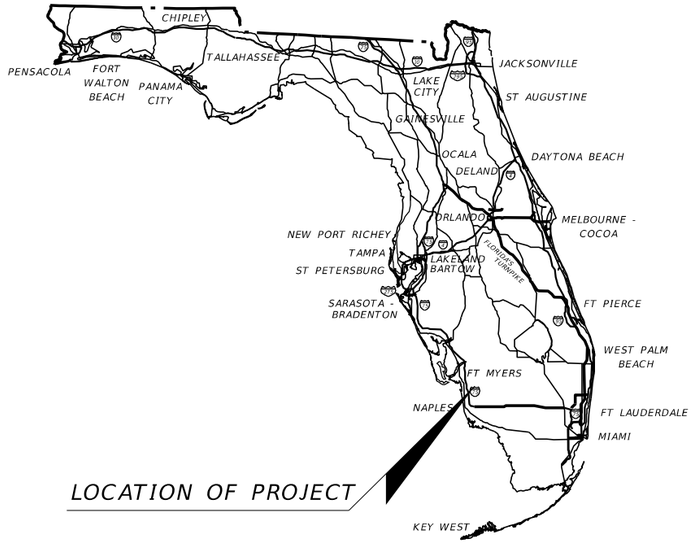
LEE COUNTY

DEPARTMENT OF TRANSPORTATION

CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

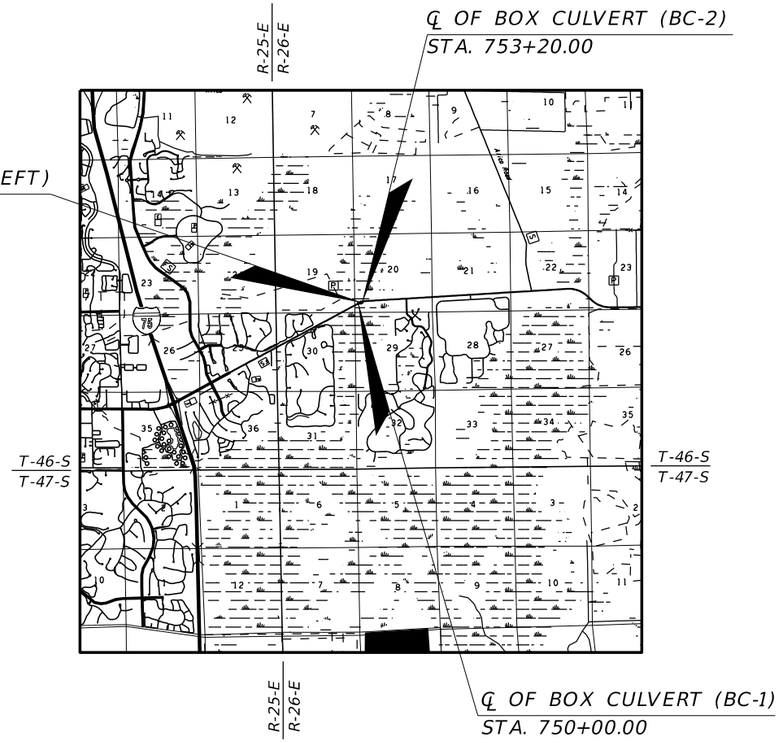
STRUCTURE PLANS



INDEX OF STRUCTURE PLANS

SHEET NO. SHEET DESCRIPTION

BRIDGE NOS. 124144 (RIGHT) & 124145 (LEFT)
BEGIN STA. 751+85.50
END STA. 752+14.50



THOMAS M. WAITS LICENSE No 55460 STATE OF FLORIDA PROFESSIONAL ENGINEER

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY

ON THE DATE ADJACENT TO THE SEAL

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

Thomas M Waits

Digitally signed by Thomas M Waits
Date: 2020.11.30 15:53:22 -05'00'

STRUCTURE PLANS ENGINEER OF RECORD:

THOMAS M. WAITS, P.E.
P.E. LICENSE NUMBER 55460
HIGHSPANS ENGINEERING, INC.
2121 MCGREGOR BLVD.
SUITE 200
FORT MYERS, FL 33901
REGISTRY NO. 27559

COUNTY PROJECT MANAGER:

THOMAS MARQUARDT, P.E.

GOVERNING STANDARD PLANS:

Florida Department of Transportation, FY 2019-20 Standard Plans for Road and Bridge Construction and applicable Interim Revisions (IRs).

Standard Plans for Road Construction and associated IRs are available at the following website: http://www.fdot.gov/design/standardplans

GOVERNING STANDARD SPECIFICATIONS:

Florida Department of Transportation, July 2019 Standard Specifications for Road and Bridge Construction at the following website: http://www.fdot.gov/programmanagement/Implemented/SpecBooks

FINAL SUBMITTAL
NOVEMBER - 2020

CONSTRUCTION CONTRACT NO.	FISCAL YEAR	SHEET NO.
	19	B-01

GENERAL SHEETS

BRIDGE NO. 124144 (RIGHT) & 124145 (LEFT)

BOX CULVERT NO. 1 (BC-1)

BOX CULVERT NO. 2 (BC-2)

MSE RETAINING WALLS

STANDARD PLANS FOR BRIDGE CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

THOMAS M. WAITS, P.E.
P.E. LICENSE NUMBER 55460

HIGHSPANS ENGINEERING, INC.
2121 MCGREGOR BOULEVARD
SUITE 200
FORT MYERS, FL 33901
REGISTRY NO. 27559

DRAWN BY: SDS 09/19
CHECKED BY: CLH 09/19
DESIGNED BY: RMW 09/19
CHECKED BY: TMW 09/19

LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

SHEET TITLE: INDEX OF SHEETS

REF. DWG. NO.

PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

SHEET NO. B-02

Sabrina 11/2/2020 4:04:12 PM H:_Project18\1831_CorkscrewCritterCrossing\struct\BIndex01.dgn

GENERAL NOTES

A. DESIGN SPECIFICATIONS
1. FDOT STRUCTURES MANUAL DATED JANUARY 2020 AND SUBSEQUENT STRUCTURES DESIGN BULLETINS.
2. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) LOAD AND RESISTANCE FACTOR (LRFD) BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION AND ALL SUBSEQUENT INTERIMS.
3. LOAD RATING IS BASED ON THE 2018 MANUAL FOR CONDITION EVALUATION AND LOAD RESISTANCE FACTOR RATING (LRFR) OF HIGHWAY BRIDGES, AND AS AMENDED BY VOLUME 8, OF THE JANUARY 2020 STRUCTURES MANUAL.
4. FDOT DESIGN MANUAL DATED JANUARY 2020 AND SUBSEQUENT ROADWAY DESIGN BULLETINS

B. GOVERNING STANDARDS AND CONSTRUCTION SPECIFICATIONS
FLORIDA DEPARTMENT OF TRANSPORTATION, FY2019-20 STANDARD PLANS AND REVISED INDEX DRAWINGS AS APPENDED HEREIN, AND JULY 2019 STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, AS AMENDED BY CONTRACT DOCUMENTS.

C. DATUM
HORIZONTAL DATUM: NAV 83 FLORIDA STATE PLANCE, WEST ZONE.
VERTICAL DATUM: NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29)

D. ENVIRONMENT

BRIDGE NUMBER	SUPERSTRUCTURE	SUBSTRUCTURE	
		CONCRETE	STEEL
124144 (RIGHT) 124145 (LEFT)	SLIGHTLY	SLIGHTLY	MODERATELY

RESISTIVITY: 7,600 TO 29,000 OHM-CM
CHLORIDES: 15 TO 30 PPM
SULFATES: <5 PPM
pH: 6.9 TO 8.2

E. DESIGN METHODOLOGY
LOAD AND RESISTANCE FACTOR DESIGN (LRFD) METHOD USING STRENGTH, SERVICE, AND FATIGUE LIMIT STATES.

F. DESIGN LOADINGS
1. LIVE LOADS: HL-93 WITH DYNAMIC LOAD ALLOWANCE
2. DEAD LOADS:
42" SINGLE-SLOPE TRAFFIC RAILING: 580 PLF
32" VERTICAL TRAFFIC RAILING W/ DOUBLE BULLET RAILING: 395 PLF
REINFORCED CONCRETE: 150 PCF
FUTURE WEARING SURFACE: 15 PSF
THE DECK THICKNESS INCLUDES A ONE-HALF INCH SACRIFICIAL THICKNESS INCLUDED IN THE DEAD LOAD OF THE DECK BUT OMITTED FROM THE SECTION PROPERTIES USED FOR DESIGN.
3. CONSTRUCTION LOADS: THE CONTRACTOR SHALL SUBMIT ALL TEMPORARY LOADING FOR REVIEW AND APPROVAL.
4. UTILITIES: 100 PLF AT EACH COPING

G. MATERIALS
1. REINFORCING STEEL: ASTM A615, GRADE 60.
2. CONCRETE:

CONCRETE CLASS	MIN. 28-DAY COMPRESSIVE STRENGTH (PSI)	LOCATION OF CONCRETE IN STRUCTURE
II	3400	TRAFFIC RAILING, APPROACH SLABS
IV	5500	C.I.P.
V (SPECIAL)	6000	PRESTRESSED CONCRETE PILES

3. CONCRETE COVER: [DEPENDS ON ENVIRONMENTAL CLASSIFICATION]

CAST-IN-PLACE SUPERSTRUCTURE (TOP OF DECK)	2½"
CAST-IN-PLACE SUPERSTRUCTURE (EXCEPT TOP OF DECK)	2"
CAST-IN-PLACE SUBSTRUCTURE (CAST AGAINST EARTH)	4"
CAST-IN-PLACE SUBSTRUCTURE (FORMED SURFACES)	3"
CAST-IN-PLACE SUBSTRUCTURE (TOP OF BEAM PEDESTALS)	2"
CAST-IN-PLACE (RETAINING WALL)	2"

CONCRETE COVER DIMENSIONS SHOWN IN THE PLANS DO NOT INCLUDE PLACEMENT AND FABRICATION TOLERANCES UNLESS SHOWN AS "MINIMUM COVER". SEE SPECIFICATIONS SECTION 415 FOR ALLOWABLE TOLERANCES. ALL DIMENSIONS PERTAINING TO THE LOCATION OF REINFORCING STEEL ARE TO CENTERLINE OF BAR EXCEPT WHERE CLEAR DIMENSION IS NOTED TO FACE OF CONCRETE.

H. CONCRETE FINISH COATING
A CLASS 5 FINISH COATING SHALL BE APPLIED TO THE PORTIONS OF THE STRUCTURES SHOWN ON THE SURFACE FINISH DETAILS. SUBMIT COLOR AND TEXTURE FOR APPROVAL.

I. PLAN DIMENSIONS
ALL DIMENSIONS IN THESE PLANS ARE MEASURED IN FEET EITHER HORIZONTALLY OR VERTICALLY UNLESS OTHERWISE NOTED.

J. UTILITIES
LOCATIONS OF UTILITIES SHOWN IN THE PLANS ARE APPROXIMATE. FOR DISPOSITION OF UTILITIES, SEE THE UTILITY ADJUSTMENT SHEETS IN THE ROADWAY PLANS.

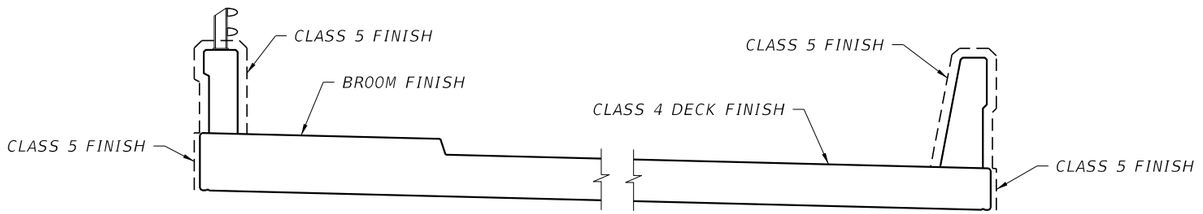
K. BRIDGE NAME AND NUMBER
PLACE THE BRIDGE NAME AND NUMBER ON THE TRAFFIC RAILINGS IN ACCORDANCE WITH THE TRAFFIC RAILING DESIGN STANDARDS.

L. SCREEDING DECKS
SCREED THE RIDING SURFACE OF THE BRIDGE DECK AND APPROACH SLABS TO ACHIEVE THE FINISH GRADE ELEVATIONS SHOWN IN THE PLANS. ACCOUNT FOR THEORETICAL DEFLECTIONS DUE TO SELF WEIGHT, DECK CASTING SEQUENCE, DECK FORMING SYSTEMS, CONSTRUCTION LOADS, OVERLAYS AND TEMPORARY SHORING, ETC. AS REQUIRED.

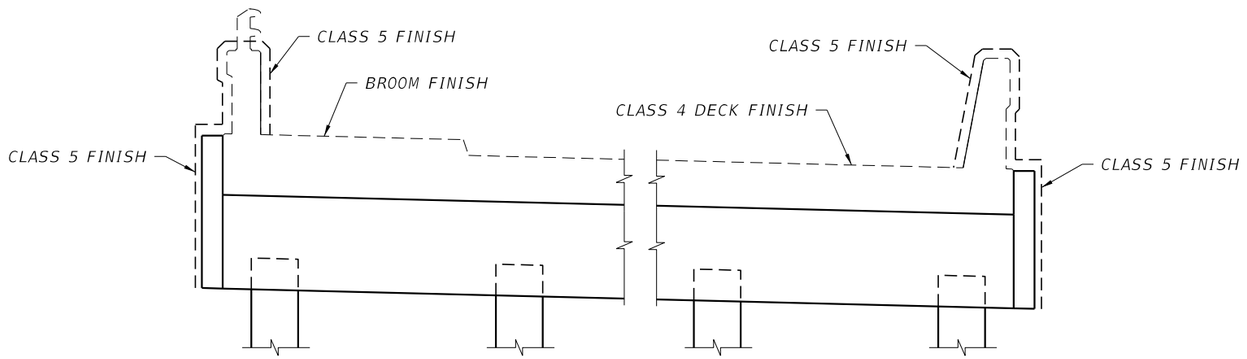
M. JOINTS IN CONCRETE
CONSTRUCTION JOINTS WILL BE PERMITTED ONLY AT THE LOCATIONS INDICATED IN THE PLANS. ADDITIONAL CONSTRUCTION JOINTS OR ALTERATIONS TO THOSE SHOWN SHALL REQUIRE APPROVAL OF THE ENGINEER.

N. TRAFFIC CONTROL PLANS
SEE ROADWAY PLANS AND CONSTRUCTION SEQUENCE

O. PHASING OF WORK
1. WORK PHASING AND PROGRESSION OF THE WORK SHALL CONFORM TO THE TRAFFIC CONTROL PLANS LOCATED IN THE ROADWAY PLANS AND THE NOTES ON THE CONSTRUCTION SEQUENCE DRAWINGS. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY DRAINAGE AND SHORING NECESSARY TO CONSTRUCT THE IMPROVEMENTS SHOWN. ALL COSTS ASSOCIATED WITH TEMPORARY DRAINAGE AND SHORING SHALL BE INCLUDED IN THE LUMP SUM MAINTENANCE OF TRAFFIC PAY ITEM.
2. CONTRACTOR SHOULD EVALUATE GROUNDWATER ELEVATIONS AT THE TIME OF CONSTRUCTION AND ANTICIPATE THE NEED TO PERFORM DEWATERING TO CONSTRUCT BOX CULVERTS AND ASSOCIATED RETAINING WALLS. ALL DEWATERING IS TO BE INCLUDED IN THE COST FOR BOX CULVERTS AND RETAINING WALLS.



SURFACE FINISH DETAILS - SUPERSTRUCTURE



SURFACE FINISH DETAILS - BENTS

BRIDGE NOS. 124144 (RIGHT) & 124145 (LEFT)

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

THOMAS M. WAITS, P.E.
P.E. LICENSE NUMBER 55460

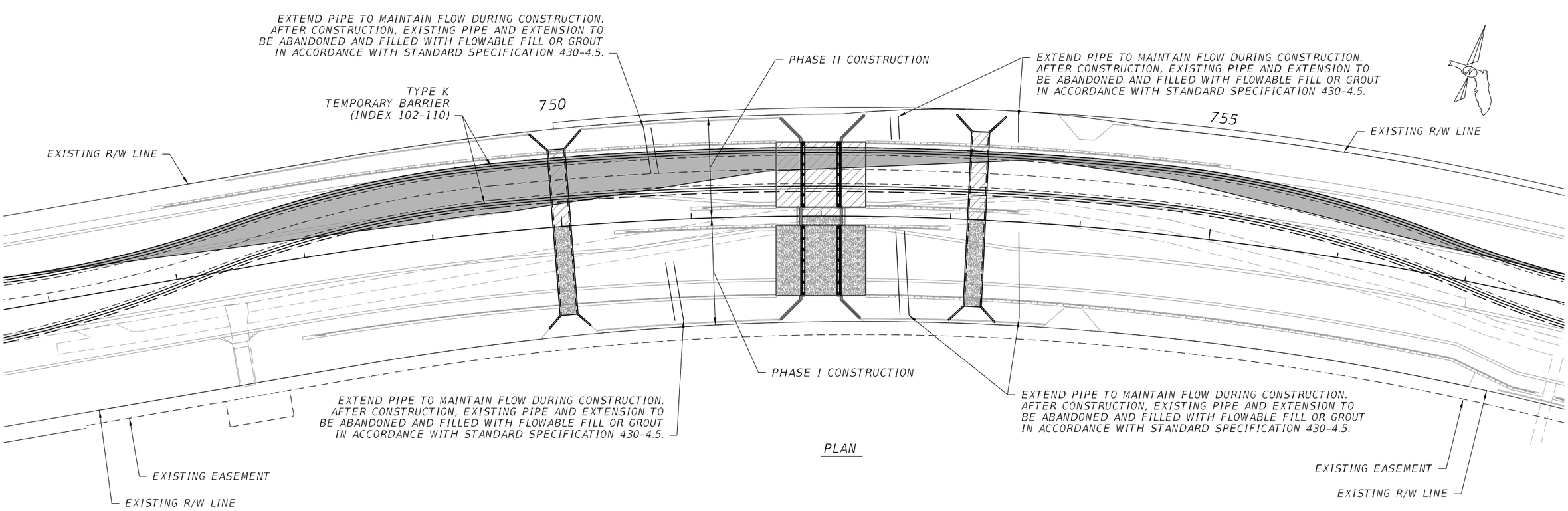
HIGHSPANS ENGINEERING, INC.
2121 MCGREGOR BOULEVARD
SUITE 200
FORT MYERS, FL 33901
REGISTRY NO. 27559

DRAWN BY: SDS 09/19
CHECKED BY: CLH 09/19
DESIGNED BY: RMW 09/19
CHECKED BY: TMW 09/19

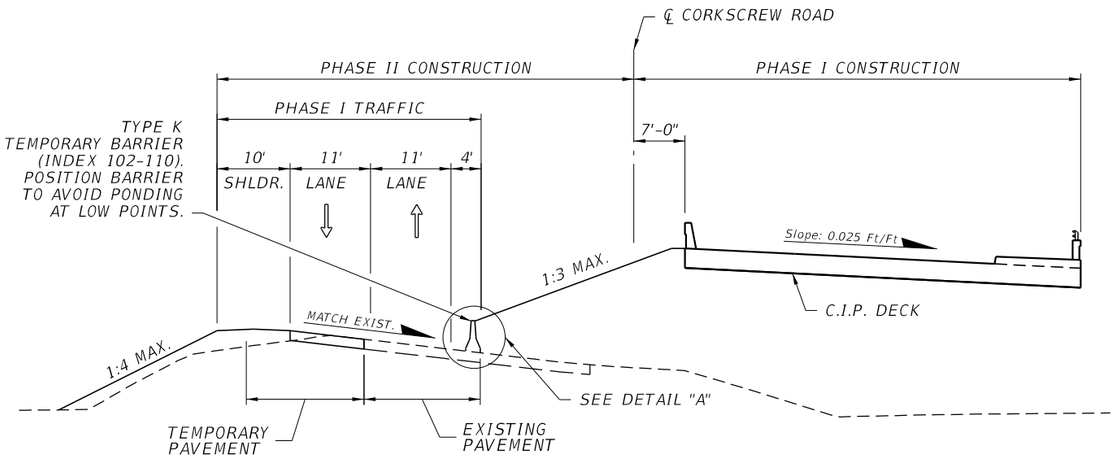
LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

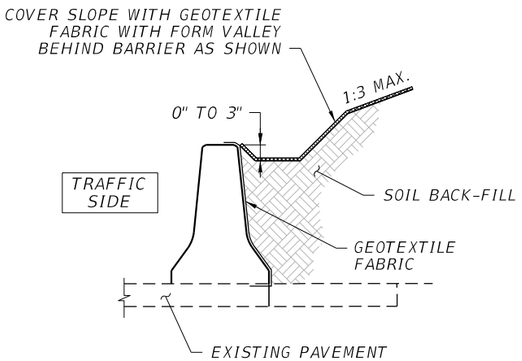
SHEET TITLE: GENERAL NOTES
REF. DWG. NO.:
PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS
SHEET NO.: B-03



PLAN



TYPICAL



DETAIL "A"

LEGEND

- TEMPORARY PAVEMENT
- PHASE I CONSTRUCTION
- PHASE II CONSTRUCTION

CONSTRUCTION PHASING PLAN

1. CONSTRUCT TEMPORARY DRAINAGE
2. CONSTRUCT TEMPORARY PAVEMENT
3. SHIFT BOTH LANES TO TEMPORARY DIVERSION AND WALLS
4. CONSTRUCT PHASE 1 CULVERTS AND BRIDGE
5. SHIFT BOTH LANES TO PHASE 1 CULVERTS AND BRIDGE
6. CONSTRUCT PHASE 2 CULVERTS, BRIDGE AND WALLS
7. GROUT TEMPORARY DRAINAGE, FINISH GRADE

BRIDGE NOS. 124144 (RIGHT) & 124145 (LEFT)

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HIGHSPANS ENGINEERING, INC.
2121 MCGREGOR BOULEVARD
SUITE 200
FORT MYERS, FL 33901
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CHECKED BY:	TMW 09/19

LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

SHEET TITLE: CONSTRUCTION SEQUENCE

REF. DWG. NO.:

PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

SHEET NO.: B-04

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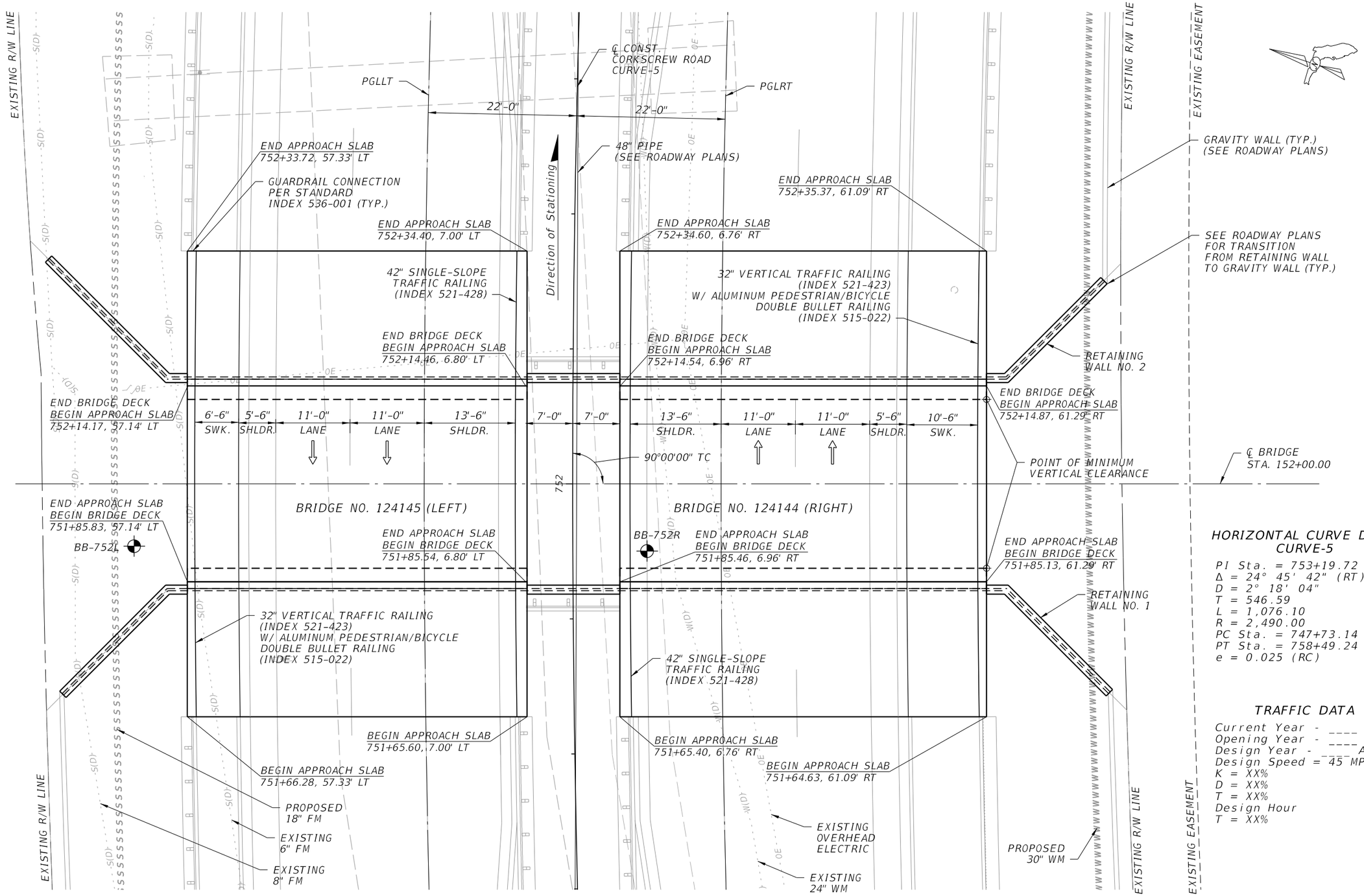

HORIZONTAL CURVE DATA: CURVE-5

PI Sta. = 753+19.72
Δ = 24° 45' 42" (RT)
D = 2° 18' 04"
T = 546.59
L = 1,076.10
R = 2,490.00
PC Sta. = 747+73.14
PT Sta. = 758+49.24
e = 0.025 (RC)

TRAFFIC DATA

Current Year - ____ AADT = XXXXX
Opening Year - ____ AADT = XXXXX
Design Year - ____ AADT = XXXXX
Design Speed = 45 MPH
K = XX%
D = XX%
T = XX%
Design Hour
T = XX%

PLAN

BRIDGE NOS. 124144 (RIGHT) & 124145 (LEFT)

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

THOMAS M. WAITS, P.E.
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FORT MYERS, FL 33901
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LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

SHEET TITLE: PLAN
REF. DWG. NO.:
PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS
SHEET NO.: B1-01

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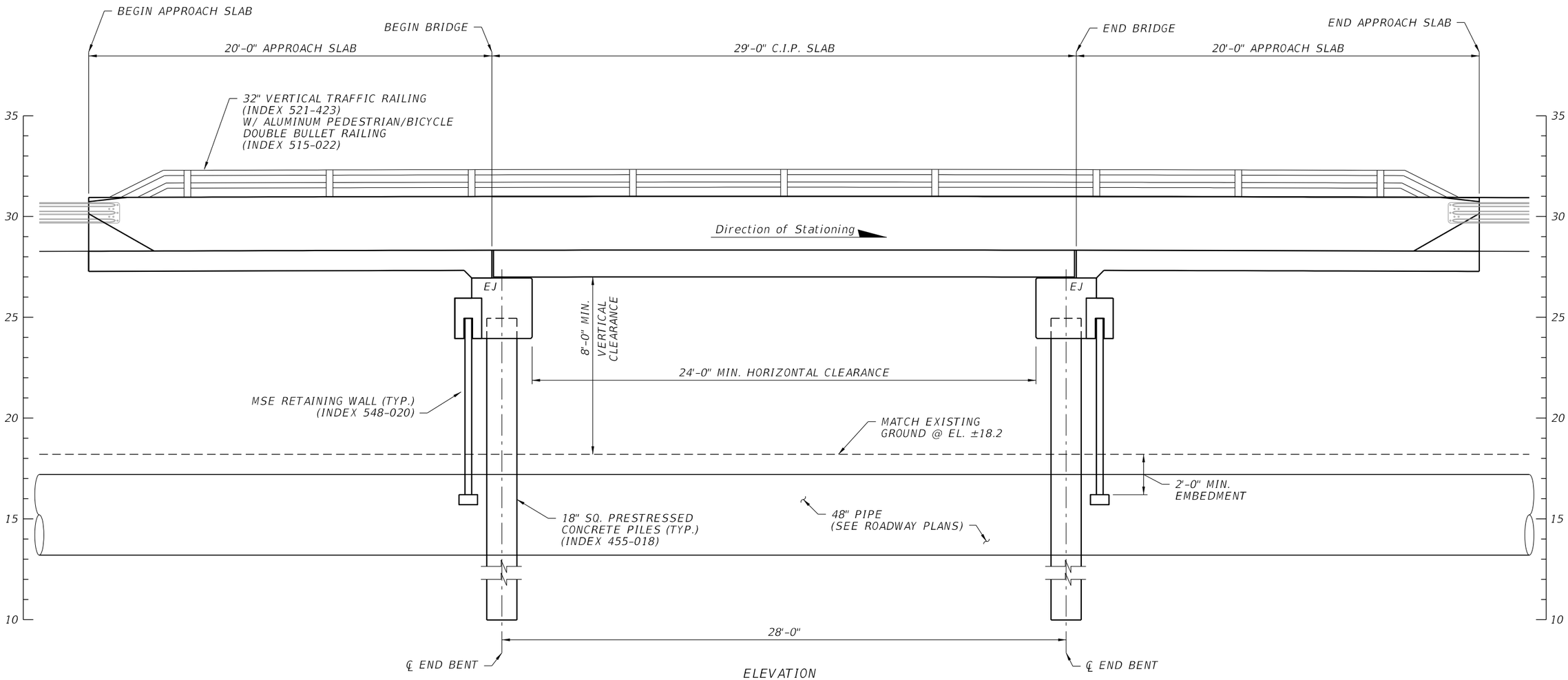
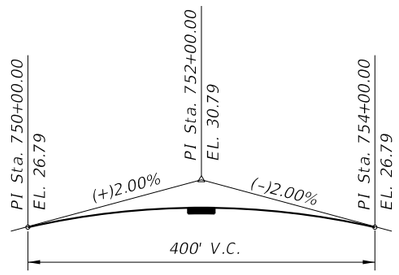
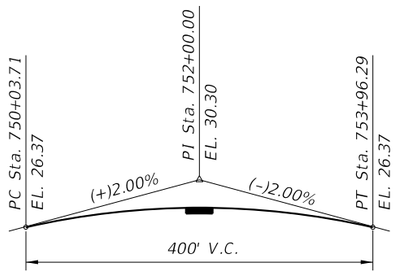


ELEVATION



VERTICAL CURVE DATA

(ALONG PGLRT NB CORKSCREW ROAD)



VERTICAL CURVE DATA

(ALONG PGLLT SB CORKSCREW ROAD)

BRIDGE NOS. 124144 (RIGHT) & 124145 (LEFT)

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

THOMAS M. WAITS, P.E.
P.E. LICENSE NUMBER 55460

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2121 MCGREGOR BOULEVARD
SUITE 200
FORT MYERS, FL 33901
REGISTRY NO. 27559

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LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

SHEET TITLE: ELEVATION

REF. DWG. NO.:

PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

SHEET NO.: B1-02

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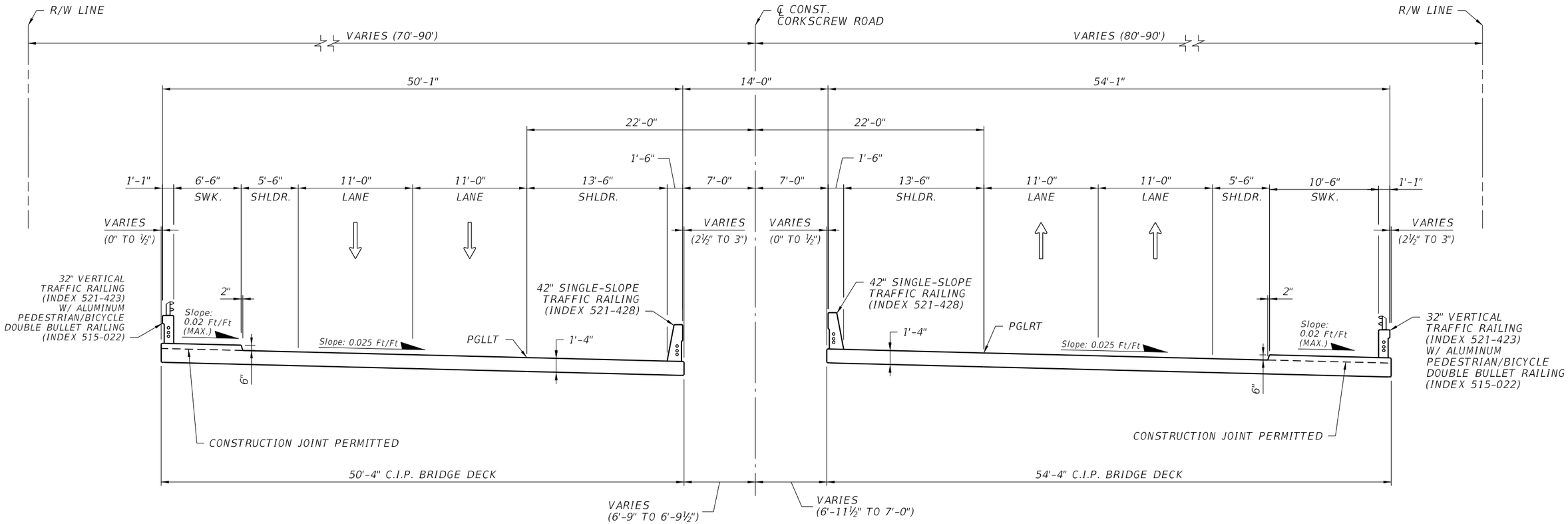

TYPICAL SECTION

NOTE:
1. CONTRACTOR SHALL DEMONSTRATE TO THE ENGINEER THAT THE TRAFFIC RAILING CONDUIT IS CLEAR OF ANY OBSTRUCTIONS PRIOR TO FINAL ACCEPTANCE.

BRIDGE NOS. 124144 (RIGHT) & 124145 (LEFT)

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

THOMAS M. WAITS, P.E.
P.E. LICENSE NUMBER 55460

HIGHSPANS ENGINEERING, INC.
2121 MCGREGOR BOULEVARD
SUITE 200
FORT MYERS, FL 33901
REGISTRY NO. 27559

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LEE COUNTY
DEPARTMENT OF TRANSPORTATION

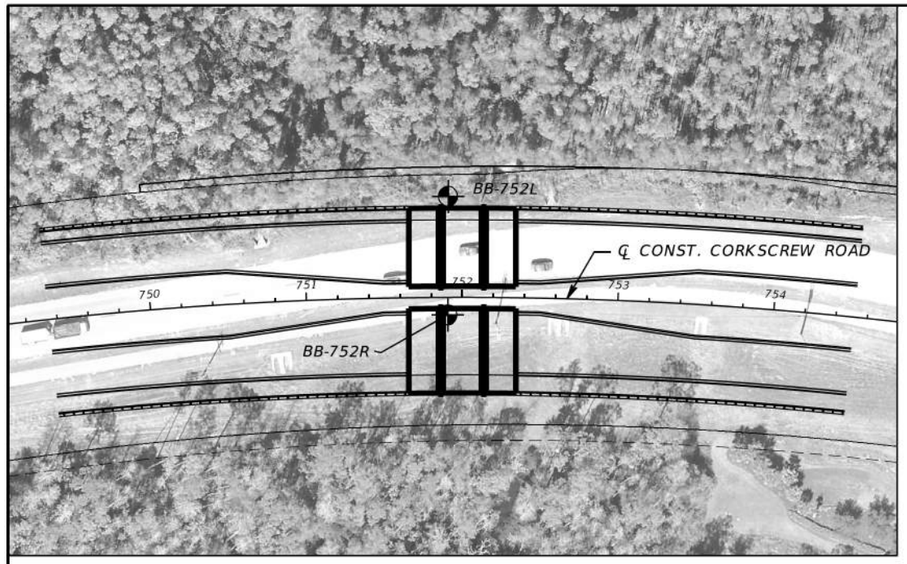
ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

SHEET TITLE: TYPICAL SECTION

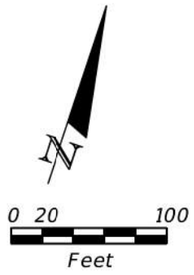
REF. DWG. NO.:

PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

SHEET NO.: B1-03



BORING LOCATION PLAN



ENVIRONMENTAL CLASSIFICATION:

SUBSTRUCTURE	CONCRETE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE	STEEL: MODERATELY AGGRESSIVE (pH = 6.9)
SUPERSTRUCTURE	SLIGHTLY AGGRESSIVE

SOIL TEST RESULTS:

RESISTIVITY	7,600 TO 29,000 OHM-CM
CHLORIDES	15 TO 30 PPM
SULFATES	<5 PPM
pH	6.9 TO 8.2

LEGEND

- GRAY TO BROWN SAND TO SAND WITH SILT, OCCASIONALLY WITH LIMEROCK AND/OR SHELL (SP/SP-SM)
- GRAY CLAY WITH SHELL AND WEATHERED LIMESTONE FRAGMENTS (CL/CH)
- WEATHERED LIMESTONE/CAPROCK

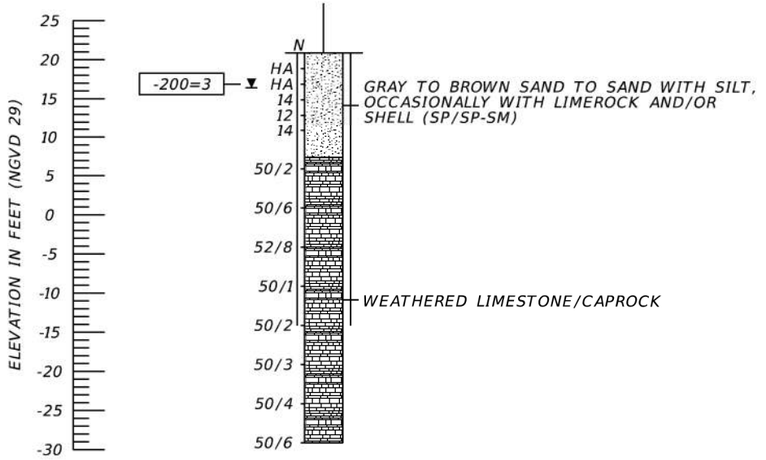
SP	UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2487) GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
50/4	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
-200	PERCENT PASSING #200 SIEVE
NGVD 29	NATIONAL GEODETIC VERTICAL DATUM OF 1929

- APPROXIMATE SPT BORING LOCATION
- GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
- CASING

℄ CONST. CENTERLINE CONSTRUCTION OF CORKSCREW ROAD

NOTE: THE BORING LOCATIONS AND ELEVATIONS WERE PROVIDED BY THE PROJECT SURVEYOR. THE STATION AND OFFSET OF THE BORING LOCATIONS WERE DETERMINED UTILIZING THE GPS COORDINATES IN CONJUNCTION WITH PROJECT DESIGN FILES.

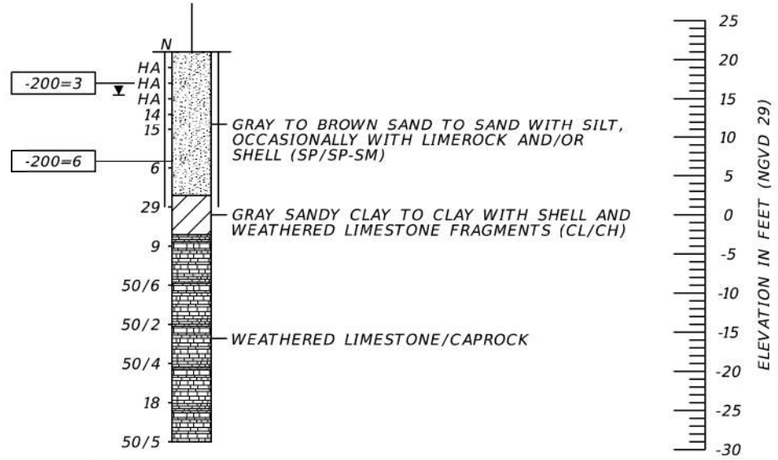
BOR # BB-752R
STA. 751+90
REF. ℄ CONST.
OFF. 11' RT.
ELEV. 20.9
DATE 2/29/2020
DRILLER I. POORAN
HAMMER AUTOMATIC
RIG D-25



BORING TERMINATED AT ELEVATION -29.1 FT (NGVD 29)

LATITUDE: N 26.45098
LONGITUDE: W 81.73911

BOR # BB-752L
STA. 751+91
REF. ℄ CONST.
OFF. 65' LT.
ELEV. 21.0
DATE 2/22/2020
DRILLER J. SHAW
HAMMER AUTOMATIC
RIG D-25



BORING TERMINATED AT ELEVATION -29.0 FT (NGVD 29)

LATITUDE: N 26.45118
LONGITUDE: W 81.73918

	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS- RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

BRIDGE NOS. 124144 (RIGHT) & 124145 (LEFT)

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

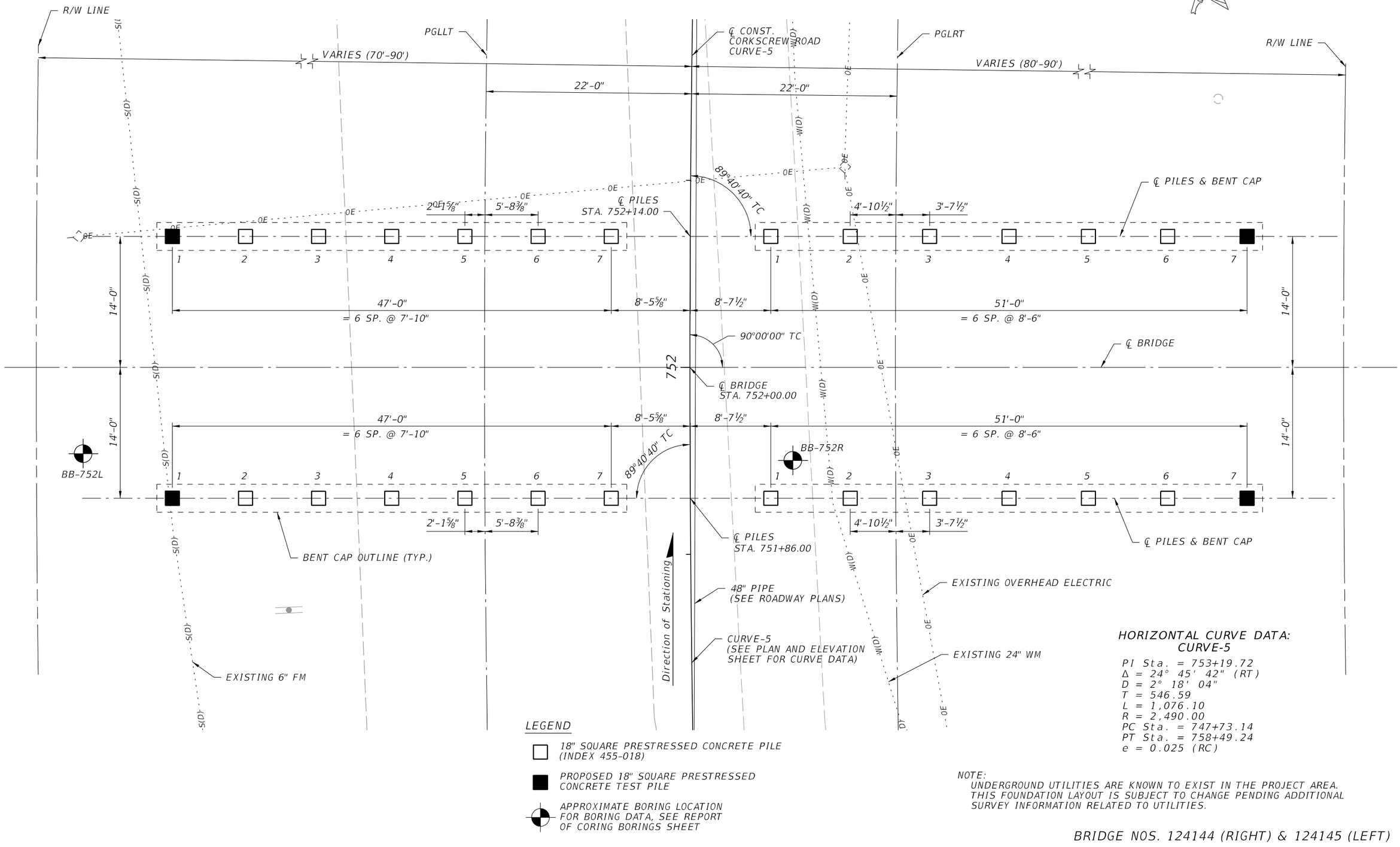
THOMAS E. MUSGRAVE, JR., P.E.
P.E. LICENSE NUMBER 81669
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

LEE COUNTY PUBLIC WORKS
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	COUNTY PROJECT NO.
CR 850	LEE	CN180576ANB

REPORT OF CORE BORINGS

SHEET NO. B1-04



LEGEND

- 18" SQUARE PRESTRESSED CONCRETE PILE (INDEX 455-018)
- PROPOSED 18" SQUARE PRESTRESSED CONCRETE TEST PILE
- APPROXIMATE BORING LOCATION FOR BORING DATA, SEE REPORT OF CORING BORINGS SHEET

HORIZONTAL CURVE DATA:
CURVE-5

PI Sta. = 753+19.72
Δ = 24° 45' 42" (RT)
D = 2° 18' 04"
T = 546.59
L = 1,076.10
R = 2,490.00
PC Sta. = 747+73.14
PT Sta. = 758+49.24
e = 0.025 (RC)

NOTE:
UNDERGROUND UTILITIES ARE KNOWN TO EXIST IN THE PROJECT AREA. THIS FOUNDATION LAYOUT IS SUBJECT TO CHANGE PENDING ADDITIONAL SURVEY INFORMATION RELATED TO UTILITIES.

BRIDGE NOS. 124144 (RIGHT) & 124145 (LEFT)

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REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

THOMAS M. WAITS, P.E.
P.E. LICENSE NUMBER 55460
HIGHSPANS ENGINEERING, INC.
2121 MCGREGOR BOULEVARD
SUITE 200
FORT MYERS, FL 33901
REGISTRY NO. 27559

DRAWN BY:	SDS 09/19
CHECKED BY:	CLH 09/19
DESIGNED BY:	RMW 09/19
CHECKED BY:	TMW 09/19

LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

SHEET TITLE: FOUNDATION LAYOUT

REF. DWG. NO.:

PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

SHEET NO.: B1-05

Sabrina 11/2/2020 4:04:36 PM H:_Project18\1831_CorkscrewCritterCrossing\struct\B1FoundLay01.dgn

PILE DATA TABLE

Table Date 01/01/16

INSTALLATION CRITERIA								DESIGN CRITERIA								PILE CUT-OFF ELEVATIONS						
PIER or BENT NUMBER	PILE SIZE (in.)	NOMINAL BEARING RESISTANCE (tons)	NOMINAL UPLIFT RESISTANCE (tons)	MINIMUM TIP ELEVATION (ft.)	TEST PILE LENGTH (ft.)	REQUIRED JET ELEVATION (ft.)	REQUIRED PREFORM ELEVATION (ft.)	FACTORED DESIGN LOAD (tons)	FACTORED DESIGN UPLIFT LOAD (tons)	DOWN DRAG (tons)	TOTAL SCOUR RESISTANCE (tons)	NET SCOUR RESISTANCE (tons)	100-YEAR SCOUR ELEVATION (ft.)	Ø COMPRESSION	Ø UPLIFT	PILE 1	PILE 2	PILE 3	PILE 4	PILE 5	PILE 6	PILE 7
END BENT 1L	18	137	N/A	SEE NOTE 5	50.0	N/A	-1.0	89	N/A	N/A	N/A	N/A	N/A	0.65	N/A	25.8	25.6	25.4	25.2	25.0	24.8	24.6
END BENT 1R	18	147	N/A	SEE NOTE 5	50.0	N/A	-1.0	95	N/A	N/A	N/A	N/A	N/A	0.65	N/A	25.7	25.5	25.3	25.1	24.9	24.7	24.4
END BENT 2L	18	137	N/A	SEE NOTE 5	50.0	N/A	-1.0	89	N/A	N/A	N/A	N/A	N/A	0.65	N/A	25.8	25.6	25.4	25.2	25.0	24.8	24.6
END BENT 2R	18	147	N/A	SEE NOTE 5	50.0	N/A	-1.0	95	N/A	N/A	N/A	N/A	N/A	0.65	N/A	25.7	25.5	25.3	25.1	24.9	24.7	24.4

$$\frac{\text{Factored Design Load + Net Scour Resistance + Down Drag}}{\text{Ø}} \leq \text{Nominal Bearing Resistance}$$

NOMINAL UPLIFT RESISTANCE – The ultimate side friction capacity that must be obtained below the 100 year scour elevation to resist pullout of the pile (Specify only when design requires uplift capacity).

TOTAL SCOUR RESISTANCE – An estimate of the ultimate static side friction resistance provided by the scourable soil.

NET SCOUR RESISTANCE – An estimate of the ultimate static side friction resistance provided by the soil from the required preformed or jetting elevation to the scour elevation.

100-YEAR SCOUR ELEVATION – Estimated elevation of scour due to the 100 year storm event.

PILE INSTALLATION NOTES [Notes Date 7-01-13]:

1. Contractor to verify location of all utilities prior to any pile installation activities.
2. At each Bent, pile driving is to commence at the center of the Bent and proceed outward.
3. All test piles shall be driven in the position of a permanent plumb pile at the locations shown or as directed by the Engineer.
4. All test piles shall be dynamically monitored using dynamic testing equipment a per section 455 of the FDOT specifications.
5. Minimum tip elevations shall be in accordance with section 455 of the FDOT specifications.
6. Piles are to be driven prior to placement of MSE wall and approach fill sections.
7. The Required Preform Elevation is Provided to Achieve Minimum Pile Penetration Requirements in Accordance with Section 455 of the FDOT Standard Specifications.

BRIDGE NOS. 124144 (RIGHT) & 124145 (LEFT)

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LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

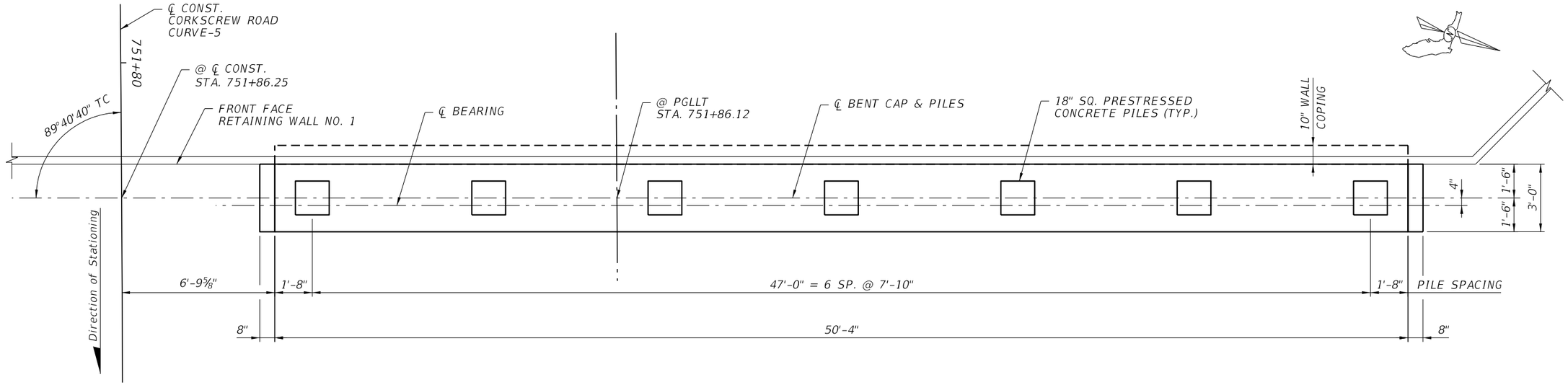
SHEET TITLE: PILE DATA TABLE

REF. DWG. NO.:

PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

SHEET NO.: B1-06

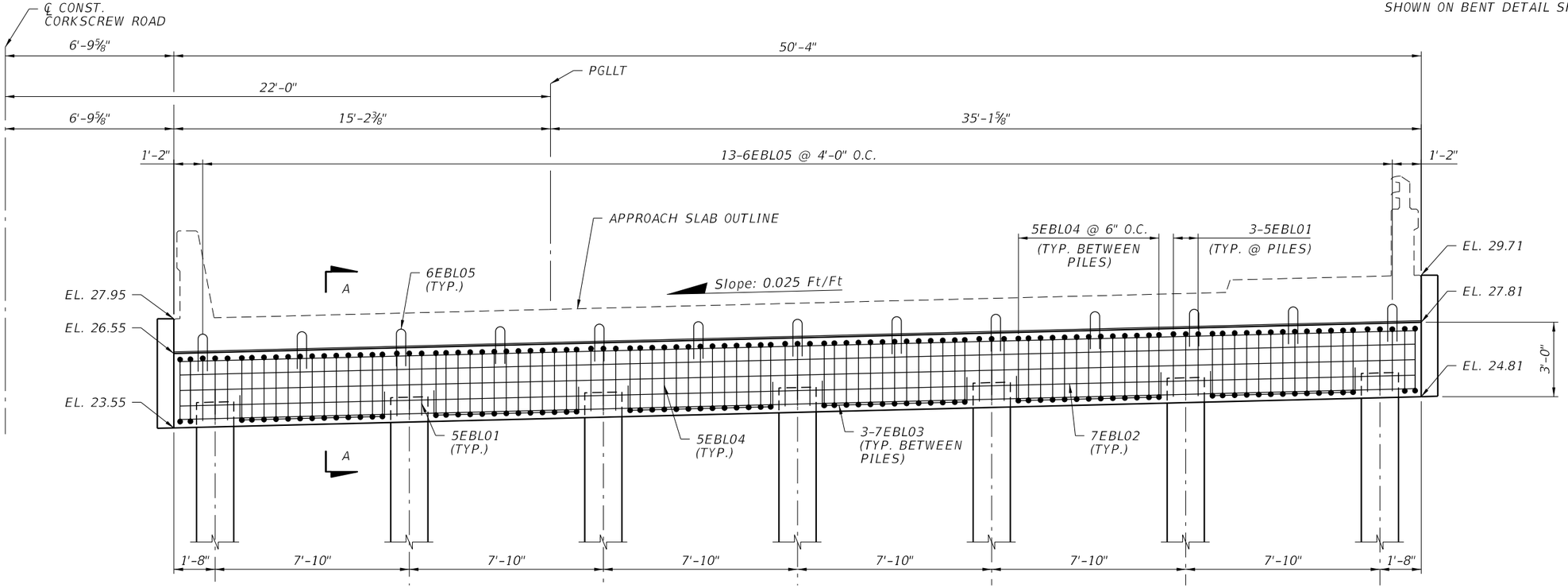
Sabrina 11/2/2020 4:04:36 PM H:_Project18\1831_CorkscrewCritterCrossing\struct\B1PileData01.dgn



PLAN

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
CONCRETE	CY	20.5*

*INCLUDES WALL COPING AND CHEEKWALL SHOWN ON BENT DETAIL SHEET



ELEVATION @ ℄ BENT CAP & PILES

LOOKING BACK STATION

BRIDGE NOS. 124144 (RIGHT) & 124145 (LEFT)

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LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

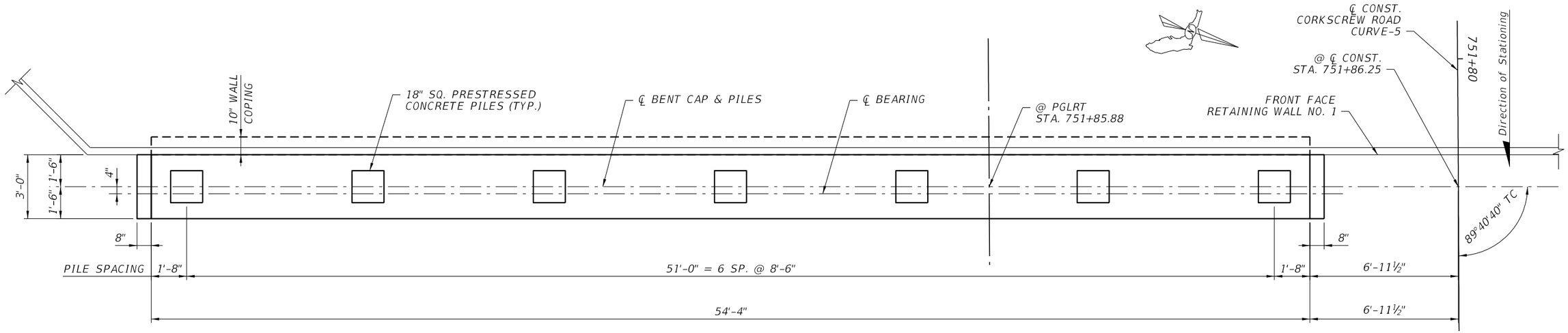
SHEET TITLE: END BENT 1 -LEFT

REF. DWG. NO.:

PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

SHEET NO.: B1-07

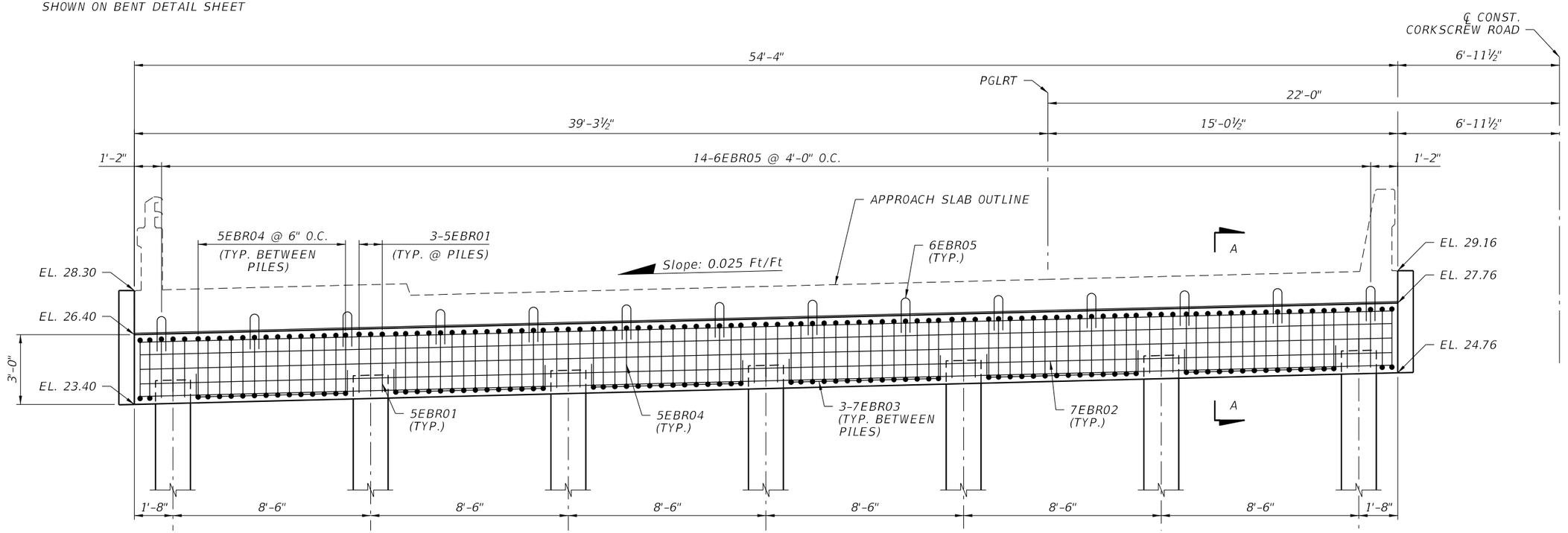
Sabrina 11/2/2020 4:04:37 PM H:_Project18\1831_CorkscrewCritterCrossing\struct\B1EndBent01L.dgn



PLAN

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
CONCRETE	CY	22.1*

*INCLUDES WALL COPING AND CHEEKWALL SHOWN ON BENT DETAIL SHEET



ELEVATION @ ℄ BENT CAP & PILES

LOOKING BACK STATION

BRIDGE NOS. 124144 (RIGHT) & 124145 (LEFT)

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REVISIONS					
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FORT MYERS, FL 33901
REGISTRY NO. 27559

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SDS 09/19	CLH 09/19	RMW 09/19	TMW 09/19

LEE COUNTY
DEPARTMENT OF TRANSPORTATION

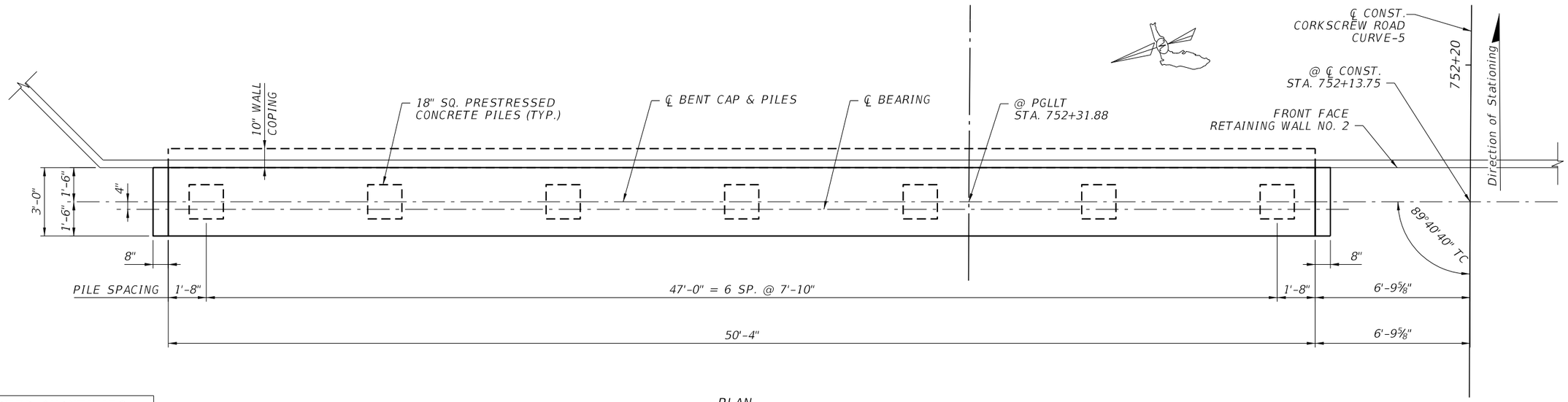
ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

SHEET TITLE: END BENT 1 -RIGHT

REF. DWG. NO.:

PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

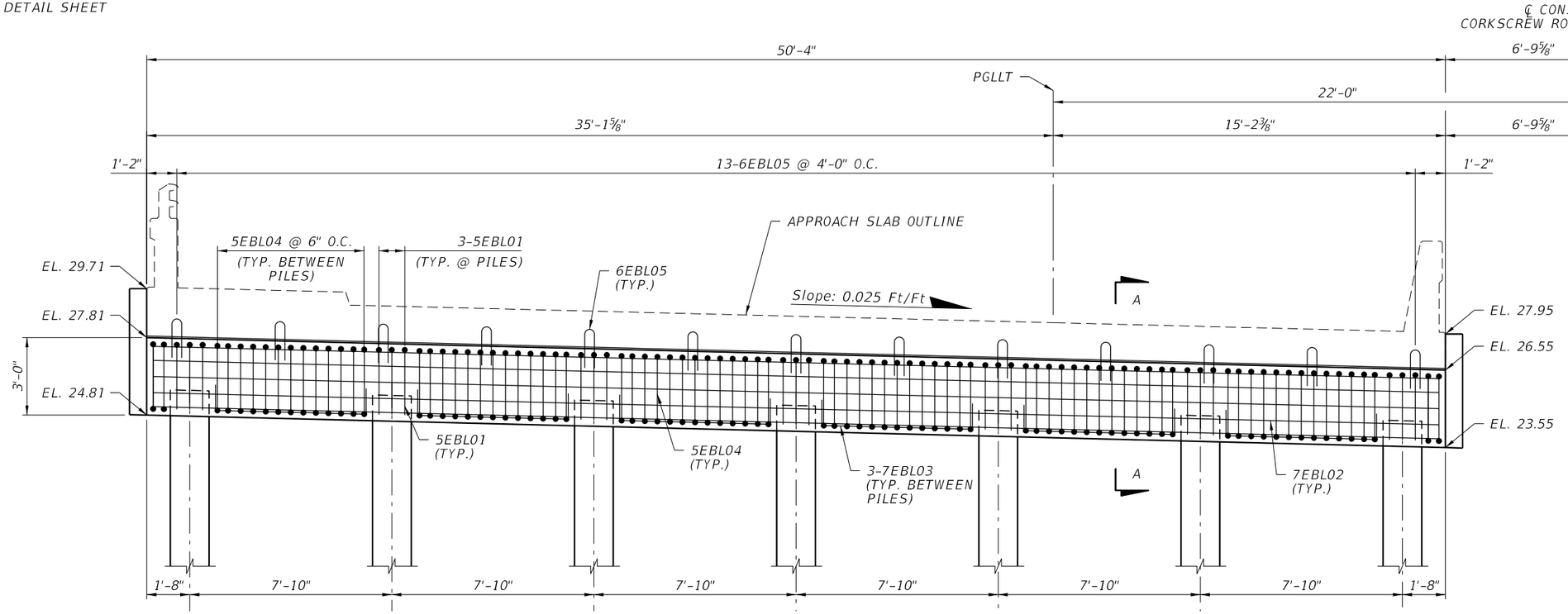
SHEET NO.: B1-08



PLAN

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
CONCRETE	CY	20.5*

*INCLUDES WALL COPING AND CHEEKWALL SHOWN ON BENT DETAIL SHEET



ELEVATION @ ℄ BENT CAP & PILES

LOOKING AHEAD STATION

BRIDGE NOS. 124144 (RIGHT) & 124145 (LEFT)

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REGISTRY NO. 27559

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CHECKED BY:	TMW 09/19

LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

SHEET TITLE: END BENT 2 -LEFT

REF. DWG. NO.:

PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

SHEET NO.: B1-09

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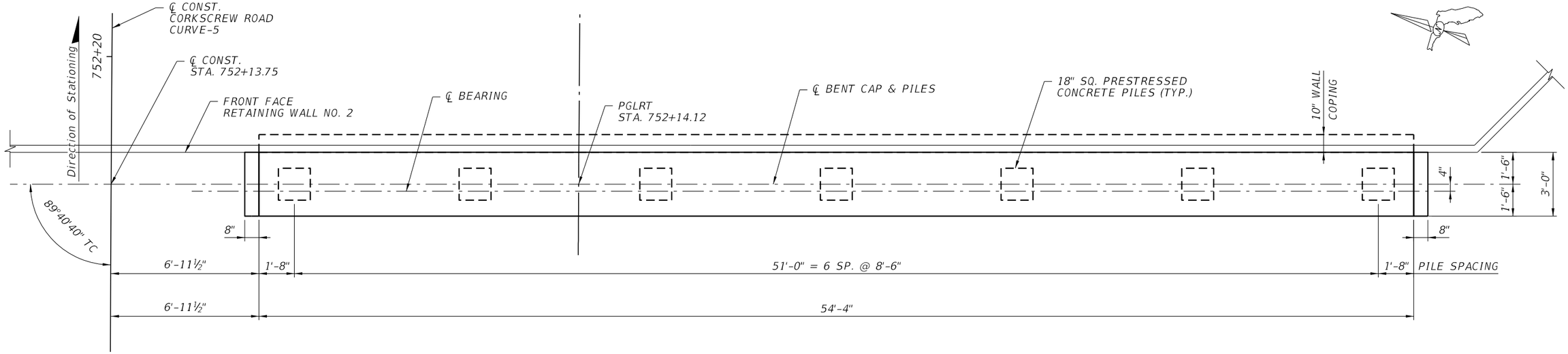
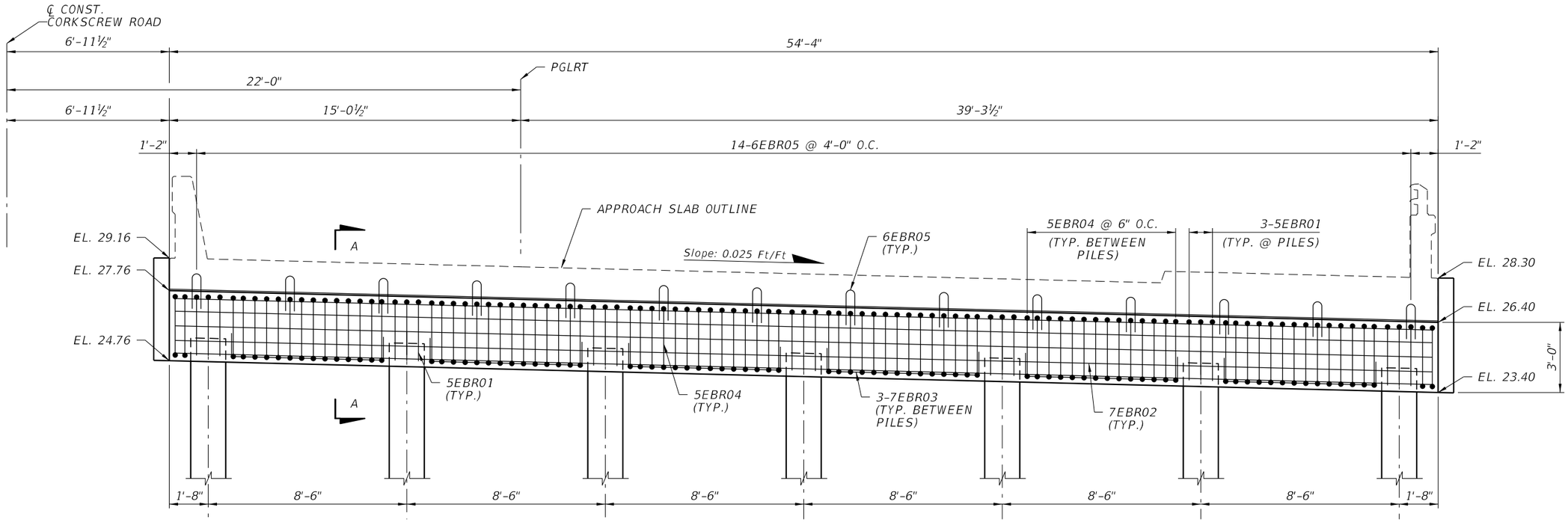


PLAN

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
CONCRETE	CY	22.1*

*INCLUDES WALL COPING AND CHEEKWALL SHOWN ON BENT DETAIL SHEET



ELEVATION @ ℄ BENT CAP & PILES

LOOKING AHEAD STATION

BRIDGE NOS. 124144 (RIGHT) & 124145 (LEFT)

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REVISIONS					
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LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

SHEET TITLE: END BENT 2 -RIGHT

REF. DWG. NO.:

PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

SHEET NO.: B1-10

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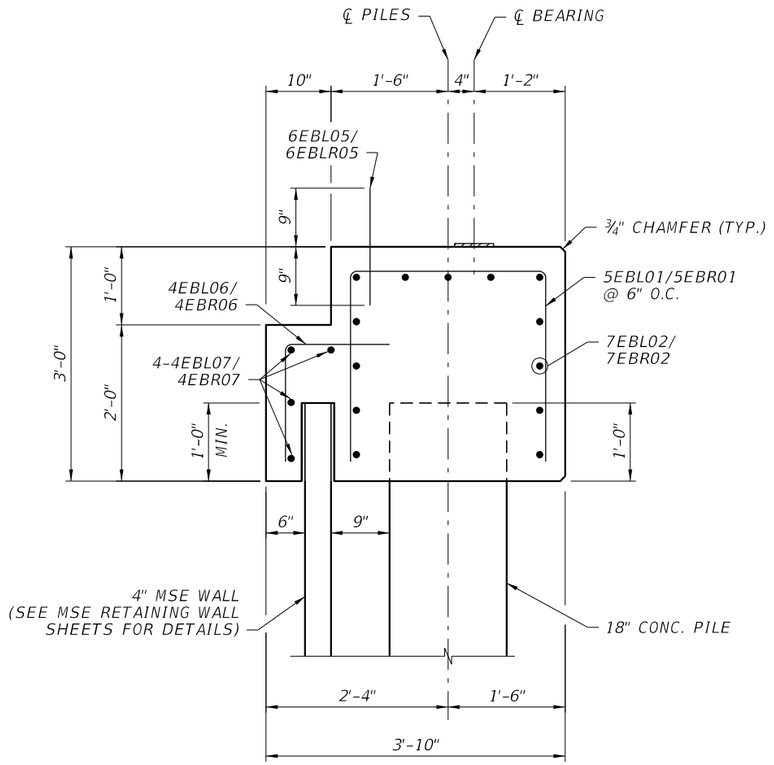
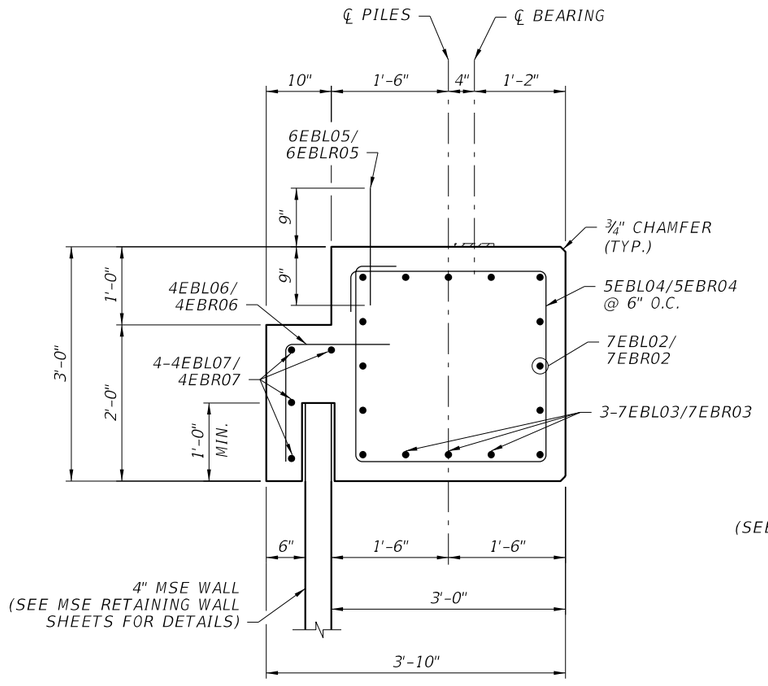
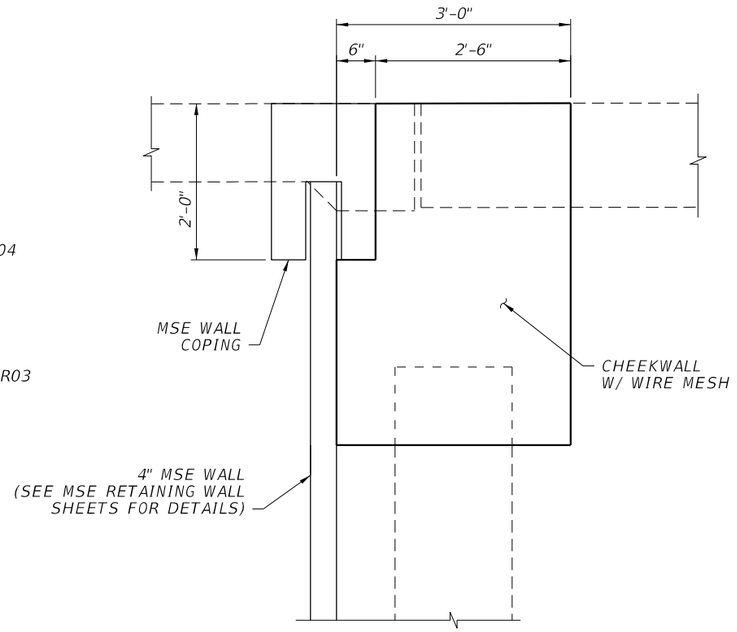


END BENT DETAIL AT PILES



END BENT DETAIL BETWEEN PILES



CHEEKWALL DETAIL

SEQUENCE OF CONSTRUCTION FOR MSE WALLS/END BENTS/PILES

1. INSTALL END BENT PILES PER PLAN
2. INSTALL APPROACH FILL/MSE WALL PANEL SECTIONS
3. POUR END BENT CAPS

BRIDGE NOS. 124144 (RIGHT) & 124145 (LEFT)

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

THOMAS M. WAITS, P.E.
P.E. LICENSE NUMBER 55460

HIGHSPANS ENGINEERING, INC.
2121 MCGREGOR BOULEVARD
SUITE 200
FORT MYERS, FL 33901
REGISTRY NO. 27559

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LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

SHEET TITLE: END BENT DETAILS

REF. DWG. NO.:

PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

SHEET NO.: B1-11

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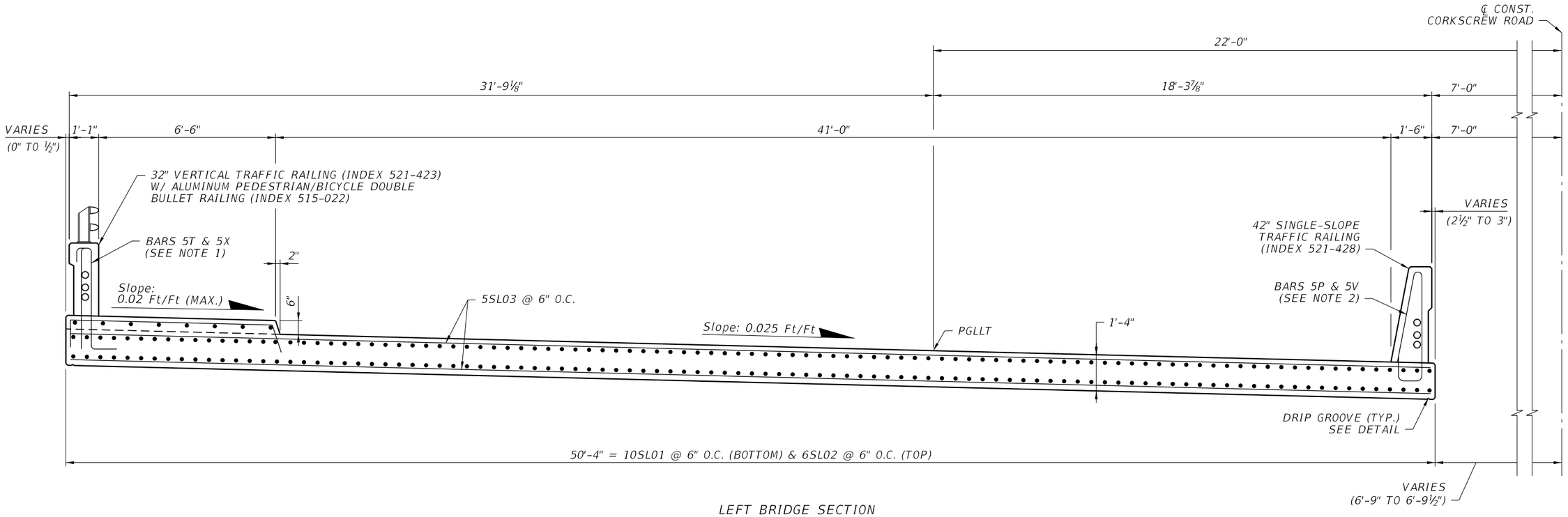
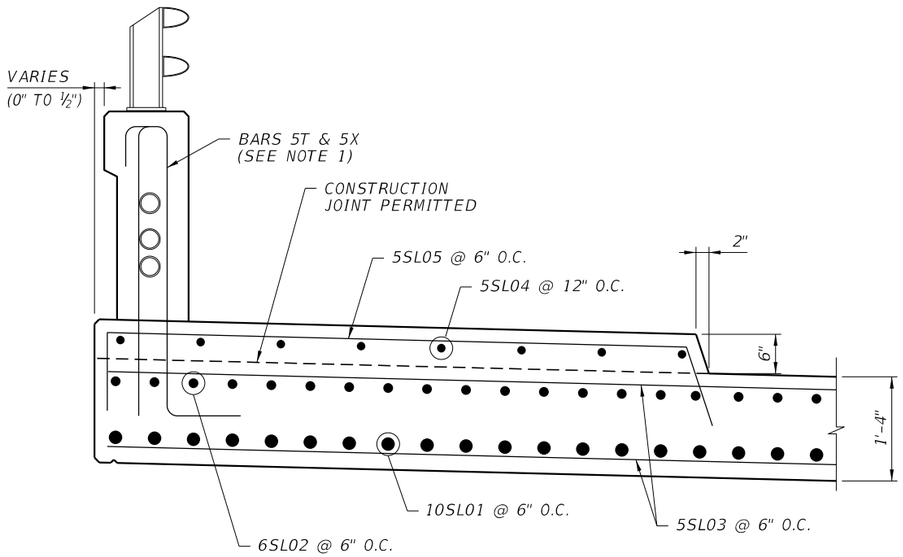
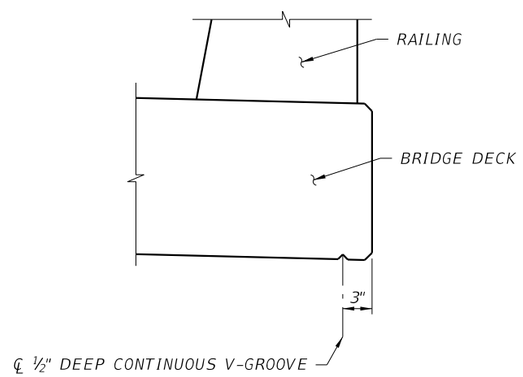


LEFT BRIDGE SECTION



SIDEWALK DETAIL



DRIP GROOVE DETAIL

ESTIMATED CONCRETE QUANTITIES		
ITEM	UNIT	QUANTITY
DECK	CY	71.9
SIDEWALK	CY	4.2

NOTE:
1. BARS 5T AND 5X ARE INCIDENTAL TO TRAFFIC RAILING (32" VERTICAL) INDEX NO. 521-423.
2. BARS 5P AND 5V ARE INCIDENTAL TO TRAFFIC RAILING (42" SINGLE-SLOPE) INDEX NO. 521-428.

BRIDGE NOS. 124144 (RIGHT) & 124145 (LEFT)

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CHECKED BY: TMW 09/19

LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

SHEET TITLE: SUPERSTRUCTURE LEFT BRIDGE

REF. DWG. NO.:

PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

SHEET NO.: B1-12

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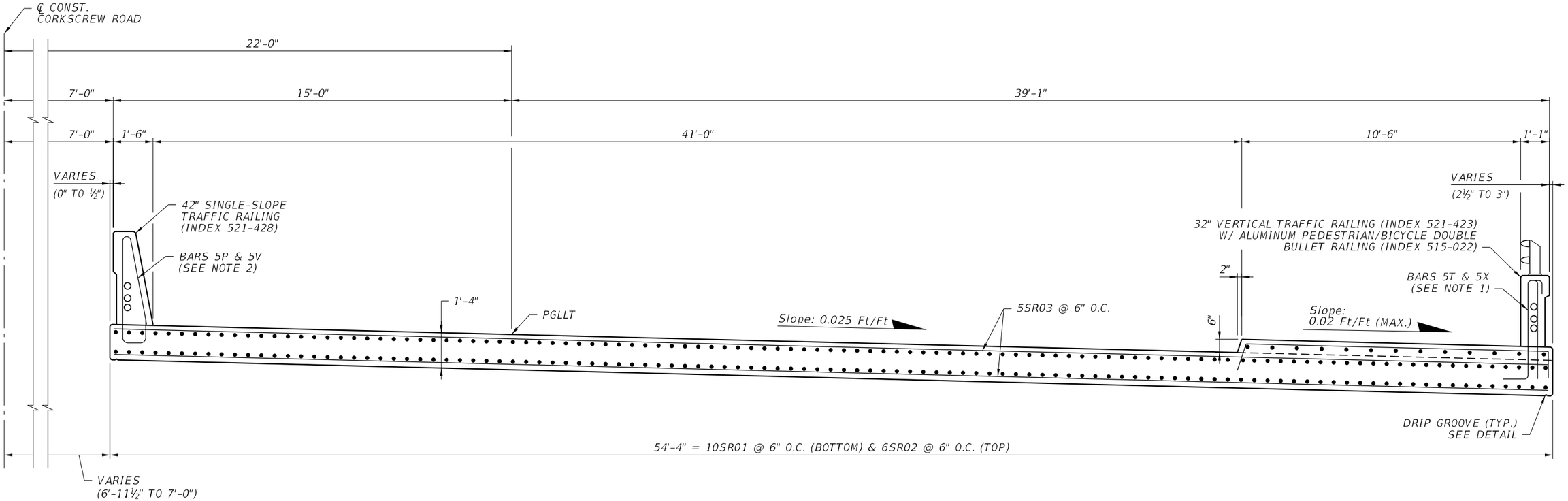
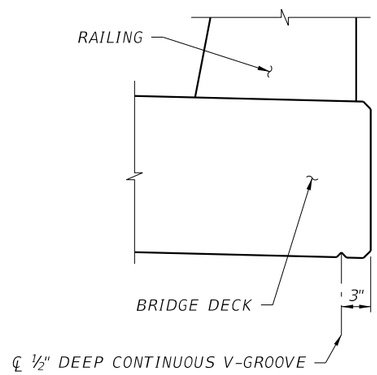
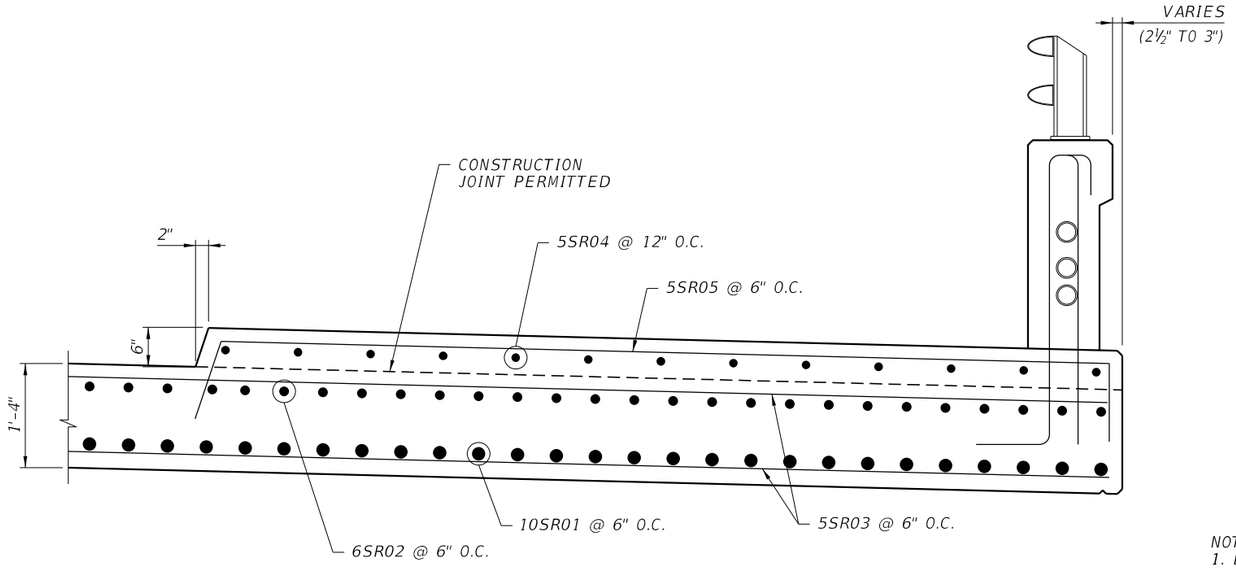




DRIP GROOVE DETAIL



SIDEWALK DETAIL

ESTIMATED CONCRETE QUANTITIES		
ITEM	UNIT	QUANTITY
DECK	CY	77.6
SIDEWALK	CY	6.4

NOTE:
1. BARS 5T AND 5X ARE INCIDENTAL TO TRAFFIC RAILING (32" VERTICAL) INDEX NO. 521-423.
2. BARS 5P AND 5V ARE INCIDENTAL TO TRAFFIC RAILING (42" SINGLE-SLOPE) INDEX NO. 521-428.

BRIDGE NOS. 124144 (RIGHT) & 124145 (LEFT)

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REGISTRY NO. 27559

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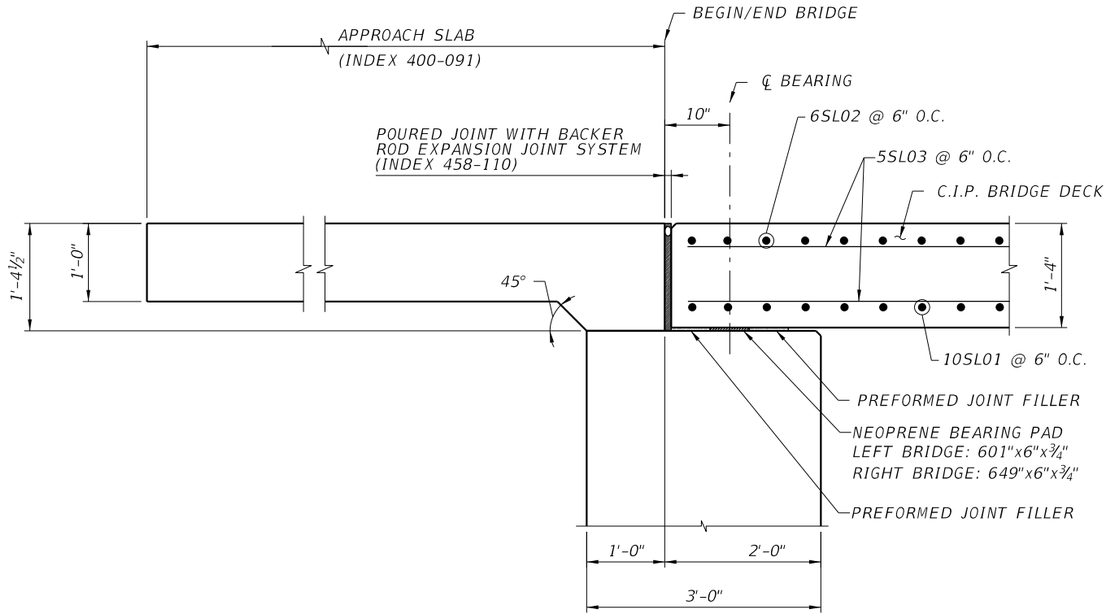
CHECKED BY: TMW 09/19

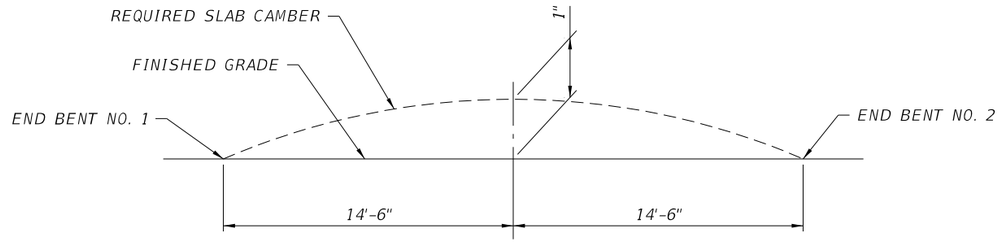
LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

SHEET TITLE: SUPERSTRUCTURE RIGHT BRIDGE
REF. DWG. NO.:
PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS
SHEET NO.: B1-13



DETAIL AT BEGIN/END BRIDGE



CAMBER DIAGRAM

CAMBER NOTES:
1. THE SLAB SHALL BE CAMBERED TO ACCOUNT FOR THE DEAD LOAD DEFLECTION WHICH WILL OCCUR UPON REMOVAL OF THE FORMS.
2. THE CAMBER VALUES SHOWN DO NOT INCLUDE THE DEFLECTION OF FORMS WHICH WILL OCCUR WHEN THE WET CONCRETE IS PLACED.
3. THE CAMBER VALUES SHOWN WERE DETERMINED ASSUMING THAT NONE OF THE FORMS WILL BE REMOVED UNTIL THE ENTIRE DECK HAS CURED.
4. ANY CHANGES TO THE ABOVE ASSUMPTIONS WILL REQUIRE REVISED CAMBER CALCULATIONS TO BE SUBMITTED FOR APPROVAL BY THE CONTRACTORS SPECIALITY ENGINEER.

ESTIMATED CONCRETE QUANTITIES					
ITEM	UNIT	QUANTITY			
		1-L	1-R	2-L	2-R
APPROACH SLAB	CY	39.7	44.1	39.7	44.1
QUANTITIES INCLUDE OVERBUILD FOR SIDEWALK. SEE STANDARD INDEX 400-091 FOR REQUIRED REINFORCMENT FOR APPROACH SLAB AND SIDEWALK OVERBUILD.					

APPROACH SLAB TABLE OF DIMENSIONS						Table Date 09-14-20
LOCATION	DIMENSIONS					ANGLE Ø
	L1	L2	M1	M2	N	
BEGIN APPROACH SLAB -LEFT	20'-0"	20'-0"	1'-1"	1'-6"	47'-5"	0
END APPROACH SLAB -LEFT	20'-0"	20'-0"	1'-1"	1'-6"	47'-5"	0
BEGIN APPROACH SLAB -RIGHT	20'-0"	20'-0"	1'-6"	1'-1"	51'-5"	0
END APPROACH SLAB -RIGHT	20'-0"	20'-0"	1'-6"	1'-1"	51'-5"	0

Dimension Notes:
Dimensions L1 & L2 are measured along gutter line, inside face of parapet or inside face of railing on raised sidewalks.
Dimensions L1 & L2 are arc dimensions within curved alignments.

Work this Data Table with Standard Plans Index 400-091.

POURED EXPANSION JOINT DATA TABLE INDEX 458-110			Table Date 09-14-20
LOCATION	DIM. "A" @ 70°F	TOTAL DESIGN MOVEMENT	DIM. "A" ADJUSTMENT PER 10°F
END BENT NO. 1 -LEFT	1"	0.29"	0.02"
END BENT NO. 1 -RIGHT	1"	0.29"	0.02"
END BENT NO. 2 -LEFT	1"	0.3"	0.02"
END BENT NO. 2 -RIGHT	1"	0.3"	0.02"

NOTE:
Dim. "A" adjustment per 10°F shown is measured perpendicular to ℄ Expansion Joint. Work this table with Standard Plans Index 458-110.

BRIDGE NOS. 124144 (RIGHT) & 124145 (LEFT)

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REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

THOMAS M. WAITS, P.E.
P.E. LICENSE NUMBER 55460
HIGHSPANS ENGINEERING, INC.
2121 MCGREGOR BOULEVARD
SUITE 200
FORT MYERS, FL 33901
REGISTRY NO. 27559

DRAWN BY: SDS 09/19
CHECKED BY: CLH 09/19
DESIGNED BY: RMW 09/19
CHECKED BY: TMW 09/19

LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

SHEET TITLE: SUPERSTRUCTURE AND APPROACH SLAB DETAILS
REF. DWG. NO.:
PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS
SHEET NO.: B1-14

Sabrina 11/2/2020 4:04:44 PM H:_Project18\1831_CorkscrewCritterCrossing\struct\B1SuperstDet01.dgn

Mark		Length		No	TYP	STY		B		C		D		E		F		H		J		K		N	ϕ
Size	Des	Ft	In	Bars	BAR	A	G	Ft	In	Ft	In	Ft	In	Ft	In	Ft	In	Ft	In	Ft	In	Ft	In	NO	ANG
														Substructure – End Bent Left				No. Required =		2					
5	EBL01	7'-6"		21	11			2'-6"		2'-6"		2'-6"													
7	EBL02	49'-10"		13	1			49'-10"																	
7	EBL03	7'-10"		18	11			5'-10"		1'-0"		1'-0"													
5	EBL04	11'-2"		82	4	1	1	2'-6"		2'-6"															
6	EBL05	3'-2 7/8 "		13	23			1'-4"		7"		1'-4"													
4	EBL06	2'-10"		102	10			1'-4"		1'-6"															
4	EBL07	49'-10"		4	1			49'-10"																	
														Substructure – End Bent Right				No. Required =		2					
5	EBR01	7'-6"		21	11			2'-6"		2'-6"		2'-6"													
7	EBR02	53'-10"		13	1			53'-10"																	
7	EBR03	8'-6"		18	11			6'-6"		1'-0"		1'-0"													
5	EBR04	11'-2"		88	4	1	1	2'-6"		2'-6"															
6	EBR05	3'-3"		14	23			1'-4"		7"		1'-4"													
4	EBR06	2'-10"		108	10			1'-4"		1'-6"															
4	EBR07	53'-10"		4	1			53'-10"																	
														Superstructure – Left Bridge				No. Required =		1					
10	SL01	28'-8"		101	1			28'-8"																	
6	SL02	28'-8"		101	1			28'-8"																	
5	SL03	50'-0"		118	1			50'-0"																	
5	SL04	28'-8"		8	1			28'-8"																	
5	SL05	9'-9"		118	35			1'-0"		7'-5"		4"		1'-0"											
														Superstructure – Right Bridge				No. Required =		1					
10	SR01	28'-8"		110	1			28'-8"																	
6	SR02	28'-8"		110	1			28'-8"																	
5	SR03	54'-0"		118	1			54'-0"																	
5	SR04	28'-8"		13	1			28'-8"																	
5	SR05	13'-9"		118	35			1'-0"		11'-5"		4"		1'-0"											

Note:

BRIDGE NOS. 124144 (RIGHT) & 124145 (LEFT)

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REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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P.E. LICENSE NUMBER 55460

HIGHSPANS ENGINEERING, INC.
2121 MCGREGOR BOULEVARD
SUITE 200
FORT MYERS, FL 33901
REGISTRY NO. 27559

DRAWN BY: SDS 09/19
CHECKED BY: CLH 09/19
DESIGNED BY: RMW 09/19
CHECKED BY: TMW 09/19

LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

SHEET TITLE: REINFORCING BAR LIST

REF. DWG. NO.:

PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

SHEET NO.: B1-15

Sabrina 11/2/2020 4:04:44 PM H:_Project18\1831_CorkscrewCritterCrossing\struct\B1RebarList01.dgn

Load Rating Summary Details for Reinforced Concrete Bridges

Table Date 07-24-2020

Table 1 - Bridge Left

Level	Limit State	Vehicle	Weight (tons)	Load Factors			Moment (Strength)					Shear (Strength)					
				LL	DC	DW	Distribution Factor (DF)	Rating Factor	Tons	Location	Dimension	Distribution Factor (DF)	Rating Factor	Tons	Location	Dimension	Comments: Interior/exterior beam DF method if other than LRFD. Other appropriate comments
Design Load Rating	Strength I (Inv)	HL-93	N/A	1.75	1.25	1.50	1.0	1.576	N/A	A	14.32'	1.0	2.029	N/A	B	8"	EQUIVALENT STRIP METHOD USED FOR CIP FLAT SLAB
Design Load Rating	Strength I (Op)	HL-93	N/A	1.35	1.25	1.50	1.0	2.043	N/A	A	14.32'	1.0	2.631	N/A	B	8"	EQUIVALENT STRIP METHOD USED FOR CIP FLAT SLAB
Permit Load Rating	Strength II	FL120	60.0	1.35	1.25	1.50	1.0	1.913	115.8	A	14.32'	1.0	2.379	142.7	B	8"	EQUIVALENT STRIP METHOD USED FOR CIP FLAT SLAB

Load Rating Summary Details for Reinforced Concrete Bridges

Table Date 07-24-2020

Table 2 - Bridge Right

Level	Limit State	Vehicle	Weight (tons)	Load Factors			Moment (Strength)					Shear (Strength)					
				LL	DC	DW	Distribution Factor (DF)	Rating Factor	Tons	Location	Dimension	Distribution Factor (DF)	Rating Factor	Tons	Location	Dimension	Comments: Interior/exterior beam DF method if other than LRFD. Other appropriate comments
Design Load Rating	Strength I (Inv)	HL-93	N/A	1.75	1.25	1.50	1.0	1.501	N/A	A	14.7'	1.0	2.005	N/A	B	8"	EQUIVALENT STRIP METHOD USED FOR CIP FLAT SLAB
Design Load Rating	Strength I (Op)	HL-93	N/A	1.35	1.25	1.50	1.0	1.946	N/A	A	14.7'	1.0	2.599	N/A	B	8"	EQUIVALENT STRIP METHOD USED FOR CIP FLAT SLAB
Permit Load Rating	Strength II	FL120	60.0	1.35	1.25	1.50	1.0	1.835	110.1	A	14.7'	1.0	2.340	140.4	B	8"	EQUIVALENT STRIP METHOD USED FOR CIP FLAT SLAB

General Notes:

1. This table is based on the requirements established in the January 2020 "Structures Manual".

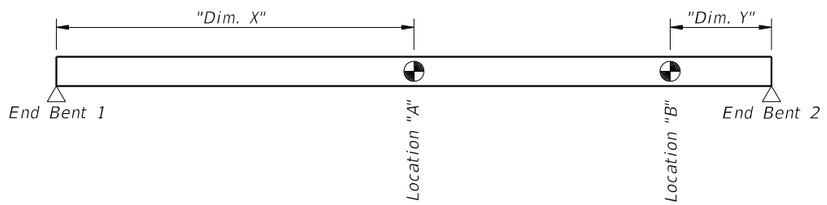
Table 1 & 2 Notes:

1. Permit capacity is determined by using the permit vehicle in all lanes.
2. Has the AASHTO LRFD Specifications Article 5.8.3.5 longitudinal reinforcement been satisfied? [X] Yes [ ] No

Abbreviations:

Inv - Inventory

Op - Operating



RATING LOCATIONS

BRIDGE NOS. 124144 (RIGHT) & 124145 (LEFT)

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2121 MCGREGOR BOULEVARD
SUITE 200
FORT MYERS, FL 33901
REGISTRY NO. 27559

DRAWN BY: SDS 09/19
CHECKED BY: CLH 09/19
DESIGNED BY: RMW 09/19
CHECKED BY: TMW 09/19

LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

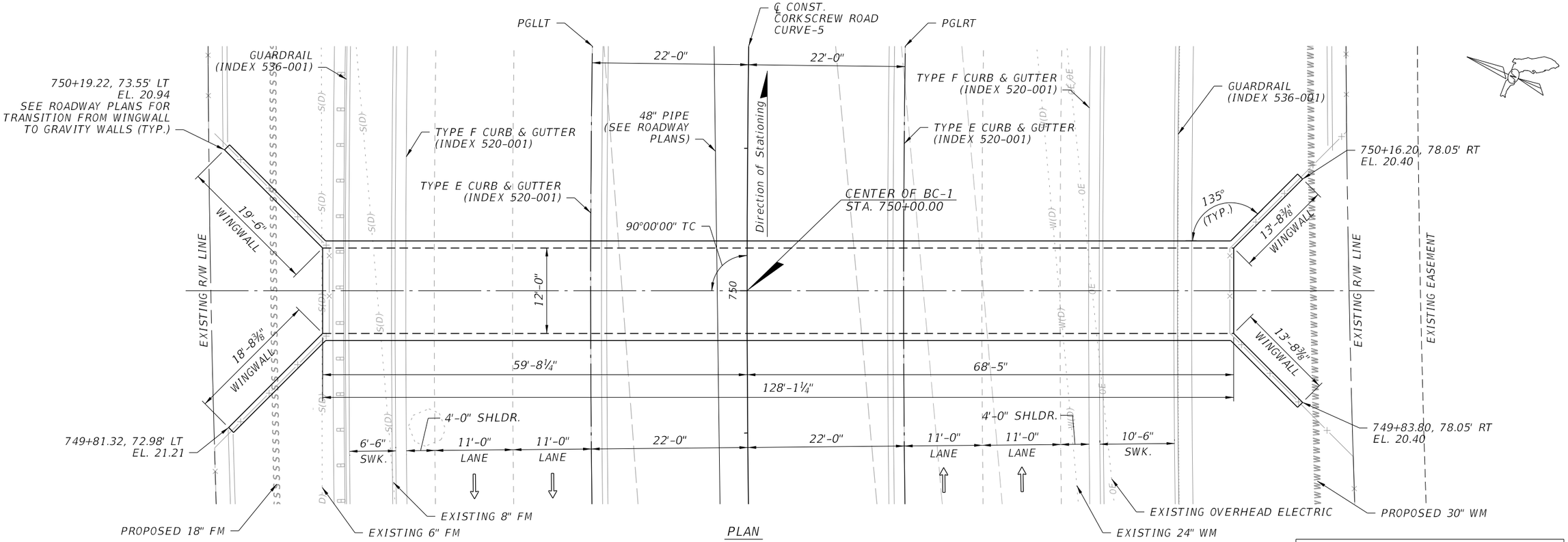
SHEET TITLE: LOAD RATING SUMMARY

REF. DWG. NO.:

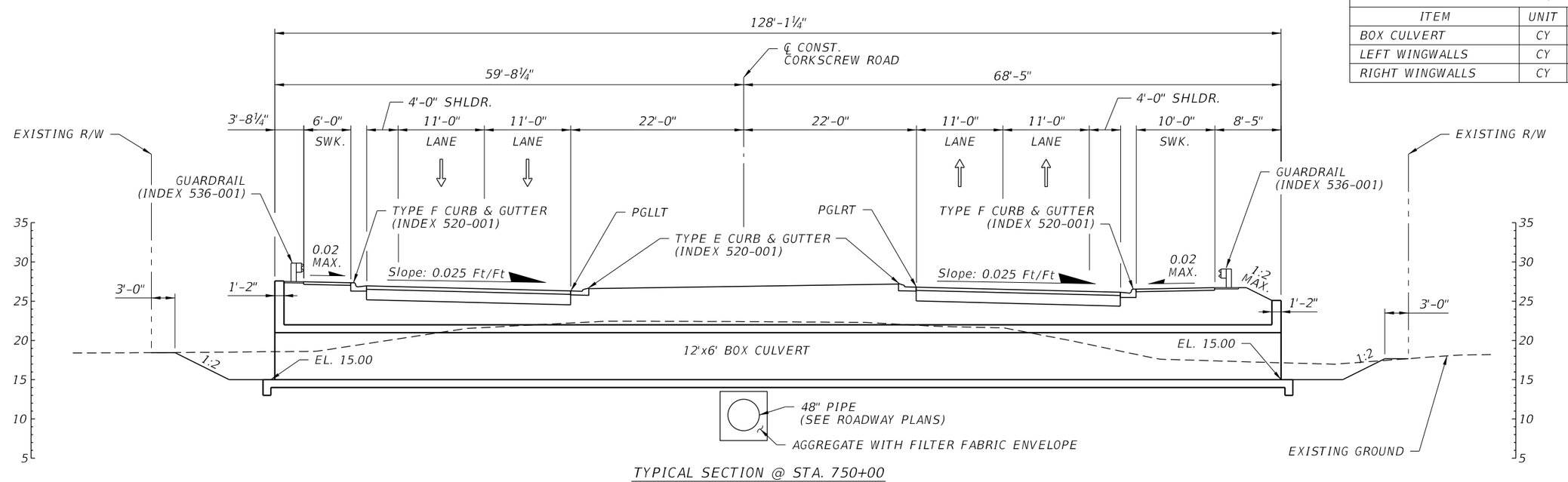
PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

SHEET NO.: B1-16

Sabrina 11/2/2020 4:04:48 PM H:_Project18\1831_CorkscrewCritterCrossing\struct\B1DataTableLoadRating01.dgn



PLAN



TYPICAL SECTION @ STA. 750+00

ESTIMATED CONCRETE QUANTITIES

ITEM	UNIT	QUANTITY
BOX CULVERT	CY	198
LEFT WINGWALLS	CY	30
RIGHT WINGWALLS	CY	22

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LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

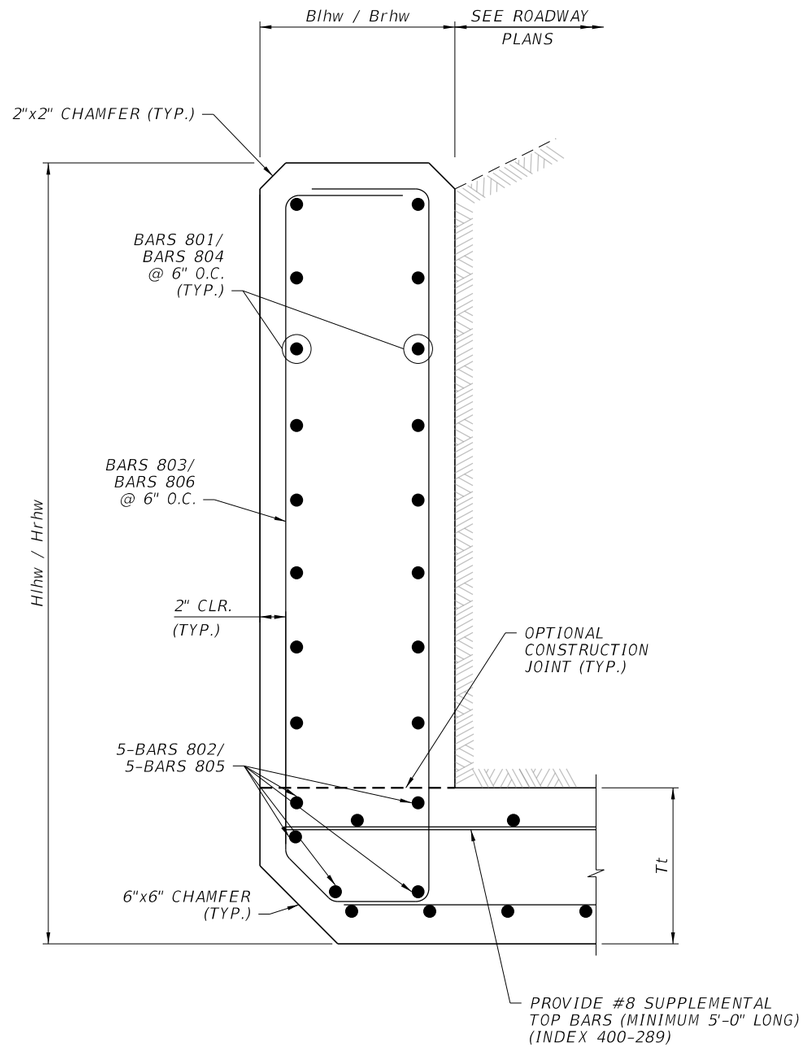
SHEET TITLE: BOX CULVERT NO. 1 (BC-1) PLAN & TYPICAL SECTION

REF. DWG. NO.

PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

SHEET NO. B2-01

Sabrina 11/2/2020 4:04:49 PM H:_Project18\1831_CorkscrewCritterCrossing\struct\B2PlanElev01.dgn



HEADWALL DETAIL

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HIGHSPANS ENGINEERING, INC.
2121 MCGREGOR BOULEVARD
SUITE 200
FORT MYERS, FL 33901
REGISTRY NO. 27559

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LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

SHEET TITLE: BOX CULVERT NO. 1 (BC-1) DETAILS

REF. DWG. NO.:

PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

SHEET NO.: B2-02

BOX CULVERT NO. 1 (BC-1) DATA TABLE

BOX, HEADWALL AND CUTOFF WALL DATA TABLE (inches unless shown otherwise)

LOCATION	STRUCTURE /BRIDGE NUMBER	BOX									HEADWALL AND CUTOFF WALL									
		Wc(ft)	Hc(ft)	Tt	Tw	Tb	Ti	#cells	Lc(ft)	Cover	Blhw	Hlhw	Brhw	Hrhw	Blcw	Hlcw	Brcw	Hrcw	SL(deg)	SR(deg)
STA. 750+00	BC-1	12	6	12	12	12	12	1	128	2	14	78.8	14	49.2	12	24	12	24	0	0

LEFT SIDE WINGWALLS DATA TABLE (inches unless shown otherwise)

STRUCTURE /BRIDGE NUMBER	LEFT END WINGWALL									LEFT BEGIN WINGWALL								
	Rt	Rw	Rh	Rd	SW(deg)	β (deg)	He(ft)	Hs(ft)	Lw(ft)	Rt	Rw	Rh	Rd	SW(deg)	β (deg)	He(ft)	Hs(ft)	Lw(ft)
BC-1 STA. 750+00	24	12	92	12	135	18.8	5.94	12.6	19.5	24	12	92	12	135	18.8	6.21	12.6	18.7

RIGHT SIDE WINGWALLS DATA TABLE (inches unless shown otherwise)

STRUCTURE /BRIDGE NUMBER	RIGHT END WINGWALL									RIGHT BEGIN WINGWALL								
	Rt	Rw	Rh	Rd	SW(deg)	β (deg)	He(ft)	Hs(ft)	Lw(ft)	Rt	Rw	Rh	Rd	SW(deg)	β (deg)	He(ft)	Hs(ft)	Lw(ft)
BC-1 STA. 750+00	12	12	126	12	135	18.8	5.4	10.1	13.7	12	12	126	12	135	18.8	5.4	10.1	13.7

ESTIMATED CONCRETE QUANTITIES (CY)

STRUCTURE /BRIDGE NUMBER	BOX								LEFT END WINGWALL			LEFT BEGIN WINGWALL			RIGHT END WINGWALL			RIGHT BEGIN WINGWALL		
	Left Cutoff Wall	Right Cutoff Wall	Bottom Slab	Walls	Top Slab	Left Head Wall	Right Head Wall	Sub Total	Footing	Wall	Sub Total	Footing	Wall	Sub Total	Footing	Wall	Sub Total	Footing	Wall	Sub Total
BC-1 STA. 750+00	0.519	0.519	67.9	56.9	66.4	1.21	1.21	195	8.43	6.68	15.1	8.08	6.5	14.6	6.85	3.93	10.8	6.85	3.93	10.8

MAIN STEEL REINFORCEMENT SPACING (inches)

STRUCTURE /BRIDGE NUMBER	BOX														HEADWALLS		CUTOFF WALLS	
	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115, 116...	803	806	809	812
BC-1 STA. 750+00	9	9	9	9	9	9	12	12	12	12	12	12	12	12	12	8	8	12	12

WINGWALL STEEL REINFORCEMENT SPACING (inches)

STRUCTURE /BRIDGE NUMBER	LEFT END WINGWALL							LEFT BEGIN WINGWALL							RIGHT END WINGWALL							RIGHT BEGIN WINGWALL						
	401 407(8)	402 (403)	404 (405)	406	409	410	411	501 507(8)	502 (503)	504 (505)	506	509	510	511	601 607(8)	602 (603)	604 (605)	606	609	610	611	701 707(8)	702 (703)	704 (705)	706	709	710	711
BC-1 STA. 750+00	6	12	12	12	8	8	12	6	12	12	12	8	8	12	6	12	12	12	8	8	12	6	12	12	12	8	8	12

WINGWALL NOTE: Bar designations in "( )" are only required for variable height wingwalls.

NOTES:

1. Environmental Class – Moderately Aggressive
2. Reinforcing Steel, Grade 60
3. Concrete Class IV f'c = 5.5 ksi
4. Soil Properties:
   Friction Angle – 30
   Modulus of Subgrade Reaction – 50000 pcf
   Nominal Bearing Resistance – 4 ksf
5. Work this Drawing with Standard Plans Index 400-289 and Sheets B2-01 and B2-02
6. Settlement criteria for Precast Box Culvert option (Index 400-291):
   Long Term Differential Settlement (ΔY) = 0.04 ft.
   Effective Length for Settlement (L) = 128.1 ft.

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HIGHSPANS ENGINEERING, INC.
2121 MCGREGOR BOULEVARD
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FORT MYERS, FL 33901
REGISTRY NO. 27559

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LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

SHEET TITLE: BOX CULVERT NO. 1 (BC-1) DATA TABLE

REF. DWG. NO.

PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

SHEET NO. B2-03

Sabrina 11/2/2020 4:04:50 PM H:_Project18\1831_CorkscrewCritterCrossing\struct\B2BoxCulvertData01.dgn

Mark		Length		No	TYP	STY		B		C		D		E		F		H		J		K		N	ϕ
Size	Des	Ft	In	Bars	BAR	A	G	Ft	In	Ft	In	Ft	In	Ft	In	Ft	In	Ft	In	Ft	In	Ft	In	NO	ANG
										Box Culvert No. 1 (BC-1)								No. Required =		1					
6	101	13'-8"		172	1			13'-8"																	
6	102	13'-8"		172	1			13'-8"																	
6	103	13'-8"		176	1			13'-8"																	
6	104	13'-8"		176	1			13'-8"																	
6	105	6'-11 1/8 "		342	10			2'- 3/4 "		4'-10 1/2 "															
6	106	6'-11 1/8 "		342	10			2'- 3/4 "		4'-10 1/2 "															
4	108	7'-7 7/8 "		256	1			7'-7 7/8 "																	
3	109	133'-3 5/8 "		15	2			1'-3 5/8 "		130'-8 3/8 "														2	
3	110	130'-3 5/8 "		15	2			1'-3 5/8 "		127'-8 3/8 "														2	
3	111	129'-7 1/4 "		15	2			1'-3 5/8 "		127'-0"														2	
3	112	133'-3 5/8 "		15	2			1'-3 5/8 "		130'-8 3/8 "														2	
3	113	130'-3 5/8 "		14	2			1'-3 5/8 "		127'-8 3/8 "														2	
3	114	130'-3 5/8 "		14	2			1'-3 5/8 "		127'-8 3/8 "														2	
5	401	12'-3 1/8 "		40	1			12'-3 1/8 "																	
4	402	19'-1 7/8 "		7	1			19'-1 7/8 "																	
4	403	17'-8 1/4 "		6	1			17'-8 1/4 "																	
4	404	19'-1 7/8 "		7	1			19'-1 7/8 "																	
4	405	17'-8 1/4 "		6	1			17'-8 1/4 "																	
4	406	12'-3 1/8 "		21	1			12'-3 1/8 "																	
5	407	5'-2 3/4 "		40	10			2'-8"		2'-6 3/4 "															
5	409	10'-4 1/8 "		30	1			10'-4 1/8 "																	
3	410	10'-4 1/8 "		30	1			10'-4 1/8 "																	
3	411	19'-2"		24	1			19'-2"																	
5	412	2'-0"		20	1			2'-0"																	
5	501	12'-3 1/8 "		38	1			12'-3 1/8 "																	
4	502	18'-4 3/8 "		7	1			18'-4 3/8 "																	
4	503	16'-10 5/8 "		6	1			16'-10 5/8																	
4	504	18'-4 3/8 "		7	1			18'-4 3/8 "																	
4	505	16'-10 5/8 "		6	1			16'-10 5/8																	
4	506	12'-3 1/8 "		20	1			12'-3 1/8 "																	
5	507	5'-2 3/4 "		38	10			2'-8"		2'-6 3/4 "															
5	509	10'-4 1/8 "		29	1			10'-4 1/8 "																	
3	510	10'-4 1/8 "		29	1			10'-4 1/8 "																	
3	511	18'-4 1/2 "		24	1			18'-4 1/2 "																	
5	512	2'-0"		20	1			2'-0"																	

REVISIONS

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LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

SHEET TITLE:
BOX CULVERT NO. 1 (BC-1)
REINFORCING BAR LIST (1 OF 2)

REF. DWG. NO.

PROJECT NAME:
CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

SHEET NO.
B2-04

Mark		Length		No	TYP	STY		B		C		D		E		F		H		J		K		N	ϕ
Size	Des	Ft	In	Bars	BAR	A	G	Ft	In	Ft	In	Ft	In	Ft	In	Ft	In	Ft	In	Ft	In	Ft	In	NO	ANG
												Box Culvert No. 1 (BC-1)				No. Required =		1							
5	601	9'-9 1/2 "		28	1			9'-9 1/2 "																	
4	602	13'-4 3/8 "		6	1			13'-4 3/8 "																	
4	603	11'-10 3/4 "		4	1			11'-10 3/4																	
4	604	13'-4 3/8 "		6	1			13'-4 3/8 "																	
4	605	11'-10 3/4 "		4	1			11'-10 3/4																	
4	606	9'-9 1/2 "		15	1			9'-9 1/2 "																	
5	607	4'-2 3/4 "		28	10			1'-8"		2'-6 3/4 "															
5	609	12'-2"		22	1			12'-2"																	
3	610	12'-2"		22	1			12'-2"																	
3	611	13'-4 1/2 "		28	1			13'-4 1/2 "																	
5	612	2'-0"		16	1			2'-0"																	
5	701	9'-9 1/2 "		28	1			9'-9 1/2 "																	
4	702	13'-4 3/8 "		6	1			13'-4 3/8 "																	
4	703	11'-10 3/4 "		4	1			11'-10 3/4																	
4	704	13'-4 3/8 "		6	1			13'-4 3/8 "																	
4	705	11'-10 3/4 "		4	1			11'-10 3/4																	
4	706	9'-9 1/2 "		15	1			9'-9 1/2 "																	
5	707	4'-2 3/4 "		28	10			1'-8"		2'-6 3/4 "															
5	709	12'-2"		22	1			12'-2"																	
3	710	12'-2"		22	1			12'-2"																	
3	711	13'-4 1/2 "		28	1			13'-4 1/2 "																	
5	712	2'-0"		16	1			2'-0"																	
6	801	13'-8"		20	1			13'-8"																	
6	802	13'-8"		5	1			13'-8"																	
5	803	14'-6 1/8 "		21	27			6'-2 1/8 "		6"		4"		5"		5'-9"		8"		8"					
6	804	13'-8"		10	1			13'-8"																	
6	805	13'-8"		5	1			13'-8"																	
5	806	9'-6 7/8 "		21	27			3'-8 1/2 "		6"		4"		5"		3'-3 3/8 "		8"		8"					
6	807	13'-8"		2	1			13'-8"																	
6	808	13'-8"		2	1			13'-8"																	
3	809	2'-11 1/4 "		14	7			1'-7 1/4 "		8"		6"		6"											
6	810	13'-8"		2	1			13'-8"																	
6	811	13'-8"		2	1			13'-8"																	
3	812	3'-3 1/4 "		14	7			1'-7 1/4 "		8"		6"		6"											

Note:

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REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

THOMAS M. WAITS, P.E.
P.E. LICENSE NUMBER 55460

HIGHSPANS ENGINEERING, INC.
2121 MCGREGOR BOULEVARD
SUITE 200
FORT MYERS, FL 33901
REGISTRY NO. 27559

DRAWN BY: SDS 09/19
CHECKED BY: CLH 09/19
DESIGNED BY: RMW 09/19
CHECKED BY: TMW 09/19

LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

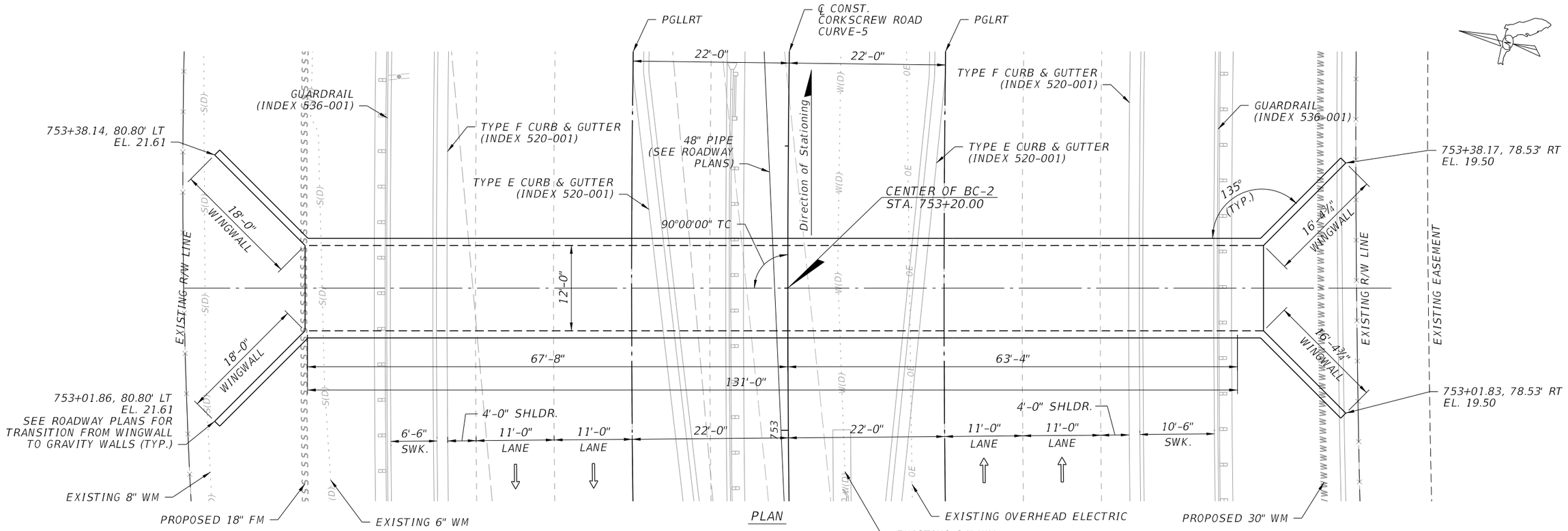
SHEET TITLE:
BOX CULVERT NO. 1 (BC-1)
REINFORCING BAR LIST (2 OF 2)

REF. DWG. NO.

PROJECT NAME:
CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

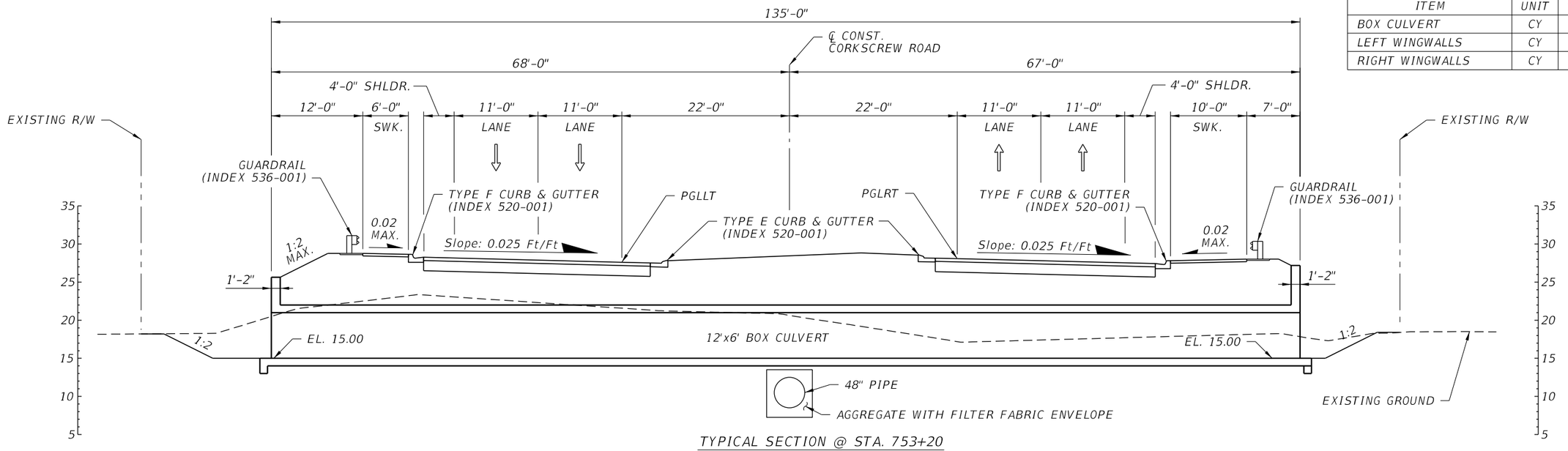
SHEET NO.
B2-05

Sabrina 11/2/2020 4:04:54 PM H:_Project18\1831_CorkscrewCritterCrossing\struct\B2RebarList01.dgn



PLAN

ESTIMATED CONCRETE QUANTITIES		
ITEM	UNIT	QUANTITY
BOX CULVERT	CY	209
LEFT WINGWALLS	CY	25
RIGHT WINGWALLS	CY	30



TYPICAL SECTION @ STA. 753+20

BRIDGE NOS. 124144 (RIGHT) & 124145 (LEFT)

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LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

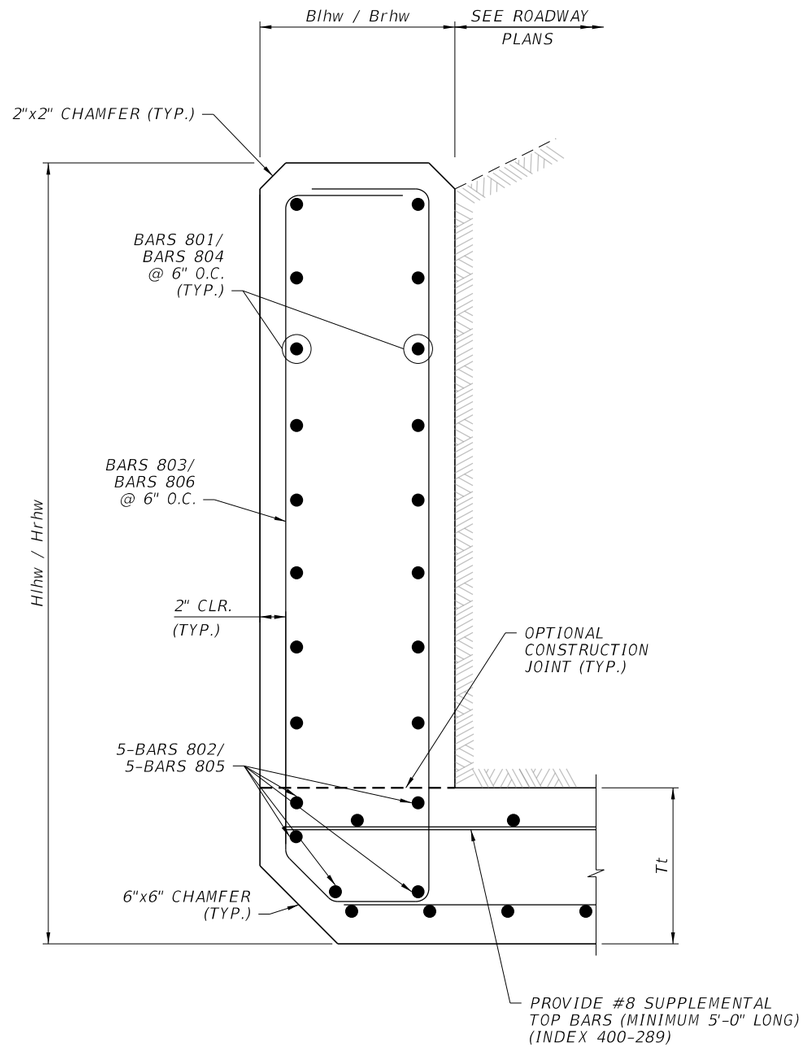
SHEET TITLE: BOX CULVERT NO. 2 (BC-2) PLAN & TYPICAL SECTION

REF. DWG. NO.:

PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

SHEET NO.: B3-01

Sabrina 11/2/2020 4:04:58 PM H:_Project18\1831_CorkscrewCritterCrossing\struct\B3PlanElev01.dgn



HEADWALL DETAIL

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HIGHSPANS ENGINEERING, INC.
2121 MCGREGOR BOULEVARD
SUITE 200
FORT MYERS, FL 33901
REGISTRY NO. 27559

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CHECKED BY:	TMW 09/19

LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

SHEET TITLE: BOX CULVERT NO. 2 (BC-2) DETAILS

REF. DWG. NO.:

PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

SHEET NO.: B3-02

BOX CULVERT NO. 2 (BC-2) DATA TABLES

BOX, HEADWALL AND CUTOFF WALL DATA TABLE (inches unless shown otherwise)

LOCATION	STRUCTURE /BRIDGE NUMBER	BOX									HEADWALL AND CUTOFF WALL									
		Wc(ft)	Hc(ft)	Tt	Tw	Tb	Ti	#cells	Lc(ft)	Cover	Blhw	Hlhw	Brhw	Hrhw	Blcw	Hlcw	Brcw	Hrcw	SL(deg)	SR(deg)
STA. 753+20	BC-2	12	6	12	12	12	12	1	135	2	14	55.7	14	74.3	12	24	12	24	0	0

LEFT SIDE WINGWALLS DATA TABLE (inches unless shown otherwise)

STRUCTURE /BRIDGE NUMBER	LEFT END WINGWALL									LEFT BEGIN WINGWALL								
	Rt	Rw	Rh	Rd	SW(deg)	β (deg)	He(ft)	Hs(ft)	Lw(ft)	Rt	Rw	Rh	Rd	SW(deg)	β (deg)	He(ft)	Hs(ft)	Lw(ft)
BC-2 STA. 753+20	18	12	92	12	135	18.8	4.5	10.6	18	18	12	92	12	135	18.8	4.5	10.6	18

RIGHT SIDE WINGWALLS DATA TABLE (inches unless shown otherwise)

STRUCTURE /BRIDGE NUMBER	RIGHT END WINGWALL									RIGHT BEGIN WINGWALL								
	Rt	Rw	Rh	Rd	SW(deg)	β (deg)	He(ft)	Hs(ft)	Lw(ft)	Rt	Rw	Rh	Rd	SW(deg)	β (deg)	He(ft)	Hs(ft)	Lw(ft)
BC-2 STA. 753+20	24	12	132	12	135	18.8	6.6	12.2	16.4	30	12	132	12	135	18.8	6.6	12.2	16.4

ESTIMATED CONCRETE QUANTITIES (CY)

STRUCTURE /BRIDGE NUMBER	BOX								LEFT END WINGWALL			LEFT BEGIN WINGWALL			RIGHT END WINGWALL			RIGHT BEGIN WINGWALL		
	Left Cutoff Wall	Right Cutoff Wall	Bottom Slab	Walls	Top Slab	Left Head Wall	Right Head Wall	Sub Total	Footing	Wall	Sub Total	Footing	Wall	Sub Total	Footing	Wall	Sub Total	Footing	Wall	Sub Total
BC-2 STA. 753+20	0.519	0.519	71.6	60	70	1.21	1.21	205	7.45	5.05	12.5	7.45	5.05	12.5	9.11	5.71	14.8	9.41	5.71	15.1

MAIN STEEL REINFORCEMENT SPACING (inches)

STRUCTURE /BRIDGE NUMBER	BOX														HEADWALLS		CUTOFF WALLS	
	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115, 116...	803	806	809	812
BC-2 STA. 753+20	9	9	6	9	9	9	12	12	12	12	12	12	12	12	12	8	8	15	15

WINGWALL STEEL REINFORCEMENT SPACING (inches)

STRUCTURE /BRIDGE NUMBER	LEFT END WINGWALL							LEFT BEGIN WINGWALL							RIGHT END WINGWALL							RIGHT BEGIN WINGWALL						
	401 407(8)	402 (403)	404 (405)	406	409	410	411	501 507(8)	502 (503)	504 (505)	506	509	510	511	601 607(8)	602 (603)	604 (605)	606	609	610	611	701 707(8)	702 (703)	704 (705)	706	709	710	711
BC-2 STA. 753+20	6	12	12	12	8	8	12	6	12	12	12	8	8	12	6	12	12	12	8	8	12	6	12	12	12	8	8	12

WINGWALL NOTE: Bar designations in "( )" are only required for variable height wingwalls.

NOTES:

1. Environmental Class – Moderately Aggressive
2. Reinforcing Steel, Grade 60
3. Concrete Class IV f'c = 5.5 ksi
4. Soil Properties:
   Friction Angle – 30
   Modulus of Subgrade Reaction – 50000 pcf
   Nominal Bearing Resistance – 4 ksf
5. Work this Drawing with Standard Plans Index 400-289 and Sheets B3-01 and B3-02
6. Settlement criteria for Precast Box Culvert option (Index 400-291):
   Long Term Differential Settlement (ΔY) = 0.04 ft.
   Effective Length for Settlement (L) = 135 ft.

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REVISIONS

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P.E. LICENSE NUMBER 55460
HIGHSPANS ENGINEERING, INC.
2121 MCGREGOR BOULEVARD
SUITE 200
FORT MYERS, FL 33901
REGISTRY NO. 27559

DRAWN BY: SDS 09/19
CHECKED BY: CLH 09/19
DESIGNED BY: RMW 09/19
CHECKED BY: TMW 09/19

LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

SHEET TITLE: BOX CULVERT NO. 2 (BC-2) DATA TABLE

REF. DWG. NO.:

PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

SHEET NO.: B3-03

Mark		Length		No	TYP	STY		B		C		D		E		F		H		J		K		N	ϕ
Size	Des	Ft	In	Bars	BAR	A	G	Ft	In	Ft	In	Ft	In	Ft	In	Ft	In	Ft	In	Ft	In	Ft	In	NO	ANG
										Box Culvert No. 2 (BC-2)								No. Required =		1					
6	101	13'-8"		181	1			13'-8"																	
6	102	13'-8"		181	1			13'-8"																	
6	103	13'-8"		277	1			13'-8"																	
6	104	13'-8"		185	1			13'-8"																	
6	105	6'-11 1/8 "		360	10			2'- 3/4 "		4'-10 1/2 "															
6	106	6'-11 1/8 "		360	10			2'- 3/4 "		4'-10 1/2 "															
4	108	7'-8"		270	1			7'-8"																	
3	109	140'-3 5/8 "		15	2			1'-3 5/8 "		137'-8 3/8														2	
3	110	137'-3 5/8 "		15	2			1'-3 5/8 "		134'-8 3/8														2	
3	111	136'-7 1/4 "		15	2			1'-3 5/8 "		134'-0"														2	
3	112	140'-3 5/8 "		15	2			1'-3 5/8 "		137'-8 3/8														2	
3	113	137'-3 5/8 "		14	2			1'-3 5/8 "		134'-8 3/8														2	
3	114	137'-3 5/8 "		14	2			1'-3 5/8 "		134'-8 3/8														2	
5	401	10'-4"		14	1			10'-4"																	
4	402	17'-7 7/8 "		5	1			17'-7 7/8 "																	
4	403	16'-2 1/4 "		6	1			16'-2 1/4 "																	
4	404	17'-7 7/8 "		5	1			17'-7 7/8 "																	
4	405	16'-2 1/4 "		6	1			16'-2 1/4 "																	
4	406	10'-4"		19	1			10'-4"																	
5	407	4'-8 3/4 "		37	10			2'-2"		2'-6 3/4 "															
5	409	9'-10"		28	1			9'-10"																	
3	410	9'-10"		28	1			9'-10"																	
3	411	17'-8"		22	1			17'-8"																	
5	412	2'-0"		17	1			2'-0"																	
5	501	10'-4"		37	1			10'-4"																	
4	502	17'-7 7/8 "		5	1			17'-7 7/8 "																	
4	503	16'-2 1/4 "		6	1			16'-2 1/4 "																	
4	504	17'-7 7/8 "		5	1			17'-7 7/8 "																	
4	505	16'-2 1/4 "		6	1			16'-2 1/4 "																	
4	506	10'-4"		19	1			10'-4"																	
5	507	4'-8 3/4 "		37	10			2'-2"		2'-6 3/4 "															
5	509	9'-10"		28	1			9'-10"																	
3	510	9'-10"		28	1			9'-10"																	
3	511	17'-8"		22	1			17'-8"																	
5	512	2'-0"		15	1			2'-0"																	

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P.E. LICENSE NUMBER 55460

HIGHSPANS ENGINEERING, INC.
2121 MCGREGOR BOULEVARD
SUITE 200
FORT MYERS, FL 33901
REGISTRY NO. 27559

DRAWN BY: SDS 09/19
CHECKED BY: CLH 09/19
DESIGNED BY: RMW 09/19
CHECKED BY: TMW 09/19

LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

SHEET TITLE: BOX CULVERT NO. 2 (BC-2)
REINFORCING BAR LIST (1 OF 2)

REF. DWG. NO.:

PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

SHEET NO.: B3-04

Mark		Length		No	TYP	STY		B		C		D		E		F		H		J		K		N	ϕ
Size	Des	Ft	In	Bars	BAR	A	G	Ft	In	Ft	In	Ft	In	Ft	In	Ft	In	Ft	In	Ft	In	Ft	In	NO	ANG
												Box Culvert No. 2 (BC-2)				No. Required =		1							
5	601	11'-10 1/2 "		34	1			11'-10 1/2																	
4	602	16'- 3/4 "		7	1			16'- 3/4 "																	
4	603	14'-7 1/8 "		5	1			14'-7 1/8 "																	
4	604	16'- 3/4 "		7	1			16'- 3/4 "																	
4	605	14'-7 1/8 "		5	1			14'-7 1/8 "																	
4	606	11'-10 1/2 "		18	1			11'-10 1/2																	
5	607	5'-2 3/4 "		34	10			2'-8"		2'-6 3/4 "															
5	609	13'-8"		26	1			13'-8"																	
3	610	13'-8"		26	1			13'-8"																	
3	611	16'- 7/8 "		30	1			16'- 7/8 "																	
5	612	2'-0"		19	1			2'-0"																	
5	701	11'-10 1/2 "		34	1			11'-10 1/2																	
4	702	16'- 3/4 "		7	1			16'- 3/4 "																	
4	703	14'-7 1/8 "		5	1			14'-7 1/8 "																	
4	704	16'- 3/4 "		7	1			16'- 3/4 "																	
4	705	14'-7 1/8 "		5	1			14'-7 1/8 "																	
4	706	11'-10 1/2 "		18	1			11'-10 1/2																	
5	707	5'-8 3/4 "		34	10			3'-2"		2'-6 3/4 "															
5	709	14'-2"		26	1			14'-2"																	
3	710	14'-2"		26	1			14'-2"																	
3	711	16'- 7/8 "		32	1			16'- 7/8 "																	
5	712	2'-0"		19	1			2'-0"																	
6	801	13'-8"		12	1			13'-8"																	
6	802	13'-8"		5	1			13'-8"																	
5	803	10'-7 7/8 "		21	27			4'-2 7/8 "		6"		4"		5"		3'-9 7/8 "		8"		8"					
6	804	13'-8"		18	1			13'-8"																	
6	805	13'-8"		5	1			13'-8"																	
5	806	13'-2 1/2 "		21	27			5'-9 1/2 "		6"		4"		5"		4'-10"		8"		8"					
6	807	13'-8"		2	1			13'-8"																	
6	808	13'-8"		2	1			13'-8"																	
3	809	3'-3 1/4 "		12	7			1'-7 1/4 "		8"		6"		6"											
6	810	13'-8"		2	1			13'-8"																	
6	811	13'-8"		2	1			13'-8"																	
3	812	3'-3 1/4 "		12	7			1'-7 1/4 "		8"		6"		6"											

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LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

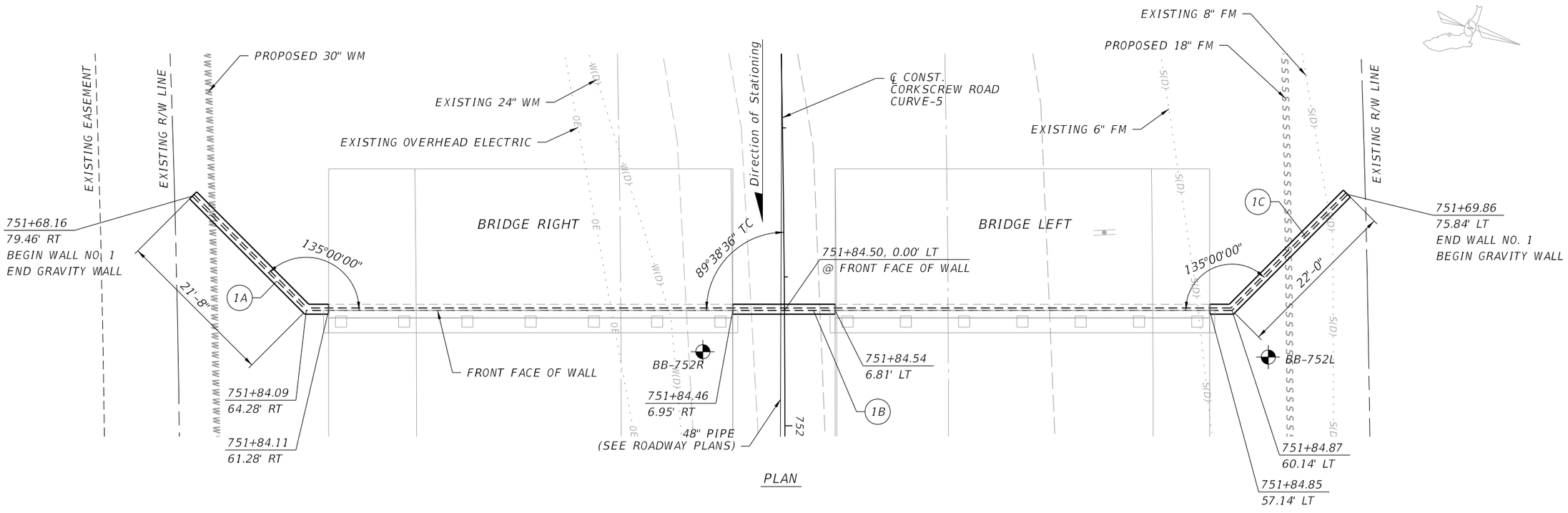
SHEET TITLE:
BOX CULVERT NO. 2 (BC-2)
REINFORCING BAR LIST (2 OF 2)

PROJECT NAME:
CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

REF. DWG. NO.

SHEET NO.
B3-05

Sabrina 11/2/2020 4:05:02 PM H:_Project18\1831_CorkscrewCritterCrossing\struct\B3RebarList01.dgn



BRIDGE NOS. 124144 (RIGHT) & 124145 (LEFT)

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REVISIONS					
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FORT MYERS, FL 33901
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CHECKED BY:	TMW 09/19

LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

SHEET TITLE: MSE RETAINING WALL NO. 1 PLAN AND ELEVATION

REF. DWG. NO.:

PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

SHEET NO.: BW-01

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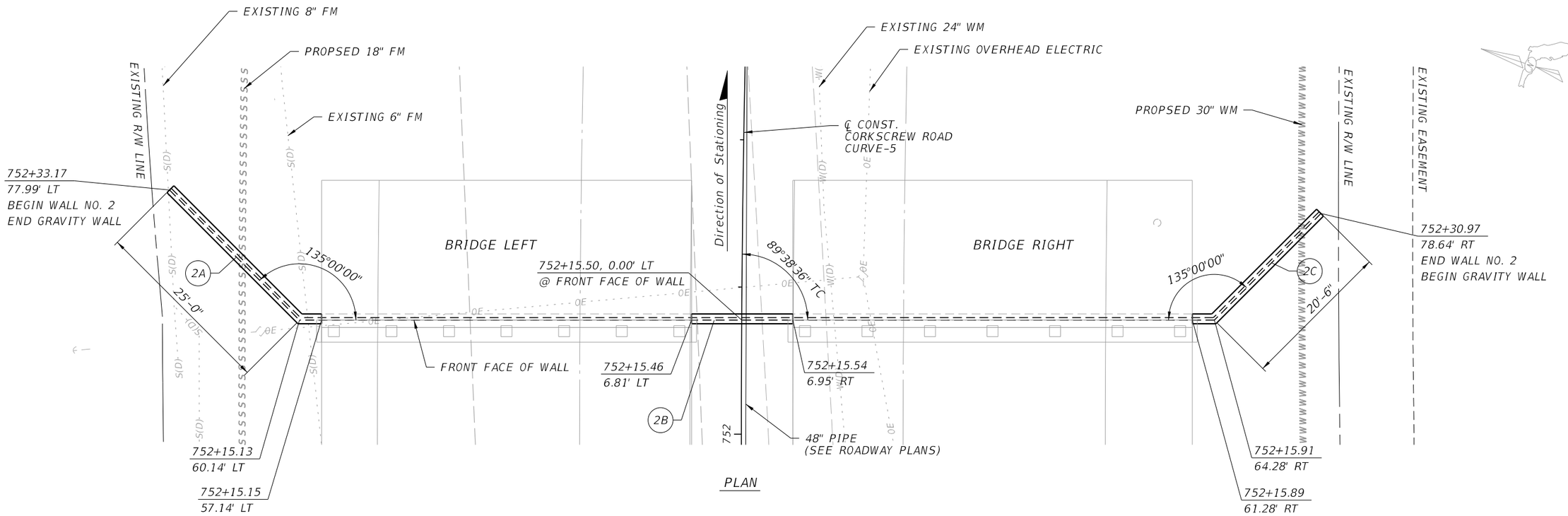
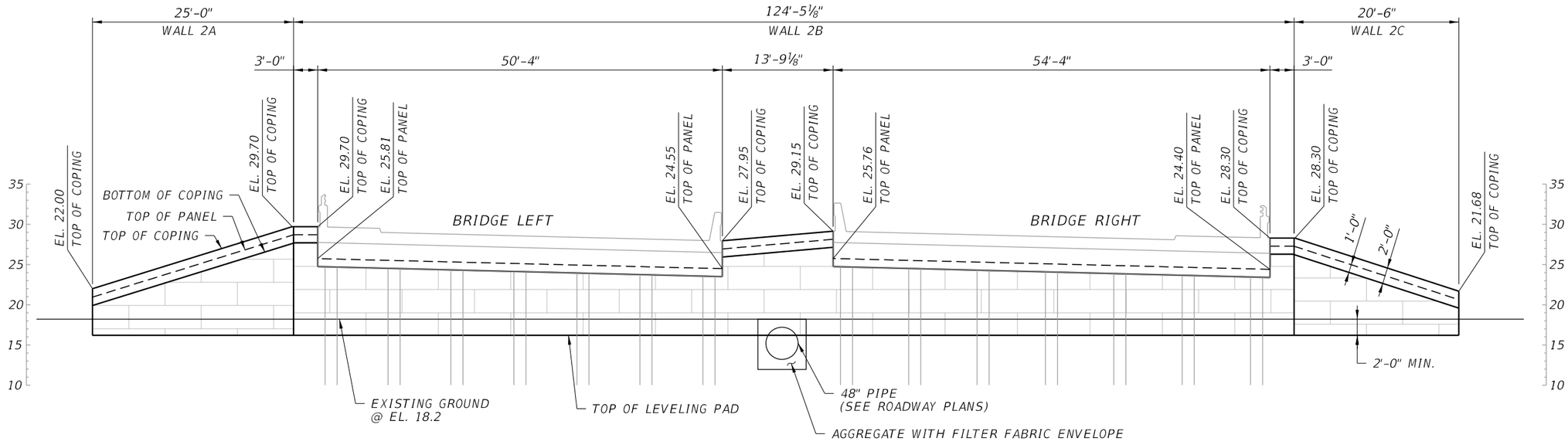


PLAN



ELEVATION @ FRONT FACE OF WALL
LOOKING AHEAD STATION

BRIDGE NOS. 124144 (RIGHT) & 124145 (LEFT)

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LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

SHEET TITLE: MSE RETAINING WALL NO. 2 PLAN AND ELEVATION

REF. DWG. NO.:

PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

SHEET NO.: BW-02

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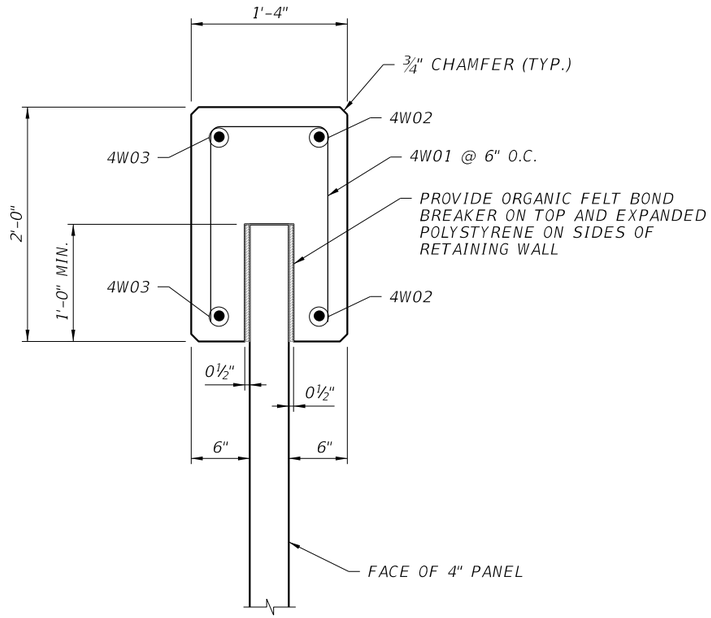


COPING DETAIL

Mark		Length		No	TYP	STY		B		C		D		E		F		H		J		K		N	ϕ
Size	Des	Ft	In	Bars	BAR	A	G	Ft	In	Ft	In	Ft	In	Ft	In	Ft	In	Ft	In	Ft	In	Ft	In	NO	ANG
Retaining Wall No. 1A Coping No. Required = 1																									
4	W01	4'-4"		50	11			1'-0"		1'-8"		1'-8"													
4	W02	24'-4"		2	12			21'-6"		2'-10"															45
4	W03	23'-8"		2	12			21'-2"		2'-6"															45
Retaining Wall No. 1B Coping No. Required = 1																									
4	W01	4'-4"		28	11			1'-0"		1'-8"		1'-8"													
4	W02	13'-6"		2	1			13'-6"																	45
4	W03	13'-6"		2	1			13'-6"																	45
Retaining Wall No. 1C Coping No. Required = 1																									
4	W01	4'-4"		51	11			1'-0"		1'-8"		1'-8"													
4	W02	24'-10"		2	12			21'-11"		2'-11"															45
4	W03	24'-2"		2	12			21'-7"		2'-7"															45
Retaining Wall No. 2A Coping No. Required = 1																									
4	W01	4'-4"		58	11			1'-0"		1'-8"		1'-8"													
4	W02	27'-2"		2	12			24'-7"		2'-7"															45
4	W03	23'-8"		2	12			21'-2"		2'-6"															45
Retaining Wall No. 2B Coping No. Required = 1																									
4	W01	4'-4"		28	11			1'-0"		1'-8"		1'-8"													
4	W02	13'-6"		2	1			13'-6"																	45
4	W03	13'-6"		2	1			13'-6"																	45
Retaining Wall No. 2C Coping No. Required = 1																									
4	W01	4'-4"		47	11			1'-0"		1'-8"		1'-8"													
4	W02	23'-3"		2	12			20'-5"		2'-10"															45
4	W03	24'-2"		2	12			21'-7"		2'-7"															45

Note:

ESTIMATED CONCRETE QUANTITIES		
ITEM	UNIT	QUANTITY
MSE WALL CAP	CY	26

BRIDGE NOS. 124144 (RIGHT) & 124145 (LEFT)

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

THOMAS M. WAITS, P.E.
P.E. LICENSE NUMBER 55460

HIGHSPANS ENGINEERING, INC.
2121 MCGREGOR BOULEVARD
SUITE 200
FORT MYERS, FL 33901
REGISTRY NO. 27559

DRAWN BY: SDS 09/19
CHECKED BY: CLH 09/19
DESIGNED BY: RMW 09/19
CHECKED BY: TMW 09/19

LEE COUNTY
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

SHEET TITLE: MSE RETAINING WALL DETAILS AND REINFORCING BAR LIST

REF. DWG. NO.:

PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS

SHEET NO.: BW-03

PERMANENT MSE RETAINING WALL SYSTEM DATA TABLES

GEOTECHNICAL INFORMATION						
		Reinforced Soil & Random Backfill	Loose to Medium Dense Sand	Very Stiff Clay	Sandy Weathered Limestone	Caprock/Weathered Limestone
Depth Below Existing Ground Line (ft.)	Wall No. 1	——	0 – 18	18 – 23	23 – 28	28 – 50
	Wall No. 2	——	0 – 18	18 – 23	23 – 28	28 – 50
Effective Unit Weight (pcf)		105	47.6	62.6	62.6	72.6
Cohesion (psf)		–	–	3000	–	10000
Internal Friction Angle		30	30	0	36	0

NOTE:
If the unit weight and/or internal friction angle of the fill proposed by the Contractor differs from that shown above, the Project Engineer will contact both the District Geotechnical Engineer and the Wall Designer for a possible redesign.

RETAINING WALL VARIABLES					
Wall No.	Wall Settlement				Design High Water Elevation (ft.)
	Long Term Settlement (in.)	Short Term Settlement (in.)	Differential Settlement		
			Longitudinal (%) (ft./100ft.)	Transverse (in.)	
1	< 0.5	0.5 – 1.5	0.05	N/A	
2	< 0.5	0.5 – 1.5	0.05	N/A	

NOTES:
1. Design wall for the settlements noted in the table.
2. Long-term settlement is measured from the end of the wall construction through the service life of the wall.
3. Short-term settlement is measured during the duration of stage one of the all construction.
4. Transverse differential settlement is measured from the face of wall to the end of the soil reinforcement.
5. Longitudinal differential settlement is from the end of stage one through the service life of the wall.

N/A – Not Applicable

SOIL REINFORCEMENT LENGTHS FOR EXTERNAL STABILITY											
Wall No. 1	Wall Height (ft.)	≤ 8	10	12	14	16					
	Reinforcement Length (ft.)	8	9	11	13	15					
	Factored Bearing Resistance (psf)	2484	2584	3016	3448	3880					
Wall No. 2	Wall Height (ft.)	≤ 8	10	12	14	16					
	Reinforcement Length (ft.)	8	9	11	13	15					
	Factored Bearing Resistance (psf)	2484	2584	3016	3448	3880					

NOTES:
1. The reinforcement strap lengths shown above are the minimum lengths required for external stability. The reinforcement lengths used in the construction of the retaining walls will be the longer of that required for external or internal stability (determined by proprietary wall companies).
2. The factored bearing resistances shown above are the critical (lowest) values from all the load cases analyzed using lrfd methodology.
3. Wall height for permanent walls is defined as the distance from top of leveling pad to top of coping or gutter grade; under bridge the wall height is measured from top of leveling pad to finished grade.

NOTES [Notes Date 09-01-19]:

1. Concrete facing panel surfaces treatment will be Class V .
2. If required, the soil reinforcement and fasteners for the abutment back wall will be designed and furnished by the proprietary wall company. The soil reinforcement will be designed to resist a factored horizontal load of 4.5 kips/ft. of back wall width. The cost of soil reinforcement and fasteners (if required) will be included in the cost of the Retaining Wall System.
3. Applicable FDOT Wall Types for each wall location are listed below. See the Approved Products List for approved Wall Systems and Standard Plans Index 548-020 for allowable Wall Type substitutions.
   Wall No. 1 – FDOT Wall Type 2A
   Wall No. 2 – FDOT Wall Type 2A
4. Concrete for Coping and/or Junction Slab shall be Class IV (f'c = 5500 psi) without highly reactive pozzolans.
5. See Standard Plans Index 548-020 for General Notes and Details.

BRIDGE NOS. 124144 (RIGHT) & 124145 (LEFT)

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

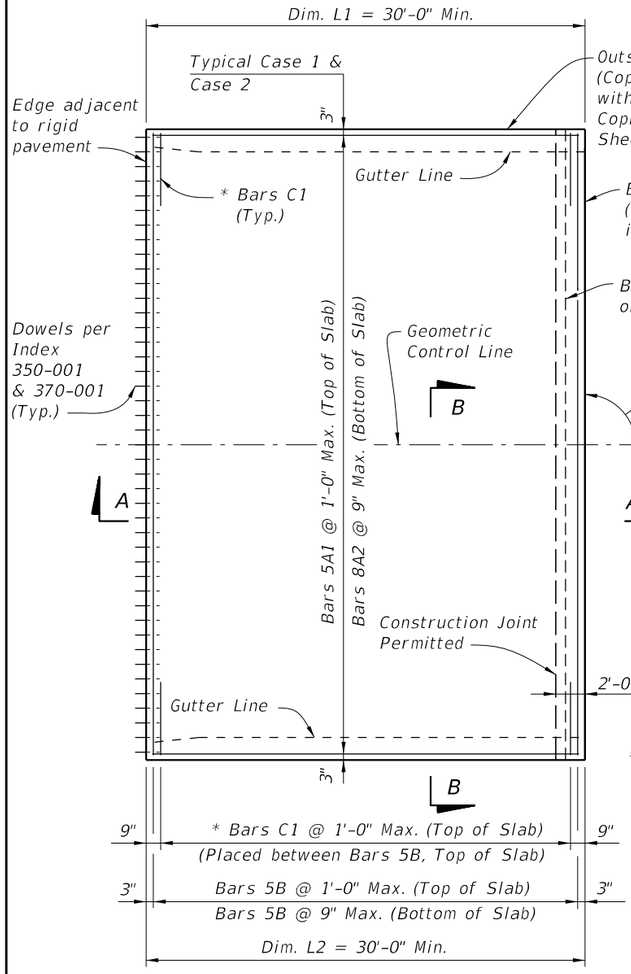
THOMAS M. WAITS, P.E.
P.E. LICENSE NUMBER 55460
HIGHSPANS ENGINEERING, INC.
2121 MCGREGOR BOULEVARD
SUITE 200
FORT MYERS, FL 33901
REGISTRY NO. 27559

DRAWN BY: SDS 09/19
CHECKED BY: CLH 09/19
DESIGNED BY: RMW 09/19
CHECKED BY: TMW 09/19

LEE COUNTY
DEPARTMENT OF TRANSPORTATION

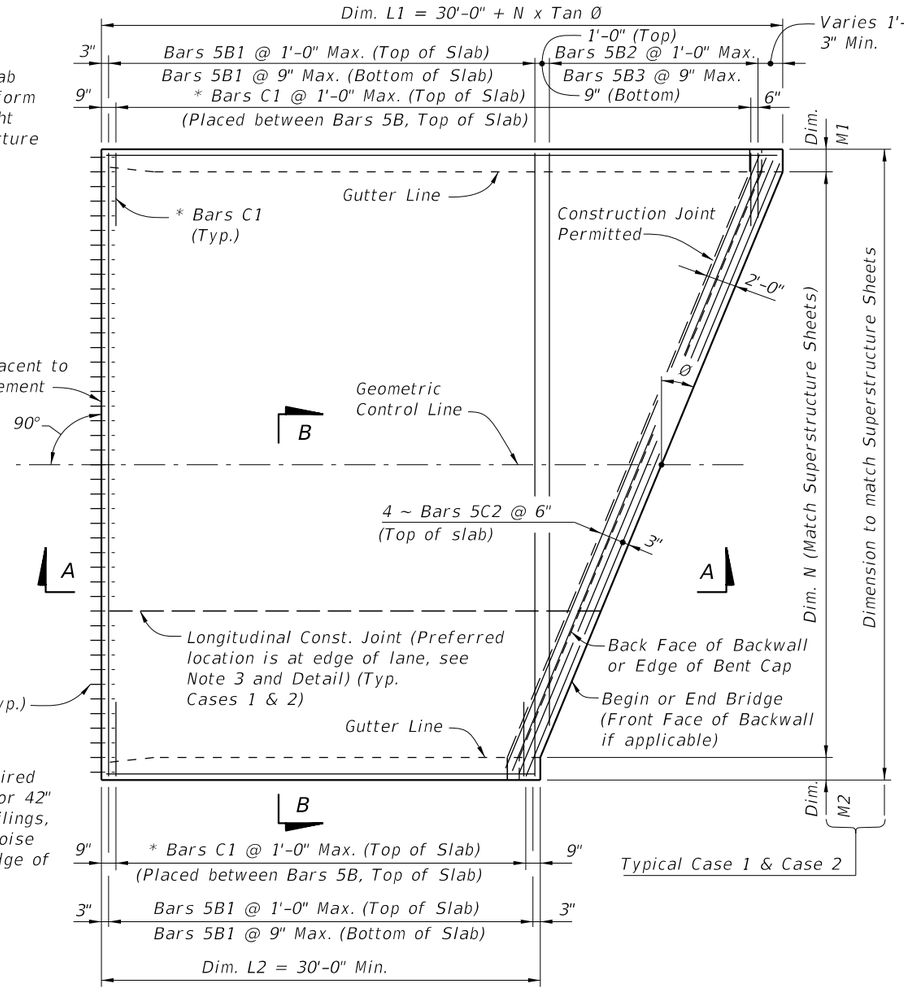
ROAD NO.	COUNTY	PROJECT ID
CR 850	LEE	

SHEET TITLE: MSE RETAINING WALL DATA TABLES
REF. DWG. NO.:
PROJECT NAME: CORKSCREW ROAD WILDLIFE CROSSING & BOX CULVERTS
SHEET NO.: BW-04

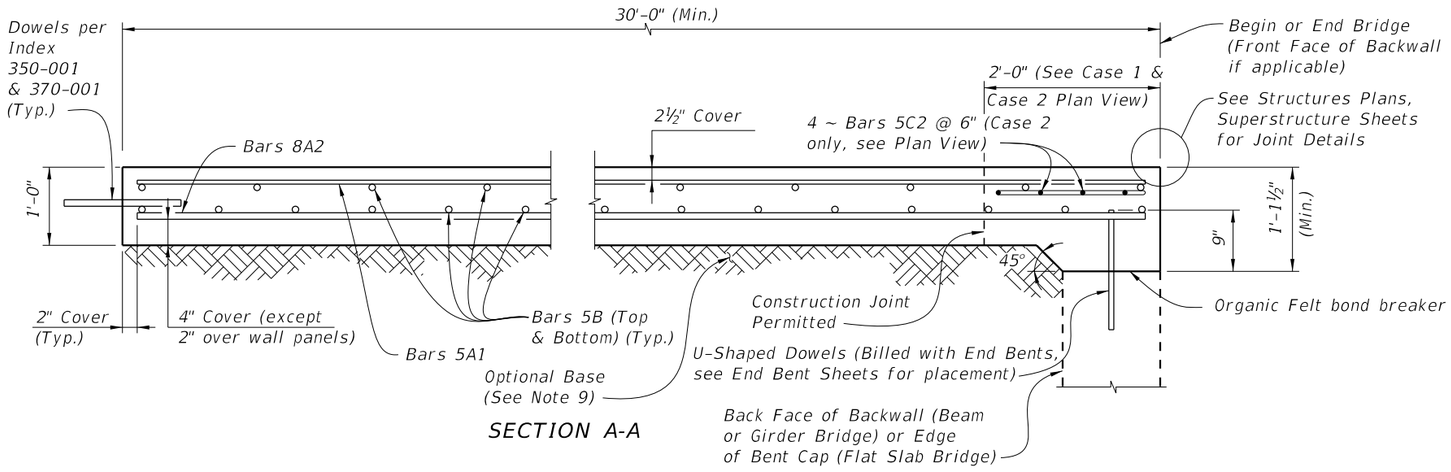


* NOTE: Bars C1 are required as shown when the 36" or 42" Single-Slope Traffic Railings, or the Traffic Railing/Noise Wall, are used at the edge of the Approach Slab.

PLAN VIEW (CASE 1)



PLAN VIEW (CASE 2)



SECTION A-A

GENERAL NOTES

1. SURFACE TREATMENT: Apply a Class 4 Floor Finish (Grooved) to the riding surface from begin or end approach slab joint to begin or end bridge. See Bid Item Notes. Apply a broomed finish to sidewalk areas.
2. CONDUIT: If required, see Structures Plans for Conduit details.
3. When a longitudinal construction joint is necessary or allowed by the Engineer, the transverse steel shall be extended as shown in the Longitudinal Construction Joint Detail.
4. The plan view for CASE 1 applies when the skew angle (Ø) = 0°. Relevant details also apply to CASE 2.
5. The plan view for CASE 2 applies where the skew angle (Ø) is > 0°. The slab shown represents a skew to the right for an approach slab at begin bridge; approach slab at the end of bridge or a left skew shall be treated similarly. The shown reinforcement shall be utilized, and Dowels provided in accordance with Index 350-001 and 370-001.
6. Deformed WWR must meet the requirements of Specification Section 931.
7. PROFILOGRAPH: If profilograph requirements apply, planing may be required. The permitted construction joint shown in Section A-A will facilitate the placement of the expansion joint.
8. Approach slabs shown in Plan View Cases 1 and 2 represent a typical approach slab with edge barriers and no sidewalks. Provide railings, parapets, traffic separators and sidewalks as detailed on the additional approach slab sheets.
9. PAYMENT: Deformed WWR for the edge of Approach Slabs on retaining walls is not included in the estimated quantity for reinforcing steel and is considered incidental to the work. See Roadway Plans for Optional Base details and quantities.

CROSS REFERENCES:

For Section B-B, Longitudinal Construction Joint Detail and Approach Slab Details see Sheet 2.

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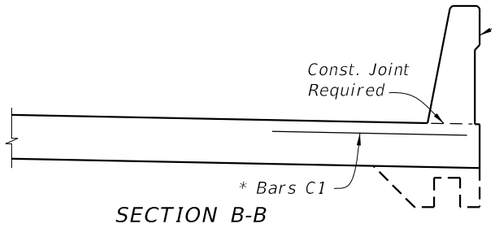
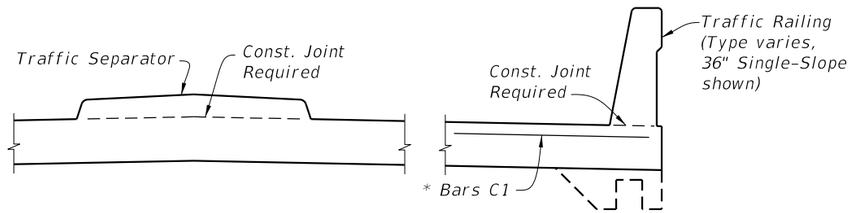
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
11/01/17			FDOT FY 2019-20 STANDARD PLANS	APPROACH SLABS (30 FT.) (RIGID PAVEMENT APPROACHES)	400-091	1 of 2



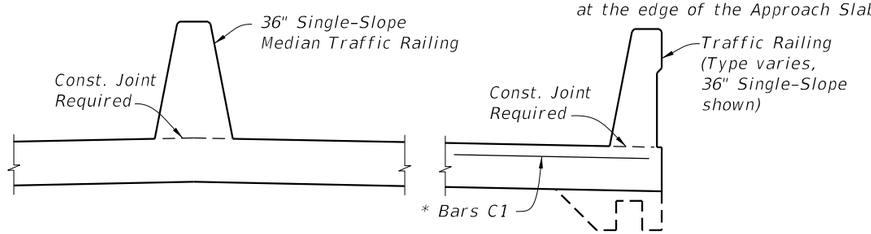
NOTE:
Geometry of Traffic Railings, Pedestrian/Bicycle Railings, Traffic Separators and Sidewalks to match those on adjoining bridge.

SECTION B-B
STANDARD APPROACH SLAB

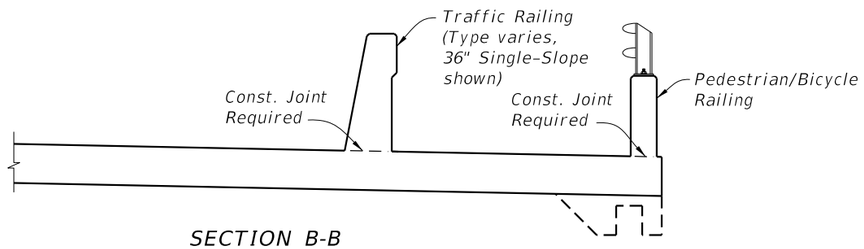


SECTION B-B
APPROACH SLAB WITH TRAFFIC SEPARATOR

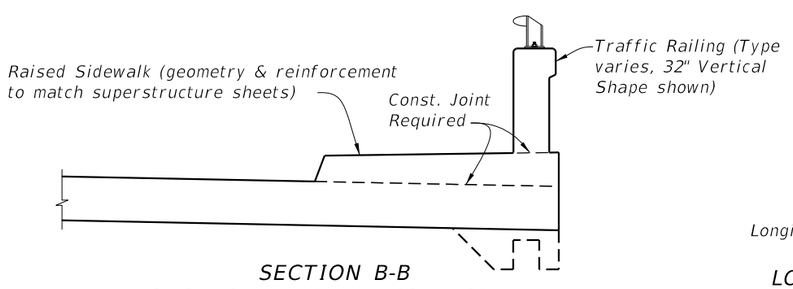
*NOTE: Bars C1 are required as shown when the 36" or 42" Single-Slope Traffic Railing, or the Traffic Railing/Noise Wall, are used at the edge of the Approach Slab.



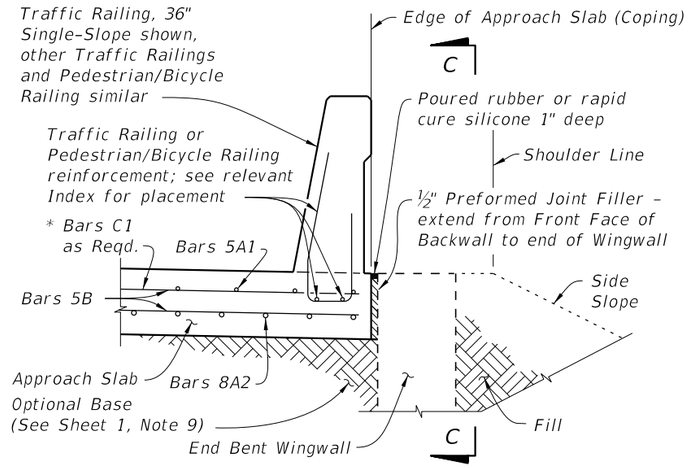
SECTION B-B
APPROACH SLAB WITH MEDIAN TRAFFIC RAILING



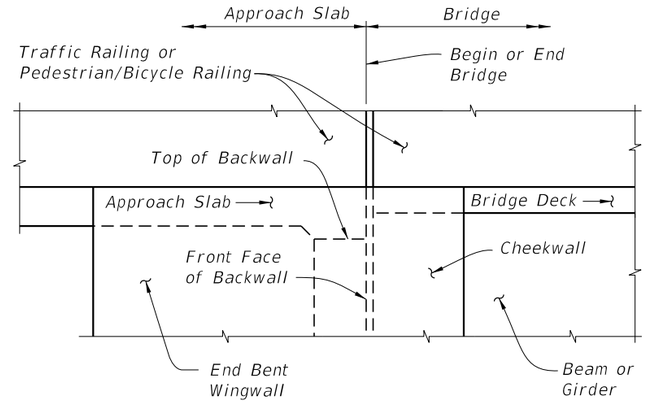
SECTION B-B
APPROACH SLAB WITH SIDEWALK



SECTION B-B
APPROACH SLAB WITH RAISED SIDEWALK

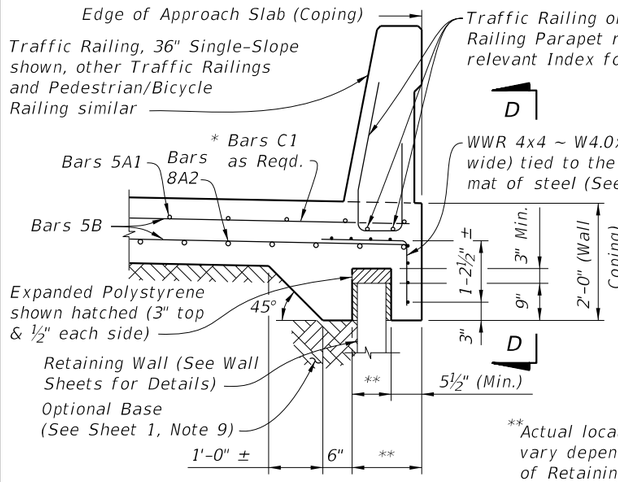


SECTION THRU APPROACH SLAB
AND END BENT WINGWALL



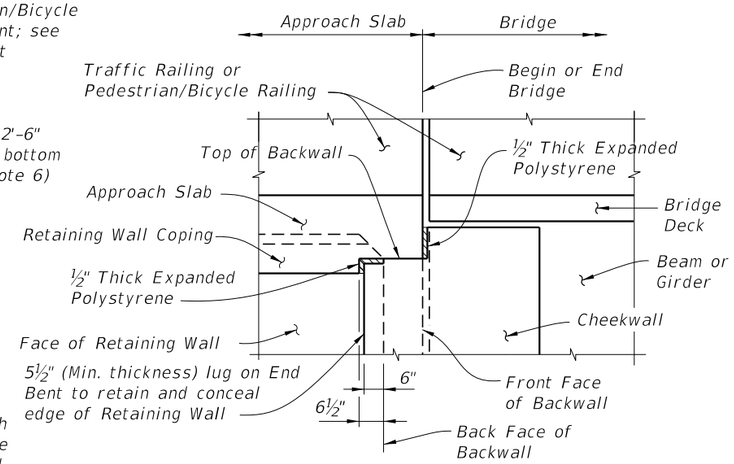
VIEW C-C AT BEGIN OR END BRIDGE (BEAM BRIDGE SHOWN, FLAT SLAB BRIDGE SIMILAR)

APPROACH SLAB WITH WINGWALL DETAILS



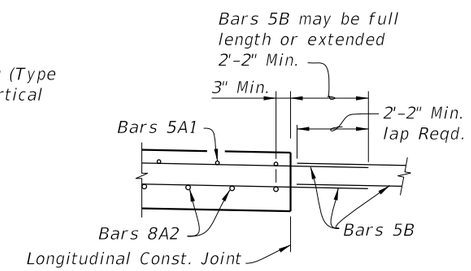
**Actual location & width vary depending on type of Retaining Wall used

SECTION THRU APPROACH SLAB
AND RETAINING WALL

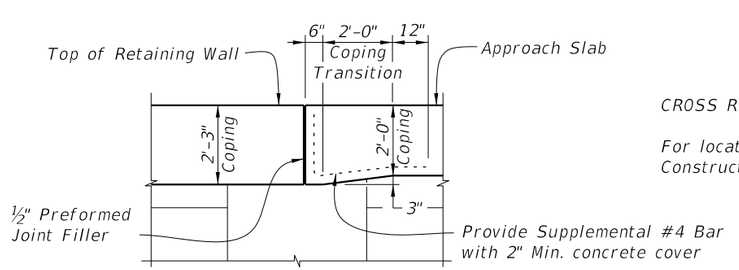


VIEW D-D AT BEGIN OR END BRIDGE (BEAM BRIDGE SHOWN, FLAT SLAB BRIDGE SIMILAR)

APPROACH SLAB WITH RETAINING WALL DETAILS



LONGITUDINAL CONSTRUCTION
JOINT DETAIL



COPING TRANSITION DETAIL FOR
RETAINING WALLS WITH 2'-3" COPING HEIGHT
(Railing Not Shown For Clarity)

CROSS REFERENCES:

For location of Section B-B and Longitudinal Construction Joint see Sheet 1.

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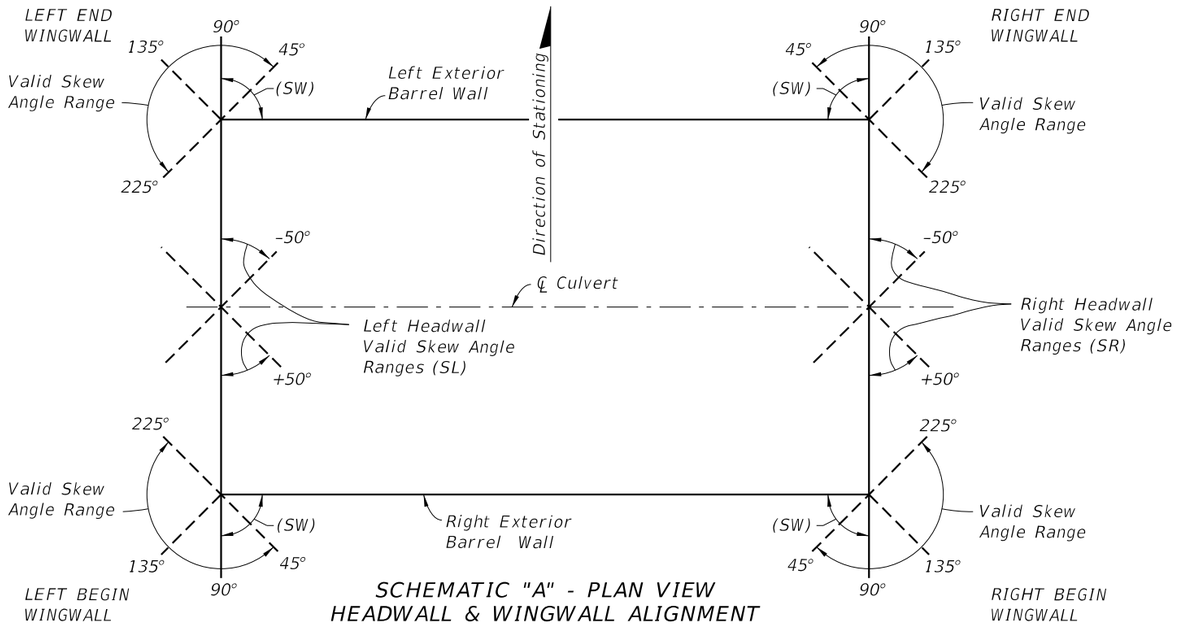
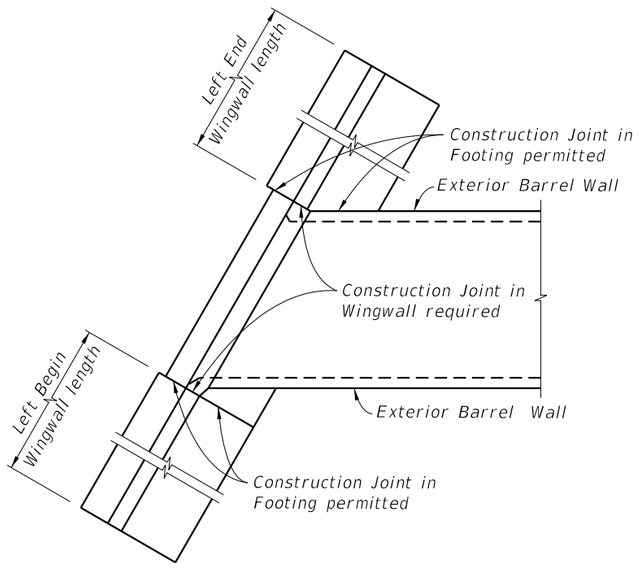
LAST REVISION	REVISION	DESCRIPTION:				
11/01/17			FDOT FY 2019-20 STANDARD PLANS	APPROACH SLABS (30 FT.) (RIGID PAVEMENT APPROACHES)	INDEX 400-091	SHEET 2 of 2



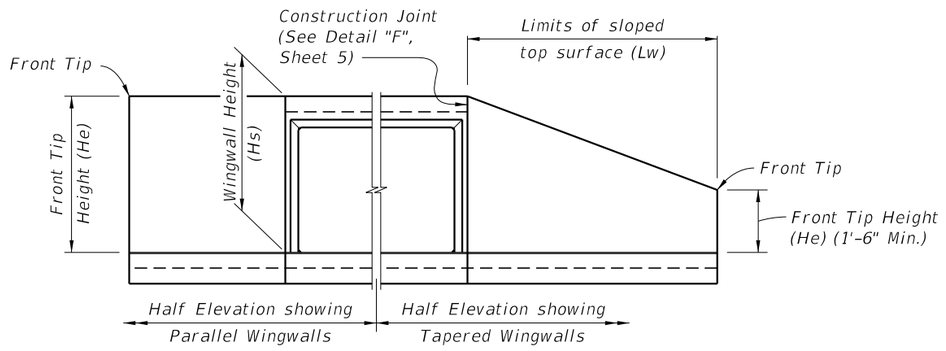
SCHEMATIC "A" - PLAN VIEW
HEADWALL & WINGWALL ALIGNMENT

NOTE: All headwall and culvert skew angles are measured in degrees from a line perpendicular to the centerline of culvert (counter-clockwise positive), see Schematic "B".



PART PLAN SHOWING PARALLEL WINGWALLS
AND LOCATION OF CONSTRUCTION JOINTS

NOTE:
Construction Joints in wingwalls and footings are located as follows: For non-skewed wingwalls they are located adjacent to the exterior face of the exterior barrel wall; when the ℄ of wingwall and ℄ of exterior barrel wall results in an acute angle see Left End Wingwall above, and when the angle is obtuse see Left Begin Wingwall above and Detail C (Sheet 5).



END ELEVATION
OF CULVERT

GENERAL NOTES:

LIVE LOAD: HL-93.

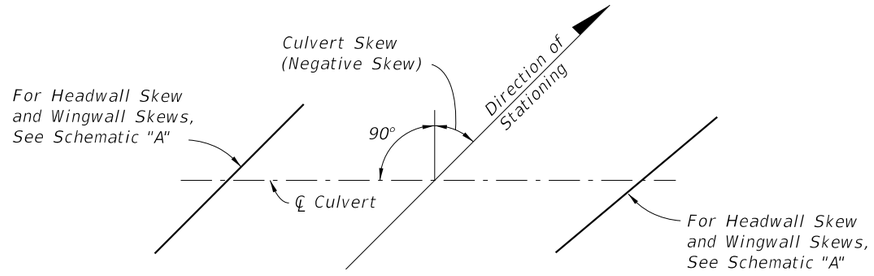
CONSTRUCTION LOADING: It is the construction Contractor's responsibility to provide for supporting construction loads that exceed AASHTO HL-93, and any construction load applied prior to 2 feet of compacted fill placed above the top slab.

SURFACE FINISH: All concrete surfaces shall receive a general surface finish.

SKEWED CONSTRUCTION JOINTS: Construction joints in barrels of culverts with skewed wingwalls may be placed parallel to the headwalls and the reinforcing steel, and the slabs may be cut provided that the cut reinforcing steel extends beyond the construction joint enough for splices to be made in accordance with Table 1 on this sheet. The cost of construction joints and additional reinforcing shall be at the expense of the Contractor.

CULVERT EXTENSIONS: For cut backs and ties into existing concrete box culverts see Sheet 6 of 8.

REINFORCING STEEL: See the "Box Culvert Data Tables" in the Contract Plans for grade and bar spacing. See the Reinforcing Bar List in the Contract Plans for bar sizes and bar bending details.



SCHEMATIC "B" - PLAN VIEW
CULVERT ALIGNMENT

NOTE: For Culvert Skew see Contract Plans.

TABLE 1 - MINIMUM BAR SPLICE LENGTHS FOR LONGITUDINAL REINFORCING

BAR SIZE	SPLICE (CLASS B) CLASS II (3400 psi)	SPLICE (CLASS B) CLASS IV (5500 psi)	BAR SIZE	SPLICE (CLASS B) CLASS II (3400 psi)	SPLICE (CLASS B) CLASS IV (5500 psi)
#3	1'-4"	1'-0"	#8	3'-5"	2'-8"
#4	1'-9"	1'-4"	#9	4'-3"	3'-4"
#5	2'-2"	1'-8"			
#6	2'-7"	2'-0"			
#7	3'-0"	2'-4"			

TABLE 1 NOTE: Splice lengths are based on an AASHTO Class B tension lap splice for the Specification Section 346 concrete class shown.

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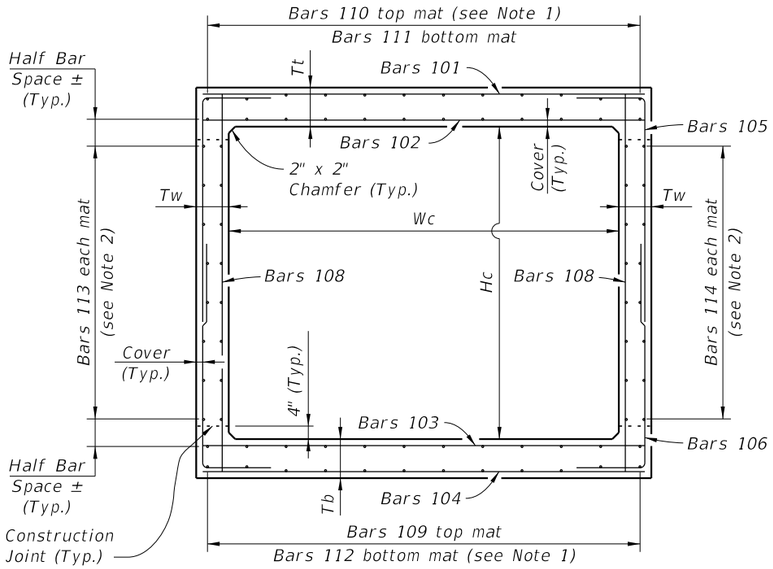
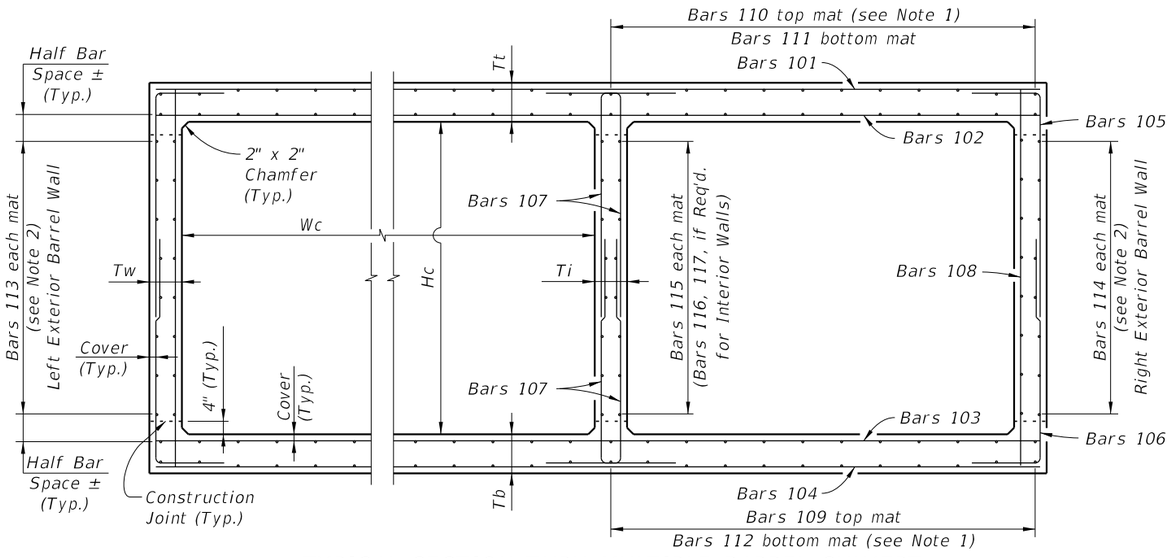
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
11/01/16			FY 2019-20 STANDARD PLANS	CONCRETE BOX CULVERT DETAILS	400-289	1 of 8



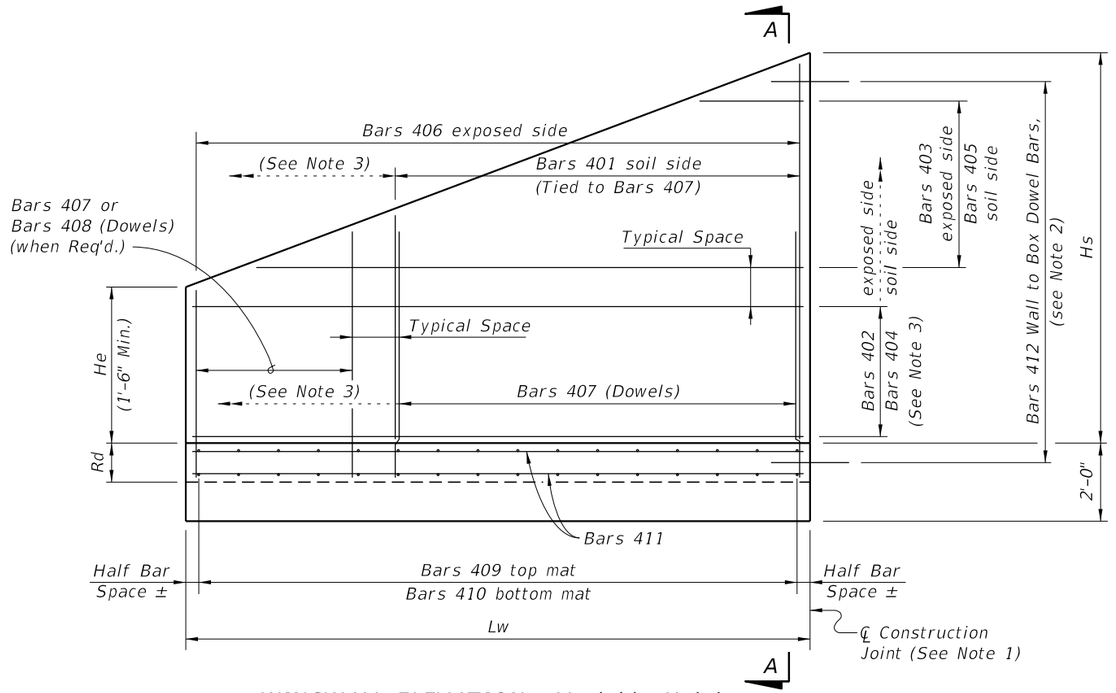
TYPICAL SECTION THRU SINGLE BARREL CULVERT

CULVERT BARREL NOTES:

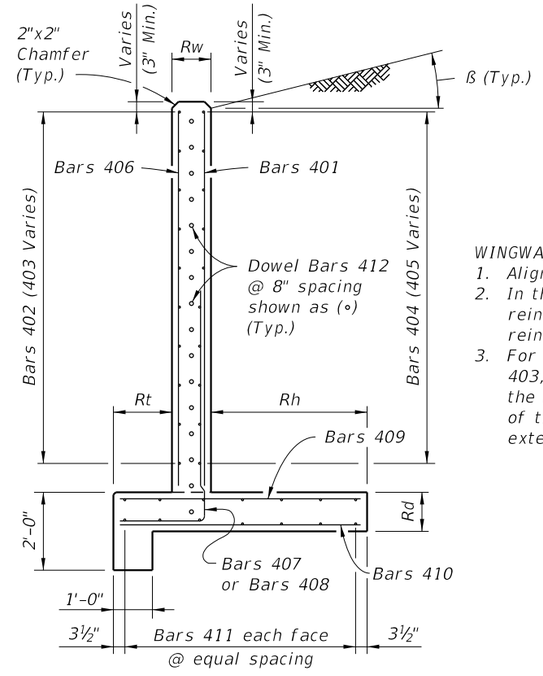
1. Space Bars 110 and 112 with a bar in each corner, and at the ℄ of interior walls (for multiple barrel culverts only), and the remaining bars placed at equal spacing shown in the Contract Plans. Adjust last bar spacing when required.
2. Place Bars 113 and 114 at spacing shown in the Contract Plans evenly between Bars 109 and 111.
3. Locate the first transverse bar from the ends of the culvert at one half the bar spacing, but provide the minimum reinforcement cover and not greater than 4" clear.



TYPICAL SECTION THRU MULTIPLE BARREL CULVERT



WINGWALL ELEVATION - Variable Height
(Left End shown - other corners similar)



WINGWALL SECTION A-A

WINGWALL NOTES:

1. Align construction joint perpendicular to wingwall.
2. In the vicinity of the construction joint, field bend reinforcement as necessary to maintain minimum reinforcement cover.
3. For constant height wingwalls, variable length Bars 403, 405 & 408 are not required, and as such the limits of Bars 401 & 407 extend the full length of the wingwall, and the limits of Bars 402 & 404 extend to the full height of the wingwall.

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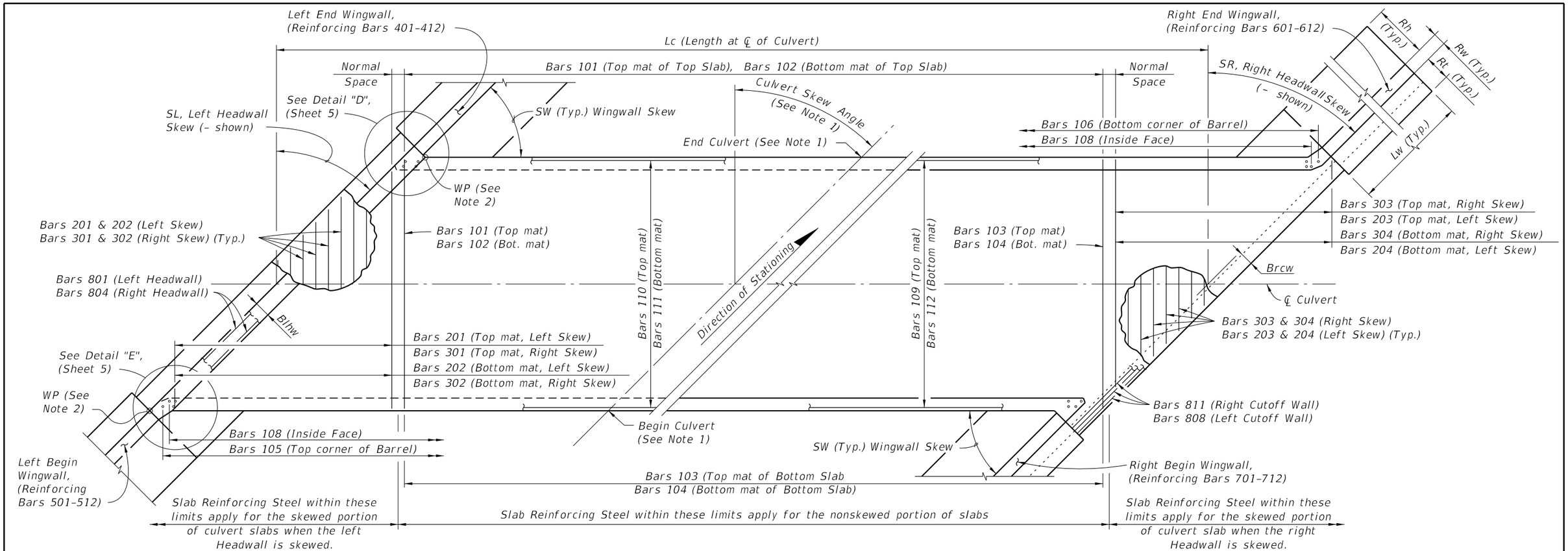
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
07/01/13			FY 2019-20 STANDARD PLANS	CONCRETE BOX CULVERT DETAILS	400-289	2 of 8

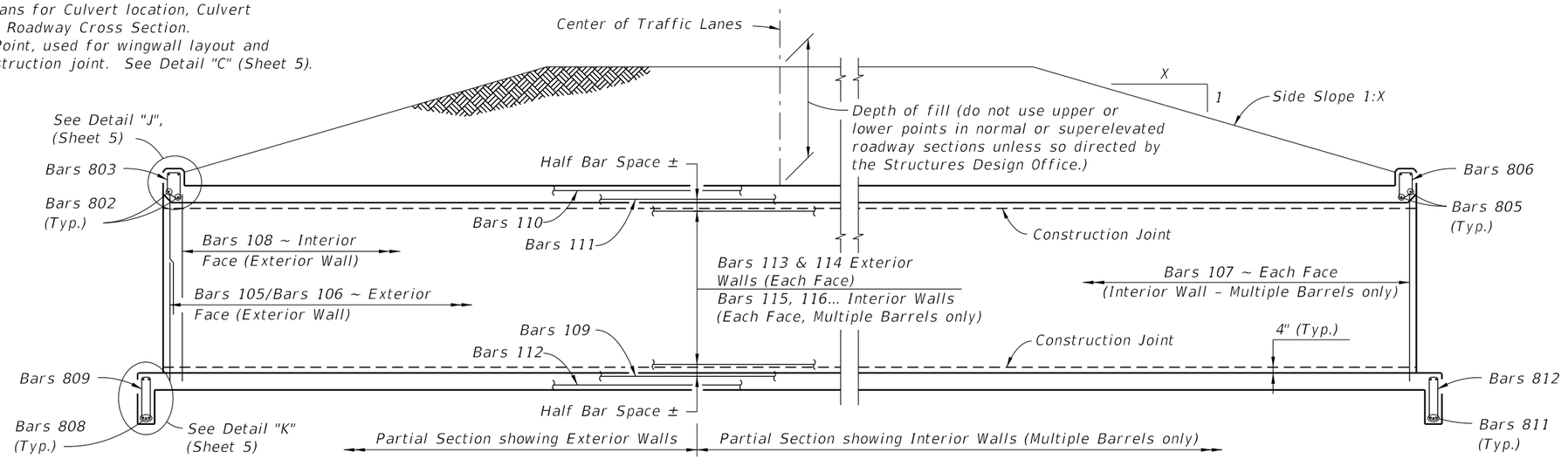


PARTIAL PLAN TOP SLAB
(Left Side, Left Skew)

PARTIAL PLAN BOTTOM SLAB
(Right Side, Right Skew)

NOTES:
1. See Contract Plans for Culvert location, Culvert Skew Angle and Roadway Cross Section.
2. WP = Working Point, used for wingwall layout and location of construction joint. See Detail "C" (Sheet 5).

SINGLE BARREL BOX CULVERT
(Skewed Culvert With Parallel Wingwalls Shown)



LONGITUDINAL SECTION THRU CULVERT
(Transverse Top & Bottom Slab Reinforcing Not Shown For Clarity)

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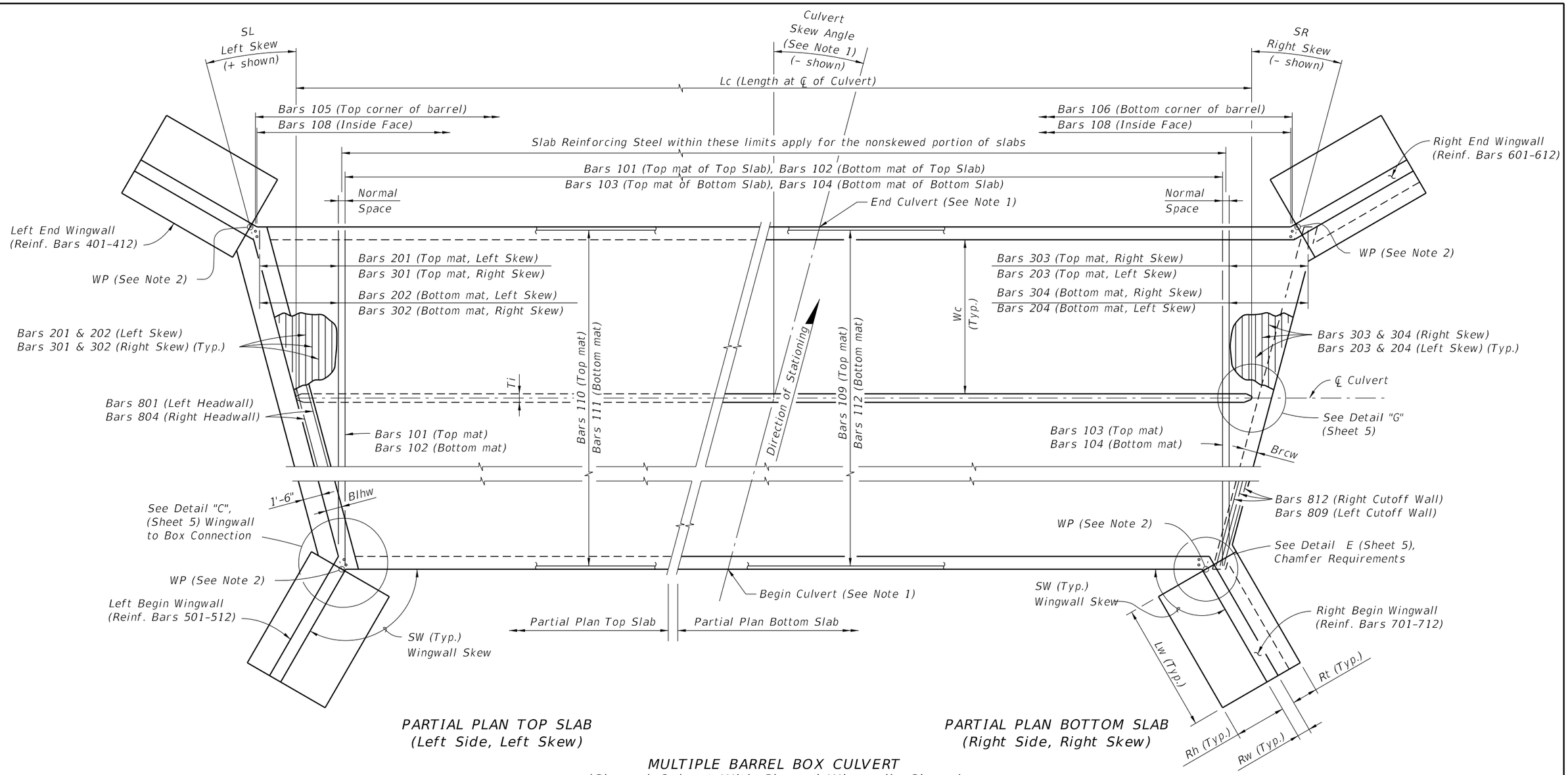
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
01/01/07			FDOT FY 2019-20 STANDARD PLANS	CONCRETE BOX CULVERT DETAILS	400-289	3 of 8



PARTIAL PLAN TOP SLAB
(Left Side, Left Skew)

PARTIAL PLAN BOTTOM SLAB
(Right Side, Right Skew)

MULTIPLE BARREL BOX CULVERT
(Skewed Culvert With Skewed Wingwalls Shown)

NOTES:
1. See Contract Plans for Culvert Location, Culvert Skew Angle and Roadway Cross Section.
2. WP = Working Point, used for wingwall layout and location of construction joint. See Detail C (Sheet 5).

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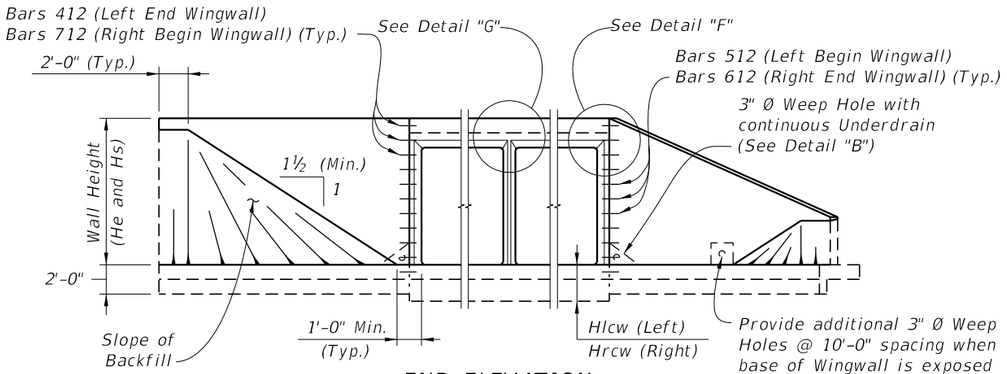
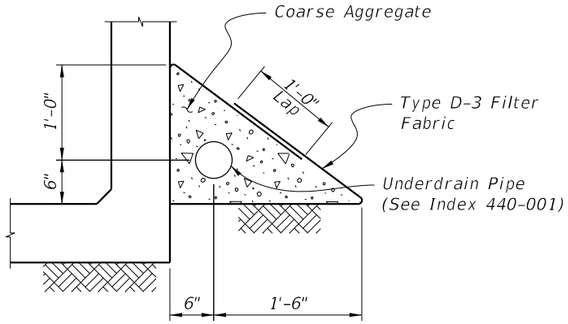
LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2019-20 STANDARD PLANS	CONCRETE BOX CULVERT DETAILS	INDEX	SHEET
01/01/07					400-289	4 of 8



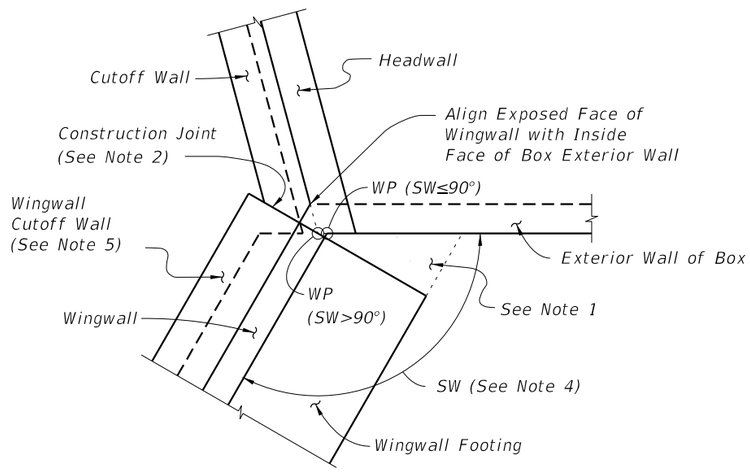
END ELEVATION
(Showing Constant Height And Variable Height Wingwalls)



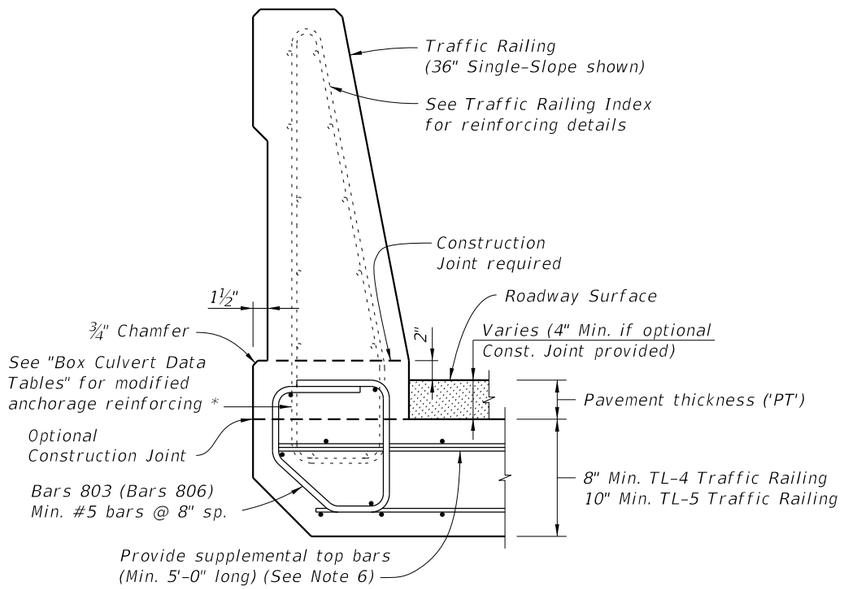
DETAIL "B"
UNDERDRAIN DETAIL
(Similar to Type II ~ Index 440-001)

NOTES:
1. For small angles, the Contractor may elect to fill the area between the box and the wingwall footing with unreinforced concrete. For wingwall skew angles less then 90 degrees, field bend wingwall reinforcement as necessary while maintaining cover. No additional payment will be made for this work.
2. Location of Construction Joint determined by WP at theoretical intersection of:
   – Soil side face of Headwall and outside face of Box Exterior Wall, for SW≤90°;
   – Outside face of Wingwall and outside face of Box Exterior Wall, for SW>90°.
3. Provide 6" chamfer when angle 'A' is greater than 45°. Maintain minimum wall thickness. Field adjust reinforcing to maintain cover.
4. Wingwall Skew Angles (SW) are measured from the adjacent box exterior wall to the wingwall.
5. Turn or extend Wingwall Cutoff Wall as necessary to meet Box Cutoff Wall.
6. Provide additional reinforcement in the top of the top slab below traffic railings to ensure a minimum area of 0.80 sq. in./ft. transverse reinforcing.

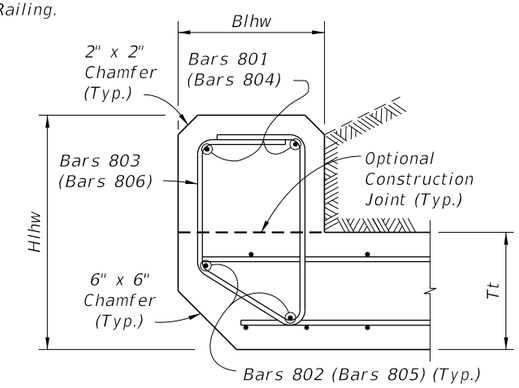
* Included in the cost of the Traffic Railing.



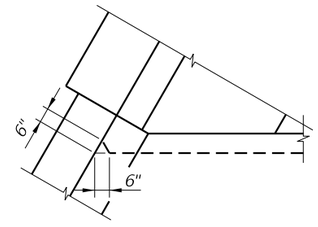
DETAIL "C" - PLAN VIEW
WINGWALL TO BOX CONNECTION
(Left Begin Corner Shown, Other Corners Similar)



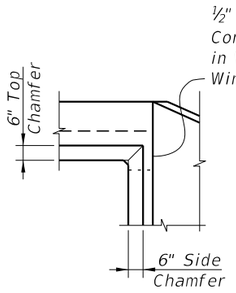
DETAIL "I"
TRAFFIC RAILING ATTACHMENT TO HEADWALL



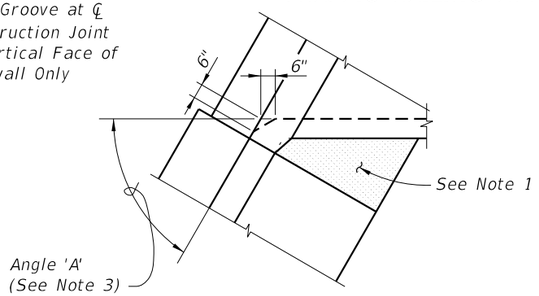
DETAIL "J"
LEFT HEADWALL SECTION
(Right Headwall similar)



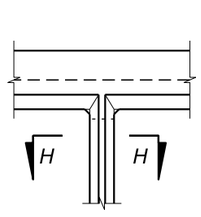
DETAIL "D"



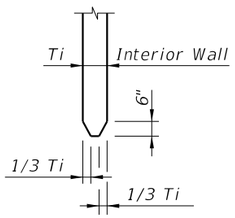
DETAIL "F"



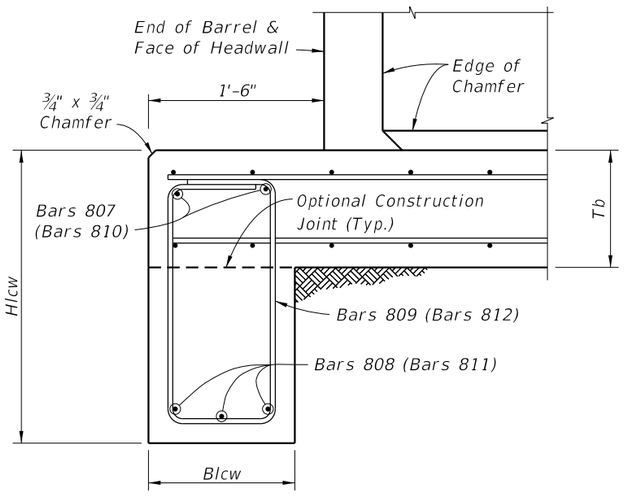
DETAIL "E"



DETAIL "G"



SECTION H-H



DETAIL "K"
LEFT CUTOFF WALL SECTION
(Right Cutoff Wall similar)

CROSS REFERENCE:
See Sheet 3 for locations of Details "D", "E", "J" & "K".
See Sheet 4 for locations of Detail "C".

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LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2019-20 STANDARD PLANS	CONCRETE BOX CULVERT DETAILS	INDEX	SHEET
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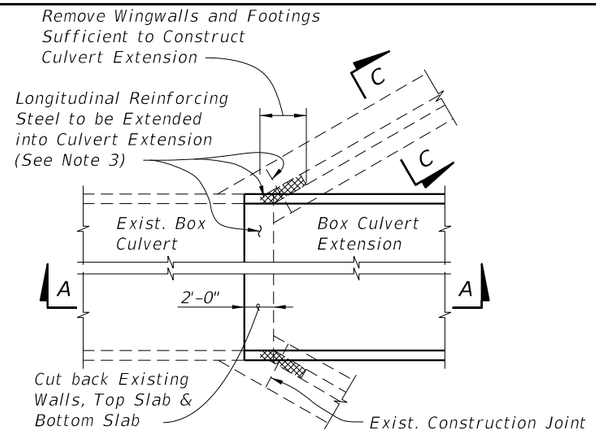
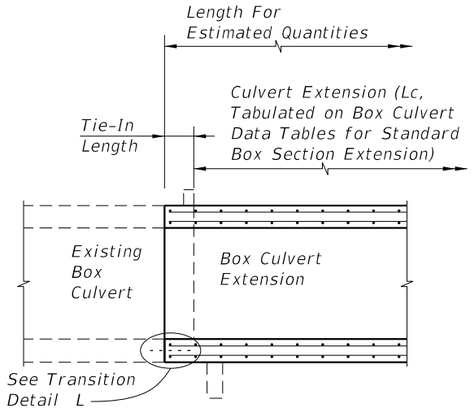
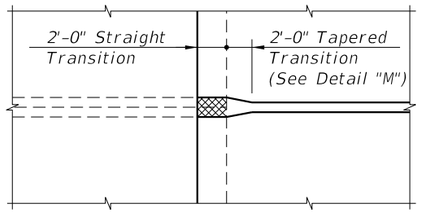


OUTSIDE WALLS OF BOXES

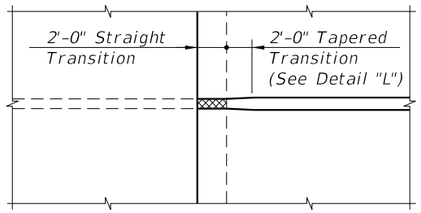


SECTION A-A

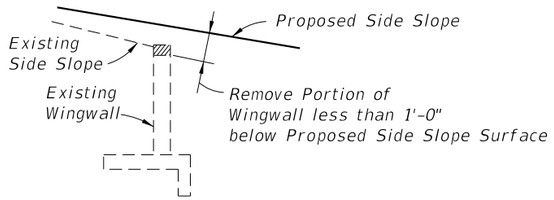
FLARED WINGWALL



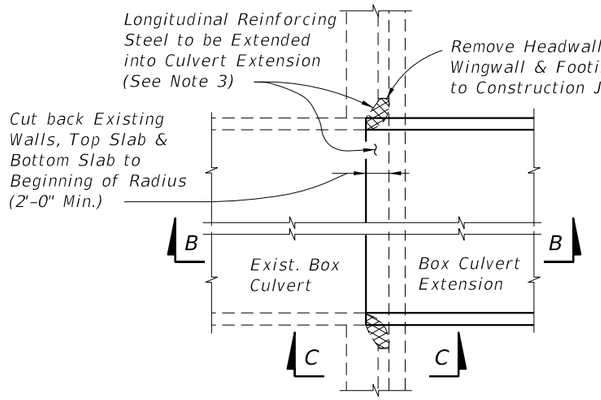
INTERIOR DOUBLE WALLS OF BOXES



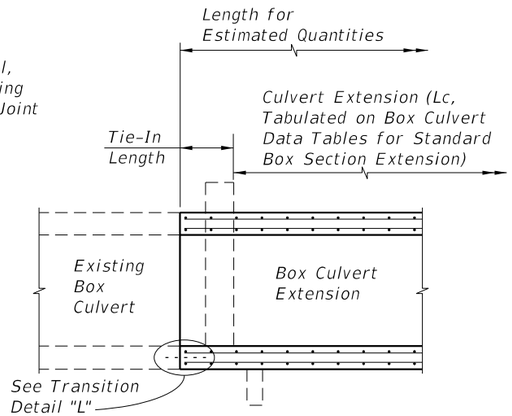
INTERIOR SINGLE WALLS OF BOXES



SECTION C-C



OUTSIDE WALLS OF BOXES



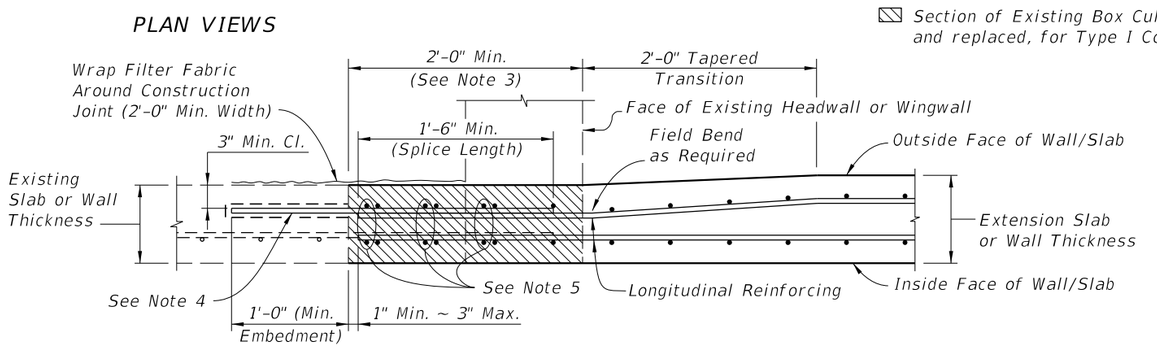
SECTION B-B

STRAIGHT WINGWALL

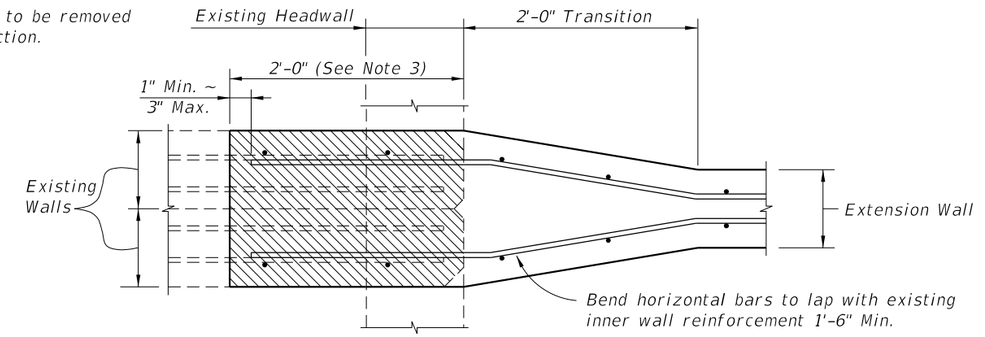
NOTES:

1. The Box Culvert Data Tables and Reinforcing Bar List do not include the additional quantities needed for dowel connections or transitions from double walls of existing concrete box culverts; the cost for additional reinforcement and the thickened concrete wall in the transitional area shall be included in the costs for concrete and steel in the culvert extension.
2. Cost for removal and disposal of material from existing headwalls, wingwalls and box, and cost of cleaning, straightening and extending or doweling longitudinal reinforcing steel shall be included in the cost for concrete and steel of the culvert extension.
3. Remove existing concrete while avoiding damage to existing reinforcement. Clean and straighten existing reinforcement, lap and tie onto extension reinforcement.
4. Dowel in #4 Bars @ 1'-0" max. spacing into wall/slab when there is a single mat of existing reinforcing steel, otherwise splice 1'-6" as shown for inside reinforcement. Use an Adhesive Bonding Material System in accordance with Specifications Section 416 & 937.
5. Provide additional transverse bars for top and bottom slab, parallel and full width of any skewed joint connection when shown in the Plans.
6. See Box Culvert Data Table notes in Plans for Connection Types allowed.

PLAN VIEWS

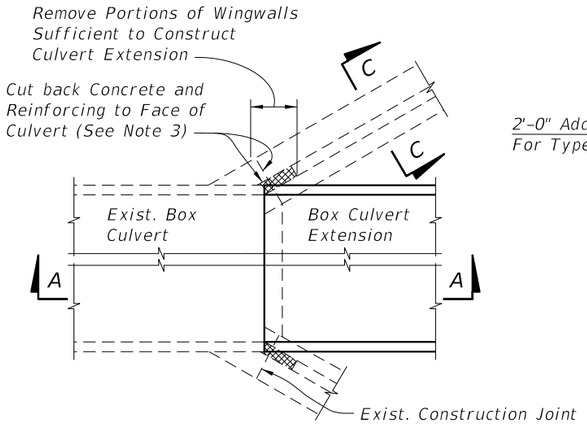


DETAIL "L" - TRANSITION FOR EXTERIOR WALL/SLAB EXTENSION
(Interior Single Walls Similar)

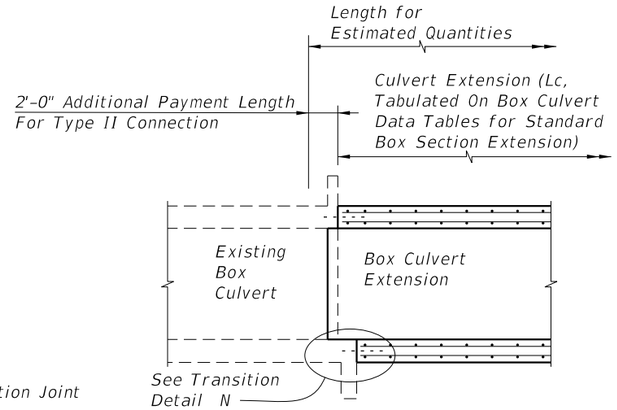


DETAIL "M" - TRANSITION FOR INTERIOR DOUBLE WALLS OF BOX CULVERTS

TYPE I CONNECTION DETAILS FOR CONCRETE BOX CULVERT EXTENSIONS (CUT BACK EXISTING CONCRETE)

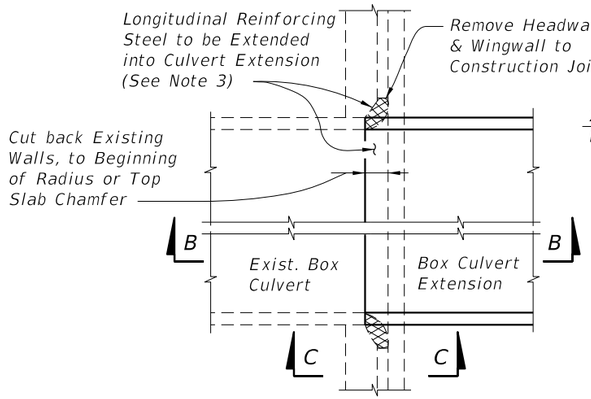


OUTSIDE WALLS OF BOXES

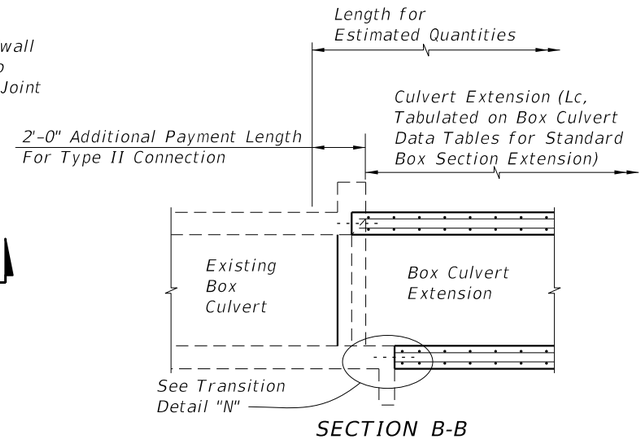


SECTION A-A

FLARED WINGWALL

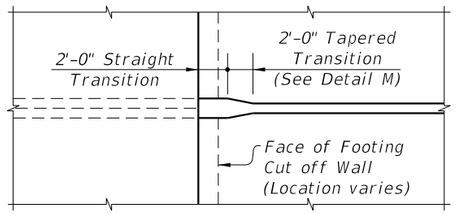


OUTSIDE WALLS OF BOXES

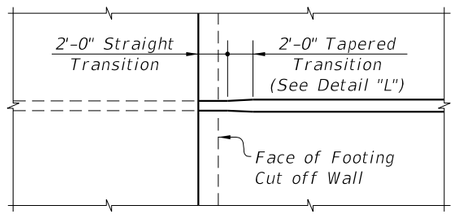


SECTION B-B

STRAIGHT WINGWALL

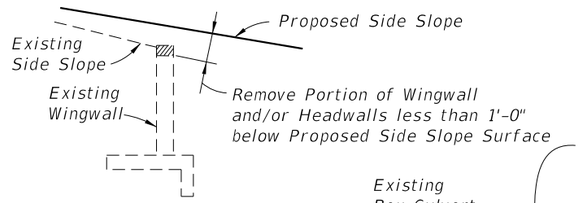


INTERIOR DOUBLE WALLS OF BOXES

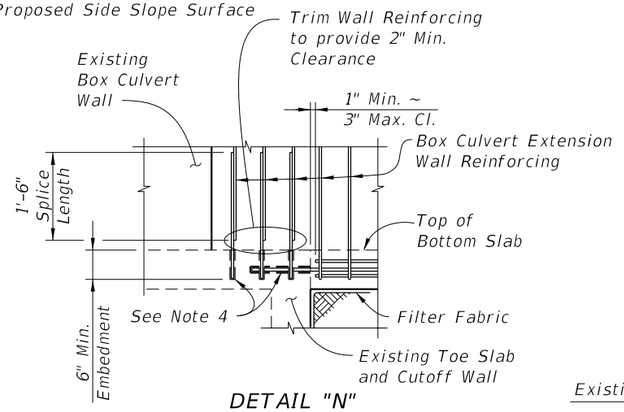


INTERIOR SINGLE WALLS OF BOXES

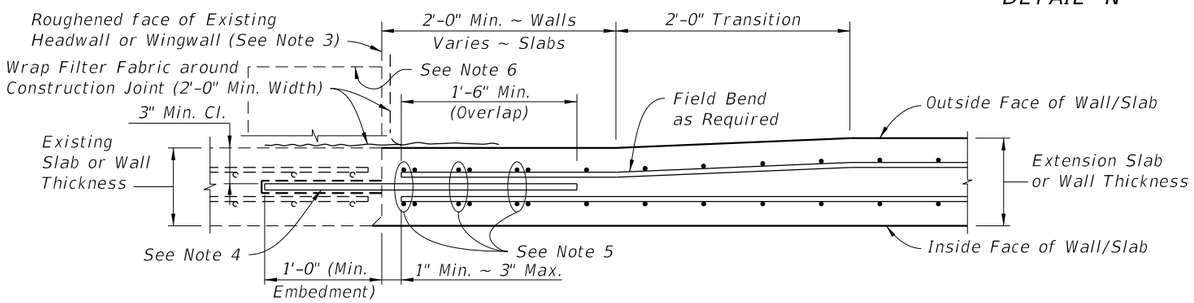
PLAN VIEWS



SECTION C-C



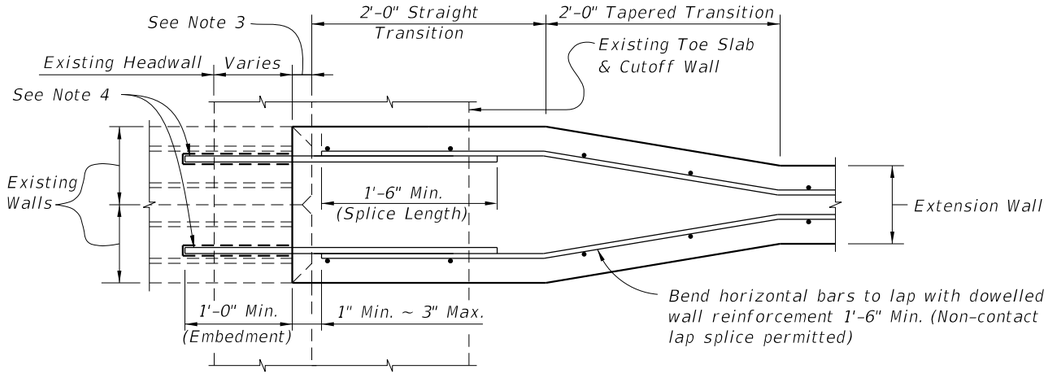
DETAIL "N"



DETAIL "L" - TRANSITION FOR EXTERIOR WALL/SLAB EXTENSION
(Interior Single Walls Similar)

NOTES:

1. The Box Culvert Data Tables and Reinforcing Bar List do not include the additional quantities needed for dowel connections or transitions from double walls of existing concrete box culverts; the cost for additional reinforcement and the thickened concrete wall in the transitional area shall be included in the costs for concrete and steel in the culvert extension.
2. Cost for roughening and cleaning existing headwalls, wingwalls and box, and cost of doweling longitudinal reinforcing steel shall be included in the cost for concrete and steel of the culvert extension.
3. Remove existing concrete and reinforcing back to edge of any chamfers exceeding 1". Roughen and clean existing or exposed surface and coat with a Type A epoxy bonding compound in accordance with the manufacturer's recommendations.
4. Dowel in #5 Bars @ 1'-0" max. spacing horizontally into center of wall/slab. Provide vertical dowels in footing to match size, alignment and spacing of outside vertical wall reinforcing. Use an Adhesive Bonding Material System in accordance with Specifications Section 416 & 937.
5. Provide additional transverse bars for top and bottom slab, parallel and full width of any skewed joint connection when shown in the Plans.
6. Remove top of existing headwall when necessary to provide 1'-0" clearance below finished grade. Saw cut full width and seal with Type F-2 epoxy compound to protect exposed reinforcing.
7. See Box Culvert Data Table notes in Plans for Connection Types allowed.



DETAIL "M" - TRANSITION FOR INTERIOR DOUBLE WALLS OF BOX CULVERTS

TYPE II CONNECTION DETAILS FOR CONCRETE BOX CULVERT EXTENSIONS
(ADHESIVE DOWEL TO EXISTING CONCRETE)

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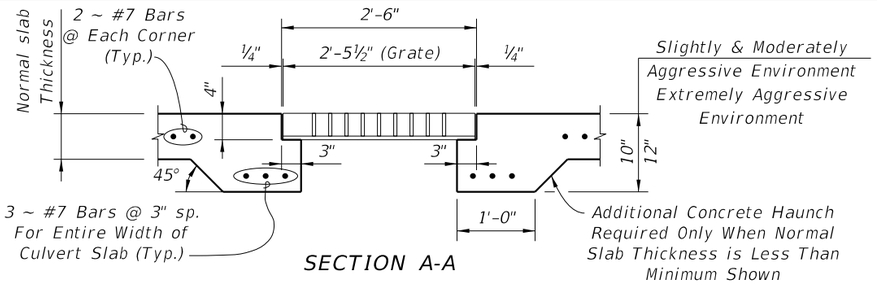
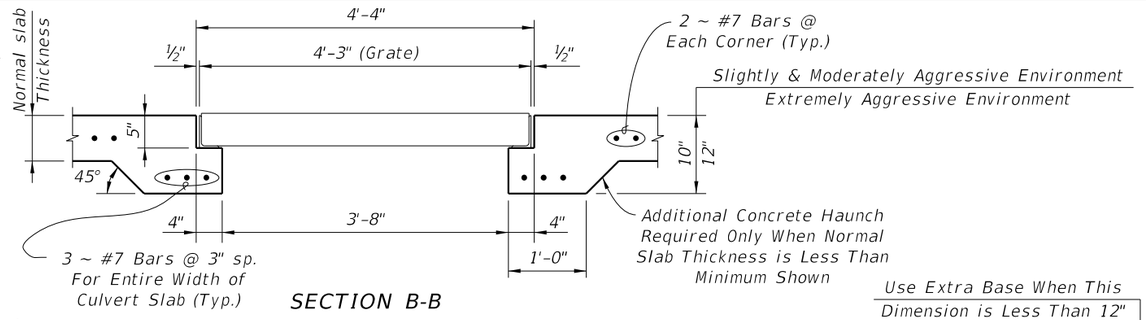
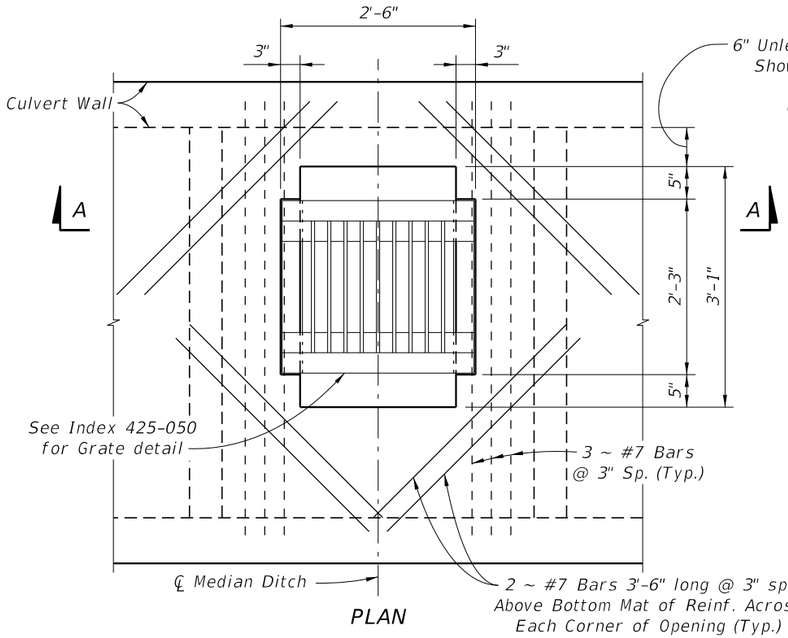


SECTION A-A

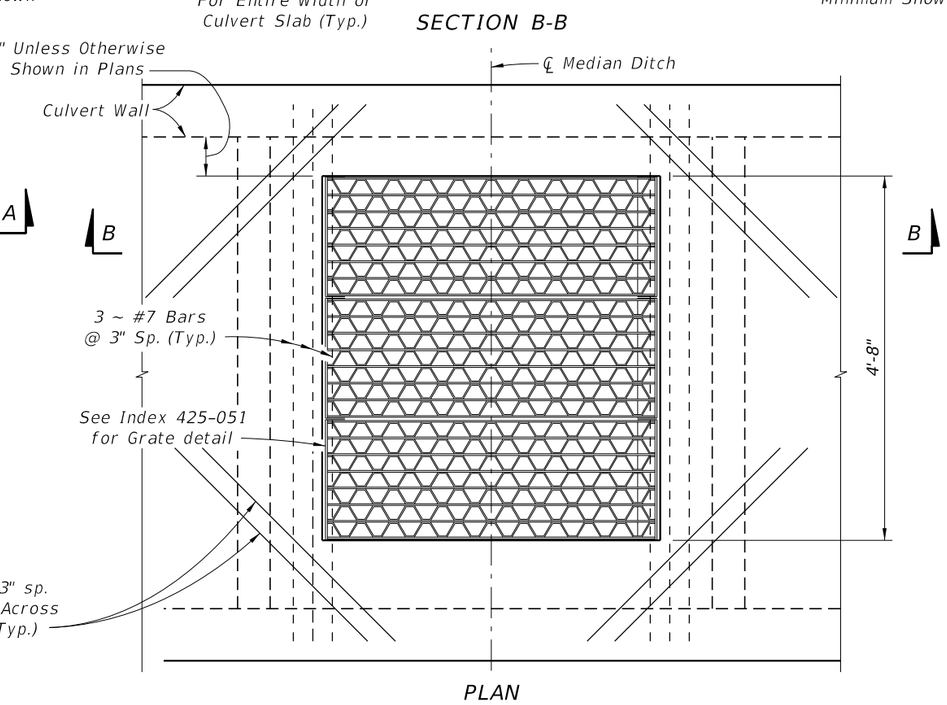


SECTION B-B



PLAN

INLET TYPE A GRATE



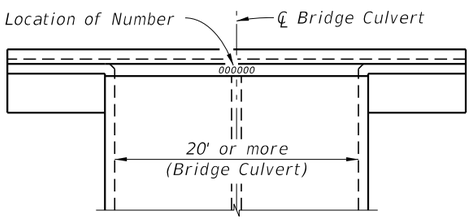
PLAN

INLET TYPE B GRATE

NOTES:

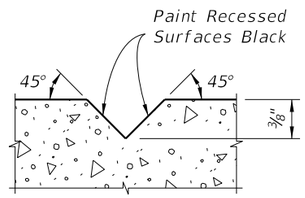
1. Cost of Steel Grating to be included in cost of Box Culvert.
2. All reinforcing shall be 2" clear for Slightly and Moderately Aggressive Environments, and 3" clear for Extremely Aggressive Environments.

INLET IN TOP OF BOX CULVERT



The number is to be placed in the center of the top surface of all bridge culvert headwalls. For Bridge Number see Plan-Profile sheet(s).

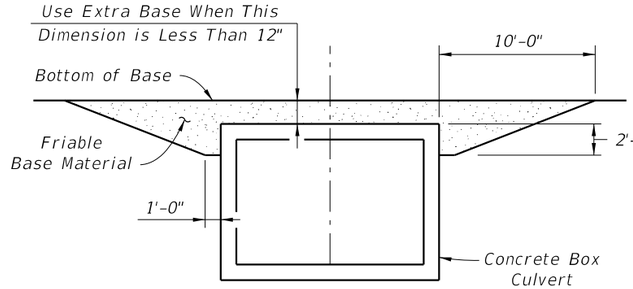
TOP VIEW OF HEADWALL



SECTION THRU RECESSED V-GROOVE TO FORM INSCRIBED FIGURES

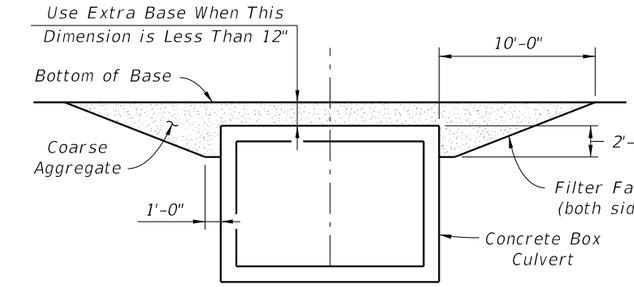
Black Plastic Figures 3" in height as approved by the Engineer may be used in lieu of numbers formed by ⅜" V-Grooves. V-Grooves shall be formed by preformed figures.

BRIDGE CULVERT NUMBER LOCATION



The cost of furnishing and installing extra friable base material shall be included in the cost of the Box Culvert.

FRIABLE BASE



Place coarse aggregate in 6 inch lifts and compact sufficiently as to be firm and unyielding. Provide coarse aggregate gravel or stone meeting the requirements of Specification Section 901-2 or 901-3 respectively. Meet the gradation requirements of Specification Section 901-6, Grades 4, 467, 5, 56 or 57 unless restricted in the plans. Provide Type D-3 filter fabric (see Specification Section 985). The cost of furnishing and installing the coarse aggregate and filter fabric shall be included in the cost of the Box Culvert.

ASPHALTIC CONCRETE BASE

NOTE: Extra base is required when cross box culverts are located on facilities subject to high speed traffic (>45 mph) or high traffic volumes (>1600 ADT) and the cover is within the range specified in the notation above.

EXTRA BASE FOR BOX CULVERTS CROSSING UNDER FLEXIBLE PAVEMENT

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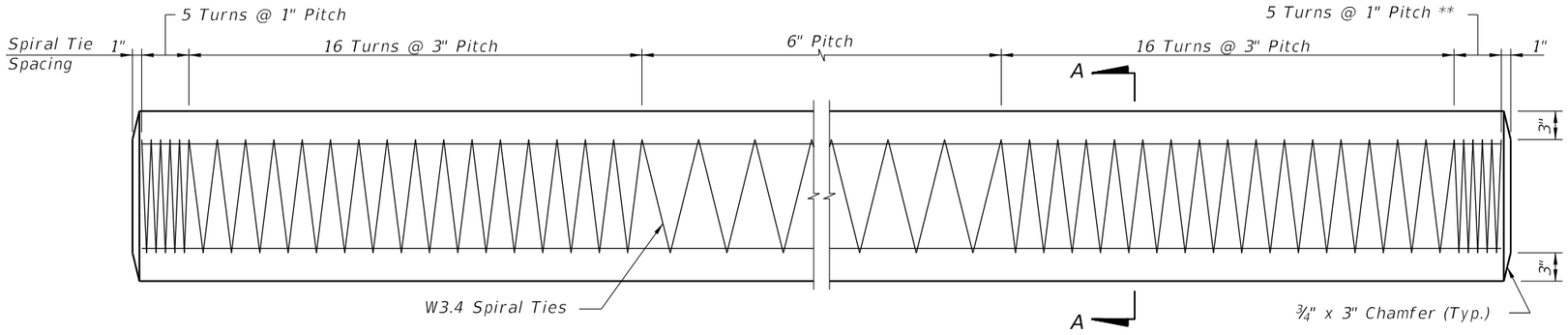
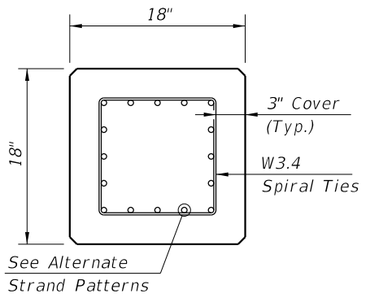
07/01/14			FDOT FY 2019-20 STANDARD PLANS	CONCRETE BOX CULVERT DETAILS	400-289	8 of 8



ELEVATION

*** See Note 4 on Index 455-002*

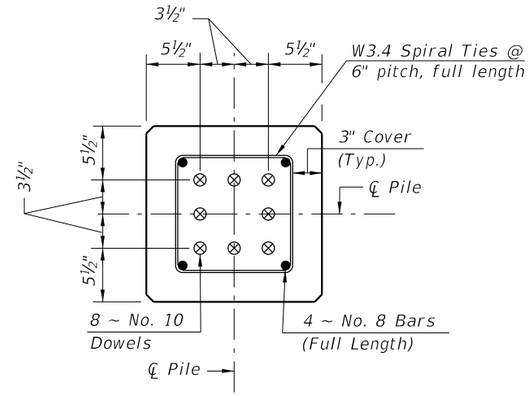


SECTION A-A

ALTERNATE STRAND PATTERNS

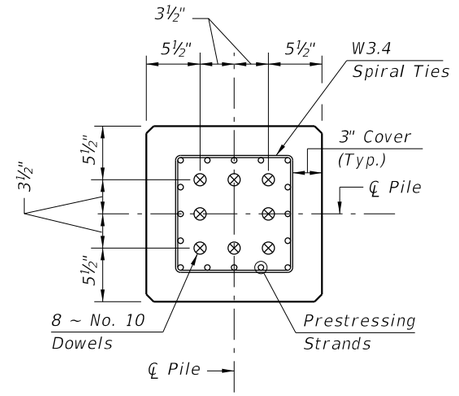
12 ~ 0.6" Ø, Grade 270 LRS, at 35 kips
12 ~ ½" Ø (Special), Grade 270 LRS, at 34 kips
16 ~ ½" Ø, Grade 270 LRS, at 26 kips
20 ~ 7/16" Ø, Grade 270 LRS, at 21 kips
24 ~ ⅜" Ø, Grade 270 LRS, at 17 kips

NOTES:
1. *Work this Index with Index 455-001 – Typical Details and Notes for Square Prestressed Concrete Piles and Index 455-002 – Square Prestressed Concrete Pile Splices.*
2. *Any of the given Alternate Strand Patterns may be utilized. The strands shall be located as follows:*
   Place one strand at each corner and place the remaining strands equally spaced between the corner strands.
   The total strand pattern shall be concentric with the nominal concrete section of the pile.



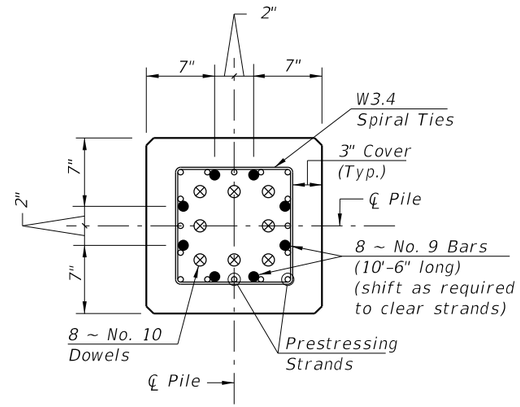
SECTION D-D

(See Non-Drivable Unforeseen Reinforced Precast Splice Detail)



SECTION E-E

(See Drivable Prestressed Precast Splice Detail)



SECTION F-F

(See Drivable Preplanned Splice Detail)

PILE SPLICE REINFORCEMENT DETAILS

10/24/2018 11:39:33 AM

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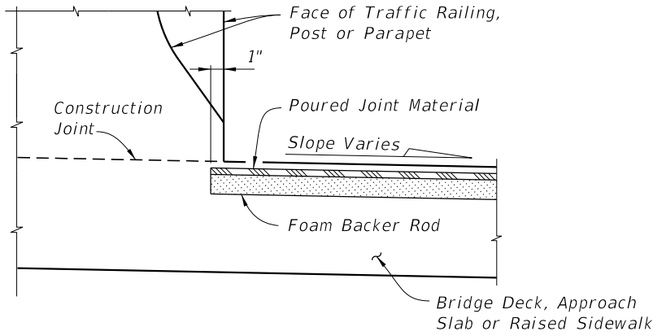
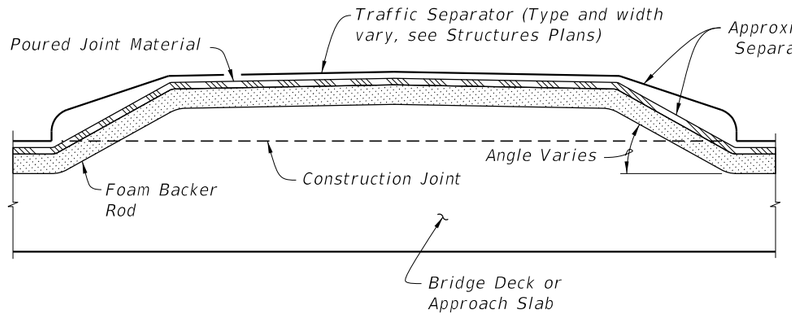
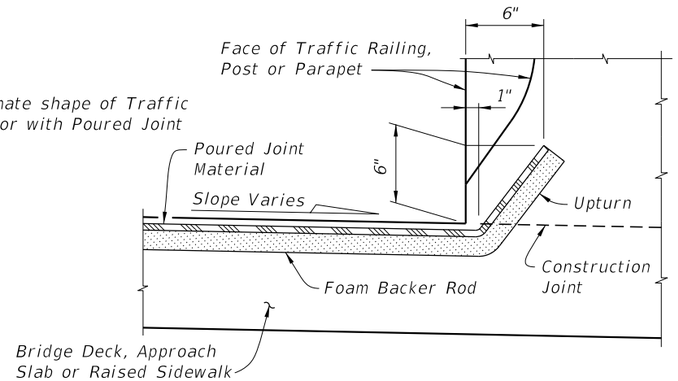
01/01/12			FDOT FY 2019-20 STANDARD PLANS	18" SQUARE PRESTRESSED CONCRETE PILE	455-018	1 of 1



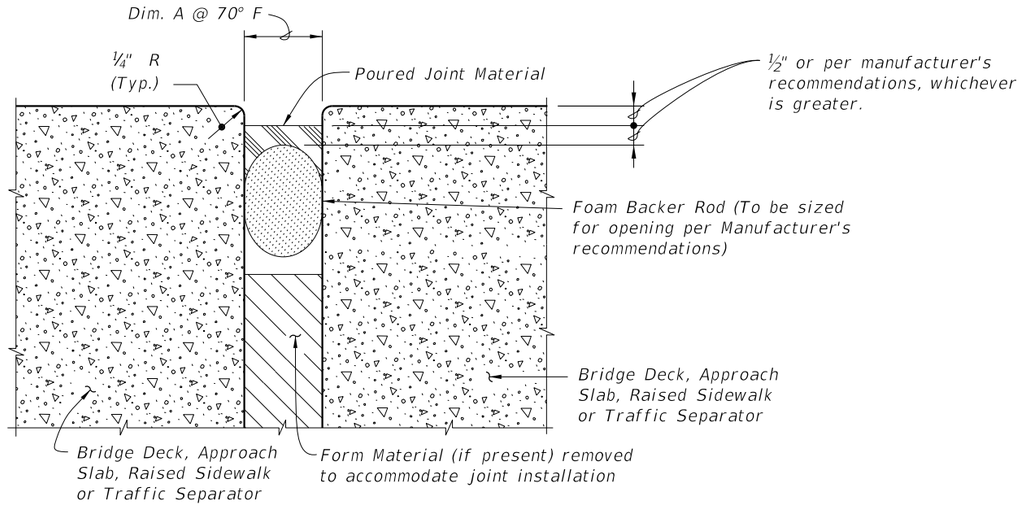
PARTIAL SECTION ALONG ℄ JOINT
JOINT TREATMENT AT HIGH SIDE OF
DECK WITH SLOPES 1% OR GREATER



PARTIAL SECTION ALONG ℄ JOINT,
JOINT TREATMENT AT TRAFFIC SEPARATOR



PARTIAL SECTION ALONG ℄ JOINT
JOINT TREATMENT AT LOW SIDE OF DECK OR
HIGH SIDE OF DECK WITH SLOPES < 1%



TYPICAL SECTION THRU JOINT

GENERAL NOTES:

1. Furnish and install Poured Joint With Backer Rod Expansion Joint Systems in accordance with Specification Sections 458 and 932 using Type D silicone sealant material.
2. Refer to the Structures Plans, Poured Expansion Joint Data Table for Dim. A @ 70° F.

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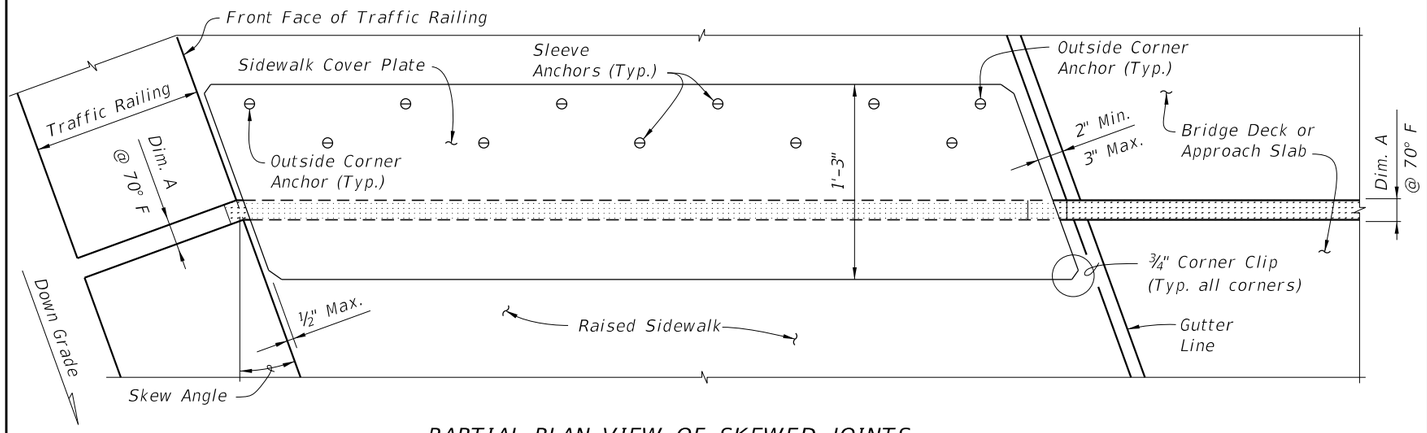
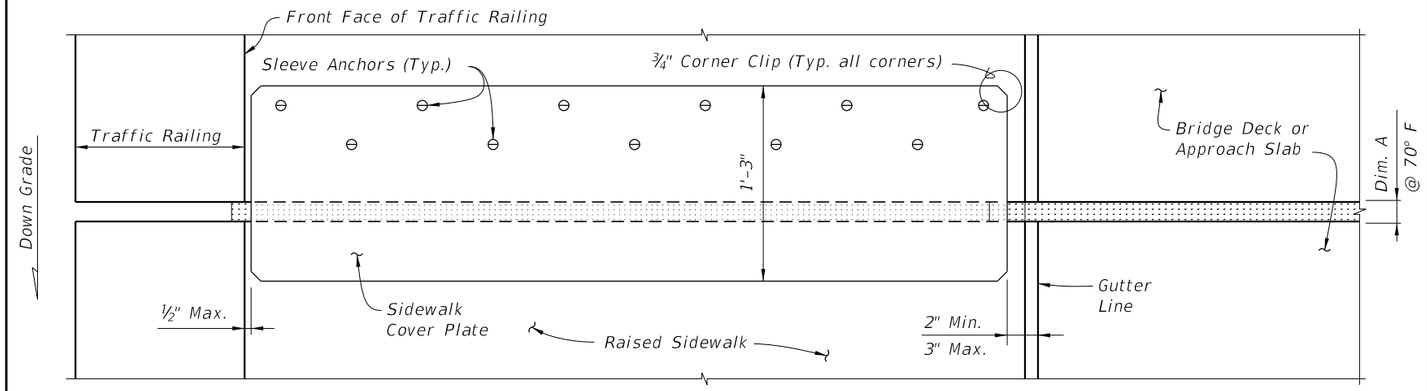
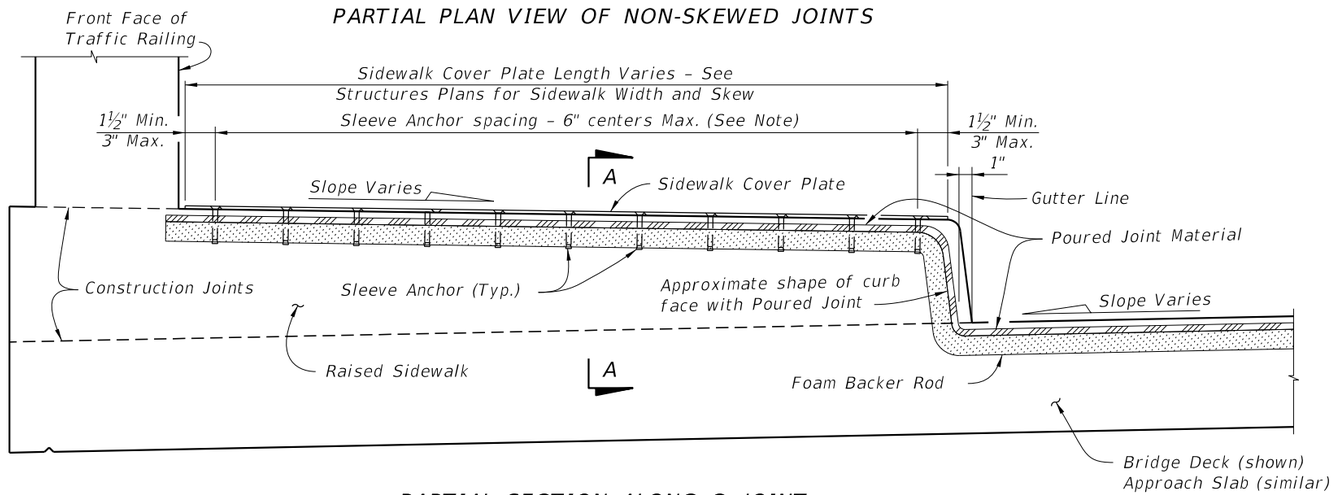
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	EXPANSION JOINT SYSTEM - POURED JOINT WITH BACKER ROD	INDEX	SHEET
07/01/14						458-110	1 of 2



PARTIAL PLAN VIEW OF SKEWED JOINTS

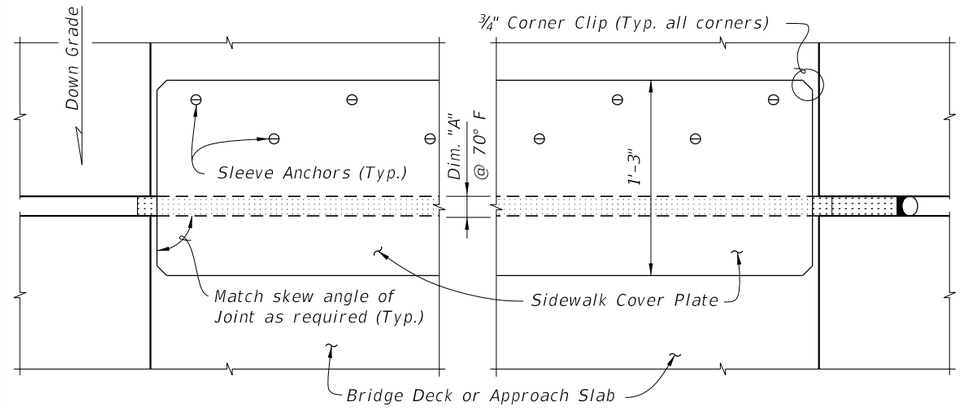


PARTIAL PLAN VIEW OF NON-SKEWED JOINTS

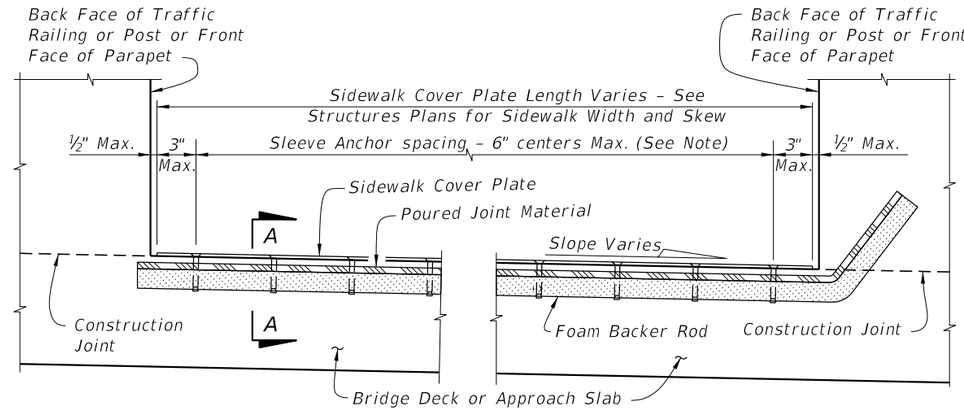


PARTIAL SECTION ALONG ℄ JOINT

RAISED SIDEWALK DETAIL

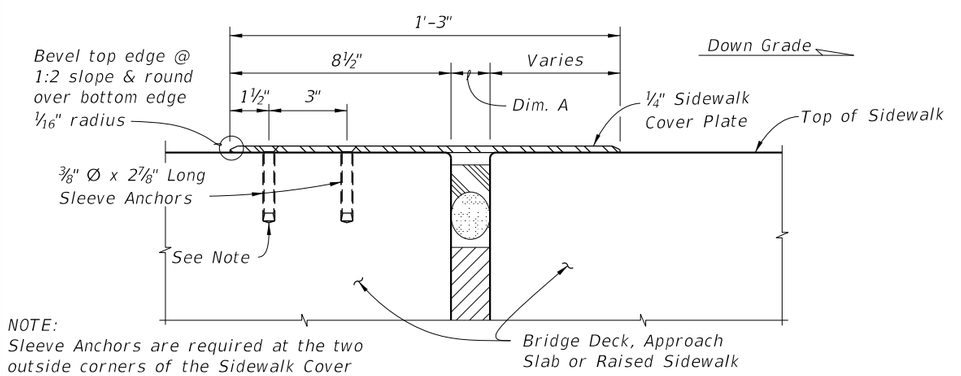


PARTIAL PLAN VIEW



PARTIAL SECTION ALONG ℄ JOINT

FLUSH SIDEWALK DETAIL



NOTE:
Sleeve Anchors are required at the two outside corners of the Sidewalk Cover Plate. Space Sleeve Anchors uniformly between the corner anchors.

SECTION A-A

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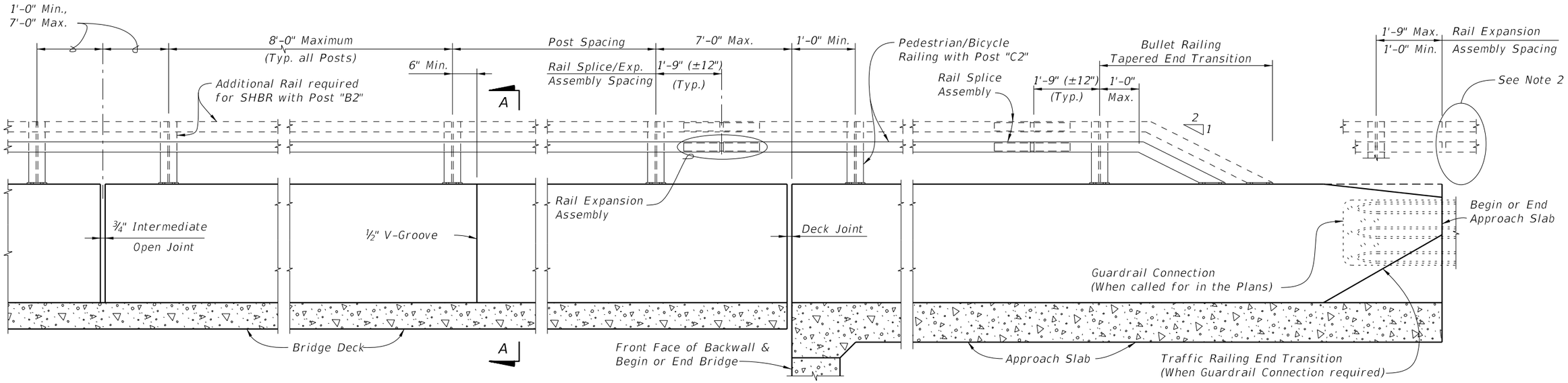
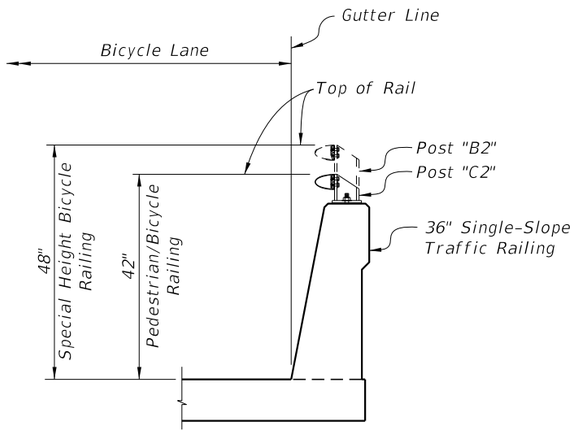
LAST REVISION	REVISION	DESCRIPTION:				
07/01/13			FDOT FY 2019-20 STANDARD PLANS	EXPANSION JOINT SYSTEM - POURED JOINT WITH BACKER ROD	INDEX 458-110	SHEET 2 of 2



ELEVATION OF INSIDE FACE OF TRAFFIC RAILING WITH PEDESTRIAN/BICYCLE BULLET RAILING



SECTION A-A
TYPICAL SECTION THRU BRIDGE DECK
(APPROACH SLAB SIMILAR)

NOTES:

1. A Bullet Railing Tapered-End Transition is required for all approach ends of Bullet Railings on Traffic Railings. When Guardrail Connection is required teminate the Bullet Railing Tapered-End Transition at begining of the Traffic Railing End Transition.

2. Where Bullet Railing continues on retaining wall mounted Traffic Railings or Barriers, provide a Bullet Railing Tapered End Transition at the terminus of the Bullet Railing.

CROSS REFERENCES:

Work in conjunction with Index 515-022.

For Traffic Railing Details, Reinforcement and Notes see Index 521-427.

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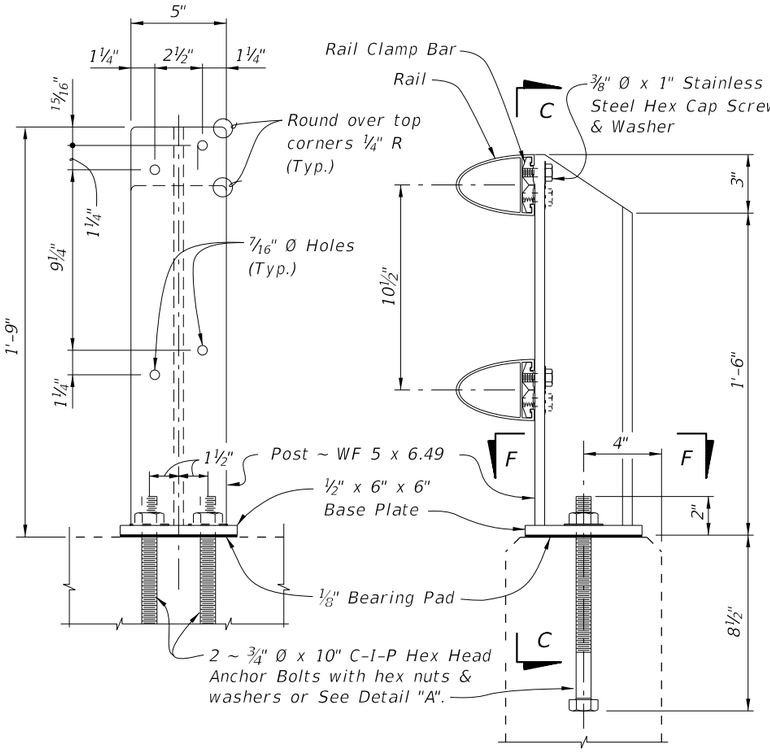
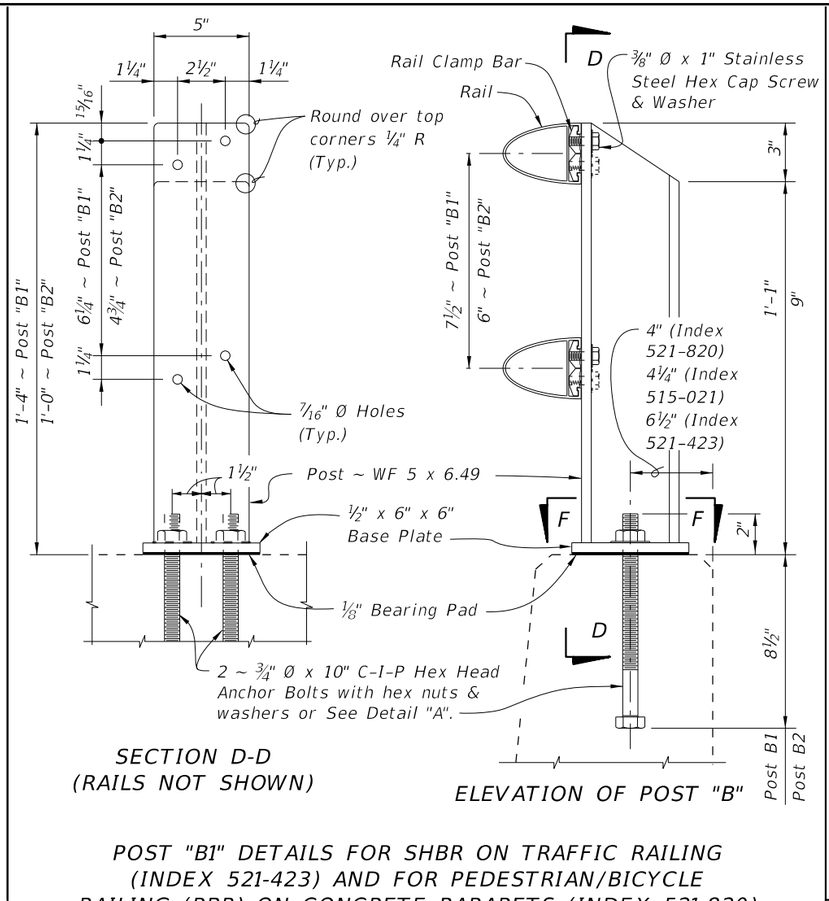
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	PEDESTRIAN/BICYCLE BULLET RAILING FOR TRAFFIC RAILING	INDEX	SHEET
11/01/17						515-021	1 of 1



SECTION C-C
(RAILS NOT SHOWN)

ELEVATION
OF POST "D"

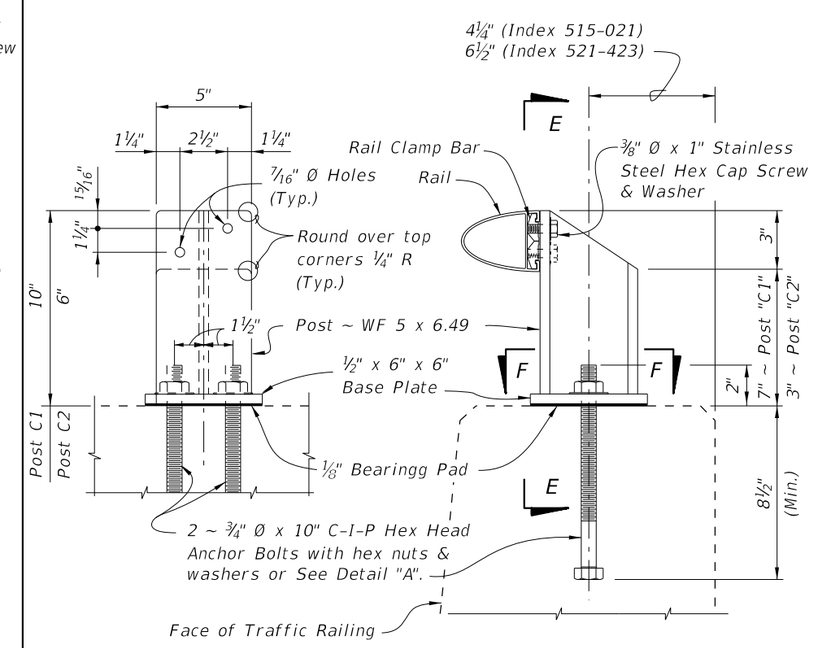
POST "D" DETAILS FOR SPECIAL HEIGHT BICYCLE RAILING (SHBR) ON CONCRETE PARAPET (INDEX 521-820)



SECTION D-D
(RAILS NOT SHOWN)

ELEVATION OF POST "B"

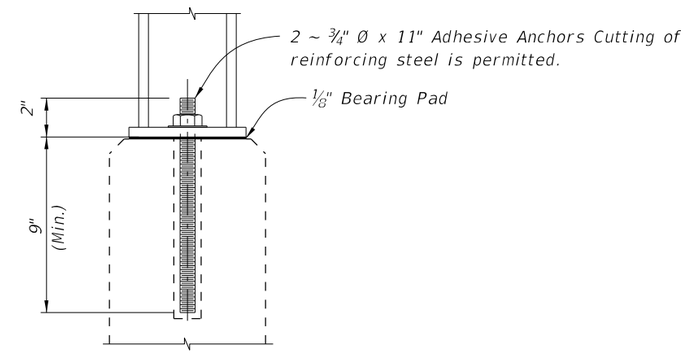
POST "B1" DETAILS FOR SHBR ON TRAFFIC RAILING (INDEX 521-423) AND FOR PEDESTRIAN/BICYCLE RAILING (PBR) ON CONCRETE PARAPETS (INDEX 521-820)
POST "B2" DETAILS FOR SHBR ON TRAFFIC RAILING (INDEX 521-427 AND 515-021)



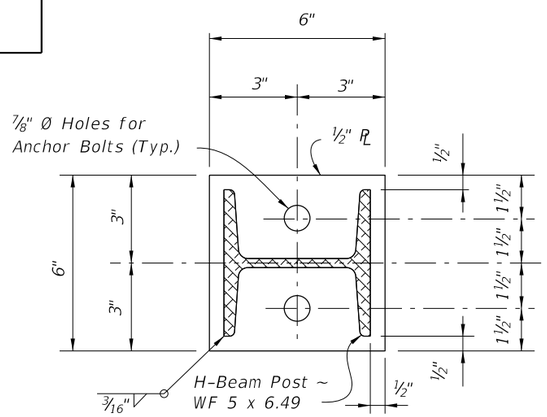
SECTION E-E
(RAIL NOT SHOWN)

ELEVATION
OF POST "C"

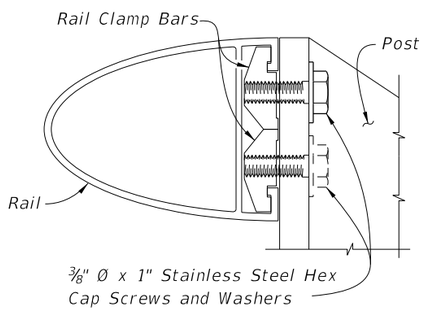
POST "C1" DETAILS FOR PEDESTRIAN/BICYCLE RAILING (PBR) ON TRAFFIC RAILINGS (INDEX 521-423)
POST "C2" DETAILS FOR PBR ON TRAFFIC RAILING (INDEX 521-427 & 515-021)



DETAIL "A"
ALTERNATE ANCHOR BOLT
(Concrete Parapet Shown, Traffic Railings Similar)



SECTION F-F
BASE PLATE DETAIL



RAIL TO POST CONNECTION DETAIL

CROSS REFERENCES:

For post spacing on Concrete Parapets see Index 521-820.

For post spacing on Traffic Railings see Index 515-021.

For Rail Details see Sheet 2.

For Railing Notes and Tapered End Transition Details see Sheet 3.

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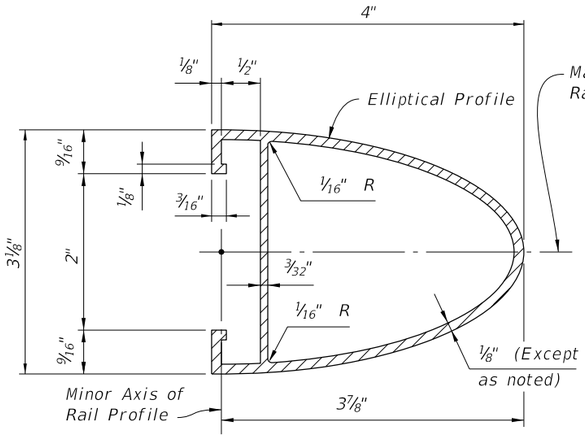
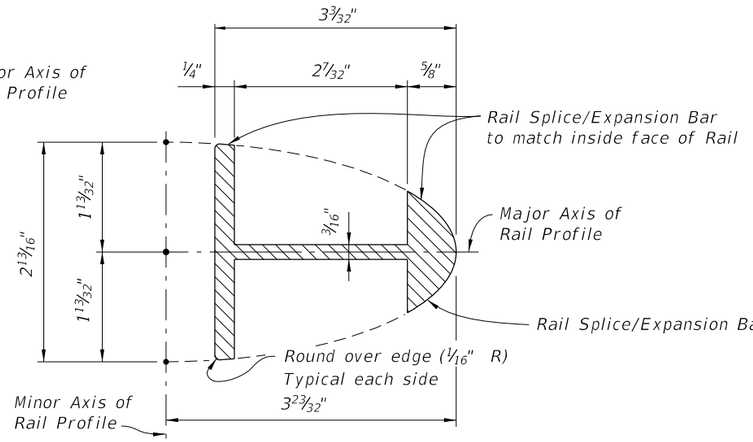
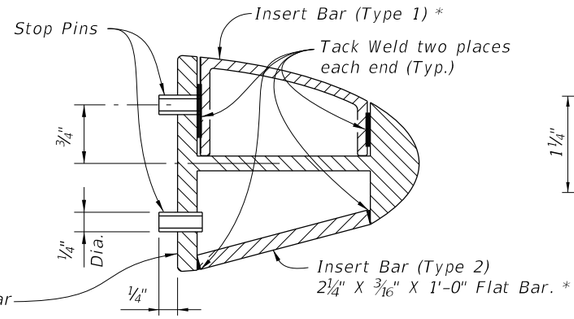
LAST REVISION	REVISION	DESCRIPTION:	FY 2019-20 STANDARD PLANS	PEDESTRIAN/BICYCLE BULLET RAILING DETAILS	INDEX	SHEET
11/01/17					515-022	1 of 3



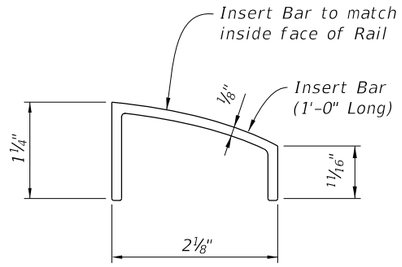
SECTION A-A
TYPICAL SECTION THRU RAIL



SECTION B-B - RAIL SPLICE/EXPANSION BAR
(Rail not shown for clarity)

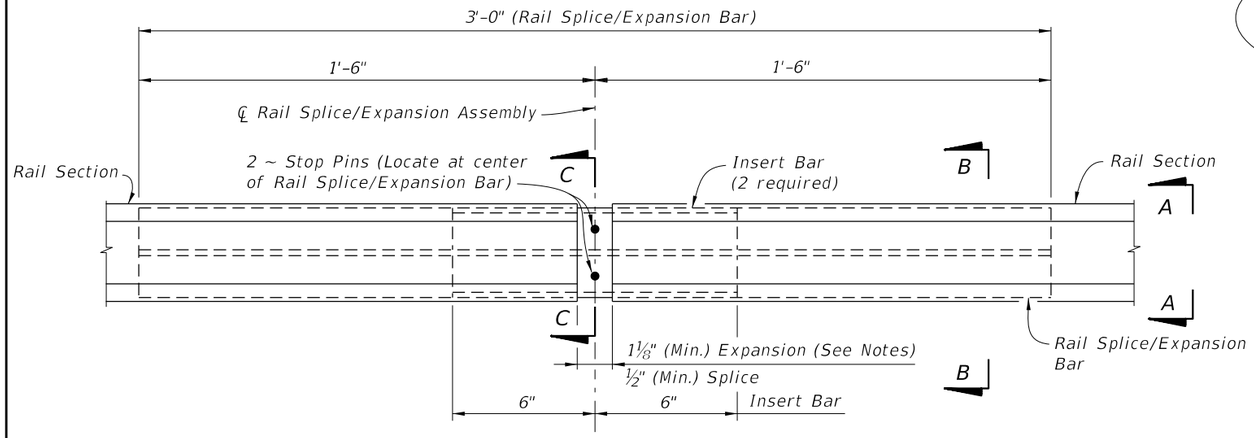


SECTION C-C
RAIL SPLICE/EXPANSION
BAR ASSEMBLY

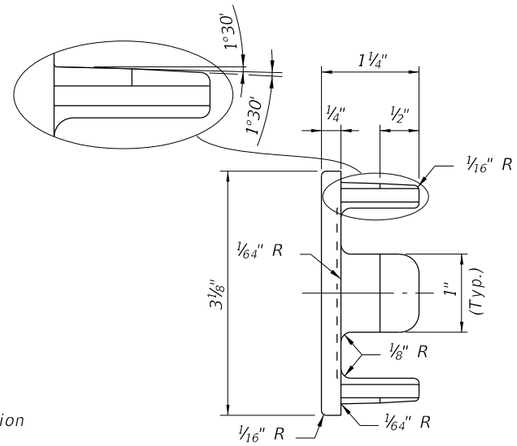


INSERT BAR DETAIL (TYPE 1)

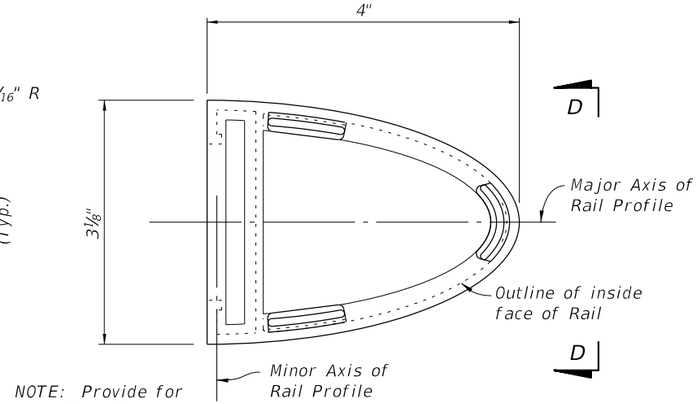
* Use of either Type 1 or Type 2 Insert Bars is at the option of the Contractor.



RAIL SPLICE/EXPANSION ASSEMBLY DETAIL



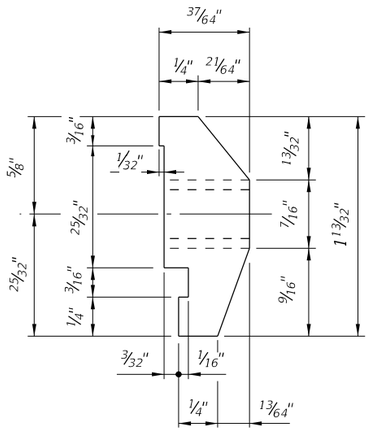
VIEW D-D



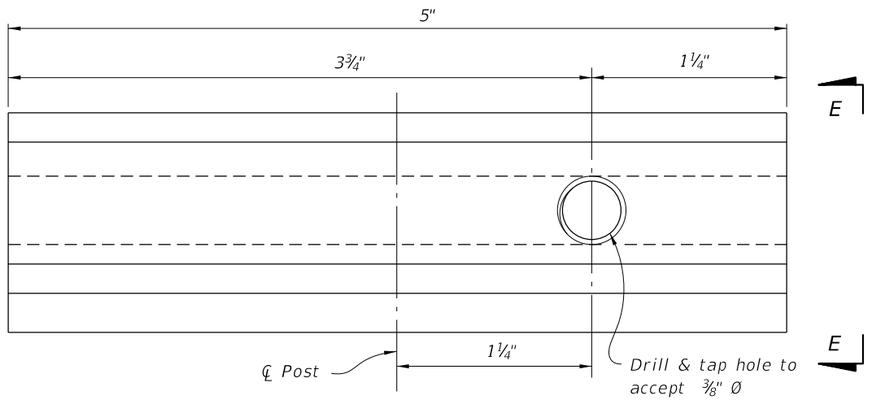
NOTE: Provide for drive fit.

RAIL END CAP DETAIL

CROSS REFERENCE:
For Notes and Tapered End Transition Details, See Sheet 3.



VIEW E-E



RAIL CLAMP BAR DETAIL

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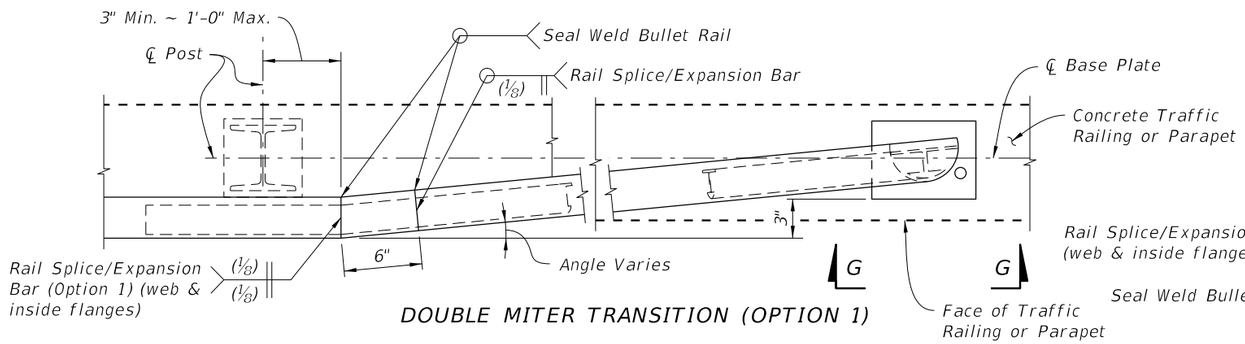
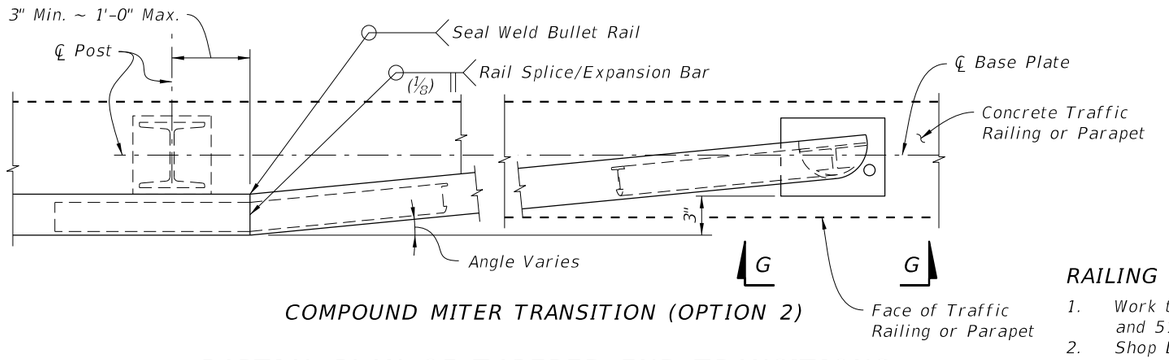
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
07/01/14			FDOT FY 2019-20 STANDARD PLANS	PEDESTRIAN/BICYCLE BULLET RAILING DETAILS	515-022	2 of 3

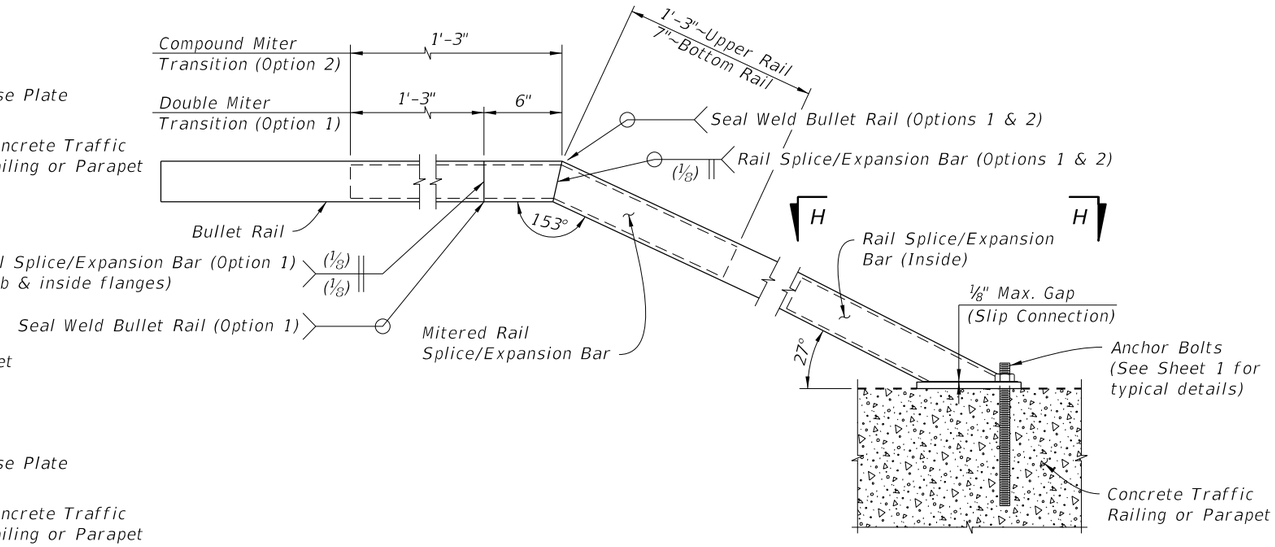


DOUBLE MITER TRANSITION (OPTION 1)

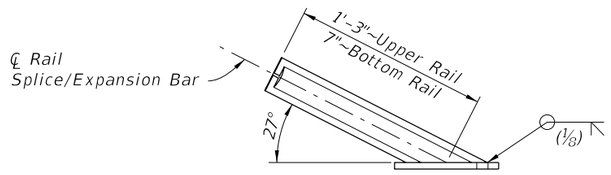


COMPOUND MITER TRANSITION (OPTION 2)

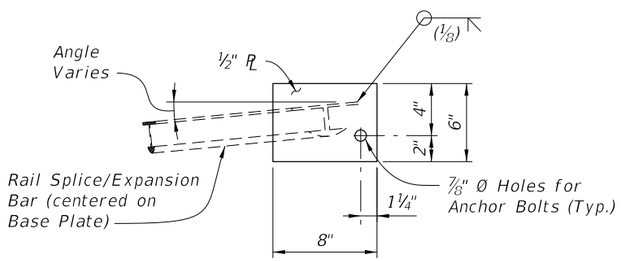
PARTIAL PLAN OF TAPERED END TRANSITIONS
(Single Rail Shown, Double or Triple Rail Similar)



ELEVATION OF TAPERED END TRANSITION
(Single Rail Shown, Double or Triple Rail Similar)



VIEW G-G TRANSITION BASE PLATE
(Bullet Rail not shown for Clarity)



VIEW H-H TRANSITION BASE PLATE
(Bullet Rail not shown for Clarity)

RAILING NOTES:

1. Work this Index with Index 521-423, 521-427, 521-428, 521-820 and 515-021 and Specification Section 515.
2. Shop Drawings: Submit shop drawings prior to fabrication.
   A. Include post and rail splice/expansion assembly location for curved alignments with radii < 40 feet and for all end terminations.
3. Materials:
   A. Supply Aluminum materials In accordance with Specification Section 965 and the following:
   Wrought Aluminum Post: ASTM B221, Alloy 6061-T6 or 6351-T5
   Rail End Cap: ASTM B26 sand cast aluminum alloy 356.0-F
   Plate and Bars: ASTM B209 Alloy 6061-T6
   Rails: ASTM B221 Alloy 6061-T6 or 6351-T5.
   Stop Pins: Press-fit aluminum or stainless steel pins or tubes
   B. Stainless Steel Fasteners: ASTM F-593, Alloy Group 2 (316).
   C. Bearing Pads: Plain or Fiber Reinforced meeting Specification Section 932 for Ancillary Structures.
4. Layout:
   A. Posts shall be uniformly spaced with reasonable consistency.
   B. Tapered End Transitions are required at the terminus of the approach ends of Bullet Railing mounted on a Traffic Railing. Bullet Railings on concrete parapets shielded by a traffic railing do not require Tapered End Transitions unless noted otherwise in the Plans.
   C. Adjust post spacing's to avoid parapet obstacles, such as armor expansion plates, by 9 inches minimum.
   D. Rails shall be continuous over a minimum of 3 posts, except that lengths less than 12 feet need only be continuous over 2 posts.
   E. Space splices at 40 feet maximum. Splice all rails in a given railing section at about the same center line.
   F. Provide rail expansion assemblies in panels between posts on either side of a bridge expansion joint. Rail expansion assemblies are similar to the rail splice assemblies with increased space at the expansion assembly to allow for movement equal to 1.5 times the bridge joint opening or 1" greater than the expected joint movement.
5. Installation:
   A. Set rails near bridge expansion joints to allow for expected movement.
   B. Cutting of reinforcing steel is permitted for post installed anchors.
6. Payment: Includes the full cost of installed bullet railing. Cost of the Concrete Parapet or Traffic Railing is separate.

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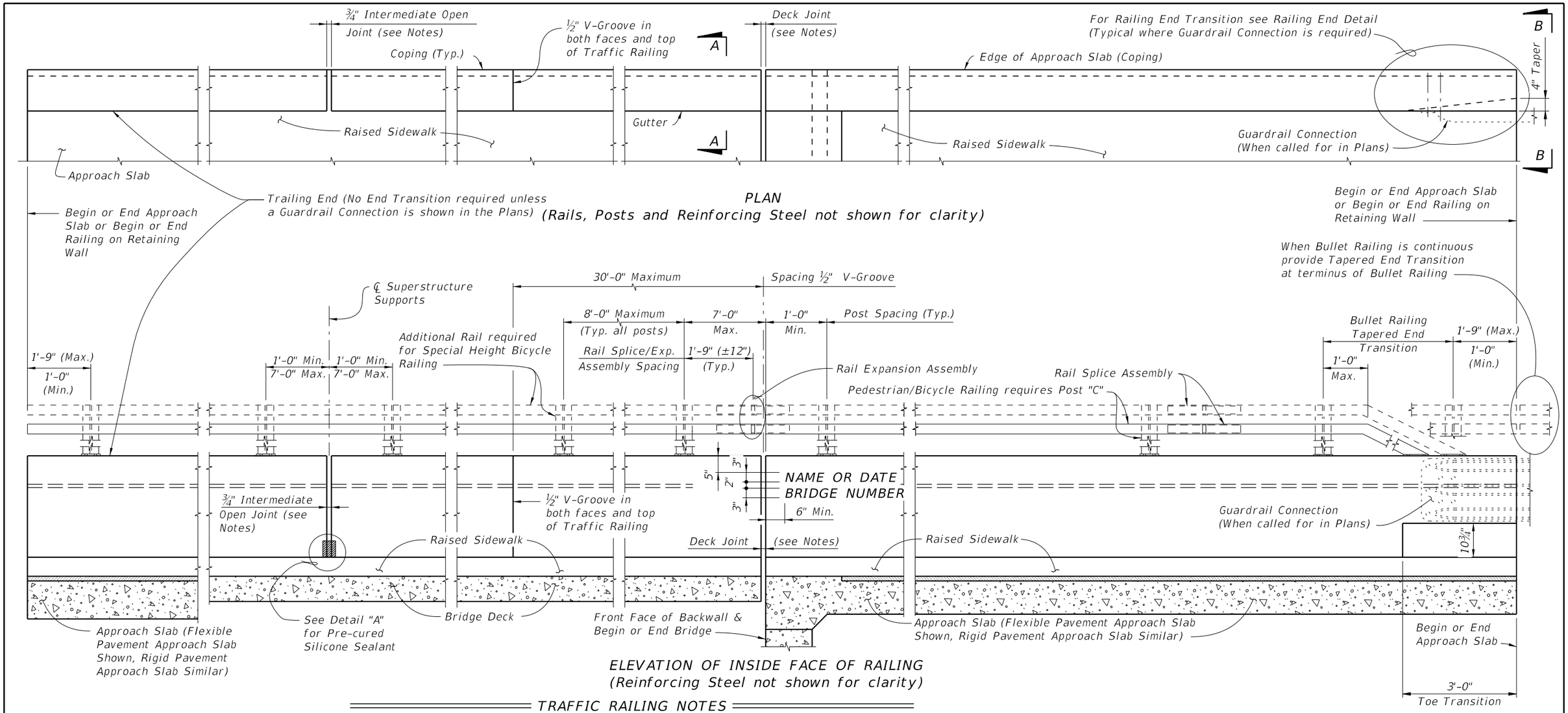
LAST REVISION	REVISION	DESCRIPTION:				
11/01/17			FDOT FY 2019-20 STANDARD PLANS	PEDESTRIAN/BICYCLE BULLET RAILING DETAILS	INDEX 515-022	SHEET 3 of 3



ELEVATION OF INSIDE FACE OF RAILING
(Reinforcing Steel not shown for clarity)

TRAFFIC RAILING NOTES

This railing has been structurally evaluated to be equivalent or greater in strength to other safety shape railings which have been crash tested to NCHRP Report 350 TL-4 and MASH TL-4 Criteria.

CONCRETE AND REINFORCING STEEL : See Structures Plans, General Notes.
GUARDRAIL : For Guardrail Connection details, see Index 536-001.
PEDESTRIAN/BICYCLE RAILING AND SPECIAL HEIGHT BICYCLE RAILING DETAILS : See Index 515-022 for Post, Rail and Rail Splice/Expansion Assembly fabrication and installation Details and Notes.
V-GROOVES : Construct ½" V-Grooves plumb. Space V-Grooves equally between ¾" Open Joints and/or Deck Joints and at V-Groove locations on Retaining Wall footings.
BARRIER DELINEATORS: Install Barrier Delineators on top of the Traffic Railing 2" from the face on the traffic side in accordance with Specification Section 705. Match the Barrier Delineator to the color (white or yellow) of the near edgeline.
END TRANSITION: When guardrail approaches are shown in the plans, provide Railing End Transition.

RAILINGS ON RETAINING WALLS : If the Traffic Railing is to be provided on a retaining wall, the railing section will be the same as shown on Sheet 2. All other details such as the End Transition, Guardrail Connection, the maximum spacing of the ¾" open joints and ½" V-Groove shall apply.
NAME, DATE, AND BRIDGE NUMBER : The Name and Bridge Number shall be placed on the Traffic Railing so as to be seen on the driver's right side when approaching the bridge. The Date shall be placed on the driver's left side when approaching the bridge. The Name shall be as shown in the General Notes of the Structures Plans. The Date shall be the year the bridge is completed. For a widening when the existing railing is removed, use both the existing date and the year of the widening. Black plastic letters and figures 3" in height may be used, as approved by the Engineer, in lieu of the letters and figures formed by ⅜" V-Grooves. V-Grooves shall be formed by preformed letters and figures.
OPEN JOINTS : See Structures Plans, Superstructure, Approach Slab Sheets and Retaining Walls for actual dimensions and joint orientation. Provide open Traffic Railing Joints at Deck Expansion Joint locations matching the dimensions of the Deck Joint. For treatment of Railings on skewed bridges see Index 521-427.
Provide ¾" Intermediate Open Joints at :
(1) – Superstructure supports where slab is continuous.
(2) – Ends of approach slabs when adjacent to retaining walls and at expansion joints on retaining wall junction slabs.

CROSS REFERENCE:
For Section A-A and View B-B, see Sheet 2.
For Detail "A" see Sheet 3.

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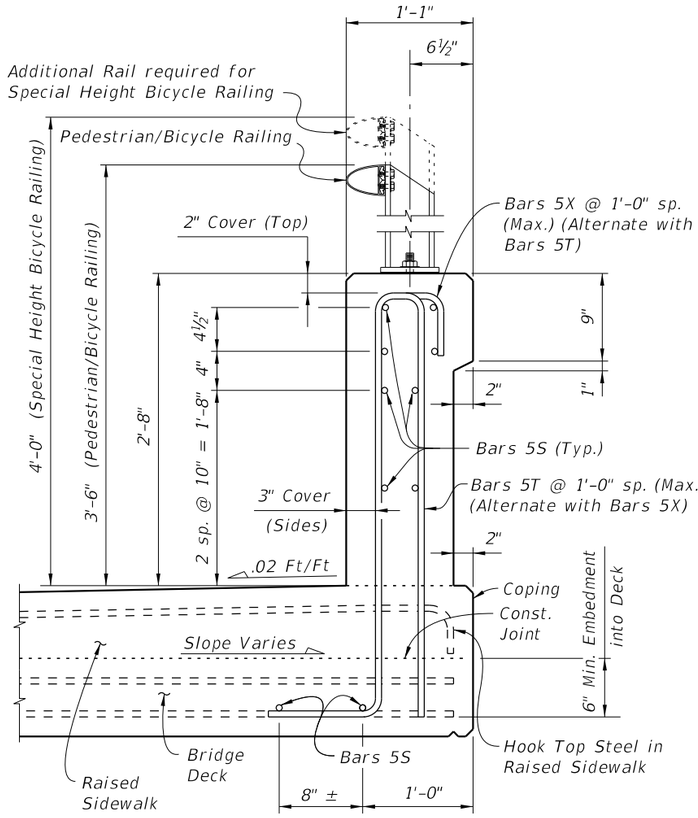
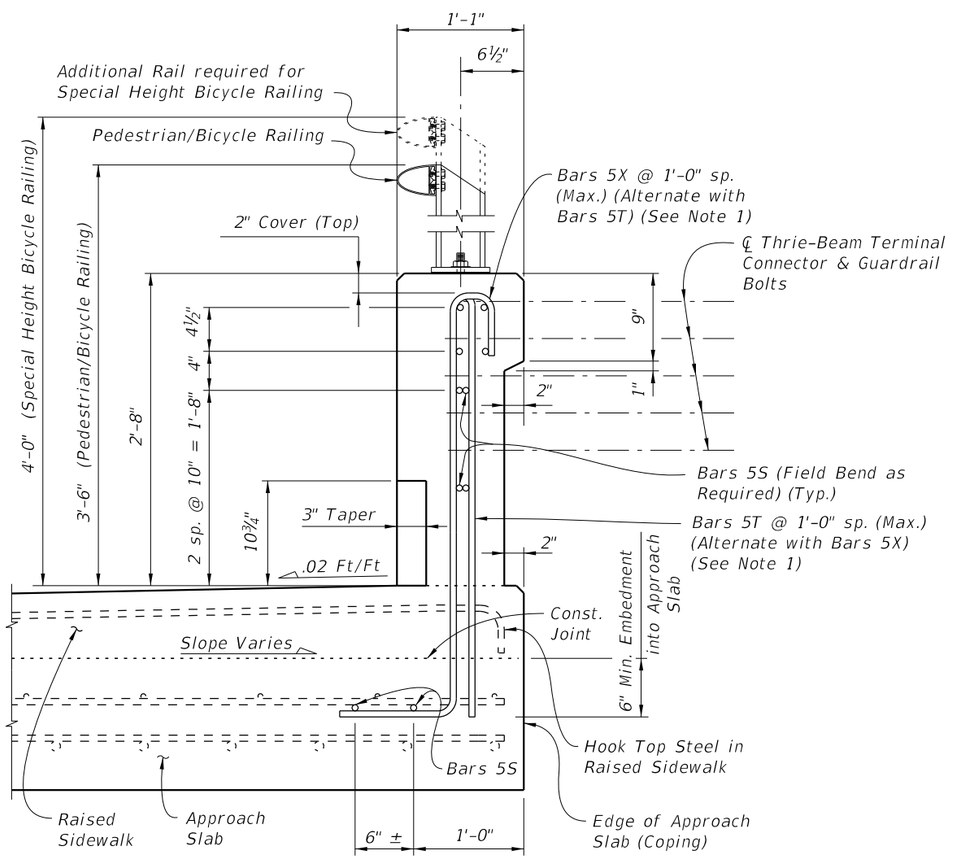
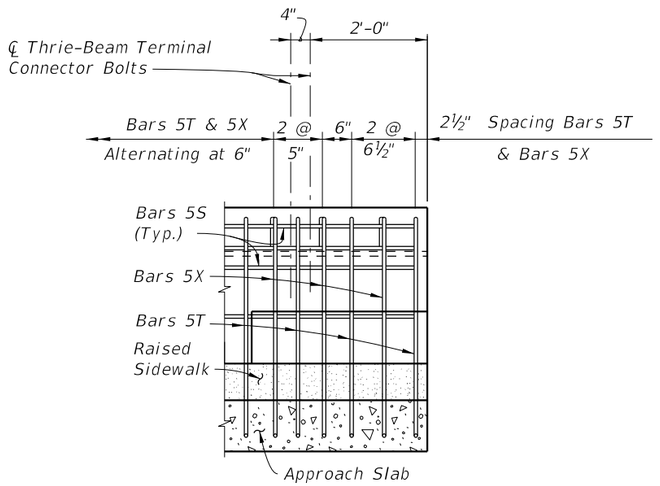
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (32" VERTICAL SHAPE)	INDEX	SHEET
11/01/18						521-423	1 of 3



SECTION A-A
TYPICAL SECTION THRU TRAFFIC RAILING
(Section Thru Bridge Deck shown)



VIEW B-B
APPROACH SLAB END VIEW
OF TRAFFIC RAILING



RAILING END DETAIL
(Guardrail Not Shown For Clarity)

NOTES:

1. Begin placing Railing Bars 5T and 5X on Approach Slab at the railing end and proceed toward Begin or End Bridge to avoid conflict with guardrail bolt holes. If required, adjustments to the bar spacing for Bars 5T and 5X shall be made immediately adjacent to Begin or End Bridge. Cut, shift and rotate Bars 5T and 5X as required to maintain cover in Railing End Transition.

2. Omit Railing End Transition and Guardrail if Concrete Traffic Railing is used beyond the Approach Slab or Retaining Wall. See Structures Plans, Plan and Elevation Sheet and Roadway Plans. If Taper and Railing End Transition is omitted, extend Typical Section to end of the Approach Slab or limiting station on Retaining Wall, and space Bars 5T and 5X at 1'-0" (Typ.)

CROSS REFERENCE:
For location of Section A-A and View B-B see Sheet 1.

NOTE: For Bullet Railing Details, see Index 515-022.

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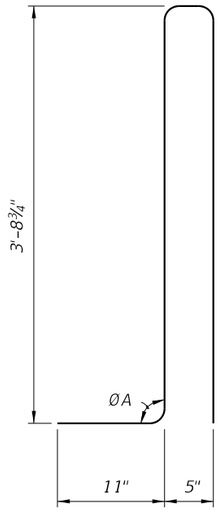
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (32" VERTICAL SHAPE)	INDEX	SHEET
11/01/17						521-423	2 of 3

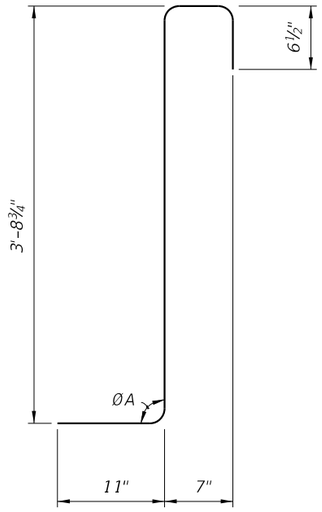
CONVENTIONAL REINFORCING STEEL BENDING DIAGRAMS

BILL OF REINFORCING STEEL		
MARK	SIZE	LENGTH
S	5	As Reqd.
T	5	9'-0"
X	5	5'-10"

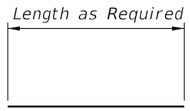
ROADWAY CROSS-SLOPE	ØA	
	LOW GUTTER	HIGH GUTTER
0% to 2%	90°	90°
2% to 6%	87°	93°
6% to 10%	84°	96°



STIRRUP BAR 5T



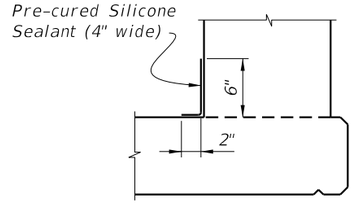
STIRRUP BAR 5X



BAR 5S

REINFORCING STEEL NOTES:

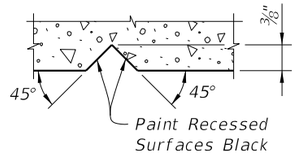
1. All bar dimensions in the bending diagrams are out to out.
2. The 3'-8¾" vertical dimensions shown for Bars 5T and 5X are based on a bridge deck with a 6" thick x 6' wide raised sidewalk at low side of deck, 2% deck cross slope and a counter 2% raised sidewalk cross slope. If the raised sidewalk thickness, width or cross slopes vary from the above amounts, adjust these vertical dimensions accordingly to achieve a 6" minimum embedment into the bridge deck.
3. The reinforcement for the railing on a Retaining Wall shall be the same as detailed with ØA = 90°.
4. All reinforcing steel at the open joints shall have a 2" minimum cover.
5. Bars 5S may be continuous or spliced at the construction joints. Bar splices for Bars 5S shall be a minimum of 2'-2".
6. The Contractor may utilize Welded Wire Reinforcement (WWR) when approved by the Engineer. WWR must consist of Deformed wire meeting the requirements of Specification Section 931.



DETAIL "A" - SECTION
AT INTERMEDIATE OPEN JOINT

INTERMEDIATE JOINT SEAL NOTES:

1. At Intermediate Open Joints, seal the lower 6" portion of the open joint with Pre-cured Silicone Sealant in accordance with Specification Section 932.
2. Apply sealant prior to any Class V finish coating and remove all curing compound and loose material from the surface prior to application of bonding agent.
3. The cost of the Pre-cured Silicone Sealant shall be included in the Contract Unit Price for the Traffic Railing.



SECTION THRU RECESSED "V" GROOVE
TO FORM INSCRIBED LETTERS AND FIGURES

ESTIMATED TRAFFIC RAILING QUANTITIES		
ITEM	UNIT	QUANTITY
Concrete	CY/LF	0.095
Reinforcing Steel	LB/LF	25.90

(The above quantities are based on a 6" thick x 6' wide raised sidewalk at low side of deck, 2% deck cross slope and counter 2% sidewalk cross slope.)

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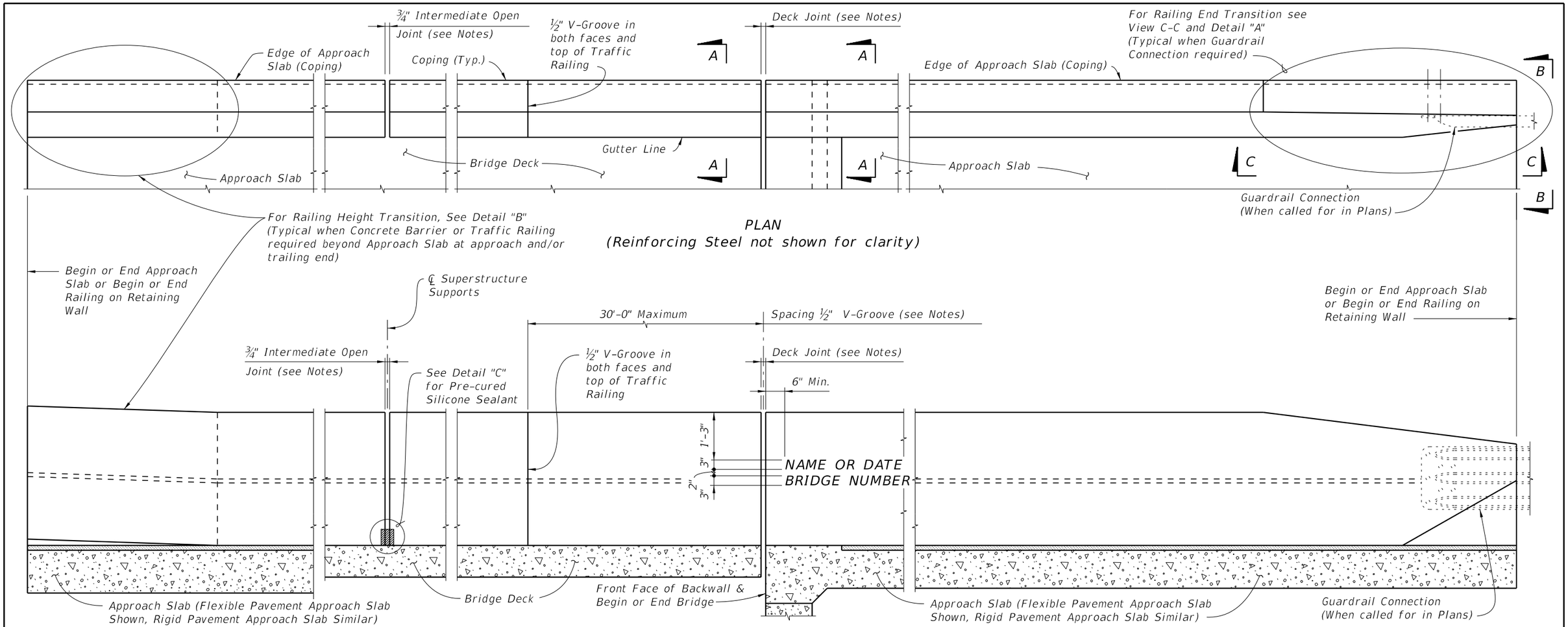

PLAN
(Reinforcing Steel not shown for clarity)

ELEVATION OF INSIDE FACE OF RAILING
(Reinforcing Steel not shown for clarity)
(Railing on Bridge Deck and Approach Slab shown, Railing on Retaining Wall similar)

CROSS REFERENCE:
For Section A-A, End View B-B and Detail "A" see Sheet 2.
For Detail "B" see Sheet 3.
For Detail "C" see Sheet 4.

TRAFFIC RAILING NOTES

This railing has been structurally evaluated to be equivalent or greater in strength to other single slope railings which have been crash tested to MASH TL-5.

CONCRETE AND REINFORCING STEEL: See Structures Plans, General Notes.

SUPERELEVATED BRIDGES: At the option of the Contractor the Traffic Railing on superelevated bridges may be constructed perpendicular to the roadway surface. If an adjoining railing is constructed plumb, transition the end of the Traffic Railing from perpendicular to plumb over a minimum distance of 20'-0". The cost of all modifications will be at the Contractor's expense.

GUARDRAIL: For Guardrail connection details, see Index 536-001.

V-GROOVES: Construct ½" V-Grooves plumb. Space V-Grooves equally between ¾" Open Joints and/or Deck Joints and at V-Groove locations on Retaining Wall footings.

END TRANSITIONS: When guardrail approaches are shown in the Plans, provide the Railing End Transition as shown in Detail "A". When a concrete traffic railing or barrier is shown on the approaches, provide the Railing Height Transition as shown in Detail "B".

NAME, DATE, AND BRIDGE NUMBER: The Name and Bridge Number shall be placed on the Traffic Railing so as to be seen on the driver's right side when approaching the bridge. The Date shall be placed on the driver's left side when approaching the bridge. The Name shall be as shown in the General Notes in the Structures Plans. The Date shall be the year the bridge is completed. For a widening when the existing railing is removed, use both the existing date and the year of the widening. Black plastic letters and figures 3" in height may be used, as approved by the Engineer, in lieu of the letters and figures formed by ⅜" V-Grooves. V-Grooves shall be formed by preformed letters and figures.

JOINTS: See Structures Plans, Superstructure, Approach Slab and Retaining Walls Sheets for actual dimensions and joint orientation. Provide open Railing Joints at Deck Expansion Joint locations matching the dimensions of the Deck Joint. For treatment of Railings on skewed bridges see Index 521-427.
Provide ¾" Intermediate Open Joints shall be provided at:
(1) - Superstructure supports where slab is continuous.
(2) - Ends of approach slabs when adjacent to retaining walls and at expansion joints on retaining wall junction slabs.

BARRIER DELINEATORS: Install Barrier Delineators on top of the Traffic Railing 2" from the face on the traffic side in accordance with Specification Section 705. Match the Barrier Delineator to the color (white or yellow) of the near edgeline.

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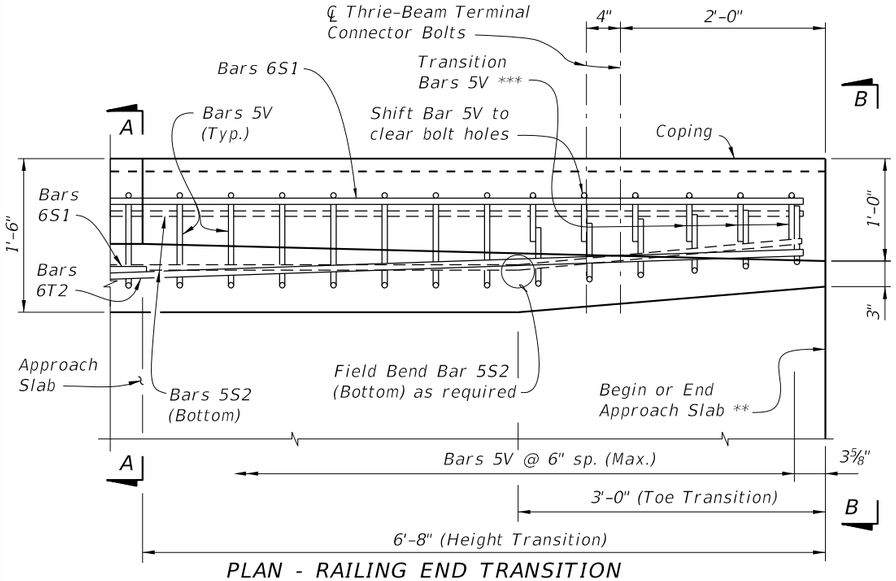
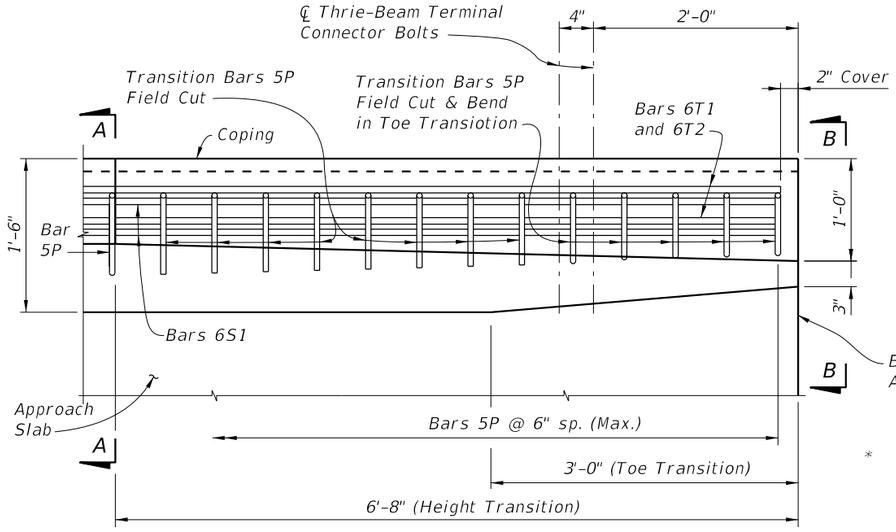
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (42" SINGLE-SLOPE)	INDEX	SHEET
11/01/18						521-428	1 of 4



PLAN - RAILING END TRANSITION
(Showing Lower Section with Bars 5V, 6S1, 5S2 and 6T2)



PLAN - RAILING END TRANSITION
(Showing Upper Section with Transition
Bars 5P and Bars 6S1, 6T1 & 6T2)

NOTE:
Begin placing Railing Bars 5P and 5V on Approach Slab at the railing end and proceed toward Begin or End Bridge to ensure placement of guardrail bolt holes. If required, adjustments to the bar spacing for Bars 5P and 5V shall be made immediately adjacent to Begin or End Bridge. Shift Bars 5P and 5V (see Detail "A") as required to maintain cover in Railing End Transition.

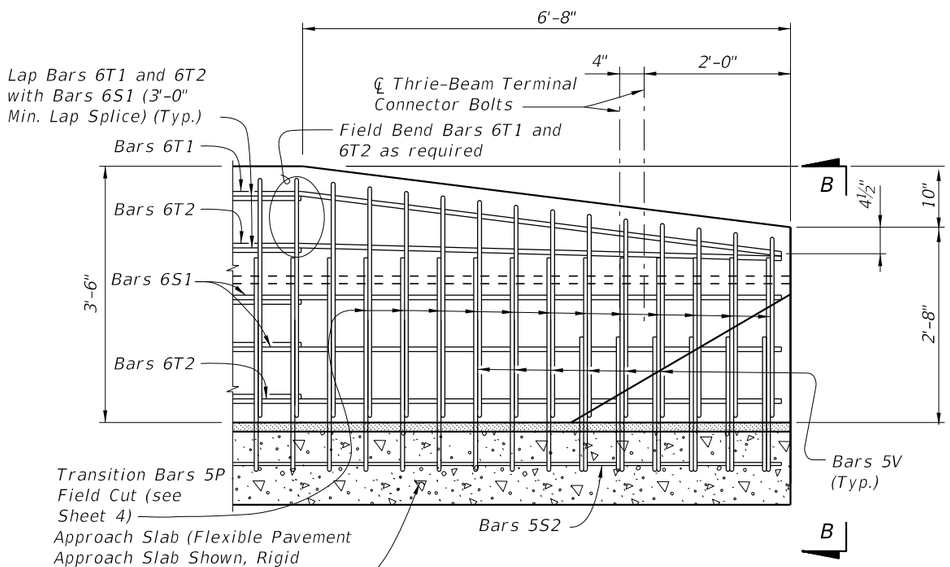
* Where railings of adjacent bridges are to be built back to back, the outside vertical plane of the railing and deck may coincide along a plane centered 1'-6" from each gutter line. A bond breaker will be required. See Structures Plans, Superstructure Sheets for Details.

** See joint orientation note on Sheet 1.

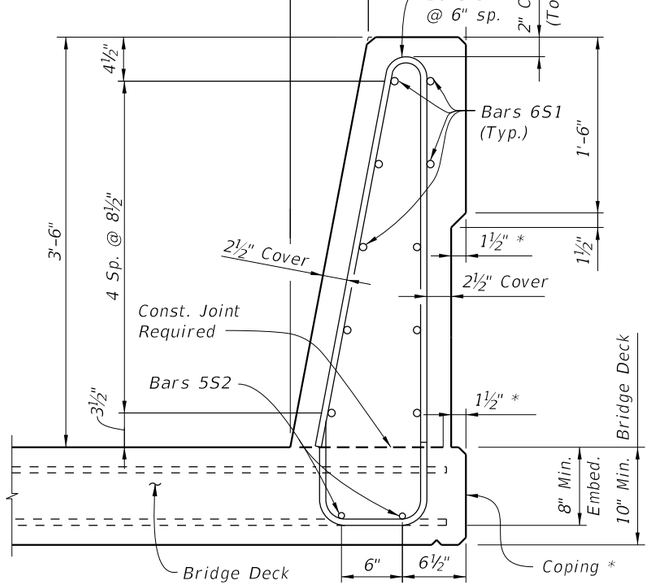
*** Field Cut & Lap Bars 5V in Toe Transition to maintain clearance.

DETAIL "A"

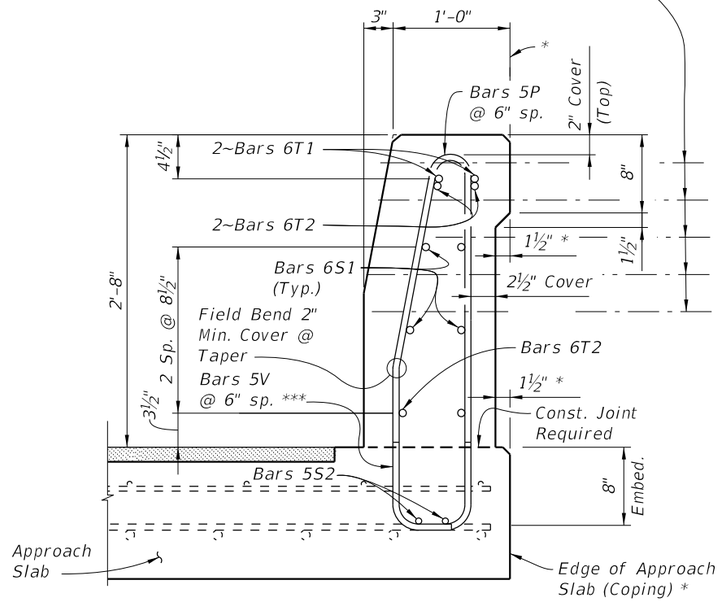
NOTE:
Omit Detail "A" and provide Detail "B" if 44" Concrete Barrier or Single-Slope Traffic Railing is used beyond the Approach Slab. See Structures Plan and Elevation Sheet and Roadway Plans. If Transitions are not required, extend Typical Section to end of Approach Slab.



VIEW C-C
ELEVATION - RAILING END TRANSITION
(Guardrail not shown for clarity)



SECTION A-A
TYPICAL SECTION THRU TRAFFIC RAILING
(Section Thru Bridge Deck shown -
Section Thru Approach Slab similar)



VIEW B-B
END TRANSITION
(Section thru Approach Slab shown,
Section thru Retaining Walls similar)

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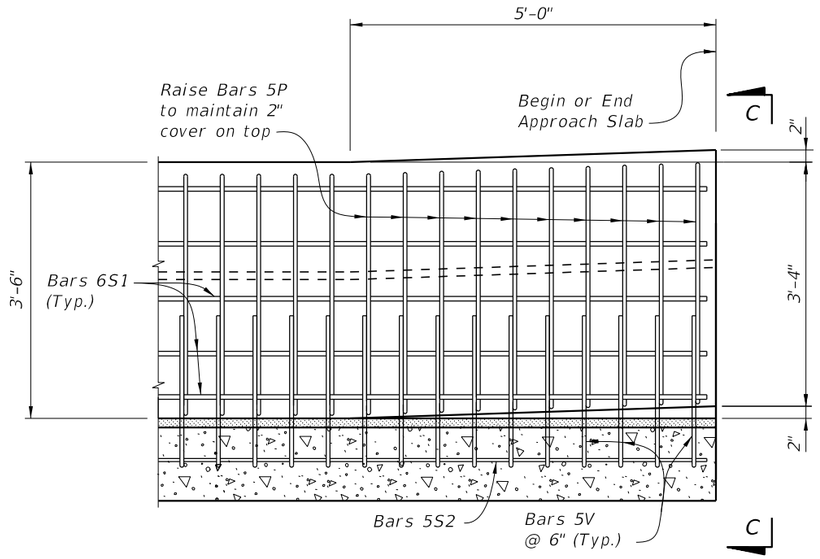
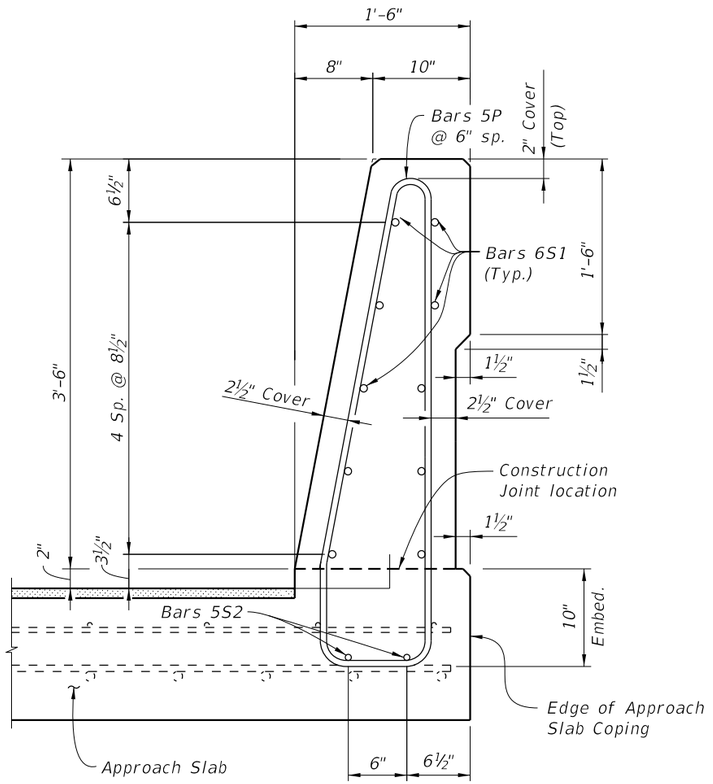
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
11/01/17			FDOT FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (42" SINGLE-SLOPE)	521-428	2 of 4



ELEVATION
RAILING HEIGHT TRANSITION



VIEW C-C
RAILING HEIGHT TRANSITION
(Section Thru Approach Slab shown)

DETAIL "B"

NOTE:
Provide Detail "B" Height Transition where 44" Single-Slope Traffic Railings or Barriers are shown on approaches.

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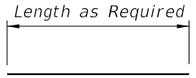
LAST REVISION	REVISION	DESCRIPTION:				
11/01/17			FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (42" SINGLE-SLOPE)	INDEX 521-428	SHEET 3 of 4

CONVENTIONAL REINFORCING STEEL BENDING DIAGRAMS

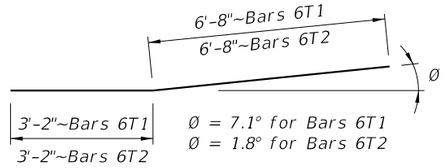
BILL OF REINFORCING STEEL		
MARK	SIZE	LENGTH
P	5	7'-0"
S1	6	As Reqd.
S2	5	As Reqd.
T1 & T2	6	10'-0"
V	5	5'-9"



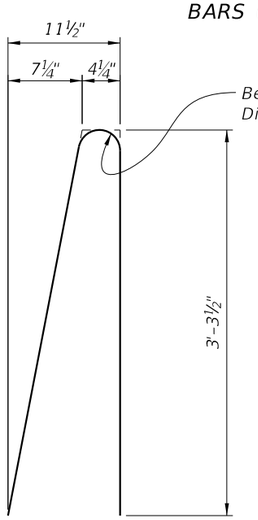
BARS 6S1 & 5S2

ROADWAY CROSS-SLOPE	LOW GUTTER	HIGH GUTTER
	ØB	ØB
0% to 2%	101°	101°
2% to 6%	98°	104°
6% to 10%	95°	107°

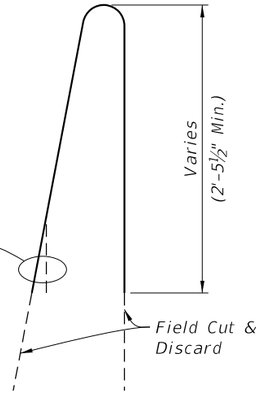
ØA and ØB shall be 90° if Contractor elects to place Railing perpendicular to the Deck.



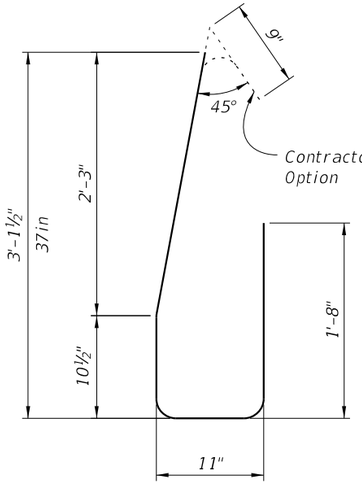
TRANSITION BARS 6T1 & 6T2
(2~Bars 6T1 & 3~Bars 6T2 required per Railing End Transition)



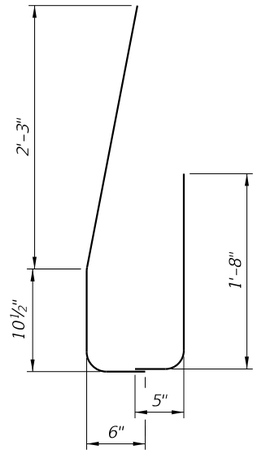
STIRRUP BAR 5P



TRANSITION STIRRUP BAR 5P
To Be Field Cut (10 of each required per Railing End Transition)

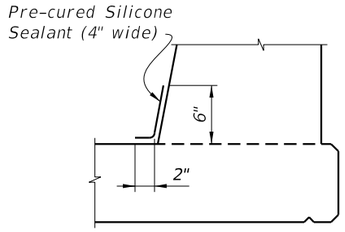


STIRRUP BAR 5V



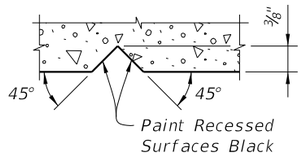
END STIRRUP BAR 5V
To Be Field Cut and Lapped

REINFORCING STEEL NOTES:
1. All bar dimensions in the bending diagrams are out to out.
2. All reinforcing steel at the open joints shall have a 2" minimum cover.
3. Bars 6S1 may be continuous or spliced at the construction joints. Lap splices for Bars 6S1 and 5S2 shall be a minimum of 3'-0" and 2'-2", respectively.
4. The Contractor may utilize deformed WWR when approved by the Engineer. WWR must meet the requirements of Specification Section 931.



DETAIL "C" - SECTION
AT INTERMEDIATE OPEN JOINT

INTERMEDIATE JOINT SEAL NOTES:
1. At Intermediate Open Joints, seal the lower 6" portion of the open joint with Pre-cured Silicone Sealant in accordance with Specification Section 932.
2. Apply sealant prior to any Class V finish coating and remove all curing compound and loose material from the surface prior to application of bonding agent.
3. The cost of the Pre-cured Silicone Sealant shall be included in the Contract Unit Price for the Traffic Railing.



SECTION THRU RECESSED
"V" GROOVE TO FORM INSCRIBED
LETTERS AND FIGURES

ESTIMATED TRAFFIC RAILING QUANTITIES		
ITEM	UNIT	QUANTITY
Concrete	CY/LF	0.143
Reinforcing Steel	LB/LF	39.34

Note:
The estimated railing quantities are based on a 2% deck cross slope; railing on low side of deck.

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SHEET	CONTENTS
1	General Notes; Index Contents
2	General, TL-3 Guardrail - Installed Plan and Elevation
3	Low-Speed, TL-2 Guardrail - Installed Plan and Elevation
4	W-Beam and Thrie-Beam Panel Details
5	Post and Offset Block Details
6	Guardrail Sections - Heights and Adjacent Slopes
7	End Treatment - Approach Terminal Geometry, Parallel and Flared
8	End Treatment - Approach Terminal Geometry, Curbed and Double Faced
9	End Treatment - Trailing Anchorage
10	End Treatment - Component Details
11	End Treatment - Controlled Release Terminal (CRT) System
12	Layout for CRT System - Side Roads and Driveways
13	Approach Transition Connection to Rigid Barrier - General, TL-3
14	Approach Transition Connection to Rigid Barrier - Low-Speed, TL-2
15	Approach Transition Connection to Rigid Barrier - Details
16	Approach Transition Connection to Rigid Barrier - Double Faced Guardrail
17	Layout to Rigid Barrier - Approach Ends
18	Layout to Rigid Barrier - Approach Ends with Double Faced Guardrail Layout to Rigid Barrier - Trailing Ends
19	Rub Rail Details
20	Pedestrian Safety Treatment - Pipe Rail
21	Modified Mount - Special Steel Post for Concrete Structure Mount; Modified Mount - Encased Post for Shallow Mount; Modified Mount - Frangible Leave-Out for Concrete Surface Mount
22	Barrier Delineators - Post Mounted; Clear Space - Reduced Post Spacing for Hazards; ⅝" Button-Head Bolt System

GENERAL NOTES:

1. INSTALLATION: Construct guardrail in accordance with Specification 536.

   This Index, along with the plans and the manufacturers' drawings on the Approved Products List (APL), is sufficiently detailed for installation of General Guardrail, Low-Speed Guardrail, End Treatment assemblies, and their connecting options shown herein. This precludes requirements for shop drawing submittals unless otherwise specified in the plans.

2. COMPATIBILITY: The General Guardrail in this Index is based on the Midwest Guardrail System (MGS) design, with an approximate height of 31" at the top of the Panel (2'-1" mounting height at vertical ℄ of Panel) and a midspan panel splice as shown on Sheet 2. Guardrail components included on the APL, which are compatible with this Index, may also be identified as 31" or MGS Guardrail.

3. STANDARD COMPONENTS: Standard guardrail components, including posts, panels, and bolt systems, are based upon English unit conversions of the AASHTO-AGC-ARTBA Joint Committee Task Force 13 Report: A Guide to Standardized Highway Barrier Hardware (http://www.aashtotf13.org/Barrier-Hardware.php).

4. BUTTON-HEAD BOLTS: Install Button-Head Bolts where indicated using bolts, nuts, and washers as defined on Sheet 22. Place washers under nuts. Do not place washers between bolt heads and panels, except where otherwise shown in this Index.

5. HEX-HEAD BOLTS: Install Hex-Head Bolts where indicated using bolts, nuts, and washers in accordance with material properties of Specification 967. Place washers under nuts.

6. MISCELLANEOUS ASPHALT PAVEMENT: Install Miscellaneous Asphalt Pavement where indicated with a tolerance of ± ½" depth and in accordance with Specification 339.

7. ADJACENT SIDEWALKS & SHARED USE PATHS: When guardrail posts are placed within 4'-0" of a sidewalk or shared use path, use timber posts, or use steel posts only if treated with Pipe Rail as shown on Sheet 20.

   When timber posts are used, one of the following safety treatments is required for the bolt(s) protruding from the back face of the posts:

   a. After tightening the nut, trim the protruding post bolt flush with the nut and galvanize per Specification 562.
   b. Use post bolts 15" in length and countersink the washer and nut between 1" and 1½" deep into the back face of the post.
   c. Use 15" post bolts with sleeve nuts and washers.

   When End Treatment posts are within 4'-0" of a sidewalk or shared use path, steel posts are not permitted within the End Treatment segment. Terminate the Pipe Rail outside of End Treatment segments, as noted per Sheet 20.

8. NESTED W-BEAM: Where called for in the plans, install two W-Beam Panels mounted flush per location, securing all panels with Button-Head Bolts threaded through aligned slots and holes. 2" Button-Head Bolts are permitted for panel splice locations.

9. CONNECTION TO RIGID BARRIER: The connections to Rigid Barrier in this Index only apply to newly constructed bridge Traffic Railing and Concrete Barrier or where the complete Approach Transition Connection to Rigid Barrier shown herein can be installed without conflicting with existing Traffic Railings, structures, or approach slabs.

   For connecting guardrail to existing bridge Traffic Railings, see the layouts and details of Indexes 536-002, 521-404, and 421-405.

10. CONNECTION TO EXISTING GUARDRAIL: Where a transition to existing guardrail at 27" height is required, linearly transition the guardrail height over a distance ranging from 25'-0" to 31"-3". Provide an immediate transition to the required midspan splice using the available panel options on Sheet 4 (9'-4½" or 15'-7½" panel).

11. PLANS CALLOUTS: Begin/End Station labels are shown throughout this Index as they correspond to the station and offset callouts specified in the plans.

    In the plans, Begin/End Guardrail Station refers to the General TL-3 Guardrail Pay Item, and it may be abbreviated as Begin/End GR. Station. Where the Low-Speed TL-2 Guardrail Pay Item is specifically required, the callout in the plans will then specify Begin/End TL-2 GR. Station.

12. QUANTITY MEASUREMENT: Measure guardrail and corresponding components as defined in Specification 536. The Guardrail length is measured along the centerline of installed Panels, between the points labeled Begin/End Guardrail Station shown on the following Index Sheets and defined in the plans (typically measured from the ℄ of the panel's post bolt slots at the approach/trailing ends).

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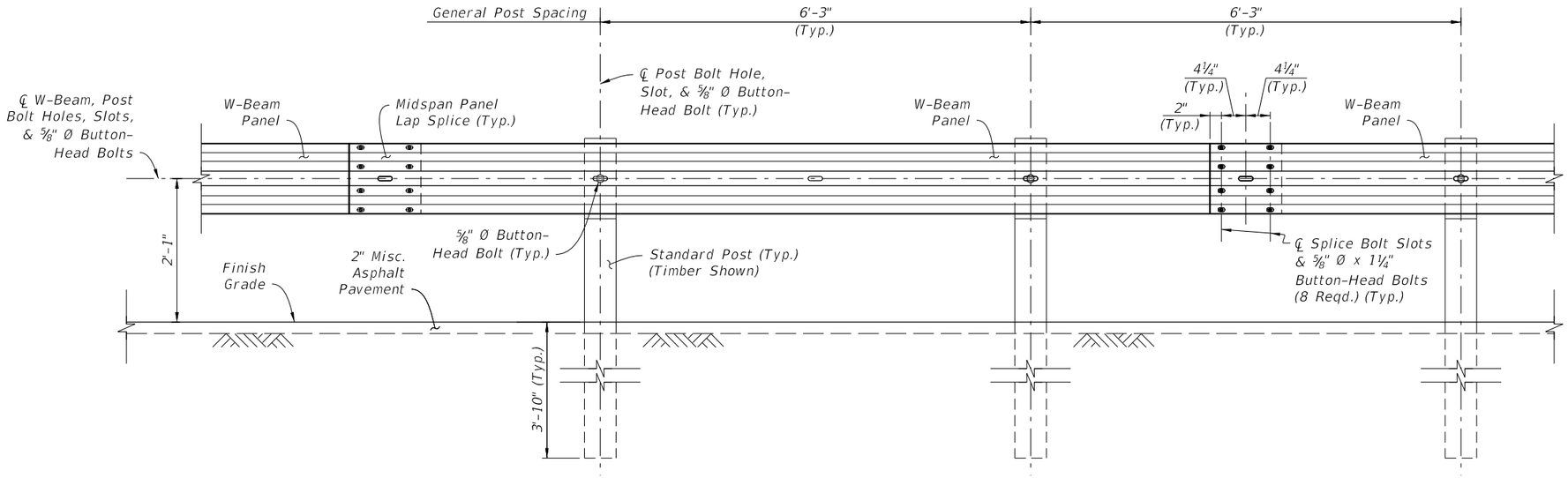
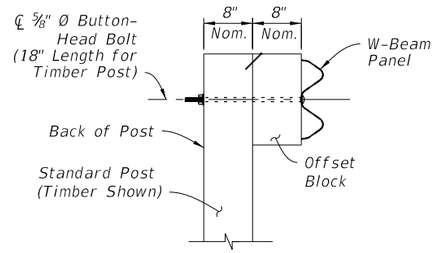
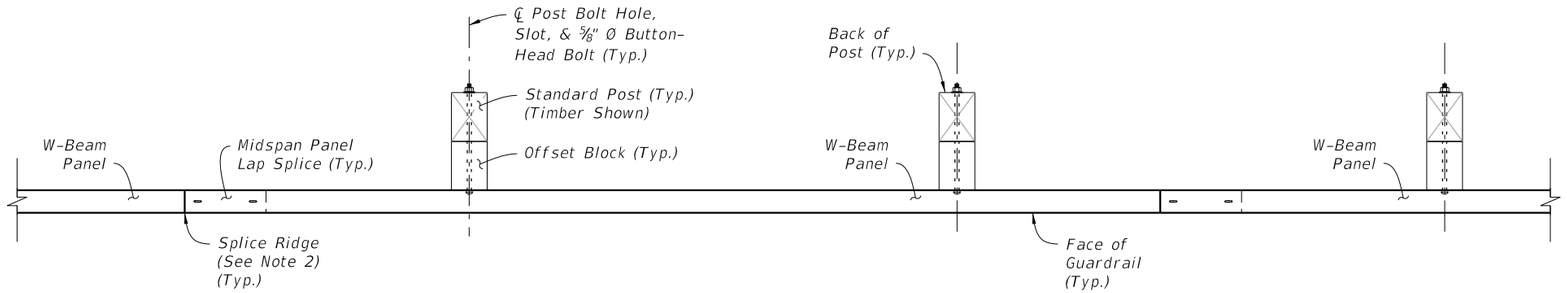


GENERAL GUARDRAIL
INSTALLED ELEVATION



INSTALLED SECTION



INSTALLED PLAN

NOTES:

1. GENERAL: Install the General Guardrail configuration where indicated in the plans. This may include tapered segments if called for in the plans.

   Use 12'-6" or longer W-Beam Panels. A single 6'-3" Panel may be used at the end of the run to meet the nominal Begin/End Guardrail Sta. requirements.

   Where a differing guardrail configuration is required for constructability beyond the options shown in this Index or the plans, obtain approval from the Engineer prior to installation.

2. MIDSPAN PANEL LAP SPLICE: For proper structural function, place all Lap Splices at midspan unless otherwise indicated.

   Lap the Panels with the Splice Ridge oriented downstream of the final Direction of Traffic in the nearest traffic lane. For reverse lane conditions, orient the Splice Ridge downstream of the lane direction with the highest traffic volume. Orienting Lap Splices for Temporary Traffic Control phasing is not required.

3. CONNECTION DETAILS: Connections to End Treatments, Approach Transitions, or other segment types are defined in the following Index Sheets, APL Drawings, or the plans.

4. W-BEAM PANEL DETAILS: See Sheet 4.

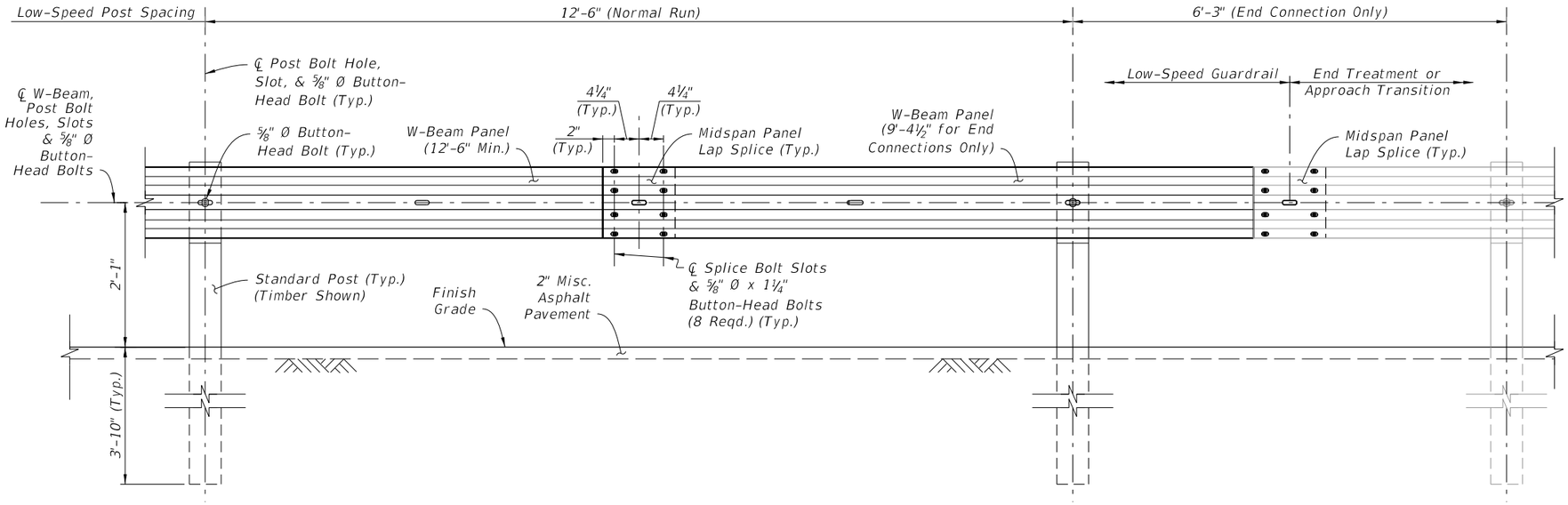
5. POST & OFFSET BLOCK DETAILS: See Sheet 5.

6. GUARDRAIL SECTIONS: For Sections showing typical mounting heights, grading, and lateral offsets in relation to adjacent roadway features, see Sheet 6.

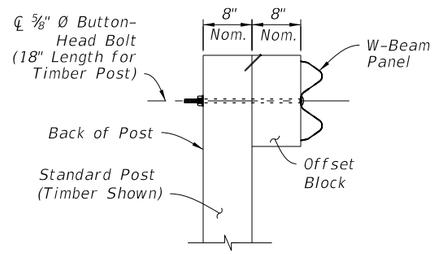
7. MODIFIED MOUNTS: Where concrete structures, concrete sidewalk, or shallow depth conditions are encountered, see Sheet 21 for additional post mounting options.

8. DEFINED SEGMENTS: The General Guardrail shown provides the base configuration, including Post Spacing and splice locations, for Defined Segment modifications where indicated in the plans and using the Guardrail Types, Sections, and/or hardware as shown in this Index (e.g. Double Faced W-Beam, Modified Thrie-Beam, Deep Posts at Slope Breaks, Pipe Rail, Rub Rail, or Reduced Post Spacing for Hazards).

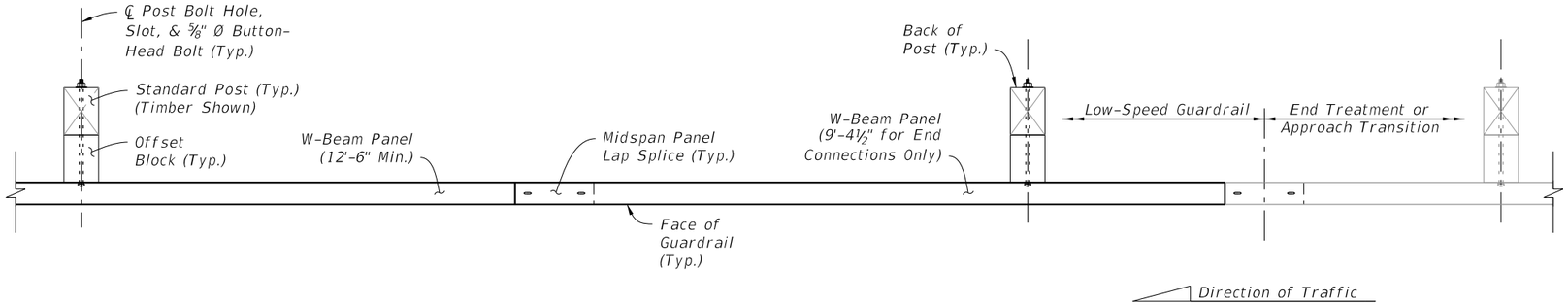
GENERAL, TL-3 GUARDRAIL DETAILS



LOW-SPEED GUARDRAIL INSTALLED ELEVATION



INSTALLED SECTION



INSTALLED PLAN

NOTES:

1. *GENERAL: Install the Low-Speed Guardrail configuration where indicated in the plans. Low-Speed Guardrail may include tapered segments if called for in the plans.*

   Use 12'-6" or 25'-0" W-Beam Panels for normal spans, and use 9'-4½" Panels for end connections to adjoining segments as shown. A single 6'-3" Panel may be used at the end of the Low-Speed Guardrail run along with a single reduced 6'-3" post spacing to meet the nominal Begin/End Guardrail Sta. required.

   Where a differing guardrail configuration is required for constructability beyond the options shown in this Index or the Plans, obtain approval from the Engineer prior to installation.

2. *MIDSPAN PANEL LAP SPLICE: For proper structural function, place all Lap Splices at midspan unless otherwise indicated.*

   Lap the Panels with the Splice Ridge oriented downstream of the final Direction of Traffic in the nearest traffic lane. For reverse lane conditions, orient the Splice Ridge downstream of the lane direction with the highest traffic volume. Orienting Lap Splices for Temporary Traffic Control phasing is not required.

3. *CONNECTION DETAILS: Connections to End Treatments, Approach Transitions, or other segment types are defined in the following Index Sheets, APL Drawings, or the plans.*

4. *W-BEAM PANEL DETAILS: See Sheet 4.*

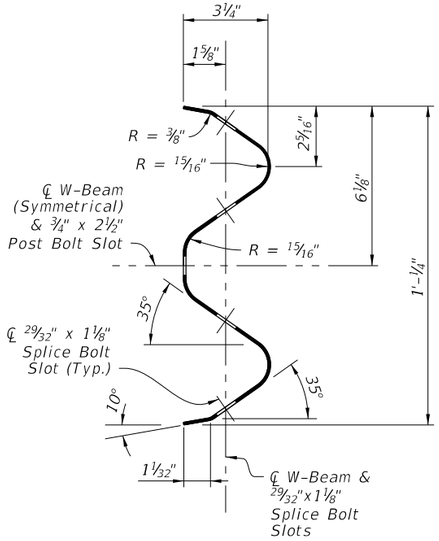
5. *POST & OFFSET BLOCK DETAILS: See Sheet 5.*

6. *GUARDRAIL SECTIONS: For Sections showing typical mounting heights, grading, and lateral offsets in relation to adjacent roadway features, see Sheet 6.*

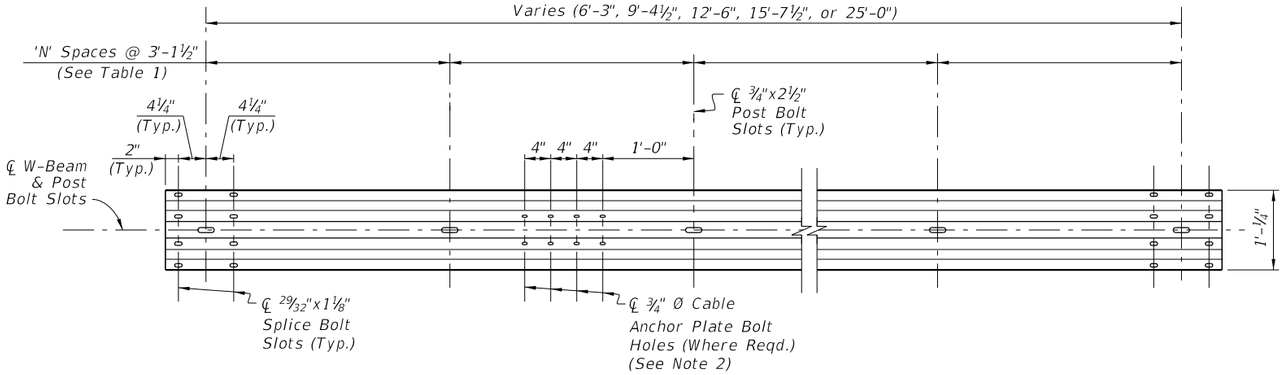
7. *MODIFIED MOUNTS: Where concrete structures, concrete sidewalk, or shallow depth conditions are encountered, see Sheet 21 for additional post mounting options.*

8. *RESTRICTIONS: Low-Speed Guardrail segments are not permitted for use with items including, but not limited to, Double Faced W-Beam, Modified Thrie-Beam, Deep Posts at Slope Breaks, Pipe Rail, and/or Rub Rail.*

LOW-SPEED, TL-2 GUARDRAIL DETAILS



W-BEAM PANEL SECTION



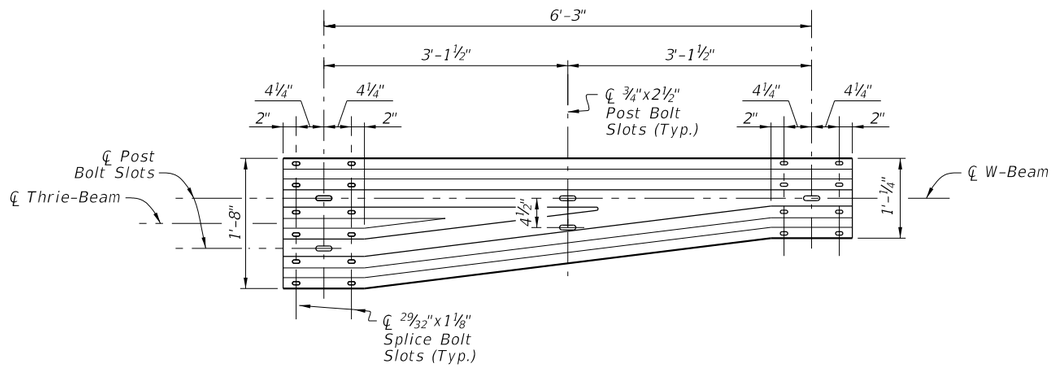
W-BEAM PANEL ELEVATION

PANEL SUMMARY TABLE:

Panel Type	Number of Spaces 'N'	Gauge
6'-3" W-Beam	2	12
9'-4½" W-Beam	3	12
12'-6" W-Beam	4	12
15'-7½" W-Beam	5	12
25'-0" W-Beam	8	12
3'-1½" Thrie-Beam	1	10
6'-3" Thrie-Beam	2	12
12-6" Thrie-Beam	4	12
25-0" Thrie-Beam	8	12
Thrie-Beam Trans.	2	10

THRIE-BEAM PANEL SECTION

THRIE-BEAM PANEL ELEVATION



THRIE-BEAM TRANSITION PANEL ELEVATION
(Reverse Direction Similar by Opposite Hand)

NOTES:

1. MATERIALS:
   Use corrugated steel panels in accordance with Specification 967 and made from either Class A, 12 gauge steel or Class B, 10 gauge steel as specified in the 'Panel Summary Table' above.

2. CABLE ANCHOR PLATE BOLT HOLES:
   Include ¾" Ø Cable Anchor Plate Bolt Holes only where required for installation of the Cable Anchor Plate shown on Sheet 9, 10, & 11.

   29⁄32" x 1⅛" slots may substitute for the ¾" Ø holes shown.

W-BEAM AND THRIE-BEAM PANEL DETAILS

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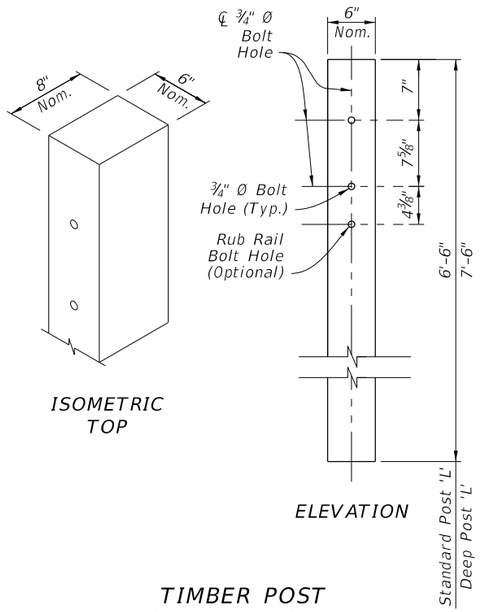
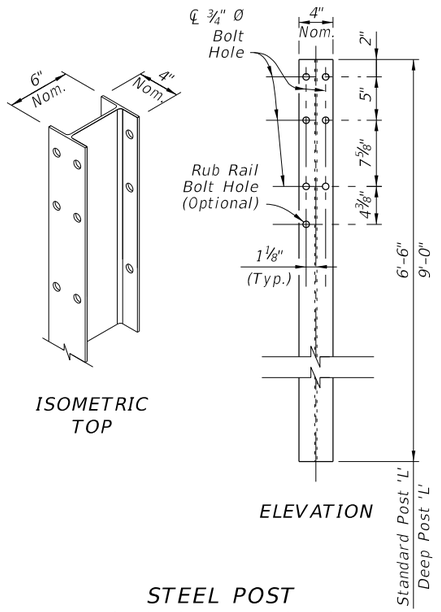
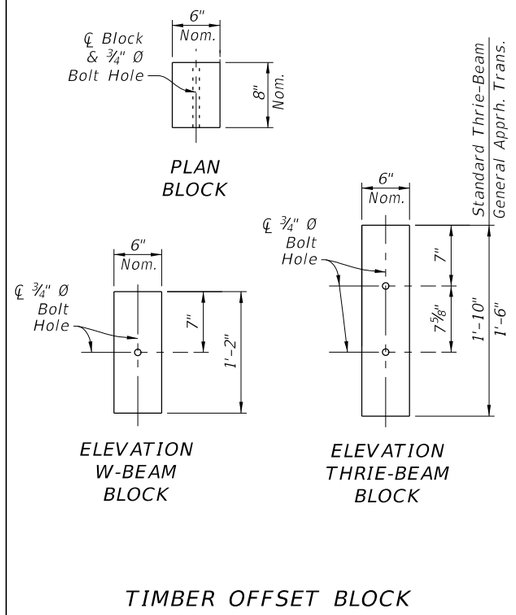
11/01/17			FY 2019-20 STANDARD PLANS	GUARDRAIL	536-001	4 of 22



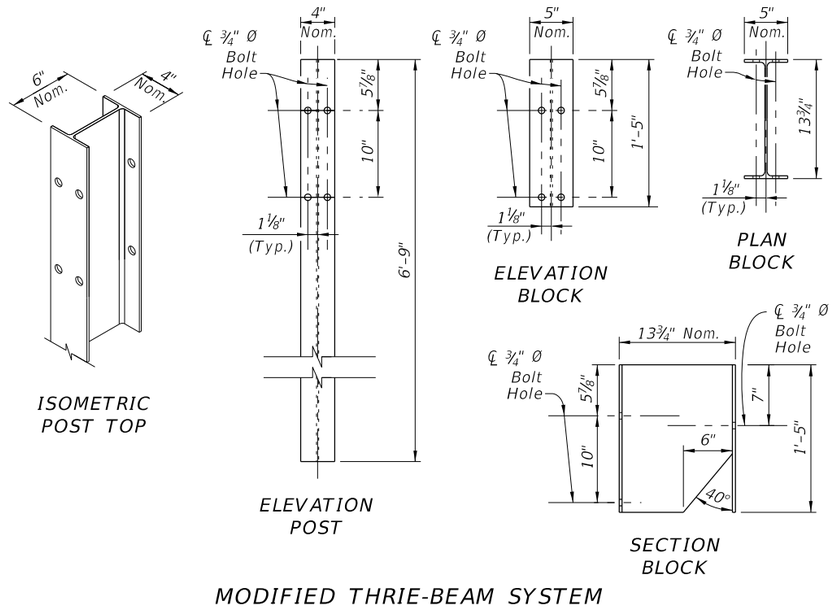
TIMBER POST
(6"X8" Nominal)



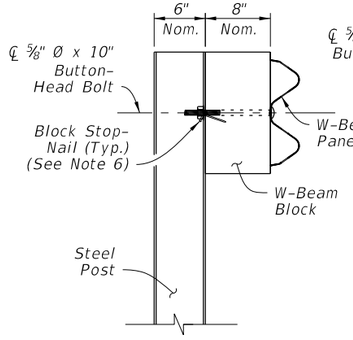
STEEL POST
(W6X8.5 or W6X9)

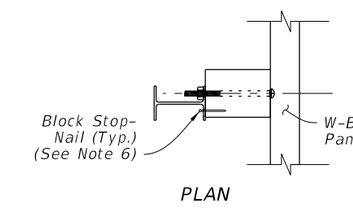


TIMBER OFFSET BLOCK
(6"X8" Nominal)

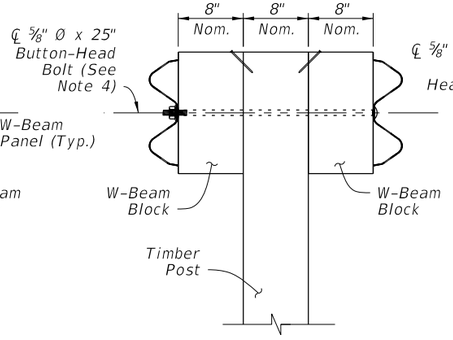


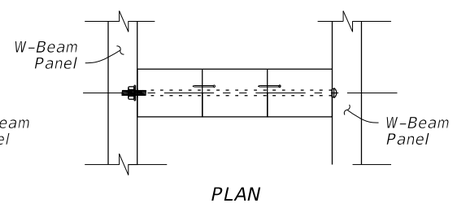
MODIFIED THRIE-BEAM SYSTEM
(W6X8.5 or W6X9 Steel Post & W14X22 Steel Block)



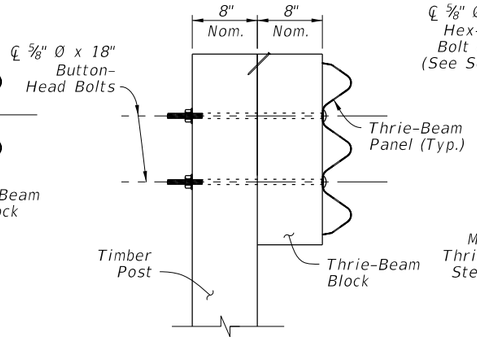


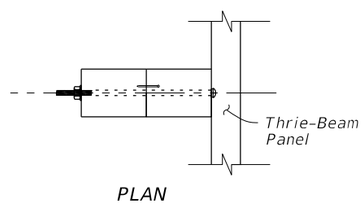
W-BEAM
STEEL POST
(Timber Post
Similar)



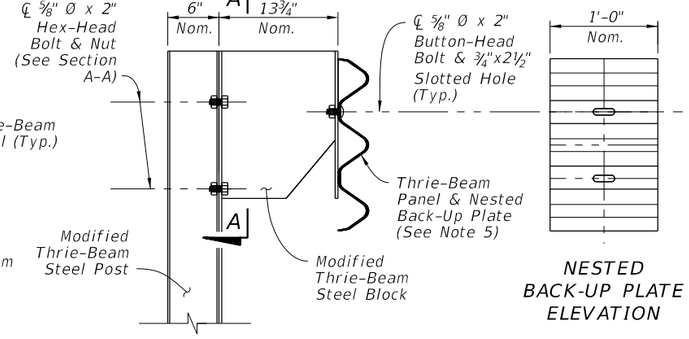


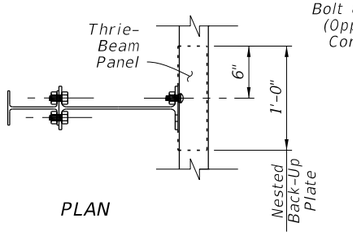
DOUBLE FACED W-BEAM
TIMBER POST
(Thrie-Beam Similar)
(Steel Post Similar)



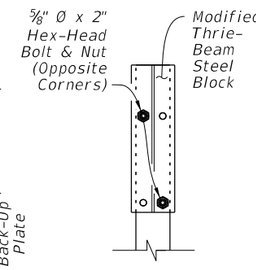


THRIE-BEAM
TIMBER POST
(Steel Post Similar)





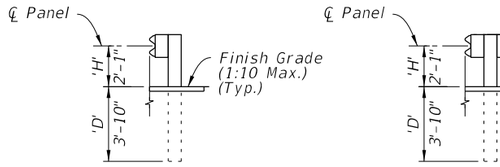
MODIFIED
THRIE-BEAM
(Steel Post Only)



NOTES:

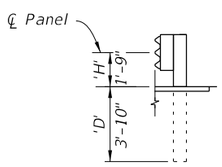
1. *STANDARD POSTS: Where Standard Posts are called for in this Index, use either a Timber Post or Steel Post at the Length, 'L', shown for Standard Posts. Use a single post material type consistently per each run of guardrail. Only where specified in the Plans, use the Deep Post 'L' for Slope Break Conditions as shown on Sheet 6.*
2. *OFFSET BLOCKS: For each Panel type, install the corresponding Offset Block type as shown. For General, TL-3 (Single Faced) Approach Transitions only, use the 1'-6" Thrie-Beam Block (See Sheet 13).*
3. *BOLT HOLES: ¾" Ø Bolt Holes shown in posts within this Index may be substituted with $^{13}/_{16}$" Ø Bolt Holes.*
4. *DOUBLE FACED GUARDRAIL: Orient Post Bolts with the Button-Head located on the side nearest the traffic lane. The bolt's threaded portion is not permitted to extend beyond ¾" from the face of the tightened nut; trim the threaded portion as needed and galvanize in accordance with Specification 562.*
5. *MODIFIED THRIE-BEAM NESTED BACK-UP PLATE: At each post connection, install a Nested Back-up Plate between the Thrie-Beam Panel and the post. The Nested Back-up Plate has a cross-section and material matching the Thrie-Beam Panel Section.*
6. *BLOCK STOP-NAIL: Drive one nail per Standard Offset Block as shown to prevent Block rotation. Use steel 3½" Type 16d nails with ASTM A153 hot-dip galvanization. For steel posts, drive the nail through the unused flange Bolt Hole and bend the nail so its head contacts the flange.*
7. *MATERIALS: Use timber and steel posts and offset blocks in accordance with Specification 967. Composite offset blocks may be substituted as approved on the APL. Use a single offset block type consistently per each run of guardrail. Steel offset blocks are only permitted for Modified Thrie Beam.*

POST AND OFFSET BLOCK DETAILS

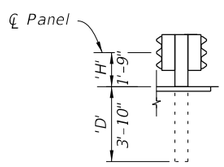


W-BEAM

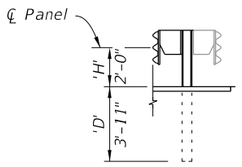
DOUBLE FACED
W-BEAM



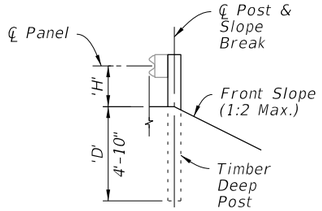
THRIE-BEAM



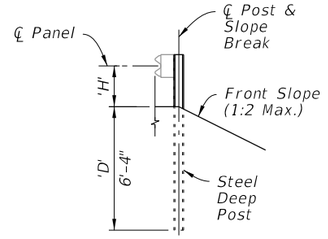
DOUBLE FACED
THRIE-BEAM



MODIFIED
THRIE-BEAM

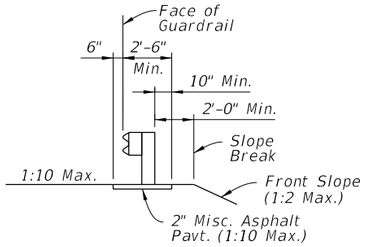


SLOPE BREAK CONDITION
TIMBER DEEP POST

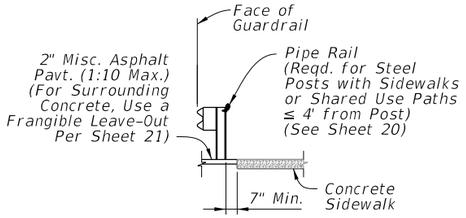


SLOPE BREAK CONDITION
STEEL DEEP POST

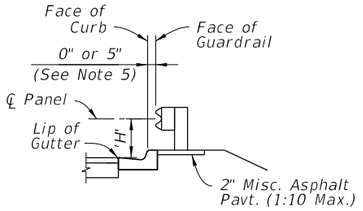
GUARDRAIL TYPES - MOUNTING HEIGHTS & POST DEPTHS



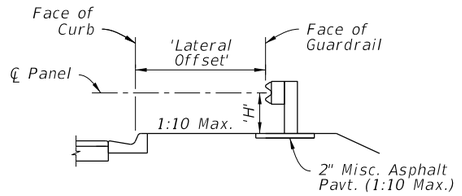
TYPICAL GRADING &
PAVT. PLACEMENT DETAIL
(See Note 2)



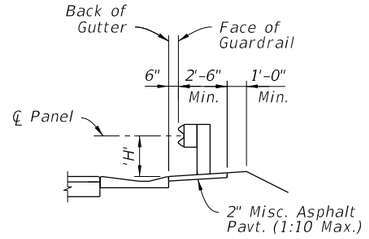
TYPICAL SIDEWALK DETAIL
(Work with Other
Sections as Reqd.)



ADJACENT TO CURB
(Type F Curb Shown)



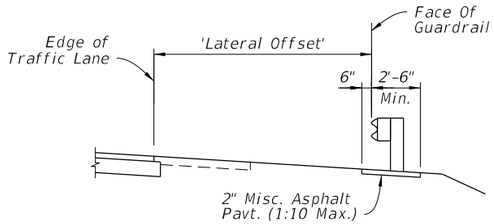
BEHIND CURB
(Type F Curb Shown)



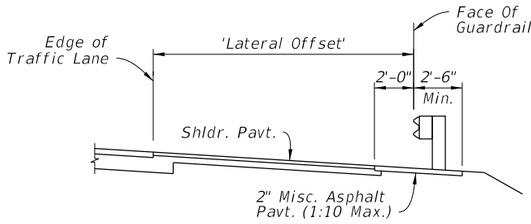
ADJACENT TO
SHOULDER GUTTER

GUARDRAIL SECTIONS - TYPICAL

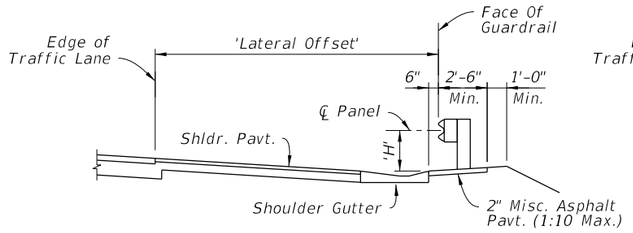
GUARDRAIL SECTIONS - CURB & GUTTER



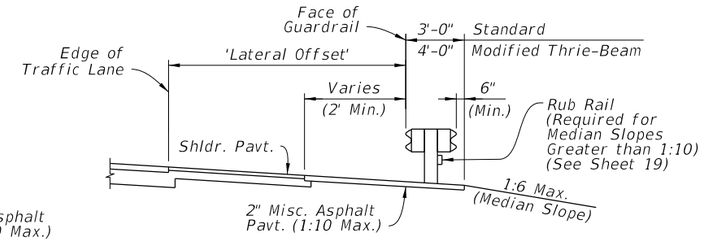
UNPAVED OR PARTIALLY
PAVED SHOULDER



FULLY PAVED SHOULDER



SHOULDER GUTTER



DOUBLE FACED GUARDRAIL
(Shown In Median)

GUARDRAIL SECTIONS - SHOULDERS

GUARDRAIL HEIGHT SUMMARY TABLE:			
Type:	Min. Depth 'D':	Mounting Height 'H':	Post Length 'L':
W-Beam (Single and Double Faced)	3'-10"	2'-1"	6'-6"
Thrie-Beam (Single and Double Faced)	3'-10"	1'-9"	6'-6"
Modified Thrie-Beam	3'-11"	2'-0"	6'-9"
Timber Deep Post	4'-10"	See Above	7'-6"
Steel Deep Post	6'-4"	See Above	9'-0"

NOTES:

1. GUARDRAIL SECTIONS: Construct Sections as indicated in the plans. The details shown herein depict W-Beam Guardrail, but are applicable to the other defined Guardrail Types placed at the corresponding height, 'H'. Use components per Sheets 4 & 5. Steel and timber post types are interchangeable unless otherwise defined. The 1:10 Max. cross slope shown is the maximum slope permitted for proper guardrail function, but project-specific cross slope requirements are governed per the plans.
2. TYPICAL GRADING & PAVEMENT PLACEMENT DETAIL: Construct features as depicted except where superceded by specific Guardrail Sections or the plans. Place the Slope Break a Minimum of 2' behind the post. For Deep Posts, the slope break may be placed at the ℄ Post with the 2" Miscellaneous Asphalt Pavement omitted.
3. SLOPE BREAK CONDITION: Install Deep Posts only where called for in the plans. Deep Posts are only permitted where post spacing is 6'-3" or less.
4. LATERAL OFFSETS: The Lateral Offsets shown are governed by the station and offset call outs for Face of Guardrail, as shown in the plans.
5. ADJACENT TO CURB: Place the Face of Guardrail consistently offset either flush with the Face of Curb or 5" behind the Face of Curb, as indicated by the plans station and offset callout. For offset changes, transition the Face of Guardrail as shown in the plans.

GUARDRAIL SECTIONS

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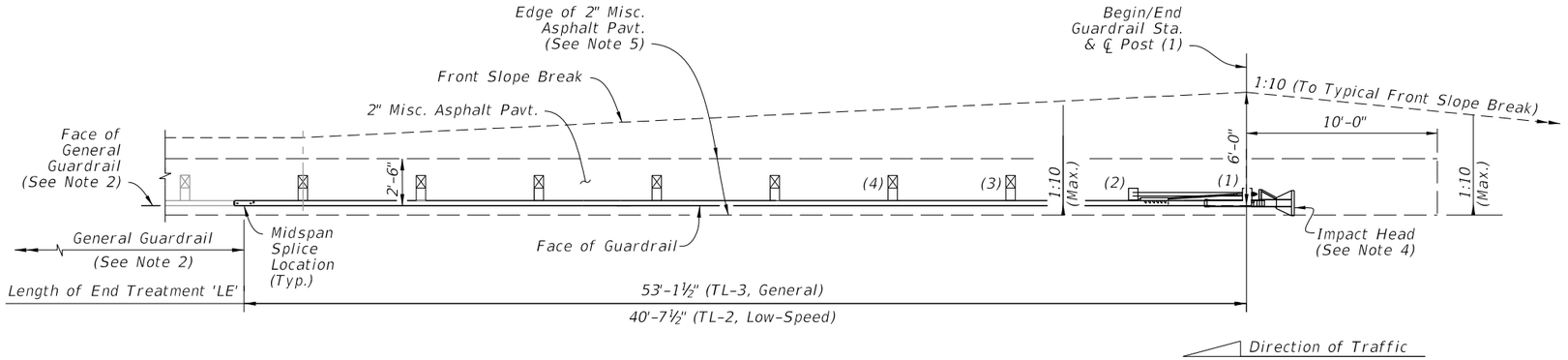
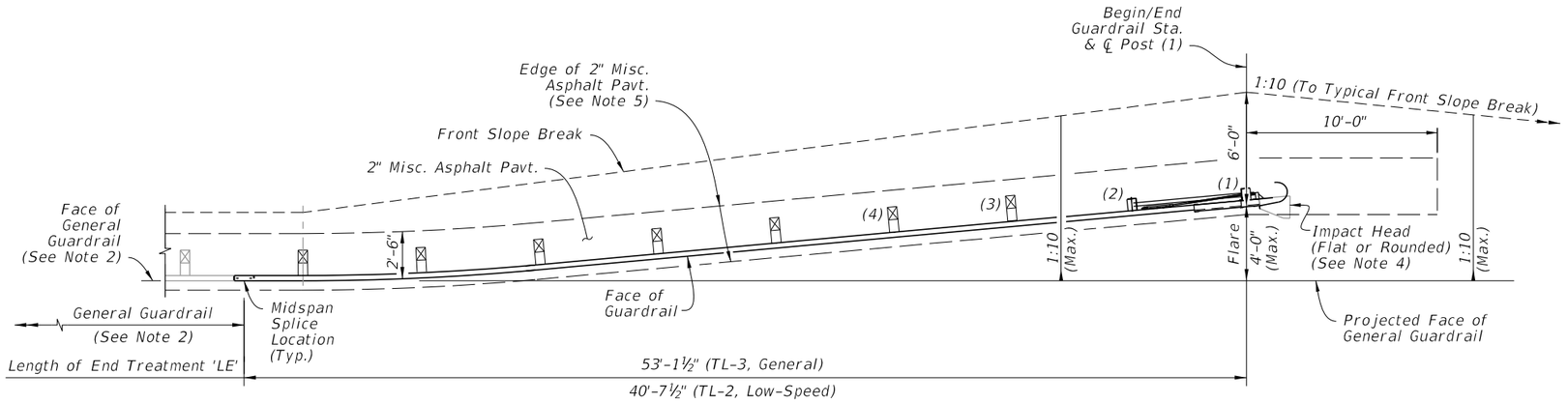


APPROACH TERMINAL ASSEMBLY
'PARALLEL' SEGMENT - PLAN VIEW



APPROACH TERMINAL ASSEMBLY
'FLARED' SEGMENT - PLAN VIEW

NOTES:

1. INSTALLATION: Locate Approach Terminals where called for in the plans, with the Post (1) ℄ placed at the Begin/End Guardrail Station indicated in the plans.

   The Plan Views shown herein are schematic only, showing basic geometry for Approach Terminals listed on the APL. The predefined Length of End Treatment, 'LE', includes the proprietary portion of various Approach Terminals and provides for more consistent planning of assembly installations across the differing Approach Terminal types. Forward-anchoring style Approach Terminals may vary from the planned lengths shown by up to 3'-0".

   Construct Approach Terminals as shown in the APL and in accordance with the manufacturer's unique drawing details, procedures, and specifications.

   Install posts in accordance with the manufacturer's drawings. The Special Posts on Sheet 21, including Special Steel Posts, Encased Posts, and Frangible Leave-Outs, are not permitted within the Approach Terminal segment unless otherwise called for in the plans.

   Align panel lap splices in accordance with the manufacturer's drawings, regardless of the direction of traffic.

   Install adjacent grading, gutters, and/or curbing as shown herein, unless otherwise specified in the plans.

2. GENERAL GUARDRAIL: General Guardrail typically includes Panels and Post Spacing as shown on Sheet 2, including parallel and tapered segments.

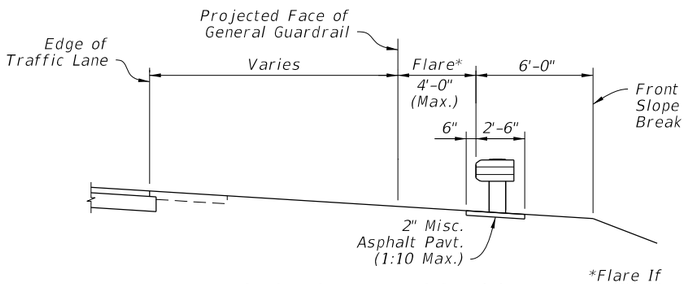
   Approach Transitions, Low-Speed Guardrail, or Reduced Post Spacing Guardrail segments may be substituted for the General Guardrail shown herein if indicated in the plans.

3. APPROACH TERMINAL TEST LEVEL: Install either a Test Level 3 (TL-3) or Test Level 2 (TL-2) Approach Terminal as specified in the plans. TL-3 Approach Terminals may substitute for TL-2 Approach Terminals unless the substitution is specifically prohibited in the plans. TL-2 Approach Terminals may not substitute for TL-3 installations.

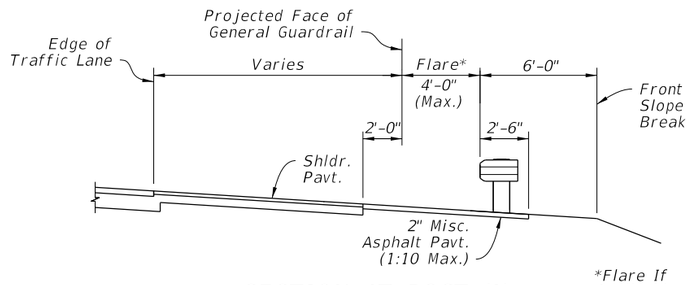
4. IMPACT HEAD END DELINEATOR: Apply Yellow Retroreflective Sheeting to the nose of the End Terminal in accordance with Specification 536.

5. 2" MISCELLANEOUS ASPHALT PAVEMENT: The Plan Views shown herein depict the Unpaved Shoulder condition. For Fully Paved Shoulder and Shoulder Gutter conditions, extend the 2" Misc. Asphalt Pavement as shown in the corresponding 'Section at Post (1)' details below.

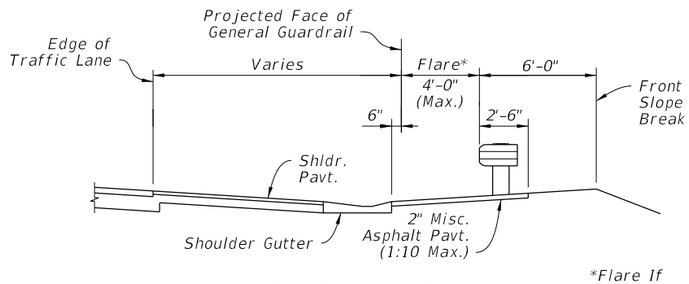
6. 'CURBED' AND 'DOUBLE FACED' GUARDRAIL SEGMENTS: See Sheet 8.



SECTION AT POST (1)
WITH UNPAVED SHOULDER



SECTION AT POST (1)
WITH FULLY PAVED SHOULDER



SECTION AT POST (1)
WITH SHOULDER GUTTER

END TREATMENT - APPROACH TERMINAL GEOMETRY PARALLEL AND FLARED

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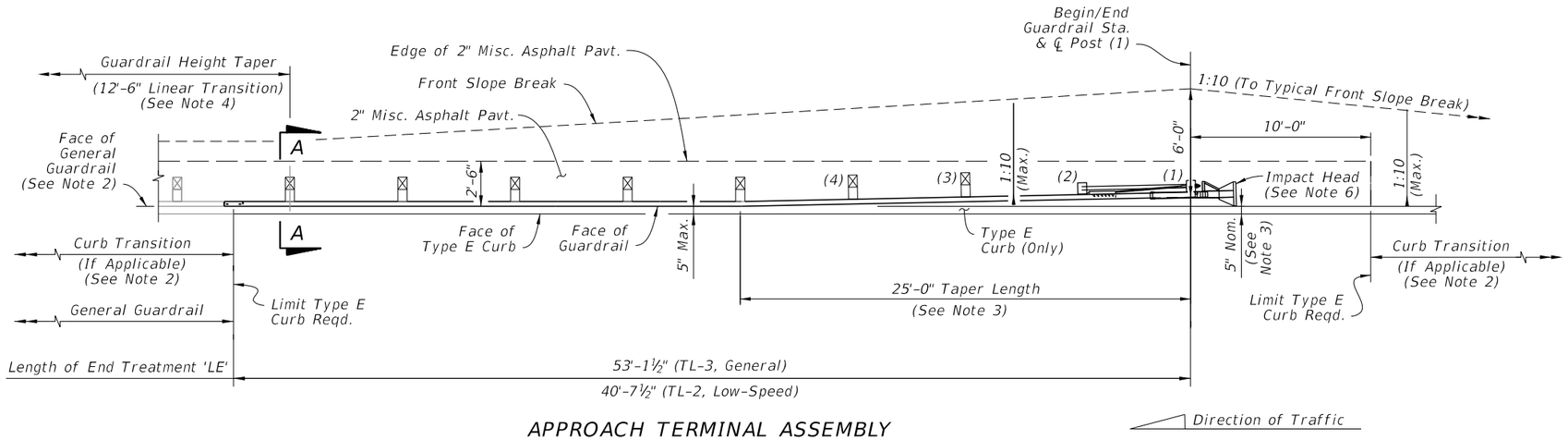
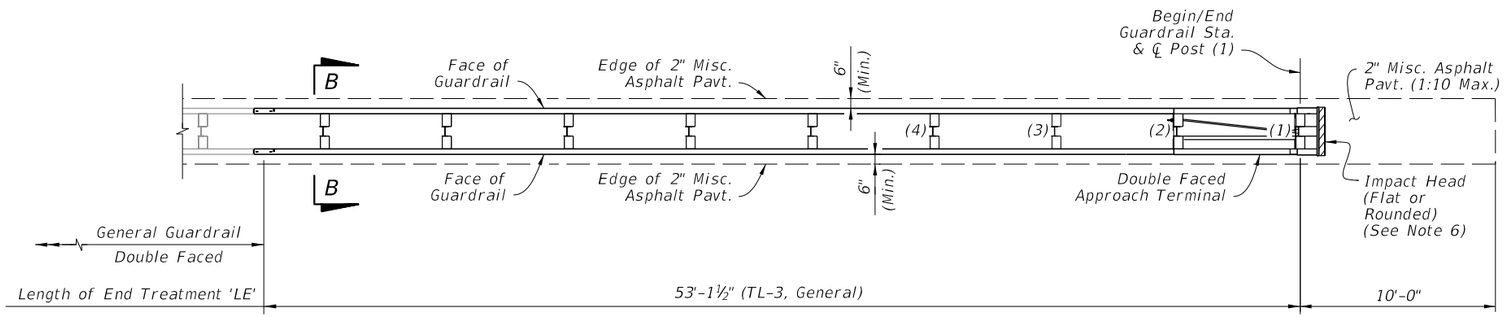
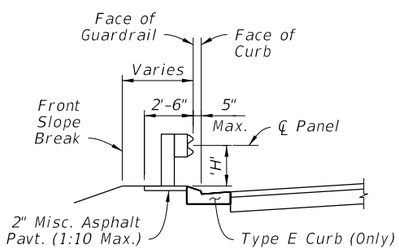


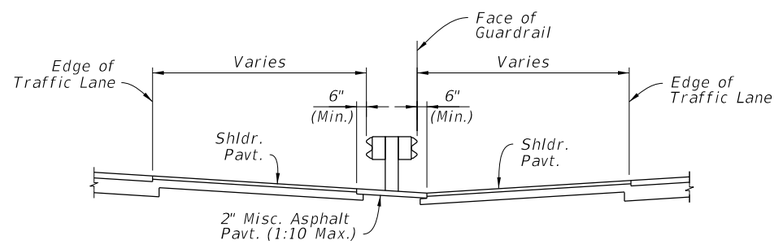
APPROACH TERMINAL ASSEMBLY
'CURBED' SEGMENT - PLAN VIEW



APPROACH TERMINAL ASSEMBLY
'DOUBLE FACED' SEGMENT - PLAN VIEW



'CURBED' SECTION A-A
(Height, 'H', Measured from
Misc. Asphalt Pavt.)



'DOUBLE FACED' SECTION B-B
(1:10 Slope or Flatter Reqd.)

NOTES:

1. GENERAL: See Notes 1 through 3 on Sheet 7.
2. CURBED SEGMENTS: Type E curb is required within the limits shown. When a different curb type is called for outside of the Type E curb limits, transition the curb shape linearly, over a nominal distance ranging 5'-0" to 10'-0"
3. TAPER LENGTH: For Curbed Segments, taper the guardrail away from the roadway where shown to place the inside edge of the Impact Head at 5" behind the face of the curb. Where additional lateral offset is required to fit the Approach Terminal Assembly hardware, such as a soil plate, place the Impact Head as close to the curb as the hardware allows, not to exceed 2'-0" from the face of curb.
4. GUARDRAIL HEIGHT TAPER: For Curbed Segments, the connecting General Guardrail Mounting Height, 'H', is typically measured from the Lip of Gutter (See Sheet 6 Guardrail Sections, 'Adjacent to Curb'), while the End Terminal Assembly 'H' is measured from the Misc. Asphalt Pavt. (See Section A-A). Linearly taper the difference in Mounting Height over a minimum length of 12'-6", starting where indicated herein.
5. DOUBLE FACED SEGMENT: Connect to Double Faced General Guardrail. Use consistent Posts and Offset Block types as specified in the APL drawings over the entire Length of End Treatment, 'LE'. Posts and Offset Blocks in the adjoining General Guardrail segment may be different from those inside of the 'LE'. A change in post type between timber and steel is permitted, immediately outside of the 'LE' segment.

   Maintain the 1:10 maximum grading as shown in Section B-B throughout segment 'LE'. Where required, transition to differing adjacent slopes linearly, over a minimum longitudinal length of 25'-0".
6. IMPACT HEAD END DELINEATOR: Apply Yellow Retroreflective Sheeting to the nose of the End Terminal in accordance with Specification 536.
7. SINGLE FACED 'PARALLEL' AND 'FLARED' SEGMENTS: See Sheet 7.

END TREATMENT - APPROACH TERMINAL GEOMETRY CURBED AND DOUBLE FACED

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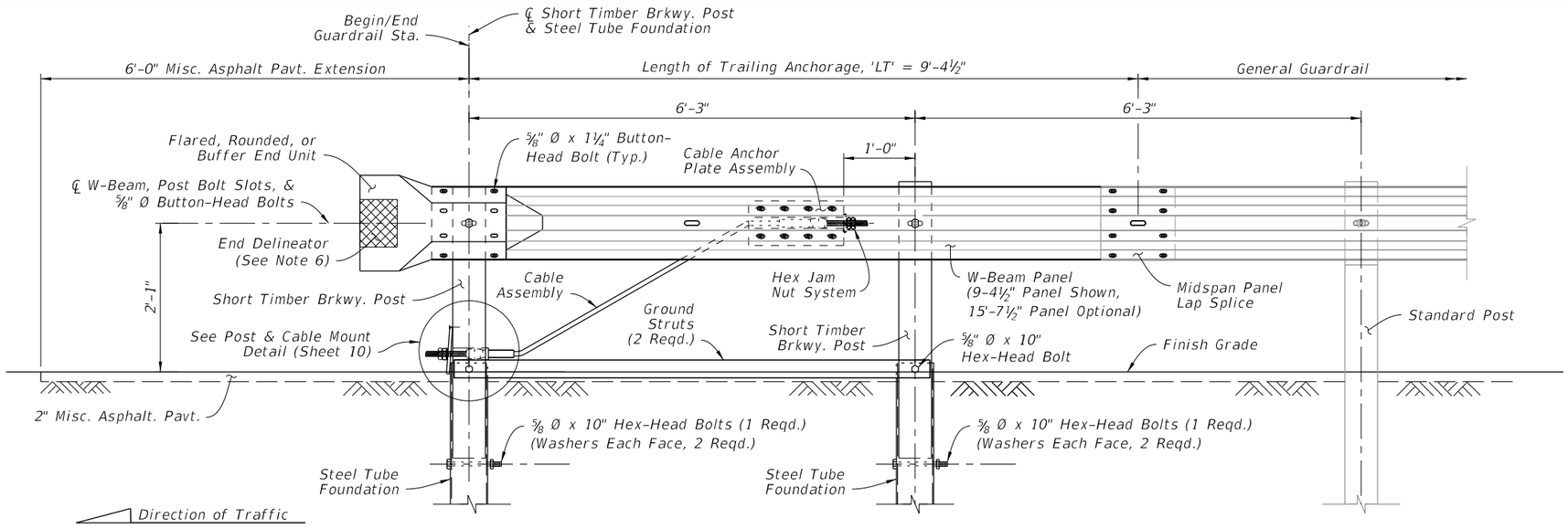
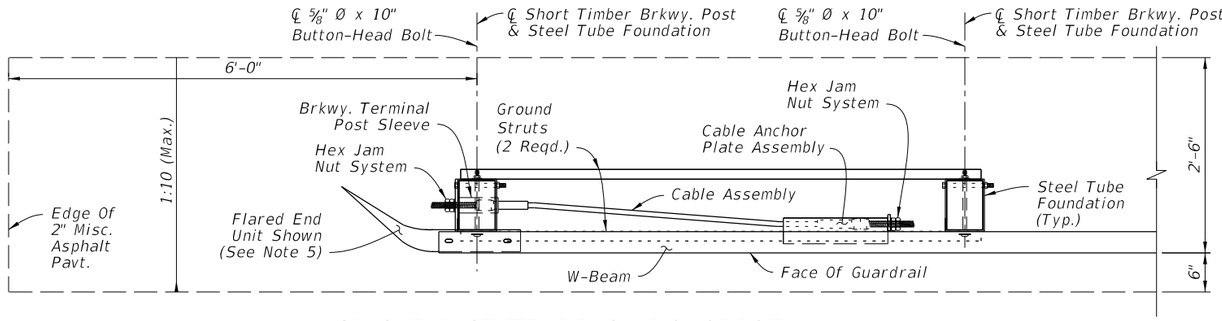
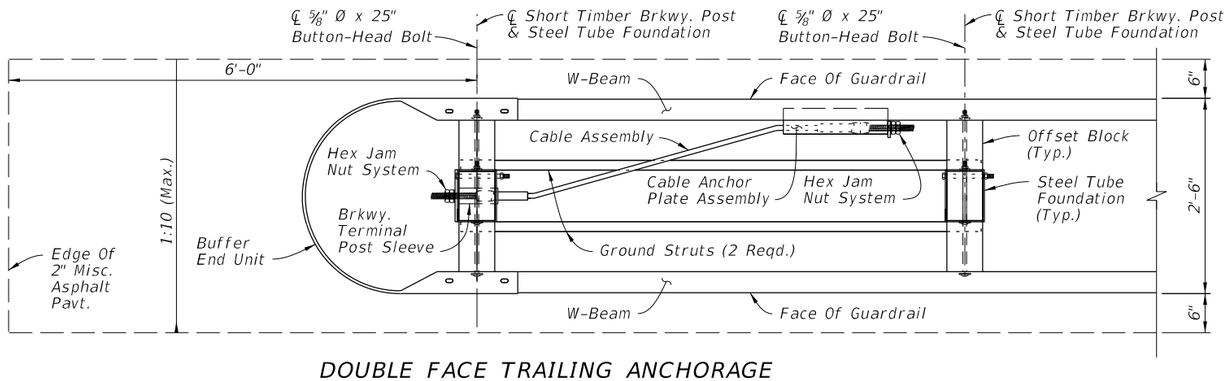


INSTALLED ELEVATION



SINGLE FACE TRAILING ANCHORAGE
INSTALLED PLAN



DOUBLE FACE TRAILING ANCHORAGE
INSTALLED PLAN

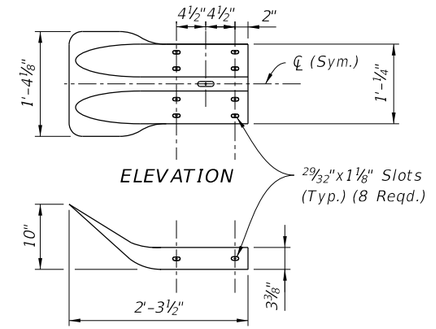
NOTES:

1. *COMPONENT DETAILS: For additional component details, See Sheet 10.*
2. *END UNITS: Use materials for end units as defined in Specifications Section 967. End Units are referred to as "End or Buffer Sections" in AASHTO M180.*

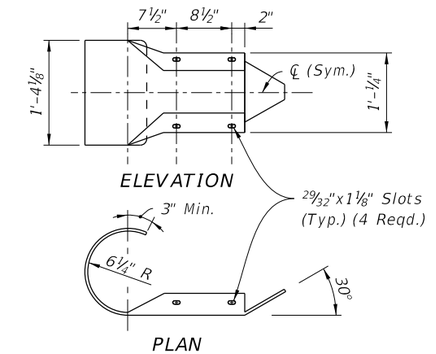
   Lap the Flared End Unit behind the W-Beam; lap the Rounded and Buffered End Units over the face of the W-Beam.
3. *FOUNDATIONS: Install Steel Tubes by either of the following methods:*

   a. Excavate, backfill, and compact material to provide full passive soil resistance to the surface of the Tube.

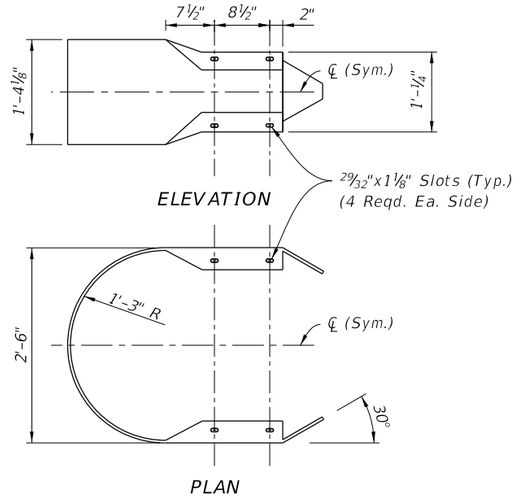
   b. Drive the Tube using a dummy timber post to prevent damage to the Breakaway Post.
4. *GENERAL GUARDRAIL: General Guardrail typically includes Panels and Post Spacing as shown on Sheet 2, including parallel and tapered segments. Transitions, Low-Speed Guardrail, or Reduced Post Spacing Guardrail segments may be substituted for the General Guardrail shown herein if indicated in the plans.*
5. *SIDEWALK REQUIREMENTS: When sidewalks are located adjacent to the End Treatment, install a Rounded End Unit (Flared End Unit not permitted for this case).*
6. *END DELINEATOR: Mount retroreflective sheeting to the approach face of the End Unit in accordance with Specification Sections 536 and 967.*



FLARED END UNIT



ROUNDED END UNIT



BUFFER END UNIT

END TREATMENT - TRAILING ANCHORAGE

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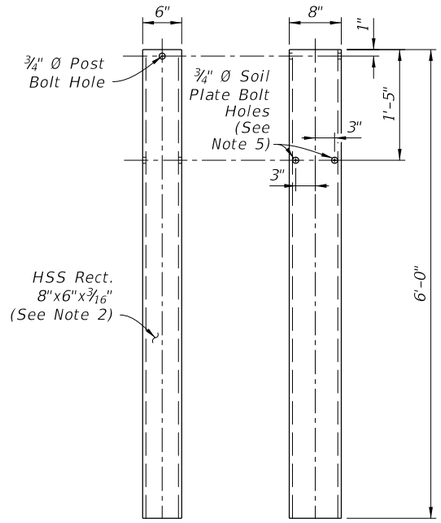
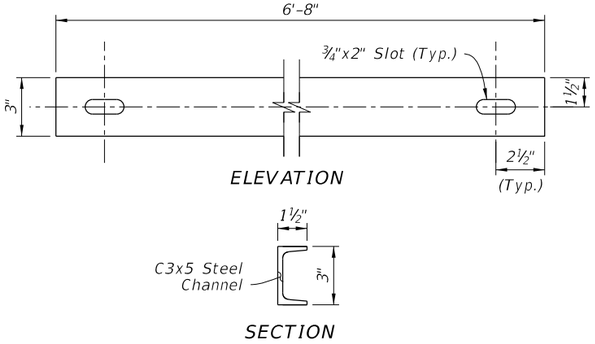
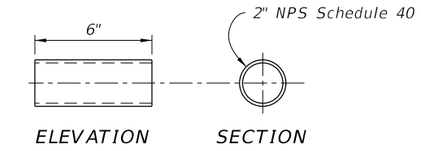


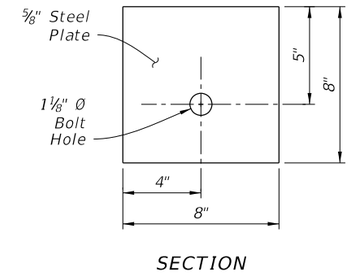
STEEL TUBE FOUNDATION



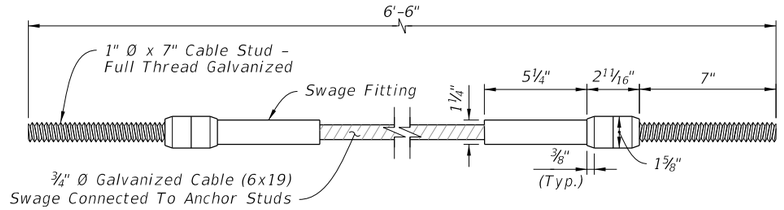
GROUND STRUT



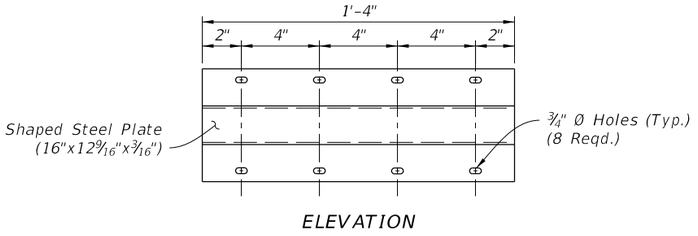
BREAKAWAY TERMINAL POST SLEEVE

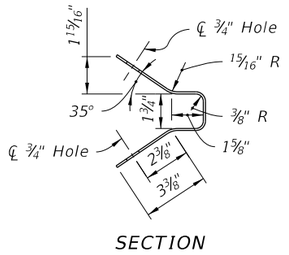


BEARING PLATE

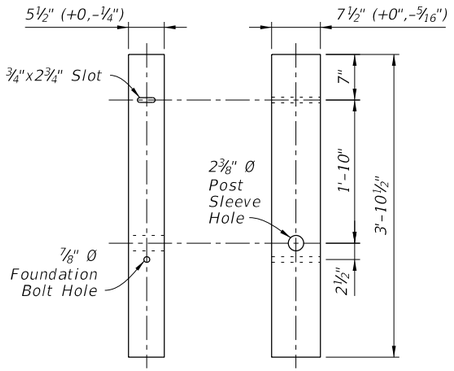


CABLE ASSEMBLY

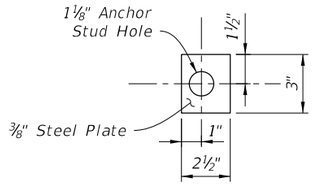




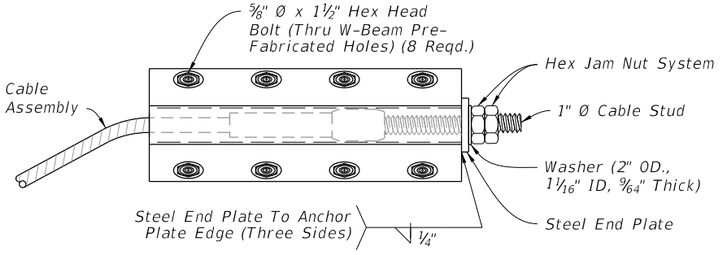
CABLE ANCHOR PLATE

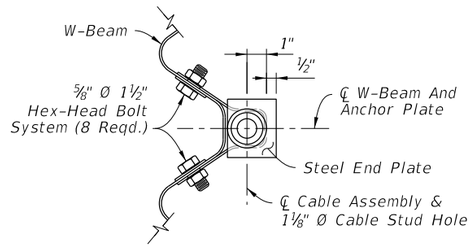


SHORT TIMBER BREAKAWAY POST (6"x8" Nom.)

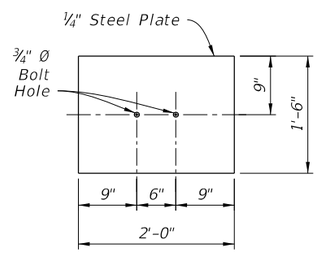


STEEL END PLATE

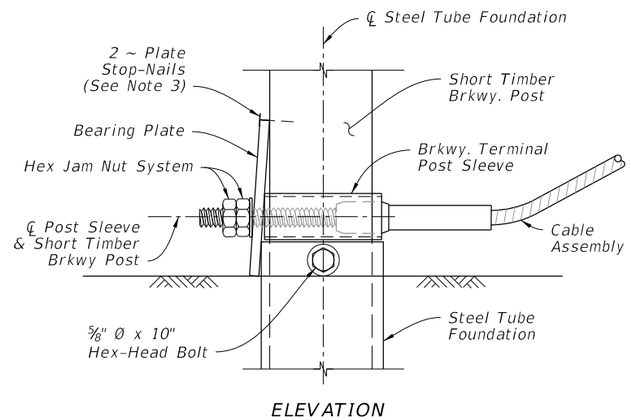




CABLE ANCHOR PLATE ASSEMBLY



SOIL PLATE



POST & CABLE MOUNT ASSEMBLY

NOTES:

1. INSTALLATION: Use components as shown on Sheets 9 & 11.
2. MATERIALS: Use steel plates, channels, and Cable Assemblies in accordance with Specification 967.

   Use Short Timber Breakaway Posts and Steel Tube Foundations in accordance with Specification 536.

   Use Hex Nuts, Hex Jam Nuts, and Washers in accordance with the AASHTO-AGC-ARTBA Guide to Standardized Barrier Hardware with English unit equivalents of components FNX24a and FWC24a, respectively. Two Hex Nuts may be used for the Hex Jam Nut System.
3. PLATE STOP-NAILS: To prevent rotation of the Bearing Plate, drive steel 2½" Type 8d nails with ASTM A153 hot-dip galvanization.
4. CABLE ANCHOR PLATE ASSEMBLY INSTALLATION: Mount to the pre-fabricated Cable Anchor Plate Bolt Holes in the W-Beam Panel, as shown on Sheet 4. These panel holes are only permitted for this Cable Anchor Plate Assembly application.
5. SOIL PLATE BOLT HOLE(S): For Trailing Anchorage installations as shown on Sheet 9, the two bolt holes shown may be substituted with a single bolt hole located at the tube centerline.

END TREATMENT - COMPONENT DETAILS

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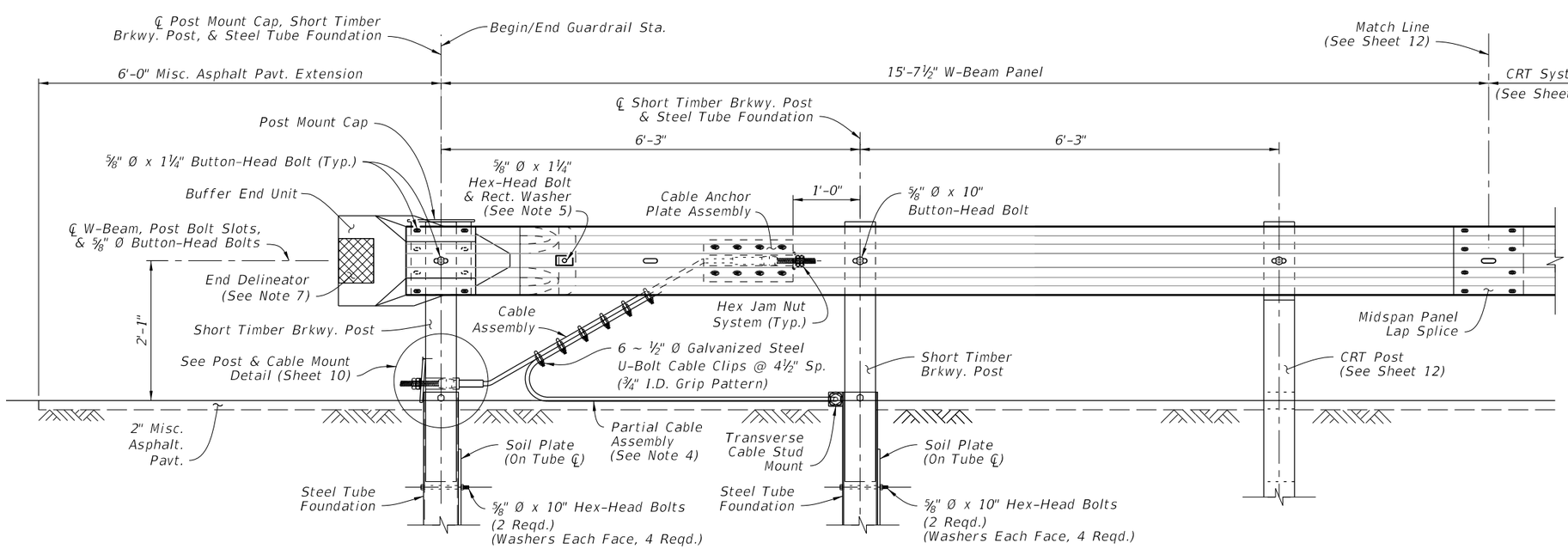
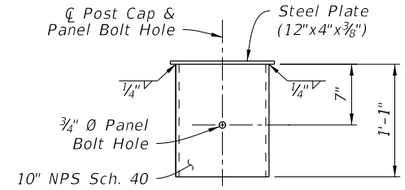
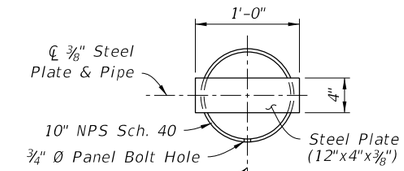


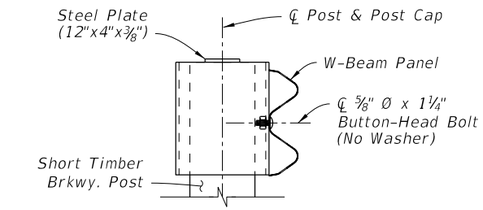
INSTALLED ELEVATION



ELEVATION

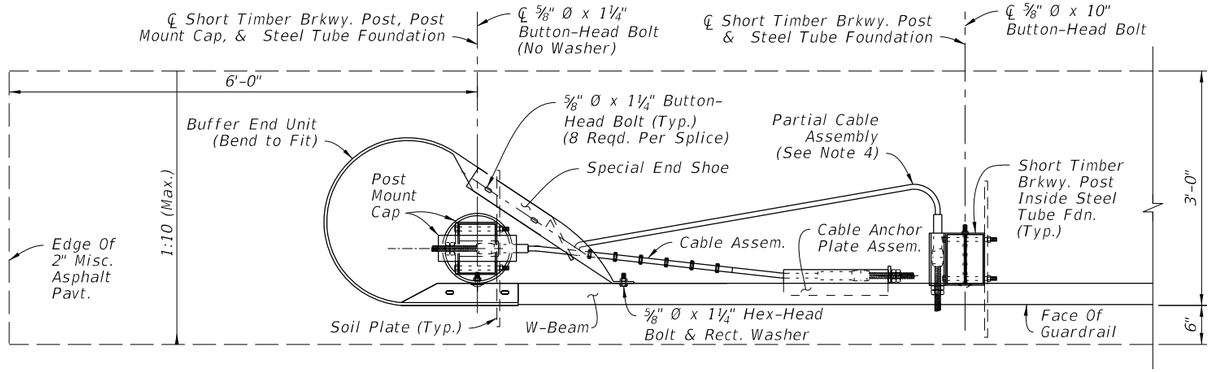


PLAN



INSTALLED SECTION

POST MOUNT CAP



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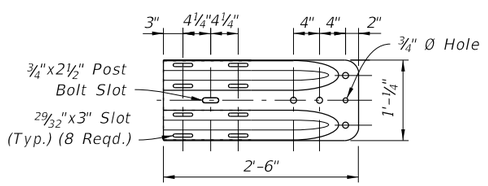
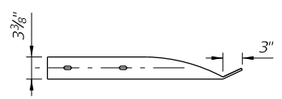
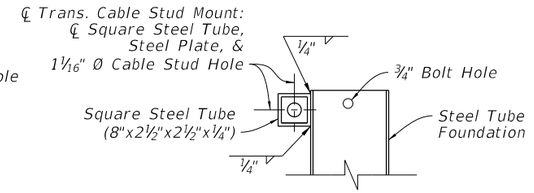


ELEVATION

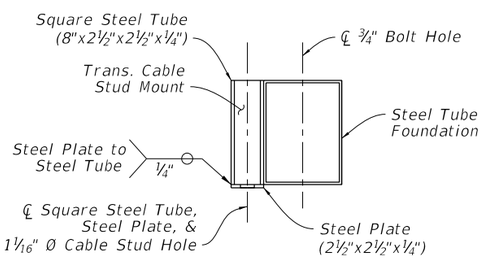


PLAN

SPECIAL END SHOE



ELEVATION



PLAN

TRANSVERSE CABLE STUD MOUNT

CRT END TREATMENT ASSEMBLY

NOTES:

1. INSTALLATION: Use with CRT Systems as required on Sheet 12.
2. COMPONENT DETAILS: For additional component details, See Sheet 10 & 12. For the Rectangular Washer detail, see Sheet 22.
3. MATERIALS: Use steel End Shoes, Plates, Tubes, and pipes in accordance with Specifications 967.
4. PARTIAL CABLE ASSEMBLY: The Partial Cable Assembly is similar to the Cable Assembly defined on Sheet 10, except with a 9'-0" total length and the Swage Fitting and Cable Stud omitted from one end.

   Feed the Cable Stud through the Cable Stud Hole of the Transverse Cable Stud Mount as shown, and secure it with the Hex Jam Nut System as defined on Sheet 10.
5. SPECIAL END SHOE MOUNT: Punch a ¾" Ø hole in the W-Beam Panel as needed to secure the Special End Shoe with the ⅝" Ø Hex-Head Bolt. Galvanize hole per Specification 562.
6. FOUNDATIONS: Install Steel Tubes with attached Soil Plates by either of the following methods:

   a. Excavate, backfill, and compact material to provide full passive soil resistance to all surfaces of the tube and soil plate.

   b. Drive the steel tube and soil plate as a single unit using a dummy timber post to prevent damage to the breakaway post.
7. END DELINEATOR: Mount retroreflective sheeting to the approach face of the Buffer End Unit in accordance with Specifications 536 and 967.

END TREATMENT - CONTROLLED RELEASE TERMINAL (CRT) SYSTEM

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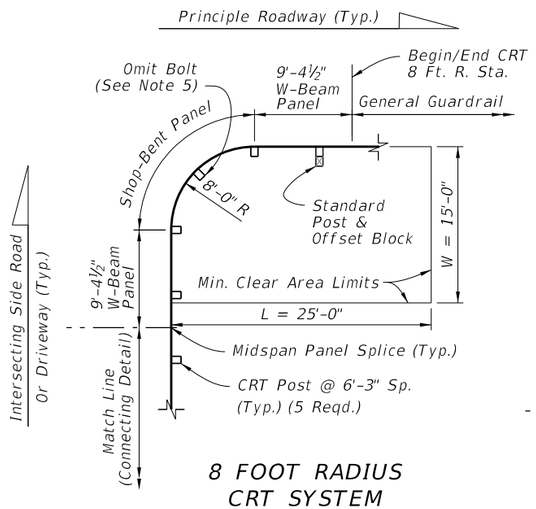
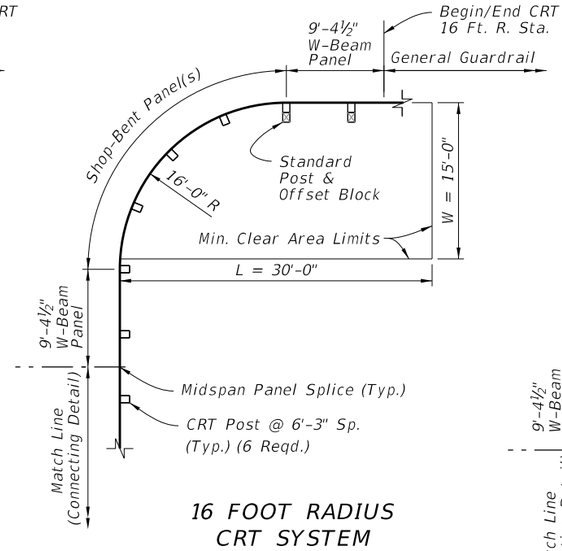
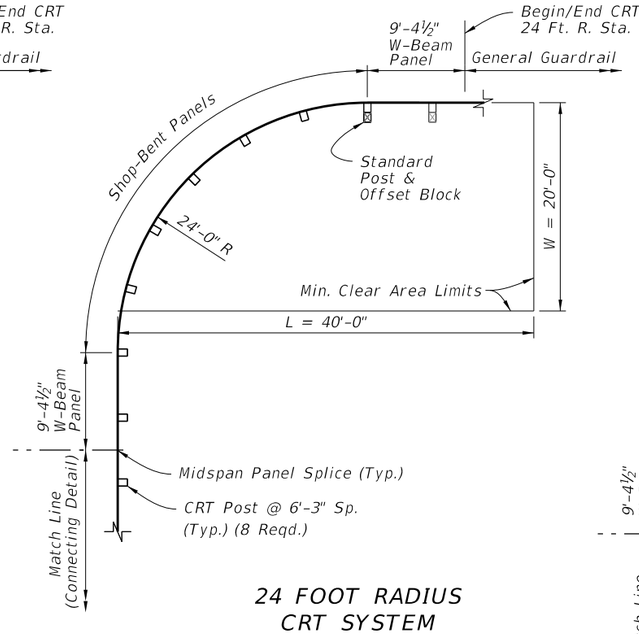


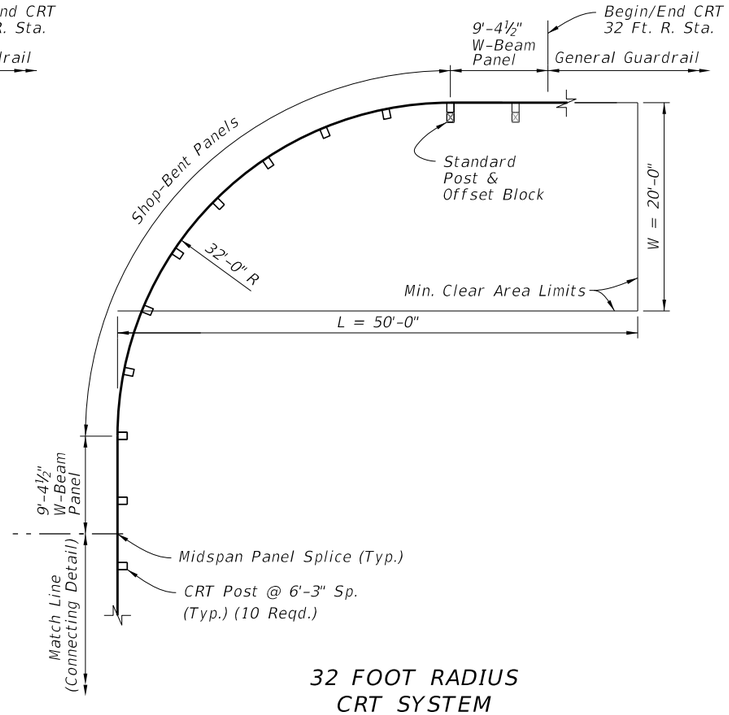
8 FOOT RADIUS CRT SYSTEM PLAN VIEW



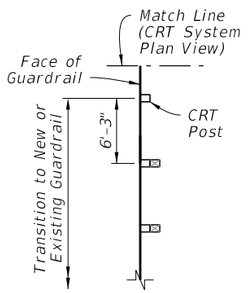
16 FOOT RADIUS CRT SYSTEM PLAN VIEW



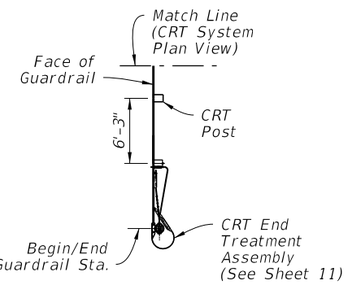
24 FOOT RADIUS CRT SYSTEM PLAN VIEW



32 FOOT RADIUS CRT SYSTEM PLAN VIEW



CONTINUING OPTION

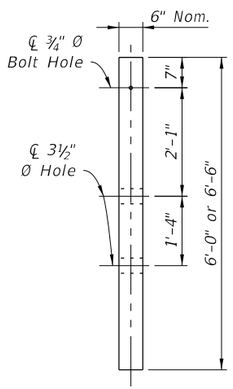


END TREATMENT OPTION

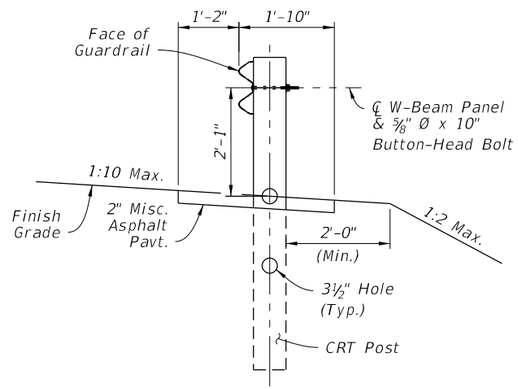
CONNECTING DETAIL

CRT SYSTEM SUMMARY TABLE:

RETURN RADIUS (FT.)	LENGTH OF SHOP-BENT PANEL(S) (FT.)	QUANTITY OF CRT POSTS	AREA CLEAR OF HAZARDS 'L' x 'W' (FT.)
8	12.5	5	25 x 15
16	25.0	6	30 x 15
24	37.5	8	40 x 20
32	50.0	10	50 x 20



CRT POST ELEVATION (6"x8" Nom. Timber)



CRT INSTALLED SECTION

NOTES:

1. INSTALLATION: Construct the specified radius layout and Connecting Detail option as shown in the plans.
2. MIN. CLEAR AREA: Keep the area behind the CRT free of fixed objects and aboveground hazards within the Min. Clear Area limits shown. Maintain a slope not steeper than 1:10 for a minimum 2' behind the posts, and maintain a slope not steeper than 1:2 beyond 2' from the posts.
3. APPROACH GRADING: Maintain grading on the roadway side of the guardrail face at a maximum slope of 1:10.
4. MATERIALS: For CRT Posts, use Timber Post material in accordance with Specification 967. Use steel panels and hardware in accordance with Specification 967.
5. BOLT OMISSION: For the 8 Foot Radius CRT System only, do not place a panel-to-post mount bolt at the center CRT Post (omit the ⅝" Button-Head Bolt only at the location shown).
6. SHOP-BENT PANELS: Install Shop-Bent panel(s) where indicated using 12'-0" or 25'-0" W-Beam Panels. Splice at post locations within the CRT radius using the General configuration of ⅝" Ø Button-Head Bolts (8 reqd. per splice).
7. GENERAL GUARDRAIL: General Guardrail typically includes Panels and Post Spacing as shown on Sheet 2, including parallel and tapered segments. Approach Transitions, Low-Speed Guardrail, or Reduced Post Spacing Guardrail segments may be substituted for the General Guardrail shown herein if indicated in the plans.

LAYOUT FOR CONTROLLED RELEASE TERMINAL (CRT) SYSTEMS - SIDE ROADS AND DRIVEWAYS

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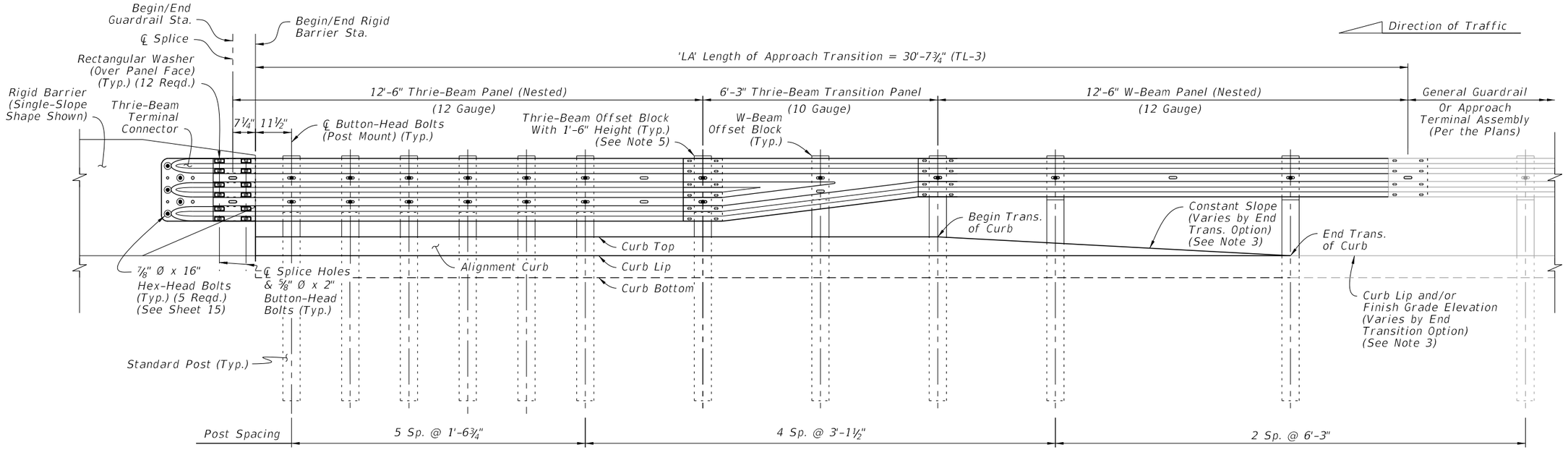
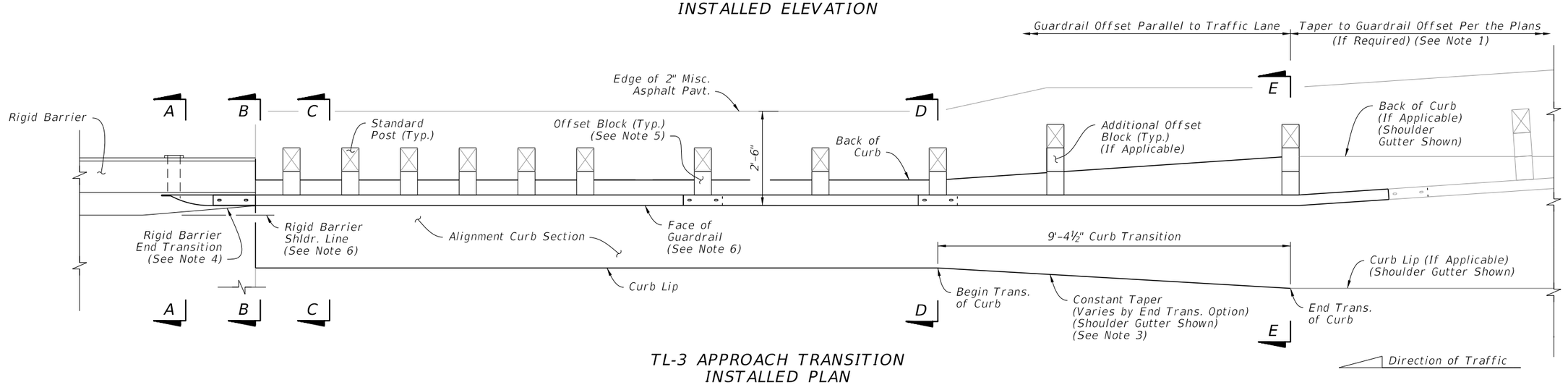


TL-3 APPROACH TRANSITION INSTALLED ELEVATION



TL-3 APPROACH TRANSITION INSTALLED PLAN

NOTES:

1. INSTALLATION: Construct the Approach Transition segment where indicated in the plans. The required offset of the connecting adjacent guardrail is shown in the plans.

   The Layouts given on Sheet 17 provide basic schemes for connections to adjacent guardrail, where a taper to a differing guardrail offset may be required. If the adjacent guardrail segment has the same offset as the Approach Transition segment, then no taper is required.

   For existing bridge connection options, see Indexes 536-002, 521-404, and 521-405.

2. SECTION VIEWS & DETAILS: For cross sections and details including the barrier mounting hardware, curb transition, adjacent grading, and installation dimensions, see Sheet 15.

3. END TRANSITION OF CURB OPTION: The Plan and Elevation views depict an example Curb Transition to Shoulder Gutter from Section D-D to E-E, but this transition may require a different shape depending on the End Transition option indicated in the plans (Either a 'Shoulder Gutter Option', 'Raised Curb Option', or 'Flat No Curb Option'). See Sheet 15 for curb shape details.

4. RIGID BARRIER END TRANSITION: Taper the Rigid Barrier toe as shown. See Concrete Barrier, Index 521-001, and Traffic Railing, Indexes 521-422 and 521-428, for details.

5. OFFSET BLOCKS: For Thrie-Beam post locations within the Length of Approach Transition segment, use the Timber Offset Blocks with 1'-6" height shown on Sheet 5.

   For the midspan of the Thrie-Beam Transition Panel and for all other W-Beam locations shown herein, use the W-Beam Offset Blocks with 1'-2" height.

6. OFFSET: The required offset difference between the Face of Guardrail and Rigid Barrier Shoulder Line is considered negligible and may not be shown in the guardrail offset callouts in the plans. A consistent guardrail offset deviation of up to 4 inches outside of the Rigid Barrier Shoulder Line is permitted over the length 'LA'.

7. GENERAL GUARDRAIL: General Guardrail typically includes Panels and Post Spacing as shown on Sheet 2, including parallel and tapered segments. Approach Terminals, Low-Speed Guardrail, or Reduced Post Spacing Guardrail segments may be substituted for the General Guardrail shown herein if indicated in the plans.

APPROACH TRANSITION CONNECTION TO RIGID BARRIER - GENERAL, TL-3

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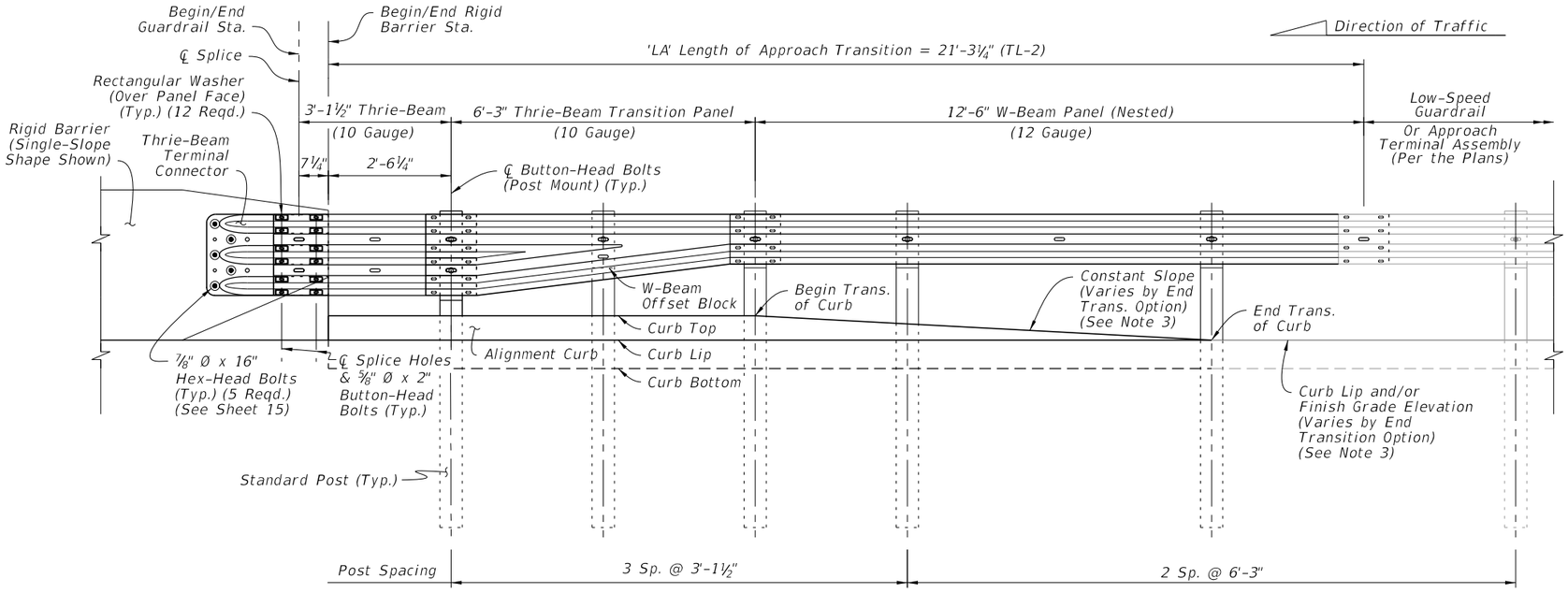
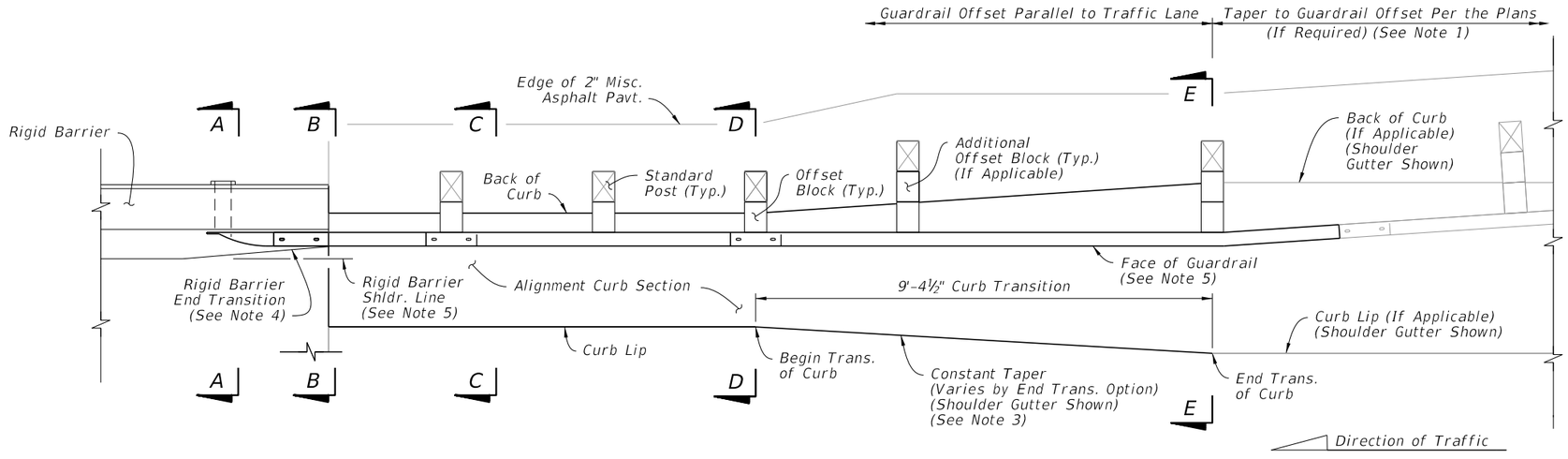


TL-2 APPROACH TRANSITION
INSTALLED ELEVATION



TL-2 APPROACH TRANSITION
INSTALLED PLAN

NOTES:

1. *INSTALLATION: Construct the Approach Transition segment where indicated in the plans. The required offset of the connecting adjacent guardrail is shown in the plans.*

   The Layouts given on Sheet 17 provide basic schemes for connections to adjacent guardrail, where a taper to a differing guardrail offset may be required. If the adjacent guardrail segment has the same offset as the Approach Transition segment, then no taper is required.

   For existing bridge connection options, see Indexes 536-002, 521-404, and 521-405.

2. *SECTION VIEWS & DETAILS: For cross sections and details including the barrier mounting hardware, curb transition, adjacent grading, and installation dimensions, see Sheet 15.*

3. *END TRANSITION OF CURB OPTION: The Plan and Elevation views depict an example Curb Transition to Shoulder Gutter from Section D-D to E-E, but this transition may require a different shape depending on the End Transition option indicated in the plans (Either a 'Shoulder Gutter Option', 'Raised Curb Option', or 'Flat No Curb Option'). See Sheet 15 for curb shape details.*

4. *RIGID BARRIER END TRANSITION: Taper the Rigid Barrier toe as shown. See Concrete Barrier, Index 521-001, and Traffic Railing, Indexes 521-422 thru 521-428, for details.*

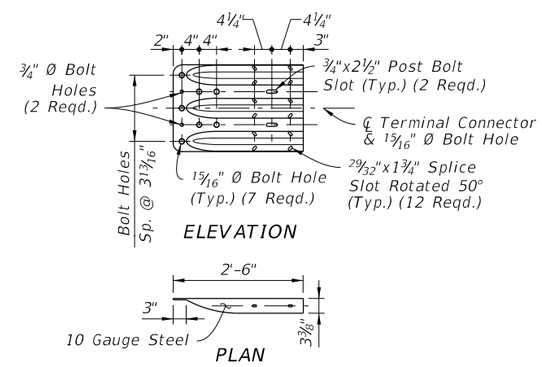
5. *OFFSET: The required offset difference between the Face of Guardrail and Rigid Barrier Shoulder Line is considered negligible and may not be shown in the guardrail offset callouts in the plans. A consistent guardrail offset deviation of up to 4 inches outside of the Rigid Barrier Shoulder Line is permitted over the length 'LA'.*

6. *LOW-SPEED GUARDRAIL: Low-Speed Guardrail typically includes Panels and Post Spacing as shown on Sheet 3, including parallel and tapered segments. Approach Terminals, General Guardrail, or Reduced Post Spacing Guardrail segments may be substituted for the Low-Speed Guardrail shown herein if indicated in the plans.*

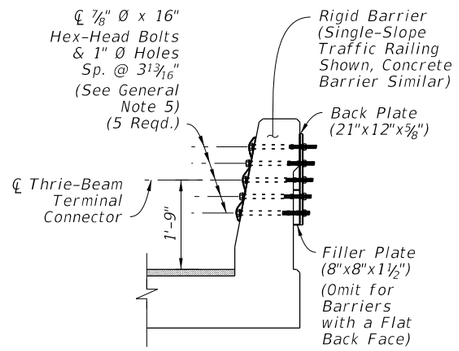
APPROACH TRANSITION CONNECTION TO RIGID BARRIER - LOW-SPEED, TL-2

10/25/2018 9:03:13 AM

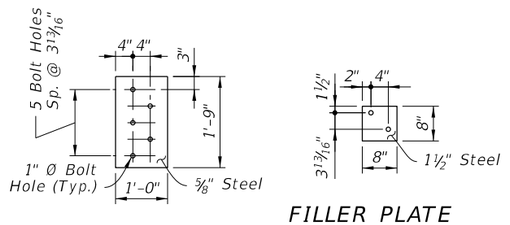
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	GUARDRAIL	INDEX	SHEET
11/01/17						536-001	14 of 22



THRIE-BEAM TERMINAL CONNECTOR DETAIL

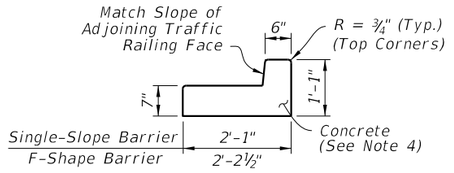


SECTION A-A RIGID BARRIER TERMINAL CONNECTOR MOUNT

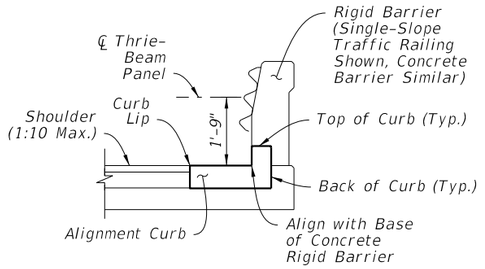


BACK PLATE

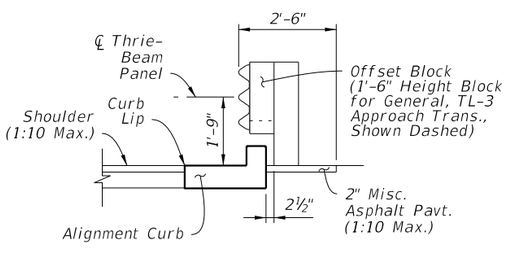
FILLER PLATE



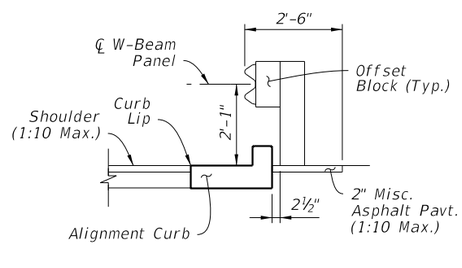
ALIGNMENT CURB SECTION



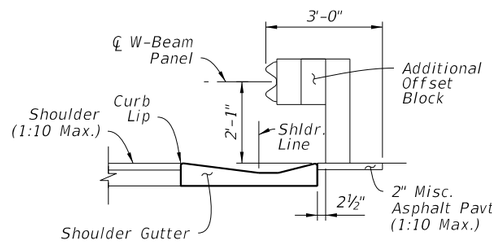
SECTION B-B BEGIN ALIGNMENT CURB (Mate to Rigid Barrier)



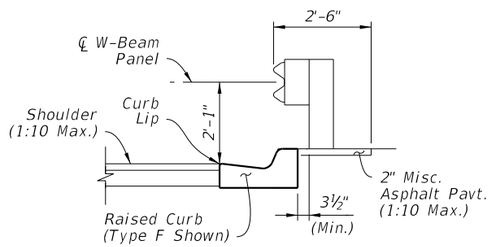
SECTION C-C ALIGNMENT CURB (Intermediate)



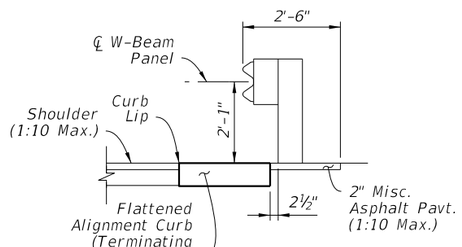
SECTION D-D BEGIN TRANSITION (End Alignment Curb)



SECTION E-E END TRANSITION SHOULDER GUTTER OPTION

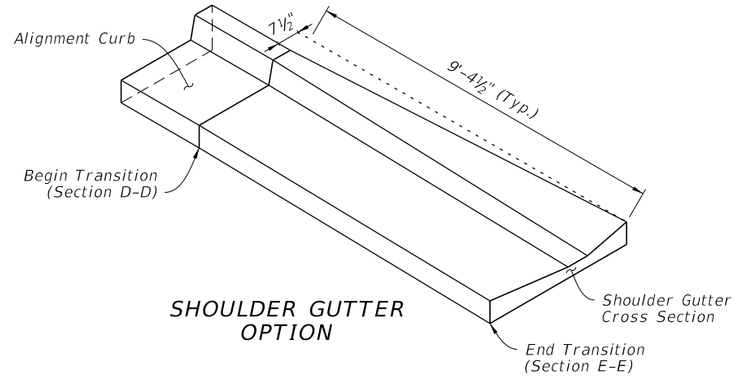


SECTION E-E END TRANSITION RAISED CURB OPTION

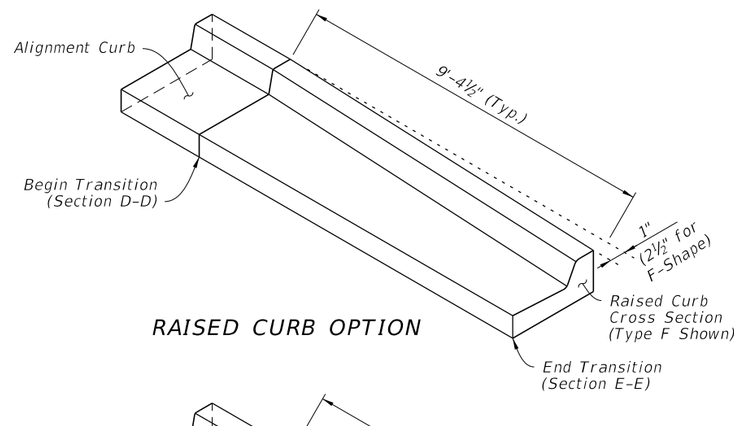


SECTION E-E END TRANSITION FLUSH SHOULDER OPTION

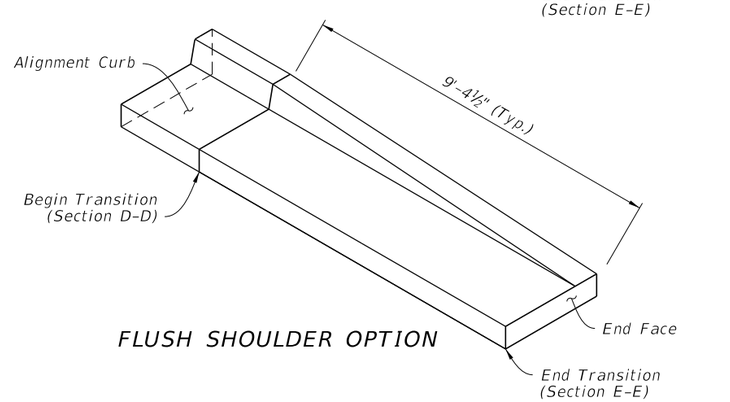
CURB TYPICAL SECTIONS



SHOULDER GUTTER OPTION



RAISED CURB OPTION



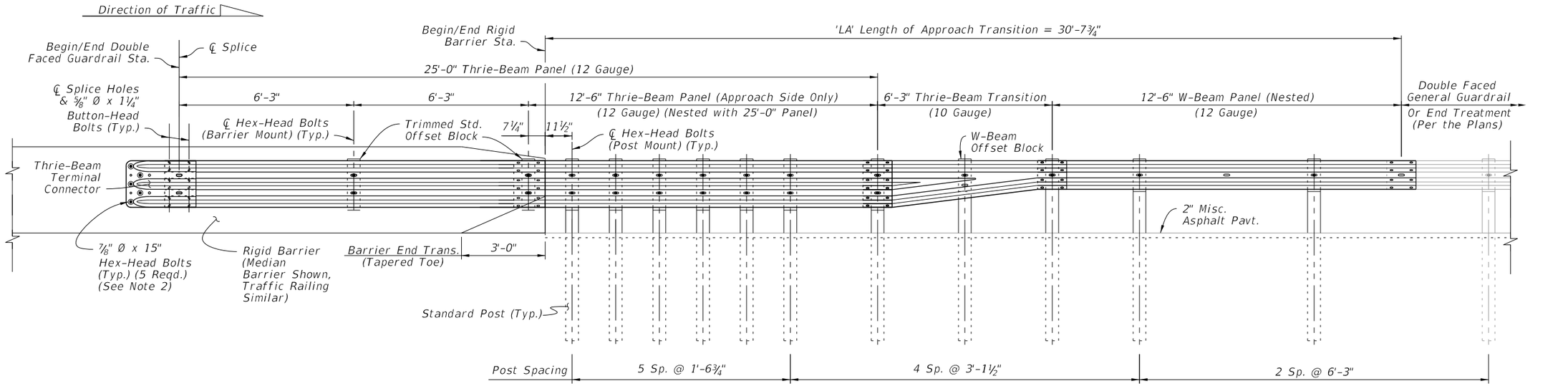
FLUSH SHOULDER OPTION

CURB TRANSITION ISOMETRIC VIEWS

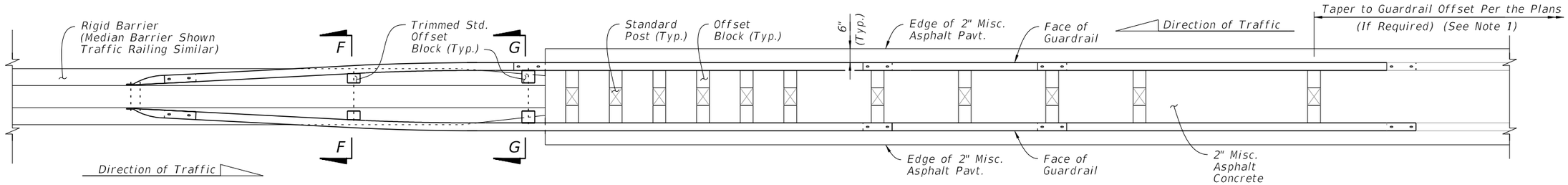
NOTES:

1. PLAN AND ELEVATION VIEWS: Work with Sheets 13 & 14.
2. END TRANSITION OF CURB OPTION: Install one of the three End Transition types shown per Section E-E as indicated by the plans.
3. GRADING BEHIND POSTS: Place Slope Break a Min. 2'-0" behind the post, per Sheet 6.
4. MATERIALS & CONSTRUCTION: Construct the concrete Aligning Curb and Curb transition in accordance with Specification 520. Use steel Plates and Thrie-Beam Terminal Connectors in accordance with Specification 967.

APPROACH TRANSITION CONNECTION - DETAILS



TL-3 DOUBLE FACED APPROACH TRANSITION
INSTALLED ELEVATION



TL-3 DOUBLE FACED APPROACH TRANSITION
INSTALLED PLAN

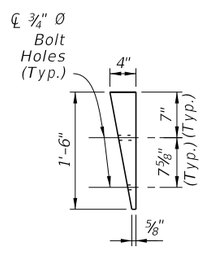
NOTES:

1. INSTALLATION: Construct the Approach Transition segment where indicated in the plans. The required offset of the connecting adjacent guardrail is shown in the plans.

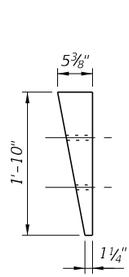
   The Layouts given on Sheet 18 provide basic schemes for connections to adjacent guardrail, where a taper to a differing guardrail offset may be required. If the adjacent guardrail has the same offset as the Approach Transition segment, then no taper is required.

2. THRIE-BEAM TERMINAL CONNECTOR: See Sheet 15 for Details. The installed bolt's threaded portion is not permitted to extend beyond ¾" from the face of the nut; trim the threaded portion as needed and galvanize in accordance with Specification 562.

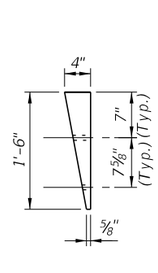
3. GENERAL GUARDRAIL: General Guardrail typically includes Panels and Post Spacing as shown on Sheet 2, including parallel and tapered segments. End Treatments or Reduced Post Spacing Guardrail segments may be substituted for the General Guardrail shown herein if indicated in the plans.



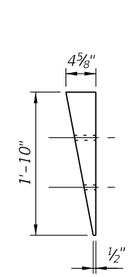
TYPE F-F SECTION



TYPE G-G SECTION



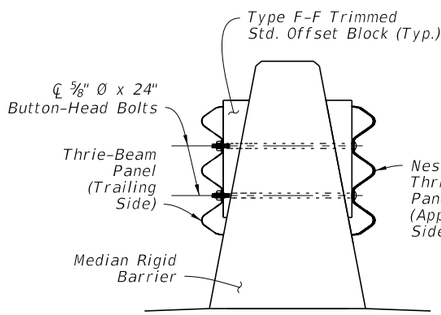
TYPE F-F SECTION



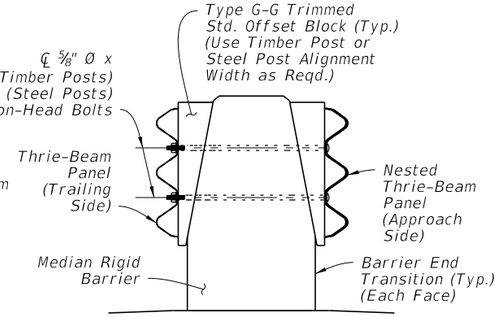
TYPE G-G SECTION

TRIMMED STD. OFFSET BLOCKS
TIMBER POST ALIGNMENT WIDTH

TRIMMED STD. OFFSET BLOCKS
STEEL POST ALIGNMENT WIDTH



SECTION F-F



SECTION G-G

APPROACH TRANSITION CONNECTION TO RIGID BARRIER WITH DOUBLE FACED GUARDRAIL

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LAST REVISION	REVISION	DESCRIPTION:	FY 2019-20 STANDARD PLANS	GUARDRAIL	INDEX	SHEET
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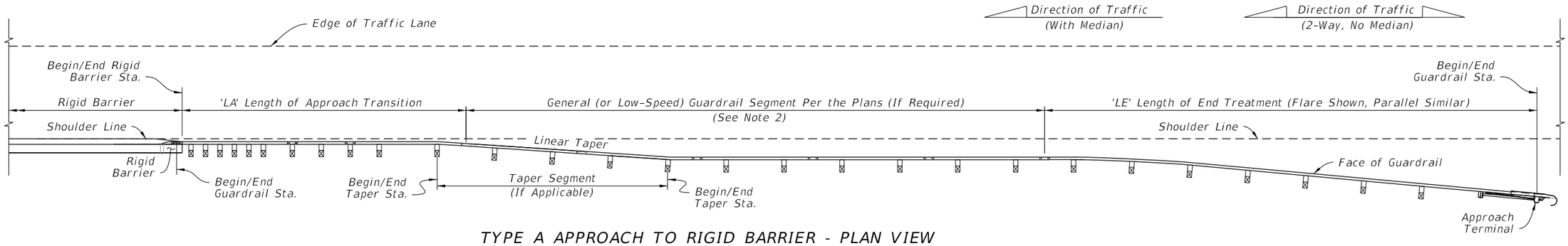
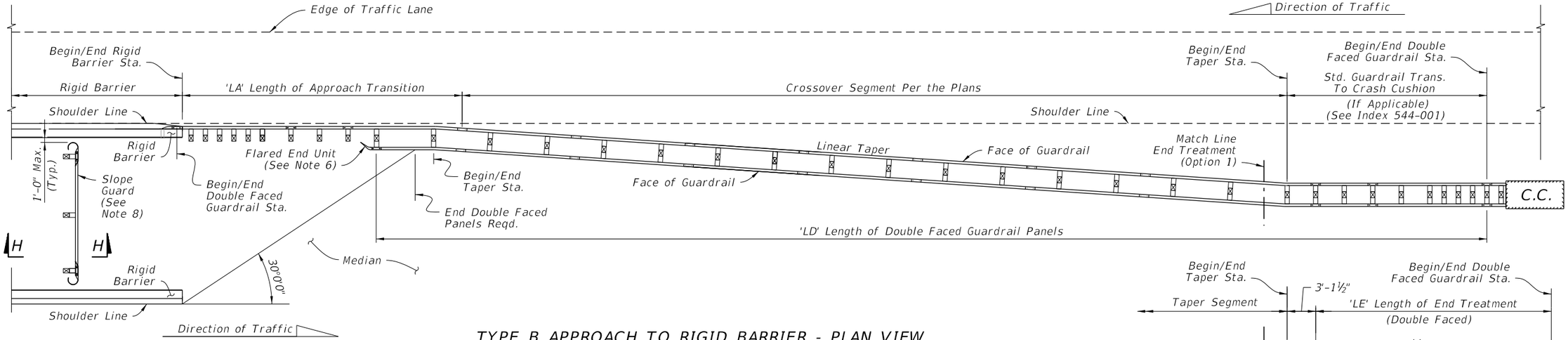
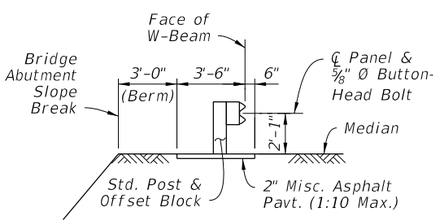


TYPE A APPROACH TO RIGID BARRIER - PLAN VIEW
MEDIAN OR OUTSIDE SHOULDERS
(Mirror Horiz. and/or Vert. for Opposite Direction and/or Side of Road)



TYPE B APPROACH TO RIGID BARRIER - PLAN VIEW
CROSSOVER GUARDRAIL FOR MEDIAN SHOULDERS ONLY
DUAL BRIDGE APPROACH CONFIGURATION
(Mirror Horiz. and Vert. for Opposite Direction)



SECTION H-H
BRIDGE ABUTMENT
SLOPE GUARD
(Between Bridges)

NOTES:

1. *INSTALLATION: The Plan Views shown are schematic only, showing example geometry for connecting guardrail segments including taper locations and Double Faced Guardrail requirements as applicable. Work this Sheet with the plans, where stationing and offsets for Begin/End Guardrail, Begin/End Rigid Barrier, and Begin/End Taper are specified. For existing bridge layouts, see Index 536-002, 521-404, and 521-405.*

2. *GENERAL (OR LOW-SPEED) GUARDRAIL SEGMENT: Construct this segment if shown in the plans. For the case where this segment's offset differs from the Approach Transition offset, linearly taper the guardrail between the Begin/End Taper Stations and offsets as specified in the plans.*

   For the shortest length case of a direct connection between the End Treatment and the Approach Transition, this segment may be omitted as shown in the plans.

3. *LENGTH OF APPROACH TRANSITION 'LA': Install the Approach Transition as shown per Sheet 13 or 14 as called for in the plans.*

4. *LENGTH OF END TREATMENT 'LE': Install the Approach Terminal End Treatment as shown per Sheet 7 or 8, where called for in the plans. Use the corresponding APL drawings for construction details.*

5. *CROSSOVER GUARDRAIL (FOR TYPE B APPROACH): Install the Crossover Segment tapering linearly from the Begin Taper Sta. and offset to the End Taper Sta. and offset as specified in the plans.*

6. *LENGTH OF DOUBLE FACED GUARDRAIL PANELS, 'LD' (FOR TYPE B APPROACH): Terminate the Double Faced Guardrail panels as shown (based upon the 30° line measured from the hazard on the opposite side of the median). Extend the panel segment longer than the dimension 'LD' as needed for the Panel's end Bolt Slot to align with a post Bolt hole.*

   Install a Flared End Unit where shown, as defined on Sheet 9.

7. *END TREATMENT OPTIONS (FOR TYPE B & C APPROACH): For Double Faced applications, use either a Double Faced Approach Terminal Assembly per Sheet 8 or a Crash Cushion per Index 544-001. For either Option, meet the 1:10 adjacent grading requirements for Approach Terminals as shown on Sheet 8.*

8. *SLOPE GUARD: Where indicated in the plans, install a Guardrail segment between bridge approaches and offset from the bridge abutment's Slope Break as shown. Install posts at the end bolt slots of the panel system. Use post spacing of either 3'-1½" or 6'-3", as needed to correctly fit system between barriers. The system may also be lengthened to fit by installing two Rounded End Units as defined on Sheet 9.*

LAYOUT TO RIGID BARRIER - APPROACH ENDS

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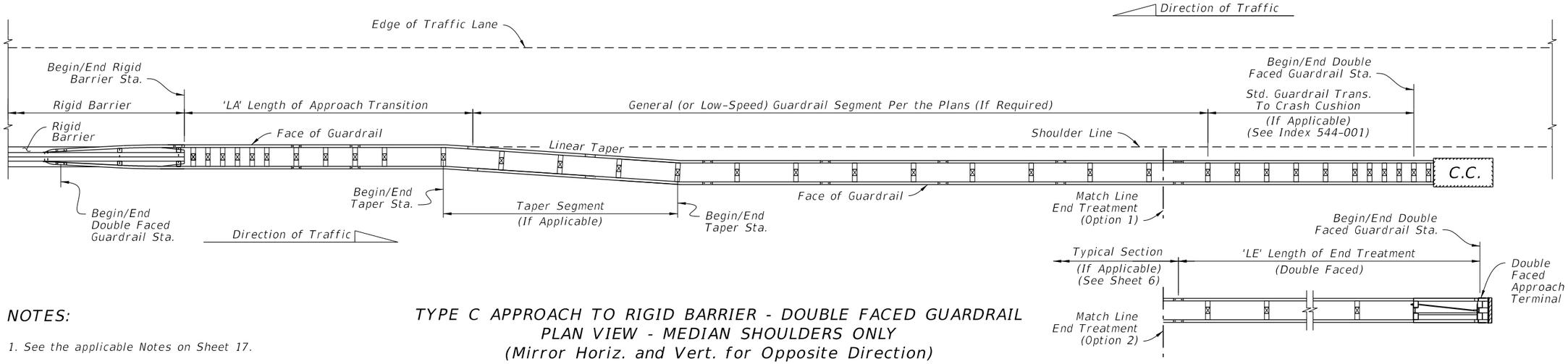
LAST REVISION	REVISION	DESCRIPTION:	FY 2019-20 STANDARD PLANS	GUARDRAIL	INDEX	SHEET
11/01/18					536-001	17 of 22

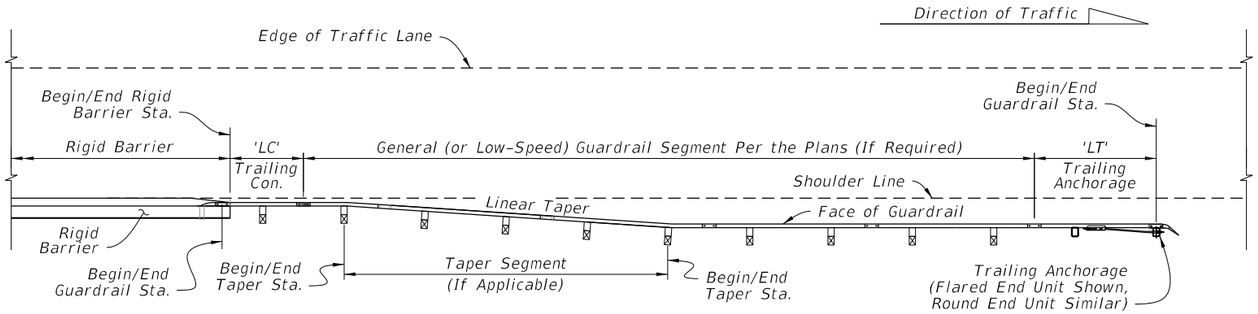


NOTES:

1. See the applicable Notes on Sheet 17.

TYPE C APPROACH TO RIGID BARRIER - DOUBLE FACED GUARDRAIL
PLAN VIEW - MEDIAN SHOULDERS ONLY
(Mirror Horiz. and Vert. for Opposite Direction)

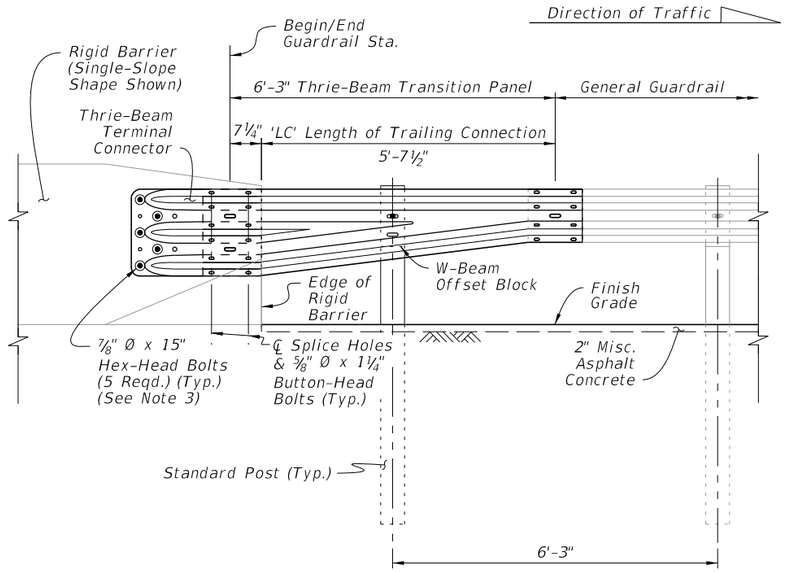
LAYOUT TO RIGID BARRIER - APPROACH ENDS WITH DOUBLE FACED GUARDRAIL



TYPE D TRAILING CONNECTION FROM RIGID BARRIER
PLAN VIEW - MEDIAN OR OUTSIDE SHOULDER
(Mirror Horiz. and/or Vert. for Opposite Direction and/or Side of Road)

NOTES:

1. See the applicable Notes on Sheet 17.
2. LENGTH OF TRAILING ANCHORAGE, 'LT': Install the Trailing Anchorage as shown on Sheet 9, where called for in the plans.
3. THRIE-BEAM TERMINAL CONNECTOR: Install connector and bolts as shown on Sheet 15.
4. RIGID BARRIER SINGLE SLOPE END FACE: See Concrete Barrier Wall, Index 521-001, and Traffic Railing, Indexes 521-422 and 521-423, for details.



TRAILING END TRANSITION CONNECTION
TO RIGID BARRIER - INSTALLED ELEVATION

LAYOUT TO RIGID BARRIER - TRAILING ENDS

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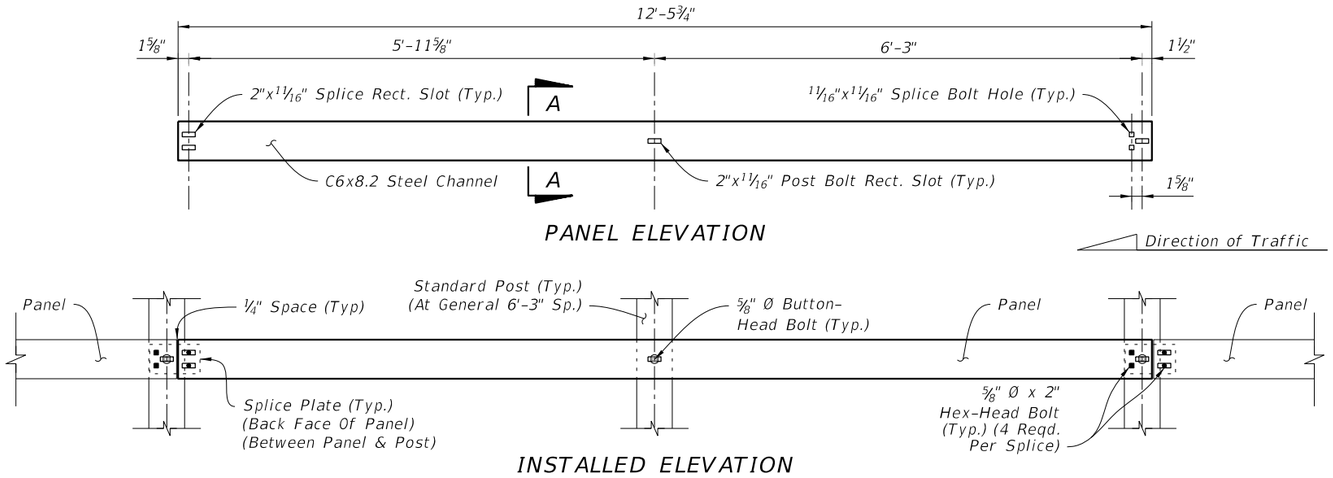
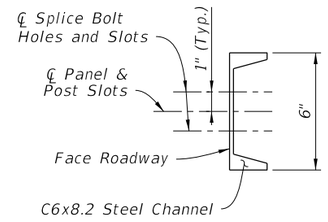
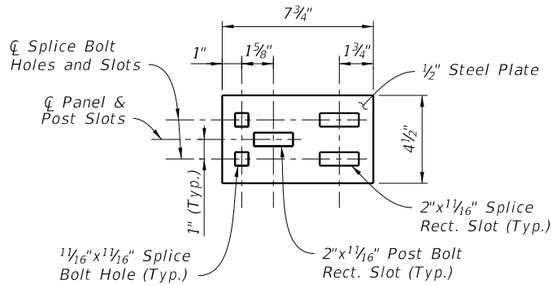
LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2019-20 STANDARD PLANS	GUARDRAIL	INDEX	SHEET
11/01/18					536-001	18 of 22



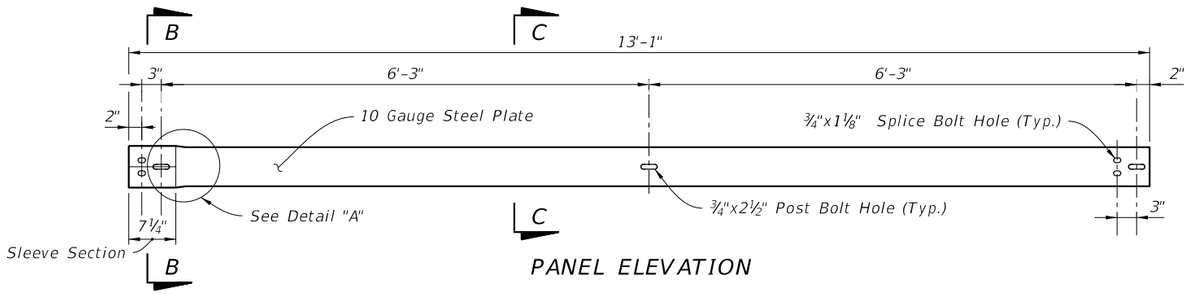


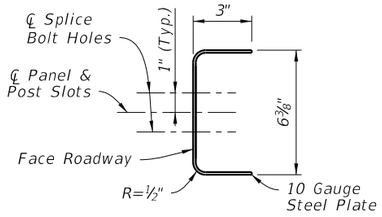
SECTION A-A
(Panel Typical)



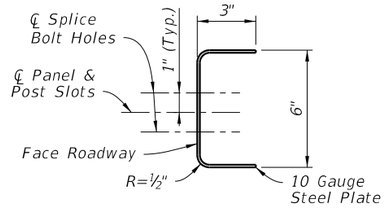
SPLICE PLATE
ELEVATION

CHANNEL SECTION RUB RAIL

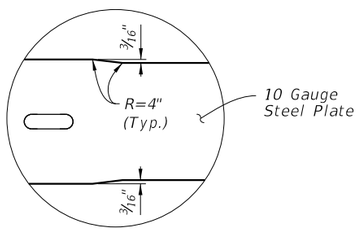




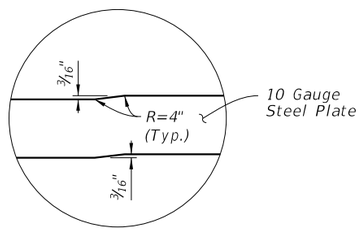
SECTION B-B
(Panel Sleeve End)



SECTION C-C
(Panel Typical)

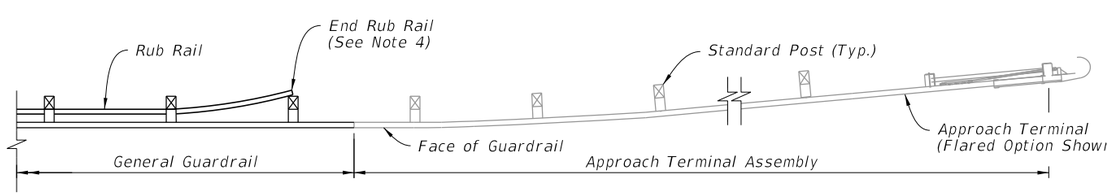


DETAIL "A"
(Sleeve Transition Elevation)



DETAIL "B"
(Sleeve Transition Plan)

BENT-PLATE PANEL RUB RAIL



RUB RAIL TERMINATION - SCHEMATIC PLAN VIEW

Direction of Traffic

NOTES:

1. GENERAL: Install Rub Rail where called for in the plans. Position as shown on Sheet 6 unless otherwise shown in the plans. Install the backs of Rub Rail panels flush against Standard Posts. Either of the Channel Section or Bent-Plate Panel Rub Rail options may be used (consistent type per project). Where Double Sided Rub Rail is called for, thread the Button-Head Bolt through the Post Bolt Hole(s) and the panels on either side, and tighten the nut against the face of the panel farthest from adjacent traffic lanes. Trim the bolt's threaded portion in accordance with Note 4 on Sheet 5.
2. MOUNTING HEIGHT: Mount to the Standard Post's Rub Rail Bolt Hole as defined on Sheet 5.
3. MATERIALS: Use steel components in accordance with Specification 967.
4. END RUB RAIL: For Single Sided Rub Rail, terminate the run of Rub Rail by bending the panel behind the post and securing in place (as shown). For Double Sided Rub Rail, terminate the runs of Rub Rail on their respective front face of the post and secure with the typical Button-Head bolt.

RUB RAIL DETAILS

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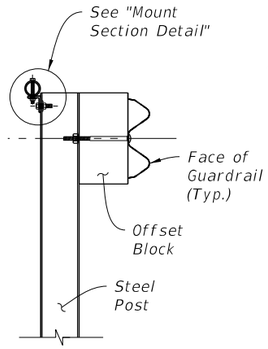
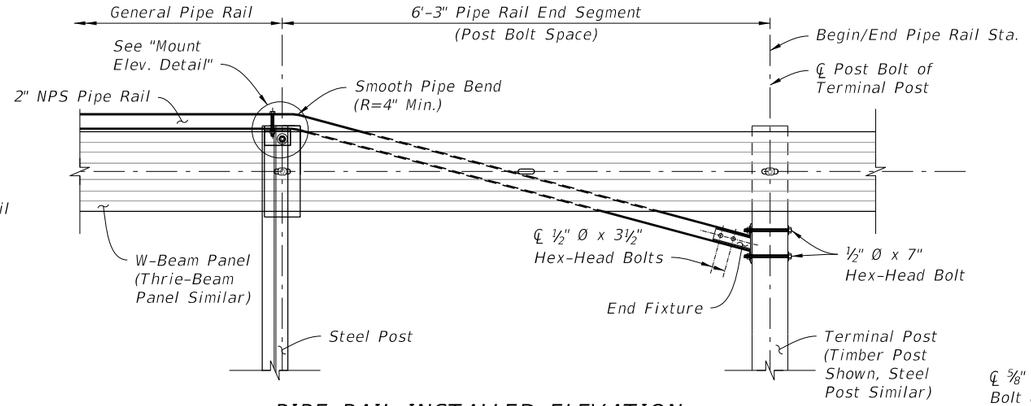
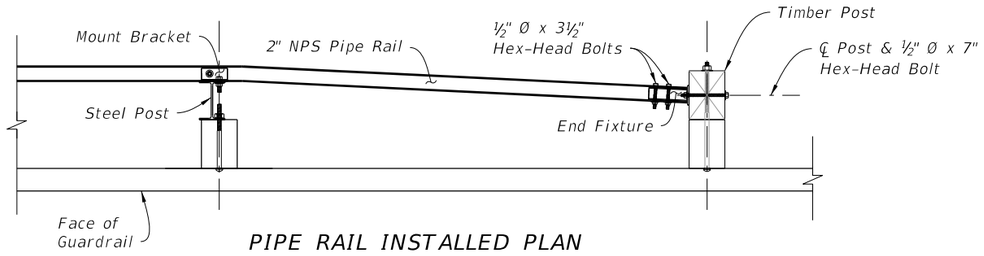


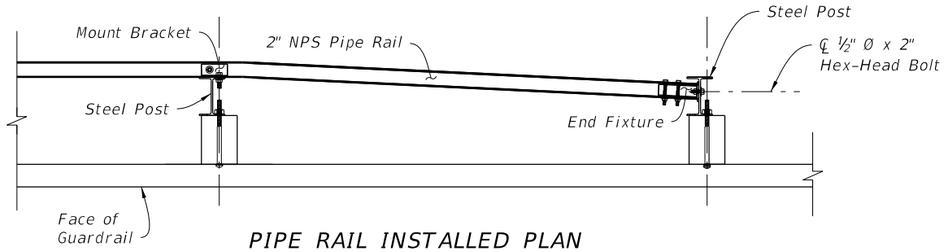
GENERAL PIPE RAIL SECTION



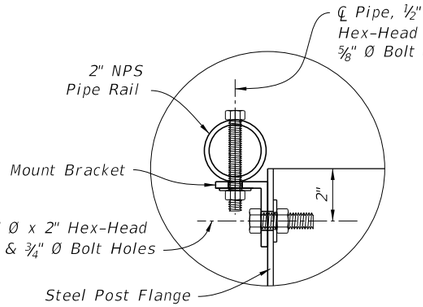
PIPE RAIL INSTALLED ELEVATION
(End Segment Shown)



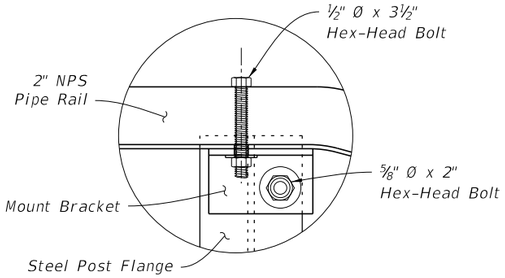
PIPE RAIL INSTALLED PLAN
END AT TIMBER POST OPTION



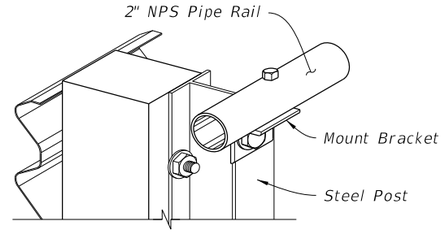
PIPE RAIL INSTALLED PLAN
END AT STEEL POST OPTION



MOUNT SECTION DETAIL



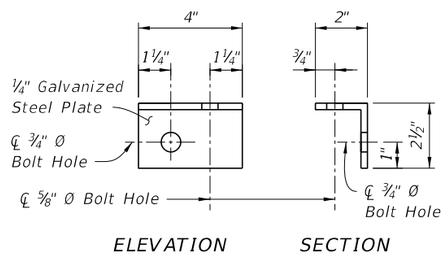
MOUNT ELEVATION DETAIL
(Back View - Mirrored)



MOUNT ISOMETRIC
CUT-AWAY

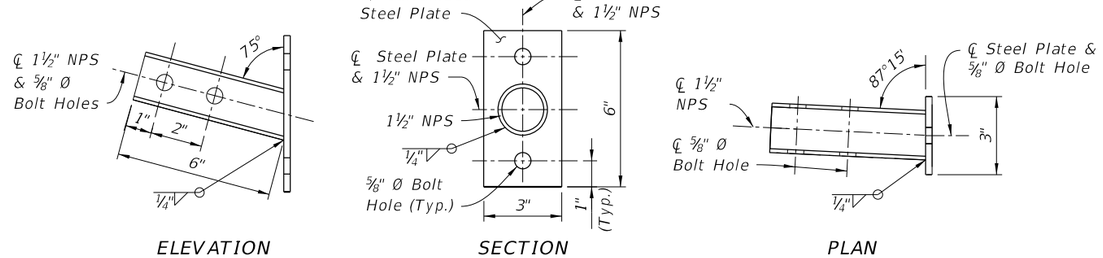
NOTES:

1. GENERAL: Install General Pipe Rail where indicated in the plans or when existing sidewalks or shared use paths are located less than 4'-0" from the back of Steel Posts as shown on Sheet 6.
2. PIPE RAIL END SEGMENTS: Place End Segments on both ends of General Pipe Rail runs, with End Fixtures mounted to Terminal Posts located outside of Approach Terminal Assembly ('LE'), Trailing Anchorage Assembly ('LT'), and Approach Transition ('LA') segments.
3. MATERIALS: Use steel brackets, fixtures, and pipes in accordance with Specification 967.
4. RAIL SPLICES: Install Rail Splices to join pieces of 2" NPS Pipe Rail into a continuous system. Place splices as needed, at a spacing of 18'-0" or greater. Orient the head of bolt on the top of the pipe.



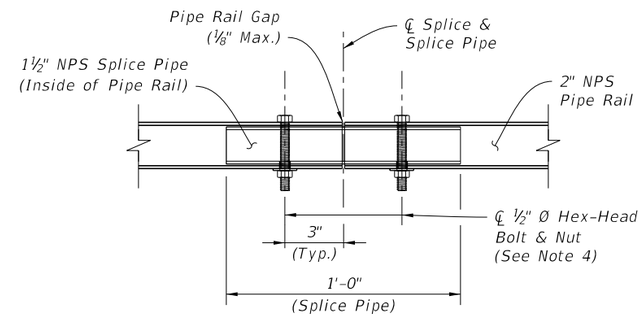
ELEVATION SECTION

MOUNT BRACKET DETAIL



ELEVATION SECTION PLAN

END FIXTURE DETAIL



RAIL SPLICE DETAIL

PEDESTRIAN SAFETY TREATMENT - PIPE RAIL

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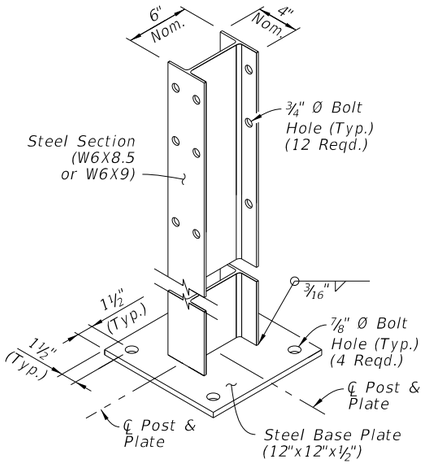
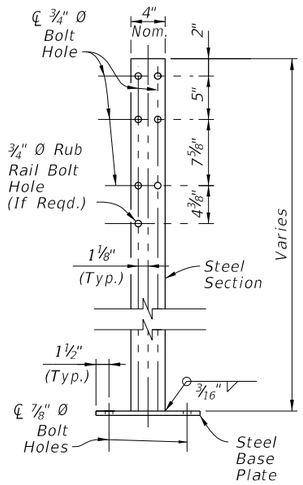
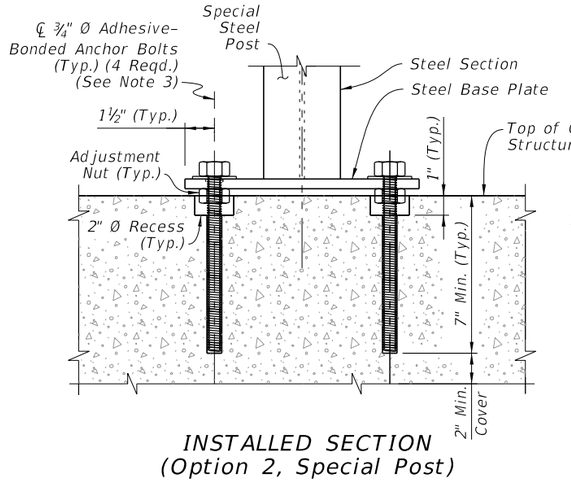


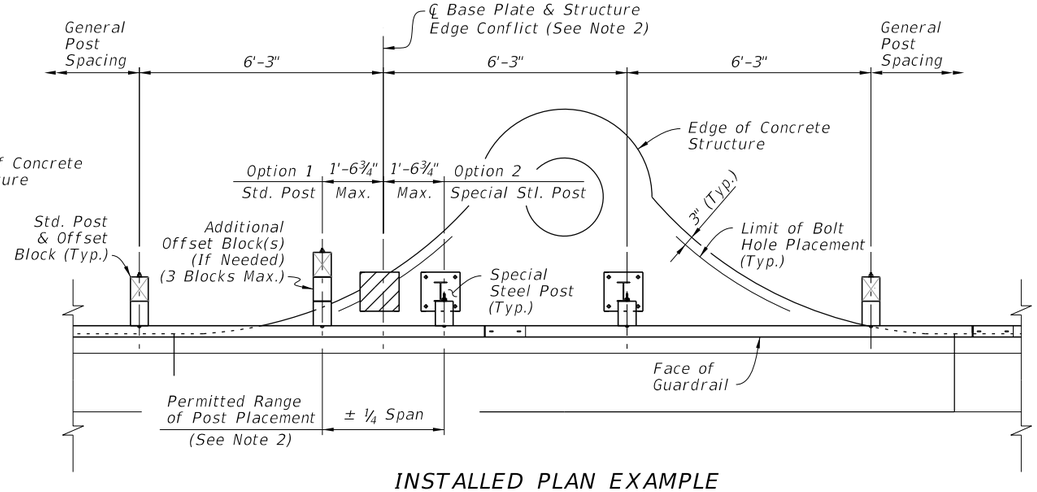
ISOMETRIC VIEW



ELEVATION



INSTALLED SECTION
(Option 2, Special Post)



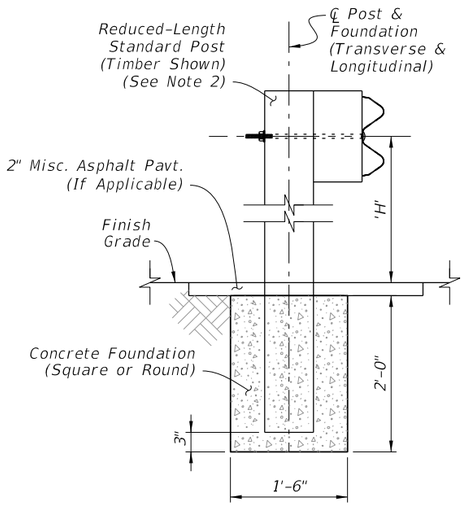
INSTALLED PLAN EXAMPLE
(Curb Inlet Top Type 2 Shown)

SPECIAL STEEL POST STRUCTURE MOUNTING

NOTES:

1. *INSTALLATION: When the construction of Guardrail at the required post spacing results in post(s) located atop culverts, inlets, pier footings, or similar concrete structures, a Special Steel Post may be substituted for a Standard Post. Install where shown in the plans and/or as-needed, in accordance with Specification 536.*
2. *EDGE CONFLICT: When a required post location causes an Edge Conflict with the structure, where the Steel Base Plate is not located entirely on the structure at least 3" from the Edge of Concrete, the longitudinal post location may be altered by up to 1'-6¾" (Quarter Span) from the original required spacing location to prevent the Edge Conflict. With the post location adjusted, use a Std. Post mounted in soil (Option 1) or a Special Steel Post with its Base Plate mounted entirely on the structure (Option 2). Maintain the original required spacing locations upstream and downstream of the structure.*
3. *BASE PLATE MOUNT: Install Special Steel Posts as shown using steel Adhesive-Bonded Anchor Bolts in accordance with Specifications 536. Use ¾" Hex-Head Bolts for structures less than 9" deep as defined in the Specification.*
4. *PANEL MOUNT TO ADJUSTED POST: Punch additional ¾"x2½" Post Bolt Slot(s) in the W-Beam or Thrie-Beam Panel only where needed to mount the panel to a post in an adjusted location. Meet the Panel Post Bolt Slots requirements of Specification 536.*
5. *MATERIALS: Use steel base plates in accordance with Specification 536.*

SPECIAL STEEL POST FOR CONCRETE STRUCTURE MOUNT

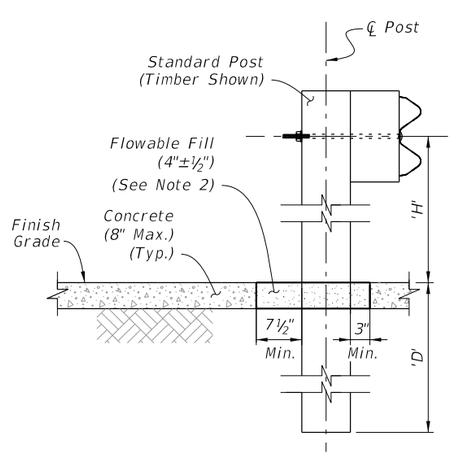


INSTALLED SECTION

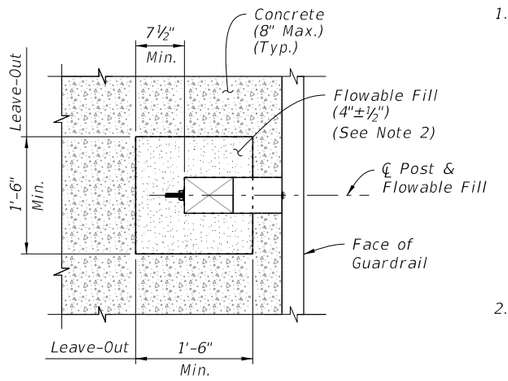
NOTES:

1. *INSTALLATION: When the construction of Guardrail at the required post spacing results in post(s) conflicting with underground utilities or other underground obstructions, an Encased Post may be used where a 2'-0" depth will avoid the conflict. Install where shown in the plans and/or as-needed, in accordance with Specification 536.*
2. *REDUCED-LENGTH STANDARD POST: Use a Standard Post with reduced Length such that the Panel Height 'H' is maintained while the post bottom terminates 3" from the bottom of the Concrete Foundation. Typically, the Post Length 'L' is 4'-7" for W-Beam Guardrail.*
3. *FOUNDATION: Use non-reinforced Class NS Concrete material in accordance with Specification 347. After casting the concrete, ensure the surrounding soil material is completely backfilled and tamped to provide full passive resistance.*
4. *LIMIT: Encased Posts are not permitted for consecutive posts unless otherwise shown in the plans.*

ENCASED POST FOR SHALLOW MOUNT



INSTALLED SECTION



INSTALLED PLAN

NOTES:

1. *INSTALLATION: When the construction of Guardrail at the required post spacing results in post(s) placed within a concrete surface (typically a sidewalk), use a Frangible Leave-Out around the post base as shown. Install where shown in the plans and/or as-needed, in accordance with Specification 536.*

   For the required 1'-6" x 1'-6" Leave-Out, smoothly cut the existing concrete surface or form-up the square shape when an application has new surrounding concrete.

   Ensure Flowable Fill surface is smooth and even with the adjacent concrete surface.
2. *MATERIALS: Use Non-Excavatable Flowable Fill in accordance with Specification 121, not to exceed 150 psi.*

FRANGIBLE LEAVE-OUT FOR CONCRETE SURFACE MOUNT

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NOTES:

1. INSTALLATION: Install Barrier Delineators as shown in accordance with the plans, with Specifications 536 and 705, and with the manufacturer's design as approved on the APL.

2. MATERIALS: Use materials of the size and type defined for Barrier Delineators in Specifications 993.

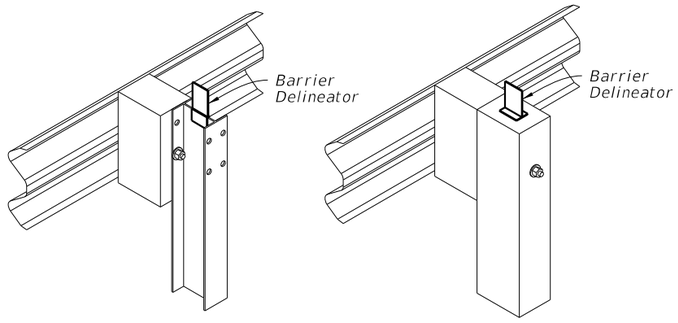
3. COLOR: Use either white or yellow retroreflective sheeting to match the color of the nearest lane's edgeline.

4. MOUNT LOCATIONS: Mount Barrier Delineators atop posts as shown, starting with Post (3) of Approach Terminals and incrementally increasing spacing towards the downstream direction. Install the Barrier Delineators at the following spacing:

   S1 = 25' x 1 Space
   S2 = 50' x 1 Space
   S3 = 75' x 1 Space
   S4 = 100' x for the Remaining Run

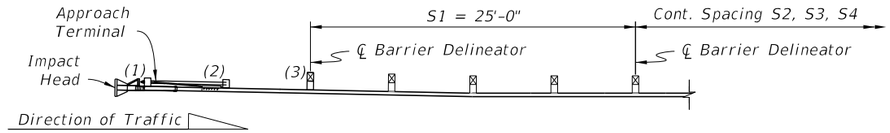
   Additionally, place a Barrier Delineator on Post (2) of the Trailing Anchorage or on the post nearest the Rigid Barrier.

5. MEDIAN GUARDRAIL: Install retroreflective sheeting on both sides of the barrier delineator for Guardrail on medians.



STEEL POSTS TIMBER POSTS

MOUNT LOCATION - ISOMETRIC VIEWS



MOUNT LOCATION - PLAN VIEW

BARRIER DELINEATORS

NOTES:

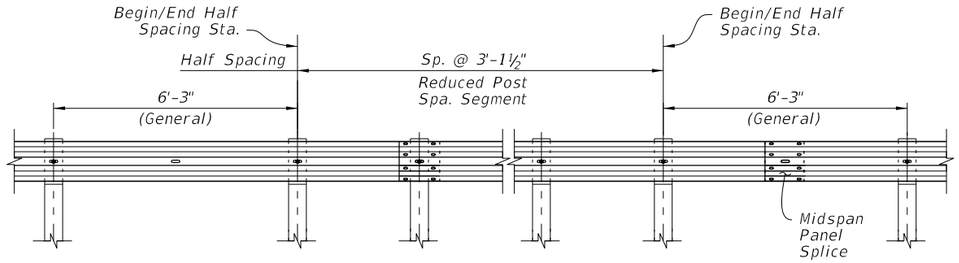
1. INSTALLATION: Work these details with the plans, where Stationing for Begin/End Half Spacing and Begin/End Quarter Spacing are indicated if required.

   Where the Begin/End Stations indicated in the plans do not correspond exactly to post locations in construction, extend the Reduced Post Spacing segment to the nearest post(s) before the Begin Station and/or after the End Station called for.

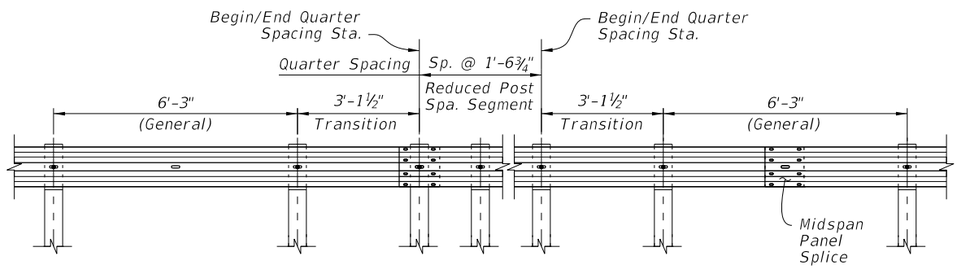
2. PANEL SPLICES: Midspan Panel Splices are not required in Transition and Reduced Post Spacing segments, however they are required for General segments. To place midspan splices in General segments, use one Non-General panel length (9'-4½" or 15'-7½") or add an additional Transition spaced post where required.

3. LOW-SPEED GUARDRAIL: For Reduced Post Spacing with Low-Speed Guardrail (12'-6" post spacing), the Reduced Spacing pattern requires a 6'-3" space between the 12'-6" and 3'-1½" spaces.

4. PANEL POST BOLT SLOTS: For Quarter Spacing configurations, punch additional ¾"x2½" Post Bolt Slots in the panels only where required for mounting and in accordance with Specification 536.

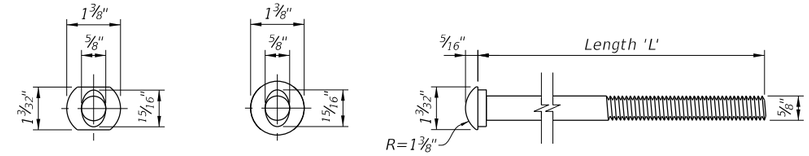


DETAIL 'S' - HALF SPACING ELEVATION
(AS REQD. PER THE PLANS)



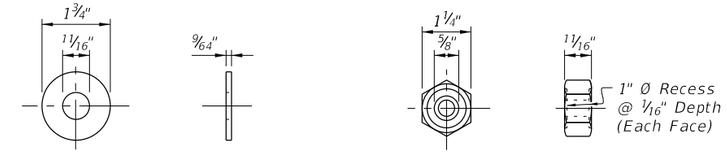
DETAIL 'S' - QUARTER SPACING ELEVATION
(AS REQD. PER THE PLANS)

REDUCED POST SPACING FOR HAZARDS



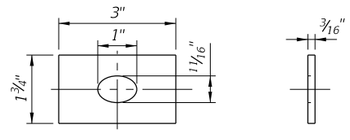
ELEVATION OPTION 1 ELEVATION OPTION 2 PROFILE (Option 1 Shown)

BUTTON-HEAD BOLT



ELEVATION PROFILE ELEVATION PROFILE

WASHER HEX-NUT



ELEVATION PROFILE

RECTANGULAR WASHER
(For CRT & Terminal Connectors Where Shown - Install Over Panel Face)

BUTTON-HEAD BOLT LENGTHS:

Application(s):	Length 'L':	Min. Thread Length:
Panel Splice	1¼"	Full Length
Steel Post Mount – Single Faced Guardrail	10"	4"
Timber Post Mount – Single Faced Guardrail	18"	4"
Steel or Timber Post Mount – Double Faced Guardrail	25"	4"
Modified Thrie-Beam Panel / Terminal Connector Splice	2"	Full Length

NOTES:

1. Use nuts, bolts, and washers in accordance with Specification 967.
2. For Steel Posts with Double Faced Guardrail, the single 25" Length bolt (one bolt thru both post flanges) may be replaced with two 10" Length bolts (one bolt per post flange).
3. Use bolts listed in Table 2 in corresponding locations shown in this Index.

⅝" BUTTON-HEAD BOLT SYSTEM

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NOTES

DESIGN CRITERIA:

1. Design is based on the assumption that the material contained within the reinforced soil volume, methods of construction and quality of prefabricated materials are in accordance with Specification Section 548 and Chapter 3 of the FDOT Structures Design Guidelines.

SOIL PARAMETERS:

1. See Wall Control Drawings for soil characteristics of foundation material to be used in the design of the wall system.
2. The Contractor will provide soil design parameters for backfill material based on the actual soil characteristics utilized at the site.

MATERIALS:

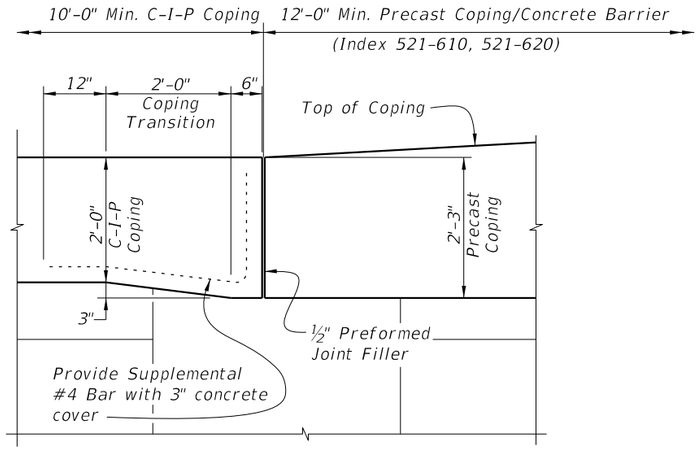
1. See Specification Section 548 for material requirements.

CONSTRUCTION:

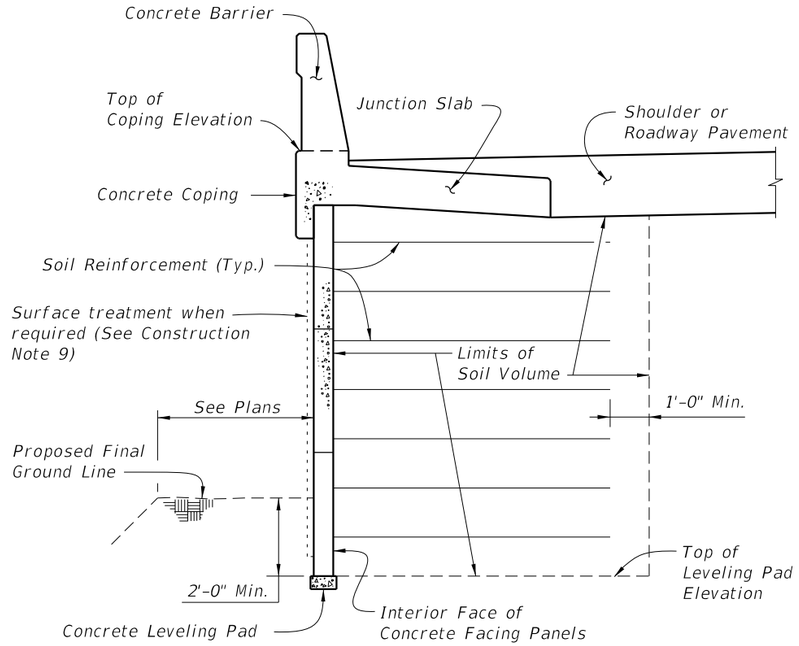
1. Walls will be constructed in accordance with Specification Section 548 and the Wall Company's instructions.
2. For location and alignment of retaining walls, see Wall Control Drawings.
3. If required, locate manholes and drop inlets as shown on wall elevations.
4. Refer to Wall Control Drawings of individual walls for minimum reinforcement strip/mesh length, factored bearing resistance's, minimum wall embedment and anticipated long term and differential settlements.
5. The Contractor is responsible for controlling water during storm events as needed during construction.
6. It is the Contractor's responsibility to determine the location of any guardrail posts behind retaining wall panels. Prior to placement of the top layer of soil reinforcement, individual reinforcing strips/mesh may be skewed (15° maximum) to avoid the post locations if authorized by the Engineer. No cutting of soil reinforcement is allowed unless shown on Shop Drawings and approved by the Engineer. Any damage done to the soil reinforcement due to installation of the guardrail will be repaired by the Contractor at the Contractor's expense. Repair method will be approved by the Engineer.
7. If existing or future structures, pipes, foundations or guardrail posts within the reinforced soil volume interfere with the normal placement of soil reinforcement and specific directions have not been provided on the plans, the Contractor will notify the Engineer to determine what course of action shall be taken.
8. The Contractor is responsible for gradually displacing upper layer(s) of soil reinforcement downward (15° maximum from horizontal) to avoid cutting soil reinforcement and conflicts with paving and subgrade preparation. The Contractor's attention is directed especially to situations where roadway superelevation and/or soil mixing are anticipated.
9. For concrete facing panel surface treatment, see Wall Control Drawings. Extend surface treatment a minimum of 6" below final ground line.
10. Drive piles located within the soil volume prior to construction of the retaining wall, unless a method to protect the structure, acceptable to both the Engineer and Wall Company, is proposed and approved in writing. The portion of piles or drilled shafts extensions within the soil volume will be wrapped with polyethylene sheeting in accordance with Specification Section 459.
11. A structural extension of the connection of the retaining wall panel to soil reinforcement will be used whenever necessary to avoid cutting or excessive skewing (greater than 15°) of the soil reinforcement around obstructions (i.e., piles, pipes, manholes, drop inlets, etc.).
12. Steps in leveling pads will occur at MSE Wall panel interfaces. Panels will not cantilever more than 2" past the end of the upper tier leveling pad.
13. The top of the leveling pad or footing will be 2'-0" minimum below final ground line.
14. Top of leveling pad elevations shown in the Wall Control Drawings are maximum elevations. The constructed leveling pad elevations may be deeper based on the panel layout shown in the shop drawings.
15. The height of panels in the bottom course of MSE Walls must not be less than half the height of a standard panel.
16. Work this Index with Index 521-600 thru 521-650.

SHOP DRAWINGS:

See Specification Section 548 for shop drawing requirements.



ELEVATION VIEW OF
COPING HEIGHT TRANSITION



TYPICAL MSE RETAINING WALL SECTION
WITH A CONCRETE BARRIER
(Showing Limits of the Reinforced Soil Volume)

FDOT MSE RETAINING WALL CLASSIFICATION TABLE

Applicable FDOT Wall Type *	Durability Requirements (Carbon-Steel Reinforcing)			Durability Requirements (FRP Reinforcing)			Soil Reinforcement Type	Other Allowable FDOT Wall Types					
	Concrete Cover (in.)	Concrete Class for Panels	Pozzolan Additions? **	Concrete Cover (in.)	Concrete Class for Panels	Pozzolan Additions? **		2A	2B	2C	2D	2E	2F
Type 2A	2	II	No	1.5	II	No	Metal		✔	✔	✔	✔	✔
Type 2B	2	IV	No	1.5	IV	No	Metal			✔	✔	✔	✔
Type 2C	3	IV	No	1.5	IV	No	Metal				✔	✔	✔
Type 2D	3	IV	Yes	2	IV	No	Metal					✔	✔
Type 2E	3	IV	No	2	IV	No	Plastic						✔
Type 2F	3	IV	Yes	2	IV	No	Plastic						

* See Data Table in Contract Plans.

** Silica fume, metakaolin or ultrafine fly ash.

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GENERAL NOTES AND DETAILS

CONDUIT GENERAL NOTES:

1. Furnish and install approved Conduits, Fittings and Embedded Junction Boxes (EBJ's) in accordance with Specification Sections 630 and 635, this Standard, the National Electric Code (NEC) and as directed by the Engineer.

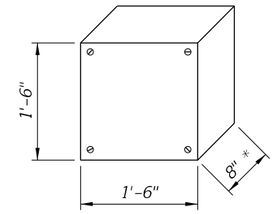
2. Furnish and install Embedded Junction Boxes (EJB) with weatherproof covers sized in accordance with NEC requirements and the maximum size limits shown. Install EJB adjacent to the Begin and End of Bridges, Begin and End of Retaining Walls, (except omit EJB adjacent to the Bridge unless a precast Traffic Railing with junction slab is used), and at other locations as necessary to maintain 300 foot maximum spacing. See Plans for additional locations and details.

3. For Conduit not designated for future use, see Plans for details. For Conduit designated for future use, stub out and cap the Conduit. Drive a 3'-0"± long ¾" (min.) diameter Steel Pipe flush with the ground line adjacent to the end of the Conduit as shown on Sheets 2, 3 or 4. Provide the location of the stub out with Steel Pipe to the Engineer for inclusion on the As-Built Plans.

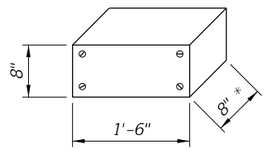
4. Shift vertical Railing reinforcement symmetrically to provide 2" clearance to EJB. Space shifted vertical reinforcement at minimum 3" centers. Cut horizontal Railing reinforcement to provide 2" clearance to EJB and provide supplemental reinforcement as shown. To facilitate placement of Conduit, Expansion Fittings, and Expansion/Deflection Fittings, shift reinforcing a maximum of 1" but do not cut railing reinforcing to facilitate Conduit or Fittings. Do not bundle Conduits, or Conduit and horizontal reinforcement.

5. Place conduits as indicated in this Standard unless Structures Plans indicate fewer.

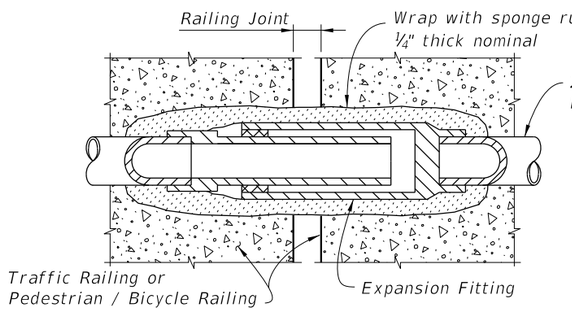
* Reduce to 6" maximum when installed in Pedestrian/ Bicycle Railings.



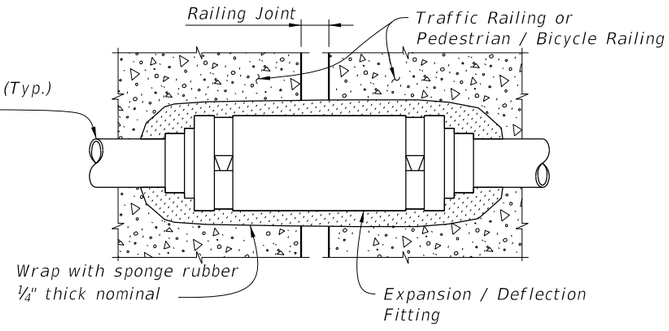
EJB "A"
Double or Triple Conduit
(Maximum Dimensions)



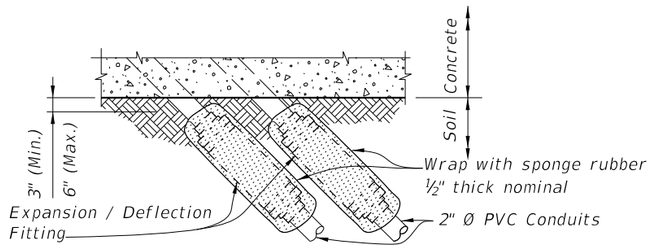
EJB "B"
Single Conduit
(Maximum Dimensions)



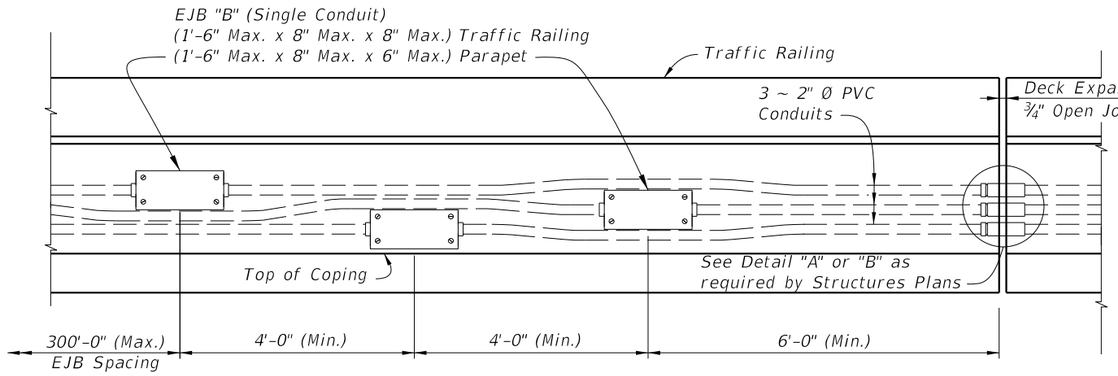
DETAIL "A"
EXPANSION FITTING DETAIL



DETAIL "B" EXPANSION / DEFLECTION
FITTING DETAIL (CONCRETE / CONCRETE)

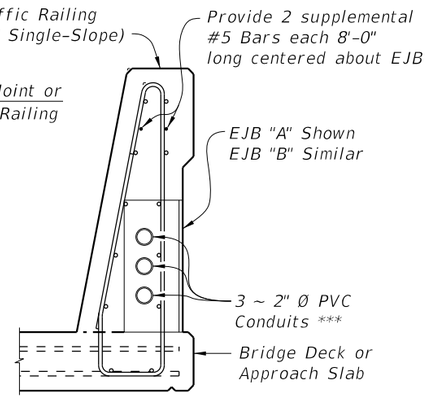


DETAIL "C" EXPANSION / DEFLECTION
FITTING DETAIL (CONCRETE / SOIL)

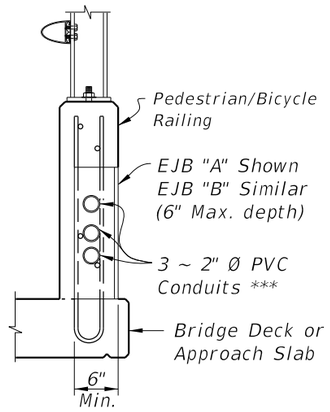


EJB "B" DETAIL

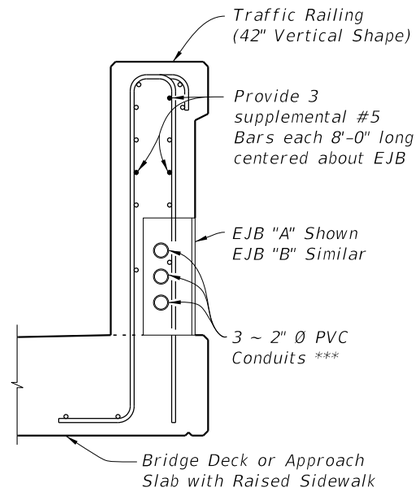
* 36" Single-Slope Traffic Railing shown, other Traffic Railings and Pedestrian/Bicycle Railings similar.
** EJB "A" shown, EJB "B" similar. See EJB "B" Detail.
*** See Sheet 1, Note 5.



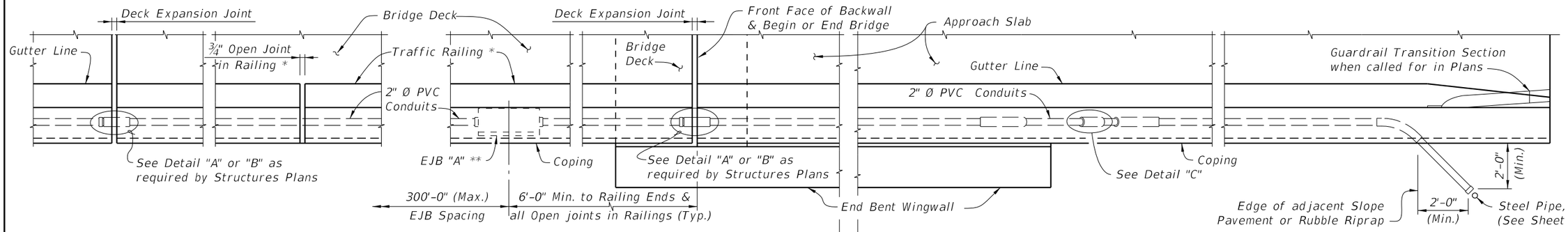
SECTION THRU
TRAFFIC RAILING AT EJB
(36" SINGLE-SLOPE SHOWN,
42" SINGLE-SLOPE SIMILAR)



SECTION THRU PEDESTRIAN /
BICYCLE RAILING AT EJB

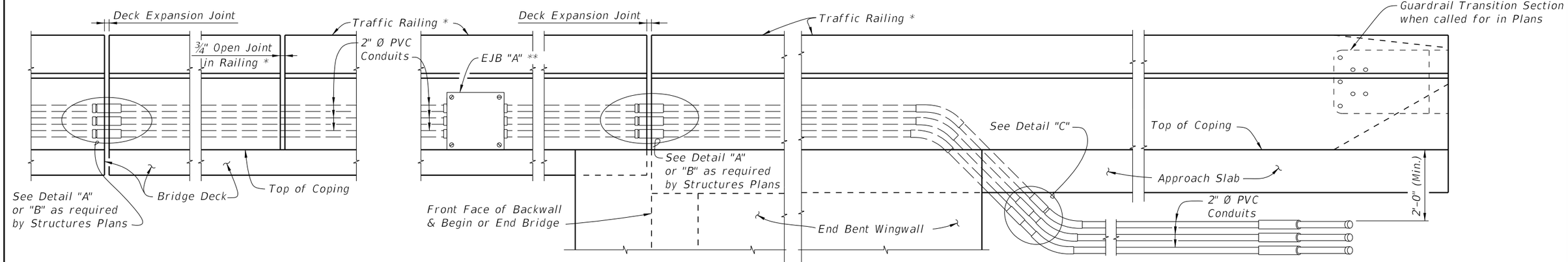


SECTION THRU
TRAFFIC RAILING AT EJB
(42" VERTICAL SHAPE SHOWN,
32" VERTICAL SHAPE SIMILAR)



PARTIAL PLAN VIEW ALONG BRIDGE

PARTIAL PLAN VIEW ALONG APPROACH SLAB WITHOUT CONTINUING TRAFFIC RAILING



PARTIAL ELEVATION VIEW ALONG BRIDGE

PARTIAL ELEVATION VIEW ALONG APPROACH SLAB WITHOUT CONTINUING TRAFFIC RAILING

BRIDGE AND APPROACH SLAB WITH EDGE RAILING

9:35:24 AM
10/8/2020

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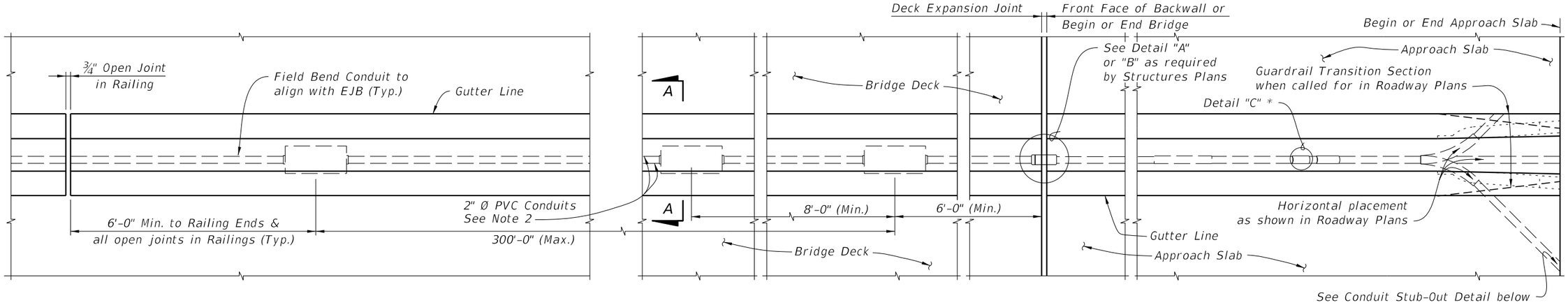
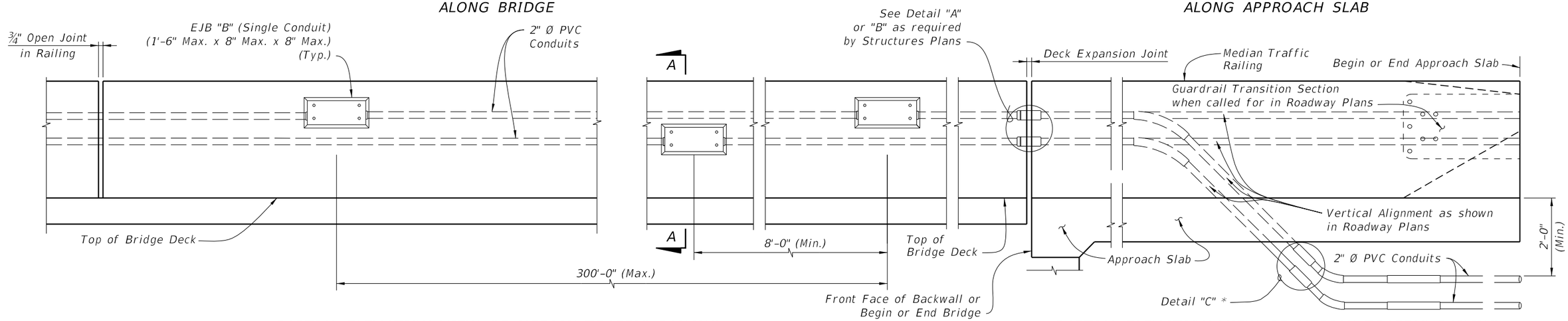


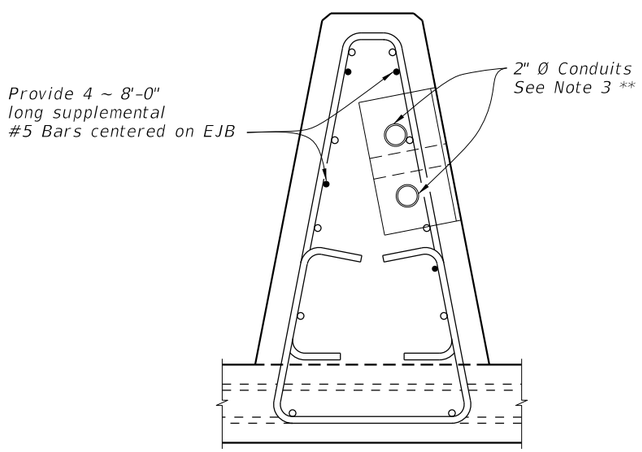
PARTIAL PLAN VIEW OF MEDIAN TRAFFIC RAILING ALONG BRIDGE

PARTIAL PLAN VIEW OF MEDIAN TRAFFIC RAILING ALONG APPROACH SLAB



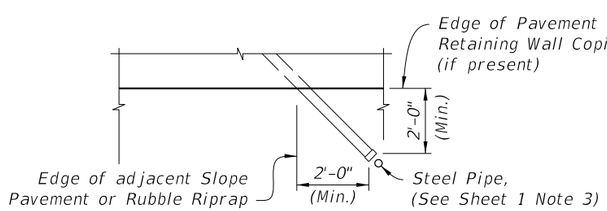
PARTIAL ELEVATION VIEW OF MEDIAN TRAFFIC RAILING ALONG BRIDGE

PARTIAL ELEVATION VIEW OF MEDIAN TRAFFIC RAILING ALONG APPROACH SLAB



SECTION A-A
Median Traffic Railing (See Note 4)

* For non-continuing Traffic Railing only.
** See Sheet 1, Note 5



CONDUIT STUB-OUT DETAIL

NOTES:

1. Work this sheet with Index 521-426.
2. Adjust Conduit horizontally and vertically as necessary to align with EJB "B".
3. When installed in traffic face of a railing, use EJB "B" with a minimum ⅜" thick galvanized steel cover.
4. Position EJB such that, with gasket and cover plate secured and in place, cover plate is flush with the railing face. Flush is +⅛" to -¼" measured with a horizontal straightedge.

BRIDGE AND APPROACH SLAB WITH MEDIAN TRAFFIC RAILING

10/8/2020 9:35:27 AM

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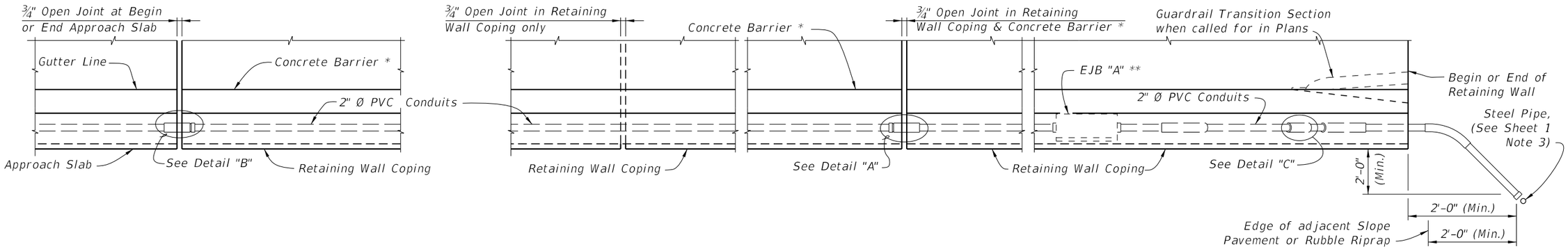
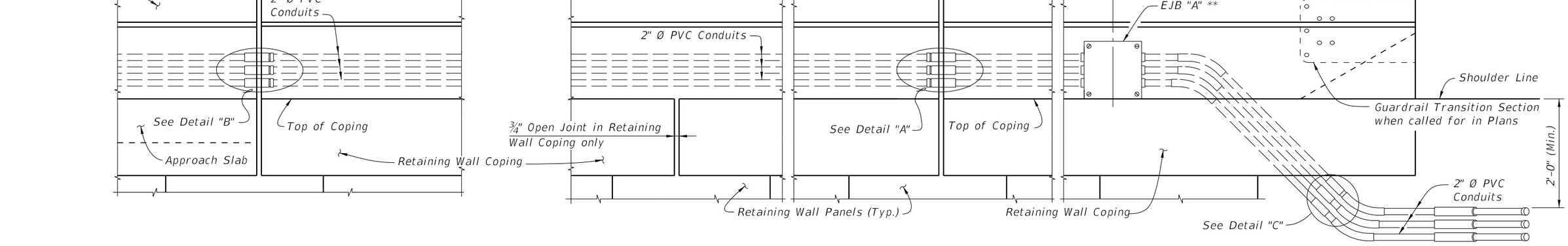


PARTIAL PLAN VIEW ALONG APPROACH SLAB WITH CONTINUING CONCRETE BARRIER

PARTIAL PLAN VIEW ALONG RETAINING WALL



PARTIAL ELEVATION VIEW ALONG APPROACH SLAB WITH CONTINUING Concrete Barrier (Retaining Wall Mounted Concrete Barrier shown, Traffic Railing similar)

PARTIAL ELEVATION VIEW ALONG RETAINING WALL

* Index 521-610 Concrete Barrier/Junction Slab shown, other railings and parapets similar.
** EJB "A" shown EJB "B" similar. See EJB "B" Detail on Sheet 2.

APPROACH SLAB AND RETAINING WALL WITH CONCRETE BARRIER

10/8/2020 9:35:29 AM

LAST REVISION	REVISION	DESCRIPTION:	FY 2021-22 STANDARD PLANS	CONDUIT DETAILS - EMBEDDED	INDEX	SHEET
11/01/18					630-010	4 of 4