

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.)

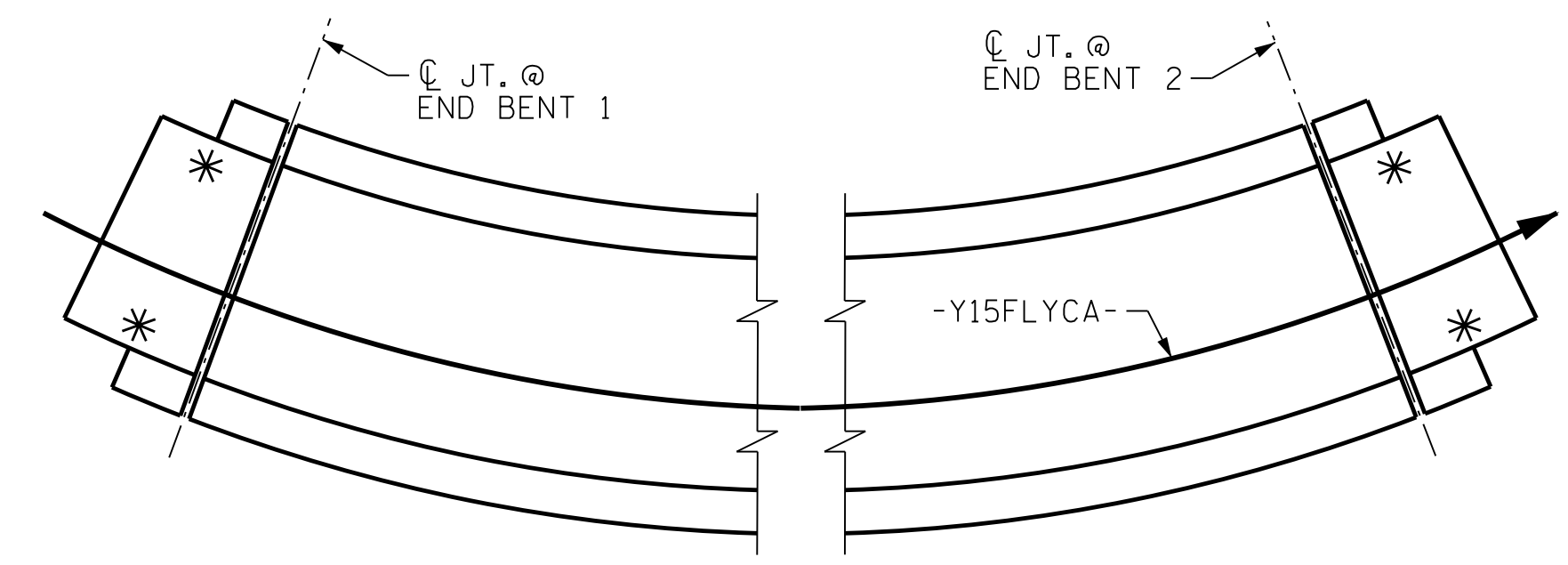
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

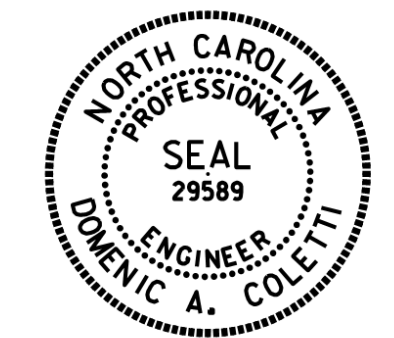
THE 1/4" HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

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.



SKETCH SHOWING POINTS OF ATTACHMENTS
* = DENOTES GUARDRAIL ANCHOR ASSEMBLY

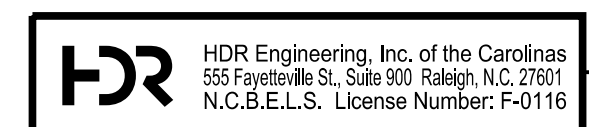
PROJECT NO. U-2579AB
FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-



Dominic A. Coletti 10/15/2021

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 GUARDRAIL ANCHORAGE
 FOR BARRIER RAIL

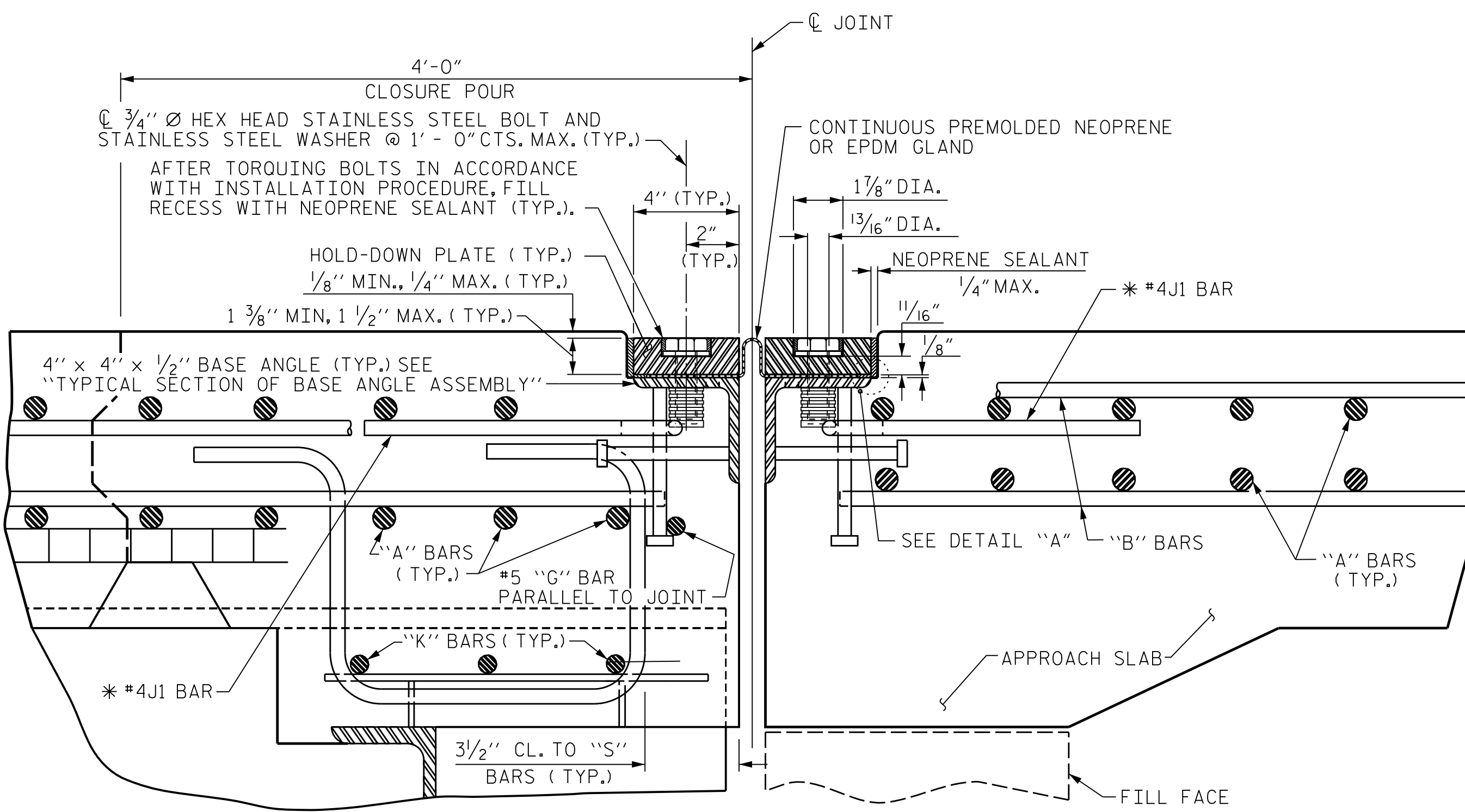
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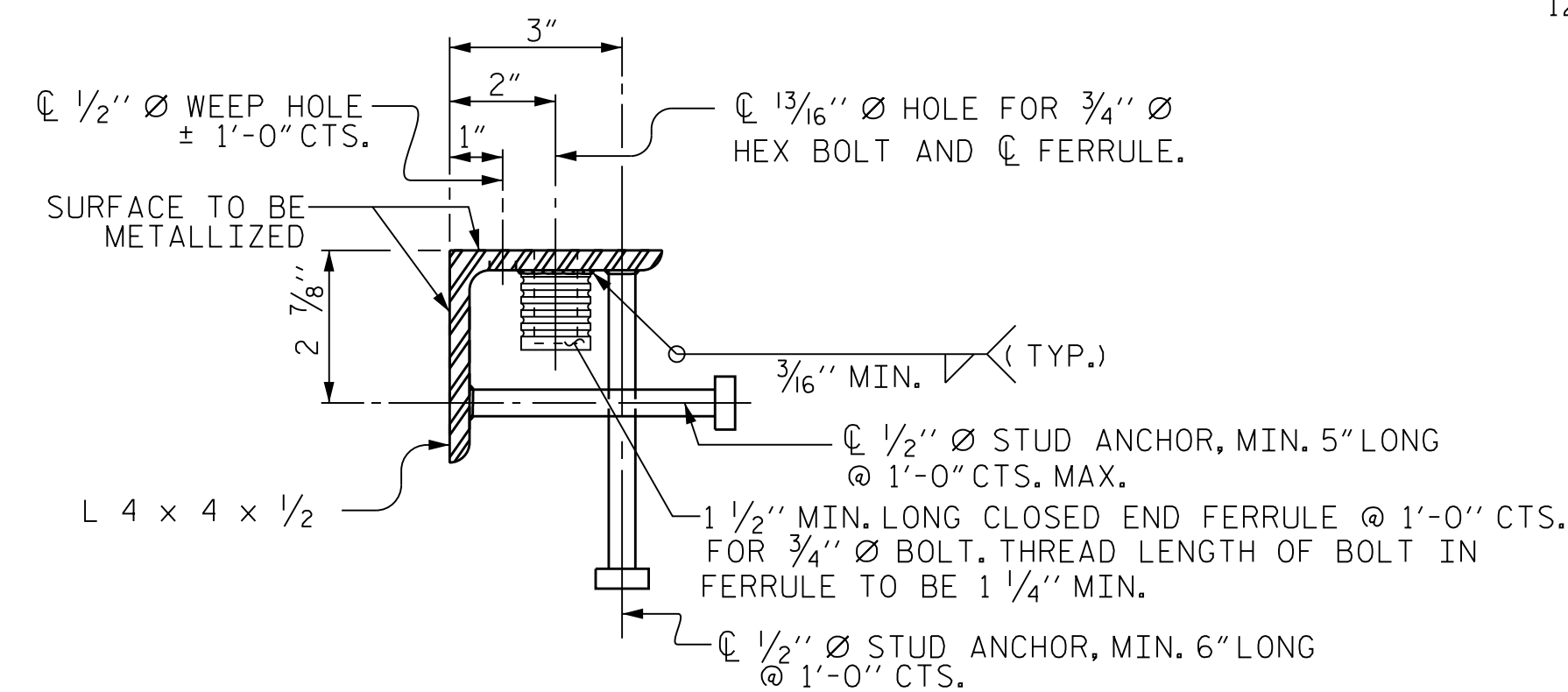
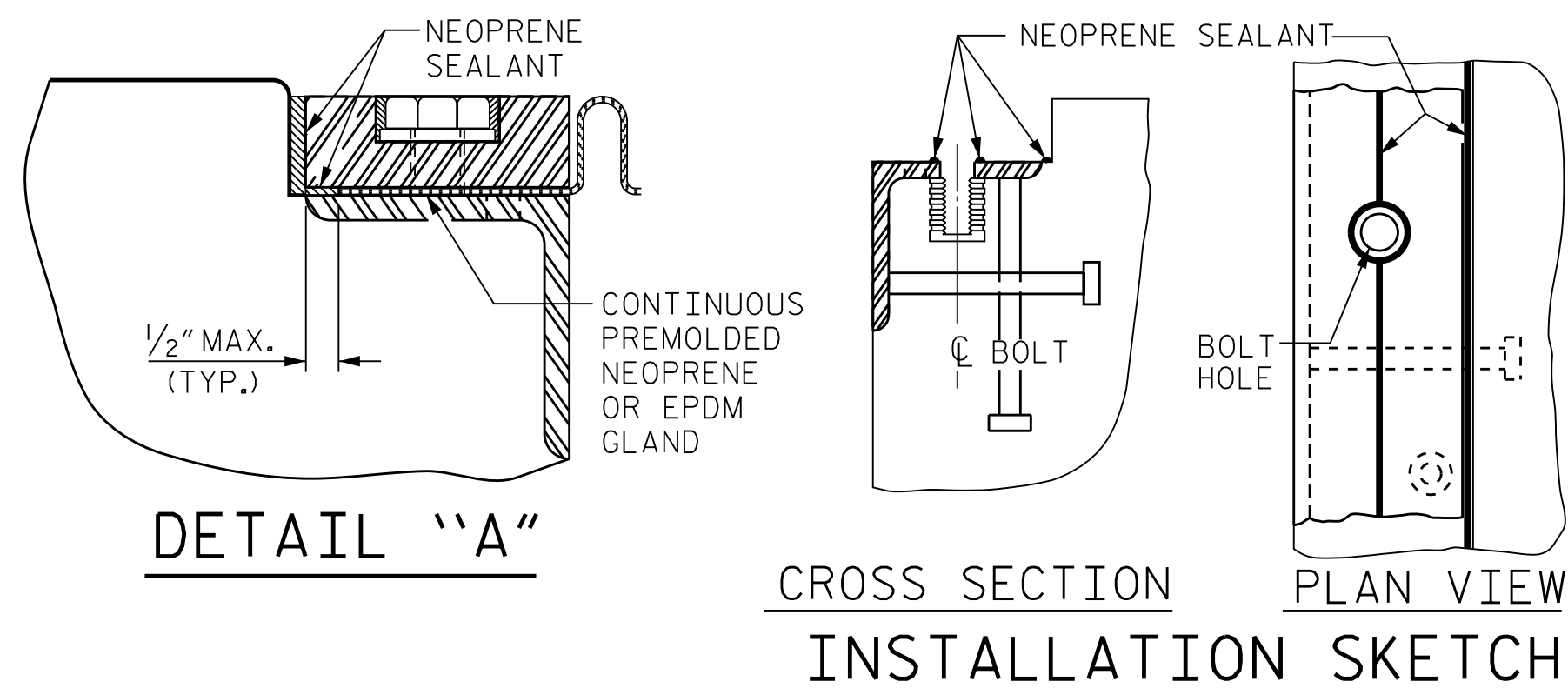
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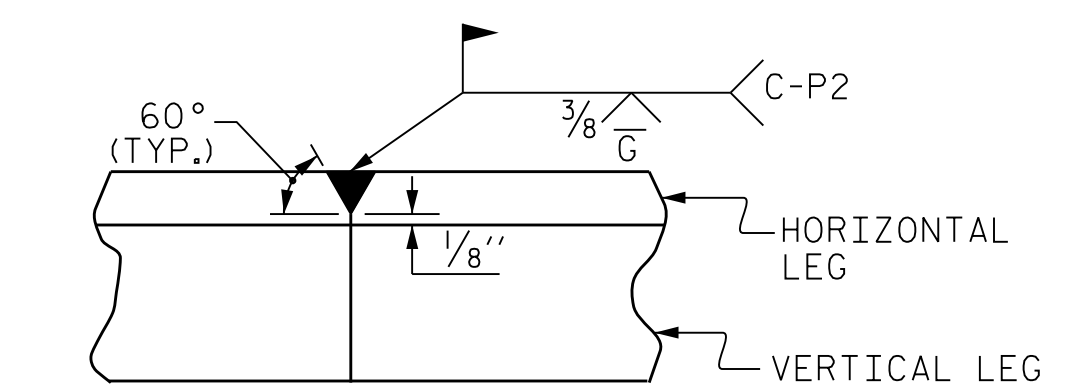
EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- STEEL SUPERSTRUCTURE

* = THE QUANTITY OF #4J1 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.



TYPICAL SECTION OF BASE ANGLE ASSEMBLY



DETAIL - FIELD WELD SPLICE OF BASE ANGLE

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 4/8" TO 4/4" 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 ENSURING 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 1/8" 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 AND 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 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.

MOVEMENT AND SETTING AT JOINT					
LOCATION	SKEW ANGLE	TOTAL MOVEMENT (ALONG CL RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
END BENT #2	90°00'00"	1 1/16"	1 15/16"	1 3/4"	1 5/8"

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EXPANSION JOINT SEAL DETAILS

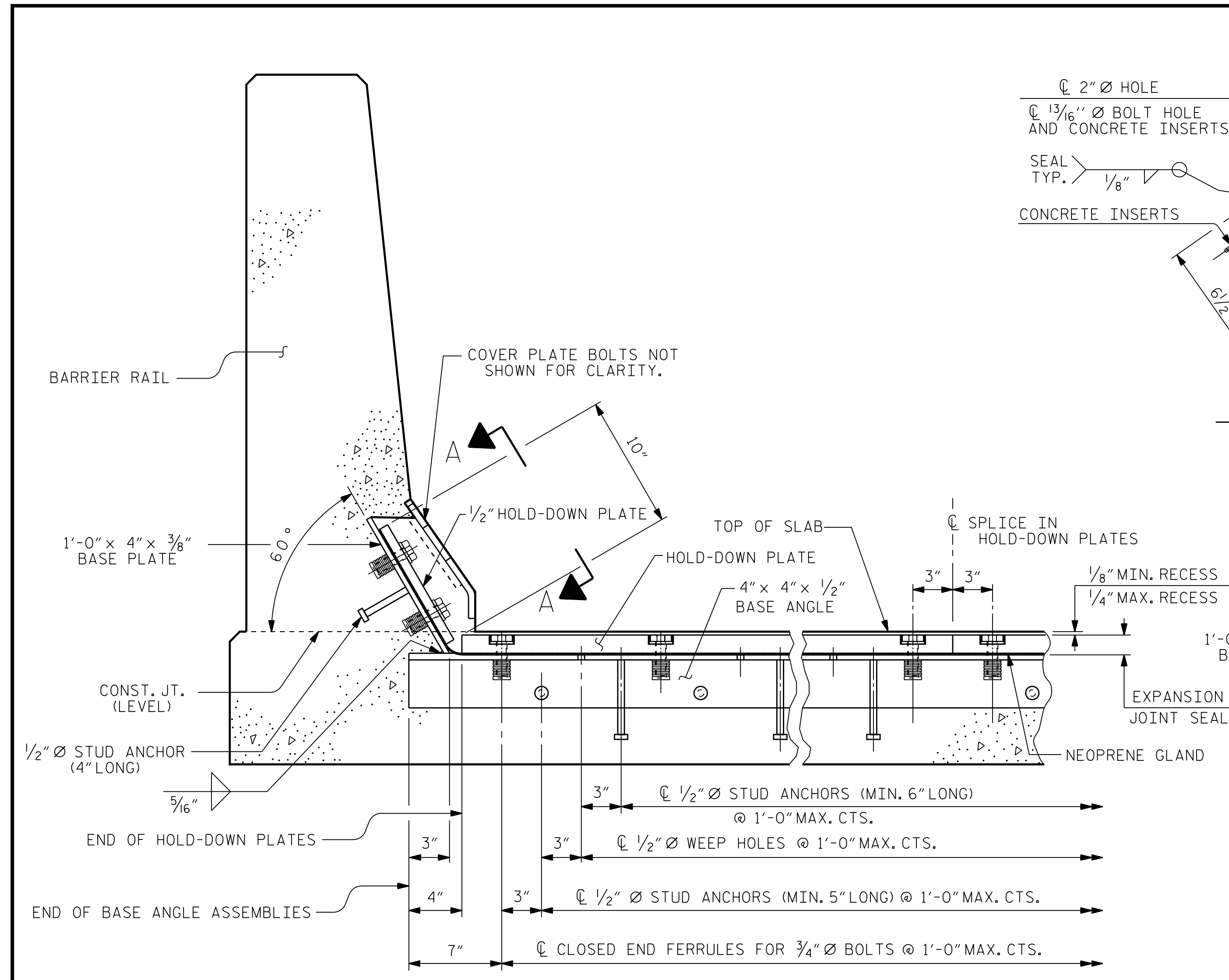
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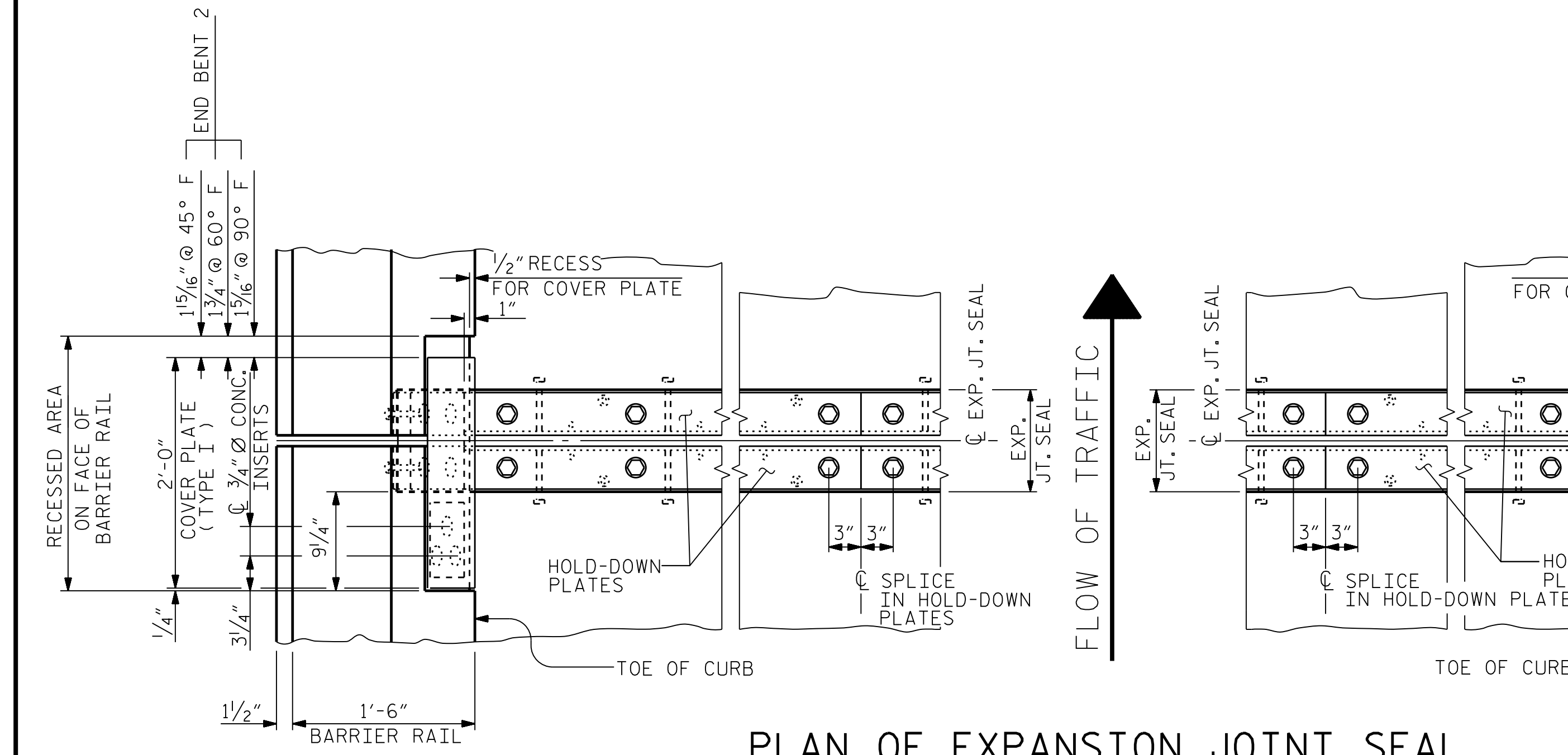
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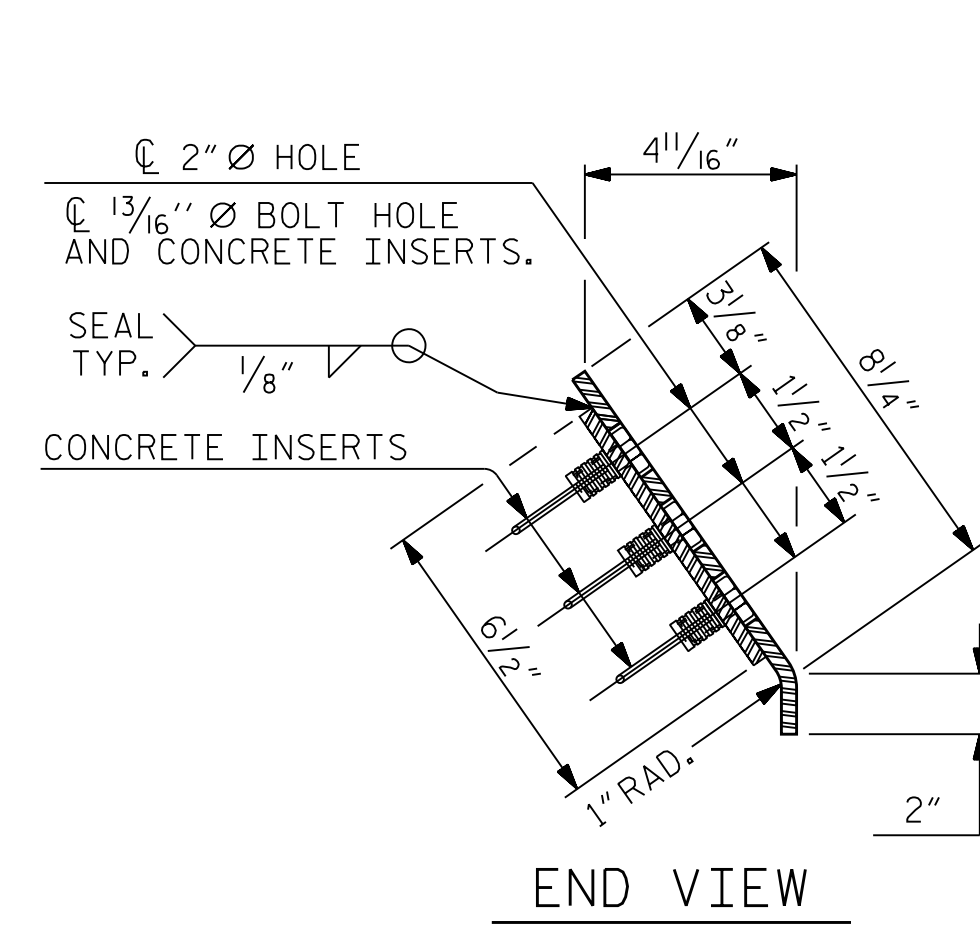
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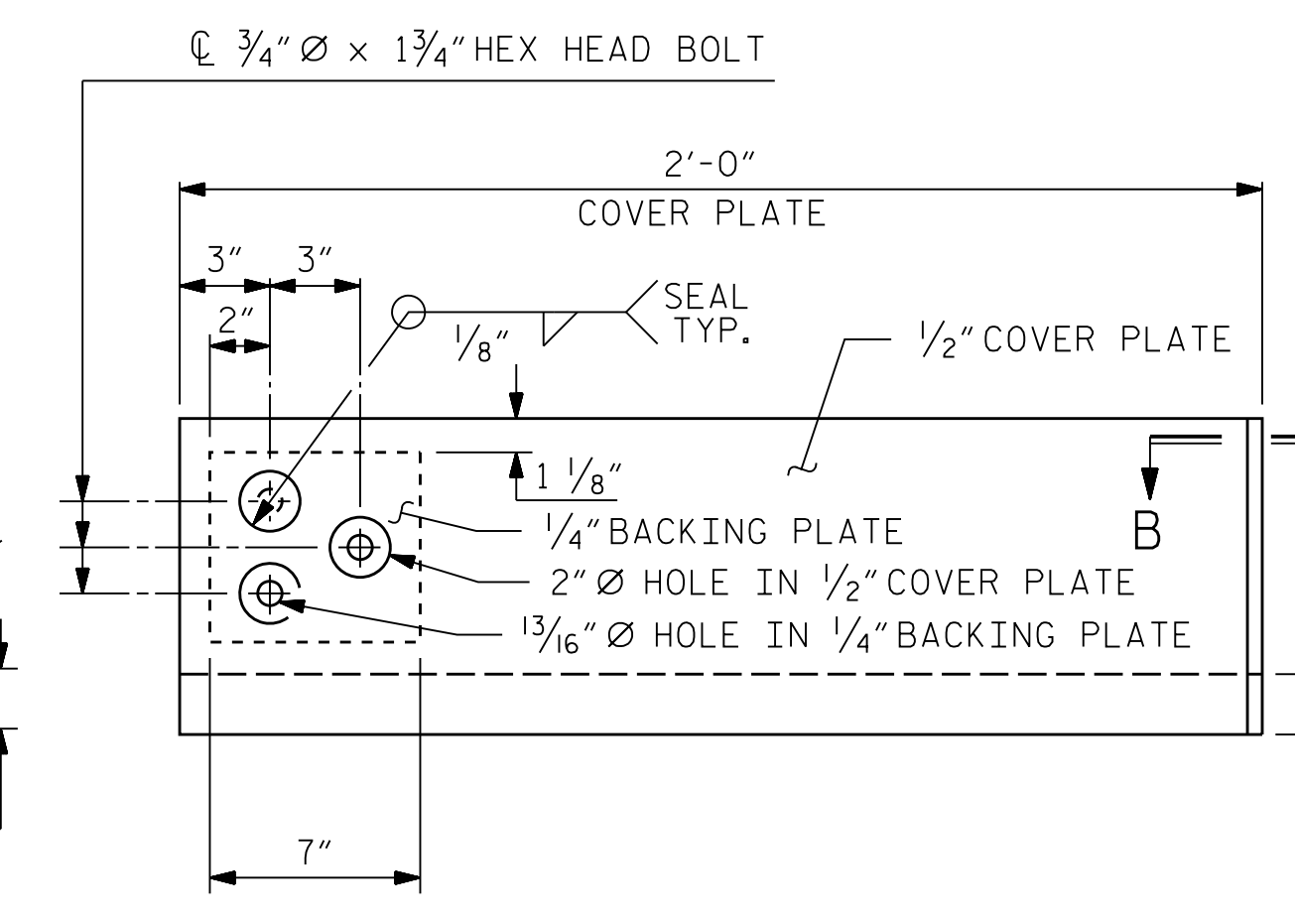
SECTION THRU RAIL NORMAL TO JOINT



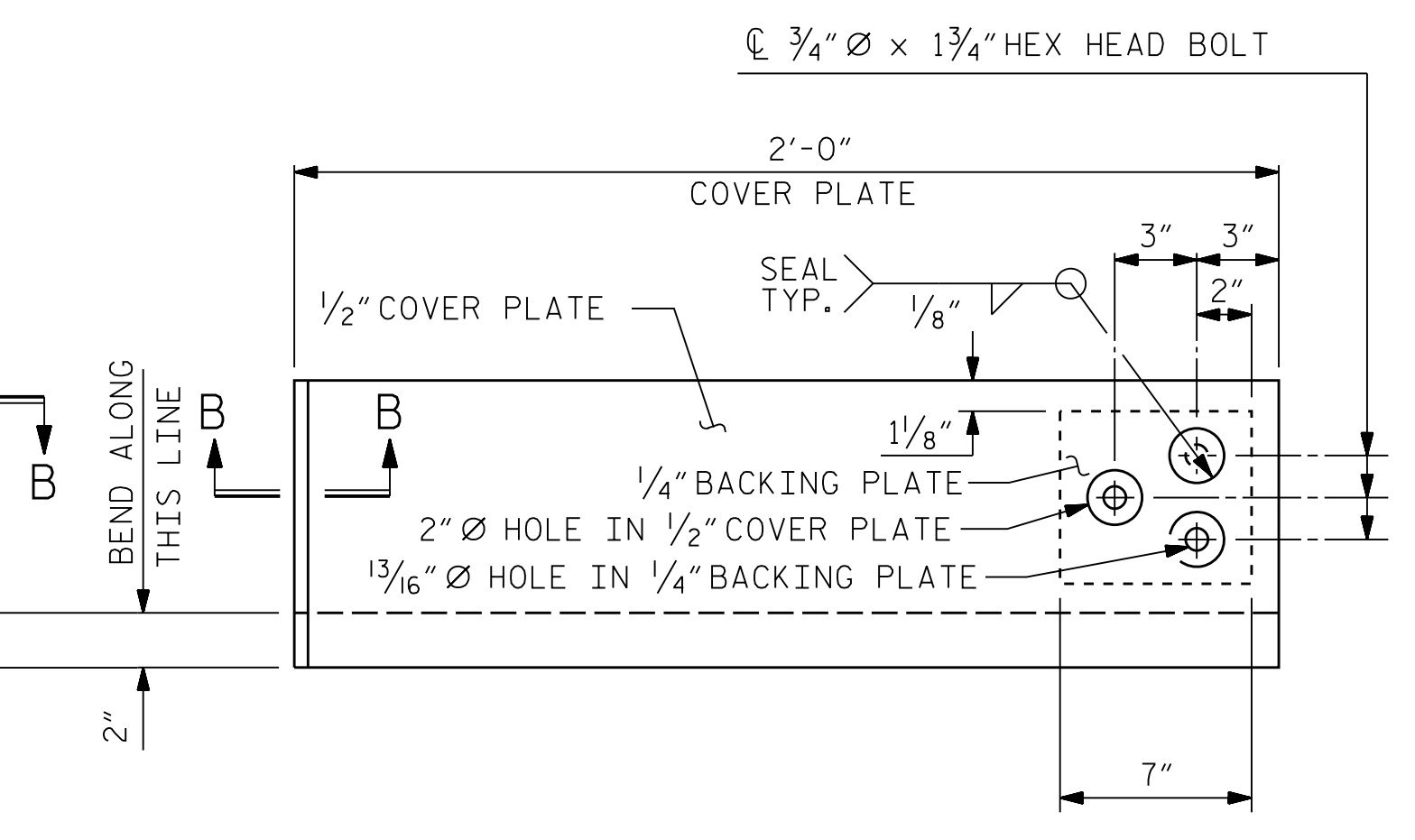
PLAN OF EXPANSION JOINT SEAL



END VIEW

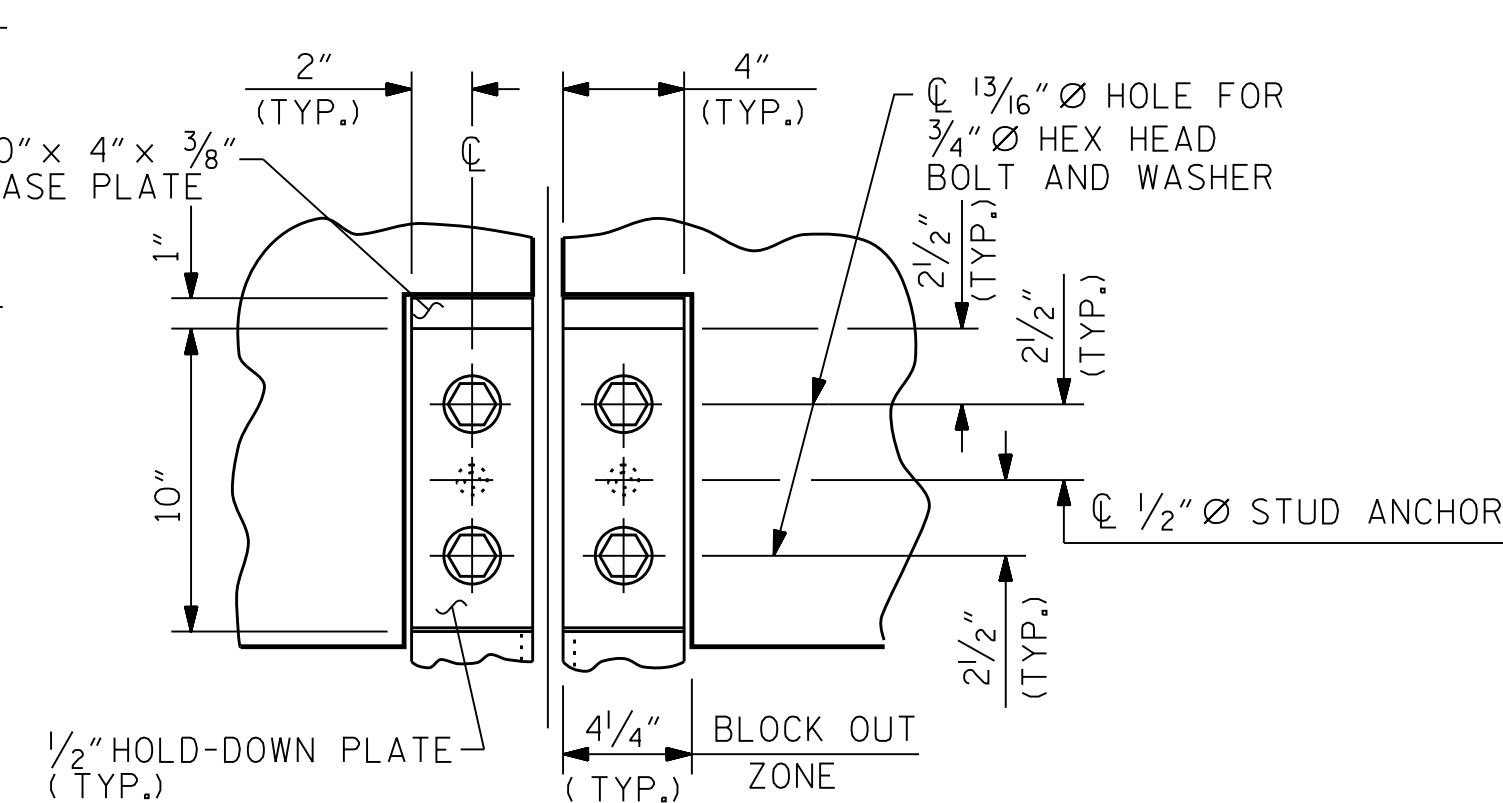


TYPE I - ELEVATION VIEW

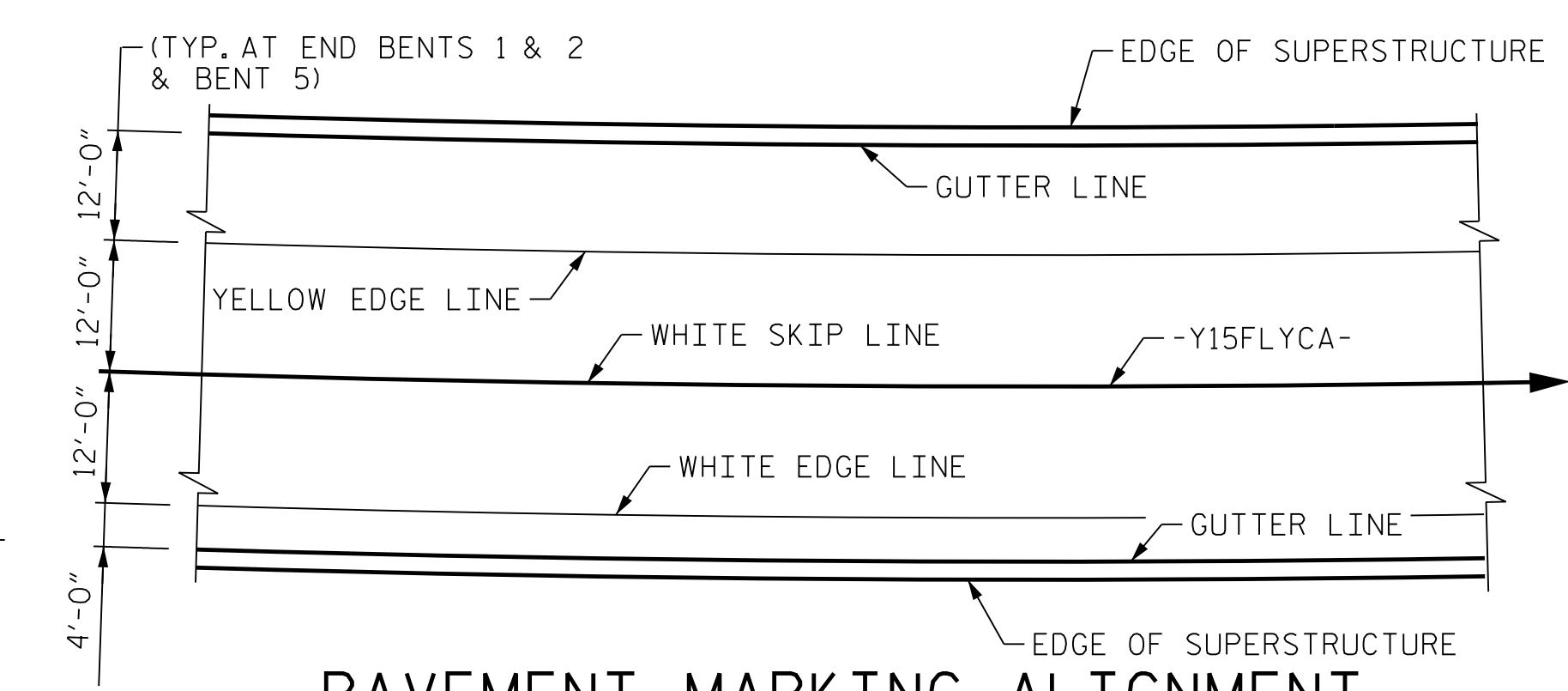


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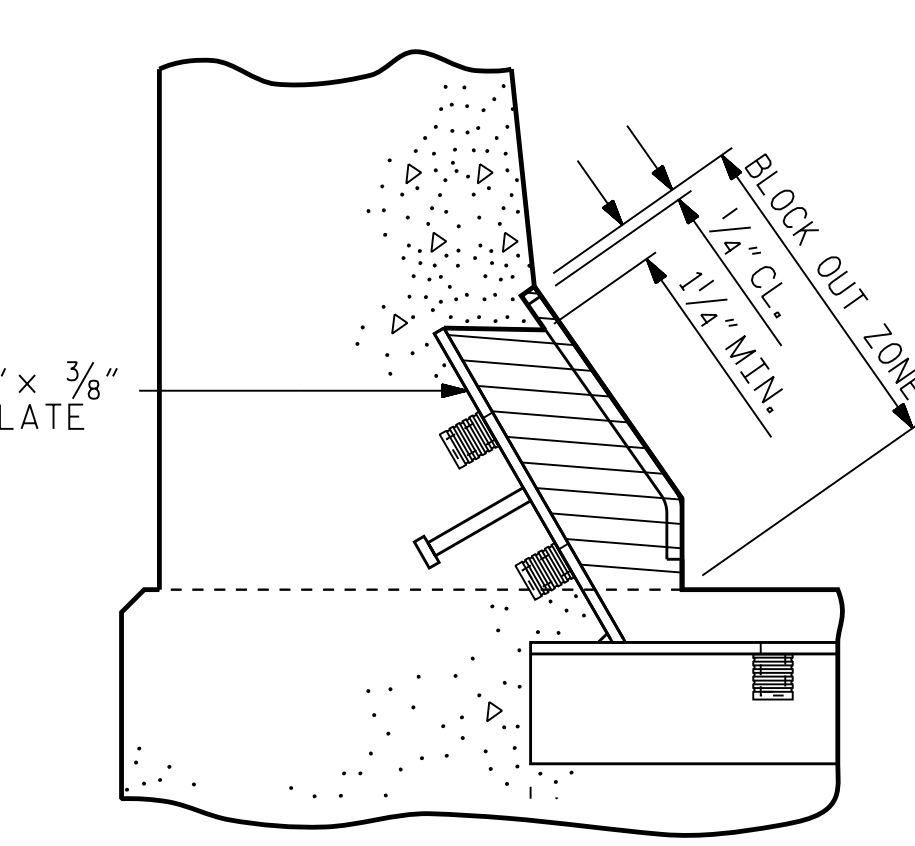
COVER PLATE DETAILS



SECTION A-A

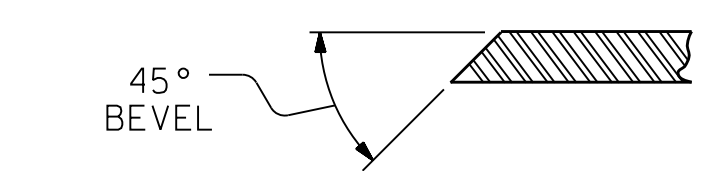


PAVEMENT MARKING ALIGNMENT

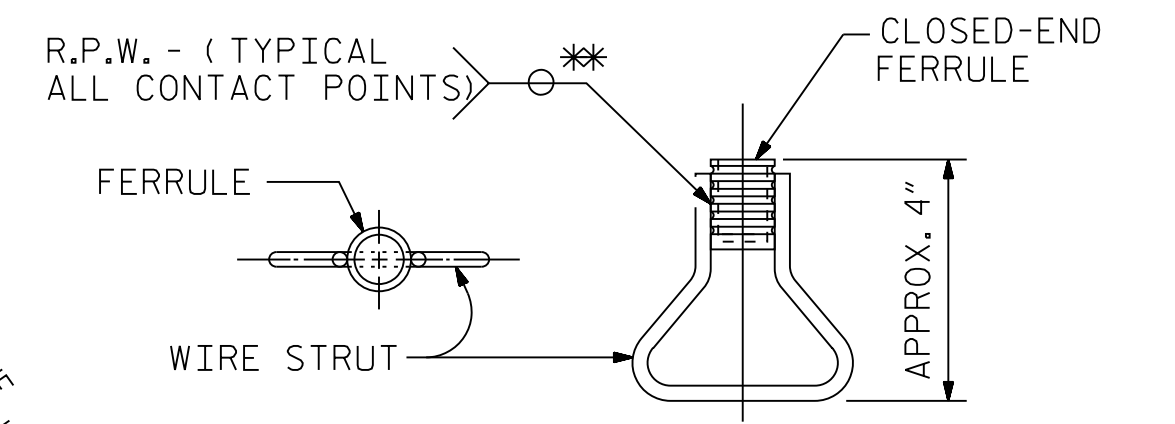


BLOCK OUT DETAIL

SEE "SECTION A - A" FOR OTHER DETAILS.



SECTION B - B



CONCRETE INSERT

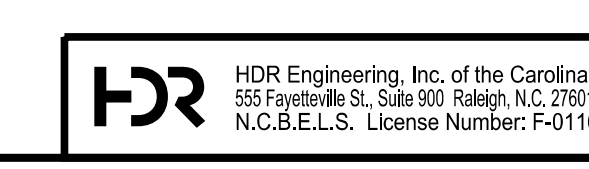
** = EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

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 RALEIGH
 STANDARD
 EXPANSION JOINT
 SEAL DETAILS
 FOR BARRIER RAIL

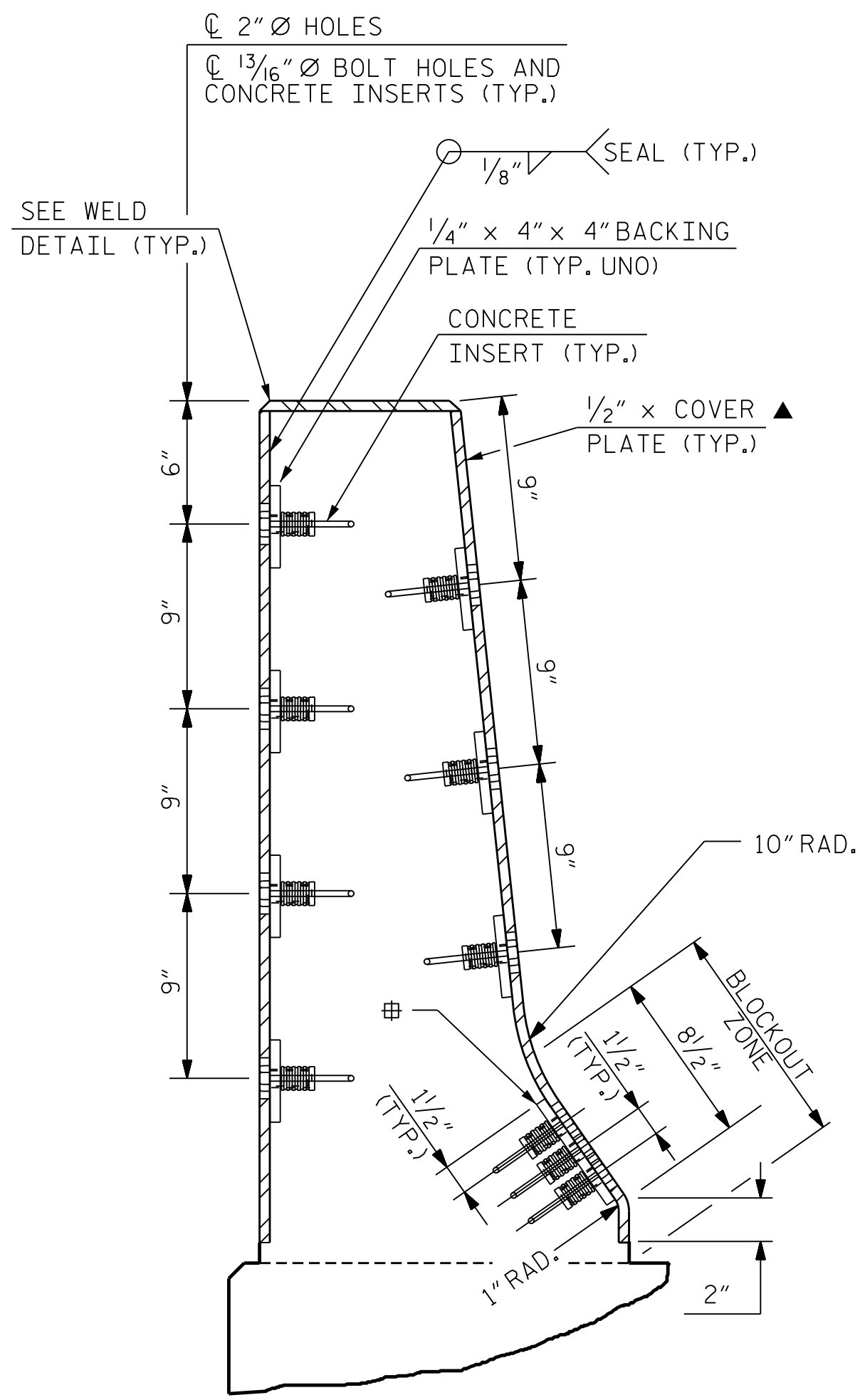
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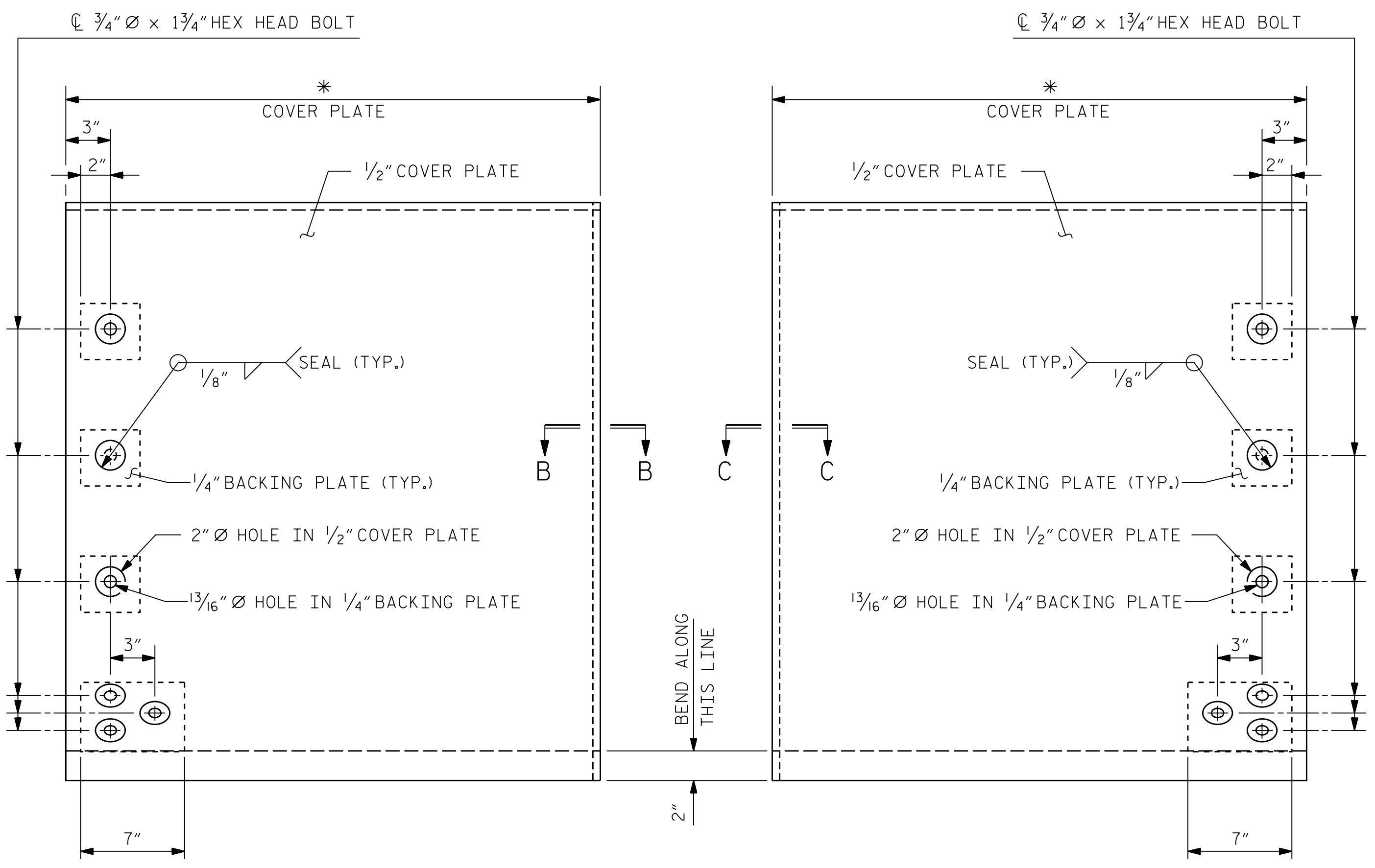
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END VIEW



TYPE I - ELEVATION VIEW

TYPE II - ELEVATION VIEW

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.

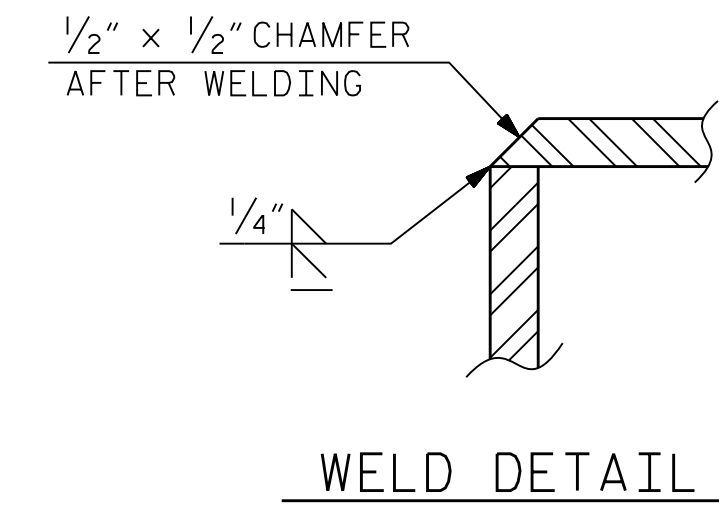
THE 3/4" CONCRETE INSERTS SHALL BE CLOSED-END FERRULES WITH LOOPED WIRE STRUTS ATTACHED TO THEM. THE INSERTS SHALL CONFORM TO AASHTO M169, GRADE 12L14 AND SHALL HAVE A TENSILE WORKING LOAD CAPACITY OF 3000 LBS.

APPLY A BOND BREAKER COATING TO THE INSIDE SURFACES OF THE STEEL COVER AND BACKING PLATES.

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".

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

LOCATION	SKWEW ANGLE	TOTAL MOVEMENT ALONG C ROADWAY
END BENT 1	90°00'00"	4 1/8"
BENT 5	90°00'00"	9 3/8"

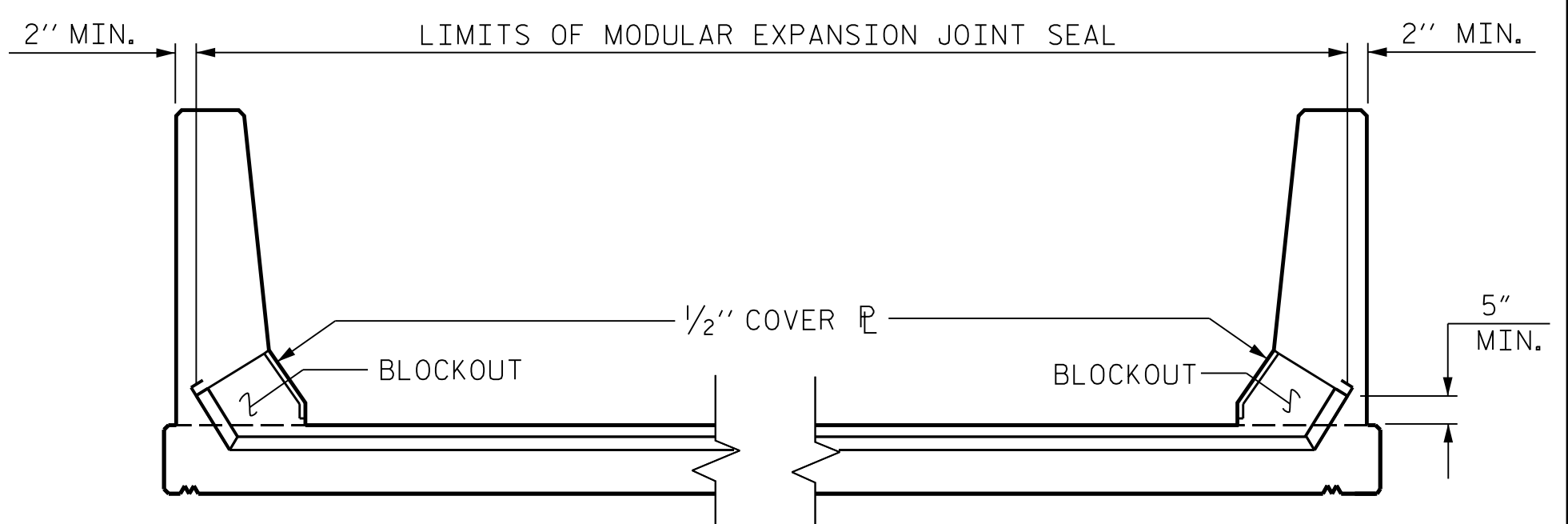


WELD DETAIL



SECTION B-B

SECTION C-C



SKETCH SHOWING LIMITS OF MODULAR EXPANSION JOINT SEAL-BARRIER RAIL

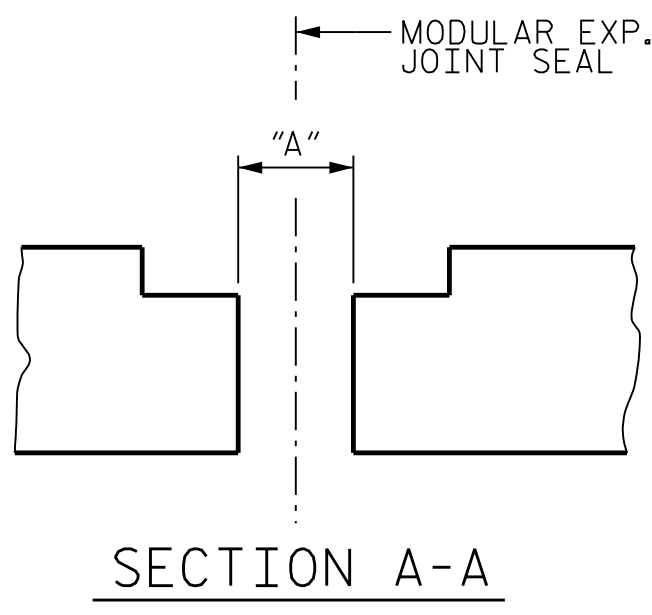
▲ = OUTSIDE DIMENSIONS OF COVER PLATE TO MATCH OUTSIDE DIMENSIONS OF CONCRETE BARRIER RAIL
 # = 1/4" x 6" x 7" BACKING PLATE

COVER PLATE DETAILS

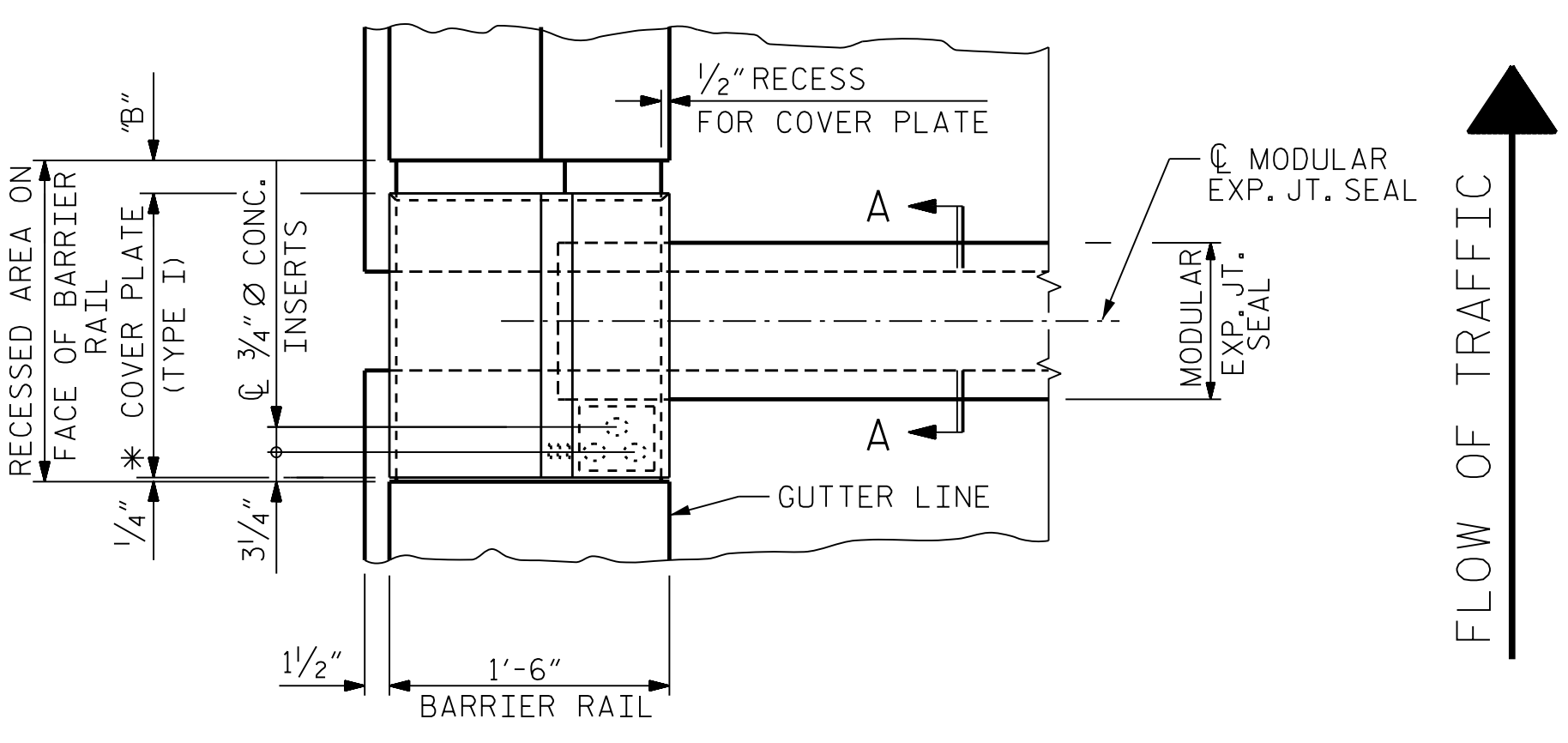
* = DETAILS OF COVER PLATES ARE SUBJECT TO CHANGE DEPENDING ON THE DETAILS OF THE MODULAR EXPANSION JOINT SEALS FURNISHED.

LOCATION	"A" (in.)		
	45° F	60° F	90° F
END BENT 1	3 1/16"	3 1/16"	1 3/16"
BENT 5	7 1/16"	5 1/16"	2 7/8"

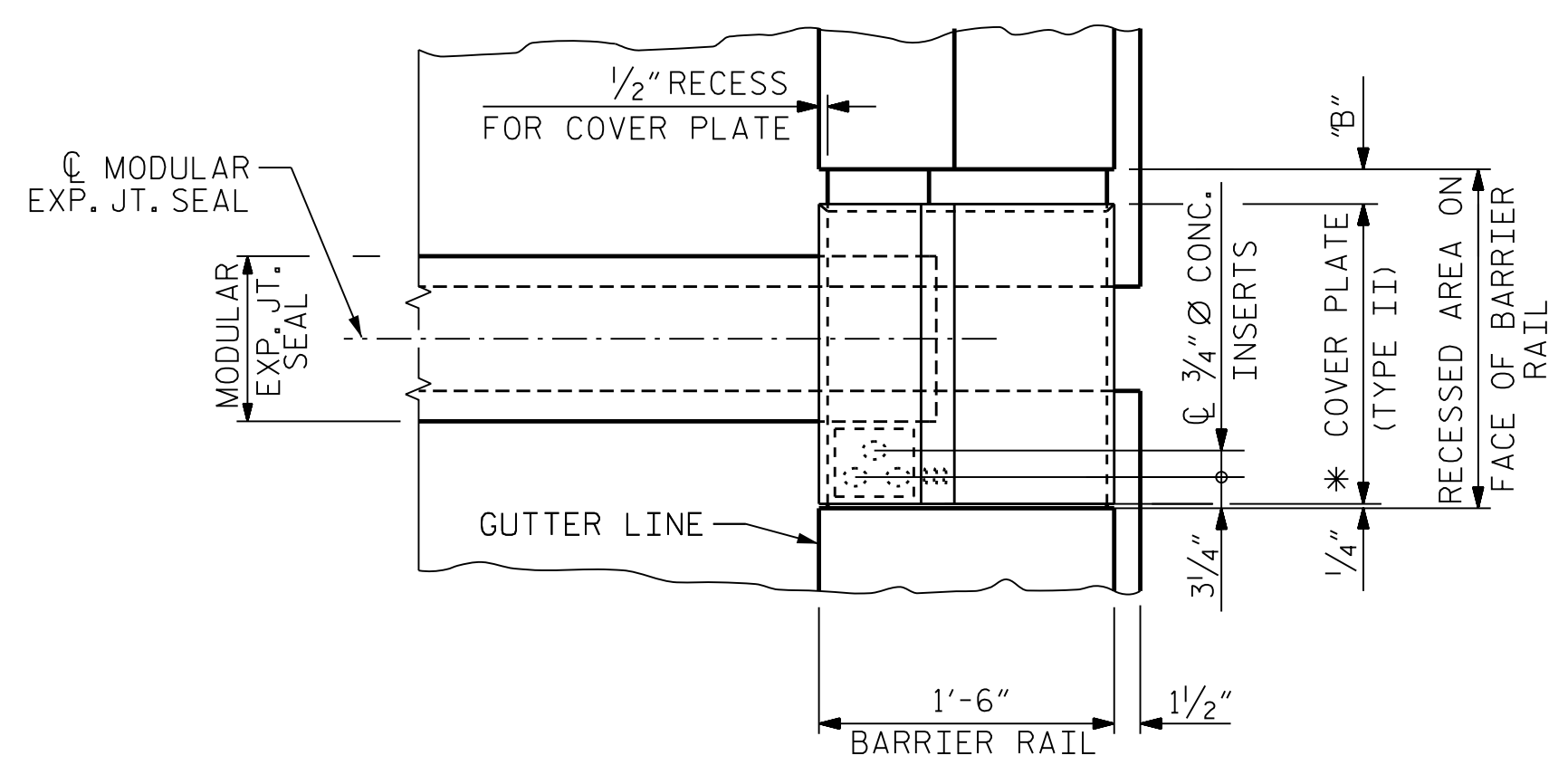
LOCATION	"B" (in.)		
	45° F	60° F	90° F
END BENT 1	3 1/16"	3 1/16"	1 3/16"
BENT 5	7 1/16"	5 1/16"	2 7/8"



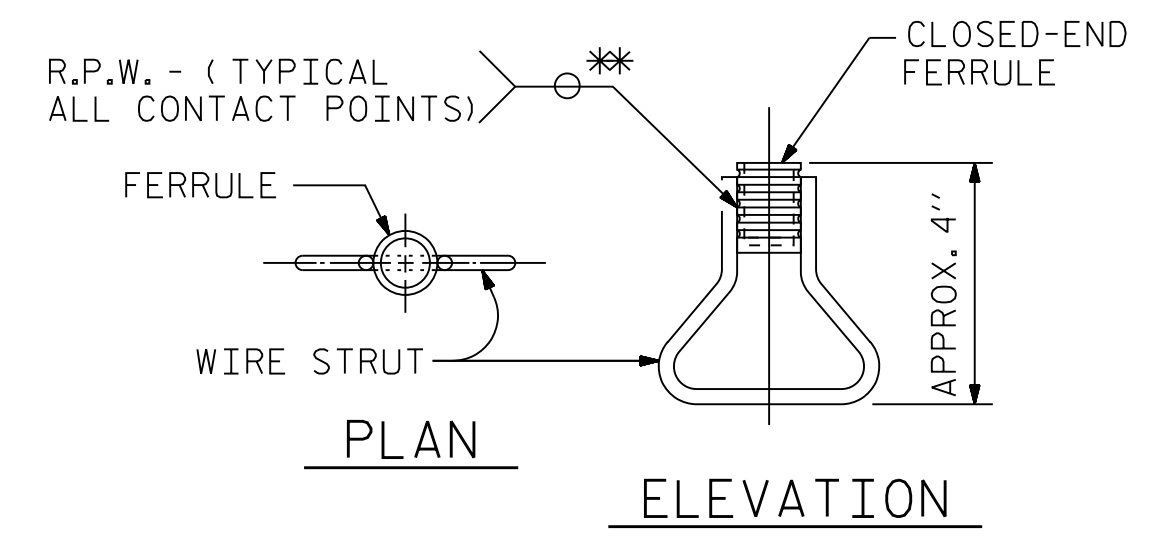
SECTION A-A



PLAN OF MODULAR EXPANSION JOINT SEAL - LEFT SIDE

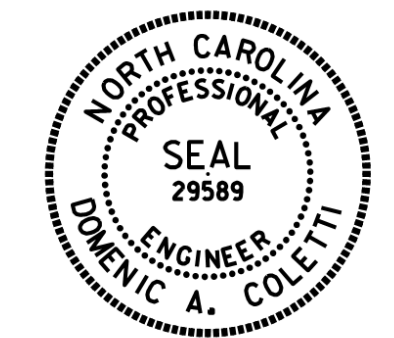


PLAN OF MODULAR EXPANSION JOINT SEAL - RIGHT SIDE



CONCRETE INSERT

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



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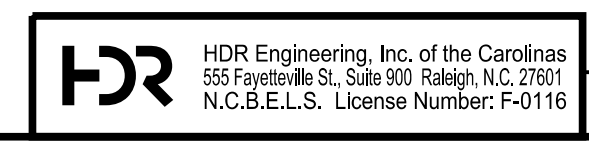
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

MODULAR EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL

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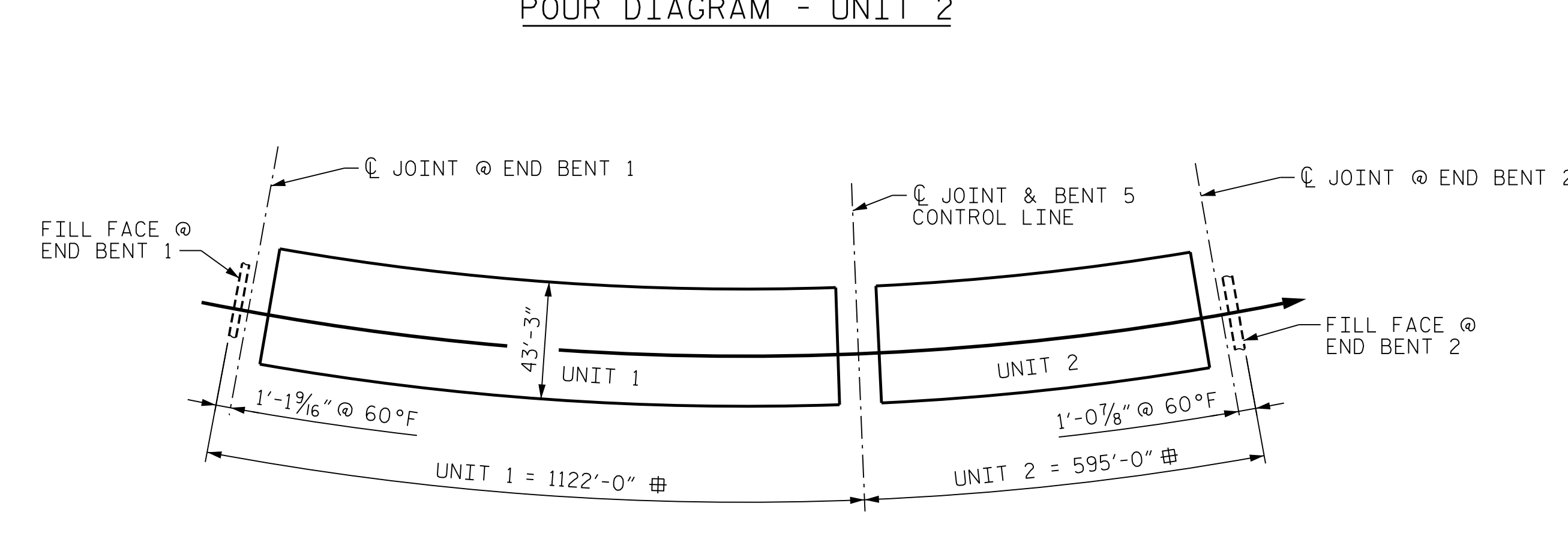
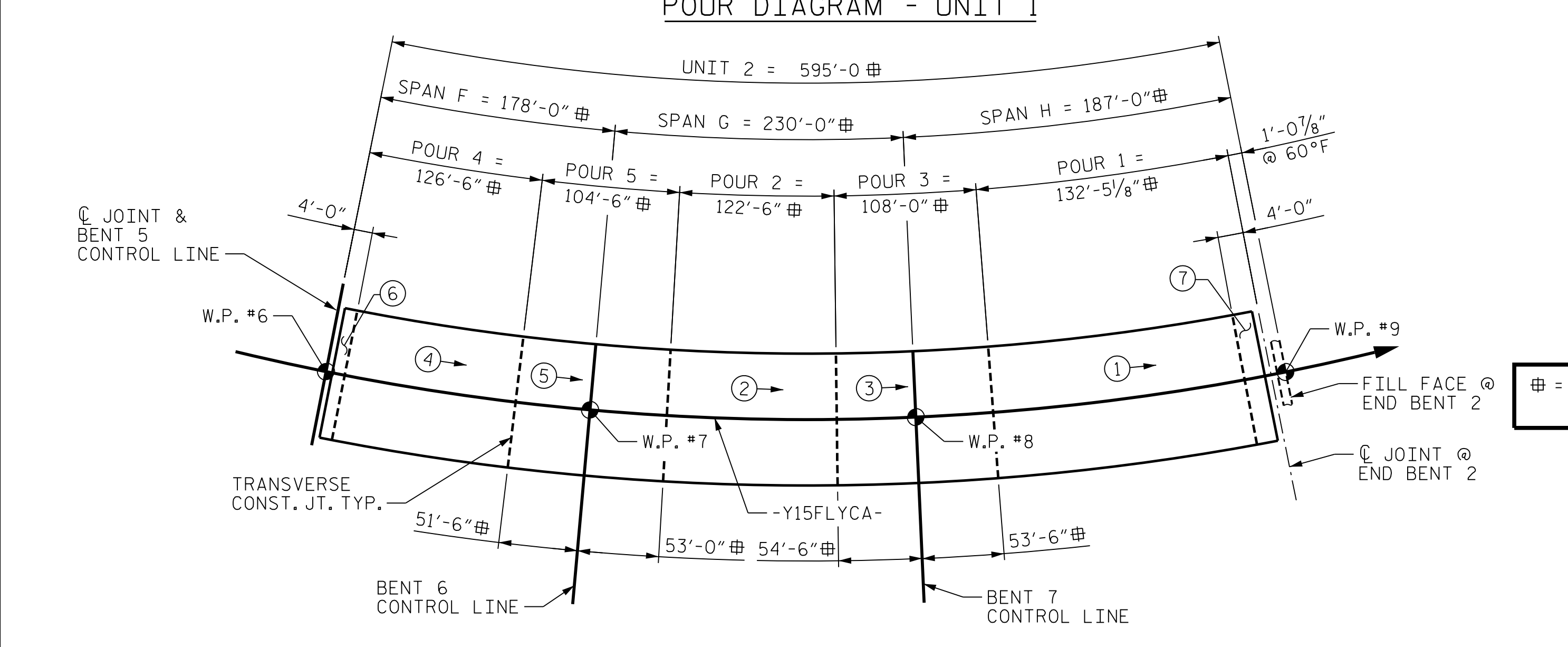
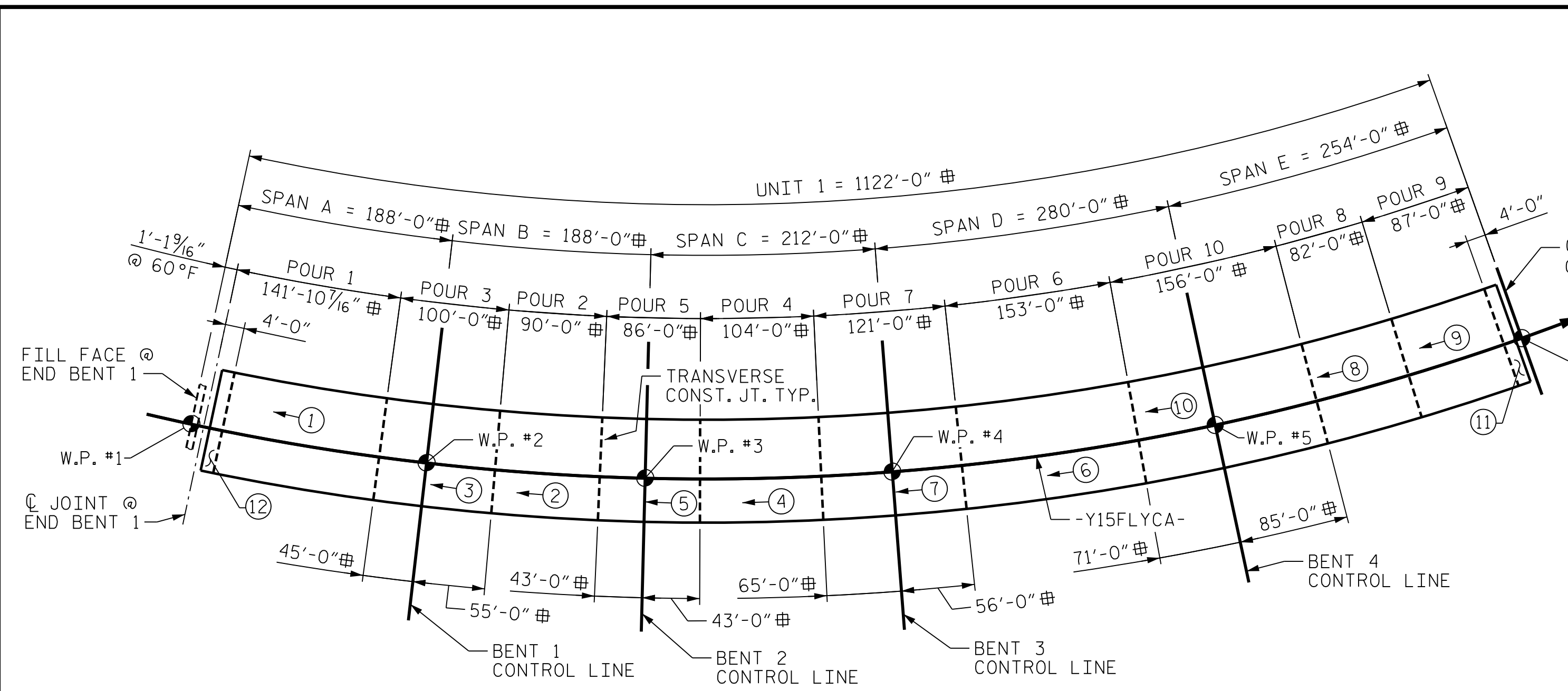
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 DWG BY: T. SAS DATE: 10/19
 CHK BY: D. OLDS DATE: 12/19



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CONCRETE BREAKDOWN

POUR	UNIT 1 CU. YDS.	UNIT 2 CU. YDS.
1	218.5	203.6
2	142.4	193.8
3	157.6	170.2
4	164.5	193.2
5	136.0	164.3
6	242.9	8.5
7	192.0	8.5
8	129.0	-
9	130.5	-
10	244.5	-
11	8.7	-
12	8.4	-
TOTAL	1775.0	942.1

GROOVING BRIDGE FLOORS

APPROACH SLABS	1,812 SQ.FT.
BRIDGE DECK	63,235 SQ.FT.
TOTAL	65,047 SQ.FT.

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"			

= DIMENSION MEASURED ALONG -Y15FLYCA-

BILL OF MATERIAL DECK & DIAPHRAGM-UNIT 1

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	2,710	#5	STR	42'-11"	121,305
A2	2,710	#5	STR	42'-11"	121,305
*B1	16	#4	STR	30'-0"	321
*B2	139	#4	STR	33'-0"	3,064
*B3	609	#6	STR	60'-0"	54,883
*B4	174	#6	STR	16'-10"	4,399
*B5	124	#4	STR	31'-2"	2,582
*B6	62	#4	STR	35'-0"	1,450
*B7	87	#6	STR	45'-8"	5,967
*B8	93	#4	STR	29'-2"	1,812
*B9	174	#6	STR	34'-2"	8,929
*B10	140	#4	STR	16'-11"	3,452
*B11	15	#4	STR	33'-11"	340
B101	1,220	#5	STR	58'-4"	74,227
*G2	22	#5	5	3'-8"	84
*K1	12	#5	2	11'-8"	146
*K2	12	#5	3	16'-6"	207
*S1	38	#4	1	4'-3"	108
*S2	38	#4	1	5'-0"	127
* EPOXY COATED BARS					
REINFORCING STEEL					LBS. 195,532
EPOXY COATED REINF. STEEL					LBS. 209,176

BILL OF MATERIAL DECK & DIAPHRAGM-UNIT 2

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	1,435	#5	STR	42'-11"	64,234
A2	1,435	#5	STR	42'-11"	64,234
*B3	174	#6	STR	60'-0"	15,681
*B12	16	#4	STR	32'-3"	345
*B13	108	#4	STR	35'-3"	2,543
*B14	87	#6	STR	31'-10"	4,160
*B15	124	#4	STR	39'-3"	3,251
*B16	87	#6	STR	34'-10"	4,552
*B17	109	#4	STR	37'-0"	2,694
*B18	15	#4	STR	34'-0"	341
B102	671	#5	STR	56'-2"	39,308
*G1	1	#5	STR	42'-11"	45
*G2	11	#5	5	3'-8"	42
*J1	41	#4	4	1'-5"	39
*K1	12	#5	2	11'-8"	146
*K2	12	#5	3	16'-6"	207
*S1	79	#4	1	4'-3"	224
* EPOXY COATED BARS					
REINFORCING STEEL					LBS. 103,542
EPOXY COATED REINF. STEEL					LBS. 98,504

NOTES

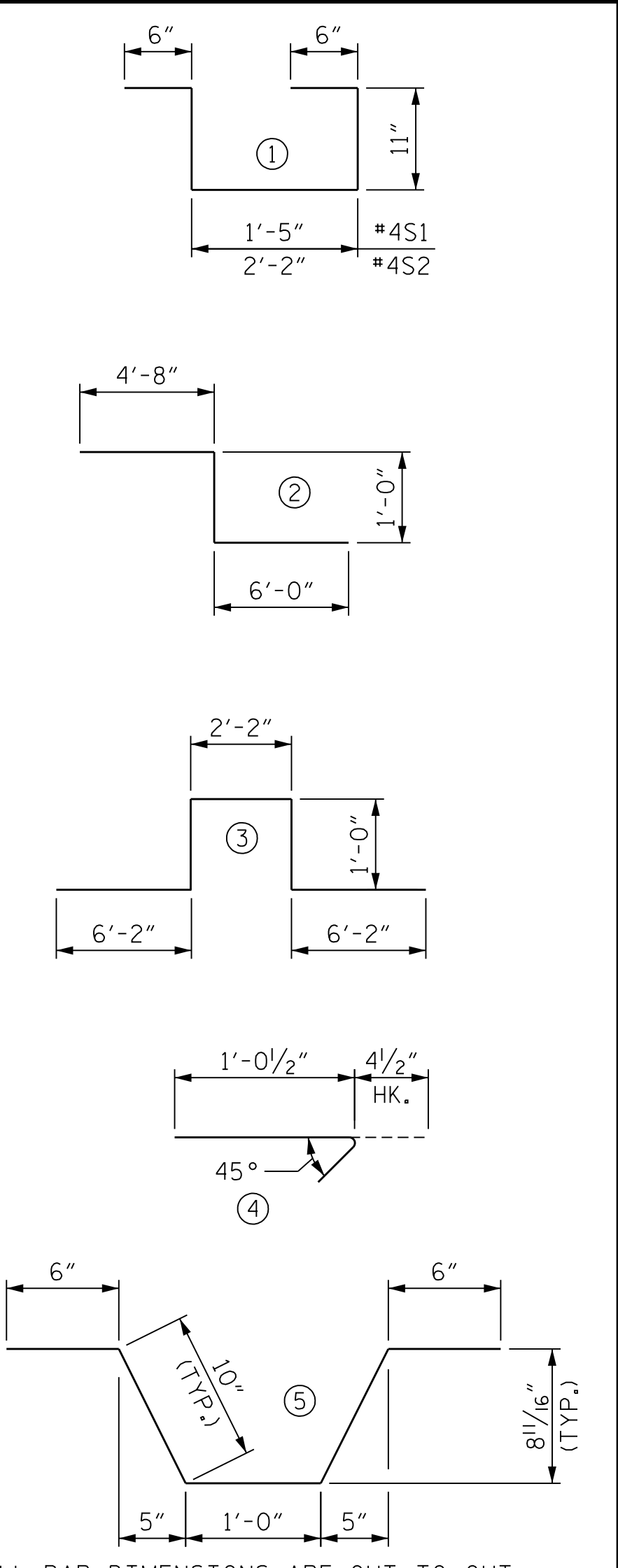
** = QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED.

PERFORM BRIDGE DECK GROOVING IN ACCORDANCE WITH STANDARD SPEC. ITEM 420-14.

THE CONCRETE DECK QUANTITIES INCLUDE CONCRETE IN THE STAY-IN-PLACE FORM FLUTES. AN ADDITIONAL 1" OF DECK THICKNESS WAS CONSIDERED WHERE STAY-IN-PLACE FORMS ARE USED.

DECK SLAB TRANSVERSE CONSTRUCTION JOINTS ARE RADIAL (EXCEPT JOINTS FOR 4'-0" CLOSURE POURS AT EXPANSION JOINTS).

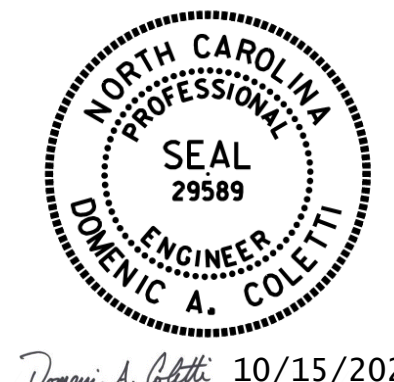
BAR TYPES



SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	CU. YARDS	LBS.	LBS.
UNIT 1	1,775.0	195,532	209,176
UNIT 2	942.1	103,542	98,504
TOTAL **	2,717.1	299,074	307,680

PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-



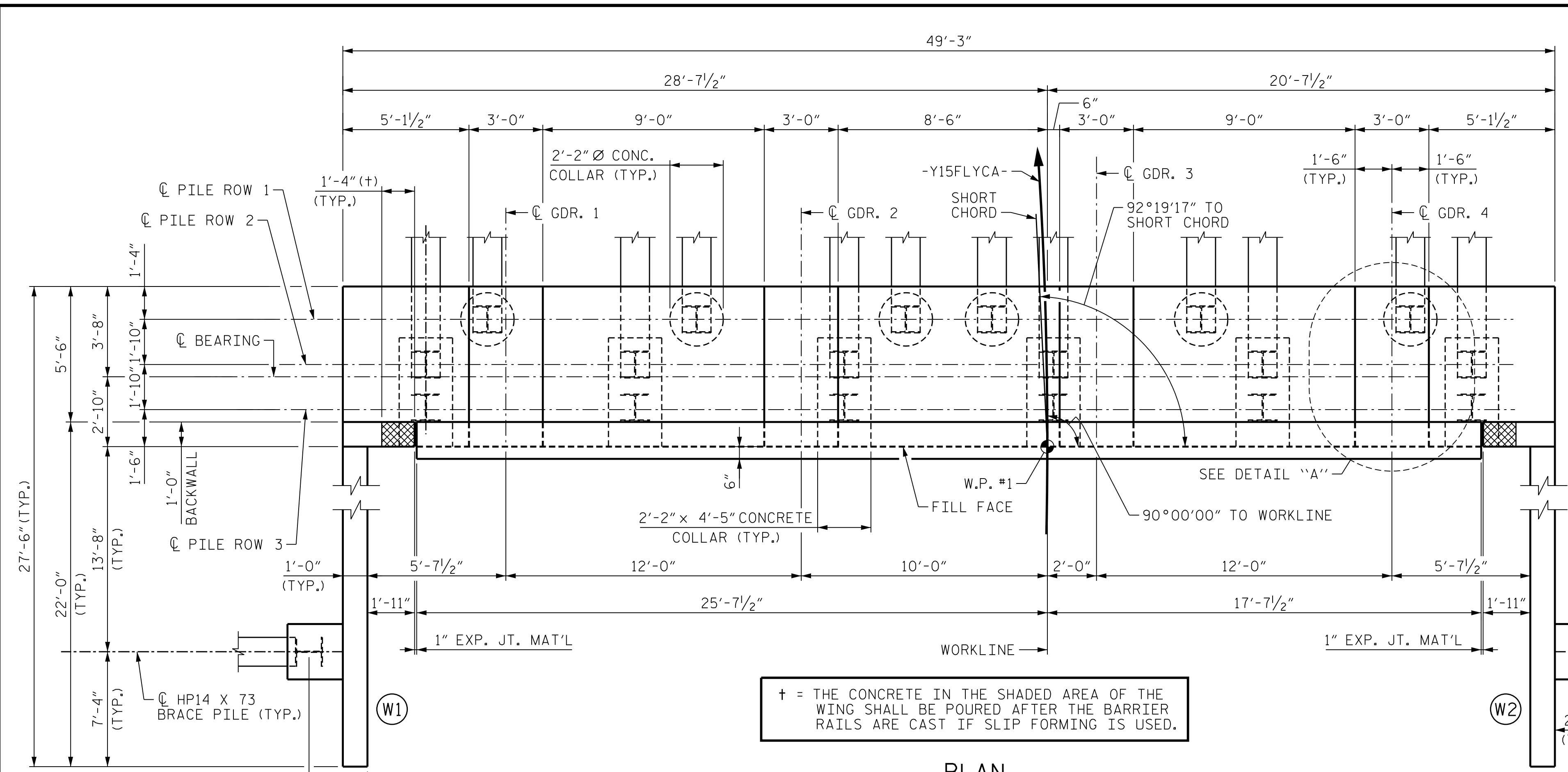
Dominic A. Coletti 10/15/2021

DES BY: G. SCHMITZ	DATE: 09/19	DWG BY: T. SAS	DATE: 09/19
DES CHK: D. COLETTI	DATE: 09/19	CHK BY: D. OLDS	DATE: 12/19



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

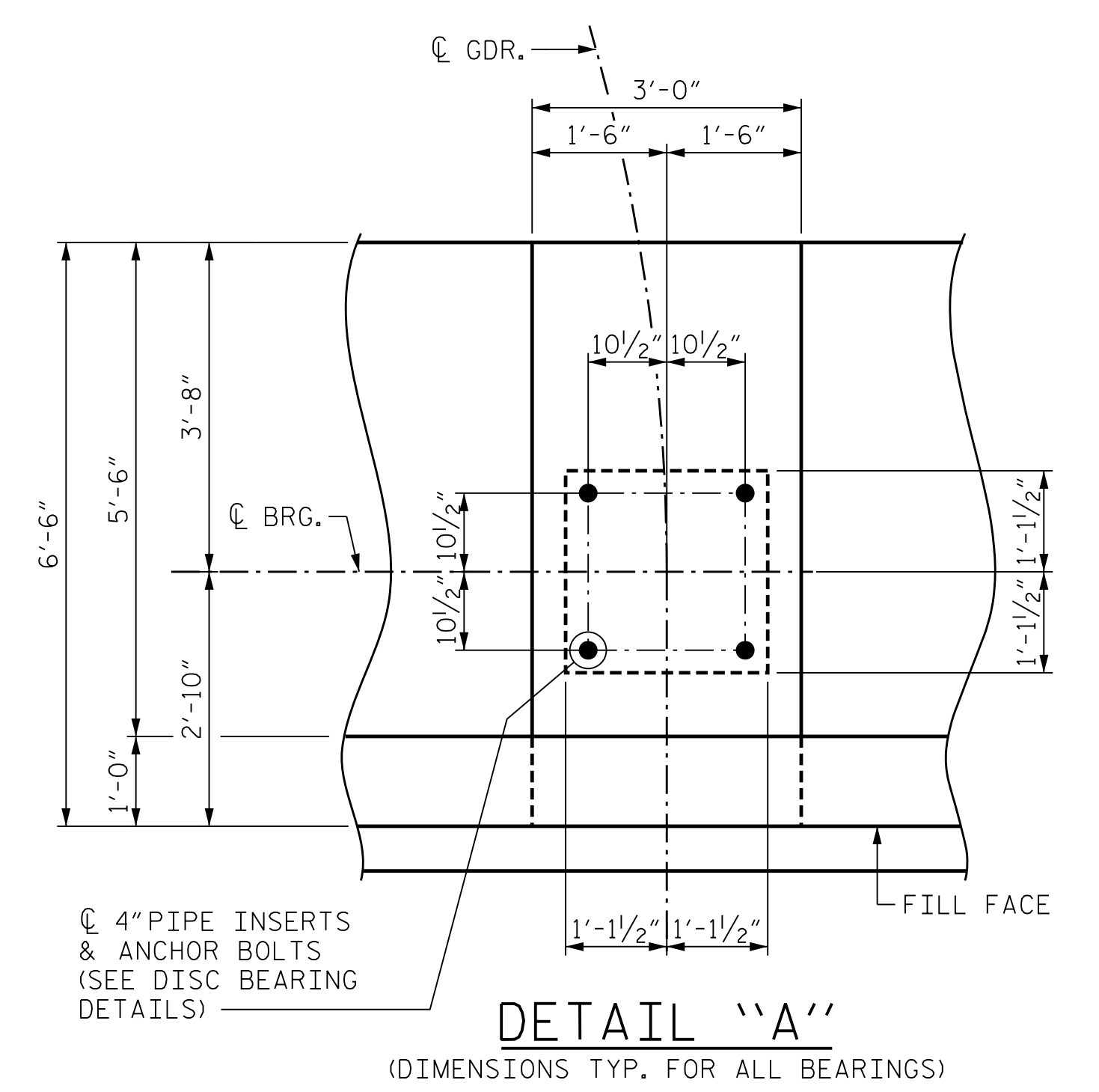
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NO.	BY:	DATE:	NO.	BY:	DATE:	
1	--	--	3	--	--	TOTAL SHEETS 129
2	--	--	4	--	--	



† = THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAILS ARE CAST IF SLIP FORMING IS USED.

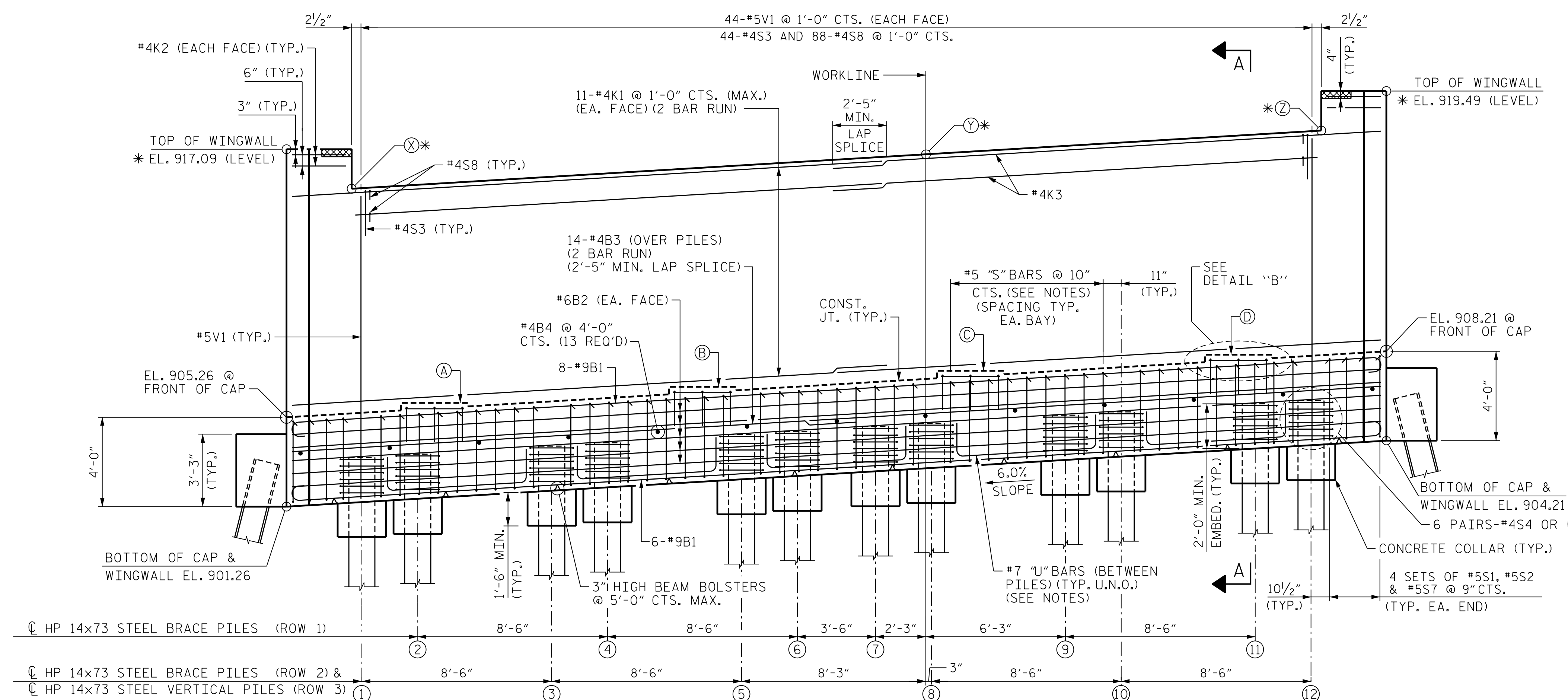
PLAN

NOTES
 FOR SECTION A-A AND ADDITIONAL NOTES SEE "END BENT 1 SECTION & DETAILS".
 SEE "SUBSTRUCTURE END BENT 1" SHEET 2 OF 4 FOR SPACING AND BAR MARKS OF #4 "S" BARS AROUND PILES, #5 STIRRUPS AND #7 "U" BARS.



DETAIL "A"

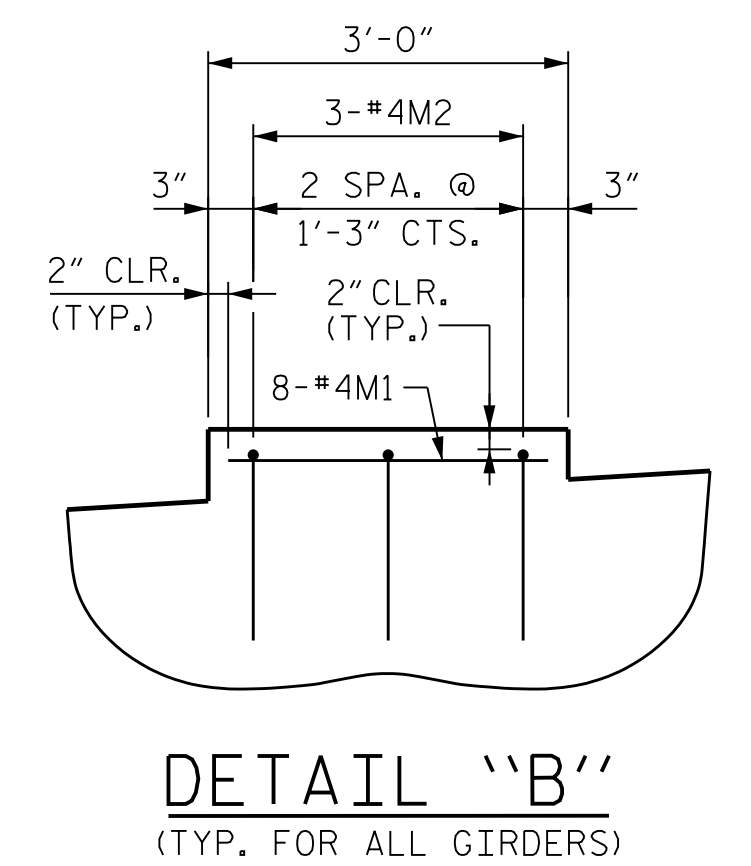
(DIMENSIONS TYP. FOR ALL BEARINGS)



ELEVATION

ELEVATION TABLE	
LOCATION	ELEVATION
A	905.91
B	906.63
C	907.35
D	908.07
* X	915.33
* Y	916.86
* Z	917.92
* AT FILL FACE	

TOP OF PILE ELEVATIONS	
LOCATION	ELEVATION
1	903.50
2	903.65
3	904.01
4	904.16
5	904.52
6	904.67
7	904.88
8	905.03
9	905.39
10	905.54
11	905.90
12	906.05



DETAIL "B"

(TYP. FOR ALL GIRDERS)

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 FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-

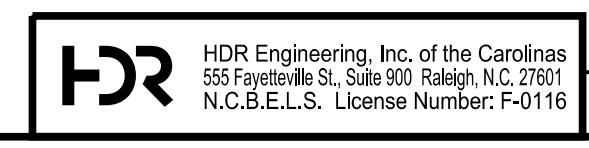
SHEET 1 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 1
 PLAN AND ELEVATION

PLOT DRIVER: NCDOT...
 USER: PETERSON...
 DATE: 10/14/2021...
 TIME: 5:18:22 PM...
 FILE: ...SUBSTR

DES BY: M. BARNES DATE: 07/19
 DES CHK: J. EARNEST DATE: 07/19
 DWG BY: B. PETERSON DATE: 07/19
 CHK BY: J. EARNEST DATE: 08/19



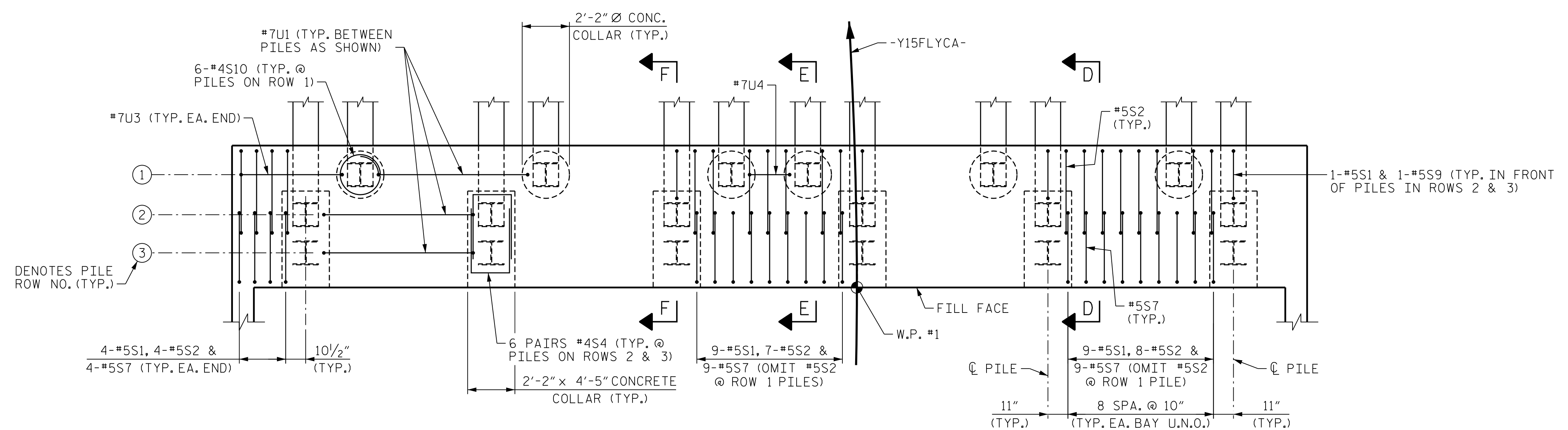
REVISIONS

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

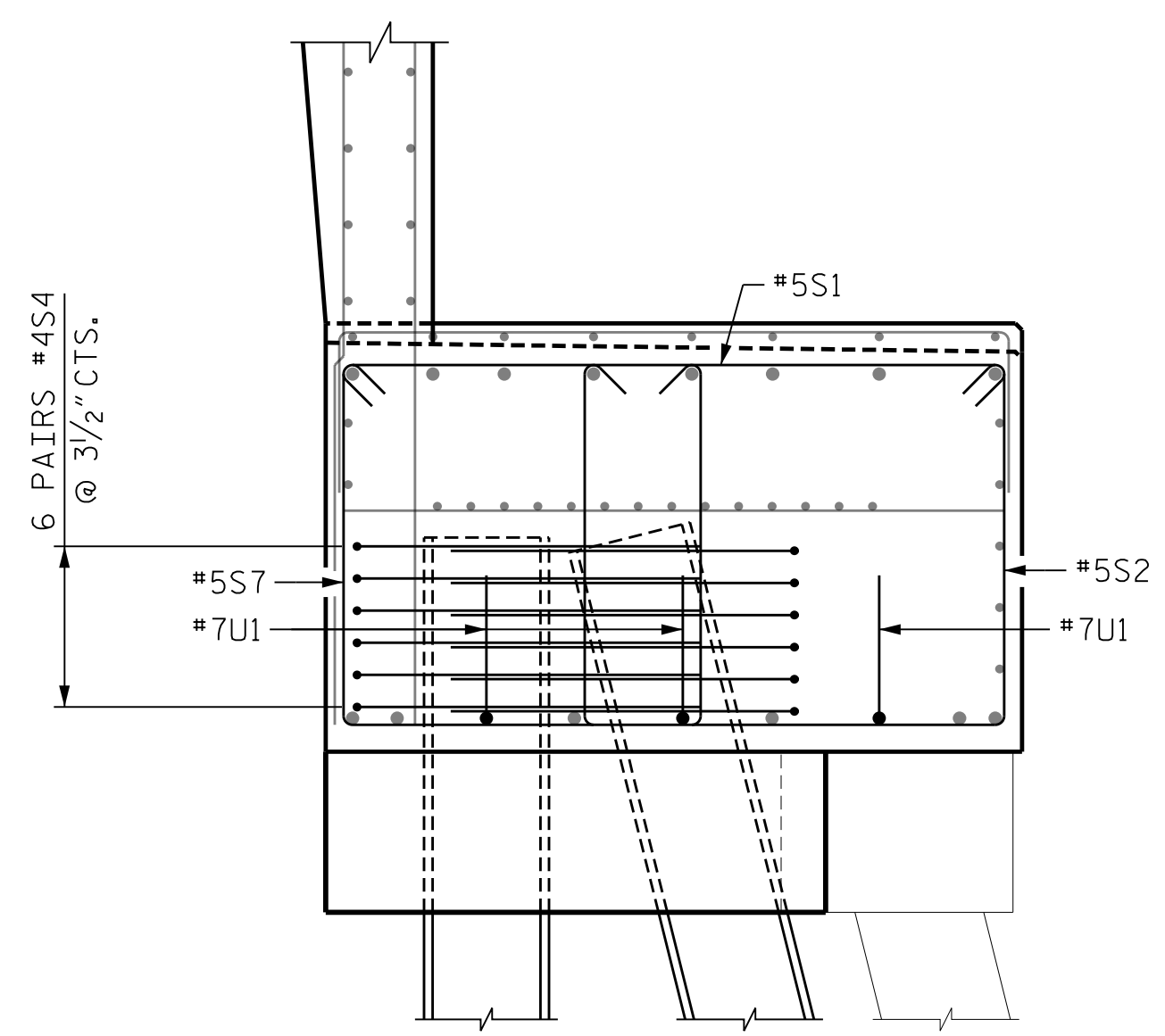
10/15/2021

SHEET NO. 506-079
 TOTAL SHEETS 129

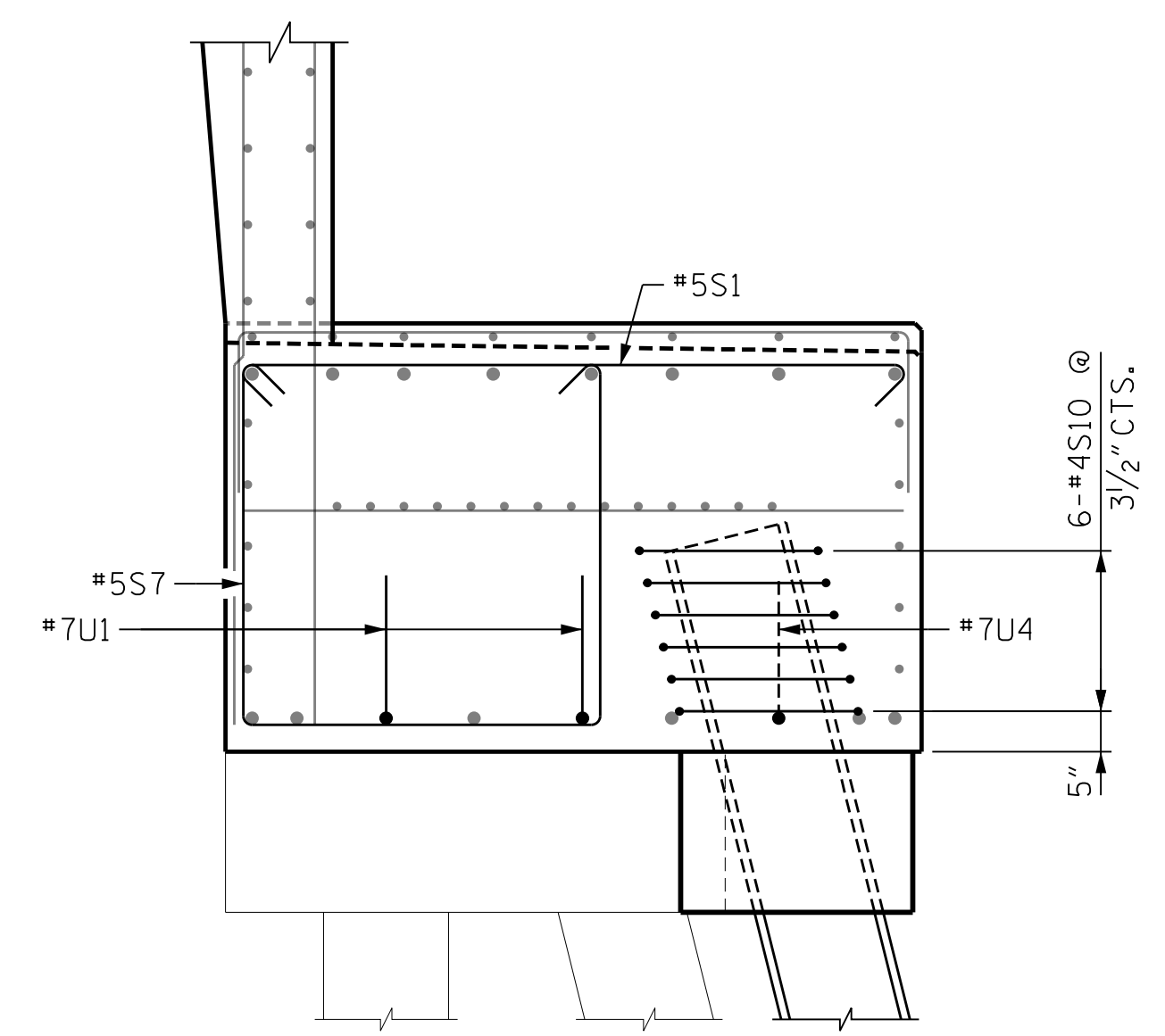
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 UNLESS ALL SIGNATURES COMPLETED



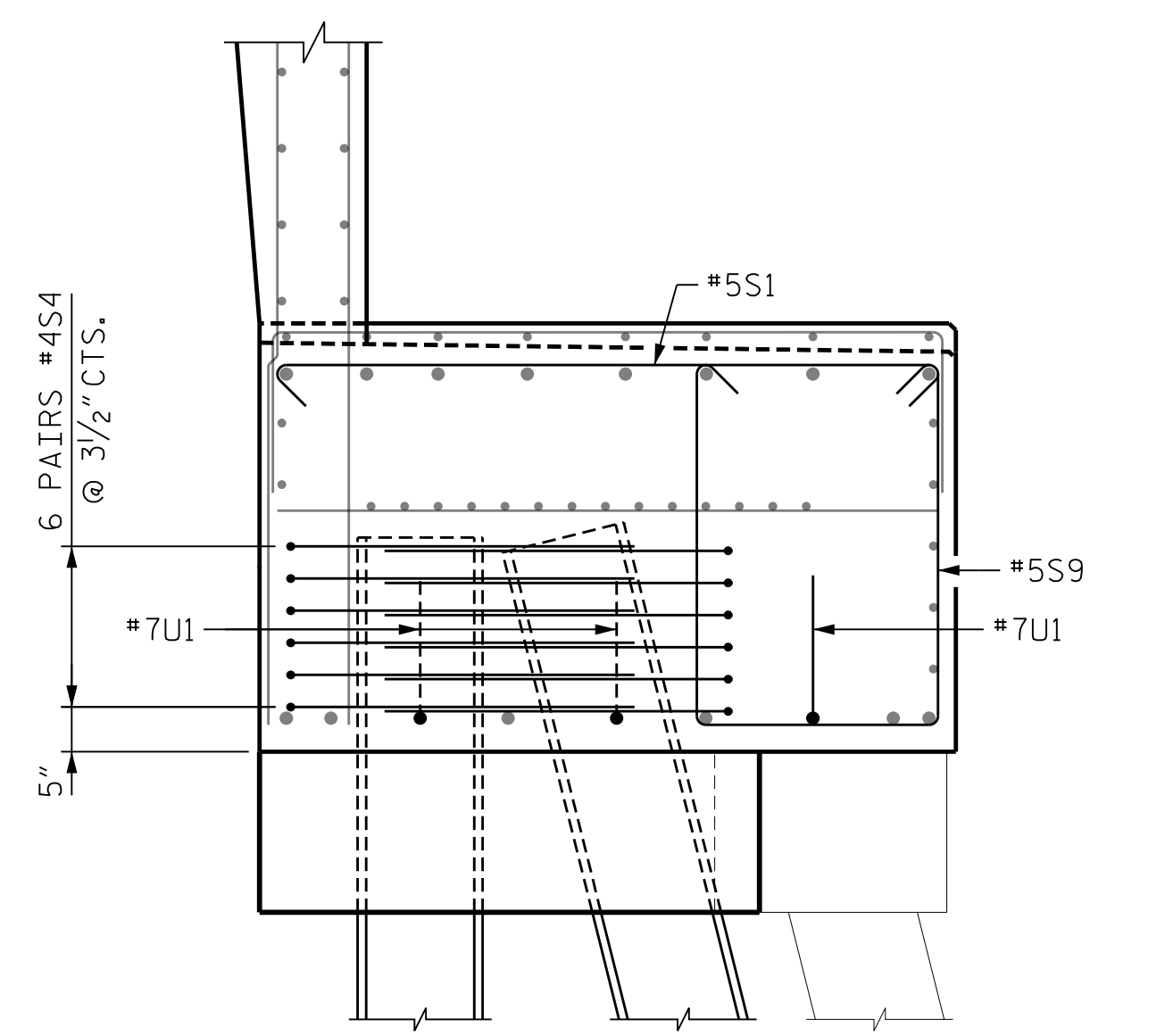
PLAN OF STIRRUPS AND "U" BARS
 (TOP & BOTTOM "B" BARS AND S1 BARS NOT SHOWN FOR CLARITY)



SECTION D-D
 SEE SECTION A-A ON "SUBSTRUCTURE END BENT 1"
 SHEET 4 OF 4 FOR MORE INFORMATION



SECTION E-E
 SEE SECTION A-A ON "SUBSTRUCTURE END BENT 1"
 SHEET 4 OF 4 FOR MORE INFORMATION

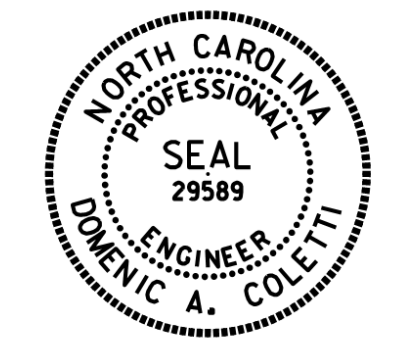


SECTION F-F
 SEE SECTION A-A ON "SUBSTRUCTURE END BENT 1"
 SHEET 4 OF 4 FOR MORE INFORMATION

PROJECT NO. U-2579AB
FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-
 SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

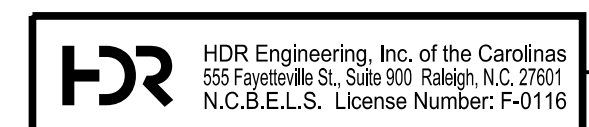
**SUBSTRUCTURE
 END BENT 1
 PLAN AND ELEVATION**



Dominic A. Coletti 10/15/2021

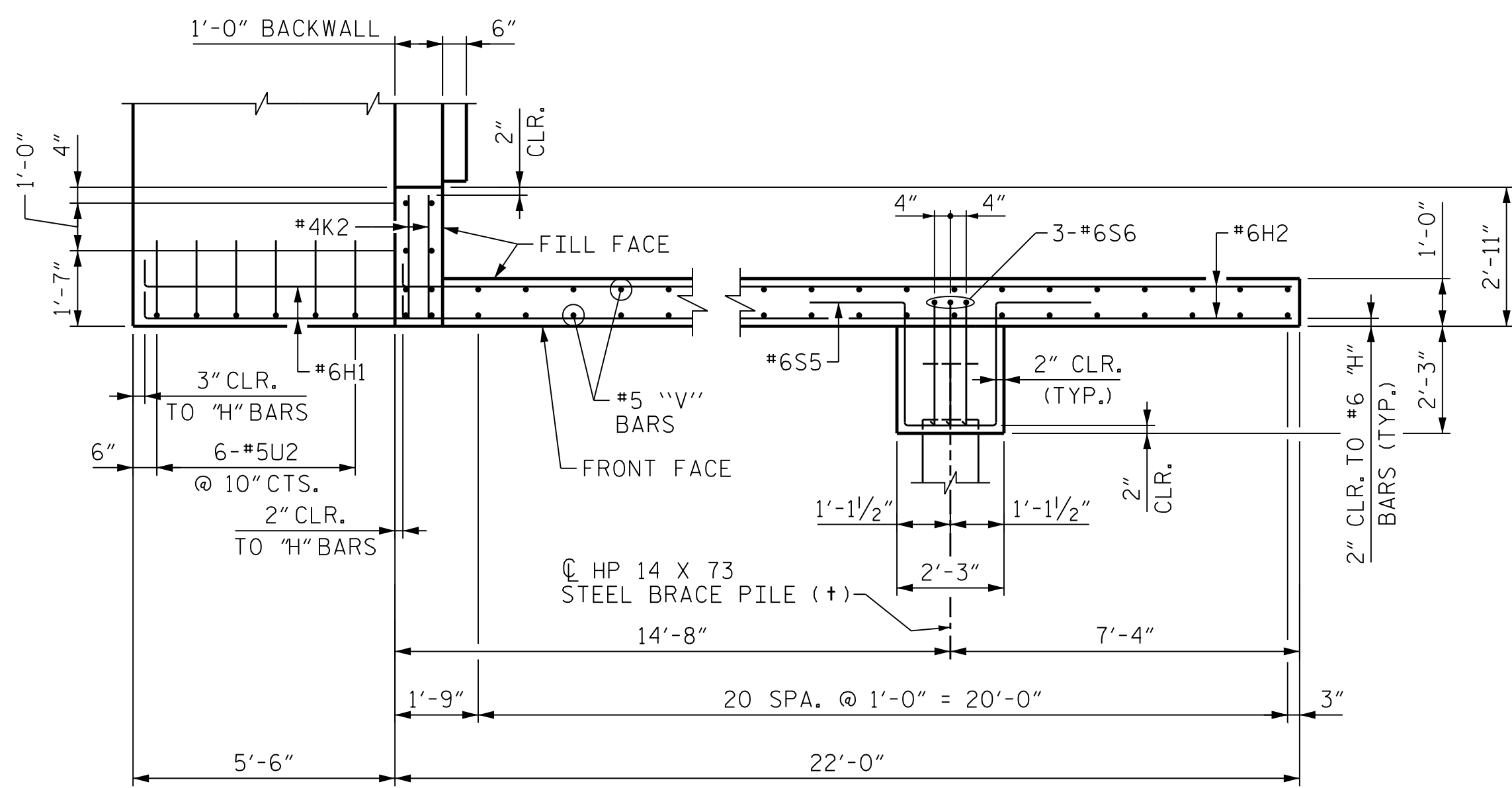
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 USER: PPETERSO DATE: 10/14/2021
 FILE: ...SUBSTR

DES BY: <u>M. BARNES</u>	DATE: <u>07/19</u>	DWG BY: <u>B. PETERSON</u>	DATE: <u>07/19</u>
DES CHK: <u>J. EARNEST</u>	DATE: <u>07/19</u>	CHK BY: <u>J. EARNEST</u>	DATE: <u>08/19</u>

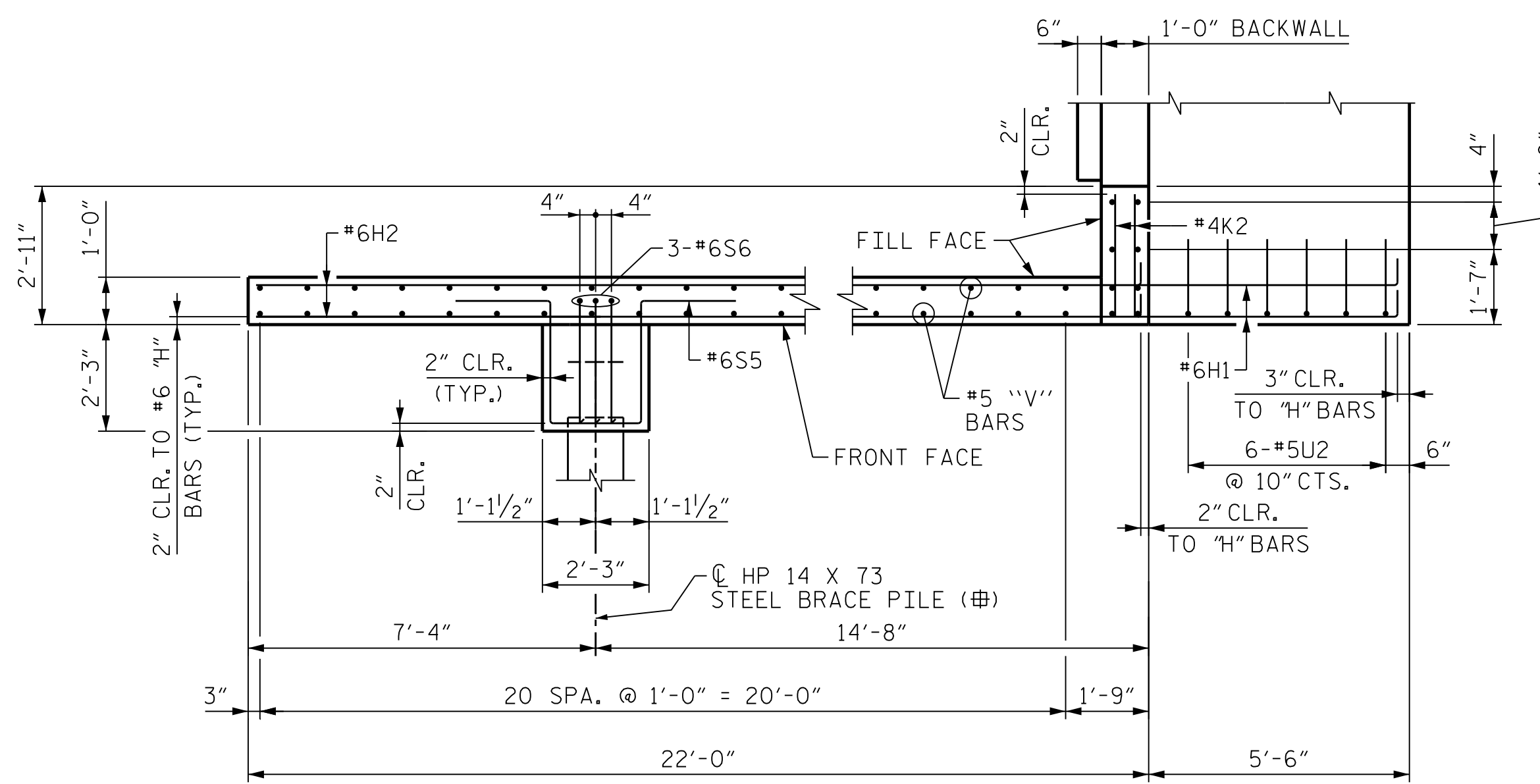


**DOCUMENT NOT CONSIDERED FINAL
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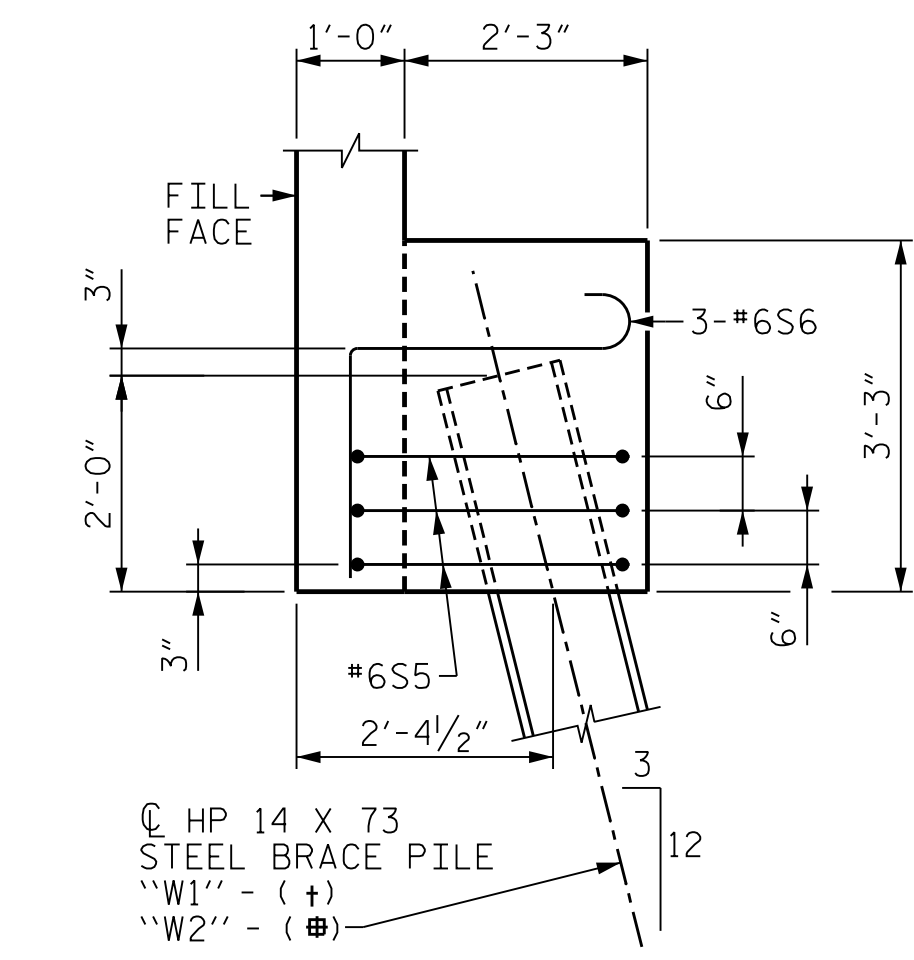
REVISIONS						SHEET NO. 506-080 TOTAL SHEETS 129
NO.	BY:	DATE:	NO.	BY:	DATE:	
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2	--	--	4	--	--	



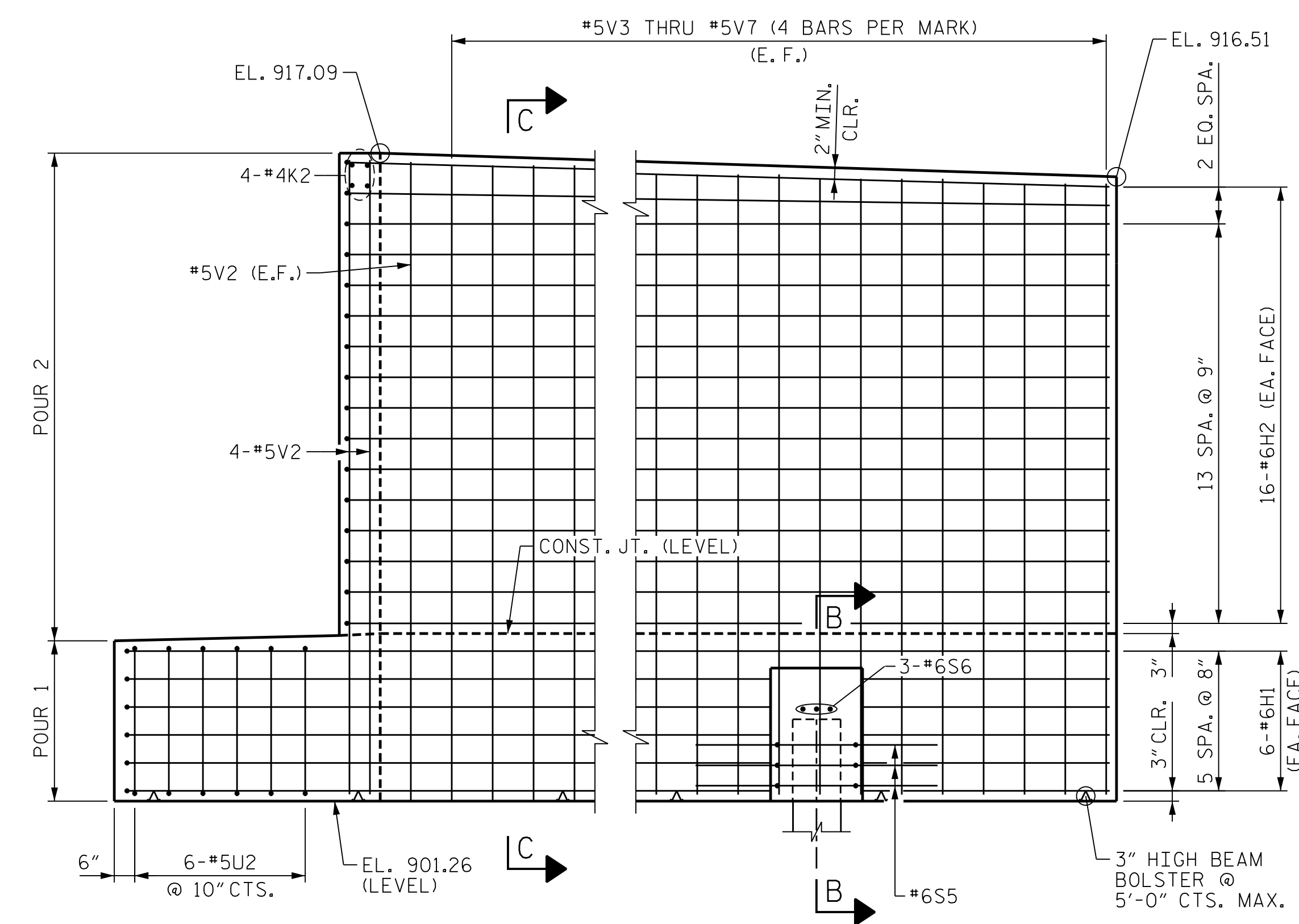
PLAN - WINGWALL "W1"



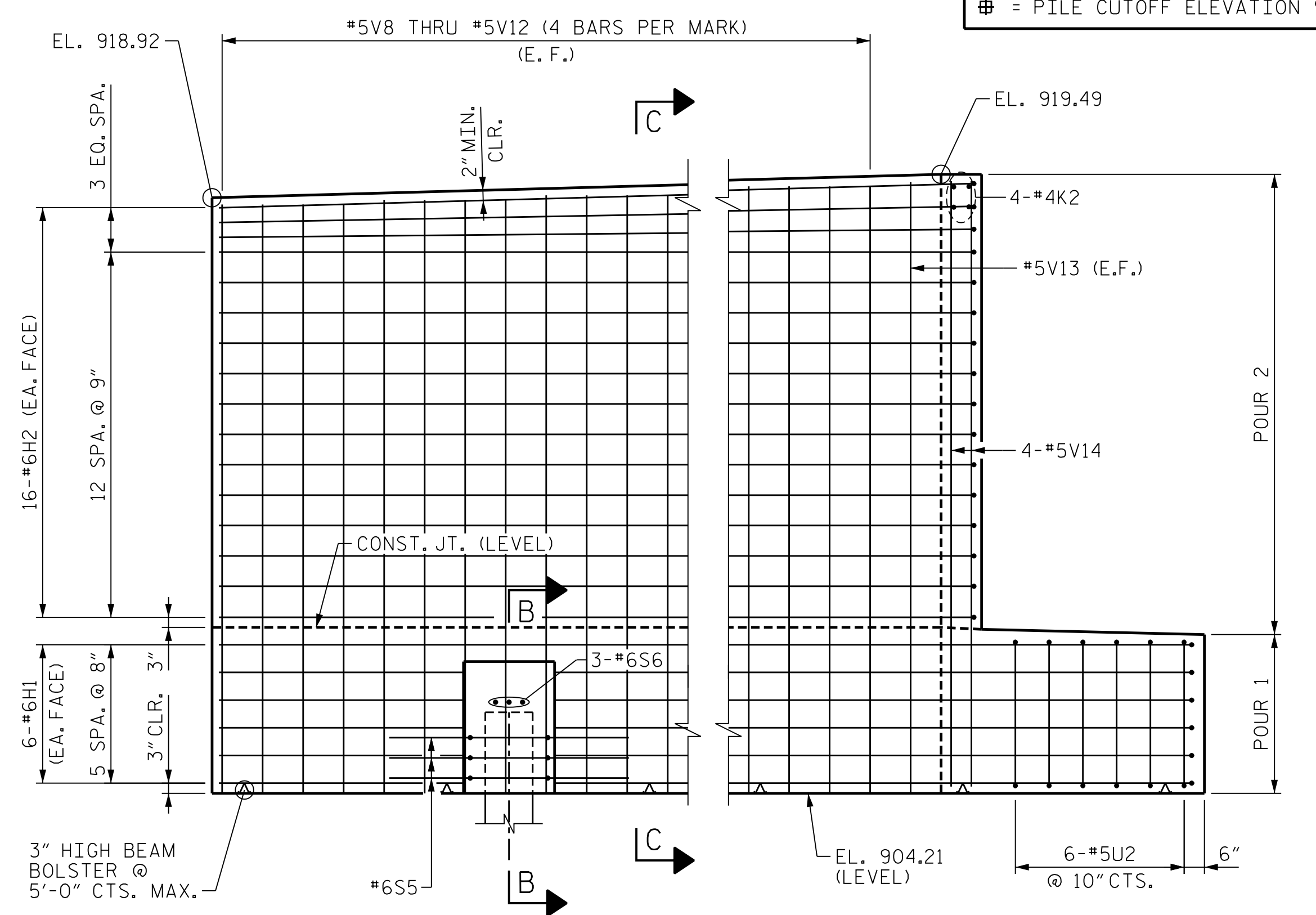
PLAN - WINGWALL "W2"



SECTION B-B

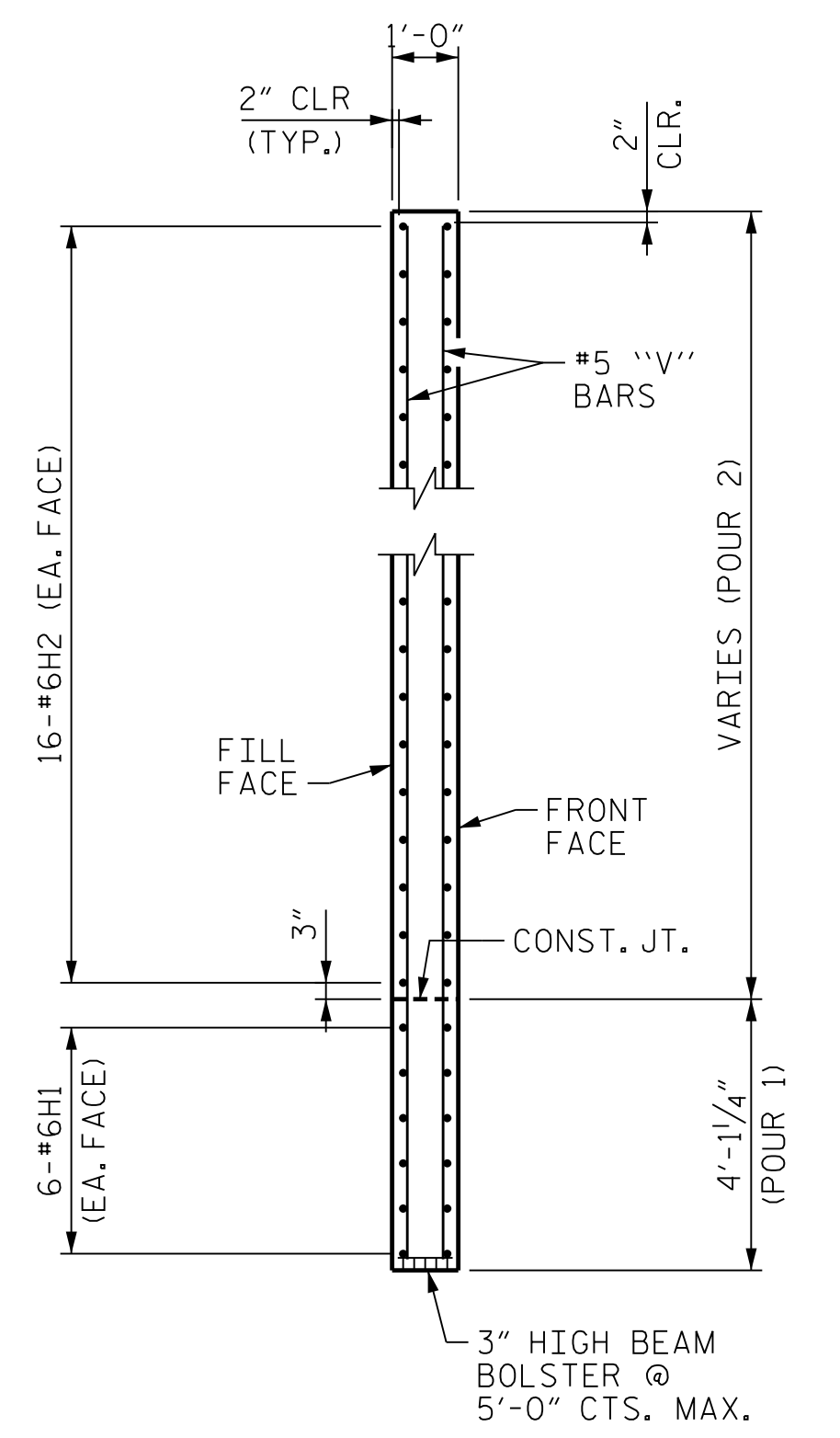


ELEVATION - WINGWALL "W1"



ELEVATION - WINGWALL "W2"

† = PILE CUTOFF ELEVATION 903.26
= PILE CUTOFF ELEVATION 906.21



SECTION C-C

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 58+33.94 -Y15FLYCA-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

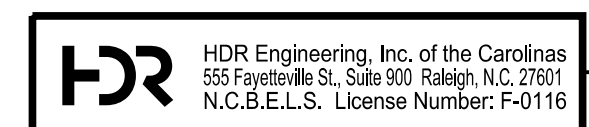
SUBSTRUCTURE
END BENT 1
WING DETAILS

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

SHEET NO. S06-081
TOTAL SHEETS 129



Dominic A. Coletti 10/15/2021

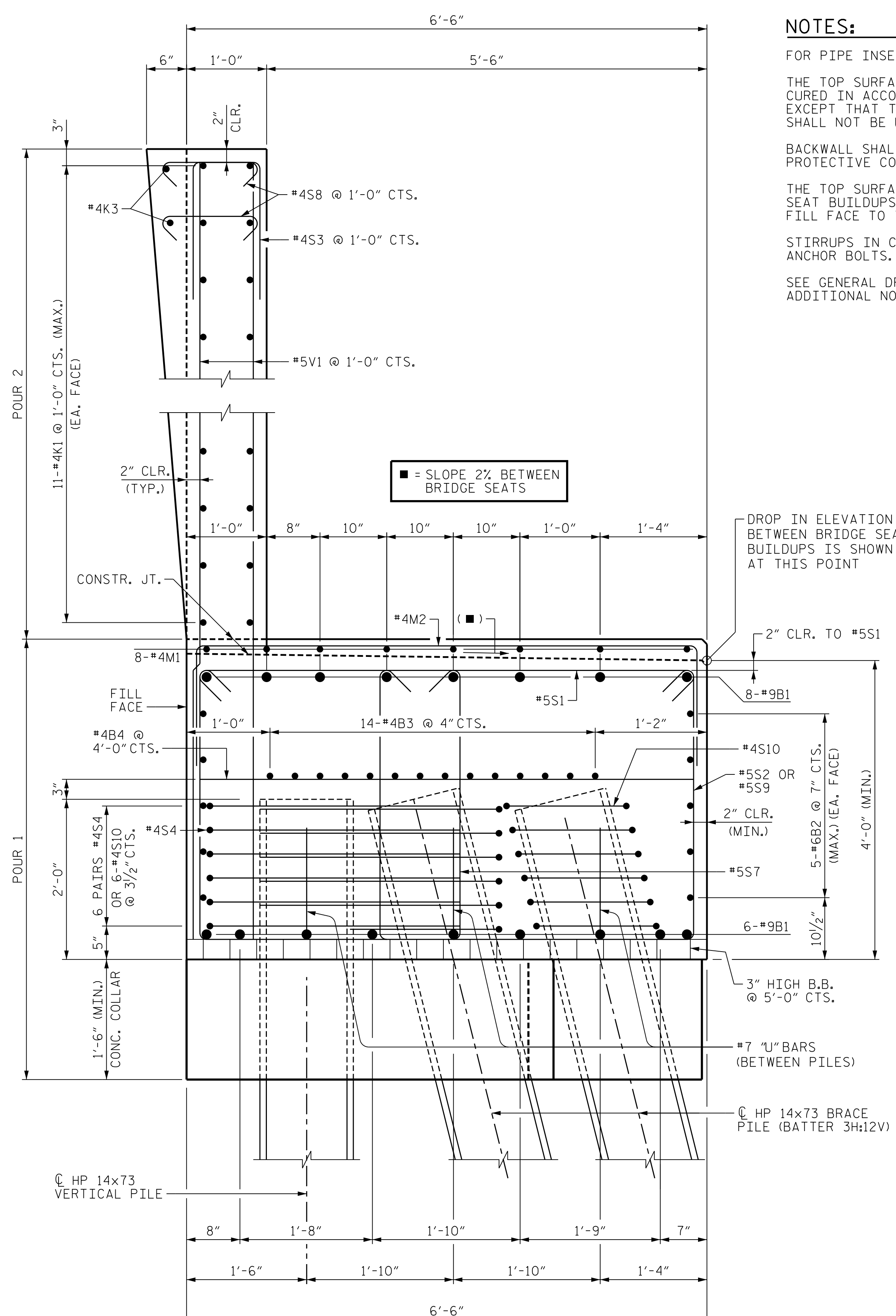


HDR Engineering, Inc. of the Carolinas
555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

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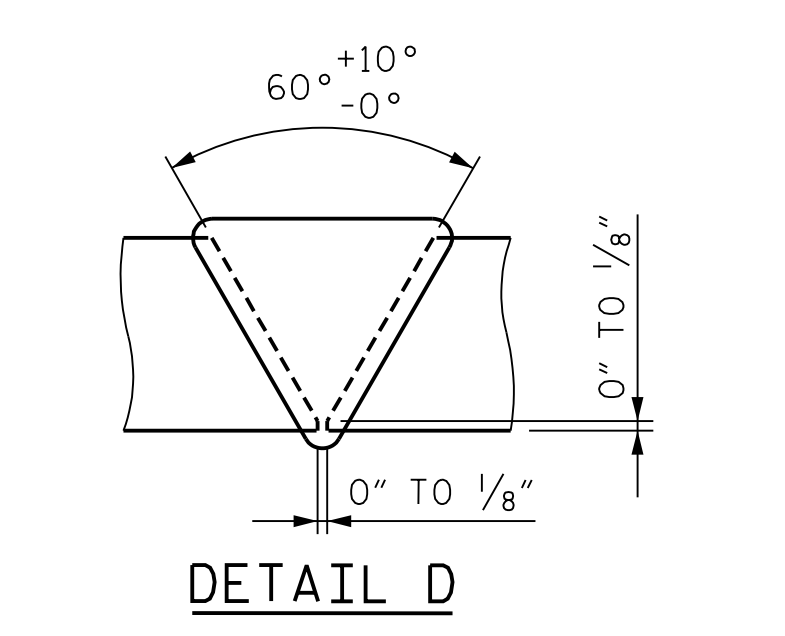
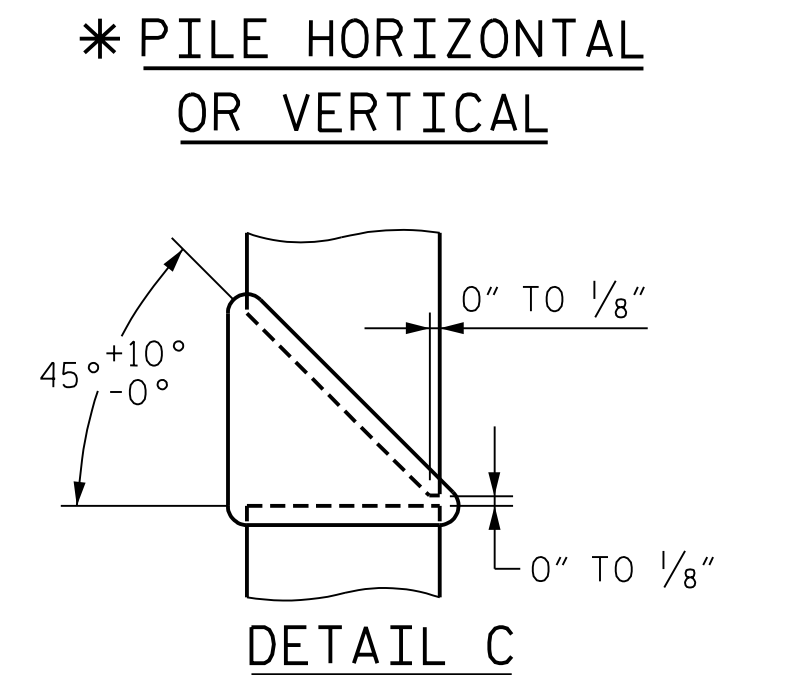
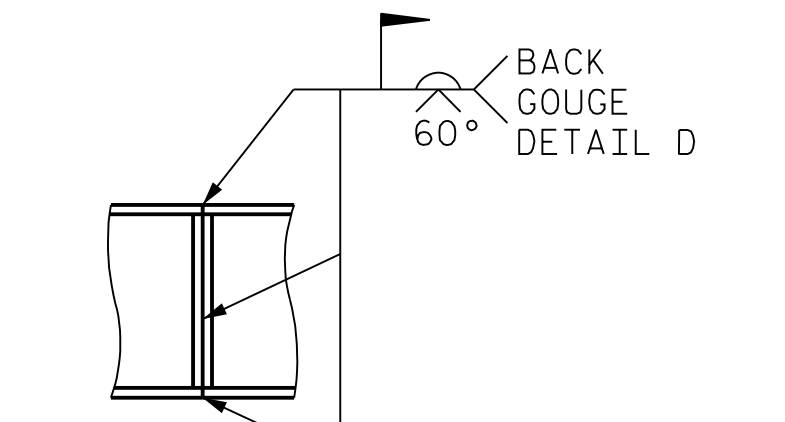
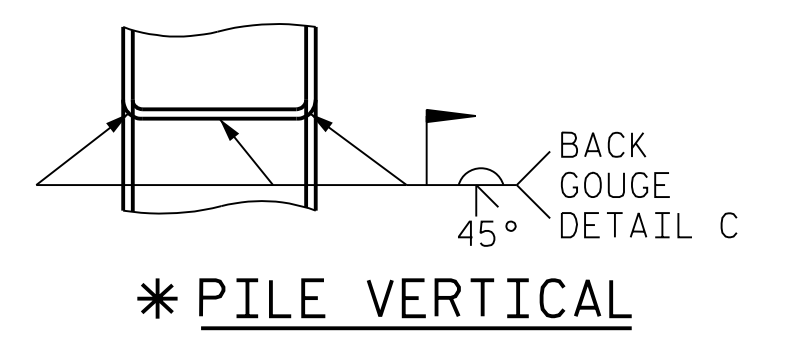
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DES BY: M. BARNES DATE: 07/19
DES CHK: J. EARNEST DATE: 07/19
DWG BY: B. PETERSON DATE: 07/19
CHK BY: J. EARNEST DATE: 08/19

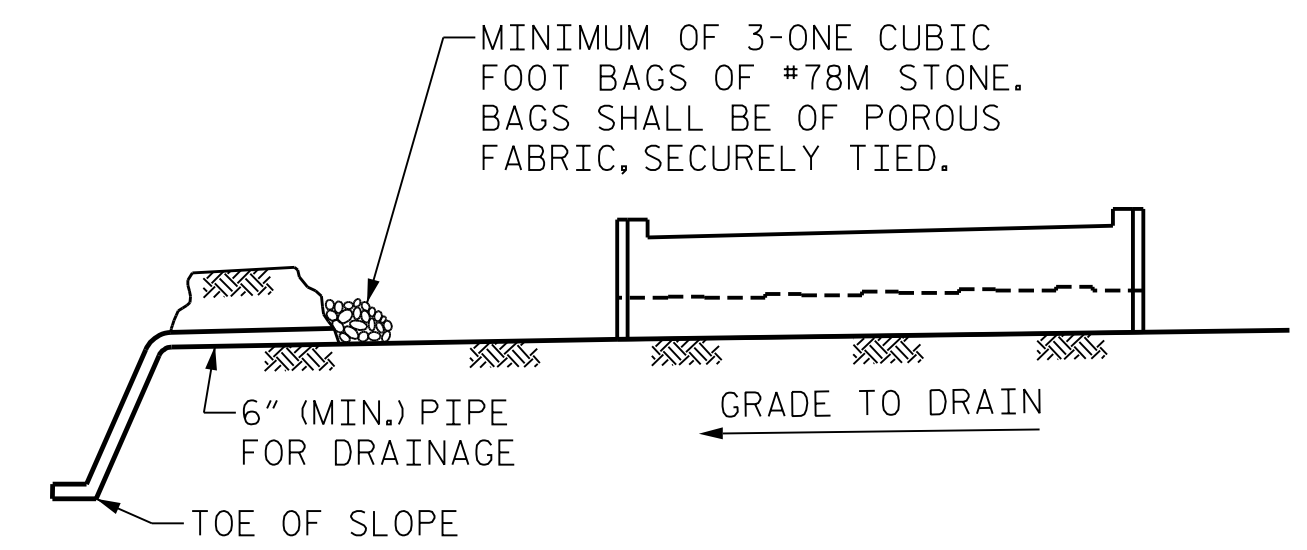


SECTION A-A

NOTES:
 FOR PIPE INSERT DETAILS, SEE BEARING SHEETS.
 THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
 BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
 THE TOP SURFACE OF THE END BENT CAP, EXCEPT THE BRIDGE SEAT BUILDUPS, SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 SEE GENERAL DRAWING "FOUNDATION LAYOUT" FOR ADDITIONAL NOTES FOR DRIVING PILES.



PILE SPLICE DETAILS
 * = POSITION OF PILE DURING WELDING



NOTES:
 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 DETEIORATED 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 FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

BAR TYPES
 (ALL DIMENSIONS ARE OUT TO OUT)

BAR TYPES

M2	6'-2"
S3	8"
S4	1'-10"
U2	3'-6"
U1	6'-6"
U3	4'-8"
U4	1'-6"

DETAILS

U1, U3, U4	1'-2"
U2	1'-6"
S4	3'-3"
S3	1'-6"
M2	1'-6"

DETAILS

H1	27'-1"
H2	21'-8"

DETAILS

H1	2'-8"
H2	8"

DETAILS

H1	2'-11"
H2	2'-7"

BILL OF MATERIAL

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	14	#9	1	51'-4"	2443
B2	10	#6	STR	49'-0"	736
B3	28	#4	STR	25'-9"	482
B4	13	#4	STR	6'-2"	54
H1	24	#6	5	28'-1"	1013
H2	64	#6	5	22'-8"	2179
K1	44	#4	STR	25'-9"	757
K2	8	#4	STR	2'-7"	14
K3	4	#4	STR	22'-9"	61
M1	32	#4	STR	2'-8"	58
M2	12	#4	4	9'-2"	74
S1	59	#5	2	7'-1"	436
S2	47	#5	3	12'-1"	593
S3	44	#4	4	3'-8"	108
S4	72	#4	4	8'-4"	401
S5	6	#6	8	9'-1"	82
S6	6	#6	7	5'-5"	49
S7	53	#5	3	11'-6"	636
S8	88	#4	2	1'-10"	108
S9	6	#5	3	10'-6"	66
S10	36	#4	6	7'-7"	183
U1	14	#7	4	8'-10"	253
U2	12	#5	4	6'-6"	82
U3	2	#7	4	7'-0"	29
U4	1	#7	4	3'-10"	8
V1	88	#5	STR	13'-5"	1232
V2	10	#5	STR	15'-4"	160
V3	8	#5	STR	15'-3"	128
V4	8	#5	STR	15'-2"	127
V5	8	#5	STR	15'-0"	126
V6	8	#5	STR	14'-11"	125
V7	8	#5	STR	14'-10"	124
V8	8	#5	STR	14'-3"	119
V9	8	#5	STR	14'-4"	120
V10	8	#5	STR	14'-6"	121
V11	8	#5	STR	14'-7"	122
V12	8	#5	STR	14'-8"	123
V13	2	#5	STR	14'-9"	31
V14	8	#5	STR	14'-10"	124
REINFORCING STEEL					LBS. 13,687
CLASS 'A' CONCRETE					
POUR 1: COLLARS, CAP & LOWER PART OF WINGS				CU. YDS.	61.5
POUR 2: BACKWALL & UPPER PART OF WINGS				CU. YDS.	40.5
TOTAL				CU. YDS.	102.0
HP 14x73 STEEL PILES		NO.	20		
		LF	1800		
PILE DRIVING EQUIPMENT SETUP FOR HP 14x73 STEEL PILES		EA.	20		

PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-
 SHEET 4 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 END BENT 1
 SECTION & DETAILS**

REVISIONS

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

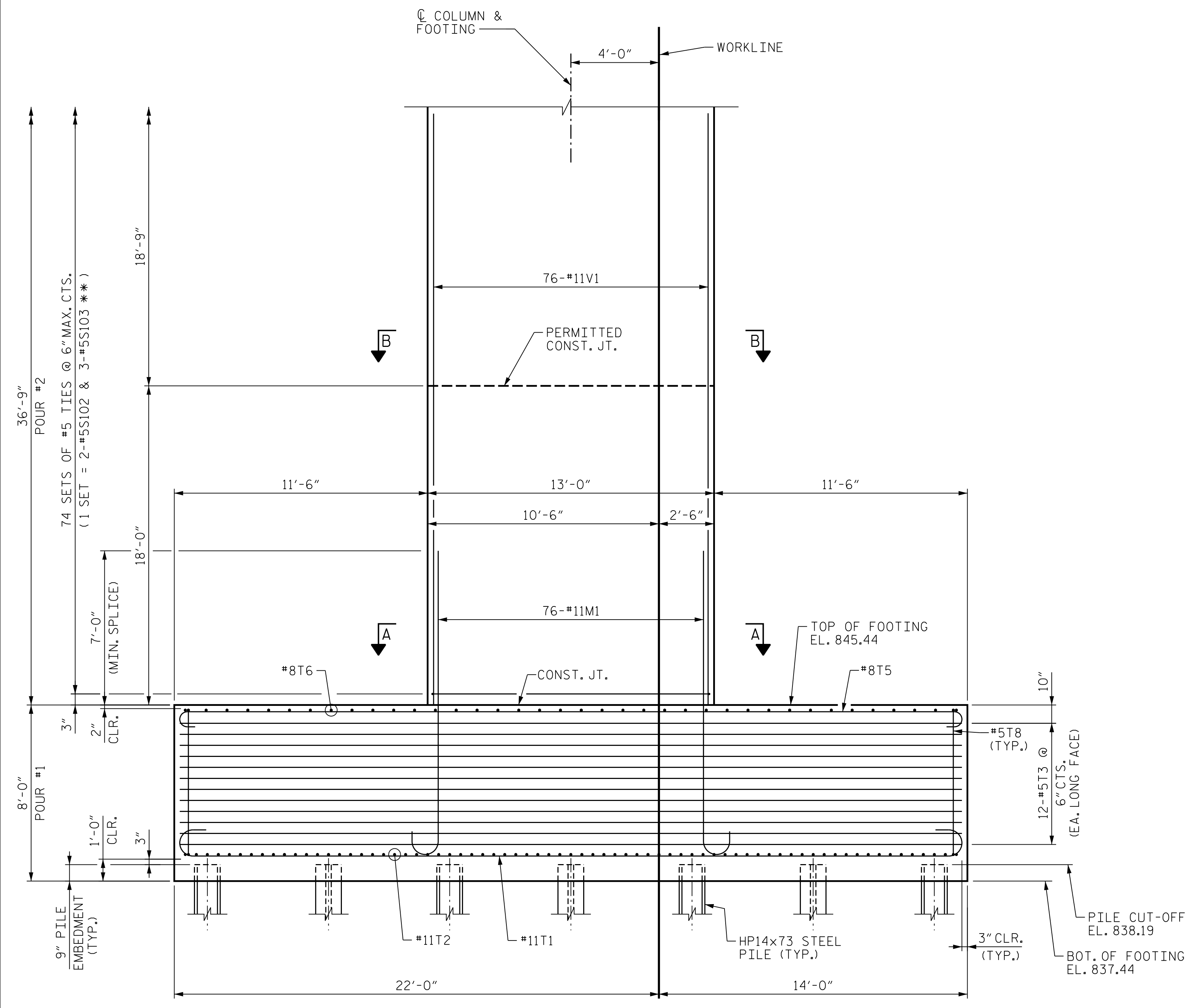
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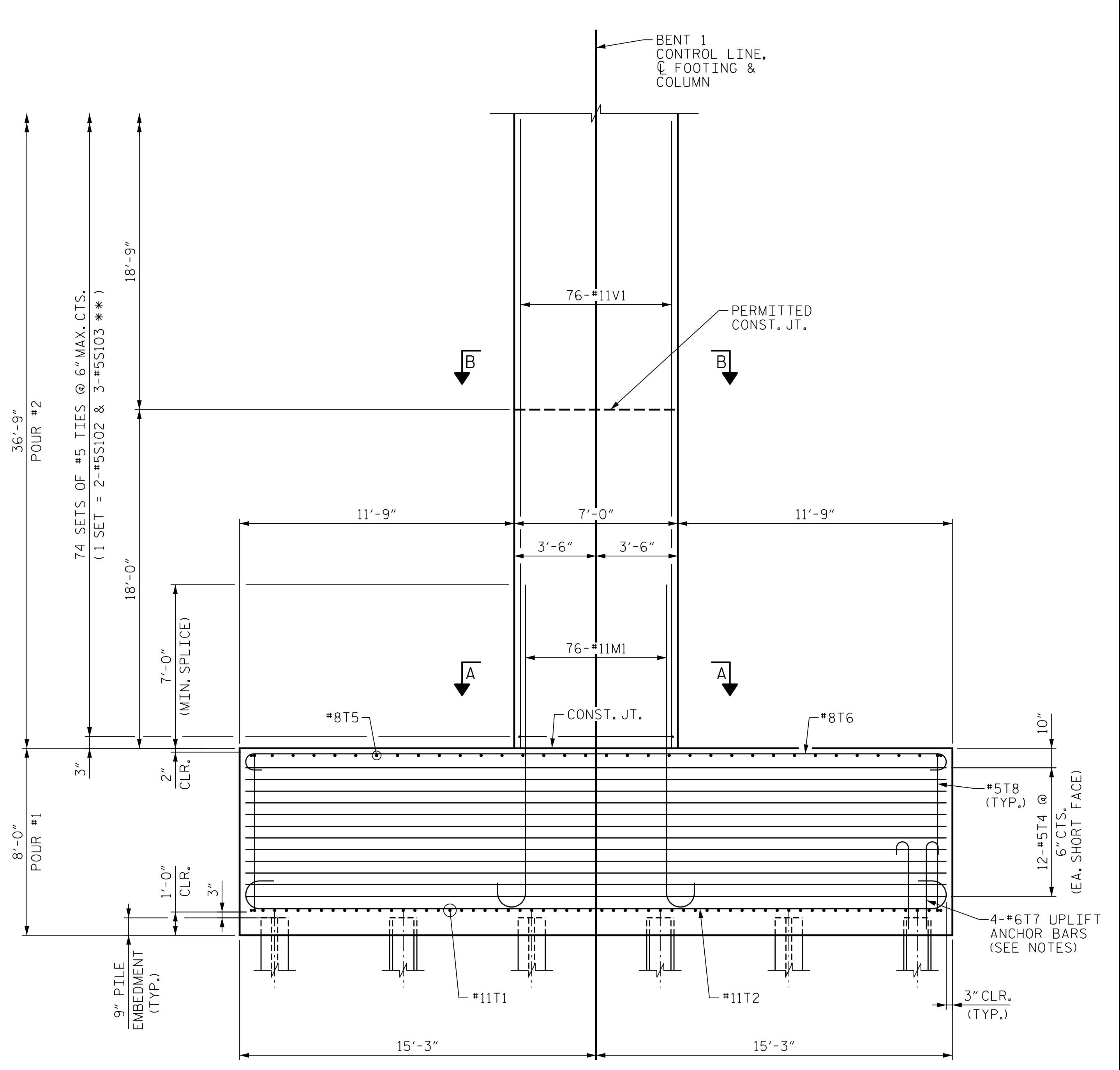
DES BY: <u>M. BARNES</u>	DATE: <u>07/19</u>	DWG BY: <u>B. PETERSON</u>	DATE: <u>07/19</u>
DES CHK: <u>J. EARNEST</u>	DATE: <u>07/19</u>	CHK BY: <u>J. EARNEST</u>	DATE: <u>08/19</u>

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 555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
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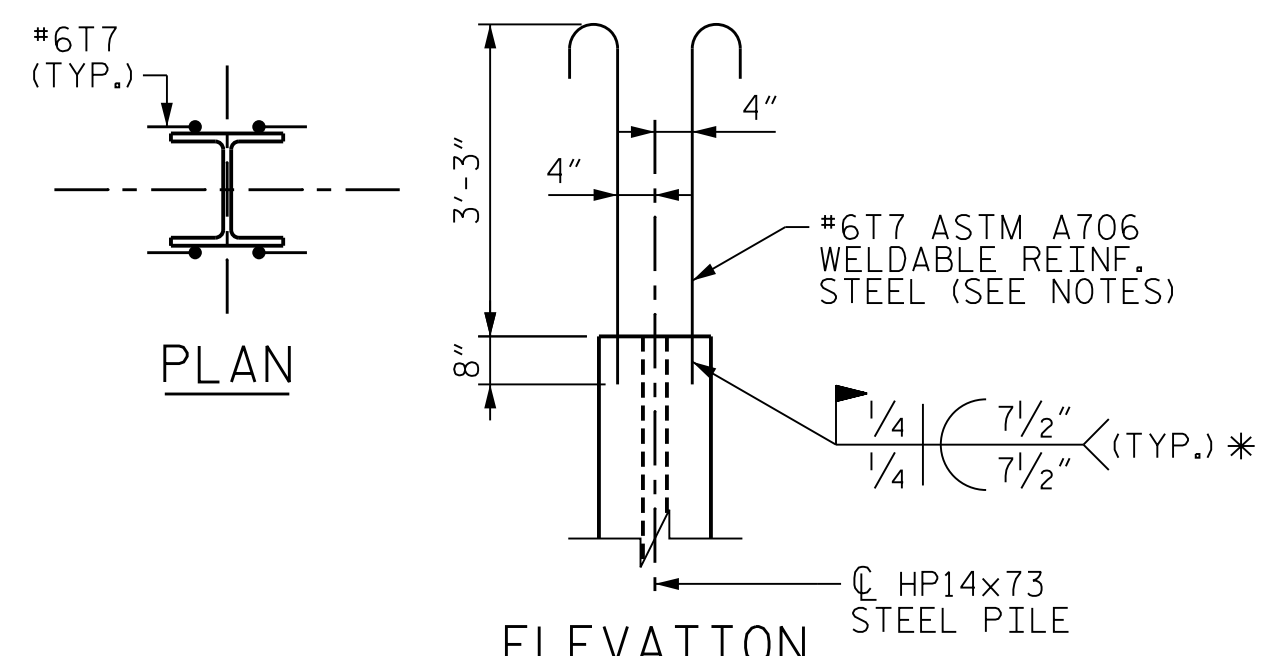


PARTIAL FRONT ELEVATION



PARTIAL END ELEVATION

** INVERT ORIENTATION OF ALTERNATE #5S103 TIES



PILE UPLIFT ANCHOR DETAILS
 * PROVIDE 1/4" SETBACK EACH END OF THE WELD
 (TYP. AT PILES NOTED THUS: # ON SUBSTRUCTURE FOOTING & COLUMN DETAILS SHEET)

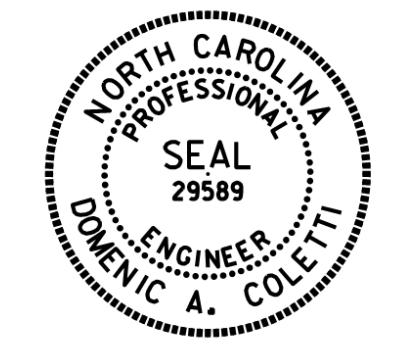
NOTES FOR BENTS 1, 2, 3, 5, 6, AND 7

HOOKS ON M1 AND T7 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
 "T" BARS IN TOP OF FOOTING MAY BE SHIFTED AS NECESSARY, WITHOUT VIOLATING THE 1'-0" MAXIMUM SPACING, TO CLEAR M1 BARS EXTENDING INTO COLUMN.
 FOR MASS CONCRETE, SEE SPECIAL PROVISIONS.
 FOR PILE SPLICE DETAILS, SEE "SUBSTRUCTURE END BENT 1", SHEET 4 OF 4.
 PLANS AND CALCULATIONS FOR ANY TEMPORARY SUPPORTS ATTACHED TO FOOTINGS, COLUMNS OR BENT CAPS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL BY THE ENGINEER PRIOR TO START OF BENT CONSTRUCTION. ANY ATTACHMENT PROVISIONS SHALL BE REMOVED AFTER USE AND THE FOOTINGS, COLUMNS OR BENT CAPS REPAIRED IN SUCH A WAY AS TO NOT COMPROMISE THE INTEGRITY OF THE BENT.
 DETAILED DRAWINGS FOR FALSEWORK AND FORMS FOR ALL HAMMERHEAD BENTS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL BY THE ENGINEER. SEE SPECIAL PROVISIONS FOR FORMWORK AND FALSEWORK.

NOTES FOR BENT 1

FOR FOOTING PLAN, SECTION A-A AND SECTION B-B, SEE "SUBSTRUCTURE BENT 1 FOOTING & COLUMN DETAILS", SHEET 3 OF 6.
 4-#6T7 UPLIFT ANCHOR BARS AT NOTED PILES - SEE "SUBSTRUCTURE BENT 1 FOOTING & COLUMN DETAILS", SHEET 3 OF 6 FOR LOCATIONS.

PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-
 SHEET 1 OF 6



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE BENT 1 ELEVATIONS

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

DATE: 10/15/2021

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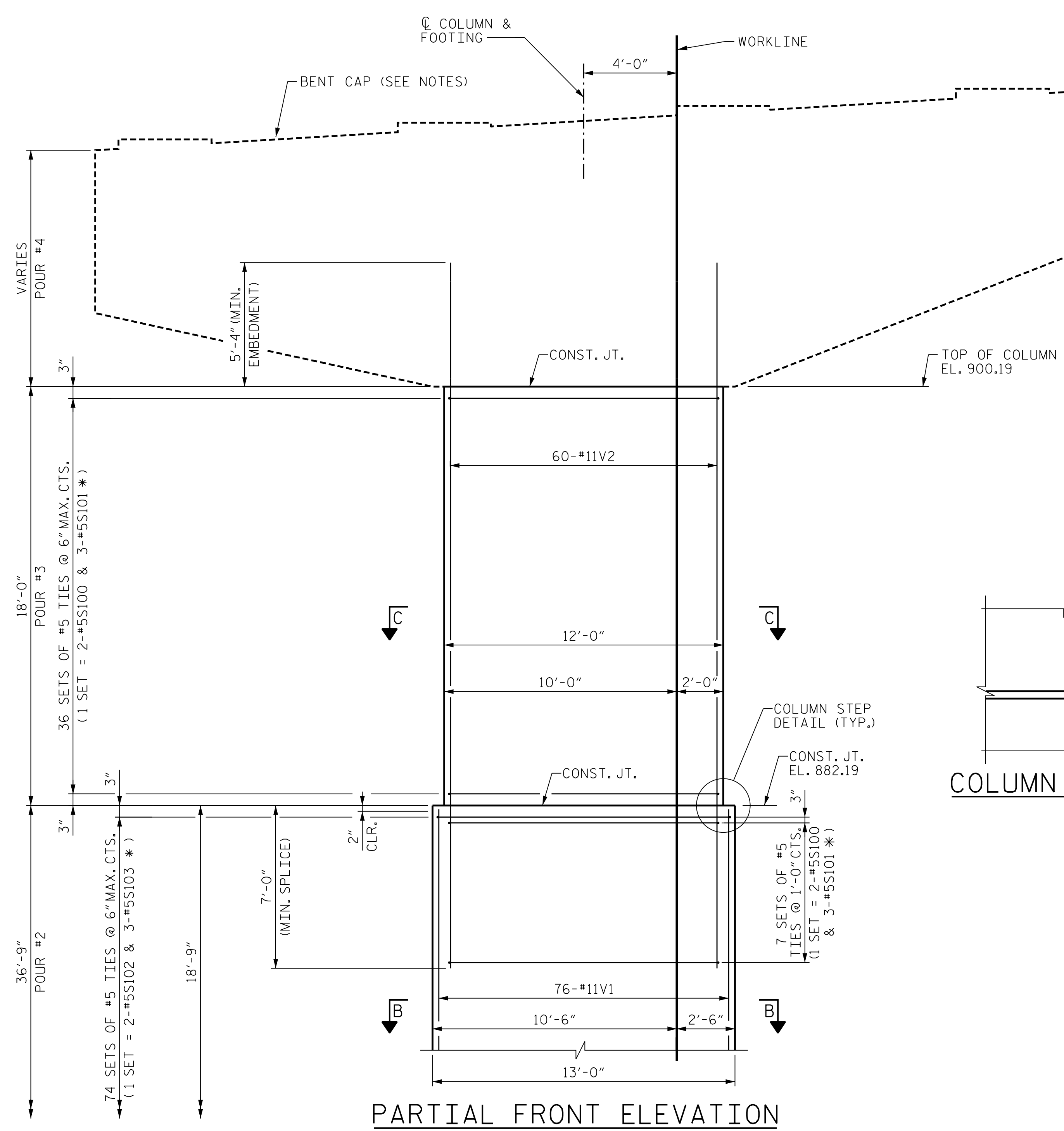
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DES CHK: <u>N. LIU</u>	DATE: <u>11/19</u>	CHK BY: <u>N. LIU</u>	DATE: <u>01/20</u>



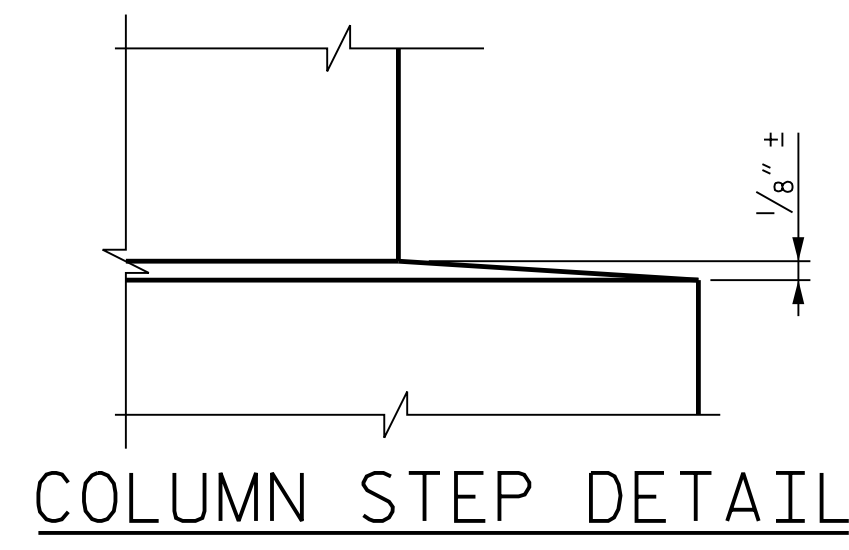
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SHEET NO. S06-083
 TOTAL SHEETS 129

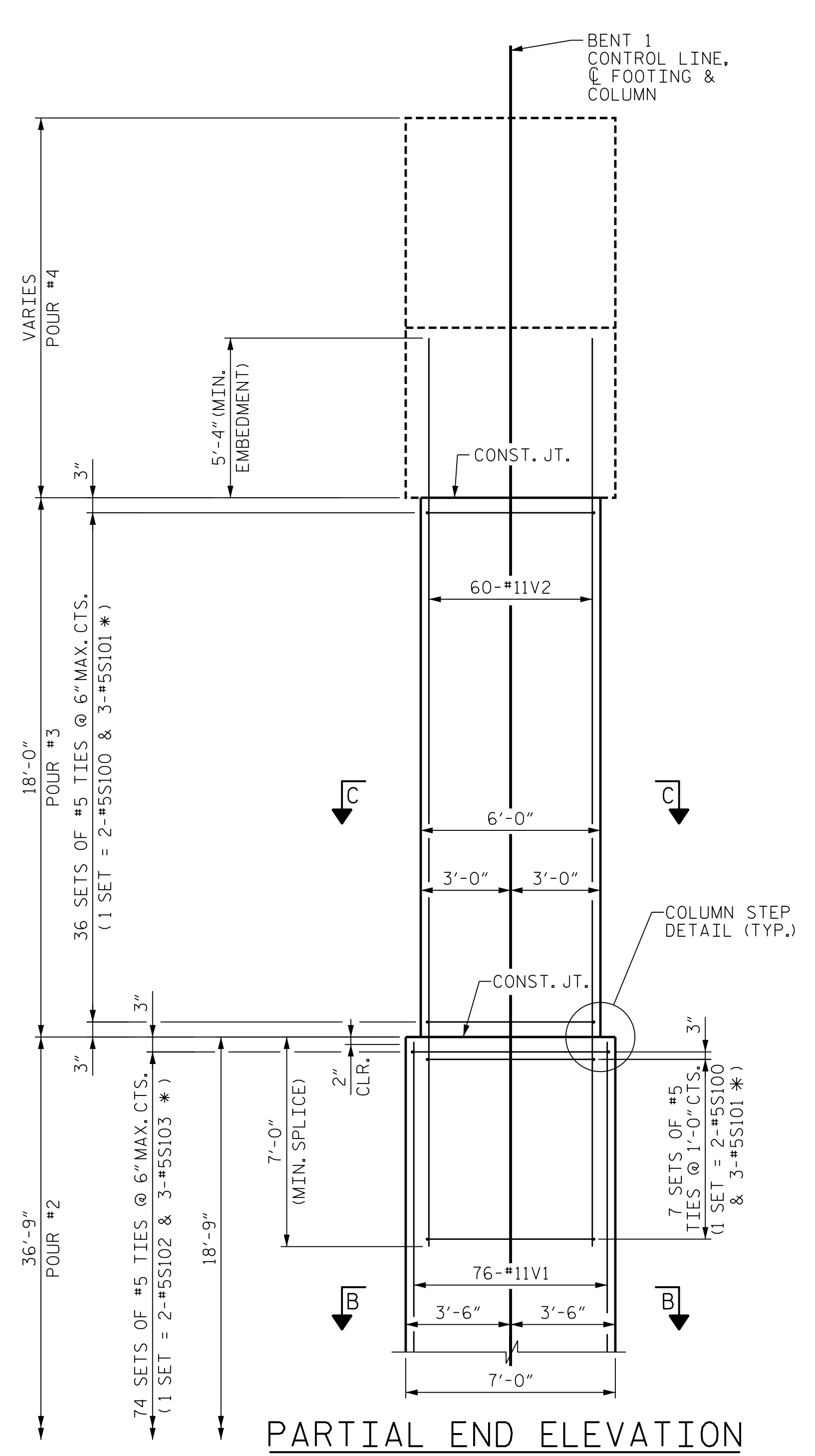
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PARTIAL FRONT ELEVATION



COLUMN STEP DETAIL



PARTIAL END ELEVATION

* INVERT ORIENTATION OF ALTERNATE #5S101 AND #5S103 TIES

NOTES

- FOR SECTION B-B, SEE "SUBSTRUCTURE BENT 1 FOOTING & COLUMN DETAILS", SHEET 3 OF 6.
- FOR SECTION C-C, SEE "SUBSTRUCTURE BENT 1 BENT CAP DETAILS", SHEET 5 OF 6.
- FOR DETAILS OF BENT CAP, SEE "SUBSTRUCTURE BENT 1 BENT CAP PLAN AND ELEVATION", SHEET 4 OF 6 AND "SUBSTRUCTURE BENT 1 BENT CAP DETAILS", SHEET 5 OF 6.
- FOR ADDITIONAL NOTES, SEE "SUBSTRUCTURE BENT 1 ELEVATIONS", SHEET 1 OF 6.

PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-
 SHEET 2 OF 6



Dominic A. Coletti 10/15/2021

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE BENT 1 ELEVATIONS

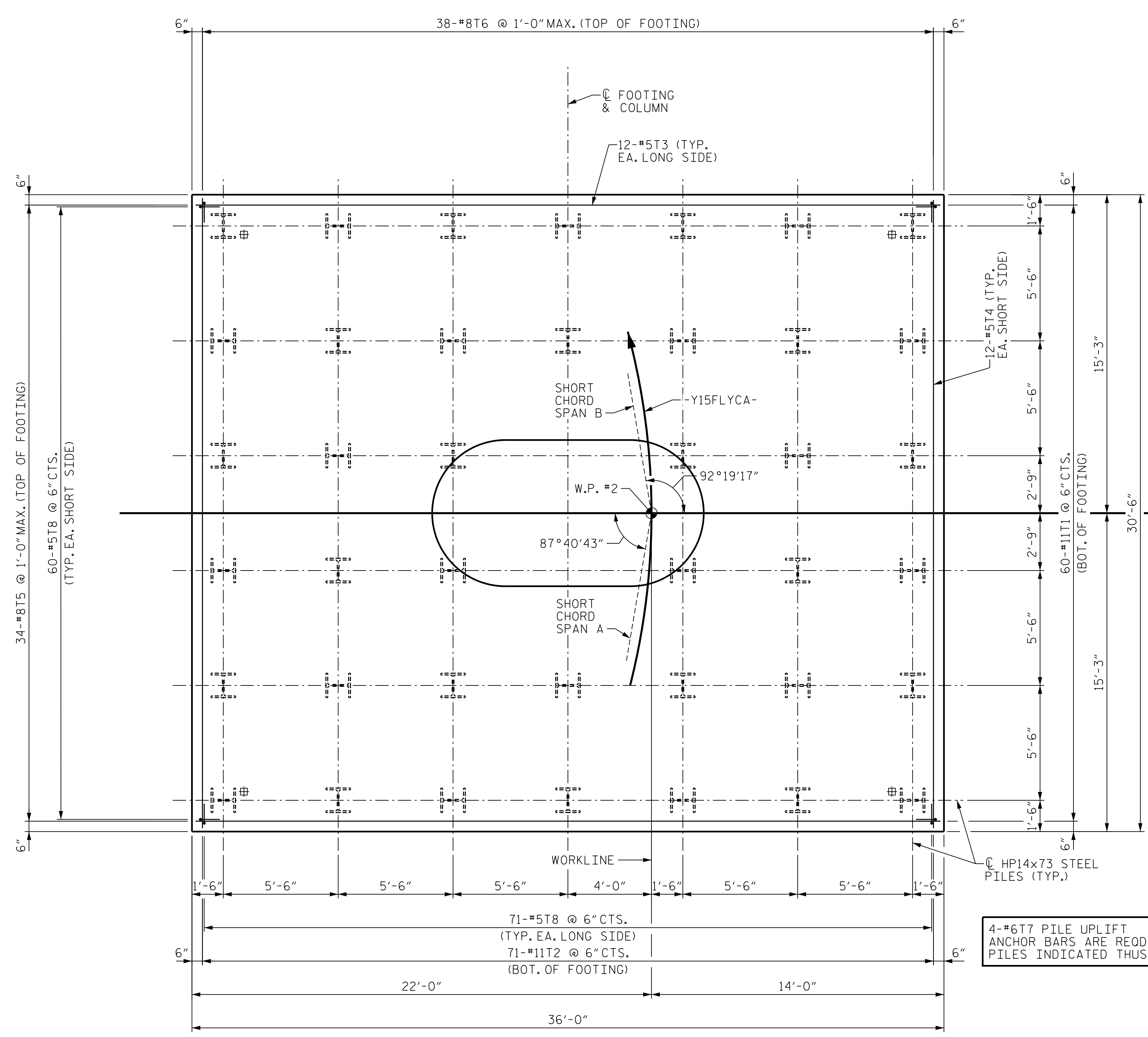
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SHEET NO. S06-084
 TOTAL SHEETS 129

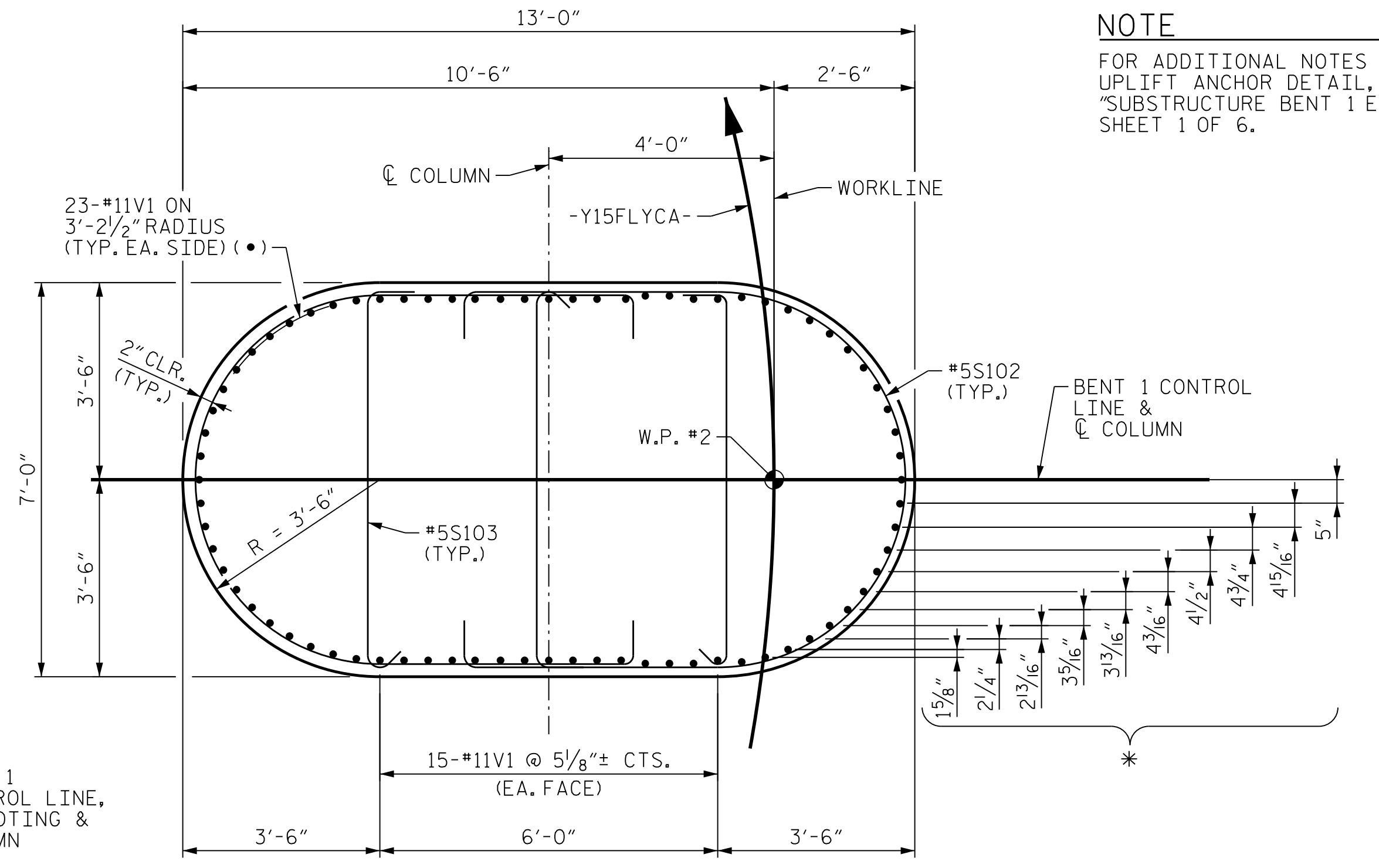
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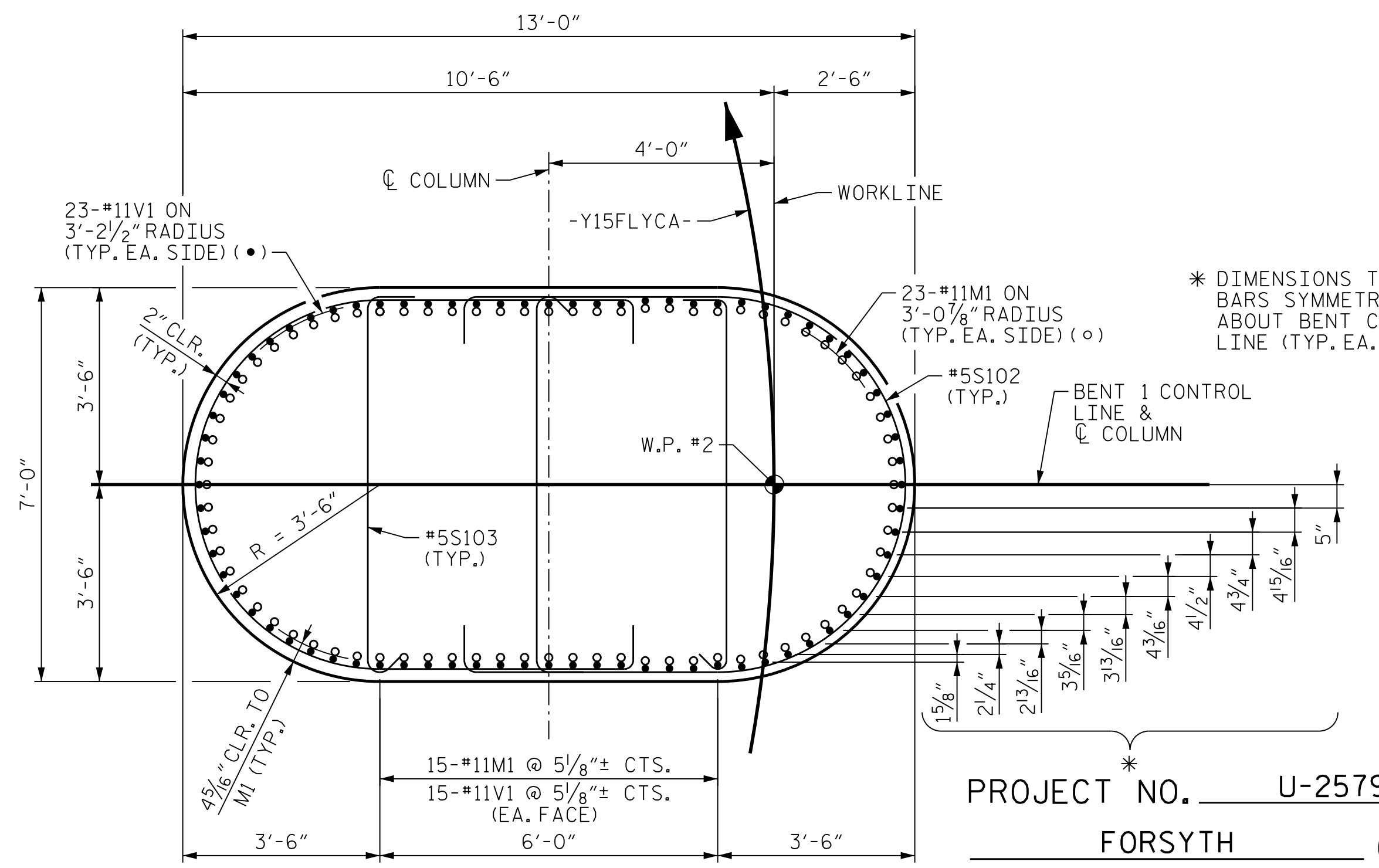
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



FOOTING PLAN



SECTION B-B

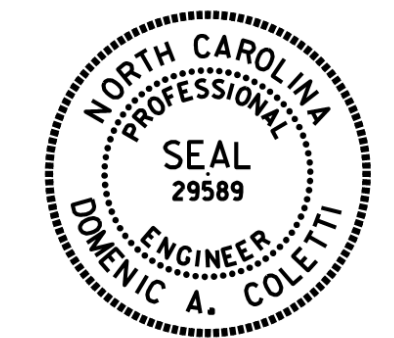


SECTION A-A

NOTE FOR ADDITIONAL NOTES AND PILE UPLIFT ANCHOR DETAIL, SEE "SUBSTRUCTURE BENT 1 ELEVATIONS", SHEET 1 OF 6.

* DIMENSIONS TO "V" BARS SYMMETRIC ABOUT BENT CONTROL LINE (TYP. EA. SIDE)

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 58+33.94 -Y15FLYCA-
SHEET 3 OF 6



Domini A. Coletti 10/15/2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1
FOOTING & COLUMN
DETAILS

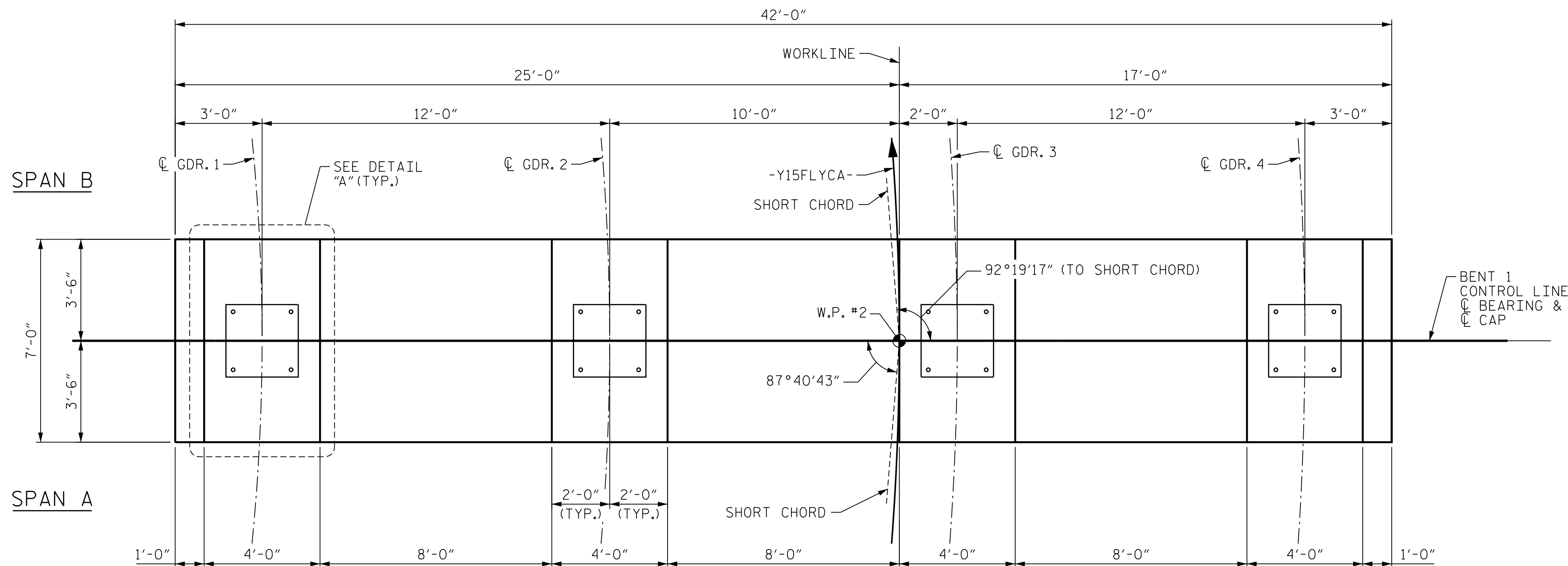
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DES CHK: N. LIU	DATE: 11/19	CHK BY: N. LIU	DATE: 01/20

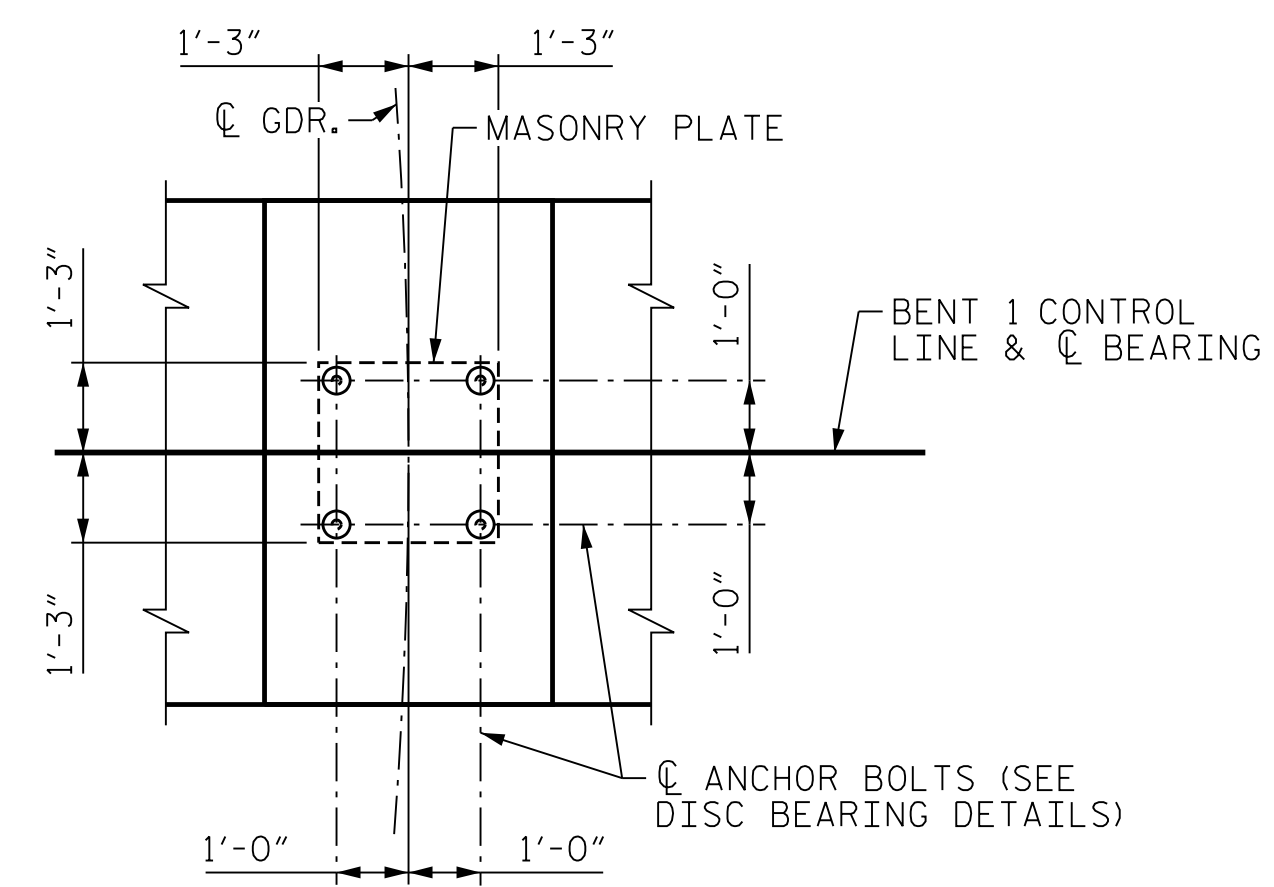
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
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2	--	--	4	--	--

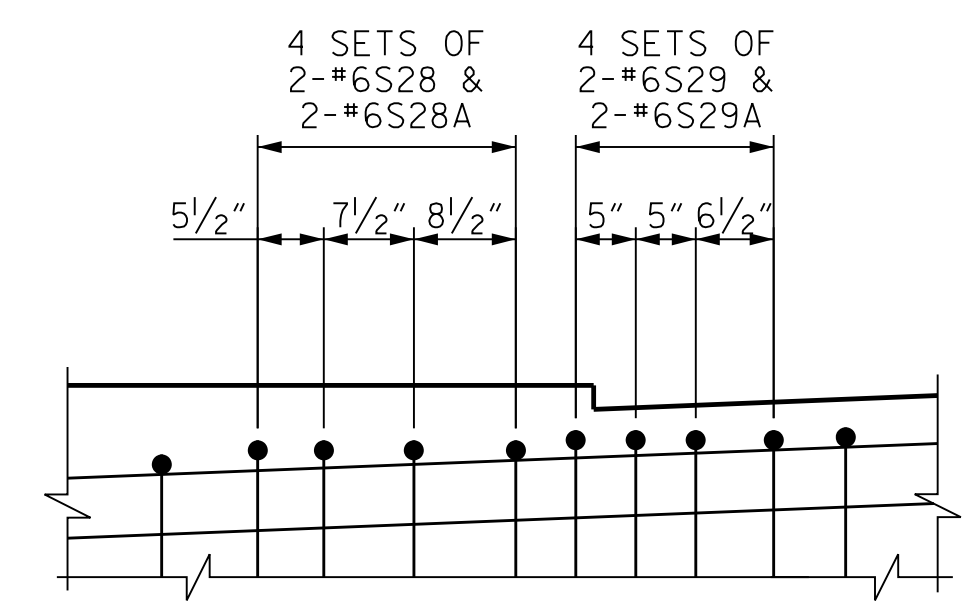
SHEET NO. S06-085
TOTAL SHEETS 129



PLAN OF CAP

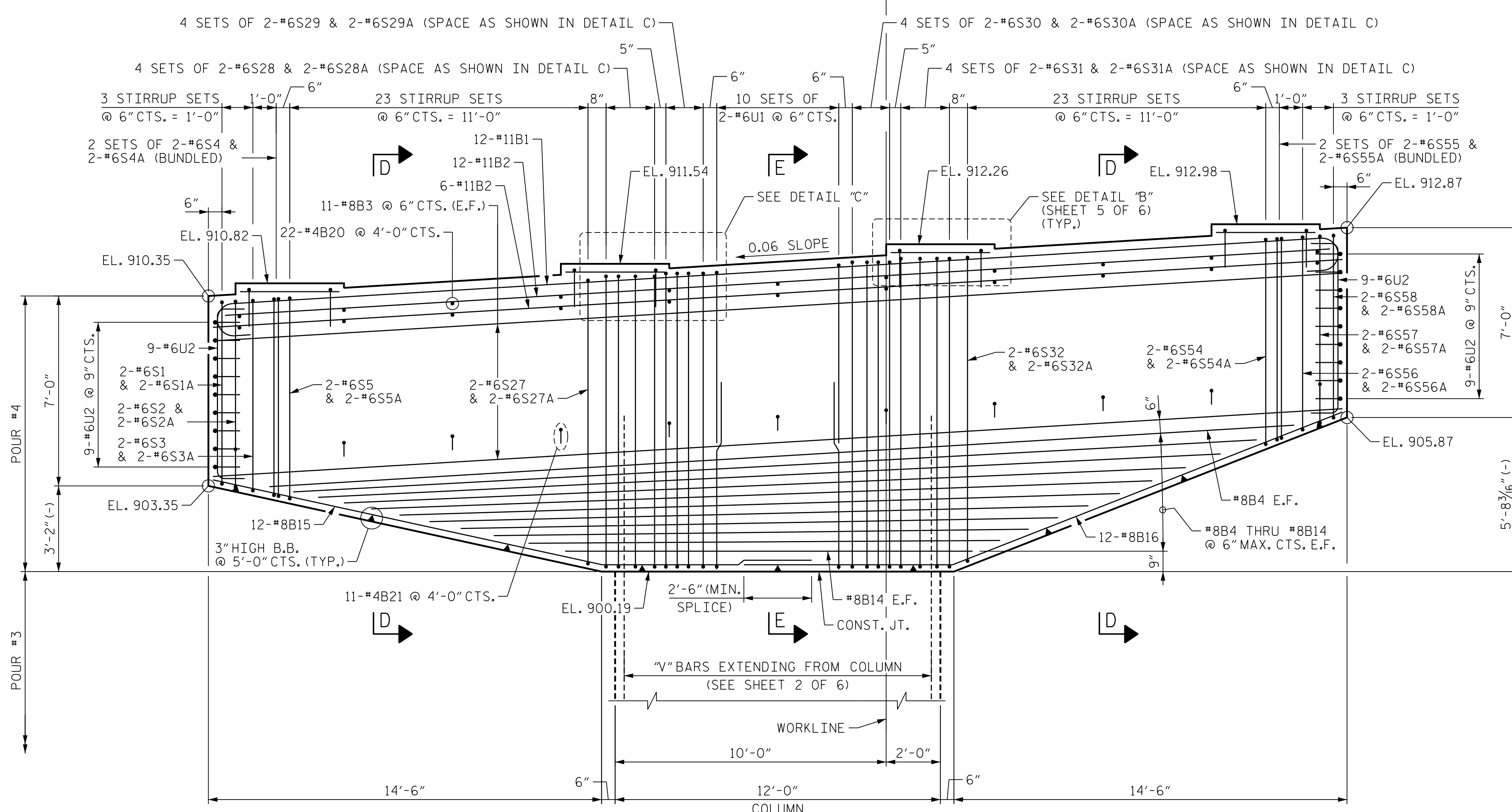


DETAIL "A"
(TYP. @ EA. BEARING)

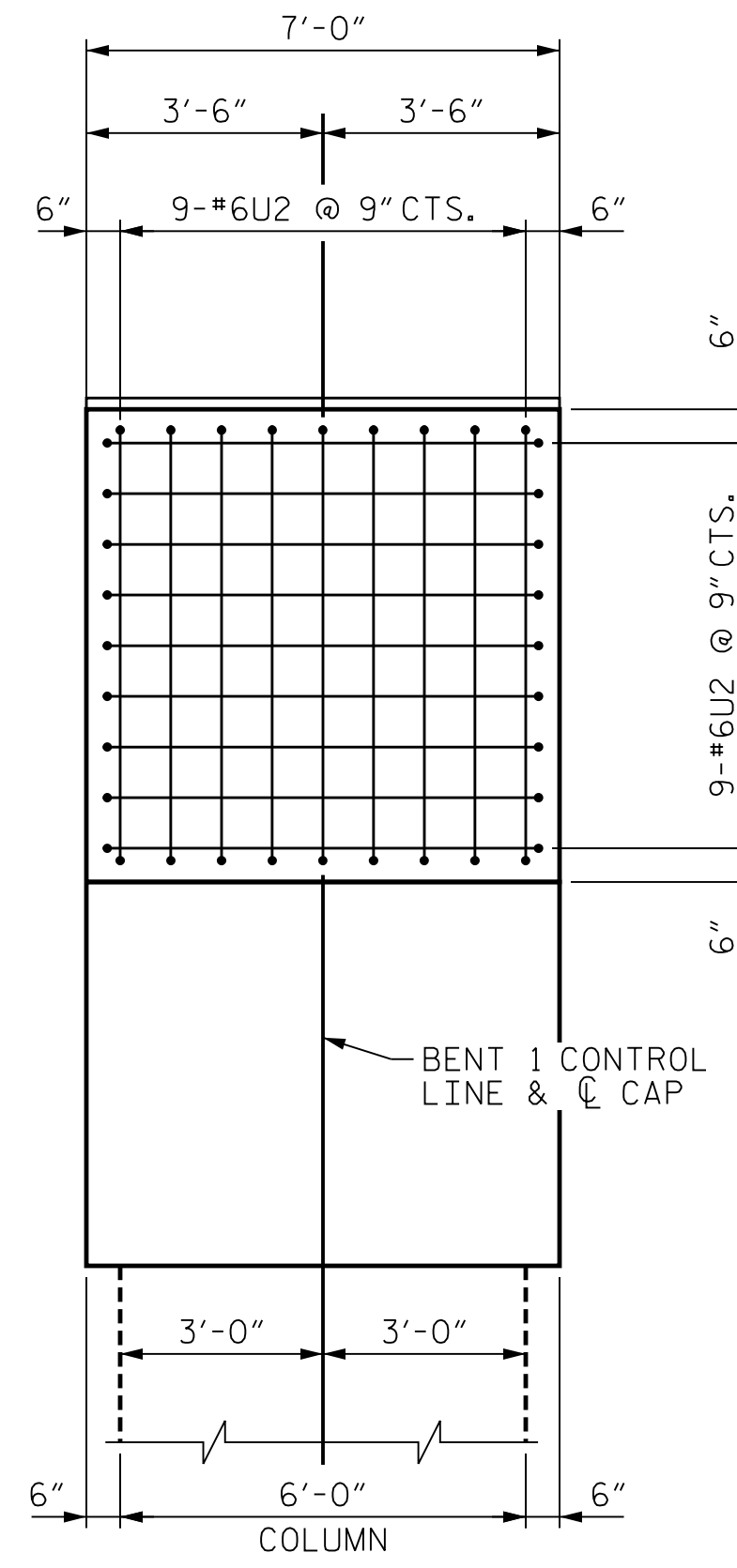


DETAIL "C"

DETAIL SHOWN AT LEFT SIDE OF CAP (SPACING OF STIRRUPS MIRRORED AT RIGHT SIDE OF CAP WITH BARS #6S30/#6S30A AND #6S31/#6S31A AS SHOWN ON THE ELEVATION)



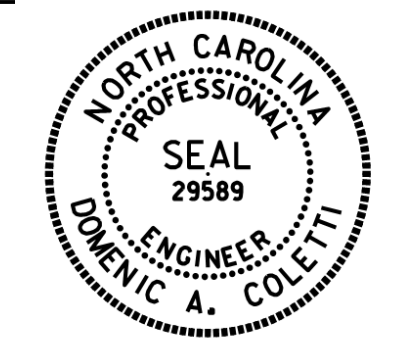
ELEVATION OF CAP



END VIEW

NOTES
FOR SECTIONS D-D AND E-E, SEE "SUBSTRUCTURE BENT 1 BENT CAP DETAILS" SHEET 5 OF 6.
FOR ADDITIONAL NOTES, SEE SHEETS 1 AND 2 OF 6.

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 58+33.94 -Y15FLYCA-
SHEET 4 OF 6



Dominic A. Coletti 10/15/2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SUBSTRUCTURE
BENT 1
BENT CAP PLAN
AND ELEVATION**

REVISIONS						SHEET NO. S06-086
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	--	--	3	--	--	TOTAL SHEETS 129
2	--	--	4	--	--	

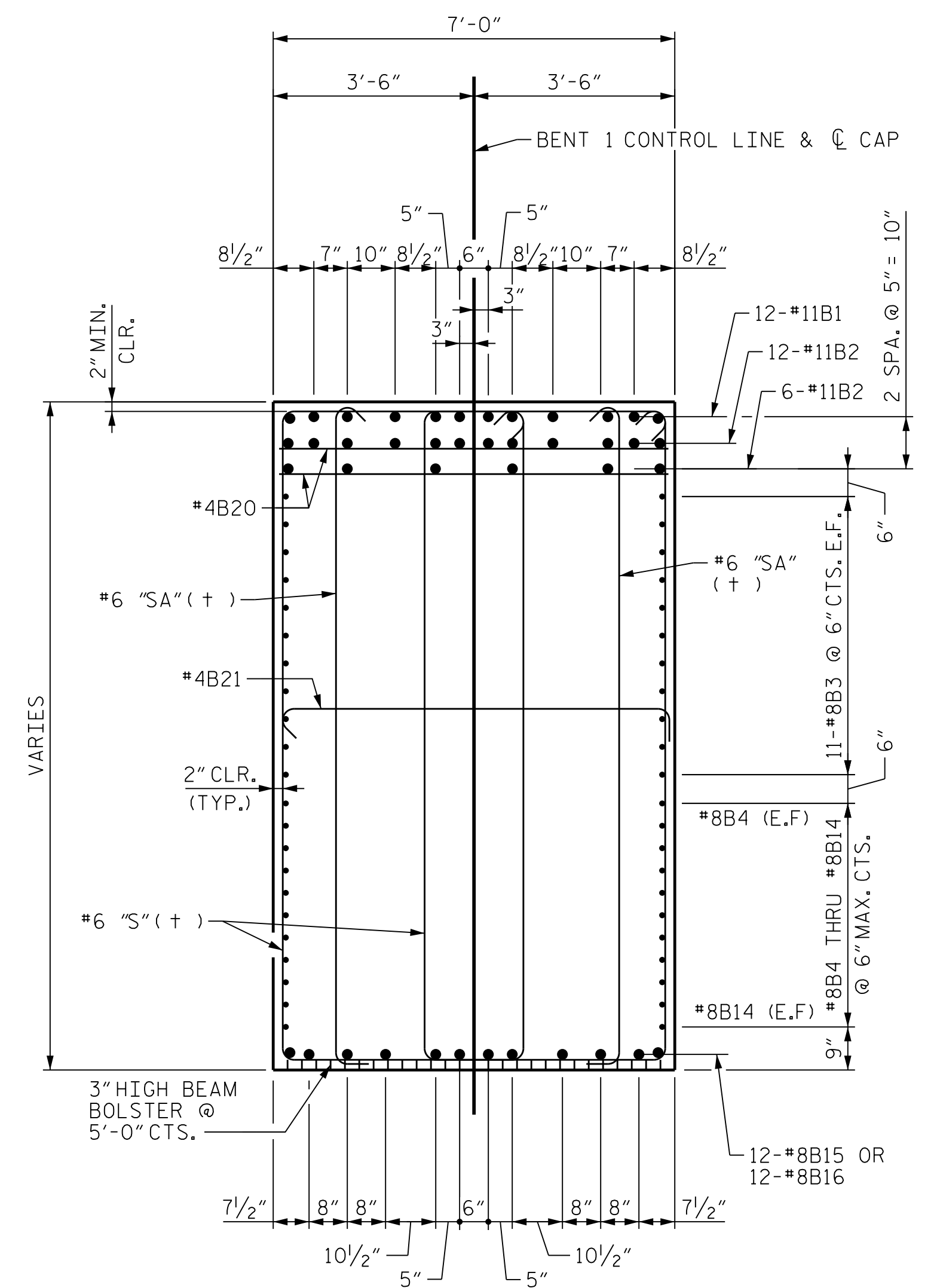
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 TIME: 5:19:22 PM

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DES CHK: <u>M. WERNER</u>	DATE: <u>10/19</u>	CHK BY: <u>N.LIU</u>	DATE: <u>01/20</u>

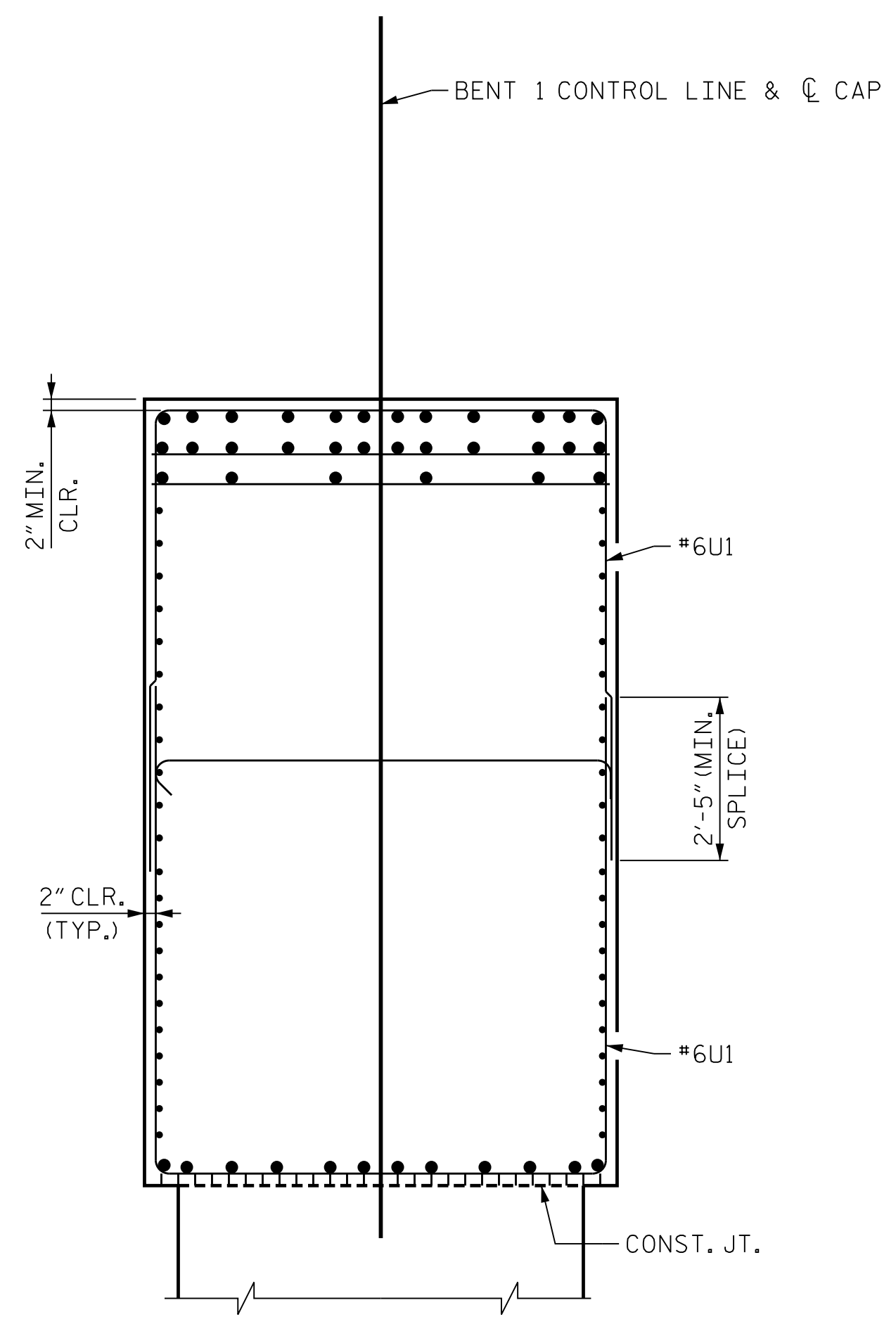


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

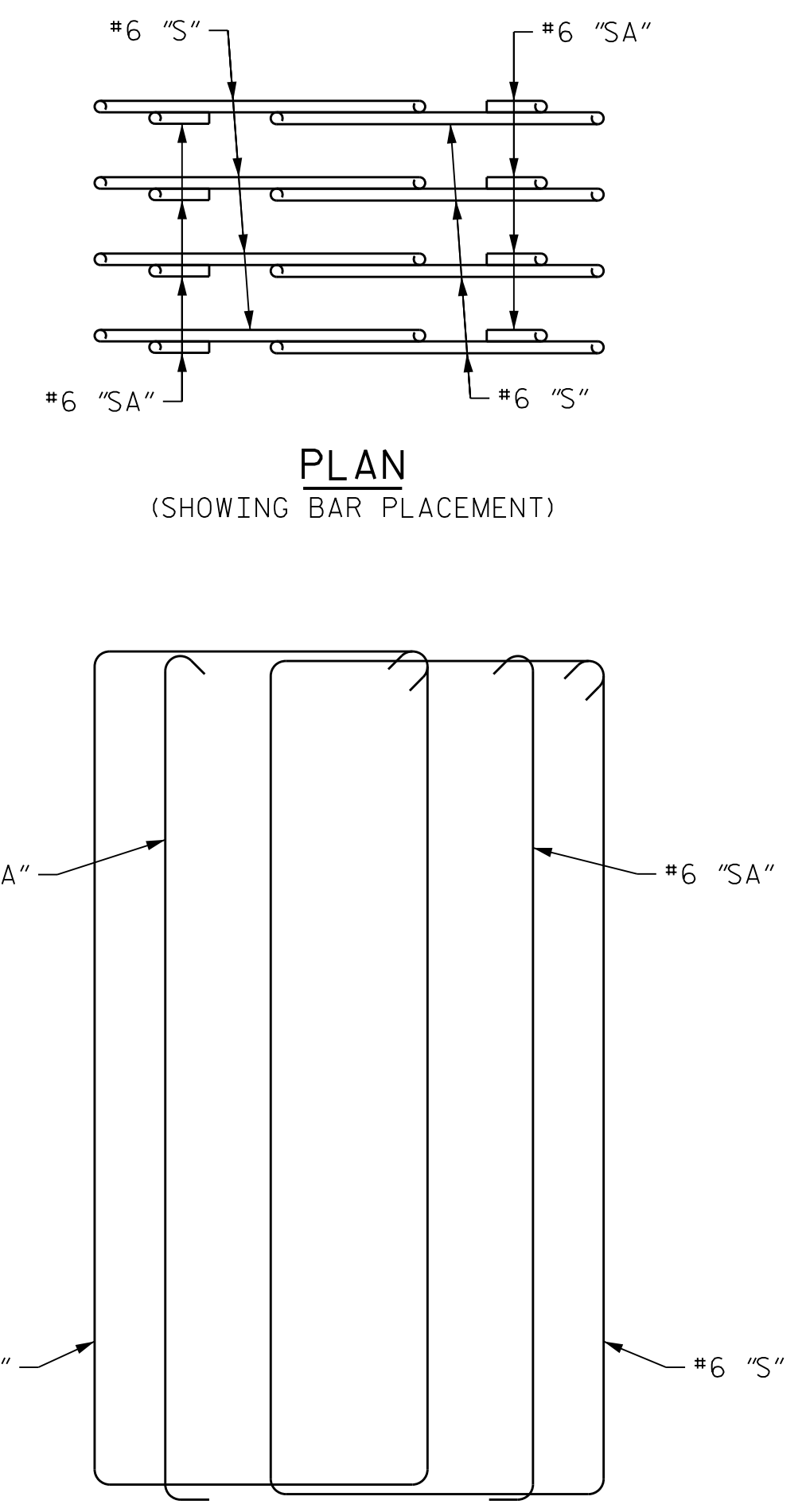
NOTE
SEE SHEETS 1 AND 2 OF 6 FOR NOTES.



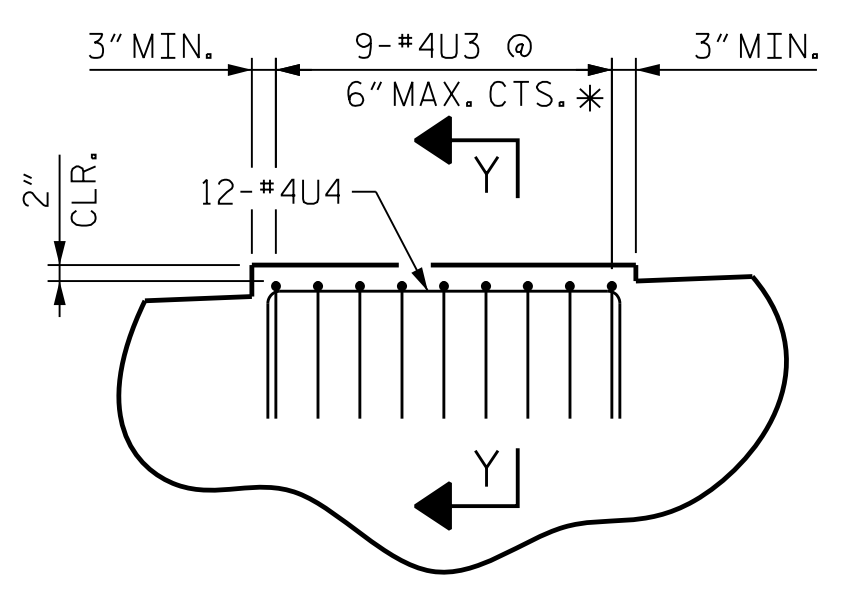
SECTION D-D
(+) SEE "STIRRUP SET DETAIL"



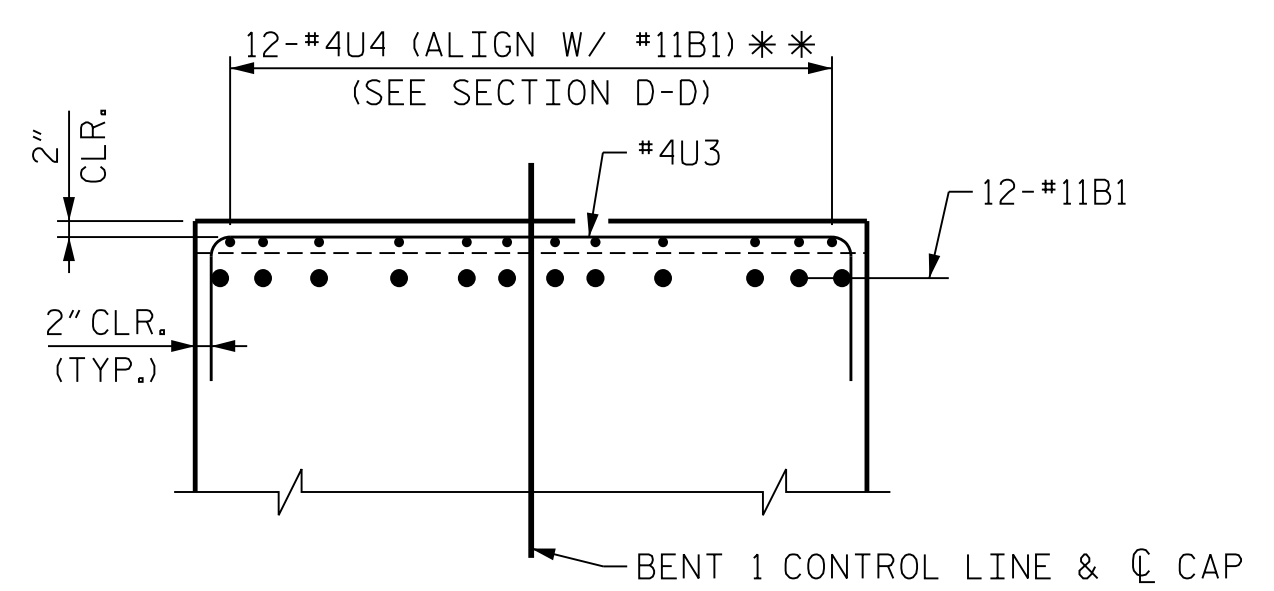
SECTION E-E
COLUMN REINFORCING STEEL NOT SHOWN FOR CLARITY



PLAN
(SHOWING BAR PLACEMENT)
ELEVATION
(SCHEMATIC)
STIRRUP SET DETAIL



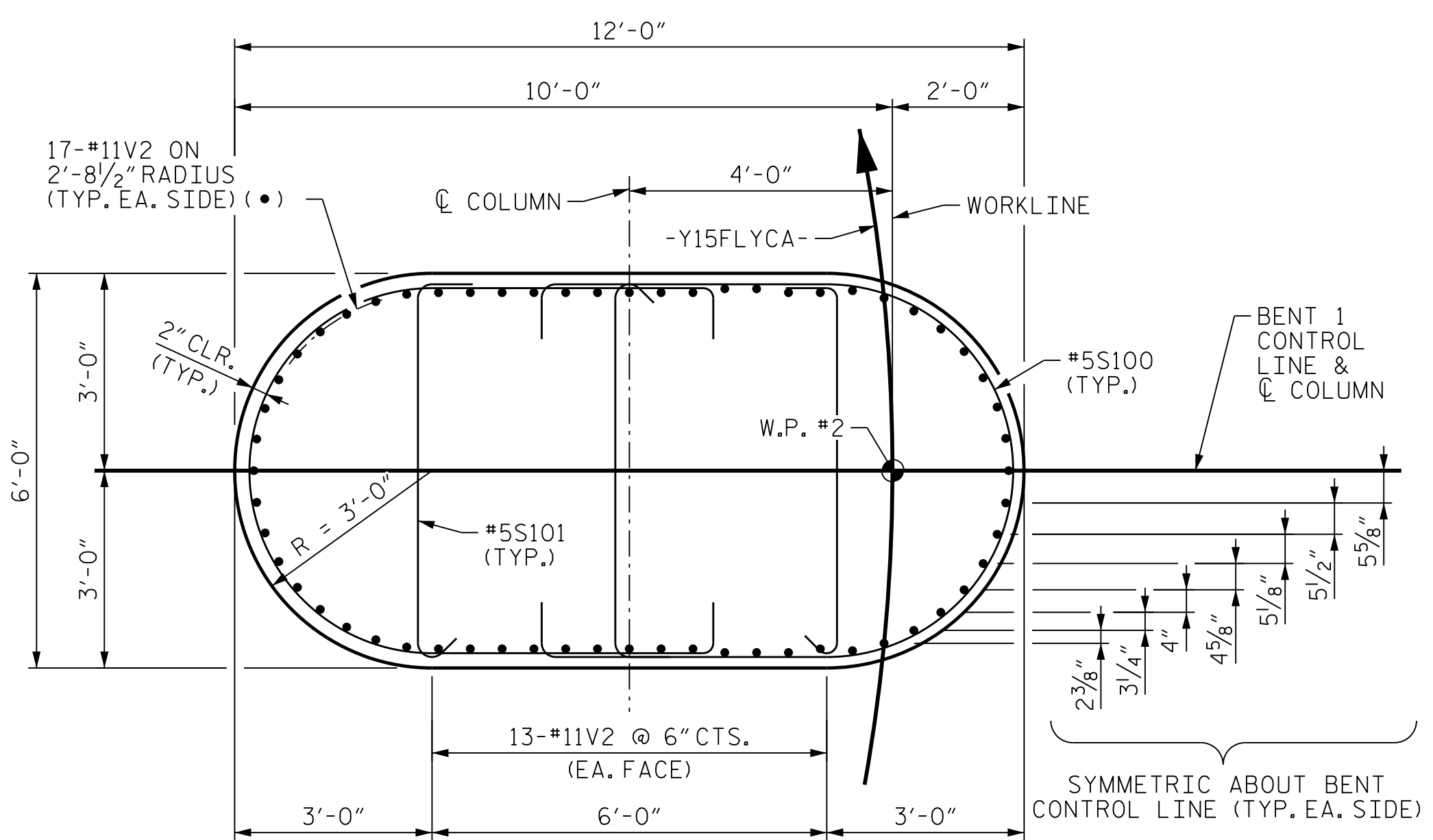
DETAIL "B"



SECTION Y-Y

* NOTE:
#4U3 BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR ANCHOR BOLTS.

** NOTE:
#4U4 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR #11B1 AND #11B2 BARS.

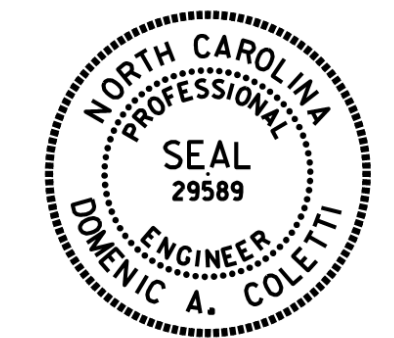


SECTION C-C

PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-
 SHEET 5 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 BENT 1
 BENT CAP DETAILS



10/15/2021

PLOT DRIVER: NCDOT...
 USER: PPETERSO
 DATE: 10/14/2021
 TIME: 5:19:33 PM
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DES BY: K. OLIVER	DATE: 10/19	DWG BY: B. PETERSON	DATE: 12/19
DES CHK: M. WERNER	DATE: 10/19	CHK BY: N. LIU	DATE: 01/20

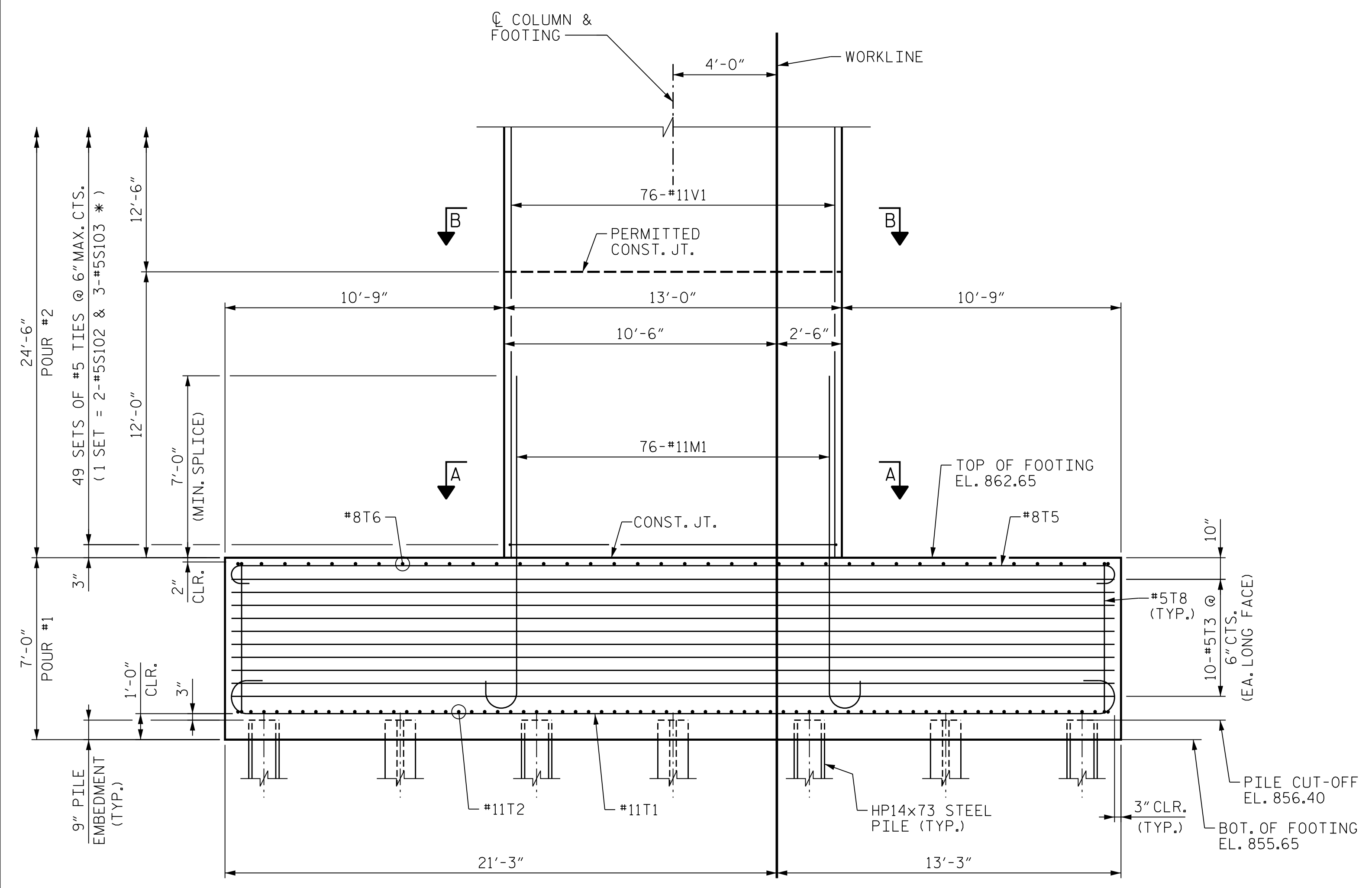


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 UNLESS ALL SIGNATURES COMPLETED

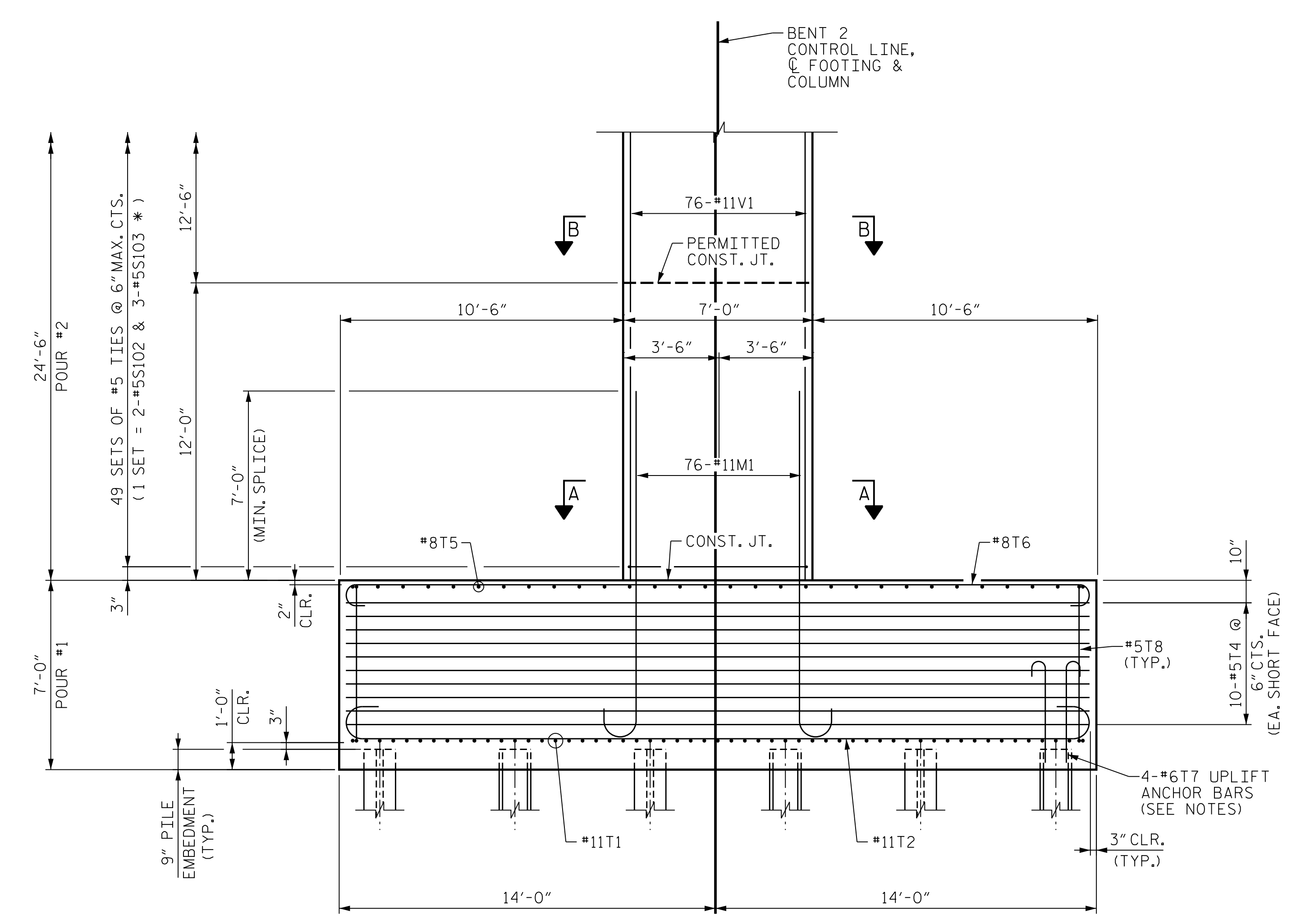
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NO.	BY:	DATE:	NO.	BY:	DATE:
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SHEET NO. 506-087
 TOTAL SHEETS 129

NOTES
 FOR FOOTING PLAN, SECTION A-A AND SECTION B-B, SEE "SUBSTRUCTURE BENT 2 FOOTING & COLUMN DETAILS", SHEET 3 OF 6.
 4-#6T7 UPLIFT ANCHOR BARS AT NOTED PILES - SEE "SUBSTRUCTURE BENT 2 FOOTING & COLUMN DETAILS", SHEET 3 OF 6 FOR LOCATIONS.
 FOR ADDITIONAL NOTES AND PILE UPLIFT ANCHOR DETAIL, SEE "SUBSTRUCTURE BENT 1 ELEVATIONS", SHEET 1 OF 6.



PARTIAL FRONT ELEVATION



PARTIAL END ELEVATION

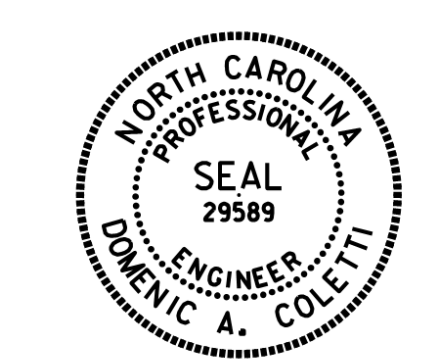
* INVERT ORIENTATION OF ALTERNATE #5S103 TIES

PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-

SHEET 1 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE BENT 2 ELEVATIONS



Dominic A. Coletti 10/15/2021

REVISIONS						SHEET NO. S06-089 TOTAL SHEETS 129
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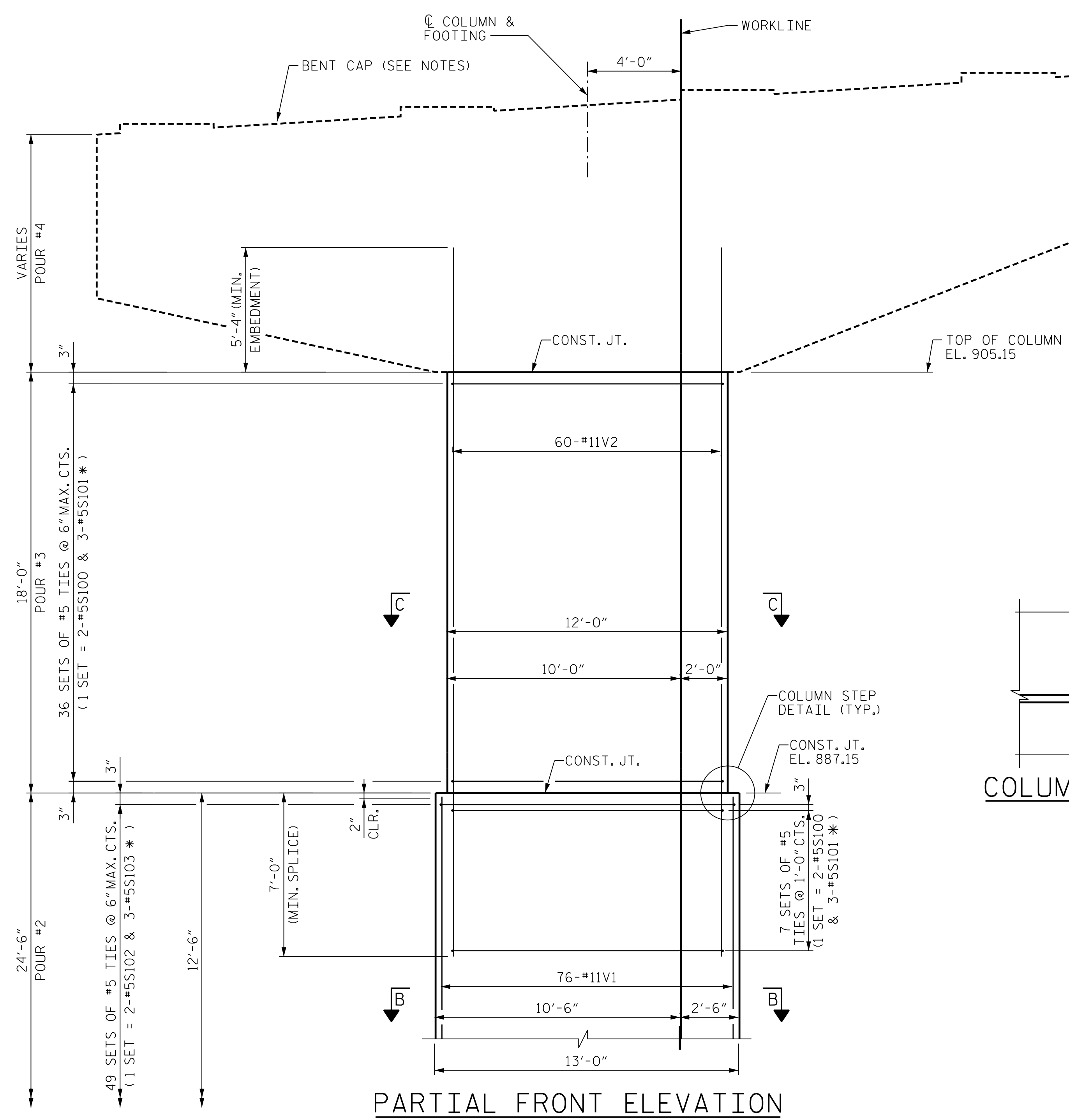
HDR HDR Engineering, Inc. of the Carolinas
 555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
 N.C.B.E.L.S. License Number: F-0116

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

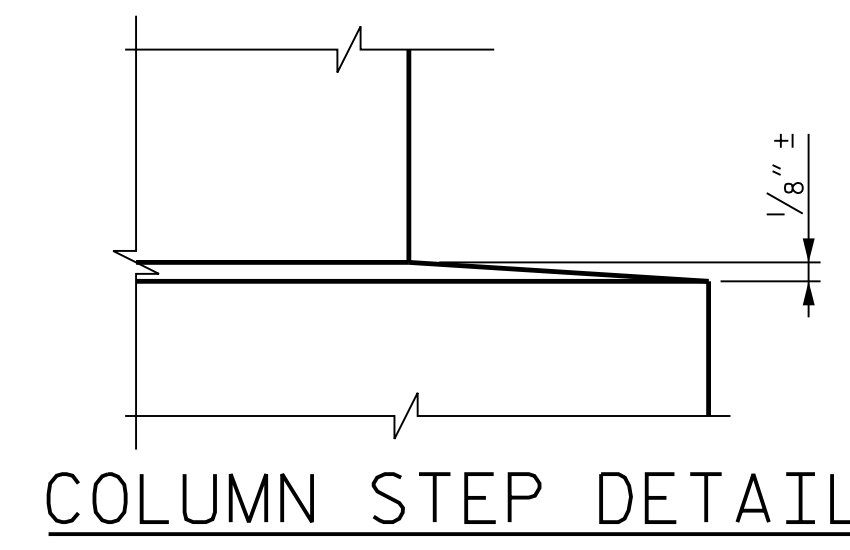
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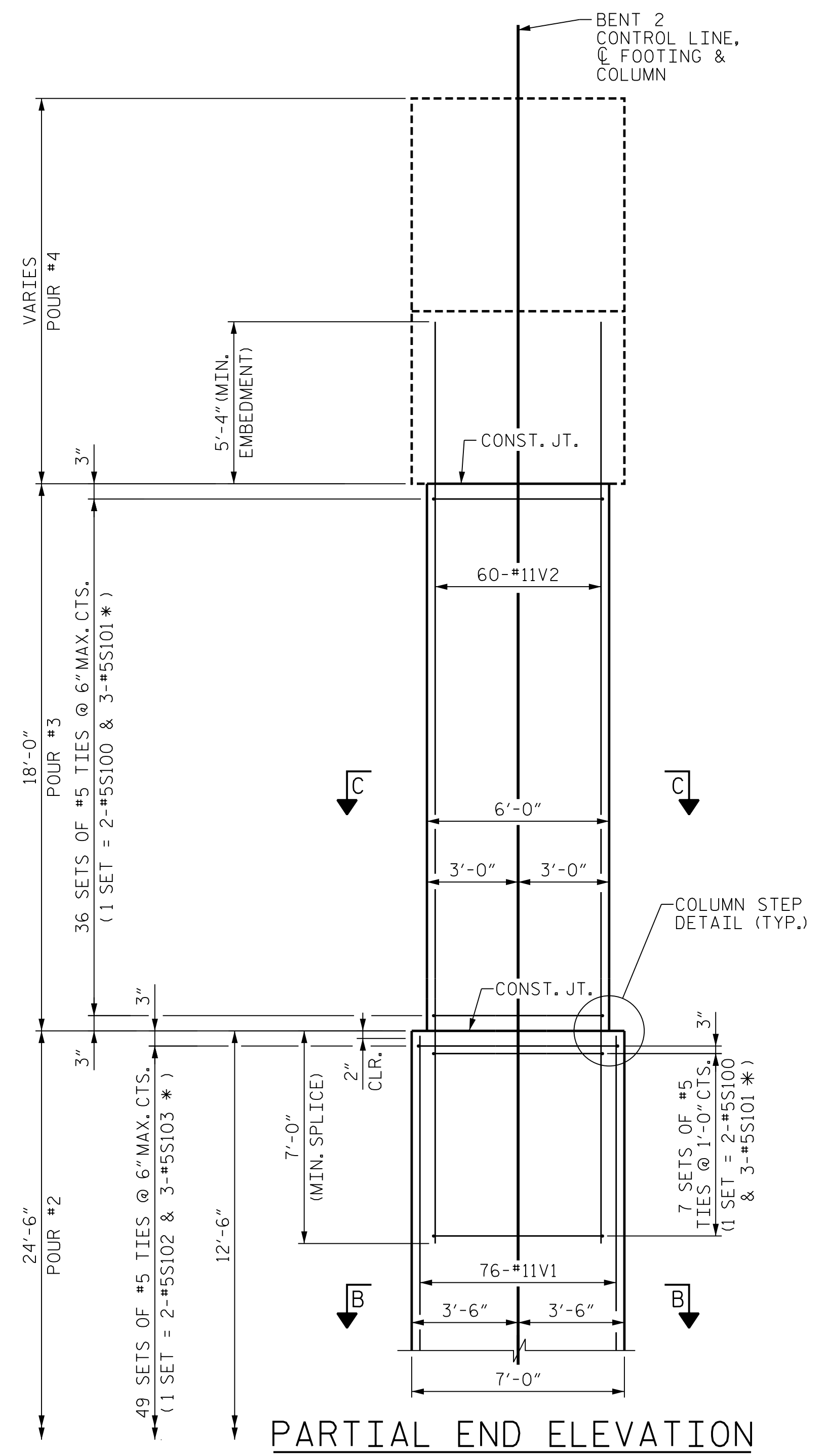
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PARTIAL FRONT ELEVATION



COLUMN STEP DETAIL

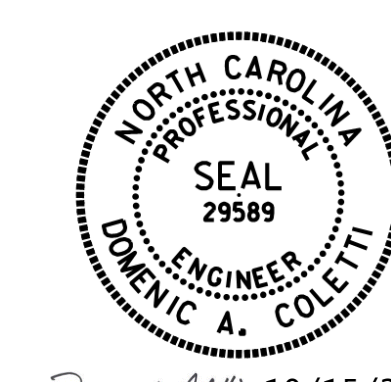


PARTIAL END ELEVATION

NOTES

- FOR SECTION B-B, SEE "SUBSTRUCTURE BENT 2 FOOTING & COLUMN DETAILS", SHEET 3 OF 6.
- FOR SECTION C-C, SEE "SUBSTRUCTURE BENT 2 BENT CAP DETAILS", SHEET 5 OF 6.
- FOR DETAILS OF BENT CAP, SEE "SUBSTRUCTURE BENT 2 BENT CAP PLAN AND ELEVATION", SHEET 4 OF 6 AND "SUBSTRUCTURE BENT 2 BENT CAP DETAILS", SHEET 5 OF 6.
- FOR ADDITIONAL NOTES, SEE "SUBSTRUCTURE BENT 1 ELEVATIONS", SHEET 1 OF 6.

PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-
 SHEET 2 OF 6



Dominic A. Coletti 10/15/2021

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE BENT 2 ELEVATIONS

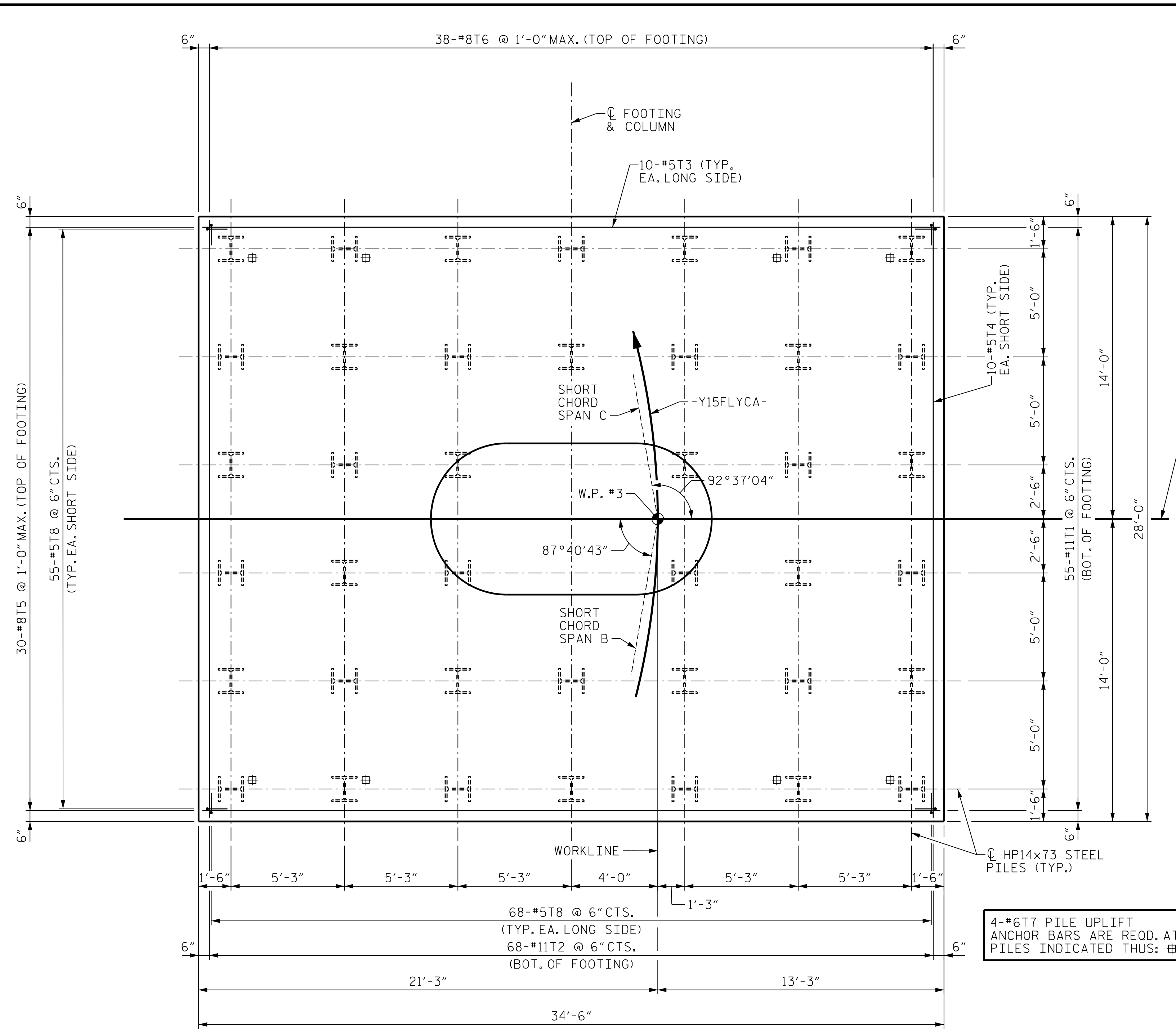
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SHEET NO. 506-090
TOTAL SHEETS 129

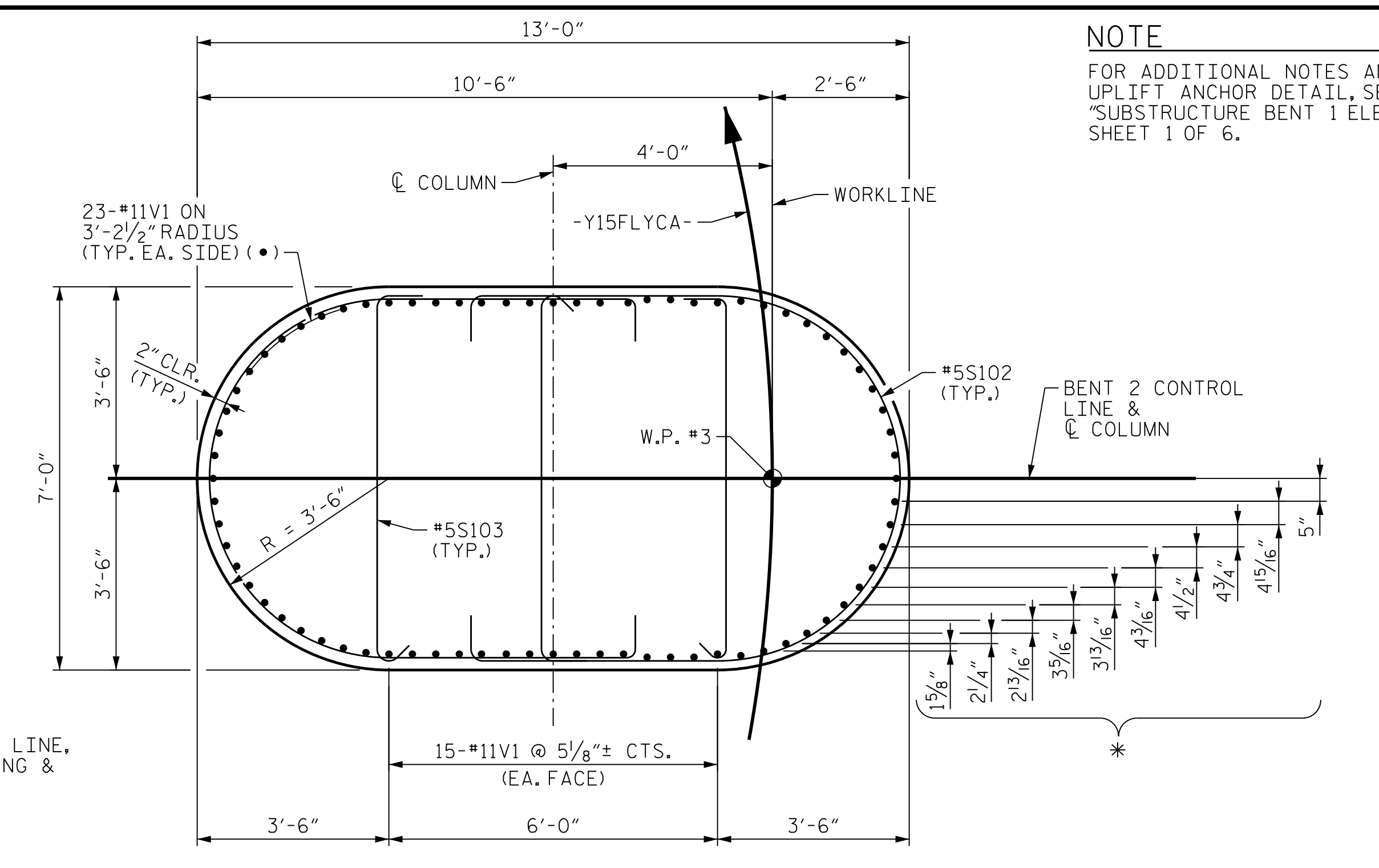
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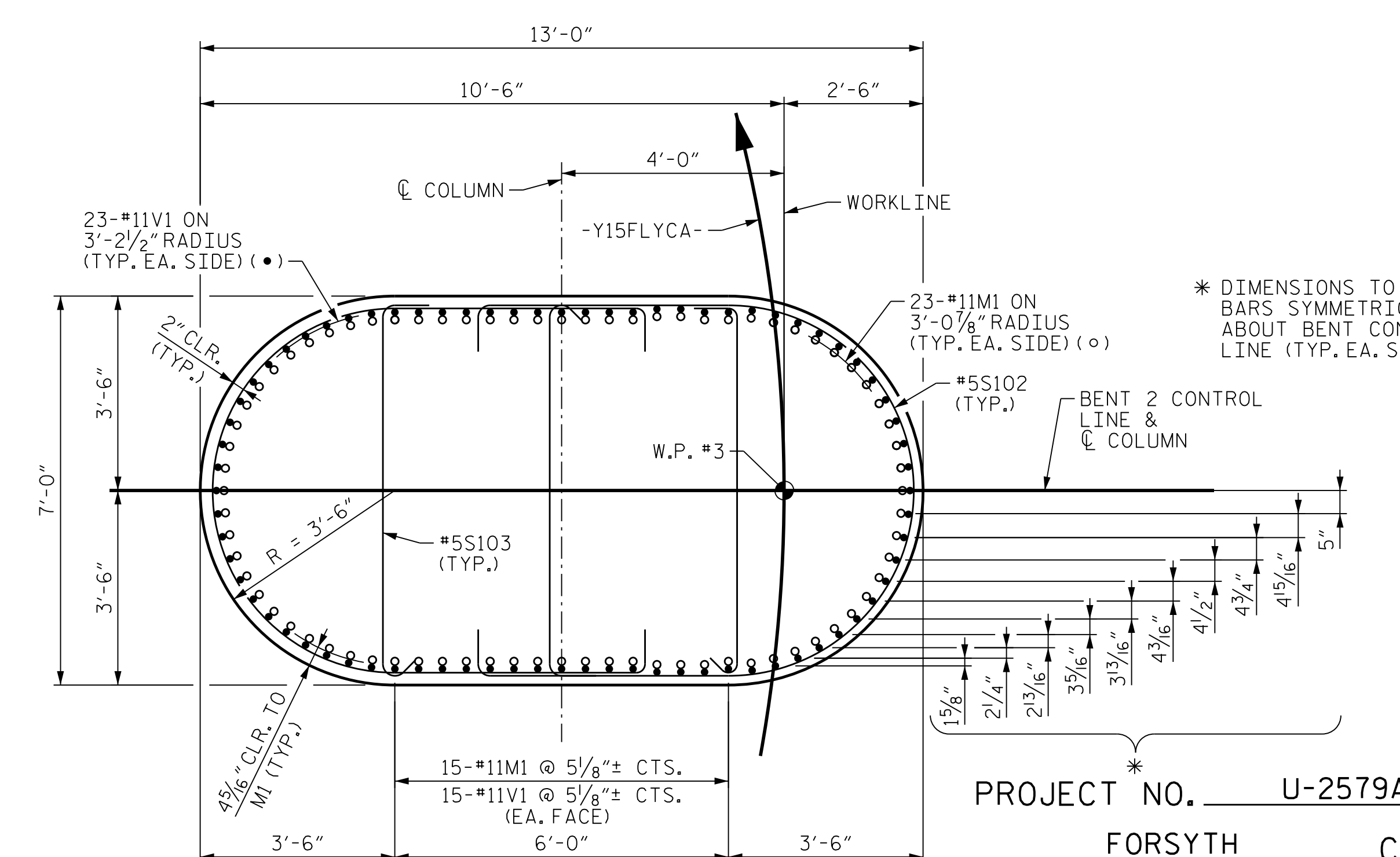
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



FOOTING PLAN



SECTION B-B



SECTION A-A

NOTE
FOR ADDITIONAL NOTES AND PILE UPLIFT ANCHOR DETAIL, SEE "SUBSTRUCTURE BENT 1 ELEVATIONS", SHEET 1 OF 6.

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 58+33.94 -Y15FLYCA-

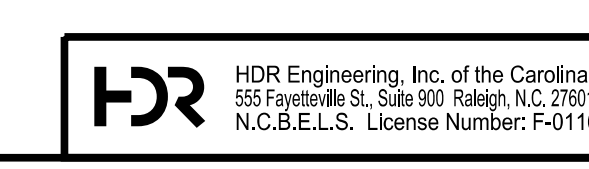
SHEET 3 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
BENT 2
FOOTING & COLUMN
DETAILS



Domini A. Coletti 10/15/2021

REVISIONS						SHEET NO. S06-091
NO.	BY:	DATE:	NO.	BY:	DATE:	
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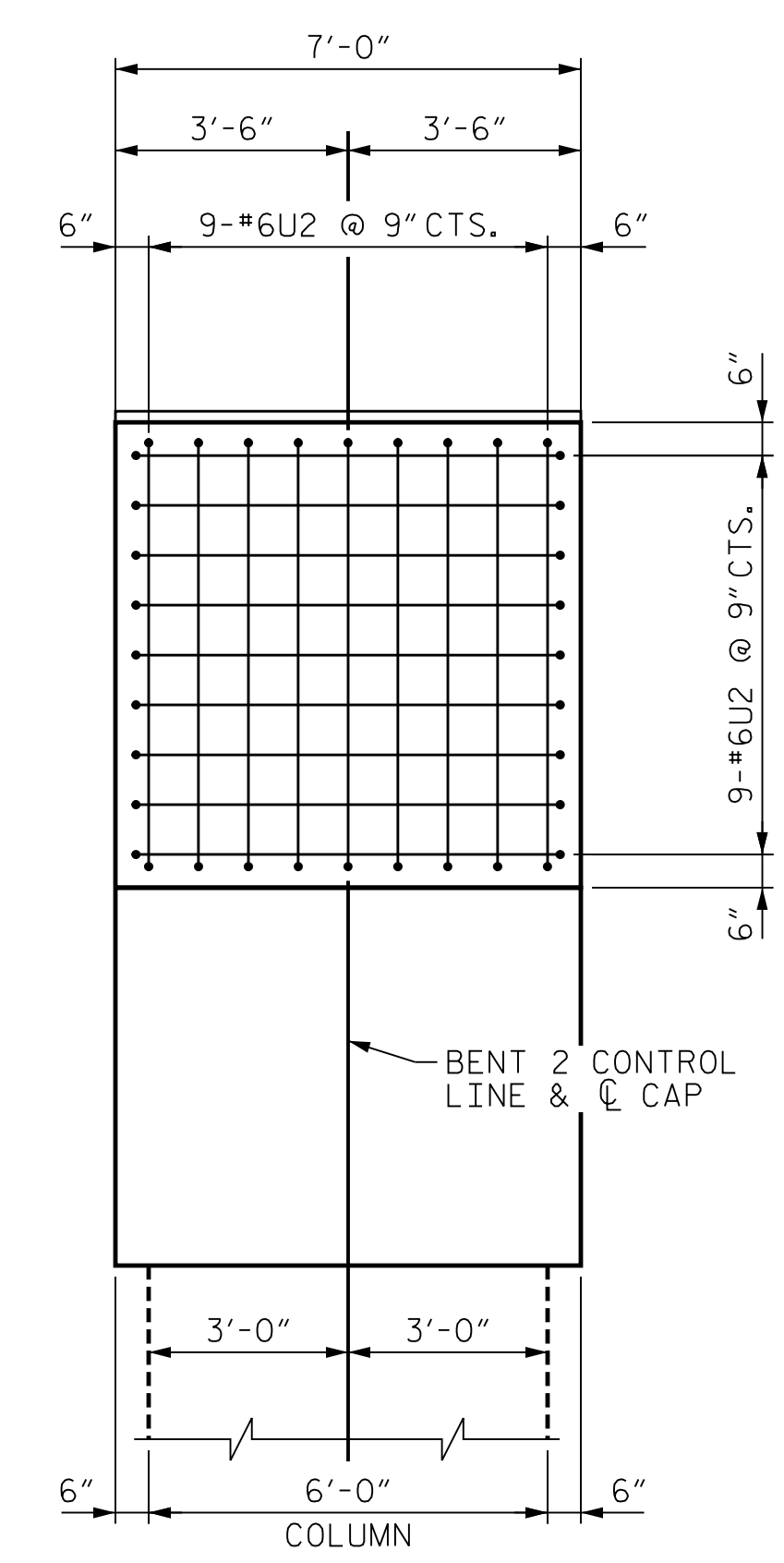
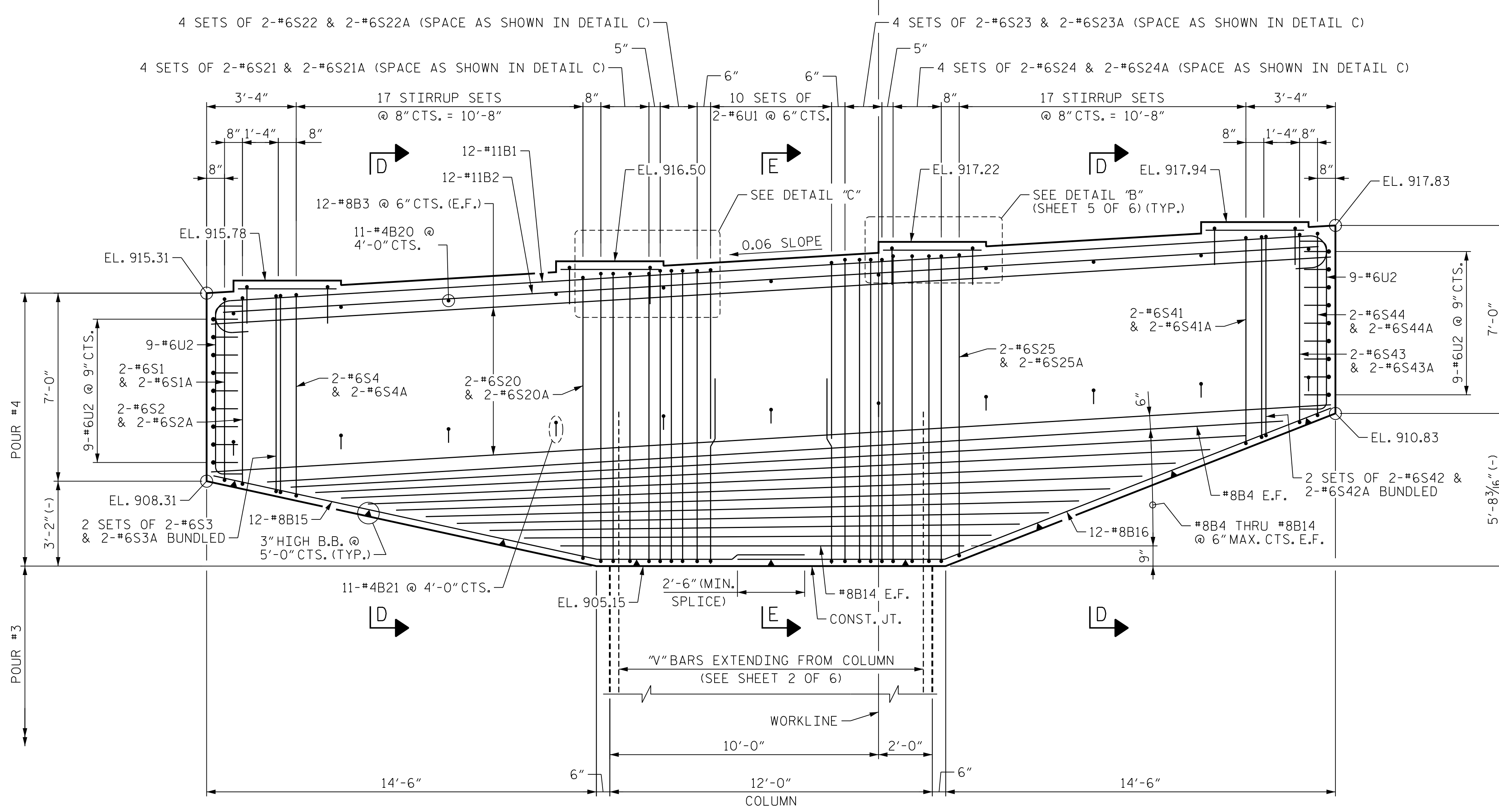
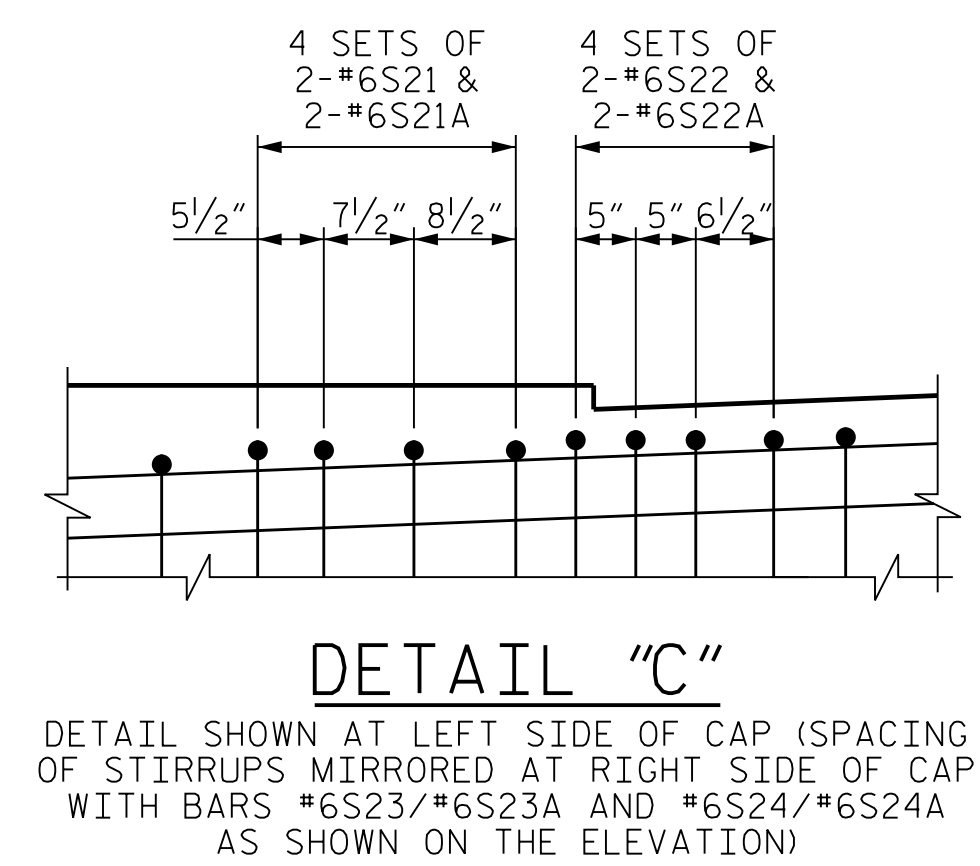
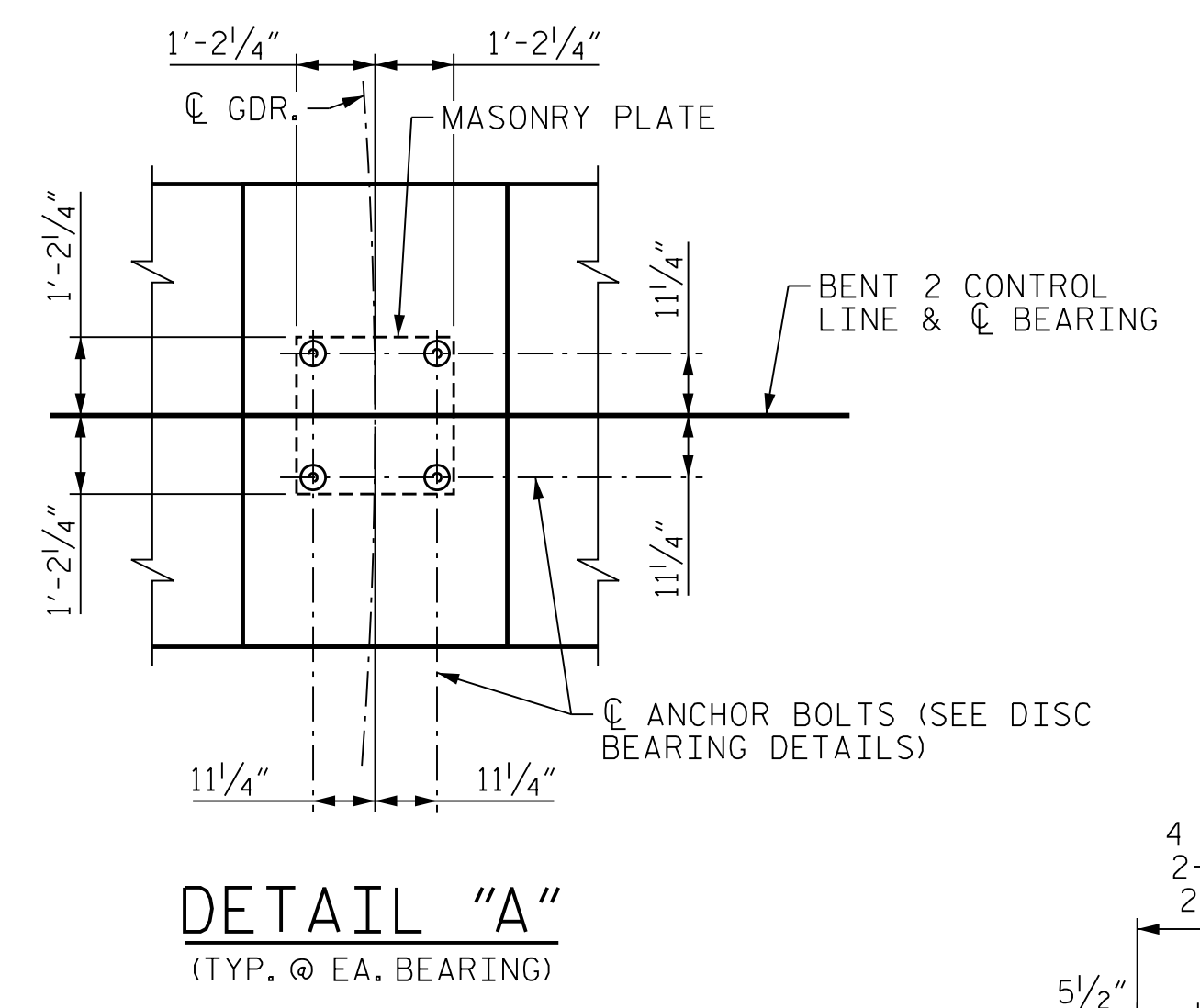
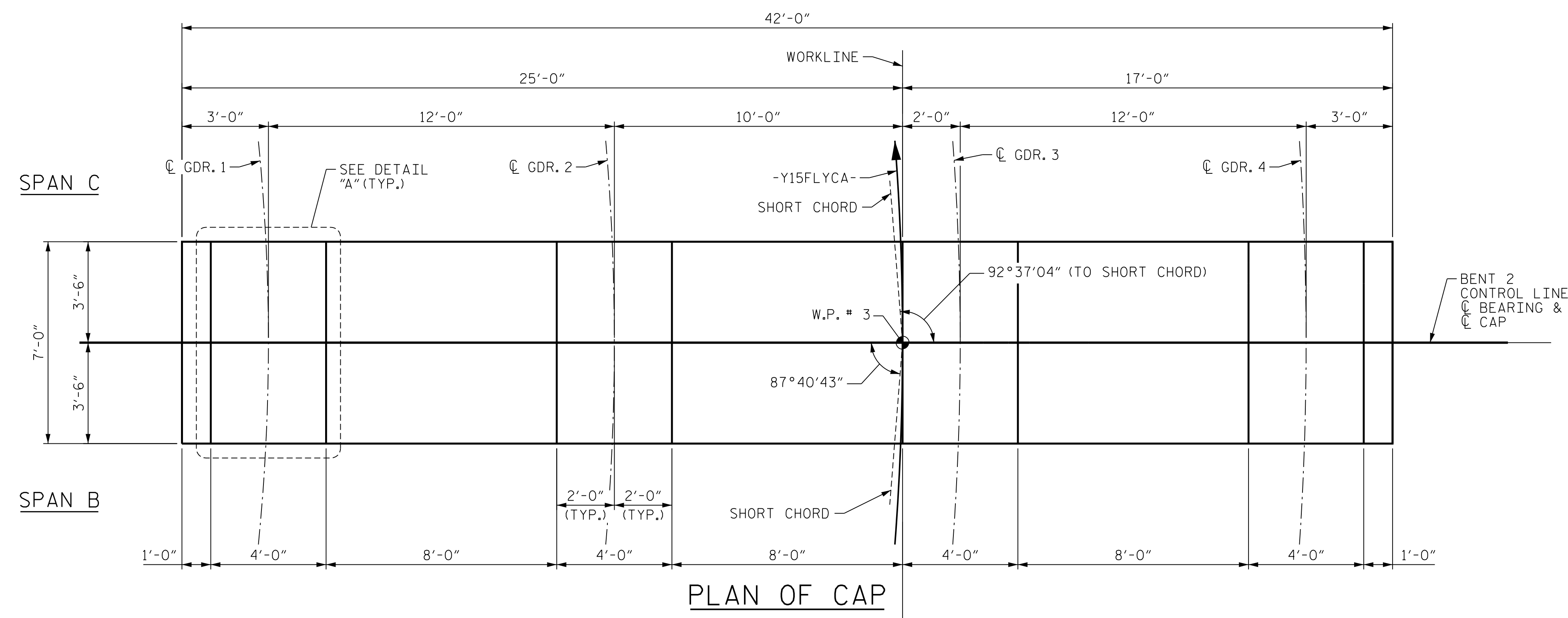


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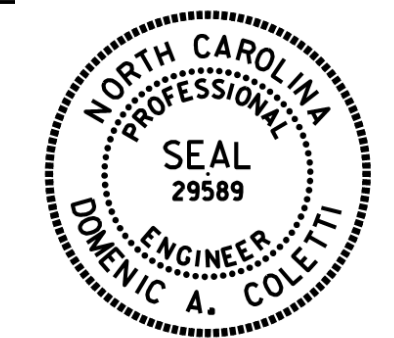
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USER: PPETERSO DATE: 10/14/2021
FILE: ...SUBSTR

DES BY: K. OLIVER	DATE: 11/19	DWG BY: B. PETERSON	DATE: 12/19
DES CHK: N. LIU	DATE: 11/19	CHK BY: N. LIU	DATE: 01/20

NOTES
FOR SECTIONS D-D AND E-E, SEE "SUBSTRUCTURE BENT 2 BENT CAP DETAILS" SHEET 5 OF 6.
FOR ADDITIONAL NOTES, SEE SHEETS 1 AND 2 OF 6.



PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 58+33.94 -Y15FLYCA-
SHEET 4 OF 6



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
BENT 2
BENT CAP PLAN & ELEVATION

REVISIONS						SHEET NO. S06-092 TOTAL SHEETS 129
NO.	BY:	DATE:	NO.	BY:	DATE:	
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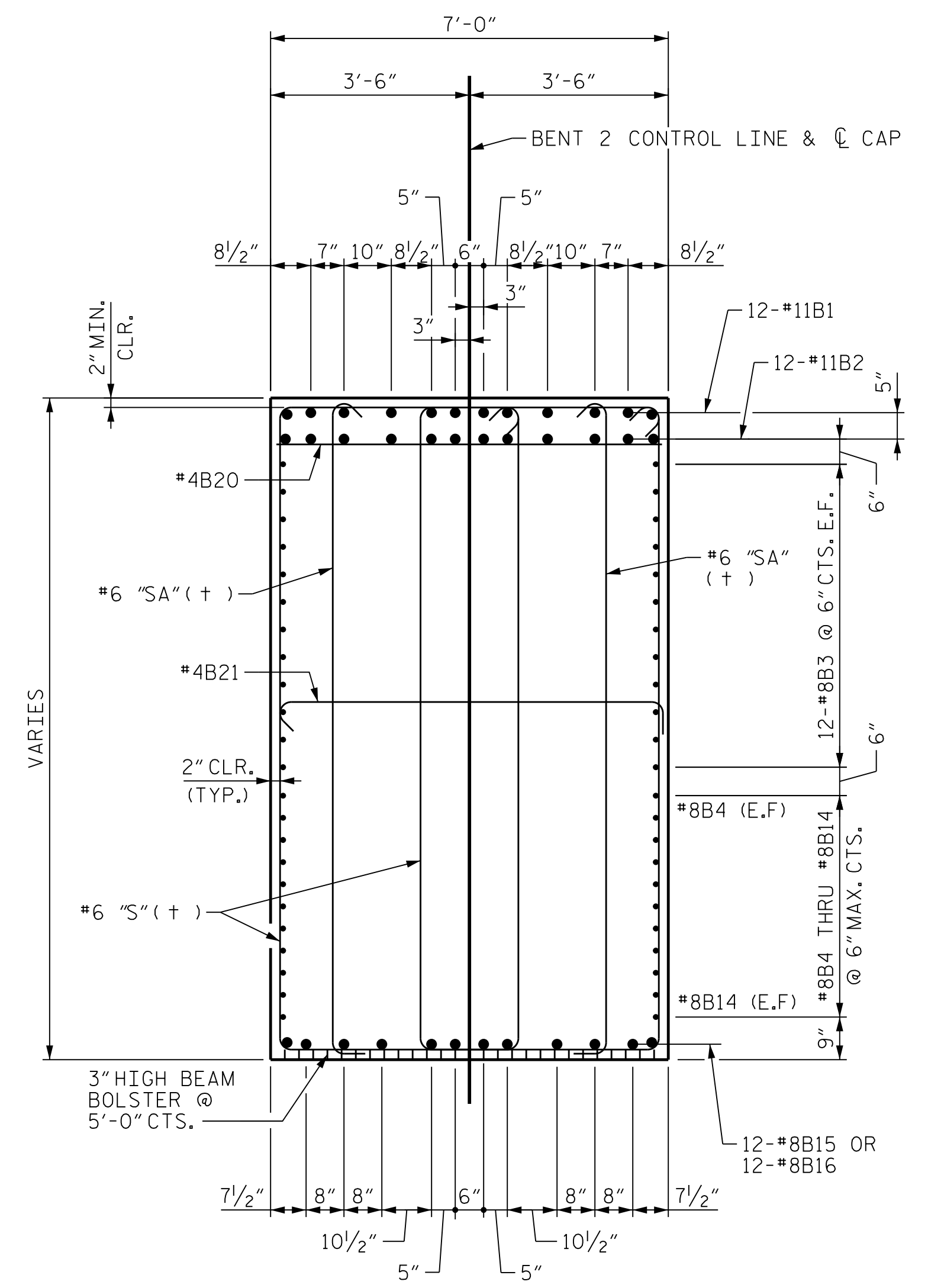
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DES CHK: M. WERNER	DATE: 10/19	CHK BY: N. LIU	DATE: 01/20

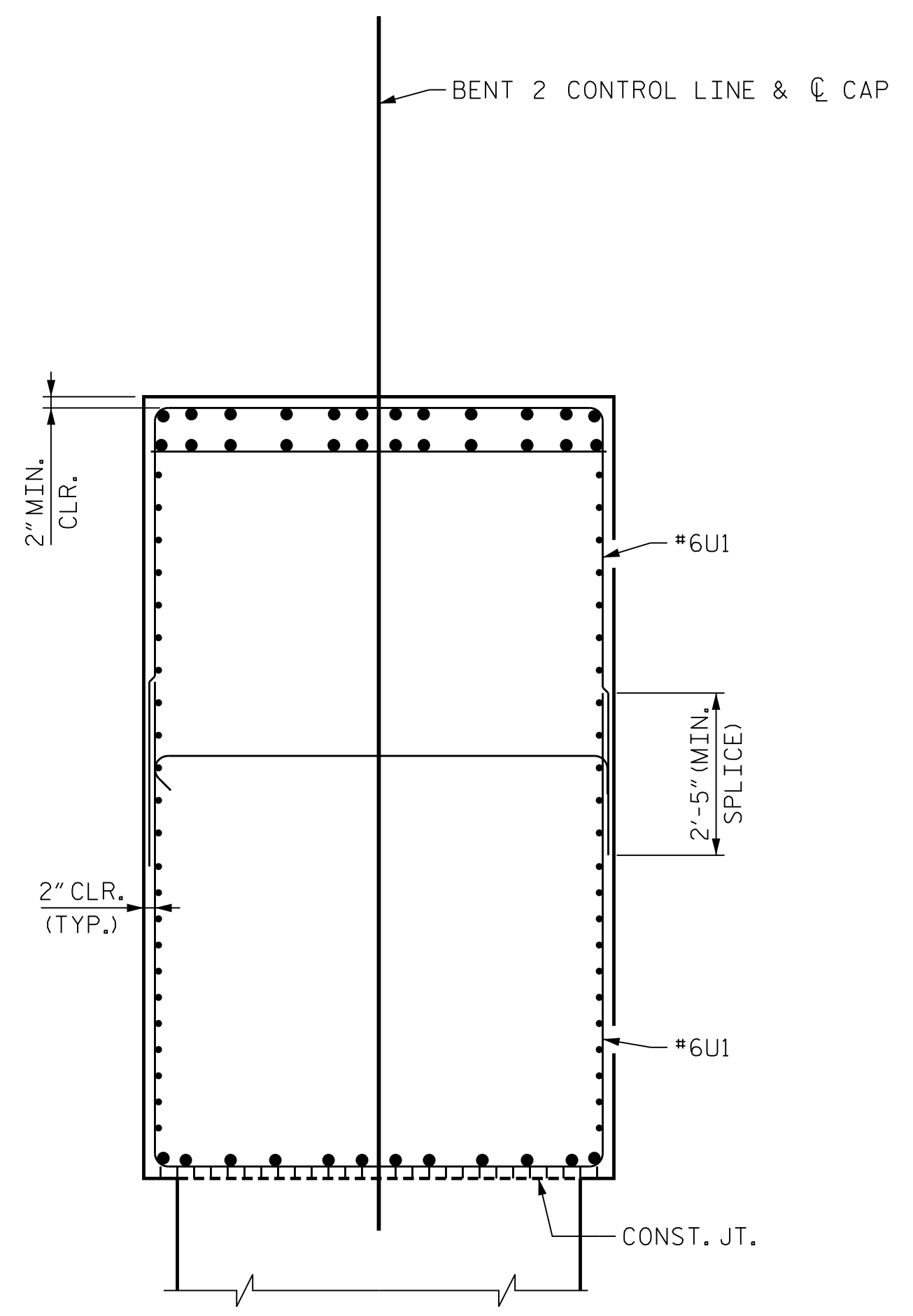
HDR
HDR Engineering, Inc. of the Carolinas
555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED
Dominic A. Coletti 10/15/2021

NOTE
SEE SHEETS 1 AND 2 OF 6 FOR NOTES.



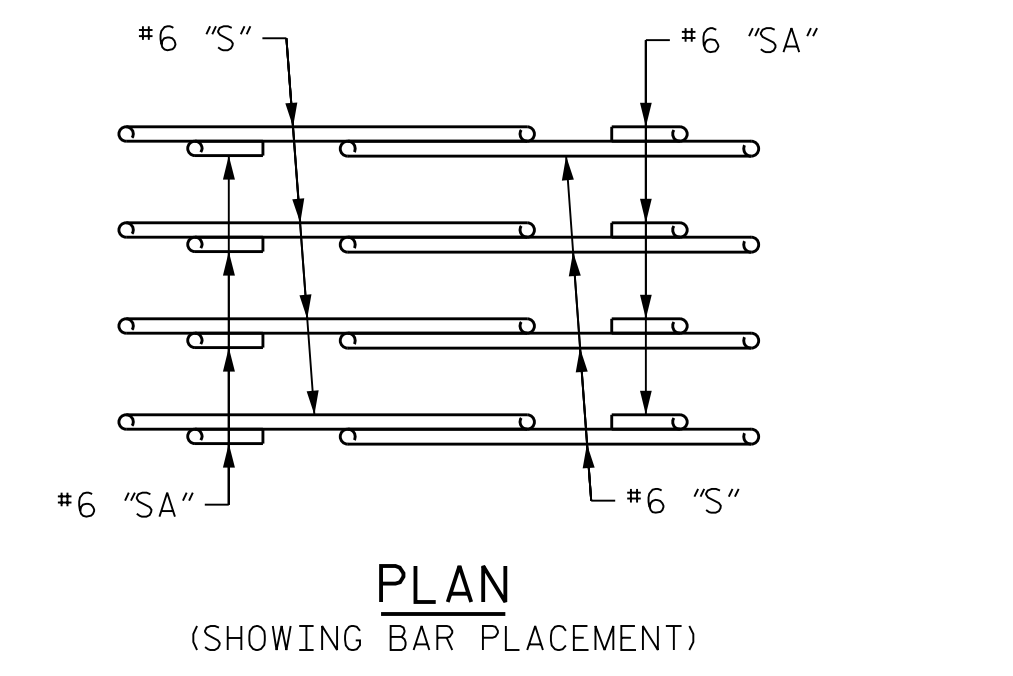
SECTION D-D
(+) SEE "STIRRUP SET DETAIL"



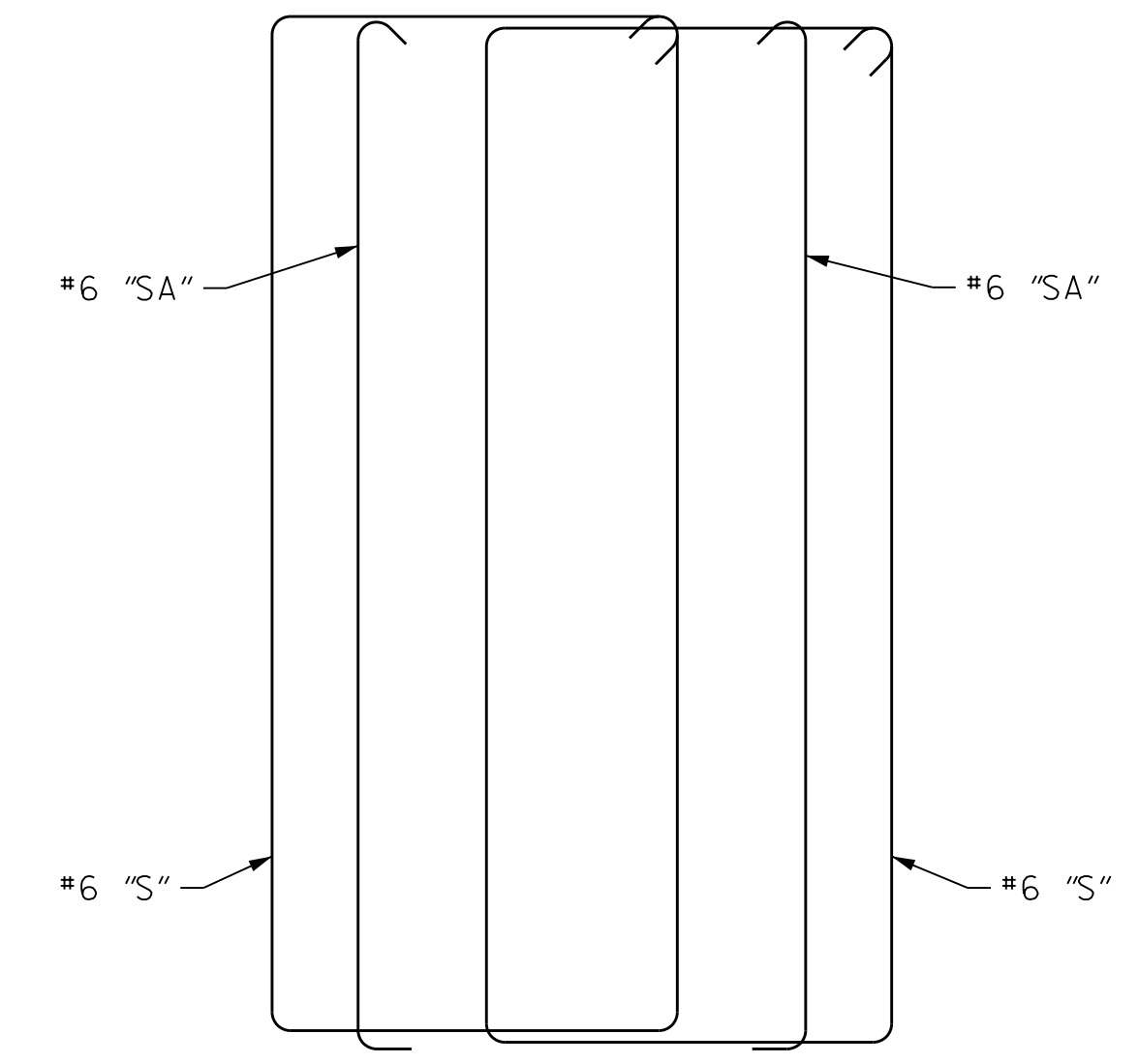
SEE SECTION D-D FOR ADDITIONAL INFORMATION

SECTION E-E

COLUMN REINFORCING STEEL NOT SHOWN FOR CLARITY

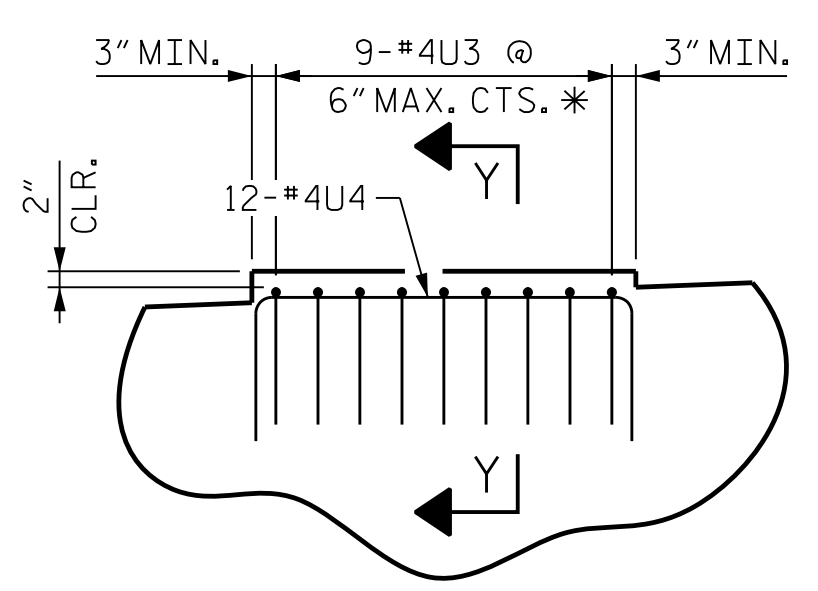


PLAN
(SHOWING BAR PLACEMENT)

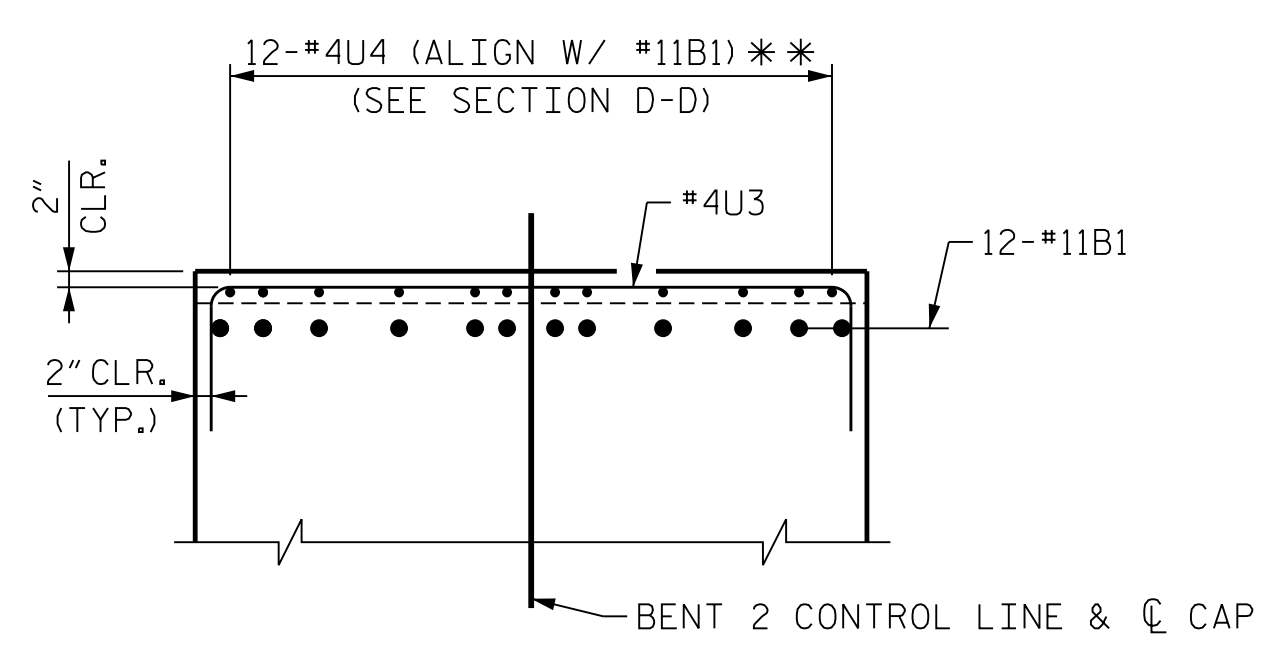


ELEVATION
(SCHEMATIC)

STIRRUP SET DETAIL

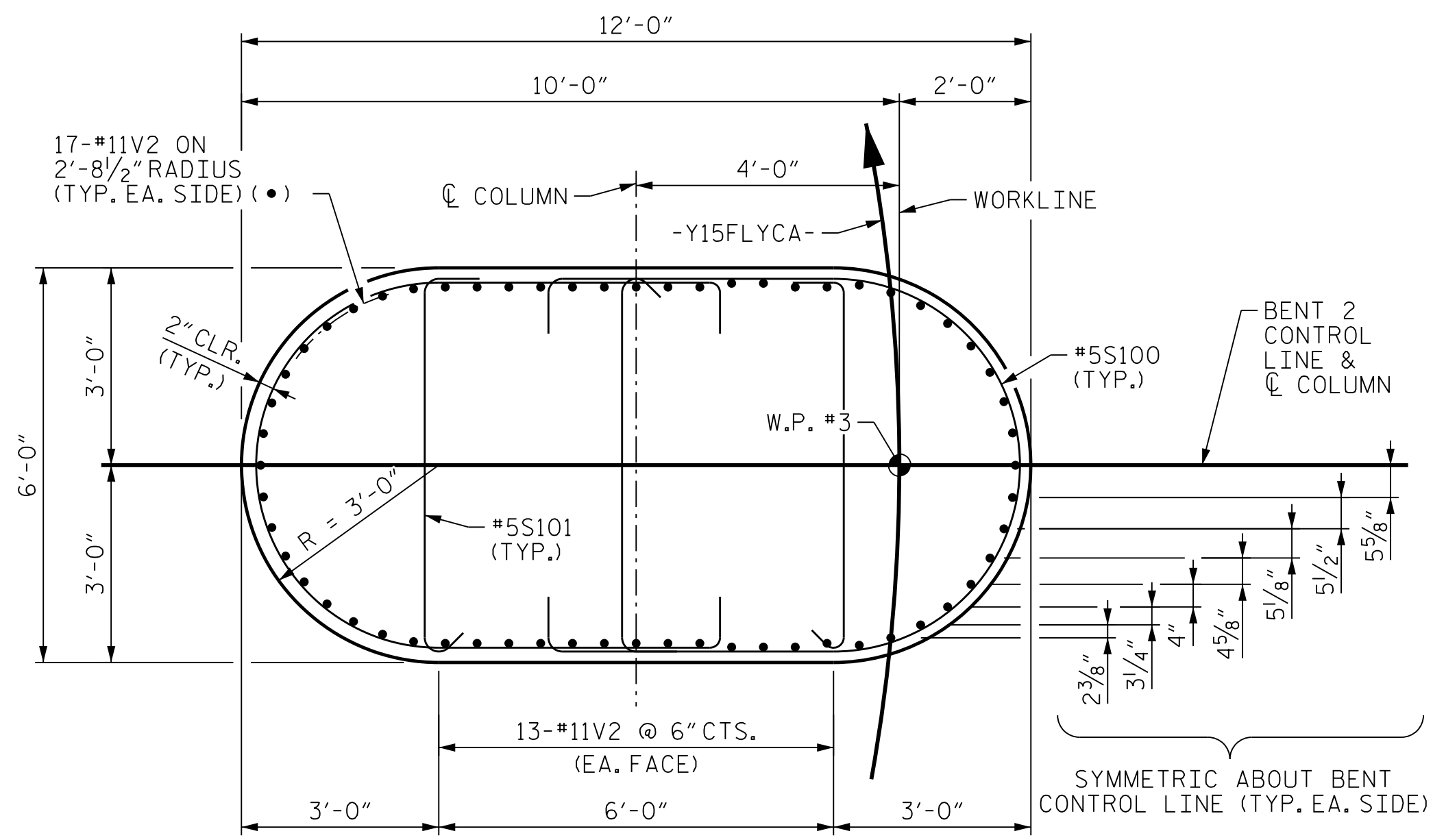


DETAIL "B"



SECTION Y-Y

* NOTE:
#4U3 BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR ANCHOR BOLTS.
** NOTE:
#4U4 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR #11B1 AND #11B2 BARS.

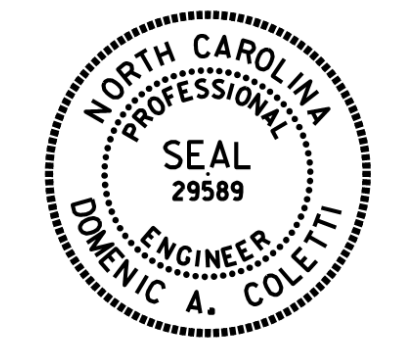


SECTION C-C

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 58+33.94 -Y15FLYCA-
SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

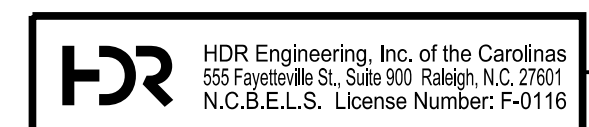
SUBSTRUCTURE
BENT 2
BENT CAP DETAILS



10/15/2021

PLOT DRIVER: NCDOT... PENTABLE: NCDOT... USER: PPETERSO... DATE: 10/14/2021... FILE: ...SUBSTR

DES BY: K. OLIVER	DATE: 10/19	DWG BY: B. PETERSON	DATE: 12/19
DES CHK: M. WERNER	DATE: 10/19	CHK BY: N. LIU	DATE: 01/20



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

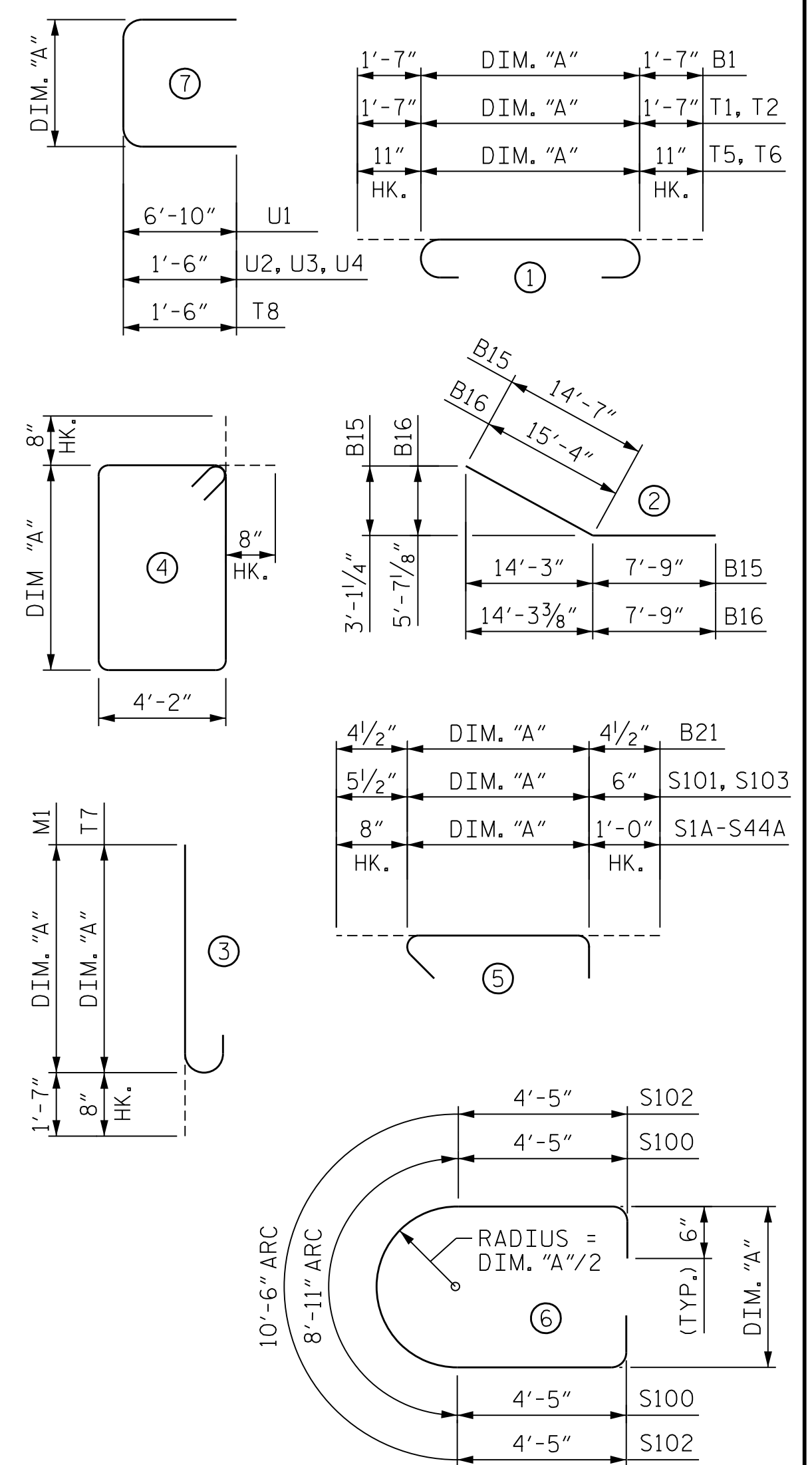
REVISIONS						SHEET NO. 506-093 TOTAL SHEETS 129
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	--	--	3	--	--	
2	--	--	4	--	--	

BILL OF MATERIAL - BENT 2

Table with columns: BAR NO., SIZE, TYPE, DIM. 'A', LENGTH, WEIGHT, BAR NO., SIZE, TYPE, DIM. 'A', LENGTH, WEIGHT. Lists materials for bent 2 including bars B1-B21, S1-S44, and M1, along with their dimensions and weights.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT



SUMMARY OF QUANTITIES - BENT 2

Table with columns: REINFORCING STEEL, CLASS AA CONCRETE, POUR #1-4, HP 14x73 STEEL PILES, PILE DRIVING EQUIPMENT SETUP. Lists quantities in LBS., C.Y., NO., and EA.

Δ = ASTM A706 WELDABLE REINFORCING STEEL

NOTE SEE SHEETS 1 AND 2 OF 6 FOR NOTES.

PROJECT NO. U-2579AB FORSYTH COUNTY STATION: 58+33.94 -Y15FLYCA-

SHEET 6 OF 6

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

SUBSTRUCTURE BENT 2 BILL OF MATERIALS



Dominic A. Coletti 10/15/2021

REVISIONS

Table with columns: NO., BY, DATE. Shows revision 1 and 2.

SHEET NO. 506-094 TOTAL SHEETS 129



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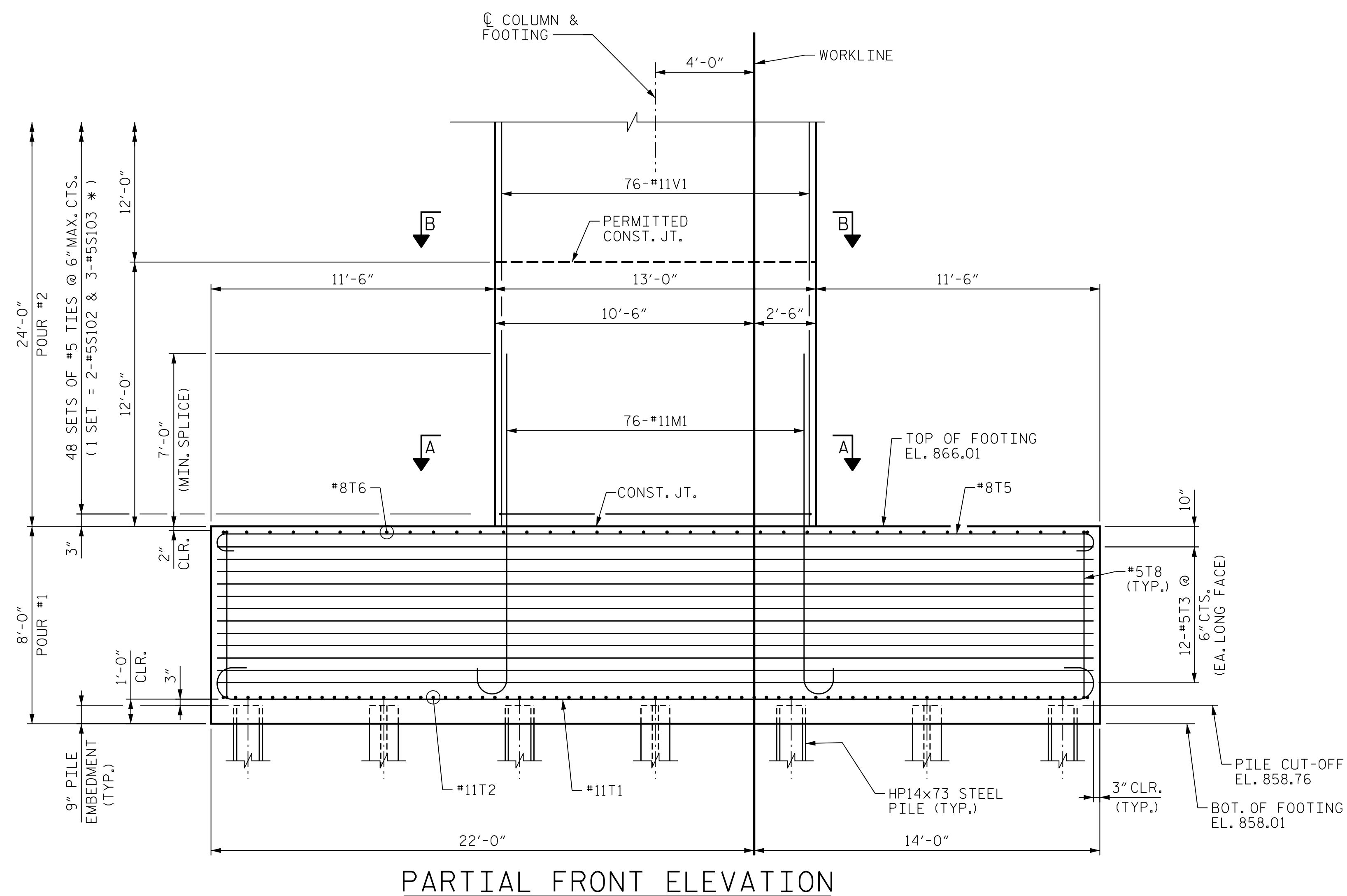
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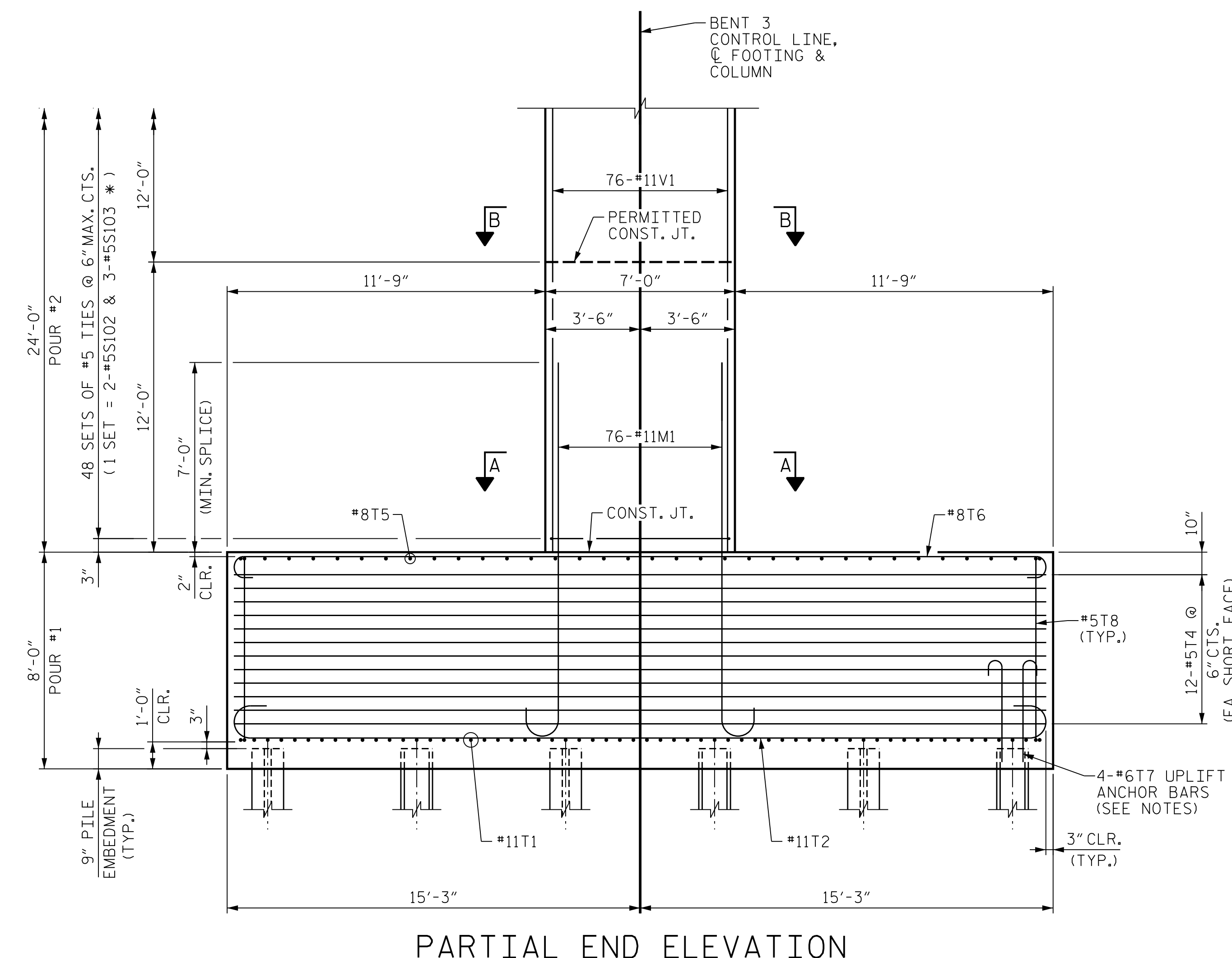
FOR FOOTING PLAN, SECTION A-A AND SECTION B-B, SEE "SUBSTRUCTURE BENT 3 FOOTING & COLUMN DETAILS", SHEET 3 OF 6.

4-#6T7 UPLIFT ANCHOR BARS AT NOTED PILES - SEE "SUBSTRUCTURE BENT 3 FOOTING & COLUMN DETAILS", SHEET 3 OF 6 FOR LOCATIONS.

FOR ADDITIONAL NOTES AND PILE UPLIFT ANCHOR DETAIL, SEE "SUBSTRUCTURE BENT 1 ELEVATIONS", SHEET 1 OF 6.



PARTIAL FRONT ELEVATION



PARTIAL END ELEVATION

* INVERT ORIENTATION OF ALTERNATE #5S103 TIES

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 58+33.94 -Y15FLYCA-

SHEET 1 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 3
ELEVATIONS



Dominic A. Coletti 10/15/2021

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
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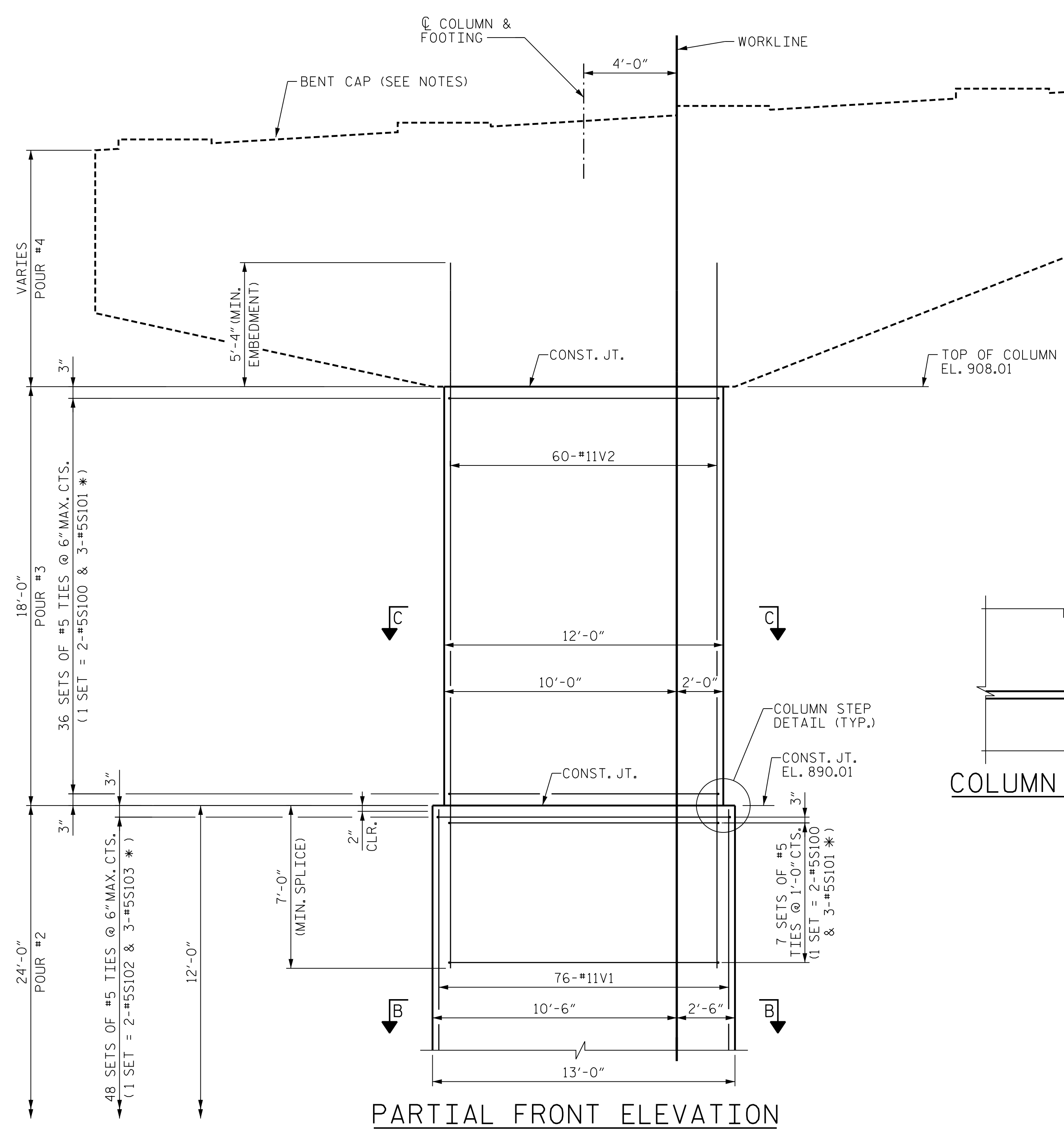
SHEET NO. S06-095
TOTAL SHEETS 129



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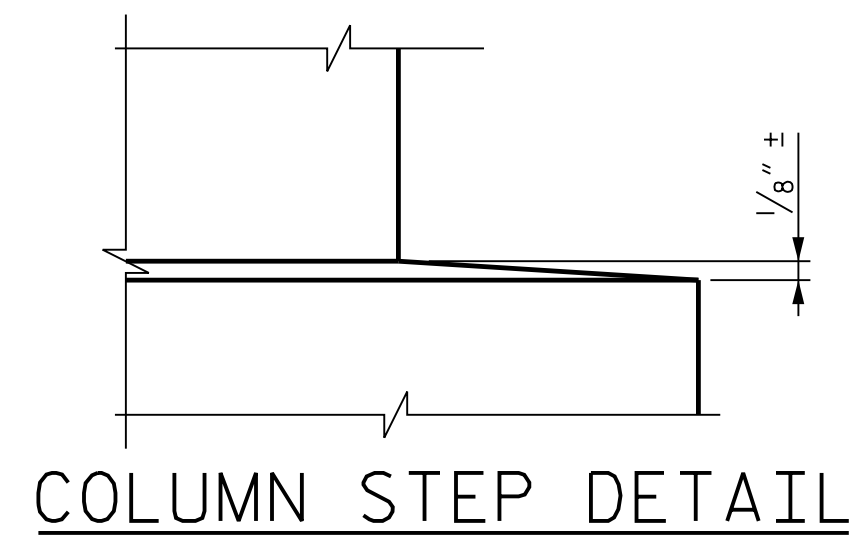
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DES CHK: N. LIU	DATE: 11/19	CHK BY: N. LIU	DATE: 01/20

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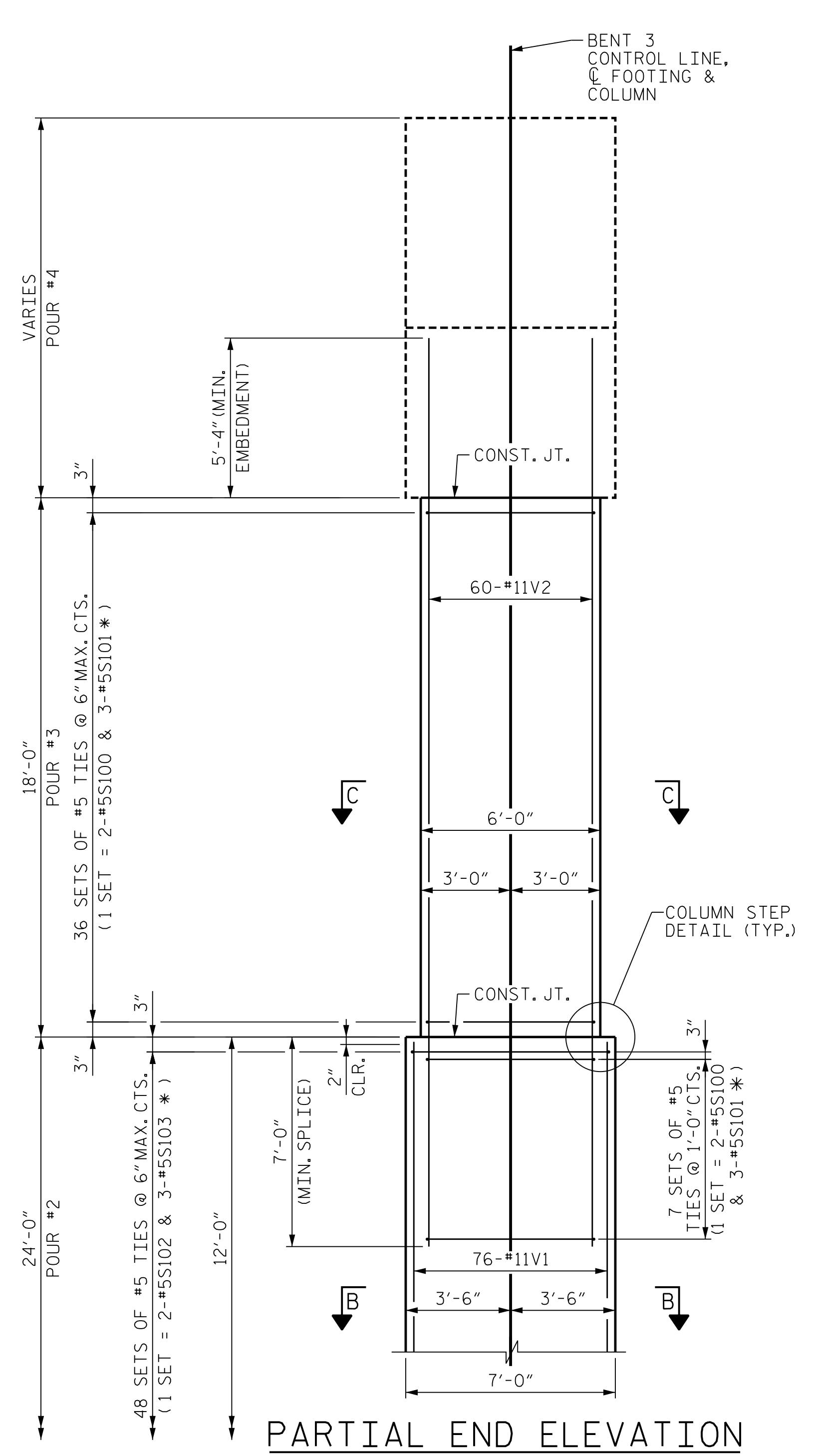


PARTIAL FRONT ELEVATION

* INVERT ORIENTATION OF ALTERNATE #5S101 AND #5S103 TIES



COLUMN STEP DETAIL

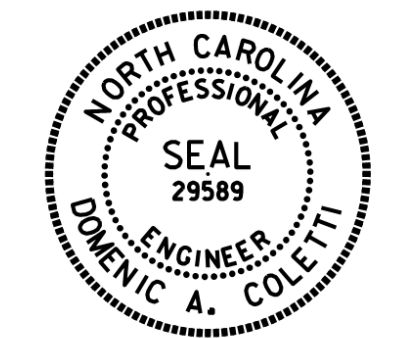


PARTIAL END ELEVATION

NOTES

- FOR SECTION B-B, SEE "SUBSTRUCTURE BENT 3 FOOTING & COLUMN DETAILS", SHEET 3 OF 6.
- FOR SECTION C-C, SEE "SUBSTRUCTURE BENT 3 BENT CAP DETAILS", SHEET 5 OF 6.
- FOR DETAILS OF BENT CAP, SEE "SUBSTRUCTURE BENT 3 BENT CAP PLAN AND ELEVATION", SHEET 4 OF 6 AND "SUBSTRUCTURE BENT 3 BENT CAP DETAILS", SHEET 5 OF 6.
- FOR ADDITIONAL NOTES, SEE "SUBSTRUCTURE BENT 1 ELEVATIONS", SHEET 1 OF 6.

PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-
 SHEET 2 OF 6



Dominic A. Coletti 10/15/2021

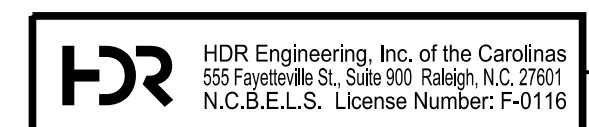
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE BENT 3 ELEVATIONS

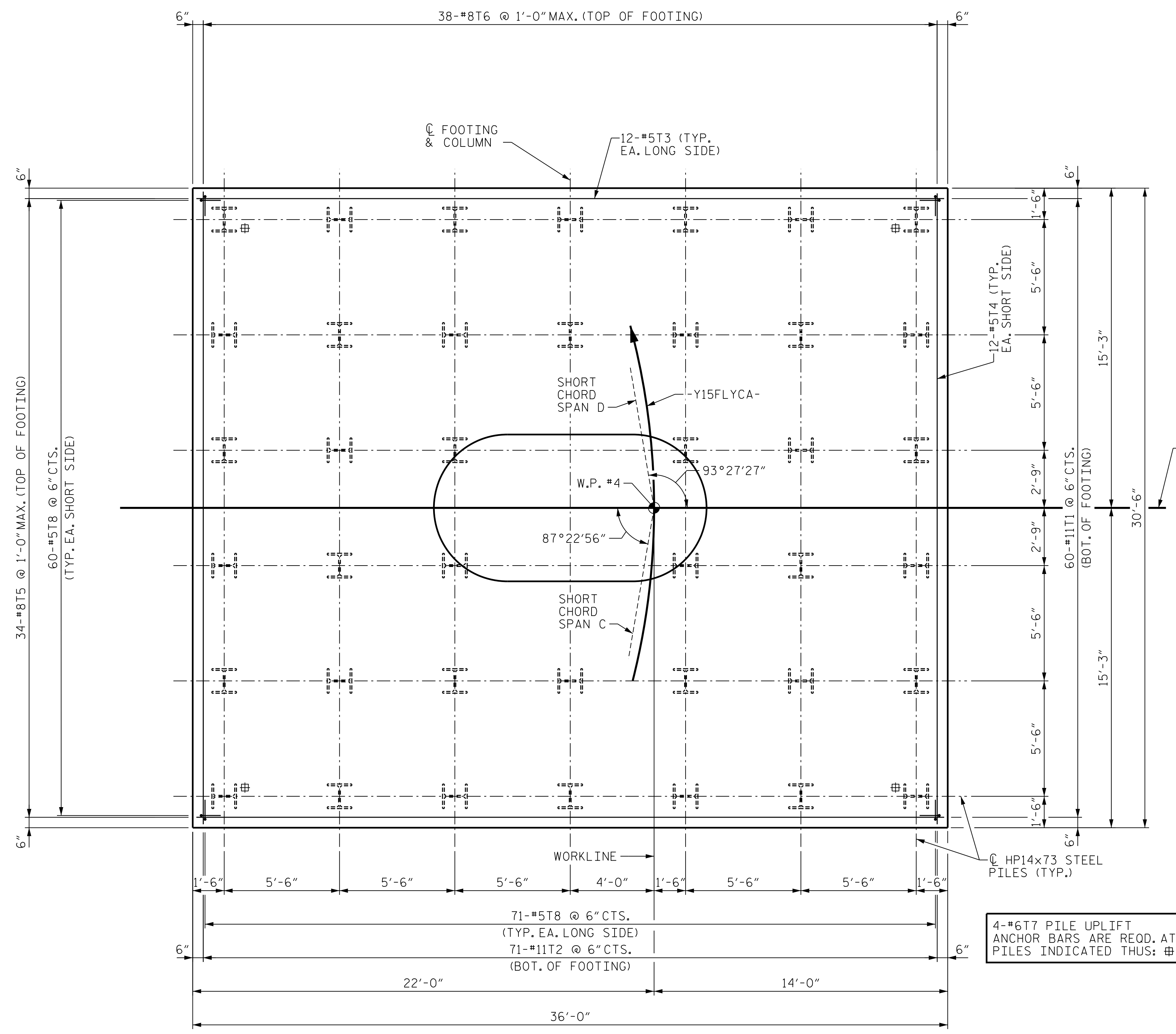
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SHEET NO. 506-096
 TOTAL SHEETS 129

DES BY: S. CHAUDHARI	DATE: 09/19	DWG BY: B. PETERSON	DATE: 12/19
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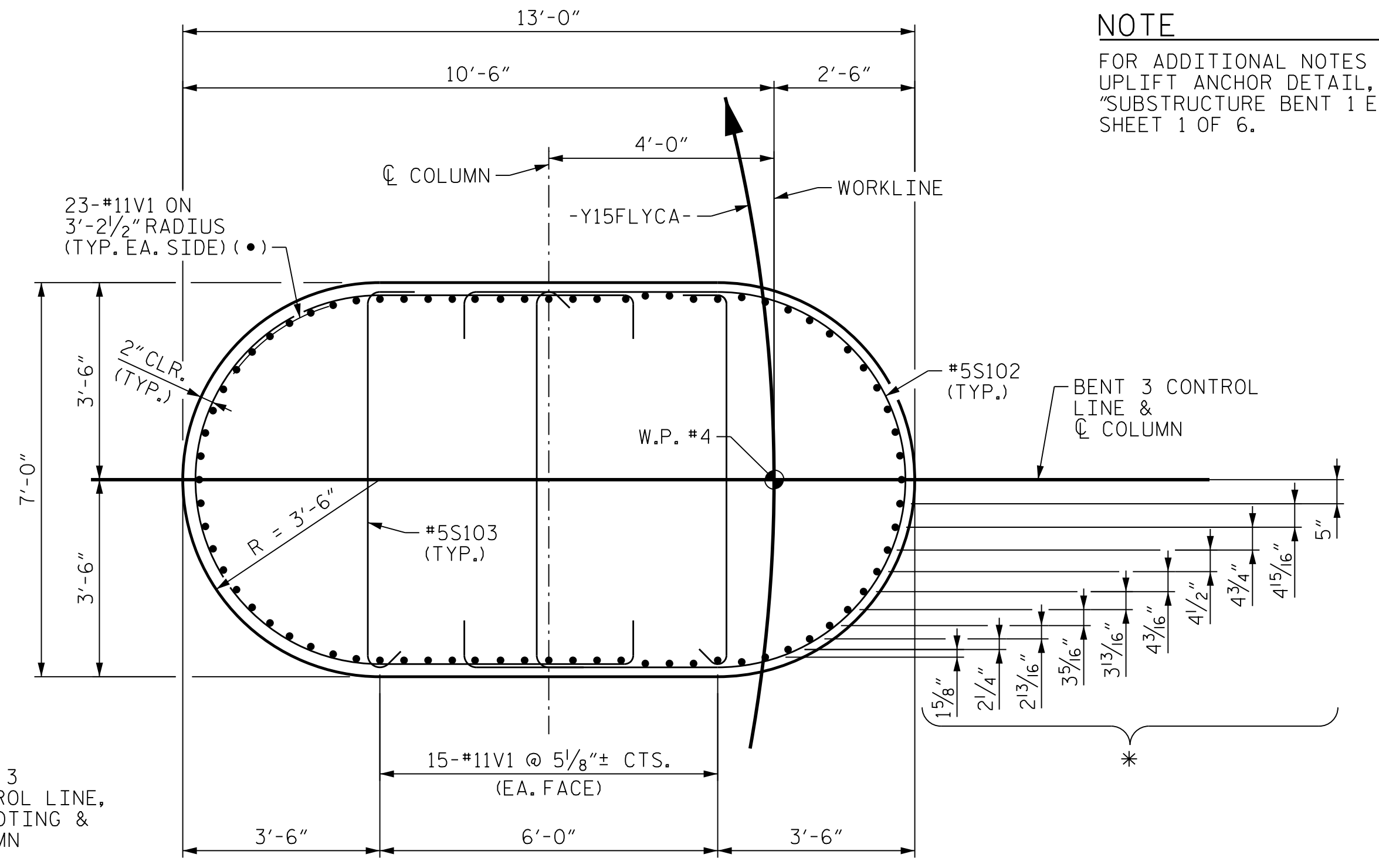


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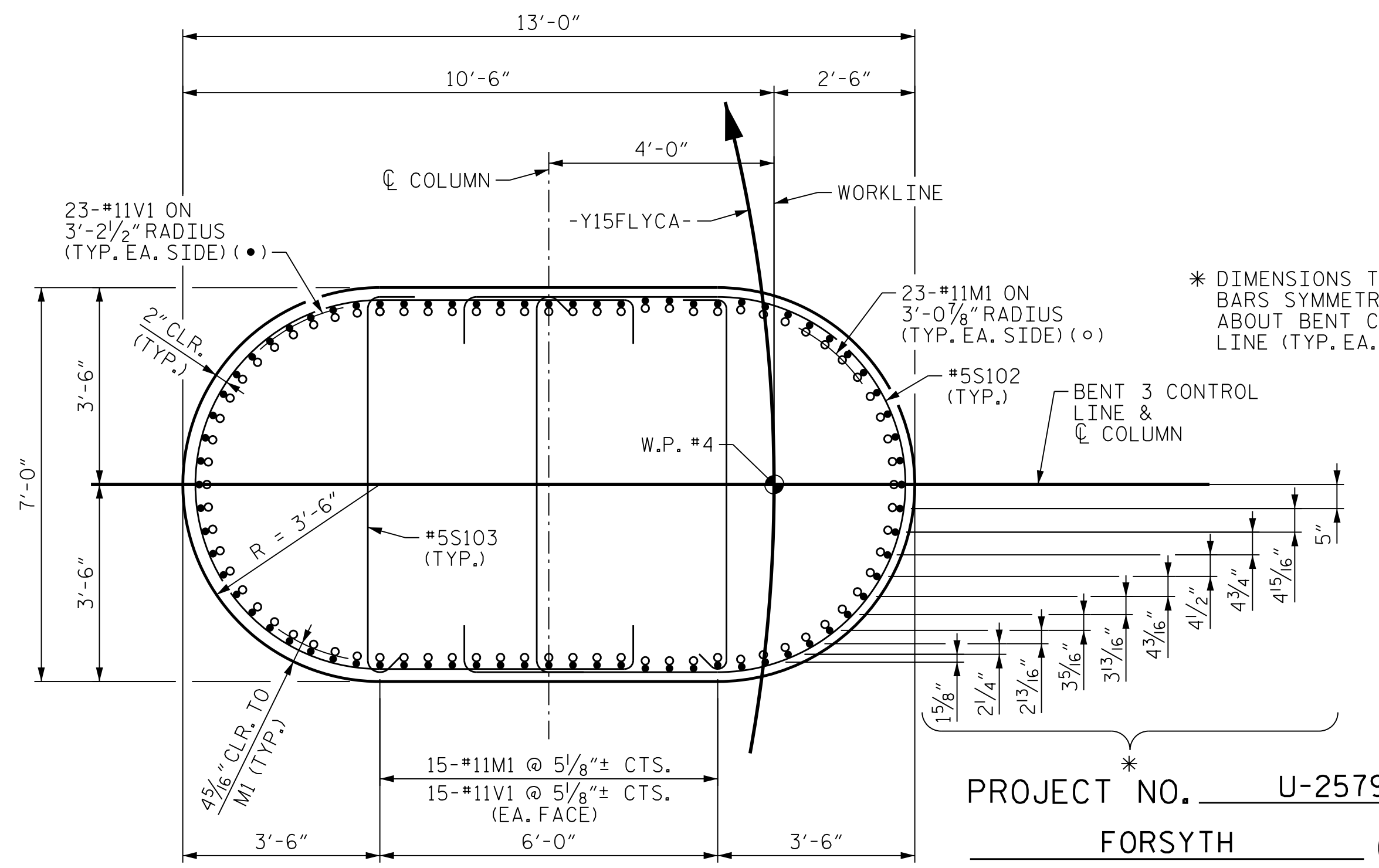


FOOTING PLAN

4-#6T7 PILE UPLIFT ANCHOR BARS ARE REQD. AT PILES INDICATED THUS: \oplus



SECTION B-B



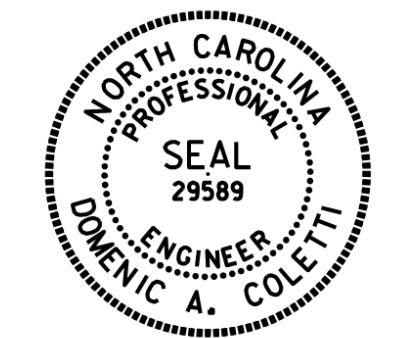
SECTION A-A

NOTE
FOR ADDITIONAL NOTES AND PILE UPLIFT ANCHOR DETAIL, SEE "SUBSTRUCTURE BENT 1 ELEVATIONS", SHEET 1 OF 6.

* DIMENSIONS TO "V" BARS SYMMETRIC ABOUT BENT CONTROL LINE (TYP. EA. SIDE)

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 58+33.94 -Y15FLYCA-

SHEET 3 OF 6



Dominic A. Coletti 10/15/2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT 3 FOOTING & COLUMN DETAILS

REVISIONS						SHEET NO. S06-097 TOTAL SHEETS 129
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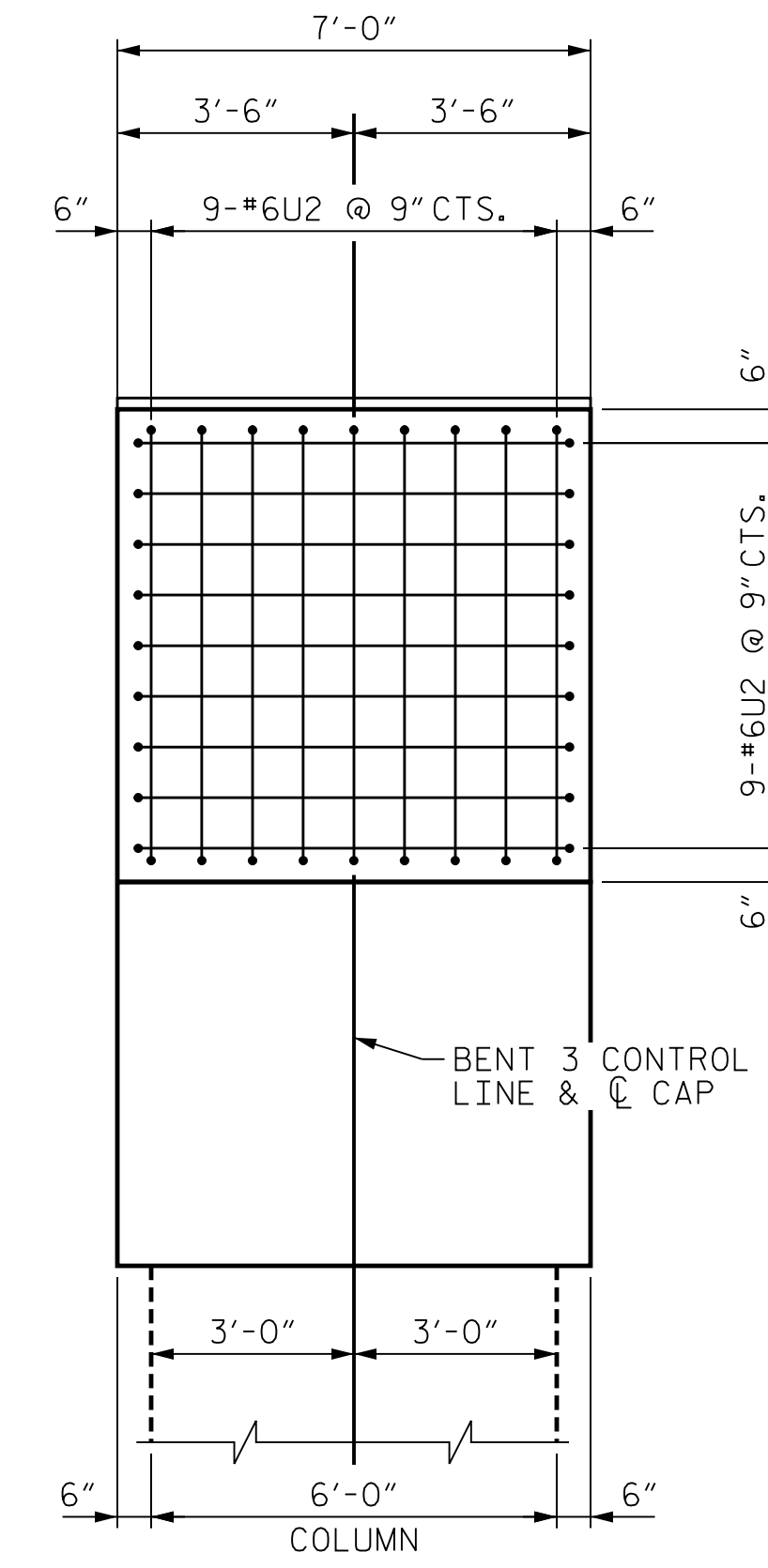
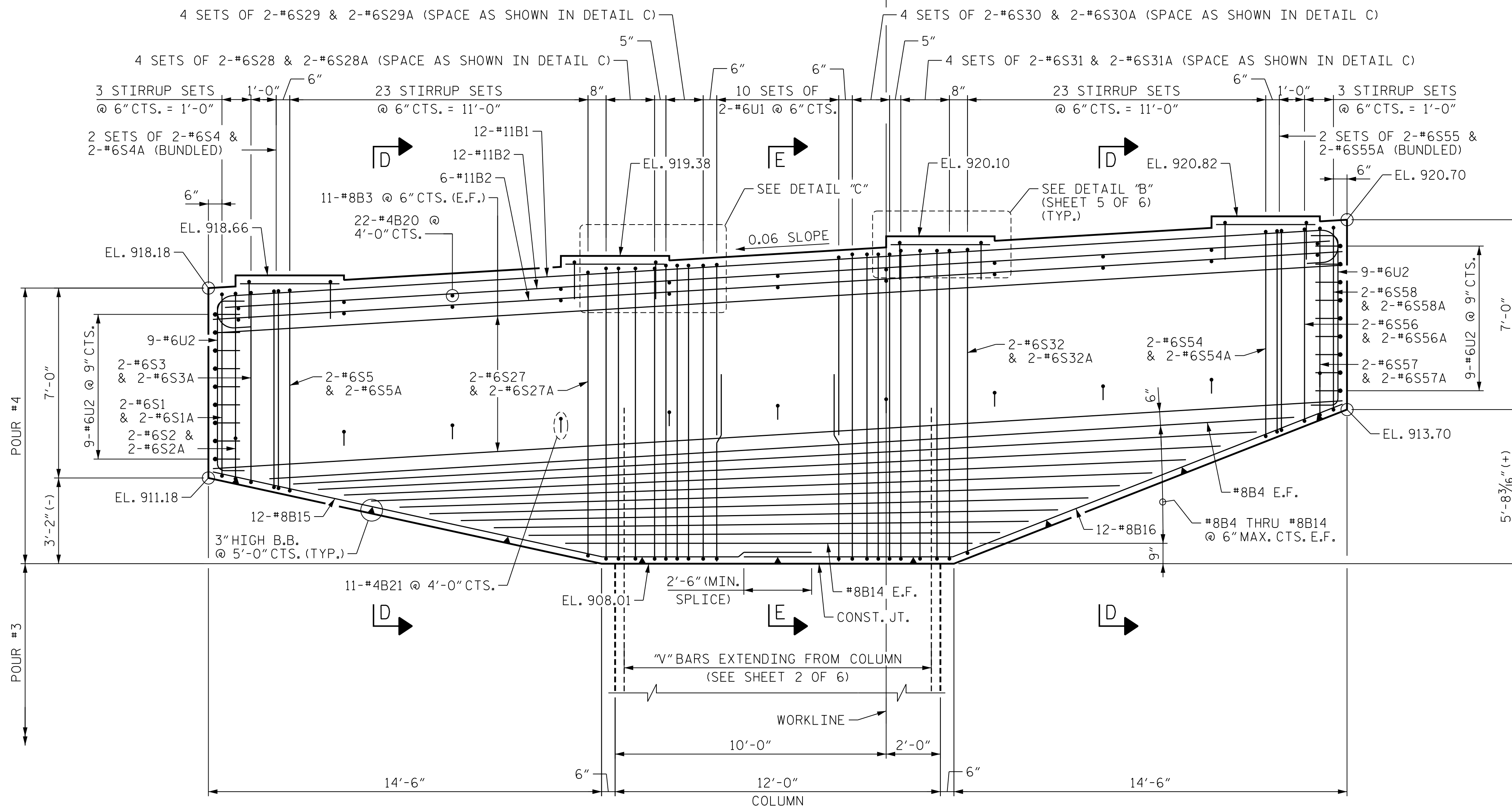
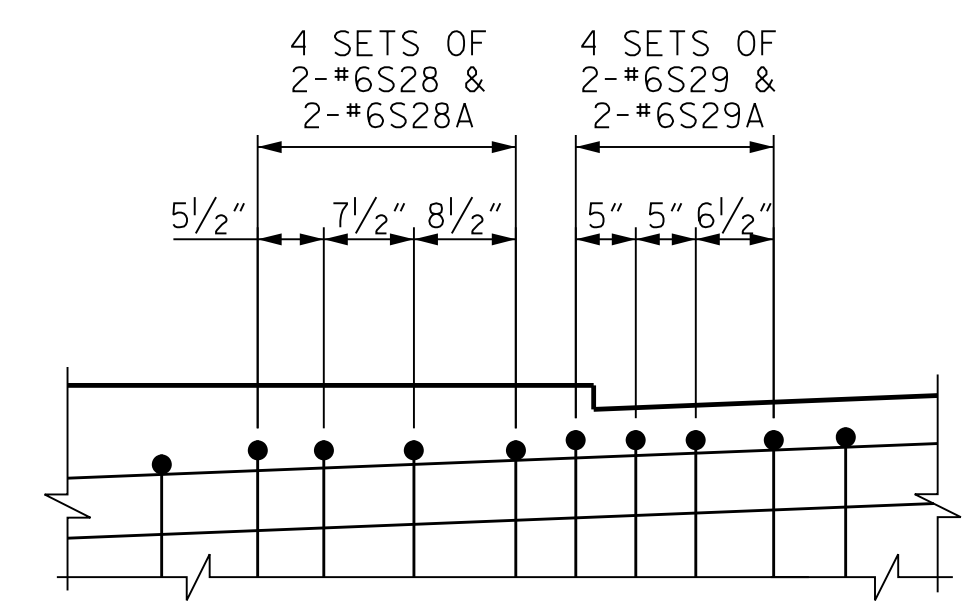
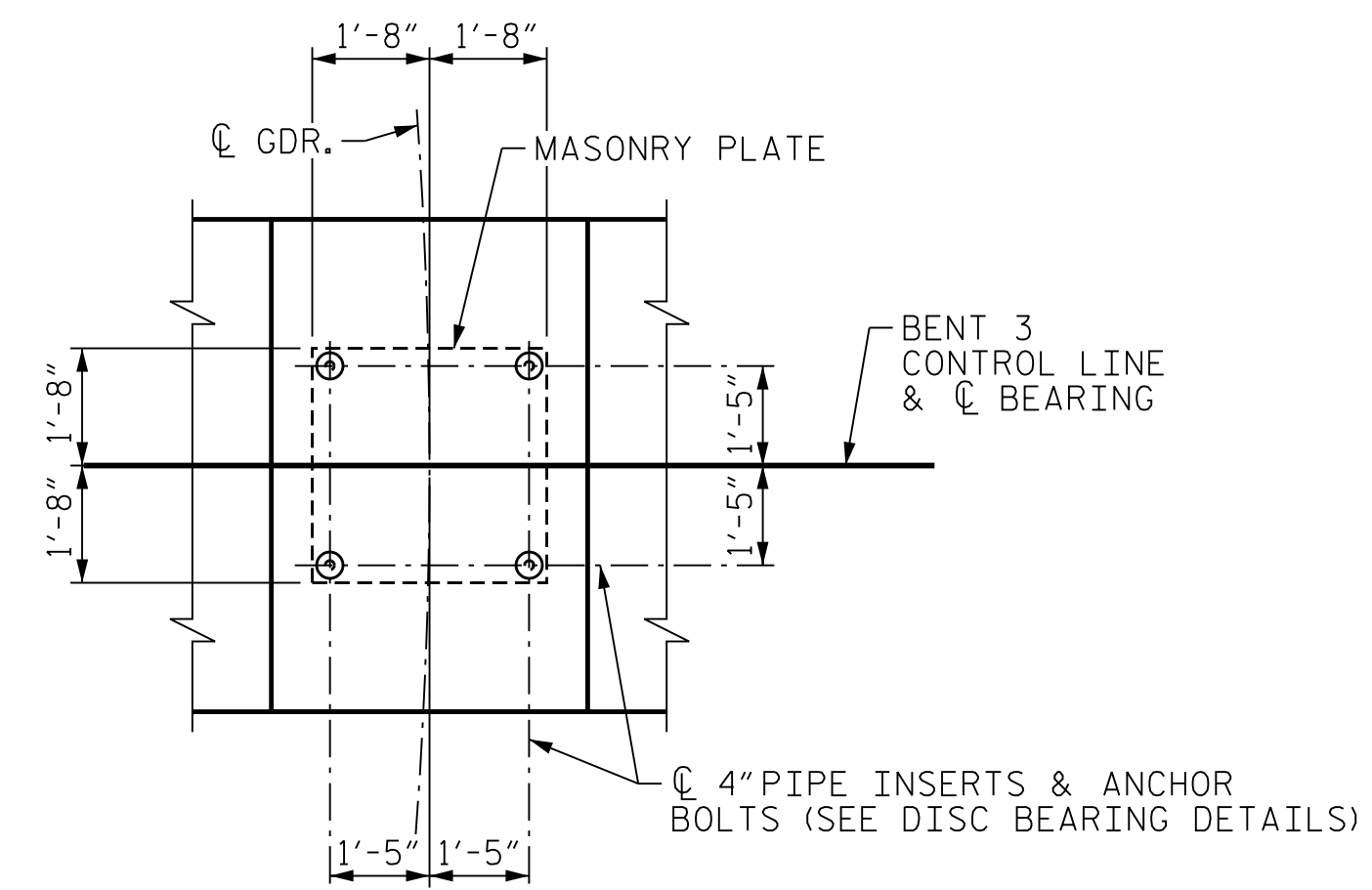
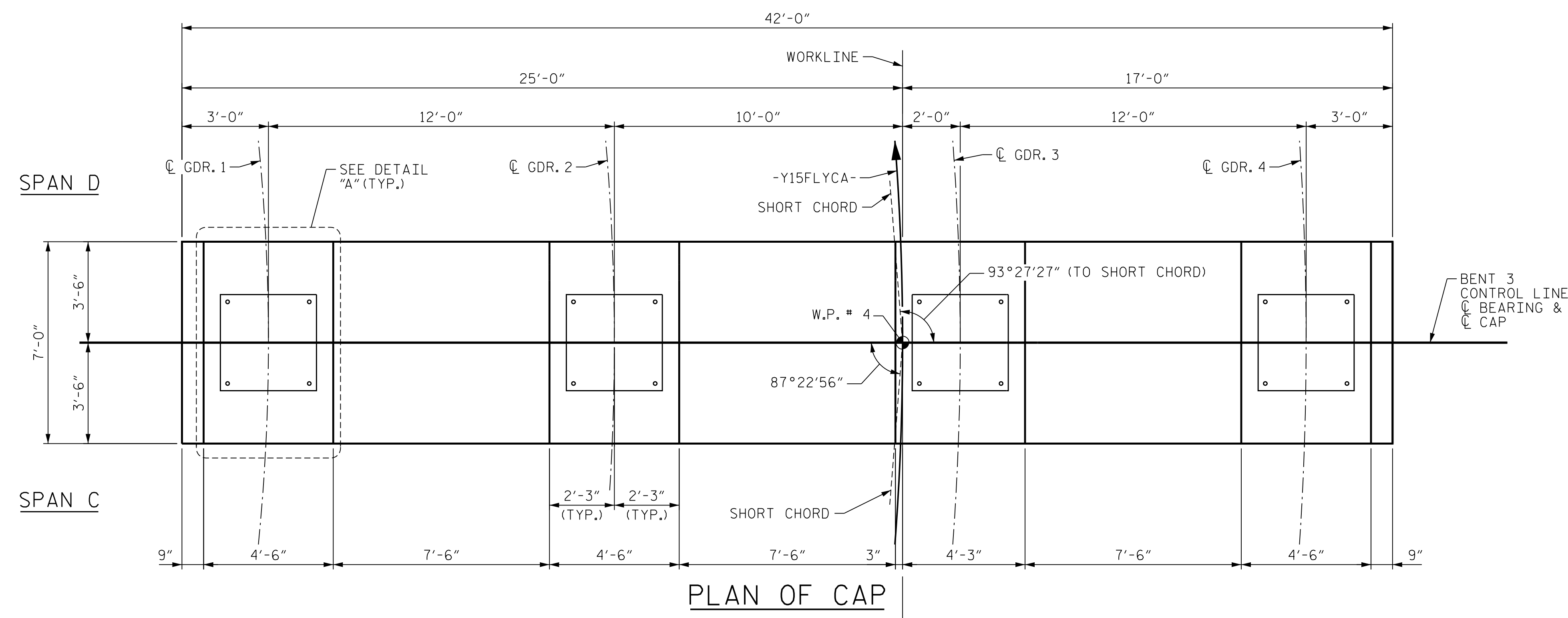


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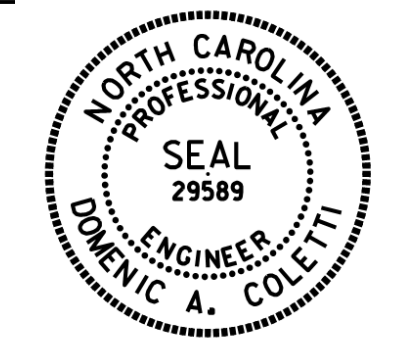
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DES CHK: <u>N. LIU</u>	DATE: <u>11/19</u>	CHK BY: <u>N. LIU</u>	DATE: <u>01/20</u>

NOTES
FOR SECTIONS D-D AND E-E, SEE
"SUBSTRUCTURE BENT 3 BENT CAP DETAILS"
SHEET 5 OF 6.
FOR ADDITIONAL NOTES, SEE SHEETS 1 AND
2 OF 6.



DETAIL "C"
DETAIL SHOWN AT LEFT SIDE OF CAP
(SPACING OF STIRRUPS MIRRORED AT
RIGHT SIDE OF CAP WITH BARS
#6S30/#6S30A AND #6S31/#6S31A AS
SHOWN ON THE ELEVATION)

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 58+33.94 -Y15FLYCA-
SHEET 4 OF 6



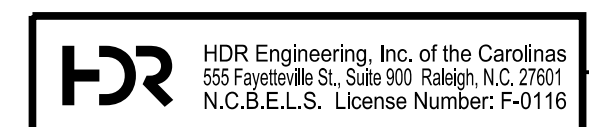
10/15/2021

ELEVATION OF CAP

END VIEW

PLOT DRIVER: NCDOT...
USER: PETERSON...
DATE: 10/14/2021

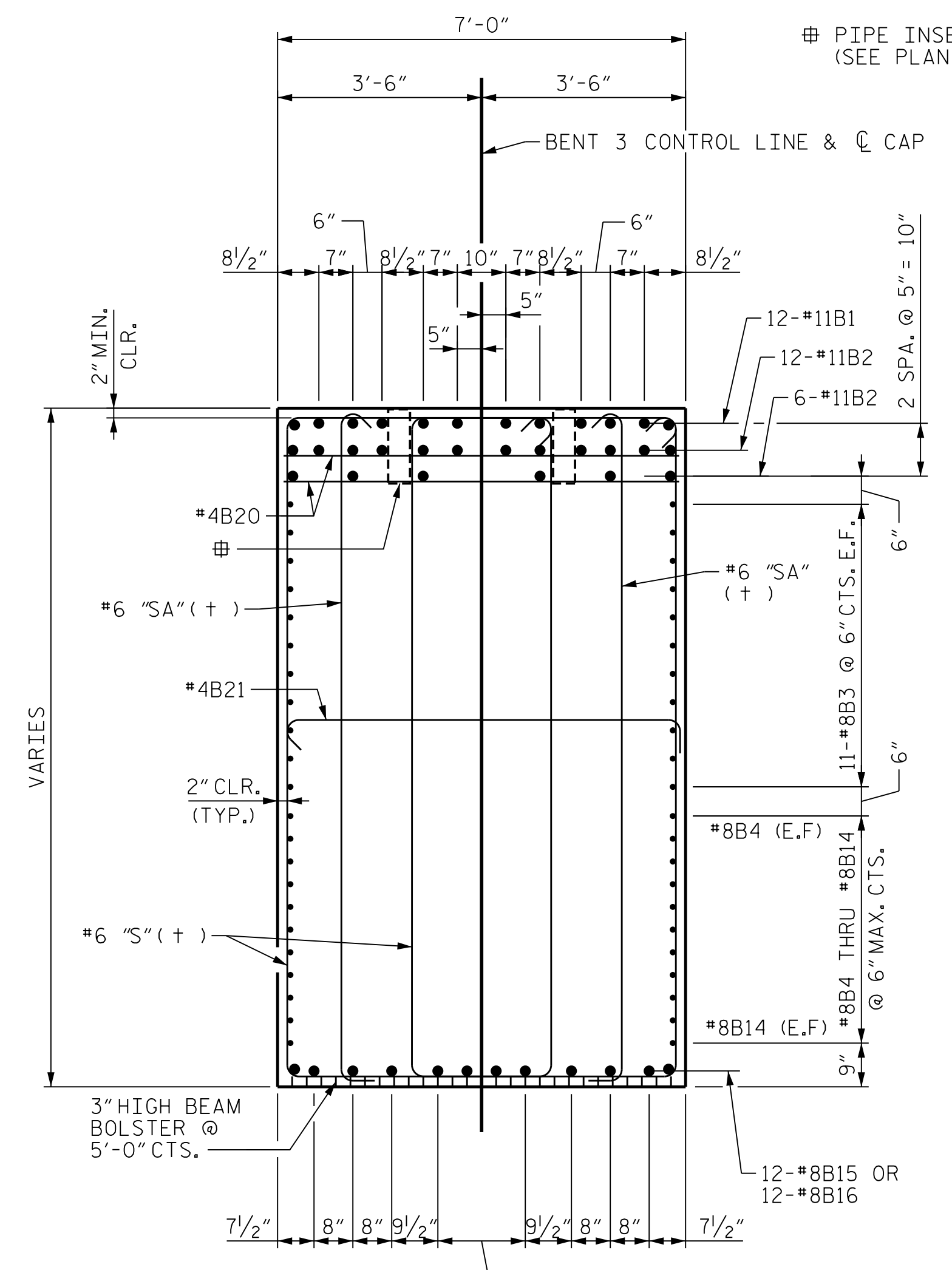
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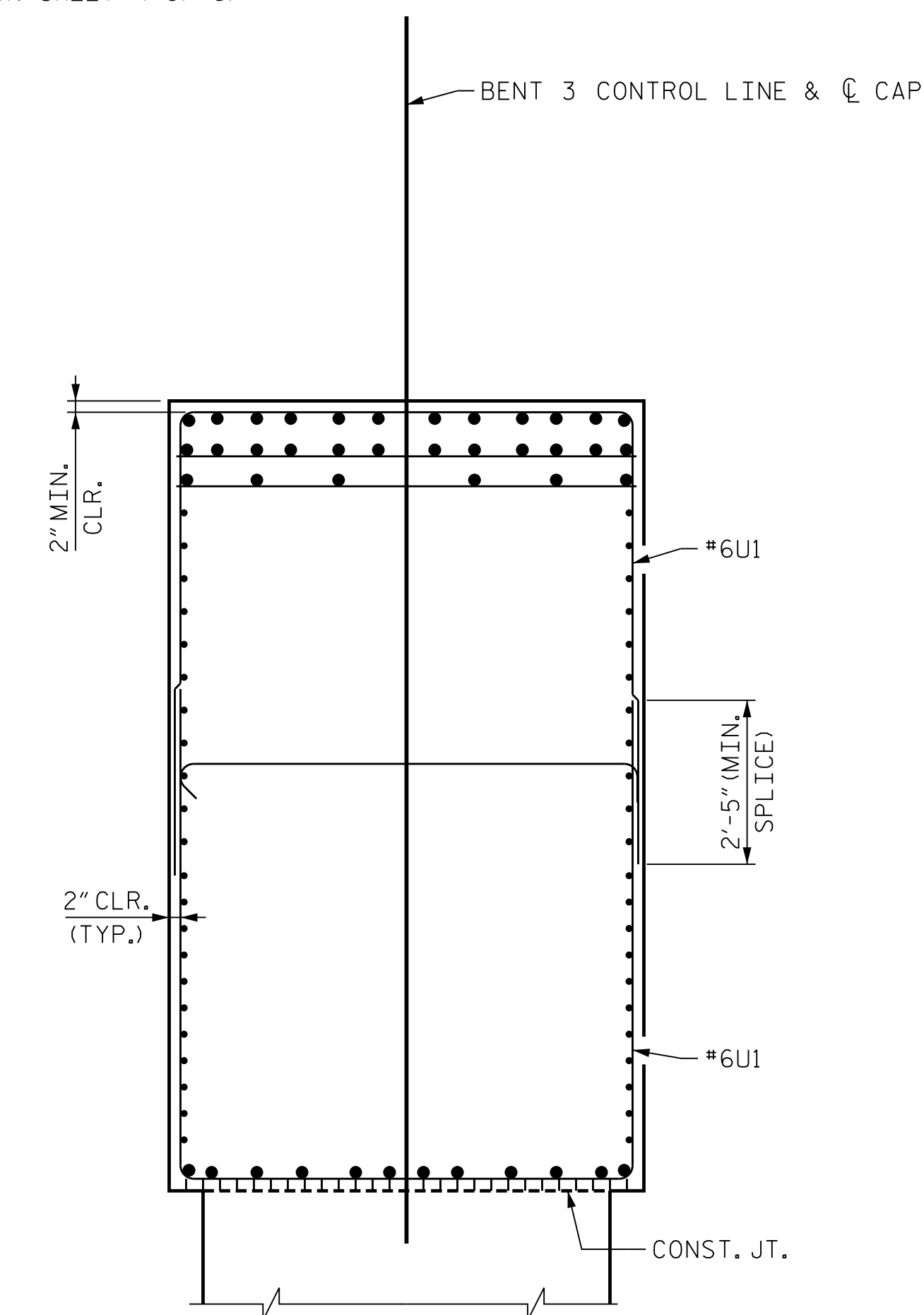
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NOTE
SEE SHEETS 1 AND 2 OF 6 FOR NOTES.

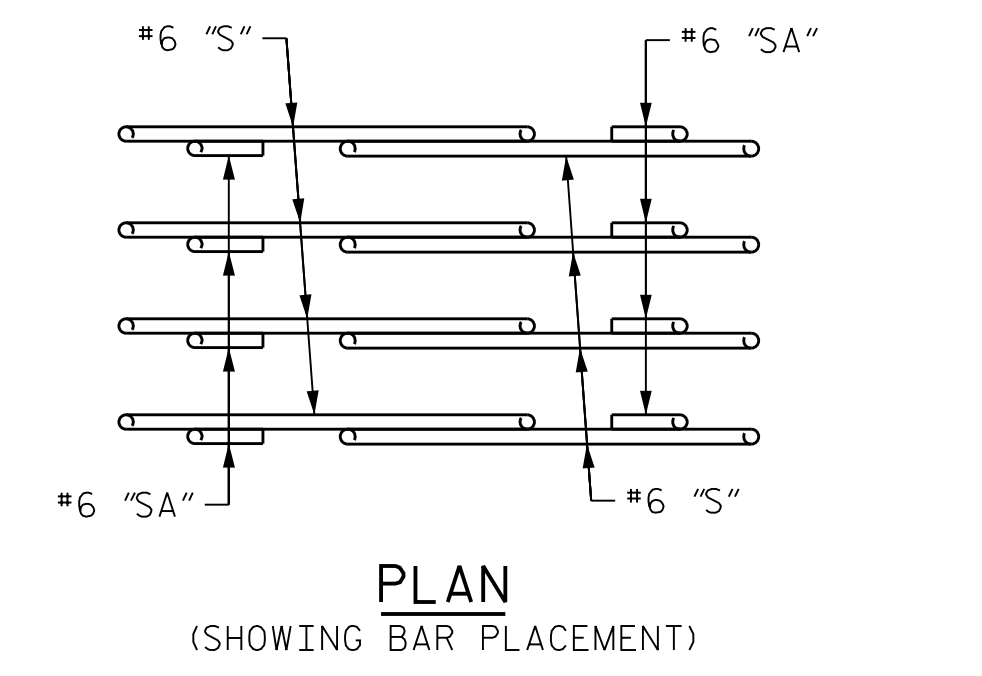


SECTION D-D
(+) SEE "STIRRUP SET DETAIL"

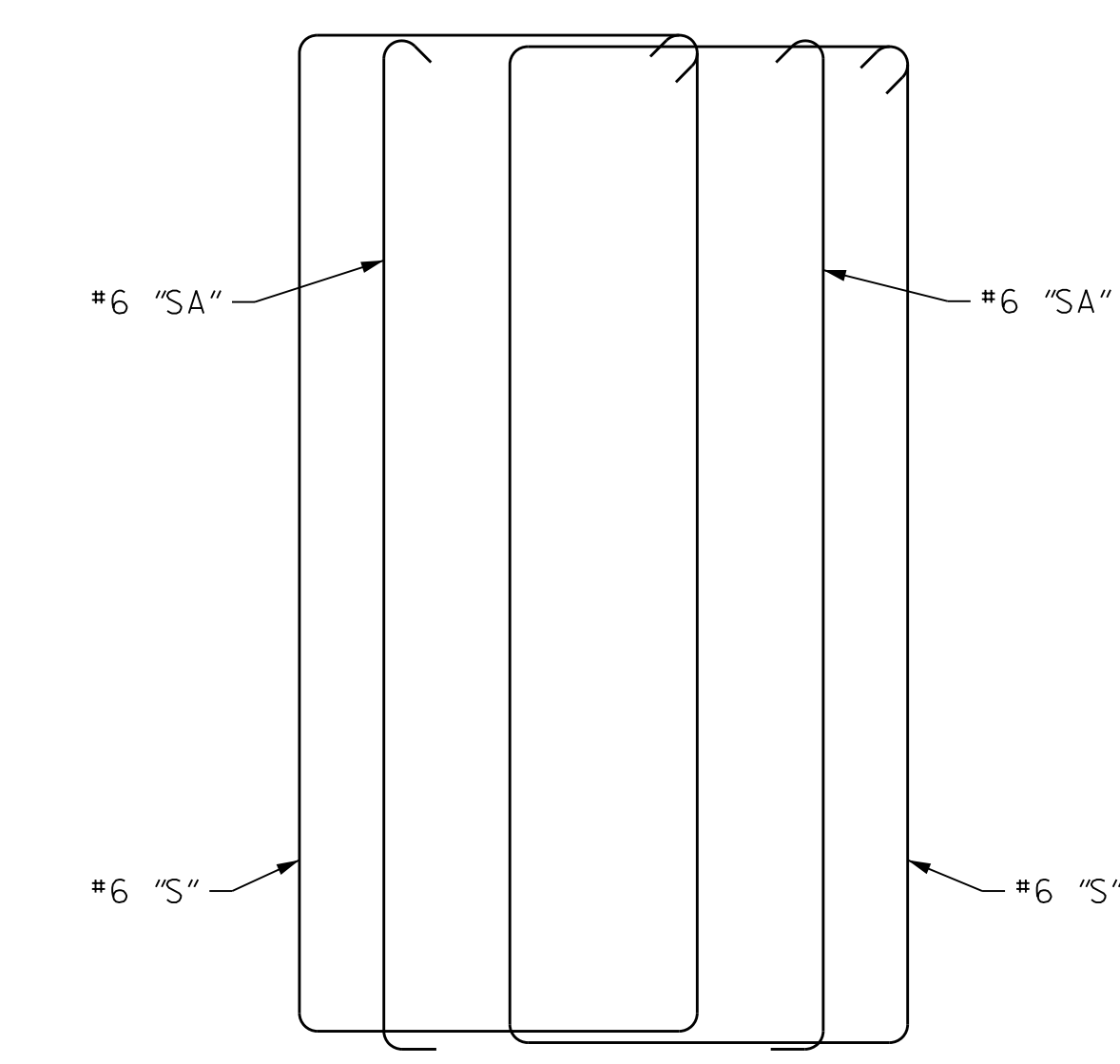


SEE SECTION D-D FOR ADDITIONAL INFORMATION

SECTION E-E
COLUMN REINFORCING STEEL NOT SHOWN FOR CLARITY

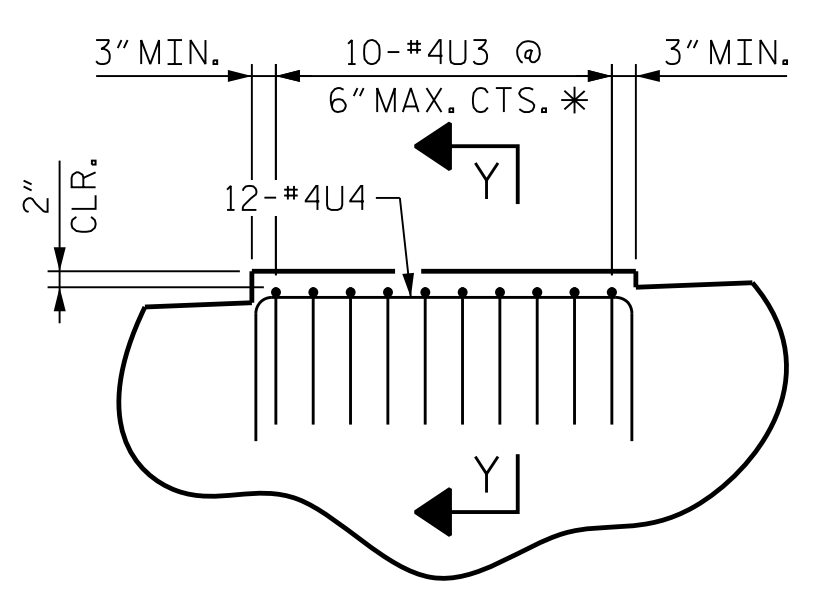


PLAN
(SHOWING BAR PLACEMENT)

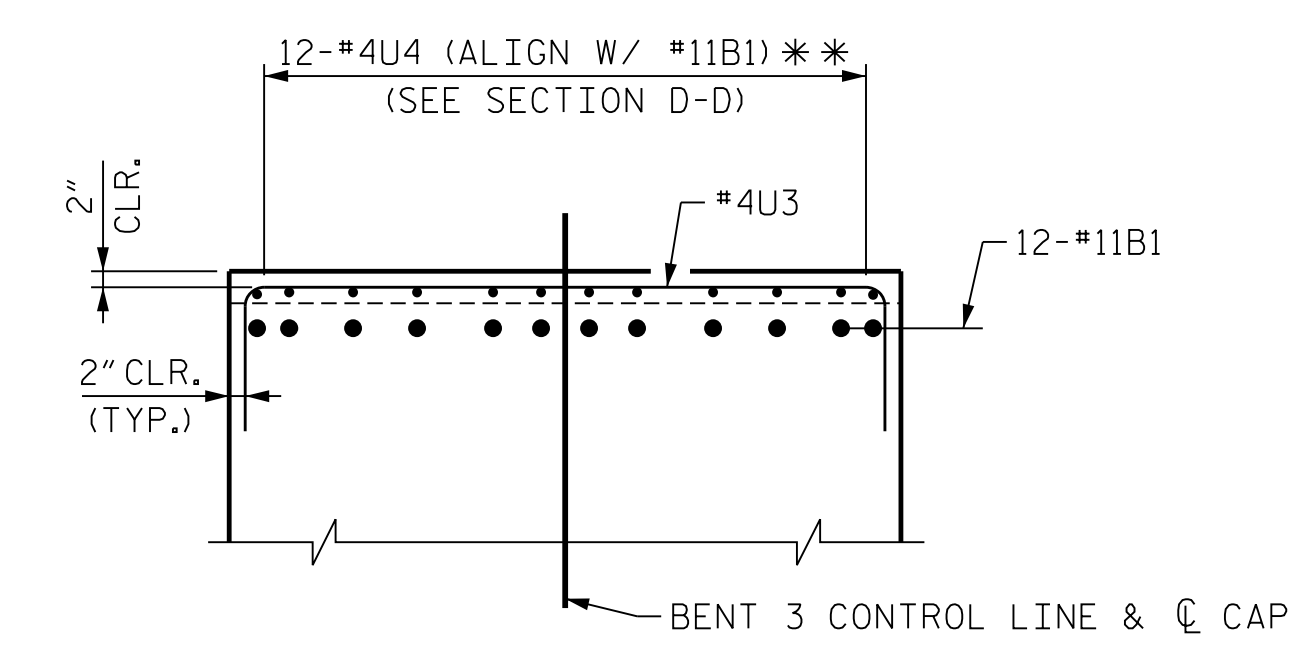


ELEVATION
(SCHEMATIC)

STIRRUP SET DETAIL

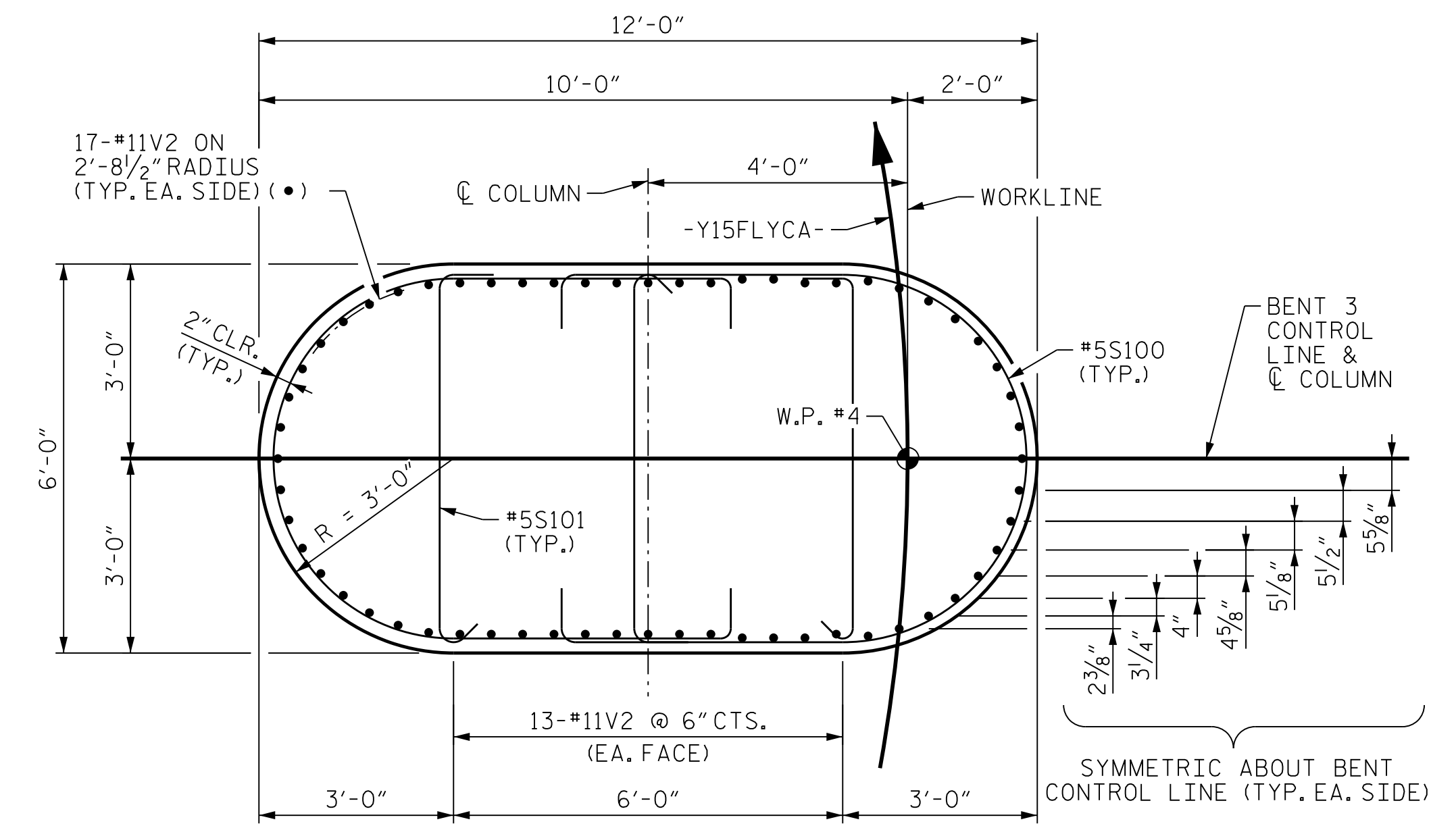


DETAIL "B"



SECTION Y-Y

* NOTE:
#4U3 BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR PIPE INSERTS FOR ANCHOR BOLTS.
** NOTE:
#4U4 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR #11B1 AND #11B2 BARS.



SECTION C-C

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 58+33.94 -Y15FLYCA-
SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT 3 CAP DETAILS



Dominic A. Coletti 10/15/2021

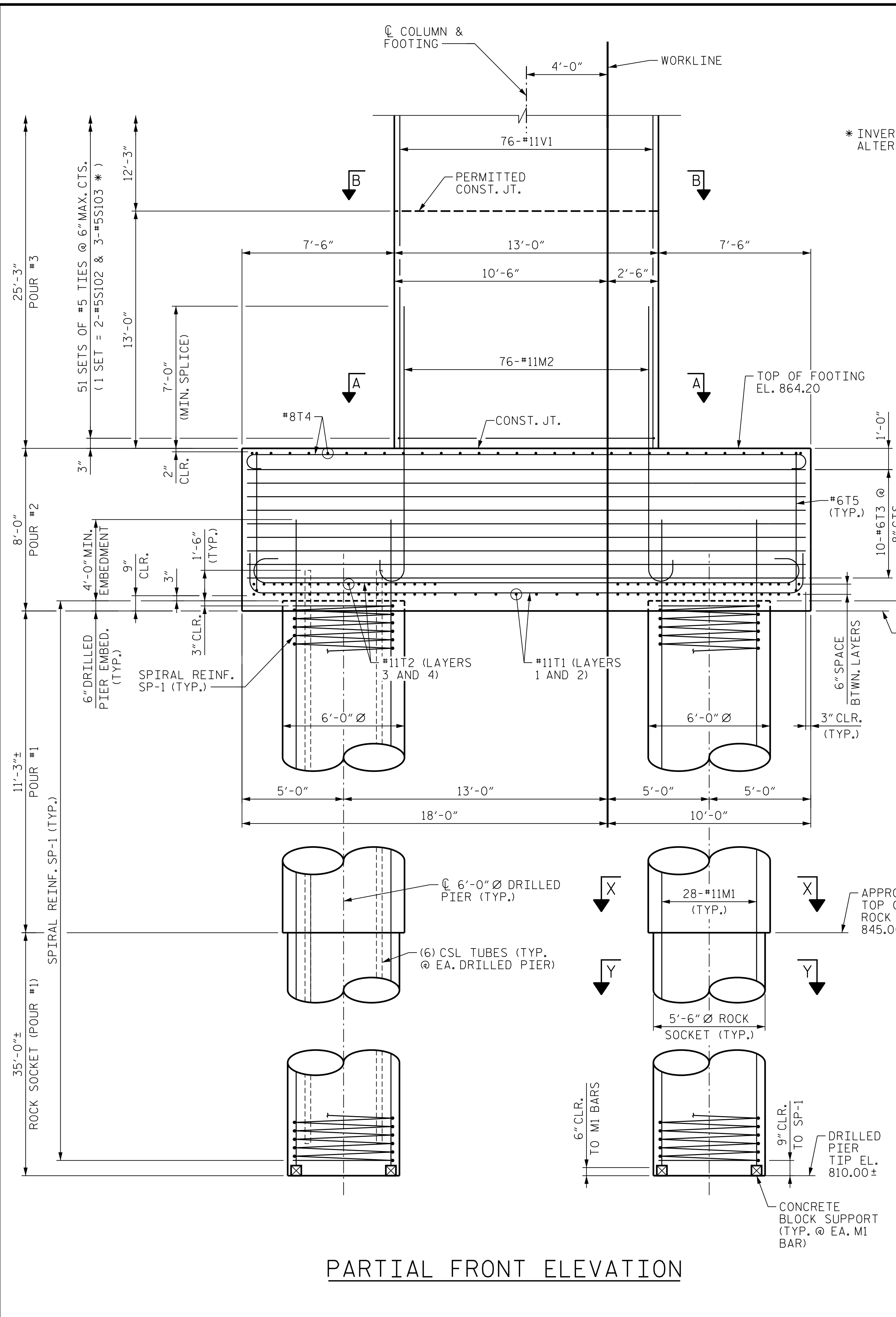
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HDR HDR Engineering, Inc. of the Carolinas
555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

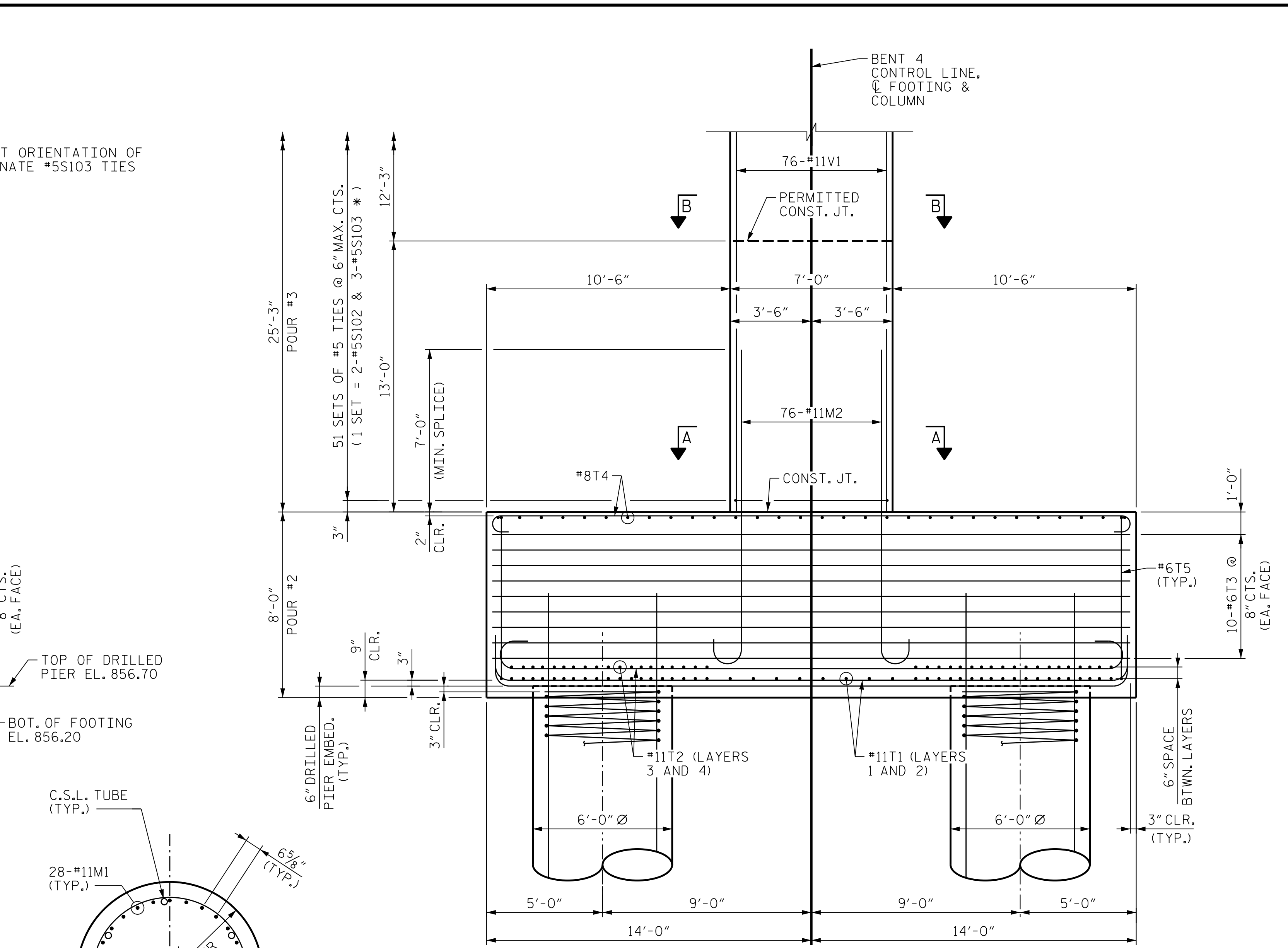
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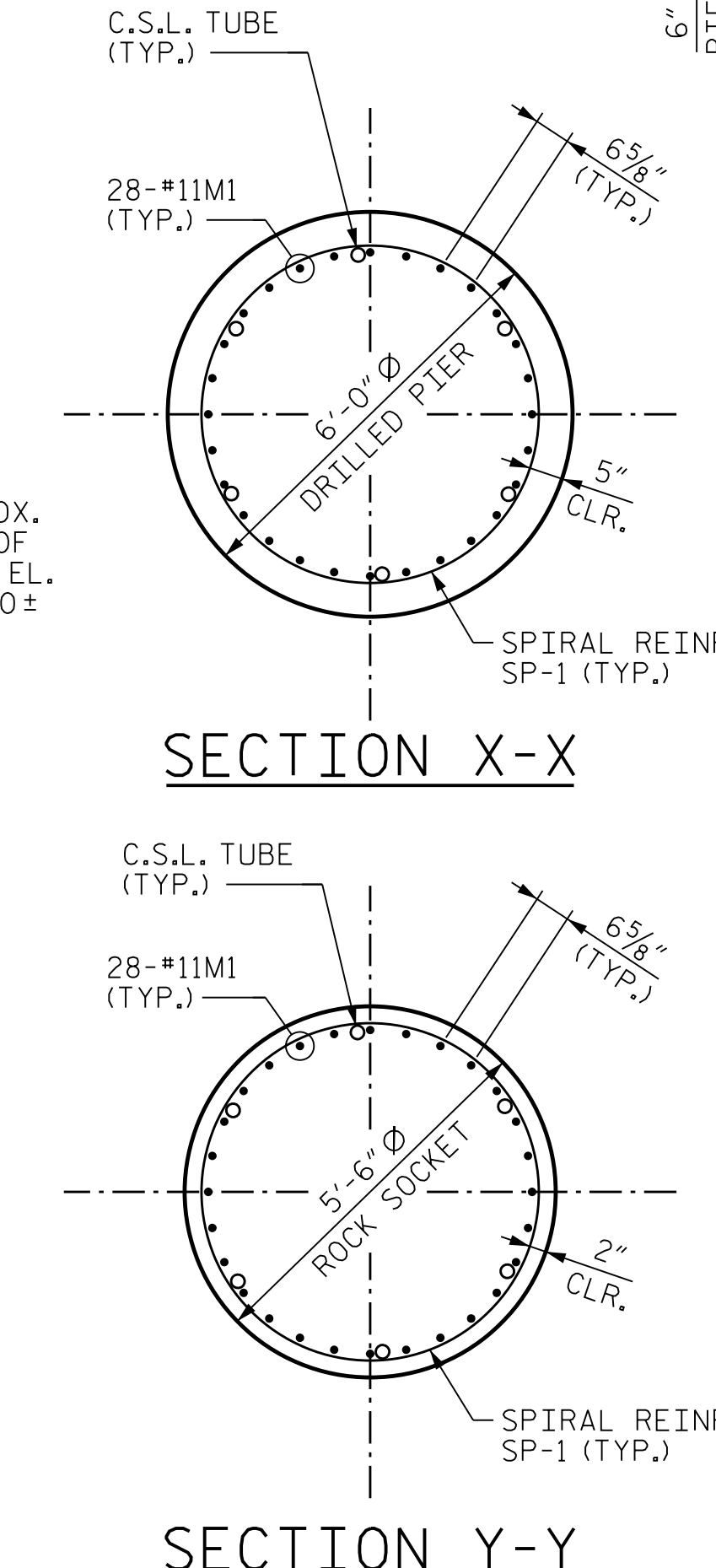
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DES CHK: <u>M. WERNER</u>	DATE: <u>10/19</u>	CHK BY: <u>N. LIU</u>	DATE: <u>01/20</u>



PARTIAL FRONT ELEVATION



PARTIAL END ELEVATION



SECTION X-X

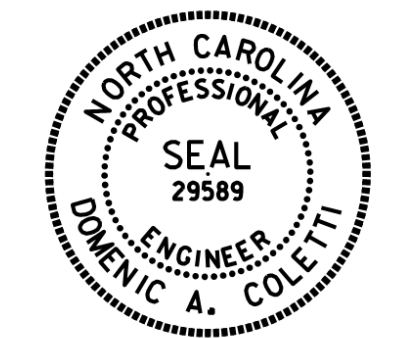
SECTION Y-Y

NOTES

- FOR FOOTING PLAN, SECTION A-A AND SECTION B-B, SEE "SUBSTRUCTURE BENT 4 FOOTING & COLUMN DETAILS", SHEET 3 OF 6.
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.
- ALL STEEL IN THE DRILLED PIER IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".
- SPLICING OF THE LONGITUDINAL BARS IN THE DRILLED PIER WILL NOT BE PERMITTED.
- THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.
- FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- LONGITUDINAL REINFORCEMENT IN DRILLED PIERS MAY BE FIELD CUT TO PROVIDE 4'-0" MINIMUM EMBEDMENT INTO FOOTING.
- NO SEPARATE PAYMENT SHALL BE MADE FOR ANY ADDITIONAL STEEL REQUIRED IN CONSTRUCTION OF DRILLED PIER AS THIS IS CONSIDERED INCIDENTAL TO THE LINEAR FOOT PRICE FOR DRILLED PIER.
- FOR CONTINUATION OF NOTES, SEE SHEET 2 OF 6.

PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-

SHEET 1 OF 6



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE BENT 4 ELEVATIONS

REVISIONS						SHEET NO. 506-101 TOTAL SHEETS 129
NO.	BY:	DATE:	NO.	BY:	DATE:	
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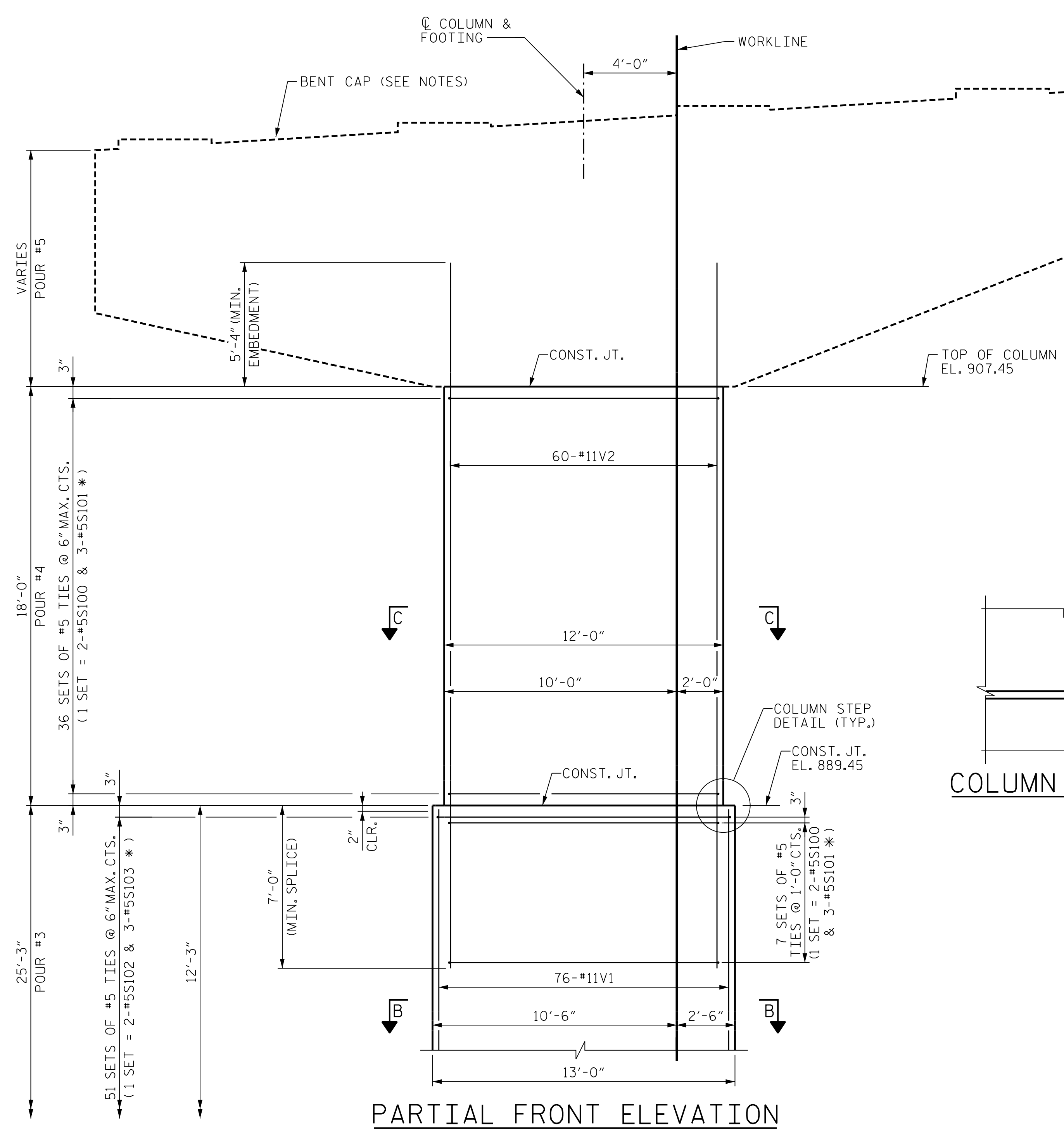
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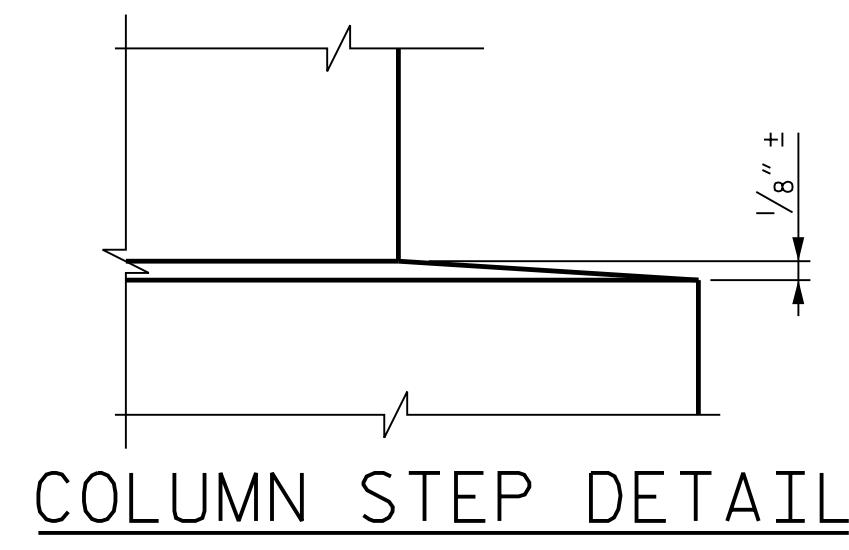
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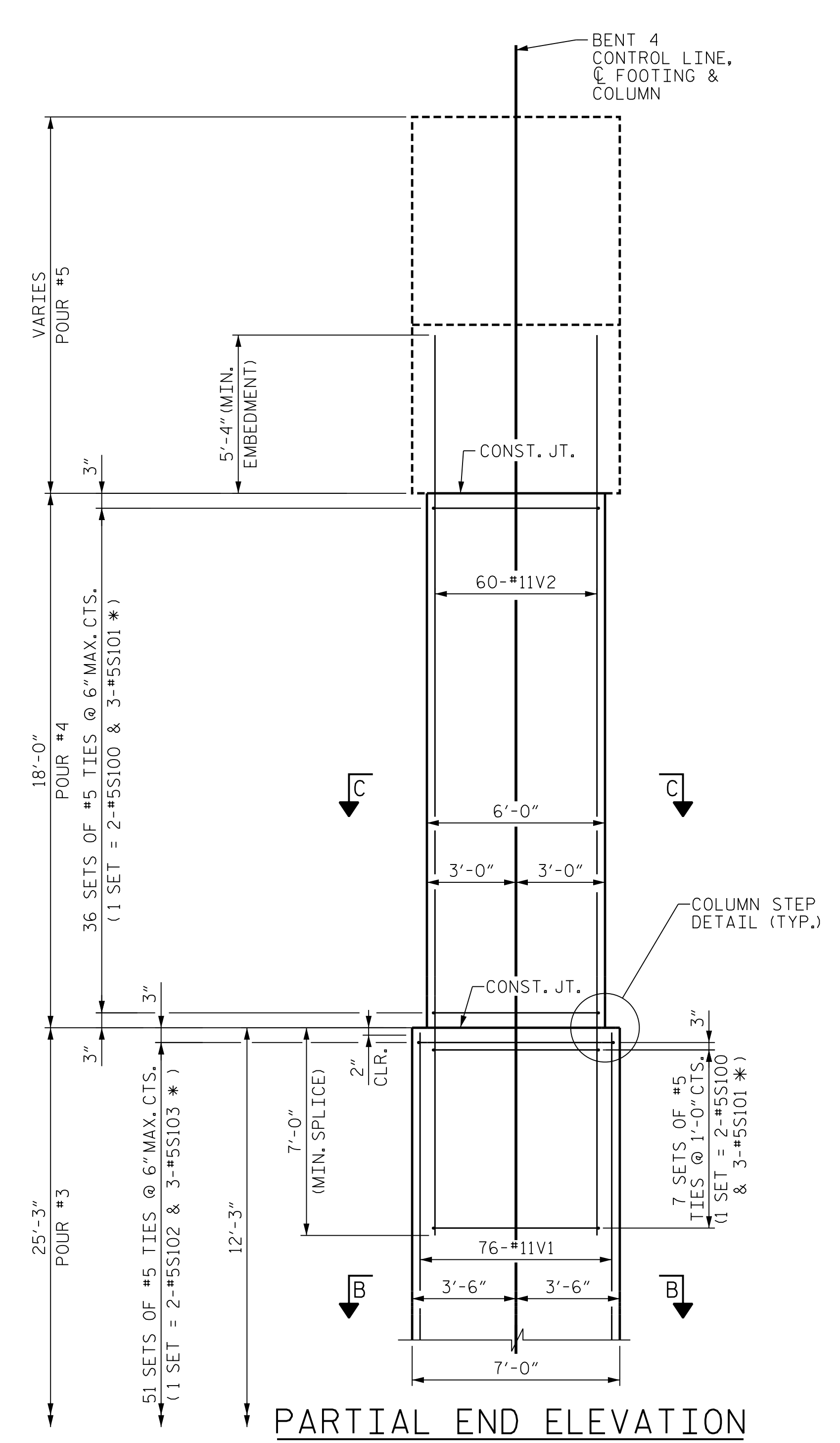


PARTIAL FRONT ELEVATION

* INVERT ORIENTATION OF ALTERNATE #5S101 AND #5S103 TIES



COLUMN STEP DETAIL



PARTIAL END ELEVATION

CONTINUATION OF NOTES FROM SHEET 1 OF 6

HOOKS ON M1 AND T7 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

"T" BARS IN TOP OF FOOTINGS MAY BE SHIFTED AS NECESSARY, WITHOUT VIOLATING THE 1'-0" MAXIMUM SPACING, TO CLEAR M1 BARS EXTENDING INTO COLUMNS.

FOR MASS CONCRETE, SEE SPECIAL PROVISIONS.

PLANS AND CALCULATIONS FOR ANY TEMPORARY SUPPORTS ATTACHED TO FOOTINGS, COLUMNS OR BENT CAPS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL BY THE ENGINEER PRIOR TO START OF BENT CONSTRUCTION. ANY ATTACHMENT PROVISIONS SHALL BE REMOVED AFTER USE AND THE FOOTINGS, COLUMNS OR BENT CAPS REPAIRED IN SUCH A WAY AS TO NOT COMPROMISE THE INTEGRITY OF THE BENT.

DETAILED DRAWINGS FOR FALSEWORK AND FORMS FOR ALL HAMMERHEAD BENTS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL BY THE ENGINEER. SEE SPECIAL PROVISIONS FOR FORMWORK AND FALSEWORK.

NOTES FOR THIS SHEET

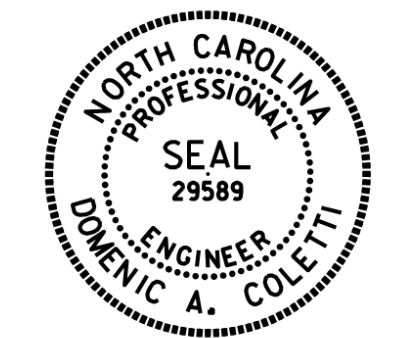
FOR SECTION B-B, SEE "SUBSTRUCTURE BENT 4 FOOTING & COLUMN DETAILS", SHEET 3 OF 6.

FOR SECTION C-C, SEE "SUBSTRUCTURE BENT 4 BENT CAP DETAILS", SHEET 5 OF 6.

FOR DETAILS OF BENT CAP, SEE "SUBSTRUCTURE BENT 4 BENT CAP PLAN AND ELEVATION", SHEET 4 OF 6 AND "SUBSTRUCTURE BENT 4 BENT CAP DETAILS", SHEET 5 OF 6.

PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-

SHEET 2 OF 6

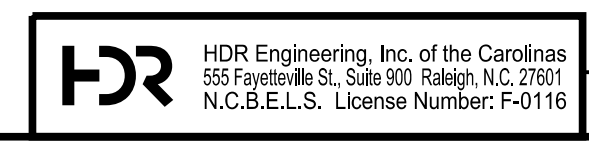


Dominic A. Coletti 10/15/2021

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE BENT 4 ELEVATIONS

DES BY: S. CHAUDHARI	DATE: 09/19	DWG BY: B. PETERSON	DATE: 12/19
DES CHK: N. LIU	DATE: 10/19	CHK BY: N. LIU	DATE: 01/20

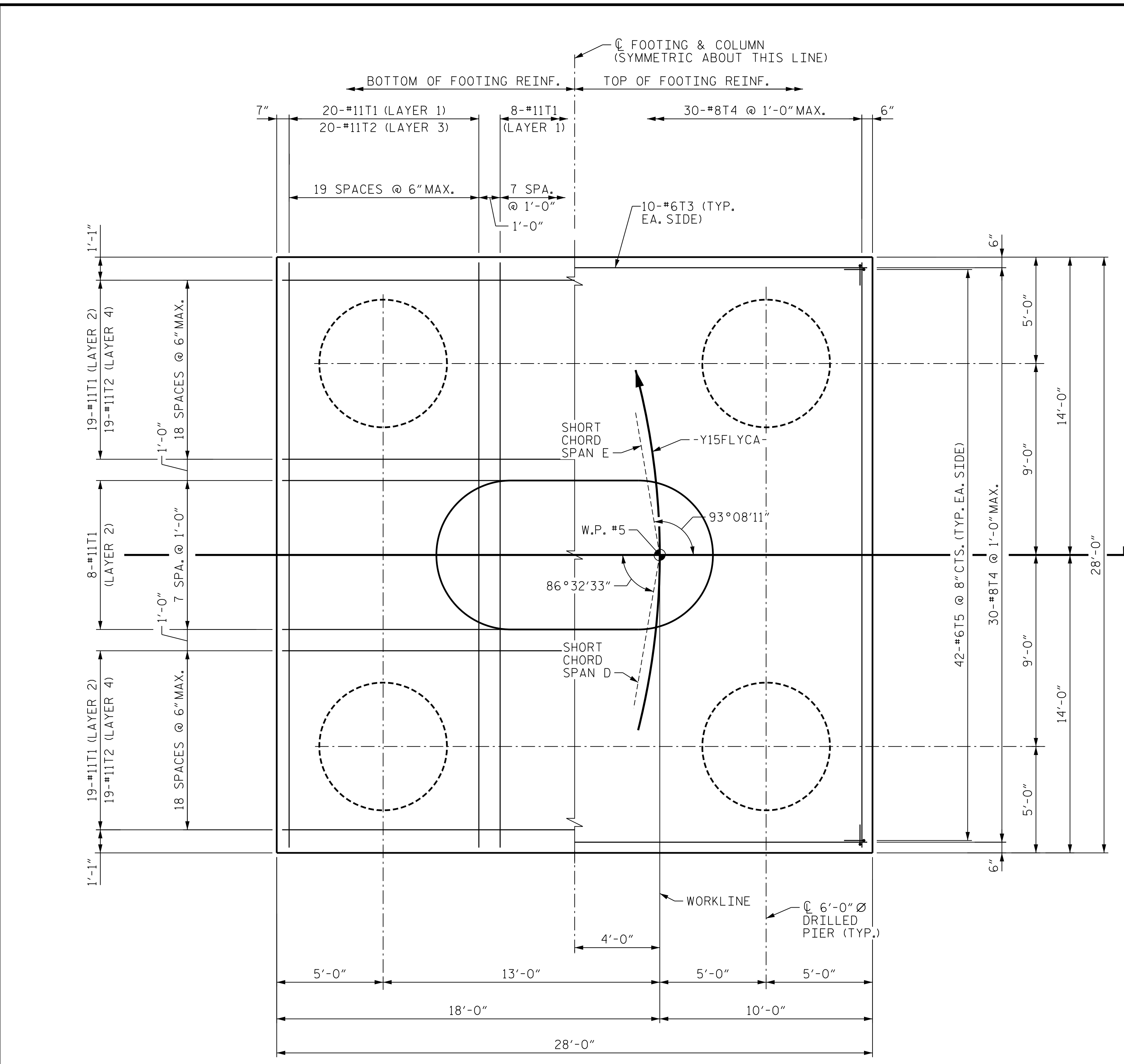


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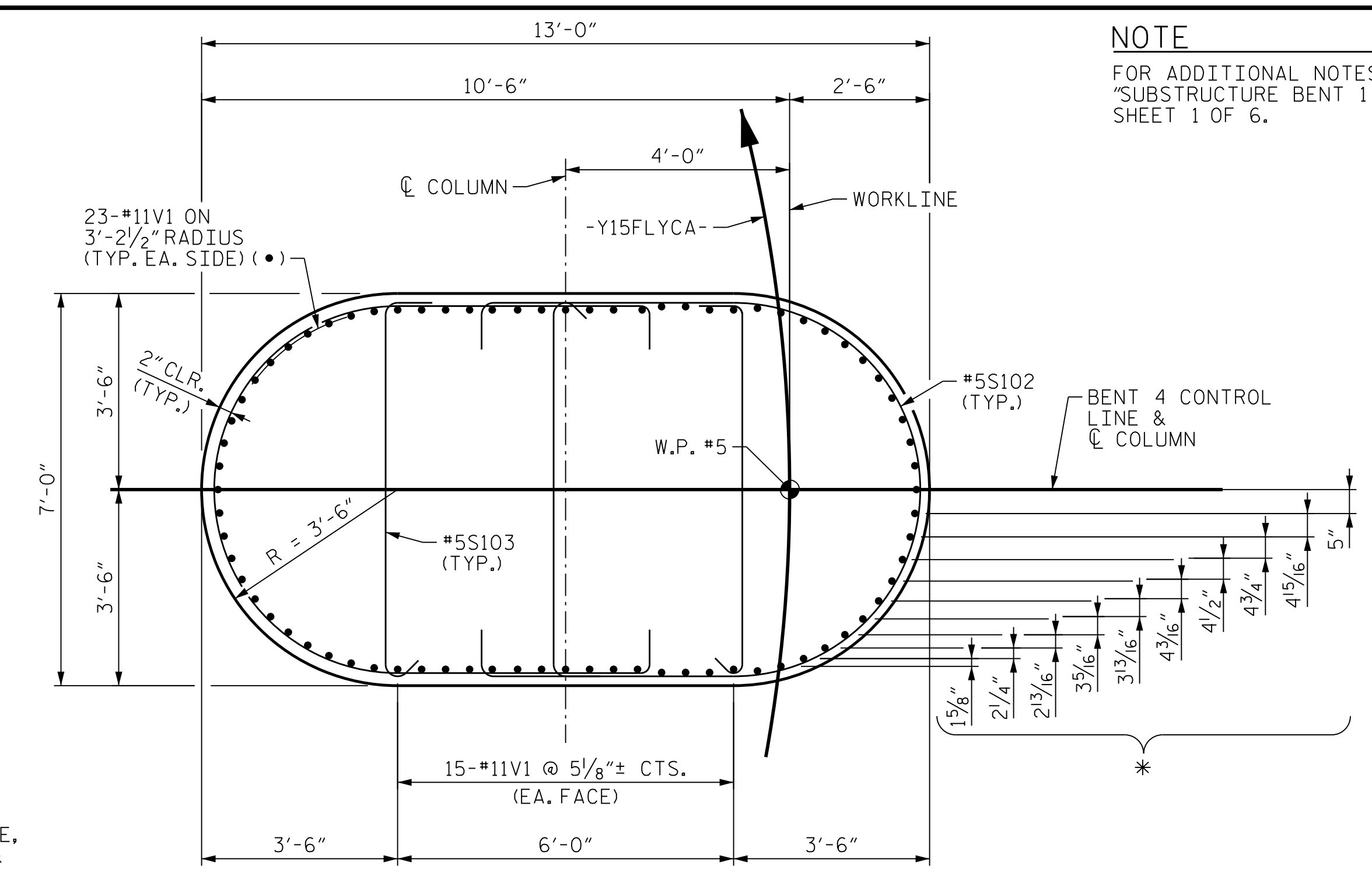
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SHEET NO. 506-102
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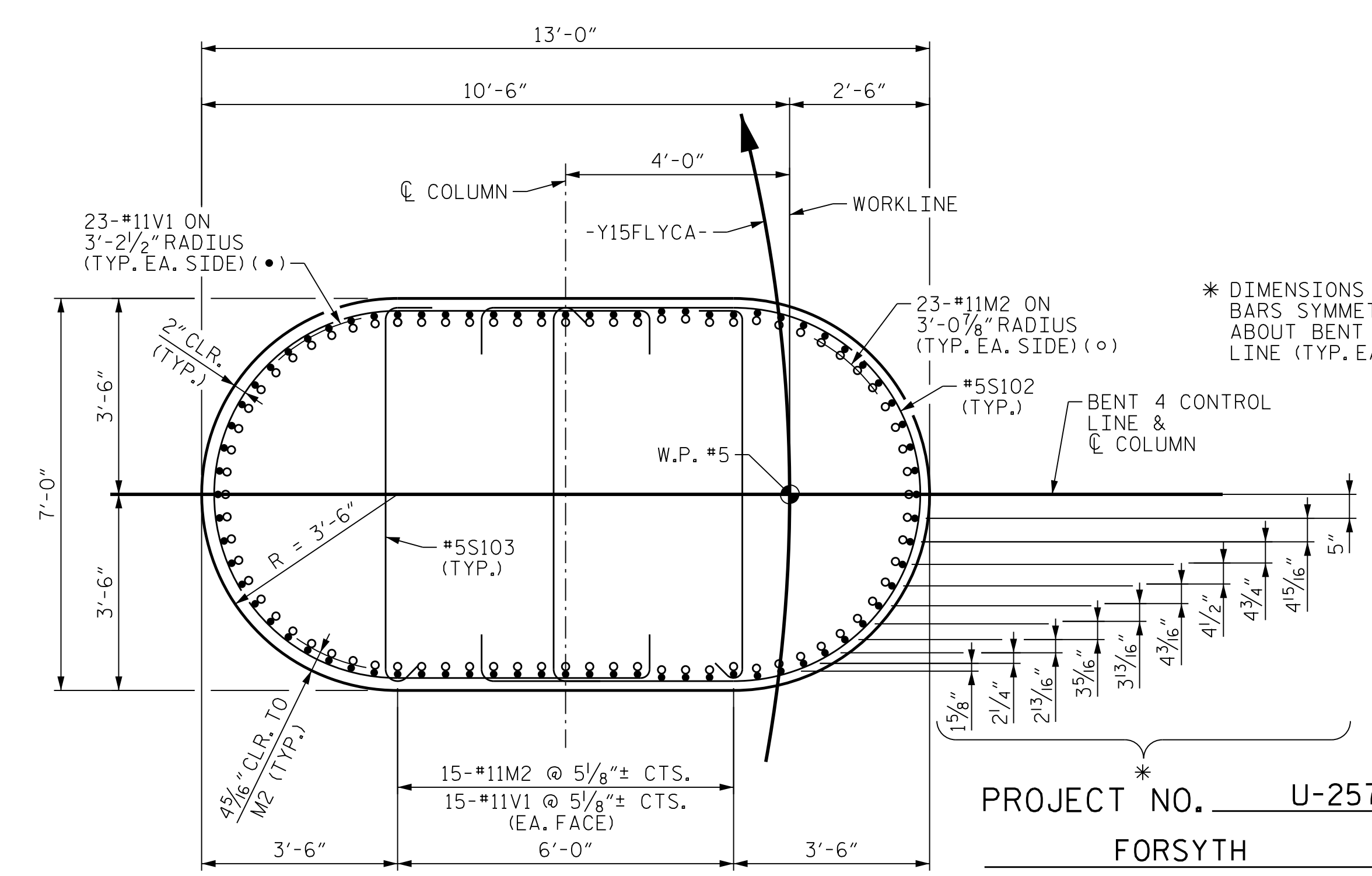
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FOOTING PLAN



SECTION B-B



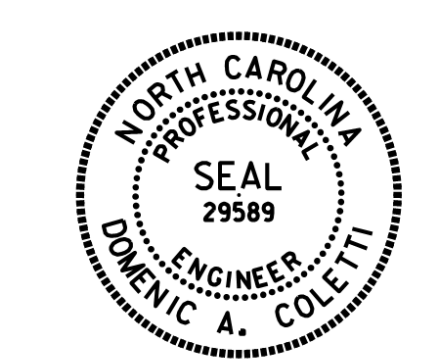
SECTION A-A

NOTE
 FOR ADDITIONAL NOTES, SEE
 "SUBSTRUCTURE BENT 1 ELEVATIONS",
 SHEET 1 OF 6.

* DIMENSIONS TO "V"
 BARS SYMMETRIC
 ABOUT BENT CONTROL
 LINE (TYP. EA. SIDE)

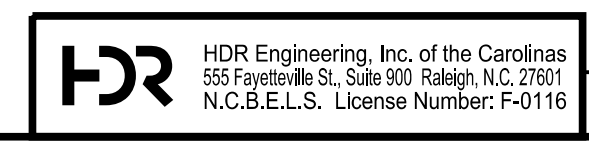
PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-

SHEET 3 OF 6



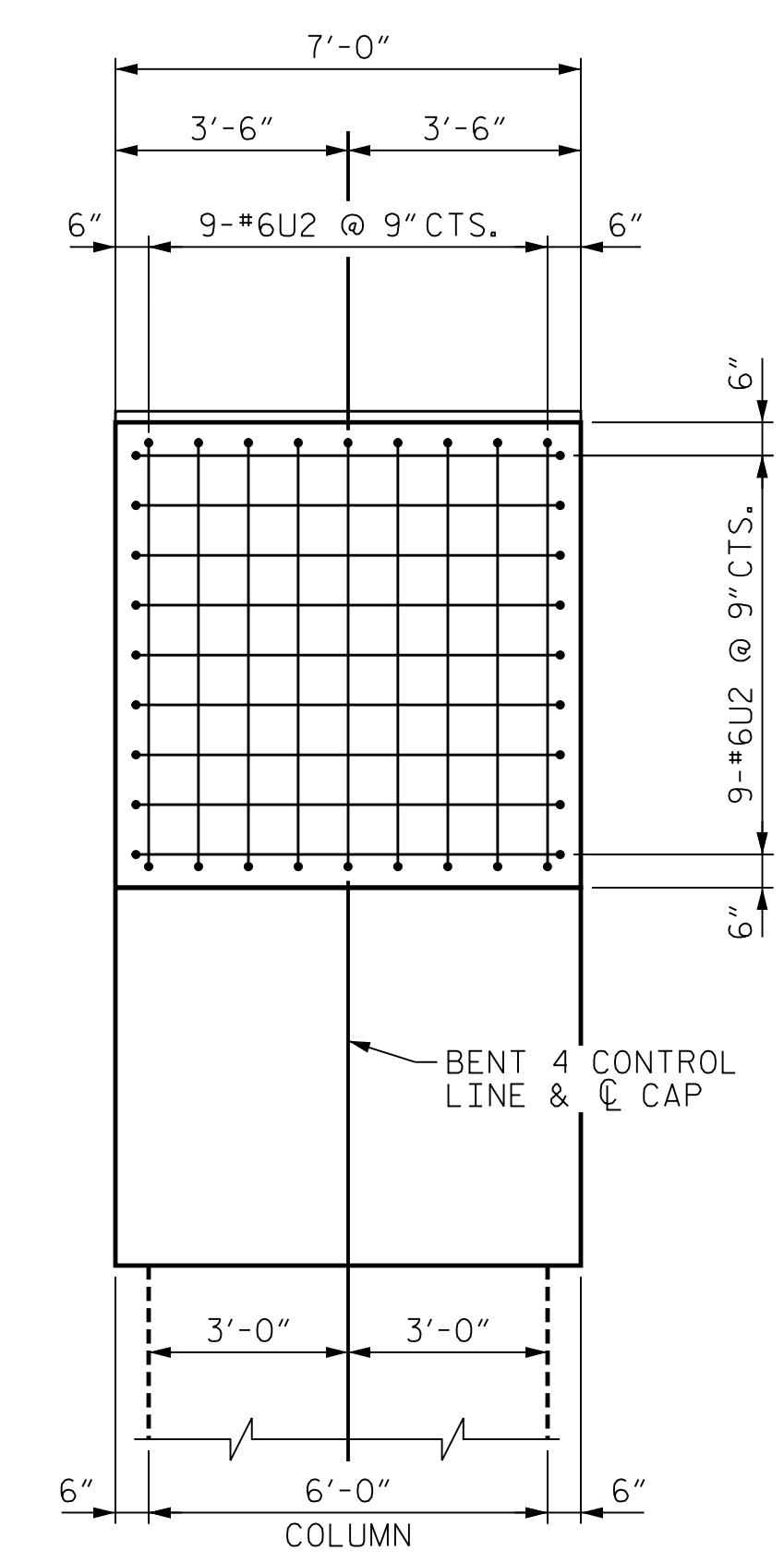
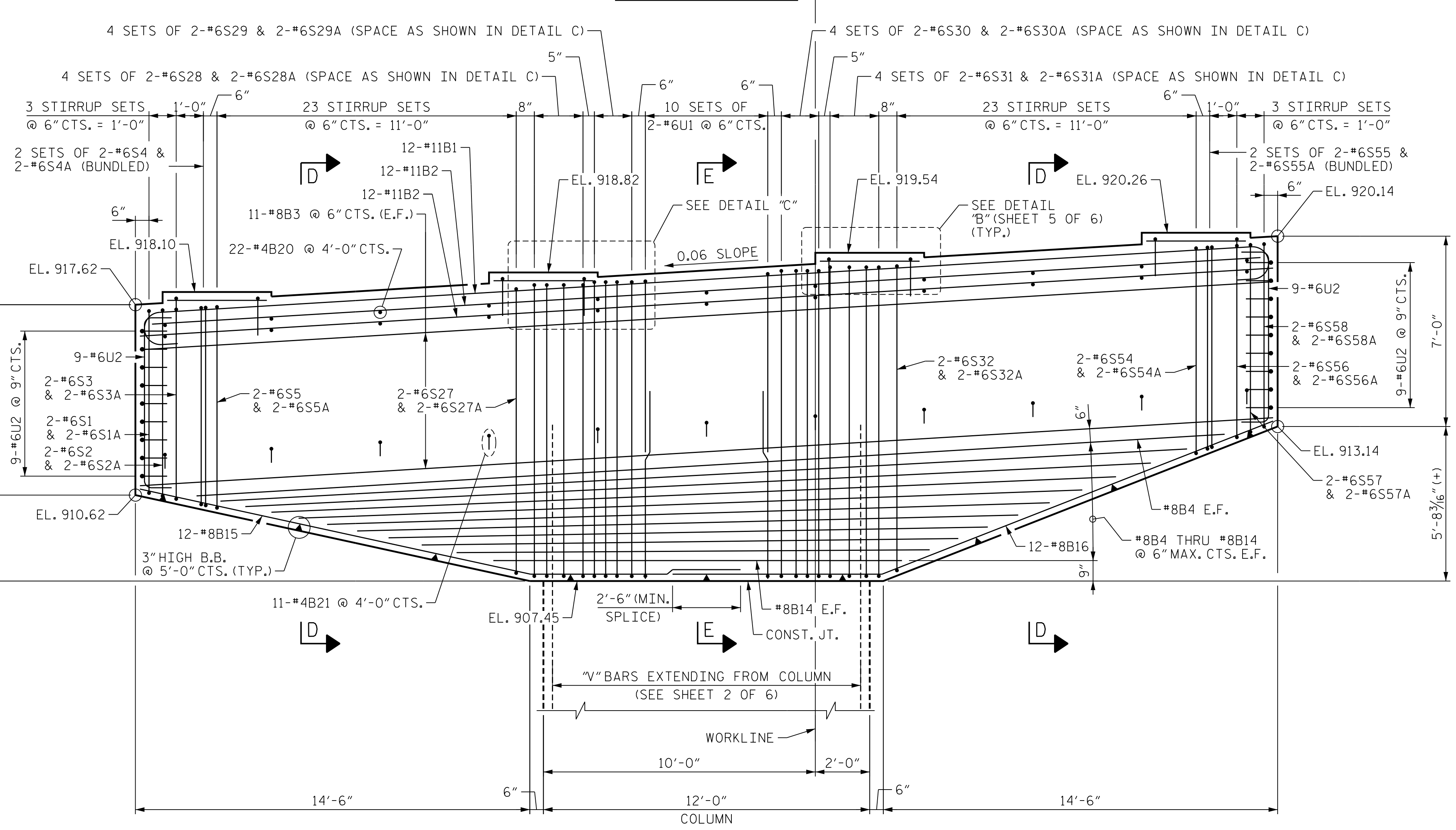
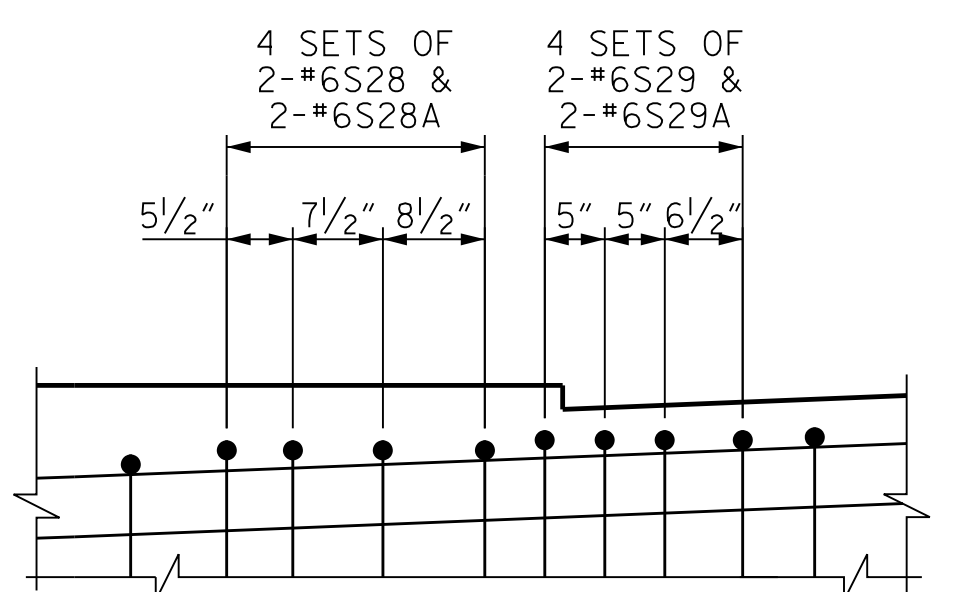
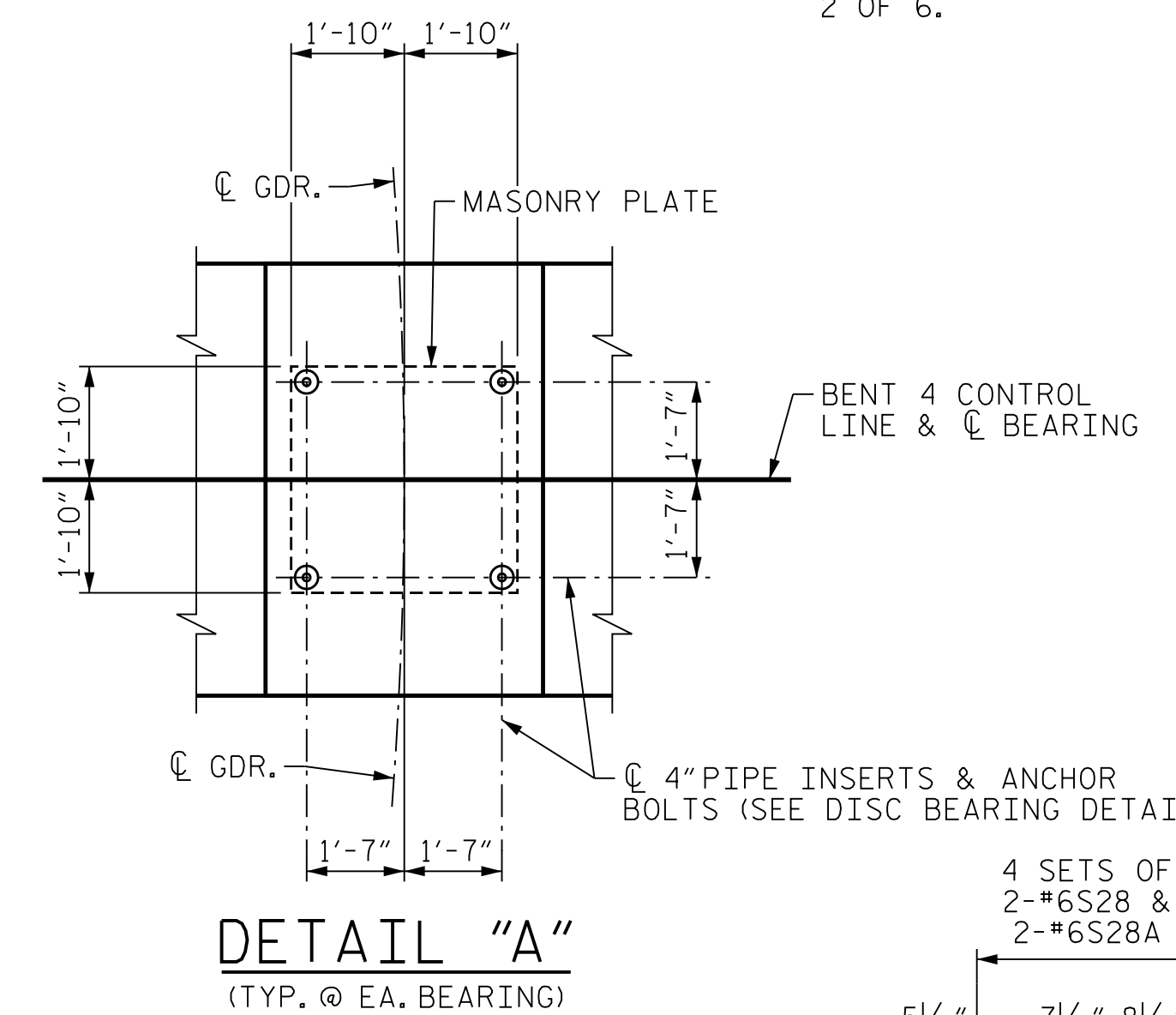
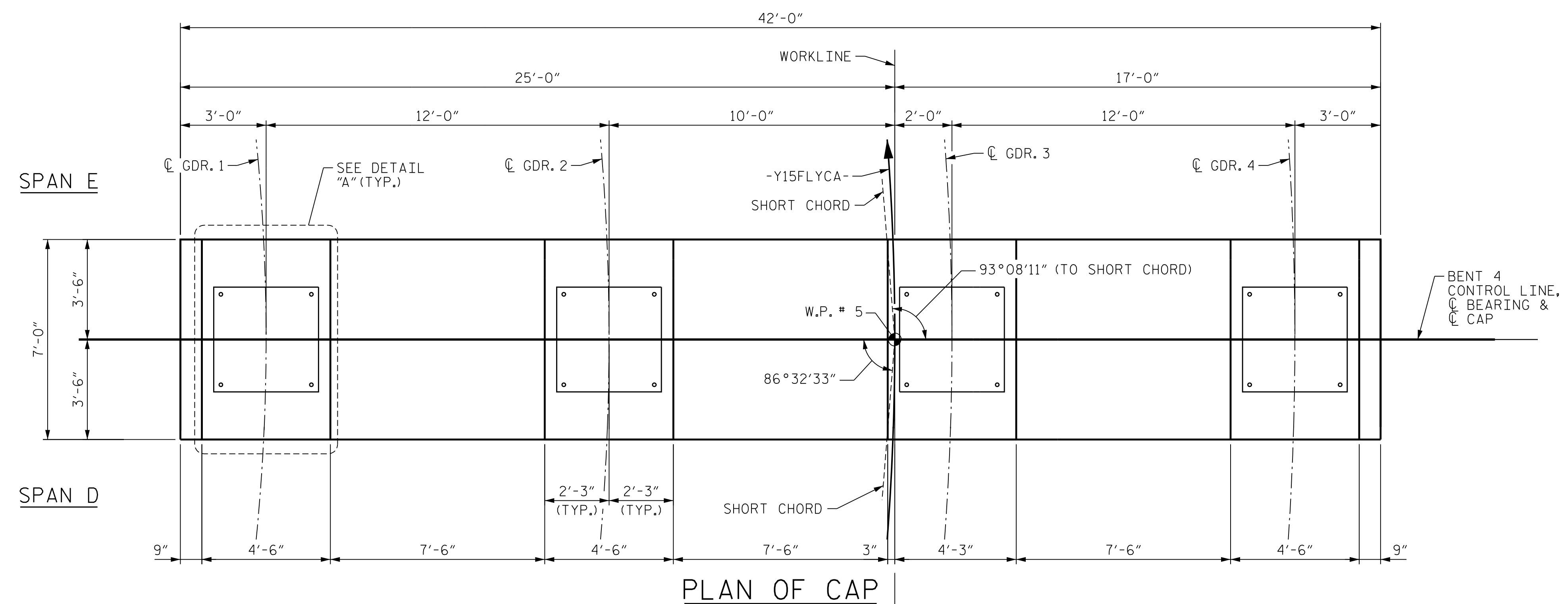
10/15/2021

DES BY: J. CABABE	DATE: 12/19	DWG BY: B. PETERSON	DATE: 12/19
DES CHK: K. SMITH	DATE: 12/19	CHK BY: K. SMITH	DATE: 01/20



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REVISIONS						SHEET NO. S06-103 TOTAL SHEETS 129
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	--	--	3	--	--	
2	--	--	4	--	--	



DETAIL "C"
 DETAIL SHOWN AT LEFT SIDE OF CAP (SPACING OF STIRRUPS MIRRORED AT RIGHT SIDE OF CAP WITH BARS #6S30/#6S30A AND #6S31/#6S31A AS SHOWN ON THE ELEVATION)

PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-
 SHEET 4 OF 6



10/15/2021

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 4
 BENT CAP PLAN
 & ELEVATION

REVISIONS						SHEET NO. 506-104 TOTAL SHEETS 129
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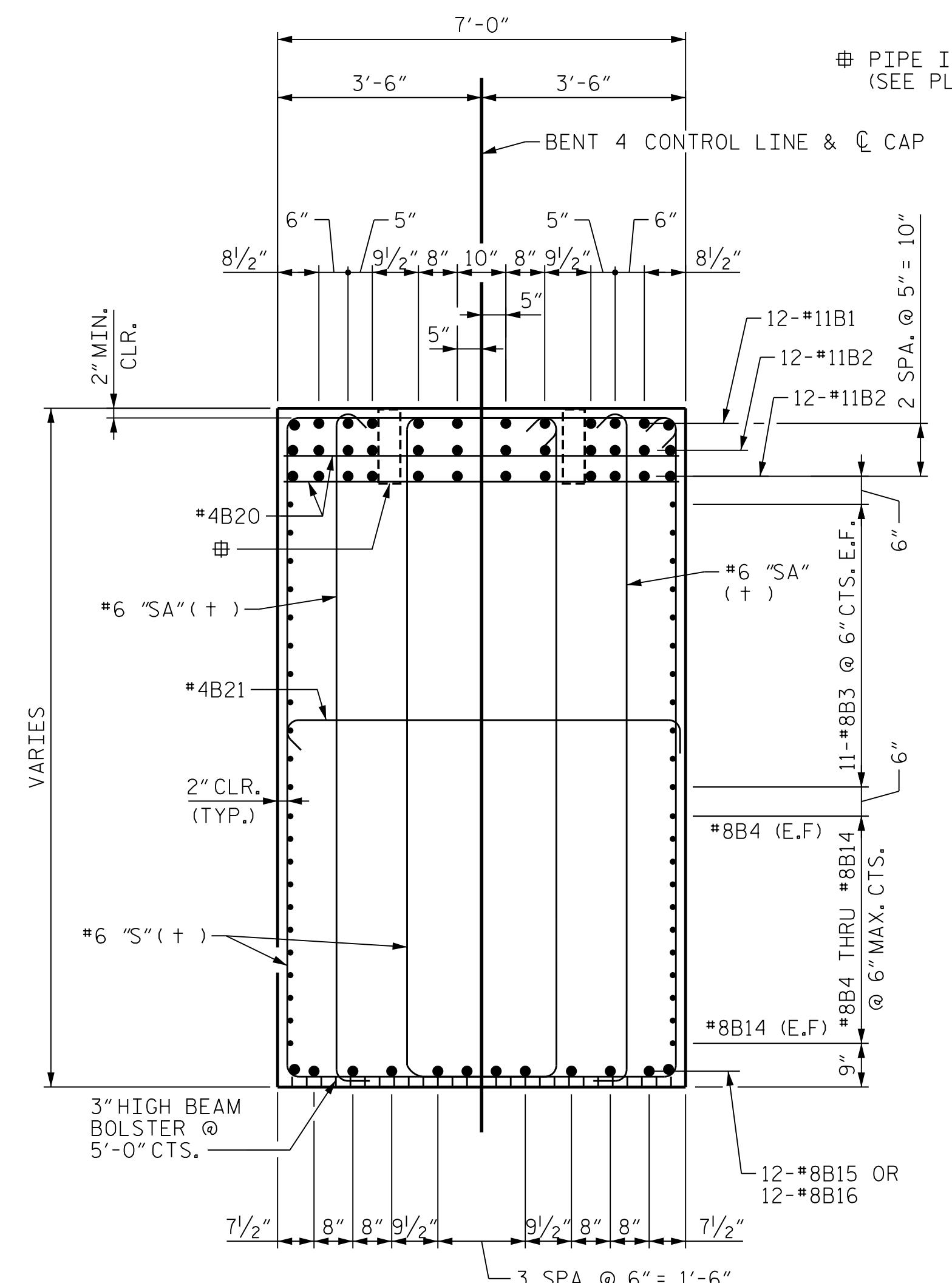


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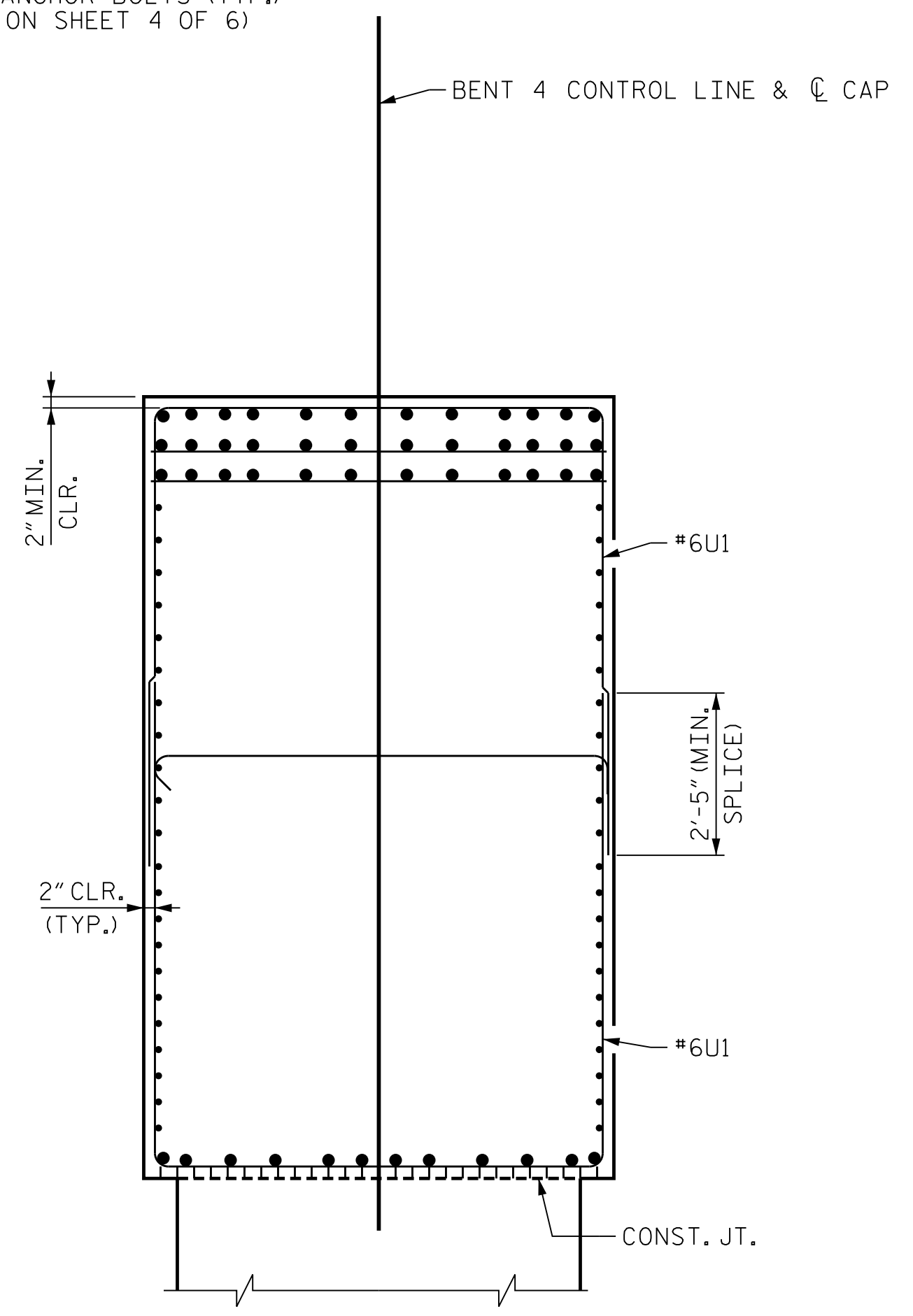
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 USER: PPETERSO
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DES BY: K. OLIVER	DATE: 10/19	DWG BY: B. PETERSON	DATE: 12/19
DES CHK: M. WERNER	DATE: 10/19	CHK BY: N. LIU	DATE: 01/20

NOTE
SEE SHEETS 1 AND 2 OF 6 FOR NOTES.

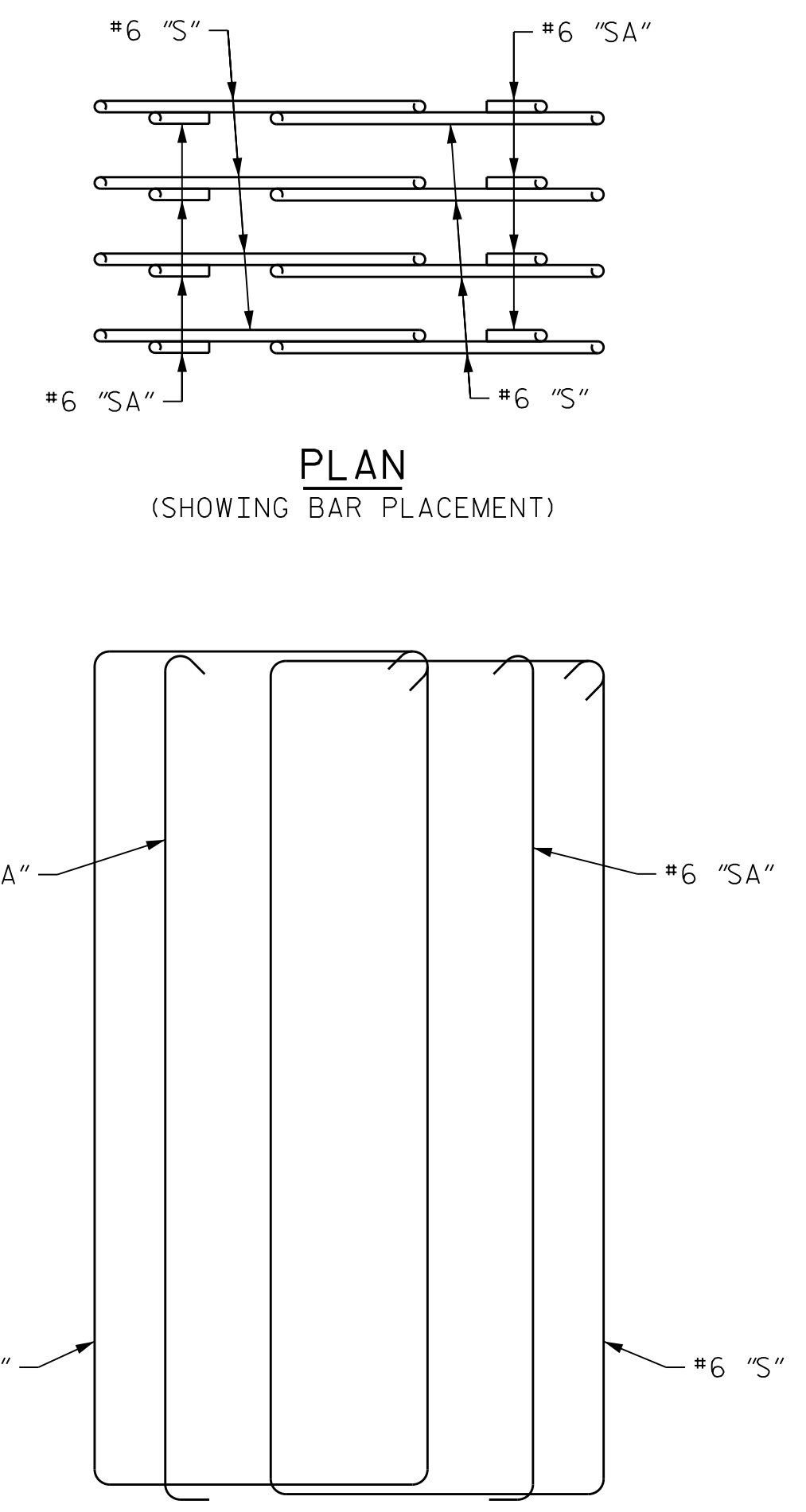


SECTION D-D
(+) SEE "STIRRUP SET DETAIL"



SEE SECTION D-D FOR ADDITIONAL INFORMATION

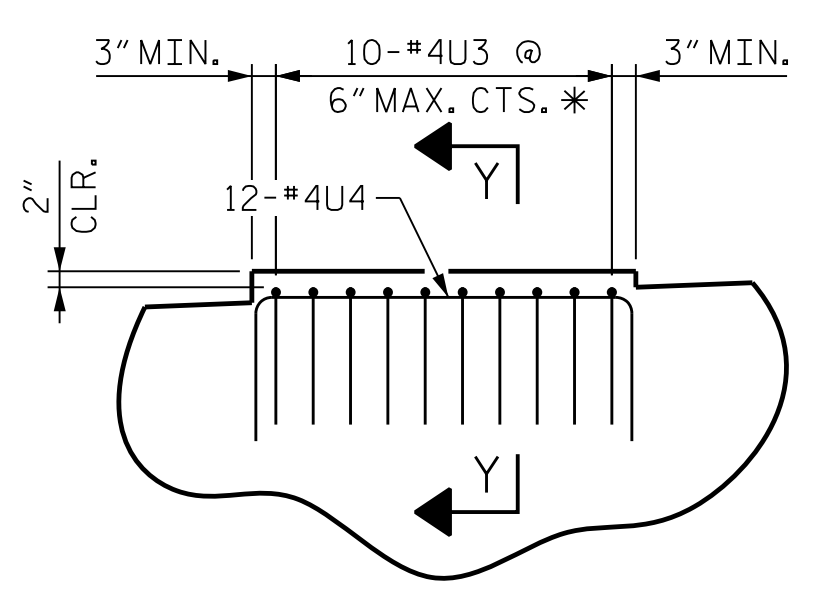
SECTION E-E
COLUMN REINFORCING STEEL NOT SHOWN FOR CLARITY



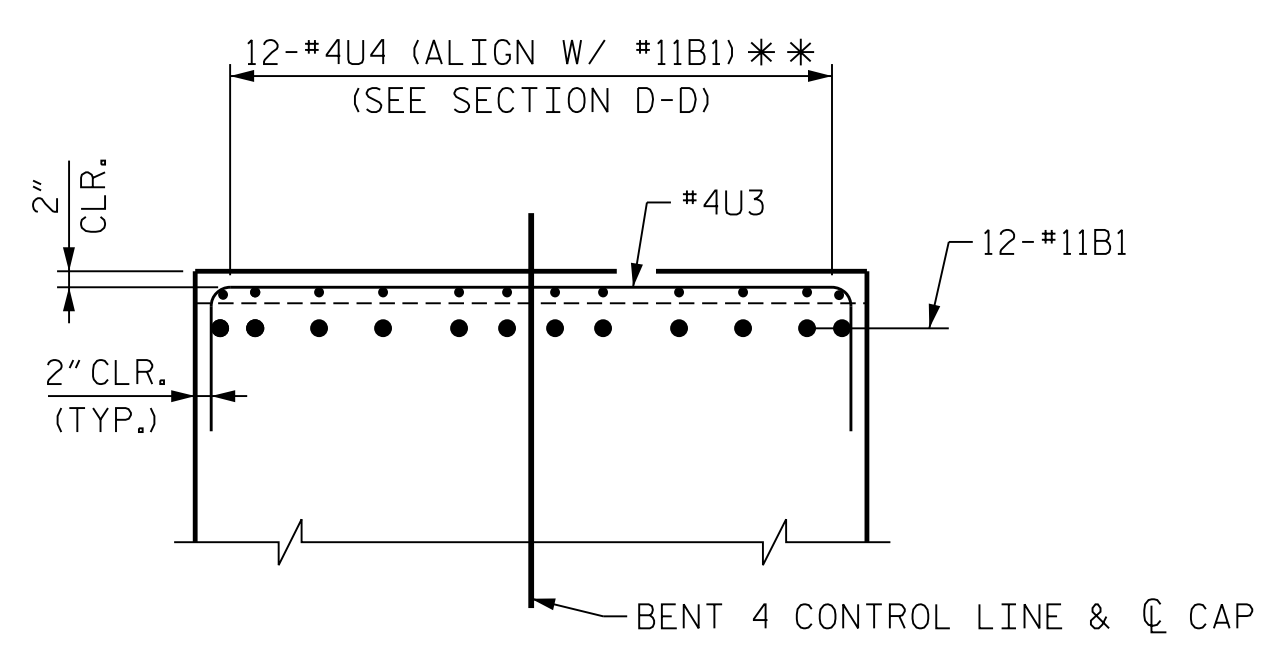
PLAN
(SHOWING BAR PLACEMENT)

ELEVATION
(SCHEMATIC)

STIRRUP SET DETAIL

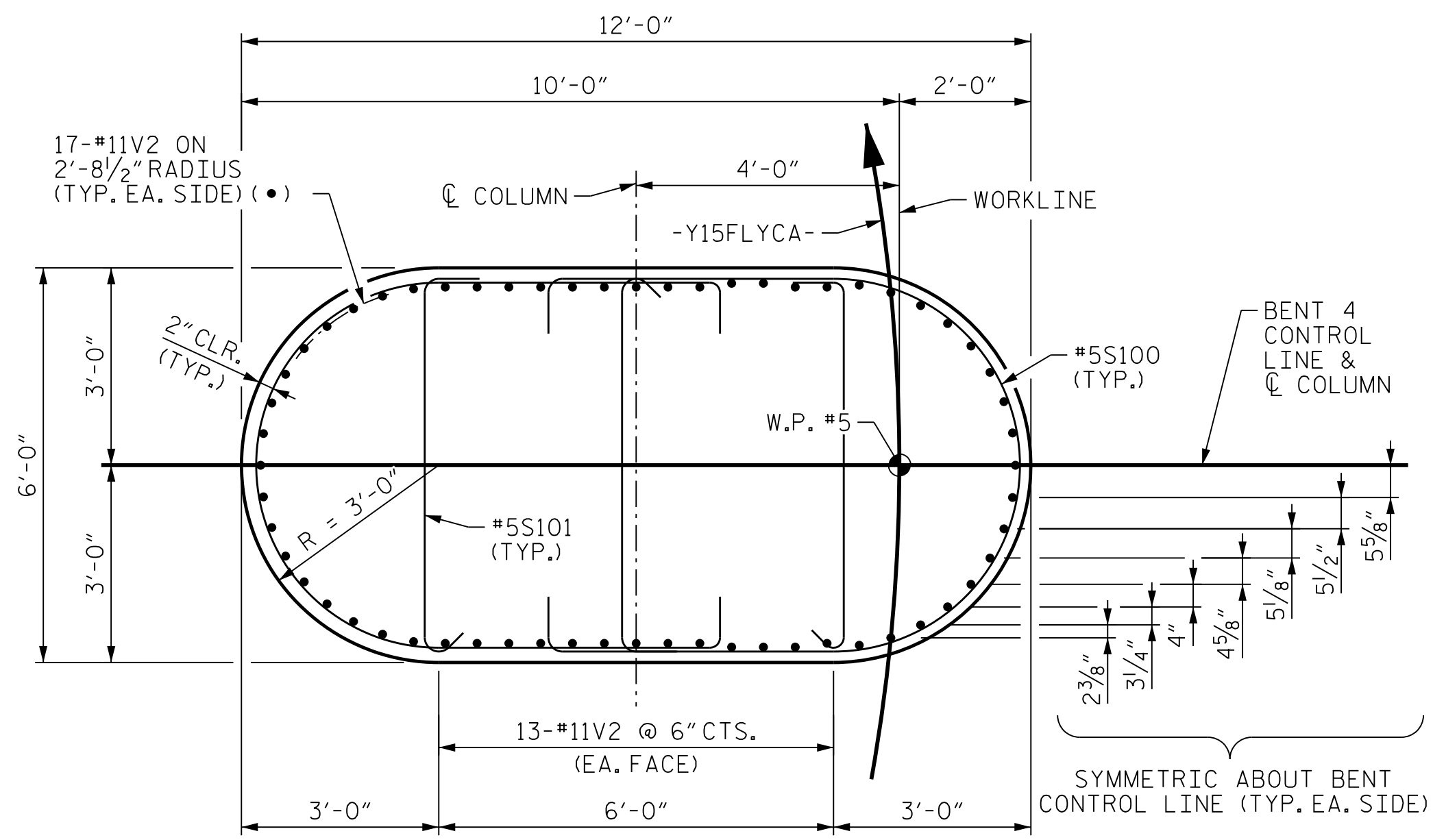


DETAIL "B"



SECTION Y-Y

* NOTE:
#4U3 BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR PIPE INSERTS FOR ANCHOR BOLTS.
** NOTE:
#4U4 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR #11B1 AND #11B2 BARS.

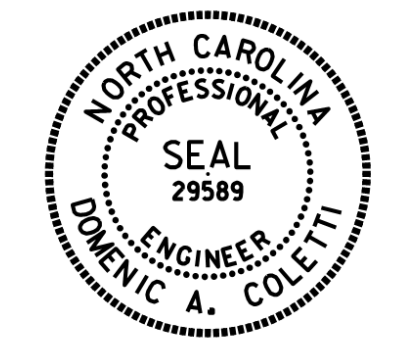


SECTION C-C

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 58+33.94 -Y15FLYCA-
SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT 4 CAP DETAILS



Dominic A. Coletti 10/15/2021

REVISIONS						SHEET NO. 506-105
NO.	BY:	DATE:	NO.	BY:	DATE:	
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2	--	--	4	--	--	

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555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

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USER: PPETERSO DATE: 10/14/2021
FILE: ...SUBSTR

DES BY: <u>K. OLIVER</u>	DATE: <u>10/19</u>	DWG BY: <u>B. PETERSON</u>	DATE: <u>12/19</u>
DES CHK: <u>M. WERNER</u>	DATE: <u>10/19</u>	CHK BY: <u>N. LIU</u>	DATE: <u>01/20</u>

BILL OF MATERIAL - BENT 4

Main table with 18 columns: BAR NO., SIZE, TYPE, DIM. 'A', LENGTH, WEIGHT, and corresponding bar details for various materials like S53, S54, S55, S56, S57, S58, S1A-S17A, S18A-S27A, S28A-S31A, S32A-S43A, S44A-S48A, S49A-S52A, S53A-S58A, T1-T5, S100-S103, and T2-T4.

SUMMARY OF QUANTITIES - BENT 4 REINFORCING STEEL LBS. 124,942

Table with 6 columns: BAR NO., SIZE, TYPE, LENGTH, WEIGHT. Example: BAR SP-1, NO. 4, SIZE **, TYPE 8, LENGTH 1,831'-6", WEIGHT 7,642

SPIRAL COLUMN REINFORCING STEEL LBS. 7,642

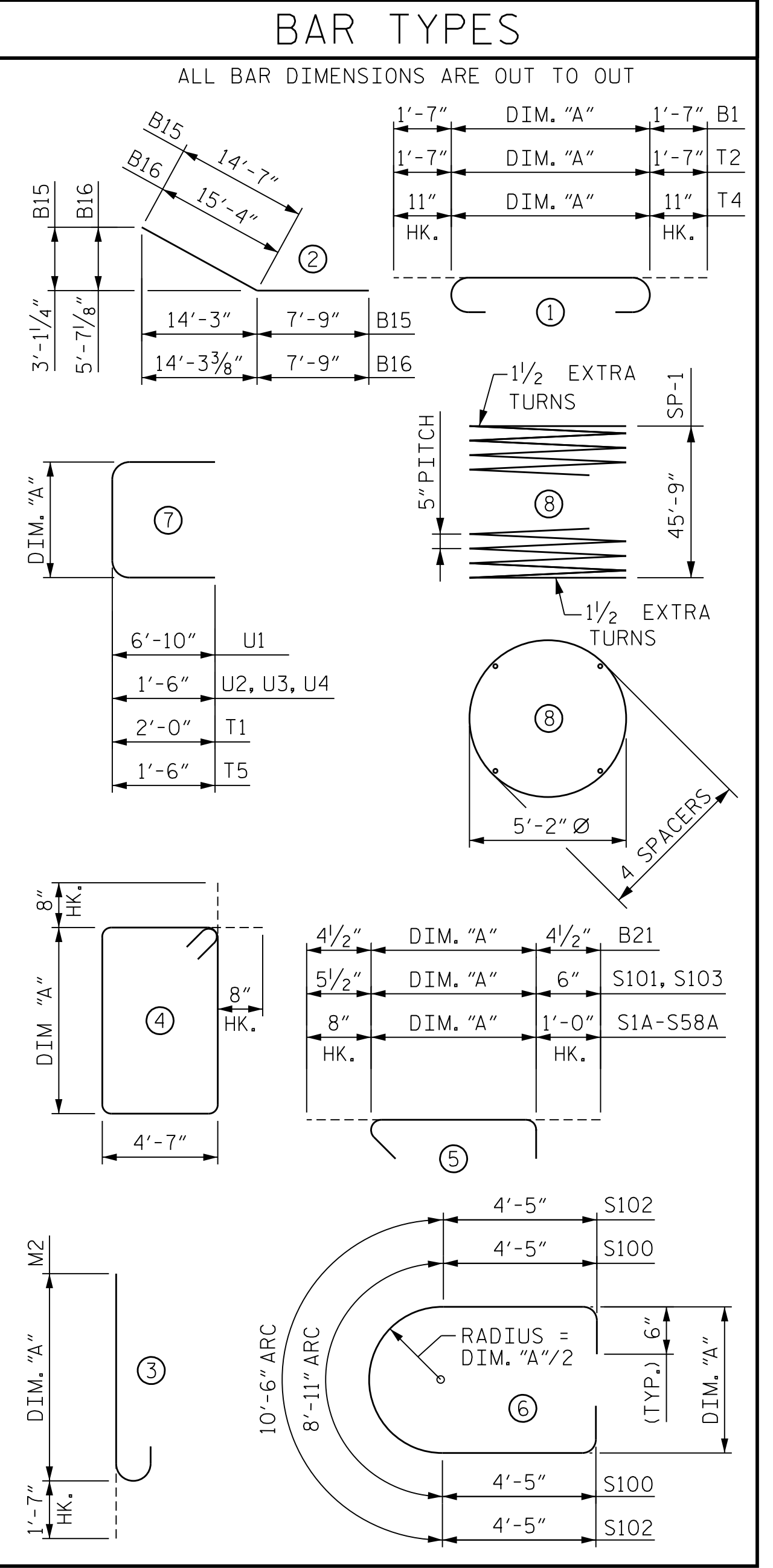
CLASS AA CONCRETE: POUR #2 - FOOTING C.Y. 232.3; POUR #3 - COLUMN C.Y. 75.3; POUR #4 - COLUMN C.Y. 42.9; POUR #5 - CAP C.Y. 109.2; TOTAL C.Y. 459.7

6'-0" Ø DRILLED PIER IN SOIL L.F. 47; 5'-6" Ø DRILLED PIER NOT IN SOIL L.F. 140

DRILLED PIER CONCRETE POUR #1 - DRILLED PIERS C.Y. 170.3; CSL TUBES L.F. 1,158; SPT TESTING EA. 8

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

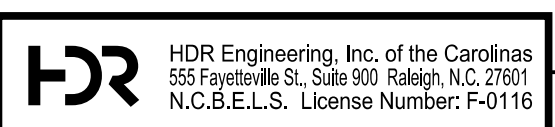
NOTE SEE SHEETS 1 AND 2 OF 6 FOR NOTES.



PROJECT NO. U-2579AB FORSYTH COUNTY STATION: 58+33.94 -Y15FLYCA-



REVISIONS table with columns: NO., BY, DATE, NO., BY, DATE, and SHEET NO. (129)



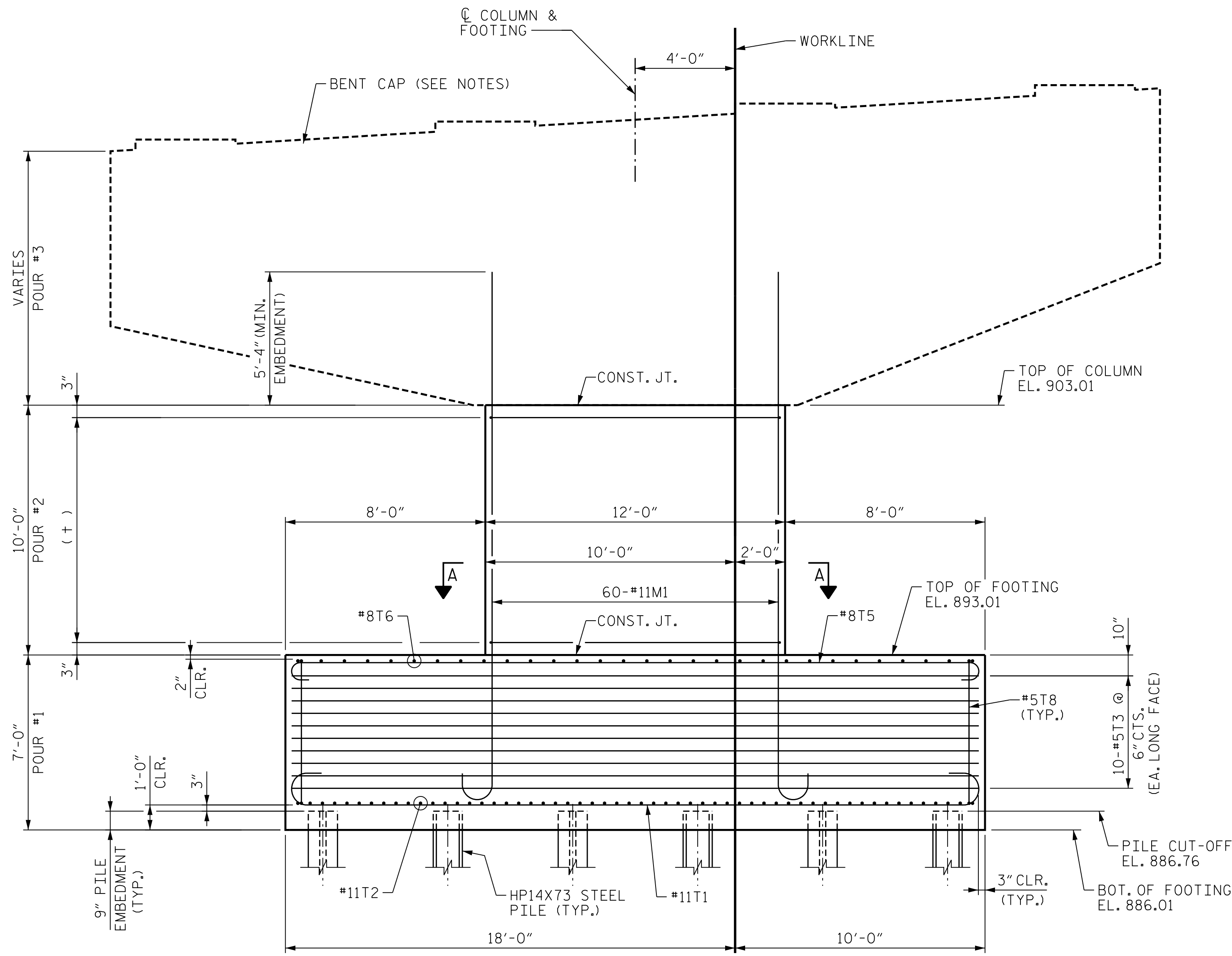
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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DESIGNER: P. STOEHR DATE: 11/19/19; DWG BY: B. PETERSON DATE: 12/19; DESIGNED: S. NIFONG DATE: 01/20; CHECKED: M. WERNER DATE: 01/20

SHEET 6 OF 6

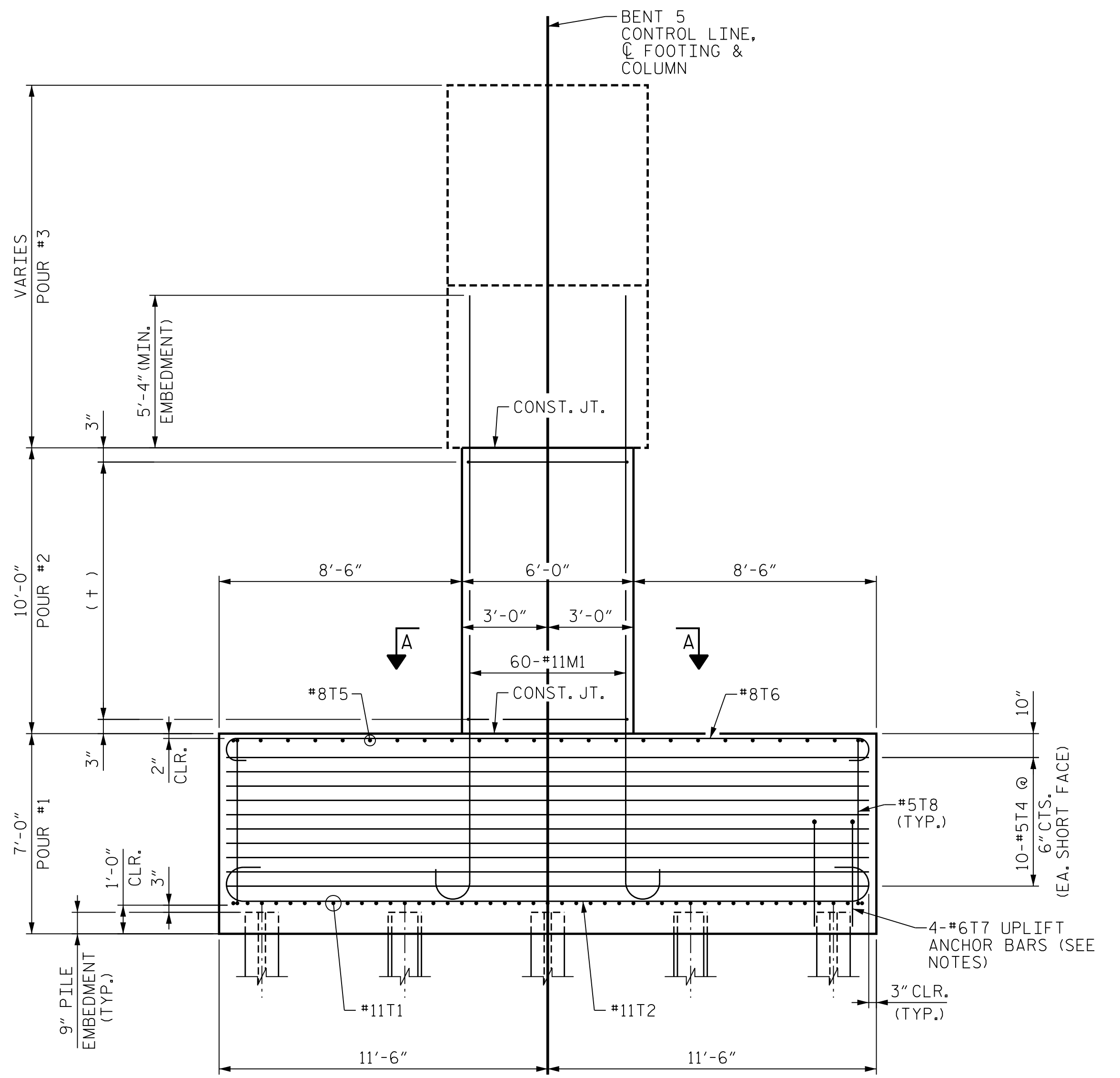
SUBSTRUCTURE BENT 4 BILL OF MATERIALS



FRONT ELEVATION

+ = 20 SETS OF #5 TIES
 @ 6" MAX. CTS.
 (1 SET = 2-#5S100
 & 3-#5S101 *)

* INVERT ORIENTATION
 OF ALTERNATE #5S101
 TIES



END ELEVATION

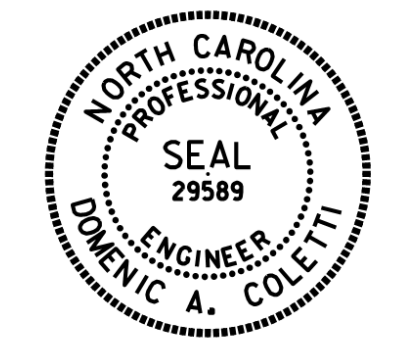
NOTES

- FOR FOOTING PLAN AND SECTION A-A, SEE "SUBSTRUCTURE BENT 5 FOOTING & COLUMN DETAILS", SHEET 2 OF 5.
- FOR DETAILS OF BENT CAP, SEE "SUBSTRUCTURE BENT 5 BENT CAP PLAN AND ELEVATION", SHEET 3 OF 5 AND "SUBSTRUCTURE BENT 5 BENT CAP DETAILS", SHEET 4 OF 5.
- 4-#6T7 UPLIFT ANCHOR BARS AT NOTED PILES - SEE "SUBSTRUCTURE BENT 5 FOOTING & COLUMN DETAILS", SHEET 2 OF 5 FOR LOCATIONS.
- FOR ADDITIONAL NOTES AND PILE UPLIFT ANCHOR DETAIL, SEE "SUBSTRUCTURE BENT 1 ELEVATIONS", SHEET 1 OF 6.

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

PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-

SHEET 1 OF 5



Dominic A. Coletti 10/15/2021

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 BENT 5
 ELEVATIONS**

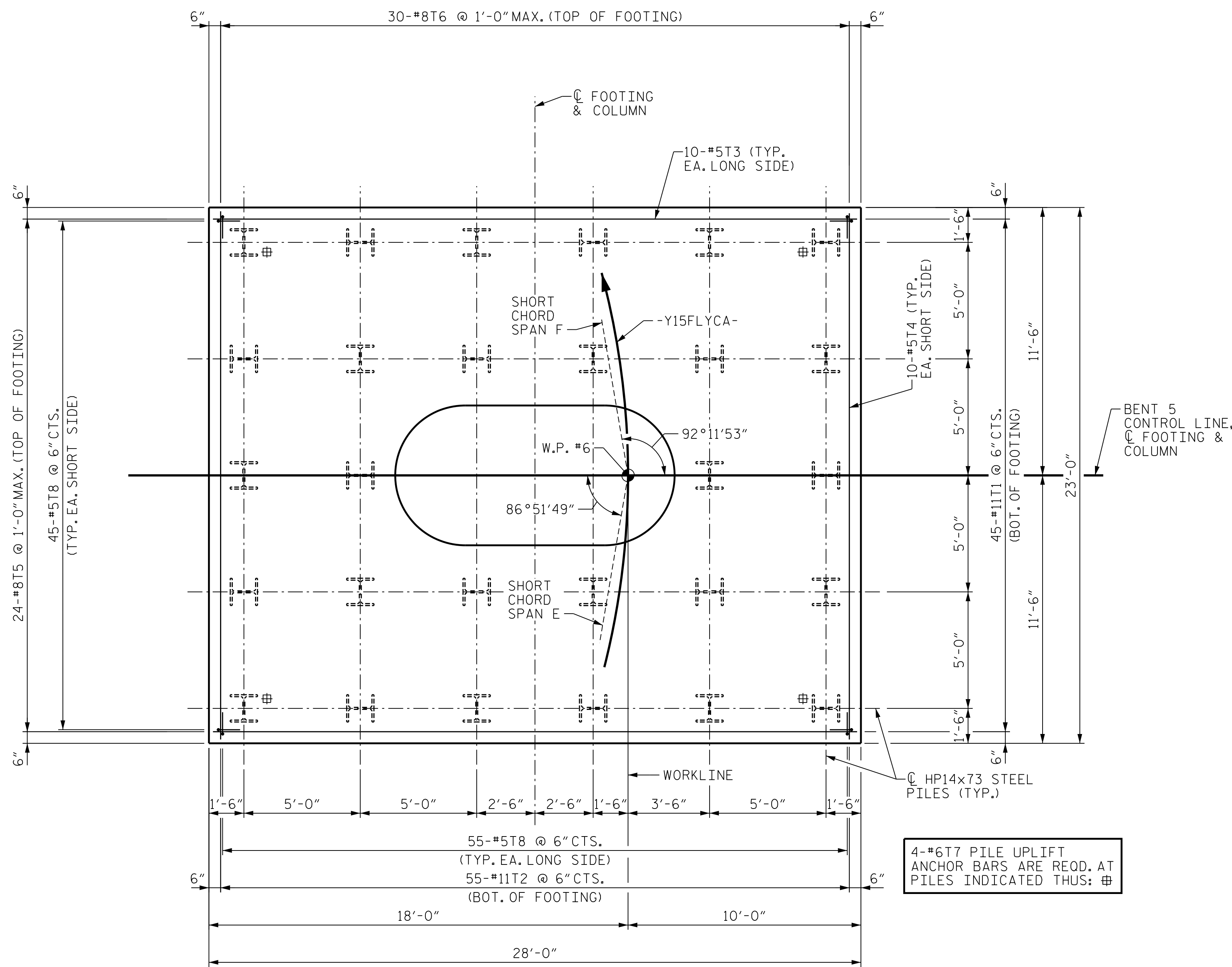
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NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	
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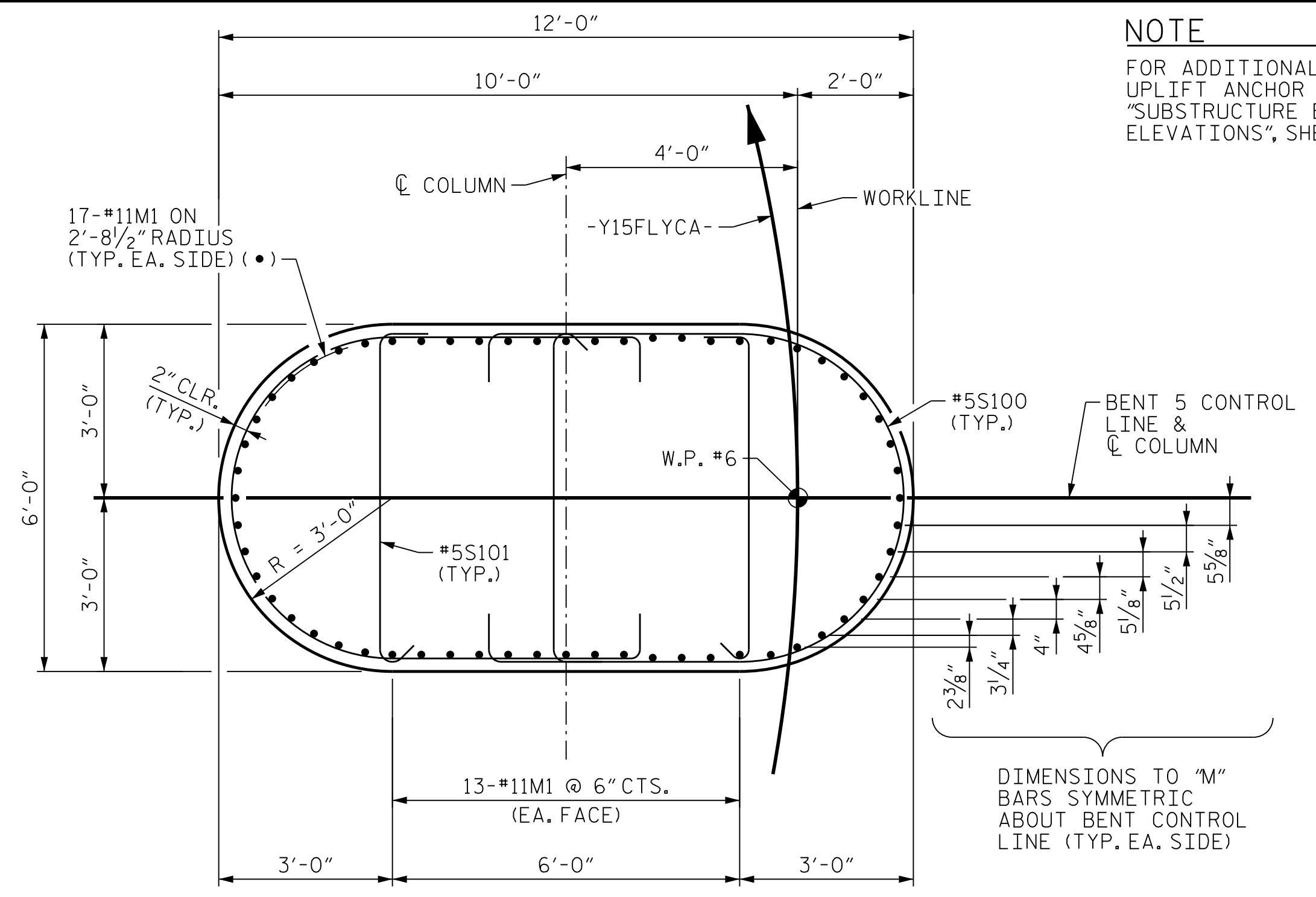
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DES CHK: <u>N. LIU</u>	DATE: <u>11/19</u>	CHK BY: <u>N. LIU</u>	DATE: <u>01/20</u>

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FOOTING PLAN



SECTION A-A

NOTE
FOR ADDITIONAL NOTES AND PILE UPLIFT ANCHOR DETAIL, SEE "SUBSTRUCTURE BENT 1 ELEVATIONS", SHEET 1 OF 6.

DIMENSIONS TO "M" BARS SYMMETRIC ABOUT BENT CONTROL LINE (TYP. EA. SIDE)

4-#6T7 PILE UPLIFT ANCHOR BARS ARE REQD. AT PILES INDICATED THUS: $\#$

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PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-

SHEET 2 OF 5



Dominic A. Coletti 10/15/2021

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 BENT 5
 FOOTING & COLUMN
 DETAILS

REVISIONS

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

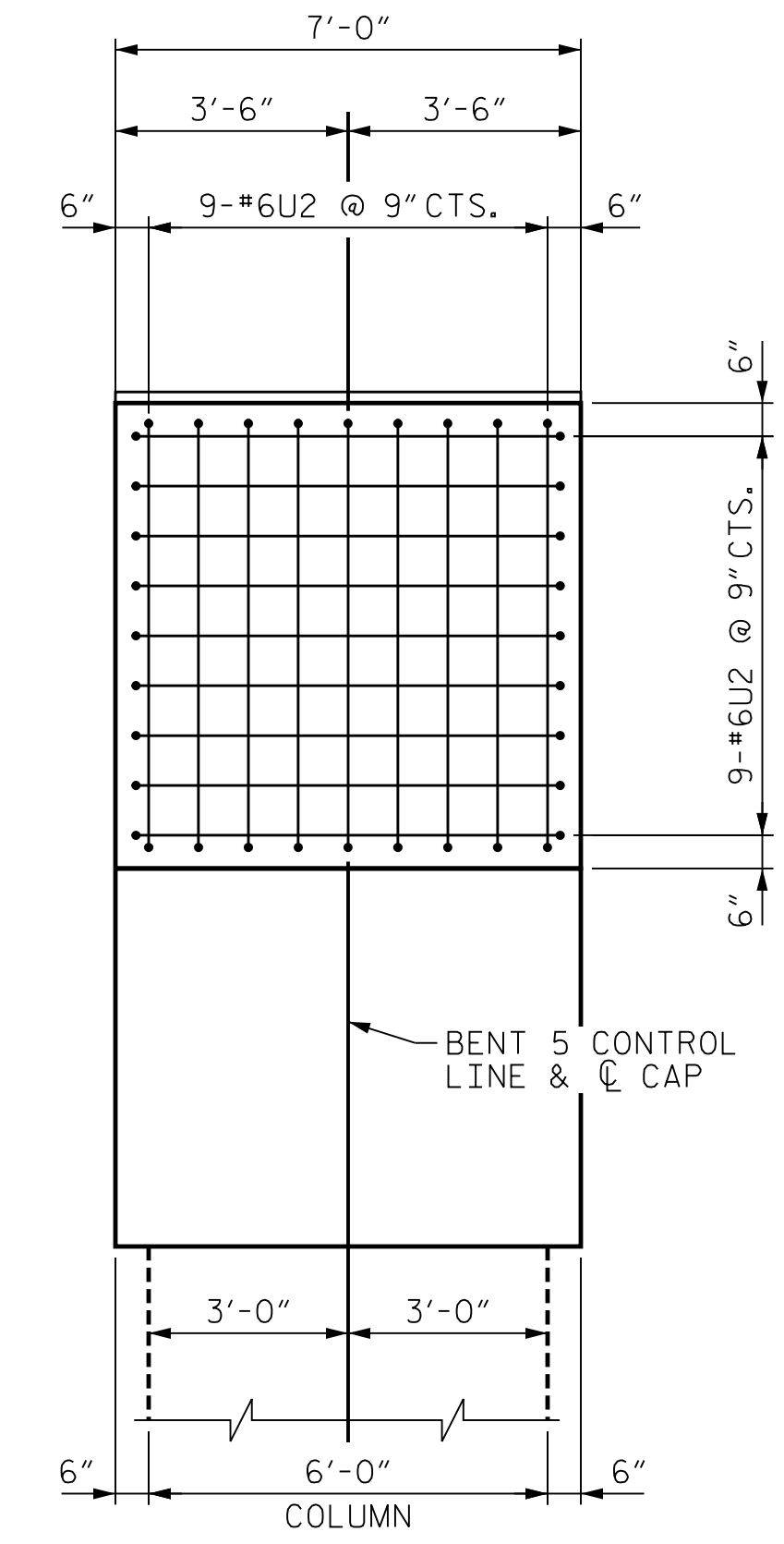
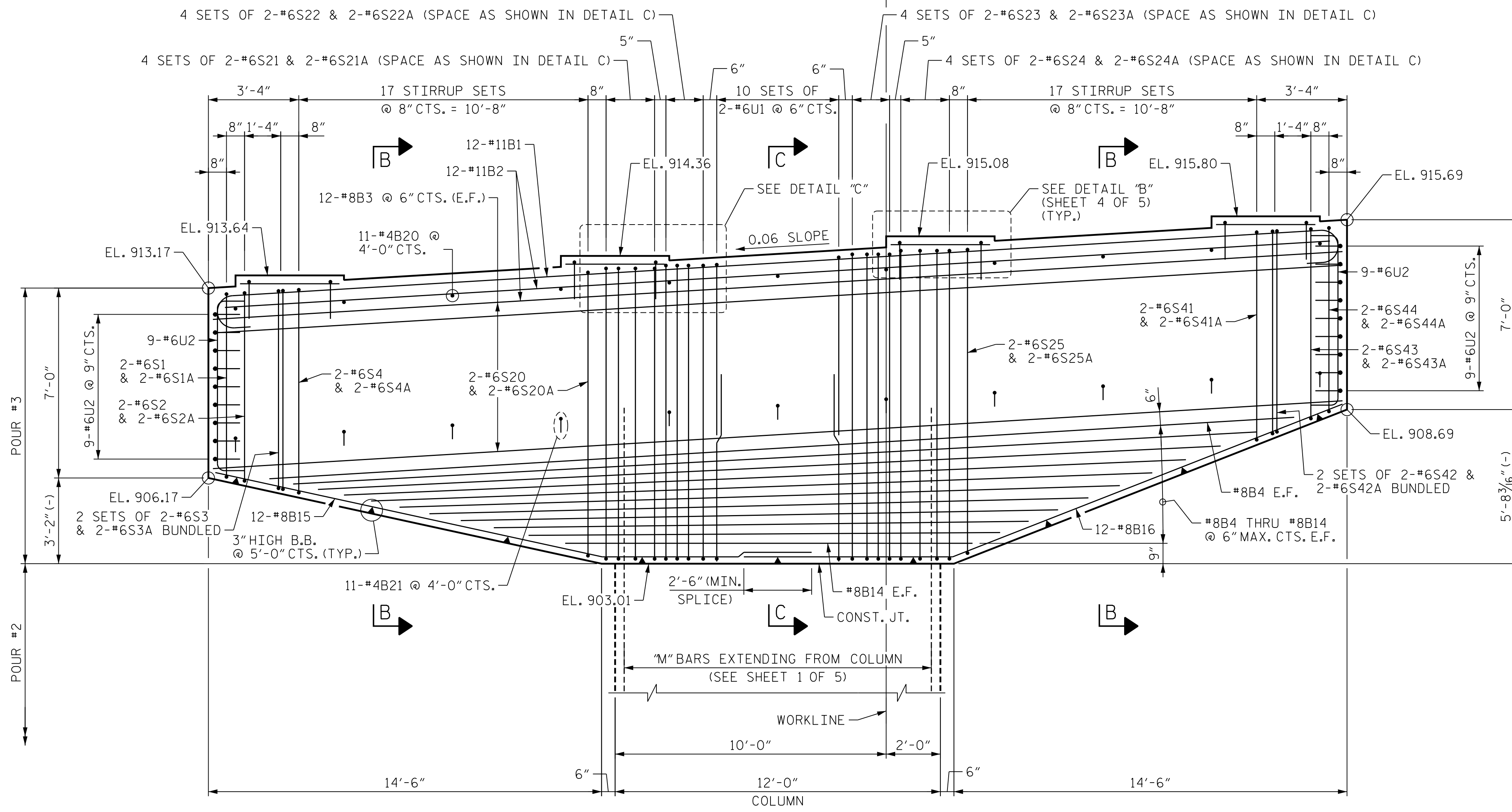
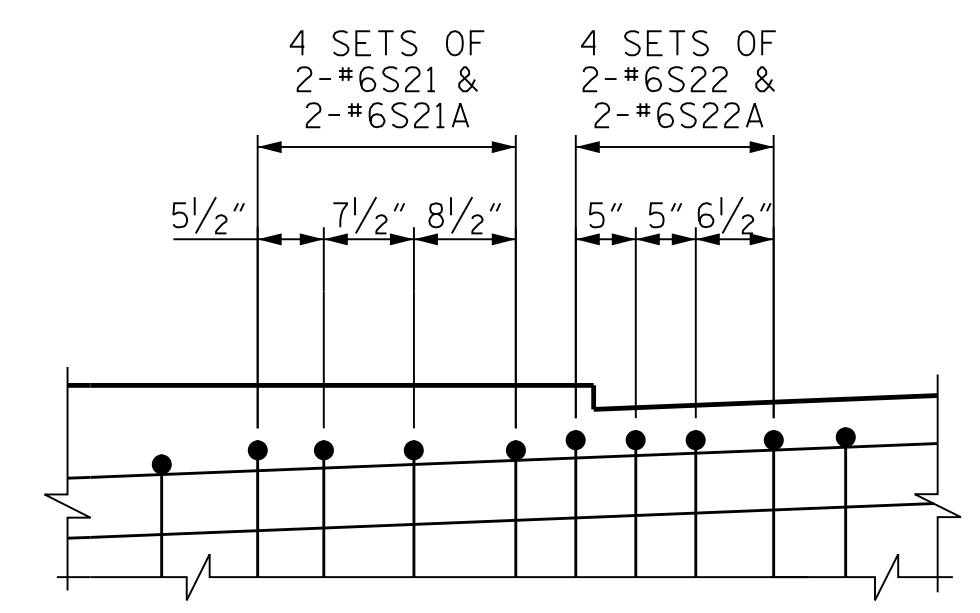
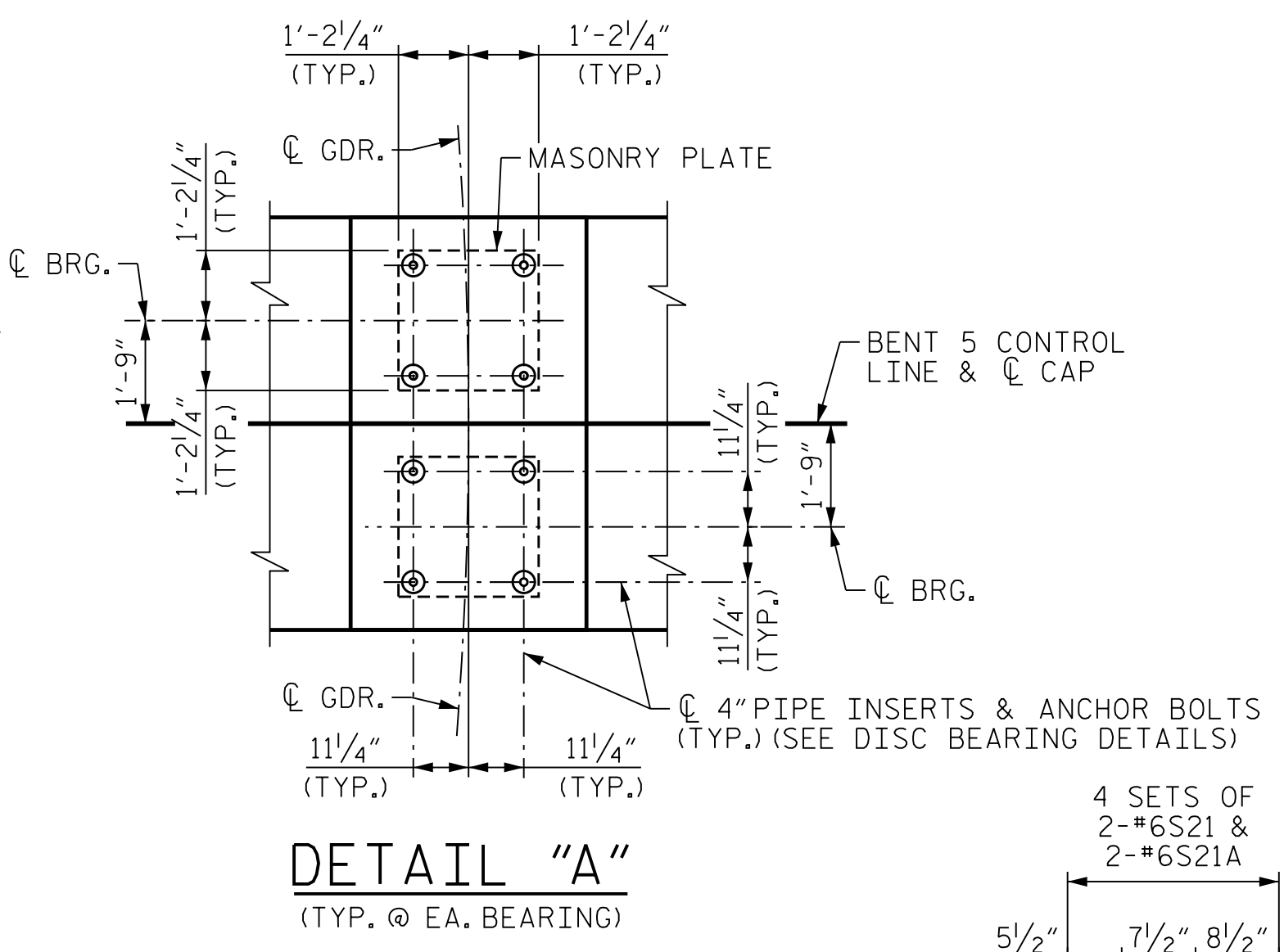
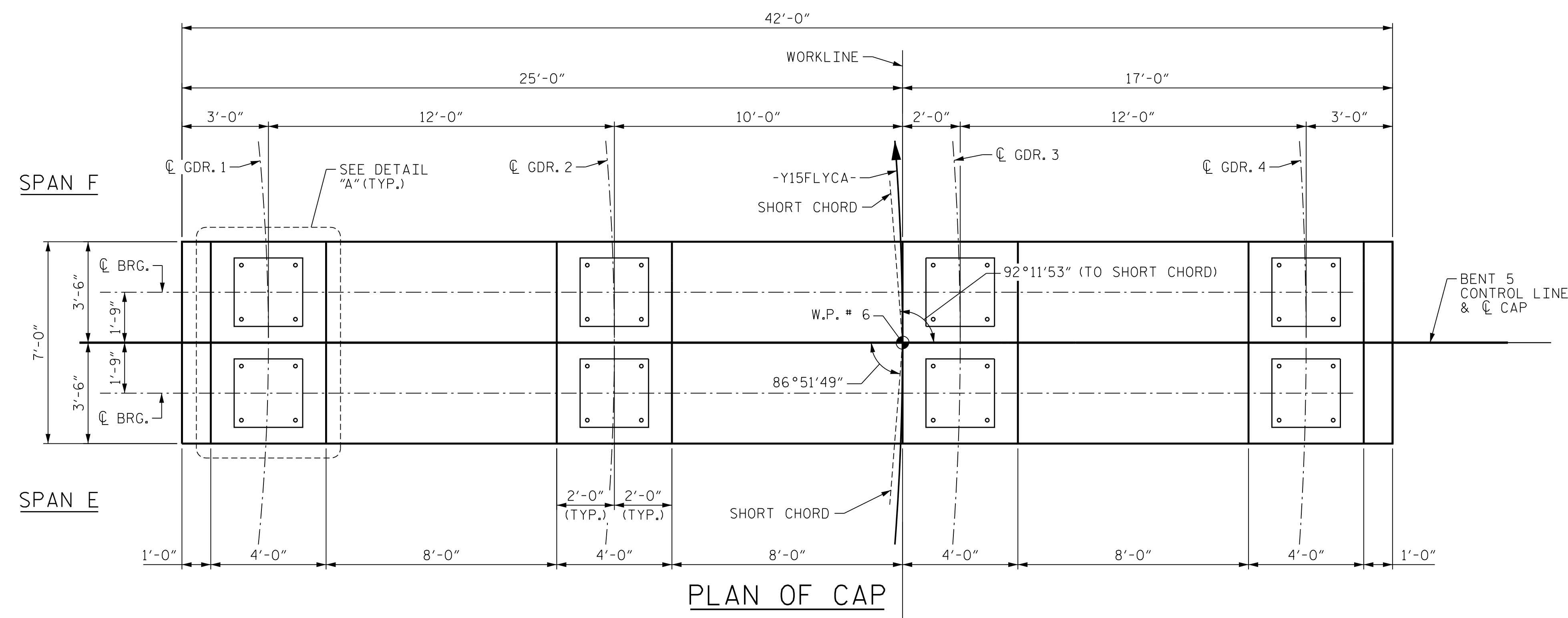
SHEET NO. 506-108
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DES BY: K. OLIVER	DATE: 11/19	DWG BY: B. PETERSON	DATE: 12/19
DES CHK: N. LIU	DATE: 11/19	CHK BY: N. LIU	DATE: 01/20



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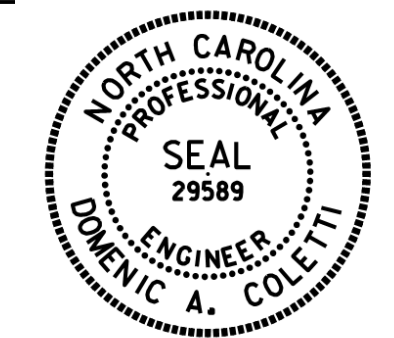
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DATE: 10/14/2021
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DETAIL SHOWN AT LEFT SIDE OF CAP (SPACING OF STIRRUPS MIRRORED AT RIGHT SIDE OF CAP WITH BARS #6S23/#6S23A AND #6S24/#6S24A AS SHOWN ON THE ELEVATION)

NOTES
FOR SECTIONS B-B AND C-C, SEE "SUBSTRUCTURE BENT 5 BENT CAP DETAILS" SHEET 4 OF 5.
FOR ADDITIONAL NOTES, SEE SHEET 1 OF 5.

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 58+33.94 -Y15FLYCA-
SHEET 3 OF 5



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SUBSTRUCTURE
BENT 5
BENT CAP PLAN
& ELEVATION**

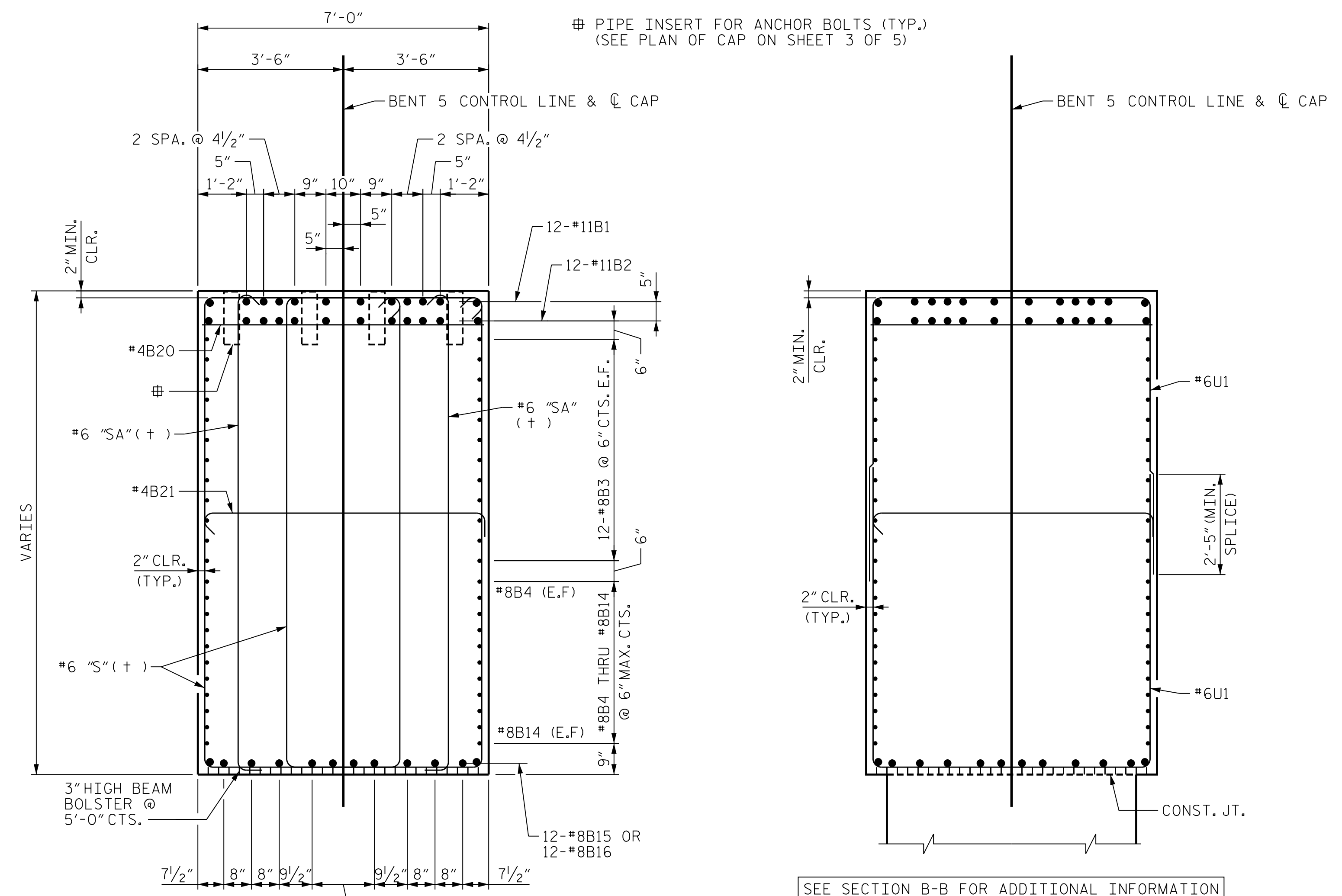
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DES CHK: <u>M. WERNER</u>	DATE: <u>10/19</u>	CHK BY: <u>N. LIU</u>	DATE: <u>01/20</u>

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

SHEET NO. 506-109
TOTAL SHEETS 129

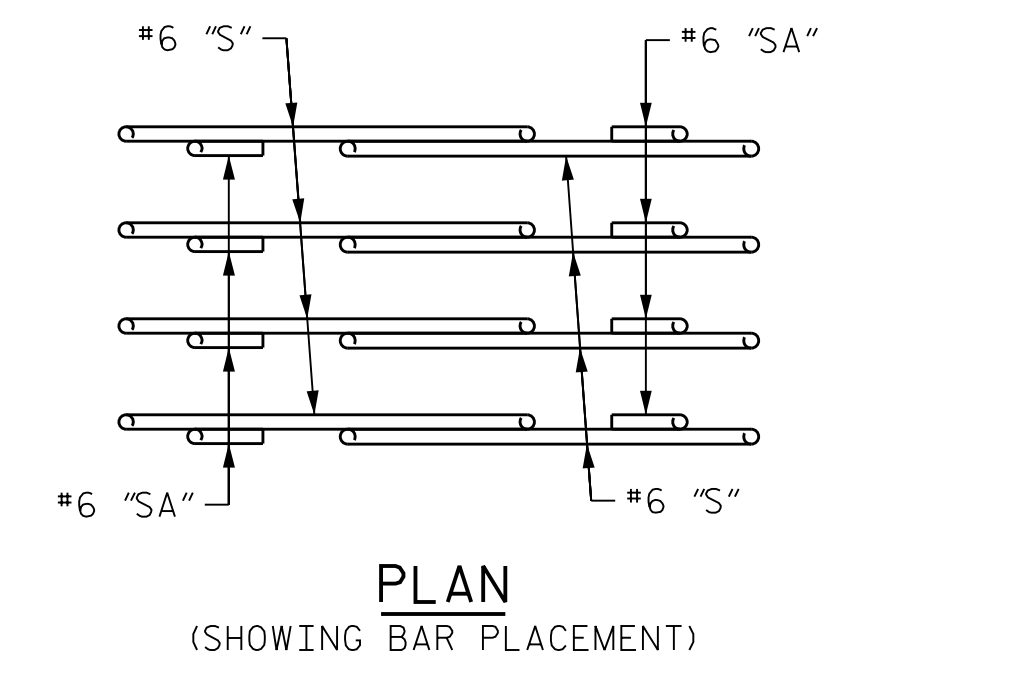
NOTE
SEE SHEET 1 OF 5 FOR NOTES.



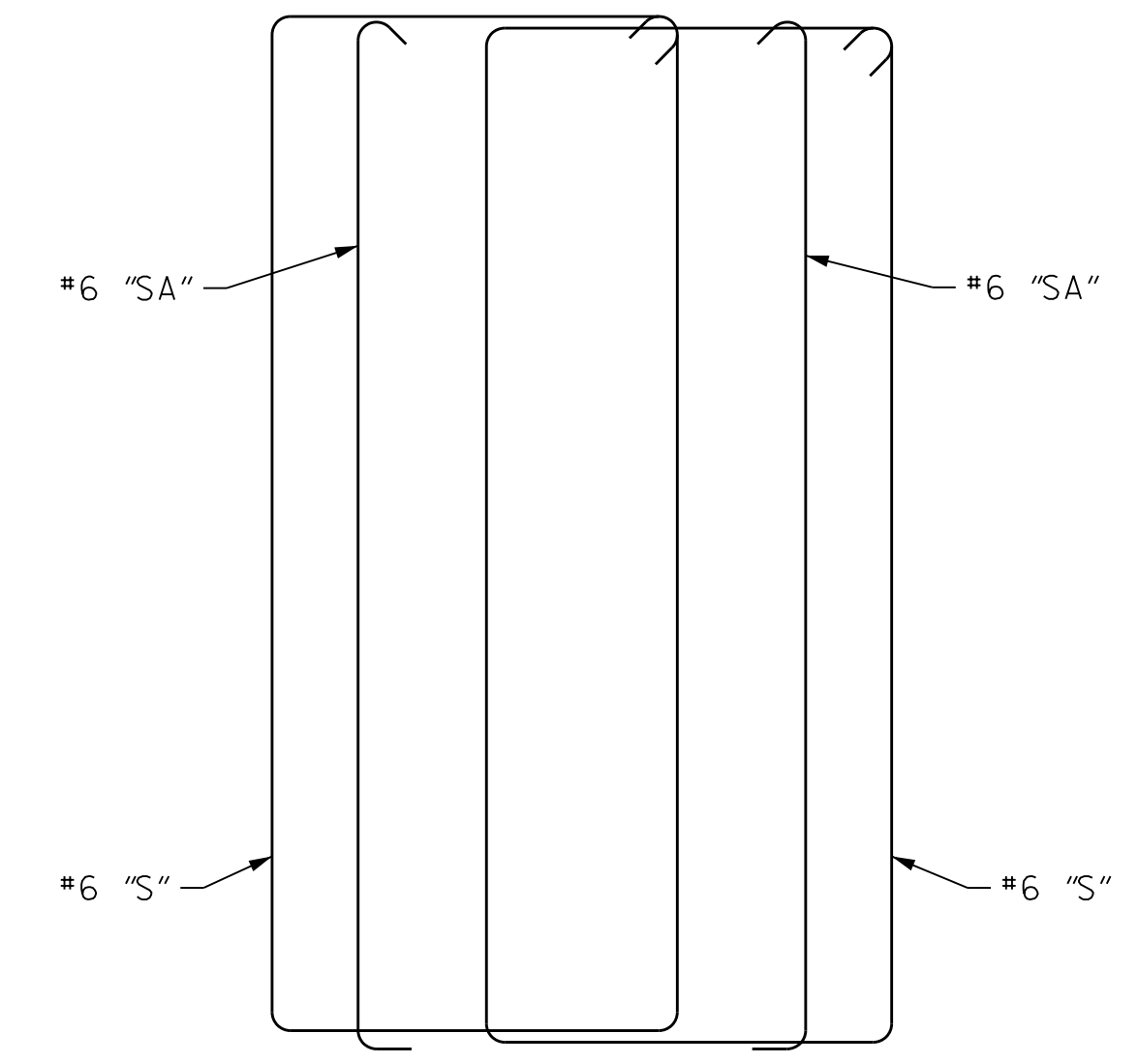
SECTION B-B
(+) SEE "STIRRUP SET DETAIL"

SEE SECTION B-B FOR ADDITIONAL INFORMATION

SECTION C-C
COLUMN REINFORCING STEEL NOT SHOWN FOR CLARITY

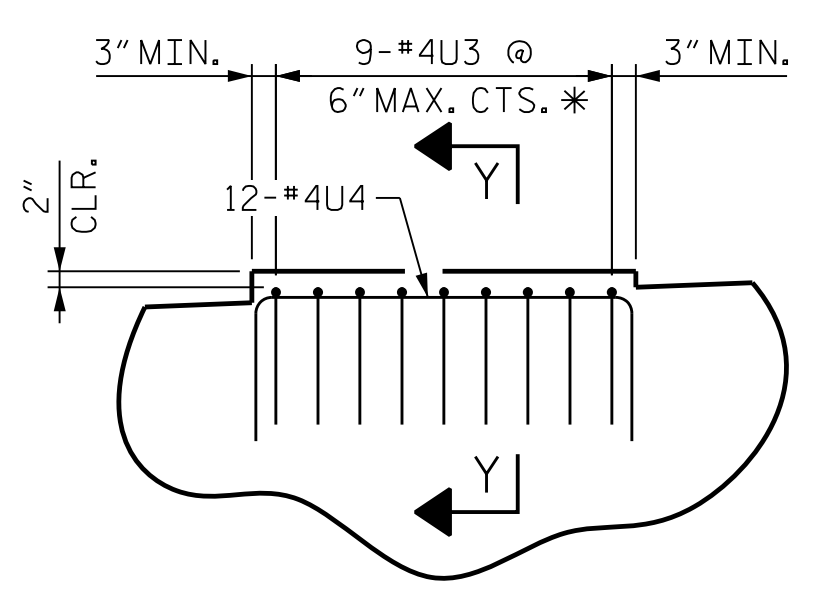


PLAN
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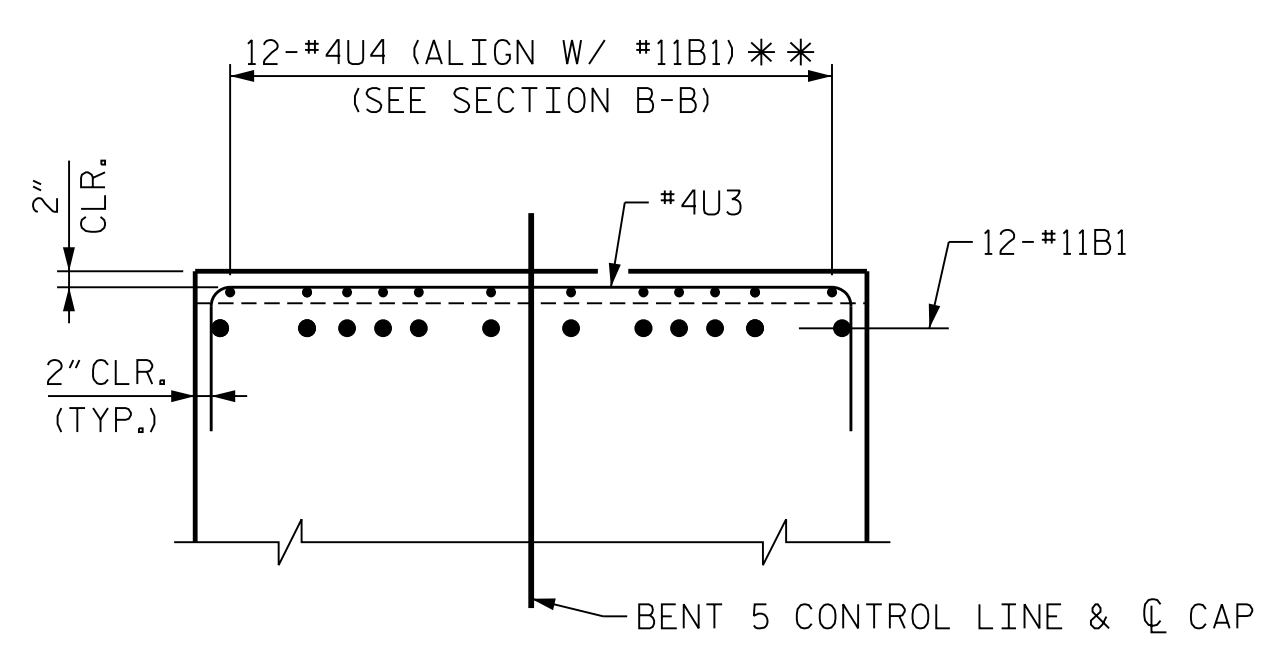


ELEVATION
(SCHEMATIC)

STIRRUP SET DETAIL



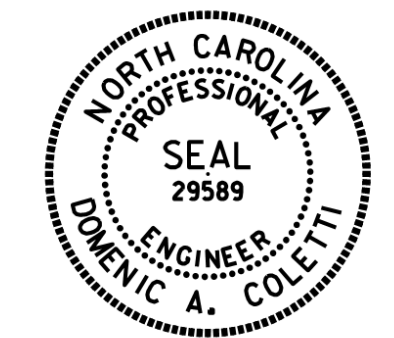
DETAIL "B"



SECTION Y-Y

* NOTE:
#4U3 BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR PIPE INSERTS FOR ANCHOR BOLTS.
** NOTE:
#4U4 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR #11B1 AND #11B2 BARS.

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 58+33.94 -Y15FLYCA-
SHEET 4 OF 5

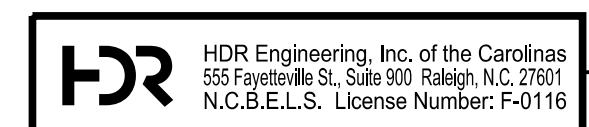


Dominic A. Coletti 10/15/2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SUBSTRUCTURE
BENT 5
BENT CAP DETAILS**

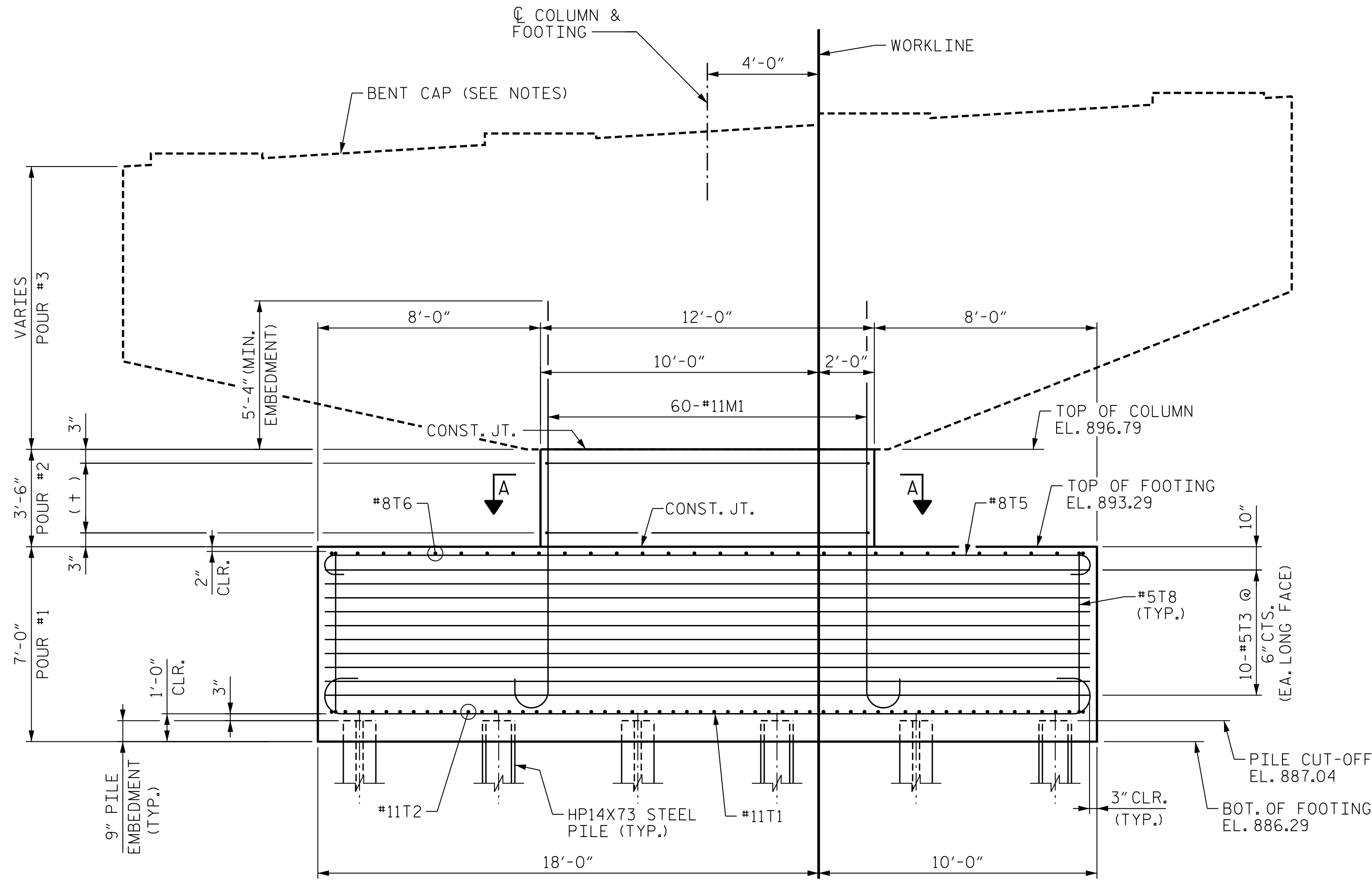
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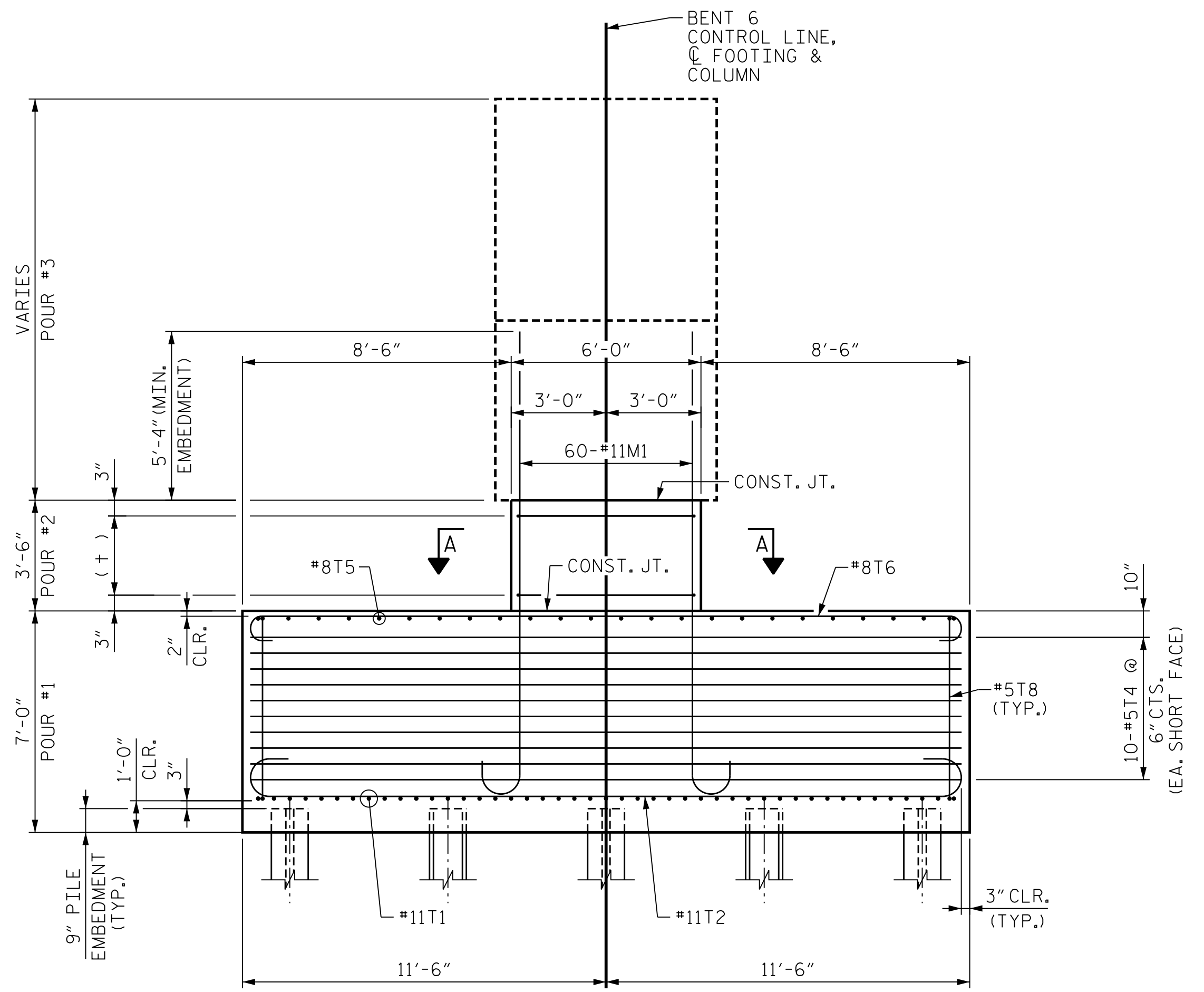
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DES CHK: <u>M. WERNER</u>	DATE: <u>10/19</u>	CHK BY: <u>N. LIU</u>	DATE: <u>01/20</u>



FRONT ELEVATION

+ = 7 SETS OF #5 TIES
 @ 6" MAX. CTS.
 (1 SET = 2-#5S100
 & 3-#5S101 *)

* INVERT ORIENTATION
 OF ALTERNATE #5S101
 TIES



END ELEVATION

NOTES

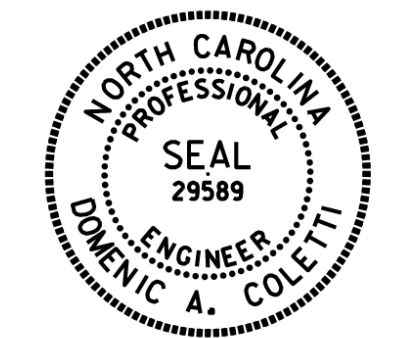
FOR FOOTING PLAN AND SECTION A-A, SEE "SUBSTRUCTURE BENT 6 FOOTING & COLUMN DETAILS", SHEET 2 OF 5.

FOR DETAILS OF BENT CAP, SEE "SUBSTRUCTURE BENT 6 BENT CAP PLAN AND ELEVATION", SHEET 3 OF 5 AND "SUBSTRUCTURE BENT 6 BENT CAP DETAILS", SHEET 4 OF 5.

FOR ADDITIONAL NOTES, SEE "SUBSTRUCTURE BENT 1 ELEVATIONS", SHEET 1 OF 6.

PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-

SHEET 1 OF 5



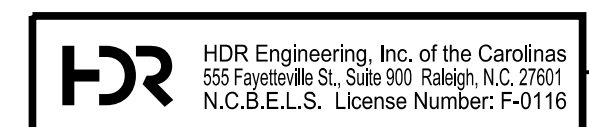
Dominic A. Coletti 10/15/2021

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 BENT 6
 ELEVATIONS**

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

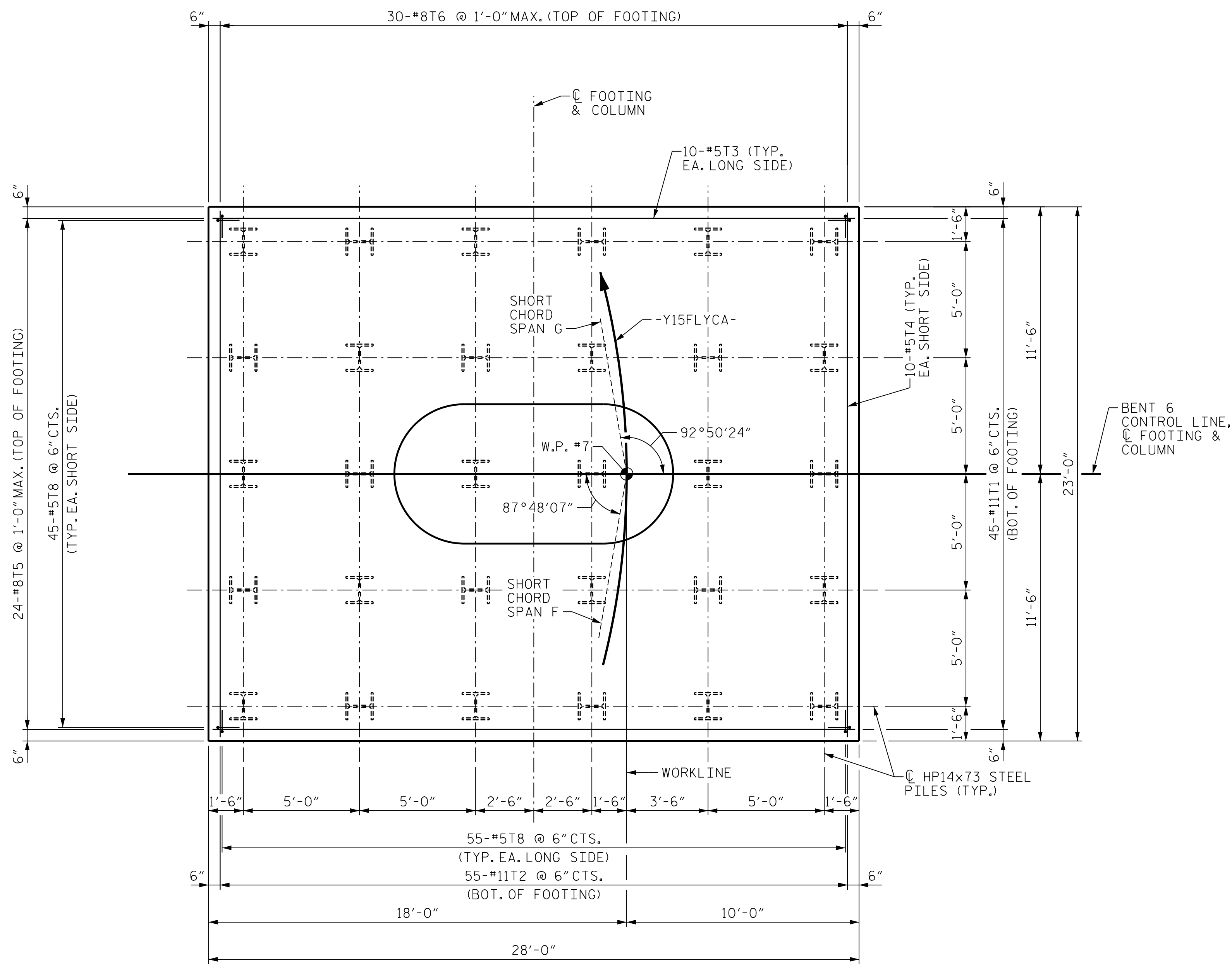
SHEET NO. 506-112
 TOTAL SHEETS 129



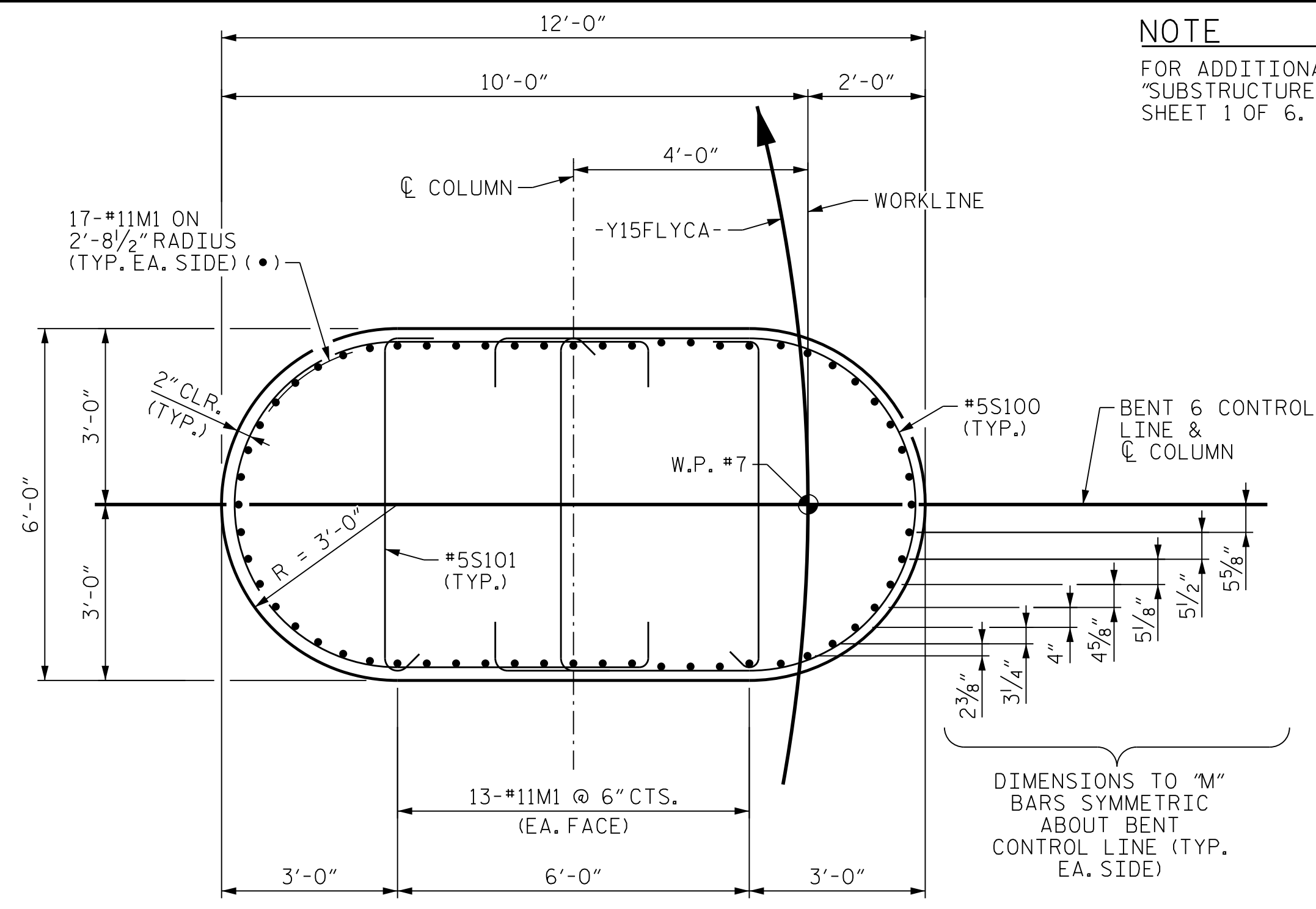
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 UNLESS ALL SIGNATURES COMPLETED

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DES BY: <u>K. OLIVER</u>	DATE: <u>11/19</u>	DWG BY: <u>B. PETERSON</u>	DATE: <u>12/19</u>
DES CHK: <u>N. LIU</u>	DATE: <u>11/19</u>	CHK BY: <u>N. LIU</u>	DATE: <u>01/20</u>



FOOTING PLAN



SECTION A-A

NOTE
FOR ADDITIONAL NOTES, SEE
"SUBSTRUCTURE BENT 1 ELEVATIONS",
SHEET 1 OF 6.

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 58+33.94 -Y15FLYCA-

SHEET 2 OF 5



Dominic A. Coletti 10/15/2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 6
FOOTING & COLUMN
DETAILS

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
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SHEET
NO.
506-113
TOTAL
SHEETS
129

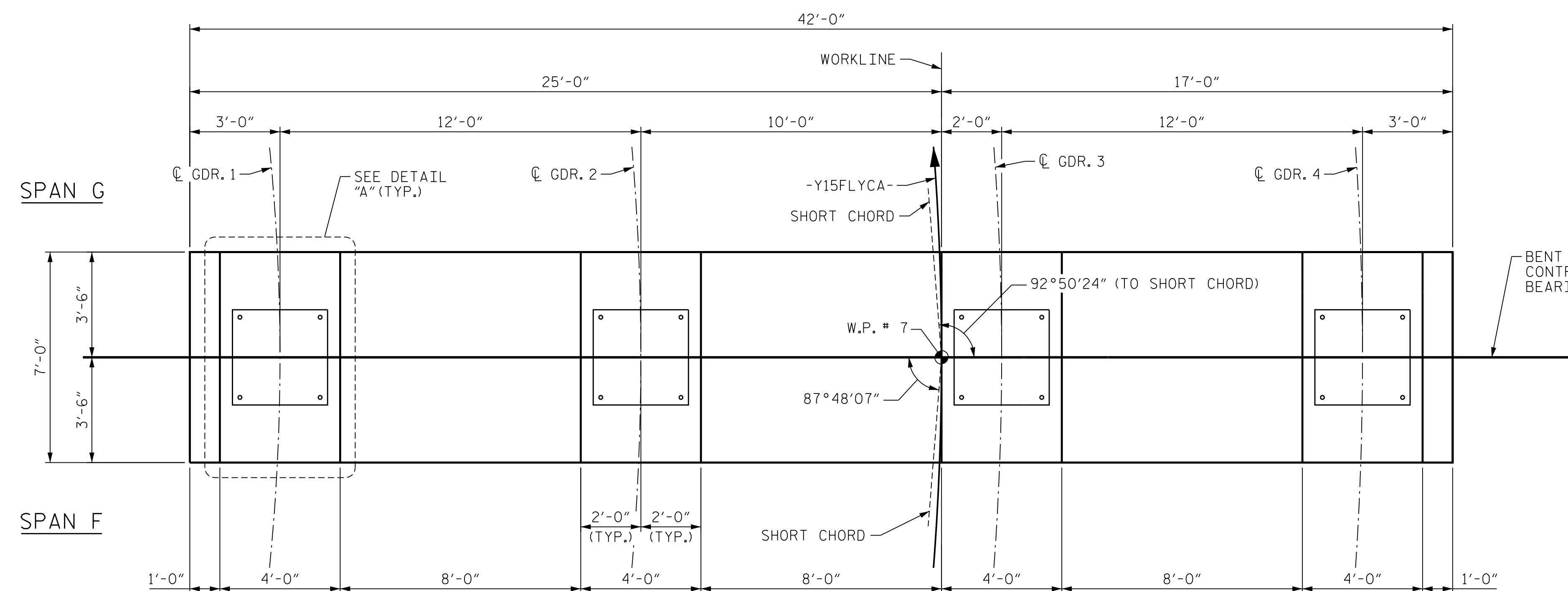


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N.C.B.E.L.S. License Number: F-0116

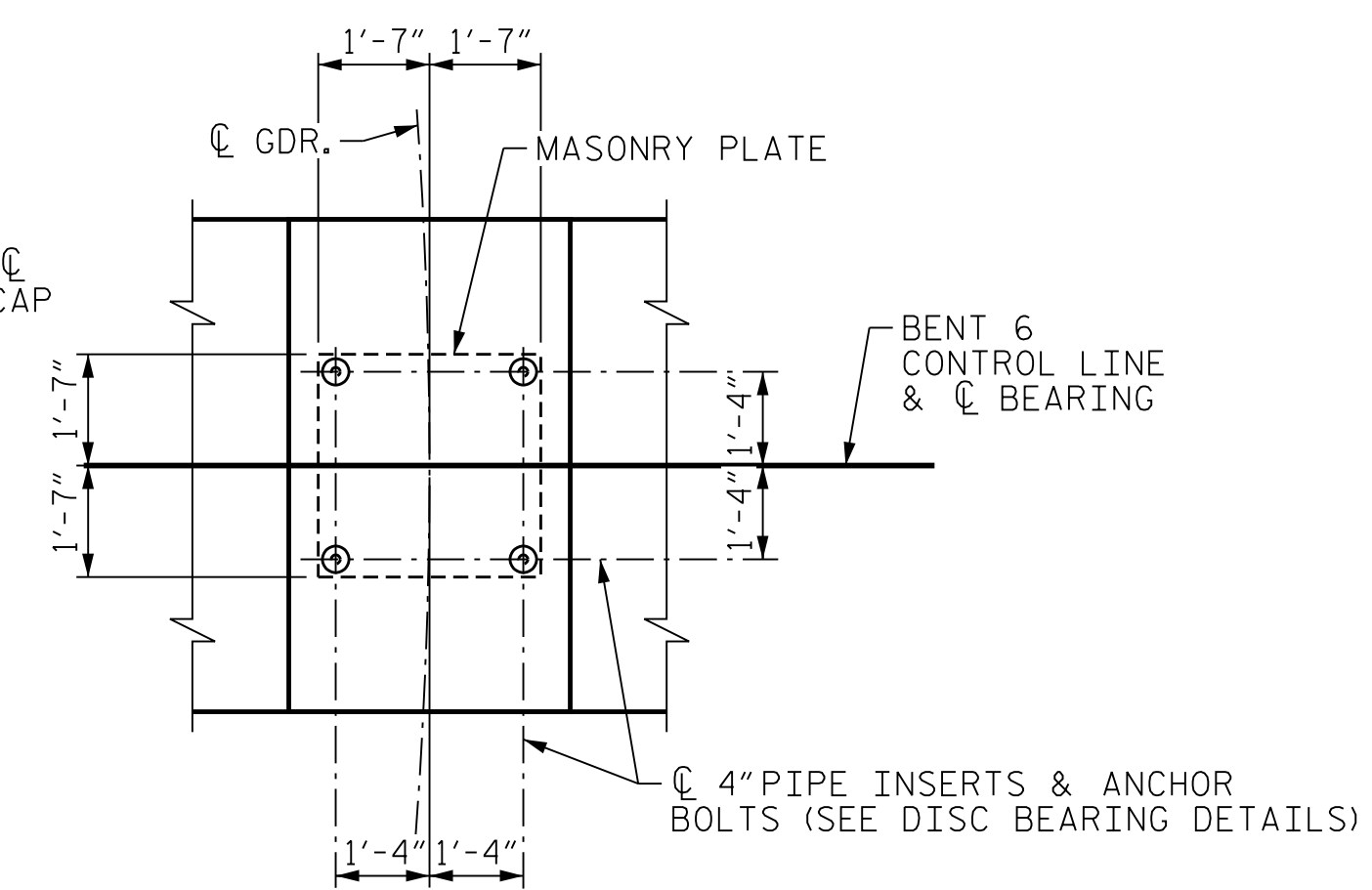
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

DES BY: <u>K. OLIVER</u>	DATE: <u>11/19</u>	DWG BY: <u>B. PETERSON</u>	DATE: <u>12/19</u>
DES CHK: <u>N. LIU</u>	DATE: <u>11/19</u>	CHK BY: <u>N. LIU</u>	DATE: <u>01/20</u>

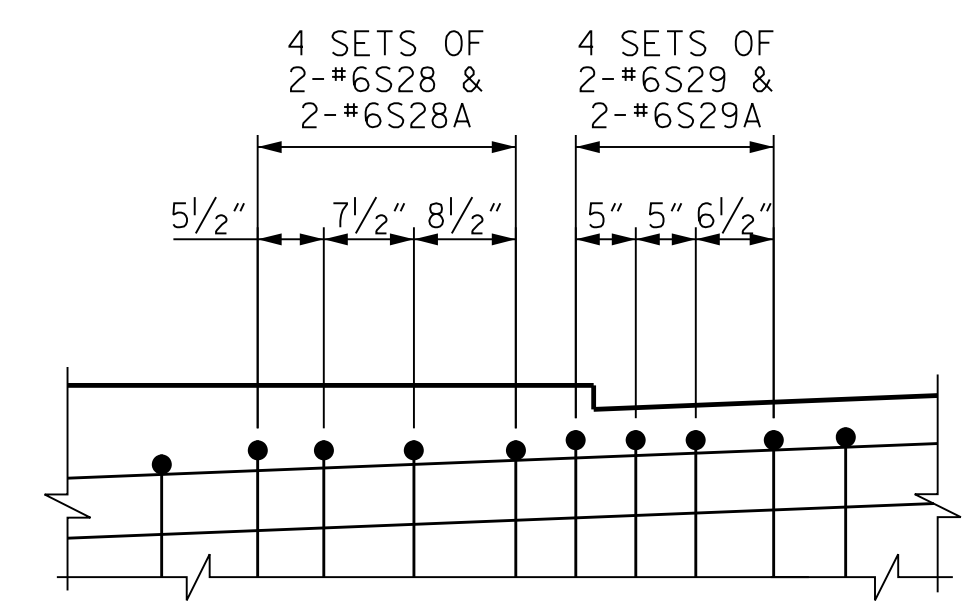
NOTES
FOR SECTIONS B-B AND C-C, SEE
"SUBSTRUCTURE BENT 6 BENT CAP DETAILS"
SHEET 4 OF 5.
FOR ADDITIONAL NOTES, SEE SHEET 1 OF 5.



PLAN OF CAP

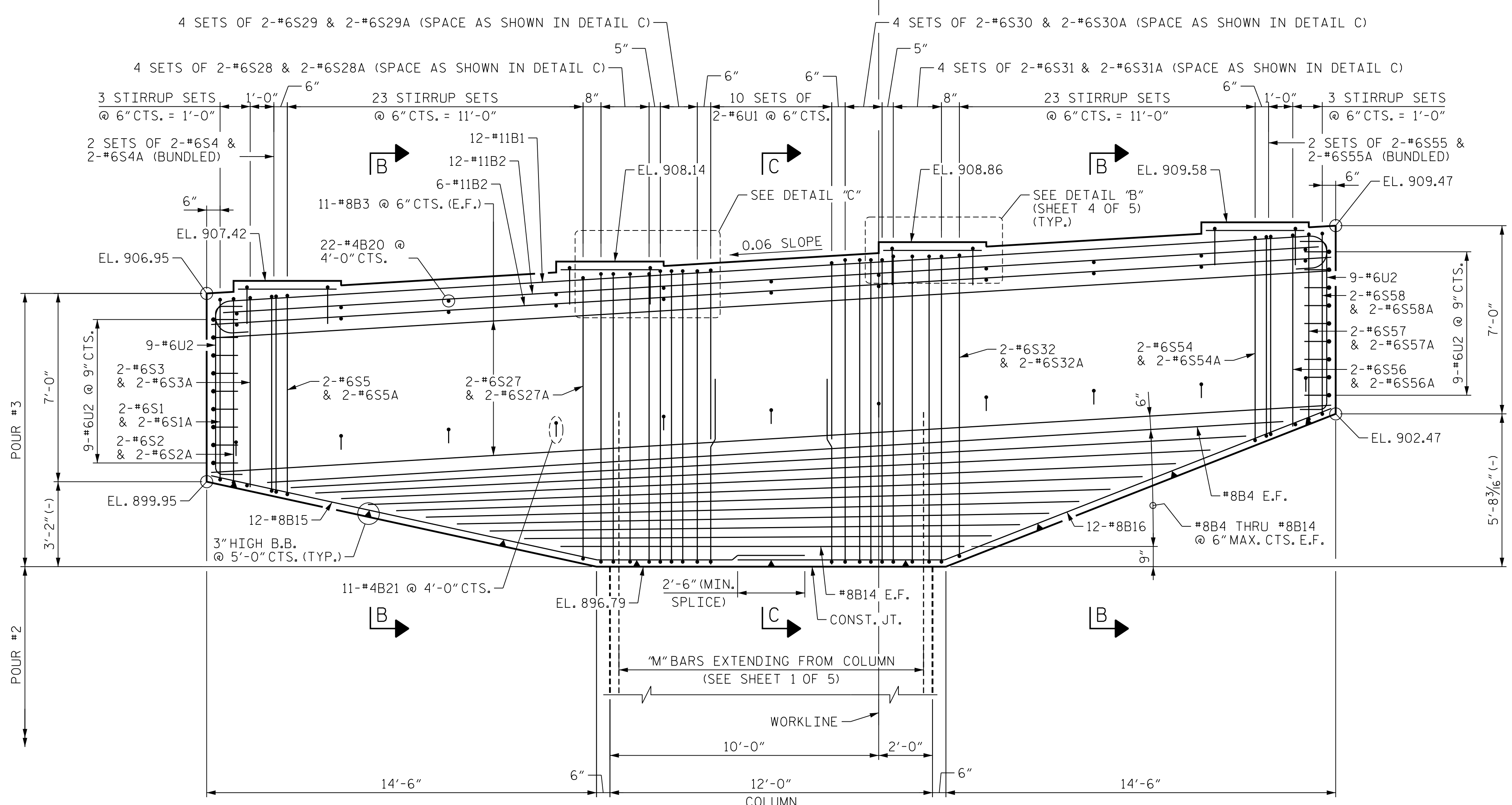


DETAIL "A"
(TYP. @ EA. BEARING)

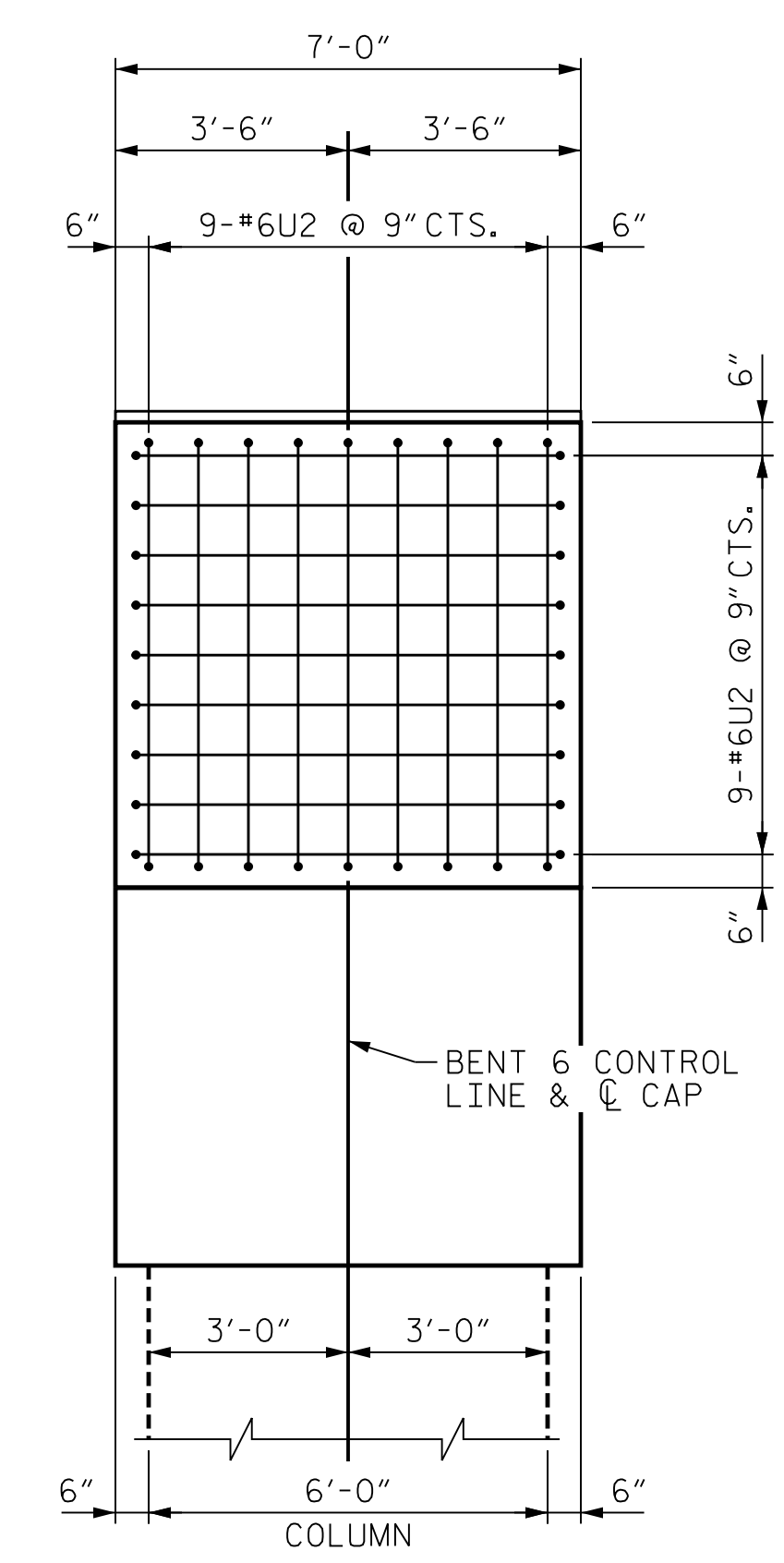


DETAIL "C"

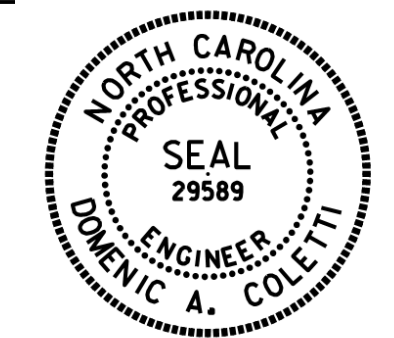
DETAIL SHOWN AT LEFT SIDE OF CAP (SPACING OF STIRRUPS MIRRORED AT RIGHT SIDE OF CAP WITH BARS #6S30/#6S30A AND #6S31/#6S31A AS SHOWN ON THE ELEVATION)



ELEVATION OF CAP



END VIEW



Dominic A. Coletti 10/15/2021

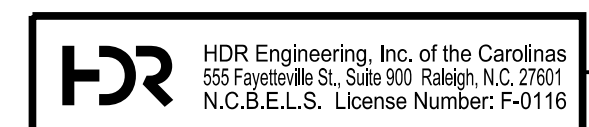
PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 58+33.94 -Y15FLYCA-
SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
BENT 6
BENT CAP PLAN
& ELEVATION

REVISIONS						SHEET NO. S06-114 TOTAL SHEETS 129
NO.	BY:	DATE:	NO.	BY:	DATE:	
1	--	--	3	--	--	TOTAL SHEETS 129
2	--	--	4	--	--	

PLOT DRIVER: NCDOT...
USER: PPETERSO
DATE: 10/14/2021
FILE: ...SUBSTR

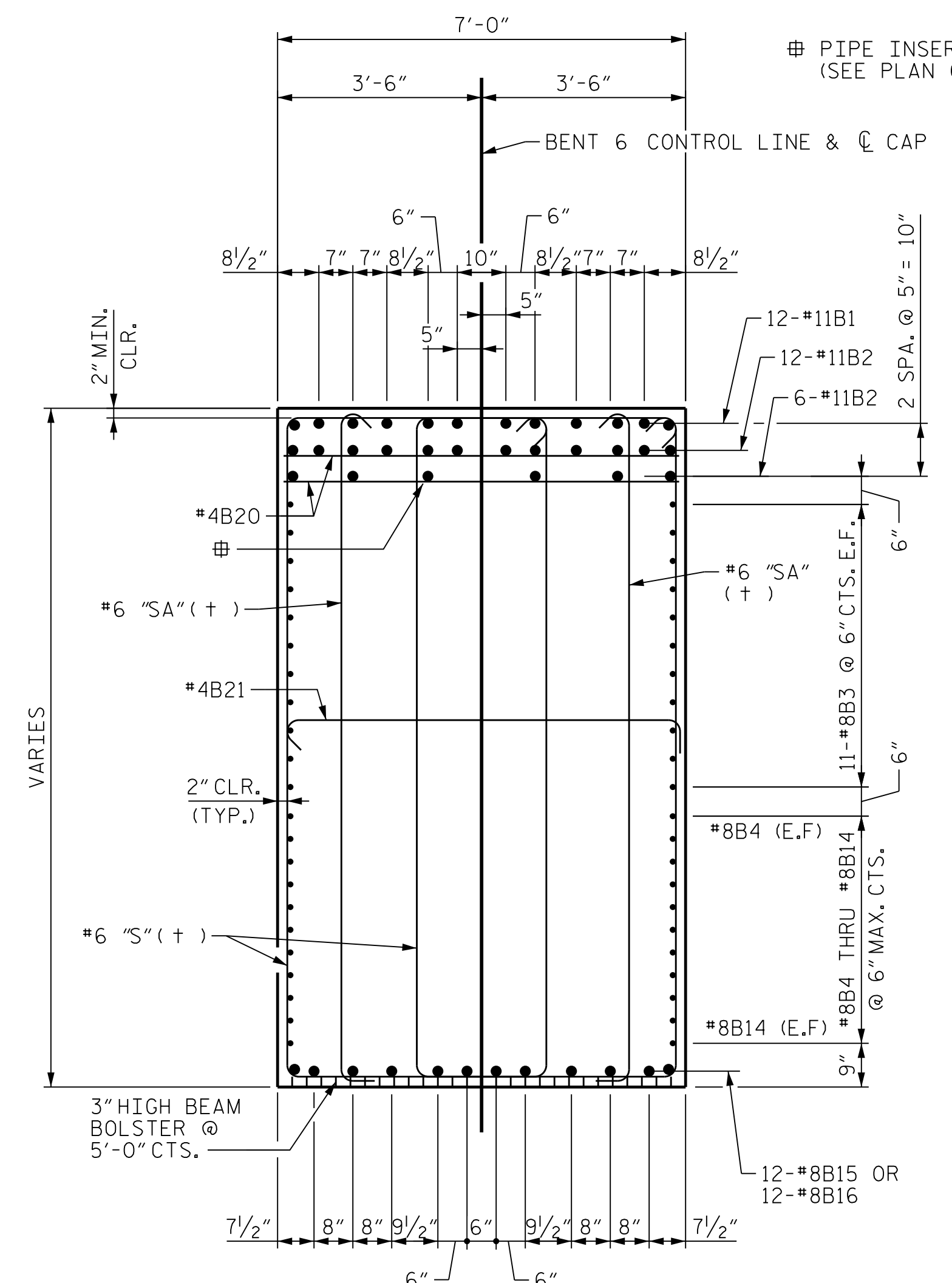
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DES CHK: M. WERNER	DATE: 10/19	CHK BY: N. LIU	DATE: 01/20



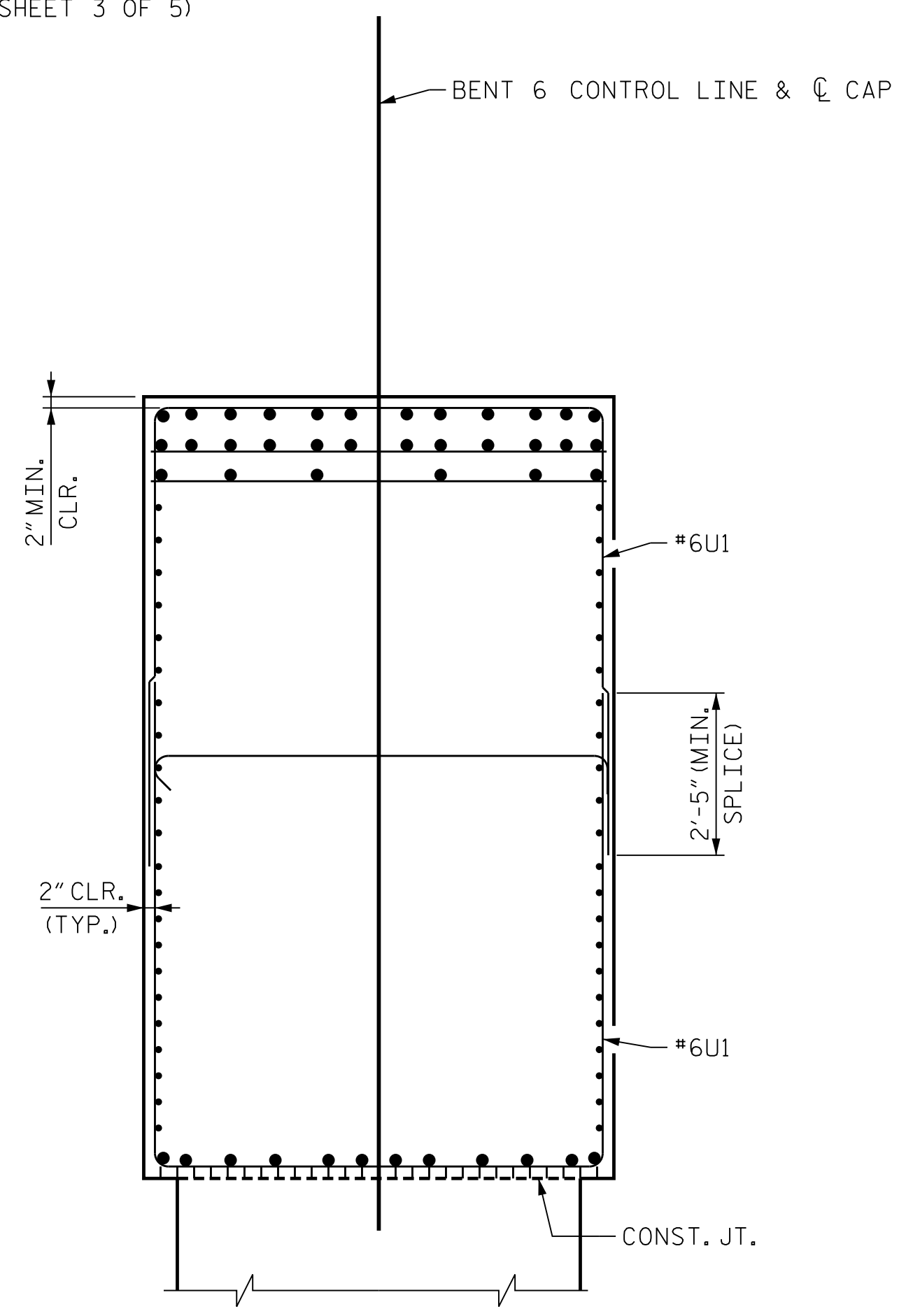
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N.C.B.E.L.S. License Number: F-0116

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NOTE
SEE SHEET 1 OF 5 FOR NOTES.

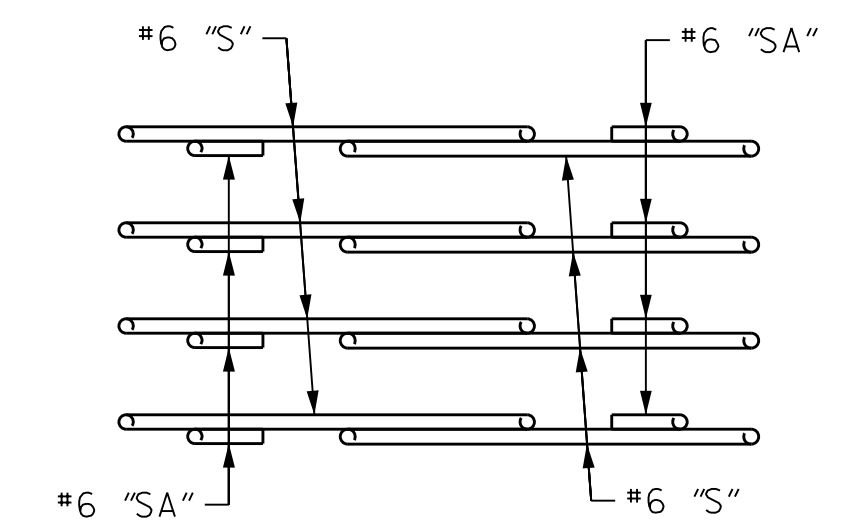


SECTION B-B
(+) SEE "STIRRUP SET DETAIL"

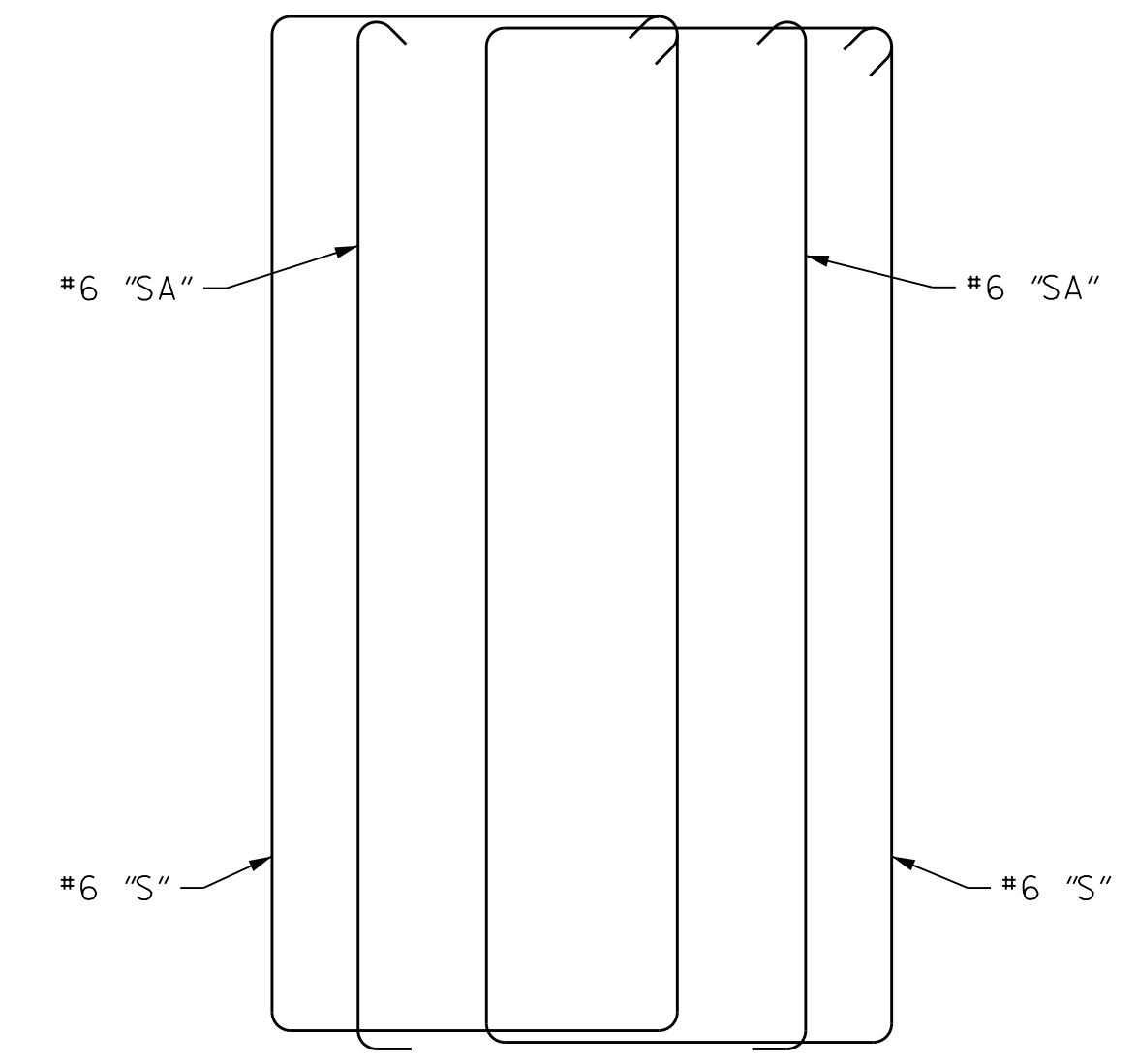


SEE SECTION B-B FOR ADDITIONAL INFORMATION

SECTION C-C
COLUMN REINFORCING STEEL NOT SHOWN FOR CLARITY

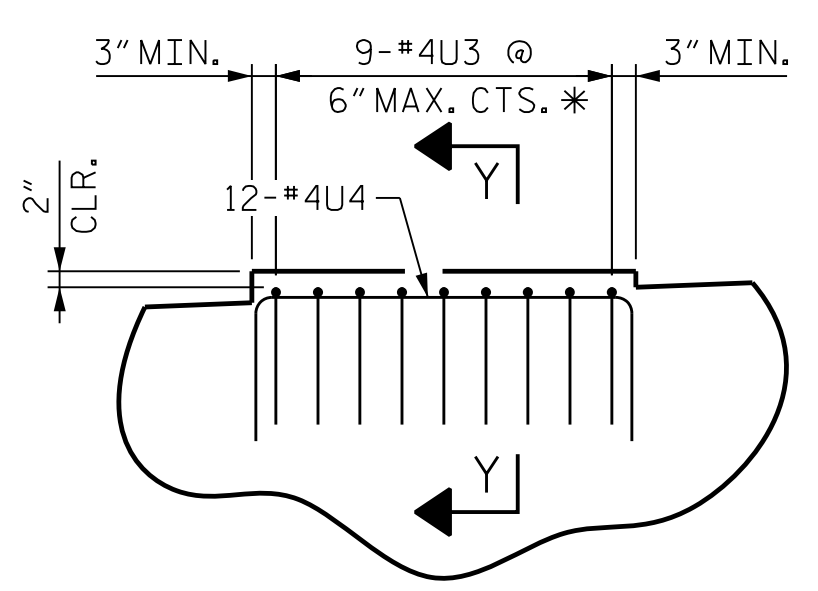


PLAN
(SHOWING BAR PLACEMENT)

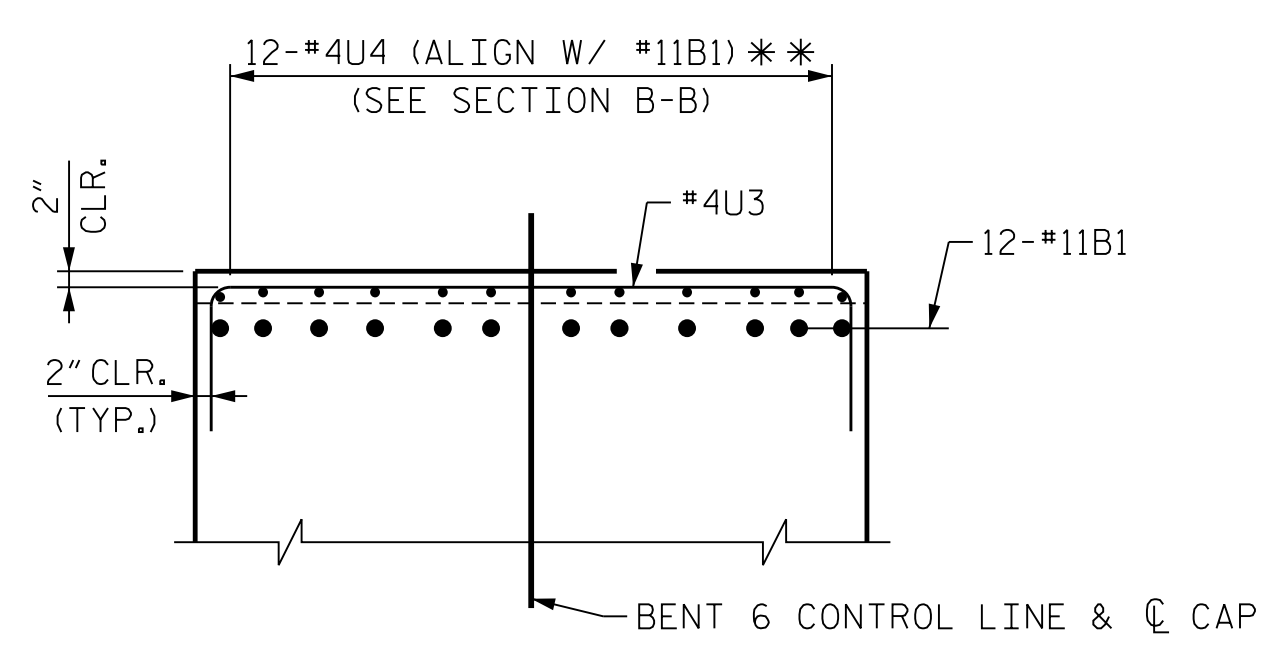


ELEVATION
(SCHEMATIC)

STIRRUP SET DETAIL



DETAIL "B"

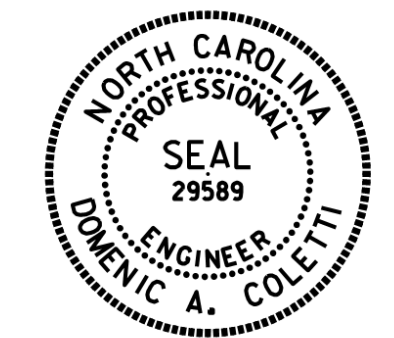


SECTION Y-Y

* NOTE:
#4U3 BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR PIPE INSERTS FOR ANCHOR BOLTS.

** NOTE:
#4U4 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR #11B1 AND #11B2 BARS.

PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-
 SHEET 4 OF 5

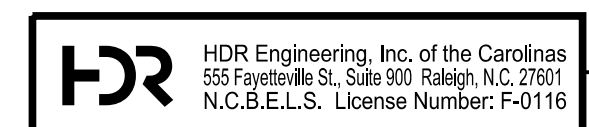


10/15/2021

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 BENT 6
 BENT CAP DETAILS

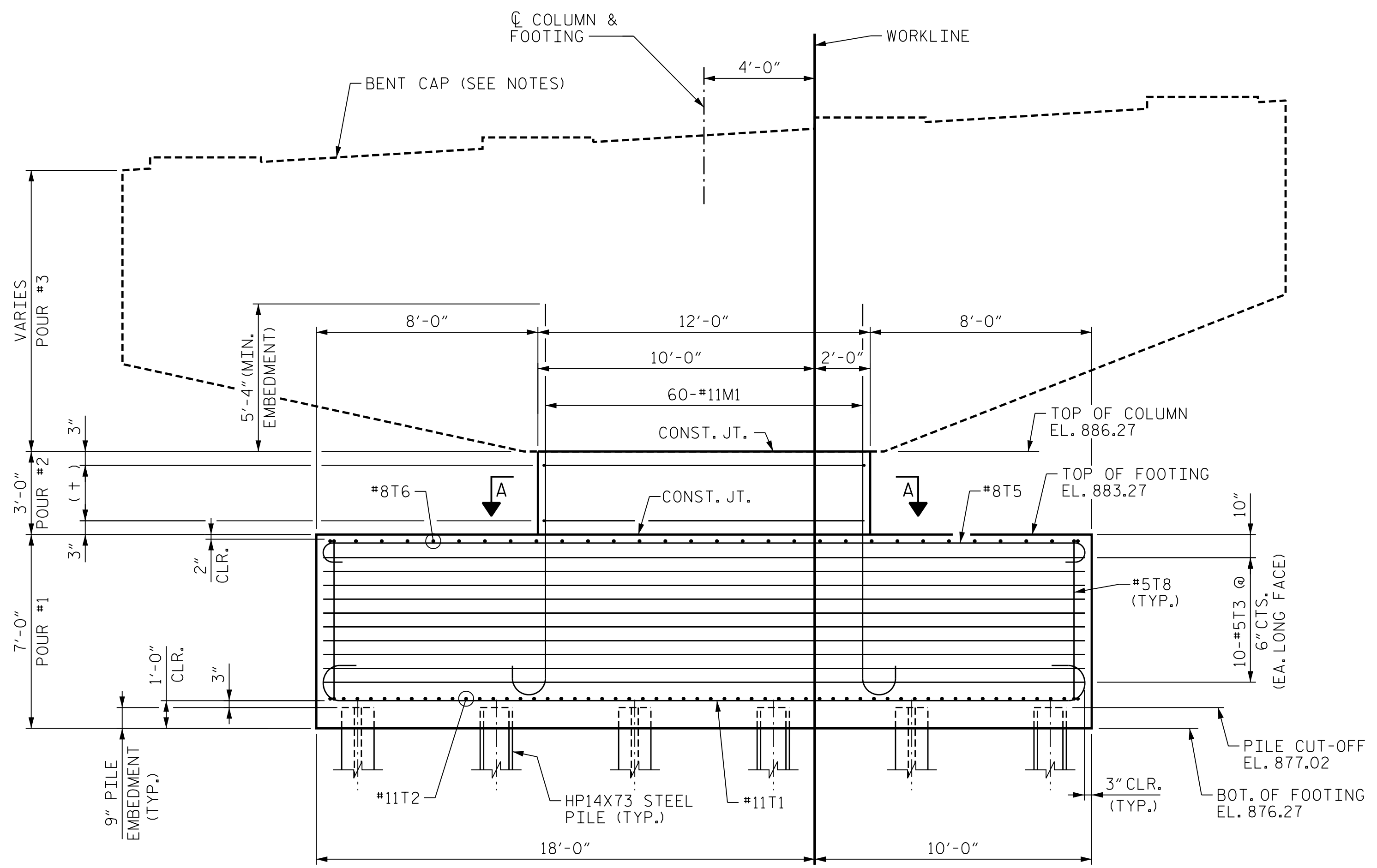
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NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS	
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2	--	--	4	--	--	129	



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLOT DRIVER: NCDOT...
 USER: PPETERSO
 DATE: 10/14/2021
 TIME: 5:24:13 PM
 FILE: ...SUBSTR

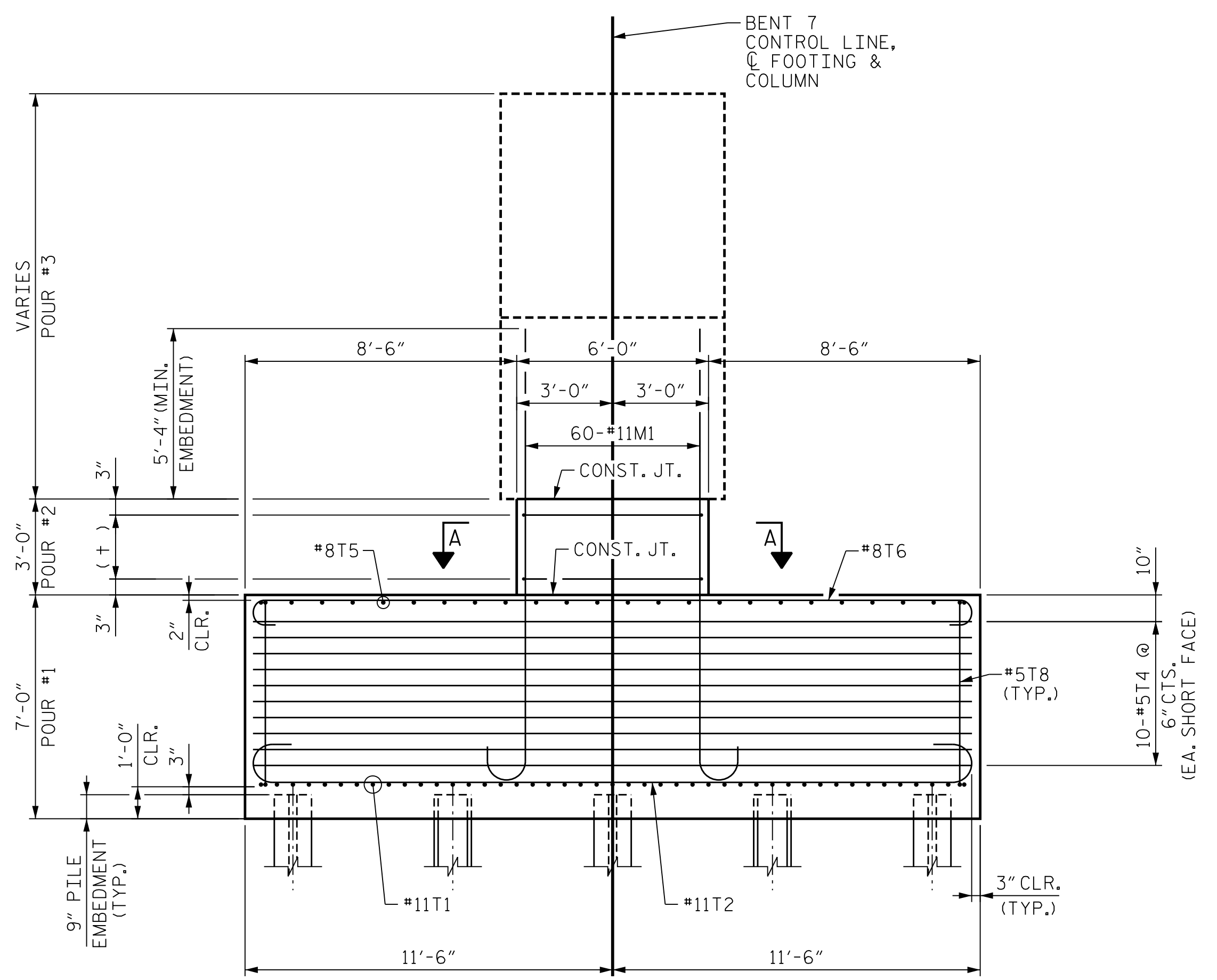
DES BY: K. OLIVER	DATE: 10/19	DWG BY: B. PETERSON	DATE: 12/19
DES CHK: M. WERNER	DATE: 10/19	CHK BY: N. LIU	DATE: 01/20



FRONT ELEVATION

+ = 6 SETS OF #5 TIES
 @ 6" MAX. CTS.
 (1 SET = 2-#5S100
 & 3-#5S101 *)

* INVERT ORIENTATION
 OF ALTERNATE #5S101



END ELEVATION

NOTES

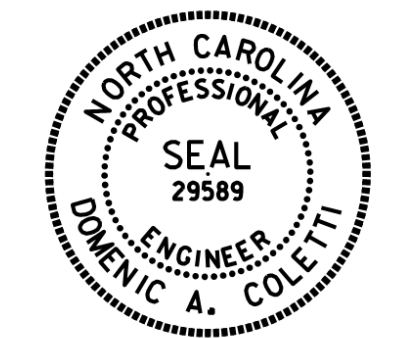
FOR FOOTING PLAN AND SECTION A-A, SEE "SUBSTRUCTURE BENT 7 FOOTING & COLUMN DETAILS", SHEET 2 OF 5.

FOR DETAILS OF BENT CAP, SEE "SUBSTRUCTURE BENT 7 BENT CAP PLAN AND ELEVATION", SHEET 3 OF 5 AND "SUBSTRUCTURE BENT 7 BENT CAP DETAILS", SHEET 4 OF 5.

FOR ADDITIONAL NOTES, SEE "SUBSTRUCTURE BENT 1 ELEVATIONS", SHEET 1 OF 6.

PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-

SHEET 1 OF 5



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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 BENT 7
 ELEVATIONS**

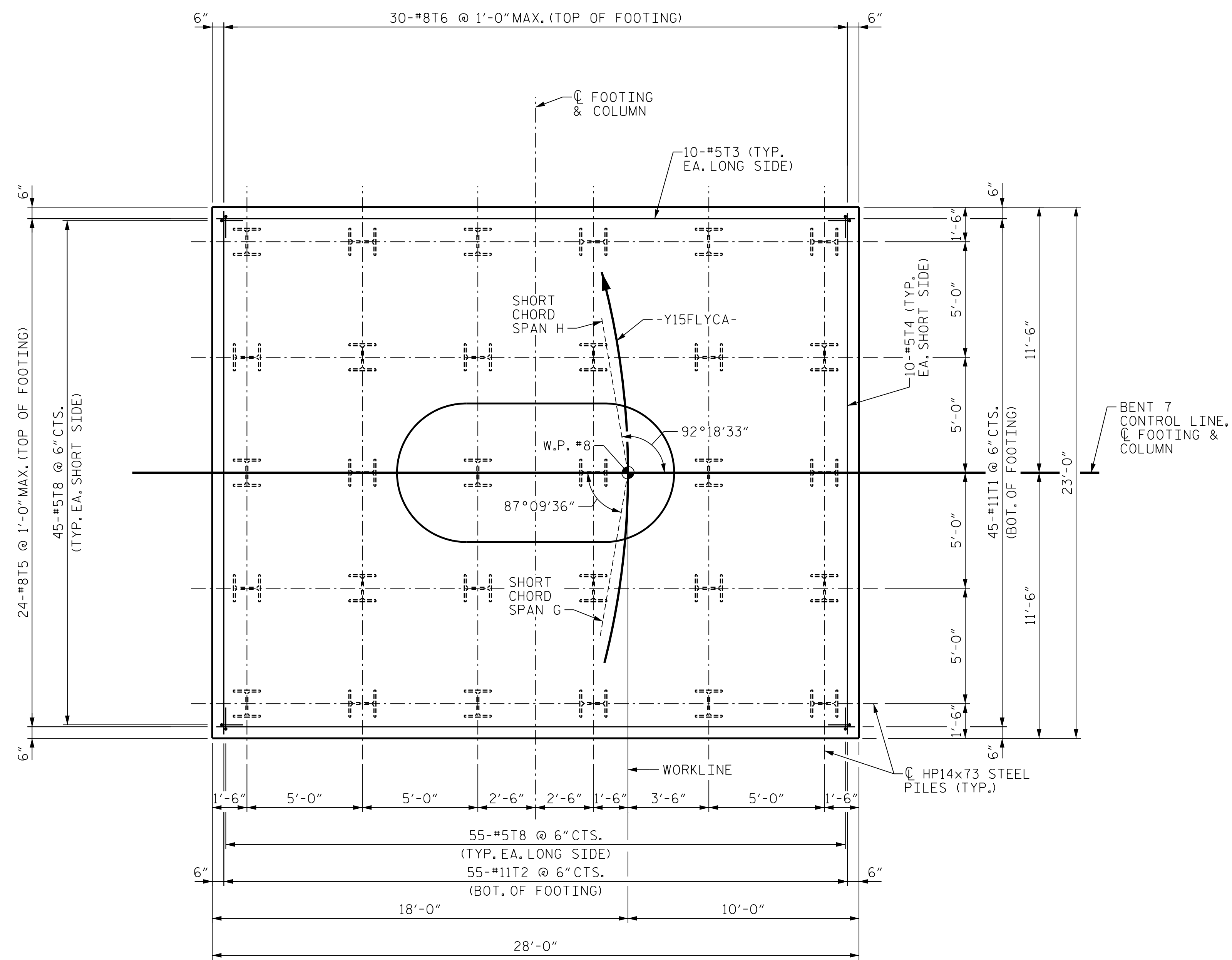
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2	--	--	4	--	--	129	



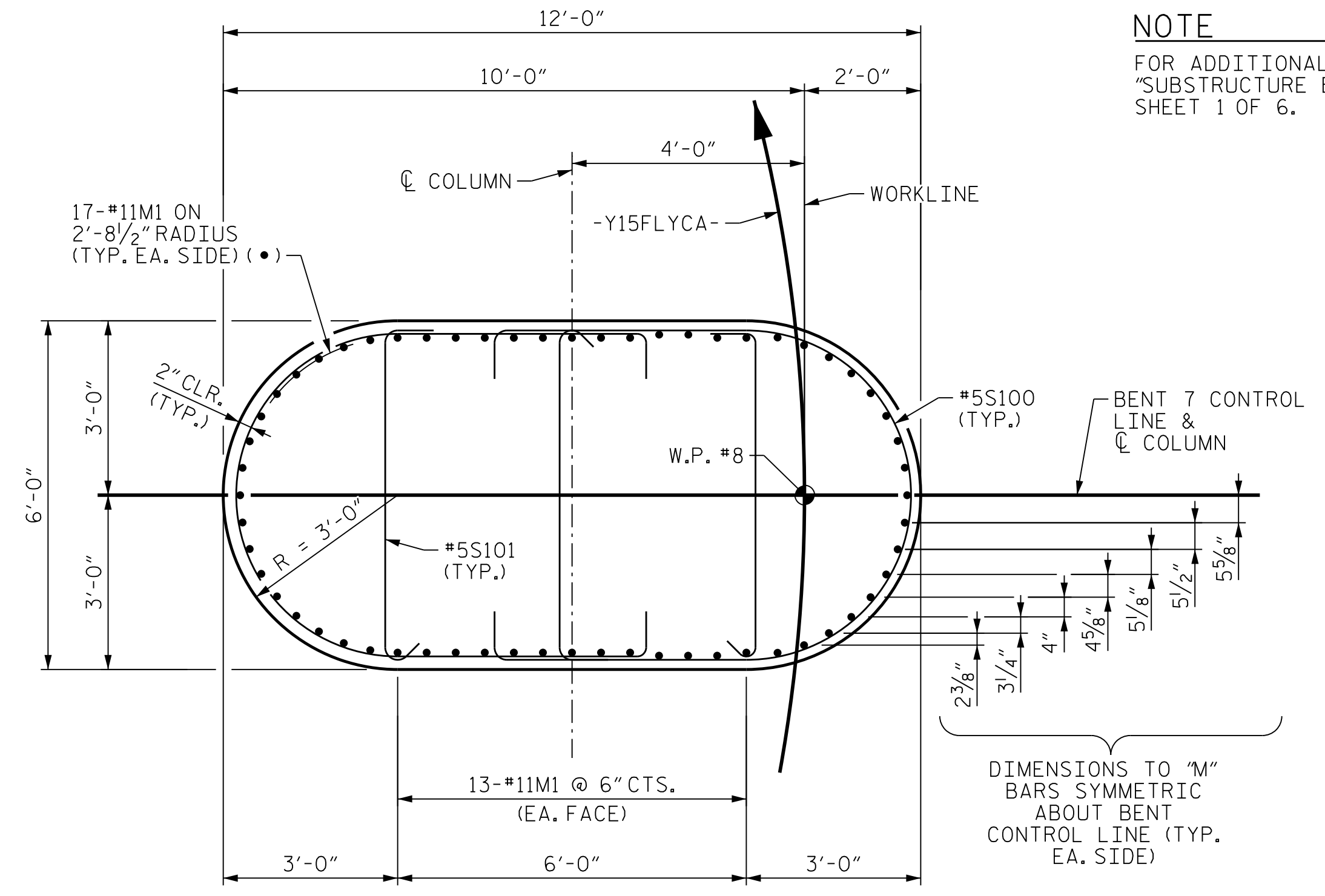
**DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED**

DES BY: <u>K. OLIVER</u>	DATE: <u>11/19</u>	DWG BY: <u>B. PETERSON</u>	DATE: <u>12/19</u>
DES CHK: <u>N. LIU</u>	DATE: <u>11/19</u>	CHK BY: <u>N. LIU</u>	DATE: <u>01/20</u>

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 USER: PPETERSO DATE: 10/14/2021 TIME: 5:24:34 PM
 FILE: ...SUBSTR



FOOTING PLAN



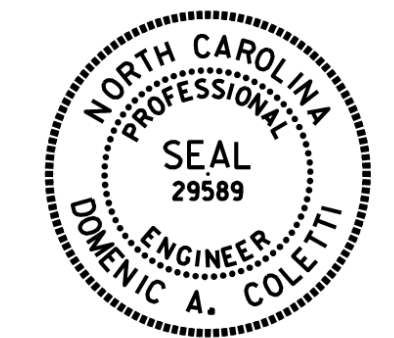
SECTION A-A

NOTE
FOR ADDITIONAL NOTES, SEE
"SUBSTRUCTURE BENT 1 ELEVATIONS",
SHEET 1 OF 6.

DIMENSIONS TO "M"
BARS SYMMETRIC
ABOUT BENT
CONTROL LINE (TYP.
EA. SIDE)

PLOT DRIVER: NCDOT... PENTABLE: NCDOT... USER: PPETERSO... DATE: 10/14/2021... FILE: ...SUBSTR

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 58+33.94 -Y15FLYCA-
SHEET 2 OF 5



Dominic A. Coletti 10/15/2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SUBSTRUCTURE
BENT 7
FOOTING & COLUMN
DETAILS**

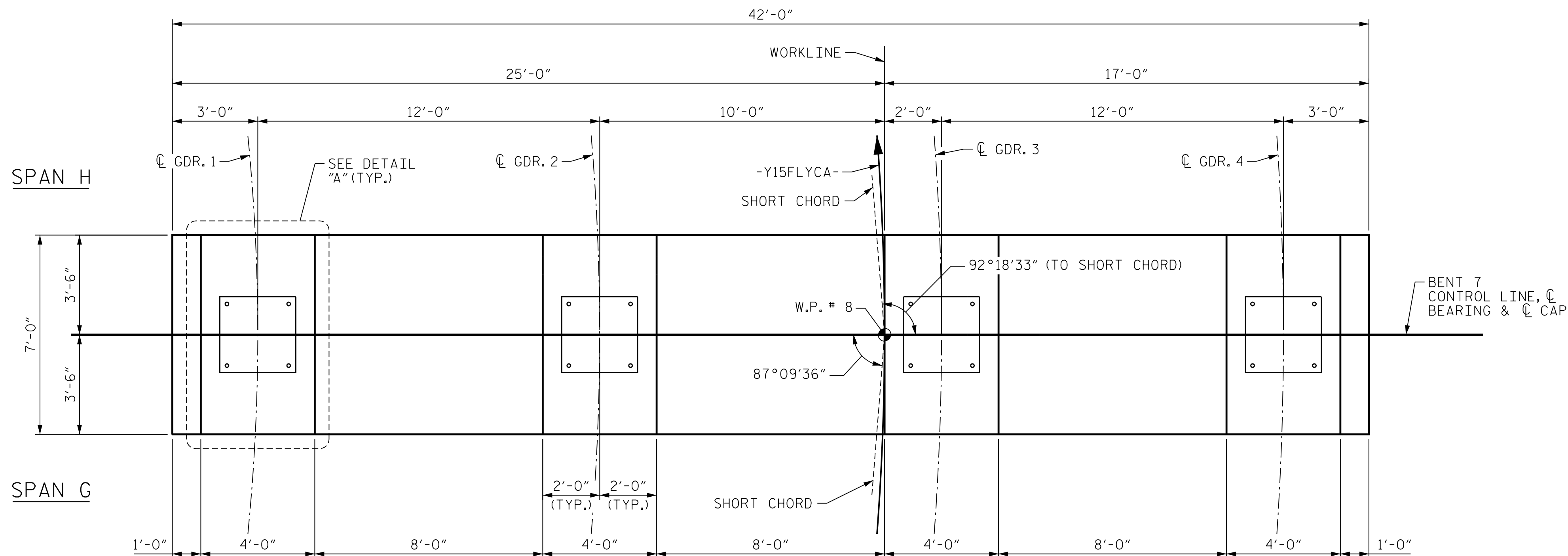
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DES CHK: N. LIU	DATE: 11/19	CHK BY: N. LIU	DATE: 01/20



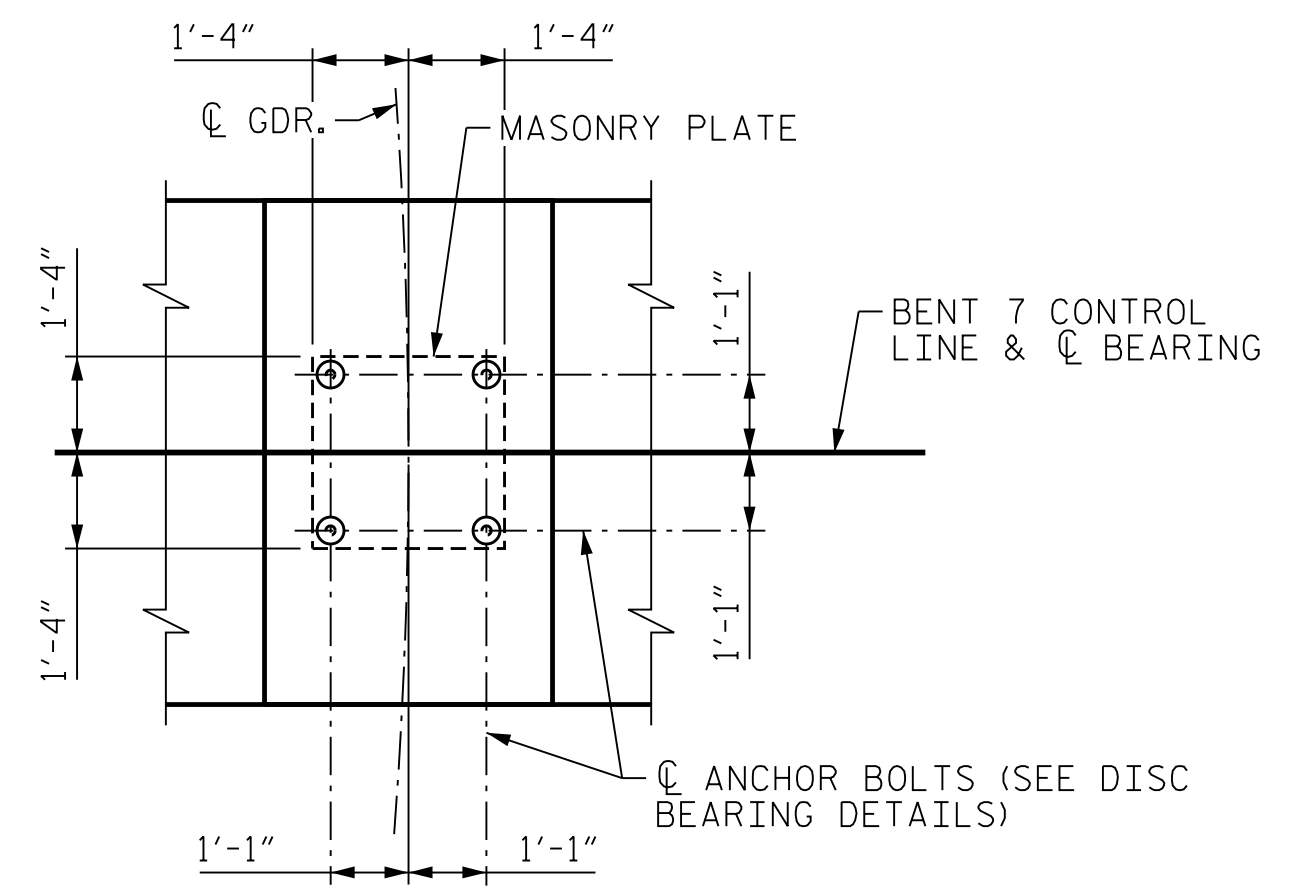
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

REVISIONS					
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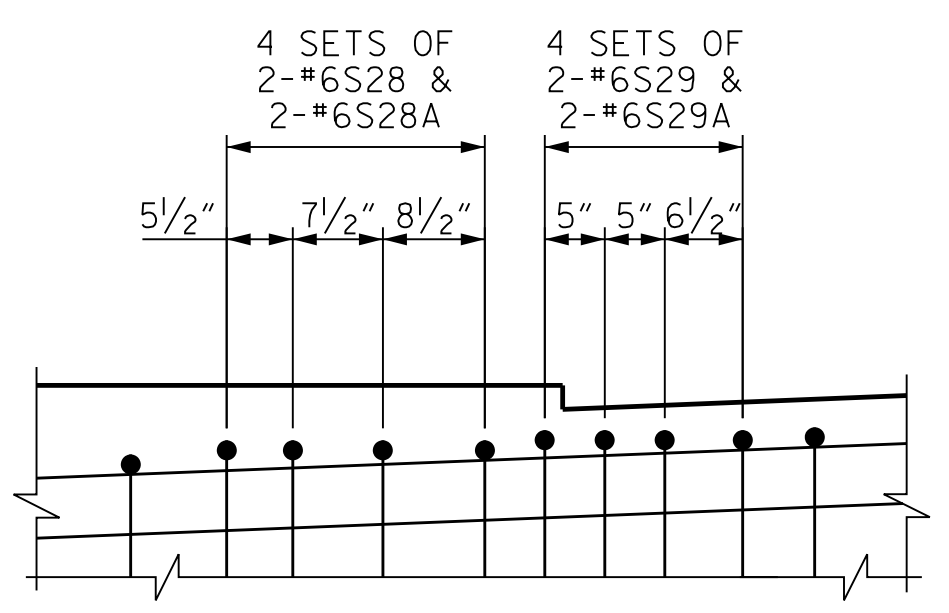
SHEET NO. 506-118
TOTAL SHEETS 129



PLAN OF CAP

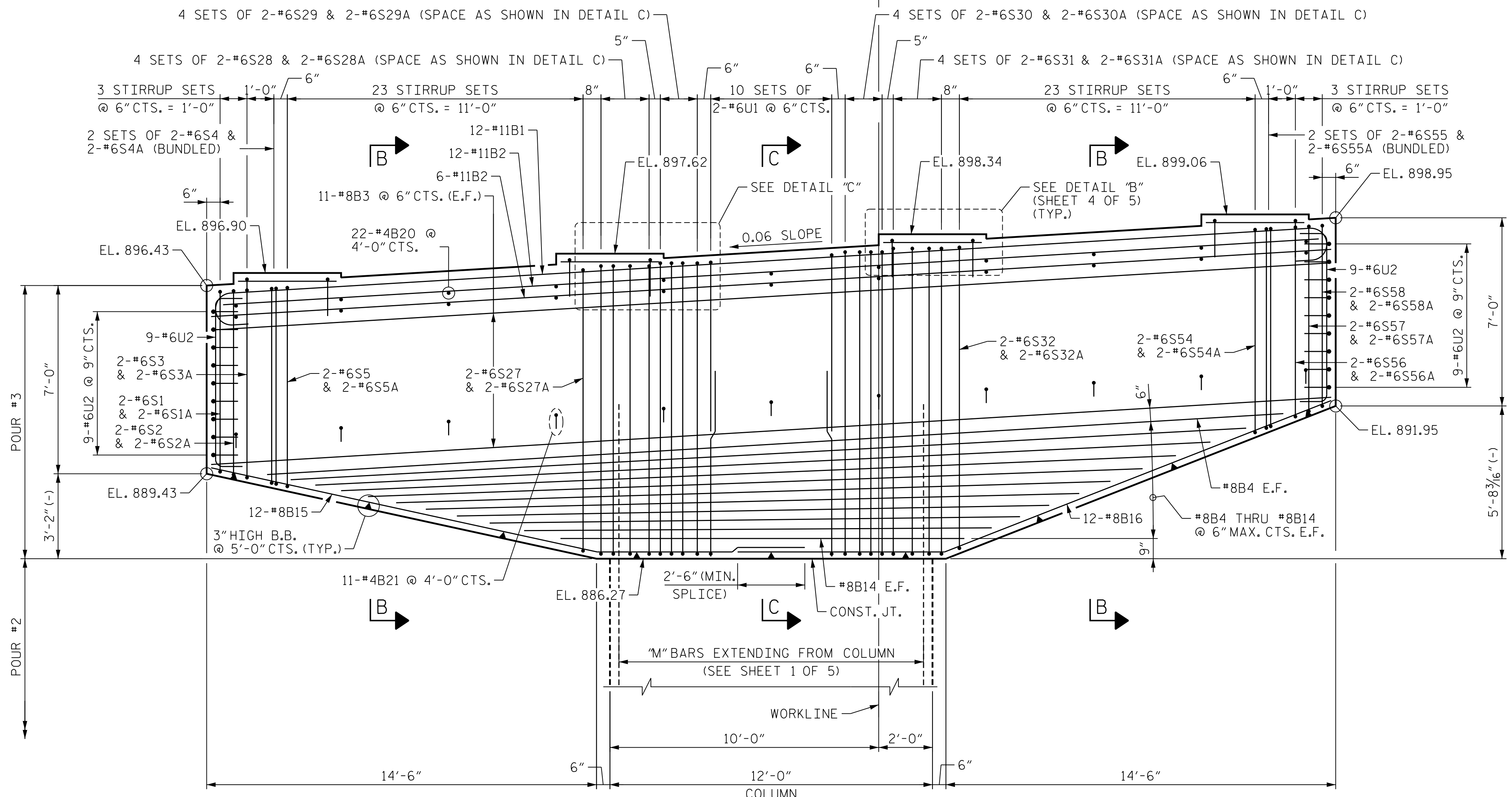


DETAIL "A"
(TYP. @ EA. BEARING)

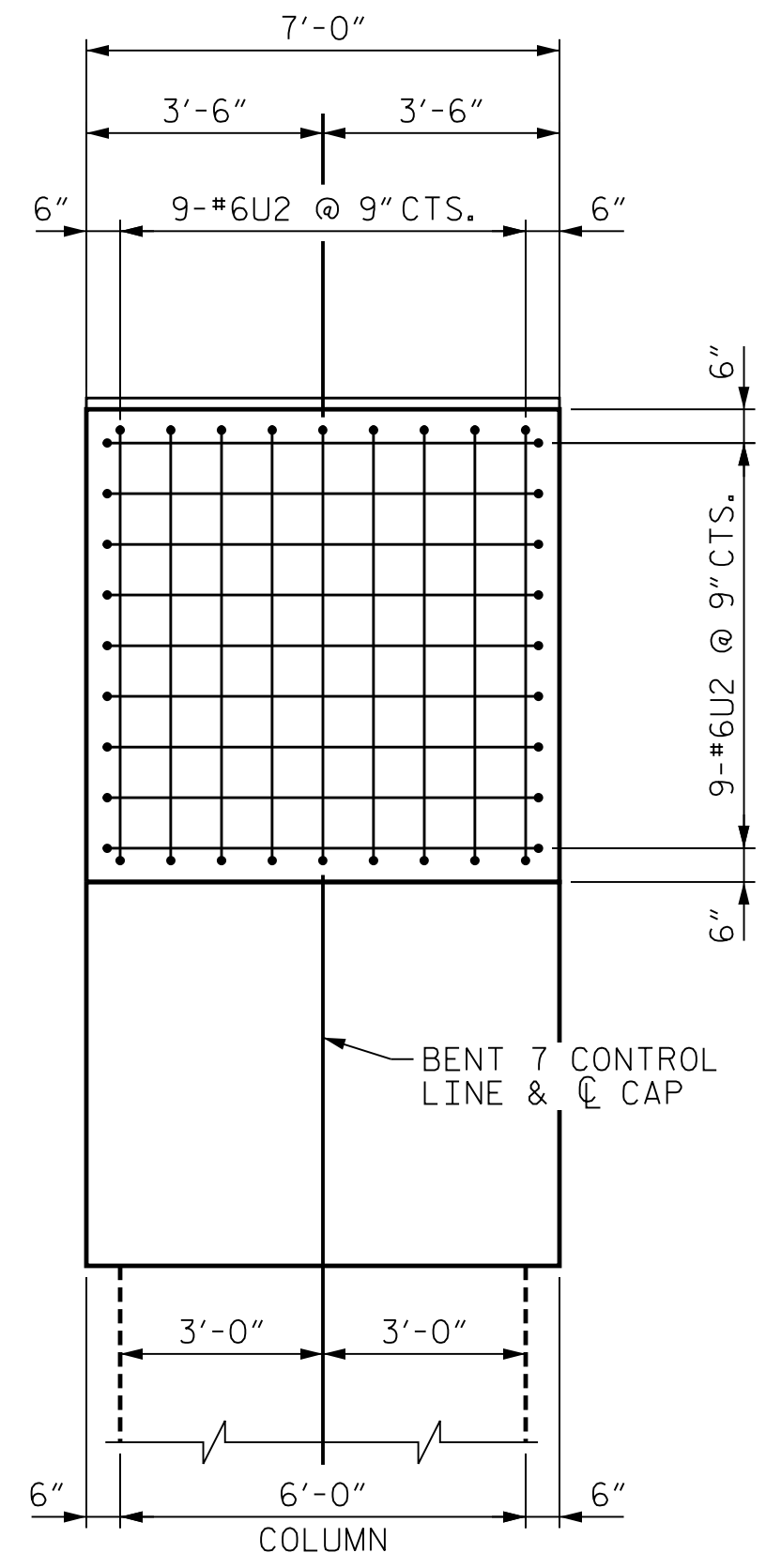


DETAIL "C"

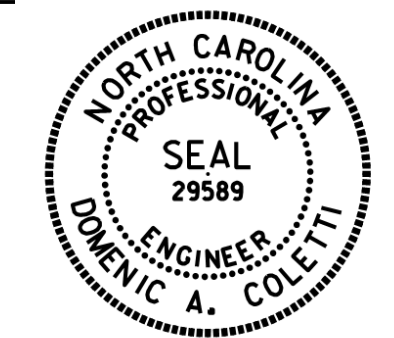
DETAIL SHOWN AT LEFT SIDE OF CAP (SPACING OF STIRRUPS MIRRORRED AT RIGHT SIDE OF CAP WITH BARS #6S30/#6S30A AND #6S31/#6S31A AS SHOWN ON THE ELEVATION)



ELEVATION OF CAP



END VIEW



PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-
 SHEET 3 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 BENT 7
 BENT CAP PLAN
 & ELEVATION

REVISIONS						SHEET NO. 506-119
NO.	BY:	DATE:	NO.	BY:	DATE:	
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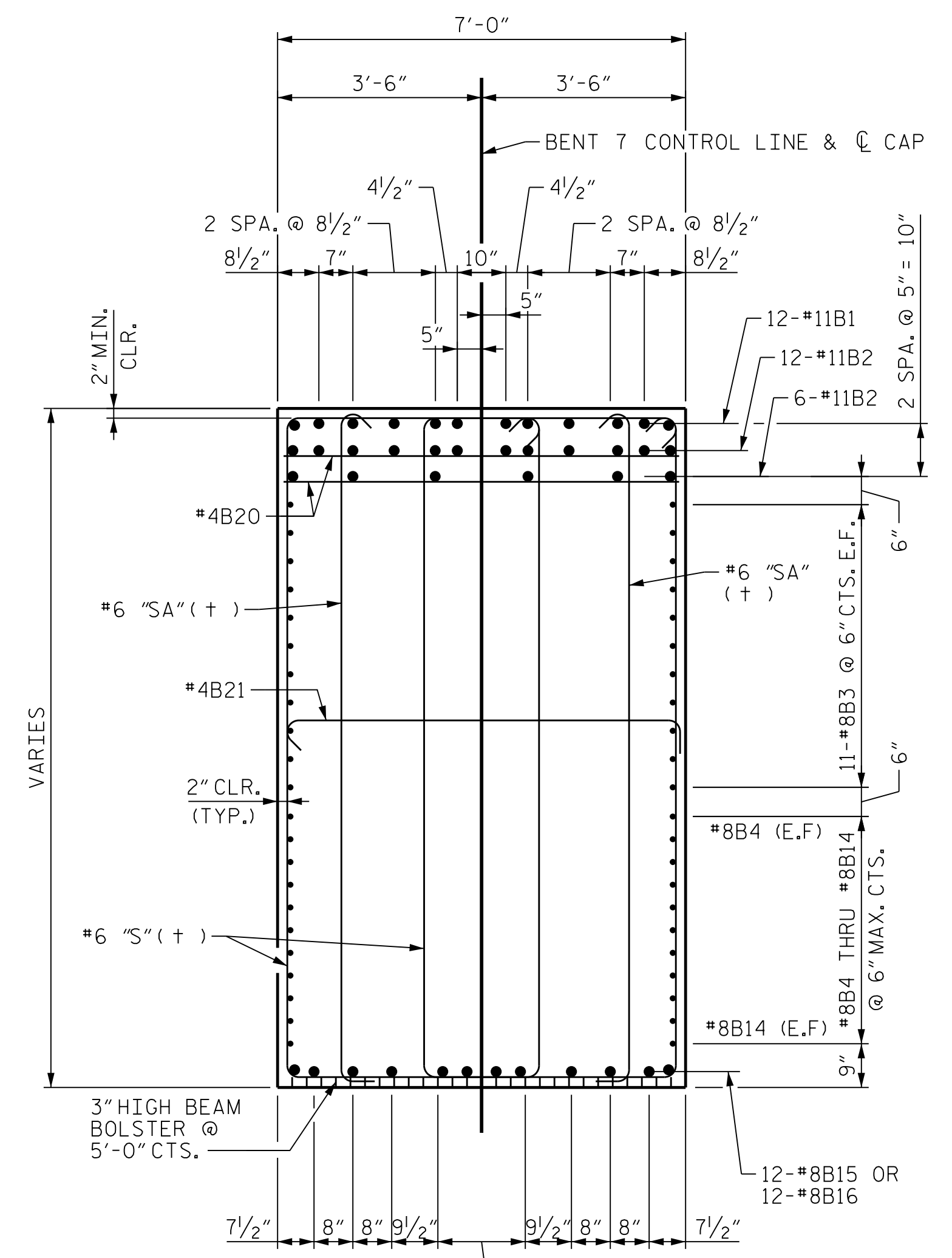
PLOT DRIVER: NCDOT_pdf_color_eng-50dpi
 USER: PPETERSO
 DATE: 10/14/2021
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DES BY: K. OLIVER	DATE: 10/19	DWG BY: B. PETERSON	DATE: 12/19
DES CHK: M. WERNER	DATE: 10/19	CHK BY: N. LIU	DATE: 01/20

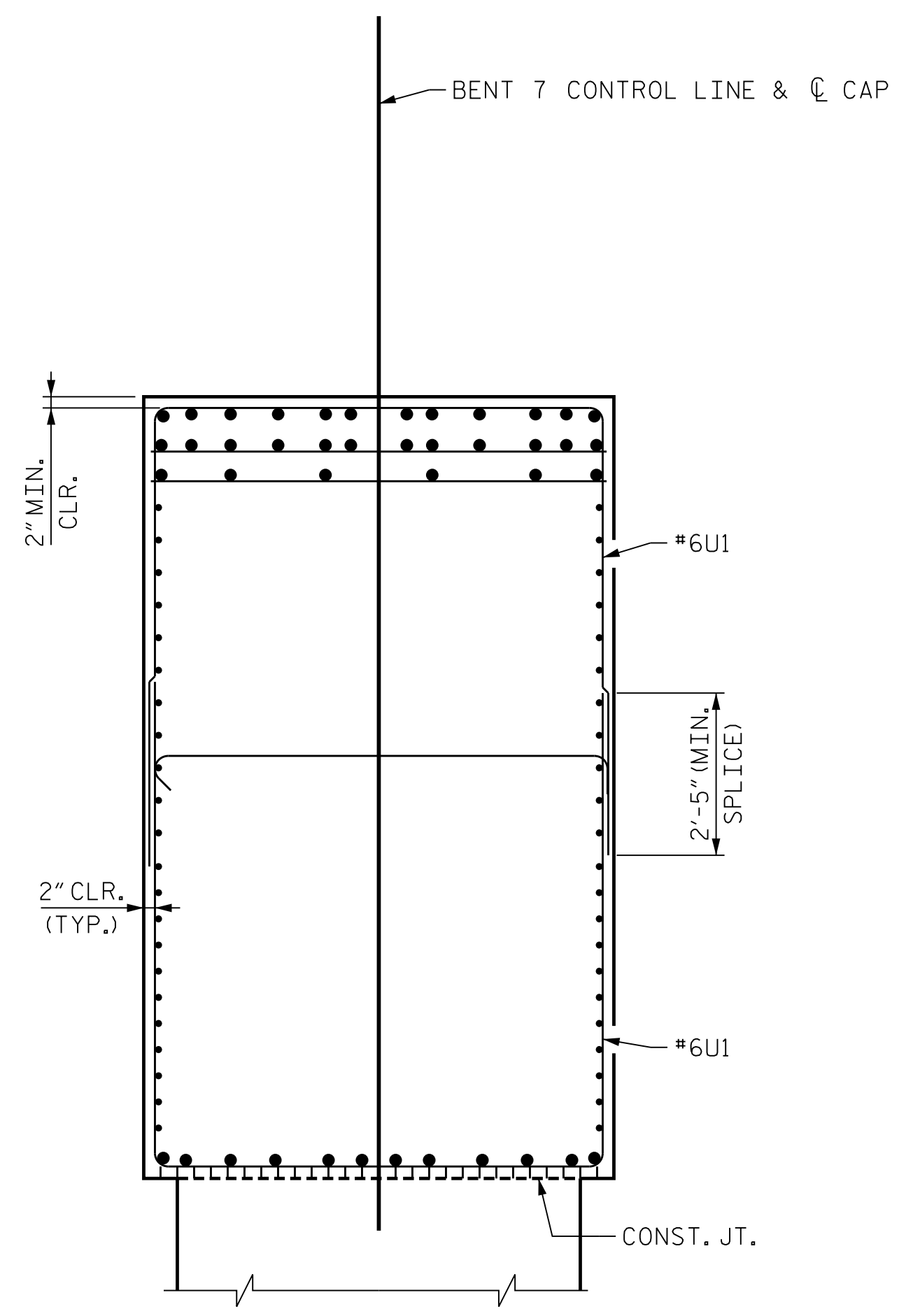
HDR HDR Engineering, Inc. of the Carolinas
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 N.C.B.E.L.S. License Number: F-0116

DOCUMENT NOT CONSIDERED FINAL
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NOTE
SEE SHEET 1 OF 5 FOR NOTES.

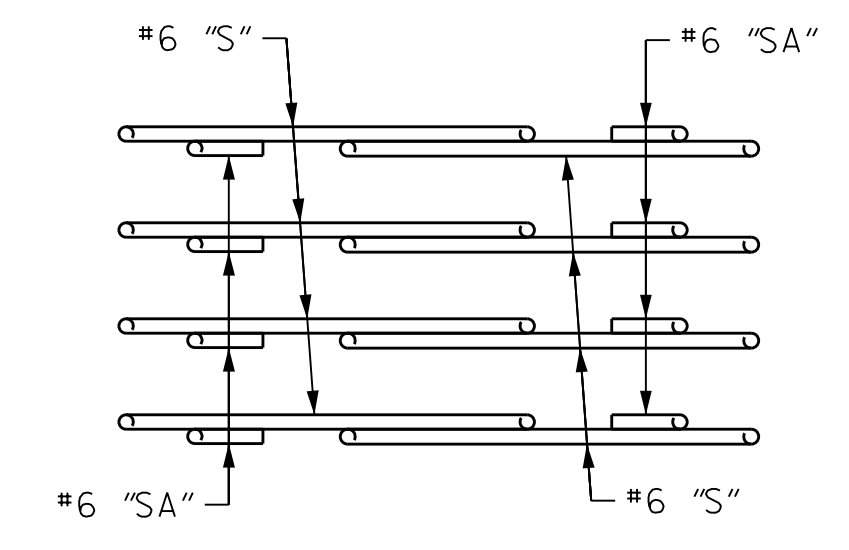


SECTION B-B
(+) SEE "STIRRUP SET DETAIL"

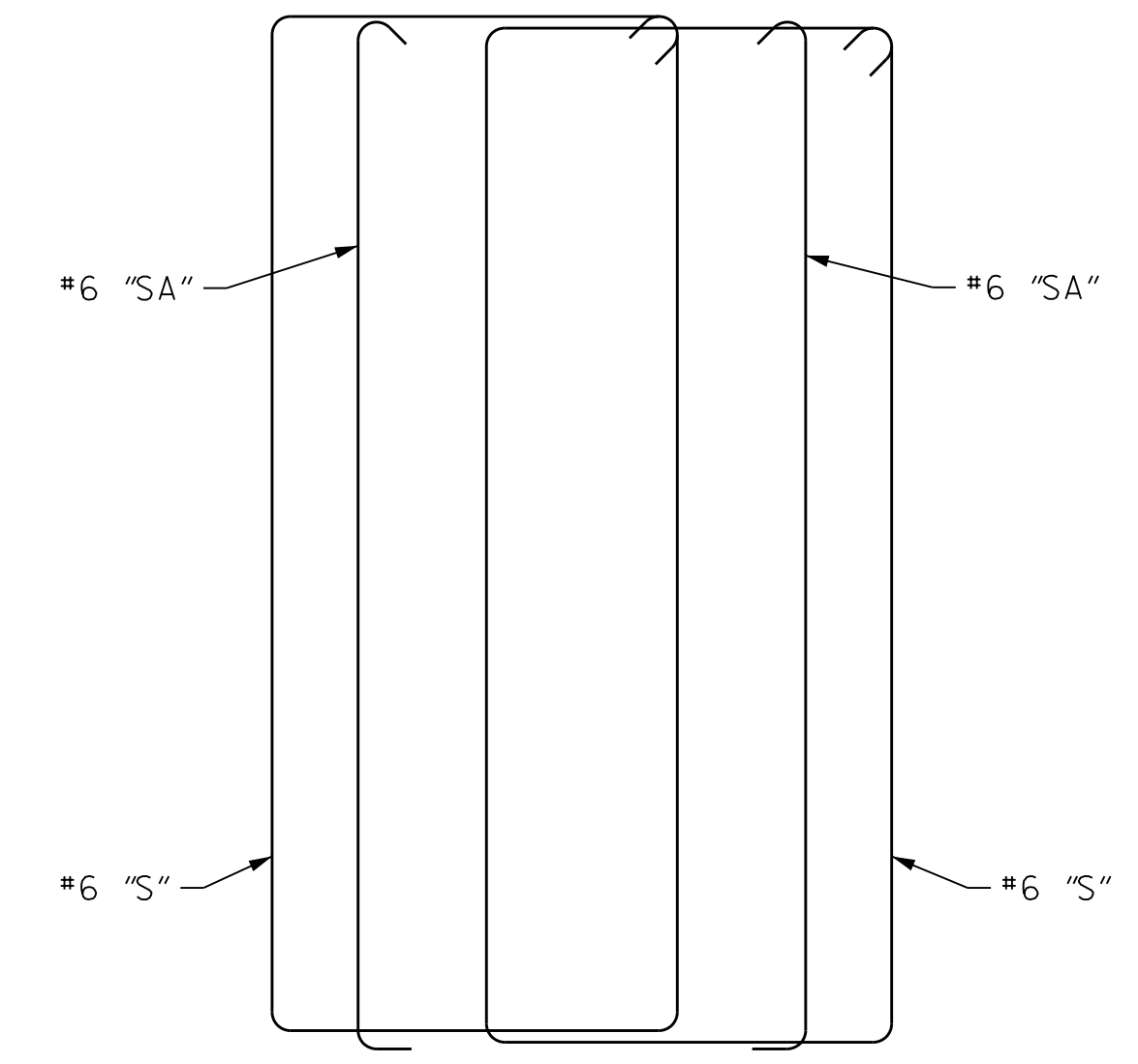


SEE SECTION B-B FOR ADDITIONAL INFORMATION

SECTION C-C
COLUMN REINFORCING STEEL NOT SHOWN FOR CLARITY

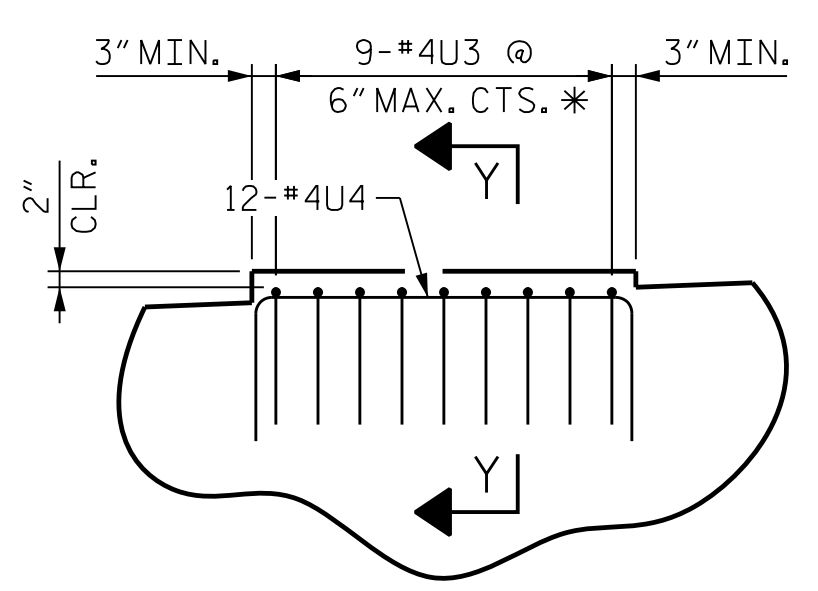


PLAN
(SHOWING BAR PLACEMENT)

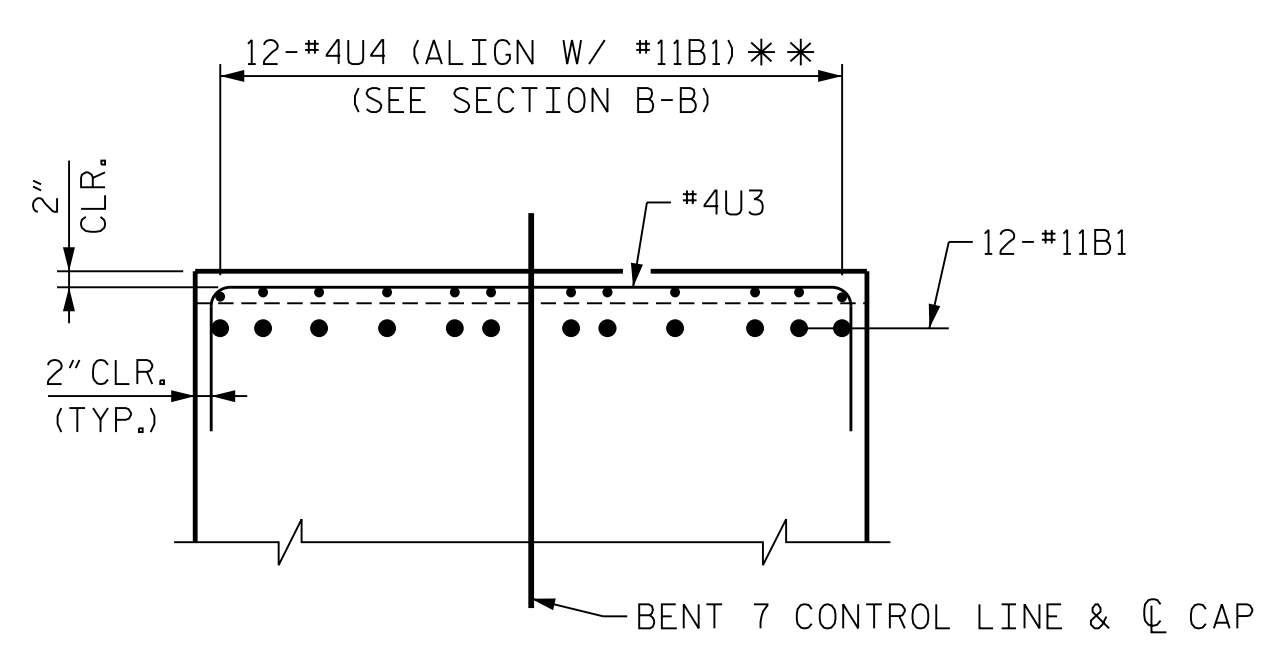


ELEVATION
(SCHEMATIC)

STIRRUP SET DETAIL



DETAIL "B"

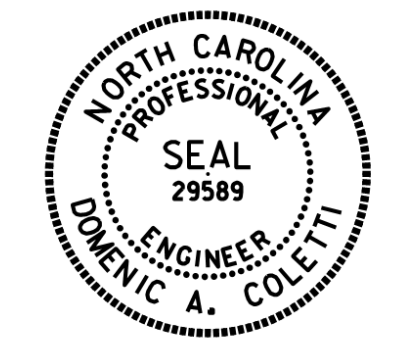


SECTION Y-Y

* NOTE:
#4U3 BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR ANCHOR BOLTS.

** NOTE:
#4U4 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR #11B1 AND #11B2 BARS.

PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-
 SHEET 4 OF 5



10/15/2021

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 BENT 7
 CAP DETAILS

REVISIONS						SHEET NO. 506-120 TOTAL SHEETS 129
NO.	BY:	DATE:	NO.	BY:	DATE:	
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2	--	--	4	--	--	



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

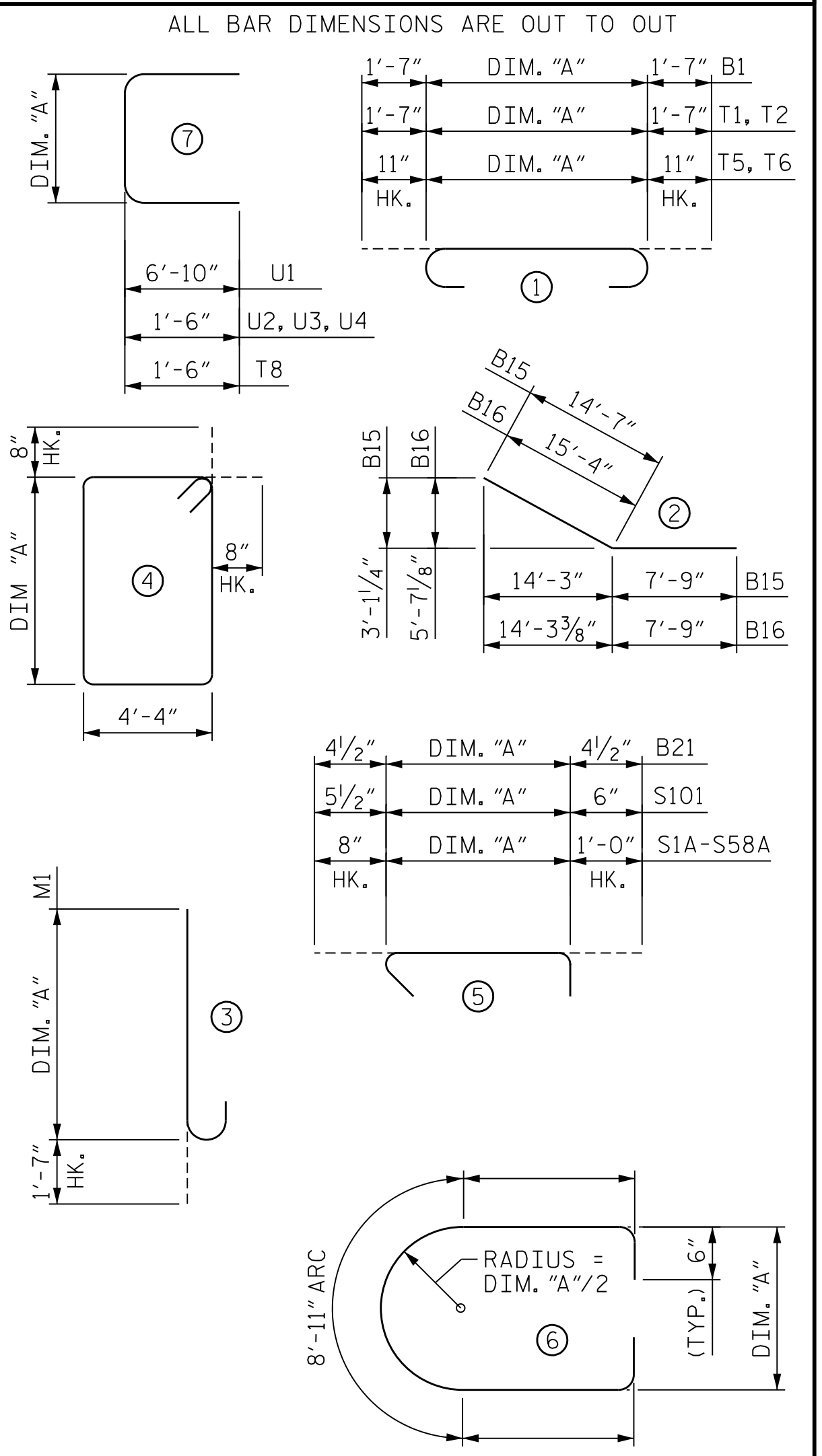
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DES BY: K. OLIVER	DATE: 10/19	DWG BY: B. PETERSON	DATE: 12/19
DES CHK: M. WERNER	DATE: 10/19	CHK BY: N. LIU	DATE: 01/20

BILL OF MATERIAL - BENT 7

Table with columns: BAR NO., SIZE, TYPE, DIM. 'A', LENGTH, WEIGHT, BAR NO., SIZE, TYPE, DIM. 'A', LENGTH, WEIGHT, BAR NO., SIZE, TYPE, DIM. 'A', LENGTH, WEIGHT. Includes bar list and summary of quantities.

BAR TYPES



SUMMARY OF QUANTITIES - BENT 7

Summary table with columns: Item, Units, Quantity. Includes Reinforcing Steel (49,477 lbs), Class AA Concrete (283.2 c.y.), and HP14x73 Piles (30 no., 600 lf).

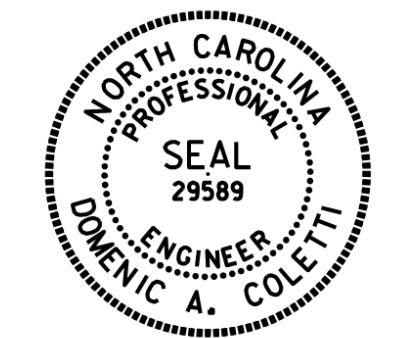
NOTE SEE SHEET 1 OF 5 FOR NOTES.

PROJECT NO. U-2579AB FORSYTH COUNTY STATION: 58+33.94 -Y15FLYCA-

SHEET 5 OF 5

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

SUBSTRUCTURE BENT 7 BILL OF MATERIALS

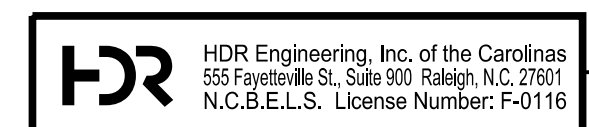


Domini A. Coletti 10/15/2021

Revisions table with columns: NO., BY, DATE, NO., BY, DATE. Shows three revisions.

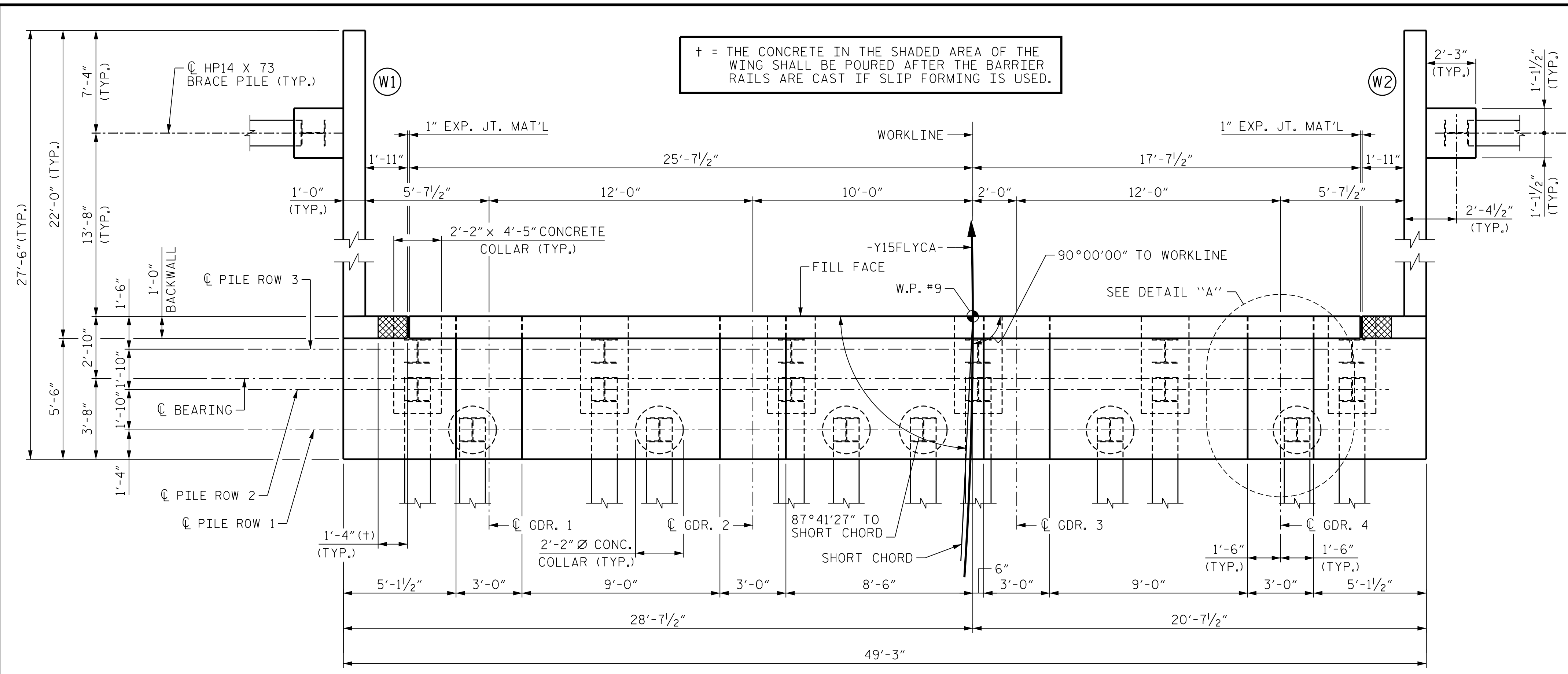
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DES BY: P. STOEHR DATE: 11/19 DWG BY: B. PETERSON DATE: 12/19 DES CHK: S. NIFONG DATE: 01/20 CHK BY: M. WERNER DATE: 01/20



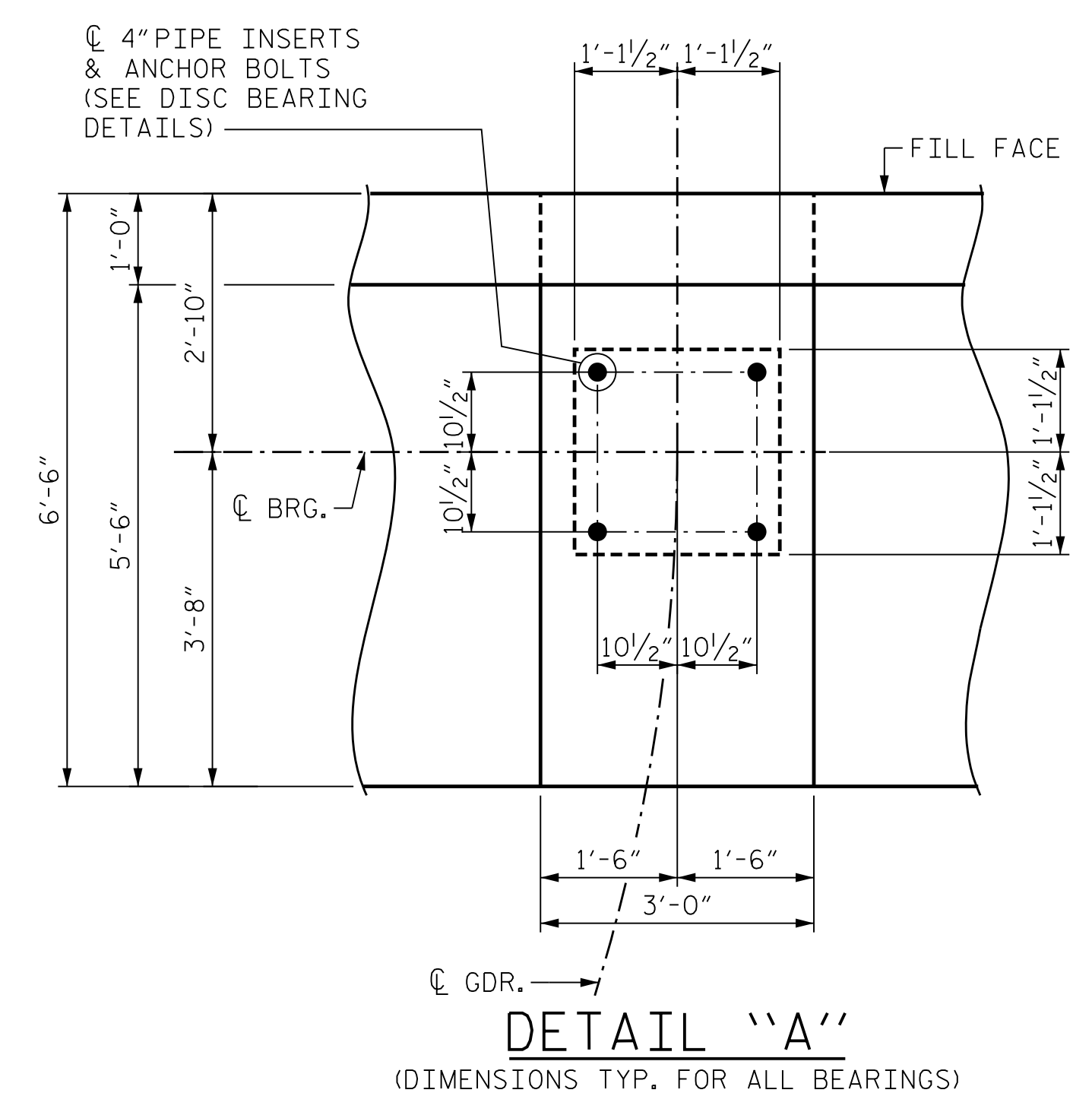
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SHEET NO. 506-121 TOTAL SHEETS 129

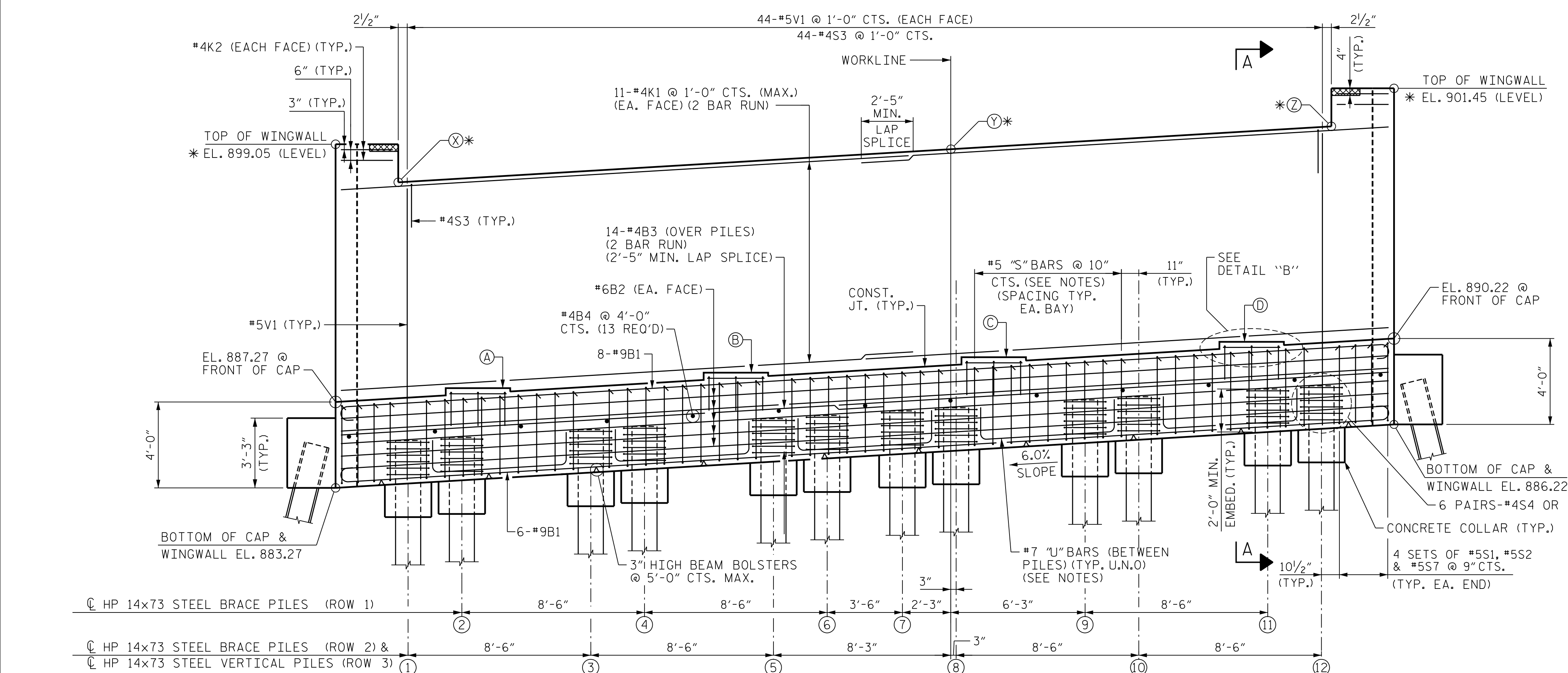


PLAN

NOTES
 FOR SECTION A-A AND ADDITIONAL NOTES SEE "END BENT 2 SECTION & DETAILS".
 SEE "SUBSTRUCTURE END BENT 2" SHEET 2 OF 4 FOR SPACING AND BAR MARKS OF #4 "S" BARS AROUND PILES, #5 STIRRUPS AND #7 "U" BARS.



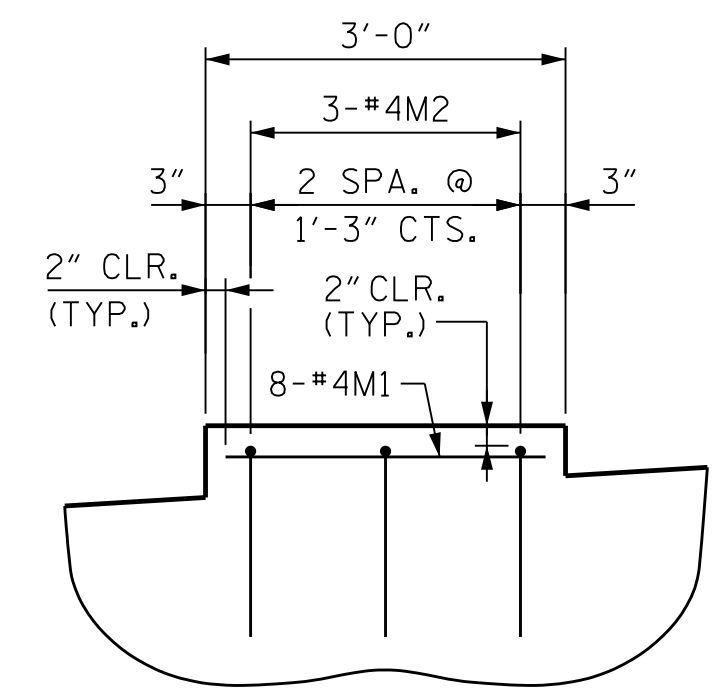
DETAIL "A"
 (DIMENSIONS TYP. FOR ALL BEARINGS)



ELEVATION

ELEVATION TABLE

LOCATION	ELEVATION
A	887.92
B	888.64
C	889.36
D	890.08
* X	897.29
* Y	898.83
* Z	899.88
* AT FILL FACE	



DETAIL "B"
 (TYP. FOR ALL GIRDERS)

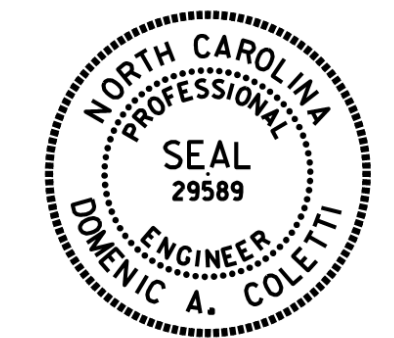
TOP OF PILE ELEVATIONS

LOCATION	ELEVATION
1	885.51
2	885.66
3	886.02
4	886.17
5	886.53
6	886.68
7	886.89
8	887.04
9	887.40
10	887.55
11	887.91
12	888.06

PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-
 SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 END BENT 2
 PLAN AND ELEVATION**



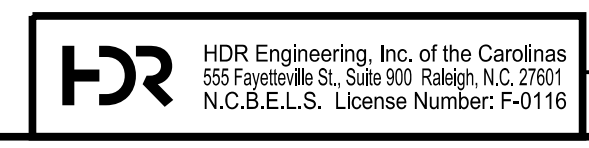
10/15/2021

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
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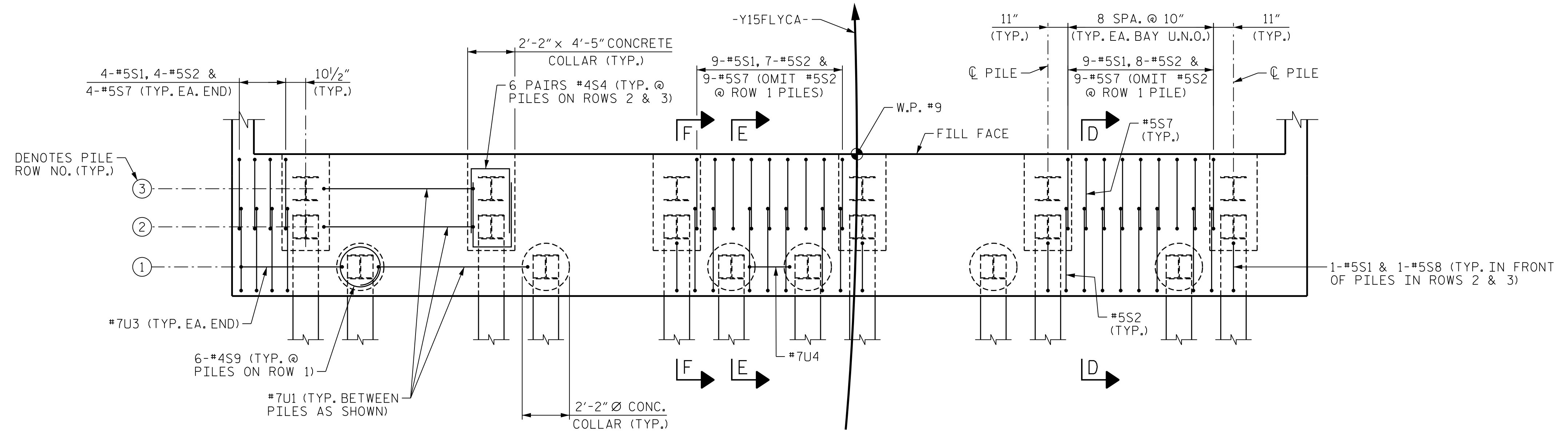
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DES BY: M. BARNES	DATE: 07/19	DWG BY: B. PETERSON	DATE: 07/19
DES CHK: J. EARNEST	DATE: 07/19	CHK BY: J. EARNEST	DATE: 08/19

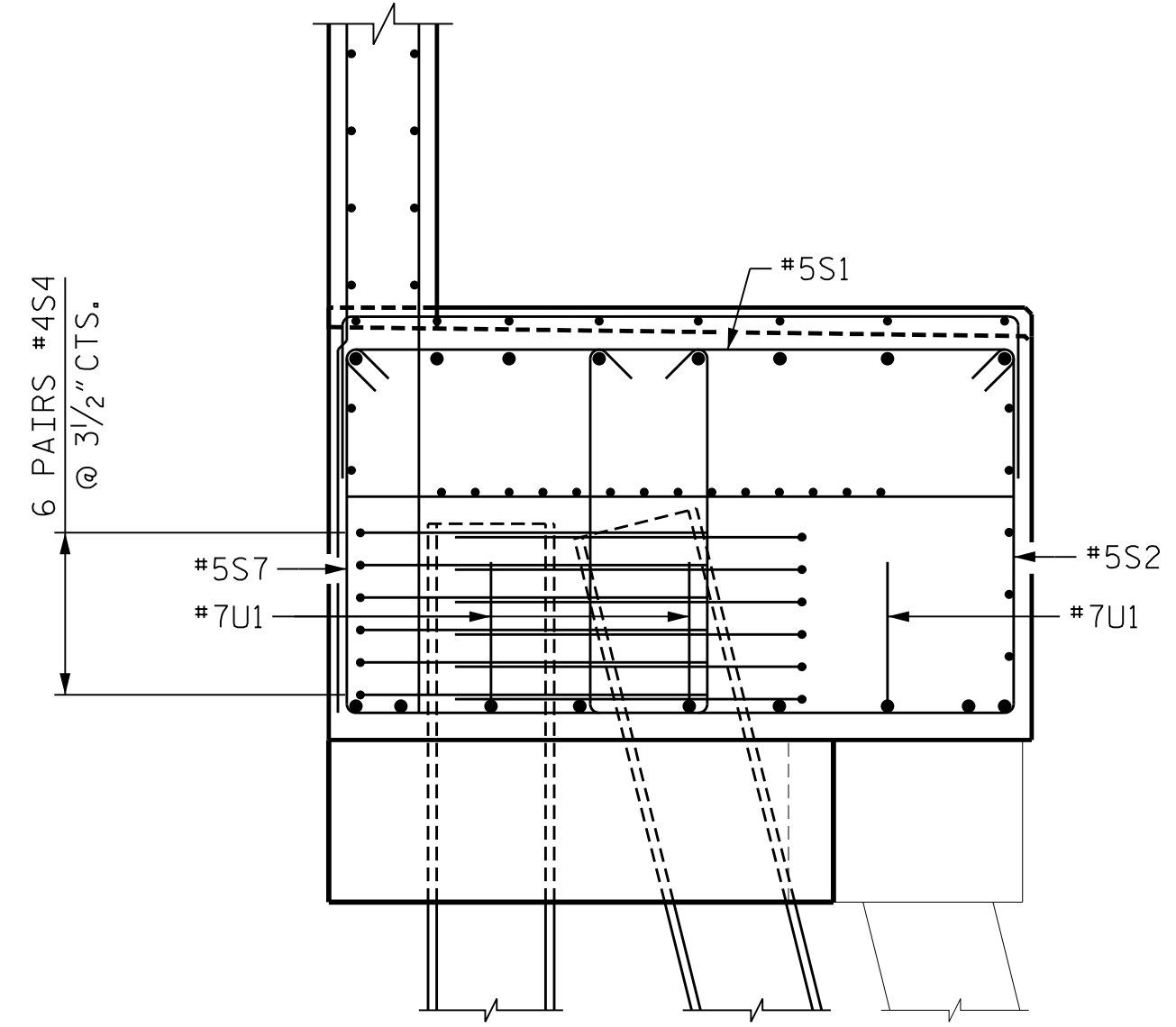


DOCUMENT NOT CONSIDERED FINAL
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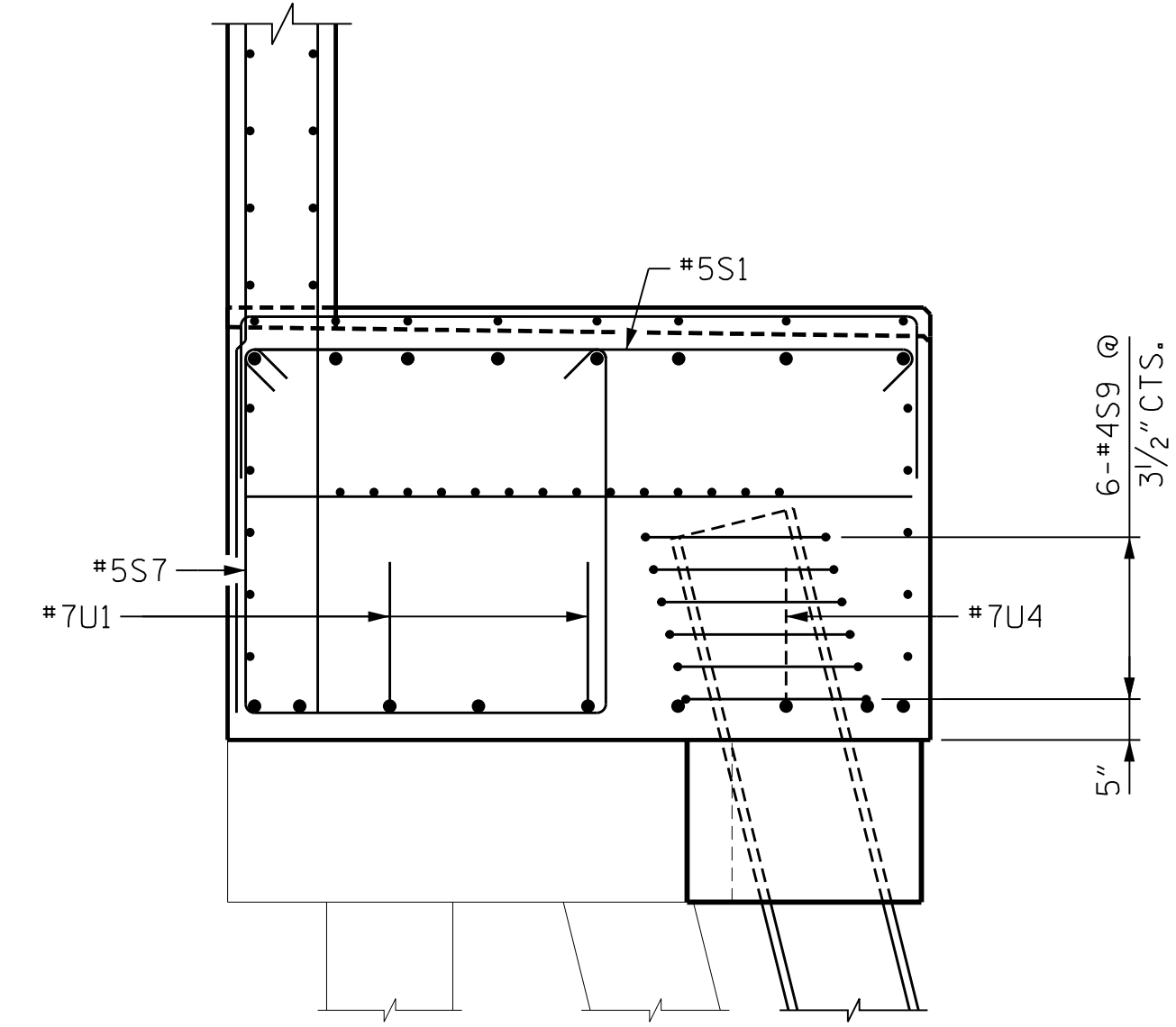
SHEET NO. 506-122
TOTAL SHEETS 129



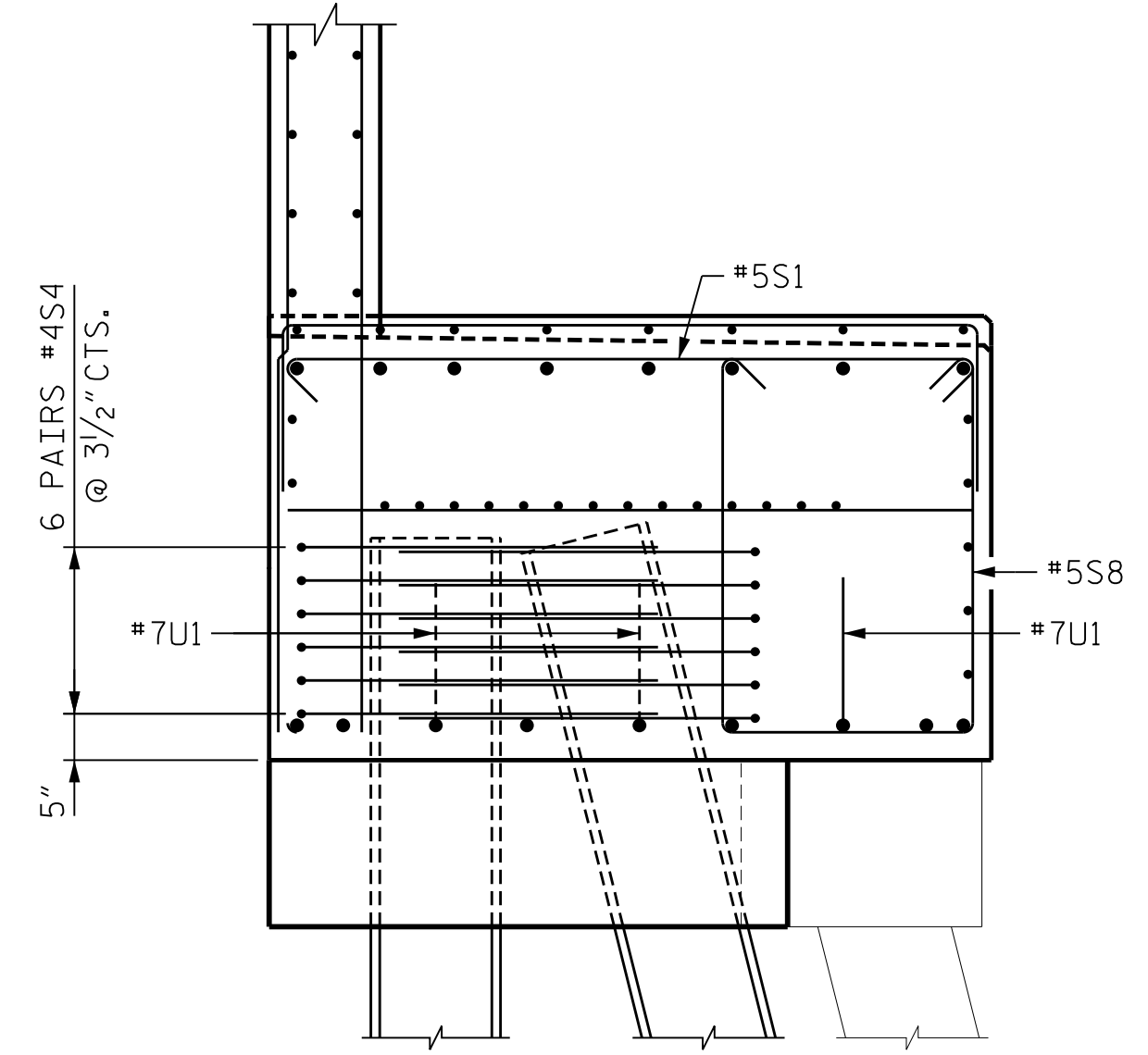
PLAN OF STIRRUPS AND "U" BARS
(TOP & BOTTOM "B" BARS AND S1 BARS NOT SHOWN FOR CLARITY)



SECTION D-D
SEE SECTION A-A ON "SUBSTRUCTURE END BENT 2"
SHEET 4 OF 4 FOR MORE INFORMATION



SECTION E-E
SEE SECTION A-A ON "SUBSTRUCTURE END BENT 2"
SHEET 4 OF 4 FOR MORE INFORMATION

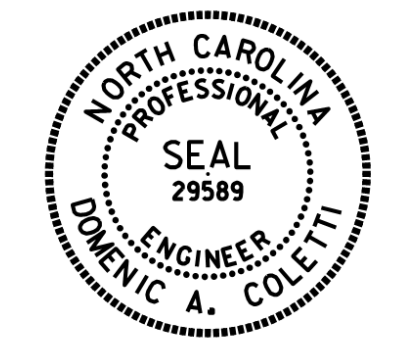


SECTION F-F
SEE SECTION A-A ON "SUBSTRUCTURE END BENT 2"
SHEET 4 OF 4 FOR MORE INFORMATION

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 58+33.94 -Y15FLYCA-
SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SUBSTRUCTURE
END BENT 2
PLAN AND ELEVATION**

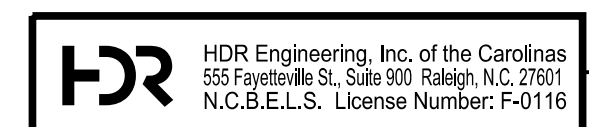


Dominic A. Coletti 10/15/2021

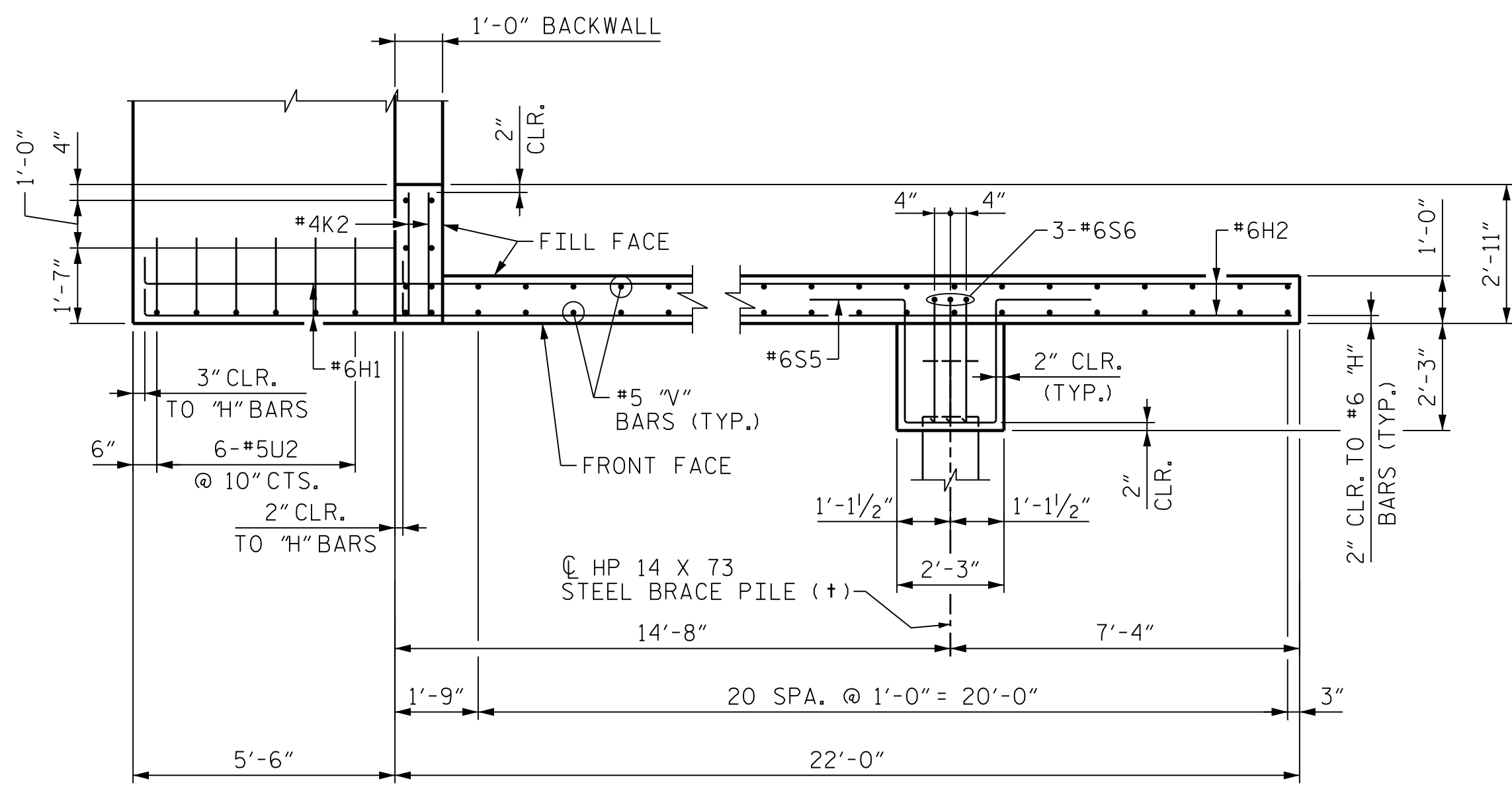
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NO.	BY:	DATE:	NO.	BY:	DATE:	
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 USER: PPETERSO DATE: 10/14/2021
 FILE: ...SUBSTR

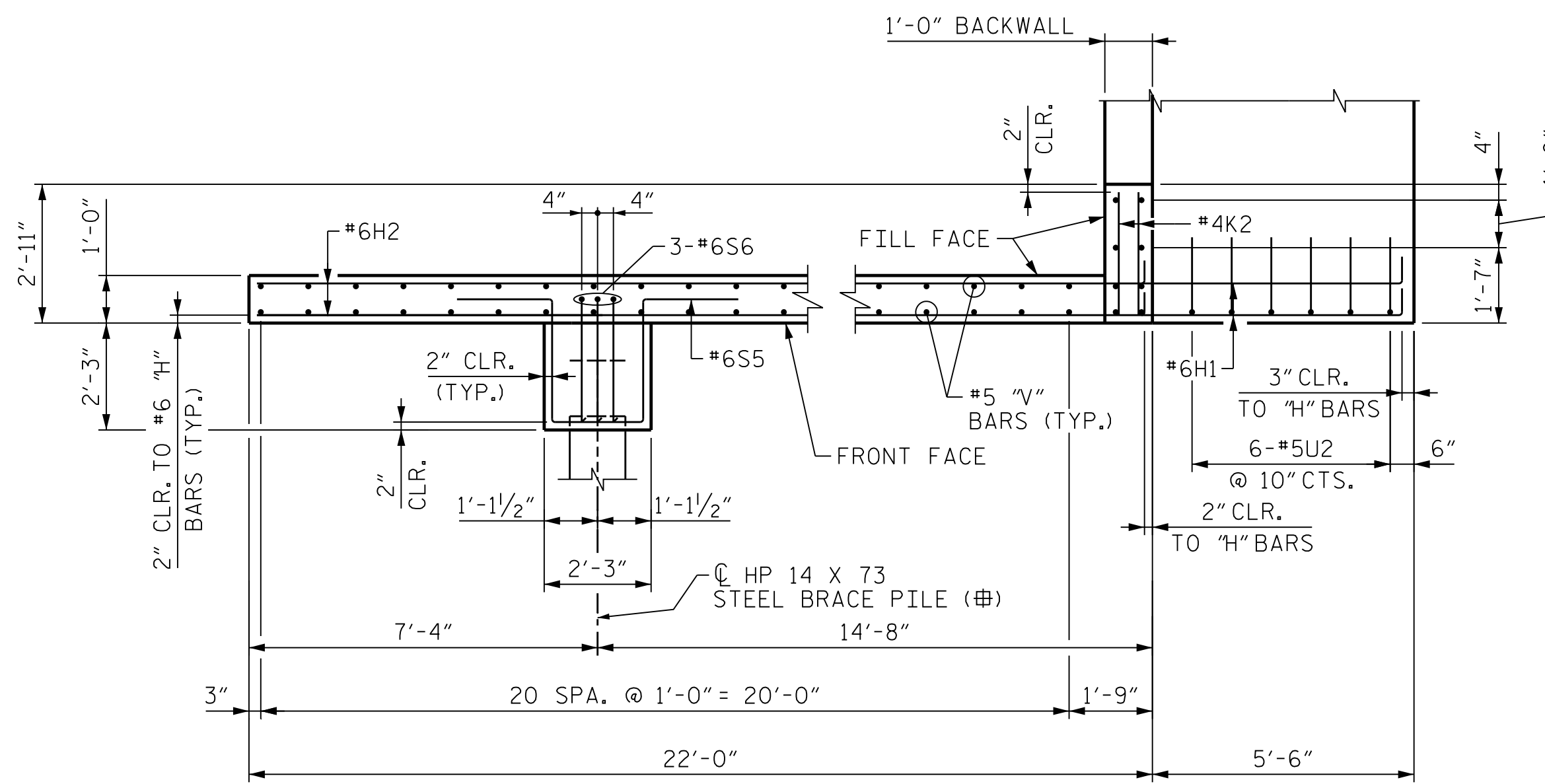
DES BY: <u>M. BARNES</u>	DATE: <u>07/19</u>	DWG BY: <u>B. PETERSON</u>	DATE: <u>08/19</u>
DES CHK: <u>J. EARNEST</u>	DATE: <u>07/19</u>	CHK BY: <u>J. EARNEST</u>	DATE: <u>08/19</u>



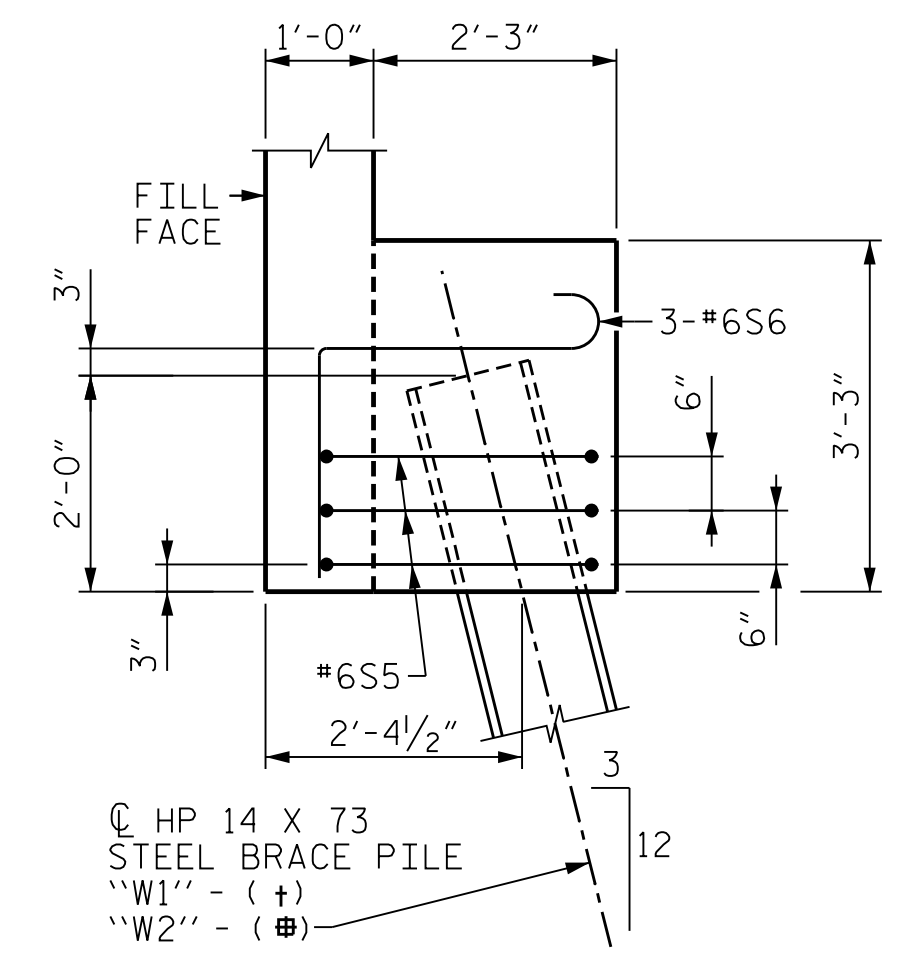
**DOCUMENT NOT CONSIDERED FINAL
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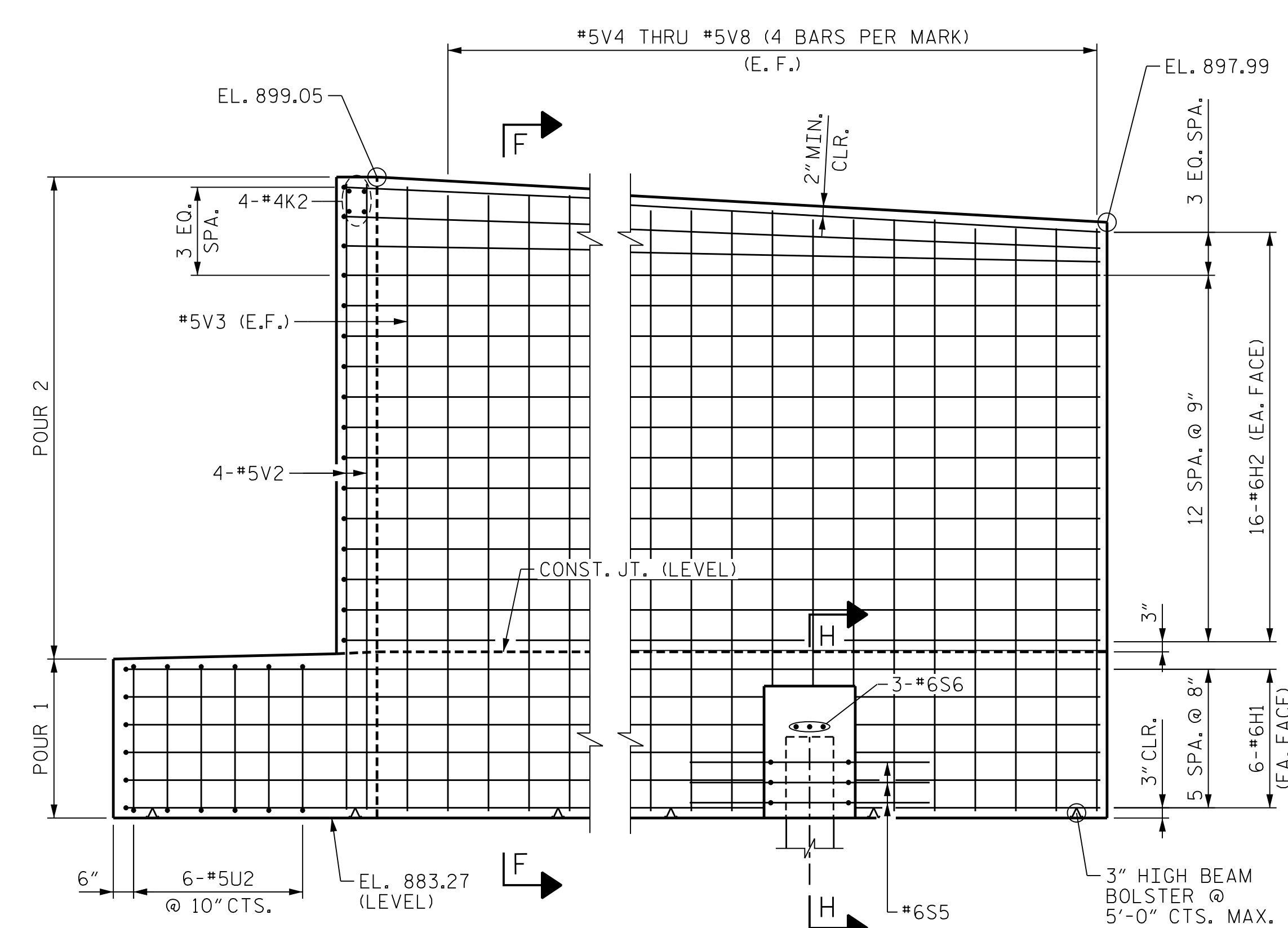
PLAN - WINGWALL "W1"



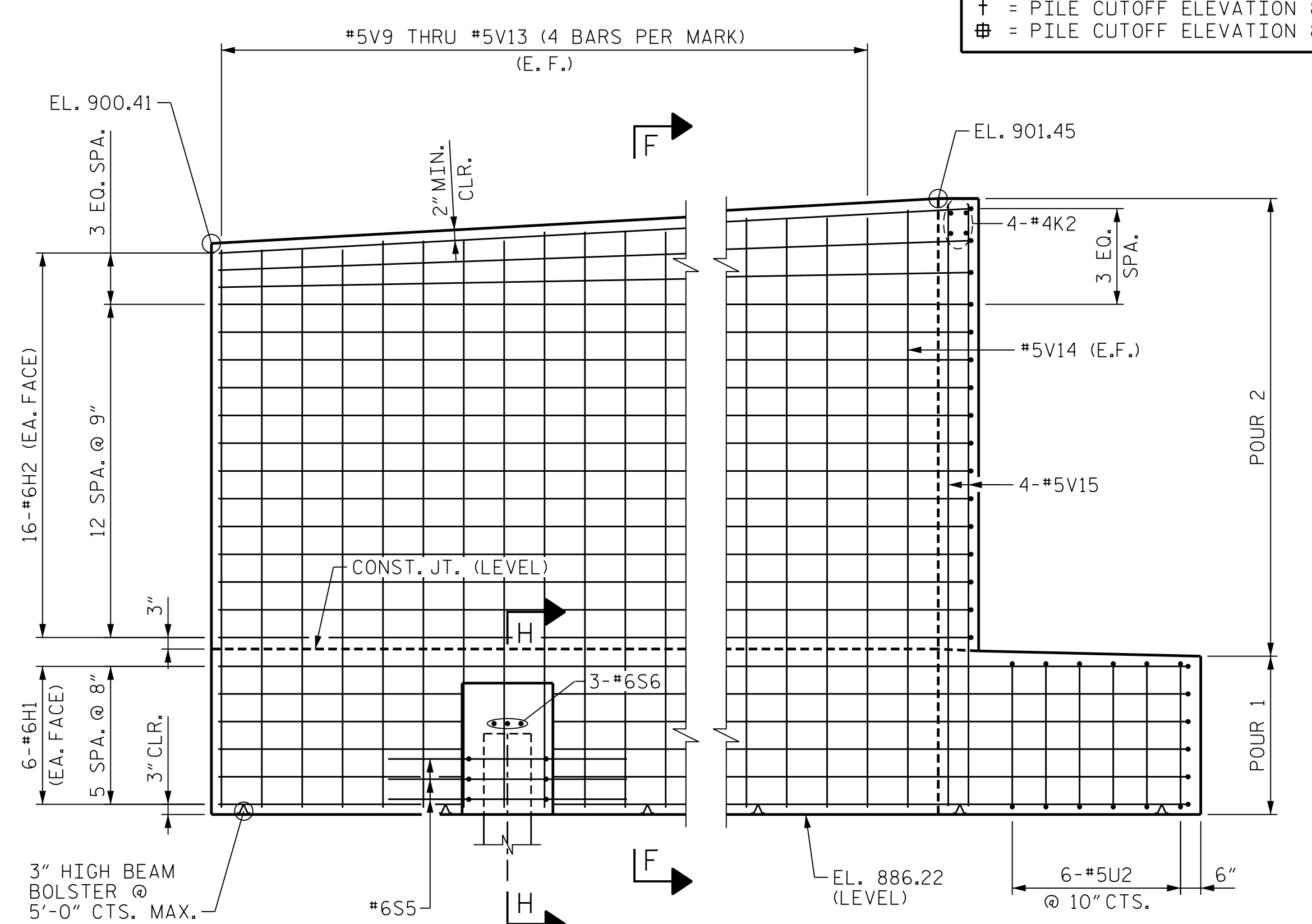
PLAN - WINGWALL "W2"



SECTION H-H

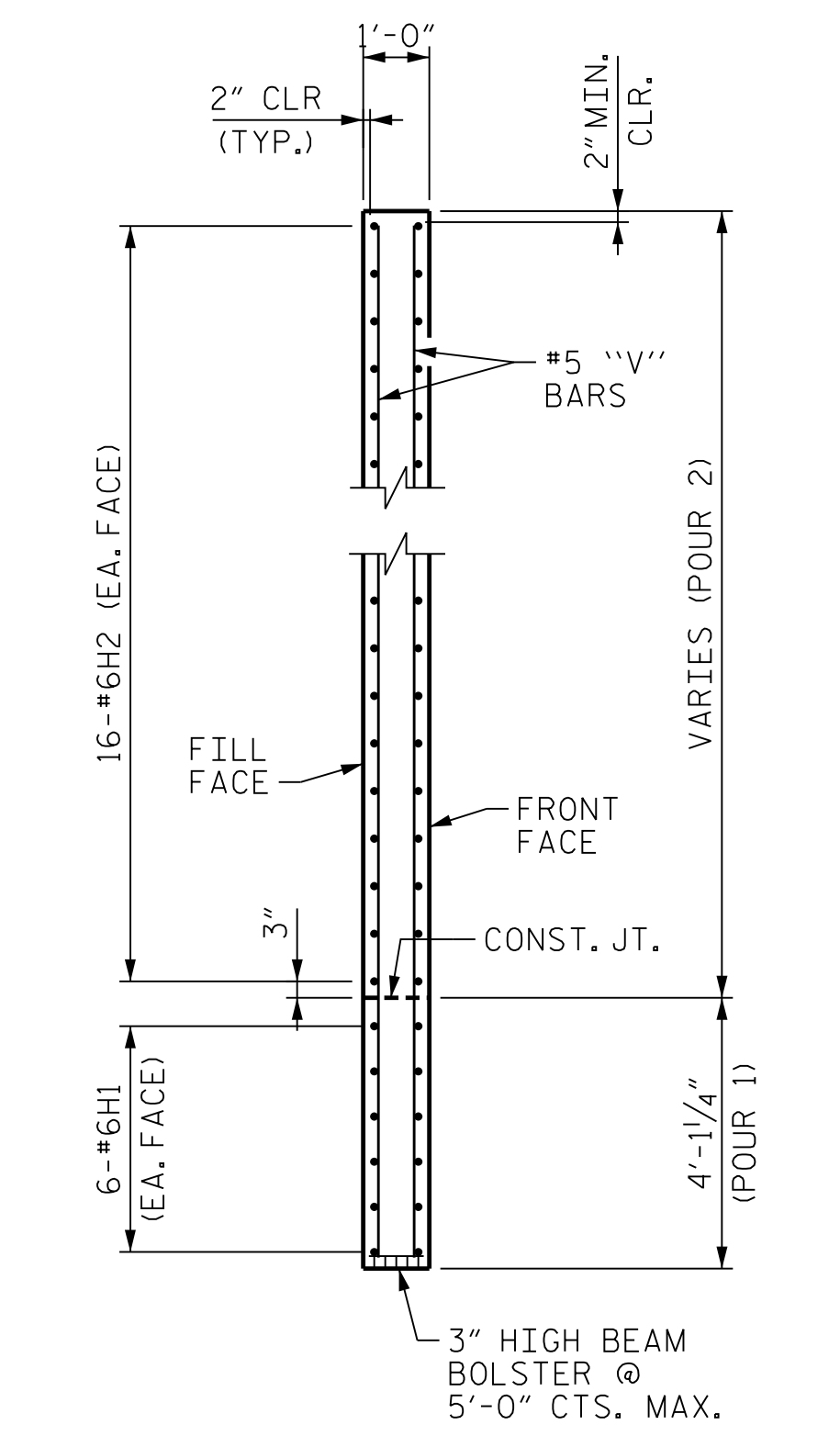


ELEVATION - WINGWALL "W1"



ELEVATION - WINGWALL "W2"

† = PILE CUTOFF ELEVATION 885.27
 ‡ = PILE CUTOFF ELEVATION 888.22



SECTION F-F

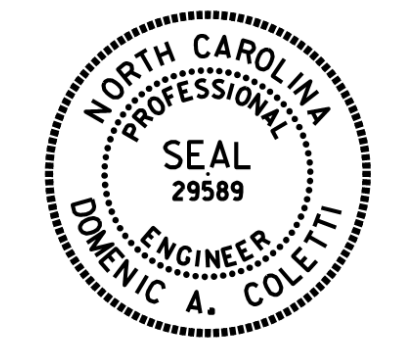
PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-
 SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

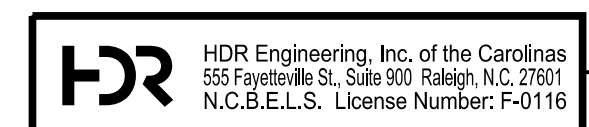
SUBSTRUCTURE
 END BENT 2
 WING DETAILS

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

SHEET NO. S06-124
 TOTAL SHEETS 129



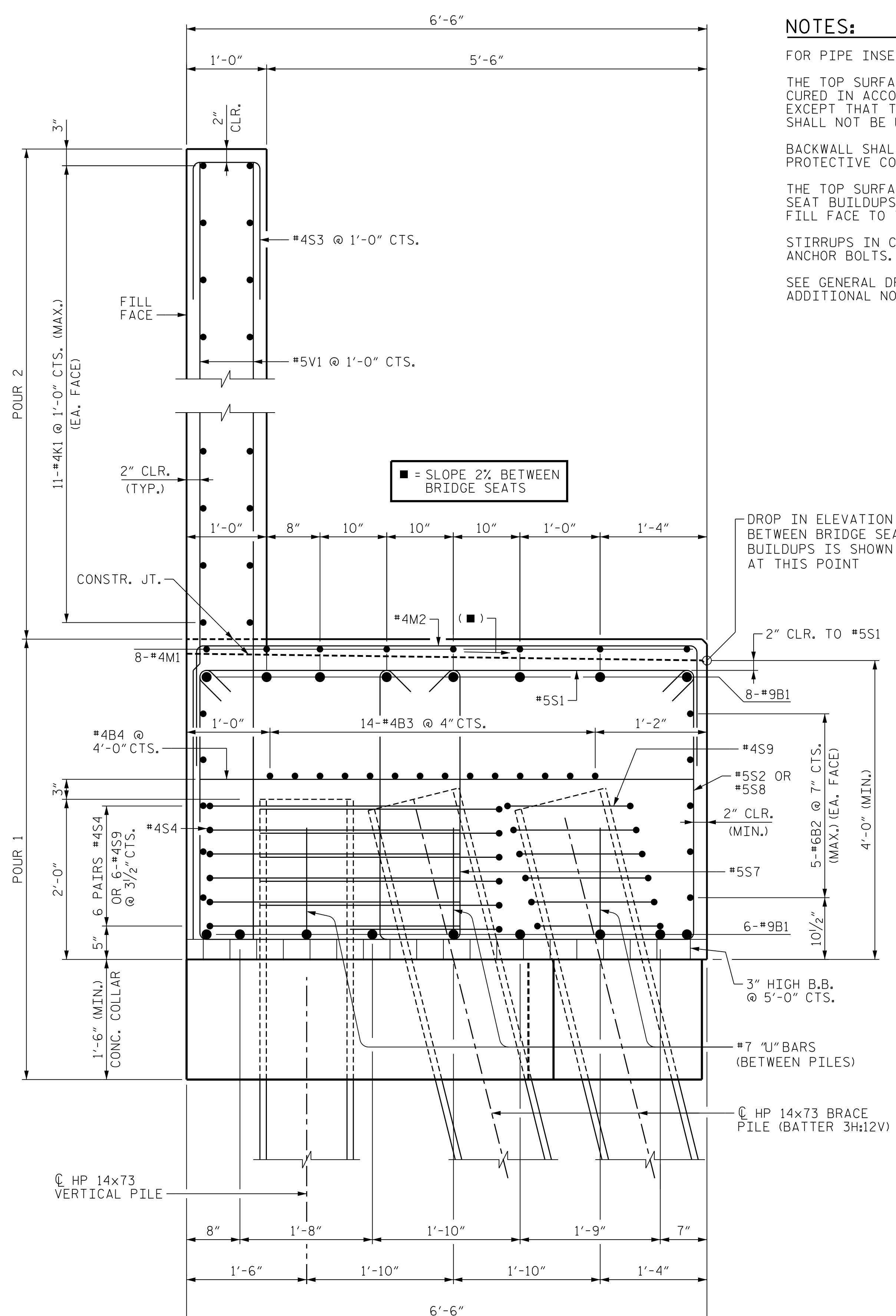
Dominic A. Coletti 10/15/2021



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLOT DRIVER: NCDOT_pdf_color_eng-50.ppt
 USER: PPETERSO DATE: 10/14/2021 TIME: 5:25:38 PM
 FILE: ...SUBSTR

DES BY: M. BARNES DATE: 07/19
 DES CHK: J. EARNEST DATE: 07/19
 DWG BY: B. PETERSON DATE: 07/19
 CHK BY: J. EARNEST DATE: 08/19



SECTION A-A

NOTES:

FOR PIPE INSERT DETAILS, SEE BEARING SHEETS.

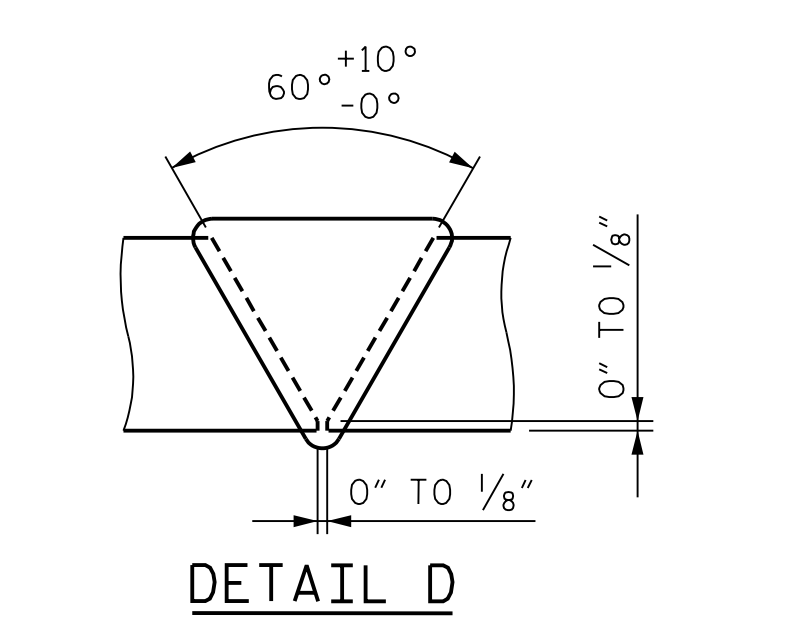
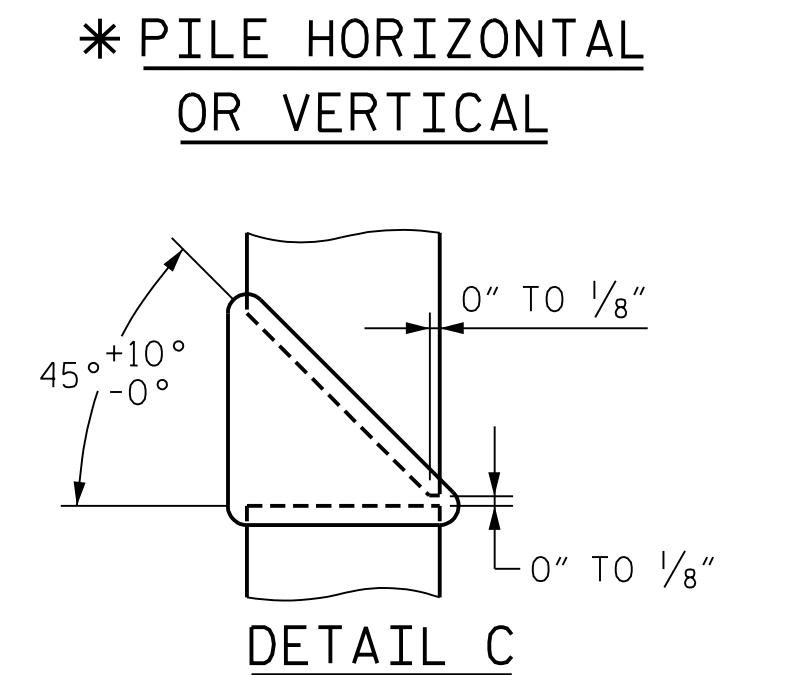
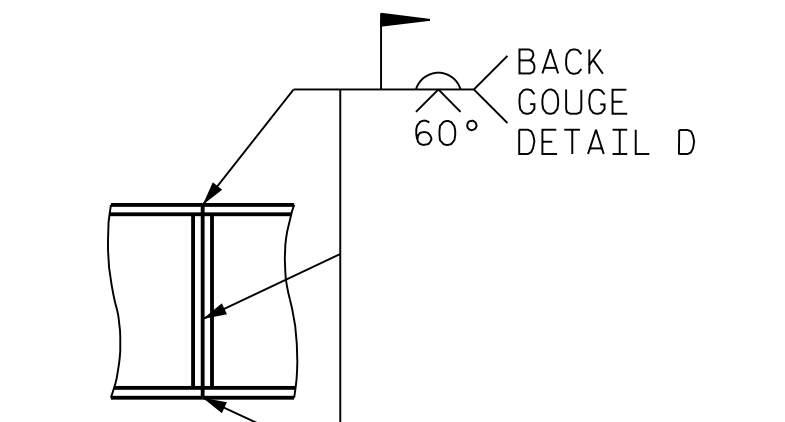
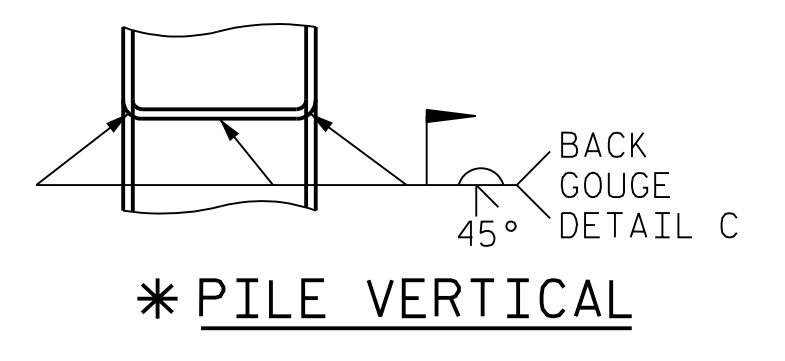
THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

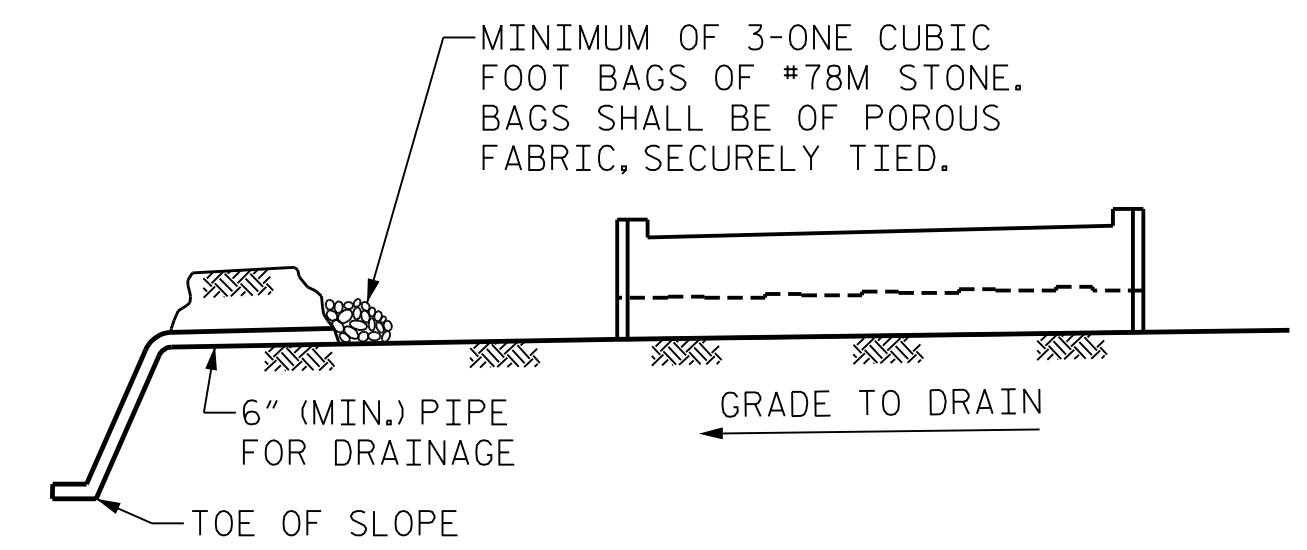
THE TOP SURFACE OF THE END BENT CAP, EXCEPT THE BRIDGE SEAT BUILDUPS, SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

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

SEE GENERAL DRAWING "FOUNDATION LAYOUT" FOR ADDITIONAL NOTES FOR DRIVING PILES.



PILE SPLICE DETAILS
* = POSITION OF PILE DURING WELDING



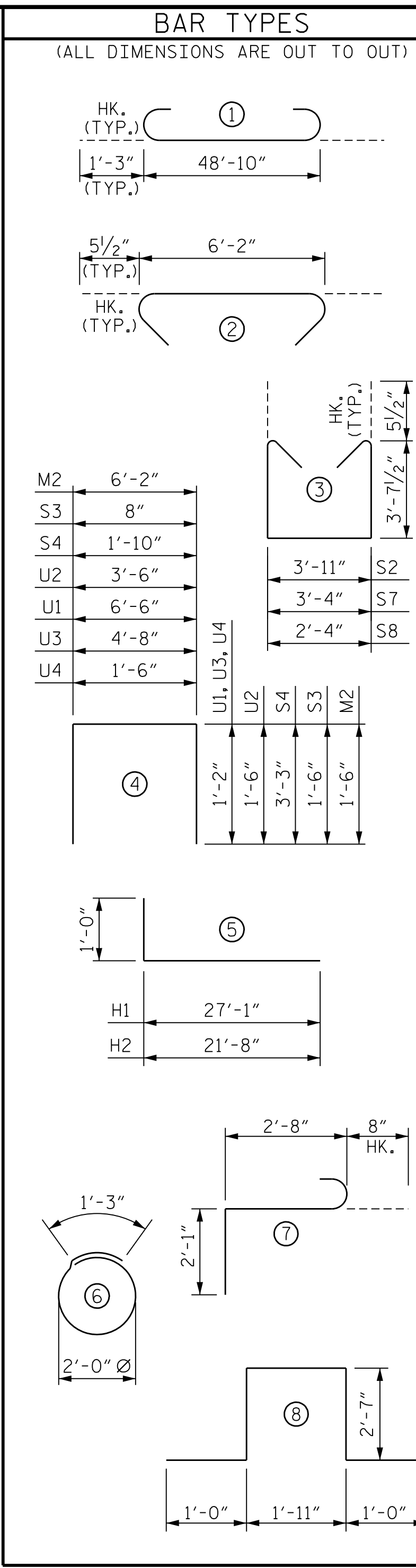
NOTES:

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 FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



BILL OF MATERIAL					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	14	#9	1	51'-4"	2443
B2	10	#6	STR	49'-0"	736
B3	28	#4	STR	25'-9"	482
B4	13	#4	STR	6'-2"	54
H1	24	#6	5	28'-1"	1013
H2	64	#6	5	22'-8"	2179
K1	44	#4	STR	25'-9"	757
K2	8	#4	STR	2'-7"	14
M1	32	#4	STR	2'-8"	58
M2	12	#4	4	9'-2"	74
S1	59	#5	2	7'-1"	436
S2	47	#5	3	12'-1"	593
S3	44	#4	4	3'-8"	108
S4	72	#4	4	8'-4"	401
S5	6	#6	8	9'-1"	82
S6	6	#6	7	5'-5"	49
S7	53	#5	3	11'-6"	636
S8	6	#5	3	10'-6"	66
S9	36	#4	6	7'-7"	183
U1	14	#7	4	8'-10"	253
U2	12	#5	4	6'-6"	82
U3	2	#7	4	7'-0"	29
U4	1	#7	4	3'-10"	8
V1	88	#5	STR	13'-6"	1240
V2	8	#5	STR	15'-4"	128
V3	2	#5	STR	15'-3"	32
V4	8	#5	STR	15'-1"	126
V5	8	#5	STR	14'-11"	125
V6	8	#5	STR	14'-8"	123
V7	8	#5	STR	14'-6"	121
V8	8	#5	STR	14'-3"	119
V9	8	#5	STR	13'-9"	115
V10	8	#5	STR	13'-11"	117
V11	8	#5	STR	14'-2"	119
V12	8	#5	STR	14'-4"	120
V13	8	#5	STR	14'-6"	121
V14	2	#5	STR	14'-8"	31
V15	8	#5	STR	14'-9"	124
REINFORCING STEEL					LBS. 13,497
CLASS 'A' CONCRETE					
POUR 1: COLLARS, CAP & LOWER PART OF WINGS				CU. YDS.	61.5
POUR 2: BACKWALL & UPPER PART OF WINGS				CU. YDS.	36.0
TOTAL				CU. YDS.	97.5
HP 14x73 STEEL PILES		NO.	20		
		LF	1500		
PILE DRIVING EQUIPMENT SETUP FOR HP 14x73 STEEL PILES		EA.	20		

PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-
 SHEET 4 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 END BENT 2
 SECTION & DETAILS**

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

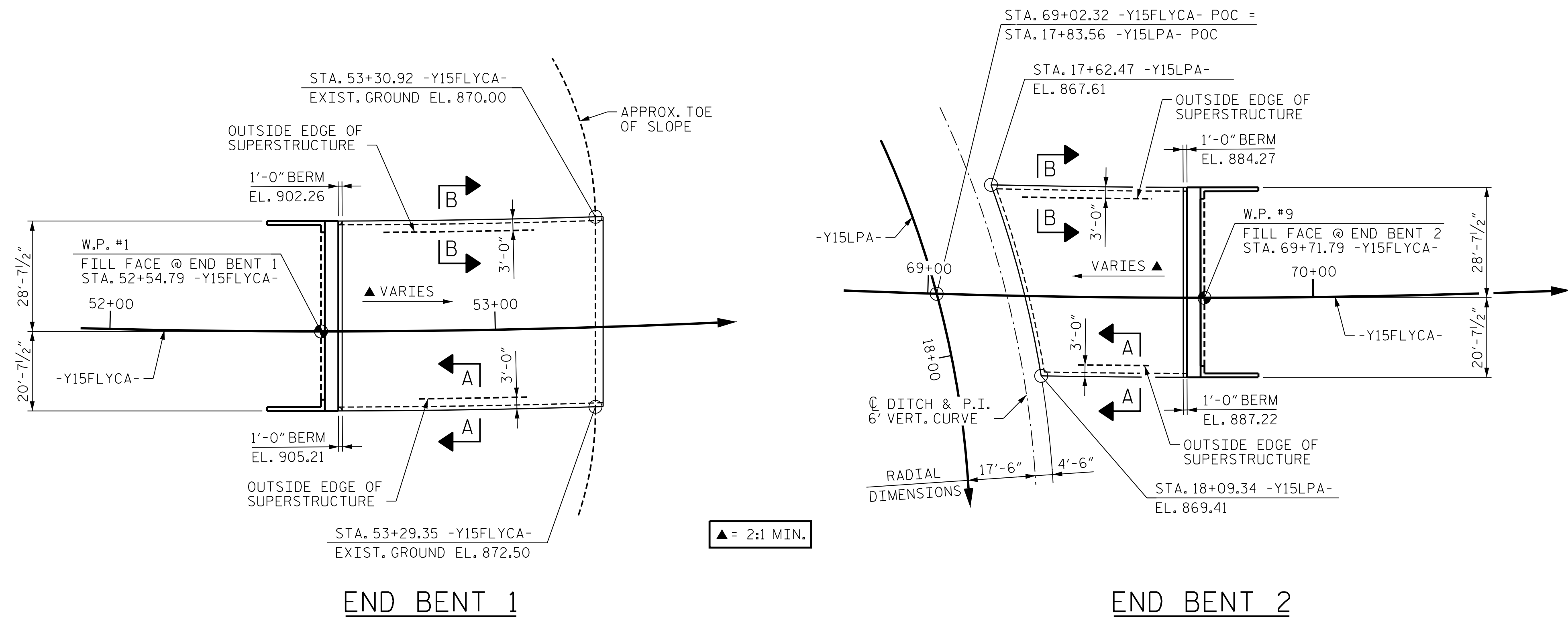
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 TOTAL SHEETS 129

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DES CHK: <u>J. EARNEST</u>	DATE: <u>07/19</u>	CHK BY: <u>J. EARNEST</u>	DATE: <u>08/19</u>

HDR HDR Engineering, Inc. of the Carolinas
 555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
 N.C.B.E.L.S. License Number: F-0116

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 UNLESS ALL SIGNATURES COMPLETED

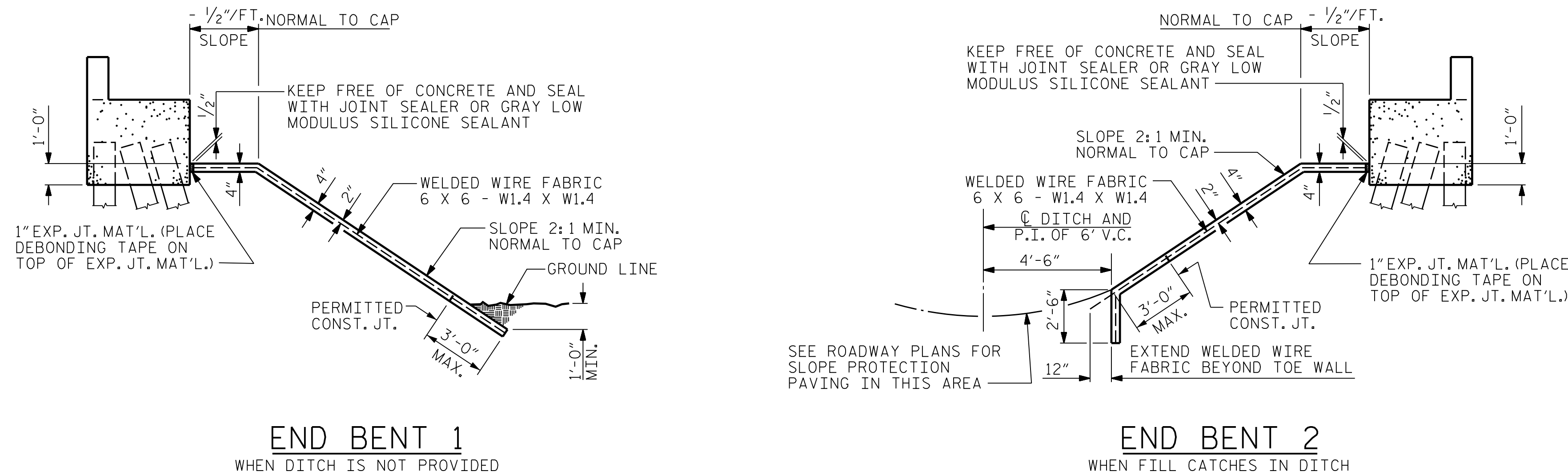


▲ = 2:1 MIN.

END BENT 1

END BENT 2

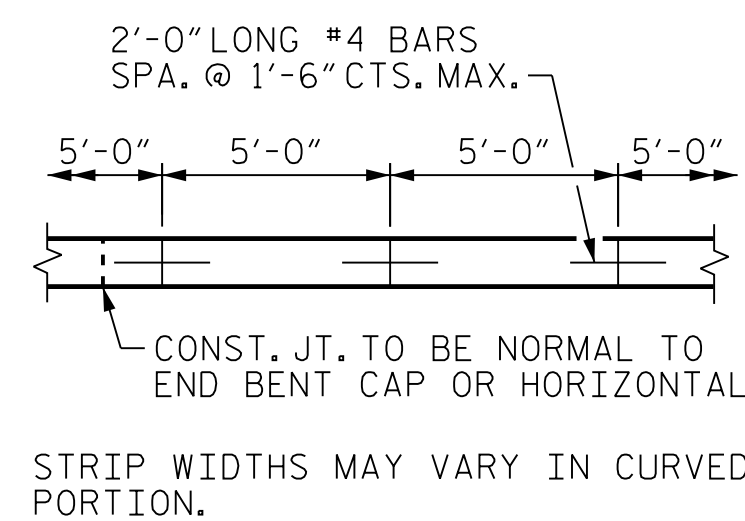
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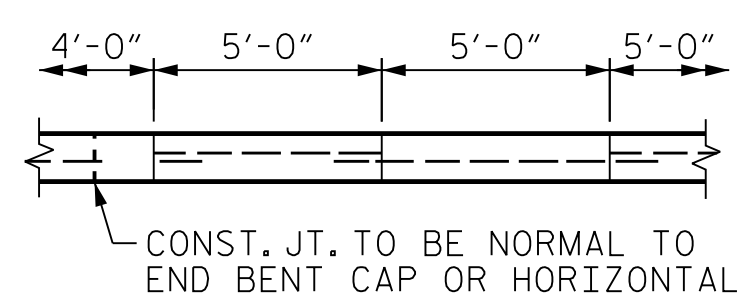
END BENT 1
WHEN DITCH IS NOT PROVIDED

END BENT 2
WHEN FILL CATCHES IN DITCH

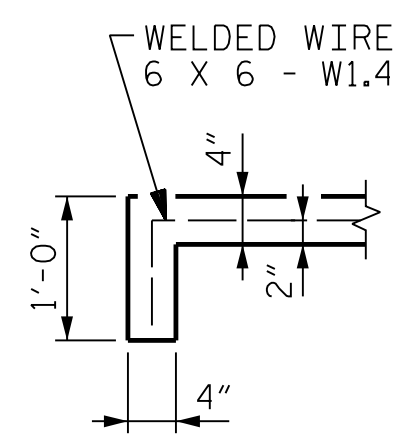
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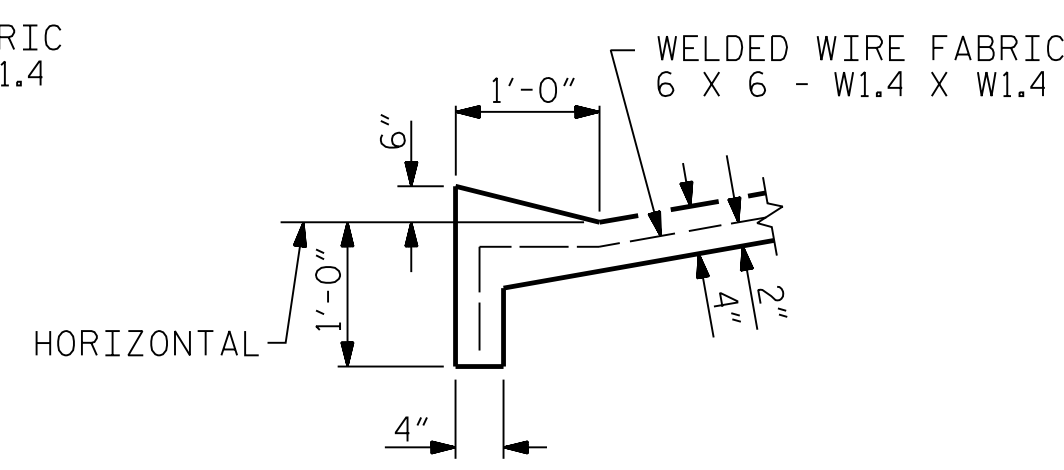
POURING DETAIL



OPTIONAL POURING DETAIL



SECTION A-A



SECTION B-B

NOTES
SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

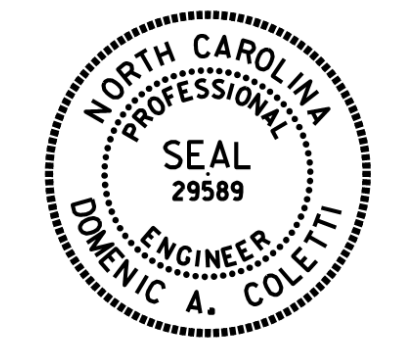
BRIDGE @ STA. 58+33.94 -Y15FLYCA-	4 INCH SLOPE PROTECTION SQUARE YARDS	WELDED WIRE FABRIC 60 INCHES WIDE APPROX. L.F.
END BENT 1	417	750
END BENT 2	245	441

* QUANTITY SHOWN IS BASED ON 5'-0" POURS.

PROJECT NO. U-2579AB
FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

CONCRETE SLOPE PROTECTION DETAILS



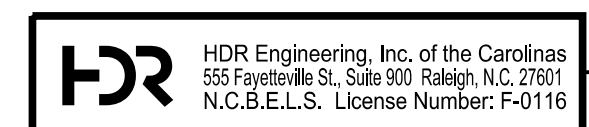
10/15/2021

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2	--	--	4	--	--

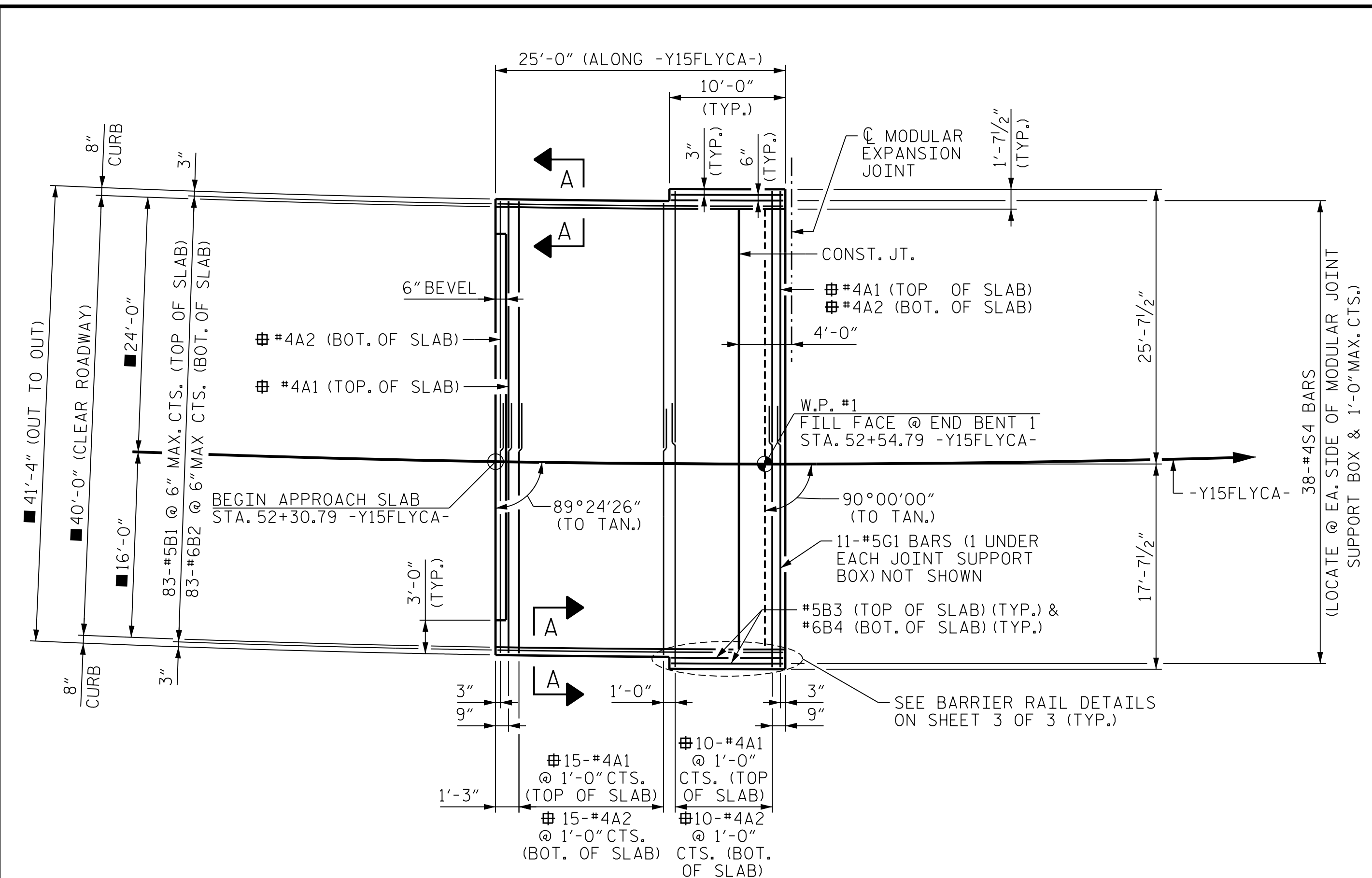
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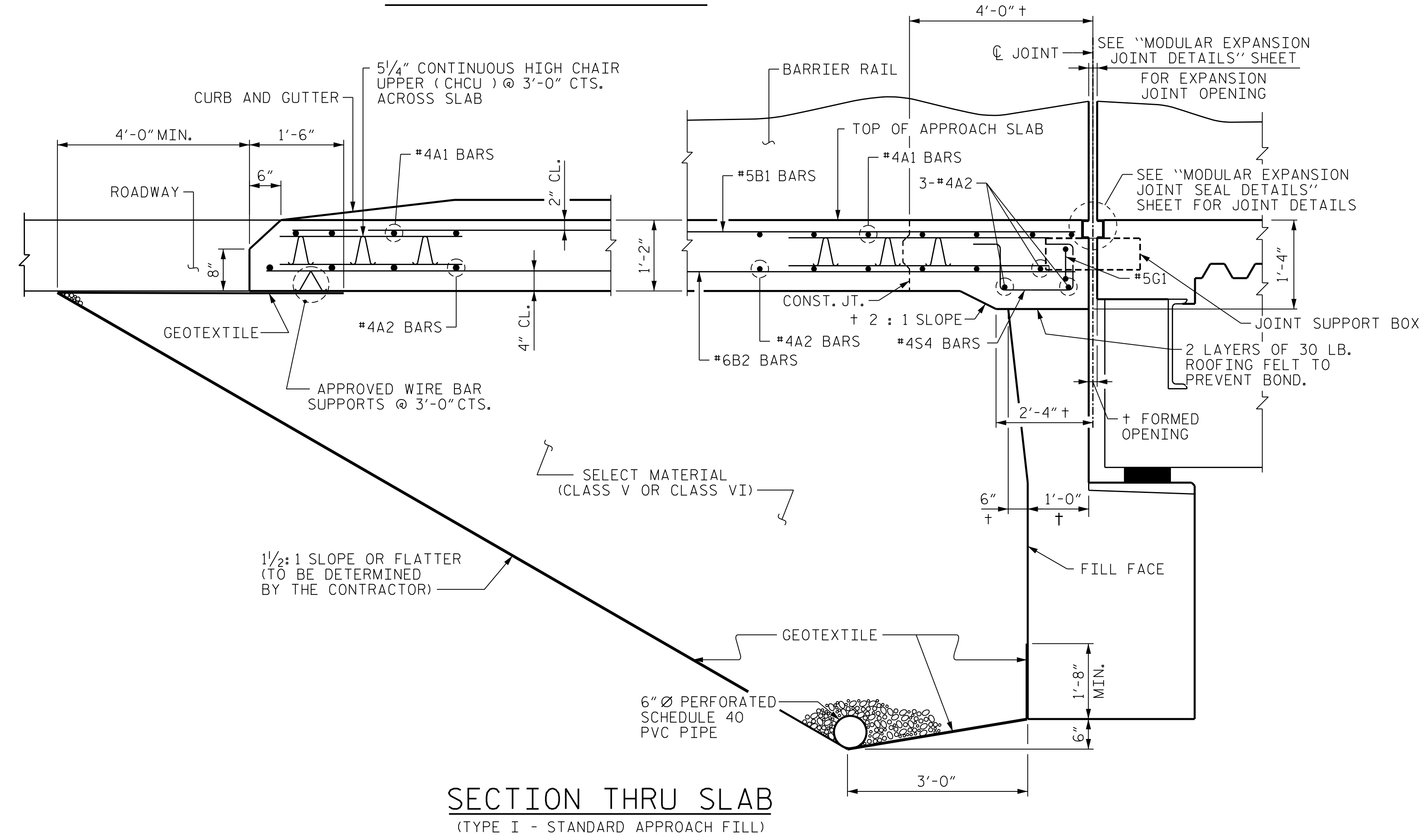
DES BY: S. NIFONG DATE: 10/19
 DES CHK: M. NEIHEISEL DATE: 10/19
 DWG BY: B. PETERSON DATE: 07/19
 CHK BY: M. NEIHEISEL DATE: 10/19



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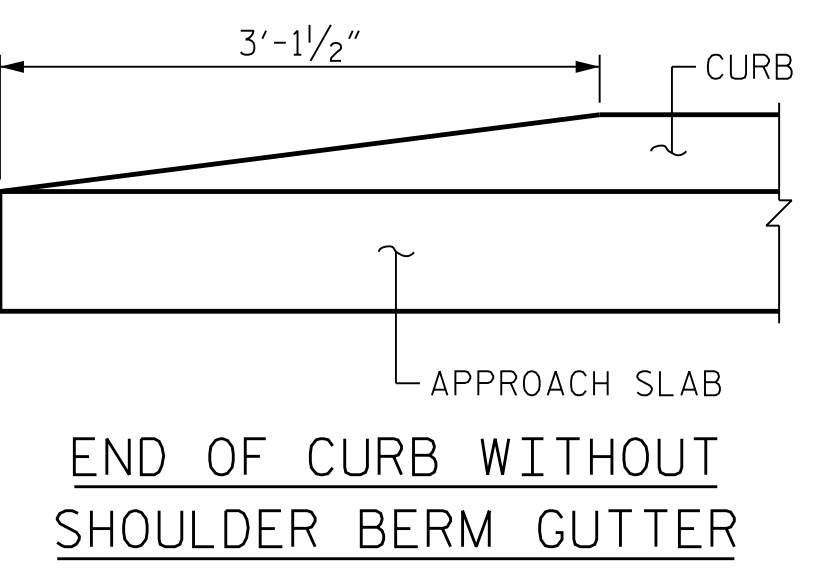
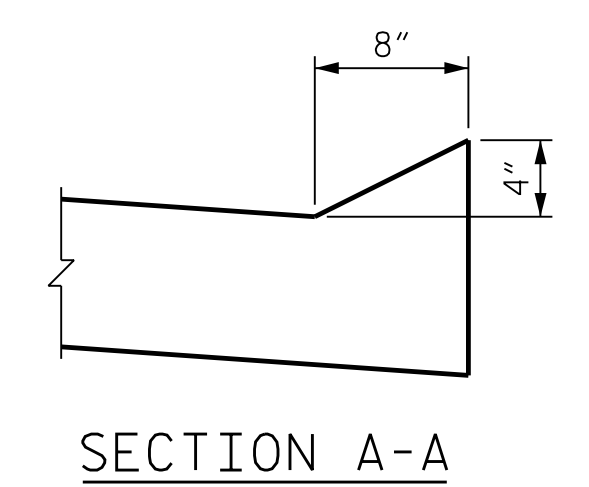


PLAN AT END BENT 1



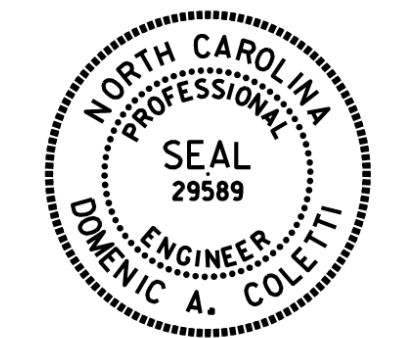
SECTION THRU SLAB
(TYPE I - STANDARD APPROACH FILL)

Δ = CONCRETE QUANTITY DOES NOT INCLUDE BARRIER RAIL
 † = NORMAL TO END BENT
 ■ = RADIAL DIMENSION
 ⊞ = 2 BAR RUN



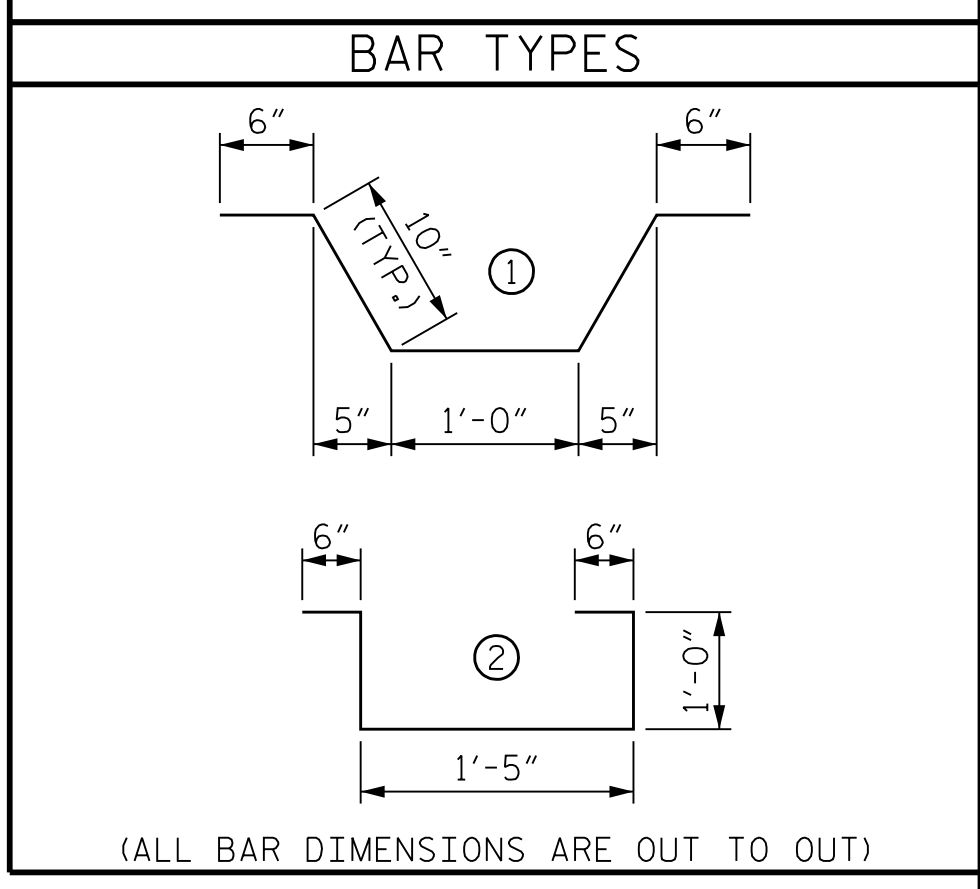
CURB DETAILS

SPlice LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"



Dominic A. Coletti 10/15/2021

BILL OF MATERIAL					
APPROACH SLAB 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR.	22'-5"	749
A2	52	#4	STR.	22'-3"	773
*B1	83	#5	STR.	23'-10"	2,064
B2	83	#6	STR.	24'-4"	3,034
*B3	4	#5	STR.	9'-8"	41
B4	4	#6	STR.	9'-8"	59
*G1	11	#5	1	3'-8"	43
*S4	38	#4	2	4'-5"	113
REINFORCING STEEL					3,866 LBS.
*EPOXY COATED REINFORCING STEEL					3,010 LBS.
Δ CLASS AA CONCRETE					46.1 C. Y.



(ALL BAR DIMENSIONS ARE OUT TO OUT)

NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 6"Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.

GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

FOR THE 6"Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE APPROACH SLAB
 PLAN AND SECTION

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

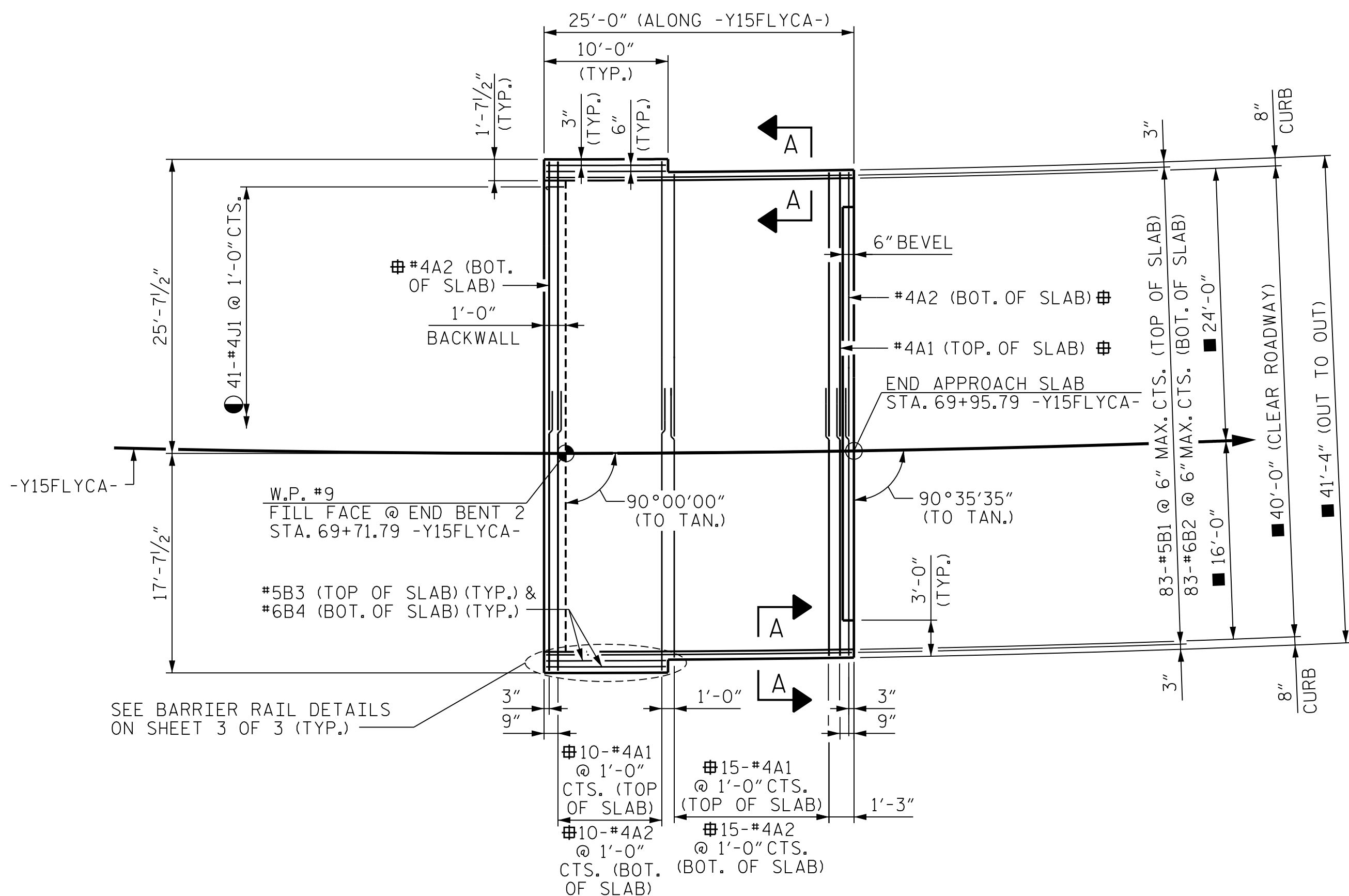
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 USER: PPETERSO
 DATE: 10/14/2021
 TIME: 5:26:10 PM

DES BY: L. ZAMPETTI DATE: 07/19
 DES CHK: J. ROBERTS DATE: 07/19
 DWG BY: M. SELLS DATE: 07/19
 CHK BY: S. NIFONG DATE: 12/19

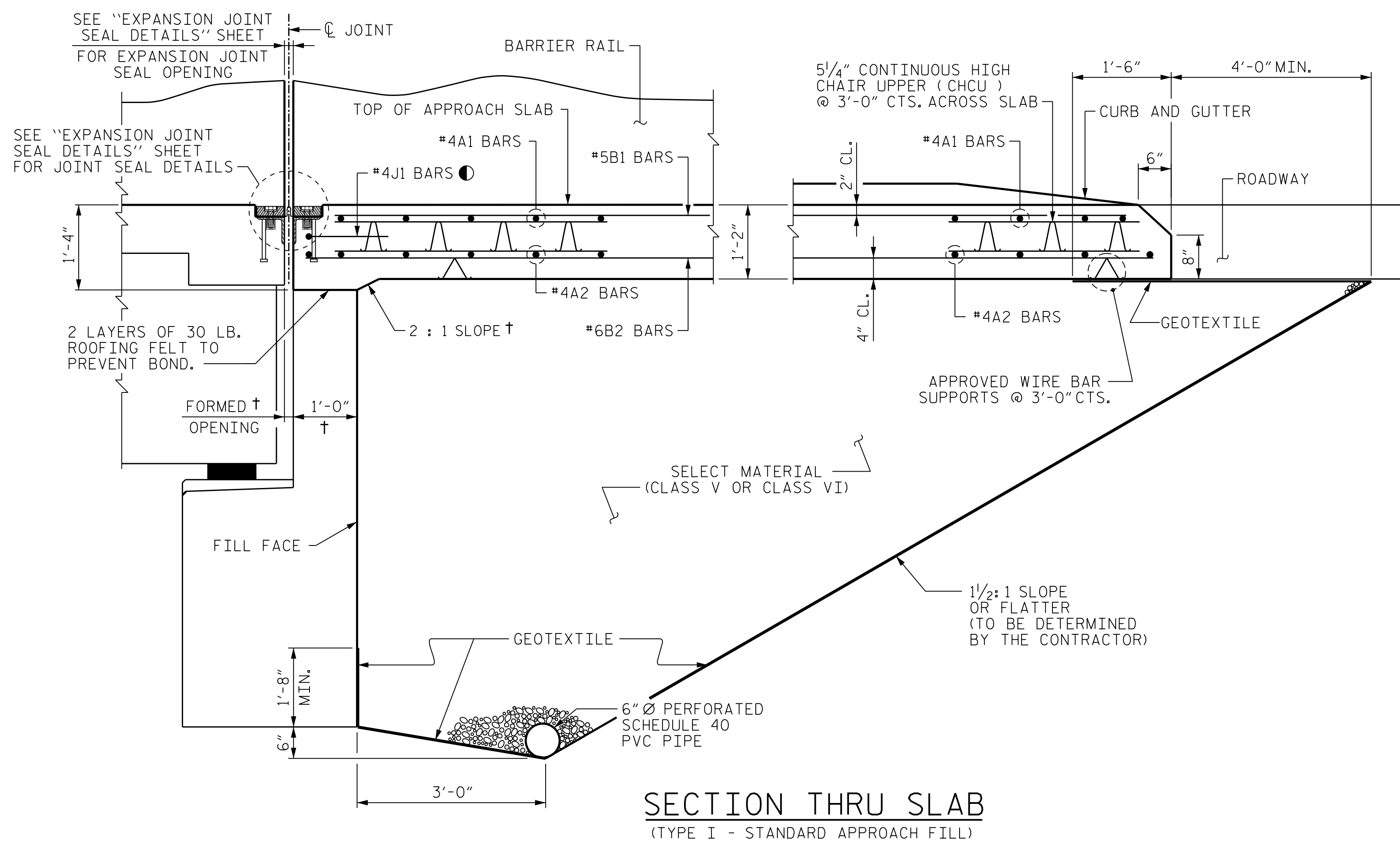


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 UNLESS ALL SIGNATURES COMPLETED

SHEET NO.	TOTAL SHEETS
506-127	129

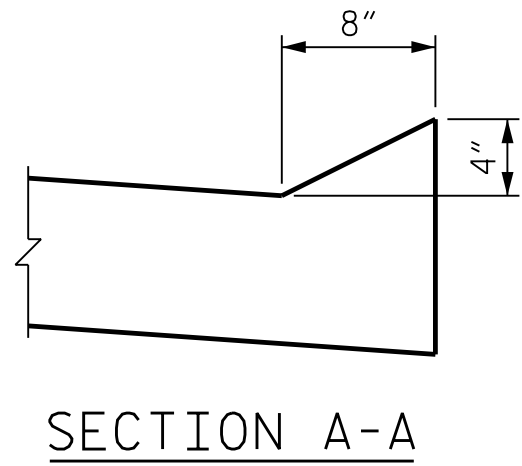


PLAN AT END BENT 2

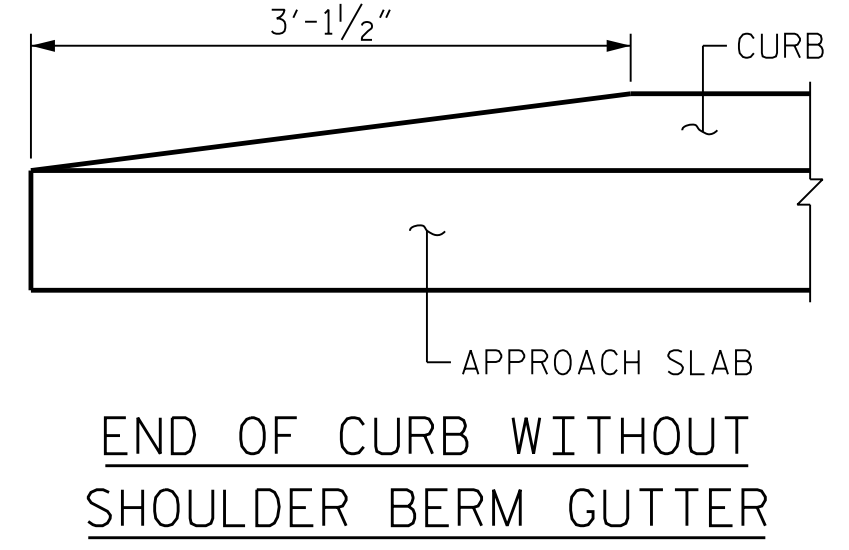


SECTION THRU SLAB
(TYPE I - STANDARD APPROACH FILL)

- = FOR PLACEMENT OF #4J1 BARS SEE "EXPANSION JOINT SEAL DETAILS" SHEET
- △ = CONCRETE QUANTITY DOES NOT INCLUDE BARRIER RAIL
- † = NORMAL TO END BENT
- = RADIAL DIMENSION
- ⊕ = 2 BAR RUN



SECTION A-A



CURB DETAILS

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"

BILL OF MATERIAL					
APPROACH SLAB 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR.	22'-5"	749
A2	52	#4	STR.	22'-3"	773
*B1	83	#5	STR.	23'-10"	2,064
B2	83	#6	STR.	24'-4"	3,034
*B3	4	#5	STR.	9'-8"	41
B4	4	#6	STR.	9'-8"	59
*J1	41	#4		1'-5"	39
REINFORCING STEEL					3,866 LBS.
*EPOXY COATED REINFORCING STEEL					2,893 LBS.
△ CLASS AA CONCRETE					45.6 C.Y.
BAR TYPES					
(ALL BAR DIMENSIONS ARE OUT TO OUT)					

NOTES

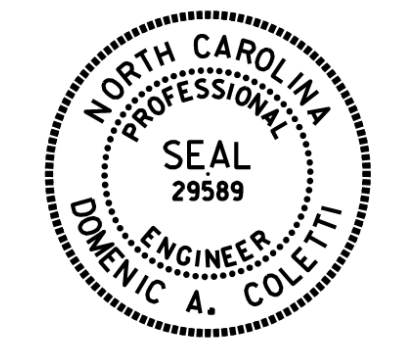
- FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.
- GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.
- SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.
- SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.
- APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.
- FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.
- AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE APPROACH SLAB
 PLAN AND SECTION



10/15/2021

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

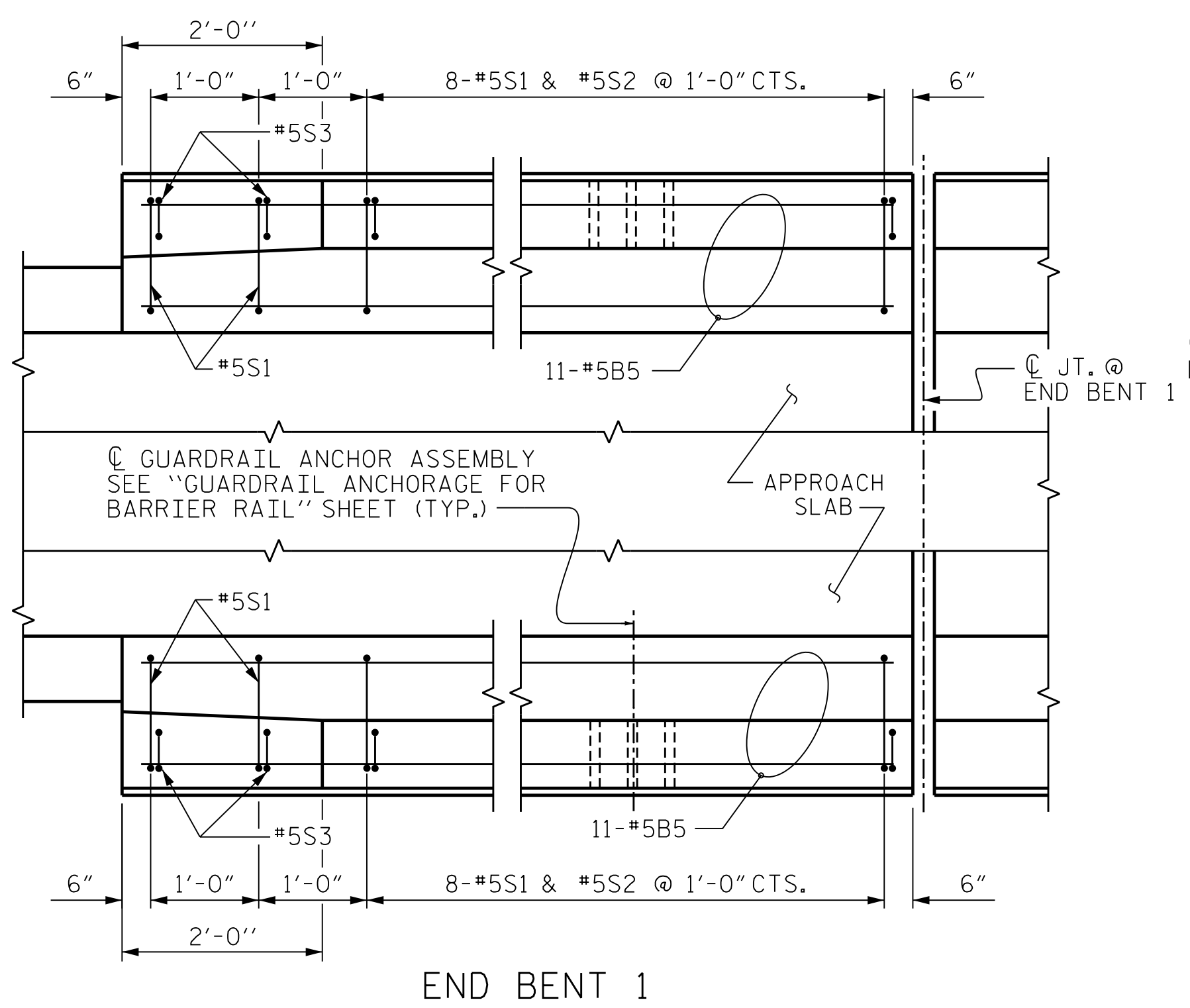
SHEET NO. S06-12B
 TOTAL SHEETS 129



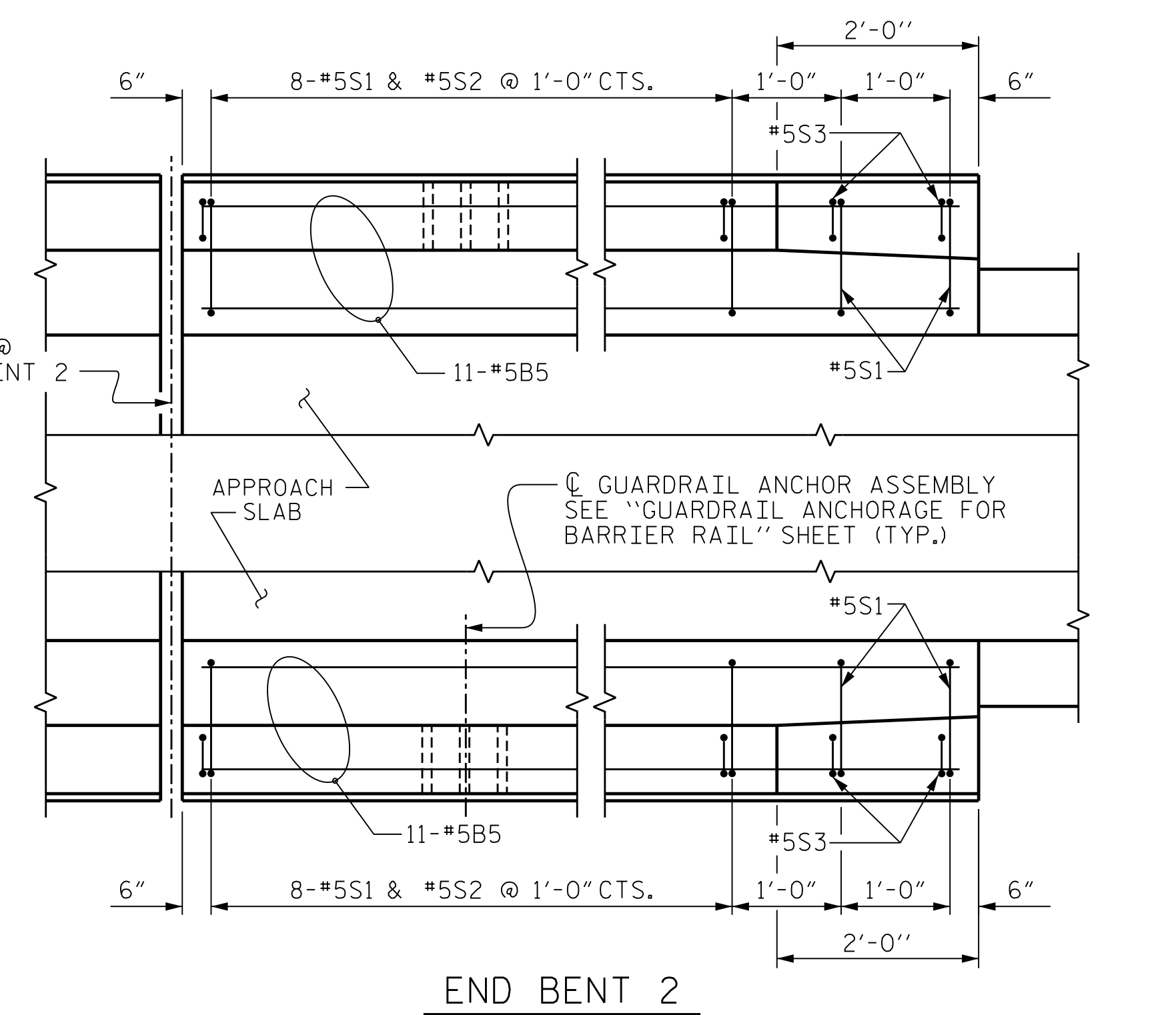
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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 DATE: 10/14/2021
 TIME: 5:26:18 PM
 FILE: ...NBRIDGE

DES BY: L. ZAMPETTI	DATE: 07/19	DWG BY: M. SELLS	DATE: 07/19
DES CHK: J. ROBERTS	DATE: 08/19	CHK BY: S. NIFONG	DATE: 12/19



END BENT 1



END BENT 2

PLAN OF BARRIER RAIL

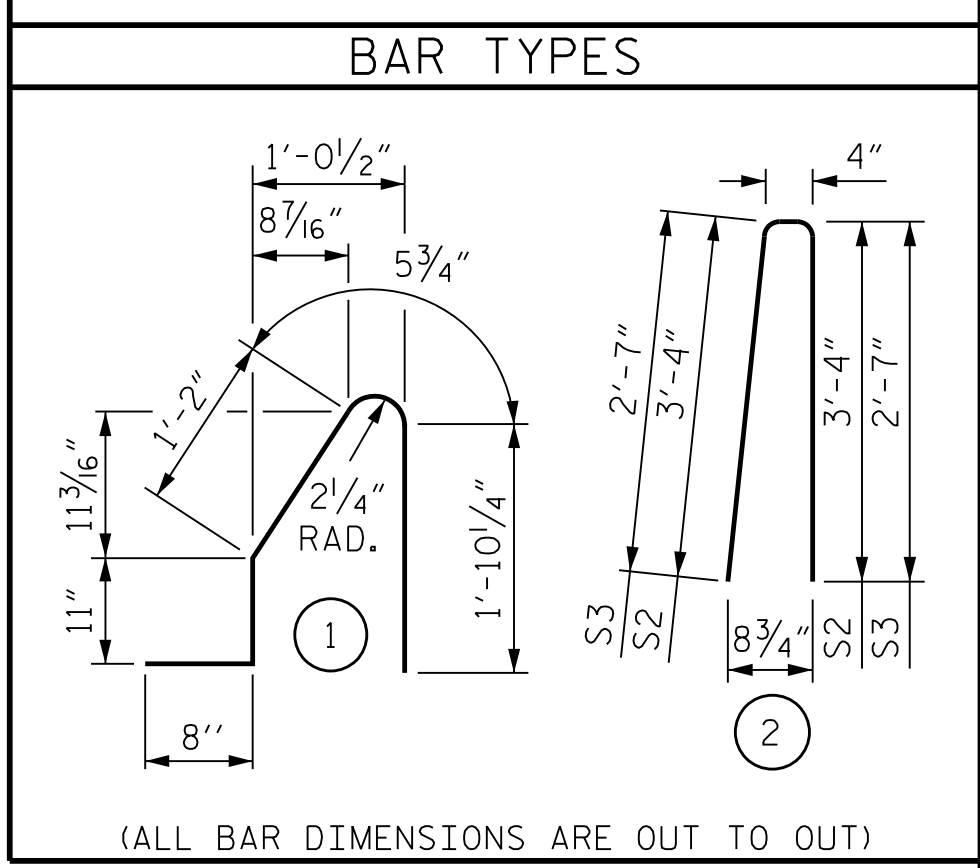
NOTES

THE COST OF THE BARRIER RAIL ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE BID FOR "CONCRETE BARRIER RAIL".

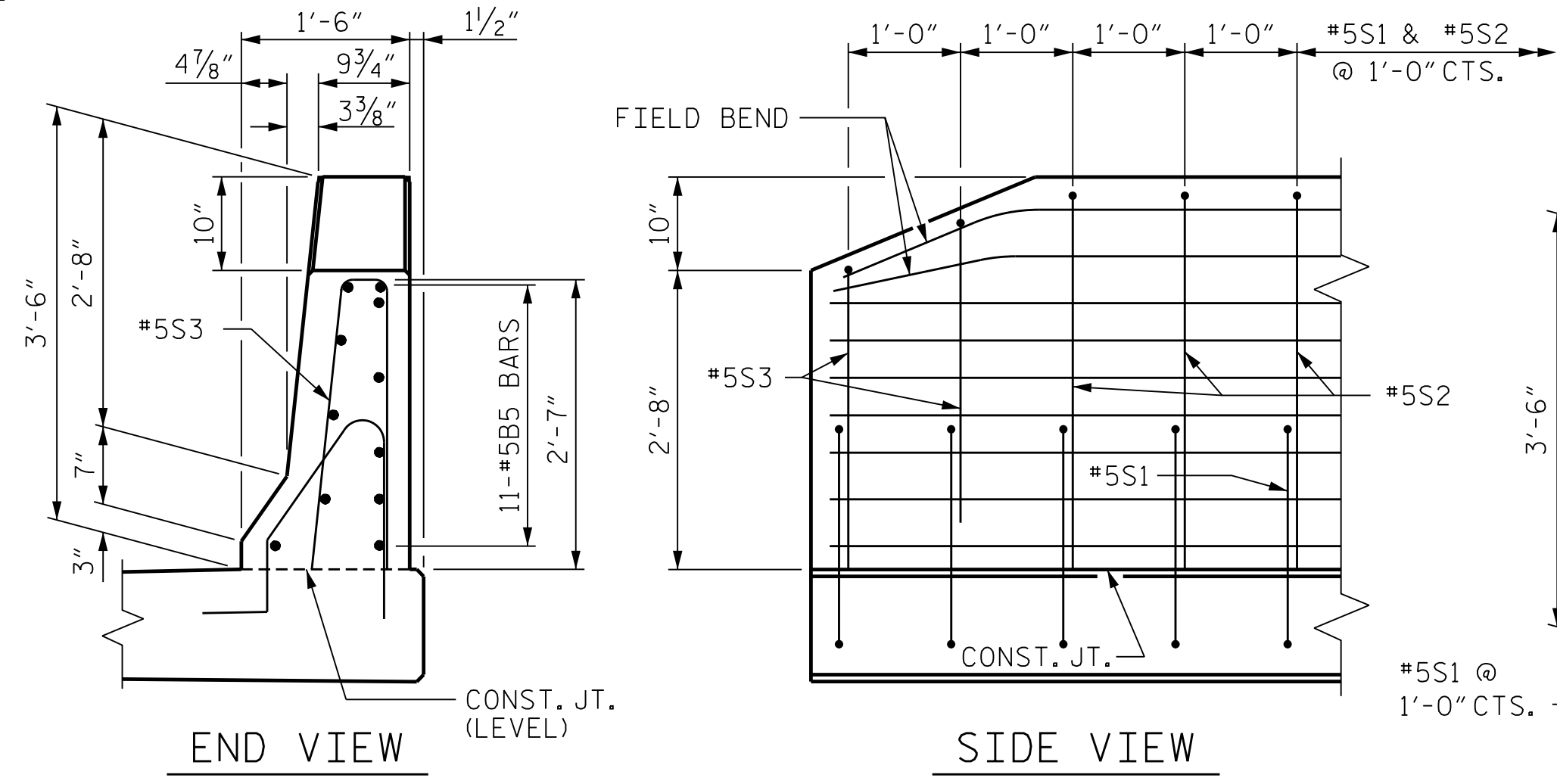
THE BARRIER RAIL ON EACH APPROACH SLAB SHALL NOT BE CAST UNTIL ALL APPROACH SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

BILL OF MATERIAL					
BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B5	44	#5	STR.	9'-8"	444
*S1	40	#5	1	5'-1"	213
*S2	32	#5	2	7'-0"	234
*S3	8	#5	2	5'-6"	46
*EPOXY COATED REINFORCING STEEL					937 LBS.
CLASS AA CONCRETE					5.3 C. Y.
CONCRETE BARRIER RAIL					40.0 L. F.



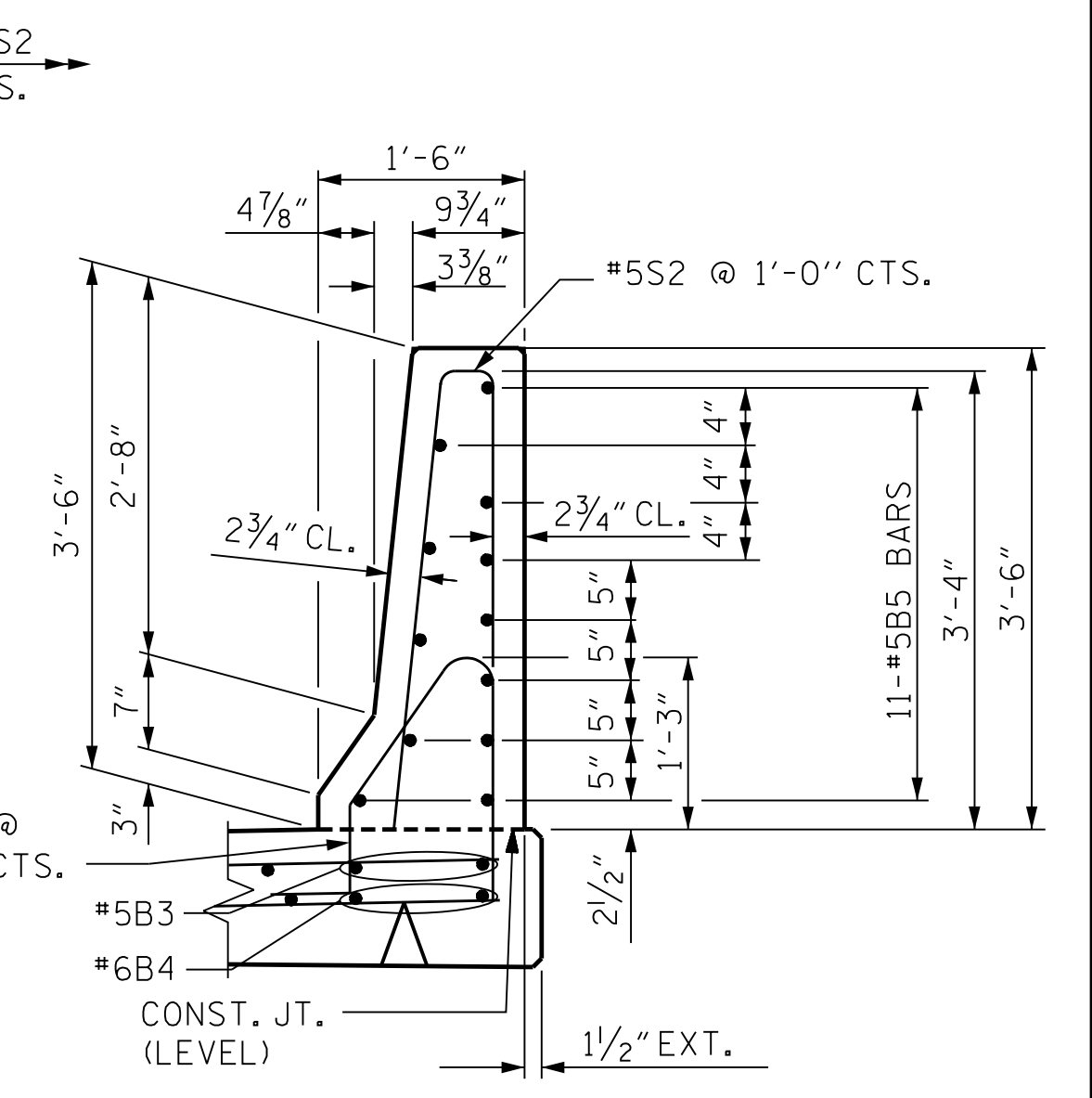
(ALL BAR DIMENSIONS ARE OUT TO OUT)



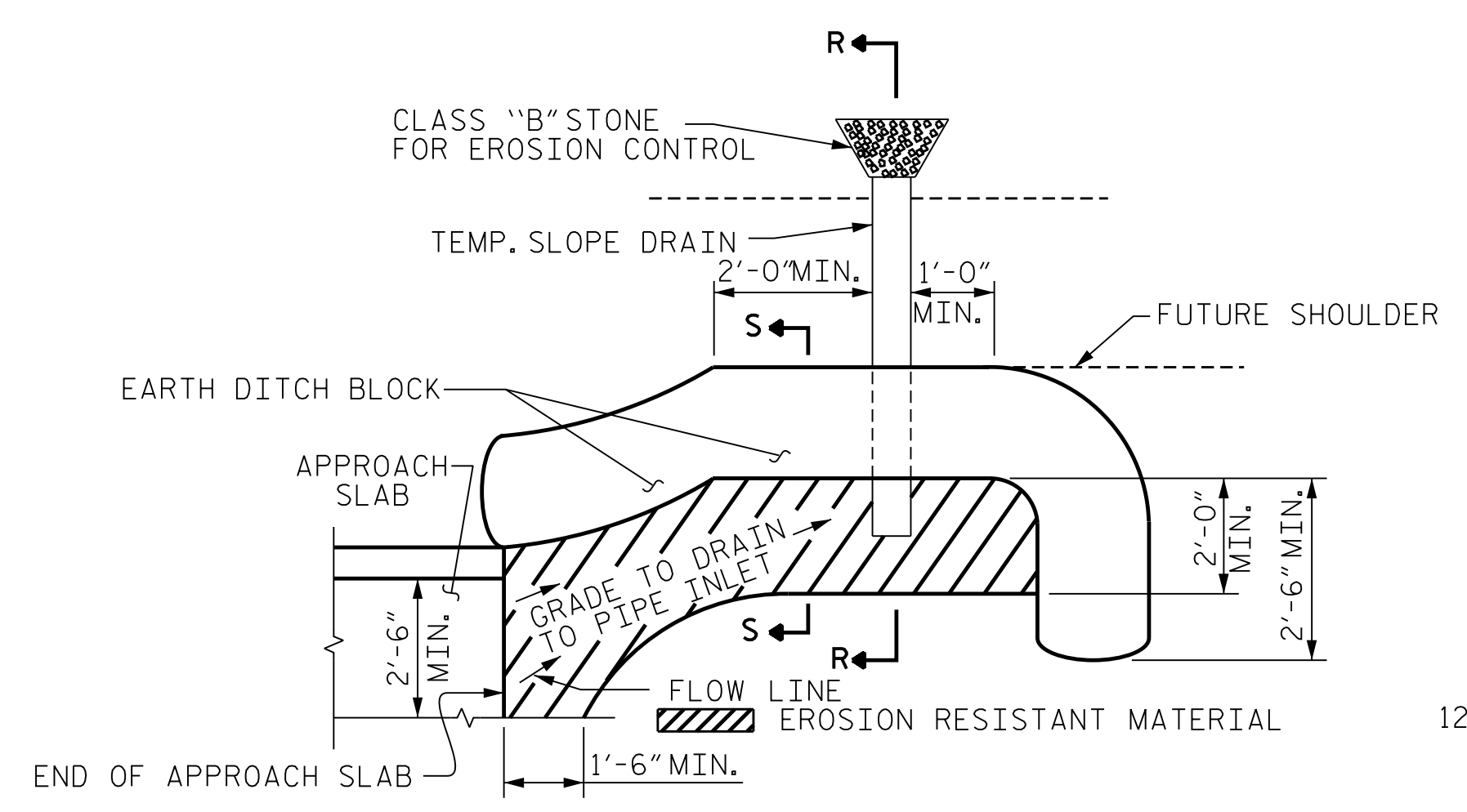
END VIEW

SIDE VIEW

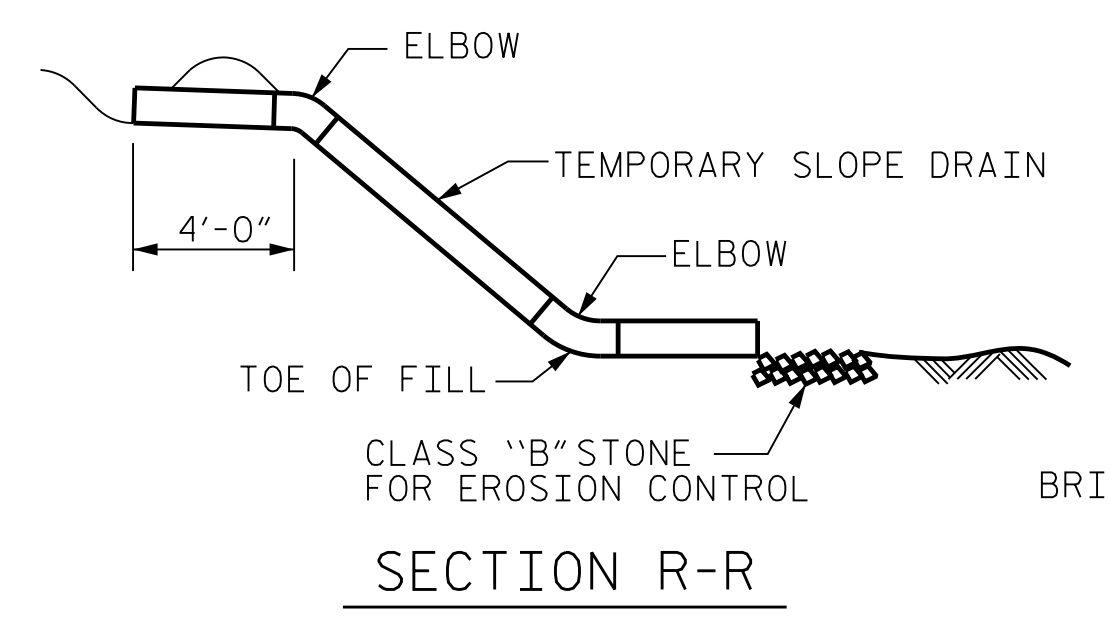
END OF RAIL DETAILS



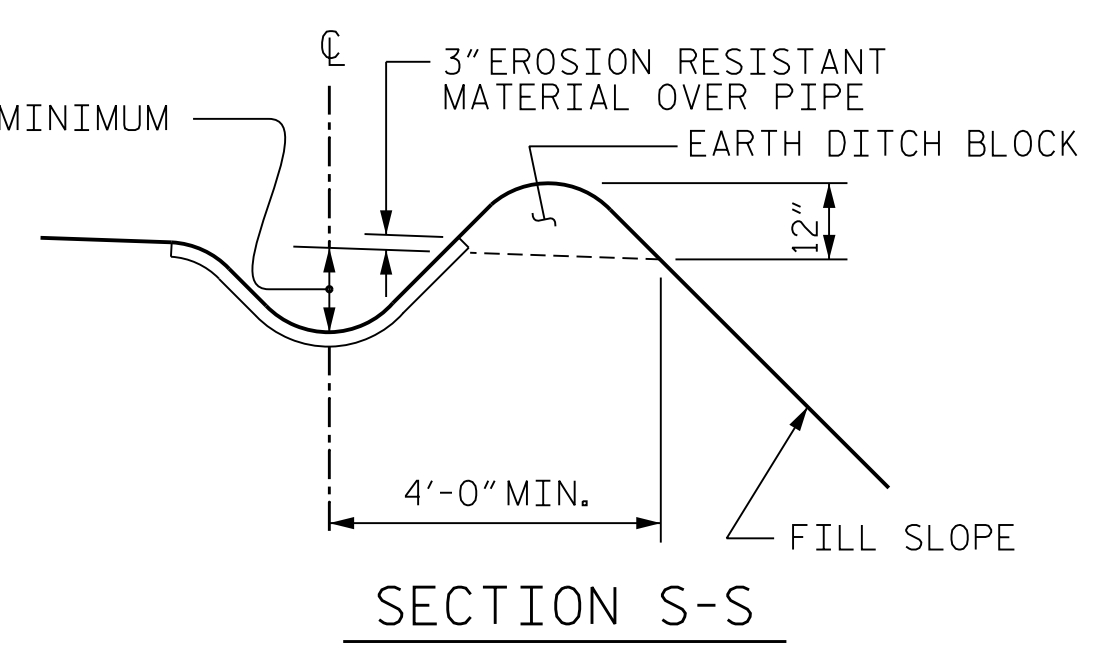
SECTION THRU RAIL



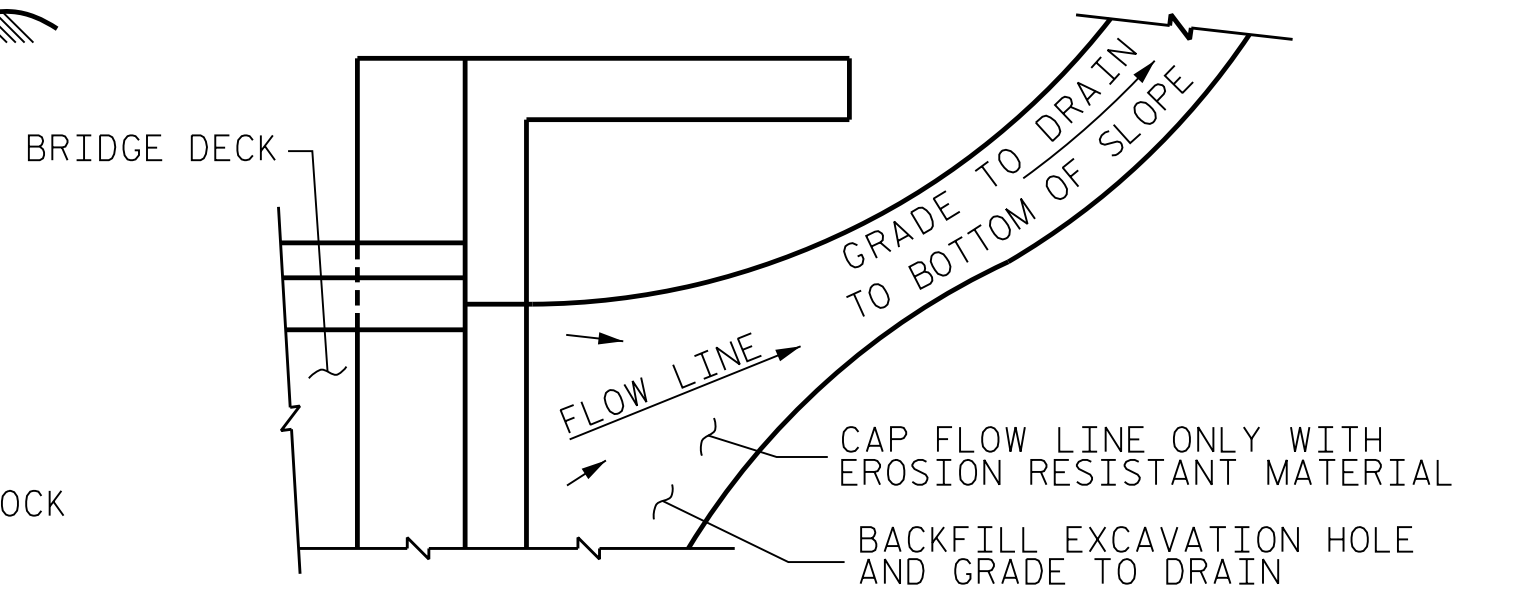
PLAN VIEW



SECTION R-R



SECTION S-S



TEMPORARY DRAINAGE DETAIL

NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 58+33.94 -Y15FLYCA-
 SHEET 3 OF 3

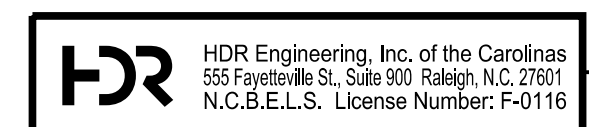
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 BRIDGE APPROACH SLAB
 DETAILS



10/15/2021

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

SHEET NO. S06-129
 TOTAL SHEETS 129



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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 USER: PPETERSO
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 TIME: 5:26:26 PM
 FILE: ...NBRIDGE

DES BY: L. ZAMPETTI	DATE: 07/19	DWG BY: M. SELLS	DATE: 07/19
DES CHK: J. ROBERTS	DATE: 08/19	CHK BY: S. NIFONG	DATE: 12/19

P.V.I. STA. = 19+32.00 -Y16-
EL = 930.42
VC = 250'

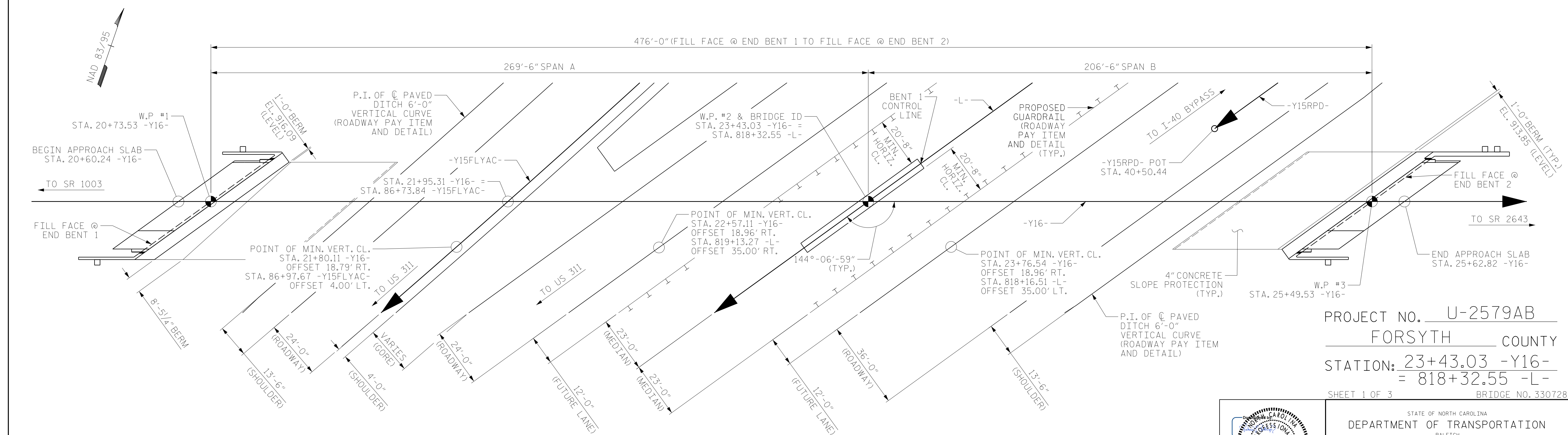
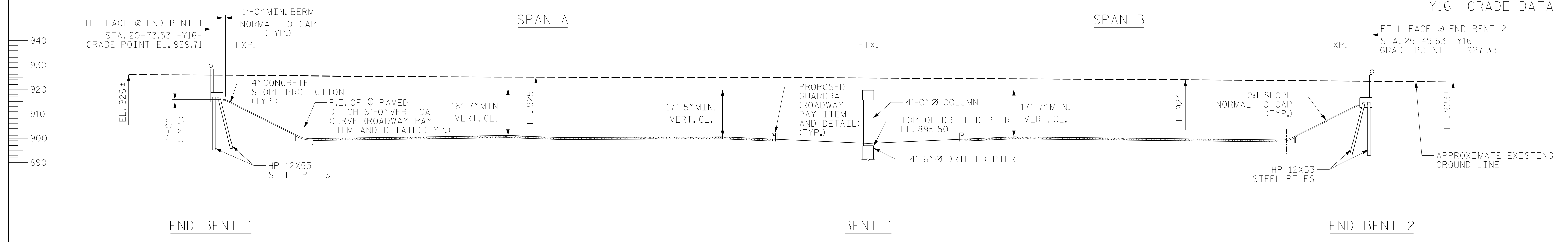
+1.3058% -0.5000%

-Y16- GRADE DATA

P.V.I. STA. = 26+55.00 -Y16-
EL = 926.80
VC = 190'

-0.5000% -2.3539%

-Y16- GRADE DATA



PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 23+43.03 -Y16-
= 818+32.55 -L-
 SHEET 1 OF 3 BRIDGE NO. 330728



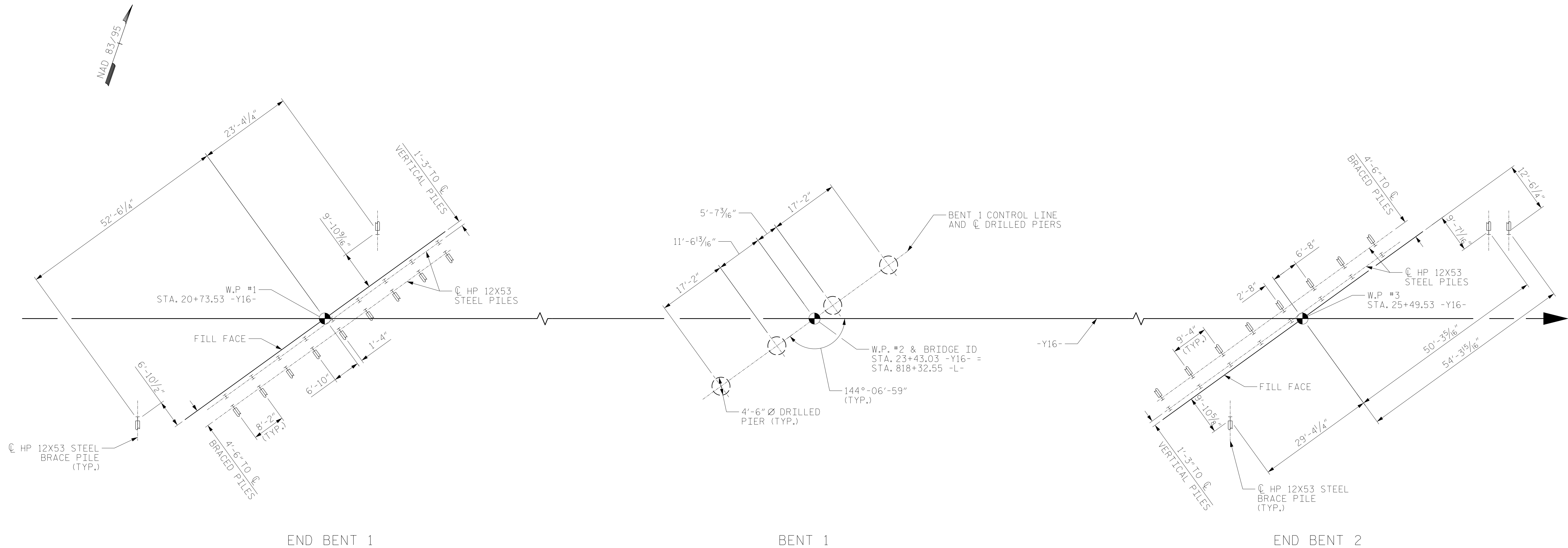
RS&H
 RS&H Architects-Engineers-Planners, Inc.
 8521 Six Forks Road, Suite 400
 919-926-4100 FAX 919-846-9080
 www.rsandh.com
 North Carolina License No. 50073-F-0403-C-28

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 FOR BRIDGE ON SR 2679
 OVER WINSTON-SALEM
 NORTHERN BELTWAY BETWEEN
 SR 1003 AND SR 2643

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S7-1
1			3			TOTAL SHEETS
2			4			48

DRAWN BY : PDS DATE : 03/2019
 CHECKED BY : MRA DATE : 12/2019
 DESIGN ENGINEER OF RECORD: JMR DATE : 12/2019

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED



FOUNDATION LAYOUT

- ⊥ = VERTICAL PILE
- ⊥ = BRACED PILE

ALL PILES ARE HP12X53 STEEL PILES.
 BRACED PILES ARE BATTERED AT 3:12.
 DIMENSIONS LOCATING DRILLED PIERS SHOWN TO THE CENTERLINE OF DRILLED PIERS.
 DIMENSIONS LOCATING PILES SHOWN TO THE CENTERLINE OF PILES AT BOTTOM OF CAP ELEVATION.

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 225 TONS PER PILE.
- FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- DRILLED PIERS AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 910 TONS/PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 40 TSF.
- INSTALL DRILLED PIERS AT BENT NO.1 TO A TIP ELEVATION NO HIGHER THAN 862.0 FT (1 LT); 873.0 FT (2 CTS); AND 862.0 FT (1 RT), SATISFY THE REQUIRED TIP RESISTANCE, AND HAVE A PENETRATION OF AT LEAST 9 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.
- 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 END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 126 TONS PER PILE.
- DRIVE PILES AT END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 210 TONS PER PILE.

PROJECT NO. U-2579AB
FORSYTH COUNTY
 STATION: 23+43.03 -Y16-

SHEET 2 OF 3

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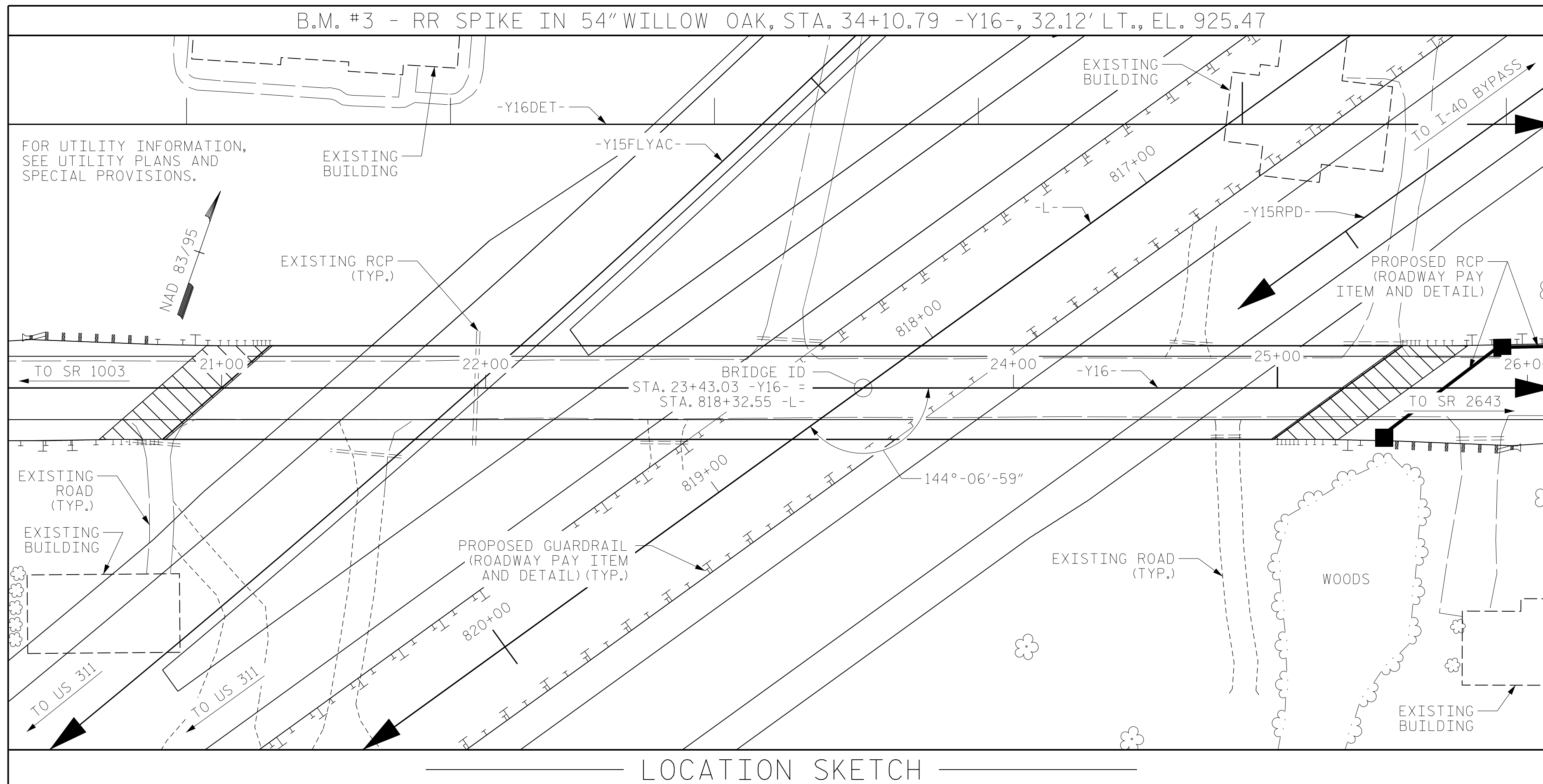
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON SR 2679
 OVER WINSTON-SALEM
 NORTHERN BELTWAY BETWEEN
 SR 1003 AND SR 2643

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S7-2
1			3			TOTAL SHEETS
2			4			48

DRAWN BY :	TRM	DATE :	10/2019
CHECKED BY :	MRA	DATE :	12/2019
DESIGN ENGINEER OF RECORD:	JMR	DATE :	12/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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 SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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

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 THE 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.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

WORK SHALL NOT BE STARTED ON THIS BRIDGE UNTIL THE ROADWAY SECTION HAS BEEN EXCAVATED.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W 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 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.

TOTAL BILL OF MATERIALS

	4'-6" Ø DRILLED PIER IN SOIL	4'-6" Ø DRILLED PIER NOT IN SOIL	CSL TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	APPROX. 1,250,000 LBS STRUCTURAL STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	HP 12X53 STEEL PILES	
	LIN. FT.	LIN. FT.	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	LUMP SUM	EACH	NO.	LIN. FT.
SUPERSTRUCTURE				17,987	12,483								
END BENT 1						121.4		16,559			20	20	900
BENT 1	56.0	56.0				84.5		25,453	5,375				
END BENT 2						138.8		23,783			19	19	860
TOTAL	56.0	56.0	1	17,987	12,483	344.7	LUMP SUM	65,795	5,375	LUMP SUM	39	39	1,760
	TWO BAR METAL RAIL	1'-2" x 2'-6" CONCRETE PARAPET	1'-2" x 3'-3 3/4" CONCRETE PARAPET	4" SLOPE PROTECTION	DISC BEARINGS	EXPANSION JOINT SEALS							
	LIN. FT.	LIN. FT.	LIN. FT.	SQ. YDS	LUMP SUM	LUMP SUM							
SUPERSTRUCTURE	929.4	481.4	481.4										
END BENT 1				240									
BENT 1													
END BENT 2				222									
TOTAL	929.4	481.4	481.4	462	LUMP SUM	LUMP SUM							

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

NOTE:
SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30" (SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND F_y = 60 KSI.

PROJECT NO. U-2579AB
FORSYTH COUNTY
 STATION: 23+43.03 -Y16-

SHEET 3 OF 3

DRAWN BY : TRM DATE : 10/2019
 CHECKED BY : MRA DATE : 12/2019
 DESIGN ENGINEER OF RECORD: JMR DATE : 12/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON SR 2679
 OVER WINSTON-SALEM
 NORTHERN BELTWAY BETWEEN
 SR 1003 AND SR 2643

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S7-3
1			3			TOTAL SHEETS
2			4			48

LOAD FACTORS:

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

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 (FF)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FF)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FF)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.19	--	1.75	--	1.19	A	EL	96.94	--	1.60	A	ER	264.38	1.30	--	1.97	A	EL	96.94		
	HL-93 (OPERATING)	N/A		1.55	--	1.35	--	1.55	A	EL	96.94	--	2.08	A	ER	264.38	1.00	--	2.56	A	EL	96.94		
	HS-20 (INVENTORY)	36.00	②	2.04	73.57	1.75	--	2.04	A	EL	96.94	--	3.03	A	ER	264.38	1.30	--	3.41	A	EL	96.94		
	HS-20 (OPERATING)	36.00		2.65	95.57	1.35	--	2.65	A	EL	96.94	--	3.92	A	ER	264.38	1.00	--	4.43	A	EL	96.94		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13,500		4.52	60.97	1.40	--	4.52	A	ER	241.78	--	5.07	A	ER	264.38	1.30	--	6.21	A	ER	241.78	
		SNGARBS2	20,000		3.58	71.69	1.40	--	3.58	A	ER	241.78	--	4.21	A	ER	264.38	1.30	--	4.93	A	ER	241.78	
		SNAGRIS2	22,000		3.40	74.69	1.40	--	3.40	A	ER	241.78	--	4.07	A	ER	264.38	1.30	--	4.66	A	ER	241.78	
		SNCOTTS3	27,250		2.76	75.16	1.40	--	2.76	A	ER	264.38	--	3.50	A	ER	264.38	1.30	--	3.78	A	ER	240.38	
		SNAGGRS4	34,925		2.36	82.32	1.40	--	2.36	A	ER	264.38	--	3.06	A	ER	264.38	1.30	--	3.26	A	ER	241.78	
		SNS5A	35,550		2.32	82.42	1.40	--	2.32	A	ER	264.38	--	3.19	A	ER	264.38	1.30	--	3.20	A	ER	241.78	
		SNS6A	39,950		2.15	85.77	1.40	--	2.15	A	ER	264.38	--	3.00	A	ER	264.38	1.30	--	2.96	A	ER	240.38	
	SNS7B	42,000		2.08	87.44	1.40	--	2.08	A	ER	264.38	--	3.02	A	ER	264.38	1.30	--	2.83	A	EL	96.94		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33,000		2.44	80.58	1.40	--	2.44	A	ER	264.38	--	3.24	A	ER	264.38	1.30	--	3.37	A	ER	241.78	
		TNT4A	33,075		2.47	81.62	1.40	--	2.47	A	ER	264.38	--	3.28	A	ER	264.38	1.30	--	3.42	A	ER	240.38	
		TNT6A	41,600		2.09	87.15	1.40	--	2.09	A	ER	264.38	--	3.01	A	ER	264.38	1.30	--	2.91	A	ER	241.78	
		TNT7A	42,000		2.10	88.08	1.40	--	2.10	A	ER	264.38	--	3.03	A	ER	264.38	1.30	--	2.91	A	EL	96.94	
		TNT7B	42,000		2.09	87.70	1.40	--	2.09	A	ER	264.38	--	2.87	A	ER	264.38	1.30	--	2.88	A	EL	241.78	
		TNAGRIT4	43,000		2.02	86.77	1.40	--	2.02	A	ER	264.38	--	2.75	A	ER	264.38	1.30	--	2.78	A	ER	241.78	
TNAGT5A		45,000		1.98	89.31	1.40	--	1.98	A	ER	264.38	--	2.60	A	ER	264.38	1.30	--	2.70	A	EL	96.94		
TNAGT5B	45,000		③	1.97	88.76	1.40	--	1.97	A	ER	264.38	--	2.55	A	ER	264.38	1.30	--	2.69	A	EL	96.94		

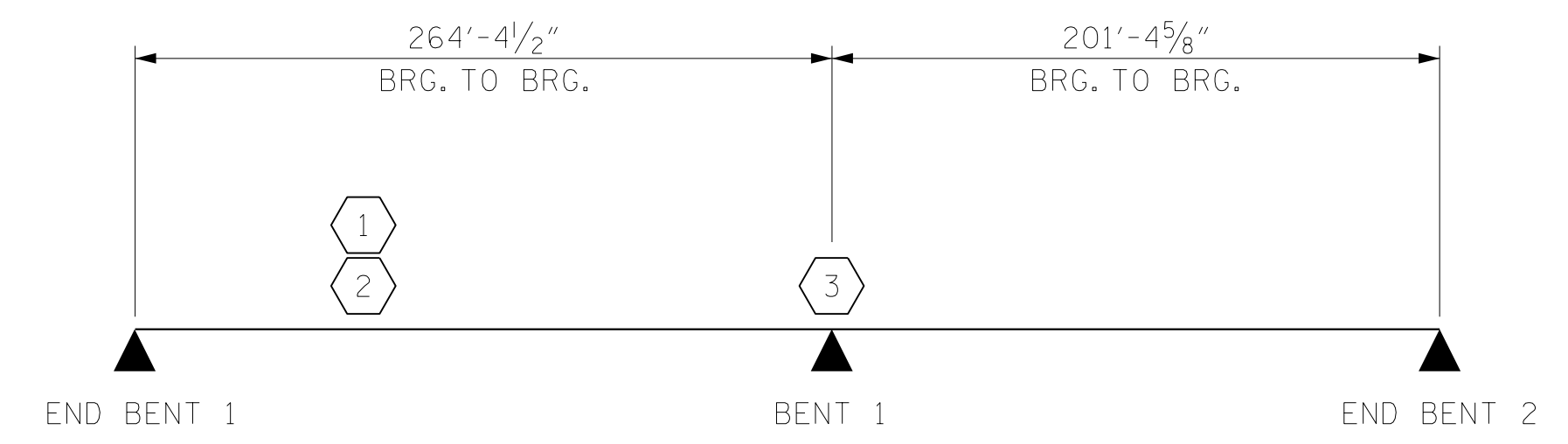
NOTES:

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:

- THE LIVE LOAD DISTRIBUTION WAS BASED ON A REFINED METHOD OF ANALYSIS USING A GRILLAGE ANALOGY METHOD.

①	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	
I - INTERIOR GIRDER EL - EXTERIOR LEFT GIRDER ER - EXTERIOR RIGHT GIRDER	



SPAN A SPAN B

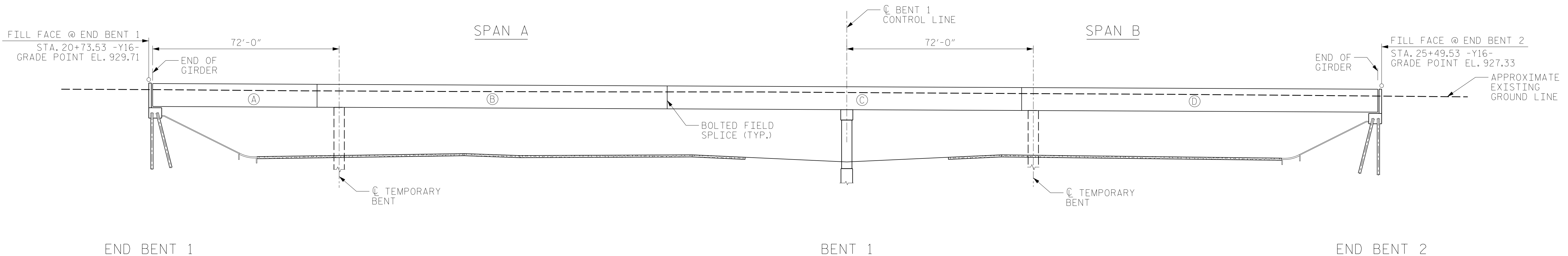
LRFR SUMMARY

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 23+43.03 -Y16-

ASSEMBLED BY : NSC	DATE : 01/2020
CHECKED BY : JMR	DATE : 01/2020
DRAWN BY : MAA 1/08	REV. 11/2/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THG

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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
STANDARD						S7-4
LRFR SUMMARY FOR STEEL GIRDERS (NON-INTERSTATE TRAFFIC)						TOTAL SHEETS
REVISIONS						48
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			



SECTION ALONG -Y16-
(ELEVATIONS TAKEN AT RIGHT ANGLES TO END BENTS AND BENT)

NOTES:

INITIAL SET WILL REQUIRE PLACEMENT OF TWO ADJACENT GIRDERS WITH CROSSFRAMES AND LATERAL BRACING.

WITHIN A FIELD SECTION, GIRDERS 3 AND 4, WITH ALL CROSSFRAME MEMBERS AND BOLTS INSTALLED, SHALL BE LIFTED FIRST. GIRDERS 1 AND 2, WITH ALL CROSSFRAME MEMBERS AND BOLTS INSTALLED, SHALL BE LIFTED SECOND. FINALLY, ALL CROSSFRAME MEMBERS AND BOLTS SHALL BE INSTALLED AND TIGHTENED BETWEEN GIRDERS 2 AND 3 BEFORE GIRDERS 1 AND 2 ARE RELEASED.

THE STRUCTURAL STEEL SHALL BE SUPPORTED DURING ERECTION IN ITS CAMBERED POSITION. DURING ERECTION OF GIRDERS, ALL CROSSFRAME MEMBERS SHALL BE INSTALLED AND ALL BOLTS SHALL BE INSTALLED AND PROPERLY TENSIONED PER THE STANDARD SPECIFICATIONS.

DURING THE GIRDER ERECTION PROCEDURE, THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY LATERAL BRACING AND OTHER MEANS OF SUPPORT, AS REQUIRED, TO ENSURE THE STABILITY OF THE GIRDERS, TO AVOID UPLIFT OF THE GIRDERS AT THE TEMPORARY BENT, AND TO MAINTAIN PLUMBNESS OF THE GIRDER WEBS.

THE CONTRACTOR MAY SUBMIT ALTERNATE ERECTION METHODS. PLANS FOR SUCH ERECTION METHODS SHALL BE APPROVED BY THE ENGINEER.

TEMPORARY BENTS, IF USED, SHALL BE LOCATED AT THE CONNECTOR PLATES, SUPPORT ALL GIRDERS IN THE TYPICAL SECTION, AND REMAIN IN PLACE UNTIL ALL CROSSFRAMES AND TEMPORARY BRACING, IF USED, ARE IN PLACE AND ALL HIGH STRENGTH BOLTS ARE TIGHTENED.

METHOD OF TEMPORARY BENT REMOVAL SHALL UNIFORMLY APPLY THE STRUCTURAL STEEL WEIGHT TO THE GIRDERS AND CROSSFRAMES.

THE CONTRACTOR IS RESPONSIBLE FOR DESIGNING ANY TEMPORARY BENTS. THE DESIGN SHALL FOLLOW THE AASHTO DESIGN GUIDE SPECIFICATIONS FOR BRIDGE TEMPORARY WORKS, 2017, AND SHALL BE COMPLETED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA. THE CONTRACTOR SHALL SUBMIT SIGNED AND SEALED CALCULATIONS AND WORKING DRAWINGS FOR APPROVAL BY THE ENGINEER. WORKING DRAWINGS SHALL INCLUDE PLANS FOR TEMPORARY BENTS, ERECTION SEQUENCE AND TEMPORARY BENT REMOVAL.

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 CONSIDERED INCIDENTAL TO THE LUMP SUM BID PRICE FOR STRUCTURAL STEEL.

FOR TEMPORARY BENTS, SEE SPECIAL PROVISIONS.

ERECTION SEQUENCE

1. CONSTRUCT TEMPORARY BENTS.
2. INSTALL FIELD SECTION D.
3. INSTALL FIELD SECTION C.
4. INSTALL FIELD SECTION B.
5. INSTALL FIELD SECTION A.
6. REMOVE TEMPORARY BENTS.

PROJECT NO. U-2579AB
FORSYTH COUNTY
 STATION: 23+43.03 -Y16-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**GIRDER ERECTION
 DETAILS**

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

S7-5

DRAWN BY : TRM	DATE : 11/2019
CHECKED BY : MAL	DATE : 12/2019
DESIGN ENGINEER OF RECORD: JMR	DATE : 12/2019

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NOTES:

PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 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 2 1/2" ABOVE THE TOP MAT 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.

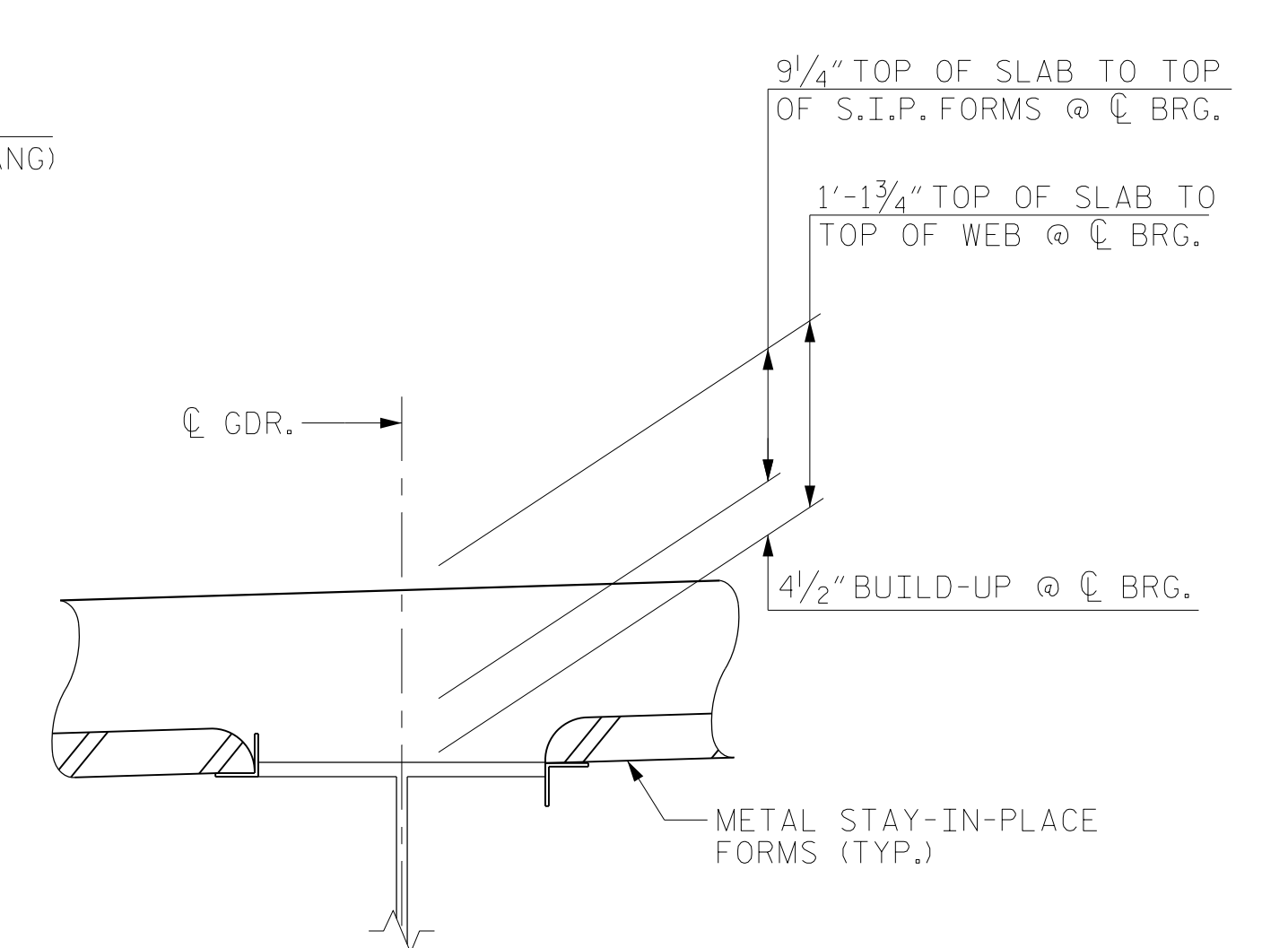
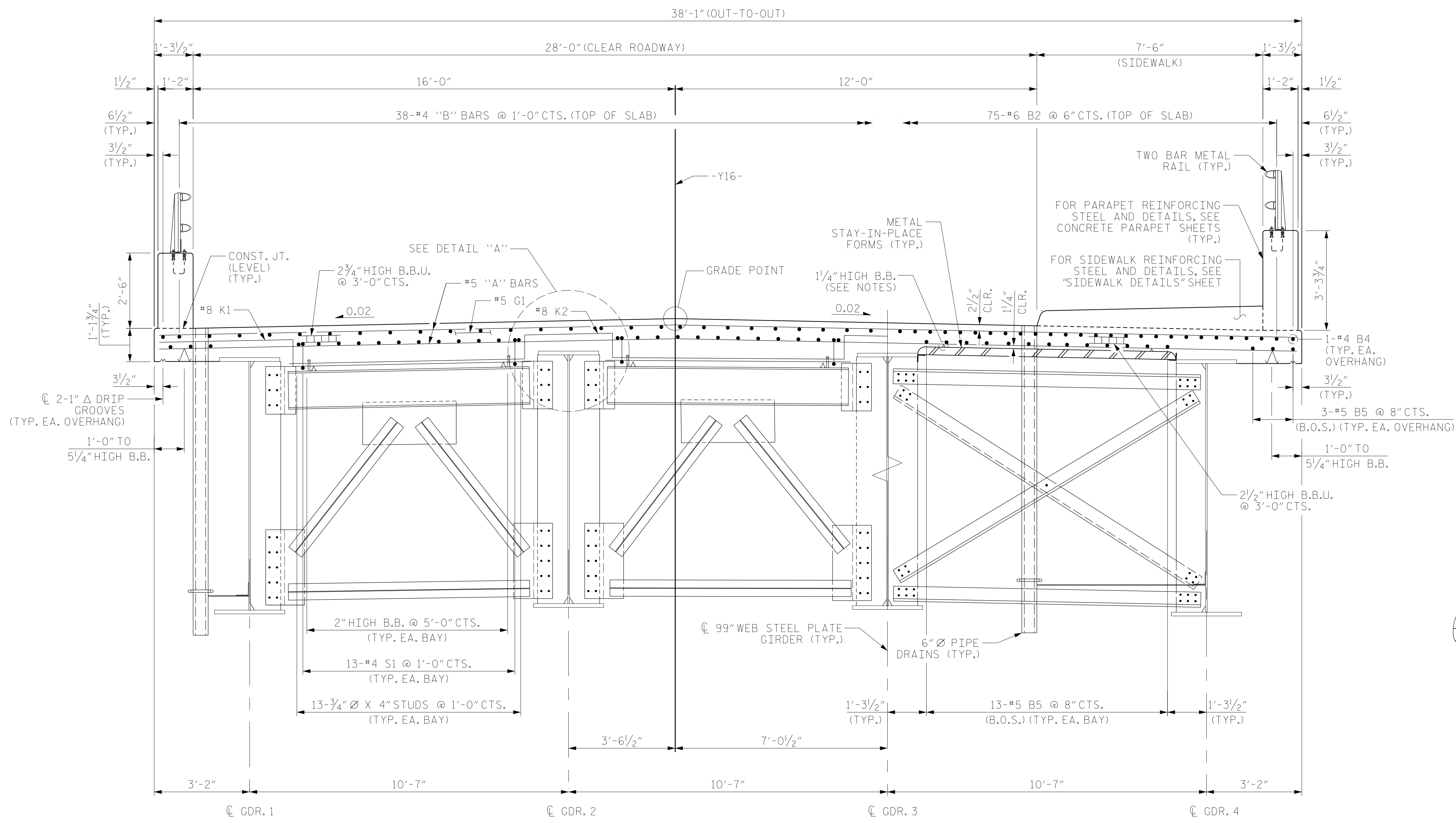
CONCRETE PARAPET IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

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 PLACES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING DRAWINGS.

FOR DIAPHRAGM LOCATIONS AND STEEL DETAILS, SEE "FRAMING PLAN" SHEET AND "STRUCTURAL STEEL DETAILS" SHEET.

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

B.O.S. = BOTTOM OF SLAB



DETAIL "A"
REINFORCING NOT SHOWN FOR CLARITY

HALF SECTION AT END BENT DIAPHRAGM

HALF SECTION AT INTERMEDIATE DIAPHRAGM

TYPICAL SECTION

PROJECT NO. U-2579AB
FORSYTH COUNTY
 STATION: 23+43.03 -Y16-

SHEET 1 OF 2



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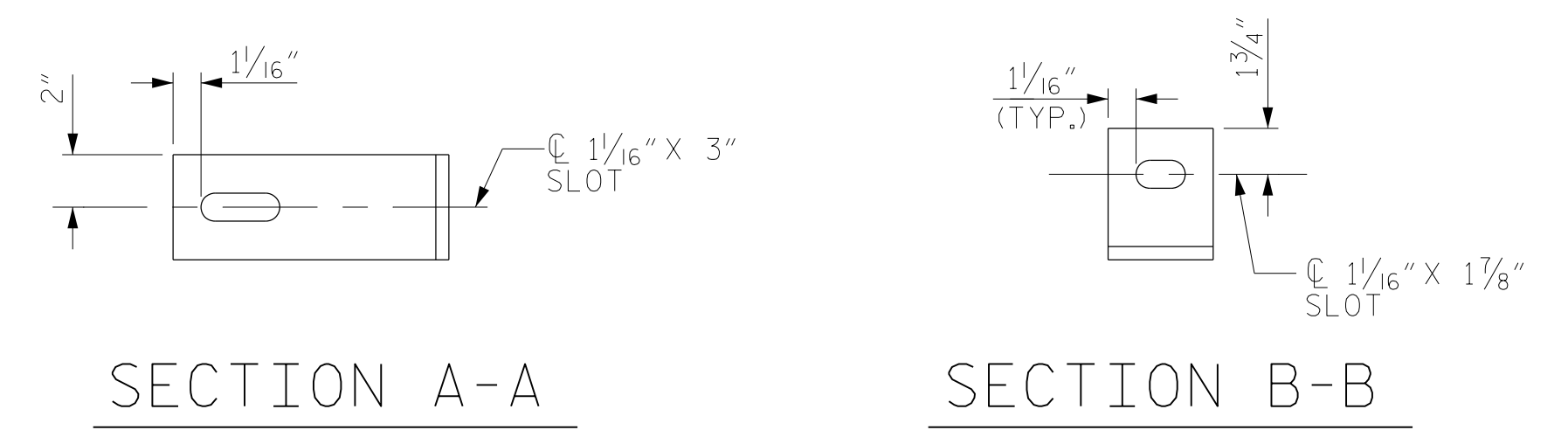
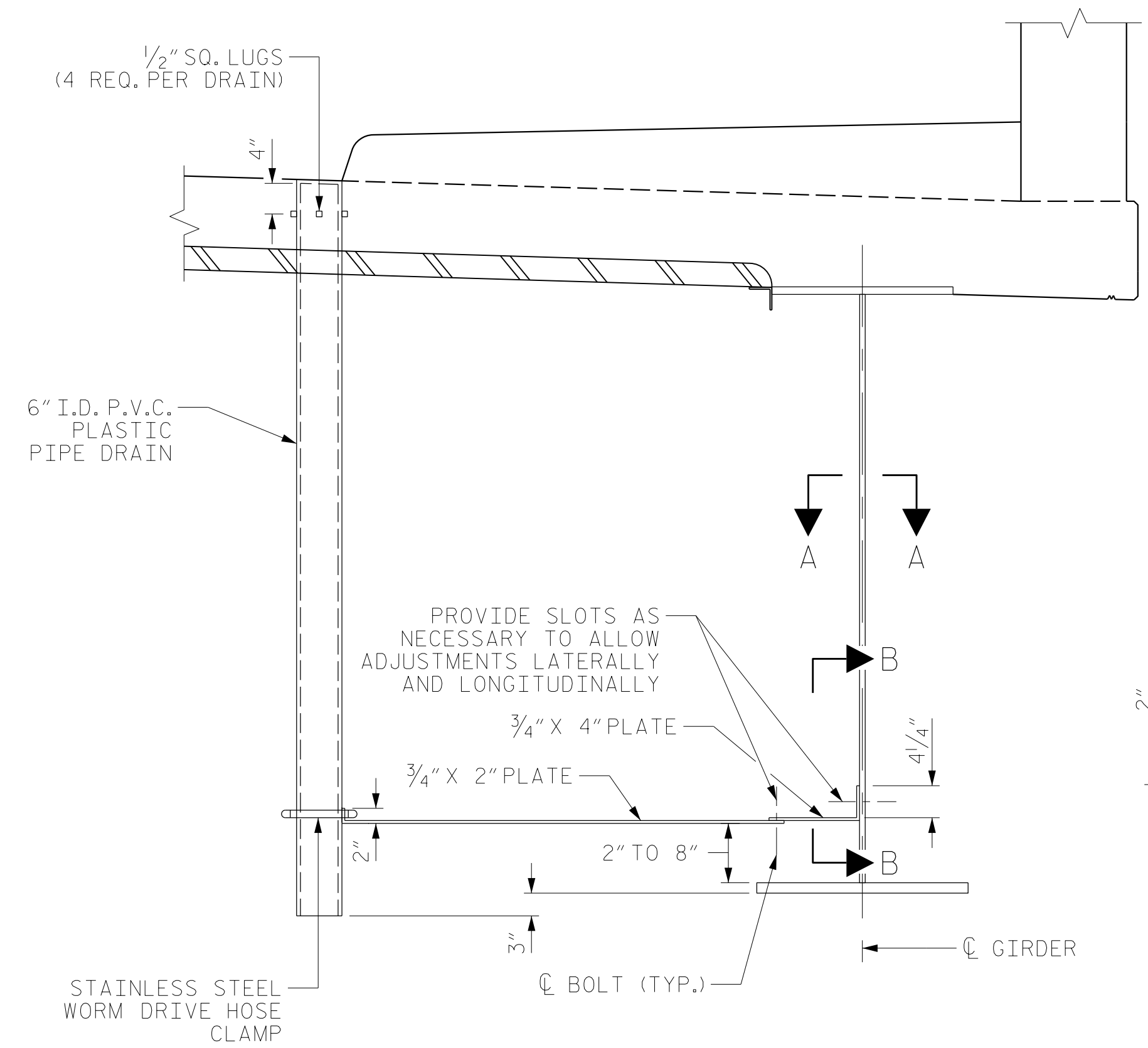
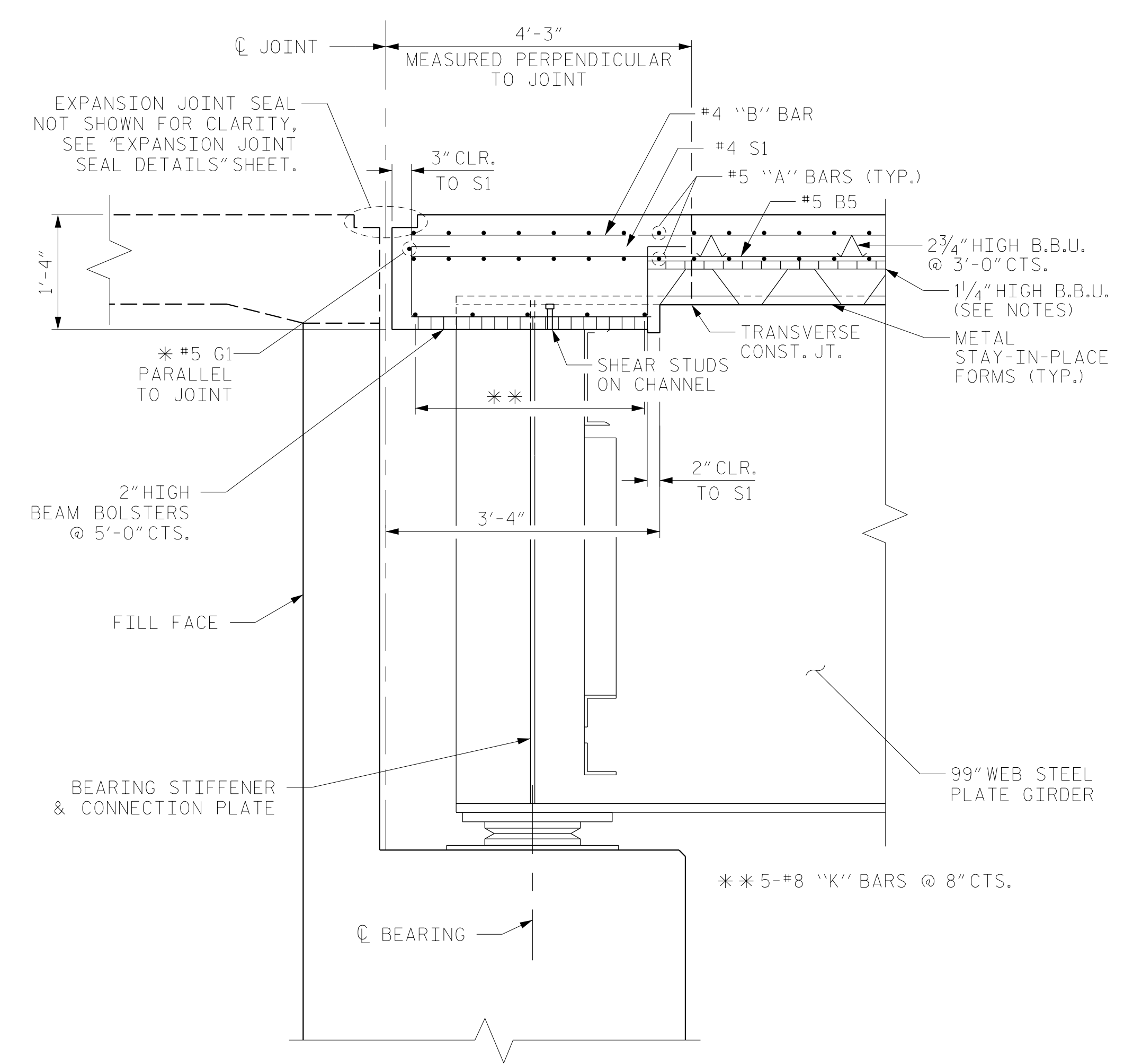
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTION

DRAWN BY : MRA DATE : 12/2019
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			48
2			4			

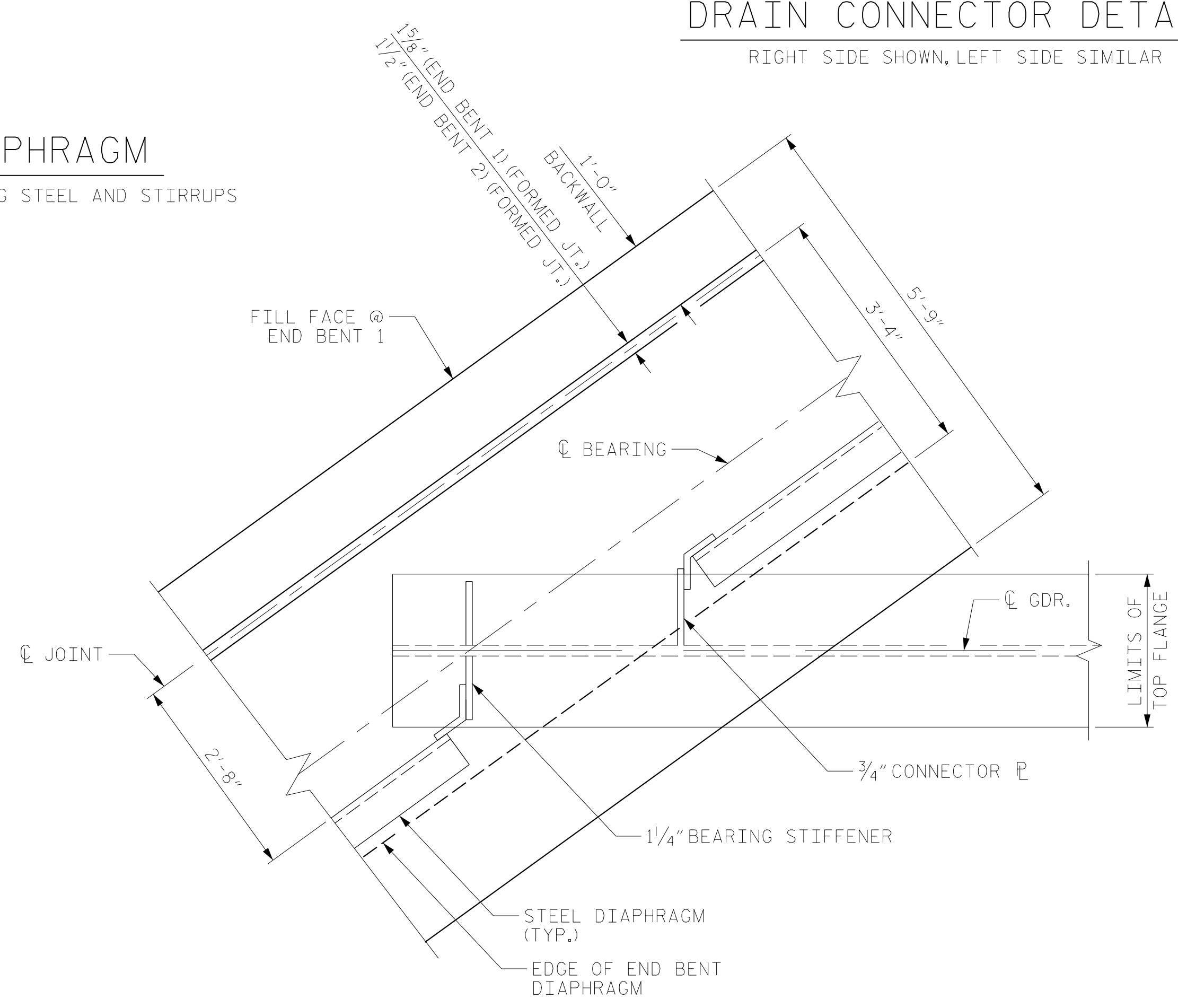
NOTES:
 PVC DECK DRAINS SHALL BE PAINTED WITH TWO COATS OF BROWN PRIMER MEETING THE REQUIREMENTS OF ARTICLE 1080-09 OF THE STANDARD SPECIFICATIONS. EACH COATS SHALL BE 2 DRY MILLS THICK. DECK DRAINS SHALL BE ROUGHENED PRIOR TO PAINTING. NO SEPARATE PAYMENT SHALL BE MADE FOR PAINTING PVC DECK DRAINS AS THIS IS CONSIDERED INCIDENTAL TO THE PAY ITEM FOR REINFORCED CONCRETE SLAB.
 TOP OF FLOOR DRAIN TO BE SET $\frac{3}{8}$ " BELOW SURFACE OF SLAB.
 4 - $\frac{1}{2}$ " 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 DIAPHRAGMS AND CROSSFRAME CONNECTIONS. STAINLESS STEEL WORM DRIVE HOSE CLAMP SHALL BE COMMERCIAL QUALITY.
 THE 6" DIA. PVC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.
 PLATES SHALL CONFORM TO AASHTO M270 GRADE 50W STEEL OR APPROVED EQUAL.
 FOR ADDITIONAL NOTES, SEE SHEET 1 OF 2.



DRAIN CONNECTOR DETAIL
 RIGHT SIDE SHOWN, LEFT SIDE SIMILAR

SECTION THROUGH END BENT DIAPHRAGM

* #5 G1 MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS
 END BENT 1 SHOWN, END BENT 2 SIMILAR



PLAN OF END BENT DIAPHRAGM
 END BENT 1 SHOWN, END BENT 2 SIMILAR

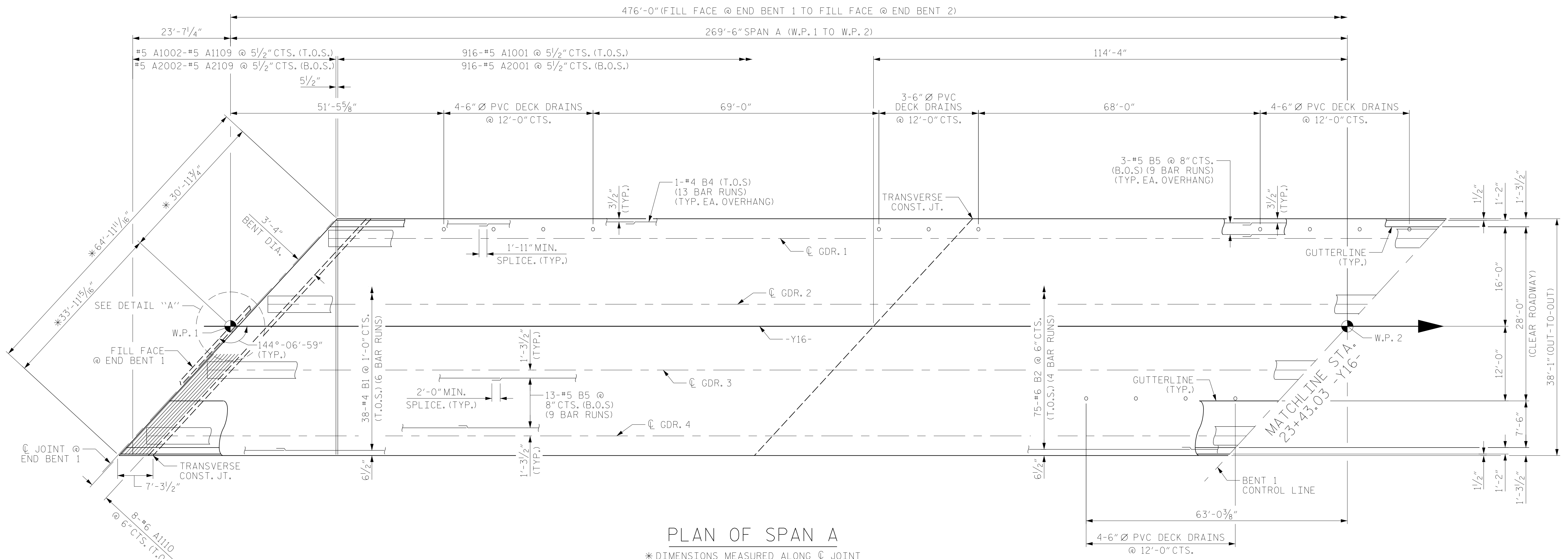
PROJECT NO. U-2579AB
FORSYTH COUNTY
 STATION: 23+43.03 -Y16-

SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
SUPERSTRUCTURE						S7-7
TYPICAL SECTION DETAILS						TOTAL SHEETS
						48
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

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PLAN OF SPAN A

* DIMENSIONS MEASURED ALONG C JOINT

NOTES:

- FOR SPLICE LENGTHS NOT SHOWN, REFER TO THE MINIMUM SPLICE LENGTH TABLE ON "SUPERSTRUCTURE BILL OF MATERIAL" SHEET 1 OF 2.
- FOR END BENT DIAPHRAGM BARS, SEE "TYPICAL SECTION DETAILS".
- INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY, FOR LOCATIONS, SEE "FRAMING PLAN" SHEET.
- FOR PARAPET REINFORCING STEEL, SEE PARAPET SHEETS.
- FOR SIDEWALK REINFORCING STEEL, SEE "SIDEWALK DETAILS" SHEET.
- FOR POURING SEQUENCE, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET 2 OF 2.
- LIMITS OF THICKENED END SLAB EXTEND TO OUTSIDE EDGE OF DECK.
- T.O.S. = TOP OF SLAB
- B.O.S. = BOTTOM OF SLAB

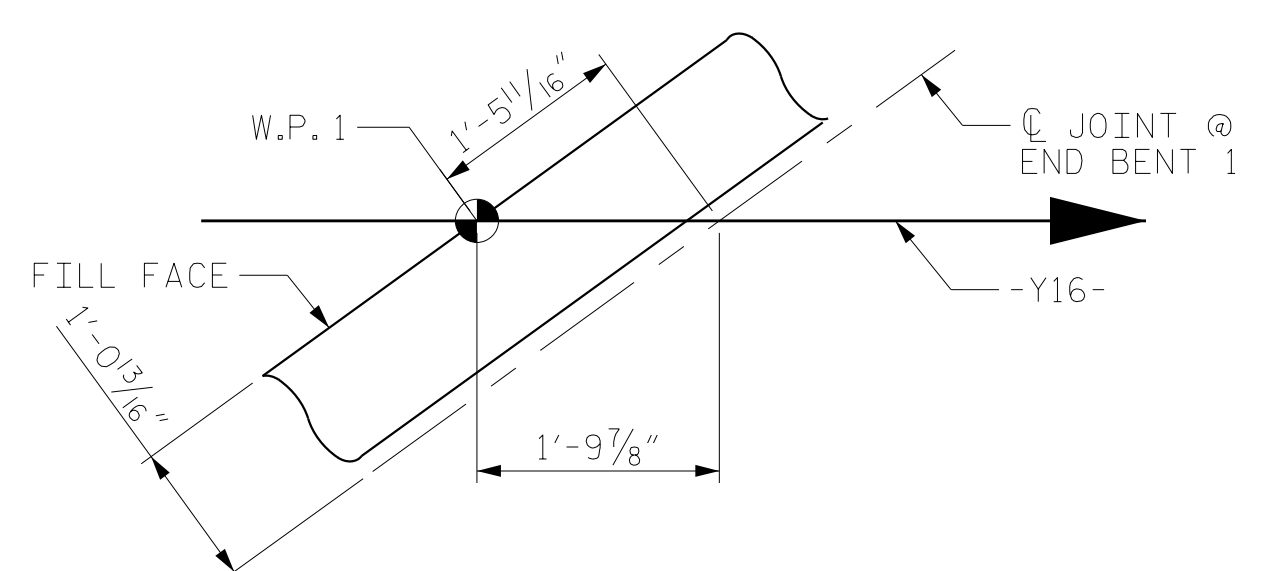
PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 23+43.03 -Y16-

SHEET 1 OF 2

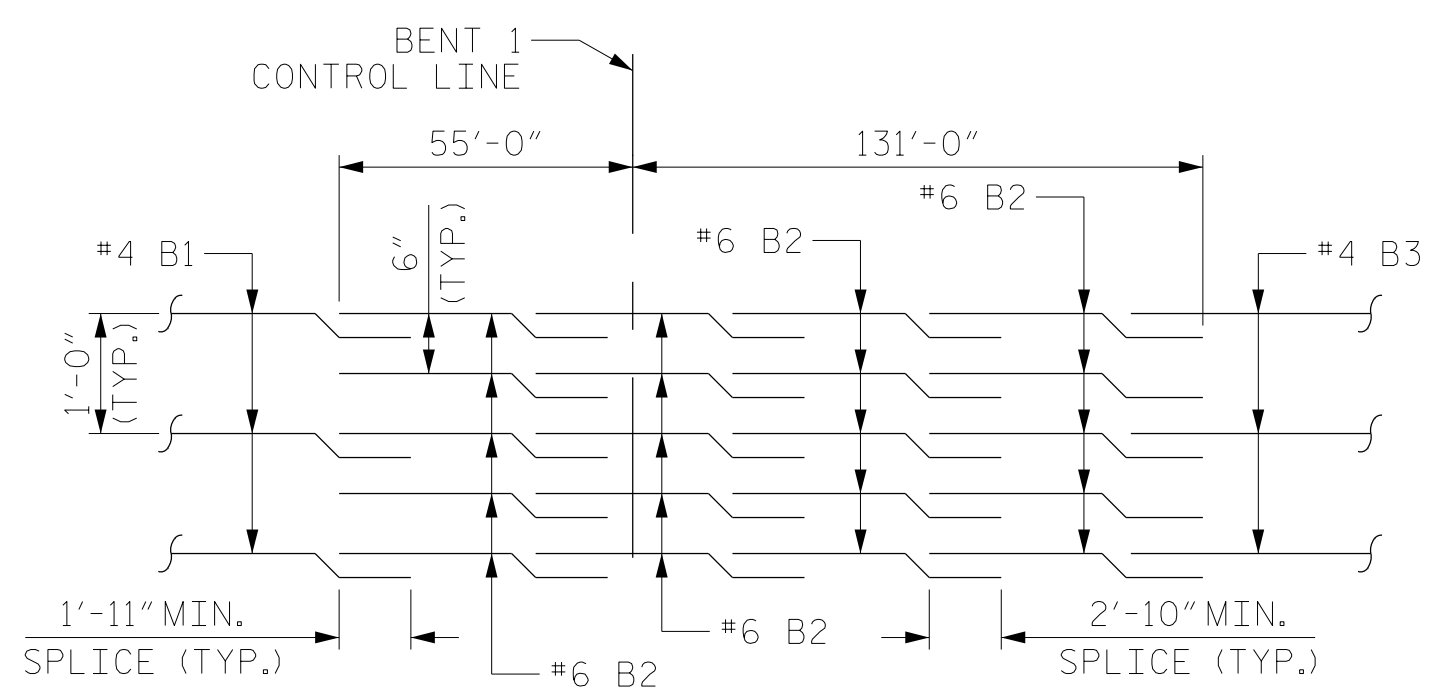


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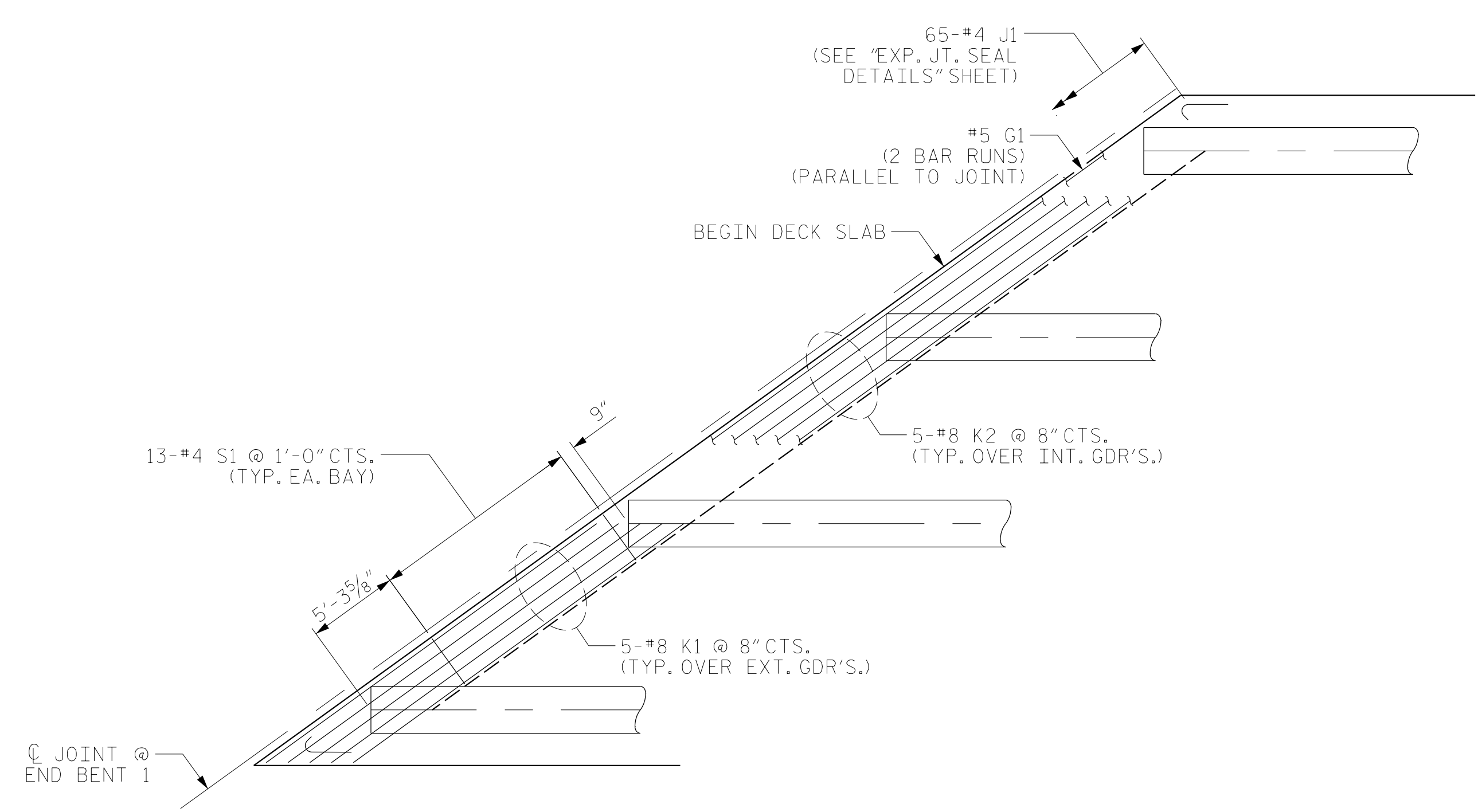
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S7-8
1			3			TOTAL SHEETS
2			4			48



DETAIL "A"



TOP OF SLAB REINFORCING STEEL LAYOUT

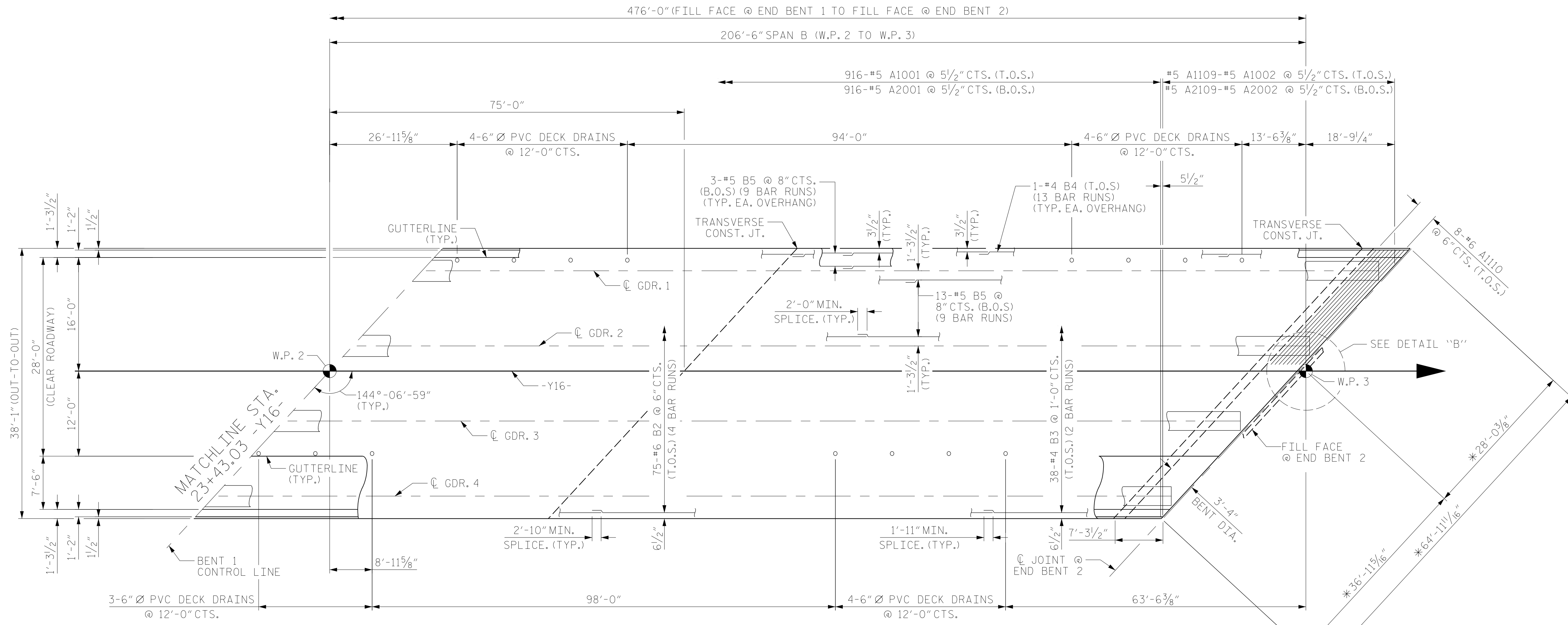


END BENT 1 DIAPHRAGM REINFORCING DETAILS

#5 G1 MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS

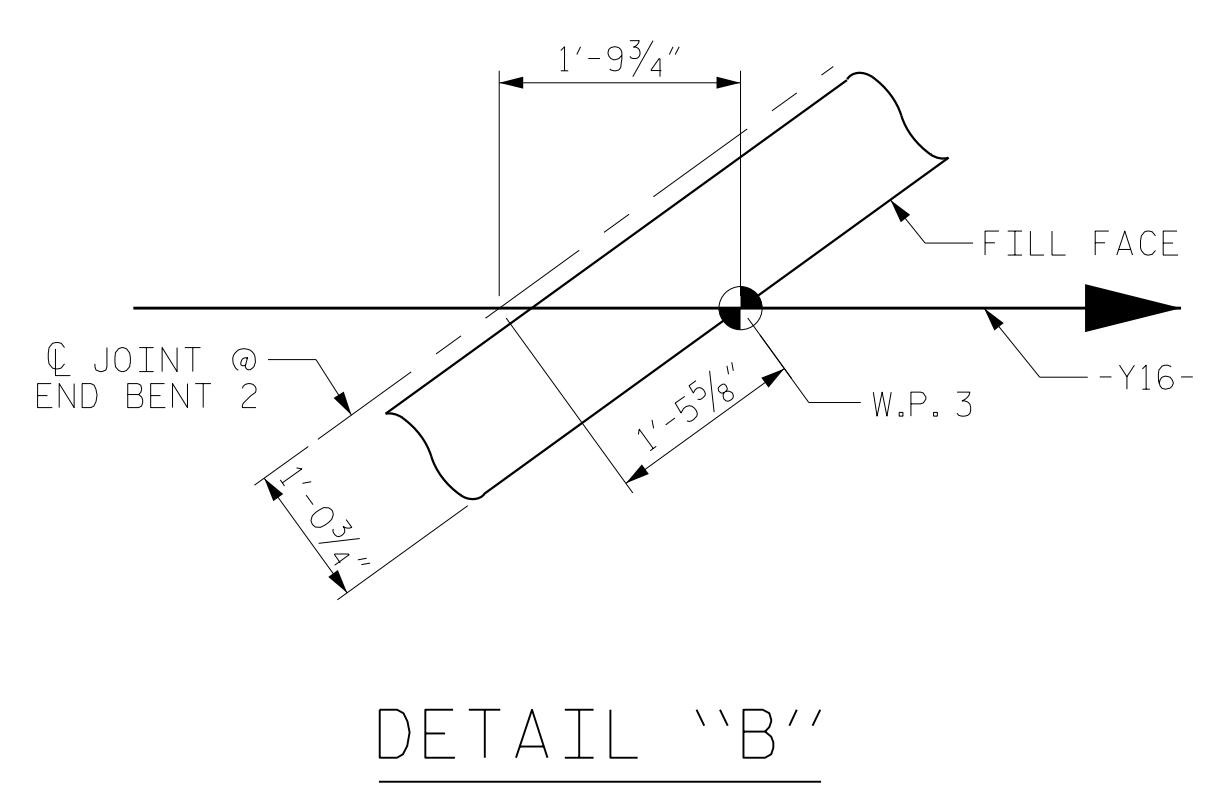
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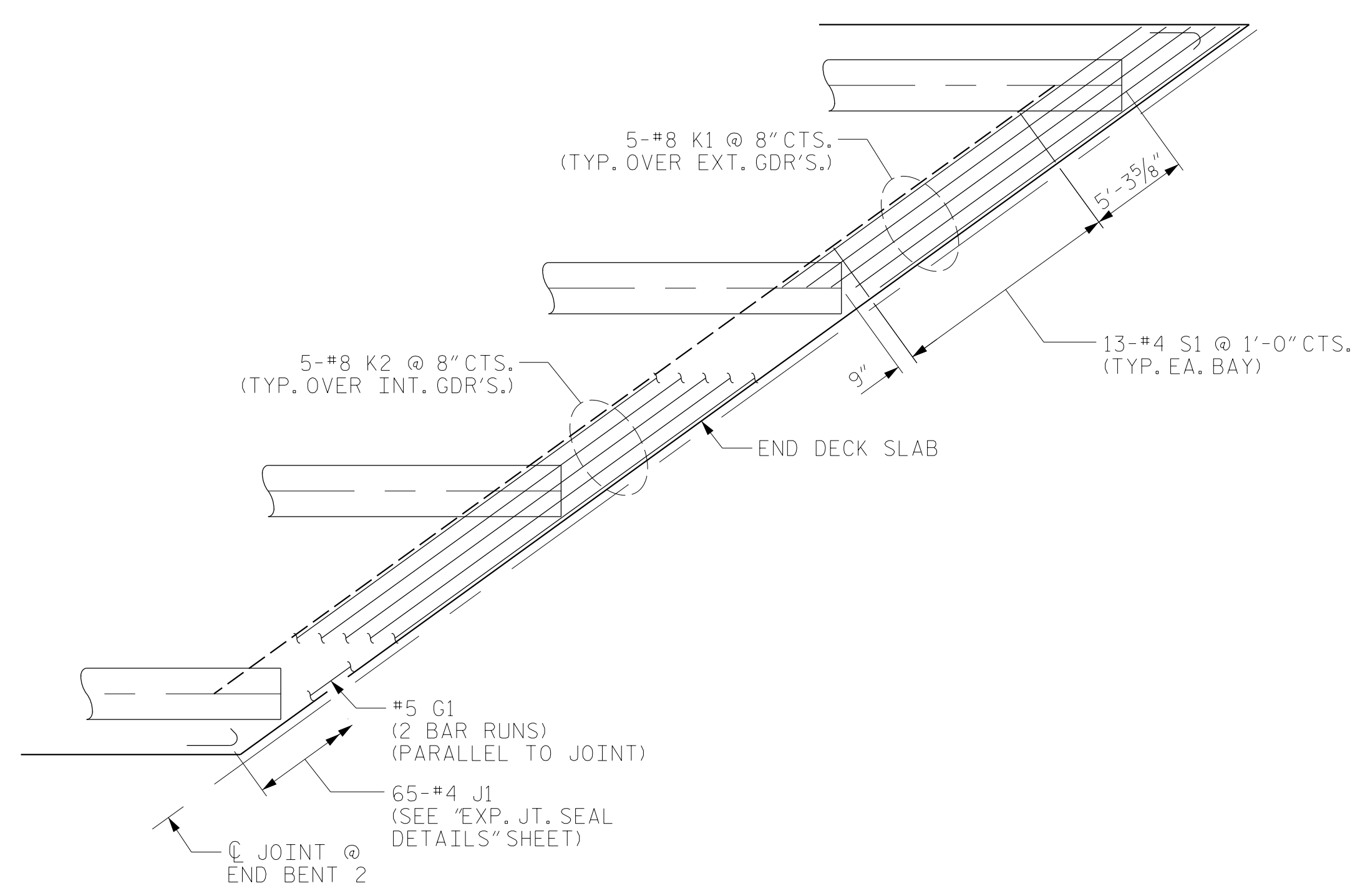


PLAN OF SPAN B

* DIMENSIONS MEASURED ALONG C JOINT



DETAIL "B"



END BENT 2 DIAPHRAGM REINFORCING DETAILS

#5 G1 MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS

NOTE:
FOR NOTES, SEE SHEET 1 OF 2.

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 23+43.03 -Y16-

SHEET 2 OF 2

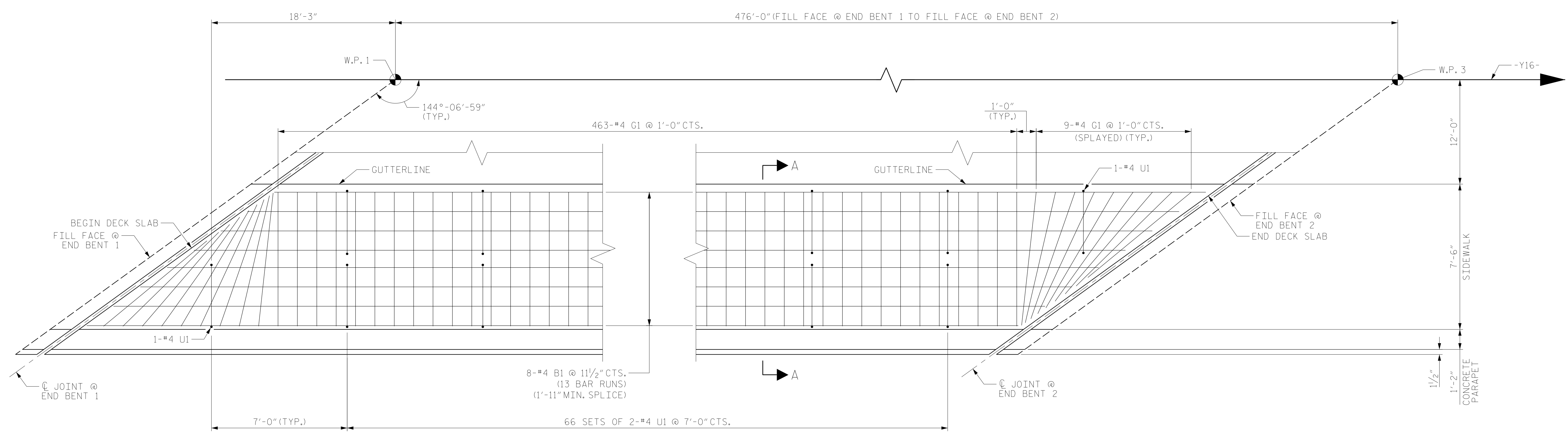


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
PLAN OF SPAN B

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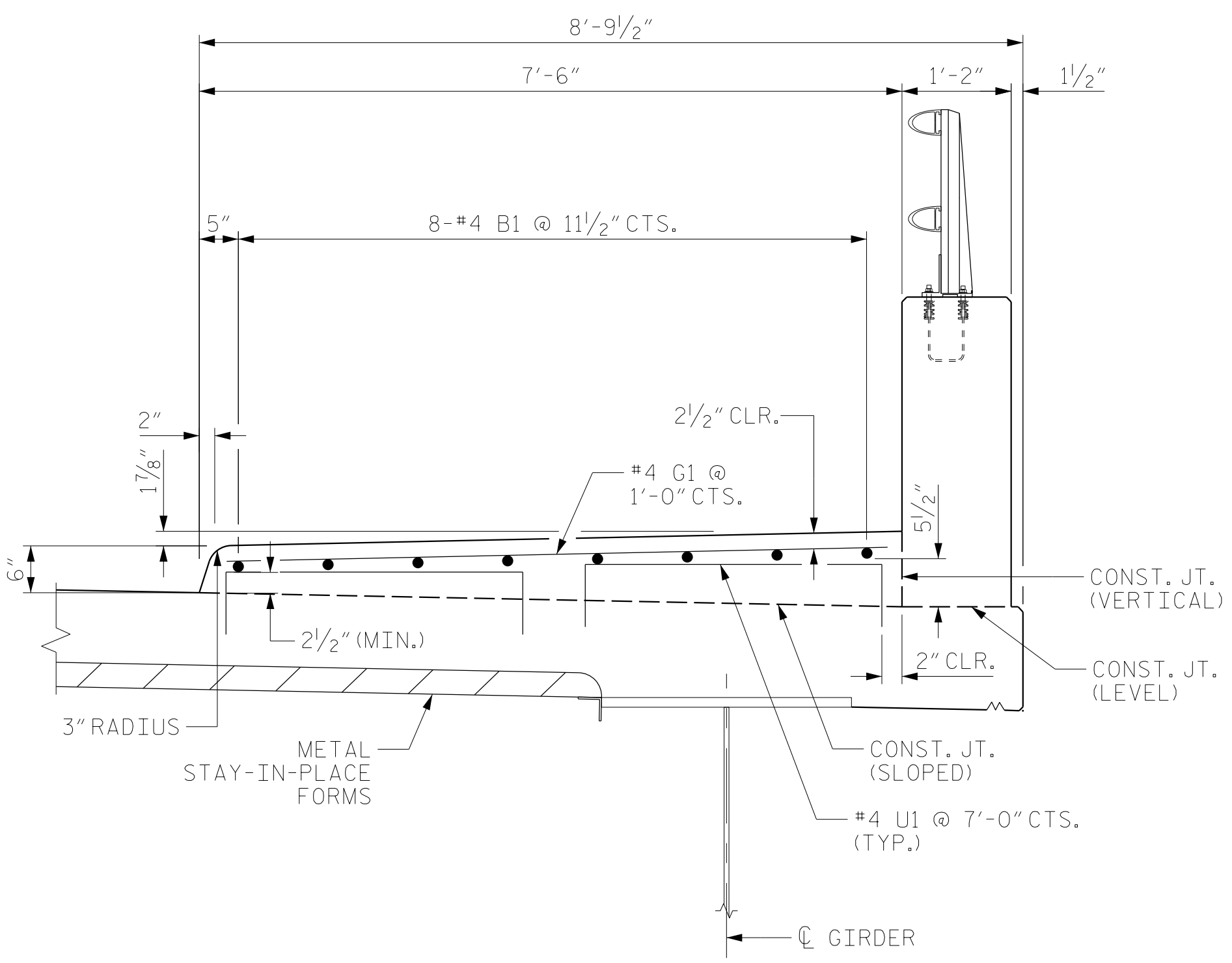
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S7-9
1			3			TOTAL SHEETS
2			4			48



PLAN OF SIDEWALK

NOTES

- GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.
- CONTRACTION JOINTS SHALL BE NORMAL TO BARRIER.
- ALL REINFORCING STEEL IN THE SIDEWALK SHALL BE EPOXY COATED.
- FOR SIDEWALK ON APPROACH SLABS, SEE APPROACH SLAB DRAWINGS.
- PAYMENT FOR THE SIDEWALK SHALL BE INCLUDED IN THE PAY ITEM FOR "REINFORCED CONCRETE DECK SLAB".
- U1 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.
- SIDEWALK 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 3000 PSI.
- FOR CONCRETE PARAPET REINFORCING STEEL AND DETAILS, SEE "CONCRETE PARAPET" SHEETS.
- FOR SIDEWALK COVER PLATE DETAILS AT END BENTS, SEE "EXPANSION JOINT SEAL DETAILS FOR SIDEWALK" SHEETS.



SECTION A-A

PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 23+43.03 -Y16-

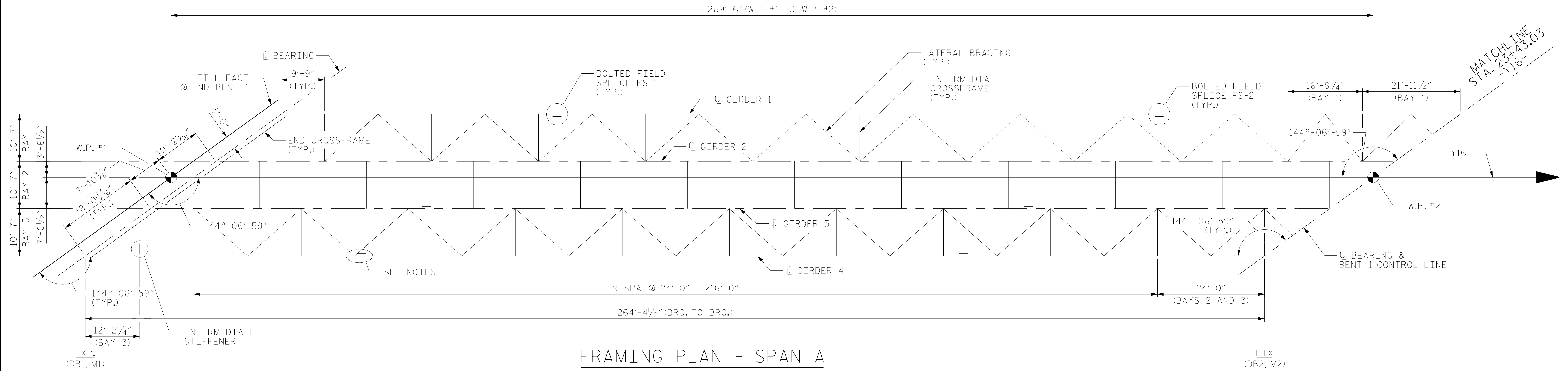
BILL OF MATERIAL						BAR TYPES	
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT		
* B1	104	#4	STR	38'-7"	2680		
* G1	481	#4	STR	7'-2"	2303		
* U1	134	#4	1	4'-8"	418		
* EPOXY COATED REINFORCING STEEL					5,401 LBS.	ALL BAR DIMENSIONS ARE OUT TO OUT	
CLASS AA CONCRETE					84.6 C.Y.		

DRAWN BY : MRA DATE : 12/2019
 CHECKED BY : JMR DATE : 12/2019
 DESIGN ENGINEER OF RECORD: JMR DATE : 12/2019

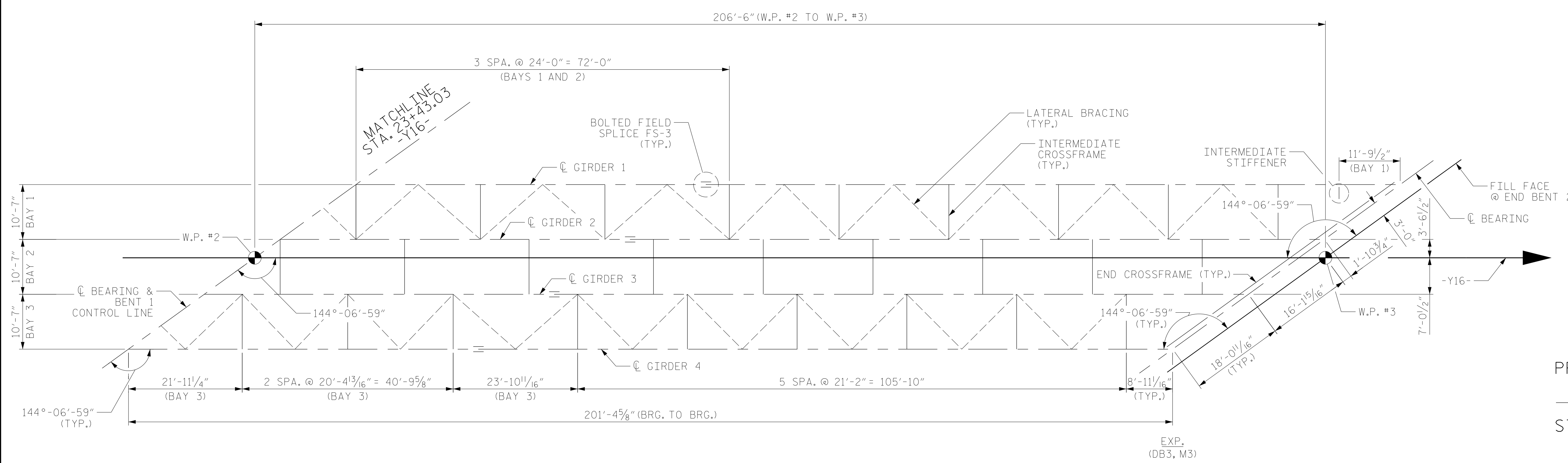
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SUPERSTRUCTURE SIDEWALK DETAILS	
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	ST-10	
1			3			TOTAL SHEETS	
2			4			48	



FRAMING PLAN - SPAN A



FRAMING PLAN - SPAN B

NOTES:
 FOR DIMENSIONS TO ϕ BOLTED FIELD SPLICE, SEE "STRUCTURAL STEEL DETAILS", SHEET 1 OF 5.
 CROSSFRAME SPACINGS ARE TYPICAL EACH BAY, UNLESS NOTED OTHERWISE.
 FOR PLACEMENT OF END CROSSFRAMES, SEE "TYPICAL SECTION" SHEETS.
 FOR DETAILS ABOUT LATERAL BRACING, SEE "LATERAL BRACING" SHEET.
 IN THE EVENT OF CONFLICT WITH LATERAL BRACING COMPONENT AND GIRDER DETAILS, LATERAL BRACING CONNECTION MAY BE SHIFTED SLIGHTLY.

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DESIGN ENGINEER OF RECORD:	JMR	DATE :	12/2019

PROJECT NO. U-2579AB
FORSYTH COUNTY
 STATION: 23+43.03 -Y16-

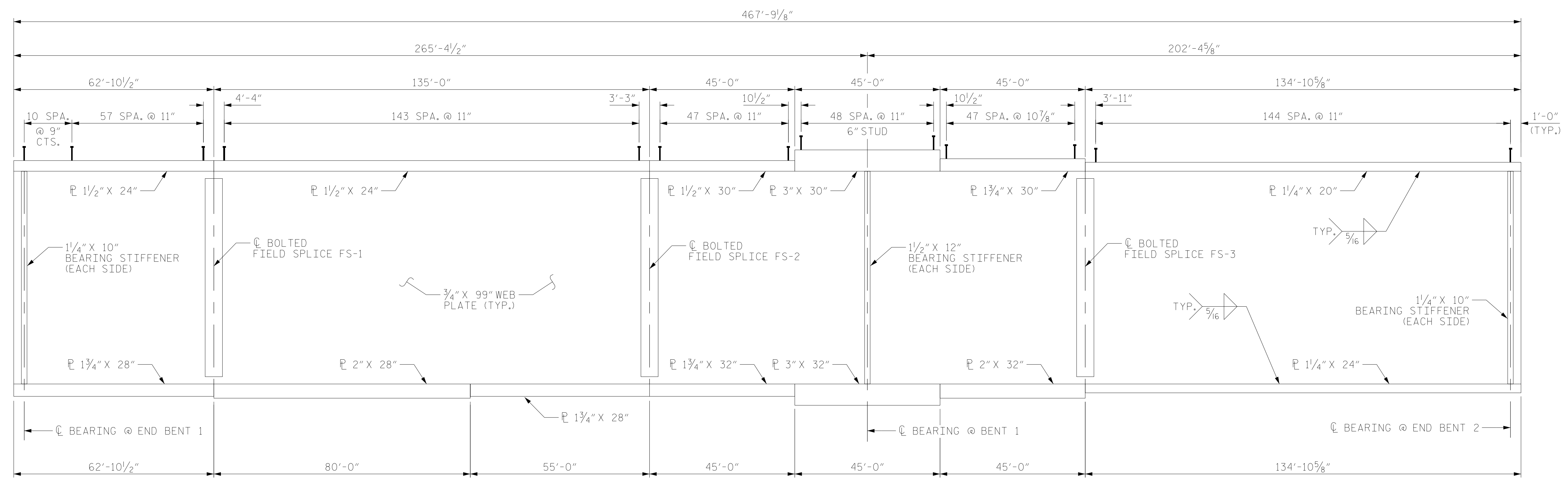


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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 FRAMING PLAN
 SPANS A & B

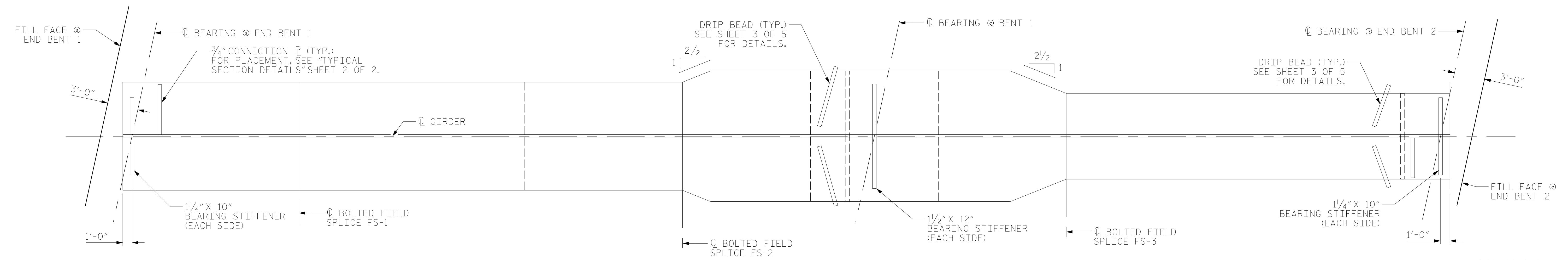
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	ST-11
1			3			TOTAL SHEETS
2			4			48



GIRDER ELEVATION

(FOR CLARITY, CONNECTOR PLATES AND INTERMEDIATE STIFFENER PLATES NOT SHOWN)



PLAN OF BOTTOM FLANGE

(FOR CLARITY, CONNECTOR PLATES AND INTERMEDIATE STIFFENER PLATES NOT SHOWN)

PROJECT NO. U-2579AB
FORSYTH COUNTY
 STATION: 23+43.03 -Y16-

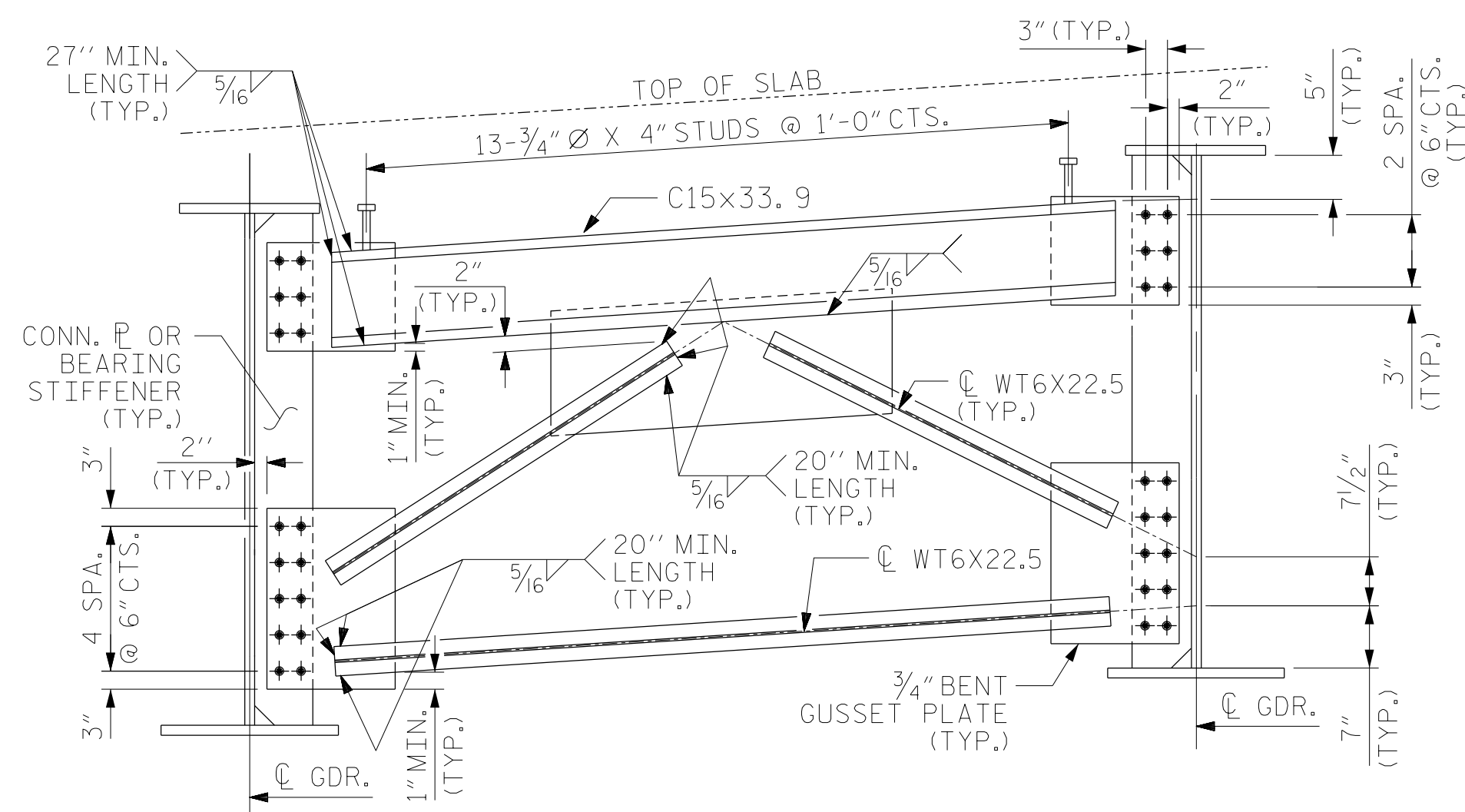
SHEET 1 OF 5

NOTES:
 FOR STRUCTURAL STEEL NOTES, SEE SHEET 2 OF 5.
 FOR SHEAR STUD DETAILS, SEE SHEET 2 OF 5.
 FOR BOLTED FIELD SPLICE DETAILS, SEE SHEET 4 AND 5 OF 5.
 ALL STUDS IN GIRDER ELEVATION ARE 7" TALL UNLESS NOTED OTHERWISE.

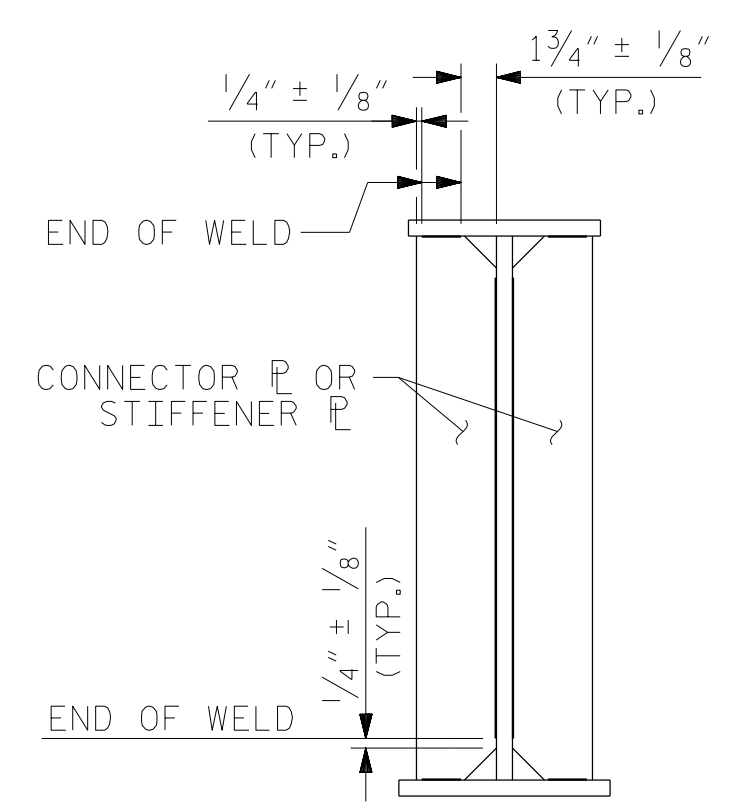
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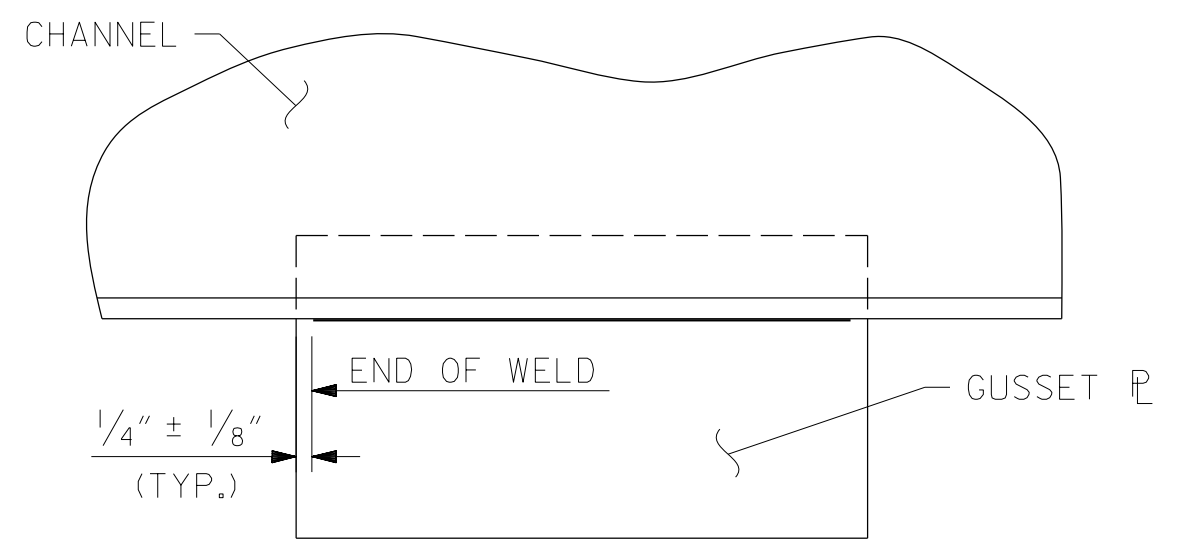
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE STRUCTURAL STEEL DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S7-12
TOTAL SHEETS					48



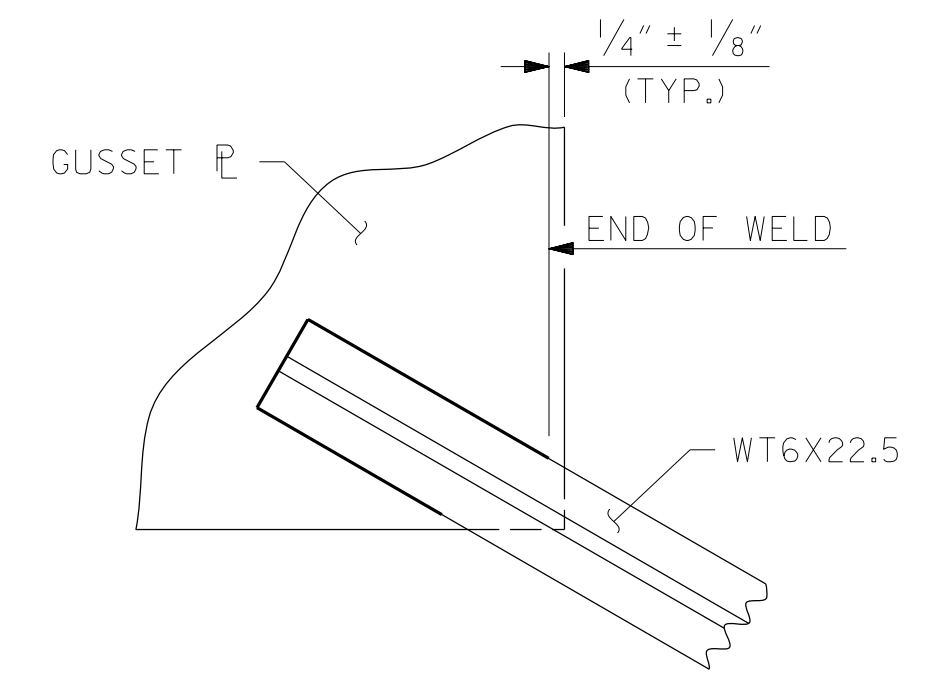
TYPICAL END CROSSFRAME



TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS
(INTERIOR GIRDER SHOWN, HOLES NOT SHOWN)



TYPICAL GUSSET PLATE CONNECTION



TYPICAL TEE TO GUSSET PLATE CONNECTION

NOTES:

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 5 OR SYSTEM 6 OF THE STRUCTURAL STEEL SHOP COATINGS PROGRAMS AND SECTION 442-8 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 7/8" DIA. F3125 GRADE A325 HIGH STRENGTH BOLTS, UNLESS OTHERWISE NOTED.

ENDS OF GIRDERS SHALL BE PLUMB.

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

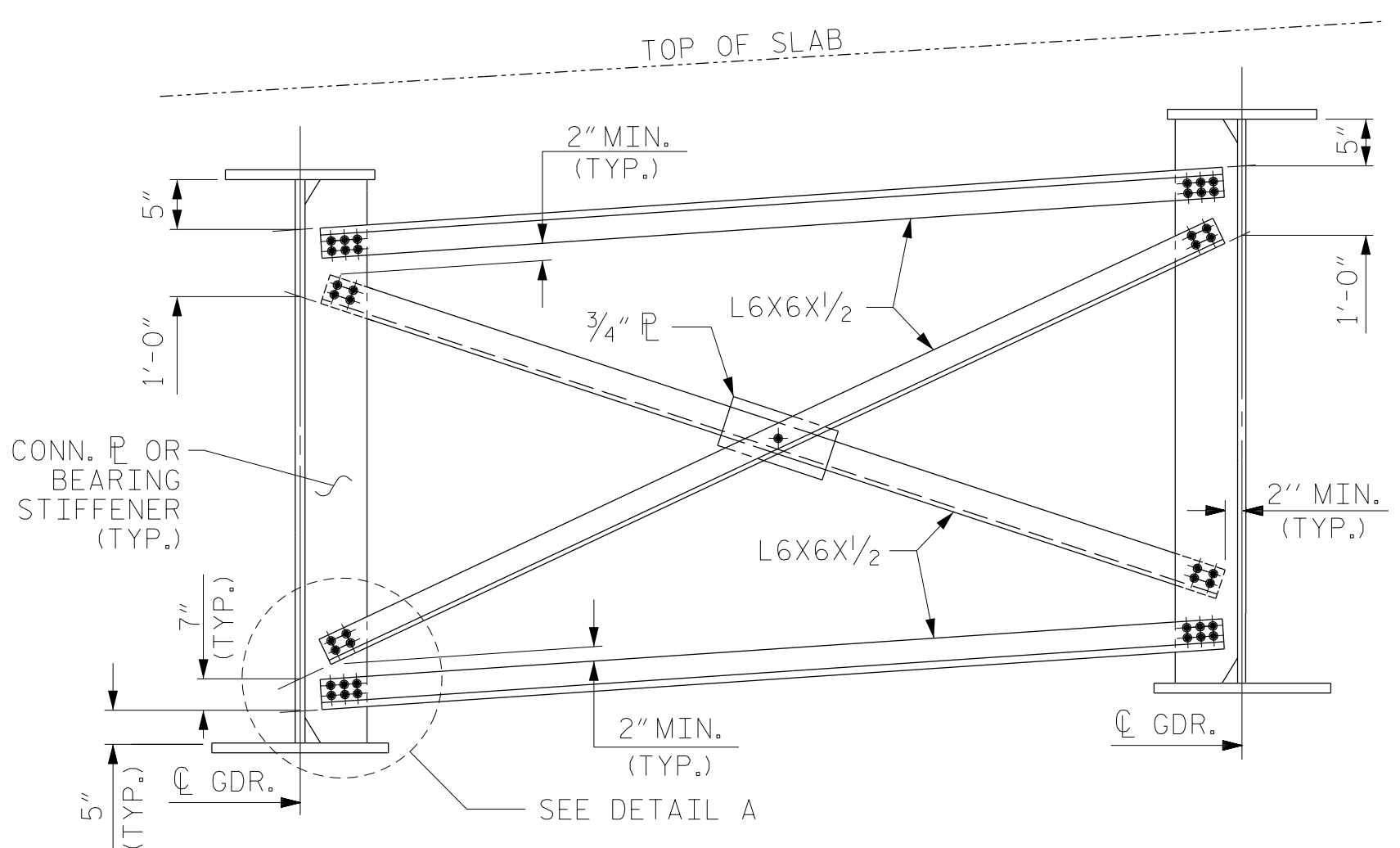
TENSION ON THE ASTM F3125 GRADE A325 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

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

PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS. KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

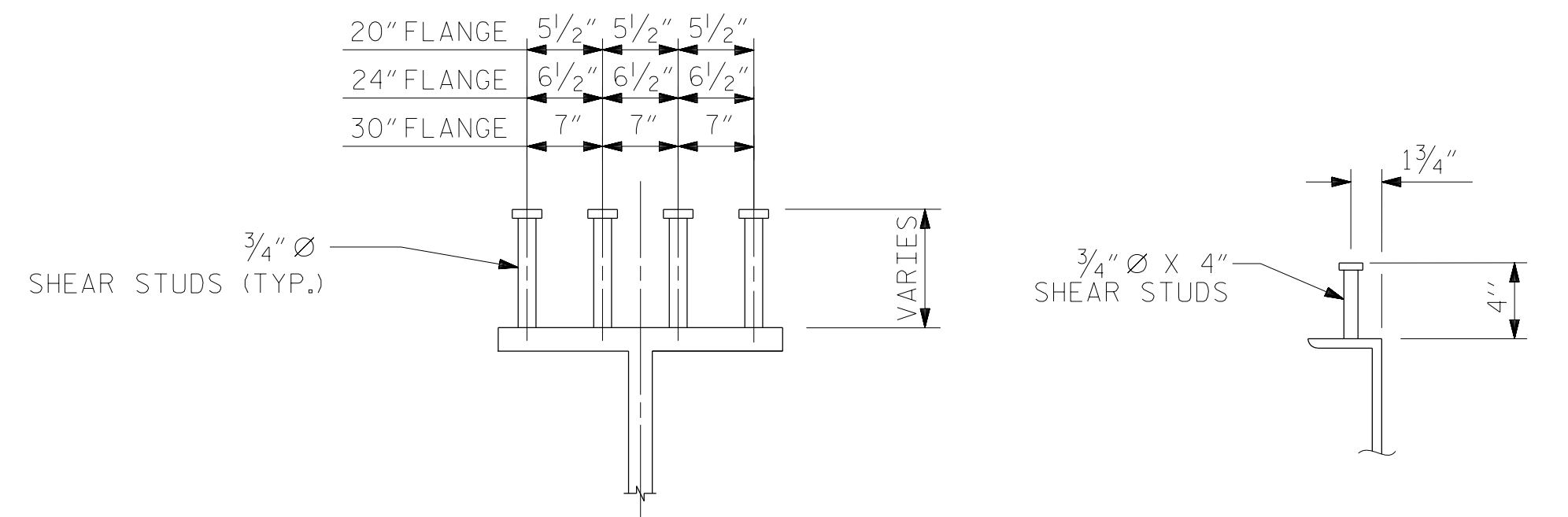
BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.

FABRICATOR SHALL DETAIL CROSSFRAME MEMBERS AND CONNECTIONS FOR STEEL DEAD LOAD FIT-UP. GIRDERS SHALL BE PLUMB AFTER THE FULL AMOUNT OF DEAD LOAD IS APPLIED.



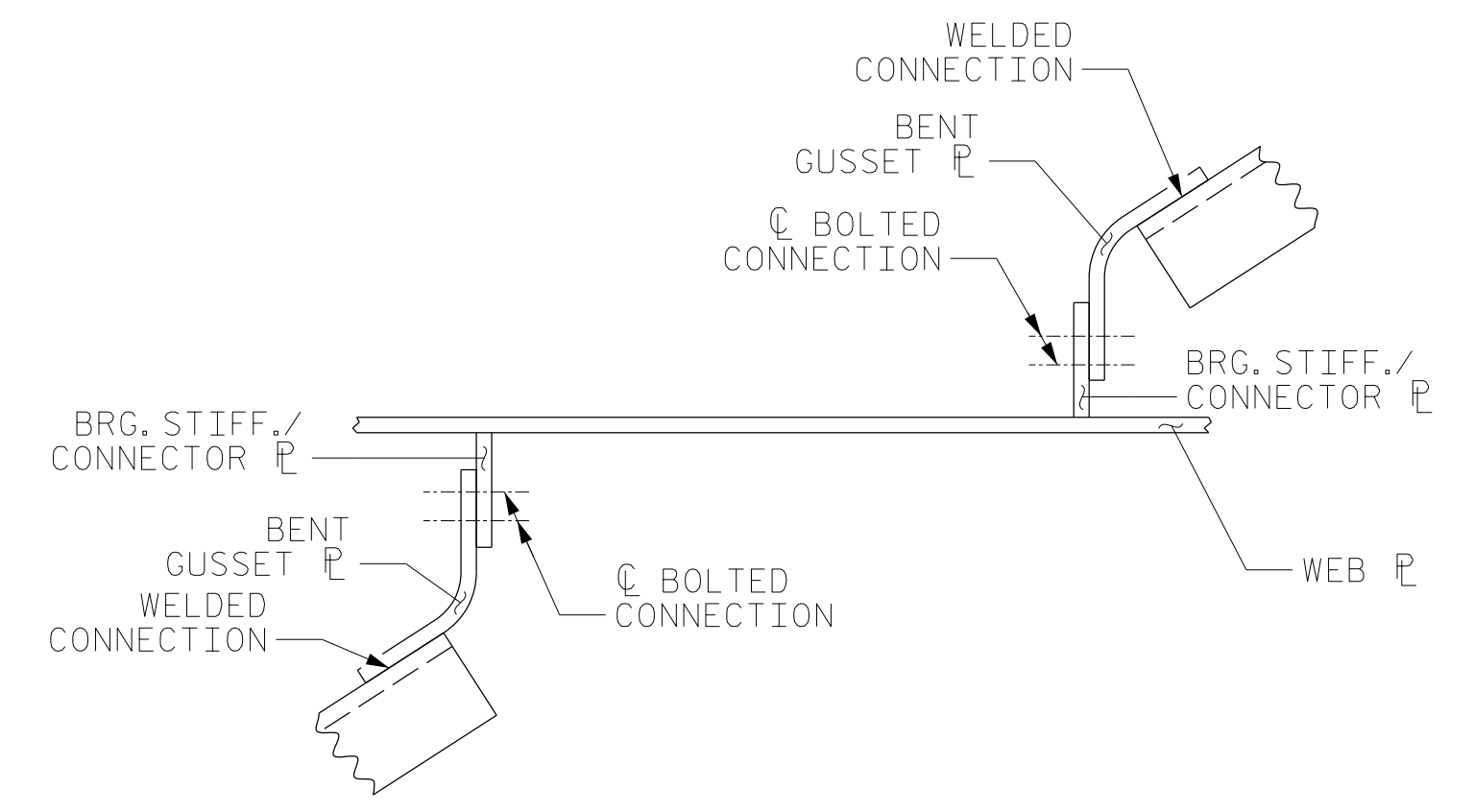
TYPICAL INTERMEDIATE CROSSFRAME

WELD TERMINATION DETAILS

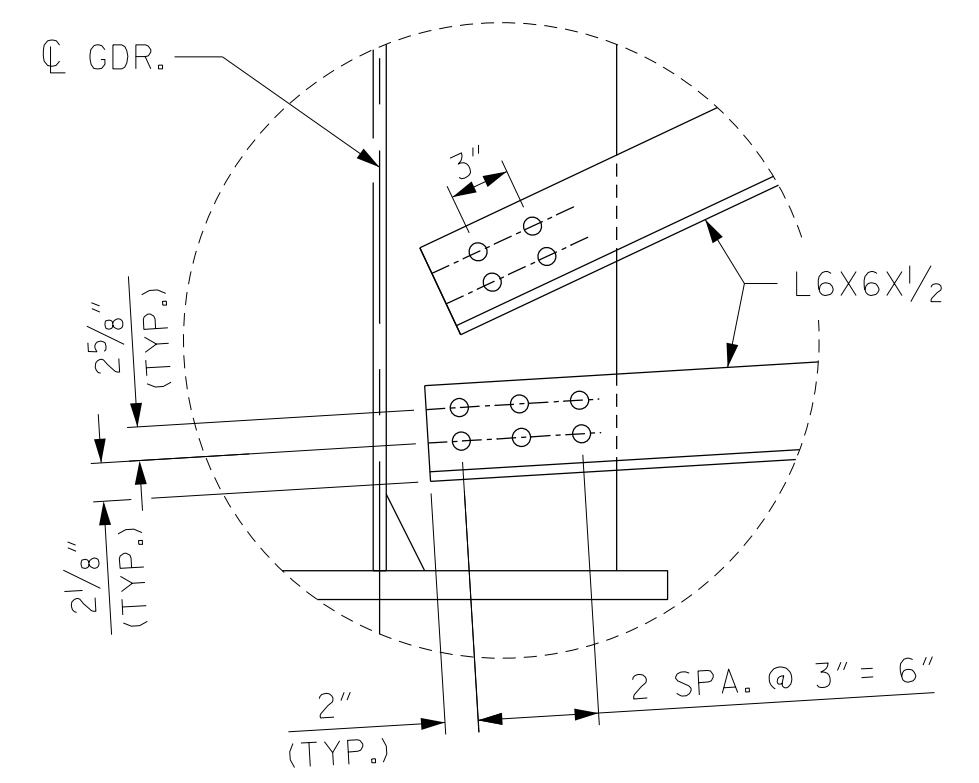


FOR STUD HEIGHTS, SEE STRUCTURAL STEEL DETAILS SHEET 1 OF 5. SHEAR STUDS ARE CENTERED ABOUT Q GIRDER

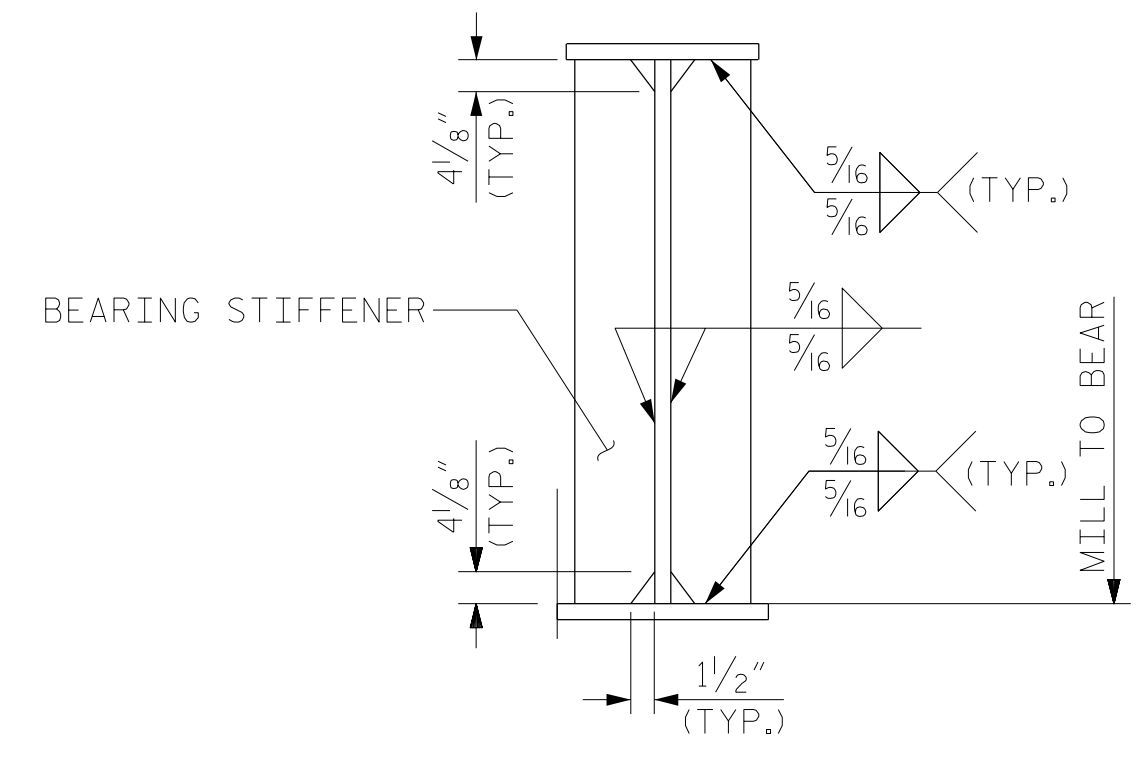
SHEAR STUD DETAILS



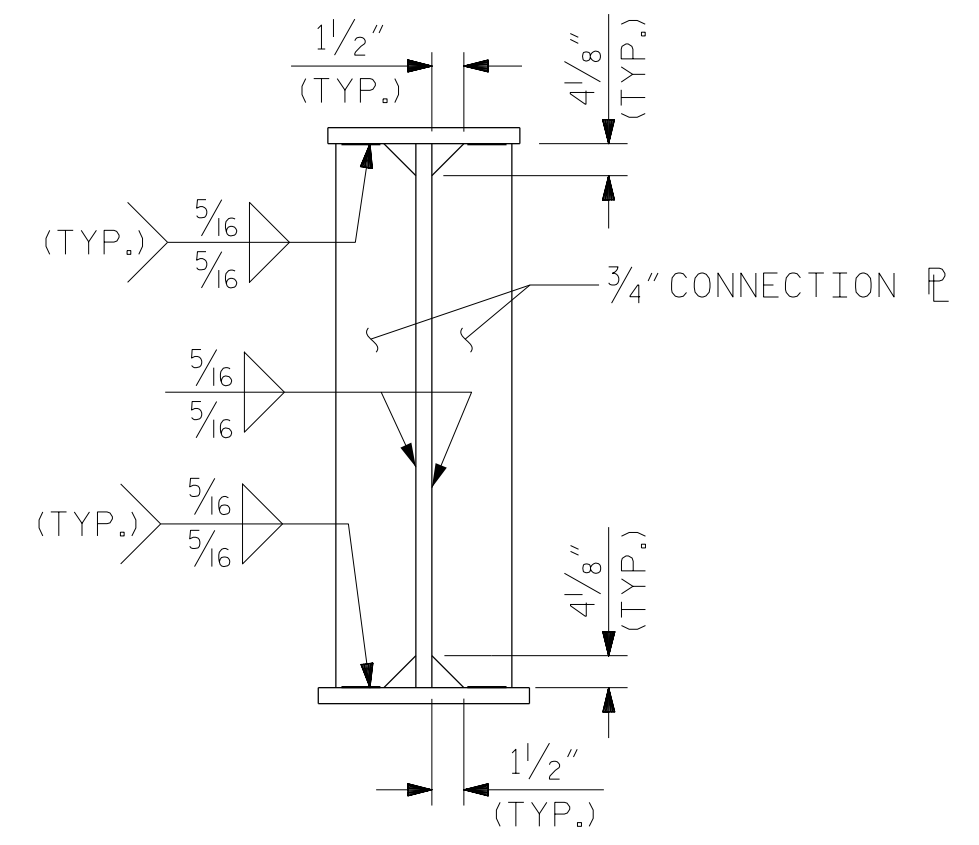
BENT GUSSET PL



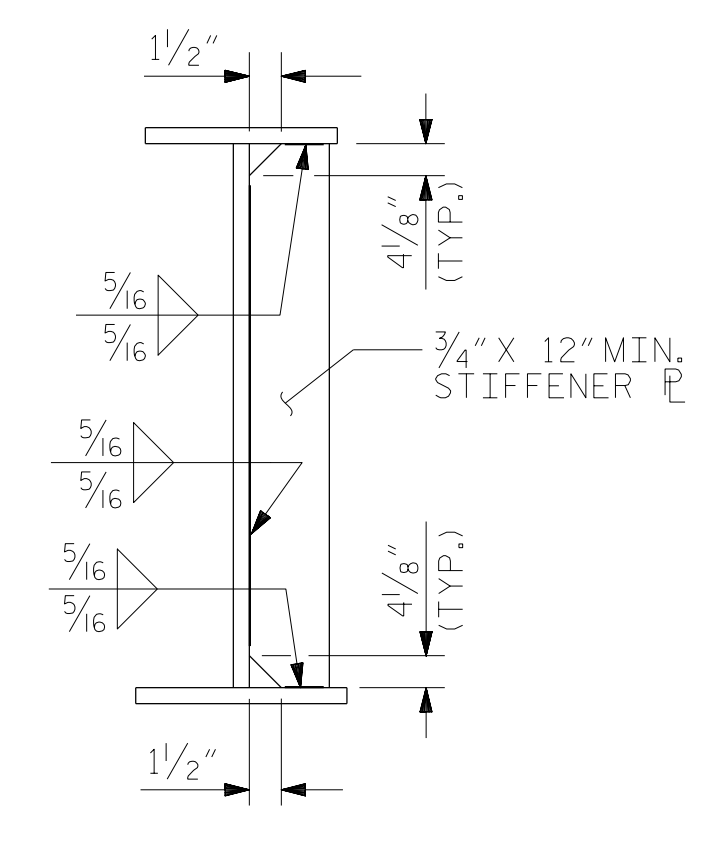
DETAIL A



BEARING STIFFENER



CONNECTOR PLATE



INTERMEDIATE STIFFENER

EXTERIOR GIRDER SHOWN

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

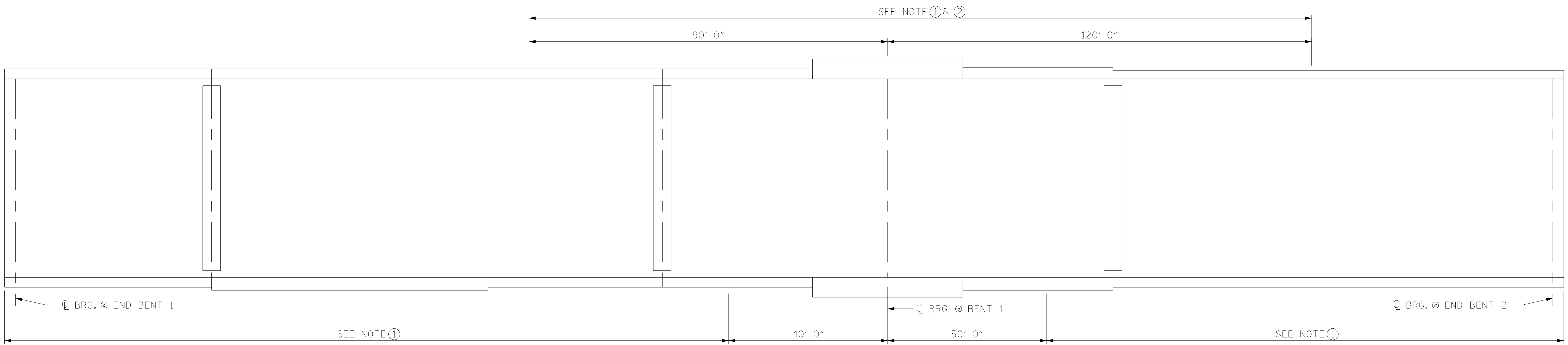
PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 23+43.03 -Y16-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
STRUCTURAL STEEL
DETAILS

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

DRAWN BY : TRM DATE : 10/2019
CHECKED BY : MAL DATE : 12/2019
DESIGN ENGINEER OF RECORD: JMR DATE : 12/2019

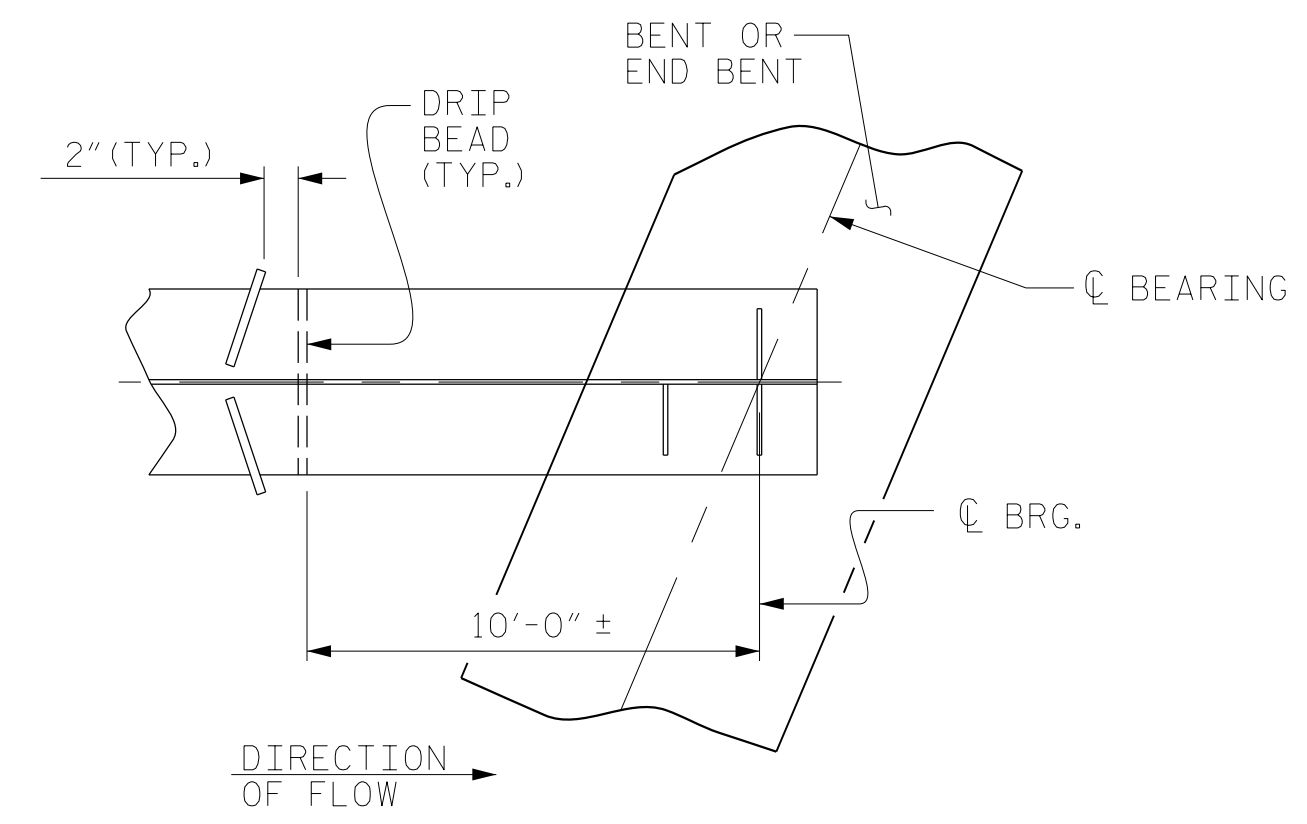


GIRDER MAKE-UP

CHARPY V-NOTCH TESTS FOR CONTINUOUS PLATE GIRDERS

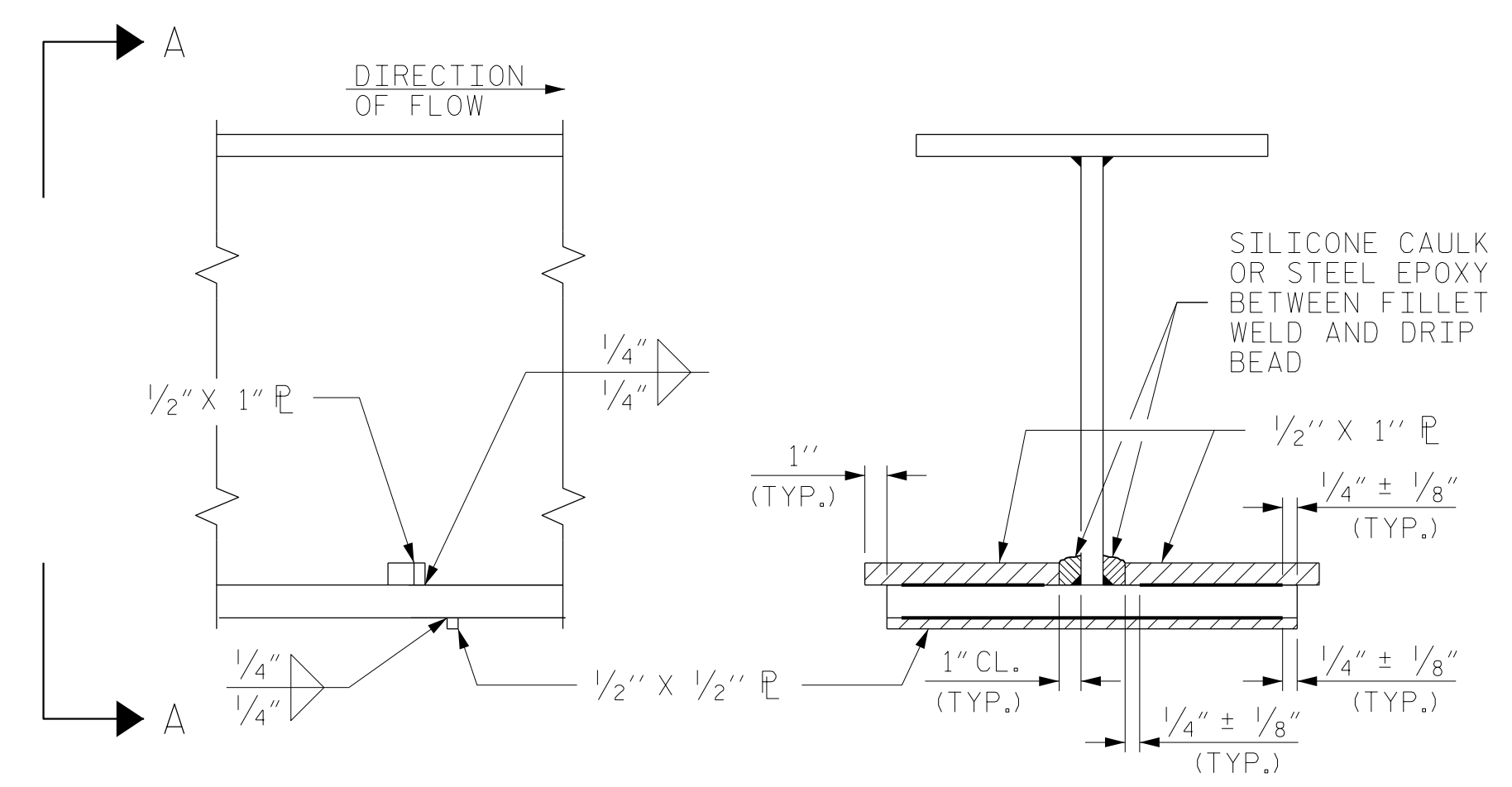
NOTES

1. CHARPY V-NOTCH TEST 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 TEST WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.
2. NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.

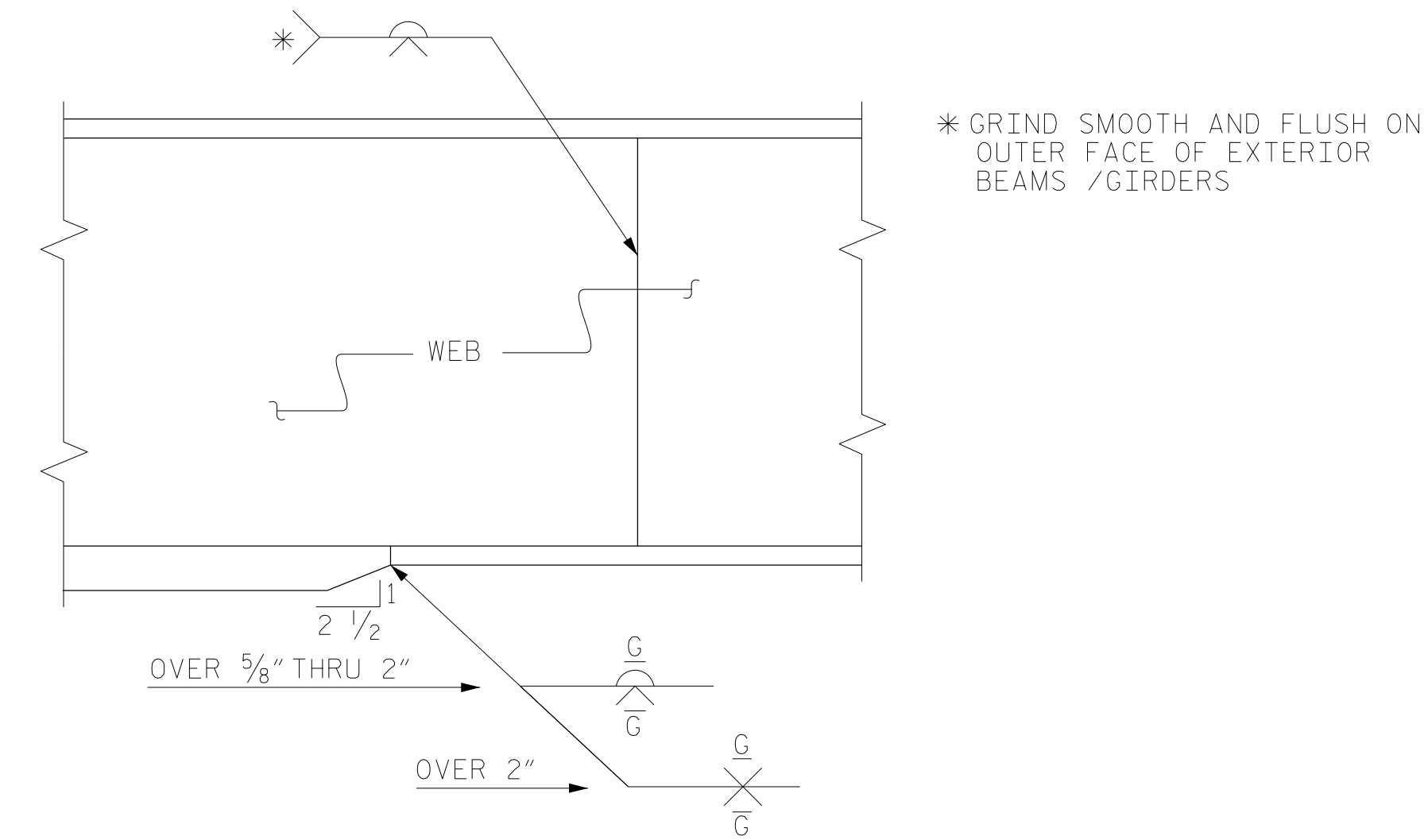


PART PLAN - BOTTOM FLANGE

END BENT 2 SHOWN, BENT 1 SIMILAR
CROSSFRAMES AND BEARING ASSEMBLY NOT SHOWN FOR CLARITY



SECTION
VIEW A-A
DRIP BEAD DETAILS



ELEVATION
TYPICAL FLANGE AND WEB BUTT JOINT

PROJECT NO. U-2579AB
FORSYTH COUNTY
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SHEET 3 OF 5



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RALEIGH
SUPERSTRUCTURE
STRUCTURAL STEEL
DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	ST-14
1			3			TOTAL SHEETS
2			4			48

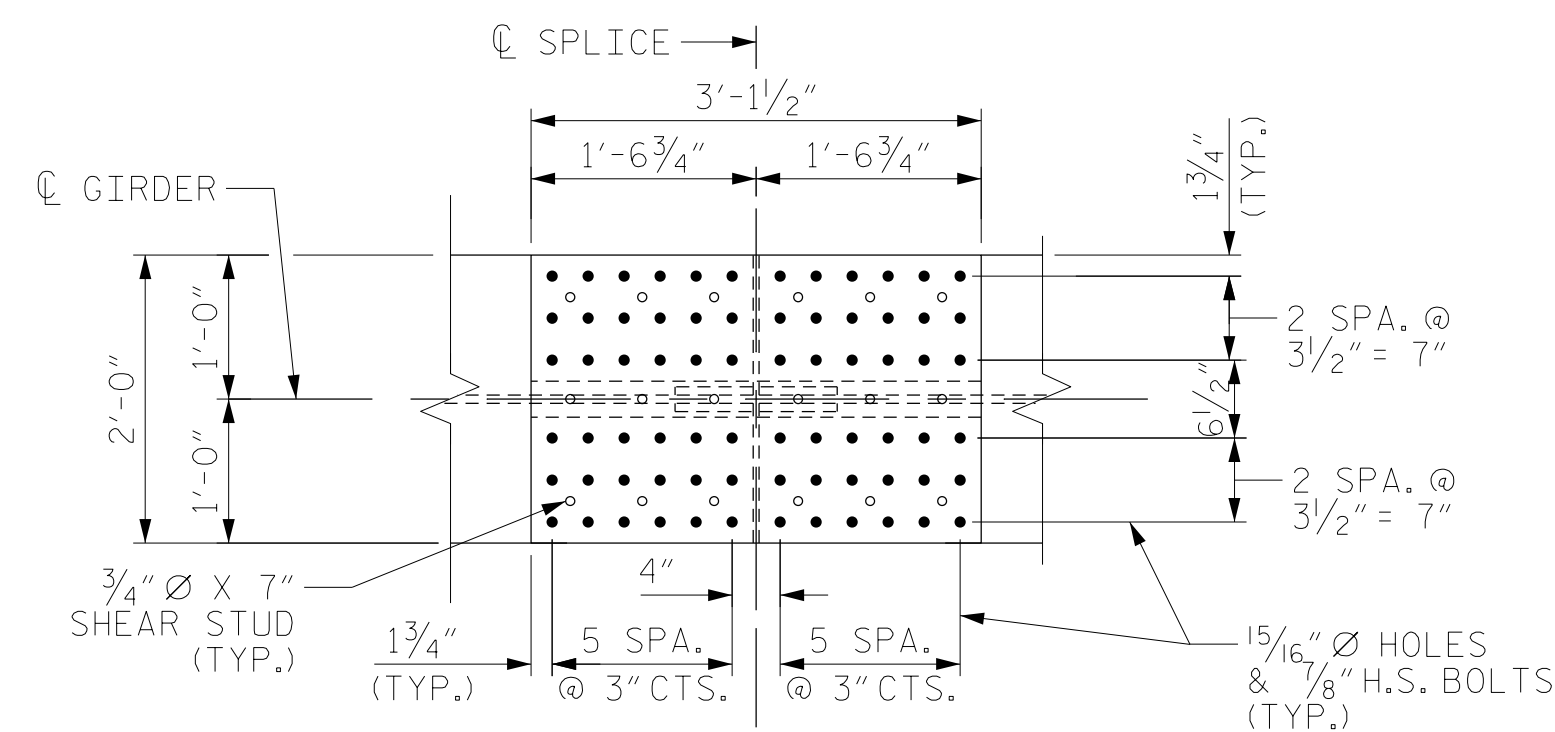
DRAWN BY : TRM DATE : 10/2019
CHECKED BY : MAL DATE : 12/2019
DESIGN ENGINEER OF RECORD: JMR DATE : 12/2019

DOCUMENT NOT CONSIDERED
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SIGNATURES COMPLETED

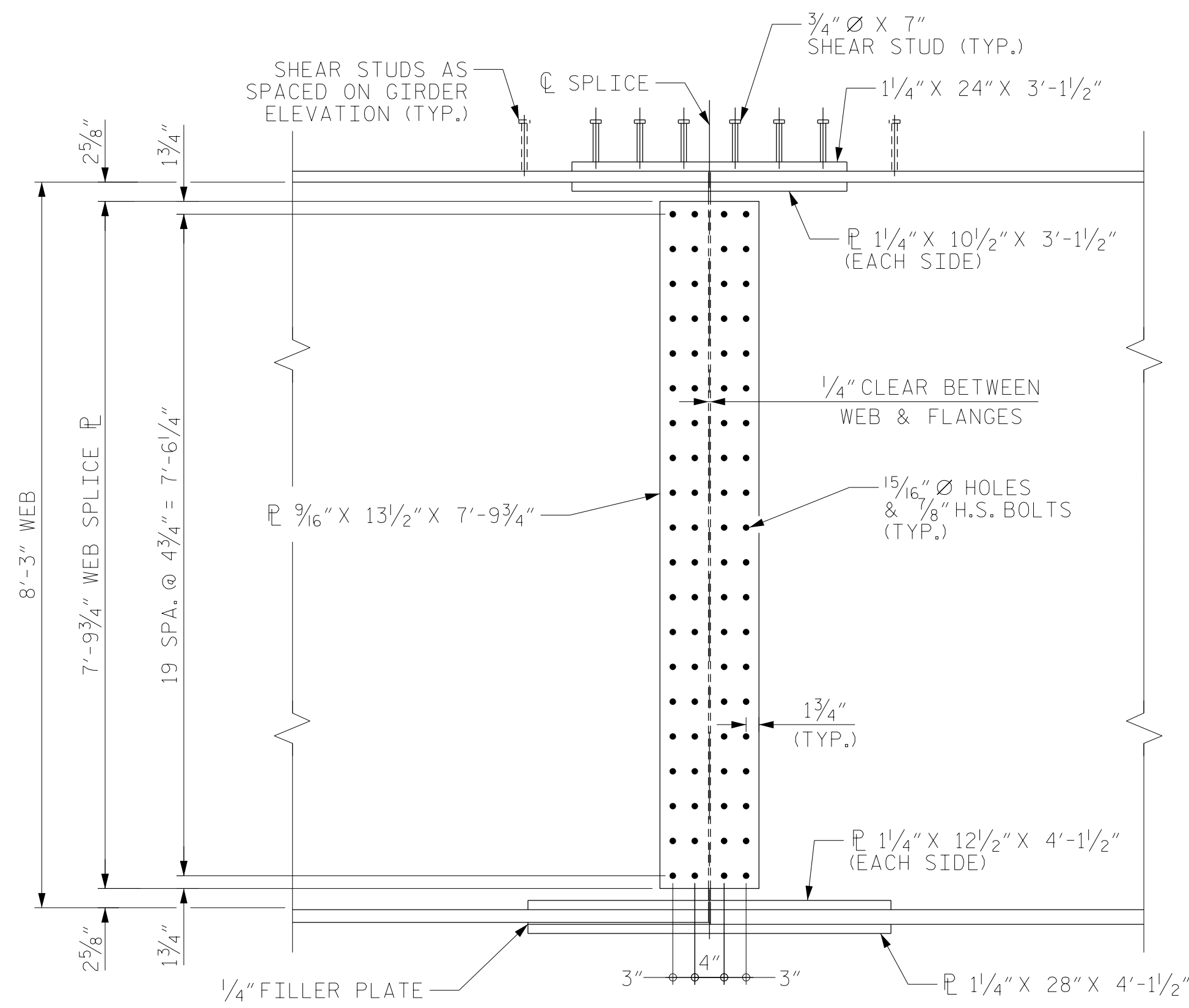
NOTES:

THREADS ARE TO BE EXCLUDED IN ALL WEB AND FLANGE SPLICES.

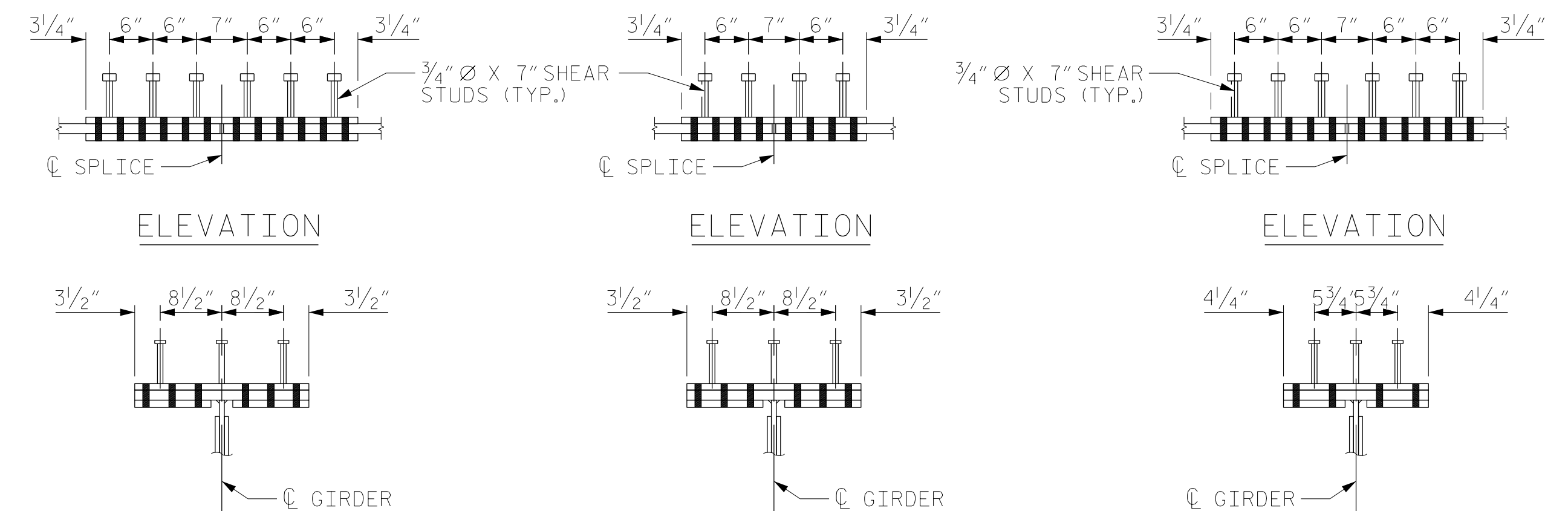
CLASS B FAYING SURFACE SHALL BE USED.



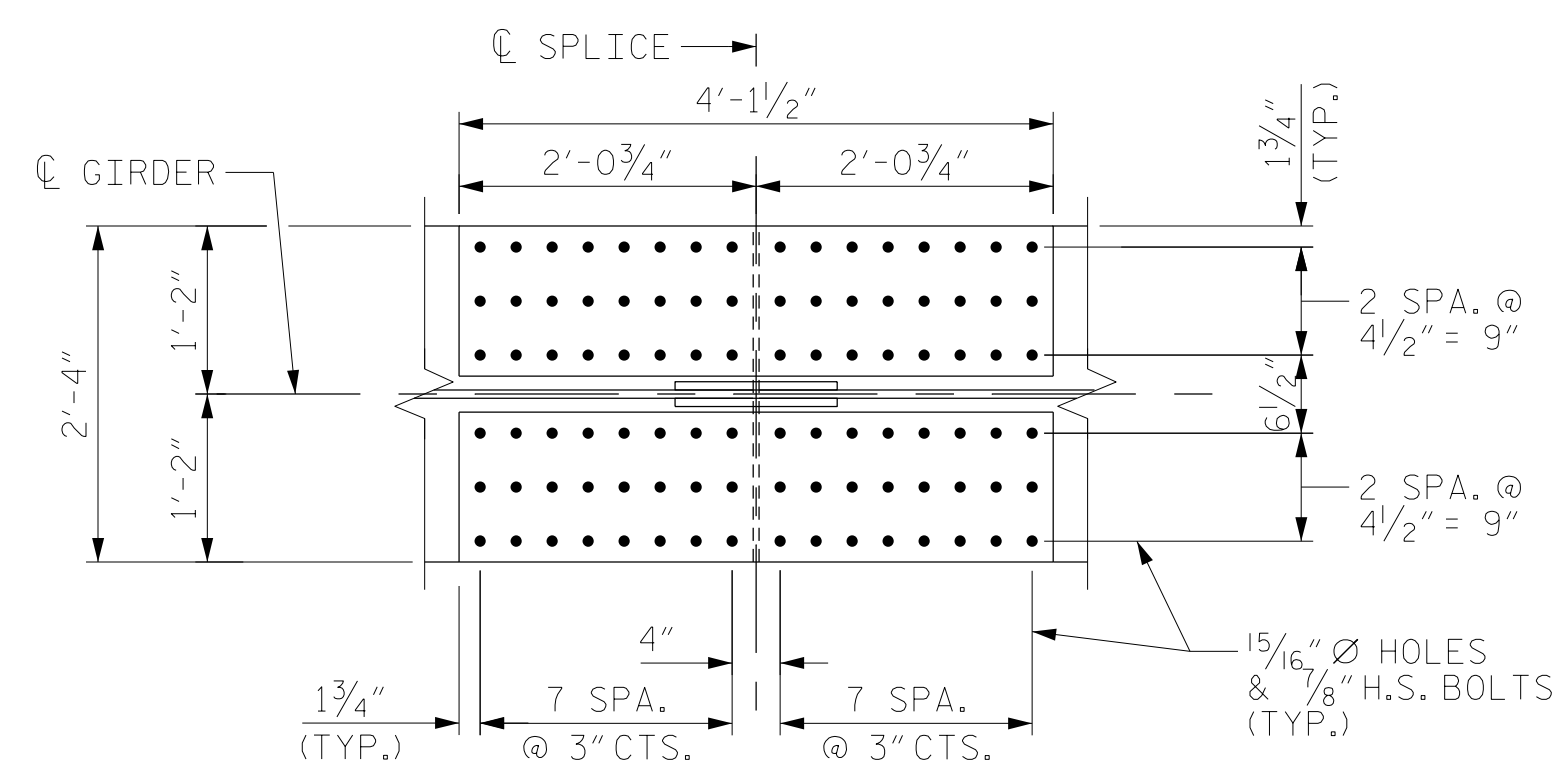
PLAN (TOP OF TOP FLANGE)



ELEVATION



SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATES



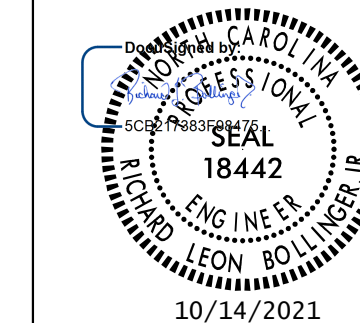
PLAN (BOTTOM OF TOP FLANGE)

FS1

BOLTED FIELD SPLICE

PROJECT NO. U-2579AB
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SHEET 4 OF 5



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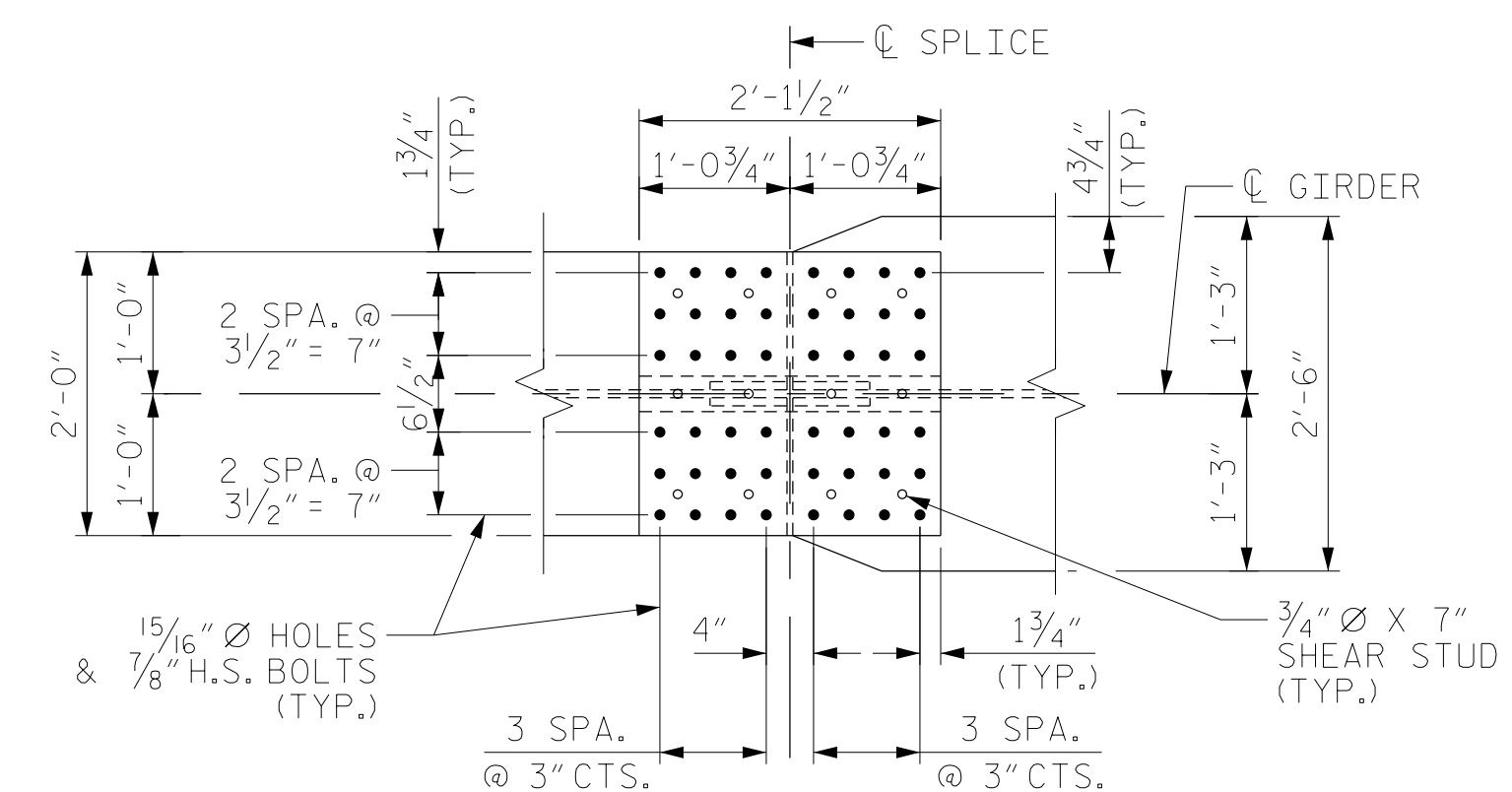
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 STRUCTURAL STEEL
 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			57-15
2			4			TOTAL SHEETS 48

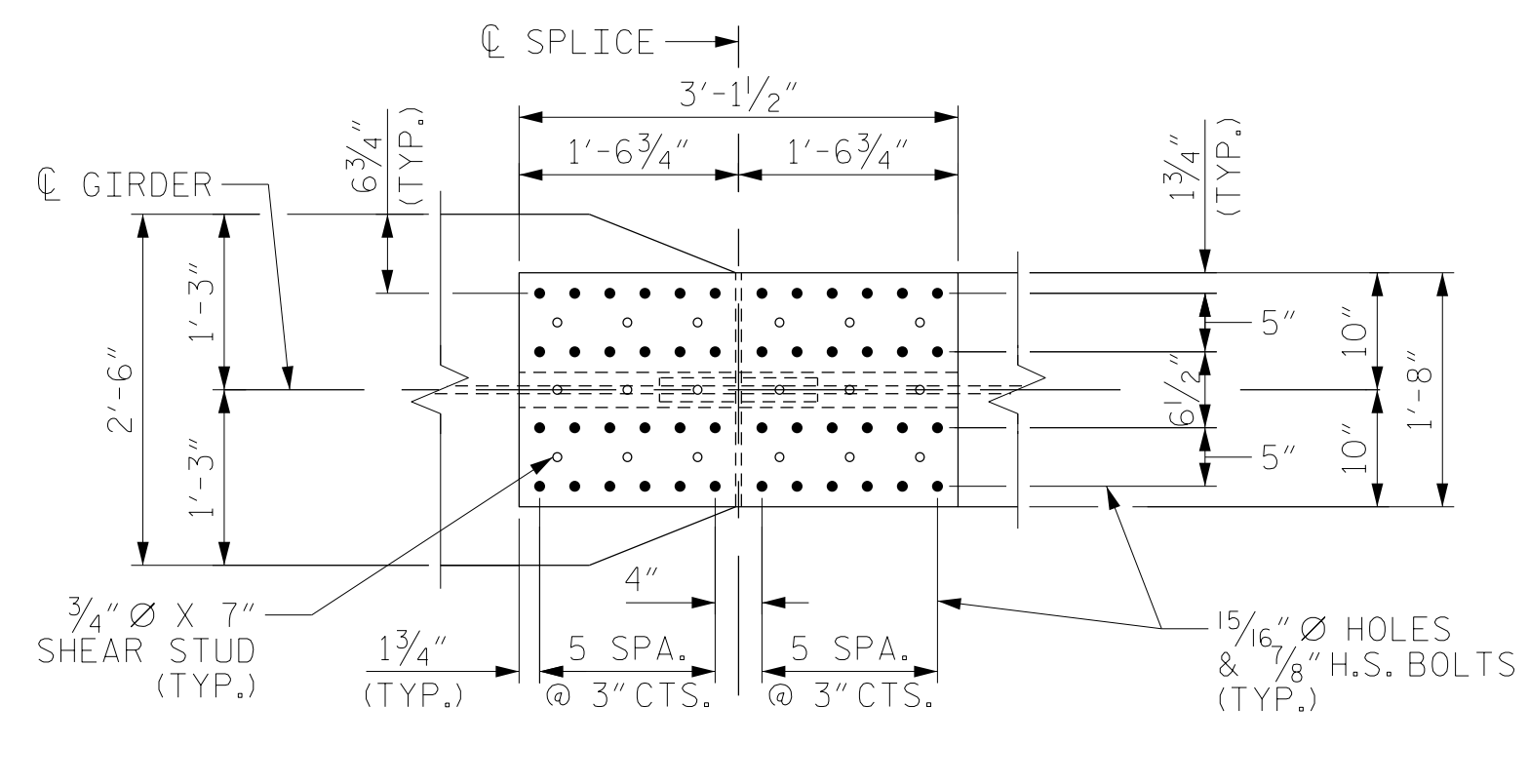
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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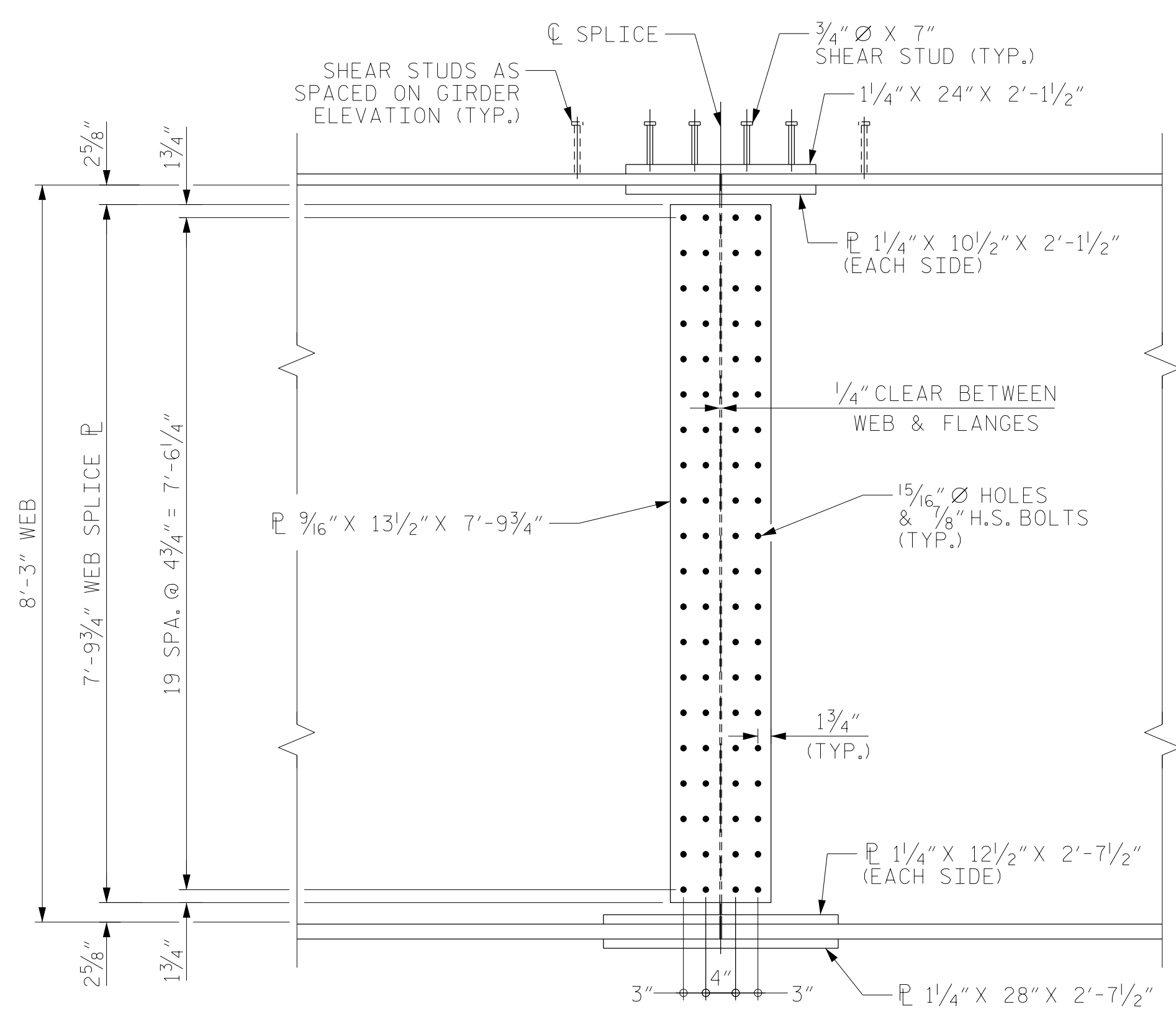
NOTE:
SEE SHEET 4 OF 5 FOR NOTES AND SHEAR STUD DETAILS.



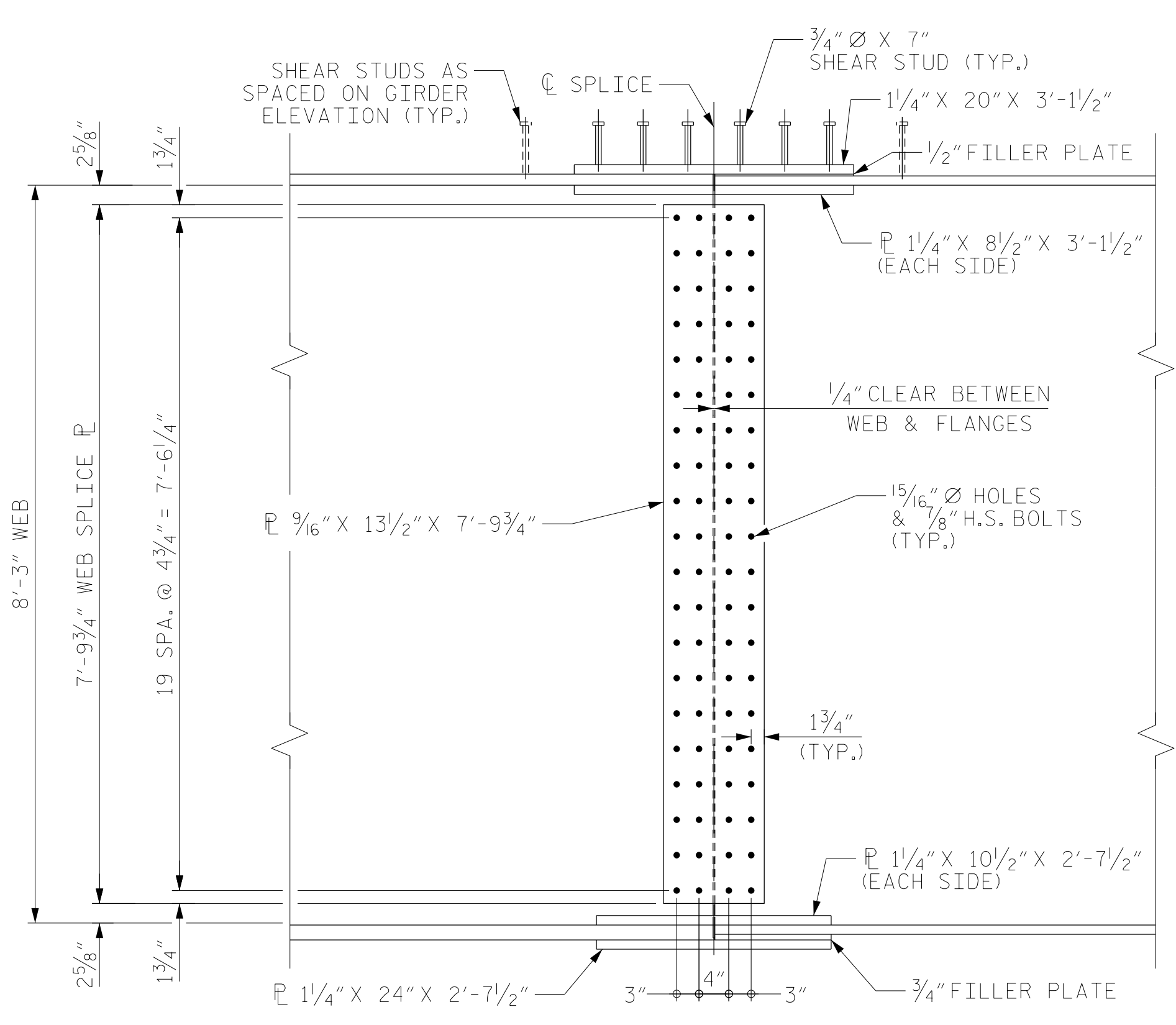
PLAN (TOP OF TOP FLANGE)



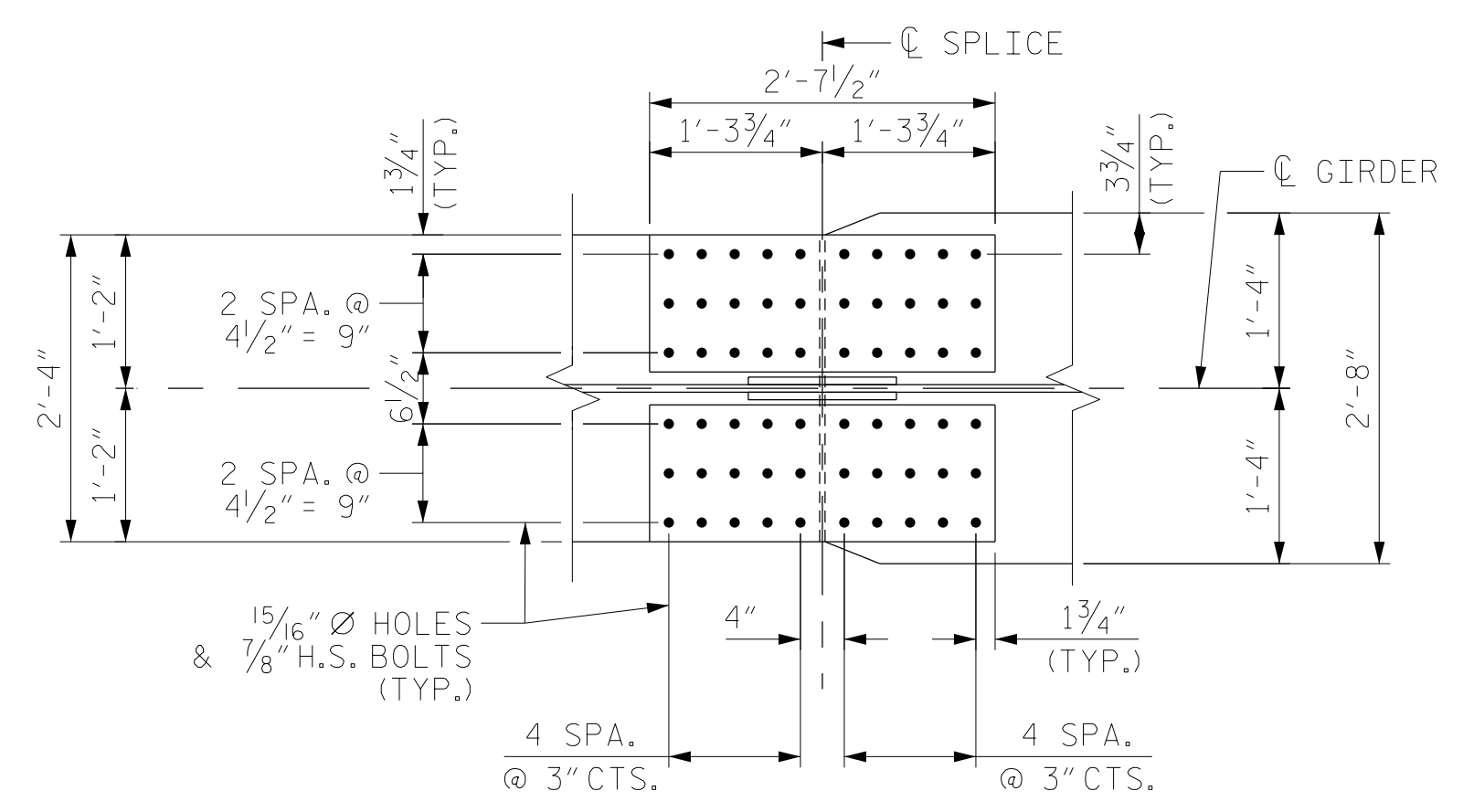
PLAN (TOP OF TOP FLANGE)



ELEVATION

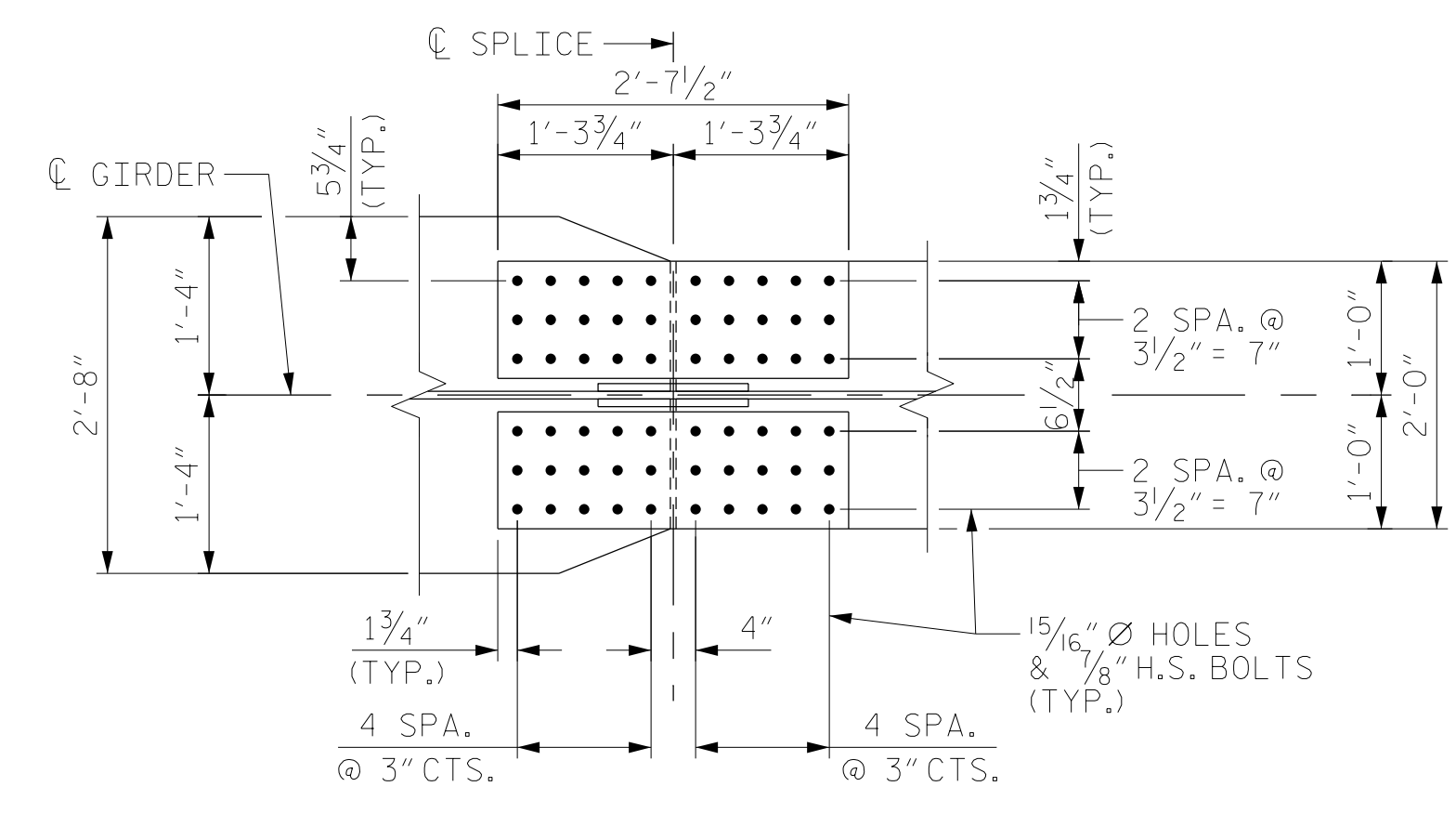


ELEVATION



PLAN (BOTTOM OF TOP FLANGE)

FS2



PLAN (BOTTOM OF TOP FLANGE)

FS3

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 23+43.03 -Y16-

SHEET 5 OF 5



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
STRUCTURAL STEEL
DETAILS

DRAWN BY : TRM DATE : 10/2019
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BOLTED FIELD SPLICE

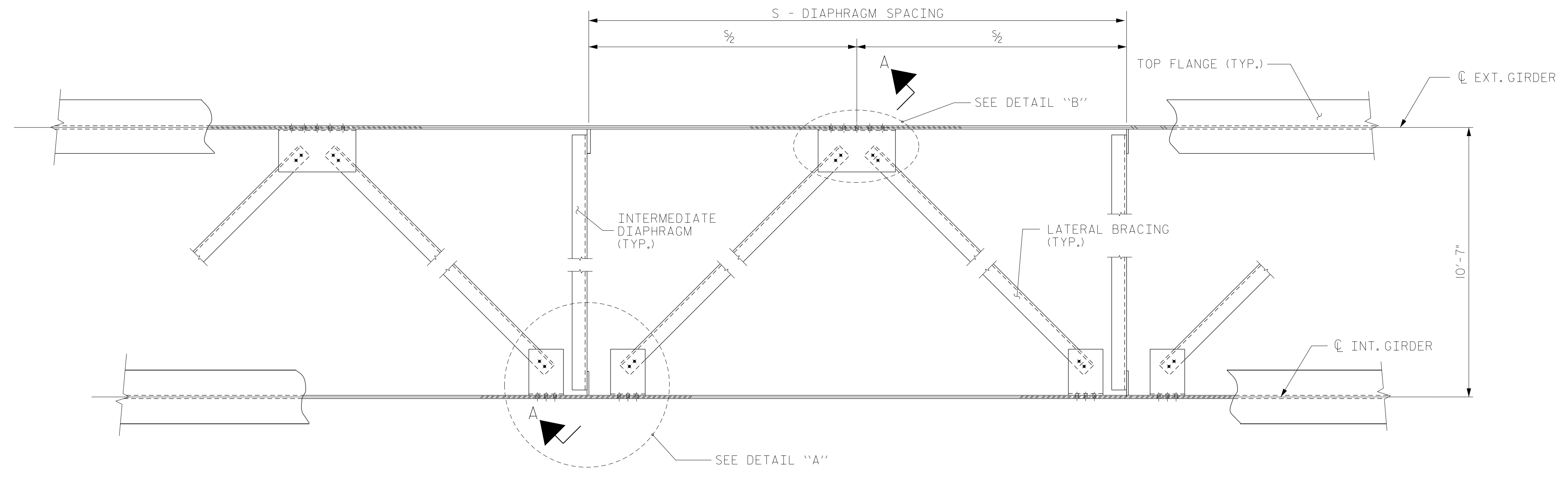
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			ST-16
2			4			TOTAL SHEETS 48

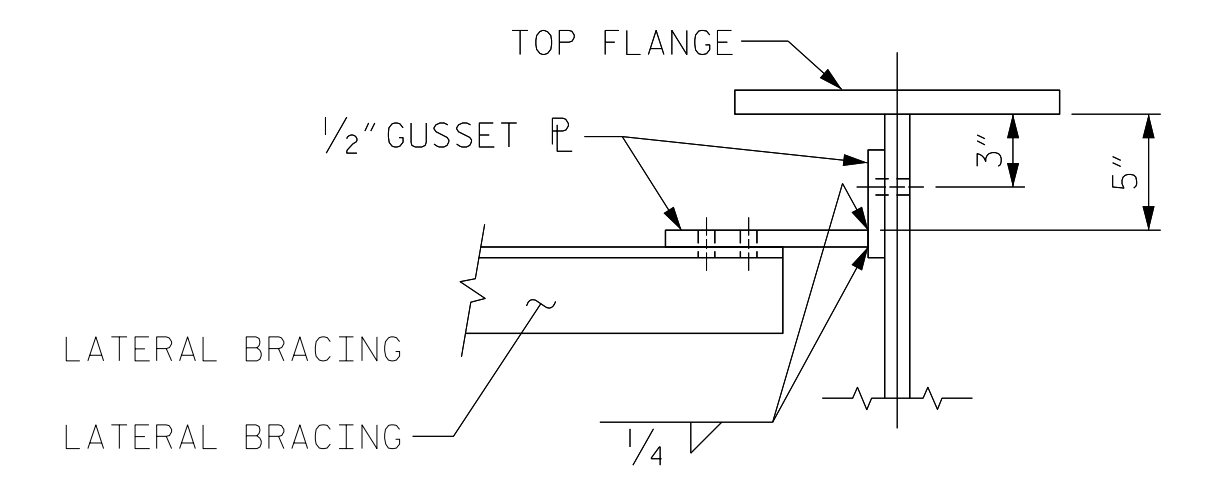
NOTES

- 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 7/8" 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.
- THE TERMS "INTERMEDIATE DIAPHRAGMS" AND "INTERMEDIATE CROSSFRAMES" SHOULD BE USED INTERCHANGEABLY THROUGHOUT.
- SEE FRAMING PLAN FOR ADDITIONAL LATERAL BRACING DETAILS.

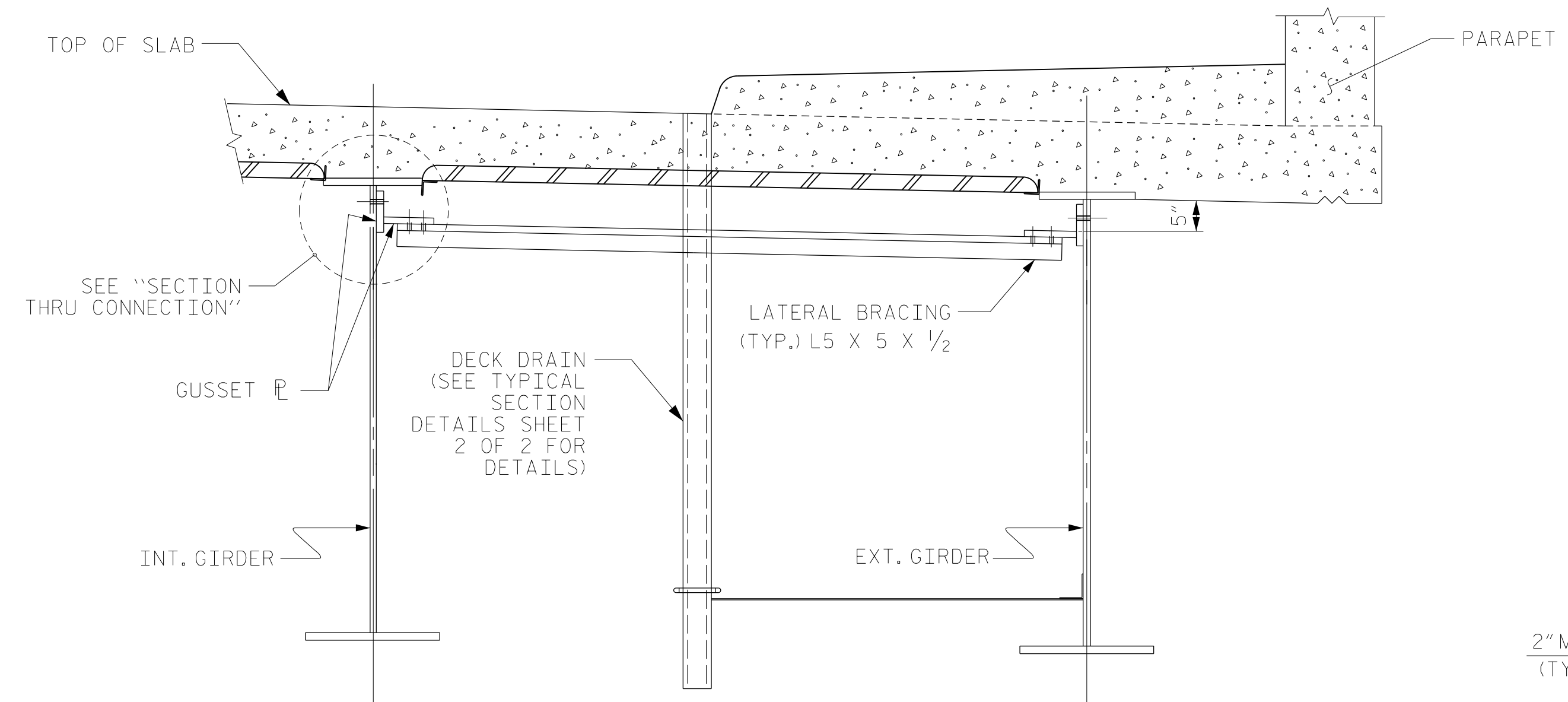


PART PLAN - NEAR TOP FLANGE LATERAL BRACING

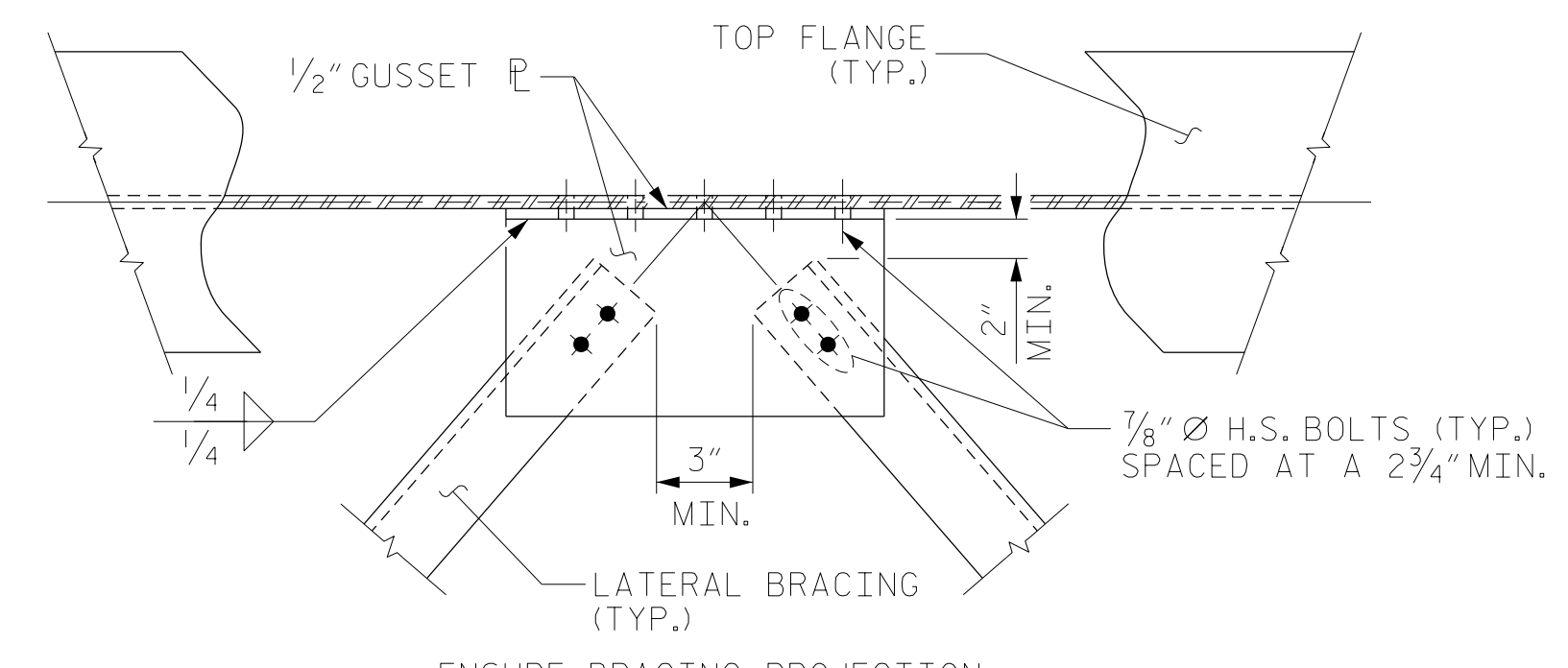
(THROUGHOUT EXTERIOR BAYS ONLY)
DECK DRAINS NOT SHOWN FOR CLARITY, SEE PLAN OF SPAN SHEETS FOR LOCATIONS



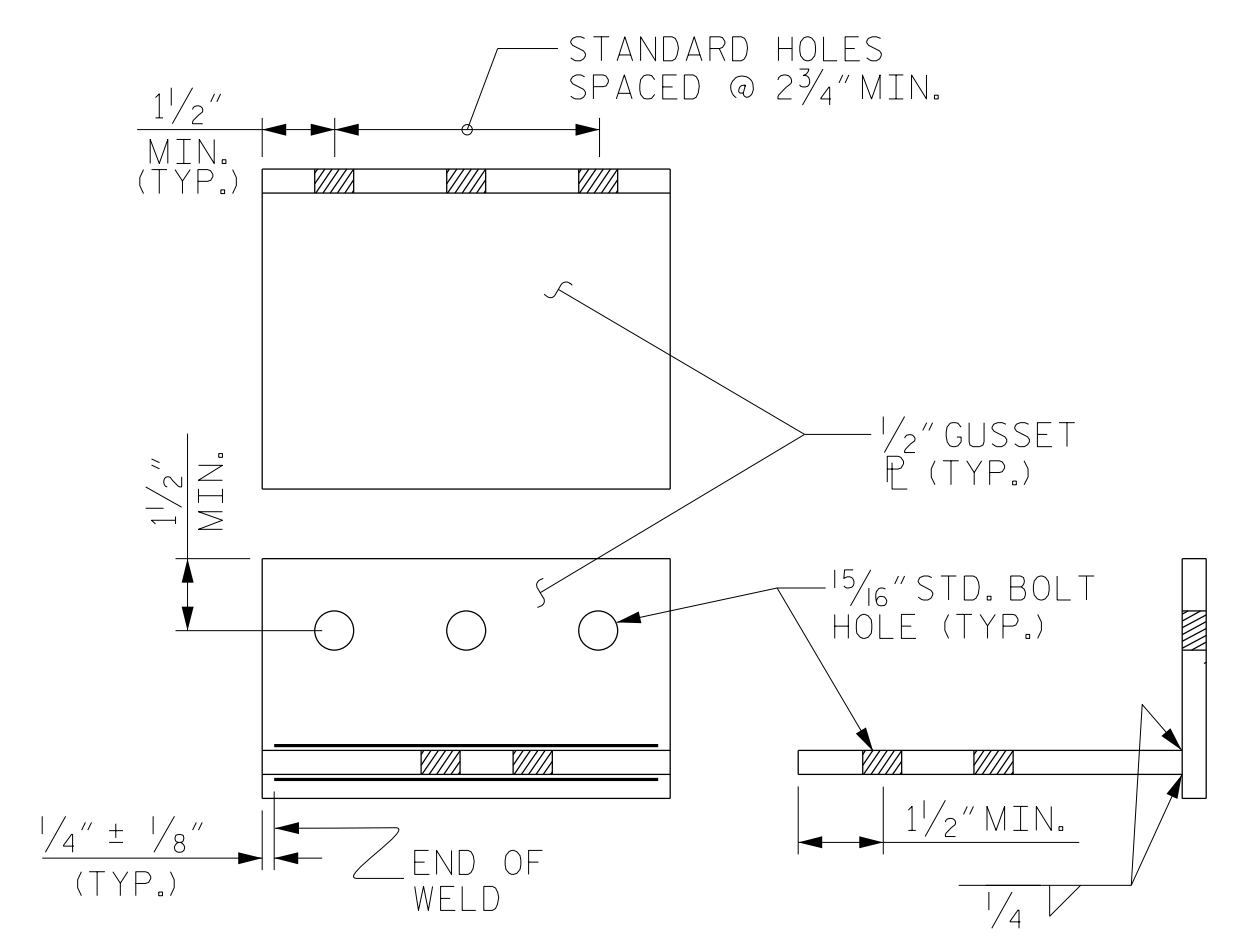
SECTION THRU CONNECTION



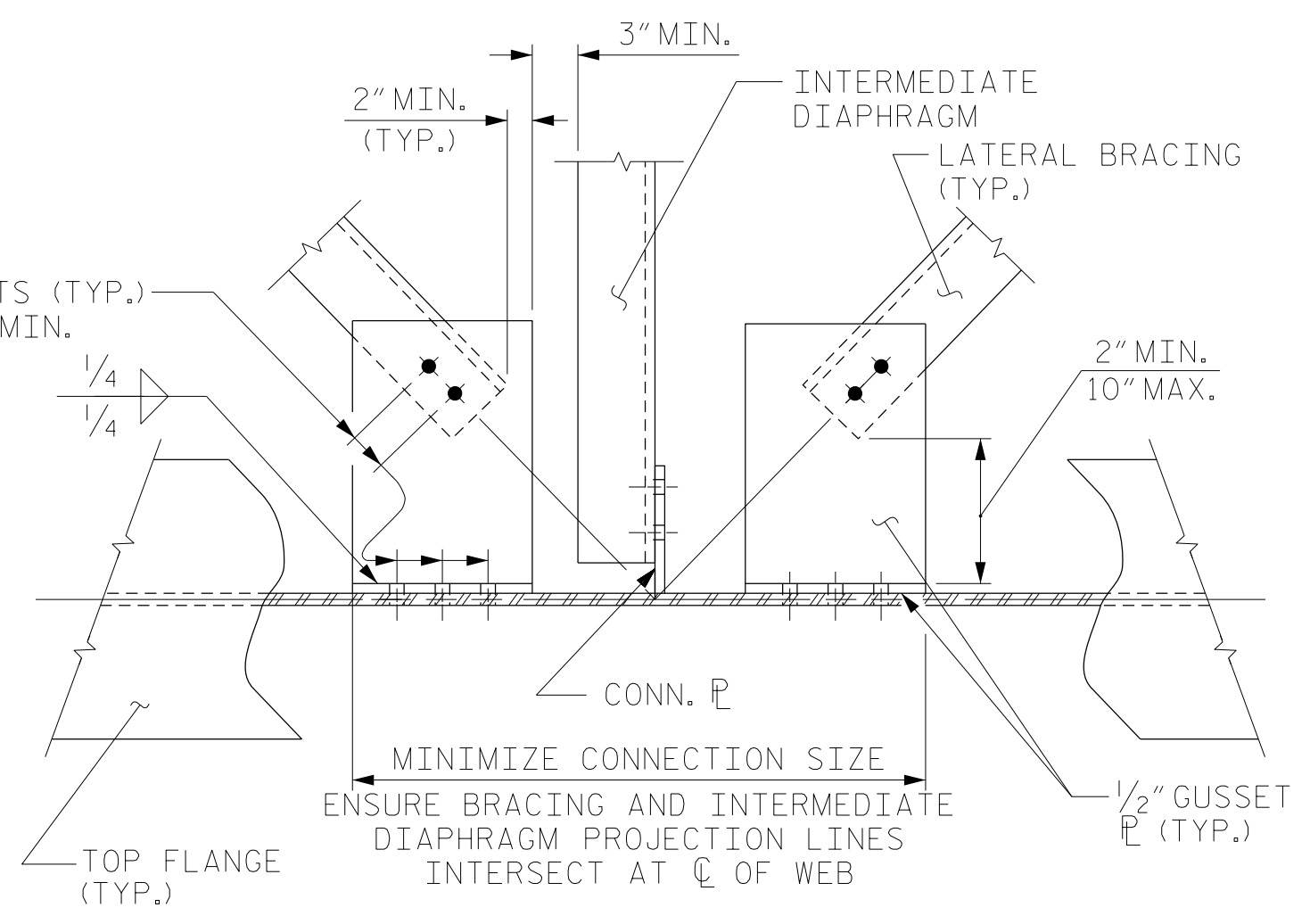
SECTION A-A



DETAIL "B"



CONNECTION DETAIL



DETAIL "A"

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 23+43.03 -Y16-



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RALEIGH
STANDARD
LATERAL BRACING

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

ASSEMBLED BY: TRM	DATE: 12/2019
CHECKED BY: MAL	DATE: 12/2019
DRAWN BY: WMC 6/11	REV. 12/17 MAA/THC
CHECKED BY: GM 6/11	

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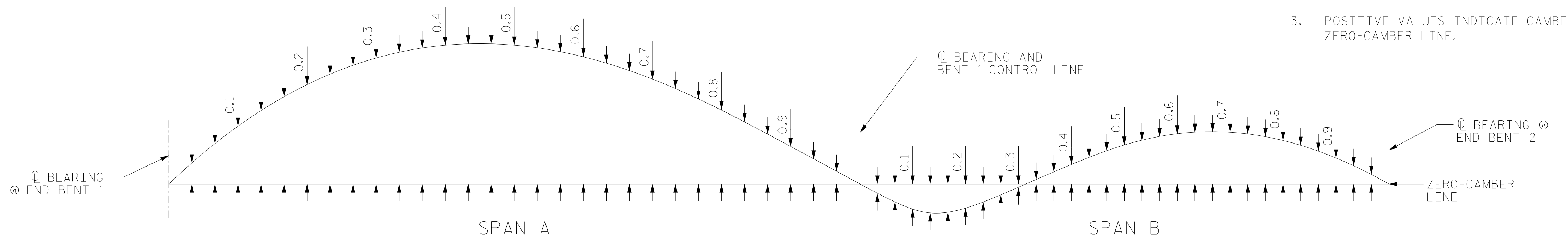
DEAD LOAD DEFLECTION TABLE FOR GIRDERS

Table with 28 columns and 10 rows per girder section. Columns include THIRTIETH POINTS, BRG., and various weight and deflection values. Rows are labeled * WEIGHT OF STEEL, * WEIGHT OF SLAB **, * WEIGHT OF RAIL, * WEIGHT OF SIDEWALK, TOTAL DL DEFLECTION, and REQUIRED CAMBER. Sections are for GIRDER 1, GIRDER 2, GIRDER 3, and GIRDER 4.

* DEFLECTION DUE TO
** INCLUDES SLAB, BUILD-UP AND STAY-IN-PLACE METAL FORMS.

- CAMBER NOTES:
1. ALL DEFLECTIONS AND CAMBER VALUES SHOWN ARE IN FEET (DECIMAL FORM), EXCEPT FOR "REQUIRED CAMBER" GIVEN IN INCHES (FRACTION FORM).
2. NO VERTICAL CURVE ORDINATE ON BRIDGE.
3. POSITIVE VALUES INDICATE CAMBER IS ABOVE ZERO-CAMBER LINE.

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 23+43.03 -Y16-



SCHEMATIC CAMBER ORDINATES
FOR CAMBER VALUES AT 30TH POINTS, SEE TABLES.

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CHECKED BY: MAL DATE: 12/2019
DESIGN ENGINEER OF RECORD: JMR DATE: 12/2019

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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH
SUPERSTRUCTURE DEAD LOAD DEFLECTIONS SPAN A
REVISIONS table with columns for NO., BY, DATE. SHEET NO. S7-18, TOTAL SHEETS 48.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

ORDINATES		SPAN "B"																													
		GIRDER 1																													
THIRTIETH POINTS	BRG.	0.033	0.066	0.1	0.133	0.166	0.2	0.233	0.266	0.3	0.333	0.366	0.4	0.433	0.466	0.5	0.533	0.566	0.6	0.633	0.666	0.7	0.733	0.766	0.8	0.833	0.866	0.9	0.933	0.966	BRG.
* WEIGHT OF STEEL	0.000	-0.009	-0.016	-0.021	-0.025	-0.027	-0.027	-0.026	-0.024	-0.021	-0.017	-0.013	-0.008	-0.002	0.003	0.008	0.013	0.017	0.021	0.024	0.026	0.027	0.027	0.027	0.025	0.022	0.019	0.015	0.010	0.005	0.000
* WEIGHT OF SLAB **	0.000	-0.014	-0.023	-0.029	-0.032	-0.031	-0.027	-0.020	-0.011	0.000	0.013	0.026	0.040	0.054	0.068	0.080	0.091	0.100	0.107	0.111	0.113	0.112	0.108	0.102	0.093	0.082	0.068	0.053	0.036	0.018	0.000
* WEIGHT OF RAIL	0.000	-0.002	-0.003	-0.004	-0.004	-0.004	-0.003	-0.002	0.000	0.001	0.003	0.005	0.007	0.009	0.011	0.012	0.014	0.015	0.016	0.016	0.016	0.016	0.016	0.015	0.013	0.012	0.010	0.008	0.005	0.003	0.000
* WEIGHT OF SIDEWALK	0.000	-0.001	-0.002	-0.003	-0.003	-0.003	-0.002	-0.001	0.000	0.001	0.002	0.003	0.005	0.006	0.007	0.008	0.009	0.010	0.011	0.011	0.011	0.011	0.011	0.010	0.009	0.008	0.007	0.005	0.004	0.002	0.000
TOTAL DL DEFLECTION	0.000	-0.026	-0.044	-0.057	-0.064	-0.065	-0.059	-0.049	-0.035	-0.018	0.001	0.022	0.044	0.067	0.089	0.109	0.127	0.142	0.154	0.162	0.166	0.166	0.161	0.153	0.140	0.123	0.103	0.080	0.055	0.028	0.000
REQUIRED CAMBER	0"	-5/16"	-9/16"	-1 1/16"	-3/4"	-3/4"	-1 1/16"	-9/16"	-7/16"	-1/4"	0"	1/4"	9/16"	13/16"	1 1/16"	1 5/16"	1 1/2"	1 11/16"	1 7/8"	1 5/16"	2"	2"	1 5/16"	1 3/16"	1 1/16"	1 1/2"	1 1/4"	1 5/16"	1 1/16"	5/16"	0"

ORDINATES		SPAN "B"																													
		GIRDER 2																													
THIRTIETH POINTS	BRG.	0.033	0.066	0.1	0.133	0.166	0.2	0.233	0.266	0.3	0.333	0.366	0.4	0.433	0.466	0.5	0.533	0.566	0.6	0.633	0.666	0.7	0.733	0.766	0.8	0.833	0.866	0.9	0.933	0.966	BRG.
* WEIGHT OF STEEL	0.000	-0.009	-0.016	-0.021	-0.025	-0.026	-0.026	-0.025	-0.022	-0.019	-0.015	-0.010	-0.004	0.001	0.007	0.012	0.017	0.022	0.025	0.028	0.030	0.031	0.031	0.030	0.028	0.025	0.021	0.017	0.011	0.006	0.000
* WEIGHT OF SLAB **	0.000	-0.014	-0.024	-0.030	-0.032	-0.030	-0.024	-0.016	-0.004	0.009	0.024	0.040	0.056	0.072	0.088	0.102	0.114	0.124	0.131	0.135	0.137	0.135	0.130	0.122	0.111	0.098	0.082	0.063	0.043	0.022	0.000
* WEIGHT OF RAIL	0.000	-0.002	-0.003	-0.004	-0.005	-0.004	-0.004	-0.003	-0.002	0.000	0.002	0.003	0.005	0.007	0.009	0.011	0.012	0.013	0.014	0.014	0.015	0.015	0.014	0.013	0.012	0.011	0.009	0.007	0.005	0.002	0.000
* WEIGHT OF SIDEWALK	0.000	-0.001	-0.002	-0.003	-0.003	-0.003	-0.003	-0.002	-0.001	0.000	0.001	0.002	0.004	0.005	0.006	0.007	0.008	0.009	0.010	0.010	0.010	0.010	0.010	0.009	0.008	0.007	0.006	0.005	0.003	0.002	0.000
TOTAL DL DEFLECTION	0.000	-0.027	-0.046	-0.058	-0.065	-0.064	-0.057	-0.045	-0.029	-0.010	0.012	0.036	0.061	0.086	0.110	0.132	0.151	0.168	0.180	0.188	0.192	0.191	0.185	0.175	0.160	0.141	0.118	0.092	0.063	0.032	0.000
REQUIRED CAMBER	0"	-5/16"	-9/16"	-1 1/16"	-3/4"	-3/4"	-1 1/16"	-9/16"	-3/8"	-1/8"	1/8"	7/16"	3/4"	1"	1 5/16"	1 9/16"	1 13/16"	2"	2 3/16"	2 1/4"	2 5/16"	2 5/16"	2 1/4"	2 1/8"	1 5/16"	1 1/16"	1 7/16"	1 1/8"	3/4"	3/8"	0"

ORDINATES		SPAN "B"																													
		GIRDER 3																													
THIRTIETH POINTS	BRG.	0.033	0.066	0.1	0.133	0.166	0.2	0.233	0.266	0.3	0.333	0.366	0.4	0.433	0.466	0.5	0.533	0.566	0.6	0.633	0.666	0.7	0.733	0.766	0.8	0.833	0.866	0.9	0.933	0.966	BRG.
* WEIGHT OF STEEL	0.000	-0.009	-0.016	-0.021	-0.025	-0.027	-0.027	-0.025	-0.023	-0.019	-0.015	-0.011	-0.005	0.000	0.006	0.011	0.016	0.021	0.025	0.028	0.030	0.031	0.031	0.030	0.028	0.025	0.021	0.016	0.011	0.006	0.000
* WEIGHT OF SLAB **	0.000	-0.015	-0.025	-0.031	-0.034	-0.032	-0.027	-0.018	-0.007	0.006	0.020	0.036	0.052	0.069	0.084	0.098	0.110	0.120	0.128	0.133	0.134	0.133	0.128	0.120	0.110	0.096	0.081	0.063	0.043	0.022	0.000
* WEIGHT OF RAIL	0.000	-0.002	-0.004	-0.005	-0.005	-0.005	-0.004	-0.003	-0.002	-0.001	0.001	0.003	0.004	0.006	0.008	0.009	0.011	0.012	0.013	0.014	0.014	0.014	0.013	0.013	0.011	0.010	0.008	0.007	0.004	0.002	0.000
* WEIGHT OF SIDEWALK	0.000	-0.001	-0.002	-0.003	-0.003	-0.003	-0.003	-0.002	-0.002	-0.001	0.001	0.002	0.003	0.004	0.005	0.007	0.007	0.008	0.009	0.009	0.009	0.009	0.009	0.009	0.008	0.007	0.006	0.005	0.003	0.002	0.000
TOTAL DL DEFLECTION	0.000	-0.027	-0.047	-0.061	-0.068	-0.067	-0.061	-0.050	-0.034	-0.015	0.006	0.030	0.054	0.079	0.103	0.126	0.145	0.162	0.174	0.183	0.187	0.186	0.181	0.171	0.157	0.138	0.116	0.090	0.062	0.031	0.000
REQUIRED CAMBER	0"	-5/16"	-9/16"	-3/4"	-13/16"	-13/16"	-3/4"	-5/8"	-7/16"	-3/16"	1/16"	3/8"	5/8"	15/16"	1 1/4"	1 1/2"	1 3/4"	1 5/16"	2 1/16"	2 3/16"	2 1/4"	2 1/4"	2 3/16"	2 1/16"	1 7/8"	1 1/16"	1 3/8"	1 1/16"	3/4"	3/8"	0"

ORDINATES		SPAN "B"																													
		GIRDER 4																													
THIRTIETH POINTS	BRG.	0.033	0.066	0.1	0.133	0.166	0.2	0.233	0.266	0.3	0.333	0.366	0.4	0.433	0.466	0.5	0.533	0.566	0.6	0.633	0.666	0.7	0.733	0.766	0.8	0.833	0.866	0.9	0.933	0.966	BRG.
* WEIGHT OF STEEL	0.000	-0.009	-0.017	-0.022	-0.026	-0.028	-0.029	-0.028	-0.026	-0.023	-0.020	-0.015	-0.010	-0.005	0.000	0.005	0.010	0.015	0.018	0.022	0.024	0.025	0.025	0.025	0.023	0.021	0.018	0.014	0.010	0.005	0.000
* WEIGHT OF SLAB **	0.000	-0.014	-0.025	-0.032	-0.035	-0.035	-0.031	-0.025	-0.016	-0.005	0.006	0.020	0.034	0.048	0.061	0.073	0.084	0.093	0.100	0.105	0.107	0.106	0.103	0.097	0.089	0.078	0.066	0.051	0.035	0.018	0.000
* WEIGHT OF RAIL	0.000	-0.002	-0.004	-0.005	-0.006	-0.006	-0.005	-0.004	-0.003	-0.002	0.000	0.002	0.004	0.005	0.007	0.009	0.010	0.012	0.013	0.013	0.014	0.014	0.013	0.013	0.012	0.010	0.009	0.007	0.005	0.002	0.000
* WEIGHT OF SIDEWALK	0.000	-0.002	-0.003	-0.003	-0.004	-0.004	-0.004	-0.003	-0.002	-0.001	0.000	0.001	0.002	0.004	0.005	0.006	0.007	0.008	0.009	0.009	0.009	0.009	0.009	0.009	0.008	0.007	0.006	0.005	0.003	0.002	0.000
TOTAL DL DEFLECTION	0.000	-0.027	-0.048	-0.063	-0.071	-0.073	-0.069	-0.060	-0.047	-0.031	-0.013	0.007	0.029	0.052	0.074	0.094	0.112	0.128	0.140	0.149	0.154	0.154	0.151	0.143	0.132	0.117	0.098	0.076	0.052	0.027	0.000
REQUIRED CAMBER	0"	-5/16"	-9/16"	-3/4"	-7/8"	-7/8"	-13/16"	-3/4"	-9/16"	-3/8"	-3/16"	1/16"	3/8"	5/8"	7/8"	1 1/8"	1 3/8"	1 9/16"	1 11/16"	1 13/16"	1 13/16"	1 7/8"	1 13/16"	1 3/4"	1 9/16"	1 3/8"	1 3/16"	1 5/16"	5/8"	5/16"	0"

* DEFLECTION DUE TO
 ** INCLUDES SLAB, BUILD-UP AND STAY-IN-PLACE METAL FORMS.

CAMBER NOTES:

- ALL DEFLECTIONS AND CAMBER VALUES SHOWN ARE IN FEET (DECIMAL FORM), EXCEPT FOR "REQUIRED CAMBER" GIVEN IN INCHES (FRACTION FORM).
- NO VERTICAL CURVE ORDINATE ON BRIDGE.
- POSITIVE VALUES INDICATE CAMBER IS ABOVE ZERO-CAMBER LINE.

PROJECT NO. U-2579AB
FORSYTH COUNTY
 STATION: 23+43.03 -Y16-

SHEET 2 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 DEAD LOAD DEFLECTIONS
 SPAN B

DRAWN BY : _____	MRA	DATE : 12/2019
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DESIGN ENGINEER OF RECORD: _____	JMR	DATE : 12/2019

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NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			48
2			4			

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 1/4 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.

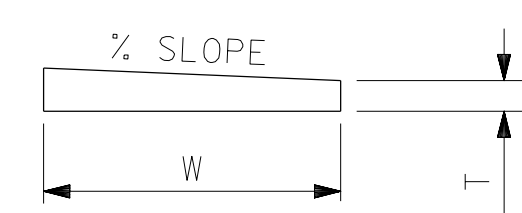
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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.

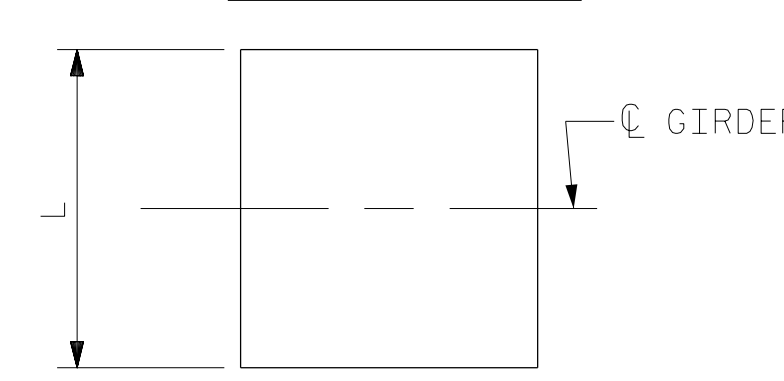
FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

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

INCREASING STATIONS →



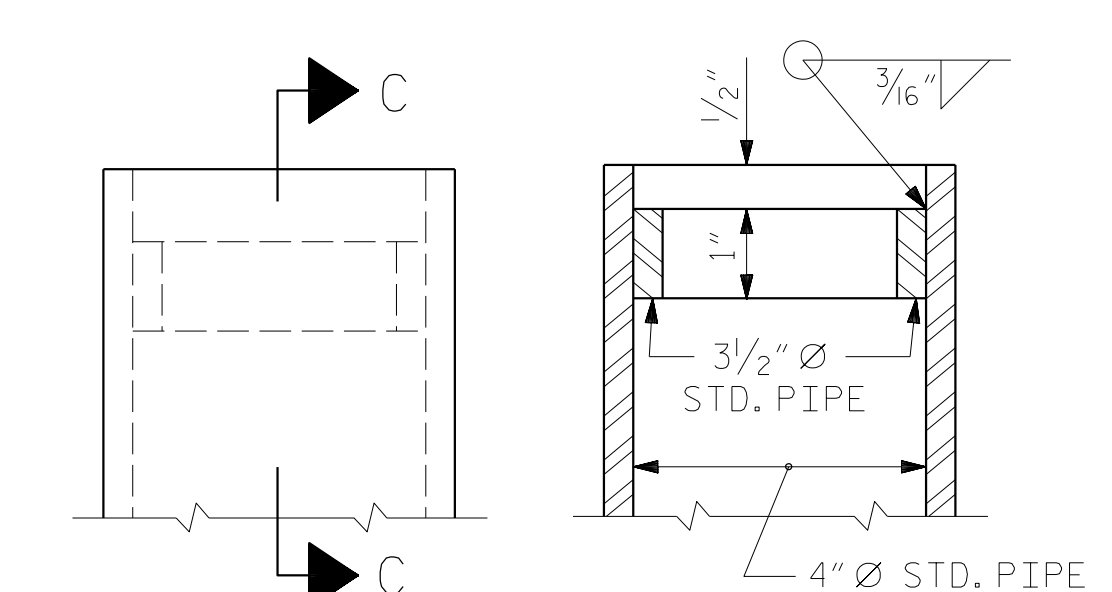
ELEVATION



PLAN

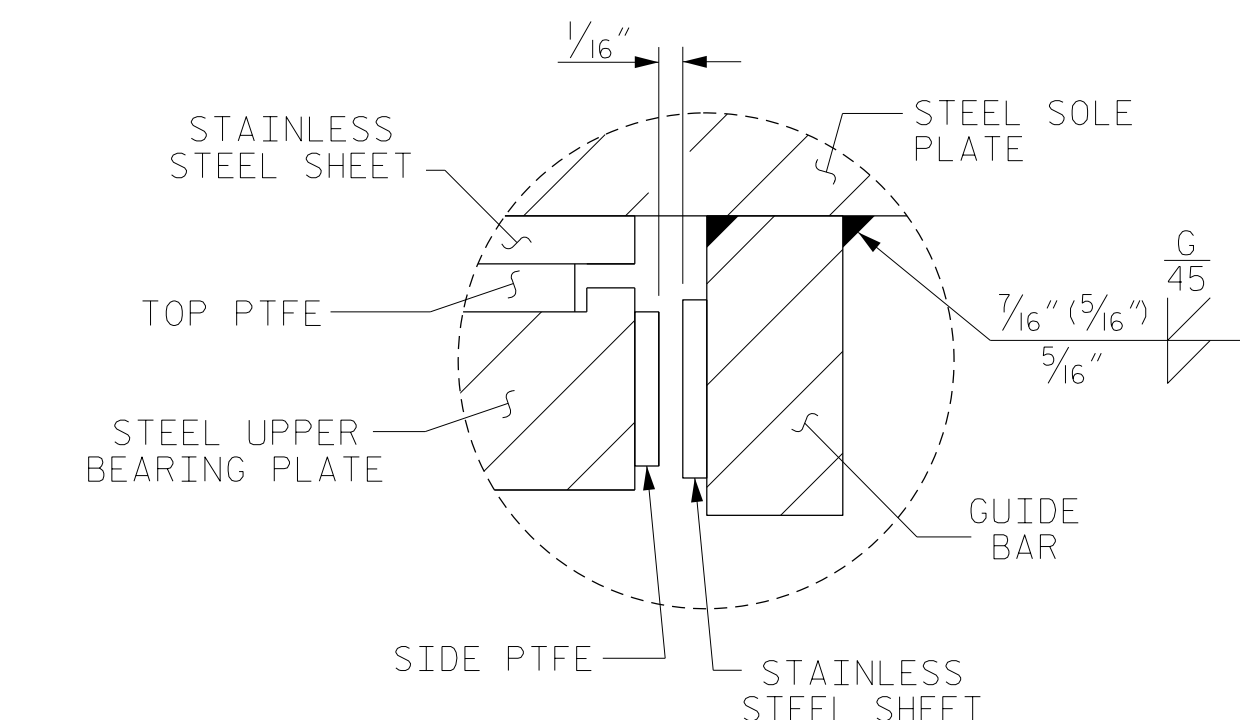
NOTE:
DIMENSIONS "W" AND "T" SHALL BE DETERMINED BY THE BEARING MANUFACTURER.

SOLE PLATE DETAILS

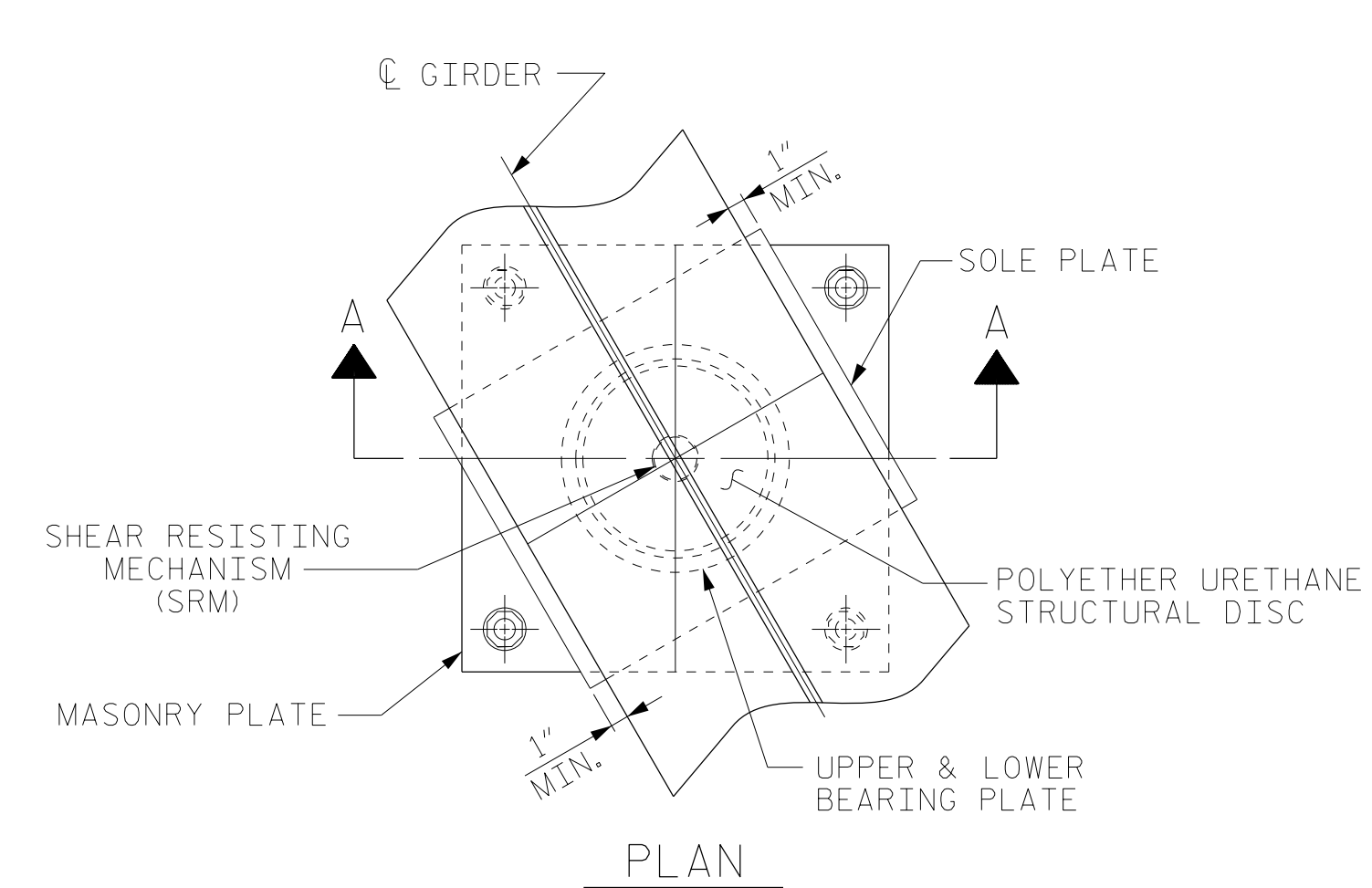


SECTION C-C

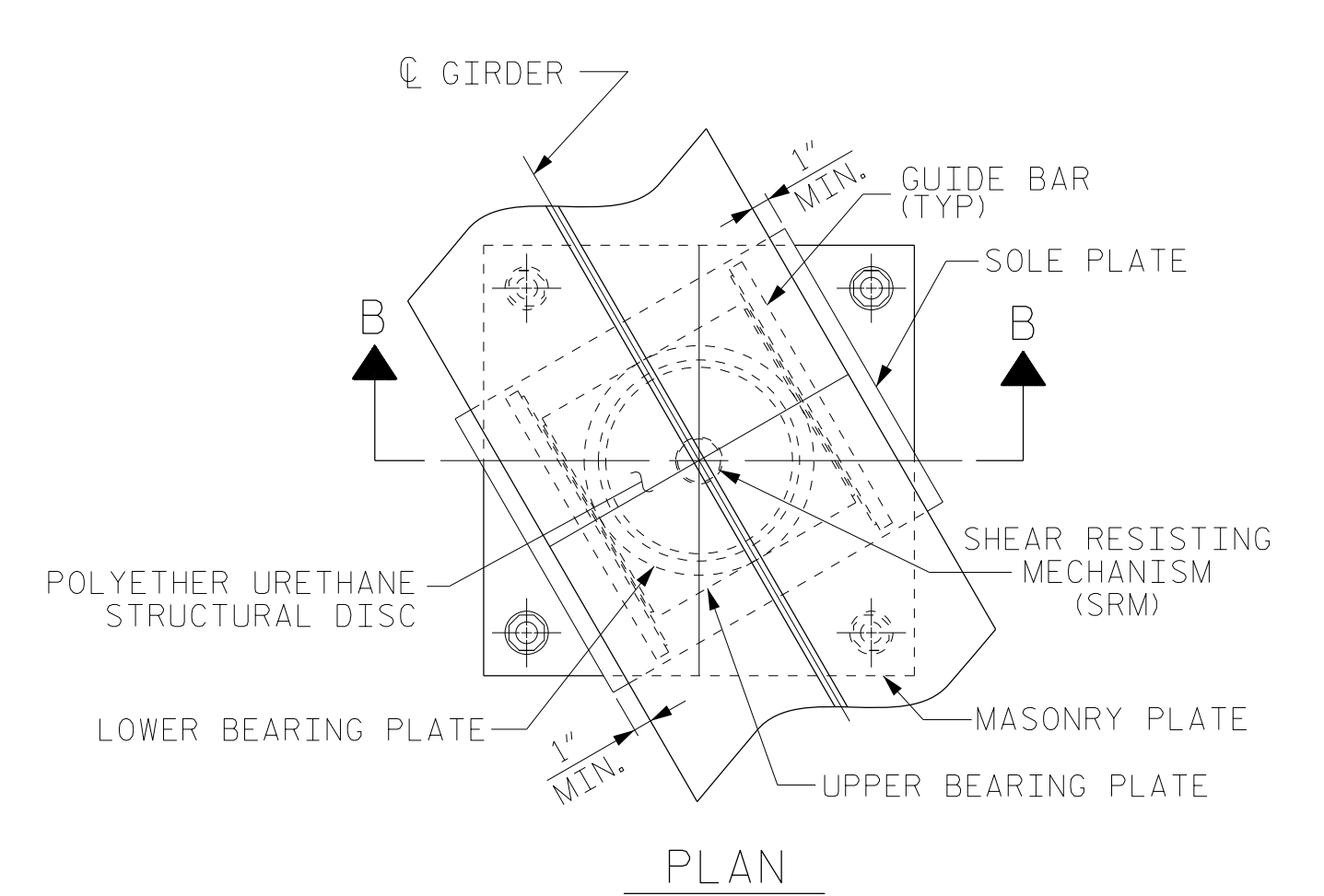
DETAIL "A"



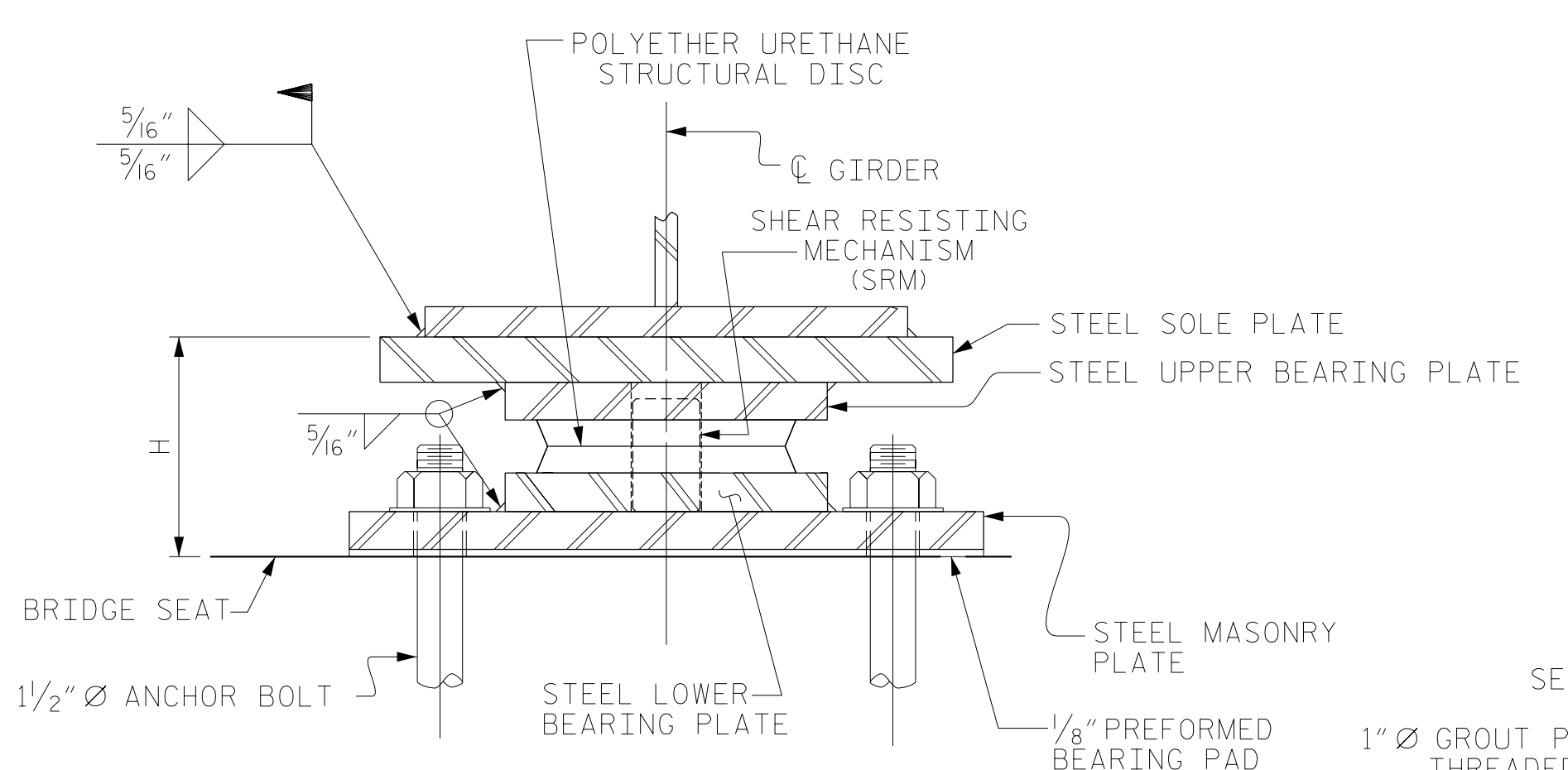
DETAIL "B"



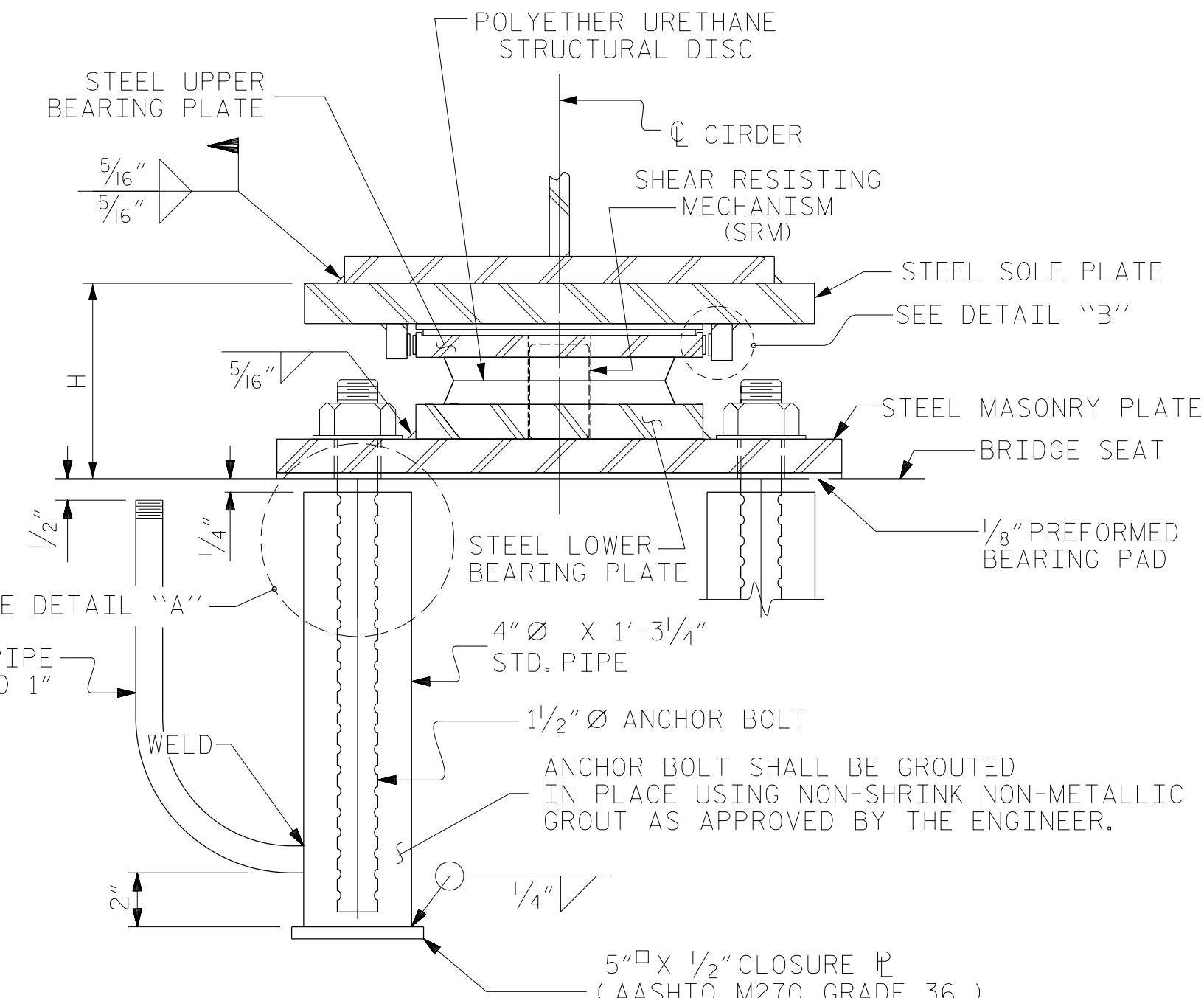
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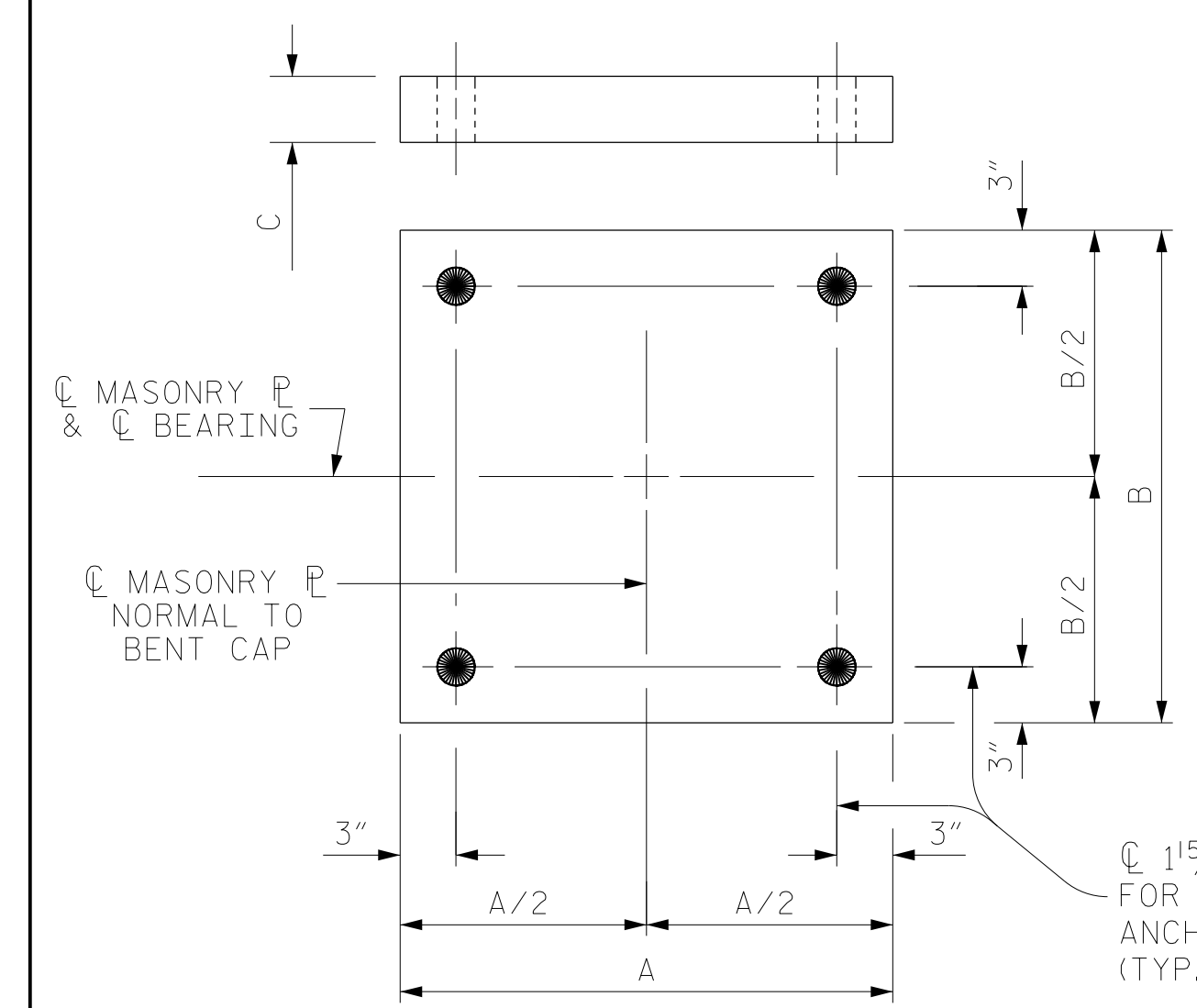
PLAN



SECTION A-A
DB2, FIXED



SECTION B-B
DB1 AND DB3, EXP.



PLAN
MASONRY PLATE DETAILS

PLATE SETTING DATA (EXPANSION DISC BEARINGS)				
LOCATION	TEMPERATURE AT TIME OF SETTING			*
	45° F	60° F	90° F	
END BENT 1	-5/16"	0"	5/8"	-1 1/16"
END BENT 2	-1/4"	0"	1/2"	-1/2"

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

TEMPERATURE SETTING DETAIL

DESIGNATIONS		LOCATION	NUMBER OF BEARINGS	DIMENSIONS				TOP SLOPE (%)	SOLE PLATE L (IN.)	LOADS AND MOVEMENT				
BEARINGS	MASONRY PLATE			BEARING H (IN.)	MASONRY PLATE A (IN.)	MASONRY PLATE B (IN.)	MASONRY PLATE C (IN.)			UNFACTORED VERTICAL LOAD (KIPS)		FACTORED HORIZONTAL LOAD (KIPS)	ONE-WAY MOVEMENT (IN.)	
DB1 (EXP.)	M1	END BENT 1	4	6 9/16"	28 1/2"	28 1/2"	3/4"	-0.50	30"	DC 271	DW 22	LL+IM 152	92	2/16"
DB2 (FIXED)	M2	BENT 1	4	8 7/16"	36"	36"	1 1/4"	-0.50	34"	807	66	328	259	0"
DB3 (EXP.)	M3	END BENT 2	4	5 5/16"	27"	27"	3/4"	-0.50	26"	160	13	137	61	1 3/16"

ASSEMBLED BY : TRM DATE : 08/2019
 CHECKED BY : MAL DATE : 12/2019
 DRAWN BY : TMG 08/13 REV. 12/17 MAA/THC
 CHECKED BY : EXP 10/13



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 RALEIGH

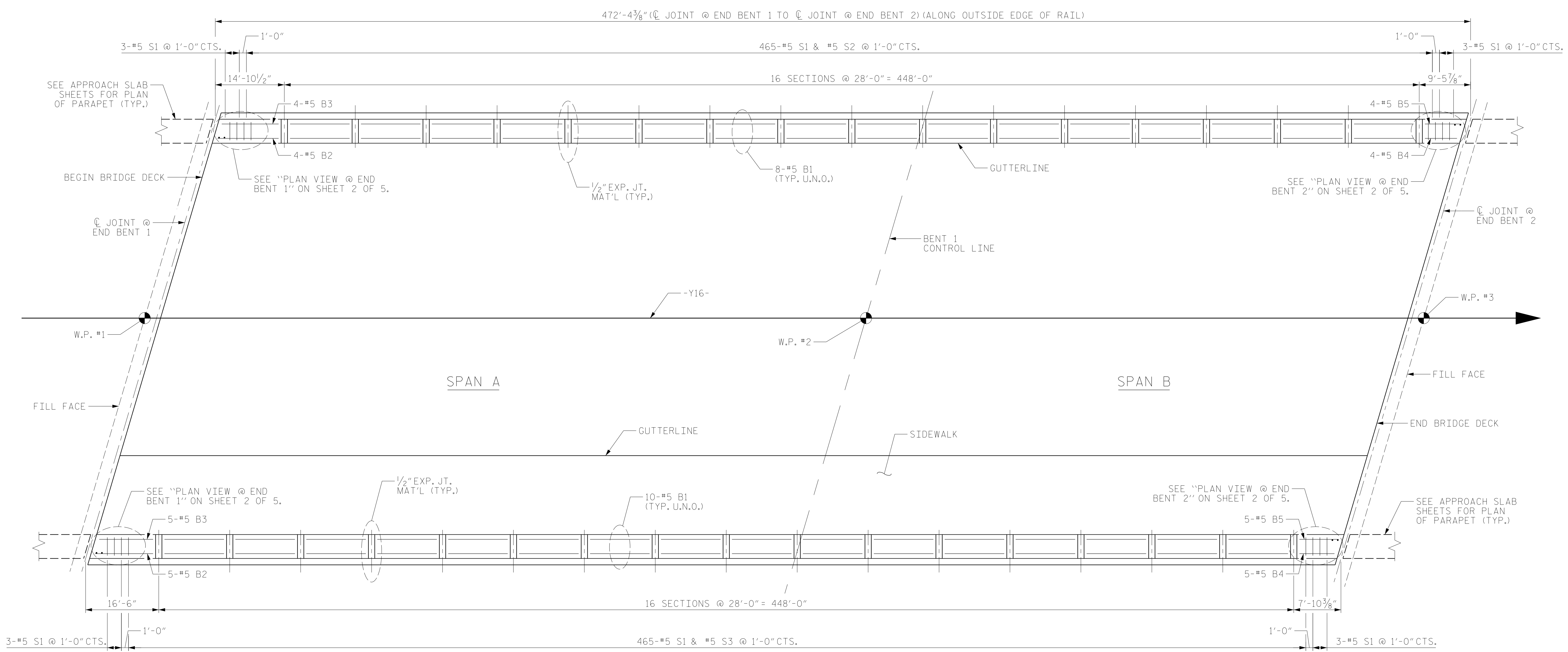
STANDARD
 DISC BEARING
 DETAILS

REVISIONS

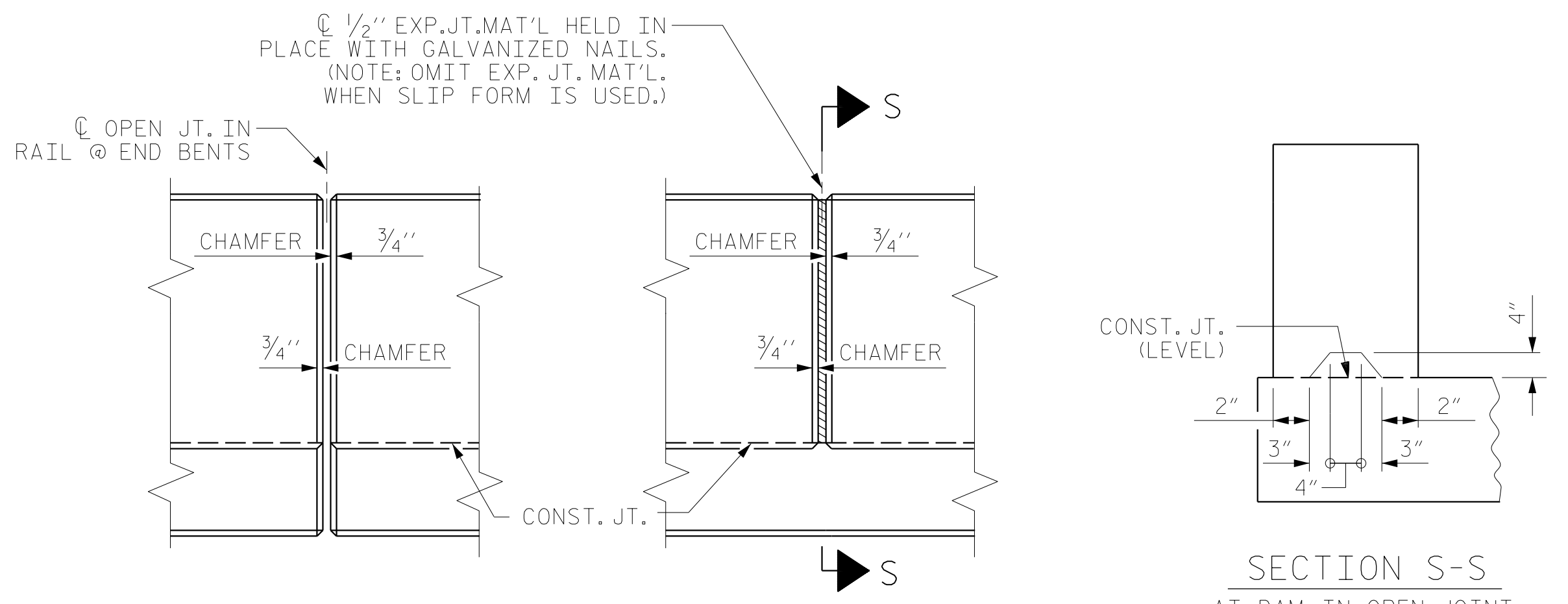
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S7-20
 TOTAL SHEETS 48

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PLAN OF CONCRETE PARAPET



ELEVATION AT EXPANSION JOINTS

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

PARAPET DETAILS

PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 23+43.03 -Y16-

SHEET 1 OF 5



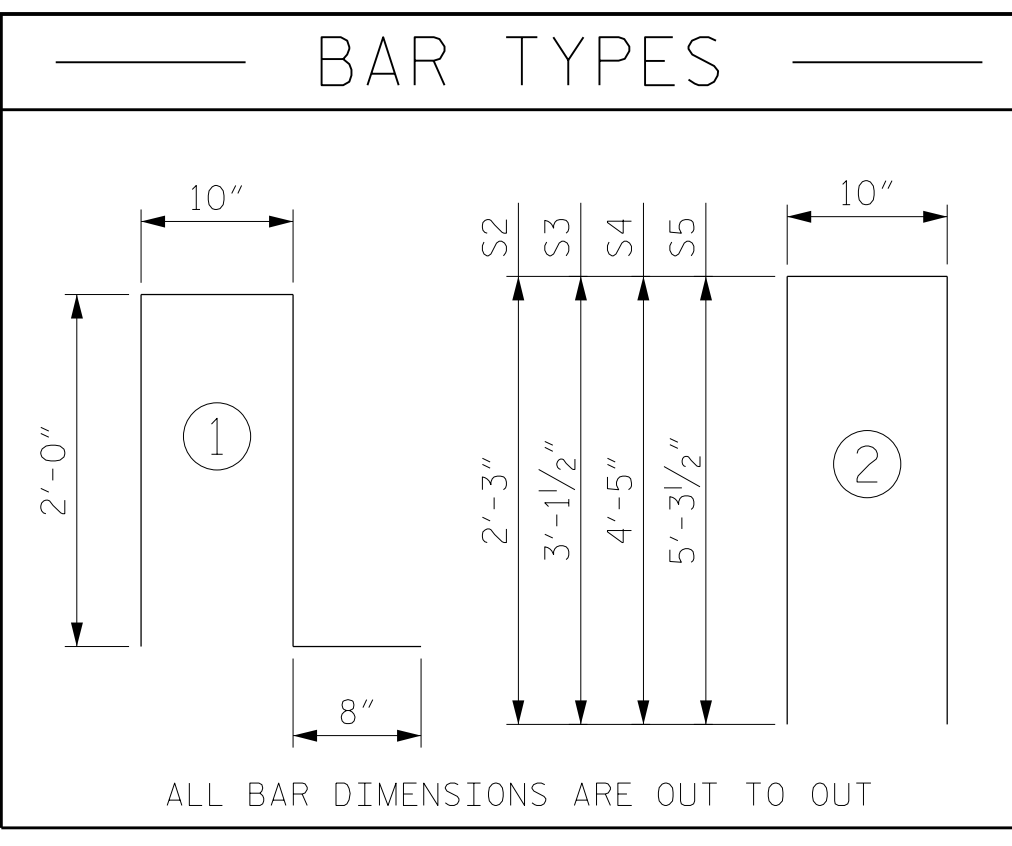
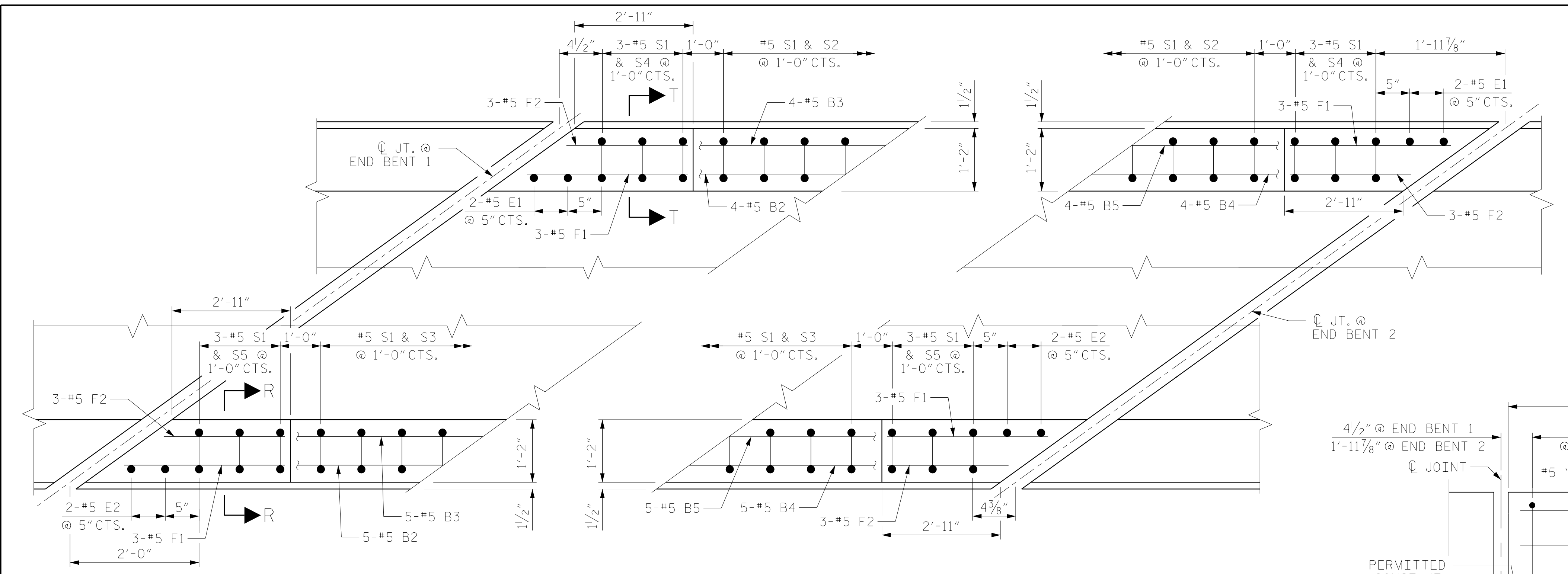
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 SUPERSTRUCTURE
 CONCRETE PARAPET

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			ST-21
2			4			TOTAL SHEETS 48

DRAWN BY : TWL DATE : 12/2019
 CHECKED BY : MRA DATE : 12/2019
 DESIGN ENGINEER OF RECORD: JMR DATE : 12/2019

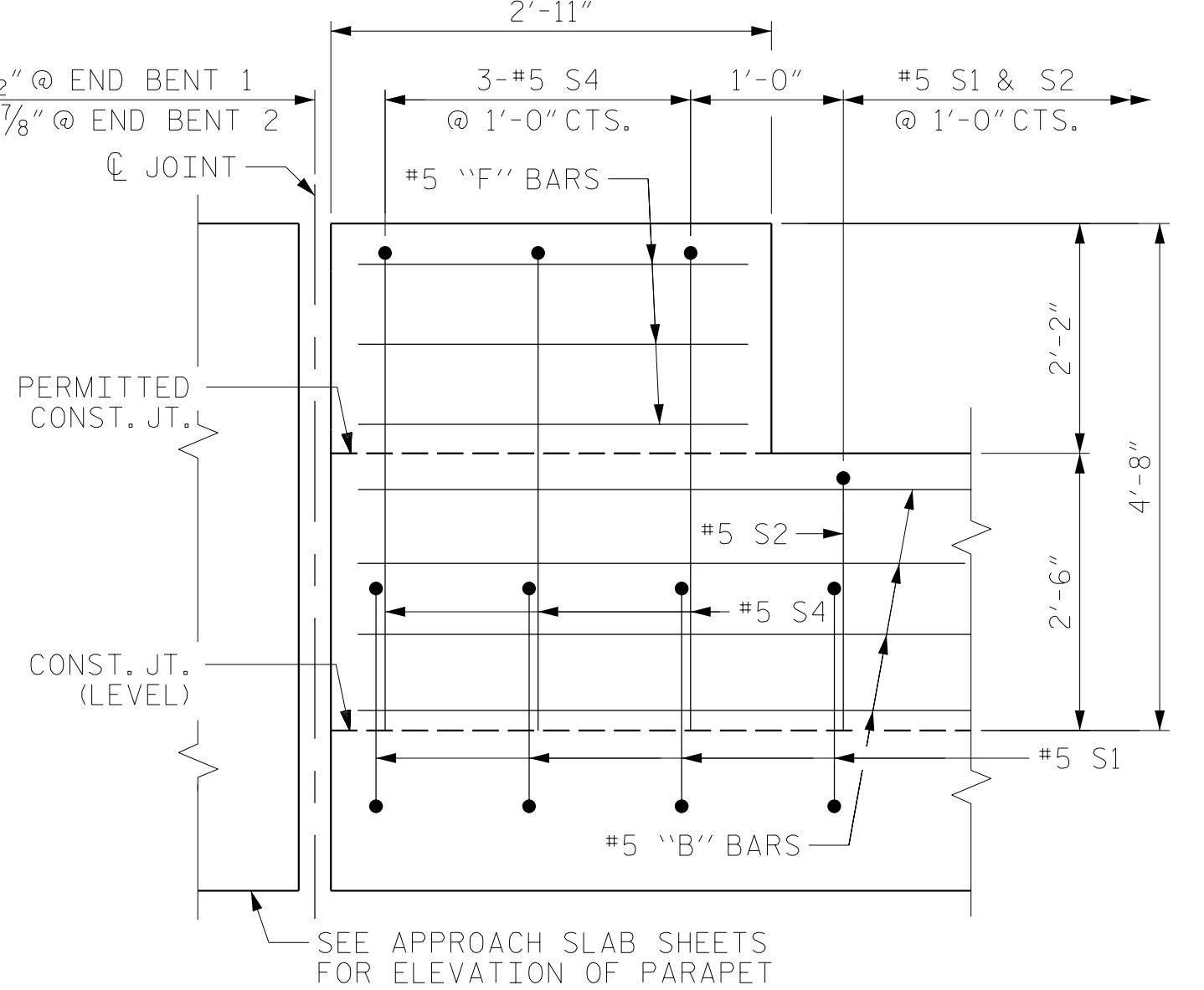
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BILL OF MATERIAL FOR CONCRETE PARAPET					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	288	#5	STR	27'-7"	8286
*B2	9	#5	STR	15'-7"	146
*B3	9	#5	STR	14'-7"	137
*B4	9	#5	STR	7'-7"	71
*B5	9	#5	STR	8'-7"	81
*E1	4	#5	STR	4'-5"	18
*E2	4	#5	STR	5'-3"	22
*F1	12	#5	STR	3'-8"	46
*F2	12	#5	STR	2'-8"	33
*S1	942	#5	1	5'-6"	5404
*S2	465	#5	2	5'-4"	2586
*S3	465	#5	2	7'-1"	3435
*S4	6	#5	2	9'-8"	60
*S5	6	#5	2	11'-5"	71
*EPOXY COATED REINFORCING STEEL					20,396 LBS.
CLASS AA CONCRETE					120.3 C.Y.
1'-2" X 2'-6" CONCRETE PARAPET					472.1 L.F.
1'-2" X 3'-3 3/4" CONCRETE PARAPET					472.1 L.F.

PLAN VIEW @ END BENT 1

PLAN VIEW @ END BENT 2

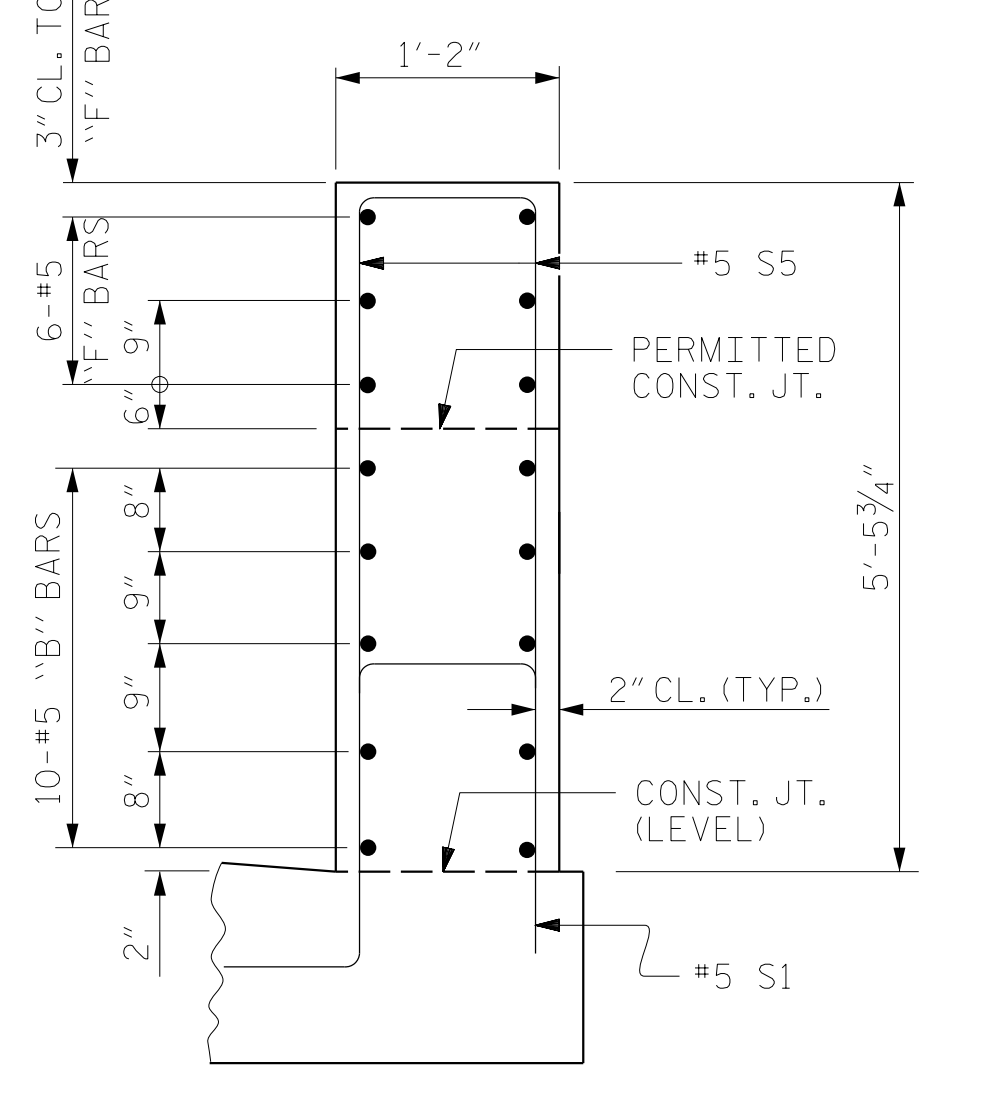
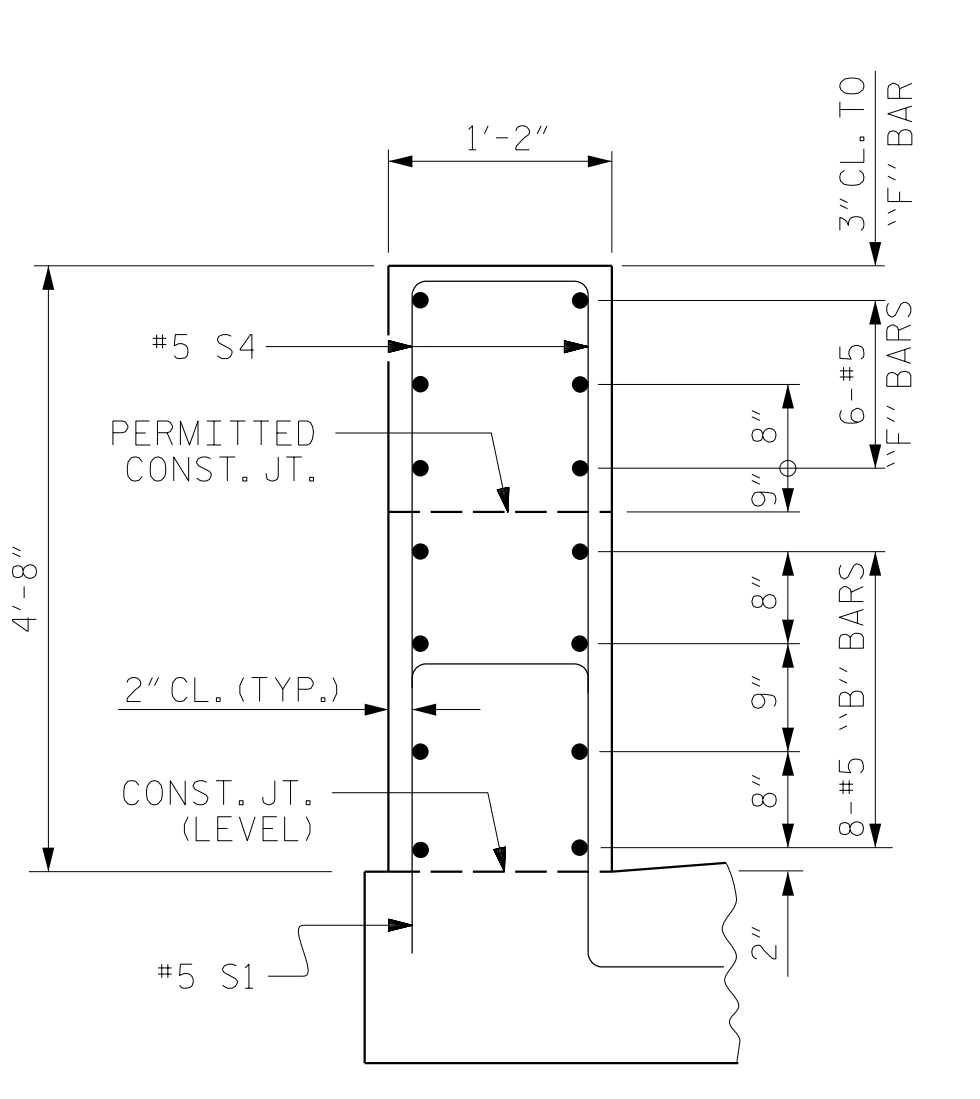


NOTES:
THE CONCRETE PARAPET IN CONTINUOUS SPANS SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSION STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN THE CONCRETE PARAPET SHALL BE EPOXY COATED.
SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEET FOR GUARDRAIL ANCHOR ASSEMBLY.

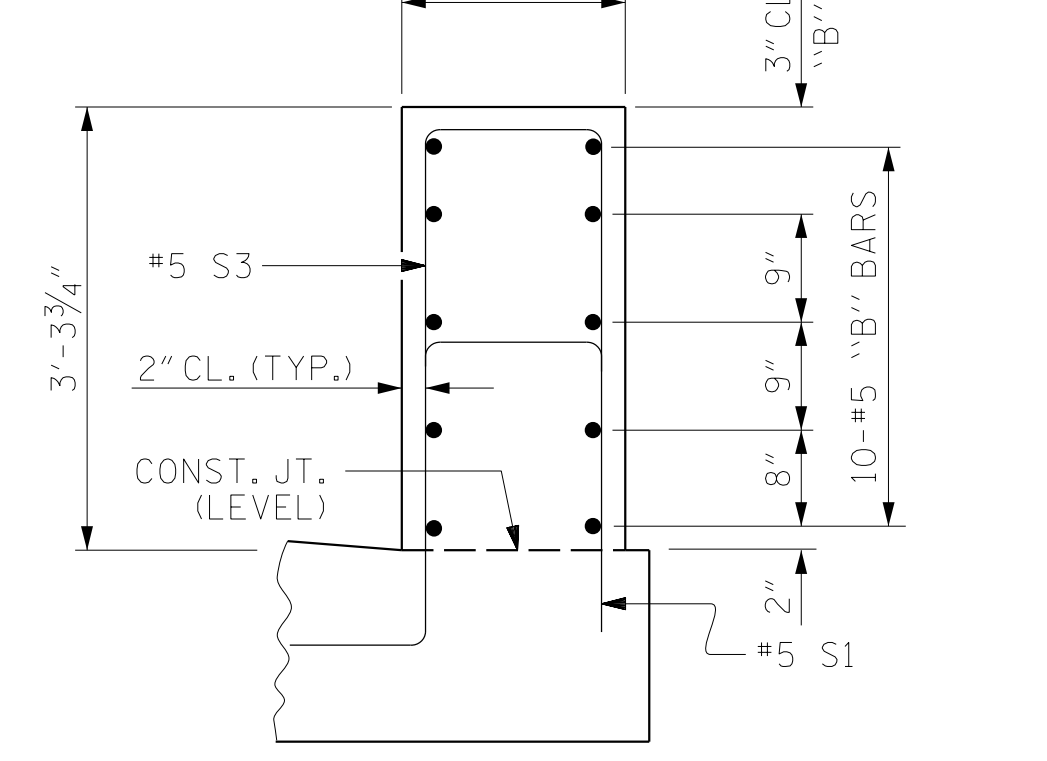
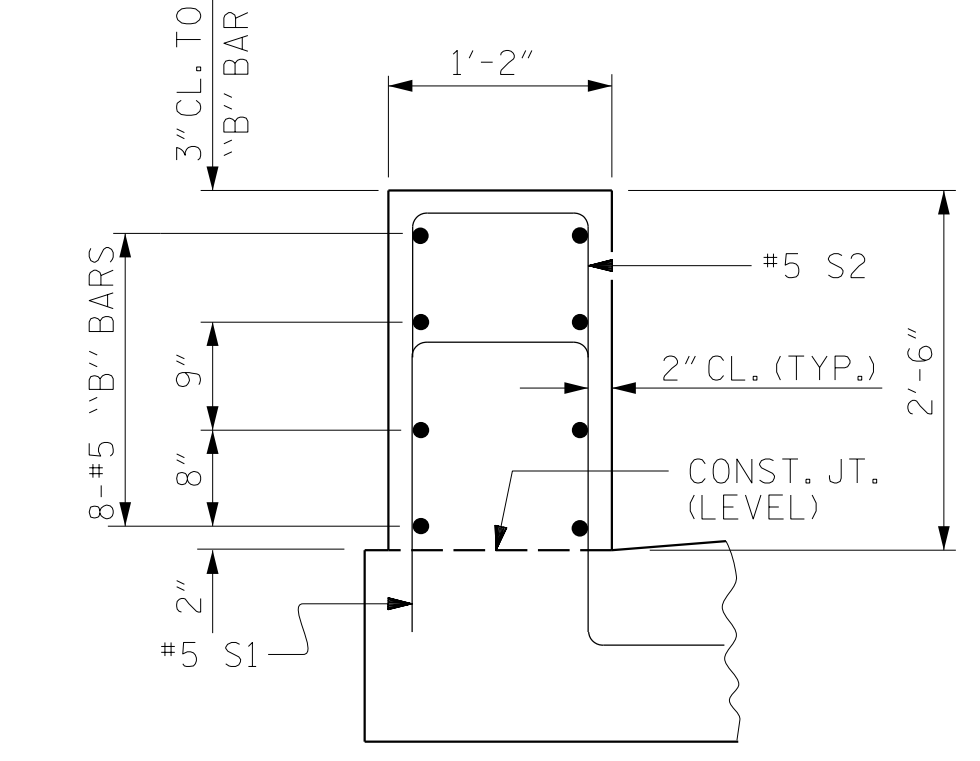
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

#5 "S" BARS MAY BE SHIFTED AS NECESSARY TO CLEAR EXPANSION JOINTS IN RAIL.



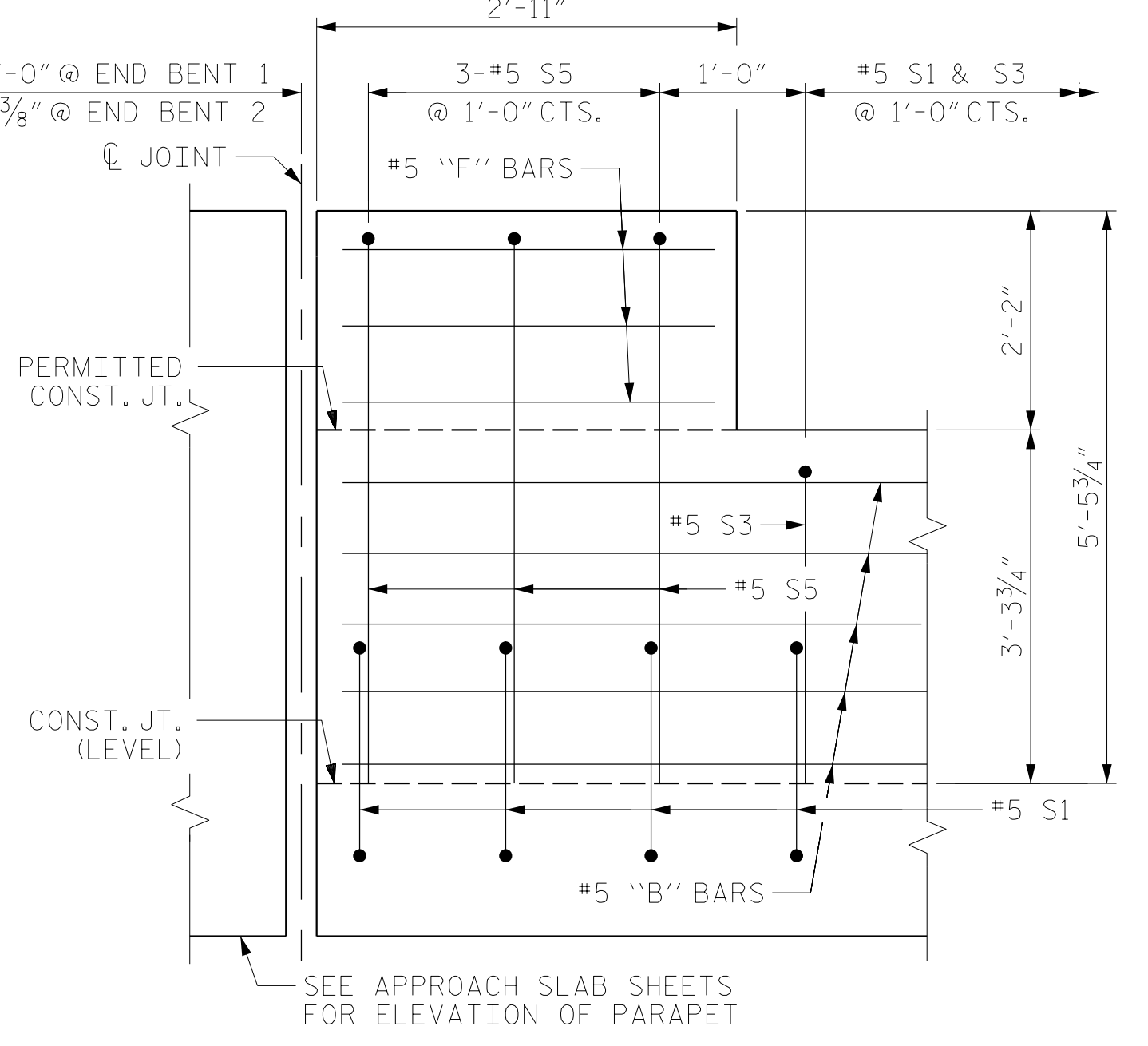
SECTION T-T

SECTION R-R



SECTION THROUGH LEFT PARAPET

SECTION THROUGH RIGHT PARAPET



ELEVATION VIEW OF RIGHT PARAPET

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 23+43.03 -Y16-

SHEET 2 OF 5



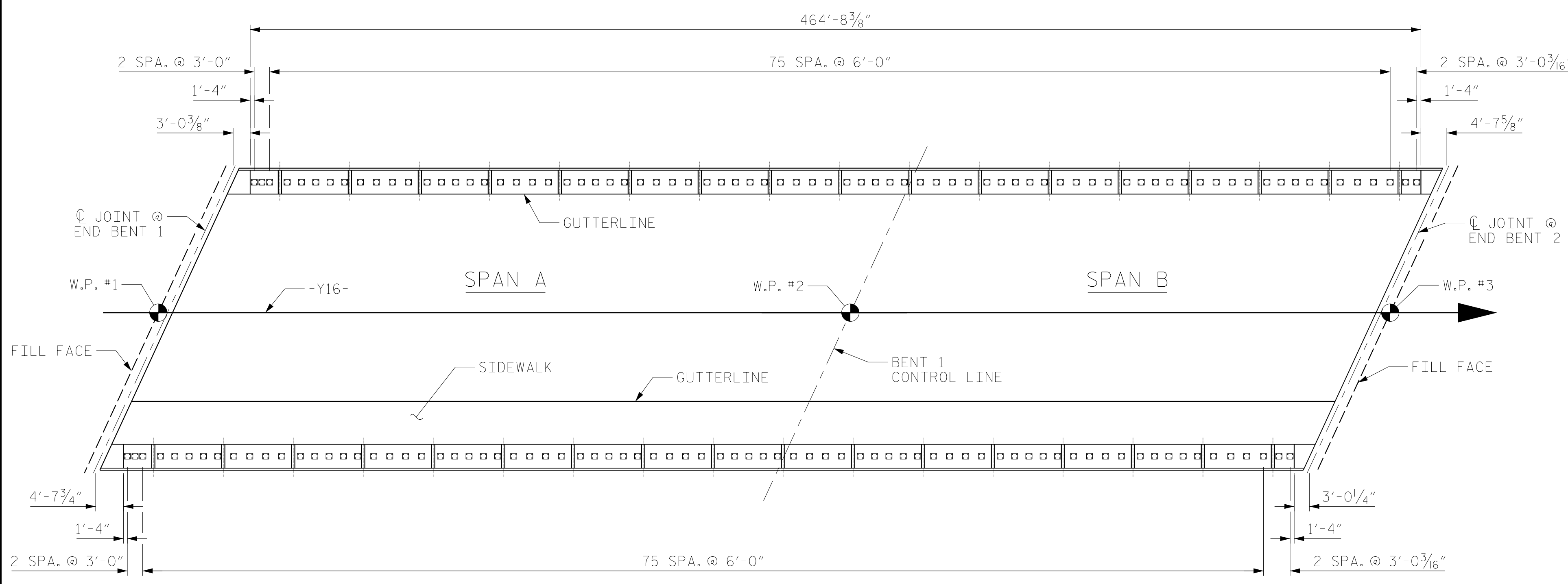
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10/14/2021

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DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
CONCRETE PARAPET
DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S7-22
1			3			TOTAL SHEETS
2			4			48

DRAWN BY : TWL DATE : 11/2019
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DESIGN ENGINEER OF RECORD: JMR DATE : 12/2019

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PLAN OF RAIL POST SPACINGS
DIMENSIONS ARE TAKEN ALONG OUTSIDE EDGE OF PARAPET

NOTES
STRUCTURAL CONCRETE INSERT

THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1/2".

B. 1 - 3/4" Ø X 1 5/8" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 1 5/8" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES
METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.

B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N.C. THREADS.

C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°.

D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).

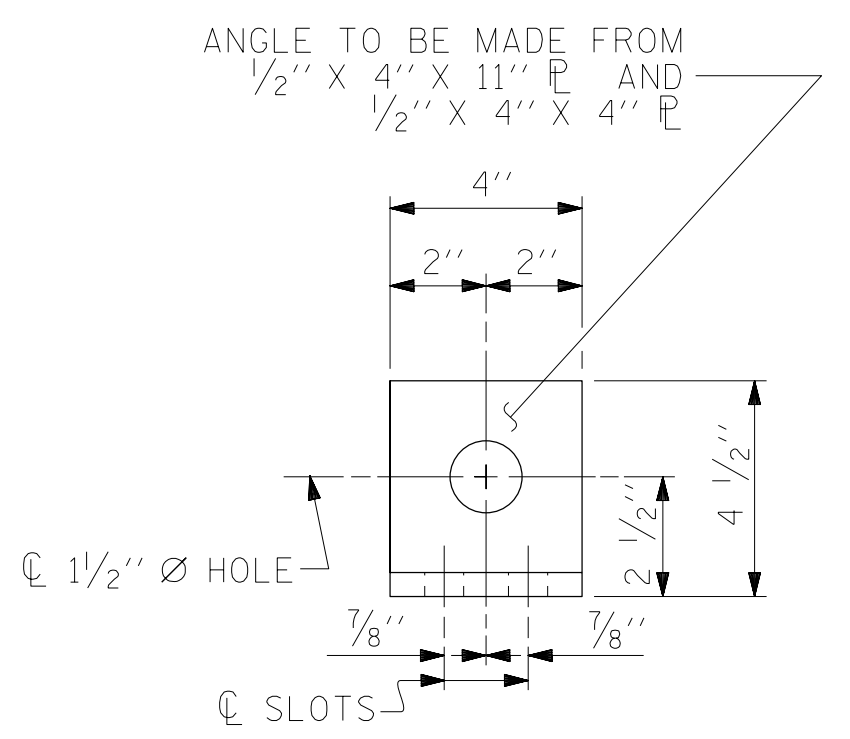
E. 1/2" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.

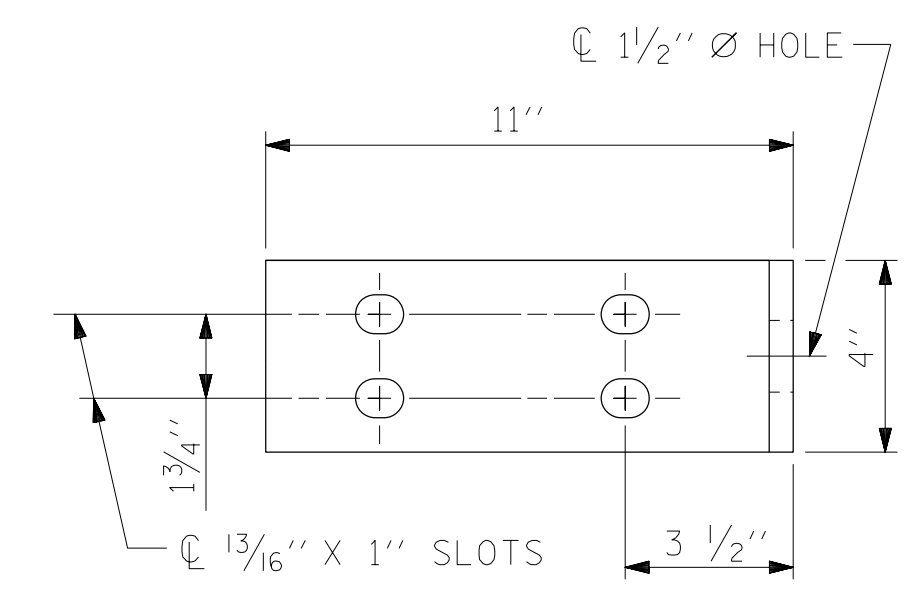
THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

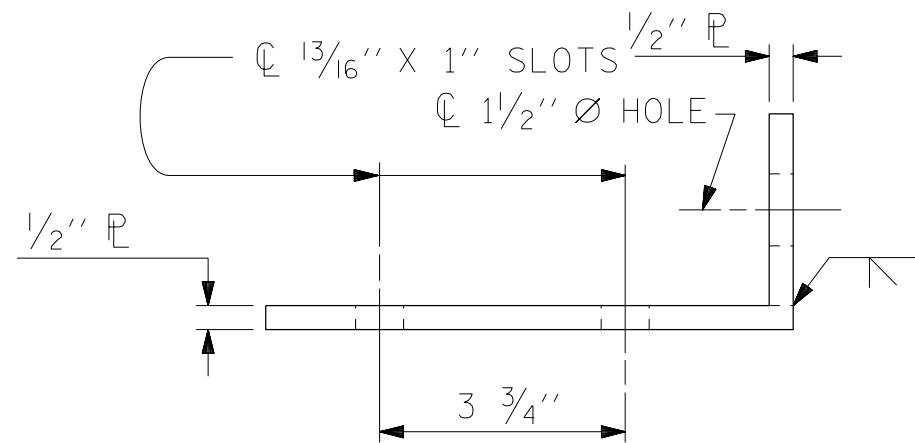
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" Ø X 1 5/8" BOLT SHALL APPLY TO THE 3/4" Ø X 6 1/2" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



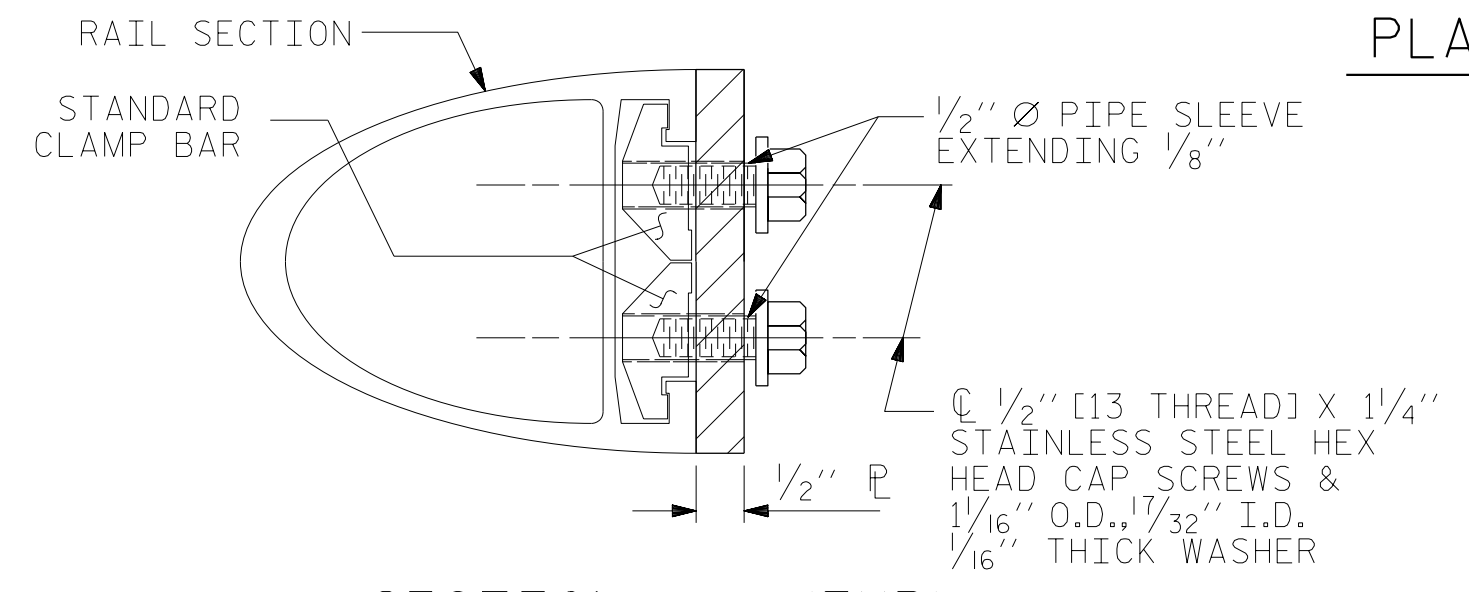
END VIEW (FIX AND EXP.)



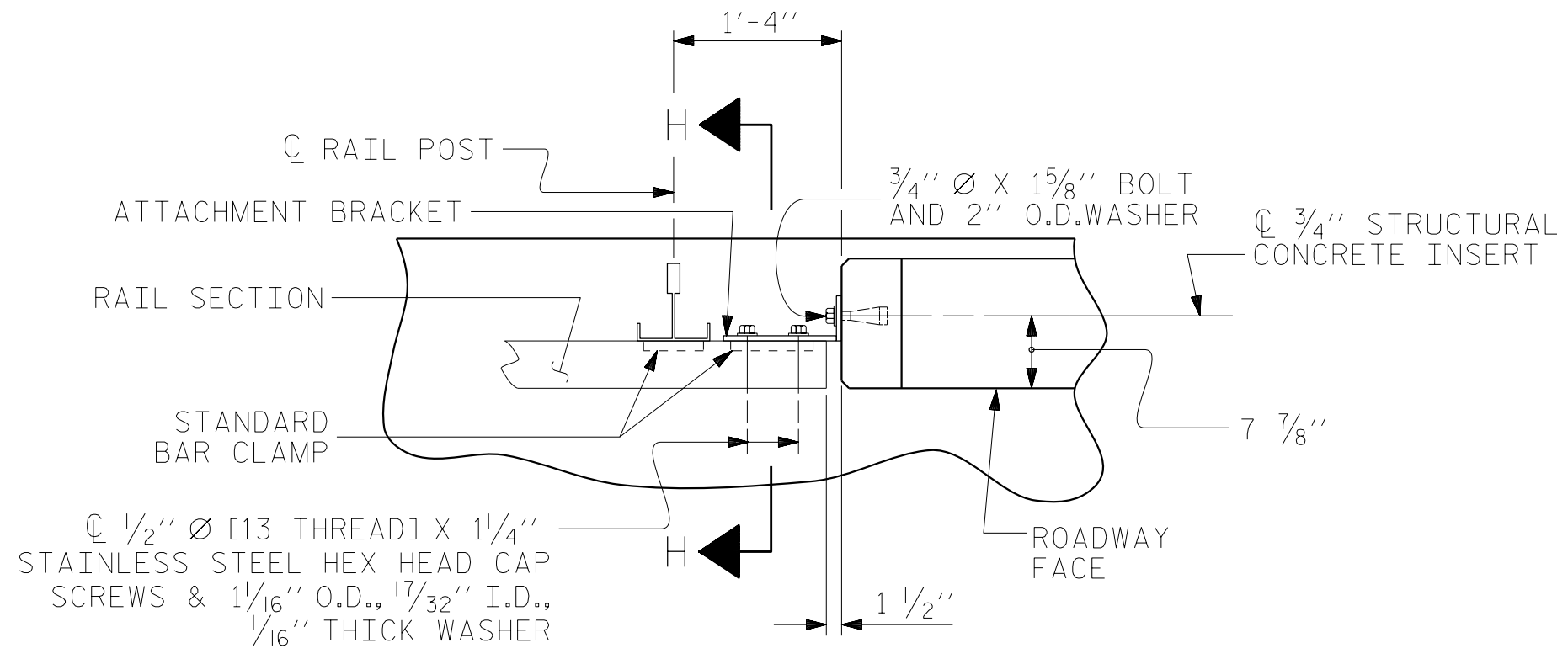
ELEVATION



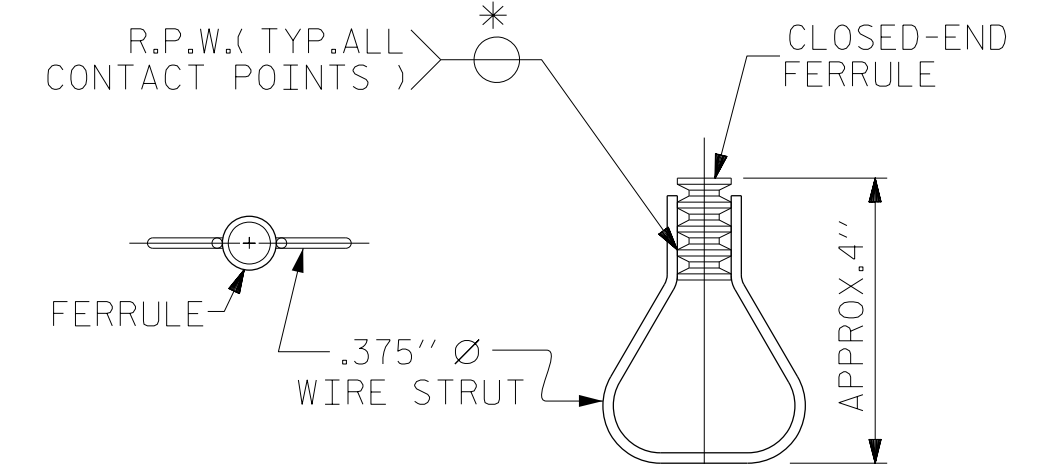
TOP VIEW



SECTION H-H (EXP)



PLAN - RAIL AND END POST



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

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

PROJECT NO. U-2579AB
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SHEET 3 OF 5



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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
RAIL POST SPACINGS
AND
END OF RAIL DETAILS
FOR ONE OR TWO BAR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			57-23
2			4			TOTAL SHEETS 48

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ASSEMBLED BY : TWL	DATE : 12/2019
CHECKED BY : MRA	DATE : 12/2019
DRAWN BY : FCJ 1/88	REV. 5/1/06 TLA/GM
CHECKED BY : CRK 3/89	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

NOTES

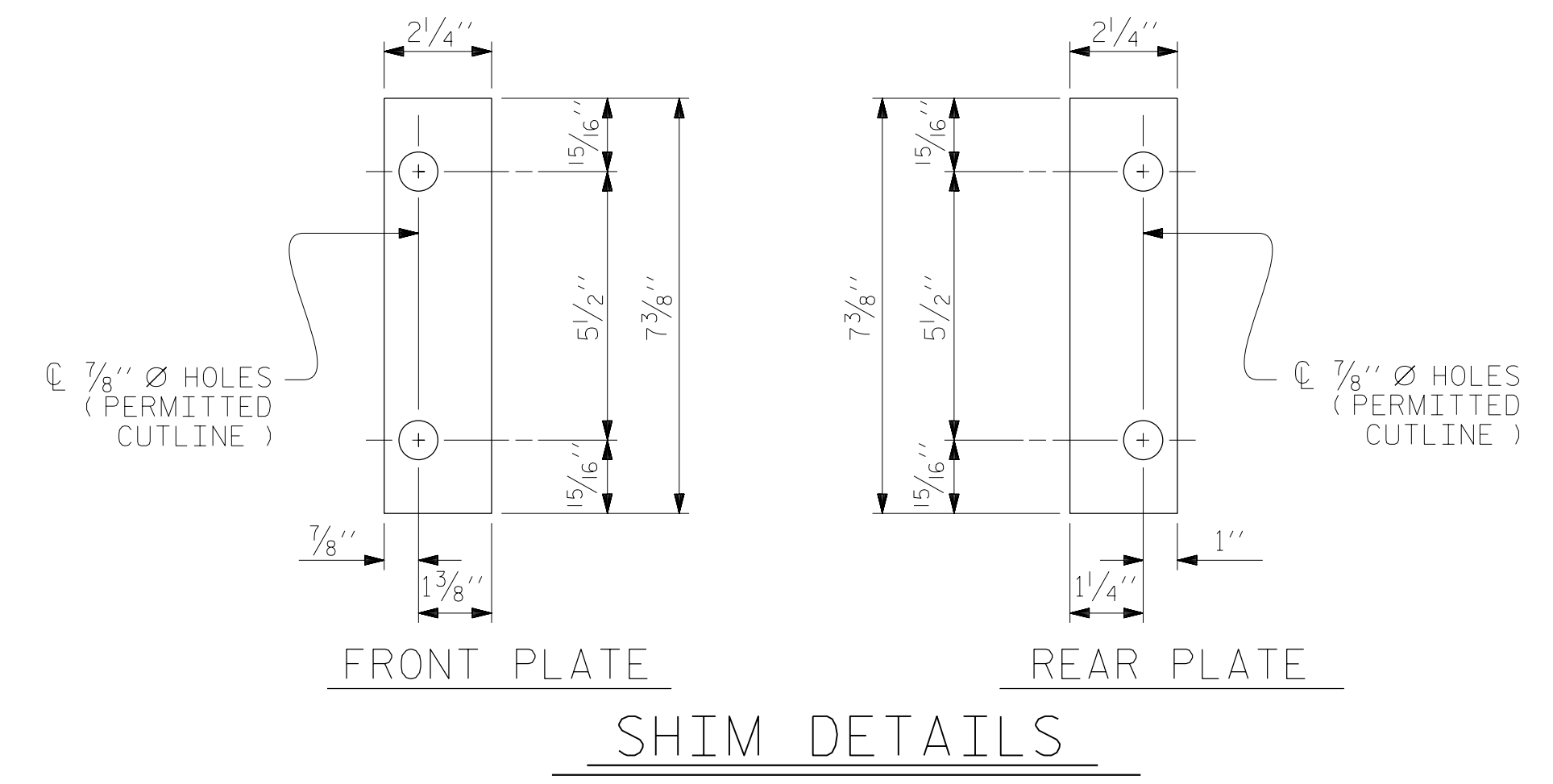
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS :

- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 2 1/2" GALVANIZED BOLTS 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.
- C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
- F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

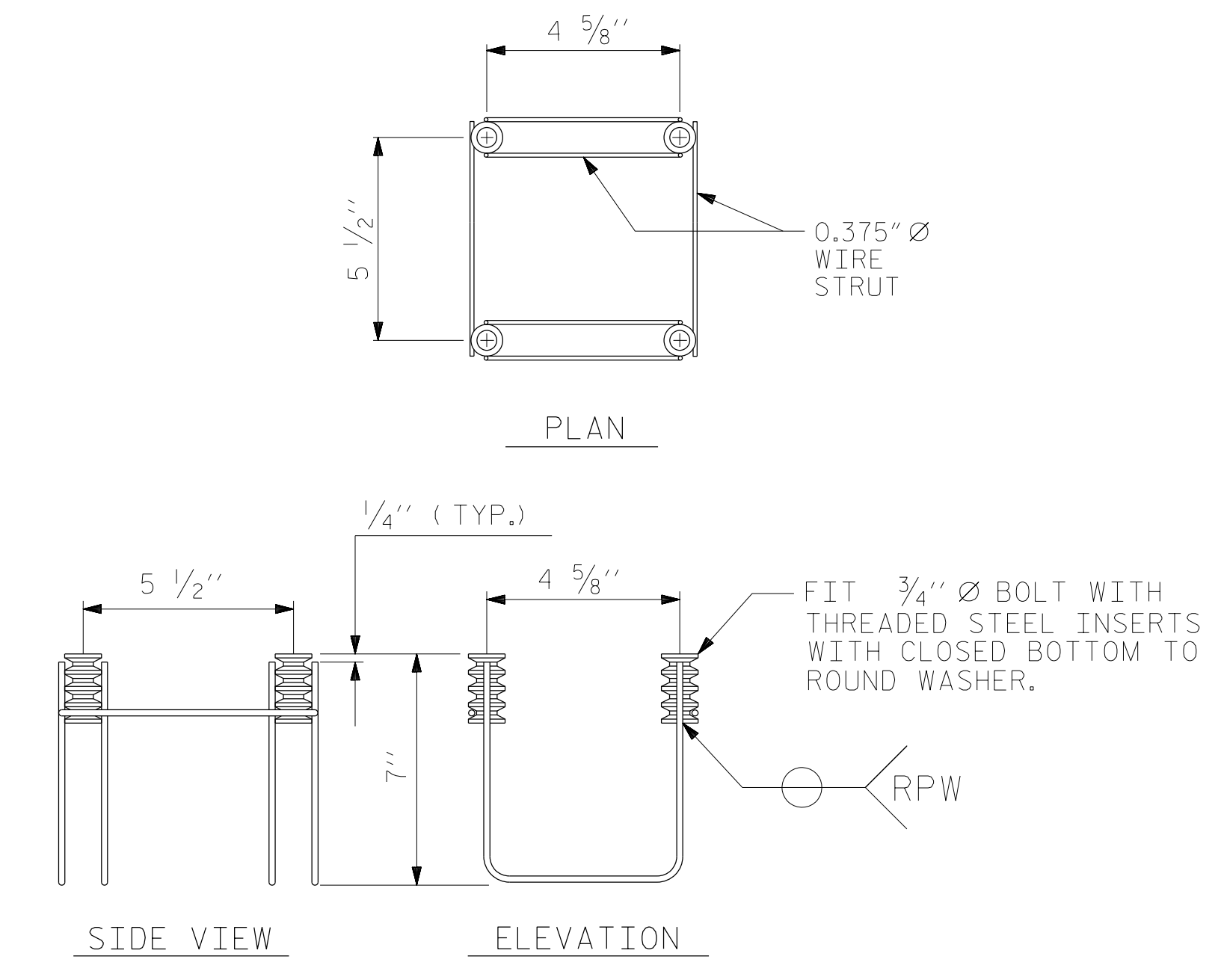
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.



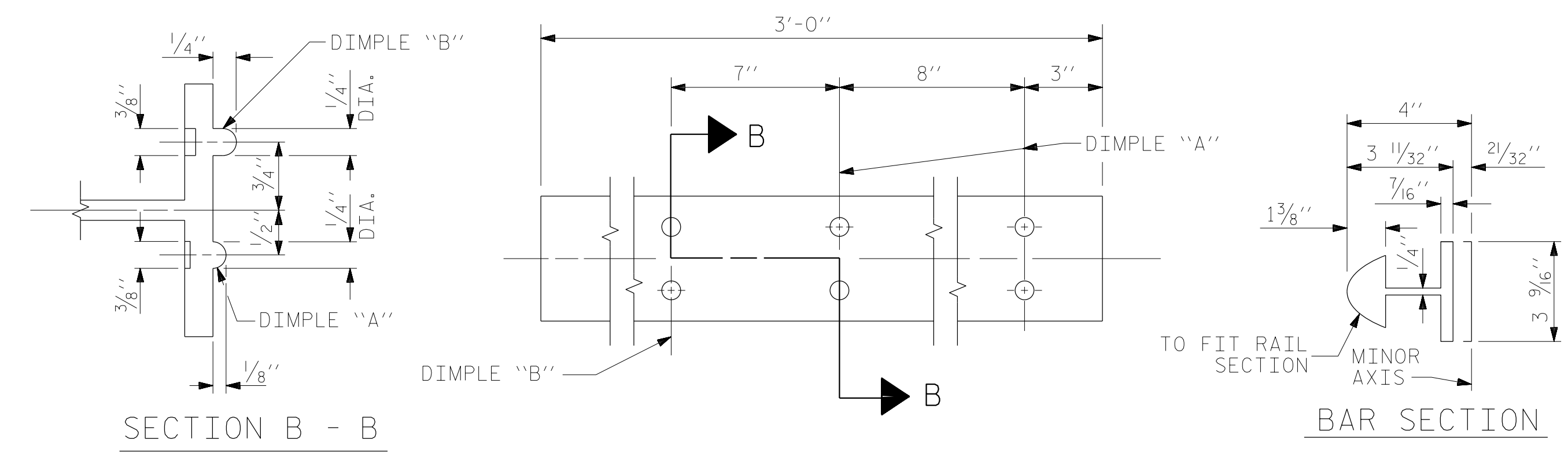
SHIM DETAILS

NOTE : SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.

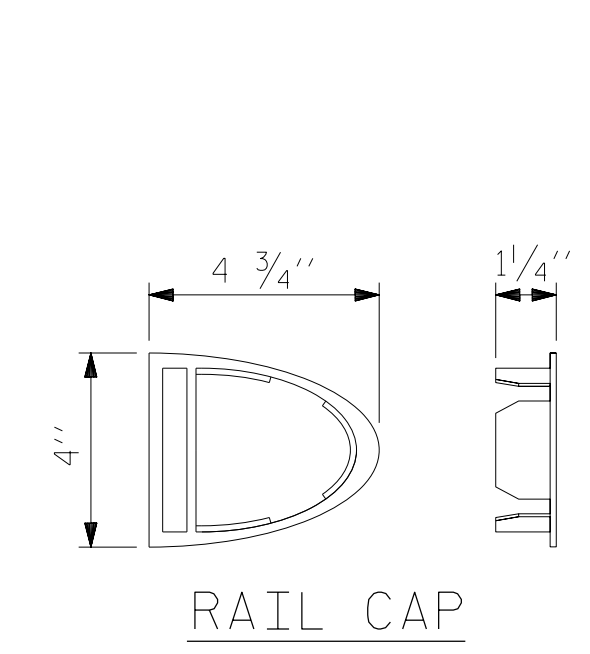


4-BOLT METAL RAIL ANCHOR ASSEMBLY

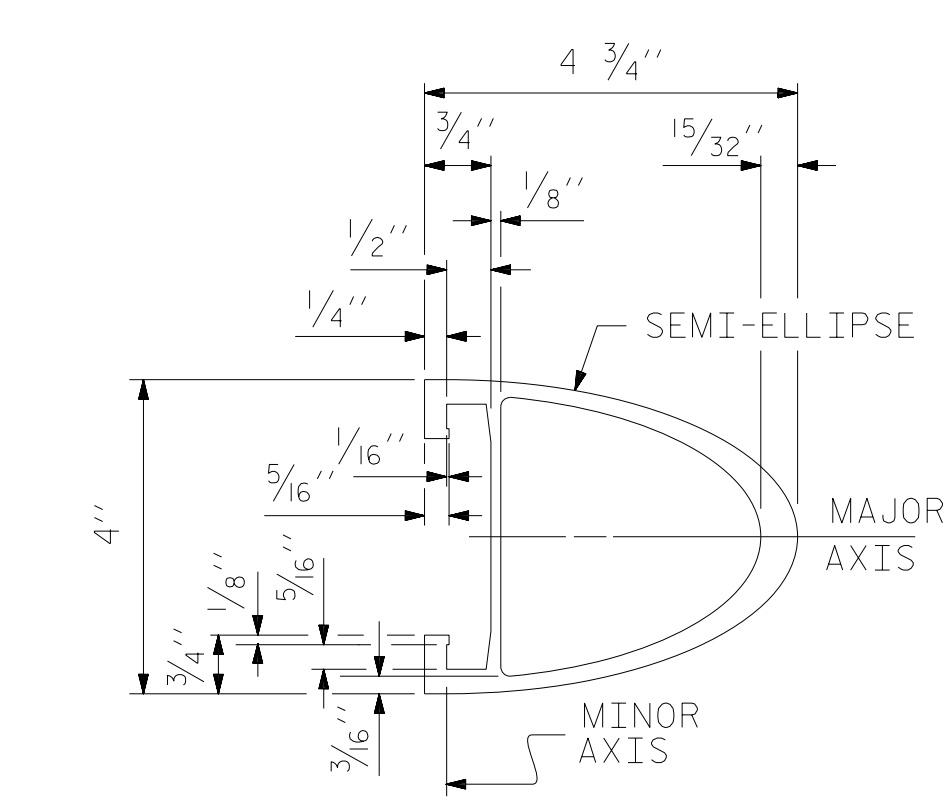
(160 ASSEMBLIES REQUIRED)



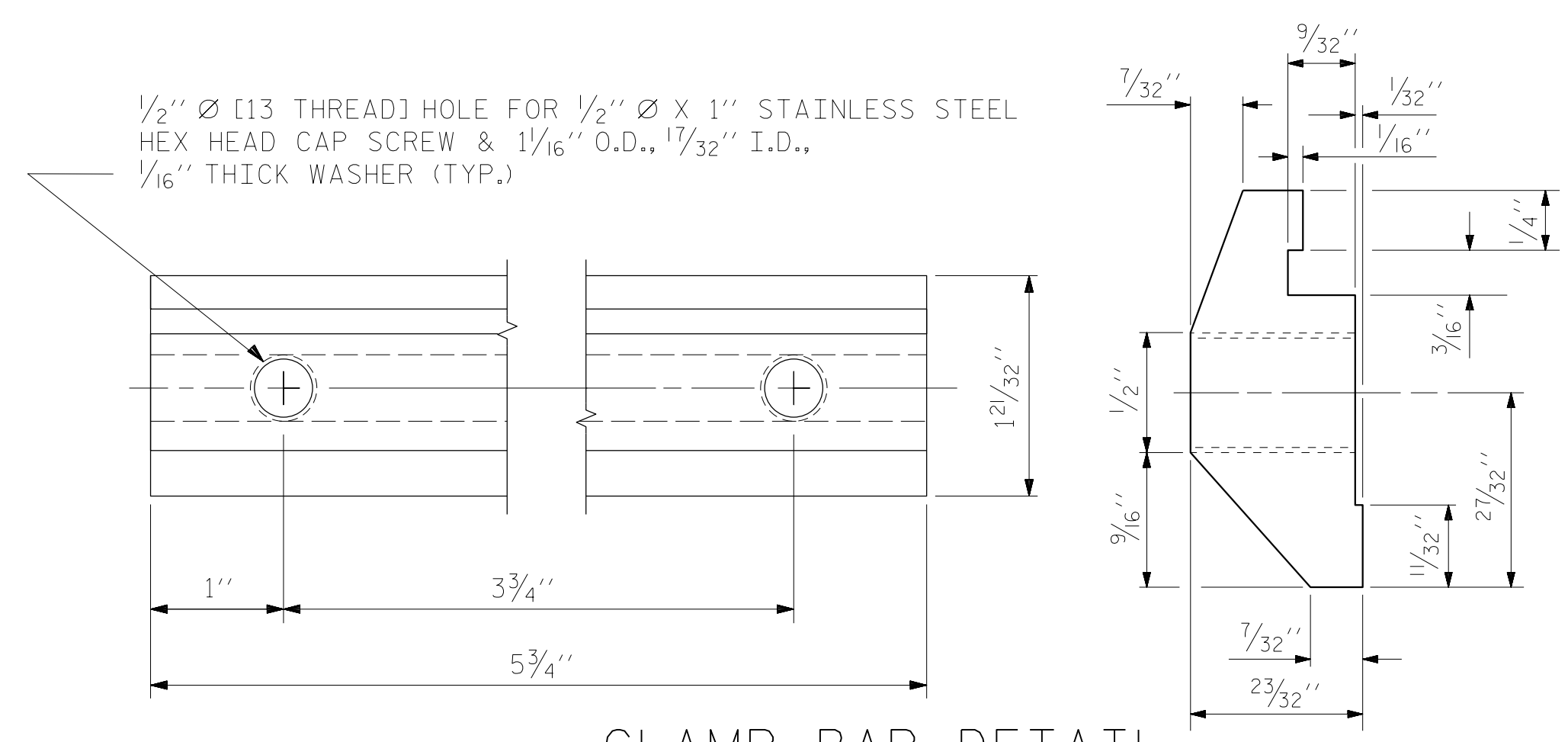
EXPANSION BAR DETAILS



RAIL CAP

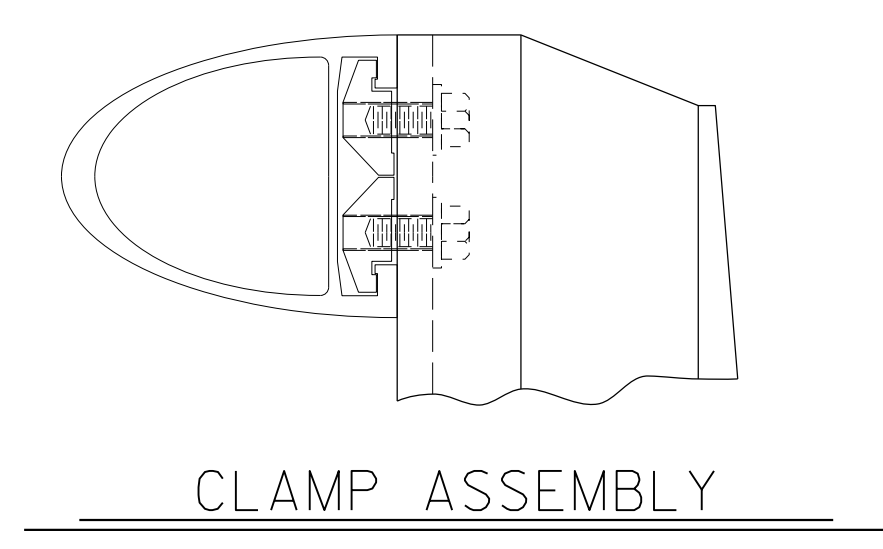


RAIL SECTION



CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY

PROJECT NO. U-2579AB
 FORSYTH COUNTY
 STATION: 23+43.03 -Y16-

SHEET 5 OF 5



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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 2 BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			57-25
2			4			48

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ASSEMBLED BY : TWL	DATE : 11/2019
CHECKED BY : MRA	DATE : 12/2019
DRAWN BY : EEM 6/94	REV. 5/1/06R KMM/GM
CHECKED BY : RGW 6/94	REV. 10/17/11 MAA/GM
	REV. 12/17 MAA/THC

NOTES

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

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.

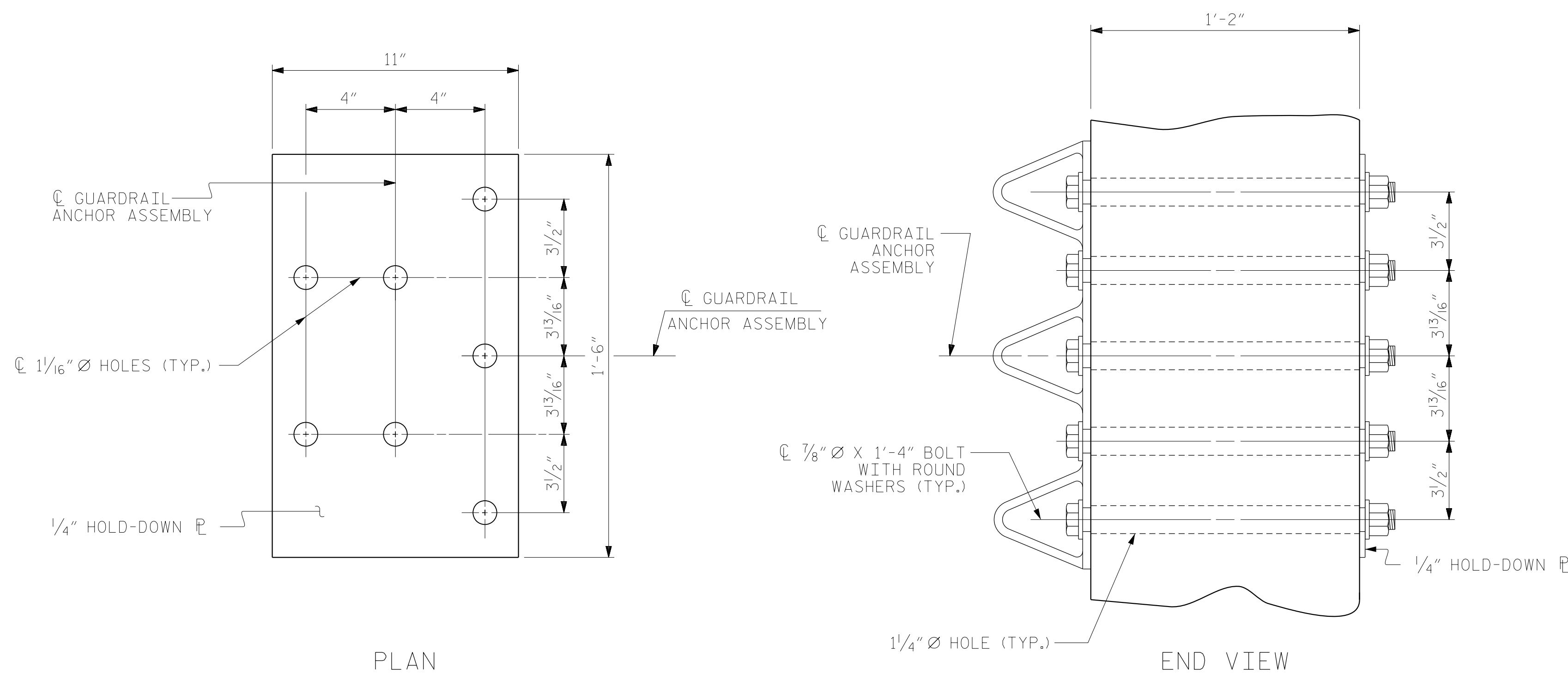
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

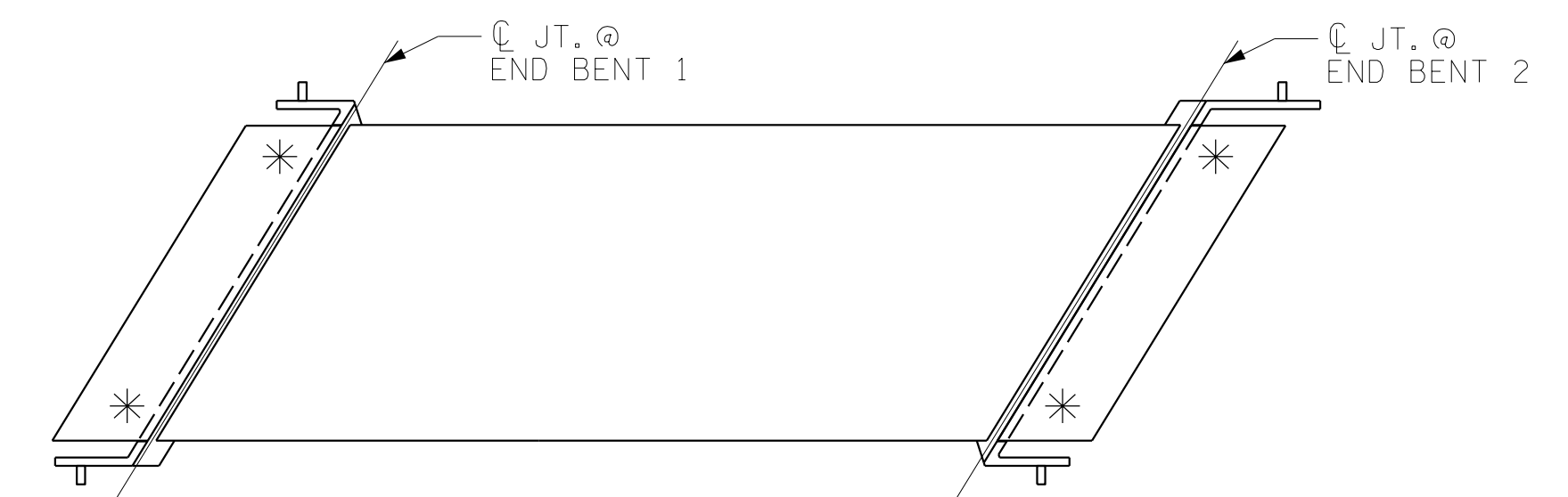
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



PLAN

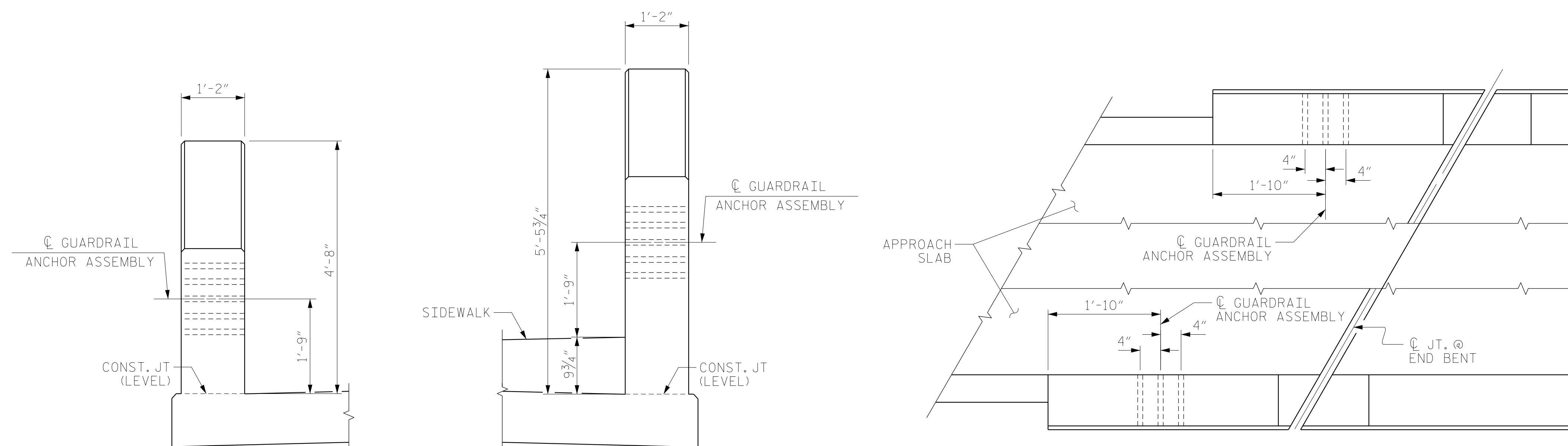
END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



LEFT PARAPET END VIEW

RIGHT PARAPET END VIEW

PLAN

END BENT 1 SHOWN, END BENT 2 SIMILAR

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. U-2579AB
FORSYTH COUNTY
 STATION: 23+43.03 -Y16-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 GUARDRAIL ANCHORAGE
 DETAILS
 FOR METAL RAILS

ASSEMBLED BY : TWL	DATE : 11/2019
CHECKED BY : MRA	DATE : 12/2019
DRAWN BY : MAA 5/10	REV. 1/15 MAA/TMG
CHECKED BY : GM 5/10	REV. 12/17 MAA/THC
	REV. 5/18 MAA/THC

DOCUMENT NOT CONSIDERED
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			48
2			4			48

(SHT 2a) STD. NO. GRA3