENCHMARKS

FILE: REFER TO ROW & SURVEY CONTROL SHEETS FOR ADDITIONAL ROW AND BENCHMARK INFORMATION.

BY	REMARKS	DATE

ENGINEER'S SEAL

SCALE		DATE	4/17/2020
HOR:	1"=60'	DESIGN BY	CV
VER:	N/A	DRAWN BY	FC
		CHKD. BY	FC
		APPD. BY	AP

PROJECT NAME

DAVIS BRIDGE REPLACEMENT ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT
CITY OF EL PASO

CONSOR F-12040
1501 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-3680

SHEET TITLE

PROJECT LAYOUT & HORIZONTAL CONTROL

SHEET
C 5 OF C 97

238618

4/17/2020 11:34:53 AM H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\General\C_419_S_GPL01.dgn

HORIZONTAL CONTROL DATA (DAVIS DR.)

```
<*       1    Describe Chain DAVIS

Chain DAVIS contains:
 D01 D02

Beginning chain DAVIS description
================================================================================

Point D01              X      430,395.6445 Y  10,636,266.5398 Sta       10+00.00

Course from D01 to D02 N 47° 25' 43.00" E Dist 456.0022

Point D02              X      430,731.4605 Y  10,636,575.0291 Sta       14+56.00

================================================================================
Ending chain DAVIS description
```

HORIZONTAL CONTROL DATA (ACCESS ROAD SOUTH)

```
<*       1    DESCRIBE CHAIN ACCESS

Chain ACCESS contains:
 CV05 CUR ACCESS1 CUR ACCESS2 CUR ACCESS3 CUR ACCESS4 CV06

Beginning chain ACCESS description
================================================================================

Point CV05             X      430,463.8268 Y  10,636,496.3395 Sta       10+00.00

Course from CV05 to PC ACCESS1 S 43° 26' 05.38" E Dist 69.2536

                                    Curve Data
                                   *----------*
Curve ACCESS1
P.I.  Station              10+76.19  X        430,516.2081  Y      10,636,441.0153
Delta          =       8° 34' 26.79" (RT)
Degree         =      61° 56' 28.98"
Tangent        =              6.9341
Length         =             13.8423
Radius         =             92.5000
External       =              0.2595
Long Chord     =             13.8294
Mid. Ord.      =              0.2588
P.C.  Station              10+69.25  X        430,511.4407  Y      10,636,446.0505
P.T.  Station              10+83.10  X        430,520.1715  Y      10,636,435.3256
C.C.                                 X        430,444.2712  Y      10,636,382.4541
Back         = S  43° 26' 05.38" E
Ahead        = S  34° 51' 38.60" E
Chord Bear   = S  39° 08' 51.99" E

Course from PT ACCESS1 to PC ACCESS2 S 34° 51' 38.60" E Dist 19.4919

                                    Curve Data
                                   *----------*
Curve ACCESS2
P.I.  Station              11+09.33  X        430,535.1646  Y      10,636,413.8020
Delta          =       7° 42' 38.41" (LT)
Degree         =      57° 17' 44.81"
Tangent        =              6.7390
Length         =             13.4577
Radius         =            100.0000
External       =              0.2268
Long Chord     =             13.4475
Mid. Ord.      =              0.2263
P.C.  Station              11+02.59  X        430,531.3127  Y      10,636,419.3316
P.T.  Station              11+16.05  X        430,539.7236  Y      10,636,408.8391
C.C.                                 X        430,613.3671  Y      10,636,476.4900
Back         = S  34° 51' 38.60" E
Ahead        = S  42° 34' 17.00" E
Chord Bear   = S  38° 42' 57.80" E

Course from PT ACCESS2 to PC ACCESS3 S 42° 34' 17.00" E Dist 14.5211

                                    Curve Data
                                   *----------*
Curve ACCESS3
P.I.  Station              11+38.24  X        430,554.7383  Y      10,636,392.4944
Delta          =       8° 46' 32.84" (LT)
Degree         =      57° 17' 44.81"
Tangent        =              7.6733
Length         =             15.3166
Radius         =            100.0000
External       =              0.2940
Long Chord     =             15.3017
Mid. Ord.      =              0.2931
P.C.  Station              11+30.57  X        430,549.5472  Y      10,636,398.1453
P.T.  Station              11+45.88  X        430,560.7307  Y      10,636,387.7017
C.C.                                 X        430,623.1907  Y      10,636,465.7962
C.C.                                 X        430,623.1907  Y      10,636,465.7962
Back         = S  42° 34' 17.00" E
Ahead        = S  51° 20' 49.84" E
Chord Bear   = S  46° 57' 33.42" E

Course from PT ACCESS3 to PC ACCESS4 S 51° 20' 49.83" E Dist 20.8579

                                    Curve Data
                                   *----------*
Curve ACCESS4
P.I.  Station              11+75.10  X        430,583.5483  Y      10,636,369.4521
Delta          =      10° 19' 42.70" (RT)
Degree         =      61° 56' 28.98"
Tangent        =              8.3600
Length         =             16.6747
Radius         =             92.5000
External       =              0.3770
Long Chord     =             16.6521
Mid. Ord.      =              0.3755
P.C.  Station              11+66.74  X        430,577.0196  Y      10,636,374.6738
P.T.  Station              11+83.42  X        430,589.0350  Y      10,636,363.1446
C.C.                                 X        430,519.2442  Y      10,636,302.4364
Back         = S  51° 20' 49.84" E
Ahead        = S  41° 01' 07.13" E
Chord Bear   = S  46° 10' 58.48" E

Course from PT ACCESS4 to CV06 S 43° 34' 30.45" E Dist 112.6223

Point CV06             X      430,666.6661 Y  10,636,281.5530 Sta       12+96.04

================================================================================
Ending chain ACCESS description
```

HORIZONTAL CONTROL DATA (ACCESS ROAD NORTH)

```
<*       1    DESCRIBE CHAIN ACCESSRD

Chain ACCESSRD contains:
 CV07 CUR ACCESSRD1 CUR ACCESSRD2 CUR ACCESSRD3 CUR ACCESSRD4 CV08

Beginning chain ACCESSRD description
================================================================================

Point CV07             X      430,499.9842 Y  10,636,529.5546 Sta       10+00.00

Course from CV07 to PC ACCESSRD1 S 42° 46' 44.09" E Dist 82.7117

                                    Curve Data
                                   *----------*
Curve ACCESSRD1
P.I.  Station              10+89.89  X        430,561.0369  Y      10,636,463.5749
Delta          =       8° 52' 43.11" (LT)
Degree         =      61° 56' 28.98"
Tangent        =              7.1813
Length         =             14.3339
Radius         =             92.5000
External       =              0.2783
Long Chord     =             14.3196
Mid. Ord.      =              0.2775
P.C.  Station              10+82.71  X        430,556.1596  Y      10,636,468.8458
P.T.  Station              10+97.05  X        430,566.6694  Y      10,636,459.1199
C.C.                                 X        430,624.0527  Y      10,636,531.6692
Back         = S  42° 46' 44.10" E
Ahead        = S  51° 39' 27.21" E
Chord Bear   = S  47° 13' 05.65" E

Course from PT ACCESSRD1 to PC ACCESSRD2 S 51° 39' 27.21" E Dist 3.5949

                                    Curve Data
                                   *----------*
Curve ACCESSRD2
P.I.  Station              11+08.59  X        430,575.7210  Y      10,636,451.9604
Delta          =       9° 05' 10.21" (RT)
Degree         =      57° 17' 44.81"
Tangent        =              7.9458
Length         =             15.8584
Radius         =            100.0000
External       =              0.3152
Long Chord     =             15.8417
Mid. Ord.      =              0.3142
P.C.  Station              11+00.64  X        430,569.4890  Y      10,636,456.8897
P.T.  Station              11+16.50  X        430,581.0964  Y      10,636,446.1088
C.C.                                 X        430,507.4529  Y      10,636,378.4580
Back         = S  51° 39' 27.21" E
Ahead        = S  42° 34' 17.00" E
Chord Bear   = S  47° 06' 52.10" E

Course from PT ACCESSRD2 to PC ACCESSRD3 S 42° 34' 17.00" E Dist 13.5855

                                    Curve Data
                                   *----------*
Curve ACCESSRD3
P.I.  Station              11+36.10  X        430,594.3566  Y      10,636,431.6741
```

REFERENCES – BENCHMARKS

FILE: REFER TO ROW & SURVEY CONTROL SHEETS FOR ADDITIONAL ROW AND BENCHMARK INFORMATION.

BY	DATE	REMARKS

ENGINEER'S SEAL

FRANCISCO A. CASTRO 109749 LICENSED PROFESSIONAL ENGINEER 4/17/2020

SCALE HOR: N/A VER: N/A

DATE 4/17/2020
DESIGN BY CV
DRAWN BY FC
CHKD. BY FC
APPD. BY RP

PROJECT NAME

DAVIS BRIDGE REPLACEMENT ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT DEPARTMENT CITY OF EL PASO

CONSOR F-12040
1501 N. MESA, STE #200 EL PASO, TX 79902
PHONE: (915) 313-3880

SHEET TITLE

HORIZONTAL CONTROL DATA

SHEET 1 OF 2

SHEET C 6 OF C 97

238618

11:34:55 AM
4/17/2020
H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\General\C_419_S_RHD01.dgn

4/17/2020 11:34:55 AM H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\General\C_419_S_RHD01.dgn

HORIZONTAL CONTROL DATA (ACCESS ROAD NORTH) (CONT.)

Delta	=	6° 53′ 05.34" (RT)				
Degree	=	57° 17′ 44.81"				
Tangent	=	6.0154				
Length	=	12.0163				
Radius	=	100.0000				
External	=	0.1808				
Long Chord	=	12.0090				
Mid. Ord.	=	0.1804				
P.C. Station		11+30.08	X	430,590.2871	Y	10,636,436.1040
P.T. Station		11+42.10	X	430,597.8656	Y	10,636,426.7883
C.C.			X	430,516.6436	Y	10,636,368.4532
Back	= S 42° 34′ 17.00" E					
Ahead	= S 35° 41′ 11.66" E					
Chord Bear	= S 39° 07′ 44.33" E					

Course from PT ACCESSRD3 to PC ACCESSRD4 S 35° 41′ 11.66" E Dist 21.7282

Curve Data

Curve ACCESSRD4						
P.I. Station		11+70.09	X	430,614.1918	Y	10,636,404.0568
Delta	=	7° 44′ 29.77" (LT)				
Degree	=	61° 56′ 28.98"				
Tangent	=	6.2587				
Length	=	12.4983				
Radius	=	92.5000				
External	=	0.2115				
Long Chord	=	12.4888				
Mid. Ord.	=	0.2110				
P.C. Station		11+63.83	X	430,610.5408	Y	10,636,409.1402
P.T. Station		11+76.33	X	430,618.4943	Y	10,636,399.5115
C.C.			X	430,685.6712	Y	10,636,463.1001
Back	= S 35° 41′ 11.66" E					
Ahead	= S 43° 25′ 41.43" E					
Chord Bear	= S 39° 33′ 26.55" E					

Course from PT ACCESSRD4 to CV08 S 43° 25′ 41.43" E Dist 119.4708

Point CV08 X 430,700.6239 Y 10,636,312.7474 Sta 12+95.80

==========

Ending chain ACCESSRD description

REFERENCES – BENCHMARKS

FILE:
REFER TO ROW & SURVEY CONTROL SHEETS
FOR ADDITIONAL ROW AND BENCHMARK INFORMATION.

DATE	REMARKS	BY

ENGINEER'S SEAL

STATE OF TEXAS
FRANCISCO A. CASTRO
109769
LICENSED PROFESSIONAL ENGINEER
4/17/2020

SCALE
HOR: N/A
VER: N/A

DATE	4/17/2020
DESIGN BY	CV
DRAWN BY	PGB/GDN
CHKD. BY	FC
APPD. BY	RP

PROJECT NAME

DAVIS BRIDGE REPLACEMENT
ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT
CITY OF EL PASO

CONSOR F-12040
1501 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-3680

SHEET TITLE

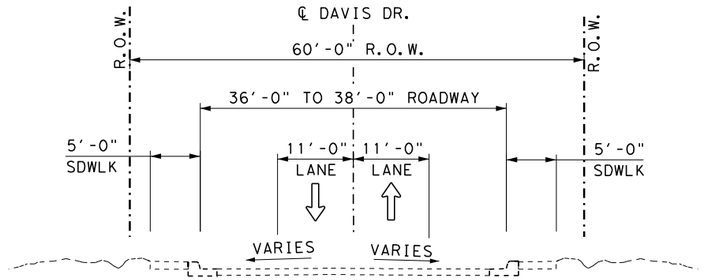
HORIZONTAL
CONTROL DATA

SHEET 2 OF 2

SHEET
C 7 OF C 97

238618

4/17/2020 11:34:56 AM H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\General\C_419_S_RHD02.dgn

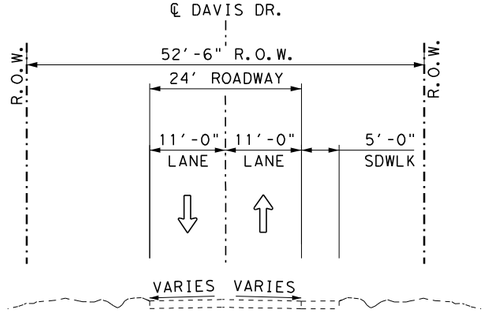


EXISTING TYPICAL SECTION
NTS

℄ DAVIS DR. STA 10+55.50 TO STA 12+08.50

LEGEND

⇧ EXISTING TRAFFIC FLOW ARROWS



EXISTING TYPICAL SECTION
NTS

℄ DAVIS DR. STA 12+47.50 TO STA 13+89.77

REFERENCES – BENCHMARKS

FILE:
REFER TO ROW & SURVEY CONTROL SHEETS
FOR ADDITIONAL ROW AND BENCHMARK INFORMATION.

BY	REMARKS	DATE

ENGINEER'S SEAL

SCALE
HOR: NTS
VER: N/A

DATE 4/17/2020
DESIGN BY CV
DRAWN BY PC/RG/DN
CHKD. BY EC
APPD. BY RP

PROJECT NAME

DAVIS BRIDGE REPLACEMENT
ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT
CITY OF EL PASO

CONSOR F-12040
1501 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-3660

SHEET TITLE

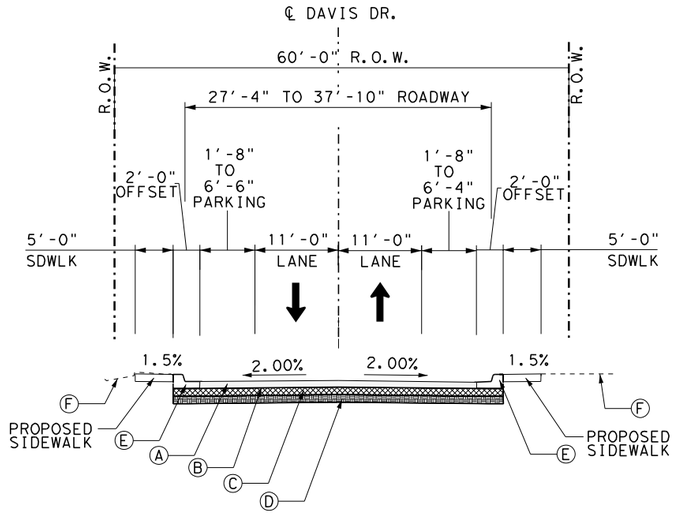
TYPICAL SECTIONS

SHEET 1 OF 2

SHEET
C 8 OF C 97

238618

11:34:58 AM
4/17/2020
H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_S_RTS01.dgn



PROPOSED TYPICAL SECTION

NTS

℄ DAVIS DR. STA 10+55.50 TO STA 12+17.18

LEGEND

Ⓐ 3" HOT MIX ASPHALT CONCRETE (HMAC), TXDOT ITEM 3076, TYPE C, 96 TO 98% MIN, 2950 (MARSHALL VALUE).

Ⓑ PRIME COAT TXDOT ITEM 310 - CSS-1H (RESIDUAL ASPHALT NON-DILUTED). APPLICATION RATE AT 0.15 TO 0.20 GAL/YD

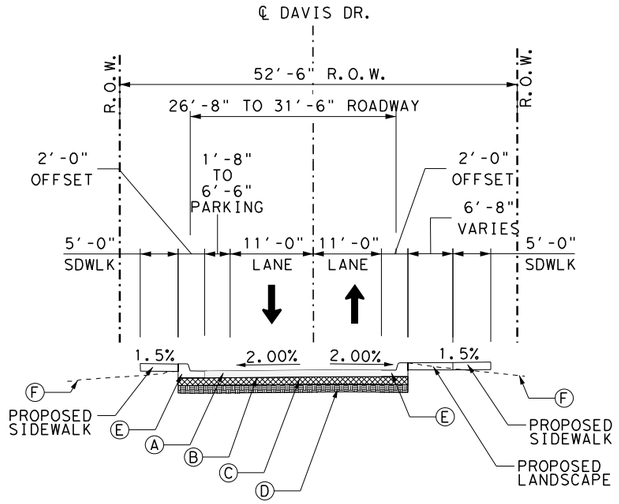
Ⓒ 8" FLEXIBLE BASE COURSE MATERIAL TXDOT ITEM 247 TYPE A, GRADE 1-2 OR APPROVED EXISTING RECYCLED BASE MATERIAL. 100% MIN., D-1557.

Ⓓ 8" SCARIFIED, MOISTURE CONDITIONED AND COMPACTED SUBGRADE SOILS. 95% MIN., D-1557

Ⓔ 6" CONCRETE CURB & GUTTER UNLESS NOTED OTHERWISE.

Ⓕ EXISTING CONDITIONS BEYOND ROW VARY.

PROPOSED TRAFFIC FLOW ARROWS



PROPOSED TYPICAL SECTION

NTS

℄ DAVIS DR. STA 12+43.18 TO STA 13+89.77

REFERENCES – BENCHMARKS

FILE: REFER TO ROW & SURVEY CONTROL SHEETS FOR ADDITIONAL ROW AND BENCHMARK INFORMATION.

DATE	REMARKS	BY

ENGINEER'S SEAL

STATE OF TEXAS — FRANCISCO A. CASTRO — 109765 — LICENSED PROFESSIONAL ENGINEER — 4/17/2020

SCALE HOR: NTS VER: NA

DATE 4/17/2020
DESIGN BY CV
DRAWN BY PGIRGON
CHKD. BY EC
APPD. BY RP

PROJECT NAME

DAVIS BRIDGE REPLACEMENT ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT — CITY OF EL PASO

CONSOR F-12040
1501 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-3680

SHEET TITLE

TYPICAL SECTIONS

SHEET 2 OF 2

SHEET C 9 OF C 97

238618

4/17/2020 11:34:59 AM H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_S_RTS02.dgn

General Notes:

Tests to be in accordance with the Texas Department of Transportation (TxDOT) Standard Test Methods

Table 1
Compaction Requirements for Base Courses

Item	Description	Outside Roadway Course Density
132[1,2,3]	Embankment (Final)(Density Control) (TY A)	(See Below)

1. **To a depth of 6 in. below natural ground scarify and compact to a 95% minimum.**
2. **From natural ground to 24 in. below finished subgrade, 98% minimum compaction.**
3. **From 24 in. below finished subgrade to finished subgrade, 100% minimum compaction.**

Table 2
Basis of Estimate

Item	Description	Rate
310	Prime Coat (CSS-1H)	0.20 gal./sq. yd.
3076	D-GR HMA TY-C PG76-22	1 in. = 110 lb./sq. yd.

1. **Deviation from the rates shown will require approval.**

General Requirements

Maintain the entire project area in a neat and orderly manner throughout the duration of the work. Remove all construction litter and undesirable vegetation within the right of way inside the project limits. This work is subsidiary to the various bid items.

Become familiar with project site prior to submitting bids.

Where nighttime work is approved, provide adequate lighting for the entire work site as directed. This is subsidiary to the various bid items.

Comply with all Occupational Safety & Health Administration (OSHA) and United States Environmental Protection Agency (EPA) regulations as well as all local and State requirements.

Refer to the traffic control narrative sheet for the proposed sequence of work. Changes will not be permitted, except as approved in writing by the Engineer.

Plan datum for this project is NAD 83 for horizontal and NAVD 88 for elevation based.

Contractor must cross-reference all elevations within the project limits, including the proposed bridge structure with the United States Bureau of Reclamation (USBR) vertical datum.

CONTROL: 0924-06-419 SHEET C10

COUNTY: EL PASO

HIGHWAY: CS (DAVIS DRIVE)

Construction within EPCWID No.1 right-of-way cannot commence until license letter of approval has been executed by EPCWID No.1.

Contact EPCWID No.1, at 915-872-4000, 72 hours prior to mobilizing for construction.

Contractor must verify United States Bureau of Reclamation (USBR) elevation from nearest USBR brass cap or physical monument prior to setting up vertical control for construction of structures within EPCWID No.1 right of way.

Construction of structures within EPCWID's irrigation delivery system, canals and lateral, will be constructed only during the non-irrigation season, November 1 through February 15.

The following Standard Detail sheet has been modified:

CRR(MOD)

Item 4L – Scope of Work

Schedule and perform all bridge work between October 15 to February 28 during the non-irrigation season. Contact and coordinate with Mr. Jay Ornelas, El Paso Water Improvement District, (915) 872-4000 before beginning work over the canal.

Schedule and perform all work to assure proper drainage during construction operations. All labor, tools, equipment and supervision required, to ensure drainage, removal, and handling of water shall be considered incidental work.

Repair any existing pavement, utilities, structures, etc., damaged as a result of construction operations, at no additional cost to the COEP.

Maintain all Contract items until final acceptance of the project.

Item 5L – Control of the Work

Verify all dimensions and grades before proceeding with construction activities. Immediately report any discrepancies found. Verification must be submitted for review and approval to the Engineer prior to start of construction.

Inform the Engineer and the respective utility companies, when it becomes apparent that the utility lines will interfere with the work in progress.

Particular attention is directed to Article 5L.7, Cooperation between Contractors, as other contractors may be working adjacent to the project limits.

Item 7L – Legal Relations and Responsibilities

No significant traffic generator events identified.

Comply with all requirements of the Environmental Permits Issues and Commitments (EPIC) Sheet.

Dispose of all waste materials in compliance with Local, State, and Federal regulations. Submit list of all approved waste sites to the Engineer for review.

Do not discharge any liquid pollutant from vehicles onto the roadside. Immediately clean spills and dispose in compliance with local, state, and federal regulations to the satisfaction of the Engineer at no additional cost to the Department.

Occupational Safety & Health Administration (OSHA) regulations prohibit operations that bring people or equipment within 10 ft. of an energized electrical line. Where workers and/or equipment may be close to an energized electrical line, notify the electrical power company and make all necessary adjustments to ensure the safety of workers near the energized line.

Item 8L – Prosecution and Progress

Working days will be calculated in accordance with Section 8.3.1.4., “Standard Workweek.”

Weather days request shall be submitted within 5 days of the event, after the 5 days no weather days will be approved.

A bar chart schedule is required for this project conforming to Section 8.5.5.1., “Bar Chart.” Provide updates as directed by the Engineer.

CONTROL: 0924-06-419 SHEET C10

COUNTY: EL PASO

HIGHWAY: CS (DAVIS DRIVE)

Prior to beginning operations, schedule and attend a preconstruction conference with the Engineer. Provide the Department a written outline of the proposed sequence of work (Bar Chart Schedule) and an estimated progress schedule.

Keep traveled surfaces used in hauling operations clear and free of dirt or other material.

Repair any existing pavement, utilities, structures, etc., damaged as a result of construction operations, at no additional cost to the COEP.

Protect from damage and destruction all areas of the right of way, which are not included in the actual limits of the proposed construction areas. Exercise care to prevent damage to trees, vegetation, and other natural features.

Protect trees, shrubs, and other landscape features from abuse, marring, or damage within the actual construction and/or fenced protection areas designated for preservation. Restore any area disturbed or damaged to a condition “as good as” or “better than” prior to start of construction operation. This work will be at the Contractor’s expense.

Item 100 – Preparing Right of Way

This Item shall cover all items requiring removal as directed by the Engineer not governed otherwise by individual removal pay items elsewhere in the plans. Refer to Specification for a list of covered items.

Item 105– Removing Treated and Untreated Base and Asphalt Pavement

Remove to finish subgrade. Scarify subgrade to a uniform depth at least 6 in. below finish subgrade elevation in areas where base or pavement structure will be placed on subgrade. Manipulate and compact subgrade in accordance with Section 132.3.4., “Compaction Methods.” Compact to 100% relative density in accordance with Section 132.3.4.2., “Density Control.”

To eliminate all drop-off conditions, construct tapers as directed. This work is subsidiary to this Item.

Item 132 – Embankment

Locate all material sources out of sight from the roadway at an approved location.

Scarify and compact top 6 in. of existing roadway as directed before additional embankment or base course is placed. This work is subsidiary to this Item.

Track the side slopes of the embankment to control erosion subsidiary to this Item.

Subgrade compaction will be density control and is subsidiary to this Item.

Item 247 – Flexible Base

Maintain moisture during compaction as directed by the Engineer. Determine the moisture content of the material in accordance with Tex-115-E or Tex-103-E as directed by the Engineer.

A 20-ton vibratory padfoot roller will be required for compaction of lifts 10 inches or greater.

Item 310 – Prime Coat

Prepare and treat existing or newly constructed surface with a bituminous material as provided or as directed by the Engineer. Apply blotter material as required.

Cure prime coat on the cement-stabilized material for at least 48 hr. prior to beginning hot-mix asphalt placement operations.

Item 416 – Drilled Shaft Foundations

Stake all foundations and locations approved by the Engineer prior to commencement of drilling operations in order to ensure no conflicts with utility lines. Coordinate with the Utility companies for utility location within the project limits. Repair any damage to existing utilities to the satisfaction of the Engineer and the utility owner at no additional cost to the COEP.

Use Class “C” concrete.

Cover drilled shafts with plywood and delineate them with cones, to the satisfaction of the Engineer, when not working in them and after work hours.

Replace faulty anchor bolts as directed. Do not weld anchor bolts.

Remove spoils, daily, out of the drainage areas or as directed.

CONTROL: 0924-06-419 SHEET C10

COUNTY: EL PASO

HIGHWAY: CS (DAVIS DRIVE)

Item 420 – Concrete Substructures

Concrete trucks will be allowed to wash out or discharge surplus concrete or drum-wash water at designated approved areas.

Item 421 – Hydraulic Cement Concrete

Furnish and properly maintain all test molds. Furnish test molds meeting the requirements of Tex-447-A. The test molds must be ready for use when needed. The Contractor will be responsible for curing and transporting concrete specimens as directed. Furnish proper equipment to remove concrete specimens from the molds. For all concrete items, provide a wheelbarrow or other acceptable container to the Engineer. This work is considered subsidiary to this Item.

Obtain approval for all concrete mix designs and concrete aggregate sources.

Provide sulfate-resistant concrete for all structural concrete in contact with soil or groundwater.

Concrete trucks will be allowed to wash out or discharge surplus concrete or drum wash water at designated areas approved by the Engineer.

Item 432 – Riprap

Finish concrete riprap with a smooth (wood float) finish, unless otherwise directed.

Obtain approval for all stone riprap material sources.

Item 479– Adjusting Manholes and Inlets

Coordinate with respective utility owners before adjusting existing utility manholes, meters, valve covers, etc.

Coordinate to complete all required adjustments within project duration acceptable to the COEP and each applicable owner.

All existing city monuments, disturbed or new installation, shall be installed, adjusted and certified by a Licensed Surveyor.

Item 502 – Barricades, Signs, and Traffic Handling

Prior to beginning construction, the Engineer will approve the routing of traffic and sequence of work.

Additional signs and barricades, placed as directed, is considered subsidiary to this Item.

In accordance with Section 7.2.6.1, designate, in writing, a Contractor Responsible Person (CRP) and a CRP alternate to take full responsibility for the set-up, maintenance, and necessary corrective measures of the traffic control plan. The CRP or CRP alternate must be present at site and implement the initial set up of every traffic control phase/stage, at each location, and/or each call out, for the entire duration of the project.

At the written request of the Engineer, immediately remove the CRP or CRP alternate from the project if, in the opinion of the Engineer, is not competent, not present at initial TCP set-ups, or does not perform in a proper, skillful, or safe manner. These individuals shall not be reinstated without written consent of the Engineer.

CRP and CRP alternate must be trained using TxDOT approved training. Provide a copy of the certificate of completion to the Engineer for project records. Refer to Table 3 for TxDOT approved training.

CONTROL: 0924-06-419 SHEET C10

COUNTY: EL PASO

HIGHWAY: CS (DAVIS DRIVE)

Table 3
Contractor Responsible Person and Alternate

Provider	Course Number	Course Title	Duration	Notes
American Traffic Safety Services Association	TCS	Traffic Control Supervisor	2 days	
National Highway Institute	133112 133113	Design and Operation of Work Zone Traffic Control Work Zone Traffic Control for Maintenance Operations	1 day 1 day	Both courses are required to meet minimum required training.
Texas Engineering Extension Services	133112A	Design and Operation of Work Zone Traffic Control	3 days	
University of Texas Arlington Division for Enterprise Development	WKZ421	Traffic Control Supervisor	16 hours	Contact UTA for training needs.

All contractor workers involved with the traffic control implementation and maintenance must participate and complete a TxDOT approved training course. Provide a copy of the certificate of completion to the Engineer for project records. Refer to Table 4 for TxDOT approved training.

Contractor may choose to train workers involved with the traffic control implementation and maintenance with a contractor developed training in lieu of TxDOT approved training. Contractor developed training must be equivalent to the TxDOT approved training shown in Table 3. Provide the Engineer a copy of the course curriculum for pre-approval, prior to conducting the contractor developed training. Provide the Engineer a copy of the log of attendees after training completion for project records.

Existing regulatory signs, route marker auxiliaries, guide signs, and warning signs that must be removed due to widening shall be relocated temporarily and erected on approved supports at locations shown in the plans, or as directed. This work is considered subsidiary to this Item.

Notify the Engineer when major traffic changes are to be made, such as detours. Coordinate with the COEP Streets Department on all traffic changes.

Provide access to driveways at all times, unless otherwise directed.

Any approved change to the sequence of work or TCP, must be signed and sealed by a Contractor's Licensed Professional Engineer assuming full responsibility for any additional barricade signs and devices needed.

Use portable changeable message signs (PCMS) to alert public of road closure two weeks prior to construction.

Place and maintain sufficient additional warning signs, beacons, delineators, and barricades to warn and guide the public of all hazards through the construction zone at all times, and as directed

Some signs, barricades, and channelization devices may not be shown at the precise or measured position. Place the barricades, devices, or signs, with approval, in positions to meet field conditions.

Fill any holes left by barricade or sign supports and restore the area to its original condition.

Use Type A flashing warning lights or delineators to mark open excavation, footings, foundations, or other obstructions near lanes that may be open to traffic, as directed.

CONTROL: 0924-06-419 SHEET C10

COUNTY: EL PASO

HIGHWAY: CS (DAVIS DRIVE)

Table 4
Other Work Zone Personnel

Provider	Course Number	Course Title	Duration	Notes
American Traffic Safety Services Association	TCT	Traffic Control Technician	1 day	
Texas Engineering Extension Services	HWS002	Work Zone Traffic Control	16 hours	Identical to HWS-410. Counts for 3 year CRP requirement.
National Highway Institute	133116	Maintenance of Traffic for Technicians	5 hours	Web based
National Highway Institute	134109-I	Maintenance Training Series: Basics of Work Zone Traffic Control	1 hour	Free, Web based
University of Texas at Arlington, Division for Enterprise Development	WKZ100	Work Zone Safety: Temporary Traffic Control	4 hours	Note name change. Free, Web based
TxDOT/AGC Joint Development	N/A	Safe Workers Awareness Highway Construction Work Zone Hazards	16 minutes 18 minutes	Videos available through AGC of Texas offices. English & Spanish
AGC America	N/A	Highway Work Zone Safety Training	1 day	
Texas Engineering Extension Service	HWS400	Temporary Traffic Control Worker	4 hours	Contact TEEX, if interested in course
TxDOT/AGC Joint Development	N/A	Work Zone Fundamentals	10 minutes	Videos available through ACT of Texas offices. English & Spanish

.

For additional information pertaining to channelization, signing, spacing details, and flagging procedures required to regulate, warn, and guide traffic through project, refer to the "Barricade and Construction Standards," BC(1)-14 and to the current *Texas Manual on Uniform Traffic Control Devices(TMUTCD).*

Remove or cover signs that do not apply to current conditions at the end of each day's work.

Repair and/or replace all signs damaged by the public or due to weather events.

Item 506 – Temporary Erosion, Sedimentation, and Environmental Controls

Place Best Method Practices (BMP's) in locations as designated in the plans or as directed to meet field conditions.

Place rain gauge(s) at locations as designated.

The total disturbed area for this project is 0.29 acres. Establish the authorization requirements for Storm Water Discharges for soil disturbed area in this project, all project locations in the Contract, and Contractor Project Specific Locations (PSLs), within one mile of the project limits. Both the Department and the Contractor shall obtain an authorization to discharge storm water from TCEQ for the construction activities shown on the plans. Obtain required authorization from the TCEQ for any Contractor PSLs for construction support activities on or off right of way.

Best Method Practices (BMP's) may be adjusted to meet field conditions, or as directed. The Engineer will verify all locations prior to placement of BMPs. Maintain and properly place the erosion control measures to prevent storm water pollution to the Waters of the United States, as directed. Within the project limits, keep all inlets functional as long as possible to accept storm water as part of the Storm Water Pollution Prevention Plan (SWP3), as directed.

Grading operations will be limited to the catch point of the proposed cross-section.

Item 529 – Concrete Curb, Gutter and Combined Curb and Gutter

Use Class A concrete for these Items, unless otherwise shown on the plans. Wire mesh and fibers for concrete will not be allowed. Reinforce all concrete using reinforcement conforming to Item 440, "Reinforcement for concrete," as shown on the plans or as directed.

Construct the curb opening with metal plate configuration detailed in the plans, or as directed, to ensure roadway drainage to the earthen ditch. No direct payment will be made for these features. Payment will be made under this Item. All required manipulations or incidentals required to complete the work are considered subsidiary to this Item.

CONTROL: 0924-06-419 SHEET C10

COUNTY: EL PASO

HIGHWAY: CS (DAVIS DRIVE)

Perform all requiring grading for proposed concrete curb, gutter, and combined curb and gutter construction as shown on the plans. All grading, including excavation and fill/embankment is subsidiary to this Item.

After construction, restore the adjacent surface to a condition approved by the Engineer. This work is considered subsidiary to this Item.

Item 530 – Intersections, Driveways, and Turnouts

The existing roadway and driveways are to be saw-cut to a straight and neat line when proposed sidewalks are being constructed across them. The area then will be cleaned out prior to concrete placement. This work is subsidiary to this Item.

Use Class A concrete for all concrete driveways, unless otherwise shown on the plans.

High early strength concrete for proposed driveways to be available as deemed necessary and as directed.

Item 531 – Sidewalk

The wheelchair ramp dimensions and locations shown in the plans may be adjusted, as directed, to match the field conditions. Any such modification is subsidiary to this Item.

Modify the sidewalk expansion joint spacing to 20 ft. spacing where waterlines may exist under the sidewalk. This work is considered subsidiary to this Item.

Perform all work under this Item to conform to ADA and TDLR standards.

Perform all requiring grading for proposed sidewalks construction as shown on the plans. All grading, including excavation, fill, and embankment is subsidiary to this Item.

Provide detectable warning surface for new ramps manufactured from a Department approved s

Surface applied vitrified polymer composite tile, red in color.

Item 585 – Ride Quality for Pavement Surfaces

Use Surface Test Type A to govern ride quality.

Use diamond grinding or equivalent to correct areas of localized roughness. Use CSS-1H emulsion to fog seal the corrected areas.

The contractor shall take care to ensure satisfactory profile results in the intermediate paving layers (mixture) to eliminate corrective action for excessive deviations in the final surface layers.

Milling will not be allowed as a corrective action for excessive deviations in the surface layer of hot mix.

Item 644 – Small Roadside Sign Assemblies

Stake all sign locations and receive approval prior to sign placement.

The 2-7/8 inch, Schedule 10 post will meet the following requirements:

- 0.120 in. nominal wall thickness
- Seamless or electric-resistance welded steel tubing or pipe
- Steel will be HSLAS Grade 55 per ASTM A1011 or ASTM A1008

Other steel may be used, if it meets the following:

- 55,000 psi minimum yield strength
- 70,000 psi minimum tensile strength
- 20% minimum elongation in 2 in.
- Wall thickness (uncoated) to be within the range of 0.108 in. to 0.132 in. galvanization per ASTM A123 or ASTM A653 G90

For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metalizing with zinc wire per ASTM B833.

Verify all post lengths to ensure the proper sign height. Remove and replace any sign installed incorrectly. This work will be done at no expense to the Department.

Provide Texas Universal Triangular Slip Base clamp type for all signs as shown on SMD (Slip-1)-08.

Item 658 – Delineator and Object Marker Assemblies

Verify all locations with the Engineer prior to installation.

Removal and proper disposal of all existing delineators, object markers, and any non-standard hardware assemblies are subsidiary to this Item.

CONTROL: 0924-06-419 SHEET C10

COUNTY: EL PASO

HIGHWAY: CS (DAVIS DRIVE)

Item 666 –Retroreflectorized Pavement Markings

Use a pilot line for final striping and remove pilot line after all striping is complete. Removal will be in accordance with the methods specified in Item 677, “Eliminating Existing Pavement Markings and Markers,” is subsidiary to this Item.

Use pavement sealer only on new concrete bridge.

Item 1005 – Loose Aggregate for Ground Cover

Clean and wash all aggregate for groundcover prior to placement.

Use crushed rhyolite rock, graded to 3/4 in. size and placed in a uniform 3 in. layer for Type I aggregate. Use Franklin Red, or as approved color prior to placement.

Item 3076 – Dense-Graded Hot-Mix Asphalt

Do not cover any existing survey monuments, manholes or valve covers, etc. with asphaltic material.

Place a string line or other suitable marking to ensure smooth, neat lines, or as directed.

Prepare the surface by removing raised pavement makers and objectionable material such as moisture, dirt, sand, leaves, and other loose impediments from the surface before placing mixture. Remove vegetation from pavement edges.

Supply Warm-Mix Asphalt (WMA) under this Item.

Provide aggregates with a Surface Aggregate Classification (SAC) of “A” for all surface mixes. Provide aggregates with a minimum SAC of B for all other layers unless otherwise shown on the plans.

In place of typical tack materials shown in Table 18 under Item 300, use a tracking resistant asphalt interlayer (TRAIL) material as a tack coat. Approved TRAIL products are found on TxDOT’s Material Producer List under Asphalt Interlayer (Tracking Resistant) through http://www.txdot.gov/business/resources/materials.html.

Hydrated Lime shall be added as an additive as per Item 301 “Asphalt Antistripping Agents” between the rates of 1.0% minimum and 2.0% maximum by weight. 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.

CONTROL: 0924-06-419 **SHEET C10**

COUNTY: EL PASO

HIGHWAY: CS (DAVIS DRIVE)

Use of RAS is not allowed for any mixtures.

Substitute PG Binders (grade dumping) will not be allowed for any mixtures.

Obtain the current version of the templates at http://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/forms/site-manager.html. Submit electronically to the Engineer.

Design the mixture at 50 gyrations (Ndesign).

Place longitudinal joints approximately 6 in. from the broken striping, or as directed, to avoid placing under the wheel path.

Operate the spreading and finishing machine at a uniform forward speed consistent with the plant production rate, hauling capability, and roller train capacity to result in a continuous operation. The speed will be slow enough, so that stopping between trucks is not ordinarily required. If the Engineer determines non-uniform delivery of material is affecting the HMA placement, the Engineer may require the paving operations to cease until acceptable methods are employed to minimize starting and stopping of the paver.

GENERAL NOTES **SHEET O**

SUMMARY OF REMOVAL ITEMS					
LOCATION	104 6015	104 6017	104 6029	105 6014	479 6004
	REMOVING CONC (SIDEWALKS)	REMOVING CONC (DRIVEWAYS)	REMOVING CONC (CURB OR CURB & GUTTER)	REMOVING STAB BASE & ASPH PAV (7"-12")	ADJUSTING MANHOLES (SANITARY)
UNITS	SY	SY	LF	SY	EA
Sheet 1 of 1	228	58	253	973	2
PROJECT TOTALS	228	58	253	973	2

SUMMARY OF ROADWAY ITEMS										
LOCATION	100 6002	110 6001	110 6002	132 6002	192 6017	247 6230	251 6036	310 6006	432 6006	500 6001
	PREPARING ROW	EXCAVATION (ROADWAY)	EXCAVATION (CHANNEL)	EMBANKMENT (FINAL)(DENS CONT)(TY A)	VEGETATION BARRIER	FL BS (CMP IN PLACE)(TY A GR 1-2)(8")	REWORK BS MTL (TY C) (8") (DENS CONT)	PRIME COAT (CSS-1H)	RIPRAP (CONC)(CL B)	MOBILIZATION
UNITS	STA	CY	CY	CY	SY	SY	SY	GAL	CY	LS
GEOMETRY LAYOUT SHEET 1 OF 1	3.4	129		101	68	927	927	186		
GRADING LAYOUT SHEET 1 OF 1			13	822					152	
PROJECT TOTALS	3.4	129	13	923	68	927	927	186	152	1

SUMMARY OF ROADWAY ITEMS CONT'D								
LOCATION	502 6001	529 6001	529 6007	529 6008	530 6004	531 6001	1005 6001	3076 6031
	BARRICADES, SIGNS AND TRAFFIC HANDLING	CONC CURB (TY I)	CONC CURB & GUTTER (TY I)	CONC CURB & GUTTER (TY II)	DRIVEWAYS (CONC)	CONC SIDEWALKS (4")	LOOSE AGGR FOR GROUNDCOVER (TYPE I)	D-GR HMA TY-C PG76-22
UNITS	MO	LF	LF	LF	SY	SY	CY	TON
GEOMETRY LAYOUT SHEET 1 OF 1		83	176	364	112	290	6	153
GRADING LAYOUT SHEET 1 OF 1								
PROJECT TOTALS	3	83	176	364	112	290	6	153

SUMMARY OF DAVIS BRIDGE									
ITEMS	400 6005	416 6002	420 6014	422 6002	422 6016	425 6010	432 6008	450 6007	450 6033
ITEM DESCRIPTION	CEM STABIL BKFL	DRILL SHAFT (24 IN)	CL C CONC (ABUT)(HPC)	REINF CONC SLAB (HPC)	APPROACH SLAB (HPC)	PRESTR CONC SLAB BEAM (5SB12)	RIPRAP (CONC)(CL B)(RR8&RR9)	RAIL (TY T223)(HPC)	RAIL (TY C223)(HPC)
UNITS	CY	LF	CY	SF	CY	LF	CY	LF	LF
2 ABUTMENTS	37.0	304	24						
SUPERSTRUCTURE				1043	60	204	15	76	52
PROJECT TOTALS	37.0	304	24	1043	60	204	15	76	52

REFERENCES – BENCHMARKS

FILE: REFER TO ROW & SURVEY CONTROL SHEETS FOR ADDITIONAL ROW AND BENCHMARK INFORMATION.

DATE	REMARKS	BY

ENGINEER'S SEAL

SCALE
HOR:
VER:

DATE 4/17/2020
DESIGN BY CV
DRAWN BY PCARSON
CHKD. BY EC
APPD. BY RP

PROJECT NAME

DAVIS BRIDGE REPLACEMENT ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT — CITY OF EL PASO

CONSOR F-12040
1501 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-3680

SHEET TITLE

SUMMARY OF QUANTITIES

SHEET 1 OF 2

SHEET
C 11 OF C 97

238618

11:35:05 AM
4/17/2020
H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\General\C_419_S_GSQ01.dgn

4/17/2020 11:35:05 AM H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\General\C_419_S_GSQ01.dgn

SUMMARY OF DAVIS BRIDGE CONT'D				
ITEMS	454 6021	496 6009	5094 6001	
ITEM DESCRIPTION	TYPE A JOINT	REMOV STR (BRIDGE 0 - 99 FT LENGTH)	AESTHETIC FENCE (CRIMPED)	
UNITS	LF	EA	LF	
2 ABUTMENTS				
SUPERSTRUCTURE	80	1	45	
PROJECT TOTALS	80	1	45	

SUMMARY OF PAVEMENT MARKING ITEMS								
LOCATION	644 6068	644 6076	658 6001	658 6053	658 6057	666 6224	666 6303	666 6315
	RELOCATE SM RD SN SUP&AM TY 10BWG	REMOVE SM RD SN SUP&AM	INSTL DEL ASSM (D-SW)SZ 1(FLX)GND	INSTL OM ASSM (OM-3L)(TWT)GND	INSTL OM ASSM (OM-3R)(TWT)GND	PAVEMENT SEALER 4"	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)
UNITS	EA	EA	EA	EA	EA	LF	LF	LF
Sheet 1 of 1	2	4	12	2	2	144	290	670
PROJECT TOTALS	2	4	12	2	2	144	290	670

SUMMARY OF EROSION CONTROL ITEMS						
LOCATION	506 6001	506 6011	506 6020	506 6024	506 6038	506 6039
	ROCK FILTER DAMS (INSTALL) (TY 1)	ROCK FILTER DAMS (REMOVE)	CONSTRUCTION EXITS (INSTALL) (TY 1)	CONSTRUCTION EXITS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)
UNITS	LF	LF	SY	SY	LF	LF
SHEET 1 OF 1	10	10	111	111	345	345
PROJECT TOTALS	10	10	111	111	345	345

REFERENCES – BENCHMARKS

FILE:
REFER TO ROW & SURVEY CONTROL SHEETS
FOR ADDITIONAL ROW AND BENCHMARK INFORMATION.

DATE	REMARKS	BY

ENGINEER'S SEAL

SCALE
HOR:
VER:

DATE 4/17/2020
DESIGN BY CV
DRAWN BY PCB/CDN
CHKD. BY EC
APPD. BY RP

PROJECT NAME

DAVIS BRIDGE REPLACEMENT
ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT
CITY OF EL PASO

CONSOR F-12040
1501 N. MESA, STE #200 EL PASO, TX 79902
PHONE: (915) 313-3680

SHEET TITLE

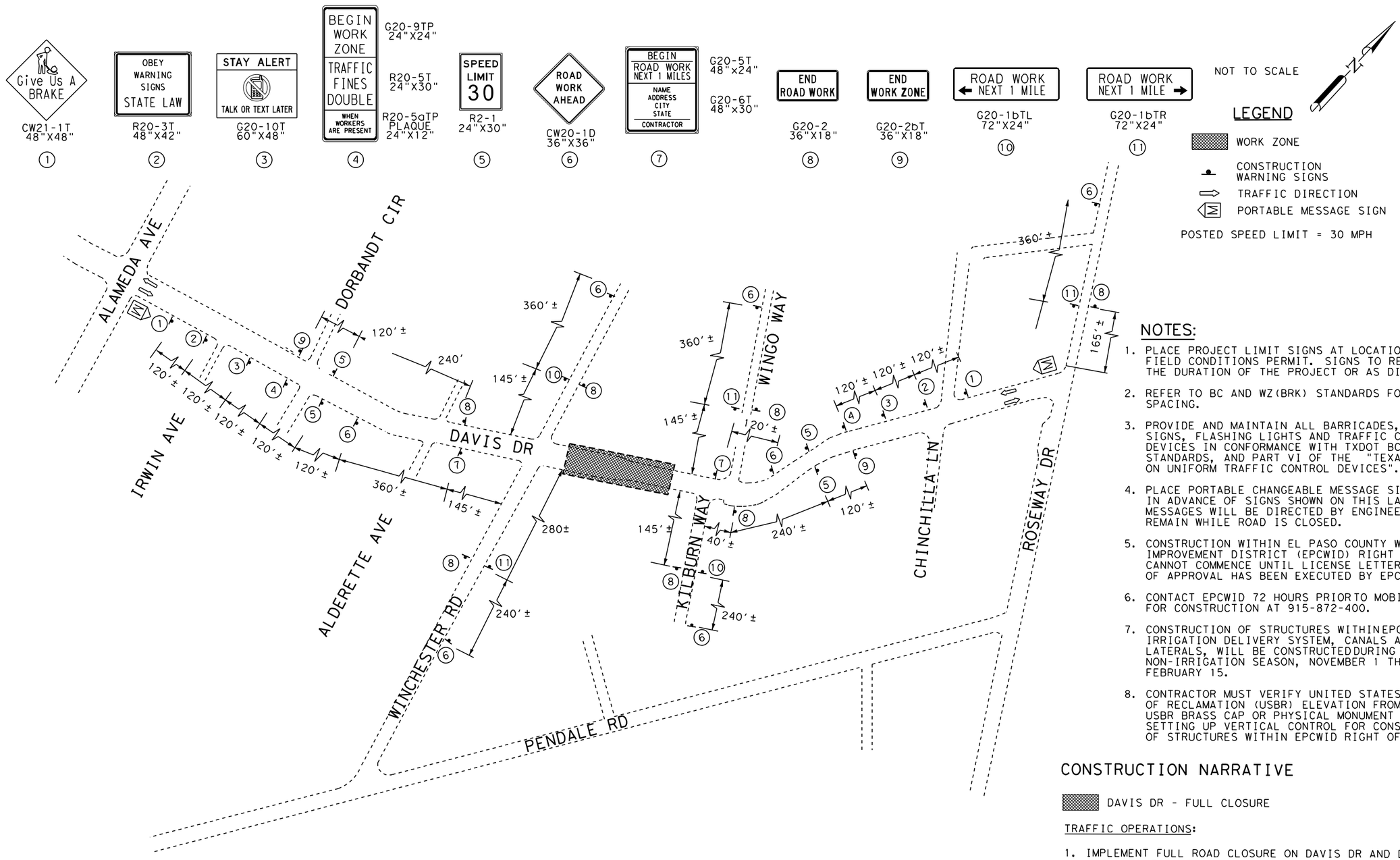
SUMMARY OF QUANTITIES

SHEET 2 OF 2

SHEET
C 12 OF C 97

238618

4/17/2020 11:35:06 AM H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\General\C_419_S_GSQ02.dgn



NOTES:

1. PLACE PROJECT LIMIT SIGNS AT LOCATION SHOWN AS FIELD CONDITIONS PERMIT. SIGNS TO REMAIN FOR THE DURATION OF THE PROJECT OR AS DIRECTED.
2. REFER TO BC AND WZ(BRK) STANDARDS FOR MINIMUM SPACING.
3. PROVIDE AND MAINTAIN ALL BARRICADES, WARNING SIGNS, FLASHING LIGHTS AND TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH TXDOT BC AND TCP STANDARDS, AND PART VI OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".
4. PLACE PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) IN ADVANCE OF SIGNS SHOWN ON THIS LAYOUT. MESSAGES WILL BE DIRECTED BY ENGINEER AND WILL REMAIN WHILE ROAD IS CLOSED.
5. CONSTRUCTION WITHIN EL PASO COUNTY WATER IMPROVEMENT DISTRICT (EPCWID) RIGHT OF WAY CANNOT COMMENCE UNTIL LICENSE LETTER OF APPROVAL HAS BEEN EXECUTED BY EPCWID.
6. CONTACT EPCWID 72 HOURS PRIOR TO MOBILIZING FOR CONSTRUCTION AT 915-872-400.
7. CONSTRUCTION OF STRUCTURES WITHIN EPCWID'S IRRIGATION DELIVERY SYSTEM, CANALS AND LATERALS, WILL BE CONSTRUCTED DURING THE NON-IRRIGATION SEASON, NOVEMBER 1 THROUGH FEBRUARY 15.
8. CONTRACTOR MUST VERIFY UNITED STATES BUREAU OF RECLAMATION (USBR) ELEVATION FROM NEAREST USBR BRASS CAP OR PHYSICAL MONUMENT PRIOR TO SETTING UP VERTICAL CONTROL FOR CONSTRUCTION OF STRUCTURES WITHIN EPCWID RIGHT OF WAY.

CONSTRUCTION NARRATIVE

DAVIS DR - FULL CLOSURE

TRAFFIC OPERATIONS:

1. IMPLEMENT FULL ROAD CLOSURE ON DAVIS DR AND DETOUR AS SHOWN ON TCP DETOUR LAYOUT.
2. DETOUR DAVIS DR NORTHBOUND TRAFFIC TO ROSEWAY DR TO PENDALE RD TO WINCHESTER RD.
3. DAVIS DR SOUTHBOUND TRAFFIC TO WINCHESTER RD TO PENDALE RD TO ROSEWAY DR.

CONSTRUCTION OPERATIONS:

1. REMOVE EXISTING BRIDGE AND ROADWAY ELEMENTS AS SHOWN ON DEMOLITION PLAN LAYOUT.
2. CONSTRUCT PROPOSED BRIDGE AS SHOWN ON BRIDGE LAYOUTS.
3. CONSTRUCT PROPOSED ROADWAY AS SHOWN ON PLAN LAYOUTS.
4. PLACE PERMANENT SIGNING AND STRIPING.
5. REMOVE DETOUR AND OPEN ROADWAY TO TRAFFIC.

238618

REFERENCES – BENCHMARKS

FILE: REFER TO ROW & SURVEY CONTROL SHEETS FOR ADDITIONAL ROW AND BENCHMARK INFORMATION.

DATE	REMARKS	BY

ENGINEER'S SEAL

FRANCISCO A. CASTRO 109749 LICENSED PROFESSIONAL ENGINEER 4/17/2020

SCALE HOR: NTS VER: NA

DATE 4/17/2020
DESIGN BY MM
DRAWN BY PG/RG/DN
CHKD. BY EC
APPD. BY RP

PROJECT NAME

DAVIS BRIDGE REPLACEMENT ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT CITY OF EL PASO

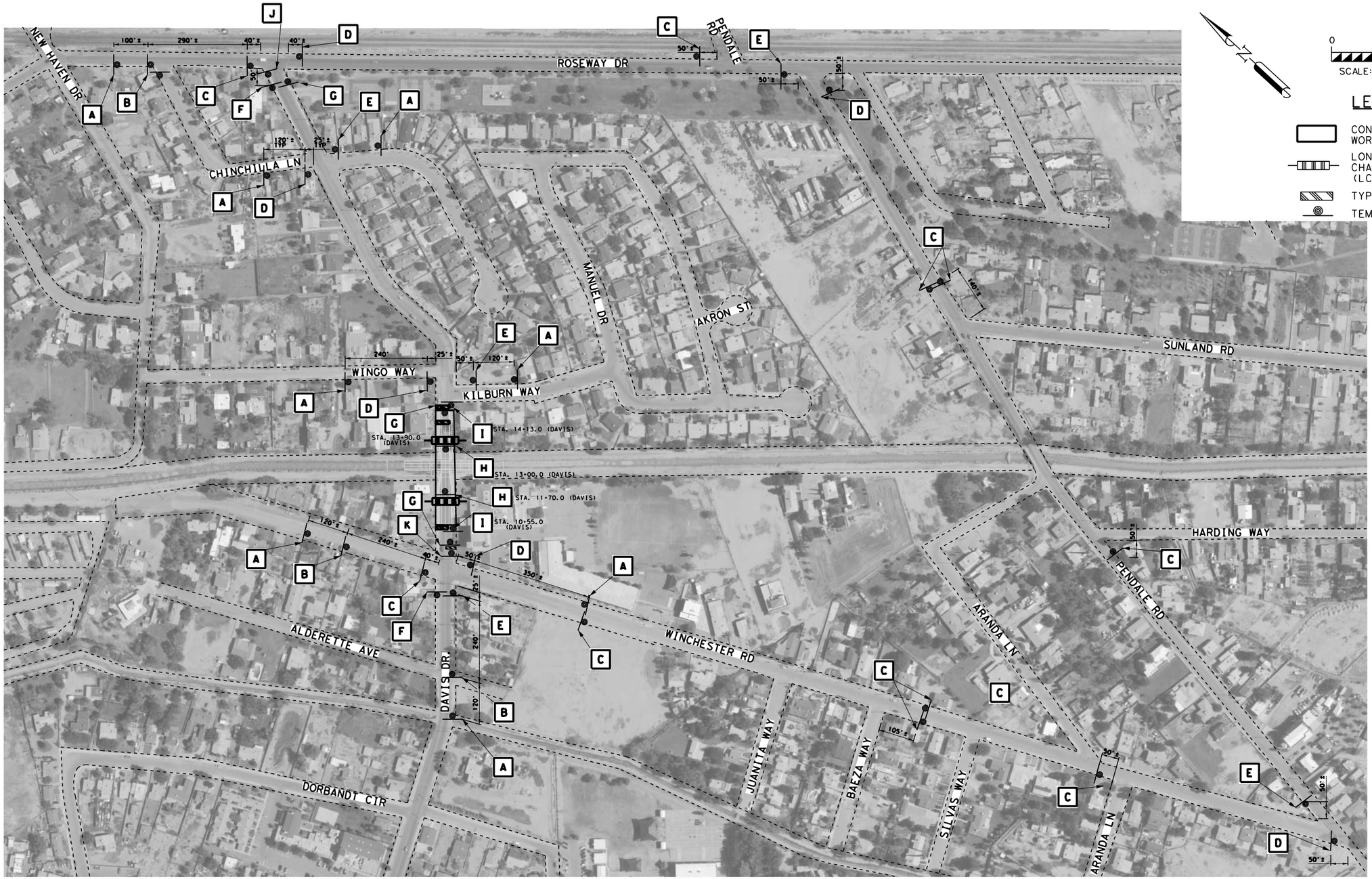
CONSOR F-12040
1501 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-3660

SHEET TITLE

NARRATIVE & ADVANCED WARNING

SHEET C 13 OF C 97

Attachment B



ROAD CLOSED AHEAD — CW20-3D 30"X30" — A

DETOUR AHEAD — CW20-2 30"X30" — B

M4-12T DAVIS DR DETOUR ↑ — M4-9S 30"X24" — C

M4-12T DAVIS DR DETOUR ← — M4-9L 30"X24" — D

M4-12T DAVIS DR DETOUR → — M4-9R 30"X24" — E

M4-12T DAVIS DR END DETOUR — M4-8a 24"X12" — F

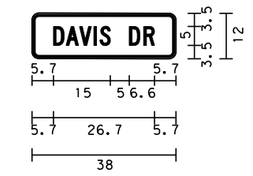
R11-4 60"X30" ROAD CLOSED TO THRU TRAFFIC DETOUR → — M4-10R 48"X18" — G

ROAD CLOSED — R11-2 48"X30" — H

SIDEWALK CLOSED — R9-9 24"X12" — I

SIDEWALK CLOSED AHEAD ← CROSS HERE — R9-11L 24"X12" — J

SIDEWALK CLOSED AHEAD → CROSS HERE — R9-11R 24"X12" — K



BORDER: R=1.5, TH=0.438, IN= 0.375 BLACK ON ORANGE, FONT: C-2000 M4-12T.ssi

NOTES:

1. MAINTAIN ACCESS TO DRIVEWAYS AT ALL TIMES. SCHEDULE PAVING OPERATIONS TO MINIMIZE IMPACT TO RESIDENTIAL DRIVEWAYS.
2. DETOUR SIGNING CAN BE ADJUSTED TO ACCOMMODAT SITE CONDITIONS AS APPROVED BY THE ENGINEER.

238618

REFERENCES – BENCHMARKS

FILE: REFER TO ROW & SURVEY CONTROL SHEETS FOR ADDITIONAL ROW AND BENCHMARK INFORMATION.

BY	REMARKS	DATE

ENGINEER'S SEAL — FRANCISCO A. CASTRO 109765 — 4/17/2020

SCALE HOR: 1"=300' VER: N/A

DATE 4/17/2020
DESIGN BY MM
DRAWN BY PG/RGDN
CHKD. BY FC
APPD. BY RP

PROJECT NAME

DAVIS BRIDGE REPLACEMENT ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT DEPARTMENT — CITY OF EL PASO

CONSOR F-12040
1501 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-3680

SHEET TITLE

DETOUR LAYOUT

SHEET C 14 OF C 97

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

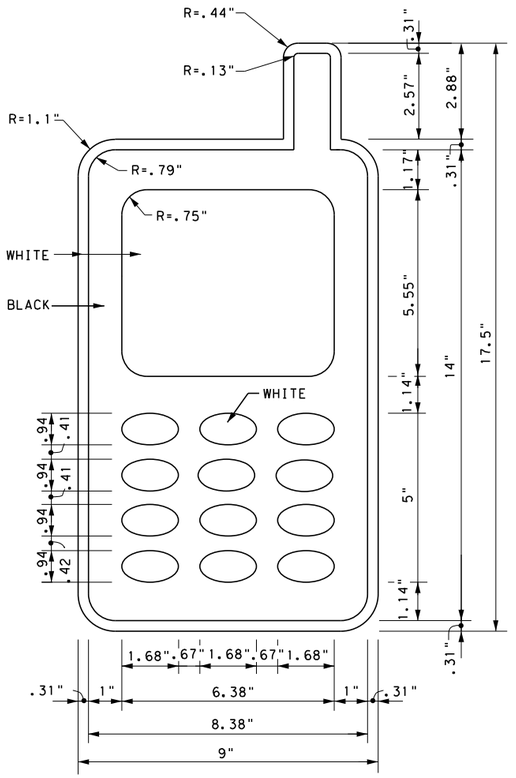
11. Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.

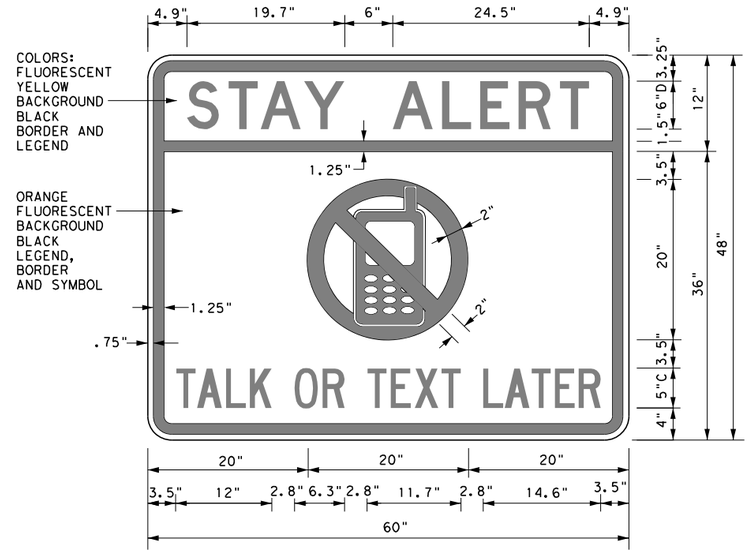
12. The Engineer has the final decision on the location of all traffic control devices.

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

WORKER SAFETY APPAREL NOTES:

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





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

SIGN DETAIL (G20-10T)

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

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

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

Texas Department of Transportation | Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

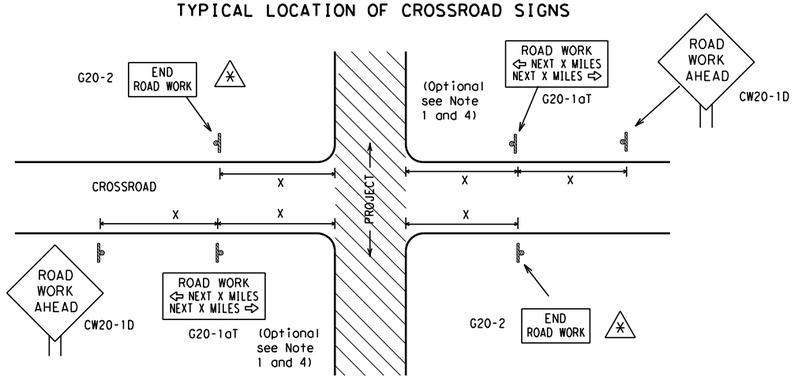
BC(1)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
4-03 5-10 8-14	DIST	COUNTY		SHEET NO.
9-07 7-13	ELP	ELP		C 15

DATE: 4/17/2020 11:36:49 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Standards\bc-14.dgn

DATE: 4/17/2020 11:36:49 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Standards\bc-14.dgn

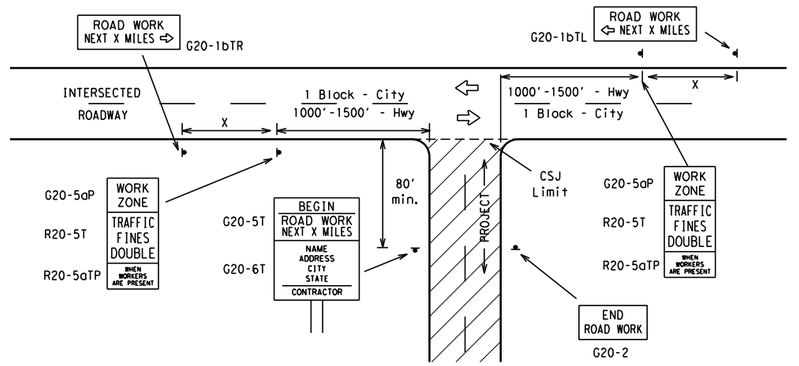
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

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

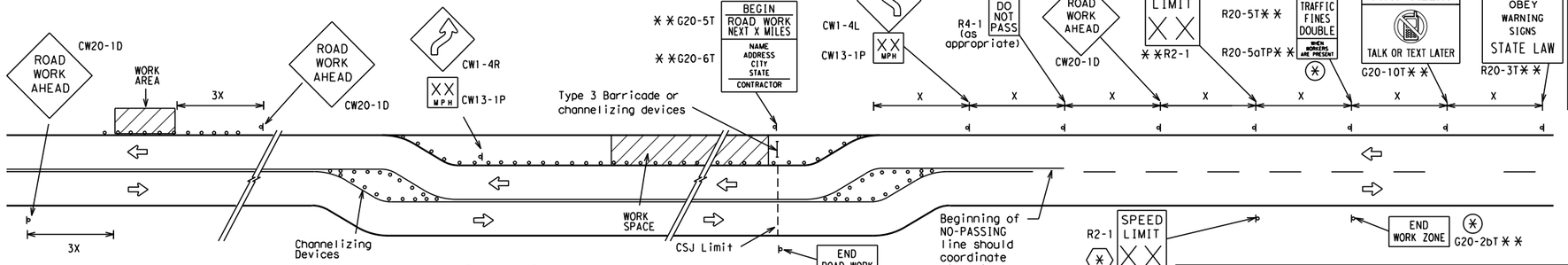
✱ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

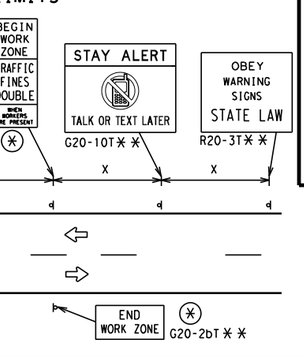
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

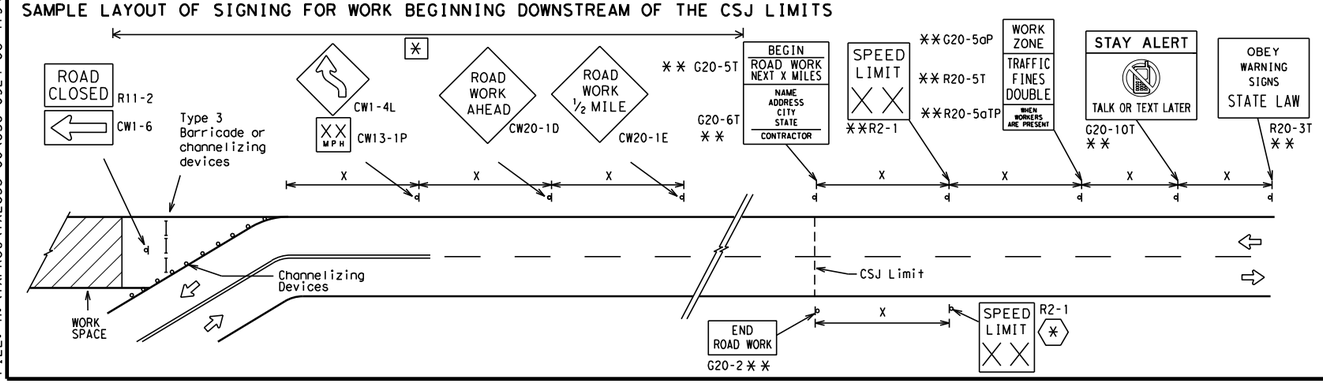


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-1D)signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



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



NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-14

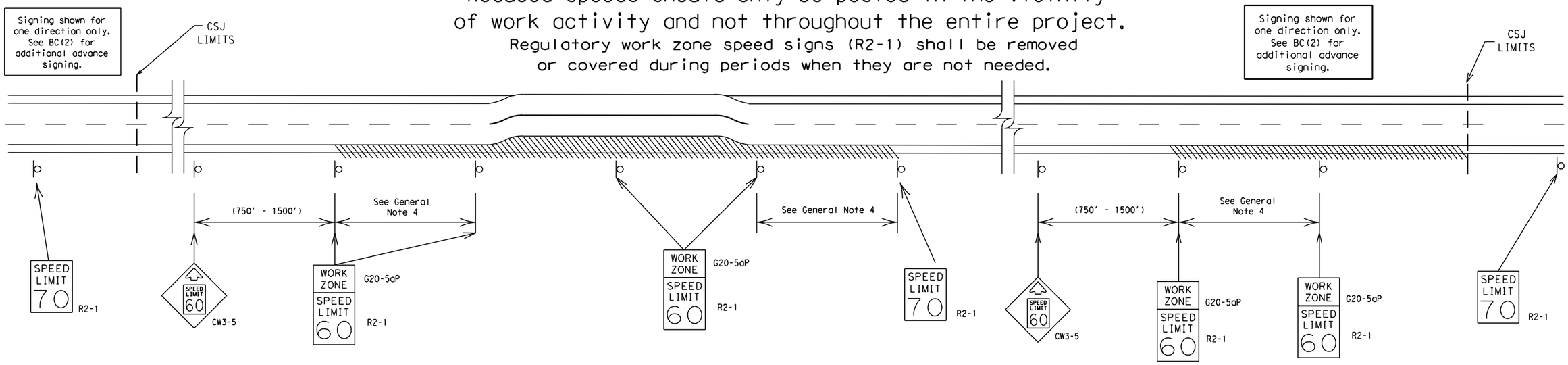
FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	ELP	ELP		C 16

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

DATE: 4/17/2020 11:36:49 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Standards\bc-14.dgn

SHEET 3 OF 12

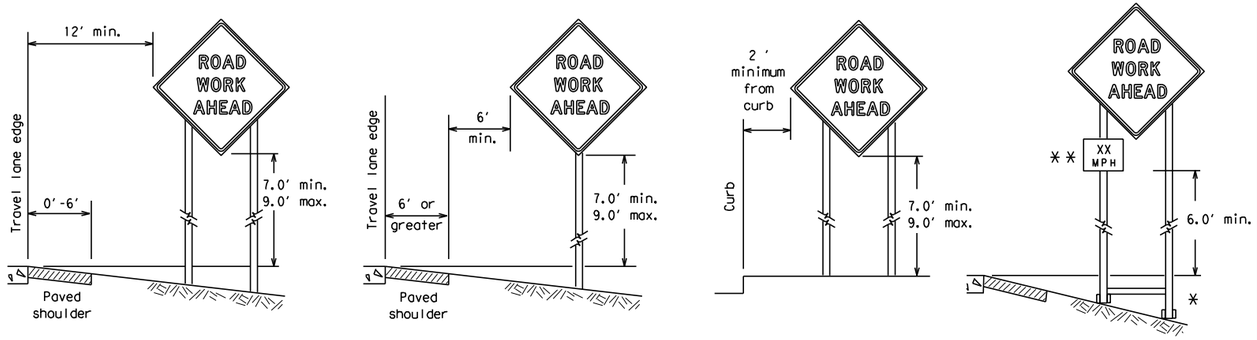
Texas Department of Transportation | Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 17

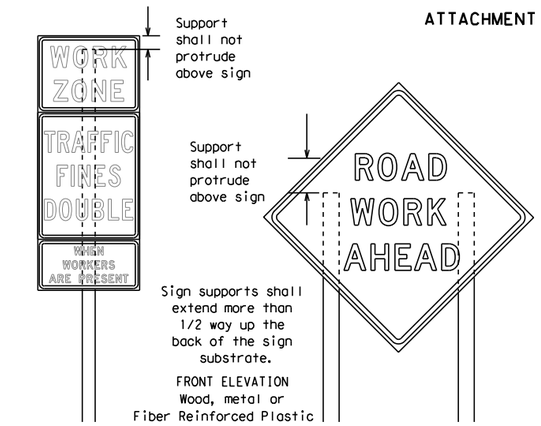
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



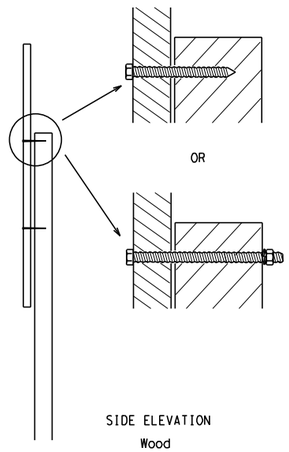
⁎ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

⁎⁎ 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



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

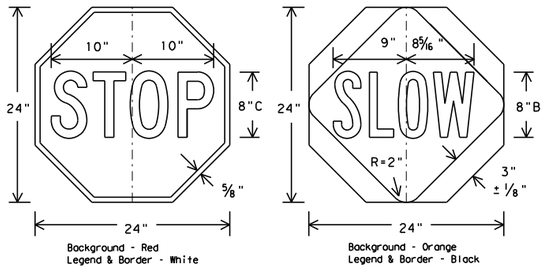


Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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.

STOP/SLOW PADDLES

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



CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation

Traffic Operations Division Standard

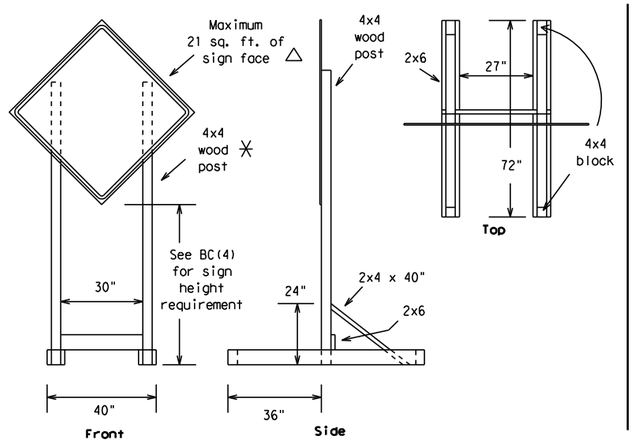
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

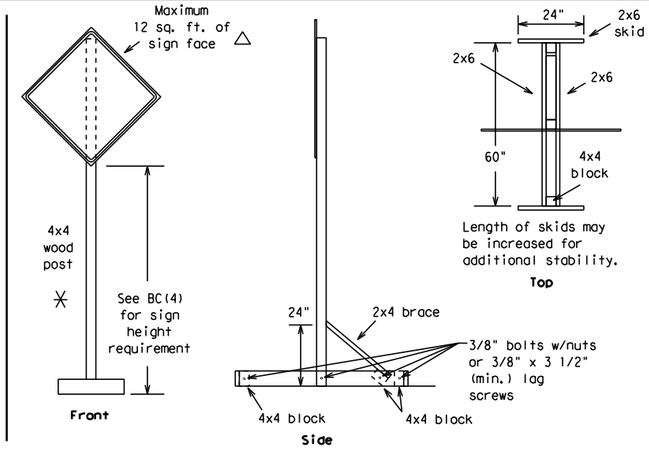
BC(4)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 18

DATE: 4/17/2020 11:36:50 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Standards\bc-14.dgn

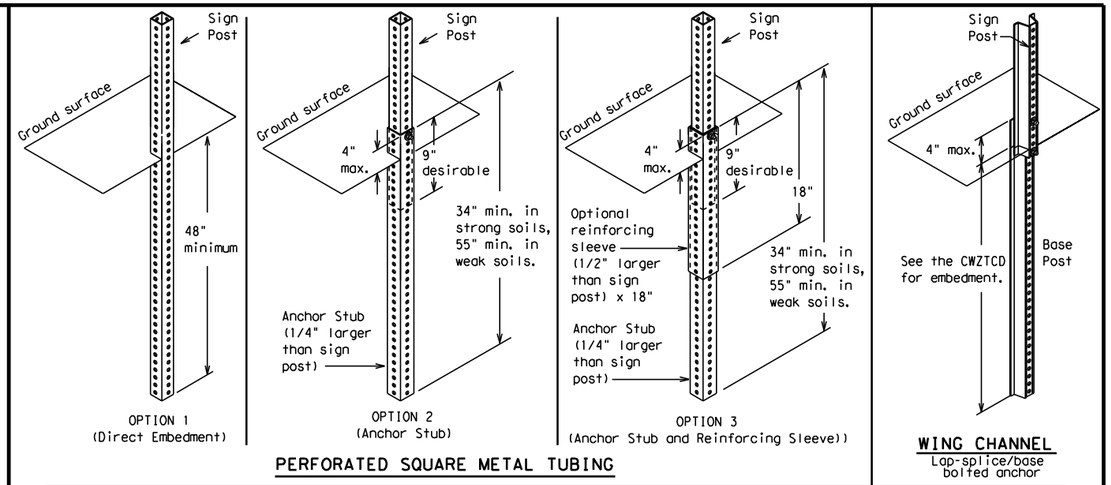
DATE: 4/17/2020 11:36:50 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Standards\bc-14.dgn





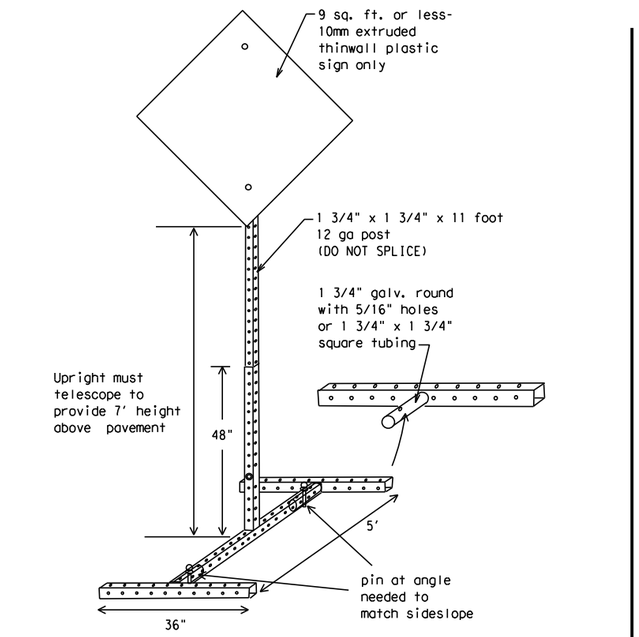
SKID MOUNTED WOOD SIGN SUPPORTS

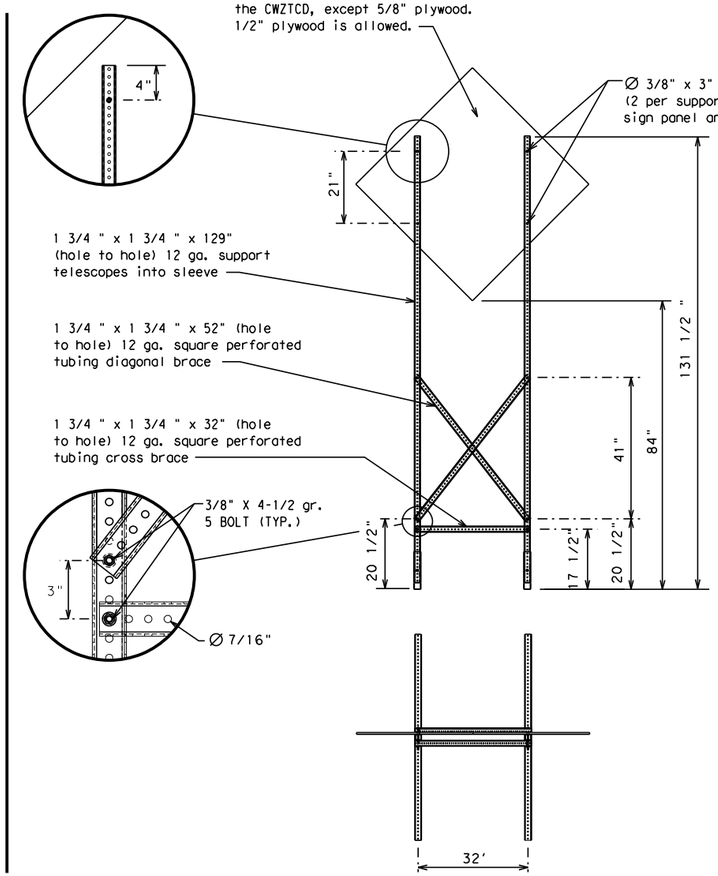
LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS □

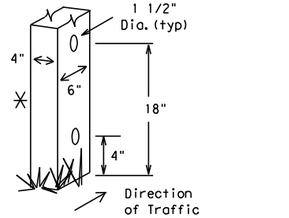


GROUND MOUNTED SIGN SUPPORTS

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.

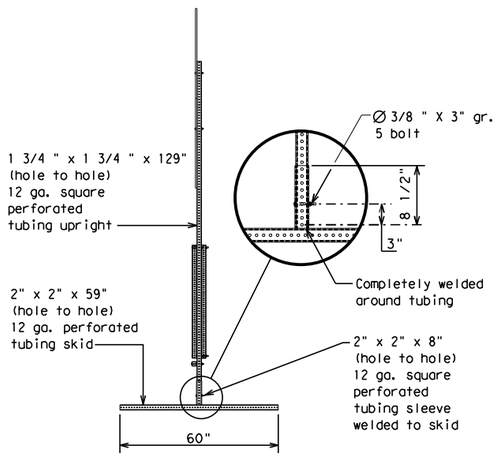






Nominal Post Size	Number of Posts	Maximum Sq. feet of Sign Face	Minimum Soil Embedment	Drilled Hole(s) Required
4 x 4	1	12	36"	NO
4 x 4	2	21	36"	NO
4 x 6	1	21	36"	YES
4 x 6	2	36	36"	YES

WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS



WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

SHEET 5 OF 12

Texas Department of Transportation | Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	ELP	ELP		C 19

SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

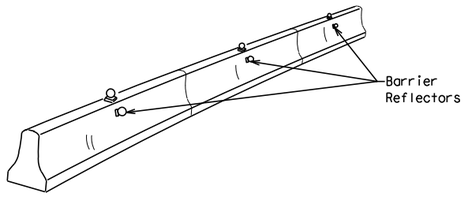
BC(6)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	ELP	ELP		C 20

100

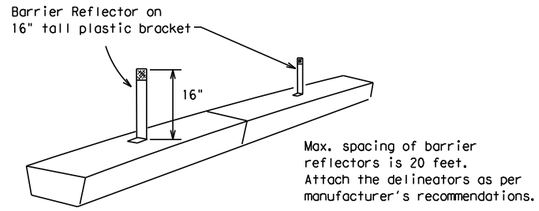
DATE: 4/17/2020 11:36:51 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Standards\bc-14.dgn

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

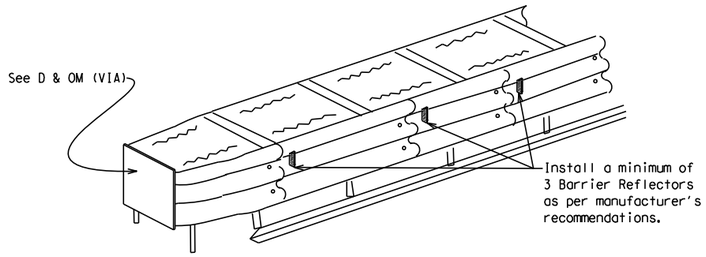


CONCRETE TRAFFIC BARRIER (CTB)

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



LOW PROFILE CONCRETE BARRIER (LPCB)

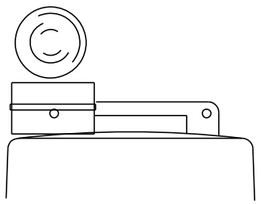


DELINEATION OF END TREATMENTS

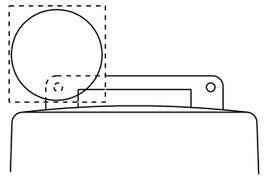
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

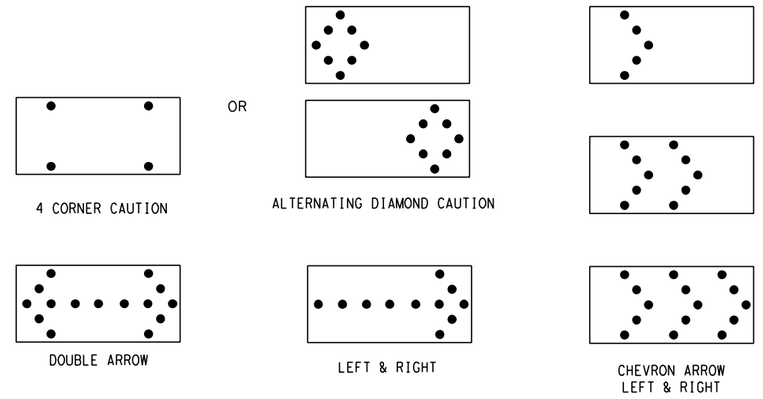
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION
Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Operations Division Standard

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

BC(7)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	ELP	ELP		C 21

101

DATE: 4/17/2020 11:36:51 AM
FILE: H:\TXPROJ\TX2633-00\ESJ-0924-06-419\DwgNDGN\Standards\bc-14.dgn

GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

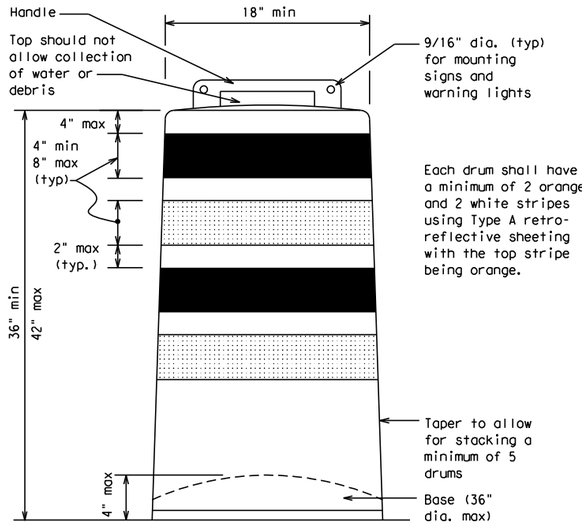
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

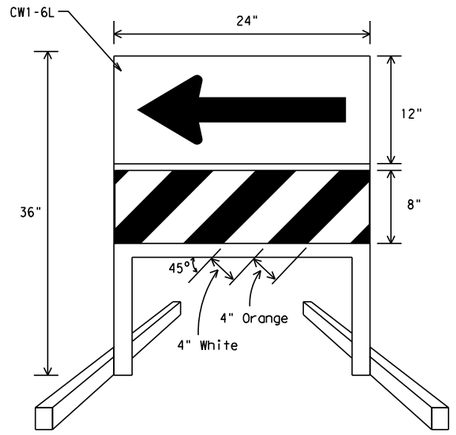
RETROREFLECTIVE SHEETING

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

BALLAST

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

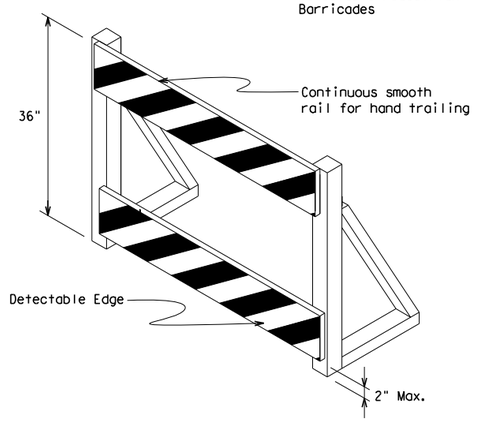




DIRECTION INDICATOR BARRICADE

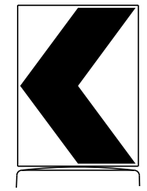
1. The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
2. If used, the Direction Indicator Barricade should be used in series to direct the driver through the transition and into the intended travel lane.
3.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

This detail is not intended for fabrication. See note 3 and the CWZTCD list for providers of approved Detectable Pedestrian Barricades

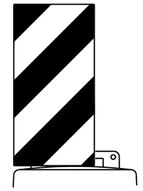


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation

Traffic Operations Division Standard

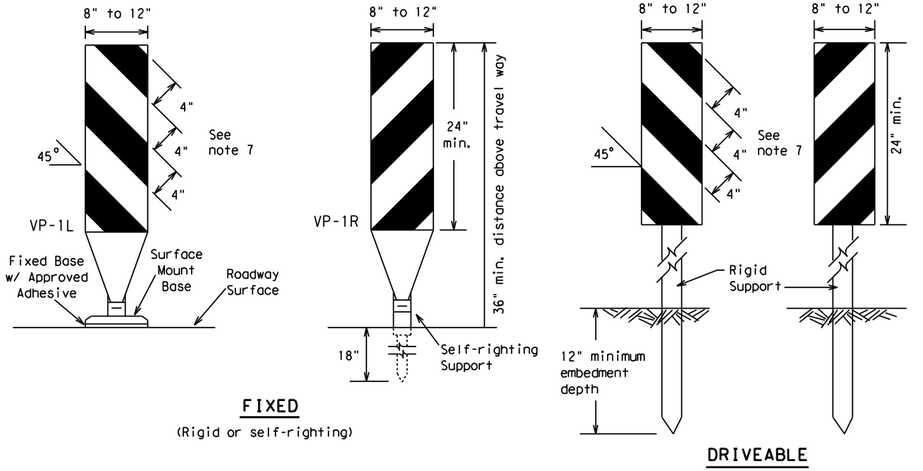
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	ELP	ELP		C 22

DATE: 4/17/2020 11:36:52 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Standards\bc-14.dgn

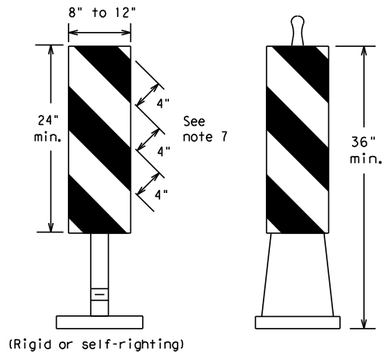
DATE: 4/17/2020 11:36:53 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Standards\bc-14.dgn



FIXED

(Rigid or self-righting)

DRIVEABLE

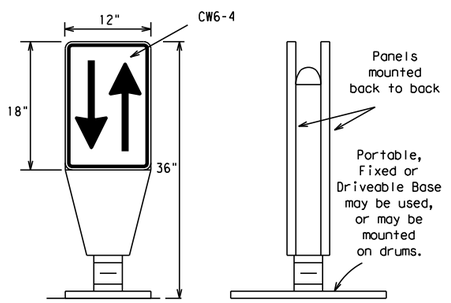


(Rigid or self-righting)

PORTABLE

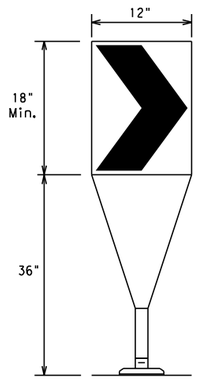
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual Appendix B "Treatment of Pavement Drop-offs in Work Zones" for additional guidelines on the use of VP's for drop-offs.
3. VP's should be mounted back to back if used at the edge of cuts adjacent to two-way two lane roadways. Stripes are to be reflective orange and reflective white and should always slope downward toward the travel lane.
4. VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
5. Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
6. Sheeting for the VP's shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
7. Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



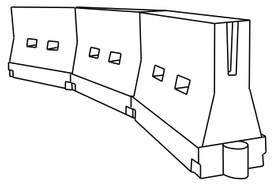
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

1. Work Zone channelizing devices illustrated on this sheet may be installed in close proximity to traffic and are suitable for use on high or low speed roadways. The Engineer/Inspector shall ensure that spacing and placement is uniform and in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. Channelizing devices shown on this sheet may have a driveable, fixed or portable base. The requirement for self-righting channelizing devices must be specified in the General Notes or other plan sheets.
3. Channelizing devices on self-righting supports should be used in work zone areas where channelizing devices are frequently impacted by errant vehicles or vehicle related wind gusts making alignment of the channelizing devices difficult to maintain. Locations of these devices shall be detailed elsewhere in the plans. These devices shall conform to the TMUTCD and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
4. The Contractor shall maintain devices in a clean condition and replace damaged, nonreflective, faded, or broken devices and bases as required by the Engineer/Inspector. The Contractor shall be required to maintain proper device spacing and alignment.
5. Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
6. Pavement surfaces shall be prepared in a manner that ensures proper bonding between the adhesives, the fixed mount bases and the pavement surface. Adhesives shall be prepared and applied according to the manufacturer's recommendations.
7. The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

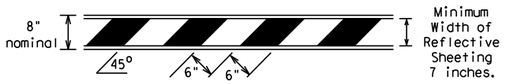
BC(9)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	ELP	ELP		C 23

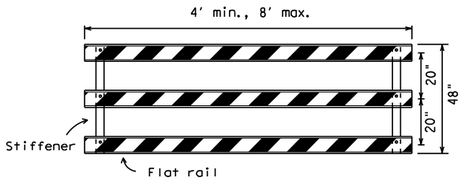
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



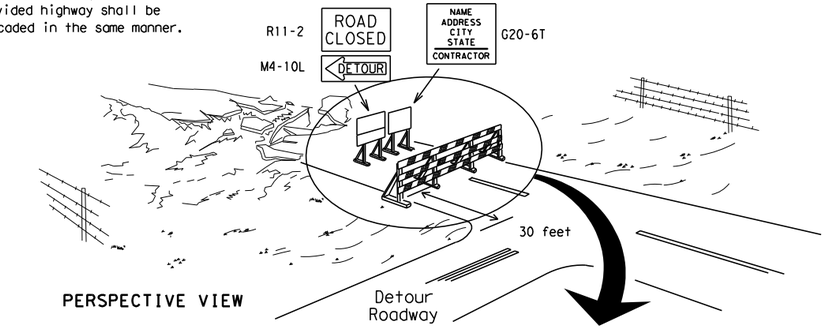
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

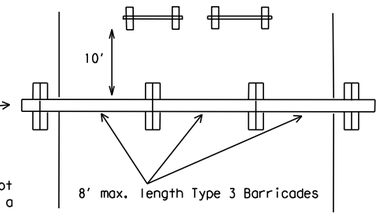
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

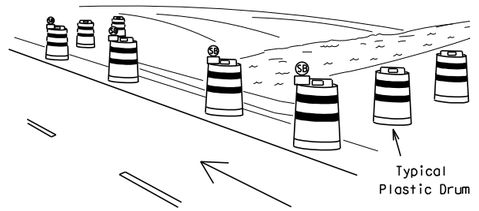
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

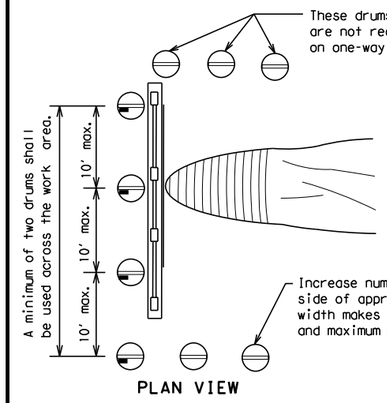
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

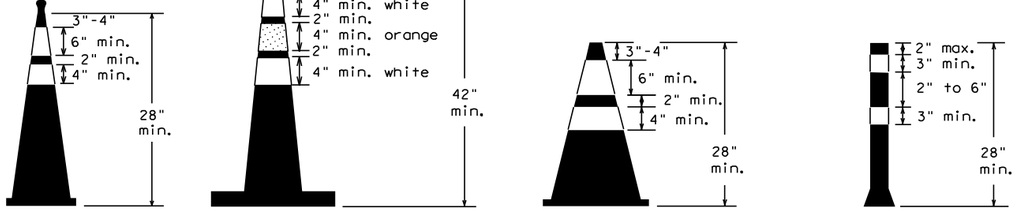
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



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

PLAN VIEW

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

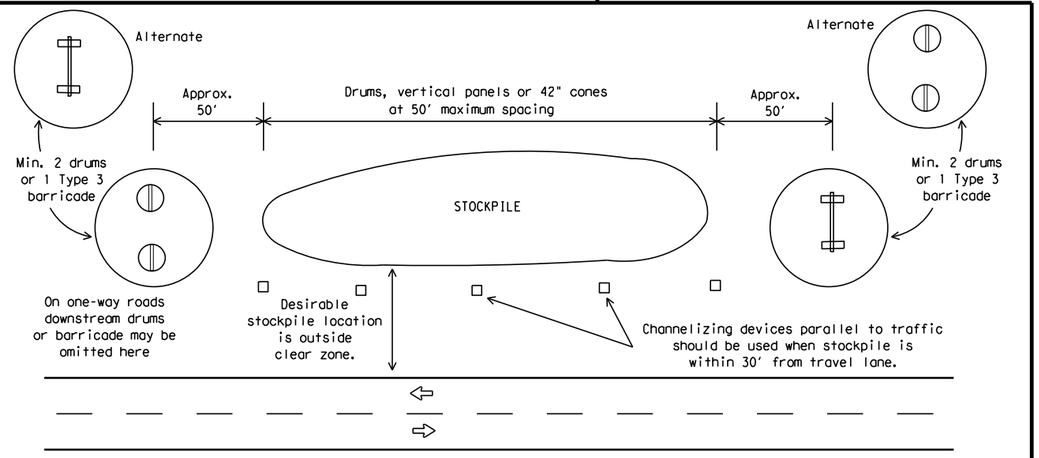


Two-Piece cones | One-Piece cones | Tubular Marker

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

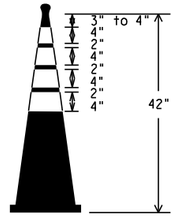
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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



EDGELINE CHANNELIZER

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

Texas Department of Transportation | Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	ELP	ELP		C 24

DATE: 4/17/2020 11:36:53 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Standards\bc-14.dgn

DATE: 4/17/2020 11:36:54 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Standards\bc-14.dgn

WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

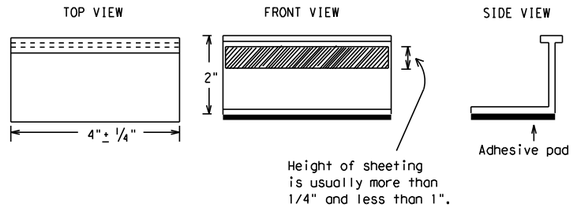
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

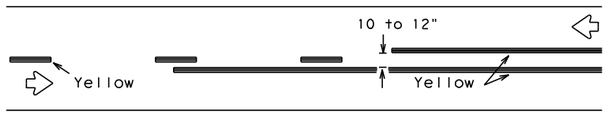
Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

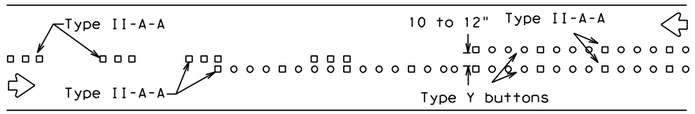
BC(11)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
2-98 9-07	DIST	COUNTY		SHEET NO.
1-02 7-13	ELP	ELP		C 25
11-02 8-14				

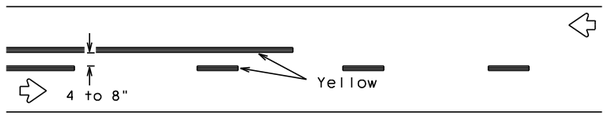
PAVEMENT MARKING PATTERNS



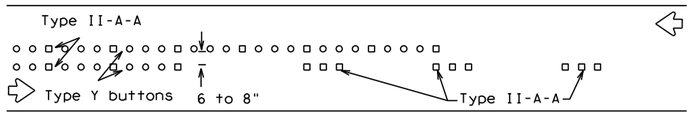
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



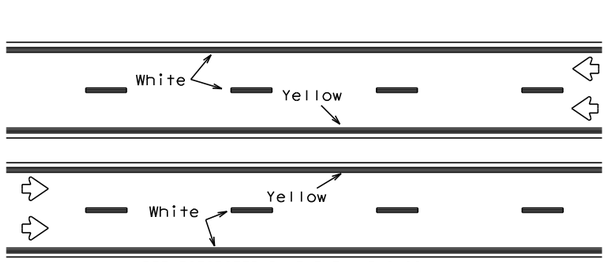
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



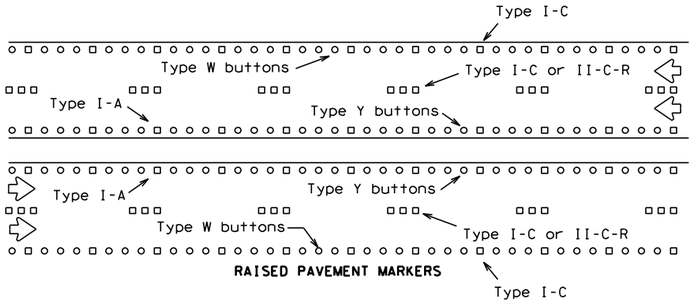
RAISED PAVEMENT MARKERS - PATTERN B

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

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



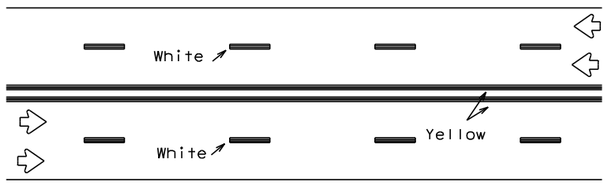
REFLECTORIZED PAVEMENT MARKINGS



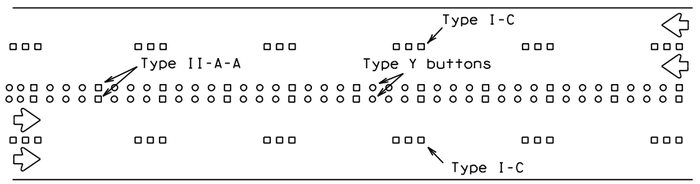
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



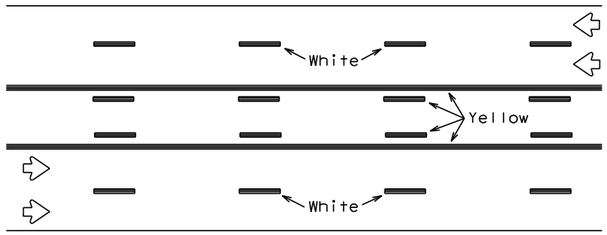
REFLECTORIZED PAVEMENT MARKINGS



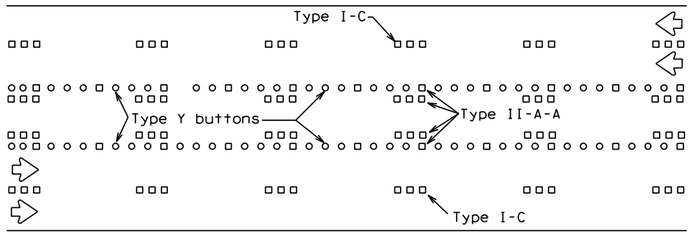
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

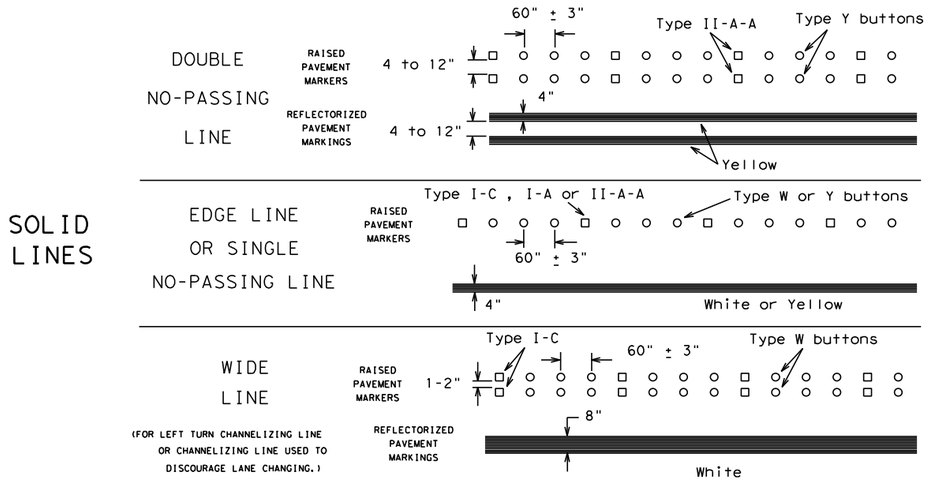


RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

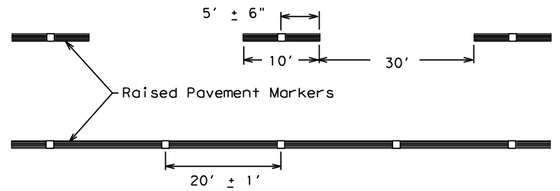
TWO-WAY LEFT TURN LANE

STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation | Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
1-97 9-07	DIST	COUNTY		SHEET NO.
2-98 7-13	ELP	ELP		C 26
11-02 8-14				

106

DATE: 4/17/2020 11:36:54 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Standards\bc-14.dgn

EXISTING UTILITY NOTES:

1. ALL UTILITIES SHOWN ARE DEPICTED AT QUALITY LEVEL C(QLC) AND QUALITY LEVEL D(QLD) PER ASCE CI/ASCE 3802, STANDARD GUIDELINE FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA, AS FOLLOWS:

   - QUALITY LEVEL C (QLC): INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE-GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGMENT IN CORRELATING THIS INFORMATION TO QUALITY LEVEL D (QLD) INFORMATION.

   - QUALITY LEVEL D (QLD): INFORMATION DERIVED FROM EXISTING RECORDS OR ORAL RECOLLECTIONS.

2. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS/HER OWN DETERMINATIONS AS TO TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERE TO. THE CONTRACTOR SHALL VERIFY LOCATION (HORIZONTAL AND VERTICAL) OF UNDERGROUND PIPELINE, CONDUITS, AND STRUCTURES BY CONTACTING OWNERS OF UNDERGROUND UTILITIES AND BY PROSPECTING IN ADVANCE OF EXCAVATING OPERATIONS.

3. ACTIVE SERVICE LINE UTILITIES INCLUDING WATER AND SANITARY SEWER, WHETHER OR NOT SHOWN ON THE DRAWINGS, SHALL BE ADEQUATELY PROTECTED FROM DAMAGE. ANY DAMAGED UTILITIES SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER. SERVICE MUST BE PROVIDED AT ALL TIMES.

4. INACTIVE OR ABANDONED UTILITIES ENCOUNTERED DURING CONSTRUCTION SHALL BE REMOVED, CAPPED, OR PLUGGED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER. IN THE ABSENCE OF SPECIFIC REQUIREMENTS, ALL WORK UNDER THIS HEADING SHALL BE DONE IN ACCORDANCE WITH LOCAL CODES OR REGULATIONS OR AS DIRECTED BY THE CITY ENGINEER OR DESIGNATED REPRESENTATIVE.

5. EXISTING GAS MAINS CURRENTLY IN SERVICE MUST REMAIN IN SERVICE THROUGHOUT CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR PROTECTING EXISTING GAS MAINS, INCLUDING SERVICE LINES, FROM DAMAGE AS A RESULT OF THE CONSTRUCTION ACTIVITIES. IN THE EVENT THAT EXISTING GAS MAINS ARE IN CONFLICT WITH CONSTRUCTION, CONTRACTOR SHALL COORDINATE WITH TEXAS GAS SERVICE COMPANY AND ALLOW 2 WEEKS WITHIN THE CITY OF EL PASO CONSTRUCTION SCHEDULE FOR RELOCATION OF HIGH PRESSURE GAS MAINS AND INTERMEDIATE PRESSURE GAS MAINS.

6. CALL FOR LINE SPOT BEFORE BEGINNING CONSTRUCTION OR EXCAVATION. TEXAS GAS SERVICE RECOMMENDS THAT CONTRACTOR CALL FOR LINE SPOTS PRIOR TO EXCAVATING IN THE AREA. IT IS REQUIRED THAT CONTRACTOR CALL TEXAS GAS SERVICE 48 HOURS PRIOR TO ANY CONSTRUCTION AND/OR GROUND DISTURBANCE WITHIN THE VICINITY OF HIGH PRESSURE AND INTERMEDIATE PRESSURE GAS MAINS.

7. CONTACT TEXAS GAS SERVICE FOR GAS VALVE ADJUSTMENTS.

8. CONTACT EL PASO ELECTRIC COMPANY 48 HOURS IN ADVANCE OF CRANE OPERATIONS THAT REQUIRE MOVING OVERHEAD LINES.

9. THE CONTRACTOR SHALL NOT INTERRUPT THE SERVICE FUNCTION OR DISTURB THE SUPPORT OF ANY UTILITY WITHOUT AUTHORITY FROM THE OWNER OR ORDER FROM THE CITY ENGINEER OR DESIGNATED REPRESENTATIVE. ALL VALVES, SWITCHES, VAULTS, AND METERS SHALL BE MAINTAINED READILY ACCESSIBLE FOR EMERGENCY SHUTOFF.

10. WHEN NECESSARY, THE CONTRACTOR SHALL SO CONDUCT ITS OPERATIONS AS TO PERMIT ACCESS TO THE WORK SITE AND PROVIDE TIME FOR UTILITY WORK TO BE ACCOMPLISHED DURING THE PROGRESS OF THE WORK.

11. SOURCE OF UTILTIY LINE INFORMATION IS AS FOLLOWS:

    GAS- TEXAS GAS SERVICE AERIAL MAPS N-47B(REV 02-17-12) & P-11A (09-12-06), AND ONE-CALL MARKINGS.

    ELECTRIC- ONE-CALL MARKINGS

    WATER- EPW WATER LINE AS-BUILT INFORMATION:

    SANITARY/SEWER- EPW SANITARY LINE AS-BUILT INFORMATION:

12. ACTIVE WATER AND SANITARY SEWER MAIN LINE UTILITIES (INCLUDING SERVICE LINES), WHETHER OR NOT SHOWN ON THESE DRAWINGS, SHALL BE ADEQUATELY PROTECTED WITH BERMS AND/OR BRIDGING DURING CONSTRUCTION SO AS NOT TO DAMAGE THE EXISTING MAINS. ANY DAMAGES CAUSED BY THE CONTRACTOR WILL BE REPAIRED AS NECCESSARY IN ACCORDANCE WITH THE EL PASO WATER UTILITIES STANDARDS AND SPECIFICATIONS, AT NO ADDITIONAL COST TO THE OWNER.

13. STREET ILLUMINATION STREET & MAINT DOES NOT LINE SPOT STREET LIGHT ILLUMINATION.

14. CITY IS NOT ON DIGG TEST LIST. CITY OF EL PASO LINE SPOTTING THRU SAM MAIN OFFICE (915) 212-0151, LINESPOTS@ELPASOTEXAS.GOV

15. COORDINATE WITH CITY OF EL PASO TO CONFIRM UTILITY ELEVATIONS OF RELOCATED UTILITIES.

WARNING! CALL BEFORE YOU DIG.

COORDINATION WITH UTILITIES:

CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES PRIOR TO ANY EXCAVATION AND/OR RELOCATION OF EXISTING UTILITIES ENCOUNTERED DURING CONSTRUCTION WORK.

CALL TEXAS EXCAVATION SAFETY SYSTEM AT LEAST TWO WORKING DAYS BEFORE YOU DIG ANYWHERE IN TEXAS FOR UTILITY LOCATES (800) 344-8377 (DIGTESS)

UTILITY CONTACTS:

EL PASO WATER
1154 HAWKINS BLVD.
(800) 344-8377

EL PASO ELECTRIC CO.:
JAIME CHACON
100 N. STANTON
EL PASO, TEXAS 79901
(915) 543-4111

TEXAS GAS SERVICE:
FRANCISCO CAMPA
4700 POLLARD STREET
EL PASO, TEXAS 79930
(915) 680-7275

AT&T TEXAS:
DIANA MCKOWN
11200 PELLICANO DRIVE
EL PASO, TEXAS 79935
(915) 595-5142

CHARTER COMM:
RAUL ROJAS
7010 AIRPORT RD
EL PASO, TEXAS 79906
(915) 373-6326

CITY OF EL PASO STREETS AND MAINTENANCE DEPARTMENT
MEDIANS & PARKWAY/ LANDSCAPING & IRRIGATION- (915) 212-7066
SIGNAL SHOP- (915) 212-0151
TRAFFIC SIGNS AND MARKINGS- (915) 212-0151
STREET LIGHTS/POLE- (915) 212-8059

STREET & MAINTENANCE DEPARTMENT
EL PASO LINE SPOTS: LINESPOTS@ELPASOTEXAS.GOV

238618

REFERENCES – BENCHMARKS
FILE:
REFER TO ROW & SURVEY CONTROL SHEETS FOR ADDITIONAL ROW AND BENCHMARK INFORMATION.

DATE	REMARKS	BY

ENGINEER'S SEAL
ARLENE FRESQUEZ
106510
LICENSED PROFESSIONAL ENGINEER
4/17/2020

SCALE
HOR: N/A
VER: N/A

DATE 4/17/2020
DESIGN BY CV
DRAWN BY PGR/GDN
CHKD. BY EC
APPD. BY JP

PROJECT NAME
DAVIS BRIDGE REPLACEMENT
ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT
CITY OF EL PASO

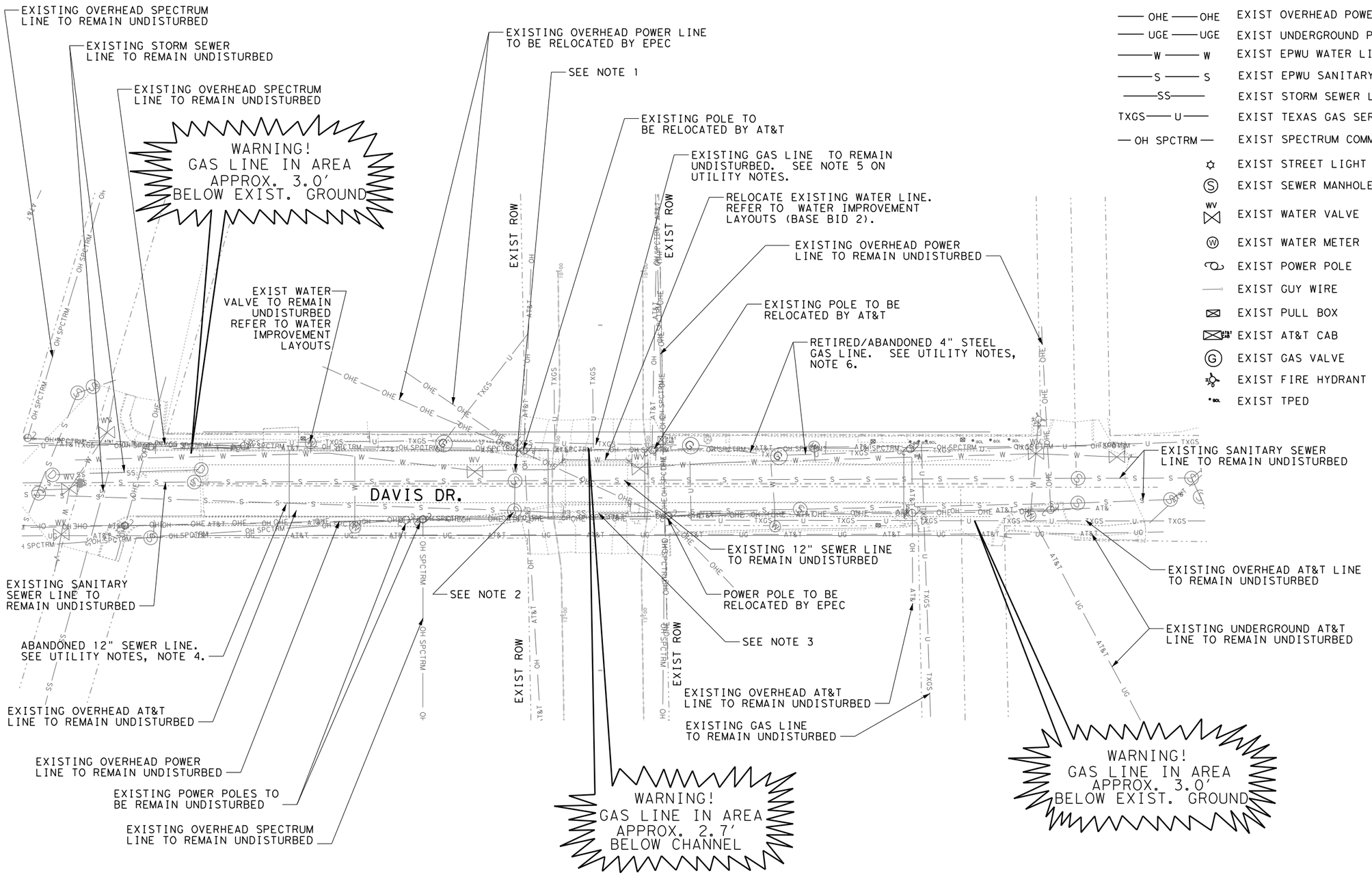
CONSOR F-12040
1501 N. MESA, STE #200 EL PASO, TX 79902
PHONE: (915) 213-3680

SHEET TITLE
UTILITY NOTES

SHEET
C 27 OF C 97

NOTES:

1. REFER TO DEMOLITION PLAN SHEET FOR UTILITY REMOVAL ITEMS.
2. CHECK MANHOLE SUBSIDIARY TO ITEM 479. VERIFY PLUG EXISTS AND EXISTING 12" SEWER PIPE IS ABANDONDED PRIOR TO REMOVING BRIDGE STRUCTURE.
3. REMOVE ABANDONED 12" SEWER PIPE ATTACHED TO EXISTING STRUCTURE SUBSIDIARY TO ITEM 496, "REMOV BRIDGE STR".



0 30′ 60′

SCALE: 1" = 60′

LEGEND

AT&T OH	EXIST AT&T OVERHEAD POWER LINE
AT&T UG	EXIST AT&T UNDERGROUND POWER LINE
OHE OHE	EXIST OVERHEAD POWER LINE
UGE UGE	EXIST UNDERGROUND POWER LINE
W W	EXIST EPWU WATER LINE
S S	EXIST EPWU SANITARY SEWER LINE
SS	EXIST STORM SEWER LINE
TXGS U	EXIST TEXAS GAS SERVICE
OH SPCTRM	EXIST SPECTRUM COMMUNICATION
	EXIST STREET LIGHT
S	EXIST SEWER MANHOLE
WV	EXIST WATER VALVE
W	EXIST WATER METER
	EXIST POWER POLE
	EXIST GUY WIRE
	EXIST PULL BOX
AT&T	EXIST AT&T CAB
G	EXIST GAS VALVE
	EXIST FIRE HYDRANT
TPED	EXIST TPED

REFERENCES – BENCHMARKS

FILE: REFER TO ROW & SURVEY CONTROL SHEETS FOR ADDITIONAL ROW AND BENCHMARK INFORMATION.

BY	REMARKS	DATE

ENGINEER'S SEAL

ARLENE FRESQUEZ 106510 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS — 4/17/2020

SCALE HOR: 1"=60' VER: N/A

DATE	4/17/2020
DESIGN BY	MM
DRAWN BY	PG/RG/DN
CHKD. BY	FC
APPD. BY	JP

PROJECT NAME

DAVIS BRIDGE REPLACEMENT ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT — CITY OF EL PASO

CONSOR F-12040

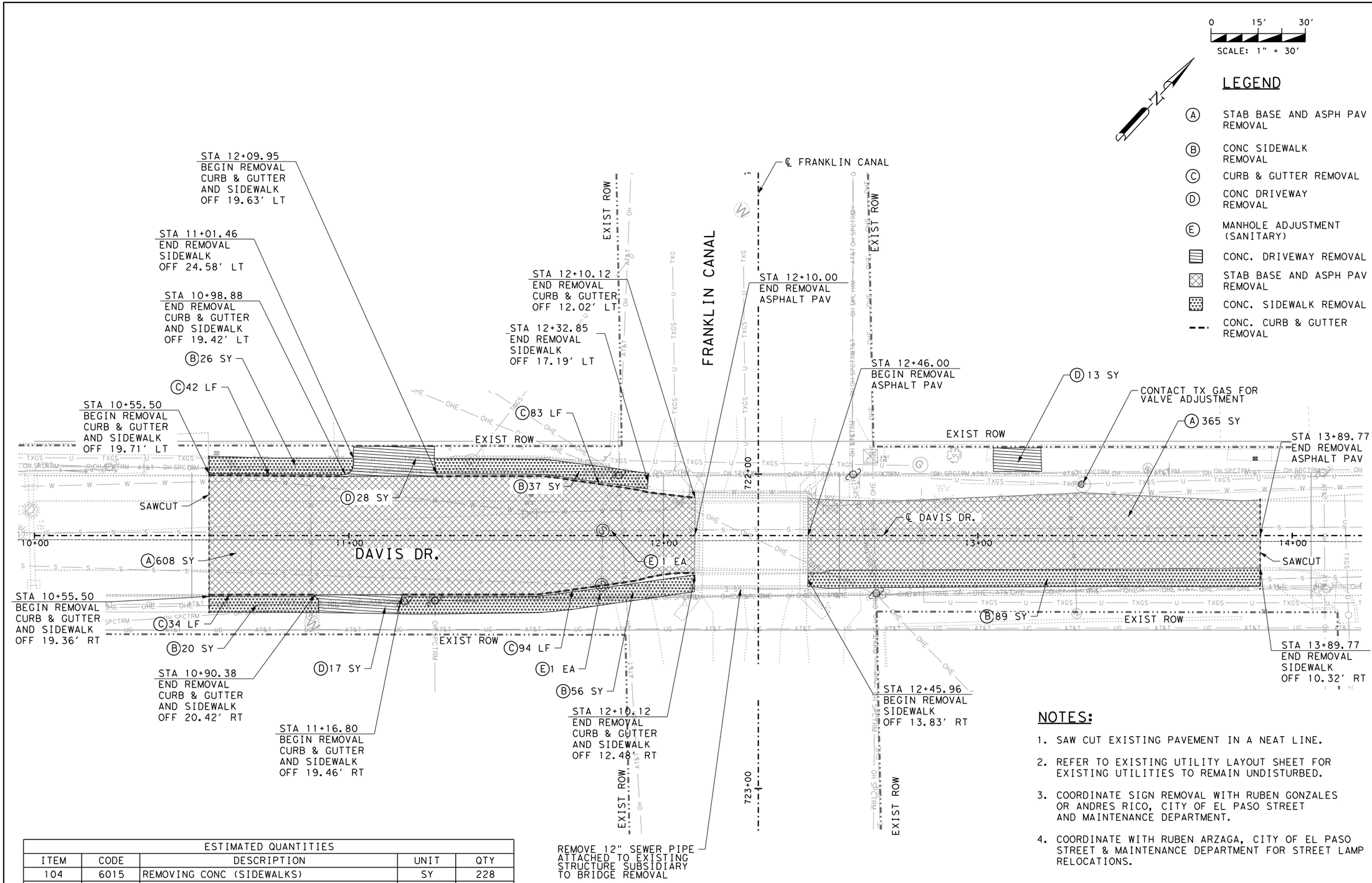
1501 N. MESA, STE #200, EL PASO, TX 79902 PHONE: (915) 313-3800

SHEET TITLE

EXISTING UTILITY LAYOUT

SHEET C 28 OF C 97

238618



ESTIMATED QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY
104	6015	REMOVING CONC (SIDEWALKS)	SY	228
104	6017	REMOVING CONC (DRIVEWAYS)	SY	58
104	6029	REMOVING CONC (CURB OR CURB & GUTTER)	LF	253
105	6014	REMOVING STAB BASE & ASPH PAV (7"-12")	SY	973
479	6004	ADJUSTING MANHOLES (SANITARY)	EA	2

NOTES:

1. SAW CUT EXISTING PAVEMENT IN A NEAT LINE.
2. REFER TO EXISTING UTILITY LAYOUT SHEET FOR EXISTING UTILITIES TO REMAIN UNDISTURBED.
3. COORDINATE SIGN REMOVAL WITH RUBEN GONZALES OR ANDRES RICO, CITY OF EL PASO STREET AND MAINTENANCE DEPARTMENT.
4. COORDINATE WITH RUBEN ARZAGA, CITY OF EL PASO STREET & MAINTENANCE DEPARTMENT FOR STREET LAMP RELOCATIONS.

REFERENCES – BENCHMARKS
FILE: REFER TO ROW & SURVEY CONTROL SHEETS FOR ADDITIONAL ROW AND BENCHMARK INFORMATION.

DATE	REMARKS	BY

ENGINEER'S SEAL
FRANCISCO J. CASTRO 109749 LICENSED PROFESSIONAL ENGINEER
4/17/2020

SCALE HOR: 1"=30' VER: N/A
DATE 4/17/2020
DESIGN BY CV
DRAWN BY PGR/GDN
CHKD. BY EC
APPD. BY JP

PROJECT NAME
DAVIS BRIDGE REPLACEMENT ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT DEPARTMENT CITY OF EL PASO

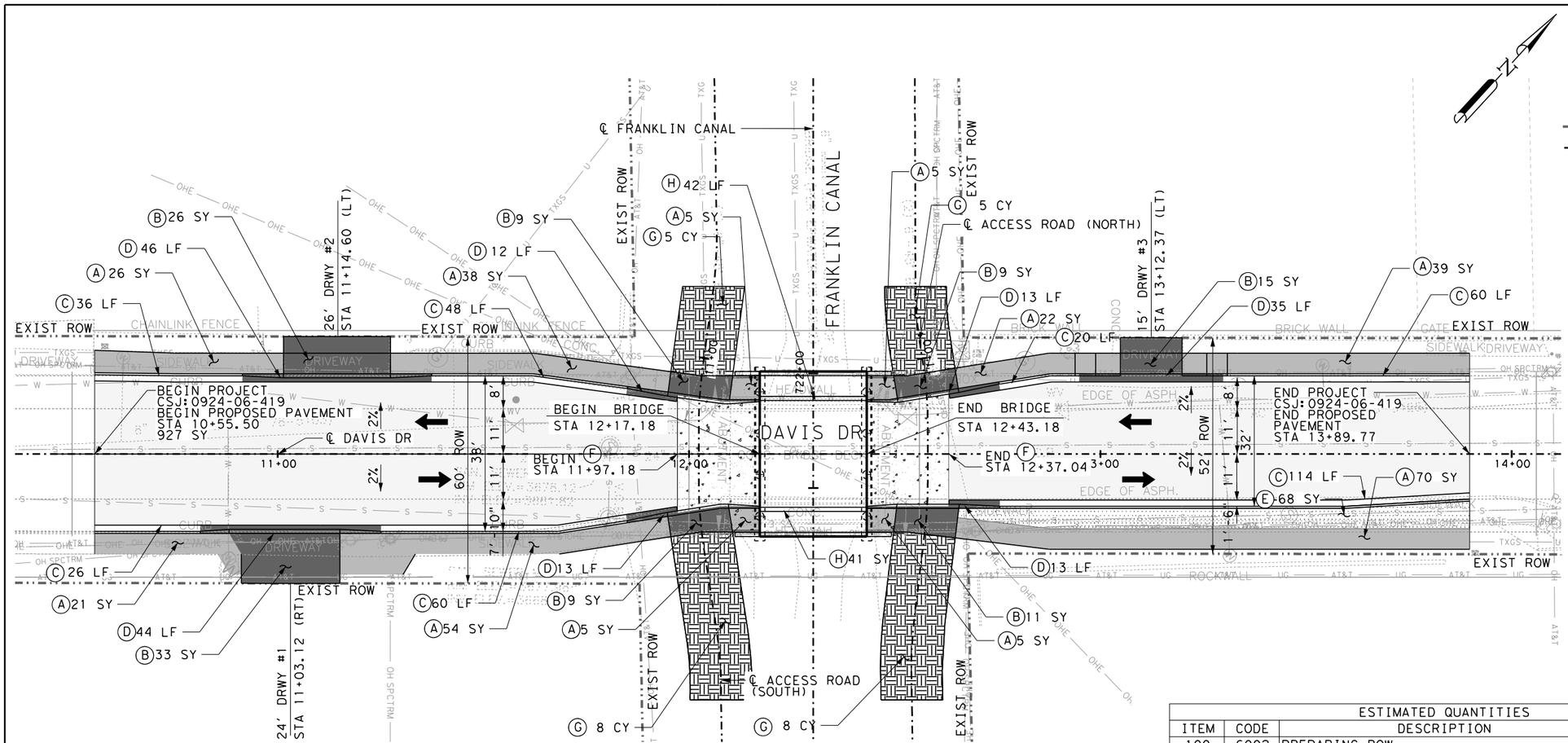
CONSOR F-12040
1501 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-0800

SHEET TITLE
DEMOLITION PLAN

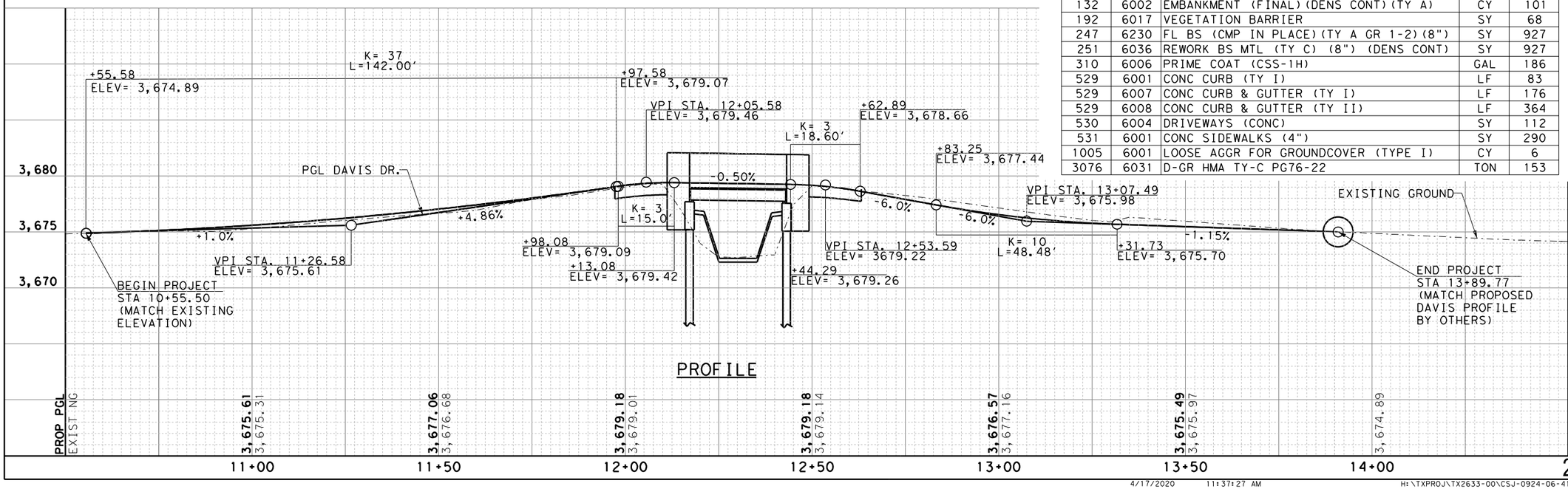
238618

SHEET
C 29 OF C 97

11:37:16 AM
4/17/2020
H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_S_RDEM001.dgn



PLAN



PROFILE

ESTIMATED QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY
100	6002	PREPARING ROW	STA	3.4
110	6001	EXCAVATION (ROADWAY)	CY	129
132	6002	EMBANKMENT (FINAL)(DENS CONT)(TY A)	CY	101
192	6017	VEGETATION BARRIER	SY	68
247	6230	FL BS (CMP IN PLACE)(TY A GR 1-2)(8")	SY	927
251	6036	REWORK BS MTL (TY C) (8") (DENS CONT)	SY	927
310	6006	PRIME COAT (CSS-1H)	GAL	186
529	6001	CONC CURB (TY I)	LF	83
529	6007	CONC CURB & GUTTER (TY I)	LF	176
529	6008	CONC CURB & GUTTER (TY II)	LF	364
530	6004	DRIVEWAYS (CONC)	SY	112
531	6001	CONC SIDEWALKS (4")	SY	290
1005	6001	LOOSE AGGR FOR GROUNDCOVER (TYPE I)	CY	6
3076	6031	D-GR HMA TY-C PG76-22	TON	153

0 15' 30'
SCALE: 1" = 30'

LEGEND

- EXIST ROW
- PROP CENTERLINE
- (A) PROP SIDEWALK
- (B) PROP DRIVEWAY
- (C) TY II CURB & GUTTER
- (D) TY I CURB & GUTTER
- (E) LANDSCAPE
- (F) PROP APROACH SLAB
- (G) PROP CANAL ACCESS ROAD (EMBANKMENT)
- (H) TY I CURB
- PROP SIDEWALK
- PROP FULL DEPTH ASPHALT PAVEMENT
- PROP DRIVEWAY
- PROP APROACH SLAB
- PROP CANAL ACCESS ROAD
- PROP LANDSCAPE
- DIRECTION OF TRAFFIC

NOTES:

1. REFER TO "HORIZONTAL CONTROL DATA" SHEETS FOR ALIGNMENT INFORMATION.
2. ALL STATIONS AND OFFSETS REFERENCE DAVIS DR. UNLESS OTHERWISE NOTED.

REFERENCES – BENCHMARKS
FILE: REFER TO ROW & SURVEY CONTROL SHEETS FOR ADDITIONAL ROW AND BENCHMARK INFORMATION.

BY	REMARKS	DATE

ENGINEER'S SEAL
4/17/2020
FRANCISCO J. CASTRO
109749
4/17/2020

SCALE HOR: 1"=30' VER: 1"=10'
DATE 4/17/2020
DESIGN BY CV
DRAWN BY FC
CHKD. BY FC
APPRD. BY JP

PROJECT NAME
DAVIS BRIDGE REPLACEMENT ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT DEPARTMENT – CITY OF EL PASO

CONSOR F-12040
1501 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-3600

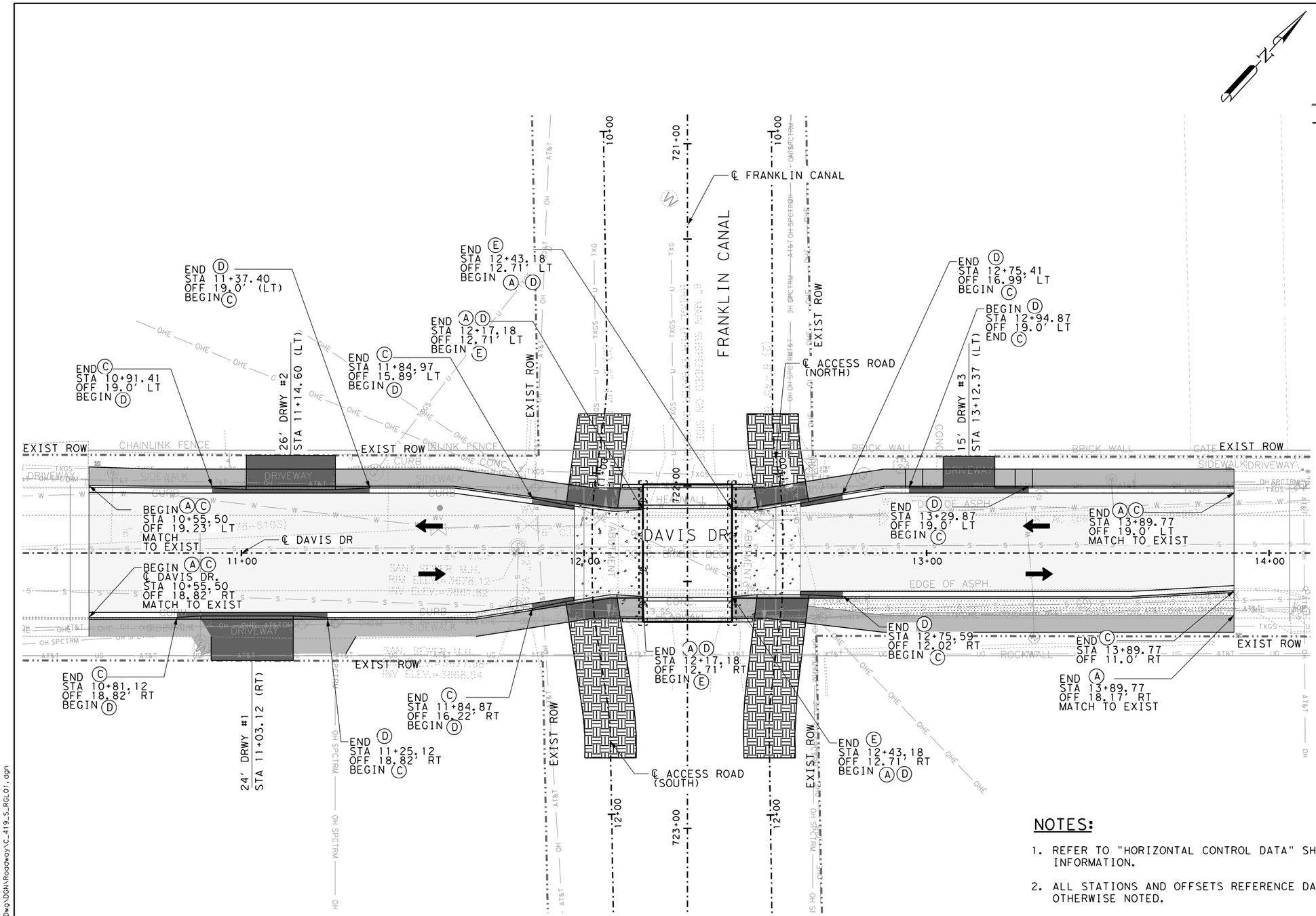
SHEET TITLE
ROADWAY PLAN AND PROFILE

SHEET
C 30 OF C 97

238618

11:37:27 AM
4/17/2020
H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_S_RPP01.dgn

4/17/2020 11:37:27 AM H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_S_RPP01.dgn



0 15' 30'

SCALE: 1" = 30'

LEGEND

- EXIST ROW
- PROP CENTERLINE
- (A) PROP SIDEWALK
- (C) TY II CURB & GUTTER
- (D) TY I CURB & GUTTER
- (E) TY I CURB
- PROP SIDEWALK
- PROP FULL DEPTH ASPHALT PAVEMENT
- PROP DRIVEWAY
- PROP APROACH SLAB
- PROP CANAL ACCESS ROAD
- PROP LANDSCAPE
- DIRECTION OF TRAFFIC

NOTES:

1. REFER TO "HORIZONTAL CONTROL DATA" SHEETS FOR ALIGNMENT INFORMATION.
2. ALL STATIONS AND OFFSETS REFERENCE DAVIS DR. UNLESS OTHERWISE NOTED.

REFERENCES – BENCHMARKS

FILE: REFER TO ROW & SURVEY CONTROL SHEETS FOR ADDITIONAL ROW AND BENCHMARK INFORMATION.

BY	REMARKS	DATE

ENGINEER'S SEAL

FRANCISCO A. CASTRO 109769 LICENSED PROFESSIONAL ENGINEER 4/17/2020

SCALE HOR: 1"=30' VER: 1"=5'

DATE 4/17/2020
DESIGN BY CV
DRAWN BY FC
CHKD. BY FC
APPD. BY RP

PROJECT NAME

DAVIS BRIDGE REPLACEMENT ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT — CITY OF EL PASO

CONSOR F-12040
1501 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-3800

SHEET TITLE

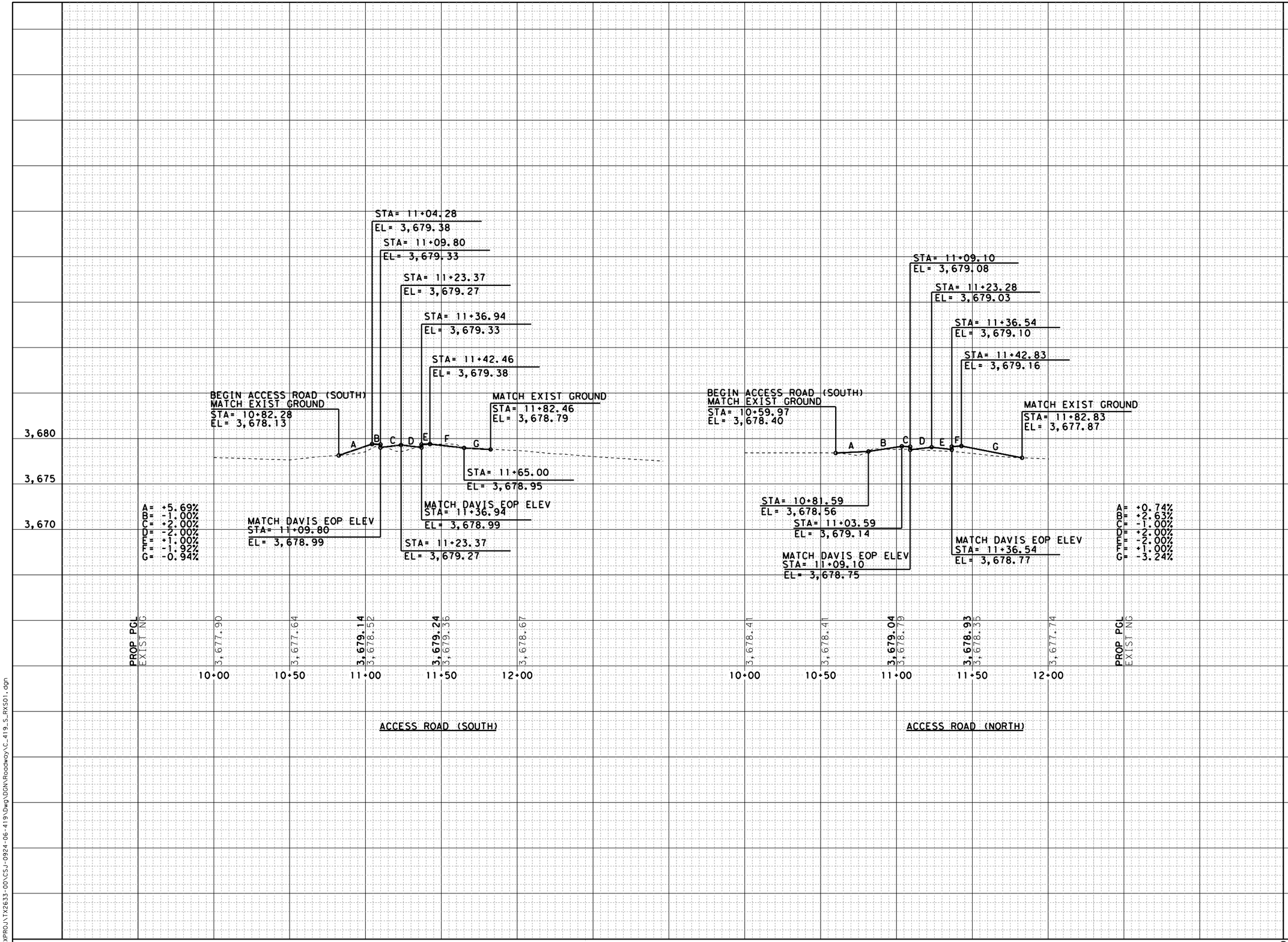
ROADWAY GEOMETRY LAYOUT

SHEET C 31 OF C 97

238618

11:37:30 AM
4/17/2020
H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_S_RGL01.dgn

4/17/2020 11:37:30 AM H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_S_RGL01.dgn



REFERENCES — BENCHMARKS

FILE:
REFER TO ROW & SURVEY CONTROL SHEETS
FOR ADDITIONAL ROW AND BENCHMARK INFORMATION.

DATE	REMARKS	BY

ENGINEER'S SEAL

STATE OF TEXAS
FRANCISCO A. CASTRO
109769
REGISTERED
PROFESSIONAL ENGINEER
4/17/2020

SCALE
HOR: 1"=50'
VER: 1"=5'

DATE 4/17/2020
DESIGN BY CV
DRAWN BY FC
CHKD. BY FC
APPD. BY JP

PROJECT NAME

DAVIS BRIDGE REPLACEMENT
ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT
CITY OF EL PASO

CONSOR F-12040
1501 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-3680

SHEET TITLE

CROSS STREET
PROFILES

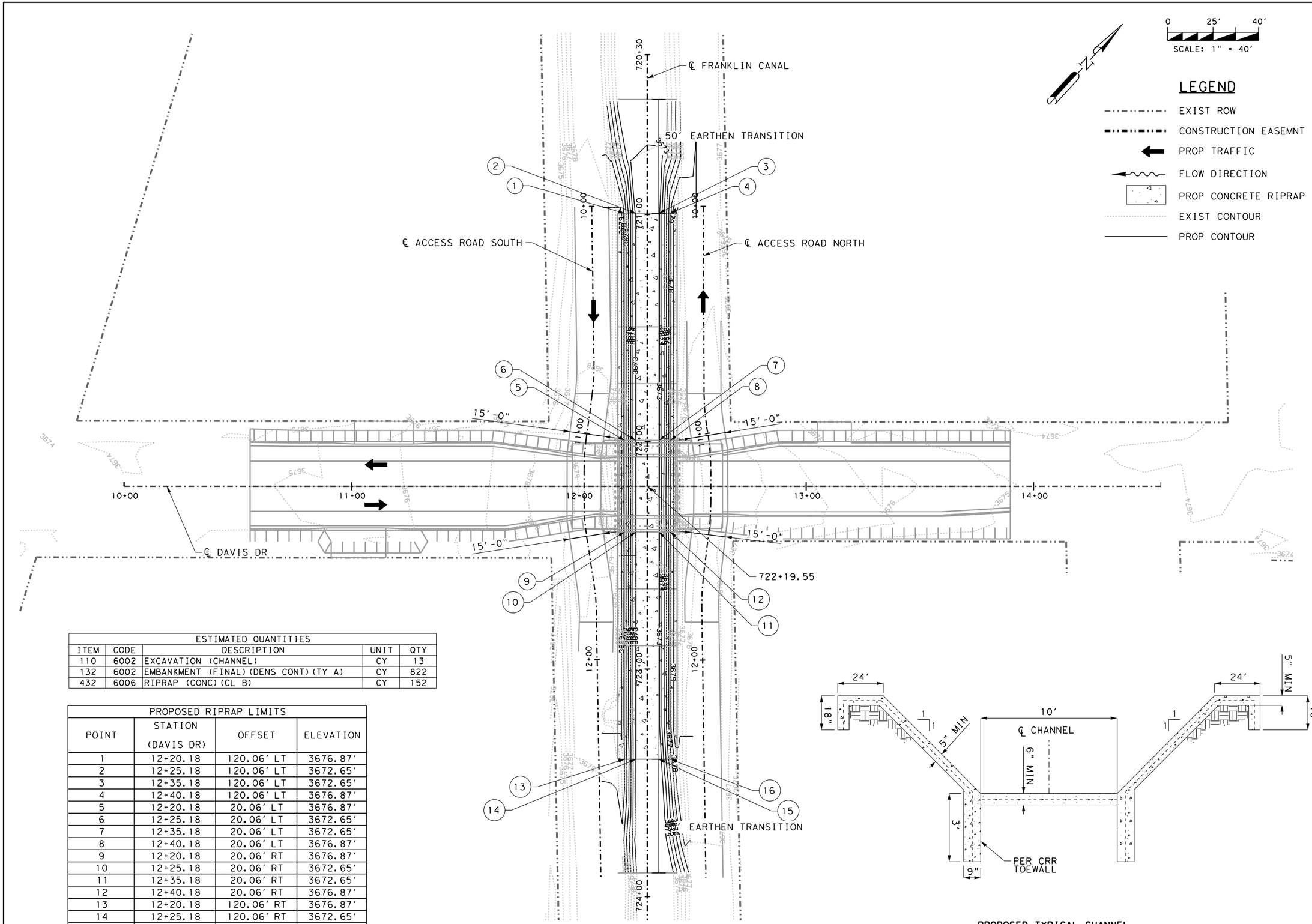
SHEET
C 32 OF C 97

238618

11:37:32 AM
4/17/2020
H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_S_RXS01.dgn

4/17/2020 11:37:32 AM H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_S_RXS01.dgn

Attachment B



ESTIMATED QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY
110	6002	EXCAVATION (CHANNEL)	CY	13
132	6002	EMBANKMENT (FINAL)(DENS CONT)(TY A)	CY	822
432	6006	RIPRAP (CONC)(CL B)	CY	152

PROPOSED RIPRAP LIMITS			
POINT	STATION (DAVIS DR)	OFFSET	ELEVATION
1	12+20.18	120.06′ LT	3676.87′
2	12+25.18	120.06′ LT	3672.65′
3	12+35.18	120.06′ LT	3672.65′
4	12+40.18	120.06′ LT	3676.87′
5	12+20.18	20.06′ LT	3676.87′
6	12+25.18	20.06′ LT	3672.65′
7	12+35.18	20.06′ LT	3672.65′
8	12+40.18	20.06′ LT	3676.87′
9	12+20.18	20.06′ RT	3676.87′
10	12+25.18	20.06′ RT	3672.65′
11	12+35.18	20.06′ RT	3672.65′
12	12+40.18	20.06′ RT	3676.87′
13	12+20.18	120.06′ RT	3676.87′
14	12+25.18	120.06′ RT	3672.65′
15	12+35.18	120.06′ RT	3672.65′
16	12+40.18	120.06′ RT	3676.87′

PROPOSED TYPICAL CHANNEL CROSS SECTION

238618

REFERENCES – BENCHMARKS
FILE: REFER TO ROW & SURVEY CONTROL SHEETS FOR ADDITIONAL ROW AND BENCHMARK INFORMATION.

BY	REMARKS	DATE

ENGINEER'S SEAL
FRANCISCO A. CASTRO 109769 LICENSED PROFESSIONAL ENGINEER
4/17/2020

SCALE HOR: 1"=40' VER: N/A
DATE 4/17/2020
DESIGN BY CV
DRAWN BY FC/BR/DN
CHKD. BY FC
APPD. BY RP

PROJECT NAME
DAVIS BRIDGE REPLACEMENT ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT DEPARTMENT CITY OF EL PASO

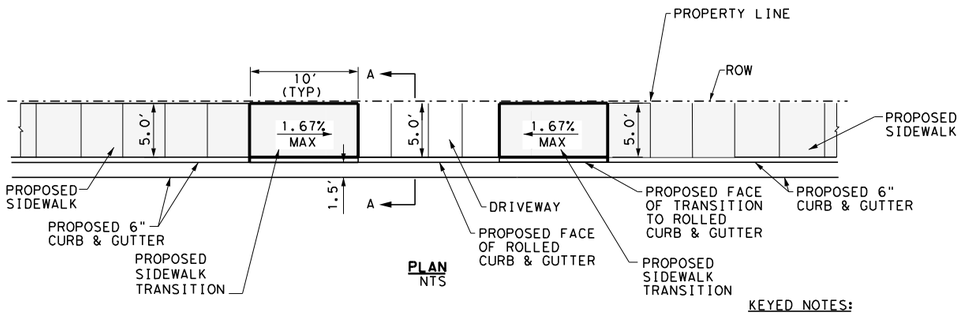
CONSOR F-12040
1501 N. MESA, STE #200 EL PASO, TX 79902
PHONE: (915) 313-3880

SHEET TITLE
GRADING LAYOUT
SHEET 1 OF 1

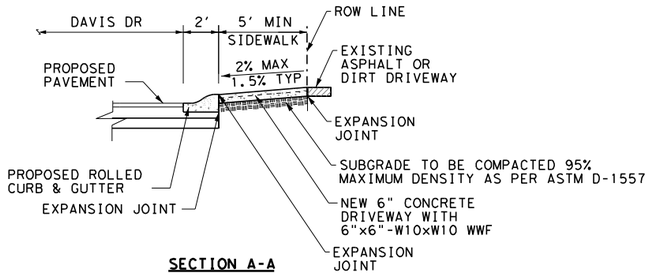
SHEET
C 33 OF C 97

11:37:44 AM
4/17/2020
H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_S_RG01.dgn

4/17/2020 11:37:44 AM H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_S_RG01.dgn



PLAN
NTS



SECTION A-A

DRIVEWAY DETAIL
SCALE: N.T.S.

KEYED NOTES:

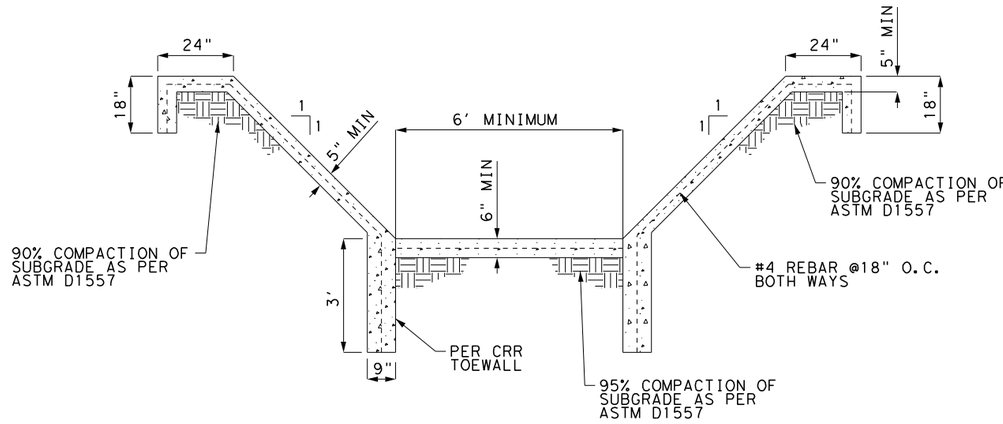
① PROVIDE A VERTICAL SIDEWALK TRANSITION AT DRIVEWAY WITH A 1.67% GRADE. REFER TO PLAN & PROFILE SHEETS FOR TRANSITION LOCATIONS.

② ADJACENT MATERIAL TO BE SUBSIDIARY TO DRIVEWAY PAY ITEM.

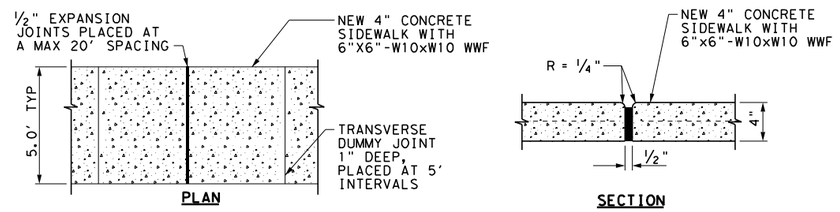
③ WHERE ROLL GATES ARE PRESENT, BEGIN 5% ADJACENT GRADING AFTER THE GATE TRACK.

DRIVEWAY NOTES:

1. CONCRETE FOR DRIVEWAY SHALL BE 3,000 PSI MIN.
2. USE PREMOLDED BITUMINOUS EXPANSION JOINT MATERIAL. EXPANSION MATERIAL SHALL BE FULL DEPTH OF NEW CONCRETE.
3. EXPANSION JOINT FILLER SHALL BE PLACED WHEREVER DRIVEWAYS ABUT ROCK OR MANSONRY STRUCTURES SUCH AS CURBS OR BUILDINGS.



CONCRETE RIPRAP ALONG CHANNEL
NTS



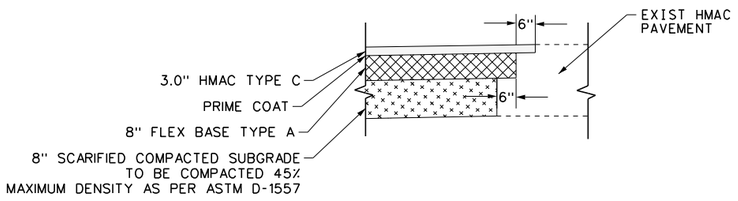
CONCRETE SIDEWALK DETAIL
SCALE: N.T.S.

SIDEWALK NOTES:

1. CONCRETE FOR SIDEWALK SHALL BE 3,000 PSI MIN.
2. USE PREMOLDED BITUMINOUS EXPANSION JOINT MATERIAL.
3. EXPANSION JOINT FILLER SHALL BE PLACED WHEREVER SIDEWALK ABUTS ROCK OR MANSONRY STRUCTURES SUCH AS CURBS OR BUILDINGS.

STEM WALL NOTES:

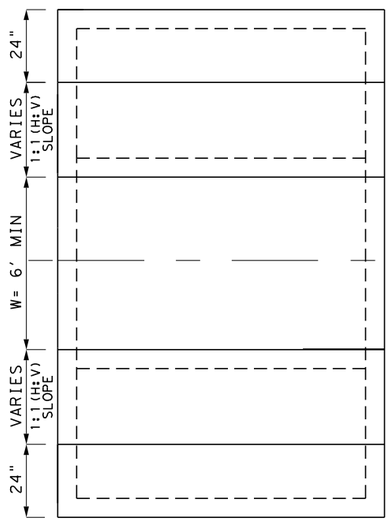
1. CONCRETE SHALL BE 3,000 PSI MIN.
2. 1" DEEP DUMMY JOINT REQUIRED AT 5' O.C.
3. REBAR IS SUBSIDIARY TO THE STEMWALL ITEM



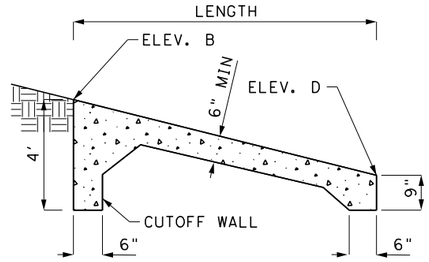
PROPOSED HMAC PAVEMENT TIE IN TO EXIST HMAC PAVEMENT
SCALE: N.T.S.

NOTES:

1. DESIGN AND CONSTRUCT REINFORCED CONCRETE TO MEET STRESS REQUIREMENTS. MINIMUM 3,000 PSI AT 28 DAYS.
2. CUTOFF WALLS TO BE NORMAL TO CENTERLINE OF WATERWAYS.
3. MINIMUM LENGTH OF TRANSITION IS 15 FEET.
4. ELEVATION "B" TO MATCH DESIGN BOTTOM GRADE.
5. ELEVATION "D" TO MATCH PROPOSED CONCRETE RIPRAP.
6. PLACE ENTIRE BOX ON UNDISTURBED NATURAL SOIL OR COMPACTED BACKFILL.



PLAN VIEW
SCALE: N.T.S.



LONGITUDINAL SECTION
SCALE: N.T.S.

CUT OFF WALL TRANSITION DETAIL
NTS

238618

REFERENCES – BENCHMARKS
FILE: REFER TO ROW & SURVEY CONTROL SHEETS FOR ADDITIONAL ROW AND BENCHMARK INFORMATION.

BY	DATE	REMARKS

ENGINEER'S SEAL
FRANCISCO A. CASTRO
109749
4/17/2020

SCALE HOR: NTS VER: NA
DATE 4/17/2020
DESIGN BY CV
DRAWN BY FC
CHKD. BY FC
APPD. BY RP

PROJECT NAME
DAVIS BRIDGE REPLACEMENT ACROSS FRANKLIN CANAL

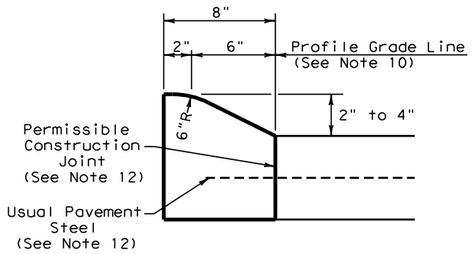
CAPITAL IMPROVEMENT — CITY OF EL PASO

CONSOR F-12040
1501 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-3680

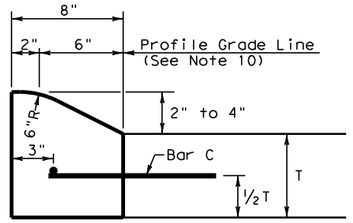
SHEET TITLE
ROADWAY DETAILS

SHEET
C 34 OF C 97

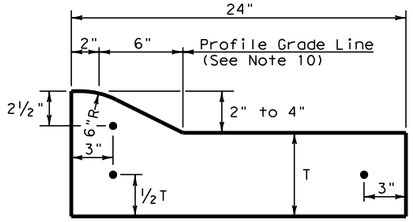
DATE: 4/17/2020 11:37:49 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Standards\cccg12.dgn



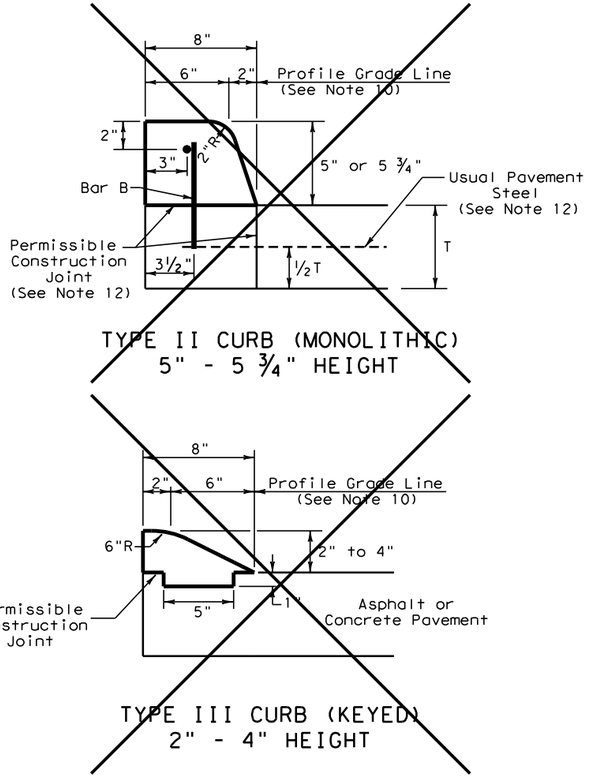
TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



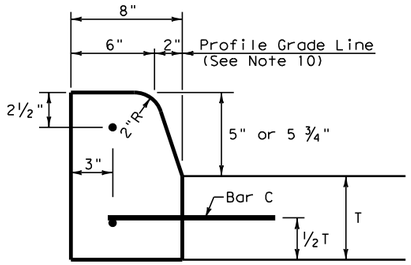
TYPE I CURB
2" - 4" HEIGHT



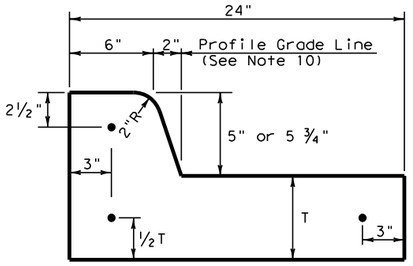
TYPE I CURB AND GUTTER
2" - 4" HEIGHT



TYPE II CURB (MONOLITHIC)
5" - 5 ¾" HEIGHT

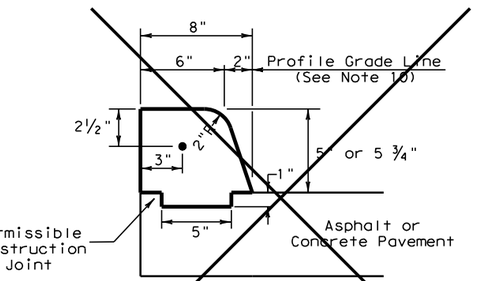


TYPE II CURB
5" - 5 ¾" HEIGHT

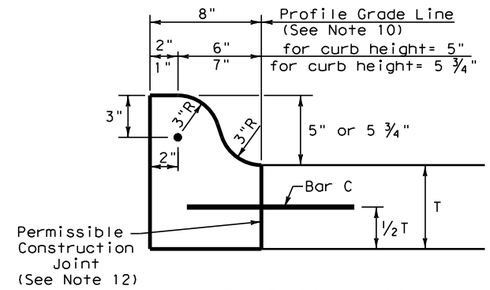


TYPE II CURB AND GUTTER
5" - 5 ¾" HEIGHT

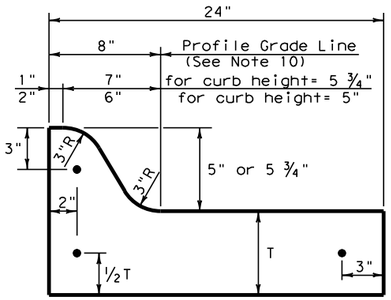
TYPE III CURB (KEYED)
2" - 4" HEIGHT



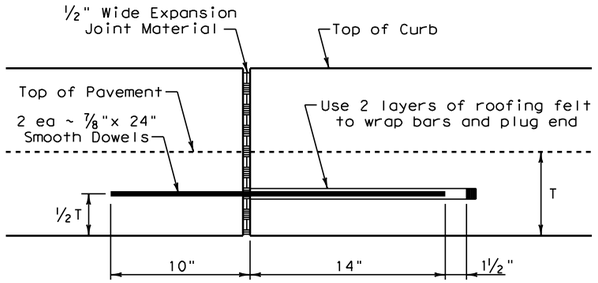
TYPE IV CURB (KEYED)
5" - 5 ¾" HEIGHT



TYPE IIa CURB
5" - 5 ¾" HEIGHT

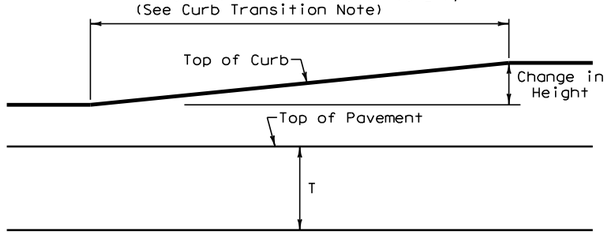


TYPE IIa CURB AND GUTTER
5" - 5 ¾" HEIGHT



EXPANSION JOINT DETAIL

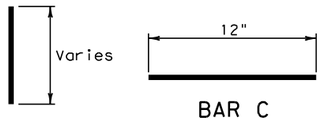
Curb Transition Note:
Field conditions may require a longer or shorter transition, and shall be shown elsewhere in the plans, or as directed by the Engineer.



CURB TRANSITION
Note: To be paid for as Highest Curb

General Notes

1. All materials and construction shall be in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
2. Concrete shall be Class A.
3. When reinforcing bars are used, they shall be No. 4 unless otherwise shown. The use of synthetic fiber in lieu of steel reinforcing is acceptable, provided the fiber producer is on the Department Producer List (MPL), maintained by TxDOT, Construction Division.
4. Round exposed sharp edges with a rounding tool, to a minimum radius of ¼ inch.
5. All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
6. Where concrete curb is placed on existing concrete pavement, the pavement shall be drilled and the reinforcing bars grouted in place.
7. 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.
8. Vertical and horizontal dowel bars and transverse reinforcing bars shall be placed at four feet C-C.
9. Dimension 'T' shown is the thickness of concrete pavement. When curb is installed adjacent to flexible pavement dimension 'T' is 8" maximum.
10. Usual profile grade line. Refer to typical sections and plan-profile sheets for exact locations.
11. One-half inch expansion joint material shall be provided where curb or curb and gutter is adjacent to sidewalk or riprap.
12. When vertical permissible construction joints are used, resulting in a longitudinal construction joint in the pavement, the longitudinal pavement steel shall be placed in accordance with pavement details shown elsewhere in the plans for longitudinal construction joints. Reinforcing steel for curb section shall then conform to that required for concrete curb.



BAR B BAR C

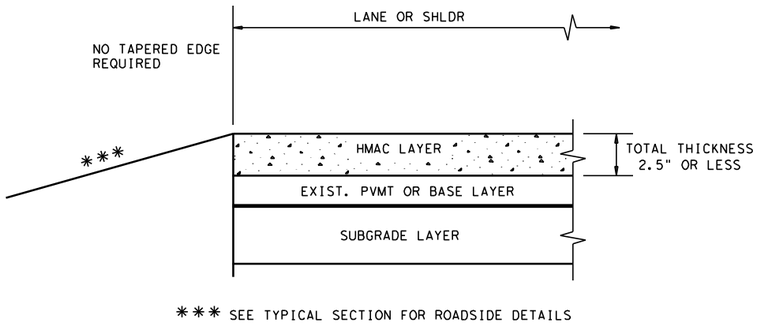
Texas Department of Transportation

Design Division Standard

CONCRETE CURB AND CURB AND GUTTER

CCCG-12

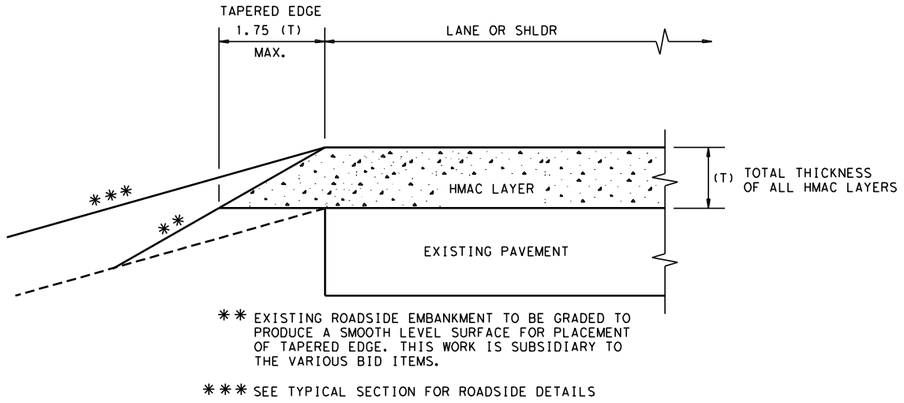
FILE: cccg12.dgn	DN: TxDOT	CK: AM	DW: VP	CK: VP
© TxDOT: 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS UPDATED 2012 - VP	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	DAL	ELL		C 35



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 1

THIN HMAC SURFACES OR HMAC OVERLAY
WITH THICKNESS OF 2.5" OR LESS

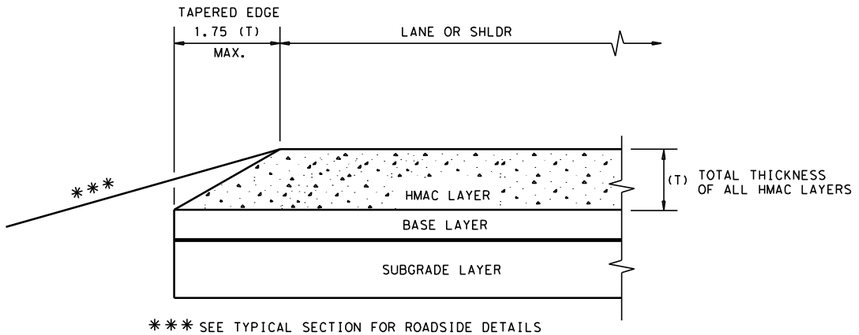


** EXISTING ROADSIDE EMBANKMENT TO BE GRADED TO PRODUCE A SMOOTH LEVEL SURFACE FOR PLACEMENT OF TAPERED EDGE. THIS WORK IS SUBSIDIARY TO THE VARIOUS BID ITEMS.

*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 2

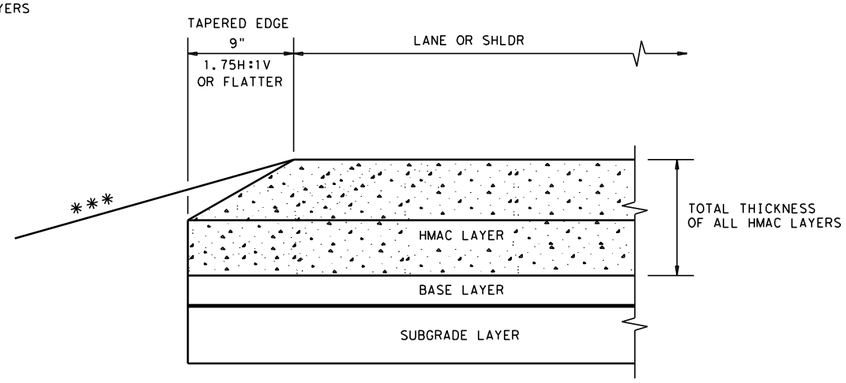
OVERLAY OF EXISTING PAVEMENT
HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 3

NEW OR RECONSTRUCTED PAVEMENT
HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 4

NEW OR RECONSTRUCTED PAVEMENT
HMAC THICKNESS 5" OR GREATER

(NOT TO SCALE)

GENERAL NOTES

1. UNLESS OTHERWISE SHOWN IN THE PLANS, A VERTICAL EDGE IS PERMISSIBLE FOR HMAC PLACED GREATER THAN 5" BELOW THE EDGE OF PAVEMENT AND FOR THICKNESS OF HMAC LESS THAN 2.5".
2. FOR FURTHER INFORMATION REGARDING THE ROADSIDE AND PAVEMENT DETAILS, SEE TYPICAL SECTIONS.
3. PAYMENT FOR TAPERED EDGE WILL BE IN ACCORDANCE WITH APPLICABLE ITEMS IN THE CONTRACT.
4. THE SLOPE OF THE TAPERED EDGE SHALL BE 1.75H:1V OR FLATTER.
5. THE TAPERED EDGE SHALL BE PRODUCED BY USE OF A SCREED ATTACHMENT CAPABLE OF PRODUCING A SMOOTH COMPACTED SURFACE. ADDITIONAL COMPACTING EFFORT BEHIND THE SCREED IS NOT REQUIRED.

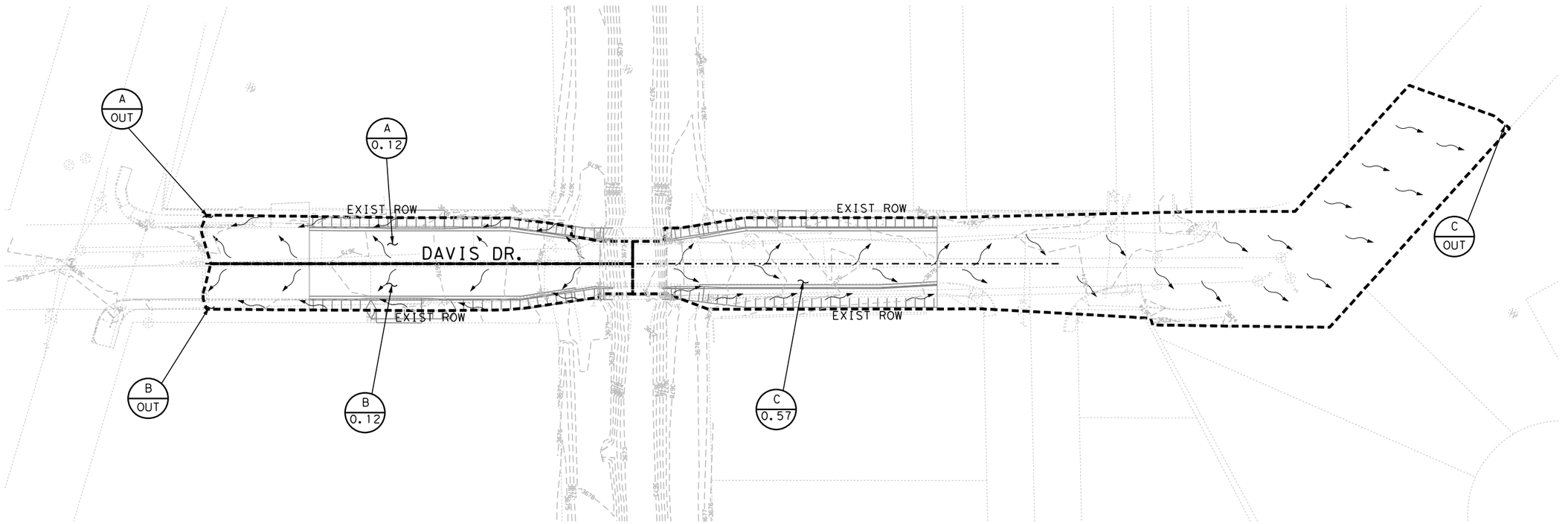
Texas Department of Transportation | Design Division Standard

TAPERED EDGE DETAILS
HMAC PAVEMENT

TE(HMAC)-11

FILE: tehmac11.dgn	DN: TxDOT	CK: RL	DW: KB	CK:
©TxDOT January 2011	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C36

DATE: 4/17/2020
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Standards\tehmac11.dgn



0 30′ 60′

SCALE: 1" = 60′

3675 EXISTING CONTOUR

AREA BOUNDARY

FLOW ARROWS

PERVIOUS COVER

AREA ID
#. # AREA IN ACRES

EXISTING CONDITIONS										
DRAINAGE AREA		SUBAREA (ACRES)		WEIGHTED AVERAGE C VALUE	TC USED	DESIGN FREQUENCY	INTENSITY I5	DISCHARGE Q5	INTENSITY I100	DISCHARGE Q100
		IMPERVIOUS	PERVIOUS							
ID	(ACRES)	C = 0.90	C = 0.40		(MIN)	(YEARS)	(IN/HR)	(CFS)	(IN/HR)	(CFS)
A	0.12	0.12	0.00	0.90	10	5	4.24	0.46	7.49	0.81
B	0.12	0.12	0.00	0.90	10	5	4.24	0.46	7.49	0.81
C	0.57	0.57	0.00	0.90	10	5	4.24	2.18	7.49	3.84

REFERENCES – BENCHMARKS

FILE:
REFER TO TOW & SURVEY CONTROL SHEETS
FOR ADDITIONAL ROW AND BENCHMARK INFORMATION.

DATE	REMARKS	BY

ENGINEER'S SEAL

STATE OF TEXAS
FRANCISCO A. CASTRO
109769
LICENSED
PROFESSIONAL ENGINEER
4/17/2020

SCALE
HOR: 1"=60'
VER: N/A

DATE 4/17/2020
DESIGN BY AM
DRAWN BY PG/RGDN
CHKD. BY FC
APPD. BY JP

PROJECT NAME

DAVIS BRIDGE REPLACEMENT
ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT
CITY OF EL PASO

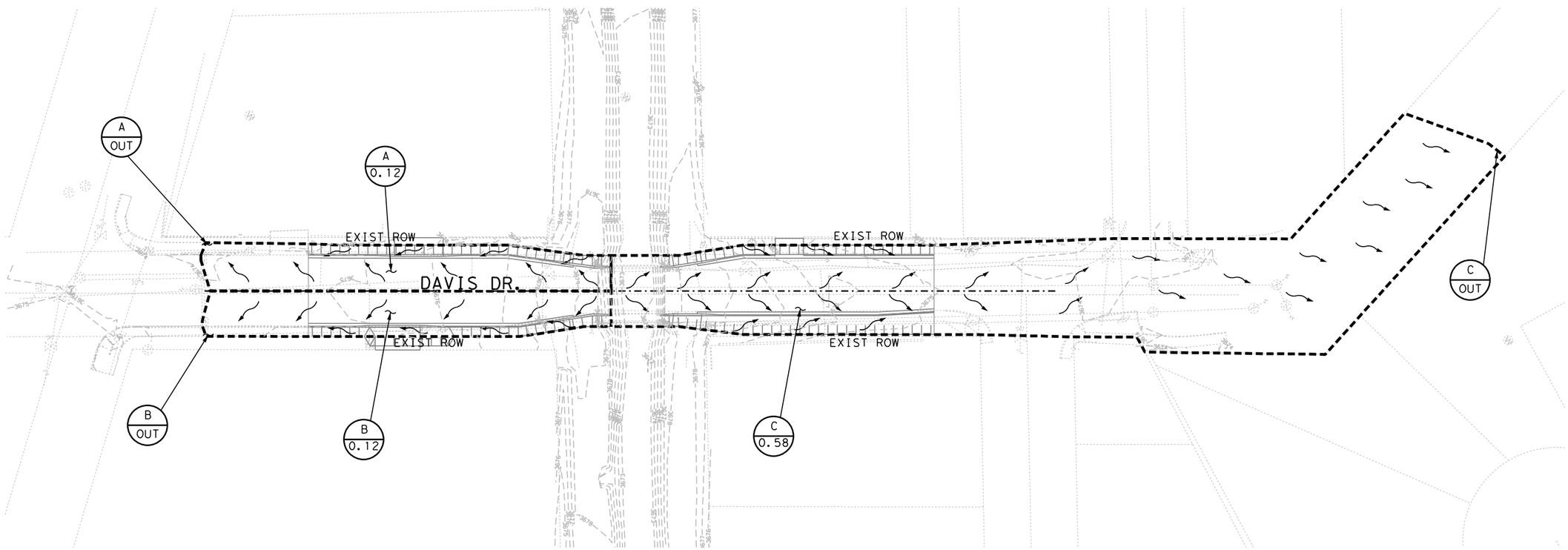
CONSOR F-12040
1501 N. MESA, STE #200 EL PASO, TX 79902
PHONE: (915) 313-3660

SHEET TITLE

EXISTING
DRAINAGE
AREA MAP

SHEET
C 37 OF C 97

238618



0 30′ 60′

SCALE: 1" = 60′

3675 PROPOSED CONTOUR

AREA BOUNDARY

FLOW ARROWS

PERVIOUS COVER

/ #.# AREA ID / AREA IN ACRES

PROPOSED CONDITIONS										
DRAINAGE AREA		SUBAREA (ACRES)		WEIGHTED AVERAGE C VALUE	TC USED	DESIGN FREQUENCY	INTENSITY I5	DISCHARGE Q5	INTENSITY I100	DISCHARGE Q100
		IMPERVIOUS	PERVIOUS							
ID	(ACRES)	C = 0.90	C = 0.40		(MIN)	(YEARS)	(IN/HR)	(CFS)	(IN/HR)	(CFS)
A	0.12	0.12	0.00	0.90	10	5	4.24	0.46	7.49	0.81
B	0.12	0.12	0.00	0.90	10	5	4.24	0.46	7.49	0.81
C	0.58	0.58	0.00	0.90	10	5	4.24	2.21	7.49	3.91

238618

REFERENCES – BENCHMARKS

FILE:
REFER TO ROW & SURVEY CONTROL SHEETS
FOR ADDITIONAL ROW AND BENCHMARK INFORMATION.

BY	REMARKS	DATE

ENGINEER'S SEAL

STATE OF TEXAS
FRANCISCO A. CASTRO
109765
REGISTERED
PROFESSIONAL ENGINEER
4/17/2020

SCALE
HOR: 1"=60'
VER: N/A

DATE	4/17/2020
DESIGN BY	AM
DRAWN BY	PG/RG/DN
CHKD. BY	FC
APPD. BY	JP

PROJECT NAME

DAVIS BRIDGE REPLACEMENT
ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT
CITY OF EL PASO

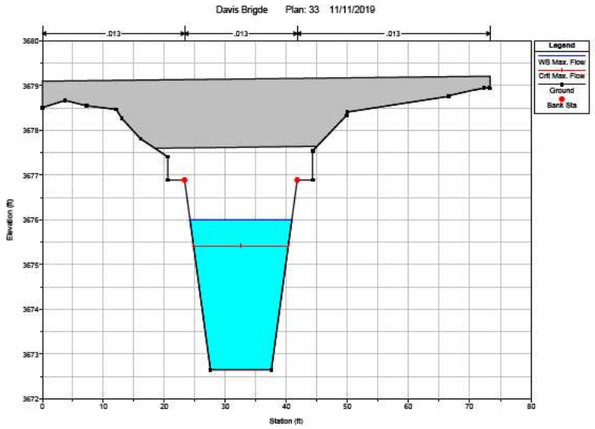
CONSOR F-12040
1501 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-3680

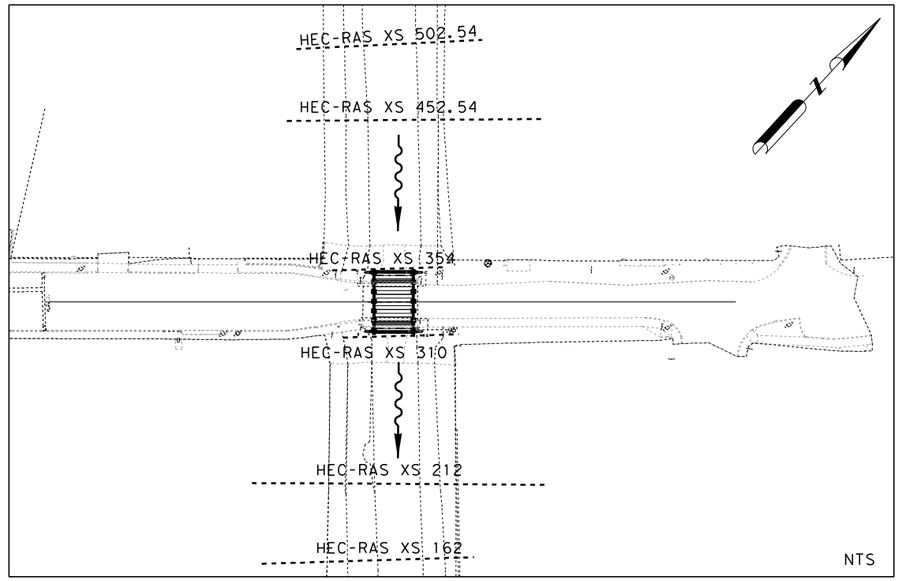
SHEET TITLE

PROPOSED
DRAINAGE
AREA MAP

SHEET
C 38 OF C 97

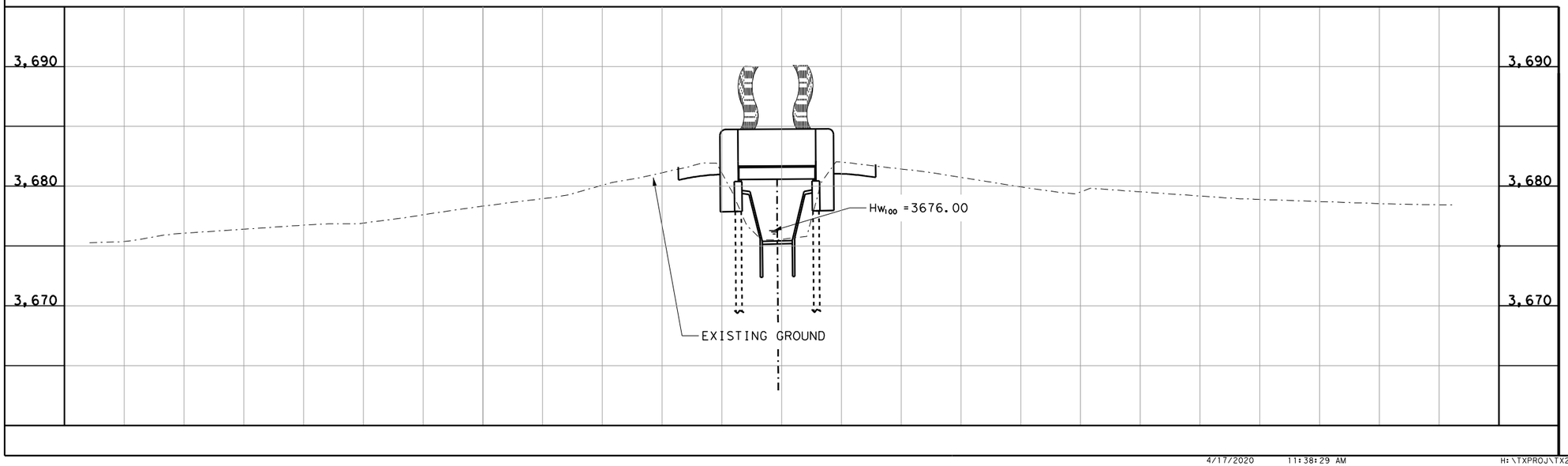
HEC-RAS DATA FOR DAVIS BRIDGE						
HEC-RAS STATION	DESIGN FREQUENCY	FLOW (CFS)	PROP VEL (FT/S)	WSEL (FT)		
				EXISTING	PROP	PR-EX
502.54	MAX. FLOW	300	2.93	3677.67	3676.71	0.96
452.54	MAX. FLOW	300	4.93	3677.64	3676.43	1.21
354	MAX. FLOW	300	6.70	3677.55	3676.00	1.55
BRIDGE						
310	MAX. FLOW	300	7.02	3677.44	3675.88	1.56
212	MAX. FLOW	300	8.51	3677.33	3675.32	2.01
162	MAX. FLOW	300	5.10	3677.28	3675.60	1.68





NOTES:
1. NO SCOUR CALCULATIONS AT ABUTMENTS SINCE PROTECTED BY CONCRETE RIPRAP.
2. BRIDGE FIELD VISIT WAS COMPLETED ON 05-01-2019.
3. STEADY STATE HYDRAULIC ANALYSIS OBTAINED FROM HEC-RAS VERSION 5.0.3.
4. DESIGN FLOWS FROM 100-YEAR STORM EVENT.
5. D50 ANALYSIS PROVIDED BY CQC TESTING AND ENGINEERING LLC FROM BORINGS TAKEN AT THE SITE.
6. CHANNEL LOCATED WITHIN ZONE X PER FEMA FIRM PANEL 4802140048C EFF. 02/16/2006.
7. H&H FILES SENT TO LOCAL FLOODPLAIN COORDINATOR KAREEM F. DALLO, P.E. ON 10/28/2019.

HYDRAULIC DATA FOR DAVIS BRIDGE												
EXISTING STRUCTURE	FREQ. (YR)	Q (CFS)	EXISTING CONDITIONS				PROPOSED STRUCTURE	FREQ. (YR)	Q (CFS)	PROPOSED CONDITIONS			
			HW ELEV (FT)	TW ELEV (FT)	SLOPE (FT/FT)	OUTLET VEL (FT/S)				HW ELEV (FT)	TW ELEV (FT)	SLOPE (FT/FT)	OUTLET VEL (FT/S)
30' Span Concrete	N/A	300	3677.55	3677.44	0.00074	2.72	26' Span Slab Beam	N/A	100	3676.00	3675.88	0.001134	7.08



REFERENCES – BENCHMARKS
FILE:
REFER TO ROW & SURVEY CONTROL SHEETS FOR ADDITIONAL ROW AND BENCHMARK INFORMATION.

DATE	REMARKS	BY

ENGINEER'S SEAL
FRANCISCO A. CASTRO 109765 LICENSED PROFESSIONAL ENGINEER
4/17/2020

SCALE HOR: 1"=40' VER: 1"=10'
DATE 4/17/2020
DESIGN BY AM
DRAWN BY PG/RG/DN
CHKD. BY EC
APPD. BY RP

PROJECT NAME
DAVIS BRIDGE REPLACEMENT ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT DEPARTMENT CITY OF EL PASO

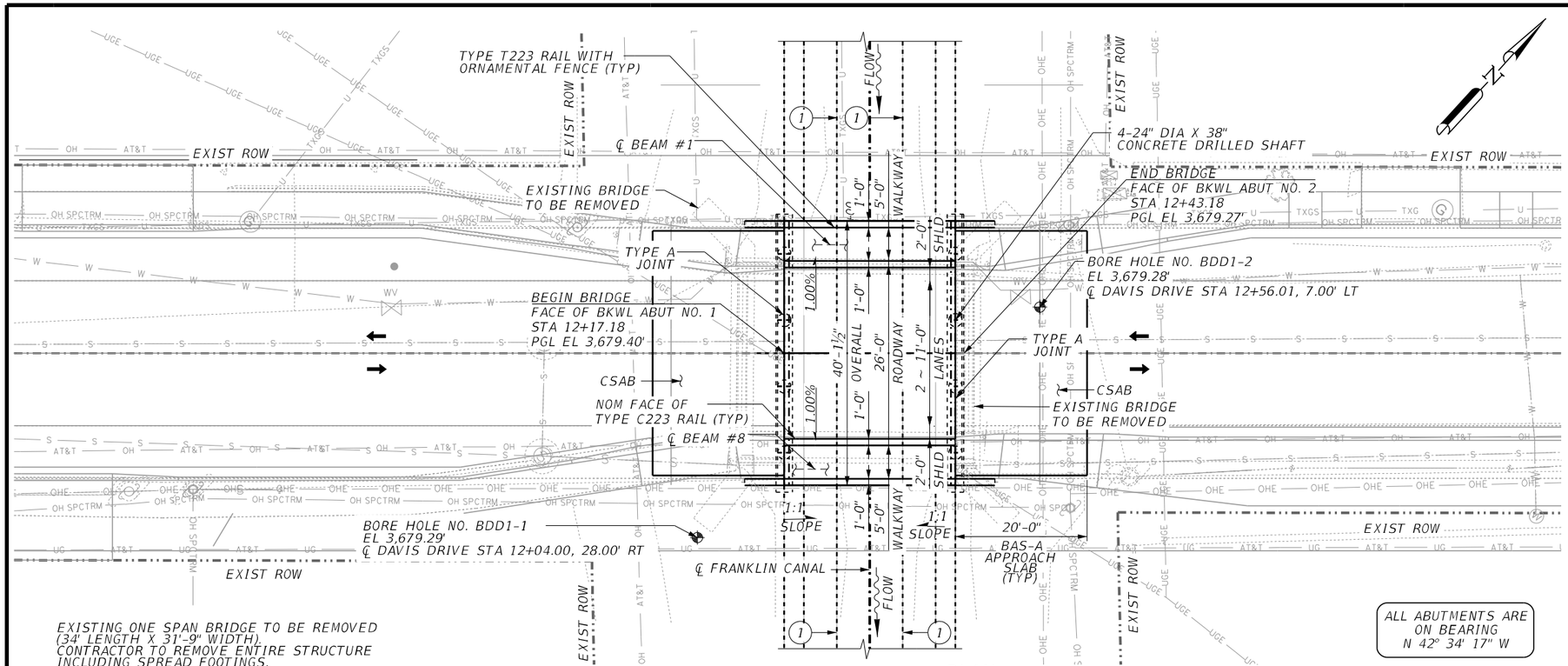
CONSOR F-12040
1501 N. MESA, STE #200 EL PASO, TX 79902
PHONE: (915) 213-3680

SHEET TITLE
HYDRAULIC DATA SHEET

SHEET
C 39 OF C 97

238618

11:38:29 AM
4/17/2020
H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Drainage\C_419_S_DHC.dgn



PLAN

GENERAL NOTES

1. BRIDGE IS REFERENCED AS NBI #24-072-0-B188-00-002. EXISTING BRIDGE IS REFERENCED AS NBI #24-072-0-B188-00-001.
2. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION (2017).
3. ◆ - DENOTES APPROXIMATE SOIL BORING LOCATION. SEE BORING LOG SHEET FOR GEOTECHNICAL INFORMATION.
4. CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO CONSTRUCTION OR FABRICATION.
5. ALL BENT CENTERLINES ARE ORIENTED RADIALLY WITH THE BASELINE ALIGNMENT.
6. DRILLED SHAFTS SHALL BE FOUNDED TO TIP ELEVATIONS SHOWN. SHAFT LENGTHS NOTED ARE AVERAGE LENGTH PER BENT.
7. SEE "AESTHETIC FENCE DETAILS" FOR SPECIAL FENCE.

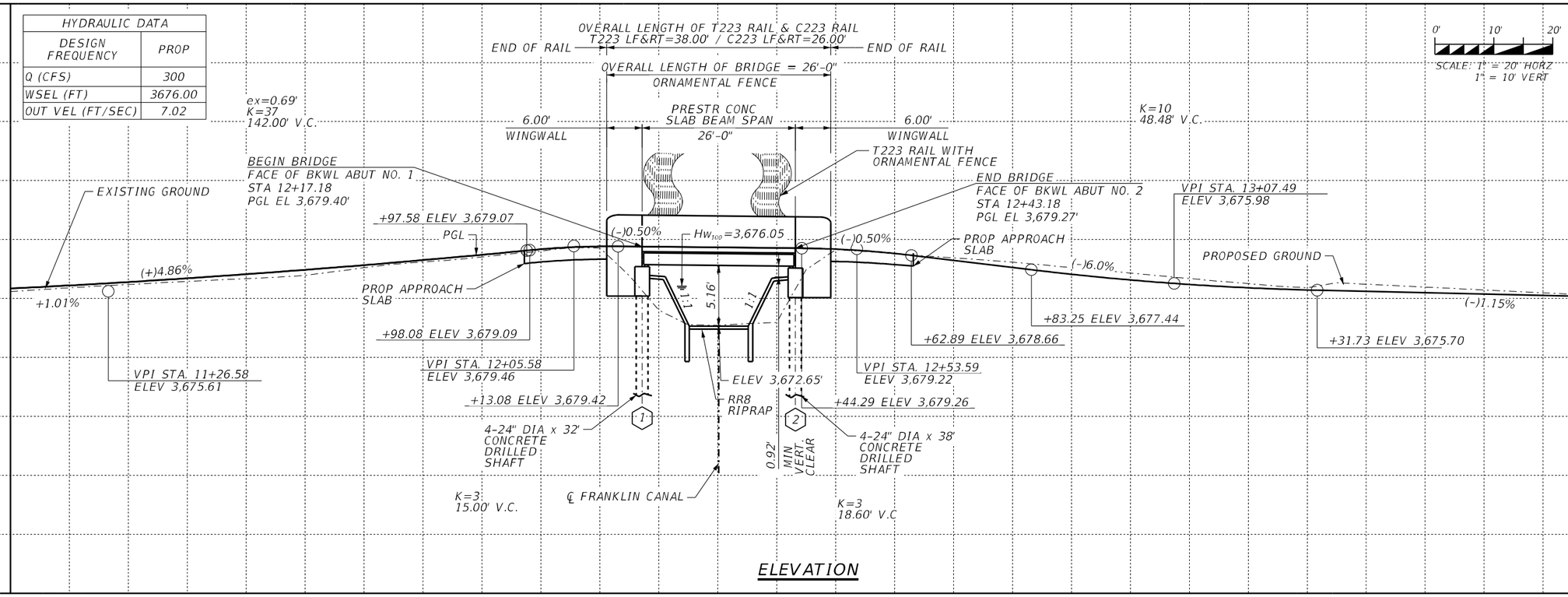
KEYED NOTES

(1) SEE ROADWAY SHEET C34 FOR RIPRAP DETAIL.

DESIGN SPEED: 15 MPH
FUNCTIONAL CLASS: MAJOR COLLECTOR
ADT: 4,909 (2017)
ADT: 6,780 (2037)
NEW NBI: 24-072-0-B188-00-002

HL-93 LOADING

HYDRAULIC DATA	
DESIGN FREQUENCY	PROP
Q (CFS)	300
WSEL (FT)	3676.00
OUT VEL (FT/SEC)	7.02



ELEVATION

ENGINEER'S SEAL
RICARDO A PRIETO
91123
LICENSED
PROFESSIONAL
ENGINEER
STATE OF TEXAS
4/17/2020

REFERENCES -- BENCHMARKS
FILE:

BY	DATE	REVISIONS

SCALE
HOR: 1"=20'
VER: 1"=10'

	DATE	BY
DESIGN BY	4/17/2020	FM
DRAWN BY		RG
CHKD. BY		SM
APPD. BY		RP

PROJECT NAME
DAVIS BRIDGE REPLACEMENT ACROSS FRANKLIN CANAL

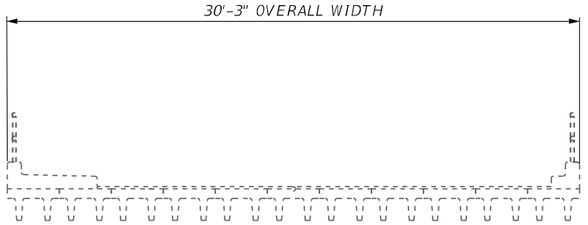
CAPITAL IMPROVEMENT
CITY OF EL PASO

CONSOR F-12040
1501 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-3680

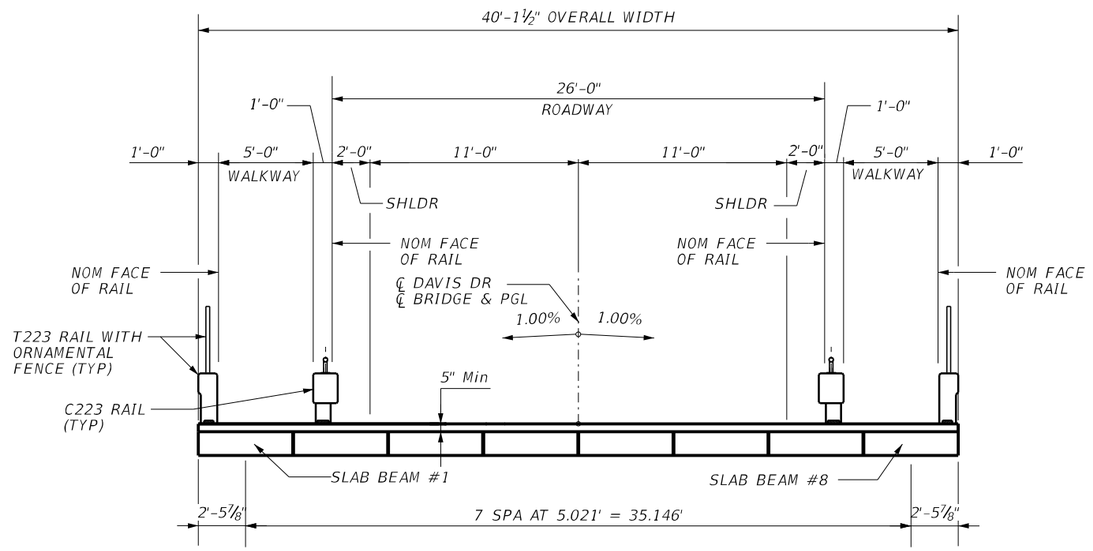
SHEET TITLE
BRIDGE LAYOUT

SHEET
C 40 OF C 97

238618



EXISTING TYPICAL TRANSVERSE SECTION



PROPOSED TYPICAL TRANSVERSE SECTION

(ALL BEAMS ARE TYPE 5SB12)

HL-93 LOADING

238618

REFERENCES -- BENCHMARKS

FILE:

DATE:	REVISIONS	BY

ENGINEER'S SEAL

RICARDO A PRIETO 91123 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

4/17/2020

SCALE

HOR: NTS
VER: NTS

DATE: 4/17/2020
DESIGN BY FM
DRAWN BY NS
CHKD. BY SM
APPD. BY RP

PROJECT NAME

DAVIS BRIDGE REPLACEMENT
ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT — CITY OF EL PASO —

CONSOR F-12040
150 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-3880

SHEET TITLE

BRIDGE TYPICAL SECTIONS

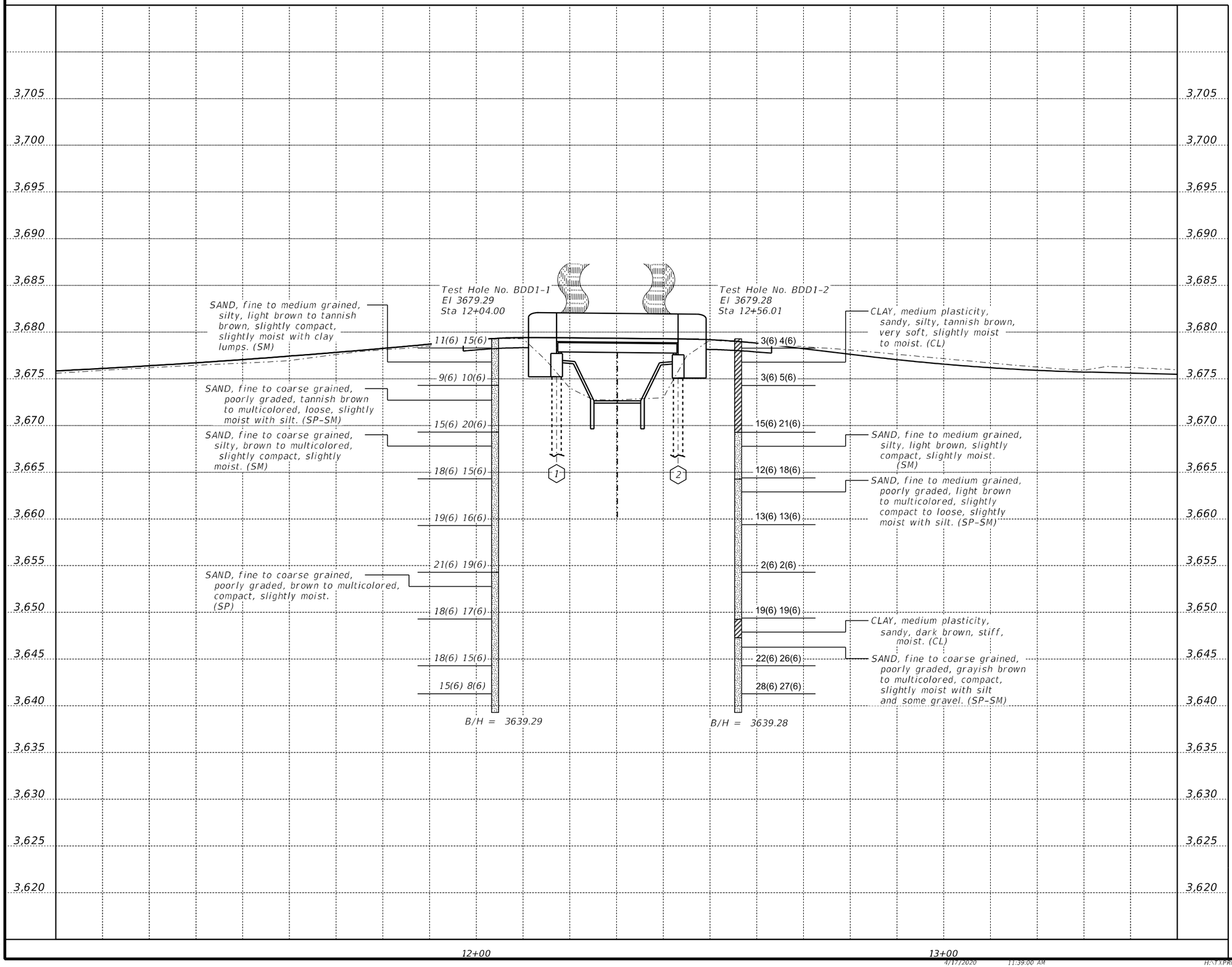
SHEET

C 41 OF C 97

H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Bridge\C_419_S_BTS01.dgn
11:38:49 AM
4/17/2020

4/17/2020 11:38:49 AM H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Bridge\C_419_S_BTS01.dgn

Attachment B



REFERENCES -- BENCHMARKS

FILE:

DATE:	REVISIONS	BY

ENGINEER'S SEAL

RICARDO A PRIETO
91123
CIVIL
4/17/2020

SCALE		DATE:	4/17/2020
HOR:	1"=20'	DESIGN BY	EM
VER:	1"=10'	DRAWN BY	NS
		CHKD. BY	SM
		APPD. BY	RP

PROJECT NAME

DAVIS BRIDGE REPLACEMENT
ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT
CITY OF EL PASO, TEXAS

CONSOR F-12040
1501 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-3680

SHEET TITLE

BORING LOGS

SHEET

C 42 OF C 97

238618

H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Bridge\C_419_5_BBZ01.dgn
11:39:00 AM
4/17/2020

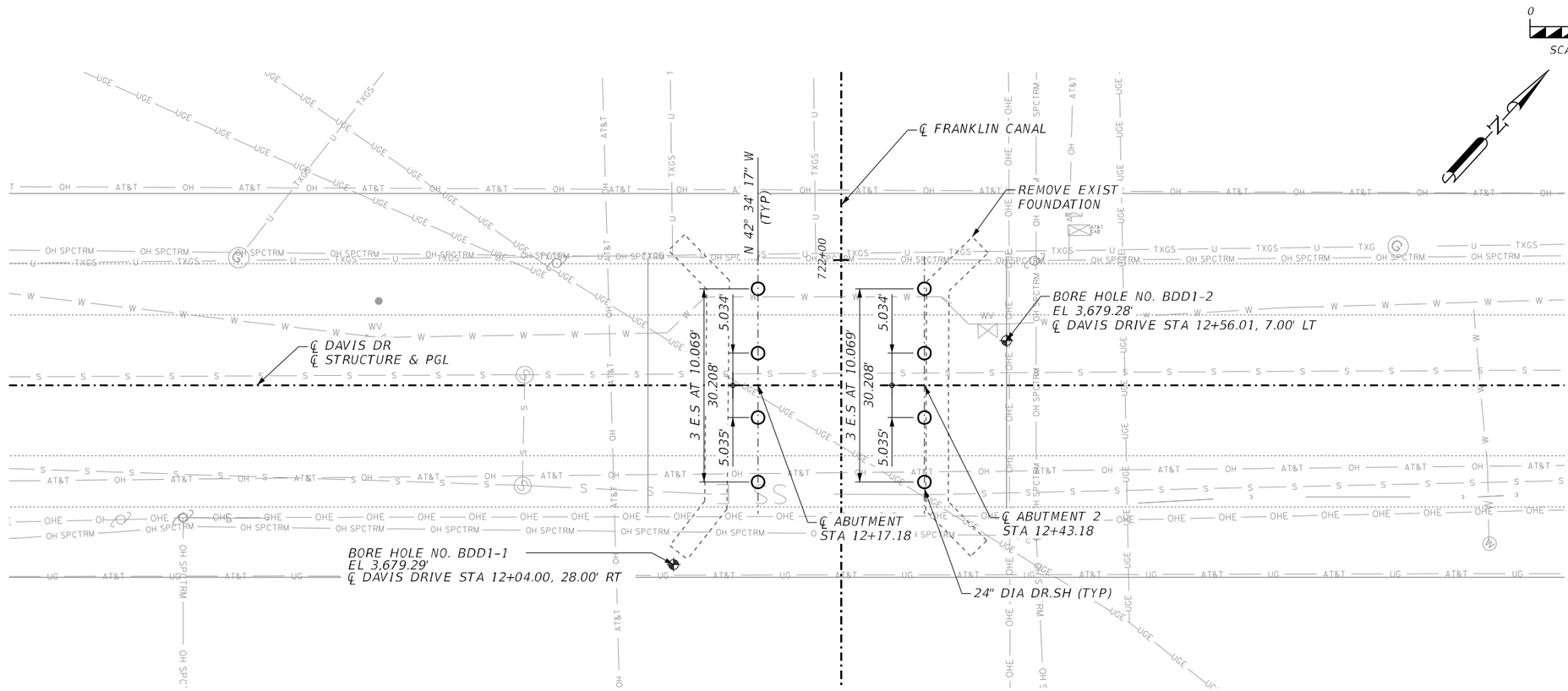
GENERAL NOTES

1. SEE STANDARD "FD" FOR SHAFT DETAILS.
2. THE CONTRACTOR SHALL FIELD LOCATE ALL UTILITIES, CULVERTS, AND ABANDONED FOUNDATIONS BEFORE DRILLING. NO ADDITIONAL PAYMENT.
3. THE CONTRACTOR'S ATTENTION IS DRAWN TO THE WATER BEARING SAND LAYERS SHOWN IN THE BORING LOGS. THE USE OF CASING AND/OR DRILLING SLURRY MAY BE NECESSARY TO INSTALL THE DRILLED SHAFTS TO THE REQUIRED PENETRATION DEPTHS.

LEGEND

◆ = BORE HOLE

○ = 24" DIAMETER DRILLED SHAFT



FOUNDATION LOADS	
ABUT	TONS/SHAFT
1 & 2	38

HL-93 LOADING

238618

REFERENCES -- BENCHMARKS

FILE:

BY	REVISIONS	DATE

ENGINEER'S SEAL

STATE OF TEXAS — RICARDO A PRIETO — 91123 — LICENSED PROFESSIONAL ENGINEER — 4/17/2020

SCALE		
HOR.	1"=20'	
VER.	N/A	
DATE:	4/17/2020	
DESIGN BY	EM	
DRAWN BY	NS	
CHKD. BY	SM	
APPD. BY	RP	

PROJECT NAME

DAVIS BRIDGE REPLACEMENT ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT — CITY OF EL PASO

CONSOR F-12040

1501 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-9680

SHEET TITLE

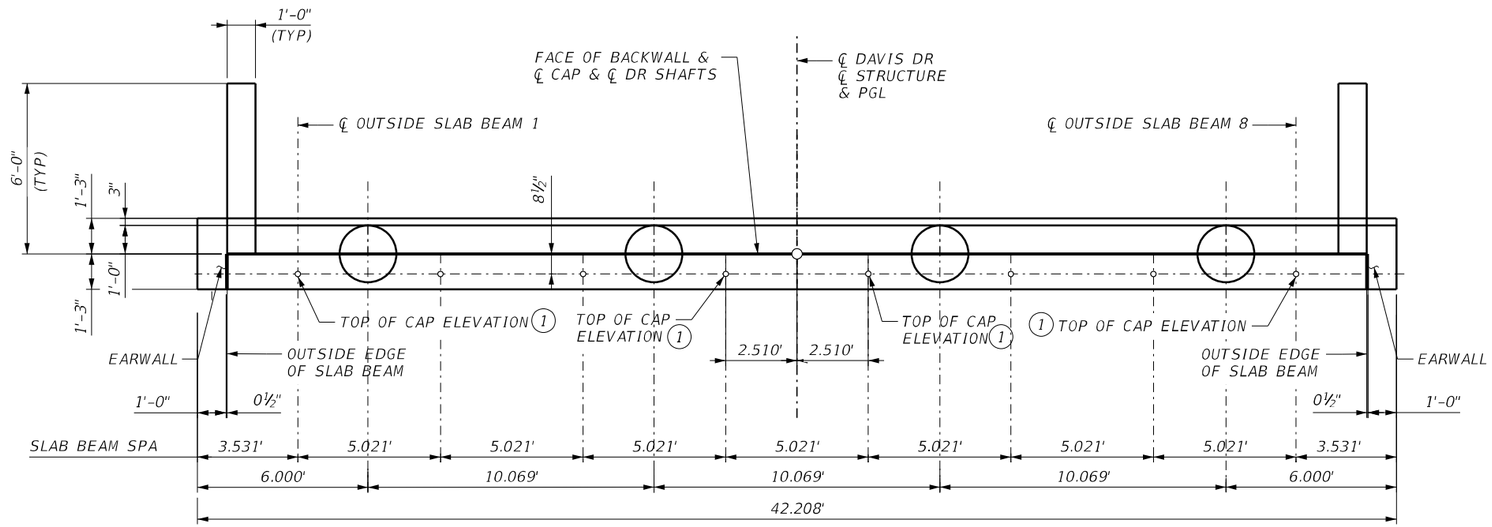
FOUNDATION LAYOUT

SHEET

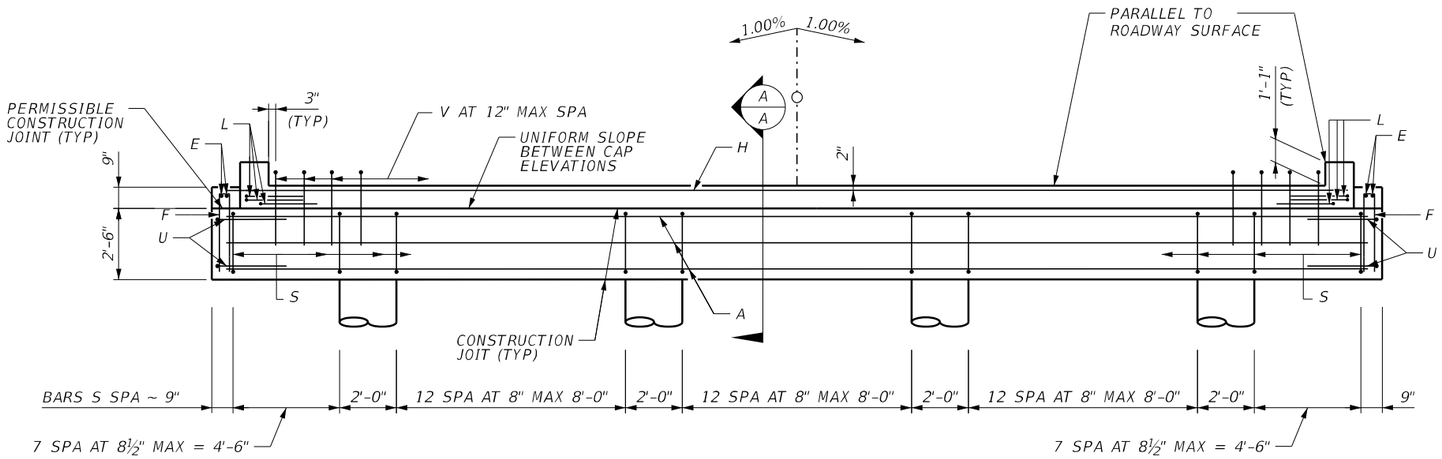
C 43 OF C 97

H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Bridge\C_419_S_BFL01.dgn
11:39:11 AM
4/17/2020

4/17/2020 11:39:11 AM H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Bridge\C_419_S_BFL01.dgn



PLAN



ELEVATION

LOOKING BACK STATION

GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
2. DESIGNED FOR A NORMAL EMBANKMENT HEADER SLOPE OF 3:1 AND A MAXIMUM SPAN LENGTH OF 50 FEET.
3. SEE BRIDGE LAYOUT FOR HEADER SLOPE AND FOUNDATION TYPE, SIZE, AND LENGTH.
4. SEE COMMON FOUNDATION DETAILS (FD) STANDARD SHEET FOR ALL FOUNDATION DETAILS AND NOTES.
5. SEE CONCRETE RIPRAP (CRR) STANDARD SHEET OR STONE RIPRAP (SRR) STANDARD SHEET FOR RIPRAP ATTACHMENT DETAILS, IF APPLICABLE.
6. SEE APPLICABLE RAIL DETAILS FOR RAIL ANCHORAGE IN WINGWALLS.
7. THESE ABUTMENT DETAILS MAY BE USED WITH STANDARD SPSB-30 ONLY.
8. COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE.
9. REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR.

MATERIAL NOTES

1. PROVIDE CLASS C CONCRETE (F'C = 3,600 PSI).
2. PROVIDE CLASS C (HPC) CONCRETE IF SHOWN ELSEWHERE IN THE PLANS.
3. PROVIDE GRADE 60 REINFORCING STEEL.

KEYED NOTES

(1) SEE SPAN DETAILS FOR "Y".

(2) INCREASE AS REQUIRED TO MAINTAIN 3" FROM FINISHED GRADE.

(3) SEE BRIDGE LAYOUT TO DETERMINE IF APPROACH SLAB IS PRESENT.

(4) SEE BRIDGE LAYOUT FOR BEAM TYPE USED IN THE SUPERSTRUCTURE.

(5) QUANTITIES SHOWN ARE FOR ONE ABUTMENT ONLY (WITH APPROACH SLAB). WITHOUT APPROACH SLAB, ADD 1.2 CY CLASS "C" CONCRETE AND 66 LB REINFORCING STEEL FOR 2 ADDITIONAL BARS H.

(6) ½" PREFORMED BITUMINOUS FIBER MATERIAL BETWEEN SLAB BEAM AND EARWALL. BOND TO EARWALL WITH AN APPROVED ADHESIVE. CAST INSIDE FACE OF EARWALL PERPENDICULAR TO CAP. (TYP)

(1) TOP OF CAP ELEVATIONS AT BEARING SEAT CENTERLINE

		BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6	BEAM 7	BEAM 8
ABUT 1	(FWD)	3677.535	3677.585	3677.635	3677.685	3677.685	3677.635	3677.585	3677.535
ABUT 2	(BK)	3677.412	3677.462	3677.512	3677.562	3677.562	3677.512	3677.462	3677.412

HL-93 LOADING

238618

REFERENCES -- BENCHMARKS

FILE:

BY	DATE	REVISIONS

ENGINEER'S SEAL

STATE OF TEXAS — RICARDO A PRIETO — 91123 — LICENSED PROFESSIONAL ENGINEER — 4/17/2020

SCALE	DATE	4/17/2020
HOR. 3/16"=1'	DESIGN BY	FM
VER. N/A	DRAWN BY	RG
	CHKD. BY	SM
	APPD. BY	RP

PROJECT NAME

DAVIS BRIDGE REPLACEMENT ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT — CITY OF EL PASO

CONSOR F-12040

1501 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-3680

SHEET TITLE

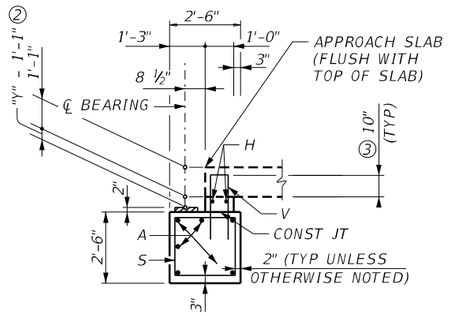
ABUTMENT NO.1 & NO.2 DETAILS

SHEET 1 OF 2

SHEET C 44 OF C 97

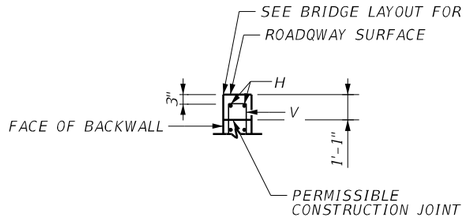
H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Bridge\C_419_S_BAD01.dgn
11:39:25 AM
4/17/2020

4/17/2020 11:39:25 AM H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Bridge\C_419_S_BAD01.dgn



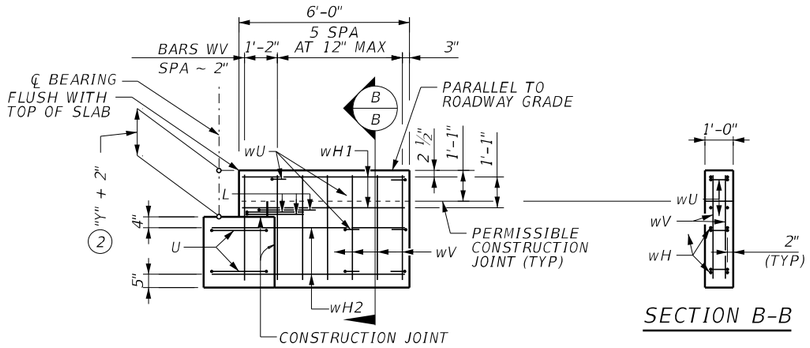
SECTION A-A ④

(WITH APPROACH SLAB)
NOTE: AT CONTRACTOR'S OPTION, BACKWALL MAY BE CAST WITH APPROACH SLAB.



BACKWALL DETAIL④

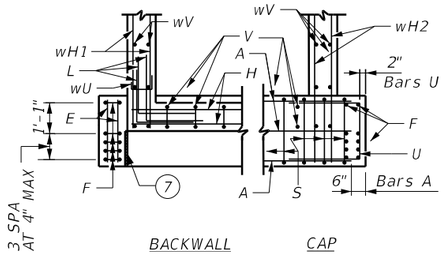
(WITHOUT APPROACH SLAB)
NOTE: AT CONTRACTOR'S OPTION, BACKWALL MAY BE CAST IN ONE LIFT TO ROADWAY SURFACE.



WINGWALL ELEVATION

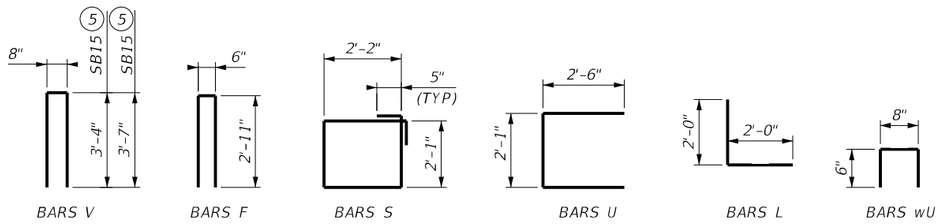
(EARWALL NOT SHOWN FOR CLARITY.)

SECTION B-B



BACKWALL CAP

CORNER DETAILS



BARS V | BARS F | BARS S | BARS U | BARS L | BARS wU

TABLE OF ESTIMATED QUANTITIES

BAR	No.	SIZE	LENGTH	WEIGHT
A	6	#11	41'-2.5"	1,314
E	4	#4	2'-2"	6
F	10	#4	6'-4"	42
H	2	#5	38'-10"	81
L	6	#6	4'-0"	36
S	55	#4	9'-4"	343
U	4	#6	7'-1"	43
V	38	#5	7'-4"	291
wH1	8	#6	5'-8"	68
wH2	8	#6	6'-11"	83
wU	12	#4	1'-8"	13
wV	28	#5	3'-10"	112
ITEM			UNIT	QUANTITY
REINFORCING STEEL			LB	2,431
CL "C" CONC (ABUT)			CY	12.1

SCALE: N.T.S.

KEYED NOTES

1. TOP OF CAP ELEVATIONS ARE BASED ON SECTION DEPTHS SHOWN ON SPAN DETAILS.
2. SEE SPAN DETAILS FOR "Y".
3. INCREASE AS REQUIRED TO MAINTAIN 3" FROM FINISHED GRADE.
4. SEE BRIDGE LAYOUT TO DETERMINE IF APPROACH SLAB IS PRESENT.
5. SEE BRIDGE LAYOUT FOR BEAM TYPE USED IN THE SUPERSTRUCTURE.
6. QUANTITIES SHOWN ARE FOR ONE ABUTMENT ONLY (WITH APPROACH SLAB). WITHOUT APPROACH SLAB, ADD 1.2 CY CLASS "C" CONCRETE AND 66 LB REINFORCING STEEL FOR 2 ADDITIONAL BARS H.
7. ½" PREFORMED BITUMINOUS FIBER MATERIAL BETWEEN SLAB BEAM AND EARWALL. BOND TO EARWALL WITH AN APPROVED ADHESIVE. CAST INSIDE FACE OF EARWALL PERPENDICULAR TO CAP. (TYP)

HL-93 LOADING

238618

REFERENCES -- BENCHMARKS

FILE:

DATE:

REVISIONS

BY

ENGINEER'S SEAL

RICARDO A PRIETO 91123 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS 4/17/2020

SCALE HOR: NTS VER: NTS

DATE 4/17/2020
DESIGN BY FM
DRAWN BY RG
CHKD. BY SM
APPD. BY RP

PROJECT NAME

DAVIS BRIDGE REPLACEMENT ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT CITY OF EL PASO

CONSOR F-12040
1501 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-3650

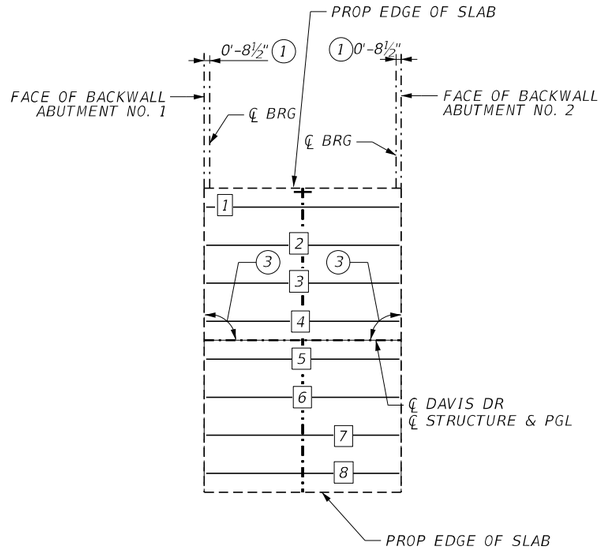
SHEET TITLE

ABUTMENT NO.1 & NO.2 DETAILS

SHEET 2 OF 2

SHEET C 45 OF C 97

H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Bridge\C_419_S_BAD02.dgn
11:39:27 AM
4/17/2020



SPAN 1

(5SB12 GIRDERS)

FRAMING PLAN

KEYED NOTES

1. SEE PSB-5SB15 STANDARD FOR ORIENTATION OF DIMENSION.
2. BEAM LENGTHS SHOWN ARE BOTTOM BEAM LENGTHS WITH ADJUSTMENTS MADE FOR BEAM SLOPE.
3. BEAM ANGLE (TYP).

LEGEND

[#] BEAM NUMBER

0 10' 20'

SCALE: 1" = 20'

BEAM REPORT, SPAN 1

	HORIZONTAL C-C BENT	DISTANCE C-C BRG.	TRUE DISTANCE BOT. BM. FLG. (2)	BEAM SLOPE
BEAM 1	26.000	24.583	25.500	-0.0050
BEAM 2	26.000	24.583	25.500	-0.0050
BEAM 3	26.000	24.583	25.500	-0.0050
BEAM 4	26.000	24.583	25.500	-0.0050
BEAM 5	26.000	24.583	25.500	-0.0050
BEAM 6	26.000	24.583	25.500	-0.0050
BEAM 7	26.000	24.583	25.500	-0.0050
BEAM 8	26.000	24.583	25.500	-0.0050

ABUTMENT NO.1 (S 42° 34' 16.96" E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 17.573

		BEAM SPA (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 1	BEAM 1	0.000	90	0	0
	BEAM 2	5.021	90	0	0
	BEAM 3	5.021	90	0	0
	BEAM 4	5.021	90	0	0
	BEAM 5	5.021	90	0	0
	BEAM 6	5.021	90	0	0
	BEAM 7	5.021	90	0	0
	BEAM 8	5.021	90	0	0
	TOTAL	35.147			

ABUTMENT NO.2 (S 42° 34' 16.96" E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 17.573

	BEAM SPA (C.L. BENT)	BEAM ANGLE D	M	S
BEAM 1	0.000	90	0	0
BEAM 2	5.021	90	0	0
BEAM 3	5.021	90	0	0
BEAM 4	5.021	90	0	0
BEAM 5	5.021	90	0	0
BEAM 6	5.021	90	0	0
BEAM 7	5.021	90	0	0
BEAM 8	5.021	90	0	0
TOTAL	35.147			

HL-93 LOADING

238618

REFERENCES -- BENCHMARKS
FILE:

BY	DATE	REVISIONS

ENGINEER'S SEAL
STATE OF TEXAS — RICARDO A PRIETO — 91123 — LICENSED PROFESSIONAL ENGINEER — 4/17/2020

SCALE
HOR. 1"=20'
VER. N/A

	DATE	
DESIGN BY	4/17/2020	FM
DRAWN BY		RG
CHKD. BY		SM
APPD. BY		RP

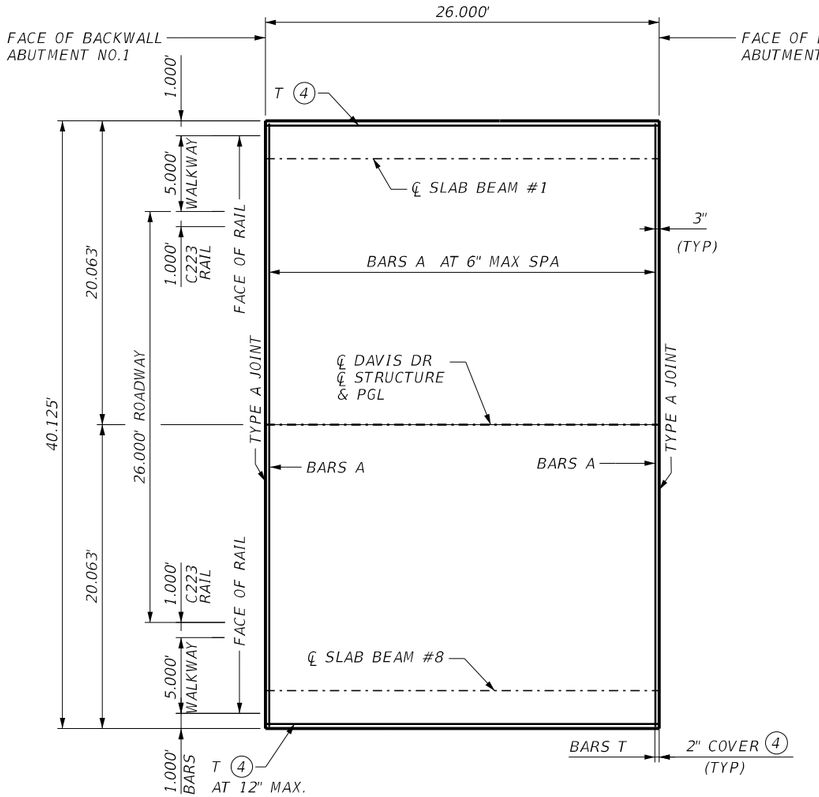
PROJECT NAME
DAVIS BRIDGE REPLACEMENT ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT — CITY OF EL PASO —

CONSOR F-12040
1501 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-3680

SHEET TITLE
FRAMING PLAN

SHEET
C 46 OF C 97



PLAN

TABLE OF ESTIMATED QUANTITIES

SPAN LENGTH	REINF CONCRETE SLAB	PRESTR CONCRETE X-BEAMS (1)	TOTAL REINF STEEL (2)
FT	SF	LF	LB
26	1,043	204.00	2,921
TOTAL	1,043	204.00	2,921

TABLE OF SECTION DEPTHS

SPAN LENGTH	BEAM	"X"	"Y"
FT	NO.	IN	IN
26	1-8	6 1/4"	18 1/4"

TABLE OF DEFLECTIONS

SPAN LENGTH	BEAM	"A"	"B"
FT	NO.	FT	FT
26	1 & 8	0.003	0.005
26	2-7	0.004	0.005

GENERAL NOTES

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
2. TWO- OR THREE-SPAN UNITS, WITH SLAB CONTINUOUS OVER INTERIOR BENTS, MAY BE FORMED WITH THE DETAILS SHOWN ON THIS SHEET.
3. SEE APPLICABLE RAIL DETAILS FOR RAIL ANCHORAGE IN SLAB.
4. THIS STANDARD DOES NOT SUPPORT THE USE OF TRANSITION BENTS.
5. COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE.

MATERIAL NOTES

1. PROVIDE CLASS S CONCRETE ($f'c$ = 4,000 PSI).
2. PROVIDE CLASS S (HPC) CONCRETE IF SHOWN ELSEWHERE IN THE PLANS.
3. PROVIDE GRADE 60 REINFORCING STEEL.
3. PROVIDE BAR LAPS, WHEN REQUIRED.
   UNCOATED ~ #4 = 1'-7"
   ~ #5 = 2'-0"
   EPOXY COATED ~ #4 = 2'-5"
   ~ #5 = 3'-0"
4. DEFORMED WELDED WIRE REINFORCEMENT (WWR) (ASTM A1064) OF EQUAL SIZE AND SPACING MAY BE SUBSTITUTED FOR BARS A OR T UNLESS NOTED OTHERWISE.

KEYED NOTES

(1) SEE BRIDGE LAYOUT FOR BEAM TYPE USED IN THE SUPERSTRUCTURE. THESE STANDARDS DO NOT PROVIDE FOR THE USE OF BOTH SB12 AND SB15 BEAMS WITHIN THE SAME STRUCTURE.

(2) REINFORCING STEEL WEIGHT IS CALCULATED USING AN APPROXIMATE FACTOR OF 2.8 LBS/SF.

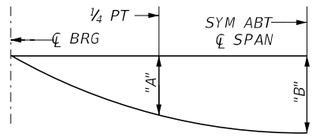
(3) FABRICATOR WILL ADJUST BEAM LENGTHS FOR BEAM SLOPES AS REQUIRED.

(4) WHERE SLAB IS CONTINUOUS OVER INTERIOR BENTS, BARS T ARE CONTINUOUS THROUGH JOINT. SEE "CONTINUOUS SLAB DETAIL".

(5) THIS STANDARD DOES NOT PROVIDE FOR CHANGES IN ROADWAY CROSS-SLOPES WITHIN THE STRUCTURE.

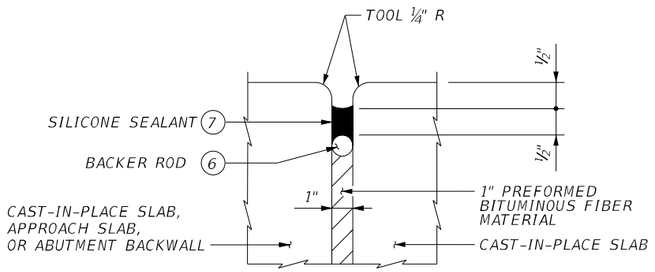
(6) 1 ¼" BACKER ROD MUST BE COMPATIBLE WITH JOINT SEALANT. USE OF MULTIPLE PIECES TO CREATE A BACKER ROD CROSS SECTION IS NOT PERMITTED. TOP OF BACKER ROD MUST BE CONVEX AS SHOWN.

(7) CLASS 7 SILICONE SEALANT THAT CONFORMS TO DMS-6310. INSTALL WHEN AMBIENT TEMPERATURE IS BETWEEN 55°F AND 85°F AND RISING. ENGINEER TO DETERMINE ALLOWABLE HOURS FOR SEALANT APPLICATION.



DEAD LOAD DEFLECTION DIAGRAM

NOTE:
DEFLECTIONS SHOWN ARE CALCULATED VALUES DUE TO ALL DEAD LOADS. FIELD DEFLECTIONS MAY BE LESS THAN THE CALCULATED VALUES SHOWN. CALCULATION ARE BASED ON AN Ec OF 5,000 PSI.



TYPE A JOINT DETAIL

SCALE: N.T.S.

HL-93 LOADING

238618

ENGINEER'S SEAL
RICARDO A PRIETO
91123
LICENSED PROFESSIONAL ENGINEER
4/17/2020

REFERENCES -- BENCHMARKS
FILE:
DATE: REVISIONS BY

SCALE HOR: 1"=10' VER: 1"=10'
DATE: 4/17/2020
DESIGN BY FM
DRAWN BY RG
CHKD. BY SM
APPD. BY RP

PROJECT NAME
DAVIS BRIDGE REPLACEMENT ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT — CITY OF EL PASO —

CONSOR F-12040
150 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-3880

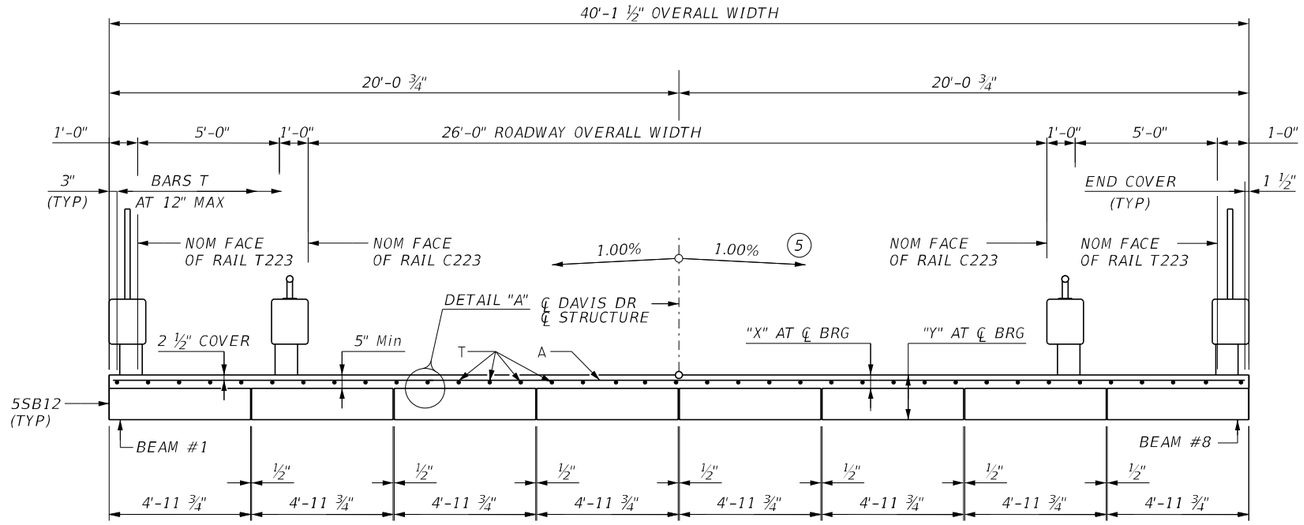
SHEET TITLE
PRESTRESSED CONCRETE SLAB BEAM SPAN (TYPE SB12)
SHEET 1 OF 2

SHEET
C 47 OF C 97

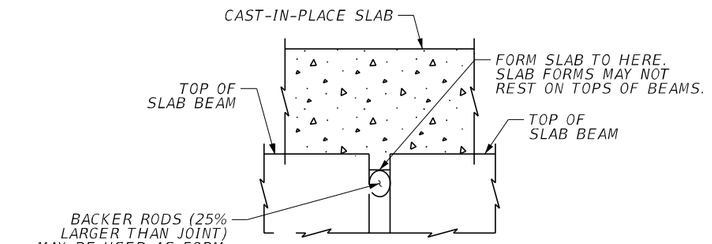
H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Bridge\C_419_S_BSD01.dgn
11:39:32 AM
4/17/2020

BAR TABLE

BAR	SIZE
A	#5
T	#4

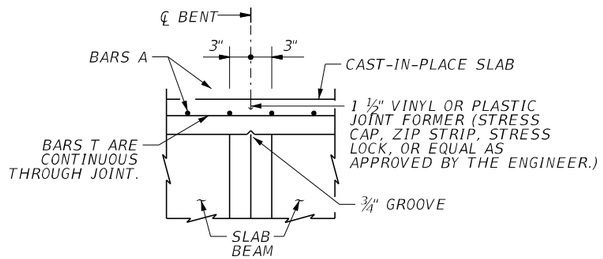


TYPICAL TRANSVERSE SECTION



DETAIL "A"

SCALE: N.T.S.



CONTINUOS SLAB DETAIL

SCALE: N.T.S.

KEYED NOTES

1. REINFORCING STEEL WEIGHT IS CALCULATED USING AN APPROXIMATE FACTOR OF 2.8 LBS/SF.
2. FABRICATOR WILL ADJUST BEAM LENGTHS FOR BEAM SLOPES AS REQUIRED.
3. WHERE SLAB IS CONTINUOUS OVER INTERIOR BENTS, BARS T ARE CONTINUOUS THROUGH JOINT. SEE "CONTINUOUS SLAB DETAIL".
4. THIS STANDARD DOES NOT PROVIDE FOR CHANGES IN ROADWAY CROSS-SLOPES WITHIN THE STRUCTURE.
5. 1 ¼" BACKER ROD MUST BE COMPATIBLE WITH JOINT SEALANT. USE OF MULTIPLE PIECES TO CREATE A BACKER ROD CROSS SECTION IS NOT PERMITTED. TOP OF BACKER ROD MUST BE CONVEX AS SHOWN.
6. CLASS 7 SILICONE SEALANT THAT CONFORMS TO DMS-6310. INSTALL WHEN AMBIENT TEMPERATURE IS BETWEEN 55°F AND 85°F AND RISING. ENGINEER TO DETERMINE ALLOWABLE HOURS FOR SEALANT APPLICATION.

HL-93 LOADING

238618

REFERENCES -- BENCHMARKS

FILE:

DATE:

REVISIONS | BY

ENGINEER'S SEAL

STATE OF TEXAS — RICARDO A PRIETO — 91123 — LICENSED PROFESSIONAL ENGINEER — 4/17/2020

SCALE: HOR. 3/16"=1' VER. N/A

DATE: 4/17/2020
DESIGN BY FM
DRAWN BY RG
CHKD. BY SM
APPD. BY RP

PROJECT NAME

DAVIS BRIDGE REPLACEMENT ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT — CITY OF EL PASO

CONSOR F-12040
1501 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-3880

SHEET TITLE

PRESTRESSED CONCRETE SLAB BEAM SPAN (TYPE SB12)

SHEET 2 OF 2

SHEET C 48 OF C 97

H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Bridge\C_419_S_BSD02.dgn
11:39:34 AM
4/17/2020

4/17/2020 11:39:34 AM H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Bridge\C_419_S_BSD02.dgn

STRUCTURE	DESIGNED GIRDERS									STRAIGHT STRAND PATTERN								DEPRESSED STRAND PATTERN			CONCRETE		OPTIONAL DESIGN				
				PRESTRESSING STRANDS							DEBONDED STRANDS PER ROW															
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STD STRAND PATTERN	TOTAL NO.	SIZE (in)	STRGTH fpu (ksi)	"e" ℄ (in)	"e" END (in)	TOT NO. DEB	DIST FROM BOTTOM (in)	NO. OF STRANDS TOTAL	NO. OF STRANDS DE-BONDED	NUMBER OF STRANDS DEBONDED TO (ft from end) 3	6	9	12	15	NO.	TO END (in)	TO ℄ (in)	RELEASE STRGTH (1) f'ci (ksi)	MINIMUM 28 DAY COMP STRGTH f'c (ksi)	DESIGN LOAD COMP STRESS (TOP ℄ (SERVICE I) fct(ksi)	DESIGN LOAD TENSILE STRESS (BOTT ℄) (SERVICE III) fcb(ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR (2) MOMENT	SHEAR
DAVIS ROAD OVER FRANKLIN CANAL	1	1-8	5SB12		10	0.6	270	3.5	3.5													4.000	5.000	1.158	-1.584	542.000	0.602	0.602

KEYED NOTES

(1) Based on the following allowable stresses (ksi):

Compression = 0.65 f'ci

Tension = $0.24\sqrt{f'ci}$

Optional designs must likewise conform.

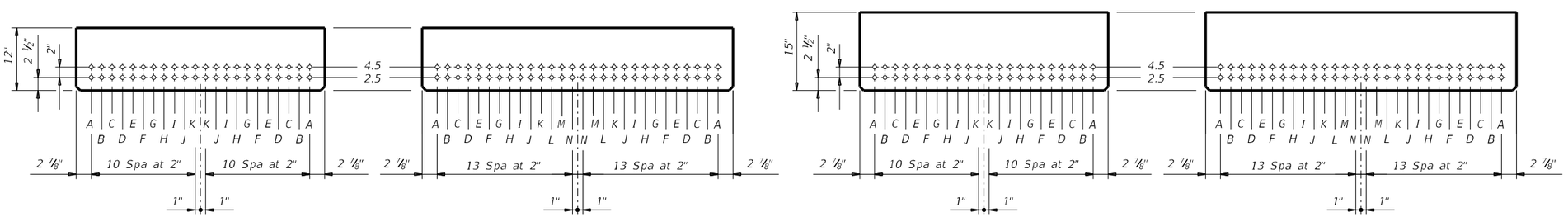
(2) Portion of full HL93.

DESIGN NOTES

Designed according to AASHTO LRFD Bridge Design Specifications.
Prestress losses for the designed beams have been calculated for a relative humidity of percent. Optional designs must likewise conform.

FABRICATION NOTES

Provide Class H concrete.
Provide Grade 60 reinforcing steel.
Use low relaxation strands, each pretensioned to 75 percent of fpu.
Full-length debonded strands are not permitted in positions "A" and "B".
Strand debonding must comply with Item 424.4.2.2.2.4.
When shown on this sheet, the Fabricator has the option of furnishing either the designed beam or an approved optional beam design. All optional design submittals and shop drawings must be signed, sealed and dated by a Professional Engineer registered in the State of Texas.
Locate strands for the designed beam as low as possible on the 2" grid system unless a non-standard strand pattern is indicated. Fill row "2.5", then row "4.5". Place strands within a row as follows:
1) Locate a strand in each "A" position.
2) Place strand symmetrically about vertical centerline of beam.
3) Space strands as equally as possible across the entire width.
Do not debond strands in position "A". Distribute debonded strands symmetrically about the vertical centerline. Increase debonded lengths working outward, with debonding staggered in each row.



TxDOT 4SB12 SLAB BEAM

TxDOT 5SB12 SLAB BEAM

TxDOT 4SB15 SLAB BEAM

TxDOT 5SB15 SLAB BEAM

HL-93 LOADING

Texas Department of Transportation

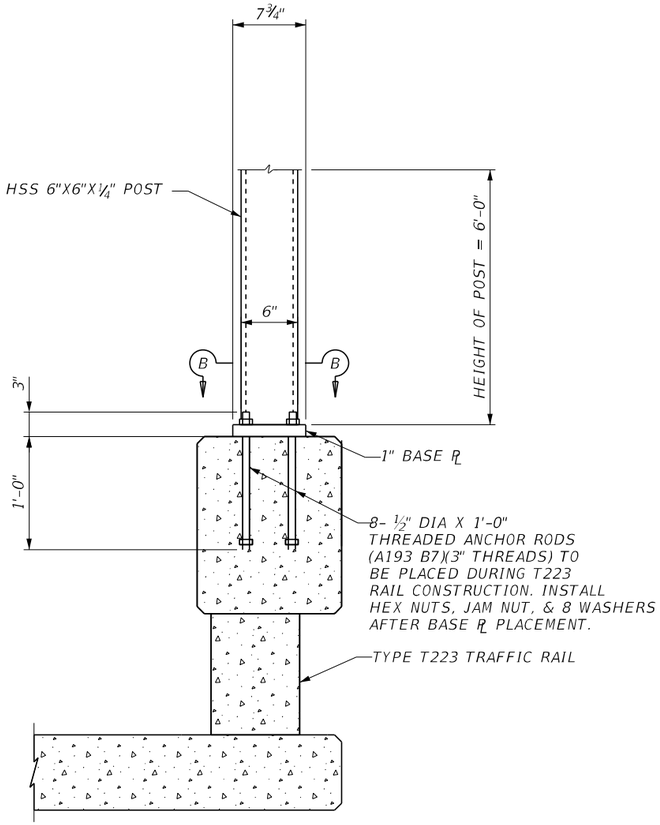
Bridge Division Standard

PRESTRESSED CONCRETE SLAB BEAMS (NON-STANDARD SPANS)

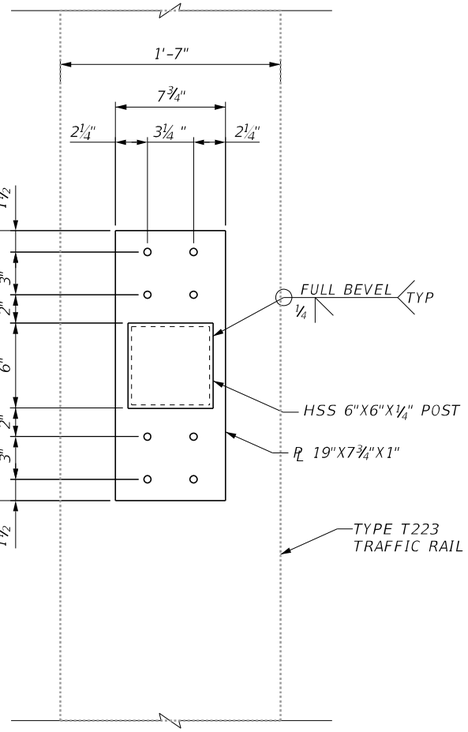
PSBND

FILE: psbsts05-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 49

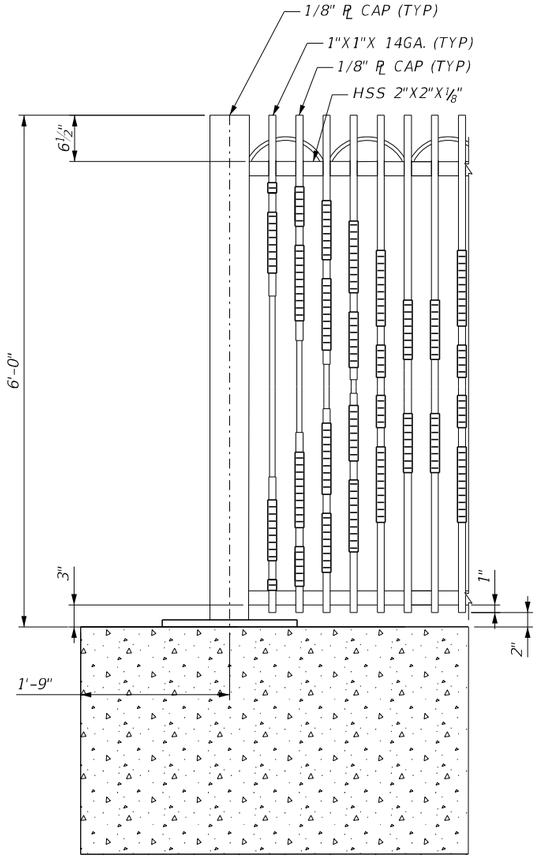
DATE: 4/17/2020 11:39:36 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Bridge\C_419_S_PSBND01.dgn



SIDE SECTION
NTS



POST CONNECTION DETAIL
SECTION B-B
NTS



POST ELEVATION AT END OF RAIL DETAIL
NTS

GENERAL NOTES

1. ATTACHMENTS TO CONCRETE RAIL SHALL BE ORNAMENTAL FENCE ITEM 5094.
2. CONTRACTOR SHALL FIELD VERIFY BRIDGE GRADES PRIOR TO PLACEMENT OF FENCING, IN ORDER TO ACCOUNT FOR GEOMETRY BRIDGE.
3. CONTRACTOR SHALL COORDINATE WITH THE CAPITAL IMPROVEMENT DEPARTMENT TO OBTAIN A DXF FILE FOR ADDITIONAL AESTHETIC BRIDGE RAILING DIMENSIONS.
4. PANELS AND POSTS SHALL BE CLEANED AND PAINTED USING PROTECTION SYSTEM I PRIME COAT PAINT AND A FINAL APPEARANCE COATING AS PER ITEM 446. PAINT COLOR ON ALL THE FENCES SHALL BE FEDERAL STANDARD 34096 DARK GREEN. THIS WORK WILL BE INCIDENTAL TO ITEM 5094.
5. THE CONTRACTOR SHALL SUBMIT COMPLETE SHOP AND ERECTION DRAWINGS FOR APPROVAL BY THE ENGINEER PRIOR TO FABRICATION OF CRIMPED (AESTHETIC) FENCE.
6. TUBE POSTS, TUBE RAILS AND PICKETS TO BE FABRICATED USING ASTM A500 GRADE B STEEL. U-RAILS TO BE FABRICATED FROM ASTM A500 GRADE B STEEL OR AS APPROVED BY THE ENGINEER. ALL STEEL FOR TUBE POSTS, U RAILS, TUBE RAILS AND PICKETS TO BE FABRICATED USING STEEL HAVING A YIELD STRENGTH OF 46 KSI. UNLESS SPECIFIED OTHERWISE ON PLAN.
7. FABRICATION, WELDS, PAINT, AND ASSEMBLY AS PER ITEM 5094. ALL RELATED HARDWARE, LABOR, INCIDENTALS, ETC IS CONSIDERED SUBSIDIARY TO ITEM 5094.
8. WHEN PLACING CONCRETE ON WALL, CARE SHALL BE TAKEN TO PREVENT HONEYCOMB OR AIR POCKETS AROUND OR BENEATH THE POST BASE PLATED.
9. ASSEMBLE PIECES AFTER ALL IRREGULARITIES ARE REMOVED. PIECES SHALL BE CHECKED FOR FIT.
10. FITTINGS AND HARDWARE TO BE USED AS DIRECTED AND APPROVED BY THE ENGINEER.

HL-93 LOADING

238618

REFERENCES -- BENCHMARKS
FILE:
DATE:

BY	REVISIONS

ENGINEER'S SEAL
SERGIO MENDEZ 121993 LICENSED PROFESSIONAL ENGINEER 4/17/2020

SCALE
HOR: 1"=NOTE 1
VER: 1"=NOTE

DATE:	4/17/2020
DESIGN BY	FM
DRAWN BY	RG
CHKD. BY	SM
APPD. BY	RP

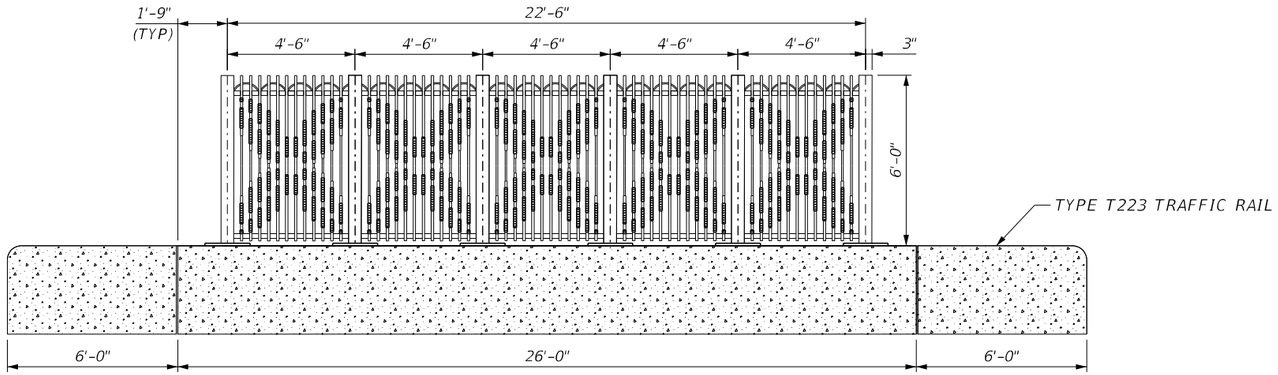
PROJECT NAME
DAVIS BRIDGE REPLACEMENT ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT DEPARTMENT CITY OF EL PASO

CONSOR F-12040
1501 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 315-3680

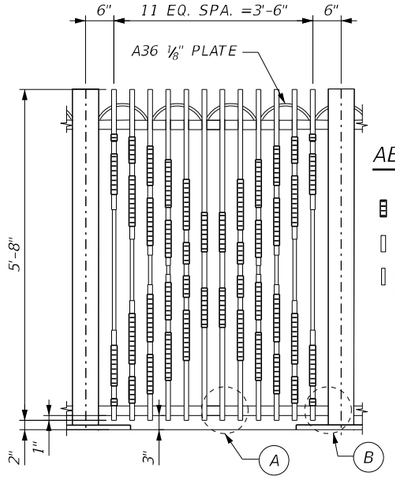
SHEET TITLE
ORNAMENTAL FENCE
SHEET 1 OF 2

SHEET
C 50 OF C 97



SPAN ELEVATION
NTS

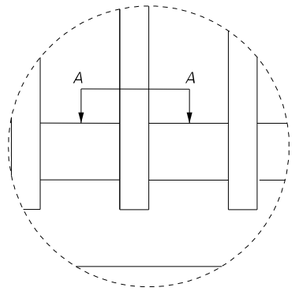
FENCE - PLAN
NTS



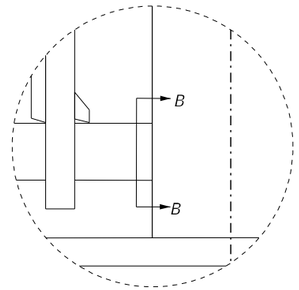
FENCE - ELEVATION
NTS

AESTHETIC FORMING LEGEND

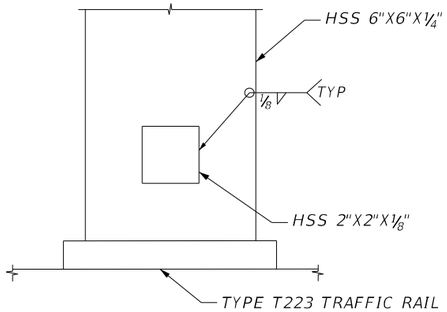
- CRIMP FRONT A MAXIMUM OF EVERY 1"
- UNFORMED
- CRIMP BOTH SIDES A MAXIMUM OF EVERY 1"



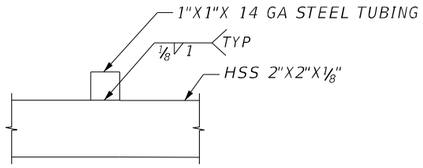
A INT MEMBER TO TRANSVERSE CONNECTION
NTS



B TRASNVERSE TO POST CONNECTION
NTS



DETAIL B-B
NTS



DETAIL A-A
NTS

HL-93 LOADING

238618

REFERENCES -- BENCHMARKS

FILE:

DATE:	REVISIONS	BY

ENGINEER'S SEAL

STATE OF TEXAS — SERGIO MENDEZ — 121993 — LICENSED PROFESSIONAL ENGINEER — 4/17/2020

SCALE
HOR: N.A.
VER. N/A

DATE:	4/17/2020
DESIGN BY	EM
DRAWN BY	NS
CHKD. BY	SM
APPD. BY	RP

PROJECT NAME

DAVIS BRIDGE REPLACEMENT
ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT — CITY OF EL PASO

CONSOR F-12040
1501 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-3880

SHEET TITLE

ORNAMENTAL FENCE

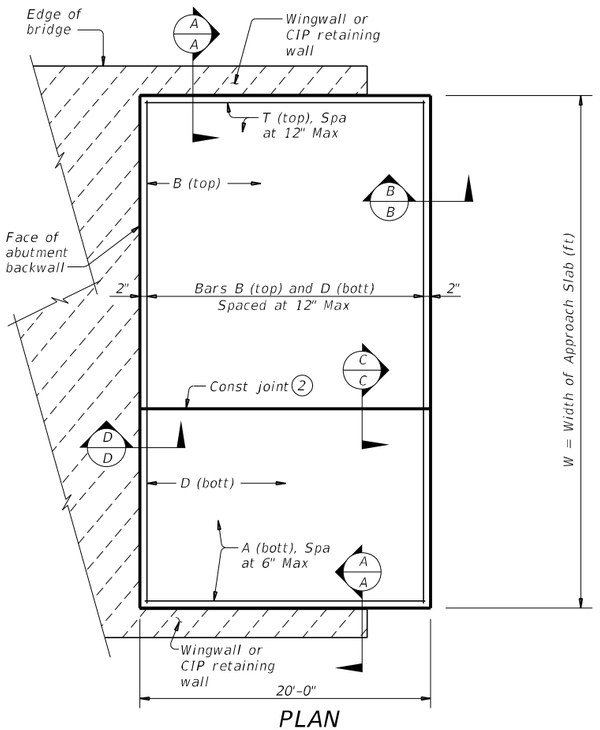
SHEET 2 OF 2

SHEET
C 51 OF C 97

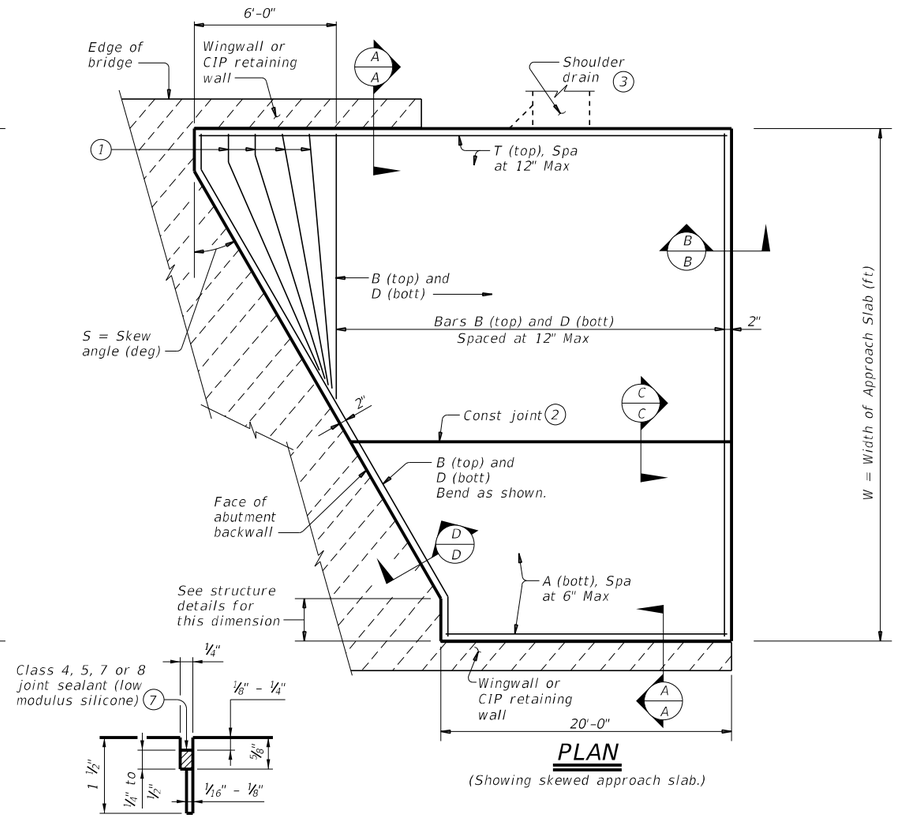
H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Bridge\C_419_S_BMD02.dgn
11:39:47 AM
4/17/2020

4/17/2020 11:39:47 AM H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Bridge\C_419_S_BMD02.dgn

DATE: 4/17/2020 11:39:49 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Ref_Base\Applicable Bridge Standards\basaste1-19.dgn



PLAN
(Showing non-skewed approach slab.)



PLAN
(Showing skewed approach slab.)

BAR TABLE

BAR	SIZE
A	#8
B	#5
D	#5
T	#5

APPROXIMATE QUANTITIES (4)

Reinf steel weight = 8.5 Lbs/SF of Approach Slab

Volume of Appr Slab Conc (CY) = 0.802W + 0.02W² Tan S

W = Width of Approach Slab (ft)

S = Skew Angle (deg)

(1) Flare Bars B and D in this region (1'-6" Max Spa, 3" Min Spa). Minimum flared bar length = 2'-6". Bend bars as necessary.

(2) Provide longitudinal construction joints that align with longitudinal construction joints in the bridge slab with bridges built in stages. Other longitudinal construction joints must receive approval of the Engineer.

(3) See details elsewhere in plans for shoulder drain location and details.

(4) For Contractor's information only. Quantities shown are for one approach slab.

(5) Multiple piece tie bars are acceptable at longitudinal construction joints provided minimum laps shown are achieved.

(6) See details elsewhere in plans for required cross-slope.

(7) Place in accordance with Item 438.

(8) Provide backer rod that is 25% larger than joint opening and compatible with the sealant.

(9) If bridge rail is present at the wingwall or CIP retaining wall, place ½" rebonded recycled tire rubber between concrete railing and top of approach slab as shown when concrete railing projects over the approach slab.

GENERAL NOTES:

Construct approach slab in accordance with Item 422.

Provide Class "S" concrete with a minimum compressive strength of 4,000 psi.

Provide Grade 60 reinforcing steel.

Provide longitudinal joints as shown on the Longitudinal Saw Cut Joint Detail at lane lines and shoulders when width between longitudinal construction joints or edges of approach slab exceeds 16 feet. Saw cut joints within 24 hours of concrete placement to a depth of 1 ½" and seal in accordance with Item 438. Alternately, provide a controlled joint consisting of 1 ½" vinyl or plastic joint former (Stress Cap, Zip Strip, Stress Lock, or equal as approved by the Engineer.)

Provide rebonded recycled tire rubber joint filler that meets the requirements of DMS-6310, "Joint Sealants and Fillers."

Construct the subgrade or subbase away from the bridge for a minimum distance of 100 feet prior to the approach slab, unless otherwise indicated on the plans.

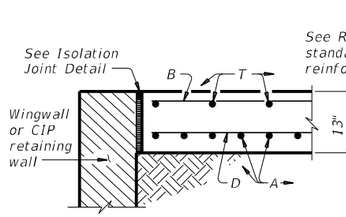
Compact and finish the subgrade or foundation for the approach slab to the typical cross-section and to the lines and grades shown on the plans.

Cure for 4 days using water or membrane curing per Item 422.

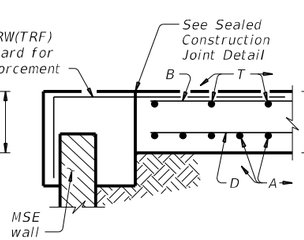
Provide a 1" (asphaltic concrete pavement or asphalt stabilized base) stress relieving pad between the approach slab and cement stabilized backfill or cement treated base. Other stress relieving pads may be used if approved by the Engineer.

All details shown herein are subsidiary to bridge approach slab.

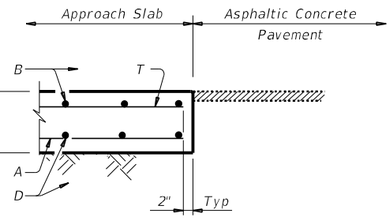
Cover dimensions are clear dimensions, unless noted otherwise.

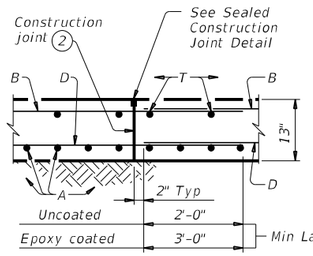


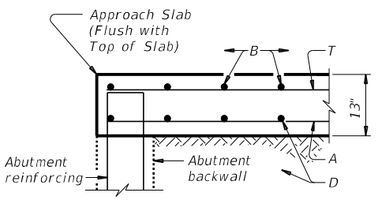
SHOWING WINGWALL OR CIP RETAINING WALL



SHOWING MSE WALL





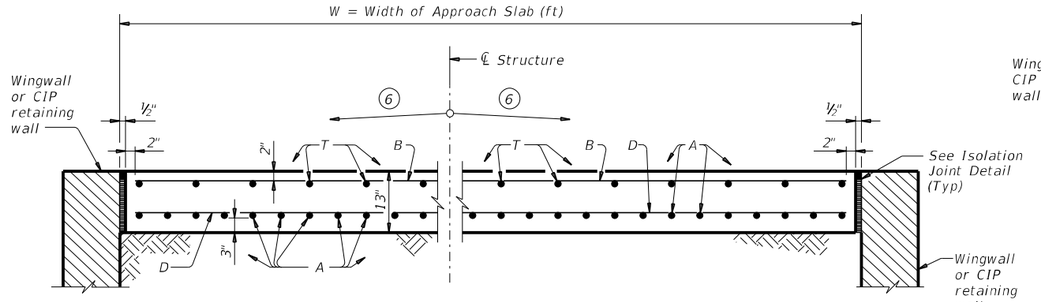


SECTION A-A

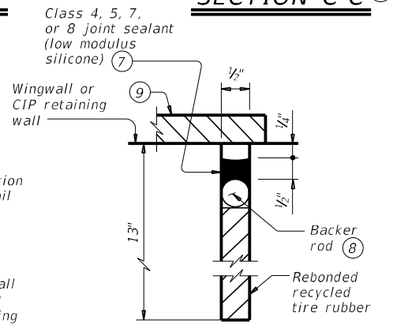
SECTION B-B

SECTION C-C (5)

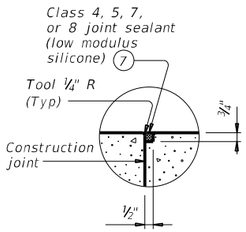
SECTION D-D



TYPICAL TRANSVERSE SECTION



ISOLATION JOINT DETAIL



SEALED CONSTRUCTION JOINT DETAIL

Texas Department of Transportation

Bridge Division Standard

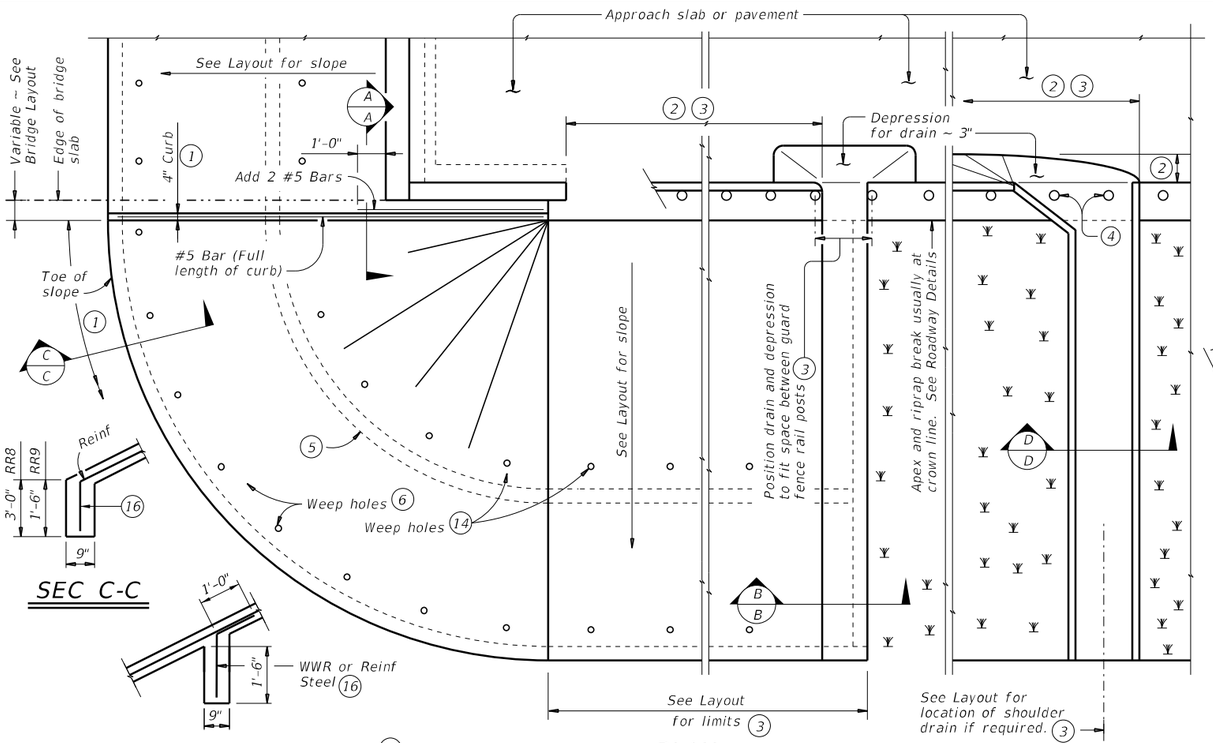
BRIDGE APPROACH SLAB

ASPHALTIC CONCRETE PAVEMENT

BAS-A

FILE: basaste1-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 52

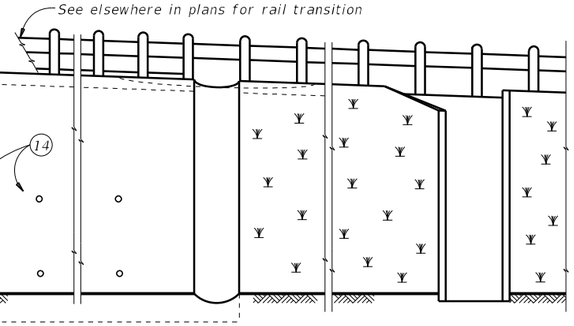
DATE: 4/17/2020 11:39:50 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Ref_Base\Applicable Bridge Standards\crrslide1-19.dgn



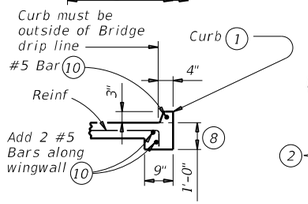
INTERMEDIATE TOEWALL (5)

SEC C-C

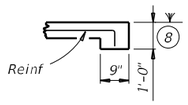
PLAN



ELEVATION

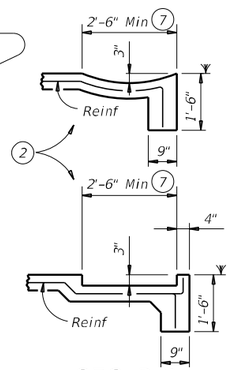


SEC A-A



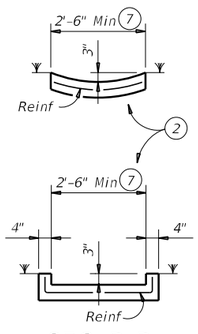
SEC B-B

(No drain)



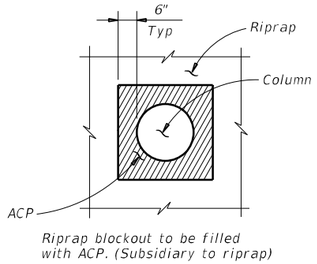
SEC B-B

(Shoulder drain integral with riprap)



SEC D-D

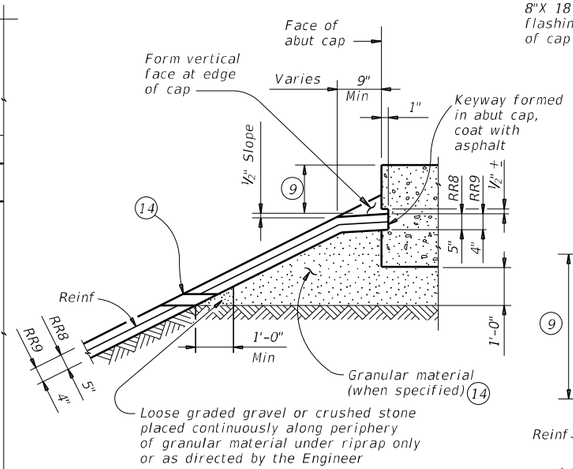
(Shoulder drain)



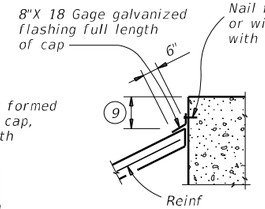
Riprap blockout to be filled with ACP. (Subsidiary to riprap)

RIPRAP DETAIL AT COLUMNS

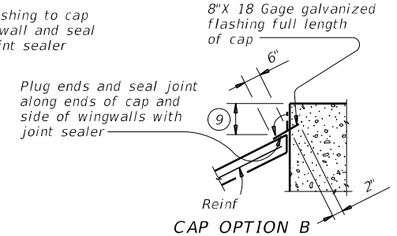
(As directed by the Engineer)



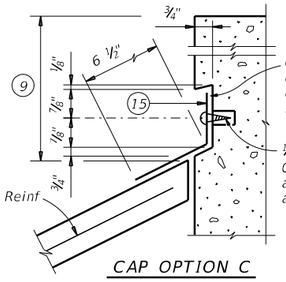
SHOWING KEYWAY OPTION



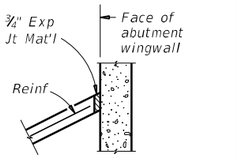
CAP OPTION A



CAP OPTION B

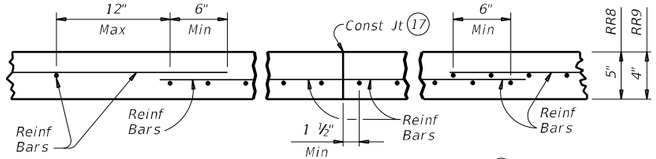


CAP OPTION C



SECT THRU RIPRAP AT WINGWALL (12)

SECTIONS THRU RIPRAP AT CAP (11)



REINFORCEMENT DETAILS (13)

See General Notes for optional synthetic fiber reinforcement.

1. When riprap is shown extended around header on layout, extend slab and toewall as shown and eliminate 4" curb.
2. Limits and configuration of drains and depressions are as shown elsewhere in plans or as directed by the Engineer.
3. Location of shoulder drain must consider limitations imposed by rail transition. Do not locate shoulder drains at expansion joints between approach slab and concrete pavement.
4. See details elsewhere in plans for installation of guard fence posts through concrete riprap.
5. Provide intermediate toewall only when designated elsewhere in the plans or included in the specifications.
6. Provide lower level of 2" Dia weep holes at 10' c-c backed by 1 CF packet of gravel and galvanized hardware cloth at all locations unless directed by the Engineer to eliminate.
7. Use wider or other drain configurations if shown elsewhere in plans or if directed by the Engineer.
8. Wall extension may be reduced or modified if approved by the Engineer. Increase wall extension to 1'-6" whenever the optional intermediate toewall is called for in the plans.
9. Top of cap to top of riprap dimension varies as directed by the Engineer. Should be 9" Min for beam/slab type bridges and 1'-6" for slab span, box beam, or slab beam bridges.
10. #5 bars shown are required even when synthetic fiber reinforcing option is selected.
11. Provide sealing option for joint between the face of cap and riprap as designated by the Engineer or as shown elsewhere on plans.
12. Flashing (shown in Cap Option A) may be used at wingwall in addition to Exp Jt Mat'l if shown on plans or directed by the Engineer.
13. Provide #4 reinforcing bars at 18" Spa c-c.
14. If granular material is specified, provide upper level of 2" Dia weep holes at 10' c-c backed by galvanized hardware cloth.
15. 8" x 18 Gage Galv Sheet Metal
16. Provide #4 bars, with 1'-0" extension into slope.
17. Reinforcing steel is continuous through riprap construction joints. Provide reinforcing steel that extends 1'-1" minimum into adjacent riprap on each side of construction joint even if synthetic reinforcing fiber is utilized.

FOR CONTRACTOR'S INFORMATION ONLY:
5" of RR8 = 0.015 CY/SF
4" of RR9 = 0.012 CY/SF
#4 Reinf at 18" c-c = 0.89 Lbs/SF

GENERAL NOTES:

Provide Class "B" concrete (f'c = 2,000 psi) unless noted elsewhere in plans.

Provide Grade 60 reinforcing steel.

Provide deformed welded wire reinforcement (WWR) meeting ASTM A1064, unless otherwise shown.

Provide reinforcing bars, deformed WWR, or any suitable combination of both types for riprap reinforcing, unless specified elsewhere in the plans.

Optionally synthetic fibers may be used if approved by the Engineer. Provide synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) in lieu of steel reinforcing in riprap concrete.

Install construction joints or grooved joints extending the full slant slope height at intervals of approximately 20 feet unless otherwise directed by the Engineer.

Hardware cloth, loose grade stone behind weep holes, flashing, or other sealing material are subsidiary to the bid item "Riprap".

See Layout for limits of riprap.

RR8 is to be used on stream crossings.

RR9 is to be used on other embankments.

STATE OF TEXAS
RICARDO A PRIETO
91123
LICENSED
PROFESSIONAL ENGINEER

4/17/2020

Texas Department of Transportation

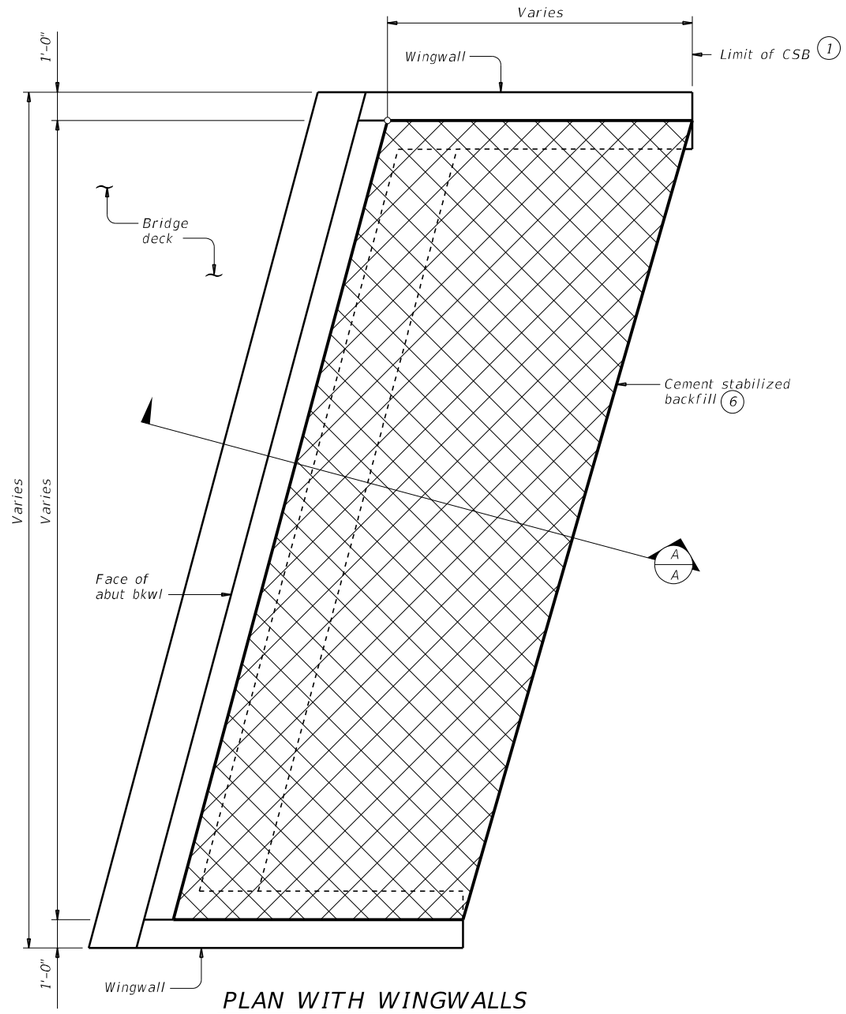
Bridge Division Standard

CONCRETE RIPRAP AND SHOULDER DRAINS
EMBANKMENTS AT BRIDGE ENDS (TYPES RR8 & RR9)

CRR(MOD)

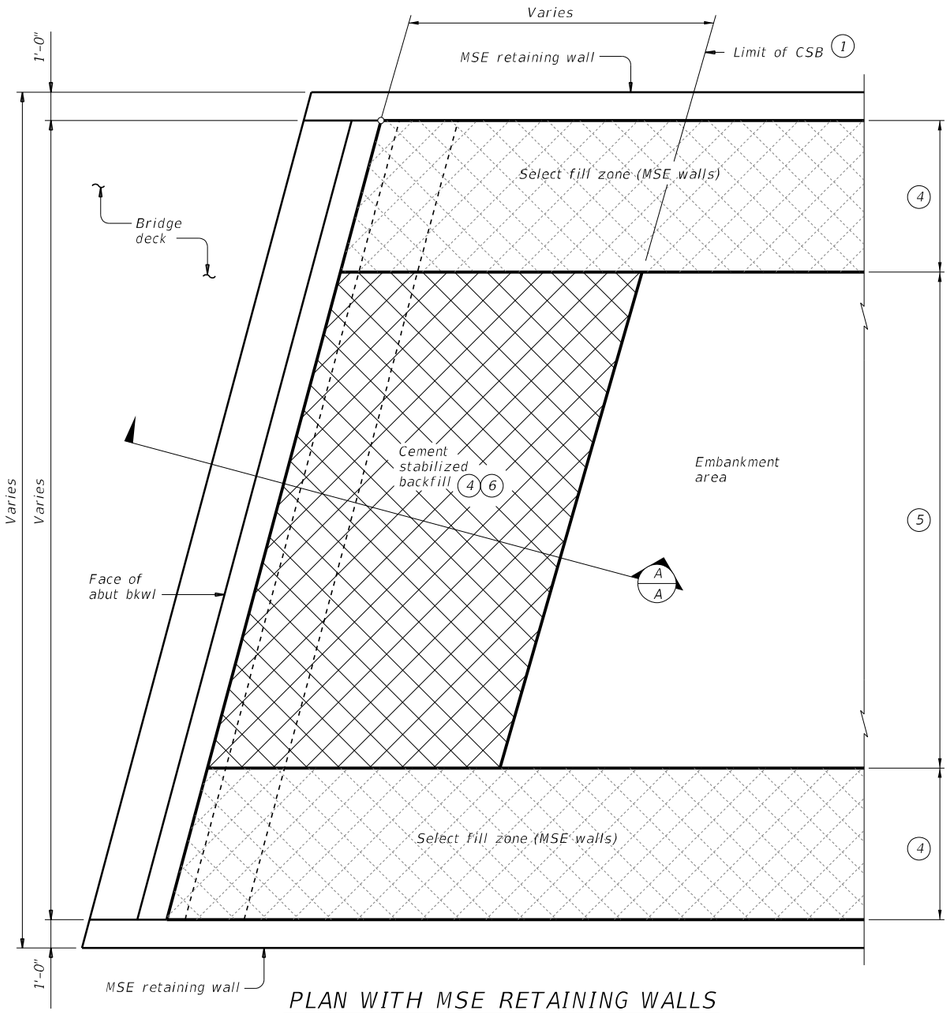
FILE: crrslide1-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 53

DATE: 4/17/2020 11:39:51 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Ref_Base\Applicable Bridge Standards\csabste1-19.dgn



PLAN WITH WINGWALLS

Cast-in-place retaining walls similar.



PLAN WITH MSE RETAINING WALLS

(1) Usual limit of Cement Stabilized Backfill is at end of wingwall. Extend CSB limits as required to maintain a slope no steeper than 1:1 at bottom of backfill.

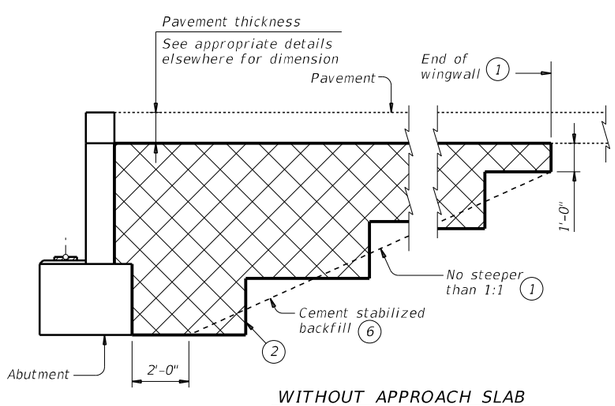
(2) Bench backfill as shown with 12" (approximate) bench depths.

(3) Other material can be used as a stress relieving pad if approved by Engineer.

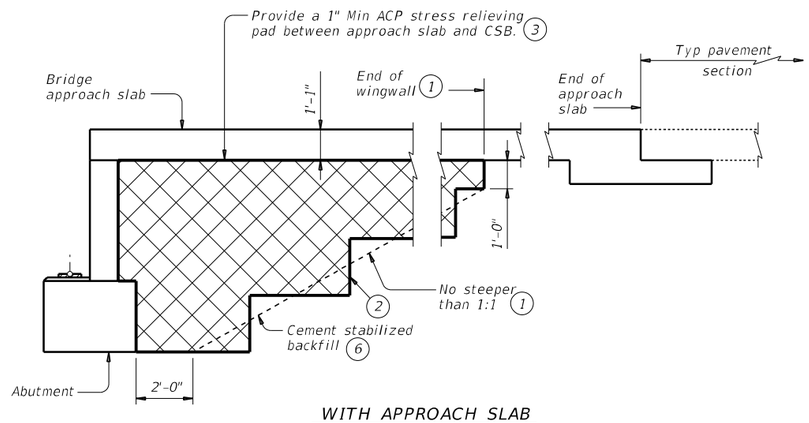
(4) Where MSE retaining walls are present, adjust CSB limits to accommodate the select fill zone. See retaining wall details for additional information.

(5) When distance between select fill zones is less than 5'-0", MSE select fill may be substituted for cement stabilized backfill with approval from the Engineer.

(6) If shown in the plans flowable backfill can be used as a substitute for cement stabilized backfill with the following constraints:
a). If flowable backfill is to be placed over MSE backfill then a filter fabric will be placed over the MSE backfill prior to placement of the flowable fill; and
b). Place flowable fill in lifts not exceeding 2 feet in height, place each successive lift when the previous lift has stiffened/hardened (i.e. has lost its flowability).



WITHOUT APPROACH SLAB



WITH APPROACH SLAB

SECTION A-A

GENERAL NOTES:

Provide Cement Stabilized Backfill (CSB) meeting the requirements of Item 400, "Excavation and Backfill for Structures", to the limits shown at bridge abutments.

If required elsewhere in the plans, provide Flowable Backfill meeting the requiremnets of Item 401, "Flowable Backfill", the limits shown at bridge abutments.

Details are drawn showing left forward skew. See Bridge Layout for actual skew direction.

These details do not apply when Concrete Block retaining walls are used in lieu of wingwalls.

Texas Department of Transportation

Bridge Division Standard

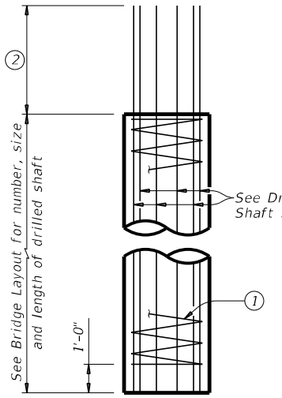
CEMENT STABILIZED ABUTMENT BACKFILL

BRIDGE ABUTMENT

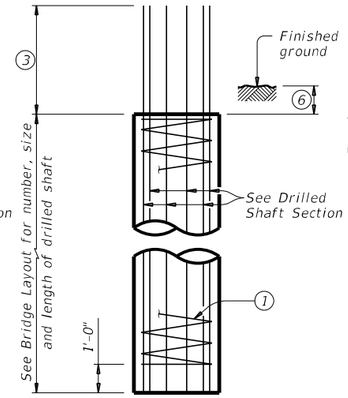
CSAB

FILE: csabste1-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 54

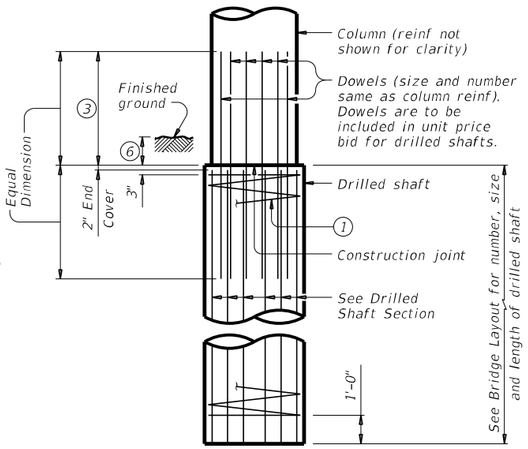
DATE: 4/17/2020 11:39:53 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Ref_Base\Applicable Bridge Standards\fdsfde01-19.dgn



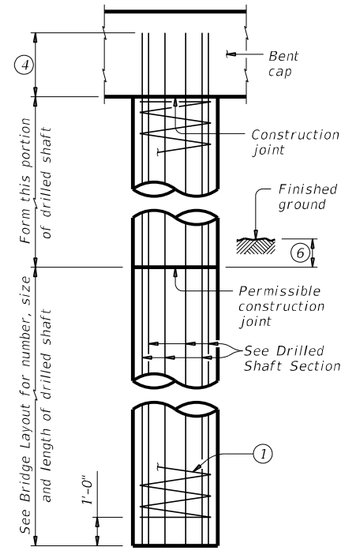
ABUTMENTS, WINGWALLS AND MULTI-DRILLED SHAFT FOOTINGS



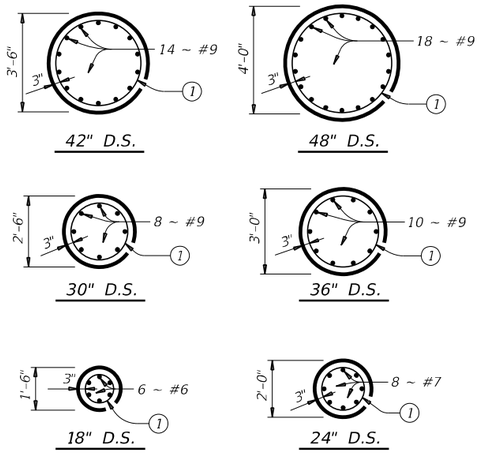
INTERIOR BENTS DRILLED SHAFT DIA EQUAL TO COLUMN DIA



INTERIOR BENTS DRILLED SHAFT DIA GREATER THAN COLUMN DIA



OPTIONAL INTERIOR BENT DRILLED SHAFT DETAIL (5)

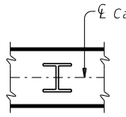


DRILLED SHAFT SECTIONS

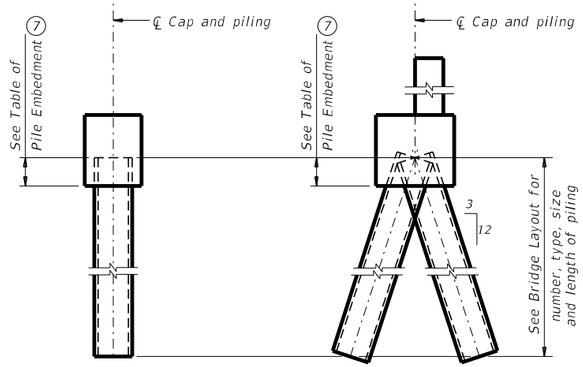
DRILLED SHAFT DETAILS

TABLE OF PILE EMBEDMENT	
Pile Type	Embedment Depth (Ft)
16" Sq Concrete 18" Sq Concrete HP14 Steel HP16 Steel	1'-0"
20" Sq Concrete 24" Sq Concrete HP18 Steel	1'-6"

See Prestressed Concrete Piling (CP) standard for additional details on concrete pile embedment.

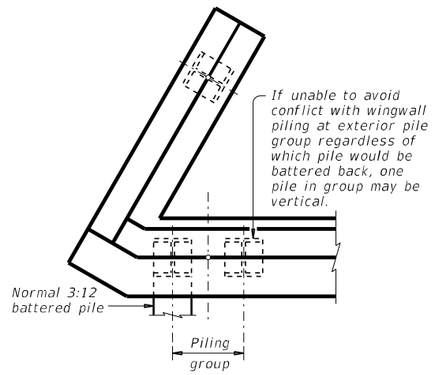


ORIENTATION OF STEEL H-PILING

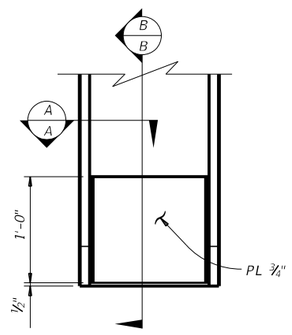


VERTICAL PILE BATTERED PILE

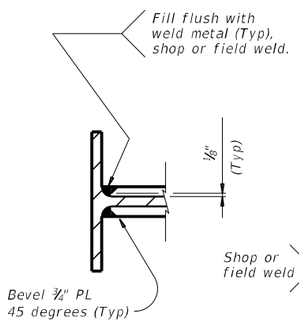
PILING DETAILS
(Concrete or steel H)



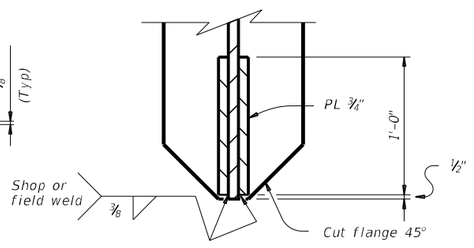
DETAIL "A"
(Showing plan view of a 30° skewed abutment)



ELEVATION

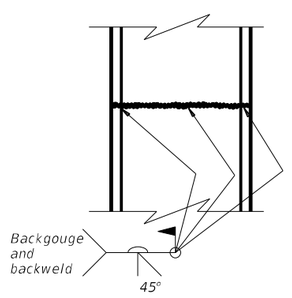


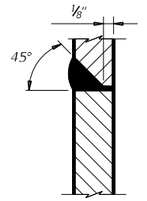
SECTION A-A



SECTION B-B

STEEL H-PILE TIP REINFORCEMENT
See Item 407 "Steel Piling" to determine when tip reinforcement is required and for options to the details shown.





SECTION THRU FLANGE OR WEB

STEEL H-PILE SPLICE DETAIL
Use when required.

(1) #3 spiral at 6" pitch (one and a half flat turns top and bottom).

(2) Min extension into supported element:
#6 Bars = 1'-11"
#7 Bars = 2'-0"
#9 Bars = 2'-3"

(3) Min lap with column reinf:
#7 Bars = 2'-11"
#9 Bars = 3'-9"

(4) Min extension into supported element:
#6 Bars = 1'-11"
#7 Bars = 2'-3"
#9 Bars = 2'-9"

(5) Drilled shafts may extend to the bottom of bent caps for "H" heights of 6 ft and less (as shown on the Bridge Layout), if approved. This option can only be used when the drilled shaft diameter equals the column diameter. Obtain approval of the forming method above the ground line prior to construction. No adjustments in payment will be made if this option is used.

(6) 1'-0" Min, unless shown otherwise on plans.

(7) Or as shown on plans.

Texas Department of Transportation

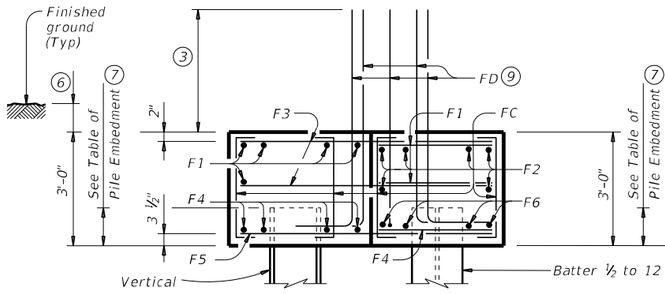
Bridge Division Standard

COMMON FOUNDATION DETAILS

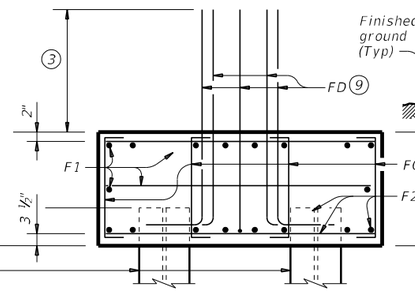
FD

FILE: fdsfde01-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 55

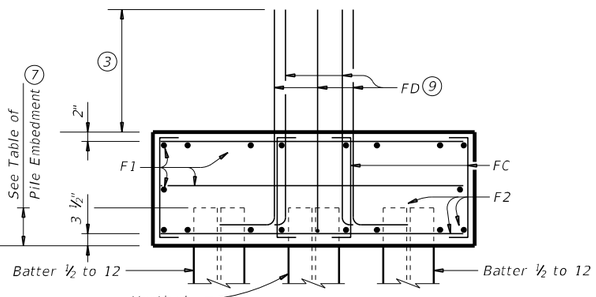
DATE: 4/17/2020 11:39:53 AM
FILE: H:\TxPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Ref_Base\Applicable Bridge Standards\fdsde01-19.dgn



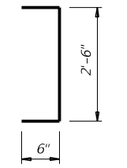
ELEVATION



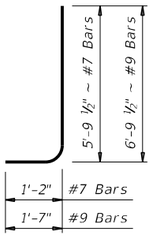
ELEVATION



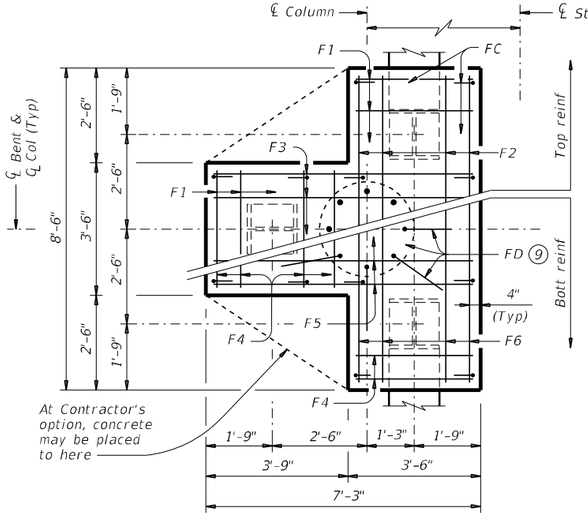
ELEVATION



BARS FC



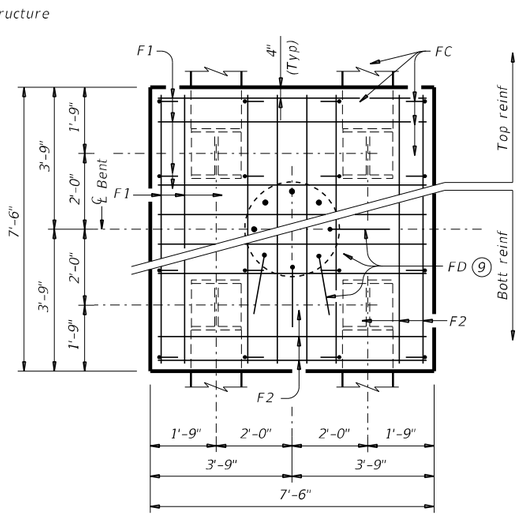
BARS FD (9)



PLAN

THREE PILE FOOTING (8)

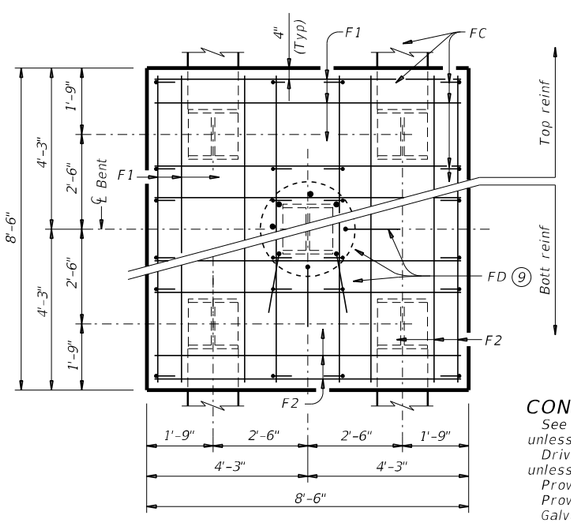
For 36" Dia and smaller columns.



PLAN

FOUR PILE FOOTING (8)

For 42" Dia and smaller columns.



PLAN

FIVE PILE FOOTING (8)

For 42" Dia and smaller columns.

(3) Min lap with column reinf:
#7 Bars = 2'-11"
#9 Bars = 3'-9"

(6) 1'-0" Min, unless shown otherwise on plans.

(7) Or as shown on plans.

(8) See Bridge Layout for type, size and length of piling.

(9) Number and size of FD bars must match column reinforcing. Tie FD bars to the top of the bottom reinforcing mat.

(10) For 24" columns, use #7 FD bars (7'-1") in place of #9 bars and deduct 116 lbs.
For 36" columns, add 2 FD bars (55 lbs).

(11) For 24" columns, use #7 FD bars (7'-1") in place of #9 bars and deduct 116 lbs.
For 36" columns, add 2 FD bars (55 lbs).
For 42" columns, add 6 FD bars (172 lbs)
(42" columns disallowed on 3 Pile Footings)

TABLE OF FOOTING QUANTITIES FOR 30" COLUMNS

ONE 3 PILE FOOTING

Bar	No.	Size	Length	Weight
F1	11	#4	3'- 2"	23
F2	6	#4	8'- 2"	33
F3	6	#4	6'- 11"	28
F4	8	#9	3'- 2"	86
F5	4	#9	6'- 11"	94
F6	4	#9	8'- 2"	111
FC	12	#4	3'- 6"	28
FD (10)	8	#9	8'- 8"	231
Reinforcing Steel			Lb	606
Class "C" Concrete			CY	4.8

ONE 4 PILE FOOTING

Bar	No.	Size	Length	Weight
F1	20	#4	7'- 2"	96
F2	16	#8	7'- 2"	306
FC	16	#4	3'- 6"	37
FD (11)	8	#9	8'- 8"	231
Reinforcing Steel			Lb	670
Class "C" Concrete			CY	6.3

ONE 5 PILE FOOTING

Bar	No.	Size	Length	Weight
F1	20	#4	8'- 2"	109
F2	16	#9	8'- 2"	444
FC	24	#4	3'- 6"	56
FD (11)	8	#9	8'- 6"	231
Reinforcing Steel			Lb	840
Class "C" Concrete			CY	8.0

CONSTRUCTION NOTES:

See Bridge Layout for foundation type required. Use these foundation details unless shown otherwise.
Drive piling under abutment wingwalls to a minimum resistance of 10 Tons/Pile unless shown otherwise.
Provide Class C Concrete (f'c = 3,600 psi), unless shown otherwise.
Provide Grade 60 reinforcing steel.
Galvanize reinforcing if shown elsewhere in the plans.
Provide bar laps for drilled shaft reinforcing, where required, as follows:
Uncoated or galvanized (#6) ~ 2'-6"
Uncoated or galvanized (#7) ~ 2'-11"
Uncoated or galvanized (#9) ~ 3'-9"

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.

DESIGNER NOTES:

Do not use the drilled shaft details shown on this standard for retaining wall, noise wall, barrier, or sign foundations without structural evaluation.
Do not use the footings shown on this standard in direct contact with salt water or exposed to salt water spray.
Maximum allowable pile loads for the footings shown are :
72 Tons/Pile with 24" Dia Columns
80 Tons/Pile with 30" Dia Columns
100 Tons/Pile with 36" Dia Columns
120 Tons/Pile with 42" Dia Columns

Texas Department of Transportation

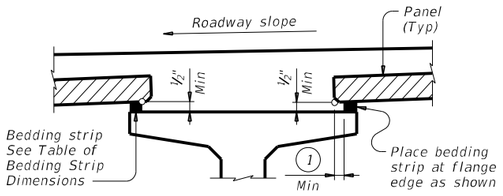
Bridge Division Standard

COMMON FOUNDATION DETAILS

FD

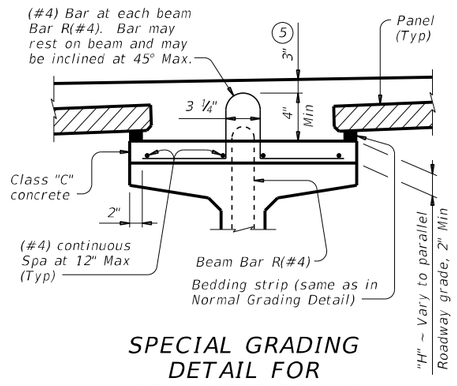
FILE: fdsde01-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 56

DATE: 4/17/2020 11:39:55 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Ref_Base\Applicable Bridge Standards\pcpstde1-19.dgn



NORMAL GRADING DETAIL (3)

Showing prestressed concrete I-girders.
(Other beam types similar)



SPECIAL GRADING DETAIL FOR CONCRETE BEAMS

Showing prestressed concrete I-girders.
(Other beam types similar)

TABLE OF BEDDING STRIP DIMENSIONS		
WIDTH	HEIGHT (4)	
	Min	Max
1" (Min)	½"	2"
1 ¼"	½"	2 ½"
1 ½"	½"	3"
1 ¾"	½"	3 ½"
2"	½"	4"
2 ¼"	½"	4 ½" (2)
2 ½"	½"	5" (2)
2 ¾"	½"	5 ½" (2)
3" (Max)	½"	6" (2)

(1) 2" Min for I-giders, 1 ½" Min for all other beam types.

(2) Allowed for I-girders, not allowed on other beam types.

(3) To reduce the quantity of cast-in-place concrete, bedding strip thickness may be increased in ¼" increments. Bedding strips must be comprised of one layer. Bond bedding strips to the beams with an adhesive compatible with bedding strips. Bedding strips over 2.5" high may need to be bonded to panels. The same thickness strip must be used under any one panel edge and the maximum change in thickness between adjacent panels is ¼". Alternatively, bedding strips may be cut to grade. Panels may be supported by an alternate method, using a commercial product, if approved by the Engineer of Bridge Design, Bridge Division. If bedding strips exceed 6" high for I-Girders, 4" high for all other beam types, use Special Grading Detail for Concrete Beams or submit an alternate method to the Bridge Division for approval.

(4) Height must not exceed twice the width.

(5) Provide clear cover as indicated unless otherwise shown on Span Details.

(6) See Span Details and Thickened Slab End Details for top slab reinforcement and clear cover. Transverse top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.

(7) Space Bars UP(#4) with Beam Bars R(#4) in all areas where measured haunch exceeds 3 ½" with I-girders, and 3" for all other beam types. Epoxy coating for Bars UP is not required.

(8) Do not locate construction joints on top of a panel.

(9) Butt adjacent bedding strips together with adhesive. Cut v-notches, approx ¼" deep, in the top of the bedding strips at 8' o.c..

CONSTRUCTION NOTES:

Erected panels must bear uniformly on bedding strips of extruded polystyrene placed along top flange edges.

Placing panels to minimize joint openings is recommended.

If additional blocking is needed, special grading details for supporting the panels and extra reinforcing between beam and slab will be considered subsidiary to deck construction.

Bars U, shown on PCP-FAB, may be bent over or cut off if necessary.

Care must be taken to ensure proper cleaning of construction debris and consolidation of concrete material under the edges of the panels. Bedding strips must be placed at beam flange edges so that adequate space is provided for the mortar to flow a minimum of 1 ½" under the panels as the slab concrete is placed.

To allow the proper amount of mortar to flow between beam and panel, the minimum vertical opening must be at least ½". Roadway cross-slope reduces the opening available for entry of the mortar. Bedding strips varying in thickness across the beam are therefore required.

For clear span between U-beams less than or equal to 18", see Permissible Slab Forming Detail on Miscellaneous Slab Detail sheets, UBMS.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel in the cast-in-place slab. See Table of Reinforcing Steel for size and spacing of reinforcement.

If the top and bottom layer of reinforcing steel is shown on the Span Details to be epoxy coated, then the D, E, P, & Z bars must be epoxy coated.

Provide bar Laps, where required, as follows:
Uncoated ~ #4 = 1'-7"
Epoxy Coated ~ #4 = 2'-5"

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

Panel placement may follow either Option 1 or Option 2 except Option 1 must be used if the skew exceeds 45 degrees.

Use of Prestressed Concrete Panels is not permitted for horizontally curved steel plate or tub girders. See Span Details for other possible restrictions on their use.

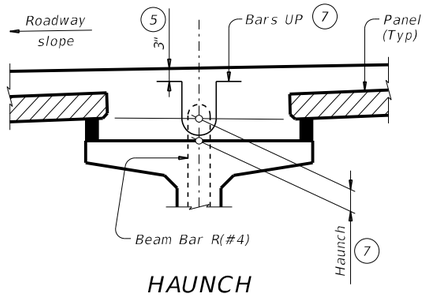
These details are to be used in conjunction with the Span Details, PCP-FAB and other applicable standard drawings.

When panel support (bedding strips) deviates from what is shown herein, provide details signed and sealed by a professional Engineer.

Any additional reinforcement or concrete required on this standard is considered subsidiary to the bid Item "Reinforced Concrete Slab".

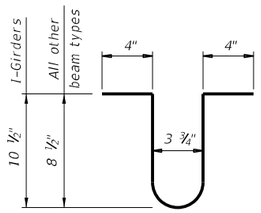
Cover dimensions are clear dimensions, unless noted otherwise.

Reinforcing bar dimensions shown are out-to-out of bar.

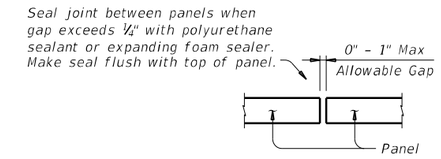


HAUNCH REINFORCING DETAIL

Showing prestressed concrete I-girders.
(Other beam types similar)

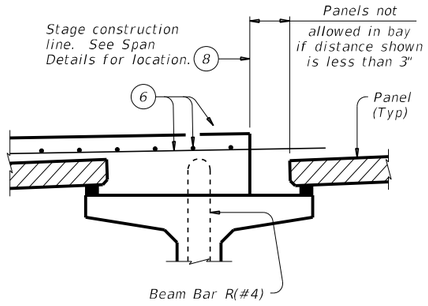


BARS UP (#4) (7)

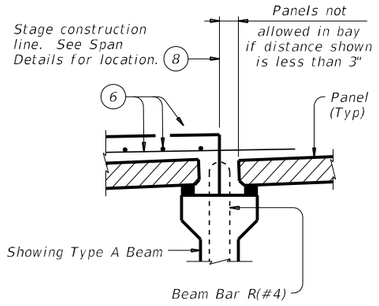


PANEL JOINTS

(Panel reinforcing not shown for clarity.
The gap cannot be considered as a panel fabrication tolerance. Adjust panel placement to minimize joint openings.)



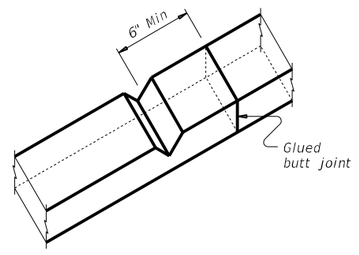
PRESTR CONC I-GIRDERS



PRESTR CONC I-BEAMS

STAGE CONSTRUCTION LIMITATIONS

(Other beam types similar)



BEDDING STRIP DETAIL (9)

HL93 LOADING SHEET 1 OF 4

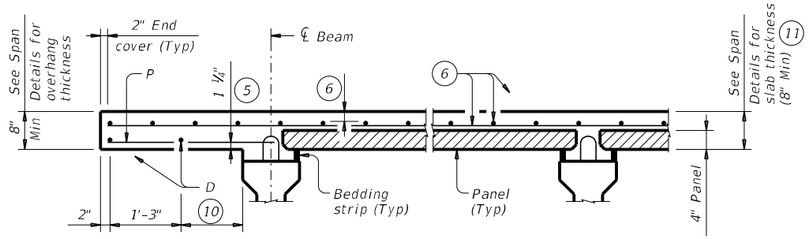
Texas Department of Transportation | Bridge Division Standard

PRESTRESSED CONCRETE PANELS
DECK DETAILS

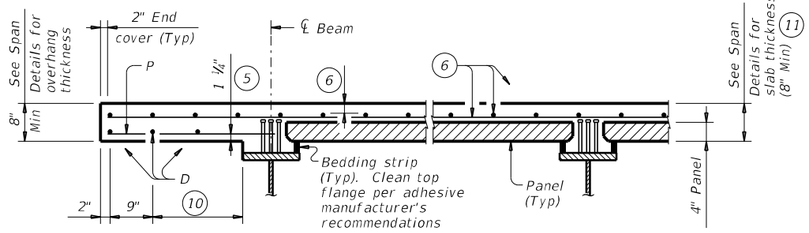
PCP

FILE: pcpstde1-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT April 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 57

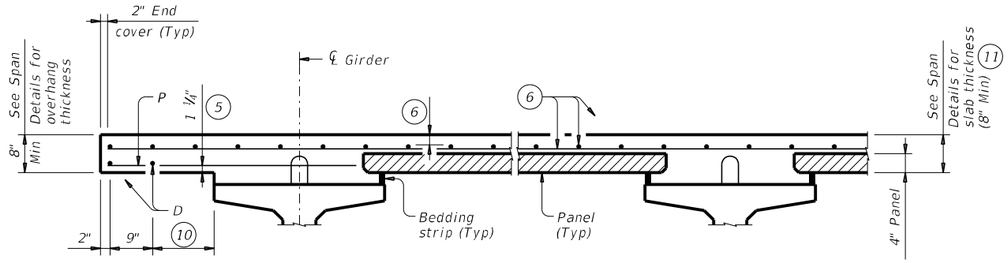
DATE: 4/17/2020 11:39:56 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Ref_Base\Applicable Bridge Standards\pcpstde1-19.dgn



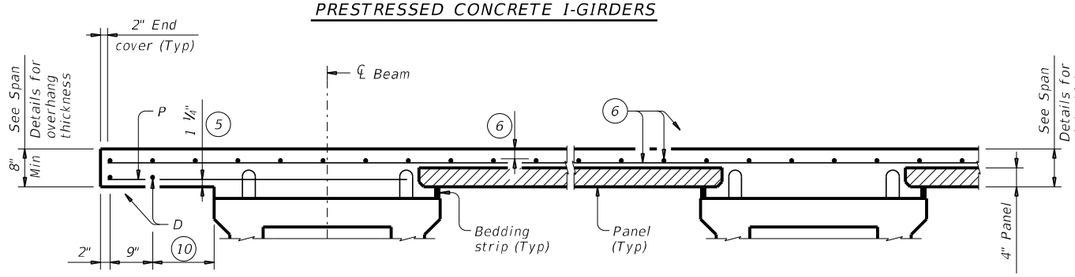
PRESTRESSED CONCRETE I-BEAMS



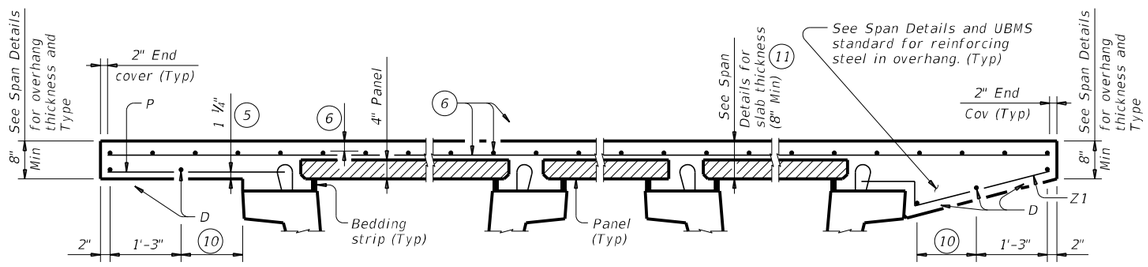
STEEL BEAMS



PRESTRESSED CONCRETE I-GIRDERS



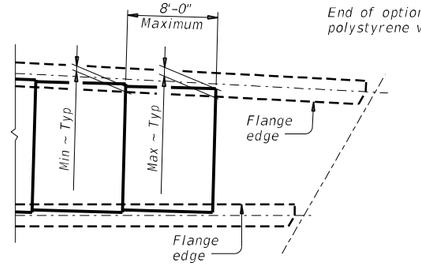
PRESTRESSED CONCRETE X-BEAMS



NORMAL OVERHANG WITH PRESTR CONC U-BEAMS

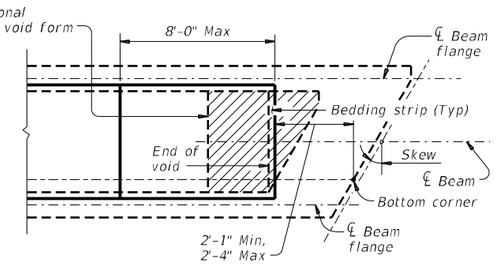
SLOPED OVERHANG WITH PRESTR CONC U-BEAMS

TYPICAL PART TRANSVERSE SECTIONS

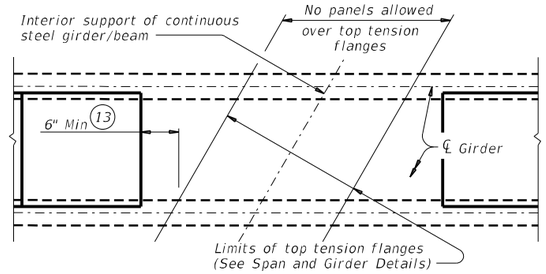


AT FLARED BEAMS OR GIRDERS

See PCP-FAB standard for Min and Max dimensions based on bemm/girder type.



OVER CONC U-BEAMS



AT INT SUPPORTS OF CONTINUOUS STEEL GIRDERS

PART PLANS OF PANEL PLACEMENT

(5) Provide clear cover as indicated unless otherwise shown on Span Details.

(6) See Span Details and Thickened Slab End Details for top slab reinforcement and clear cover. Transverse top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.

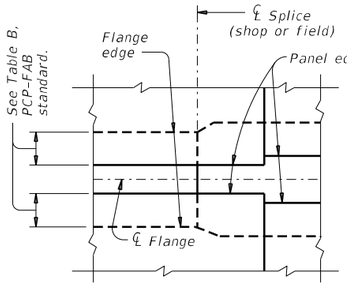
(9) Butt adjacent bedding strips together with adhesive. Cut v-notches, approx ¼" deep, in the top of the bedding strips at 8' o.c..

(10) Equally space additional bar if more than 1'-3" Max.

(11) The actual thickness constructed may exceed the slab thickness shown on the Span Details but the extra thickness may be no more than 2" (1" for prestressed concrete U-beams and steel beams). Bearing seat elevations or finished grade may be adjusted.

(12) Field adjust Bars Z1(#4) to match actual slope of slab overhangs. Width of slab overhang will vary along span with curved slab edges. Adjust Bar Z1(#4) dimensions to maintain proper cover. Bars Z2(#4) are located at Inverted-Tee stems only.

(13) Location of concrete placement sequence boundaries and bolted field splices should be considered by the contractor in determining panel limits.

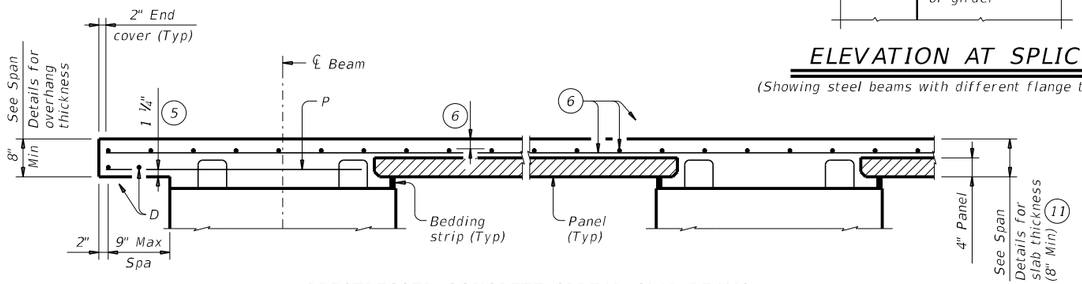


PLAN AT SPLICE

(Showing steel beams with flange width transition)

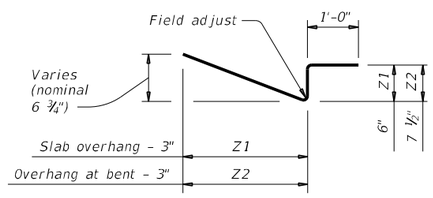
ELEVATION AT SPLICE

(Showing steel beams with different flange thickness)



PRESTRESSED CONCRETE SPREAD SLAB BEAMS

Bars P over exterior beams are still required when no overhang is used. In this case, only one Bar D, 2" from slab edge, is required.



BARS Z (#4) (12)

HL93 LOADING

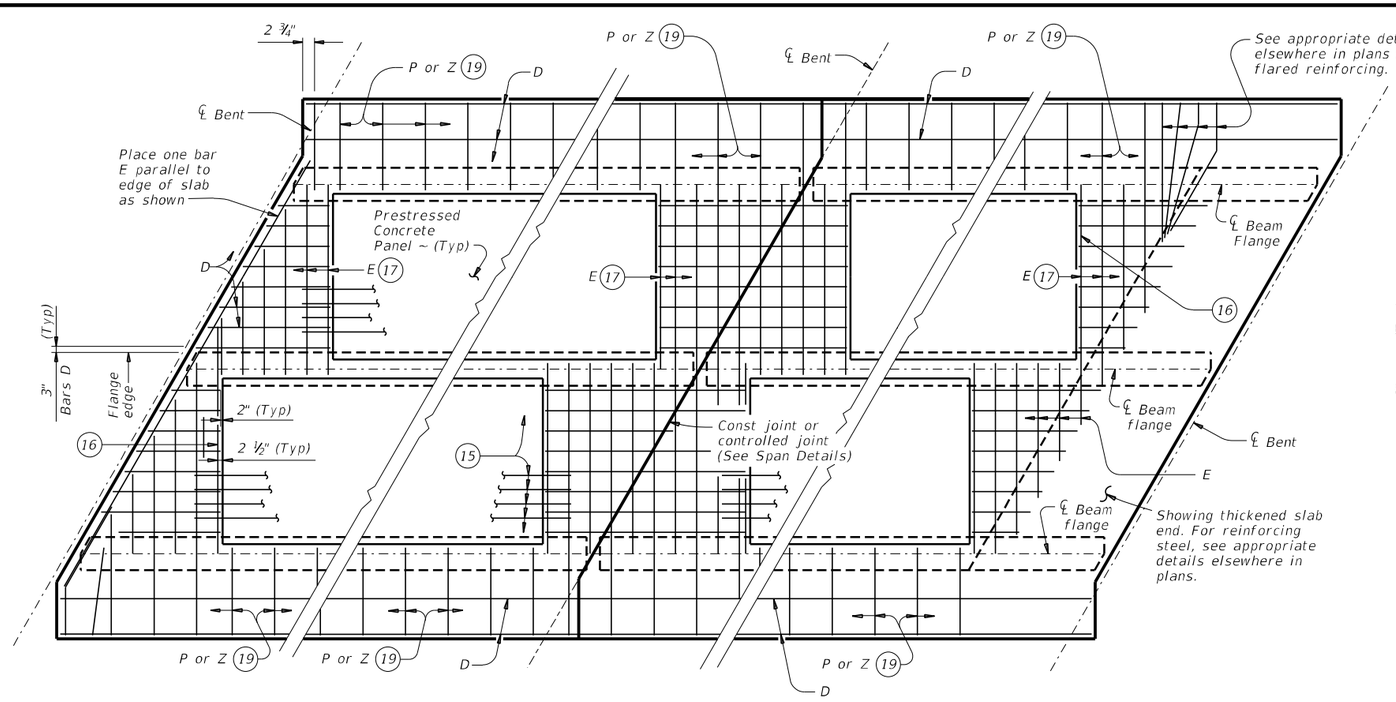
Texas Department of Transportation

Bridge Division Standard

PRESTRESSED CONCRETE PANELS
DECK DETAILS

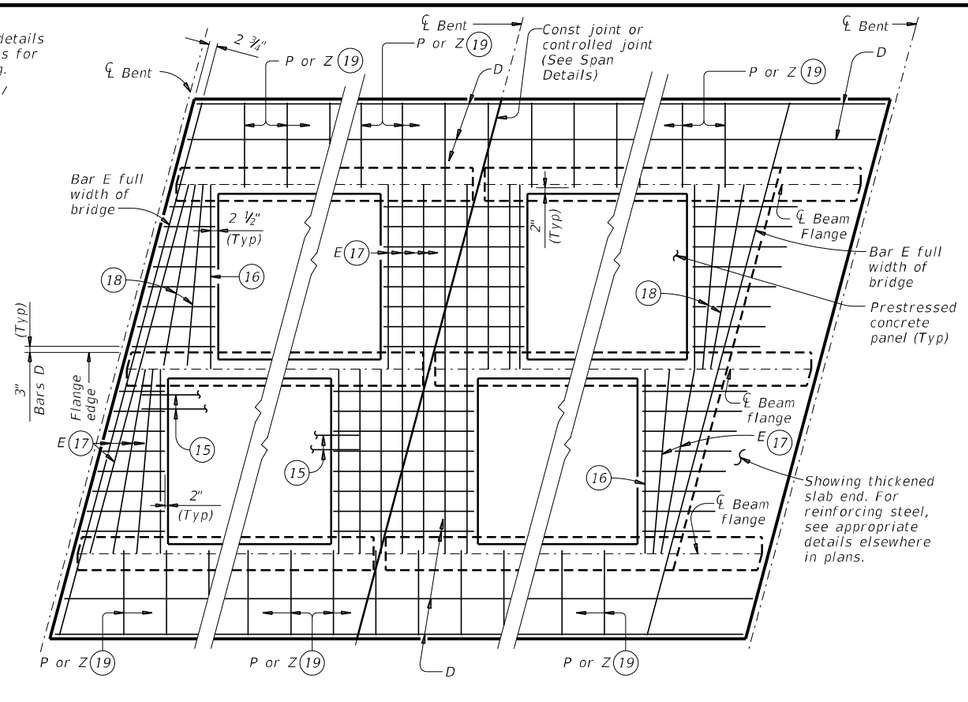
PCP

FILE: pcpstde1-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT April 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 58



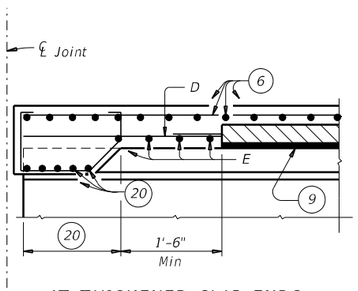
AT ALL SPAN ENDS UNLESS NOTED OTHERWISE | AT INTERIOR BENTS | AT THICKENED END SLABS

OPTION 1 ~ PLAN OF SLABS WITH NORMAL REINFORCEMENT

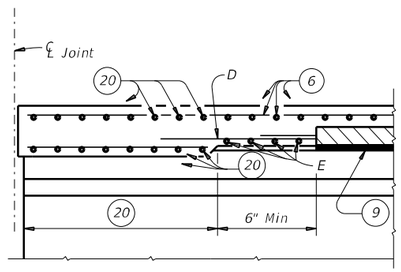


AT ALL SPAN ENDS UNLESS NOTED OTHERWISE | AT INTERIOR BENTS | AT THICKENED END SLABS

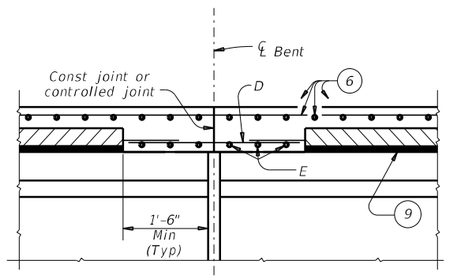
OPTION 1 ~ PLAN OF SLABS WITH SKEWED REINFORCEMENT



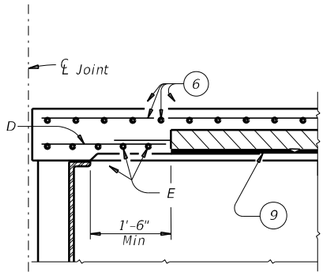
AT THICKENED SLAB ENDS FOR PRESTR CONC U-BMS



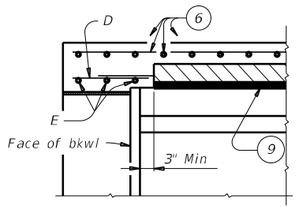
AT THICKENED SLAB ENDS FOR PRESTR CONC I-BMS AND STEEL BMS



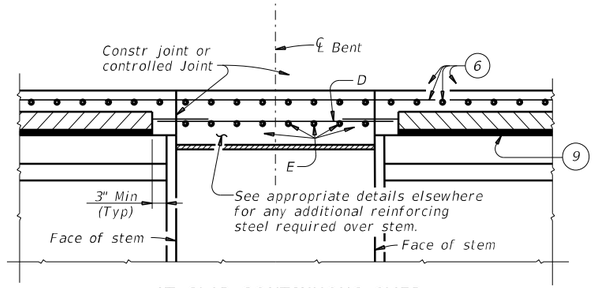
AT SLAB CONTINUOUS OVER CONVENTIONAL INTERIOR BENTS FOR ALL SIMPLE SPAN BMS



AT CONVENTIONAL END DIAPHRAGMS FOR STEEL BMS



AT SLAB OVER ABUTMENT BACKWALL FOR ALL BMS



AT SLAB CONTINUOUS OVER INVERTED-T BENTS FOR ALL BMS

OPTION 1 ~ ELEVATIONS AT BEAM ENDS

(6) See Span Details and Thickened Slab End Details for top slab reinforcement and clear cover. Transverse top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.

(9) Butt adjacent bedding strips together with adhesive. Cut v-notches, approx ¼" deep, in the top of the bedding strips at 8' o.c.

(14) Max Spacing as listed unless otherwise shown.

(15) At connection with cast-in-place slab, extend longitudinal panel reinforcement. See PCP-FAB for details.

(16) Maintain one Bar E(#4) parallel to panel ends (Typ).

(17) Bars E(#4) not continuous over beam flanges must overlap beam flange 6" Min.

(18) Add flared Bars E(#4) (Min Spa = 6", Max Spa = 12") as required at panel ends.

(19) Where possible, Bars E(#4) may be extended into overhangs to replace Bars P(#4). Bars Z(#4) are required for sloped overhangs with U-Beams.

(20) See appropriate thickened slab end details for reinforcing and limits of thickened slab end.

TABLE OF REINFORCING STEEL (14)

BAR	SIZE	Max Spa (in.)
D	#4	9
E	#4	9
P	#4	18
UP	#4	~
Z	#4	18

HL93 LOADING

SHEET 3 OF 4

Texas Department of Transportation

Bridge Division Standard

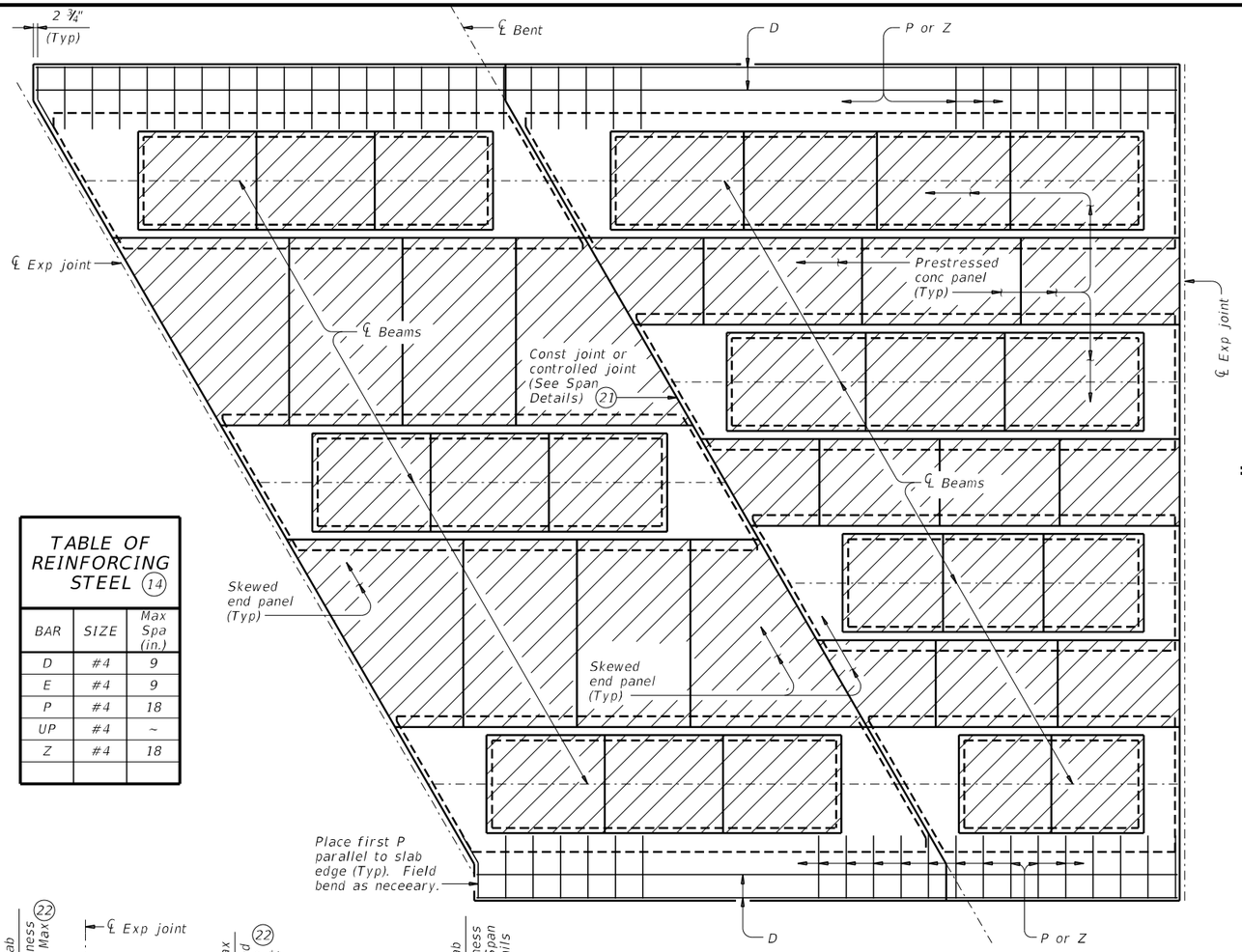
PRESTRESSED CONCRETE PANELS DECK DETAILS

PCP

FILE: pcpsIde1-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT April 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 59

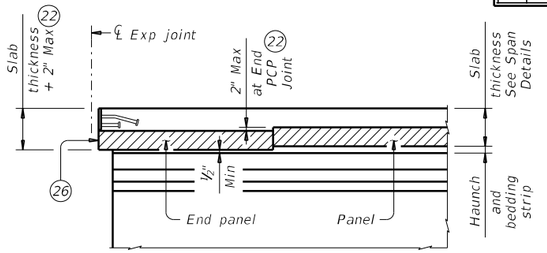
DATE: 4/17/2020 11:39:56 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Ref_Base\Applicable Bridge Standards\pcpsIde1-19.dgn

DATE: 4/17/2020 11:39:57 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Ref_Base\Applicable Bridge Standards\pcpstde1-19.dgn



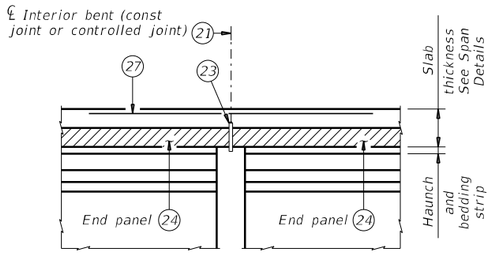
OPTION 2 ~ PLAN OF SLAB

(Showing U-Beams; other beams similar)



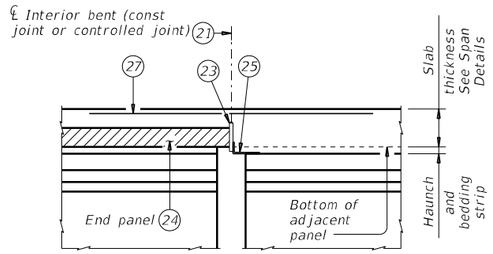
JOINTS (BETWEEN BEAMS/GIRDERS OR AT INV-T STEM)

For SEJ-A, SEJ-S(0), AJ, and Type A expansion joints only.



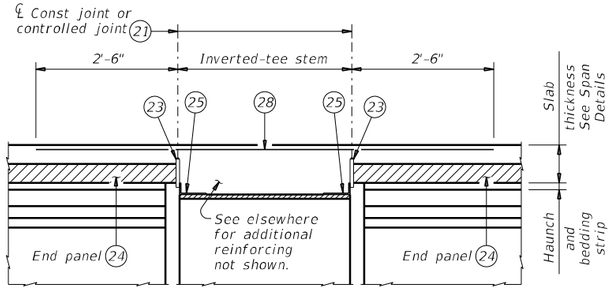
CONVENTIONAL INTERIOR BENT

Panel against panel between beams/girders.



CONVENTIONAL INTERIOR BENT

Panel against beam/girder end in adacent span.



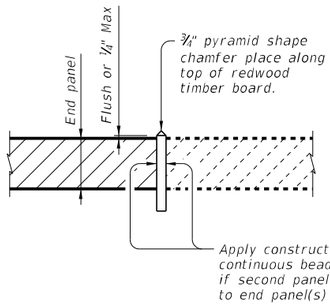
INVERTED-T BENT

Panels against inverted-tee stem

OPTION 2 ~ ELEVATIONS AT BEAM ENDS (6)

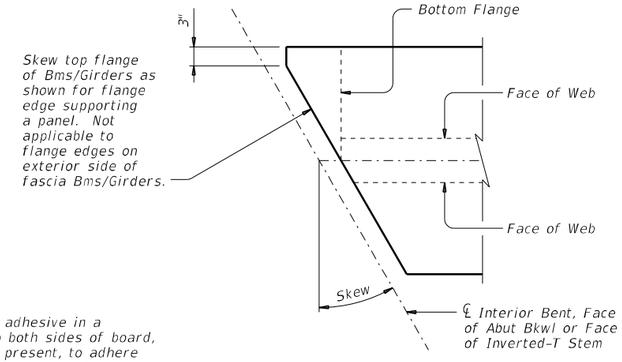
TABLE OF REINFORCING STEEL (14)

BAR	SIZE	Max Spa (in.)
D	#4	9
E	#4	9
P	#4	18
UP	#4	~
Z	#4	18



ELEVATION EXAMPLE OF END PANEL AND TIMBER BOARD (23)

See "Option 2 ~ Elevation At Beam Ends".



OPTION 2 ~ SHOWING MODIFICATION TO BEAM/GIRDER TOP FLANGE FOR SKEWS OVER 5°

Showing I-Bm/I-Girder, U-Bms and Steel Bms similar.

(6) See Span Details and Thickened Slab End Details for top slab reinforcement and clear cover. Transverse top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.

(14) Max Spacing as listed unless otherwise shown.

(21) 1 ½" Vinyl or plastic joint former at controlled joints (Stress Cap, Zip Strip, Stress Lock, or equal as approved by the Engineer.)

(22) End panel may be set up to 2" lower to accommodate expansion joint hardware, provided bedding strip is not less than ½" thick.

(23) ¾" thick redwood timber board, leave in place. Redwood timber board placed flush with top of panel or within ¼" Max above panel. Place ¾" pyramid shape chamfer along top of timber board. See "Elevation Example of End Panel and Timber Board". Place straight, within ¼" of centerline of bent or face of inverted-tee, across bridge width and end board at exterior flange edge of fascia beams/girders. Do not extend into overhang.

(24) Place panel within ½" of ¾" thick board.

(25) Permanent galvanized steel sheet form. Removable formwork is acceptable.

(26) Place end panel within ½" of expansion joint opening. End panel cannot encroach on required expansion joint opening.

(27) Place additional (#4) bar 5'-0" in length between every slab bars T. Center (#4) bar on Joint.

(28) Place additional (#4) bar continuous 2'-6" beyond each side of Inverted-T Stem between every slab bars T.

SPECIAL OPTION 2 CONSTRUCTION NOTES:

When Option 2 is chosen bottom mat of thickened end slab reinforcing is not required. Use the same top mat as shown on the Thickened Slab End Details sheet.

Placing panels adjacent to expansion joints and bent centerlines prior to completing interior panel placement is recommended. Saw cutting panels to fit is acceptable when approved by the Engineer. Minimum distance from a saw cut edge to a panel strand is 1 ½".

Do not extend the longitudinal panel reinforcement into the cast-in-place slab.

Top flanges of beams and girders on skewed bridges must be modified as shown on this drawing. The Contractor is responsible for coordinating this modification with the beam fabricator prior to submitting shop drawings for approval.

Fabricator may optionally skew the whole end. When electing to skew whole end, girder end details and bearing type at conventional interior bent must be changed to use condition at abutment. Fabricator must coordinate change in bearing type, bearing centerline location, and dowel location with Engineer and Contractor. Show appropriate changes on girder and bearing shop drawings.

Bending of anchor studs of expansion joints shown on standards AJ, SEJ-A and SEJ-S(0) is permissible if necessary to clear top of end panels. The Contractor is responsible for coordinating modifications with the joint fabricator. Submit shop drawings for approval when modifications to expansion joint hardware are made.

Bedding strips under skewed end panels must conform to the requirements of Item 422 except their minimum compressive strength must be 60 psi.

Provide Bars AA, G, K and 0A from standard IGTS in the slab.

HL93 LOADING SHEET 4 OF 4

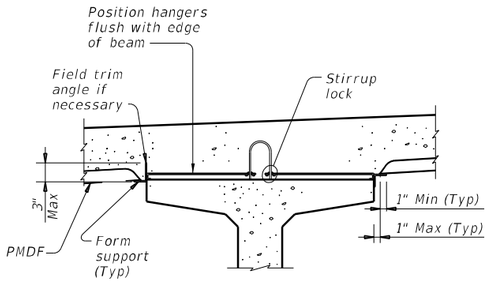
Texas Department of Transportation — Bridge Division Standard

PRESTRESSED CONCRETE PANELS
DECK DETAILS

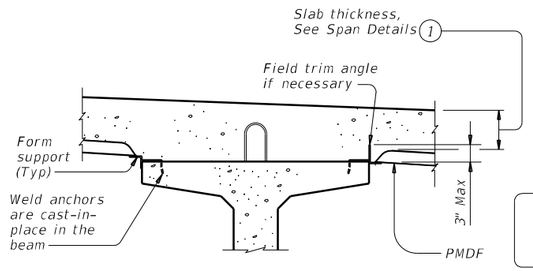
PCP

FILE: pcpstde1-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT April 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 60

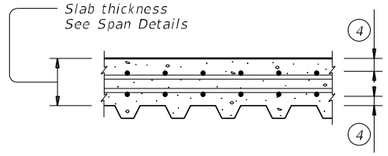
DATE: 4/17/2020 11:39:58 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Ref_Base\Applicable Bridge Standards\pmdfste1-19.dgn



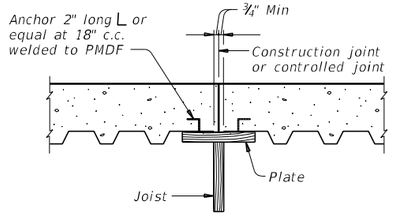
PRESTR CONC I-BEAMS AND I-GIRDERS WITH STIRRUP LOCKS



PRESTR CONC I-BEAMS AND I-GIRDERS WITH WELD ANCHORS

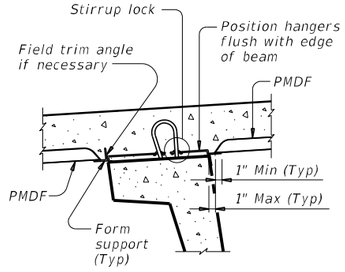


TYP LONGITUDINAL SLAB SECTION

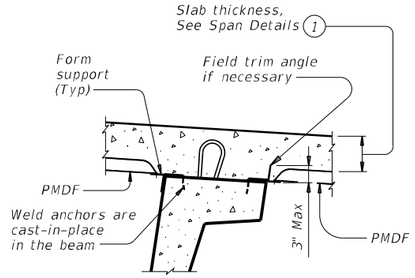


Note: In spans where PMD forms are used, timber forms must be used at construction joints. Adequate provision must be made to support edge of metal form and to provide anchorage of metal form to slab concrete where joined to wood forms.

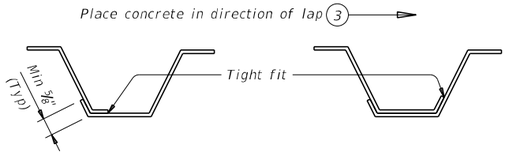
SECTION THRU CONSTRUCTION JOINT



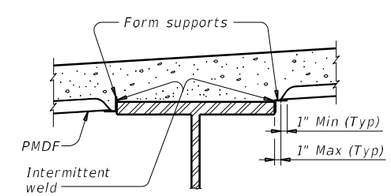
U-BEAMS WITH STIRRUP LOCKS



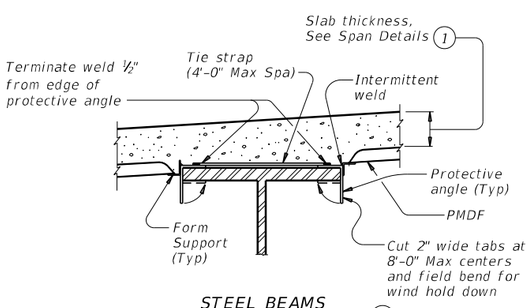
U-BEAMS WITH WELD ANCHORS



SIDE LAP DETAILS

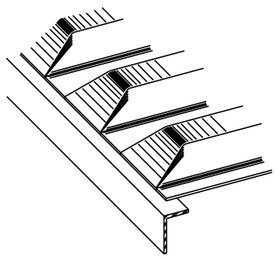


STEEL BEAMS AT COMPRESSION FLANGES

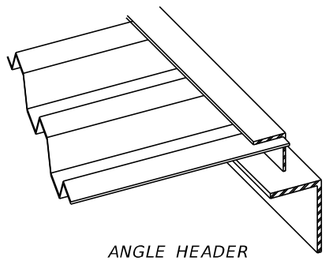


STEEL BEAMS AT TENSION FLANGES (2)

TYPICAL TRANSVERSE SECTIONS



PRECLOSED



ANGLE HEADER

NOTE: This type is to be used for skewed ends only.

TYPES OF END CLOSURES

(1) Slab thickness minus 5/8" if corrugations match reinforcing bars.

(2) Welding of form supports to tension flanges will not be permitted. Other methods of providing wind hold down resistance for PMDF in tension flange zones will be considered. At least one layer of sheet metal must be provided between the flange and the weld joint.

(3) The direction of concrete placement will be such that the upper layer of the form overlap is loaded first.

(4) See Span details for cover requirements.

GENERAL NOTES:

Steel for Permanent Metal Deck Forms (PMDF) and support angles shall conform to ASTM A653, structural steel (SS), with coating designation G165. Steel must have a minimum yield strength of 33 ksi. Minimum thickness of PMDF is 20 gage and that of support angles and protective angles is 12 gage.

Submit two copies of forming plans for PMDF to the Engineer. These plans must show all essential details of proposed form sheets, closures, fasteners, supports, connectors, special conditions and size and location of welds. These plans must clearly show areas of tension flanges for steel beams and provisions for protecting the tension flanges from welding notch effects by inclusion of separating sheet metal or other positive method. These plans must be designed, signed, and sealed by a licensed professional engineer. Department approval of these plans is not required, but the Department reserves the right to require modifications to the plans. The Contractor is responsible for the adequacy of these plans.

The details and notes shown on this standard are to be used as a guide in preparation of the forming plans.

All material, labor, tools and incidentals necessary to form a bridge deck with Permanent Metal Deck Forms is considered subsidiary to Item 422, "Concrete Superstructures".

DESIGN NOTES:

As a minimum, PMDF and support angles must be designed for the dead load of the form, reinforcement and concrete plus 50 psf for construction loads. Flexural stresses due to these design loads must not exceed 75 percent of the yield strength of the steel. Allowable stress for weld metal must be 12,400 psi.

Maximum deflection under the weight of forms, reinforcement and concrete or 120 psf, whichever is greater, shall not exceed the following:

1/180 of the form design span, but not more than 0.50", for design spans of 10' or less.

1/240 of the form design span, but not more than 0.75", for design spans greater than 10'.

The form design span must not be less than the clear distance between beam flanges, measured parallel to the form flutes, minus 2".

CONSTRUCTION NOTES:

Form sheets must not be permitted to rest directly on the top of beam flanges. Form sheets must be securely fastened to form supports and must have a minimum bearing length of one inch at each end. Form supports must be placed in direct contact with beam flanges.

All attachments must be made by permissible welds, screws, bolts, clips or other means shown on the the forming plans. All sheet metal assembly screws must be installed with torque-limiting devices to prevent stripping. Only welds or bolts must be used to support vertical loads.

Welding and welds must be in accordance with the provisions of Item 448, "Structural Field Welding", pertaining to fillet welds. All welds must be made by a qualified welder in accordance with Item 448.

All permanently exposed form metal, where the galvanized coating has been damaged, must be thoroughly cleaned and repaired in accordance with Item 445, "Galvanizing". Minor heat discoloration in areas of welds need not be touched up.

Flutes must line up uniformly across the entire width of the structure where main reinforcing steel is located in the flute.

Construction joints will not be permitted unless shown on the plans. The location of and forming details for any construction joint used must be shown on the forming plans. Forms below a construction joint must be removed after curing of the slab.

A sequence for uniform vibration of concrete must be approved by the Engineer prior to concrete placement. Attention must be given to prevent damage to the forms, yet provide proper vibration to prevent voids or honeycomb in the flutes and at headers and/or construction joints.

FOR PRESTR CONC U-BEAM BRIDGES:
Size, spacing, and orientation of bottom mat of slab reinforcement must match the top mat of reinforcing shown on the span details except all bottom mat bars are to be #5.

FOR PRESTR CONC TX-GIRDER BRIDGES:
See Miscellaneous Slab Details, Prestr Concrete I-Girders (IGMS) standard sheet for bottom mat reinforcing.

Texas Department of Transportation

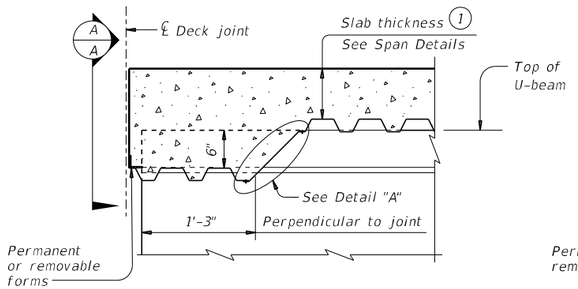
Bridge Division Standard

PERMANENT METAL DECK FORMS

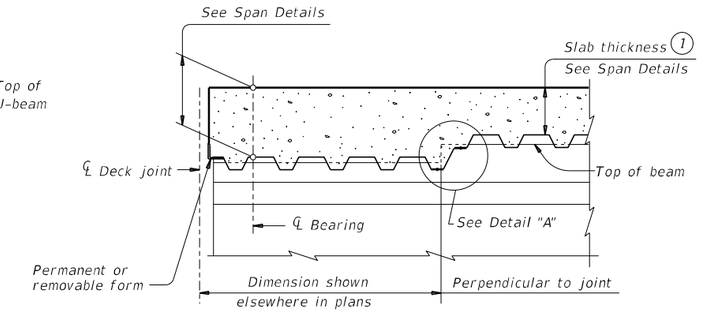
PMDF

FILE: pmdfste1-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 61

DATE: 4/17/2020 11:39:59 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Ref_Base\Applicable Bridge Standards\pmdfste1-19.dgn

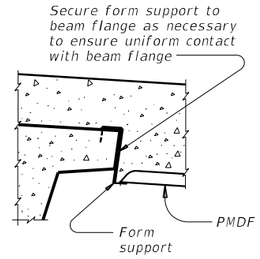


AT THICKENED SLAB END FOR U-BEAMS

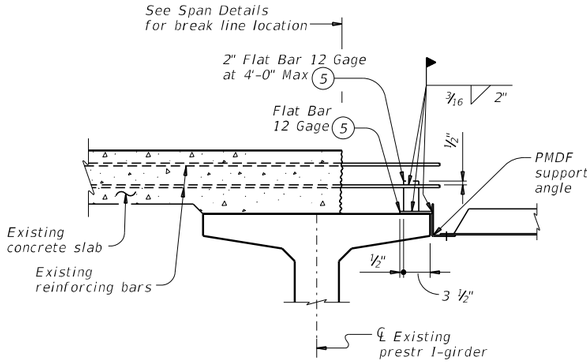


AT THICKENED SLAB END FOR PRESTRESSED I-BEAMS, I-GIRDERS AND STEEL BEAMS

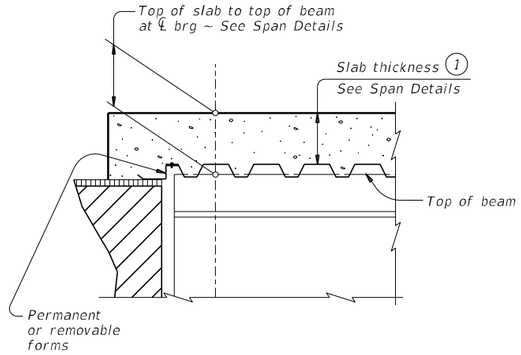
Showing I-beam block-out. No block-out for I-girders or steel beams.



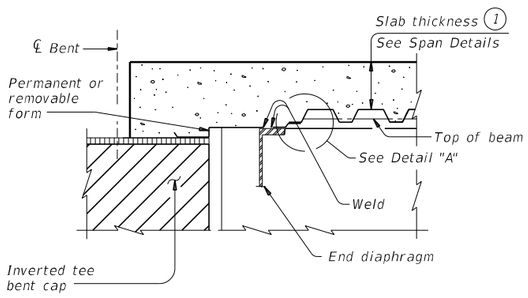
SECTION A-A



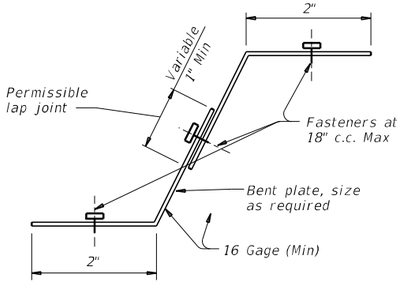
SHOWING PRESTRESSED CONCRETE I-BEAMS, I-GIRDERS AND U-BEAMS



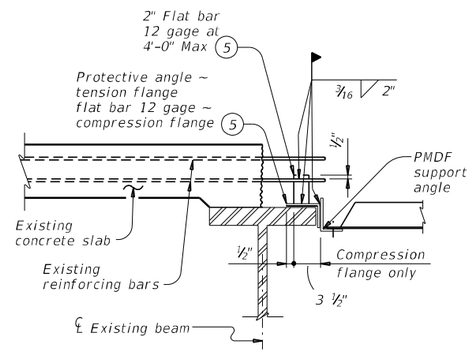
AT SLAB OVER ABUT BKWL OR INV TEE STEM FOR CONC BEAMS WITHOUT THICKENED SLAB END



AT SLAB OVER INV TEE STEM FOR STEEL BEAMS WITHOUT THICKENED SLAB END

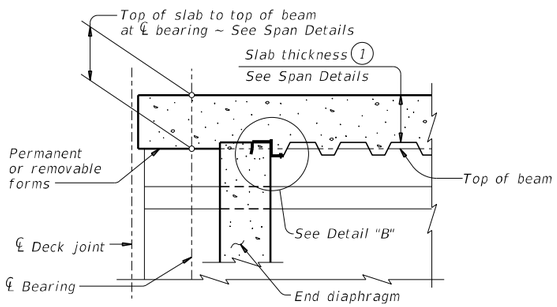


DETAIL "A"

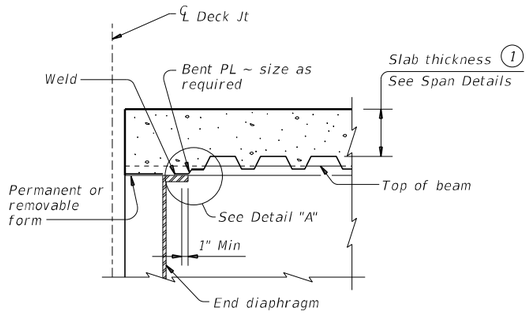


SHOWING STEEL BEAMS

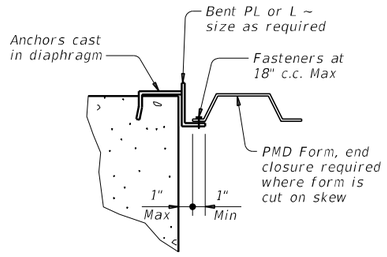
WIDENING DETAILS



AT CONC END DIAPHRAGM FOR PRESTRESSED I-BEAMS AND STEEL BEAMS



AT END DIAPHRAGM FOR STEEL BEAMS WITHOUT THICKENED SLAB END



DETAIL "B"

(1) Slab thickness minus 5/8" if corrugations match reinforcing bars

(5) Minimum yield stress of 12 gage bars shall be 40 ksi

DETAILS AT ENDS OF BEAMS

SHEET 2 OF 2

Texas Department of Transportation

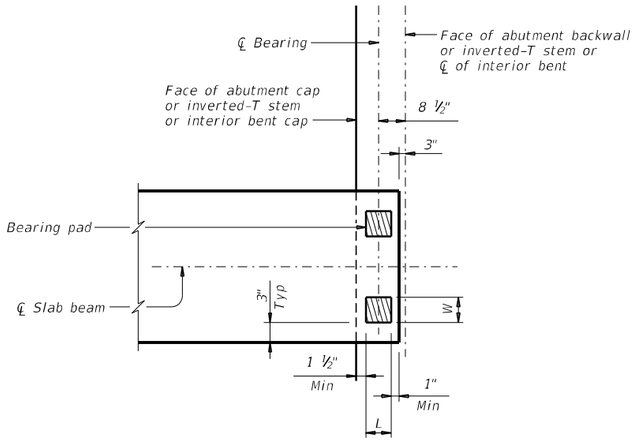
Bridge Division Standard

PERMANENT METAL DECK FORMS

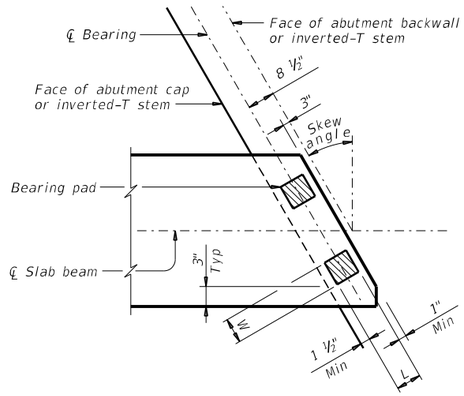
PMDF

FILE: pmdfste1-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 62

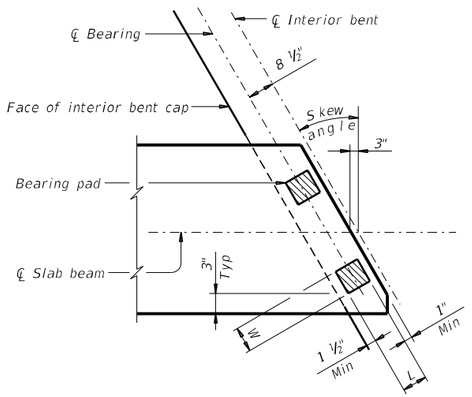
DATE: 4/17/2020 11:40:00 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Ref_Base\Applicable Bridge Standards\psbs



TWO-PAD DETAIL PLAN
(At abutment or inverted-T cap or at interior bent)



TWO-PAD DETAIL SKEW PLAN
(At abutment or inverted-T cap)



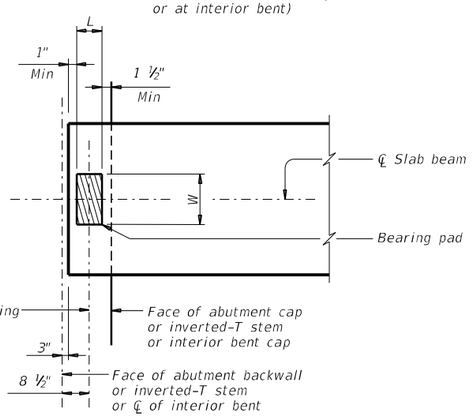
TWO-PAD DETAIL SKEW PLAN
(At interior bent)

TABLE OF BEARING PAD DIMENSIONS (ALL PRESTR CONC SLAB BM TYPES)

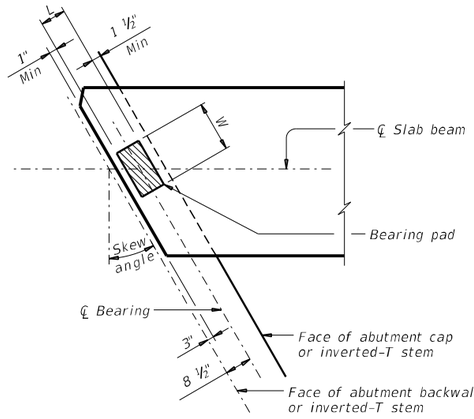
One-Pad (Ty SB1-"N") (2)			Two-Pad (Ty SB2-"N") (2)		
W	L	T	W	L	T
14"	7"	2"	7"	7"	2"

Pad sizes shown are applicable for the following conditions:

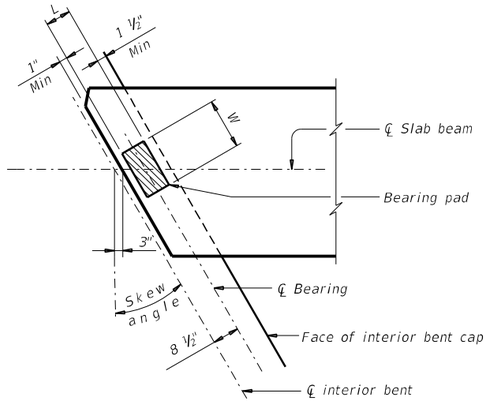
(1) All one, two and three span units where the minimum span length is not less than 25' and the maximum span is not more than 50'.
(2) Skews less than or equal to 30°.



ONE-PAD DETAIL PLAN
(At abutment or inverted-T cap or at interior bent)



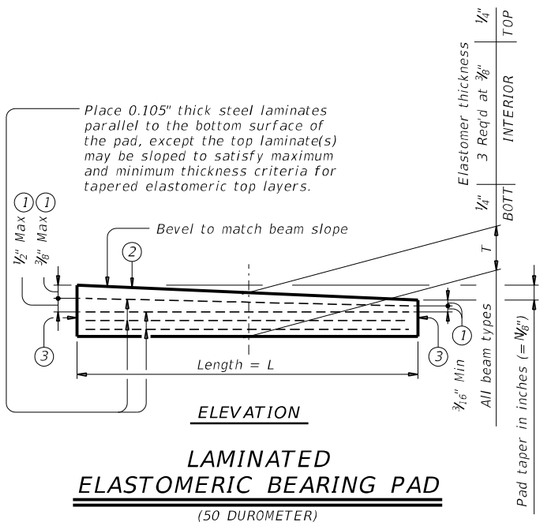
ONE-PAD DETAIL SKEW PLAN
(At abutment or inverted-T cap)



ONE-PAD DETAIL SKEW PLAN
(At interior bent)

ELASTOMERIC BEARING PAD PLACEMENT AND BEAM END DIAGRAMS

Place one bearing pad at forward station beam end.
Place two bearing pads at back station beam end.



ELEVATION

LAMINATED ELASTOMERIC BEARING PAD

(50 DUROMETER)

(1) Maximum and minimum layer thicknesses shown are for elastomer only, on tapered layers.

(2) Indicate BEARING TYPE on all pads. For tapered pads, locate BEARING TYPE on the high side. The Fabricator must include the value of "N" (amount of taper in ⅛" increments) in this mark.
Examples: N=0, (for 0" taper)
N=1, (for ⅛" taper)
N=2, (for ¼" taper)
(etc.)
Fabricated pad top surface slope must not vary from plan beam slope by more than $\left(\frac{0.0625"}{Length}\right)$ IN/IN.

(3) Locate permanent mark here.

GENERAL NOTES:
These details accommodate skew angles up to 30°.
Shop drawings for approval are required.
A bearing layout which identifies location and orientation of all bearings must be developed by the bearing fabricator. Permanently mark each bearing in accordance with the bearing layout. A copy of the bearing layout is to be provided to the Engineer.
Cost of furnishing and installing elastomeric bearings must be included in unit price bid for "Prestressed Concrete Slab Beams".

HL93 LOADING

Texas Department of Transportation | Bridge Division Standard

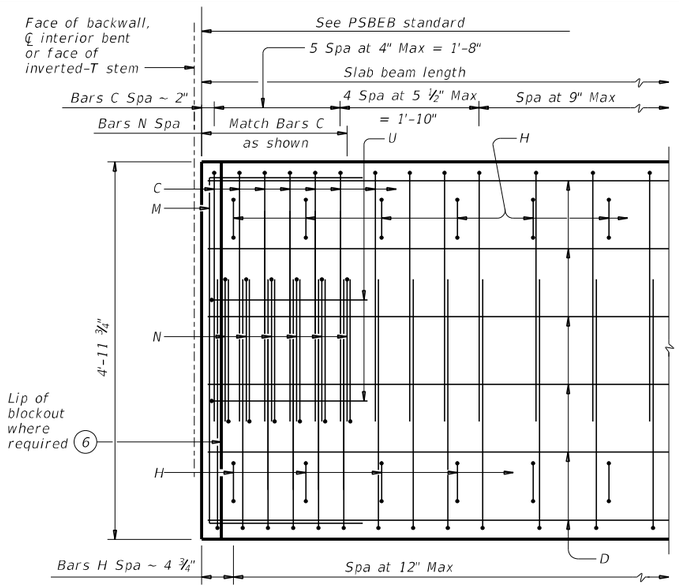
ELASTOMERIC BEARING AND BEAM END DETAILS

PRESTR CONCRETE SLAB BEAM

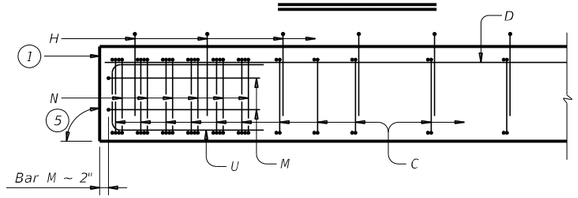
PSBEB

FILE: psbsle06-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 63

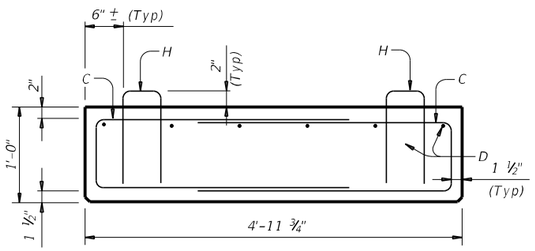
DATE: 4/17/2020 11:40:02 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Ref_Base\Applicable Bridge Standards\psbsts03-17.dgn



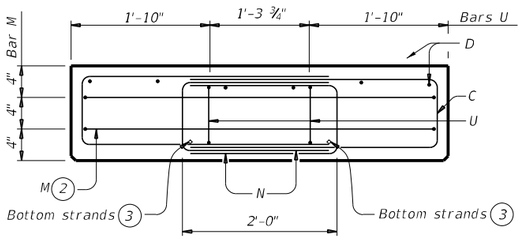
PART PLAN



ELEVATION

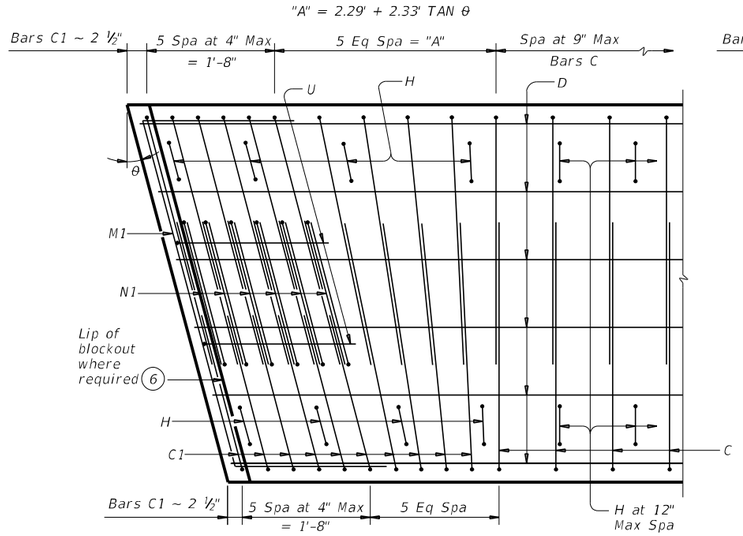


SECTION



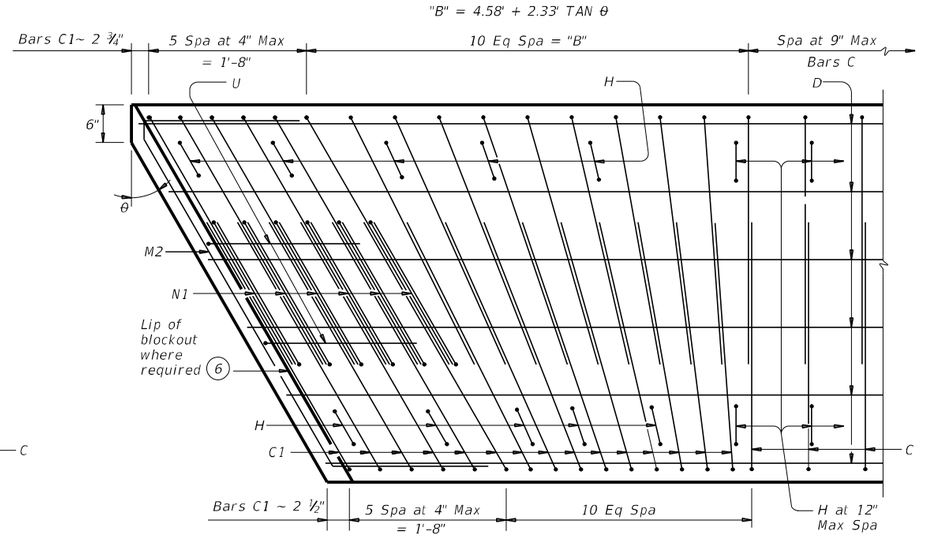
END MAT REINFORCING

Bars H not shown for clarity.



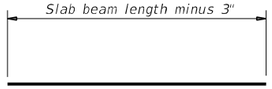
PART SKEW PLAN

(Showing θ over 0° to 15° Skew)

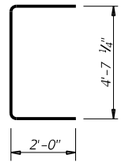


PART SKEW PLAN

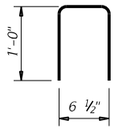
(Showing θ over 15° to 30° Skew)



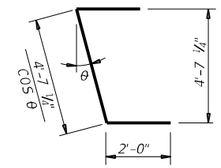
BARS D(#6)



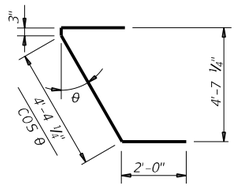
BARS M(#4)



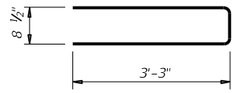
BARS H(#4)



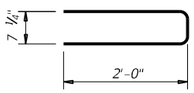
BARS M1(#4)



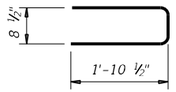
BARS M2(#4)



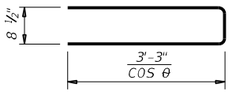
BARS C(#4)



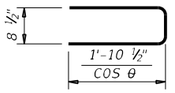
BARS U(#5)



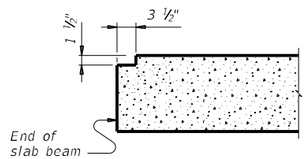
BARS N(#4)



BARS C1(#4)



BARS N1(#4)



ELEVATION OF BLOCKOUT 6

BEAM PROPERTIES		
Area	in^2	717.0
Y top	in	6.00
Y bott	in	6.00
I	in^4	8,604
Weight (4)	lb/ft	747

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

Provide Class H concrete. Provide Class H (HPC) if shown elsewhere in the plans.

Provide Grade 60 reinforcing steel.

An equal area of welded wire reinforcement (WWR) (ASTM 1064) may be substituted for bars C and D if approved by the Engineer.

These details can be used for any skew angle up to a maximum of 30 degrees.

Chamfer all exposed corners ¾" or round to a ¾" radius.

Details are drawn showing right forward skew. See Bridge Layout for actual direction.

Cover dimensions are clear dimensions, unless noted otherwise.

Reinforcing bar dimensions shown are out-to-out of bar.

(1) See End Mat Reinforcing detail.

(2) Adjust bars M vertically to avoid strands.

(3) See sheet PSBND or PSBSD for strand locations.

(4) Assumes 150 pcf weight density of concrete.

(5) 90° at conventional interior bents. End of beam must be vertical at abutment backwall and inverted-T stem.

(6) Blockout required at armor joint (AJ) and sealed expansion joint (SEJ) locations to accommodate joint anchorage.

HL93 LOADING

Texas Department of Transportation

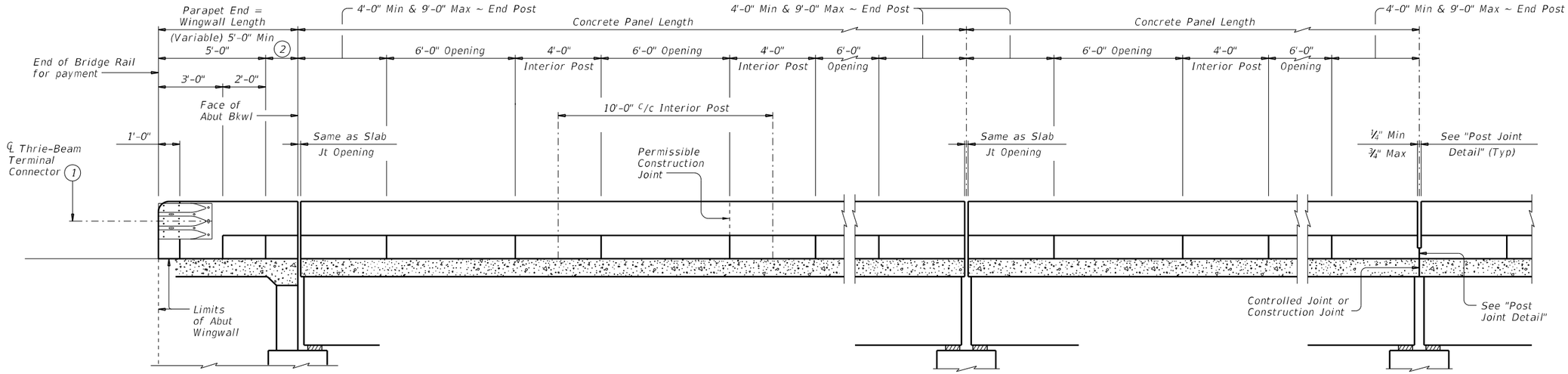
Bridge Division Standard

PRESTRESSED CONCRETE SLAB BEAM DETAILS

(TYPE 5SB12)

PSB-5SB12

FILE: psbsts03-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 64

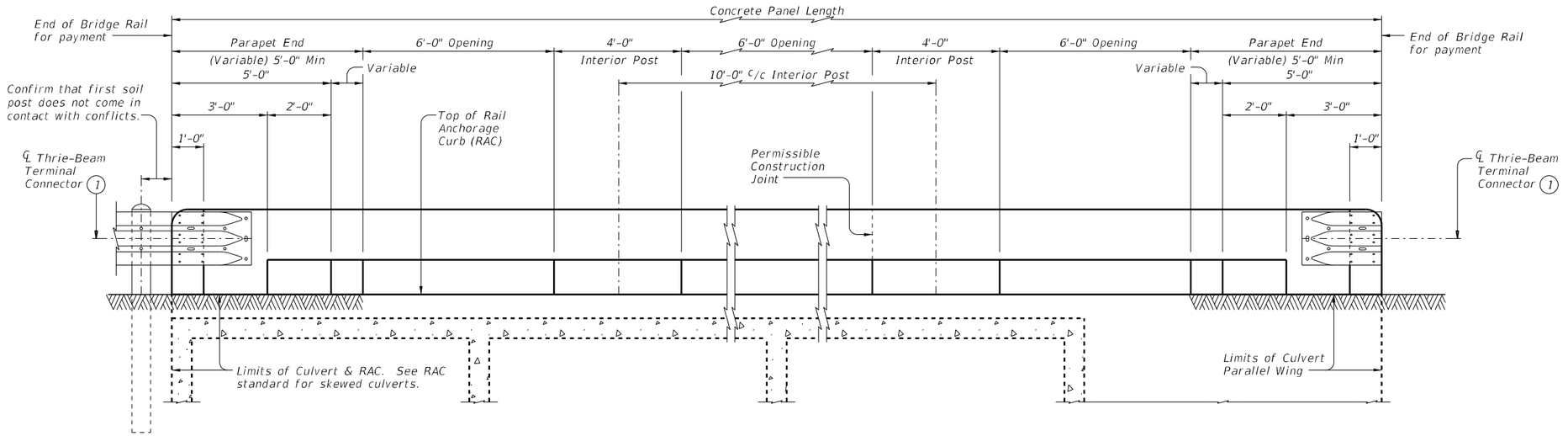


AT ABUTMENTS

AT BENTS WITH SLAB EXP JOINTS

AT BENTS WITHOUT SLAB EXP JOINTS

ROADWAY ELEVATION OF RAIL ON BRIDGE



AT STRAIGHT OR FLARED WINGS

AT PARALLEL WINGS

ROADWAY ELEVATION OF RAIL ON BOX CULVERTS

Showing 0° skew culvert. Skewed culverts similar. See RAC standard for details not shown.
Vertical joints in concrete rail are not required, unless shown elsewhere.

(1) Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.

(2) Wingwall Length minus 5'-0" (Varies)

DATE: 4/17/2020 11:40:03 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Ref_Base\Applicable Bridge Standards\rlstd005-18.dgn

SHEET 1 OF 3

Texas Department of Transportation

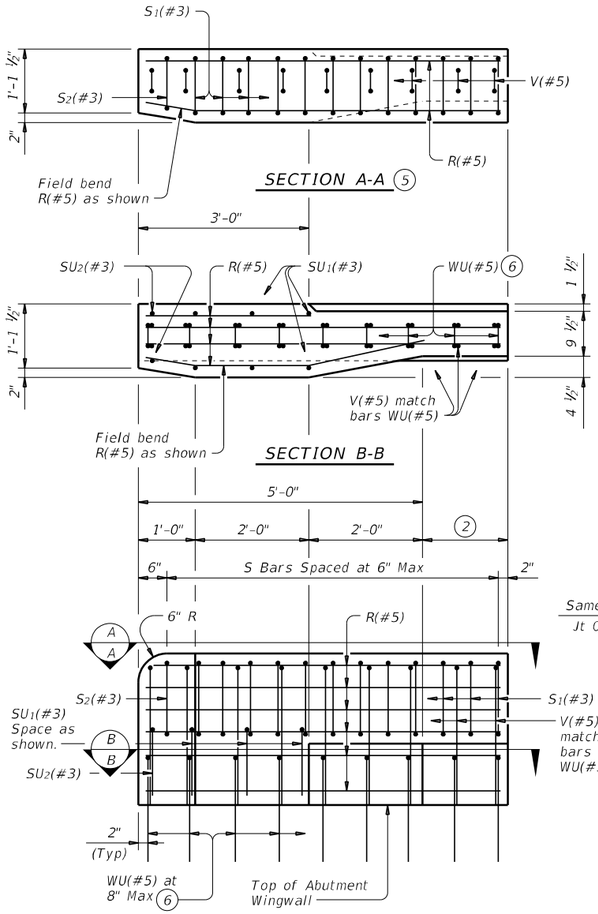
Bridge Division Standard

TRAFFIC RAIL

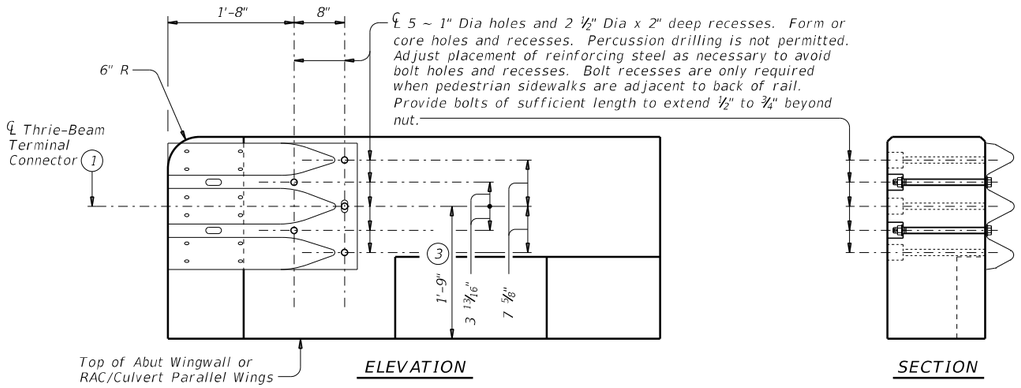
TYPE T223

FILE: rlstd005-18.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT March 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 65

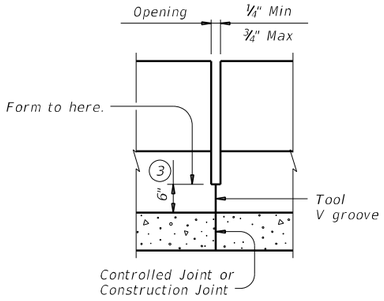
DATE: 4/17/2020 11:40:04 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Ref_Base\Applicable Bridge Standards\rlstd005-18.dgn



PARAPET END AT ABUT WINGWALL (6)

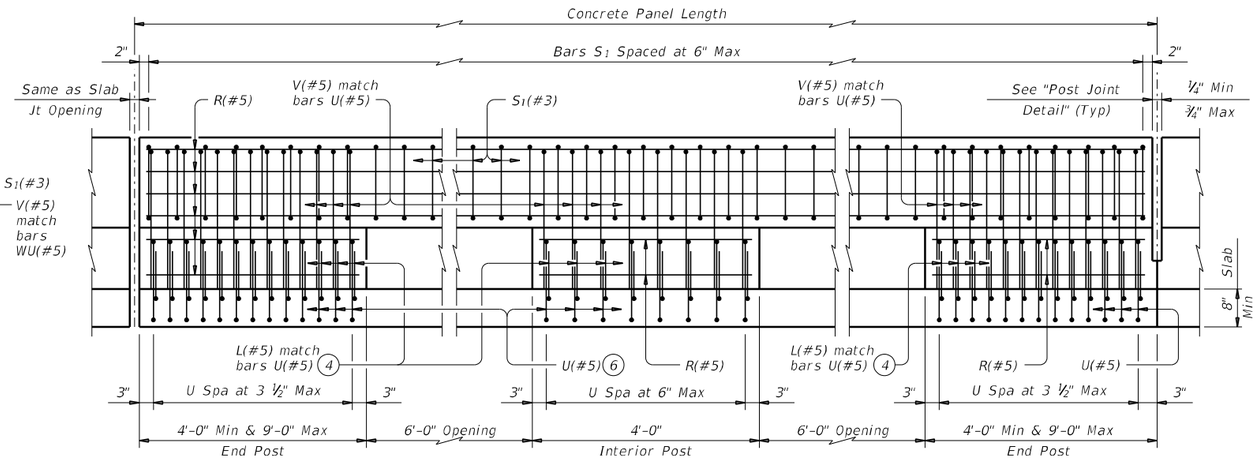


TERMINAL CONNECTION DETAILS



POST JOINT DETAIL

Provide at all interior bents without slab expansion joints.



AT SLAB EXPANSION JOINTS | AT 4' INTERIOR POST | AT BENTS WITHOUT SLAB EXPANSION JOINTS

ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT

Showing rail on slab. Rail on box culvert similar.

(1) Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.

(2) Wingwall Length minus 5'-0" (Varies)

(3) Increase 2" for structures with overlay.

(4) Bars L(#5) are part of rail reinforcing and are included in unit price bid for railing. Space with Bars U. Bars L match slab bar cover. Bars L may be bundled with top slab reinforcing if spacing is equivalent.

(5) Bars $SU_1(\#3)$, $SU_2(\#3)$ and WU(#5) not shown for clarity.

(6) Substitute Bars U(#5) for Bars WU(#5) when parapet end is located on achorage curb over culvert top slab. Use Bars WU(#5) in culvert parallel wings.

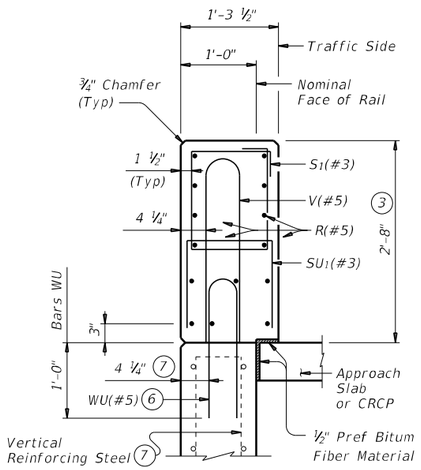
Texas Department of Transportation | Bridge Division Standard

TRAFFIC RAIL

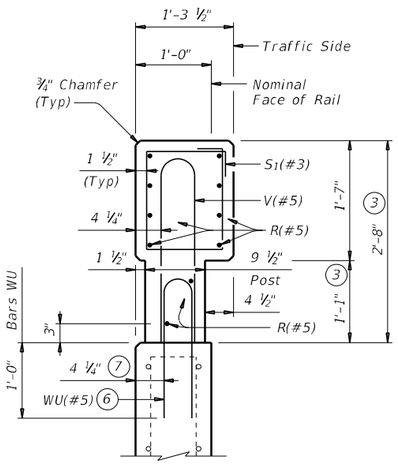
TYPE T223

FILE: rlstd005-18.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT March 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 66

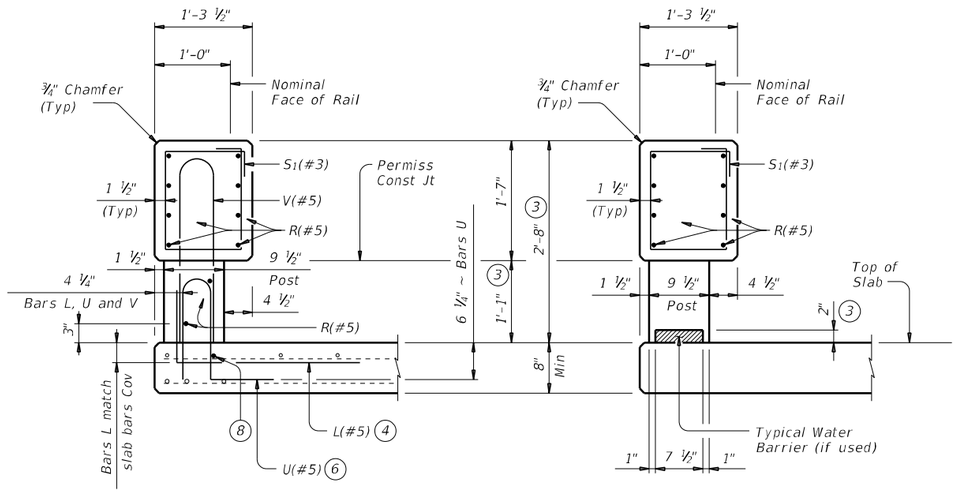
DATE: 4/17/2020 11:40:04 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Ref_Base\Applicable Bridge Standards\rlstd005-18.dgn



SECTION C-C
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS



SECTION D-D
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS

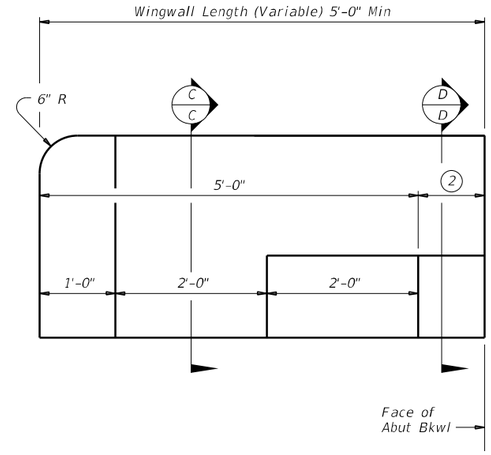


AT POST
ON BRIDGE SLAB

AT OPENING
ON BRIDGE SLAB

SECTIONS THRU RAIL

Sections on box culverts similar.



ELEVATION AT ABUTMENT WINGWALL

Box culvert parallel wings or rail anchorage curb similar.

CONSTRUCTION NOTES:

Face of rail and parapet must be vertical transversely unless otherwise shown in the plans or approved by the Engineer.

Provide water barriers at openings draining onto undercrossing roadways and sidewalks. They may be cast-in-place or precast in convenient lengths and bonded to the bridge deck with an approved epoxy cement.

Chamfer all exposed corners.

MATERIAL NOTES:

Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if slab bars are epoxy coated or galvanized.

Deformed Welded Wire Reinforcing (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars U, V, and WU unless noted otherwise. Provide the same laps as required for reinforcing bars.

Provide bar laps, where required, as follows:

Uncoated or galvanized ~ #5 = 2'-0"
Epoxy coated ~ #5 = 3'-0"

GENERAL NOTES:

This rail has been evaluated by full-scale crash test to meet MASH TL-3 criteria. This rail can be used for speeds of 50 mph and greater when a TL-3 rated guard fence transition is used. When a TL-2 rated guard fence transition is used, this rail can only be used for speeds of 45 mph and less.

Do not use this railing on bridges with expansion joints providing more than 5" movement.

Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

Shop drawings are not required for this rail.

Average weight of railing with no overlay is 358 plf.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.

(2) Wingwall Length minus 5'-0" (Varies)

(3) Increase 2" for structures with overlay.

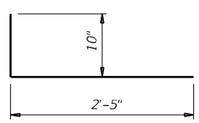
(4) Bars L(#5) are part of rail reinforcing and are included in unit price bid for railing. Space with Bars U. Bars L match slab bar cover. Bars L may be bundled with top slab reinforcing if spacing is equivalent.

(6) Substitute Bars U(#5) for Bars WU(#5) when parapet end is located on anchorage curb over culvert top slab. Use Bars WU(#5) in culvert parallel wings.

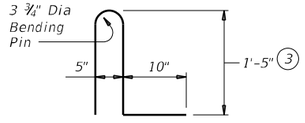
(7) When vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls on traffic side of wall, move the horizontal wingwall/retaining wall reinforcing to the inside of Bars WU where bars conflict.

(8) Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.

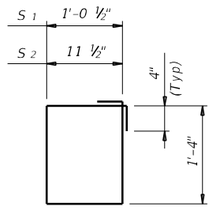
(9) At the Contractor's option, Bars V may be replaced by extending Bars U to 2'-5 ¼" above the roadway surface without overlay.



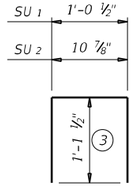
BARS L (#5)



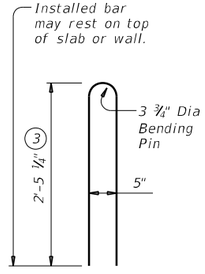
BARS U (#5) (9)



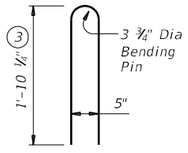
BARS S (#3)



BARS SU (#3)



BARS V (#5) (9)



BARS WU (#5)

SHEET 3 OF 3

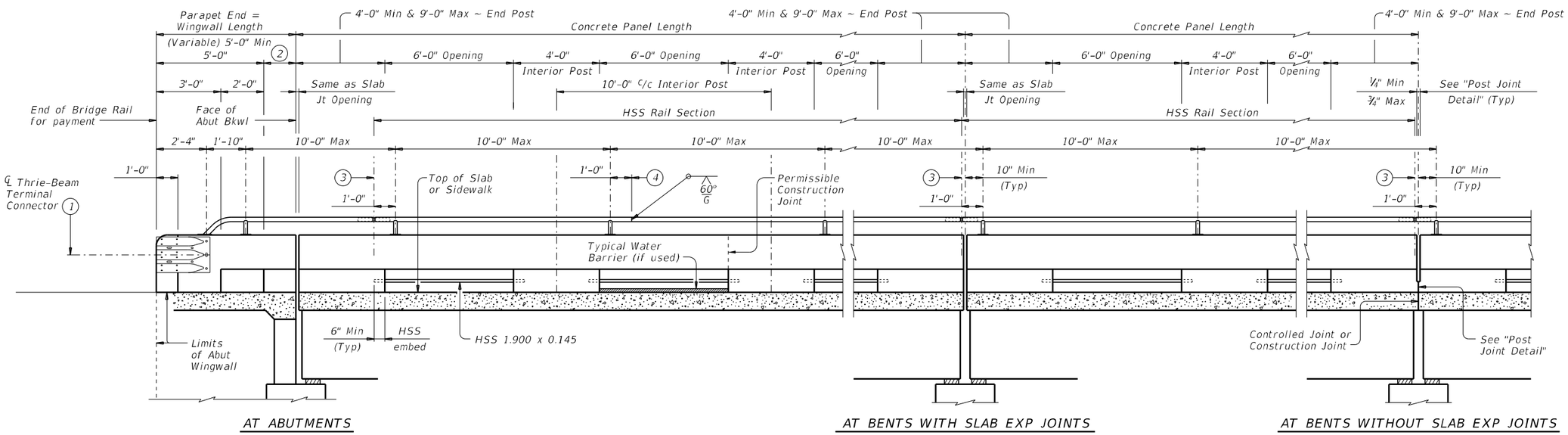
Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL

TYPE T223

FILE: rlstd005-18.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT March 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 67



AT ABUTMENTS | AT BENTS WITH SLAB EXP JOINTS | AT BENTS WITHOUT SLAB EXP JOINTS

ROADWAY ELEVATION OF RAIL ON BRIDGE

(Showing without raised sidewalk)

AT STRAIGHT OR FLARED WINGS | AT PARALLEL WINGS

ROADWAY ELEVATION OF RAIL ON BOX CULVERTS

Showing 0° skew culvert. Skewed culverts similar. See RAC standard for details not shown. Vertical joints in concrete rail are not required, unless shown elsewhere.

(1) Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.

(2) Wingwall Length minus 5'-0" (Varies)

(3) ℄ Splice Jt or Exp Jt

(4) One shop splice per HSS rail section is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.

DATE: 4/17/2020 11:40:06 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Ref_Base\Applicable Bridge Standards\rlsld019-18.dgn

SHEET 1 OF 4

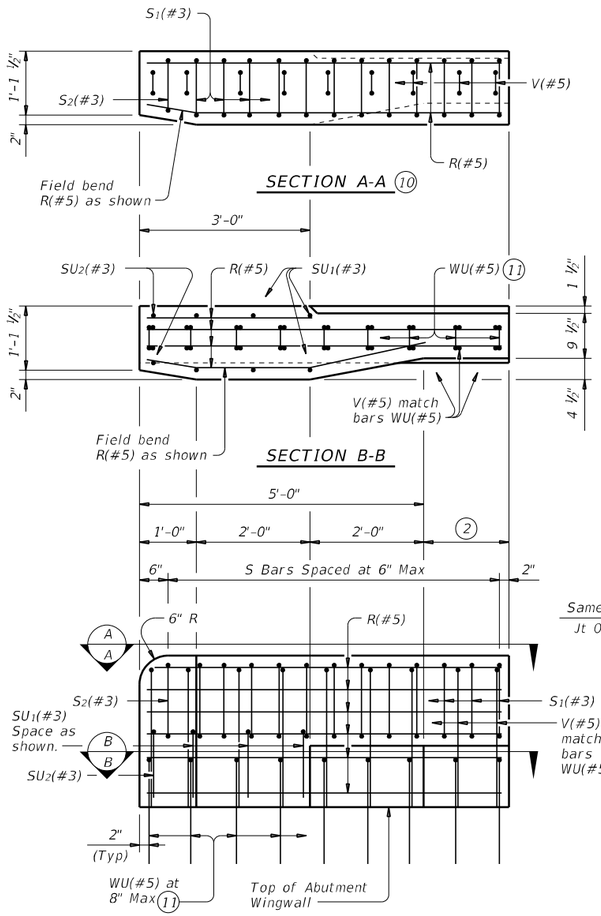
Texas Department of Transportation | Bridge Division Standard

COMBINATION RAIL

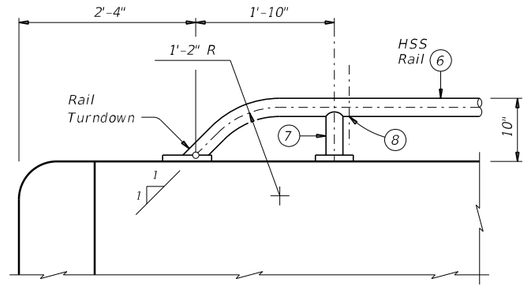
TYPE C223

FILE: rlsld019-18.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT March 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 68

DATE: 4/17/2020 11:40:06 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Ref_Base\Applicable Bridge Standards\rlstd019-18.dgn

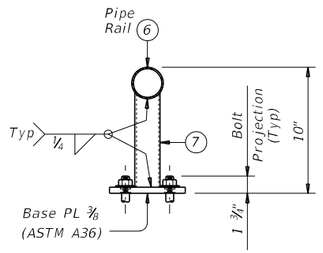


PARAPET END AT ABUT WINGWALL (11)

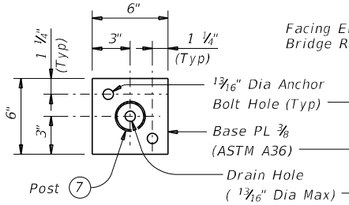


Note that at least two anchor points (as shown) are required for the Bridge Rail on the Abutment Wingwall. Longer Wingwalls may require more than two Rail anchorages.

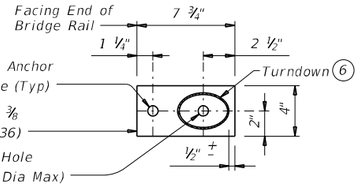
HSS RAIL TERMINAL DETAIL



TRANSVERSE SECTION

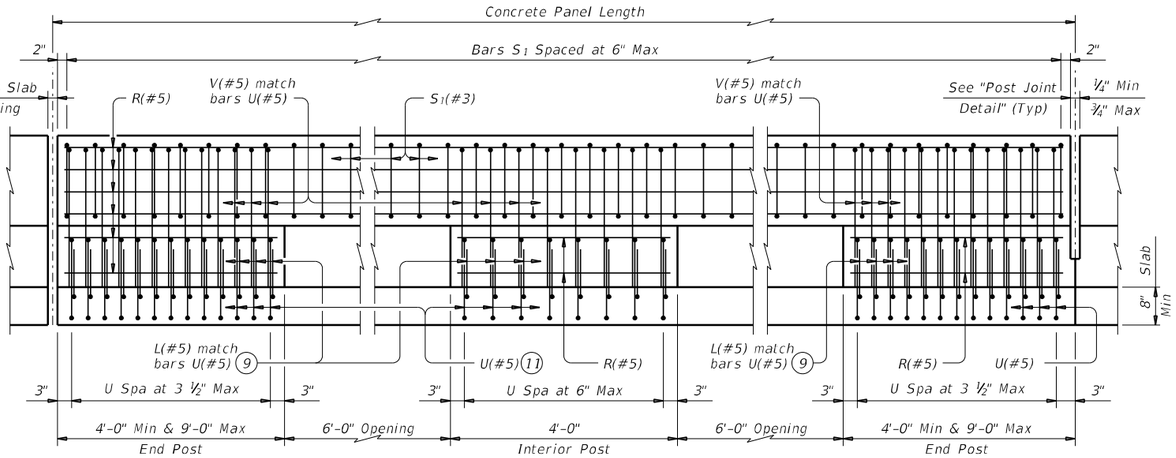


POST BASE PLATE PLAN



RAIL TURNDOWN BASE PLATE PLAN

HSS RAIL DETAILS



AT BENTS WITH SLAB EXP JOINTS

AT 4' INTERIOR POST

AT BENTS WITHOUT SLAB EXP JOINTS

ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT

Showing rail on slab and without raised sidewalk. Rail on box culvert similar. HSS not shown for clarity.

(1) Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.

(2) Wingwall Length minus 5'-0" (Varies)

(5) Increase 2" for structures with overlay.

(6) HSS 2.875 x 0.203

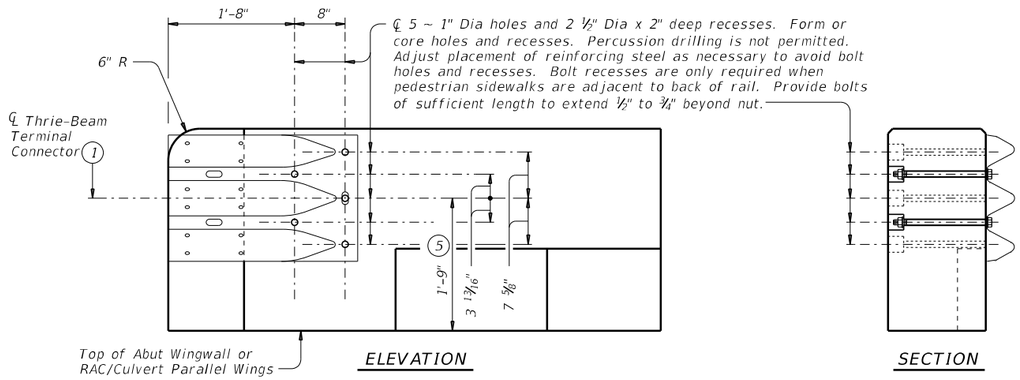
(7) HSS 2.375 x 0.154

(8) ⅜" Dia Hole in bottom of HSS rail (Minimum 1 hole between posts ~ Typ)

(9) Bars L(#5) are part of rail reinforcing and are included in unit price bid for railing. Space with Bars U. Bars L match slab bar cover. Bars L may be bundled with top slab reinforcing if spacing is equivalent.

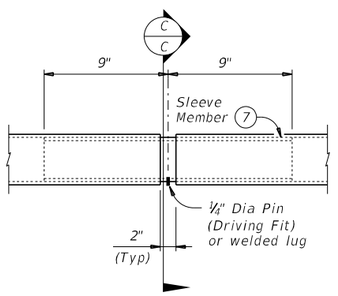
(10) Bars SU_1(#3), SU_2(#3) and WU(#5) not shown for clarity.

(11) Substitute Bars U(#5) for Bars WU(#5) when parapet end is located on anchorage curb over culvert top slab. Use Bars WU(#5) in culvert parallel wings.

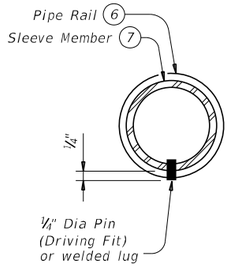


ELEVATION

SECTION



AT SPLICE OR EXP JTS



SECTION C-C

TERMINAL CONNECTION DETAILS

PIPE SPLICE DETAILS

SHEET 2 OF 4

Texas Department of Transportation

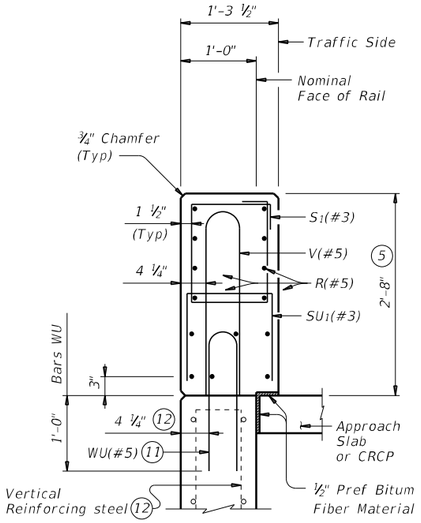
Bridge Division Standard

COMBINATION RAIL

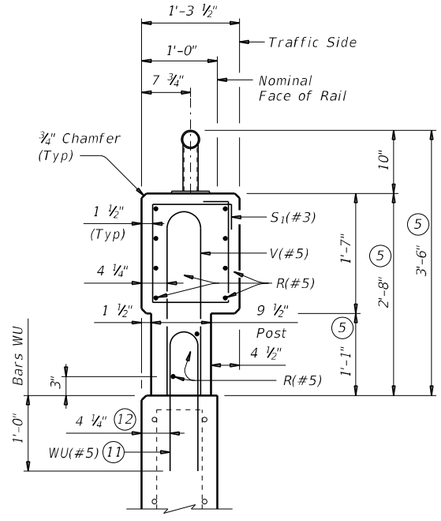
TYPE C223

FILE: rlstd019-18.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT March 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 69

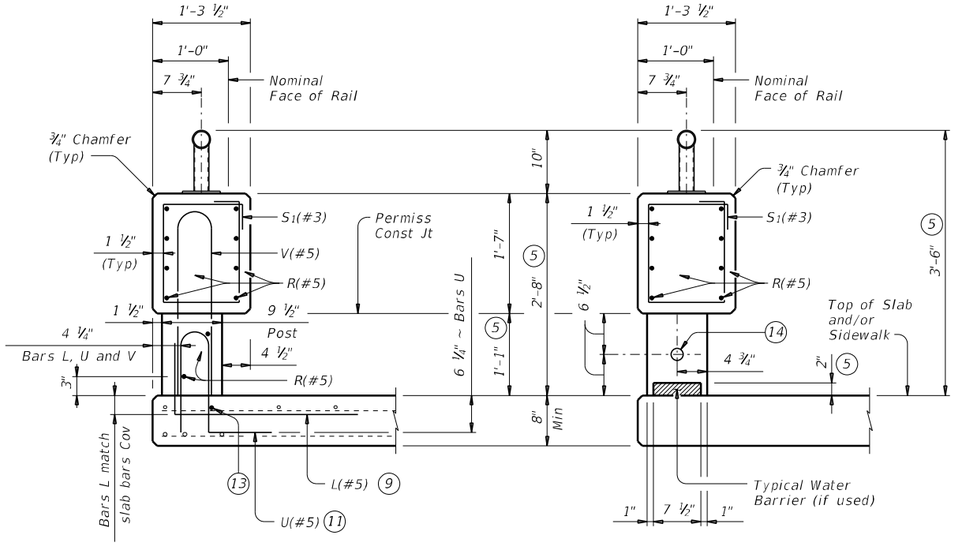
DATE: 4/17/2020 11:40:07 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Ref_Base\Applicable Bridge Standards\rlsld019-18.dgn



SECTION D-D
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS

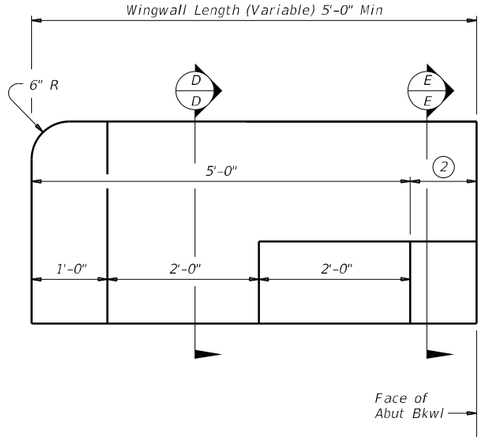


SECTION E-E
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS



AT POST
ON BRIDGE SLAB

AT OPENING
ON BRIDGE SLAB

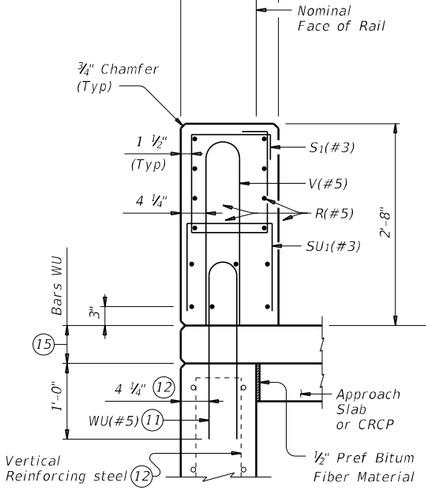


ELEVATION AT
ABUTMENT WINGWALL

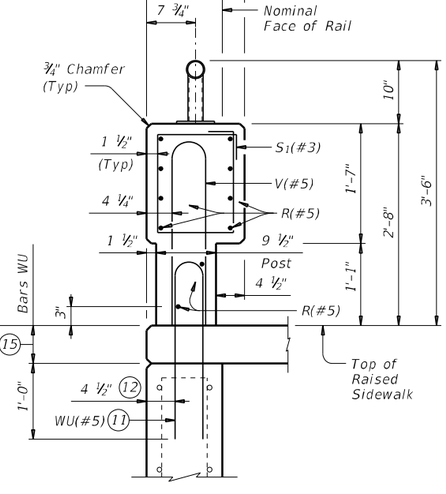
Box culvert parallel wings or rail anchorage curb similar.
HSS rail not shown for clarity.

SECTIONS THRU RAIL WITHOUT RAISED SIDEWALK

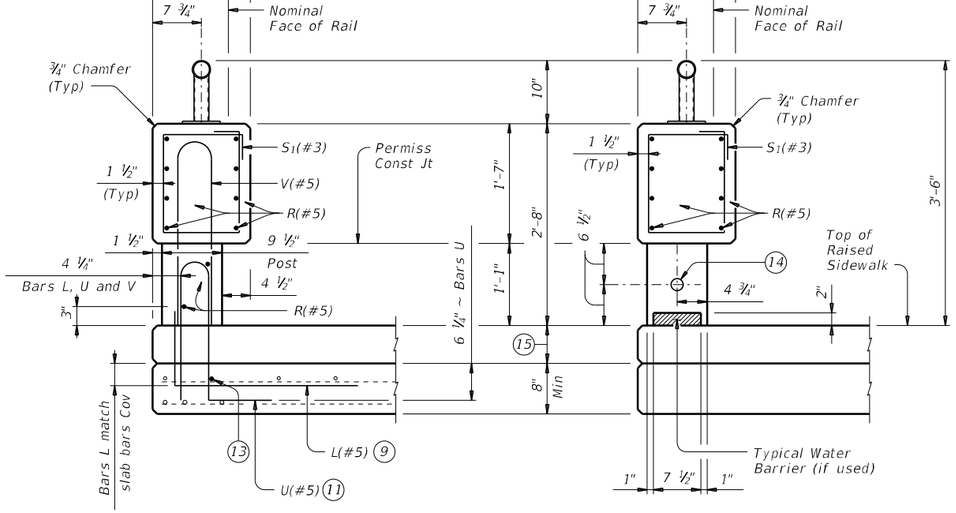
Sections on box culvert similar.



SECTION D-D
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS



SECTION E-E
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS



AT POST
ON BRIDGE SLAB

AT OPENING
ON BRIDGE SLAB

POST JOINT DETAIL

(Showing without raised sidewalk)
Provide at all interior bents without slab expansion joints. Location independent of HSS rail splices.

SECTIONS THRU RAIL WITH RAISED SIDEWALK

Sections on box culvert similar.

(2) Wingwall Length minus 5'-0" (Varies)

(5) Increase 2" for structures with overlay.

(9) Bars L(#5) are part of rail reinforcing and are included in unit price bid for railing. Space with Bars U. Bars L match slab bar cover. Bars L may be bundled with top slab reinforcing if spacing is equivalent.

(11) Substitute Bars U(#5) for Bars WU(#5) when parapet end is located on anchorage curb over culvert top slab. Use Bars WU(#5) in culvert parallel wings.

(12) When vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls on traffic side of wall, move the horizontal wingwall/retaining wall reinforcing to the inside of Bars WU where bars conflict.

(13) Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.

(14) HSS 1.900 x 0.145

(15) Raised Sidewalk.

Texas Department of Transportation

Bridge Division Standard

COMBINATION RAIL

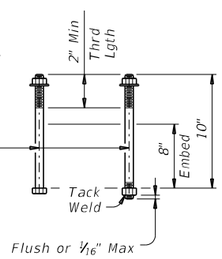
TYPE C223

FILE: rlsld019-18.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT March 2018 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 70

RAIL DATA FOR HORIZONTAL CURVES

	RADIUS TO FACE OF RAIL	MAX CHORD LENGTH	CONSTRUCT OR FABRICATE
HSS Rail	Over 2800'	29'-0"	Straight rail sections
	Over 1400' thru 2800'	14'-6"	To required radius or to chords shown
	Over 700' thru 1400'	7'-3"	
	Thru 700'	Zero	To required radius

℄ ⅞" Dia hex head anchor bolt or threaded rod (ATSM A307 Gr A) with one hardened steel washer (ASTM F436) placed under each hex nut (ASTM A563). One additional hex nut must be furnished and tack welded for each threaded rod.



CAST-IN-PLACE ANCHOR BOLT OPTIONS (16)

(5) Increase 2" for structures with overlay.

(16) See "Material Notes" for anchor bolt information.

(17) For raised sidewalks, add sidewalk height to total bar height. Use sidewalk height at rail's location.

(18) At the Contractor's option, Bars V may be replaced by extending Bars U to 2'-5 ¼" above the roadway/sidewalk surface without overlay.

CONSTRUCTION NOTES:

Face of rail, posts and parapet must be vertical transversely unless otherwise approved by the Engineer. HSS rail posts and opening end faces must be perpendicular to top of adjacent concrete parapet grade. Use epoxy mortar under HSS rail post base plates if gaps larger than 1/16" exist.

Provide water barriers at openings draining onto undercrossing roadways and sidewalks. They may be cast-in-place or precast in convenient lengths and bonded to the bridge deck with an approved epoxy cement.

HSS rail sections must not include less than two posts, and no more than four (except at Abutments).

Round or chamfer exposed edges of HSS rail and HSS rail posts to approximately 1/16" by grinding.

Test adhesive anchors in accordance with Item 450.3.3, "Tests". Test 3 anchors per 100 anchors installed. Perform corrective measures to provide adequate capacity if any of the tests do not meet the required test load. Repair damage from testing as directed.

At the Contractor's option anchor bolts may be cast with the parapet. See "Material Notes".

Chamfer all exposed corners.

MATERIAL NOTES:

Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if slab bars are epoxy coated or galvanized.

Provide ASTM A1085, A500 Gr B or A53 Gr B for all HSS.

Galvanize all metal components of steel rail system. Apply additional coatings when shown elsewhere on the plans. When plans require paint over gavanizing, follow the requirements for painting galvanized steel in Item 445, "Galvanizing" and when field painting, Item 446, "Field Cleaning and Painting Steel". Sleeve members and anchor bolts must receive galvanization prior to installation and only field paint after installation unless directed otherwise by Engineer.

Deformed Welded Wire Reinforcing (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars U, V, and WU unless noted otherwise.

Anchor bolts must be ⅞" Dia ASTM A307 Gr A fully threaded rods with one hex nut and one hardened steel washer (ASTM F436) each. Nuts must conform to ASTM A563 requirements. Embed fully threaded rods into parapet wall with a Type III, Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 3". Anchor adhesive chosen must be able to achieve a nominal bond strength in tension of a single anchor, Na, of 5 kips (edge distance must be accounted for). Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".

Optional cast-in-place anchor bolts must be ⅝" Dia ASTM A307 Gr A bolts (or threaded rods with one tack welded hex nut each) with one hex nut and one hardened steel washer (ASTM F436) at each bolt. Nuts must conform to ASTM A563 requirements.

Provide bar laps, where required, as follows: Uncoated or galvanized ~ #5 = 2'-0"
Epoxy coated ~ #5 = 3'-0"

GENERAL NOTES:

This rail has been evaluated by full-scale crash test to meet MASH TL-3 criteria. This rail can be used for speeds of 50 mph and greater when a TL-3 rated guard fence transition is used. When a TL-2 rated guard fence transition is used, this rail can only be used for speeds of 45 mph and less.

Do not use this railing on bridges with expansion joints providing more than 5" movement.

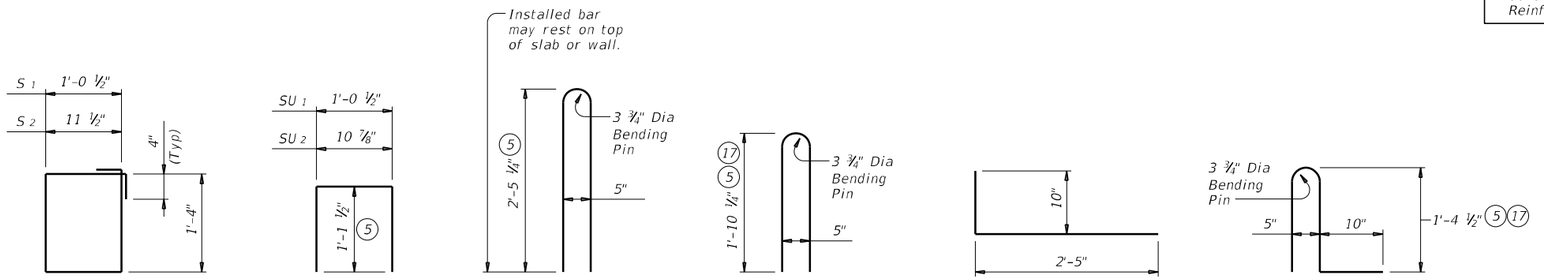
Rail anchorage details shown on this standard may require modification for select structure types.

See appropriate details elsewhere in plans for these modifications.

Submit erection drawings showing panel lengths, HSS rail post spacing, and anchor bolt setting to the Engineer for approval.

Average weight of railing with no overlay:
370 plf total
358 plf (Conc)
12 plf (Steel)

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.



BARS S (#3) BARS SU (#3) BARS V (#5) (18) BARS WU (#5) BARS L (#5) BARS U (#5) (18)

SHEET 4 OF 4

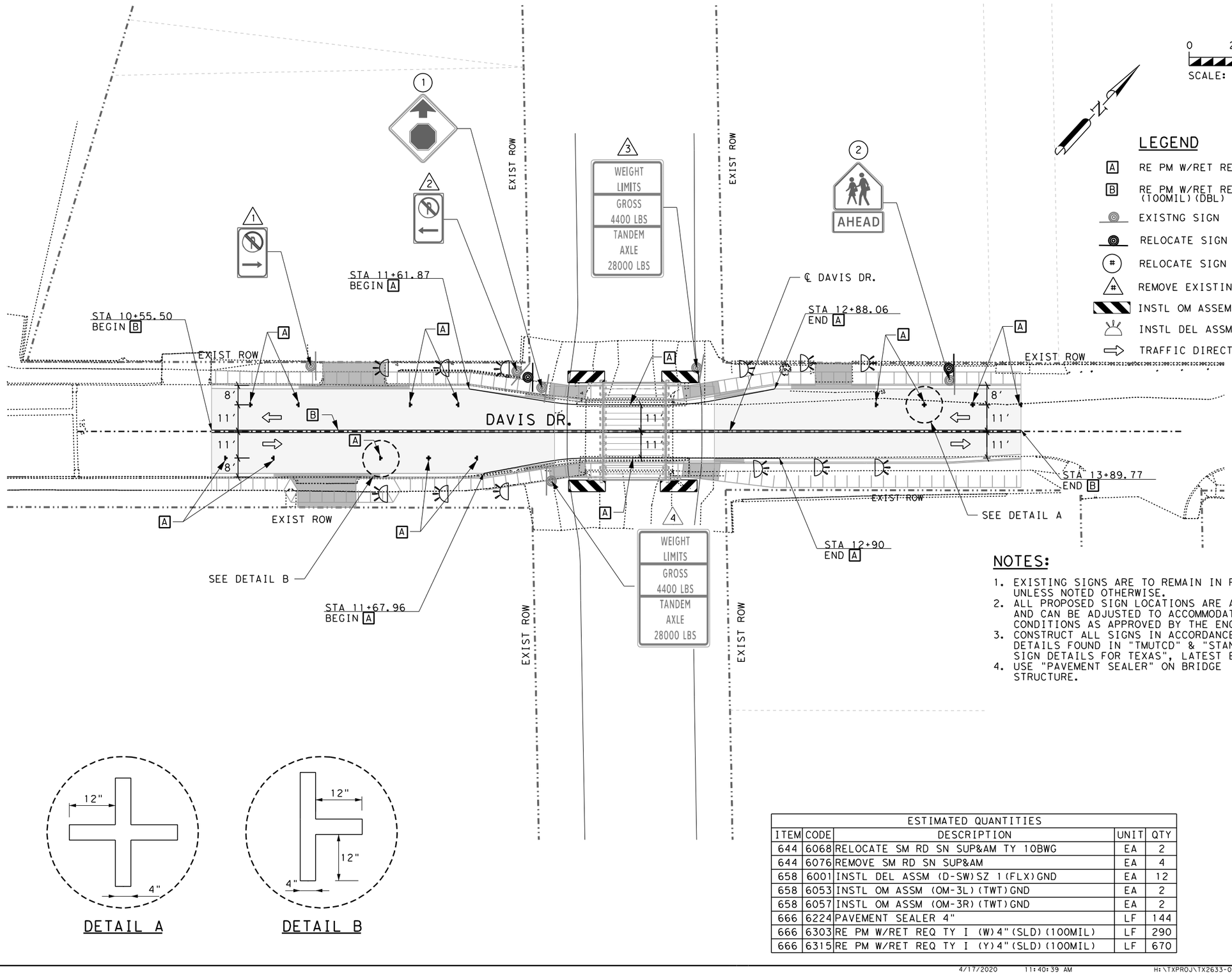
Texas Department of Transportation | Bridge Division Standard

COMBINATION RAIL

TYPE C223

FILE:	rlsld019-18.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT March 2018		CONT	SECT	JOB	HIGHWAY
REVISIONS		0924	06	419	DAVIS
		DIST	COUNTY		SHEET NO.
		ELP	ELP		C 71

DATE: 4/17/2020 11:40:08 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Ref_Base\Applicable Bridge Standards\rlsld019-18.dgn



NOTES:

1. EXISTING SIGNS ARE TO REMAIN IN PLACE UNLESS NOTED OTHERWISE.
2. ALL PROPOSED SIGN LOCATIONS ARE APPROXIMATE AND CAN BE ADJUSTED TO ACCOMMODATE SITE CONDITIONS AS APPROVED BY THE ENGINEER.
3. CONSTRUCT ALL SIGNS IN ACCORDANCE WITH DETAILS FOUND IN "TMUTCD" & "STANDARD HIGHWAY SIGN DETAILS FOR TEXAS", LATEST EDITIONS.
4. USE "PAVEMENT SEALER" ON BRIDGE STRUCTURE.

DETAIL A

DETAIL B

ESTIMATED QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY
644	6068	RELOCATE SM RD SN SUP&AM TY 10BWG	EA	2
644	6076	REMOVE SM RD SN SUP&AM	EA	4
658	6001	INSTL DEL ASSM (D-SW)SZ 1(FLX)GND	EA	12
658	6053	INSTL OM ASSM (OM-3L)(TWT)GND	EA	2
658	6057	INSTL OM ASSM (OM-3R)(TWT)GND	EA	2
666	6224	PAVEMENT SEALER 4"	LF	144
666	6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	290
666	6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	670

REFERENCES – BENCHMARKS

FILE: REFER TO ROW & SURVEY CONTROL SHEETS FOR ADDITIONAL ROW AND BENCHMARK INFORMATION.

DATE	REMARKS	BY

ENGINEER'S SEAL

ARLENE FRESQUEZ 106510 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

4/17/2020

SCALE HOR: 1"=40' VER: N/A

DATE 4/17/2020
DESIGN BY JR
DRAWN BY JR
CHKD. BY AF
APPD. BY RP

PROJECT NAME

DAVIS BRIDGE REPLACEMENT ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT — CITY OF EL PASO —

CONSOR F-12040
1501 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-3680

SHEET TITLE

SIGNING AND PAVEMENT MARKING LAYOUT

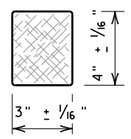
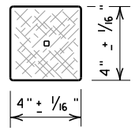
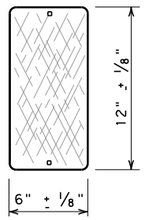
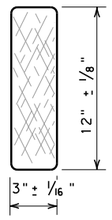
SHEET C 72 OF C 97

238618

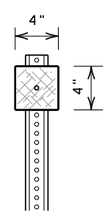
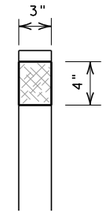
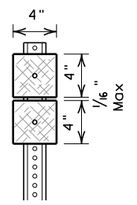
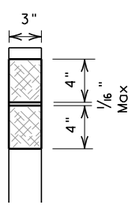
11:40:39 AM
4/17/2020
H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Signing_Pvmt Mrk\C_419_S_SPM01.dgn

4/17/2020 11:40:39 AM H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Signing_Pvmt Mrk\C_419_S_SPM01.dgn

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

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

DELINEATORS

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

D & OM DESCRIPTIVE CODES

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

NUMBER OF REFLECTORS
S = Single
D = Double

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

REFLECTOR UNIT SIZE
1 or 2

TYPE OF POST OR DELINEATOR
WC = Wing Channel Post
FLX = Flexible Post
BRF = Barrier Reflector

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

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

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

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

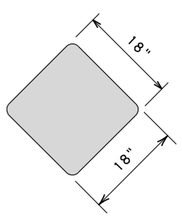
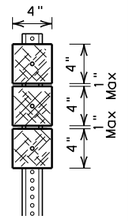
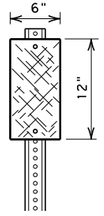
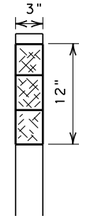
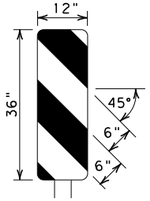
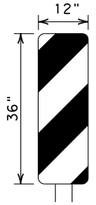
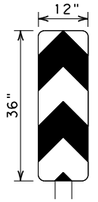
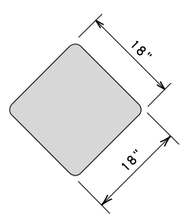
NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s) (Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

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

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

DIRECTION
If Required
BI = Bi-Directional

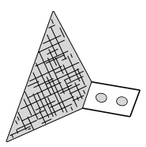
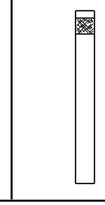
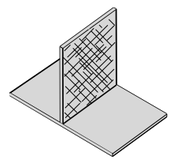
OBJECT MARKERS

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

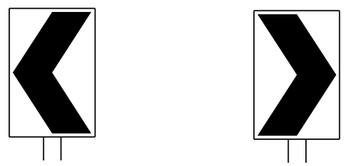
DEPARTMENTAL MATERIAL SPECIFICATIONS

FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

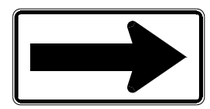
BARRIER REFLECTORS (BRF)

	GF1	GF2	CTB
DEVICE			
	1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.		
SHEETING	Yellow, White, Red		
NOTE	1. Minimum 9 square inches of reflective sheeting surface area.		

CHEVRONS

DEVICE	 W1-8			
SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)
MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only	
NOTE	1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies). 2. The Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTIONAL LARGE ARROW (W1-6).			

ONE DIRECTION LARGE ARROW

DEVICE	 W1-6	
SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
MOUNTING HEIGHT	7'-0"	

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

Texas Department of Transportation

Traffic Operations Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-15

FILE: dom1-15.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10	ELP	ELP		C 73

20A

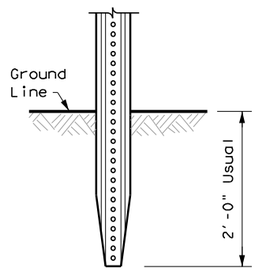
DATE: 4/17/2020 11:40:42 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Standards\SIGN & PAV MRK Standards\dom1-15.dgn

DATE: 4/17/2020 11:40:43 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Standards\SIGN & PAV MRK\dom2-15.dgn

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

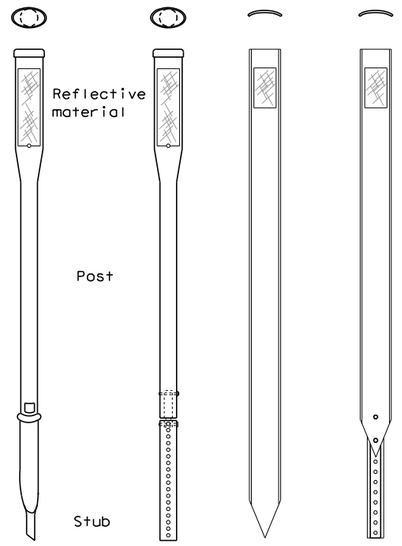


NOTES

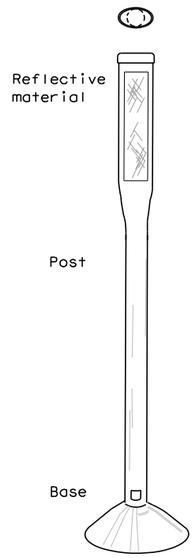
1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only.
2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499.

FLEXIBLE POSTS (FLX)

GND



SRF



EMBEDDED

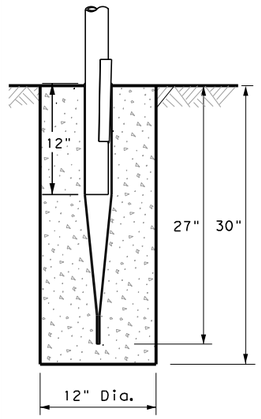
SURFACE MOUNT

NOTES

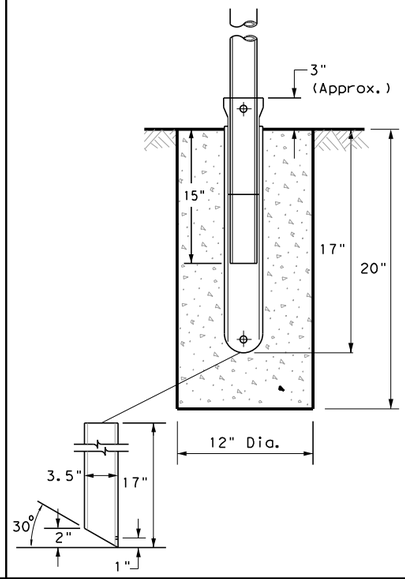
1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices.
2. Install per manufacturer's recommendations.
3. Post length may vary to meet field conditions.

WEDGE ANCHOR SYSTEMS

WAS



WAP



STEEL

PLASTIC

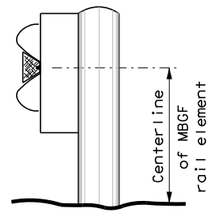
NOTE

1. Install per manufacturer's recommendations.

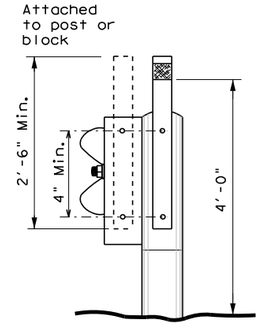
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

GF1

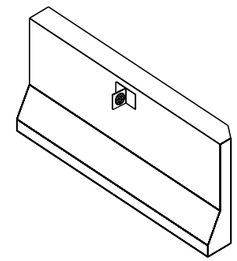


GF2

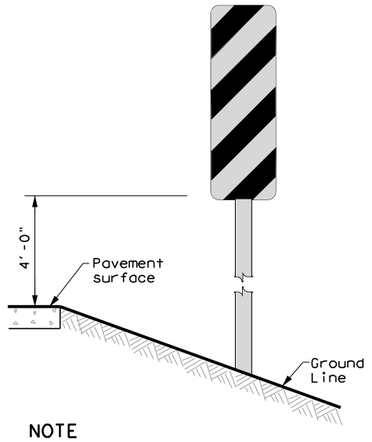


CONCRETE BARRIER / BRIDGE RAIL

CTB



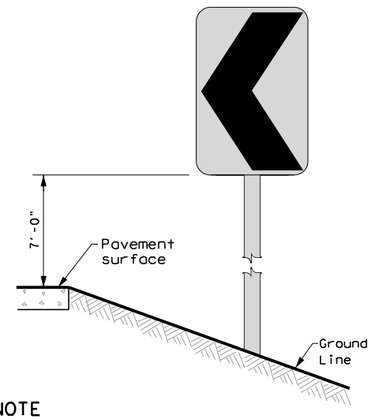
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

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

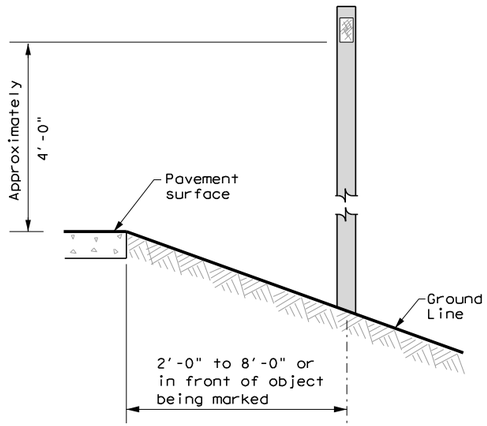
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

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

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

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.

Texas Department of Transportation

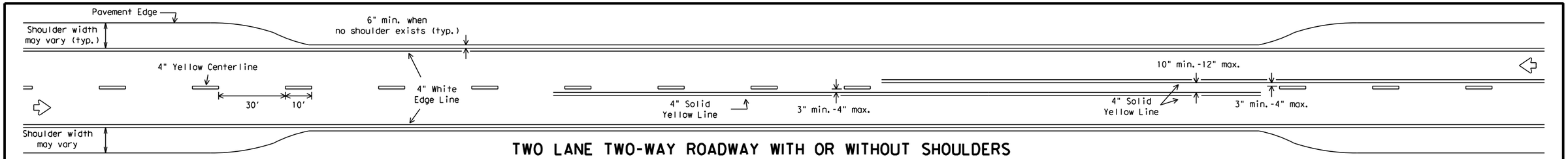
Traffic Operations Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

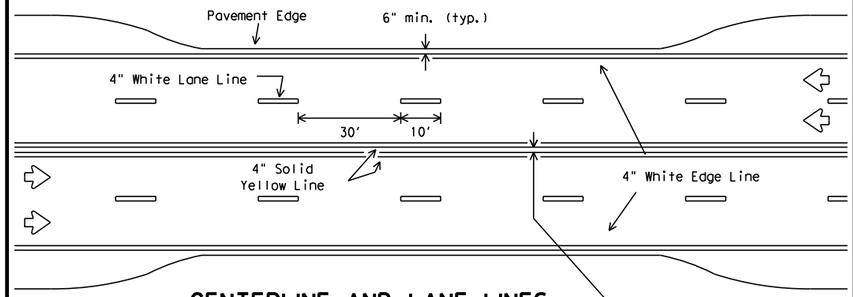
D & OM(2)-15

FILE: dom2-15.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10	ELP	ELP		C 74

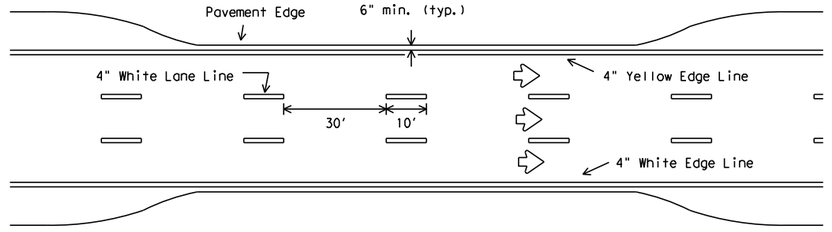
20B



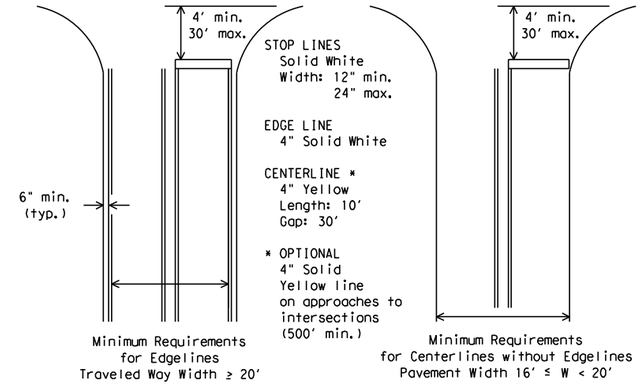
TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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

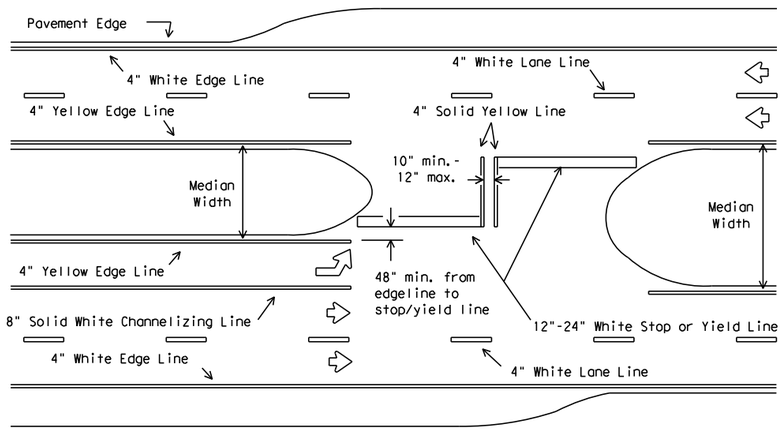


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



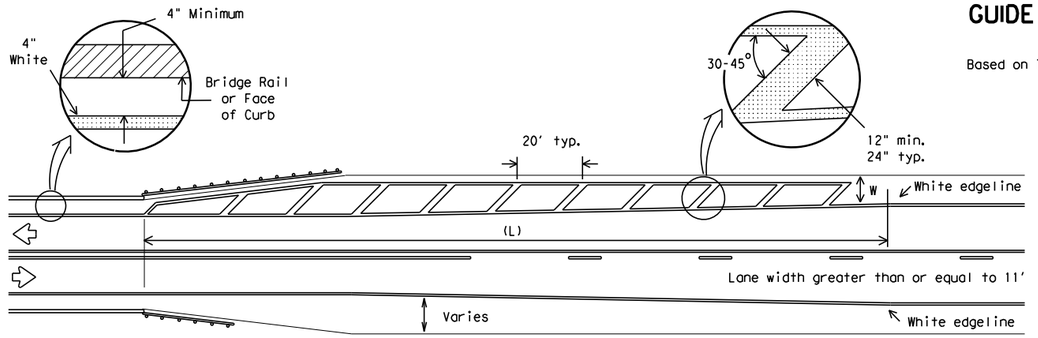
GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Highways



All medians shall be field measured to determine the location of necessary striping. Stop/Yield bars and centerlines shall be placed when the median width is greater than 30 ft. The median width is defined as the area between two roadways of a divided highway measured from edge of traveled way to edge of traveled way. The median excludes turn lanes. The median width might be different between intersections, interchanges and of opposite approaches of the same intersection. The narrow median width will be the controlling width to determine if markings are required.

FOUR LANE DIVIDED ROADWAY INTERSECTIONS



NOTES:

1. No-passing zone on bridge approach is optional but if used, it shall be a minimum 500 feet long.
2. For crosshatching length (L) see Table 1.
3. The width of the offset (W) and the required crosshatching width is the full shoulder width in advance of the bridge.
4. The crosshatching is not required if delineators or barrier reflectors are used along the structure.
5. For guard fence details, refer elsewhere in the plans.

ROADWAYS WITH REDUCED SHOULDER WIDTHS ACROSS BRIDGE OR CULVERT

TABLE 1 - TYPICAL LENGTH (L)

Posted Speed *	Formula
≤ 40	$L = \frac{WS^2}{60}$
≥ 45	L=WS

* 85th Percentile Speed may be used on roads where traffic speeds normally exceed the posted speed limit. Crosshatching length should be rounded up to nearest 5 foot increment.

L=Length of Crosshatching (FT.) W=Width of Offset (FT.)
S=Posted Speed (MPH)

EXAMPLES:

An 8 foot shoulder in advance of a bridge reduces to 4 feet on a 70 MPH roadway. The length of the crosshatching should be:

L = 8 x 70 = 560 ft.

A 4 foot shoulder in advance of a bridge reduces to 2 feet on a 40 MPH roadway. The length of the crosshatching should be:

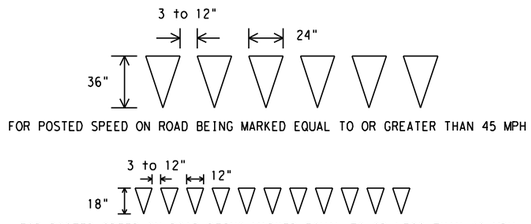
L = 4(40)² / 60 = 106.67 ft. rounded to 110 ft.

GENERAL NOTES

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

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

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



YIELD LINES

Texas Department of Transportation
Traffic Operations Division

TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-12

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

REVISIONS	CONT	SECT	JOB	HIGHWAY
8-95 2-12	0924	06	419	DAVIS
5-00	DIST	COUNTY		SHEET NO.
8-00	ELP	ELP		C 75
3-03				

22A

DATE: 4/17/2020 11:40:44 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Standards\SIGN & PAV MRKS\pm1-12.dgn

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

SM RD SGN ASSM TY XXXXX(X)XX(X-XXXX)

Post Type

FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
TWT = Thin-Walled Tubing (see SMD(TWT))
10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

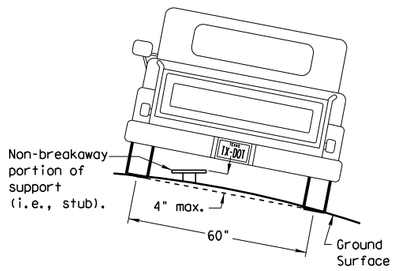
Anchor Type

UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
WS = Wedge Anchor Steel - (see SMD(TWT))
WP = Wedge Anchor Plastic (see SMD(TWT))
SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation

P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-1))

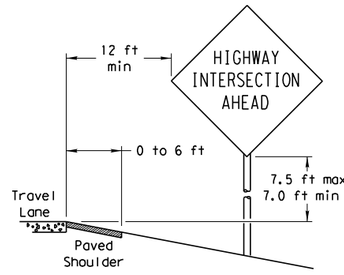
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

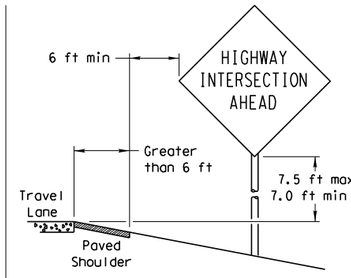
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

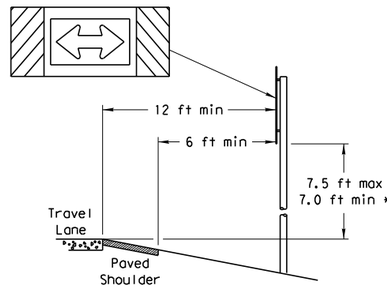
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



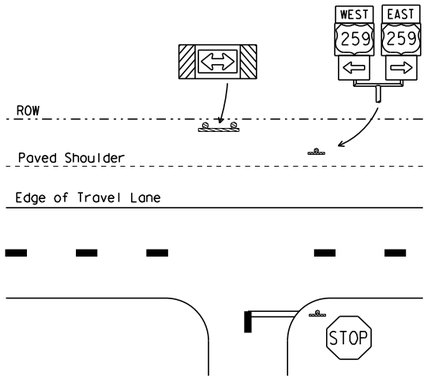
GREATER THAN 6 FT. WIDE

When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

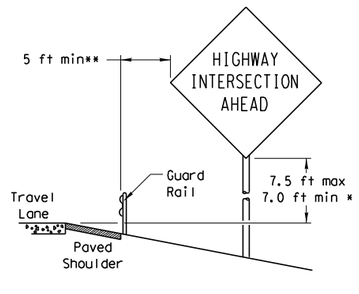
T-INTERSECTION



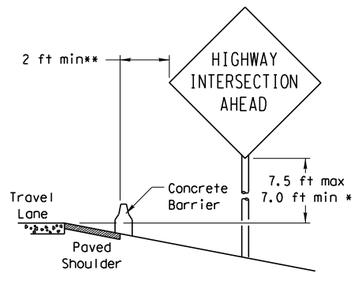
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



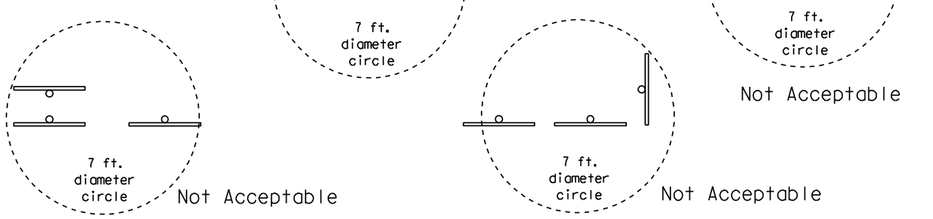
BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

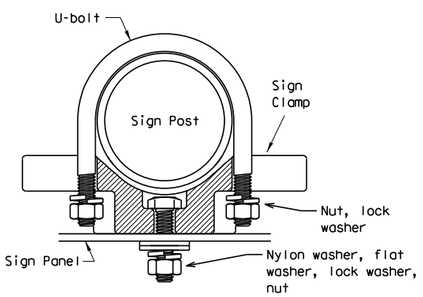
**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

No more than 2 sign posts should be located within a 7 ft. circle.



TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

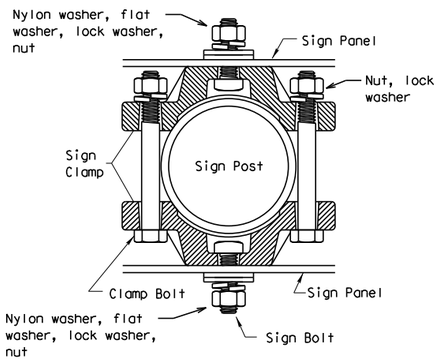


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

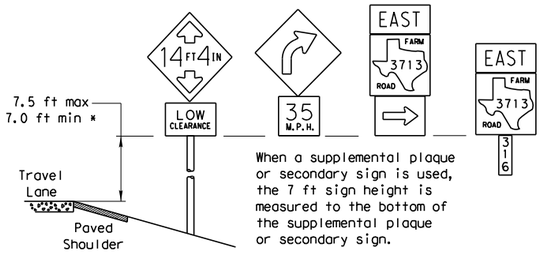
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



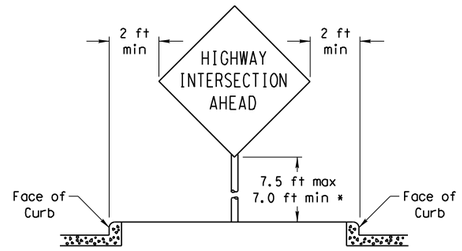
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



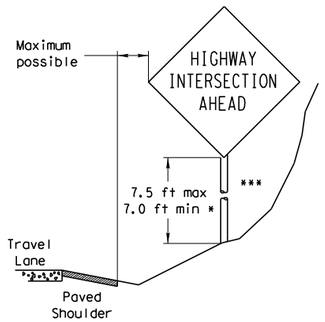
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

* Signs shall be mounted using the following condition that results in the greatest sign elevation:

(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website address is:
http://www.txdot.gov/publications/traffic.htm

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

REVISIONS
9-08

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

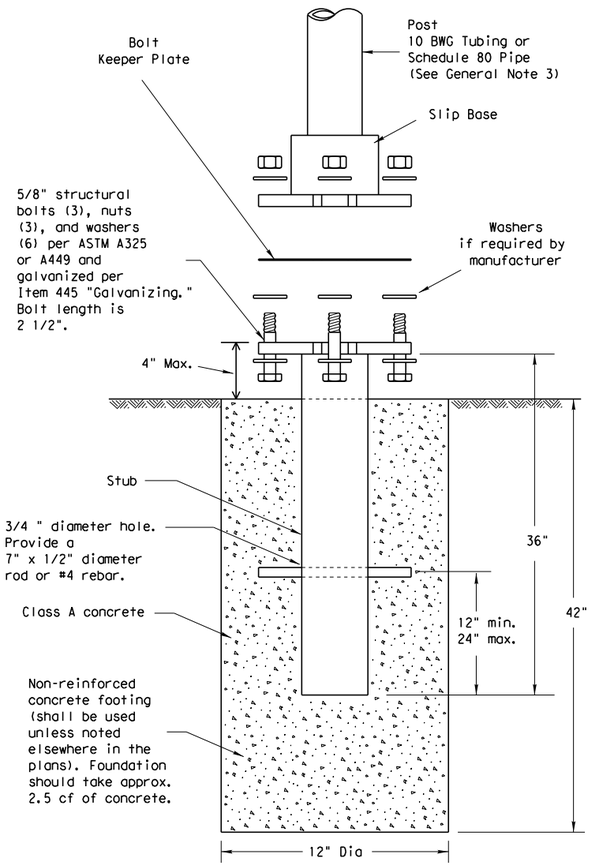
CONT	SECT	JOB	HIGHWAY
0924	06	419	DAVIS

DIST	COUNTY	SHEET NO.
ELP	ELP	C 76

26A

DATE: 4/17/2020 11:40:45 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Standards\SIGN & PAV MRKS\smdgen.dgn

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



SM RD SGN ASSM TY XXXXX(X)SA(X-XXXX)

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   - 0.134" nominal wall thickness
   - Seamless or electric-resistance welded steel tubing or pipe
   - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   - Other steels may be used if they meet the following:
     - 55,000 PSI minimum yield strength
     - 70,000 PSI minimum tensile strength
     - 20% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.

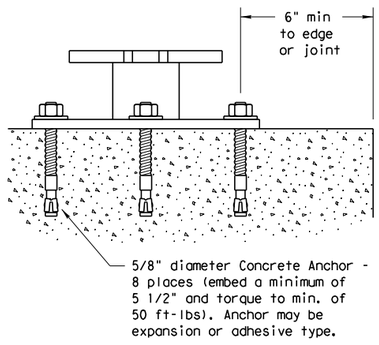
   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum yield strength
     - 62,000 PSI minimum tensile strength
     - 21% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   - Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support
1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



SM RD SGN ASSM TY XXXXX(X)SB(X-XXXX)

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

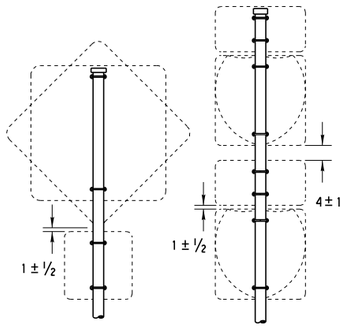
Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

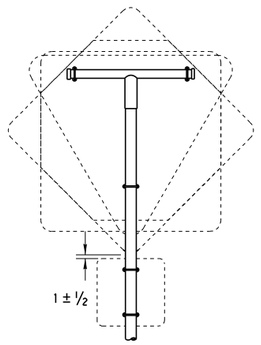
SMD(SLIP-1)-08

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 77

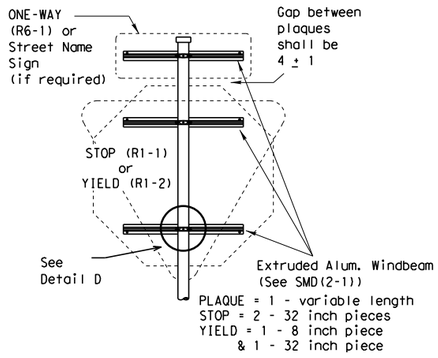
DATE: 4/17/2020 11:40:46 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Standards\SIGN & PAV MRKS\smds1.dgn



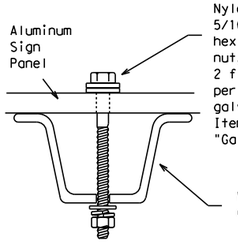
SM RD SGN ASSM TY XXXXX(1)XX(P)



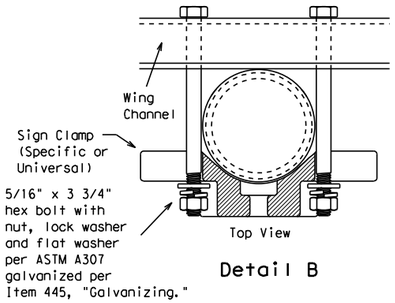
SM RD SGN ASSM TY XXXXX(1)XX(T)



SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



Detail A



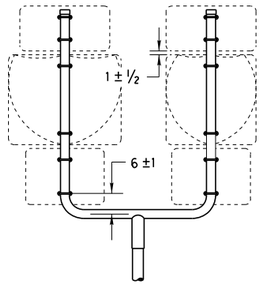
Detail B

GENERAL NOTES:

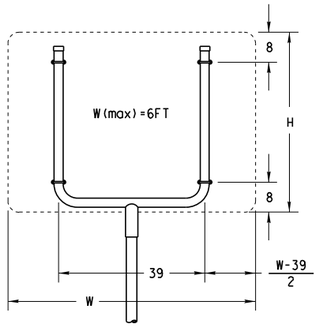
1.

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

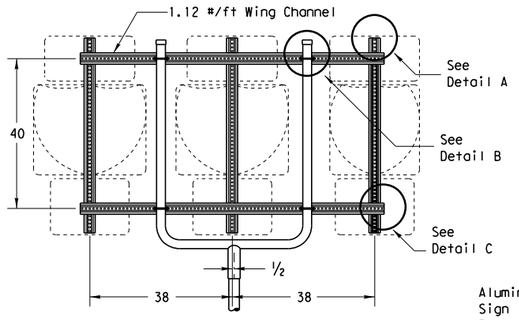
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material 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.



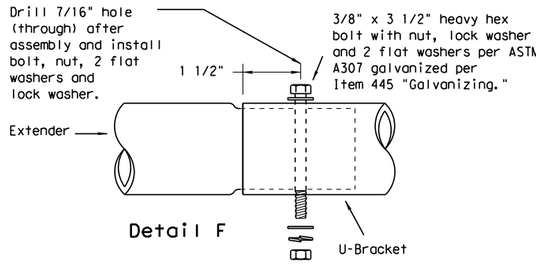
SM RD SGN ASSM TY XXXXX(1)XX(U)



SM RD SGN ASSM TY XXXXX(1)XX(U)

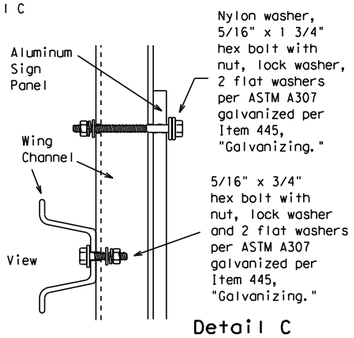


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

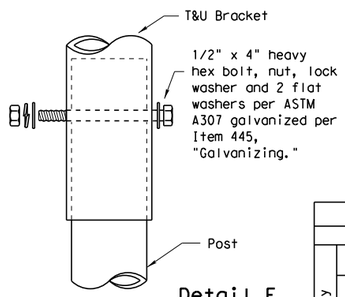


Detail F

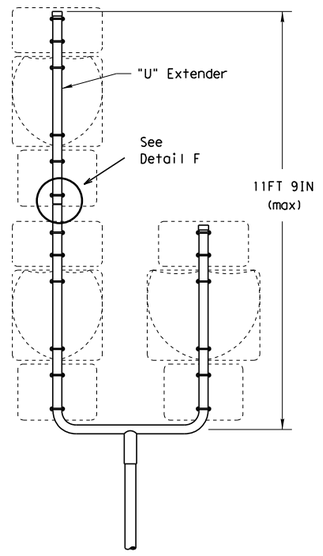
Splices shall only be allowed behind the sign substrate.



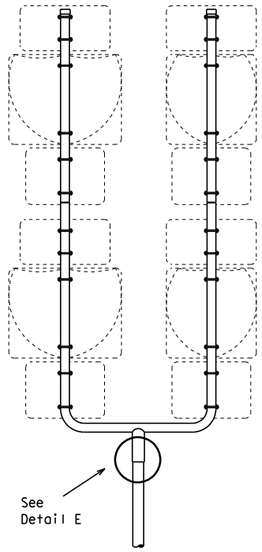
Detail C



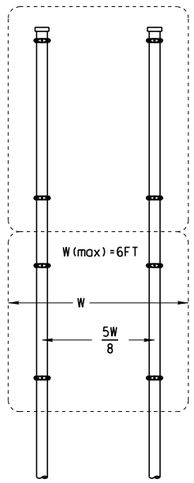
Detail E



SM RD SGN ASSM TY S80(1)XX(U-1EXT)

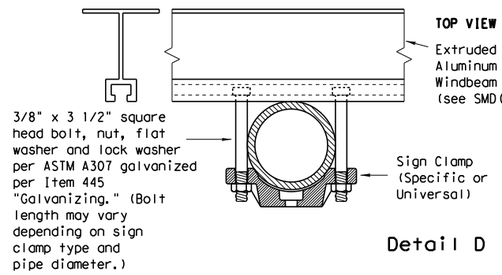


SM RD SGN ASSM TY S80(1)XX(U-2EXT)

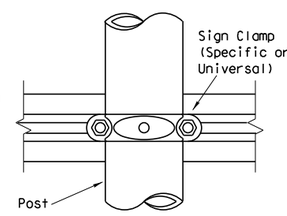


SM RD SGN ASSYM TY XXXXX(2)XX(P)

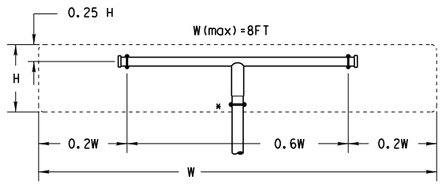
SIDE VIEW



Detail D



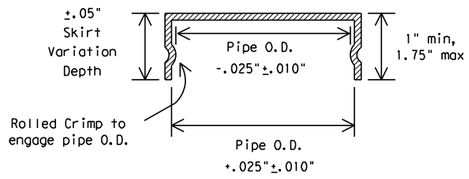
REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)



SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

All dimensions are in english unless detailed otherwise.

FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

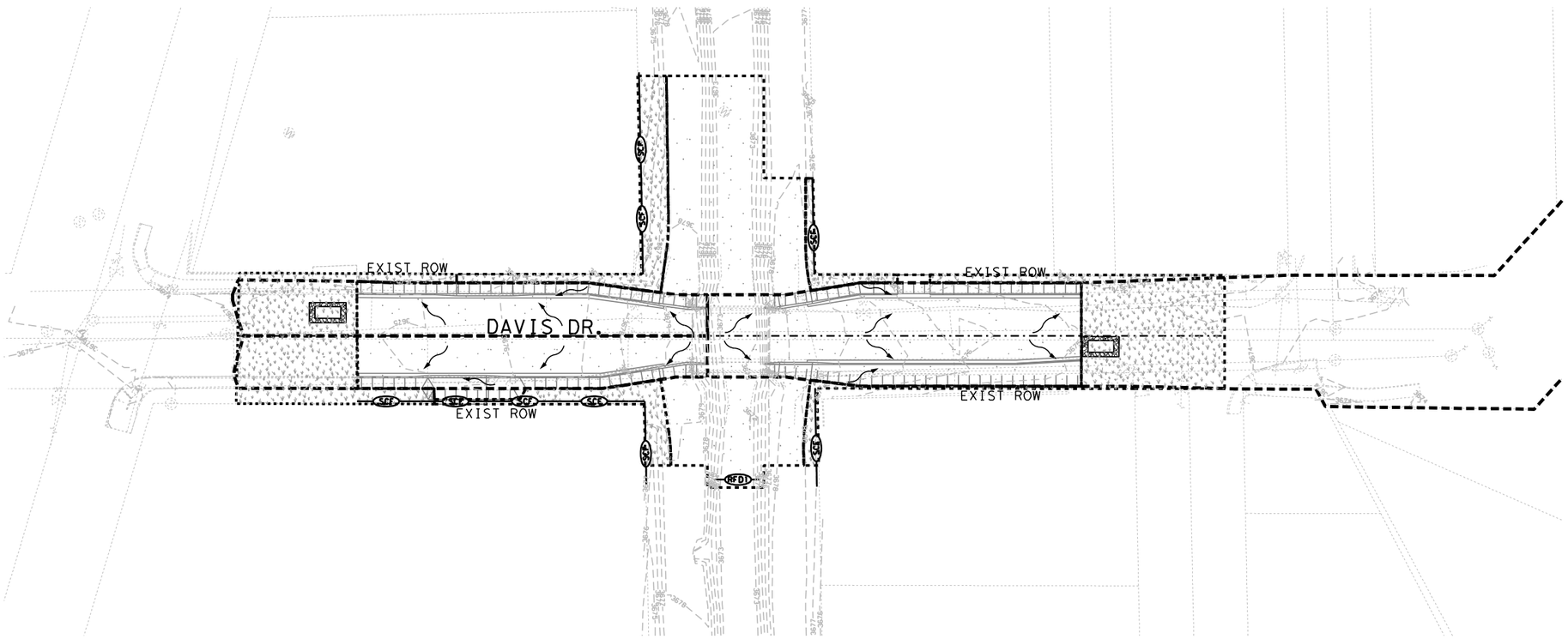
SMD(SLIP-2)-08

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

REVISIONS	CONT	SECT	JOB	HIGHWAY
9-08	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 78

DATE: 4/17/2020 11:40:47 AM
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Standards\SIGN & PAV MRKS\smds2.dgn

ESTIMATED QUANTITIES				
ITEM	CODE	DESCRIPTIONS	UNIT	QTY
506	6001	ROCK FILTER DAMS (INSTALL) (TY 1)	LF	10
506	6011	ROCK FILTER DAMS (REMOVE)	LF	10
506	6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	111
506	6024	CONSTRUCTION EXITS (REMOVE)	SY	111
506	6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	345
506	6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	345



0 30′ 60′

SCALE: 1" = 60′

LEGEND

- DIRECTION OF FLOW
- RFDI — TY I ROCK FILTER DAM
- SCF — SILT FENCE
- CONSTRUCTION EXIT (55.5 SY TYP)
- DISTURBED AREA
- UNDISTURBED AREA

ESTIMATED 55.5 SY CONSTRUCTION EXIT PER LOCATION UNLESS OTHERWISE INDICATED.

REFERENCES – BENCHMARKS

FILE:
REFER TO ROW & SURVEY CONTROL SHEETS FOR ADDITIONAL ROW AND BENCHMARK INFORMATION.

BY	REMARKS	DATE

ENGINEER'S SEAL

ARLENE FRESQUEZ
106510
LICENSED PROFESSIONAL ENGINEER
4/17/2020

SCALE HOR: 1"=60' VER: N/A

DATE 4/17/2020
DESIGN BY AM
DRAWN BY PG/RG/DN
CHKD. BY EC
APPD. BY JP

PROJECT NAME

DAVIS BRIDGE REPLACEMENT ACROSS FRANKLIN CANAL

CAPITAL IMPROVEMENT DEPARTMENT CITY OF EL PASO

CONSOR F-12040
1501 N. MESA, STE #200, EL PASO, TX 79902
PHONE: (915) 313-3680

SHEET TITLE

SWP3 LAYOUT

SHEET
C 79 OF C 97

238618

11:41:07 AM
4/17/2020
H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Environmental\C_419_S_EEC02.dgn

4/17/2020 11:41:07 AM H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Environmental\C_419_S_EEC02.dgn

STORM WATER POLLUTION PREVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with TPDES General Permit TXR150000. The operator, The Texas Department of Transportation ensures that: Project specifications provide that adequate BMPs have been developed for this project. The contractor shall be the party responsible for implementing the BMPs described herein. The contractor shall implement changes approved by the Project Engineer to the SWP3 within the times specified in the SWP3 or the TPDES General Permit. Operators affected by modifications to specifications will be notified in a timely manner.

1. SITE OR PROJECT DESCRIPTION:

NATURE OF THE CONSTRUCTION ACTIVITY: SEE TITLE SHEET

POTENTIAL POLLUTANTS AND SOURCES:

Sediment laden storm water	*Storm water conveyance over disturbed areas*
Fuels, oils, and lubricants	*Construction vehicles*
Construction debris and waste	*Various construction activities*
Sanitary waste	*Restroom facilities*
Trash	

SEQUENCE OF ACTIVITIES THAT WILL DISTURB SOILS:

1. *PREP EXISTING ROW, REMOVE BRIDGE, SIDEWALKS, ADA RAMPS AND DRIVEWAYS.*
2. *EXCAVATE AND INSTALL DRILL SHAFTS FOR NEW BRIDGE. CONSTRUCT NEW BRIDGE. INSTALL HEADWALLS, WINGWALLS AND RIPRAP. CONSTRUCT SIDEWALKS AND DRIVEWAYS.*
3. *REMOVE ASPHALT, FLEX BASE AND RECONSTRUCT PAVEMENT. INSTALL CURB AND FINISH SIDE SLOPES.*
4. *CLEAN UP PROJECT.*
5.
6.

AREAS:

TOTAL AREA OF PROJECT: 0.43 ACRES *(Area within ROW between project limits)*

TOTAL AREA OF SOIL DISTURBANCE: 0.29 ACRES

TOTAL AREA OFF-SITE: 0.00

WEIGHTED RUNOFF COEFFICIENT (BEFORE AND AFTER CONSTRUCTION): *0.90*

DATA DESCRIBING THE SOIL: *Sand, Fine to medium grained, Silty and Clayey.*

GENERAL LOCATION MAP: SEE TITLE SHEET

THE LOCATION AND DESCRIPTION OF CONCRETE AND ASPHALT PLANTS:

Supporting Concrete Plant Facilities shall be located off site.
Supporting Asphalt Plant Facilities shall be located off site.

NAME OF RECEIVING WATERS: *Pond on site along right of way until it evaporates.*

A COPY OF TPDES CGP TXR150000 IS INCLUDED IN THE SWP3 FILE.

REMARKS: *See Environmental Assessment for environmental, archeological, and historical documentation.*

401 WATER QUALITY CERTIFICATION: YES____ NO__X__

2. BEST MANAGEMENT PRACTICES (BMPs):

EROSION AND SEDIMENT CONTROLS: Erosion and sediment controls have been designed to retain sediment on-site. Controls shall be utilized to reduce off site transport of suspended sediments and pollutants if it is necessary to pump water from the site. Control measures shall be installed per specifications or as directed by the Project Engineer. Sediment must be removed from controls per the plan requirements or manufacturers recommendations, but no later than the time that design capacity has been reduced by 50%. If sediment escapes the site, accumulations will be removed to minimize further negative effects. Controls will be developed to limit the off site transportation of litter, construction debris, and construction materials.

INTERIM (INT), PERMANENT (PER), AND 401 CERTIFICATION BMP'S:

EROSION CONTROLS:	401	INT	PER
☐ *Compaction & Tracking of slopes*	__	__	__
☐ *Diversion Dike*	__	__	__
☐ *Preserve Existing Vegetation*	__	__	__
☐ *Soil Stabilization*	__	__	__
☐ *Permanent Vegetation*	__	__	__
☒ *No Erosion Controls are Required.*			

SEDIMENT CONTROLS:	401	INT	PER
☒ *Silt Fence*	__	✓	__
☒ *Rock Berm*	__	✓	__
☐ *Buffer Zones*	__	__	__
☐ *Vegetative Filter Strips*	__	__	__
☐ *Ditch Block*	__	__	__
☐ *No Sediment Controls are Required.*			
☒ *Other: Erosion Control Logs (INT)*			

POST CONSTRUCTION TSS CONTROL (401 CERTIFICATION ONLY):

- ☐ *Vegetation Lined Drainage Ditch*
- ☐ *Retention/Irrigation*
- ☐ *Erosion Control Compost*
- ☐ *Grassy Swales*
- ☐ *Vegetative Filter Strips*
- ☒ *No Post Construction TSS Control Required.*

The El Paso District of the Texas Department of Transportation uses Site-Manager, a computer based construction record-keeping system. Documentation describing grading activities, temporary or permanent cessation of construction, and stabilization measures is a part of this system and is incorporated by reference into this SWPPP.

3. STRUCTURAL CONTROL PRACTICES:

Structural control practices for this project are listed elsewhere herein.

4. PERMANENT STORM WATER CONTROLS:

Structural control practices installed during construction will be maintained and inspected after construction has ceased on the site and until final stabilization is attained. Unless specified in the plans, after project acceptance TxDOT will assume maintenance responsibilities for the controls and measures. Other permanent controls include existing and proposed; riprap at culvert inlets and outlets, diversion dikes, swales, retaining walls, and other similar devices.

5. OTHER CONTROLS:

OFF-SITE VEHICLE TRACKING OF SEDIMENTS AND THE GENERATION OF DUST: The off site vehicle tracking of sediments shall be minimized by removal of excess dirt from the road and at entrances to the work site. The generation of dust will be minimized as directed by the Project Engineer by dampening haul roads and covering haul trucks with a tarpaulin.

CONSTRUCTION AND WASTE MATERIALS: The contractor will maintain a clean, orderly construction site. Construction waste including trash, rubble, scrap and vegetation shall be disposed of in lidded dumpsters or in a manner approved by the Project Engineer. Disposal methods must meet Federal, State, and Local waste management guidelines. No construction waste will be buried or burned on site. Spoils disposal, material storage, and materials resulting from the destruction of existing roads and structures shall be stored in areas designated by the Project Engineer and protected from run-off. All waterways shall be cleared of temporary embankment, temporary bridges, matting, false work, piling, debris, or other obstructions placed during construction operations, that are not part of the finished work, as soon as practicable. All excess soil generated by the construction will be collected and disposed of by the contractor. Disposal areas, stockpiles, and haul roads shall be constructed in a manner that will minimize and control the amount of sediment that may enter receiving waters. Disposal areas shall not be located in any wetland, water body, or stream bed.

POLLUTANT SOURCES FROM AREAS OTHER THAN CONSTRUCTION: Staging areas and vehicle maintenance areas shall be located and constructed in a manner to minimize the runoff of pollutants. If potential pollutant sources are identified after the start of construction, controls and measures shall be implemented as directed by the Project Engineer.

5. OTHER CONTROLS (CONT):

DEDICATED ASPHALT PLANTS: Asphalt or asphaltic material for this project will be produced off site. If the project requires a dedicated asphalt plant and the plant within 1 mile of the project limits it will be considered an off site PSL. Consideration shall be given to on site plant and storage facilities and measures implemented as directed by the Project Engineer.

DEDICATED CONCRETE PLANTS: Cement or Concrete material for this project will be produced off site. If the project requires a dedicated concrete plant and the plant is within 1 mile of the project limits it will be considered an off site PSL. Consideration shall be given to on site plant and storage facilities and measures implemented as directed by the Project Engineer. Concrete trucks shall be wasted or washed out in locations designated by the Project Engineer. The locations shall be protected by a berm sufficient to contain all waste and wash water. Wash water shall not be allowed to enter any storm drainage system or waterway. The residual material and contaminated soil shall be collected and disposed of in accordance with Federal, State, and Local guidelines. Staging areas and vehicle maintenance areas shall be located and constructed in a manner to minimize the runoff of pollutants.

HAZARDOUS MATERIALS AND SPILL REPORTING: The contractor shall take appropriate measures to prevent, minimize, and control the spillage or leakage of hazardous materials and any associated wastes on site and in maintenance and staging areas. Hazardous materials shall include but are not limited to paints, acids, solvents, asphalt products, chemical additives, curing compounds, oils, fuels, and lubricants. Hazardous materials shall not be stored, accumulated, or transported in open containers subject to precipitation or spillage, but shall be stored, accumulated, or transported in closed containers of the type recommended by the manufacturer. In the event of a spill the Project Engineer should be contacted immediately. All spills shall be immediately cleaned and any contaminated soil removed and disposed of in accordance with Local, State, and Federal laws. Fuel tanks shall be protected by a secondary containment, such as a lined berm, capable of containing 1.5 times the capacity of the tank, or as approved by the Project Engineer.

OFF SITE PSLs: All off site project specific locations including dedicated asphalt plants, concrete plants, or utility installations, required by the contractor, are the contractor's responsibility. The contractor shall secure all permits required by local, state, or federal laws for off site PSLs. The contractor shall provide diagrams and areas of disturbance for all PSL's within 1 mile of the project.

SANITARY FACILITIES: All sanitary or septic wastes that are generated onsite shall be treated and disposed of in accordance with state and local regulations. Raw sewage or septage shall not be discharged or buried on site. Precaution shall be taken to prevent illicit discharges to storm water. Licensed waste management contractors shall be required to dispose of sanitary waste. Porta johns will be required for the construction site or as directed by the Project Engineer.

VELOCITY DISSIPATION DEVICES: Velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel as shown in the plans or as directed by the Project Engineer to provide a non-erosive flow velocity from the structure to a watercourse so that the natural physical and biological characteristics and functions are maintained and protected.

7. MAINTENANCE:

Control measures shall be properly installed according to specifications. If inspections or other information indicates a control has been installed, used, or is performing inadequately, the contractor must replace or modify the control as soon as practicable after discovery. Control measures shall be maintained in effective operating condition. If inspections determine that BMPs are not operating effectively maintenance will be performed as necessary to continue the effectiveness of the controls. Maintenance must be accomplished as soon as practicable. Controls adjacent to creeks, culverts, bridges, and water crossings shall have priority. Controls that have been disabled, run over, removed, or otherwise rendered ineffective must be corrected immediately upon discovery.

8. INSPECTION OF CONTROLS:

A TxDOT inspector will inspect disturbed areas of the site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, and structural controls for evidence of, or the potential for, pollutants entering the drainage system. Sediment and erosion controls measures identified in the SWP3 will be inspected to ensure that they are operating correctly. Locations where vehicles enter or exit the site will be inspected for evidence of off-site vehicle tracking.

9. NON-STORM WATER COMPONENTS:

The contractor shall be required to implement appropriate pollution prevention controls and measures for all eligible non-storm water components of the discharge as approved and directed by the Project Engineer.

TxDOT STORM WATER POLLUTION PREVENTION PLAN (SWP3) (SOIL DISTURBANCE LESS THAN 1 ACRE)

Texas Department of Transportation

STATE OF TEXAS — ARLENE FRESQUEZ — 106510 — REGISTERED ENGINEER

4/17/2020

FED. RD. DIV. NO.			SHEET NO.
6			C 80
STATE	STATE DIST.	COUNTY	
TEXAS	ELP	EL PASO	
CONT.	SECT.	JOB	HIGHWAY NO.
0924	06	419	DAVIS

REV: 07-2014

TIME PRINTED: 11:41:10 AM
DATE PRINTED: 4/17/2020
FILE NAME: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Environmental\C*419*S*EEC01.dgn

DATE:
FILE:

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1.

2.

☐ No Action Required ☒ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas.

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 (1/10 to <1/2 acre, 1/3 in tidal waters)
☐ Individual 404 Permit Required
☐ Other Nationwide Permit Required: NWP# _____

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post-project TSS.

1. Project requires a NWP 14 with PCN due to work within the Franklin Canal.
2.
3.
4.

The elevation of the ordinary high water marks of any areas requiring work to be performed in the waters of the US requiring the use of a nationwide permit can be found on the Bridge Layouts.

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
☐ Temporary Vegetation	☒ Silt Fence	☐ Vegetative Filter Strips
☐ Blankets/Matting	☒ Rock Berm	☐ Retention/Irrigation Systems
☐ Mulch	☐ Triangular Filter Dike	☐ Extended Detention Basin
☐ Sodding	☐ Sand Bag Berm	☐ Constructed Wetlands
☐ Interceptor Swale	☐ Straw Bale Dike	☐ Wet Basin
☐ Diversion Dike	☐ Brush Berms	☐ Erosion Control Compost
☐ Erosion Control Compost	☐ Erosion Control Logs	☐ Mulch Filter Berm and Socks
☐ Mulch Filter Berm and Socks	☐ Mulch Filter Berm and Socks	☐ Compost Filter Berm and Socks
☐ Compost Filter Berm and Socks	☐ Compost Filter Berm and Socks	☐ Vegetation Lined Ditches
	☐ Stone Outlet Sediment Traps	☐ Sand Filter Systems
	☐ Sediment Basins	☐ Grassy Swales

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications 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.

☐ No Action Required ☒ Required Action

Action No.

1. In the event that unanticipated archeological deposits/findings are encountered during construction operations, work in the immediate area shall cease. Contractor shall contact TxDOT archeological staff such that post-review discovery procedures are implemented.
2. Contractor shall non re-initiate construction operations until authorized, in writing, from TxDOT archeological staff.

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.
Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

☐ No Action Required ☒ Required Action

Action No.

1. Do not disturb vegetation and/or soils beyond existing pavement limits.
2. Minimize disturbance to existing/native vegetation throughout project limits.
3. In accordance with Executive Order 3112 on Invasive Species, seeding and replanting with TxDOT approved seeding specifications will be performed where possible.

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS.

☐ No Action Required ☒ Required Action

Action No.

1. Migratory Bird Nest: Schedule construction activities, as needed, to meet the following protective requirements:
   a. Do not remove or destroy any active migratory bird nest (including nests containing eggs and/or flightless birds) at anytime of the year. Should there be any active nests, they shall remain undisturbed until the nest becomes inactive.
   b. On/in structures, should there be an inactive nests, surrounding nests shall remain undisturbed until all nests become inactive. Upon removal of nests and/or before nesting activities begin, contractor shall install deterrent materials to the structures to inhibit wildlife from building future nests.
2. The project area contains potential habitat for the Pecos River muskrat. Avoid harming them if encountered, and avoid unnecessary impacts to dens and lodges.
3. The project area contains potential habitat for the Woodhouse's toad. Avoid harming them if encountered.

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediate area, and contact the Engineer immediately.

LIST OF ABBREVIATIONS

BMP:	Best Management Practice	SPCC:	Spill Prevention Control and Countermeasure
CGP:	Construction General Permit	SW3P:	Storm Water Pollution Prevention Plan
DSHS:	Texas Department of State Health Services	PCN:	Pre-Construction Notification
FHWA:	Federal Highway Administration	PSL:	Project Specific Location
MOA:	Memorandum of Agreement	TCEQ:	Texas Commission on Environmental Quality
MOU:	Memorandum of Understanding	TPDES:	Texas Pollutant Discharge Elimination System
MS4:	Municipal Separate Stormwater Sewer System	TPWD:	Texas Parks and Wildlife Department
MBTA:	Migratory Bird Treaty Act	TxDOT:	Texas Department of Transportation
NOT:	Notice of Termination	T&E:	Threatened and Endangered Species
NWP:	Nationwide Permit	USACE:	U.S. Army Corps of Engineers
NOI:	Notice of Intent	USFWS:	U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) 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 Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the 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 (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

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 is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

☐ Yes ☒ No

If "Yes", then TxDOT must retain a 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 demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

☒ No Action Required ☐ Required Action

Action No.

1.

2.

VII. OTHER ENVIRONMENTAL ISSUES

(includes regional issues such as Edwards Aquifer District, etc.)

☐ No Action Required ☒ Required Action

Action No.

1. Minimize particulate matter emissions by using on-going dust control measures, as indicated in Standard Specifications. The Texas Emission Reduction Plan (TERP) provides financial incentives to reduce emissions from vehicles and equipment. TxDOT encourages construction Contractors to use this and other local and/or federal incentive programs to the fullest possible extent, in an effort to minimize fossil fuel emissions.

STATE OF TEXAS
ARLENE FRESQUEZ
106510
LICENSED
PROFESSIONAL ENGINEER

5/1/2020

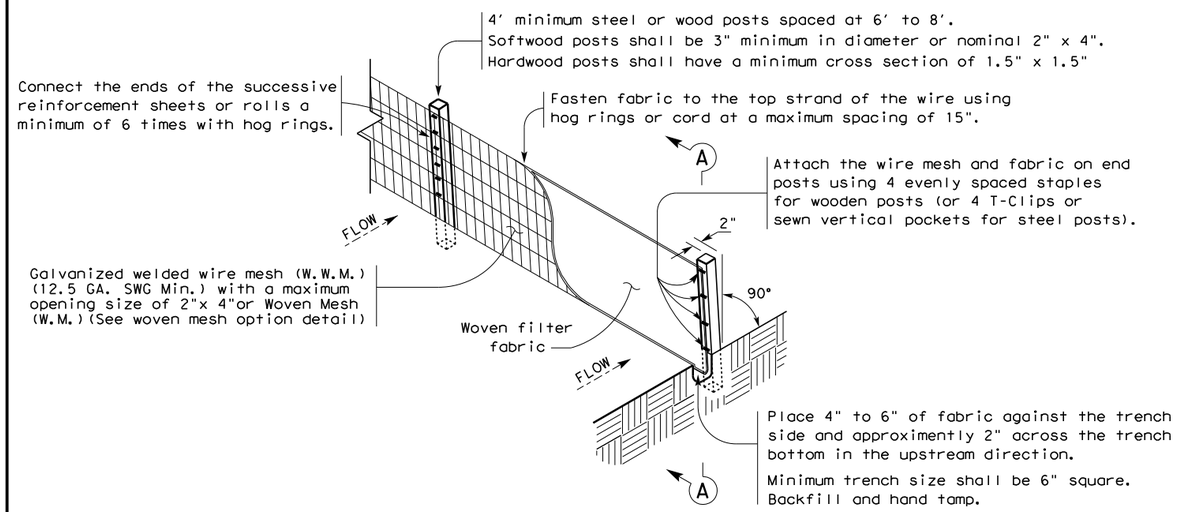
Texas Department of Transportation — Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

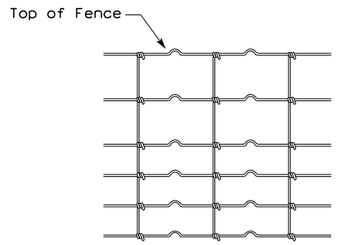
FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-12-2011 (DS) 05-07-14 ADDED NOTE SECTION IV. 01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	EL PASO		C 81

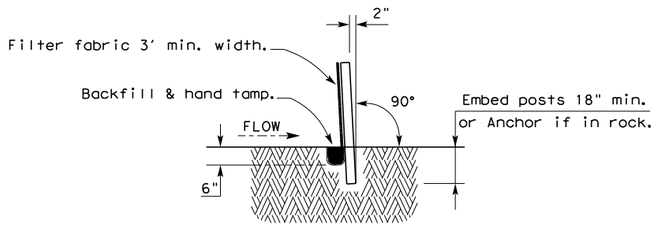
FILE: C:\PROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Standards\ec116.dgn
DATE: 2020



TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

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^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

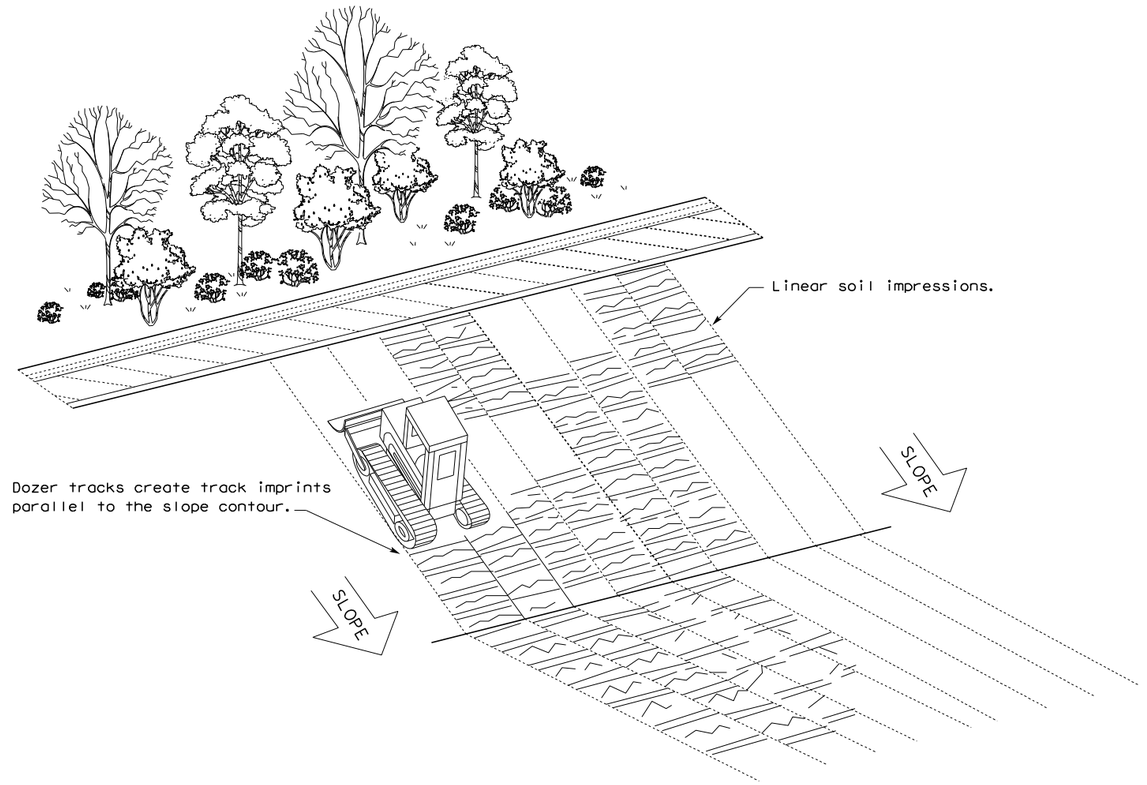
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



VERTICAL TRACKING

Texas Department of Transportation

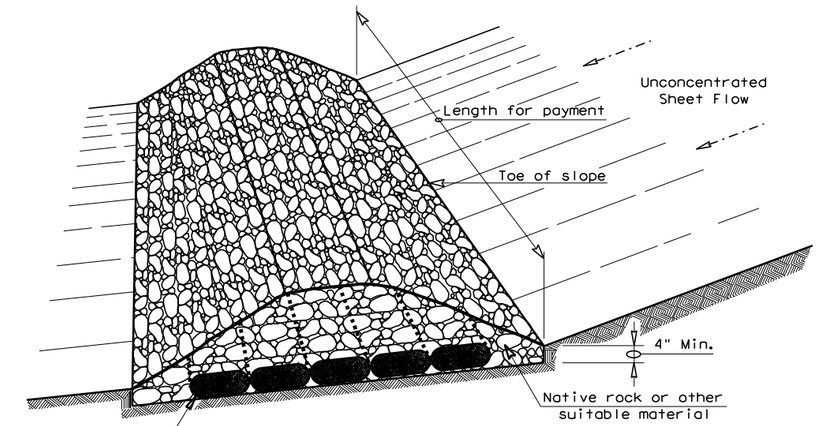
Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

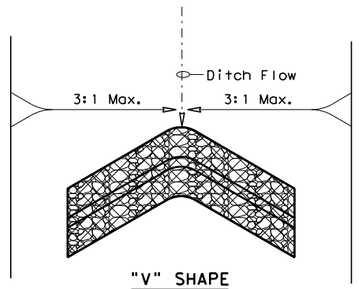
EC(1)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 82

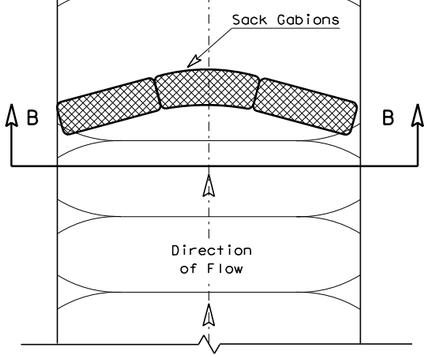


FILTER DAM AT TOE OF SLOPE

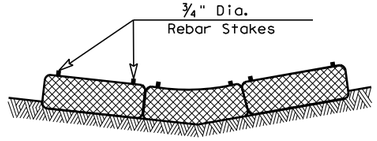
RFD1



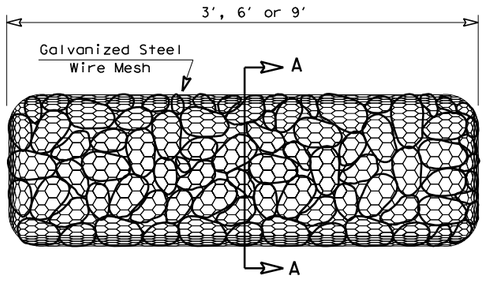
"V" SHAPE
PLAN VIEW



PLAN VIEW

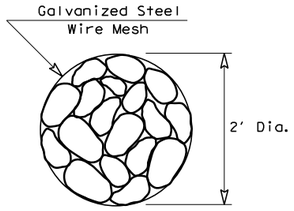


SECTION B-B

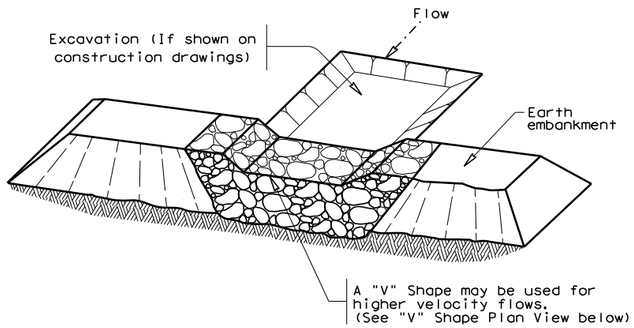


TYPE 4 (SACK GABIONS)

RFD4

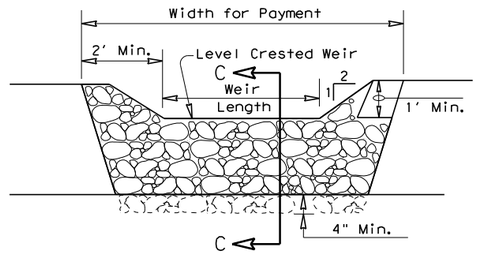


SECTION A-A

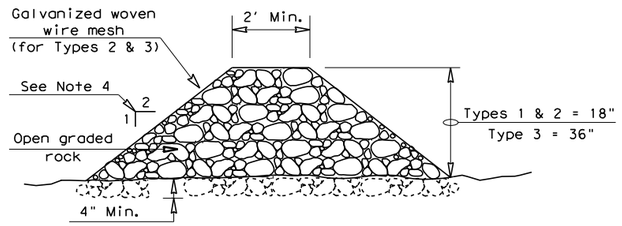


FILTER DAM AT SEDIMENT TRAP

RFD1 OR RFD2



PROFILE



SECTION C-C

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT^2 of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

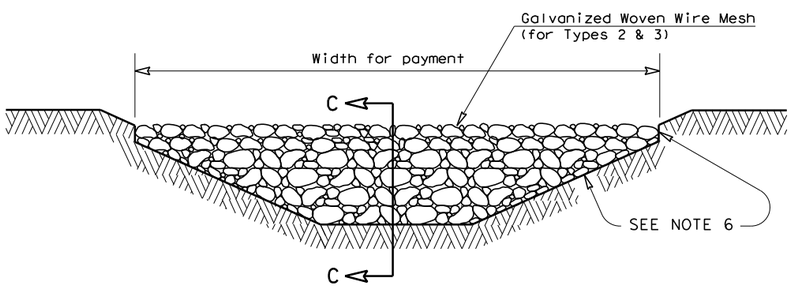
Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximently 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh) (3" to 6" aggregate): Type 2 may be used in ditches and at dike or swale outlets.

Type 3 (36" high with wire mesh) (4" to 8" aggregate): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions) (3" to 6" aggregate): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

Type 5: Provide rock filter dams as shown on plans.



FILTER DAM AT CHANNEL SECTIONS

RFD1 OR RFD2 OR RFD3

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with ¾" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 ½" x 3 ¼"
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

PLAN SHEET LEGEND

Type 1 Rock Filter Dam	RFD1
Type 2 Rock Filter Dam	RFD2
Type 3 Rock Filter Dam	RFD3
Type 4 Rock Filter Dam	RFD4

Texas Department of Transportation

Design Division Standard

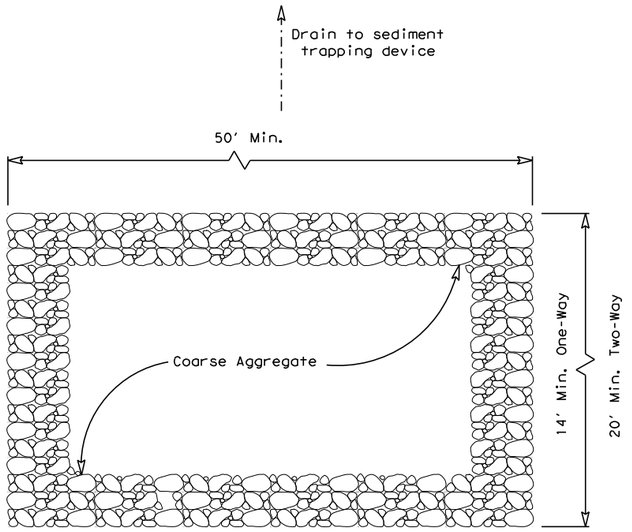
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

ROCK FILTER DAMS

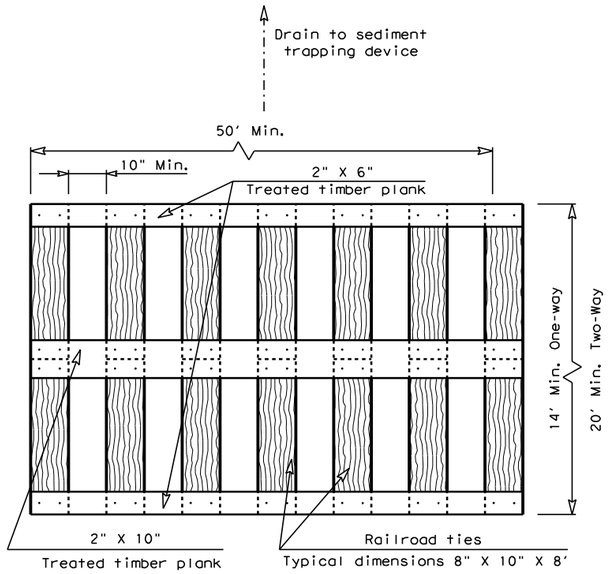
EC(2)-16

FILE: ec216	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 83

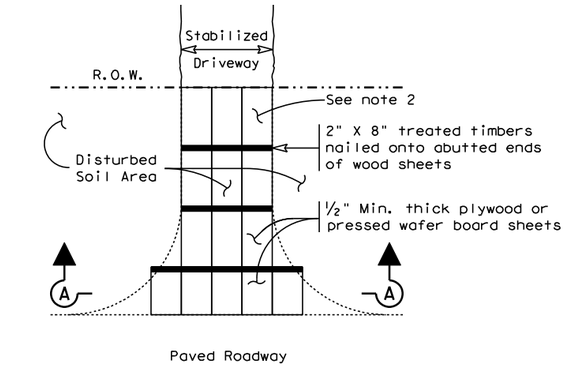
DATE: 4/17/2020
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Standards\ec216.dgn



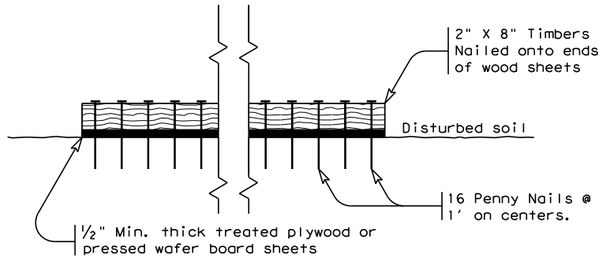
PLAN VIEW



PLAN VIEW



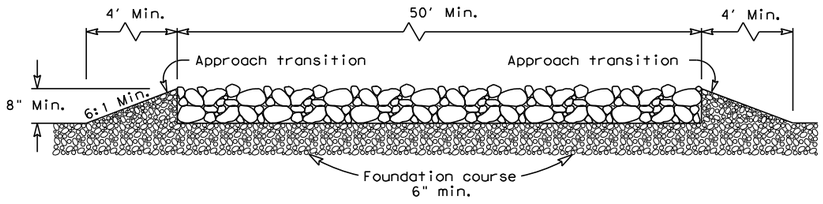
PLAN VIEW



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

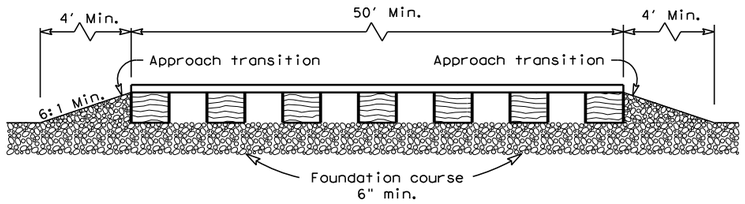
SHORT TERM



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK CONSTRUCTION (LONG TERM)



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

1. The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50'.
2. The coarse aggregate should be open graded with a size of 4" to 8".
3. The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
4. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other materialas approved by the Engineer.
5. The construction exit shall be graded to allow drainage to a sediment trapping device.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
7. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 2)

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
2. The treated timber planks shall be attached to the railroad ties with ½"x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
8. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 3)

1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

Texas Department of Transportation

Design Division Standard

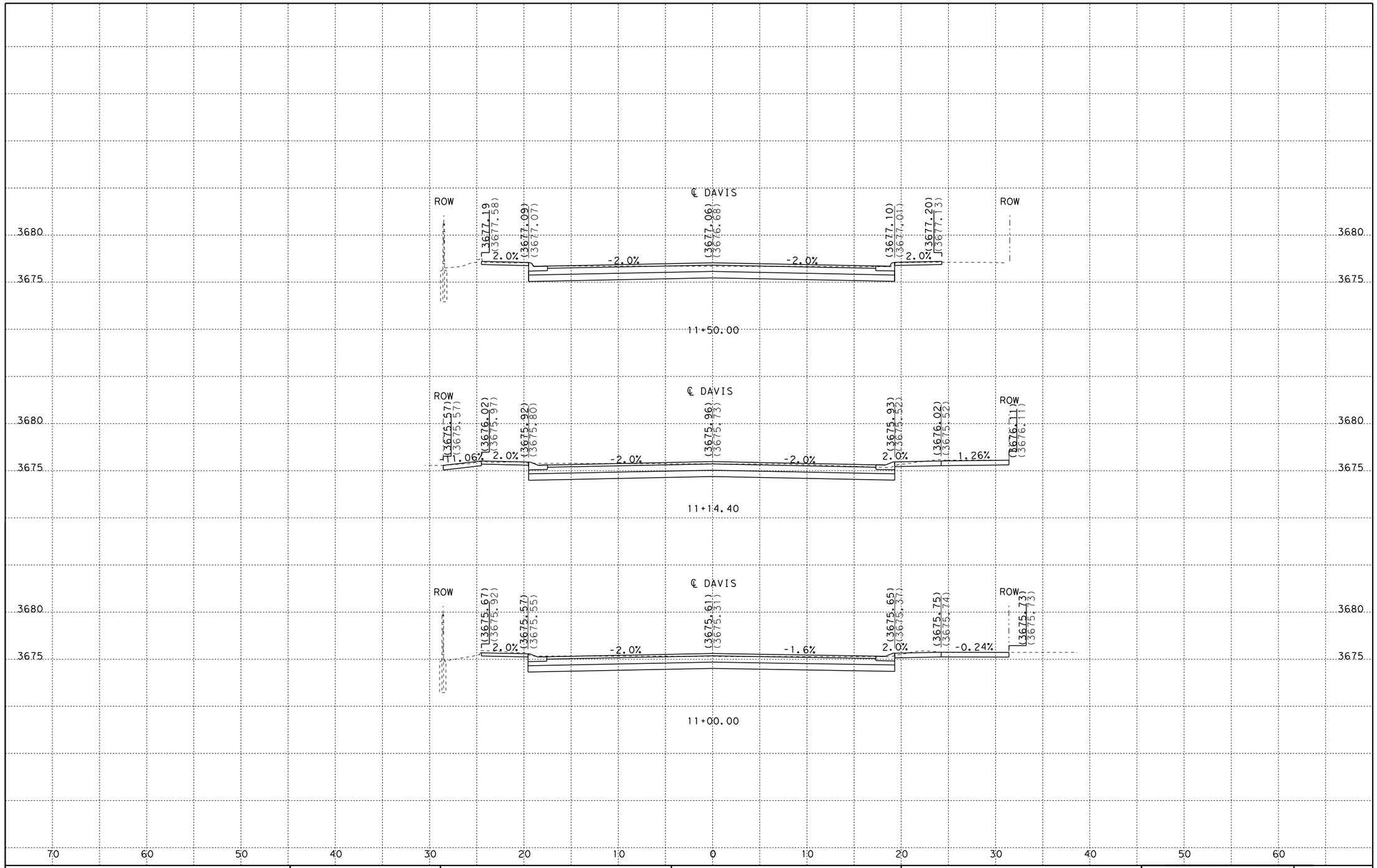
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

EC(3)-16

FILE: ec316	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0924	06	419	DAVIS
	DIST	COUNTY		SHEET NO.
	ELP	ELP		C 84

DATE: 4/17/2020
FILE: H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Standards\ec316.dgn



FOR CONTRACTOR'S INFORMATION ONLY

4/17/2020

SCALE
HOR: 1"=5'
VER: 1"=5'

DATE 4/17/2020
DESIGN BY CV
DRAWN BY CV
CHKD. BY FC
APPD. BY FC

CONSOR
F-12040

CAPITAL IMPROVEMENT
CITY OF EL PASO

PROJECT NAME

DAVIS
BRIDGE REPLACEMENT
CROSS-SECTIONS
SHEET 1 OF 4

REFERENCES – BENCHMARKS
FILE:

DATE	REVISIONS	BY

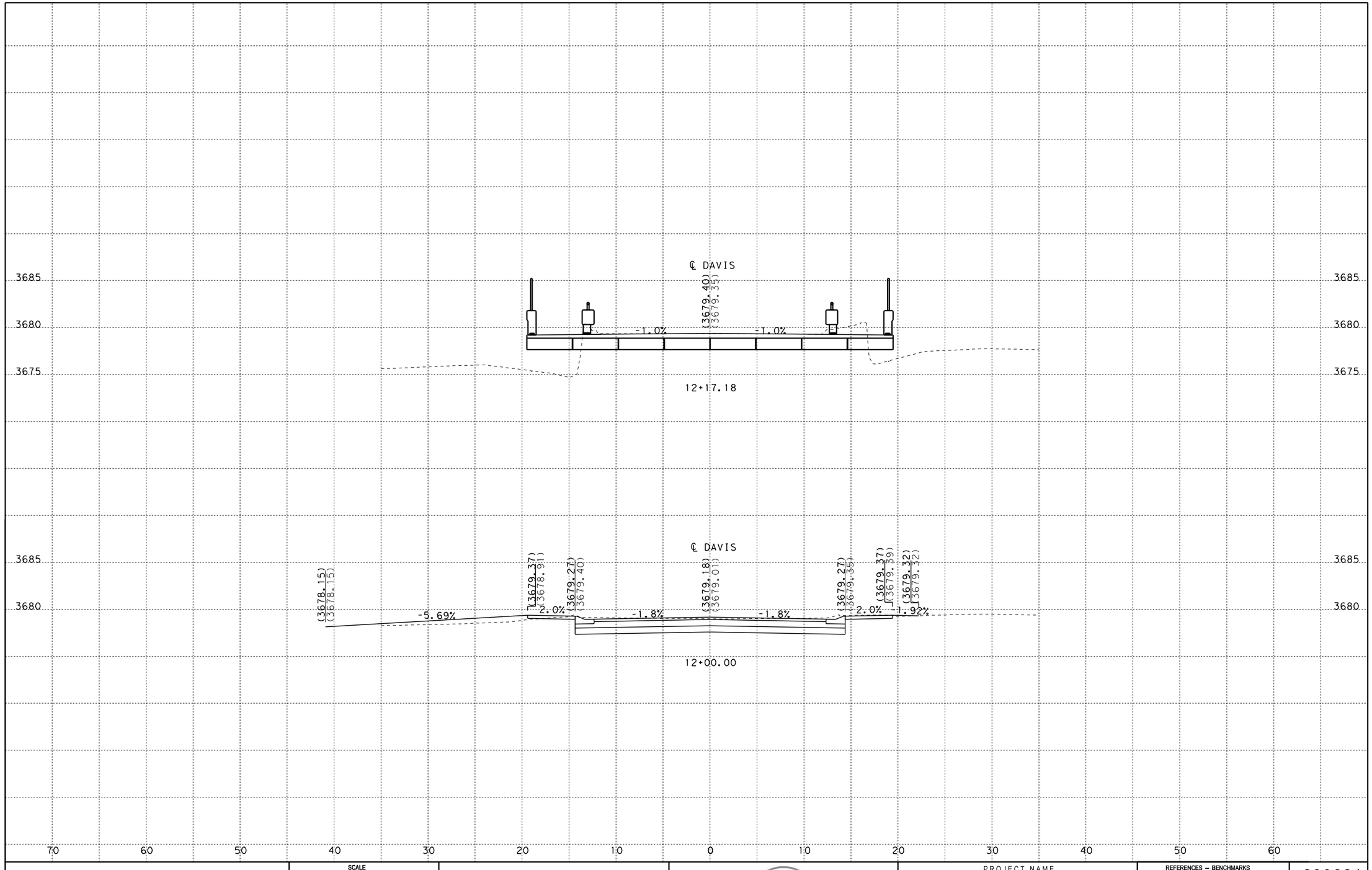
238621

SHEET
C 85 OF C 97

H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_B_XS01_SHEETS.DGN

H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_B_XS01_SHEETS.DGN
11:41:20 AM
4/17/2020

4/17/2020 11:41:20 AM



FOR CONTRACTOR'S INFORMATION ONLY

4/17/2020

SCALE
HOR: 1"=5'
VER: 1"=5'

DATE 4/17/2020
DESIGN BY CV
DRAWN BY CV
CHKD. BY FC
APPD. BY FC

CONSOR
F-12040

CAPITAL IMPROVEMENT
CITY OF EL PASO

PROJECT NAME
DAVIS
BRIDGE REPLACEMENT
CROSS-SECTIONS
SHEET 2 OF 4

REFERENCES – BENCHMARKS
FILE:

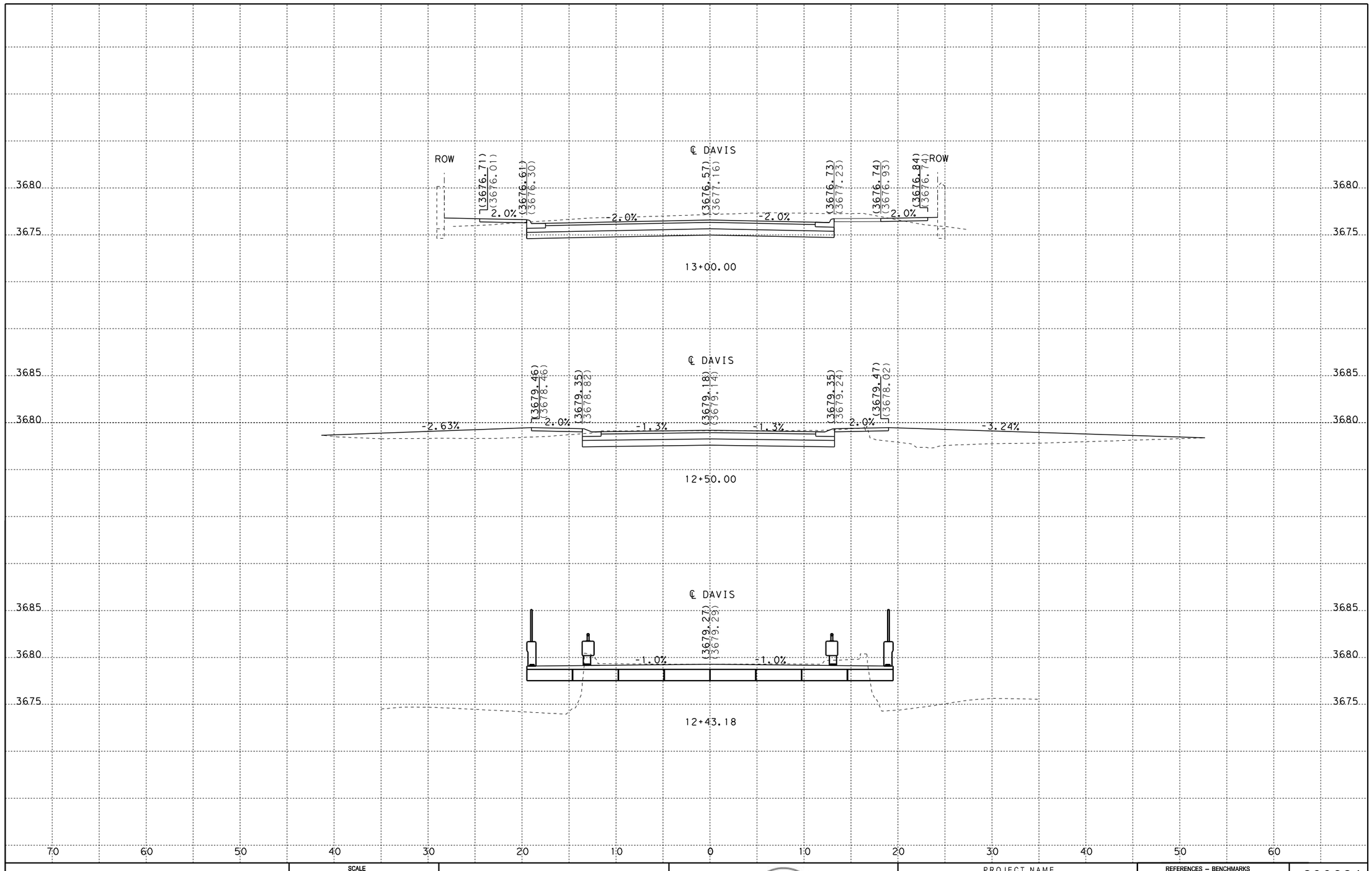
DATE	REVISIONS	BY

238621

SHEET
C 86 OF C 97

H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_B_XS01_SHEETS.DGN

H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_B_XS01_SHEETS.DGN
11:41:20 AM
4/17/2020



FOR CONTRACTOR'S INFORMATION ONLY

4/17/2020

SCALE	
HOR:	1"=5'
VER:	1"=5'
DATE	4/17/2020
DESIGN BY	CV
DRAWN BY	CV
CHKD. BY	FC
APPD. BY	FC

CONSOR

F-12040

CAPITAL IMPROVEMENT
CITY OF EL PASO

PROJECT NAME

DAVIS
BRIDGE REPLACEMENT
CROSS-SECTIONS
SHEET 3 OF 4

REFERENCES – BENCHMARKS

FILE:

DATE	REVISIONS	BY

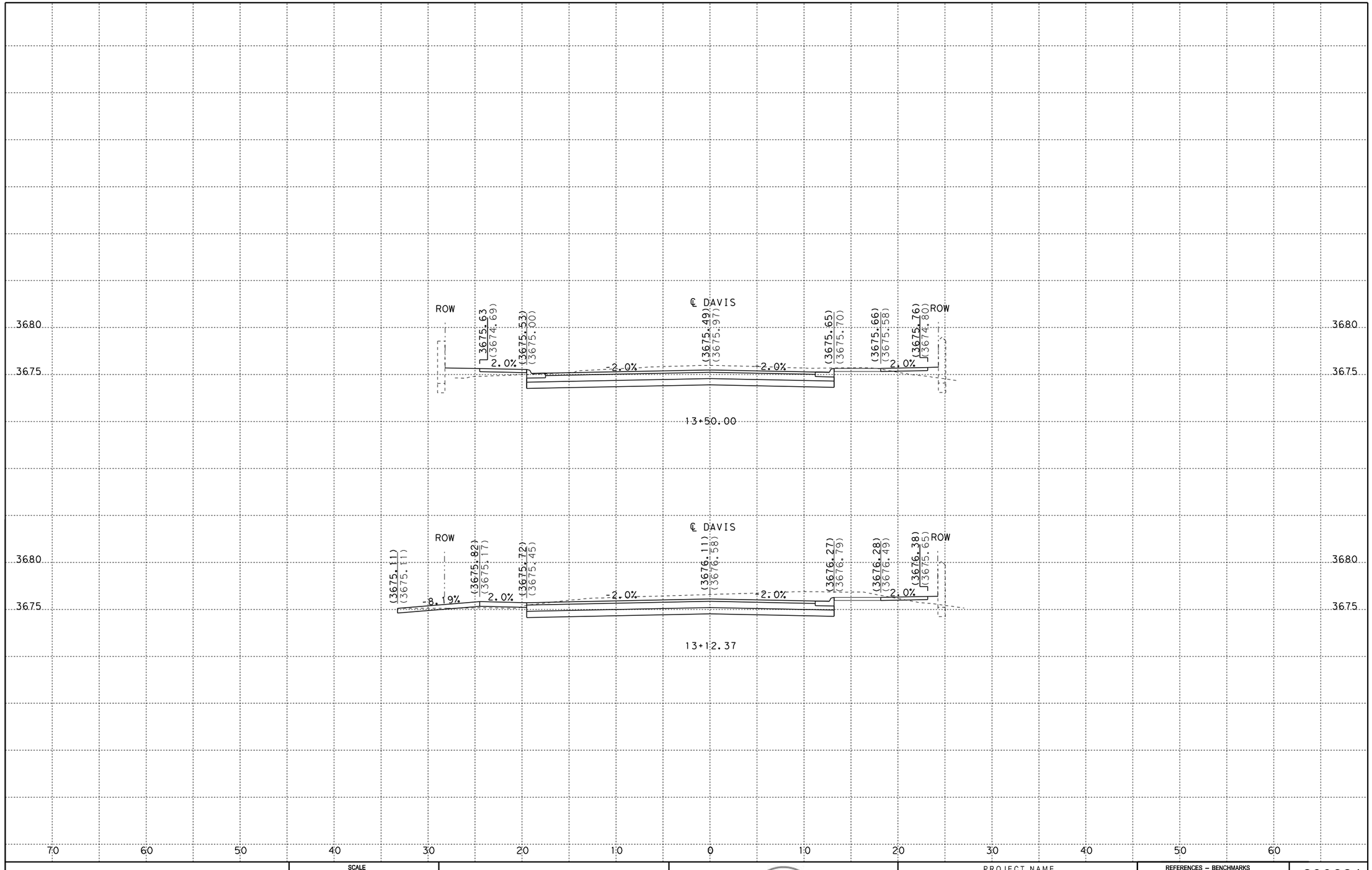
238621

SHEET
C 87 OF C 97

H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_B_XS01_SHEETS.DGN

H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_B_XS01_SHEETS.DGN
11:41:20 AM
4/17/2020

4/17/2020 11:41:20 AM



FOR CONTRACTOR'S INFORMATION ONLY

4/17/2020

SCALE	
HOR:	1"=5'
VER:	1"=5'
DATE	4/17/2020
DESIGN BY	CV
DRAWN BY	CV
CHKD. BY	FC
APPD. BY	FC

CONSOR

F-12040

CAPITAL IMPROVEMENT
CITY OF EL PASO

PROJECT NAME

DAVIS
BRIDGE REPLACEMENT
CROSS-SECTIONS
SHEET 4 OF 4

REFERENCES – BENCHMARKS

FILE:

DATE	REVISIONS	BY

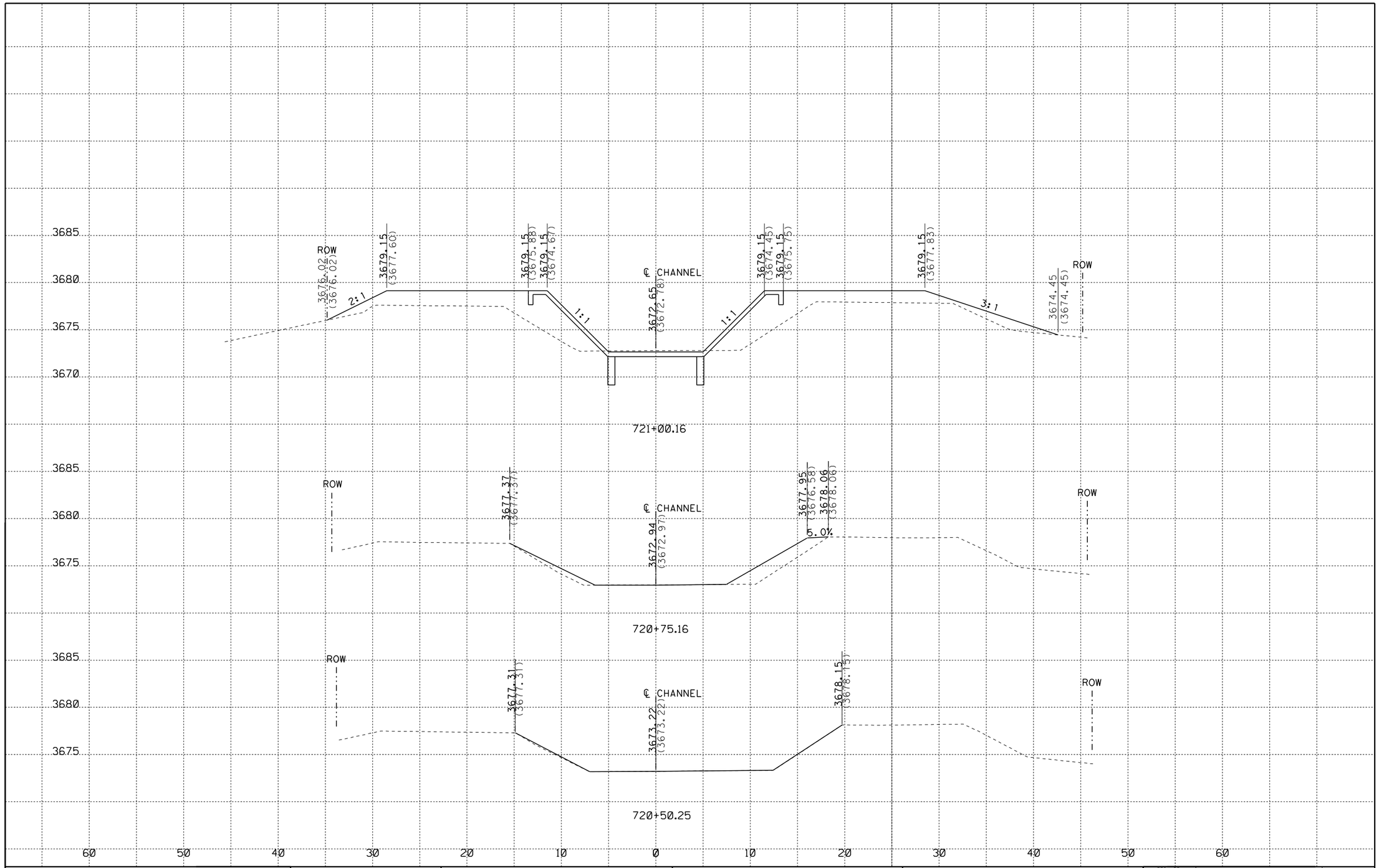
238621

SHEET
C 88 OF C 97

H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_B_XS01_SHEETS.DGN

4/17/2020 11:41:21 AM

H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_B_XS01_SHEETS.DGN
11:41:21 AM
4/17/2020



FOR CONTRACTOR'S INFORMATION ONLY

4/17/2020

SCALE	
HOR:	1"=20'
VER:	1"=20'
DATE	4/17/2020
DESIGN BY	CA
DRAWN BY	CA
CHKD. BY	FC
APPD. BY	RP

CONSOR

F-12040

CAPITAL IMPROVEMENT
CITY OF EL PASO

PROJECT NAME

CHANNEL

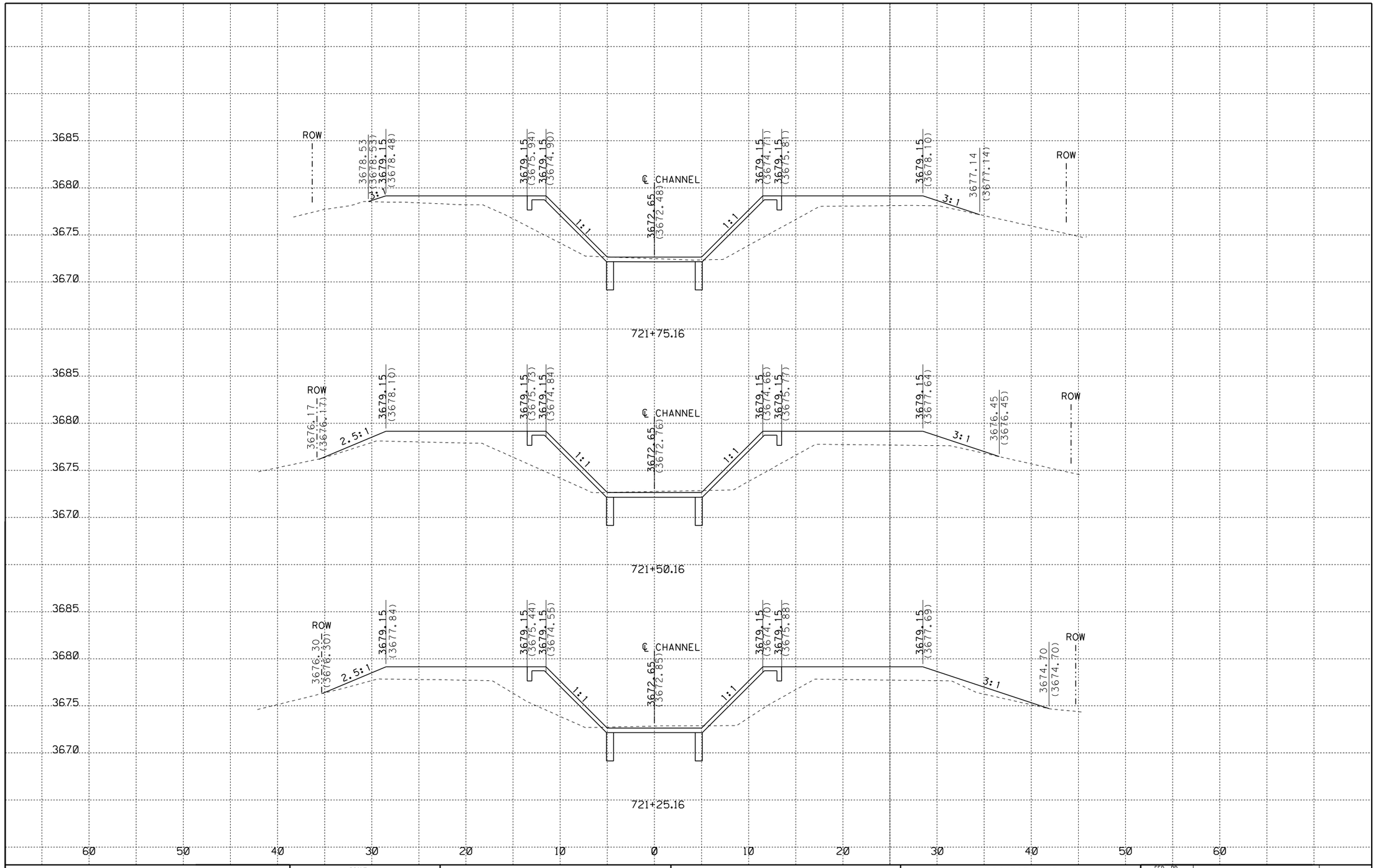
CROSS-SECTIONS

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITTLE SHEET		89
STATE	DISTRICT	COUNTY	
TEXAS	ELP	ELP	
CONT	SECT	JOB	HIGHWAY NO
0924	06	419	DAVIS

H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_B_CXS02_SHEETS.DGN

H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_B_CXS02_SHEETS.DGN
11:41:24 AM
4/17/2020

4/17/2020 11:41:24 AM



FOR CONTRACTOR'S INFORMATION ONLY

4/17/2020

SCALE	
HOR:	1"=20'
VER:	1"=20'
DATE	4/17/2020
DESIGN BY	CA
DRAWN BY	CA
CHKD. BY	FC
APPD. BY	RP

CONSOR

F-12040

CAPITAL IMPROVEMENT
CITY OF EL PASO

PROJECT NAME

CHANNEL

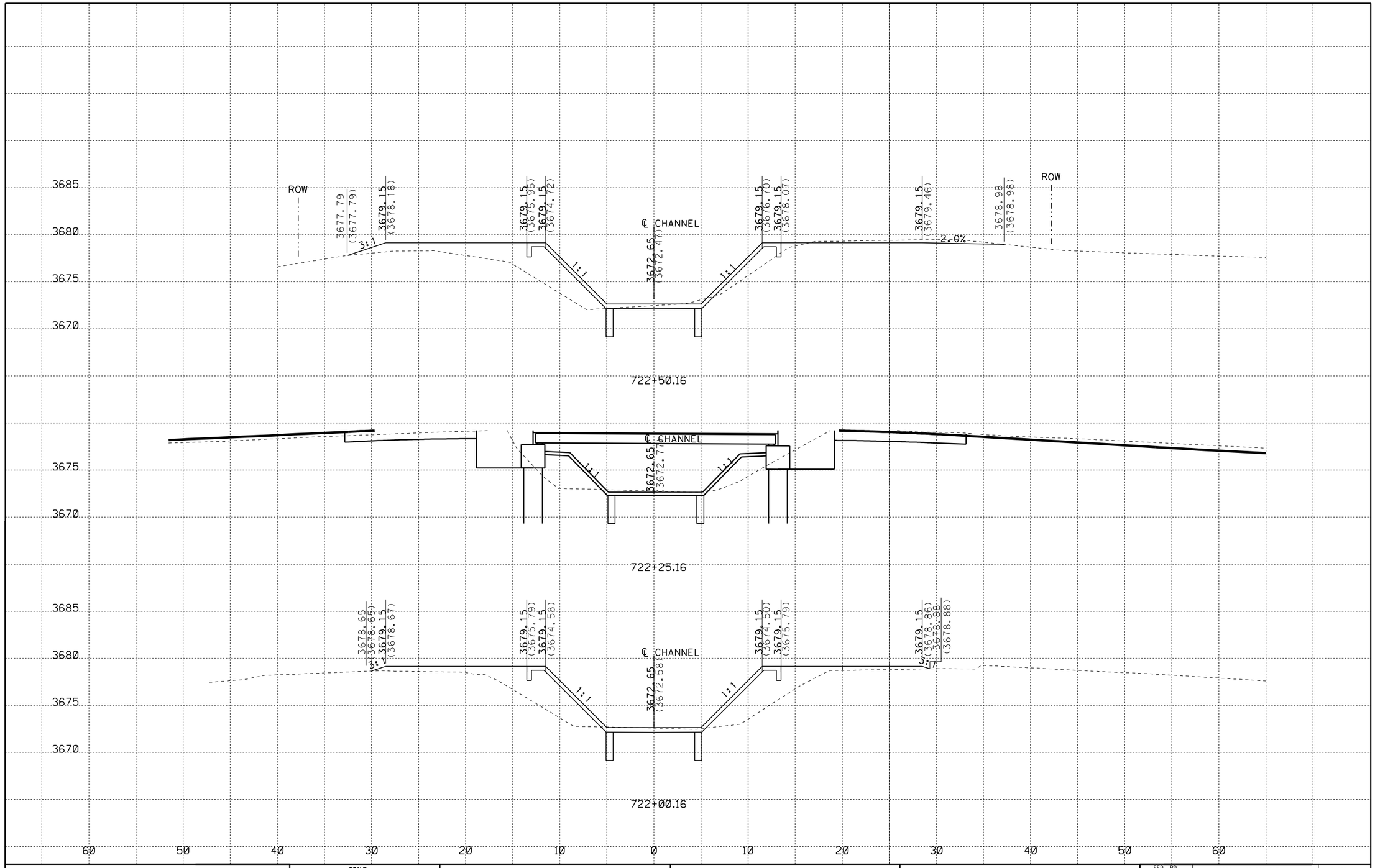
CROSS-SECTIONS

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITTLE SHEET		90
STATE	DISTRICT	COUNTY	
TEXAS	ELP	ELP	
CONT	SECT	JOB	HIGHWAY NO
0924	06	419	DAVIS

H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_B_CXS02_SHEETS.DGN

H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_B_CXS02_SHEETS.DGN
11:41:24 AM
4/17/2020

4/17/2020 11:41:24 AM



FOR CONTRACTOR'S INFORMATION ONLY

4/17/2020

SCALE	
HOR:	1"=20'
VER:	1"=20'
DATE	4/17/2020
DESIGN BY	CA
DRAWN BY	CA
CHKD. BY	FC
APPD. BY	RP

CONSOR

F-12040

CAPITAL IMPROVEMENT
CITY OF EL PASO

PROJECT NAME

CHANNEL

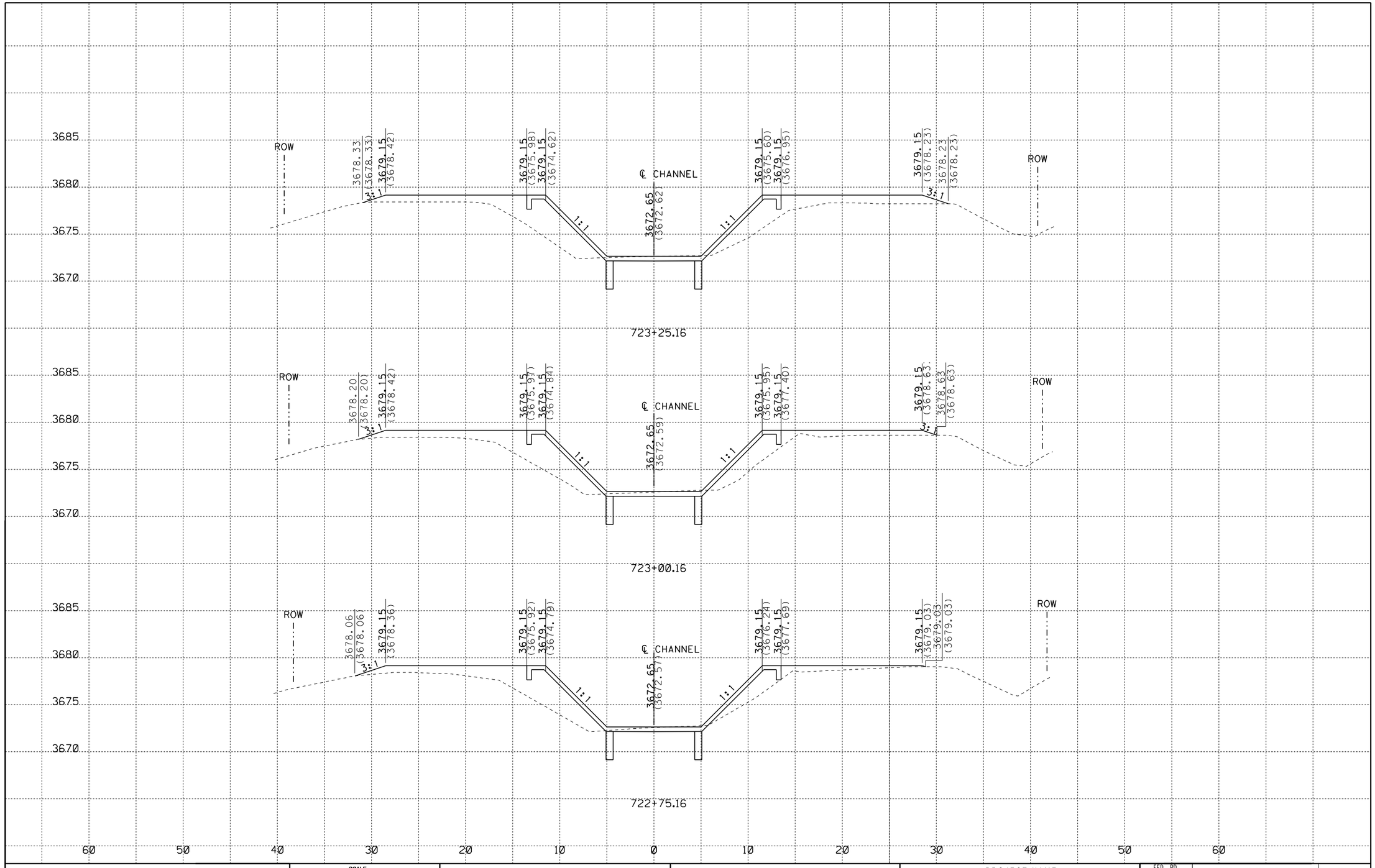
CROSS-SECTIONS

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITTLE SHEET		91
STATE	DISTRICT	COUNTY	
TEXAS	ELP	ELP	
CONT	SECT	JOB	HIGHWAY NO
0924	06	419	DAVIS

H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_B_CXS02_SHEETS.DGN

4/17/2020 11:41:25 AM

H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_B_CXS02_SHEETS.DGN
11:41:25 AM
4/17/2020



FOR CONTRACTOR'S INFORMATION ONLY

4/17/2020

SCALE	
HOR:	1"=20'
VER:	1"=20'
DATE	4/17/2020
DESIGN BY	CA
DRAWN BY	CA
CHKD. BY	FC
APPD. BY	RP

CONSOR

F-12040

CAPITAL IMPROVEMENT
CITY OF EL PASO

PROJECT NAME

CHANNEL

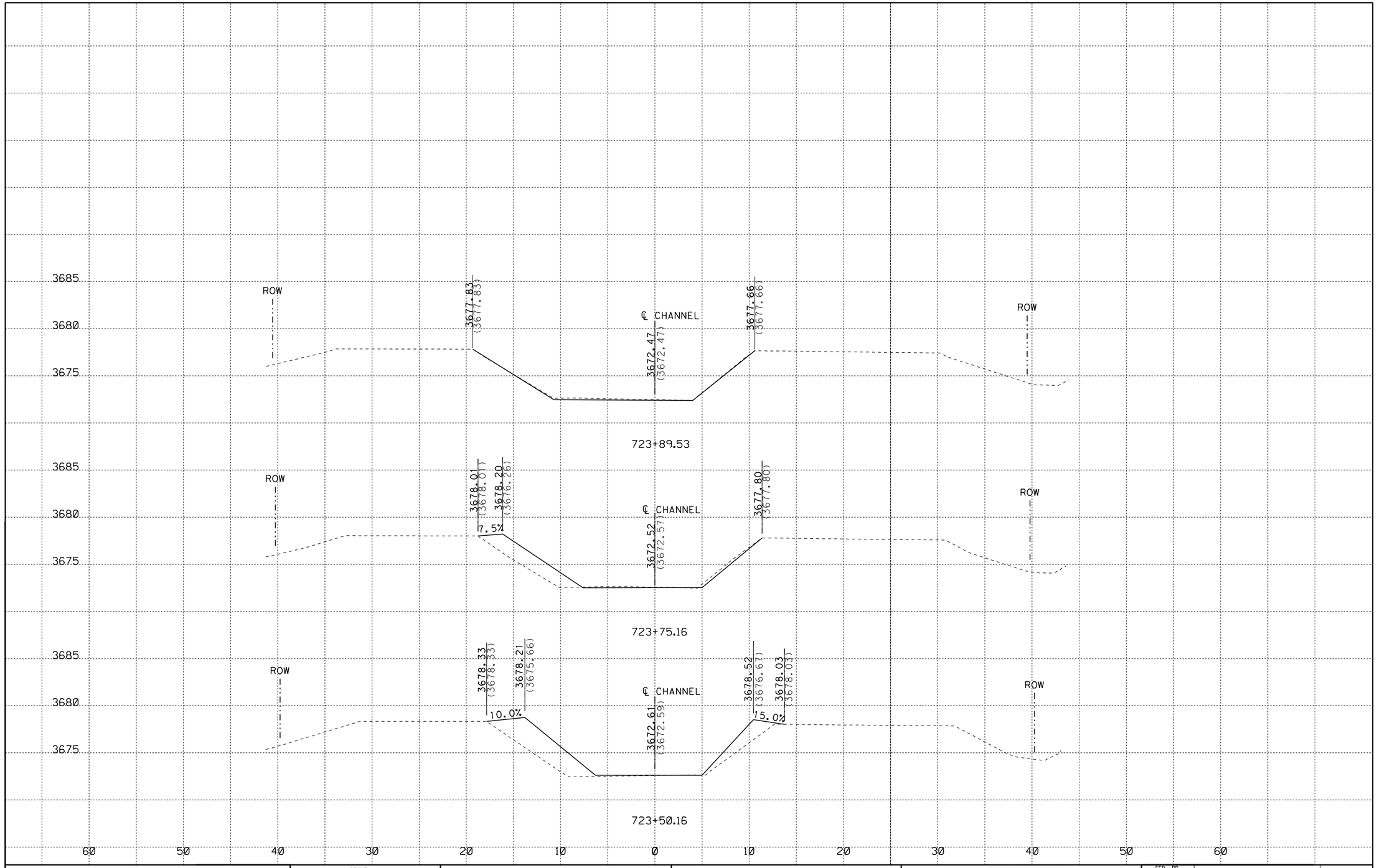
CROSS-SECTIONS

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITTLE SHEET		92
STATE	DISTRICT	COUNTY	
TEXAS	ELP	ELP	
CONT	SECT	JOB	HIGHWAY NO
0924	06	419	DAVIS

H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_B_CXS02_SHEETS.DGN

H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_B_CXS02_SHEETS.DGN
11:41:40 AM
4/17/2020

4/17/2020 11:41:40 AM



FOR CONTRACTOR'S INFORMATION ONLY

4/17/2020

SCALE	
HOR:	1"=20'
VER:	1"=20'
DATE	4/17/2020
DESIGN BY	CA
DRAWN BY	CA
CHKD. BY	FC
APPD. BY	RP

CONSOR F-12040

CAPITAL IMPROVEMENT CITY OF EL PASO

PROJECT NAME

CHANNEL

CROSS-SECTIONS

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITTLE SHEET		93
STATE	DISTRICT	COUNTY	
TEXAS	ELP	ELP	
CONT	SECT	JOB	HIGHWAY NO
0924	06	419	DAVIS

H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_B_CXS02_SHEETS.DGN

4/17/2020 11:41:41 AM

H:\TXPROJ\TX2633-00\CSJ-0924-06-419\Dwg\DGN\Roadway\C_419_B_CXS02_SHEETS.DGN
11:41:41 AM
4/17/2020

PROJECT OVERVIEW AND SEQUENCE OF WORK

1.) THIS WORK TO BE DONE IN CONJUNCTION WITH "DAVIS DRIVE BRIDGE REPLACEMENT – WATER LINE IMPROVEMENT" PROJECT.
2.) CONTRACTOR SHALL COORDINATE WATER SYSTEM CONSTRUCTION AND SEQUENCE OF WORK WITH COEP TRAFFIC CONTROL PLANS. ANY ADJUSTMENTS AND/OR MODIFICATIONS TO THE EXISTING TRAFFIC CONTROL PLANS THAT ARE REQUIRED FOR THE WATER SYSTEM CONSTRUCTION WILL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED SUBSIDIARY TO THE VARIOUS BID ITEMS INCLUDING NIGHTTIME AND WEEKEND WORK AS NEEDED.
3.) THE CONTRACTOR MAY NEED TO WORK DURING OFF–HOURS, NIGHTS AND/OR WEEKENDS TO INSTALL THE WATER MAINS AND TO EXTEND SERVICES ACROSS THE STREET TO ASSURE ADEQUATE CONSTRUCT–TABILITY AND OPERATION OF THESE TWO SYSTEMS.
4.) WATER MAINS AND ASSOCIATED SERVICE LINES SHALL BE COMPLETED PRIOR TO OR DURING CONSTRUCTION PHASING AS SHOWN ON THE PLANS.
5.) WATER MAIN AND ASSOCIATED SERVICE LINE INSTALLATION MAY REQUIRE THAT CERTAIN PORTIONS OF THIS WORK BE PERFORMED OUTSIDE THE RESPECTIVE WORK ZONE AREA LIMITS SHOWN ON THE CONSTRUCTION PHASING PLANS. THEREFORE, THE WORK ZONE AREA LIMITS SHALL BE INCREASED, EXTENDED AND/OR MODIFIED AS NEEDED TO ACCOMMODATE THIS WORK.

GENERAL NOTES

1.) CONTACT UTILITY COMPANIES FOR EXACT LOCATION OF UNDERGROUND UTILITIES IN THIS AREA BEFORE EXCAVATION.
2.) CONTRACTOR SHALL PAY CLOSE ATTENTION TO THE UTILITY SHEETS; COORDINATE SEQUENCE OF WORK, AND SHALL COORDINATE FIELD LOCATIONS OF ALL UTILITIES WITH THE APPROPRIATE UTILITY COMPANIES IN ORDER TO MINIMIZE CONFLICTS DURING WATER CONSTRUCTION AND TO PREVENT DAMAGE TO ANY UTILITIES.
3.) INSTALL A TRENCH SAFETY SYSTEM TO PROVIDE FOR THE SAFE EXCAVATION OF ALL TRENCHES EXCEEDING A DEPTH OF 5–FEET AS PER O.S.H.A. STANDARDS.
4.) CITY PAVING CUT PERMIT REQUIRED BEFORE EXCAVATING WITHIN CITY STREETS.
5.) WHEN EXISTING PAVEMENT AND BASE ARE TO BE CUT & RESTORED IN CITY R.O.W., CONTRACTOR SHALL PLACE 12–INCHES OF FLOWABLE BACKFILL (2–SACK) AND 2–INCHES OF ASPHALT. TYPE OF REPLACEMENT MATERIALS MUST BE APPROVED BY ENGINEER. IN TxDOT R.O.W., CONTRACTOR SHALL RESTORE THE EXISTING PAVEMENT BY PLACING HOT MIX ASPHALTIC CONCRETE FOR THE FULL THICKNESS OF BASE AND PAVEMENT. FOR ESTIMATING PURPOSES, THE THICKNESS OF THE EXISTING PAVEMENT IS APPROXIMATELY 12 INCHES. THE HMAC USED FOR RESTORING SHALL BE THE THE SAME MATERIAL AND HAVE THE SAME SPECIFICATIONS AS GIVEN IN THE CONTRACT. ITEMS 351 AND 400 SHALL BE REFERENCED FOR THIS WORK.
6.) CONTRACTOR IS RESPONSIBLE FOR ACQUIRING AND PAYING ALL PERMITS ASSOCIATED WITH WATER CONSTRUCTION.
7.) ALL EXISTING FACILITIES CURRENTLY IN SERVICE MUST REMAIN IN SERVICE THROUGHOUT CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR PROTECTING EXISTING WATER LINES (INCLUDING SERVICES) FROM DAMAGE AS A RESULT OF CONSTRUCTION ACTIVITIES.
8.) RECONNECTION OF EXISTING FACILITIES SHOWN ON THIS PLAN MUST BE MADE SUCH THAT MINIMAL INTERRUPTION OF WATER SERVICE TO CUSTOMER IS MADE.
9.) CONTRACTOR SHALL PROVIDE TEMPORARY SERVICE TO CUSTOMERS IF SERVICE WILL BE INTERRUPTED FOR MORE THAN 4 HOURS IN A 24–HOUR PERIOD AND SHALL ISSUE A 48–HOUR ADVANCE NOTICE TO THE CUSTOMERS WHOSE SERVICES WILL BE INTERRUPTED.
10.) ALL WORK REQUIRED TO SAW–CUT EXISTING CONCRETE SIDEWALKS, EXISTING DRIVEWAYS, ETC., AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER WILL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED SUBSIDIARY TO THE 7016 BID ITEMS.
11.) USE CAUTION WHEN DIGGING IN THE AREA OF EXISTING ELECTRIC & GAS MAINS.
12.) BENCHMARK IS BASED ON CP 101, NORTHING (10636218.60), EASTING (430342.95), ELEVATION (NAVD 88) 3674.6. CITY MONUMENT WINCHESTER RD. & DAVIS DR. (NOT AT CL INTERSECTION).
13.) ALL COORDINATES ARE BASED ON FROM A SCALING OF TEXAS STATE PLANE GRID COORDINATES CENTRAL ZONE NAD 83 BY 1.000231. TO CONVERT FROM THIS GROUND COORDINATE SYSTEM BACK TO STATE PLANE GRID MULTIPLY BY 0.99976905. VERTICAL DATUM IS NAVD 1988.
14.) THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO PRIVATE PROPERTY CAUSED BY THE CONSTRUCTION PROJECT. THE CONTRACTOR UPON RECEIPT OF A COMPLAINT OF DAMAGE, SHALL WITHIN 10 DAYS, RESPOND IN WRITING WITH A PROPOSAL TO REPAIR SAID DAMAGE.
15.) EMERGENCY RESPONSE NOTE: THE CONTRACTOR SHALL IMMEDIATELY CALL AND NOTIFY THE EL PASO WATER UTILITIES DISPATCHER AT 594–5775 OR 594–5778 WHEN A WATER OR SANITARY SEWER MAIN IS BROKEN DURING CONSTRUCTION EXCAVATION. THE CONTRACTOR SHALL ALSO IMMEDIATELY NOTIFY THE EL PASO WATER UTILITIES FIELD INSPECTOR AND PROJECT ENGINEER ASSIGNED TO THE PROJECT.
16.) ALL MATERIAL FOR WATER SYSTEM ARE SUBJECT TO "BUY AMERICAN CLAUSE".
17.) CONSTRUCTION OF 12" WATER MAIN WITHIN EPCWID R.O.W. WILL BE DURING NON–IRRIGATION SEASON STARTING NOVEMBER 1 TO FEBRUARY 15 OF THE FOLLOWING YEAR.

WATER NOTES

1.) PROVIDE ADEQUATE CONCRETE THRUST BLOCKING AND MECHANICAL RESTRAINT DEVICES AT THE FOLLOWING: TAPPING SLEEVES, TEES, BENDS, PLUGS, AND ALL FITTINGS.
2.) CONTRACTOR MUST INSTALL APPROVED MECHANICAL JOINT RESTRAINT DEVICES AT ALL FITTINGS AND VALVES. INSTALL PER MANUFACTURER'S REQUIREMENTS.
3.) ALL PVC PIPE ON THIS PLAN SHALL BE ENCASED WITH SELECT BEDDING MATERIAL (CLASS II & III). SEE DETAIL FOR DRY CONDITIONS II OR III.
4.) ALL VALVES ON PVC WATER MAINS SHALL BE ANCHORED IN CONCRETE, AS PER DETAILS AND SPECIFICATIONS.
5.) INSTALL NEW WATER LINE WITH MIN. OF 4 FEET OF COVER UNDER PROPOSED FINISHED GRADE.
6.) WATER LINES DESIGNATED TO BE ABANDONED IN PLACE SHALL BE COMPLETELY DEWATERED (DRAINED) BEFORE THEY ARE FILLED WITH CEMENT SLURRY. REMOVAL AND DISPOSAL OF ANY PIPE MATERIAL SCHEDULED TO BE ABANDONED WILL BE THE CONTRACTOR'S RESPONSIBILITY AND SUBSIDIARY TO THE ABANDONMENT OF EXISTING PIPES BID ITEM.
7.) LOCATION OF EXISTING WATER SERVICES IS APPROXIMATE. CONTRACTOR SHALL VERIFY EXACT LOCATION OF SERVICES, AT AND WITH RESPECT TO THE NEW RIGHT–OF–WAY, PRIOR TO CONSTRUCTION.
8.) CONTRACTOR SHALL REPLACE AND RECONNECT ALL WATER SERVICES (UNLESS OTHERWISE INDICATED ON THE PLANS) AS PER RECONNECTION DETAILS, INCLUDING BUT NOT LIMITED TO METER BOXES.
9.) CONTRACTOR SHALL REMOVE ANY MATERIALS SCHEDULED TO BE SALVAGED OR DEEMED SALVAGEABLE BY THE ENGINEER AND DELIVER TO THE OWNER.
10.) CUTTING, REMOVAL, AND RECONNECTION OF EXISTING WATER MAINS AND/OR SERVICES SHALL BE SUBSIDIARY TO THE WATER SYSTEM CONSTRUCTION.
11.) BYPASS OF EXISTING WATER MAINS AND/OR SERVICES TO ASSIST IN CONSTRUCTION ACTIVITIES SHALL BE THE CONTRACTOR'S RESPONSIBILITY AND SUBSIDIARY TO THE VARIOUS WATER SYSTEM CONSTRUCTION BID ITEMS.
12.) ALL ASBESTOS CEMENT PIPE SHALL BE ABANDONED IN PLACE.
13). ALL PRESSURIZED PVC PIPE SHALL BE MARKED WITH DUAL INDICATOR LINES AT THE SPIGOT END INDICATING PROPER PENETRATION WHEN JOINT IS ASSEMBLED. IN LIEU OF DUAL LINES, A BELL PROTECTION SYSTEM AT EACH JOINT TO PREVENT OVER INSERTION MAY BE USED.
14). ALL PIPE JOINTS WITHIN THE 16" STEEL CASING SHALL BE MECHANICALLY RESTRAINED.

ENGINEER'S SEAL

STATE OF TEXAS
AMY C. CASTNER
113706
LICENSED
PROFESSIONAL ENGINEER
4/17/20

DAVIS DRIVE
BRIDGE REPLACEMENT
WATER LINE IMPROVEMENT

SCALE:
PLAN NOT TO SCALE
PROFILE NOT TO SCALE

SHEET 1 OF 4 SHEETS

el paso WATER			DATE: 4/17/2020
DRAWN BY: A.H.V.	CHECKED BY F.H.2	JOB # 20–5021	ACC,T #

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6		94

STATE	DIST.	COUNTY	
TEXAS	ELP	EL PASO	
CONT.	SECT.	JOB	HIGHWAY NO
0924	06	419	DAVIS

DAVIS DRIVE BRIDGE REPLACEMENT
WATER LINE IMPROVEMENT

DAVIS BRIDGE - WATER SYSTEM SUMMARY

ITEM	0402-6001	7016-6004	7016-6018	7016-6019	7016-6033	7016-6087
DESCRIPTION	TRENCH EXCAVATION PROTECTION	WATER MAIN PVC (C-900) (CL. 305) 8-INCH	ABAND/FILL EXIST WATER PIPE (6")	ABAND/FILL EXIST WATER PIPE (8")	ADDITIONAL FITTINGS *	CASING (STEEL) **(16 IN) (BORE)**
UNIT	LF	LF	LF	LF	LB	LF
SHEET 3 OF 4	166	166	60	55	500	97

TOTALS FOR WATER SYSTEM	166	166	60	55	500	97

***NOTE:**
"ADDITIONAL FITTINGS" ONLY APPLY WHEN NO FITTINGS CALLED IN PLANS. FITTINGS IDENTIFIED IN PLANS NOT PAID UNDER THIS ITEM–CONSIDERED SUBSIDIARY TO COST OF WATERLINE. TO BE USED AS DEEMED NECESSARY BY THE ENGINEER. DOES NOT APPLY TO FITTINGS REQUIRED FOR WATER SERVICE INSTALLATION.

ENGINEER'S SEAL

STATE OF TEXAS
AMY C. CASTNER
113706
LICENSED
PROFESSIONAL ENGINEER
4/17/20

DAVIS DRIVE
BRIDGE REPLACEMENT
WATER LINE IMPROVEMENT

SCALE:
PLAN NOT TO SCALE
PROFILE NOT TO SCALE

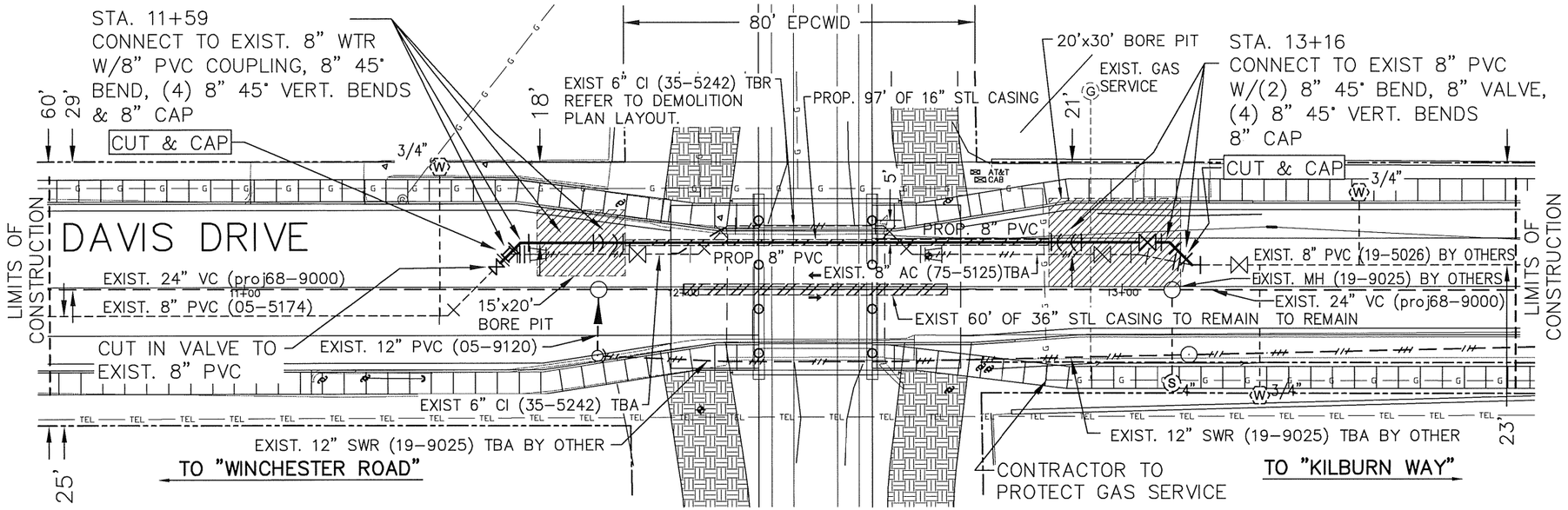
SHEET **2** OF **4** SHEETS

el paso WATER

DRAWN BY:	CHECKED BY	JOB #	DATE: 4/17/2020
A.H.V.	F.H.2	20-5021	ACC,T #

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6			95

STATE	DIST.	COUNTY	
TEXAS	ELP	EL PASO	
CONT.	SECT.	JOB	HIGHWAY NO
0924	06	419	DAVIS



SHEET TOTALS FOR WATER				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
0402	6001	TRENCH EXCAVATION PROTECTION	LF	166
7016	6004	WATER MAIN PVC (C-900) (CL. 305) 8-INCH	LF	166
7016	6018	ABAND/FILL EXIST WATER PIPE (6")	LF	60
7016	6019	ABAND/FILL EXIST WATER PIPE (8")	LF	55
7016	6033	ADDITIONAL FITTINGS	LB	500
7016	6087	CASING (STEEL) (16 IN) (BORE)	LF	97

N

SCALE: 1" = 30'

The El Paso County Water Improvement District No.1 (District) approves these drawings as meeting the District Design Standards in effect on the date below. The District has not reviewed these drawings for any purpose other than those set forth in the Districts Design Standards and the District does not warrant to anyone that any of the information, designs, specifications, or any other information represented on these drawings is appropriate, suitable, or otherwise sufficient for safety or structural integrity or any other purpose.

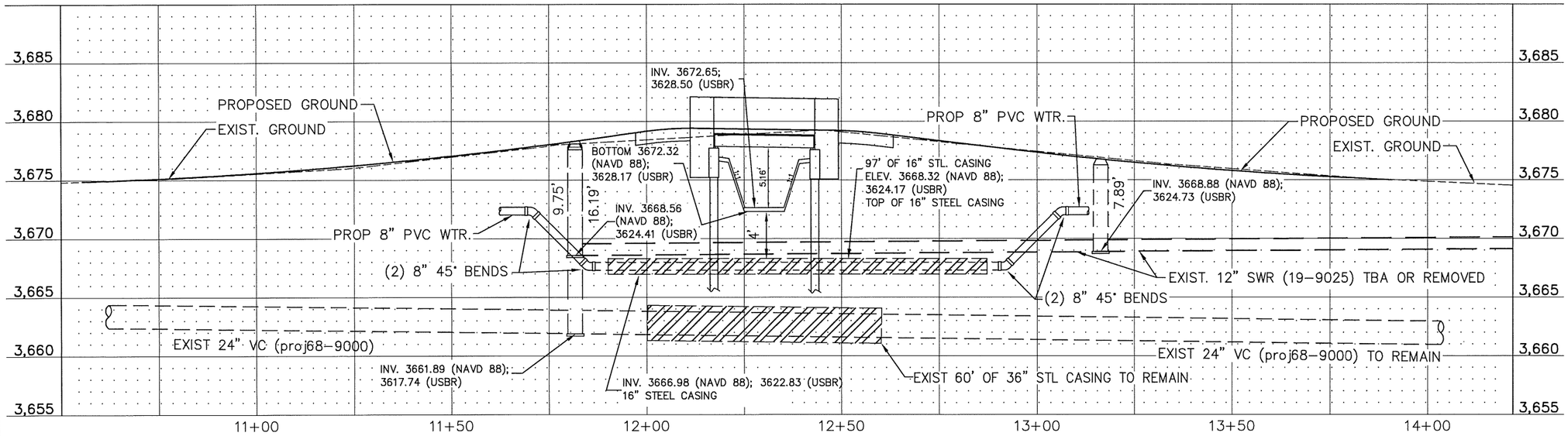
Date_____

By: El Paso County Water Improvement District No. 1

EPCWID #1 BENCHMARK:

EXISTING BRASS CAP (CADWALLADER CHECK)
ELEVATION = **3643.02** FEET (USBR DATUM)

LOCATED AT FRANKLIN CANEL AT CADWALLADER, TOP OF CATWALK, RIGHT SIDE



ENGINEER'S SEAL

STATE OF TEXAS
AMY C. CASTNER
113706
LICENSED PROFESSIONAL ENGINEER
4/17/20

LEGEND

- EXISTING WATER LINE
- PROPOSED WATER LINE
- EXISTING VALVE
- PROPOSED VALVE
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- EXISTING SEWER LINE
- PROPOSED SEWER LINE
- EXISTING MANHOLE
- PROPOSED MANHOLE
- TO BE ABANDONED (TBA)
- TO BE REMOVED (TBR)
- STEEL CASING
- TBR TO BE REMOVED

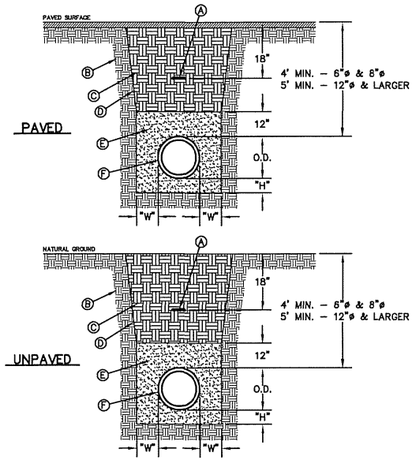
DAVIS DRIVE

BRIDGE REPLACEMENT WATER LINE IMPROVEMENT

SCALE:
PLAN 1" = 30' HORIZ.
PROFILE 1" = 5' VERT.

SHEET **3** OF **4** SHEETS

el paso WATER			DATE: 4/17/2020
DRAWN BY: A.H.V.	CHECKED BY F.H.2	JOB # 20-5021	ACC,T #
FED.RD. DIV.NO. 6	FEDERAL AID PROJECT NO.		SHEET NO. 96
STATE TEXAS	DIST. ELP	COUNTY EL PASO	
CONT. 0924	SECT. 06	JOB 419	HIGHWAY NO DAVIS



EMBEDMENT CLASS "A" FOR PRESSURE PIPE AND GRAVITY PIPE DRY CONDITIONS

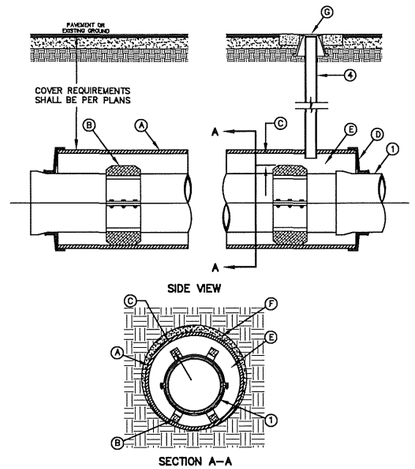
GENERAL NOTES:
1. BEDDING FOR PRESSURE AND GRAVITY PIPE IN DRY CONDITIONS.
2. PROVIDE TRENCH SAFETY SYSTEM FOR TRENCH DEPTHS GREATER THAN 5 FEET.
3. IF THE NATIVE MATERIAL EXCAVATED FROM THE TRENCH IS UNSUITABLE AS BACKFILL MATERIAL, OR THE REQUIRED COMPACTION IS UNATTAINABLE, THE CONTRACTOR SHALL, AT HIS EXPENSE, IMPORT SELECT MATERIAL TO BE MIXED WITH OR USED IN PLACE OF THE NATIVE MATERIAL. SELECT MATERIAL MUST BE APPROVED BY EPWU. SUBSTITUTE SOIL CEMENT SLURRY (1–SACK) IF REQUIRED IN SPECS.

CONSTRUCTION KEY NOTES:
A. APPROVED MARKING TAPE.
B. UNDISTURBED STABLE MATERIAL.
C. NATIVE MATERIAL BACKFILL.
PAVED CONDITION: COMPACT TO 90% DENSITY PER ASTM D-1557 MODIFIED PROCTOR.
UNPAVED CONDITION: COMPACT TO 85% DENSITY PER ASTM D-1557 MODIFIED PROCTOR.
(*SEE NOTE #3 IF THESE PREVIOUS CONDITIONS CANNOT BE MET.)
D. SLOPE TRENCH IN SANDY SOIL CONDITIONS.
E. USE CLASS II OR CLASS III SAND PER ASTM D-2487. NATIVE MATERIAL OR IMPORTED SELECT MATERIAL MEETING OR EXCEEDING THIS REQUIREMENT MAY BE USED. COMPACT TO 85% DENSITY PER ASTM D-1557 MODIFIED PROCTOR (OR 90% D-698 STANDARD PROCTOR).
F. APPROVED PIPE.
G. TRENCH DIMENSIONS AS FOLLOWS:

PIPE DIAMETER	"H"
6" – 30"	4"
GREATER THAN 30"	6"

PIPE DIAMETER	"W"
6" – 30"	8"
GREATER THAN 30"	12"

DETAIL No. 171

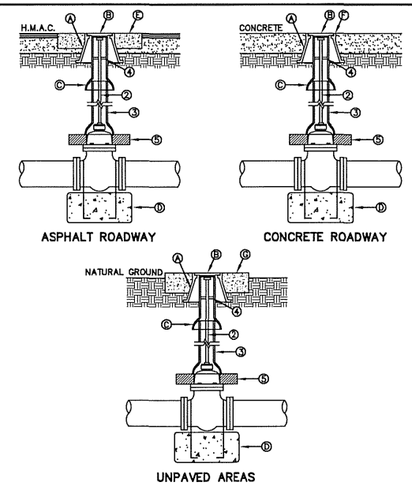


CARRIER PIPE INSTALLATION WITH CASING INSULATORS

GENERAL NOTES:
1. INSTALLATION FOR APPROVED CARRIER PIPE.
2. CASING SHALL BE INSTALLED USING EITHER JACKING, BORING OR TUNNELING METHODS FROM THE END WHICH CREATES A MINIMUM OF ACCESS AND RELOCATION PROBLEMS.
3. INSULATED SPACERS SHALL BE USED WHEN SPECIFIED, TO PROVIDE CORROSION PROTECTION.
4. PRECAUTIONARY OUTLET (6") WITH BONNET BOX AND COVER SHALL BE USED WHEN REQUIRED BY OTHER GOVERNING AGENCIES.

CONSTRUCTION KEY NOTES:
A. STEEL CASING MINIMUM YIELD 35000 PSI, SIZE AND LENGTH AS SPECIFIED.
B. CASING INSULATORS, SPACING AND LOCATION PER MANUFACTURES RECOMMENDATIONS. INSULATORS SHALL FIT SNUG OVER THE CARRIER PIPE.
C. POSITION CARRIER PIPE APPROXIMATELY IN CENTER OF CASING. MINIMUM SPACING BETWEEN INSULATOR AND CARRIER PIPE SHALL BE 1", MAXIMUM SPACING SHALL BE 2".
D. END SHALL BE SEALED WITH BRICK AND MORTAR, BULKHEAD AND GROUT, OR WITH SYNTHETIC RUBBER SEAL, AS SPECIFIED.
E. ANNULAR SPACE SHALL BE LEFT OPEN FOR CATHODICALLY PROTECTED SYSTEM WHERE BOTH CASING AND CARRIER PIPE ARE METALLIC MATERIAL, OR AS OTHERWISE SPECIFIED.
F. PRESSURE GROUT ANNULAR SPACE OUTSIDE CASING AFTER CASING IS INSTALLED.
G. BONNET BOX AND COVER (SEE DETAILS 268, 269–1 & 269–2) SET FRAME AND COVER FLUSH WITH ROADWAY SURFACE OR FINISHED GRADE (SEE DETAIL 260).

DETAIL No. 180

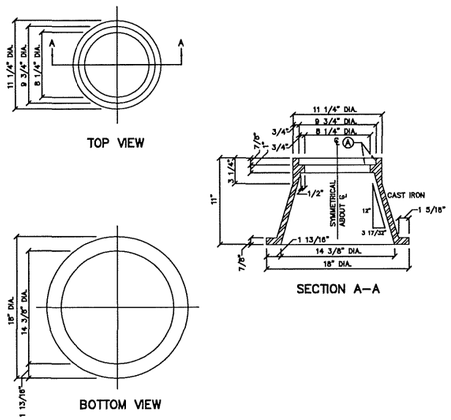


GATE VALVE INSTALLATION

GENERAL NOTES:
1. VALVE TYPE AND VALVE ENDS SHALL BE AS SHOWN ON THE PLANS.
2. ALL BURIED VALVES 5' AND DEEPER SHALL BE PROVIDED WITH SOLID STEEL EXTENSION STEM OPERATOR WITH 2" SQUARE AWWA NUT WITHIN 36" OF VALVE BOX COVER. NUT IS TO INDICATE DIRECTION OF ROTATION TO OPEN VALVE.
3. 8" DIA. MINIMUM VITRIFIED CLAY OR SDR 35 P.V.C. PIPE, PIPE SHALL NOT REST ON VALVE BODY.
4. ¼" THICK STEEL TRASH RING VALVE BOX INSIDE DIAMETER MINUS ½".
5. MINIMUM 2½" CONCRETE OR BRICK ALL AROUND.
6. CLEAN BONNET BOX OF ALL DEBRIS AND SOIL.
7. COAT BURIED PIPE AND BONNET BOX PER SPECIFICATIONS, VALVE SHALL BE WRAPPED IN POLYETHYLENE IN ACCORDANCE WITH SPECIFICATIONS.

CONSTRUCTION KEY NOTES:
A. BONNET BOX (SEE DETAIL 268).
B. BONNET BOX COVER (SEE DETAILS 269–1 & 269–2)
C. FINAL EXTENSION TO BONNET BOX SHALL BE WITH BELL AND SPIGOT ENDS (CLAY OR SDR 35 P.V.C. SPOOL).
D. CONCRETE VALVE ANCHOR (SEE DETAIL 271).
E. CONCRETE COLLAR (SEE DET 184–1) FLUSH WITH TOP OF H.M.A.C.
F. BONNET BOX FLUSH WITH TOP OF CONCRETE, CONCRETE COLLAR NOT NEEDED.
G. CONCRETE APRON (SEE DETAIL 184–2) FLUSH WITH BONNET BOX AND 2" ABOVE NATURAL GROUND.

DETAIL No. 260

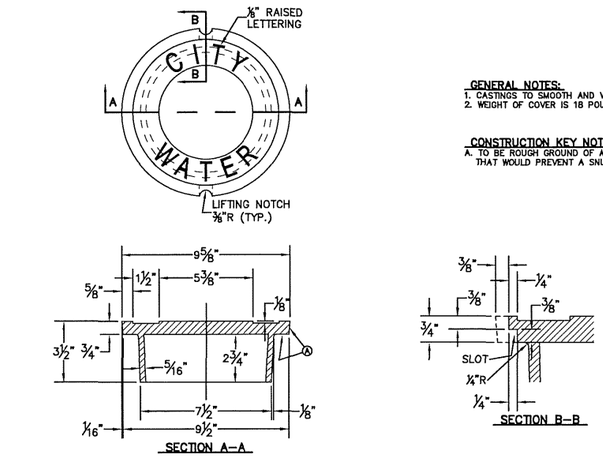


BONNET BOX

GENERAL NOTES:
1. CASTING TO BE SMOOTH AND VOID OF AIR HOLES.
2. WEIGHT OF BONNET BOX IS 95 POUNDS.

CONSTRUCTION KEY NOTES:
A. TO BE ROUGH GROUND OF ANY IRREGULARITIES THAT WOULD PREVENT A SNUG FIT.

DETAIL No. 268

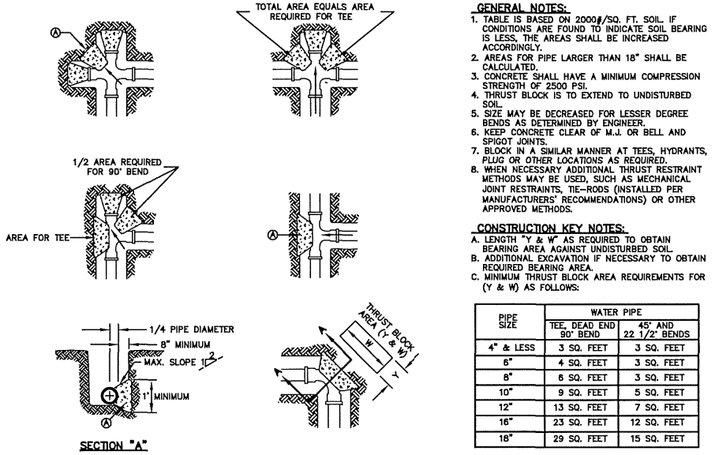


BONNET BOX COVER (FLIP RESISTANT)

GENERAL NOTES:
1. CASTINGS TO SMOOTH AND VOID OF AIR HOLES.
2. WEIGHT OF COVER IS 18 POUNDS.

CONSTRUCTION KEY NOTES:
A. TO BE ROUGH GROUND OF ANY IRREGULARITIES THAT WOULD PREVENT A SNUG FIT.

DETAIL No. 269–2

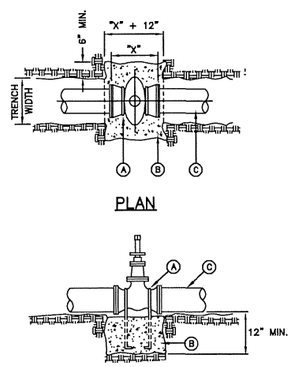


GENERAL NOTES:
1. TABLE IS BASED ON 2000#/SQ. FT. SOIL. IF CONDITIONS ARE FOUND TO INDICATE SOIL BEARING IS LESS, THE AREAS SHALL BE INCREASED ACCORDINGLY.
2. AREAS FOR PIPE LARGER THAN 18" SHALL BE CALCULATED.
3. CONCRETE SHALL HAVE A MINIMUM COMPRESSION STRENGTH OF 2500 PSI.
4. THRUST BLOCK IS TO EXTEND TO UNDISTURBED SOIL.
5. SIZE MAY BE DECREASED FOR LESSER DEGREE BENDS AS DETERMINED BY ENGINEER.
6. KEEP CONCRETE CLEAR OF M.J. OR BELL AND SPIGOT JOINTS.
7. BLOCK IN A SIMILAR MANNER AT TEES, HYDRANTS, PLUG OR OTHER LOCATIONS AS REQUIRED.
8. WHEN NECESSARY ADDITIONAL THRUST RESTRAINT METHODS MAY BE USED, SUCH AS MECHANICAL JOINT RESTRAINTS, TIE–RODS (INSTALLED PER MANUFACTURERS' RECOMMENDATIONS) OR OTHER APPROVED METHODS.

CONSTRUCTION KEY NOTES:
A. LENGTH "Y & W" AS REQUIRED TO OBTAIN BEARING AREA AGAINST UNDISTURBED SOIL.
B. ADDITIONAL EXCAVATION IF NECESSARY TO OBTAIN REQUIRED BEARING AREA.
C. MINIMUM THRUST BLOCK AREA REQUIREMENTS FOR (Y & W) AS FOLLOWS:

PIPE SIZE	WATER PIPE	
	TEE, DEAD END 90° BEND	45° AND 22 1/2° BENDS
4" & LESS	3 SQ. FEET	3 SQ. FEET
6"	4 SQ. FEET	3 SQ. FEET
8"	6 SQ. FEET	3 SQ. FEET
10"	9 SQ. FEET	5 SQ. FEET
12"	13 SQ. FEET	7 SQ. FEET
16"	23 SQ. FEET	12 SQ. FEET
18"	29 SQ. FEET	15 SQ. FEET

DETAIL No. 270



VALVE ANCHOR

GENERAL NOTES:
1. THE ENGINEER SHALL PROVIDE DESIGN FOR ALL VALVES GREATER THAN 12".
2. COMPLY WITH REQUIREMENTS OF AWWA C–550, PROTECTIVE EPOXY INTERIOR COATINGS FOR VALVES.

CONSTRUCTION KEY NOTES:
A. TWO No. 5 REBAR HAIR PINS. PAINT UNEMBEDDED PORTION OF REBARS WITH TWO COATS OF COAL TAR EPOXY.
B. CONCRETE VALVE SUPPORT, 2500 PSI. CONCRETE.
C. APPROVED PIPE.

DETAIL No. 271

ENGINEER'S SEAL

STATE OF TEXAS
AMY C. CASTNER
113706
LICENSED
PROFESSIONAL ENGINEER
4/17/20

DAVIS DRIVE
BRIDGE REPLACEMENT
WATER LINE IMPROVEMENT

SCALE:
PLAN NOT TO SCALE
PROFILE NOT TO SCALE

SHEET 4 OF 4 SHEETS

El Paso Water			DATE: 4/17/2020
DRAWN BY: A.H.V.	CHECKED BY F.H.2	JOB # 20–5021	ACC,T #
FED.RD. DIV.NO. 6	FEDERAL AID PROJECT NO.		SHEET NO. 97
STATE TEXAS	DIST. ELP	COUNTY EL PASO	
CONT. 0924	SECT. 06	JOB 419	HIGHWAY NO DAVIS