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09/08/99

TIP PROJECT: U–2579AA

CONTRACT: C204746

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

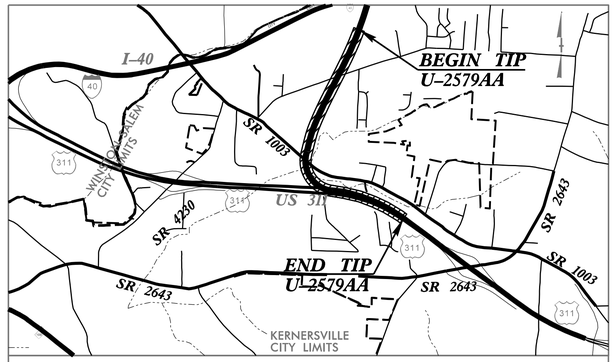
FORSYTH COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U–2579AA	1	

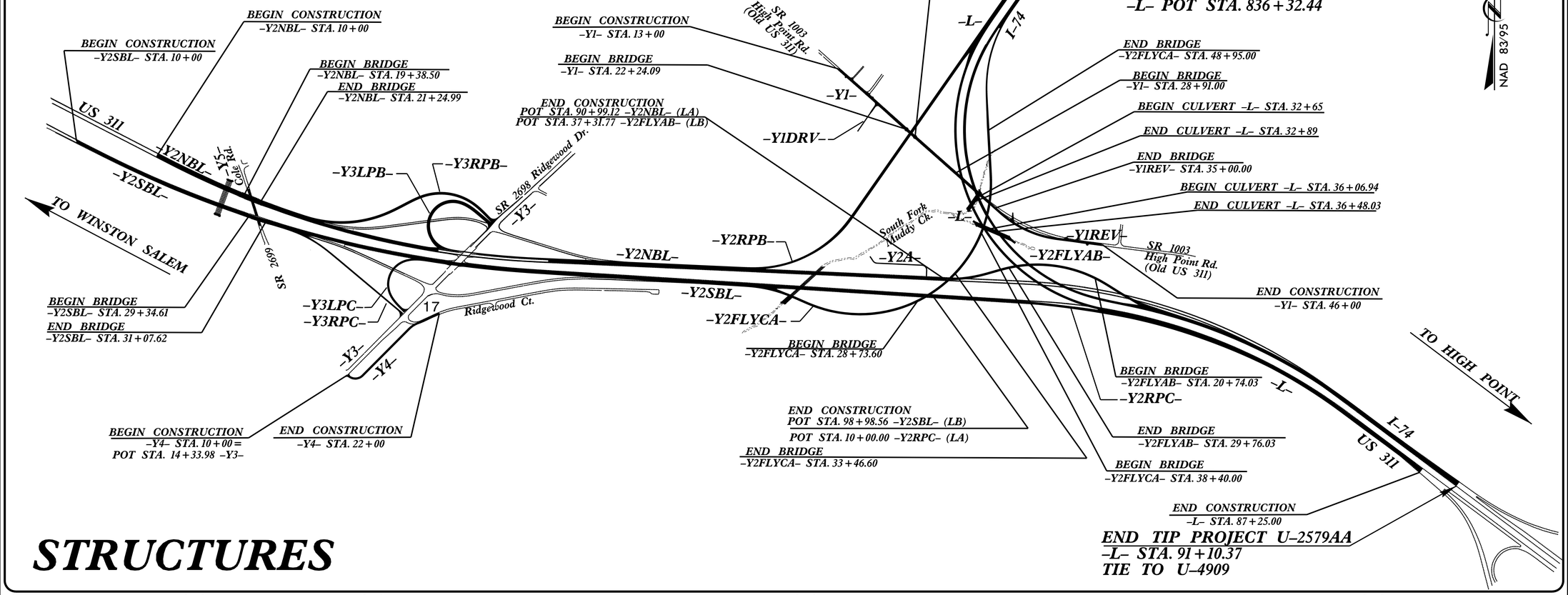
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34839.1.7	N/A	PE
34839.2.3	N/A	ROW, UTIL.
34839.3.13	0074226	CONSTRUCTION

LOCATION: WINSTON–SALEM NORTHERN BELTWAY EASTERN SECTION (FUTURE I–74) FROM US 311 TO I–40

TYPE OF WORK: GRADING, PAVING, DRAINAGE, CULVERTS, RETAINING WALLS, STRUCTURES & BRIDGE REHABILITATION



VICINITY MAP



STRUCTURES

DESIGN DATA

ADT 2020 = 10,733
ADT 2040 = 16,400
K = 9 %
D = 60 %
T = 7 % *
V = 70 MPH
* (TTST = 4% & DUAL = 3%)
FUNC CLASS = INTERSTATE STATEWIDE TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT U–2579AA = 1.524 MILES
LENGTH OF STRUCTURES TIP PROJECT U–2579AA = 0.012 MILES
TOTAL LENGTH TIP PROJECT U–2579AA = 1.536 MILES

Prepared In the Office of:
DIVISION OF HIGHWAYS
STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR. RALEIGH, NC 27610
2018 STANDARD SPECIFICATIONS

LETTING DATE:
OCTOBER 18, 2022

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

7/28/2022
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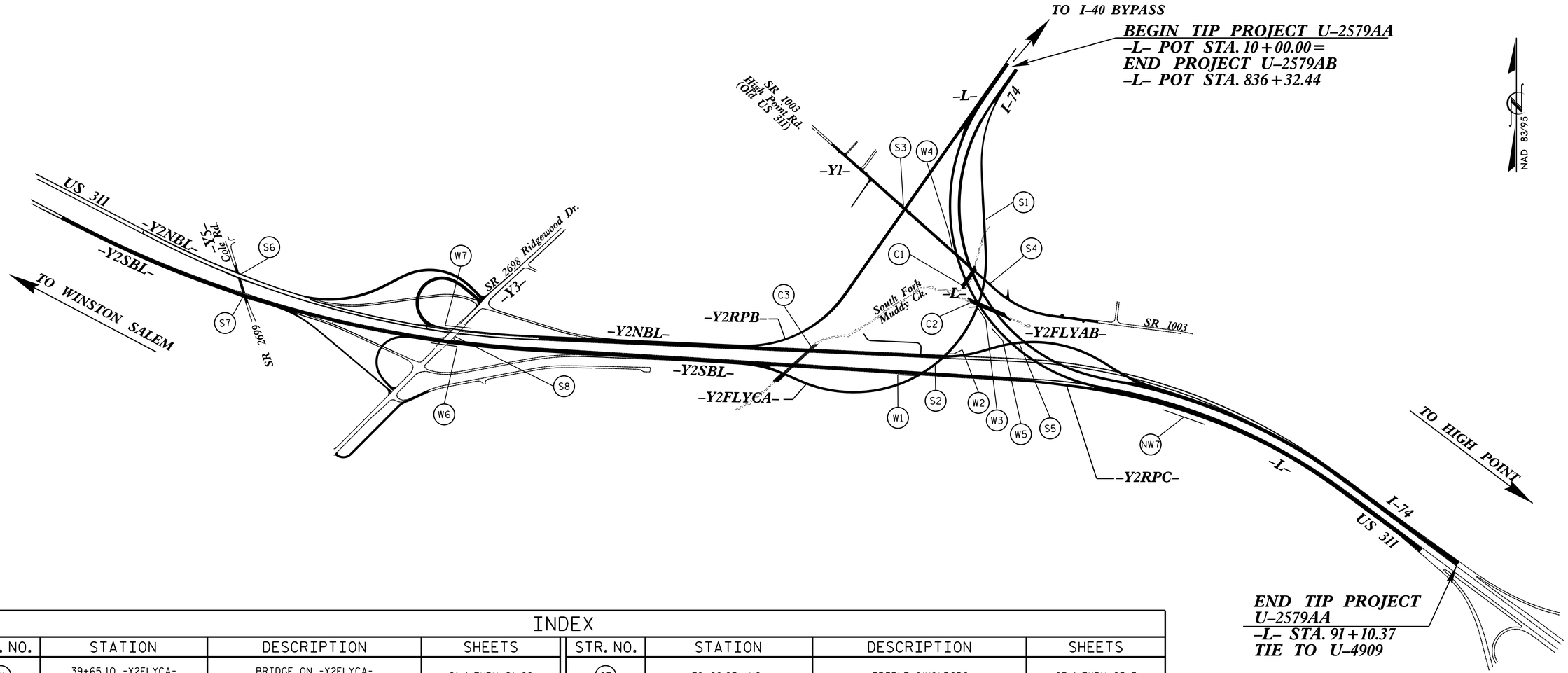
jpadams



INDEX

STR. NO.	STATION	DESCRIPTION	SHEETS
S1	39+65.10 -Y2FLYCA- 35+17.72 -L-	BRIDGE ON -Y2FLYCA- OVER FUTURE I-74	S1-1 THRU S1-92
S2	30+02.29 -Y2FLYCA- 98+82.37 -Y2SBL-	BRIDGE ON -Y2FLYCA- OVER US 311	S2-1 THRU S2-59
S3	22+84.09 -Y1- 25+32.95 -Y2RPB-	BRIDGE ON SR 1003 OVER RAMP -Y2RPB-	S3-1 THRU S3-22
S4	30+69.44 -Y1- 31+06.88 -L-	BRIDGE ON SR 1003 OVER FUTURE I-74 AND NC 87	S4-1 THRU S4-50
S5	28+33.21 -Y2FLYAB- 41+07.80 -L-	BRIDGE ON US 311 NBL FLYOVER OVER WINSTON SALEM NORTHERN BELTWAY	S5-1 THRU S5-84
S6	20+68.01 -Y2NBL- 5+61.50 -Y5-	BRIDGE ON US311 (FUTURE I-74) OVER SR 2699	S6-1 THRU S6-31
S7	29+89.90 -Y2SBL- 7+33.25 -Y5-	BRIDGE ON US311 (FUTURE I-74) OVER SR 2699	S7-1 THRU S7-32
S8	BRIDGE REHAB	BRIDGE ON SR 2698 OVER I-74/US 311	S8-1 THRU S8-26
C1	32+77.50 -L-	DOUBLE 9'X9' RCBC	C1-1 THRU C1-6
C2	36+27.30 -L-	DOUBLE 10'X9' RCBC	C2-1 THRU C2-6

STR. NO.	STATION	DESCRIPTION	SHEETS
C3	78+68.93 -Y2-	TRIPLE 8'X8' RCBC	C3-1 THRU C3-7
W1	86+45.00 -Y2SBL-	MSE RETAINING WALL	W1 THRU W12
W2	33+93.62 -Y2FLYAB-	MSE RETAINING WALL	
W3	33+93.62 -Y2FLYAB-	MSE RETAINING WALL	
W4	28+42.02 -L-	MSE RETAINING WALL	
W5	39+48.40 -L-	MSE RETAINING WALL	
W6	42+43.09 -Y2NBL-	MSE RETAINING WALL	
W7	49+34.73 -Y2SBL-	MSE RETAINING WALL	
NW7	53+26.30 -L-	SOUND BARRIER WALL	NW-1 THRU NW-3

7/28/2022
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jpadams

F.A. PROJECT NO. 0074226


39+00
40+00
41+00
42+00
✱✱ 1'-5" WIDE, 41" SINGLE FACED PRECAST CONCRETE BARRIER RAIL WITH 1" EXP. JT. MAT'L. (ROADWAY PAY ITEM AND DETAIL)
FILL FACE @ END BENT NO. 1 STA. 38+40.00-Y2FLYCA- G.P. EL. = 887.39
SPAN A
SPAN B
SPAN C
BENT 1 CONTROL LINE
BENT 2 CONTROL LINE
4" CONCRETE SLOPE PROTECTION (2% SLOPE NORMAL TO CAP)
EXP.
FIX
FILL
1'-0" MIN.
PROPOSED MSE WALL
HP 14X73 STEEL PILES
42'-7 3/8" MIN. VERT. CLR. (16'-6" REQ'D.)
TOP OF FOOTING EL. 825.66
GUARDRAIL (TYP.) (ROADWAY PAY ITEM)
42'-4 13/16" MIN. VERT. CLR. (16'-6" REQ'D.)
29'-2 1/8" MIN. VERT. CLR. TO OVERHANGING CAP (16'-6" REQ'D.)
PROPOSED STR. #4 BRIDGE
-Y1-
17'-9 15/16" MIN. VERT. CLR. (16'-6" REQ'D.)
PROPOSED ROAD -L- (SBL)
PROPOSED ROAD -L- (NBL)
PROPOSED GROUND
APPROX. EXISTING GROUND
TOP OF FOOTING EL. 813.44
5'-0" DIA. DRILLED PIERS (TYP. BENTS 1 AND 2 ONLY)
PROPOSED 2-10'x9' RCBC
890
880
870
860
850
840
830
820
810
800
EL. 832±
EL. 826±
EL. 817±
EL. 815±
EL. 810±
EL. 810±
EL. 815±
EL. 814±
EL. 819±
EL. 820±
EL. 821±
EL. 815±
END BENT NO. 1
BENT NO. 1
BENT NO. 2

SECTION ALONG -Y2FLYCA-

SECTIONS AT END BENTS AND BENTS ARE AT RIGHT ANGLES.

(+)3.4261% (-)2.5231%

PI = 33+84.00
EL = 898.95'
VC = 1,000'

GRADE DATA -Y2FLYCA-

(+)0.8447% (-)3.1561%

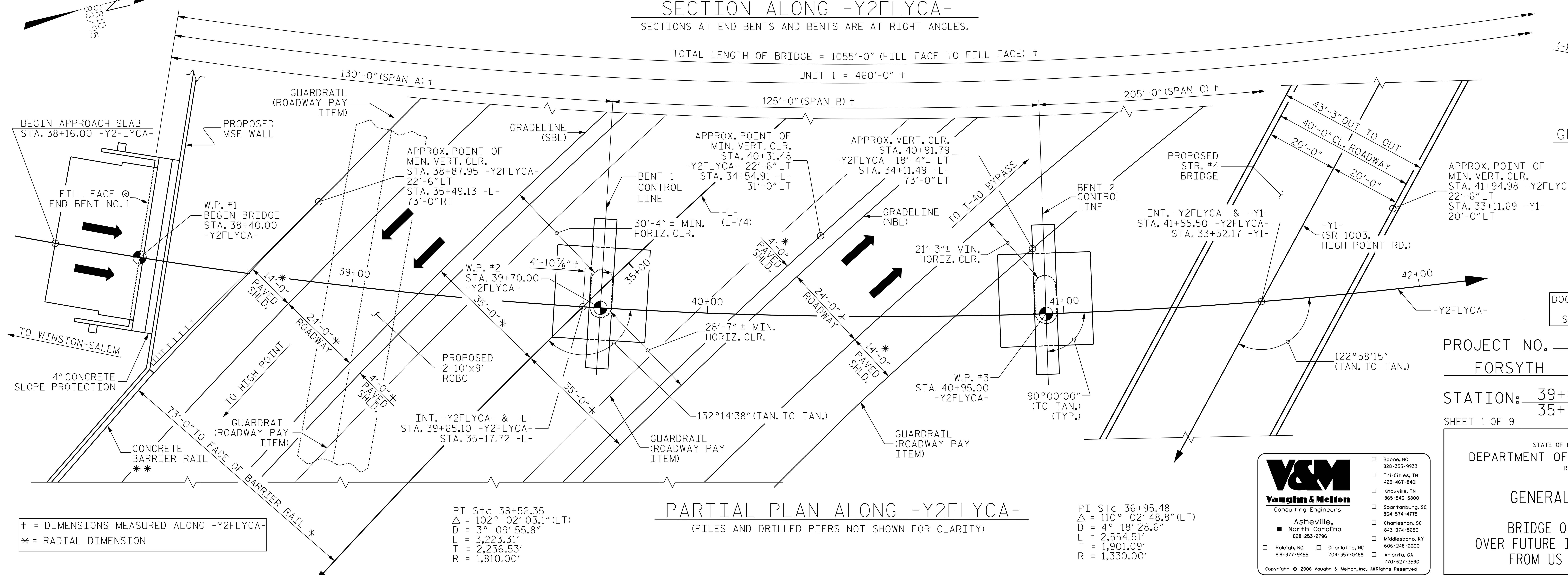
PI = 27+48.00
EL = 868.10'
VC = 640'

GRADE DATA -Y1-

(-)3.7377% (+)3.4198%

PI = 31+16.00
EL = 813.16'
VC = 1,550'

GRADE DATA -L-


NC GRID NAD 83/95
TOTAL LENGTH OF BRIDGE = 1055'-0" (FILL FACE TO FILL FACE) †
UNIT 1 = 460'-0" †
130'-0" (SPAN A) †
125'-0" (SPAN B) †
205'-0" (SPAN C) †
BEGIN APPROACH SLAB STA. 38+16.00 -Y2FLYCA-
PROPOSED MSE WALL
GUARDRAIL (ROADWAY PAY ITEM)
GRADELINE (SBL)
APPROX. POINT OF MIN. VERT. CLR. STA. 38+87.95 -Y2FLYCA- 22'-6" LT STA. 35+49.13 -L- 73'-0" RT
APPROX. POINT OF MIN. VERT. CLR. STA. 40+31.48 -Y2FLYCA- 22'-6" LT STA. 34+54.91 -L- 31'-0" LT
APPROX. VERT. CLR. STA. 40+91.79 -Y2FLYCA- 18'-4"± LT STA. 34+11.49 -L- 73'-0" LT
PROPOSED STR. #4 BRIDGE
43'-3" OUT TO OUT
40'-0" CL. ROADWAY
20'-0"
20'-0"
APPROX. POINT OF MIN. VERT. CLR. STA. 41+94.98 -Y2FLYCA- 22'-6" LT STA. 33+11.69 -Y1- 20'-0" LT
FILL FACE @ END BENT NO. 1
W.P. #1 BEGIN BRIDGE STA. 38+40.00 -Y2FLYCA-
BENT 1 CONTROL LINE
30'-4" ± MIN. HORIZ. CLR.
-L- (I-74)
TO I-40 BYPASS
GRADELINE (NBL)
BENT 2 CONTROL LINE
21'-3"± MIN. HORIZ. CLR.
INT. -Y2FLYCA- & -Y1- STA. 41+55.50 -Y2FLYCA- STA. 33+52.17 -Y1-
-Y1- (SR 1003, HIGH POINT RD.)
39+00
W.P. #2 STA. 39+70.00 -Y2FLYCA-
4'-10 7/8" †
35+00
4'-0"✱ PAVED SHLD.
40+00
41+00
42+00
-Y2FLYCA-
14'-0"✱ PAVED SHLD.
24'-0"✱ ROADWAY
35'-0"✱
28'-7" ± MIN. HORIZ. CLR.
24'-0"✱ ROADWAY
14'-0"✱ PAVED SHLD.
TO WINSTON-SALEM
4" CONCRETE SLOPE PROTECTION
TO HIGH POINT
PROPOSED 2-10'x9' RCBC
4'-0"✱ PAVED SHLD.
GUARDRAIL (ROADWAY PAY ITEM)
INT. -Y2FLYCA- & -L- STA. 39+65.10 -Y2FLYCA- STA. 35+17.72 -L-
35'-0"✱
132°14'38" (TAN. TO TAN.)
W.P. #3 STA. 40+95.00 -Y2FLYCA-
90°00'00" (TO TAN.) (TYP.)
122°58'15" (TAN. TO TAN.)
CONCRETE BARRIER RAIL ✱✱
73'-0" TO FACE OF BARRIER RAIL ✱
GUARDRAIL (ROADWAY PAY ITEM)
GUARDRAIL (ROADWAY PAY ITEM)

PARTIAL PLAN ALONG -Y2FLYCA-

(PILES AND DRILLED PIERS NOT SHOWN FOR CLARITY)

† = DIMENSIONS MEASURED ALONG -Y2FLYCA-
✱ = RADIAL DIMENSION

PI Sta 38+52.35
Δ = 102° 02' 03.1" (LT)
D = 3° 09' 55.8"
L = 3,223.31'
T = 2,236.53'
R = 1,810.00'

HORIZ. CURVE DATA -L-

PI Sta 36+95.48
Δ = 110° 02' 48.8" (LT)
D = 4° 18' 28.6"
L = 2,554.51'
T = 1,901.09'
R = 1,330.00'

HORIZ. CURVE DATA -Y2FLYCA-

NOTE: ALL BENTS AND END BENTS ARE PERPENDICULAR TO -Y2FLYCA- AT GIVEN STATIONS.

DocuSigned by: Hardy Willis 7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. U-2579AA
FORSYTH COUNTY
STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-
SHEET 1 OF 9 BRIDGE NO. 729

V&M Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Boone, NC 828-355-9933; Tri-Cities, TN 423-467-8401; Knoxville, TN 865-546-5800; Spartanburg, SC 864-574-4775; Charleston, SC 843-974-5650; Middlesboro, KY 606-248-6600; Atlanta, GA 770-627-3590; Raleigh, NC 919-977-9455; Charlotte, NC 704-357-0488

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON -Y2FLYCA-
OVER FUTURE I-74 AND SR 1003
FROM US 311 TO I-40

DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: RTS	DATE: 03/2022

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-1
TOTAL SHEETS 92

SECTION ALONG -Y2FLYCA-

SECTIONS AT END BENTS AND BENTS ARE AT RIGHT ANGLES.

PARTIAL PLAN ALONG -Y2FLYCA-

(PILES NOT SHOWN FOR CLARITY)

† = DIMENSIONS MEASURED ALONG -Y2FLYCA-

PI Sta 36+95.48
Δ = 110° 02' 48.8" (LT)
D = 4° 18' 28.6"
L = 2,554.51'
T = 1,901.09'
R = 1,330.00'

HORIZ. CURVE DATA -Y2FLYCA-

PI Sta 44+02.91
$\emptyset s$ = 3° 29' 22.0"
Ls = 162.00'
LT = 108.02'
ST = 54.02'

HORIZ. SPIRAL DATA -Y2FLYCA-

NOTE: ALL BENTS AND END BENTS ARE PERPENDICULAR TO -Y2FLYCA- AT GIVEN STATIONS.

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-

SHEET 2 OF 9

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL — DocuSigned By: Hardy Willis — 7/26/2022

Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Raleigh, NC 919-977-9455 | Charlotte, NC 704-357-0488
Boone, NC 828-355-9933 | Tri-Cities, TN 423-467-8401 | Knoxville, TN 865-546-5800 | Spartanburg, SC 864-574-4775 | Charleston, SC 843-974-5650 | Middlesboro, KY 606-248-6600 | Atlanta, GA 770-627-3590

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON -Y2FLYCA-
OVER FUTURE I-74
FROM US 311 TO I-40

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

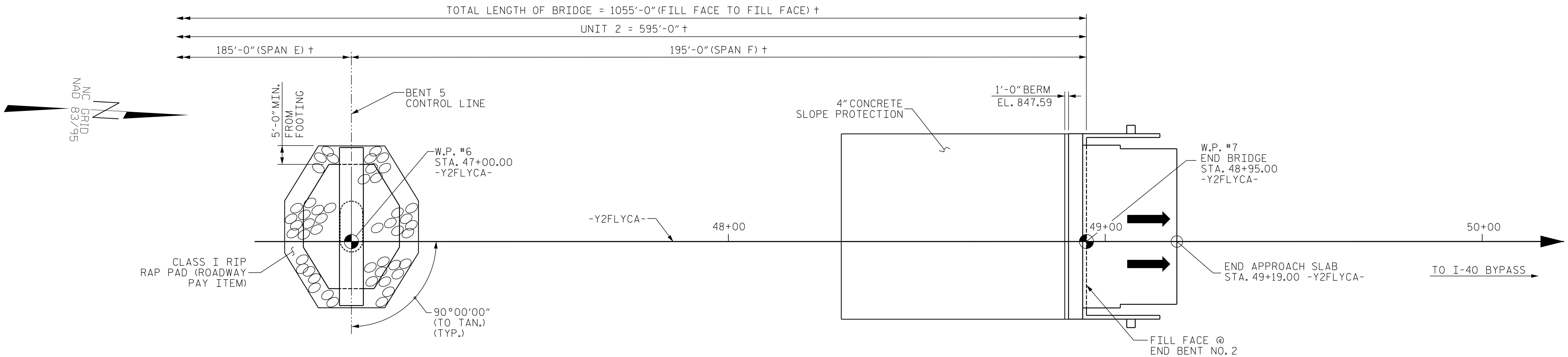
DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: RTS	DATE: 03/2022

REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

SHEET NO. S1-2
TOTAL SHEETS 92

SECTION ALONG -Y2FLYCA-

SECTIONS AT END BENTS AND BENTS ARE AT RIGHT ANGLES.



PARTIAL PLAN ALONG -Y2FLYCA-

(PILES NOT SHOWN FOR CLARITY)

† = DIMENSIONS MEASURED ALONG -Y2FLYCA-

NOTE: ALL BENTS AND END BENTS ARE PERPENDICULAR TO -Y2FLYCA- AT GIVEN STATIONS.

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-

SHEET 3 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON -Y2FLYCA-
OVER FUTURE I-74
FROM US 311 TO I-40

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DWN. BY: NCW DATE: 03/2022
CHKD. BY: PRG DATE: 03/2022
DES. EGR. OF RECORD: RTS DATE: 03/2022

REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:		
1			3				
2			4				

SHEET NO. S1-3

TOTAL SHEETS 92

Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Boone, NC 828-355-9933
Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Atlanta, GA 770-627-3590
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL
DocuSigned by: Hardy Willis
7/26/2022

PARTIAL FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE AT BOTTOM OF THE CAP OR FOOTING.

BENT 1 & 2 CONTROL LINES & ℄ FOOTINGS IN TRANSVERSE DIRECTION ARE RADIAL TO -Y2FLYCA-.

I - DENOTES VERTICAL (PLUMB) HP14X73 STEEL PILES

FOUNDATION NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 135 TONS PER PILE.

DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 265 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG.

PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT NO. 1. EXCAVATE HOLES AT PILE LOCATIONS TO 825 FT FOR PILE EXCAVATION. SEE SECTION 450 OF THE STANDARD SPECIFICATION.

CONCRETE IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT END BENT NO. 1.

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

DRILLED PIERS AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 1030 TONS/PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 200 TSF.

INSTALL DRILLED PIERS AT BENT NO. 1 TO A TIP ELEVATION NO HIGHER THAN 781.5 FT, SATISFY THE REQUIRED TIP RESISTANCE, AND HAVE A PENETRATION OF AT LEAST 10 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

PERMANENT STEEL CASINGS ARE REQUIRED FOR DRILLED PIERS AT BENT NO. 1. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 795 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

DRILLED PIERS AT BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 1365 TONS/PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 200 TSF.

INSTALL DRILLED PIERS AT BENT NO. 2 TO A TIP ELEVATION NO HIGHER THAN 772.5 FT, SATISFY THE REQUIRED TIP RESISTANCE, AND HAVE A PENETRATION OF AT LEAST 10 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

PERMANENT STEEL CASINGS ARE REQUIRED FOR DRILLED PIERS AT BENT NO. 2. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 791 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR THE DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

PILES AT BENT NO. 3 ARE DESIGNED FOR A FACTORED RESISTANCE OF 174 TONS PER PILE.

DRIVE PILES AT BENT NO. 3 TO A REQUIRED DRIVING RESISTANCE OF 290 TONS PER PILE.

PILES AT BENT NO. 4 ARE DESIGNED FOR A FACTORED RESISTANCE OF 180 TONS PER PILE.

DRIVE PILES AT BENT NO. 4 TO A REQUIRED DRIVING RESISTANCE OF 300 TONS PER PILE.

PILES AT BENT NO. 5 ARE DESIGNED FOR A FACTORED RESISTANCE OF 187.5 TONS PER PILE.

DRIVE PILES AT BENT NO. 5 TO A REQUIRED DRIVING RESISTANCE OF 313 TONS PER PILE.

PILES AT END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 133.5 TONS PER PILE.

DRIVE PILES AT END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 223 TONS PER PILE.

OBSERVE A 2 MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO WITHIN 2 FEET OF FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT NO.2.

COFFERDAMS MAY BE REQUIRED TO PERFORM THE FOUNDATION EXCAVATION AT BENT NOS. 2 THROUGH 5 DUE TO HIGH GROUNDWATER ELEVATIONS. FOR COFFERDAMS, SEE SECTION 410 OF THE STANDARD SPECIFICATIONS.

CLASS I RIP RAP PAD IS REQUIRED AT BENT NOS. 4 AND 5 FOR SCOUR PROTECTION. SEE ROADWAY PLANS FOR DETAILS.

DocuSigned by: Hardy Willis
7/26/2022

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V&M Vaughn & Melton Consulting Engineers
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Raleigh, NC 919-977-9455 · Charlotte, NC 704-357-0488 · Boone, NC 828-355-9933 · Tri-Cities, TN 423-467-8401 · Knoxville, TN 865-546-5800 · Spartanburg, SC 864-574-4775 · Charleston, SC 843-974-5650 · Middlesboro, KY 606-248-6600 · Atlanta, GA 770-627-3590

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOUNDATION LAYOUT

BRIDGE ON -Y2FLYCA-
OVER FUTURE I-74
FROM US 311 TO I-40

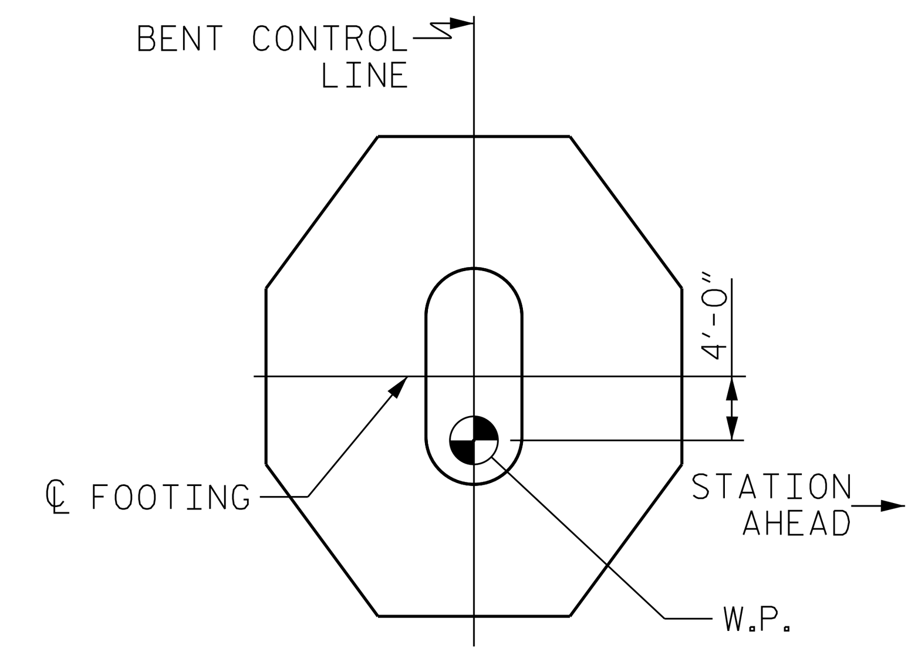
DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: RTS	DATE: 03/2022

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

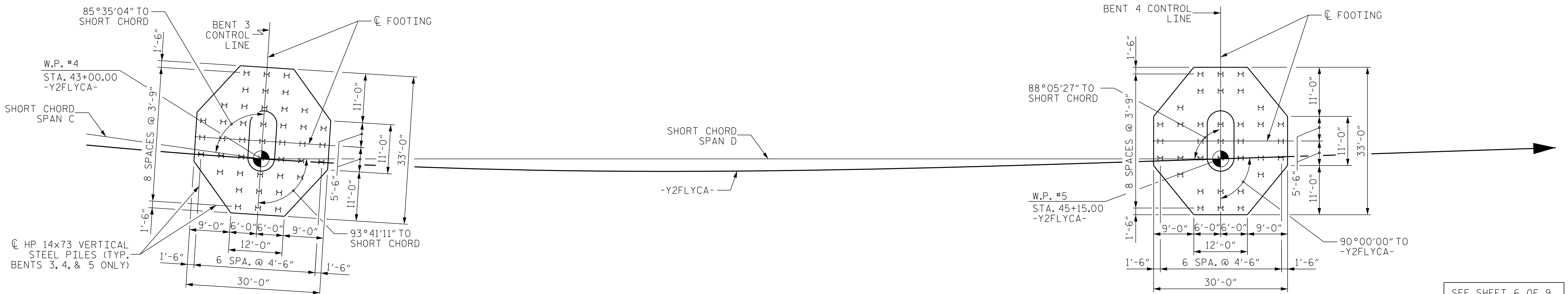
SHEET NO. S1-4

TOTAL SHEETS 92



FOOTING OFFSET DETAIL
(TYP. EA. BENT)

NC GRID NAD 83/95



BENT NO. 3

BENT NO. 4

SEE SHEET 6 OF 9 FOR CONTINUATION.

PARTIAL FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE AT BOTTOM OF THE CAP OR FOOTING.

ALL BENT CONTROL LINE & ℄ FOOTING IN TRANSVERSE DIRECTION ARE RADIAL TO -Y2FLYCA-.

SEE SHEET 4 OF 9 FOR CONTINUATION.

7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

V&M Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488
Boone, NC 828-355-9933
Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Atlanta, GA 770-627-3590

PROJECT NO. U-2579AA

FORSYTH COUNTY

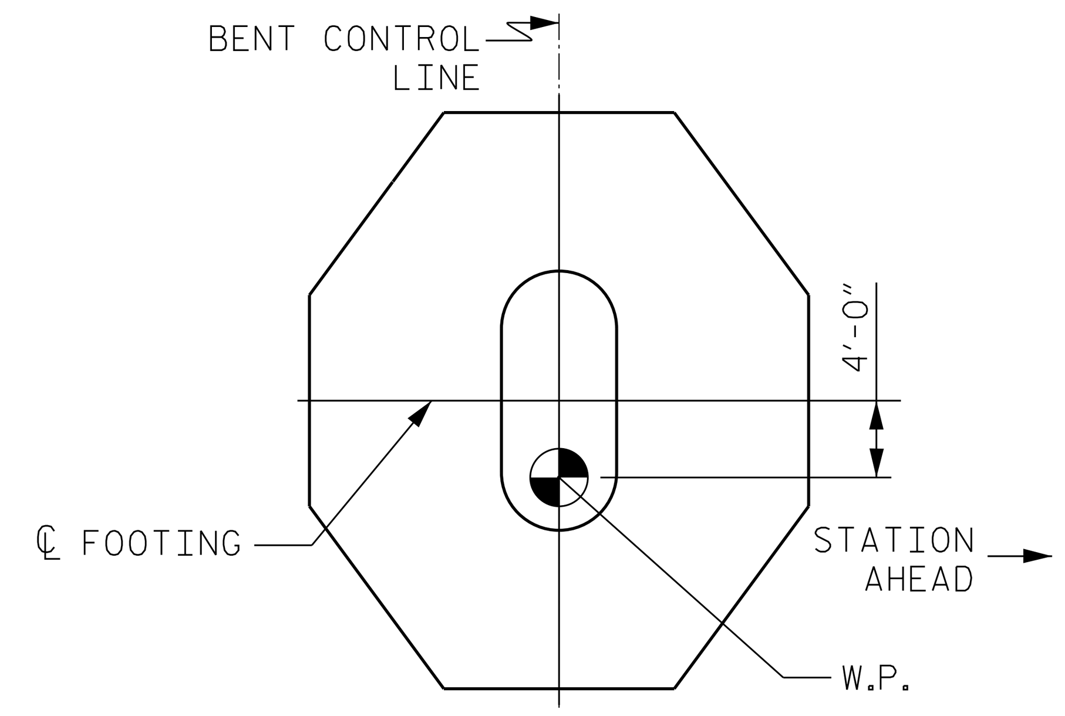
STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOUNDATION LAYOUT

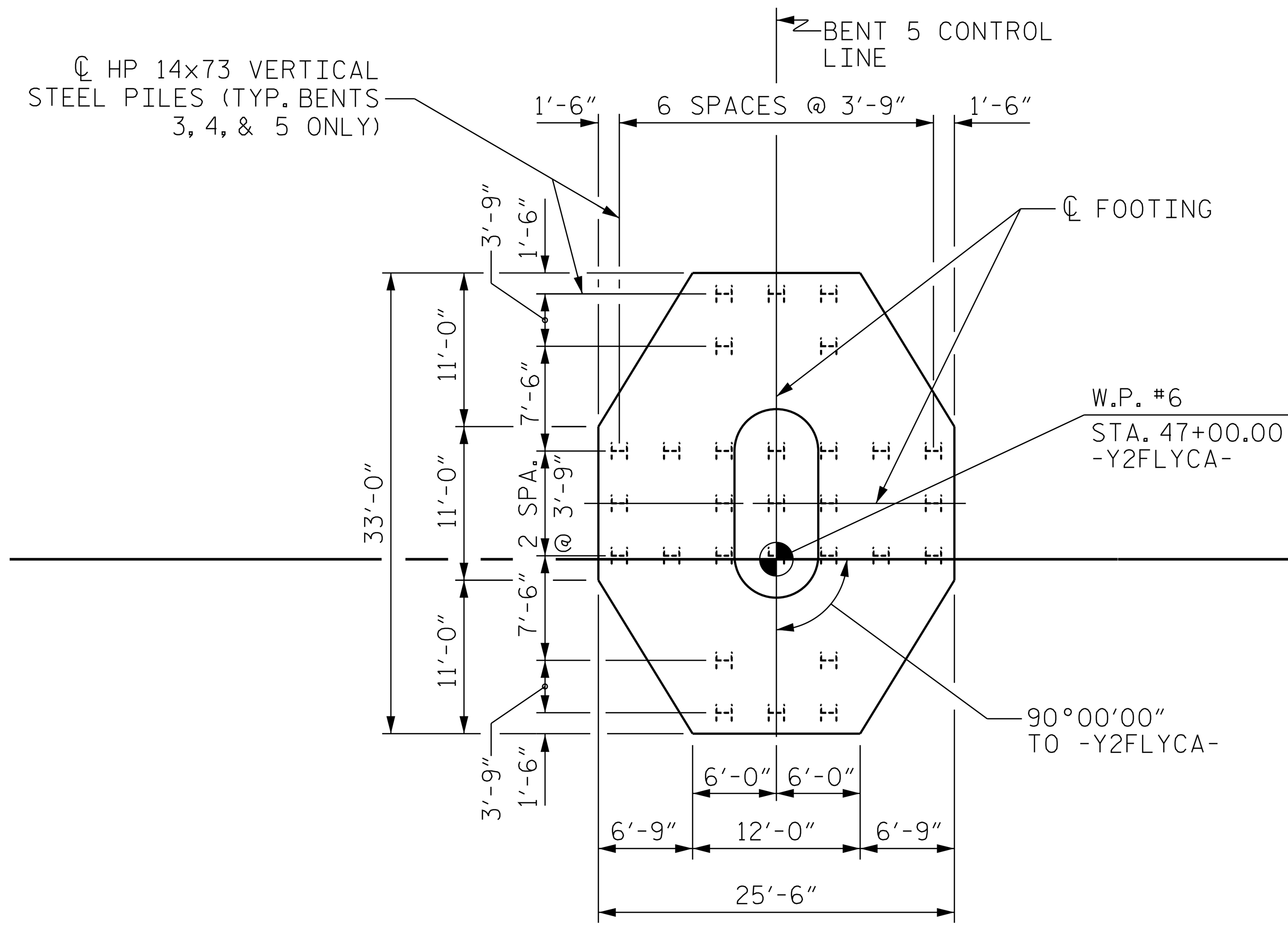
BRIDGE ON -Y2FLYCA-
OVER FUTURE I-74
FROM US 311 TO I-40

			REVISIONS					
DWN. BY: NCW	DATE: 03/2022	NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO. S1-5
CHKD. BY: PRG	DATE: 03/2022	1			3			TOTAL SHEETS 92
DES. EGR. OF RECORD: RTS	DATE: 03/2022	2			4			

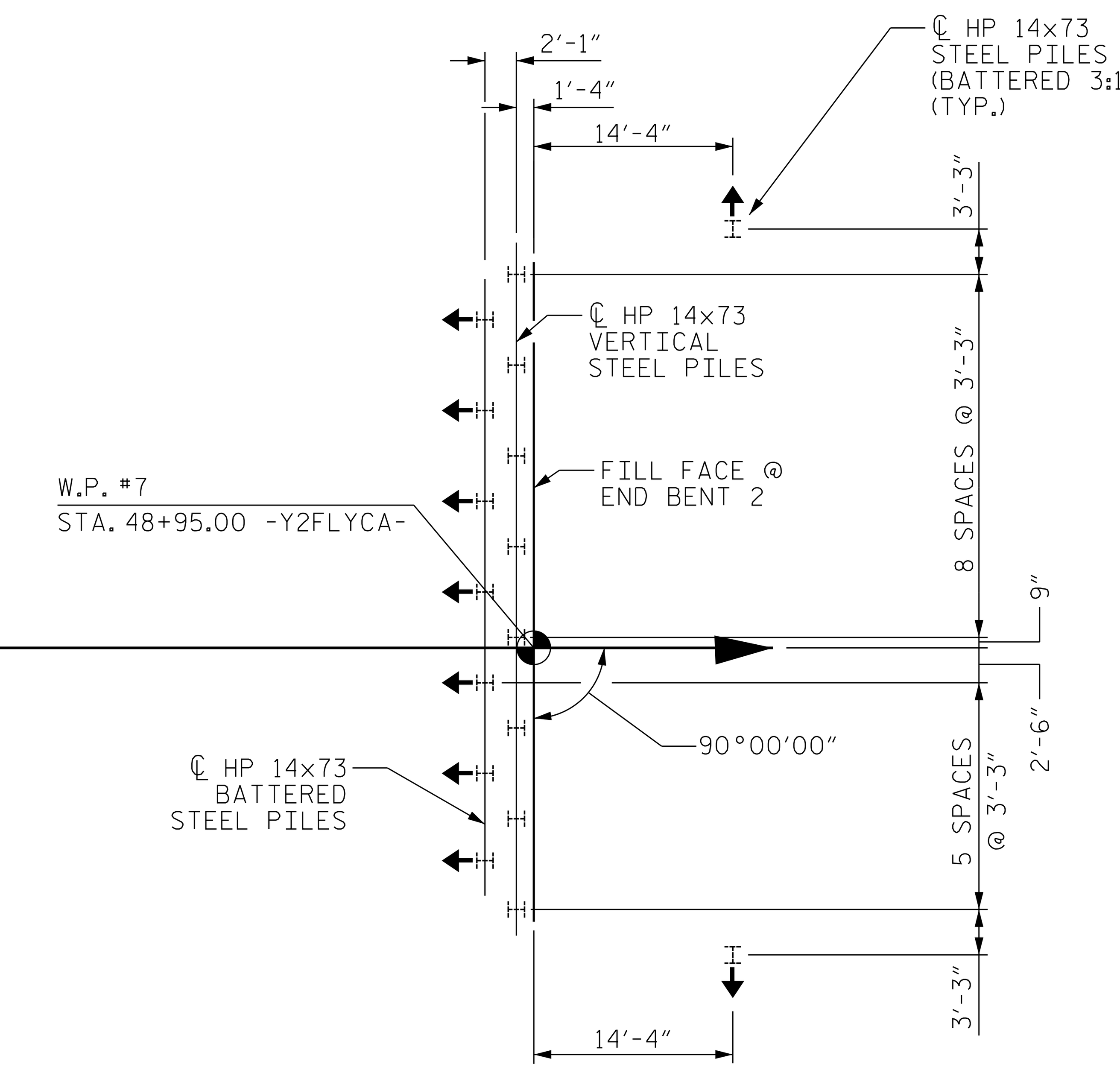


FOOTING OFFSET DETAIL
(TYP. EA. BENT)

NC GRID NAD 83/95



BENT NO. 5



END BENT NO. 2

SEE SHEET 5 OF 9 FOR CONTINUATION.

PARTIAL FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE AT BOTTOM OF THE CAP OR FOOTING.

ALL BENT CONTROL LINE & ℄ FOOTINGS IN TRANSVERSE DIRECTION ARE RADIAL TO -Y2FLYCA-.

I - DENOTES VERTICAL (PLUMB) HP14X73 STEEL PILES

I - DENOTES HP14X73 STEEL PILES BATTERED AT 3:12

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL
7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Raleigh, NC 919-977-9455 · Charlotte, NC 704-357-0488 · Boone, NC 828-355-9933 · Tri-Cities, TN 423-467-8401 · Knoxville, TN 865-546-5800 · Spartanburg, SC 864-574-4775 · Charleston, SC 843-974-5650 · Middlesboro, KY 606-248-6600 · Atlanta, GA 770-627-3590

PROJECT NO. U-2579AA
FORSYTH COUNTY
STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOUNDATION LAYOUT

BRIDGE ON -Y2FLYCA- OVER FUTURE I-74 FROM US 311 TO I-40

DWN. BY: NCW	DATE: 03/2022	REVISIONS				
		NO.	BY:	DATE:	NO.	BY: / DATE:
CHKD. BY: PRG	DATE: 03/2022	1			3	
DES. EGR. OF RECORD: RTS	DATE: 03/2022	2			4	

SHEET NO. S1-6
TOTAL SHEETS 92

wdtrutcher
DGN: V:\NC\Structures\03748-44 U-2579AA STP\Structures\SITE 1 - FLYCA NorthPlans\FINAL PLANS\401_011_U2579AA_SMU_FL03_006.dgn
TIME: 10:02 AM on Tuesday, July 26, 2022

LONG CHORD LAYOUT

END BENTS AND BENTS ARE RADIAL TO -Y2FLYCA-
AT WORKING POINT STATIONS

PI Sta 36+95.48
Δ = 110° 02' 48.8" (LT)
D = 4° 18' 28.6"
L = 2,554.51'
T = 1,901.09'
R = 1,330.00'

HORIZ. CURVE DATA -Y2FLYCA-

PI Sta 44+02.91
θs = 3° 29' 22.0"
Ls = 162.00'
LT = 108.02'
ST = 54.02'

HORIZ. SPIRAL DATA -Y2FLYCA-

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL — HARDY L. WILLIS — DocuSigned by: Hardy Willis
7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

V&M Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Raleigh, NC 919-977-9455 | Charlotte, NC 704-357-0488
Boone, NC 828-355-9933 | Tri-Cities, TN 423-467-8401 | Knoxville, TN 865-546-5800 | Spartanburg, SC 864-574-4775 | Charleston, SC 843-974-5650 | Middlesboro, KY 606-248-6600 | Atlanta, GA 770-627-3590

PROJECT NO. U-2579AA
FORSYTH COUNTY
STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-
SHEET 7 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
LONG CHORD LAYOUT

BRIDGE ON -Y2FLYCA-
OVER FUTURE I-74
FROM US 311 TO I-40

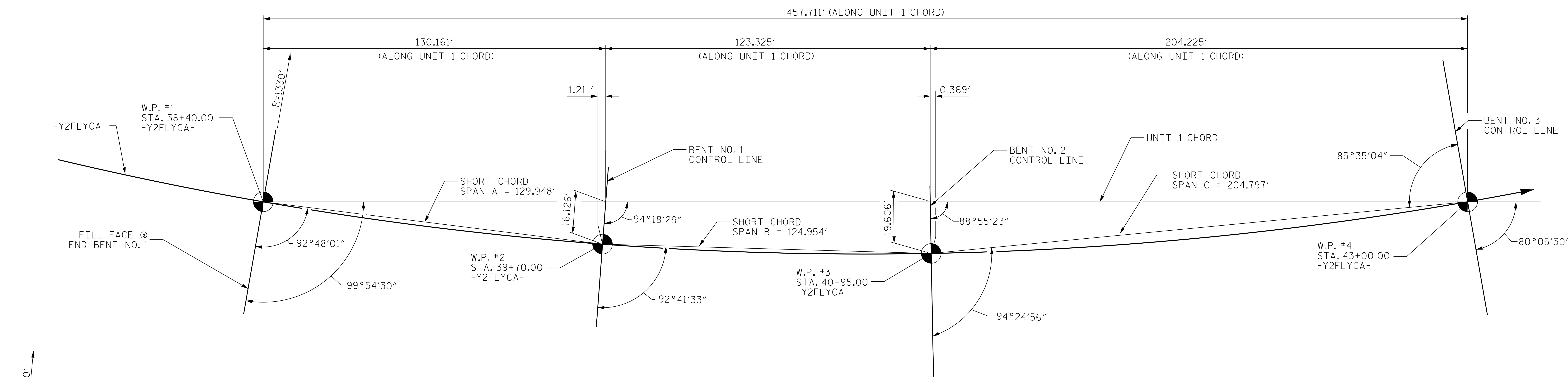
DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: RTS	DATE: 03/2022

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-7
TOTAL SHEETS 92

wdtruiner
DGN: V:\NC\Structures\031748-44 U-2579AA STPS\Structures\SITE 1 - FLYCA NorthPlans\FINAL PLANS\401_013_U2579AA_SMU_LCOL_007.dgn
TIME: 10:02 AM on Tuesday, July 26, 2022



UNIT 1 CHORD LAYOUT

END BENTS AND BENTS ARE RADIAL TO -Y2FLYCA-

UNIT 2 CHORD LAYOUT

END BENTS AND BENTS ARE PERPENDICULAR TO -Y2FLYCA- AT WORKING POINT STATIONS

NORTH CAROLINA PROFESSIONAL ENGINEER HARDY L. WILLIS

DocuSigned by: Hardy Willis

7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

V&M Vaughn & Melton Consulting Engineers

Asheville, North Carolina 828-253-2796

Raleigh, NC 99-977-9455 · Charlotte, NC 704-357-0488 · Boone, NC 828-355-9933 · Tri-Cities, TN 423-467-8401 · Knoxville, TN 865-546-5800 · Spartanburg, SC 864-574-4775 · Charleston, SC 843-974-5650 · Middlesboro, KY 606-248-6600 · Atlanta, GA 770-627-3590

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-

SHEET 8 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
LONG CHORD LAYOUT

BRIDGE ON -Y2FLYCA-
OVER FUTURE I-74
FROM US 311 TO I-40

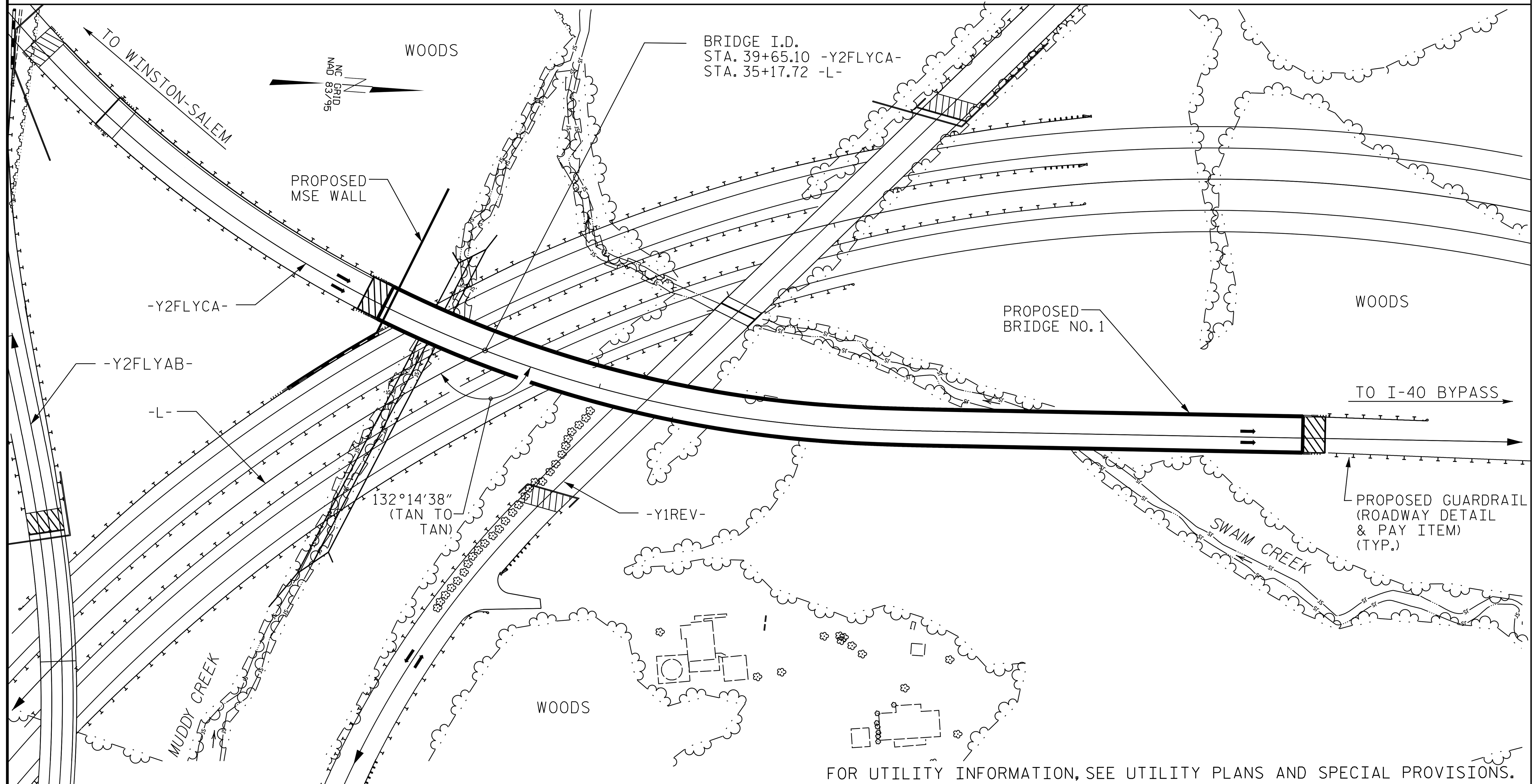
REVISIONS							
NO.	BY:	DATE:		NO.	BY:	DATE:	
1				3			
2				4			

DWN. BY: NCW DATE: 03/2022
CHKD. BY: PRG DATE: 03/2022
DES. EGR. OF RECORD: RTS DATE: 03/2022

SHEET NO. S1-8

TOTAL SHEETS 92

BM#4: N 842,239.136 E 1,662,449.676 -Y2FLYCA- STA. 46+31.14 1117.35' RT. ELEV. 876.61'



LOCATION SKETCH

TOTAL BILL OF MATERIAL

	FOUNDATION EXCAVATION FOR BENT	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	5'-0" Ø DRILLED PIERS IN SOIL	5'-0" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 5'-0" Ø DRILLED PIERS	PDA TESTING	CSL TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	STRUCTURAL STEEL APPROX. LBS. 3,188,000
	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	SQ.FT.	SQ.FT.	CU.YDS.	LUMP SUM	LBS.	LBS.	LUMP SUM
SUPERSTRUCTURE									45,427	40,557		LUMP SUM			LUMP SUM
END BENT NO. 1		50.0	39.0								71.1		12,257		
BENT NO. 1	LUMP SUM			107.67	41.00	94.64					391.4		109,352	5,425	
BENT NO. 2	LUMP SUM			94.75	41.00	61.76					415.6		127,604	4,957	
BENT NO. 3	LUMP SUM										429.9		80,810		
BENT NO. 4	LUMP SUM										413.7		75,942		
BENT NO. 5	LUMP SUM										353.2		69,977		
END BENT NO. 2											81.3		13,376		
TOTAL	LUMP SUM	50.0	39.0	202.42	82.00	156.40	1	1	45,427	40,557	2,156.2	LUMP SUM	489,318	10,382	LUMP SUM

	PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES	HP 14 X 73 STEEL PILES		CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	DISC BEARINGS	EXPANSION JOINT SEALS	MODULAR EXPANSION JOINT SEALS
	EACH	NO.	LIN.FT.	LIN.FT.	SQ. YARDS	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE				2141.59		LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM
END BENT NO. 1	11	11	572		14				
BENT NO. 1									
BENT NO. 2									
BENT NO. 3	43	43	1,466						
BENT NO. 4	35	35	1,368						
BENT NO. 5	29	29	1,327						
END BENT NO. 2	17	17	1,224		360				
TOTAL	135	135	5,957	2141.59	374	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM

GENERAL NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W, EXCEPT AS NOTED, AND PAINTED IN ACCORDANCE WITH SYSTEM 5 OR SYSTEM 6 OF THE STRUCTURAL STEEL SHOP COATINGS PROGRAM AND SECTION 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

FOR MASS CONCRETE, SEE SPECIAL PROVISIONS. BENTS 1, 2, 3, 4, & 5 INCLUDE MASS CONCRETE.

FOR MSE RETAINING WALLS, SEE GEOTECHNICAL SPECIAL PROVISIONS.

ALL FALSEWORK AND FORMS FOR THE CAST-IN-PLACE DECK SLAB CONTINUOUS UNIT SHALL REMAIN IN PLACE UNTIL THE ENTIRE UNIT IS CAST AND CURED.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

SAMPLE BAR REPLACEMENT

SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH
#3	6'-2"	#6	9'-8"	#9	13'-2"
#4	7'-4"	#7	10'-10"	#10	14'-6"
#5	8'-6"	#8	12'-0"	#11	15'-10"

NOTE: SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30" (SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND f_y = 60ksi

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-

SHEET 9 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON -Y2FLYCA- OVER FUTURE I-74 FROM US 311 TO I-40

V&M Vaughn & Melton Consulting Engineers

10/5/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DWN. BY: AW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: RTS	DATE: 03/2022

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-9

TOTAL SHEETS 92

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL GIRDERS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	⟨#⟩ CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE: LIVE-LOAD FACTORS (γ_{LL})	STRENGTH I MOMENT: DISTRIBUTION FACTORS (DF)	STRENGTH I MOMENT: RATING FACTOR	STRENGTH I MOMENT: SPAN	STRENGTH I MOMENT: GIRDER LOCATION	STRENGTH I MOMENT: DISTANCE FROM LEFT END OF SPAN (ft)	STRENGTH I SHEAR: DISTRIBUTION FACTORS (DF)	STRENGTH I SHEAR: RATING FACTOR	STRENGTH I SHEAR: SPAN	STRENGTH I SHEAR: GIRDER LOCATION	STRENGTH I SHEAR: DISTANCE FROM LEFT END OF SPAN (ft)	SERVICE II LIMIT STATE: LIVE-LOAD FACTORS (γ_{LL})	SERVICE II MOMENT: DISTRIBUTION FACTORS (DF)	SERVICE II MOMENT: RATING FACTOR	SERVICE II MOMENT: SPAN	SERVICE II MOMENT: GIRDER LOCATION	SERVICE II MOMENT: DISTANCE FROM LEFT END OF SPAN (ft)	COMMENT NUMBER
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	⟨1⟩	1.37	--	1.75	----	1.40	C	5	127.1	----	1.37	C	5	206.2	1.30	----	2.50	C	5	120.2	
		HL-93 (OPERATING)	N/A		1.77	--	1.35	----	1.82	C	5	127.1	----	1.77	C	5	206.2	1.00	----	3.25	C	5	120.2	
		HS-20 (INVENTORY)	36.000	⟨2⟩	2.26	81.25	1.75	----	2.41	A	5	66.8	----	2.26	C	3	199.9	1.30	----	4.80	C	5	124.6	
		HS-20 (OPERATING)	36.000		2.93	105.34	1.35	----	3.14	A	5	66.8	----	2.93	C	3	199.9	1.00	----	6.25	C	5	124.6	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH	12.500		6.36	79.55	1.40	----	6.36	A	5	66.8	----	6.69	C	3	199.9	1.30	----	13.01	C	5	124.6	
		S3C	21.500		3.99	85.76	1.40	----	4.57	A	5	66.8	----	3.99	C	3	199.9	1.30	----	7.82	C	5	120.2	
		S3A	22.750		3.82	86.79	1.40	----	4.43	A	5	66.8	----	3.82	C	3	199.9	1.30	----	7.46	C	5	120.2	
		S4A	26.750		3.43	91.75	1.40	----	4.11	A	5	66.8	----	3.43	C	3	199.9	1.30	----	6.40	C	5	120.2	
		S5A	30.500		3.31	100.89	1.40	----	3.84	C	5	127.1	----	3.31	C	3	199.9	1.30	----	5.69	C	5	120.2	
		S6A	34.500		3.04	104.71	1.40	----	3.37	C	5	127.1	----	3.04	C	3	199.9	1.30	----	5.06	C	5	123.7	
		S7B	38.500		2.93	112.81	1.40	----	3.08	C	5	127.1	----	2.93	C	3	199.9	1.30	----	4.55	C	5	120.2	
		S7A	40.000		2.93	117.24	1.40	----	3.02	C	5	127.1	----	2.93	C	3	199.9	1.30	----	4.43	C	5	120.2	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	T4A	28.250		3.42	96.47	1.40	----	3.84	A	5	49.6	----	3.42	C	3	199.9	1.30	----	6.24	C	5	120.2	
		T5B	32.000		3.24	103.71	1.40	----	3.66	C	5	127.1	----	3.42	C	3	199.9	1.30	----	5.47	C	5	120.2	
		T6A	36.000		3.17	114.23	1.40	----	3.36	C	5	127.1	----	3.17	C	3	199.9	1.30	----	4.89	C	5	120.2	
		T7A	40.000		2.94	117.40	1.40	----	3.06	C	5	127.1	----	2.94	C	3	199.9	1.30	----	4.44	C	5	12.7	
		T7B	40.000	⟨3⟩	2.76	110.40	1.40	----	3.09	C	5	127.1	----	2.76	C	3	199.9	1.30	----	4.55	C	5	124.6	
FATIGUE		HL-93 (INVENTORY)	γ_{LL}=0.75																					

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{DC}	γ_{DW}
	STRENGTH I	1.25	1.50
	SERVICE II	1.00	1.00

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE II LIMIT STATES.

ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

1. THIS BRIDGE WAS DESIGNED AND RATED WITH THE GRILLAGE METHOD.

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

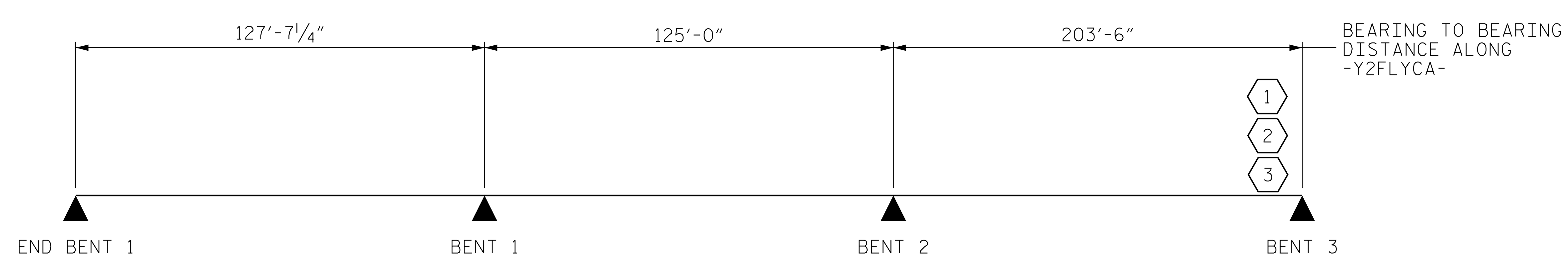
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING ✻✻

✻✻ SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

GIRDER LOCATION IS PROVIDED USING GIRDER NUMBER, WHERE GIRDER 1 IS THE EXTERIOR GIRDER TO THE LEFT OF -Y2FLYCA-



LRFR SUMMARY - UNIT 1

7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Boone, NC 828-355-9933 · Tri-Cities, TN 423-467-8401 · Knoxville, TN 865-546-5800 · Spartanburg, SC 864-574-4775 · Charleston, SC 843-974-5650 · Middlesboro, KY 606-248-6600 · Atlanta, GA 770-627-3590 · Raleigh, NC 99-977-9455 · Charlotte, NC 704-357-0488

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR STEEL GIRDERS (INTERSTATE TRAFFIC) (UNIT 1)

DWN. BY: AW DATE: 11/2021
CHKD. BY: PRG DATE: 03/2022
DES. EGR. OF RECORD: PRG DATE: 03/2022

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-10
1			3			TOTAL SHEETS
2			4			92

DRAWN BY : MAA 1/08 · CHECKED BY : GM/DI 2/08
REV. 11/12/08RR MAA/GM · REV. 10/1/11 MAA/GM · REV. 12/17 MAA/THC

STD. NO. LRFR4

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL GIRDERS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE											SERVICE II LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT					
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.05	--	1.75	----	1.05	D	5	85.6	----	1.26	D	5	0.0	1.30	----	2.14	D	5	85.6	
		HL-93 (OPERATING)	N/A		1.36	--	1.35	----	1.36	D	5	85.6	----	1.63	D	5	0.0	1.00	----	2.78	D	5	85.6	
		HS-20 (INVENTORY)	36.000	2	2.05	73.80	1.75	----	2.05	D	5	90.2	----	2.19	D	3	0.0	1.30	----	4.14	D	5	90.2	
		HS-20 (OPERATING)	36.000		2.66	95.80	1.35	----	2.66	D	5	90.2	----	2.84	D	3	0.0	1.00	----	5.38	D	5	90.2	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH	12.500		6.47	80.90	1.40	----	6.47	D	5	85.6	----	6.55	D	3	0.0	1.30	----	11.44	D	5	85.6	
		S3C	21.500		3.82	82.09	1.40	----	3.82	D	5	85.6	----	3.95	D	3	0.0	1.30	----	6.87	D	5	85.6	
		S3A	22.750		3.63	82.63	1.40	----	3.63	D	5	85.6	----	3.77	D	3	0.0	1.30	----	6.49	D	5	85.6	
		S4A	26.750		3.24	86.72	1.40	----	3.24	D	5	85.6	----	3.39	D	3	0.0	1.30	----	5.62	D	5	85.6	
		S5A	30.500		2.91	88.63	1.40	----	2.91	D	5	85.6	----	3.29	D	3	0.0	1.30	----	4.97	D	5	85.6	
		S6A	34.500		2.59	89.46	1.40	----	2.59	D	5	85.6	----	2.99	D	3	0.0	1.30	----	4.43	D	5	85.6	
		S7B	38.500		2.35	90.36	1.40	----	2.35	D	5	85.6	----	2.87	D	3	0.0	1.30	----	3.97	D	5	85.6	
		S7A	40.000		2.32	92.92	1.40	----	2.32	D	5	85.6	----	2.86	D	3	0.0	1.30	----	3.86	D	5	85.6	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	T4A	28.250		3.08	87.07	1.40	----	3.08	D	5	85.6	----	3.37	D	3	0.0	1.30	----	5.33	D	5	85.6	
		T5B	32.000		2.80	89.66	1.40	----	2.80	D	5	85.6	----	3.17	D	3	0.0	1.30	----	4.75	D	5	85.6	
		T6A	36.000		2.60	93.64	1.40	----	2.60	D	5	85.6	----	3.08	D	3	0.0	1.30	----	4.33	D	5	85.6	
		T7A	40.000		2.40	95.84	1.40	----	2.40	D	5	85.6	----	2.85	D	3	0.0	1.30	----	3.93	D	5	85.6	
		T7B	40.000	3	2.39	95.48	1.40	----	2.39	D	5	85.6	----	2.69	D	3	0.0	1.30	----	3.93	D	5	85.6	
FATIGUE		HL-93 (INVENTORY)	γ_{LL}=0.75																					

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{DC}	γ_{DW}
	STRENGTH I	1.25	1.50
	SERVICE II	1.00	1.00

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE II LIMIT STATES.

ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

1. THIS BRIDGE WAS DESIGNED AND RATED WITH THE GRILLAGE METHOD.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

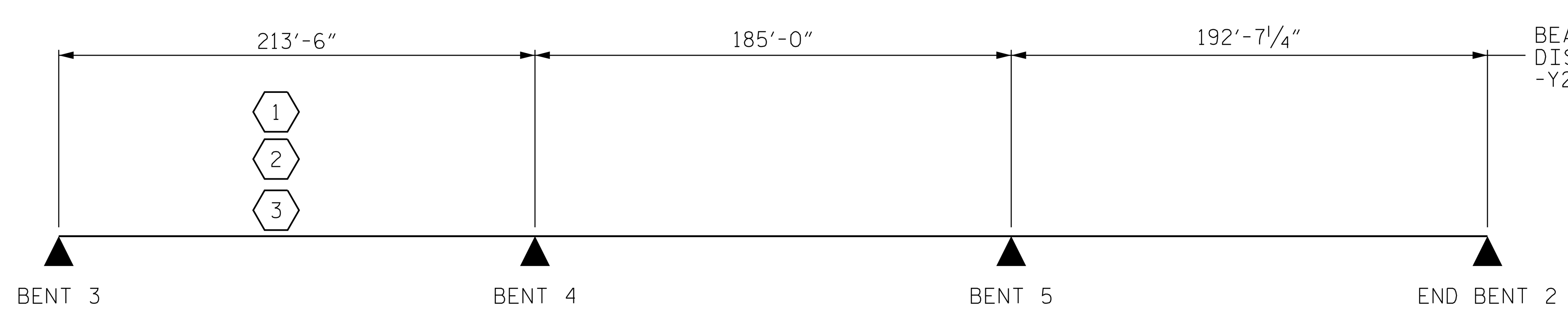
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING ✻✻

✻✻ SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

GIRDER LOCATION IS PROVIDED USING GIRDER NUMBER, WHERE GIRDER 1 IS THE EXTERIOR GIRDER TO THE LEFT OF -Y2FLYCA-



LRFR SUMMARY - UNIT 2

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL
DocuSigned by: Harry L. Willis
7/26/2022

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Vaughn & Melton Consulting Engineers
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Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Atlanta, GA 770-627-3590
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR STEEL GIRDERS (INTERSTATE TRAFFIC) (UNIT 2)

DWN. BY: AW	DATE: 11/2021
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: PRG	DATE: 03/2022

REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	S1-11
1			3			TOTAL SHEETS	92
2			4				

STD. NO. LRFR4

DRAWN BY : MAA 1/08	REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

wdsrufner
DGN: V:\NC\Structures\03148-44 U-2579AA STP\Structures\SITE 1 - FLYCA NorthPlans\FINAL PLANS\401_02_U2579AA_SMU_LR02_01.dgn
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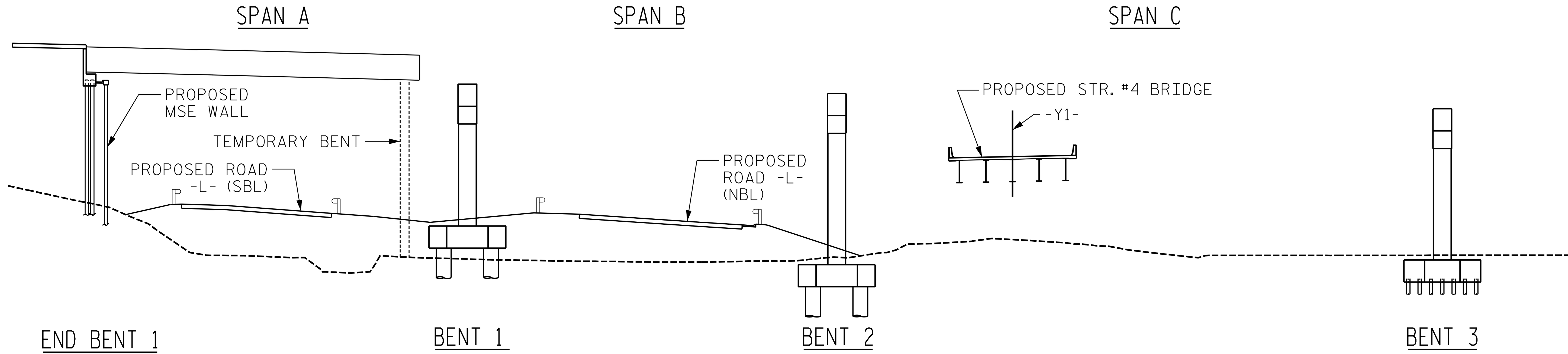
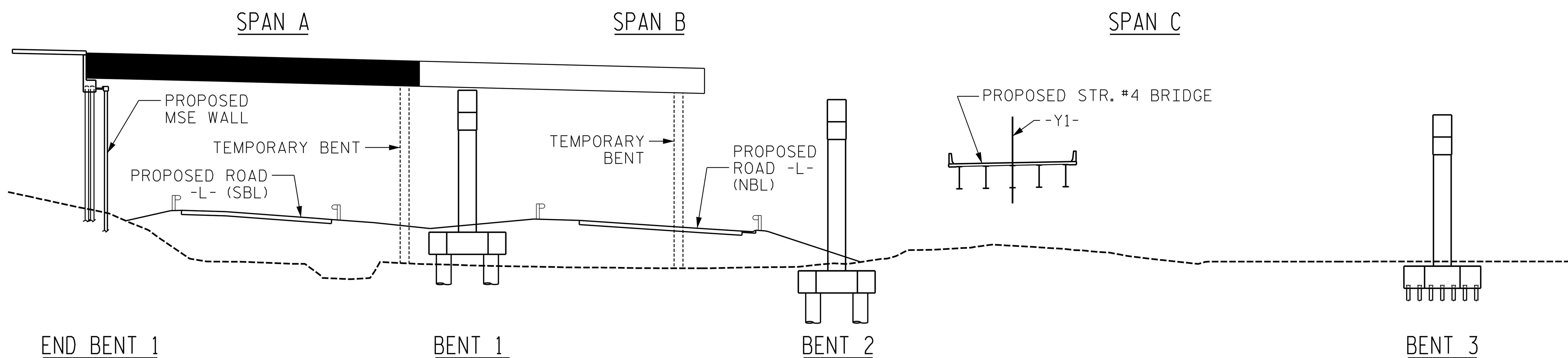


UNIT 1, STEP 1 GIRDER ERECTION



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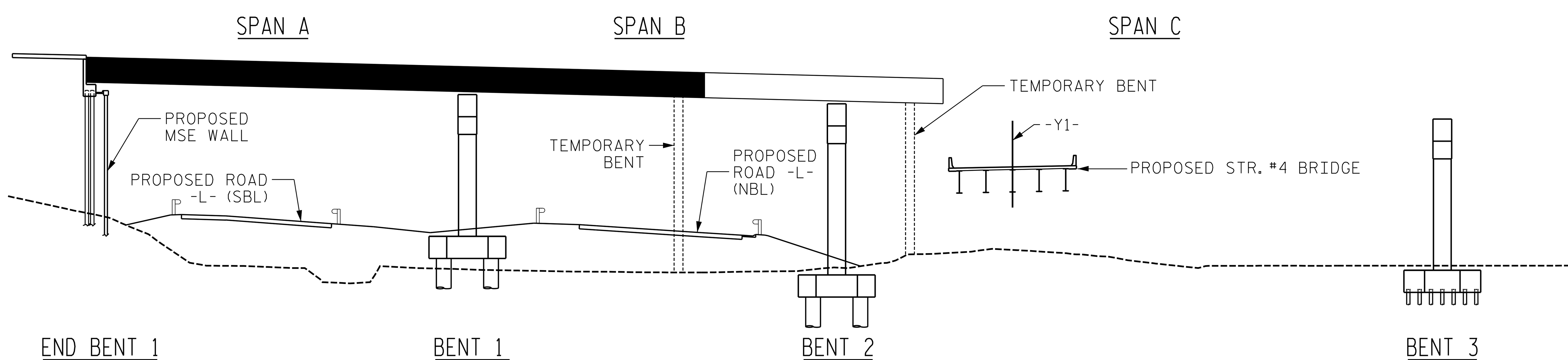

UNIT 1, STEP 3 GIRDER ERECTION

ERECTION NOTES

FOR TEMPORARY BENTS, SEE SPECIAL PROVISIONS.

ERECT A MINIMUM OF TWO GIRDERS WITH ALL DIAPHRAGMS/CROSSFRAMES BETWEEN THE GIRDERS IN PLACE AND THE BOLTS TIGHTENED PRIOR TO RELEASING THE GIRDERS.

ERECT EACH SUBSEQUENT GIRDER WITH DIAPHRAGMS/CROSSFRAMES CONNECTING TO THE ADJACENT PREVIOUSLY ERECTED GIRDER AND TIGHTEN ALL BOLTS BEFORE RELEASING THE GIRDERS.

THE STRUCTURAL STEEL SHALL BE SUPPORTED DURING ERECTION IN ITS CAMBERED POSITION. A MINIMUM OF ONE TEMPORARY BENT SHALL BE USED IN SPAN A.

THE TEMPORARY BENT SHALL REMAIN IN PLACE UNTIL ALL GIRDERS, DIAPHRAGMS, AND CROSSFRAMES ARE IN PLACE AND ALL HIGH STRENGTH BOLTS ARE TIGHTENED.

THE TEMPORARY BENT SHALL PROVIDE BEARING AT CONNECTOR PLATE LOCATIONS. WHEN CONNECTOR PLATES ARE USED AS TEMPORARY BEARING STIFFENERS, DIAPHRAGMS MUST BE ATTACHED.

THE CONTRACTOR'S ERECTION PLANS SHALL INCLUDE A METHOD OF TEMPORARY BENT REMOVAL THAT WILL UNIFORMLY TRANSFER THE STRUCTURAL WEIGHT TO THE DIAPHRAGMS/CROSSFRAMES AND THE GIRDERS WILL REMAIN IN CAMBERED POSITIONS.

PLANS FOR TEMPORARY BENT ERECTION AND REMOVAL SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.

THE CONTRACTOR IS RESPONSIBLE FOR DESIGNING THE TEMPORARY BENT. THE DESIGNS SHALL BE COMPLETED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA. THE CONTRACTOR SHALL SUBMIT SIGNED AND SEALED WORKING DRAWINGS AND CALCULATIONS FOR APPROVAL BY THE ENGINEER.

DURING THE GIRDER ERECTION PROCEDURE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TEMPORARY LATERAL BRACING AND OTHER MEANS OF SUPPORT, AS REQUIRED TO ENSURE STABILITY OF THE GIRDERS, AVOID UPLIFT OF THE GIRDERS AT THE TEMPORARY BENT, AND TO ENSURE PLUMBNESS OF THE GIRDERS IN THE FINAL CONDITION.

NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR PROVIDING THE TEMPORARY BENT. THE COST FOR ALL MATERIALS, EQUIPMENT, TOOLS, LABOR, AND ANY INCIDENTALS NECESSARY TO PROVIDE THE TEMPORARY BENT SHALL BE INCIDENTAL TO THE LUMP SUM BID FOR STRUCTUAL STEEL.

THE CONTRACTOR MAY SUBMIT AN ALTERNATE ERECTION METHOD TO THE ENGINEER FOR REVIEW AND APPROVAL.

7/26/2022

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Charlotte, NC 704-357-0488

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GIRDER ERECTION DETAILS UNIT 1

DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: PRG	DATE: 03/2022

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-12

TOTAL SHEETS 92

wdcrutcher
DGN: V:\NC\Structures\031748-44 U-2579AA STRS\Structures\SITE 1 - FLYCA North\Plans\FINAL PLANS\401_023_U2579AA_SMU_GE01_012.dgn
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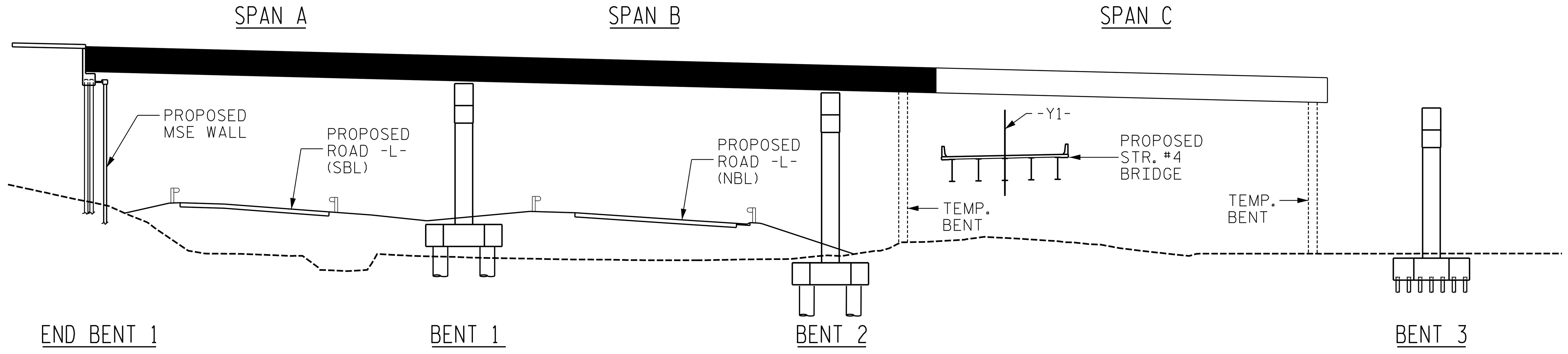
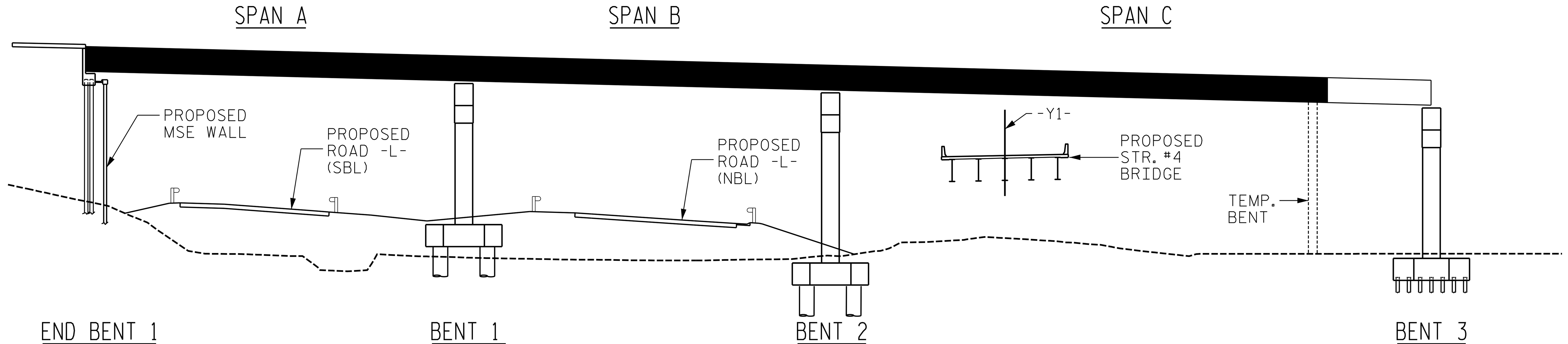
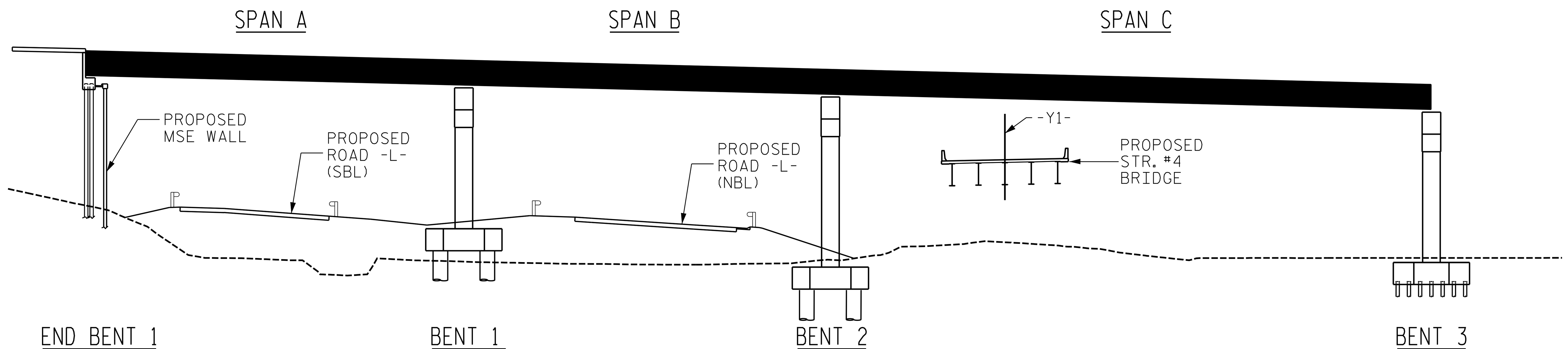


UNIT 1, STEP 4 GIRDER ERECTION



UNIT 1, STEP 5 GIRDER ERECTION



UNIT 1, STEP 6 GIRDER ERECTION

7/26/2022

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PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
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SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GIRDER ERECTION DETAILS
UNIT 1

DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: PRG	DATE: 03/2022

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1			3		
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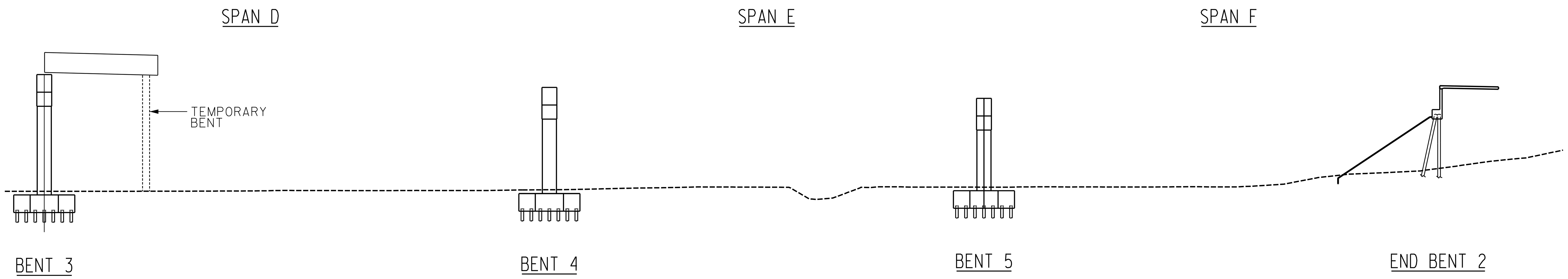
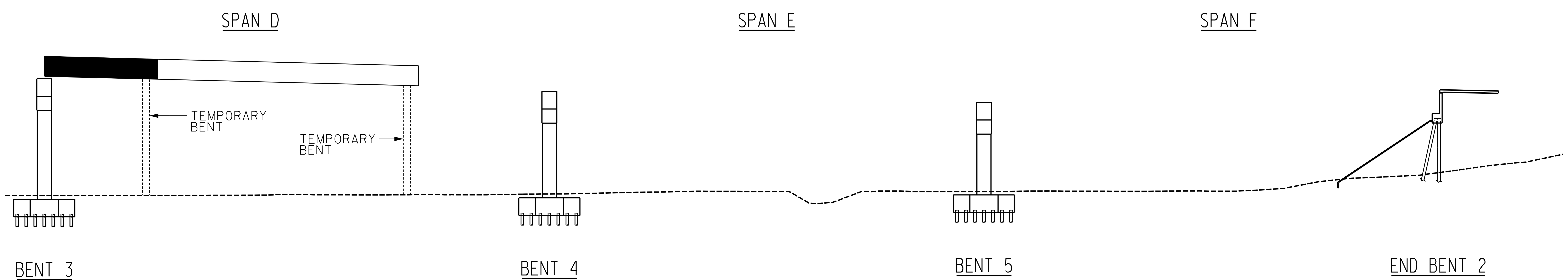
SHEET NO. S1-13

TOTAL SHEETS 92



UNIT 2, STEP 1 GIRDER ERECTION



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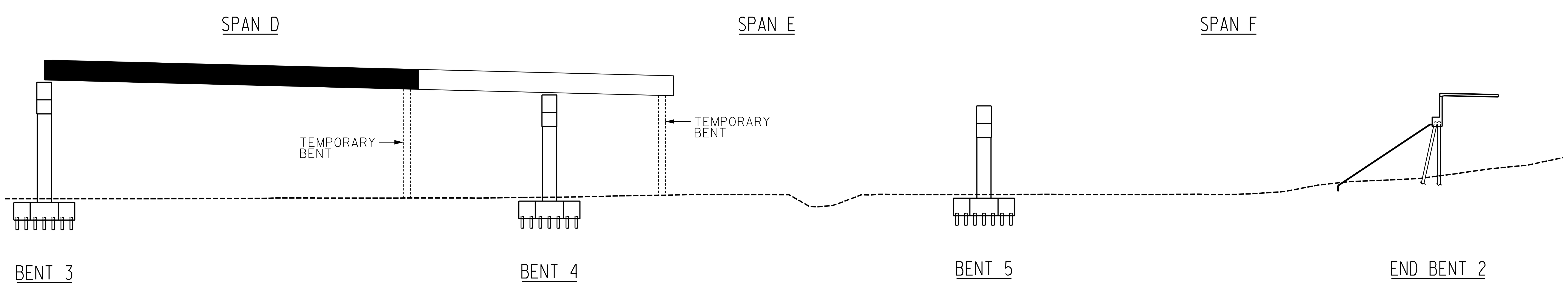

UNIT 2, STEP 3 GIRDER ERECTION

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GIRDER ERECTION DETAILS
UNIT 2

NORTH CAROLINA PROFESSIONAL SEAL 20777 ENGINEER HARDY L. WILLIS
DocuSigned by: Hardy Willis
CC287FCF0223461...
7/26/2022

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Consulting Engineers
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CHKD. BY: PRG DATE: 03/2022
DES. EGR. OF RECORD: PRG DATE: 03/2022

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-14
1			3			TOTAL SHEETS
2			4			92

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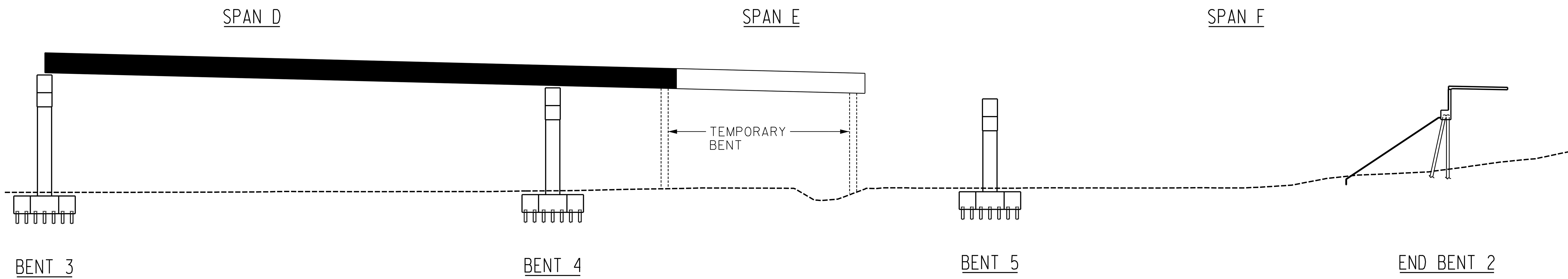
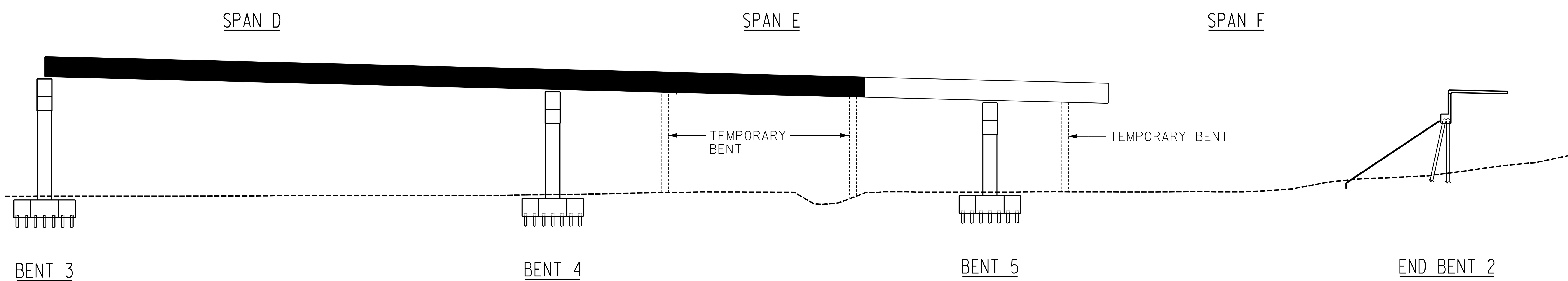
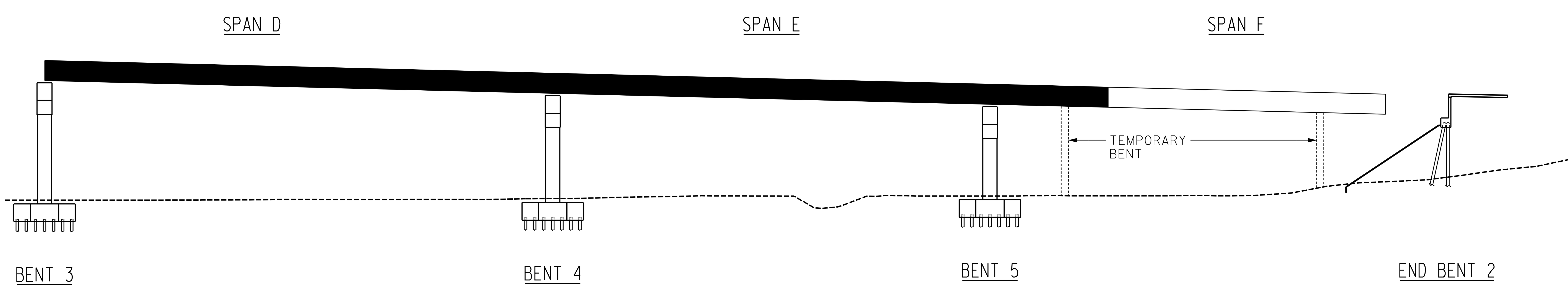


UNIT 2, STEP 3 GIRDER ERECTION



UNIT 2, STEP 4 GIRDER ERECTION



UNIT 2, STEP 5 GIRDER ERECTION

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
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SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GIRDER ERECTION DETAILS
UNIT 2

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Asheville, North Carolina 828-253-2796

DWN. BY: NCW DATE: 03/2022
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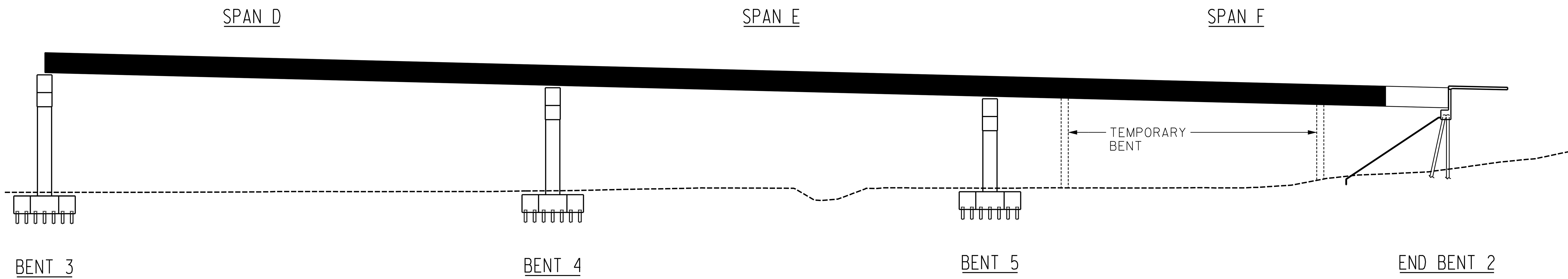
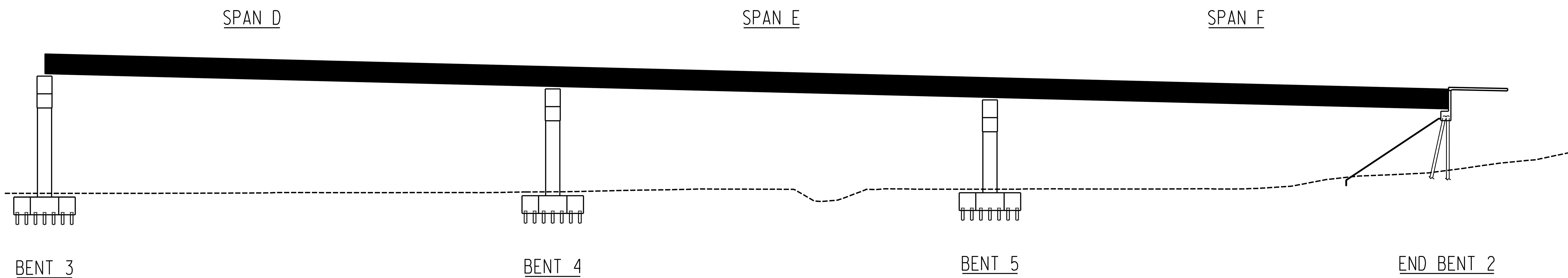
DES. EGR. OF RECORD: PRG DATE: 03/2022

REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-15
TOTAL SHEETS 92



UNIT 2, STEP 6 GIRDER ERECTION



UNIT 2, STEP 7 GIRDER ERECTION

7/26/2022

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Middlesboro, KY 606·248·6600
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PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
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SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GIRDER ERECTION DETAILS
UNIT 2

DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: PRG	DATE: 03/2022

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-16

TOTAL SHEETS 92

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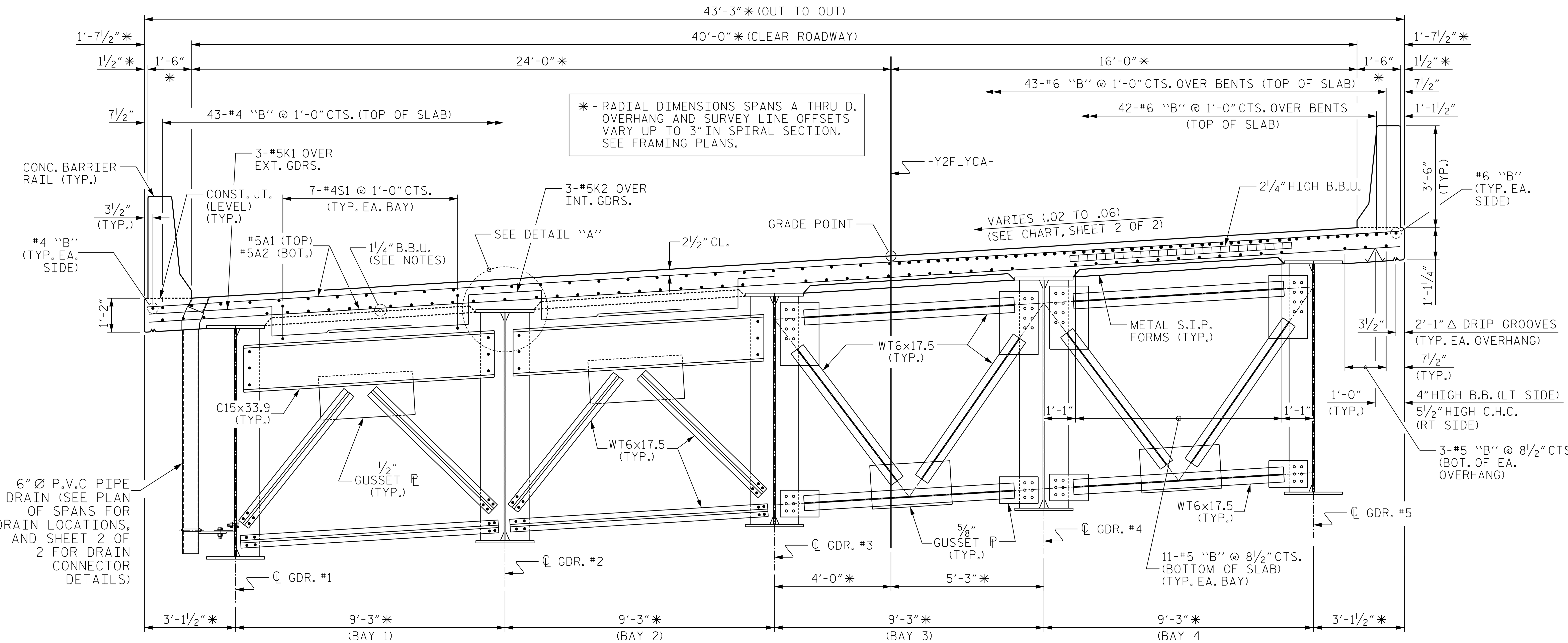


PARTIAL TYPICAL SECTION
(SHOWING END BENT DIAPHRAGMS)

PARTIAL TYPICAL SECTION
(SHOWING BENT 1, 2, 4 & 5 DIAPHRAGMS)

NOTES

PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER @ 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2½" ABOVE THE TOP OF THE REMOVABLE FORM.

METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO BEAM OR GIRDER FLANGES IN THE ZONES REQUIRING CHARPY V-NOTCH TEST. SEE STRUCTURAL STEEL DETAIL SHEETS.

PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED IN THE UNIT.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND BEAM/GIRDER STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING DRAWINGS.

PVC DECK DRAINS SHALL BE PAINTED WITH TWO COATS OF BROWN PRIMER MEETING THE REQUIREMENTS OF ARTICLE 1080-09 OF THE STANDARD SPECIFICATIONS. EACH COAT SHALL BE 2 DRY MILS THICK. DECK DRAINS SHALL BE ROUGHENED PRIOR TO PAINTING. NO SEPARATE PAYMENT SHALL BE MADE FOR PAINTING PVC DECK DRAINS AS THIS IS CONSIDERED INCIDENTAL TO THE PAY ITEM FOR REINFORCED CONCRETE DECK SLAB.

EXPANSION JOINT SEALS

FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

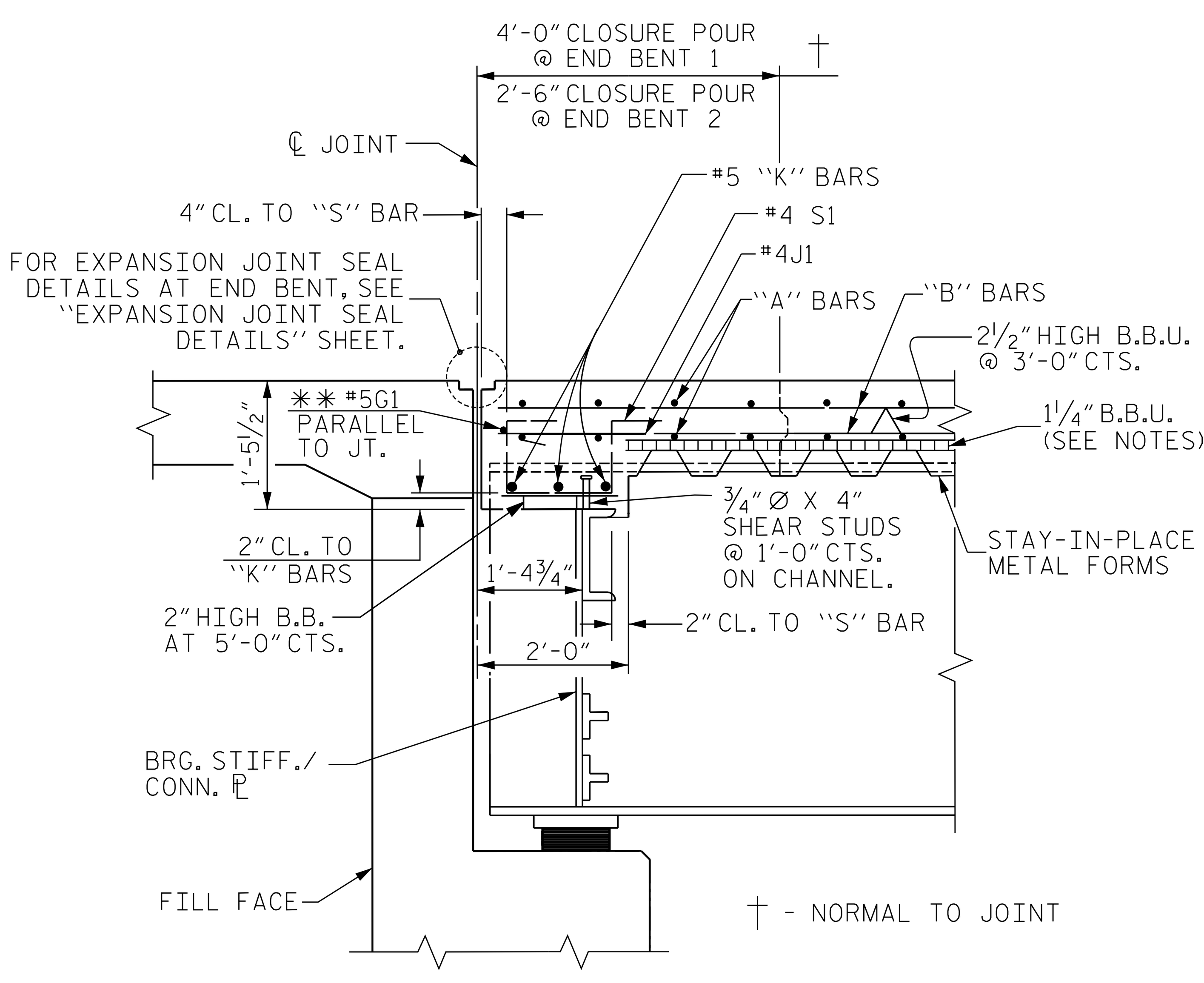
✱✱ #5G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND SHEAR STUDS.

MODULAR EXPANSION JOINT SEALS

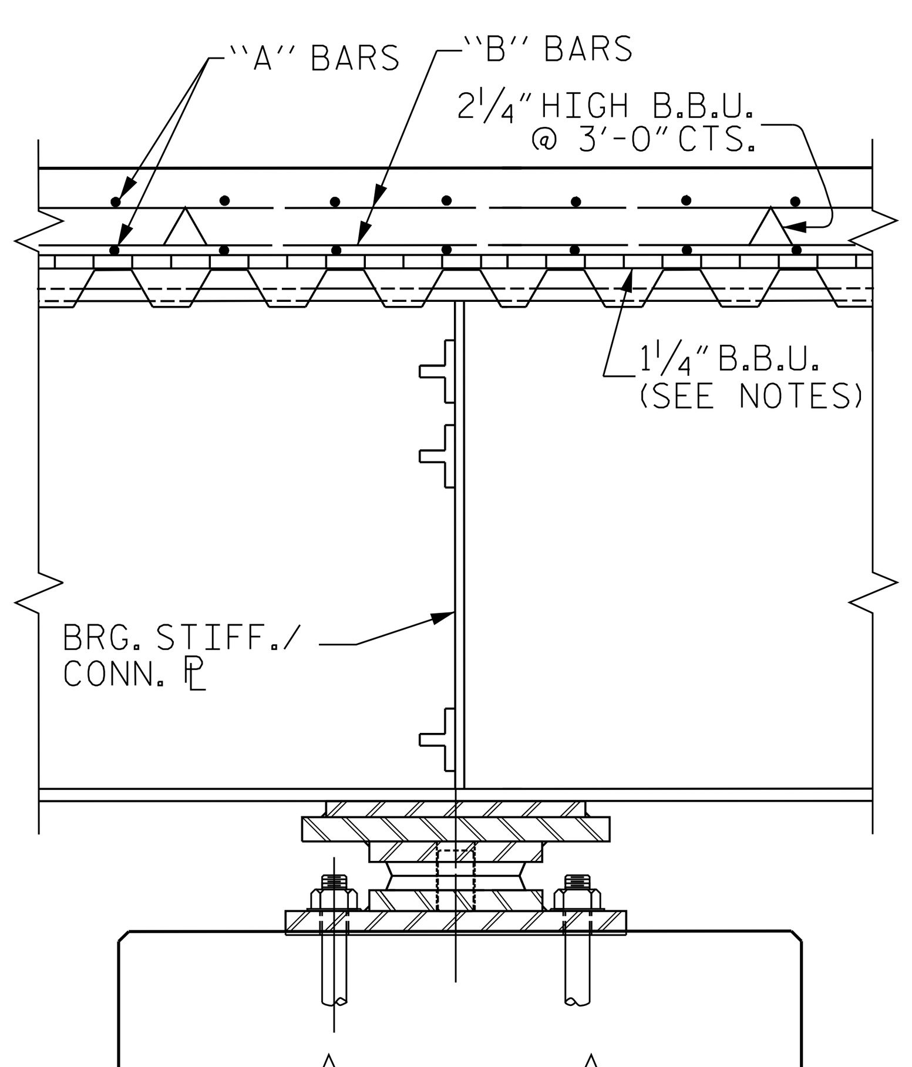
FOR MODULAR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

THE "B" BARS IN THE DECK SLAB MAY BE CUT AS DIRECTED BY THE ENGINEER TO CLEAR THE MODULAR JOINT SUPPORT BOXES.

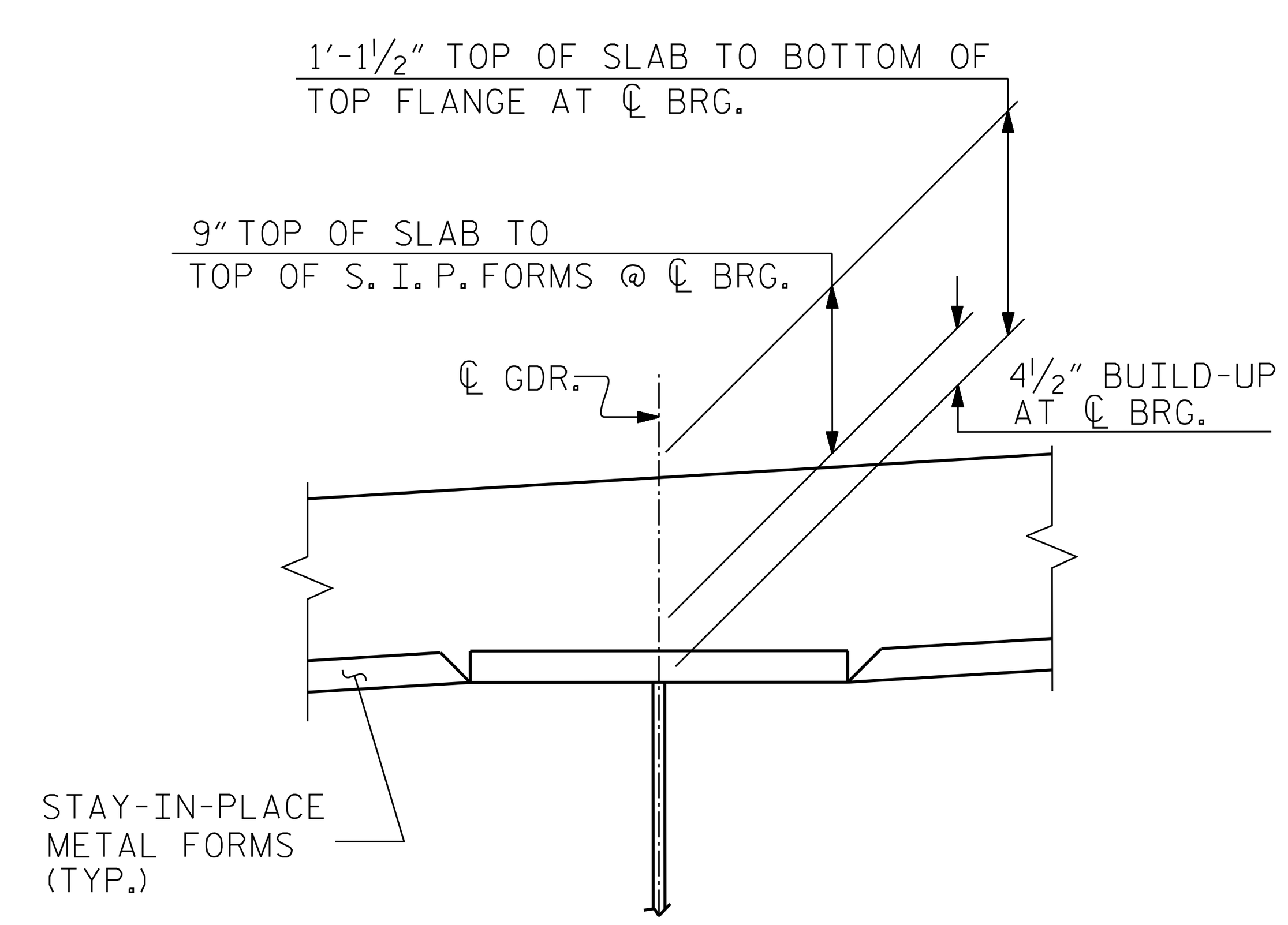
SPECIAL SNOWPLOW PROTECTION IS REQUIRED. SEE SPECIAL PROVISION FOR MODULAR EXPANSION JOINT SEALS.



SECTION THRU END BENT
END BENT 1 SHOWN
END BENT 2 SIMILAR



SECTION THRU BENTS 1, 2, 4, & 5



DETAIL "A"

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL — HARDY L. WILLIS
DocuSigned by: Hardy Willis
7/26/2022

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PROJECT NO. U-2579AA
FORSYTH COUNTY
STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION

			REVISIONS					SHEET NO.
DWN. BY: NCW	DATE: 03/2022	NO.	BY:	DATE:	NO.	BY:	DATE:	S1-17
CHKD. BY: PRG	DATE: 03/2022	1			3			TOTAL SHEETS
DES. EGR. OF RECORD: PRG	DATE: 03/2022	2			4			92

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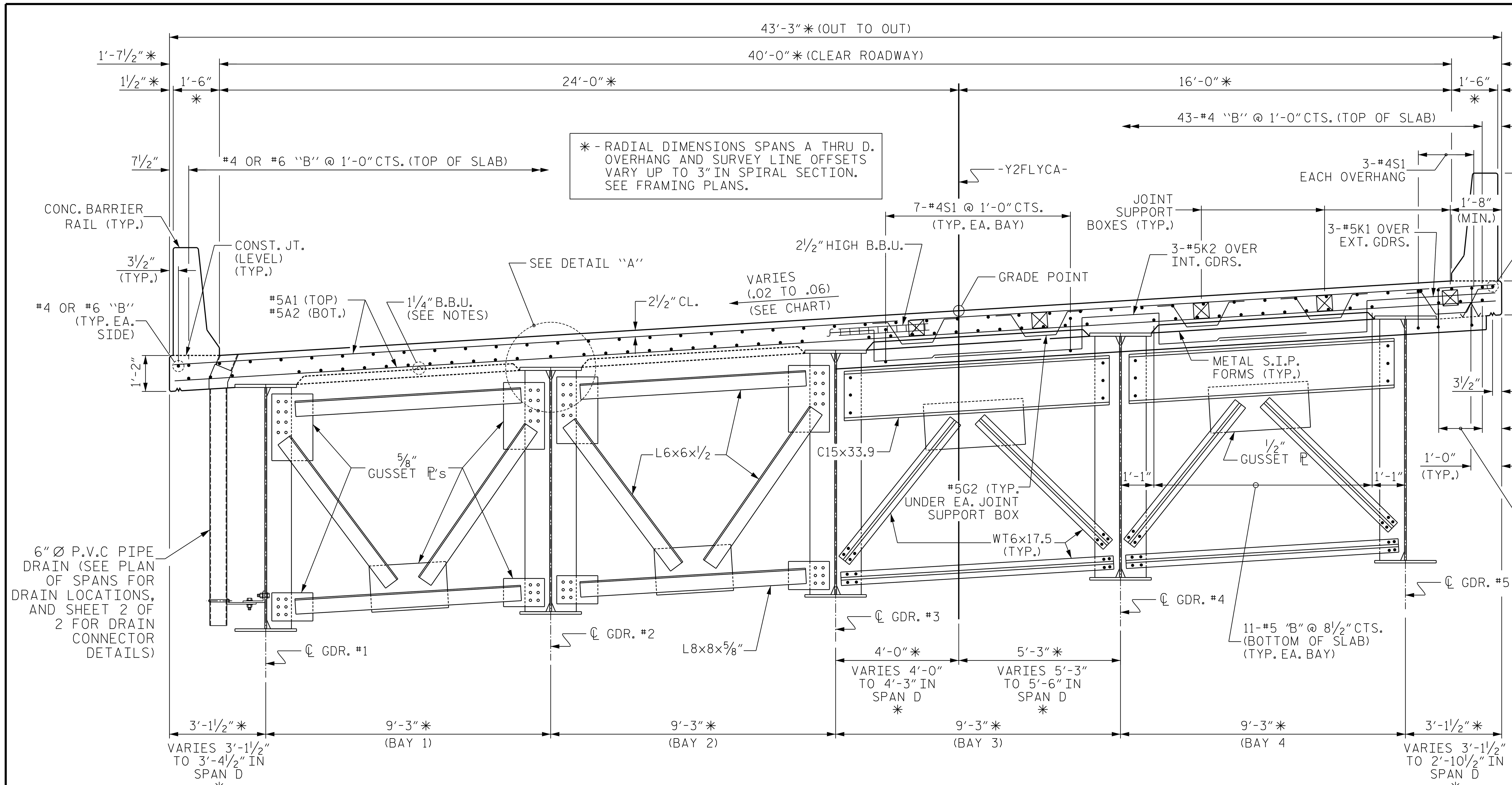
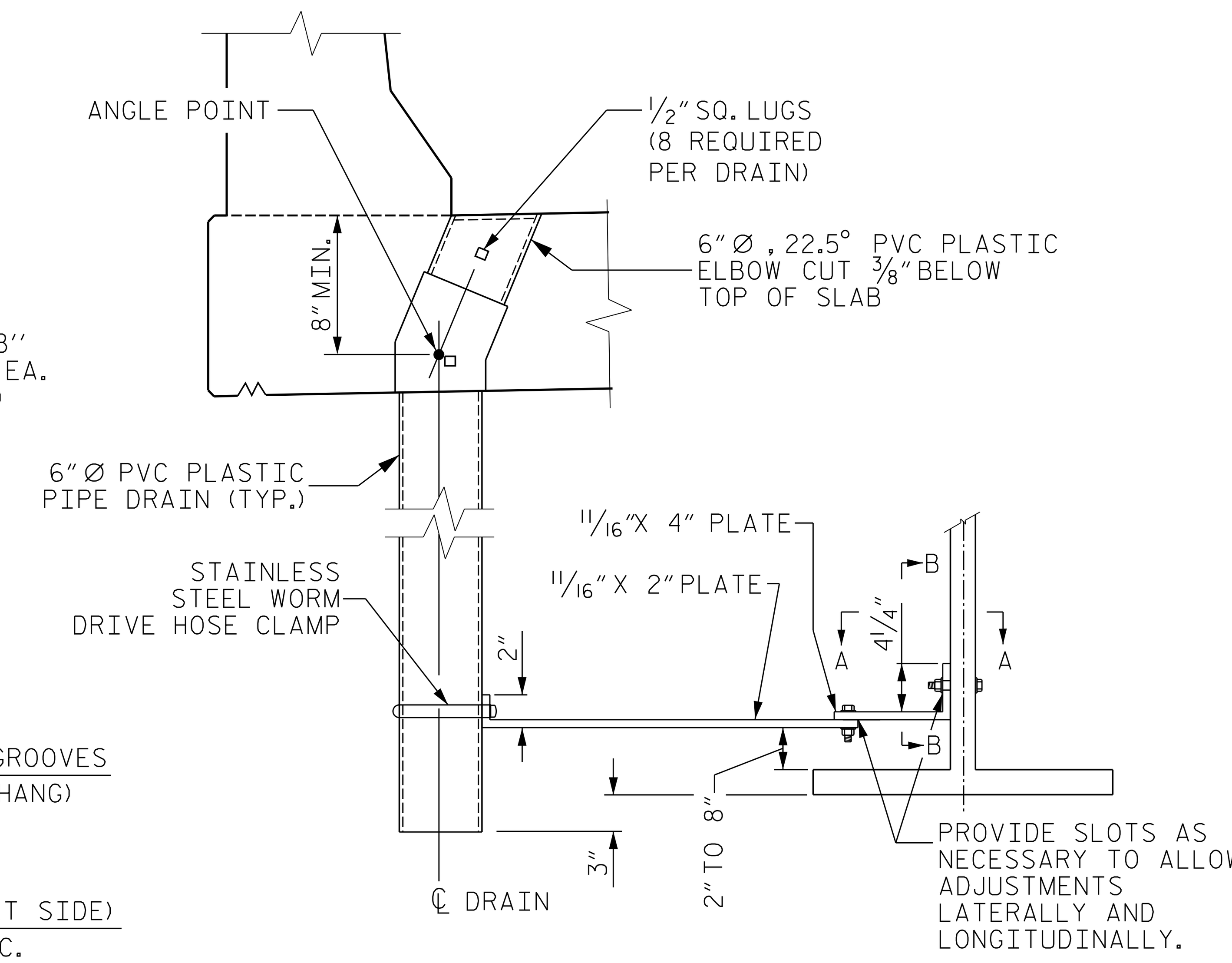


PARTIAL TYPICAL SECTION
(SHOWING INTERMEDIATE DIAPHRAGMS)

PARTIAL TYPICAL SECTION
(SHOWING BENT 3 DIAPHRAGMS)



DRAIN CONNECTOR DETAIL

30 DRAINS REQUIRED.

COUPLING IN DRAIN PIPE WILL BE PERMITTED AS APPROVED BY THE ENGINEER.

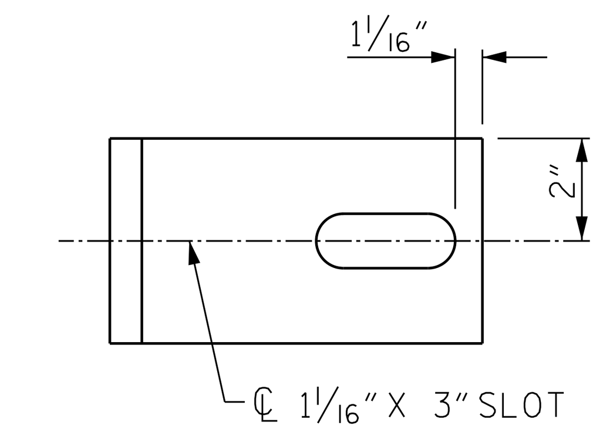
TOP OF FLOOR DRAIN TO BE SET ⅜" BELOW SURFACE OF SLAB.

4 - ½" SQUARE LUGS TO BE GLUED TO THE PVC PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM THE TOP OF THE PIPE.

BOLT SIZE TO BE SAME AS DIAPHRAGM AND CROSSFRAME CONNECTIONS. STAINLESS STEEL WORM DRIVE HOSE CLAMP SHALL BE COMMERCIAL QUALITY.

THE 6"Ø PVC PLASTIC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.

PLATES SHALL BE GRADE 50 STEEL.



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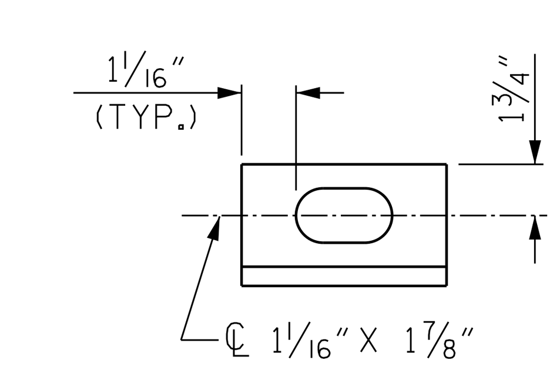

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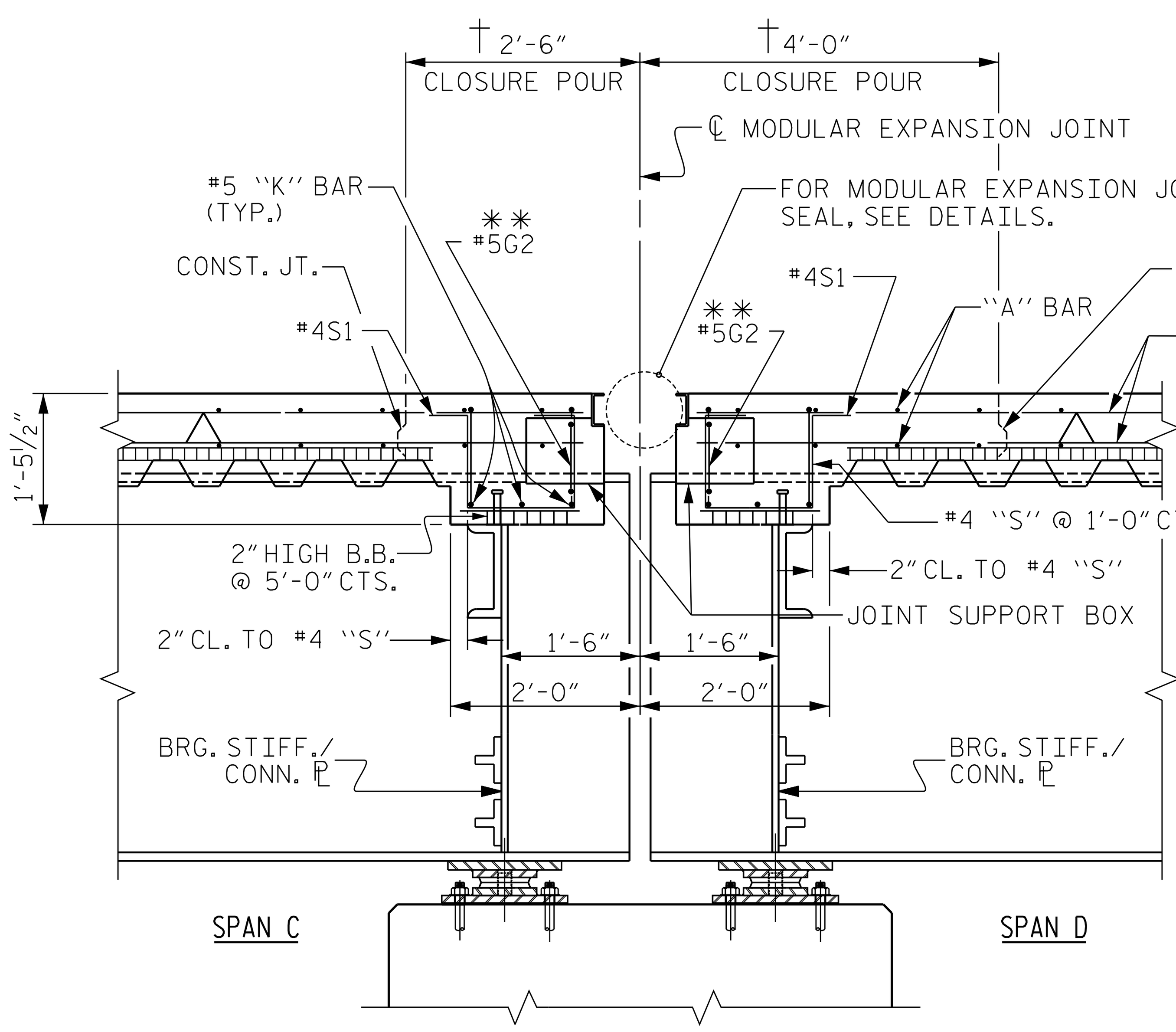
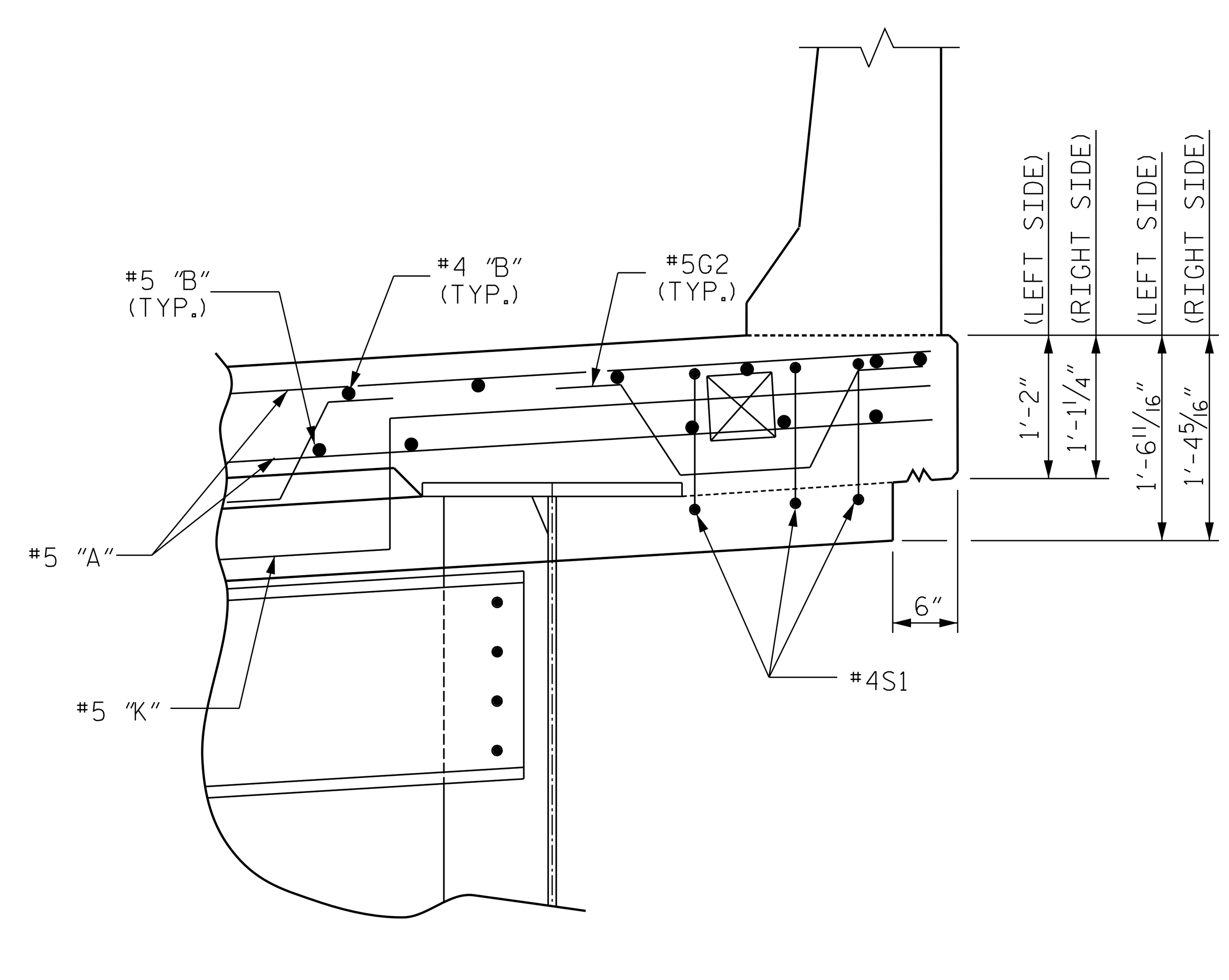
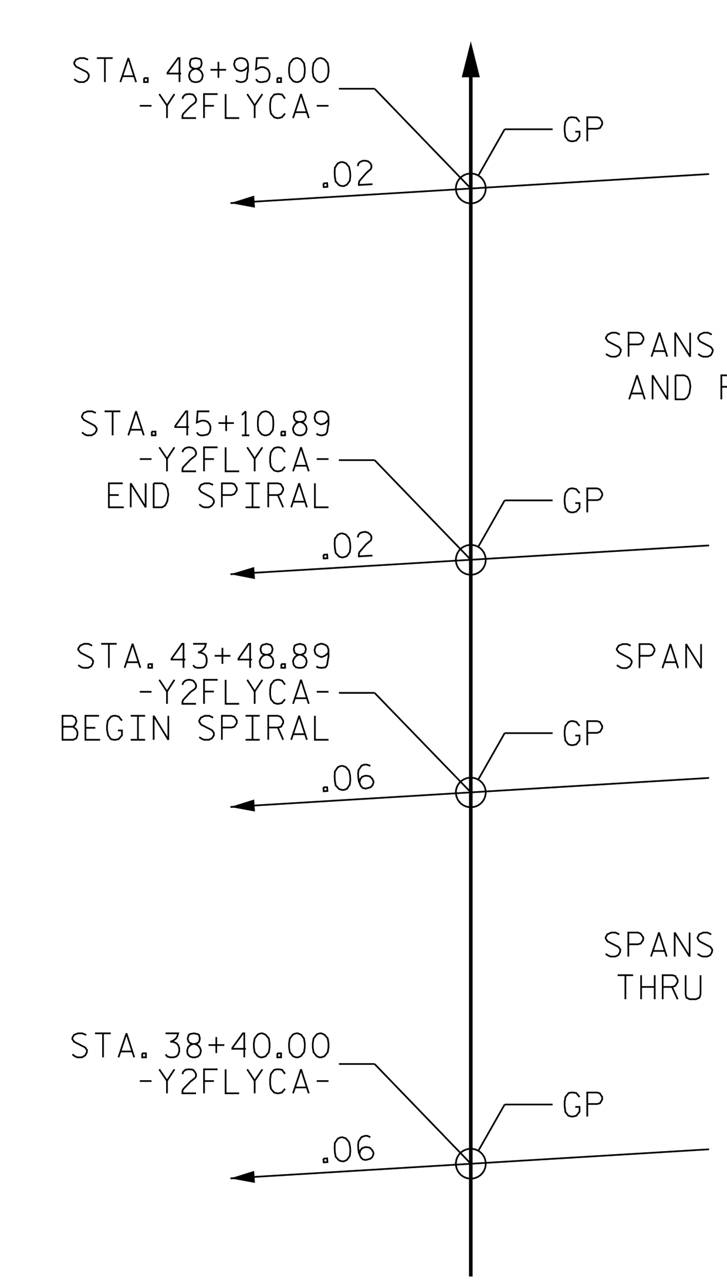


SECTION THRU BENT 3

† - NORMAL TO JOINT



MODULAR JOINT OVERHANG DETAIL



VARIABLE SUPERELEVATION

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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

V&M Vaughn & Melton Consulting Engineers — Asheville, North Carolina 828-253-2796

PROJECT NO. U-2579AA
FORSYTH COUNTY
STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

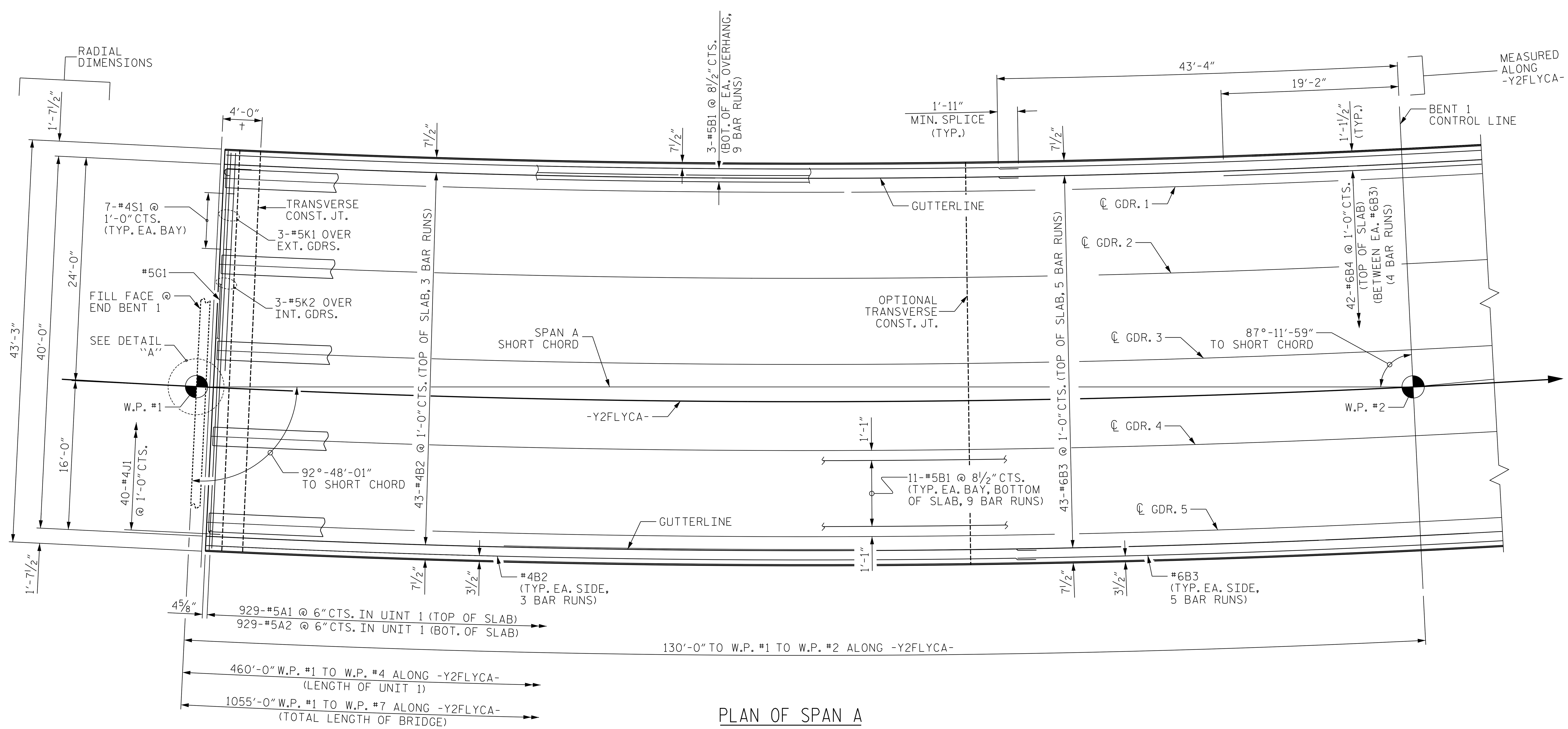
SUPERSTRUCTURE
TYPICAL SECTION

DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: PRG	DATE: 03/2022

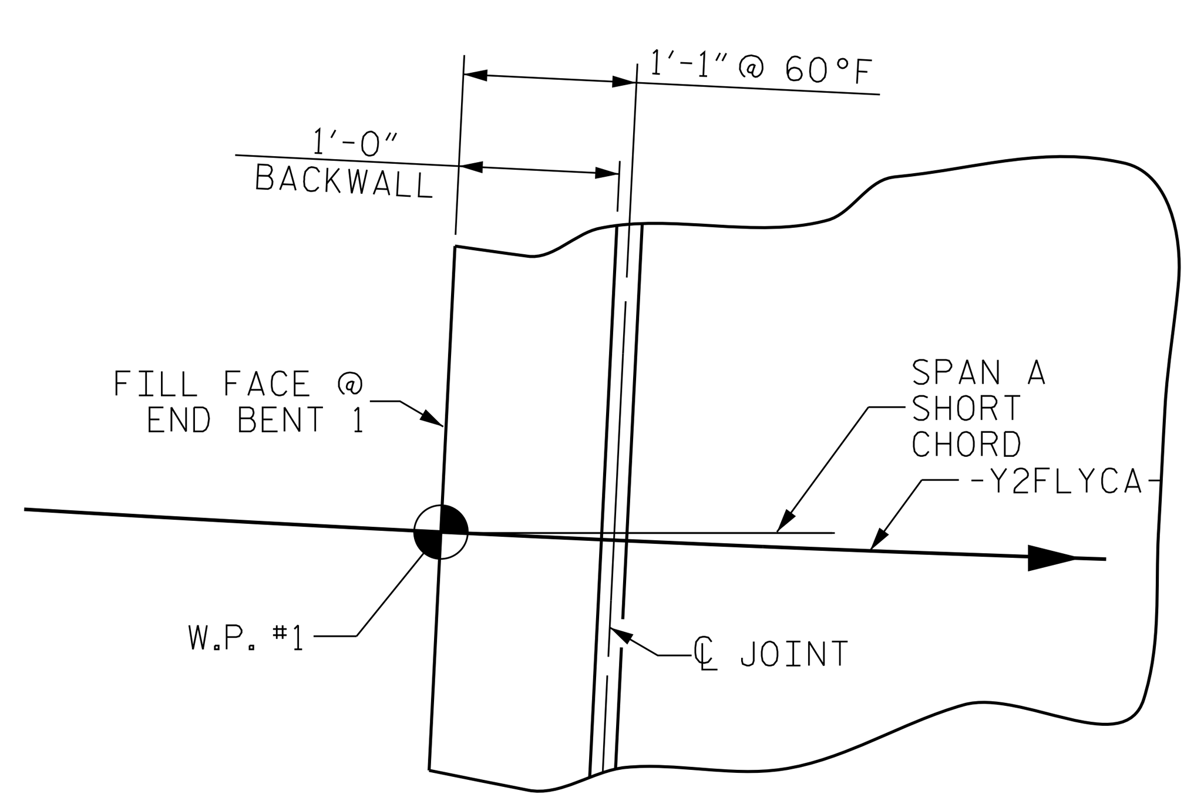
REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

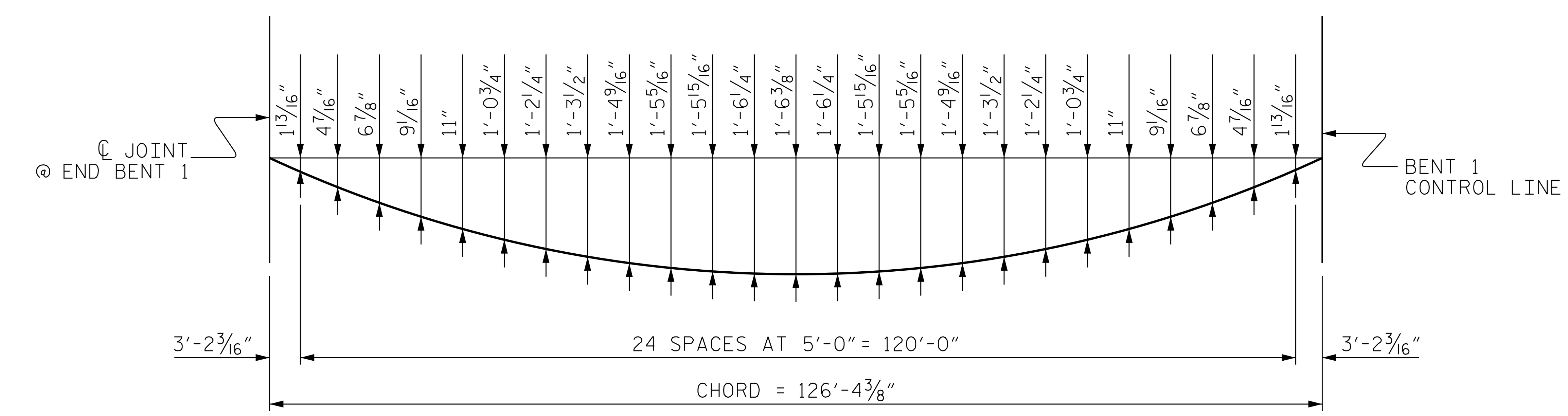
SHEET NO. S1-18
TOTAL SHEETS 92



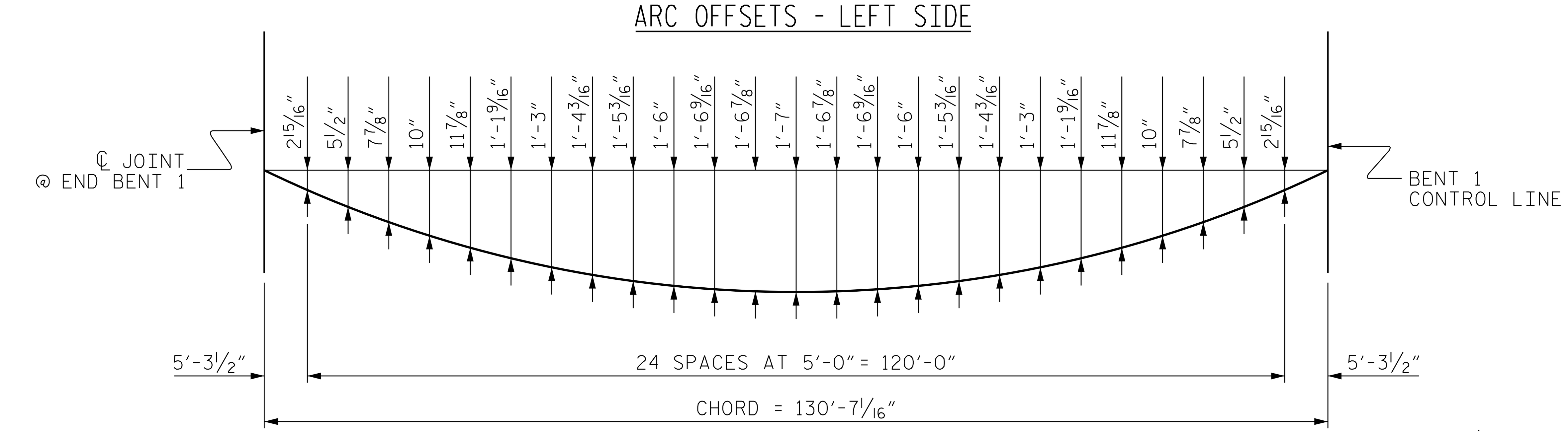
PLAN OF SPAN A



DETAIL "A"



ARC OFFSETS - LEFT SIDE



ARC OFFSETS - RIGHT SIDE

NOTE:

FOR REINFORCING STEEL IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS.

#5 "A" BARS ARE TO BE PLACED RADIALLY ALONG RIGHT OUTSIDE EDGE OF SUPERSTRUCTURE.

FOR DECK POURING SEQUENCE, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

† DISTANCE NORMAL TO JOINT

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL
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7/26/2022

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Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Atlanta, GA 770-627-3590
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-

SHEET 1 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPANS
SPAN A

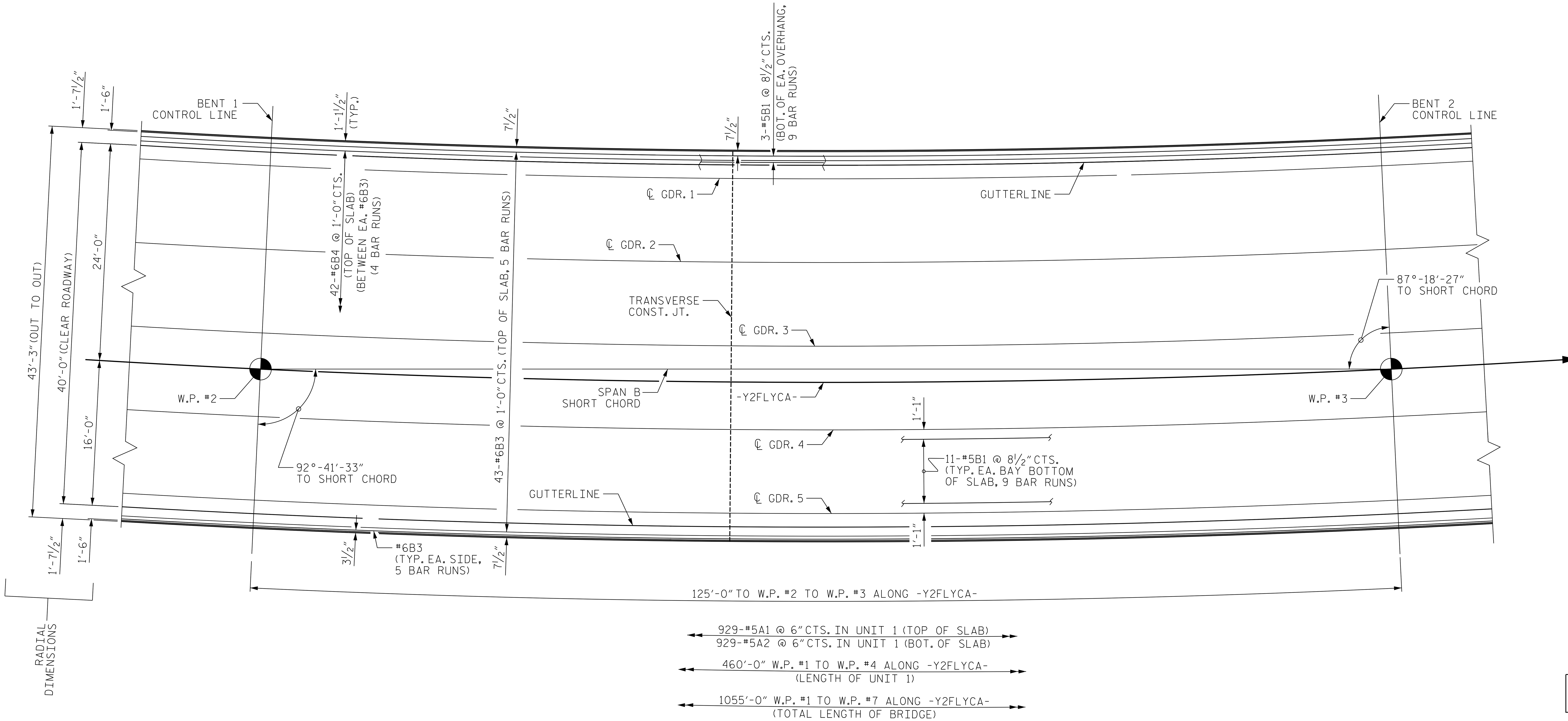
DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: PRG	DATE: 03/2022

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-19

TOTAL SHEETS 92



PLAN OF SPAN B

NOTE:

FOR REINFORCEMENT IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS.

#5 "A" BARS ARE TO BE PLACED RADIALLY ALONG RIGHT OUTSIDE EDGE OF SUPERSTRUCTURE.

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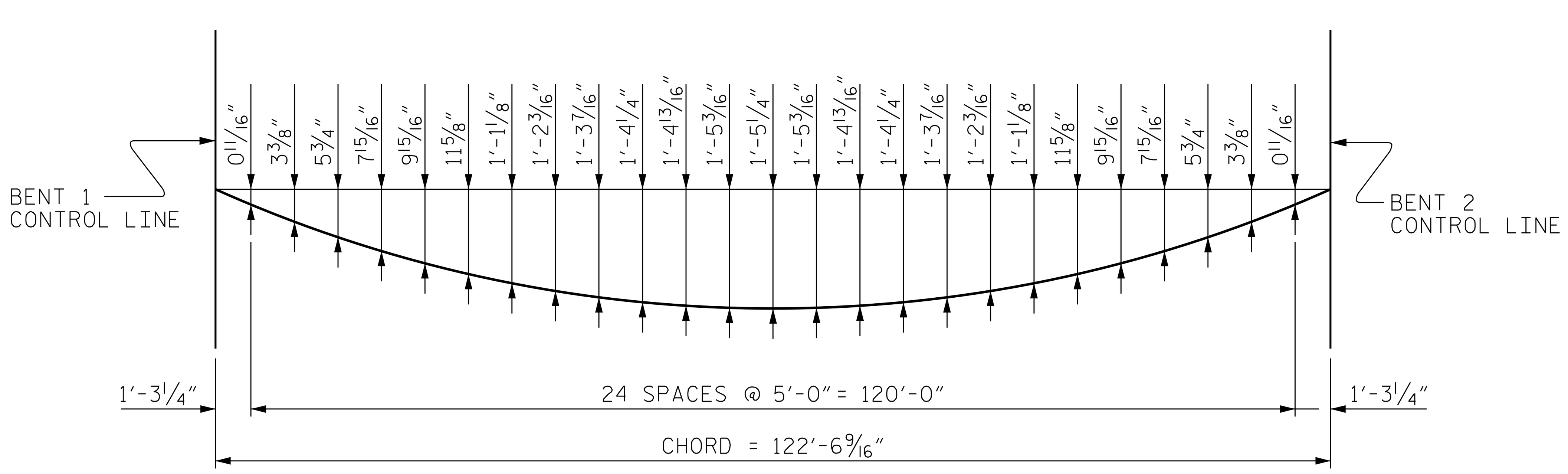

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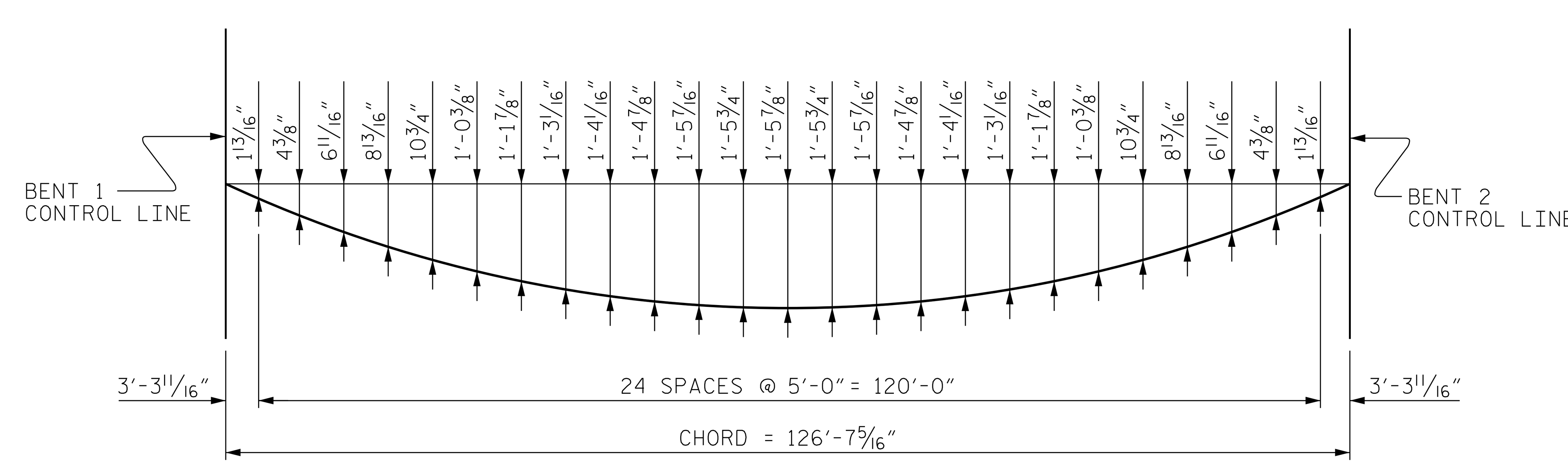

ARC OFFSETS - RIGHT SIDE

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PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

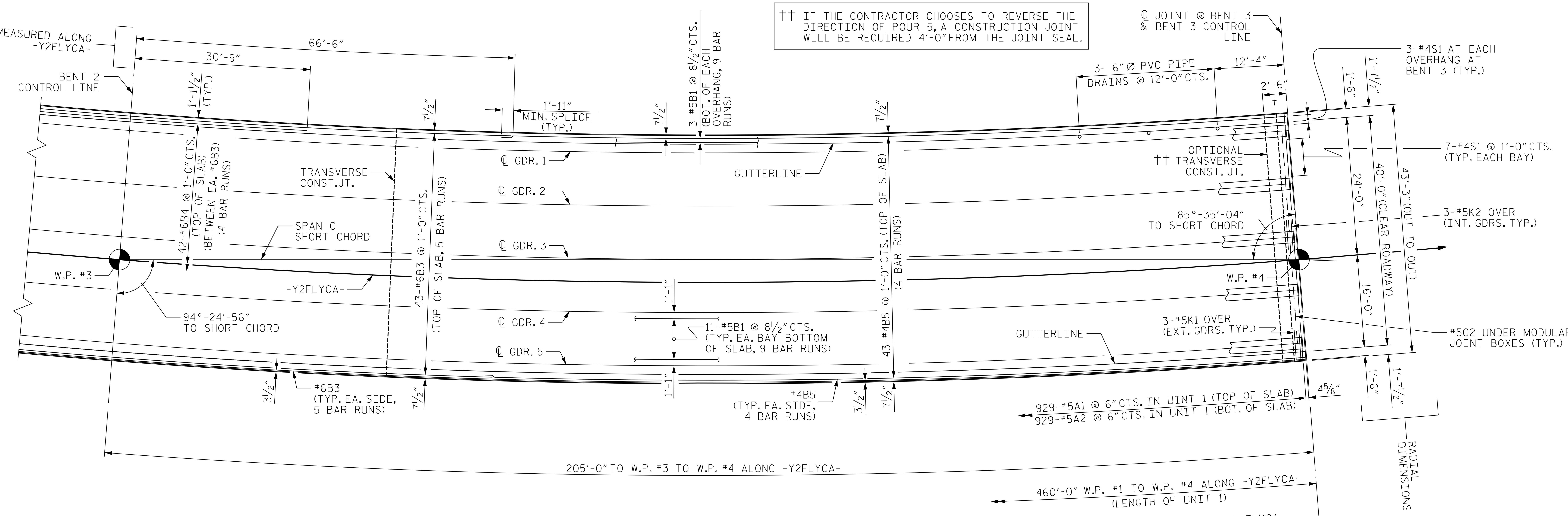
SUPERSTRUCTURE
PLAN OF SPANS
SPAN B

DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: PRG	DATE: 03/2022

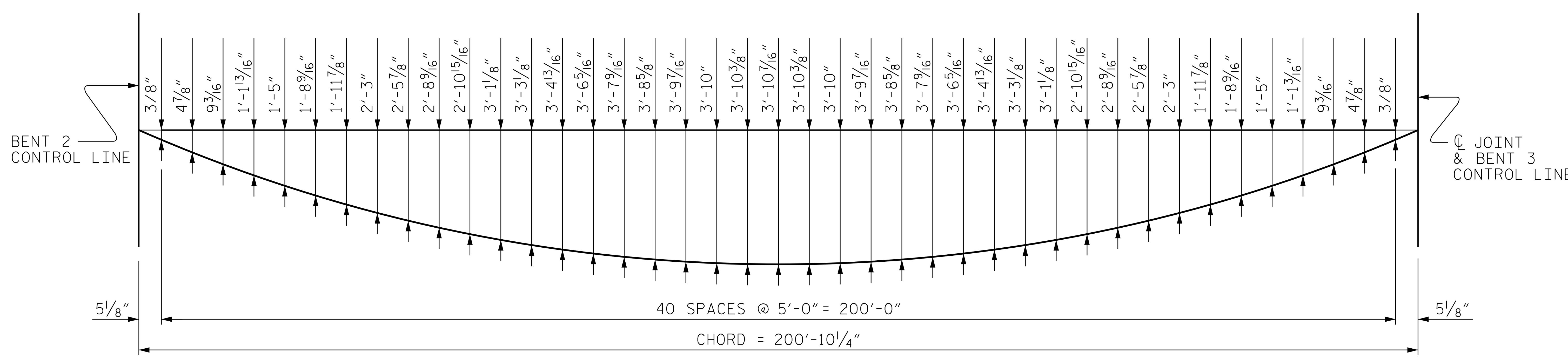
REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-20
TOTAL SHEETS 92



PLAN OF SPAN C



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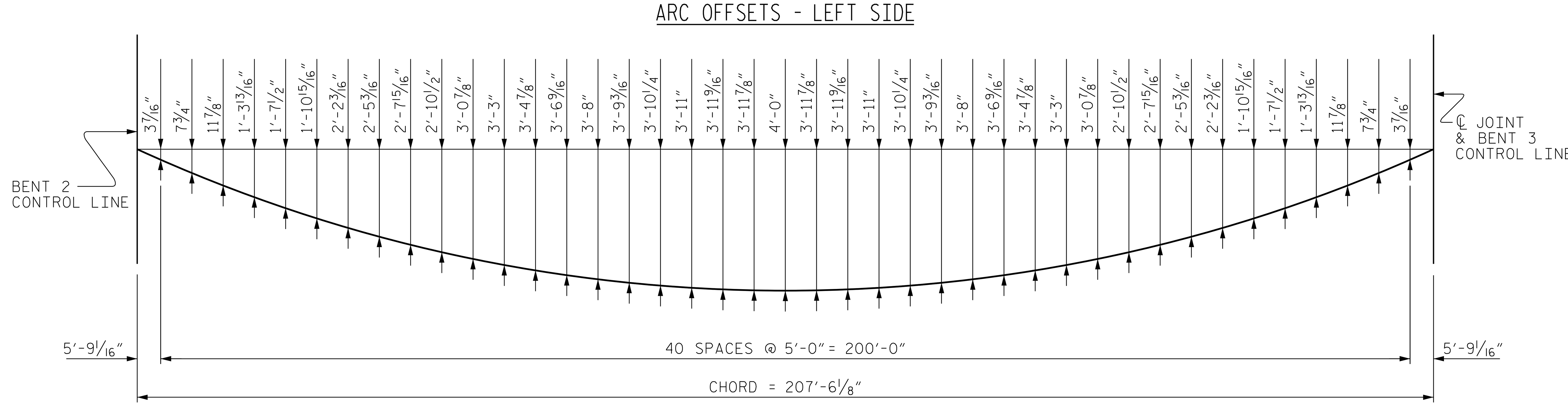

ARC OFFSETS - RIGHT SIDE

NOTE:

FOR REINFORCEMENT IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS.

#5 "A" BARS ARE TO BE PLACED RADIALLY ALONG RIGHT OUTSIDE EDGE OF SUPERSTRUCTURE.

FOR DECK POURING SEQUENCE, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

† DISTANCE NORMAL TO JOINT.

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PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-

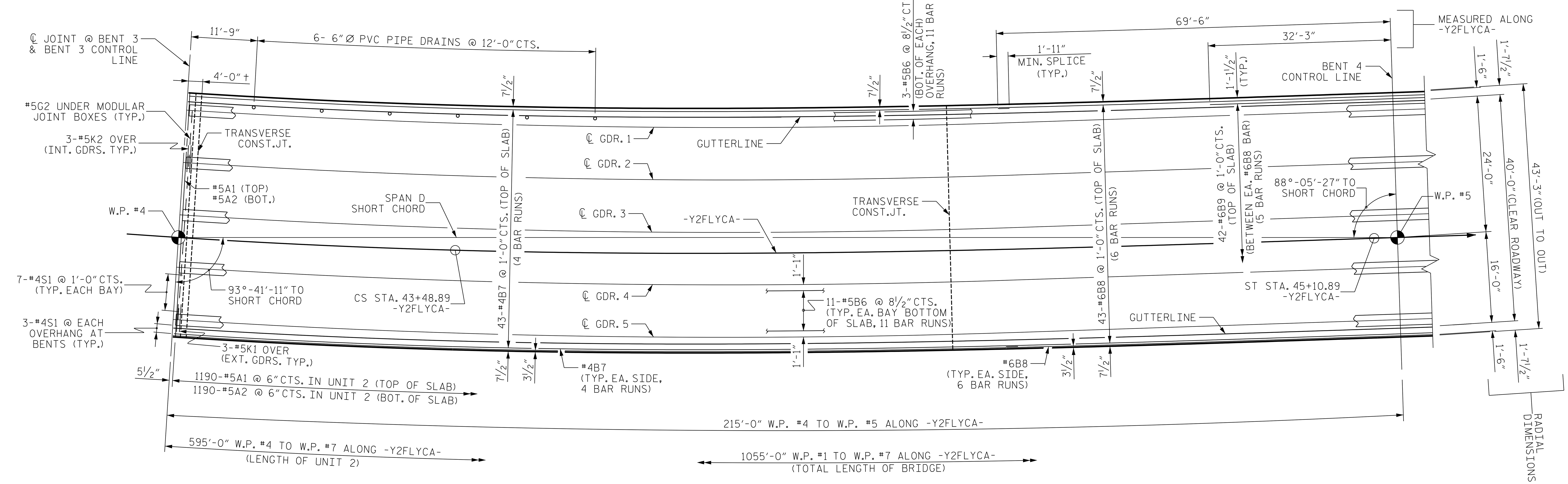
SHEET 3 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

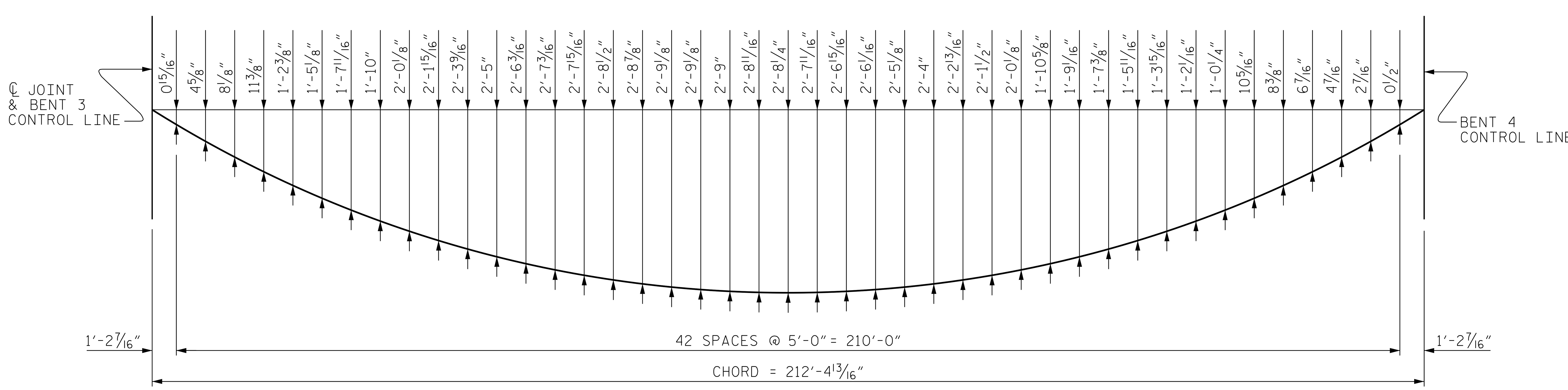
SUPERSTRUCTURE
PLAN OF SPANS
SPAN C

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			S1-21
1			3					TOTAL SHEETS
2			4					92

DWN. BY: NCW DATE: 03/2022
CHKD. BY: PRG DATE: 03/2022
DES. EGR. OF RECORD: PRG DATE: 03/2022



PLAN OF SPAN D



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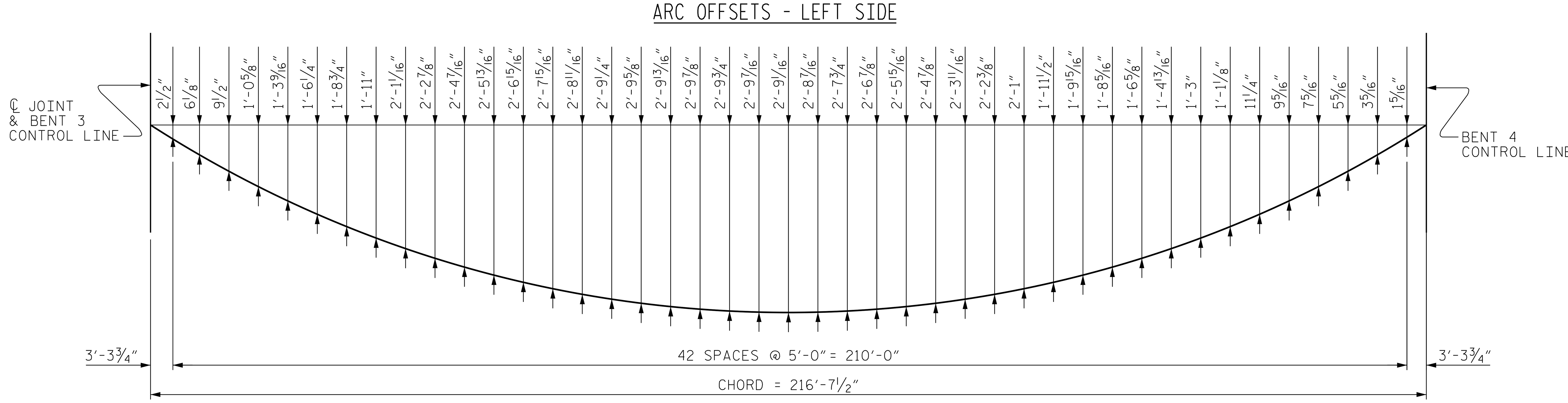

ARC OFFSETS - RIGHT SIDE

NOTE:

FOR REINFORCEMENT IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS.

#5 "A" BARS ARE TO BE PLACED RADIALLY ALONG RIGHT OUTSIDE EDGE OF SUPERSTRUCTURE.

FOR DECK POURING SEQUENCE, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

† DISTANCE NORMAL TO JOINT.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL — HARDY L. WILLIS
DocuSigned by: Hardy Willis
7/26/2022

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FORSYTH COUNTY

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SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPANS
SPAN D

DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: PRG	DATE: 03/2022

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-22
1			3			TOTAL SHEETS
2			4			92

wdrutcher
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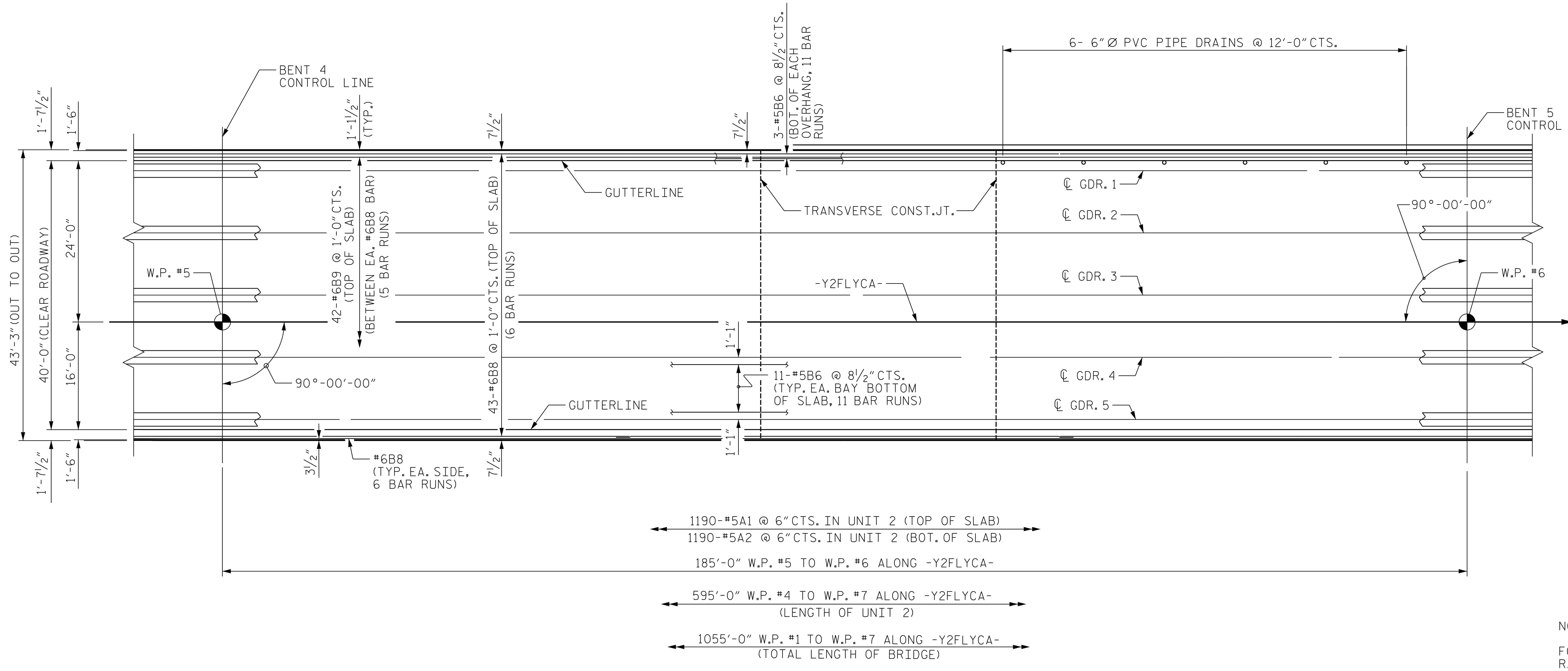
TIME: 10:02 AM on Tuesday, July 26, 2022



PLAN OF SPAN E

NOTE:

FOR REINFORCING STEEL IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS.

FOR DECK POURING SEQUENCE, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

DocuSigned by: Hardy Willis
7/26/2022

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Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Atlanta, GA 770-627-3590
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488

PROJECT NO. U-2579AA
FORSYTH COUNTY
STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

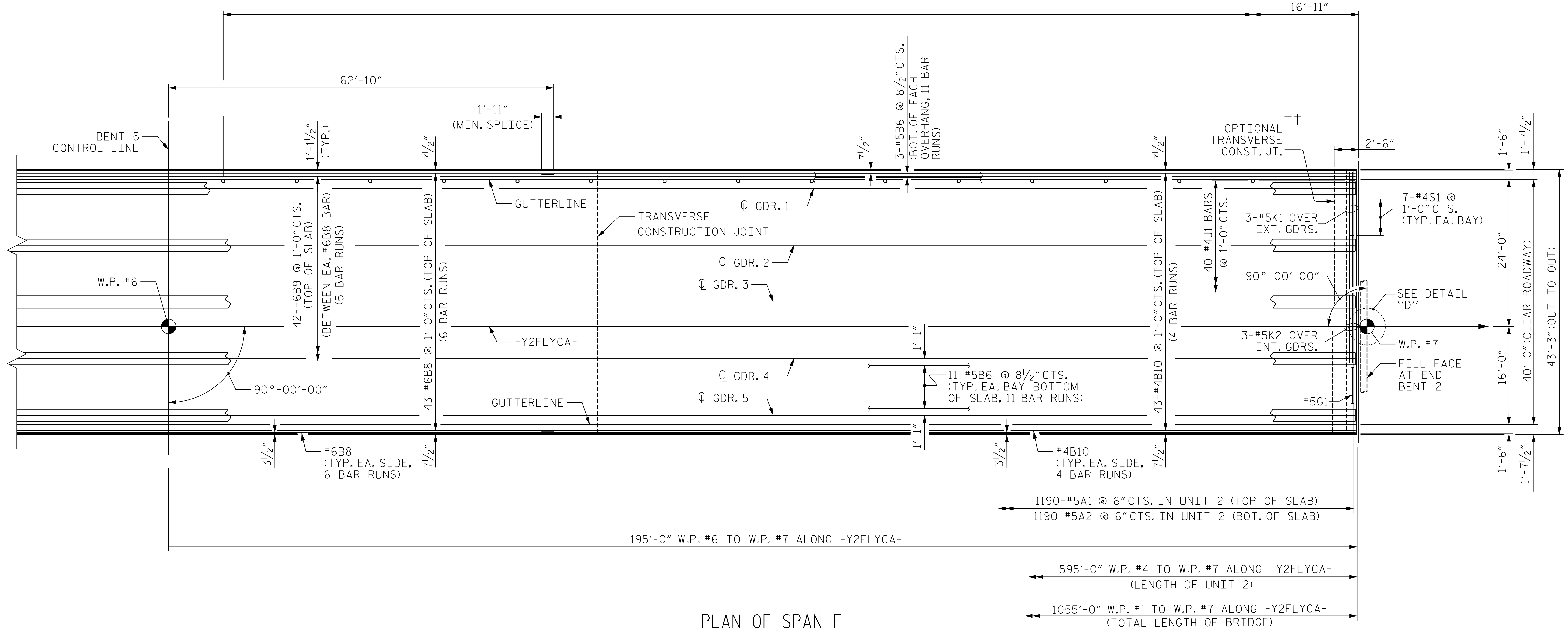
SUPERSTRUCTURE
PLAN OF SPANS
SPAN E

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			S1-23
1			3					TOTAL SHEETS
2			4					92

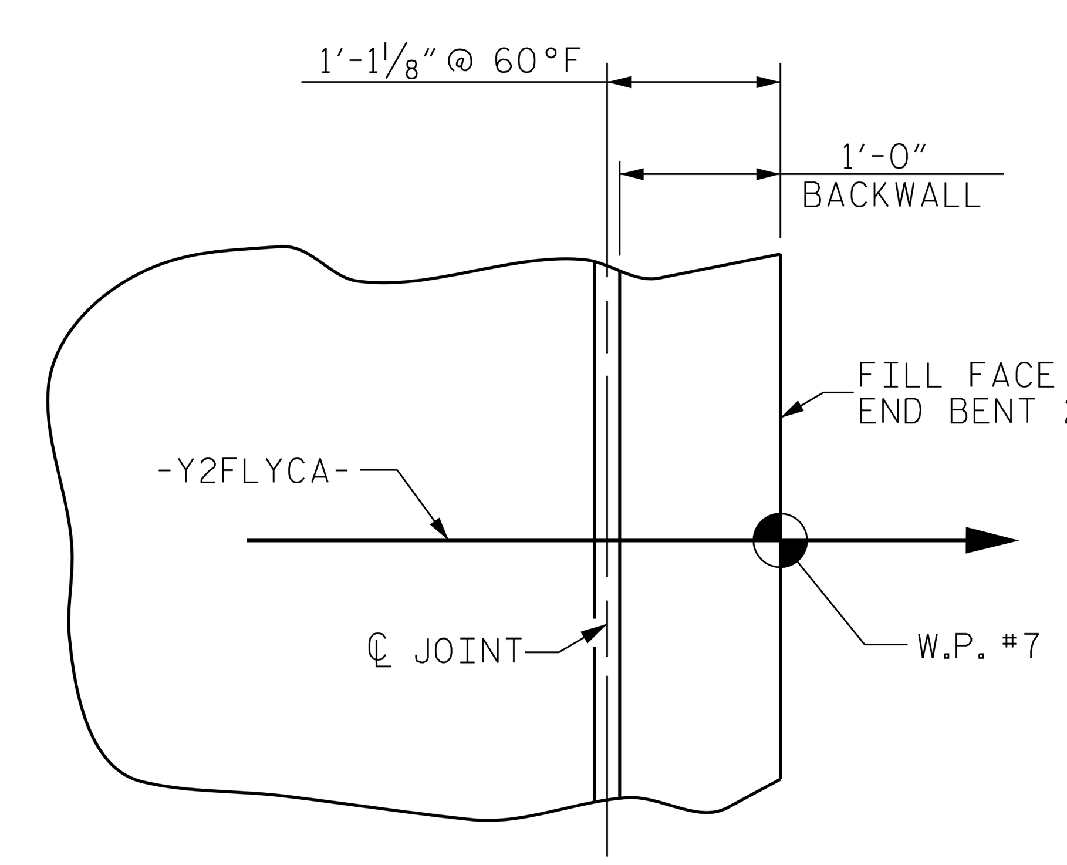
DWN. BY: NCW DATE: 03/2022
CHKD. BY: PRG DATE: 03/2022
DES. EGR. OF RECORD: PRG DATE: 03/2022

wdcrutcher
DGN: V:\NC\Structures\031748-44 U-2579AA STRS\Structures\SITE 1 - FLYCA North\Plans\FINAL PLANS\401_045_U2579AA_SMU_PS05_023.dgn
TIME: 10:02 AM on Tuesday, July 26, 2022

†† IF THE CONTRACTOR CHOOSES TO REVERSE THE DIRECTION OF POUR 1, A CONSTRUCTION JOINT WILL BE REQUIRED 4'-0" FROM THE JOINT SEAL.



PLAN OF SPAN F



DETAIL D

NOTE:

FOR REINFORCING IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS.

FOR DECK POURING SEQUENCE, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

DocuSigned by: Hardy Willis
SEAL
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PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-

SHEET 6 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPANS
SPAN F

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

REVISIONS

DWN. BY: NCW DATE: 03/2022
CHKD. BY: PRG DATE: 03/2022
DES. EGR. OF RECORD: PRG DATE: 03/2022

SHEET NO. S1-24
TOTAL SHEETS 92

wdtoruhe
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TIME: 10:02 AM on Tuesday, July 26, 2022

FRAMING PLAN - UNIT 1

✳ = LENGTH ALONG -Y2FLYCA-

† = RADIAL DIMENSION

† = MEASURED PERPENDICULAR TO BENT CONTROL LINE OR END BENT FILL FACE

[X] = FIELD SPLICE TYPE

NOTE: ALL DIMENSIONS HORIZONTAL.

ANGLES TO SHORT CHORD

1. 92°48'01"
2. 87°11'59"
3. 92°41'33"
4. 87°18'27"
5. 94°24'56"
6. 85°35'04"

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PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

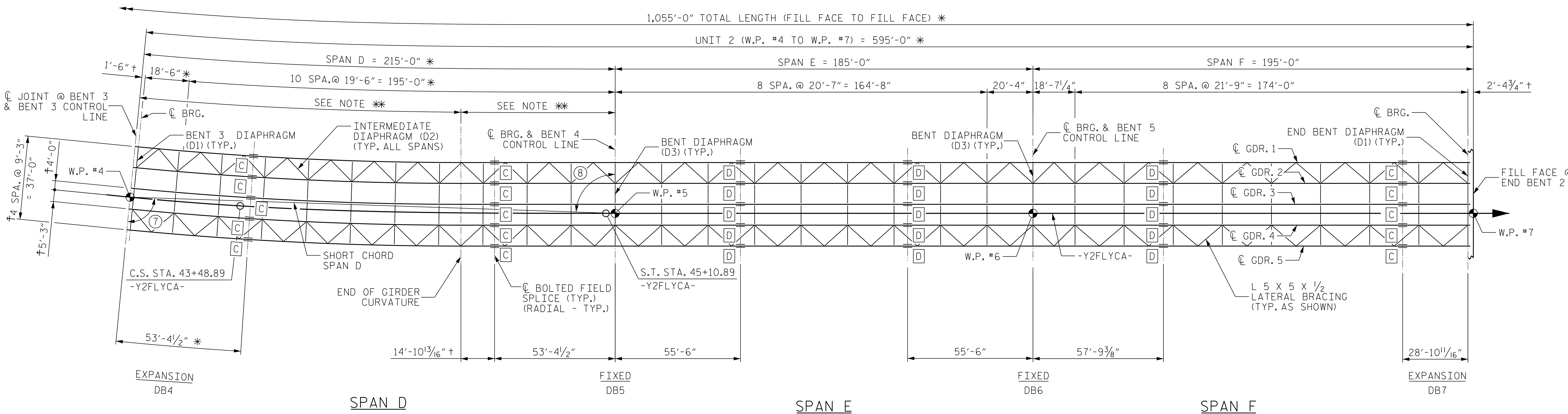
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE FRAMING PLAN UNIT 1

REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	S1-25
1			3			TOTAL SHEETS	92
2			4				

DWN. BY: AW — DATE: 11/2021
CHKD. BY: PRG — DATE: 03/2022
DES. EGR. OF RECORD: PRG — DATE: 03/2022



FRAMING PLAN- UNIT 2

✱ = LENGTH ALONG -Y2FLYCA-

† = RADIAL DIMENSION (TYP.), VARIABLE BETWEEN STATIONS 43+48.89 AND 45+10.89

† = MEASURED PERPENDICULAR TO BENT CONTROL LINE OR END BENT FILL FACE

[X] = FIELD SPLICE TYPE

NOTE: ALL DIMENSIONS HORIZONTAL.

ANGLES TO SHORT CHORD

(7) 93°41'11"

(8) 88°05'27"

✱✱ NOTE:

SPAN D CONTAINS A PARTIALLY SPIRAL ALIGNMENT. HOWEVER, THE GIRDERS ARE SET ON SIMPLE CONCENTRIC CIRCLES BETWEEN BENT 3 AND A POINT 68'-3 5/16" BEFORE THE BENT 4 CONTROL LINE. THE GIRDERS ARE TANGENT FROM THAT POINT TO THE END OF THE BRIDGE. A PERMITTED FLANGE AND WEB SHOP SPLICE MAY BE PERMITTED AT THIS POINT.

DocuSigned by: Hardy Willis
7/26/2022

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PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE FRAMING PLAN UNIT 2

Vaughn & Melton Consulting Engineers, Asheville, North Carolina

DWN. BY: NCW	DATE: 11/2021
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: PRG	DATE: 03/2022

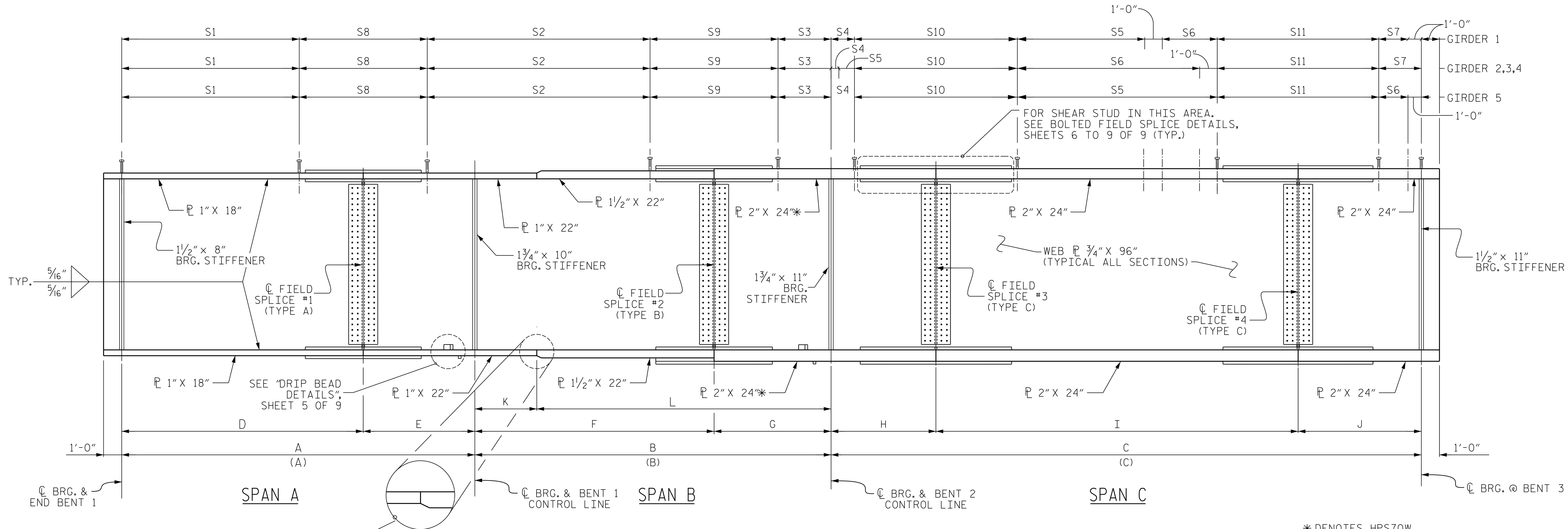
REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-26

TOTAL SHEETS 92

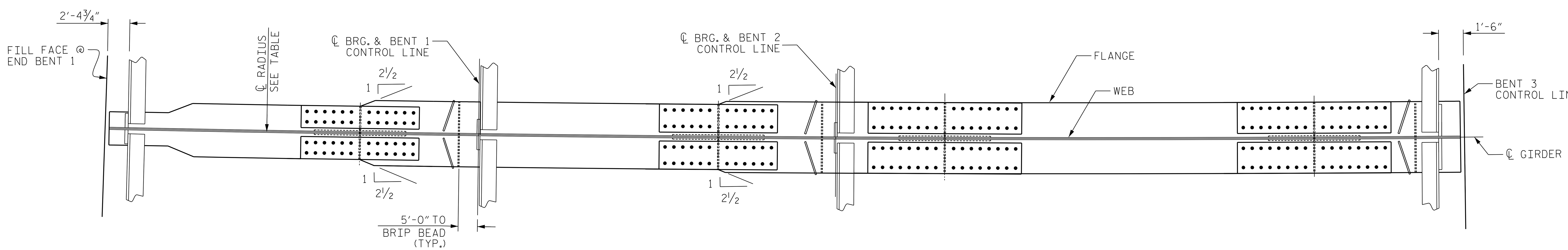
TIME: 10:02 AM on Tuesday, July 26, 2022



UNIT 1 ELEVATION OF GIRDER

( ) DENOTES SLOPE DIMENSION.

✱ DENOTES HPS70W STEEL REQUIRED

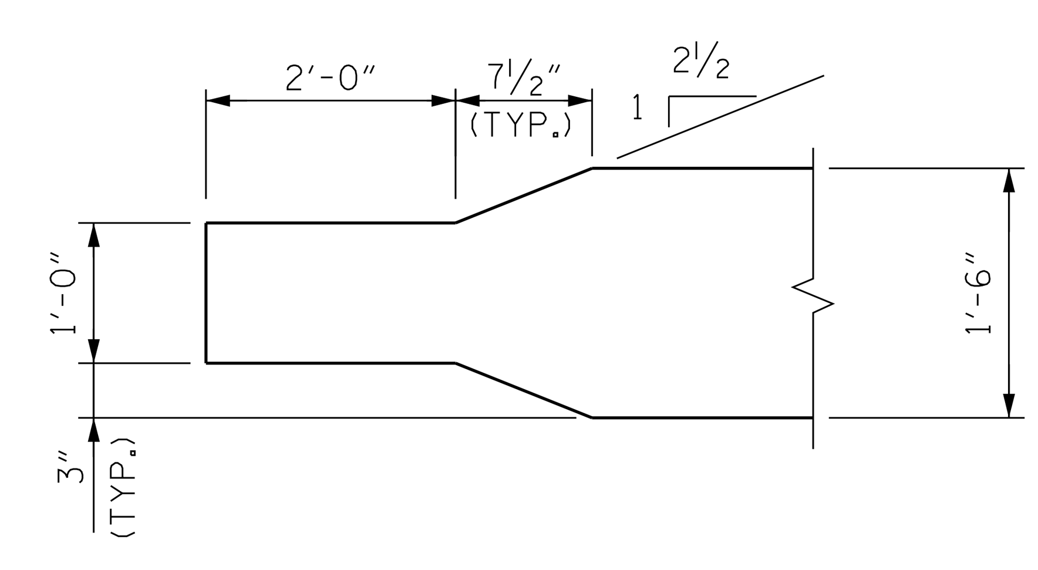


UNIT 1 PLAN OF BOTTOM FLANGE

OMIT CONNECTOR PLATE ON OUTSIDE OF EXTERIOR GIRDERS, INTERMEDATE CROSSFRAMES NOT SHOWN

NOTES:

1. SEE SHEETS 6 TO 9 OF 9 FOR BOLTED FIELD SPLICE DETAILS
2. LETTERED DIMENSIONS ARE MEASURED ALONG GIRDER CENTERLINES. SEE SHEET 2 OF 9 FOR TABLES.



END OF GIRDER DETAIL

BOTTOM FLANGE ONLY END BENT 1

7/26/2022

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PROJECT NO. U-2579AA

FORSYTH COUNTY

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SHEET 1 OF 9

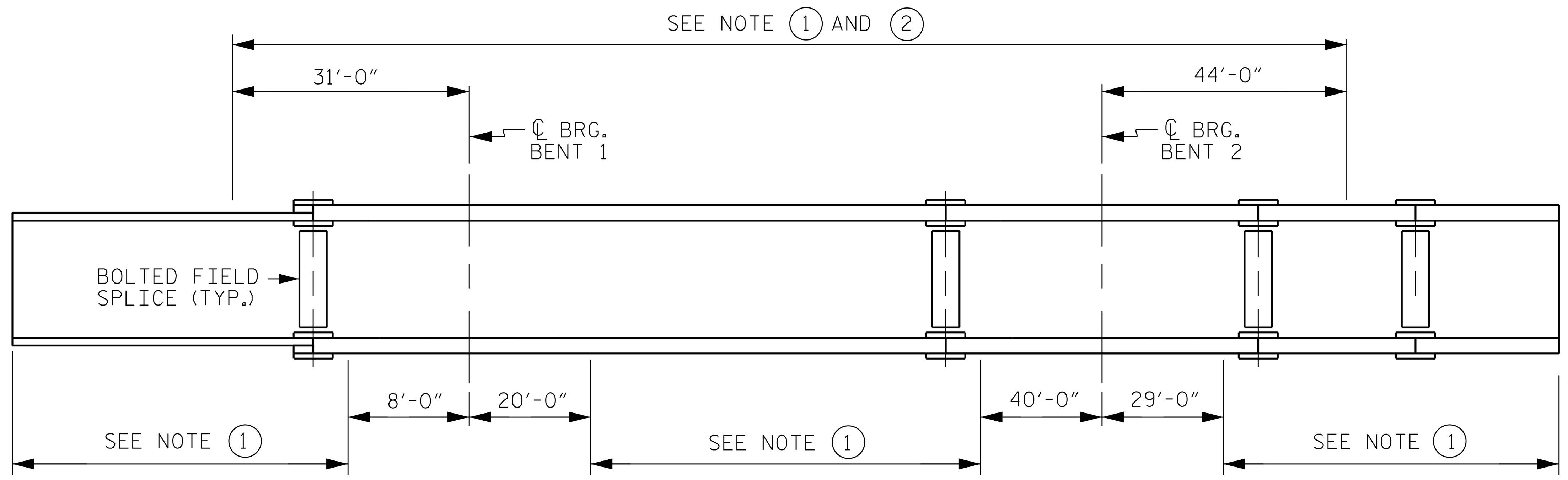
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
STRUCTURAL STEEL DETAILS
UNIT 1

DWN. BY: AW	DATE: 11/2021
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: PRG	DATE: 03/2022

REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:		
1			3				
2			4				

SHEET NO. S1-27
TOTAL SHEETS 92



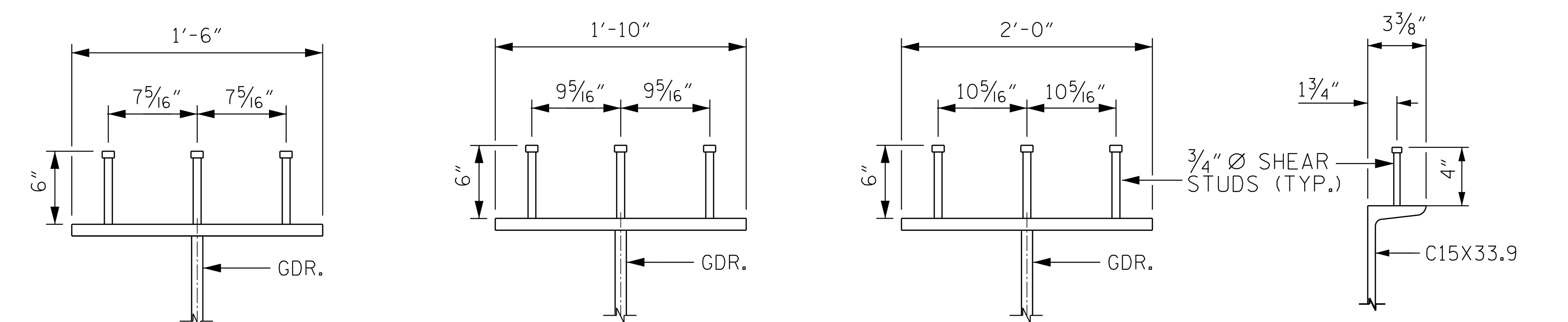
GIRDER MAKE UP

NOTE (1): CHARPY V-NOTCH TESTS ARE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALL WITHIN THESE LIMITS, ALL WEB PLATES, AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.

NOTE (2): NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.

CHARPY V-NOTCH TESTS FOR CONTINUOUS PLATE GIRDERS

UNIT 1



STUDS ON GIRDERS 18" WIDE FLANGE

STUDS ON GIRDERS 22" WIDE FLANGE

STUDS ON GIRDERS 24" WIDE FLANGE

STUDS ON END BENT DIAPHRAGMS

SHEAR STUD DETAILS

SHEAR STUDS ARE TO BE SHOP WELDED ON TOP OF GIRDER PLATE BEFORE FIELD ASSEMBLY

UNIT 1 GIRDER DIMENSIONS

GIRDER	℄ RADIUS	A	(A)	B	(B)	C	(C)	D	E	F	G	H	I	J	K	L
1	1307'-6"	125'-4 13/16"	125'-5 5/16"	122'-10 5/8"	122'-11 1/8"	200'-0 3/8"	200'-1 3/16"	96'-6 11/16"	28'-10 1/8"	92'-2"	30'-8 5/8"	30'-0 1/16"	120'-0 1/4"	50'-0 1/8"	30'-8 5/8"	92'-2"
2	1316'-9"	126'-3 11/16"	126'-4 3/16"	123'-9 1/16"	123'-9 9/16"	201'-5 1/2"	201'-6 5/16"	97'-3 1/16"	29'-0 5/8"	92'-9 13/16"	30'-11 1/4"	30'-2 5/8"	120'-10 1/2"	50'-4 3/8"	30'-11 1/4"	92'-9 13/16"
3	1326'-0"	127'-2 1/2"	127'-3"	124'-7 1/2"	124'-8"	202'-10 5/8"	202'-11 3/8"	97'-11 7/16"	29'-3 1/8"	93'-5 5/8"	31'-1 7/8"	30'-5 1/4"	121'-8 3/4"	50'-8 5/8"	31'-1 7/8"	93'-5 5/8"
4	1335'-3"	128'-1 3/8"	128'-1 7/8"	125'-5 15/16"	125'-6 7/16"	204'-3 11/16"	204'-4 1/2"	98'-7 3/4"	29'-5 5/8"	94'-1 7/16"	31'-4 1/2"	30'-7 3/4"	122'-7"	51'-0 15/16"	31'-4 1/2"	94'-1 7/16"
5	1344'-6"	129'-0 3/16"	129'-0 11/16"	126'-4 3/8"	126'-4 7/8"	205'-8 13/16"	205'-9 9/16"	99'-4 1/8"	29'-8 1/16"	94'-9 1/4"	31'-7 1/8"	30'-10 5/16"	123'-5 5/16"	51'-5 3/16"	31'-7 1/8"	94'-9 1/4"

( ) DENOTES SLOPE DIMENSIONS.

UNIT 1 SHEAR STUD SPACING

GIRDER	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11
1	94 SPA. @ 1'-0"	116 SPA. @ 1'-0"	39' SPA. @ 1'-0"	10 SPA. @ 1'-8"	59 SPA. @ 1'-8"	8 SPA. @ 2'-0"	23 SPA. @ 2'-0"	5'-0"	5'-0"	5'-0"	5'-3 7/8"
2	95 SPA. @ 1'-0"	117 SPA. @ 1'-0"	40' SPA. @ 1'-0"	6 3/16"	8 SPA. @ 2'-0"	57 SPA. @ 2'-0"	24 SPA. @ 2'-0"	5'-0"	4'-0"	6'-0"	5'-0"
3	96 SPA. @ 1'-0"	118 SPA. @ 1'-0"	40' SPA. @ 1'-0"	8 11/16"	8 SPA. @ 2'-0"	58 SPA. @ 2'-0"	24 SPA. @ 2'-0"	4'-0"	5'-0"	5'-0"	5'-0"
4	96 SPA. @ 1'-0"	119 SPA. @ 1'-0"	41 SPA. @ 1'-0"	11"	8 SPA. @ 2'-0"	58 SPA. @ 2'-0"	24 SPA. @ 2'-0"	5'-0"	4'-0"	5'-0"	6'-0"
5	97 SPA. @ 1'-0"	120 SPA. @ 1'-0"	41 SPA. @ 1'-0"	10 SPA. @ 1'-8"	59' SPA. @ 2'-0"	24 SPA. @ 2'-0"	-	4'-9"	4'-3"	5'-0"	5'-4 1/16"

7/26/2022

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PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 2 OF 9

Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Raleigh, NC 99-977-9455 · Charlotte, NC 704-357-0488 · Boone, NC 828-355-9933 · Tri-Cities, TN 423-467-8401 · Knoxville, TN 865-546-5800 · Spartanburg, SC 864-574-4775 · Charleston, SC 843-974-5650 · Middlesboro, KY 606-248-6600 · Atlanta, GA 770-627-3590

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS UNIT 1

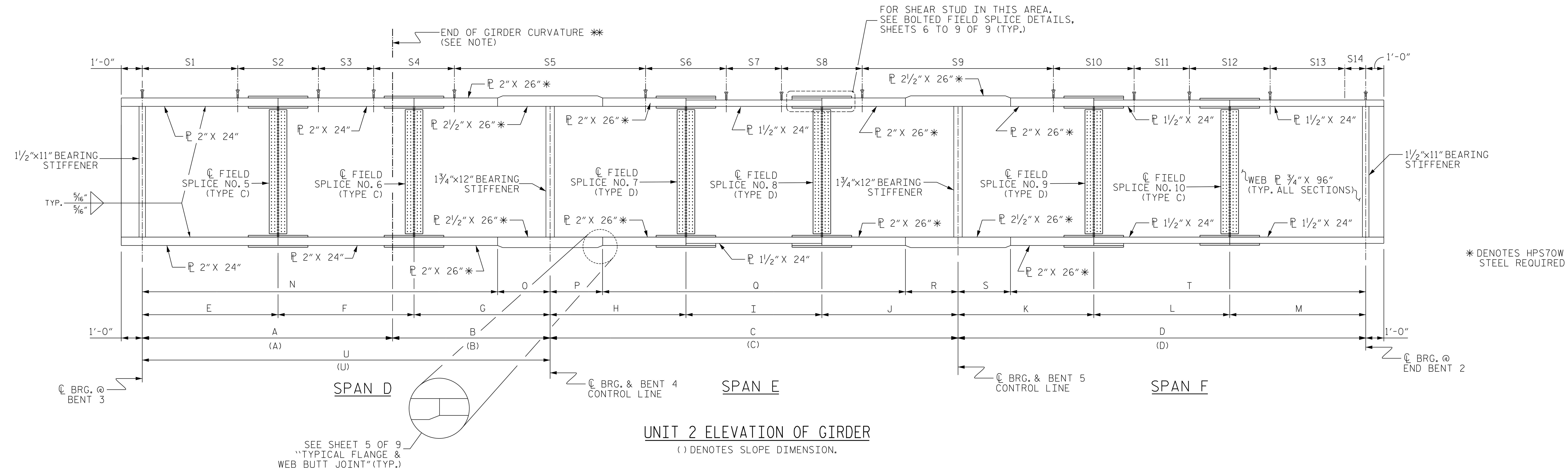
DWN. BY: AW	DATE: 11/2021
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: PRG	DATE: 03/2022

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

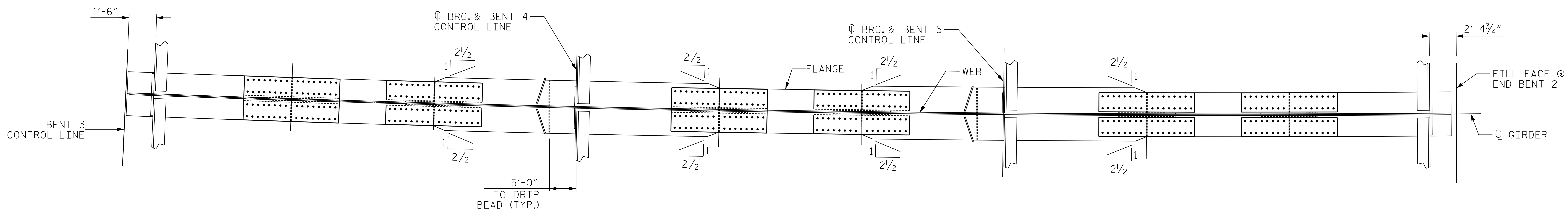
SHEET NO. S1-28

TOTAL SHEETS 92



UNIT 2 ELEVATION OF GIRDER

( ) DENOTES SLOPE DIMENSION.



UNIT 2 PLAN OF BOTTOM FLANGE

OMIT CONNECTOR PLATES ON OUTSIDE OF EXTERIOR GIRDERS
INTERMEDIATE CROSSFRAMES NOT SHOWN

NOTES:

1. SEE SHEETS 6 TO 9 OF 9 FOR BOLTED FIELD SPLICE DETAILS
2. LETTERED DIMENSIONS ARE MEASURED ALONG GIRDER CENTERLINES.

**** NOTE:**

SPAN D CONTAINS A PARTIALLY SPIRAL ALIGNMENT. HOWEVER, THE GIRDERS ARE SET ON SIMPLE CONCENTRIC CIRCLES BETWEEN BENT 3 AND A POINT 68'-3 5/16" BEFORE THE BENT 4 CONTROL LINE. THE GIRDERS ARE TANGENT FROM THAT POINT TO THE END OF THE BRIDGE.

7/26/2022

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PROJECT NO. U-2579AA
FORSYTH COUNTY
STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-
SHEET 3 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
STRUCTURAL STEEL DETAILS UNIT 2

DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: PRG	DATE: 03/2022

REVISIONS							
NO.	BY:	DATE:		NO.	BY:	DATE:	
1				3			
2				4			

SHEET NO. S1-29
TOTAL SHEETS 92

UNIT 2 GIRDER DIMENSIONS

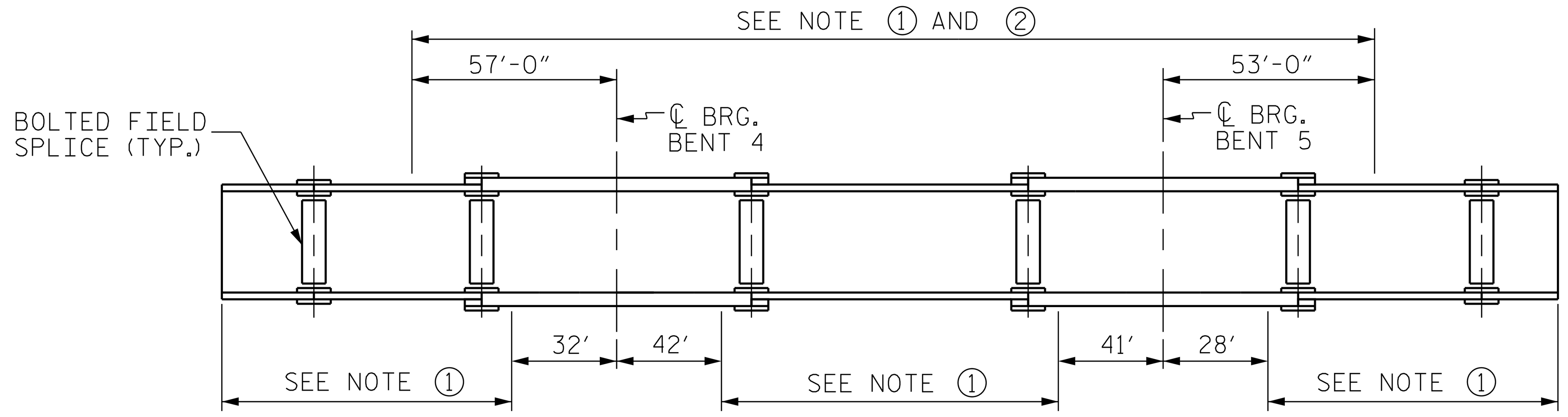
GIRDER	℄ RADIUS	A	(A)	B	(B)	C	(C)	D	(D)	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	(U)
1	1480'-0"	143'-0 1/2"	143'-1 1/8"	68'-3 5/16"	68'-3 7/8"	185'-0"	185'-0 11/16"	192'-7 1/4"	192'-7 15/16"	52'-9 15/16"	105'-7 15/16"	52'-9 15/16"	55'-6"	74'-0"	55'-6"	57'-9 3/8"	105'-11 3/16"	28'-10 11/16"	190'-2 1/4"	21'-1 9/16"	18'-6"	148'-0"	18'-6"	19'-3 1/8"	173'-4 1/16"	211'-3 13/16"	211'-5"
2	1489'-3"	143'-11 3/8"	144'-0 1/16"	68'-3 5/16"	68'-4"	185'-0"	185'-0 11/16"	192'-7 1/4"	192'-7 15/16"	53'-0 11/16"	106'-1 5/16"	53'-0 11/16"	55'-6"	74'-0"	55'-6"	57'-9 3/8"	105'-11 3/16"	28'-10 11/16"	191'-0"	21'-2 11/16"	18'-6"	148'-0"	18'-6"	19'-3 1/8"	173'-4 1/16"	212'-2 11/16"	212'-4 1/16"
3	1498'-6"	144'-10 3/16"	144'-11"	68'-3 5/16"	68'-4 1/16"	185'-0"	185'-0 11/16"	192'-7 1/4"	192'-7 15/16"	53'-3 3/8"	106'-6 3/4"	53'-3 3/8"	55'-6"	74'-0"	55'-6"	57'-9 3/8"	105'-11 3/16"	28'-10 11/16"	191'-9 3/4"	21'-3 3/4"	18'-6"	148'-0"	18'-6"	19'-3 1/8"	173'-4 1/16"	213'-1 1/2"	213'-3 1/16"
4	1507'-9"	145'-9 1/16"	145'-9 15/16"	68'-3 5/16"	68'-4 3/16"	185'-0"	185'-0 11/16"	192'-7 1/4"	192'-7 15/16"	53'-6 1/16"	107'-0 1/4"	53'-6 1/16"	55'-6"	74'-0"	55'-6"	57'-9 3/8"	105'-11 3/16"	28'-10 11/16"	192'-7 1/2"	21'-4 7/8"	18'-6"	148'-0"	18'-6"	19'-3 1/8"	173'-4 1/16"	214'-0 3/8"	214'-2 1/8"
5	1517'-0"	146'-7 7/8"	146'-8 7/8"	68'-3 5/16"	68'-4 5/16"	185'-0"	185'-0 11/16"	192'-7 1/4"	192'-7 15/16"	53'-8 13/16"	107'-5 9/16"	53'-8 13/16"	55'-6"	74'-0"	55'-6"	57'-9 3/8"	105'-11 3/16"	28'-10 11/16"	193'-5 1/4"	21'-5 15/16"	18'-6"	148'-0"	18'-6"	19'-3 1/8"	173'-4 1/16"	214'-11 3/16"	215'-1 3/16"

( ) DENOTES SLOPE DIMENSION.

( ) DENOTES SLOPE DIMENSION.

UNIT 2 SHEAR STUD SPACING

GIRDER	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14
1	25 SPA. @ 2'-0"	6'-0"	60 SPA. @ 1'-8"	5'-0"	77 SPA. @ 1'-4"	6'-0"	51 SPA. @ 1'-4"	6'-0"	81 SPA. @ 1'-4"	5'-0"	60 SPA. @ 1'-8"	5'-8"	13 SPA. @ 2'-0"	7"
2	38 SPA. @ 1'-4"	5'-6"	75 SPA. @ 1'-4"	5'-6"	62 SPA. @ 1'-8"	5'-0"	41 SPA. @ 1'-8"	5'-9"	65 SPA. @ 1'-8"	5'-6"	60 SPA. @ 1'-8"	5'-6"	15 SPA. @ 1'-8"	1'-4 7/8"
3	38 SPA. @ 1'-4"	5'-6"	76 SPA. @ 1'-4"	5'-0"	77 SPA. @ 1'-4"	6'-0"	41 SPA. @ 1'-8"	5'-6"	81 SPA. @ 1'-4"	5'-9"	60 SPA. @ 1'-8"	5'-6"	15 SPA. @ 1'-8"	1'-5 11/16"
4	38 SPA. @ 1'-4"	5'-6"	76 SPA. @ 1'-4"	5'-6"	62 SPA. @ 1'-8"	6'-0"	41 SPA. @ 1'-8"	5'-6"	65 SPA. @ 1'-8"	5'-6"	60 SPA. @ 1'-8"	5'-6"	15 SPA. @ 1'-8"	1'-1 9/16"
5	25 SPA. @ 2'-0"	6'-0"	51 SPA. @ 2'-0"	6'-0"	62 SPA. @ 1'-8"	5'-6"	34 SPA. @ 2'-0"	6'-0"	54 SPA. @ 2'-0"	5'-6"	60 SPA. @ 1'-8"	5'-8"	13 SPA. @ 2'-0"	6 3/8"



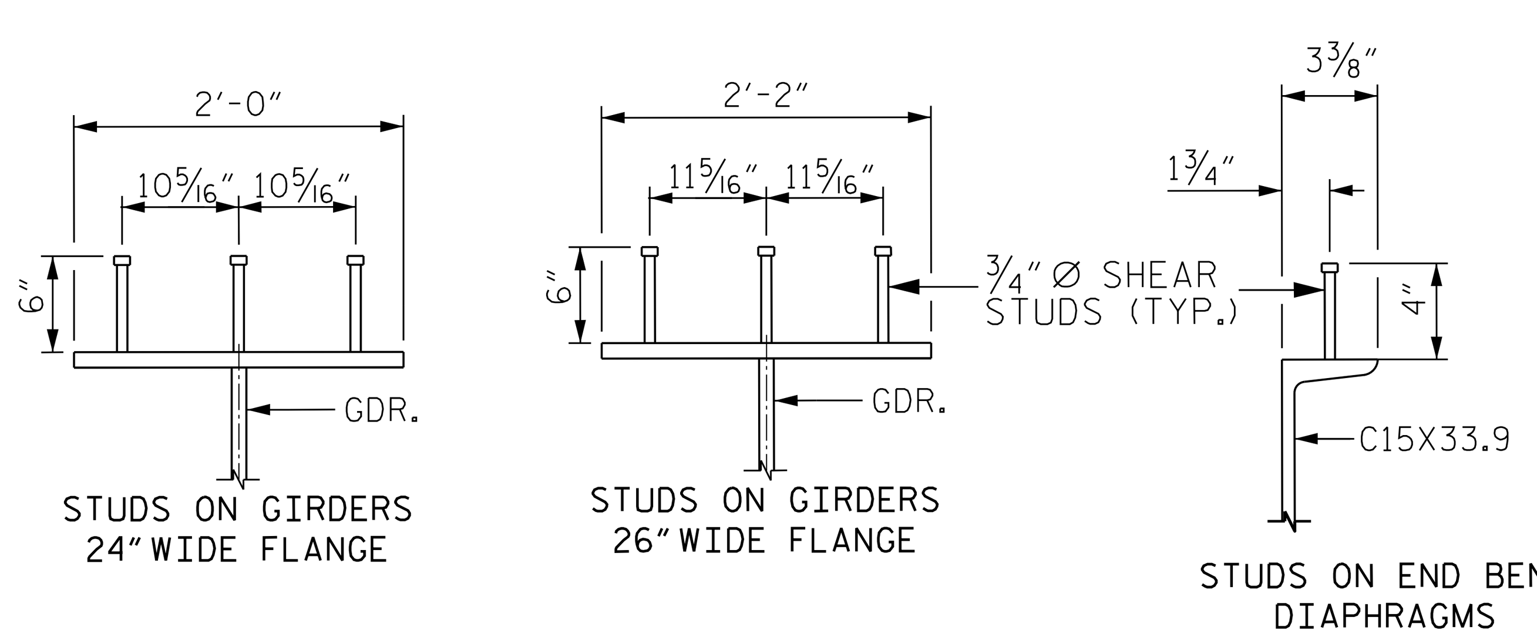
GIRDER MAKE UP

NOTE ①: CHARPY V-NOTCH TESTS ARE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALL WITHIN THESE LIMITS, ALL WEB PLATES, AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.

NOTE ②: NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.

CHARPY V-NOTCH TESTS FOR CONTINUOUS PLATE GIRDERS

UNIT 2



SHEAR STUD DETAILS

SHEAR STUDS ARE TO BE SHOP WELDED ON TOP OF GIRDER PLATE BEFORE FIELD ASSEMBLY

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL — HARDY L. WILLIS — DocuSigned by: Hardy Willis

7/26/2022

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PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 4 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
STRUCTURAL STEEL DETAILS
UNIT 2

DWN. BY: AW	DATE: 11/2021
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: PRG	DATE: 03/2022

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-30

TOTAL SHEETS 92

wdbrutcher
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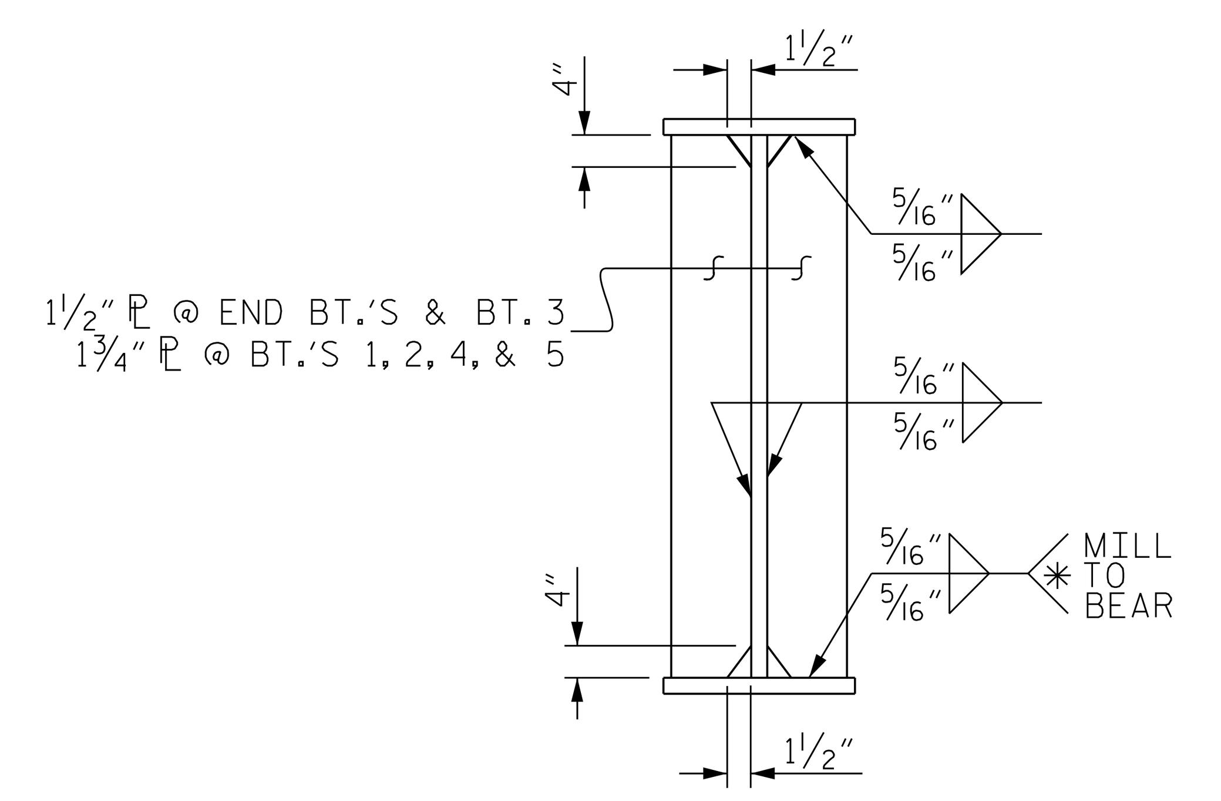
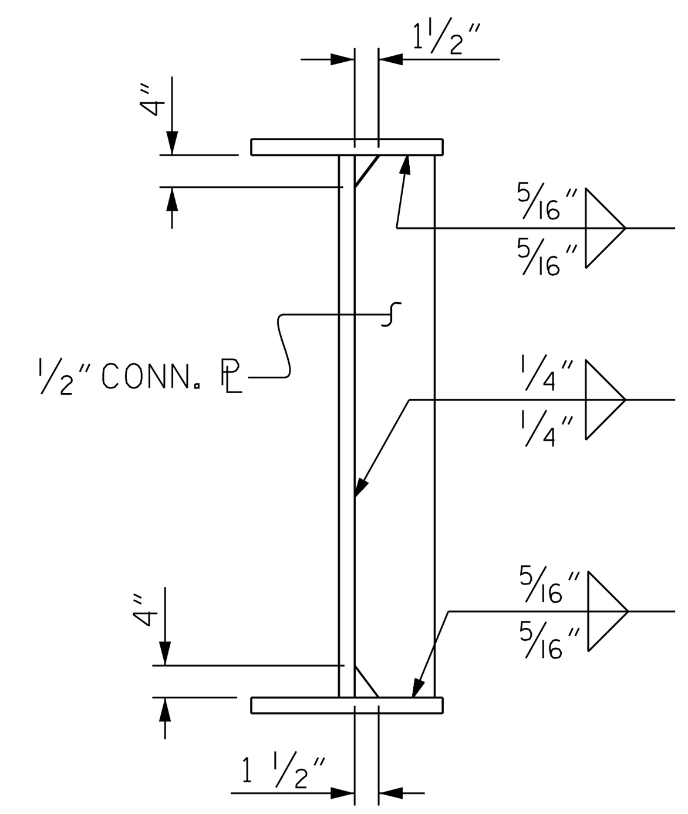
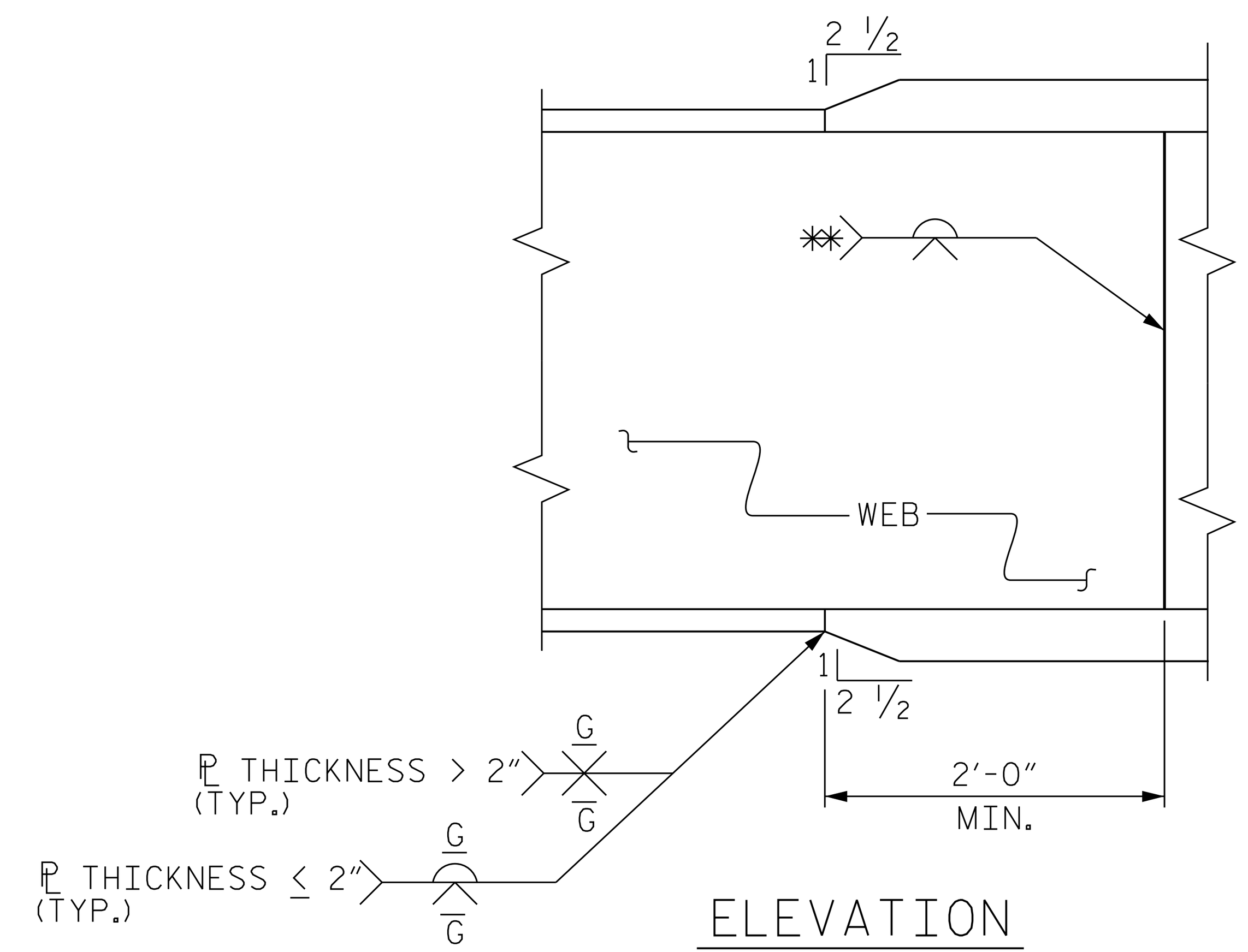


BEARING STIFFENER

✱ WELD TO BOTTOM FLANGE IS ONLY REQUIRED WHEN BEARING STIFFENER IS ALSO CONNECTOR PLATE



CONNECTOR PLATE



ELEVATION

TYPICAL FLANGE & WEB BUTT JOINT

✱✱ GRIND SMOOTH AND FLUSH ON OUTER FACE OF EXTERIOR GIRDERS

NOTES

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W, EXCEPT AS NOTED, AND PAINTED IN ACCORDANCE WITH SYSTEM 5 OR SYSTEM 6 OF ARTICLE 552-8 OF THE OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.

ALL FIELD CONNECTIONS TO BE ⅞" DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.

A CHARPY V-NOTCH TEST IS REQUIRED FOR WEB PLATES, BOTTOM FLANGE PLATES, BOTTOM FLANGE SPLICE PLATES, AND WEB SPLICE PLATES FOR ALL GIRDERS AND IN ACCORDANCE WITH ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.

PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION. KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE AND WEB OR FLANGE SHOP SPLICES.

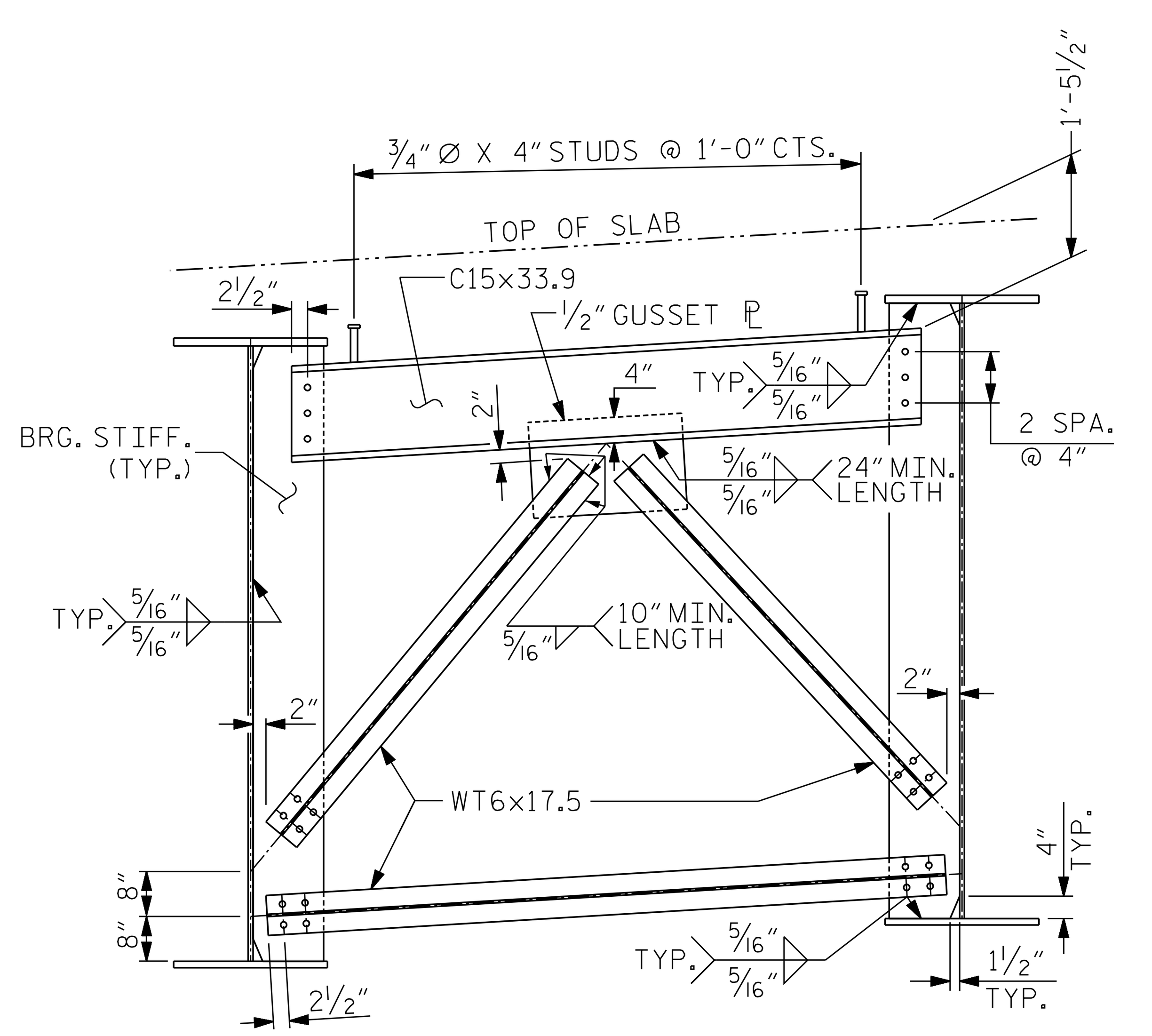
STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.

TENSION ON THE ASTM A325 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

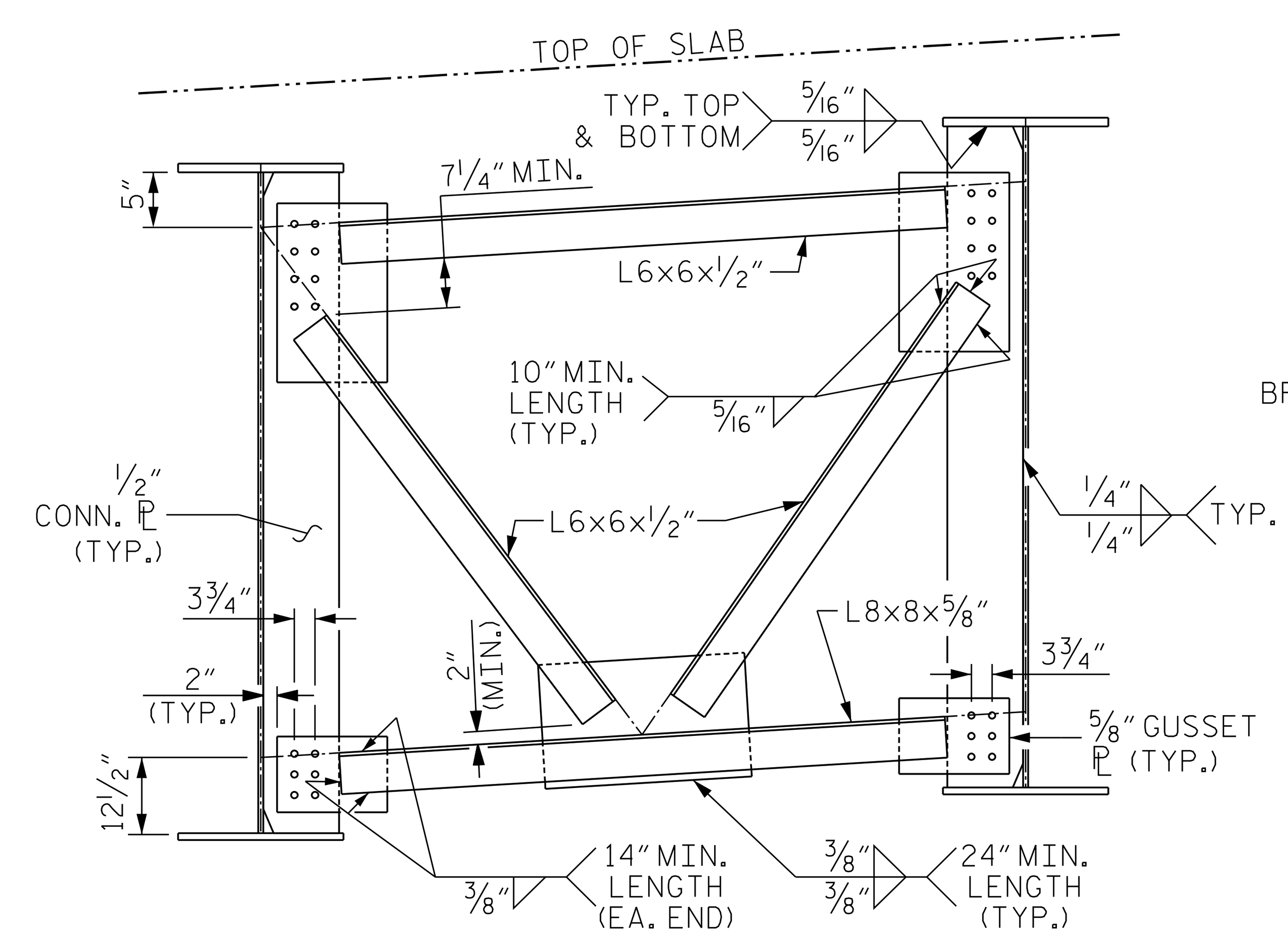
END OF GIRDERS SHALL BE PLUMB.

BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE.

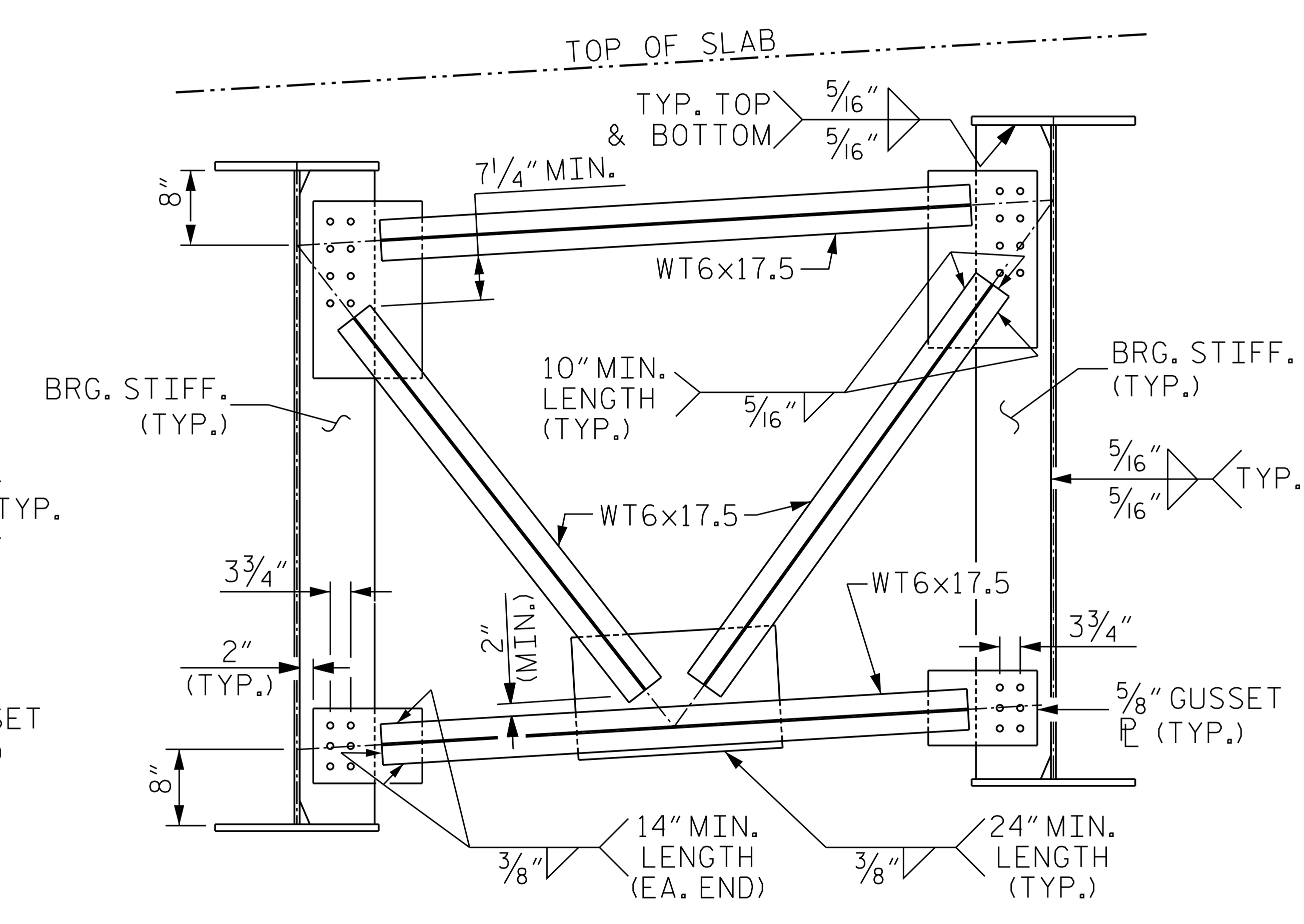
FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR NO LOAD FIT UP.



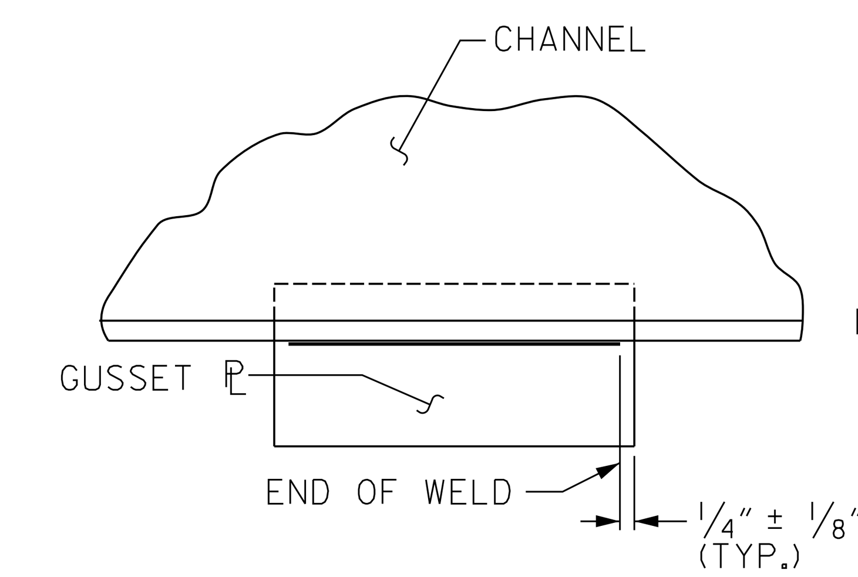
END BENTS & BENT 3 DIAPHRAGMS
(D1)



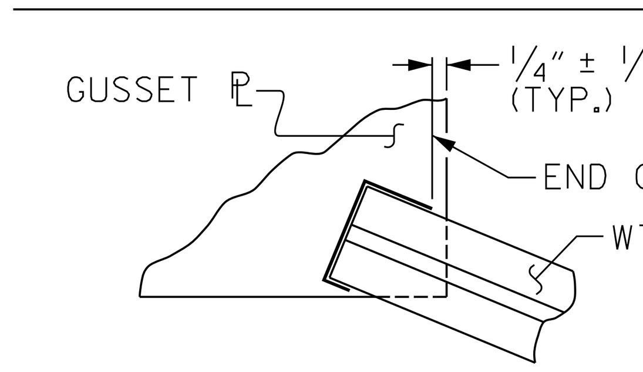
INTERMEDIATE DIAPHRAGMS
(D2)



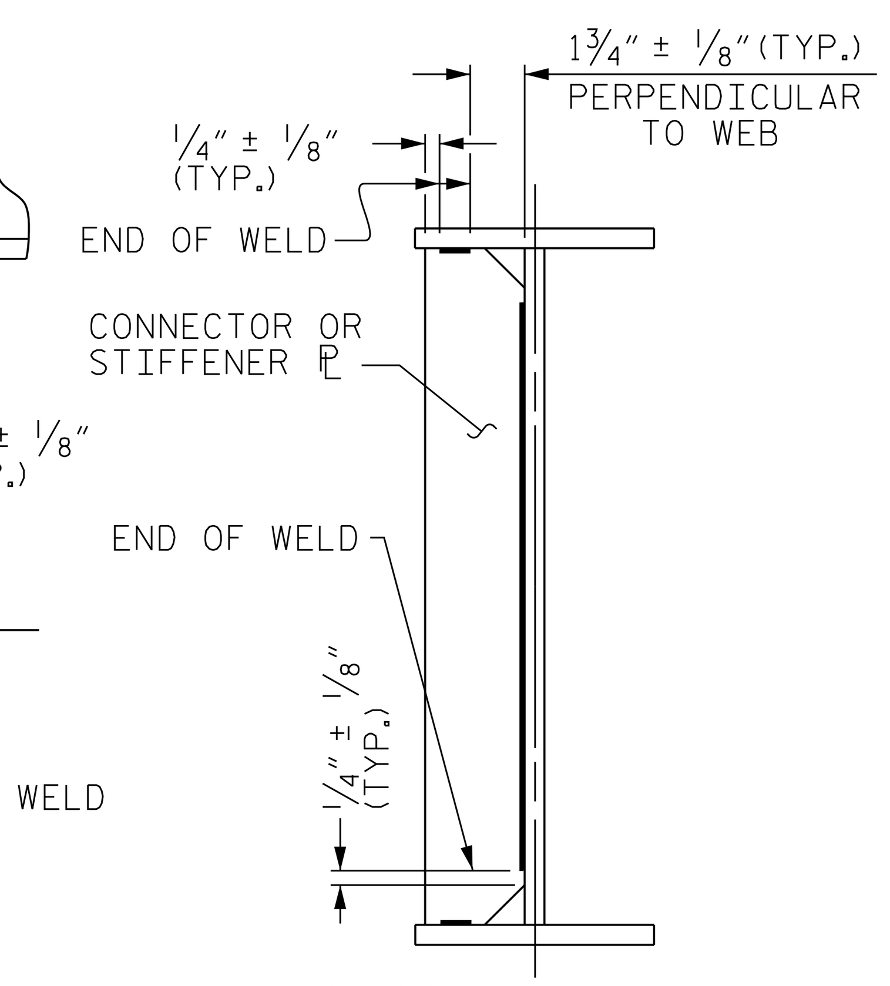
BENTS 1, 2, 4, 5 DIAPHRAGMS
(D3)



TYPICAL GUSSET PLATE CONNECTION

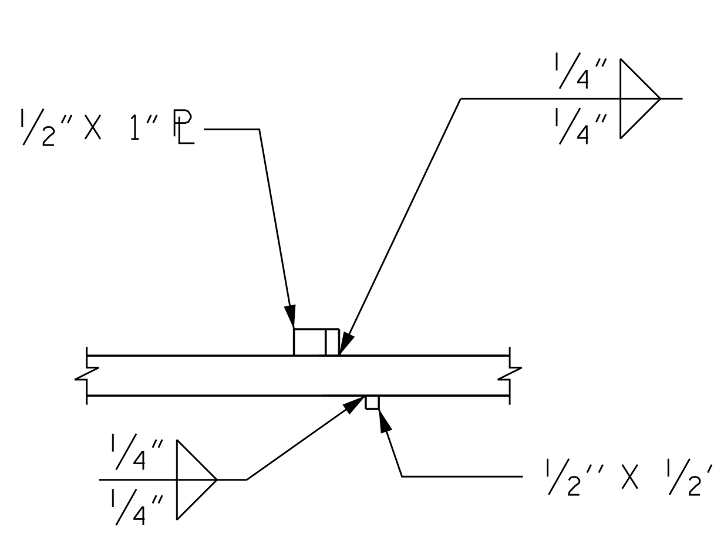


TYPICAL "TEE" TO GUSSET PLATE CONNECTION

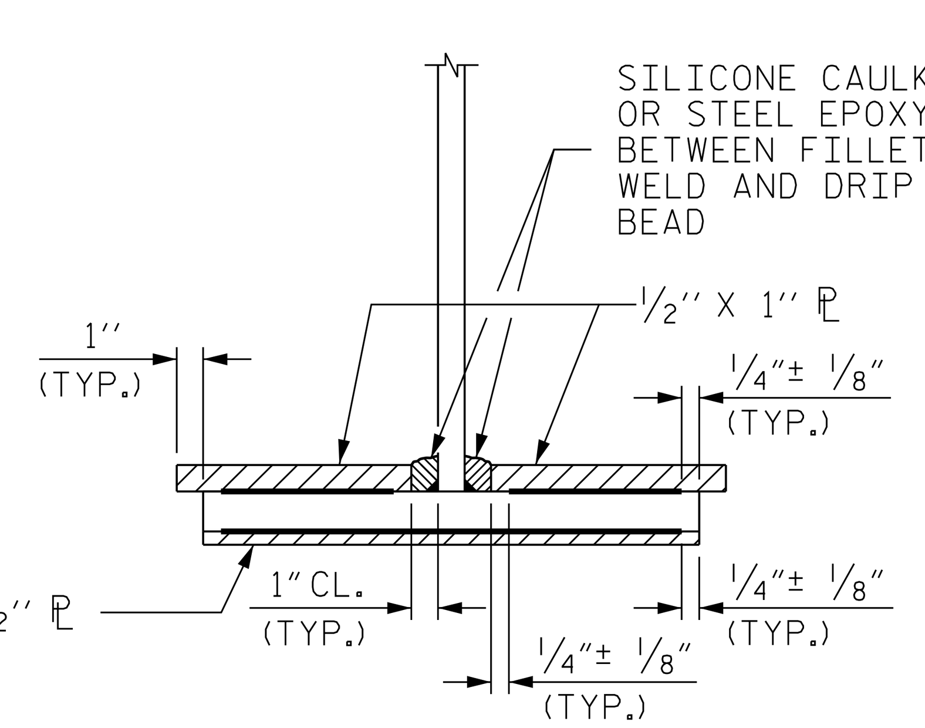


TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS

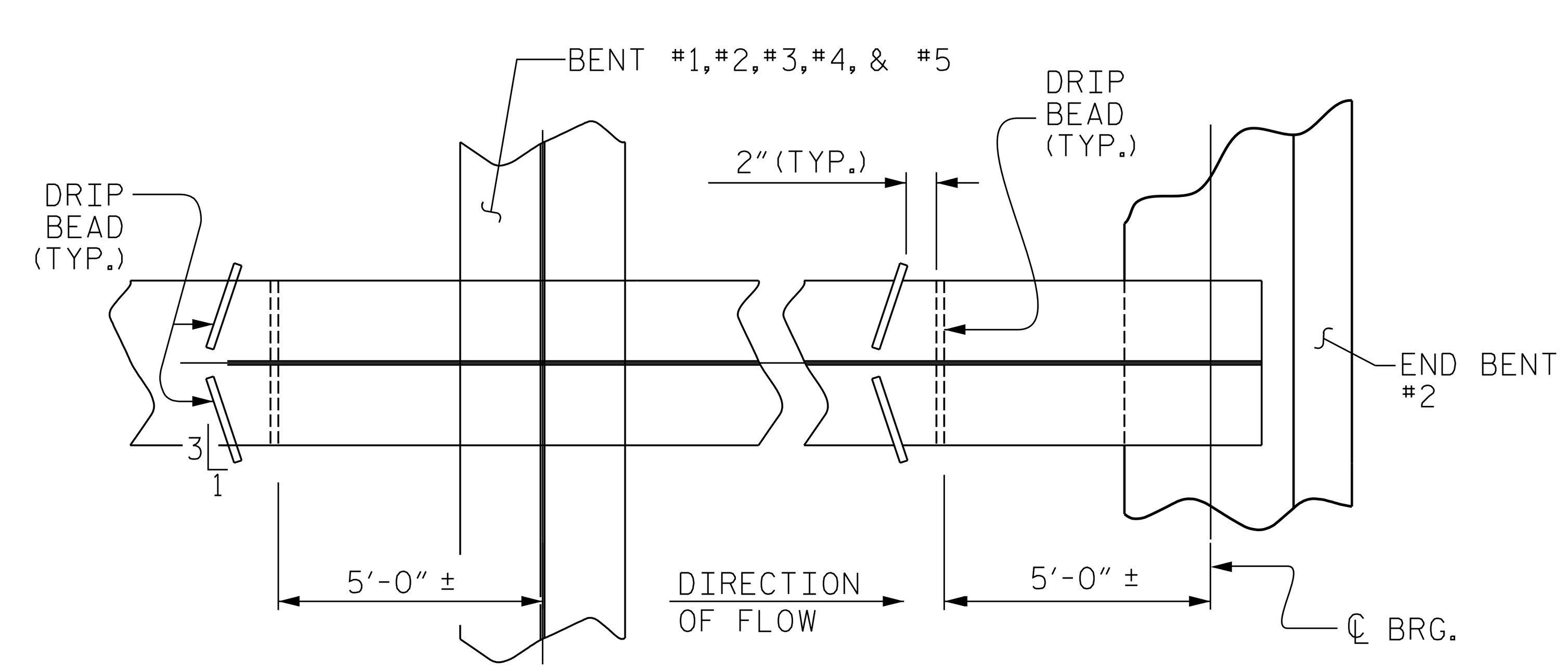
WELD TERMINATION DETAILS



SIDE VIEW



SECTION



PART PLAN - BOTTOM FLANGE

DRIP BEAD DETAILS

PROJECT NO. U-2579AA
FORSYTH COUNTY
STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-
SHEET 5 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE STRUCTURAL STEEL DETAILS

V&M Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796

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7/26/2022

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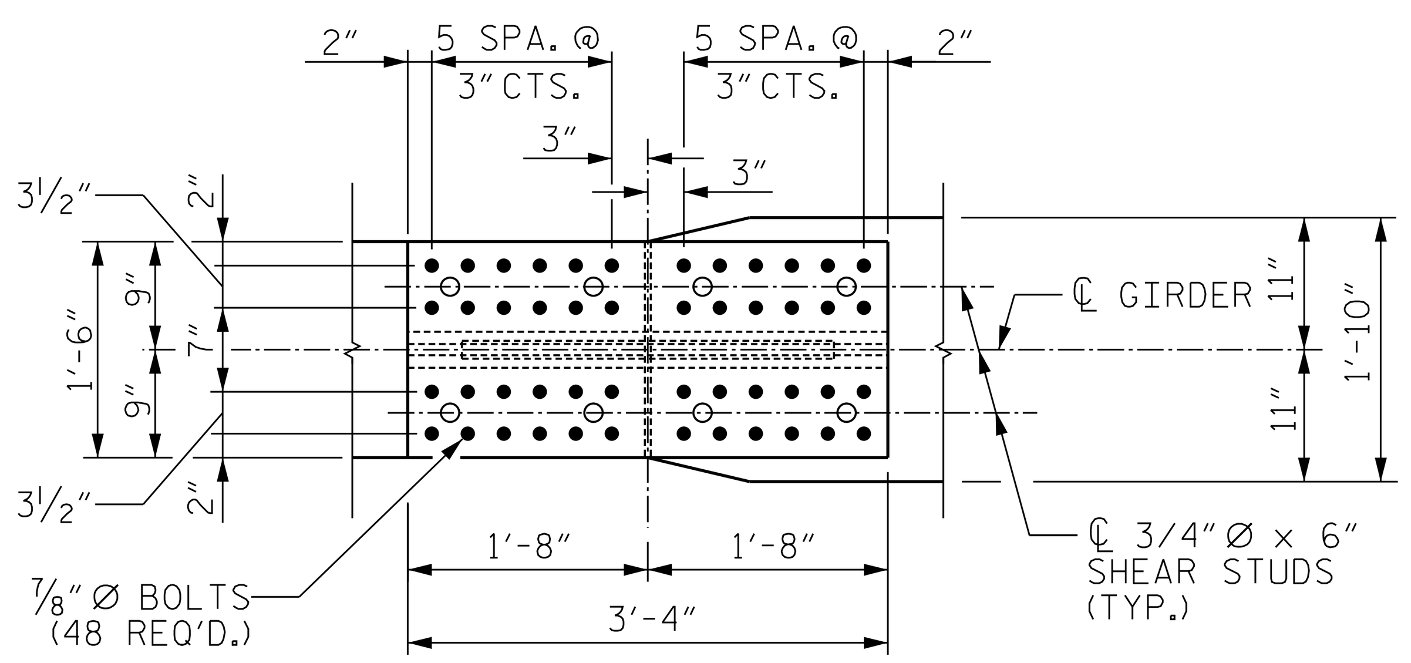
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: PRG	DATE: 03/2022

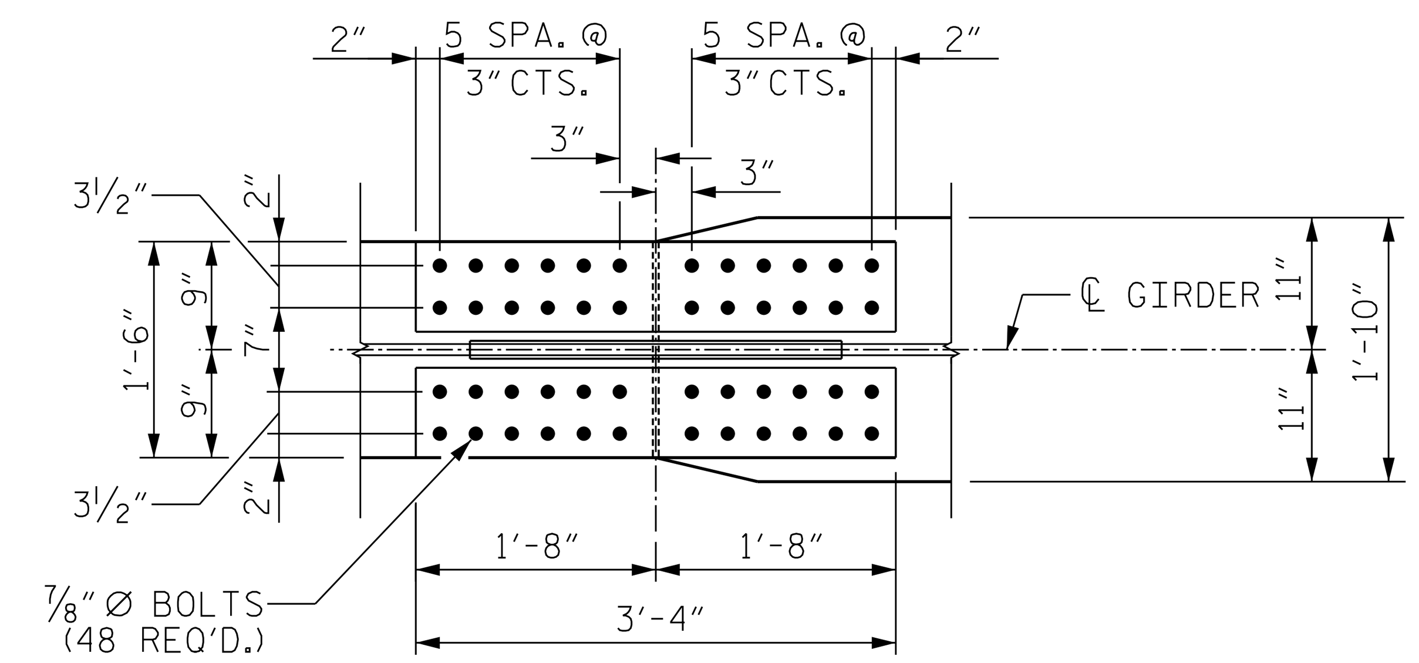
REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

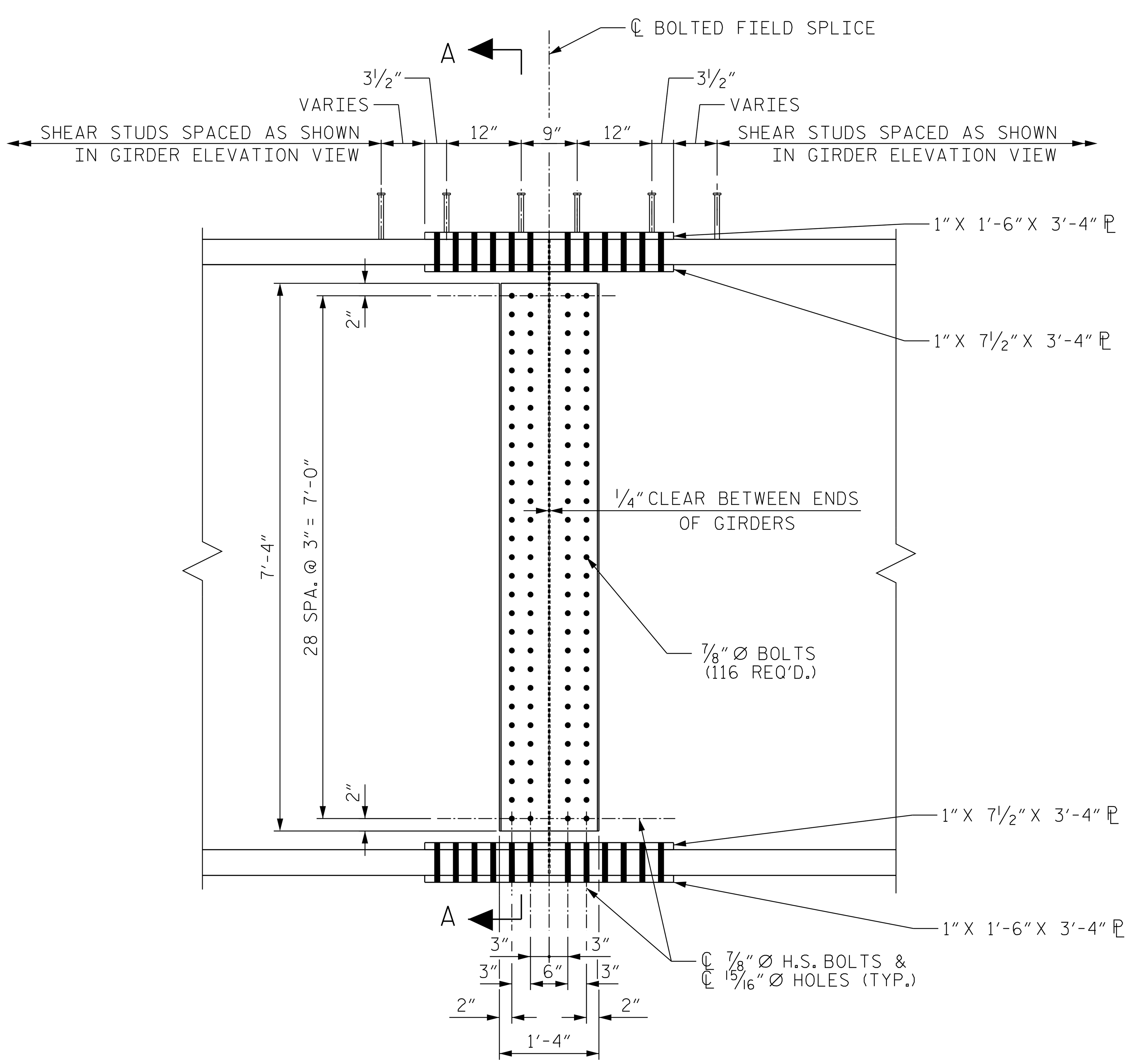
SHEET NO. S1-31
TOTAL SHEETS 92



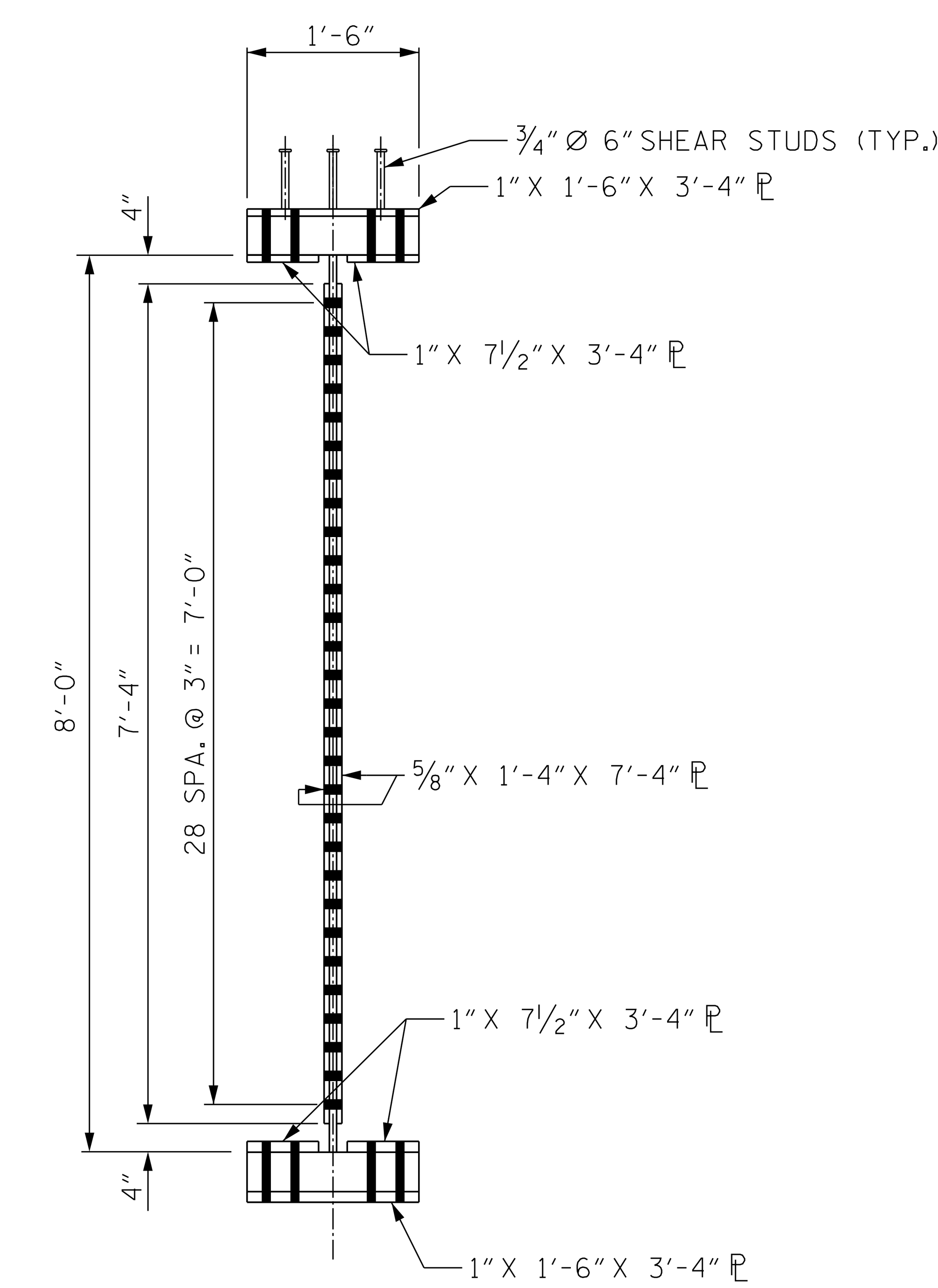
PLAN (TOP OF TOP FLANGE)



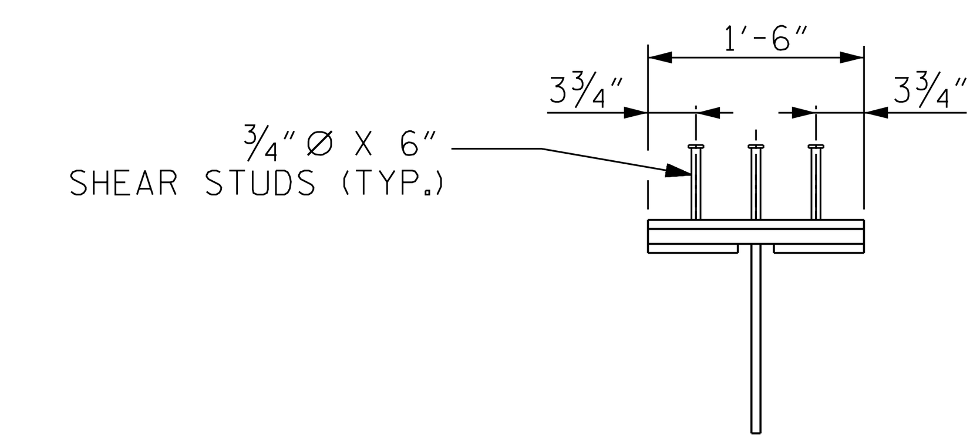
PLAN (TOP OF BOTTOM FLANGE)



ELEVATION



SECTION A-A



SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATE

SHEAR STUDS ARE TO BE SHOP WELDED ON TOP OF PLATE BEFORE FIELD ASSEMBLY.

BOLTED FIELD SPLICE NO. 1 DETAILS

DocuSigned by: Hardy Willis
7/26/2022

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Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Raleigh, NC 919-977-9455 | Charlotte, NC 704-357-0488
Boone, NC 828-355-9933 | Tri-Cities, TN 423-467-8401 | Knoxville, TN 865-546-5800 | Spartanburg, SC 864-574-4775 | Charleston, SC 843-974-5650 | Middlesboro, KY 606-248-6600 | Atlanta, GA 770-627-3590

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 6 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
BOLTED FIELD SPLICE
DETAILS - TYPE "A"

DWN. BY: AW	DATE: 11/2021
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: PRG	DATE: 03/2022

REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-32
TOTAL SHEETS 92

wdstrucher
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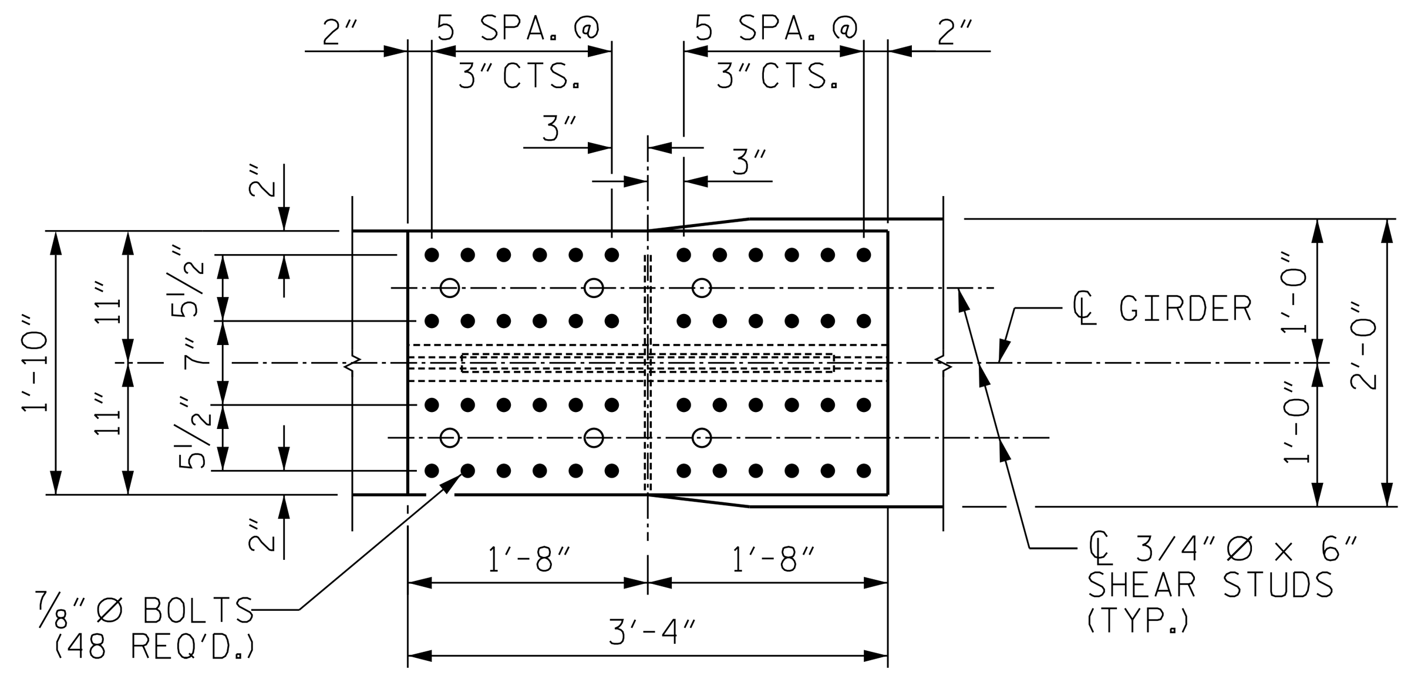
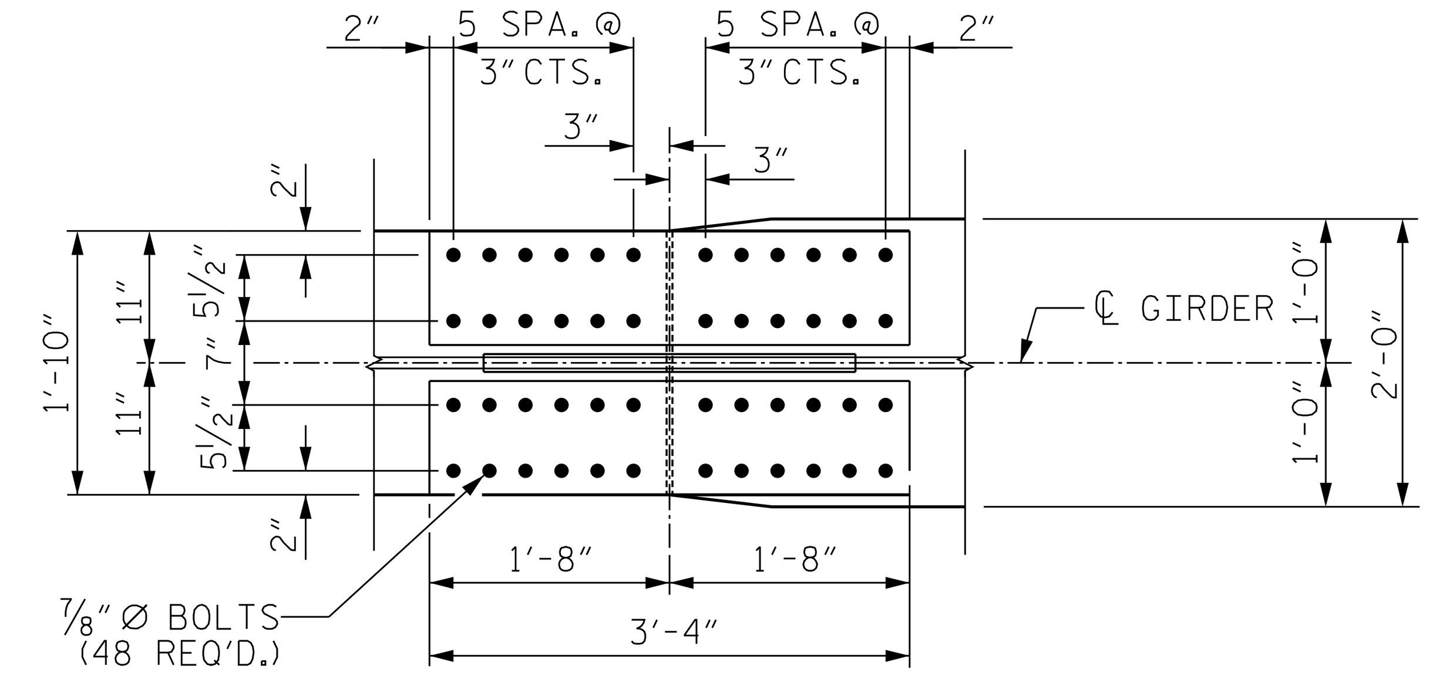
TIME: 10:03 AM on Tuesday, July 26, 2022



PLAN (TOP OF TOP FLANGE)



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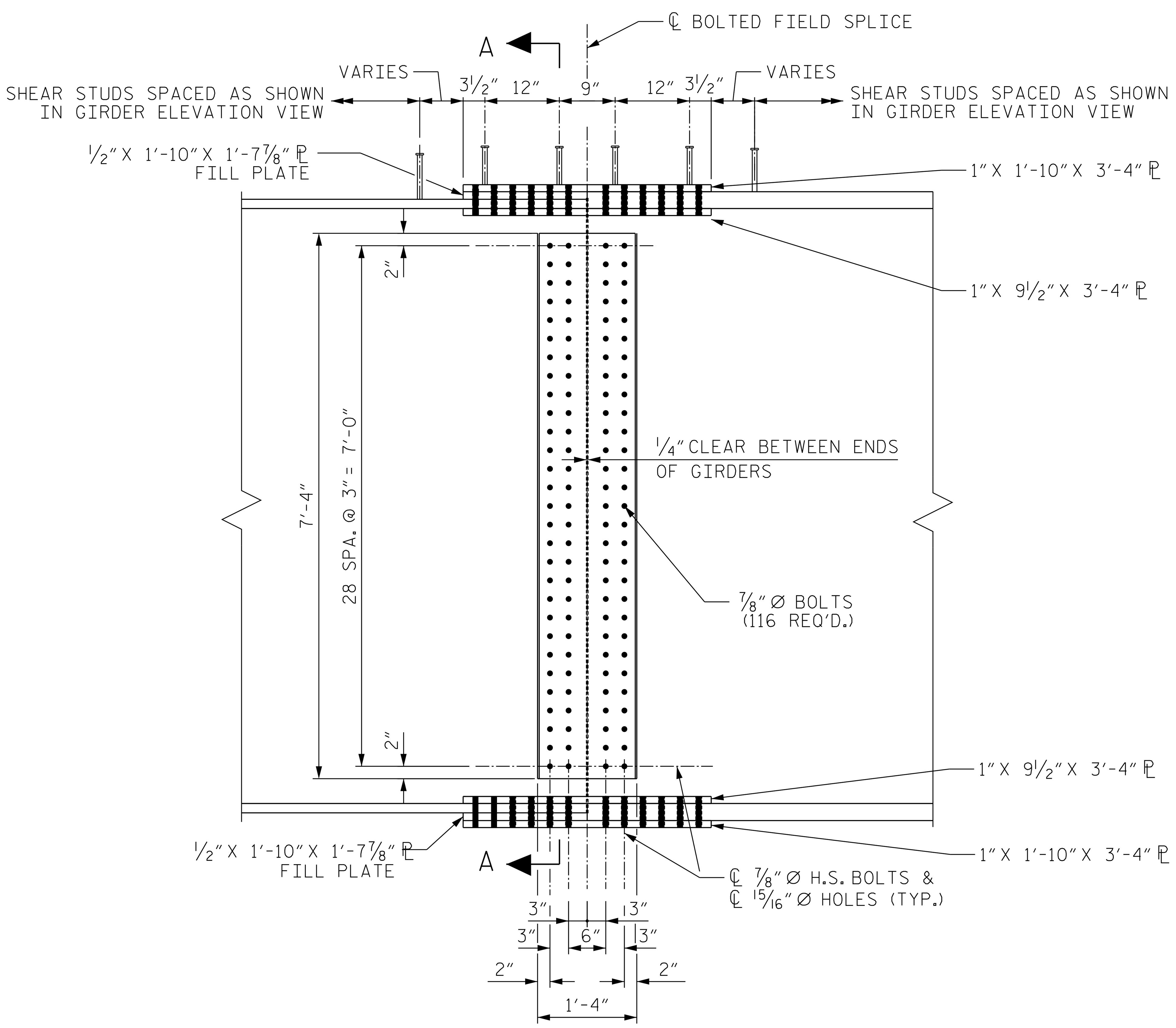

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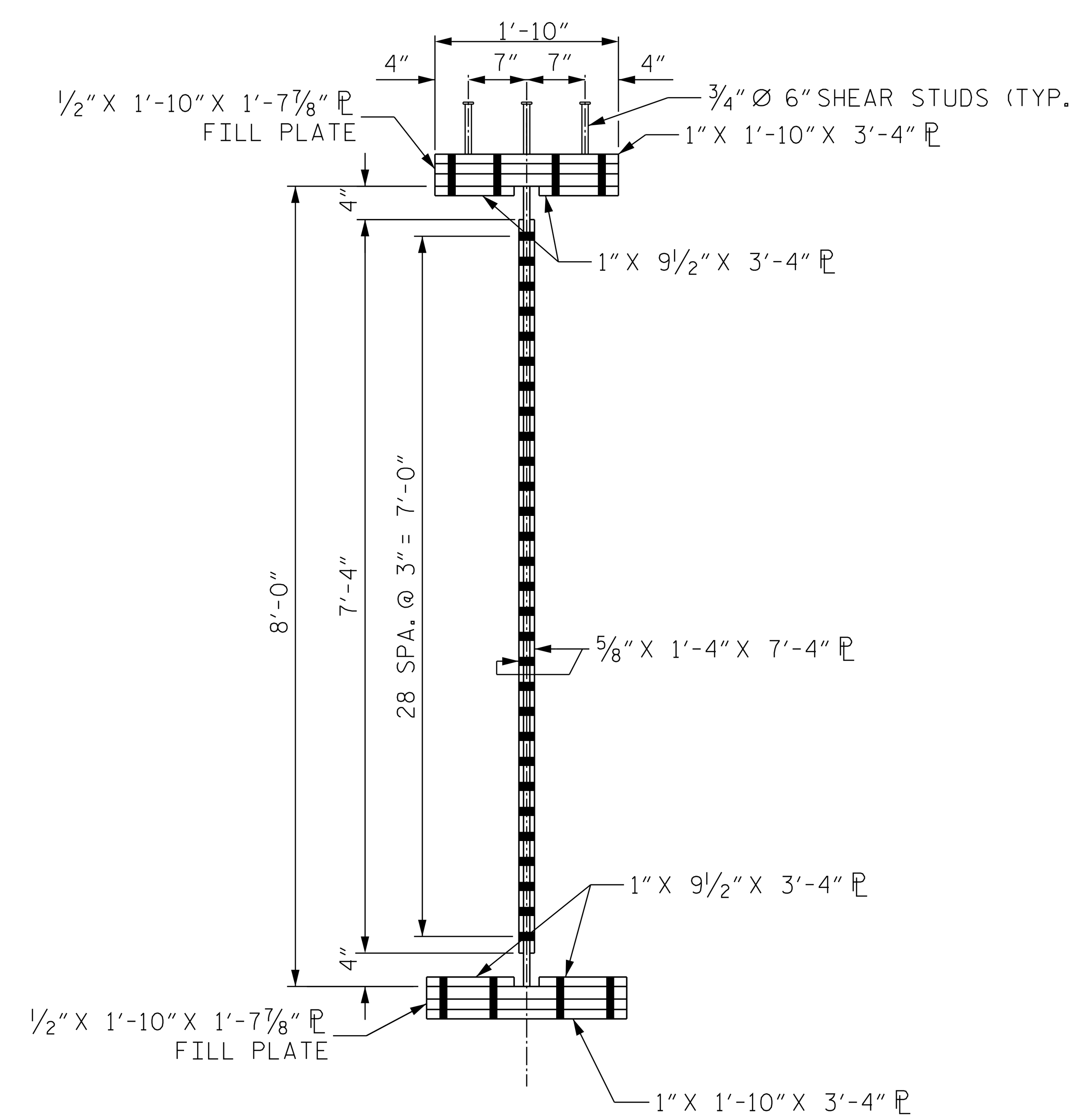

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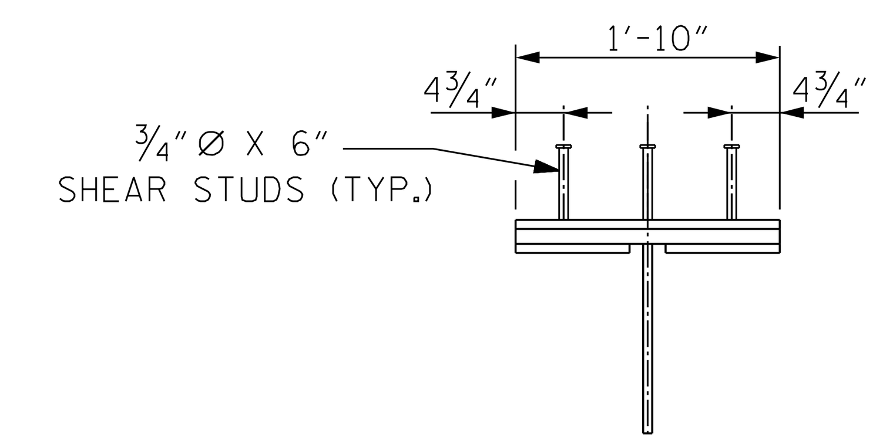

SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATE

SHEAR STUDS ARE TO BE SHOP WELDED ON TOP OF PLATE BEFORE FIELD ASSEMBLY.

BOLTED FIELD SPLICE NO. 2 DETAILS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 29771 — DocuSigned by: Hardy Willis — 7/26/2022

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Boone, NC 828-355-9933
Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Atlanta, GA 770-627-3590

PROJECT NO. U-2579AA
FORSYTH COUNTY
STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-
SHEET 7 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
BOLTED FIELD SPLICE
DETAILS - TYPE "B"

			REVISIONS					SHEET NO.
DWN. BY: AW	DATE: 11/2021	NO.	BY:	DATE:	NO.	BY:	DATE:	S1-33
CHKD. BY: PRG	DATE: 03/2022	1			3			TOTAL SHEETS
DES. EGR. OF RECORD: PRG	DATE: 03/2022	2			4			92

wdtrucher
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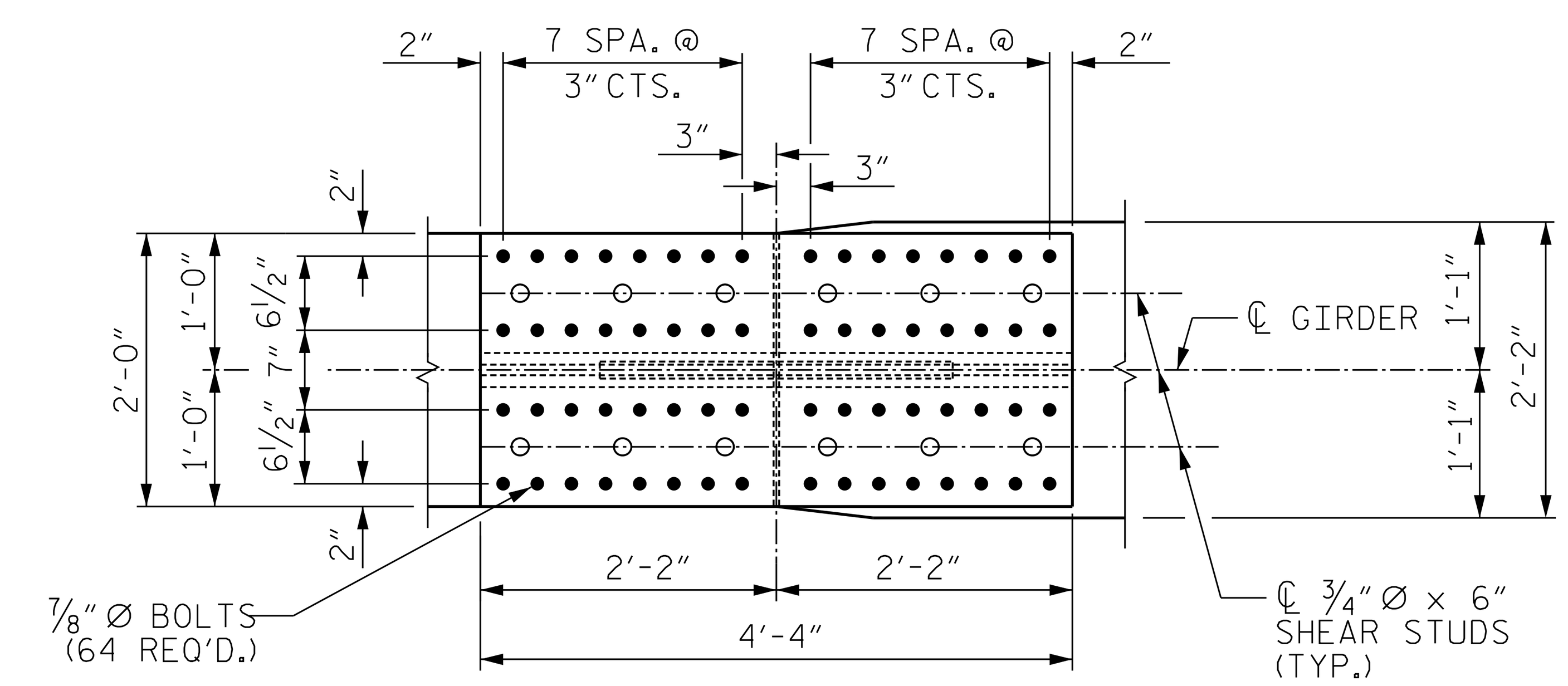

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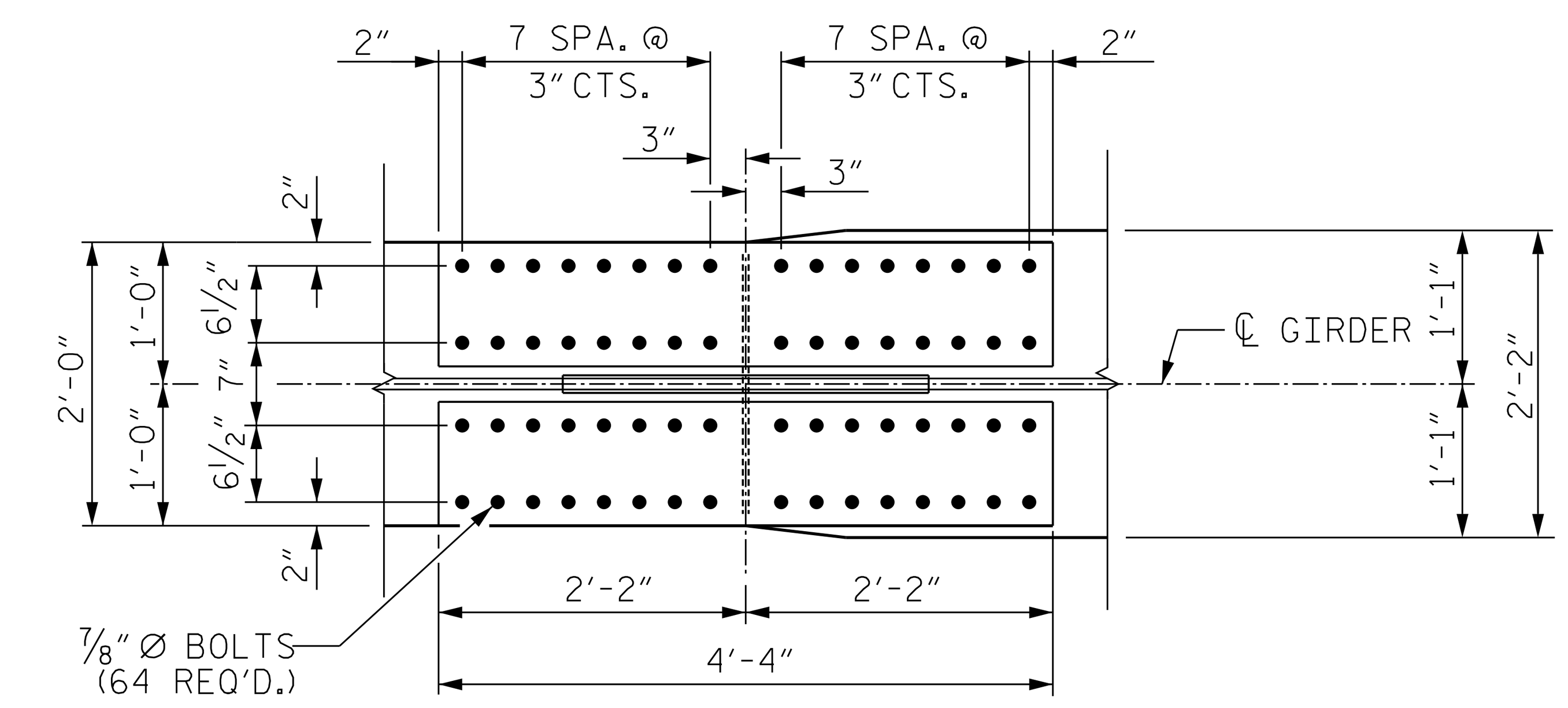

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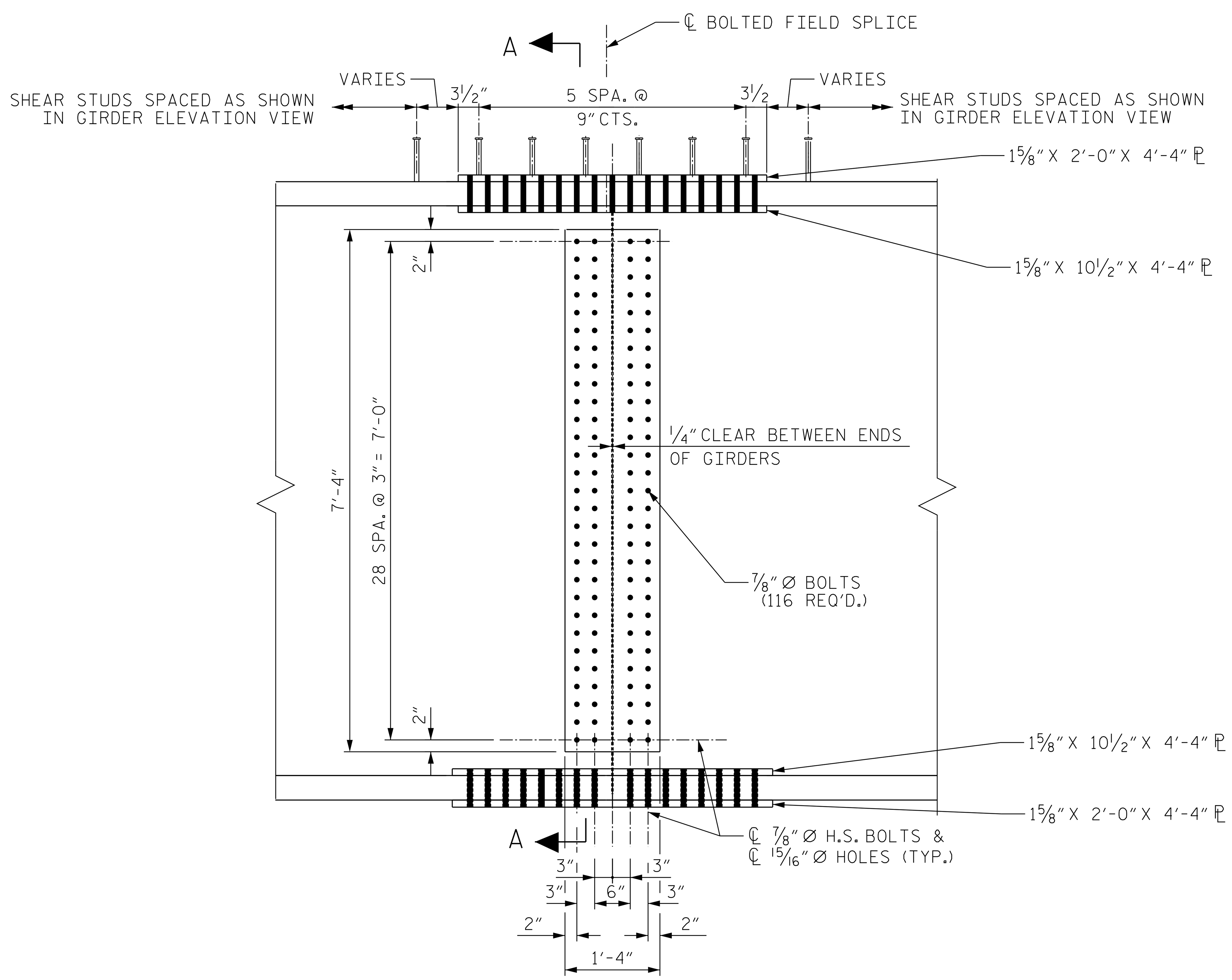

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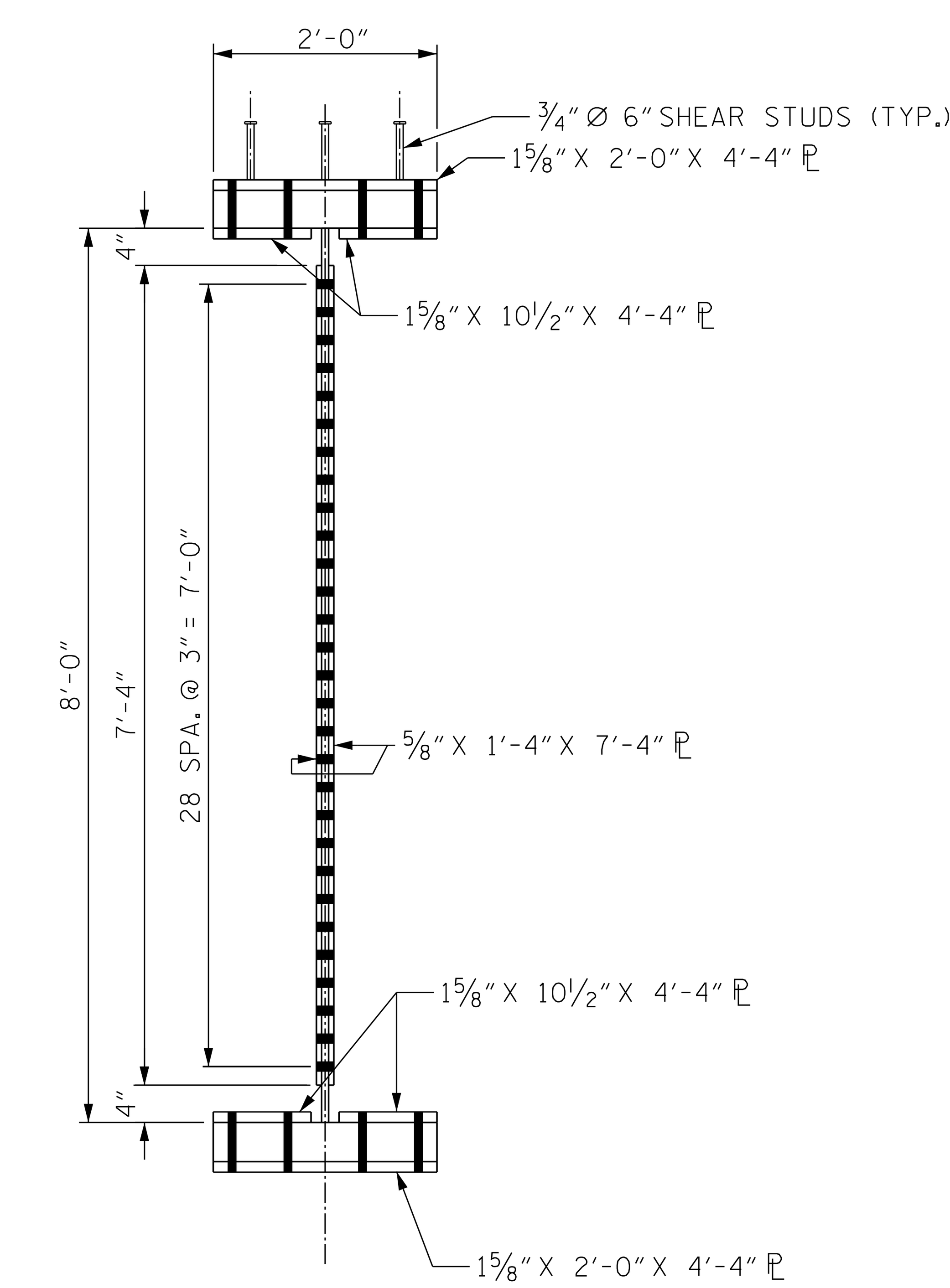
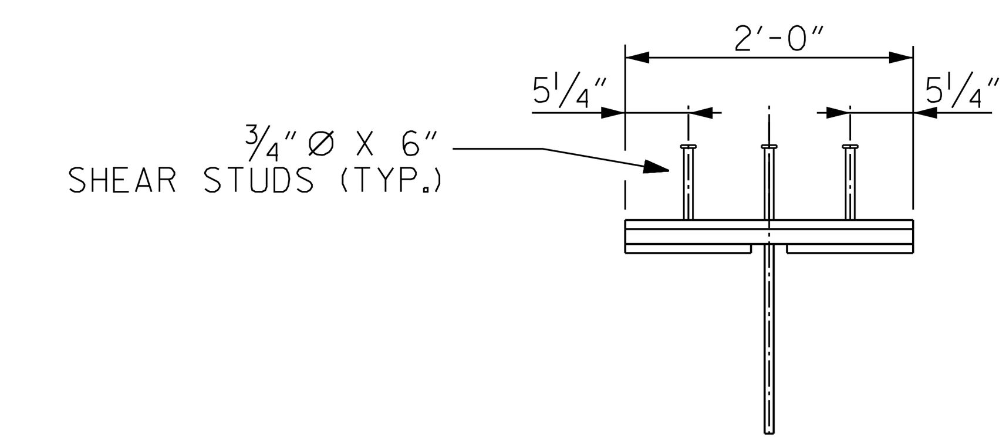


SECTION A-A



SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATE

SHEAR STUDS ARE TO BE SHOP WELDED ON TOP OF PLATE BEFORE FIELD ASSEMBLY.

BOLTED FIELD SPLICE NOS. 3, 4, 5, 6 & 10 DETAILS

FIELD SPLICE 6 SHOWN, OTHERS SIMILAR

7/26/2022

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PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 8 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE BOLTED FIELD SPLICE DETAILS - TYPE "C"

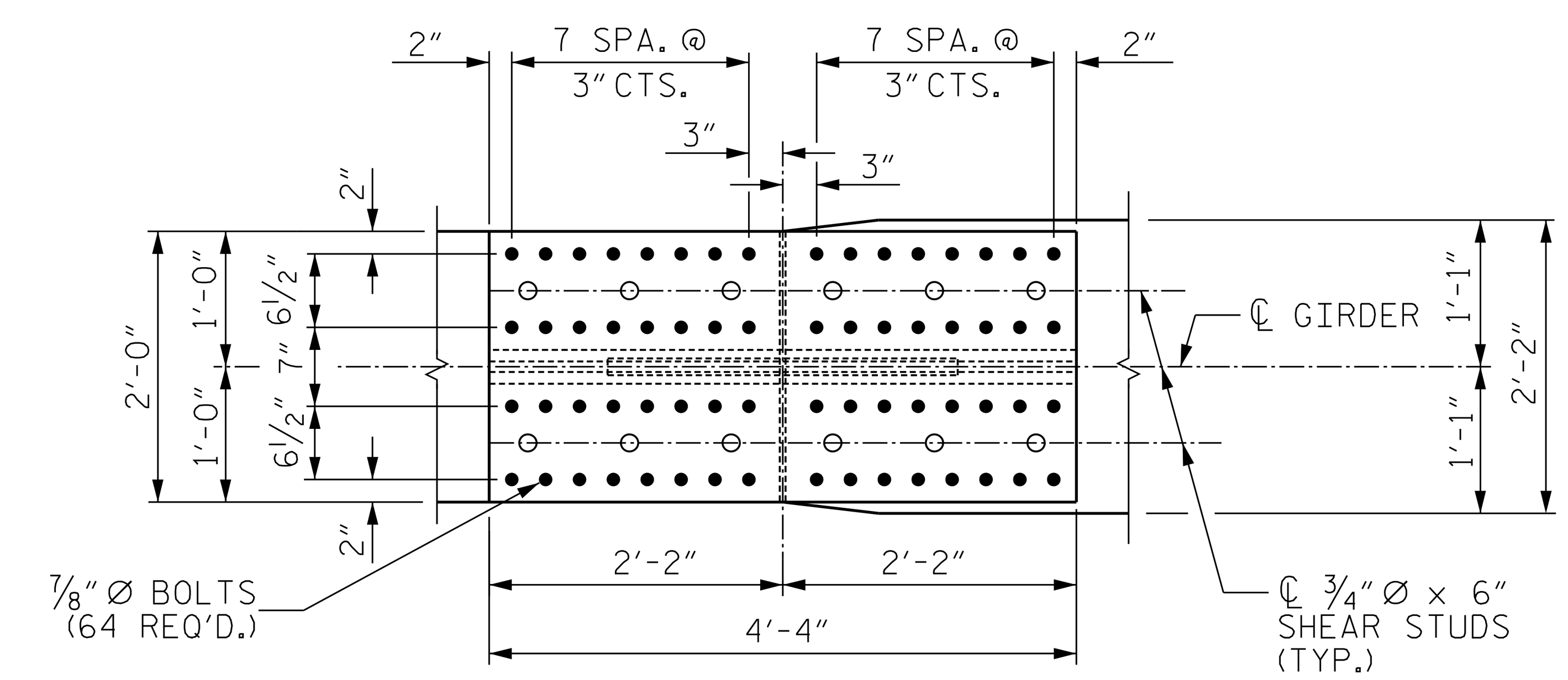
DWN. BY: AW	DATE: 11/2021
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: PRG	DATE: 03/2022

REVISIONS

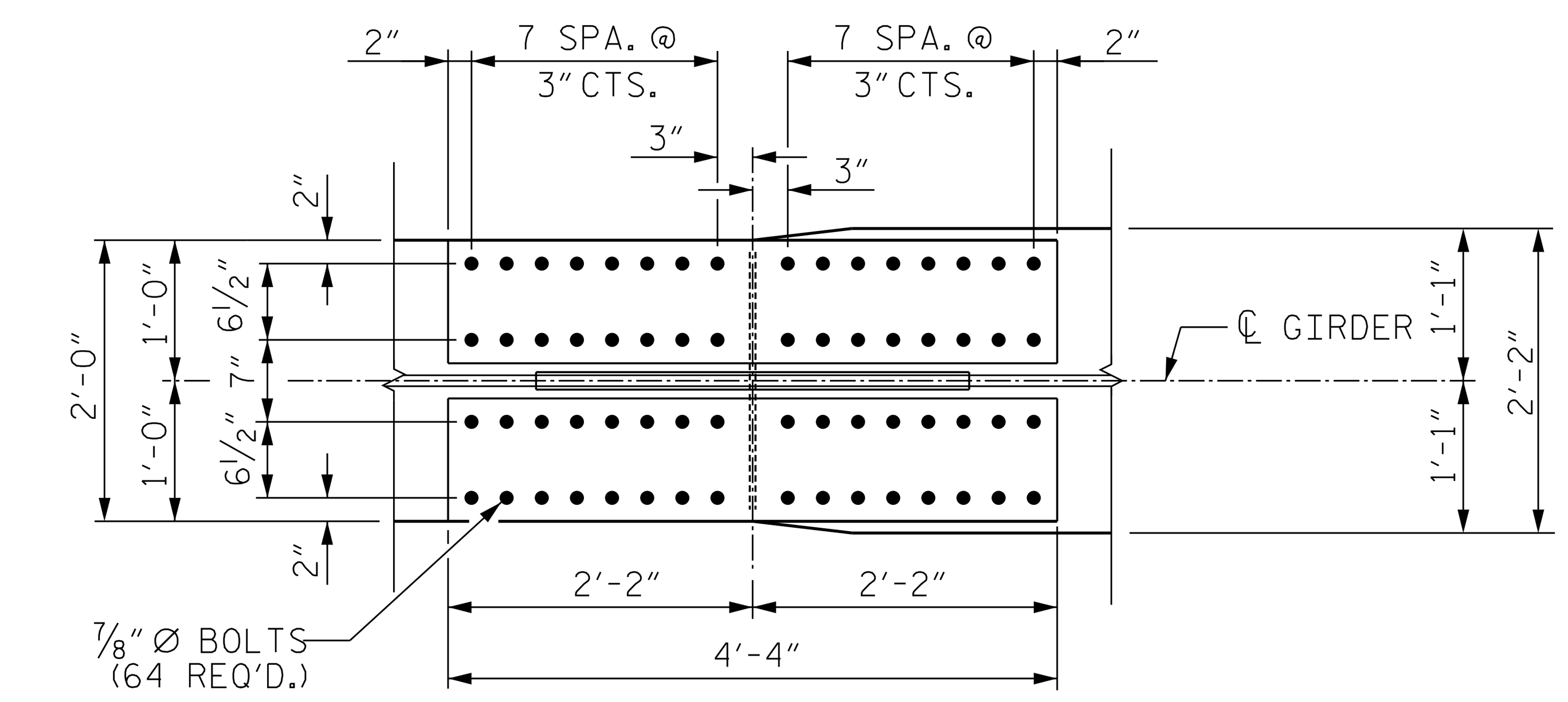
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-34

TOTAL SHEETS 92



PLAN (TOP OF TOP FLANGE)



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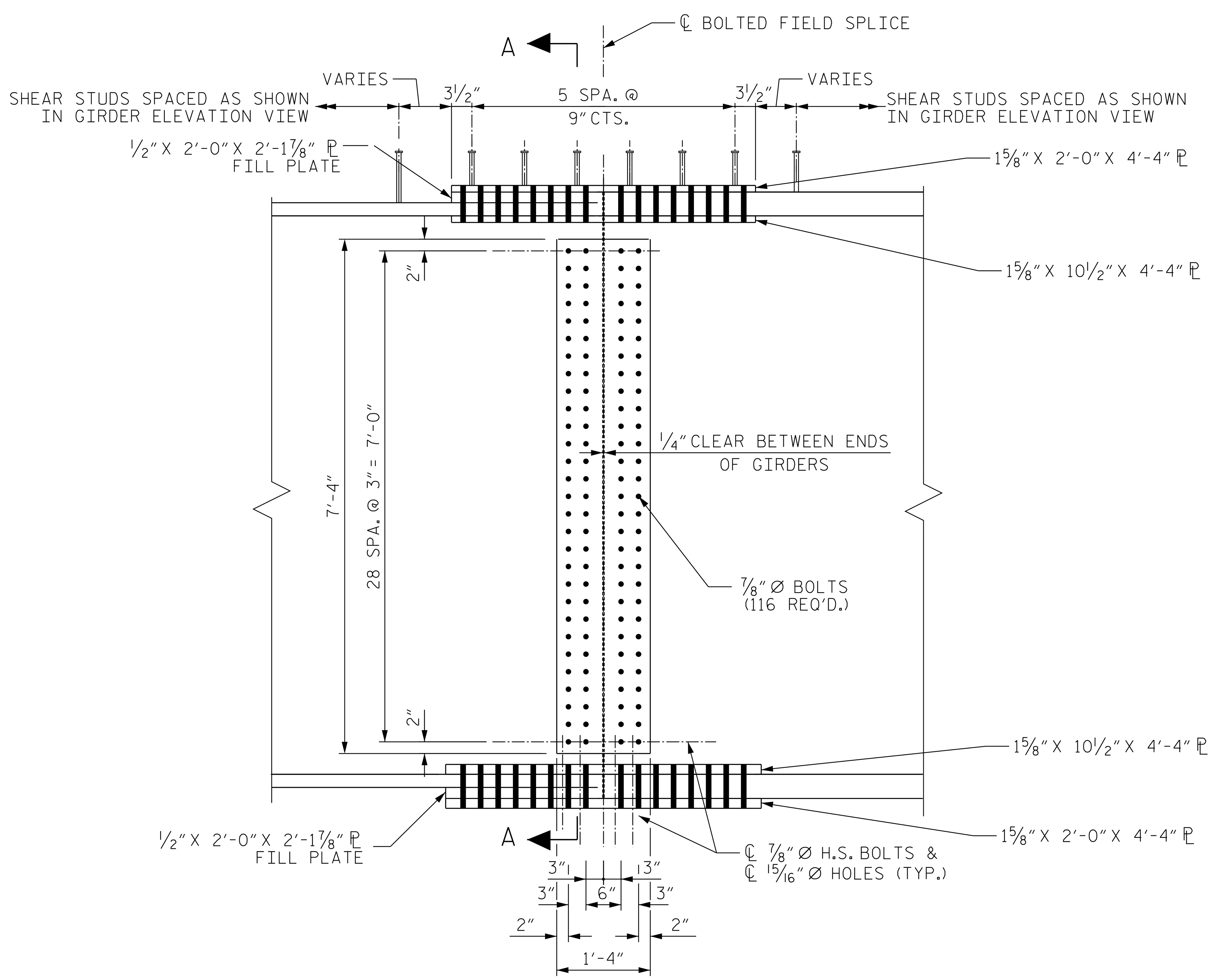

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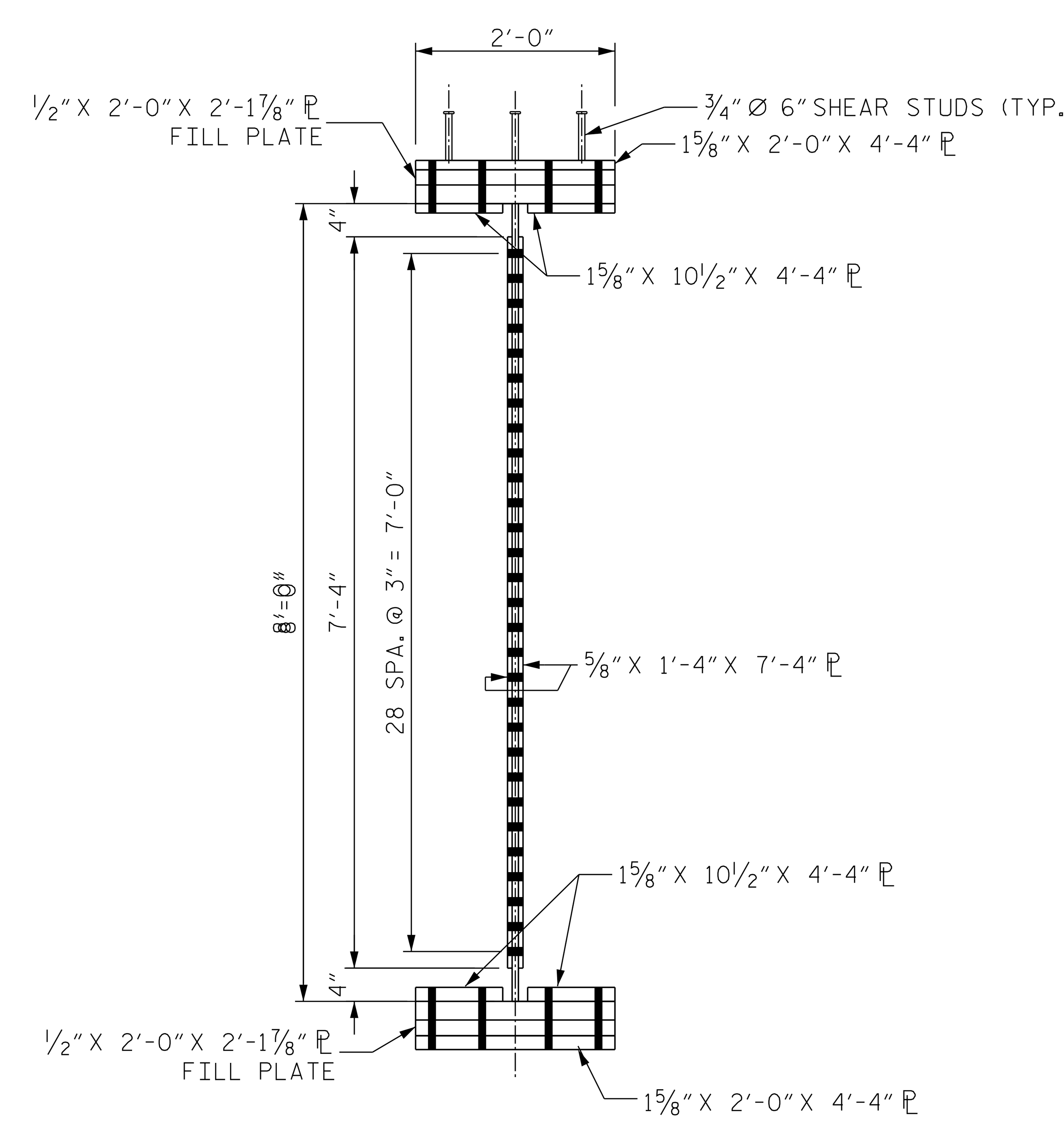
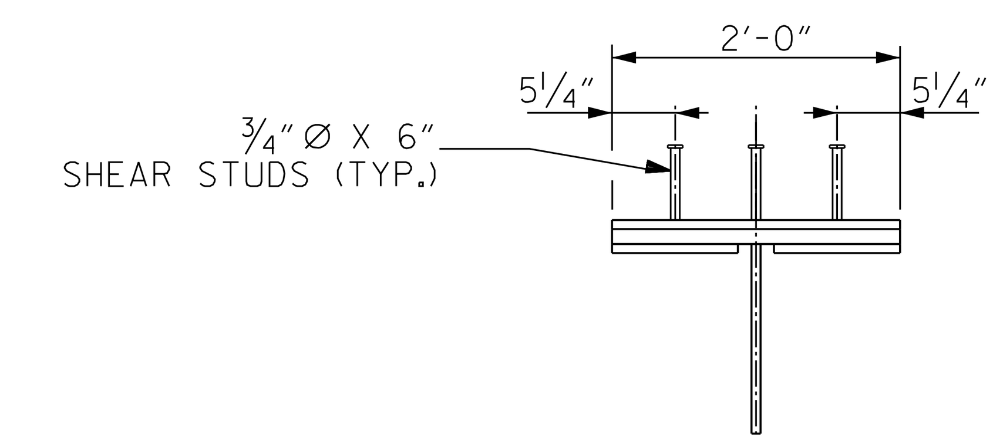


SECTION A-A



SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATE

SHEAR STUDS ARE TO BE SHOP WELDED ON TOP OF PLATE BEFORE FIELD ASSEMBLY.

BOLTED FIELD SPLICE NOS. 7, 8, & 9 DETAILS

FIELD SPLICE 8 SHOWN, OTHERS SIMILAR

7/26/2022

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Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796

PROJECT NO. U-2579AA
FORSYTH COUNTY
STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 9 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
BOLTED FIELD SPLICE
DETAILS - TYPE "D"

DWN. BY: AW	DATE: 11/2021		
CHKD. BY: PRG	DATE: 03/2022		
DES. EGR. OF RECORD: PRG	DATE: 03/2022		

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-35
TOTAL SHEETS 92

NOTES

LATERAL BRACING ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W OR APPROVED EQUAL.

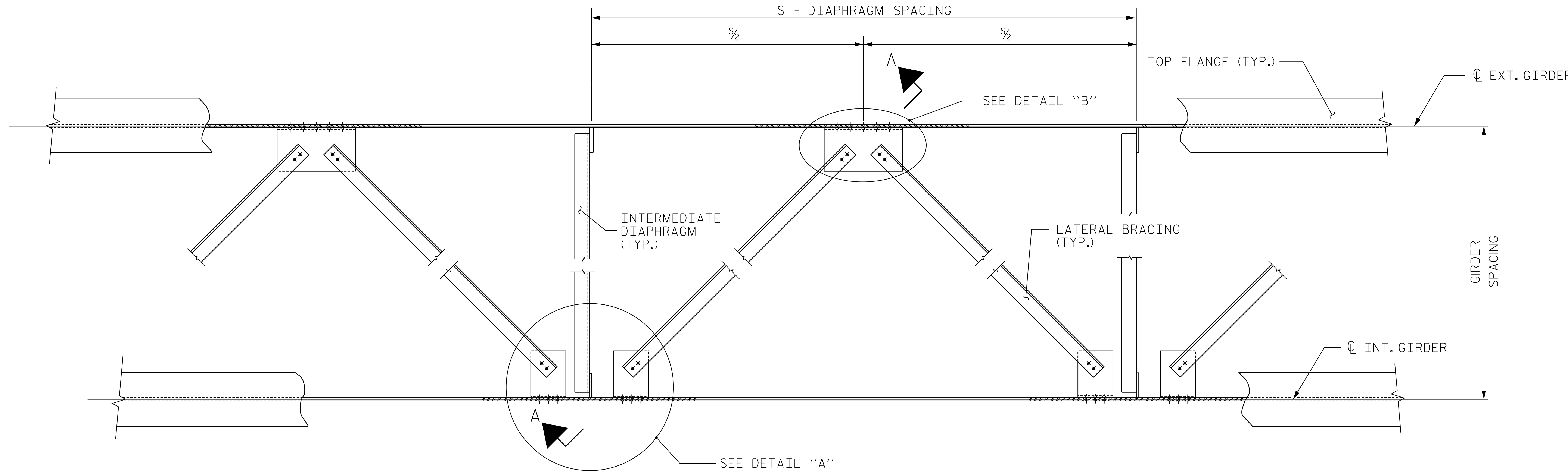
TENSION ON THE ASTM A325 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL BOLTED CONNECTIONS SHALL BE ⅞"Ø HIGH STRENGTH BOLTS.

THE CONTRACTOR HAS THE OPTION TO CLIP THE PROTRUDING CORNERS OF THE GUSSET PLATES, AT NO ADDITIONAL COST TO THE DEPARTMENT.

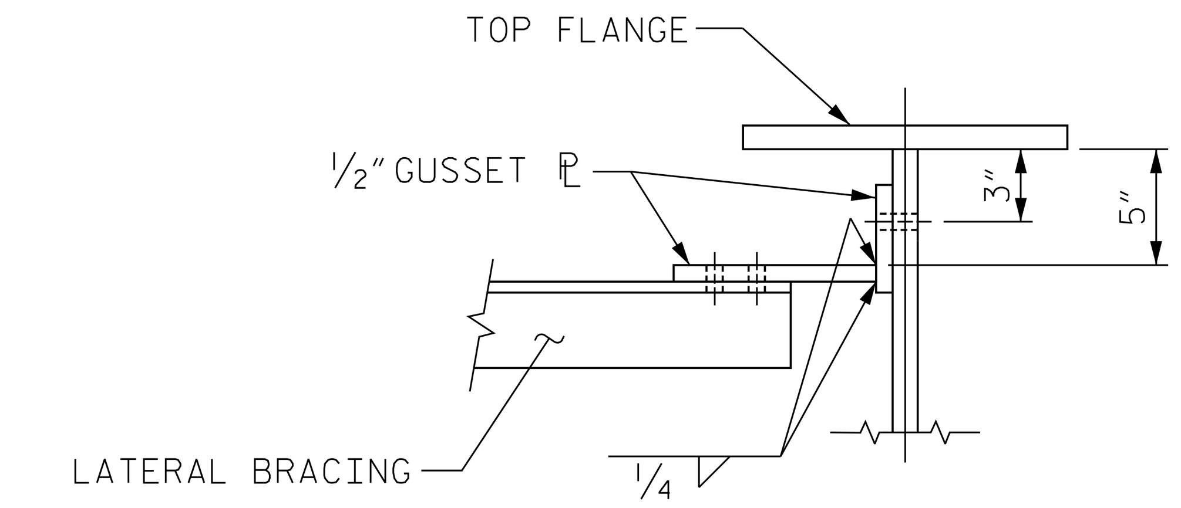
BENT GUSSET PLATES OR ROLLED ANGLE SHAPES MAY BE SUBSTITUTED FOR THE WELDED GUSSET PLATES DETAILED IF APPROVED BY THE ENGINEER, AT NO ADDITIONAL COST TO THE DEPARTMENT.

INSTALL THE LATERAL BRACING AFTER ERECTING THE EXTERIOR GIRDER AND THE ADJACENT INTERIOR GIRDER AND INSTALLING THE INTERMEDIATE DIAPHRAGMS.

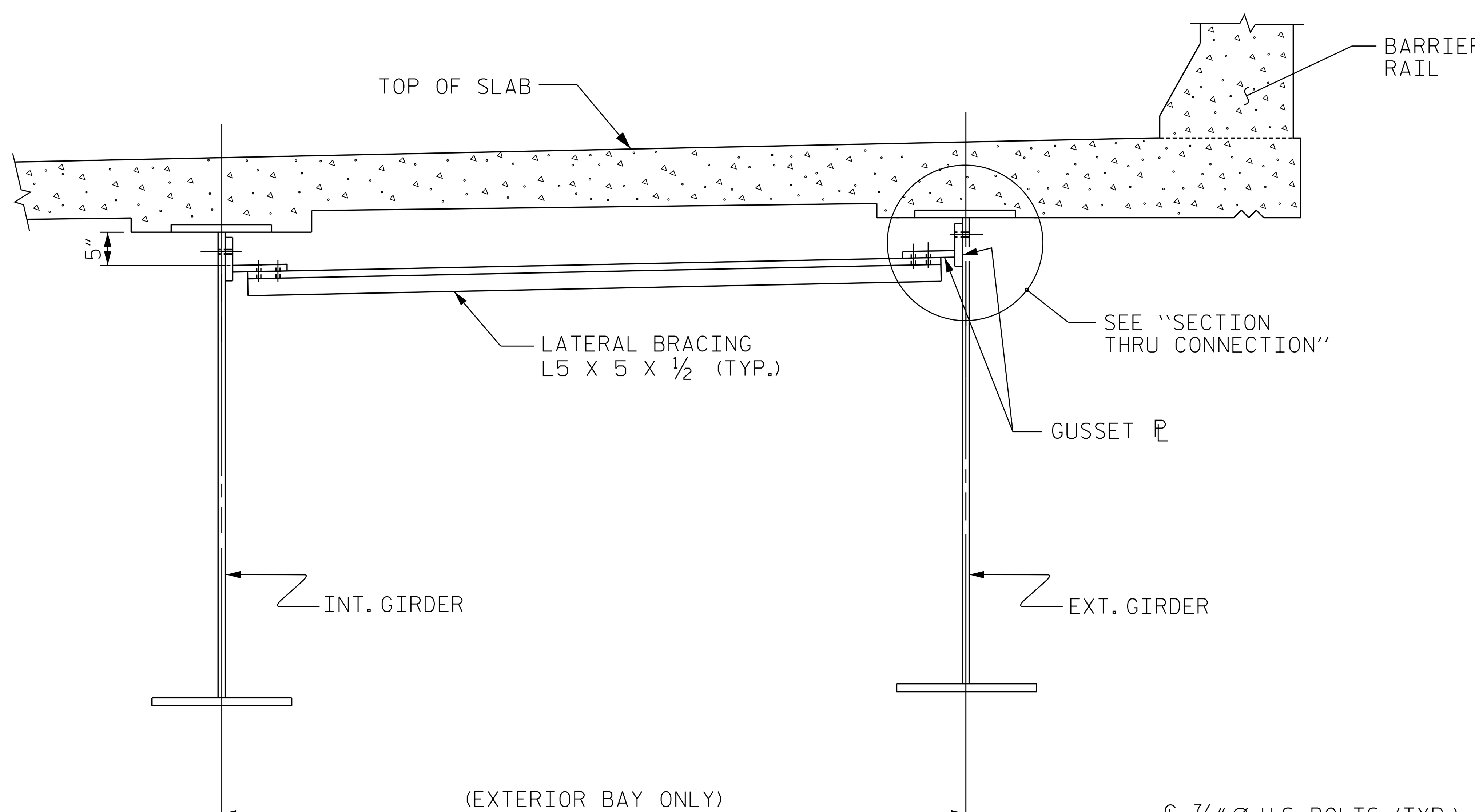


PART PLAN - NEAR TOP FLANGE LATERAL BRACING

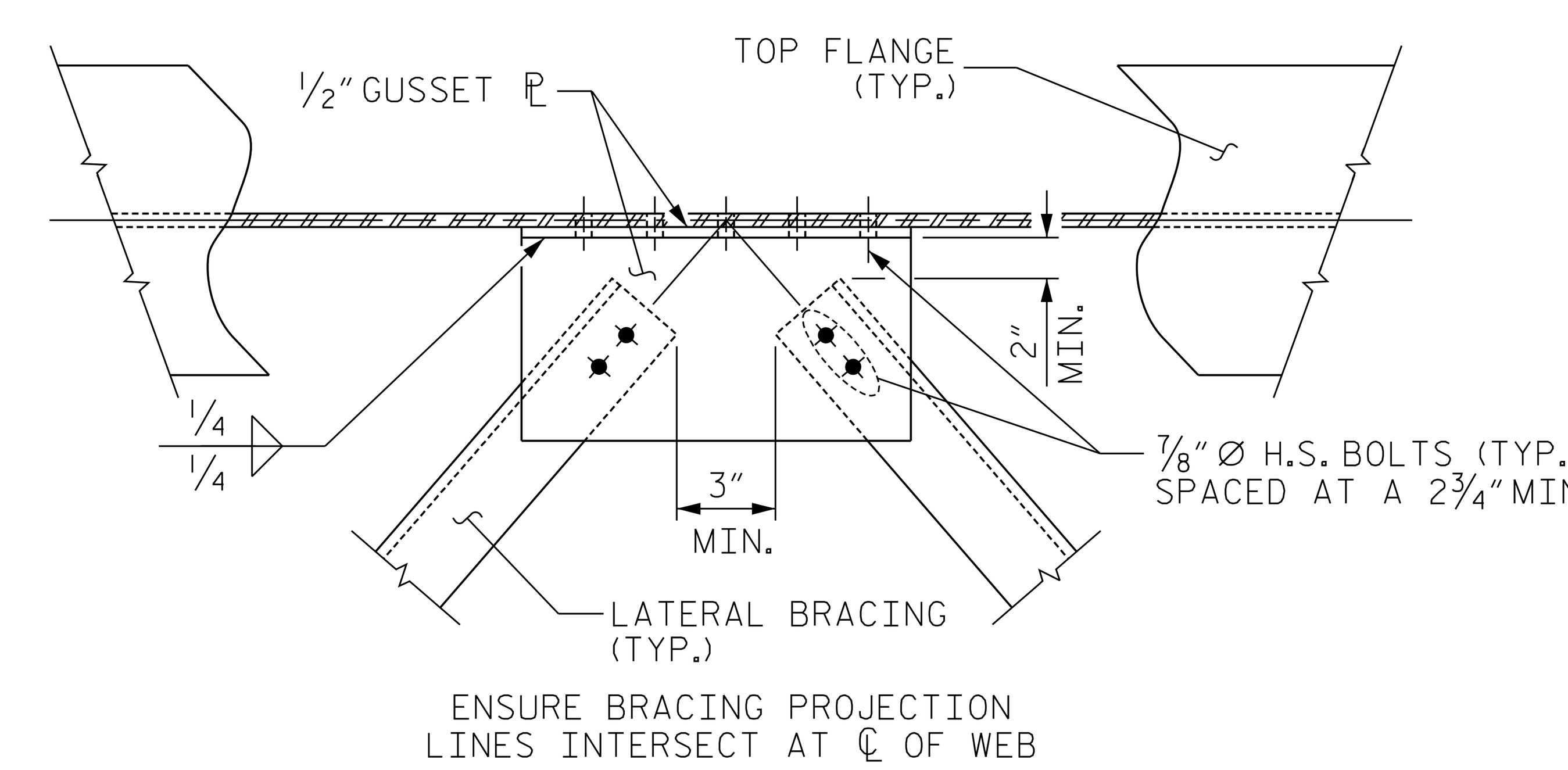
(THROUGHOUT EXTERIOR BAYS ONLY)



SECTION THRU CONNECTION



SECTION A-A



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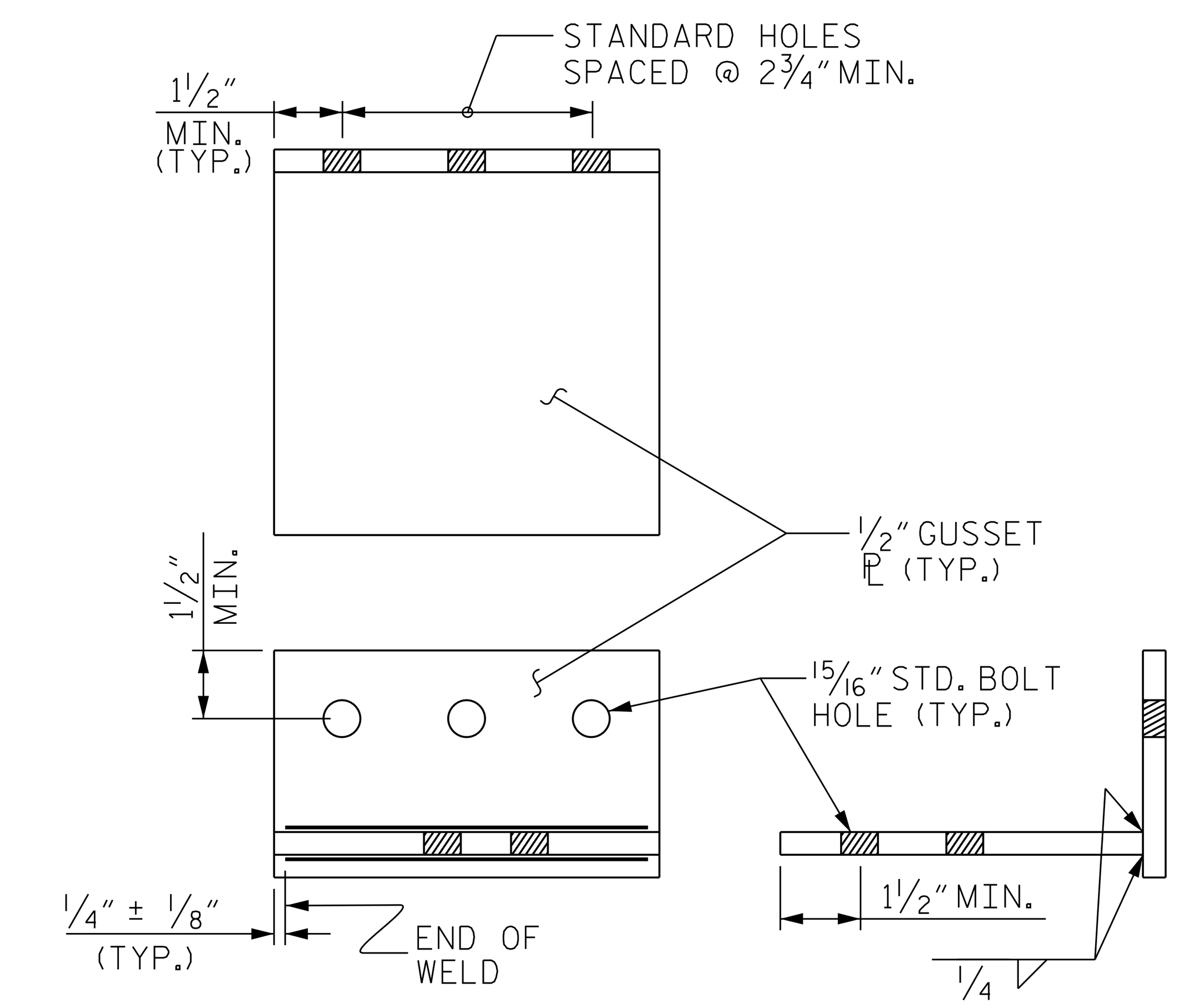
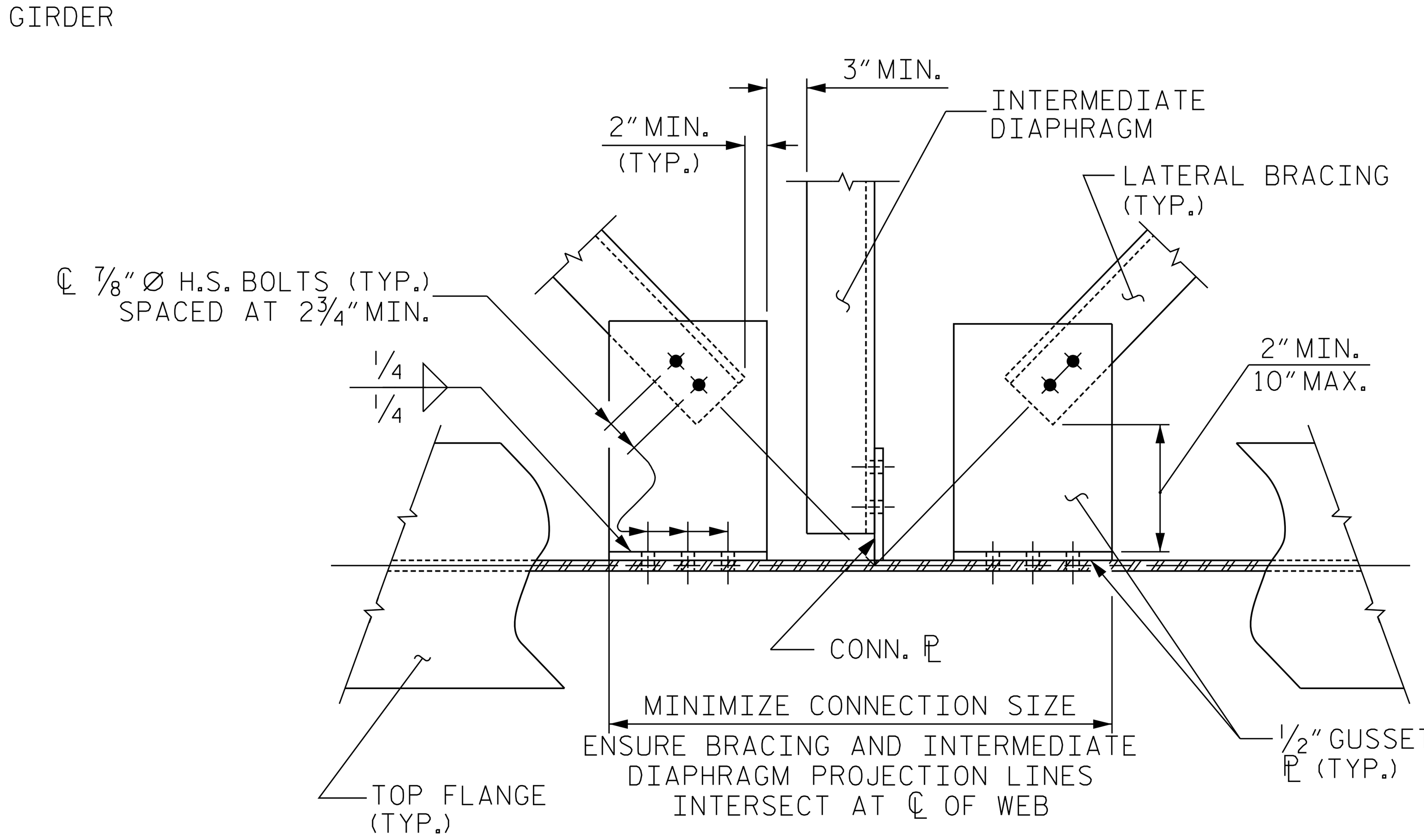


CONNECTION DETAIL



DETAIL "A"

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

LATERAL BRACING

Vaughn & Melton Consulting Engineers
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Boone, NC 828-355-9933; Tri-Cities, TN 423-467-8401; Knoxville, TN 865-546-5800; Spartanburg, SC 864-574-4775; Charleston, SC 843-974-5650; Middlesboro, KY 606-248-6600; Atlanta, GA 770-627-3590; Raleigh, NC 919-977-9455; Charlotte, NC 704-357-0488

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL — DocuSigned by: Hardy Willis — 7/26/2022

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ASSEMBLED BY: AW	DATE: 07/2021	
CHECKED BY: PRG	DATE: 07/2021	
DRAWN BY: WMC 6/11	REV. 12/17	MAA/THC
CHECKED BY: GM 6/11		

DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: PRG	DATE: 03/2022

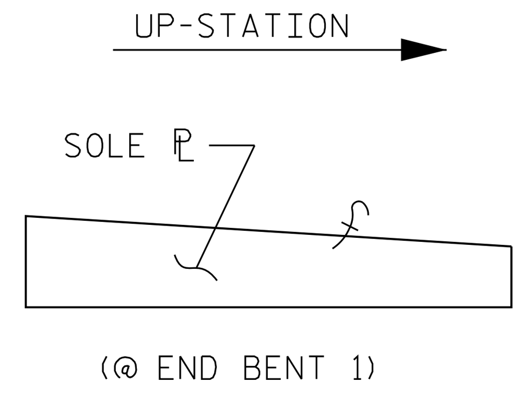
REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

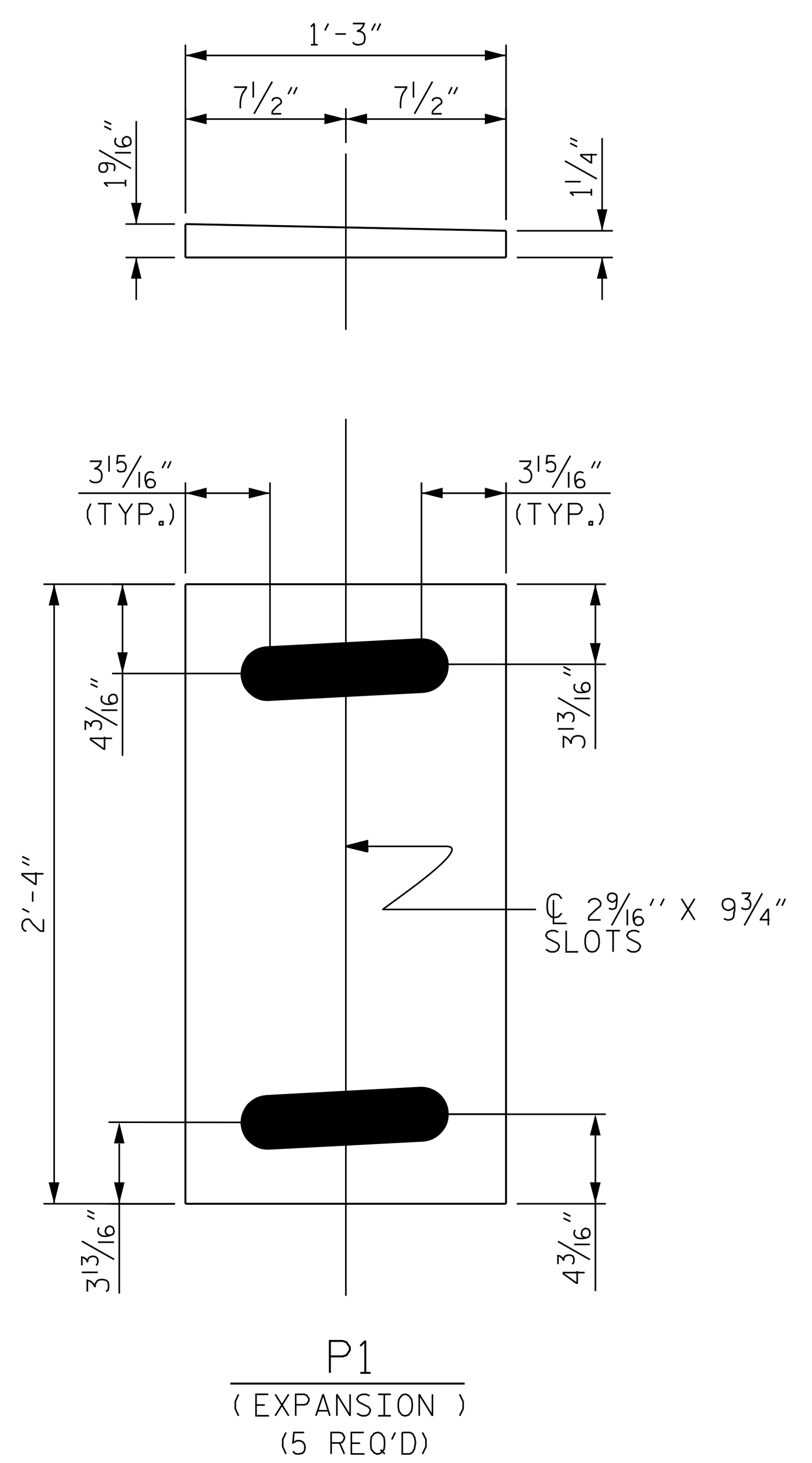
SHEET NO. S1-36

TOTAL SHEETS 92

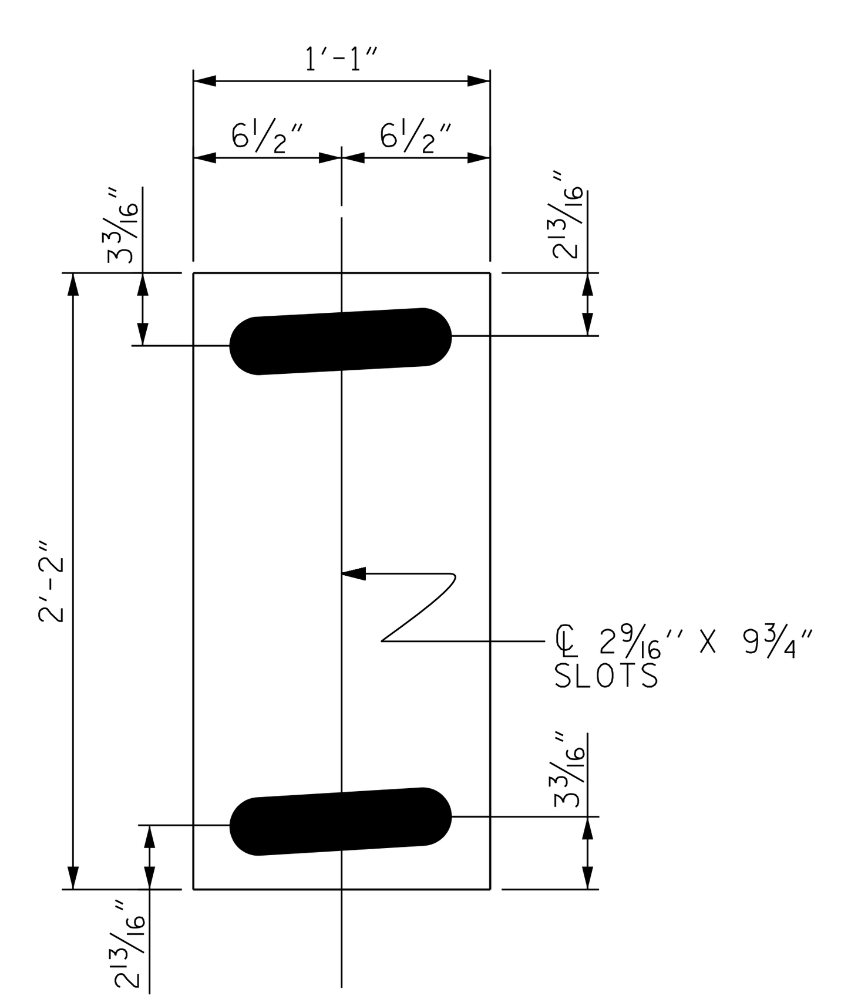
STD. NO. LB1



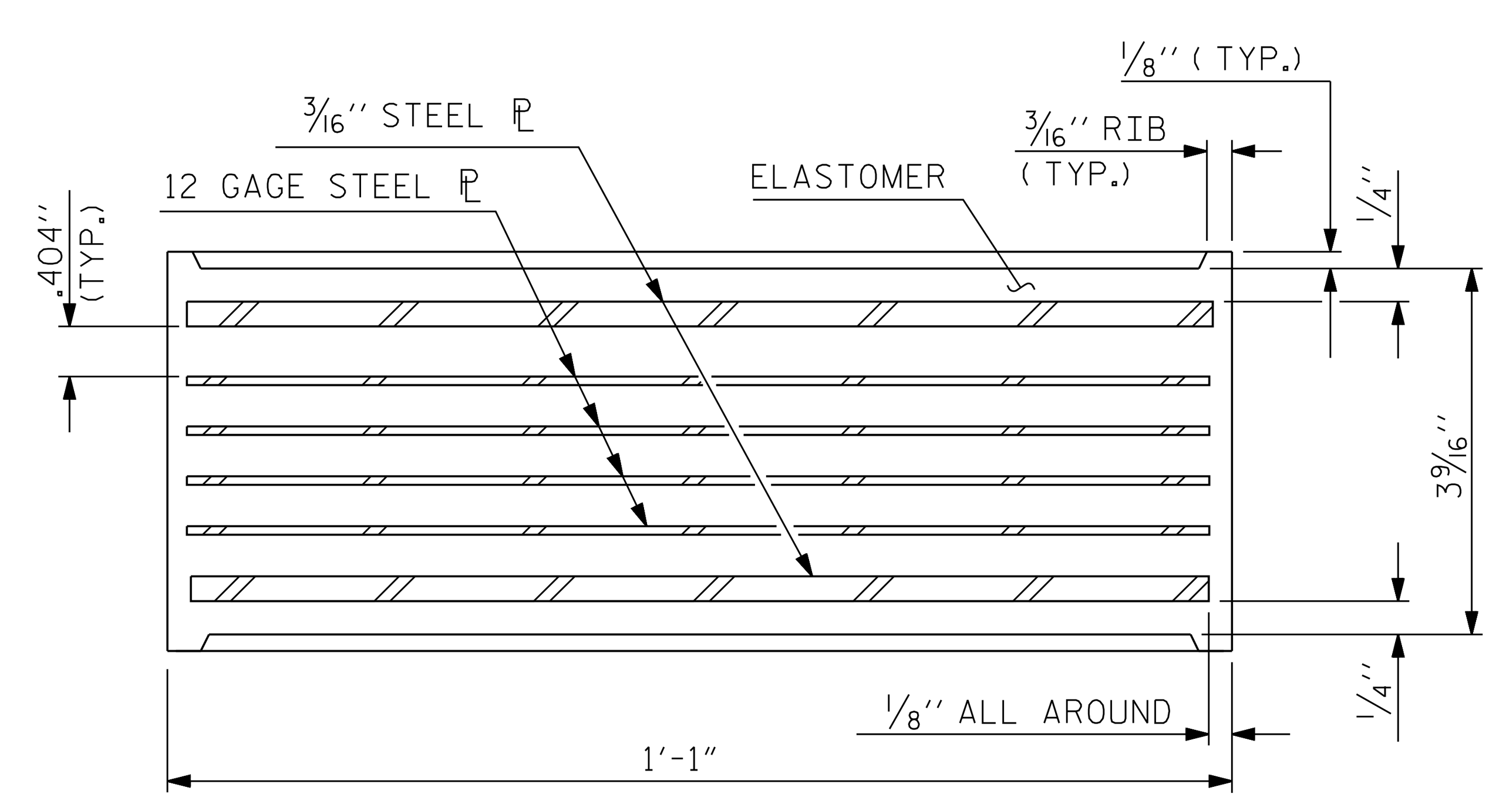
SOLE PLATE PLACEMENT DETAIL



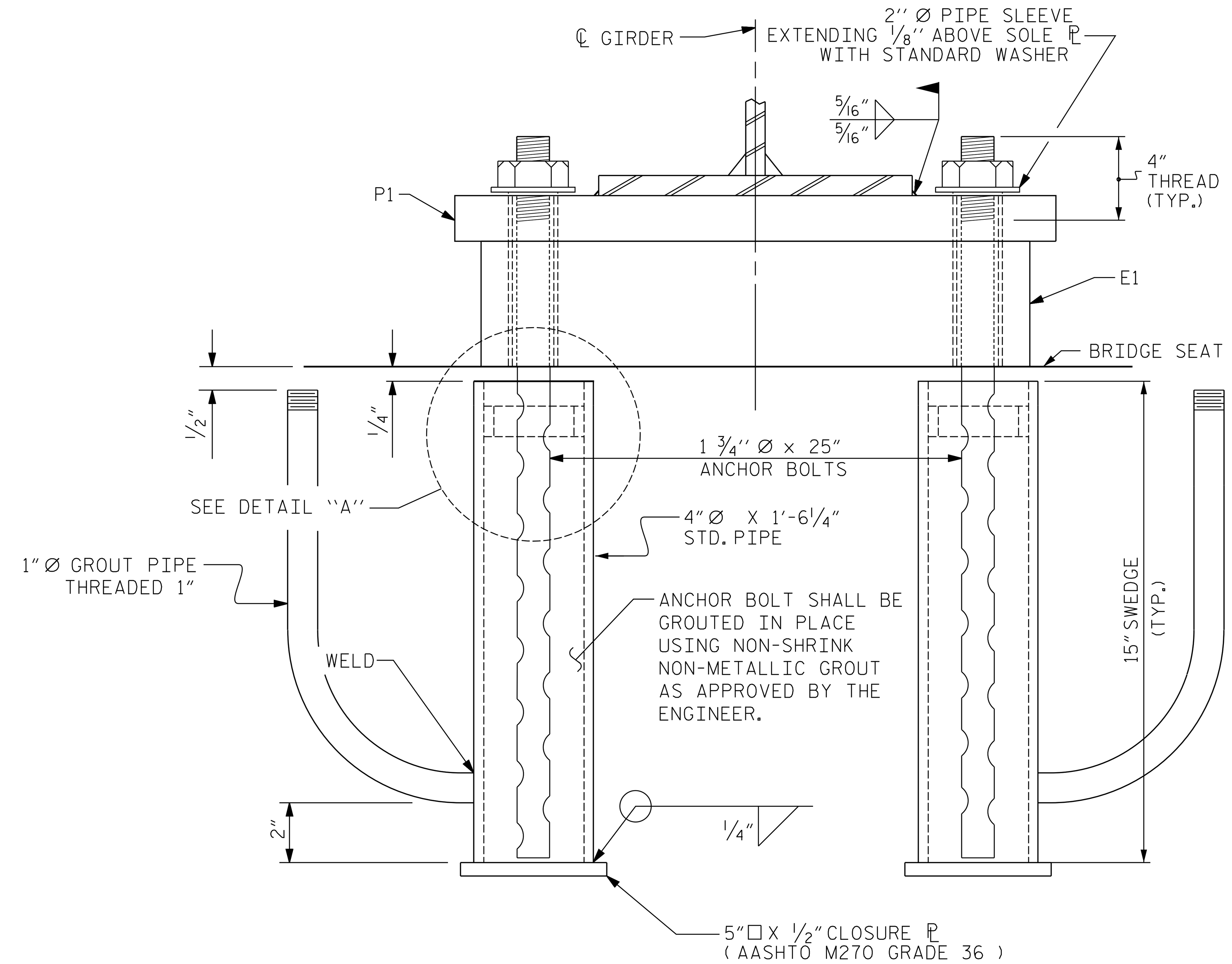
SOLE PLATE DETAILS ("P")



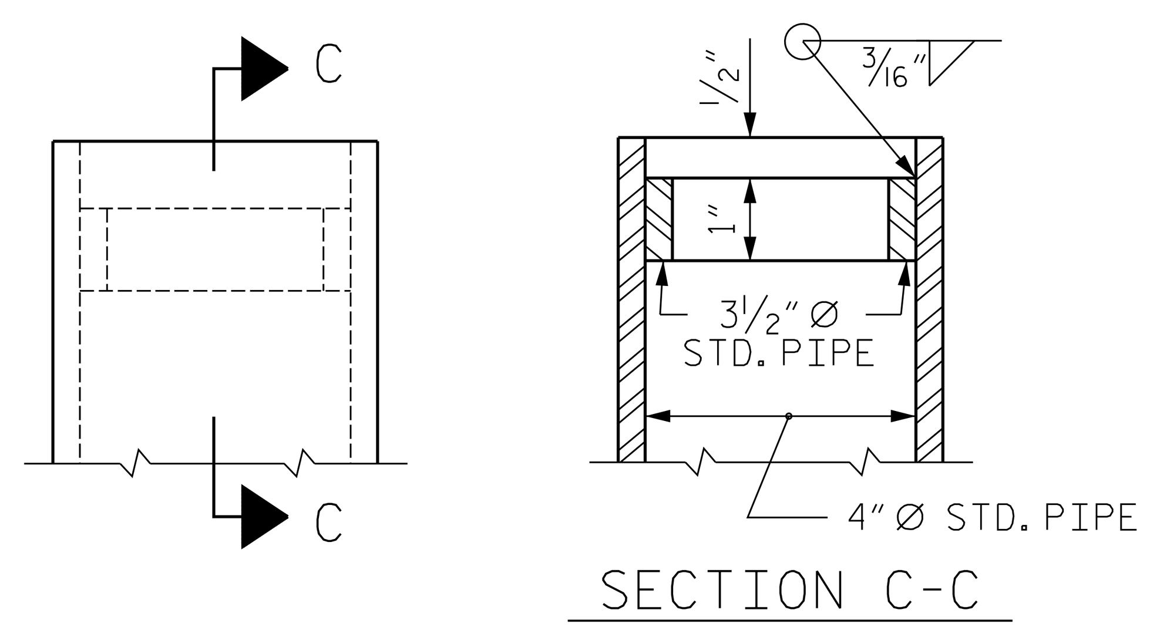
PLAN VIEW OF ELASTOMERIC BEARING



TYPICAL SECTION OF ELASTOMERIC BEARING



EXPANSION END VIEW



DETAIL "A"

NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

THE 2" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.

THE PAYMENT FOR THE PIPE SLEEVES SHALL BE INCLUDED IN THE SEVERAL PAY ITEMS.

FOR PAINTED STRUCTURAL STEEL (EXCLUDING AASHTO M270 GRADE 50W), SOLE PLATES, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

FOR AASHTO M270 GRADE 50W STRUCTURAL STEEL, SOLE PLATE SHALL BE AASHTO M270 GRADE 50W AND SHALL NOT BE GALVANIZED. ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

WHEN FIELD WELDING THE SOLE PLATE TO THE GIRDER FLANGE, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

THE CLOSURE PLATE, GROUT PIPE, AND STANDARD PIPE FOR THE EXPANSION ASSEMBLY NEED NOT BE GALVANIZED.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FOLLOWING PROCEDURE, WHICH MAY BE REQUIRED BY THE ENGINEER, TO RESET ELASTOMERIC BEARINGS DUE TO GIRDER TRANSLATION AND END ROTATION:

1. ONCE THE DECK HAS CURED, THE GIRDERS SHALL BE JACKED THEN THE ANCHOR BOLTS AND ELASTOMERIC BEARING SLOTS CENTERED AS NEARLY AS PRACTICAL ABOUT THE BEARING STIFFENER. THIS OPERATION SHALL BE PERFORMED AT APPROXIMATELY 60° F
2. AFTER CENTERING THE ELASTOMERIC BEARING SLOTS AND ANCHOR BOLTS, THE ANCHOR BOLTS SHALL BE GROUTED.

THE CONTRACTOR MAY PROPOSE ALTERNATE METHODS, PROVIDED DETAILS ARE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
	335 k

7/26/2022

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Spartanburg, SC 864·574·4775
Charleston, SC 843·974·5650
Middlesboro, KY 606·248·6600
Atlanta, GA 770·627·3590

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

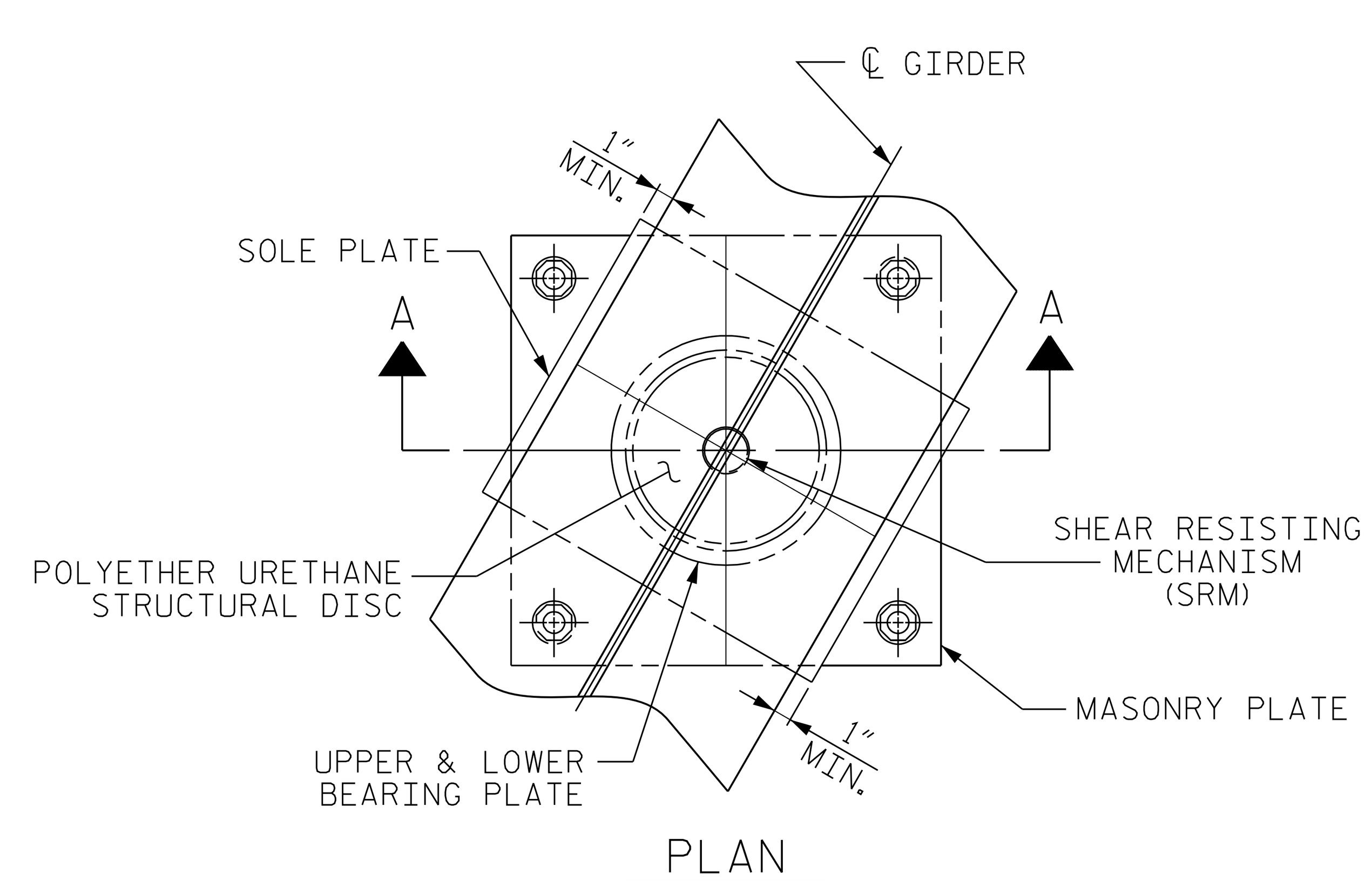
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ELASTOMERIC BEARING DETAILS

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-37
TOTAL SHEETS 92

DWN. BY: NCW DATE: 03/2022
CHKD. BY: PRG DATE: 03/2022
DES. EGR. OF RECORD: PRG DATE: 03/2022



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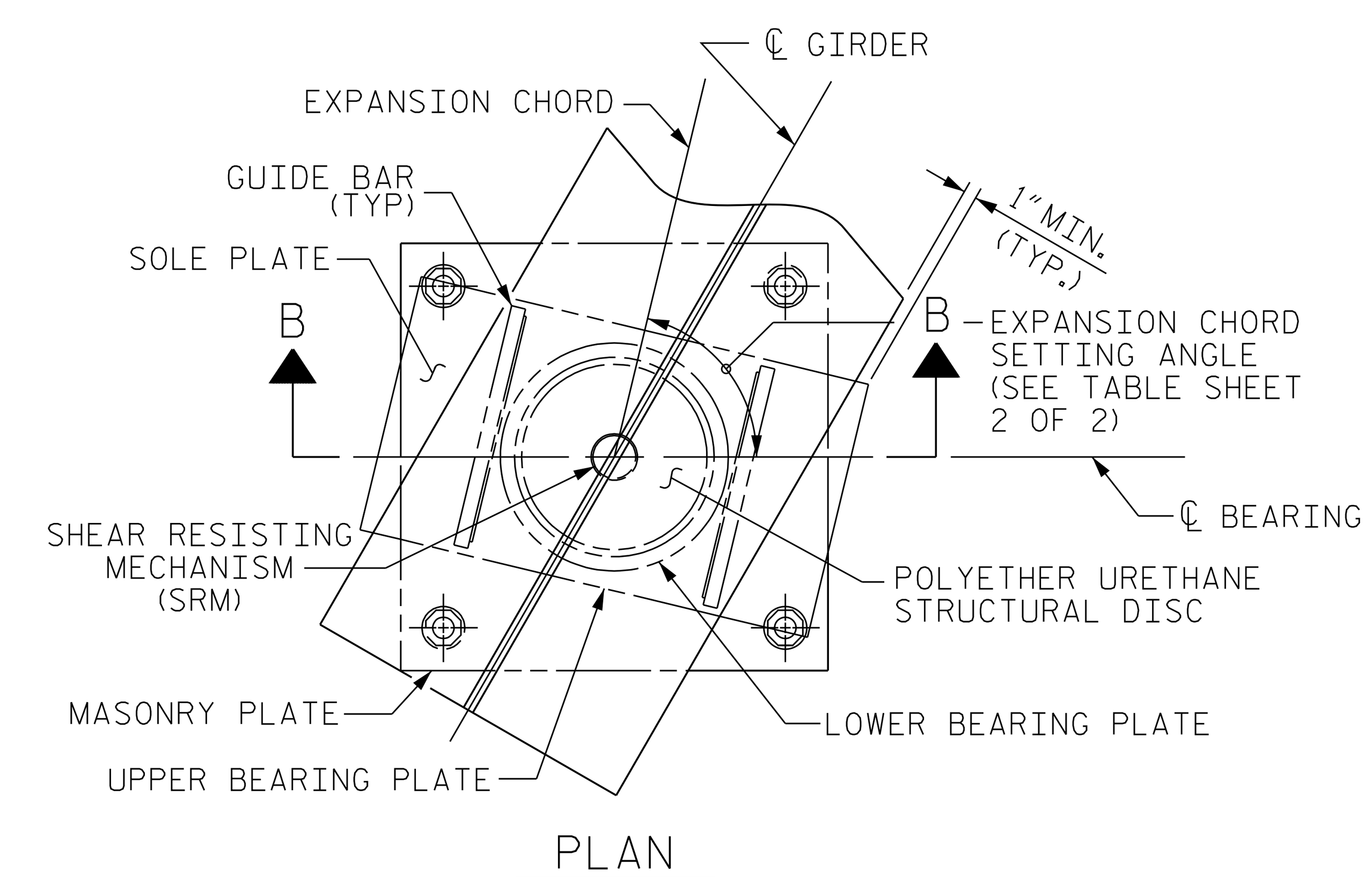

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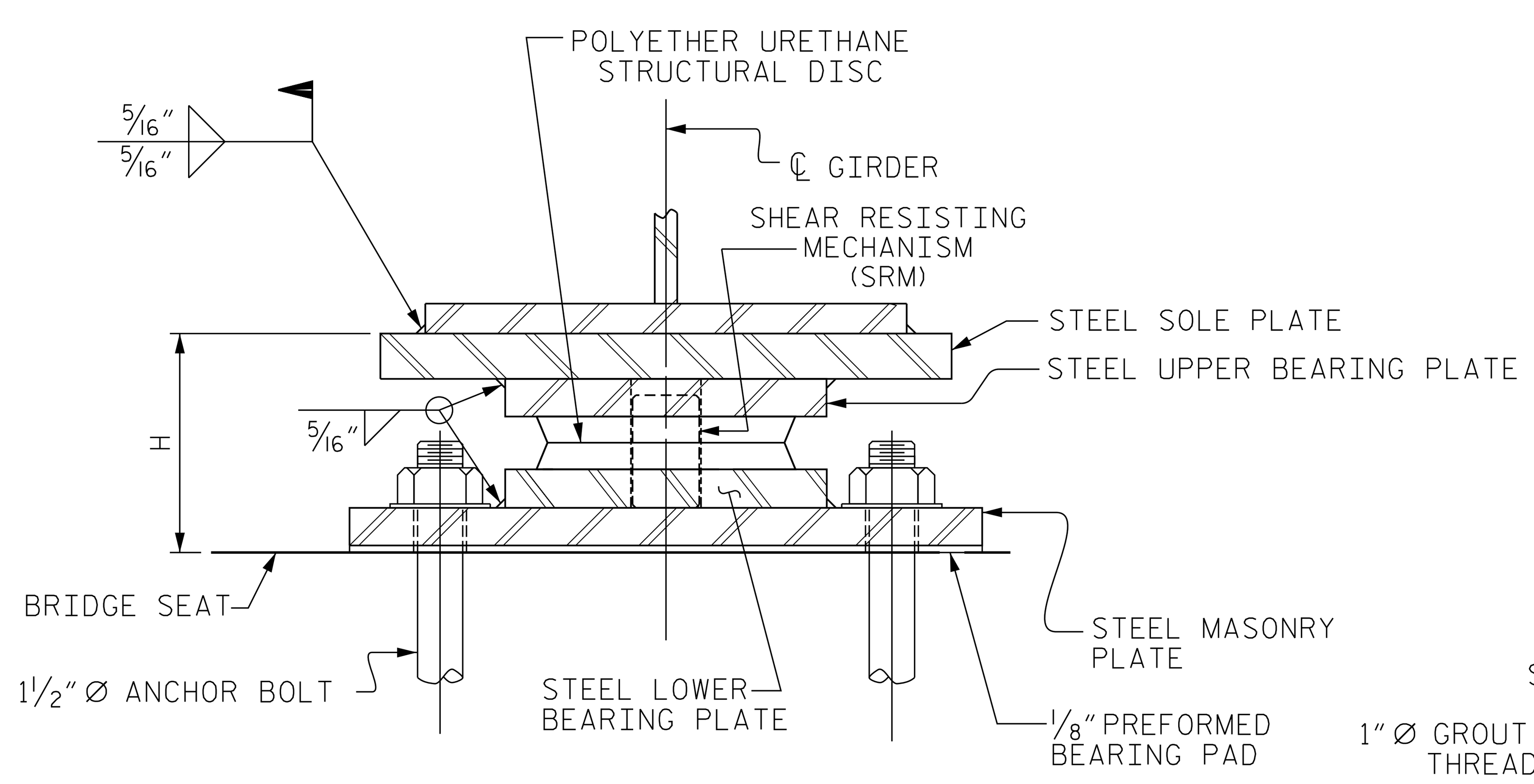
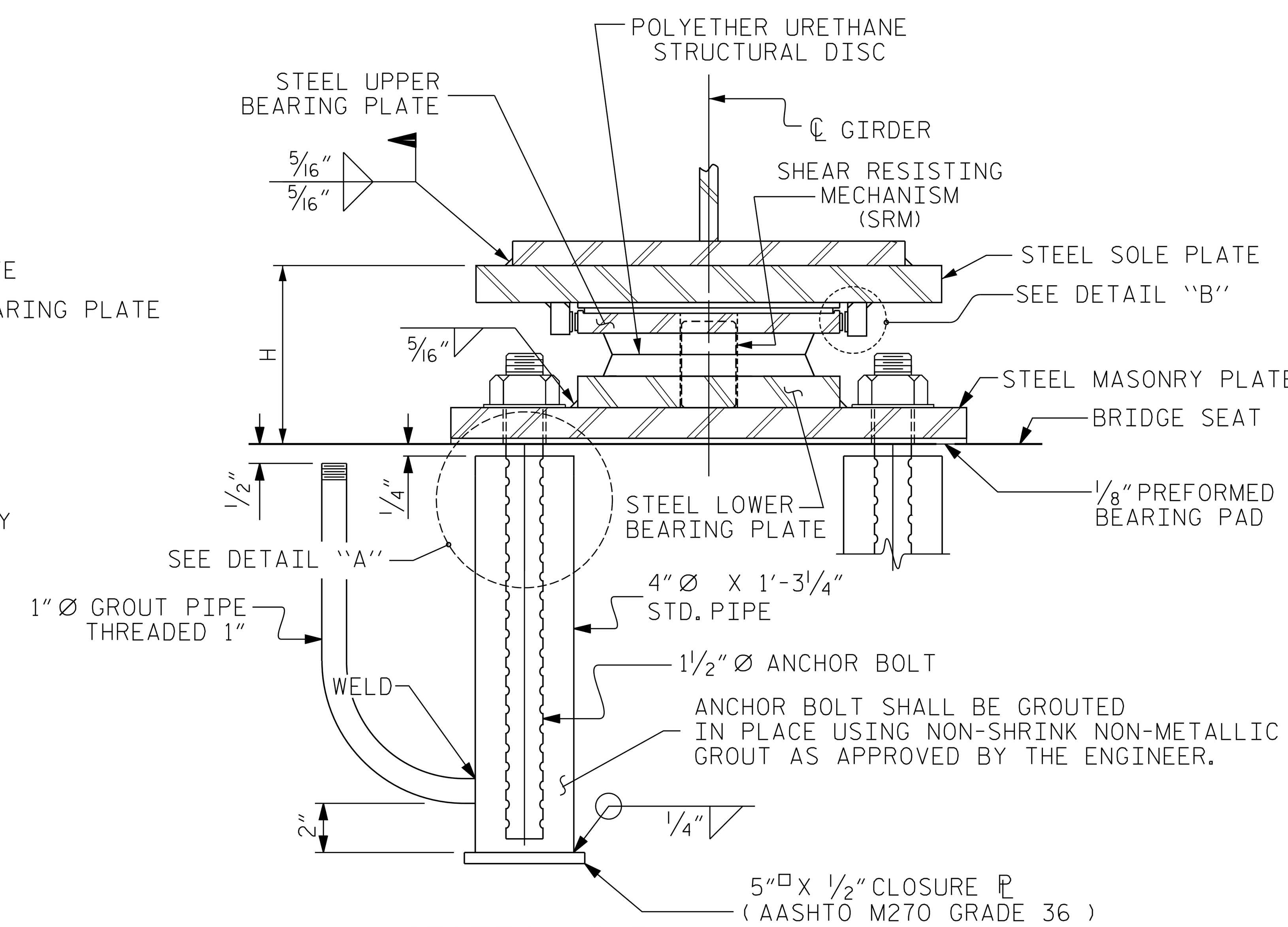


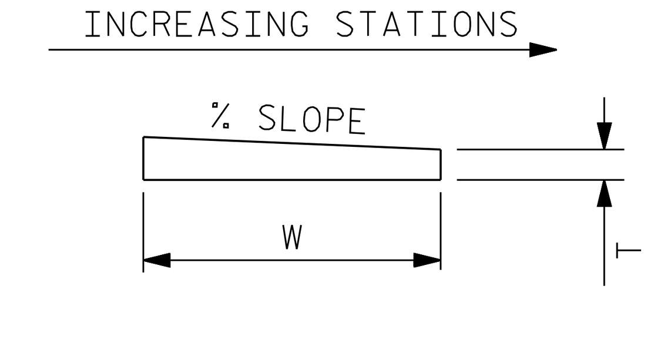
SECTION A-A

DB1, DB2, DB5, DB6 FIXED



SECTION B-B

DB3, DB4, DB7 EXP.



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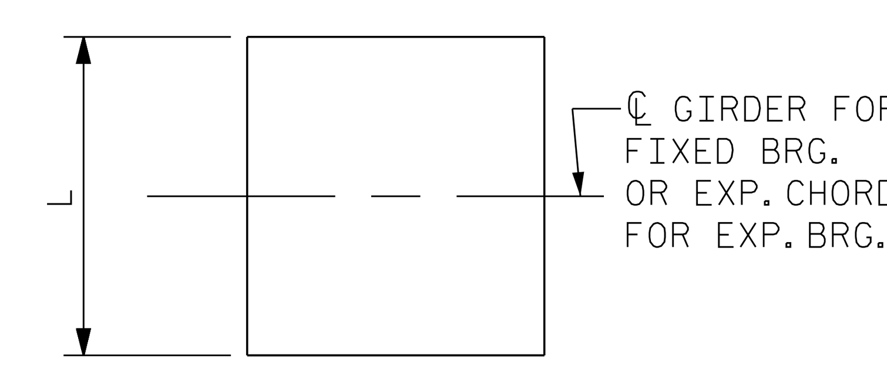


PLAN

NOTE:
DIMENSIONS "L", "W", AND "T" SHALL BE DETERMINED BY THE BEARING MANUFACTURER. SET DIMENSION "L" SUCH THAT THE MINIMUM EDGE DISTANCE TO THE GIRDER FLANGE IS 1".

SOLE PLATE DETAILS

NOTES

FOR DISC BEARINGS, SEE SPECIAL PROVISIONS.

ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 50W OR GRADE 50.

AT ALL POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS SHALL BE FINGER-TIGHTENED PLUS AN ADDITIONAL ¼ TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

WHEN WELDING THE SOLE PLATE TO THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE BEARING DOES NOT EXCEED 250°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE TFE OR URETHANE DISC.

AFTER BEARING ASSEMBLY IS IN PLACE AND ANCHOR BOLTS HAVE BEEN FINALLY POSITIONED, THEY SHALL BE GROUTED IN PLACE AS SHOWN.

THE CLOSURE PLATE, GROUT PIPE, AND STANDARD PIPE FOR THIS ASSEMBLY NEED NOT BE GALVANIZED.

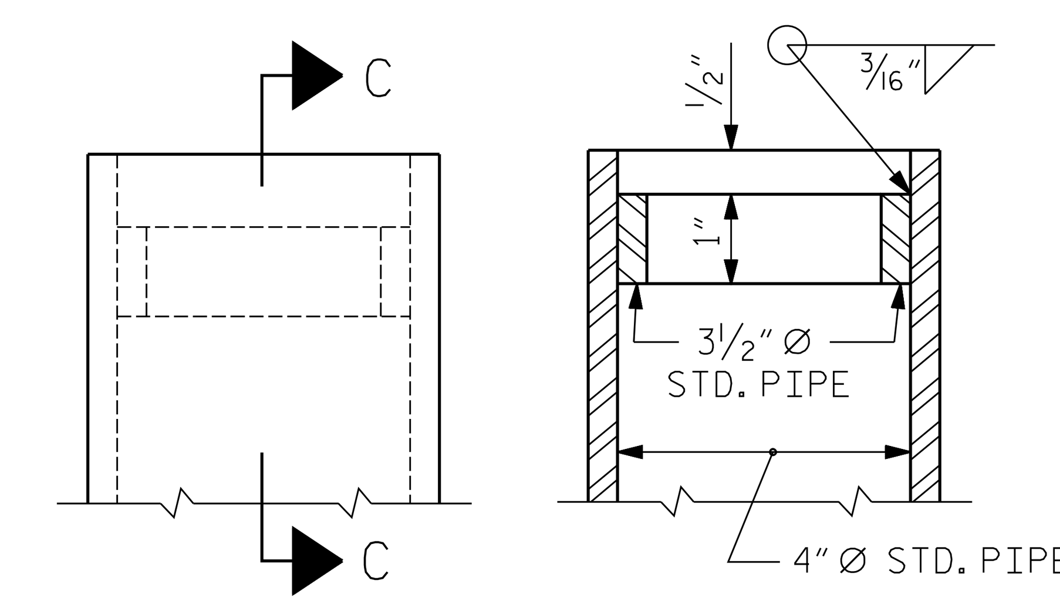
SOLE PLATES SHOULD BE WELDED TO GIRDER FLANGES AND ANCHOR BOLTS SHOULD BE GROUTED BEFORE FALSEWORK IS PLACED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

FOR ATTACHMENT OF THE STAINLESS STEEL SHEETS TO THE STEEL SOLE PLATE AND GUIDE BARS, AS WELL AS THE TOP AND SIDE PTFE SHEETS TO THE STEEL UPPER BEARING PLATE, SEE SPECIAL PROVISIONS.

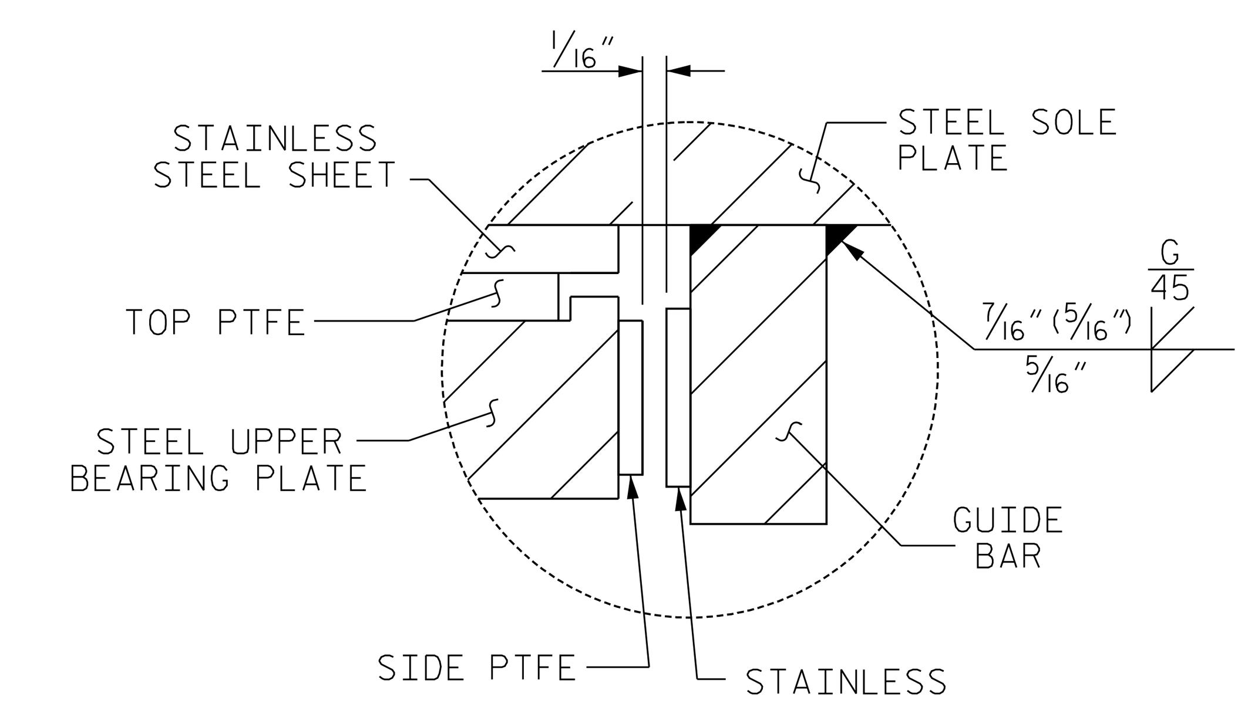
FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE MINIMUM ROTATIONAL CAPACITY FOR ALL BEARINGS SHALL BE 0.02 RADIANS.

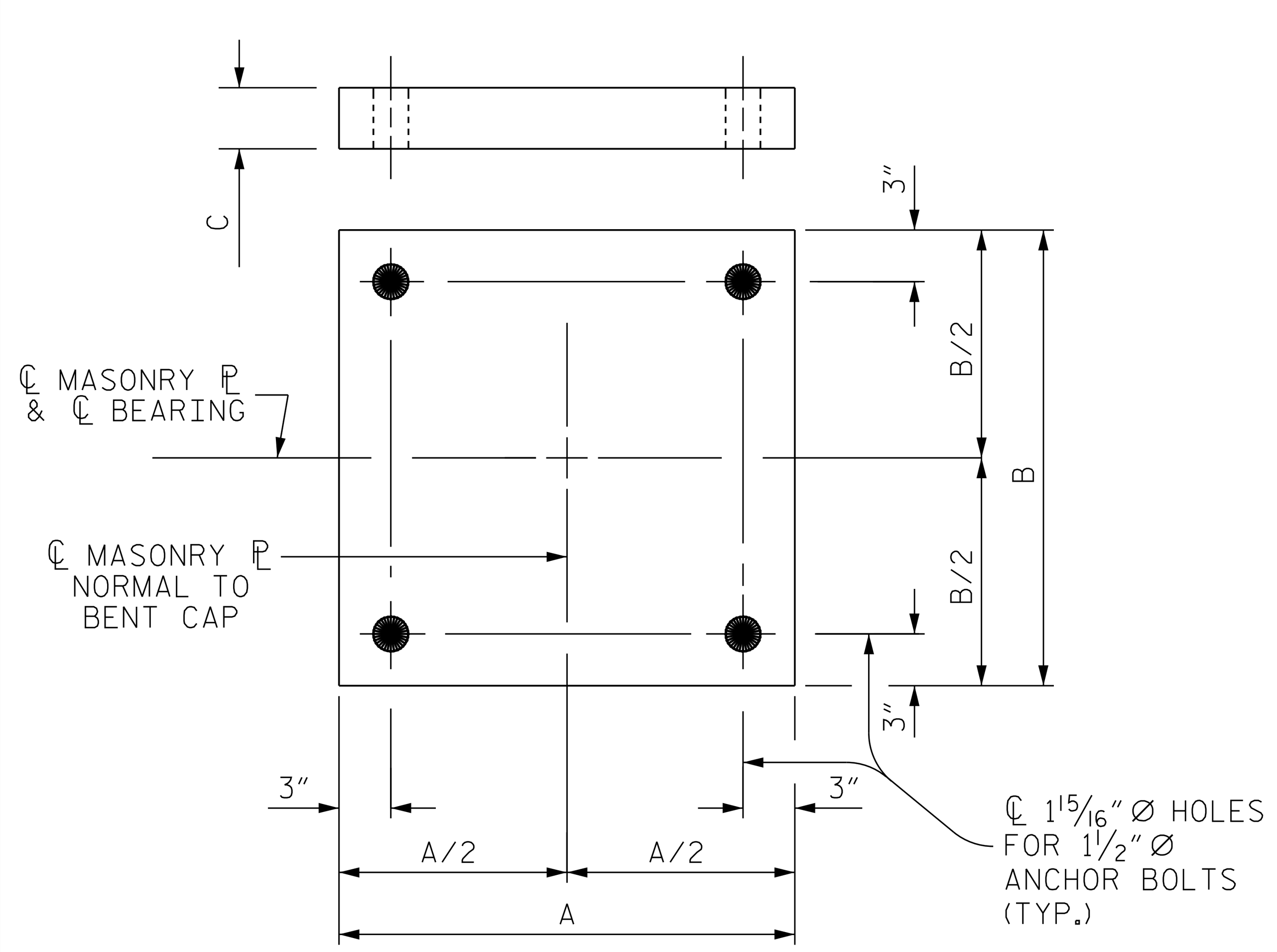


SECTION C-C

DETAIL "A"



DETAIL "B"



PLAN

MASONRY PLATE DETAILS

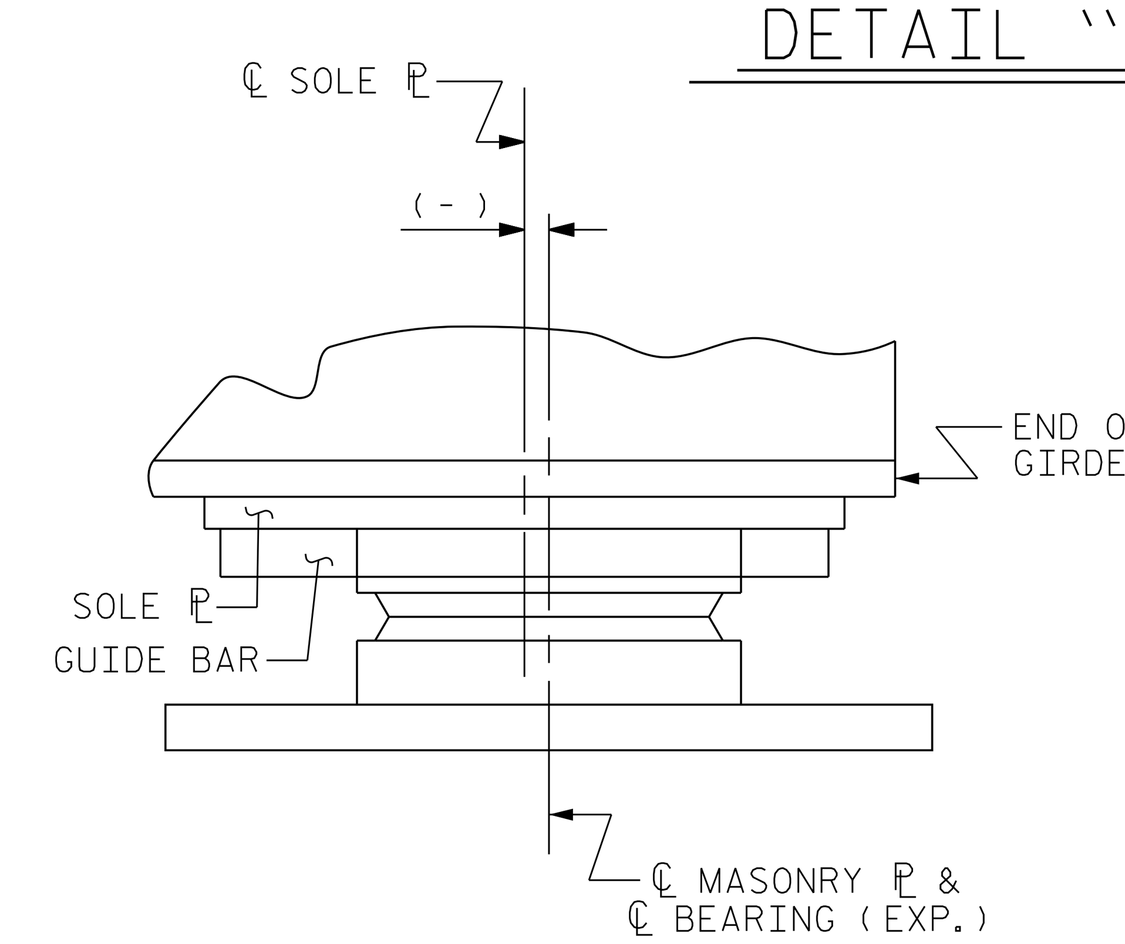


PLATE SETTING DATA (EXPANSION DISC BEARINGS)				
LOCATION	TEMPERATURE AT TIME OF SETTING			*
	45° F	60° F	90° F	
BENT 3 BACK	¼"	0"	9/16"	⅛"
BENT 3 AHEAD	5/16"	0"	¾"	⅛"
END BENT 2	5/16"	0"	¾"	⅛"

* CORRECTION FOR END ROTATION DUE TO WEIGHT OF SLAB AND COMPOSITE DEAD LOAD.

TEMPERATURE SETTING DETAIL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL — HARDY L. WILLIS
DocuSigned by: Hardy Willis
7/26/2022

Vaughn & Melton Consulting Engineers — Asheville, North Carolina 828-253-2796 — Raleigh, NC 919-977-9455 — Charlotte, NC 704-357-0488 — Boone, NC 828-355-9933 — Tri-Cities, TN 423-467-8401 — Knoxville, TN 865-546-5800 — Spartanburg, SC 864-574-4775 — Charleston, SC 843-974-5650 — Middlesboro, KY 606-248-6600 — Atlanta, GA 770-627-3590

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. U-2579AA
FORSYTH COUNTY
STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

DISC BEARING DETAILS

DRAWN BY : TMG 08/13 | REV. 12/17 MAA/THC
CHECKED BY : EKP 10/13

DWN. BY: NCW DATE: 03/2022
CHKD. BY: PRG DATE: 03/2022
DES. EGR. OF RECORD: PRG DATE: 03/2022

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

REVISIONS

SHEET NO. S1-38
TOTAL SHEETS 92

STD. NO. DB1

DESIGNATIONS		LOCATION	NUMBER OF BEARINGS	DIMENSIONS						LOADS AND MOVEMENT				
				BEARING	MASONRY PLATE			SOLE PLATE		UNFACTORED VERTICAL LOAD (KIPS)			FACTORED HORIZONTAL LOAD (KIPS)	ONE-WAY MOVEMENT (IN.)
										DEAD		LIVE		
BEARINGS	MASONRY ℄			H (IN.)	A (IN.)	B (IN.)	C (IN.)	TOP SLOPE (%)	L (IN.)	DC	DW	LL+IM		
DB1	M1	BENT 1	5	5 13/16"	22 1/2	22 1/2	3/4	2.5231	-	203	28	178	80	0
DB2	M2	BENT 2	5	6 11/16"	26 1/2	26 1/2	1	2.5231	-	418	53	196	142	0
DB3	M3	BENT 3 BACK	5	7 1/16"	27	27	3/4	2.5231	-	201	24	122	71	1.835
DB4	M4	BENT 3 AHEAD	5	6 3/16"	27	27	3/4	2.5231	-	213	25	128	75	2.313
DB5	M5	BENT 4	5	7 5/16"	28 1/2	28 1/2	1	2.5231	-	487	58	223	164	0
DB6	M6	BENT 5	5	6 11/16"	26 1/2	26 1/2	1	2.5231	-	419	50	206	143	0
DB7	M7	END BENT 2	5	5 13/16"	25 1/2	25 1/2	3/4	2.1344	-	152	19	104	56	2.313

EXPANSION CHORD SETTING ANGLE

GIRDER	LOCATION		
	BENT 3 BACK	BENT 3 AHEAD	END BENT 2
1	85°-33'-05"	86°-16'-42"	90°
2	85°-33'-06"	86°-16'-56"	90°
3	85°-33'-07"	86°-17'-10"	90°
4	85°-33'-08"	86°-17'-24"	90°
5	85°-33'-09"	86°-17'-38"	90°

DocuSigned by: Hardy Willis
7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Boone, NC 828-355-9933
Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Atlanta, GA 770-627-3590
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

DISC BEARING DETAILS

DRAWN BY : TMG 08/13	REV. 12/17 MAA/THC
CHECKED BY : EKP 10/13	

DWN. BY: NCW DATE: 03/2022
CHKD. BY: PRG DATE: 03/2022
DES. EGR. OF RECORD: PRG DATE: 03/2022

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-39
TOTAL SHEETS 92

STD. NO. DB1

wdtrucher
DGN: V:\NC\Structures\031748-44 U-2579AA STPS\Structures\SITE 1 - FLYCA NorthPlans\FINAL PLANS\40_017_U2579AA_SMU_B002_039.dgn
TIME: 10:03 AM on Tuesday, July 26, 2022

DEAD LOAD DEFLECTION AND CAMBER

SPAN A

GIRDER 1

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60	18/60	19/60	20/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	0.002	0.003	0.005	0.007	0.008	0.010	0.011	0.013	0.014	0.015	0.017	0.018	0.019	0.020	0.021	0.022	0.023	0.024	0.025	0.026
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	0.004	0.009	0.013	0.017	0.021	0.025	0.029	0.033	0.037	0.041	0.044	0.048	0.051	0.054	0.056	0.059	0.061	0.064	0.066	0.067
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	0.001	0.001	0.002	0.002	0.003	0.003	0.004	0.004	0.005	0.005	0.005	0.006	0.006	0.007	0.007	0.007	0.007	0.008	0.008	0.008
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.007	0.013	0.019	0.026	0.032	0.038	0.044	0.050	0.056	0.061	0.066	0.071	0.076	0.080	0.085	0.088	0.092	0.095	0.099	0.101
VERTICAL CURVE ORDINATE ↑	0.000	0.004	0.008	0.012	0.015	0.019	0.022	0.024	0.027	0.029	0.031	0.032	0.033	0.034	0.038	0.036	0.036	0.036	0.036	0.035	0.034
SUPER ELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0"	1/8"	1/4"	3/8"	1/2"	5/8"	11/16"	13/16"	15/16"	1"	1 1/8"	1 3/16"	1 1/4"	1 5/16"	1 3/8"	1 7/16"	1 1/2"	1 9/16"	1 9/16"	1 5/8"	1 5/8"

SIXTIETH POINTS	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60	36/60	37/60	38/60	39/60	40/60	41/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.026	0.027	0.027	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.027	0.027	0.026	0.026	0.025	0.024	0.023	0.023	0.022
DEFLECTION DUE TO WT. OF SLAB * ↓	0.069	0.070	0.071	0.072	0.073	0.074	0.074	0.074	0.074	0.073	0.073	0.072	0.071	0.069	0.068	0.066	0.064	0.063	0.060	0.058	0.056
DEFLECTION DUE TO WT. OF RAIL ↓	0.008	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.008	0.008	0.008	0.008	0.008	0.007	0.007	0.007
TOTAL DEAD LOAD DEFLECTION ↓	0.104	0.106	0.107	0.109	0.110	0.111	0.111	0.111	0.111	0.110	0.109	0.108	0.106	0.105	0.102	0.100	0.097	0.094	0.091	0.088	0.084
VERTICAL CURVE ORDINATE ↑	0.033	0.033	0.032	0.031	0.030	0.029	0.028	0.027	0.027	0.026	0.025	0.024	0.023	0.022	0.021	0.021	0.020	0.019	0.018	0.017	0.016
SUPER ELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	1 5/8"	1 11/16"	1 11/16"	1 11/16"	1 11/16"	1 11/16"	1 11/16"	1 11/16"	1 5/8"	1 5/8"	1 5/8"	1 9/16"	1 9/16"	1 1/2"	1 1/2"	1 7/16"	1 3/8"	1 3/8"	1 5/16"	1 1/4"	1 3/16"

SIXTIETH POINTS	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60	54/60	55/60	56/60	57/60	58/60	59/60	60/60		
DEFLECTION DUE TO WT. OF STEEL ↓	0.021	0.020	0.019	0.017	0.016	0.015	0.014	0.013	0.012	0.010	0.009	0.008	0.007	0.006	0.004	0.003	0.002	0.001	0.000		
DEFLECTION DUE TO WT. OF SLAB * ↓	0.053	0.050	0.047	0.045	0.041	0.038	0.035	0.032	0.029	0.026	0.023	0.020	0016	0.013	0.011	0.008	0.005	0.002	0.000		
DEFLECTION DUE TO WT. OF RAIL ↓	0.007	0.006	0.006	0.005	0.005	0.005	0.004	0.004	0.004	0.003	0.003	0.002	0.002	0.002	0.001	0.001	0.001	0.000	0.000		
TOTAL DEAD LOAD DEFLECTION ↓	0.080	0.076	0.072	0.067	0.063	0.058	0.054	0.049	0.044	0.039	0.035	0.030	0.025	0.021	0.016	0.012	0.008	0.004	0.000		
VERTICAL CURVE ORDINATE ↑	0.015	0.015	0.014	0.013	0.012	0.011	0.010	0.009	0.009	0.008	0.007	0.006	0.005	0.004	0.003	0.003	0.002	0.001	0.000		
SUPER ELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
REQUIRED CAMBER ↑	1 1/8"	1 1/16"	1"	15/16"	7/8"	13/16"	3/4"	11/16"	5/8"	9/16"	1/2"	7/16"	1/2"	5/16"	1/4"	3/16"	1/8"	1/16"	0"		

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.

DEAD LOAD DEFLECTION AND CAMBER

SPAN B

GIRDER 1

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	-0.001	-0.002	-0.003	-0.003	-0.004	-0.004	-0.005	-0.006	-0.006	-0.007	-0.007	-0.008	-0.008	-0.008	-0.009	-0.009	-0.010
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	-0.002	-0.004	-0.005	-0.007	-0.008	-0.010	-0.011	-0.012	-0.013	-0.014	-0.014	-0.015	-0.016	-0.017	-0.017	-0.018	-0.018
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	0.000	0.000	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
TOTAL DEAD LOAD DEFLECTION ↓	0.000	-0.003	-0.006	-0.009	-0.011	-0.013	-0.017	-0.017	-0.019	-0.020	-0.022	-0.023	-0.025	-0.026	-0.027	-0.028	-0.029	-0.030
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPER ELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0"	-1/16"	-1/16"	-1/8"	-1/8"	-1/8"	-3/16"	-3/16"	-1/4"	-1/4"	-1/4"	-1/4"	-5/16"	-5/16"	-5/16"	-5/16"	-3/8"	-3/8"

SIXTIETH POINTS	18/60	19/60	20/60	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60
DEFLECTION DUE TO WT. OF STEEL ↓	-0.010	-0.010	-0.011	-0.011	-0.012	-0.012	-0.012	-0.013	-0.013	-0.013	-0.014	-0.014	-0.014	-0.014	-0.015	-0.015	-0.015	-0.015
DEFLECTION DUE TO WT. OF SLAB * ↓	-0019	-0.019	-0.020	-0.020	-0.021	-0.021	-0.022	-0.022	-0.023	-0.023	-0.024	-0.024	-0.025	-0.025	-0.025	-0.026	-0.026	-0.026
DEFLECTION DUE TO WT. OF RAIL ↓	-0.002	-0.002	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003
TOTAL DEAD LOAD DEFLECTION ↓	-0.031	-0.032	-0.033	-0.034	-0.035	-0.036	-0.037	-0.038	-0.039	-0.039	-0.040	-0.041	-0.042	-0.042	-0.043	-0.044	-0.044	-0.045
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPER ELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	-3/8"	-3/8"	-3/8"	-7/16"	-7/16"	-7/16"	-7/16"	-7/16"	-7/16"	-1/2"	-1/2"	-1/2"	-1/2"	-1/2"	-1/2"	-1/2"	-1/2"	-9/16"

SIXTIETH POINTS	36/60	37/60	38/60	39/60	40/60	41/60	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60
DEFLECTION DUE TO WT. OF STEEL ↓	-0.015	-0.016	-0.016	-0.016	-0.016	-0.016	-0.015	-0.015	-0.015	-0.015	-0.014	-0.014	-0.013	-0.013	-0.012	-0.011	-0.010	-0.010
DEFLECTION DUE TO WT. OF SLAB * ↓	-0.026	-0.027	-0.027	-0.027	-0.027	-0.026	-0.026	-0.026	-0.026	-0.025	-0.024	-0.024	-0.023	-0.022	-0.021	-0.019	-0.018	-0.016
DEFLECTION DUE TO WT. OF RAIL ↓	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.002	-0.002
TOTAL DEAD LOAD DEFLECTION ↓	-0.045	-0.045	-0.046	-0.046	-0.046	-0.045	-0.045	-0.045	-0.044	-0.043	-0.042	-0.041	-0.039	-0.037	-0.035	-0.033	-0.031	-0.028
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPER ELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	-9/16"	-9/16"	-9/16"	-9/16"	-9/16"	-9/16"	-9/16"	-9/16"	-1/2"	-1/2"	-1/2"	-1/2"	-7/16"	-7/16"	-7/16"	-3/8"	-3/8"	-5/16"

SIXTIETH POINTS	54/60	55/60	56/60	57/60	58/60	59/60	60/60											
DEFLECTION DUE TO WT. OF STEEL ↓	-0.009	-0.007	-0.006	-0.005	-0.003	-0.002	0.000											
DEFLECTION DUE TO WT. OF SLAB * ↓	-0.015	-0.013	-0.011	-0.008	-0.006	-0.003	0.000											
DEFLECTION DUE TO WT. OF RAIL ↓	-0.002	-0.002	-0.001	-0.001	-0.001	0.000	0.000											
TOTAL DEAD LOAD DEFLECTION ↓	-0.025	-0.022	-0.018	-0.014	-0.010	-0.005	0.000											
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000											
SUPER ELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000											
REQUIRED CAMBER ↑	-5/16"	-1/4"	-3/16"	-3/16"	-1/8"	-1/16"	0"											

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.

NOTES

SLOPE FOR THE ZERO CAMBER LINE VARIES.

VALUES ARE AT THE SIXTIETH POINTS BETWEEN CENTERLINE OF BEARINGS.

DEFLECTIONS AND ORDINATES ARE IN FEET (DECIMAL FORM).

REQUIRED CAMBER VALUES ARE IN INCHES (FRACTION FORM).

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL — DocuSigned by: Hardy Willis — 7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

V&M
Vaughn & Melton
Consulting Engineers
Asheville, North Carolina 828-253-2796
Boone, NC 828-355-9933
Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Atlanta, GA 770-627-3590
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 1 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE DEADLOAD DEFLECTION AND CAMBER ORDINATES UNIT 1

DWN. BY: AW	DATE: 11/2021
CHKD. BY: PRG	DATE: 11/2021
DES. EGR. OF RECORD: PRG	DATE: 11/2021

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-40

TOTAL SHEETS 92

wdtrutcher
DGN: V:\NC\Structures\031748-44 U-2579AA STRS\Structures\SITE 1 - FLYCA North\Plans\FINAL PLANS\40I_079_U2579AA_SMU_DL01_040.dgn
TIME: 10:03 AM on Tuesday, July 26, 2022

DEAD LOAD DEFLECTION AND CAMBER

SPAN C

GIRDER 1

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60	18/60	19/60	20/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	0.003	0.007	0.011	0.015	0.019	0.024	0.029	0.034	0.039	0.043	0.048	0.053	0.058	0.063	0.068	0.072	0.077	0.081	0.085	0.089
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	0.006	0.012	0.019	0.027	0.034	0.043	0.051	0.059	0.068	0.077	0.086	0.094	0.103	0.111	0.120	0.128	0.136	0.143	0.151	0.158
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.010	0.011	0.012	0.013	0.014	0.016	0.017	0.018	0.019	0.020	0.021	0.022
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.010	0.021	0.033	0.045	0.059	0.072	0.087	0.101	0.116	0.131	0.146	0.161	0.175	0.190	0.204	0.218	0.231	0.244	0.257	0.268
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0"	1/8"	1/4"	3/8"	9/16"	11/16"	7/8"	1 1/16"	1 3/16"	1 3/8"	1 1/8"	1 3/4"	1 15/16"	2 1/8"	2 5/16"	2 7/16"	2 5/8"	2 13/16"	2 15/16"	3 1/16"	3 1/4"

SIXTIETH POINTS	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60	36/60	37/60	38/60	39/60	40/60	41/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.092	0.096	0.099	0.102	0.104	0.107	0.109	0.110	0.112	0.113	0.114	0.114	0.114	0.114	0.113	0.112	0.111	0.109	0.107	0.104	0.102
DEFLECTION DUE TO WT. OF SLAB * ↓	0.164	0.170	0.176	0.181	0.185	0.190	0.193	0.196	0.199	0.200	0.202	0.203	0.203	0.202	0.201	0.199	0.197	0.194	0.190	0.186	0.181
DEFLECTION DUE TO WT. OF RAIL ↓	0.023	0.024	0.025	0.025	0.026	0.027	0.027	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.027	0.027	0.026	0.025
TOTAL DEAD LOAD DEFLECTION ↓	0.279	0.290	0.299	0.308	0.316	0.323	0.329	0.334	0.338	0.342	0.344	0.345	0.345	0.344	0.342	0.339	0.335	0.330	0.027	0.316	0.308
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	3 3/8"	3 1/2"	3 9/16"	3 11/16"	3 13/16"	3 7/8"	3 15/16"	4"	4 1/16"	4 1/8"	4 1/8"	4 1/8"	4 1/8"	4 1/8"	4 1/8"	4 1/16"	4"	3 15/16"	3 7/8"	3 13/16"	3 11/16"

SIXTIETH POINTS	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60	54/60	55/60	56/60	57/60	58/60	59/60	60/60		
DEFLECTION DUE TO WT. OF STEEL ↓	0.099	0.095	0.092	0.088	0.083	0.079	0.074	0.069	0.063	0.058	0.052	0.046	0.040	0.006	0.027	0.020	0.014	0.007	0.000		
DEFLECTION DUE TO WT. OF SLAB * ↓	0.175	0.169	0.163	0.156	0.148	0.140	0.131	0.122	0.113	0.103	0.092	0.082	0.070	0.013	0.048	0.005	0.024	0.012	0.000		
DEFLECTION DUE TO WT. OF RAIL ↓	0.025	0.024	0.023	0.022	0.021	0.020	0.018	0.017	0.016	0.014	0.013	0.011	0.010	0.002	0.007	0.061	0.003	0.002	0.000		
TOTAL DEAD LOAD DEFLECTION ↓	0.299	0.288	0.277	0.265	0.252	0.238	0.223	0.208	0.192	0.175	0.157	0.139	0.120	0.021	0.081	0.061	0.041	0.020	0.000		
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
REQUIRED CAMBER ↑	3 9/16"	3 7/16"	3 5/16"	3 3/16"	3"	2 7/8"	2 11/16"	2 1/2"	2 5/16"	2 1/8"	1 7/8"	1 11/16"	1 7/16"	1 3/16"	1"	3/4"	1/2"	1/4"	0"		

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.

NOTES

SLOPE FOR THE ZERO CAMBER LINE VARIES.

VALUES ARE AT THE SIXTIETH POINTS BETWEEN CENTERLINE OF BEARINGS.

DEFLECTIONS AND ORDINATES ARE IN FEET (DECIMAL FORM).

REQUIRED CAMBER VALUES ARE IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTION AND CAMBER

SPAN A

GIRDER 2

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	0.002	0.004	0.006	0.007	0.009	0.011	0.013	0.014	0.016	0.017	0.019	0.020	0.022	0.023	0.024	0.025	0.026
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	0.005	0.010	0.014	0.019	0.024	0.028	0.033	0.037	0.041	0.045	0.049	0.053	0.056	0.060	0.063	0.066	0.068
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	0.001	0.001	0.002	0.002	0.003	0.003	0.004	0.005	0.005	0.006	0.006	0.006	0.007	0.007	0.008	0.008	0.008
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.007	0.014	0.022	0.029	0.036	0.043	0.049	0.056	0.062	0.068	0.074	0.079	0.085	0.090	0.094	0.099	0.103
VERTICAL CURVE ORDINATE ↑	0.000	0.004	0.008	0.012	0.015	0.019	0.022	0.024	0.027	0.029	0.031	0.032	0.033	0.035	0.035	0.036	0.036	0.036
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0"	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1 1/16"	1 3/16"	1 1/4"	1 3/8"	1 7/16"	1 1/2"	1 9/16"	1 5/8"	1 11/16"

SIXTIETH POINTS	18/60	19/60	20/60	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.027	0.028	0.029	0.030	0.030	0.031	0.031	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.031	0.031	0.031	0.030
DEFLECTION DUE TO WT. OF SLAB * ↓	0.071	0.073	0.075	0.077	0.078	0.080	0.081	0.081	0.082	0.082	0.082	0.082	0.082	0.081	0.080	0.079	0.078	0.076
DEFLECTION DUE TO WT. OF RAIL ↓	0.009	0.009	0.009	0.009	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.009
TOTAL DEAD LOAD DEFLECTION ↓	0.107	0.110	0.113	0.116	0.118	0.120	0.122	0.123	0.124	0.124	0.124	0.124	0.124	0.123	0.121	0.120	0.118	0.115
VERTICAL CURVE ORDINATE ↑	0.036	0.035	0.034	0.033	0.033	0.032	0.031	0.030	0.029	0.028	0.027	0.027	0.026	0.025	0.024	0.023	0.022	0.021
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	1 11/16"	1 3/4"	1 3/4"	1 13/16"	1 13/16"	1 13/16"	1 13/16"	1 13/16"	1 13/16"	1 13/16"	1 13/16"	1 13/16"	1 13/16"	1 3/4"	1 3/4"	1 11/16"	1 11/16"	1 5/8"

SIXTIETH POINTS	36/60	37/60	38/60	39/60	40/60	41/60	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.029	0.029	0.028	0.027	0.026	0.025	0.024	0.023	0.021	0.020	0.019	0.018	0.016	0.015	0.013	0.012	0.011	0.009
DEFLECTION DUE TO WT. OF SLAB * ↓	0.074	0.072	0.070	0.068	0.065	0.062	0.060	0.057	0.053	0.050	0.047	0.044	0.040	0.036	0.033	0.029	0.026	0.022
DEFLECTION DUE TO WT. OF RAIL ↓	0.009	0.009	0.009	0.008	0.008	0.008	0.007	0.007	0.007	0.006	0.006	0.005	0.005	0.005	0.004	0.004	0.003	0.003
TOTAL DEAD LOAD DEFLECTION ↓	0.113	0.110	0.106	0.103	0.099	0.095	0.091	0.086	0.081	0.076	0.071	0.066	0.061	0.056	0.050	0.045	0.040	0.034
VERTICAL CURVE ORDINATE ↑	0.021	0.020	0.019	0.018	0.017	0.016	0.015	0.015	0.014	0.013	0.012	0.011	0.010	0.009	0.009	0.008	0.007	0.006
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	1 5/8"	1 9/16"	1 1/2"	1 7/16"	1 3/8"	1 5/16"	1 1/4"	1 3/16"	1 1/8"	1 1/16"	1"	15/16"	7/8"	13/16"	11/16"	5/8"	9/16"	1/2"

SIXTIETH POINTS	54/60	55/60	56/60	57/60	58/60	59/60	60/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.008	0.006	0.005	0.004	0.003	0.001	0.000
DEFLECTION DUE TO WT. OF SLAB * ↓	0.019	0.015	0.012	0.009	0.006	0.003	0.000
DEFLECTION DUE TO WT. OF RAIL ↓	0.002	0.002	0.002	0.001	0.001	0.000	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.029	0.024	0.019	0.014	0.009	0.004	0.000
VERTICAL CURVE ORDINATE ↑	0.005	0.004	0.003	0.003	0.002	0.001	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	7/16"	5/16"	1/4"	3/16"	1/8"	1/16"	0"

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.


7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

V&M Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-

SHEET 2 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE DEADLOAD DEFLECTION AND CAMBER ORDINATES UNIT 1

DWN. BY: AW DATE: 11/2021
CHKD. BY: PRG DATE: 11/2021
DES. EGR. OF RECORD: PRG DATE: 11/2021

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-41

TOTAL SHEETS 92

DEAD LOAD DEFLECTION AND CAMBER

SPAN B

GIRDER 2

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60	18/60	19/60	20/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	-0.001	-0.002	-0.003	-0.004	-0.005	-0.005	-0.006	-0.007	-0.008	-0.008	-0.009	-0.010	-0.010	-0.011	-0.011	-0.012	-0.013	-0.013	-0.014	-0.014
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	-0.002	-0.005	-0.007	-0.008	-0.010	-0.012	-0.013	-0.015	-0.016	-0.017	-0.018	-0.019	-0.020	-0.021	-0.022	-0.023	-0.024	-0.025	-0.026	-0.026
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	0.000	-0.001	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003
TOTAL DEAD LOAD DEFLECTION ↓	0.000	-0.004	-0.007	-0.010	-0.013	-0.016	-0.019	-0.021	-0.024	-0.026	-0.028	-0.030	-0.032	-0.033	-0.035	-0.037	-0.038	-0.040	-0.041	-0.043	-0.044
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0"	-1/16"	-1/16"	-1/8"	-3/16"	-3/16"	-1/4"	-1/4"	-5/16"	-5/16"	-5/16"	-3/8"	-3/8"	-3/8"	-7/16"	-7/16"	-7/16"	-1/2"	-1/2"	-1/2"	-1/2"

SIXTIETH POINTS	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60	36/60	37/60	38/60	39/60	40/60	41/60
DEFLECTION DUE TO WT. OF STEEL ↓	-0.015	-0.015	-0.016	-0.016	-0.016	-0.017	-0.017	-0.018	-0.018	-0.018	-0.019	-0.019	-0.019	-0.020	-0.020	-0.020	-0.020	-0.020	-0.020	-0.020	-0.020
DEFLECTION DUE TO WT. OF SLAB * ↓	-0.027	-0.028	-0.029	-0.029	-0.030	-0.030	-0.031	-0.032	-0.032	-0.033	-0.033	-0.033	-0.034	-0.034	-0.034	-0.034	-0.035	-0.035	-0.034	-0.034	-0.034
DEFLECTION DUE TO WT. OF RAIL ↓	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
TOTAL DEAD LOAD DEFLECTION ↓	-0.045	-0.046	-0.048	-0.049	-0.050	-0.051	-0.052	-0.053	-0.054	-0.055	-0.056	-0.057	-0.057	-0.058	-0.059	-0.059	-0.059	-0.059	-0.059	-0.059	-0.058
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	-9/16"	-9/16"	-9/16"	-9/16"	-5/8"	-5/8"	-5/8"	-5/8"	-5/8"	-11/16"	-11/16"	-11/16"	-11/16"	-11/16"	-11/16"	-11/16"	-11/16"	-11/16"	-11/16"	-11/16"	-11/16"

SIXTIETH POINTS	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60	54/60	55/60	56/60	57/60	58/60	59/60	60/60		
DEFLECTION DUE TO WT. OF STEEL ↓	-0.019	-0.019	-0.019	-0.018	-0.018	-0.017	-0.016	-0.016	-0.015	-0.014	-0.013	-0.012	-0.010	-0.009	-0.007	-0.006	-0.004	-0.002	0.000		
DEFLECTION DUE TO WT. OF SLAB * ↓	-0.034	-0.033	-0.032	-0.032	-0.031	-0.030	-0.029	-0.027	-0.026	-0.024	-0.022	-0.020	-0.018	-0.016	-0.013	-0.010	-0.007	-0.004	0.000		
DEFLECTION DUE TO WT. OF RAIL ↓	-0.005	-0.005	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.003	-0.003	-0.003	-0.003	-0.002	-0.002	-0.001	-0.001	-0.001	0.000		
TOTAL DEAD LOAD DEFLECTION ↓	-0.058	-0.057	-0.056	-0.054	-0.053	-0.051	-0.049	-0.047	-0.044	-0.041	-0.038	-0.035	-0.031	-0.027	-0.022	-0.017	-0.012	-0.006	0.000		
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
REQUIRED CAMBER ↑	-11/16"	-11/16"	-11/16"	-5/8"	-5/8"	-5/8"	-9/16"	-9/16"	-1/2"	-1/2"	-7/16"	- 7/16"	-3/8"	-5/16"	-1/4"	-3/16"	-1/8"	-1/16"	0"		

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* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.

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DEFLECTIONS AND ORDINATES ARE IN FEET (DECIMAL FORM).

REQUIRED CAMBER VALUES ARE IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTION AND CAMBER

SPAN C

GIRDER 2

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	0.004	0.008	0.013	0.018	0.023	0.028	0.034	0.039	0.045	0.051	0.056	0.062	0.068	0.073	0.079	0.084	0.089
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	0.007	0.014	0.022	0.031	0.040	0.050	0.059	0.069	0.079	0.089	0.099	0.110	0.120	0.130	0.139	0.149	0.158
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	0.001	0.002	0.003	0.004	0.006	0.007	0.008	0.010	0.011	0.013	0.014	0.016	0.017	0.018	0.020	0.021	0.022
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.012	0.025	0.038	0.053	0.069	0.085	0.101	0.118	0.135	0.153	0.170	0.187	0.204	0.221	0.238	0.254	0.269
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0"	1/8"	5/16"	7/16"	5/8"	13/16"	1"	1 13/16"	1 7/16"	1 5/8"	1 13/16"	2"	2 1/4"	2 7/16"	2 5/8"	2 7/8"	3"	3 1/4"

SIXTIETH POINTS	18/60	19/60	20/60	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.094	0.099	0.103	0.107	0.111	0.115	0.118	0.121	0.124	0.126	0.128	0.130	0.131	0.132	0.133	0.133	0.132	0.131
DEFLECTION DUE TO WT. OF SLAB * ↓	0.167	0.175	0.183	0.191	0.198	0.204	0.210	0.215	0.220	0.224	0.228	0.231	0.233	0.234	0.235	0.235	0.235	0.233
DEFLECTION DUE TO WT. OF RAIL ↓	0.024	0.025	0.026	0.027	0.028	0.029	0.030	0.031	0.031	0.032	0.032	0.033	0.033	0.033	0.033	0.034	0.033	0.033
TOTAL DEAD LOAD DEFLECTION ↓	0.284	0.298	0.312	0.325	0.337	0.348	0.358	0.367	0.376	0.383	0.389	0.394	0.397	0.400	0.401	0.401	0.400	0.398
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	3 7/16"	3 9/16"	3 3/4"	3 7/8"	4"	4 3/16"	4 5/16"	4 7/16"	4 1/2"	4 9/16"	4 11/16"	4 3/4"	4 3/4"	4 13/16"	4 13/16"	4 13/16"	4 13/16"	4 3/4"

SIXTIETH POINTS	36/60	37/60	38/60	39/60	40/60	41/60	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.130	0.129	0.127	0.124	0.121	0.118	0.115	0.111	0.106	0.102	0.097	0.091	0.086	0.080	0.073	0.067	0.060	0.053
DEFLECTION DUE TO WT. OF SLAB * ↓	0.231	0.228	0.225	0.221	0.216	0.210	0.204	0.197	0.189	0.181	0.172	0.162	0.152	0.142	0.131	0.119	0.107	0.094
DEFLECTION DUE TO WT. OF RAIL ↓	0.033	0.033	0.032	0.031	0.031	0.030	0.029	0.028	0.027	0.026	0.024	0.023	0.022	0.020	0.019	0.017	0.015	0.013
TOTAL DEAD LOAD DEFLECTION ↓	0.394	0.390	0.383	0.376	0.368	0.358	0.347	0.335	0.322	0.308	0.293	0.277	0.259	0.241	0.223	0.203	0.182	0.161
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	4 3/4"	4 11/16"	4 5/8"	4 1/2"	4 7/16"	4 5/16"	4 3/16"	4"	3 7/8"	3 11/16"	3 1/2"	3 5/16"	3 1/8"	2 7/8"	2 11/16"	2 7/16"	2 3/16"	1 15/16"

SIXTIETH POINTS	54/60	55/60	56/60	57/60	58/60	59/60	60/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.046	0.039	0.031	0.023	0.016	0.008	0.000
DEFLECTION DUE TO WT. OF SLAB * ↓	0.082	0.069	0.055	0.042	0.028	0.014	0.000
DEFLECTION DUE TO WT. OF RAIL ↓	0.012	0.010	0.008	0.006	0.004	0.002	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.139	0.117	0.094	0.071	0.047	0.024	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	1 11/16"	1 3/8"	1 1/8"	7/8"	9/16"	5/16"	0"

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL — DocuSigned by: Hardy Willis — 7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

V&M Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Boone, NC 828-355-9933
Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Atlanta, GA 770-627-3590
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 3 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE DEADLOAD DEFLECTION AND CAMBER ORDINATES UNIT 1

DWN. BY: AW	DATE: 11/2021
CHKD. BY: PRG	DATE: 11/2021
DES. EGR. OF RECORD: PRG	DATE: 11/2021

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-42

TOTAL SHEETS 92

TIME: 10:03 AM on Tuesday, July 26, 2022

DEAD LOAD DEFLECTION AND CAMBER

SPAN A

GIRDER 3

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60	18/60	19/60	20/60
DEFLECTION DUE TO WT. OF STEEL	0.000	0.002	0.004	0.006	0.008	0.010	0.012	0.014	0.016	0.018	0.019	0.021	0.022	0.024	0.025	0.027	0.028	0.029	0.030	0.031	0.032
DEFLECTION DUE TO WT. OF SLAB *	0.000	0.005	0.011	0.016	0.021	0.026	0.031	0.036	0.041	0.045	0.049	0.054	0.058	0.062	0.065	0.069	0.072	0.075	0.078	0.080	0.082
DEFLECTION DUE TO WT. OF RAIL	0.000	0.001	0.001	0.002	0.003	0.003	0.004	0.004	0.005	0.006	0.006	0.007	0.007	0.008	0.008	0.008	0.009	0.009	0.009	0.010	0.010
TOTAL DEAD LOAD DEFLECTION	0.000	0.008	0.016	0.024	0.032	0.039	0.047	0.054	0.061	0.068	0.075	0.081	0.087	0.093	0.099	0.104	0.109	0.113	0.117	0.121	0.125
VERTICAL CURVE ORDINATE	0.000	0.004	0.008	0.012	0.015	0.019	0.022	0.024	0.027	0.029	0.031	0.032	0.033	0.035	0.035	0.036	0.036	0.036	0.036	0.035	0.034
SUPERELEVATION ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0"	1/8"	5/16"	7/16"	9/16"	11/16"	13/16"	15/16"	1"	1 3/16"	1 1/4"	1 3/8"	1 7/16"	1 1/2"	1 5/8"	1 11/16"	1 3/4"	1 13/16"	1 13/16"	1 7/8"	1 7/8"

SIXTIETH POINTS	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60	36/60	37/60	38/60	39/60	40/60	41/60
DEFLECTION DUE TO WT. OF STEEL	0.033	0.034	0.034	0.035	0.035	0.035	0.036	0.036	0.036	0.036	0.035	0.035	0.035	0.034	0.033	0.033	0.032	0.031	0.030	0.029	0.028
DEFLECTION DUE TO WT. OF SLAB *	0.084	0.086	0.087	0.089	0.089	0.090	0.091	0.091	0.090	0.090	0.089	0.088	0.087	0.086	0.084	0.082	0.080	0.077	0.075	0.072	0.069
DEFLECTION DUE TO WT. OF RAIL	0.010	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.010	0.010	0.009	0.009	0.009
TOTAL DEAD LOAD DEFLECTION	0.127	0.130	0.132	0.134	0.136	0.137	0.137	0.137	0.137	0.136	0.136	0.134	0.132	0.130	0.128	0.125	0.122	0.118	0.114	0.110	0.106
VERTICAL CURVE ORDINATE	0.033	0.033	0.032	0.031	0.030	0.029	0.028	0.027	0.027	0.026	0.025	0.024	0.023	0.022	0.021	0.021	0.020	0.019	0.018	0.017	0.016
SUPERELEVATION ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	1 15/16"	1 15/16"	2"	2"	2"	2"	2"	2"	1 15/16"	1 15/16"	1 15/16"	1 7/8"	1 7/8"	1 13/16"	1 13/16"	1 3/4"	1 11/16"	1 5/8"	1 9/16"	1 1/2"	1 7/16"

SIXTIETH POINTS	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60	54/60	55/60	56/60	57/60	58/60	59/60	60/60		
DEFLECTION DUE TO WT. OF STEEL	0.027	0.026	0.024	0.023	0.021	0.020	0.018	0.017	0.015	0.014	0.012	0.011	0.009	0.007	0.006	0.004	0.003	0.001	0.000		
DEFLECTION DUE TO WT. OF SLAB *	0.066	0.063	0.059	0.056	0.052	0.048	0.045	0.041	0.037	0.033	0.029	0.025	0.021	0.017	0.014	0.010	0.007	0.003	0.000		
DEFLECTION DUE TO WT. OF RAIL	0.008	0.008	0.007	0.007	0.006	0.006	0.006	0.005	0.005	0.004	0.004	0.003	0.003	0.002	0.002	0.001	0.001	0.000	0.000		
TOTAL DEAD LOAD DEFLECTION	0.101	0.096	0.091	0.086	0.080	0.074	0.069	0.063	0.057	0.051	0.045	0.039	0.033	0.027	0.021	0.016	0.010	0.005	0.000		
VERTICAL CURVE ORDINATE	0.015	0.015	0.014	0.013	0.012	0.011	0.010	0.009	0.009	0.008	0.007	0.006	0.005	0.004	0.003	0.003	0.002	0.001	0.000		
SUPERELEVATION ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
REQUIRED CAMBER	1 3/8"	1 5/16"	1 1/4"	1 3/16"	1 1/8"	1"	15/16"	7/8"	13/16"	11/16"	5/8"	9/16"	7/16"	3/8"	5/16"	3/16"	1/8"	1/16"	0"		

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.

NOTES

SLOPE FOR THE ZERO CAMBER LINE VARIES.

VALUES ARE AT THE SIXTIETH POINTS BETWEEN CENTERLINE OF BEARINGS.

DEFLECTIONS AND ORDINATES ARE IN FEET (DECIMAL FORM).

REQUIRED CAMBER VALUES ARE IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTION AND CAMBER

SPAN B

GIRDER 3

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60
DEFLECTION DUE TO WT. OF STEEL	0.000	-0.001	-0.002	-0.004	-0.005	-0.006	-0.007	-0.008	0.009	-0.009	-0.010	-0.011	-0.012	-0.013	-0.013	-0.014	-0.015	-0.016
DEFLECTION DUE TO WT. OF SLAB *	0.000	-0.003	-0.005	-0.008	-0.010	-0.012	-0.014	-0.016	-0.018	-0.019	-0.021	-0.022	-0.024	-0.025	-0.026	-0.027	-0.029	-0.030
DEFLECTION DUE TO WT. OF RAIL	0.000	0.000	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.004	-0.004	-0.004
TOTAL DEAD LOAD DEFLECTION	0.000	-0.004	-0.008	-0.012	-0.016	-0.019	-0.022	-0.025	-0.028	-0.031	-0.034	-0.036	-0.039	-0.041	-0.043	-0.045	-0.047	-0.049
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0"	-1/16"	-1/8"	-1/8"	-3/16"	-1/4"	-1/4"	-5/16"	-5/16"	-3/8"	-3/8"	-7/16"	-7/16"	-1/2"	-1/2"	-9/16"	-9/16"	-9/16"

SIXTIETH POINTS	18/60	19/60	20/60	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60
DEFLECTION DUE TO WT. OF STEEL	-0.016	-0.017	-0.018	-0.018	-0.019	-0.019	-0.020	-0.020	-0.021	-0.021	-0.022	-0.022	-0.023	-0.023	-0.023	-0.024	-0.024	-0.024
DEFLECTION DUE TO WT. OF SLAB *	-0.031	-0.032	-0.033	-0.034	-0.035	-0.036	-0.036	-0.037	-0.038	-0.039	-0.039	-0.040	-0.040	-0.041	-0.041	-0.042	-0.042	-0.042
DEFLECTION DUE TO WT. OF RAIL	-0.004	-0.004	-0.004	-0.004	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.006	-0.006	-0.006	-0.006	-0.006
TOTAL DEAD LOAD DEFLECTION	-0.051	-0.053	-0.055	-0.056	-0.058	-0.060	-0.061	-0.062	-0.064	-0.065	-0.066	-0.068	-0.069	-0.070	-0.070	-0.071	-0.072	-0.072
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	-5/8"	-5/8"	-5/8"	-11/16"	-11/16"	-11/16"	-3/4"	-3/4"	-3/4"	-13/16"	-13/16"	-13/16"	-13/16"	-13/16"	-13/16"	-7/8"	-7/8"	-7/8"

SIXTIETH POINTS	36/60	37/60	38/60	39/60	40/60	41/60	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60
DEFLECTION DUE TO WT. OF STEEL	-0.024	-0.024	-0.024	-0.024	-0.024	-0.024	-0.023	-0.023	-0.023	-0.022	-0.021	-0.020	-0.020	-0.019	-0.018	-0.016	-0.015	-0.014
DEFLECTION DUE TO WT. OF SLAB *	-0.042	-0.042	-0.042	-0.042	-0.042	-0.042	-0.041	-0.040	-0.039	-0.038	-0.037	-0.036	-0.034	-0.032	-0.031	-0.029	-0.026	-0.024
DEFLECTION DUE TO WT. OF RAIL	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.004	-0.004	-0.004	-0.003
TOTAL DEAD LOAD DEFLECTION	-0.072	-0.072	-0.072	-0.072	-0.072	-0.071	-0.070	-0.069	-0.067	-0.066	-0.063	-0.061	-0.058	-0.056	-0.052	-0.049	-0.045	-0.041
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	-7/8"	-7/8"	-7/8"	-7/8"	-7/8"	-7/8"	-13/16"	-13/16"	-13/16"	-13/16"	-3/4"	-3/4"	-11/16"	-11/16"	-5/8"	-9/16"	-9/16"	-1/2"

SIXTIETH POINTS	54/60	55/60	56/60	57/60	58/60	59/60	60/60
DEFLECTION DUE TO WT. OF STEEL	-0.012	-0.010	-0.009	-0.007	-0.005	-0.002	0.000
DEFLECTION DUE TO WT. OF SLAB *	-0.021	-0.018	-0.015	-0.012	-0.008	-0.004	0.000
DEFLECTION DUE TO WT. OF RAIL	-0.003	-0.003	-0.002	-0.002	-0.001	-0.001	0.000
TOTAL DEAD LOAD DEFLECTION	-0.037	-0.031	-0.026	-0.020	-0.014	-0.007	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	-7/16"	-3/8"	-5/16"	-1/4"	-3/16"	-1/16"	0"

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL — Hardy Willis — 7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Boone, NC 828-355-9933
Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488
Atlanta, GA 770-627-3590

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 4 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE DEADLOAD DEFLECTION AND CAMBER ORDINATES UNIT 1

REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	S1-43
1			3			TOTAL SHEETS	92
2			4				

DWN. BY: AW DATE: 11/2021
CHKD. BY: PRG DATE: 11/2021
DES. EGR. OF RECORD: PRG DATE: 11/2021

DEAD LOAD DEFLECTION AND CAMBER

SPAN C

GIRDER 3

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60	18/60	19/60	20/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	0.005	0.009	0.014	0.020	0.026	0.032	0.038	0.045	0.051	0.058	0.064	0.071	0.077	0.083	0.089	0.095	0.101	0.107	0.112	0.117
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	0.008	0.017	0.026	0.036	0.046	0.057	0.068	0.079	0.091	0.102	0.114	0.125	0.136	0.148	0.159	0.169	0.180	0.190	0.199	0.208
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	0.001	0.002	0.004	0.005	0.007	0.008	0.010	0.011	0.013	0.015	0.016	0.018	0.020	0.021	0.023	0.024	0.026	0.027	0.029	0.030
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.014	0.028	0.044	0.061	0.079	0.097	0.116	0.135	0.154	0.174	0.194	0.213	0.233	0.252	0.271	0.289	0.307	0.324	0.340	0.355
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0″	3/16″	5/16″	1/2″	3/4″	15/16″	1 3/16″	1 3/8″	1 5/8″	1 7/8″	2″	2 5/16″	2 9/16″	2 13/16″	3″	3 1/4″	3 7/16″	3 11/16″	3 7/8″	4 1/16″	4 1/4″

SIXTIETH POINTS	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60	36/60	37/60	38/60	39/60	40/60	41/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.122	0.127	0.131	0.135	0.138	0.141	0.144	0.146	0.148	0.149	0.150	0.151	0.151	0.150	0.149	0.148	0.146	0.144	0.141	0.138	0.134
DEFLECTION DUE TO WT. OF SLAB * ↓	0.217	0.225	0.232	0.239	0.245	0.251	0.255	0.259	0.263	0.265	0.267	0.268	0.268	0.267	0.266	0.263	0.260	0.256	0.251	0.245	0.239
DEFLECTION DUE TO WT. OF RAIL ↓	0.031	0.032	0.033	0.034	0.035	0.036	0.037	0.037	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.037	0.037	0.036	0.035	0.034
TOTAL DEAD LOAD DEFLECTION ↓	0.370	0.384	0.396	0.408	0.418	0.428	0.436	0.443	0.448	0.452	0.455	0.457	0.457	0.456	0.453	0.449	0.443	0.436	0.428	0.419	0.407
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	4 7/16″	4 5/8″	4 3/4″	4 7/8″	5″	5 1/8″	5 1/4″	5 5/16″	5 3/8″	5 7/16″	5 7/16″	5 1/2″	5 1/2″	5 7/16″	5 7/16″	5 3/8″	5 5/16″	5 1/4″	5 1/8″	5″	4 7/8″

SIXTIETH POINTS	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60	54/60	55/60	56/60	57/60	58/60	59/60	60/60		
DEFLECTION DUE TO WT. OF STEEL ↓	0.130	0.126	0.121	0.115	0.110	0.104	0.097	0.090	0.083	0.076	0.068	0.060	0.052	0.044	0.035	0.027	0.018	0.009	0.000		
DEFLECTION DUE TO WT. OF SLAB * ↓	0.232	0.224	0.215	0.205	0.195	0.184	0.173	0.161	0.148	0.135	0.121	0.107	0.093	0.078	0.063	0.047	0.032	0.016	0.000		
DEFLECTION DUE TO WT. OF RAIL ↓	0.033	0.032	0.031	0.030	0.028	0.027	0.025	0.023	0.021	0.019	0.017	0.015	0.013	0.011	0.009	0.007	0.005	0.002	0.000		
TOTAL DEAD LOAD DEFLECTION ↓	0.395	0.381	0.366	0.350	0.333	0.314	0.295	0.274	0.253	0.230	0.207	0.183	0.158	0.133	0.107	0.081	0.054	0.027	0.000		
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
REQUIRED CAMBER ↑	4 3/4″	4 9/16″	4 3/8″	4 3/16″	4″	3 3/4″	3 9/16″	3 5/16″	3″	2 3/4″	2 1/2″	2 3/16″	1 7/8″	1 9/16″	1 1/4″	15/16″	5/8″	5/16″	0″		

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.

DEAD LOAD DEFLECTION AND CAMBER

SPAN A

GIRDER 4

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	0.002	0.004	0.007	0.009	0.011	0.013	0.015	0.017	0.019	0.021	0.023	0.025	0.026	0.028	0.029	0.031	0.032
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	0.006	0.012	0.017	0.023	0.028	0.034	0.039	0.044	0.049	0.054	0.059	0.063	0.067	0.071	0.075	0.078	0.082
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	0.001	0.001	0.002	0.003	0.003	0.004	0.005	0.005	0.006	0.007	0.007	0.008	0.008	0.009	0.009	0.010	0.010
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.009	0.017	0.026	0.034	0.043	0.051	0.059	0.067	0.074	0.081	0.088	0.095	0.102	0.108	0.113	0.119	0.124
VERTICAL CURVE ORDINATE ↑	0.000	0.004	0.008	0.012	0.015	0.019	0.022	0.024	0.027	0.029	0.031	0.032	0.034	0.035	0.035	0.036	0.036	0.036
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0″	1/8″	5/16″	7/16″	5/8″	3/4″	7/8″	1″	1 1/8″	1 1/4″	1 5/16″	1 7/16″	1 9/16″	1 5/8″	1 11/16″	1 13/16″	1 7/8″	1 15/16″

SIXTIETH POINTS	18/60	19/60	20/60	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.033	0.034	0.035	0.036	0.037	0.038	0.038	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.038	0.038	0.037
DEFLECTION DUE TO WT. OF SLAB * ↓	0.085	0.087	0.090	0.092	0.094	0.095	0.097	0.098	0.098	0.099	0.099	0.099	0.098	0.098	0.097	0.095	0.094	0.092
DEFLECTION DUE TO WT. OF RAIL ↓	0.010	0.011	0.011	0.011	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.011
TOTAL DEAD LOAD DEFLECTION ↓	0.128	0.132	0.136	0.139	0.142	0.145	0.147	0.148	0.150	0.150	0.151	0.150	0.150	0.149	0.147	0.145	0.143	0.140
VERTICAL CURVE ORDINATE ↑	0.036	0.035	0.034	0.033	0.033	0.032	0.031	0.030	0.029	0.028	0.027	0.027	0.026	0.025	0.024	0.023	0.022	0.021
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	1 15/16″	2″	2 1/16″	2 1/16″	2 1/8″	2 1/8″	2 1/8″	2 1/8″	2 1/8″	2 1/8″	2 1/8″	2 1/8″	2 1/8″	2 1/16″	2 1/16″	2″	2″	1 15/16″

SIXTIETH POINTS	36/60	37/60	38/60	39/60	40/60	41/60	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.036	0.035	0.034	0.033	0.032	0.031	0.030	0.028	0.027	0.025	0.024	0.022	0.021	0.019	0.017	0.015	0.014	0.012
DEFLECTION DUE TO WT. OF SLAB * ↓	0.090	0.088	0.085	0.082	0.079	0.076	0.073	0.069	0.065	0.062	0.058	0.054	0.049	0.045	0.041	0.037	0.032	0.028
DEFLECTION DUE TO WT. OF RAIL ↓	0.011	0.011	0.011	0.010	0.010	0.009	0.009	0.009	0.008	0.008	0.007	0.007	0.006	0.006	0.005	0.005	0.004	0.004
TOTAL DEAD LOAD DEFLECTION ↓	0.137	0.134	0.130	0.126	0.121	0.117	0.111	0.106	0.101	0.095	0.089	0.082	0.076	0.070	0.063	0.056	0.050	0.043
VERTICAL CURVE ORDINATE ↑	0.021	0.020	0.019	0.018	0.017	0.016	0.015	0.015	0.014	0.013	0.012	0.011	0.010	0.009	0.009	0.008	0.007	0.006
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	1 7/8″	1 13/16″	1 13/16″	1 3/4″	1 11/16″	1 9/16″	1 1/2″	1 7/16″	1 3/16″	1 5/16″	1 3/16″	1 1/8″	1 1/16″	15/16″	7/8″	3/4″	11/16″	9/16″

SIXTIETH POINTS	54/60	55/60	56/60	57/60	58/60	59/60	60/60											
DEFLECTION DUE TO WT. OF STEEL ↓	0.010	0.008	0.007	0.005	0.003	0.002	0.000											
DEFLECTION DUE TO WT. OF SLAB * ↓	0.024	0.020	0.015	0.011	0.007	0.004	0.000											
DEFLECTION DUE TO WT. OF RAIL ↓	0.003	0.002	0.002	0.001	0.001	0.000	0.000											
TOTAL DEAD LOAD DEFLECTION ↓	0.037	0.030	0.024	0.018	0.012	0.006	0.000											
VERTICAL CURVE ORDINATE ↑	0.005	0.004	0.003	0.003	0.002	0.001	0.000											
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000											
REQUIRED CAMBER ↑	1/2″	7/16″	5/16″	1/4″	3/16″	1/16″	0″											

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.

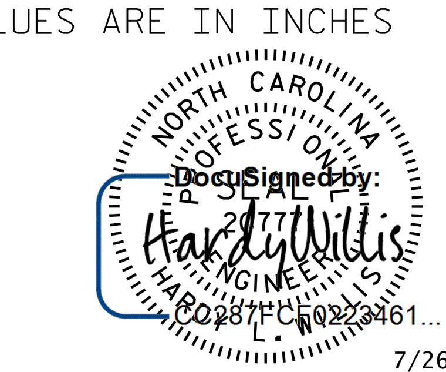
NOTES

SLOPE FOR THE ZERO CAMBER LINE VARIES.

VALUES ARE AT THE SIXTIETH POINTS BETWEEN CENTERLINE OF BEARINGS.

DEFLECTIONS AND ORDINATES ARE IN FEET (DECIMAL FORM).

REQUIRED CAMBER VALUES ARE IN INCHES (FRACTION FORM).



7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

V&M
Vaughn & Melton
Consulting Engineers
Asheville, North Carolina 828-253-2796
Boone, NC 828-355-9933
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Middlesboro, KY 606-248-6600
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488
Atlanta, GA 770-627-3590

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-

SHEET 5 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
DEADLOAD DEFLECTION
AND CAMBER ORDINATES
UNIT 1

DWN. BY: AW	DATE: 11/2021
CHKD. BY: PRG	DATE: 11/2021
DES. EGR. OF RECORD: PRG	DATE: 11/2021

REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

SHEET NO. S1-44

TOTAL SHEETS 92

wdcrutcher
DGN: V:\NC\Structures\0317\48-44 U-2579AA STP\S\Structures\SITE 1 - FLYCA North\Plans\FINAL PLANS\40_DB_U2579AA_SMU_DL05_044.dgn
TIME: 10:03 AM on Tuesday, July 26, 2022

DEAD LOAD DEFLECTION AND CAMBER
SPAN B
GIRDER 4

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60	18/60	19/60	20/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	-0.001	-0.003	-0.004	-0.005	-0.007	-0.008	-0.009	-0.010	-0.011	-0.012	-0.013	-0.014	-0.015	-0.016	-0.017	-0.018	-0.019	-0.019	-0.020	-0.021
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	-0.003	-0.006	-0.009	-0.012	-0.014	-0.016	-0.019	-0.021	-0.023	-0.025	-0.026	-0.028	-0.030	-0.031	-0.033	-0.034	-0.035	-0.037	-0.038	-0.039
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	0.000	-0.001	-0.001	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003	-0.003	-0.003	-0.004	-0.004	-0.004	-0.004	-0.005	-0.005	-0.005	-0.005	-0.005
TOTAL DEAD LOAD DEFLECTION ↓	0.000	-0.005	-0.010	-0.014	-0.018	-0.022	-0.026	-0.030	-0.033	-0.037	-0.040	-0.043	-0.046	-0.049	-0.051	-0.054	-0.056	-0.059	-0.061	-0.064	-0.066
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0"	-1/16"	-1/8"	-3/16"	-1/4"	-1/4"	-5/16"	-3/8"	-3/8"	-7/16"	1/2"	-1/2"	-9/16"	-9/16"	-5/8"	-5/8"	-11/16"	-11/16"	-3/4"	-3/4"	-13/16"

SIXTIETH POINTS	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60	36/60	37/60	38/60	39/60	40/60	41/60
DEFLECTION DUE TO WT. OF STEEL ↓	-0.022	-0.023	-0.023	-0.024	-0.024	-0.025	-0.026	-0.026	-0.027	-0.027	-0.028	-0.028	-0.028	-0.028	-0.028	-0.029	-0.029	-0.029	-0.028	-0.028	-0.028
DEFLECTION DUE TO WT. OF SLAB * ↓	-0.041	-0.042	-0.043	-0.044	-0.045	-0.046	-0.046	-0.047	-0.048	-0.049	-0.049	-0.050	-0.050	-0.050	-0.050	-0.051	-0.050	-0.050	-0.050	-0.050	-0.049
DEFLECTION DUE TO WT. OF RAIL ↓	-0.005	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007
TOTAL DEAD LOAD DEFLECTION ↓	-0.068	-0.070	-0.072	-0.073	-0.075	-0.077	-0.078	-0.080	-0.081	-0.082	-0.083	-0.084	-0.085	-0.085	-0.006	-0.086	-0.086	-0.086	-0.085	-0.085	-0.084
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	-13/16"	-13/16"	-7/8"	-7/8"	-7/8"	-15/16"	-15/16"	-15/16"	-1"	-1"	-1"	-1"	-1"	-1"	-1"	-1 1/16"	-1"	-1"	-1"	-1"	-1"

SIXTIETH POINTS	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60	54/60	55/60	56/60	57/60	58/60	59/60	60/60		
DEFLECTION DUE TO WT. OF STEEL ↓	-0.028	-0.027	-0.026	-0.026	-0.025	-0.024	-0.023	-0.022	-0.020	-0.019	-0.017	-0.016	-0.014	-0.012	-0.010	-0.008	-0.005	-0.003	0.000		
DEFLECTION DUE TO WT. OF SLAB * ↓	-0.048	-0.047	-0.046	-0.045	-0.043	-0.042	-0.040	-0.038	-0.036	-0.033	-0.031	-0.028	-0.025	-0.021	-0.018	-0.014	-0.009	-0.005	0.000		
DEFLECTION DUE TO WT. OF RAIL ↓	-0.007	-0.007	-0.006	-0.006	-0.006	-0.006	-0.006	-0.005	-0.005	-0.005	-0.004	-0.004	-0.004	-0.003	-0.003	-0.002	-0.001	-0.001	0.000		
TOTAL DEAD LOAD DEFLECTION ↓	-0.083	-0.081	-0.079	-0.077	-0.074	-0.071	-0.068	-0.065	-0.061	-0.057	-0.052	-0.047	-0.042	-0.036	-0.030	-0.023	-0.016	-0.008	0.000		
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
REQUIRED CAMBER ↑	-1"	-1"	-15/16"	-15/16"	-7/8"	-7/8"	-13/16"	-3/4"	-3/4"	-11/16"	-5/8"	-9/16"	-1/2"	-7/16"	-3/8"	-1/4"	-3/16"	-1/8"	0"		

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.

NOTES

SLOPE FOR THE ZERO CAMBER LINE VARIES.

VALUES ARE AT THE SIXTIETH POINTS BETWEEN CENTERLINE OF BEARINGS.

DEFLECTIONS AND ORDINATES ARE IN FEET (DECIMAL FORM).

REQUIRED CAMBER VALUES ARE IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTION AND CAMBER
SPAN C
GIRDER 4

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	0.005	0.011	0.017	0.023	0.029	0.036	0.043	0.050	0.057	0.065	0.072	0.079	0.086	0.093	0.100	0.107	0.117
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	0.009	0.019	0.029	0.040	0.052	0.064	0.076	0.089	0.102	0.115	0.128	0.141	0.153	0.166	0.178	0.190	0.202
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	0.001	0.003	0.004	0.006	0.008	0.009	0.011	0.013	0.015	0.017	0.018	0.020	0.022	0.024	0.026	0.027	0.029
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.015	0.032	0.050	0.069	0.089	0.110	0.131	0.152	0.173	0.196	0.218	0.240	0.262	0.283	0.304	0.325	0.345
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0"	3/16"	3/8"	5/8"	13/16"	1 1/16"	1 5/16"	1 9/16"	1 13/16"	2 1/16"	2 3/8"	2 5/8"	2 7/8"	3 1/8"	3 3/8"	3 5/8"	3 7/8"	4 1/8"

SIXTIETH POINTS	18/60	19/60	20/60	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.120	0.126	0.132	0.137	0.142	0.147	0.151	0.155	0.158	0.161	0.164	0.166	0.167	0.168	0.169	0.169	0.168	0.168
DEFLECTION DUE TO WT. OF SLAB * ↓	0.213	0.224	0.234	0.244	0.253	0.261	0.039	0.275	0.281	0.287	0.291	0.295	0.298	0.300	0.301	0301	0.300	0.298
DEFLECTION DUE TO WT. OF RAIL ↓	0.031	0.032	0.034	0.035	0.037	0.038	0.039	0.040	0.041	0.042	0.042	0.043	0.043	0.043	0.044	0.044	0.043	0.043
TOTAL DEAD LOAD DEFLECTION ↓	0.364	0.382	0.399	0.416	0.431	0.445	0.458	0.470	0.480	0.490	0.497	0.504	0.508	0.511	0.513	0.513	0.512	0.509
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	4 3/8"	4 9/16"	4 13/16"	5"	5 3/16"	5 5/16"	5 1/2"	5 5/8"	5 3/4"	5 7/8"	5 15/16"	6 1/16"	6 1/8"	6 1/8"	6 1/8"	6 1/8"	6 1/8"	6 1/8"

SIXTIETH POINTS	36/60	37/60	38/60	39/60	40/60	41/60	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.166	0.164	0.161	0.158	0.155	0.151	0.146	0.141	0.135	0.129	0.123	0.116	0.109	0.101	0.093	0.085	0.076	0.068
DEFLECTION DUE TO WT. OF SLAB * ↓	0.295	0.292	0.287	0.282	0.275	0.268	0.260	0.251	0.241	0.231	0.219	0.207	0.194	0.180	0.166	0.151	0.136	0.120
DEFLECTION DUE TO WT. OF RAIL ↓	0.043	0.042	0.042	0.041	0.040	0.039	0.038	0.036	0.035	0.033	0.032	0.030	0.028	0.026	0.024	0.022	0.020	0.017
TOTAL DEAD LOAD DEFLECTION ↓	0.504	0.498	0.490	0.481	0.470	0.457	0.444	0.428	0.411	0.393	0.374	0.353	0.331	0.308	0.284	0.258	0.232	0.205
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	6 1/16"	6"	5 7/8"	5 3/4"	5 5/8"	5 1/2"	5 5/16"	5 1/8"	4 15/16"	4 7/8"	4 1/2"	4 1/4"	4"	3 11/16"	3 3/8"	3 1/8"	2 13/16"	2 7/16"

SIXTIETH POINTS	54/60	55/60	56/60	57/60	58/60	59/60	60/60											
DEFLECTION DUE TO WT. OF STEEL ↓	0.058	0.049	0.039	0.030	0.020	0.010	0.000											
DEFLECTION DUE TO WT. OF SLAB * ↓	0.104	0.087	0.070	0.053	0.035	0.018	0.000											
DEFLECTION DUE TO WT. OF RAIL ↓	0.015	0.013	0.010	0.008	0.005	0.003	0.000											
TOTAL DEAD LOAD DEFLECTION ↓	0.177	0.149	0.120	0.090	0.060	0.030	0.000											
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000											
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000											
REQUIRED CAMBER ↑	2 1/8"	1 13/16"	1 7/16"	1 1/16"	3/4"	3/8"	0"											

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.

7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Vaughn & Melton
Consulting Engineers
Asheville, North Carolina 828·253·2796
Boone, NC 828·355·9933
Tri-Cities, TN 423·467·8401
Knoxville, TN 865·546·5800
Spartanburg, SC 864·574·4775
Charleston, SC 843·974·5650
Middlesboro, KY 606·248·6600
Atlanta, GA 770·627·3590
Raleigh, NC 919·977·9455
Charlotte, NC 704·357·0488

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-

SHEET 6 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
DEADLOAD DEFLECTION
AND CAMBER ORDINATES
UNIT 1

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

DWN. BY: AW DATE: 11/2021
CHKD. BY: PRG DATE: 11/2021
DES. EGR. OF RECORD: PRG DATE: 11/2021

TIME: 10:03 AM on Tuesday, July 26, 2022

DEAD LOAD DEFLECTION AND CAMBER

SPAN A

GIRDER 5

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60	18/60	19/60	20/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	0.003	0.005	0.007	0.010	0.012	0.014	0.017	0.019	0.021	0.023	0.025	0.027	0.029	0.031	0.032	0.034	0.035	0.036	0.038	0.039
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	0.006	0.012	0.019	0.025	0.031	0.037	0.042	0.048	0.053	0.059	0.064	0.068	0.073	0.077	0.081	0.085	0.089	0.092	0.095	0.098
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	0.001	0.002	0.002	0.003	0.004	0.005	0.005	0.006	0.007	0.007	0.008	0.008	0.009	0.010	0.010	0.011	0.011	0.011	0.012	0.012
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.010	0.019	0.028	0.037	0.046	0.055	0.064	0.072	0.081	0.089	0.096	0.104	0.111	0.117	0.124	0.129	0.135	0.140	0.144	0.148
VERTICAL CURVE ORDINATE ↑	0.000	0.004	0.008	0.012	0.015	0.019	0.022	0.024	0.027	0.029	0.031	0.032	0.034	0.035	0.035	0.036	0.036	0.036	0.036	0.035	0.034
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0"	3/16"	5/16"	1/2"	5/8"	3/4"	15/16"	1 1/16"	1 3/16"	1 5/16"	1 7/16"	1 9/16"	1 5/8"	1 3/4"	1 13/16"	1 15/16"	2"	2 1/16"	2 1/8"	2 1/8"	2 3/16"

SIXTIETH POINTS	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60	36/60	37/60	38/60	39/60	40/60	41/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.040	0.040	0.041	0.042	0.042	0.043	0.043	0.043	0.043	0.043	0.043	0.042	0.042	0.041	0.041	0.040	0.039	0.038	0.037	0.036	0.034
DEFLECTION DUE TO WT. OF SLAB * ↓	0.100	0.102	0.104	0.105	0.106	0.107	0.108	0.108	0.108	0.107	0.107	0.106	0.104	0.102	0.101	0.098	0.096	0.093	0.090	0.087	0.083
DEFLECTION DUE TO WT. OF RAIL ↓	0.012	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.012	0.012	0.012	0.011	0.011	0.010
TOTAL DEAD LOAD DEFLECTION ↓	0.152	0.155	0.158	0.160	0.162	0.163	0.164	0.165	0.165	0.164	0.163	0.161	0.159	0.157	0.154	0.150	0.147	0.143	0.138	0.133	0.128
VERTICAL CURVE ORDINATE ↑	0.034	0.033	0.032	0.031	0.030	0.029	0.028	0.027	0.027	0.026	0.025	0.024	0.023	0.022	0.021	0.021	0.020	0.019	0.018	0.017	0.016
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	2 1/4"	2 1/4"	2 1/4"	2 5/16"	2 5/16"	2 5/16"	2 5/16"	2 5/16"	2 5/16"	2 1/4"	2 1/4"	2 1/4"	2 3/16"	2 1/8"	2 1/8"	2 1/16"	2"	1 15/16"	1 7/8"	1 13/16"	1 3/4"

SIXTIETH POINTS	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60	54/60	55/60	56/60	57/60	58/60	59/60	60/60		
DEFLECTION DUE TO WT. OF STEEL ↓	0.033	0.031	0.030	0.028	0.026	0.025	0.023	0.021	0.019	0.017	0.015	0.013	0.011	0.009	0.007	0.005	0.004	0.002	0.000		
DEFLECTION DUE TO WT. OF SLAB * ↓	0.080	0.076	0.072	0.068	0.063	0.059	0.054	0.050	0.045	0.040	0.036	0.031	0.026	0.022	0.017	0.013	0.008	0.004	0.000		
DEFLECTION DUE TO WT. OF RAIL ↓	0.010	0.010	0.009	0.009	0.008	0.007	0.007	0.006	0.006	0.005	0.005	0.004	0.003	0.003	0.002	0.002	0.001	0.001	0.000		
TOTAL DEAD LOAD DEFLECTION ↓	0.122	0.117	0.110	0.104	0.098	0.091	0.084	0.077	0.070	0.063	0.055	0.048	0.041	0.034	0.027	0.020	0.013	0.006	0.000		
VERTICAL CURVE ORDINATE ↑	0.015	0.015	0.014	0.013	0.012	0.011	0.010	0.009	0.009	0.008	0.007	0.006	0.005	0.004	0.003	0.003	0.002	0.001	0.000		
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
REQUIRED CAMBER ↑	1 5/8"	1 9/16"	1 1/2"	1 3/8"	1 5/16"	1 1/4"	1 1/8"	1 1/16"	15/16"	13/16"	3/4"	5/8"	9/16"	7/16"	3/8"	1/4"	3/16"	1/16"	0"		

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.

NOTES

SLOPE FOR THE ZERO CAMBER LINE VARIES.

VALUES ARE AT THE SIXTIETH POINTS BETWEEN CENTERLINE OF BEARINGS.

DEFLECTIONS AND ORDINATES ARE IN FEET (DECIMAL FORM).

REQUIRED CAMBER VALUES ARE IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTION AND CAMBER

SPAN B

GIRDER 5

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	-0.002	-0.003	-0.005	-0.006	-0.008	-0.009	-0.010	-0.012	-0.013	-0.014	-0.015	-0.017	-0.018	-0.019	-0.020	-0.021	-0.022
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	-0.004	-0.007	-0.010	-0.013	-0.016	-0.019	-0.021	-0.024	-0.026	-0.028	-0.031	-0.033	-0.035	-0.036	-0.038	-0.040	-0.042
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	0.000	-0.001	-0.001	-0.002	-0.002	-0.002	-0.003	-0.003	-0.003	-0.004	-0.004	-0.004	-0.005	-0.005	-0.005	-0.005	-0.006
TOTAL DEAD LOAD DEFLECTION ↓	0.000	-0.006	-0.011	-0.016	-0.021	-0.026	-0.030	-0.035	-0.039	-0.043	-0.046	-0.050	-0.054	-0.057	-0.060	-0.063	-0.066	-0.069
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0"	-1/16"	-1/8"	-3/16"	-1/4"	-5/16"	-3/8"	-7/16"	-7/16"	-1/2"	-9/16"	-5/8"	-5/8"	-11/16"	-3/4"	-3/4"	-13/16"	-13/16"

SIXTIETH POINTS	18/60	19/60	20/60	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60
DEFLECTION DUE TO WT. OF STEEL ↓	-0.023	-0.024	-0.025	-0.026	-0.026	-0.027	-0.028	-0.029	-0.030	-0.030	-0.031	-0.031	-0.032	-0.032	-0.033	-0.033	-0.033	-0.033
DEFLECTION DUE TO WT. OF SLAB * ↓	-0.043	-0.045	-0.046	-0.048	-0.049	-0.050	-0.051	-0.052	-0.053	-0.054	-0.055	-0.056	-0.057	-0.058	-0.058	-0.059	-0.059	-0.059
DEFLECTION DUE TO WT. OF RAIL ↓	-0.006	-0.006	-0.006	-0.006	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008
TOTAL DEAD LOAD DEFLECTION ↓	-0.072	-0.074	-0.077	-0.080	-0.082	-0.084	-0.086	-0.088	-0.090	-0.092	-0.094	-0.095	-0.096	-0.098	-0.099	-0.099	-0.100	-0.101
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	-7/8"	-7/8"	-15/16"	-15/16"	-1"	-1"	-1 1/16"	-1 1/16"	-1 1/16"	1 1/8"	-1 1/8"	-1 1/8"	-1 3/16"	-1 3/16"	-1 3/16"	-1 3/16"	-1 3/16"	-1 3/16"

SIXTIETH POINTS	36/60	37/60	38/60	39/60	40/60	41/60	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60
DEFLECTION DUE TO WT. OF STEEL ↓	-0.033	-0.033	-0.033	-0.033	-0.033	-0.032	-0.032	-0.031	-0.031	-0.030	-0.029	-0.027	-0.026	-0.025	-0.023	-0.022	-0.020	-0.018
DEFLECTION DUE TO WT. OF SLAB * ↓	-0.059	-0.059	-0.059	-0.058	-0.058	-0.057	-0.056	-0.055	-0.054	-0.052	-0.050	-0.048	-0.046	-0.044	-0.041	-0.038	-0.035	-0.032
DEFLECTION DUE TO WT. OF RAIL ↓	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.007	-0.007	-0.007	-0.007	-0.006	-0.006	-0.005	-0.005	-0.005
TOTAL DEAD LOAD DEFLECTION ↓	-0.101	-0.101	-0.100	-0.100	-0.099	-0.097	-0.096	-0.094	-0.092	-0.089	-0.086	-0.082	-0.079	-0.075	-0.070	-0.065	-0.060	-0.054
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	-1 3/16"	1 3/16"	-1 3/16"	-1 3/16"	-1 3/16"	-1 3/16"	-1 1/8"	-1 1/8"	-1 1/8"	-1 1/16"	-1"	-1"	-15/16"	-7/8"	-13/16"	-13/16"	-11/16"	-5/8"

SIXTIETH POINTS	54/60	55/60	56/60	57/60	58/60	59/60	60/60											
DEFLECTION DUE TO WT. OF STEEL ↓	-0.016	-0.014	-0.011	-0.009	-0.006	-0.003	0.000											
DEFLECTION DUE TO WT. OF SLAB * ↓	-0.028	-0.024	-0.020	-0.016	-0.011	-0.005	0.000											
DEFLECTION DUE TO WT. OF RAIL ↓	-0.004	-0.003	-0.003	-0.002	-0.002	-0.001	0.000											
TOTAL DEAD LOAD DEFLECTION ↓	-0.048	-0.041	-0.034	-0.026	-0.018	-0.009	0.000											
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000											
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000											
REQUIRED CAMBER ↑	-9/16"	-1/2"	-7/16"	-5/16"	-3/16"	-1/8"	0"											

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20777 HARDY L. WILLIS
DocuSigned by: Hardy Willis
6C287FCF0223461...
7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Vaughn & Melton
Consulting Engineers
Asheville, North Carolina 828·253·2796
Boone, NC 828·355·9933
Tri-Cities, TN 423·467·8401
Knoxville, TN 865·546·5800
Spartanburg, SC 864·574·4775
Charleston, SC 843·974·5650
Middlesboro, KY 606·248·6600
Atlanta, GA 770·627·3590
Raleigh, NC 919·977·9455
Charlotte, NC 704·357·0488

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 7 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE DEADLOAD DEFLECTION AND CAMBER ORDINATES UNIT 1

DWN. BY: AW	DATE: 11/2021
CHKD. BY: PRG	DATE: 11/2021
DES. EGR. OF RECORD: PRG	DATE: 11/2021

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-46

TOTAL SHEETS 92

DEAD LOAD DEFLECTION AND CAMBER

SPAN C

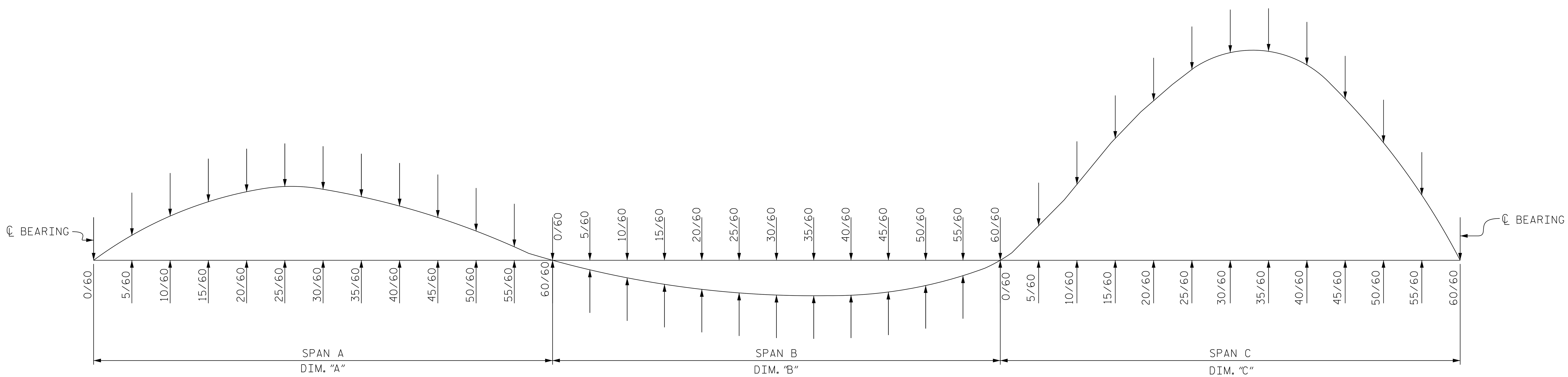
GIRDER 5

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60	18/60	19/60	20/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	0.006	0.012	0.019	0.026	0.033	0.040	0.048	0.056	0.064	0.072	0.080	0.088	0.096	0.104	0.111	0.119	0.126	0.133	0.140	0.146
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	0.010	0.021	0.033	0.045	0.058	0.071	0.085	0.099	0.113	0.128	0.142	0.156	0.171	0.185	0.198	0.212	0.224	0.237	0.249	0.260
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	0.001	0.003	0.005	0.007	0.008	0.010	0.012	0.014	0.016	0.019	0.021	0.023	0.025	0.027	0.029	0.031	0.033	0.035	0.036	0.038
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.017	0.036	0.056	0.077	0.099	0.122	0.145	0.169	0.194	0.218	0.243	0.267	0.291	0.315	0.338	0.361	0.383	0.405	0.425	0.444
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0"	3/16"	7/16"	11/16"	15/16"	1 3/16"	1 7/16"	1 3/4"	2 1/16"	2 5/16"	2 5/8"	2 15/16"	3 3/16"	3 1/2"	3 3/4"	4 1/16"	4 5/16"	4 5/8"	4 7/8"	5 1/8"	5 5/16"

SIXTIETH POINTS	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60	36/60	37/60	38/60	39/60	40/60	41/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.152	0.158	0.163	0.168	0.172	0.176	0.179	0.182	0.184	0.186	0.187	0.188	0.188	0.188	0.186	0.185	0.182	0.180	0.176	0.172	0.168
DEFLECTION DUE TO WT. OF SLAB * ↓	0.271	0.281	0.290	0.299	0.307	0.313	0.319	0.324	0.328	0.331	0.334	0.335	0.335	0.334	0.332	0.329	0.325	0.320	0.314	0.307	0.299
DEFLECTION DUE TO WT. OF RAIL ↓	0.040	0.041	0.042	0.044	0.045	0.046	0.047	0.047	0.048	0.048	0.049	0.049	0.049	0.049	0.049	0.048	0.048	0.047	0.046	0.045	0.044
TOTAL DEAD LOAD DEFLECTION ↓	0.463	0.480	0.496	0.510	0.523	0.535	0.545	0.554	0.561	0.566	0.570	0.572	0.572	0.570	0.567	0.562	0.555	0.546	0.536	0.523	0.510
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	5 9/16"	5 3/4"	5 15/16"	6 1/8"	6 1/4"	6 7/16"	6 9/16"	6 5/8"	6 3/4"	6 13/16"	6 13/16"	6 7/8"	6 7/8"	6 13/16"	6 13/16"	6 3/4"	6 11/16"	6 9/16"	6 7/16"	6 1/4"	6 1/8"

SIXTIETH POINTS	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60	54/60	55/60	56/60	57/60	58/60	59/60	60/60		
DEFLECTION DUE TO WT. OF STEEL ↓	0.162	0.157	0.151	0.144	0.137	0.129	0.121	0.113	0.104	0.095	0.085	0.075	0.065	0.054	0.044	0.033	0.022	0.011	0.000		
DEFLECTION DUE TO WT. OF SLAB * ↓	0.290	0.279	0.268	0.257	0.244	0.230	0.216	0.201	0.185	0.169	0.151	0.134	0.116	0.097	0.078	0.059	0.039	0.020	0.000		
DEFLECTION DUE TO WT. OF RAIL ↓	0.042	0.041	0.039	0.038	0.036	0.034	0.032	0.029	0.027	0.025	0.022	0.020	0.017	0.014	0.011	0.009	0.006	0.003	0.000		
TOTAL DEAD LOAD DEFLECTION ↓	0.494	0.477	0.458	0.439	0.417	0.393	0.369	0.343	0.316	0.288	0.258	0.228	0.198	0.166	0.133	0.101	0.067	0.000	0.000		
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
REQUIRED CAMBER ↑	5 15/16"	5 3/4"	5 1/2"	5 1/4"	5"	4 3/4"	4 7/16"	4 1/8"	3 13/16"	3 7/16"	3 1/8"	2 3/4"	2 3/8"	2"	1 5/8"	1 3/16"	13/16"	3/8"	0"		

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.



SCHEMATIC OF CAMBER ORDINATES

FOR CAMBER VALUES (SIXTIETH POINTS) AT EACH GIRDER, SEE TABLES ON SHEETS 1 THRU 8. SLOPE FOR ZERO CAMBER BASE LINE VARIES.

GIRDER	DIM. A	DIM. "B"	DIM. "C"
1	125'-4 13/16"	122'-10 5/8"	200'-0 3/8"
2	126'-3 11/16"	123'-9 1/16"	201'-5 1/2"
3	127'-2 1/2"	124'-7 1/2"	202'-10 5/8"
4	128'-1 3/8"	125'-5 15/16"	204'-3 11/16"
5	129'-1 5/16"	126'-4 3/8"	205'-8 13/16"

NOTES

SLOPE FOR THE ZERO CAMBER LINE VARIES.

VALUES ARE AT THE SIXTY POINTS BETWEEN CENTERLINE OF BEARINGS.

DEFLECTIONS AND ORDINATES ARE IN FEET (DECIMAL FORM).

REQUIRED CAMBER VALUES ARE IN INCHES (FRACTION FORM).

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL — DocuSigned by: 7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Boone, NC 828-355-9933 · Tri-Cities, TN 423-467-8401 · Knoxville, TN 865-546-5800 · Spartanburg, SC 864-574-4775 · Charleston, SC 843-974-5650 · Middlesboro, KY 606-248-6600 · Atlanta, GA 770-627-3590 · Raleigh, NC 919-977-9455 · Charlotte, NC 704-357-0488

PROJECT NO. U-2579AA
FORSYTH COUNTY
STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-

SHEET 8 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE DEADLOAD DEFLECTION AND CAMBER ORDINATES UNIT 1

CHKD. BY: AW	DATE: 11/2021	
CHKD. BY: PRG	DATE: 03/2022	1
DES. EGR. OF RECORD: PRG	DATE: 03/2022	2

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-47
TOTAL SHEETS 92

wdtrutcher
DGN: V:\NC\Structures\03748-44 U-2579AA STPS\Structures\SITE 1 - FLYCA North\Plans\FINAL PLANS\401_093_U2579AA_SMU_DL08_047.dgn
TIME: 10:03 AM on Tuesday, July 26, 2022

DEAD LOAD DEFLECTION AND CAMBER

SPAN D

GIRDER 1

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60	18/60	19/60	20/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	0.008	0.015	0.023	0.031	0.038	0.045	0.052	0.059	0.066	0.072	0.078	0.084	0.090	0.095	0.100	0.104	0.108	0.112	0.116	0.119
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	0.014	0.029	0.043	0.057	0.071	0.084	0.097	0.110	0.123	0.134	0.146	0.157	0.167	0.177	0.186	0.194	0.202	0.209	0.215	0.221
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	0.002	0.004	0.006	0.008	0.010	0.011	0.013	0.015	0.017	0.018	0.020	0.021	0.023	0.024	0.025	0.026	0.027	0.028	0.029	0.030
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.024	0.048	0.072	0.095	0.118	0.141	0.163	0.184	0.205	0.225	0.244	0.262	0.279	0.295	0.310	0.324	0.337	0.349	0.360	0.369
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	-0.015	-0.030	-0.045	-0.060	-0.075	-0.090	-0.105	-0.120	-0.135	-0.150	-0.165	-0.180	-0.195	-0.196	-0.192	-0.187	-0.182	-0.177	-0.173	-0.168
REQUIRED CAMBER ↑	0"	1/8"	3/16"	5/16"	7/16"	1/2"	5/8"	11/16"	3/4"	13/16"	7/8"	15/16"	1"	1"	1 3/16"	1 7/16"	1 5/8"	1 7/8"	2 1/16"	2 1/4"	2 7/16"

SIXTIETH POINTS	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60	36/60	37/60	38/60	39/60	40/60	41/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.121	0.124	0.126	0.127	0.128	0.129	0.129	0.129	0.128	0.127	0.126	0.124	0.122	0.120	0.117	0.114	0.111	0.107	0.103	0.099	0.094
DEFLECTION DUE TO WT. OF SLAB * ↓	0.226	0.230	0.233	0.236	0.238	0.239	0.239	0.239	0.238	0.236	0.234	0.230	0.227	0.222	0.217	0.211	0.205	0.198	0.190	0.182	0.174
DEFLECTION DUE TO WT. OF RAIL ↓	0.030	0.031	0.031	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.031	0.031	0.030	0.030	0.029	0.028	0.028	0.027	0.026	0.025	0.023
TOTAL DEAD LOAD DEFLECTION ↓	0.378	0.385	0.390	0.395	0.398	0.400	0.401	0.400	0.398	0.395	0.391	0.386	0.379	0.372	0.363	0.354	0.343	0.331	0.319	0.305	0.292
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	-0.163	-0.158	-0.154	-0.149	-0.144	-0.139	-0.134	-0.130	-0.125	-0.120	-0.115	-0.111	-0.106	-0.101	-0.096	-0.092	-0.087	-0.082	-0.077	-0.072	-0.068
REQUIRED CAMBER ↑	2 9/16"	2 11/16"	2 13/16"	2 15/16"	3 1/16"	3 1/8"	3 3/16"	3 1/4"	3 1/4"	3 5/16"	3 5/16"	3 5/16"	3 1/4"	3 1/4"	3 3/16"	3 1/8"	3 1/16"	3"	2 7/8"	2 13/16"	2 11/16"

SIXTIETH POINTS	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60	54/60	55/60	56/60	57/60	58/60	59/60	60/60		
DEFLECTION DUE TO WT. OF STEEL ↓	0.090	0.085	0.080	0.074	0.069	0.064	0.058	0.053	0.047	0.042	0.036	0.031	0.026	0.021	0.016	0.012	0.008	0.004	0.000		
DEFLECTION DUE TO WT. OF SLAB * ↓	0.165	0.156	0.147	0.137	0.127	0.117	0.107	0.096	0.086	0.076	0.066	0.057	0.047	0.038	0.030	0.021	0.014	0.007	0.000		
DEFLECTION DUE TO WT. OF RAIL ↓	0.022	0.021	0.020	0.018	0.017	0.016	0.014	0.013	0.012	0.010	0.009	0.008	0.006	0.005	0.004	0.003	0.002	0.001	0.000		
TOTAL DEAD LOAD DEFLECTION ↓	0.277	0.261	0.246	0.229	0.213	0.196	0.179	0.162	0.145	0.128	0.111	0.095	0.080	0.064	0.050	0.036	0.023	0.011	0.000		
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
SUPERELEVATION ORDINATE ↑	-0.063	-0.058	-0.053	-0.049	-0.044	-0.039	-0.034	-0.030	-0.025	-0.020	-0.015	-0.011	-0.006	-0.001	0.004	0.009	0.013	0.015	0.000		
REQUIRED CAMBER ↑	2 9/16"	2 7/16"	2 5/16"	2 3/16"	2"	1 7/8"	1 3/4"	1 9/16"	1 7/16"	1 5/16"	1 1/8"	1"	7/8"	3/4"	5/8"	9/16"	7/16"	5/16"	0"		

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.

DEAD LOAD DEFLECTION AND CAMBER

SPAN E

GIRDER 1

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	-0.003	-0.005	-0.007	-0.009	-0.011	-0.012	-0.013	-0.014	-0.015	-0.016	-0.017	-0.017	-0.017	-0.017	-0.018	-0.018	-0.018
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	-0.005	-0.009	-0.013	-0.016	-0.019	-0.022	-0.024	-0.025	-0.027	-0.028	-0.029	-0.029	-0.030	-0.030	-0.030	-0.030	-0.030
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	-0.001	-0.001	-0.002	-0.002	-0.002	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003
TOTAL DEAD LOAD DEFLECTION ↓	0.000	-0.008	-0.015	-0.022	-0.027	-0.032	-0.036	-0.040	-0.043	-0.045	-0.047	-0.049	-0.050	-0.050	-0.051	-0.051	-0.051	-0.050
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑		-1/8"	-3/16"	-1/4"	-5/16"	-3/8"	-7/16"	-1/2"	-1/2"	-9/16"	-9/16"	-9/16"	-5/8"	-5/8"	-5/8"	-5/8"	-5/8"	-5/8"

SIXTIETH POINTS	18/60	19/60	20/60	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60
DEFLECTION DUE TO WT. OF STEEL ↓	-0.018	-0.018	-0.017	-0.017	-0.017	-0.017	-0.017	-0.016	-0.016	-0.016	-0.016	-0.016	-0.016	-0.016	-0.016	-0.016	-0.016	-0.016
DEFLECTION DUE TO WT. OF SLAB * ↓	-0.029	-0.029	-0.028	-0.028	-0.028	-0.027	-0.027	-0.026	-0.026	-0.026	-0.026	-0.026	-0.026	-0.026	-0.026	-0.026	-0.026	-0.027
DEFLECTION DUE TO WT. OF RAIL ↓	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003
TOTAL DEAD LOAD DEFLECTION ↓	-0.050	-0.050	-0.049	-0.048	-0.047	-0.046	-0.046	-0.045	-0.045	-0.044	-0.044	-0.044	-0.043	-0.043	-0.044	-0.044	-0.045	-0.045
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	-5/8"	-5/8"	-9/16"	-9/16"	9/16"	-9/16"	-9/16"	-9/16"	-9/16"	-1/2"	-1/2"	-1/2"	-1/2"	-1/2"	-1/2"	-1/2"	-9/16"	-9/16"

SIXTIETH POINTS	36/60	37/60	38/60	39/60	40/60	41/60	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60
DEFLECTION DUE TO WT. OF STEEL ↓	-0.016	-0.016	-0.016	-0.016	-0.016	-0.016	-0.016	-0.016	-0.016	-0.016	-0.016	-0.016	-0.015	-0.015	-0.015	-0.014	-0.013	-0.012
DEFLECTION DUE TO WT. OF SLAB * ↓	-0.027	-0.028	-0.028	-0.029	-0.029	-0.030	-0.030	-0.030	-0.031	-0.031	-0.031	-0.030	-0.030	-0.030	-0.029	-0.028	-0.026	-0.025
DEFLECTION DUE TO WT. OF RAIL ↓	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.004	-0.004	-0.003	-0.003	-0.003	-0.003	-0.003
TOTAL DEAD LOAD DEFLECTION ↓	-0.046	-0.046	-0.047	-0.047	-0.048	-0.049	-0.049	-0.050	-0.050	-0.050	-0.050	-0.050	-0.049	-0.048	-0.047	-0.045	-0.043	-0.040
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	-9/16"	-9/16"	-9/16"	-9/16"	-9/16"	-9/16"	-9/16"	-5/8"	-5/8"	-5/8"	-5/8"	-5/8"	-9/16"	-9/16"	-9/16"	-9/16"	-1/2"	-1/2"

SIXTIETH POINTS	54/60	55/60	56/60	57/60	58/60	59/60	60/60											
DEFLECTION DUE TO WT. OF STEEL ↓	-0.011	-0.010	-0.008	-0.007	-0.005	-0.002	0.000											
DEFLECTION DUE TO WT. OF SLAB * ↓	-0.022	-0.020	-0.017	-0.013	-0.009	-0.005	0.000											
DEFLECTION DUE TO WT. OF RAIL ↓	-0.003	-0.002	-0.002	-0.002	-0.001	-0.001	0.000											
TOTAL DEAD LOAD DEFLECTION ↓	-0.036	-0.032	-0.027	-0.021	-0.015	-0.008	0.000											
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000											
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000											
REQUIRED CAMBER ↑	-7/16"	-3/8"	-5/16"	-1/4"	-3/16"	-1/8"	0"											

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.

NOTES

SLOPE FOR THE ZERO CAMBER LINE VARIES.

VALUES ARE AT THE SIXTIETH POINTS BETWEEN CENTERLINE OF BEARINGS.

DEFLECTIONS AND ORDINATES ARE IN FEET (DECIMAL FORM).

REQUIRED CAMBER VALUES ARE IN INCHES (FRACTION FORM).

7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Boone, NC 828-355-9933 · Tri-Cities, TN 423-467-8401 · Knoxville, TN 865-546-5800 · Spartanburg, SC 864-574-4775 · Charleston, SC 843-974-5650 · Middlesboro, KY 606-248-6600 · Atlanta, GA 770-627-3590 · Raleigh, NC 919-977-9455 · Charlotte, NC 704-357-0488

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 1 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE DEADLOAD DEFLECTION AND CAMBER ORDINATES UNIT 2

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			S1-48
1			3					TOTAL SHEETS
2			4					92

DWN. BY: AW DATE: 11/2021
CHKD. BY: PRG DATE: 11/2021
DES. EGR. OF RECORD: PRG DATE: 11/2021

DEAD LOAD DEFLECTION AND CAMBER

SPAN F

GIRDER 1

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60	18/60	19/60	20/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	0.003	0.006	0.010	0.014	0.018	0.022	0.026	0.030	0.035	0.039	0.044	0.049	0.053	0.058	0.063	0.067	0.072	0.076	0.080	0.084
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	0.006	0.013	0.020	0.028	0.036	0.044	0.053	0.062	0.071	0.081	0.090	0.100	0.110	0.119	0.129	0.138	0.148	0.157	0.166	0.175
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	0.011	0.012	0.013	0.015	0.016	0.017	0.018	0.020	0.021	0.022	0.023
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.010	0.021	0.032	0.045	0.058	0.071	0.086	0.100	0.115	0.131	0.146	0.162	0.177	0.193	0.209	0.224	0.239	0.254	0.268	0.282
VERTICAL CURVE ORDINATE ↑	0.000	-0.002	-0.004	-0.007	-0.009	-0.011	-0.013	-0.015	-0.018	-0.020	-0.022	-0.024	-0.026	-0.028	-0.031	-0.033	-0.035	-0.037	-0.039	-0.042	-0.044
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0"	1/8"	3/16"	5/16"	7/16"	9/16"	11/16"	13/16"	1"	1 1/8"	1 5/16"	1 7/16"	1 5/8"	1 13/16"	1 15/16"	2 1/8"	2 1/4"	2 7/16"	2 9/16"	2 3/4"	2 7/8"

SIXTIETH POINTS	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60	36/60	37/60	38/60	39/60	40/60	41/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.088	0.092	0.095	0.098	0.101	0.104	0.106	0.108	0.110	0.111	0.112	0.113	0.113	0.113	0.113	0.112	0.110	0.109	0.107	0.105	0.102
DEFLECTION DUE TO WT. OF SLAB * ↓	0.183	0.191	0.198	0.205	0.211	0.216	0.221	0.226	0.229	0.232	0.234	0.236	0.236	0.236	0.236	0.234	0.232	0.229	0.225	0.220	0.215
DEFLECTION DUE TO WT. OF RAIL ↓	0.024	0.025	0.026	0.027	0.028	0.029	0.029	0.030	0.030	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.030	0.030	0.029	0.028
TOTAL DEAD LOAD DEFLECTION ↓	0.295	0.308	0.319	0.330	0.340	0.349	0.357	0.364	0.369	0.374	0.377	0.380	0.381	0.381	0.379	0.377	0.373	0.368	0.361	0.354	0.345
VERTICAL CURVE ORDINATE ↑	-0.046	-0.048	-0.050	-0.053	-0.055	-0.057	-0.059	-0.061	-0.063	-0.066	-0.068	-0.070	-0.072	-0.074	-0.077	-0.079	-0.081	-0.083	-0.085	-0.088	-0.090
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	3"	3 1/8"	3 1/4"	3 5/16"	3 7/16"	3 1/2"	3 9/16"	3 5/8"	3 11/16"	3 11/16"	3 11/16"	3 11/16"	3 11/16"	3 11/16"	3 5/8"	3 9/16"	3 1/2"	3 7/16"	3 5/16"	3 3/16"	3 1/16"

SIXTIETH POINTS	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60	54/60	55/60	56/60	57/60	58/60	59/60	60/60		
DEFLECTION DUE TO WT. OF STEEL ↓	0.099	0.096	0.092	0.088	0.084	0.080	0.075	0.069	0.064	0.058	0.052	0.046	0.040	0.034	0.027	0.020	0.014	0.007	0.000		
DEFLECTION DUE TO WT. OF SLAB * ↓	0.208	0.202	0.194	0.186	0.177	0.167	0.157	0.146	0.135	0.123	0.111	0.098	0.085	0.071	0.057	0.043	0.029	0.014	0.000		
DEFLECTION DUE TO WT. OF RAIL ↓	0.028	0.027	0.026	0.025	0.023	0.022	0.021	0.019	0.018	0.016	0.015	0.013	0.011	0.009	0.008	0.006	0.004	0.002	0.000		
TOTAL DEAD LOAD DEFLECTION ↓	0.335	0.324	0.312	0.229	0.284	0.269	0.252	0.235	0.216	0.198	0.178	0.157	0.136	0.114	0.092	0.069	0.046	0.023	0.000		
VERTICAL CURVE ORDINATE ↑	-0.092	-0.093	-0.093	-0.093	-0.092	-0.090	-0.087	-0.084	-0.080	-0.075	-0.070	-0.064	-0.057	-0.049	-0.041	-0.032	-0.022	-0.011	0.000		
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
REQUIRED CAMBER ↑	2 15/16"	2 3/4"	2 5/8"	2 7/16"	2 5/16"	2 1/8"	2"	1 13/16"	1 5/8"	1 7/16"	1 5/16"	1 1/8"	15/16"	3/4"	5/8"	7/16"	5/16"	1/8"	0"		

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.

DEAD LOAD DEFLECTION AND CAMBER

SPAN D

GIRDER 2

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	0.009	0.018	0.027	0.036	0.044	0.053	0.061	0.069	0.077	0.084	0.091	0.098	0.105	0.111	0.116	0.122	0.126
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	0.017	0.034	0.050	0.067	0.083	0.098	0.114	0.129	0.143	0.157	0.170	0.183	0.195	0.206	0.217	0.227	0.236
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	0.002	0.005	0.007	0.009	0.011	0.013	0.016	0.018	0.020	0.021	0.023	0.025	0.027	0.028	0.030	0.031	0.032
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.028	0.056	0.084	0.111	0.138	0.165	0.190	0.215	0.240	0.263	0.285	0.306	0.326	0.345	0.363	0.379	0.395
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	-0.009	-0.018	-0.027	-0.035	-0.044	-0.053	-0.062	-0.071	-0.079	-0.088	-0.097	-0.106	-0.115	-0.116	-0.113	-0.110	-0.107
REQUIRED CAMBER ↑	0"	1/4"	7/16"	11/16"	15/16"	1 1/8"	1 5/16"	1 9/16"	1 3/4"	1 15/16"	2 1/16"	2 1/4"	2 3/8"	2 9/16"	2 3/4"	3"	3 1/4"	3 7/16"

SIXTIETH POINTS	18/60	19/60	20/60	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.131	0.135	0.139	0.142	0.144	0.146	0.148	0.149	0.150	0.150	0.150	0.149	0.148	0.147	0.145	0.143	0.140	0.136
DEFLECTION DUE TO WT. OF SLAB * ↓	0.244	0.252	0.258	0.264	0.269	0.273	0.276	0.278	0.279	0.280	0.279	0.278	0.276	0.273	0.269	0.265	0.259	0.253
DEFLECTION DUE TO WT. OF RAIL ↓	0.033	0.034	0.035	0.036	0.037	0.037	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.037	0.037	0.036	0.035	0.035
TOTAL DEAD LOAD DEFLECTION ↓	0.408	0.421	0.432	0.441	0.450	0.456	0.462	0.465	0.467	0.468	0.468	0.466	0.462	0.457	0.451	0.443	0.434	0.424
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	-0.104	-0.102	-0.099	-0.096	-0.093	-0.090	-0.088	-0.085	-0.082	-0.079	-0.076	-0.074	-0.071	-0.065	-0.065	-0.062	-0.060	-0.057
REQUIRED CAMBER ↑	3 5/8"	3 13/16"	4"	4 1/8"	4 1/4"	4 3/8"	4 1/2"	4 9/16"	4 5/8"	4 11/16"	4 11/16"	4 11/16"	4 11/16"	4 11/16"	4 5/8"	4 9/16"	4 1/2"	4 7/16"

SIXTIETH POINTS	36/60	37/60	38/60	39/60	40/60	41/60	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.133	0.129	0.125	0.120	0.115	0.110	0.104	0.098	0.093	0.087	0.080	0.074	0.068	0.061	0.055	0.049	0.042	0.036
DEFLECTION DUE TO WT. OF SLAB * ↓	0.246	0.239	0.231	0.222	0.213	0.203	0.193	0.182	0.171	0.160	0.148	0.137	0.125	0.113	0.101	0.089	0.078	0.066
DEFLECTION DUE TO WT. OF RAIL ↓	0.034	0.033	0.032	0.030	0.029	0.028	0.026	0.025	0.023	0.022	0.020	0.019	0.017	0.015	0.014	0.012	0.011	0.009
TOTAL DEAD LOAD DEFLECTION ↓	0.413	0.400	0.387	0.372	0.357	0.340	0.323	0.305	0.287	0.268	0.249	0.229	0.209	0.189	0.170	0.150	0.131	0.112
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	-0.054	-0.051	-0.048	-0.046	-0.043	-0.040	-0.037	-0.034	-0.031	-0.029	-0.026	-0.023	-0.020	-0.017	-0.015	-0.012	-0.009	-0.006
REQUIRED CAMBER ↑	4 5/16"	4 3/16"	4 1/16"	3 15/16"	3 3/4"	3 5/8"	3 7/16"	3 1/4"	3 1/16"	2 7/8"	2 11/16"	2 1/2"	2 1/4"	2 1/16"	1 7/8"	1 11/16"	1 7/16"	1 1/4"

SIXTIETH POINTS	54/60	55/60	56/60	57/60	58/60	59/60	60/60											
DEFLECTION DUE TO WT. OF STEEL ↓	0.030	0.025	0.019	0.014	0.009	0.004	0.000											
DEFLECTION DUE TO WT. OF SLAB * ↓	0.055	0.045	0.035	0.025	0.016	0.008	0.000											
DEFLECTION DUE TO WT. OF RAIL ↓	0.008	0.006	0.005	0.003	0.002	0.001	0.000											
TOTAL DEAD LOAD DEFLECTION ↓	0.093	0.075	0.058	0.042	0.027	0.013	0.000											
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000											
SUPERELEVATION ORDINATE ↑	-0.003	-0.001	0.002	0.005	0.008	0.009	0.000											
REQUIRED CAMBER ↑	1 1/16"	7/8"	3/4"	9/16"	7/16"	1/4"	0"											

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.

NOTES

SLOPE FOR THE ZERO CAMBER LINE VARIES.

VALUES ARE AT THE SIXTIETH POINTS BETWEEN CENTERLINE OF BEARINGS.

DEFLECTIONS AND ORDINATES ARE IN FEET (DECIMAL FORM).

REQUIRED CAMBER VALUES ARE IN INCHES (FRACTION FORM).

NORTH CAROLINA PROFESSIONAL ENGINEER
DocuSigned by: Hardy Willis
7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Boone, NC 828-355-9933 · Tri-Cities, TN 423-467-8401 · Knoxville, TN 865-546-5800 · Spartanburg, SC 864-574-4775 · Charleston, SC 843-974-5650 · Middlesboro, KY 606-248-6600 · Atlanta, GA 770-627-3590 · Raleigh, NC 919-977-9455 · Charlotte, NC 704-357-0488

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-

SHEET 2 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
DEADLOAD DEFLECTION
AND CAMBER ORDINATES
UNIT 2

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			S1-49
1			3					TOTAL SHEETS
2			4					92

DWN. BY: AW DATE: 11/2021
CHKD. BY: PRG DATE: 11/2021
DES. EGR. OF RECORD: PRG DATE: 11/2021

DEAD LOAD DEFLECTION AND CAMBER
SPAN E
GIRDER 2

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60	18/60	19/60	20/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	-0.003	-0.006	-0.009	-0.011	-0.013	-0.015	-0.016	-0.018	-0.019	-0.020	-0.021	-0.021	-0.022	-0.022	-0.022	-0.023	-0.023	-0.023	-0.023	-0.023
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	-0.006	-0.011	-0.015	-0.020	-0.023	-0.026	-0.029	-0.031	-0.033	-0.035	-0.036	-0.037	-0.038	-0.038	-0.039	-0.039	-0.039	-0.039	-0.039	-0.038
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	-0.001	-0.001	-0.002	-0.003	-0.003	-0.003	-0.004	-0.004	-0.004	-0.004	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
TOTAL DEAD LOAD DEFLECTION ↓	0.000	-0.010	-0.018	-0.026	-0.033	-0.039	-0.044	-0.049	-0.053	-0.056	-0.059	-0.061	-0.063	-0.064	-0.065	-0.066	-0.066	-0.066	-0.066	-0.066	-0.065
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0"	-1/8"	-1/4"	-5/16"	-3/8"	-1/2"	-9/16"	-9/16"	-5/8"	-11/16"	-11/16"	-3/4"	-3/4"	-3/4"	-3/4"	-13/16"	-13/16"	-13/16"	-13/16"	-13/16"	-13/16"

SIXTIETH POINTS	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60	36/60	37/60	38/60	39/60	40/60	41/60
DEFLECTION DUE TO WT. OF STEEL ↓	-0.023	-0.023	-0.022	-0.022	-0.022	-0.022	-0.021	-0.021	-0.021	-0.021	-0.021	-0.021	-0.020	-0.020	-0.020	-0.020	-0.020	-0.020	-0.020	-0.020	-0.020
DEFLECTION DUE TO WT. OF SLAB * ↓	-0.038	-0.037	-0.037	-0.036	-0.036	-0.036	-0.035	-0.035	-0.035	-0.035	-0.035	-0.034	-0.034	-0.035	-0.035	-0.035	-0.035	-0.035	-0.035	-0.036	-0.036
DEFLECTION DUE TO WT. OF RAIL ↓	-0.005	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004
TOTAL DEAD LOAD DEFLECTION ↓	-0.065	-0.064	-0.063	-0.063	-0.062	-0.061	-0.061	-0.060	-0.060	-0.059	-0.059	-0.059	-0.059	-0.059	-0.059	-0.059	-0.059	-0.059	-0.059	-0.059	-0.060
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	-3/4"	-3/4"	-3/4"	-3/4"	-3/4"	-3/4"	-3/4"	-3/4"	-11/16"	-11/16"	-11/16"	-11/16"	-11/16"	-11/16"	-11/16"	-11/16"	-11/16"	-11/16"	-11/16"	-11/16"	-11/16"

SIXTIETH POINTS	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60	54/60	55/60	56/60	57/60	58/60	59/60	60/60		
DEFLECTION DUE TO WT. OF STEEL ↓	-0.020	-0.019	-0.019	-0.019	-0.019	-0.018	-0.018	-0.017	-0.016	-0.016	-0.015	-0.013	-0.012	-0.011	-0.009	-0.007	-0.005	-0.003	0.000		
DEFLECTION DUE TO WT. OF SLAB * ↓	-0.036	-0.036	-0.036	-0.035	-0.035	-0.035	-0.034	-0.033	-0.032	-0.030	-0.029	-0.027	-0.024	-0.021	-0.018	-0.014	-0.010	-0.005	0.000		
DEFLECTION DUE TO WT. OF RAIL ↓	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.003	-0.003	-0.003	-0.002	-0.002	-0.001	-0.001	0.000		
TOTAL DEAD LOAD DEFLECTION ↓	-0.060	-0.059	-0.059	-0.058	-0.058	-0.057	-0.056	-0.054	-0.052	-0.050	-0.047	-0.043	-0.039	-0.034	-0.029	-0.023	-0.016	-0.009	0.000		
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
REQUIRED CAMBER ↑	-11/16"	-11/16"	-11/16"	-11/16"	-11/16"	-11/16"	-11/16"	-5/8"	-5/8"	-5/8"	-9/16"	-1/2"	-7/16"	-7/16"	-3/8"	-1/4"	-3/16"	-1/8"	0"		

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.

DEAD LOAD DEFLECTION AND CAMBER
SPAN F
GIRDER 2

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	0.003	0.007	0.010	0.014	0.018	0.023	0.027	0.031	0.036	0.041	0.045	0.050	0.055	0.060	0.064	0.069	0.074
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	0.006	0.013	0.021	0.029	0.037	0.046	0.055	0.064	0.073	0.083	0.093	0.103	0.113	0.123	0.132	0.142	0.152
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.009	0.010	0.011	0.012	0.014	0.015	0.016	0.018	0.019	0.020
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.010	0.022	0.034	0.047	0.060	0.075	0.089	0.104	0.119	0.135	0.151	0.166	0.183	0.199	0.214	0.230	0.245
VERTICAL CURVE ORDINATE ↑	0.000	-0.002	-0.004	-0.007	-0.009	-0.011	-0.013	-0.015	-0.018	-0.020	-0.022	-0.024	-0.026	-0.028	-0.031	-0.033	-0.035	-0.037
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0"	1/8"	3/16"	5/16"	7/16"	9/16"	3/4"	7/8"	1 1/16"	1 3/16"	1 3/8"	1 1/2"	1 11/16"	1 7/8"	2"	2 3/16"	2 5/16"	2 1/2"

SIXTIETH POINTS	18/60	19/60	20/60	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.078	0.082	0.086	0.090	0.094	0.097	0.100	0.103	0.106	0.108	0.110	0.112	0.113	0.114	0.115	0.115	0.115	0.114
DEFLECTION DUE TO WT. OF SLAB * ↓	0.161	0.170	0.179	0.187	0.195	0.202	0.209	0.215	0.221	0.226	0.230	0.233	0.236	0.239	0.240	0.241	0.241	0.240
DEFLECTION DUE TO WT. OF RAIL ↓	0.021	0.023	0.024	0.025	0.026	0.027	0.028	0.029	0.029	0.030	0.030	0.031	0.031	0.032	0.032	0.032	0.032	0.032
TOTAL DEAD LOAD DEFLECTION ↓	0.260	0.275	0.289	0.302	0.315	0.326	0.337	0.347	0.356	0.364	0.371	0.376	0.381	0.384	0.386	0.387	0.387	0.386
VERTICAL CURVE ORDINATE ↑	-0.039	-0.042	-0.044	-0.046	-0.048	-0.050	-0.053	-0.055	-0.057	-0.059	-0.061	-0.063	-0.066	-0.068	-0.070	-0.072	-0.074	-0.077
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	2 5/8"	3 13/16"	2 15/16"	3 1/16"	3 3/16"	3 5/16"	3 7/16"	3 1/2"	3 9/16"	3 5/8"	3 11/16"	3 3/4"	3 13/16"	3 13/16"	3 13/16"	3 13/16"	3 3/4"	3 11/16"

SIXTIETH POINTS	36/60	37/60	38/60	39/60	40/60	41/60	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.114	0.112	0.111	0.109	0.106	0.104	0.101	0.097	0.094	0.090	0.085	0.081	0.076	0.070	0.065	0.059	0.053	0.047
DEFLECTION DUE TO WT. OF SLAB * ↓	0.238	0.236	0.232	0.228	0.224	0.218	0.212	0.205	0.197	0.189	0.180	0.170	0.159	0.148	0.137	0.125	0.112	0.099
DEFLECTION DUE TO WT. OF RAIL ↓	0.031	0.031	0.031	0.030	0.030	0.029	0.028	0.027	0.026	0.025	0.024	0.022	0.021	0.020	0.018	0.016	0.015	0.013
TOTAL DEAD LOAD DEFLECTION ↓	0.383	0.379	0.374	0.367	0.360	0.350	0.340	0.329	0.317	0.303	0.288	0.273	0.256	0.238	0.220	0.200	0.015	0.159
VERTICAL CURVE ORDINATE ↑	-0.079	-0.081	-0.083	-0.085	-0.088	-0.090	-0.092	-0.093	-0.093	-0.093	-0.092	-0.090	-0.087	-0.084	-0.080	-0.075	-0.070	-0.064
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	3 5/8"	3 9/16"	3 1/2"	3 3/8"	3 1/4"	3 1/8"	3"	2 13/16"	2 11/16"	2 1/2"	2 3/8"	2 3/16"	2"	1 7/8"	1 11/16"	1 1/2"	1 5/16"	1 1/8"

SIXTIETH POINTS	54/60	55/60	56/60	57/60	58/60	59/60	60/60											
DEFLECTION DUE TO WT. OF STEEL ↓	0.041	0.034	0.027	0.021	0.014	0.007	0.000											
DEFLECTION DUE TO WT. OF SLAB * ↓	0.086	0.072	0.058	0.044	0.029	0.015	0.000											
DEFLECTION DUE TO WT. OF RAIL ↓	0.011	0.010	0.008	0.006	0.004	0.002	0.000											
TOTAL DEAD LOAD DEFLECTION ↓	0.138	0.116	0.093	0.070	0.047	0.024	0.000											
VERTICAL CURVE ORDINATE ↑	-0.057	-0.049	-0.041	-0.032	-0.022	-0.011	0.000											
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000											
REQUIRED CAMBER ↑	1"	13/16"	5/8"	7/16"	5/16"	1/8"	0"											

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.

NOTES

SLOPE FOR THE ZERO CAMBER LINE VARIES.

VALUES ARE AT THE SIXTY POINTS BETWEEN CENTERLINE OF BEARINGS.

DEFLECTIONS AND ORDINATES ARE IN FEET (DECIMAL FORM).

REQUIRED CAMBER VALUES ARE IN INCHES (FRACTION FORM).

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20777 — DocuSigned by: Andy Willis — 7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

V&M Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Boone, NC 828-355-9933 · Tri-Cities, TN 423-467-8401 · Knoxville, TN 865-546-5800 · Spartanburg, SC 864-574-4775 · Charleston, SC 843-974-5650 · Middlesboro, KY 606-248-6600 · Atlanta, GA 770-627-3590 · Raleigh, NC 919-977-9455 · Charlotte, NC 704-357-0488

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 3 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE DEADLOAD DEFLECTION AND CAMBER ORDINATES UNIT 2

DWN. BY: AW	DATE: 11/2021
CHKD. BY: PRG	DATE: 11/2021
DES. EGR. OF RECORD: PRG	DATE: 11/2021

REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

SHEET NO. S1-50
TOTAL SHEETS 92

wdsrdsher
DGN: V:\NC\Structures\03748-44 U-2579AA STFS\Structures\SITE 1 - FLYCA NorthPlans\FINAL PLANS\40I_099_U2579AA_SMU_DLD_050.dgn
TIME: 10:03 AM on Tuesday, July 26, 2022

DEAD LOAD DEFLECTION AND CAMBER
SPAN D
GIRDER 3

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60	18/60	19/60	20/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	0.010	0.020	0.031	0.041	0.050	0.060	0.069	0.078	0.087	0.096	0.104	0.112	0.119	0.126	0.133	0.139	0.144	0.149	0.154	0.158
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	0.019	0.038	0.057	0.076	0.094	0.112	0.130	0.147	0.163	0.179	0.194	0.209	0.222	0.235	0.248	0.259	0.269	0.278	0.287	0.294
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	0.003	0.005	0.008	0.011	0.013	0.016	0.018	0.020	0.023	0.025	0.027	0.029	0.031	0.033	0.034	0.036	0.037	0.039	0.040	0.041
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.032	0.064	0.096	0.127	0.158	0.188	0.217	0.245	0.273	0.300	0.325	0.349	0.372	0.394	0.414	0.433	0.450	0.466	0.480	0.493
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	-0.003	-0.005	-0.008	-0.011	-0.013	-0.016	-0.019	-0.021	-0.024	-0.027	-0.029	-0.032	-0.035	-0.035	-0.034	-0.033	-0.032	-0.032	-0.031	-0.030
REQUIRED CAMBER ↑	0"	3/8"	11/16"	1 1/16"	1 1/8"	1 3/4"	2 1/16"	2 3/8"	2 11/16"	3"	3 1/4"	3 9/16"	3 13/16"	4 1/16"	4 5/16"	4 9/16"	4 13/16"	5"	5 3/16"	5 3/8"	5 9/16"

SIXTIETH POINTS	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60	36/60	37/60	38/60	39/60	40/60	41/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.161	0.164	0.167	0.169	0.170	0.171	0.171	0.171	0.170	0.169	0.167	0.165	0.162	0.159	0.155	0.151	0.147	0.142	0.137	0.131	0.125
DEFLECTION DUE TO WT. OF SLAB * ↓	0.301	0.307	0.311	0.315	0.317	0.319	0.319	0.319	0.317	0.315	0.311	0.307	0.302	0.296	0.289	0.281	0.273	0.263	0.253	0.243	0.232
DEFLECTION DUE TO WT. OF RAIL ↓	0.042	0.042	0.043	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.043	0.043	0.042	0.041	0.040	0.039	0.038	0.036	0.035	0.034	0.032
TOTAL DEAD LOAD DEFLECTION ↓	0.504	0.513	0.521	0.527	0.531	0.534	0.534	0.534	0.532	0.528	0.522	0.515	0.506	0.496	0.484	0.471	0.457	0.422	0.425	0.407	0.389
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	-0.029	-0.028	-0.027	-0.026	-0.026	-0.025	-0.024	-0.023	-0.022	-0.021	-0.021	-0.020	-0.019	-0.018	-0.017	-0.016	-0.015	-0.015	-0.014	-0.013	-0.012
REQUIRED CAMBER ↑	5 11/16"	5 13/16"	5 15/16"	6"	6 1/16"	6 1/8"	6 1/8"	6 1/8"	6 1/8"	6 1/16"	6"	5 15/16"	5 7/8"	5 3/4"	5 5/8"	5 7/16"	5 5/16"	5 1/8"	4 15/16"	4 3/4"	4 1/2"

SIXTIETH POINTS	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60	54/60	55/60	56/60	57/60	58/60	59/60	60/60		
DEFLECTION DUE TO WT. OF STEEL ↓	0.119	0.112	0.106	0.099	0.092	0.084	0.077	0.070	0.063	0.055	0.048	0.041	0.035	0.028	0.022	0.016	0.010	0.005	0.000		
DEFLECTION DUE TO WT. OF SLAB * ↓	0.220	0.208	0.195	0.182	0.169	0.156	0.142	0.129	0.115	0.102	0.089	0.076	0.064	0.052	0.040	0.029	0.019	0.009	0.000		
DEFLECTION DUE TO WT. OF RAIL ↓	0.030	0.029	0.027	0.025	0.023	0.022	0.020	0.018	0.016	0.014	0.012	0.011	0.009	0.007	0.006	0.004	0.003	0.001	0.000		
TOTAL DEAD LOAD DEFLECTION ↓	0.369	0.349	0.328	0.306	0.284	0.262	0.239	0.217	0.194	0.172	0.150	0.128	0.107	0.087	0.067	0.049	0.031	0.015	0.000		
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
SUPERELEVATION ORDINATE ↑	-0.011	-0.010	-0.010	-0.009	-0.008	-0.007	-0.006	-0.005	-0.004	-0.004	-0.003	-0.002	-0.001	0.000	0.001	0.002	0.002	0.003	0.000		
REQUIRED CAMBER ↑	4 5/16"	4 1/16"	3 13/16"	3 9/16"	3 5/16"	3 1/16"	2 13/16"	2 9/16"	2 1/4"	2"	1 3/4"	1 1/2"	1 1/4"	1 1/16"	13/16"	5/8"	3/8"	3/16"	0"		

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.

DEAD LOAD DEFLECTION AND CAMBER
SPAN E
GIRDER 3

SIXTIETH POINTS ↓	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	-0.004	-0.007	-0.010	-0.013	-0.015	-0.017	-0.019	-0.021	-0.023	-0.024	-0.025	-0.026	-0.027	-0.027	-0.027	-0.028	-0.028
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	-0.007	-0.013	-0.018	-0.023	-0.027	-0.031	-0.035	-0.037	-0.040	-0.042	-0.044	-0.045	-0.046	-0.047	-0.048	-0.048	-0.048
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	-0.001	-0.002	-0.002	-0.003	-0.004	-0.004	-0.005	-0.005	-0.005	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006
TOTAL DEAD LOAD DEFLECTION ↑	0.000	-0.011	-0.021	-0.030	-0.039	-0.046	-0.053	-0.058	-0.063	-0.068	-0.071	-0.074	-0.077	-0.079	-0.080	-0.081	-0.082	-0.083
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0"	-1/8"	-1/4"	-3/8"	-7/16"	-9/16"	-5/8"	-11/16"	-3/4"	-13/16"	-7/8"	-7/8"	-15/16"	-15/16"	-15/16"	-1"	-1"	-1"

SIXTIETH POINTS ↓	18/60	19/60	20/60	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60
DEFLECTION DUE TO WT. OF STEEL ↓	-0.028	-0.028	-0.028	-0.028	-0.028	-0.028	-0.028	-0.028	-0.027	-0.027	-0.027	-0.026	-0.026	-0.026	-0.026	-0.025	-0.025	-0.025
DEFLECTION DUE TO WT. OF SLAB * ↓	-0.048	-0.048	-0.048	-0.048	-0.048	-0.047	-0.047	-0.046	-0.046	-0.045	-0.045	-0.044	-0.044	-0.044	-0.044	-0.043	-0.043	-0.043
DEFLECTION DUE TO WT. OF RAIL ↓	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.005	-0.005	-0.005	-0.005
TOTAL DEAD LOAD DEFLECTION ↑	-0.083	-0.083	-0.083	-0.082	-0.082	-0.081	-0.080	-0.080	-0.079	-0.078	-0.077	-0.076	-0.076	-0.075	-0.075	-0.074	-0.074	-0.073
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	-1"	-1"	-1"	-1"	-1"	-1"	-15/16"	-15/16"	-15/16"	-15/16"	-15/16"	-15/16"	-15/16"	-7/8"	-7/8"	-7/8"	-7/8"	-7/8"

SIXTIETH POINTS ↓	36/60	37/60	38/60	39/60	40/60	41/60	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60
DEFLECTION DUE TO WT. OF STEEL ↓	-0.025	-0.024	-0.024	-0.024	-0.024	-0.023	-0.023	-0.022	-0.022	-0.022	-0.021	-0.021	-0.020	-0.019	-0.018	-0.017	-0.016	-0.015
DEFLECTION DUE TO WT. OF SLAB * ↓	-0.043	-0.043	-0.043	-0.043	-0.042	-0.042	-0.042	-0.041	-0.041	-0.040	-0.040	-0.039	-0.038	-0.037	-0.035	-0.033	-0.031	-0.029
DEFLECTION DUE TO WT. OF RAIL ↓	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.004	-0.004	-0.004
TOTAL DEAD LOAD DEFLECTION ↑	-0.073	-0.073	-0.072	-0.072	-0.071	-0.071	-0.070	-0.069	-0.068	-0.067	-0.066	-0.064	-0.062	-0.060	-0.058	-0.054	-0.051	-0.047
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	-7/8"	-7/8"	-7/8"	-7/8"	-7/8"	-7/8"	-13/16"	-13/16"	-13/16"	-13/16"	-13/16"	-3/4"	-3/4"	-3/4"	-11/16"	-5/8"	-5/8"	-9/16"

SIXTIETH POINTS	54/60	55/60	56/60	57/60	58/60	59/60	60/60											
DEFLECTION DUE TO WT. OF STEEL ↓	-0.013	-0.012	-0.010	-0.008	-0.005	-0.003	0.000											
DEFLECTION DUE TO WT. OF SLAB * ↓	-0.026	-0.023	-0.019	-0.015	-0.011	-0.005	0.000											
DEFLECTION DUE TO WT. OF RAIL ↓	-0.003	-0.003	-0.003	-0.002	-0.001	-0.001	0.000											
TOTAL DEAD LOAD DEFLECTION ↓	-0.042	-0.037	-0.031	-0.024	-0.017	-0.009	0.000											
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000											
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000											
REQUIRED CAMBER ↑	-1/2"	-7/16"	-3/8"	-5/16"	-3/16"	-1/8"	0"											

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.

NOTES

SLOPE FOR THE ZERO CAMBER LINE VARIES.

VALUES ARE AT THE SIXTIETH POINTS BETWEEN CENTERLINE OF BEARINGS.

DEFLECTIONS AND ORDINATES ARE IN FEET (DECIMAL FORM).

REQUIRED CAMBER VALUES ARE IN INCHES (FRACTION FORM).

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL — HARDY L. WILLIS — DocuSigned by: Hardy Willis

7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

V&M Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Boone, NC 828-355-9933
Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Atlanta, GA 770-627-3590
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 4 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE DEADLOAD DEFLECTION AND CAMBER ORDINATES UNIT 2

DWN. BY: AW	DATE: 11/2021
CHKD. BY: PRG	DATE: 11/2021
DES. EGR. OF RECORD: PRG	DATE: 11/2021

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-51
TOTAL SHEETS 92

DEAD LOAD DEFLECTION AND CAMBER

SPAN F

GIRDER 3

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60	18/60	19/60	20/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	0.003	0.007	0.011	0.015	0.019	0.023	0.028	0.032	0.037	0.042	0.047	0.052	0.056	0.061	0.066	0.071	0.075	0.080	0.084	0.088
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	0.007	0.014	0.022	0.030	0.038	0.047	0.056	0.066	0.076	0.086	0.096	0.105	0.116	0.126	0.136	0.145	0.155	0.164	0.174	0.182
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.008	0.009	0.010	0.011	0.013	0.014	0.015	0.017	0.018	0.019	0.021	0.022	0.023	0.024
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.011	0.023	0.035	0.049	0.062	0.077	0.092	0.107	0.123	0.139	0.155	0.171	0.187	0.204	0.220	0.235	0.251	0.266	0.281	0.295
VERTICAL CURVE ORDINATE ↑	0.000	-0.002	-0.004	-0.007	-0.009	-0.011	-0.013	-0.015	-0.018	-0.020	-0.022	-0.024	-0.026	-0.028	-0.031	-0.033	-0.035	-0.037	-0.039	-0.042	-0.044
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0"	1/8"	1/4"	5/16"	1/2"	5/8"	3/4"	15/16"	1 1/16"	1 1/4"	1 3/8"	1 9/16"	1 3/4"	1 15/16"	2 1/16"	2 1/4"	2 3/8"	2 9/16"	2 3/4"	2 7/8"	3"

SIXTIETH POINTS	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60	36/60	37/60	38/60	39/60	40/60	41/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.092	0.096	0.099	0.103	0.105	0.108	0.110	0.112	0.114	0.115	0.116	0.117	0.117	0.117	0.116	0.115	0.114	0.112	0.110	0.108	0.105
DEFLECTION DUE TO WT. OF SLAB * ↓	0.191	0.199	0.206	0.213	0.219	0.225	0.230	0.234	0.237	0.240	0.242	0.244	0.244	0.244	0.243	0.242	0.239	0.236	0.232	0.227	0.221
DEFLECTION DUE TO WT. OF RAIL ↓	0.025	0.026	0.027	0.028	0.029	0.030	0.030	0.031	0.031	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.031	0.031	0.030	0.029
TOTAL DEAD LOAD DEFLECTION ↓	0.308	0.321	0.333	0.343	0.353	0.362	0.370	0.377	0.383	0.387	0.391	0.393	0.394	0.393	0.392	0.389	0.385	0.379	0.373	0.365	0.355
VERTICAL CURVE ORDINATE ↑	-0.046	-0.048	-0.050	-0.053	-0.055	-0.057	-0.059	-0.061	-0.063	-0.066	-0.068	-0.070	-0.072	-0.074	-0.077	-0.079	-0.081	-0.083	-0.085	-0.088	-0.090
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	3 1/8"	3 1/4"	3 3/8"	3 1/2"	3 9/16"	3 11/16"	3 3/4"	3 13/16"	3 13/16"	3 7/8"	3 7/8"	3 7/8"	3 7/8"	3 13/16"	3 3/4"	3 11/16"	3 5/8"	3 9/16"	3 7/16"	3 5/16"	3 3/16"

SIXTIETH POINTS	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60	54/60	55/60	56/60	57/60	58/60	59/60	60/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.102	0.099	0.095	0.091	0.086	0.082	0.077	0.071	0.066	0.060	0.054	0.048	0.041	0.035	0.028	0.021	0.014	0.007	0.000
DEFLECTION DUE TO WT. OF SLAB * ↓	0.215	0.208	0.200	0.191	0.182	0.172	0.161	0.150	0.139	0.126	0.114	0.100	0.087	0.073	0.059	0.044	0.030	0.015	0.000
DEFLECTION DUE TO WT. OF RAIL ↓	0.028	0.027	0.026	0.025	0.024	0.023	0.021	0.020	0.018	0.017	0.015	0.013	0.011	0.010	0.008	0.006	0.004	0.002	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.345	0.334	0.321	0.307	0.292	0.276	0.259	0.241	0.223	0.203	0.183	0.161	0.139	0.117	0.094	0.071	0.048	0.024	0.000
VERTICAL CURVE ORDINATE ↑	-0.092	-0.093	-0.093	-0.093	-0.092	-0.090	-0.087	-0.084	-0.080	-0.075	-0.070	-0.064	-0.057	-0.049	-0.041	-0.032	-0.022	-0.011	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	3 1/16"	2 7/8"	2 3/4"	2 9/16"	2 7/16"	2 1/4"	2 1/16"	1 7/8"	1 11/16"	1 1/2"	1 3/8"	1 3/16"	1"	13/16"	5/8"	1/2"	5/16"	1/8"	0"

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.

DEAD LOAD DEFLECTION AND CAMBER

SPAN D

GIRDER 4

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	0.012	0.023	0.034	0.046	0.057	0.067	0.078	0.088	0.098	0.108	0.117	0.126	0.134	0.142	0.149	0.156	0.162
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	0.022	0.043	0.064	0.085	0.106	0.126	0.146	0.165	0.183	0.201	0.218	0.234	0.250	0.264	0.278	0.290	0.302
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	0.003	0.006	0.009	0.012	0.015	0.018	0.020	0.023	0.026	0.028	0.031	0.033	0.035	0.037	0.039	0.041	0.042
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.036	0.072	0.107	0.143	0.177	0.211	0.244	0.276	0.307	0.337	0.365	0.393	0.418	0.443	0.466	0.487	0.506
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.003	0.007	0.010	0.014	0.018	0.021	0.024	0.028	0.031	0.035	0.038	0.042	0.045	0.046	0.045	0.044	0.043
REQUIRED CAMBER ↑	0"	1/2"	15/16"	1 7/16"	1 7/8"	2 5/16"	2 3/4"	3 1/4"	3 5/8"	4 1/16"	4 7/16"	4 7/8"	5 3/16"	5 9/16"	5 7/8"	6 1/8"	6 3/8"	6 9/16"

SIXTIETH POINTS	18/60	19/60	20/60	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.168	0.173	0.177	0.181	0.185	0.188	0.190	0.191	0.192	0.193	0.192	0.192	0.190	0.188	0.186	0.182	0.179	0.175
DEFLECTION DUE TO WT. OF SLAB * ↓	0.313	0.322	0.331	0.338	0.344	0.349	0.353	0.356	0.358	0.358	0.358	0.356	0.353	0.350	0.345	0.339	0.332	0.324
DEFLECTION DUE TO WT. OF RAIL ↓	0.044	0.045	0.046	0.047	0.048	0.049	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.049	0.048	0.048	0.047	0.046
TOTAL DEAD LOAD DEFLECTION ↓	0.524	0.540	0.554	0.567	0.577	0.586	0.592	0.597	0.600	0.601	0.600	0.598	0.593	0.587	0.579	0.569	0.557	0.544
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.041	0.040	0.039	0.038	0.037	0.036	0.035	0.034	0.033	0.031	0.030	0.029	0.028	0.027	0.026	0.025	0.024	0.022
REQUIRED CAMBER ↑	6 13/16"	6 15/16"	7 1/8"	7 1/4"	7 3/8"	4 7/16"	7 1/2"	7 9/16"	7 9/16"	7 9/16"	7 9/16"	7 1/2"	7 7/16"	7 3/8"	7 1/4"	7 1/8"	7"	6 13/16"

SIXTIETH POINTS	36/60	37/60	38/60	39/60	40/60	41/60	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.170	0.165	0.159	0.153	0.147	0.140	0.133	0.126	0.119	0.111	0.103	0.095	0.087	0.079	0.070	0.062	0.054	0.047
DEFLECTION DUE TO WT. OF SLAB * ↓	0.316	0.306	0.296	0.284	0.273	0.260	0.247	0.233	0.219	0.205	0.190	0.175	0.160	0.020	0.130	0.115	0.100	0.086
DEFLECTION DUE TO WT. OF RAIL ↓	0.044	0.043	0.042	0.040	0.038	0.037	0.035	0.033	0.031	0.029	0.027	0.025	0.023	0.244	0.018	0.016	0.014	0.012
TOTAL DEAD LOAD DEFLECTION ↓	0.530	0.514	0.496	0.478	0.458	0.437	0.415	0.392	0.369	0.344	0.320	0.295	0.269	0.000	0.219	0.193	0.169	0.144
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.021	0.020	0.019	0.018	0.017	0.016	0.015	0.014	0.012	0.011	0.010	0.009	0.008	0.007	0.006	0.005	0.004	0.002
REQUIRED CAMBER ↑	0"	6 7/16"	6 3/16"	5 15/16"	5 11/16"	5 7/16"	5 1/8"	4 7/8"	4 9/16"	4 1/4"	3 15/16"	3 5/8"	3 5/16"	3"	2 11/16"	2 3/8"	2 1/16"	1 3/4"

SIXTIETH POINTS	54/60	55/60	56/60	57/60	58/60	59/60	60/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.039	0.032	0.025	0.018	0.012	0.006	0.000
DEFLECTION DUE TO WT. OF SLAB * ↓	0.072	0.058	0.045	0.033	0.021	0.010	0.000
DEFLECTION DUE TO WT. OF RAIL ↓	0.010	0.008	0.006	0.005	0.003	0.001	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.121	0.098	0.076	0.055	0.035	0.017	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.001	0.	-0.001	-0.002	-0.003	-0.004	0.000
REQUIRED CAMBER ↑	1 7/16"	1 3/16"	7/8"	5/8"	3/8"	3/16"	0"

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.

NOTES

SLOPE FOR THE ZERO CAMBER LINE VARIES.

VALUES ARE AT THE SIXTIETH POINTS BETWEEN CENTERLINE OF BEARINGS.

DEFLECTIONS AND ORDINATES ARE IN FEET (DECIMAL FORM).

REQUIRED CAMBER VALUES ARE IN INCHES (FRACTION FORM).

NORTH CAROLINA PROFESSIONAL SEAL 20777 ENGINEER HARDY L. WILLIS
DocuSigned by: Hardy Willis
0C287FCF0223461...
7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Vaughn & Melton
Consulting Engineers
Asheville, North Carolina 828·253·2796
Raleigh, NC 919·977·9455
Charlotte, NC 704·357·0488
Boone, NC 828·355·9933
Tri-Cities, TN 423·467·8401
Knoxville, TN 865·546·5800
Spartanburg, SC 864·574·4775
Charleston, SC 843·974·5650
Middlesboro, KY 606·248·6600
Atlanta, GA 770·627·3590

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 5 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE DEADLOAD DEFLECTION AND CAMBER ORDINATES UNIT 2

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

DWN. BY: AW DATE: 11/2021
CHKD. BY: PRG DATE: 11/2021
DES. EGR. OF RECORD: PRG DATE: 11/2021

SHEET NO. S1-52
TOTAL SHEETS 92

...rutcher
V:\NC\Structures\031748-44 U-2579AA STRS\Structures\SITE 1 - FLYCA North\Plans\FINAL PLANS\401_103_U2579AA_SMU_DL13_052.dgn
10:03 AM on Tuesday, July 26, 2022

DEAD LOAD DEFLECTION AND CAMBER

SPAN E

GIRDER 4

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60	18/60	19/60	20/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	-0.004	-0.008	-0.011	-0.015	-0.017	-0.020	-0.022	-0.024	-0.026	-0.028	-0.029	-0.030	-0.031	-0.032	-0.032	-0.033	-0.033	-0.034	-0.034	-0.034
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	-0.008	-0.014	-0.021	-0.026	-0.031	-0.036	-0.040	-0.044	-0.047	-0.049	-0.051	-0.053	-0.055	-0.056	-0.057	-0.058	-0.058	-0.059	-0.059	-0.059
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	-0.001	-0.002	-0.003	-0.004	-0.004	-0.005	-0.006	-0.006	-0.006	-0.007	-0.007	-0.007	-0.007	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008
TOTAL DEAD LOAD DEFLECTION ↓	0.000	-0.013	-0.024	-0.035	-0.044	-0.053	-0.061	-0.068	-0.074	-0.079	-0.084	-0.087	-0.091	-0.093	-0.095	-0.097	-0.098	-0.099	-0.100	-0.100	-0.101
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0"	-1/8"	-5/16"	-7/16"	-9/16"	-5/8"	-3/4"	-13/16"	-7/8"	-15/16"	-1"	-1 1/16"	-1 1/16"	-1 1/8"	-1 1/8"	-1 3/16"	-1 3/16"	-1 3/16"	-1 3/16"	-1 3/16"	-1 3/16"
SIXTIETH POINTS	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60	36/60	37/60	38/60	39/60	40/60	41/60
DEFLECTION DUE TO WT. OF STEEL ↓	-0.034	-0.034	-0.034	-0.034	-0.033	-0.033	-0.033	-0.032	-0.032	-0.031	-0.031	-0.031	-0.030	-0.030	-0.029	-0.029	-0.029	-0.028	-0.028	-0.027	-0.027
DEFLECTION DUE TO WT. OF SLAB * ↓	-0.059	-0.058	-0.058	-0.057	-0.057	-0.056	-0.056	-0.055	-0.035	-0.054	-0.054	-0.053	-0.053	-0.052	-0.052	-0.051	-0.051	-0.051	-0.050	-0.050	-0.049
DEFLECTION DUE TO WT. OF RAIL ↓	-0.008	-0.008	-0.008	-0.008	-0.008	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.006	-0.006
TOTAL DEAD LOAD DEFLECTION ↓	-0.100	-0.100	-0.099	-0.099	-0.098	-0.097	-0.096	-0.095	-0.094	-0.093	-0.092	-0.091	-0.090	-0.089	-0.088	-0.087	-0.086	-0.085	-0.084	-0.083	-0.082
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	-1 3/16"	-1 3/16"	-1 3/16"	-1 3/16"	-1 3/16"	-1 3/16"	-1 1/8"	-1 1/8"	-1 1/8"	-1 1/8"	-1 1/8"	-1 1/16"	-1 1/16"	-1 1/16"	-1 1/16"	-1 1/16"	-1 1/16"	-1"	-1"	-1"	-1"
SIXTIETH POINTS	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60	54/60	55/60	56/60	57/60	58/60	59/60	60/60		
DEFLECTION DUE TO WT. OF STEEL ↓	-0.026	-0.026	-0.025	-0.024	-0.024	-0.023	-0.022	-0.021	-0.020	-0.019	-0.017	-0.016	-0.014	-0.012	-0.010	-0.008	-0.006	-0.003	0.000		
DEFLECTION DUE TO WT. OF SLAB * ↓	-0.048	-0.047	-0.047	-0.046	-0.045	-0.043	-0.042	-0.040	-0.038	-0.036	-0.034	-0.031	-0.028	-0.024	-0.020	-0.016	-0.011	-0.006	0.000		
DEFLECTION DUE TO WT. OF RAIL ↓	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.005	-0.005	-0.005	-0.005	-0.004	-0.004	-0.004	-0.003	-0.003	-0.002	-0.002	-0.001	0.000		
TOTAL DEAD LOAD DEFLECTION ↓	-0.081	-0.079	-0.078	-0.076	-0.074	-0.072	-0.069	-0.067	-0.063	-0.060	-0.056	-0.051	-0.045	-0.040	-0.033	-0.026	-0.018	-0.009	0.000		
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
REQUIRED CAMBER ↑	-1"	-15/16"	-15/16"	-15/16"	-7/8"	-7/8"	-13/16"	-13/16"	-3/4"	-11/16"	-11/16"	-5/8"	-9/16"	-1/2"	-3/8"	-5/16"	-3/16"	-1/8"	0"		

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.

DEAD LOAD DEFLECTION AND CAMBER

SPAN F

GIRDER 4

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	0.004	0.007	0.011	0.015	0.020	0.024	0.029	0.034	0.038	0.043	0.048	0.053	0.058	0.063	0.068	0.072	0.077
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	0.001	0.014	0.022	0.031	0.040	0.049	0.058	0.068	0.078	0.088	0.098	0.108	0.118	0.128	0.139	0.148	0.158
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	0.007	0.002	0.003	0.004	0.005	0.007	0.008	0.009	0.010	0.012	0.013	0.015	0.016	0.017	0.019	0.020	0.021
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.011	0.024	0.037	0.050	0.064	0.079	0.095	0.110	0.126	0.143	0.159	0.176	0.192	0.208	0.225	0.241	0.256
VERTICAL CURVE ORDINATE ↑	0.000	-0.002	-0.004	-0.007	-0.009	-0.011	-0.013	-0.018	-0.018	-0.020	-0.022	-0.024	-0.026	-0.028	-0.031	-0.033	-0.035	-0.037
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0"	1/8"	1/4"	3/8"	1/2"	5/8"	13/16"	15/16"	1 1/8"	1 1/4"	1 7/16"	1 5/8"	1 13/16"	1 15/16"	2 1/8"	2 5/16"	2 7/16"	2 5/8"
SIXTIETH POINTS	18/60	19/60	20/60	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.082	0.086	0.090	0.094	0.098	0.101	0.104	0.107	0.110	0.112	0.114	0.116	0.117	0.118	0.118	0.119	0.118	0.118
DEFLECTION DUE TO WT. OF SLAB * ↓	0.168	0.177	0.186	0.194	0.202	0.209	0.216	0.222	0.228	0.233	0.237	0.241	0.244	0.246	0.247	0.248	0.247	0.246
DEFLECTION DUE TO WT. OF RAIL ↓	0.022	0.024	0.025	0.026	0.027	0.028	0.029	0.030	0.030	0.031	0.032	0.032	0.032	0.033	0.033	0.033	0.033	0.033
TOTAL DEAD LOAD DEFLECTION ↓	0.272	0.286	0.301	0.314	0.327	0.339	0.349	0.359	0.368	0.376	0.383	0.389	0.393	0.396	0.398	0.399	0.399	0.397
VERTICAL CURVE ORDINATE ↑	-0.039	-0.042	-0.044	-0.046	-0.048	-0.050	-0.053	-0.055	-0.057	-0.059	-0.061	-0.063	-0.066	-0.068	-0.070	-0.072	-0.074	-0.077
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	2 13/16"	2 15/16"	3 1/16"	3 3/16"	3 5/16"	3 7/16"	3 9/16"	3 5/8"	3 3/4"	3 13/16"	3 7/8"	3 7/8"	3 15/16"	3 15/16"	3 15/16"	3 15/16"	3 7/8"	3 13/16"
SIXTIETH POINTS	36/60	37/60	38/60	39/60	40/60	41/60	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.117	0.116	0.114	0.112	0.109	0.107	0.104	0.100	0.096	0.092	0.088	0.083	0.078	0.072	0.067	0.061	0.055	0.048
DEFLECTION DUE TO WT. OF SLAB * ↓	0.244	0.242	0.239	0.234	0.229	0.224	0.217	0.210	0.202	0.193	0.184	0.174	0.163	0.152	0.140	0.128	0.115	0.101
DEFLECTION DUE TO WT. OF RAIL ↓	0.032	0.032	0.032	0.031	0.030	0.030	0.029	0.028	0.027	0.026	0.024	0.023	0.022	0.020	0.019	0.017	0.015	0.013
TOTAL DEAD LOAD DEFLECTION ↓	0.394	0.390	0.384	0.377	0.369	0.360	0.349	0.338	0.325	0.311	0.296	0.279	0.262	0.244	0.225	0.205	0.184	0.163
VERTICAL CURVE ORDINATE ↑	-0.079	-0.081	-0.083	-0.085	-0.088	-0.090	-0.092	-0.093	-0.093	-0.093	-0.092	-0.090	-0.087	-0.084	-0.080	-0.075	-0.070	-0.064
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	3 3/4"	3 11/16"	3 5/8"	3 1/2"	3 3/8"	3 1/4"	3 1/16"	2 15/16"	2 3/4"	2 5/8"	2 7/16"	2 1/4"	2 1/8"	1 15/16"	1 3/4"	1 9/16"	1 3/8"	1 3/16"
SIXTIETH POINTS	54/60	55/60	56/60	57/60	58/60	59/60	60/60											
DEFLECTION DUE TO WT. OF STEEL ↓	0.042	0.035	0.028	0.021	0.014	0.007	0.000											
DEFLECTION DUE TO WT. OF SLAB * ↓	0.088	0.074	0.059	0.045	0.030	0.015	0.000											
DEFLECTION DUE TO WT. OF RAIL ↓	0.012	0.010	0.008	0.006	0.004	0.002	0.000											
TOTAL DEAD LOAD DEFLECTION ↓	0.141	0.119	0.095	0.072	0.048	0.024	0.000											
VERTICAL CURVE ORDINATE ↑	-0.057	-0.049	-0.041	-0.032	-0.022	-0.011	0.000											
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	-0.004	0.000											
REQUIRED CAMBER ↑	1"	13/16"	5/8"	1/2"	5/16"	1/8"	0"											

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.

NOTES

SLOPE FOR THE ZERO CAMBER LINE VARIES.

VALUES ARE AT THE SIXTIETH POINTS BETWEEN CENTERLINE OF BEARINGS.

DEFLECTIONS AND ORDINATES ARE IN FEET (DECIMAL FORM).

REQUIRED CAMBER VALUES ARE IN INCHES (FRACTION FORM).

NORTH CAROLINA PROFESSIONAL ENGINEER
DocuSigned by: Hardy Willis
7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

V&M
Vaughn & Melton
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Asheville, North Carolina 828-253-2796
Boone, NC 828-355-9933
Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Atlanta, GA 770-627-3590
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488

PROJECT NO. U-2579AA
FORSYTH COUNTY
STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-

SHEET 6 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
DEADLOAD DEFLECTION
AND CAMBER ORDINATES
UNIT 2

REVISIONS								SHEET NO.
NO.	BY:	DATE:		NO.	BY:	DATE:		S1-53
1				3				TOTAL SHEETS
2				4				92

DWN. BY: AW DATE: 11/2021
CHKD. BY: PRG DATE: 11/2021
DES. EGR. OF RECORD: PRG DATE: 11/2021

DEAD LOAD DEFLECTION AND CAMBER

SPAN D

GIRDER 5

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60	18/60	19/60	20/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	0.013	0.026	0.038	0.051	0.063	0.075	0.087	0.098	0.109	0.120	0.130	0.140	0.149	0.158	0.166	0.174	0.181	0.187	0.193	0.198
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	0.024	0.048	0.071	0.094	0.117	0.140	0.162	0.183	0.203	0.223	0.242	0.260	0.278	0.294	0.309	0.323	0.336	0.348	0.358	0.368
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	0.003	0.007	0.010	0.013	0.017	0.020	0.023	0.026	0.029	0.032	0.034	0.037	0.039	0.042	0.044	0.046	0.048	0.049	0.051	0.052
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.040	0.080	0.120	0.159	0.197	0.235	0.271	0.307	0.342	0.375	0.407	0.437	0.466	0.493	0.519	0.542	0.564	0.584	0.602	0.618
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.010	0.019	0.029	0.039	0.048	0.058	0.068	0.077	0.087	0.097	0.106	0.116	0.126	0.127	0.124	0.121	0.117	0.114	0.111	0.108
REQUIRED CAMBER ↑	0"	5/8"	1 3/16"	1 13/16"	2 3/8"	2 15/16"	3 1/2"	4 1/16"	4 5/8"	5 1/8"	5 11/16"	6 1/8"	6 5/8"	7 1/8"	7 7/16"	7 11/16"	7 15/16"	8 3/16"	8 3/8"	8 9/16"	8 11/16"

SIXTIETH POINTS	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60	36/60	37/60	38/60	39/60	40/60	41/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.202	0.206	0.209	0.211	0.213	0.214	0.215	0.214	0.213	0.212	0.209	0.206	0.203	0.199	0.194	0.189	0.183	0.177	0.170	0.163	0.156
DEFLECTION DUE TO WT. OF SLAB * ↓	0.376	0.383	0.389	0.393	0.396	0.398	0.399	0.398	0.396	0.393	0.389	0.383	0.377	0.369	0.360	0.350	0.340	0.328	0.316	0.302	0.288
DEFLECTION DUE TO WT. OF RAIL ↓	0.053	0.054	0.055	0.056	0.056	0.057	0.057	0.057	0.056	0.056	0.055	0.055	0.054	0.053	0.051	0.050	0.048	0.047	0.045	0.043	0.041
TOTAL DEAD LOAD DEFLECTION ↓	0.631	0.643	0.653	0.660	0.666	0.669	0.670	0.669	0.666	0.661	0.653	0.644	0.633	0.620	0.606	0.589	0.572	0.552	0.531	0.509	0.483
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.105	0.102	0.099	0.096	0.093	0.090	0.087	0.084	0.081	0.078	0.074	0.071	0.068	0.065	0.062	0.059	0.056	0.053	0.050	0.047	0.044
REQUIRED CAMBER ↑	8 13/16"	8 15/16"	9"	9 1/8"	9 1/8"	9 1/8"	9 1/8"	9"	8 15/16"	8 7/8"	8 3/4"	8 9/16"	8 7/16"	8 1/4"	8"	7 13/16"	7 1/2"	7 1/4"	7"	6 11/16"	6 3/8"

SIXTIETH POINTS	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60	54/60	55/60	56/60	57/60	58/60	59/60	60/60		
DEFLECTION DUE TO WT. OF STEEL ↓	0.148	0.140	0.132	0.123	0.114	0.105	0.096	0.087	0.078	0.069	0.060	0.052	0.043	0.035	0.027	0.020	0.013	0.006	0.000		
DEFLECTION DUE TO WT. OF SLAB * ↓	0.274	0.259	0.243	0.227	0.211	0.194	0.177	0.161	0.144	0.127	0.111	0.095	0.080	0.064	0.050	0.036	0.023	0.011	0.000		
DEFLECTION DUE TO WT. OF RAIL ↓	0.039	0.037	0.035	0.032	0.030	0.028	0.025	0.023	0.021	0.018	0.016	0.014	0.011	0.009	0.007	0.005	0.003	0.002	0.000		
TOTAL DEAD LOAD DEFLECTION ↓	0.461	0.436	0.409	0.382	0.355	0.327	0.299	0.271	0.243	0.215	0.187	0.160	0.134	0.109	0.085	0.062	0.040	0.019	0.000		
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
SUPERELEVATION ORDINATE ↑	0.041	0.038	0.034	0.031	0.028	0.025	0.022	0.019	0.016	0.013	0.010	0.007	0.004	0.001	-0.002	-0.005	-0.009	-0.010	0.000		
REQUIRED CAMBER ↑	6"	5 11/16"	5 5/16"	4 15/16"	4 5/8"	4 1/4"	3 7/8"	3 1/2"	3 1/8"	2 3/4"	2 3/8"	2"	1 5/8"	1 5/16"	1"	11/16"	3/8"	1/8"	0"		

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.

DEAD LOAD DEFLECTION AND CAMBER

SPAN E

GIRDER 5

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	-0.005	-0.009	-0.013	-0.016	-0.020	-0.023	-0.025	-0.028	-0.030	-0.032	-0.033	-0.035	-0.036	-0.037	-0.038	-0.038	-0.039
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	-0.009	-0.016	-0.023	-0.030	-0.036	-0.041	-0.046	-0.050	-0.053	-0.057	-0.059	-0.062	-0.064	-0.065	-0.067	-0.068	-0.069
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	-0.001	-0.002	-0.003	-0.004	-0.005	-0.006	-0.006	-0.007	-0.007	-0.008	-0.008	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009
TOTAL DEAD LOAD DEFLECTION ↓	0.000	-0.014	-0.027	-0.039	-0.050	-0.060	-0.069	-0.077	-0.084	-0.091	-0.096	-0.101	-0.105	-0.108	-0.111	-0.113	-0.115	-0.117
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0"	-3/16"	-5/16"	-1/2"	-5/8"	-3/4"	-13/16"	-15/16"	-1"	-1 1/16"	-1 1/8"	-1 3/16"	-1 1/4"	-1 5/16"	-1 5/16"	-1 3/8"	-1 3/8"	-1 3/8"

SIXTIETH POINTS	18/60	19/60	20/60	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60
DEFLECTION DUE TO WT. OF STEEL ↓	-0.039	-0.039	-0.040	-0.040	-0.040	-0.039	-0.039	-0.039	-0.038	-0.038	-0.038	-0.037	-0.037	-0.036	-0.036	-0.035	-0.035	-0.034
DEFLECTION DUE TO WT. OF SLAB * ↓	-0.069	-0.070	-0.070	-0.070	-0.069	-0.069	-0.069	-0.068	-0.068	-0.067	-0.066	-0.066	-0.065	-0.064	-0.063	-0.063	-0.062	-0.061
DEFLECTION DUE TO WT. OF RAIL ↓	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009	-0.008	-0.008	-0.008	-0.008
TOTAL DEAD LOAD DEFLECTION ↓	-0.118	-0.118	-0.119	-0.119	-0.118	-0.118	-0.117	-0.116	-0.115	-0.114	-0.113	-0.119	-0.110	-0.109	-0.107	-0.106	-0.105	-0.103
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	-1 7/16"	-1 7/16"	-1 7/16"	-1 7/16"	-1 7/16"	-1 7/16"	-1 3/8"	-1 3/8"	-1 3/8"	-1 3/8"	-1 3/8"	-1 5/16"	-1 5/16"	-1 5/16"	-1 5/16"	-1 1/4"	-1 1/4"	-1 1/4"

SIXTIETH POINTS	36/60	37/60	38/60	39/60	40/60	41/60	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60
DEFLECTION DUE TO WT. OF STEEL ↓	-0.034	-0.033	-0.032	-0.032	-0.031	-0.031	-0.030	-0.025	-0.028	-0.027	-0.026	-0.025	-0.024	-0.023	-0.022	-0.020	-0.019	-0.017
DEFLECTION DUE TO WT. OF SLAB * ↓	-0.060	-0.060	-0.059	-0.058	-0.057	-0.056	-0.055	-0.054	-0.053	-0.051	-0.050	-0.048	-0.046	-0.044	-0.042	-0.039	-0.037	-0.033
DEFLECTION DUE TO WT. OF RAIL ↓	-0.008	-0.008	-0.008	-0.008	-0.008	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.006	-0.006	-0.006	-0.006	-0.005	-0.005	-0.004
TOTAL DEAD LOAD DEFLECTION ↓	-0.102	-0.100	-0.099	-0.097	-0.096	-0.094	-0.092	-0.090	-0.088	-0.085	-0.083	-0.080	-0.076	-0.073	-0.069	-0.065	-0.060	-0.055
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	-1 1/4"	-1 3/16"	-1 3/16"	-1 3/16"	-1 1/8"	-1 1/8"	-1 1/8"	-1 1/16"	-1 1/16"	-1"	-1"	-15/16"	-15/16"	-7/8"	-13/16"	-3/4"	-3/4"	-11/16"

SIXTIETH POINTS	54/60	55/60	56/60	57/60	58/60	59/60	60/60
DEFLECTION DUE TO WT. OF STEEL ↓	-0.015	-0.013	-0.011	-0.009	-0.006	-0.003	0.000
DEFLECTION DUE TO WT. OF SLAB * ↓	-0.030	-0.026	-0.021	-0.017	-0.012	-0.006	0.000
DEFLECTION DUE TO WT. OF RAIL ↓	-0.004	-0.003	-0.003	-0.002	-0.002	-0.001	0.000
TOTAL DEAD LOAD DEFLECTION ↓	-0.049	-0.042	-0.035	-0.028	-0.019	-0.010	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	-9/16"	-1/2"	-7/16"	-5/16"	-1/4"	-1/8"	0"

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.

NOTES

SLOPE FOR THE ZERO CAMBER LINE VARIES.

VALUES ARE AT THE SIXTIETH POINTS BETWEEN CENTERLINE OF BEARINGS.

DEFLECTIONS AND ORDINATES ARE IN FEET (DECIMAL FORM).

REQUIRED CAMBER VALUES ARE IN INCHES (FRACTION FORM).

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20777 HARDY L. WILLIS
DocuSigned by: Hardy Willis
CC287FCF0223461...
7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

V&M
Vaughn & Melton
Consulting Engineers
Asheville, North Carolina 828·253·2796
Raleigh, NC 919·977·9455
Charlotte, NC 704·357·0488
Boone, NC 828·355·9933
Tri-Cities, TN 423·467·8401
Knoxville, TN 865·546·5800
Spartanburg, SC 864·574·4775
Charleston, SC 843·974·5650
Middlesboro, KY 606·248·6600
Atlanta, GA 770·627·3590

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 7 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
DEADLOAD DEFLECTION
AND CAMBER ORDINATES
UNIT 2

DWN. BY: AW	DATE: 11/2021
CHKD. BY: PRG	DATE: 11/2021
DES. EGR. OF RECORD: PRG	DATE: 11/2021

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-54

TOTAL SHEETS 92

TIME: 10:03 AM on Tuesday, July 26, 2022

DEAD LOAD DEFLECTION AND CAMBER

SPAN F

GIRDER 5

SIXTIETH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60	18/60	19/60	20/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.000	0.004	0.007	0.012	0.016	0.020	0.025	0.030	0.034	0.039	0.044	0.049	0.054	0.059	0.064	0.069	0.074	0.079	0.083	0.088	0.092
DEFLECTION DUE TO WT. OF SLAB * ↓	0.000	0.007	0.015	0.023	0.032	0.041	0.050	0.060	0.070	0.080	0.090	0.100	0.110	0.121	0.131	0.141	0.151	0.161	0.170	0.180	0.189
DEFLECTION DUE TO WT. OF RAIL ↓	0.000	0.001	0.002	0.003	0.004	0.006	0.007	0.008	0.009	0.011	0.012	0.014	0.015	0.016	0.018	0.019	0.020	0.022	0.023	0.024	0.025
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.012	0.024	0.038	0.052	0.067	0.082	0.097	0.113	0.130	0.146	0.163	0.180	0.196	0.213	0.229	0.245	0.261	0.277	0.292	0.306
VERTICAL CURVE ORDINATE ↑	0.000	-0.002	-0.004	-0.007	-0.009	-0.011	0.013	-0.015	-0.018	-0.020	-0.022	-0.024	-0.026	-0.028	-0.031	-0.033	-0.035	-0.037	-0.039	-0.042	-0.044
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0"	1/8"	1/4"	3/8"	1/2"	11/16"	13/16"	1"	1 1/8"	1 5/16"	1 1/2"	1 11/16"	1 13/16"	2"	2 3/16"	2 3/8"	2 1/2"	2 11/16"	2 7/8"	3"	3 1/8"

SIXTIETH POINTS	21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60	36/60	37/60	38/60	39/60	40/60	41/60
DEFLECTION DUE TO WT. OF STEEL ↓	0.096	0.100	0.103	0.106	0.213	0.112	0.114	0.116	0.118	0.119	0.120	0.120	0.120	0.120	0.120	0.119	0.117	0.116	0.113	0.111	0.108
DEFLECTION DUE TO WT. OF SLAB * ↓	0.197	0.205	0.212	0.219	0.225	0.231	0.236	0.240	0.244	0.246	0.248	0.250	0.250	0.250	0.249	0.247	0.244	0.241	0.236	0.231	0.226
DEFLECTION DUE TO WT. OF RAIL ↓	0.027	0.028	0.029	0.029	0.030	0.301	0.032	0.032	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.032	0.032	0.031	0.030
TOTAL DEAD LOAD DEFLECTION ↓	0.319	0.332	0.344	0.355	0.365	0.374	0.382	0.388	0.394	0.398	0.401	0.403	0.404	0.403	0.401	0.399	0.394	0.388	0.381	0.373	0.364
VERTICAL CURVE ORDINATE ↑	-0.046	-0.048	-0.050	-0.053	-0.055	-0.057	-0.059	-0.061	-0.063	-0.066	-0.068	-0.070	-0.072	-0.074	-0.077	-0.079	-0.081	-0.083	-0.085	-0.088	-0.090
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	3 1/4"	3 7/16"	3 1/2"	3 5/8"	3 3/4"	3 13/16"	3 7/8"	3 15/16"	3 15/16"	4"	4"	4"	4"	3 15/16"	3 7/8"	3 13/16"	3 3/4"	3 11/16"	3 9/16"	3 7/16"	3 5/16"

SIXTIETH POINTS	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60	54/60	55/60	56/60	57/60	58/60	59/60	60/60		
DEFLECTION DUE TO WT. OF STEEL ↓	0.105	0.101	0.097	0.093	0.089	0.084	0.079	0.073	0.067	0.061	0.055	0.049	0.042	0.035	0.029	0.022	0.014	0.007	0.000		
DEFLECTION DUE TO WT. OF SLAB * ↓	0.219	0.212	0.203	0.195	0.185	0.175	0.164	0.153	0.141	0.128	0.115	0.102	0.088	0.074	0.060	0.045	0.030	0.015	0.000		
DEFLECTION DUE TO WT. OF RAIL ↓	0.029	0.028	0.027	0.026	0.025	0.023	0.022	0.020	0.019	0.017	0.015	0.014	0.012	0.010	0.008	0.006	0.004	0.002	0.000		
TOTAL DEAD LOAD DEFLECTION ↓	0.353	0.341	0.328	0.314	0.298	0.282	0.265	0.246	0.227	0.207	0.186	0.164	0.142	0.119	0.096	0.072	0.049	0.024	0.000		
VERTICAL CURVE ORDINATE ↑	-0.092	-0.093	-0.093	-0.093	-0.092	-0.090	-0.087	-0.084	-0.080	-0.075	-0.070	-0.064	-0.057	-0.049	-0.041	-0.032	-0.022	-0.011	0.000		
SUPERELEVATION ORDINATE ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
REQUIRED CAMBER ↑	3 1/8"	3"	2 13/16"	2 5/8"	2 1/2"	2 5/16"	2 1/8"	1 15/16"	1 3/4"	1 9/16"	1 3/8"	1 3/16"	1"	13/16"	11/16"	1/2"	5/16"	3/16"	0"		

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
* INCLUDES SLAB, BUILD-UP & STAY-IN-PLACE FORMS.

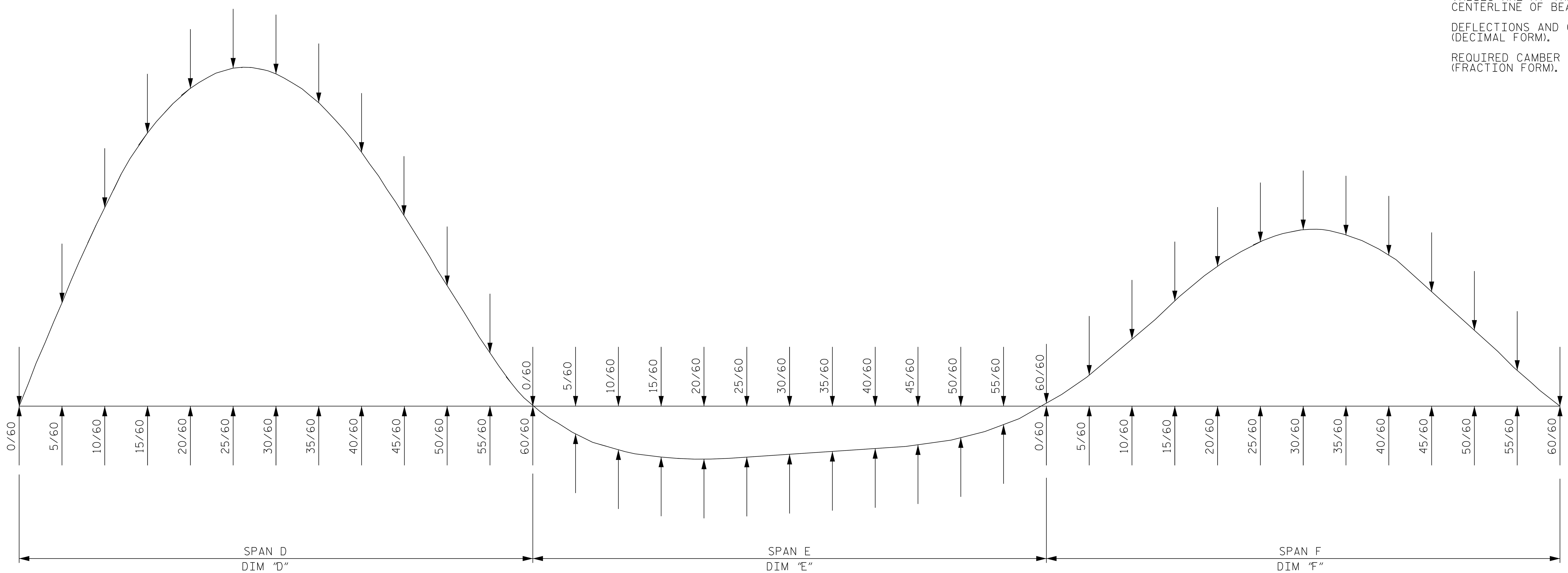
NOTES

SLOPE FOR THE ZERO CAMBER LINE VARIES.

VALUES ARE AT THE SIXTIETH POINTS BETWEEN CENTERLINE OF BEARINGS.

DEFLECTIONS AND ORDINATES ARE IN FEET (DECIMAL FORM).

REQUIRED CAMBER VALUES ARE IN INCHES (FRACTION FORM).



GIRDER	DIM. "D"	DIM. "E"	DIM. "F"
1	211'-3 13/16"	185'-0"	192'-7 1/4"
2	212'-2 11/16"	185'-0"	192'-7 1/4"
3	213'-1 1/2"	185'-0"	192'-7 1/4"
4	214'-0 3/8"	185'-0"	192'-7 1/4"
5	214'-11 3/16"	185'-0"	192'-7 1/4"

SCHEMATIC OF CAMBER ORDINATES

FOR CAMBER VALUES (SIXTIETH POINTS) AT EACH GIRDER, SEE TABLES ON SHEETS 1 THRU 8. SLOPE FOR ZERO CAMBER BASE LINE VARIES.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 027781
DocuSigned by: Hardy Willis
7/26/2022

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V&M Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
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Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488
Atlanta, GA 770-627-3590

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 8 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE DEADLOAD DEFLECTION AND CAMBER ORDINATES UNIT 2

DWN. BY: NCW	DATE: 11/2021
CHKD. BY: HLW	DATE: 11/2021
DES. EGR. OF RECORD: PRG	DATE: 11/2021

REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

SHEET NO. S1-55

TOTAL SHEETS 92

wdtruher
DGN: V:\NC\Structures\031748-44 U-2579AA STFS\Structures\SITE 1 - FLYCA NorthPlans\FINAL PLANS\40_09_U2579AA_SMU_DL6_055.dgn
TIME: 10:03 AM on Tuesday, July 26, 2022

PLAN OF BARRIER RAIL

SPANS A & B

SEAL 028781 — HARDY L. WILLIS — NORTH CAROLINA PROFESSIONAL ENGINEER
DocuSigned by: Hardy Willis
7/26/2022

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SHEET 1 OF 4

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
CONCRETE BARRIER RAIL
SPANS A & B

DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: PRG	DATE: 03/2022

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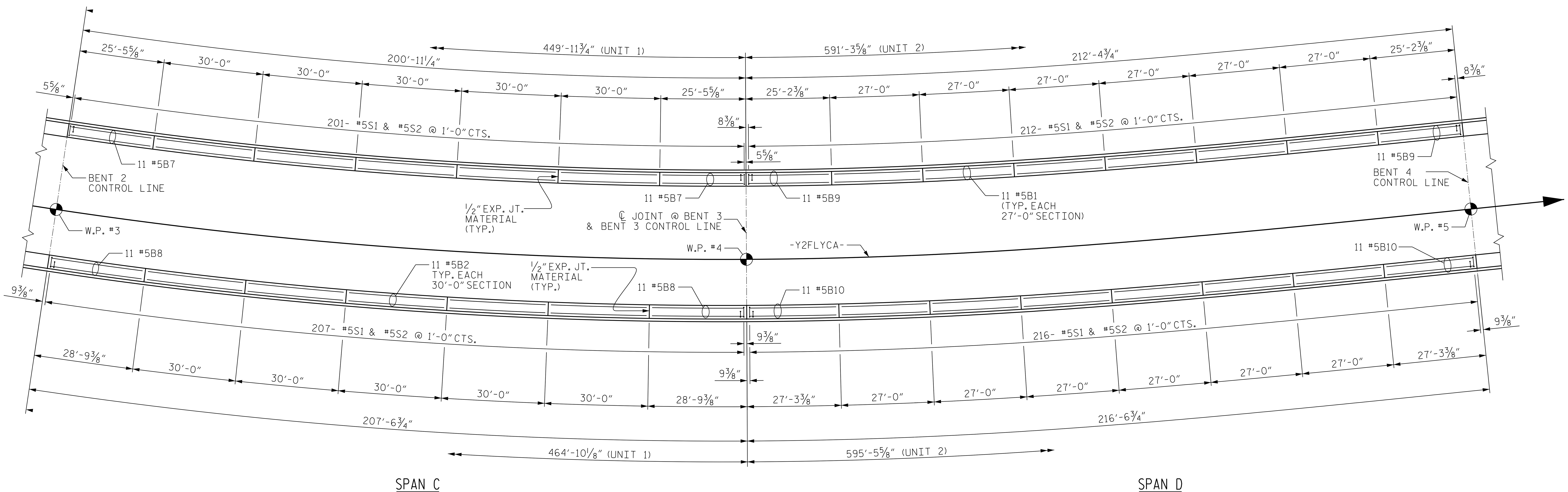
SHEET NO. S1-56

TOTAL SHEETS 92



PLAN OF BARRIER RAIL

SPANS C & D

DocuSigned by: Hardy Willis
7/26/2022

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PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
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SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE CONCRETE BARRIER RAIL SPANS C & D

DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
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SHEET NO. S1-57

TOTAL SHEETS 92

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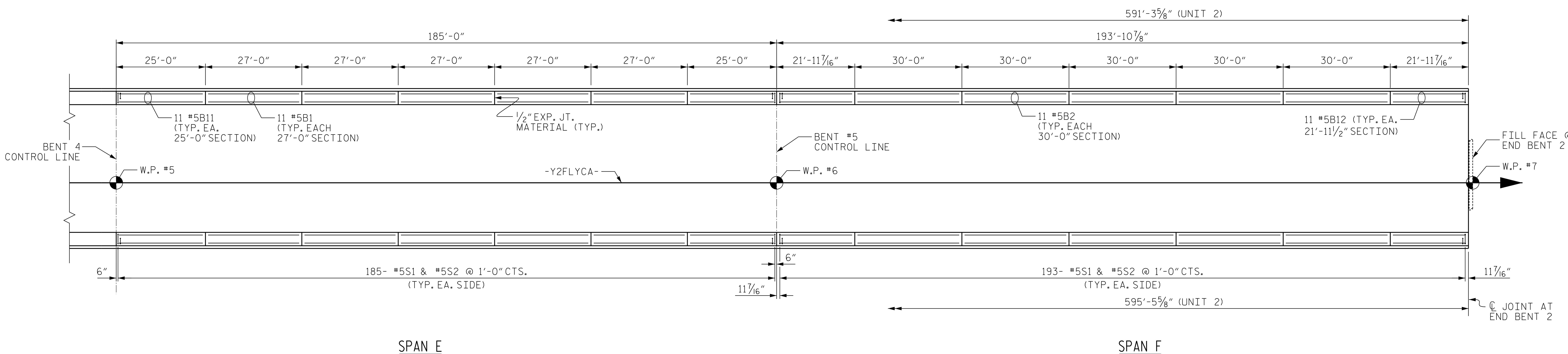

PLAN OF BARRIER RAIL

SPANS E & F

HARDY L. WILLIS — NORTH CAROLINA PROFESSIONAL ENGINEER — SEAL 028461

DocuSigned by: Hardy Willis 287PC... 7/26/2022

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PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
CONCRETE BARRIER RAIL
SPANS E & F

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DWN. BY: NCW	DATE: 03/2022
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DES. EGR. OF RECORD: PRG	DATE: 03/2022

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-58

TOTAL SHEETS 92

NOTES

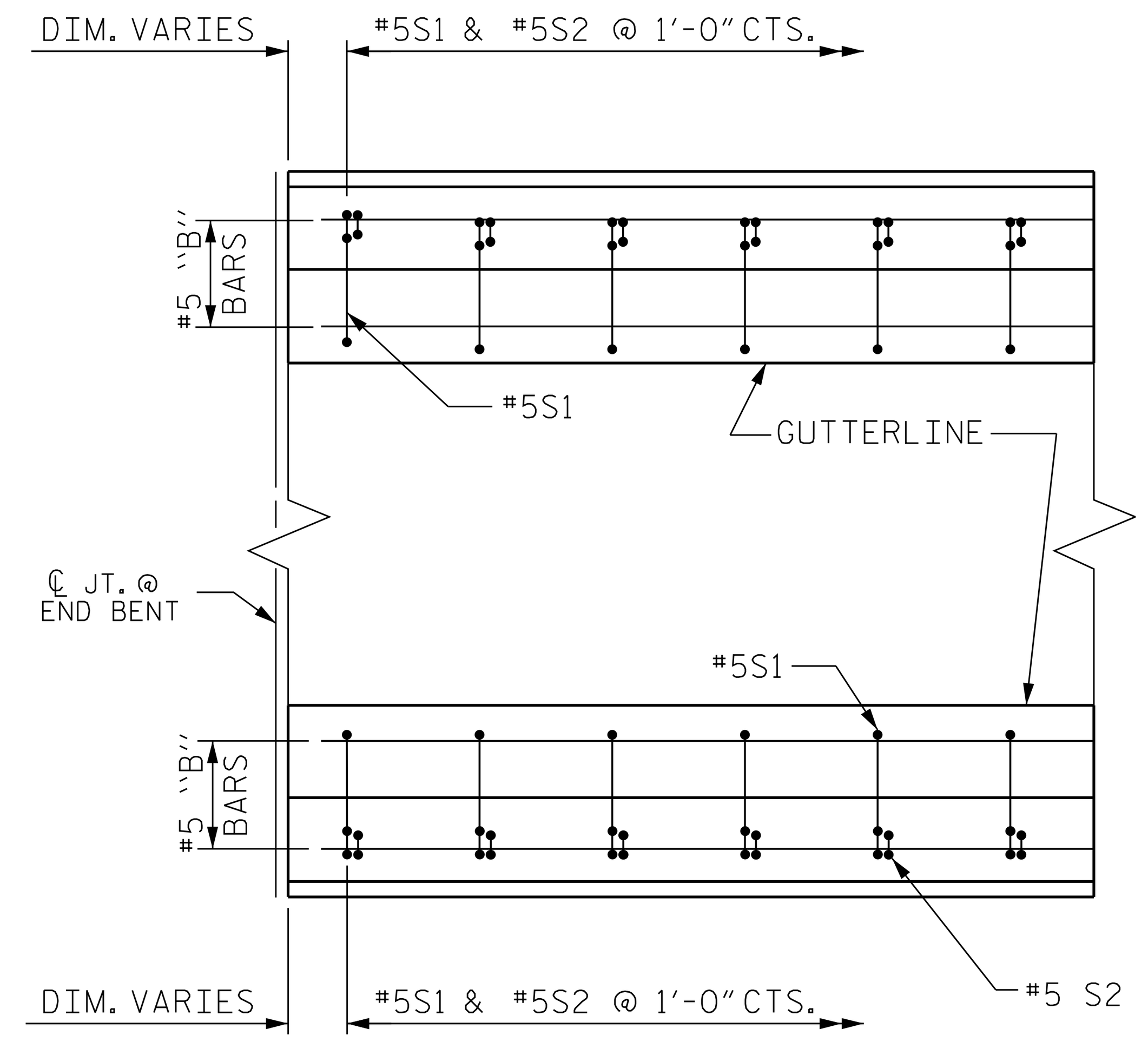
THE BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

FOR CONCRETE BARRIER RAILS ON APPROACH SLABS, SEE "BRIDGE APPROACH SLAB SHEETS.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

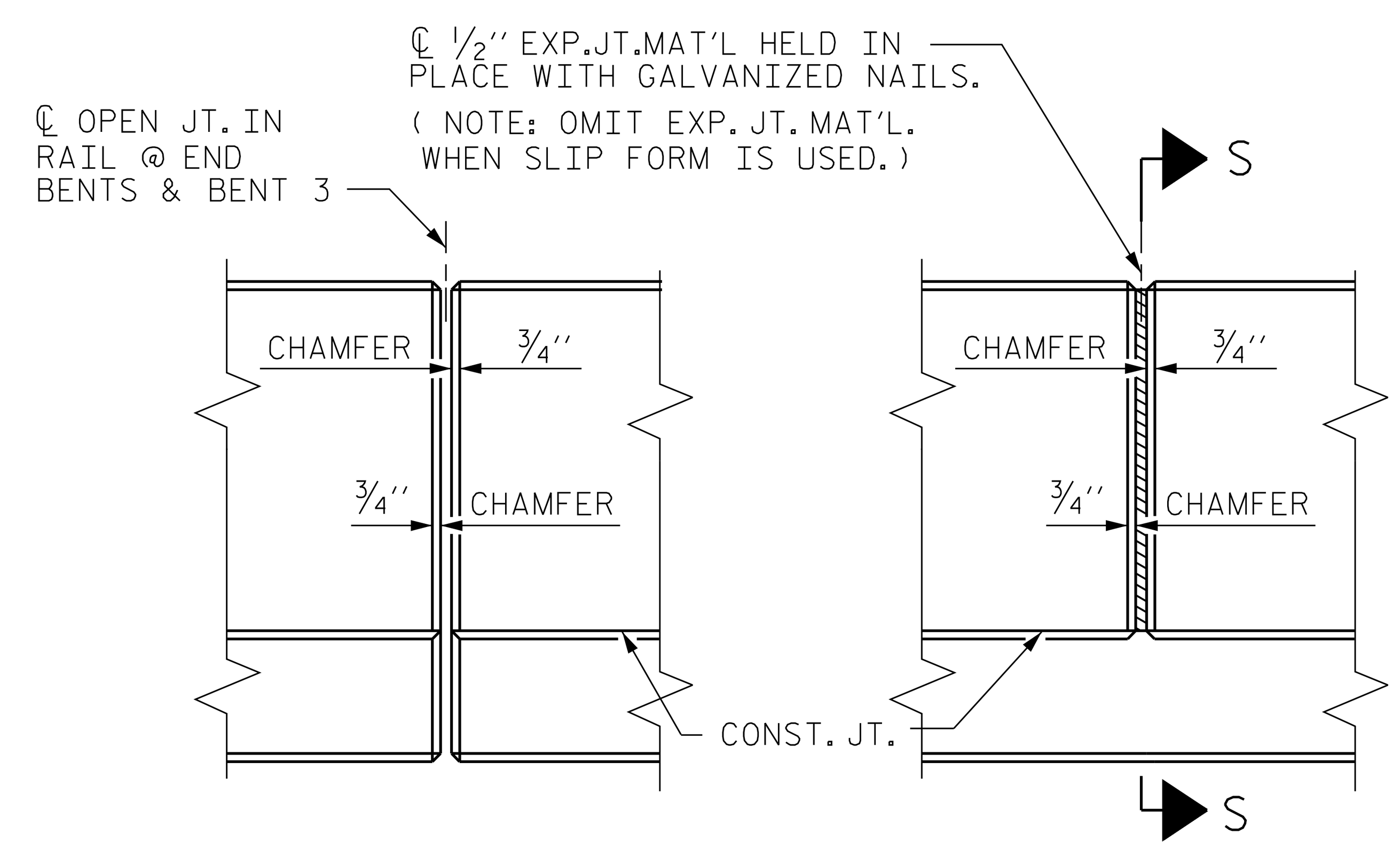
GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

THE #5S1 & #5S2 BARS MAY BE SHIFTED SLIGHTLY TO CLEAR THE ½" EXPANSION JOINTS OPENINGS IN THE RAIL.

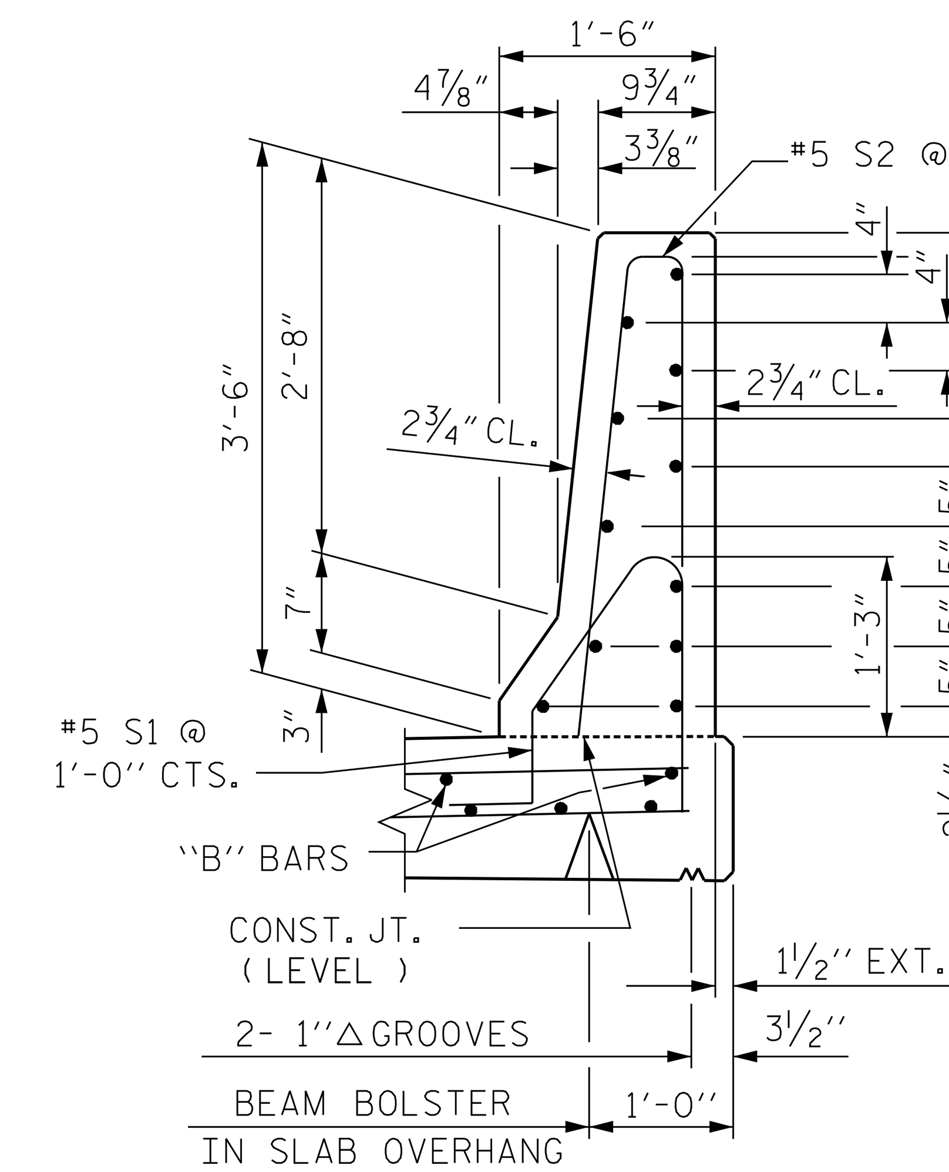


PLAN

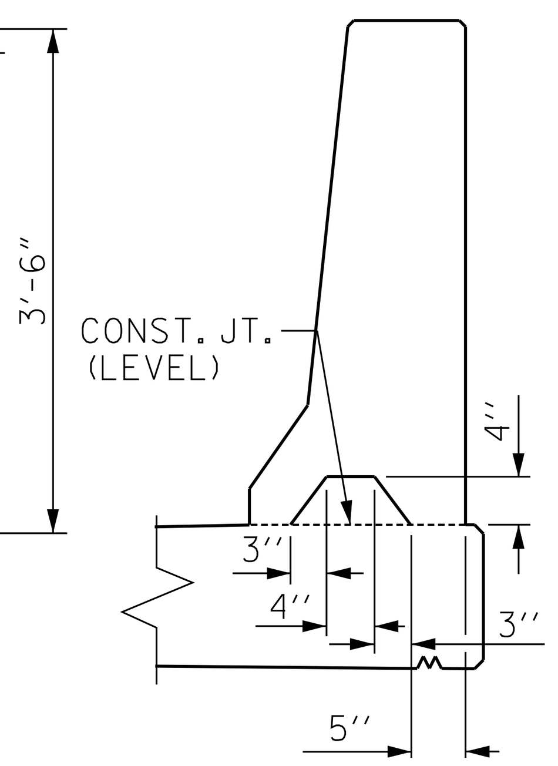
(FOR END OF RAIL DETAILS, SEE BRIDGE APPROACH SLAB SHEETS)



ELEVATION AT EXPANSION JOINTS



SECTION THRU RAIL

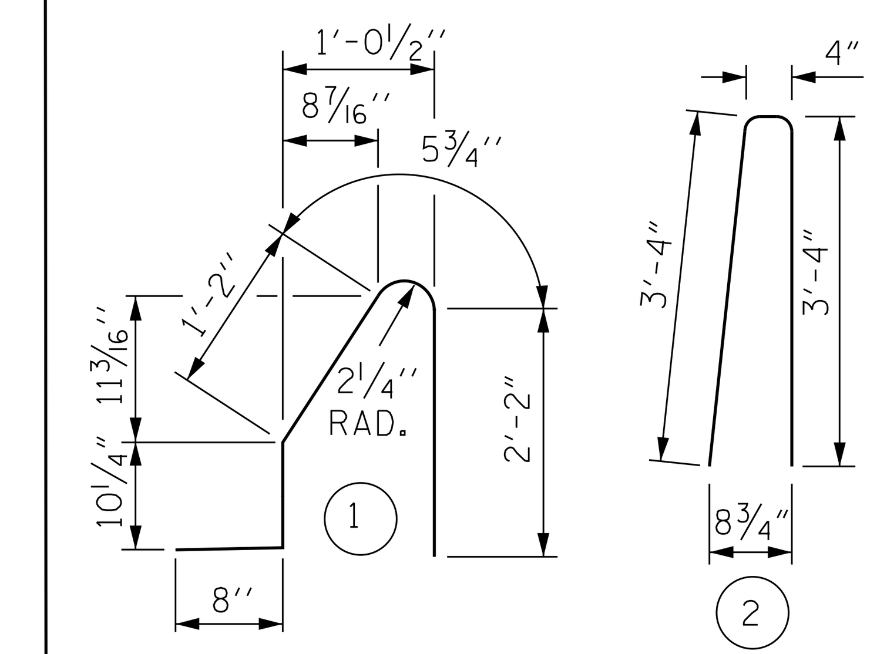


SECTION S-S

AT DAM IN OPEN JOINT (THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

BARRIER RAIL DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ON BRIDGE DECK ONLY

UNIT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	132	#5	STR	26'-8"	3671
* B2	110	#5	STR	29'-8"	3404
* B3	22	#5	STR	22'-4"	512
* B4	22	#5	STR	24'-5"	560
* B5	22	#5	STR	20'-5"	468
* B6	22	#5	STR	22'-5"	514
* B7	22	#5	STR	25'-2"	577
* B8	22	#5	STR	28'-6"	654
* S1	912	#5	1	5'-4"	5073
* S2	912	#5	2	7'-0"	6659

*EPOXY COATED REINFORCING STEEL 22,092 LBS.
CLASS AA CONCRETE 124.3 CU. YDS.
CONCRETE BARRIER RAIL 914.82 LIN. FT.

UNIT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	242	#5	STR	26'-8"	6731
* B2	110	#5	STR	29'-8"	3404
* B9	22	#5	STR	24'-11"	572
*B10	22	#5	STR	27'-0"	620
*B11	44	#5	STR	24'-8"	1132
*B12	44	#5	STR	27'-7"	1266
* S1	1184	#5	1	5'-4"	6586
* S2	1184	#5	2	7'-0"	8644

*EPOXY COATED REINFORCING STEEL 28,955 LBS.
CLASS AA CONCRETE 161.3 CU. YDS.
CONCRETE BARRIER RAIL 1186.77 LIN. FT.

CONCRETE BARRIER RAIL ON APPROACH SLABS 40.0 LIN. FT.

** TOTAL LENGTH OF CONCRETE BARRIER RAIL 2141.59 LIN. FT.

** FOR BARRIER RAIL DETAILS ON APPROACH SLABS, SEE SHEET S-91.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20770 HARDY L. WILLIS
DocuSigned by: Hardy Willis
7/26/2022

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PROJECT NO. U-2579AA
FORSYTH COUNTY
STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-
SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
CONCRETE BARRIER RAIL

DRAWN BY : ARB 5/87	REV. 7/12 MAA/GM
CHECKED BY : SJD 9/87	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

CHKD. BY: AW DATE: 11/2021
CHKD. BY: PRG DATE: 03/2022
DES. EGR. OF RECORD: PRG DATE: 03/2022

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NO.	BY:	DATE:	NO.	BY:	DATE:
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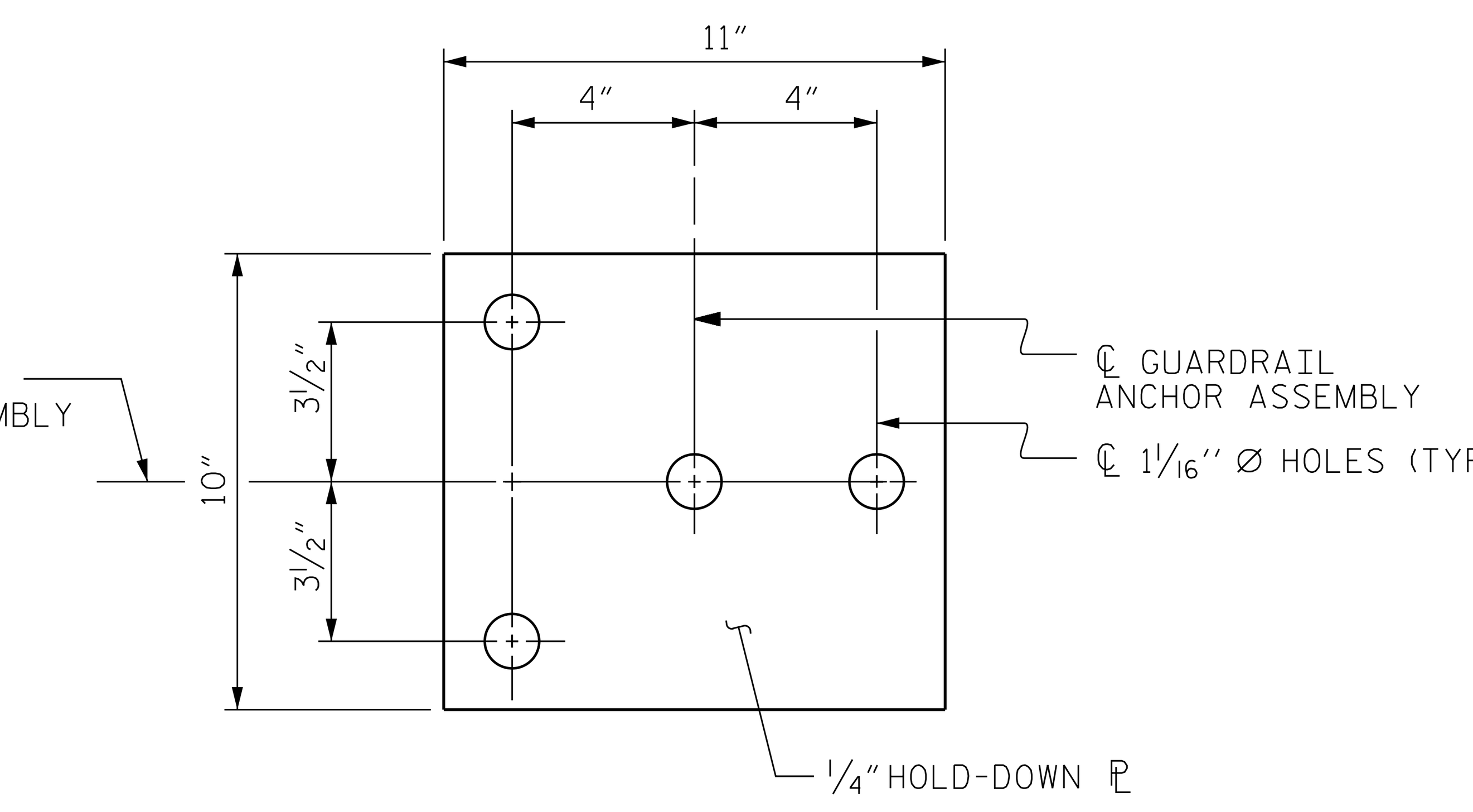
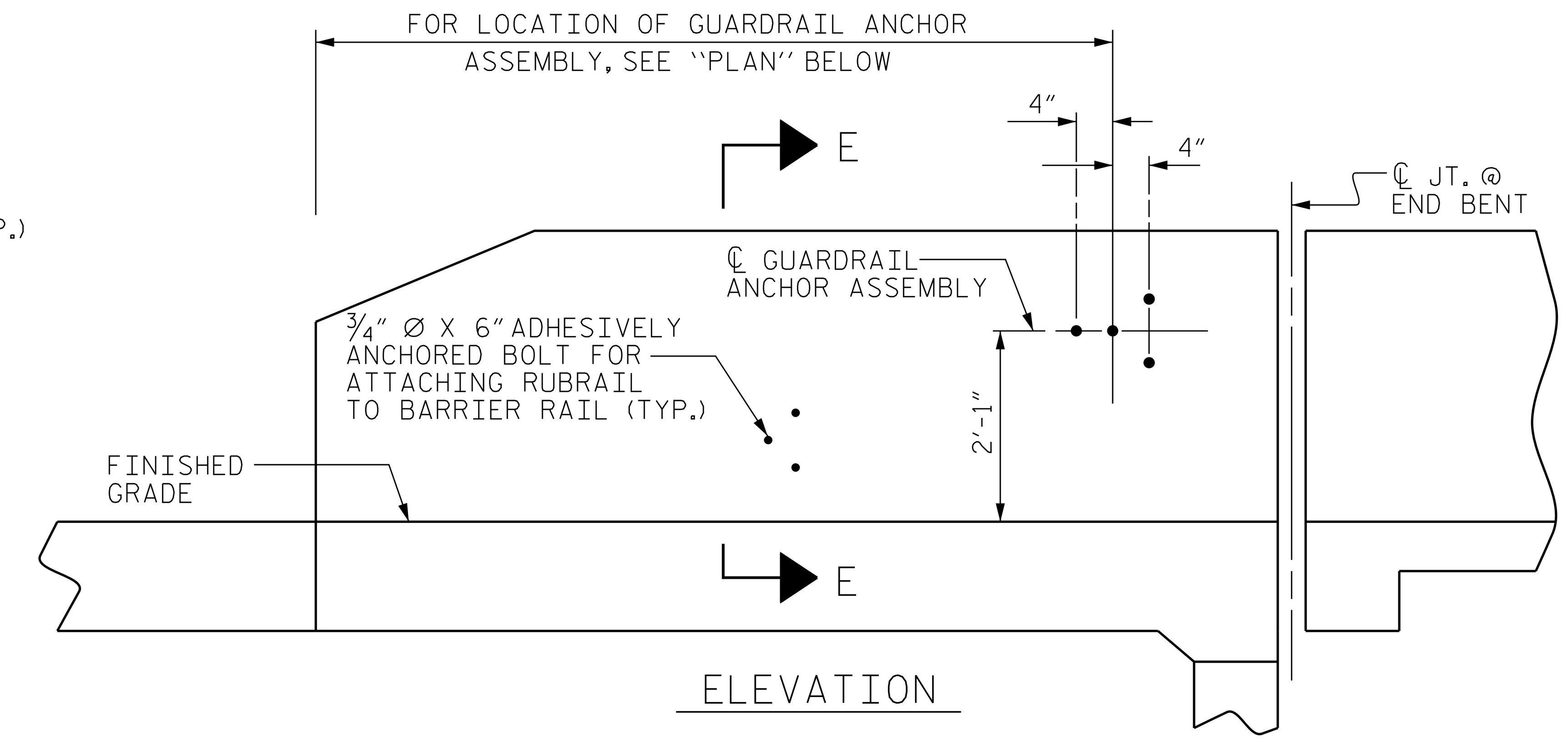
2			4		

SHEET NO. S1-59
TOTAL SHEETS 92

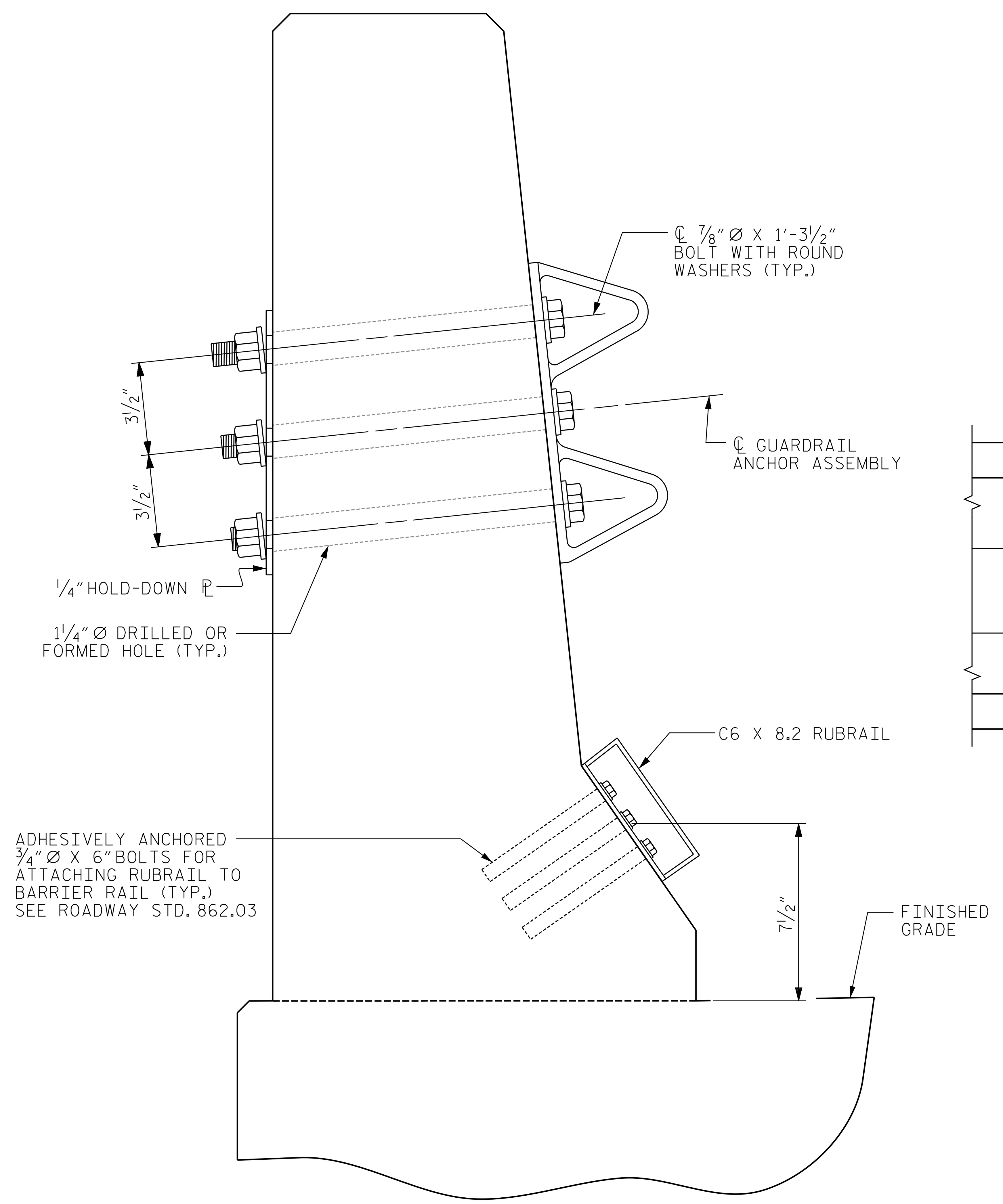
STD. NO. CBR1



PLAN



ELEVATION



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD-DOWN PLATE AND 4 - 7/8" Ø BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

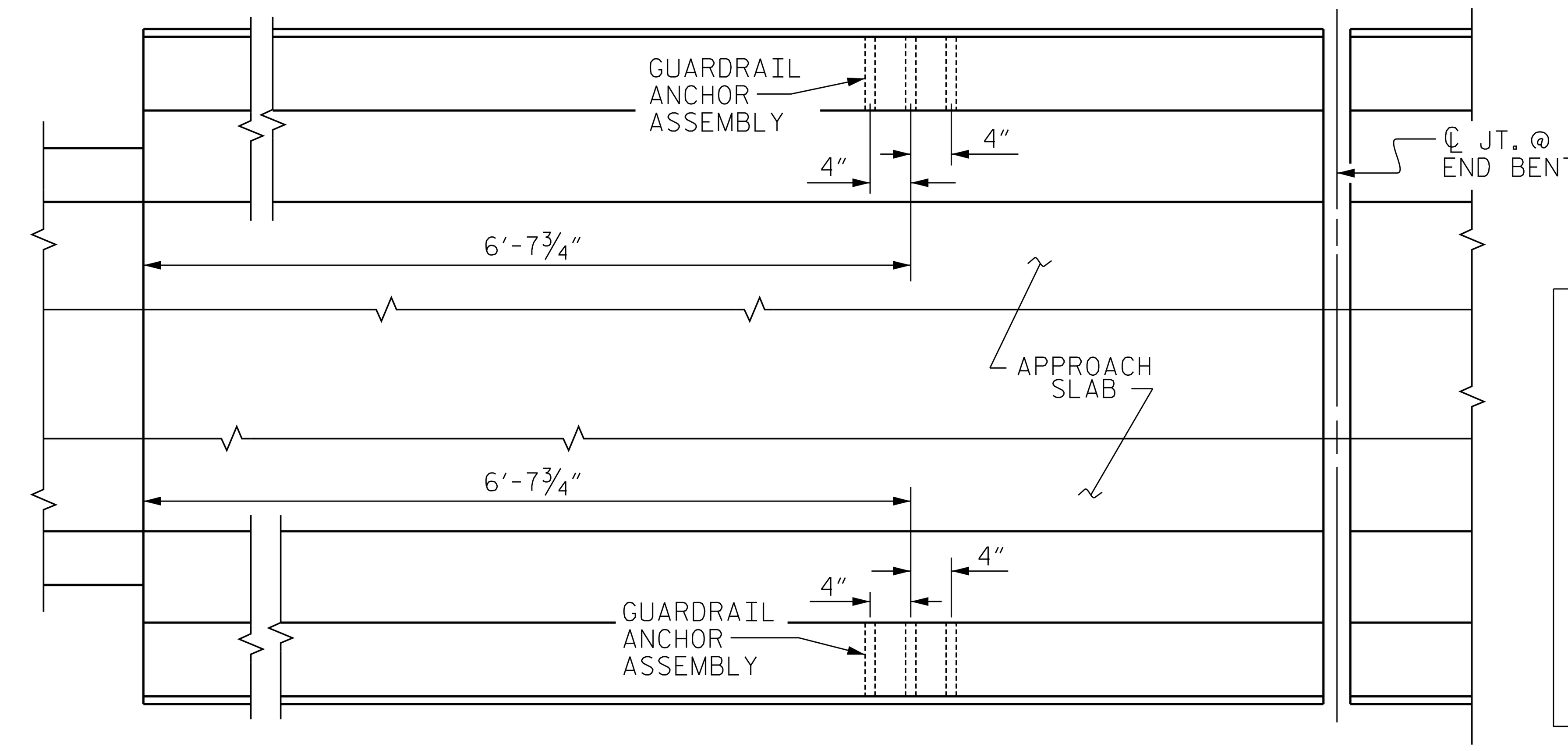
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

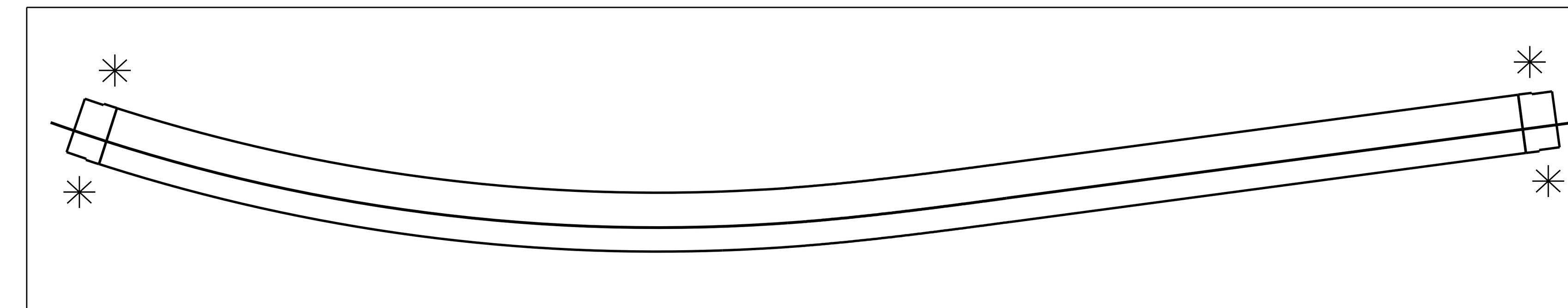
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



PLAN



SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

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Charlotte, NC 704-357-0488

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20771 HARDY L. WILLIS
DocuSigned by: Hardy Willis
7/26/2022

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REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	S1-60
1			3			TOTAL SHEETS	92
2			4				

DRAWN BY : TLA 5/06	REV. 7/12	MAA/GM
CHECKED BY : GM 5/06	REV. 6/13	MAA/GM
	REV. 12/17	MAA/THC

STD. NO. GRA2

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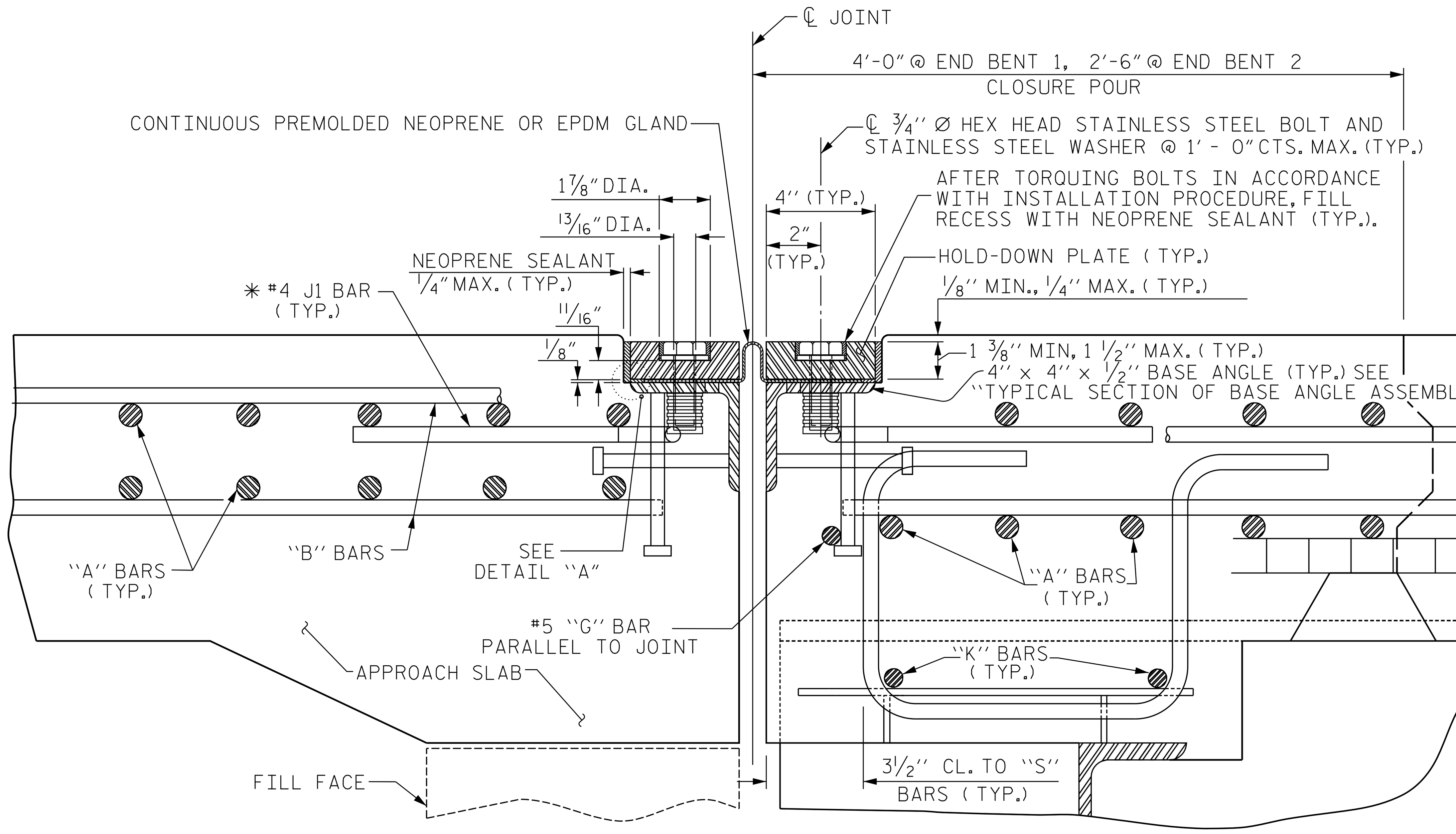


EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- STEEL SUPERSTRUCTURE

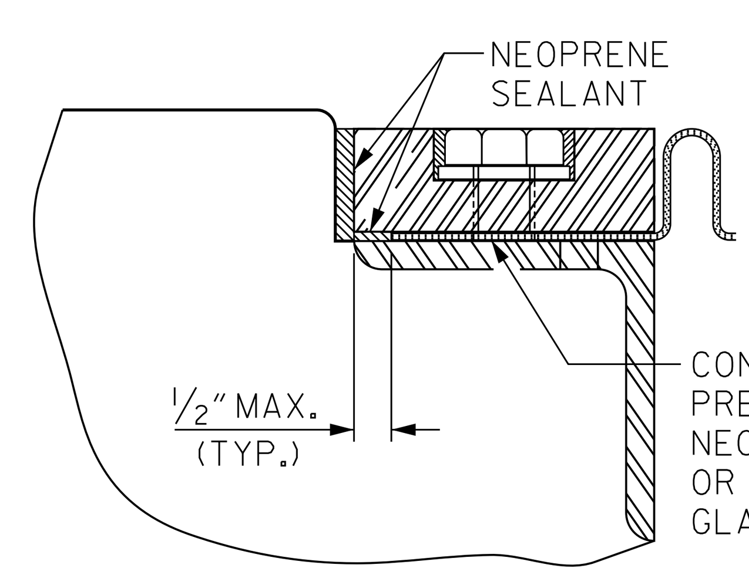
✻ THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

INSTALLATION PROCEDURE

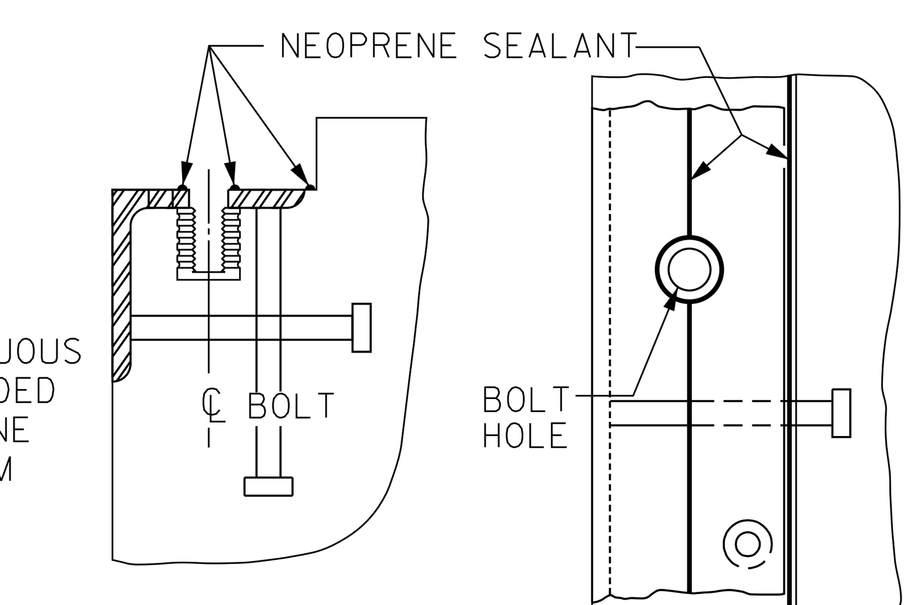
1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4 1/8" TO 4 1/4" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE 3/4" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" X 4" X 1/2" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED 7/8" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES, THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, AND THE LIFTING HOLES IN THE HOLD-DOWN PLATE, AND COMPLETELY FILL THE RECESSES AND LIFTING HOLES WITH NEOPRENE SEALANT.

GENERAL NOTES

1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED END AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MINIMUM.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
5. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.
6. UPON COMPLETION OF SHOP FABRICATION, THE HOLD-DOWN PLATE AND BASE ANGLE ASSEMBLY, AS SHOWN IN THE "TYPICAL SECTION OF BASE ANGLE ASSEMBLY", SHALL BE METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
7. THE COVER PLATES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
8. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. FINISHED WELD SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
9. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER.
10. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
11. THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.
12. THE FABRICATOR SHALL PROVIDE 1/2" Ø THREADED HOLES IN THE HOLD-DOWN PLATES TO ASSIST IN LIFTING AND PLACING. THE HOLES SHALL BE 3/4" DEEP AT 6'-0" MAXIMUM SPACING AND A MINIMUM OF TWO HOLES PER PLATE.

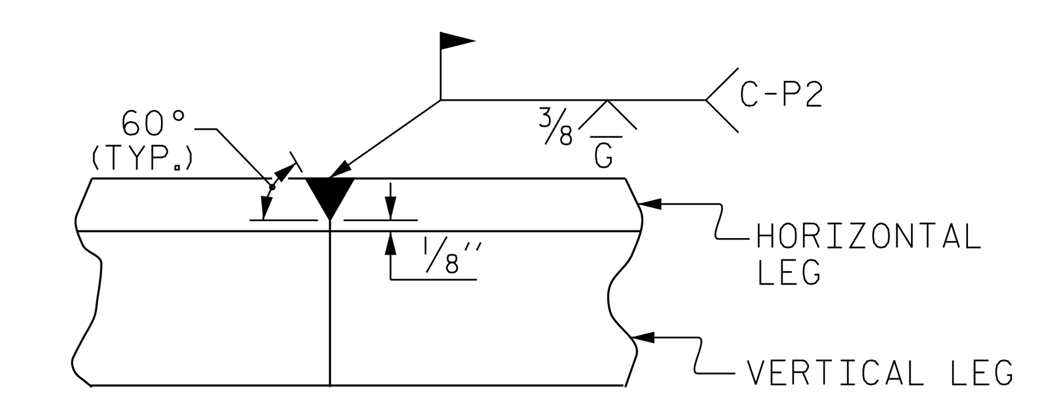


DETAIL "A"

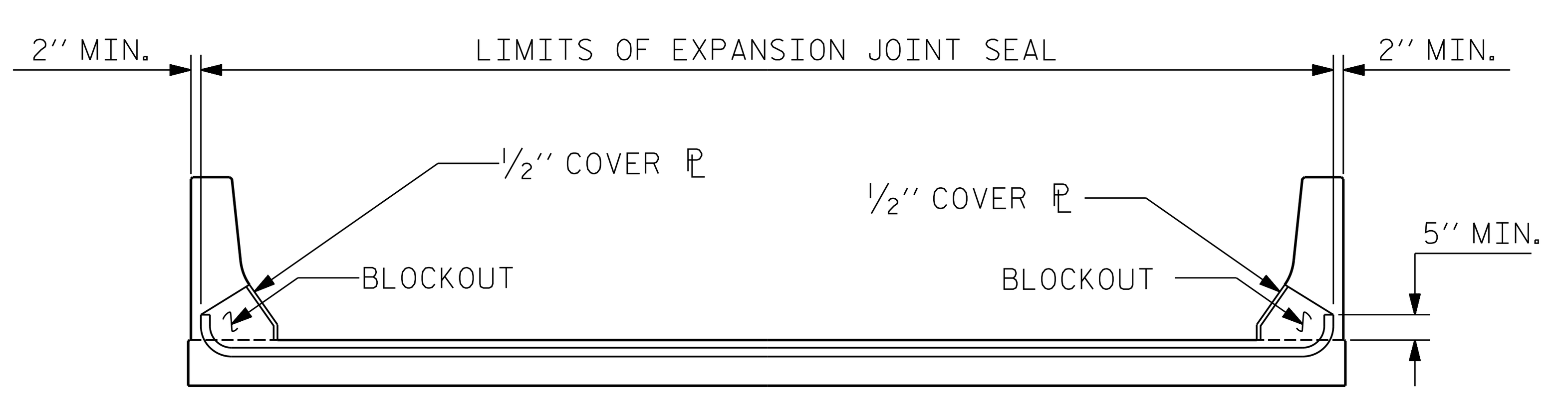


CROSS SECTION   PLAN VIEW

INSTALLATION SKETCH

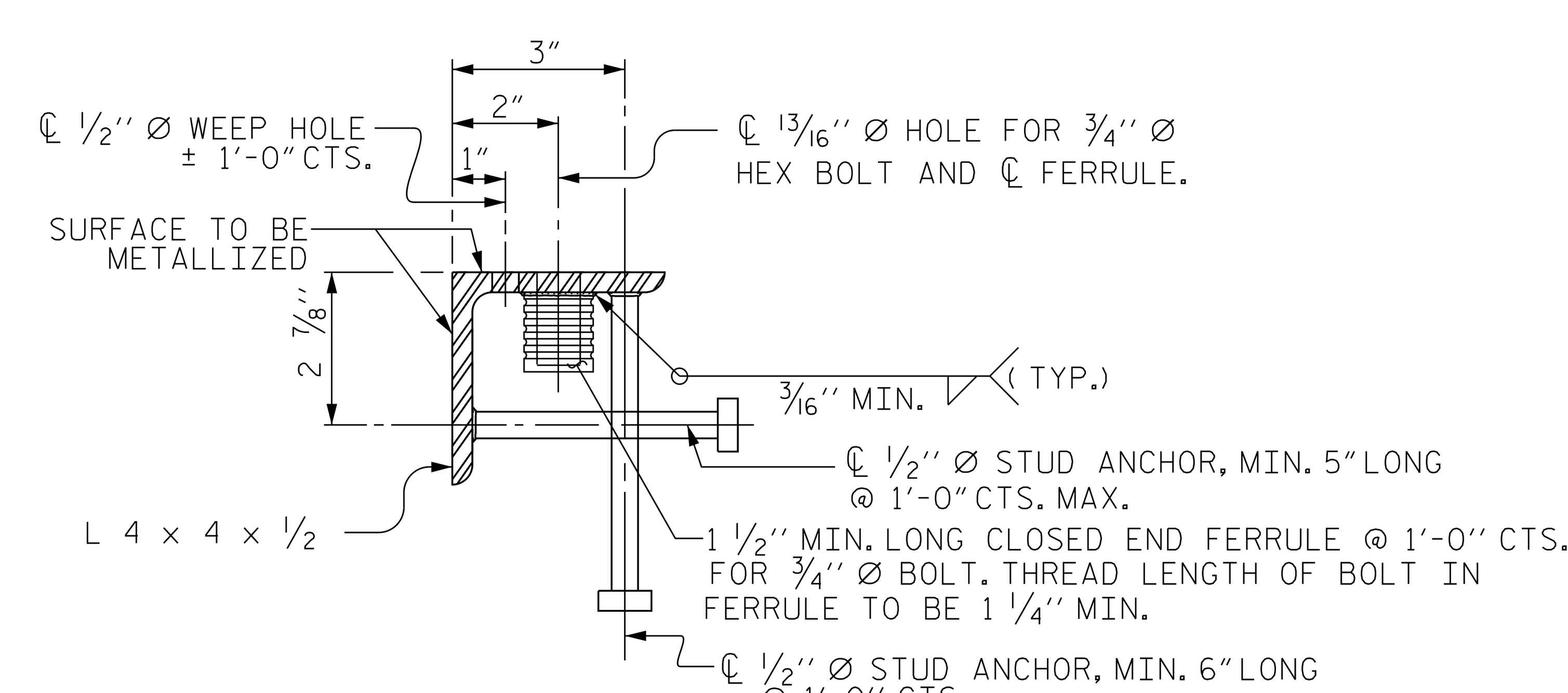


DETAIL- FIELD WELD SPLICE OF BASE ANGLE



SKETCH SHOWING LIMITS OF EXPANSION JOINT SEAL

MOVEMENT AND SETTING AT JOINT					
LOCATION	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
END BENT 1	90°	1 13/16"	2 3/16"	1 15/16"	1 3/8"
END BENT 2	90°	2 5/16"	2 1/2"	2 3/16"	1 7/16"



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL — HARDY L. WILLIS — 7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

V&M Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Boone, NC 828-355-9933 | Tri-Cities, TN 423-467-8401 | Knoxville, TN 865-546-5800 | Spartanburg, SC 864-574-4775 | Charleston, SC 843-974-5650 | Middlesboro, KY 606-248-6600 | Atlanta, GA 770-627-3590 | Raleigh, NC 919-977-9455 | Charlotte, NC 704-357-0488

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

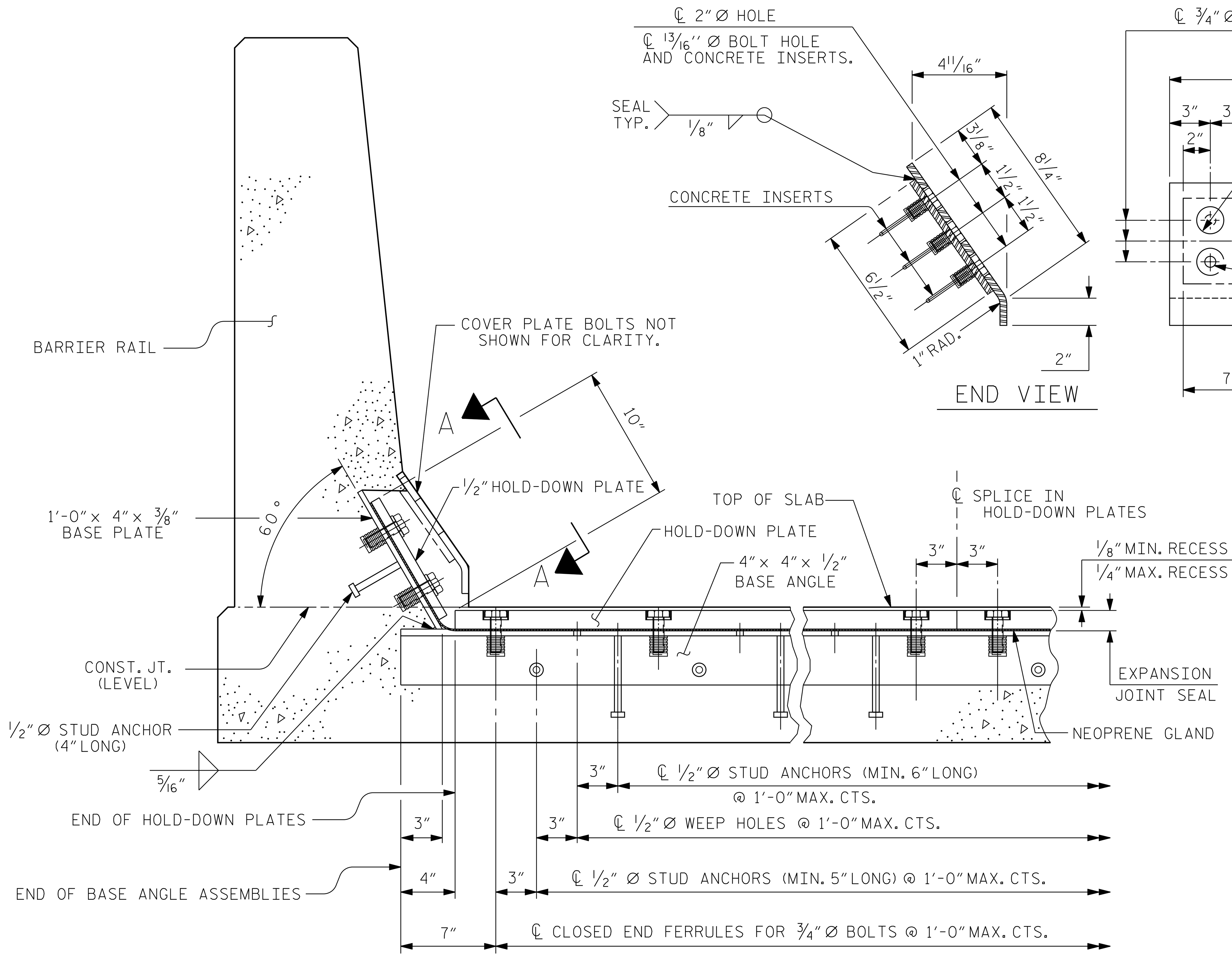
STANDARD

EXPANSION JOINT SEAL DETAILS

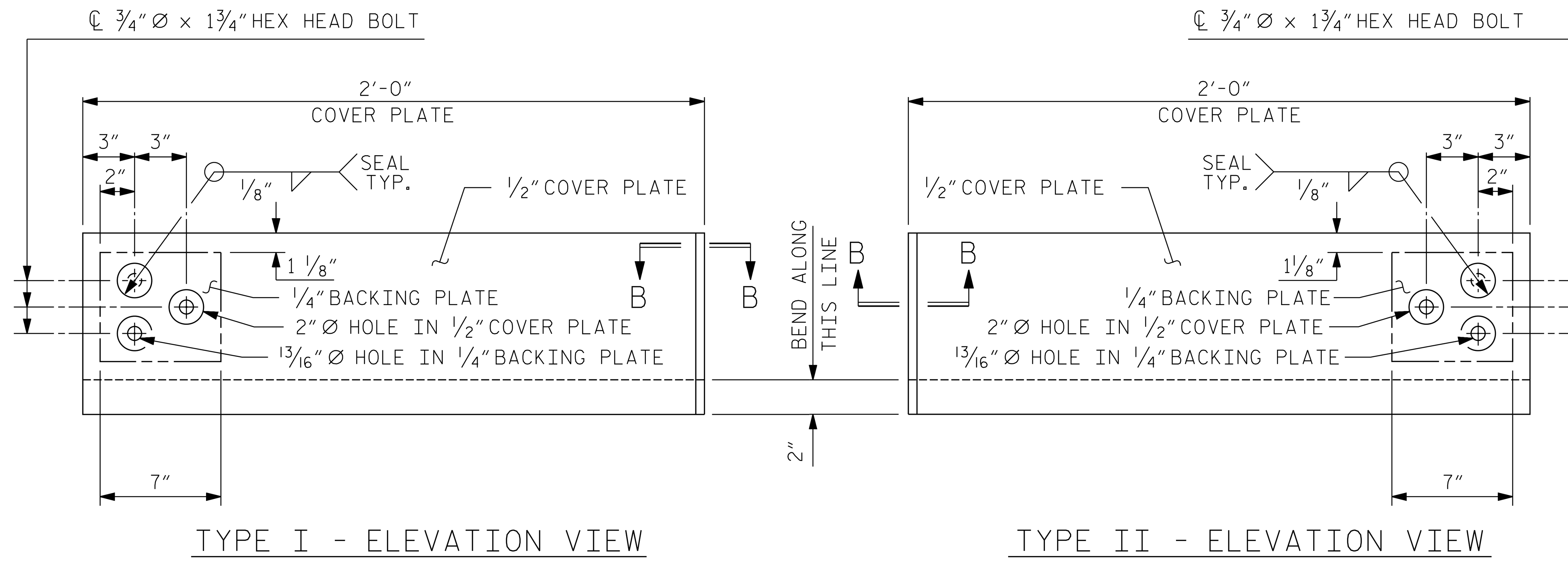
DRAWN BY : REK 9/87	REV. 10/1/11 MAA/GM	DWN. BY: NCW	DATE: 03/2022	REVISIONS			SHEET NO. S1-61
CHECKED BY : CRK 10/87	REV. 10/17 MAA/THC	CHKD. BY: PRG	DATE: 03/2022	NO. 1	NO. 3		TOTAL SHEETS 92
	REV. 6/18 MAA/THC	DES. EGR. OF RECORD: PRG	DATE: 03/2022	NO. 2	NO. 4		

STD. NO. EJS1

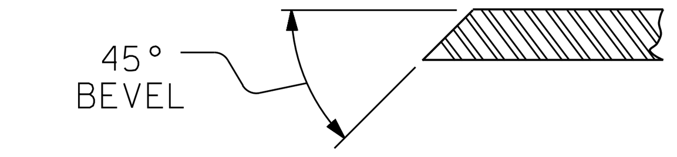
wdstruther
DGN: V:\NC\Structures\031748-44 U-2579AA STPS\Structures\SITE 1 - FLYCA NorthPlans\FINAL PLANS\40L\2L\U2579AA_SMU_EJOL06.dgn
TIME: 10:03 AM on Tuesday, July 26, 2022



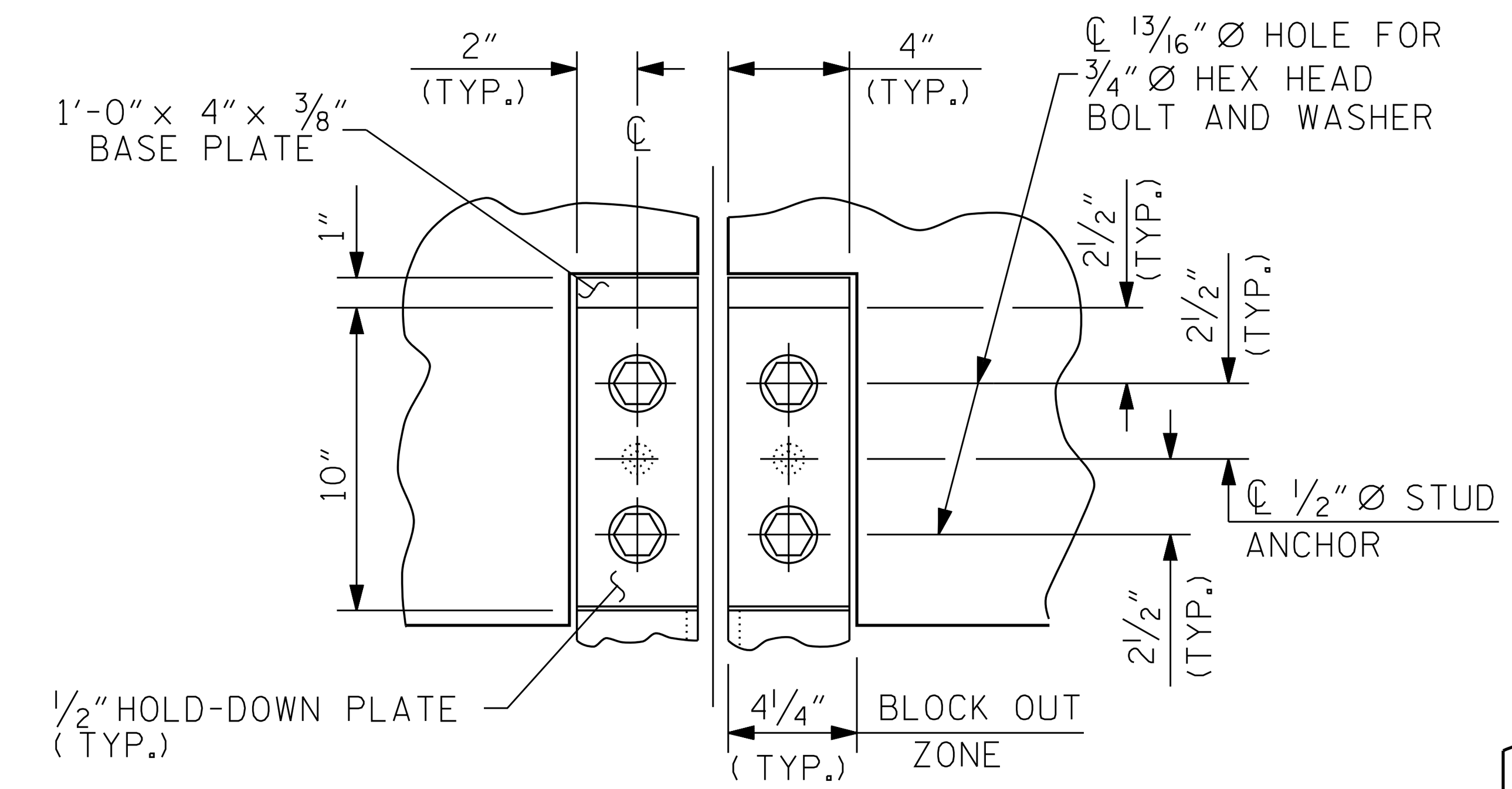
SECTION THRU RAIL NORMAL TO JOINT



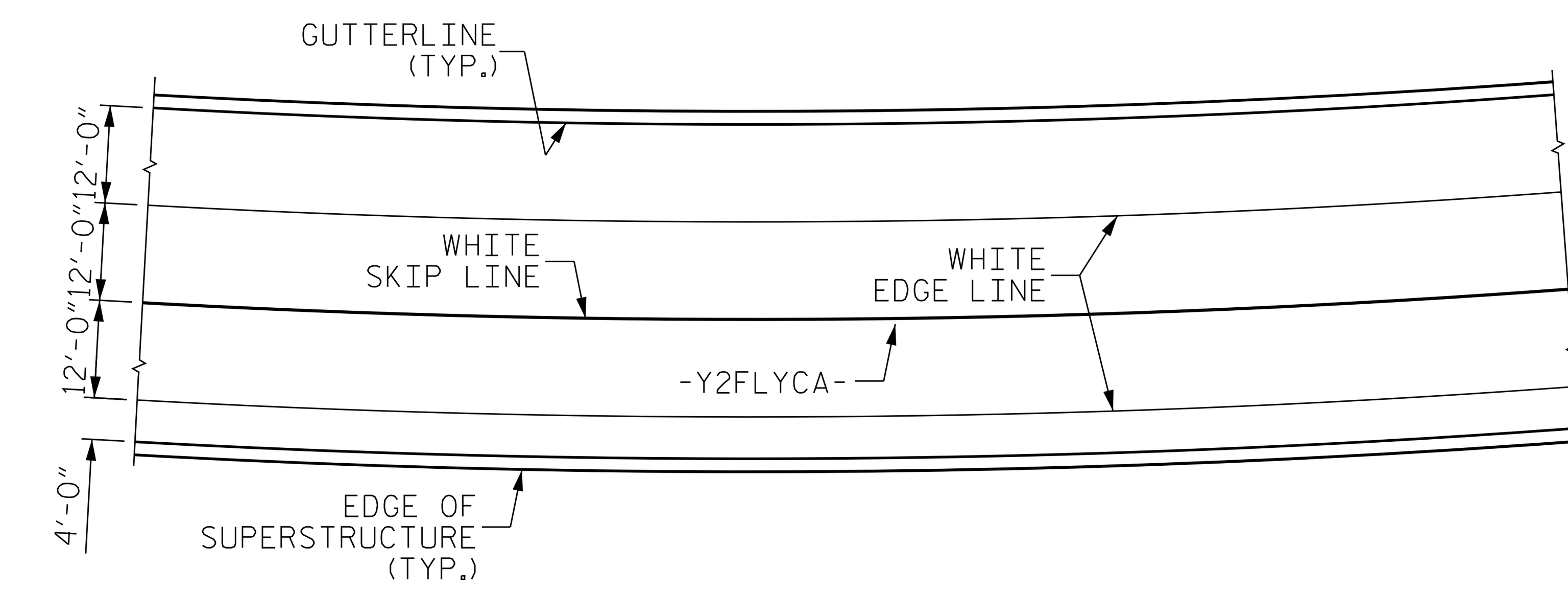
COVER PLATE DETAILS



SECTION B-B

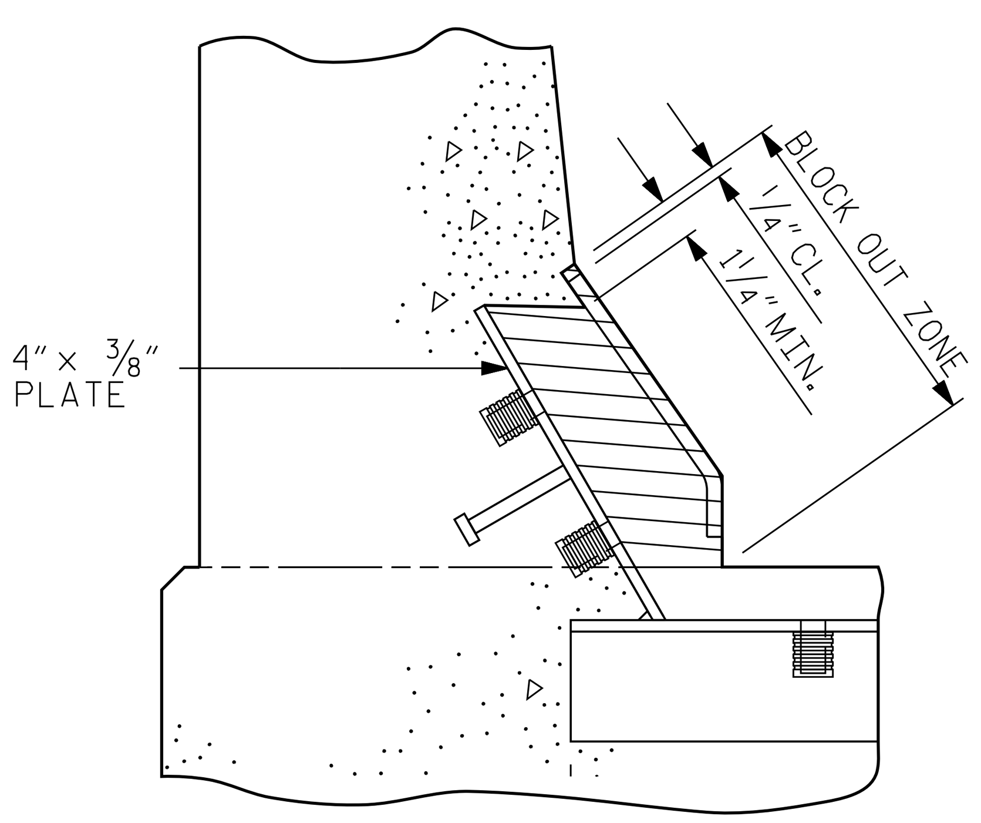


SECTION A-A



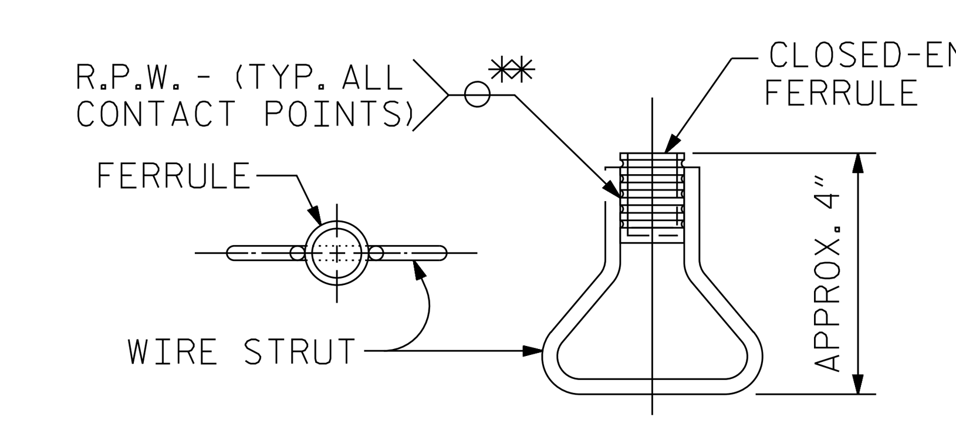
PAVEMENT MARKING ALIGNMENT

RADIAL DIMENSIONS



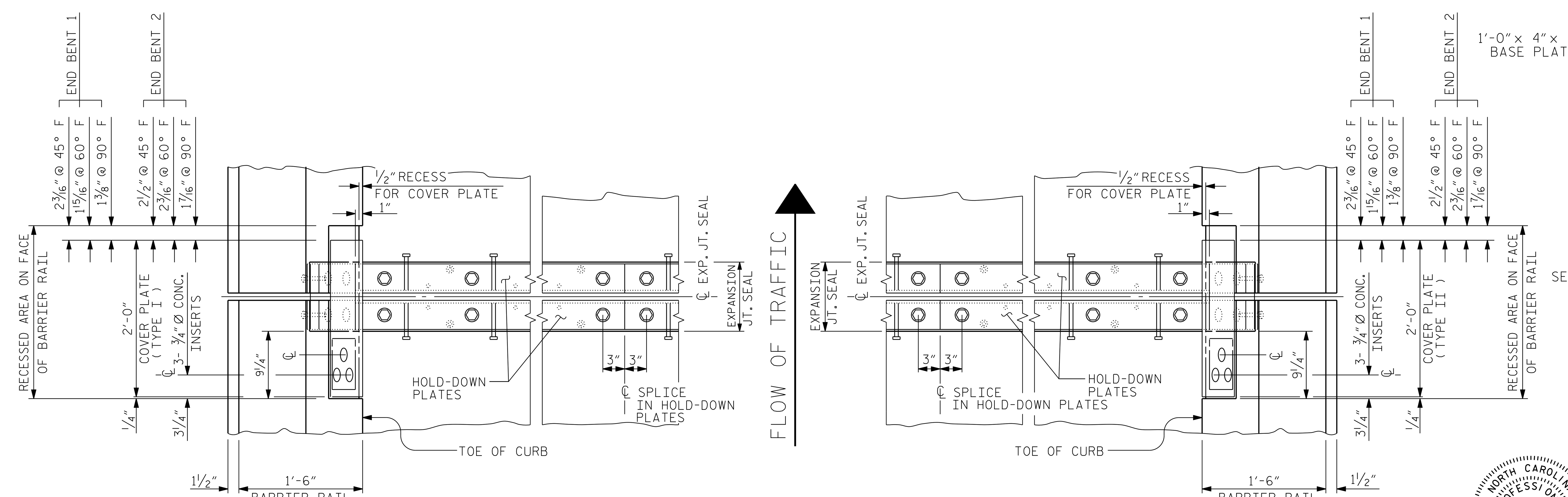
BLOCK OUT DETAIL

SEE "SECTION A-A" FOR OTHER DETAILS.



CONCRETE INSERT

** EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.



PLAN OF EXPANSION JOINT SEAL

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL

V&M Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Raleigh, NC 919-977-9455 · Charlotte, NC 704-357-0488 · Boone, NC 828-355-9933 · Tri-Cities, TN 423-467-8401 · Knoxville, TN 865-546-5800 · Spartanburg, SC 864-574-4775 · Charleston, SC 843-974-5650 · Middlesboro, KY 606-248-6600 · Atlanta, GA 770-627-3590

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20777 — DocuSigned by: Hardy Willis — 7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY : REK 9/87	REV. 7/12	MAA/GM	
CHECKED BY : CRK 10/87	REV. 6/13	MAA/GM	
	REV. 12/17	MAA/THC	

DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: PRG	DATE: 03/2022

REVISIONS

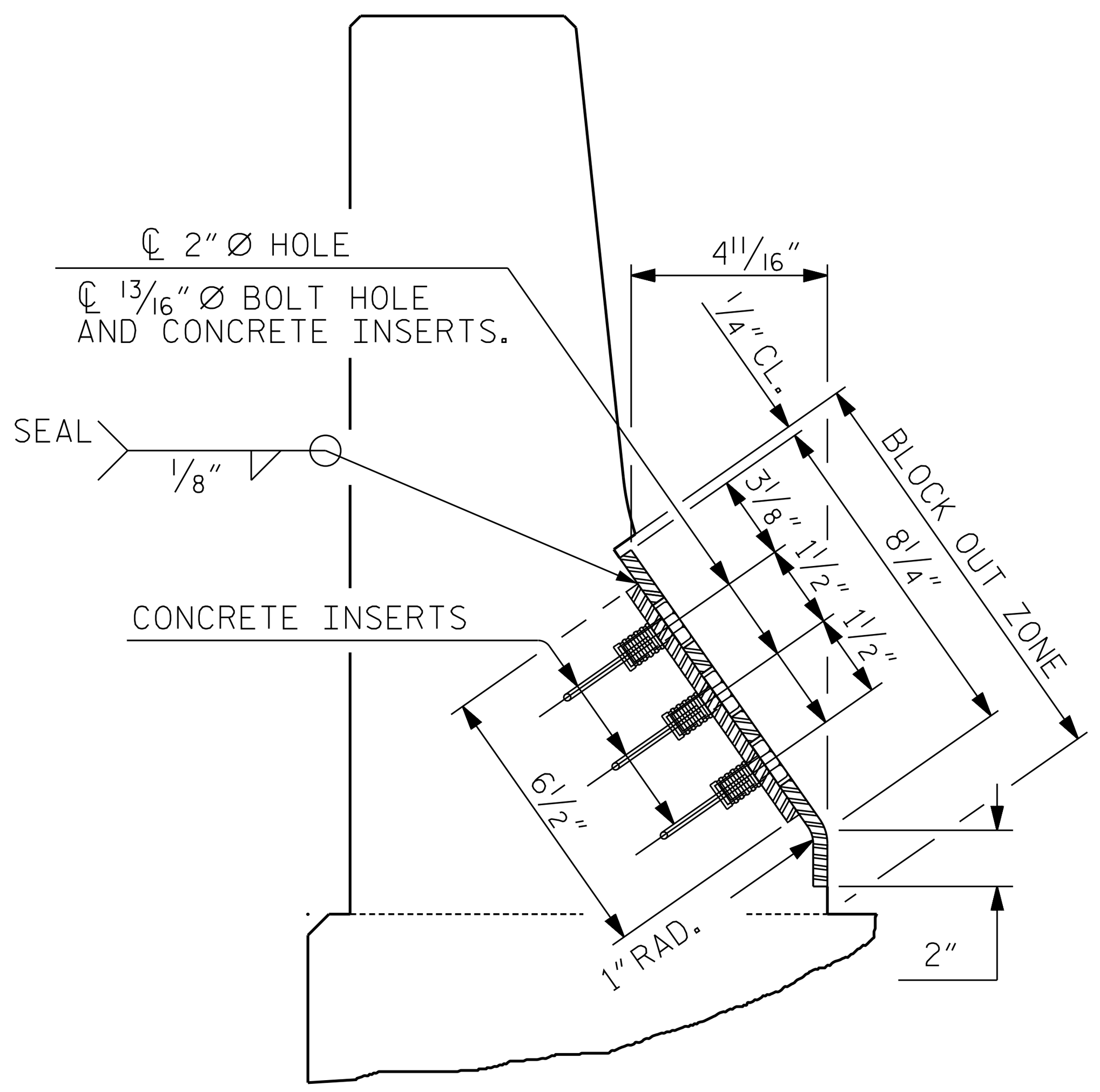
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-62

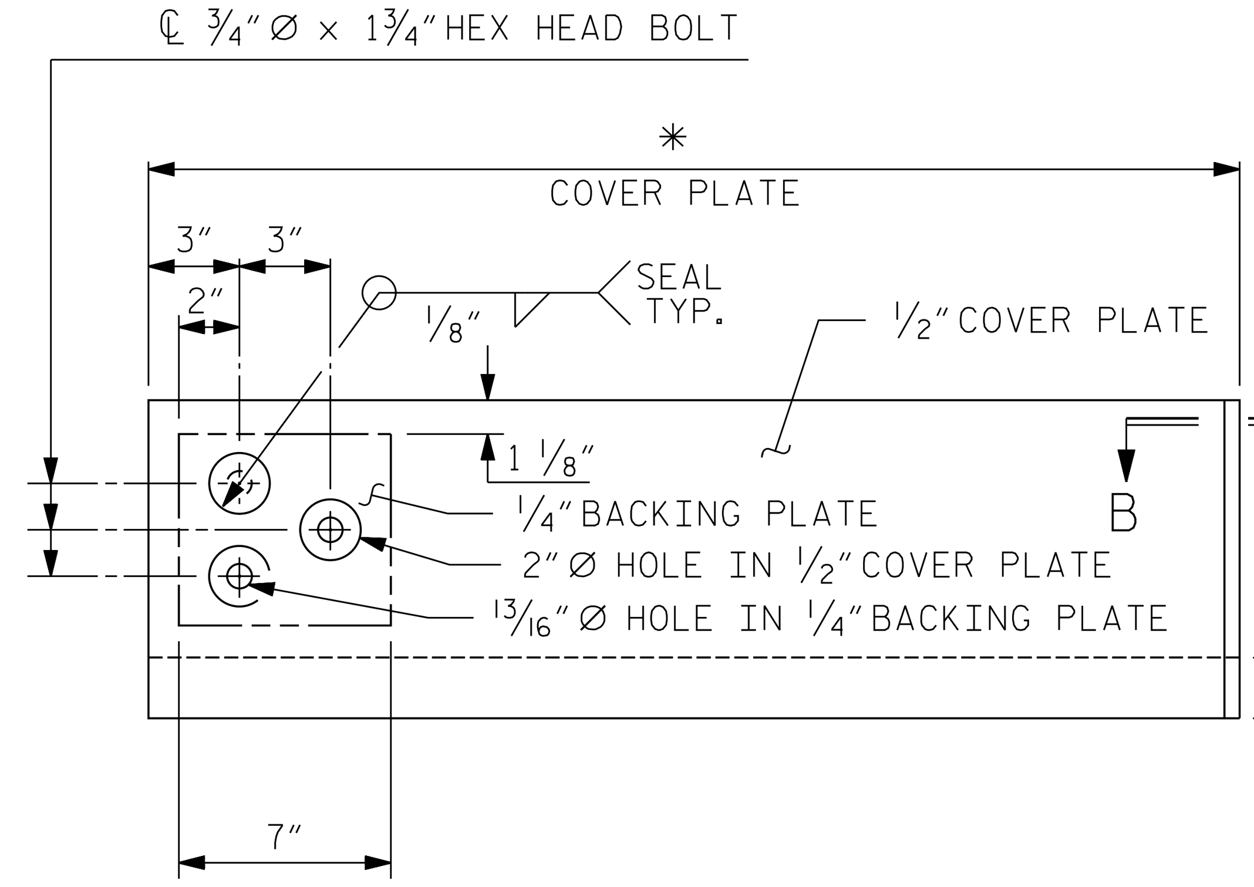
TOTAL SHEETS 92

STD. NO. EJS2

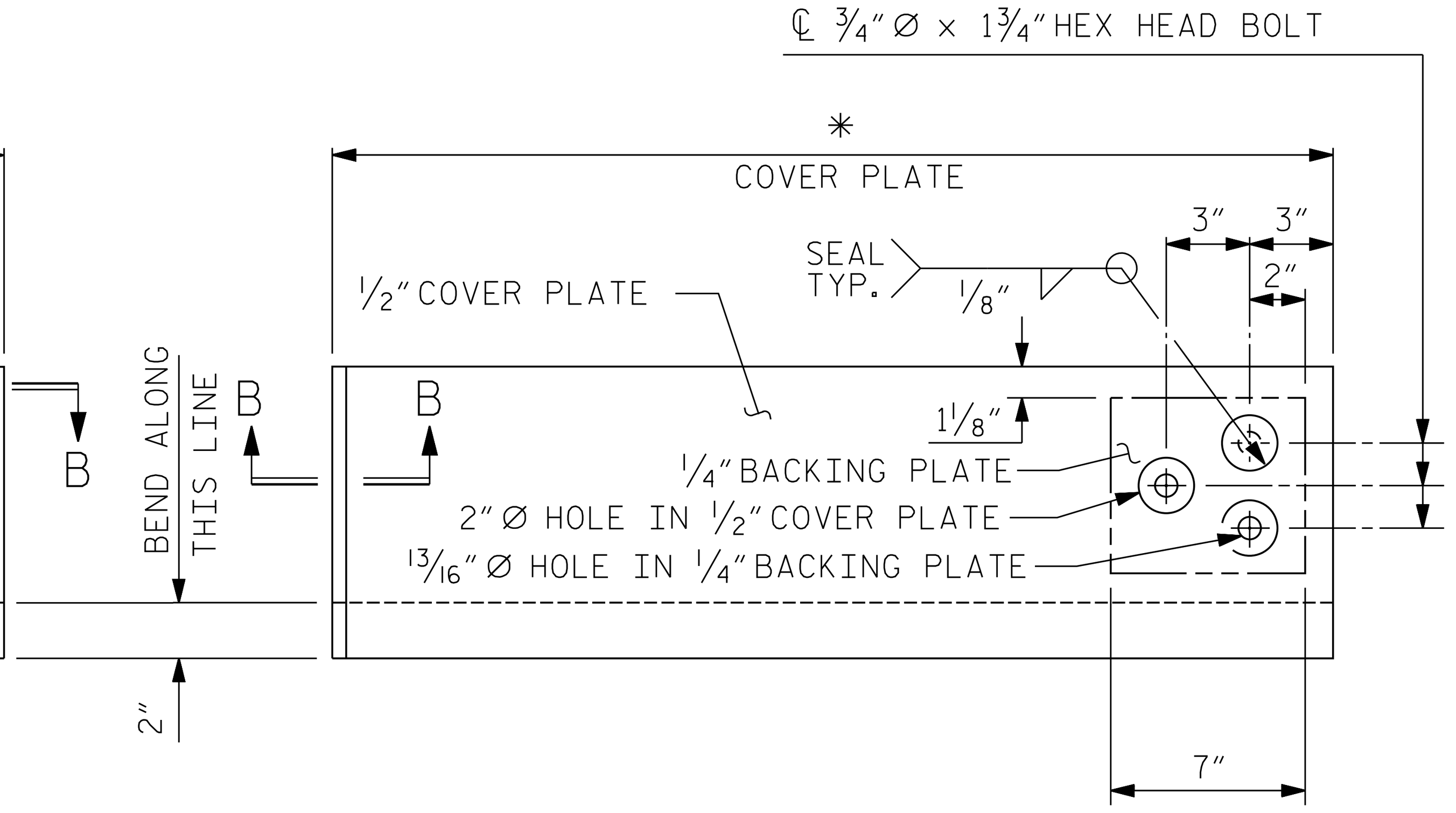
wdtutcher
DGN: V:\NC\Structures\031148-44 U-2579AA STPS\Structures\SITE 1 - FLYCA North\Plans\FINAL PLANS\40\J23_U2579AA_SMU_EJ02_062.dgn
TIME: 10:03 AM on Tuesday, July 26, 2022



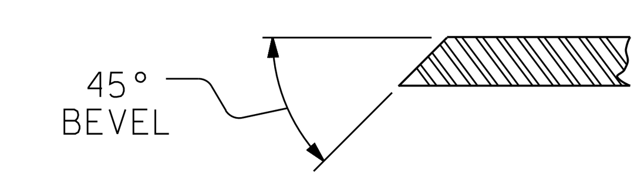
END VIEW



TYPE I - ELEVATION VIEW



TYPE II - ELEVATION VIEW



SECTION B-B

COVER PLATE DETAILS

* = DETAILS OF COVER PLATES ARE SUBJECT TO CHANGE DEPENDING ON THE DETAILS OF THE MODULAR EXPANISON JOINT SEALS FURNISHED

NOTES

FOR MODULAR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

THE STEEL PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 OR APPROVED EQUAL AND BE PAINTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. AT THE CONTRACTOR'S OPTION, THE PLATES MAY BE METALLIZED AFTER FABRICATION. SEE SPECIAL PROVISIONS FOR THERMAL SPRAYED COATINGS (METALLIZATION).

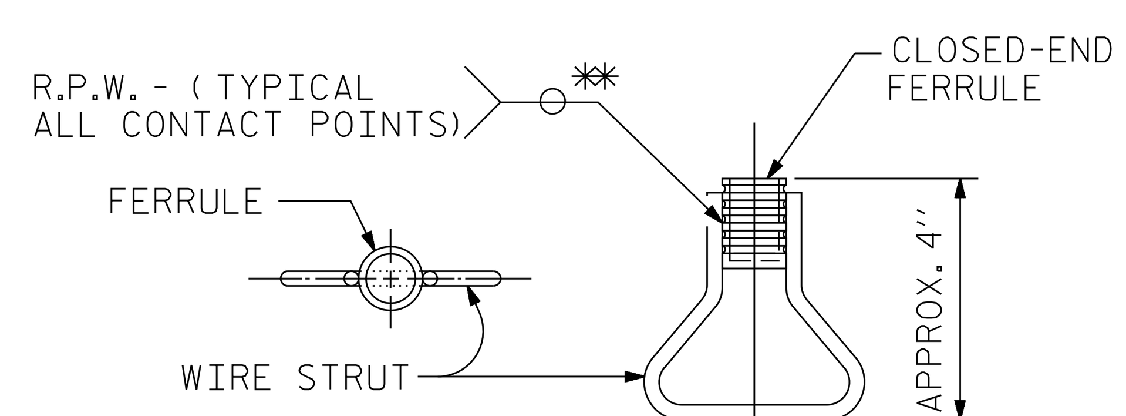
THE 3/4″ Ø HEX HEAD BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL.

THE 3/4″ CONCRETE INSERTS SHALL BE CLOSED-END FERRULES WITH LOOPED WIRE STRUTS ATTACHED TO THEM. THE INSERTS SHALL CONFORM TO AASHTO M169, GRADE 12L14 AND SHALL HAVE A TENSILE WORKING LOAD CAPACITY OF 3000 LBS.

NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE COVER PLATE. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR "MODULAR EXPANSION JOINT SEALS".

SPECIAL SNOWPLOW PROTECTION IS REQUIRED. SEE SPECIAL PROVISION FOR MODULAR EXPANSION JOINT SEALS.

LOCATION	SKEW ANGLE	TOTAL MOVEMENT ALONG ℄ ROADWAY
BENT #3	90°	4 3/16″

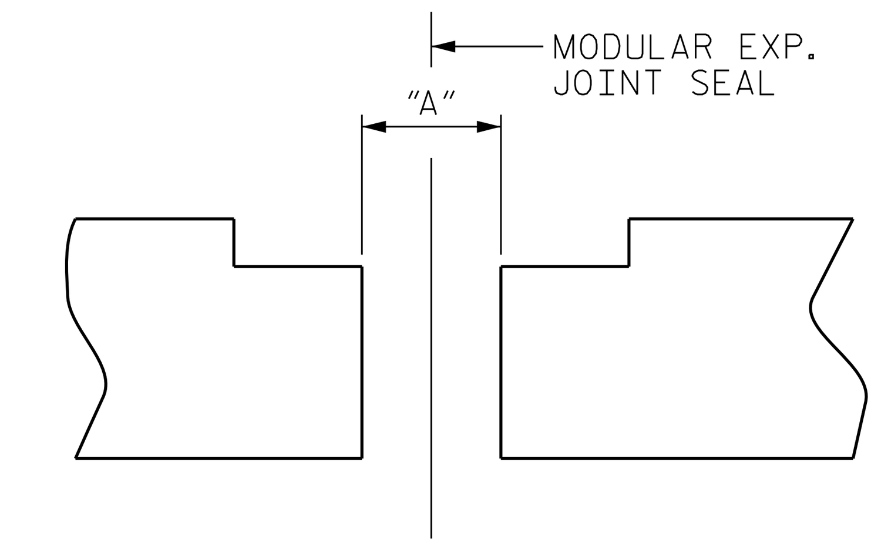


PLAN

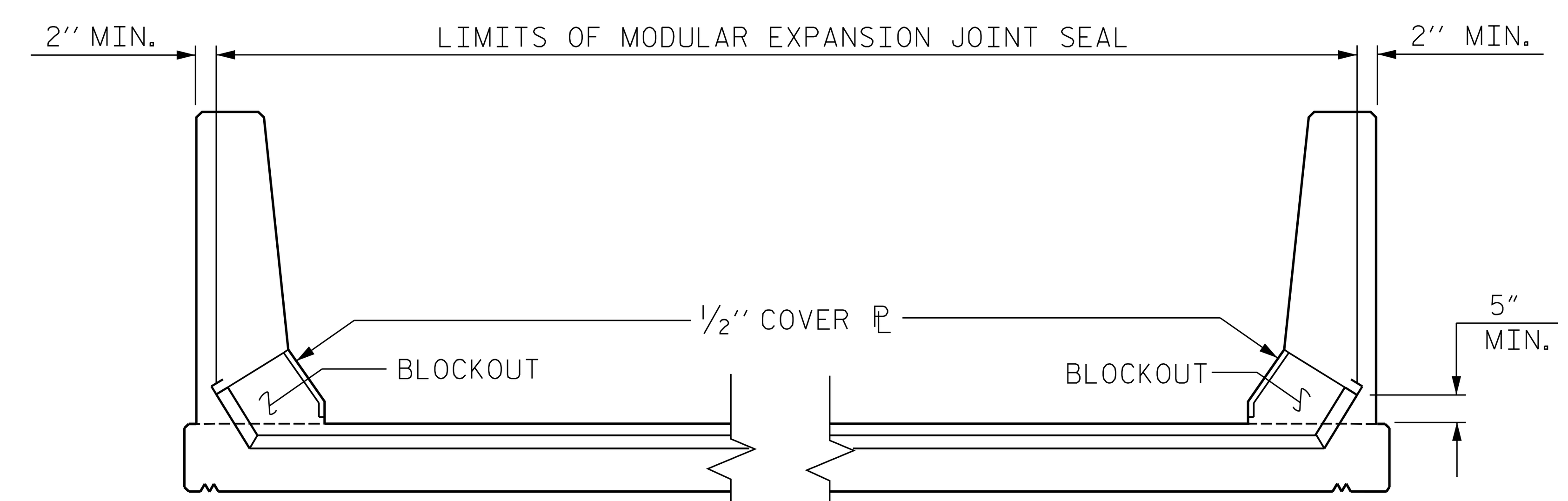
ELEVATION

CONCRETE INSERT

** EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.



SECTION A-A



SKETCH SHOWING LIMITS OF MODULAR EXPANSION JOINT SEAL-BARRIER RAIL

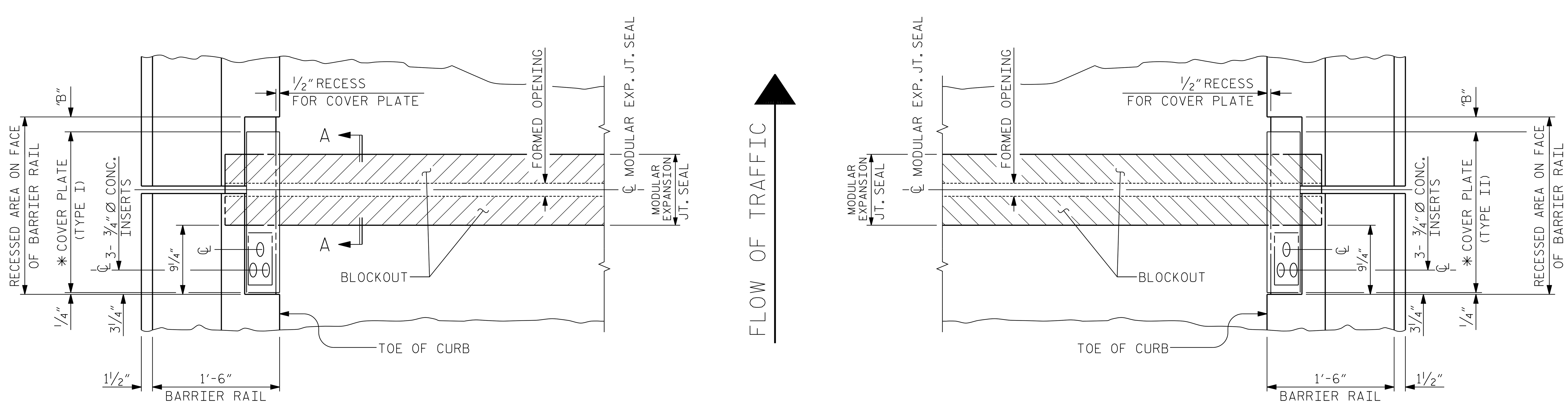
TABLE FOR BARRIER RAIL RECESS

LOCATION	"B" (in.)		
	45° F	60° F	90° F
BENT #3	4 3/16	3 9/16	2 5/16

TABLE OF JOINT OPENINGS

LOCATION	"A" (in.)		
	45° F	60° F	90° F
BENT #3	3 11/16	3 1/16	1 13/16

FOR PAVEMENT MARKING ALIGNMENT SKETCH, SEE "EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL" SHEET.



PLAN OF MODULAR EXPANSION JOINT SEAL

7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Boone, NC 828-355-9933 · Tri-Cities, TN 423-467-8401 · Knoxville, TN 865-546-5800 · Spartanburg, SC 864-574-4775 · Charleston, SC 843-974-5650 · Middlesboro, KY 606-248-6600 · Atlanta, GA 770-627-3590 · Raleigh, NC 919-977-9455 · Charlotte, NC 704-357-0488

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

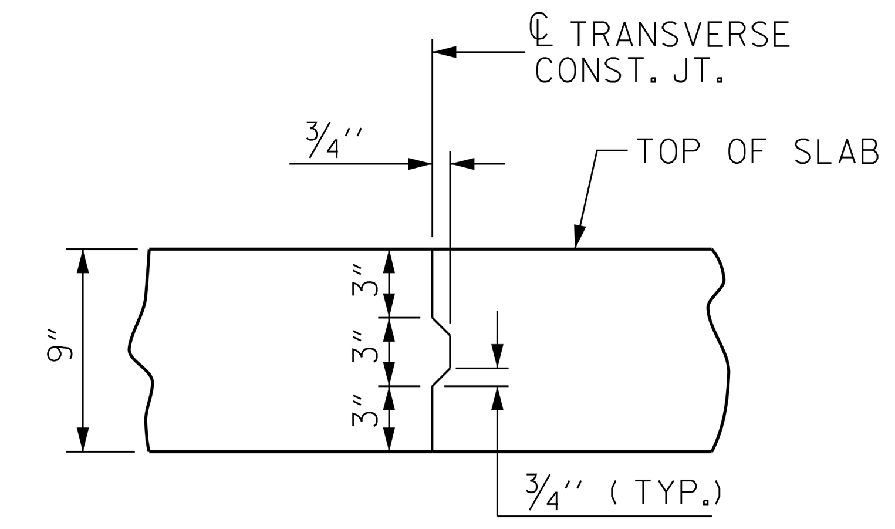
MODULAR EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL

DRAWN BY : EEM 7/96	REV. 10/1/11 MAA/GM
CHECKED BY : VAP 7/96	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

DWN. BY: NCW DATE: 03/2022
CHKD. BY: PRG DATE: 03/2022
DES. EGR. OF RECORD: PRG DATE: 03/2022

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-63
1			3			TOTAL SHEETS
2			4			92

STD. NO. MEJS1



TRANSVERSE CONSTRUCTION JOINT DETAIL

NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	1′-11″	1′-7″	1′-11″	1′-7″	2′-6″
#5	2′-5″	2′-0″	2′-5″	2′-0″	3′-1″
#6	2′-10″	2′-5″	3′-7″	2′-5″	3′-8″
#7	4′-2″	2′-9″			
#8	4′-9″	3′-2″			

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR 1	180.4	-----	-----
POUR 2	252.7	-----	-----
POUR 3	238.3	-----	-----
POUR 4	188.8	-----	-----
POUR 5	233.6	-----	-----
POUR 6	169.2	-----	-----
POUR 7	255.5	-----	-----
POUR 8	5.8	-----	-----
TOTALS**	1524.3	153,304	177,793

** QUANTITIES FOR BARRIER RAILS ARE NOT INCLUDED.

† IF THE CONTRACTOR CHOOSES TO REVERSE THE DIRECTION OF POURS 1 OR 5, A CONSTRUCTION JOINT WILL BE REQUIRED 4′-0″ FROM THE JOINT SEAL.

GROOVING BRIDGE FLOORS

APPROACH SLABS	1768	SQ.FT.
BRIDGE DECK	38789	SQ.FT.
TOTAL	40557	SQ.FT.

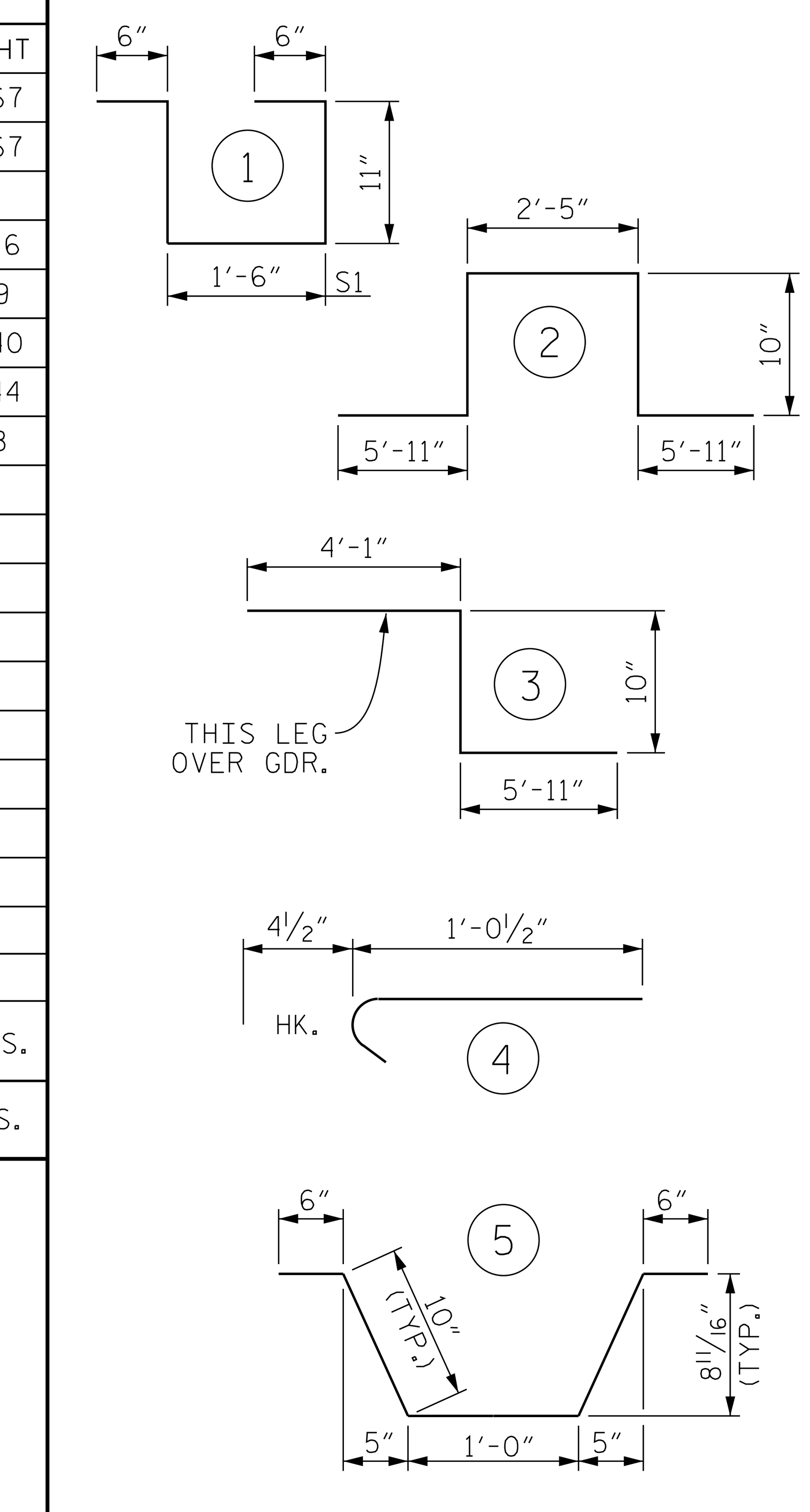
BILL OF MATERIAL UNIT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	929	#5	STR	42′-11″	41,584
A2	929	#5	STR	42′-11″	41,584
B1	450	#5	STR	53′-10″	25,267
* B2	135	#4	STR	30′-10″	2781
* B3	225	#6	STR	49′-9″	16,813
* B4	168	#6	STR	46′-6″	11,734
* B5	180	#4	STR	37′-2″	4469
* G1	1	#5	STR	42′-11″	45
* G2	10	#5	5	3′-8″	38
* J1	40	#4	4	1′-5″	38
K1	12	#5	3	10′-10″	136
K2	18	#5	2	15′-11″	299
* S1	62	#4	1	4′-4″	179
REINFORCING STEEL					67,286 LBS.
* EPOXY COATED REINF. STEEL					77,681 LBS.

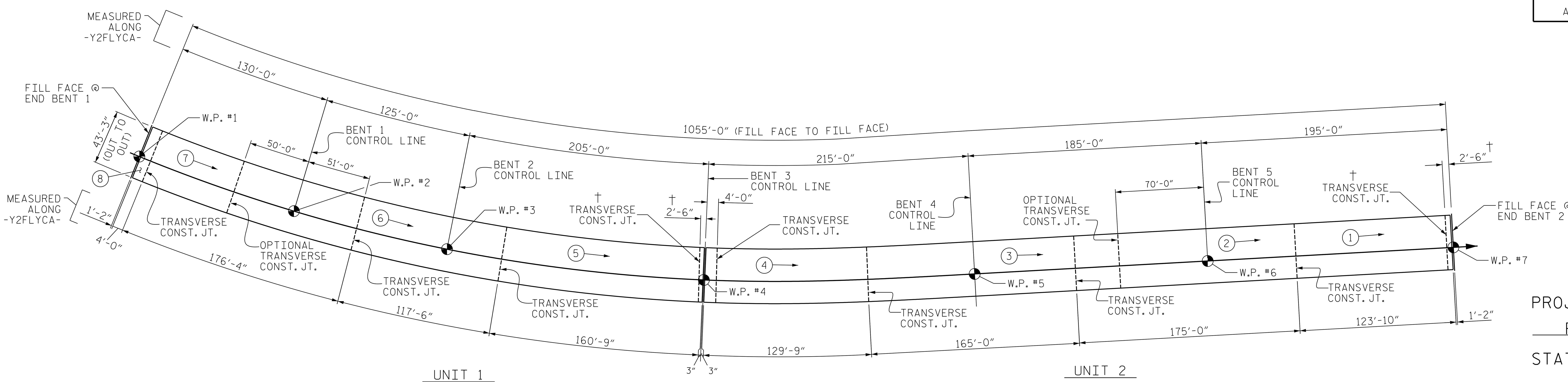
BILL OF MATERIAL UNIT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	1190	#5	STR	42′-11″	53,267
A2	1190	#5	STR	42′-11″	53,267
B6	550	#5	STR	56′-4″	32,316
* B7	180	#4	STR	39′-0″	4689
* B8	270	#6	STR	55′-4″	22,440
* B9	210	#6	STR	51′-6″	16,244
* B10	180	#4	STR	34′-8″	4168
* G1	1	#5	STR	42′-11″	45
* G1	10	#5	5	3′-8″	38
* J1	40	#4	4	1′-5″	38
K1	12	#5	3	10′-10″	136
K2	18	#5	2	15′-11″	299
* S1	62	#4	1	4′-4″	179
REINFORCING STEEL					86,018 LBS.
* EPOXY COATED REINF. STEEL					101,108 LBS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB AND POURING SEQUENCE

TOTAL = 45,427 SQ.FT.

Vaughn & Melton
Consulting Engineers
Asheville, North Carolina
828-253-2796
Boone, NC 828-355-9933
Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488
Atlanta, GA 770-627-3590

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-

NORTH CAROLINA PROFESSIONAL SEAL 020771 ENGINEER
DocuSigned by: Hardy Willis
7/26/2022

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL

DWN. BY: AW	DATE: 11/2021		
CHKD. BY: PRG	DATE: 11/2021		
DES. EGR. OF RECORD: PRG	DATE: 11/2021		

REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:		
1			3				
2			4				

SHEET NO. S1-64

TOTAL SHEETS 92

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING METHOD SHALL NOT BE USED.

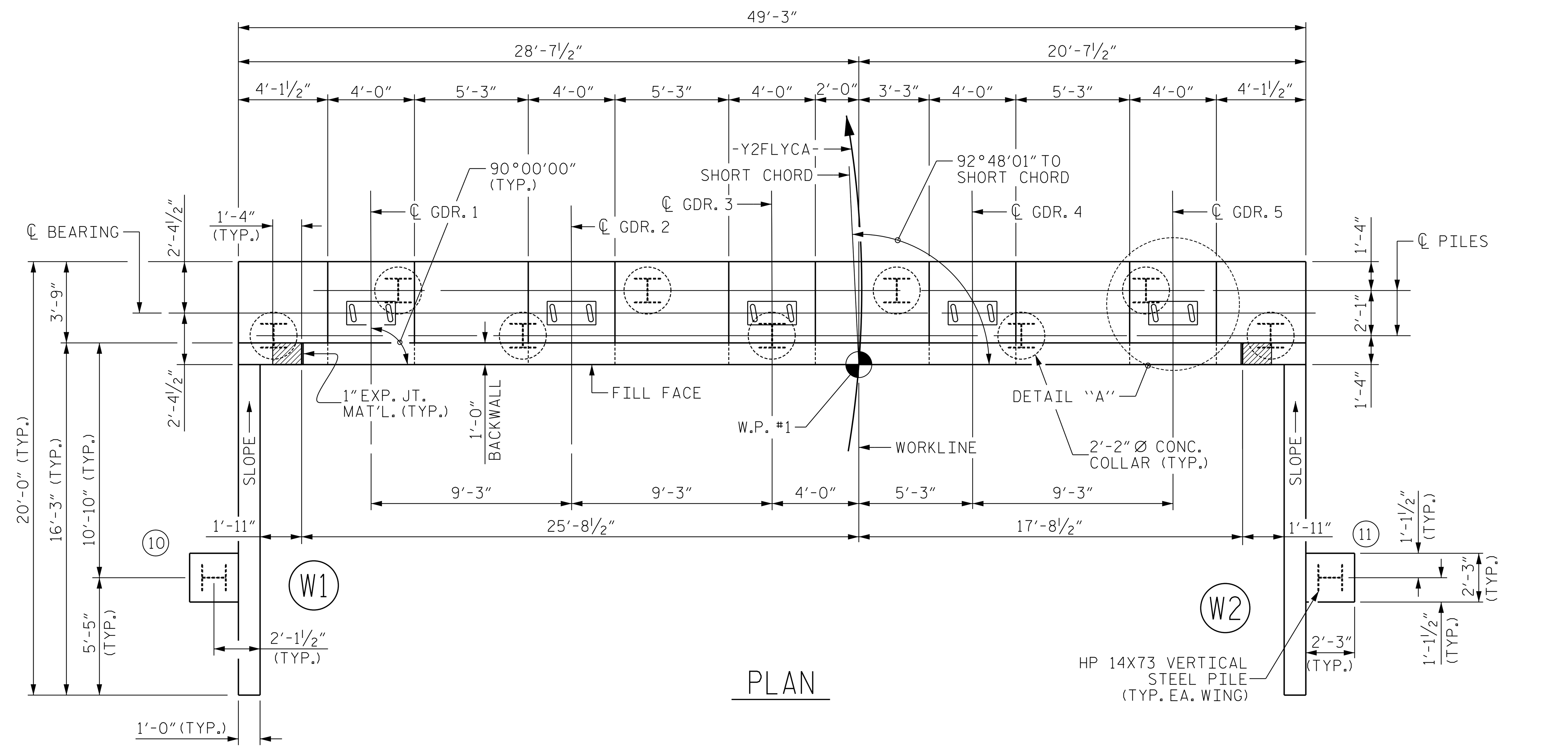
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

FOR PIPE INSERT DETAILS, SEE "ELASTOMERIC BEARING DETAILS" SHEET.

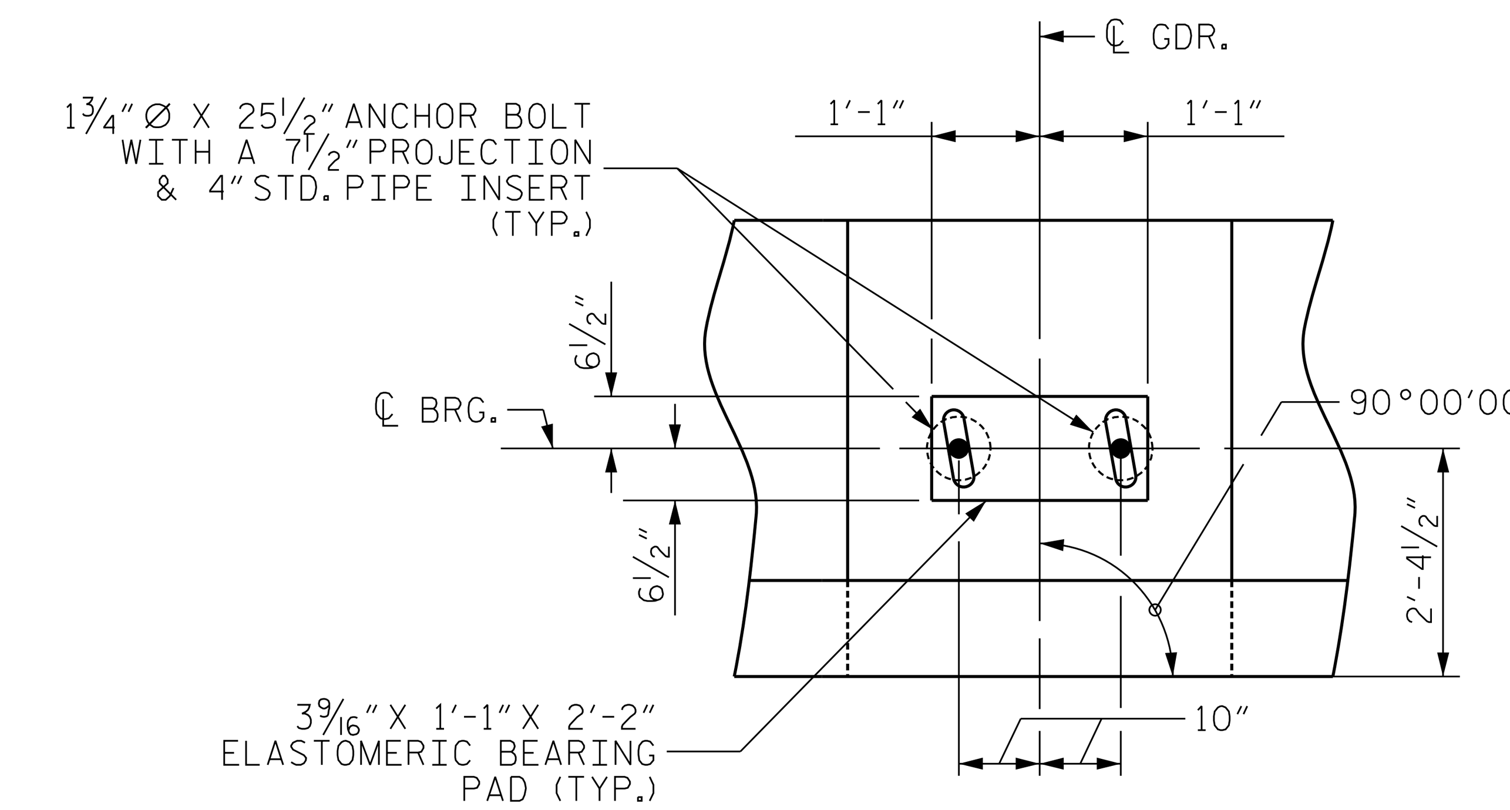
FOR WING DETAILS, SEE SHEET 2 OF 3.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

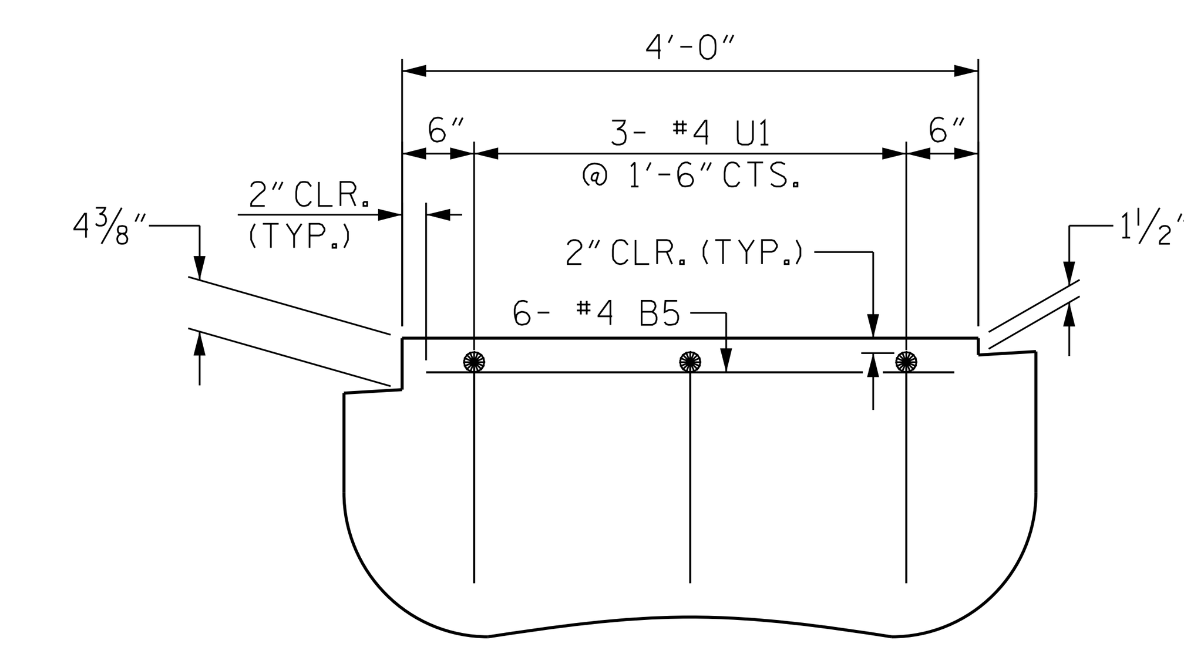
EPOXY COAT THE END BENT CAP AFTER ADJUSTMENTS ARE MADE TO THE BEARINGS AND ANCHOR BOLTS ARE GROUTED.



PLAN



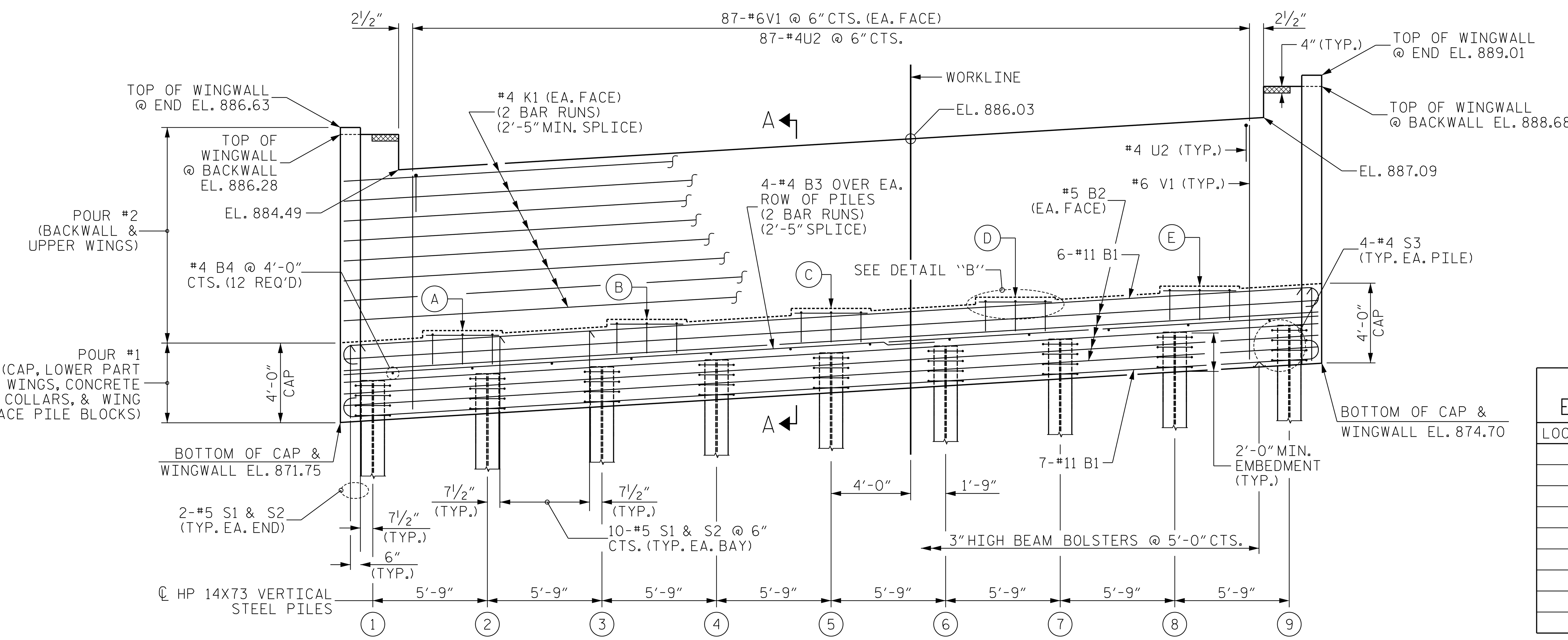
DETAIL "A"



DETAIL "B"

(TYP. EACH BRIDGE SEAT)

ELEVATION TABLE	
LOCATION	ELEVATION
A	876.36
B	876.92
C	877.47
D	878.03
E	878.58



ELEVATION

(CONCRETE PILE COLLARS AND WING BRACE PILE BLOCKS NOT SHOWN FOR CLARITY)

TOP OF PILE ELEVATIONS ✱	
LOCATION	ELEVATION
1	873.88
2	874.23
3	874.57
4	874.92
5	875.26
6	875.61
7	875.95
8	876.30
9	876.64

✱ 2'-0" MIN. EMBEDMENT IS MEASURED FROM RIGHT SIDE OF PILE

DocuSigned by: Hardy Willis 7/26/2022

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Vaughn & Melton Consulting Engineers — Asheville, North Carolina 828-253-2796

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

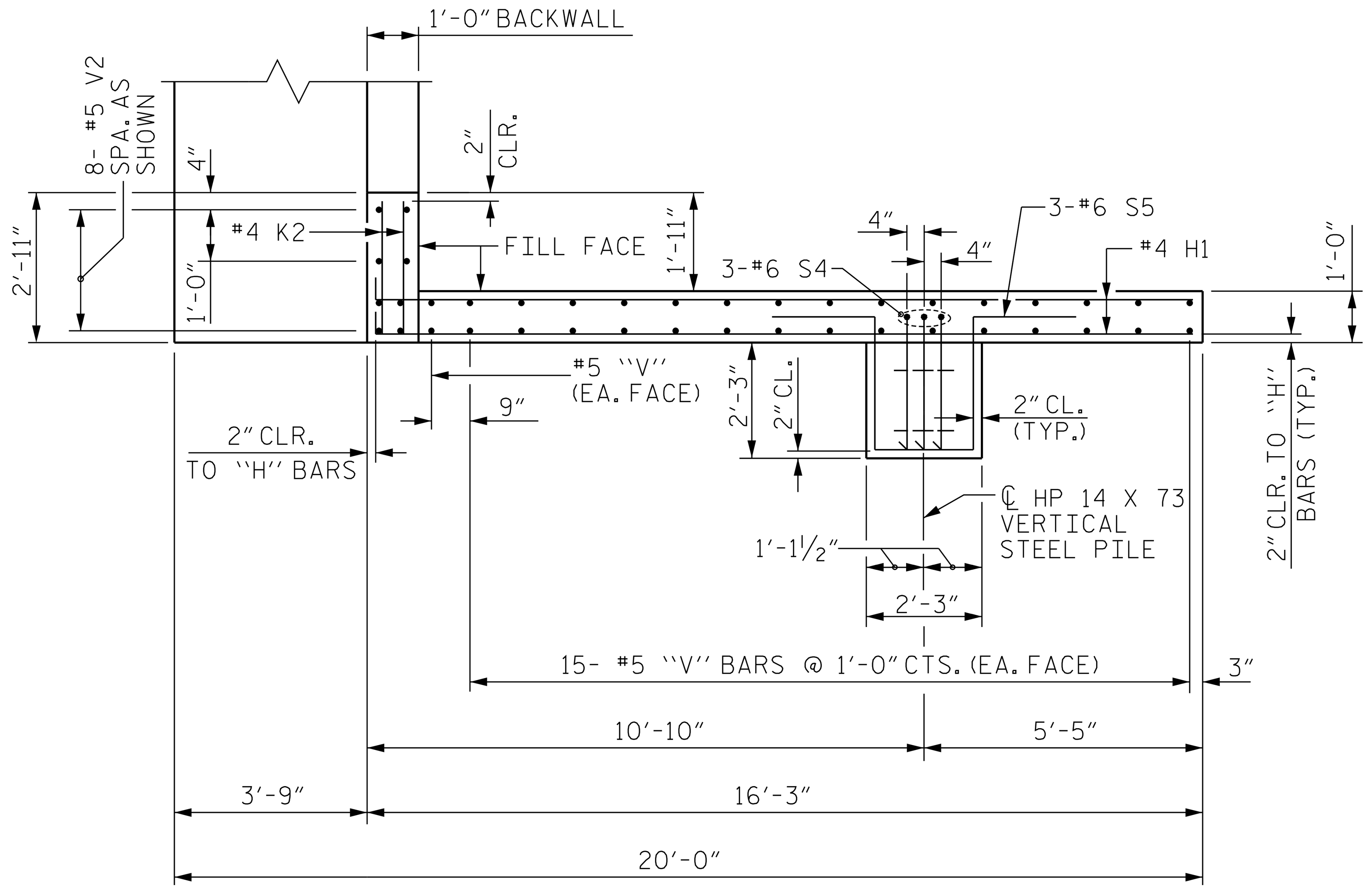
SUBSTRUCTURE

END BENT 1

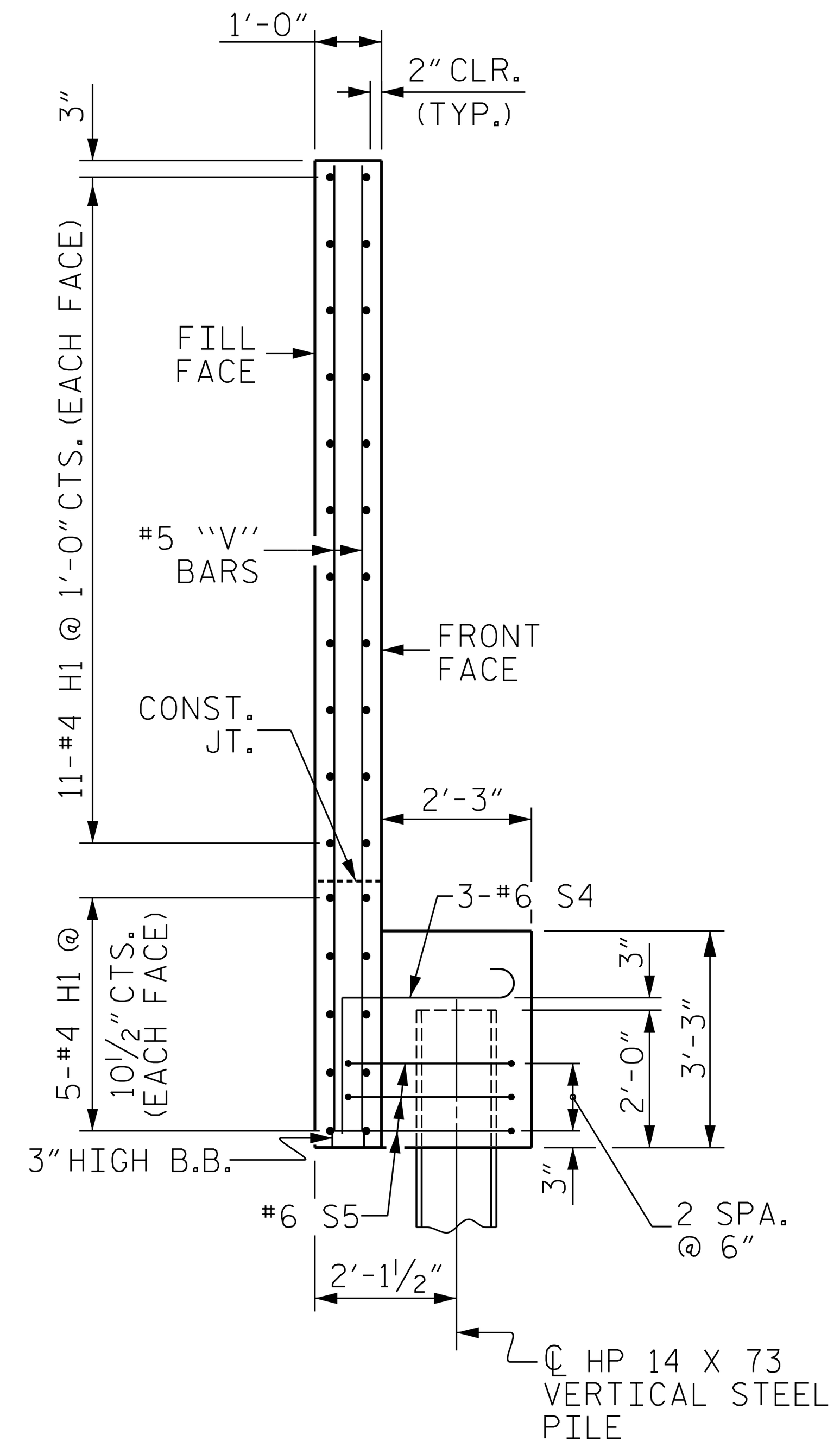
DWN. BY: NCW DATE: 03/2022
CHKD. BY: PRG DATE: 03/2022
DES. EGR. OF RECORD: RTS DATE: 03/2022

SHEET NO. S1-65

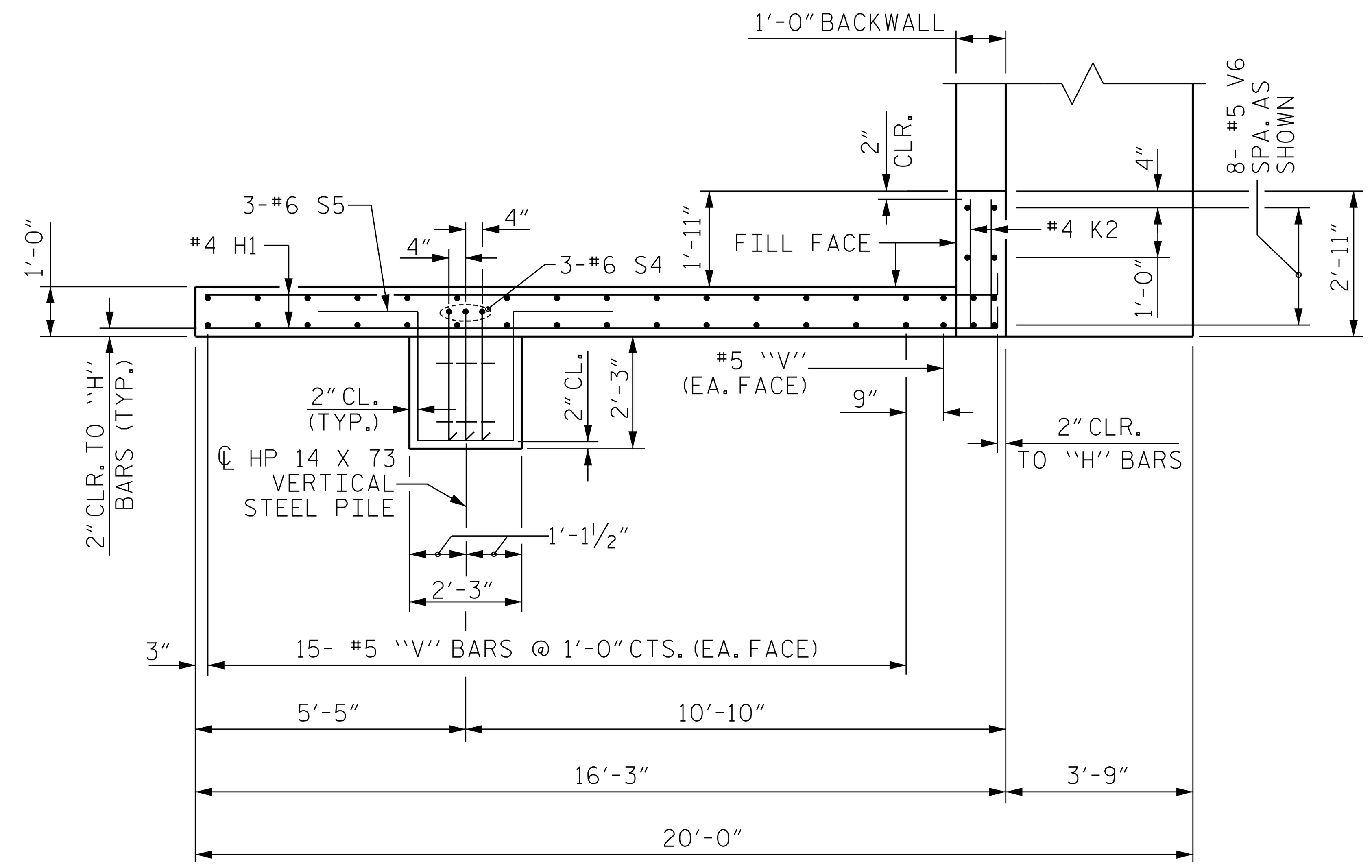
TOTAL SHEETS 92



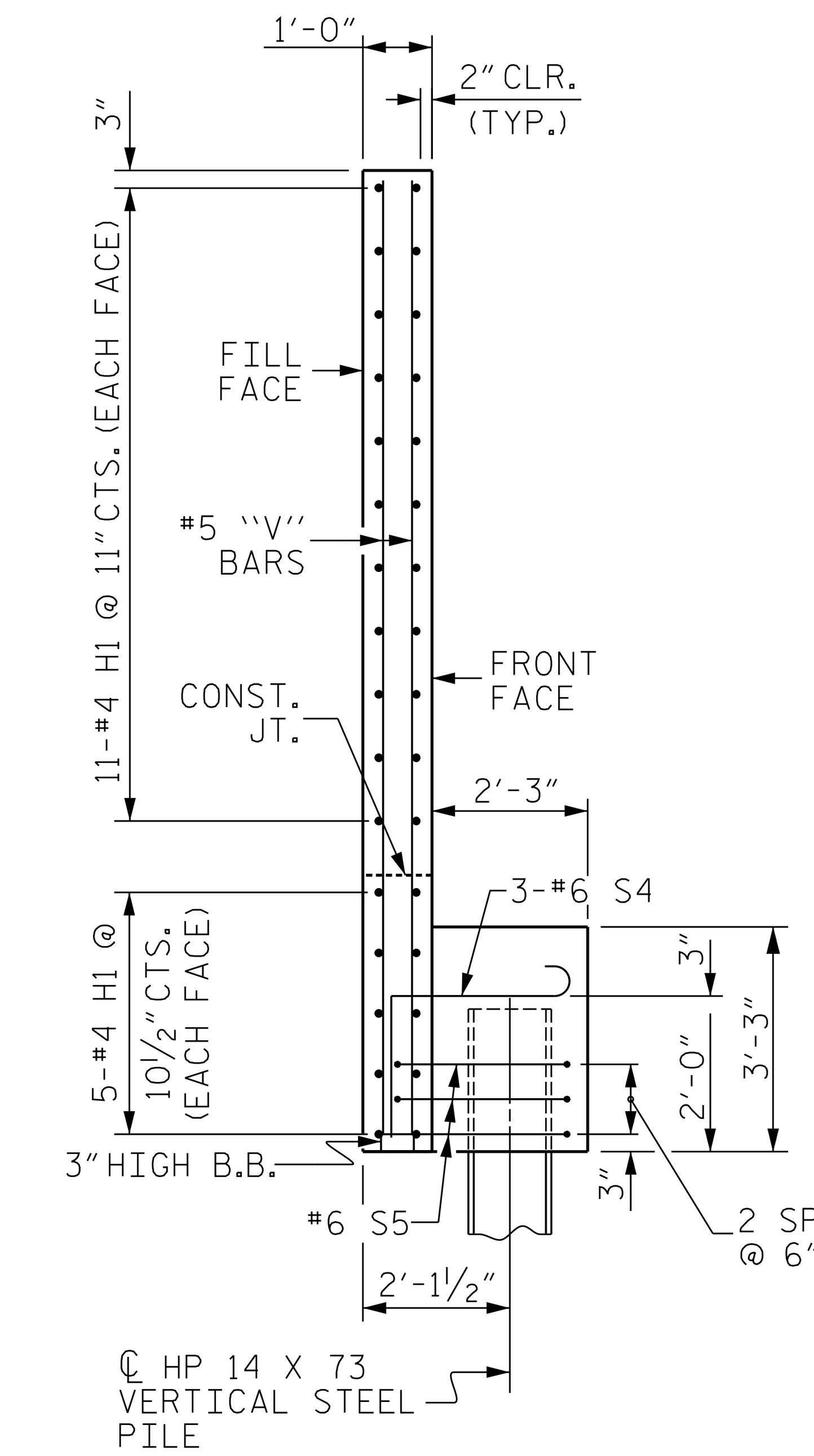
PLAN - WINGWALL (W1)



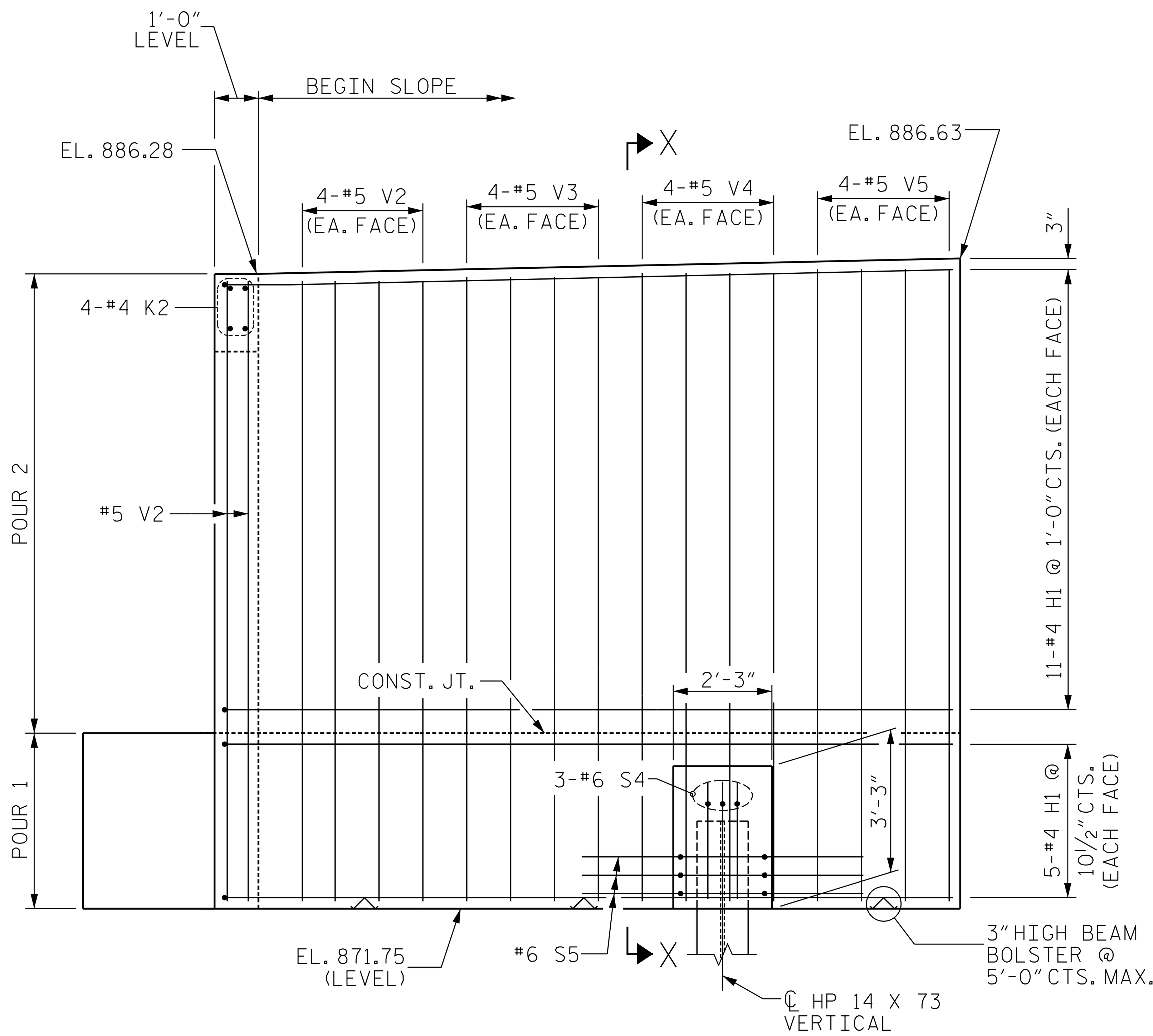
SECTION X-X



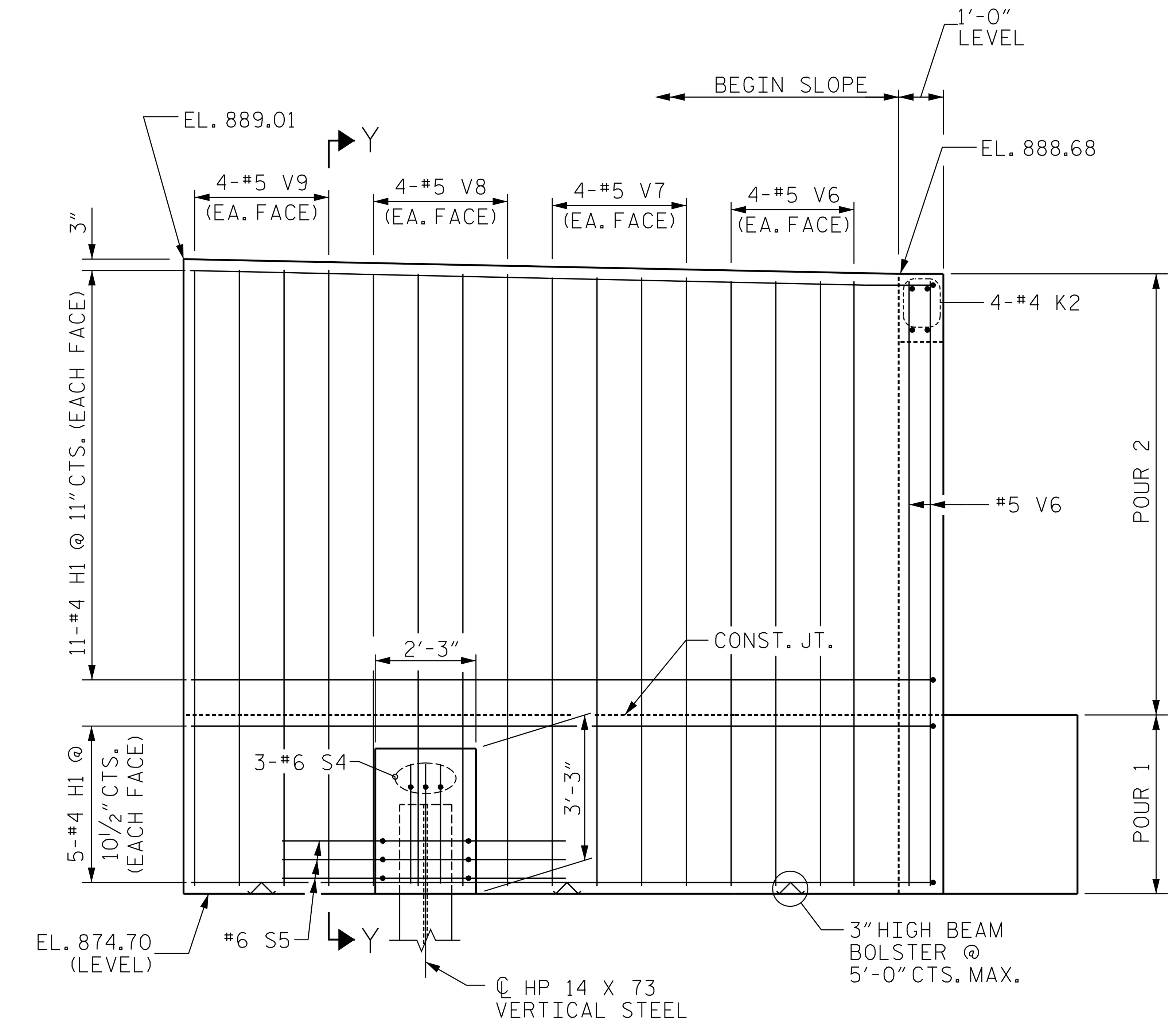
PLAN - WINGWALL (W2)



SECTION Y-Y



ELEVATION - WINGWALL (W1)



ELEVATION - WINGWALL (W2)

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

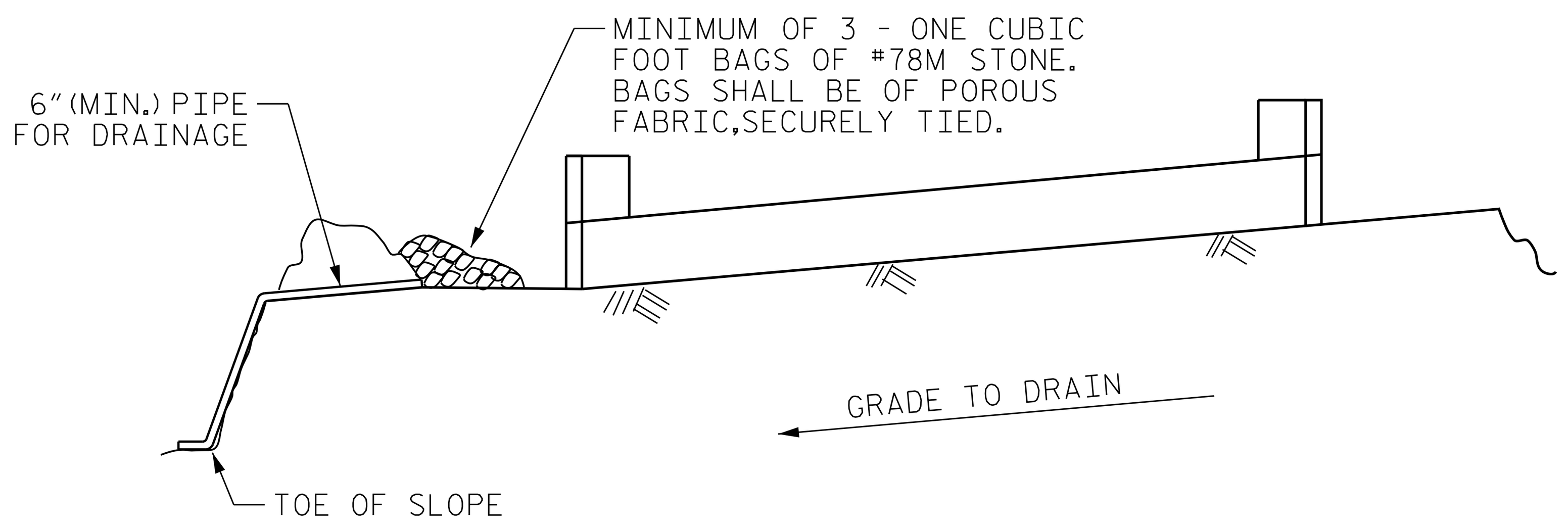
END BENT 1

Vaughn & Melton
Consulting Engineers
Asheville, North Carolina 828-253-2796

7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DWN. BY: FRJ	DATE: 03/2022	REVISIONS						SHEET NO. S1-66
CHKD. BY: PRG	DATE: 03/2022	NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS 92
DES. EGR. OF RECORD: RTS	DATE: 03/2022	1			3			
		2			4			

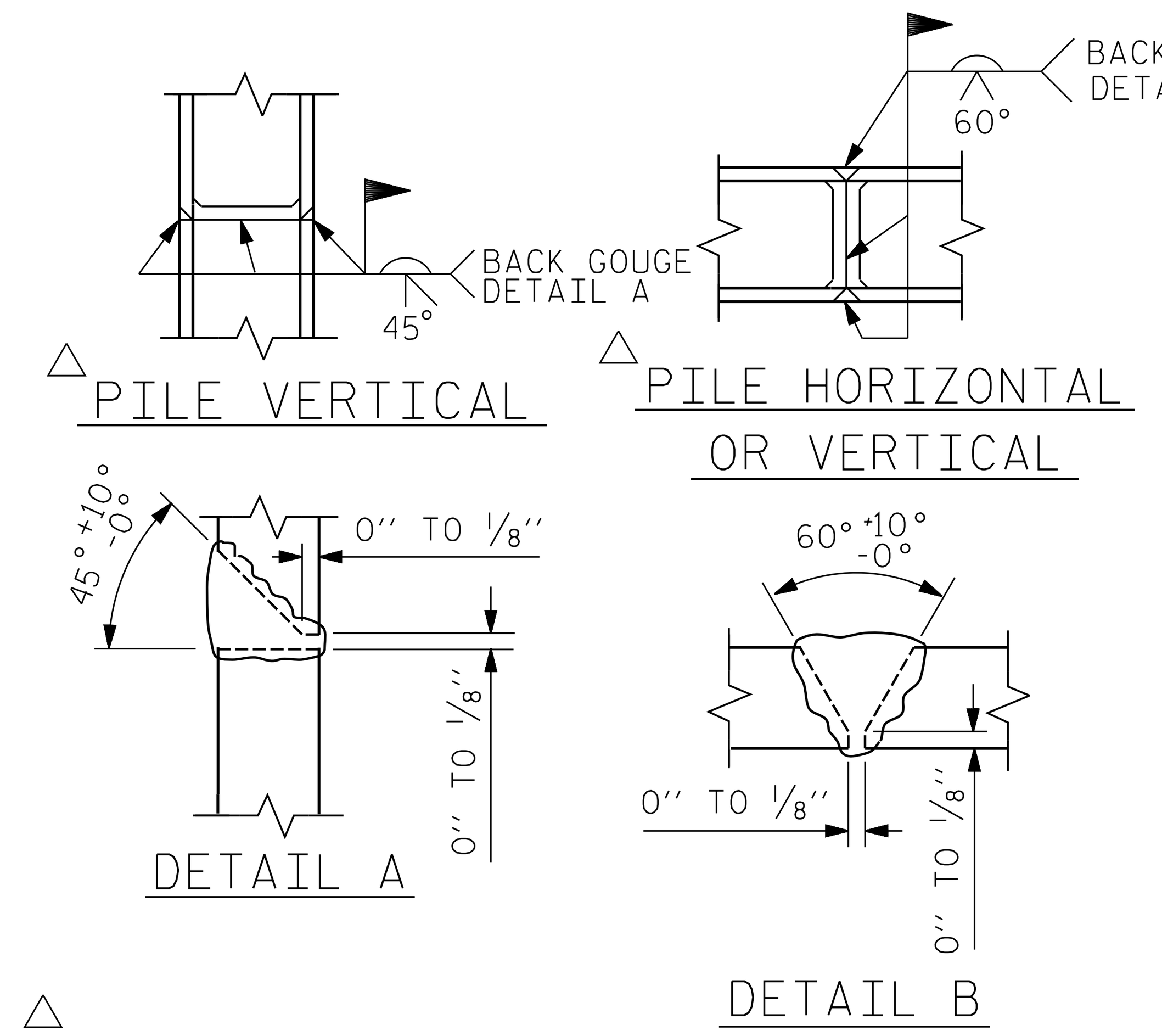


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

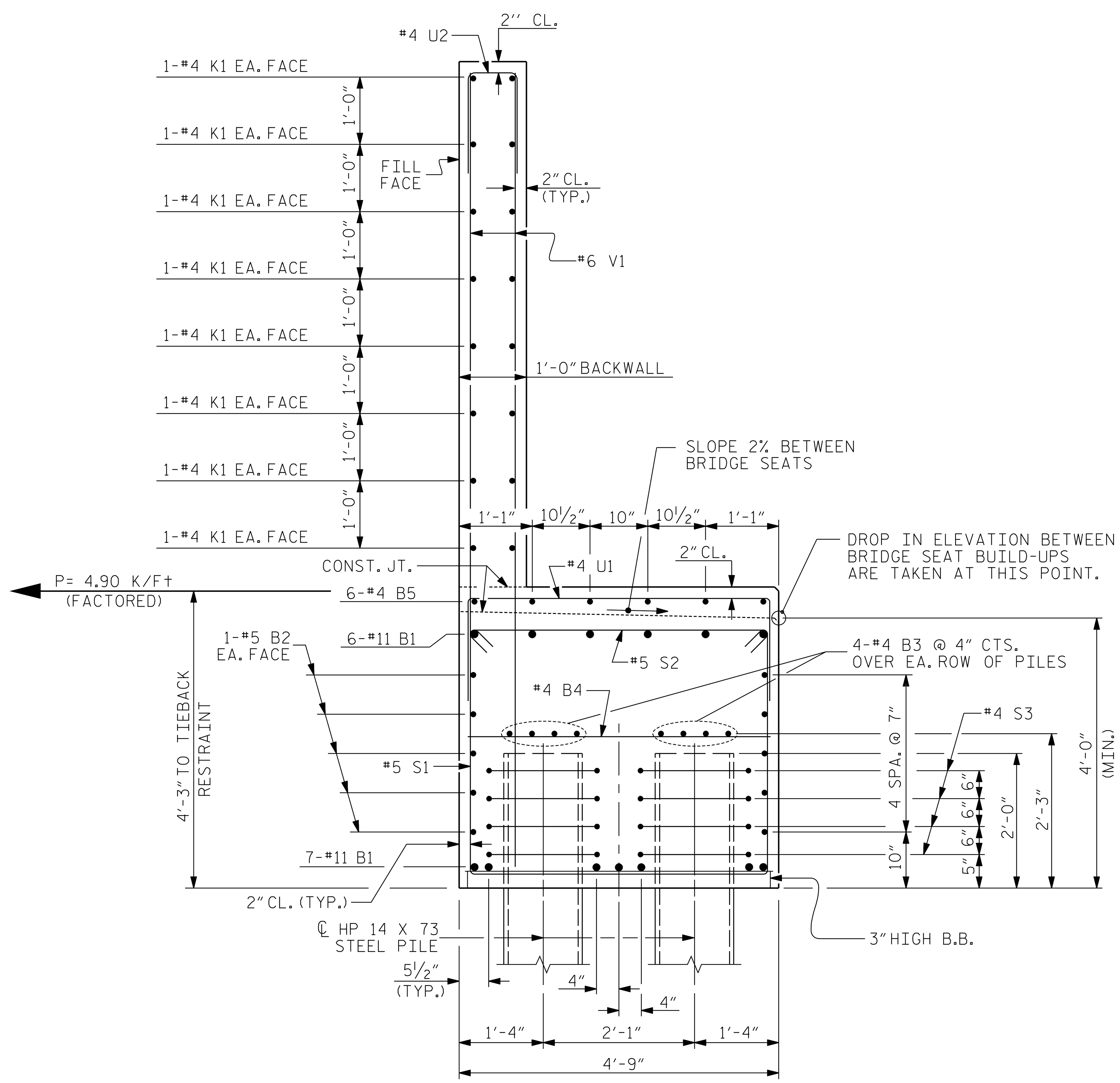
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



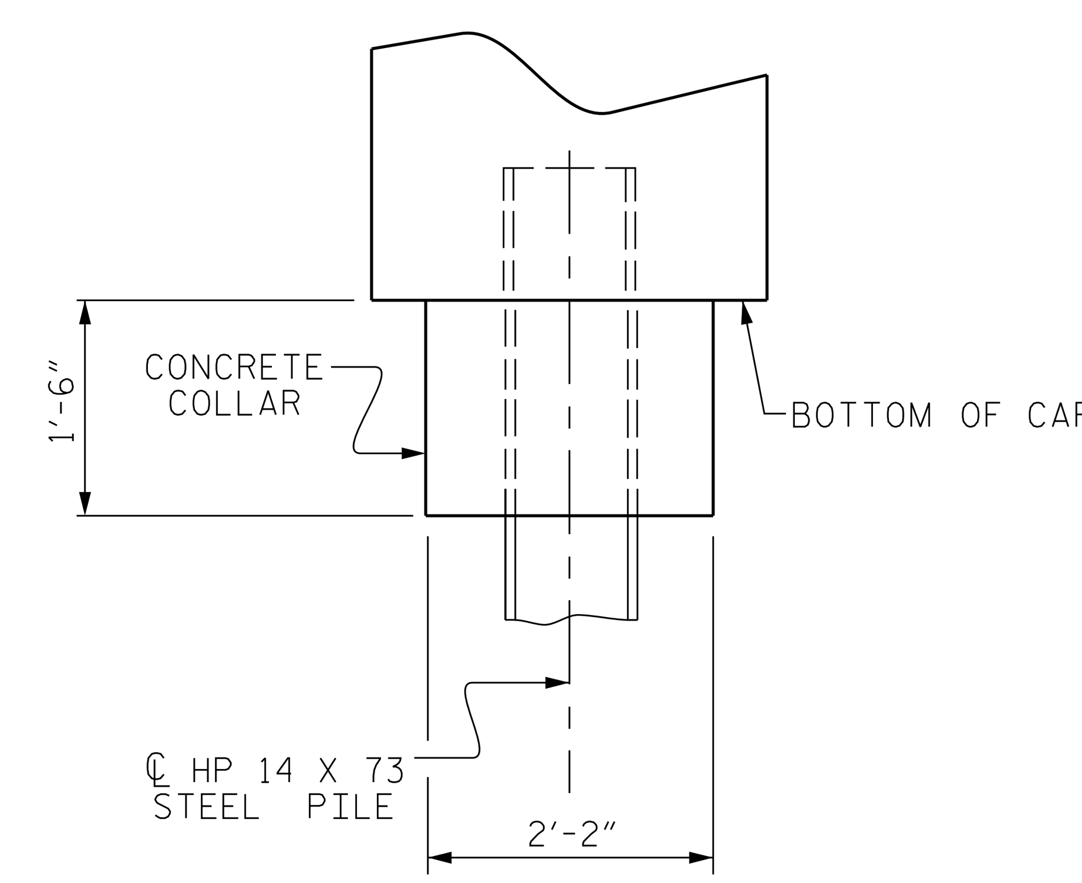
△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

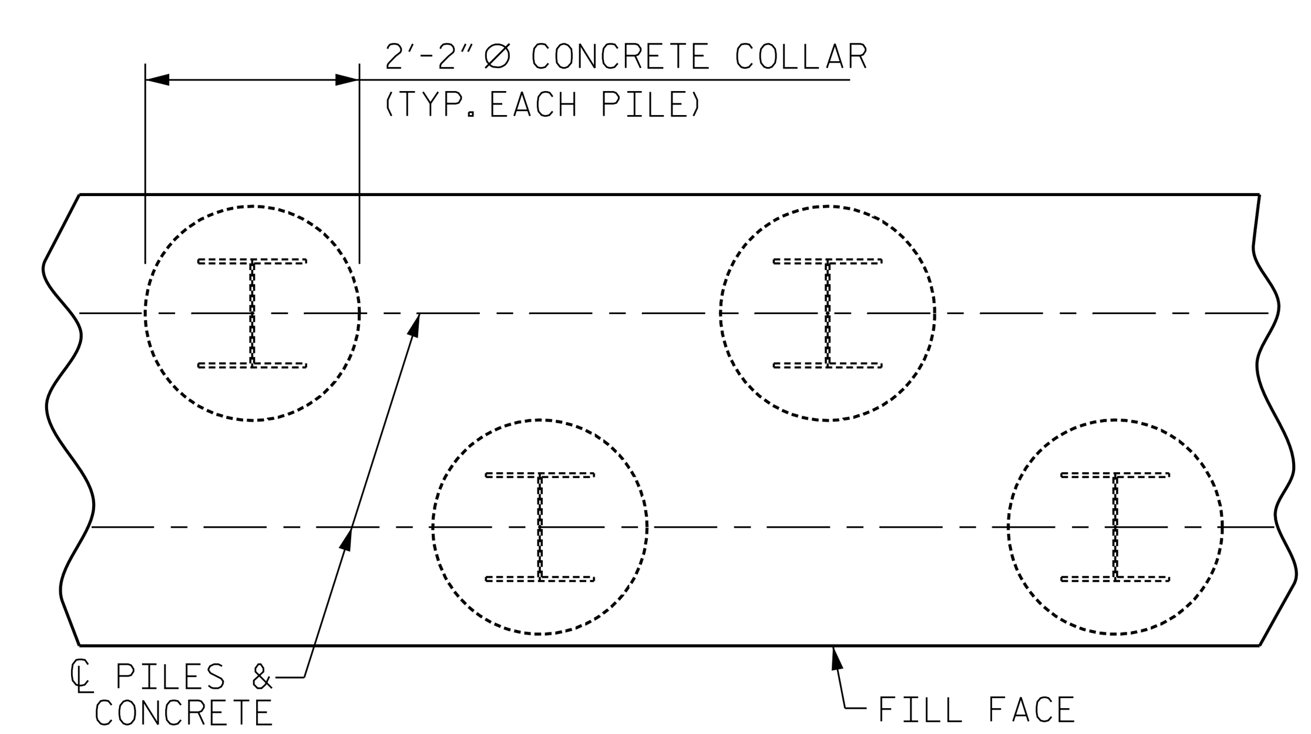


SECTION A-A

(PILE COLLARS NOT SHOWN FOR CLARITY)



ELEVATION



PLAN

CORROSION PROTECTION FOR STEEL PILES DETAIL

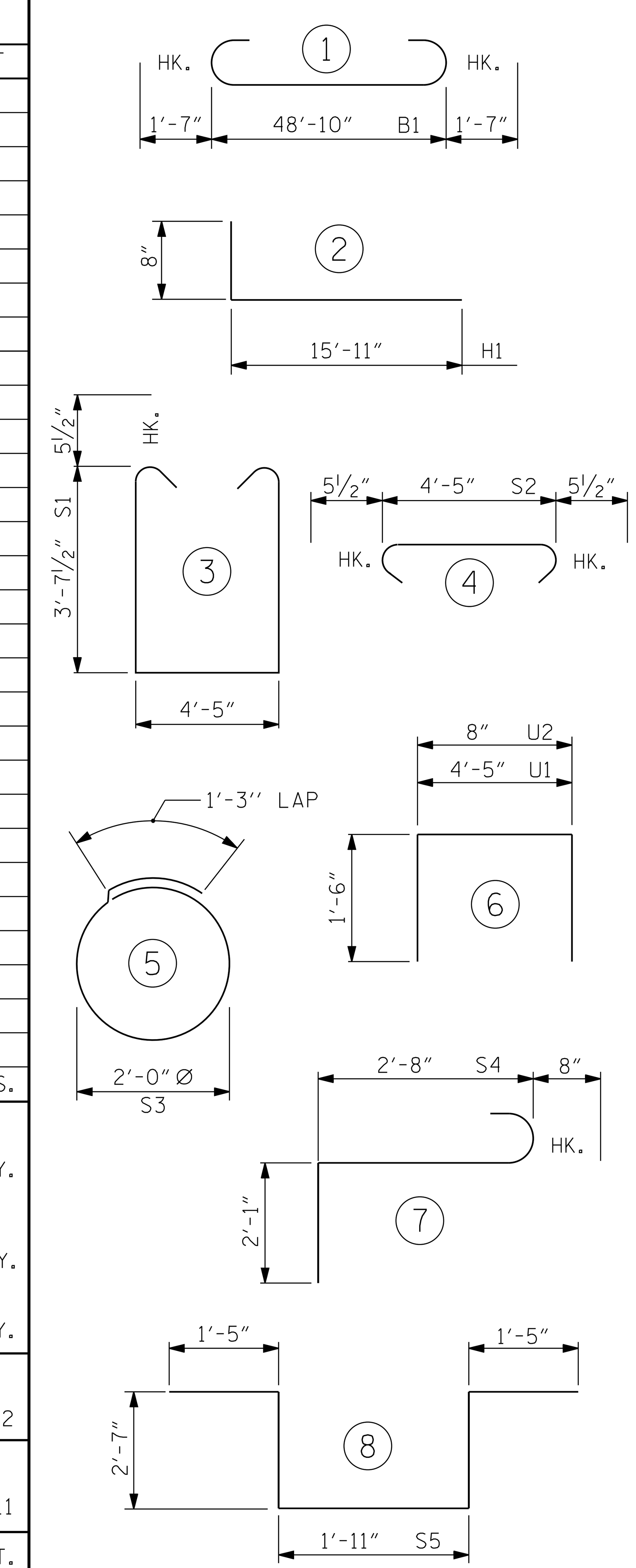
BILL OF MATERIAL

END BENT NO. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	13	#11	1	52'-0"	3592
B2	10	#5	STR	48'-10"	509
B3	16	#4	STR	25'-8"	274
B4	12	#4	STR	4'-5"	35
B5	30	#4	STR	3'-8"	73
H1	64	#4	2	16'-7"	709
K1	32	#4	STR	25'-8"	549
K2	8	#4	STR	2'-7"	14
S1	84	#5	3	12'-7"	1102
S2	84	#5	4	5'-4"	467
S3	36	#4	5	7'-7"	182
S4	6	#6	7	5'-5"	49
S5	6	#6	8	9'-11"	89
U1	15	#4	6	7'-5"	74
U2	87	#4	6	3'-8"	213
V1	174	#6	STR	12'-1"	3158
V2	16	#5	STR	14'-2"	236
V3	8	#5	STR	14'-3"	119
V4	8	#5	STR	14'-5"	120
V5	8	#5	STR	14'-6"	121
V6	16	#5	STR	13'-7"	227
V7	8	#5	STR	13'-8"	114
V8	8	#5	STR	13'-9"	115
V9	8	#5	STR	13'-11"	116
REINFORCING STEEL					12,257 LBS.

CLASS A CONCRETE BREAKDOWN	
POUR #1 CAP, LOWER PART OF WINGS, CONCRETE COLLARS, & WING BRACE PILE BLOCKS	43.4 C.Y.
POUR #2 BACKWALL & UPPER PART OF WINGS	27.7 C.Y.
TOTAL CLASS A CONCRETE	71.1 C.Y.
HP 14 X 73 STEEL PILES NO: 11	LIN. FT.= 572
PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES	NO: 11
PILE EXCAVATION IN SOIL	50.0 LIN. FT.
PILE EXCAVATION NOT IN SOIL	39.0 LIN. FT.
PDA TESTING	NO: 1

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

DocuSigned by: Hardy Willis — SEAL — 10/5/2022

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V&M Vaughn & Melton Consulting Engineers
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PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

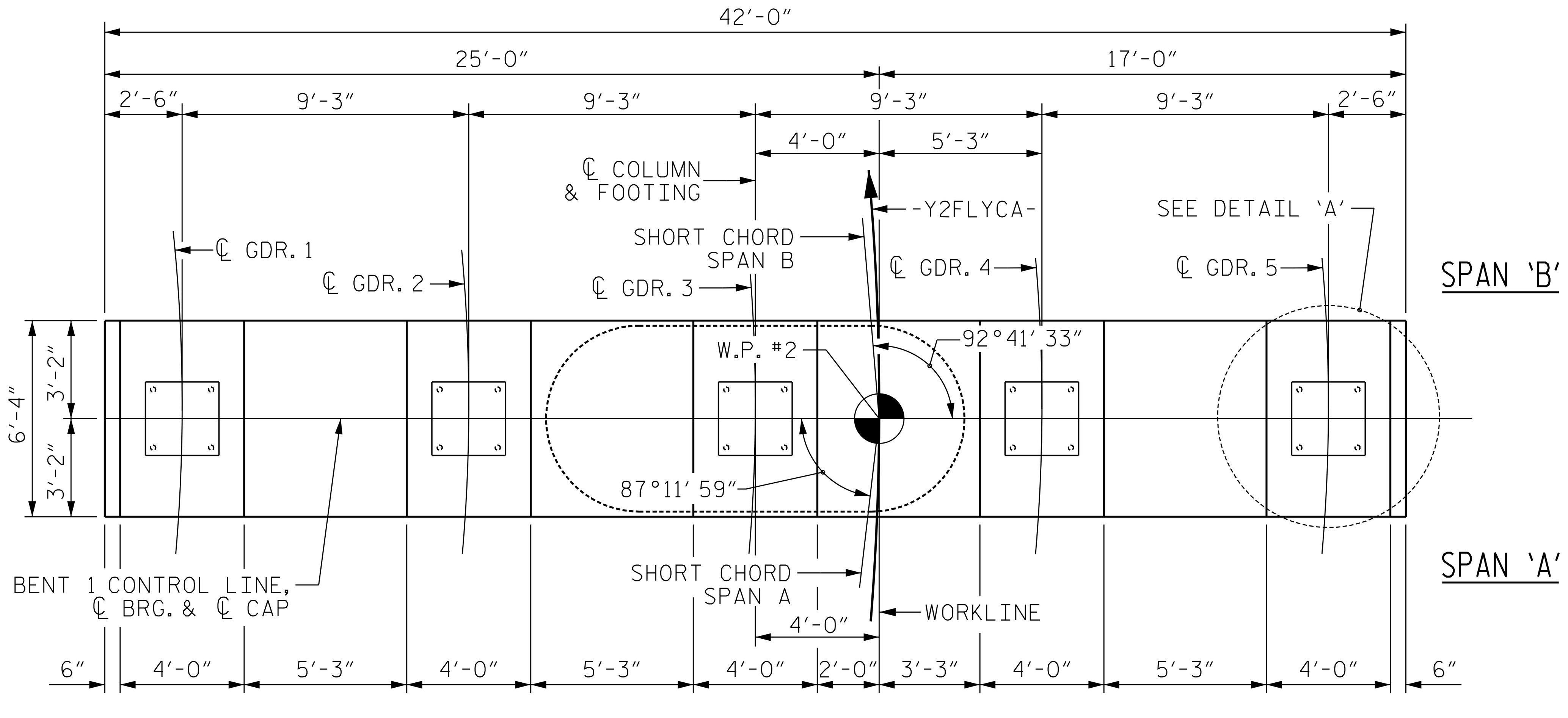
END BENT 1

DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: RTS	DATE: 03/2022

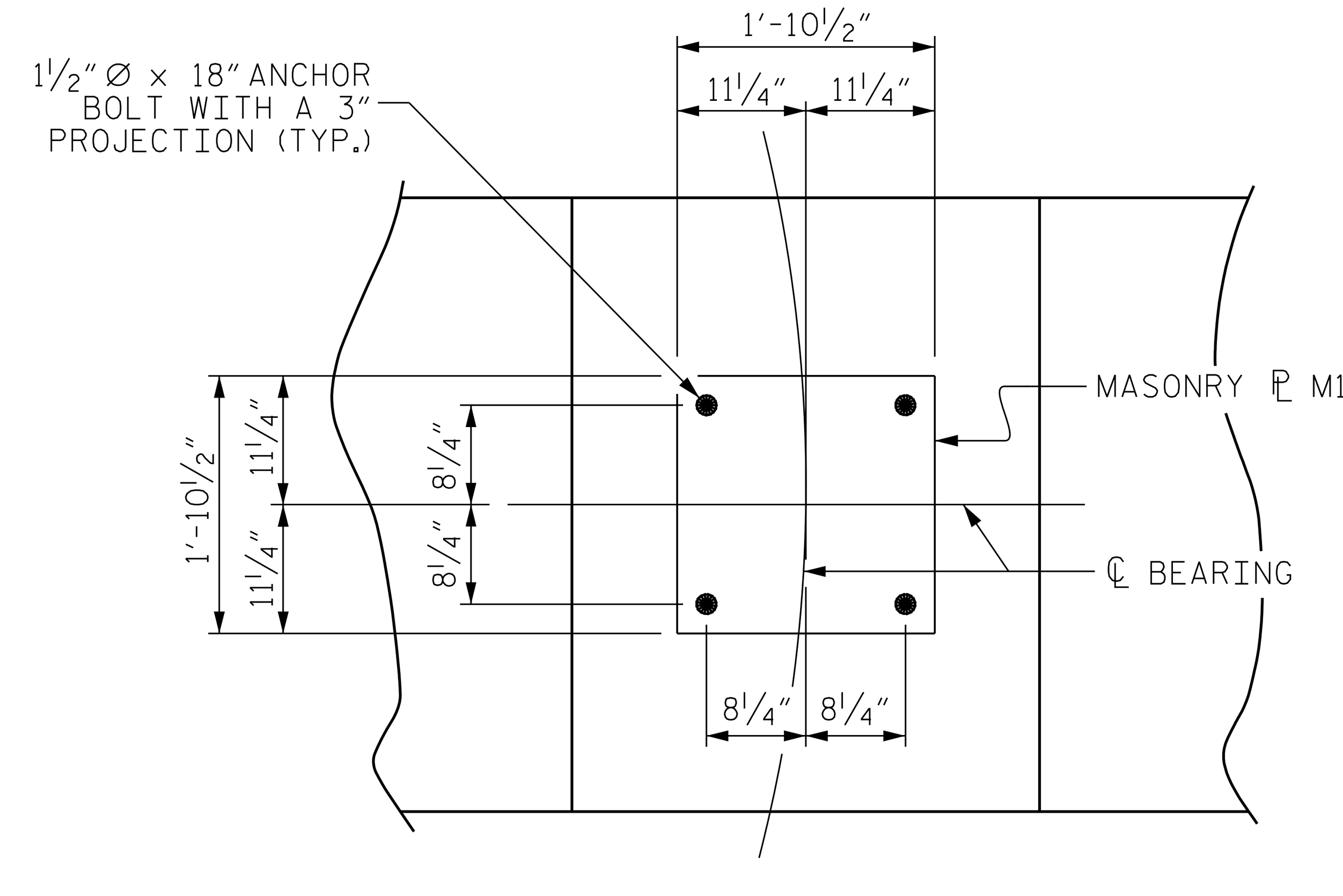
REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-67
TOTAL SHEETS 92



PLAN OF CAP



DETAIL 'A'

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

HOOKS ON "M" & "T" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

"T" BARS IN FOOTING MAY BE SHIFTED AS NECESSARY TO CLEAR "M" BARS EXTENDING INTO COLUMN.

FOR MASS CONCRETE, SEE SPECIAL PROVISIONS.

FOR FOOTING PLAN, SECTION B-B, SECTION, C-C, SEE SHEET 2 OF 3.

FOR SECTION A-A, DETAIL "B", AND BILL OF MATERIAL, SEE SHEET 3 OF 3.

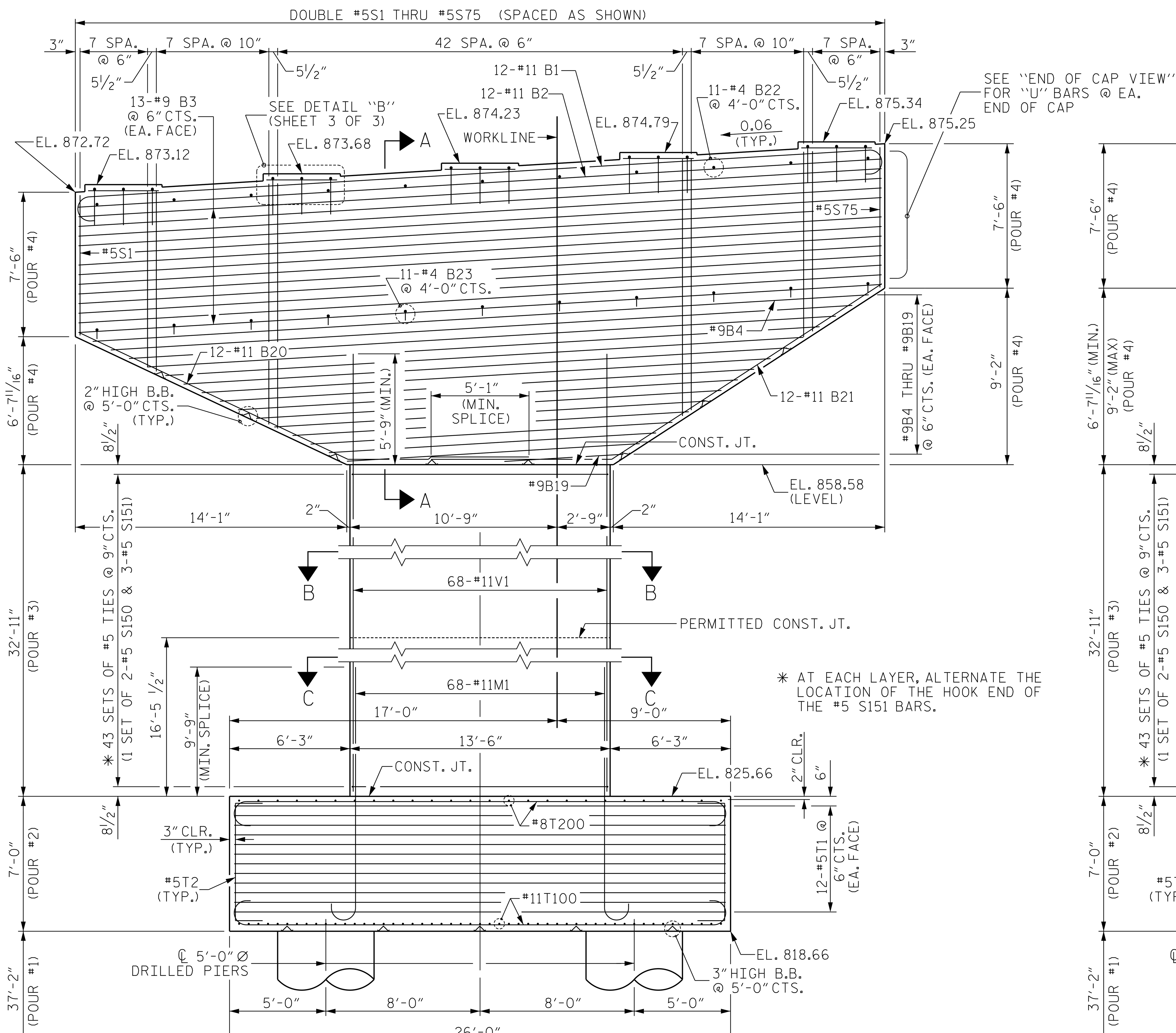
DETAILED DRAWINGS FOR FALSEWORK AND FORMS FOR THIS HAMMERHEAD BENT CAP SHALL BE SUBMITTED, SEE SHEET SN.

FOR DRILLED PIER DETAILS, SEE SHEET 2 OF 3.

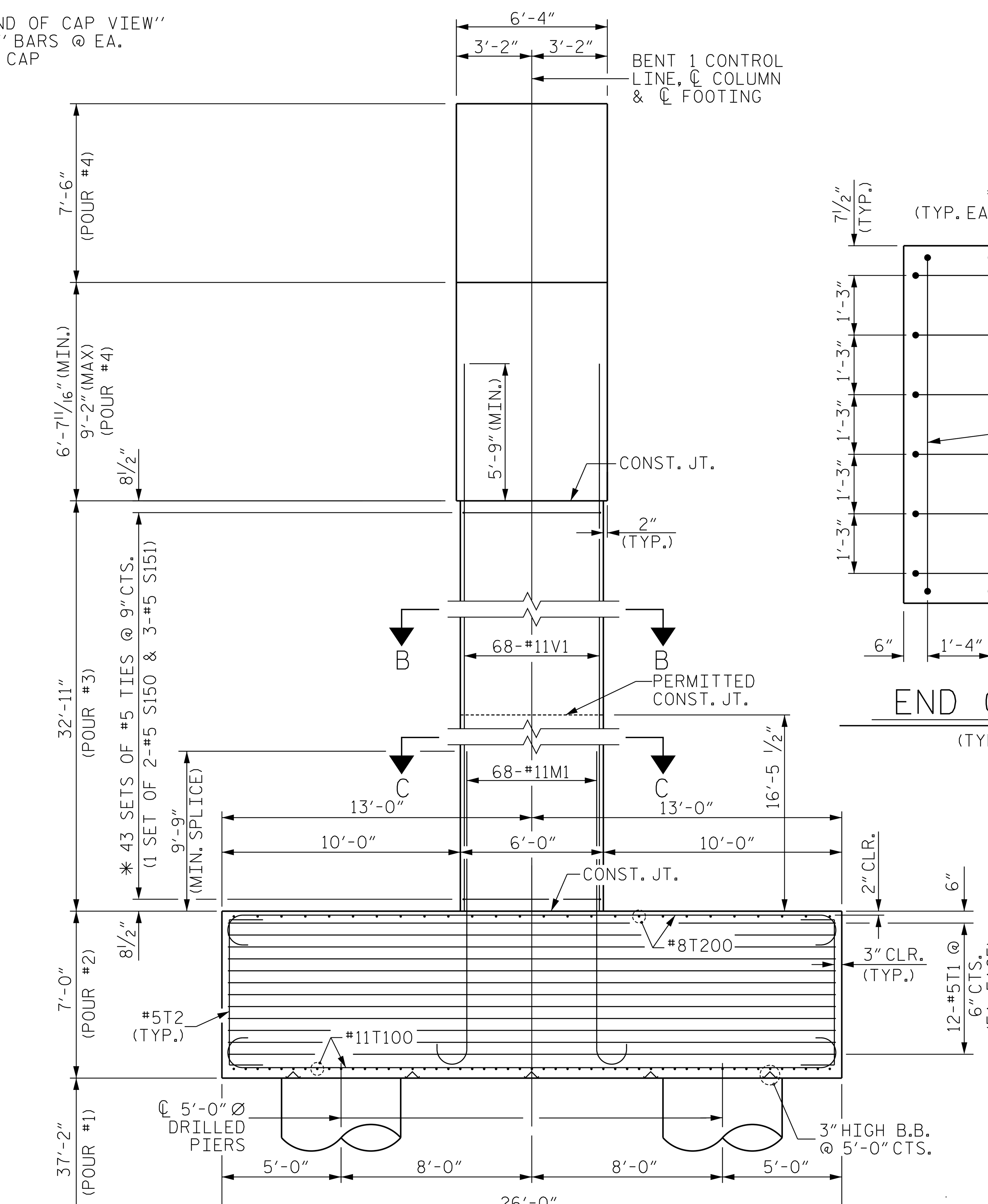
FOR DRILLED PIERS, SEE SECTION 411 OF THE SPECIAL PROVISIONS.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."

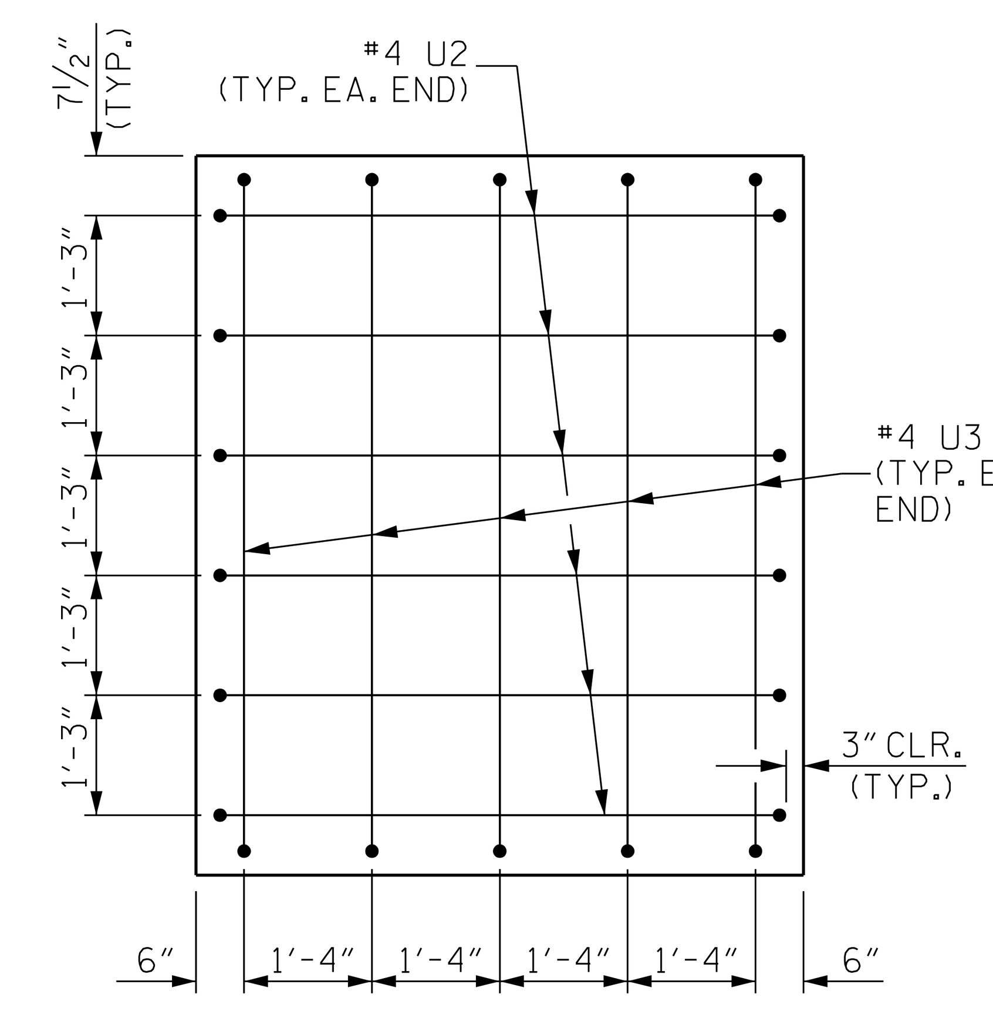
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.



ELEVATION



END ELEVATION



END OF CAP VIEW

(TYPICAL BOTH ENDS)

7/26/2022

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PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

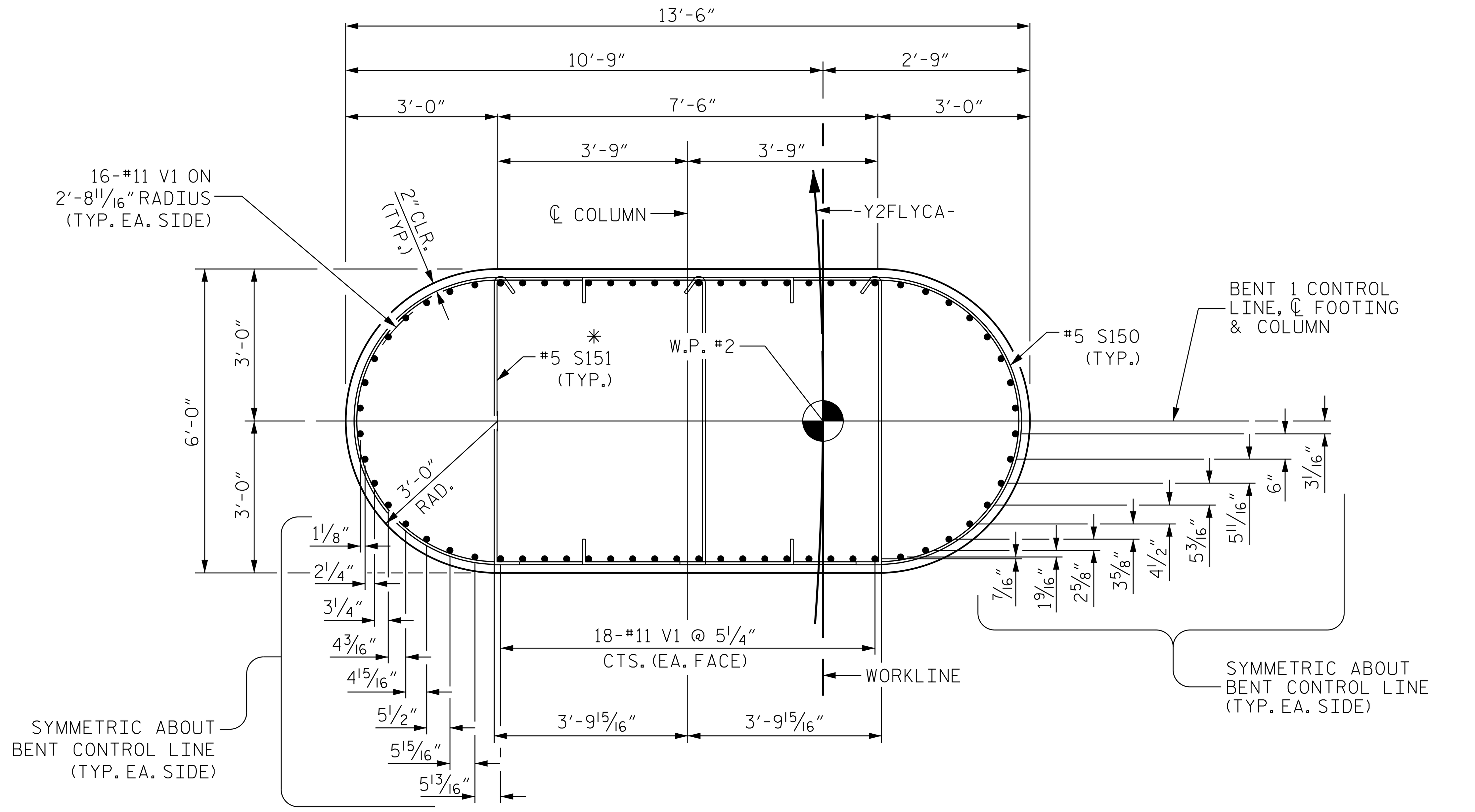
DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: RTS	DATE: 03/2022

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-68

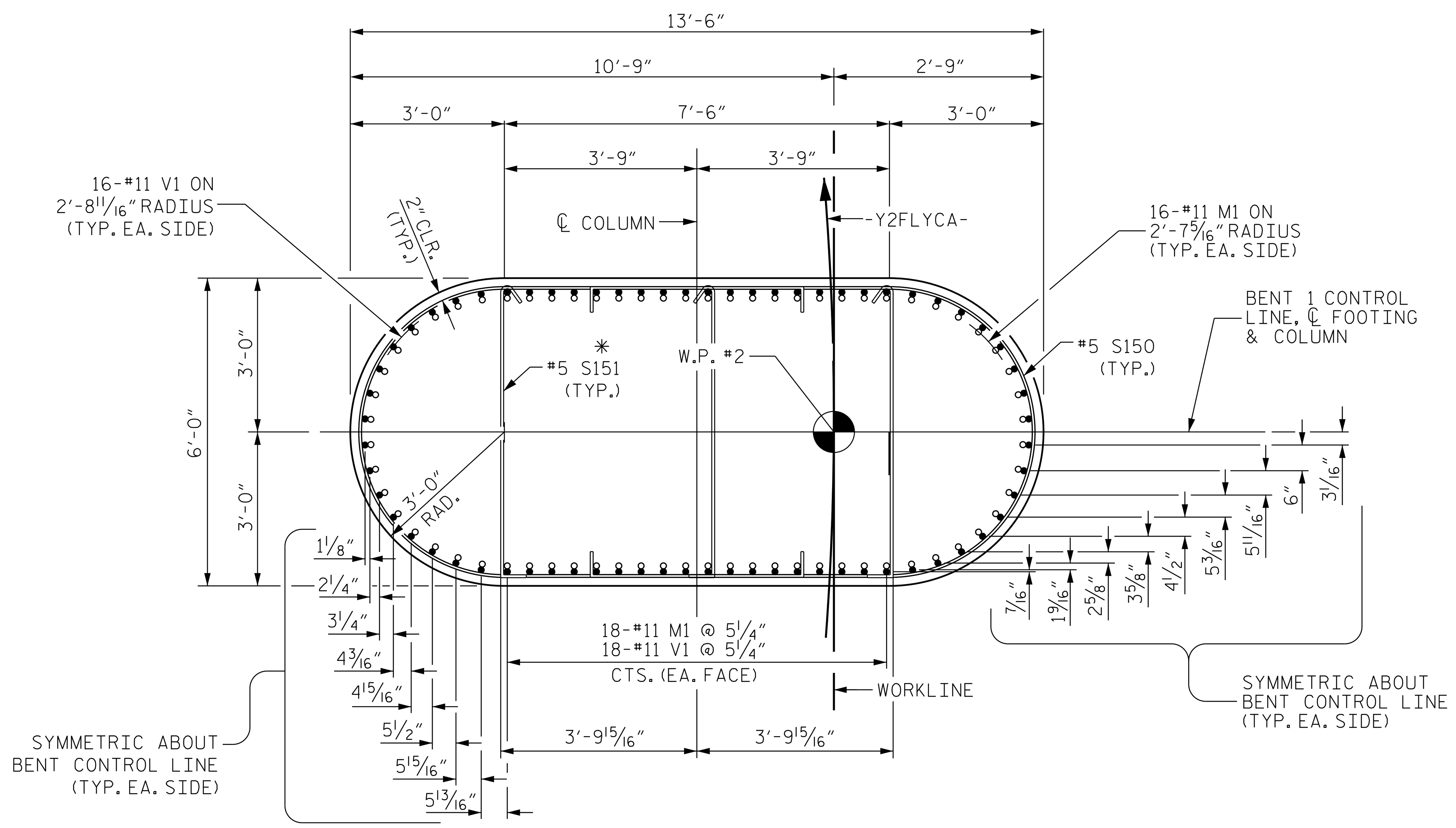
TOTAL SHEETS 92



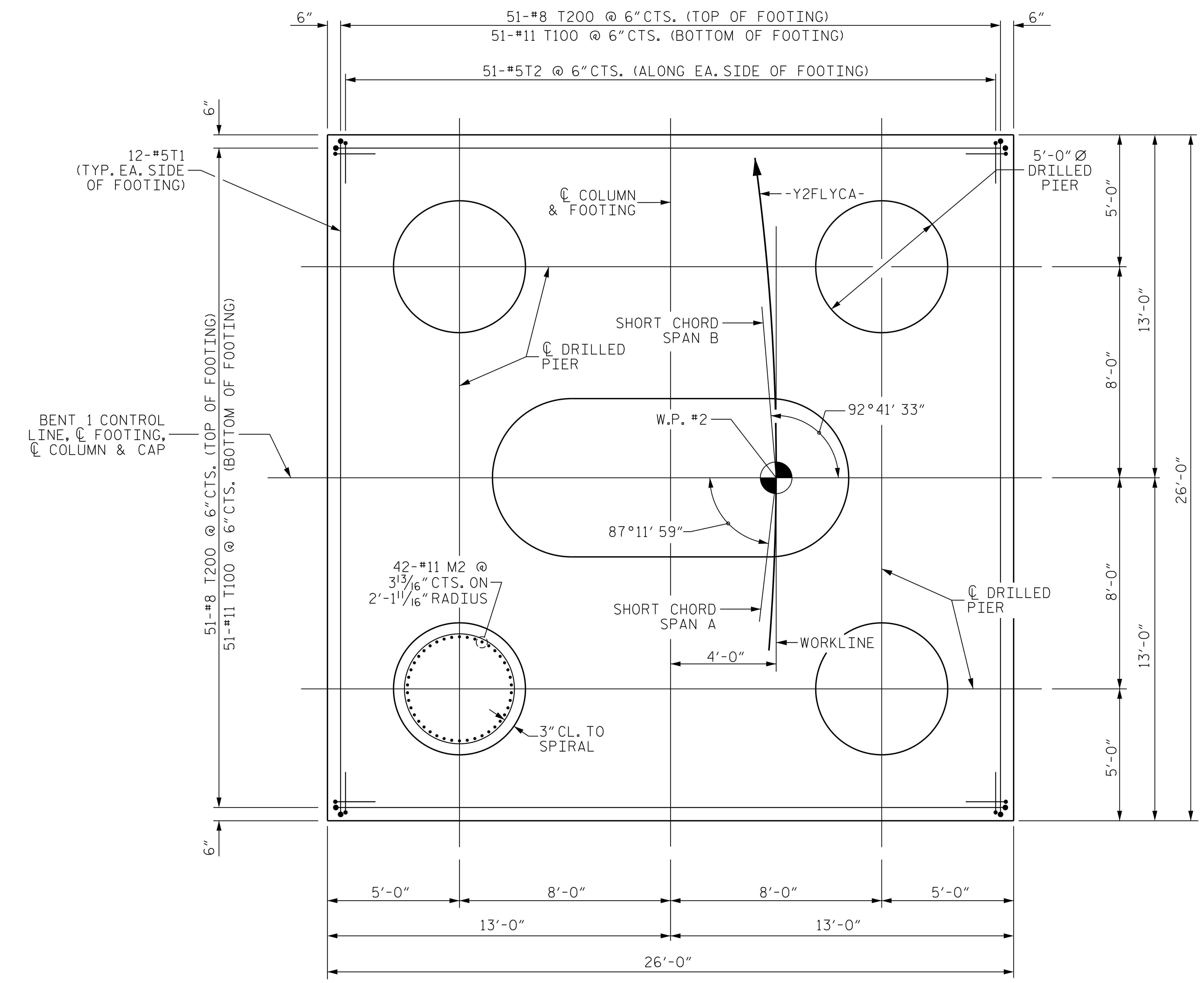
SECTION B-B

○	M1 BAR LOCATION
●	V1 BAR LOCATION

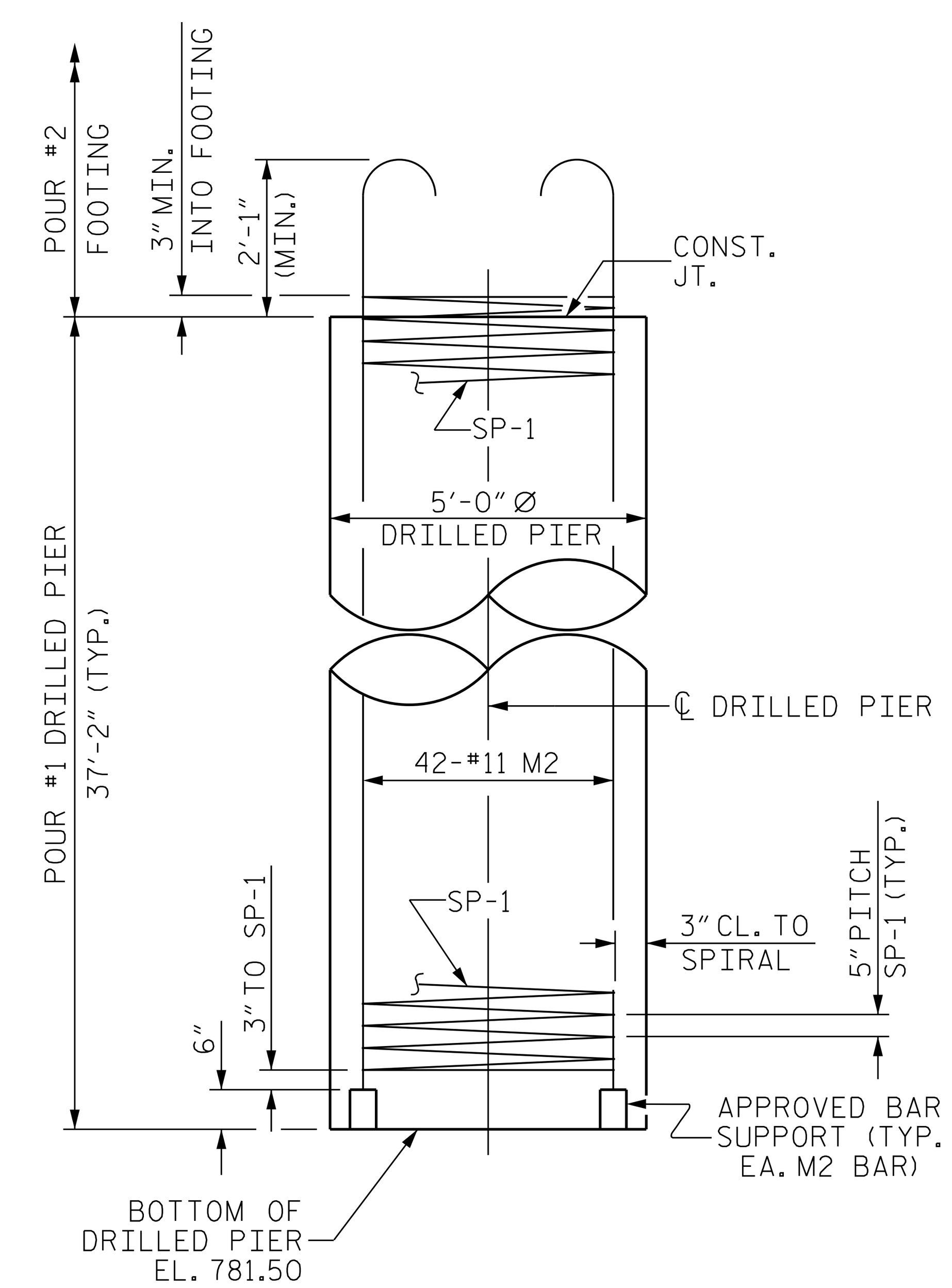
✻ AT EACH LAYER, ALTERNATE THE LOCATION OF THE HOOK END OF THE #5 S151 BARS.



SECTION C-C



PLAN OF FOOTING



DRILLED PIER ELEVATION

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28770 — Docusigned by: [signature] — 7/26/2022

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PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: RTS	DATE: 03/2022

REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

SHEET NO.	S1-69
TOTAL SHEETS	92

wdrutcher
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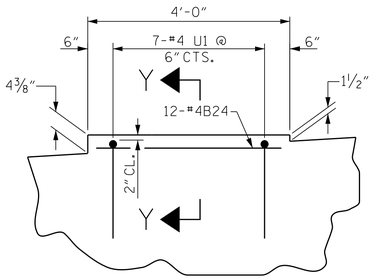
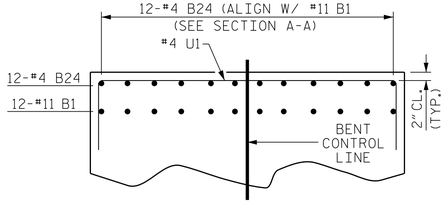
TIME: 10:03 AM on Tuesday, July 26, 2022



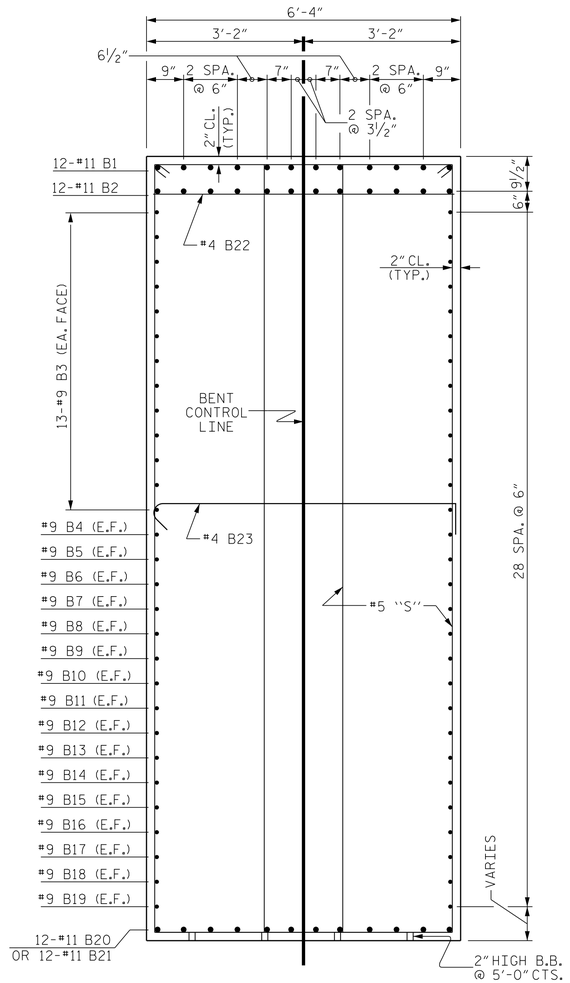
DETAIL ''B''

(TYP. UNDER EA. GIRDER)



SECTION Y-Y

(ANCHOR BOLTS NOT SHOWN)



SECTION A-A

BILL OF MATERIAL

BENT NO. 1

BAR	NO.	SIZE	TYPE	DIM. ''A''	LENGTH	WEIGHT
B1	12	#11	1	---	44'-10"	2858
B2	12	#11	STR	---	41'-8"	2657
B3	26	#9	STR	---	41'-8"	3683
B4	2	#9	STR	---	40'-4"	274
B5	2	#9	STR	---	38'-6"	262
B6	2	#9	STR	---	36'-8"	249
B7	2	#9	STR	---	34'-11"	237
B8	2	#9	STR	---	33'-1"	225
B9	2	#9	STR	---	31'-4"	213
B10	2	#9	STR	---	29'-6"	201
B11	2	#9	STR	---	27'-9"	189
B12	2	#9	STR	---	25'-11"	176
B13	2	#9	STR	---	24'-2"	164
B14	2	#9	STR	---	22'-4"	152
B15	2	#9	STR	---	20'-7"	140
B16	2	#9	STR	---	18'-9"	128
B17	2	#9	STR	---	17'-0"	116
B18	2	#9	STR	---	15'-2"	103
B19	2	#9	STR	---	6'-2"	42
B20	12	#11	2	---	24'-10"	1583
B21	12	#11	2	---	26'-1"	1663
B22	11	#4	STR	---	6'-0"	44
B23	11	#4	7	---	6'-11"	51
B24	60	#4	STR	---	3'-8"	147
M1	68	#11	4	---	17'-11"	6473
M2	168	#11	4	---	43'-4"	38679
S1	2	#5	5	7'-3"	23'-0"	48
S2	2	#5	5	7'-6 1/2"	23'-7"	49
S3	2	#5	5	7'-9 1/2"	24'-1"	50
S4	2	#5	5	8'-0 1/2"	24'-7"	51
S5	2	#5	5	8'-4"	25'-2"	52
S6	2	#5	5	8'-7"	25'-8"	54
S7	2	#5	5	8'-10 1/2"	26'-3"	55
S8	2	#5	5	9'-1 1/2"	26'-9"	56
S9	2	#5	5	9'-4 1/2"	27'-3"	57
S10	2	#5	5	9'-9 1/2"	28'-1"	59
S11	2	#5	5	10'-3"	29'-0"	60
S12	2	#5	5	10'-8 1/2"	29'-11"	62
S13	2	#5	5	11'-1 1/2"	30'-9"	64
S14	2	#5	5	11'-7"	31'-8"	66
S15	2	#5	5	12'-0 1/2"	32'-7"	68
S16	2	#5	5	12'-5 1/2"	33'-5"	70
S17	2	#5	5	12'-8 1/2"	33'-11"	71
S18	2	#5	5	12'-11 1/2"	34'-5"	72
S19	2	#5	5	13'-3"	35'-0"	73
S20	2	#5	5	13'-6"	35'-6"	74
S21	2	#5	5	13'-9 1/2"	36'-1"	75
S22	2	#5	5	14'-0 1/2"	36'-7"	76
S23	2	#5	5	14'-3 1/2"	37'-1"	77
S24	2	#5	5	14'-7"	37'-8"	79
S25	2	#5	5	14'-8"	37'-10"	79
S26	2	#5	5	14'-8 1/2"	37'-11"	79
S27	2	#5	5	14'-8 1/2"	37'-11"	79
S28	2	#5	5	14'-9"	38'-0"	79
S29	2	#5	5	14'-9 1/2"	38'-1"	79
S30	2	#5	5	14'-9 1/2"	38'-1"	79
S31	2	#5	5	14'-10"	38'-2"	80
S32	2	#5	5	14'-10 1/2"	38'-3"	80
S33	2	#5	5	14'-11"	38'-4"	80
S34	2	#5	5	14'-11"	38'-4"	80
S35	2	#5	5	14'-11 1/2"	38'-5"	80
S36	2	#5	5	15'-0"	38'-6"	80
S37	2	#5	5	15'-0"	38'-6"	80
S38	2	#5	5	15'-0 1/2"	38'-7"	80
S39	2	#5	5	15'-1"	38'-8"	81
S40	2	#5	5	15'-1 1/2"	38'-9"	81
S41	2	#5	5	15'-1 1/2"	38'-9"	81
S42	2	#5	5	15'-2"	38'-10"	81
S43	2	#5	5	15'-2 1/2"	38'-11"	81
S44	2	#5	5	15'-2 1/2"	38'-11"	81
S45	2	#5	5	15'-3"	39'-0"	81
S46	2	#5	5	15'-3 1/2"	39'-1"	82
S47	2	#5	5	15'-4"	39'-2"	82
S48	2	#5	5	15'-4"	39'-2"	82
S49	2	#5	5	15'-4 1/2"	39'-3"	82
S50	2	#5	5	15'-5"	39'-4"	82
S51	2	#5	5	15'-5 1/2"	39'-5"	82
S52	2	#5	5	15'-4 1/2"	39'-3"	82
S53	2	#5	5	15'-1"	38'-8"	81
S54	2	#5	5	14'-9 1/2"	38'-1"	79
S55	2	#5	5	14'-6"	37'-6"	78
S56	2	#5	5	14'-2 1/2"	36'-11"	77
S57	2	#5	5	13'-11"	36'-4"	76
S58	2	#5	5	13'-7 1/2"	35'-9"	75
S59	2	#5	5	13'-4"	35'-2"	73
S60	2	#5	5	13'-0 1/2"	34'-7"	72
S61	2	#5	5	12'-6 1/2"	33'-7"	70
S62	2	#5	5	12'-0 1/2"	32'-7"	68
S63	2	#5	5	11'-7"	31'-8"	66
S64	2	#5	5	11'-1"	30'-8"	64
S65	2	#5	5	10'-7"	29'-8"	62
S66	2	#5	5	10'-1"	28'-8"	60
S67	2	#5	5	9'-7"	27'-8"	58
S68	2	#5	5	9'-4"	27'-2"	57
S69	2	#5	5	9'-0 1/2"	26'-7"	55
S70	2	#5	5	8'-9"	26'-0"	54
S71	2	#5	5	8'-5 1/2"	25'-5"	53
S72	2	#5	5	8'-2"	24'-10"	52
S73	2	#5	5	7'-10"	24'-2"	50
S74	2	#5	5	7'-6 1/2"	23'-7"	49
S75	2	#5	5	7'-3"	23'-0"	48
S150	86	#5	6	---	21'-7"	1936
S151	129	#5	7	---	6'-8"	897
T1	48	#5	STR	---	25'-6"	1277
T2	204	#5	3	---	9'-4"	1986
T100	102	#11	1	---	28'-8"	15535
T200	102	#8	1	---	27'-4"	7444
U1	35	#4	3	---	9'-0"	210
U2	12	#4	3	---	8'-10"	71
U3	10	#4	3	---	10'-0"	67
V1	68	#11	STR	---	38'-8"	13970

REINFORCING STEEL	109,352 LBS.

SP-1	4	*	8	---	1300'-5"	5,425

SPIRAL COLUMN REINFORCING STEEL	5,425 LBS.

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

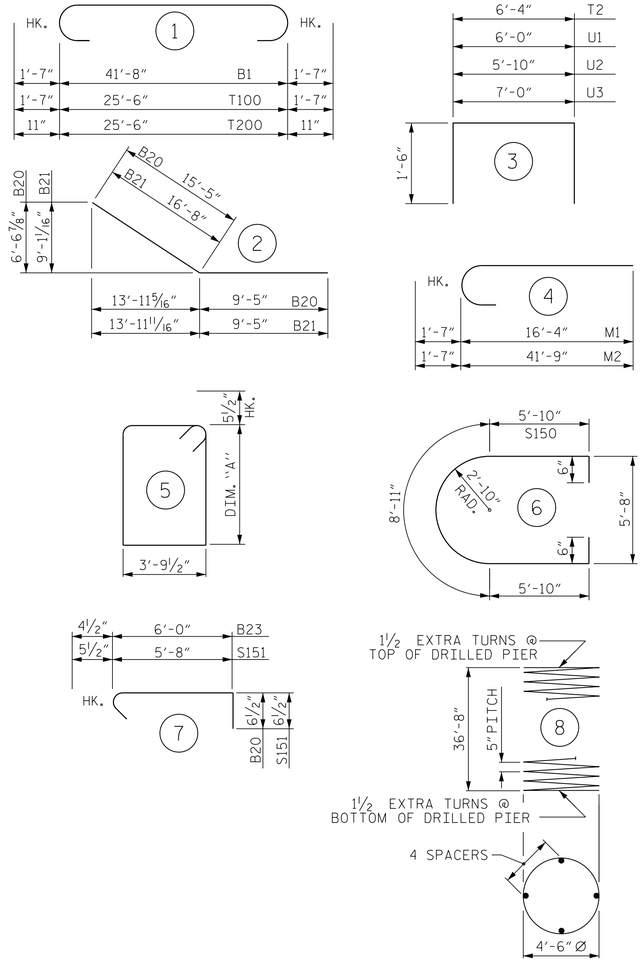
CLASS A CONCRETE BREAKDOWN

POUR #2 (FOOTING)	175.3 C.Y.
POUR #3 (COLUMN)	89.3 C.Y.
POUR #4 (CAP)	126.8 C.Y.
TOTAL CLASS A CONCRETE	391.4 C.Y.

DRILLED PIERS:

DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	108.1 C.Y.
5'-0" Ø DRILLED PIERS NOT IN SOIL	41.00 LIN. FT.
5'-0" Ø DRILLED PIERS IN SOIL	107.67 LIN. FT.
PERMANENT STEEL CASING FOR 5'-0" Ø DRILLED PIER	94.64 LIN. FT.
CSL TUBES	743 LIN. FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Vaughn & Melton
Consulting Engineers
Asheville, North Carolina 828-253-2796
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Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Atlanta, GA 770-627-3590
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-

SHEET 3 OF 3

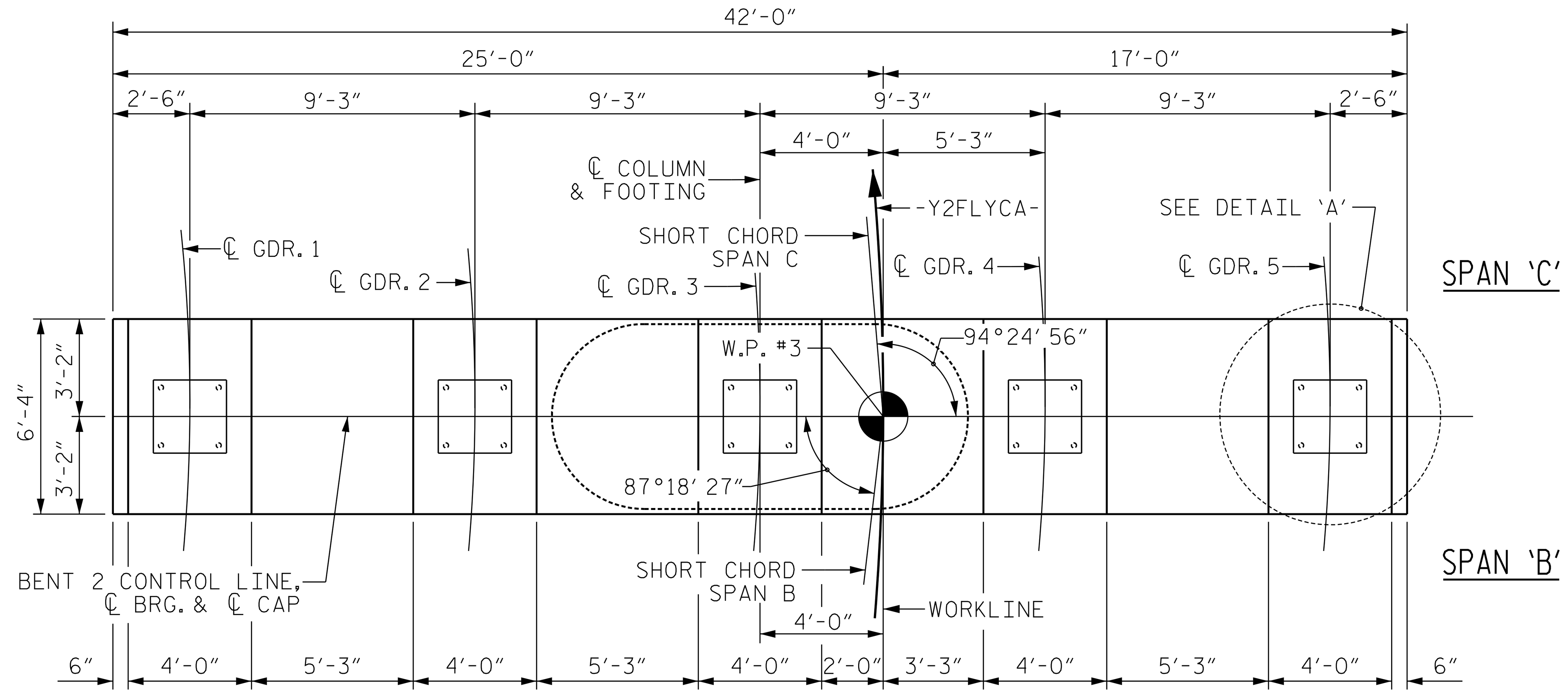
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

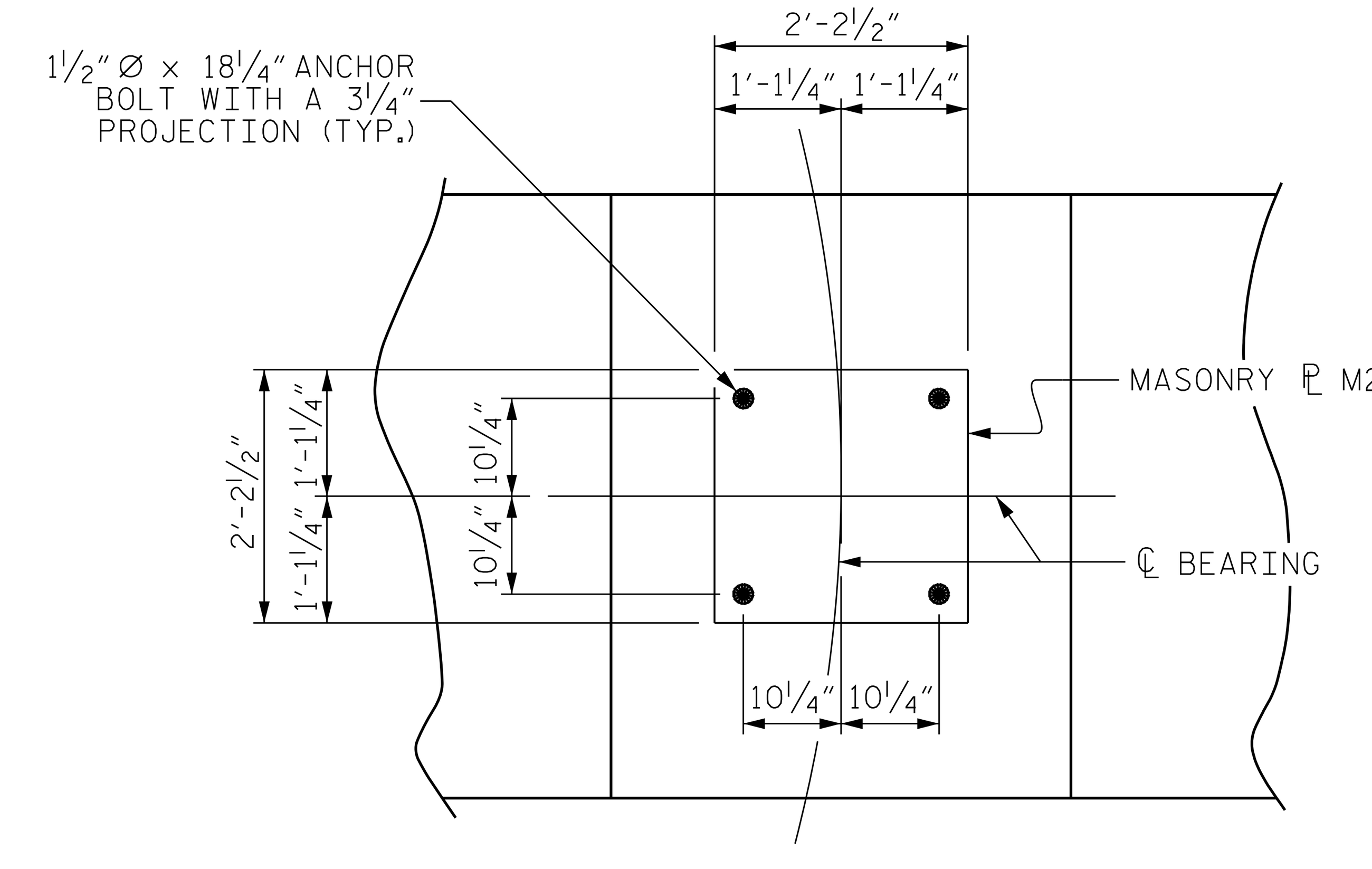
BENT 1

DWN. BY: NCW	DATE: 03/2022	REVISIONS	SHEET NO. S1-70
CHKD. BY: PRG	DATE: 03/2022	NO. BY: DATE: NO. BY: DATE:	TOTAL SHEETS 92
DES. EGR. OF RECORD: RTS	DATE: 03/2022	1 3 2 4	

wdcructor
DGN: V:\MC\Structures\03148-44 U-2579AA STRS\Structures\SITE 1 - FLYCA NorthPlans\FINAL PLANS\40_139_U2579AA_SMU_BT13.DTOdgn
TIME: 6:03:5 AM on Tuesday, July 26, 2022



PLAN OF CAP



DETAIL 'A'

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

HOOKS ON "M" & "T" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

"T" BARS IN FOOTING MAY BE SHIFTED AS NECESSARY TO CLEAR "M" BARS EXTENDING INTO COLUMN.

FOR MASS CONCRETE, SEE SPECIAL PROVISIONS.

FOR FOOTING PLAN, SECTION B-B, SECTION, C-C, SEE SHEET 2 OF 3.

FOR SECTION A-A, DETAIL "B", AND BILL OF MATERIAL, SEE SHEET 3 OF 3.

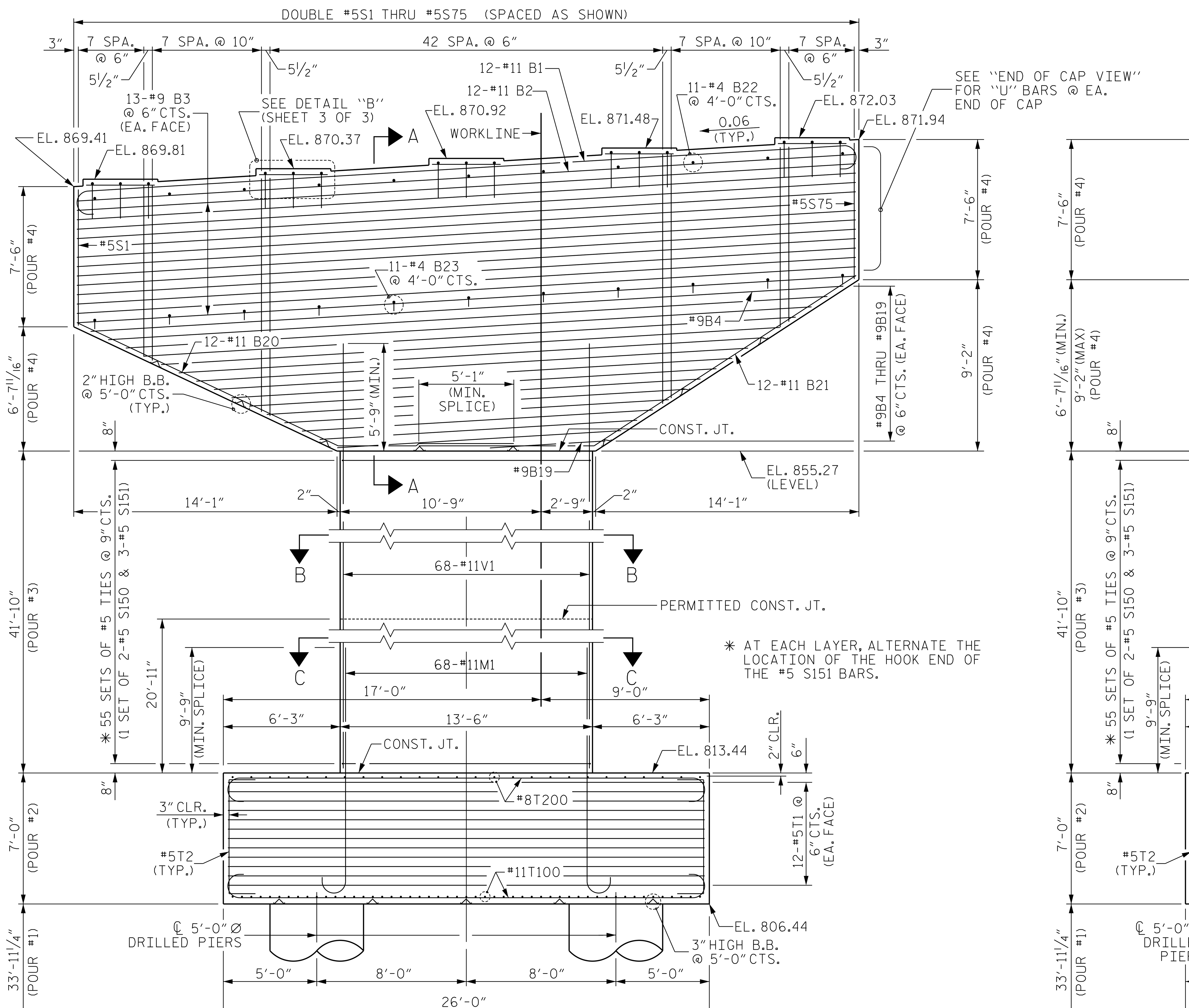
DETAILED DRAWINGS FOR FALSEWORK AND FORMS FOR THIS HAMMERHEAD BENT CAP SHALL BE SUBMITTED, SEE SHEET SN.

FOR DRILLED PIER DETAILS, SEE SHEET 2 OF 3.

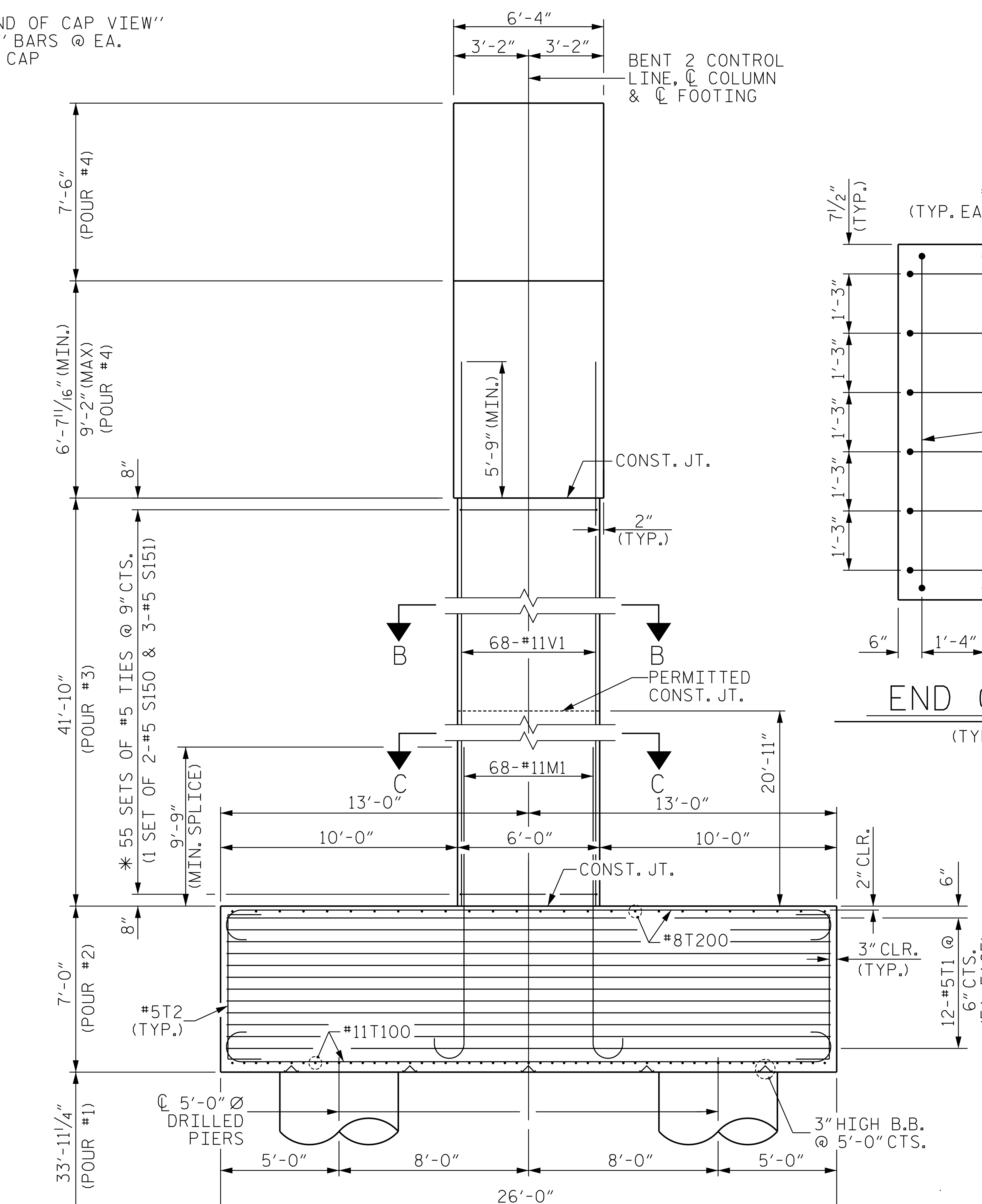
FOR DRILLED PIERS, SEE SECTION 411 OF THE SPECIAL PROVISIONS.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.



ELEVATION



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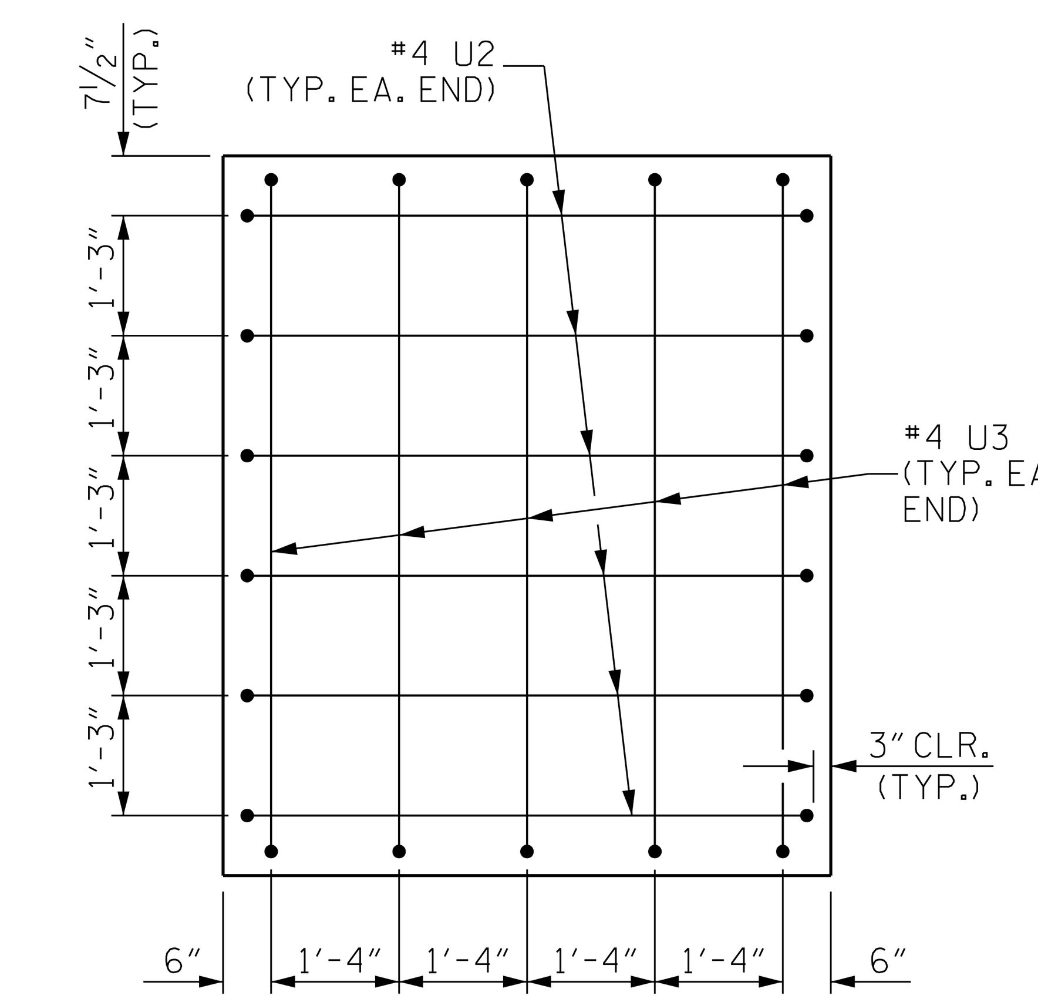


END OF CAP VIEW

(TYPICAL BOTH ENDS)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

7/26/2022

Vaughn & Melton Consulting Engineers — Asheville, North Carolina

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

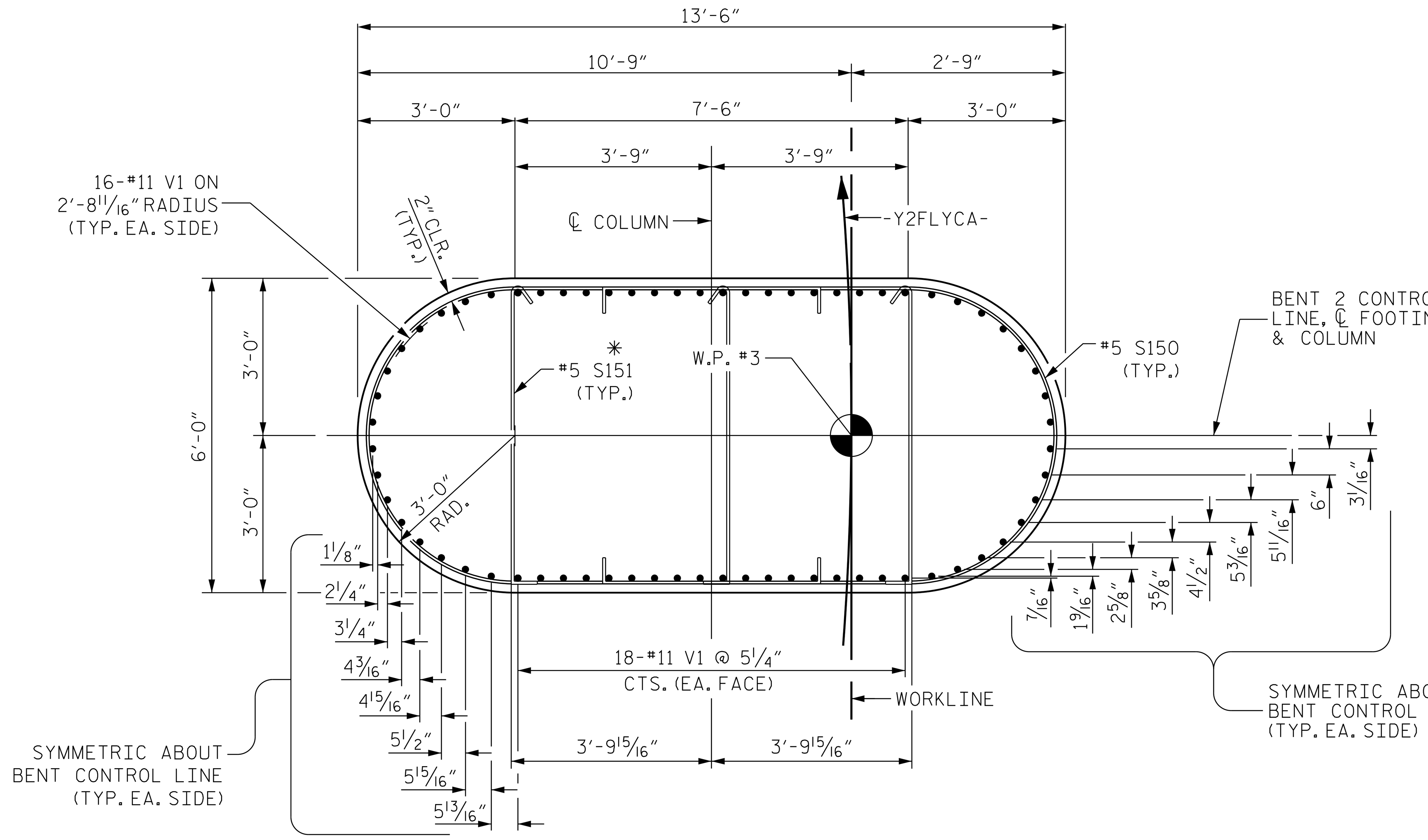
BENT 2

DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: RTS	DATE: 03/2022

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-71

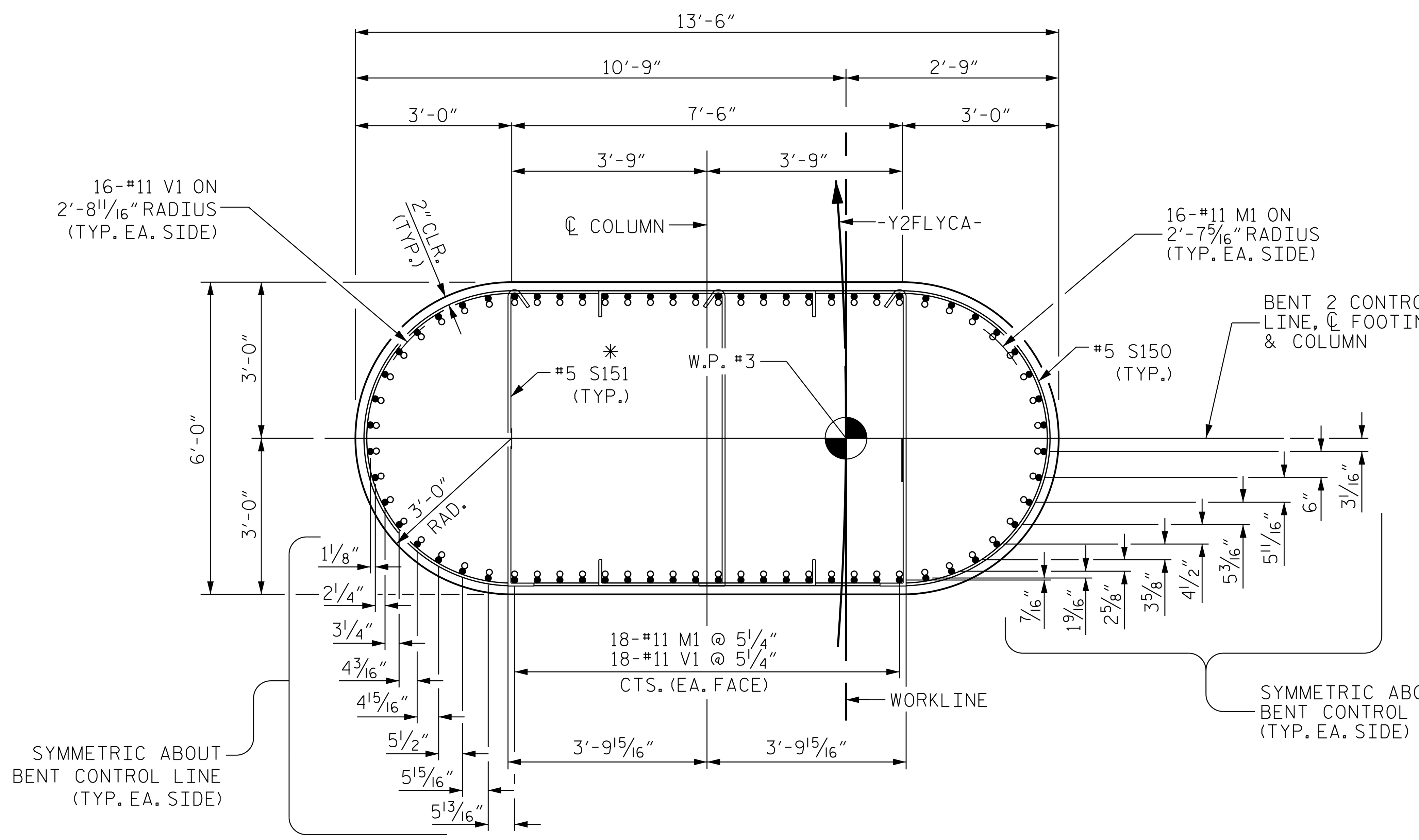
TOTAL SHEETS 92



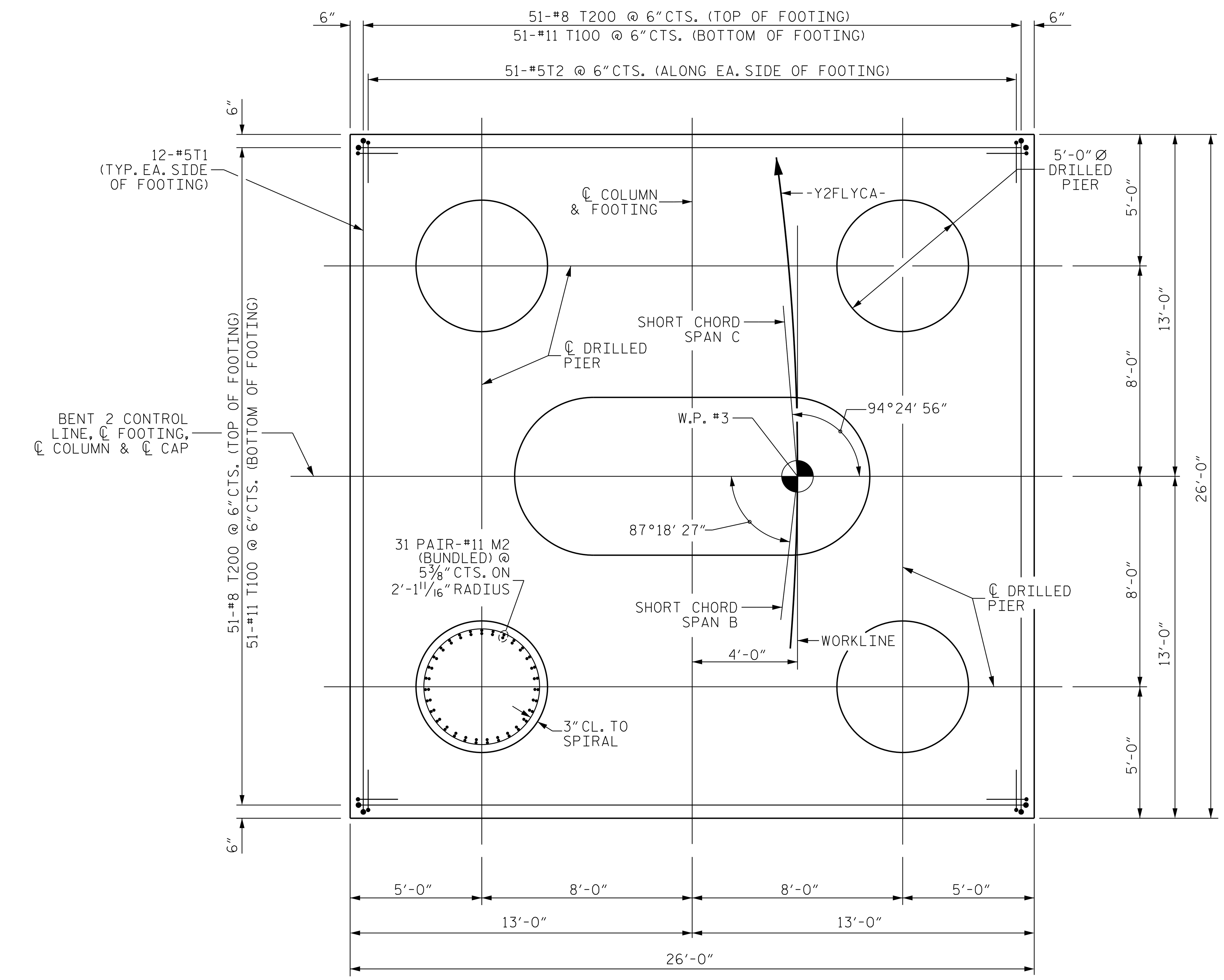
SECTION B-B

○ - M1 BAR LOCATION	
● - V1 BAR LOCATION	

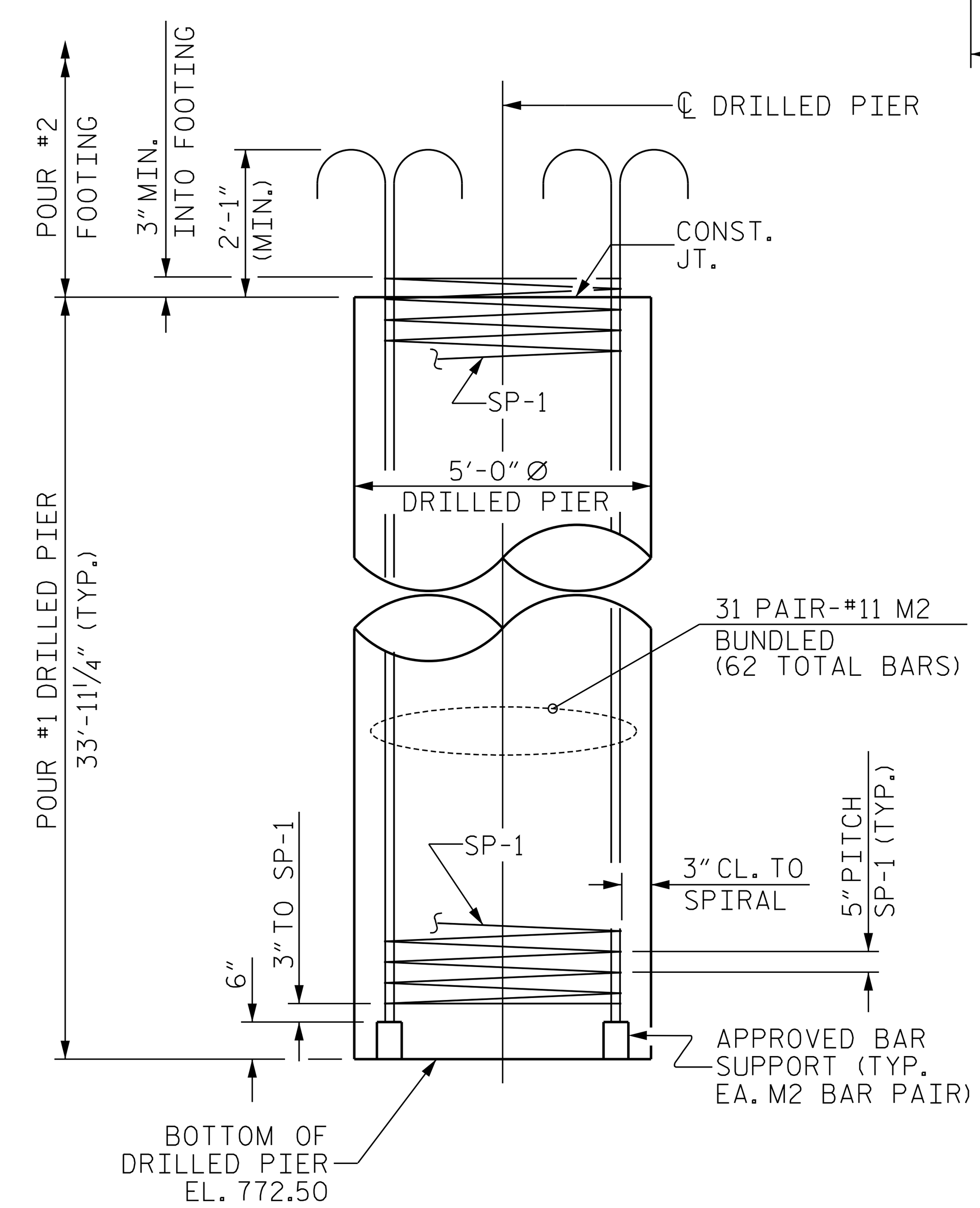
* AT EACH LAYER, ALTERNATE THE LOCATION OF THE HOOK END OF THE #5 S151 BARS.



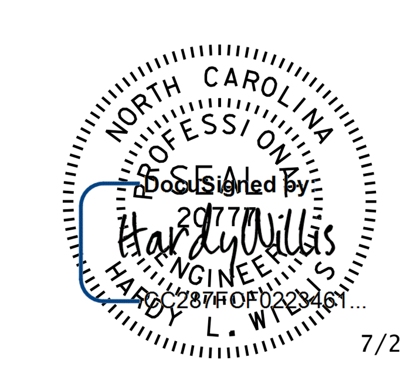
SECTION C-C



PLAN OF FOOTING



DRILLED PIER ELEVATION



7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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Asheville, North Carolina 828-253-2796
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Middlesboro, KY 606-248-6600
Atlanta, GA 770-627-3590
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488

PROJECT NO. U-2579AA
FORSYTH COUNTY
STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

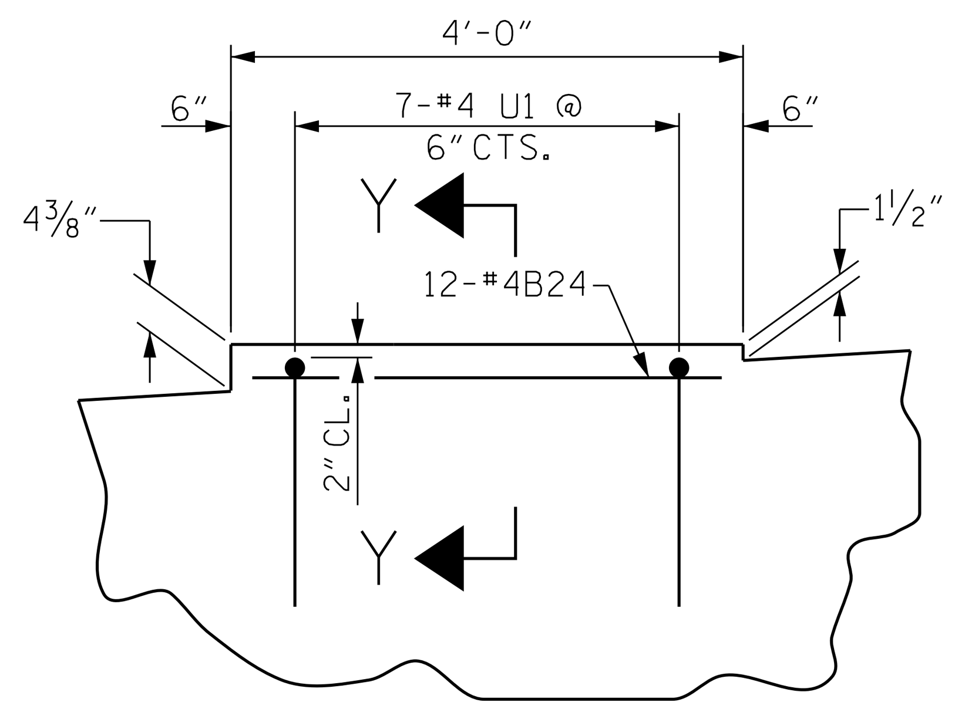
SUBSTRUCTURE

BENT 2

DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: RTS	DATE: 03/2022

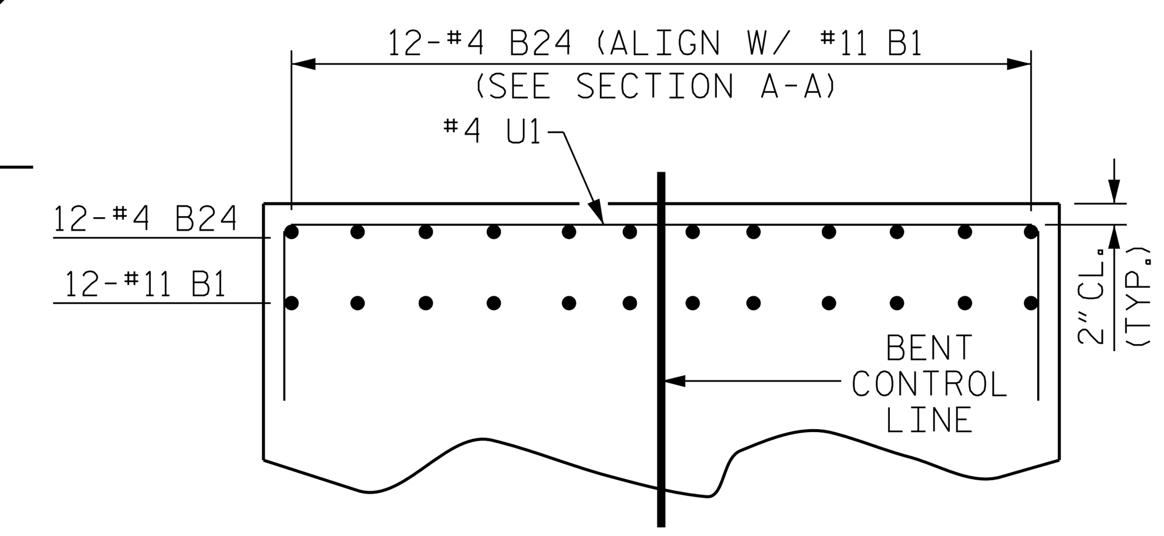
REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:		
1			3				
2			4				

SHEET NO. S1-72
TOTAL SHEETS 92



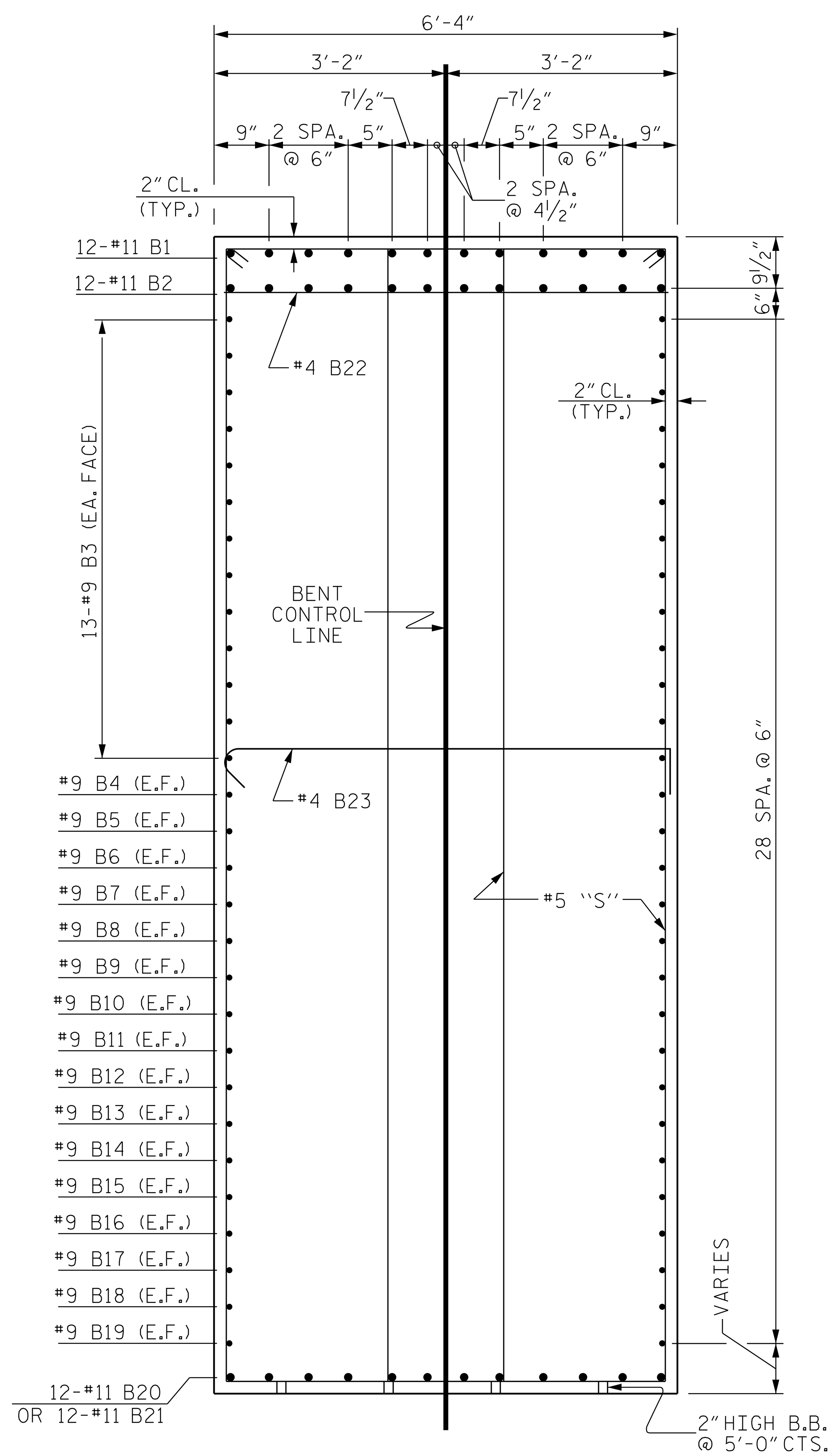
DETAIL "B"

(TYP. UNDER EA. GIRDER)



SECTION Y-Y

(ANCHOR BOLTS NOT SHOWN)



SECTION A-A

BILL OF MATERIAL

BENT NO. 2

BAR	NO.	SIZE	TYPE	DIM. "A"	LENGTH	WEIGHT
B1	12	#11	1	---	44′-10″	2858
B2	12	#11	STR	---	41′-8″	2657
B3	26	#9	STR	---	41′-8″	3683
B4	2	#9	STR	---	40′-4″	274
B5	2	#9	STR	---	38′-6″	262
B6	2	#9	STR	---	36′-8″	249
B7	2	#9	STR	---	34′-11″	237
B8	2	#9	STR	---	33′-1″	225
B9	2	#9	STR	---	31′-4″	213
B10	2	#9	STR	---	29′-6″	201
B11	2	#9	STR	---	27′-9″	189
B12	2	#9	STR	---	25′-11″	176
B13	2	#9	STR	---	24′-2″	164
B14	2	#9	STR	---	22′-4″	152
B15	2	#9	STR	---	20′-7″	140
B16	2	#9	STR	---	18′-9″	128
B17	2	#9	STR	---	17′-0″	116
B18	2	#9	STR	---	15′-2″	103
B19	2	#9	STR	---	6′-2″	42
B20	12	#11	2	---	24′-10″	1583
B21	12	#11	2	---	26′-1″	1663
B22	11	#4	STR	---	6′-0″	44
B23	11	#4	7	---	6′-11″	51
B24	60	#4	STR	---	3′-8″	147
M1	68	#11	4	---	17′-11″	6473
M2	248	#11	4	---	40′-2″	52925
S1	2	#5	5	7′-3″	23′-0″	48
S2	2	#5	5	7′-6½″	23′-7″	49
S3	2	#5	5	7′-9½″	24′-1″	50
S4	2	#5	5	8′-0½″	24′-7″	51
S5	2	#5	5	8′-4″	25′-2″	52
S6	2	#5	5	8′-7″	25′-8″	54
S7	2	#5	5	8′-10½″	26′-3″	55
S8	2	#5	5	9′-1½″	26′-9″	56
S9	2	#5	5	9′-4½″	27′-3″	57
S10	2	#5	5	9′-9½″	28′-1″	59
S11	2	#5	5	10′-3″	29′-0″	60
S12	2	#5	5	10′-8½″	29′-11″	62
S13	2	#5	5	11′-1½″	30′-9″	63
S14	2	#5	5	11′-7″	31′-8″	66
S15	2	#5	5	12′-0½″	32′-7″	68
S16	2	#5	5	12′-5½″	33′-5″	70
S17	2	#5	5	12′-8½″	33′-11″	71
S18	2	#5	5	12′-11½″	34′-5″	72
S19	2	#5	5	13′-3″	35′-0″	73
S20	2	#5	5	13′-6″	35′-6″	74
S21	2	#5	5	13′-9½″	36′-1″	75
S22	2	#5	5	14′-0½″	36′-7″	76
S23	2	#5	5	14′-3½″	37′-1″	77
S24	2	#5	5	14′-7″	37′-8″	79
S25	2	#5	5	14′-8″	37′-10″	79
S26	2	#5	5	14′-8½″	37′-11″	79
S27	2	#5	5	14′-8½″	37′-11″	79
S28	2	#5	5	14′-9″	38′-0″	79
S29	2	#5	5	14′-9½″	38′-1″	79
S30	2	#5	5	14′-9½″	38′-1″	79
S31	2	#5	5	14′-10″	38′-2″	80
S32	2	#5	5	14′-10½″	38′-3″	80
S33	2	#5	5	14′-11″	38′-4″	80
S34	2	#5	5	14′-11″	38′-4″	80
S35	2	#5	5	14′-11½″	38′-5″	80
S36	2	#5	5	15′-0″	38′-6″	80
S37	2	#5	5	15′-0″	38′-6″	80
S38	2	#5	5	15′-0½″	38′-7″	80
S39	2	#5	5	15′-1″	38′-8″	81
S40	2	#5	5	15′-1½″	38′-9″	81
S41	2	#5	5	15′-1½″	38′-9″	81
S42	2	#5	5	15′-2″	38′-10″	81
S43	2	#5	5	15′-2½″	38′-11″	81
S44	2	#5	5	15′-2½″	38′-11″	81
S45	2	#5	5	15′-3″	39′-0″	81
S46	2	#5	5	15′-3½″	39′-1″	82
S47	2	#5	5	15′-4″	39′-2″	82
S48	2	#5	5	15′-4″	39′-2″	82
S49	2	#5	5	15′-4½″	39′-3″	82
S50	2	#5	5	15′-5″	39′-4″	82
S51	2	#5	5	15′-5½″	39′-5″	82

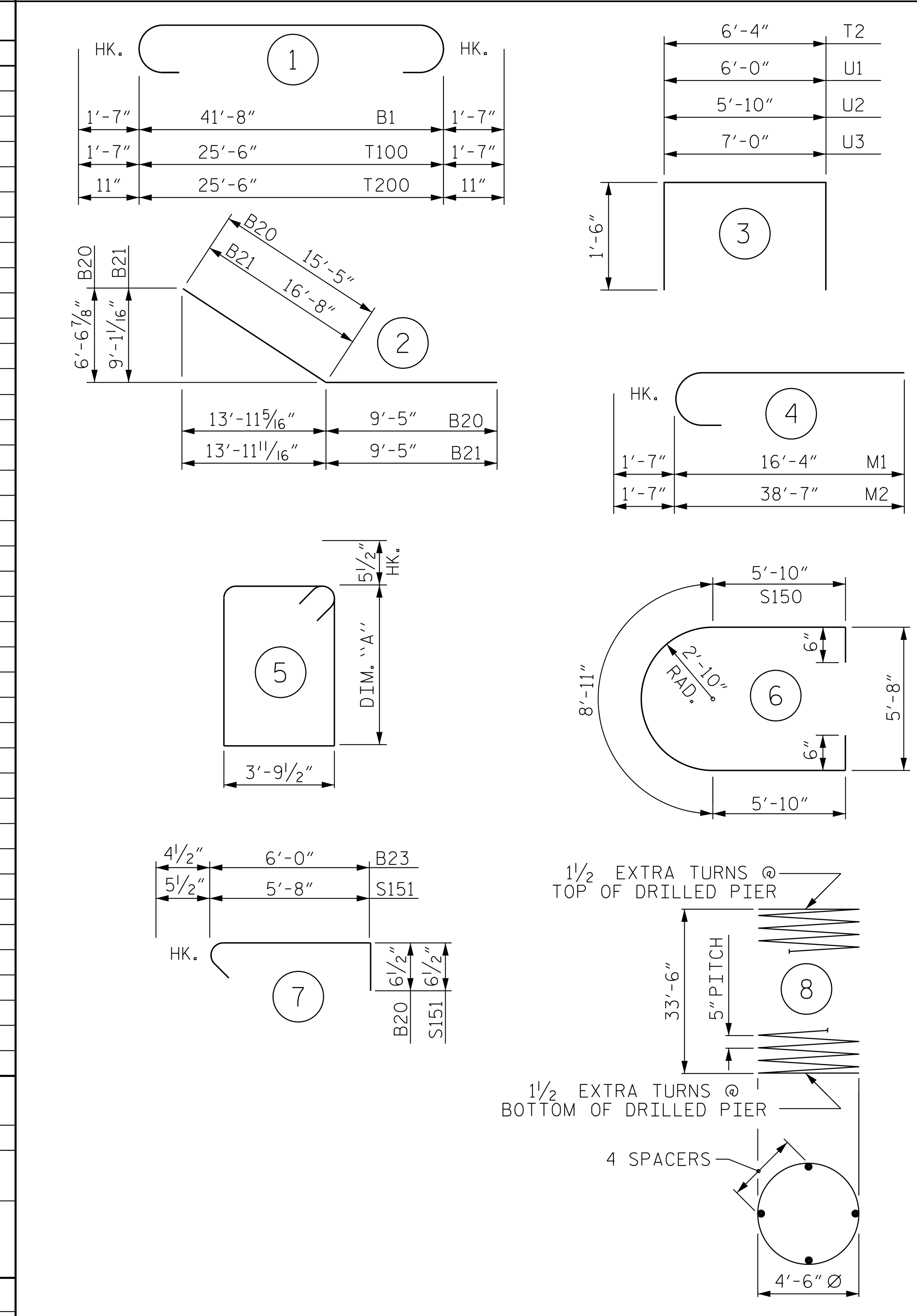
BAR	NO.	SIZE	TYPE	DIM. "A"	LENGTH	WEIGHT
S52	2	#5	5	15′-4½″	39′-3″	82
S53	2	#5	5	15′-1″	38′-8″	81
S54	2	#5	5	14′-9½″	38′-1″	79
S55	2	#5	5	14′-6″	37′-6″	78
S56	2	#5	5	14′-2½″	36′-11″	77
S57	2	#5	5	13′-11″	36′-4″	76
S58	2	#5	5	13′-7½″	35′-9″	75
S59	2	#5	5	13′-4″	35′-2″	73
S60	2	#5	5	13′-0½″	34′-7″	72
S61	2	#5	5	12′-6½″	33′-7″	70
S62	2	#5	5	12′-1½″	32′-7″	68
S63	2	#5	5	11′-7″	31′-8″	66
S64	2	#5	5	11′-1″	30′-8″	64
S65	2	#5	5	10′-7″	29′-8″	62
S66	2	#5	5	10′-1″	28′-8″	60
S67	2	#5	5	9′-7″	27′-8″	58
S68	2	#5	5	9′-4″	27′-2″	57
S69	2	#5	5	9′-0½″	26′-7″	55
S70	2	#5	5	8′-9″	26′-0″	54
S71	2	#5	5	8′-5½″	25′-5″	53
S72	2	#5	5	8′-2″	24′-10″	52
S73	2	#5	5	7′-10″	24′-2″	50
S74	2	#5	5	7′-6½″	23′-7″	49
S75	2	#5	5	7′-3″	23′-0″	48
S150	110	#5	6	---	21′-7″	2476
S151	165	#5	7	---	6′-8″	1147
T1	48	#5	STR	---	25′-6″	1277
T2	204	#5	3	---	9′-4″	1986
T100	102	#11	1	---	28′-8″	15535
T200	102	#8	1	---	27′-4″	7444
U1	35	#4	3	---	9′-0″	210
U2	12	#4	3	---	8′-10″	71
U3	10	#4	3	---	10′-0″	67
V1	68	#11	STR	---	47′-7″	17191
REINFORCING STEEL						127,604 LBS.
SP-1	4	*	8	---	1188′-1″	4,957
SPIRAL COLUMN REINFORCING STEEL						4,957 LBS.

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN	
POUR #2 (FOOTING)	175.3 C.Y.
POUR #3 (COLUMN)	113.5 C.Y.
POUR #4 (CAP)	126.8 C.Y.
TOTAL CLASS A CONCRETE	415.6 C.Y.
FOUNDATION EXCAVATION	LUMP SUM

DRILLED PIERS:	
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	98.7 C.Y.
5′-0″Ø DRILLED PIERS NOT IN SOIL	41.00 LIN. FT.
5′-0″Ø DRILLED PIERS IN SOIL	94.75 LIN. FT.
PERMANENT STEEL CASING FOR 5′-0″Ø DRILLED PIER	61.76 LIN. FT.
CSL TUBES	679 LIN. FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20771
DocuSigned by: Hardy Willis
7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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Vaughn & Melton
Consulting Engineers
Asheville, North Carolina 828-253-2796
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Atlanta, GA 770-627-3590
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 2

DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: RTS	DATE: 03/2022

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-73

TOTAL SHEETS 92

wdtrocher
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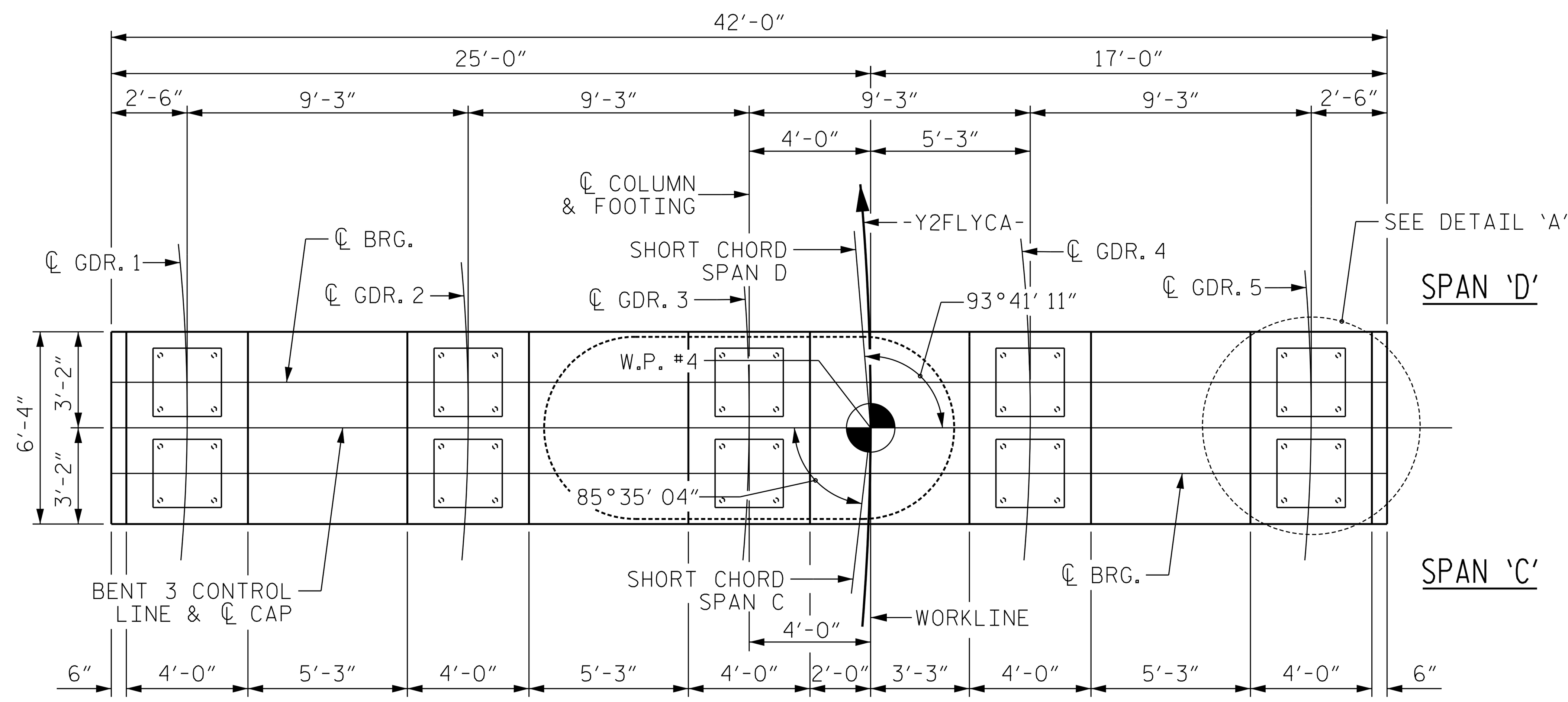
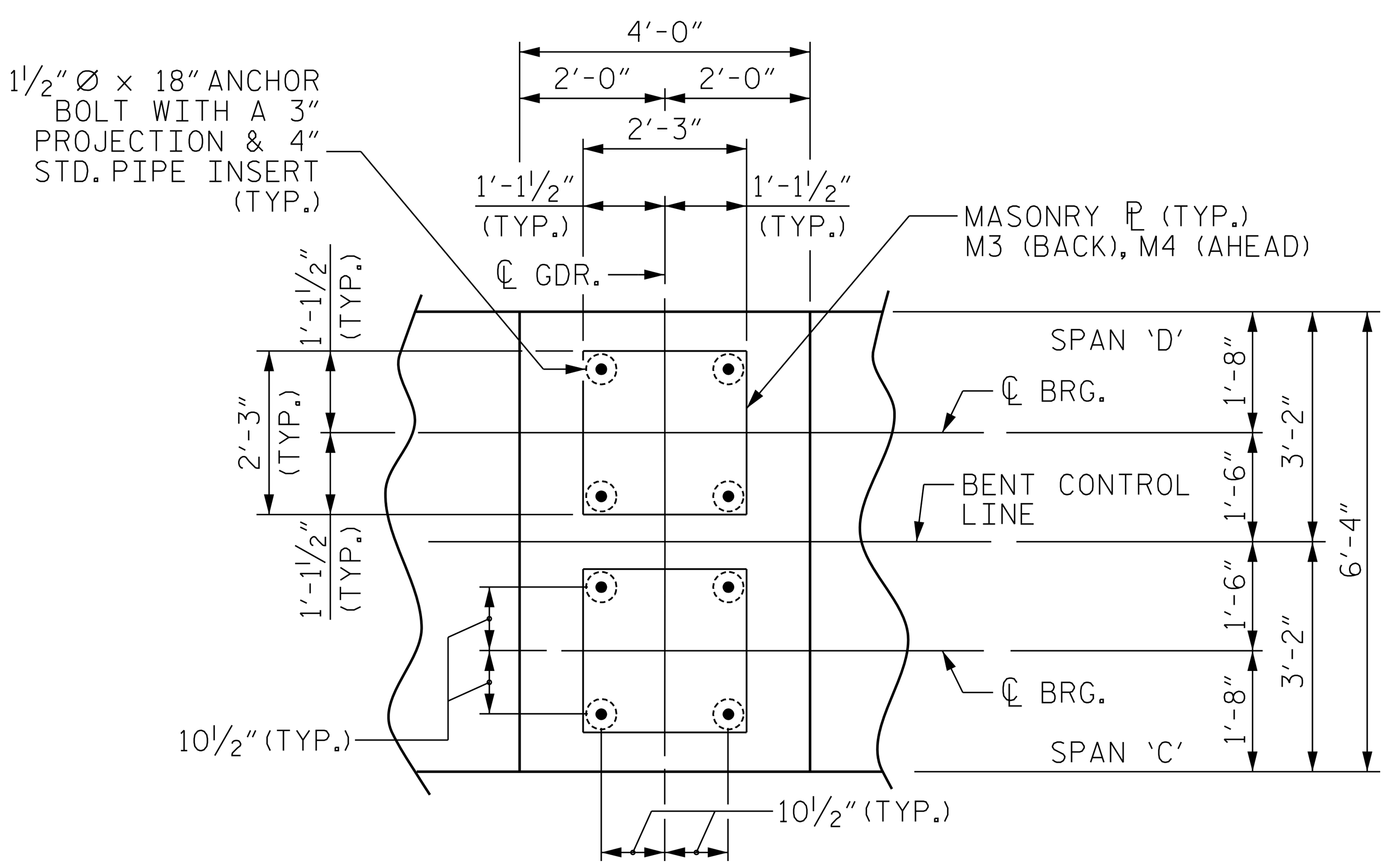
TIME: 10:03 AM on Tuesday, July 26, 2022



PLAN OF CAP



DETAIL 'A'

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

HOOKS ON "M" & "T" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

"T" BARS IN FOOTING MAY BE SHIFTED AS NECESSARY TO CLEAR M1 BARS EXTENDING INTO COLUMN.

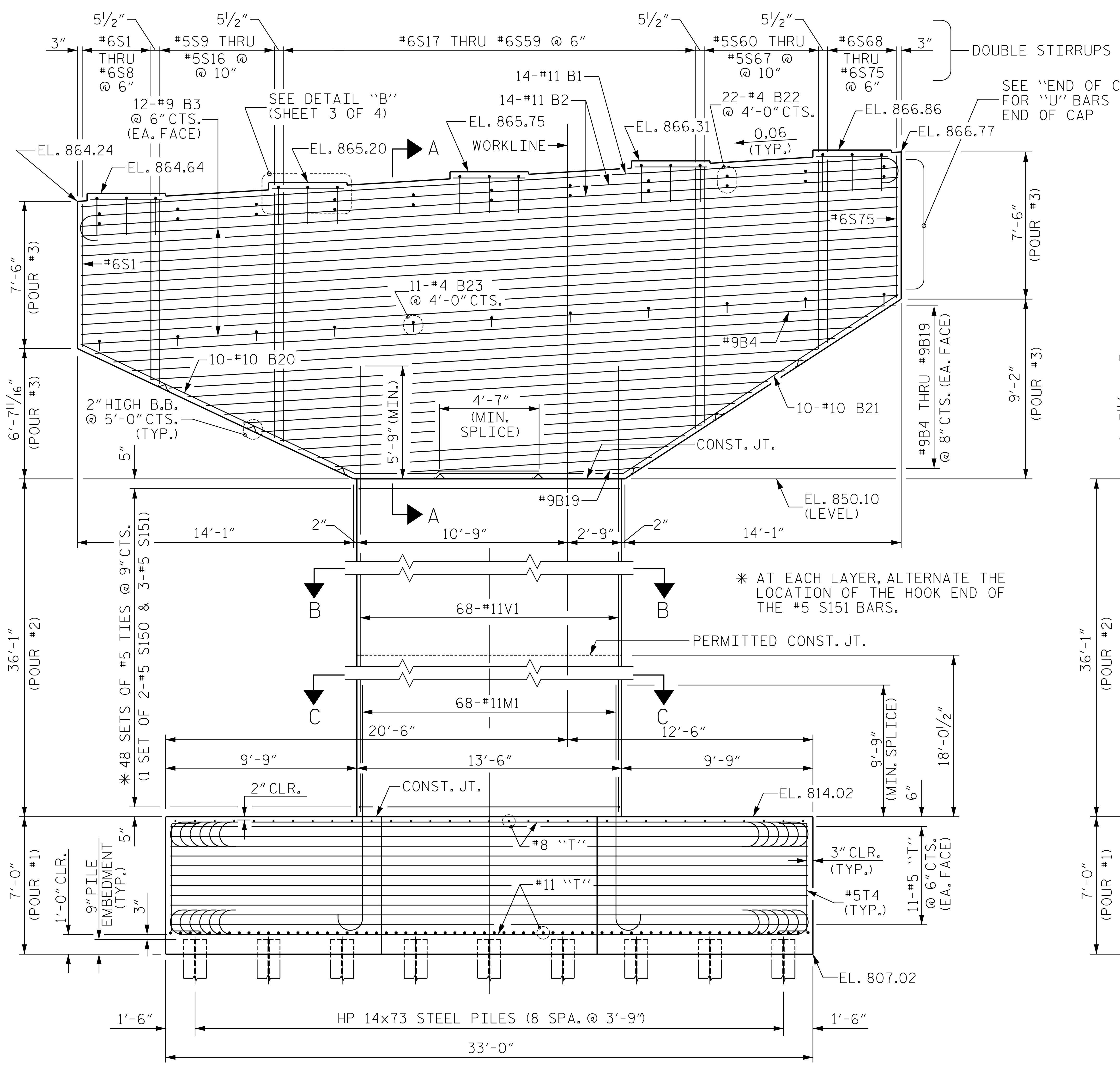
FOR MASS CONCRETE, SEE SPECIAL PROVISIONS.

FOR FOOTING PLAN, SECTION B-B, SECTION, C-C, AND PILE UPLIFT ANCHOR DETAILS, SEE SHEET 2 OF 4.

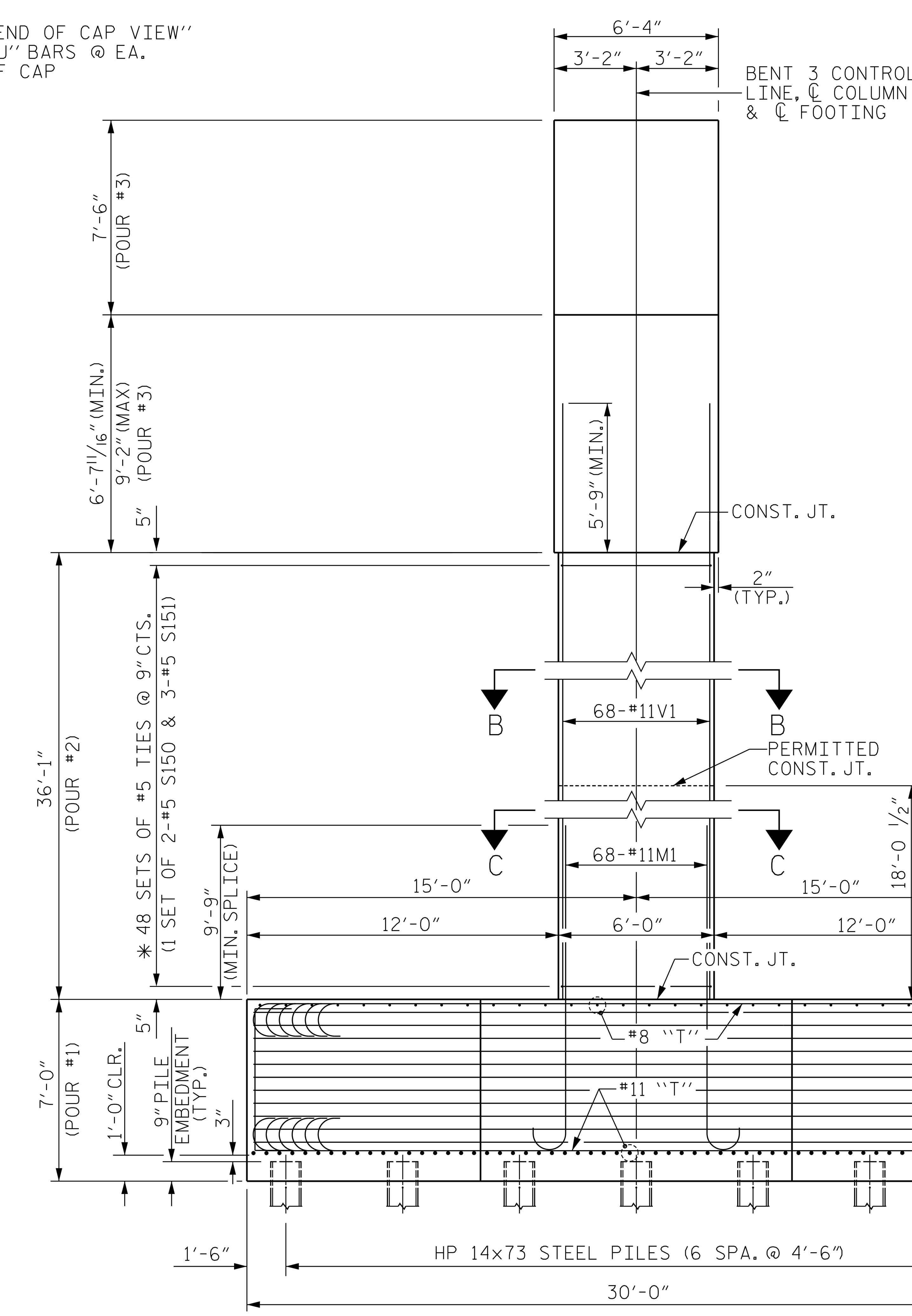
FOR SECTION A-A, DETAIL "B", SEE SHEET 3 OF 4.

DETAILED DRAWINGS FOR FALSEWORK AND FORMS FOR THIS HAMMERHEAD BENT CAP SHALL BE SUBMITTED, SEE SHEET SN.

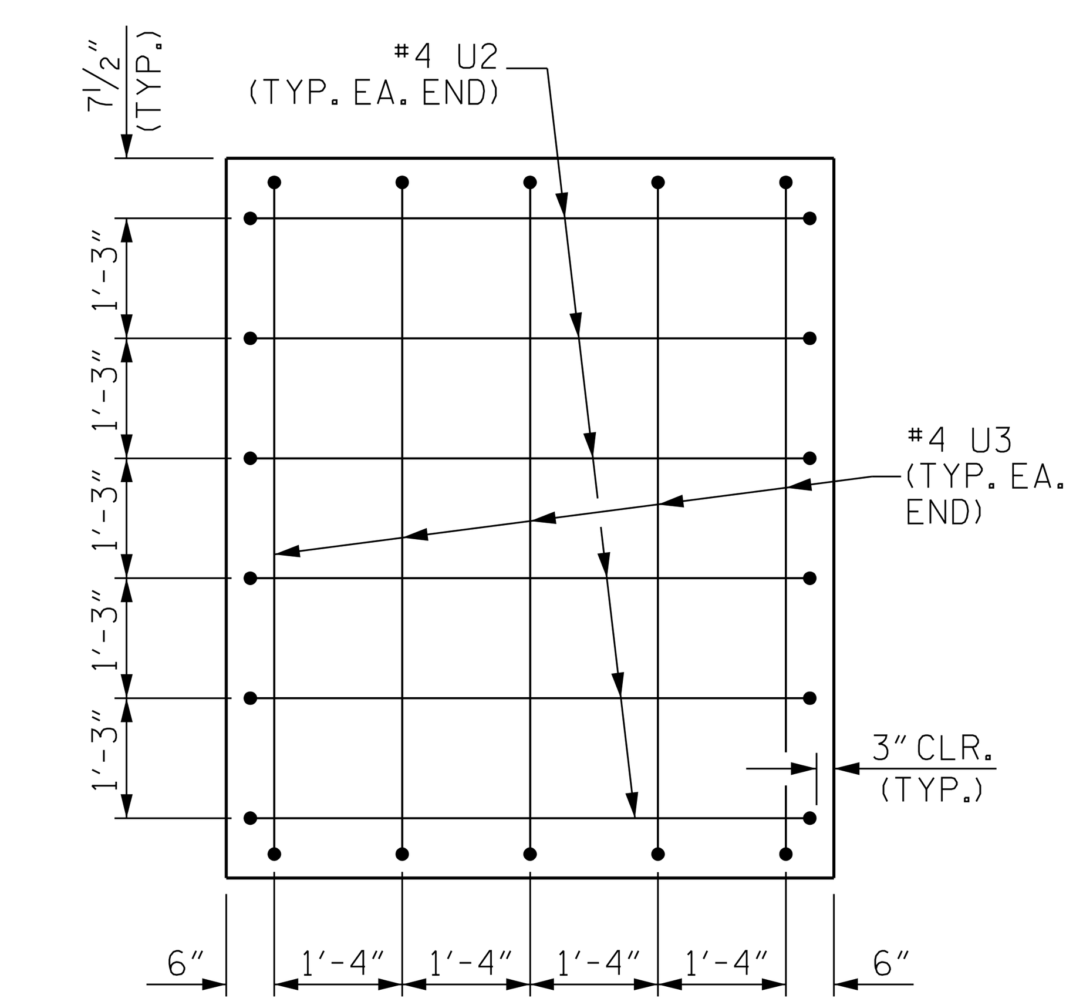
FOR PIPE INSERT DETAILS, SEE "DISC BEARING DETAILS" SHEET.



ELEVATION



END ELEVATION



END OF CAP VIEW

(TYPICAL BOTH ENDS)

Hardy Willis 7/26/2022

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Vaughn & Melton Consulting Engineers — Asheville, North Carolina 828-253-2796

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 3

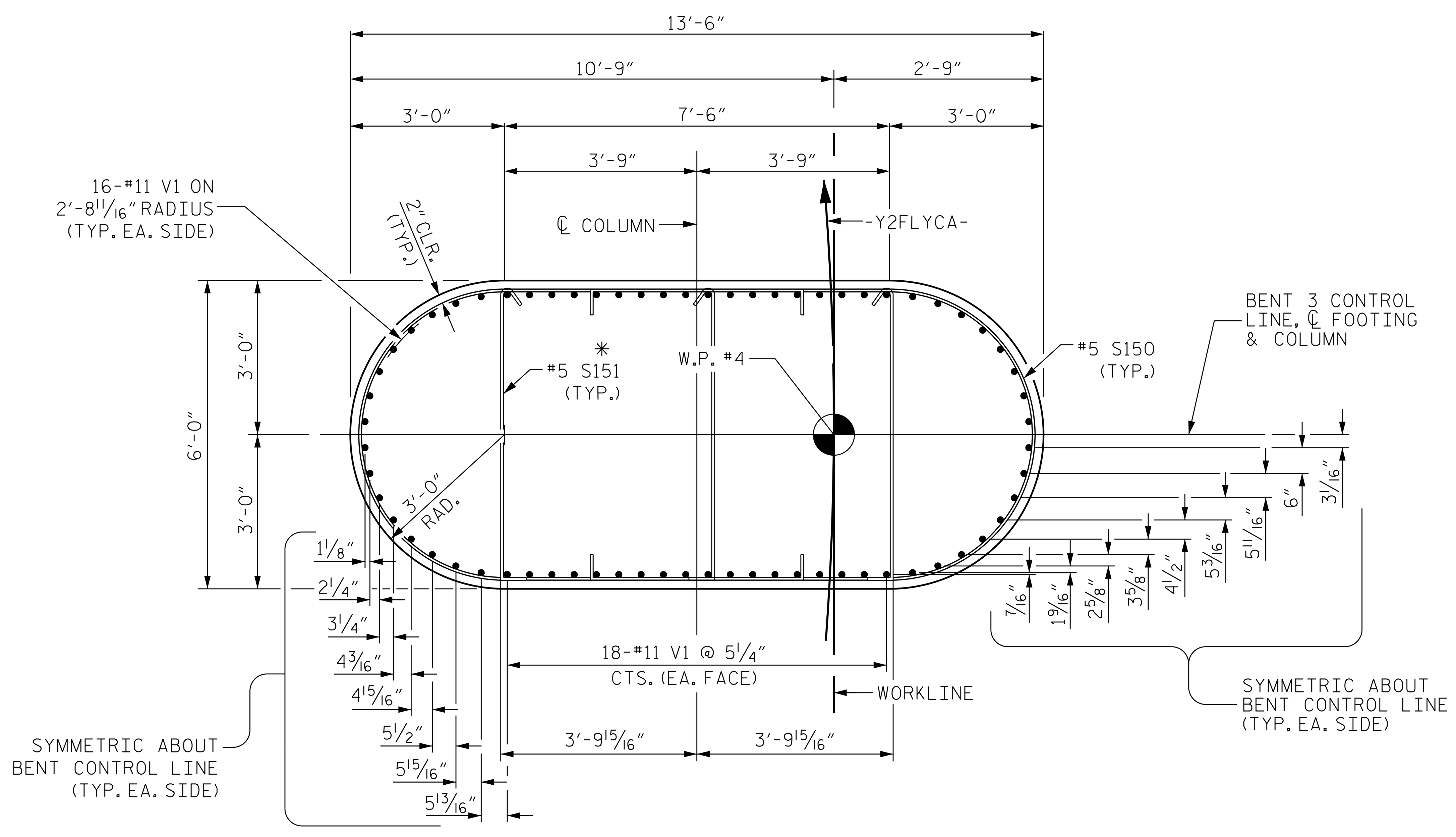
DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: RTS	DATE: 03/2022

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-74

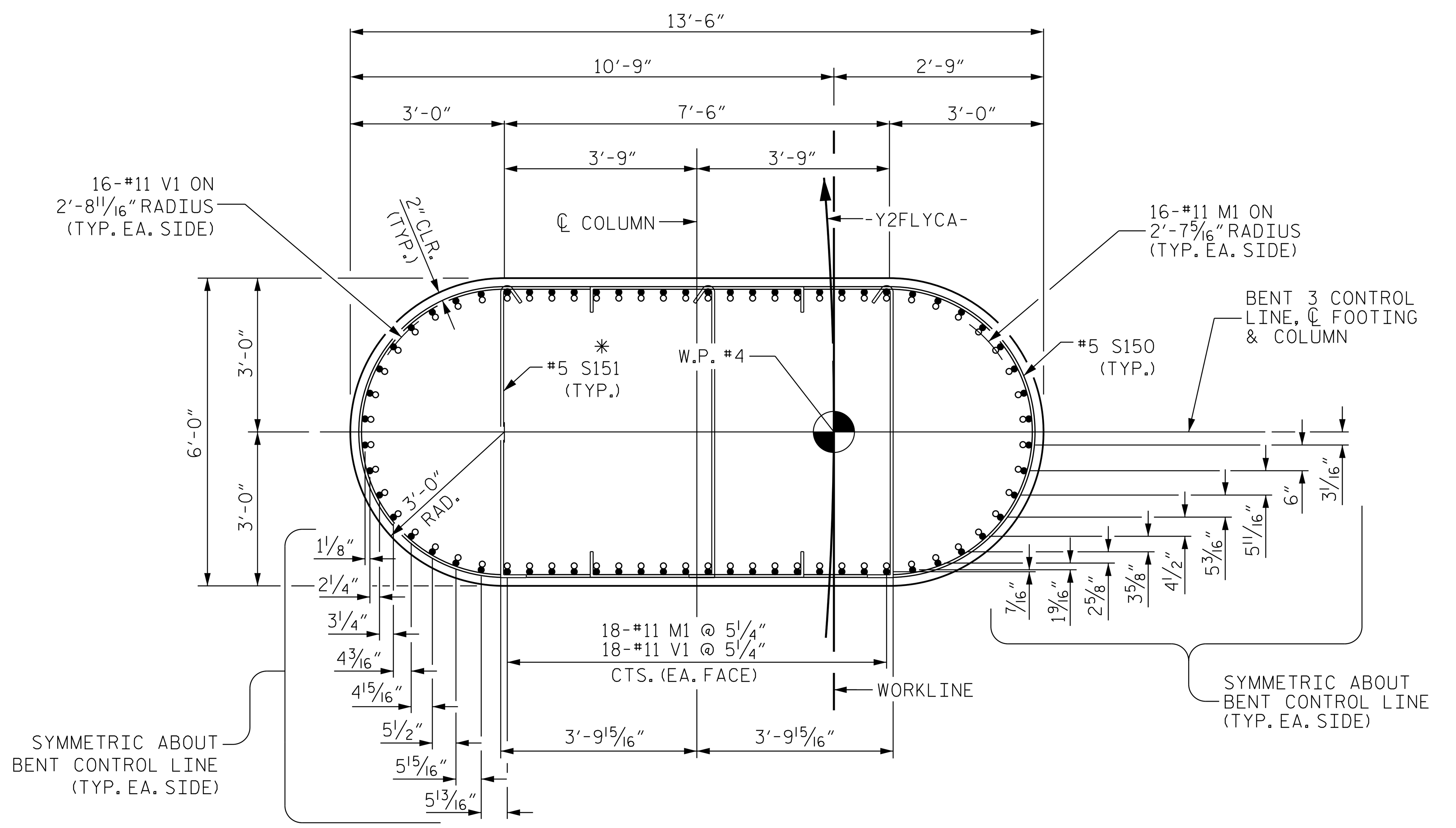
TOTAL SHEETS 92



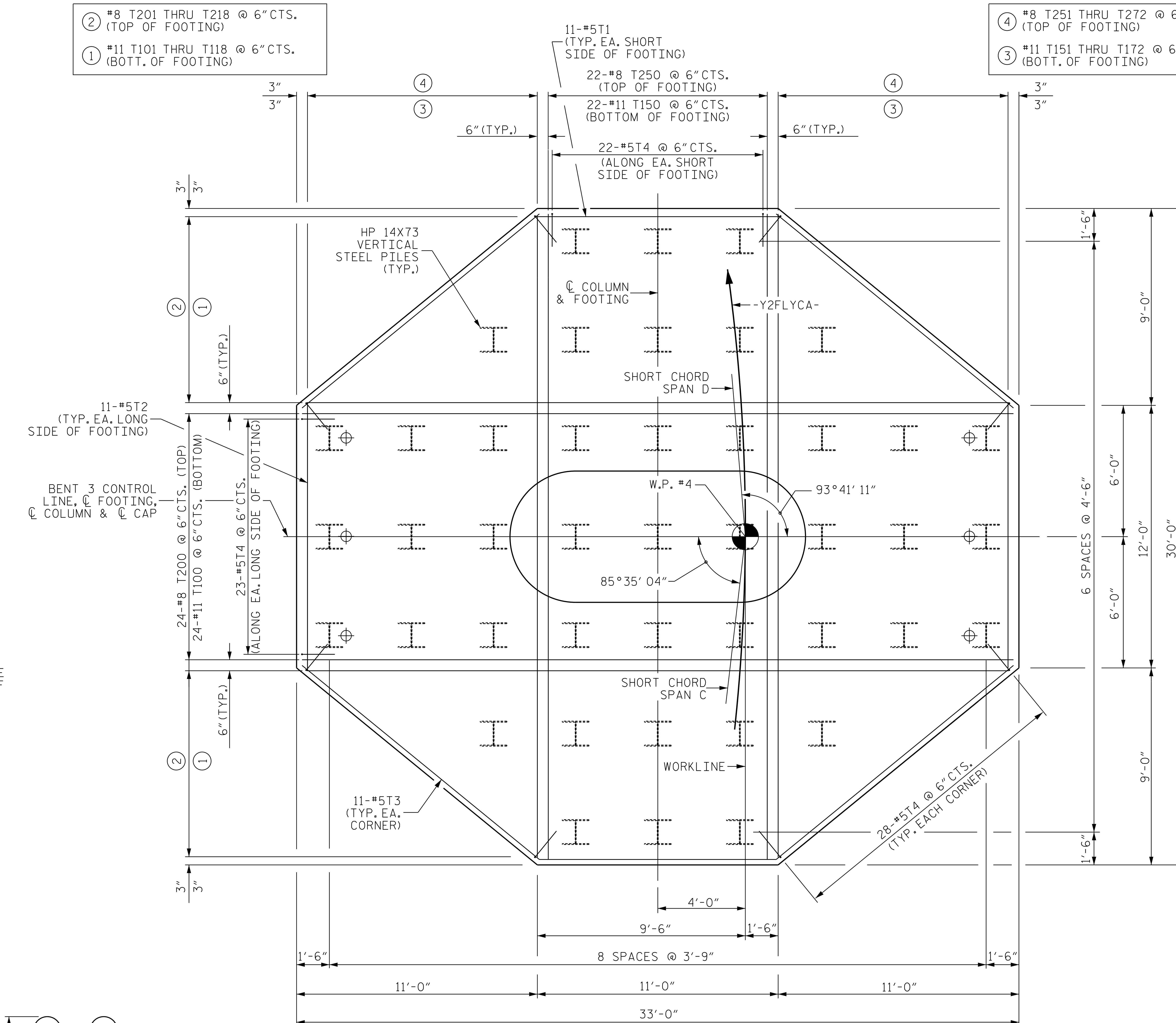
SECTION B-B

○ - M1 BAR LOCATION
● - V1 BAR LOCATION

* AT EACH LAYER, ALTERNATE THE LOCATION OF THE HOOK END OF THE #5 S151 BARS.

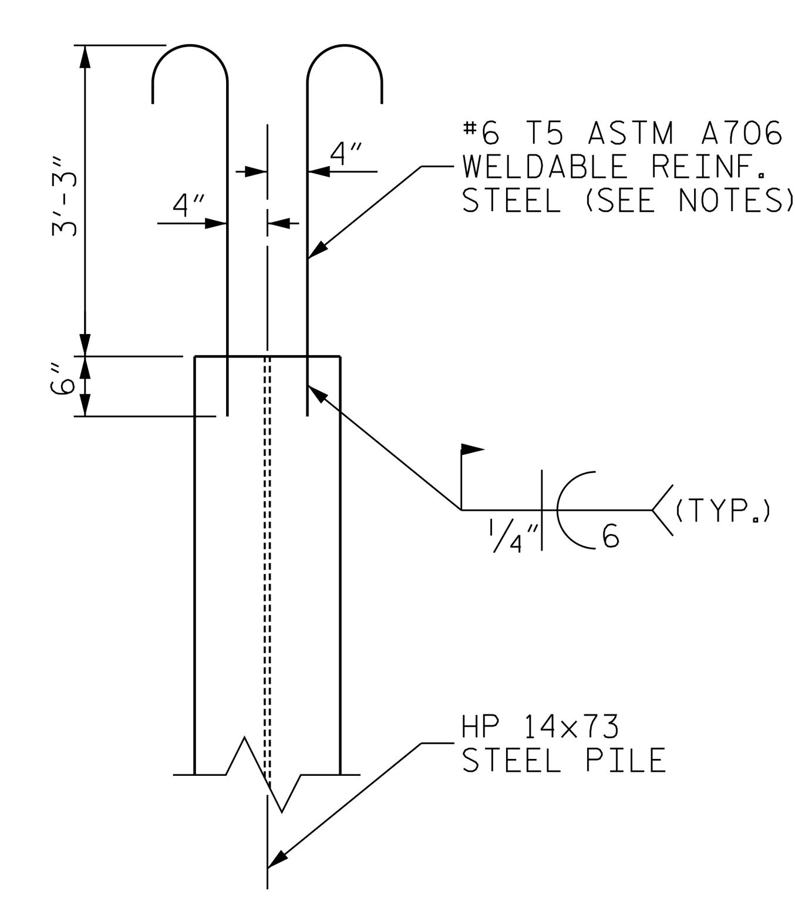


SECTION C-C

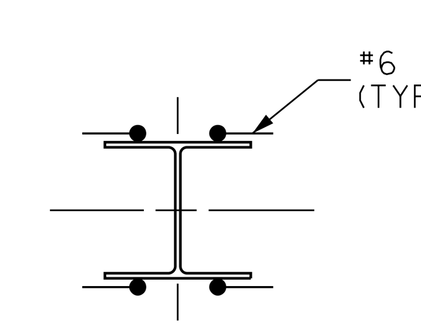


PLAN OF FOOTING

⌖ (DENOTES PILES WITH UPLIFT ANCHORS)



ELEVATION



PLAN

PILE UPLIFT ANCHOR DETAILS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DocuSigned by: Hardy Willis 7/26/2022

Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Boone, NC 828-355-9933 · Tri-Cities, TN 423-467-8401 · Knoxville, TN 865-546-5800 · Spartanburg, SC 864-574-4775 · Charleston, SC 843-974-5650 · Middlesboro, KY 606-248-6600 · Atlanta, GA 770-627-3590 · Raleigh, NC 919-977-9455 · Charlotte, NC 704-357-0488

PROJECT NO. U-2579AA
FORSYTH COUNTY
STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-
SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

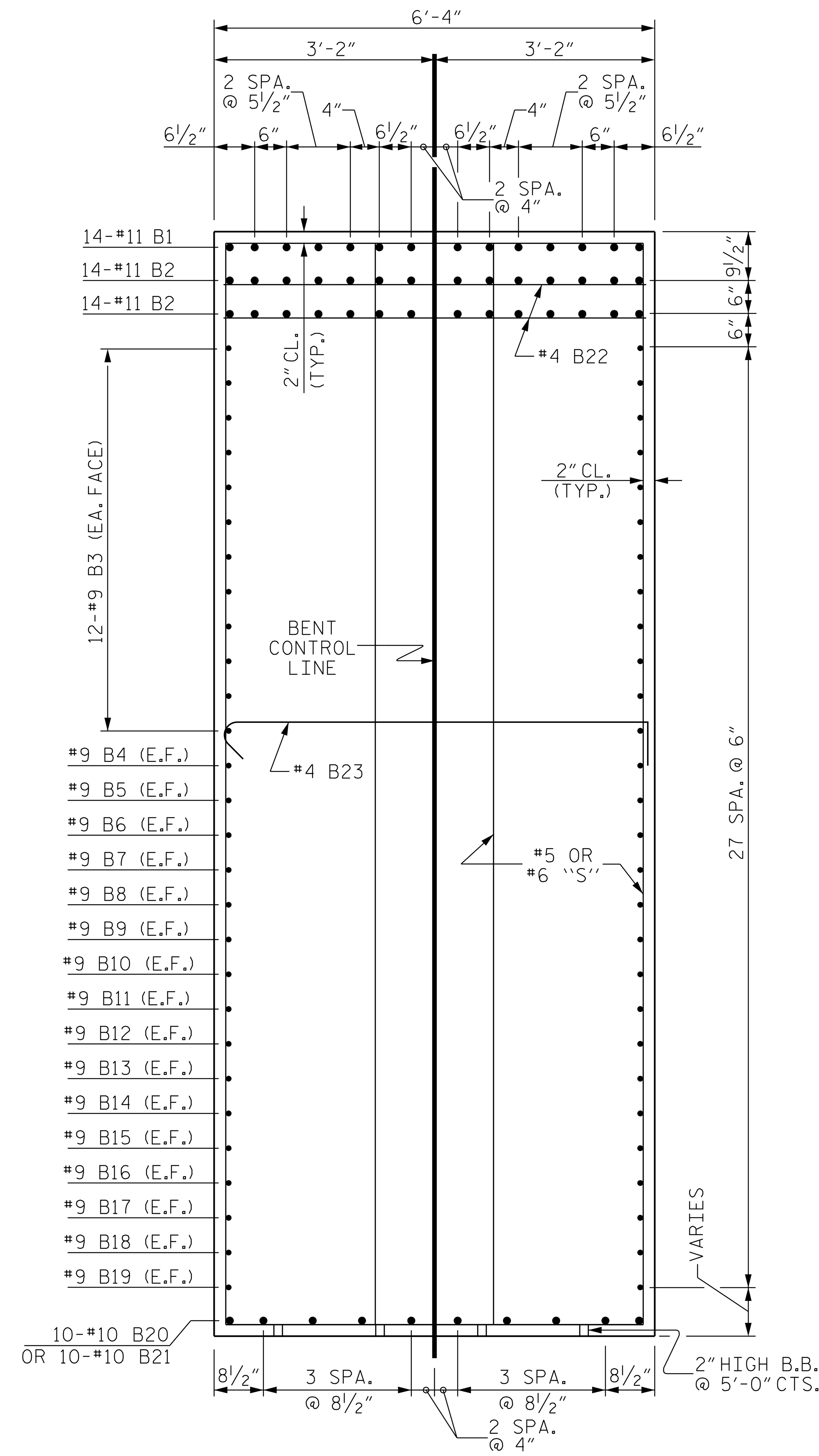
SUBSTRUCTURE
BENT 3

DWN. BY: NCW DATE: 03/2022
CHKD. BY: PRG DATE: 03/2022
DES. EGR. OF RECORD: RTS DATE: 03/2022

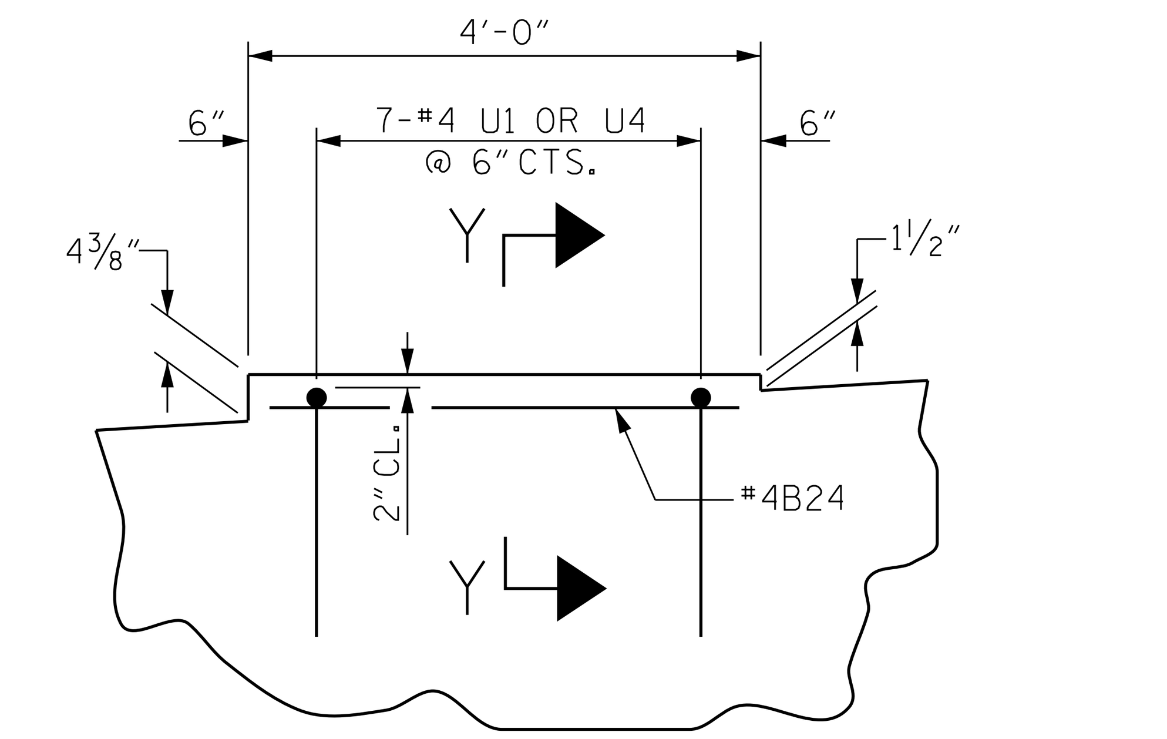
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-75
TOTAL SHEETS 92

wdrucker
DGN: V:\NC\Structures\031148-44 U-2579AA STPS\Structures\SITE 1 - FLYCA NorthPlans\FINAL PLANS\40_U49_U2579AA_SMU_B132_075.dgn
TIME: 10:03 AM on Tuesday, July 26, 2022

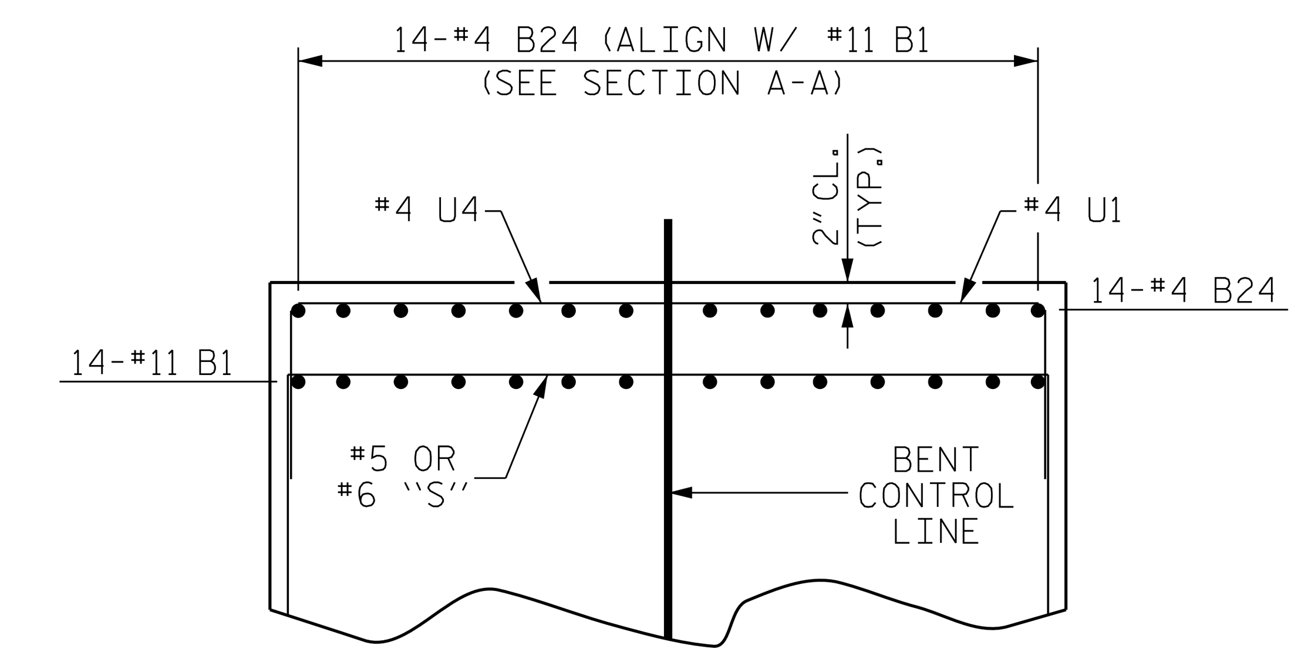


SECTION A-A



DETAIL "B"

(TYP. UNDER EA. GIRDER)



SECTION Y-Y

(ANCHOR BOLTS NOT SHOWN)

7/26/2022

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PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-

SHEET 3 OF 4

Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Raleigh, NC 99-977-9455
Charlotte, NC 704-357-0488
Boone, NC 828-355-9933
Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Atlanta, GA 770-627-3590

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 3

DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: RTS	DATE: 03/2022

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-76

TOTAL SHEETS 92

wdcrutcher
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TIME: 10:03 AM on Tuesday, July 26, 2022

BILL OF MATERIAL

BENT NO. 3

BAR	NO.	SIZE	TYPE	DIM. "A"	LENGTH	WEIGHT
B1	14	#11	1	---	44'-10"	3335
B2	28	#11	STR	---	41'-8"	6199
B3	24	#9	STR	---	41'-8"	3400
B4	2	#9	STR	---	40'-4"	274
B5	2	#9	STR	---	38'-6"	262
B6	2	#9	STR	---	36'-8"	249
B7	2	#9	STR	---	34'-11"	237
B8	2	#9	STR	---	33'-1"	225
B9	2	#9	STR	---	31'-4"	213
B10	2	#9	STR	---	29'-6"	201
B11	2	#9	STR	---	27'-9"	189
B12	2	#9	STR	---	25'-11"	176
B13	2	#9	STR	---	24'-2"	164
B14	2	#9	STR	---	22'-4"	152
B15	2	#9	STR	---	20'-7"	140
B16	2	#9	STR	---	18'-9"	128
B17	2	#9	STR	---	17'-0"	116
B18	2	#9	STR	---	15'-2"	103
B19	2	#9	STR	---	6'-2"	42
B20	10	#10	2	---	24'-7"	1061
B21	10	#10	2	---	25'-10"	1115
B22	22	#4	STR	---	6'-0"	88
B23	11	#4	7	---	6'-11"	51
B24	70	#4	STR	---	3'-8"	171
M1	68	#11	4	---	17'-2"	6202
S1	2	#6	5	7'-3"	23'-5"	70
S2	2	#6	5	7'-6½"	24'-0"	72
S3	2	#6	5	7'-9½"	24'-6"	74
S4	2	#6	5	8'-0½"	25'-0"	75
S5	2	#6	5	8'-4"	25'-7"	77
S6	2	#6	5	8'-7"	26'-1"	78
S7	2	#6	5	8'-10½"	26'-8"	80
S8	2	#6	5	9'-1½"	27'-2"	82
S9	2	#5	5	9'-4½"	27'-3"	57
S10	2	#5	5	9'-9½"	28'-1"	59
S11	2	#5	5	10'-3"	29'-0"	60
S12	2	#5	5	10'-8½"	29'-11"	62
S13	2	#5	5	11'-1½"	30'-9"	64
S14	2	#5	5	11'-7"	31'-8"	66
S15	2	#5	5	12'-0½"	32'-7"	68
S16	2	#5	5	12'-5½"	33'-5"	70
S17	2	#6	5	12'-8½"	34'-4"	103
S18	2	#6	5	12'-11½"	34'-10"	105
S19	2	#6	5	13'-3"	35'-5"	106
S20	2	#6	5	13'-6"	35'-11"	108
S21	2	#6	5	13'-9½"	36'-6"	110
S22	2	#6	5	14'-0½"	37'-0"	111
S23	2	#6	5	14'-3½"	37'-6"	113
S24	2	#6	5	14'-7"	38'-1"	114
S25	2	#6	5	14'-8"	38'-3"	115
S26	2	#6	5	14'-8½"	38'-4"	115
S27	2	#6	5	14'-8½"	38'-4"	115
S28	2	#6	5	14'-9"	38'-5"	115
S29	2	#6	5	14'-9½"	38'-6"	116
S30	2	#6	5	14'-9½"	38'-6"	116
S31	2	#6	5	14'-10"	38'-7"	116
S32	2	#6	5	14'-10½"	38'-8"	116
S33	2	#6	5	14'-11"	38'-9"	116
S34	2	#6	5	14'-11"	38'-9"	116
S35	2	#6	5	14'-11½"	38'-10"	117
S36	2	#6	5	15'-0"	38'-11"	117
S37	2	#6	5	15'-0"	38'-11"	117
S38	2	#6	5	15'-0½"	39'-0"	117
S39	2	#6	5	15'-1"	39'-1"	117
S40	2	#6	5	15'-1½"	39'-2"	118
S41	2	#6	5	15'-1½"	39'-2"	118
S42	2	#6	5	15'-2"	39'-3"	118
S43	2	#6	5	15'-2½"	39'-4"	118
S44	2	#6	5	15'-2½"	39'-4"	118
S45	2	#6	5	15'-3"	39'-5"	118
S46	2	#6	5	15'-3½"	39'-6"	119
S47	2	#6	5	15'-4"	39'-7"	119
S48	2	#6	5	15'-4"	39'-7"	119
S49	2	#6	5	15'-4½"	39'-8"	119
S50	2	#6	5	15'-5"	39'-9"	119
S51	2	#6	5	15'-5½"	39'-10"	120
S52	2	#6	5	15'-4½"	39'-8"	119

BAR	NO.	SIZE	TYPE	DIM. "A"	LENGTH	WEIGHT
S53	2	#6	5	15'-1"	39'-1"	117
S54	2	#6	5	14'-9½"	38'-6"	116
S55	2	#6	5	14'-6"	37'-11"	114
S56	2	#6	5	14'-2½"	37'-4"	112
S57	2	#6	5	13'-11"	36'-9"	110
S58	2	#6	5	13'-7½"	36'-2"	109
S59	2	#6	5	13'-4"	35'-7"	107
S60	2	#5	5	13'-0½"	34'-7"	72
S61	2	#5	5	12'-6½"	33'-7"	70
S62	2	#5	5	12'-0½"	32'-7"	68
S63	2	#5	5	11'-7"	31'-8"	66
S64	2	#5	5	11'-1"	30'-8"	64
S65	2	#5	5	10'-7"	29'-8"	62
S66	2	#5	5	10'-1"	28'-8"	60
S67	2	#5	5	9'-7"	27'-8"	58
S68	2	#6	5	9'-4"	27'-7"	83
S69	2	#6	5	9'-0½"	27'-0"	81
S70	2	#6	5	8'-9"	26'-5"	79
S71	2	#6	5	8'-5½"	25'-10"	78
S72	2	#6	5	8'-2"	25'-3"	76
S73	2	#6	5	7'-10"	24'-7"	74
S74	2	#6	5	7'-6½"	24'-0"	72
S75	2	#6	5	7'-3"	23'-5"	70
S150	96	#5	6	---	21'-7"	2161
S151	144	#5	7	---	6'-8"	1001
T1	22	#5	STR	---	11'-1"	254
T2	22	#5	STR	---	12'-3"	281
T3	44	#5	STR	---	14'-0"	642
T4	202	#5	3	---	8'-7"	1808
† T5	24	#6	4	---	4'-5"	159
T100	24	#11	1	32'-6"	35'-8"	4548
T101	2	#11	1	31'-7"	34'-9"	369
T102	2	#11	1	30'-4"	33'-6"	356
T103	2	#11	1	29'-1"	32'-3"	343
T104	2	#11	1	27'-11"	31'-1"	330
T105	2	#11	1	26'-8"	29'-10"	317
T106	2	#11	1	25'-5"	28'-7"	304
T107	2	#11	1	24'-3"	27'-5"	291
T108	2	#11	1	23'-0"	26'-2"	278
T109	2	#11	1	21'-9"	24'-11"	265
T110	2	#11	1	20'-7"	23'-9"	252
T111	2	#11	1	19'-4"	22'-6"	239
T112	2	#11	1	18'-1"	21'-3"	226
T113	2	#11	1	16'-11"	20'-1"	213
T114	2	#11	1	15'-8"	18'-10"	200
T115	2	#11	1	14'-5"	17'-7"	187
T116	2	#11	1	13'-3"	16'-5"	174
T117	2	#11	1	12'-0"	15'-2"	161
T118	2	#11	1	10'-9"	13'-11"	148
T150	22	#11	1	29'-6"	32'-8"	3818
T151	2	#11	1	28'-11"	32'-1"	341
T152	2	#11	1	28'-1"	31'-3"	332
T153	2	#11	1	27'-3"	30'-5"	323
T154	2	#11	1	26'-5"	29'-7"	314
T155	2	#11	1	25'-8"	28'-10"	306
T156	2	#11	1	24'-10"	28'-0"	298
T157	2	#11	1	24'-0"	27'-2"	289
T158	2	#11	1	23'-2"	26'-4"	280
T159	2	#11	1	22'-4"	25'-6"	271
T160	2	#11	1	21'-7"	24'-9"	263
T161	2	#11	1	20'-9"	23'-11"	254
T162	2	#11	1	19'-11"	23'-1"	245
T163	2	#11	1	19'-1"	22'-3"	236
T164	2	#11	1	18'-3"	21'-5"	228
T165	2	#11	1	17'-5"	20'-7"	219
T166	2	#11	1	16'-8"	19'-10"	211
T167	2	#11	1	15'-10"	19'-0"	202
T168	2	#11	1	15'-0"	18'-2"	193
T169	2	#11	1	14'-2"	17'-4"	184
T170	2	#11	1	13'-4"	16'-6"	175
T171	2	#11	1	12'-7"	15'-9"	167
T172	2	#11	1	11'-9"	14'-11"	159

BAR	NO.	SIZE	TYPE	DIM. "A"	LENGTH	WEIGHT
T200	24	#8	1	32'-6"	34'-4"	2200
T201	2	#8	1	31'-7"	33'-5"	178
T202	2	#8	1	30'-4"	32'-2"	172
T203	2	#8	1	29'-1"	30'-11"	165
T204	2	#8	1	27'-11"	29'-9"	159
T205	2	#8	1	26'-8"	28'-6"	152
T206	2	#8	1	25'-5"	27'-3"	146
T207	2	#8	1	24'-3"	26'-1"	139
T208	2	#8	1	23'-0"	24'-10"	133
T209	2	#8	1	21'-9"	23'-7"	126
T210	2	#8	1	20'-7"	22'-5"	120
T211	2	#8	1	19'-4"	21'-2"	113
T212	2	#8	1	18'-1"	19'-11"	106
T213	2	#8	1	16'-11"	18'-9"	100
T214	2	#8	1	15'-8"	17'-6"	93
T215	2	#8	1	14'-5"	16'-3"	87
T216	2	#8	1	13'-3"	15'-1"	81
T217	2	#8	1	12'-0"	13'-10"	74
T218	2	#8	1	10'-9"	12'-7"	67
T250	22	#8	1	29'-6"	31'-4"	1841
T251	2	#8	1	28'-11"	30'-9"	164
T252	2	#8	1	28'-1"	29'-11"	160
T253	2	#8	1	27'-3"	29'-1"	155
T254	2	#8	1	26'-5"	28'-3"	151
T255	2	#8	1	25'-8"	27'-6"	147
T256	2	#8	1	24'-10"	26'-8"	142
T257	2	#8	1	24'-0"	25'-10"	138
T258	2	#8	1	23'-2"	25'-0"	134
T259	2	#8	1	22'-4"	24'-2"	129
T260	2	#8	1	21'-7"	23'-5"	125
T261	2	#8	1	20'-9"	22'-7"	121
T262	2	#8	1	19'-11"	21'-9"	116
T263	2	#8	1	19'-1"	20'-11"	112
T264	2	#8	1	18'-3"	20'-1"	107
T265	2	#8	1	17'-5"	19'-3"	103
T266	2	#8	1	16'-8"	18'-6"	99
T267	2	#8	1	15'-10"	17'-8"	94
T268	2	#8	1	15'-0"	16'-10"	90
T269	2	#8	1	14'-2"	16'-0"	85
T270	2	#8	1	13'-4"	15'-2"	81
T271	2	#8	1	12'-7"	14'-5"	77
T272	2	#8	1	11'-9"	13'-7"	73
U1	35	#4	3	---	9'-0"	210
U2	12	#4	3	---	8'-10"	71
U3	10	#4	3	---	10'-0"	67
V1	68	#11	STR	---	41'-10"	15114

⊞ REINFORCING STEEL	80,810 LBS.

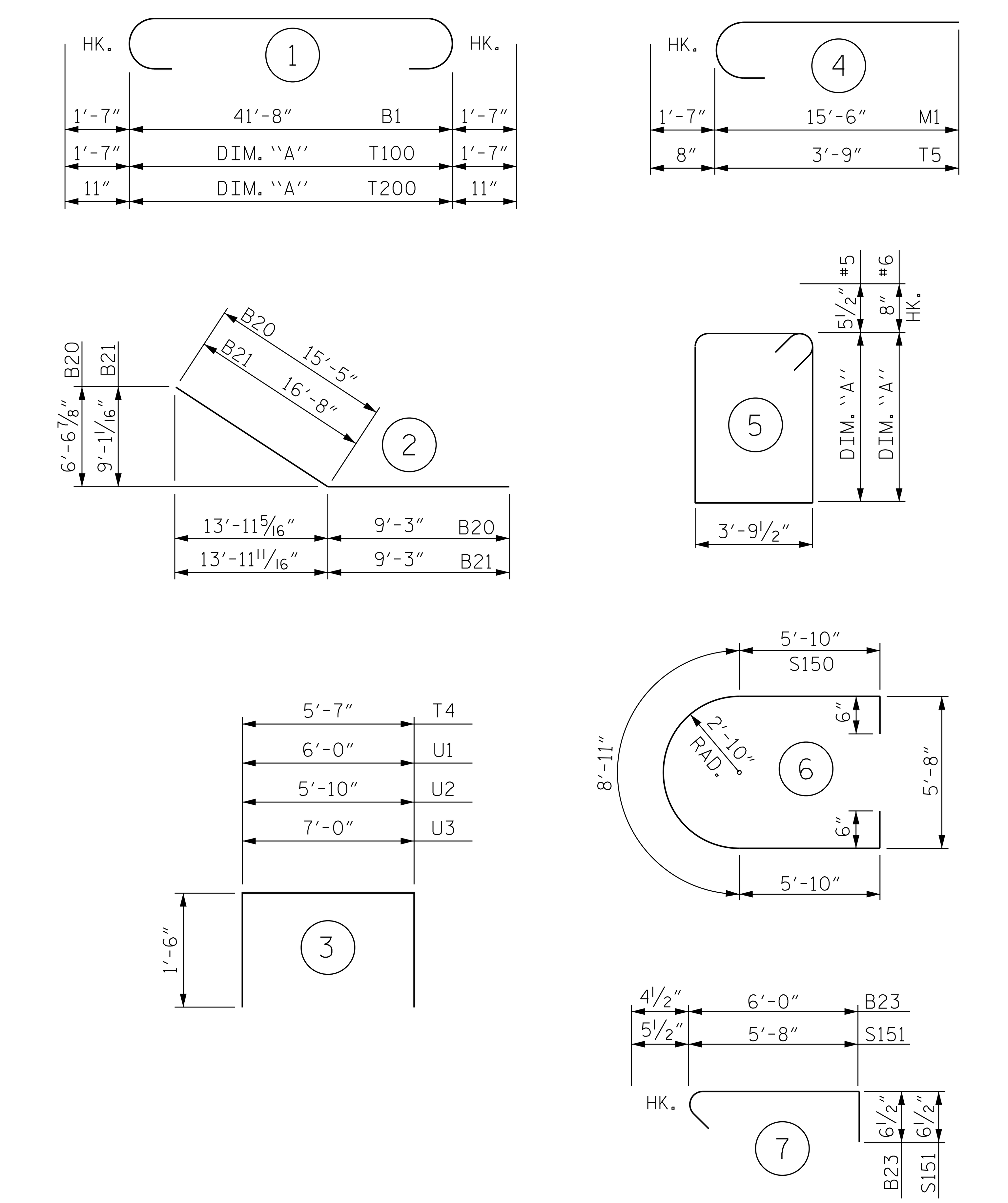
† = ASTM A706 WELDABLE REINFORCING STEEL.

⊞ = TOTAL WEIGHT OF REINFORCING STEEL INCLUDES 159 LBS. OF ASTM A706 WELDABLE REINFORCING STEEL.

CLASS A CONCRETE BREAKDOWN	
POUR #1 (FOOTING)	205.3 C.Y.
POUR #2 (COLUMN)	97.8 C.Y.
POUR #3 (CAP)	126.8 C.Y.
TOTAL CLASS A CONCRETE	429.9 C.Y.

FOUNDATION EXCAVATION		LUMP SUM
HP 14 X 73 STEEL PILES	NO. 43	LIN. FT. 1466
PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES		NO. 43

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SEAL 29777 — DocuSigned by: 7/26/2022

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Vaughn & Melton Consulting Engineers — Asheville, North Carolina 828-253-2796; Raleigh, NC 919-977-9455; Charlotte, NC 704-357-0488; Boone, NC 828-355-9933; Tri-Cities, TN 423-467-8401; Knoxville, TN 865-546-5800; Spartanburg, SC 864-574-4775; Charleston, SC 843-974-5650; Middlesboro, KY 606-248-6600; Atlanta, GA 770-627-3590

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

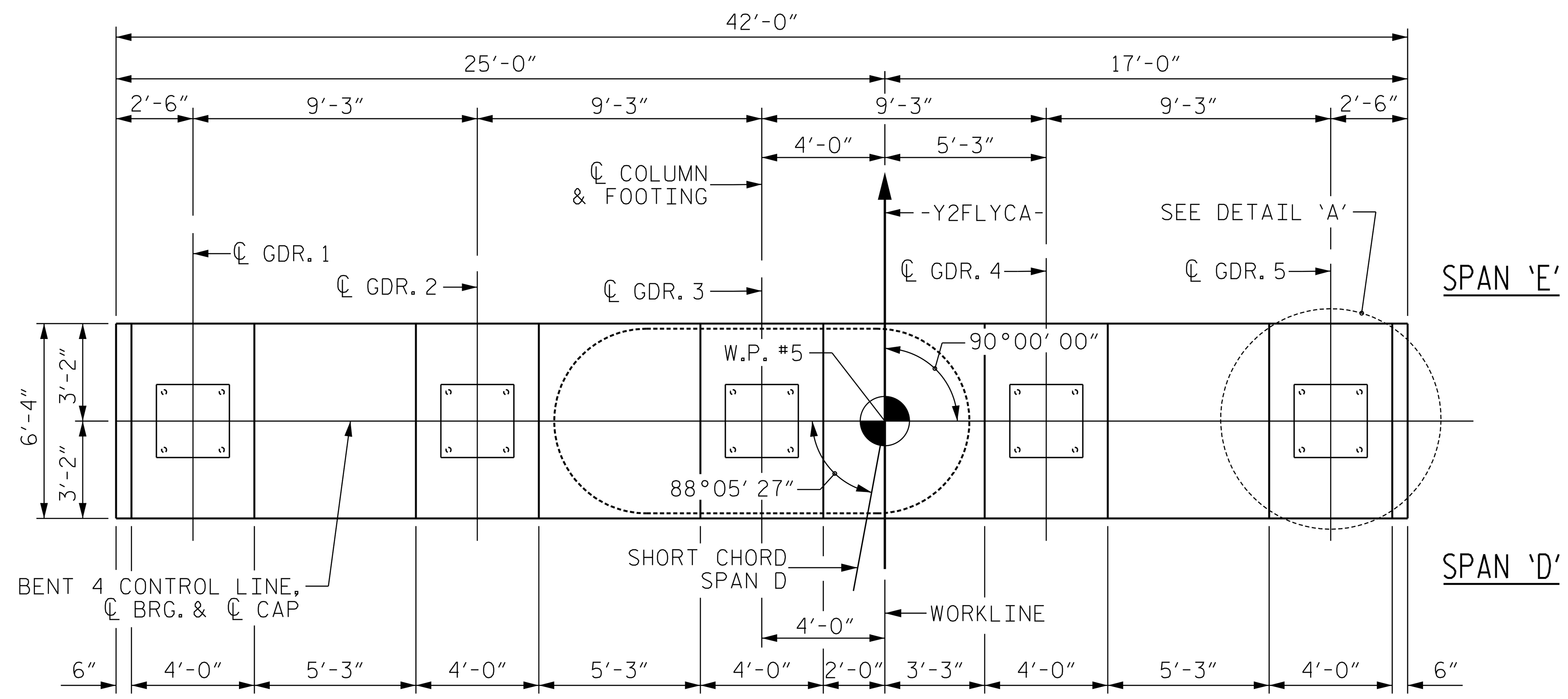
BENT 3

DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: RTS	DATE: 03/2022

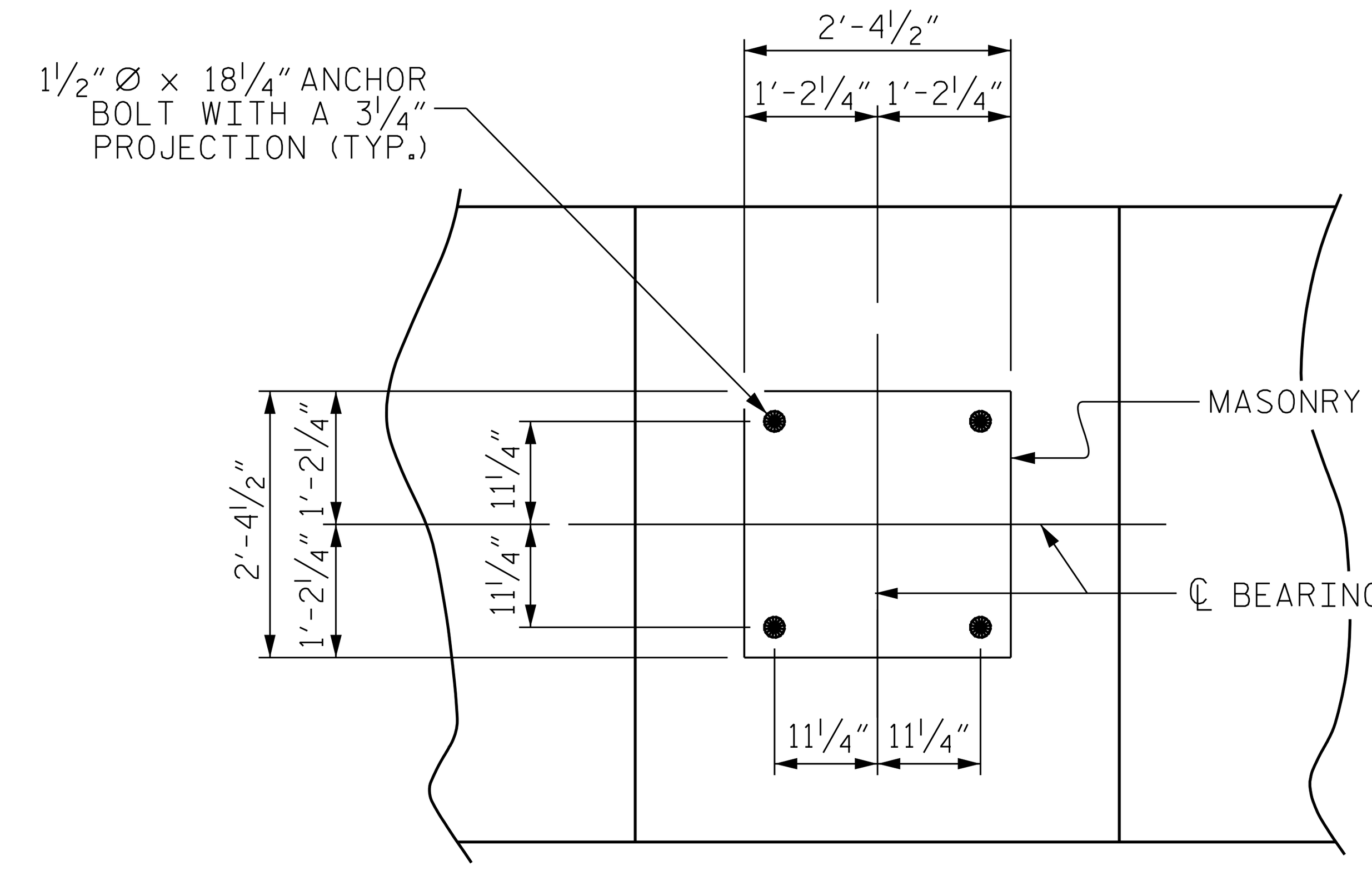
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-77

TOTAL SHEETS 92



PLAN OF CAP



DETAIL 'A'

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

HOOKS ON "M" & "T" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

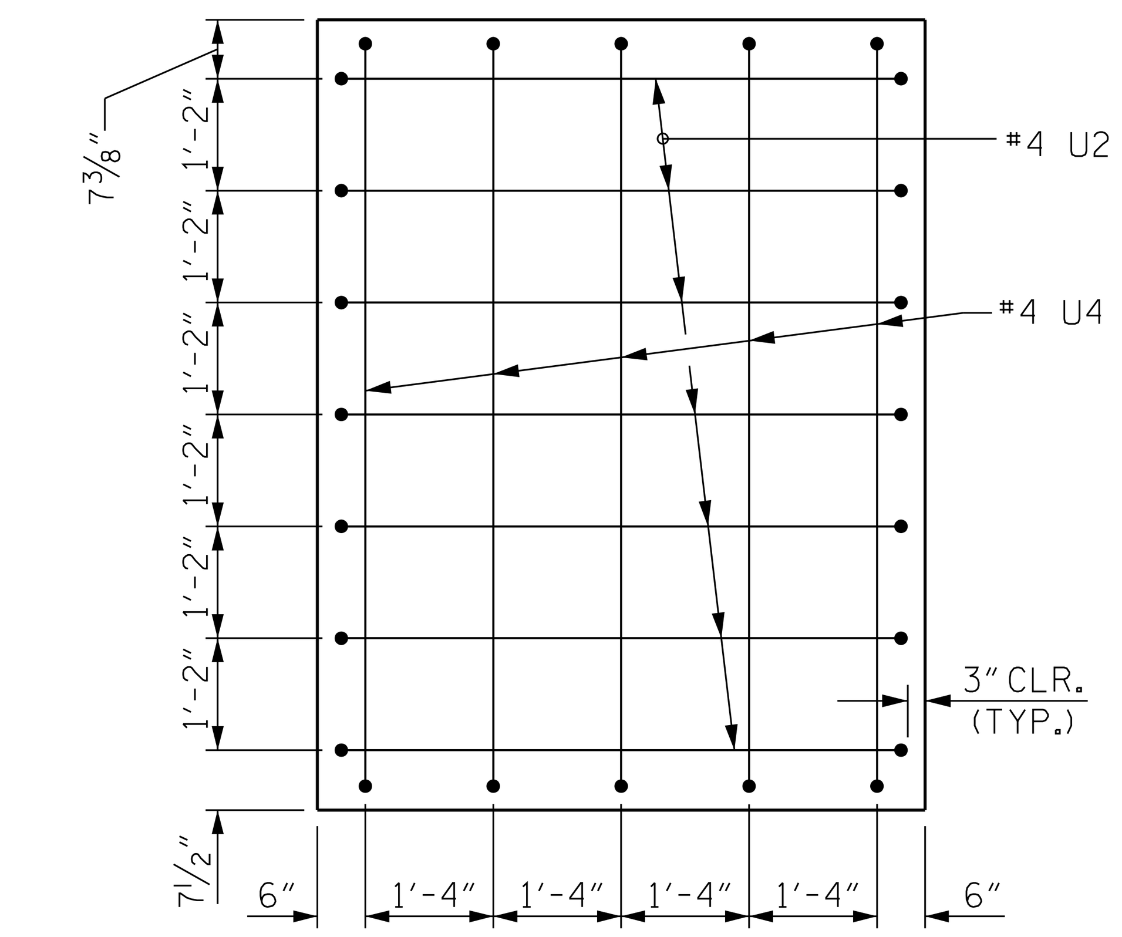
"T" BARS IN FOOTING MAY BE SHIFTED AS NECESSARY TO CLEAR M1 BARS EXTENDING INTO COLUMN.

FOR MASS CONCRETE, SEE SPECIAL PROVISIONS.

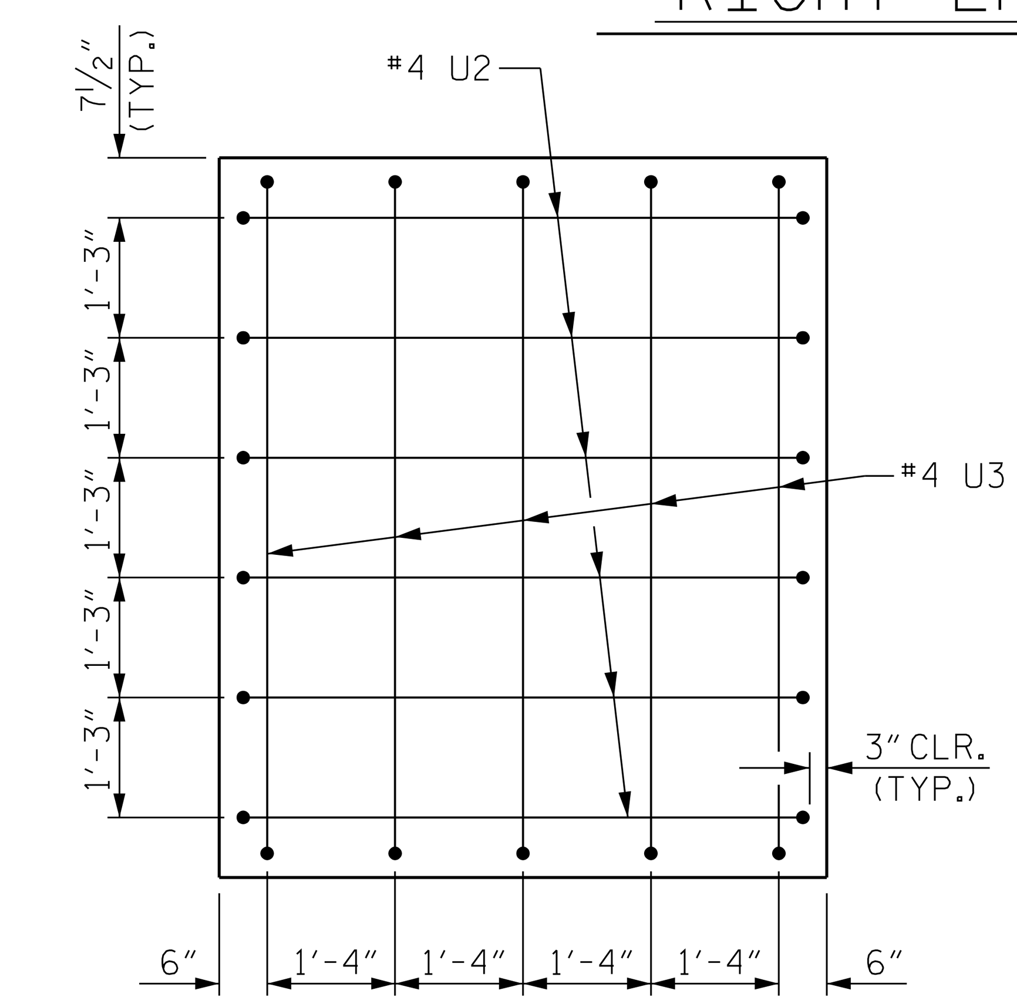
FOR FOOTING PLAN, SECTION B-B, SECTION C-C, AND PILE UPLIFT ANCHOR DETAILS, SEE SHEET 2 OF 3.

FOR SECTION A-A, DETAIL "B", AND BILL OF MATERIAL, SEE SHEET 3 OF 3.

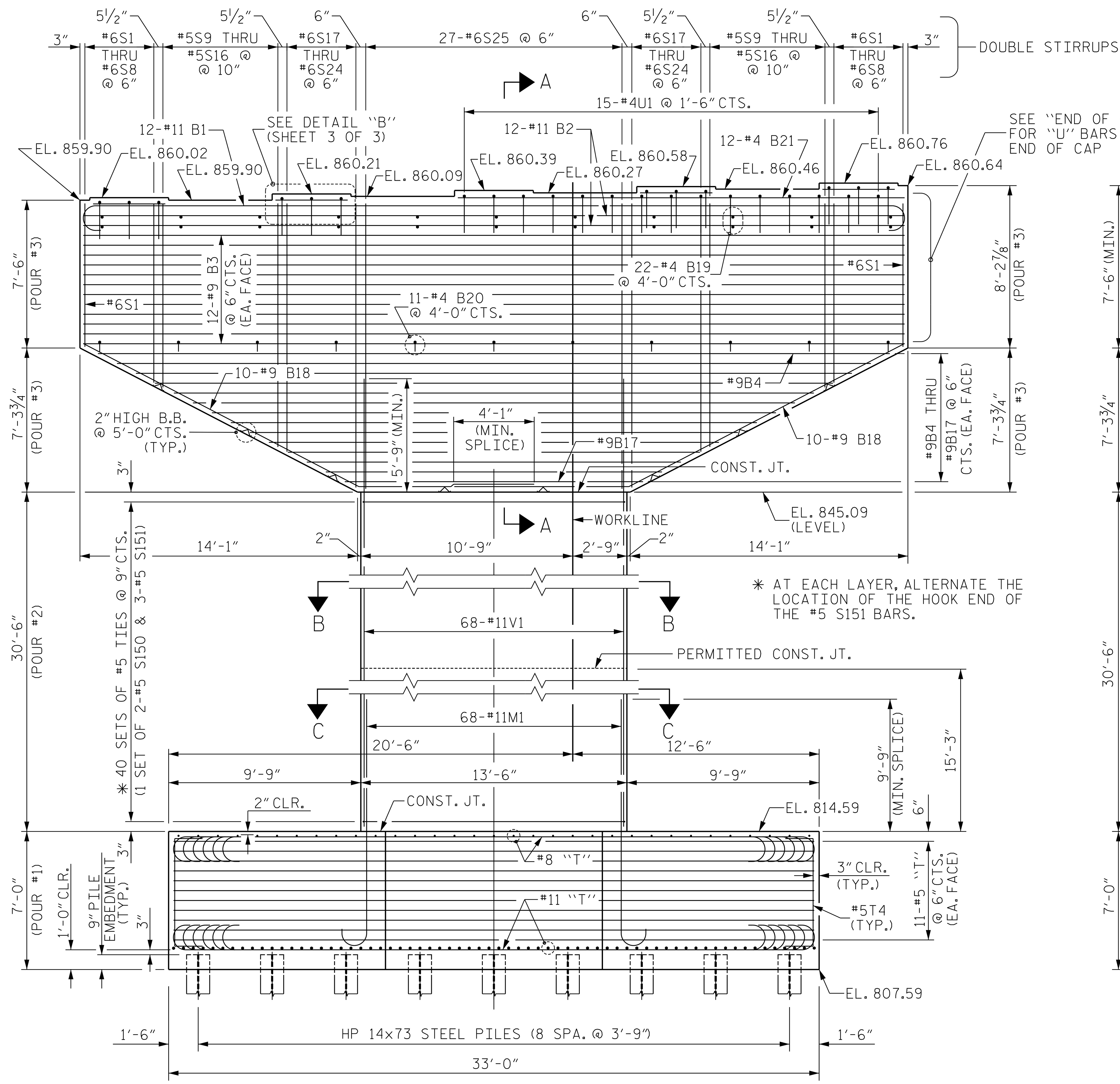
DETAILED DRAWINGS FOR FALSEWORK AND FORMS FOR THIS HAMMERHEAD BENT CAP SHALL BE SUBMITTED, SEE SHEET SN.



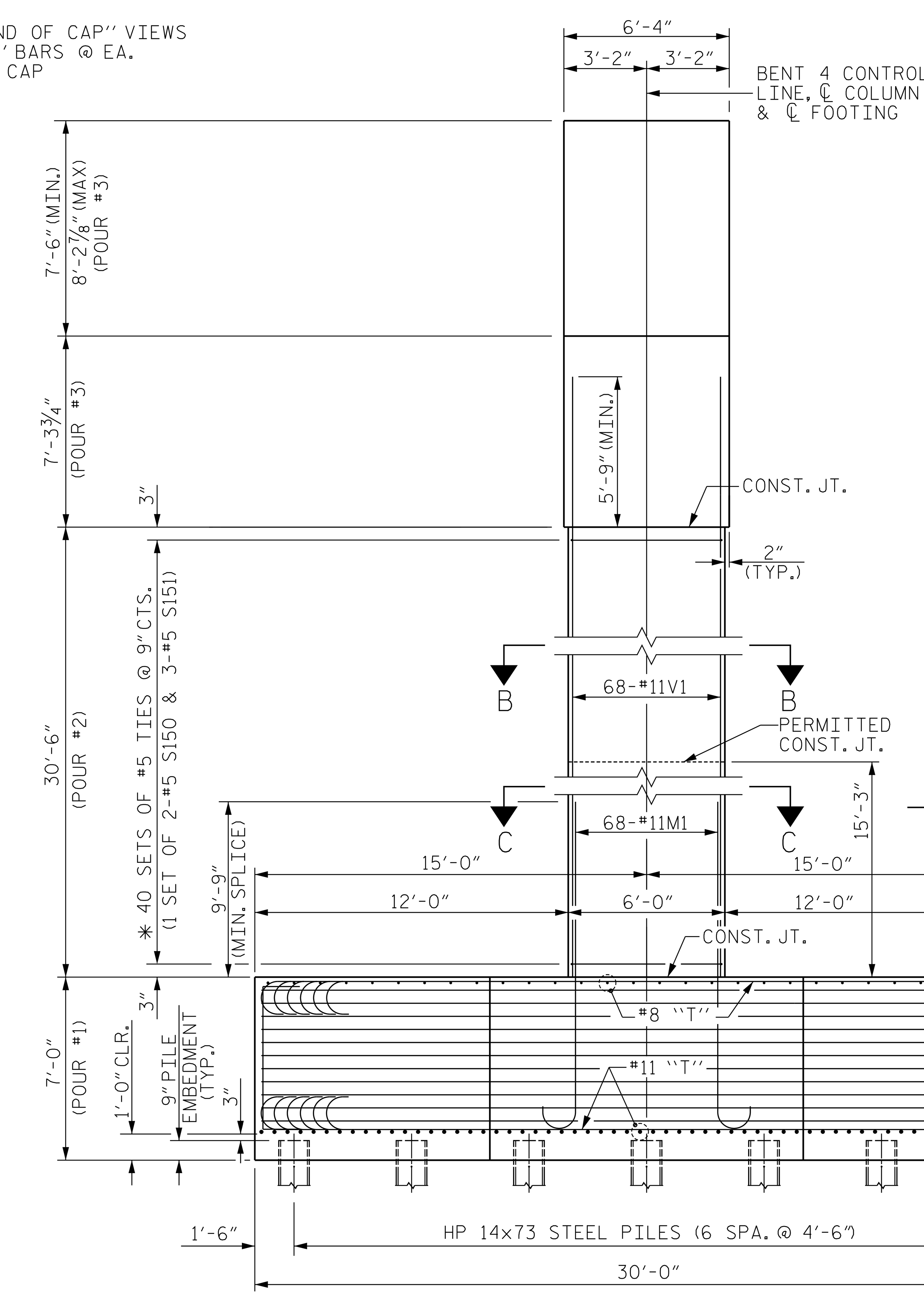
RIGHT END OF CAP VIEW



LEFT END OF CAP VIEW



ELEVATION



END ELEVATION

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7/26/2022

Vaughn & Melton Consulting Engineers — Asheville, North Carolina

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 4

DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: RTS	DATE: 03/2022

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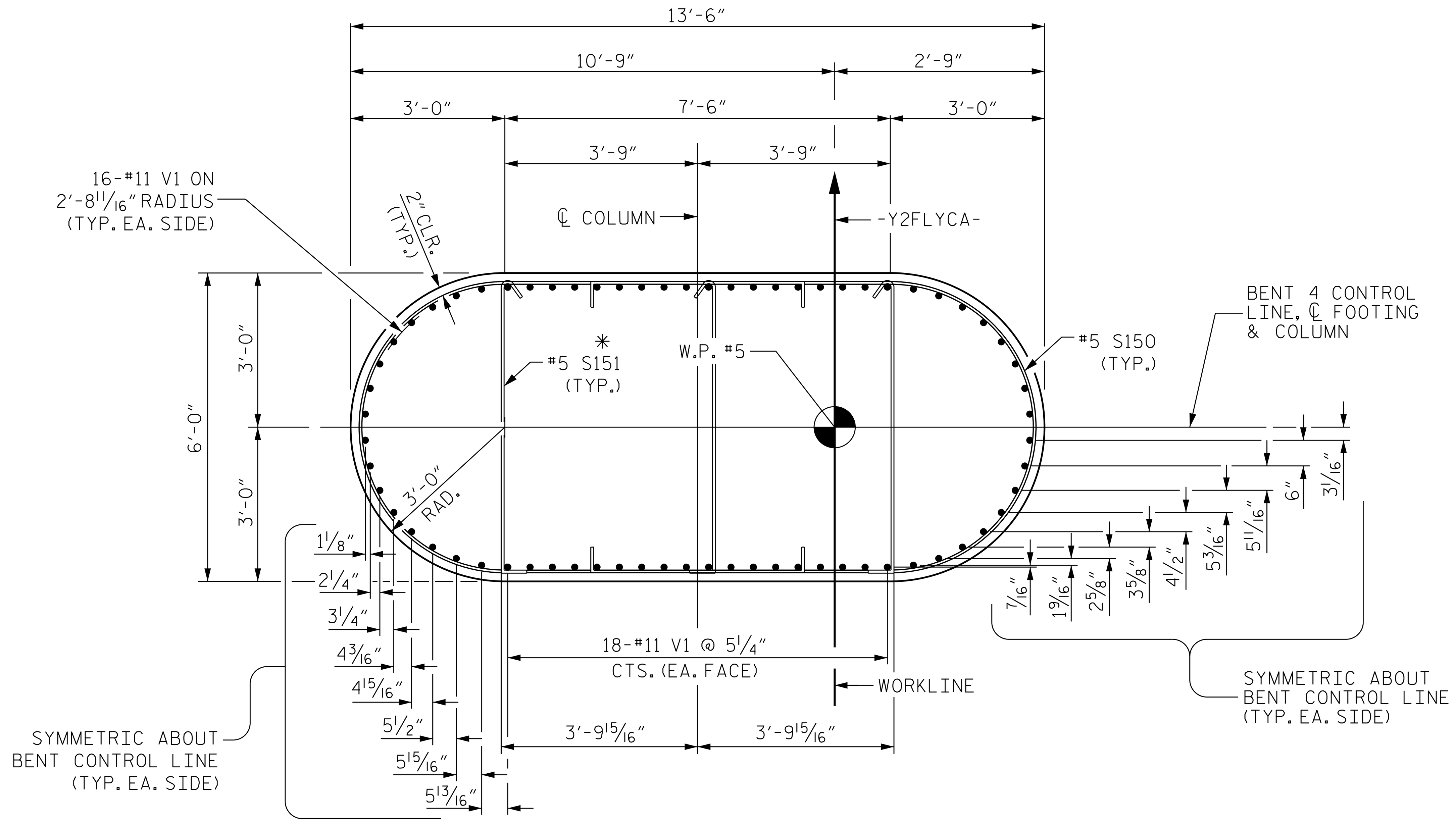
2			4		

SHEET NO. S1-78

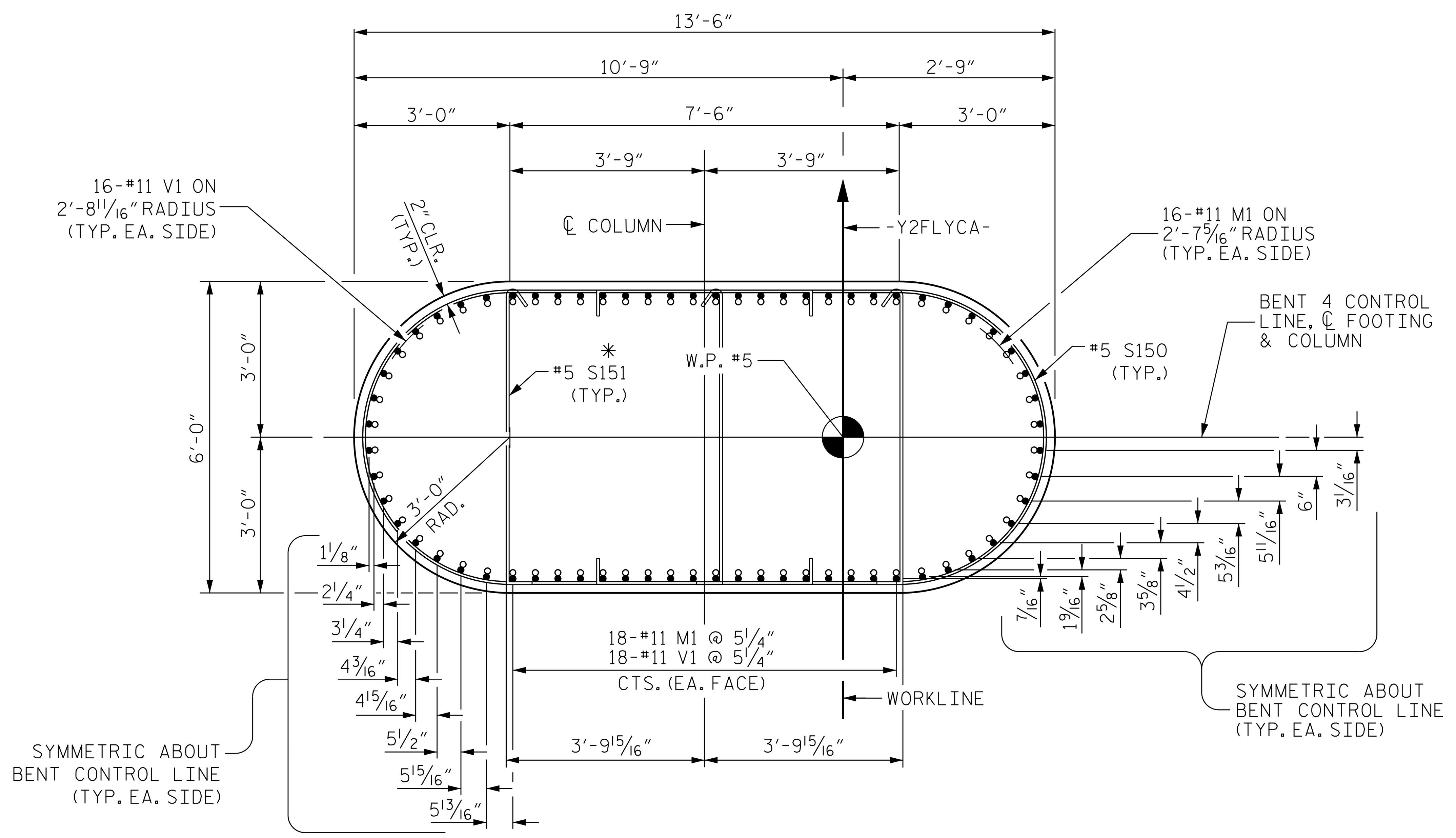
TOTAL SHEETS 92



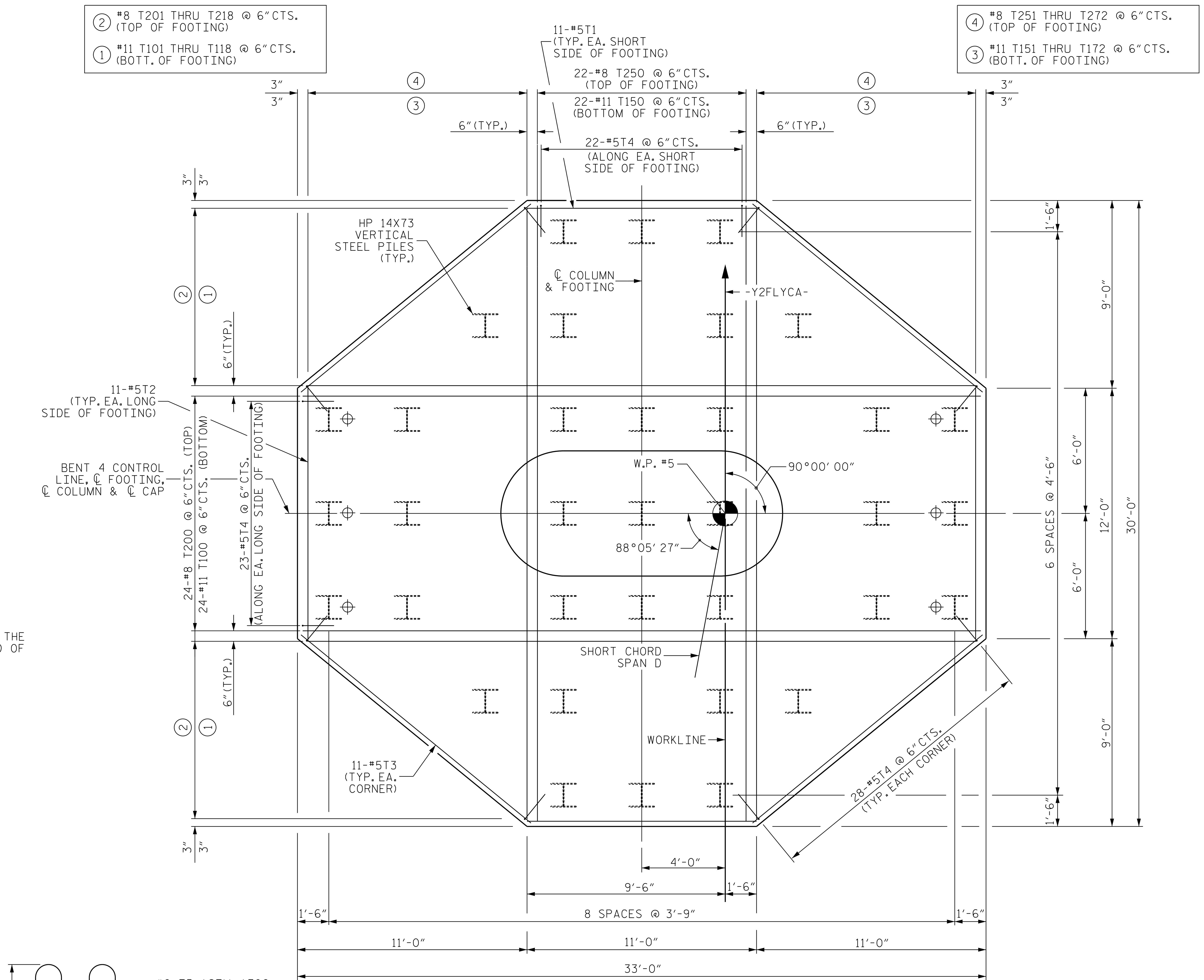
SECTION B-B

○ - M1 BAR LOCATION
● - V1 BAR LOCATION

✱ AT EACH LAYER, ALTERNATE THE LOCATION OF THE HOOK END OF THE #5 S151 BARS.

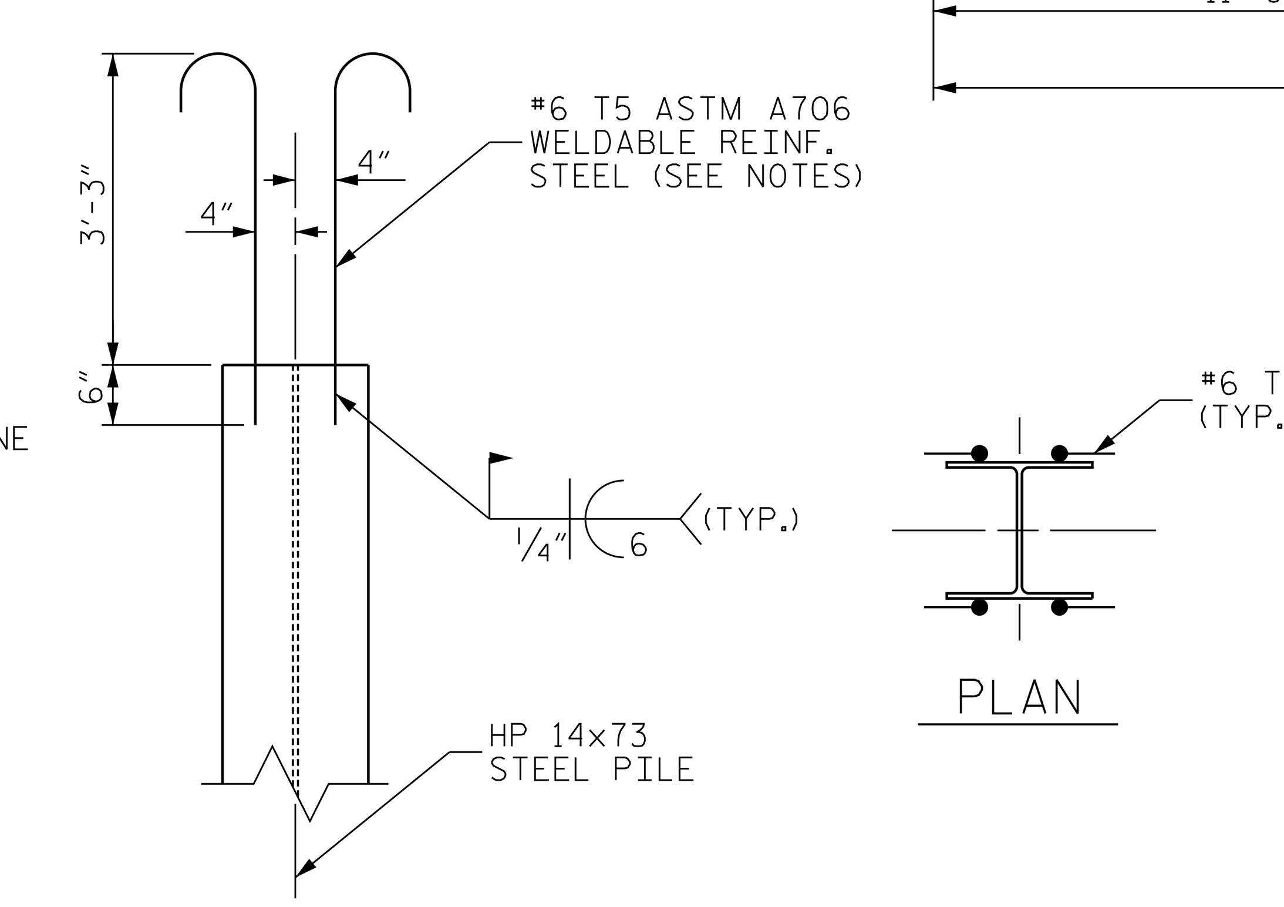


SECTION C-C



PLAN OF FOOTING

⌖ (DENOTES PILES WITH UPLIFT ANCHORS)



PILE UPLIFT ANCHOR DETAILS

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 4

V&M Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Boone, NC 828-355-9933 · Tri-Cities, TN 423-467-8401 · Knoxville, TN 865-546-5800 · Spartanburg, SC 864-574-4775 · Charleston, SC 843-974-5650 · Middlesboro, KY 606-248-6600 · Atlanta, GA 770-627-3590 · Raleigh, NC 919-977-9455 · Charlotte, NC 704-357-0488

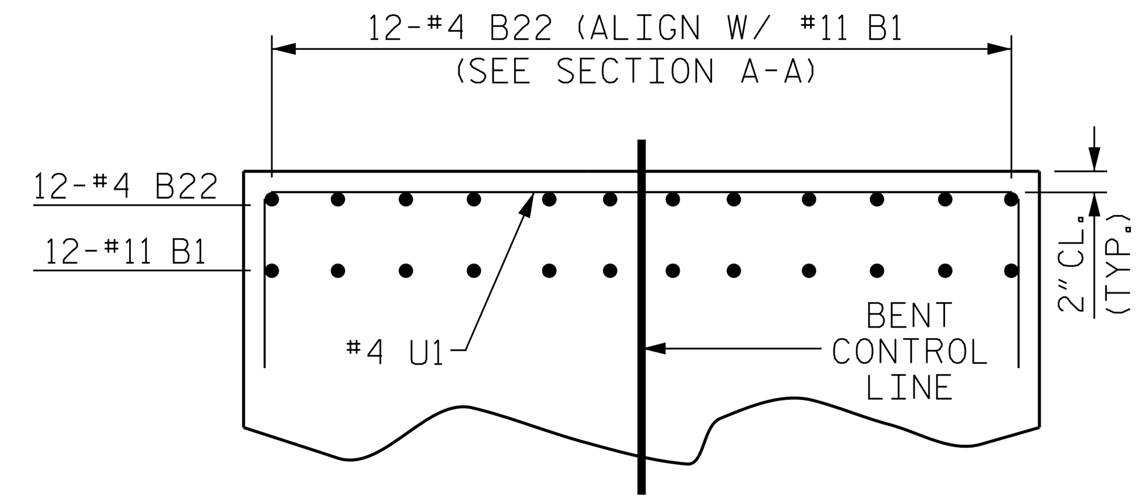
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20777 — DocuSigned by: Hardy Willis — 7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DWN. BY: NCW DATE: 03/2022
CHKD. BY: PRG DATE: 03/2022
DES. EGR. OF RECORD: RTS DATE: 03/2022

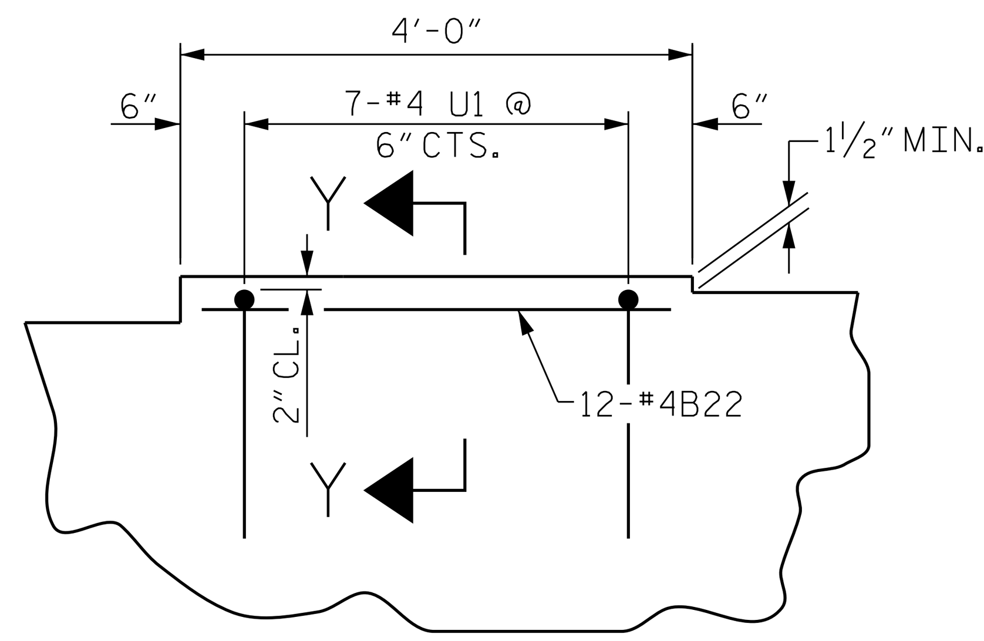
REVISIONS							
NO.	BY:	DATE:		NO.	BY:	DATE:	
1				3			
2				4			

SHEET NO. S1-79
TOTAL SHEETS 92



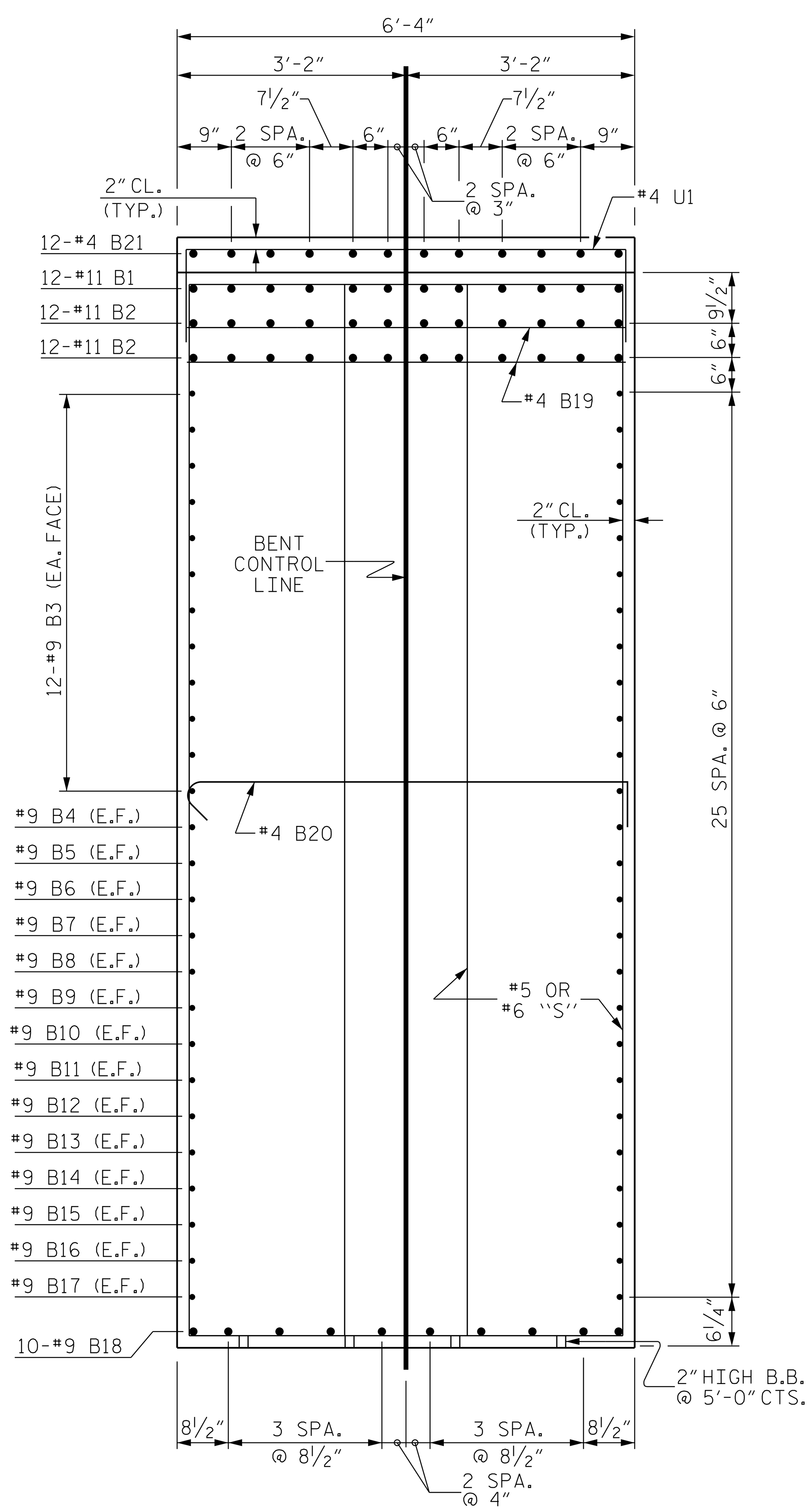
SECTION Y-Y

(ANCHOR BOLTS NOT SHOWN)



DETAIL "B"

(TYP. UNDER EA. GIRDER)



SECTION A-A

BILL OF MATERIAL

BENT NO. 4

BAR	NO.	SIZE	TYPE	DIM. "A"	LENGTH	WEIGHT
B1	12	#11	1	---	44'-10"	2858
B2	24	#11	STR	---	41'-8"	5313
B3	24	#9	STR	---	41'-8"	3400
B4	2	#9	STR	---	40'-2"	273
B5	2	#9	STR	---	38'-2"	260
B6	2	#9	STR	---	36'-3"	245
B7	2	#9	STR	---	34'-4"	233
B8	2	#9	STR	---	32'-5"	220
B9	2	#9	STR	---	30'-6"	207
B10	2	#9	STR	---	28'-7"	194
B11	2	#9	STR	---	26'-8"	181
B12	2	#9	STR	---	24'-9"	168
B13	2	#9	STR	---	22'-10"	155
B14	2	#9	STR	---	20'-10"	142
B15	2	#9	STR	---	18'-11"	129
B16	2	#9	STR	---	17'-0"	116
B17	2	#9	STR	---	15'-1"	103
B18	20	#9	2	---	24'-8"	1677
B19	22	#4	STR	---	6'-0"	88
B20	11	#4	7	---	6'-11"	51
B21	12	#4	STR	---	22'-8"	182
B22	60	#4	STR	---	3'-8"	147
M1	68	#11	4	---	17'-2"	6202
S1	4	#6	5	7'-3"	23'-5"	141
S2	4	#6	5	7'-6"	23'-11"	144
S3	4	#6	5	7'-9½"	24'-6"	147
S4	4	#6	5	8'-0½"	25'-0"	150
S5	4	#6	5	8'-3½"	25'-6"	153
S6	4	#6	5	8'-6½"	26'-0"	156
S7	4	#6	5	8'-10"	26'-7"	160
S8	4	#6	5	9'-1"	27'-1"	163
S9	4	#5	5	9'-4"	27'-2	113
S10	4	#5	5	9'-9½"	28'-1"	117
S11	4	#5	5	10'-2½"	28'-11"	121
S12	4	#5	5	10'-7½"	29'-9"	124
S13	4	#5	5	11'-1"	30'-8"	128
S14	4	#5	5	11'-6"	31'-6"	131
S15	4	#5	5	11'-11"	32'-4"	135
S16	4	#5	5	12'-4"	33'-2"	138
S17	4	#6	5	12'-7"	34'-1"	205
S18	4	#6	5	12'-10"	34'-7"	208
S19	4	#6	5	13'-1"	35'-1"	211
S20	4	#6	5	13'-4½"	35'-8"	214
S21	4	#6	5	13'-7½"	36'-2"	217
S22	4	#6	5	13'-10½"	36'-8"	220
S23	4	#6	5	14'-1½"	37'-2"	223
S24	4	#6	5	14'-4½"	37'-8"	226
S25	54	#6	5	14'-5½"	37'-10"	3069
S150	80	#5	6	---	21'-7"	1801
S151	120	#5	7	---	6'-8"	834
T1	22	#5	STR	---	11'-1"	254
T2	22	#5	STR	---	12'-3"	281
T3	44	#5	STR	---	14'-0"	642
T4	202	#5	3	---	8'-7"	1808
† T5	24	#6	4	---	4'-5"	159
T100	24	#11	1	32'-6"	35'-8"	4548
T101	2	#11	1	31'-7"	34'-9"	369
T102	2	#11	1	30'-4"	33'-6"	356
T103	2	#11	1	29'-1"	32'-3"	343
T104	2	#11	1	27'-11"	31'-1"	330
T105	2	#11	1	26'-8"	29'-10"	317
T106	2	#11	1	25'-5"	28'-7"	304
T107	2	#11	1	24'-3"	27'-5"	291
T108	2	#11	1	23'-0"	26'-2"	278
T109	2	#11	1	21'-9"	24'-11"	265
T110	2	#11	1	20'-7"	23'-9"	252
T111	2	#11	1	19'-4"	22'-6"	239
T112	2	#11	1	18'-1"	21'-3"	226
T113	2	#11	1	16'-11"	20'-1"	213
T114	2	#11	1	15'-8"	18'-10"	200
T115	2	#11	1	14'-5"	17'-7"	187
T116	2	#11	1	13'-3"	16'-5"	174
T117	2	#11	1	12'-0"	15'-2"	161
T118	2	#11	1	10'-9"	13'-11"	148

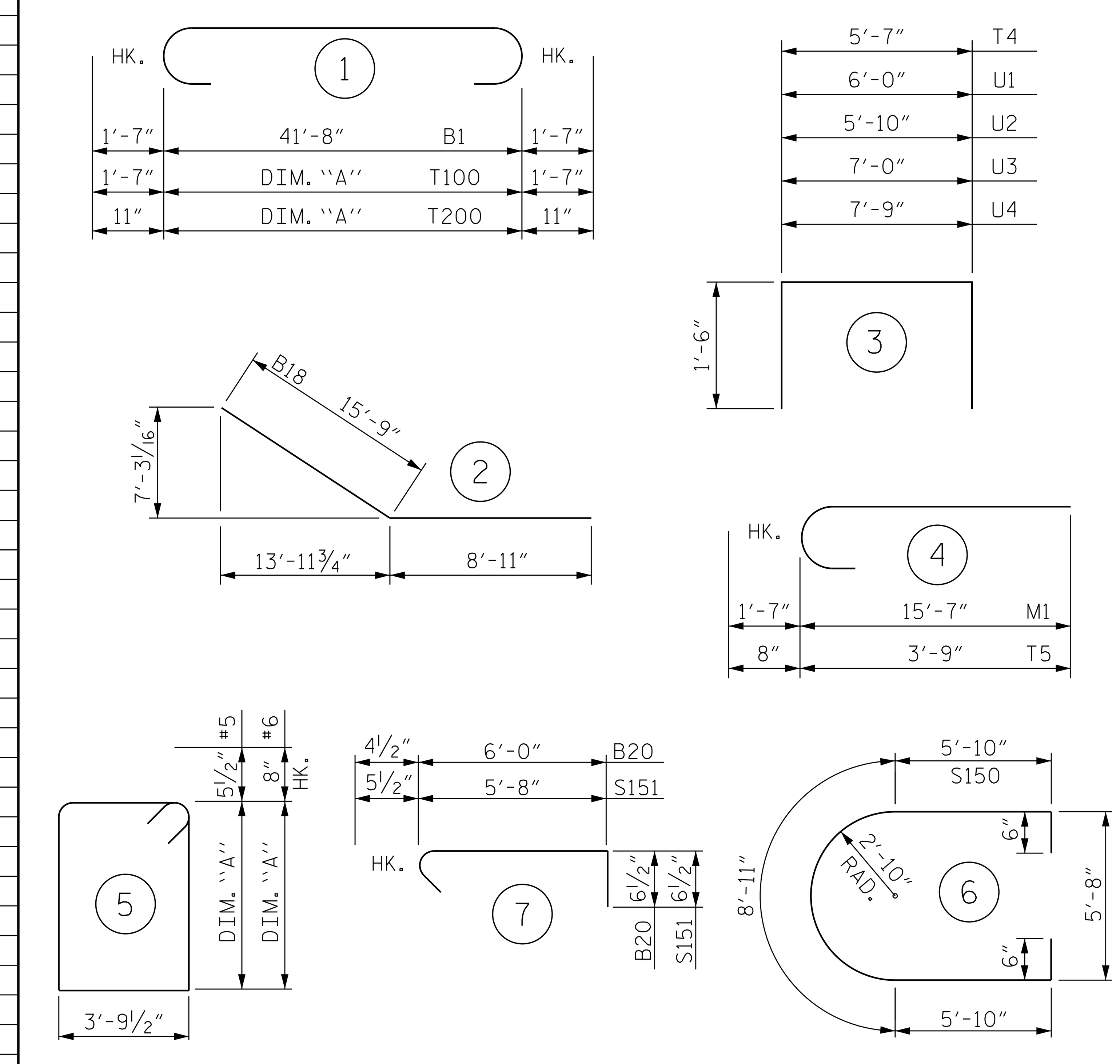
BAR	NO.	SIZE	TYPE	DIM. "A"	LENGTH	WEIGHT
T150	22	#11	1	29'-6"	32'-8"	3818
T151	2	#11	1	28'-11"	32'-1"	341
T152	2	#11	1	28'-1"	31'-3"	332
T153	2	#11	1	27'-3"	30'-5"	323
T154	2	#11	1	26'-5"	29'-7"	314
T155	2	#11	1	25'-8"	28'-10"	306
T156	2	#11	1	24'-10"	28'-0"	298
T157	2	#11	1	24'-0"	27'-2"	289
T158	2	#11	1	23'-2"	26'-4"	280
T159	2	#11	1	22'-4"	25'-6"	271
T160	2	#11	1	21'-7"	24'-9"	263
T161	2	#11	1	20'-9"	23'-11"	254
T162	2	#11	1	19'-11"	23'-1"	245
T163	2	#11	1	19'-1"	22'-3"	236
T164	2	#11	1	18'-3"	21'-5"	228
T165	2	#11	1	17'-5"	20'-7"	219
T166	2	#11	1	16'-8"	19'-10"	211
T167	2	#11	1	15'-10"	19'-0"	202
T168	2	#11	1	15'-0"	18'-2"	193
T169	2	#11	1	14'-2"	17'-4"	184
T170	2	#11	1	13'-4"	16'-6"	175
T171	2	#11	1	12'-7"	15'-9"	167
T172	2	#11	1	11'-9"	14'-11"	159
T200	24	#8	1	32'-6"	34'-4"	2200
T201	2	#8	1	31'-7"	33'-5"	178
T202	2	#8	1	30'-4"	32'-2"	172
T203	2	#8	1	29'-1"	30'-11"	165
T204	2	#8	1	27'-11"	29'-9"	159
T205	2	#8	1	26'-8"	28'-6"	152
T206	2	#8	1	25'-5"	27'-3"	146
T207	2	#8	1	24'-3"	26'-1"	139
T208	2	#8	1	23'-0"	24'-10"	133
T209	2	#8	1	21'-9"	23'-7"	126
T210	2	#8	1	20'-7"	22'-5"	120
T211	2	#8	1	19'-4"	21'-2"	113
T212	2	#8	1	18'-1"	19'-11"	106
T213	2	#8	1	16'-11"	18'-9"	100
T214	2	#8	1	15'-8"	17'-6"	93
T215	2	#8	1	14'-5"	16'-3"	87
T216	2	#8	1	13'-3"	15'-1"	81
T217	2	#8	1	12'-0"	13'-10"	74
T218	2	#8	1	10'-9"	12'-7"	67
T250	22	#8	1	29'-6"	31'-4"	1841
T251	2	#8	1	28'-11"	30'-9"	164
T252	2	#8	1	28'-1"	29'-11"	160
T253	2	#8	1	27'-3"	29'-1"	155
T254	2	#8	1	26'-5"	28'-3"	151
T255	2	#8	1	25'-8"	27'-6"	147
T256	2	#8	1	24'-10"	26'-8"	142
T257	2	#8	1	24'-0"	25'-10"	138
T258	2	#8	1	23'-2"	25'-0"	134
T259	2	#8	1	22'-4"	24'-2"	129
T260	2	#8	1	21'-7"	23'-5"	125
T261	2	#8	1	20'-9"	22'-7"	121
T262	2	#8	1	19'-11"	21'-9"	116
T263	2	#8	1	19'-1"	20'-11"	112
T264	2	#8	1	18'-3"	20'-1"	107
T265	2	#8	1	17'-5"	19'-3"	103
T266	2	#8	1	16'-8"	18'-6"	99
T267	2	#8	1	15'-10"	17'-8"	94
T268	2	#8	1	15'-0"	16'-10"	90
T269	2	#8	1	14'-2"	16'-0"	85
T270	2	#8	1	13'-4"	15'-2"	81
T271	2	#8	1	12'-7"	14'-5"	77
T272	2	#8	1	11'-9"	13'-7"	73
U1	50	#4	3	---	9'-0"	301
U2	13	#4	3	---	8'-10"	77
U3	5	#4	3	---	10'-0"	33
U4	5	#4	3	---	10'-9"	36
V1	68	#11	STR	---	36'-3"	13097
⊕ REINFORCING STEEL						75,942 LBS.

† = ASTM A706 WELDABLE REINFORCING STEEL.

⊕ = TOTAL WEIGHT OF REINFORCING STEEL INCLUDES 159 LBS. OF ASTM A706 WELDABLE REINFORCING STEEL.

CLASS A CONCRETE BREAKDOWN		
POUR #1 (FOOTING)		205.3 C.Y.
POUR #2 (COLUMN)		82.8 C.Y.
POUR #3 (CAP)		125.6 C.Y.
TOTAL CLASS A CONCRETE		413.7 C.Y.
FOUNDATION EXCAVATION		LUMP SUM
HP 14 X 73 STEEL PILES	NO. 35	LIN. FT. 1368
PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES		NO. 35

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

NORTH CAROLINA PROFESSIONAL SEAL 20777 ENGINEER — DocuSigned by: Hardy Willis — 7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Raleigh, NC 919-977-9455 · Charlotte, NC 704-357-0488 · Boone, NC 828-355-9933 · Tri-Cities, TN 423-467-8401 · Knoxville, TN 865-546-5800 · Spartanburg, SC 864-574-4775 · Charleston, SC 843-974-5650 · Middlesboro, KY 606-248-6600 · Atlanta, GA 770-627-3590

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

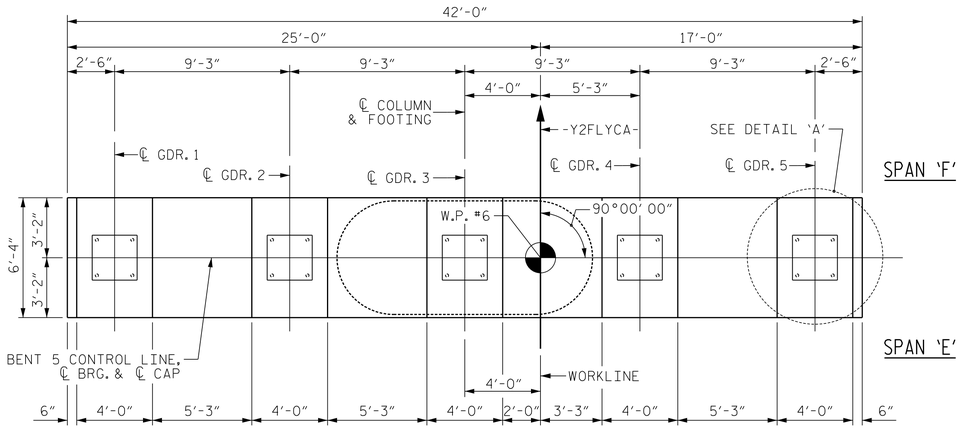
BENT 4

DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: RTS	DATE: 03/2022

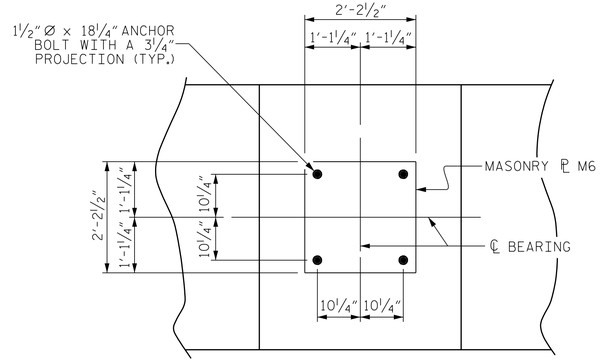
REVISIONS							
NO.	BY:	DATE:		NO.	BY:	DATE:	
1				3			
2				4			

SHEET NO. S1-80

TOTAL SHEETS 92



PLAN OF CAP



DETAIL 'A'

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

HOOKS ON "M" & "T" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

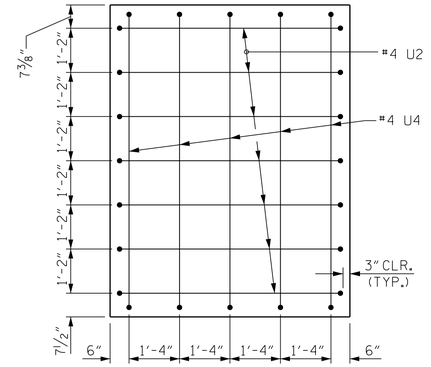
"T" BARS IN FOOTING MAY BE SHIFTED AS NECESSARY TO CLEAR M1 BARS EXTENDING INTO COLUMN.

FOR MASS CONCRETE, SEE SPECIAL PROVISIONS.

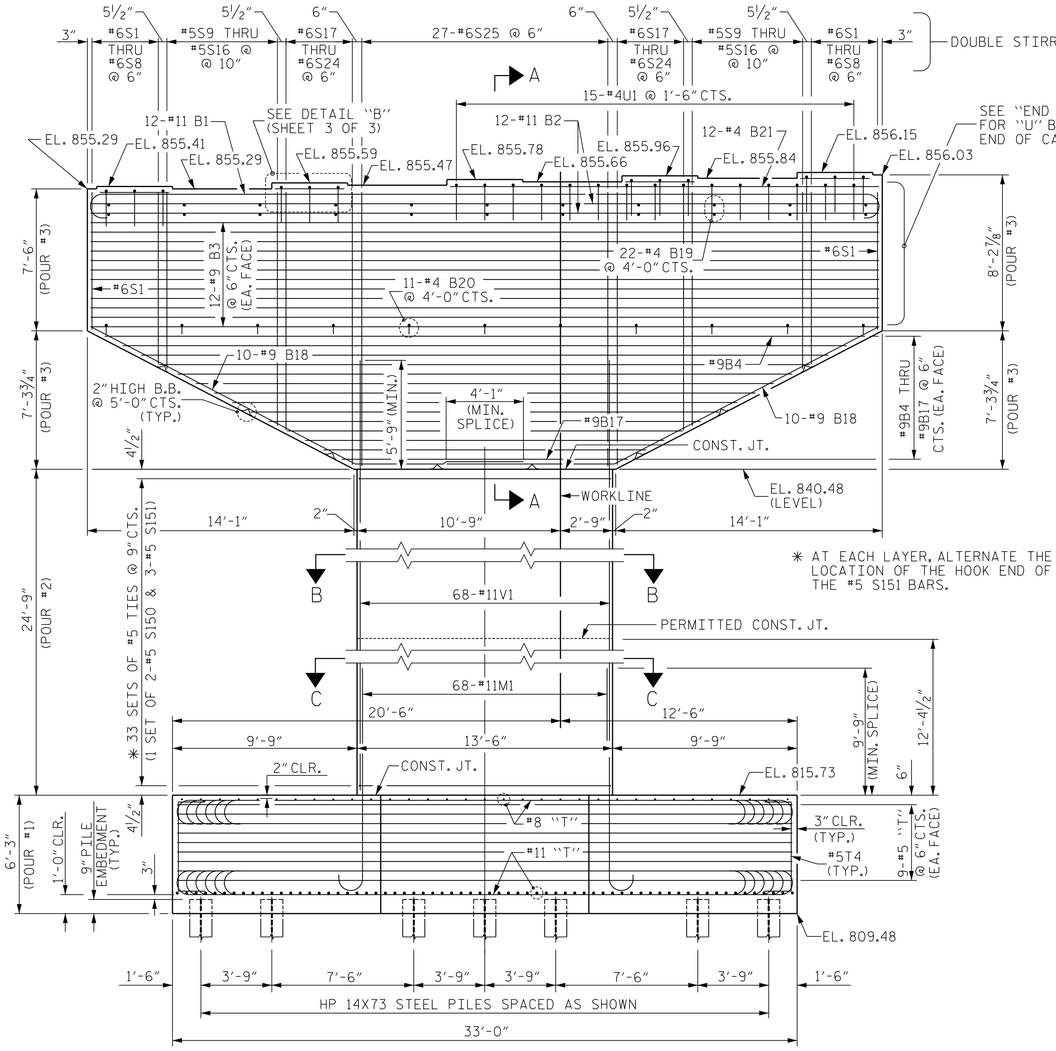
FOR FOOTING PLAN, SECTION B-B, SECTION, C-C, AND PILE UPLIFT ANCHOR DETAILS, SEE SHEET 2 OF 3.

FOR SECTION A-A, DETAIL "B", AND BILL OF MATERIAL, SEE SHEET 3 OF 3.

DETAILED DRAWINGS FOR FALSEWORK AND FORMS FOR THIS HAMMERHEAD BENT CAP SHALL BE SUBMITTED, SEE SHEET SN.

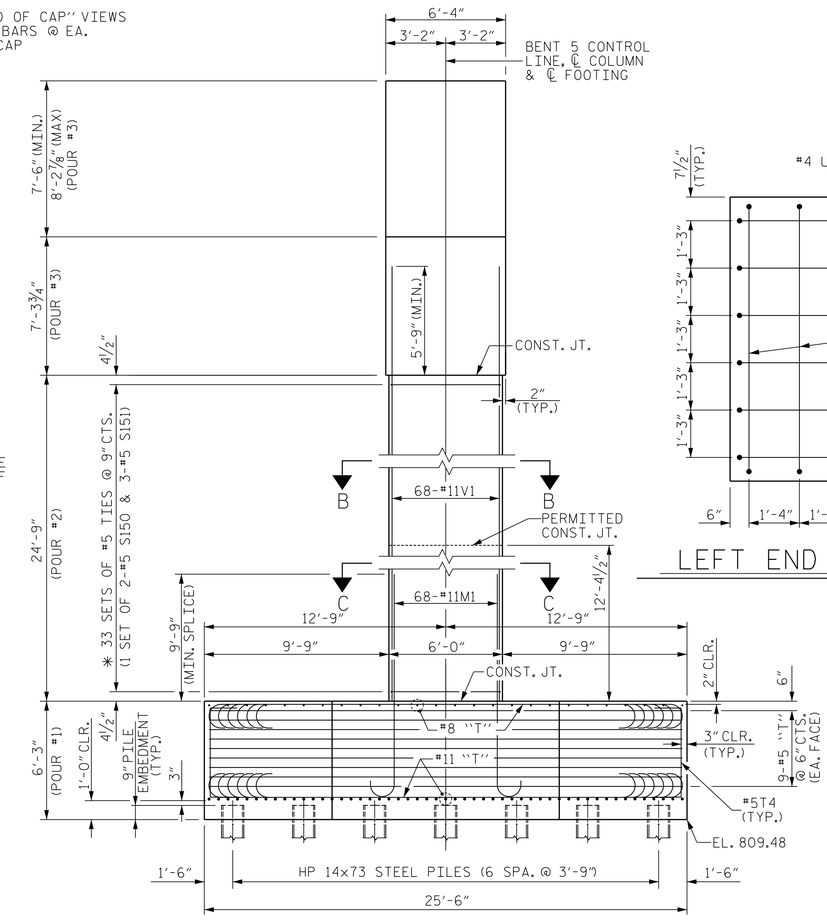


RIGHT END OF CAP VIEW

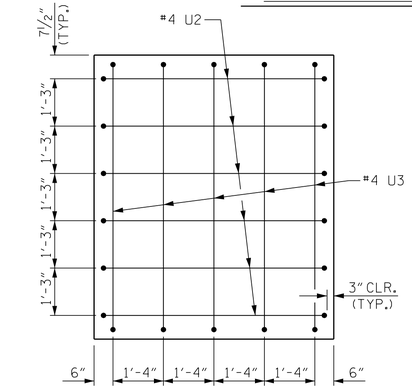


* AT EACH LAYER, ALTERNATE THE LOCATION OF THE HOOK END OF THE #5 S151 BARS.

ELEVATION



END ELEVATION



LEFT END OF CAP VIEW

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Vaughn & Melton
Consulting Engineers
Asheville, North Carolina 828-253-2796
Boone, NC 828-355-9933
Tri-Cities, TN 423-467-8400
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488
Atlanta, GA 770-627-3590

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 5

DWN. BY: NCW DATE: 03/2022
CHKD. BY: PRG DATE: 03/2022
DES. EGR. OF RECORD: RTS DATE: 03/2022

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-81
1			3			TOTAL SHEETS
2			4			92

wdcruzer
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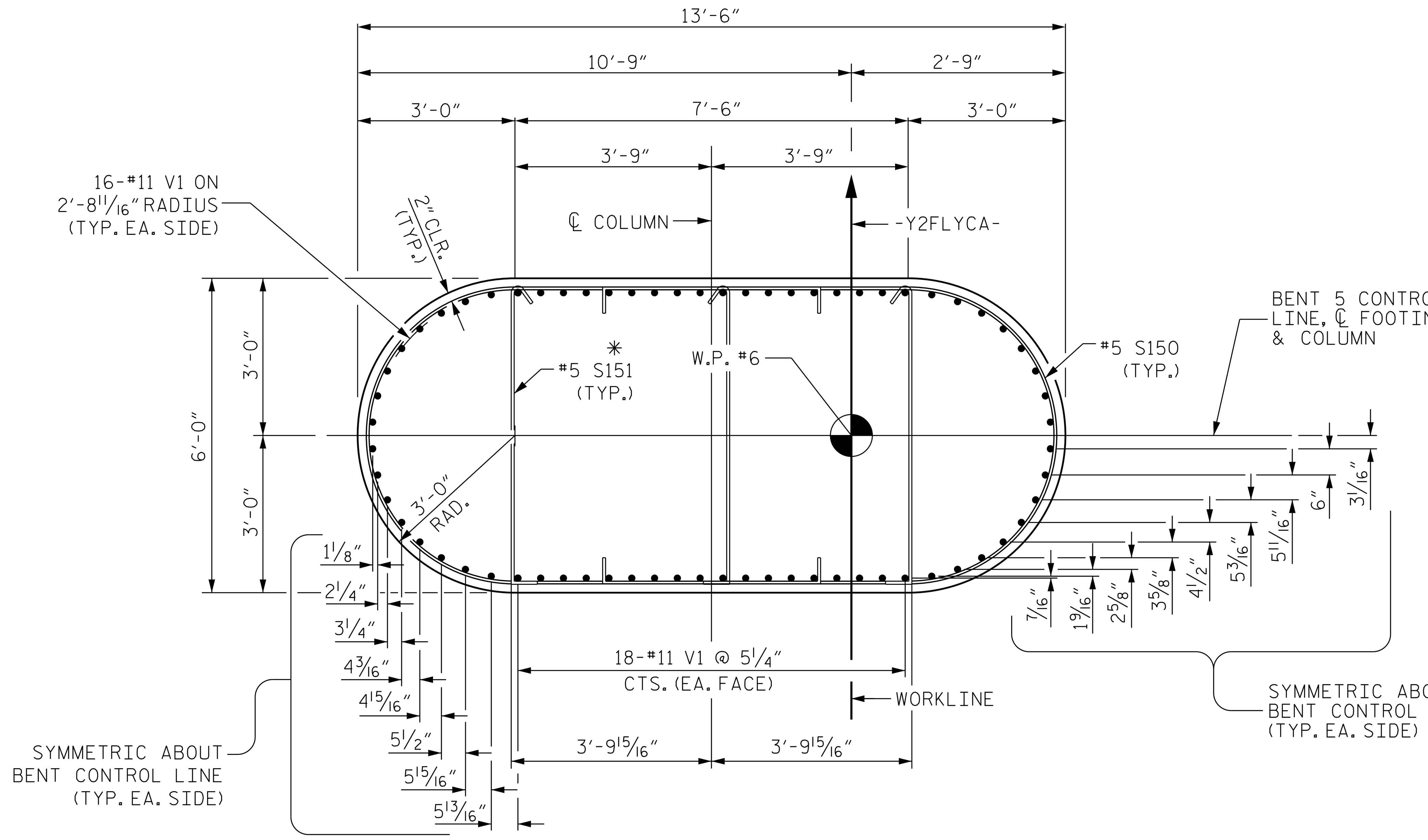
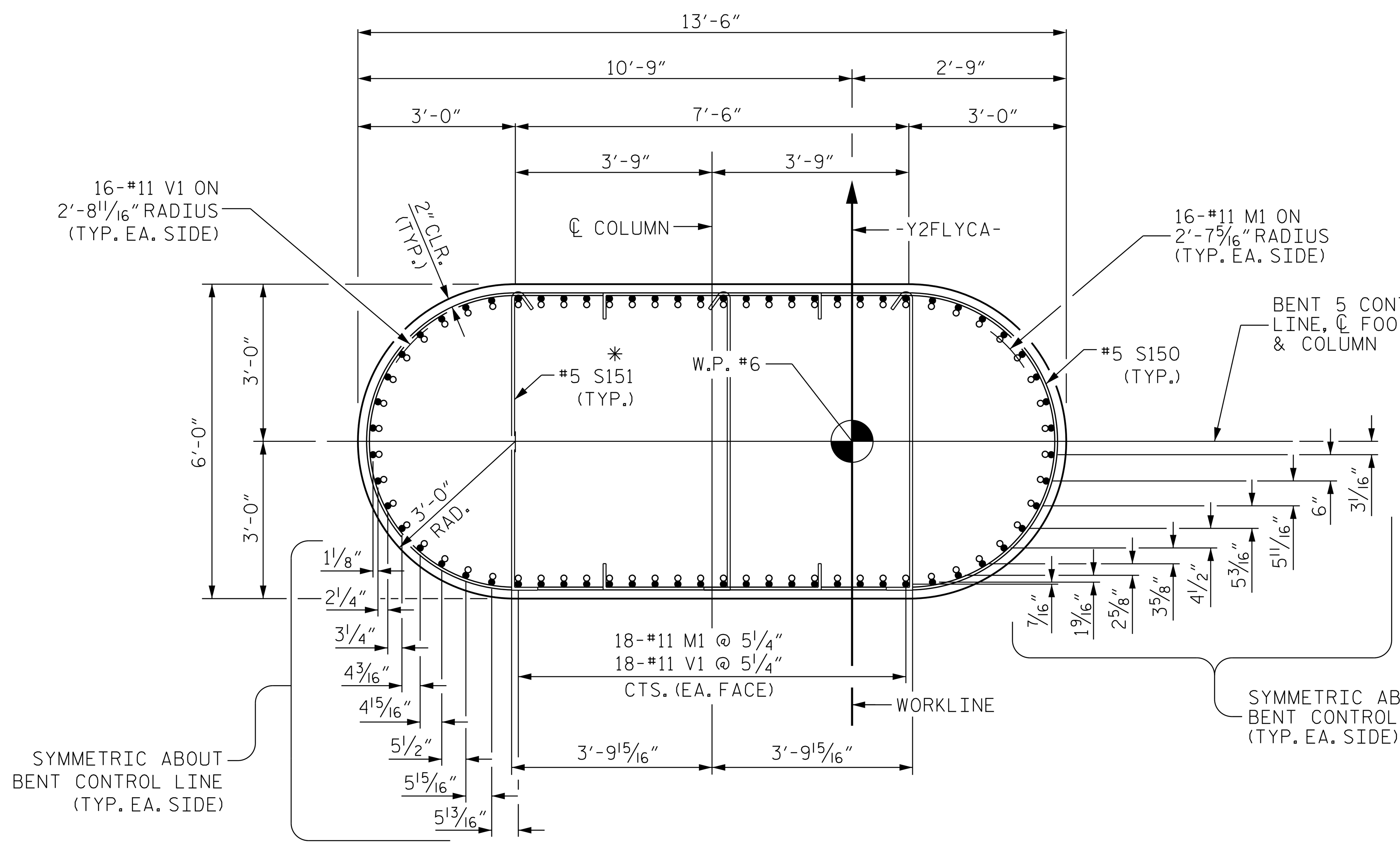
TIME: 10:03 AM on Tuesday, July 26, 2022



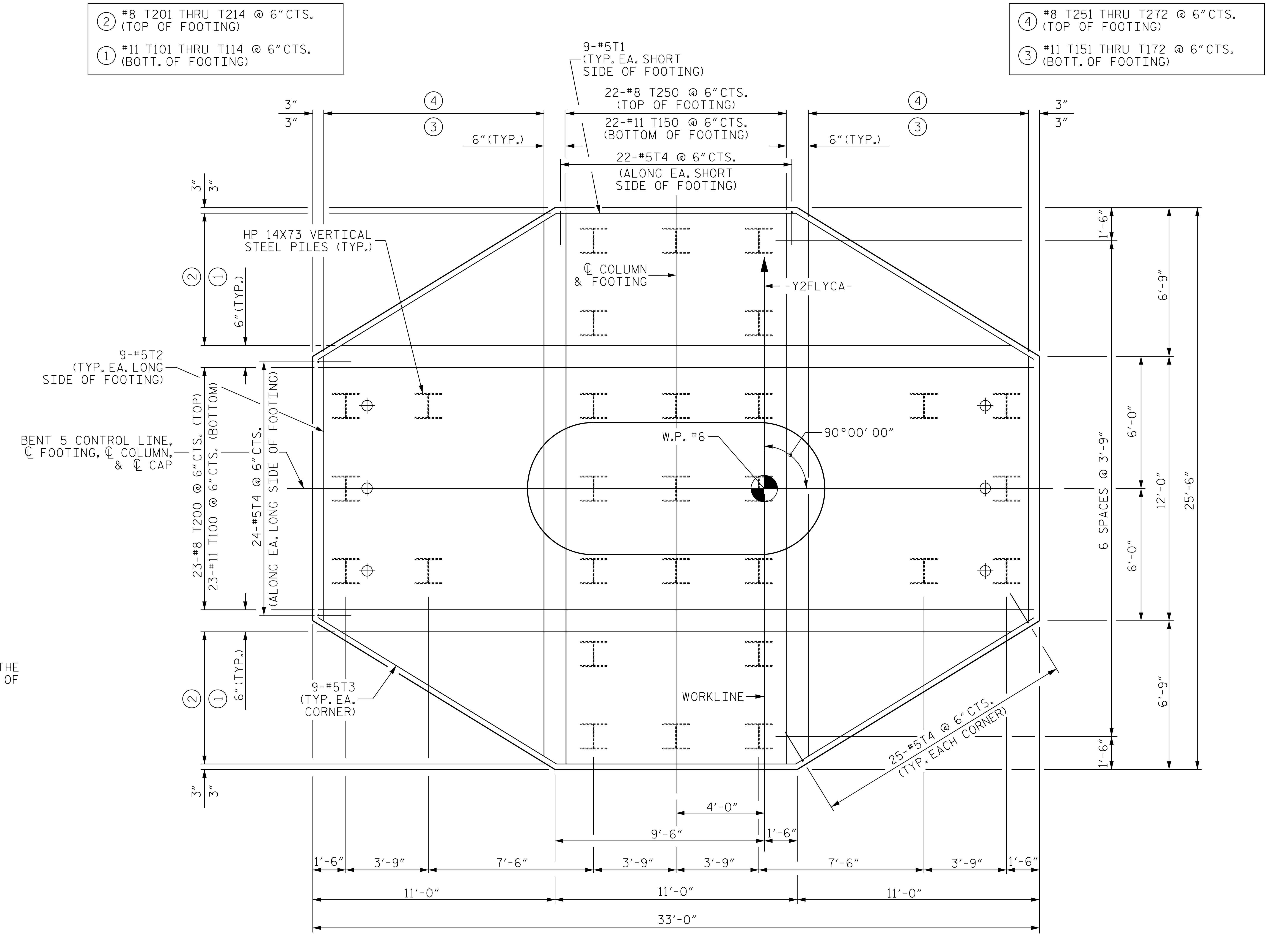
SECTION B-B

○ - M1 BAR LOCATION
● - V1 BAR LOCATION

✱ AT EACH LAYER, ALTERNATE THE LOCATION OF THE HOOK END OF THE #5 S151 BARS.

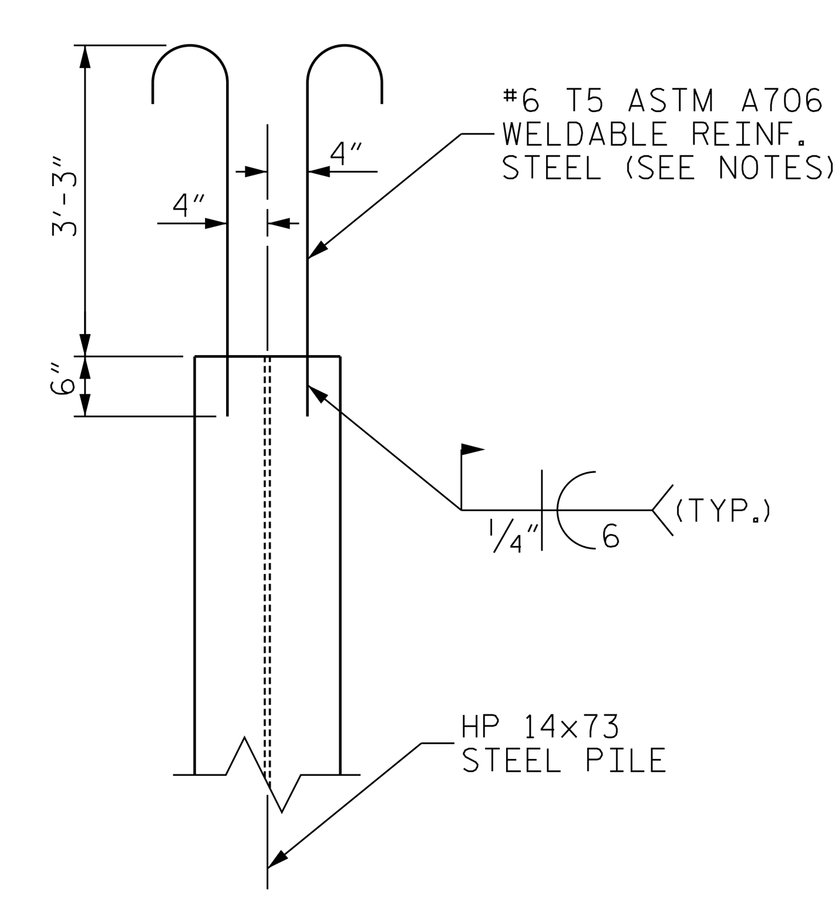


SECTION C-C

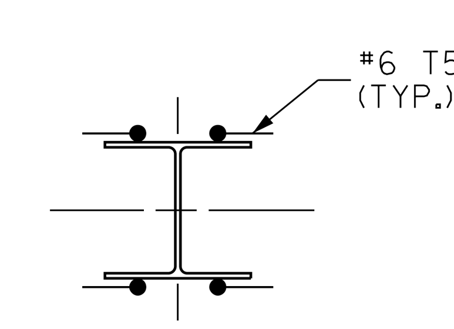


PLAN OF FOOTING

⊕ (DENOTES PILES WITH UPLIFT ANCHORS)



ELEVATION



PLAN

PILE UPLIFT ANCHOR DETAILS

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 5

V&M Vaughn & Melton Consulting Engineers, Asheville, North Carolina

7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

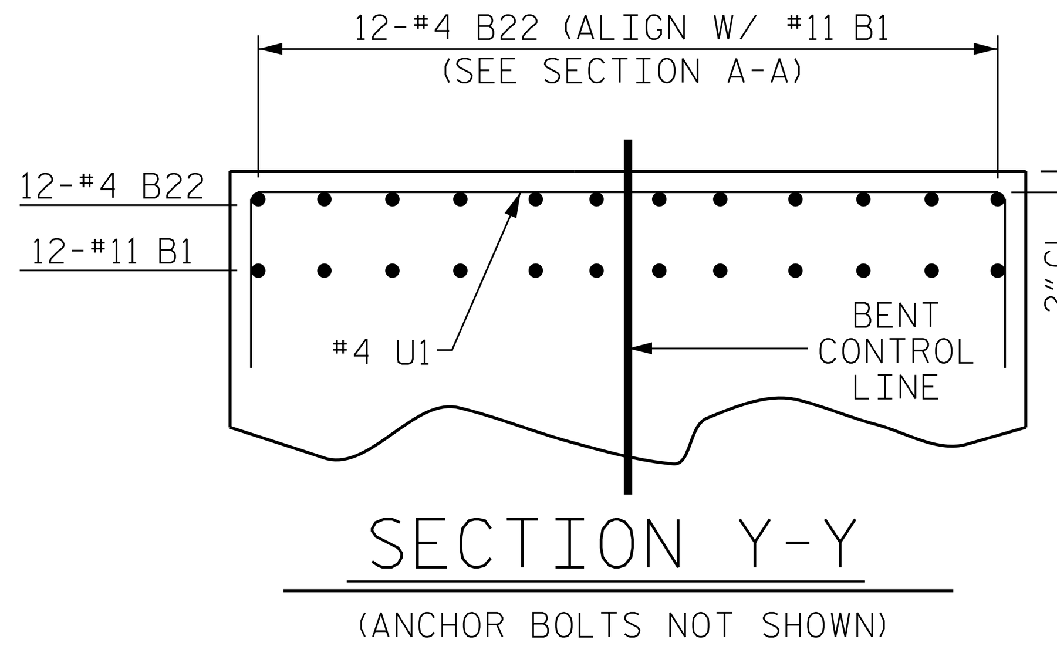
DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: RTS	DATE: 03/2022

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

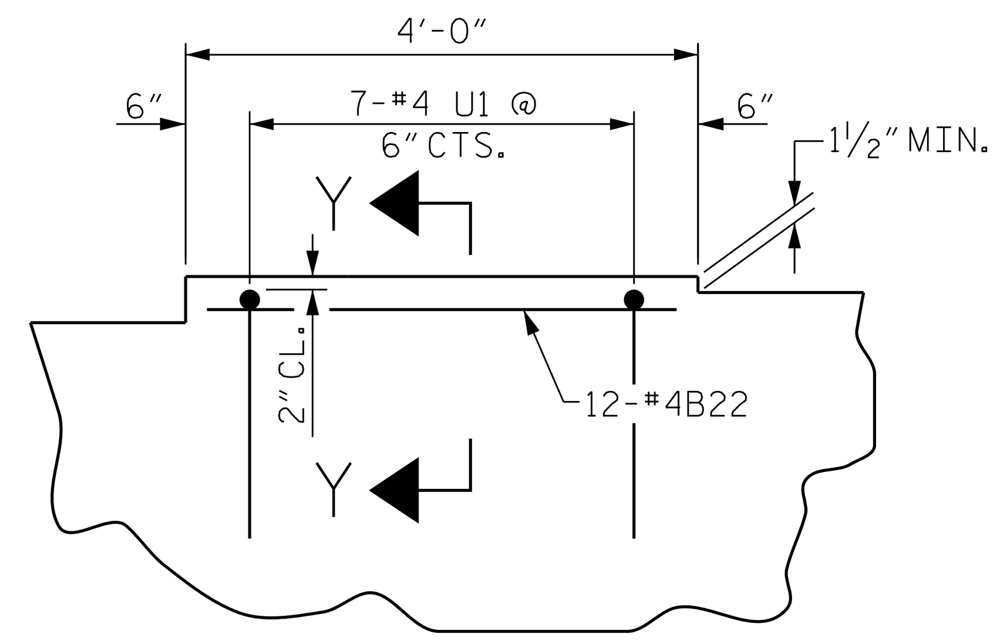
SHEET NO. S1-82

TOTAL SHEETS 92



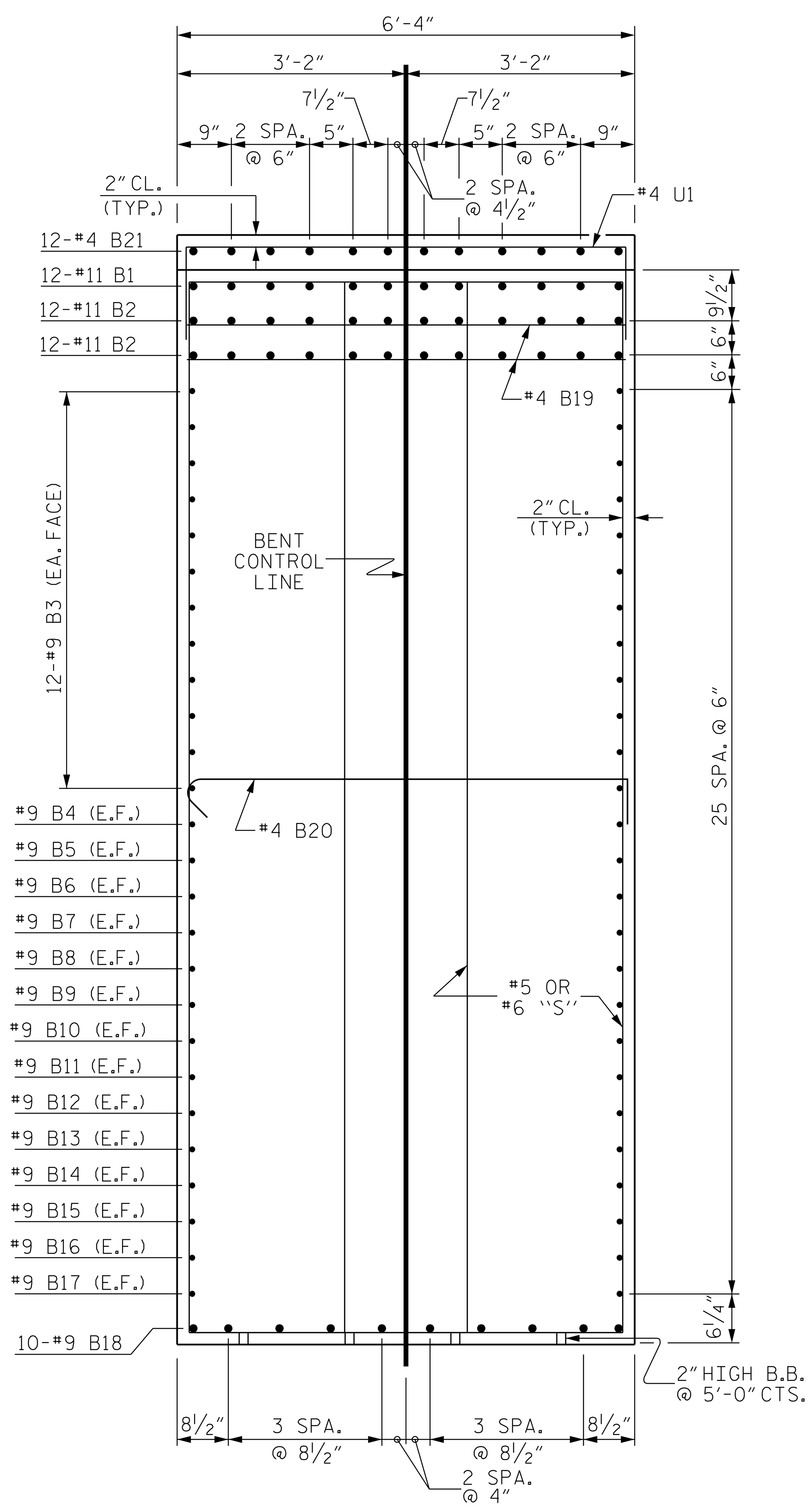
SECTION Y-Y

(ANCHOR BOLTS NOT SHOWN)



DETAIL "B"

(TYP. UNDER EA. GIRDER)



SECTION A-A

BILL OF MATERIAL

BENT NO. 5

BAR	NO.	SIZE	TYPE	DIM. "A"	LENGTH	WEIGHT
B1	12	#11	1	---	44′-10″	2858
B2	24	#11	STR	---	41′-8″	5313
B3	24	#9	STR	---	41′-8″	3400
B4	2	#9	STR	---	40′-2″	273
B5	2	#9	STR	---	38′-2″	260
B6	2	#9	STR	---	36′-3″	245
B7	2	#9	STR	---	34′-4″	233
B8	2	#9	STR	---	32′-5″	220
B9	2	#9	STR	---	30′-6″	207
B10	2	#9	STR	---	28′-7″	194
B11	2	#9	STR	---	26′-8″	181
B12	2	#9	STR	---	24′-9″	168
B13	2	#9	STR	---	22′-10″	155
B14	2	#9	STR	---	20′-10″	142
B15	2	#9	STR	---	18′-11″	129
B16	2	#9	STR	---	17′-0″	116
B17	2	#9	STR	---	15′-1″	103
B18	20	#9	2	---	24′-8″	1677
B19	22	#4	STR	---	6′-0″	88
B20	11	#4	7	---	6′-11″	51
B21	12	#4	STR	---	22′-8″	182
B22	60	#4	STR	---	3′-8″	147
M1	68	#11	4	---	16′-5″	5931
S1	4	#6	5	7′-3″	23′-5″	141
S2	4	#6	5	7′-6″	23′-11″	144
S3	4	#6	5	7′-9½″	24′-6″	147
S4	4	#6	5	8′-0½″	25′-0″	150
S5	4	#6	5	8′-3½″	25′-6″	153
S6	4	#6	5	8′-6½″	26′-0″	156
S7	4	#6	5	8′-10″	26′-7″	160
S8	4	#6	5	9′-1″	27′-1″	163
S9	4	#5	5	9′-4″	27′-2	113
S10	4	#5	5	9′-9½″	28′-1″	117
S11	4	#5	5	10′-2½″	28′-11″	121
S12	4	#5	5	10′-7½″	29′-9″	124
S13	4	#5	5	11′-1″	30′-8″	128
S14	4	#5	5	11′-6″	31′-6″	131
S15	4	#5	5	11′-11″	32′-4″	135
S16	4	#5	5	12′-4″	33′-2″	138
S17	4	#6	5	12′-7″	34′-1″	205
S18	4	#6	5	12′-10″	34′-7″	208
S19	4	#6	5	13′-1″	35′-1″	211
S20	4	#6	5	13′-4½″	35′-8″	214
S21	4	#6	5	13′-7½″	36′-2″	217
S22	4	#6	5	13′-10½″	36′-8″	220
S23	4	#6	5	14′-1½″	37′-2″	223
S24	4	#6	5	14′-4½″	37′-8″	226
S25	54	#6	5	14′-5½″	37′-10″	3069
S150	66	#5	6	---	21′-7″	1486
S151	99	#5	7	---	6′-8″	688
T1	18	#5	STR	---	10′-10″	203
T2	18	#5	STR	---	11′-8″	219
T3	36	#5	STR	---	12′-8″	476
T4	192	#5	3	---	7′-10″	1569
† T5	24	#6	4	---	4′-5″	159
T100	23	#11	1	32′-6″	35′-8″	4358
T101	2	#11	1	32′-0″	35′-2″	374
T102	2	#11	1	30′-5″	33′-7″	357
T103	2	#11	1	28′-9″	31′-11″	339
T104	2	#11	1	27′-1″	30′-3″	321
T105	2	#11	1	25′-6″	28′-8″	305
T106	2	#11	1	23′-10″	27′-0″	287
T107	2	#11	1	22′-3″	25′-5″	270
T108	2	#11	1	20′-7″	23′-9″	252
T109	2	#11	1	19′-0″	22′-2″	236
T110	2	#11	1	17′-4″	20′-6″	218
T111	2	#11	1	15′-9″	18′-11″	201
T112	2	#11	1	14′-1″	17′-3″	183
T113	2	#11	1	12′-5″	15′-7″	166
T114	2	#11	1	10′-10″	14′-0″	149

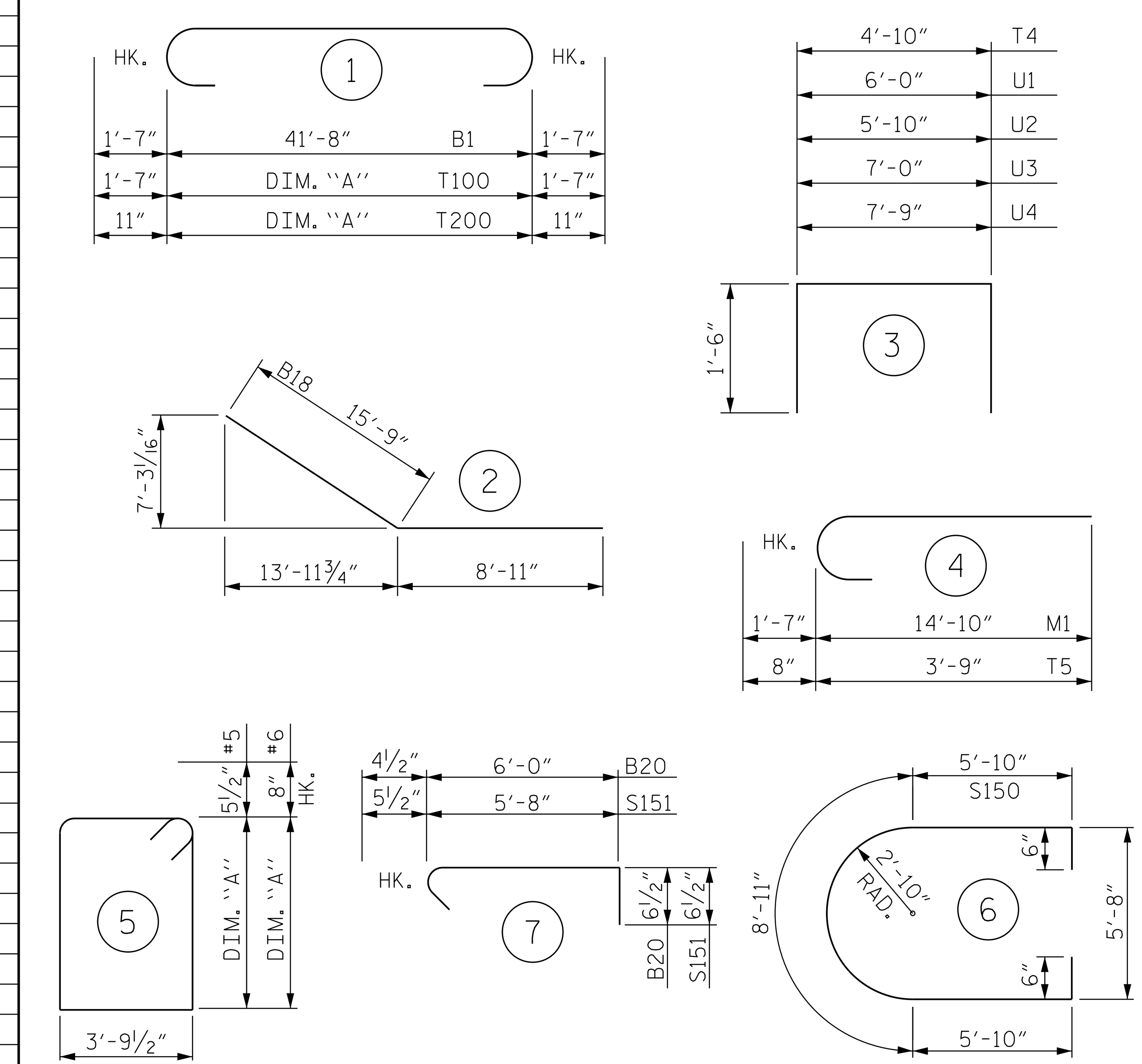
BAR	NO.	SIZE	TYPE	DIM. "A"	LENGTH	WEIGHT
T150	22	#11	1	25′ -0″	28′-8″	3351
T151	2	#11	1	24′-7″	27′-9″	295
T152	2	#11	1	23′-11″	27′-1″	288
T153	2	#11	1	23′-4″	26′-6″	282
T154	2	#11	1	22′-9″	25′-11″	275
T155	2	#11	1	22′-1″	25′-3″	268
T156	2	#11	1	21′-6″	24′-8″	262
T157	2	#11	1	20′-11″	24′-1″	256
T158	2	#11	1	20′-3″	23′-5″	249
T159	2	#11	1	19′-8″	22′-10″	243
T160	2	#11	1	19′-1″	22′-3″	236
T161	2	#11	1	18′-5″	21′-7″	229
T162	2	#11	1	17′-10″	21′-0″	223
T163	2	#11	1	17′-2″	20′-4″	216
T164	2	#11	1	16′-7″	19′-9″	210
T165	2	#11	1	16′-0″	19′-2″	204
T166	2	#11	1	15′-4″	18′-6″	197
T167	2	#11	1	14′-9″	17′-11″	190
T168	2	#11	1	14′-2″	17′-4″	184
T169	2	#11	1	13′-6″	16′-8″	177
T170	2	#11	1	12′-11″	16′-1″	171
T171	2	#11	1	12′-4″	15′-6″	165
T172	2	#11	1	11′-8″	14′-10″	158
T200	23	#8	1	32′-6″	34′-3″	2108
T201	2	#8	1	32′-0″	33′-10″	181
T202	2	#8	1	30′-5″	32′-3″	172
T203	2	#8	1	28′-9″	30′-7″	163
T204	2	#8	1	27′-1″	28′-11″	154
T205	2	#8	1	25′-6″	27′-4″	146
T206	2	#8	1	23′-10″	25′-8″	137
T207	2	#8	1	22′-3″	24′-1″	129
T208	2	#8	1	20′-7″	22′-5″	120
T209	2	#8	1	19′-0″	20′-10″	111
T210	2	#8	1	17′-4″	19′-2″	102
T211	2	#8	1	15′-9″	17′-7″	94
T212	2	#8	1	14′-1″	15′-11″	85
T213	2	#8	1	12′-5″	14′-3″	76
T214	2	#8	1	10′-10″	12′-8″	68
T250	22	#8	1	25′ -0″	26′-10″	1576
T251	2	#8	1	24′-7″	26′-5″	141
T252	2	#8	1	23′-11″	25′-9″	138
T253	2	#8	1	23′-4″	25′-2″	134
T254	2	#8	1	22′-9″	24′-7″	131
T255	2	#8	1	22′-1″	23′-11″	128
T256	2	#8	1	21′-6″	23′-4″	125
T257	2	#8	1	20′-11″	22′-9″	121
T258	2	#8	1	20′-3″	22′-1″	118
T259	2	#8	1	19′-8″	21′-6″	115
T260	2	#8	1	19′-1″	20′-11″	112
T261	2	#8	1	18′-5″	20′-3″	108
T262	2	#8	1	17′-10″	19′-8″	105
T263	2	#8	1	17′-2″	19′-0″	101
T264	2	#8	1	16′-7″	18′-5″	98
T265	2	#8	1	16′-0″	17′-10″	95
T266	2	#8	1	15′-4″	17′-2″	92
T267	2	#8	1	14′-9″	16′-7″	89
T268	2	#8	1	14′-2″	16′-0″	85
T269	2	#8	1	13′-6″	15′-4″	82
T270	2	#8	1	12′-11″	14′-9″	79
T271	2	#8	1	12′-4″	14′-2″	76
T272	2	#8	1	11′-8″	13′-6″	72
U1	50	#4	3	---	9′-0″	301
U2	13	#4	3	---	8′-10″	77
U3	5	#4	3	---	10′-0″	33
U4	5	#4	3	---	10′-9″	36
V1	68	#11	STR	---	30′-7″	11049
⊞ REINFORCING STEEL						69,977 LBS.

⊞ = TOTAL WEIGHT OF REINFORCING STEEL INCLUDES 159 LBS. OF ASTM A706 WELDABLE REINFORCING STEEL.

† = ASTM A706 WELDABLE REINFORCING STEEL.

CLASS A CONCRETE BREAKDOWN		
POUR #1 (FOOTING)		160.4 C.Y.
POUR #2 (COLUMN)		67.2 C.Y.
POUR #3 (CAP)		125.6 C.Y.
TOTAL CLASS A CONCRETE		353.2 C.Y.
FOUNDATION EXCAVATION		LUMP SUM
HP 14 X 73 STEEL PILES	NO. 29	LIN. FT. 1327
PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES		NO. 29

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL — DocuSigned by: Hardy Wills 7/26/2022

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PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

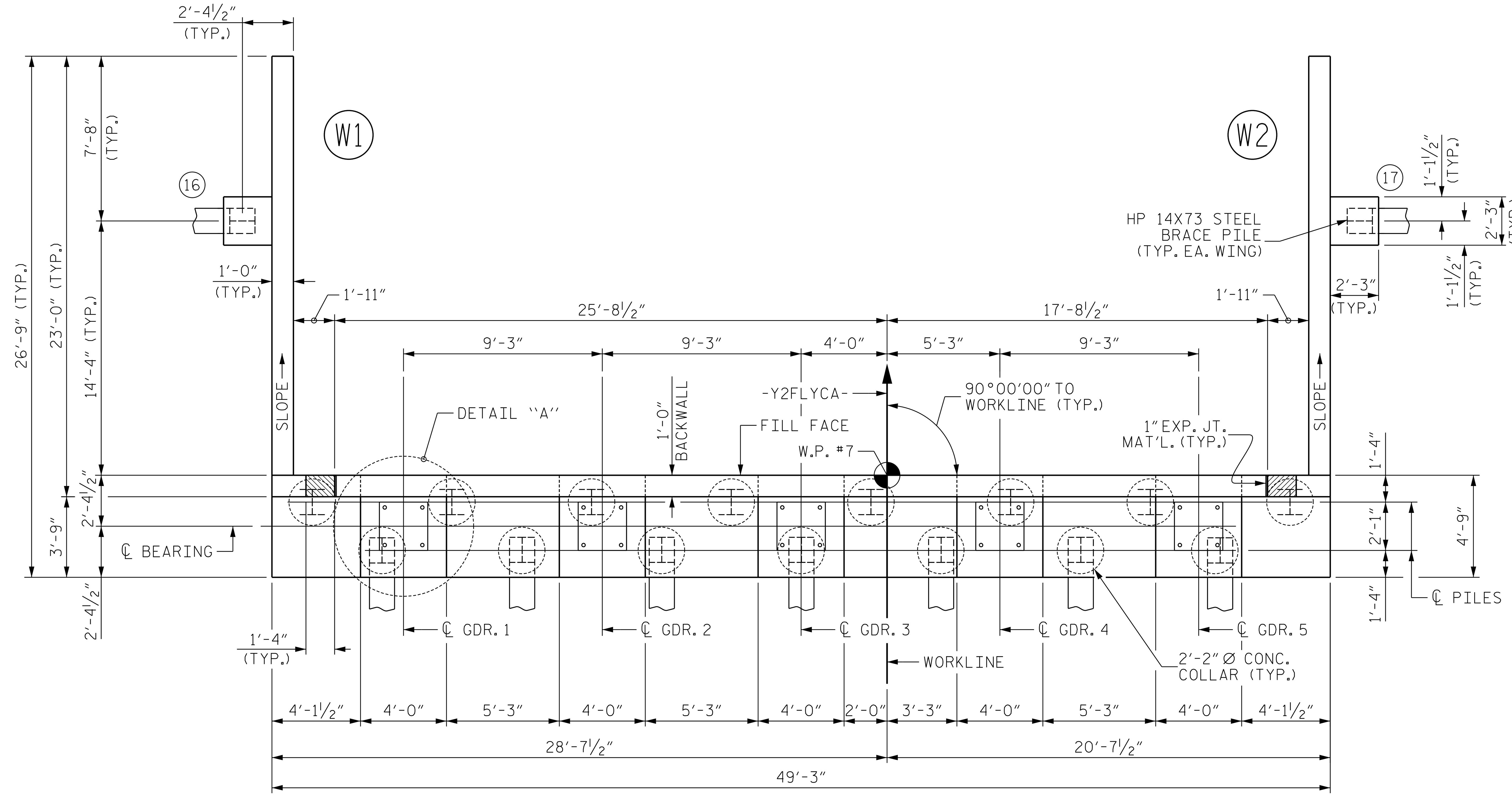
BENT 5

DWN. BY: NCW	DATE: 03/2022
CHKD. BY: PRG	DATE: 03/2022
DES. EGR. OF RECORD: RTS	DATE: 03/2022

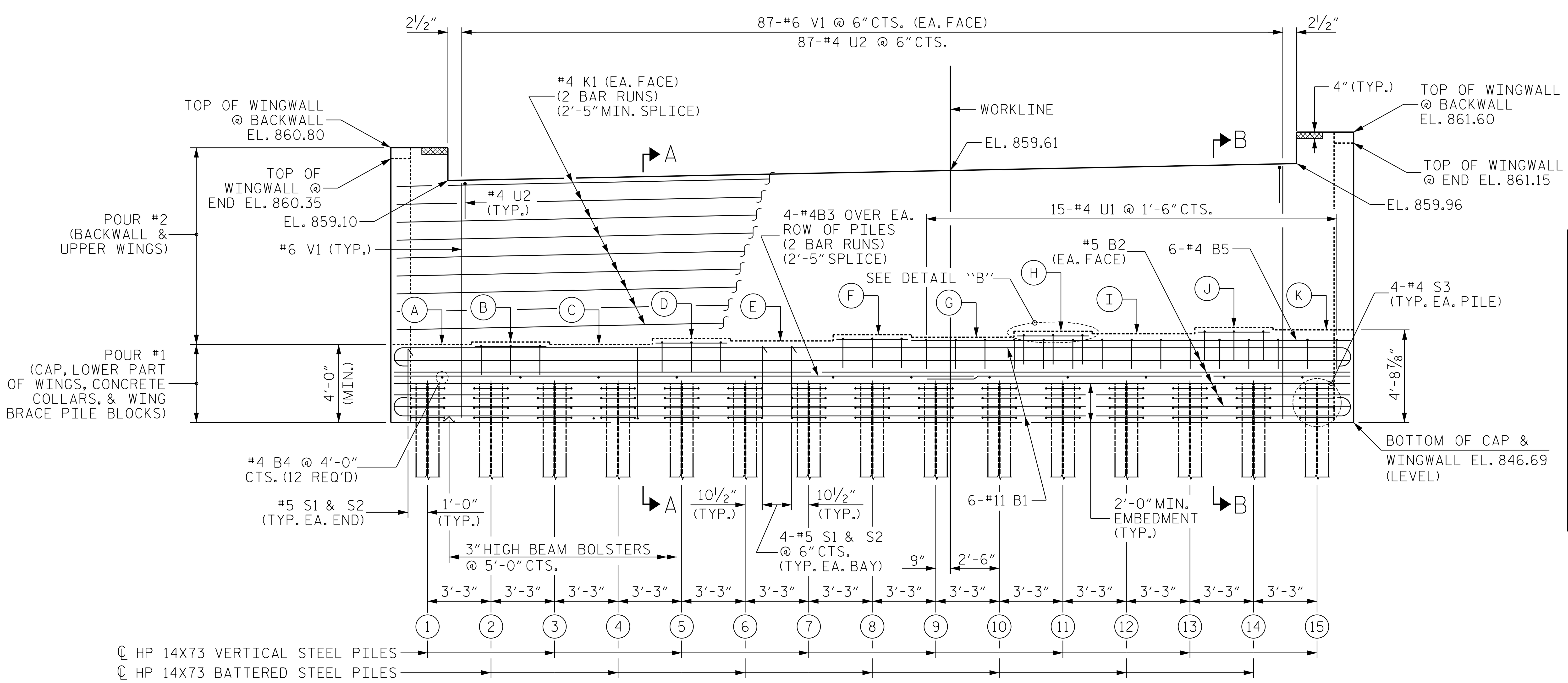
REVISIONS							
NO.	BY:	DATE:		NO.	BY:	DATE:	
1				3			
2				4			

SHEET NO. S1-83

TOTAL SHEETS 92



PLAN



ELEVATION

(CONCRETE PILE COLLARS AND WING BRACE PILE BLOCKS NOT SHOWN FOR CLARITY)

ELEVATION TABLE	
LOCATION	ELEVATION
A	850.69
B	850.81
C	850.69
D	851.00
E	850.88
F	851.18
G	851.06
H	851.37
I	851.25
J	851.55
K	851.43

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

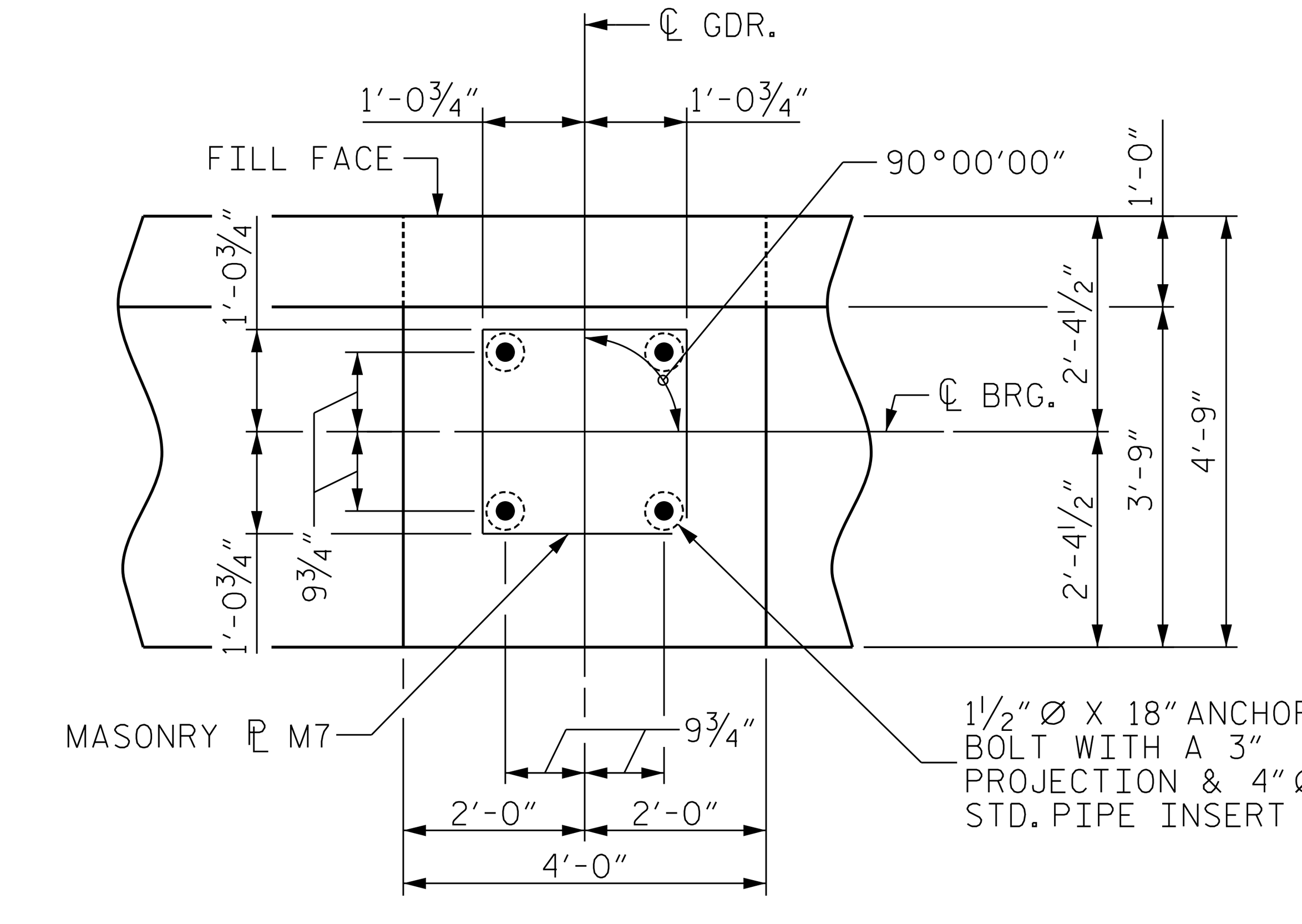
THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING METHOD SHALL NOT BE USED.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

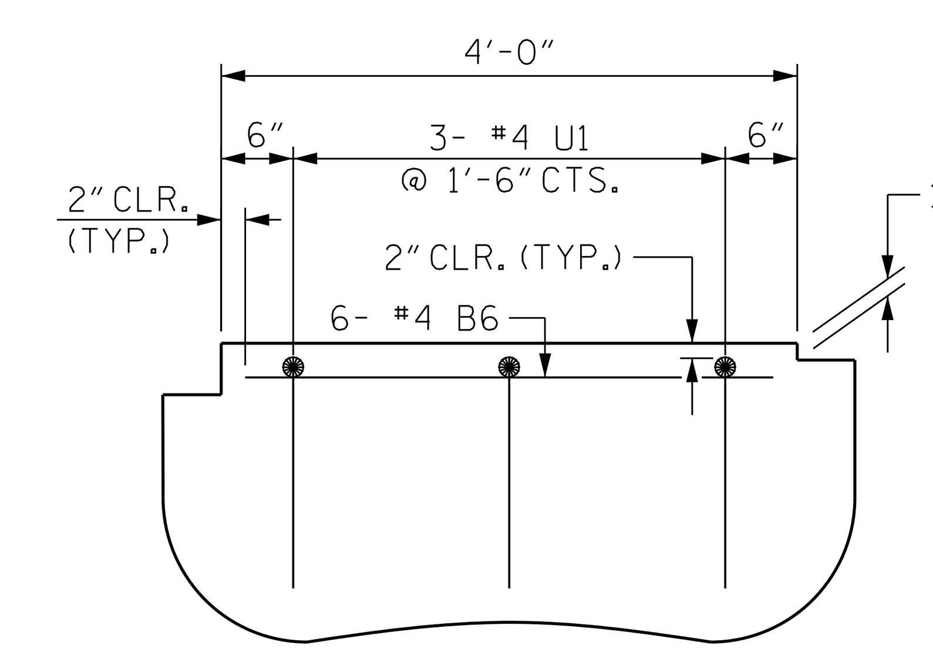
FOR PIPE INSERT DETAILS, SEE "DISC BEARING DETAILS" SHEET.

FOR WING DETAILS, SEE SHEET 2 OF 4.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.



DETAIL "A"



DETAIL "B"

(TYP. EACH BRIDGE SEAT)

7/26/2022

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PROJECT NO. U-2579AA
FORSYTH COUNTY
STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-
SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

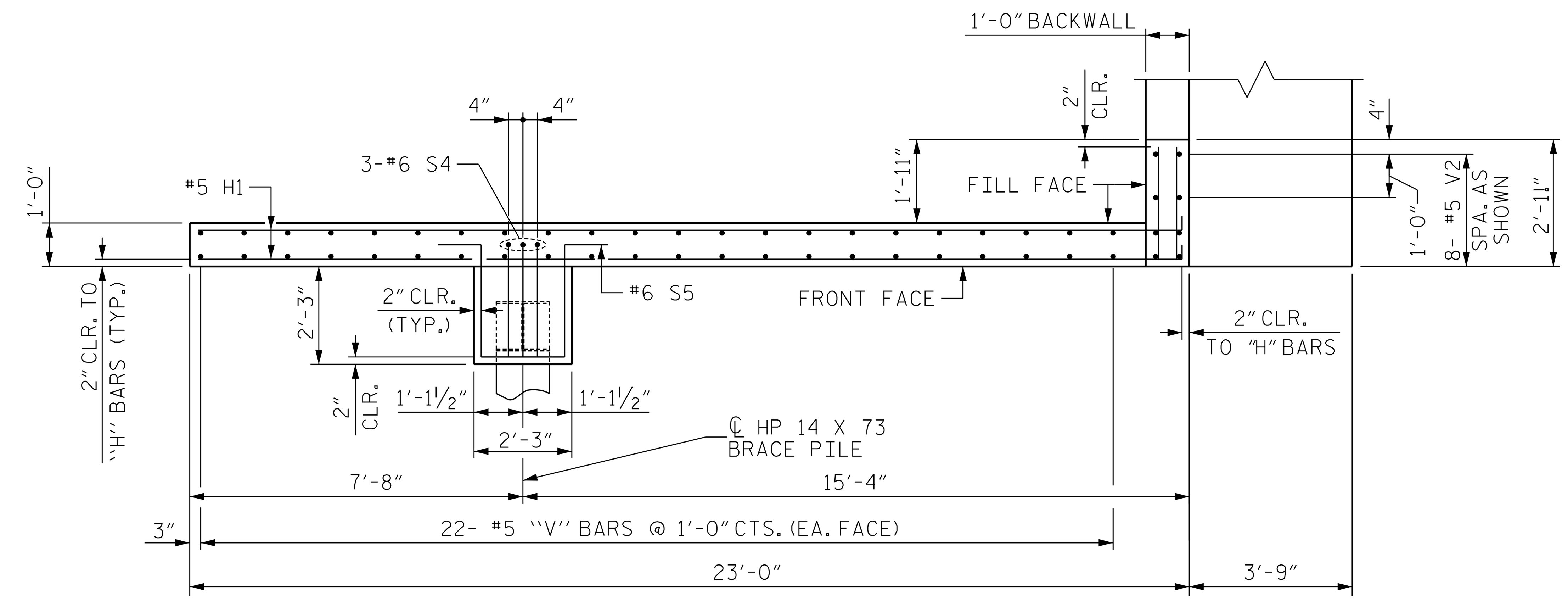
SUBSTRUCTURE
END BENT 2

DWN. BY: NCW DATE: 03/2022
CHKD. BY: PRG DATE: 03/2022
DES. EGR. OF RECORD: RTS DATE: 03/2022

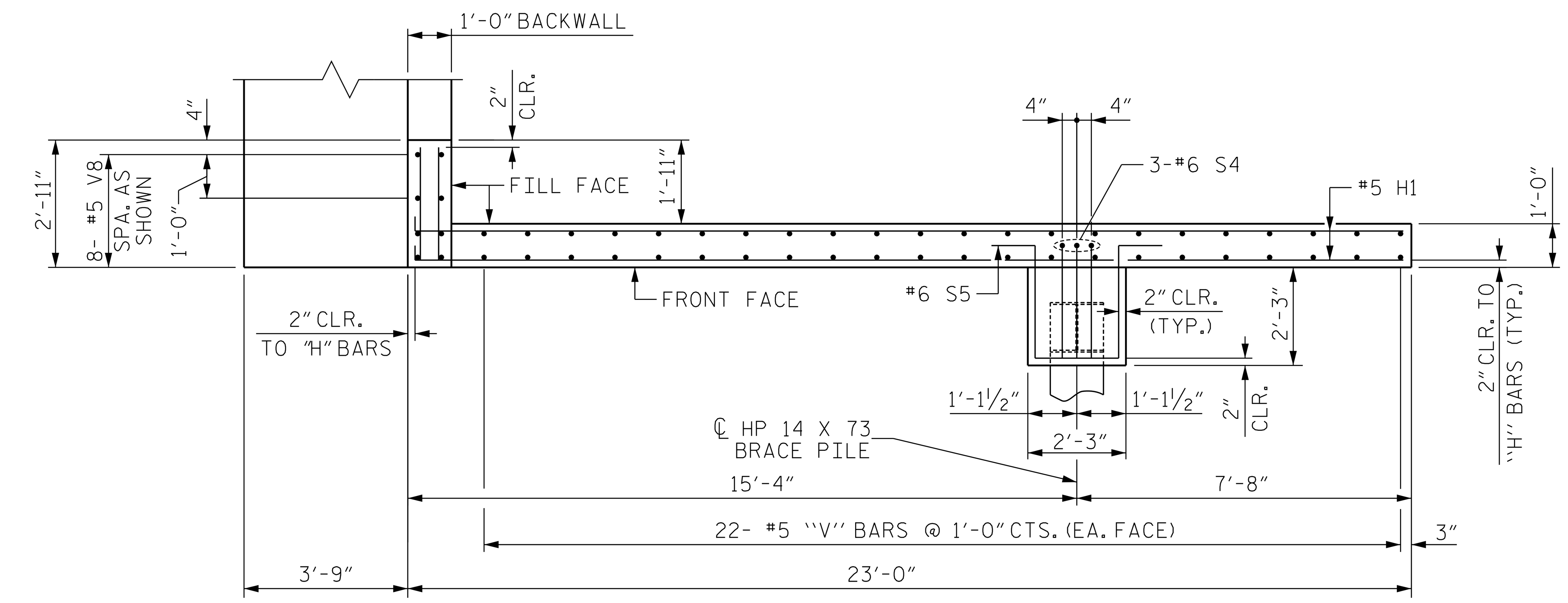
REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

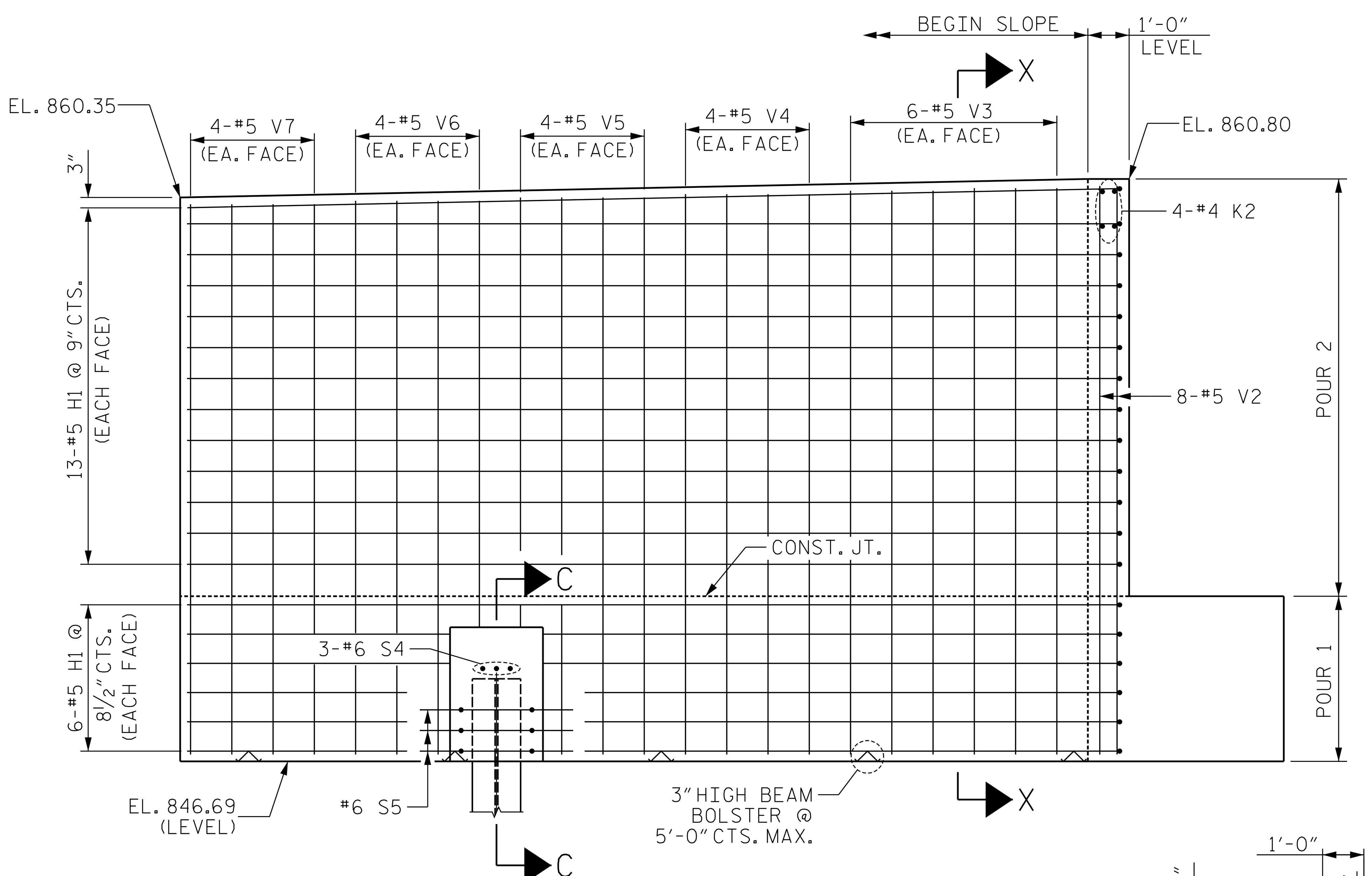
SHEET NO. S1-84
TOTAL SHEETS 92



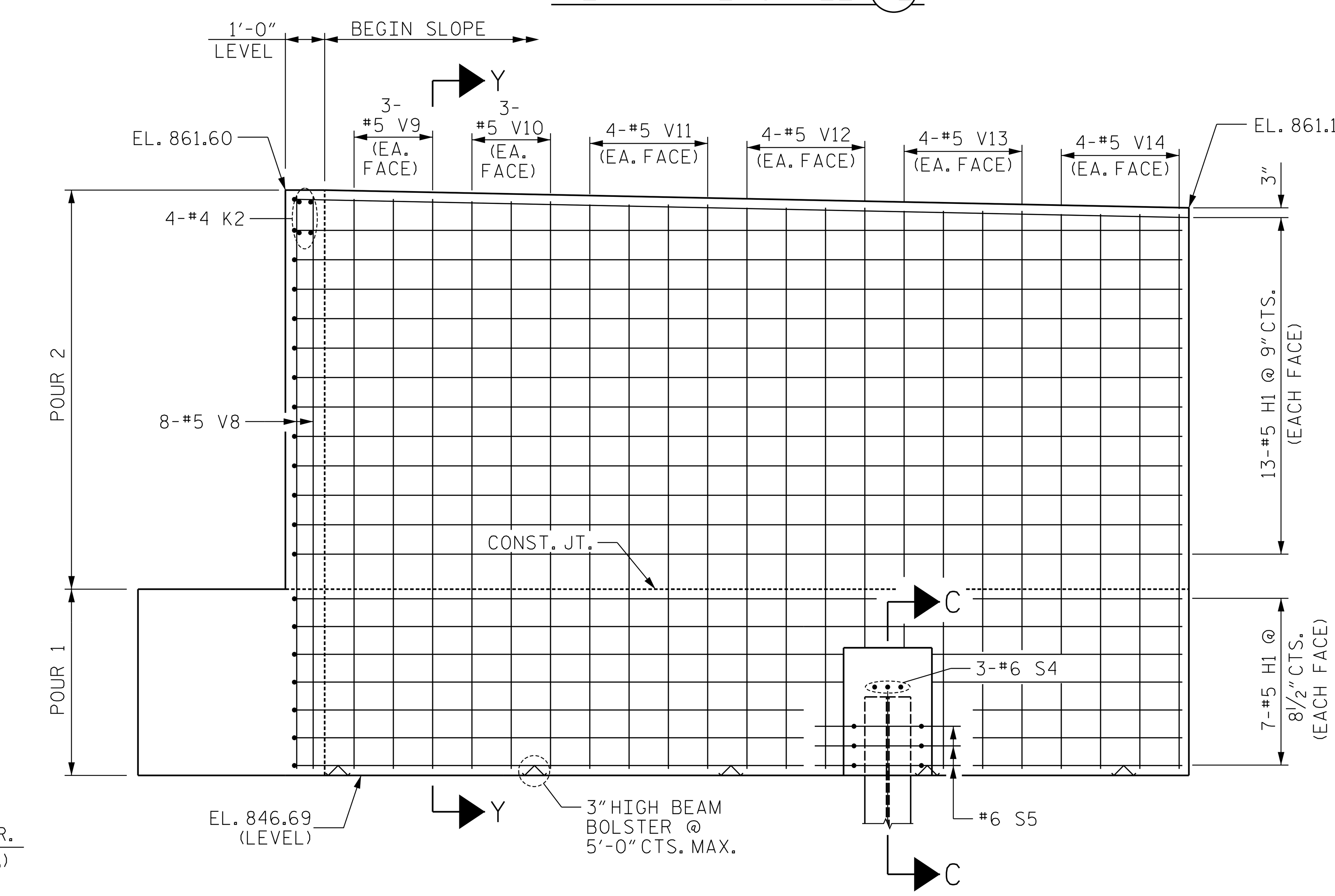
PLAN - WINGWALL (W1)



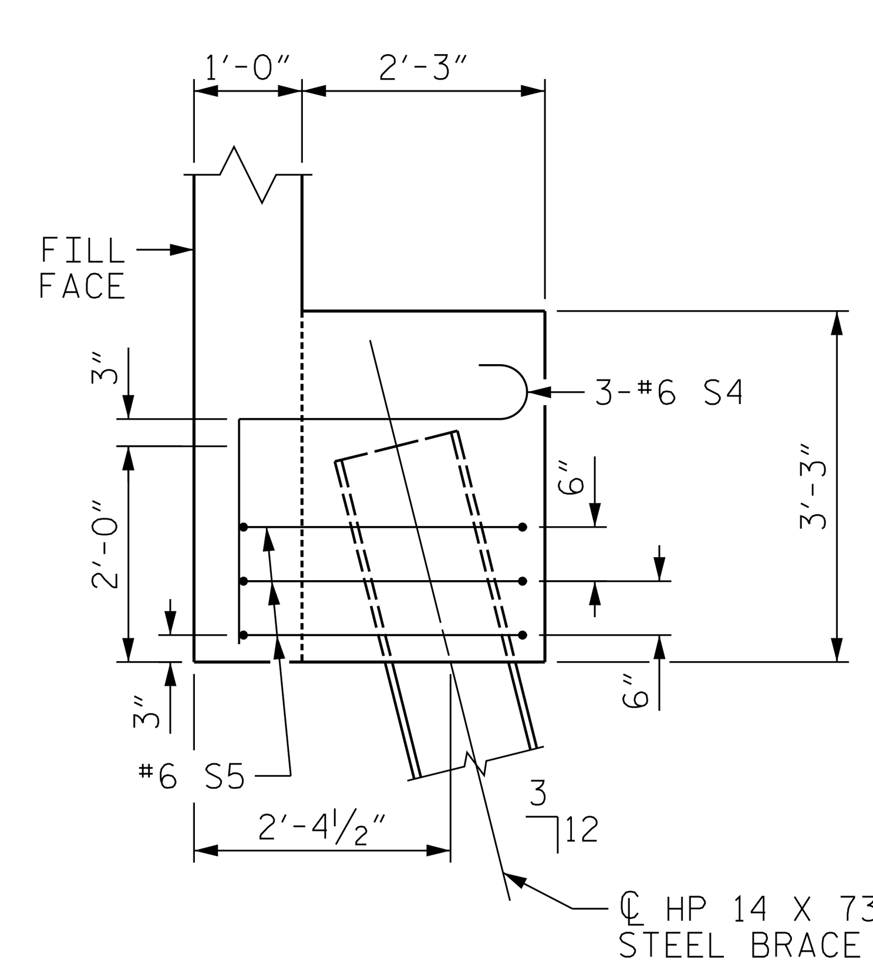
PLAN - WINGWALL (W2)



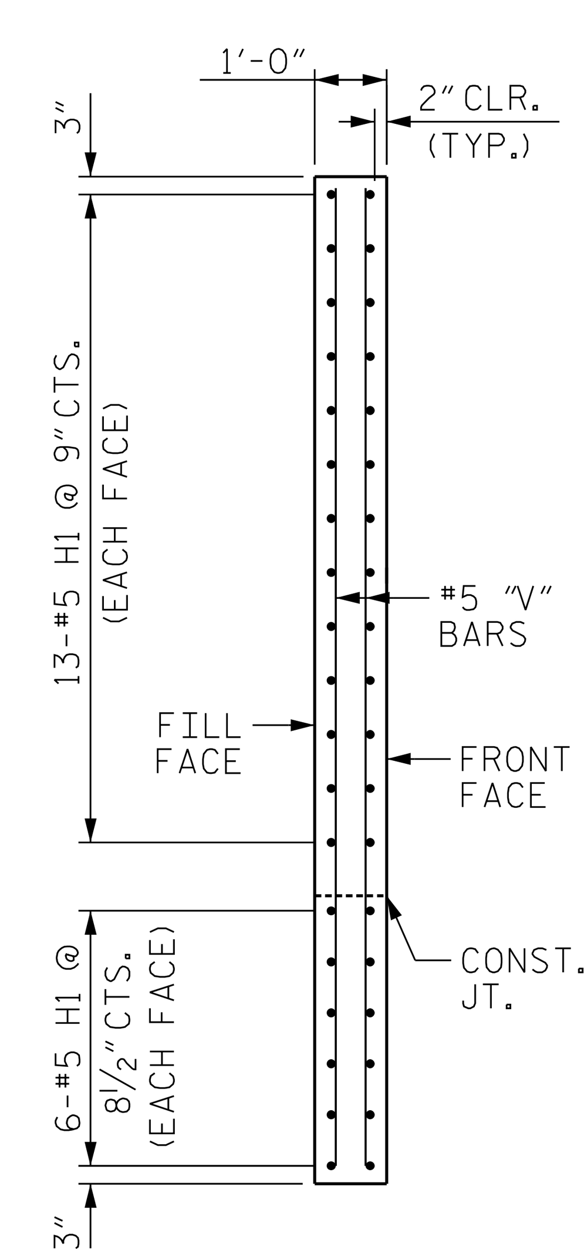
ELEVATION - WINGWALL (W1)



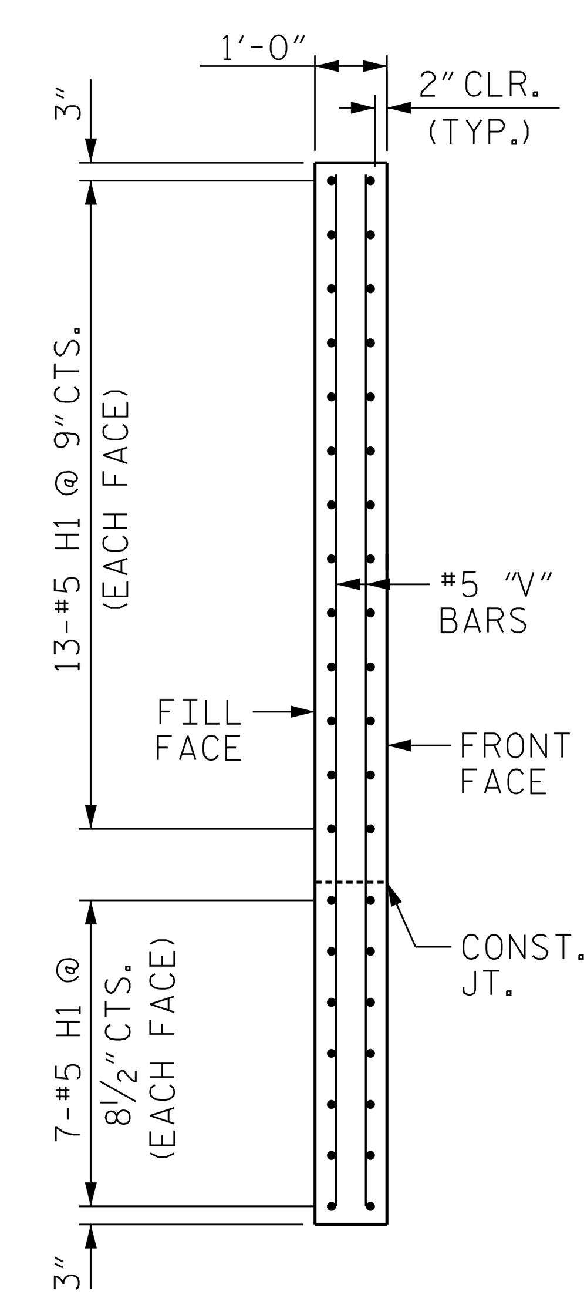
ELEVATION - WINGWALL (W2)



SECTION C-C



SECTION X-X



SECTION Y-Y

PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-

SHEET 2 OF 4

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

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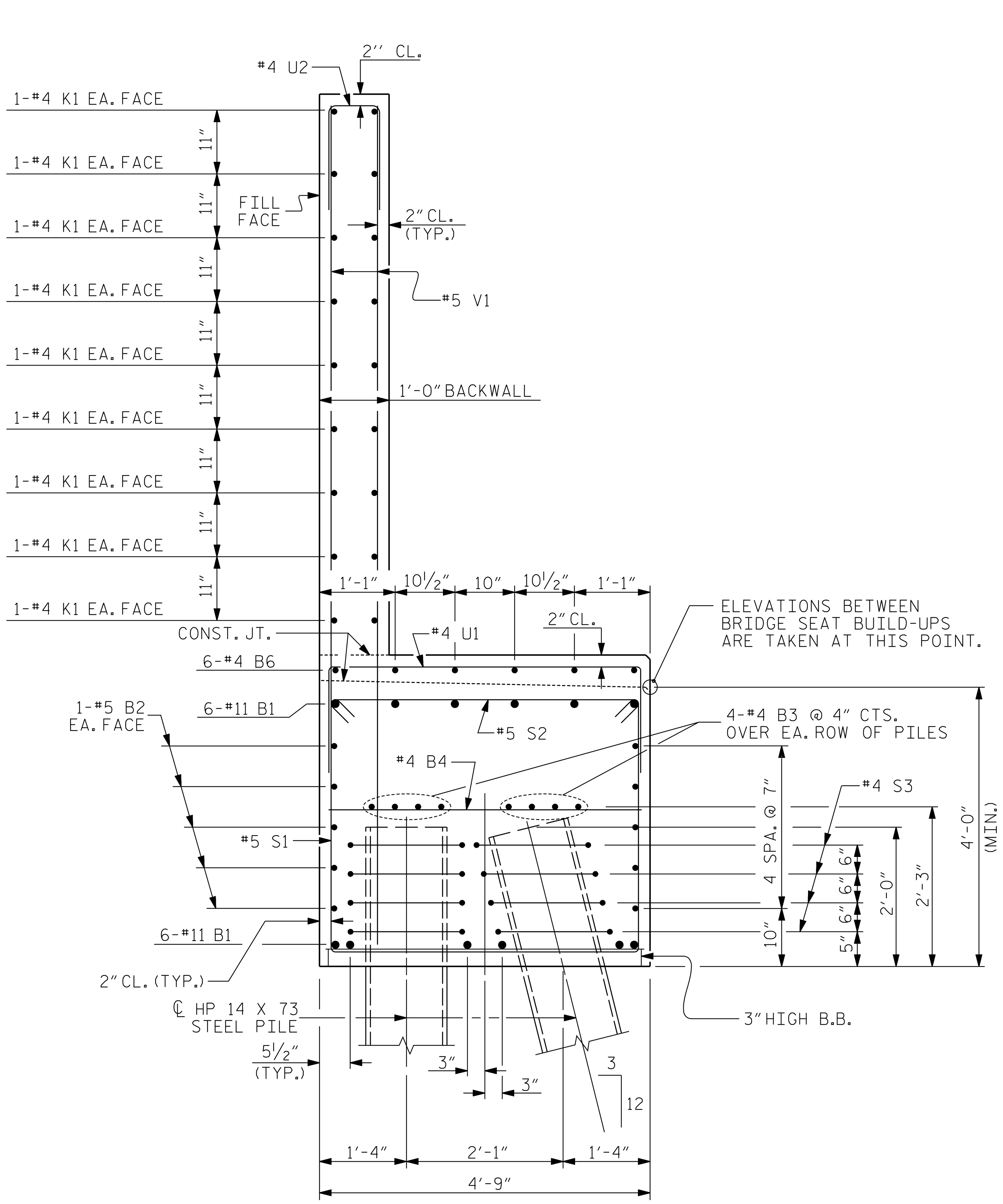
DWN. BY: NCW DATE: 03/2022
CHKD. BY: PRG DATE: 03/2022
DES. EGR. OF RECORD: RTS DATE: 03/2022

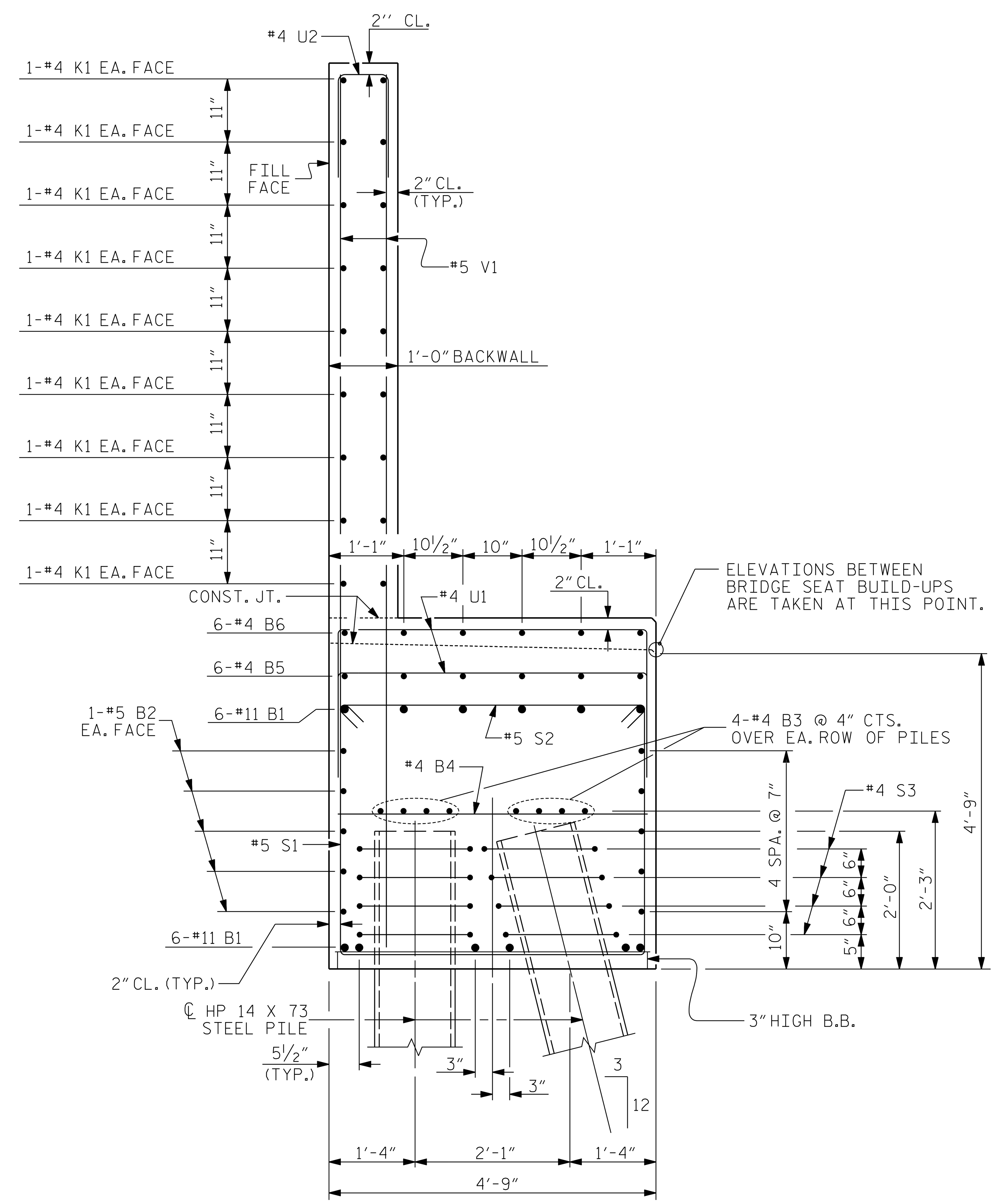
REVISIONS							
NO.	BY:	DATE:		NO.	BY:	DATE:	
1				3			
2				4			

SHEET NO. S1-85
TOTAL SHEETS 92



SECTION A-A

(PILE COLLARS NOT SHOWN FOR CLARITY)



SECTION B-B

(PILE COLLARS NOT SHOWN FOR CLARITY)

7/26/2022

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PROJECT NO. U-2579AA

FORSYTH COUNTY

STATION: 39+65.10 -Y2FLYCA- 35+17.72 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

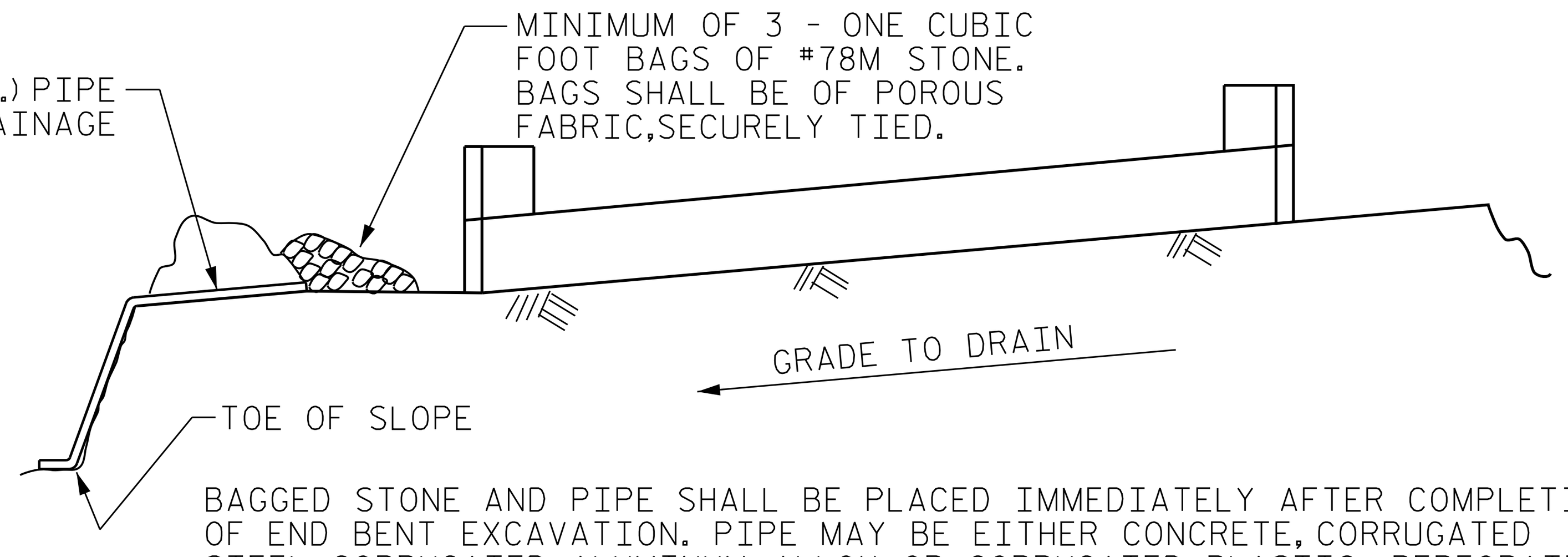
END BENT 2

DWN. BY: NCW DATE: 03/2022
CHKD. BY: PRG DATE: 03/2022
DES. EGR. OF RECORD: RTS DATE: 03/2022

REVISIONS							
NO.	BY:	DATE:		NO.	BY:	DATE:	
1				3			
2				4			

SHEET NO. S1-86
TOTAL SHEETS 92

wdstrufner
DGN: V:\NC\Structures\031748-44 U-2579AA STPS\Structures\SITE 1 - FLYCA NorthPlans\FINAL PLANS\40_FT_U2579AA_SMU_EB23_086.dgn
TIME: 10:04 AM on Tuesday, July 26, 2022

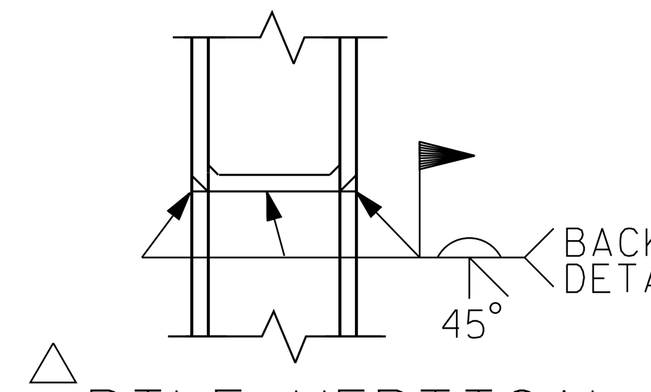


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

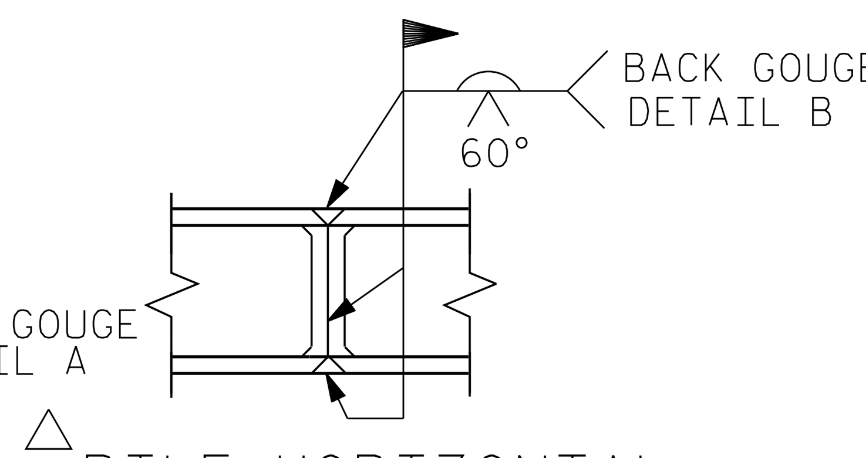
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

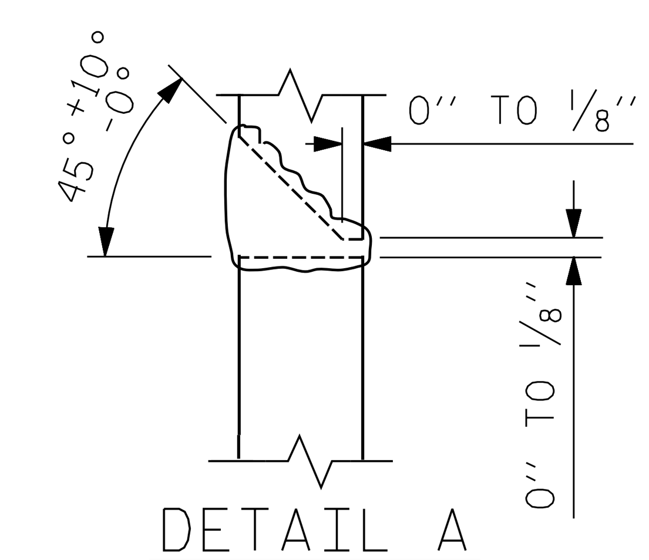
TEMPORARY DRAINAGE AT END BENT



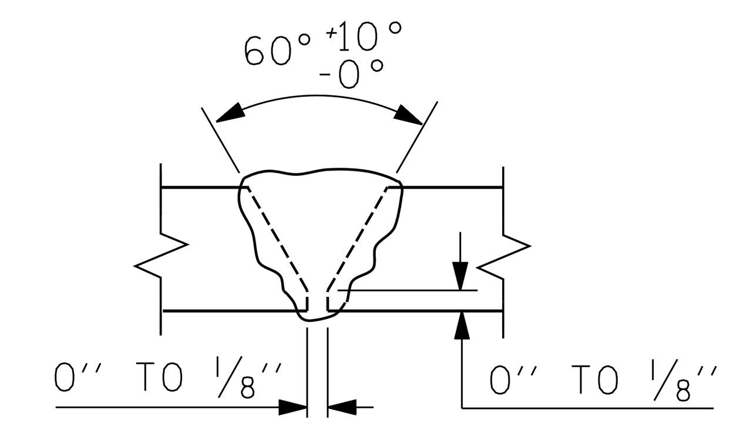
△ PILE VERTICAL



△ PILE HORIZONTAL OR VERTICAL



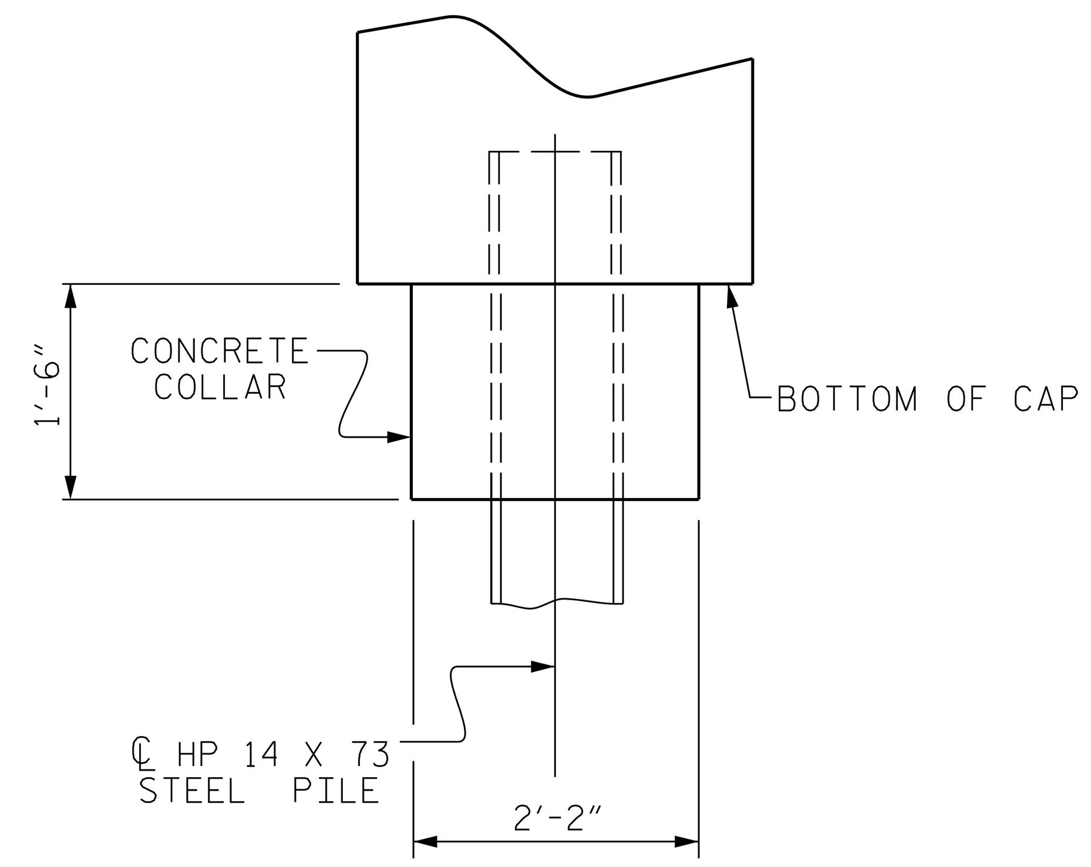
DETAIL A



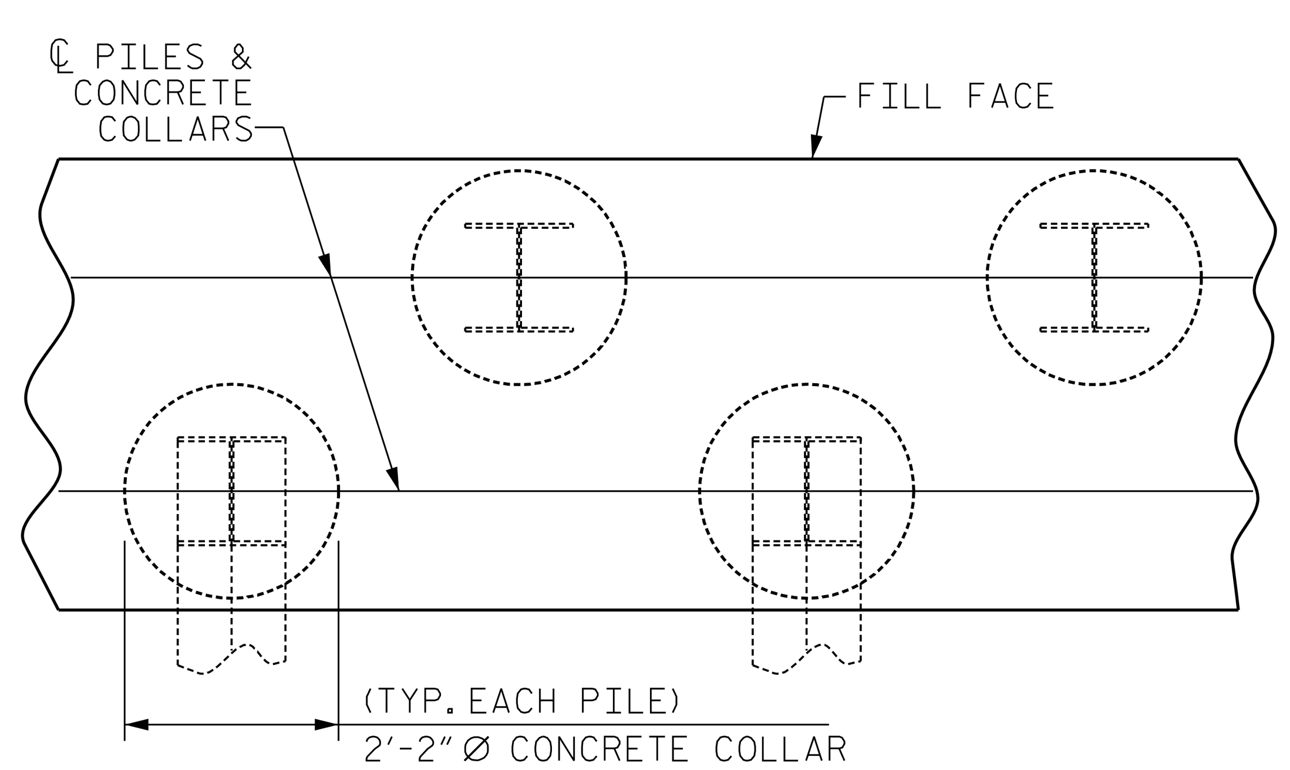
DETAIL B

PILE SPLICE DETAILS

△ POSITION OF PILE DURING WELDING.



ELEVATION



PLAN

CORROSION PROTECTION FOR STEEL PILES DETAIL

BILL OF MATERIAL

END BENT NO. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#11	1	52'-0"	3315
B2	10	#5	STR	48'-10"	509
B3	16	#4	STR	25'-10"	276
B4	12	#4	STR	4'-5"	35
B5	6	#4	STR	22'-5"	90
B6	30	#4	STR	3'-8"	73
H1	78	#5	2	23'-6"	1912
K1	36	#4	STR	25'-8"	617
K2	8	#4	STR	2'-7"	14
S1	58	#5	3	12'-7"	761
S2	58	#5	4	5'-4"	323
S3	60	#4	5	7'-7"	304
S4	6	#6	7	5'-5"	49
S5	6	#6	8	9'-11"	89
U1	30	#4	6	7'-5"	149
U2	87	#4	6	3'-8"	213
V1	174	#6	STR	12'-0"	3136
V2	8	#5	STR	13'-8"	114
V3	12	#5	STR	13'-8"	171
V4	8	#5	STR	13'-7"	113
V5	8	#5	STR	13'-6"	113
V6	8	#5	STR	13'-5"	112
V7	8	#5	STR	13'-4"	111
V8	8	#5	STR	14'-6"	121
V9	6	#5	STR	14'-6"	91
V10	6	#5	STR	14'-5"	90
V11	8	#5	STR	14'-4"	120
V12	8	#5	STR	14'-3"	119
V13	8	#5	STR	14'-2"	118
V14	8	#5	STR	14'-1"	118

REINFORCING STEEL 13,376 LBS.

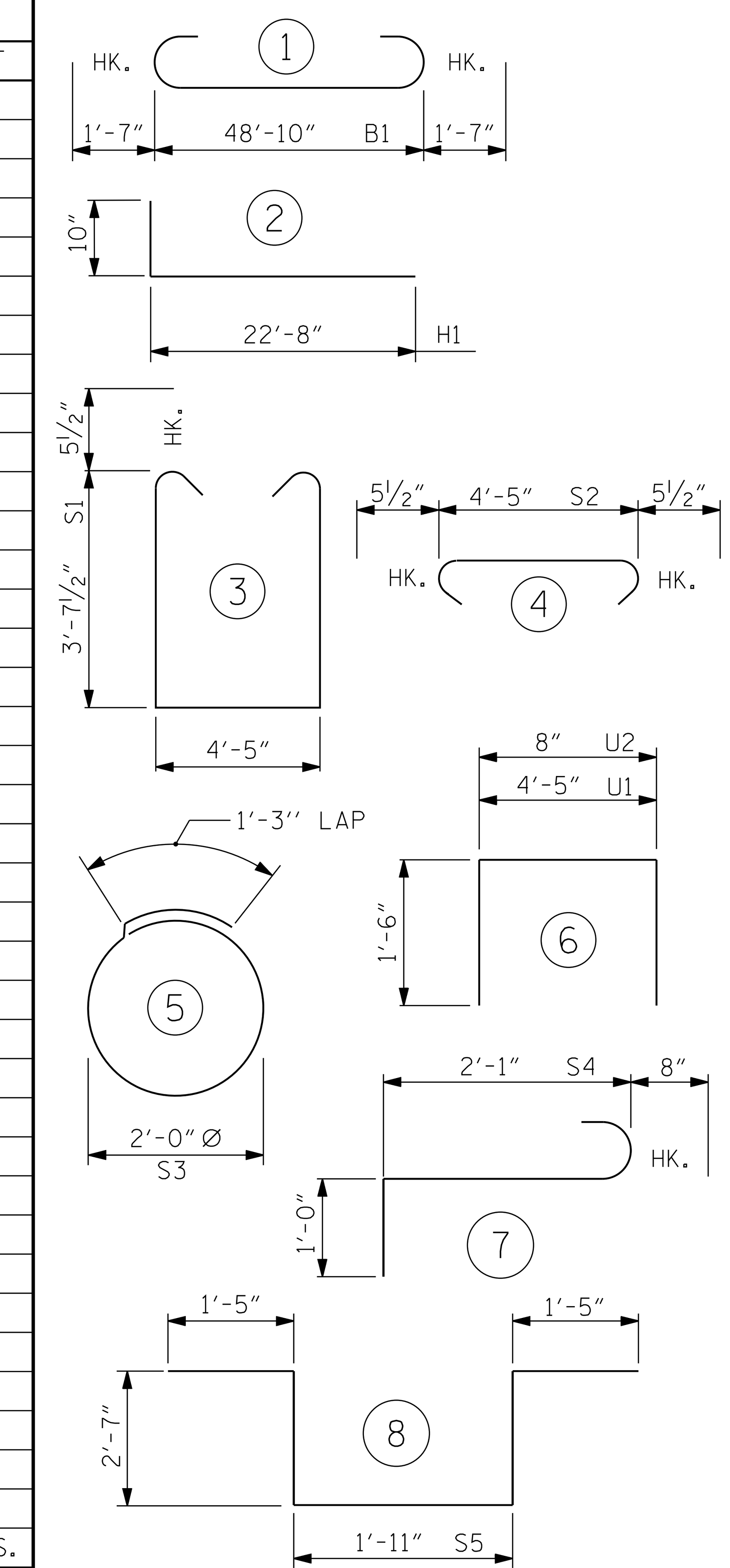
CLASS A CONCRETE BREAKDOWN

POUR #1	CAP, LOWER PART OF WINGS, PILE COLLARS & WING BRACE PILE BLOCKS	49.3 C.Y.
POUR #2	BACKWALL & UPPER PART OF WINGS	32.0 C.Y.
TOTAL CLASS A CONCRETE		81.3 C.Y.

HP 14 X 73 STEEL PILES
NO: 17 LIN. FT.= 1,224

PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES NO: 17

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

PROJECT NO. U-2579AA
FORSYTH COUNTY
STATION: 39+65.10 -Y2FLYCA-
35+17.72 -L-
SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2

Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Boone, NC 828-355-9933; Tri-Cities, TN 423-467-8401; Knoxville, TN 865-546-5800; Spartanburg, SC 864-574-4775; Charleston, SC 843-974-5650; Middlesboro, KY 606-248-6600; Atlanta, GA 770-627-3590; Raleigh, NC 919-977-9455; Charlotte, NC 704-357-0488

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL — DocuSigned by: Hardy Willis
7/26/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DWN. BY: NCW DATE: 03/2022
CHKD. BY: PRG DATE: 03/2022
DES. EGR. OF RECORD: RTS DATE: 03/2022

REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	S1-87
1			3			TOTAL SHEETS	92
2			4				