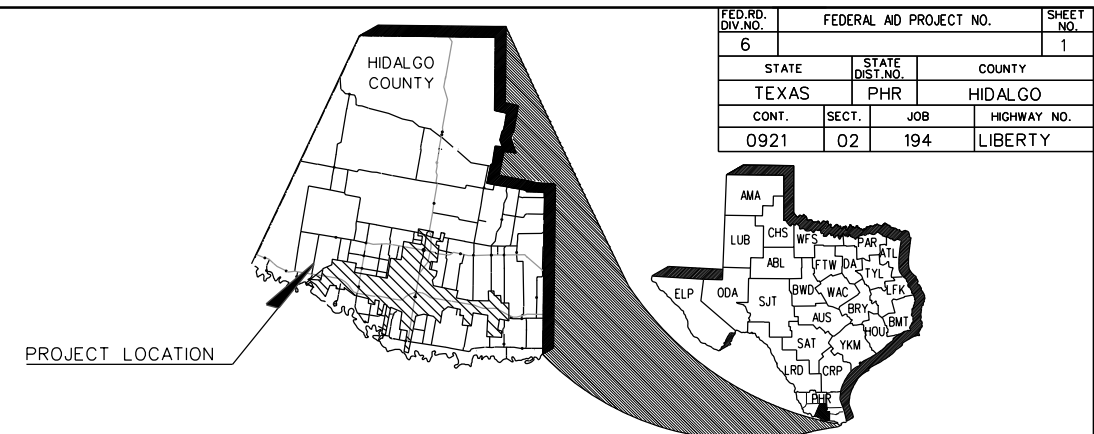


INDEX DATA
SHEET ON PAGE 2

HIDALGO COUNTY PRECINCT No.3

PLANS OF PROPOSED ROADWAY IMPROVEMENT LIBERTY BLVD

CSJ: 0921-02-194 •
PROJECT LENGTH: 12439.63 FT. • 2.356 MI.
INCIDENTAL LENGTH: 1564.28 FT. • 0.296 MI.
TOTAL LENGTH: 14197 FT. • 2.689 MI.

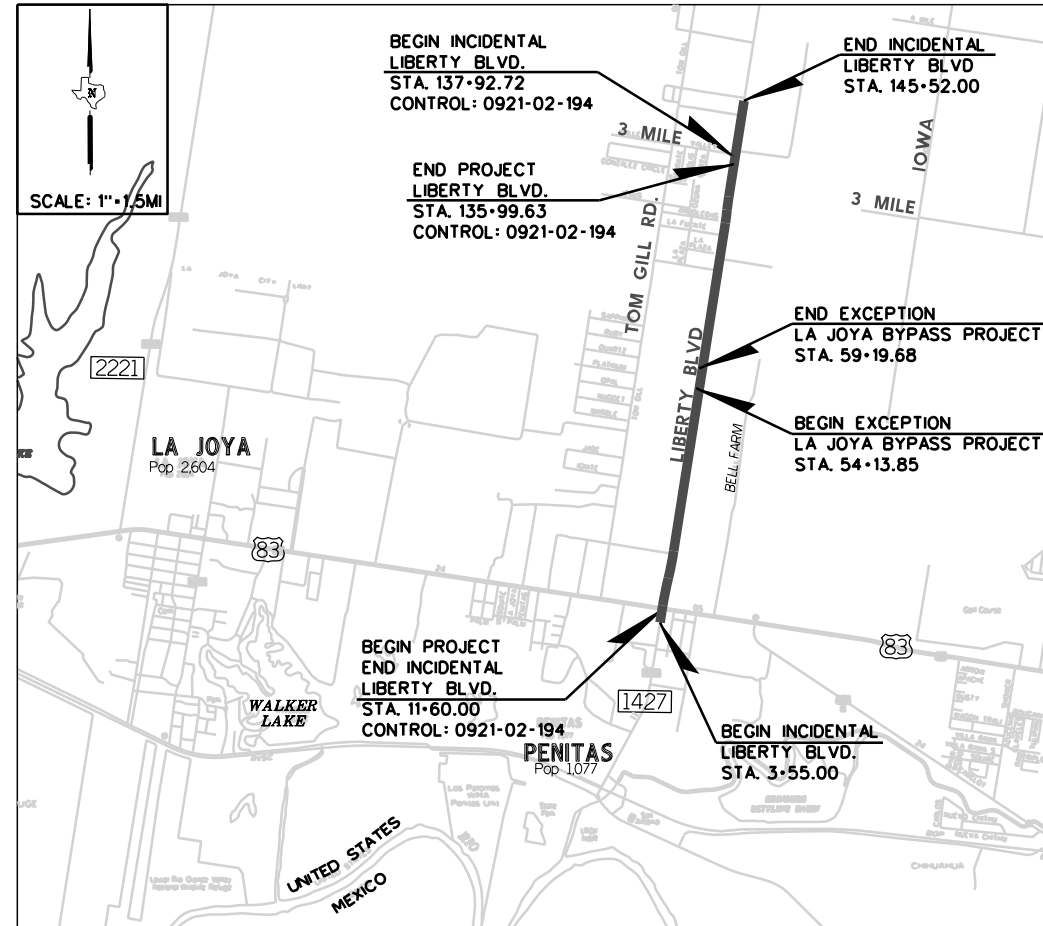


LIBERTY BLVD 0921-02-194

HIDALGO COUNTY COMMISSIONERS COURT

<p>RICHARD F. CORTEZ DAVID L. FUENTES EDUARDO "EDDIE" CANTU EVERARDO "EVER" VILLARREAL ELLIE TORRES</p>	<p>COUNTY JUDGE COMMISSIONER PCT. 1 COMMISSIONER PCT. 2 COMMISSIONER PCT. 3 COMMISSIONER PCT. 4</p>
--	--

LIMITS: FROM US 83 TO MILE 3 RD.
RECONSTRUCTION AND WIDENING OF A NON-FREEWAY FACILITY
CONSISTING OF GRADING, LIME TREATED SUBGRADE, FLEXIBLE BASE, STRUCTURES
ASPHALTIC CONCRETE PAVEMENT, CURB AND GUTTER, DRAINAGE STRUCTURE,
STORM SEWER, SIGNING, DELINEATION, AND PAVEMENT MARKINGS.



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LIBERTY BLVD PROJECT DATA (CSJ: 0921-02-194)	
DESIGN SPEED: LIBERTY RD.: 55 mph	FUNCTION CLASS: LIBERTY RD.: MAJOR COLLECTOR
EXCEPTIONS: STA. 54+13.85 TO STA. 59+19.68	BRIDGE STA. 40+94.76 - STA. 41+34.76
RAILROAD CROSSINGS: NONE	ADT LIBERTY BLVD: 6,900 (2016) 10,300 (2036)
EQUATIONS: NONE	

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

LOCAL ENTITIES	
HIDALGO COUNTY IRRIG. DISTRICT NO. 6 CONCURRENCE :	DATE : <input type="text"/>
<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>
NAME	TITLE
HIDALGO COUNTY IRRIG. DISTRICT NO. 16 CONCURRENCE :	DATE : <input type="text"/>
<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>
NAME	TITLE
HIDALGO CO. DRAINAGE DIST. NO. 1 CONCURRENCE :	DATE : <input type="text"/>
<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>
NAME	TITLE

L & G Engineering

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 585-9813
Fax : (866) 605-1331

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (866) 605-1331

Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

DATE :

NAME TITLE

© 2022
Texas Department of Transportation

DATE :

NAME TITLE

THE CITY OF PENITAS TEXAS
FOUNDED 1920

DATE :

NAME TITLE

THE COUNTY OF HIDALGO
TEXAS

DATE :

NAME TITLE

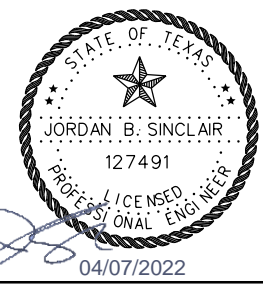
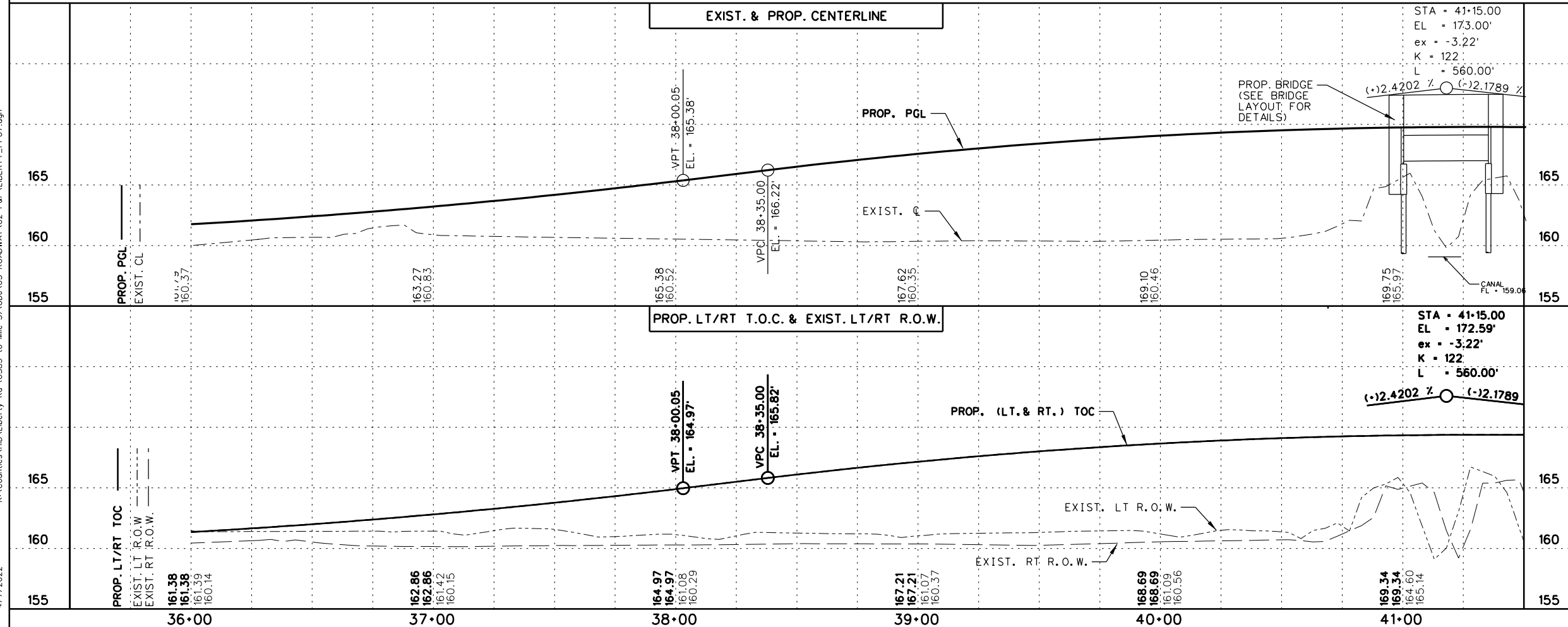
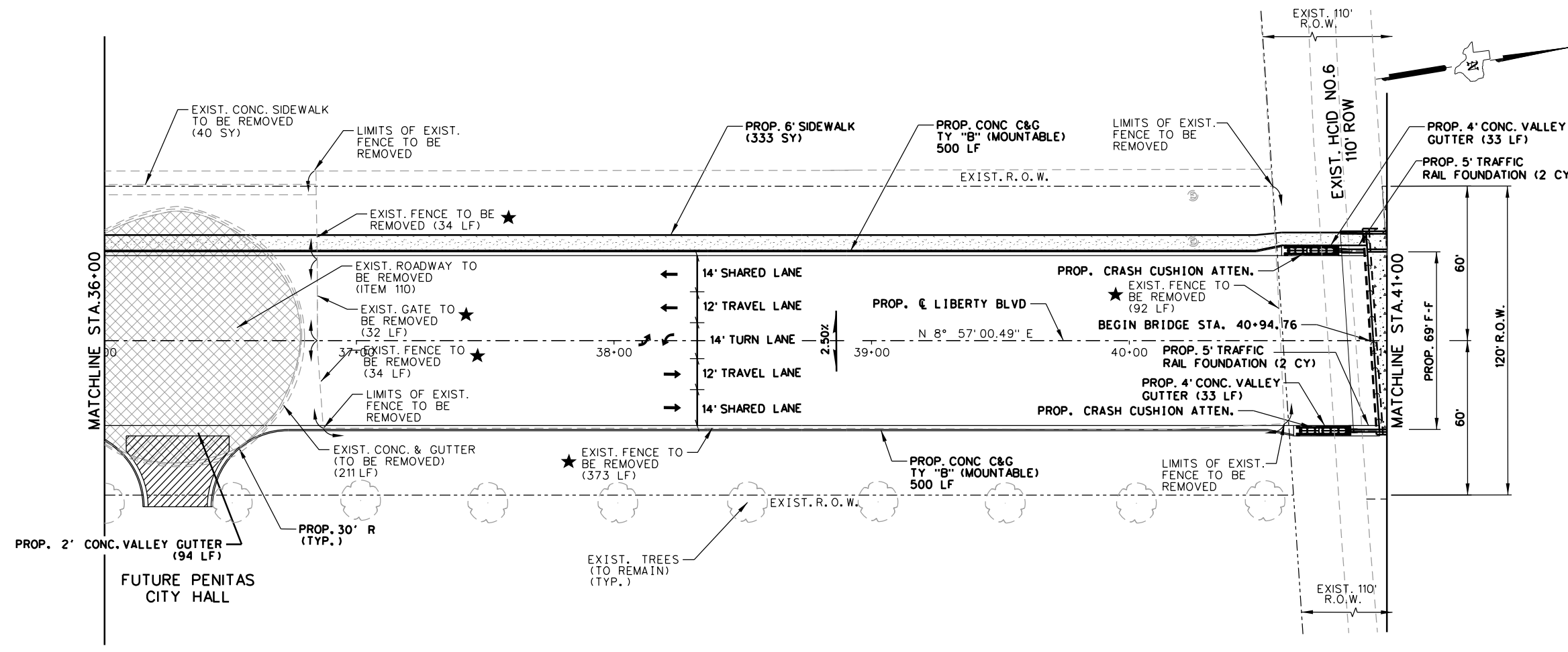
SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
104	REMOVE CONC. (SIDEWALKS)	SY	40
104	REMOVE CONC. (CURB & GUTTER)	LF	211
420	CL C CONC. (RAIL FOUNDATION)	CY	4
529	CONC. CURB & GUTTER (TY-B) (MOUNTABLE)	LF	1000
529	CONC. CURB & GUTTER (VALLEY GUTTER)	LF	160
531	CONCRETE SIDEWALKS	SY	333
545	CRASH CUSHION ATTEN.	EA	2

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1/2")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

- NOTES:
- SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
 - SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
 - FOR DRAINAGE & UTILITIES INFORMATION SEE U&D'S SHEETS



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 Fax : (956) 565-1927

LIBERTY BLVD
 PLAN AND PROFILE
 STA. 36+00 TO STA. 41+00

SCALE:
 HOR: 1" = 50'
 VER: 1" = 10'

SHEET 7 OF 28

DN:	FED. RD. DIV. NO.:	STATE:	PROJECT NO.:	SHEET NO.:
CK DN:	6	TEXAS		79
DW:	STATE DIST. NO.:	COUNTY:	CONTROL NO.:	SECTION NO.:
CK DW:	PHR	HIDALGO	0921	02
TR:				JOB NO.:
CK TR:				194
				HIGHWAY NO.:
				LIBERTY

4/7/2022 K:\Counties\Hidalgo\Roadway\02 P&P\LIBERTY_PPO7.dgn

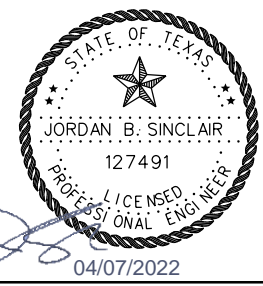
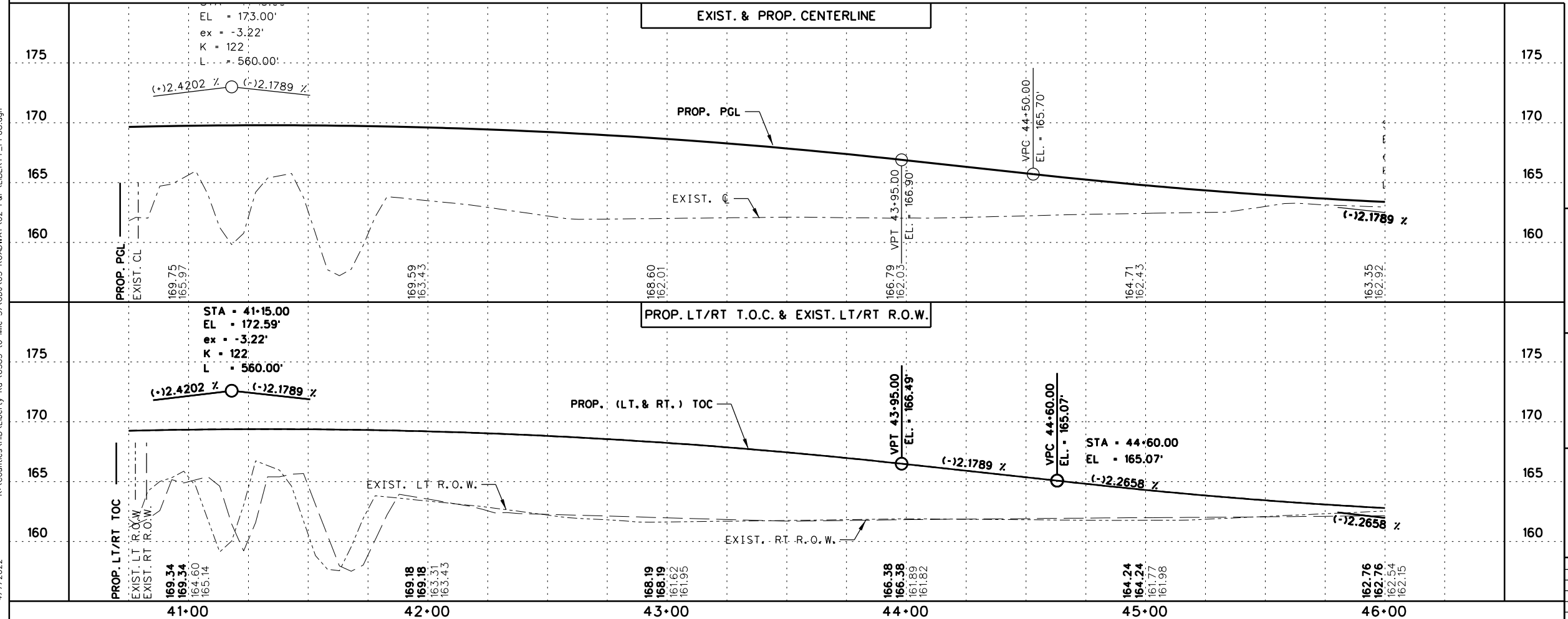
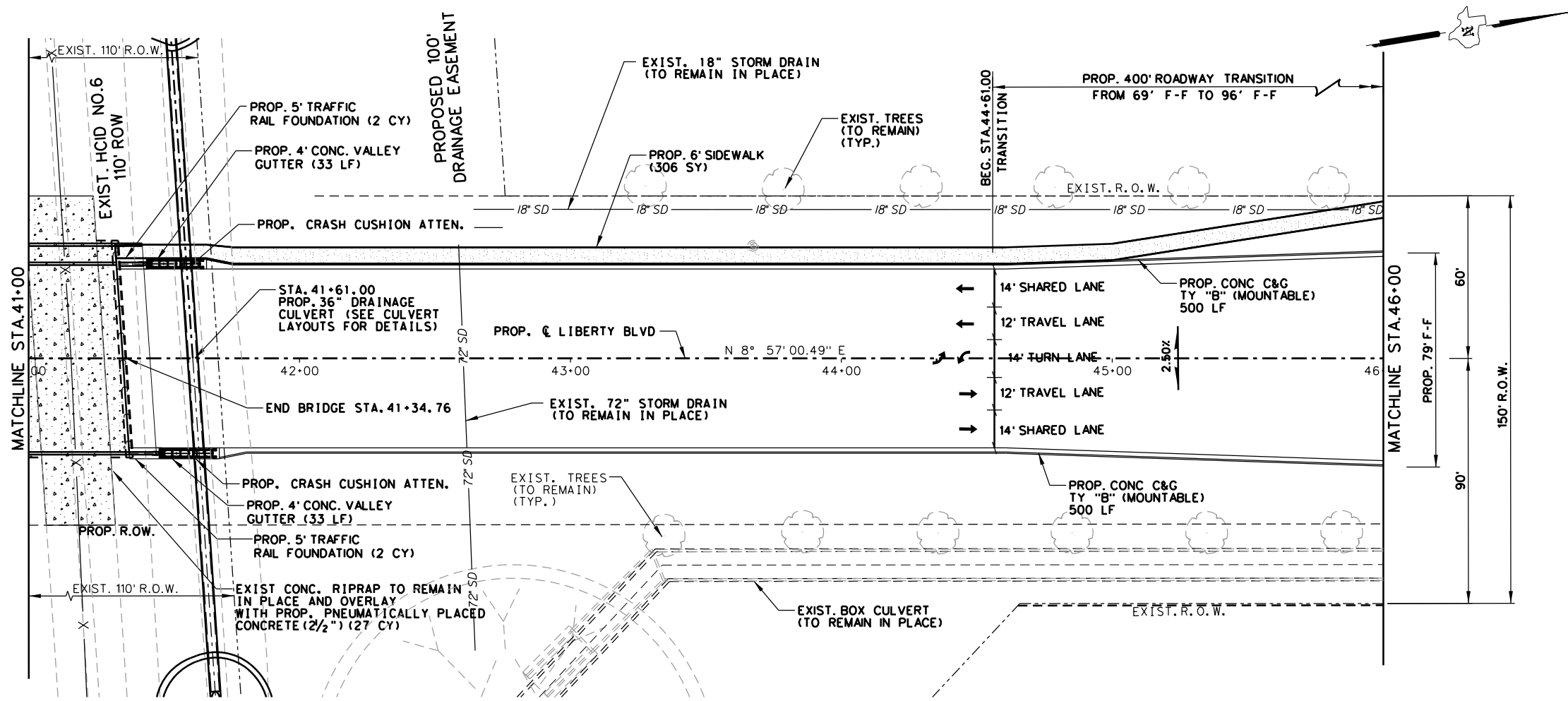
SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
420	CL C CONC. (RAIL FOUNDATION)	CY	4
432	RIPRAP (PNEUM PLAC CONC)(2.5IN)	CY	27
529	CONC CURB & GUTTER (VALLEY GUTTER)	LF	66
529	CONC CURB & GUTTER (TY-B) (MOUNTABLE)	LF	1000
531	CONCRETE SIDEWALKS	SY	306
545	CRASH CUSHION ATTN.	EA	2

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1/2")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

- NOTES:
- SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
 - SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
 - FOR DRAINAGE & UTILITIES INFORMATION SEE U&D'S SHEETS



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LIBERTY BLVD
 PLAN AND PROFILE
 STA. 41+00 TO STA. 46+00

SCALE:
 HOR: 1" = 50'
 VER: 1" = 10'

SHEET 8 OF 28

DN:	FED. RD. DIST. NO.	STATE	PROJECT NO.	SHEET NO.
CK DN:	6	TEXAS		80
DW:	STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.
CK DW:	PHR	HIDALGO	0921	02
TR:				JOB NO.
CK TR:				194
				HIGHWAY NO.
				LIBERTY

K:\Counties\Hidalgo\Roadway\02 P&P\LIBERTY_PPOB.dgn 4/7/2022

SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	383
400	STRUCT EXCAVATION (SPL)	CY	-
400	SAND BACKFILL	CY	155
400	CUT & RESTORE	SY	-
402	TRENCH EXCAVATION PROT.	LF	321
464	18" RCP SEWER (CL III)(SPL)	LF	321

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

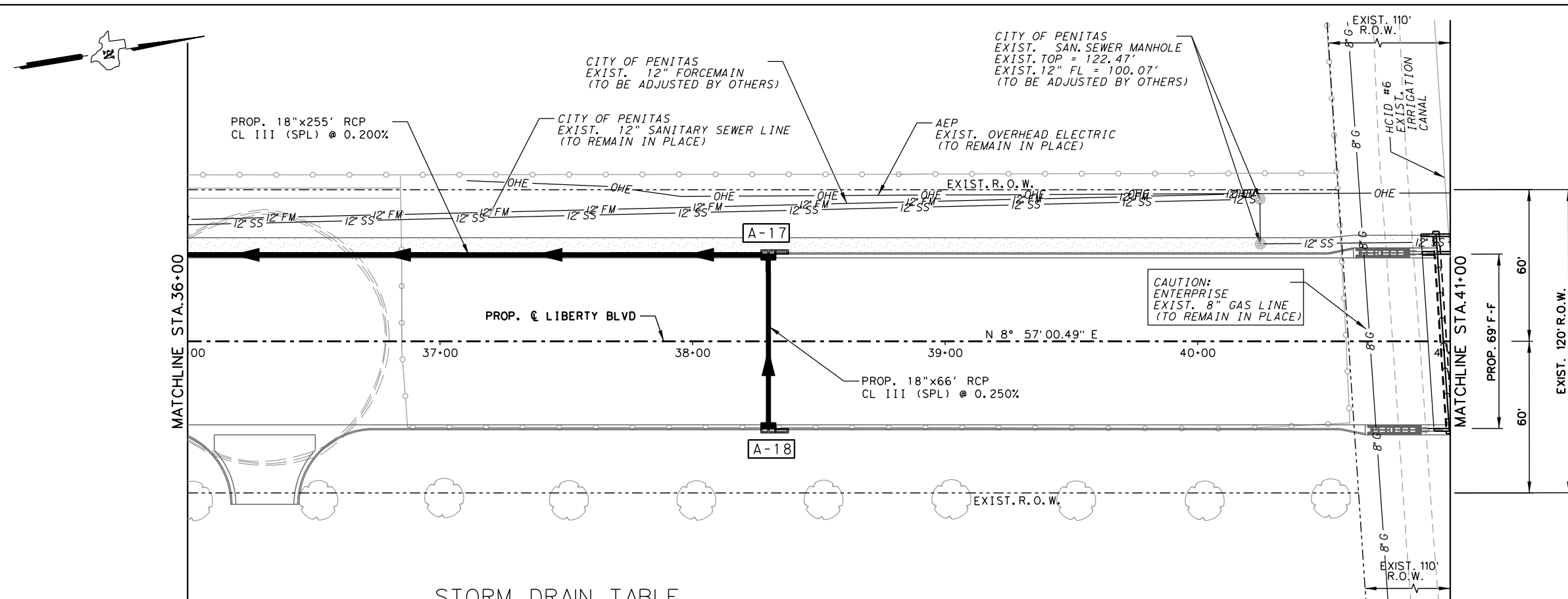
- ▣ SEE P&P SHEETS FOR DETAILS
- ★ TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- ▨ LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- ⊕ NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

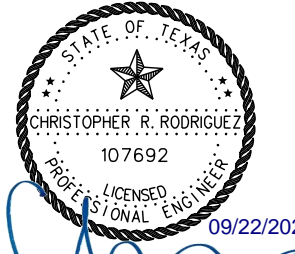
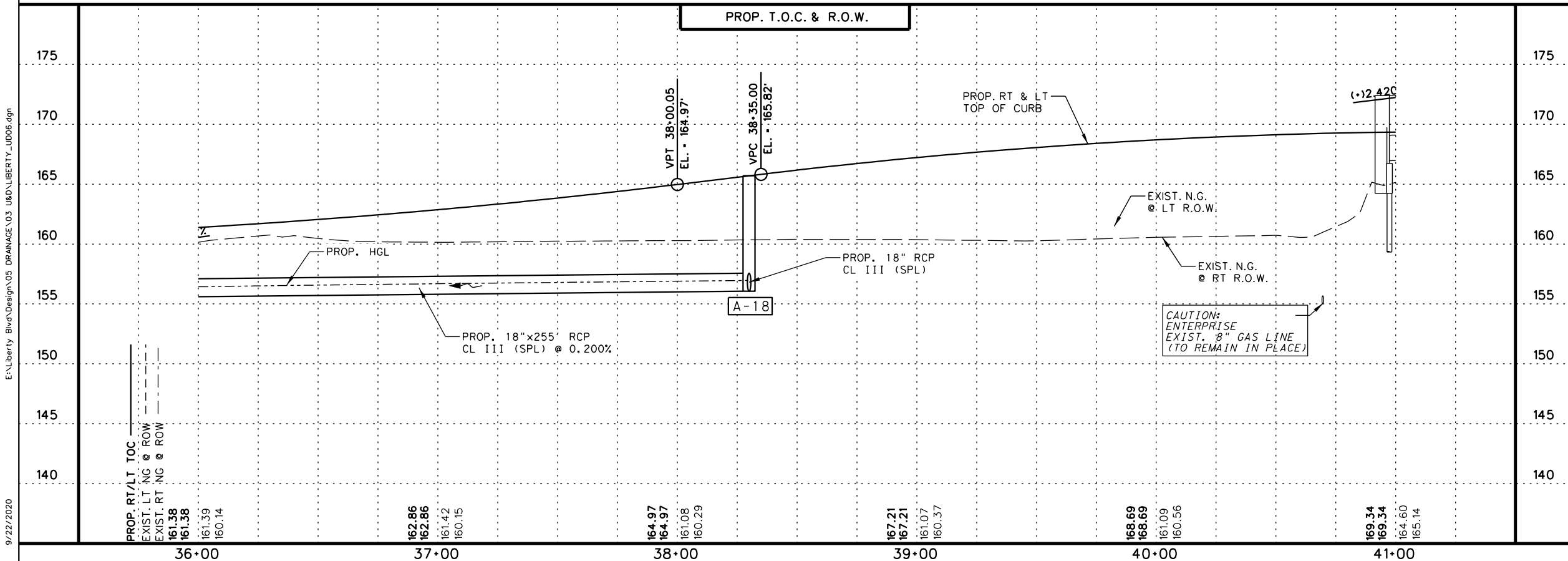


STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
A-17	PCU10R-3x5	38+30.00 -34.50	165.69	156.06		156.06	156.06	
A-18	PCU10L-3x5	38+30.00 34.50	165.69	156.23			156.23	

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6



L & G Engineering
 Highway / Civil
 Structural / Bridge
 Environmental
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 Fax : (956) 585-1927

LIBERTY BLVD
 UTILITY AND DRAINAGE
 STA. 36+00 TO STA. 41+00

SCALE:
 HOR: 1" = 50'
 VER: 1" = 10'

SHEET 6 OF 27

DN:	FED. NO.	STATE	PROJECT NO.	SHEET NO.		
CK DN:	6	TEXAS		149		
DW:	STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:	PHR	HIDALGO	0921	02	194	LIBERTY
TR:						
CK TR:						

9/22/2020 E:\Liberty Blvd\Design\05 DRAINAGE\03 URD\LIBERTY_UD06.dgn

SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	917
400	STRUCT EXCAVATION (SPL)	CY	24
400	SAND BACKFILL	CY	358
400	CUT & RESTORE	SY	-
402	TRENCH EXCAVATION PROT.	LF	511
464	18" RCP SEWER (CL III)(SPL)	LF	65
464	30" RCP SEWER (CL III)(SPL)	LF	343
464	36" RCP SEWER (CL III)(SPL)	LF	103

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

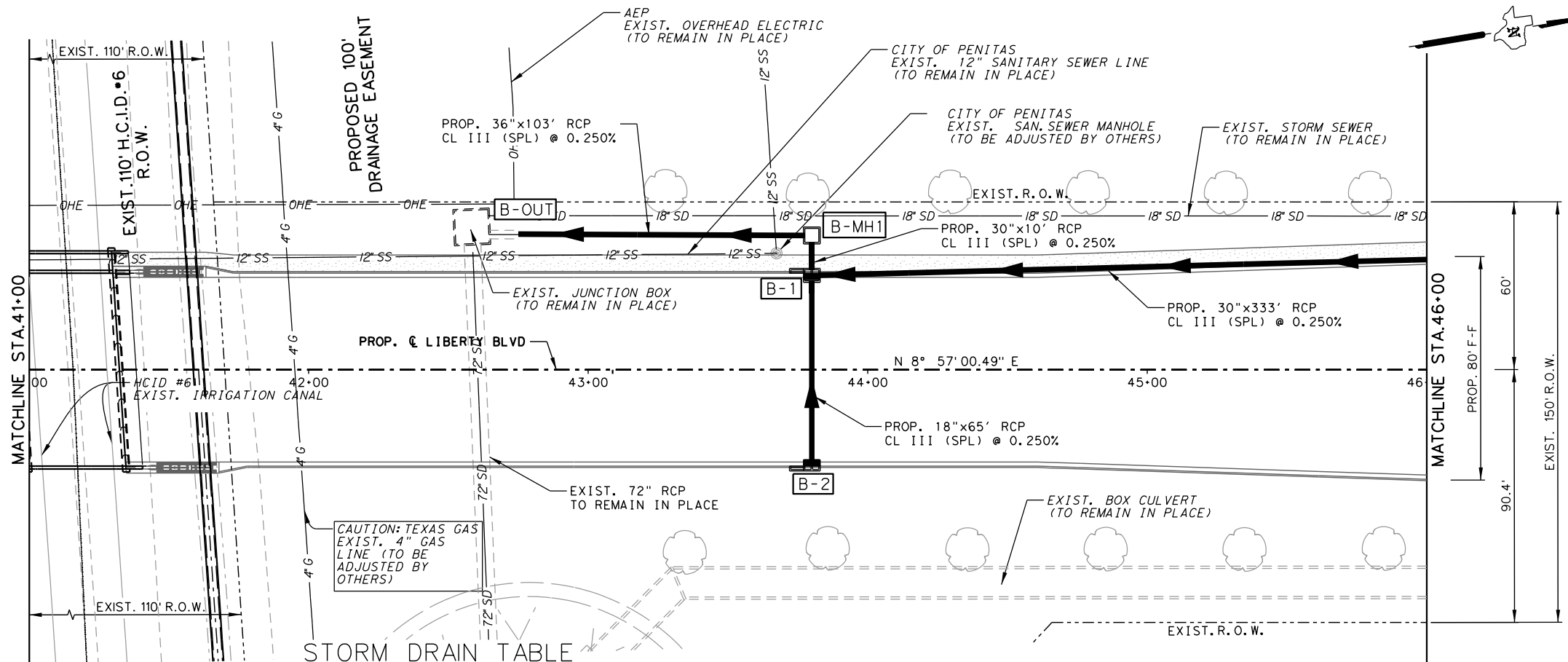
- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

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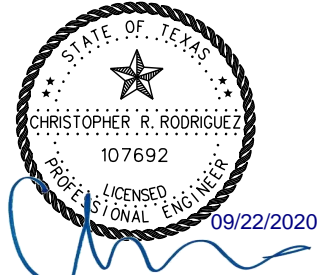
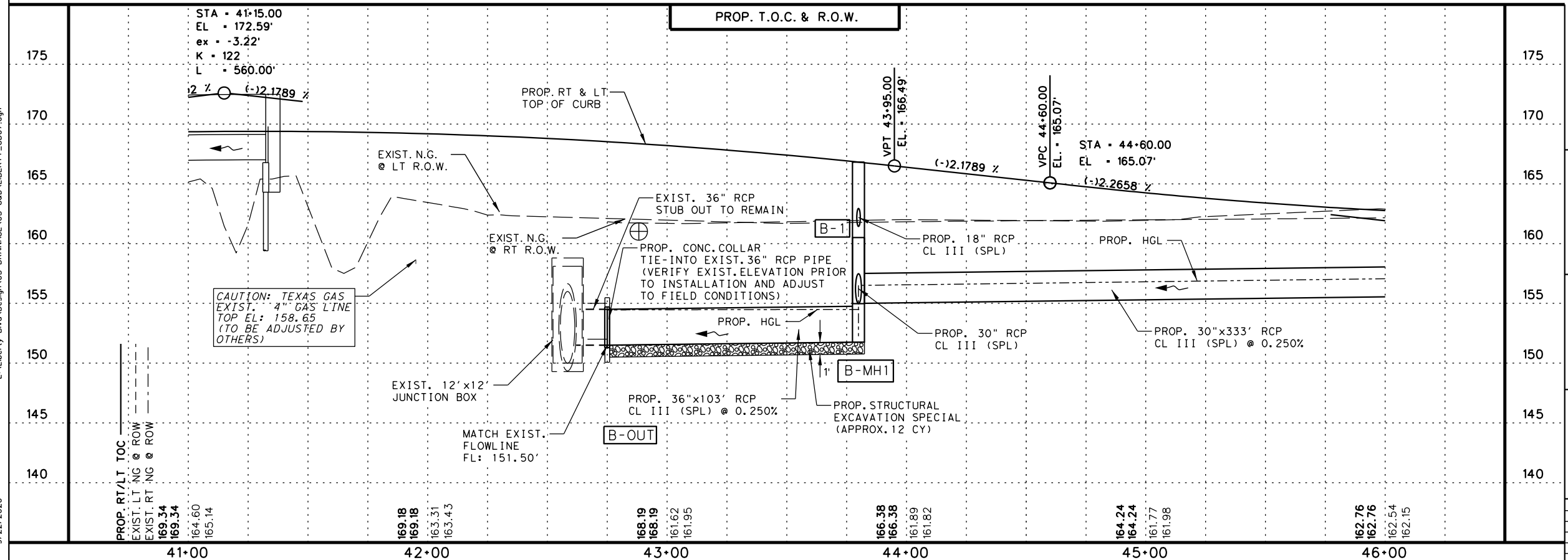


STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
B-1	PCU10L-4x5	43+80.00 -34.50	166.81	155.00	155.00		161.43	155.00
B-2	PCU10R-3x5	43+80.00 34.50	166.81	161.60			161.60	
B-MH1	PJB 5x5	43+80.00 -48.00	160.50	151.76		151.76		
B-OUT	OUTLET	42+75.00 -48.50	161.80	151.50				

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6



L & G Engineering
 Highway / Civil
 Structural / Bridge
 Environmental
 Firm No. : F-4105

2100 W. Expressway 83
 Mercedes, TX, 78570
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 Fax : (956) 585-1927

LIBERTY BLVD
 UTILITY AND DRAINAGE
 STA. 41+00 TO STA. 46+00

SCALE:
 HOR: 1" = 50'
 VER: 1" = 10'

SHEET 7 OF 27

NO.	DATE	BY	CHKD BY	DESCRIPTION
1				DESIGN
2				DRAWING
3				CHECK DRAWING
4				REVISION

FED. DIST. NO.	STATE	PROJECT NO.	SHEET NO.
6	TEXAS		150

STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
PHR	HIDALGO	0921	02	194	LIBERTY

9/22/2020 E:\Liberty Blvd\Design\05_DRAINAGE\03_LRD\LIBERTY_UD07.dgn

SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT. EXCAVATION (NON-PAY)	CY	---
400	STRUCT. EXCAVATION (SPL)	CY	4.7
400	SAND BACKFILL	CY	187
402	TRENCH EXCAV. PROTECTION	LF	264
432	RIPRAP (CONC.) (4")	CY	20
464	RC PIPE (CL III)(36 IN)(SPL)	LF	264

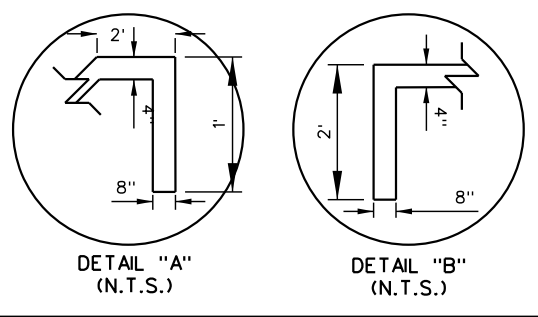
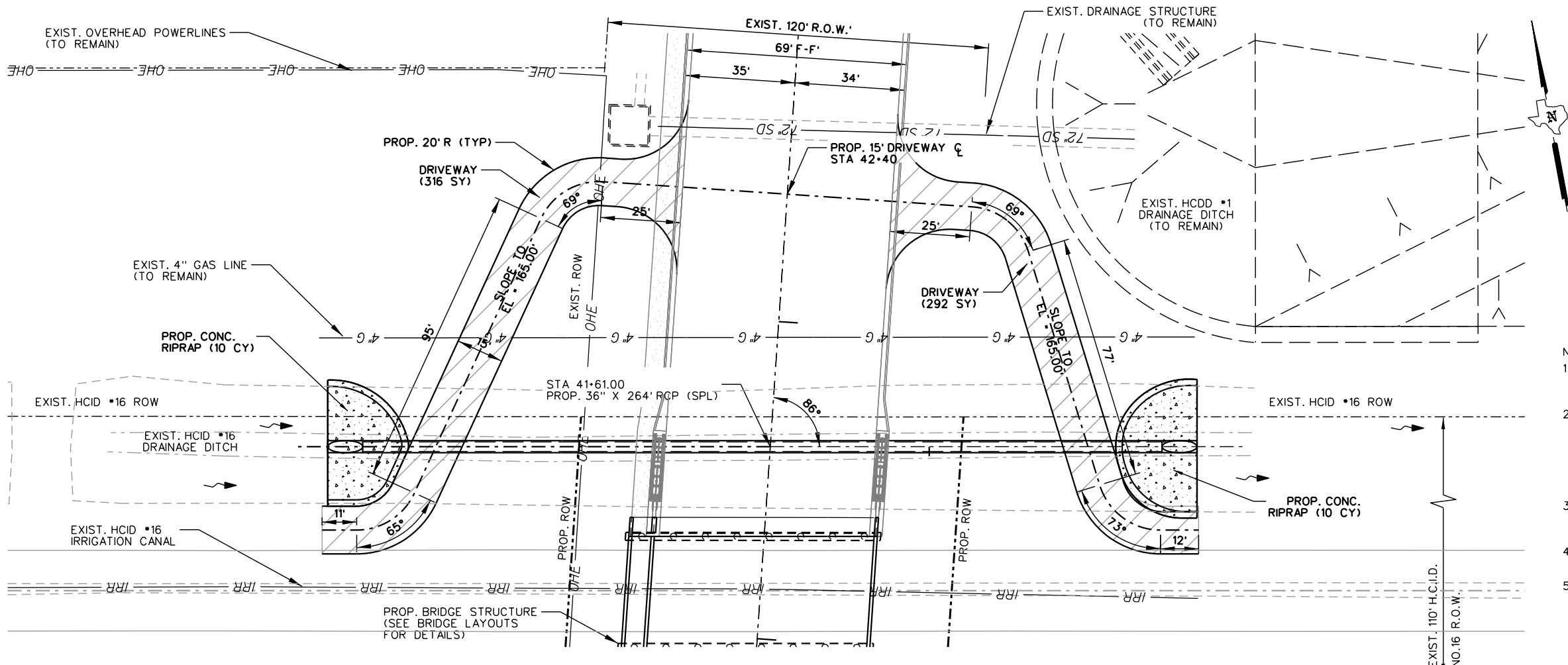
* FOR CONTRACTORS INFORMATION ONLY

LEGEND

- SEE P&P SHEETS FOR DETAILS
- ⊗ NON-PAY, SUBSIDIARY TO PERTINENT BID ITEMS.
- ⊕ TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- ⊙ TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- ▨ PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/ TURNOUT TABLE FOR QUANTITIES AND DETAILS)

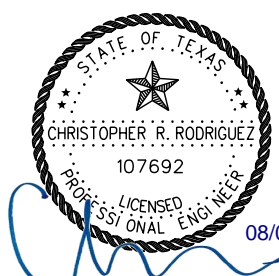
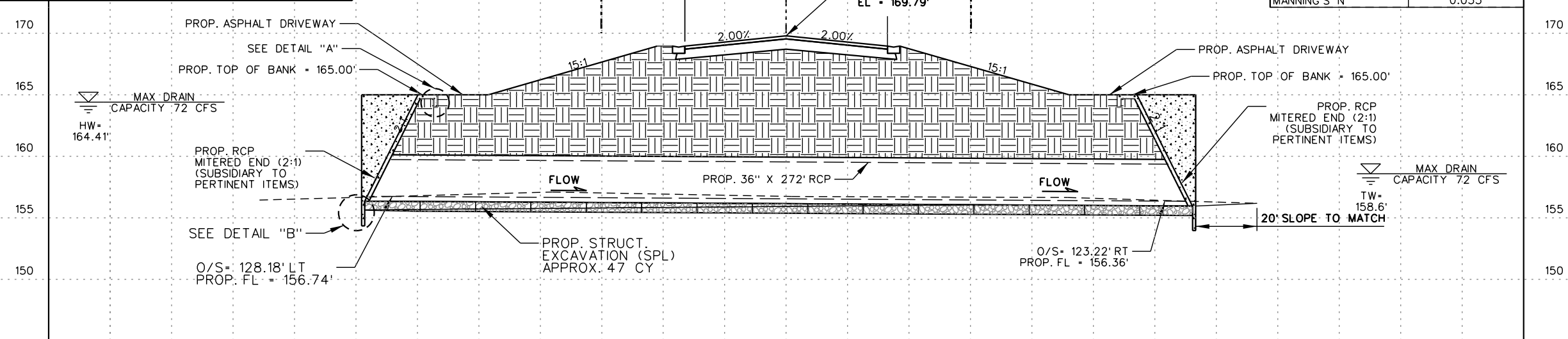
NOTE:

1. THE CONTRACTOR WILL COORDINATE WITH HIDALGO COUNTY IRRIG DISTRICT *16. 72 HOURS PRIOR TO ANY WORK DONE ON OR NEAR THE IRRIGATION STRUCTURES.
2. PRIOR TO WORKING OUTSIDE THE ROW THE CONTRACTOR SHALL CONTACT THE PROJECT ENGINEER. CAUTION SHALL BE TAKEN NOT TO DAMAGE EXISTING FENCES, TREES, ETC. THE CONTRACTOR SHALL NOTIFY PROPERTY OWNERS WHEN WORKING OUTSIDE THE ROW. ANY DAMAGES DONE TO THEIR PROPERTY SHALL BE REPAIRED AT CONTRACTORS EXPENSE.
3. THE CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES TO FIELD VERIFY UTILITIES PRIOR TO CONSTRUCTION.
4. ALL PVC ELBOWS, AND CONNECTIONS SHALL BE SUBSIDIARY TO PERTINENT BID ITEMS.
5. SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.



EXISTING IRRIGATION OWNED BORROW DITCHES WERE DETERMINED TO HAVE MINIMAL CONTRIBUTING WATERSHEDS. CULVERT CROSSINGS ARE DESIGNED BASED ON MAX DITCH CAPACITY WITH A 2' FREEBOARD DEPTH. DITCH CAPACITY EXCEEDS CONTRIBUTING WATERSHED 10 YEAR FLOW FREQUENCY SATISFYING TxDOT HYDRAULIC REQUIREMENTS FOR A ROADWAY COLLECTOR FACILITY.

CULVERT HYDRAULICS	
	MAXIMUM CAPACITY
FLOW (CFS)	72.02
HW (FT)	164.41
TW (FT)	158.60
OUT. VELOCITY (FPS)	10.80
MANNING'S N	0.035



L & G Engineering
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LIBERTY BLVD
 CULVERT CROSSING
 STA 41+61

SCALE:
 HOR: 1" = 40'
 VER: 1" = 10'

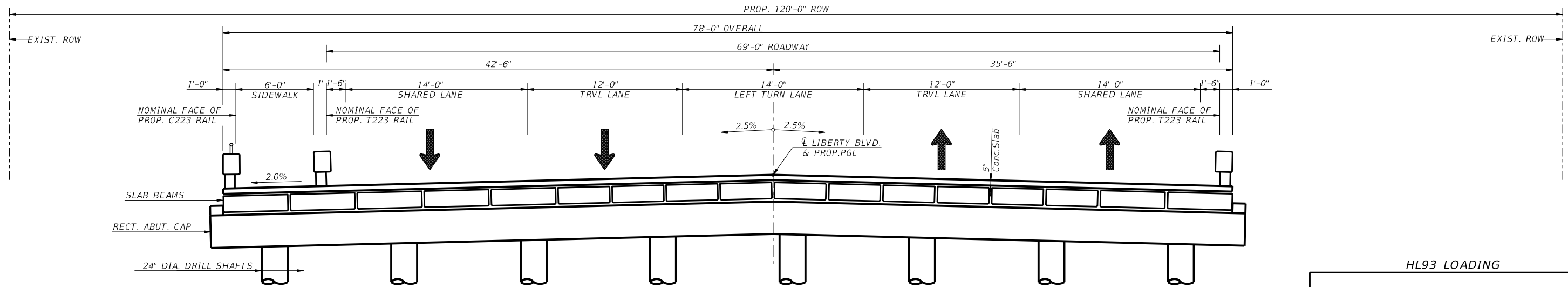
SHEET 1 OF 2

DN:	FED. NO.	STATE	PROJECT NO.	SHEET NO.
CK DN:	6	TEXAS		174
DW:	STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.
CK DW:	PHR	HIDALGO	0921	02
TR:				JOB NO.
CK TR:				194
				HIGHWAY NO.
				LIBERTY

STA. 41+61
 PROP. 36" X 264' RCP

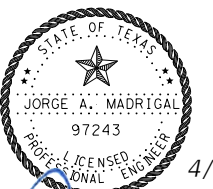
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 FILE: K:\Counties\HID\Liberty_Rd (US83 to Mile 3)\06 BRIDGES\Bridge Typical Sections\Liberty Blvd Bridge Typical Working.dgn



PROPOSED BRIDGE TYPICAL SECTION

HL93 LOADING



4/7/2022

Jorge A. Madrigal



L&G Engineering 2100 W. Expressway 83
 Mercedes, TX. 78370
 Phone : (956) 565-9813
 Fax : (956) 565-9018

Highway / Civil
 Structural / Bridge
 Environmental
 Firm No. : F-4105

900 S. Stewart Rd., Ste. 10
 Mission, TX. 78572
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 Fax : (956) 585-1927

BRIDGE TYPICAL
LIBERTY BLVD
BRIDGE

SHEET 1 OF 1

DN:	FED. RD. DIV. NO.	STATE	PROJECT NO.	SHEET NO.
CK DN:	6	TEXAS		291
DW:	STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.
TR:	PHR	HIDALGO	0921	02
CK TR:				JOB NO. 194 HIGHWAY NO. LIBERTY



DRILLING LOG

1 of 2

County Hidalgo Hole B-01 District Pharr
 Highway CSJ Structure Bridge Date 4/20/2016
 Station Grnd. Elev. 164.00 ft
 Offset GW Elev. 143.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
5		19 (6) 23 (6)	CLAY, Sandy Lean Clay, Brown, w/ Traces of Calcareous Nodules, Stiff, Dry (CL)							-200 = 59.6%
10		50 (4) 50 (2)				11.7				
149		50 (3) 50 (2)	SAND, Poorly Graded Sand w/ Silt, Brown, Very Dense, Dry to Moist (SP-SM)							-200 = 57.4%
144		50 (1) 50 (0)				15.5	27	9		
25		50 (1) 50 (0)	GRAVEL, Poorly Graded Gravel w/ Silt and Sand, Gravel Sized 1/4" - 1/2" (Sub-Angular), Very Dense, Moist to Wet (GP-GM)							-200 = 6.1%
134		43 (6) 50 (2)				37.2				
35		42 (6) 50 (1)	CLAY, Sandy Fat Clay, Brown, Hard, Wet (CH)							-200 = 51.3%
40		48 (6) 50 (0)				6.4	0	0		
						53.6				
						48	52	35		

Remarks: Sulfate Test Performed at 10 and 55 ft. Results Provided on Seperate Document. Boring Locate: 26°15'03.78"N, 98°26'21.36"W (WGS84) (From Field GPS). Assumed Natural Ground Elevation.

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: B. Gonzalez Logger: O. Garcia Organization: L&G Engineering Laboratory
 L:\Projects\Year 2016 Projects\L&G Engineering\G16005 - Liberty Rd Project (US 83 to Mile 3)\Borings\Liberty Rd_Bridge.CLG Prepared By: J.B.S. Reviewed By: D.A.S.



DRILLING LOG

2 of 2

County Hidalgo Hole B-01 District Pharr
 Highway CSJ Structure Bridge Date 4/20/2016
 Station Grnd. Elev. 164.00 ft
 Offset GW Elev. 143.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
119		50 (3) 50 (0)	CLAY, Sandy Fat Clay, Brown, Hard, Wet (CH)							-200 = 55.4%
50		38 (6) 44 (6)				42				
55		24 (6) 38 (6)	CLAY, Lean Clay w/ Sand, Brown, Hard, Wet (CL)							-200 = 79.3%
60		32 (6) 46 (6)				37.9	44	26		
99		44 (6) 50 (1)	CLAY, Fat Clay, Brown, Hard, Wet (CH)							-200 = 78.1%
70		50 (3) 50 (0)				30.7				
89		50 (2) 50 (0)								-200 = 90.4%
						21.3	58	40		
						25.4				

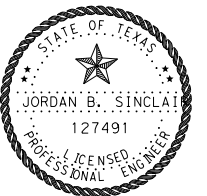
Remarks: Sulfate Test Performed at 10 and 55 ft. Results Provided on Seperate Document. Boring Locate: 26°15'03.78"N, 98°26'21.36"W (WGS84) (From Field GPS). Assumed Natural Ground Elevation.

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: B. Gonzalez Logger: O. Garcia Organization: L&G Engineering Laboratory
 L:\Projects\Year 2016 Projects\L&G Engineering\G16005 - Liberty Rd Project (US 83 to Mile 3)\Borings\Liberty Rd_Bridge.CLG Prepared By: J.B.S. Reviewed By: D.A.S.

DATE: 3/4/2022 4:10:43 PM
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HL93 LOADING



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 900 S. Stewart Rd., Ste. 10
 Mission, TX 78572
 Phone : (956) 585-1909
 Fax : (956) 585-1927

TEST HOLE DATA LIBERTY BLVD BRIDGE

SHEET 1 OF 2

DN:	FED. RD. NO.	STATE	PROJECT NO.	SHEET NO.
CK DN:	6	TEXAS		292
DW:	STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.
CK DW:	PHR	HIDALGO	0921	02
TR:	JOB NO.	HIGHWAY NO.		
CK TR:	194	LIBERTY		



DRILLING LOG

1 of 2

County Hidalgo Hole B-02 District Pharr
 Highway CSJ Structure Bridge Date 4/21/2016
 Station Grnd. Elev. 166.00 ft
 Offset GW Elev. 148.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
161.5		16 (6) 19 (6)	CLAY, Sandy Lean Clay, Dark Brown, Stiff, Dry (CL)							
						11.6	38	26		-200 = 57.8%
10		31 (6) 48 (6)	CLAY, Sandy Fat Clay, Brown, Stiff to Hard, Dry (CH)							
						13.9				
151.15		48 (6) 50 (2)	CLAY, Lean Clay w/ Sand, Brown, w/ Traces of Gravel Sized 1/4" (Sub-Angular) (Noted From 20' - 25'), Very Stiff to hard, Moist to Wet (CL)							
						17.6	56	38		-200 = 64.8%
20		19 (6) 30 (6)								
						35.3				-200 = 72.9%
141.25		38 (6) 50 (2)	GRAVEL, Poorly Graded Gravel, Sized 1/4" (Sub-Angular), Very Dense, Wet (GP)							
						25.2	26	10		
30		50 (2) 50 (0)								
						5.7				-200 = 1.2%
35		50 (4) 50 (0)								
						4.8				
126.40		50 (1) 50 (0)								
						9.8				-200 = 4.8%

Remarks: Sulfate Test Performed at 15 and 65 ft. Results Provided on Sperate Document. Boring Locate: 26°15'05.22"N, 98°26'22.02"W (WGS84) (From Field GPS). Assumed Natural Ground Elevation.

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: B. Gonzalez Logger: O. Garcia Organization: L&G Engineering Laboratory

L:\Projects\Year 2016 Projects\L&G Engineering\G16005 - Liberty Rd Project (US 83 to Mile 3)\Borings\Liberty Rd_Bridge.CLG Prepared By: J.B.S. Reviewed By: D.A.S.



DRILLING LOG

2 of 2

County Hidalgo Hole B-02 District Pharr
 Highway CSJ Structure Bridge Date 4/21/2016
 Station Grnd. Elev. 166.00 ft
 Offset GW Elev. 148.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
45		32 (6) 46 (6)	SAND, Silty Sand, Brown, Dense, Wet (SM)							
						26.8	0	0		
50		28 (6) 37 (6)								
						24.2				-200 = 13.9%
55		43 (6) 50 (0)								
						22.5				
60		39 (6) 46 (6)								
						22.7	0	0		-200 = 12.8%
65		36 (6) 49 (6)								
						30.1				
70		42 (6) 50 (1)								
						23.3				-200 = 19.4%
91.75		46 (6) 50 (2)								
						23.5	0	0		

Remarks: Sulfate Test Performed at 15 and 65 ft. Results Provided on Sperate Document. Boring Locate: 26°15'05.22"N, 98°26'22.02"W (WGS84) (From Field GPS). Assumed Natural Ground Elevation.

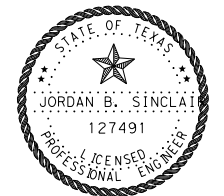
Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: B. Gonzalez Logger: O. Garcia Organization: L&G Engineering Laboratory

L:\Projects\Year 2016 Projects\L&G Engineering\G16005 - Liberty Rd Project (US 83 to Mile 3)\Borings\Liberty Rd_Bridge.CLG Prepared By: J.B.S. Reviewed By: D.A.S.

DATE: 3/4/2022 4:12:25 PM
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HL93 LOADING



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 Fax : (956) 585-1927

TEST HOLE DATA LIBERTY BLVD BRIDGE

SHEET 2 OF 2

DN:	FED. RD. DIV. NO.:	STATE:	PROJECT NO.:	SHEET NO.:
CK DN:	6	TEXAS		293
DW:	STATE DIST. NO.:	COUNTY:	CONTROL NO.:	SECTION NO.:
CK DW:		PHR	0921	02
TR:				JOB NO.:
CK TR:				194
				HIGHWAY NO.:
				LIBERTY

SUMMARY OF ESTIMATED QUANTITIES

ITEM NO.	400	416	420	422	425	425	432	450	450	454
DESC CODE	6005	6002	6013	6007	6009	6010	6010	6006	6032	6021
BRIDGE ELEMENT	CEMENT STABILIZED BACKFILL	DRILL SHAFT (24 IN)	CLASS "C" CONCRETE	REINFORCED CONCRETE SLAB (SLAB BEAM)	PRESTRESSED CONCRETE SLAB BEAM	PRESTRESSED CONCRETE SLAB BEAM	RIPRAP (CONC) (CL B) (5 IN)	RAIL	RAIL	(TY A JOINT)
			ABUTMENT	(TX4SB12)	(TX5SB12)	(TY RR8)	(TY T223)	(TY C223)		
	CY	LF	CY	SF	LF	LF	CY	LF	LF	LF
2 ~ ABUTMENTS	115.4	320	53.0							
1 ~ 40.00' PRESTR CONC SLAB BEAM SPAN				3,120	395.00	276.50		120	60	156
							29.6			
TOTAL	115.4	320	53.0	3,120	395.00	276.50	29.6	120	60	156

DATE: \$DATES\$ STIME\$
FILE: \$FILES\$



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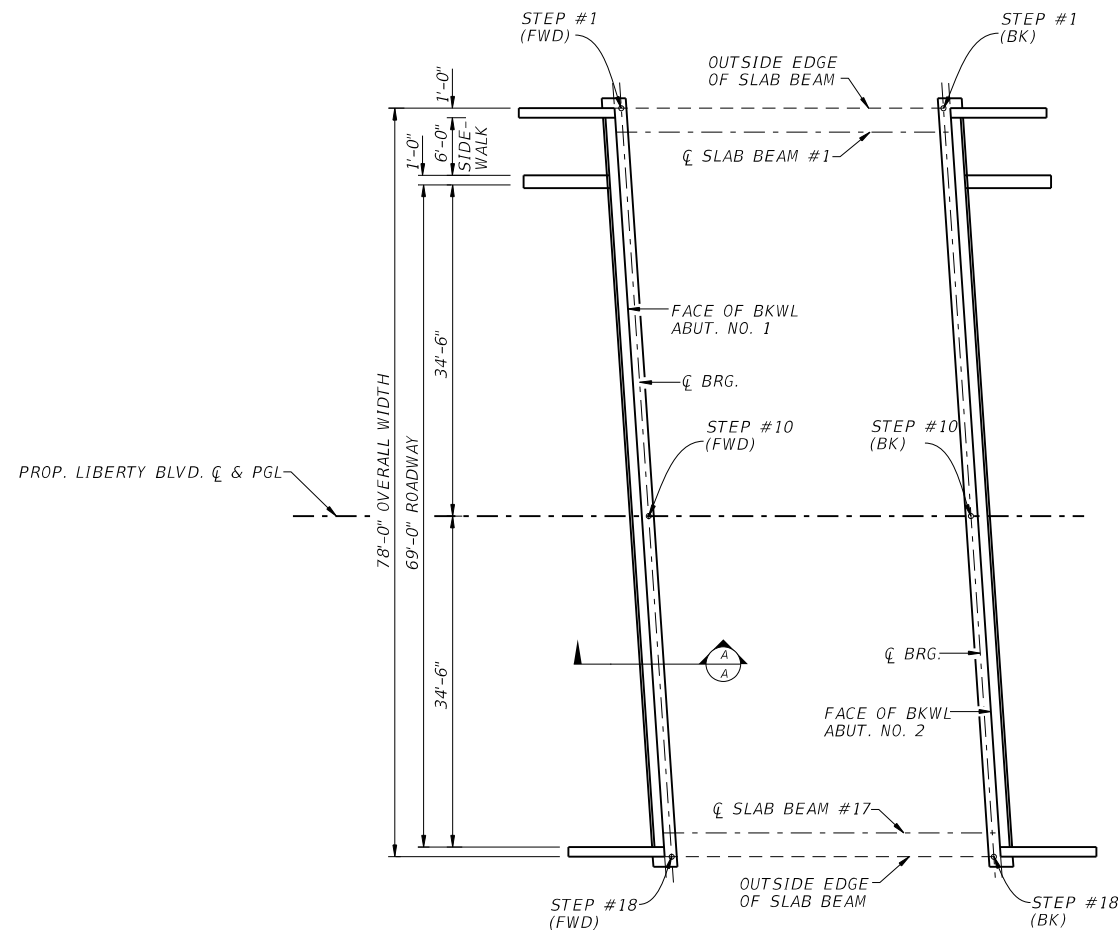
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

ESTIMATED QUANTITIES LIBERTY BLVD BRIDGE

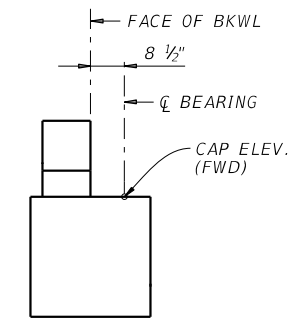
SHEET 1 OF 1

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CK DN:	6	TEXAS		294
DW:	STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.
CK DW:	PHR	HIDALGO	0921	02
TR:				JOB NO.
CK TR:				194
				HIGHWAY NO.
				LIBERTY

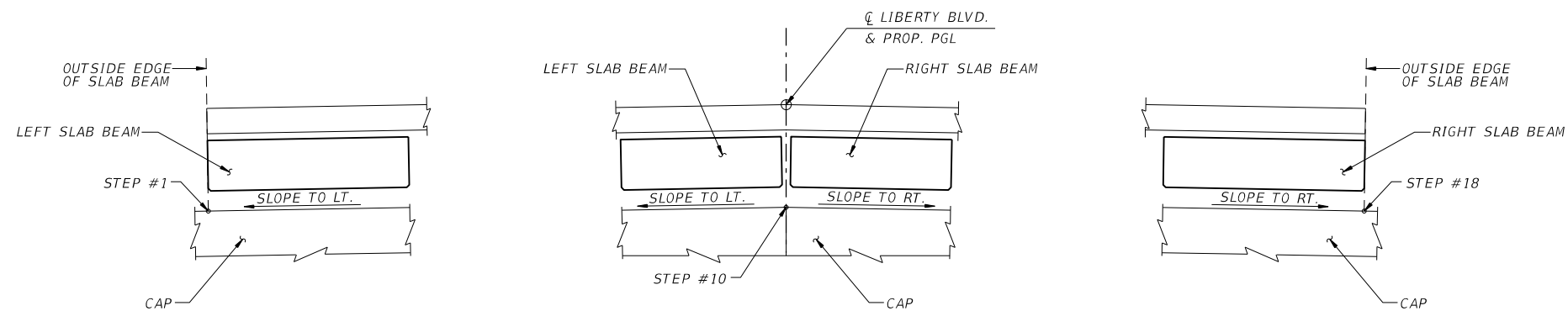


PLAN OF STEP LOCATIONS

CAP ELEVATIONS			
	STEP #1	STEP #10	STEP #18
ABUT. #1 (FWD)	166.916	167.947	167.067
ABUT. #2 (BK)	166.967	167.995	167.110

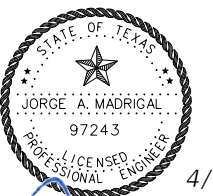


SECTION A-A



COMMON TRANSVERSE SECTIONS AT STEP LOCATIONS

HL93 LOADING



4/7/2022

Jorge A. Madrigal



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Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

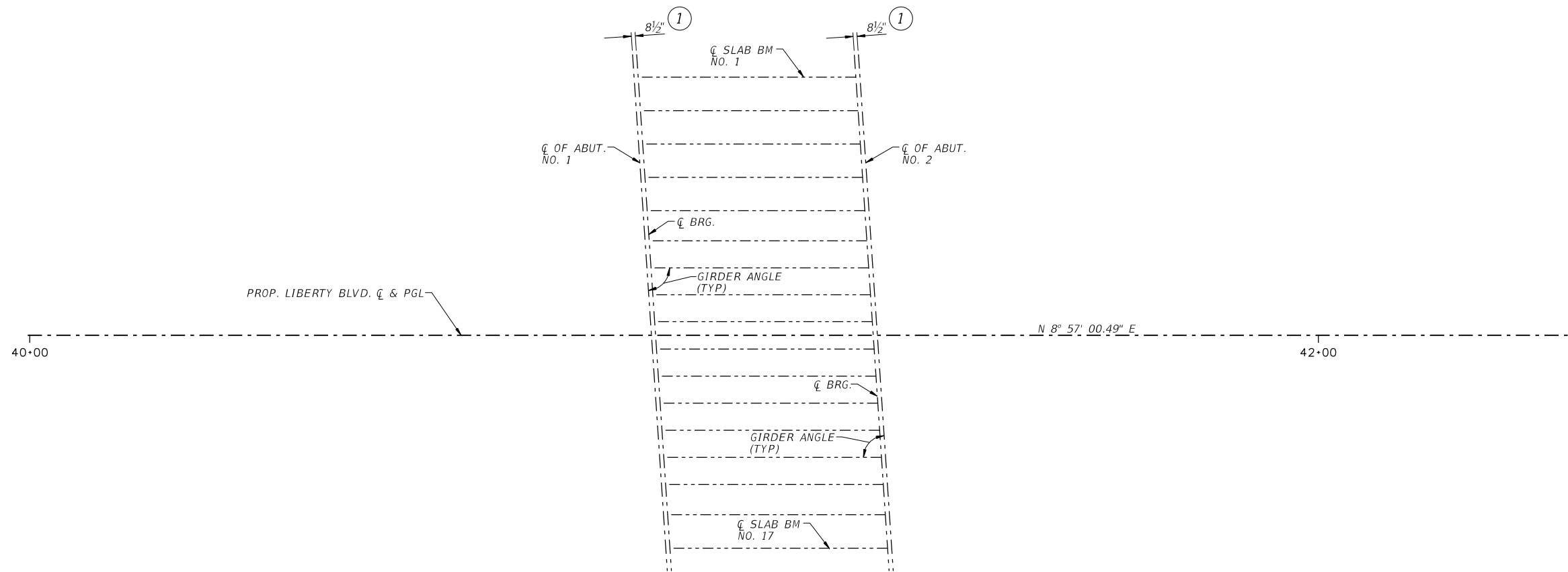
CAP ELEVATION DETAILS
LIBERTY BLVD BRIDGE

SCALE:
HOR: 1"=20'

SHEET 1 OF 1

DN:	FED. RD. DIV. NO.	STATE	PROJECT NO.	SHEET NO.
CK DN:	6	TEXAS		297
DW:	STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.
CK DW:	PHR	HIDALGO	0921	02
TR:	JOB NO.	HIGHWAY NO.		
CK TR:	194	LIBERTY		

DATE: SDATES
FILE: SFILES



FRAMING PLAN
(45B12 & 55B12 SLAB BEAMS)

BENT REPORT

BENT NO. 1 (S 84 54 4.19 E)				40.101 L			
DISTANCE BETWEEN STATION LINE AND BEAM 1,							
BEAM SPAC.		BEAM ANGLE		D		M	
(C.L. BENT)		(C.L. BENT)		D		M	
SPAN 1	BEAM 1	0.000	86 8 55				
	BEAM 2	5.185	86 8 55				
	BEAM 3	5.185	86 8 55				
	BEAM 4	5.185	86 8 55				
	BEAM 5	5.185	86 8 55				
	BEAM 6	4.684	86 8 55				
	BEAM 7	4.183	86 8 55				
	BEAM 8	4.183	86 8 55				
	BEAM 9	4.183	86 8 55				
	BEAM 10	4.260	86 8 55				
	BEAM 11	4.207	86 8 55				
	BEAM 12	4.207	86 8 55				
	BEAM 13	4.208	86 8 55				
	BEAM 14	4.207	86 8 55				
	BEAM 15	4.207	86 8 55				
	BEAM 16	4.709	86 8 55				
	BEAM 17	5.210	86 8 55				
	TOTAL	73.186					

BEAM REPORT

BEAM REPORT, SPAN 1			
HORIZONTAL DISTANCE		TRUE DISTANCE	
C-C BENT	C-C BRG.	BOT. BM. FLG. ②	BEAM SLOPE
BEAM 1	40.000	38.580	39.50
BEAM 2	40.000	38.580	39.50
BEAM 3	40.000	38.580	39.50
BEAM 4	40.000	38.580	39.50
BEAM 5	40.000	38.580	39.50
BEAM 6	40.000	38.580	39.50
BEAM 7	40.000	38.580	39.50
BEAM 8	40.000	38.580	39.50
BEAM 9	40.000	38.580	39.50
BEAM 10	40.000	38.580	39.50
BEAM 11	40.000	38.580	39.50
BEAM 12	40.000	38.580	39.50
BEAM 13	40.000	38.580	39.50
BEAM 14	40.000	38.580	39.50
BEAM 15	40.000	38.580	39.50
BEAM 16	40.000	38.580	39.50
BEAM 17	40.000	38.580	39.50

BENT NO. 2 (S 84 54 4.19 E)				40.101 L			
DISTANCE BETWEEN STATION LINE AND BEAM 1,							
BEAM SPAC.		BEAM ANGLE		D		M	
(C.L. BENT)		(C.L. BENT)		D		M	
SPAN 1	BEAM 1	0.000	86 8 55				
	BEAM 2	5.185	86 8 55				
	BEAM 3	5.185	86 8 55				
	BEAM 4	5.185	86 8 55				
	BEAM 5	5.185	86 8 55				
	BEAM 6	4.684	86 8 55				
	BEAM 7	4.183	86 8 55				
	BEAM 8	4.183	86 8 55				
	BEAM 9	4.183	86 8 55				
	BEAM 10	4.260	86 8 55				
	BEAM 11	4.207	86 8 55				
	BEAM 12	4.207	86 8 55				
	BEAM 13	4.208	86 8 55				
	BEAM 14	4.207	86 8 55				
	BEAM 15	4.207	86 8 55				
	BEAM 16	4.709	86 8 55				
	BEAM 17	5.210	86 8 55				
	TOTAL	73.186					

HL93 LOADING



Jorge A. Madrigal
4/7/2022



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Highway / Civil
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Firm No. : F-4105

FRAMING PLAN
LIBERTY BLVD
BRIDGE

SHEET 1 OF 1

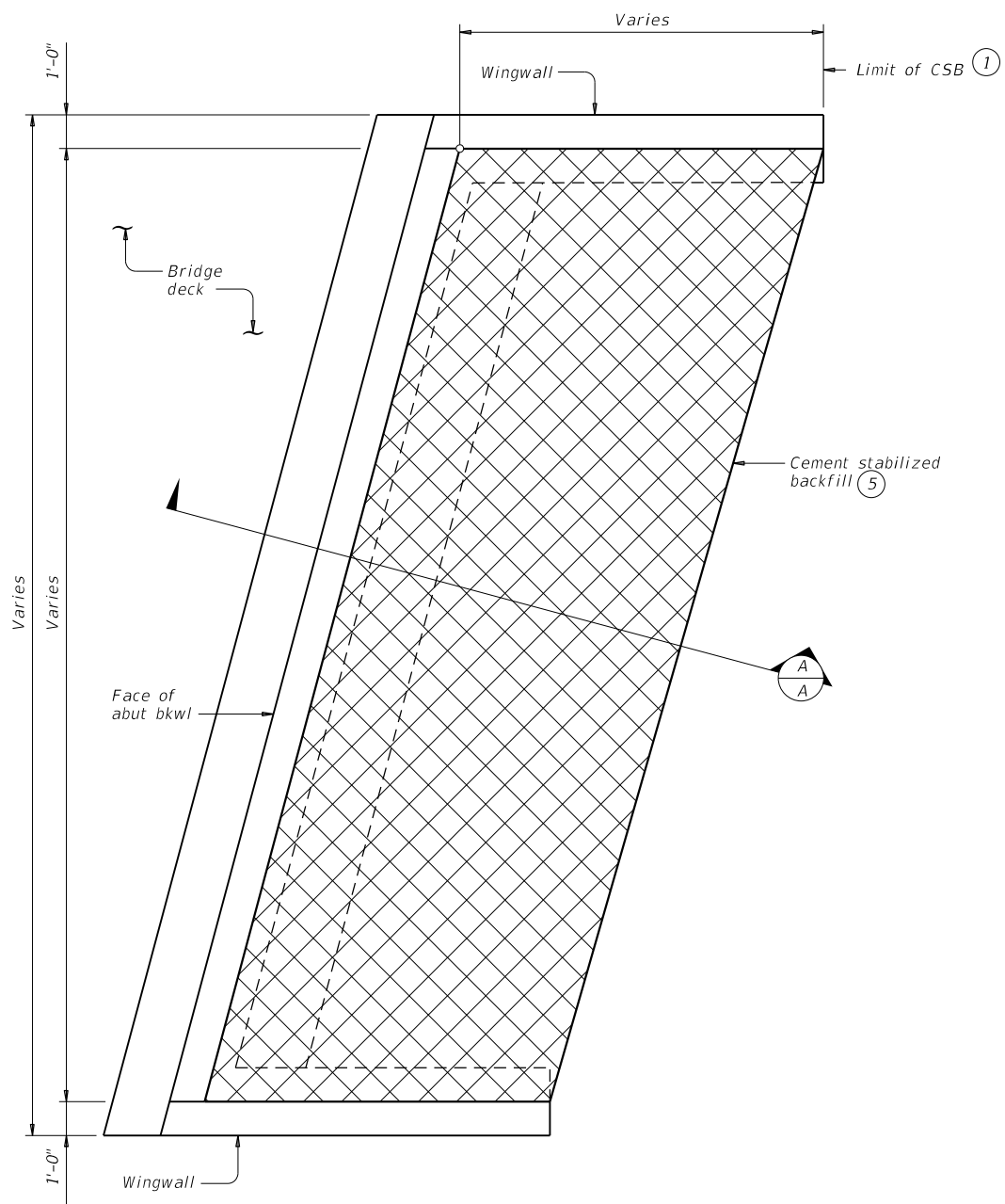
- ① See Slab Beam Elastomeric Bearing Details (PSBEB) standard sheet for orientation of dimension.
- ② Beam lengths shown are bottom beam lengths with adjustments made for beam slope.

DATE: SDATES \$TIMES
FILE: SFILES \$

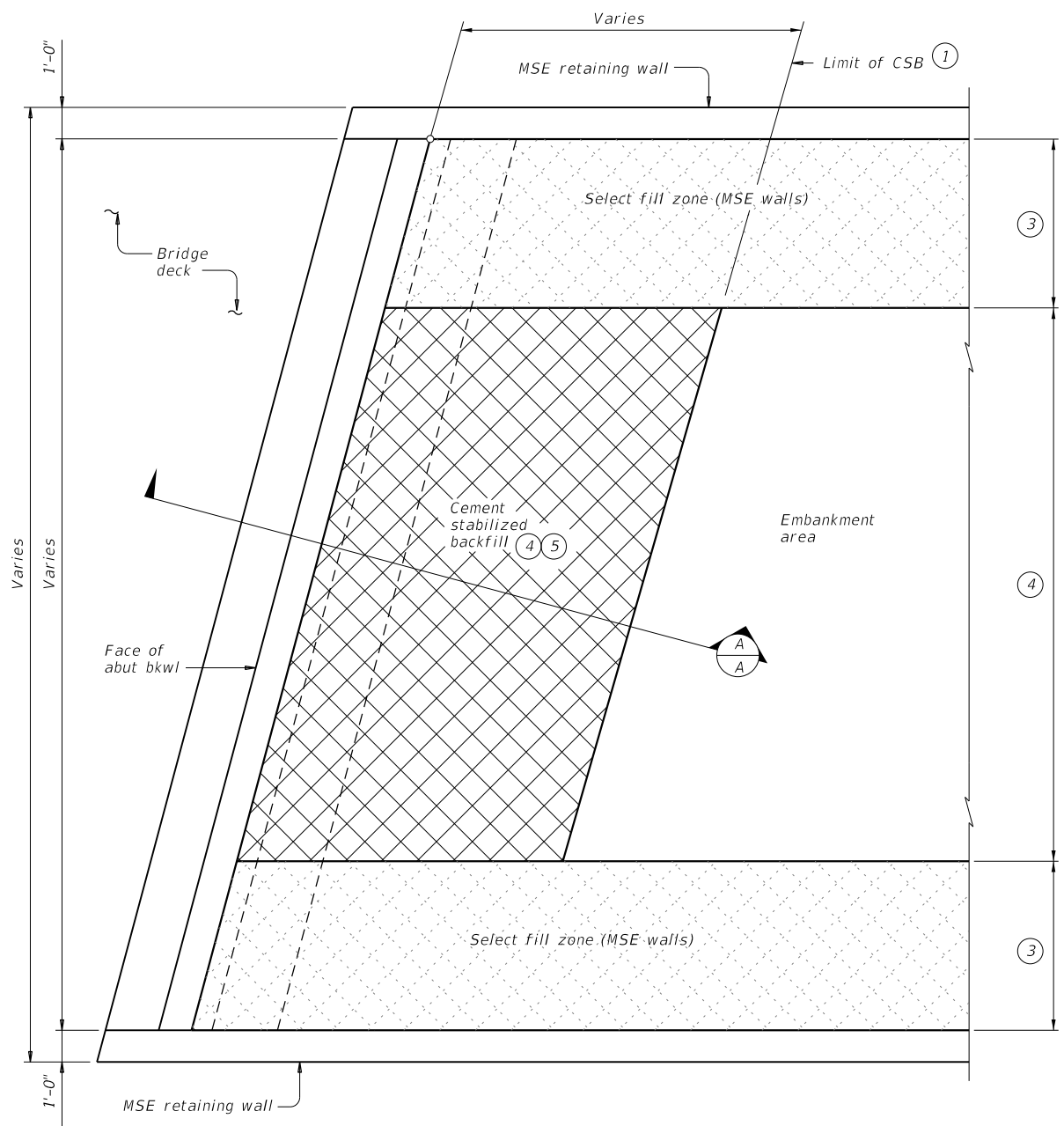
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1"=20'	6	TEXAS		298
CK DW:	STATE DIST. NO.:	COUNTY:	CONTROL NO.:	SECTION NO.:
	PHR	HIDALGO	0921	02
TR:				JOB NO.:
				194
CK TR:				HIGHWAY NO.:
				LIBERTY

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DATE: FILE:



OPTION 1 ~ PLAN WITH WINGWALLS
Cast-in-place retaining walls similar.



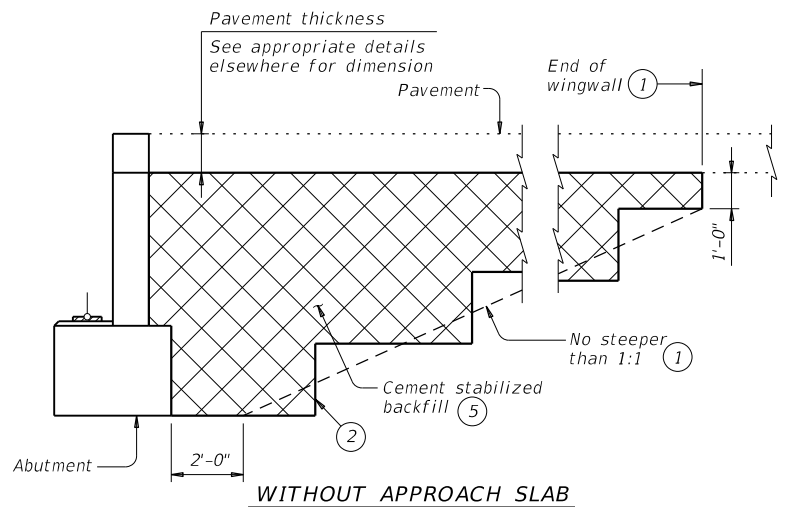
OPTION 1 ~ PLAN WITH MSE RETAINING WALLS

- 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 Where MSE retaining walls are present, adjust CSB limits to accommodate the select fill zone. See retaining wall details for additional information.
- ④ 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.
- ⑤ 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 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).

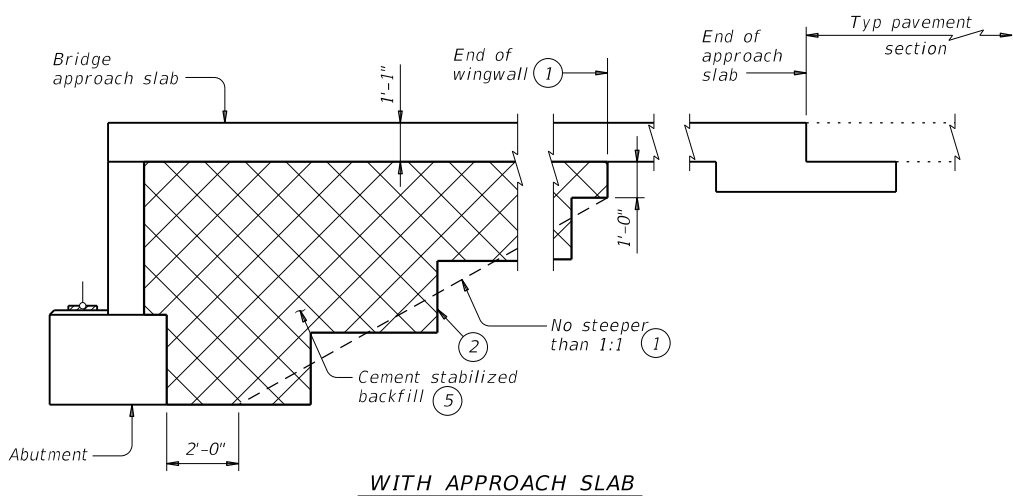
GENERAL NOTES:
See the Bridge Layout for selected Option. Option 2 is intended for new construction requiring high plasticity embankment fill with a plasticity index (PI) greater than 30 or pavement built in poor native soil. Poor soils are defined as high plasticity clays or expansive clays. Option 1 is intended for construction only requiring PI controlled embankment fill or excavation in competent soils/rocks in order to construct the abutment. 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 requirements of Item 401, "Flowable Backfill", to 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.

SHEET 1 OF 2

		Bridge Division Standard	
<h2>CEMENT STABILIZED ABUTMENT BACKFILL BRIDGE ABUTMENT</h2>			
<h3>CSAB</h3>			
FILE: csabste1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT	APRIL 2019	CONTRACT NO. 0921	SECTION 02
REVISIONS		JOB NO. 194	HIGHWAY LIBERTY
02-20: Added Option 2.		DIST. COUNTY	SHEET NO.
		PHR HIDALGO	301



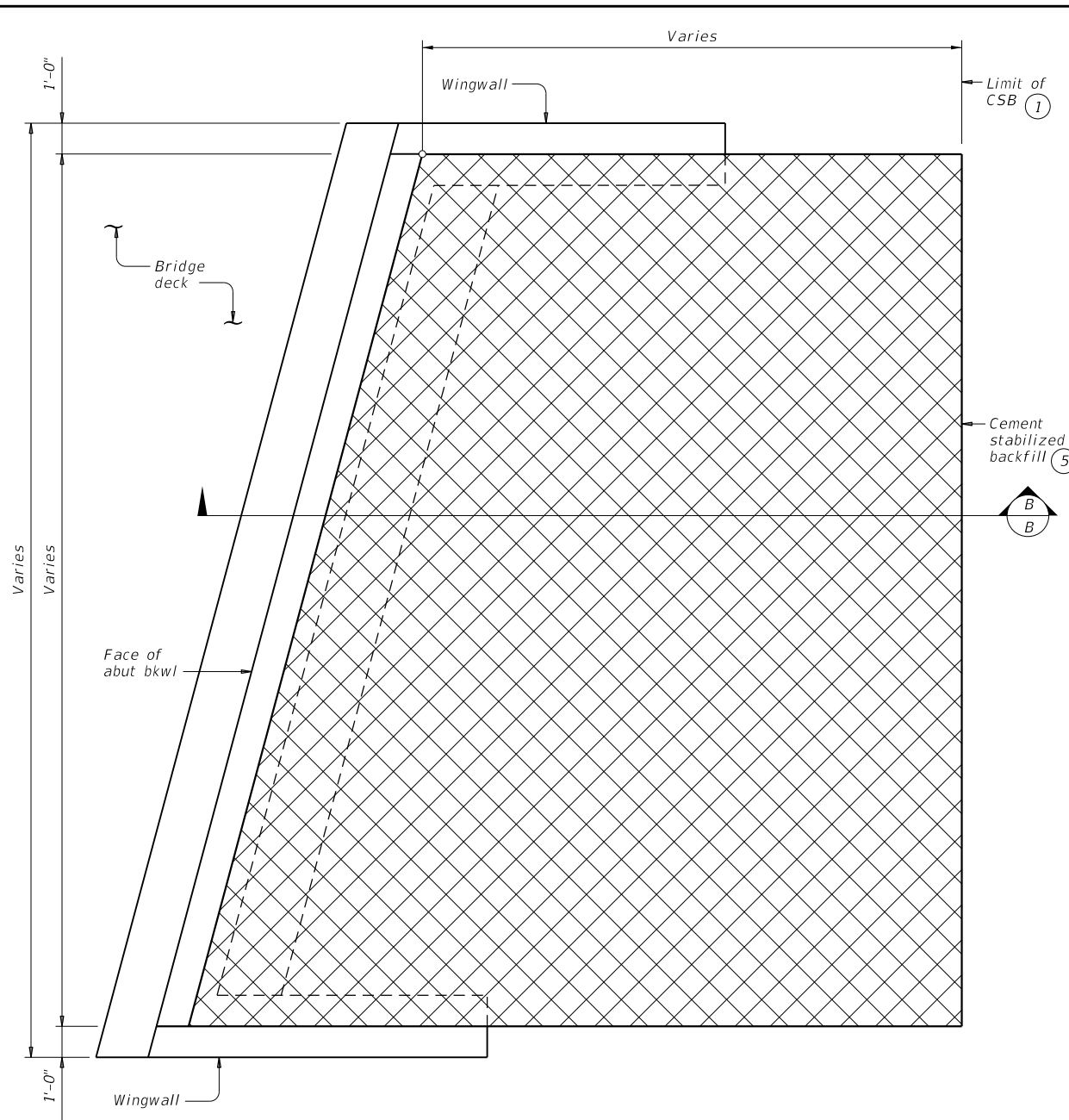
WITHOUT APPROACH SLAB



SECTION A-A

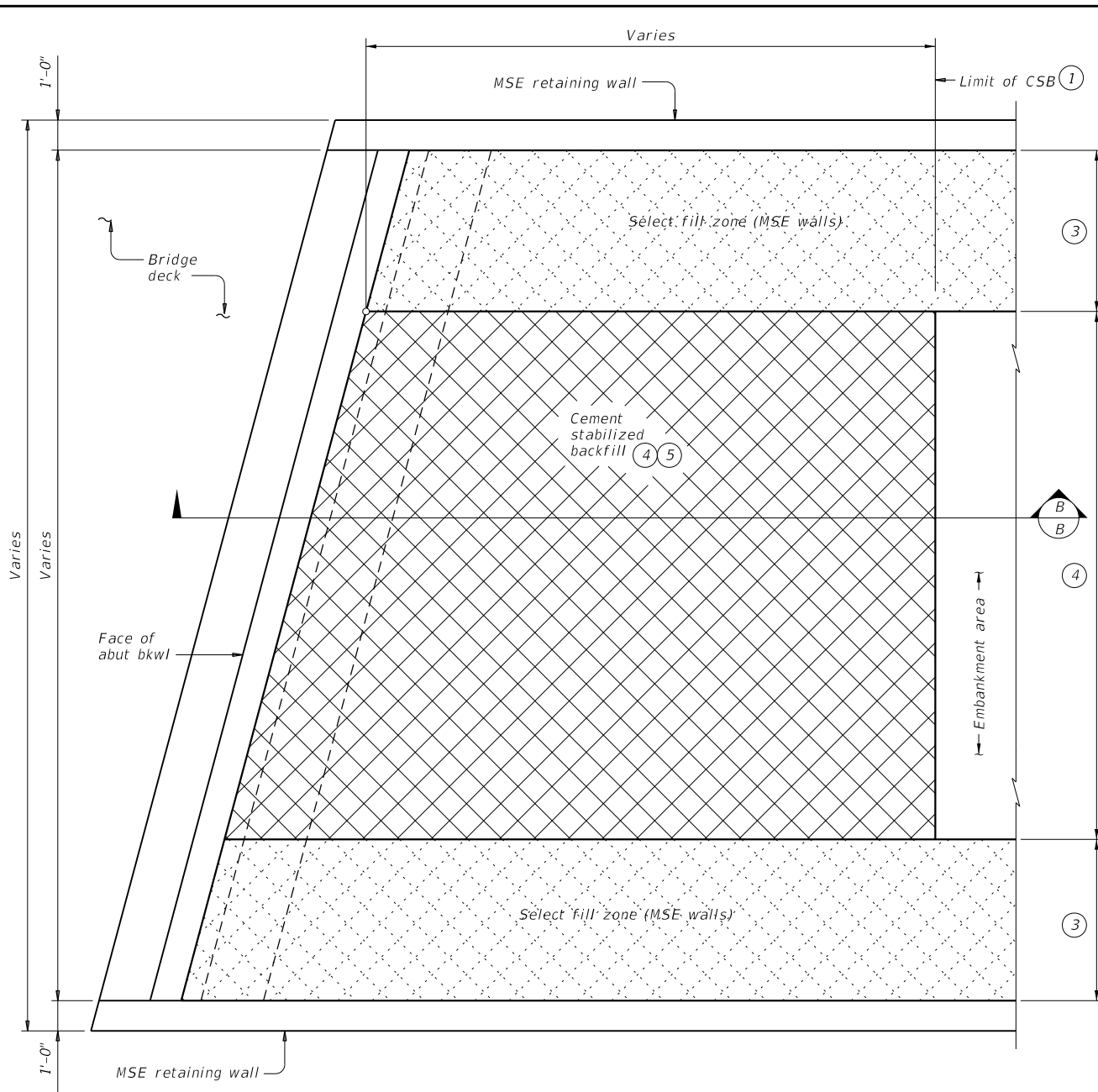
WITH APPROACH SLAB
(Showing BAS-C, BAS-A similar.)

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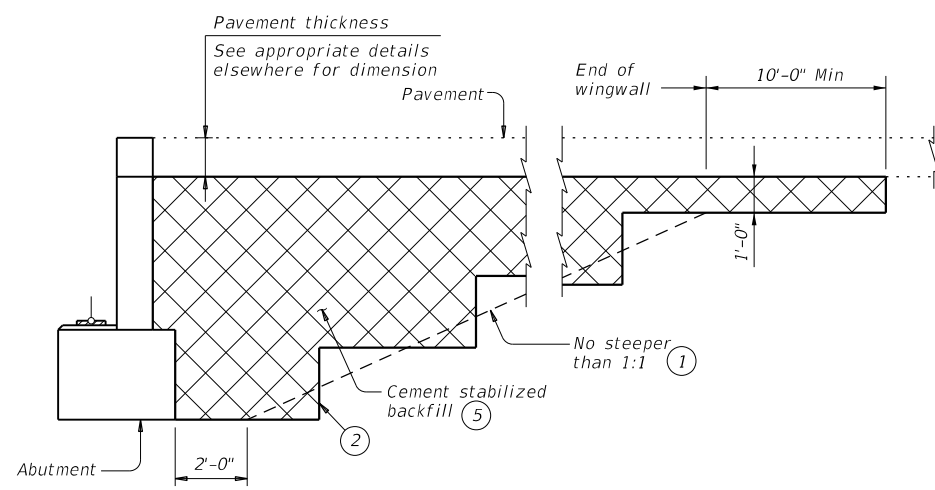
OPTION 2 ~ PLAN WITH WINGWALLS

Cast-in-place retaining walls similar.

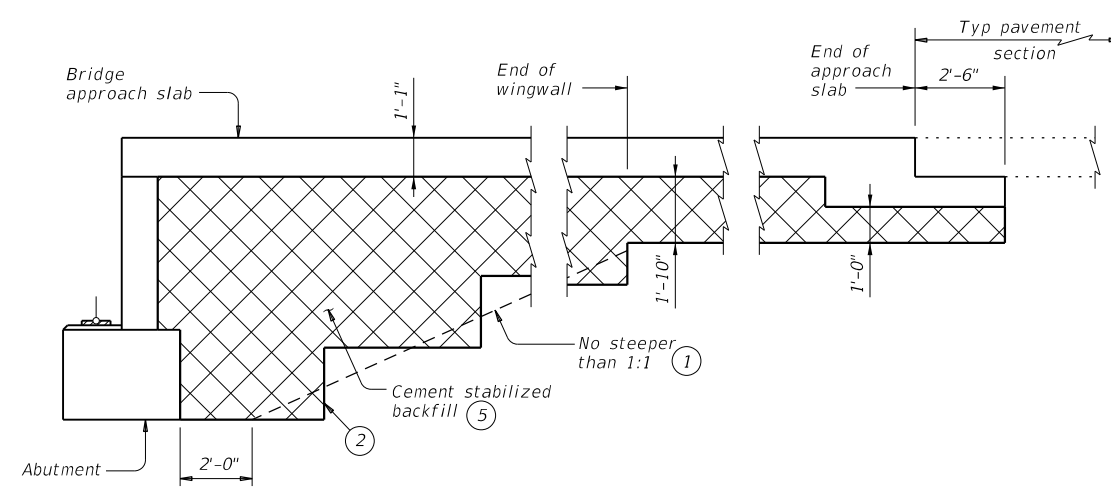


OPTION 2 ~ PLAN WITH MSE RETAINING WALLS

- 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 Where MSE retaining walls are present, adjust CSB limits to accommodate the select fill zone. See retaining wall details for additional information.
- ④ 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.
- ⑤ 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



SECTION B-B

WITH APPROACH SLAB
(Showing BAS-C, BAS-A similar.)

SHEET 2 OF 2



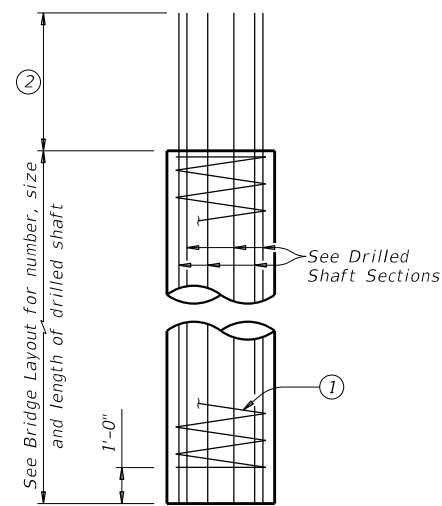
**CEMENT STABILIZED
ABUTMENT BACKFILL
BRIDGE ABUTMENT**

CSAB

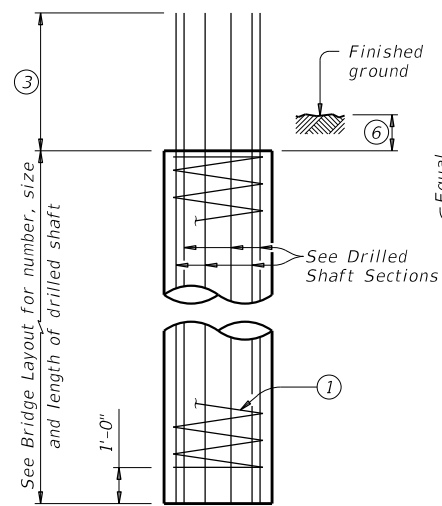
FILE: csabste1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONV	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
02-20: Added Option 2.	DIST	COUNTY	SHEET NO.	
	PHR	HIDALGO	302	

DATE:
FILE:

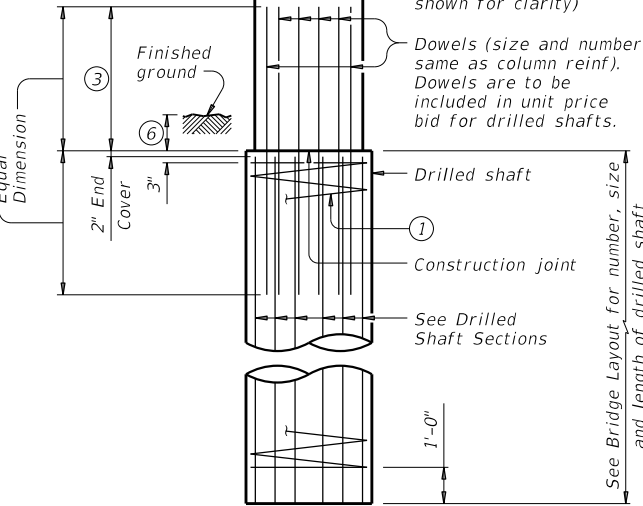
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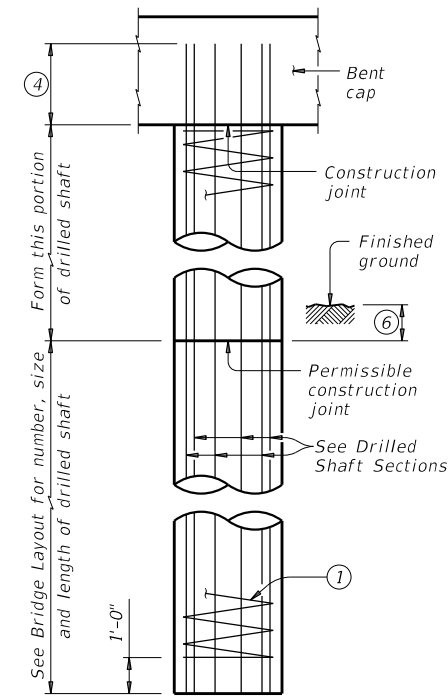
ABUTMENTS, WINGWALLS AND MULTI-DRILLED SHAFT FOOTINGS



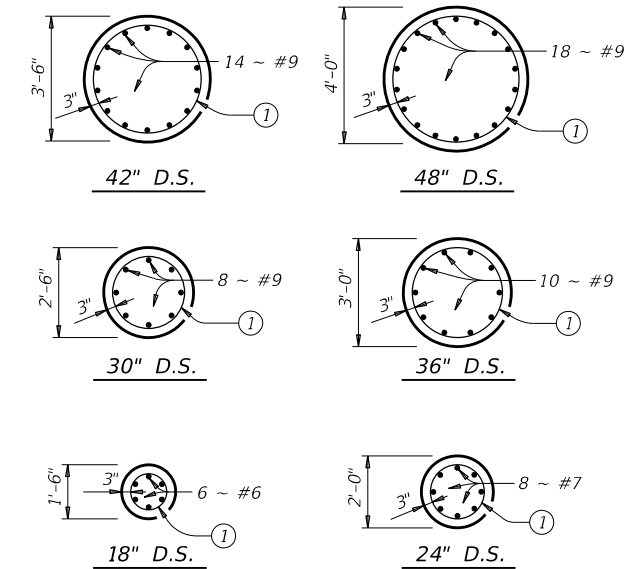
INTERIOR BENTS DRILLED SHAFT DIA EQUAL TO COLUMN DIA



INTERIOR BENTS DRILLED SHAFT DIA GREATER THAN COLUMN DIA



OPTIONAL INTERIOR BENT DRILLED SHAFT DETAIL ⑤



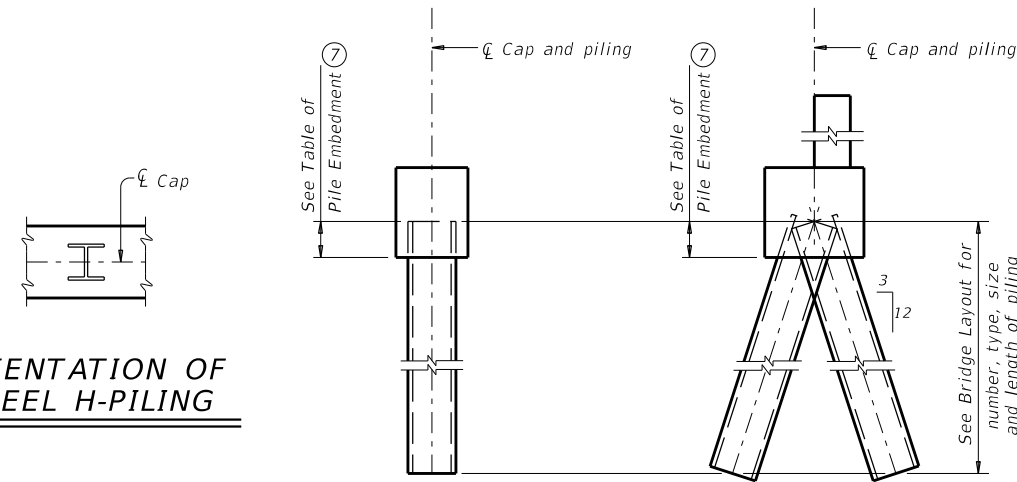
DRILLED SHAFT SECTIONS

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"

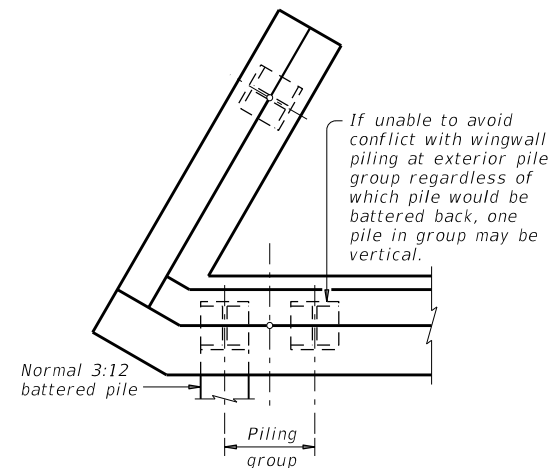
See Prestressed Concrete Piling (CP) standard for additional details on concrete pile embedment.

ORIENTATION OF STEEL H-PILING



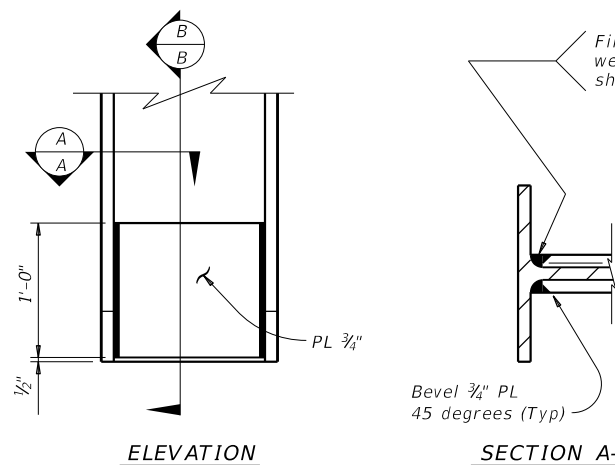
VERTICAL PILE BATTERED PILE

PILING DETAILS (Concrete or steel H)



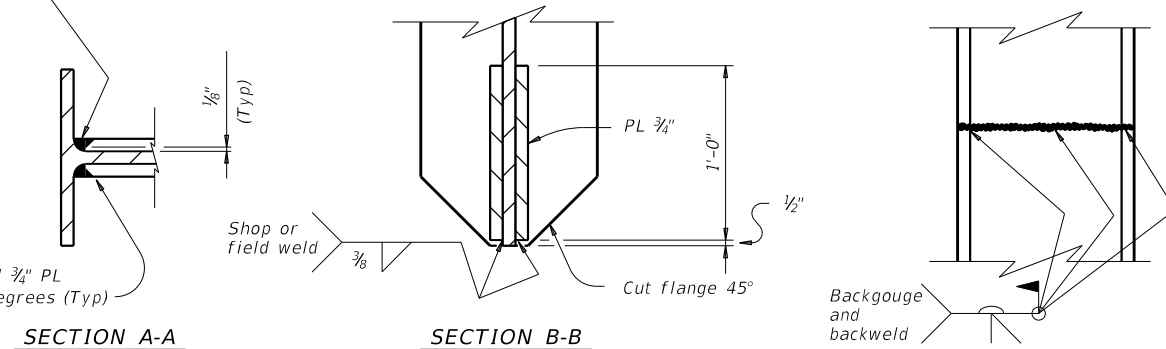
DETAIL "A"

(Showing plan view of a 30° skewed abutment)



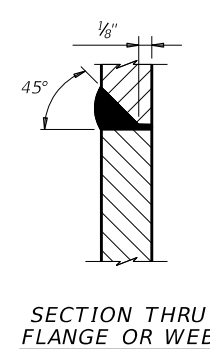
STEEL H-PILE TIP REINFORCEMENT

See Item 407 "Steel Piling" to determine when tip reinforcement is required and for options to the details shown.



STEEL H-PILE SPLICE DETAIL

Use when required.



SECTION THRU FLANGE OR WEB

- 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"
#11 Bars = 4'-8"
- 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.

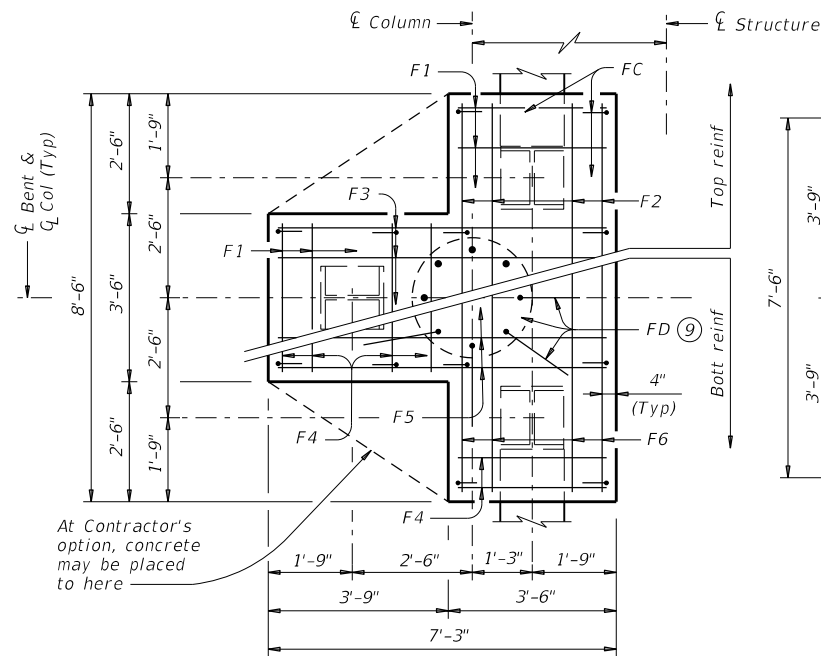
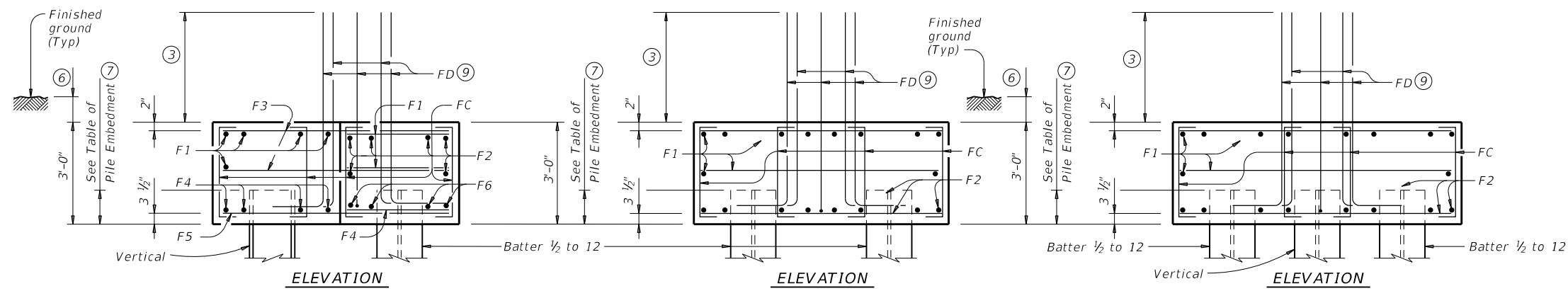
SHEET 1 OF 2

		Bridge Division Standard	
<h2>COMMON FOUNDATION DETAILS</h2>			
FD			
FILE: fdstoe01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT April 2019	CONTRACT	SECTION	JOB
01-20: Added #11 bars to the FD bars.	0921	02	194
	DIST	COUNTY	SHEET NO.
	PHR	HIDALGO	303

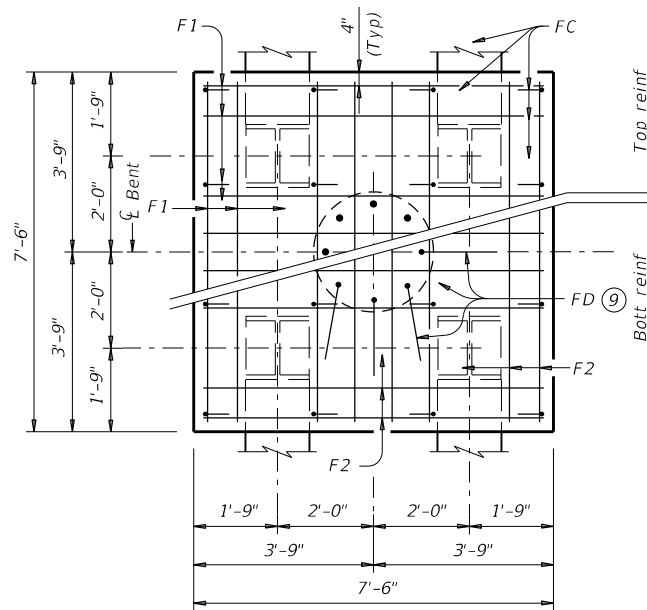
DATE: FILE:

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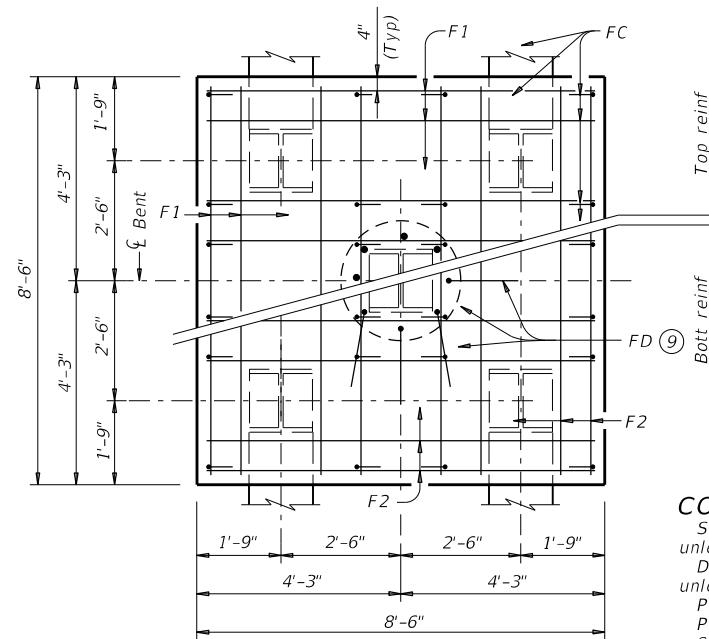
DATE: FILE:



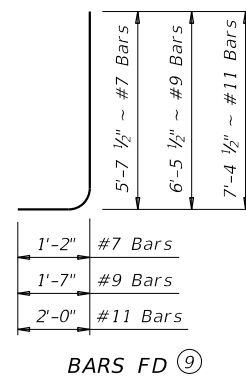
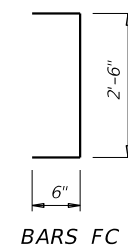
THREE PILE FOOTING^⑧
For 36" Dia and smaller columns.



FOUR PILE FOOTING^⑧
For 42" Dia and smaller columns.



FIVE PILE FOOTING^⑧
For 42" Dia and smaller columns.



- ③ Min lap with column reinforcing:
#7 Bars = 2'-11"
#9 Bars = 3'-9"
#11 Bars = 4'-8"
- 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 Adjust FD quantity, size and weight as needed to match column reinforcing.

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'- 1"	220	
Reinforcing Steel				Lb	623
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 ^⑩	8	#9	8'- 1"	220	
Reinforcing Steel				Lb	659
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 ^⑩	8	#9	8'- 1"	220	
Reinforcing Steel				Lb	829
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

SHEET 2 OF 2

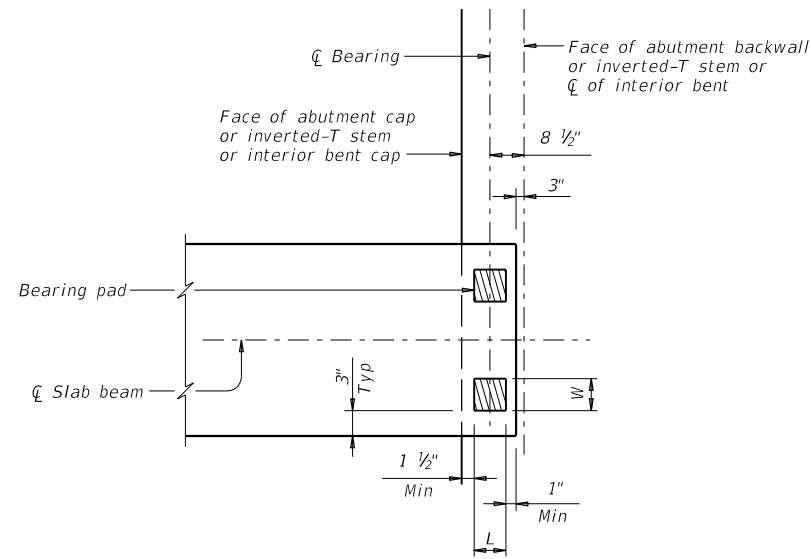


COMMON FOUNDATION DETAILS

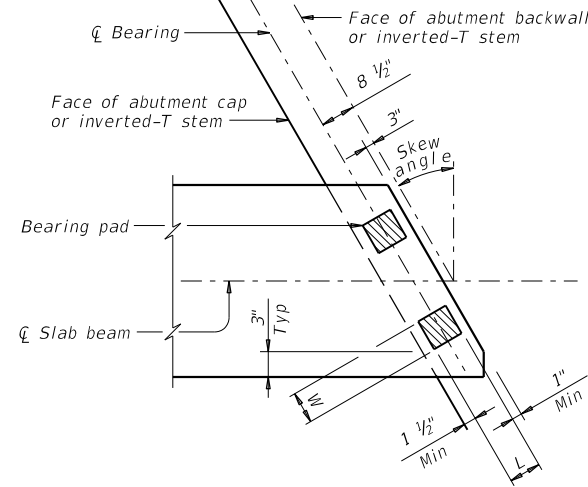
FD

FILE: fdstoe01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
01-20: Added #11 bars to the FD bars.	DIST	COUNTY	SHEET NO.	
	PHR	HIDALGO	304	

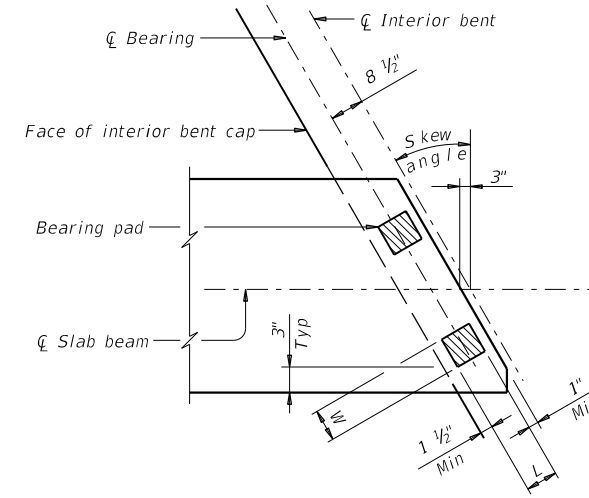
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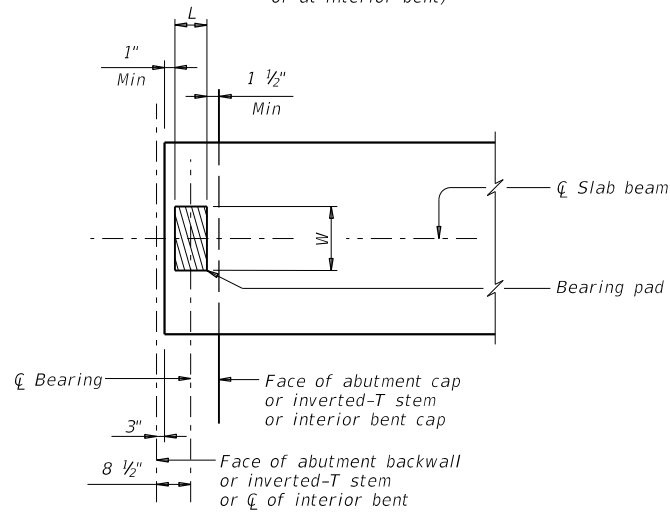
TWO-PAD DETAIL PLAN
(At abutment or inverted-T cap or at interior bent)



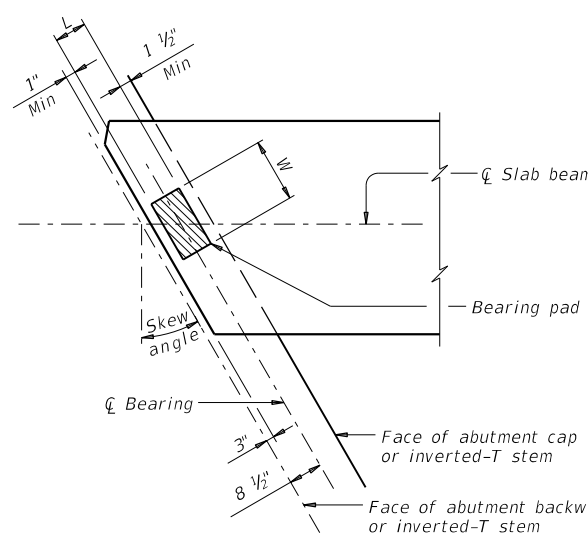
TWO-PAD DETAIL SKEW PLAN
(At abutment or inverted-T cap)



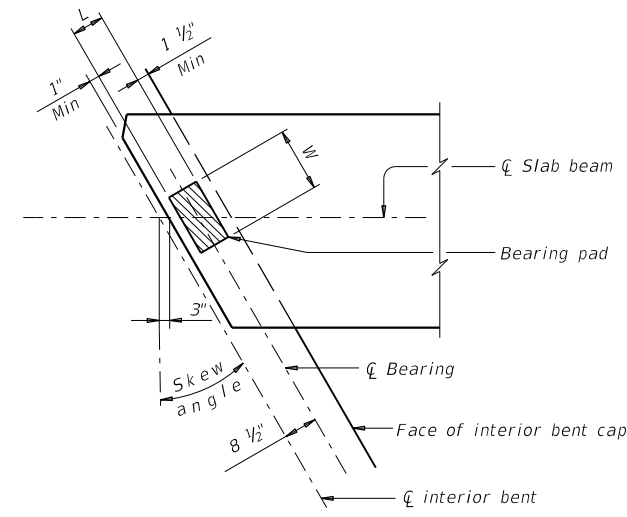
TWO-PAD DETAIL SKEW PLAN
(At interior bent)



ONE-PAD DETAIL PLAN
(At abutment or inverted-T cap or at interior bent)



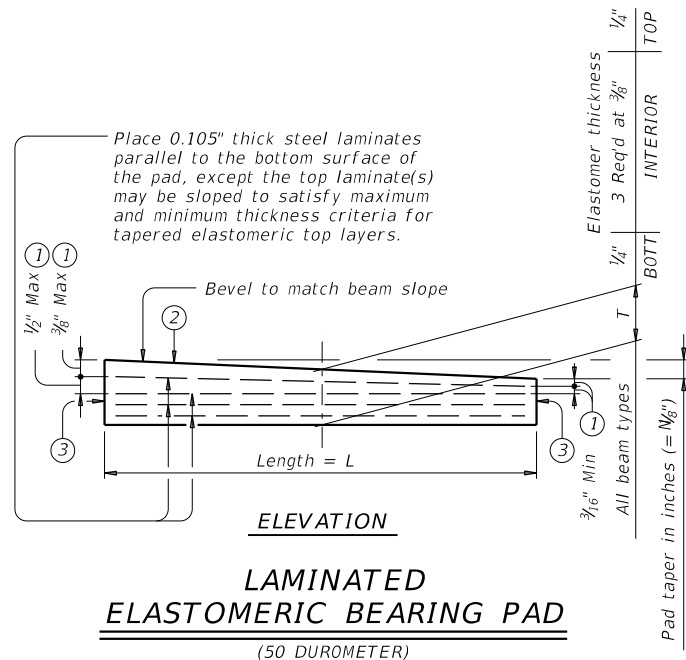
ONE-PAD DETAIL SKEW PLAN
(At abutment or inverted-T cap)



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.



LAMINATED ELASTOMERIC BEARING PAD
(50 DUROMETER)

- Maximum and minimum layer thicknesses shown are for elastomer only, on tapered layers.
- 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 1/8" increments) in this mark.
Examples: N=0, (for 0" taper)
N=1, (for 1/8" taper)
N=2, (for 1/4" taper)
(etc.)
Fabricated pad top surface slope must not vary from plan beam slope by more than $(\frac{0.0625}{\text{Length}})$ IN/IN.
- Locate permanent mark here.

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:

- 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'.
- Skews less than or equal to 30°.

GENERAL NOTES:

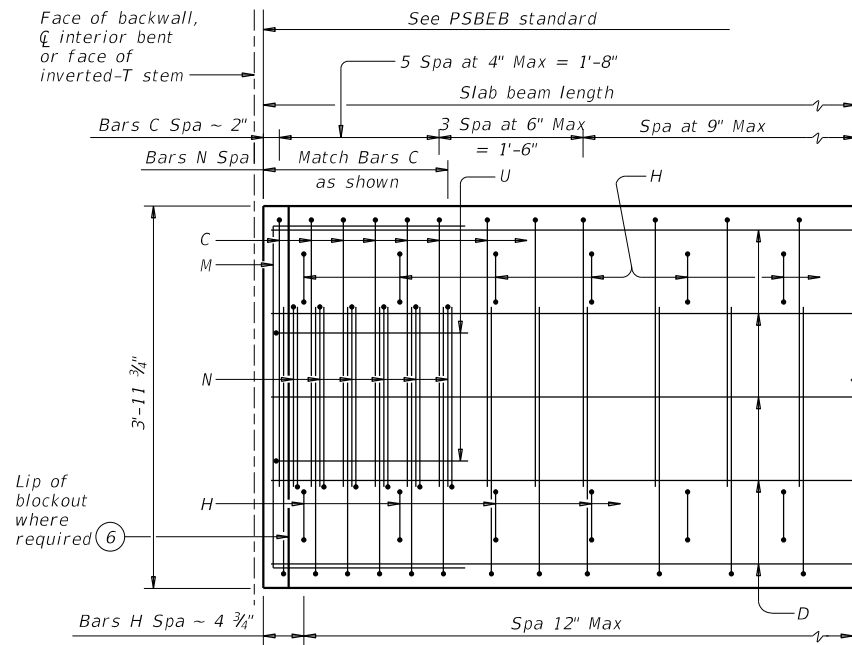
These details accommodate skew angles up to 30°.
Shop drawings for approval are required.
A bearing layout which identifies location and orientation of all bearings must be developed by the bearing fabricator. Permanently mark each bearing in accordance with the bearing layout. A copy of the bearing 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

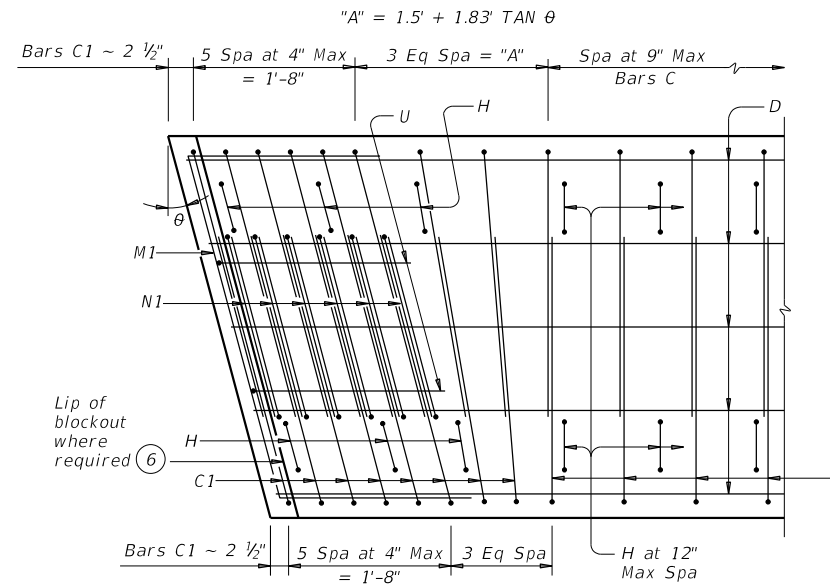
		Bridge Division Standard	
ELASTOMERIC BEARING AND BEAM END DETAILS			
PRESTR CONCRETE SLAB BEAM			
PSBEB			
FILE: psbste06-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT January 2017	CONTRACT: 0921	SECTION: 02	JOB: 194
REVISIONS	COUNTY: HIDALGO		SHEET NO.: 305

DATE: FILE:

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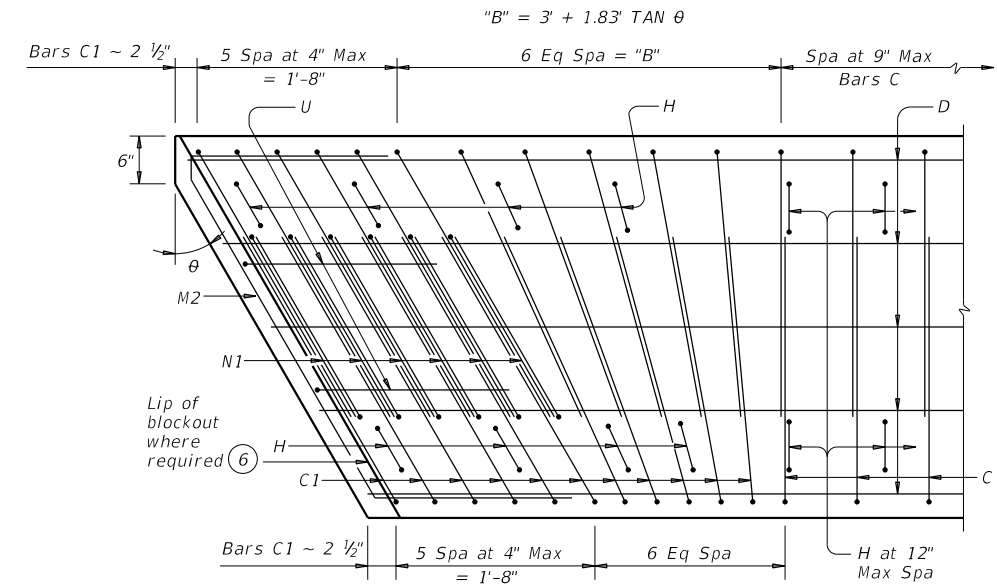


PART PLAN



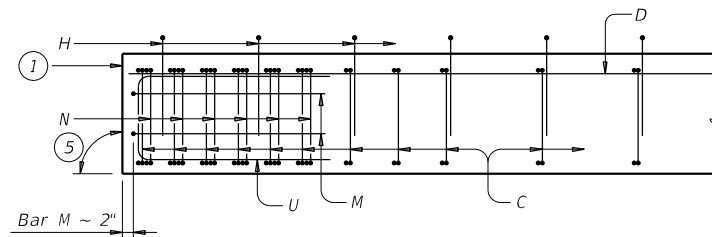
PART SKEW PLAN

(Showing θ over 0° to 15° Skew)

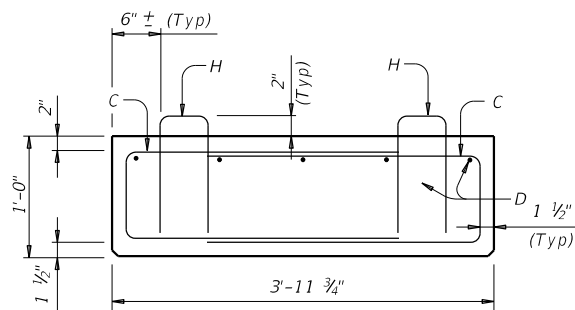


PART SKEW PLAN

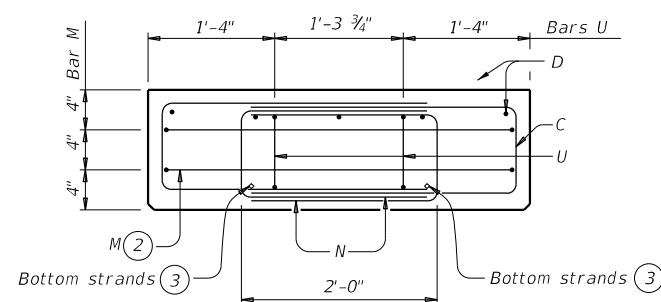
(Showing θ over 15° to 30° Skew)



ELEVATION

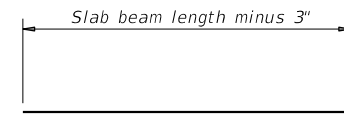


SECTION

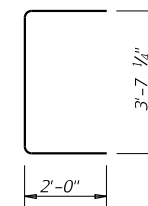


END MAT REINFORCING

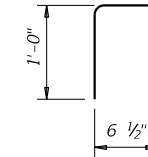
Bars H not shown for clarity.



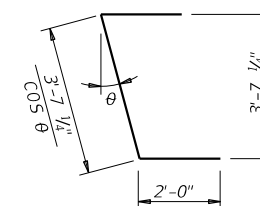
BARS D(#6)



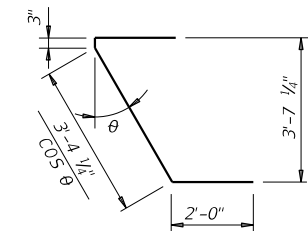
BARS M(#4)



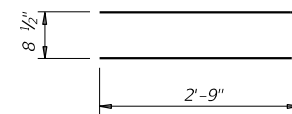
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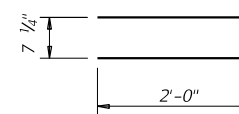
BARS M1(#4)



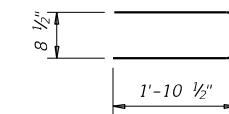
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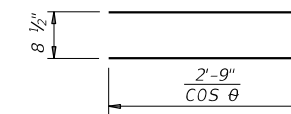
BARS C(#4)



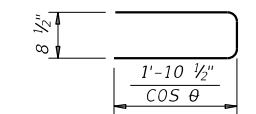
BARS U(#5)



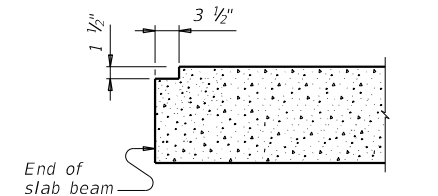
BARS N(#4)



BARS C1(#4)



BARS N1(#4)



ELEVATION OF BLOCKOUT ⑥

BEAM PROPERTIES

Area	in ²	573.0
Y top	in	6.00
Y bott	in	6.00
I	in ⁴	6,876
Weight ④	lb/ft	597

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 3/4" or round to a 3/4" 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

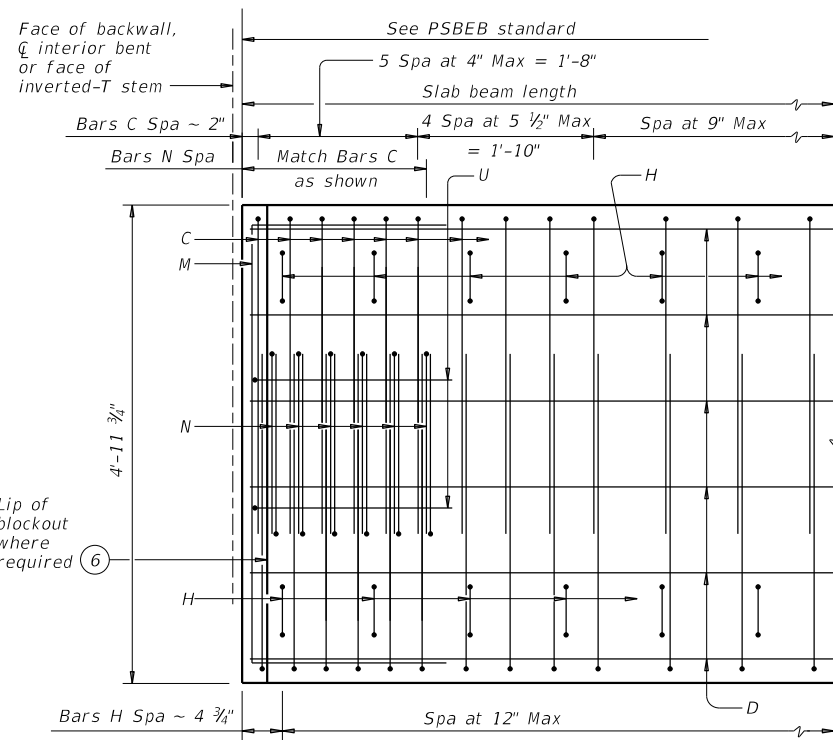
Texas Department of Transportation
Bridge Division Standard

PRESTRESSED CONCRETE SLAB BEAM DETAILS
(TYPE 4SB12)
PSB-4SB12

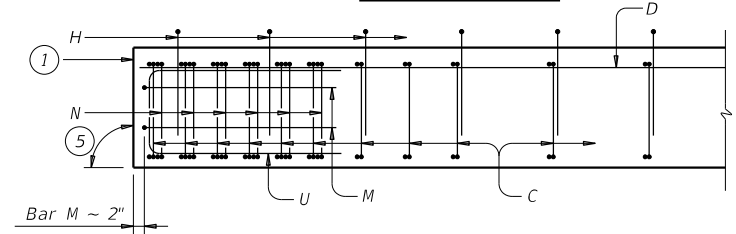
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©TxDOT January 2017	CONTRACT	SECTION	JOB	HIGHWAY
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DIST	COUNTY		SHEET NO.	
PHR	HIDALGO		306	

DATE: FILE:

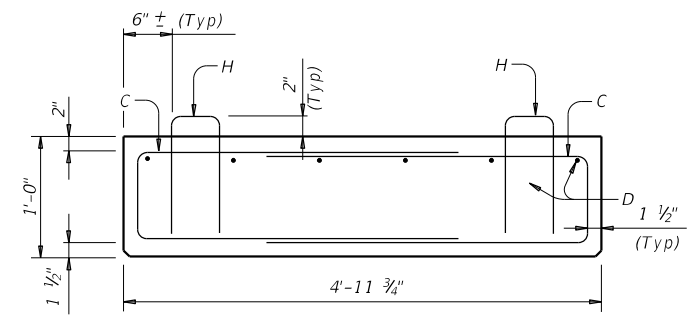
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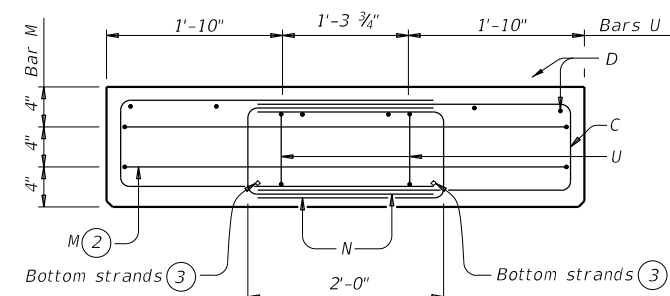
PART PLAN



ELEVATION

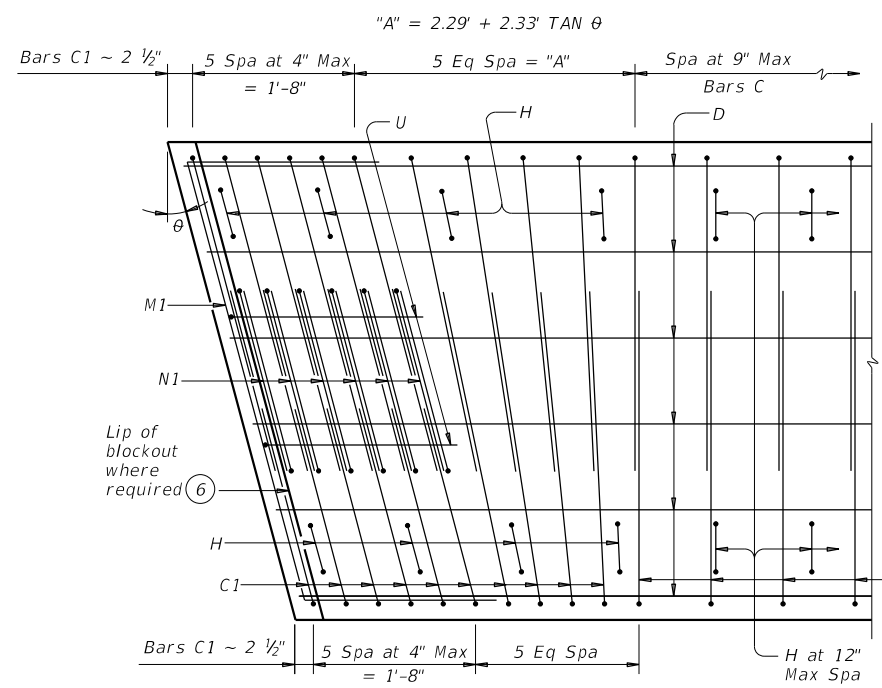


SECTION



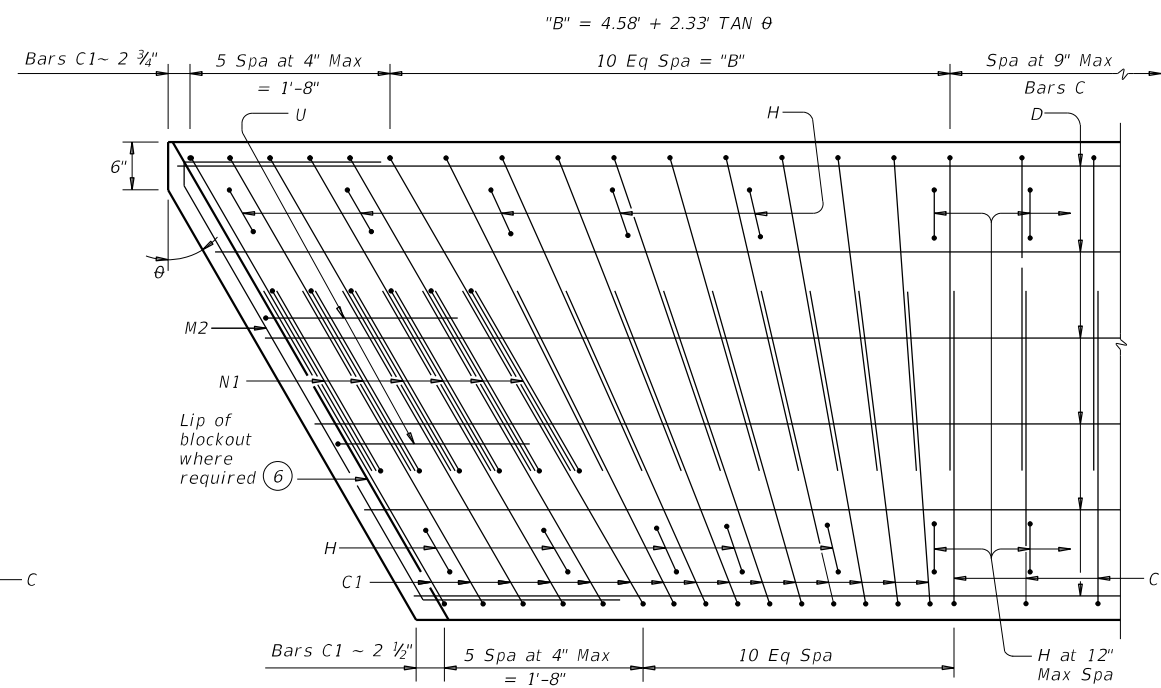
END MAT REINFORCING

Bars H not shown for clarity.



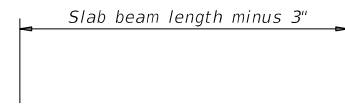
PART SKEW PLAN

(Showing θ over 0° to 15° Skew)

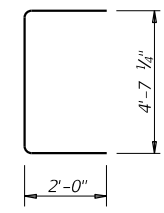


PART SKEW PLAN

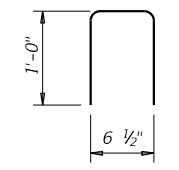
(Showing θ over 15° to 30° Skew)



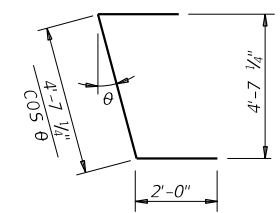
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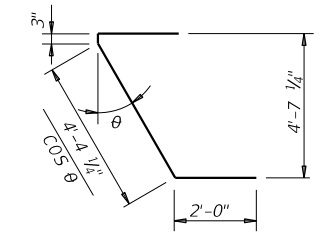
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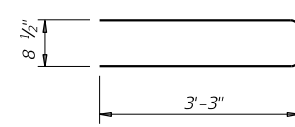
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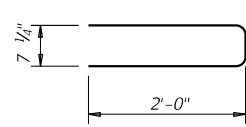
BARS M1(#4)



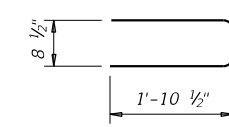
BARS M2(#4)



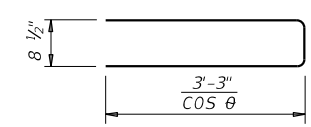
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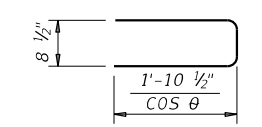
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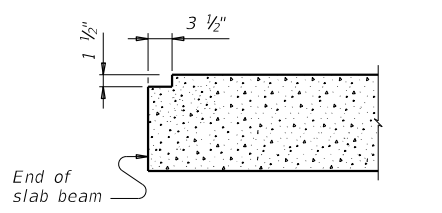
BARS N(#4)



BARS C1(#4)



BARS N1(#4)



ELEVATION OF BLOCKOUT

BEAM PROPERTIES		
Area	in ²	717.0
Y top	in	6.00
Y bolt	in	6.00
I	in ⁴	8,604
Weight	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 3/4" or round to a 3/4" 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.

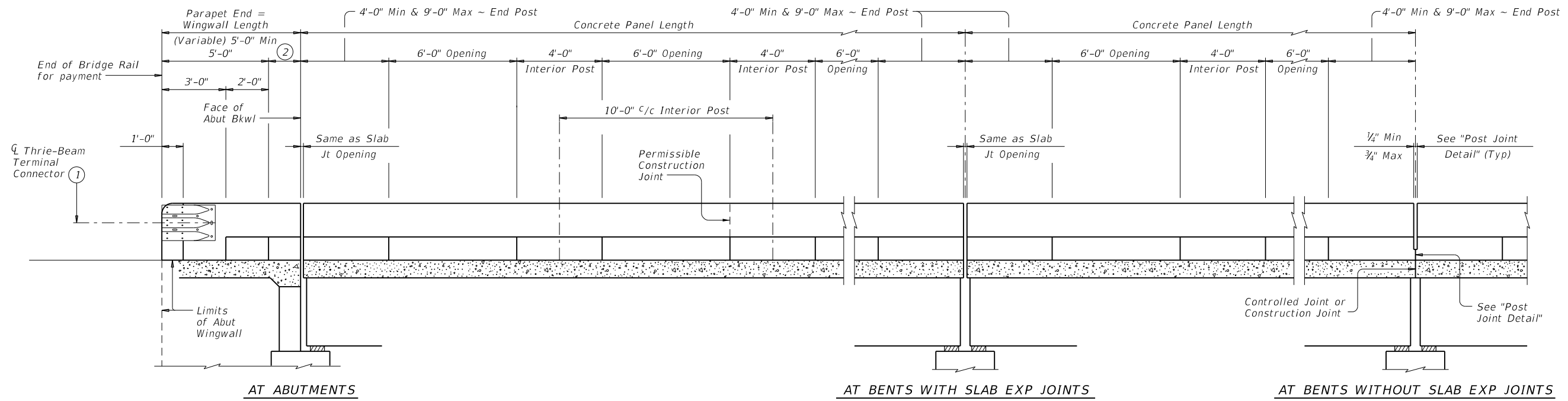
HL93 LOADING

		Bridge Division Standard	
PRESTRESSED CONCRETE SLAB BEAM DETAILS			
(TYPE 5SB12)			
PSB-5SB12			
FILE: psbsts03-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT January 2017	CONTRACT: 0921	SECTION: 02	JOB: 194
REVISIONS	COUNTY: PHR	HIGHWAY: HIDALGO	SHEET NO.: 307

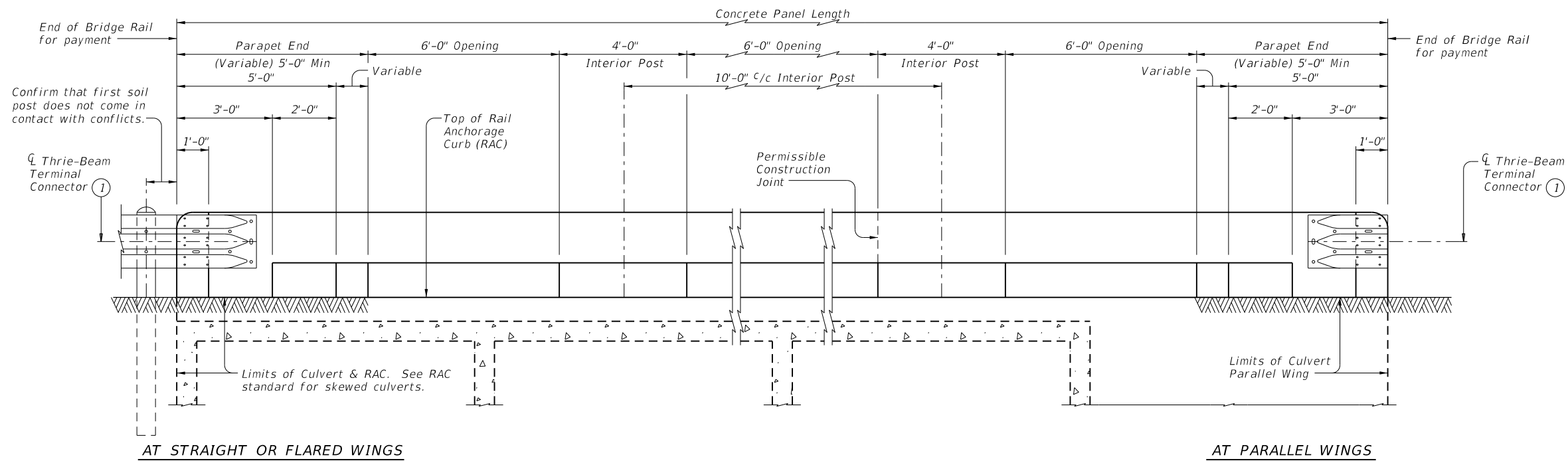
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DATE:
FILE:



ROADWAY ELEVATION OF RAIL ON BRIDGE



ROADWAY ELEVATION OF RAIL ON BOX CULVERTS

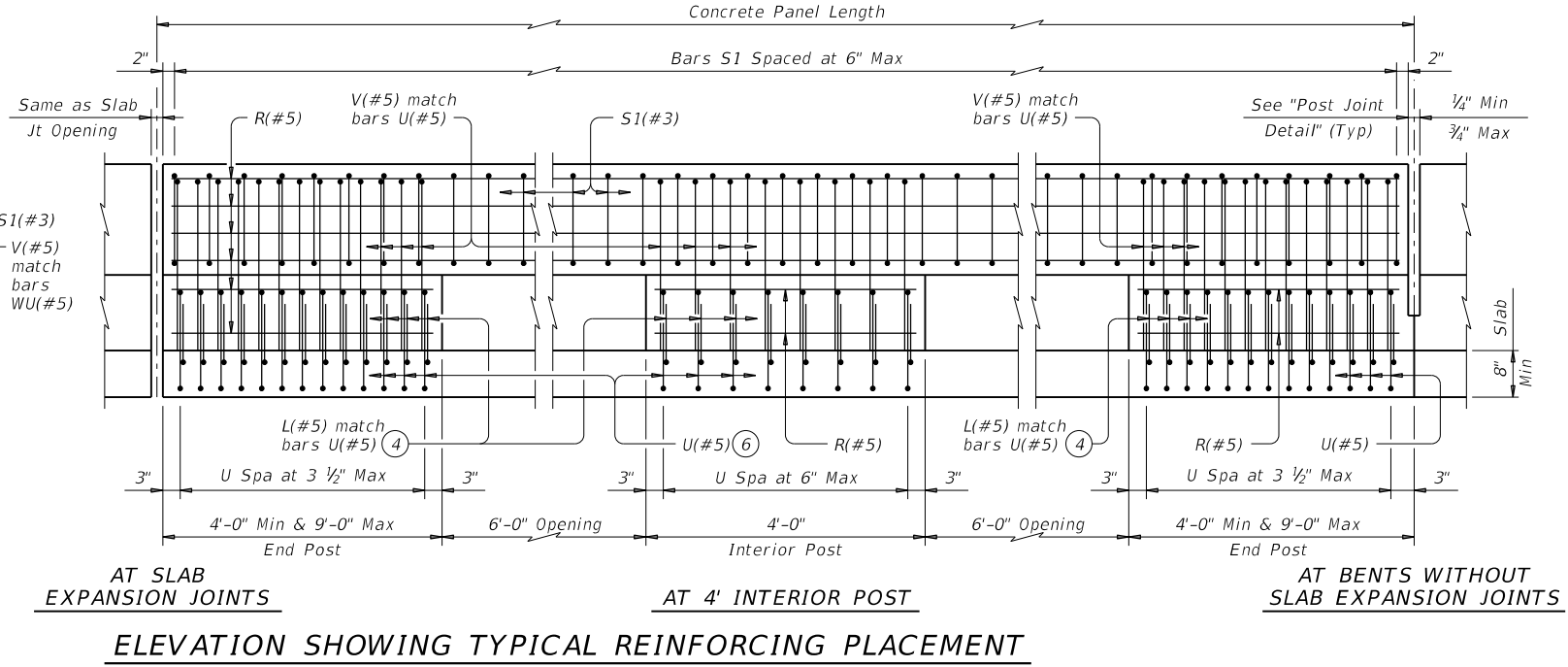
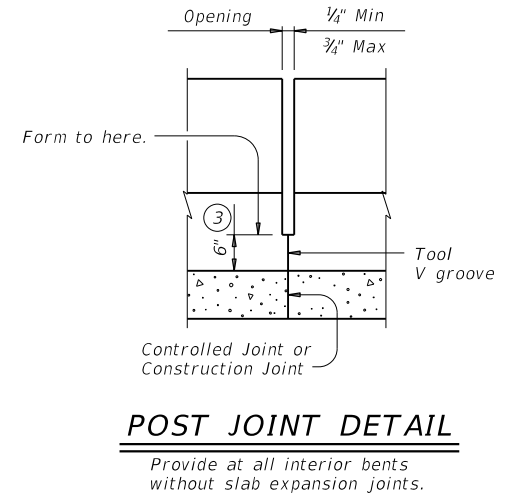
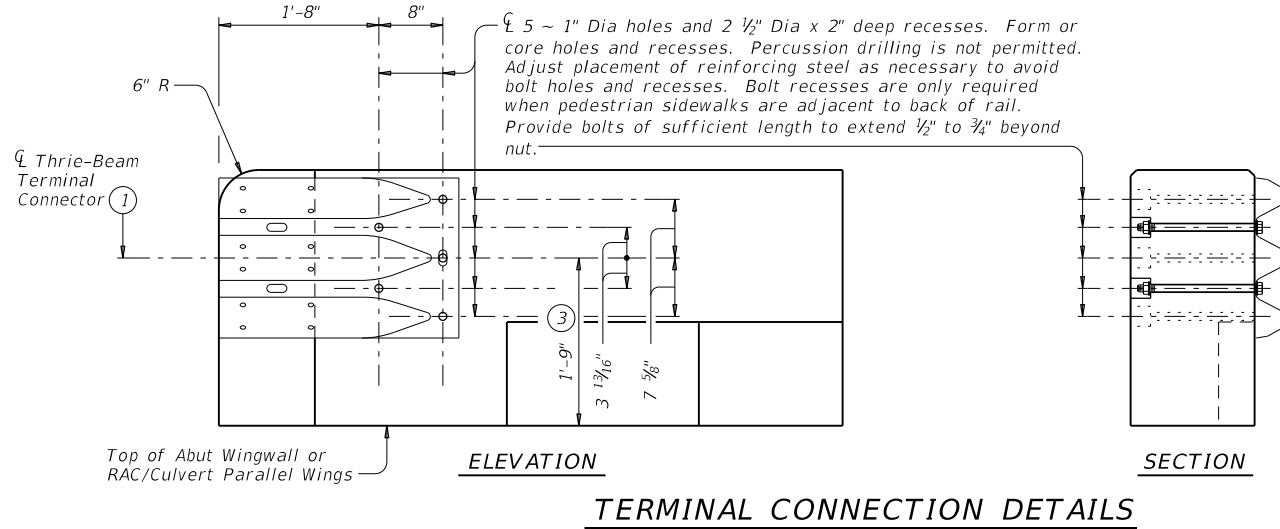
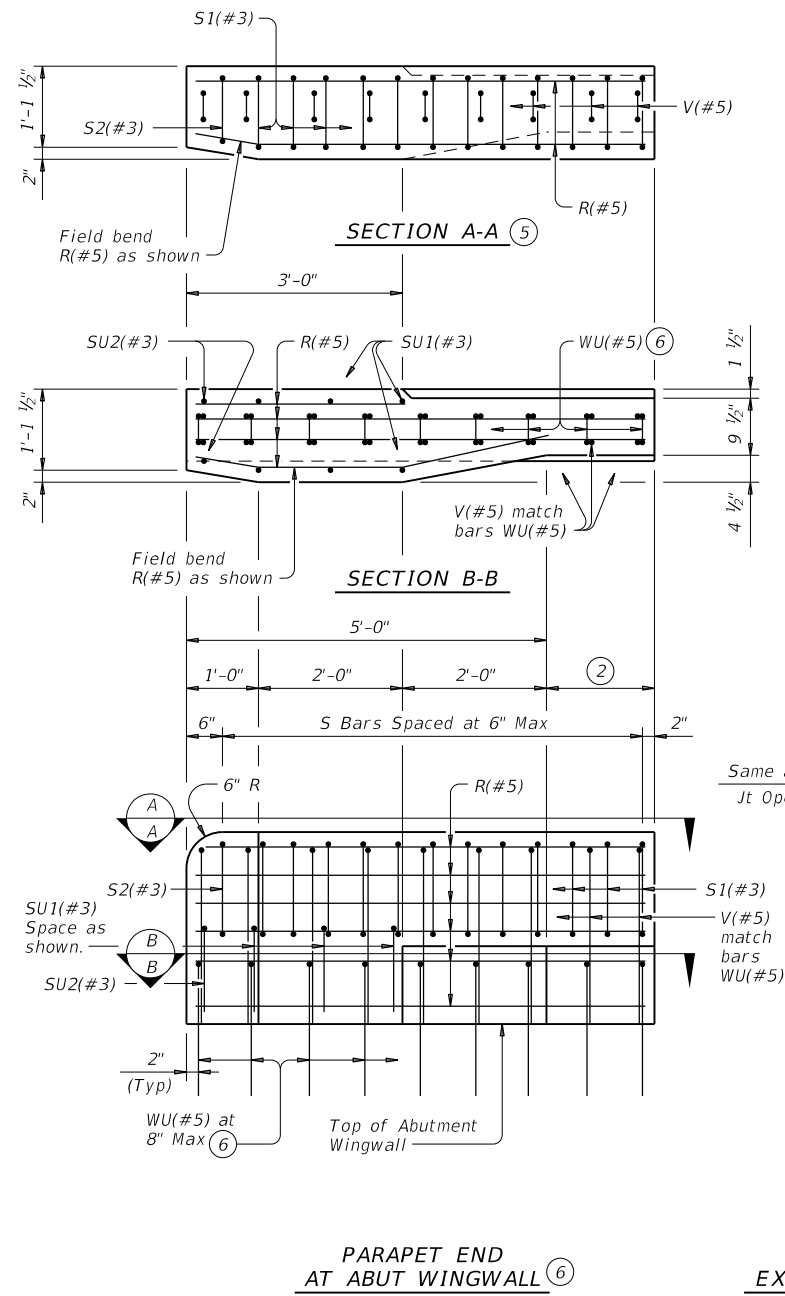
Showing 0° skew culvert. Skewed culverts similar. See RAC standard for details not shown. Vertical joints in concrete rail are not required, unless shown elsewhere.

- 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)

		Bridge Division Standard	
<h2>TRAFFIC RAIL</h2>			
<h3>TYPE T223</h3>			
FILE: r1std005-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT September 2019	CONTRACT: 0921	SECTION: 02	JOB: 194
REVISIONS	DIST: PHR	COUNTY: HIDALGO	HIGHWAY: LIBERTY
			SHEET NO. 308

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DATE: FILE:



- 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 SU1(#3), SU2(#3) and WU(#5) not shown for clarity.
- 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.

SHEET 2 OF 3

Texas Department of Transportation Bridge Division Standard

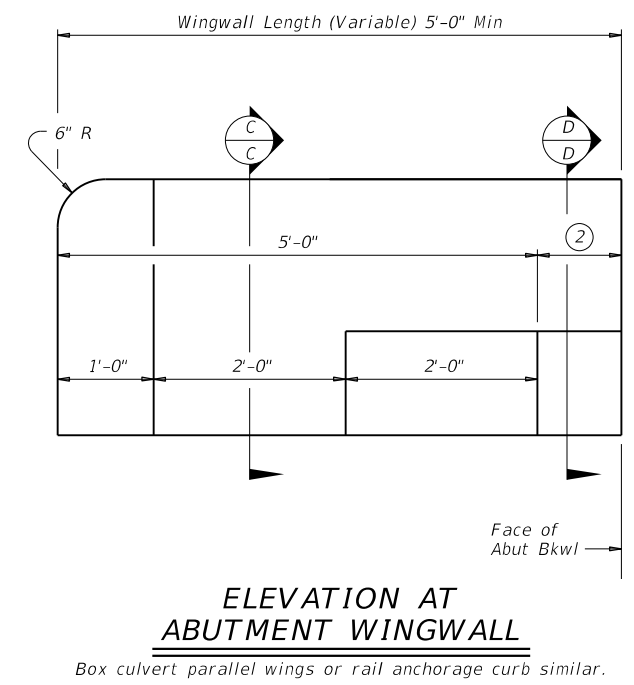
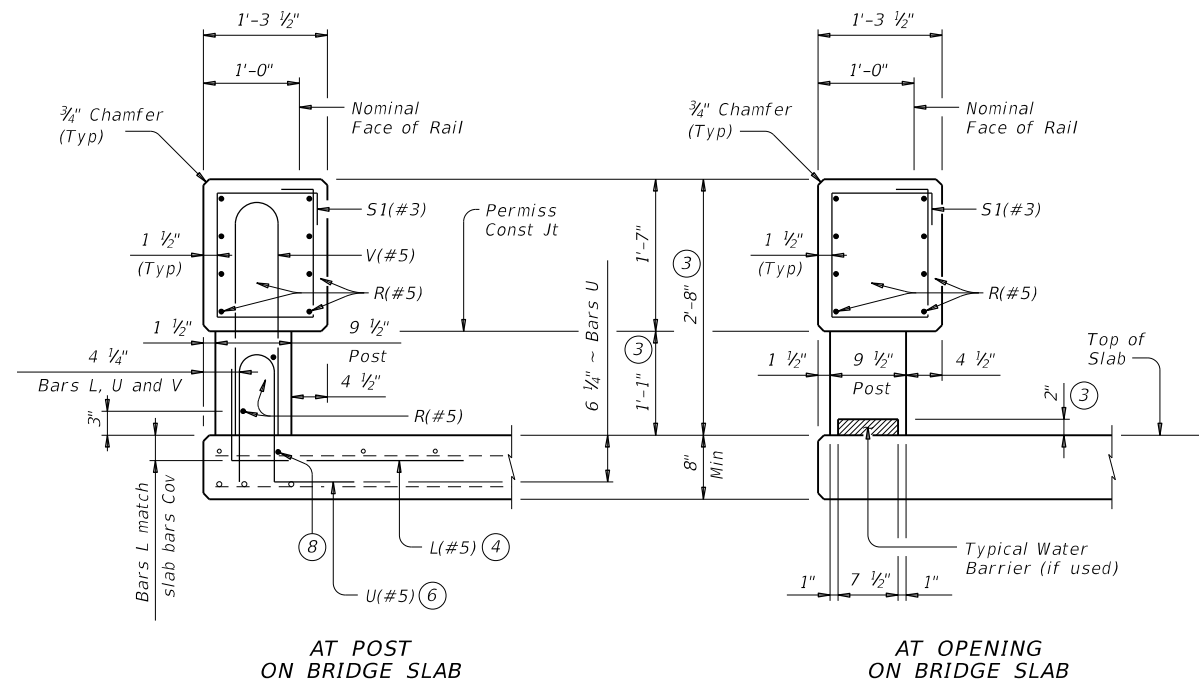
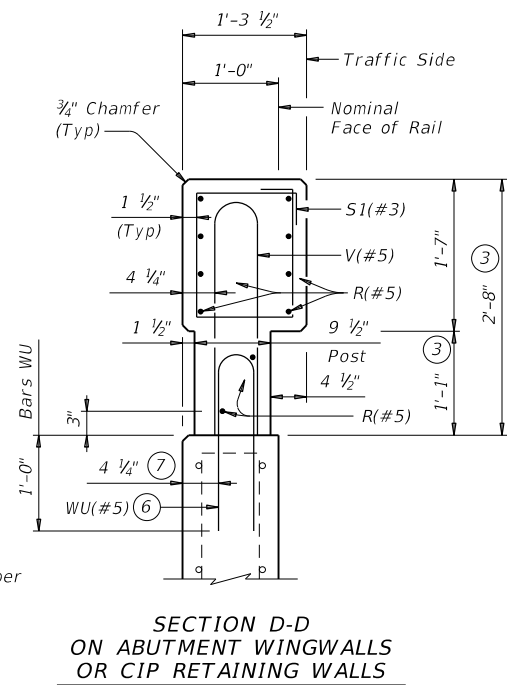
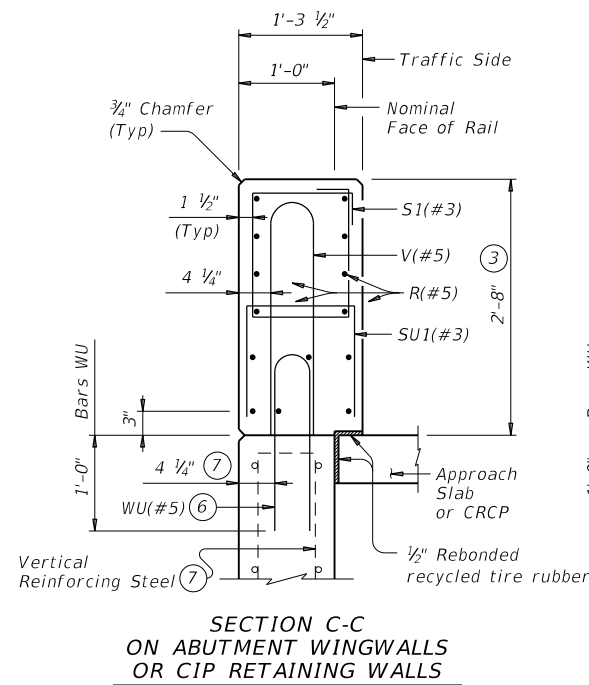
TRAFFIC RAIL

TYPE T223

FILE: r1std005-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
	DIST	COUNTY	SHEET NO.	
	PHR	HIDALGO	309	

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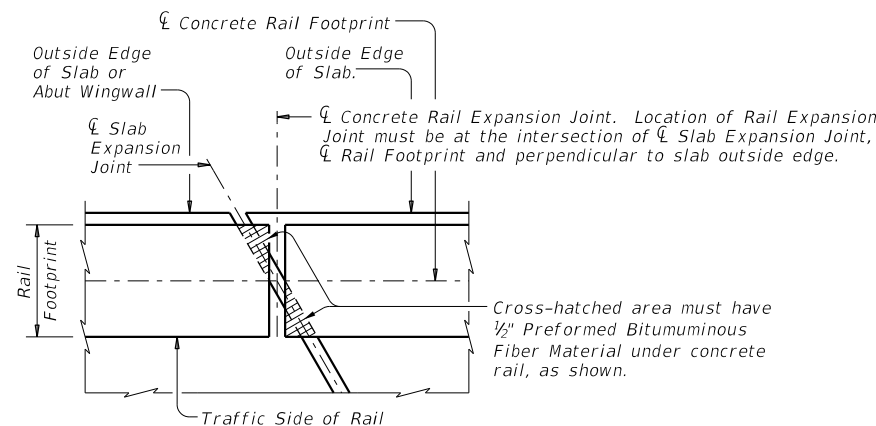
DATE: FILE:



SECTIONS THRU RAIL

Sections on box culverts similar.

- 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 1/4" above the roadway surface without overlay.



PLAN OF RAIL AT EXPANSION JOINTS

Example showing Slab Expansion Joints without breakbacks.

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.

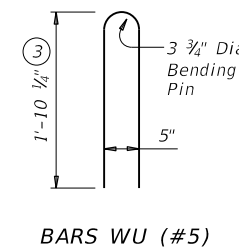
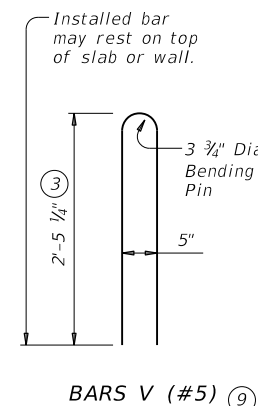
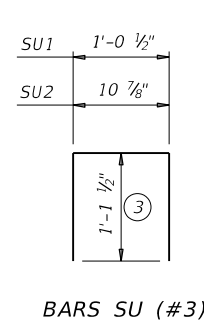
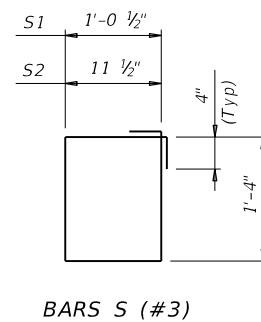
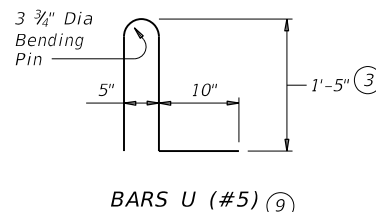
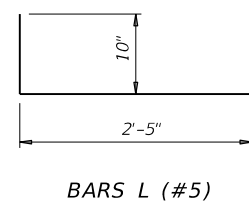
MATERIAL NOTES:

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.

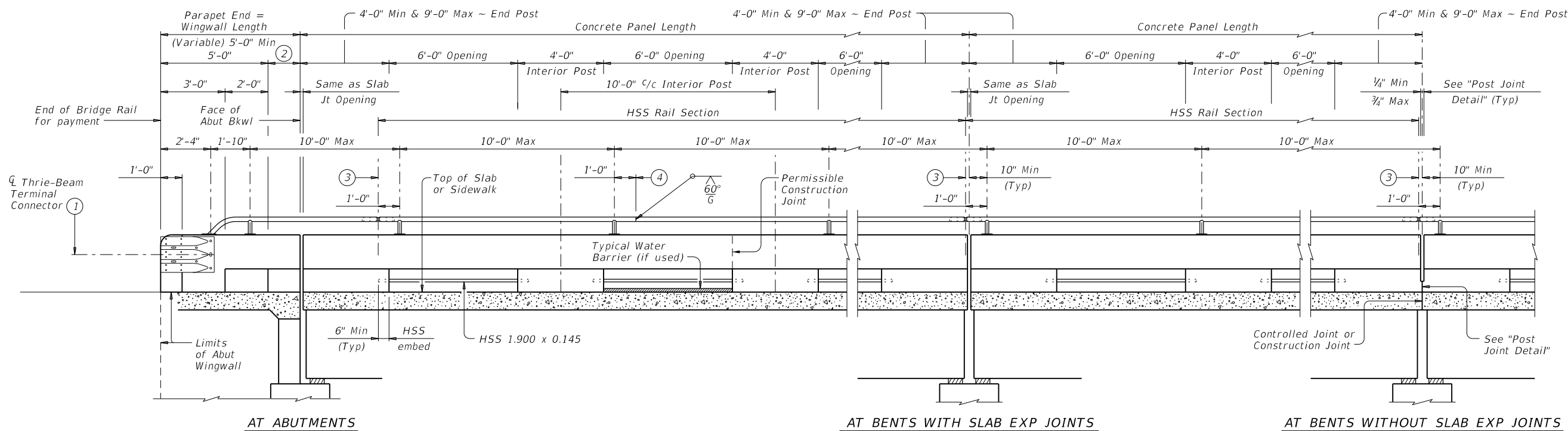
Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.



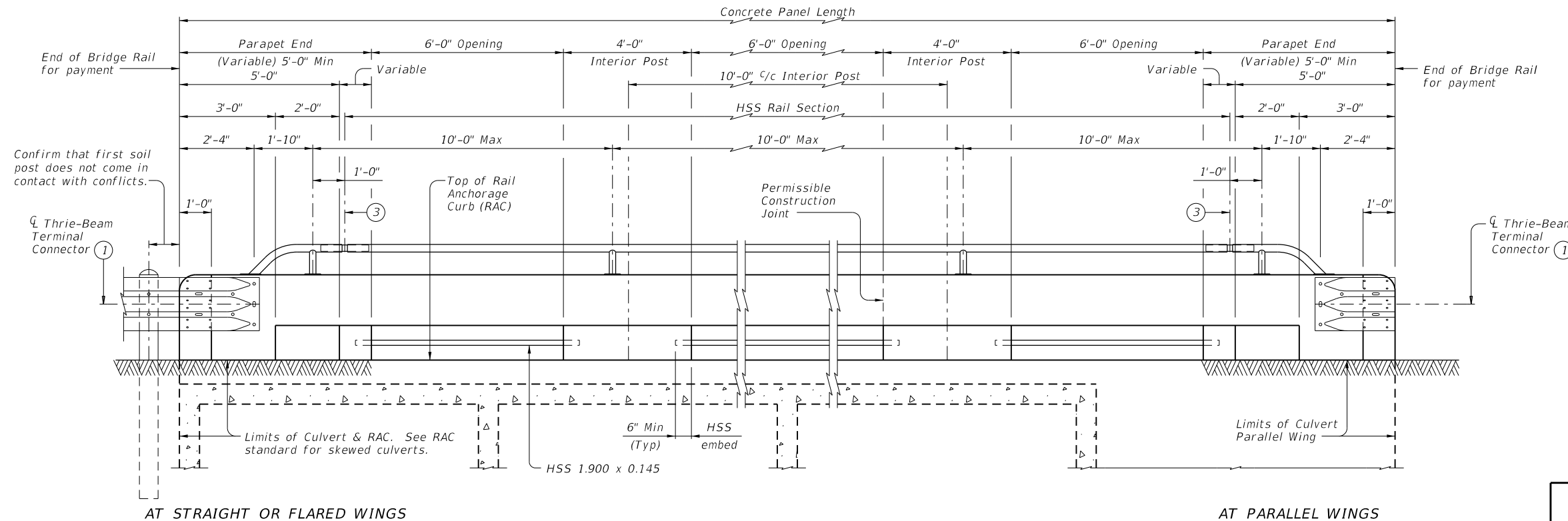
		Bridge Division Standard	
<h1>TRAFFIC RAIL</h1>			
<h2>TYPE T223</h2>			
FILE: r1std005-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT September 2019	CONV: 0921	SECT: 02	JOB: 194
REVISIONS			HIGHWAY: LIBERTY
	DIST: PHR	COUNTY: HIDALGO	SHEET NO.: 310

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ROADWAY ELEVATION OF RAIL ON BRIDGE
(Showing without raised sidewalk)



ROADWAY ELEVATION OF RAIL ON BOX CULVERTS

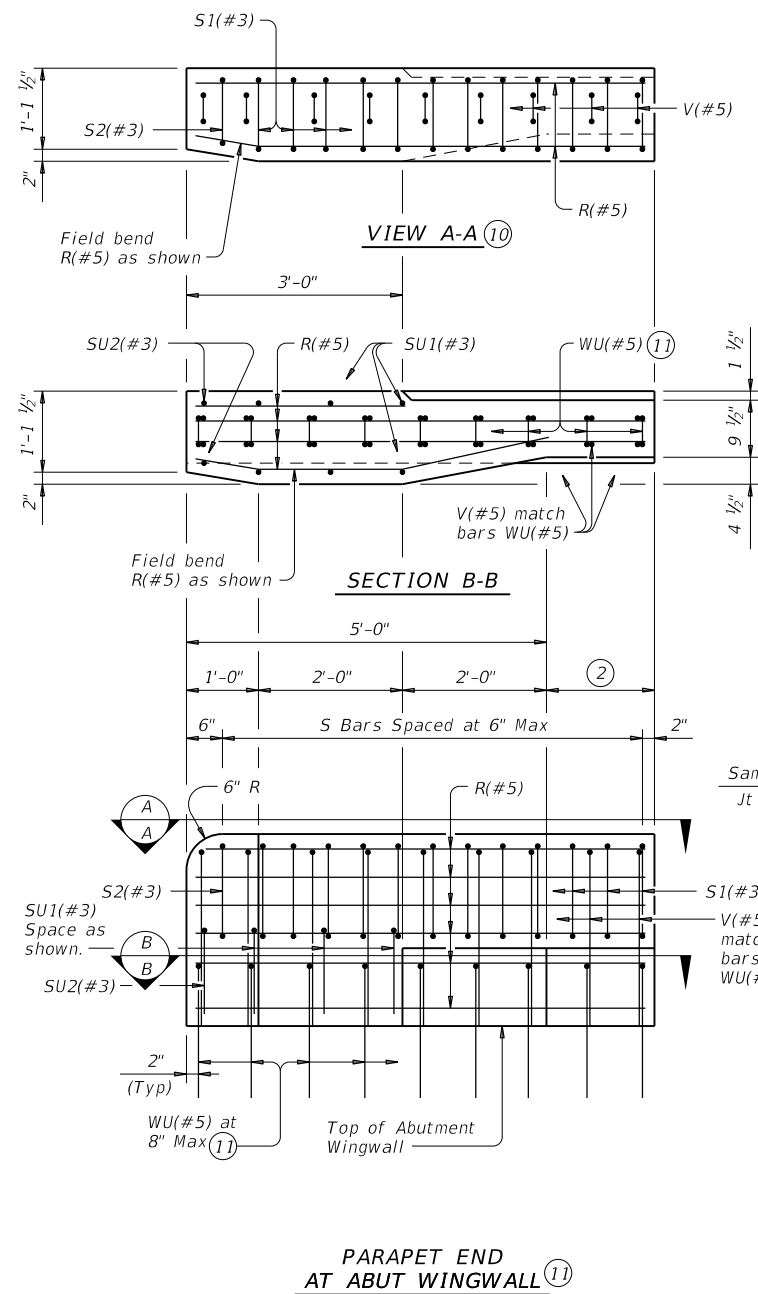
Showing 0° skew culvert. Skewed culverts similar. See RAC standard for details not shown. Vertical joints in concrete rail are not required, unless shown elsewhere.

- 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.

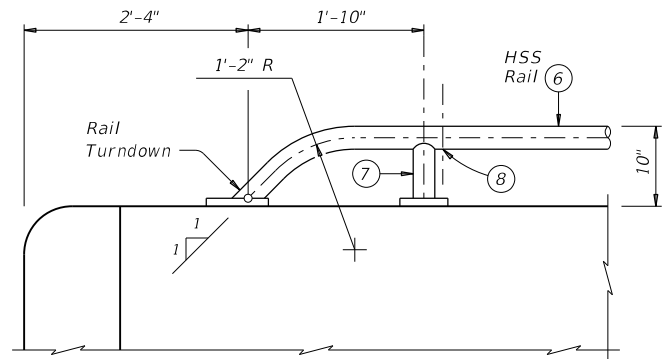
SHEET 1 OF 4

		Bridge Division Standard	
<h2>COMBINATION RAIL</h2>			
<h3>TYPE C223</h3>			
FILE: r1std019-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
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REVISIONS	COUNTY: HIDALGO		HIGHWAY: LIBERTY
PHR	SHEET NO.		311

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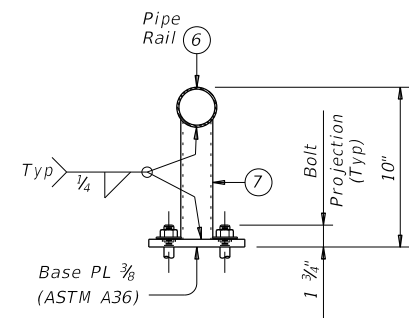


PARAPET END AT ABUT WINGWALL (1)

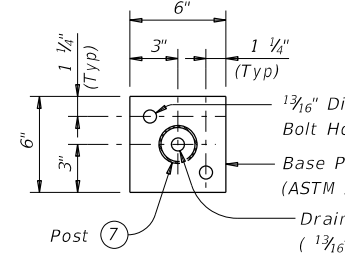


Note that at least two anchor points (as shown) are required for the Bridge Rail on the Abutment Wingwall. Longer Wingwalls may require more than two Rail anchorages.

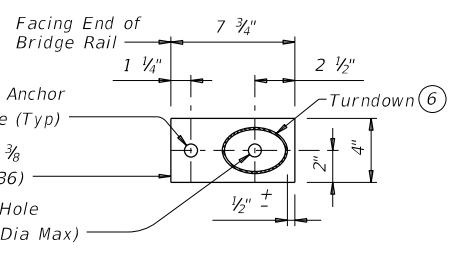
HSS RAIL TERMINAL DETAIL



TRANSVERSE SECTION

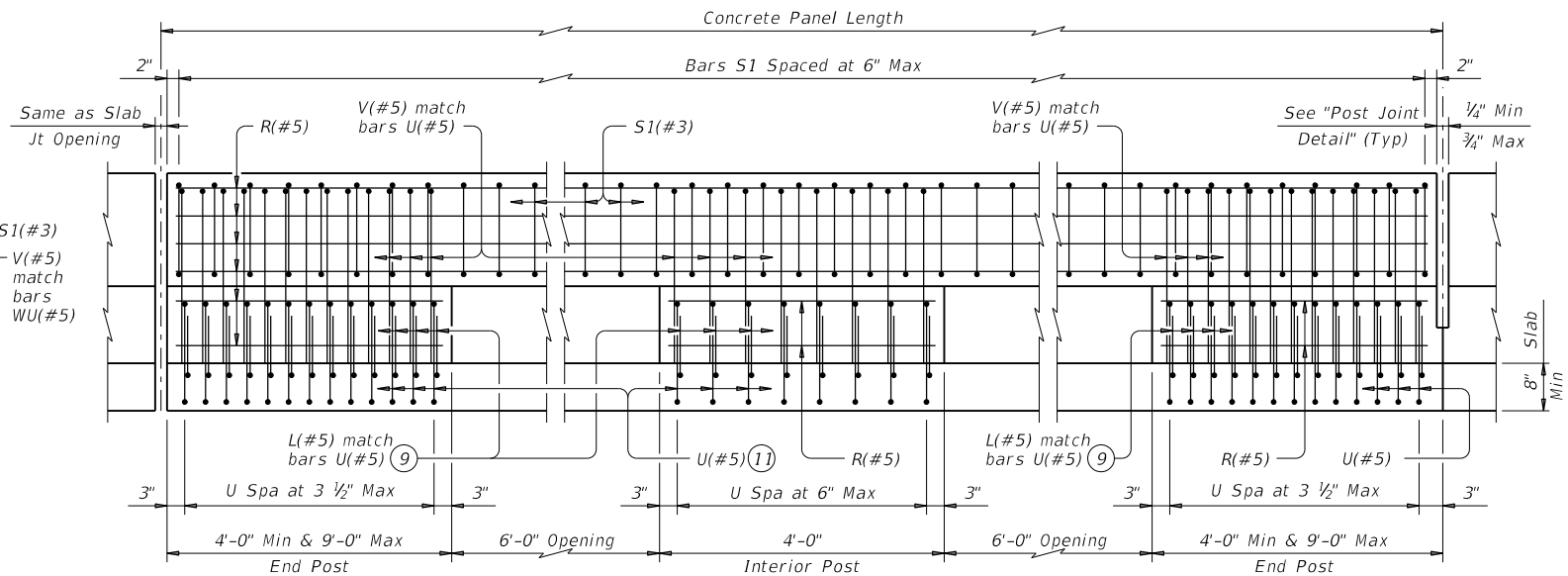


POST BASE PLATE PLAN



RAIL TURNDOWN BASE PLATE PLAN

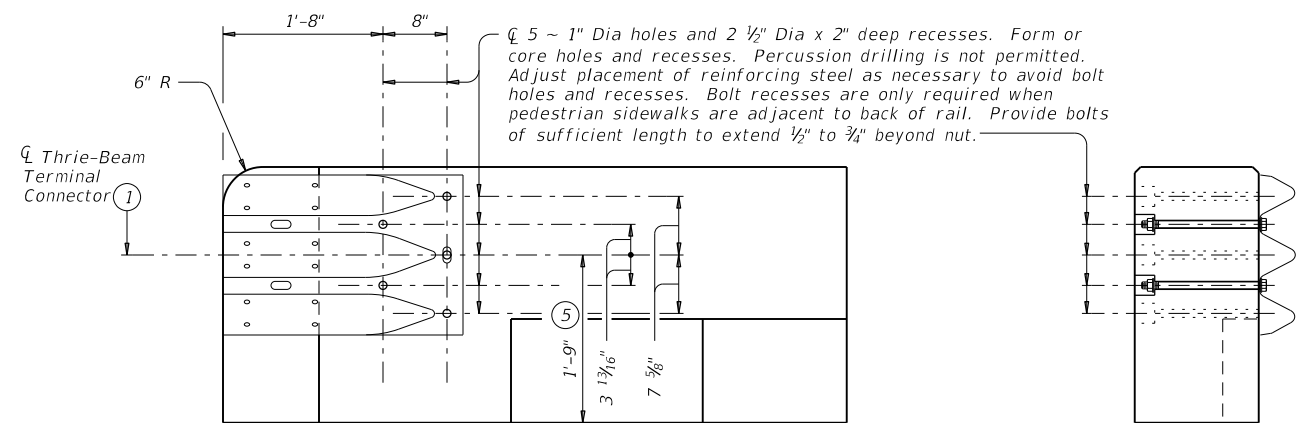
HSS RAIL DETAILS



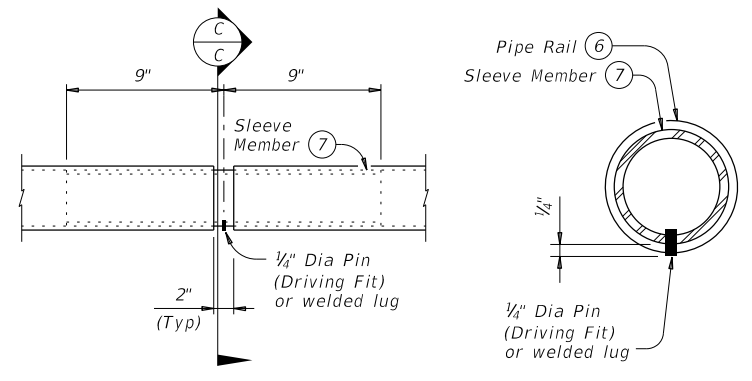
ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT

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) 3/8" 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 SU1(#3), SU2(#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.



TERMINAL CONNECTION DETAILS



PIPE SPLICE DETAILS

SHEET 2 OF 4

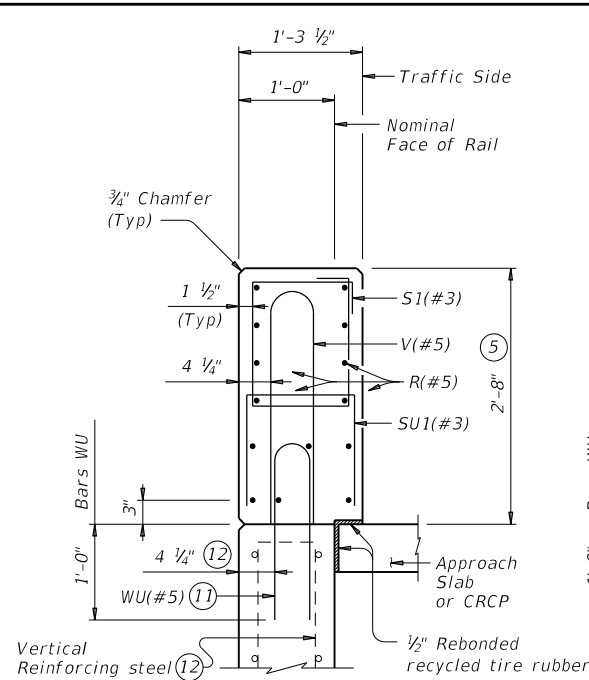
COMBINATION RAIL

TYPE C223

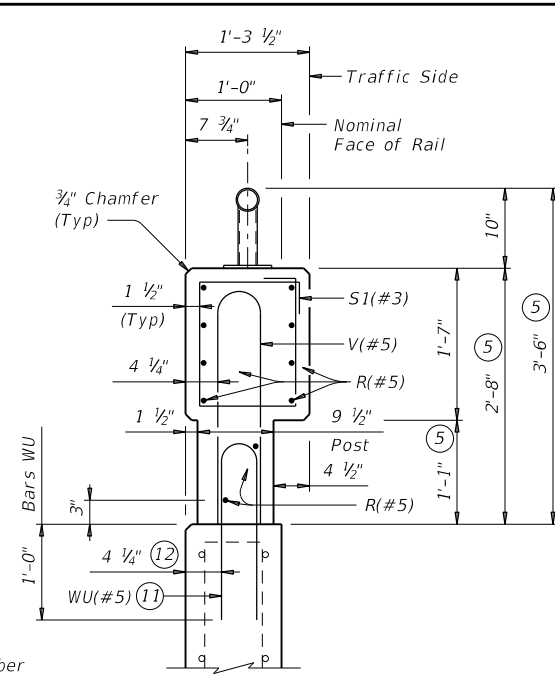
FILE: r1std019-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
	DIST	COUNTY	SHEET NO.	
	PHR	HIDALGO	312	

DATE: FILE:

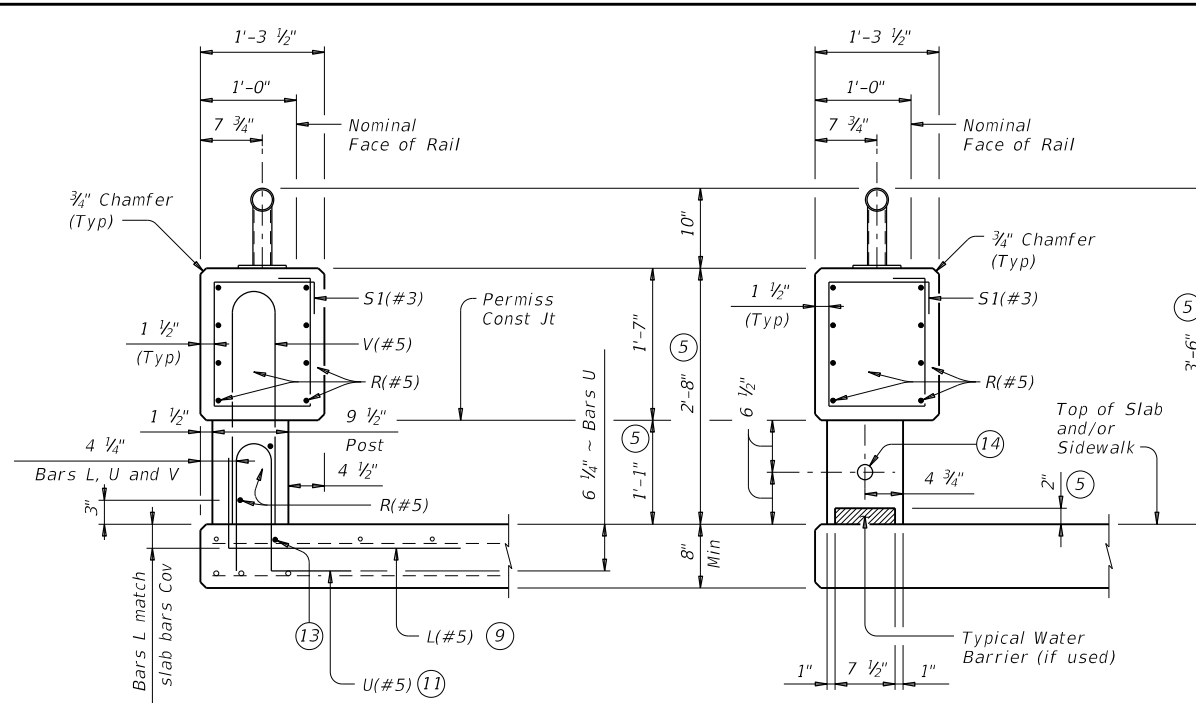
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SECTION D-D
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS

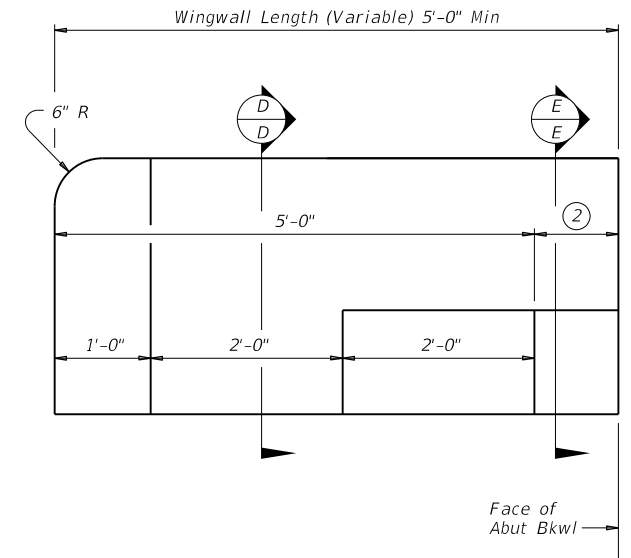


SECTION E-E
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS



AT POST
ON BRIDGE SLAB

AT OPENING
ON BRIDGE SLAB

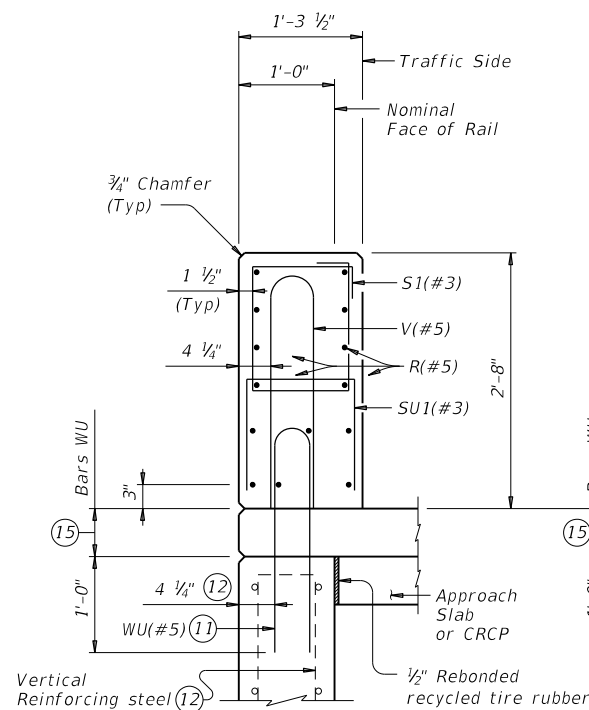


ELEVATION AT
ABUTMENT WINGWALL

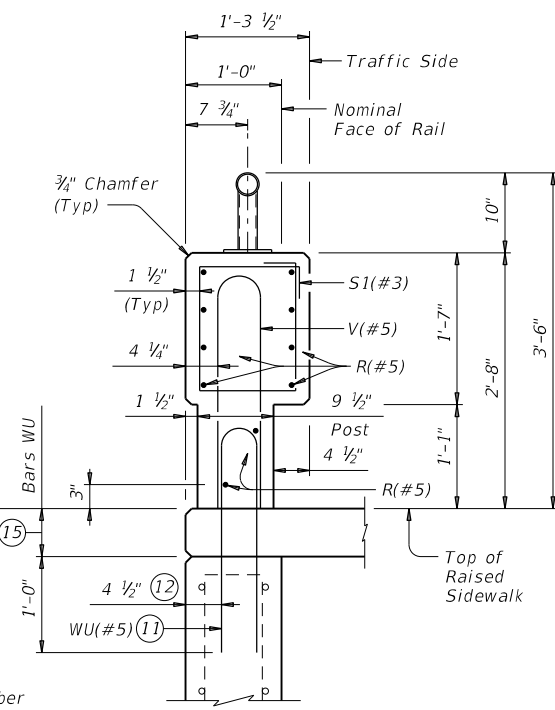
Box culvert parallel wings or rail anchorage curb similar.
HSS rail not shown for clarity.

SECTIONS THRU RAIL WITHOUT RAISED SIDEWALK

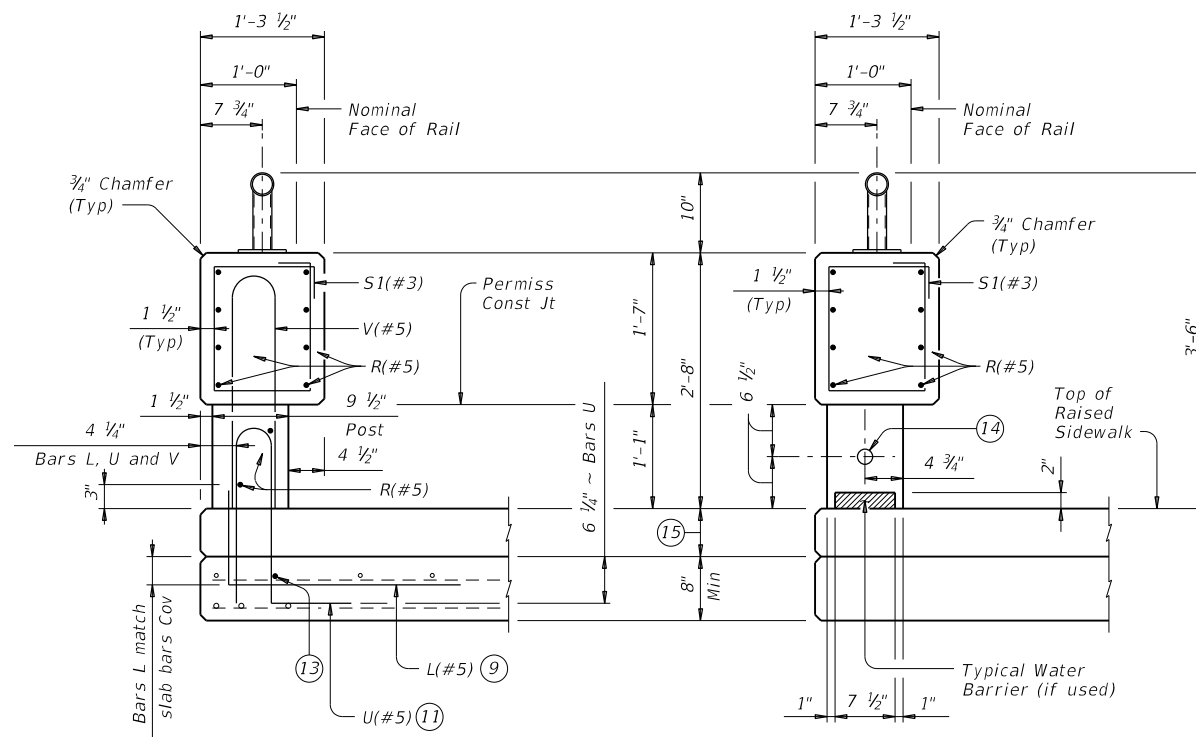
Sections on box culvert similar.



SECTION D-D
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS

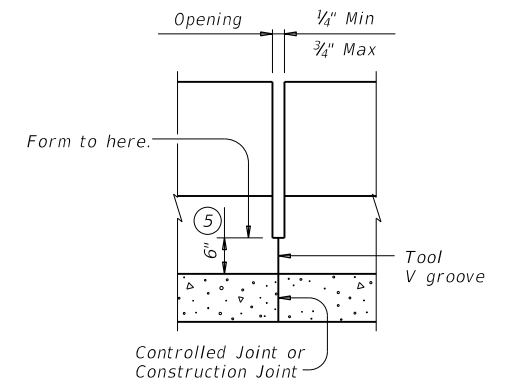


SECTION E-E
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS



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.

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.

SHEET 3 OF 4



COMBINATION RAIL

TYPE C223

FILE: r1std019-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
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DIST	COUNTY	SHEET NO.		
PHR	HIDALGO			313

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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

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 galvanizing, 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 3/8" 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 3/8" 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.

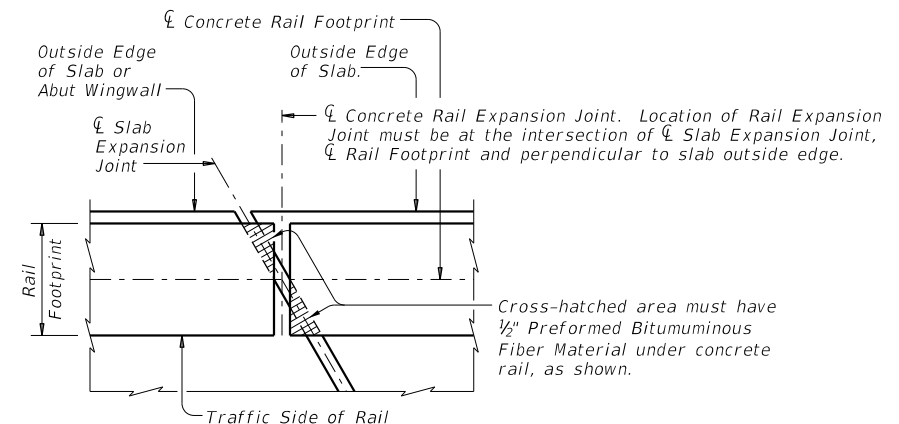
Do not use this railing on bridges with expansion joints providing more than 5" movement. Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

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)

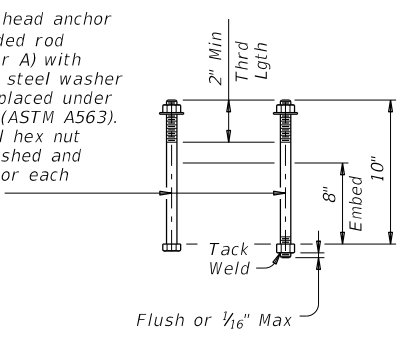
Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.



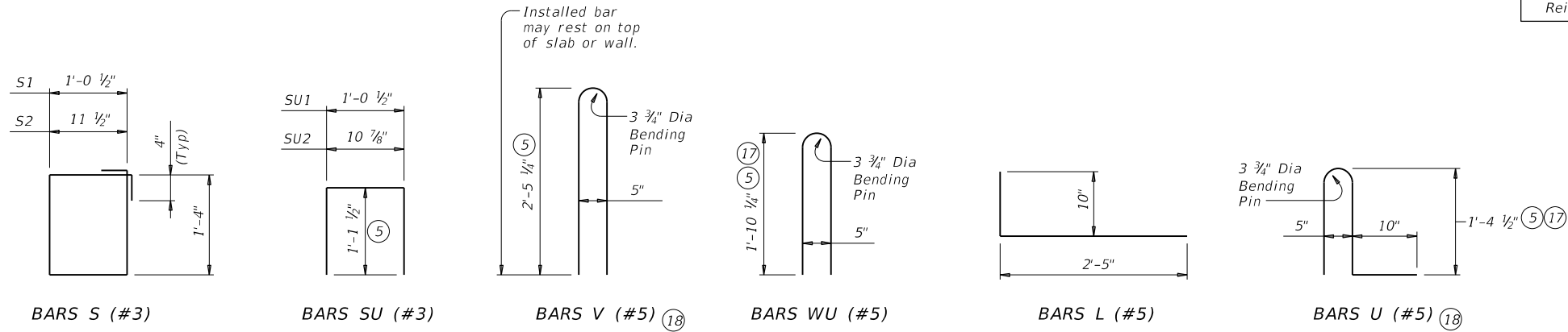
PLAN OF RAIL AT EXPANSION JOINTS

Example showing Slab Expansion Joints without breakbacks.

CAST-IN-PLACE ANCHOR BOLT OPTIONS ⑩



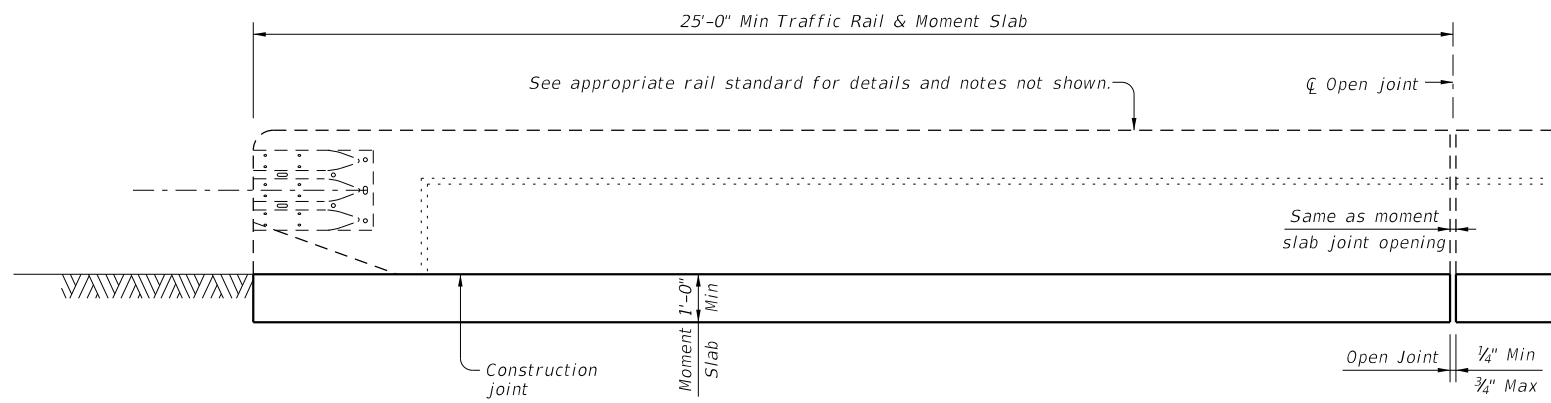
- ⑤ Increase 2" for structures with overlay.
- ⑩ See "Material Notes" for anchor bolt information.
- ⑰ For raised sidewalks, add sidewalk height to total bar height. Use sidewalk height at rail's location.
- ⑱ At the Contractor's option, Bars V may be replaced by extending Bars U to 2'-5 1/4" above the roadway/sidewalk surface without overlay.



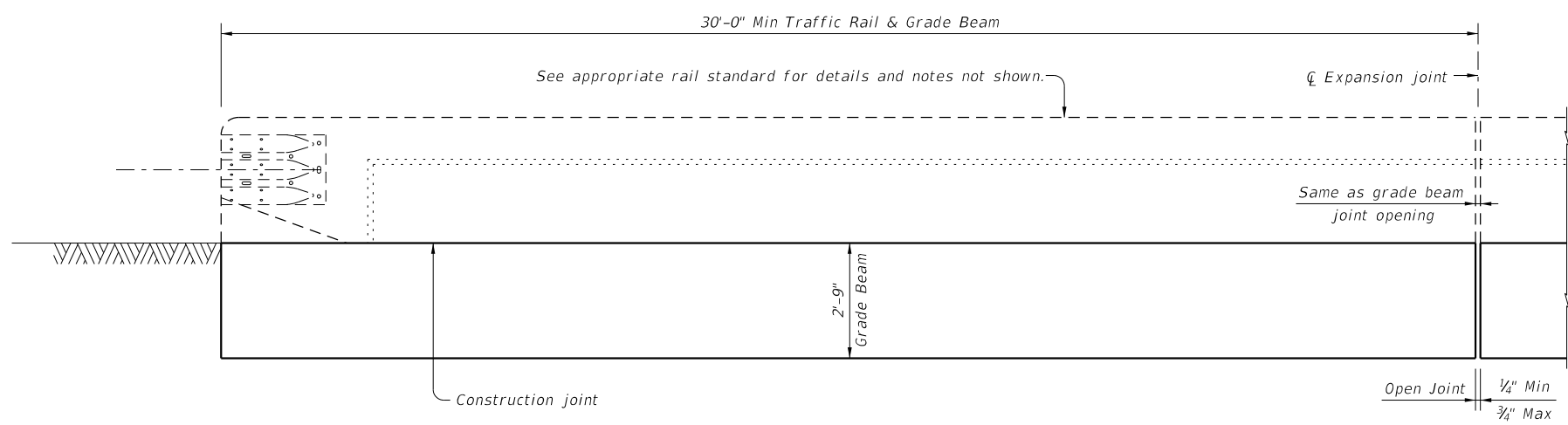
		Bridge Division Standard	
COMBINATION RAIL			
TYPE C223			
FILE: r1std019-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT September 2019	CON: 0921	SECT: 02	JOB: 194
REVISIONS	COUNTY: HIDALGO		HIGHWAY: LIBERTY
	SHEET NO. 314		

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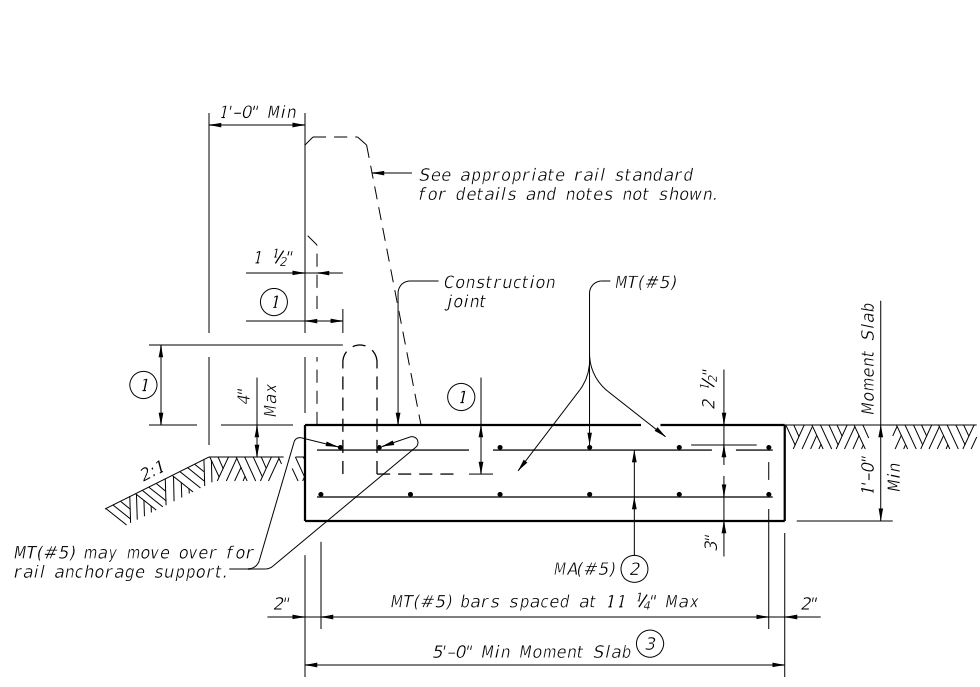
DATE: FILE:



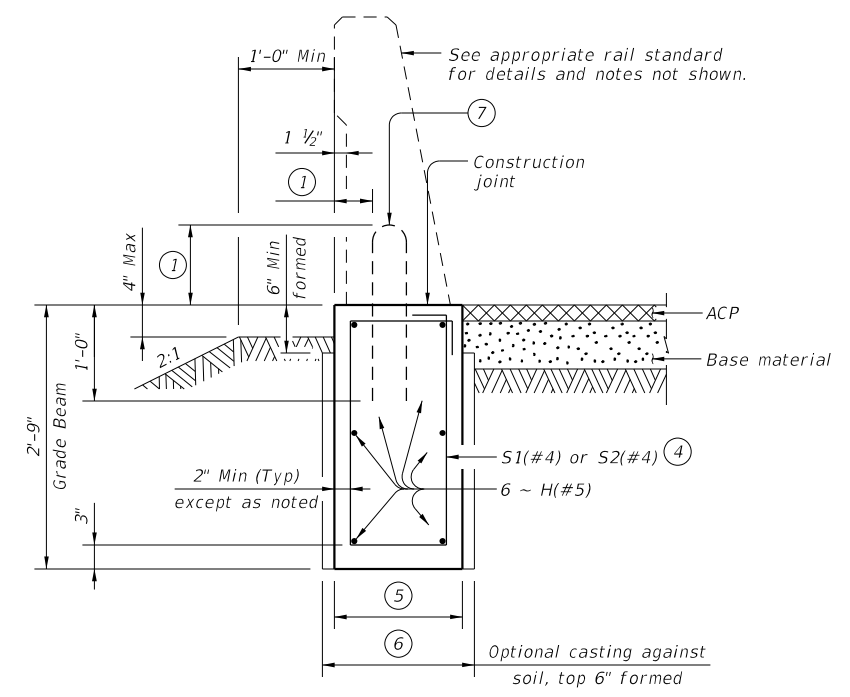
ROADWAY ELEVATION OF TRAFFIC RAIL ON MOMENT SLAB (TRF-MS)
(Showing SSTR rail other rails are similar. Reinforcing not shown for clarity.)



ROADWAY ELEVATION OF TRAFFIC RAIL ON GRADE BEAM (TRF-GB)
(Showing SSTR rail other rails are similar. Reinforcing not shown for clarity.)

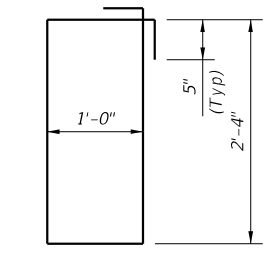


SECTION OF TRAFFIC RAIL ON MOMENT SLAB (TRF-MS)
(Showing SSTR rail other rails are similar.)

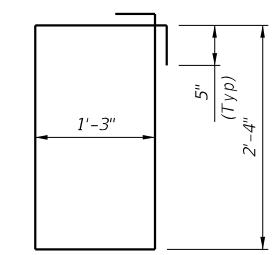


SECTION OF TRAFFIC RAIL ON GRADE BEAM (TRF-GB)
(Showing SSTR rail other rails are similar.)

- ① See applicable bridge rail standard.
- ② MA(#5) space longitudinally along moment slab at 12" Max. (Spaced 2 1/2" longitudinally from outside edge of moment slab).
- ③ Approximate moment slab concrete = 0.19 CY/LF and reinforcement = 22.4 LB/LF.
- ④ S1(#4) or S2(#4) spaced longitudinally along grade beam at 8" Max. (Spaced 2 1/2" longitudinally from outside edge of grade beam).
- ⑤ Use bar S1(#4) with 1'-4" grade beam width and bridge rail types: All rails except for T224, C412, T66, C66, T80HT and T80SS. Approximate grade beam concrete = 0.14 CY/LF and reinforcement = 13.8 LB/LF. Use bar S2(#4) with 1'-7" grade beam width and bridge rail types: T66 and C66. Approximate grade beam concrete = 0.16 CY/LF and reinforcement = 14.2 LB/LF.
- ⑥ 1'-6" for bridge rail types: All rails except for T224, C412, T66, C66, T80HT and T80SS. 1'-9" bridge rail types: T66 and C66.
- ⑦ Modify reinforcing on standard bridge rail anchorage if necessary by extending rail anchorage 12" Min, vertically into traffic rail



BARS S1(#4)



BARS S2(#4)

CONSTRUCTION NOTES:
Align moment slab (TRF-MS) or grade beam (TRF-GB) open joints with rail open joints maintaining no less than minimum rail length. Provide moment slab (TRF-MS) or grade beam (TRF-GB) with open joints at no greater than 100' spacing unless otherwise shown on the plans or approved by the Engineer.

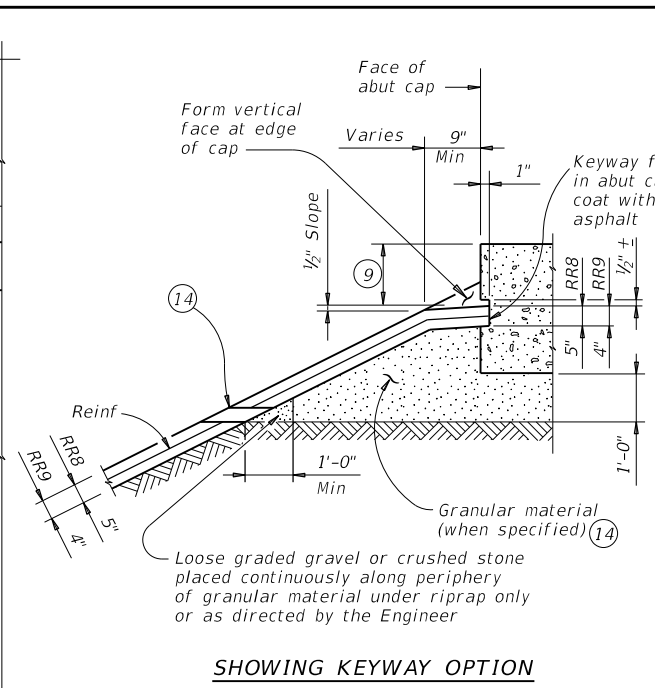
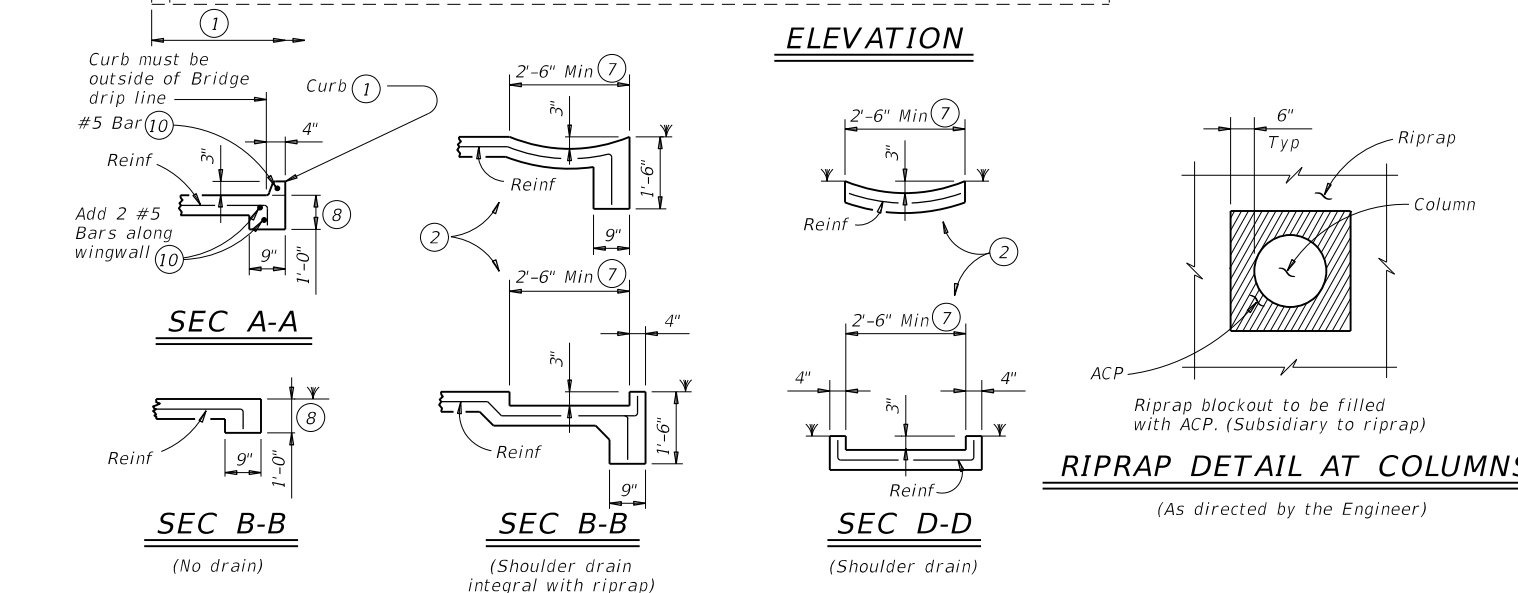
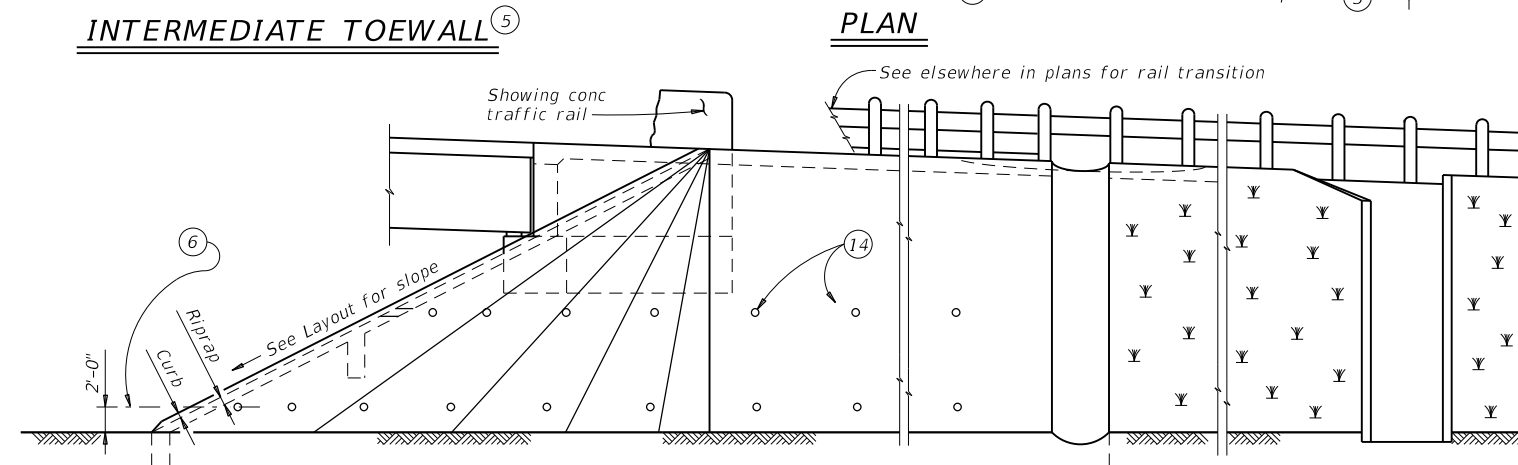
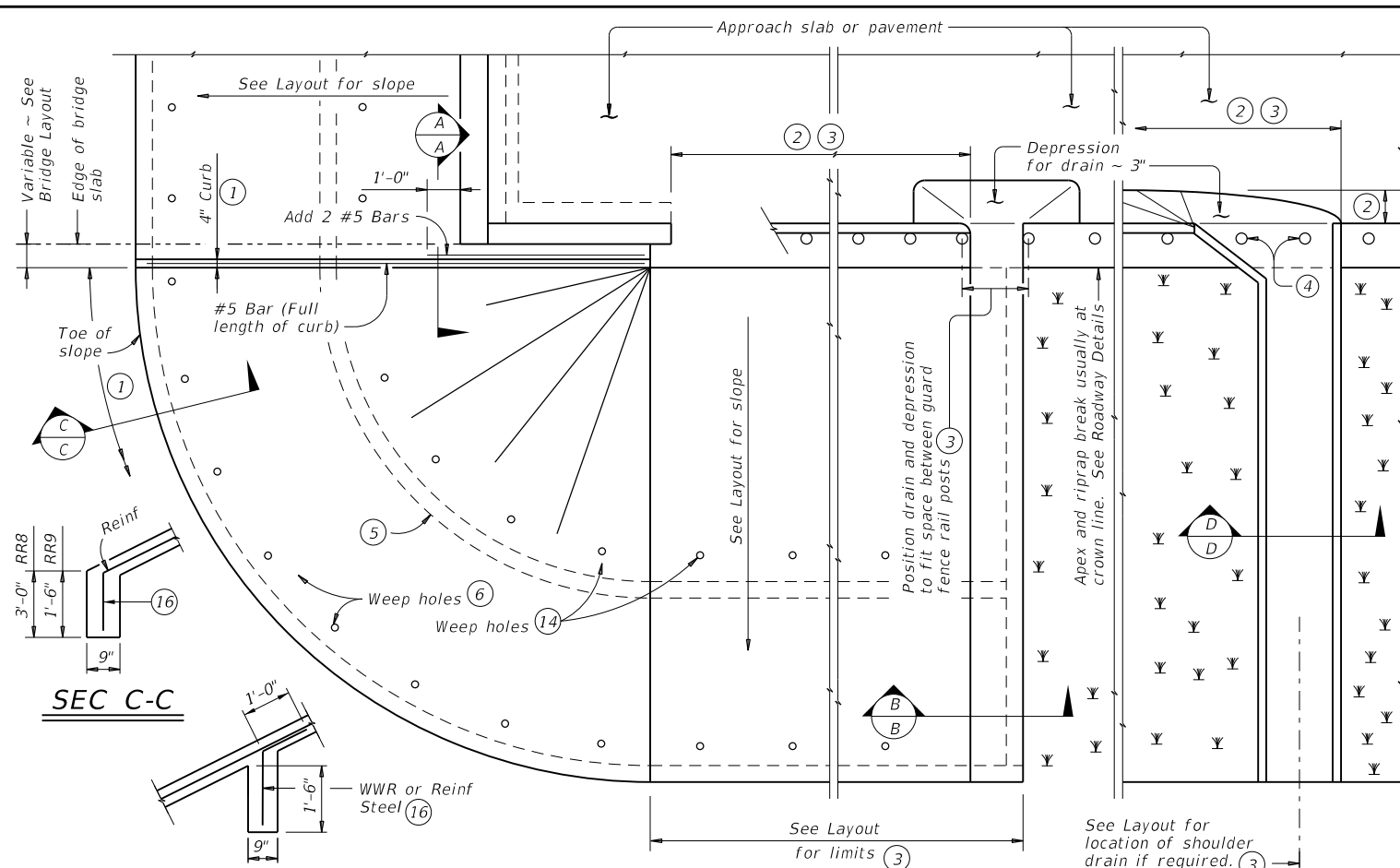
MATERIAL NOTES:
Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.
Provide Grade 60 reinforcing steel.
Epoxy coat or galvanize all reinforcing steel if required elsewhere.
Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for bars S1(#4), S2(#4) and H(#5) unless noted otherwise. Provide the same laps as required for reinforcing bars.
Provide bar laps, where required, as follows:
Uncoated or galvanized ~ #5 = 2'-4"
Epoxy coated ~ #5 = 3'-6"

GENERAL NOTES:
Use of these details will result in a moment slab (TRF-MS) or grade beam (TRF-GB) foundation that is acceptable for traffic rails which are MASH TL-2, TL-3, or TL-4 compliant.
See elsewhere in the plans for selected options between moment slab (TRF-MS) and/or grade beam (TRF-GB).
The foundation design resistance is based on the current AASHTO bridge railing requirements with the assumption of fair to good soil support conditions. Poor soil conditions will require suitably deeper and/or wider foundations.
See appropriate rail standard for details and notes not shown. This detail is intended for use as a guide to unusual railing anchorage situations but may be included in the plans, modified as necessary to apply to specific installations required on the project.
Payment for moment slab (TRF-MS) and/or grade beam (TRF-GB) will be by Class "C" concrete or Class "C" (HPC) concrete for rail foundations.
The associated bridge railing will be paid for by the linear foot which includes the concrete and reinforcement.
Excavation will be subsidiary to other items.

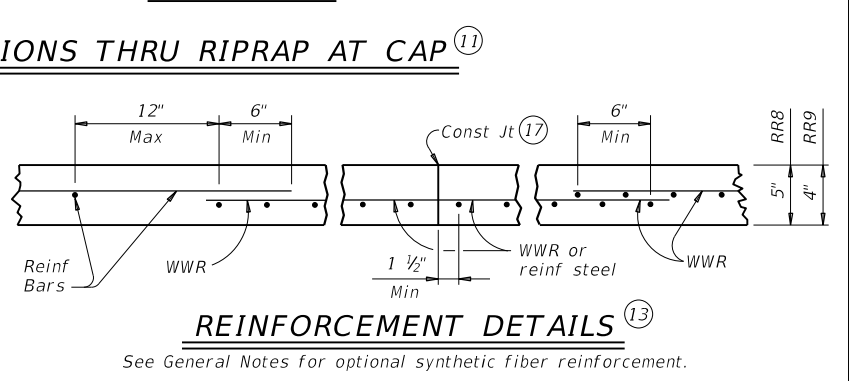
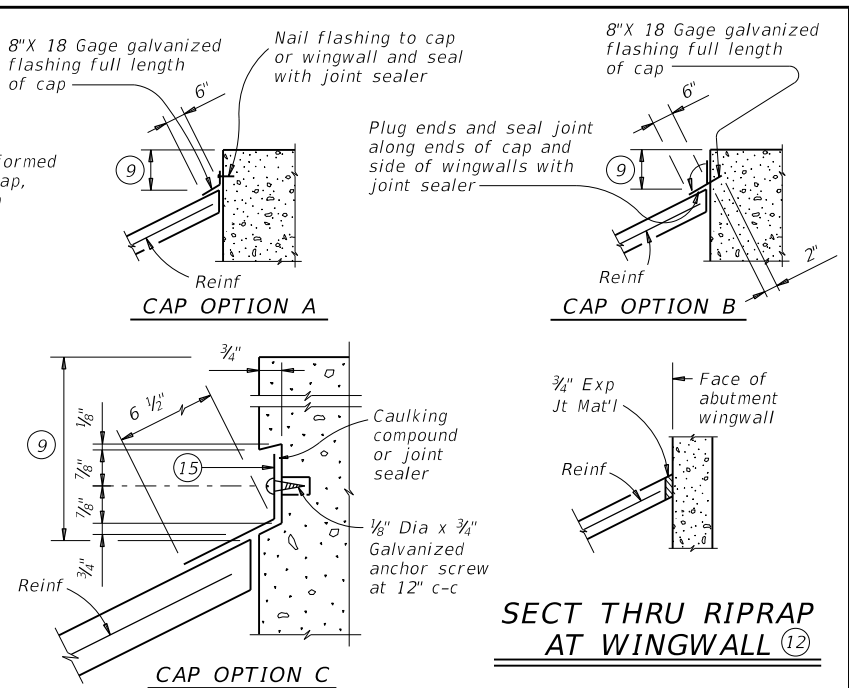
Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.

		Bridge Division Standard	
TRAFFIC RAIL FOUNDATIONS FOR MASH TL-2, TL-3 & TL-4 BRIDGE RAILS			
TRF			
FILE: r1Std027-20.dgn	DN: TxDOT	CK: TAR	DW: JTR
©TxDOT September 2019	CONV	SECT	JOB
REVISIONS	0921	02	194
07-20: Added moment slab with rail foundation lengths.	DIST	COUNTY	SHEET NO.
	PHR	HIDALGO	315

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- SHOWING KEYWAY OPTION**
- When riprap is shown extended around header on layout, extend slab and toewall as shown and eliminate 4" curb.
 - Limits and configuration of drains and depressions are as shown elsewhere in plans or as directed by the Engineer.
 - 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.
 - See details elsewhere in plans for installation of guard fence posts through concrete riprap.
 - Provide intermediate toewall only when designated elsewhere in the plans or included in the specifications.
 - 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.
 - Use wider or other drain configurations if shown elsewhere in plans or if directed by the Engineer.
 - 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.
 - 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.
 - #5 bars shown are required even when synthetic fiber reinforcing option is selected.
 - Provide sealing option for joint between the face of cap and riprap as designated by the Engineer or as shown elsewhere on plans.
 - 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.
 - Provide #3 reinforcing bars at 18" Spa c-c. Provide Welded Wire Reinforcement (WWR) as 6x6-D2.9xD2.9 or D3xD3. Combinations of WWR and reinforcing bars may be used if both are permitted. Use lap splices of a minimum 6 inches, measured from the transverse wire of WWR, and the ends of reinforcing bars.
 - If granular material is specified, provide upper level of 2" Dia weep holes at 10' c-c backed by galvanized hardware cloth.
 - 8" x 18 Gage Galv Sheet Metal
 - Provide WWR or #3 bars, with 1'-0" extension into slope.
 - WWR or reinforcing steel is continuous through riprap construction joints. Provide WWR or reinforcing steel that extends 1'-1" minimum into adjacent riprap on each side of construction joint even if synthetic reinforcing fiber is utilized.



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.

FOR CONTRACTOR'S INFORMATION ONLY:

5" of RR8	= 0.015 CY/SF
4" of RR9	= 0.012 CY/SF
#3 Reinf at 18" c-c	= 0.501 Lbs/SF
6x6-D3xD3	= 0.408 Lbs/SF

		Bridge Division Standard	
CONCRETE RIPRAP AND SHOULDER DRAINS EMBANKMENTS AT BRIDGE ENDS (TYPES RR8 & RR9)			
CRR			
FILE: crrslide1-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT April 2019	CONTRACT	SECTION	JOB
REVISIONS			194
	DIST	COUNTY	SHEET NO.
	PHR	HIDALGO	316