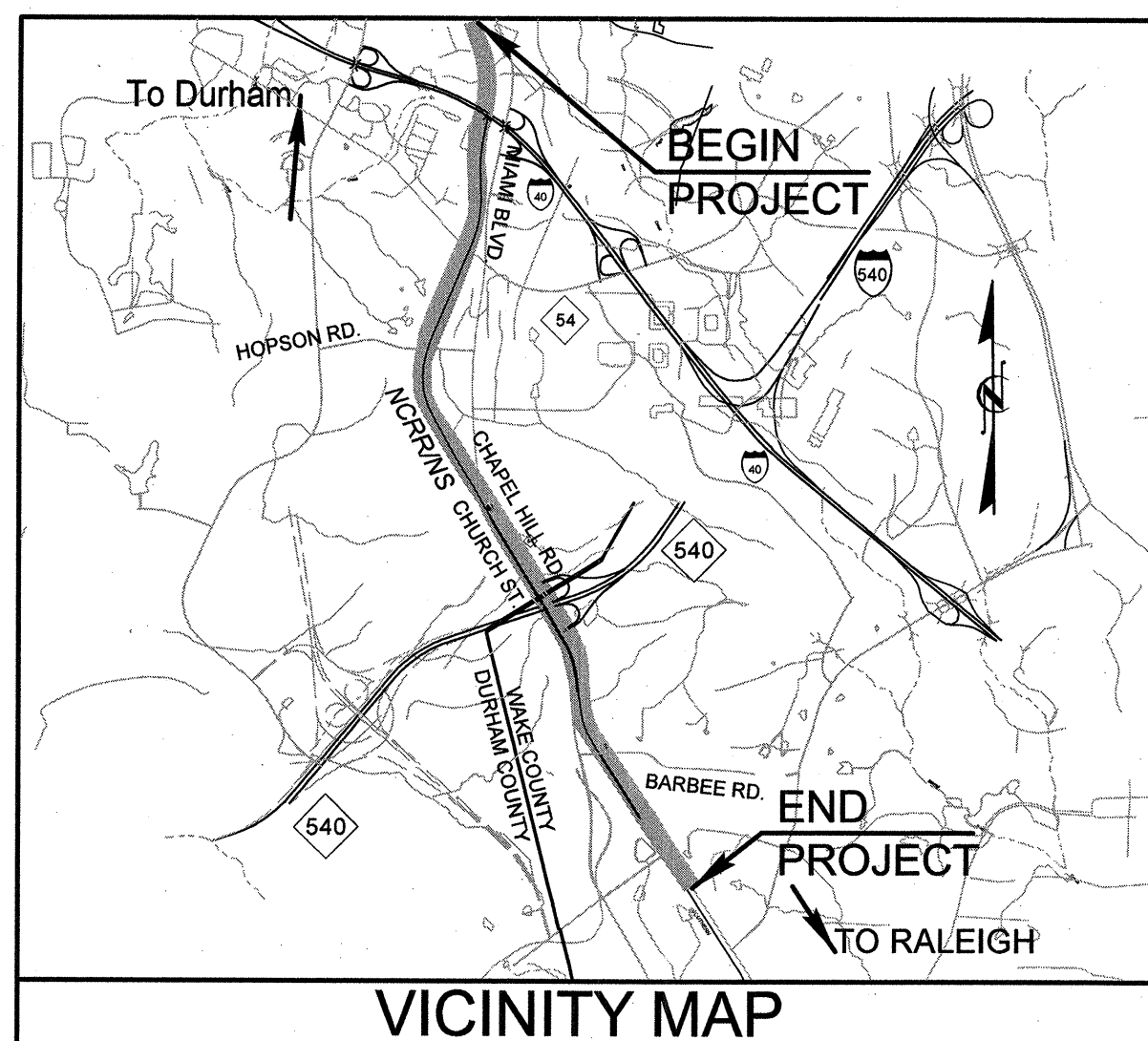


NCDOT
RAIL DIVISION



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4716A/C	S-0	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
54000.1		P.E.	
54000.3.STR01T4A		CONST.	

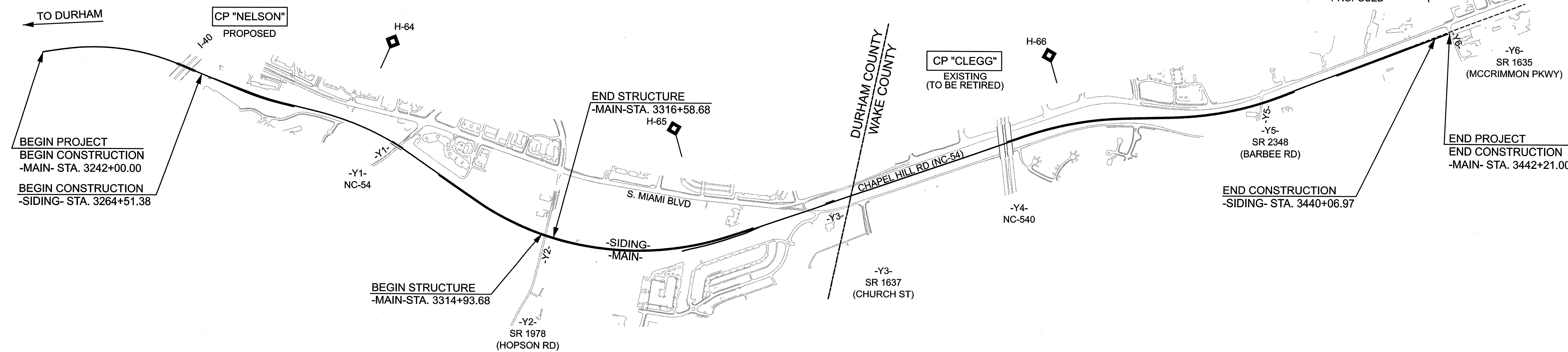


DURHAM AND WAKE COUNTIES

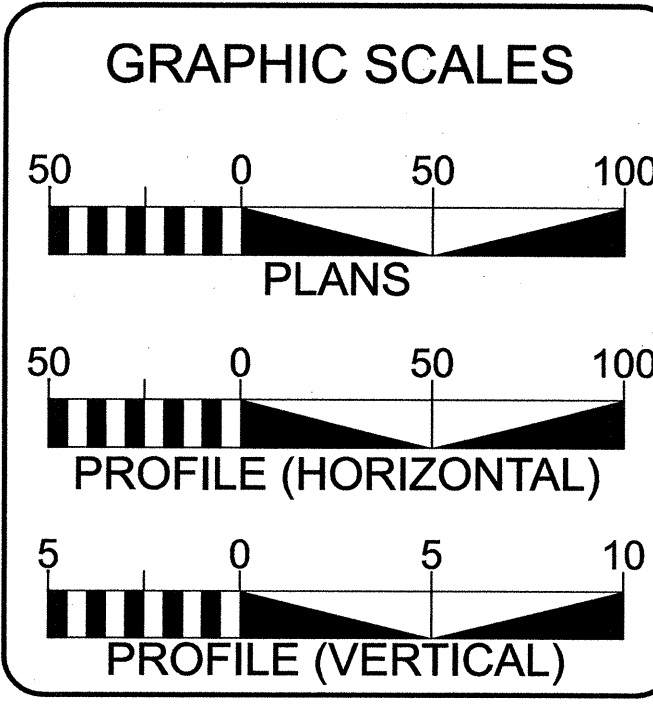
PROJECT TITLE: CLEGG PASSING SIDING AND HOPSON ROAD GRADE SEPARATION

LOCATION: CP "NELSON" (MP H-63.2) TO CP "CLEGG" (MP H-67.0) ON THE NCRR/NS H-LINE

TYPE OF WORK: BRIDGE ON NCRR OVER HOPSON ROAD



STRUCTURE



PROJECT LENGTH	
LENGTH OF RAIL TIP PROJECT	3.761 mi.
LENGTH OF STRUCTURES TIP PROJECT	0.031 mi.
TOTAL LENGTH OF TIP PROJECT	3.792 mi.

Prepared in the Office of:
HNTB HNTB NORTH CAROLINA, P.C.
 343 E. Six Forks Road, Suite 200
 Raleigh, North Carolina 27609
 NC License No: C-1554

2012 STANDARD SPECIFICATIONS

ROBERT BURNETT, P.E.
RAIL PROJECT ENGINEER

PAUL BARBER, P.E.
STRUCTURES PROJECT ENGINEER

JASON ORTHNER, P.E.
NCDOT PROJECT MANAGER

LETTING DATE:
NOVEMBER 20, 2012

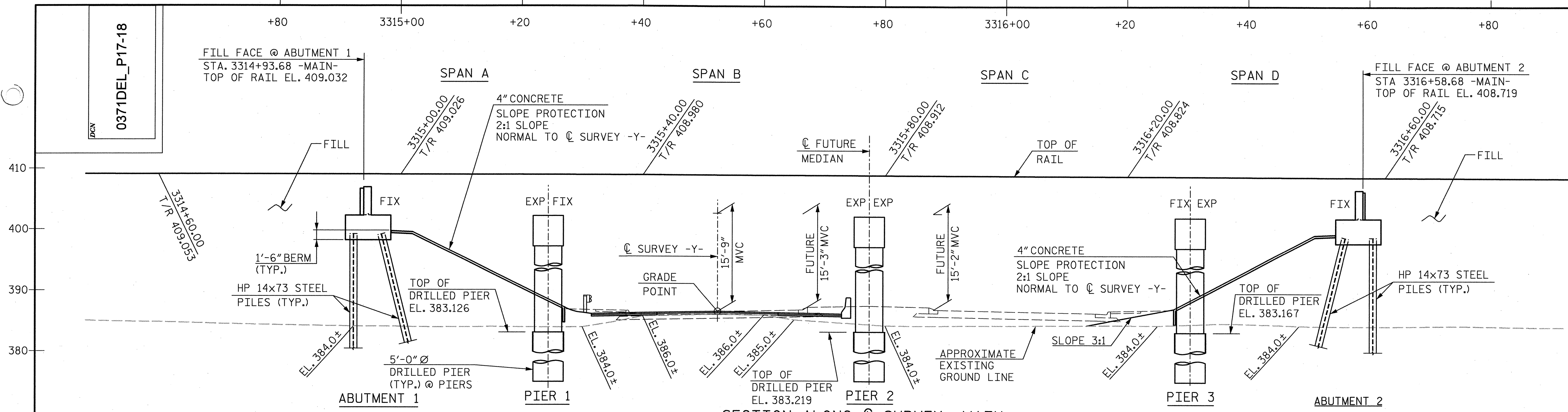
STRUCTURES ENGINEER

Paul J. Barber 10/8/12 P.E.

NC DEPARTMENT OF TRANSPORTATION
RAIL DIVISION

ENGINEERING AND SAFETY BRANCH
CAPITAL YARD
166 MAIL SERVICE CENTER
RALEIGH, NC 27699-1666

0371DEL_P17-18



SECTION ALONG Q SURVEY -MAIN-
(ABUTMENTS AND BENTS ON SECTION AT RIGHT ANGLES TO ABUTMENTS AND BENTS)

IDENTIFICATION STATION
POC STA. 3315+52.15 -MAIN- =
POT STA. 23+06.08 -Y-

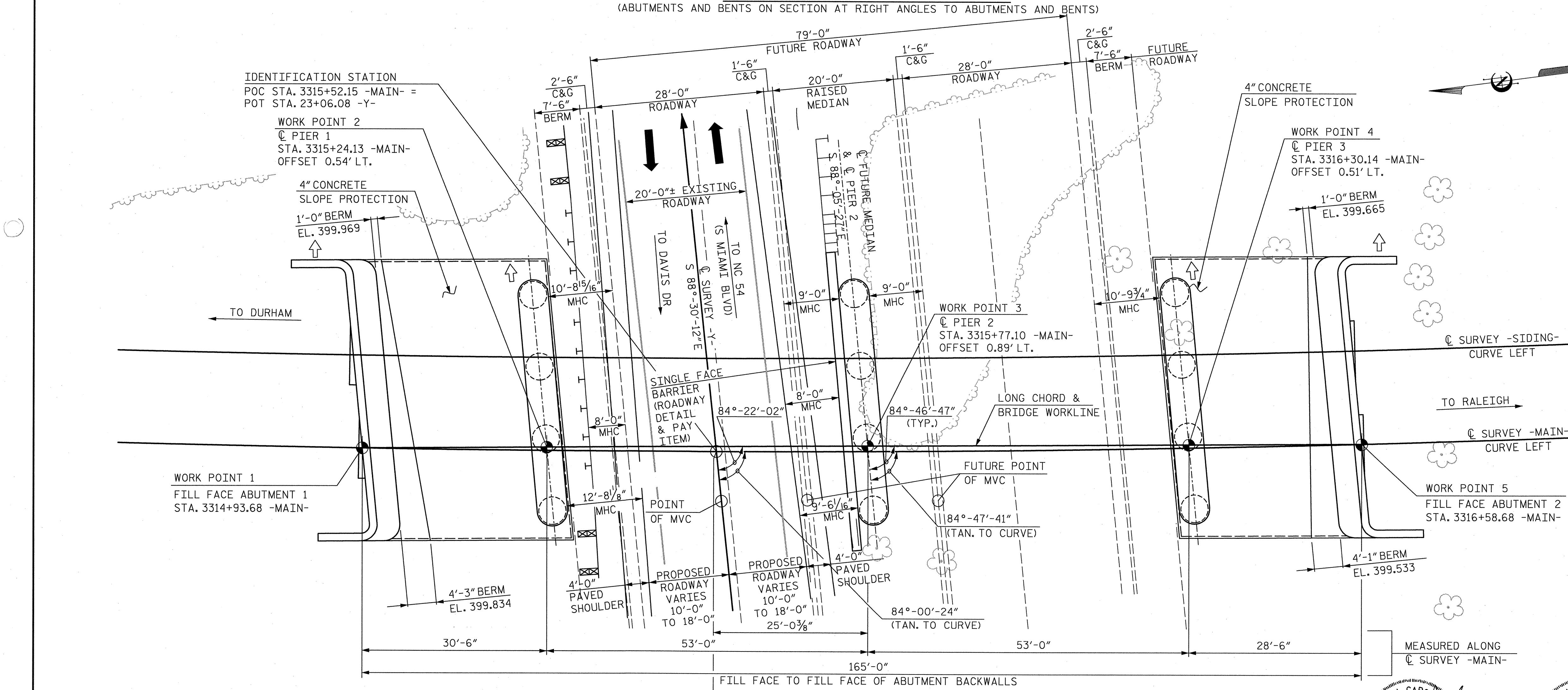
WORK POINT 2
Q PIER 1
STA. 3315+24.13 -MAIN-
OFFSET 0.54' LT.

WORK POINT 3
Q PIER 2
STA. 3315+77.10 -MAIN-
OFFSET 0.89' LT.

WORK POINT 4
Q PIER 3
STA. 3316+30.14 -MAIN-
OFFSET 0.51' LT.

WORK POINT 1
FILL FACE ABUTMENT 1
STA. 3314+93.68 -MAIN-

WORK POINT 5
FILL FACE ABUTMENT 2
STA. 3316+58.68 -MAIN-



PLAN

NOTES:
SEE "GENERAL DRAWING: LONG CHORD LAYOUT AND GENERAL NOTES (SHEET 4 OF 4)" FOR GENERAL NOTES.
STRUCTURE DRAINAGE OUTLET LOCATION AND DIRECTION.
MVC = MINIMUM VERTICAL CLEARANCE
MHC = MINIMUM HORIZONTAL CLEARANCE TO CAP

PI STA. = 21+10.00
ELEV. = 394.510
V.C. = 320.00'
-10.4000%
-4.0756%
-2.8462%
PI STA. = 23+35.00
ELEV. = 385.340
V.C. = 130.00'

GRADE DATA -Y-
(+0.6200% (-)0.9600%
PI STA. = 3315+61.00
ELEV. = 411.366
V.C. = 1,225.00'

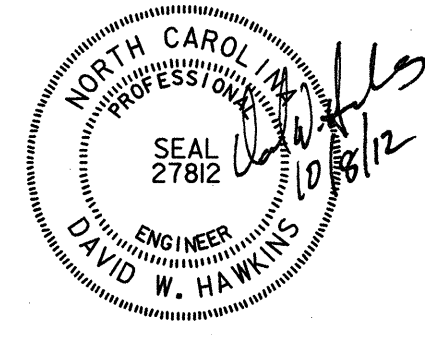
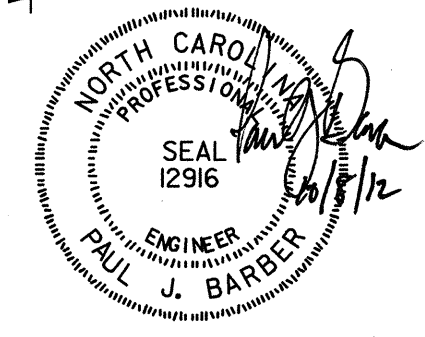
GRADE DATA -MAIN-
(+0.6139% (-)0.9665%
PI STA. = 3315+65.92
ELEV. = 411.366
V.C. = 1,225.00'

CURVE DATA FOR -MAIN-
PI STA 3323+73.92
Δ = 46°-10'-49.0" (LT)
L = 3,078.69
T = 1,628.52
R = 3,819.83
e = 332.66

CURVE DATA FOR -SIDING-
PI STA 3323+69.92
Δ = 46°-10'-49.0" (LT)
L = 3,078.69
T = 1,628.52
R = 3,819.83
e = 332.66

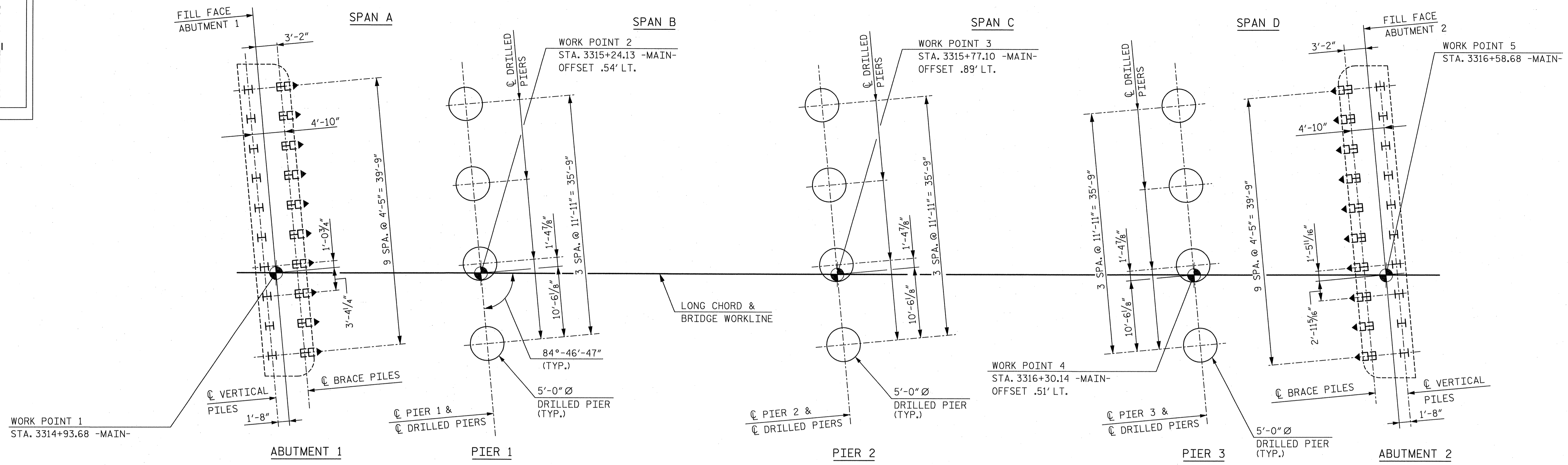
PROJECT NO. U-4716A/C
DURHAM COUNTY
STATION: POC STA. 3315+52.15 -MAIN-
POT STA 23+06.08 -Y-
MILE POST: H64.60
SHEET 1 OF 4 BRIDGE NO. R-605

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
BRIDGE ON NCR MAINLINE
OVER HOPSON ROAD BETWEEN
DAVIS DRIVE (SR 1999) AND
S. MIAMI BLVD (NC 54)



HNTB HNTB NORTH CAROLINA, P.C.
License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY J. BAYNE/M. WRIGHT DATE 11/11
CHECKED BY D. HAWKINS DATE 12/11 DWG. NO. 1

REVISIONS				SHEET NO. S-1
NO.	BY:	DATE:	DATE:	
1		3		TOTAL SHEETS 40
2		4		



FOUNDATION LAYOUT

FOR WORK POINT AND WORKLINE LOCATION RELATIVE TO \odot SURVEY -MAIN-, SEE LONG CHORD LAYOUT.

FOUNDATION NOTES:

PILES AT ABUTMENT 1 ARE DESIGNED FOR AN ALLOWABLE LOAD OF 80 TONS PER PILE.

DRIVE PILES AT ABUTMENT 1 TO A REQUIRED BEARING CAPACITY OF 160 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH THE MINIMUM FACTOR OF SAFETY OF 2.0.

PILES AT ABUTMENT 2 ARE DESIGNED FOR AN ALLOWABLE LOAD OF 80 TONS PER PILE.

DRIVE PILES AT ABUTMENT 2 TO A REQUIRED BEARING CAPACITY OF 160 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH THE MINIMUM FACTOR OF SAFETY OF 2.0.

INSTALL PILES AT ABUTMENT 1 TO A TIP ELEVATION NO HIGHER THAN 369.0 FEET.

INSTALL PILES AT ABUTMENT 2 TO A TIP ELEVATION NO HIGHER THAN 368.0 FEET

PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT ABUTMENT 1. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 369.0 FEET. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT ABUTMENT 2. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 368.0 FEET. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

CONCRETE OR GROUT IS REQUIRED TO FILL HOLES FOR PILE EXCAVATIONS AT ABUTMENT 1 AND ABUTMENT 2.

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

DRILLED PIERS AT PIER NO. 1 ARE DESIGNED FOR BOTH SKIN FRICTION AND END BEARING. CHECK FIELD CONDITIONS FOR THE REQUIRED END BEARING CAPACITY OF 20 TSF.

INSTALL DRILLED PIERS AT PIER NO. 1 (LEFT OF CENTERLINE) THAT EXTEND TO AN ELEVATION NO HIGHER THAN 350 FT., AND SATISFY THE REQUIRED END BEARING CAPACITY.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT PIER NO. 1 (LEFT OF CENTERLINE). IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 377 FEET WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

INSTALL DRILLED PIERS AT PIER NO. 1 (RIGHT OF CENTERLINE) THAT EXTEND TO AN ELEVATION NO HIGHER THAN 354 FT., AND SATISFY THE REQUIRED END BEARING CAPACITY.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT PIER NO. 1 (RIGHT OF CENTERLINE). IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 370 FEET WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

DRILLED PIERS AT PIER NO. 2 ARE DESIGNED FOR BOTH SKIN FRICTION AND END BEARING. CHECK FIELD CONDITIONS FOR THE REQUIRED END BEARING CAPACITY OF 20 TSF.

INSTALL DRILLED PIERS AT PIER NO. 2 (LEFT OF CENTERLINE) THAT EXTEND TO AN ELEVATION NO HIGHER THAN 348 FT., AND SATISFY THE REQUIRED TIP RESISTANCE.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT PIER NO. 2 (LEFT OF CENTERLINE). IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 378 FEET WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

INSTALL DRILLED PIERS AT PIER NO. 2 (RIGHT OF CENTERLINE) THAT EXTEND TO AN ELEVATION NO HIGHER THAN 354 FT., AND SATISFY THE REQUIRED TIP RESISTANCE.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT PIER NO. 2 (RIGHT OF CENTERLINE). IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 378 FEET WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

DRILLED PIERS AT PIER NO. 3 ARE DESIGNED FOR BOTH SKIN FRICTION AND END BEARING. CHECK FIELD CONDITIONS FOR THE REQUIRED END BEARING CAPACITY OF 20 TSF.

INSTALL DRILLED PIERS AT PIER NO. 3 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 353 FT., AND SATISFY THE REQUIRED TIP RESISTANCE.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT PIER NO. 3. IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 378 FEET WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

SID INSPECTIONS ARE REQUIRED FOR DRILLED PIERS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

CSL TUBES ARE REQUIRED AND CSL TESTING IS REQUIRED FOR DRILLED PIERS. FOR CROSSHOLE SONIC LOGGING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

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

◀▶ INDICATES PILE TO BE BATTERED 3:12 IN DIRECTION OF ARROW.

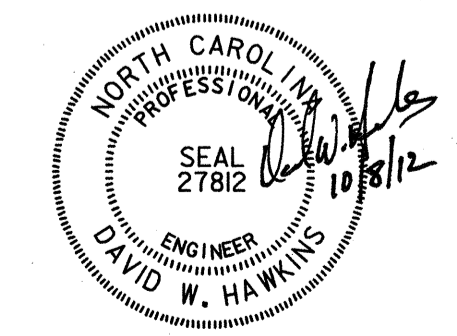
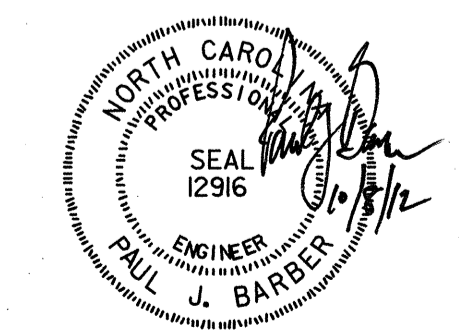
ALL DIMENSIONS ARE PARALLEL OR NORMAL TO FILL FACE ABUTMENTS, \odot PIERS, OR WORKLINE.

FOR FOUNDATION ELEVATIONS AND DETAILS, SEE PIER AND ABUTMENT DETAILS.

ALL PILES ARE STEEL HP 14x73.

ALL DIMENSIONS TO BATTERED PILES ARE AT BOTTOM OF CAP ELEVATION.

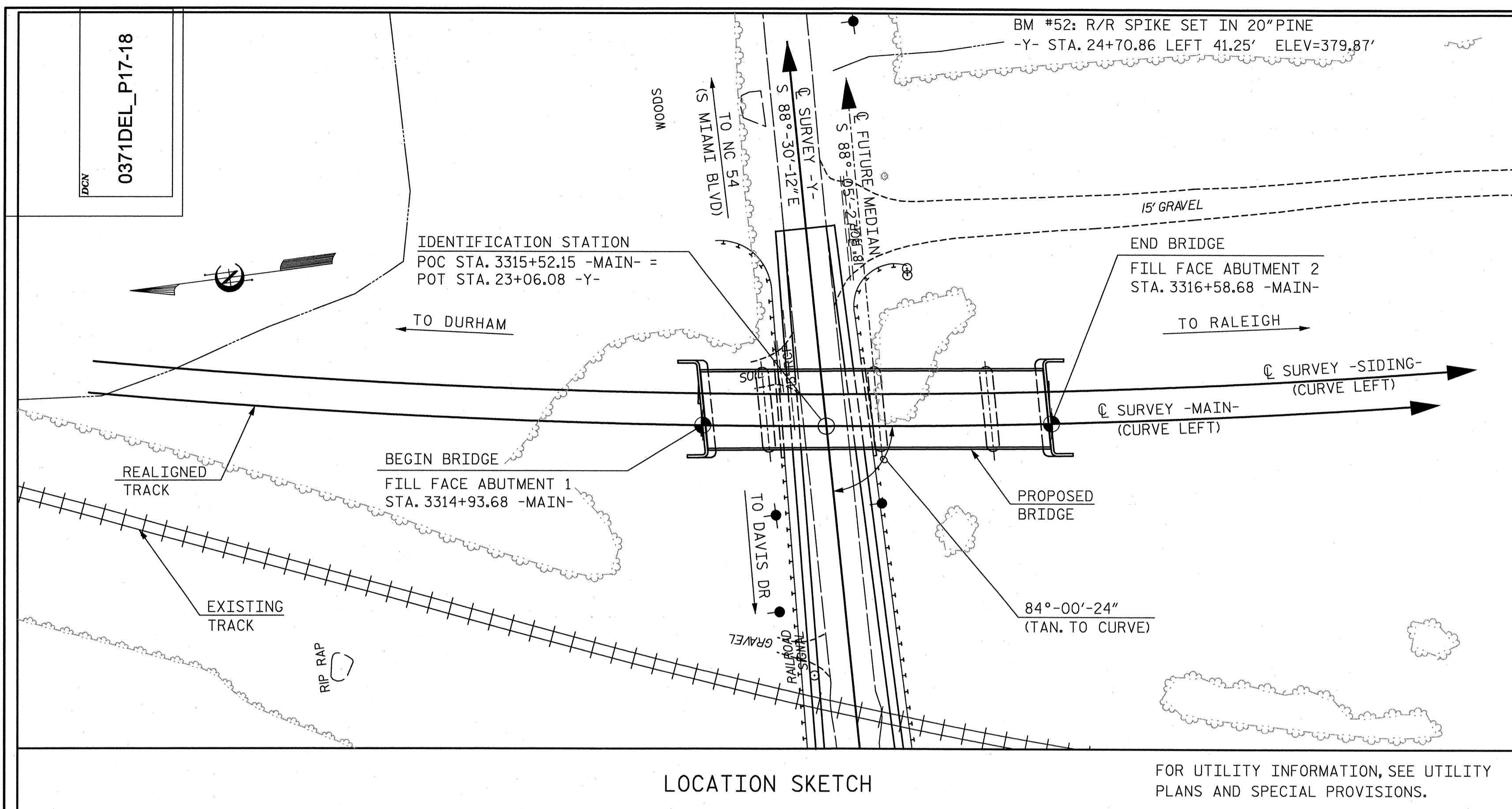
PROJECT NO. U-4716A/C
DURHAM COUNTY
 STATION: POC STA. 3315+52.15 -MAIN-
 MILE POST: H64.60
 SHEET 2 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 FOUNDATION LAYOUT
 AND
 FOUNDATION NOTES

HNTB		HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		DWG. NO. 2	
DRAWN BY	M. WRIGHT	DATE	3/12	NO.	3
CHECKED BY	D. HAWKINS	DATE	3/12	NO.	4
				REVISIONS	SHEET NO.
					S-2
				TOTAL SHEETS	40

0371DEL_P17-18



INDEX OF DRAWINGS

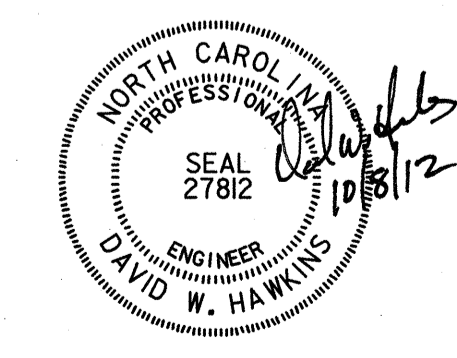
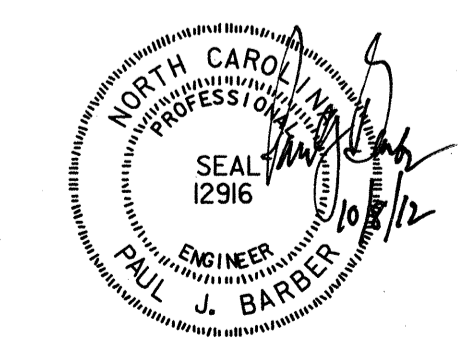
- 1 GENERAL DRAWING: GENERAL PLAN AND ELEVATION (SHEET 1 OF 4)
- 2 GENERAL DRAWING: FOUNDATION LAYOUT AND FOUNDATION NOTES (SHEET 2 OF 4)
- 3 GENERAL DRAWING: LOCATION SKETCH AND TOTAL BOM (SHEET 3 OF 4)
- 4 GENERAL DRAWING: LONG CHORD LAYOUT AND GENERAL NOTES (SHEET 4 OF 4)
- 5 SUPERSTRUCTURE: TYPICAL SECTION
- 6 SUPERSTRUCTURE: DETAILS
- 7 SUPERSTRUCTURE: PLAN OF SPAN A
- 8 SUPERSTRUCTURE: PLAN OF SPAN B
- 9 SUPERSTRUCTURE: PLAN OF SPAN C
- 10 SUPERSTRUCTURE: PLAN OF SPAN D
- 11 SUPERSTRUCTURE: FRAMING PLAN AND GIRDER DETAILS - SPANS A & D
- 12 SUPERSTRUCTURE: FRAMING PLAN AND GIRDER DETAILS - SPAN B
- 13 SUPERSTRUCTURE: FRAMING PLAN AND GIRDER DETAILS - SPAN C
- 14 SUPERSTRUCTURE: STRUCTURAL STEEL DETAILS
- 15 SUPERSTRUCTURE: BEARING DETAILS SPANS A & D
- 16 SUPERSTRUCTURE: BEARING DETAILS SPANS B & C
- 17 SUPERSTRUCTURE: EXPANSION PLATE DETAILS
- 18 SUPERSTRUCTURE: CONCRETE PARAPET DETAILS (SHEET 1 OF 2)
- 19 SUPERSTRUCTURE: CONCRETE PARAPET DETAILS (SHEET 2 OF 2)
- 20 SUPERSTRUCTURE: HANDRAIL LAYOUT
- 21 SUPERSTRUCTURE: HANDRAIL DETAILS
- 22 SUPERSTRUCTURE: BILL OF MATERIAL
- 23 SUBSTRUCTURE: ABUTMENT 1 (SHEET 1 OF 3)
- 24 SUBSTRUCTURE: ABUTMENT 1 (SHEET 2 OF 3)
- 25 SUBSTRUCTURE: ABUTMENT 1 (SHEET 3 OF 3)
- 26 SUBSTRUCTURE: PIER 1 (SHEET 1 OF 2)
- 27 SUBSTRUCTURE: PIER 1 (SHEET 2 OF 2)
- 28 SUBSTRUCTURE: PIER 2 (SHEET 1 OF 2)
- 29 SUBSTRUCTURE: PIER 2 (SHEET 2 OF 2)
- 30 SUBSTRUCTURE: PIER 3 (SHEET 1 OF 2)
- 31 SUBSTRUCTURE: PIER 3 (SHEET 2 OF 2)
- 32 SUBSTRUCTURE: ABUTMENT 2 (SHEET 1 OF 3)
- 33 SUBSTRUCTURE: ABUTMENT 2 (SHEET 2 OF 3)
- 34 SUBSTRUCTURE: ABUTMENT 2 (SHEET 3 OF 3)
- 35 STRUCTURE DRAINAGE DETAILS (SHEET 1 OF 4)
- 36 STRUCTURE DRAINAGE DETAILS (SHEET 2 OF 4)
- 37 STRUCTURE DRAINAGE DETAILS (SHEET 3 OF 4)
- 38 STRUCTURE DRAINAGE DETAILS (SHEET 4 OF 4)
- 39 SLOPE PROTECTION DETAILS (SHEET 1 OF 2)
- 40 SLOPE PROTECTION DETAILS (SHEET 2 OF 2)

TOTAL BILL OF MATERIAL

	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	5'-0" DIA. DRILLED PIERS	PERMANENT STEEL CASING FOR 5'-0" DIA. DRILLED PIER	SID INSPECTIONS	CSL TESTING	REINFORCED CONCRETE DECK SLAB	CLASS AA CONCRETE	REINFORCING STEEL	APPROX. 585,411 LBS. STRUCTURAL STEEL
	L.F.	L.F.	L.F.	L.F.	EACH	EACH	SQ. FEET	CU. YARDS	LBS.	LUMP SUM
SUPERSTRUCTURE	---	---	---	---	---	---	6,276.1	---	---	LUMP SUM
ABUTMENT 1	510	50	---	---	---	---	---	70.3	5,443	---
PIER 1	---	---	125.0	38.5	4	4	---	70.3	38,740	---
PIER 2	---	---	129.0	20.9	4	4	---	69.7	39,339	---
PIER 3	---	---	121.0	20.7	4	4	---	69.7	37,935	---
ABUTMENT 2	415	200	---	---	---	---	---	70.3	5,458	---
TOTAL	925	250	375.0	80.1	12	12	6,276.1	350.3	126,915	LUMP SUM

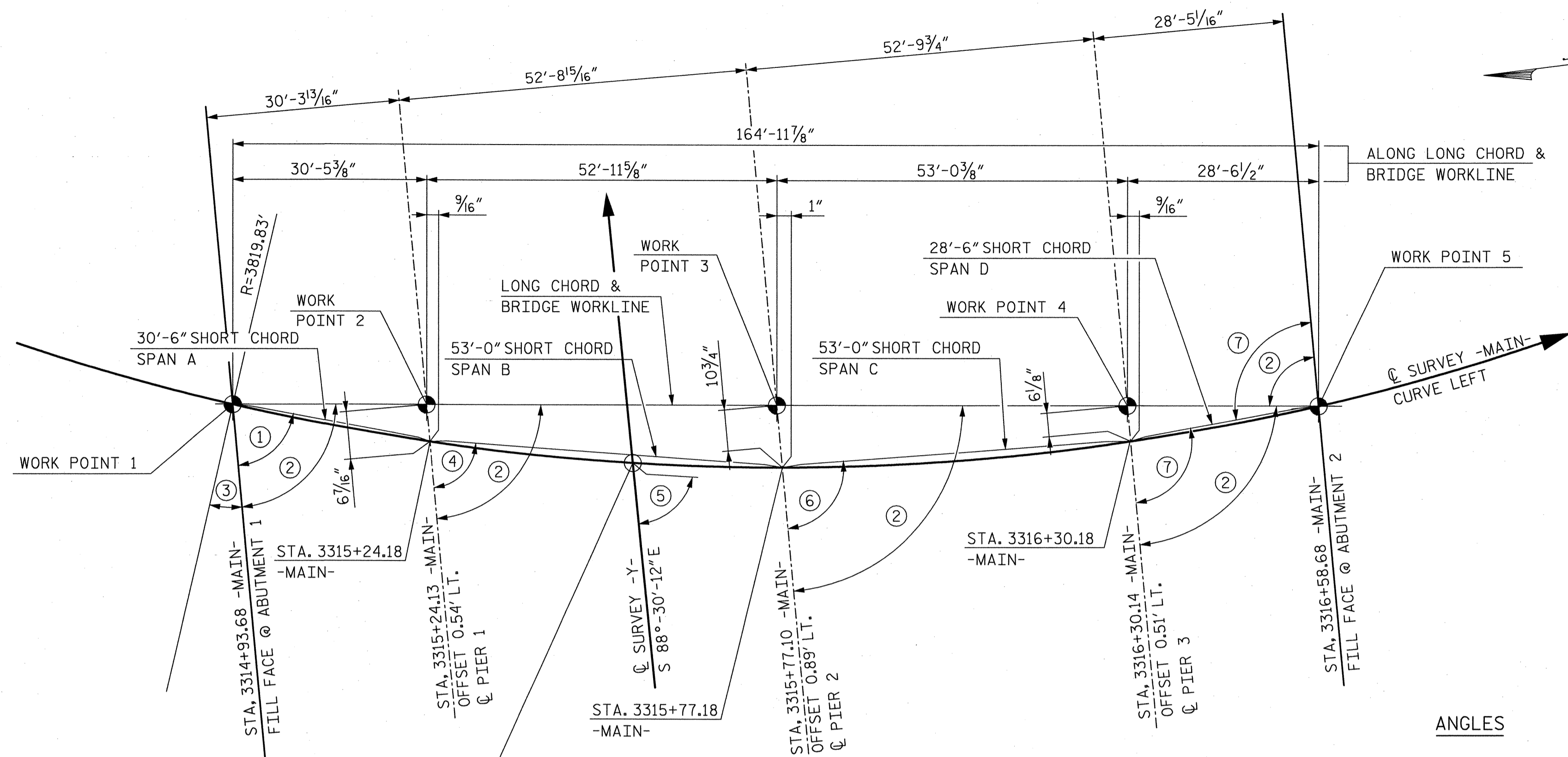
	PAINTING OF STRUCTURAL STEEL	HP 14 x 73 STEEL PILES		WATERPROOFING	METHOD B DAMPPROOFING	METAL RAIL (ALUMINUM)	CONCRETE PARAPET	4" SLOPE PROTECTION	SELF-LUBRICATING EXPANSION BEARING ASSEMBLIES	STRUCTURE DRAINAGE SYSTEM
	LUMP SUM	NO.	L.F.	SQ. YARDS	SQ. YARDS	L.F.	L.F.	SQ. YARDS	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	LUMP SUM	---	---	683.0	---	386.3	324.3	---	LUMP SUM	LUMP SUM
ABUTMENT 1	---	20	600.0	11.1	83.9	---	---	179.2	---	---
PIER 1	---	---	---	12.6	22.0	---	---	---	---	---
PIER 2	---	---	---	12.6	22.0	---	---	---	---	---
PIER 3	---	---	---	12.6	22.0	---	---	---	---	---
ABUTMENT 2	---	20	700.0	11.1	83.9	---	---	168.9	---	---
TOTAL	LUMP SUM	40	1,300.0	743.0	233.8	386.3	324.3	348.1	LUMP SUM	LUMP SUM

PROJECT NO. U-4716A/C
DURHAM COUNTY
 STATION: POC STA. 3315+52.15 -MAIN-
 MILE POST: H64.60
 SHEET 3 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 LOCATION SKETCH
 AND
 TOTAL BILL OF MATERIAL

HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 DRAWN BY: J. BAYNE/M. WRIGHT DATE: 3/12 CHECKED BY: D. HAWKINS DATE: 3/12 DWG. NO. 3	REVISIONS				SHEET NO. S-3 TOTAL SHEETS 40	
	NO.	BY:	DATE:	NO.		BY:
1				3		
2				4		



LONG CHORD LAYOUT

NOTE: ALL SUBSTRUCTURE UNITS ARE PARALLEL. LONG CHORD IS EXAGGERATED FOR CLARITY.

ANGLES

- ① 83°-46'-16"
- ② 84°-46'-47"
- ③ 06°-27'-28"
- ④ 84°-23'-50"
- ⑤ 84°-00'-24" (TAN TO CURVE)
- ⑥ 85°-11'-32"
- ⑦ 85°-48'-12"

GENERAL NOTES:

ASSUMED LIVE LOAD = AREMA E80 OR ALTERNATE LIVE LOAD
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
 FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT EDITION OF AREMA'S MANUAL FOR RAILWAY ENGINEERING, VOL. 2, STRUCTURES, AND NORFOLK SOUTHERN CORPORATION'S "GUIDELINES FOR DESIGN OF HIGHWAY SEPARATION STRUCTURES UNDER RAILROAD (UNDERPASS GRADE SEPARATION)"

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO STANDARD SPECIFICATIONS FOR SEISMIC DESIGN OF HIGHWAY BRIDGES FOR SEISMIC PERFORMANCE CATEGORY A.

REINFORCING STEEL SHALL BE ASTM DESIGNATION A615, GRADE 60. ALL DIMENSIONS RELATING TO BAR SPACING ARE TO BAR CENTERS UNLESS NOTED. FABRICATION TO BE IN ACCORDANCE WITH THE "MANUAL OF STANDARD PRACTICE", A.C.I. 315-80. ALL REINFORCING IN THE CONCRETE DECK SLAB AND PARAPETS SHALL BE EPOXY COATED.

EXPANSION JOINT MATERIAL SHALL BE EITHER RUBBER OR CORK CONFORMING WITH AASHTO SPECIFICATIONS M-153-84 EXCEPT AS SHOWN ON THE PLANS OR IN THE SPECIAL PROVISIONS. CELLULAR AND BULB TYPE WATERSTOPS AND RUBBER JOINT COMPOUNDS SHALL BE AS SHOWN ON THE PLANS AND IN THE SPECIAL PROVISIONS.

STRUCTURE DRAINAGE SYSTEM: METAL DRAINS BEHIND ABUTMENTS AND IN BALLAST TROUGH OF BRIDGE, INCLUDING DUCTILE IRON PIPE COLLECTOR SYSTEM, SHALL BE AS SHOWN ON THE PLANS AND OUTLINED IN THE SPECIAL PROVISIONS. DETAILS OF THE DRAINAGE SYSTEM SHALL BE SUBMITTED TO THE CHIEF ENGINEER BRIDGES AND STRUCTURES, NORFOLK SOUTHERN CORPORATION, ATLANTA, GA. FOR APPROVAL.

DAMP-PROOFING: PIER COLUMNS UP TO GROUND LINE, BACK OF BACKWALLS AND ABUTMENT SEATS, AND BACK OF WINGS SHALL BE DAMP-PROOFED WITH METHOD "B" DAMP-PROOFING.

WATERPROOFING: BRIDGE DECK AND ALL CONSTRUCTION JOINTS WHICH WILL BE COVERED BY FILL SHALL BE WATERPROOFED WITH A COLD LIQUID-APPLIED ELASTOMERIC MEMBRANE. FOR WATERPROOFING, SEE SPECIAL PROVISIONS.

WATERPROOFING IS REQUIRED AT THE FOLLOWING LOCATIONS:
 1. BRIDGE DECK AND INSIDE OF CONCRETE PARAPET AS SHOWN ON DWG. NO. 5 "TYPICAL SECTION"
 2. ALONG FULL CIRCUMFERENCE OF EACH BOTTOM OF COLUMN TO TOP OF DRILLED PIER INTERFERENCE.
 3. ALONG FILL FACE OF HORIZONTAL CONSTRUCTION JOINT AT TOP OF FOOTING ELEVATION AT EACH ABUTMENT.

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 BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES", JANUARY 2012, NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (HEREIN CALLED STANDARD SPECIFICATIONS), EXCEPT AS NOTED HEREIN, ELSEWHERE ON PLANS, OR IN THE SPECIAL PROVISIONS (STRUCTURAL STEEL IN ACCORDANCE WITH CURRENT AREMA SPECIFICATIONS).

ALL CONCRETE SHALL BE 4,500 PSI CLASS AA CONCRETE WITH NO. 57 OR 67 COARSE AGGREGATE AND SHALL BE AIR-ENTRAINED. MINIMUM CEMENT CONTENT PER CUBIC YARD OF CONCRETE SHALL BE 6.5 BAGS. NO SUBSTITUTION OF FLYASH, BLAST FURNACE SLAG OR OTHER MATERIAL WILL BE PERMITTED IN MEETING THIS MINIMUM CEMENT REQUIREMENT. CHAMFER ALL EXPOSED EDGES AND CORNERS 3/4" EXCEPT AS NOTED. THE USE OF GROUND GRANULATED BLAST FURNACE SLAG IS NOT PERMITTED IN THIS STRUCTURE.

CONTROL OF WORK: ALL WORK INVOLVED IN THE CONSTRUCTION OF THE RAILWAY STRUCTURE SHALL BE PERFORMED SATISFACTORY TO THE ENGINEER AND/OR NORFOLK SOUTHERN RAILWAY COMPANY. ALL METHODS OF HANDLING THE WORK AFFECTING THE SAFETY OF RAIL OPERATIONS MUST BE APPROVED BY THE RAILWAY COMPANY BEFORE PROCEEDING WITH THAT PORTION OF THE WORK. RAIL TRAFFIC SHALL, AT ALL TIMES, BE MAINTAINED AND PROTECTED. THE CONTRACTOR SHALL NOT AT ANY TIME DELAY OR INTERFERE WITH RAIL OPERATIONS.

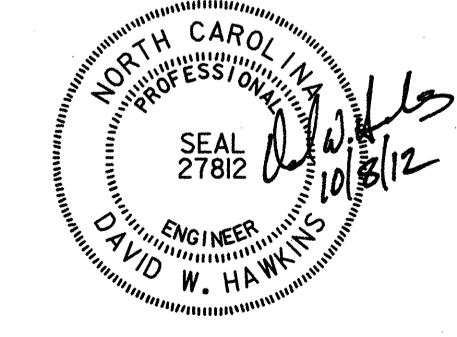
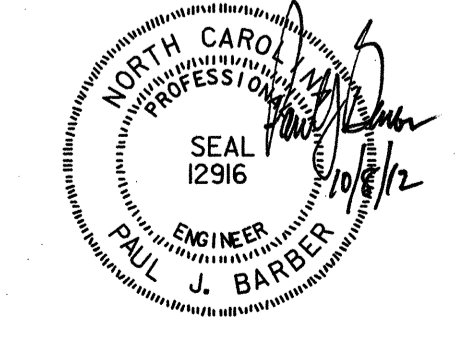
NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

FOR METAL RAIL (ALUMINUM), SEE SPECIAL PROVISIONS.
 FOR SELF-LUBRICATING EXPANSION BEARING ASSEMBLIES, SEE SPECIAL PROVISIONS.
 FOR CONDUIT IN PARAPETS, SEE SPECIAL PROVISIONS.
 FOR PORTLAND CEMENT, SEE SPECIAL PROVISIONS.
 FOR FINE AND COARSE AGGREGATE, SEE SPECIAL PROVISIONS.
 SEE "STRUCTURAL STEEL DETAILS" SHEET FOR STRUCTURAL STEEL NOTES.
 FOR BACKFILL BEHIND ABUTMENTS AND OTHER BACKFILL AROUND THE STRUCTURE, SEE SPECIAL PROVISION "BACKFILLING AROUND STRUCTURES".
 FOR PAINTING STRUCTURAL STEEL, SEE SPECIAL PROVISIONS.
 FOR WATERSTOPS, SEE SPECIAL PROVISIONS.
 FOR ELASTOMERIC FLASHING, SEE SPECIAL PROVISIONS.
 FOR RUBBER JOINT COMPOUNDS, SEE SPECIAL PROVISIONS.
 FOR STRUCTURE DRAINAGE SYSTEM, SEE SPECIAL PROVISIONS.
 FOR STRUCTURAL STEEL, SEE SPECIAL PROVISIONS.
 FOR RAILROAD TRACKWORK, SEE RAILROAD TRACKWORK PLANS.

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

PROJECT NO. U-4716A/C
DURHAM COUNTY
 STATION: POC STA. 3315+52.15 -MAIN-
 MILE POST: H64.60
 SHEET 4 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 LONG CHORD LAYOUT
 AND
 GENERAL NOTES

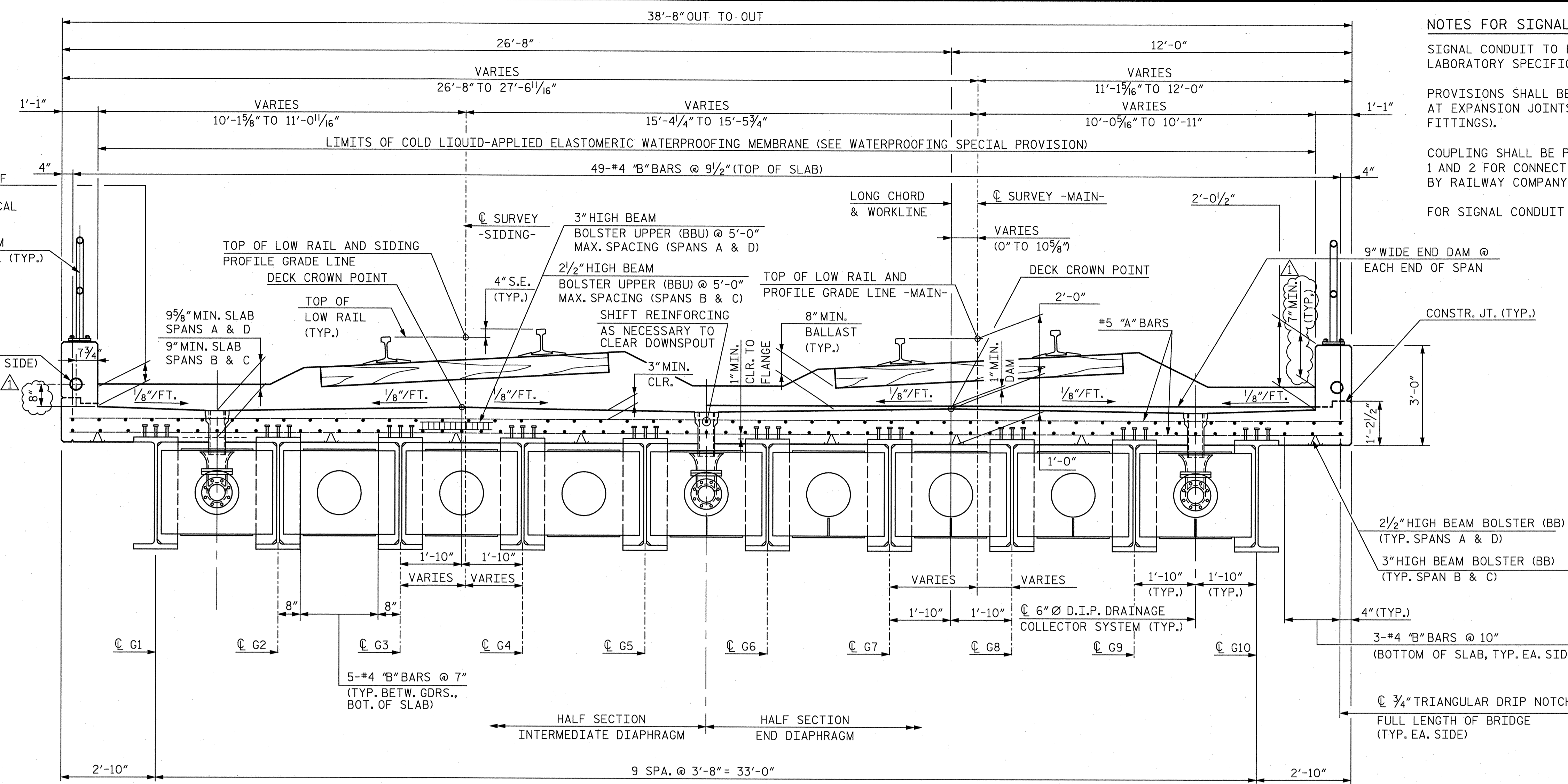


HNTB HNTB NORTH CAROLINA, P.C.
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 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: M. WRIGHT DATE: 3/12
 CHECKED BY: D. HAWKINS DATE: 3/12 DWG. NO. 4

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-4
1			3			TOTAL SHEETS
2			4			40

0371DEL_P17-18
0001ADD_P17-18

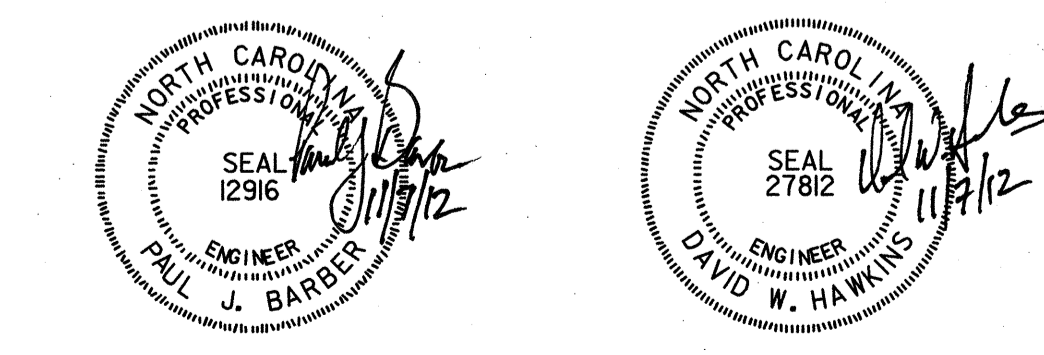


TYPICAL SECTION
(ALL SPANS SIMILAR)

NOTES FOR SIGNAL CONDUIT IN PARAPET
 SIGNAL CONDUIT TO BE 4" DIA. IN ACCORDANCE WITH UNDERWRITER'S LABORATORY SPECIFICATIONS.
 PROVISIONS SHALL BE MADE FOR EXPANSION BETWEEN DECK SLABS AT EXPANSION JOINTS AT PIERS 1, 2 & 3 (GALVANIZED EXPANSION FITTINGS).
 COUPLING SHALL BE PROVIDED BEHIND BACKWALL OF ABUTMENT 1 AND 2 FOR CONNECTION TO 4" DIA. RIGID PIPE (RIGID PIPE BY RAILWAY COMPANY).
 FOR SIGNAL CONDUIT IN PARAPET SEE PROJECT SPECIAL PROVISIONS.

NOTES:
 ALL REINFORCING STEEL IN THE DECK AND PARAPETS SHALL BE EPOXY COATED. CLEAR COVER TO ALL REINFORCING IS 2" MINIMUM UNLESS NOTED OTHERWISE.
 FOR ALUMINUM HANDRAIL DETAILS, SEE "HANDRAIL LAYOUT" AND "HANDRAIL DETAILS" SHEETS.
 FOR CONCRETE PARAPET DETAILS, SEE "CONCRETE PARAPET DETAILS" SHEET.
 DESIGN INCLUDES WEIGHT OF 6" ADDITIONAL BALLAST TO ACCOUNT FOR FUTURE RESURFACING OF TRACK.

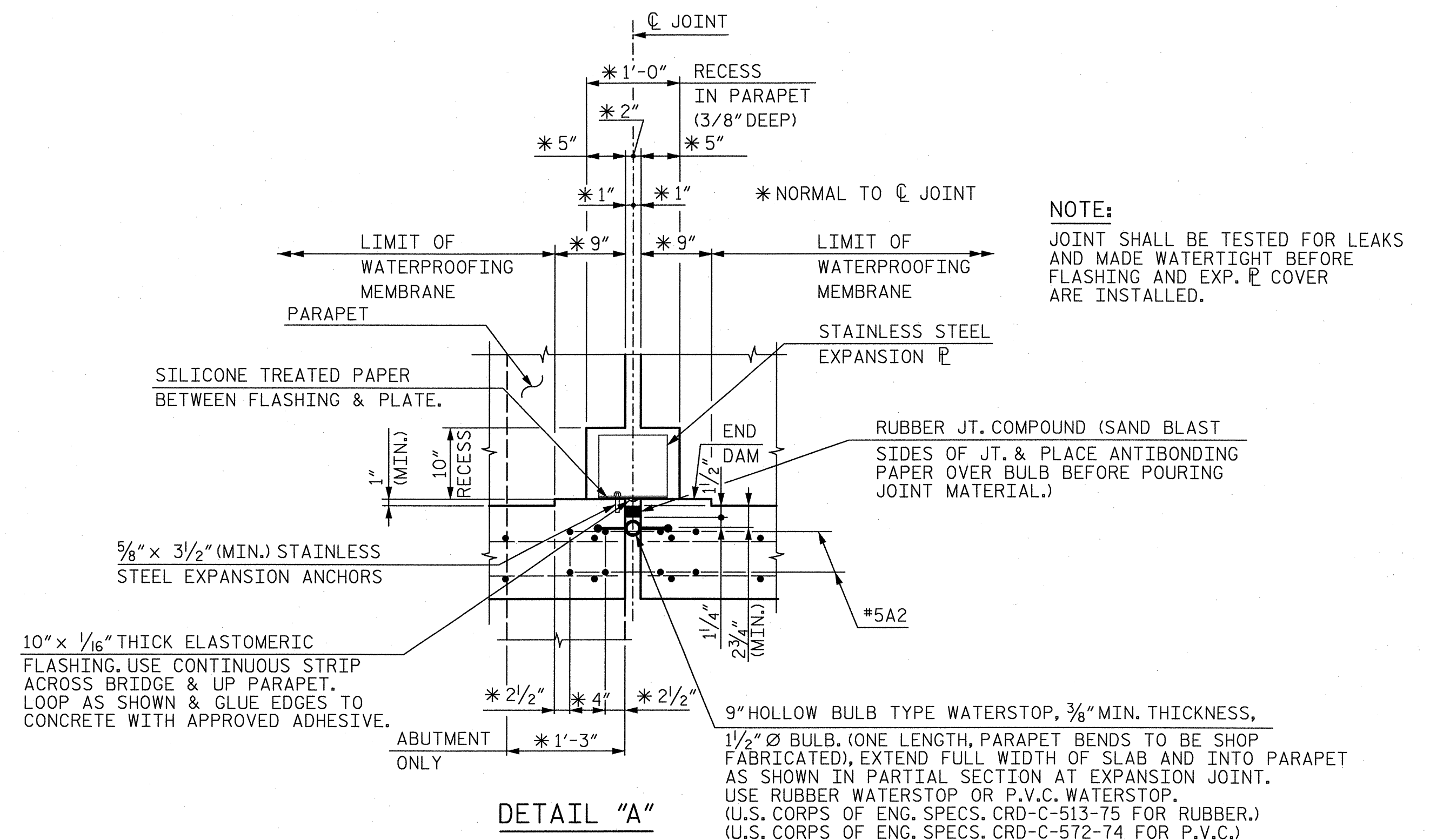
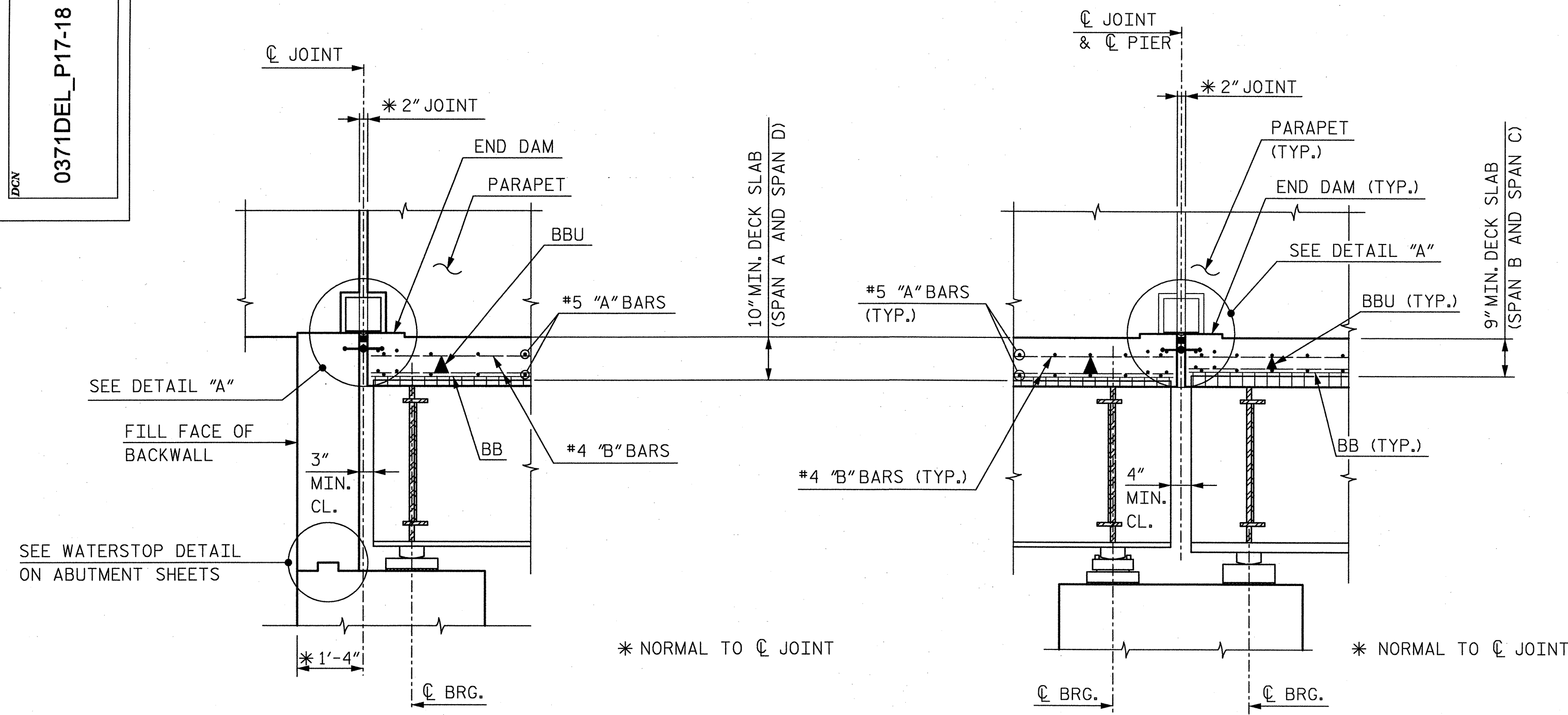
PROJECT NO. U-4716A/C
DURHAM COUNTY
 STATION: POC STA. 3315+52.15 -MAIN-
 MILE POST: H64.60



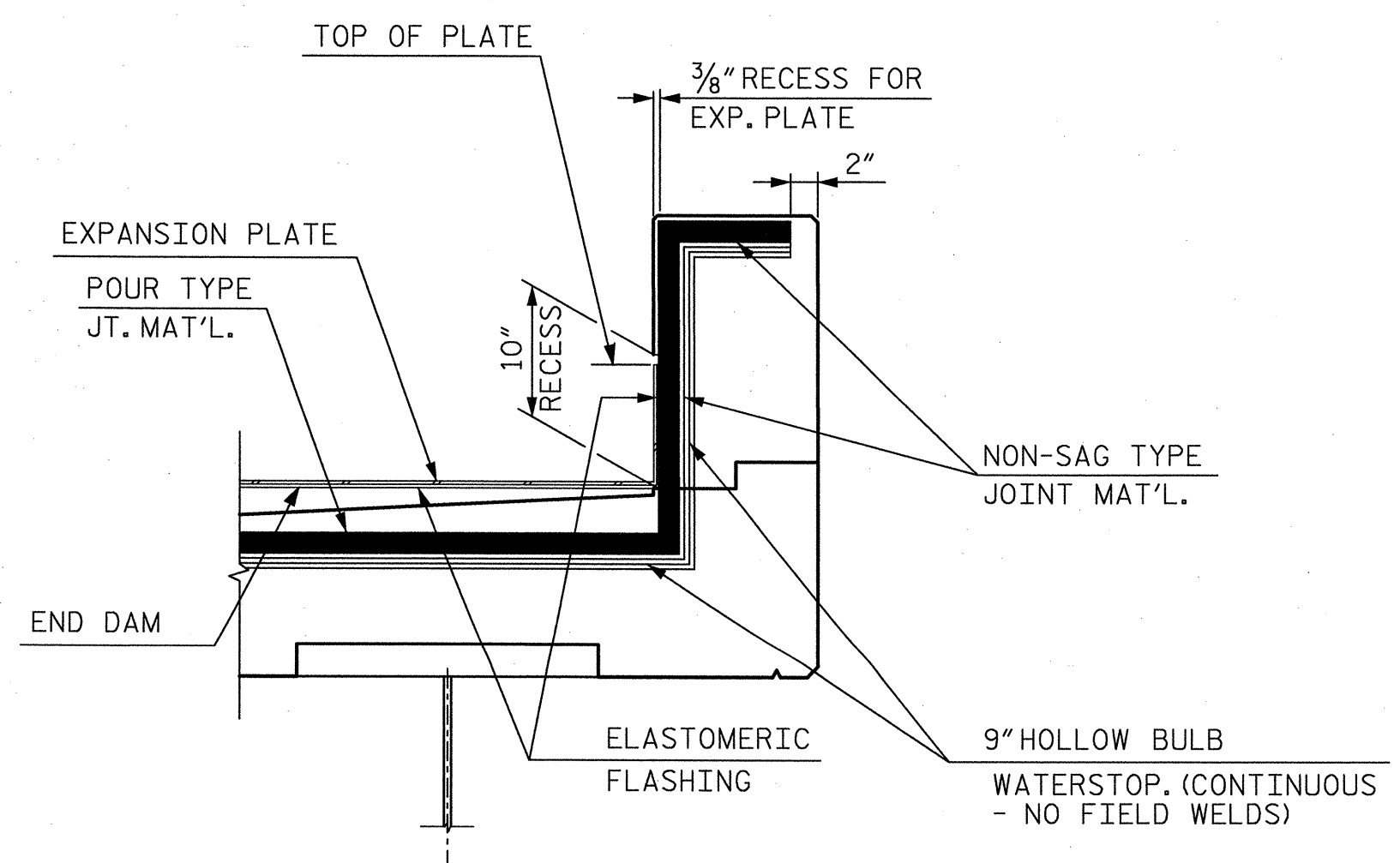
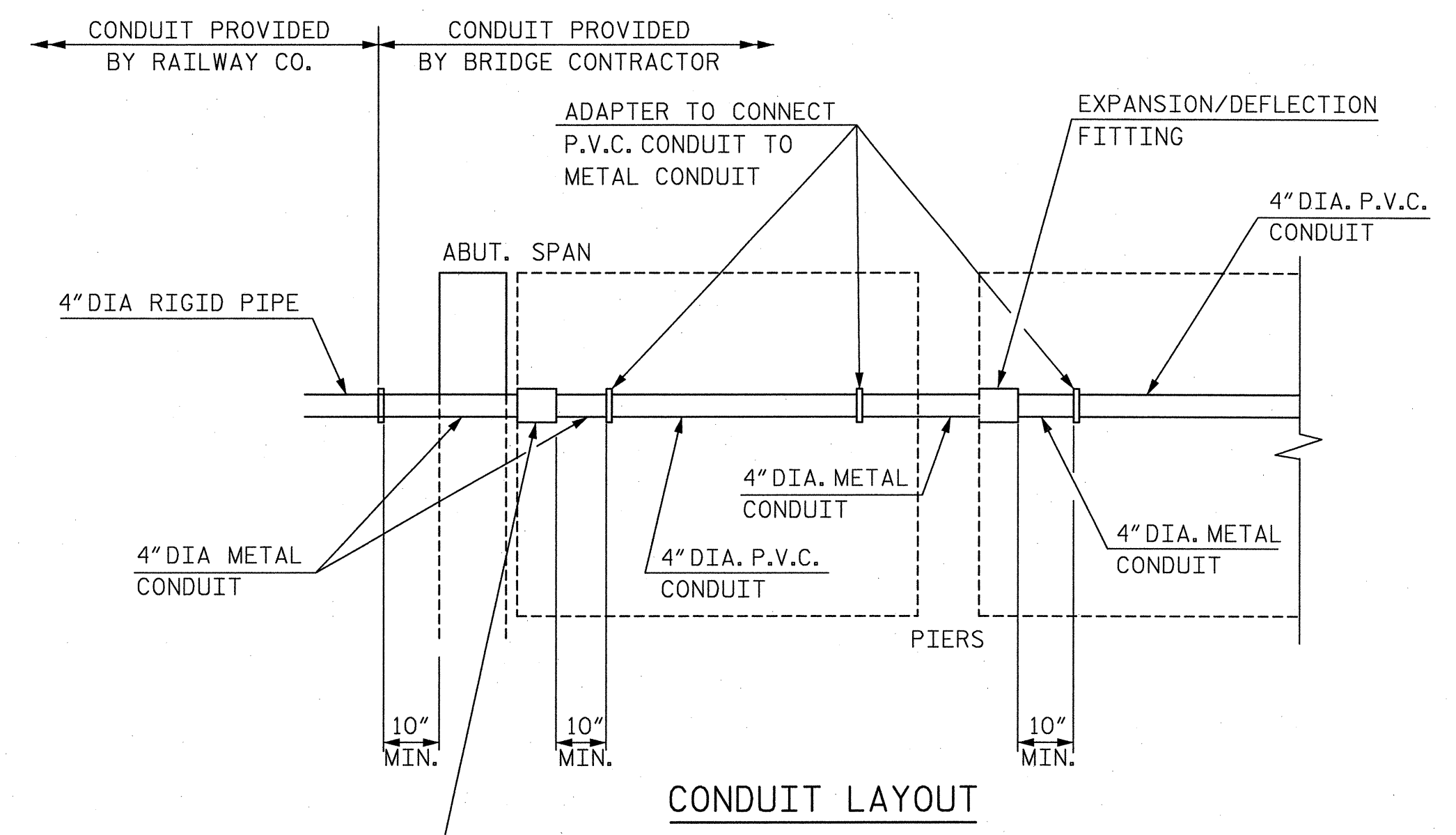
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUPERSTRUCTURE
 TYPICAL SECTION

HNTB		HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRWN BY: M. WRIGHT	DATE: 12/11	DWG. NO. 5	
CHECKED BY: P. BARBER	DATE: 1/12		
REVISIONS			
NO.	BY:	DATE:	NO.
1	DWH	11/7/12	3
2			4
			SHEET NO. S-5
			TOTAL SHEETS 40

0371DEL_P17-18

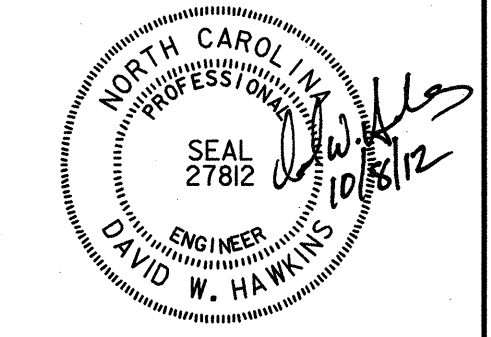
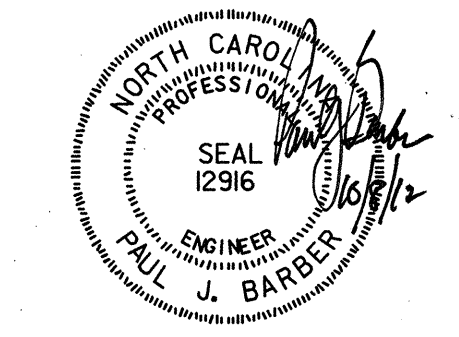


NOTE:
JOINT SHALL BE TESTED FOR LEAKS AND MADE WATERTIGHT BEFORE FLASHING AND EXP. PLATE COVER ARE INSTALLED.



NOTE: FOR ADDITIONAL PARAPET DETAILS, SEE "CONCRETE PARAPET DETAILS" SHEET.

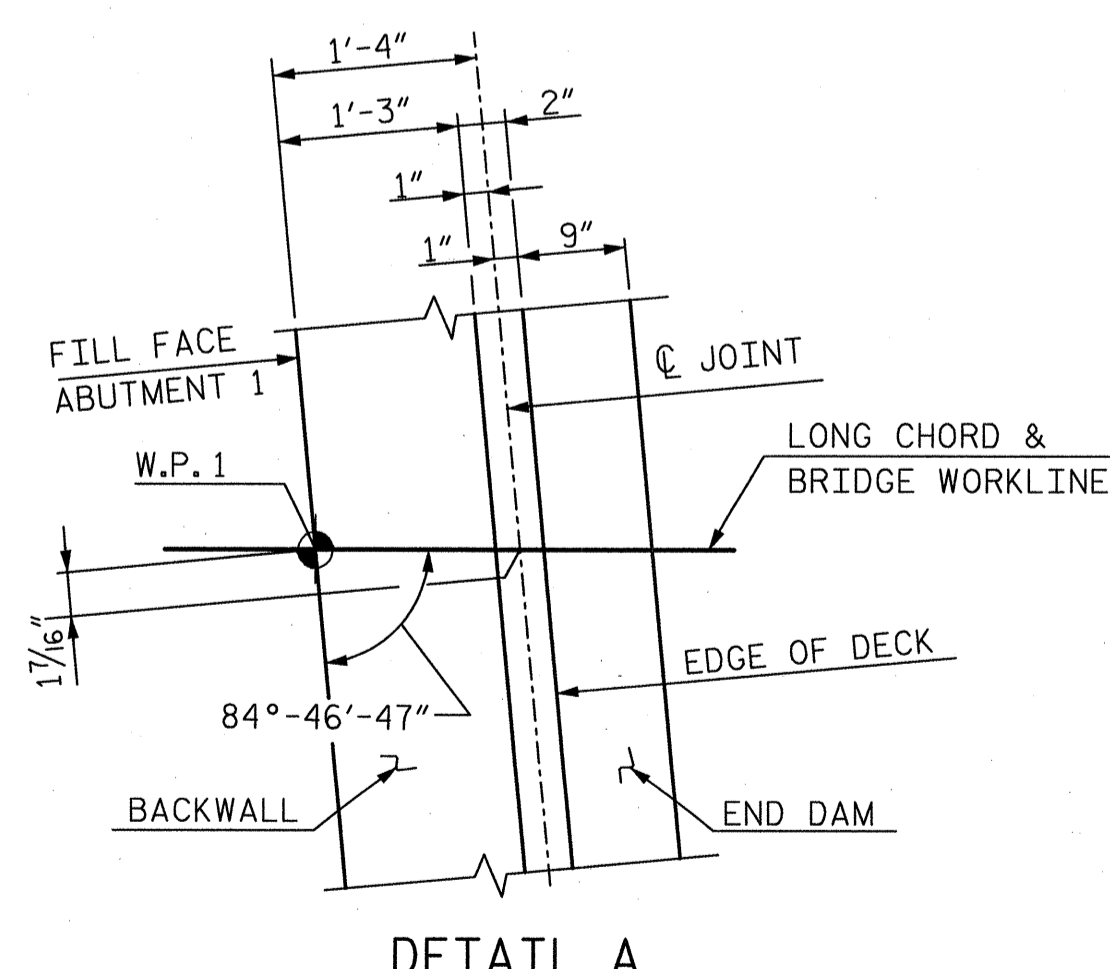
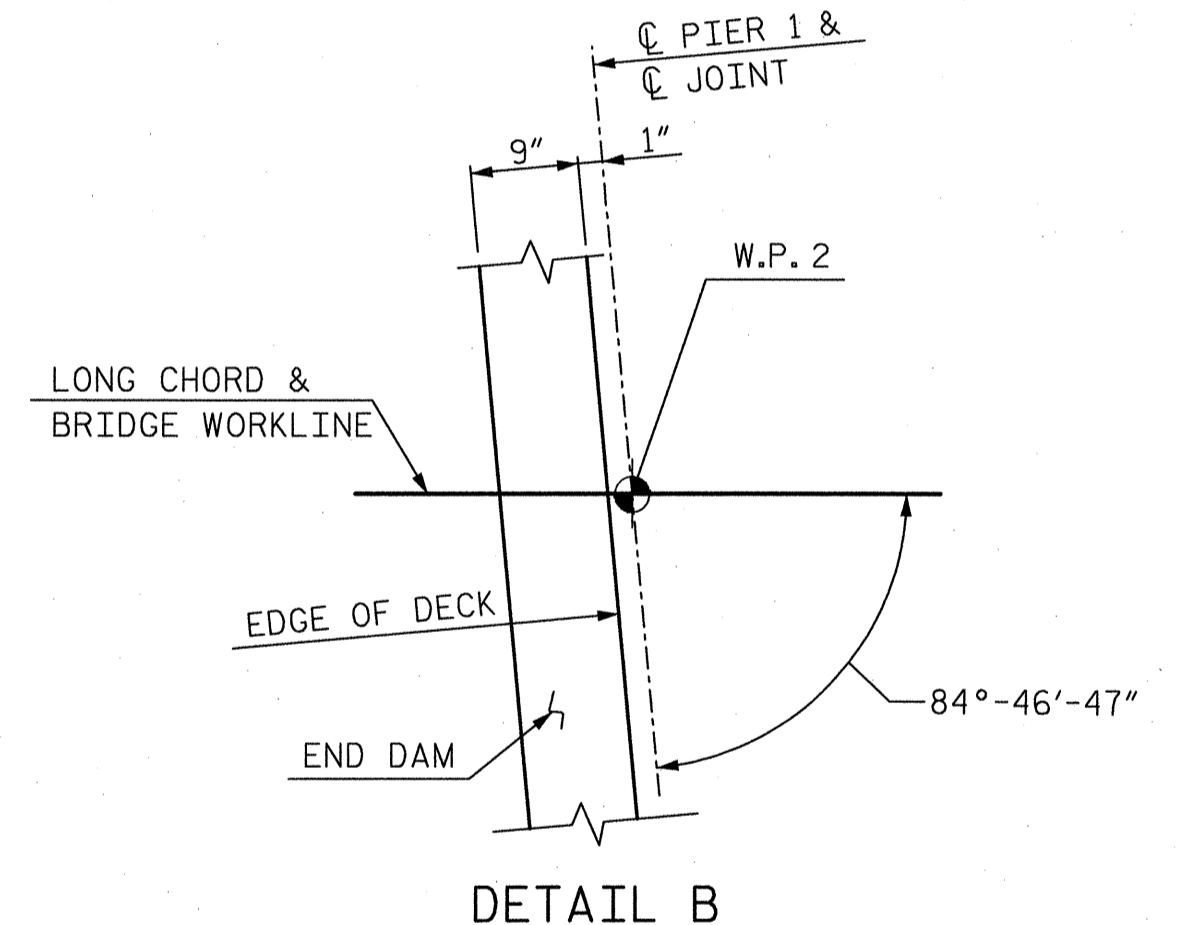
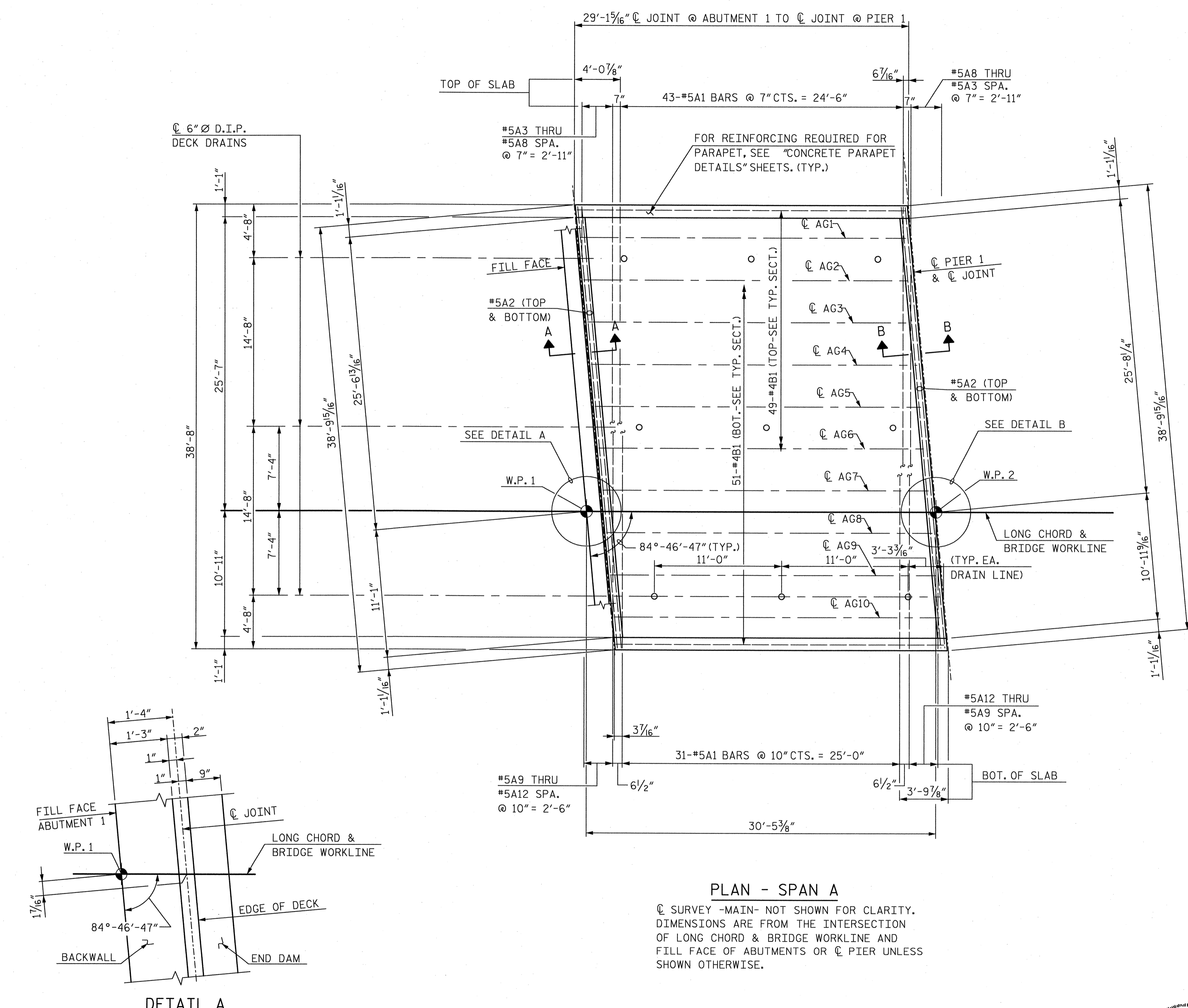
PROJECT NO. U-4716A/C
 DURHAM COUNTY
 STATION: POC STA. 3315+52.15 -MAIN-
 MILE POST: H64.60



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 DETAILS

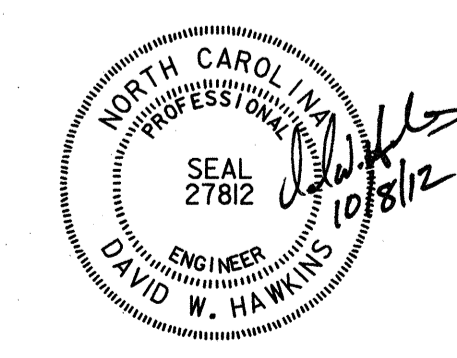
HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS			SHEET NO. S-6
DRAWN BY: M. WRIGHT	DATE: 12/11	NO. 1	BY:	DATE:	TOTAL SHEETS 40
CHECKED BY: P. BARBER	DATE: 2/12	NO. 2	BY:	DATE:	
		NO. 3	BY:	DATE:	
		NO. 4	BY:	DATE:	

NOTES:
 ALL REINFORCING SHALL BE EPOXY COATED.
 FOR SECTION A-A & B-B SEE "SUPERSTRUCTURE DETAILS" SHEET.
 FOR DECK DRAIN DETAIL SEE DETAIL "B" ON "STRUCTURE DRAINAGE DETAILS", SHEET 3 OF 4.
 FOR CONCRETE PARAPET DETAILS, SEE "CONCRETE PARAPET DETAILS" SHEETS.



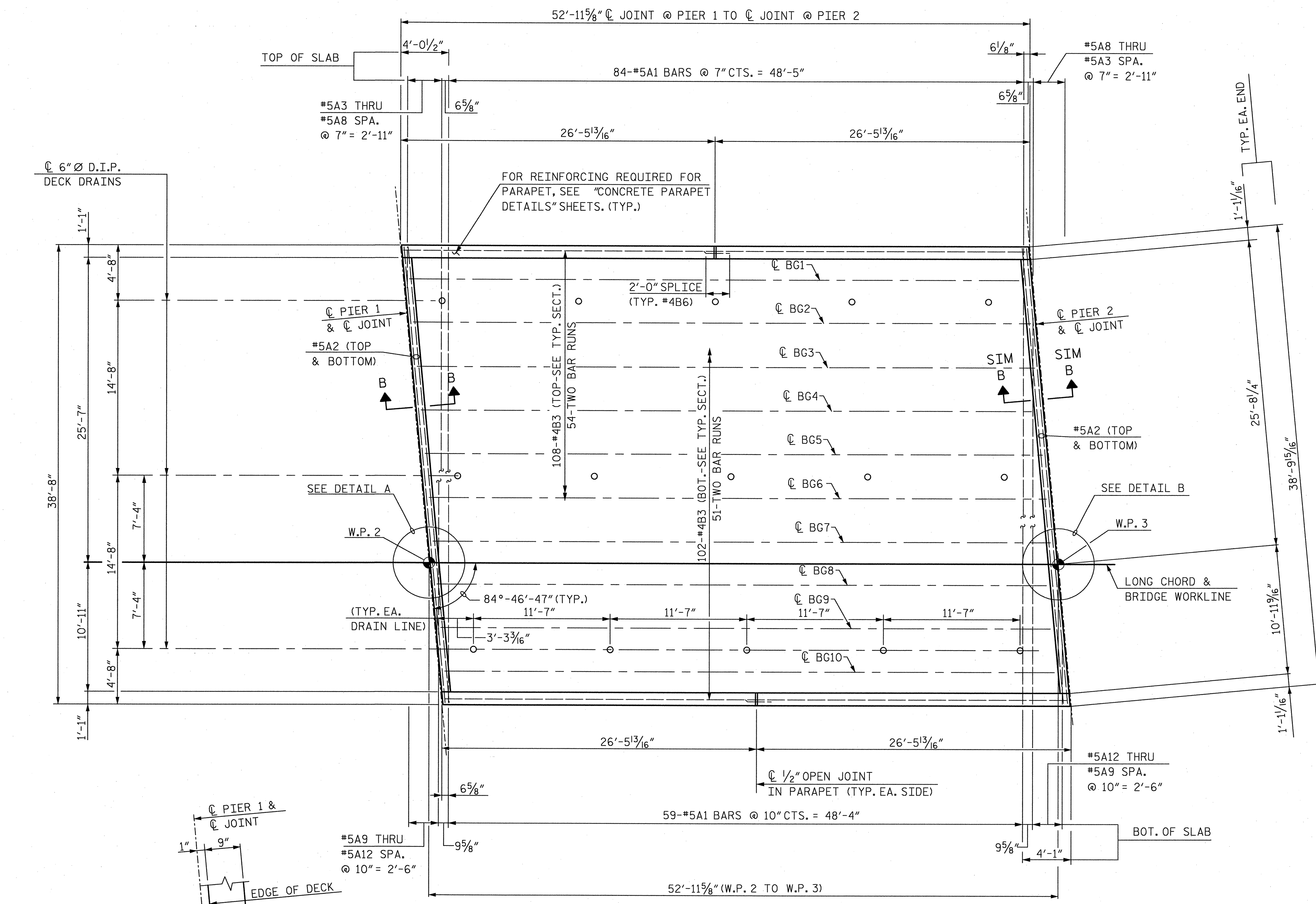
PLAN - SPAN A
 C SURVEY -MAIN- NOT SHOWN FOR CLARITY. DIMENSIONS ARE FROM THE INTERSECTION OF LONG CHORD & BRIDGE WORKLINE AND FILL FACE OF ABUTMENTS OR C PIER UNLESS SHOWN OTHERWISE.

PROJECT NO. U-4716A/C
 DURHAM COUNTY
 STATION: POC STA. 3315+52.15 -MAIN-
 MILE POST: H64.60



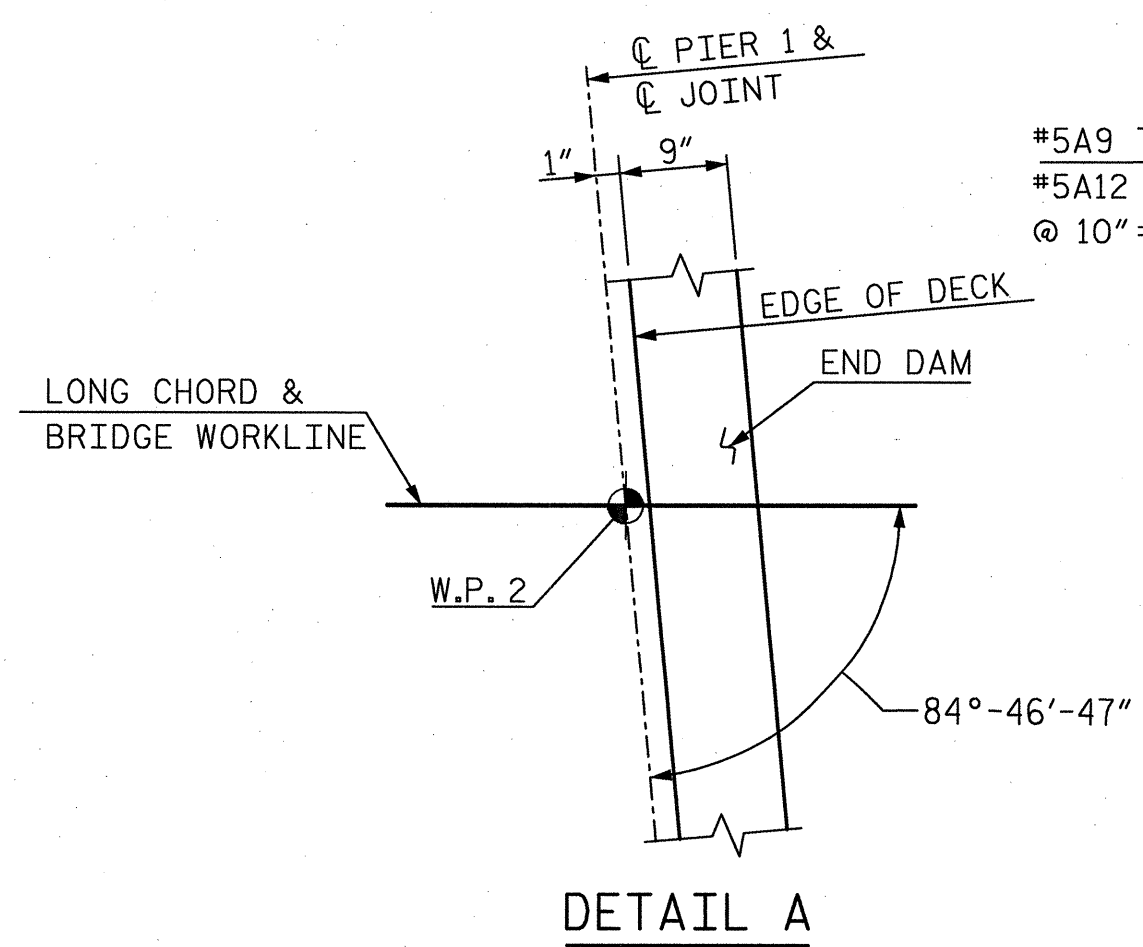
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUPERSTRUCTURE
 PLAN OF DECK - SPAN A

HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS			SHEET NO. S-7
DRAWN BY: M. WRIGHT	DATE: 12/11	NO. 1	BY: 7	DATE:	TOTAL SHEETS 40
CHECKED BY: P. BARBER	DATE: 2/12	NO. 2	BY: 3	DATE:	
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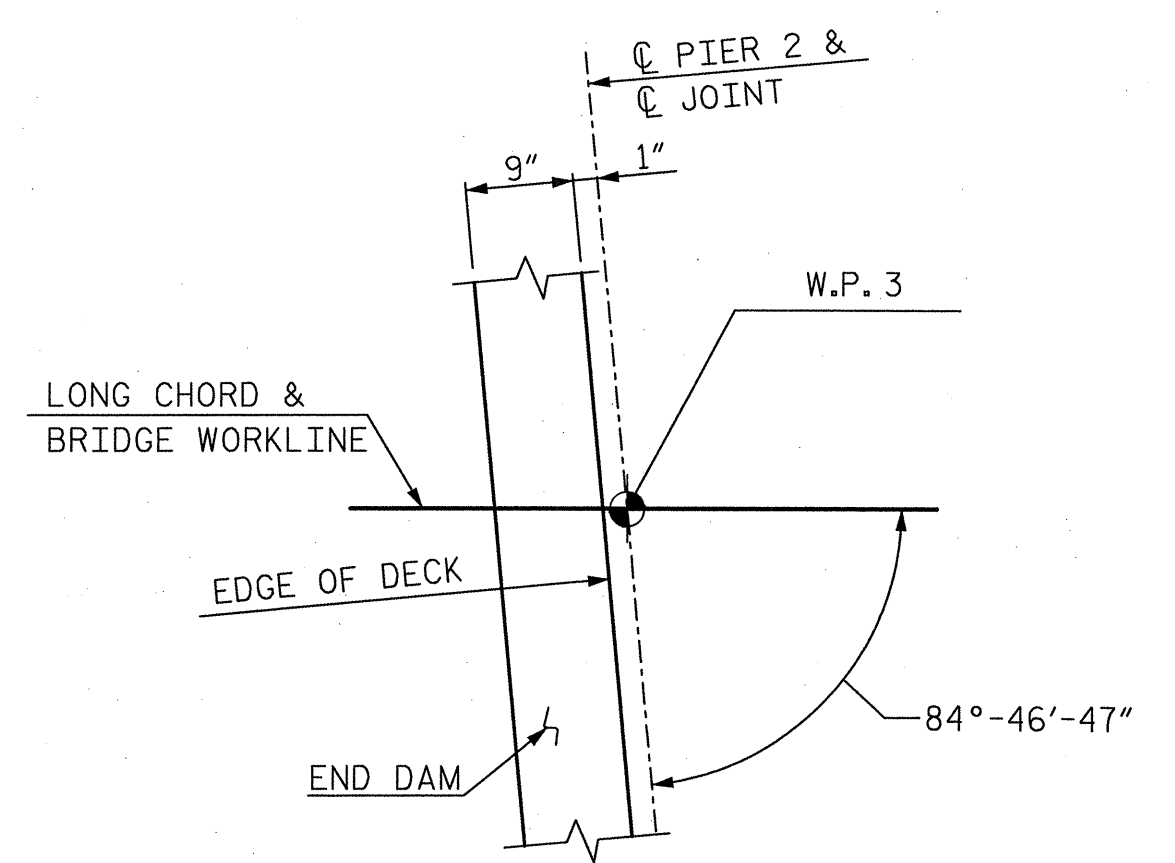


PLAN - SPAN B

© SURVEY - MAIN- NOT SHOWN FOR CLARITY. DIMENSIONS ARE FROM THE INTERSECTION OF LONG CHORD & BRIDGE WORKLINE AND FILL FACE OF ABUTMENTS OR © PIER UNLESS SHOWN OTHERWISE.



DETAIL A

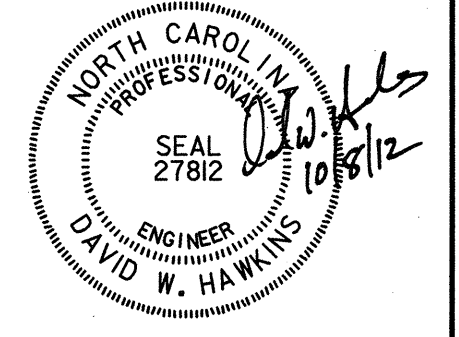
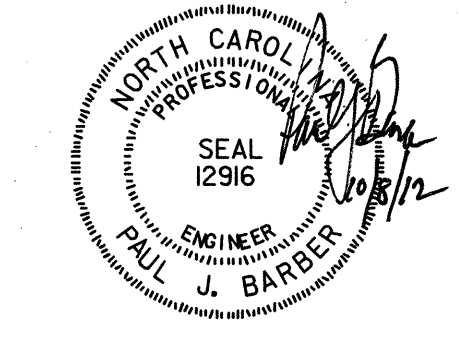


DETAIL B

NOTES:
 ALL REINFORCING SHALL BE EPOXY COATED.
 FOR SECTION B-B, SEE "SUPERSTRUCTURE DETAILS" SHEET.
 FOR DECK DRAIN DETAIL SEE DETAIL "B" ON "STRUCTURE DRAINAGE DETAILS", SHEET 3 OF 4.
 FOR CONCRETE PARAPET DETAILS, SEE "CONCRETE PARAPET DETAILS" SHEETS.

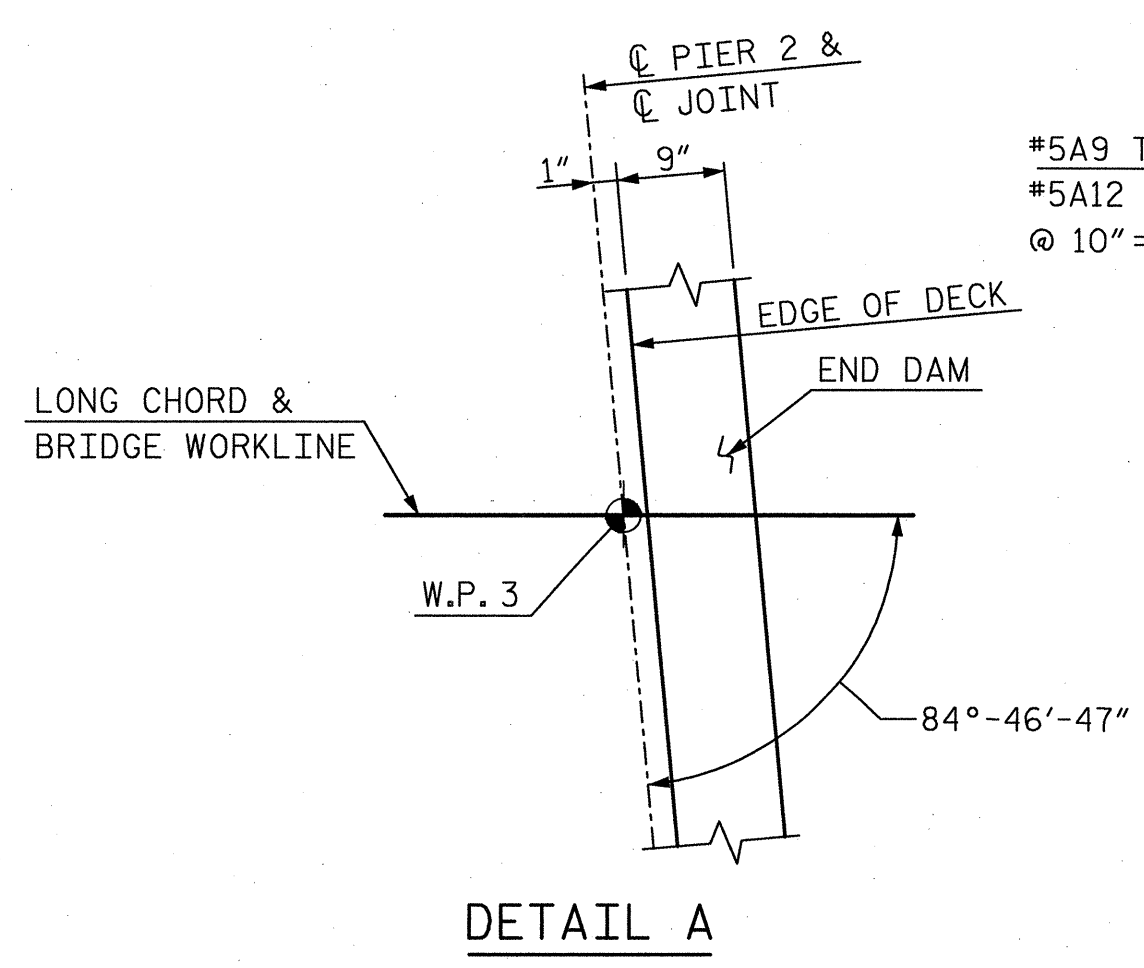
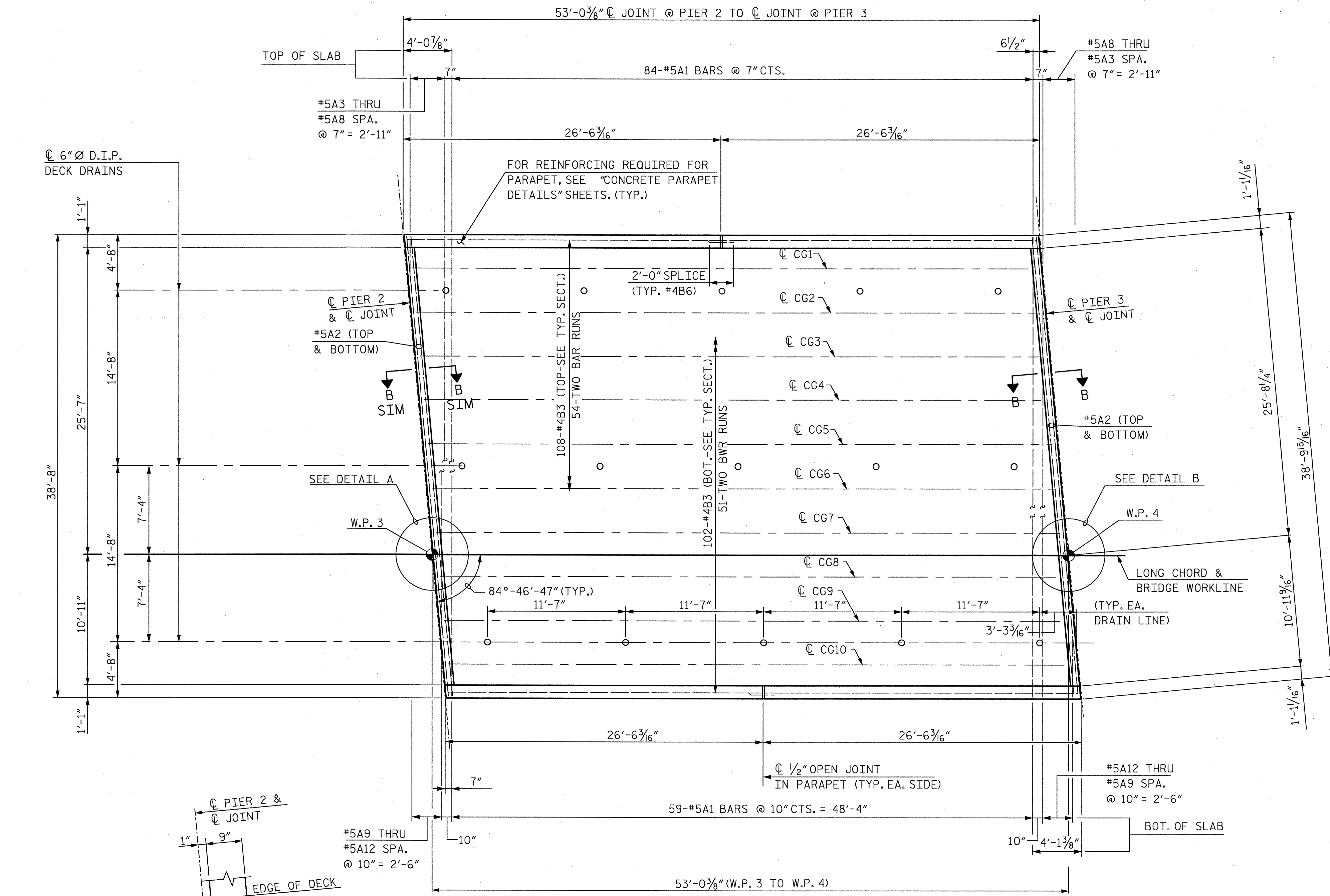
PROJECT NO. U-4716A/C
DURHAM COUNTY
 STATION: POC STA. 3315+52.15 -MAIN-
 MILE POST: H64.60

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



HNTB HNTB NORTH CAROLINA, P.C.
 License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
 DRAWN BY: M. WRIGHT DATE: 12/11
 CHECKED BY: P. BARBER DATE: 2/12 DWG. NO. 8

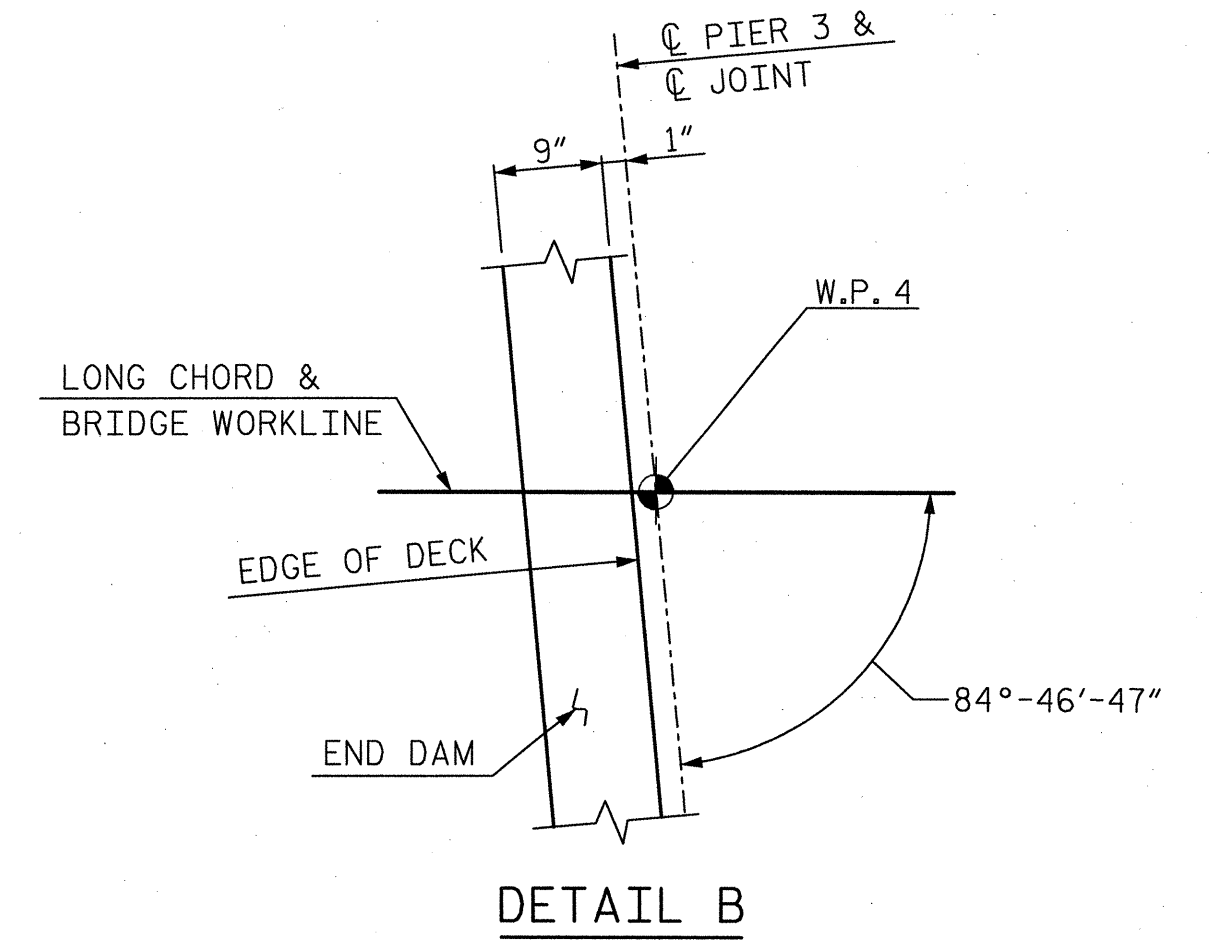
REVISIONS						SHEET NO. S-8
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 40
2			4			



PLAN - SPAN C

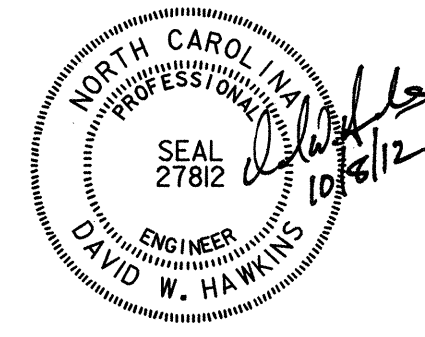
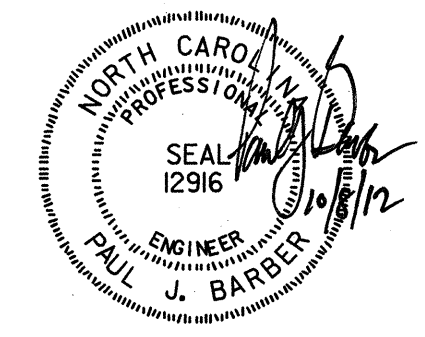
☉ SURVEY -MAIN- NOT SHOWN FOR CLARITY.
DIMENSIONS ARE FROM THE INTERSECTION
OF LONG CHORD & BRIDGE WORKLINE AND
FILL FACE OF ABUTMENTS OR ☉ PIER UNLESS
SHOWN OTHERWISE.

NOTES:
ALL REINFORCING SHALL BE EPOXY COATED.
FOR SECTION B-B, SEE "SUPERSTRUCTURE
DETAILS" SHEET.
FOR DECK DRAIN DETAIL SEE DETAIL "B" ON
"STRUCTURE DRAINAGE DETAILS", SHEET 3 OF 4.
FOR CONCRETE PARAPET DETAILS, SEE
"CONCRETE PARAPET DETAILS" SHEETS.



PROJECT NO. U-4716A/C
DURHAM COUNTY
STATION: POC STA. 3315+52.15 -MAIN-
MILE POST: H64.60

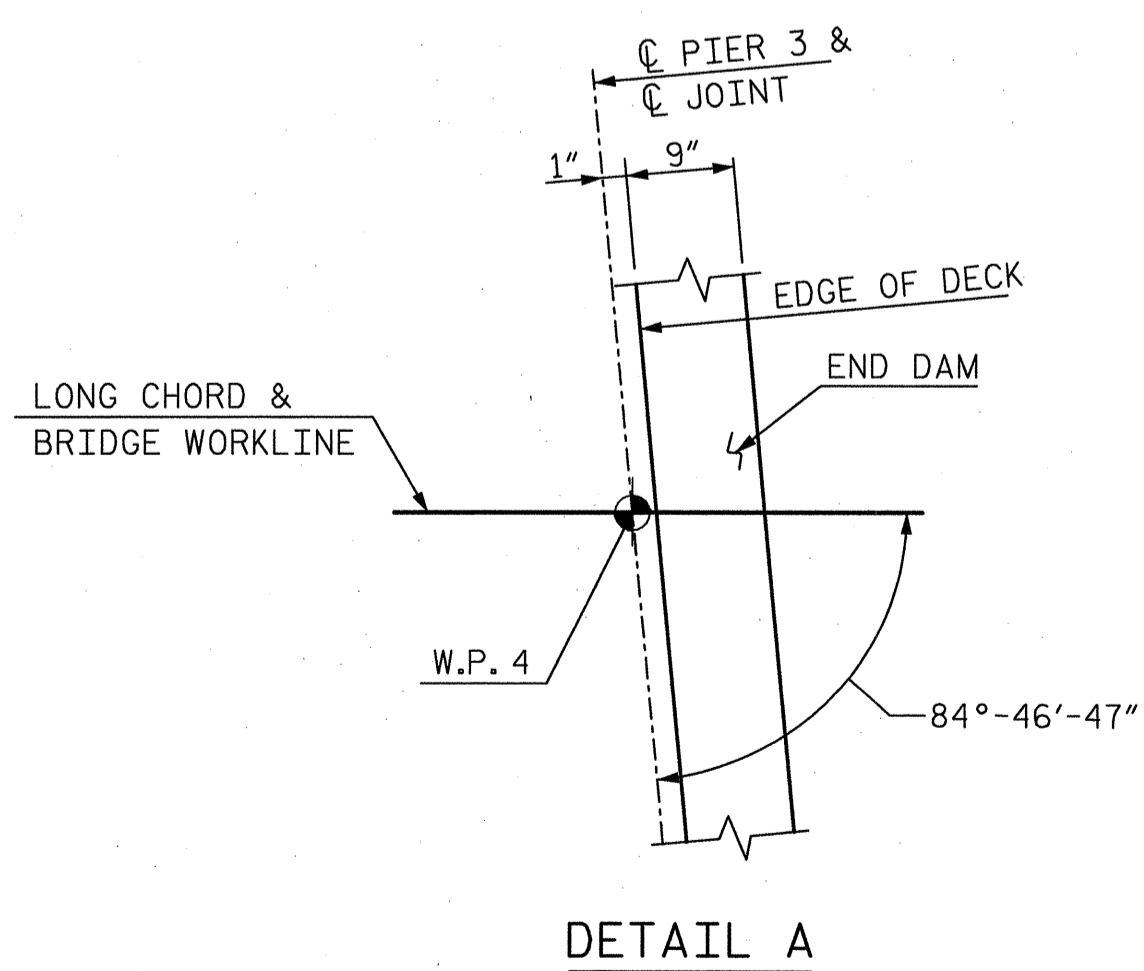
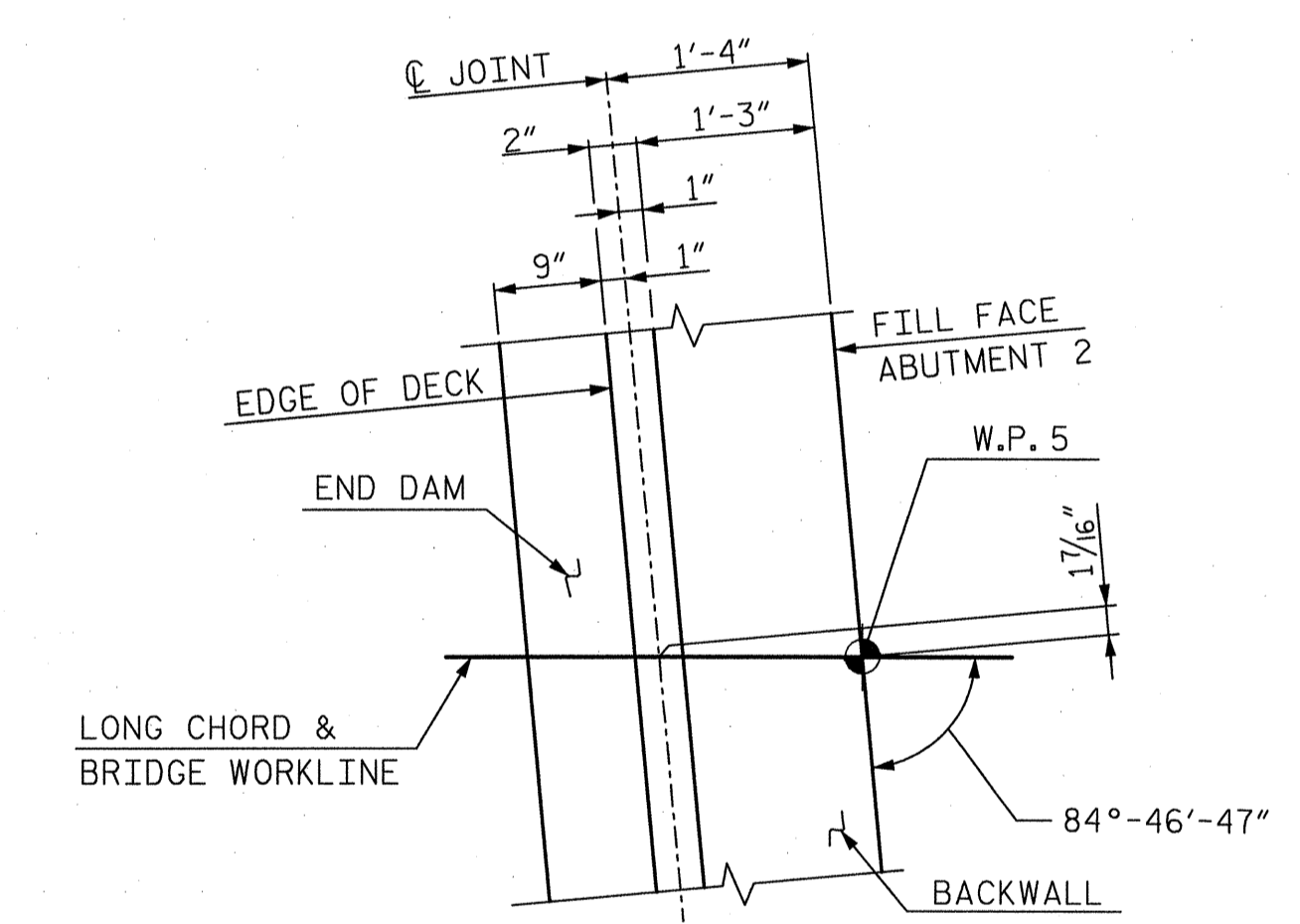
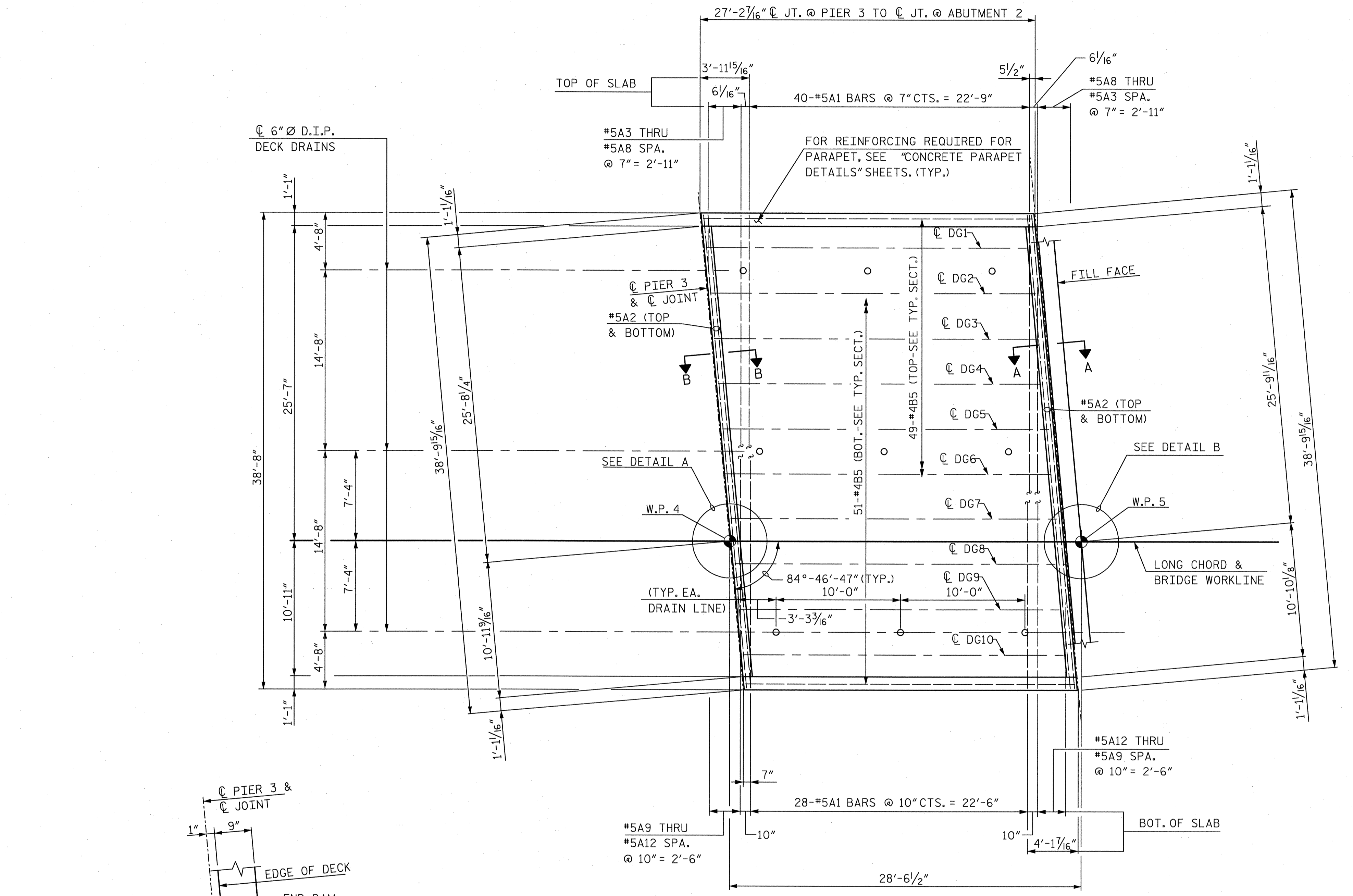
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
PLAN OF DECK - SPAN C



HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		DWG. NO. 9	
DRAWN BY: M. WRIGHT	DATE: 12/11		
CHECKED BY: P. BARBER	DATE: 2/12		
		REVISIONS	
NO.	BY:	DATE:	NO.
1			3
2			4
			SHEET NO. S-9
			TOTAL SHEETS 40

NOTES:

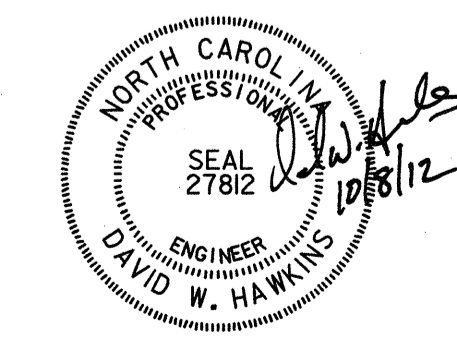
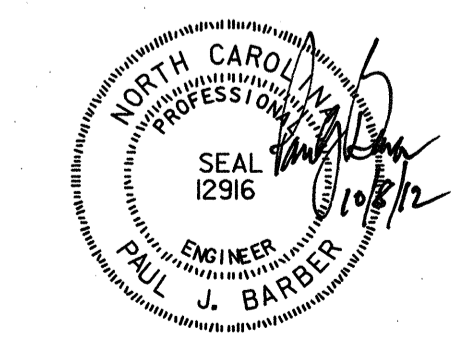
ALL REINFORCING SHALL BE EPOXY COATED.
 FOR SECTION A-A & B-B SEE "SUPERSTRUCTURE DETAILS" SHEET.
 FOR DECK DRAIN DETAIL SEE DETAIL "B" ON "STRUCTURE DRAINAGE DETAILS", SHEET 3 OF 4.
 FOR CONCRETE PARAPET DETAILS, SEE "CONCRETE PARAPET DETAILS" SHEETS.



PLAN - SPAN D
 CL SURVEY -MAIN- NOT SHOWN FOR CLARITY. DIMENSIONS ARE FROM THE INTERSECTION OF LONG CHORD & BRIDGE WORKLINE AND FILL FACE OF ABUTMENTS OR CL PIER UNLESS SHOWN OTHERWISE.

DETAIL B

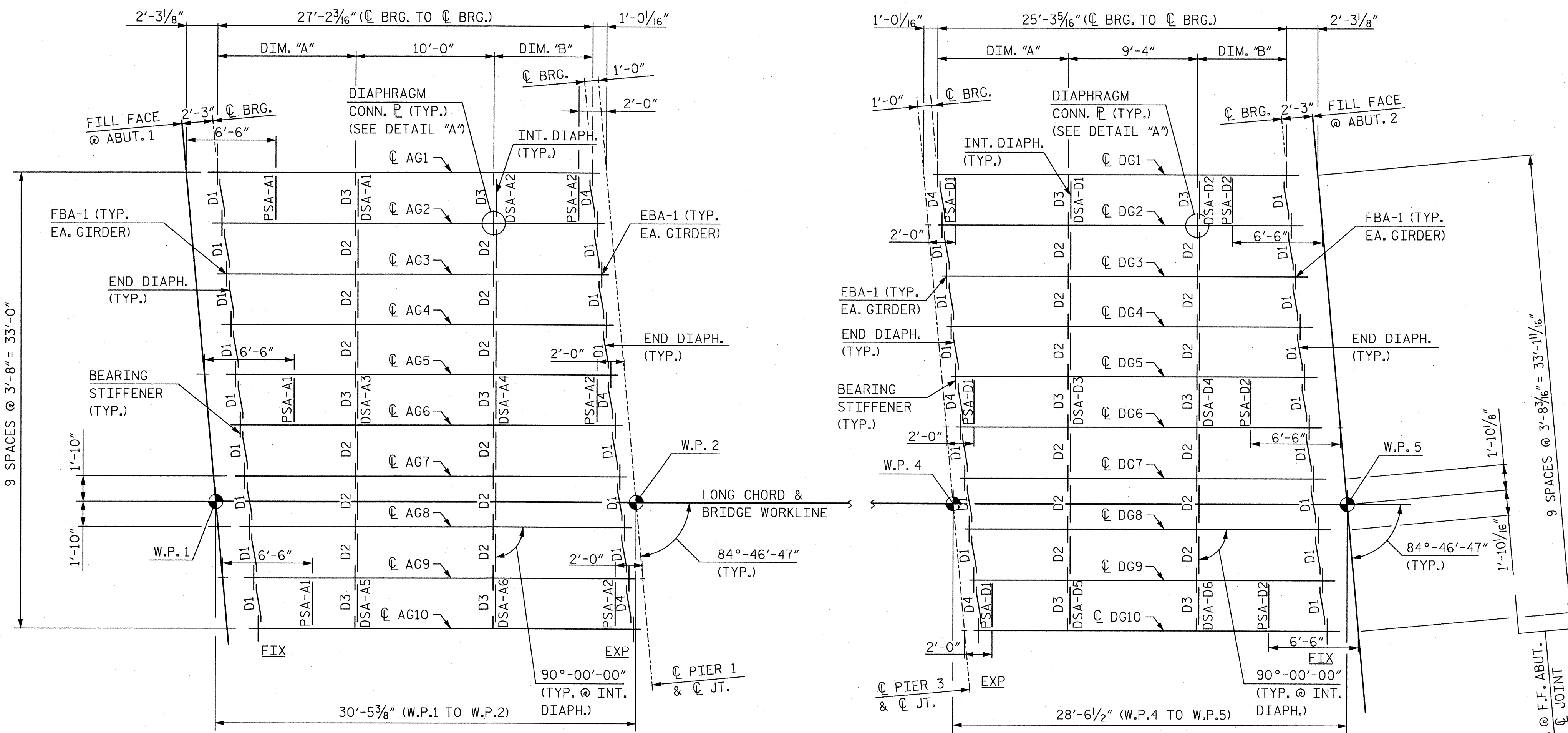
PROJECT NO. U-4716A/C
DURHAM COUNTY
 STATION: POC STA. 3315+52.15 -MAIN-
 MILE POST: H64.60



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

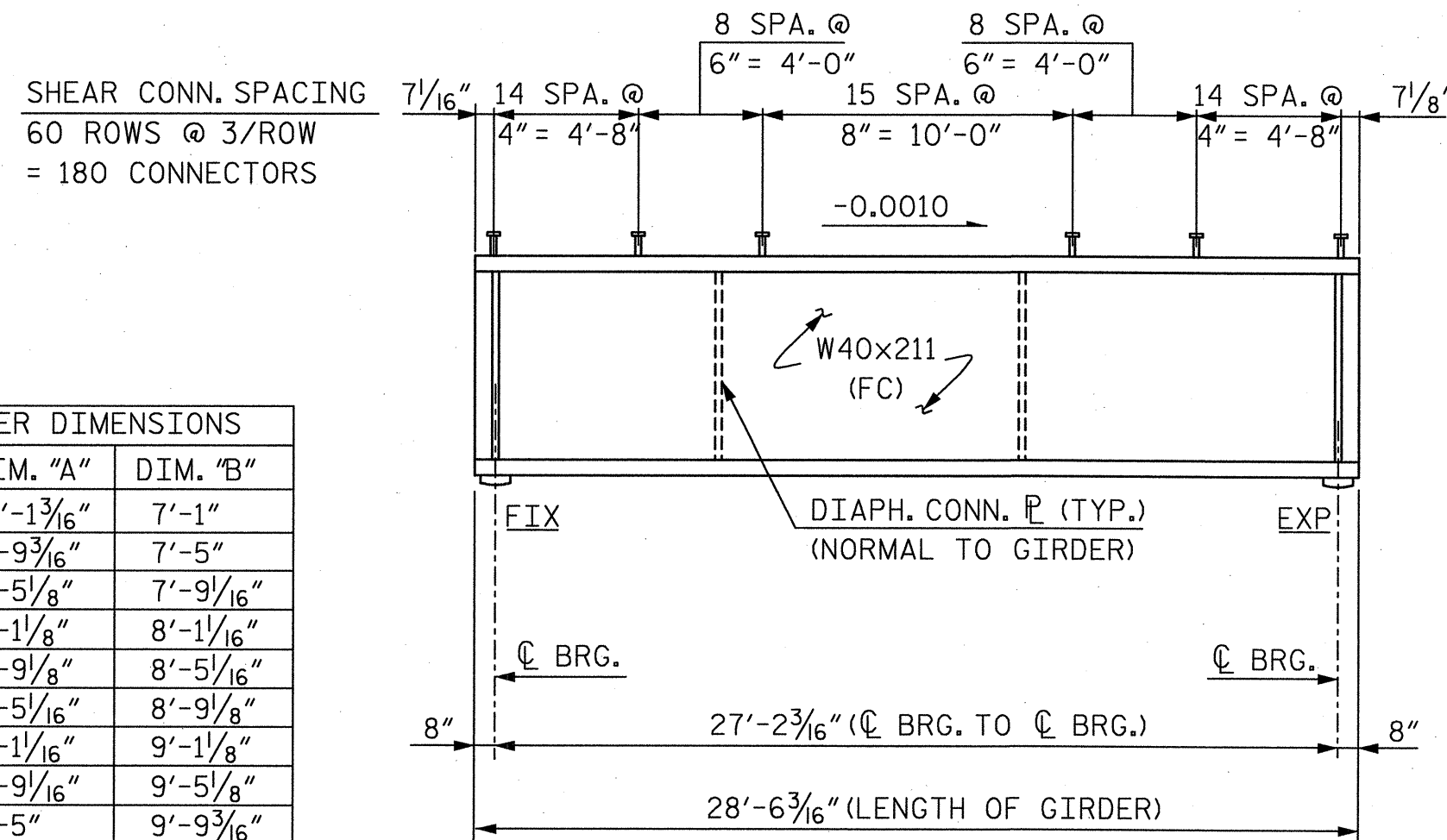
SUPERSTRUCTURE
PLAN OF DECK - SPAN D

HNTB		HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, NC. 27609		REVISIONS		SHEET NO. S-10
DRAWN BY: M. WRIGHT	DATE: 12/11	NO. 1	BY:	DATE:	NO. 3	TOTAL SHEETS: 40
CHECKED BY: P. BARBER	DATE: 2/12	NO. 2	BY:	DATE:	NO. 4	
DWG. NO. 10						

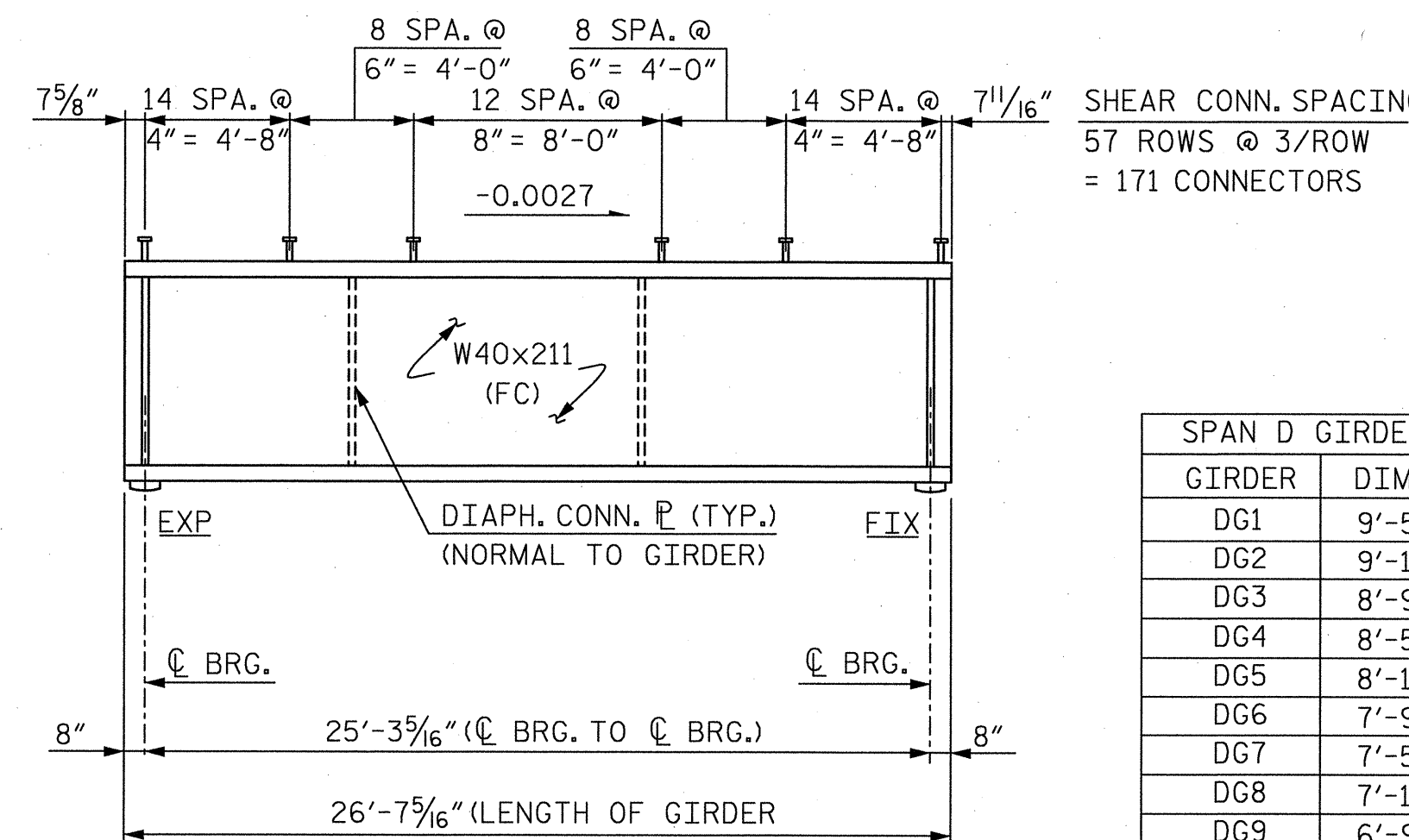


FRAMING PLAN

NOTES:
 ALL DIMENSIONS ON THIS DRAWING ARE HORIZONTAL.
 ALL ABUTMENT FILL FACES, C PIER AND C BEARINGS ARE PARALLEL.
 NO SHOP CAMBER REQUIRED, TURN NATURAL MILL CAMBER UP.
 REFER TO "STRUCTURAL STEEL DETAILS" SHEET FOR:
 • STRUCTURAL STEEL NOTES
 • DIAPHRAGM DETAILS
 • STIFFENER AND CONNECTOR P DETAILS
 • SHEAR CONNECTOR DETAILS
 FOR BEARINGS, SEE "BEARING DETAILS SPANS A & D" SHEET.
 FOR DRAIN PIPE SUPPORT DETAILS, SEE "STRUCTURE DRAINAGE DETAILS" SHEET 3 OF 4.
 FC = "FRACTURE CRITICAL"



SPAN A



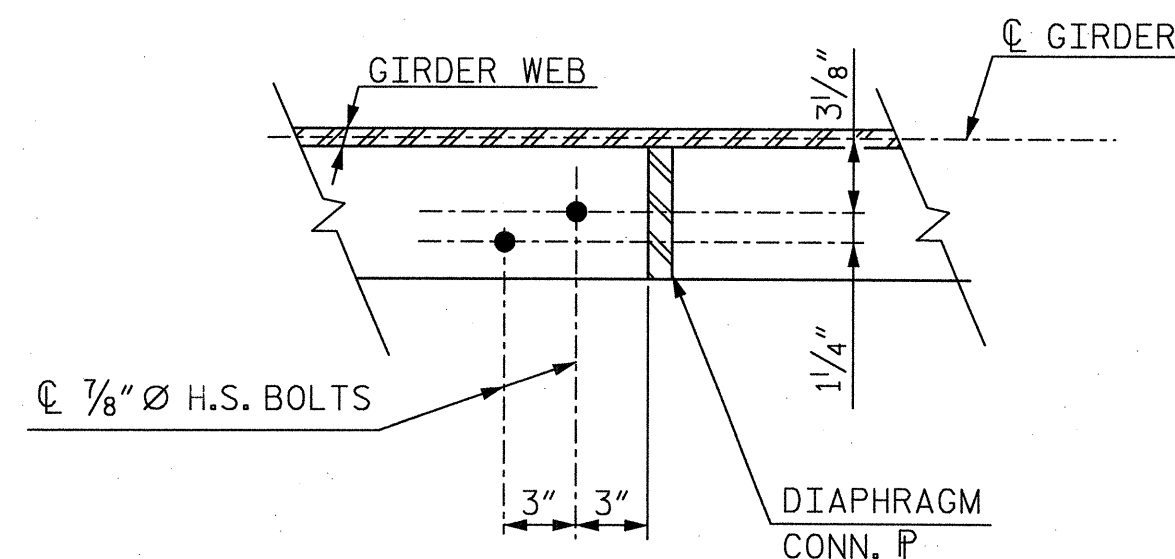
SPAN D

TYPICAL GIRDER ELEVATION

(INTERIOR GIRDER SHOWN, EXTERIOR GIRDER SIMILAR)

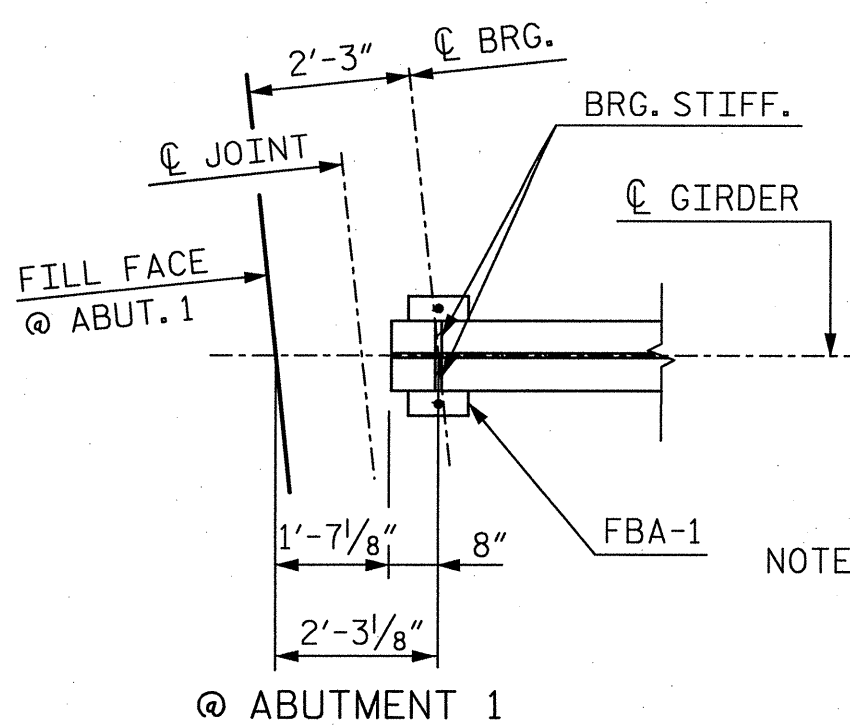
SPAN A GIRDER DIMENSIONS		
GIRDER	DIM. "A"	DIM. "B"
AG1	10'-1 3/8"	7'-1"
AG2	9'-9 3/8"	7'-5"
AG3	9'-5 1/8"	7'-9 1/16"
AG4	9'-1 1/8"	8'-1 1/16"
AG5	8'-9 1/8"	8'-5 1/16"
AG6	8'-5 1/16"	8'-9 1/8"
AG7	8'-1 1/16"	9'-1 1/8"
AG8	7'-9 1/16"	9'-5 1/8"
AG9	7'-5"	9'-9 3/8"
AG10	7'-1"	10'-1 3/8"

SPAN D GIRDER DIMENSIONS		
GIRDER	DIM. "A"	DIM. "B"
DG1	9'-5 3/4"	6'-5 9/16"
DG2	9'-1 3/4"	6'-9 5/8"
DG3	8'-9 3/4"	7'-1 5/8"
DG4	8'-5 1/16"	7'-5 5/8"
DG5	8'-1 1/16"	7'-9 1/16"
DG6	7'-9 1/16"	8'-1 1/16"
DG7	7'-5 5/8"	8'-5 1/16"
DG8	7'-1 5/8"	8'-9 3/4"
DG9	6'-9 5/8"	9'-1 3/4"
DG10	6'-5 3/4"	9'-5 3/4"



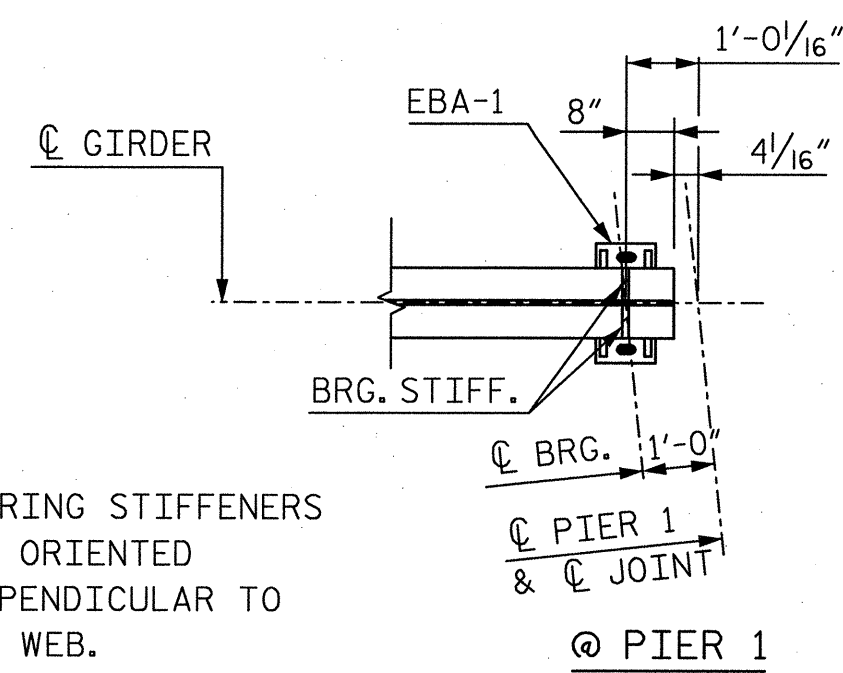
DETAIL "A"
 (RIGHT SIDE OF WEB SHOWN, LEFT SIDE SIMILAR)

PROJECT NO. U-4716A/C
 DURHAM COUNTY
 STATION: POC STA. 3315+52.15 -MAIN-
 MILE POST: H64.60

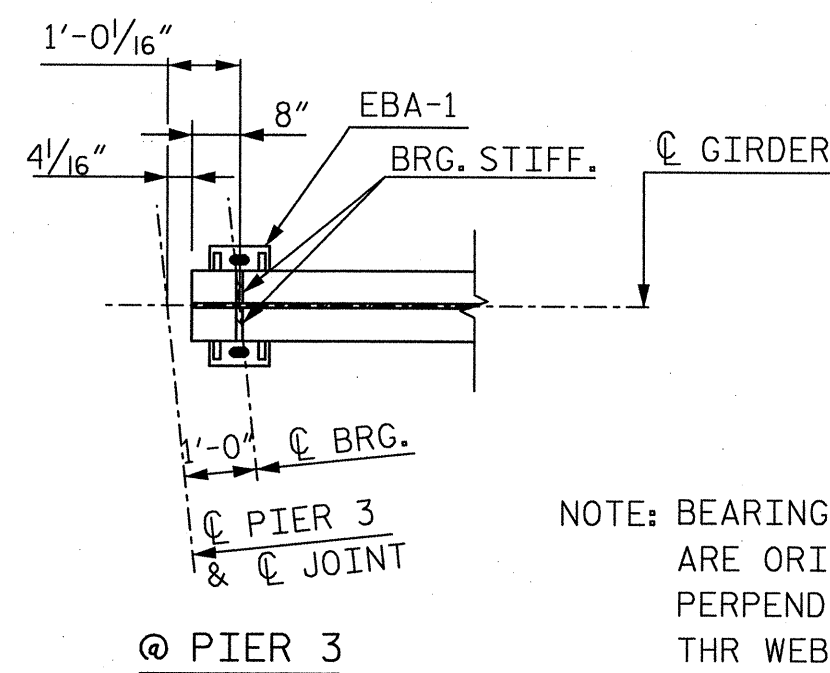


BOTTOM FLANGE GIRDER END DETAILS - SPAN A

NOTE: BEARING STIFFENERS ARE ORIENTED PERPENDICULAR TO THR WEB.

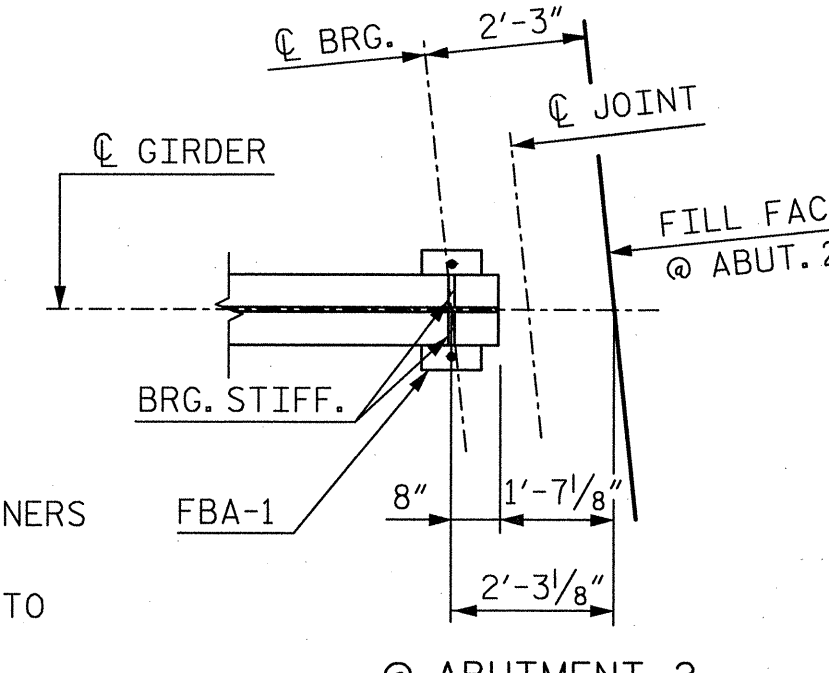


@ PIER 1

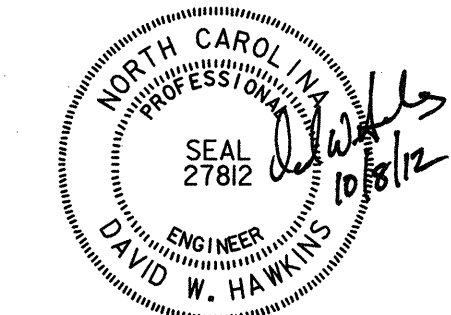
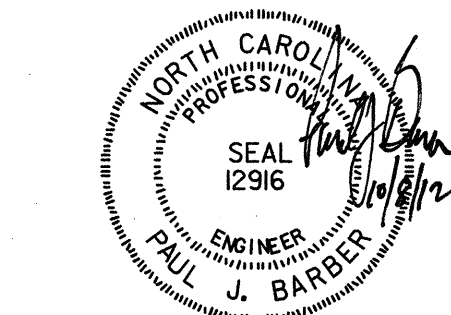


@ PIER 3

NOTE: BEARING STIFFENERS ARE ORIENTED PERPENDICULAR TO THR WEB.



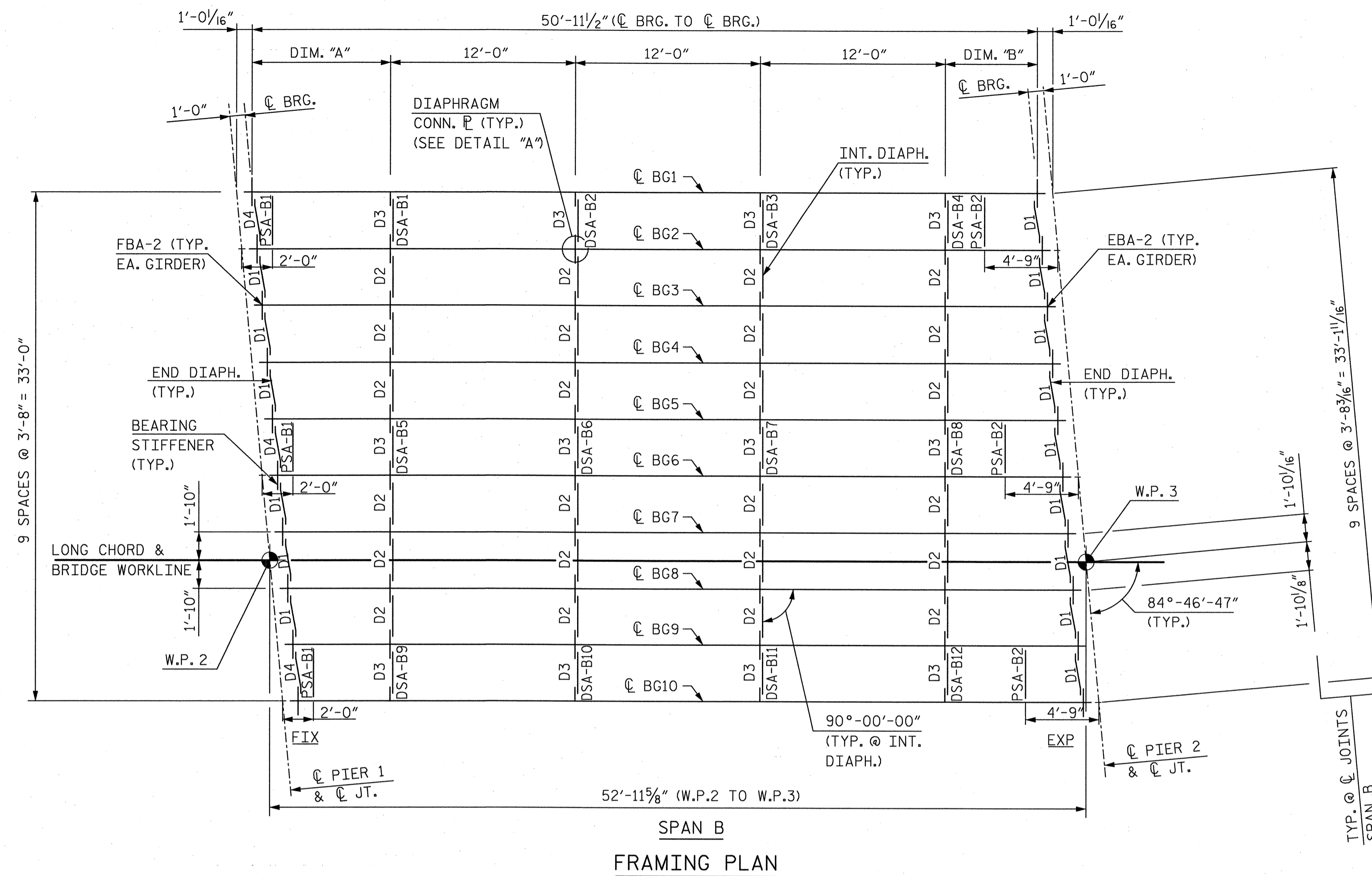
@ ABUTMENT 2



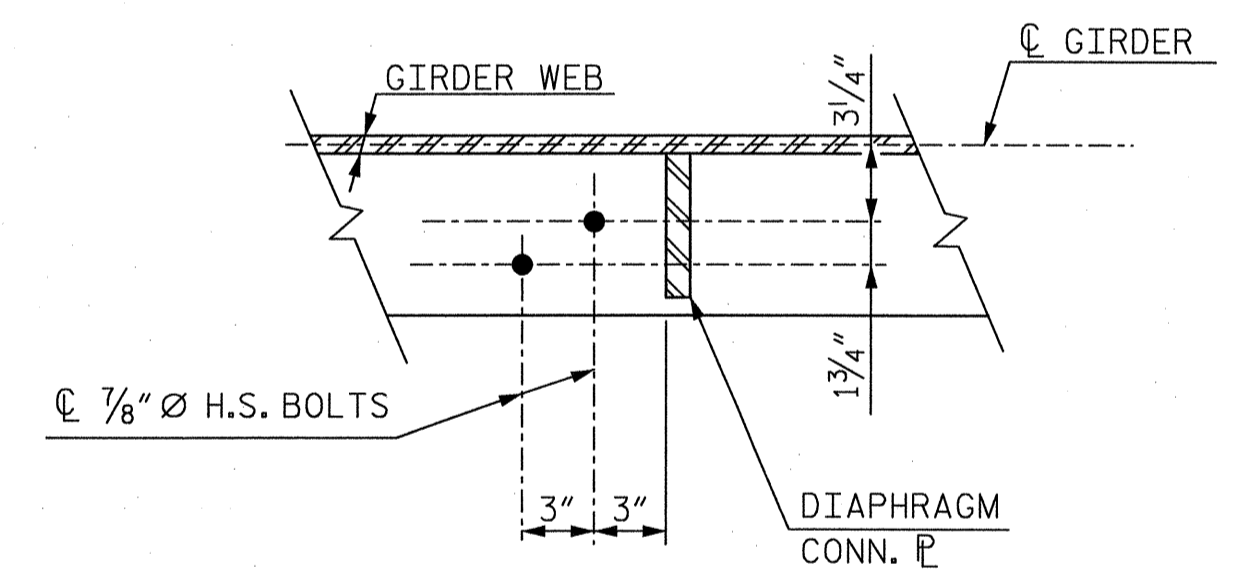
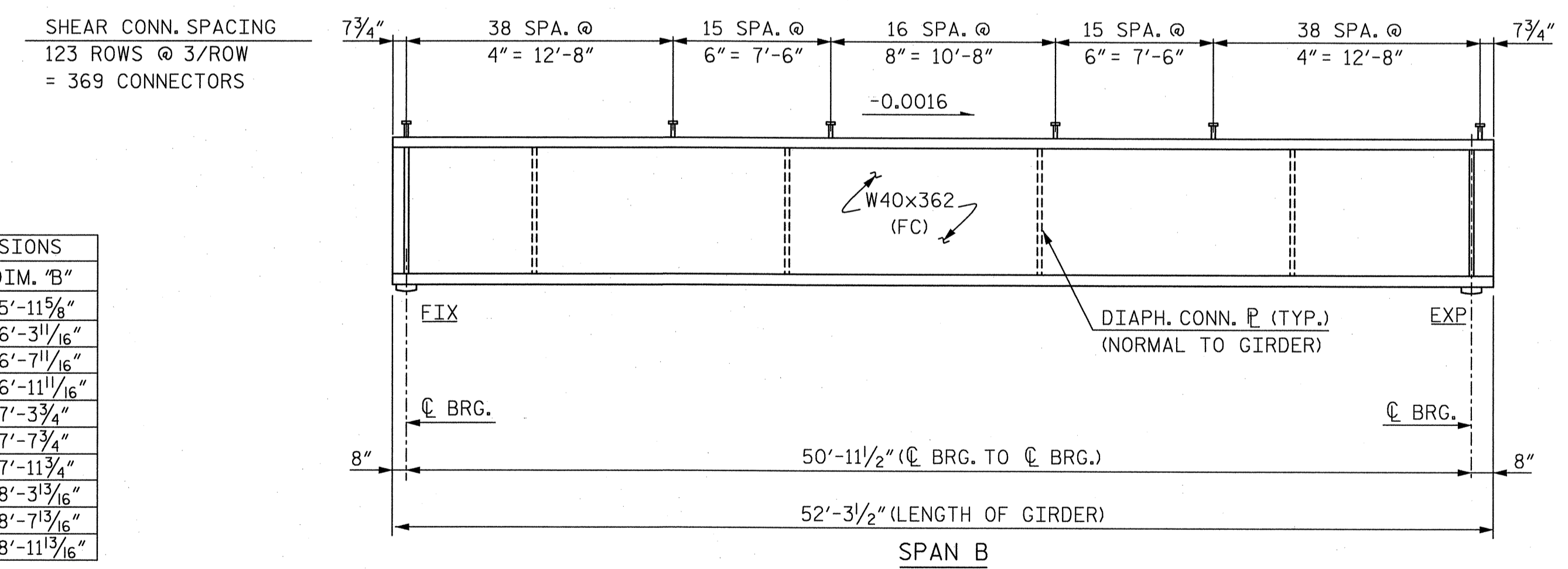
HNTB HNTB NORTH CAROLINA, P.C.
 License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
 DRAWN BY: J. BAYNE DATE: 3/12
 CHECKED BY: D. RAGAN DATE: 3/12 DWG. NO. 11

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

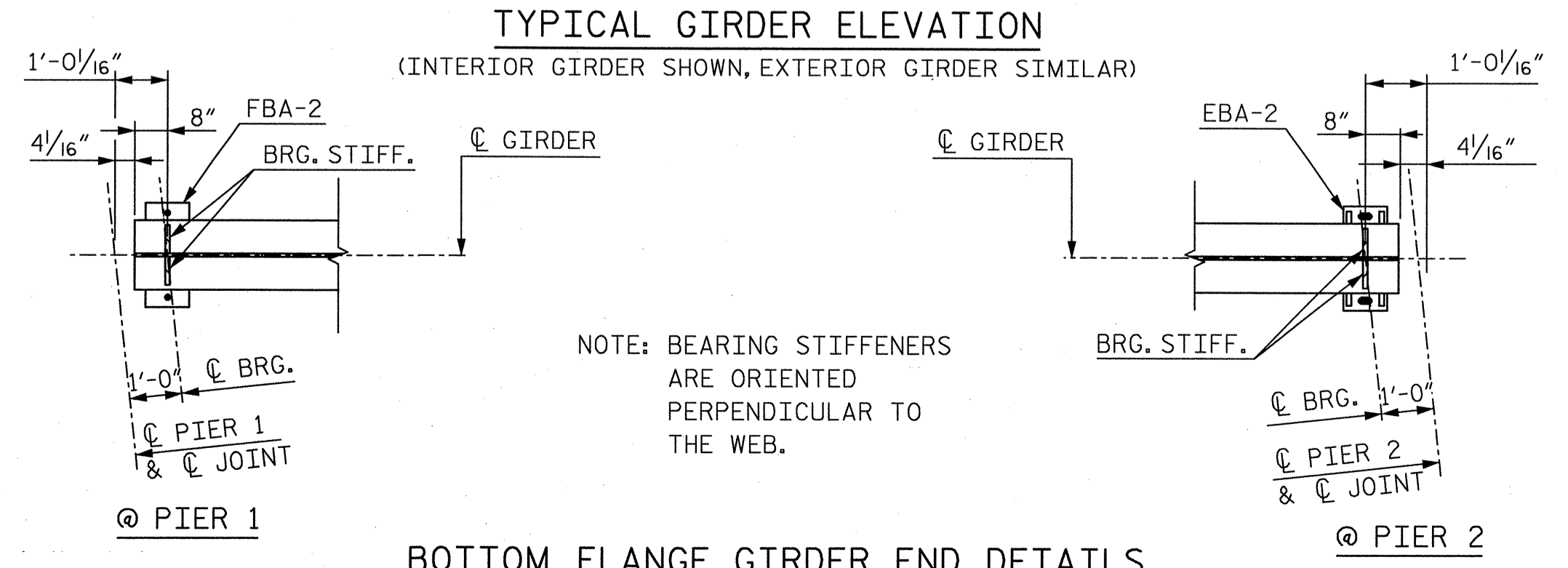
TOTAL SHEETS: 40



NOTES:
 ALL DIMENSIONS ON THIS DRAWING ARE HORIZONTAL.
 ALL $\text{\textcircled{C}}$ PIERS AND $\text{\textcircled{C}}$ BEARINGS ARE PARALLEL.
 NO SHOP CAMBER REQUIRED, TURN NATURAL MILL CAMBER UP.
 REFER TO "STRUCTURAL STEEL DETAILS" SHEET FOR:
 • STRUCTURAL STEEL NOTES
 • DIAPHRAGM DETAILS
 • STIFFENER AND CONNECTOR $\text{\textcircled{P}}$ DETAILS
 • SHEAR CONNECTOR DETAILS
 FOR BEARINGS, SEE "BEARING DETAILS SPANS B & C" SHEET.
 FOR DRAIN PIPE SUPPORT DETAILS, SEE "STRUCTURE DRAINAGE DETAILS" SHEET 3 OF 4.
 FC = "FRACTURE CRITICAL"

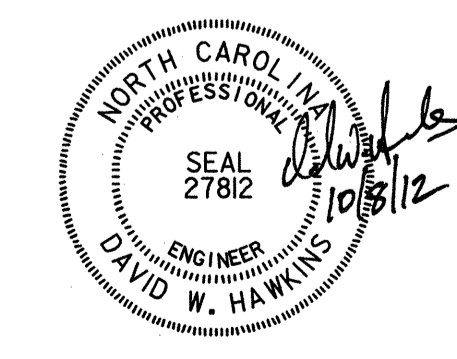
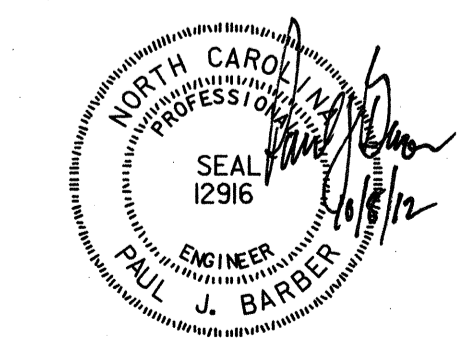


SPAN B GIRDER DIMENSIONS		
GIRDER	DIM. "A"	DIM. "B"
BG1	8'-11 3/16"	5'-11 5/8"
BG2	8'-7 13/16"	6'-3 11/16"
BG3	8'-3 13/16"	6'-7 11/16"
BG4	7'-11 3/4"	6'-11 11/16"
BG5	7'-7 3/4"	7'-3 3/4"
BG6	7'-3 3/4"	7'-7 3/4"
BG7	6'-11 11/16"	7'-11 3/4"
BG8	6'-7 11/16"	8'-3 13/16"
BG9	6'-3 11/16"	8'-7 13/16"
BG10	5'-11 5/8"	8'-11 13/16"



DETAIL "A"
 (RIGHT SIDE OF WEB SHOWN, LEFT SIDE SIMILAR)

PROJECT NO. U-4716A/C
DURHAM COUNTY
 STATION: POC STA. 3315+52.15 -MAIN-
 MILE POST: H64.60

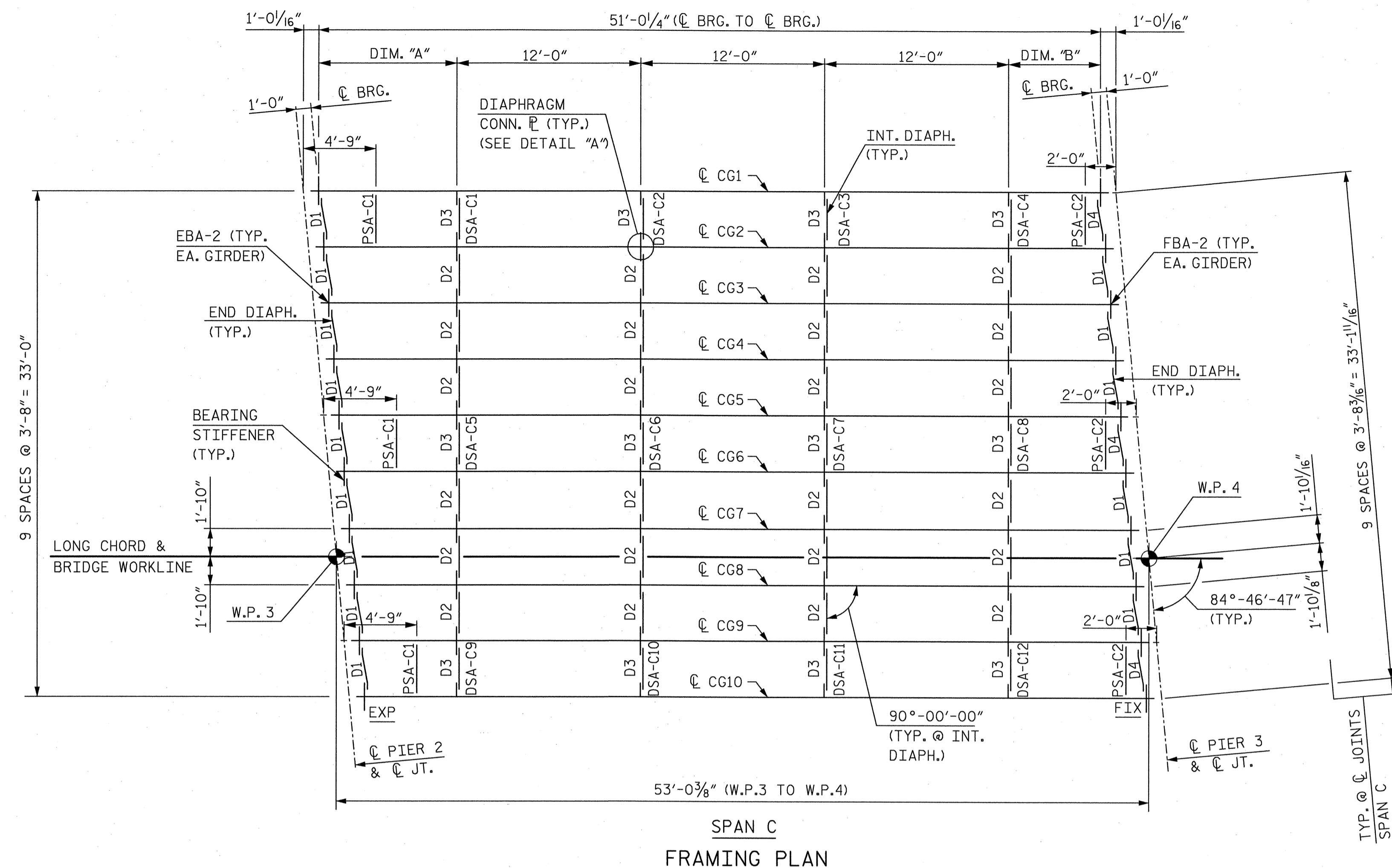


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUPERSTRUCTURE
 FRAMING PLAN
 AND GIRDER DETAILS
 SPAN B

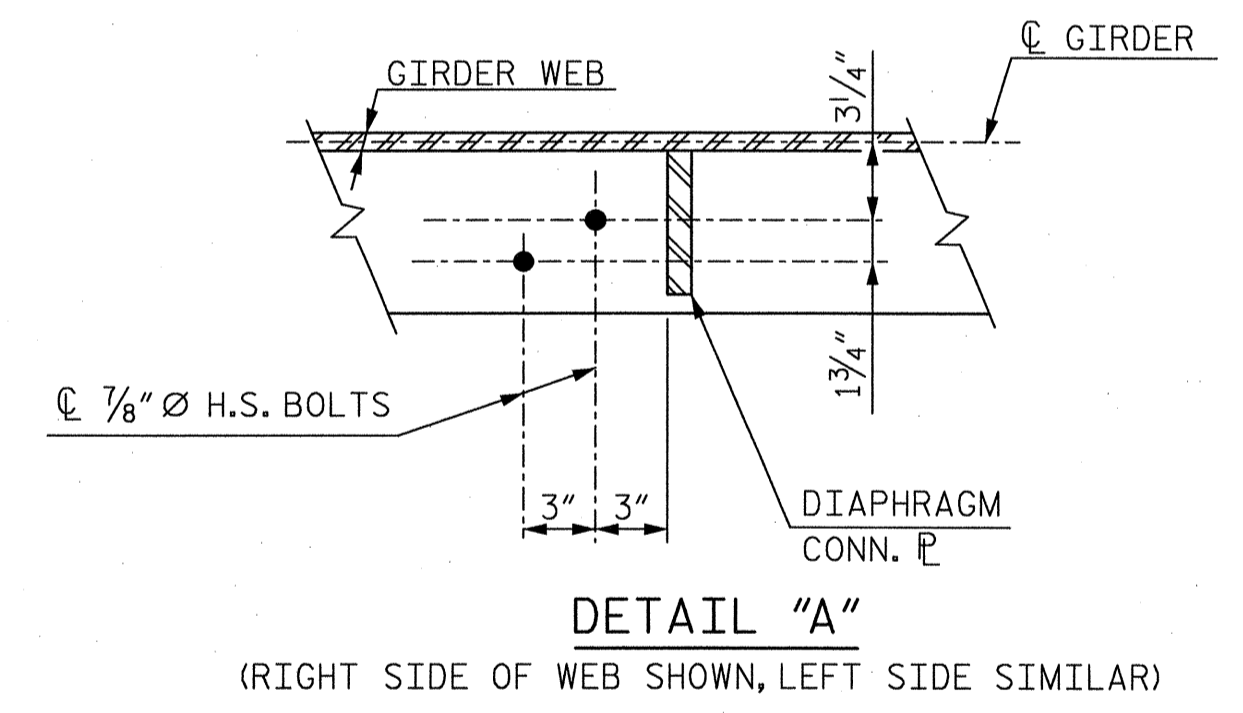
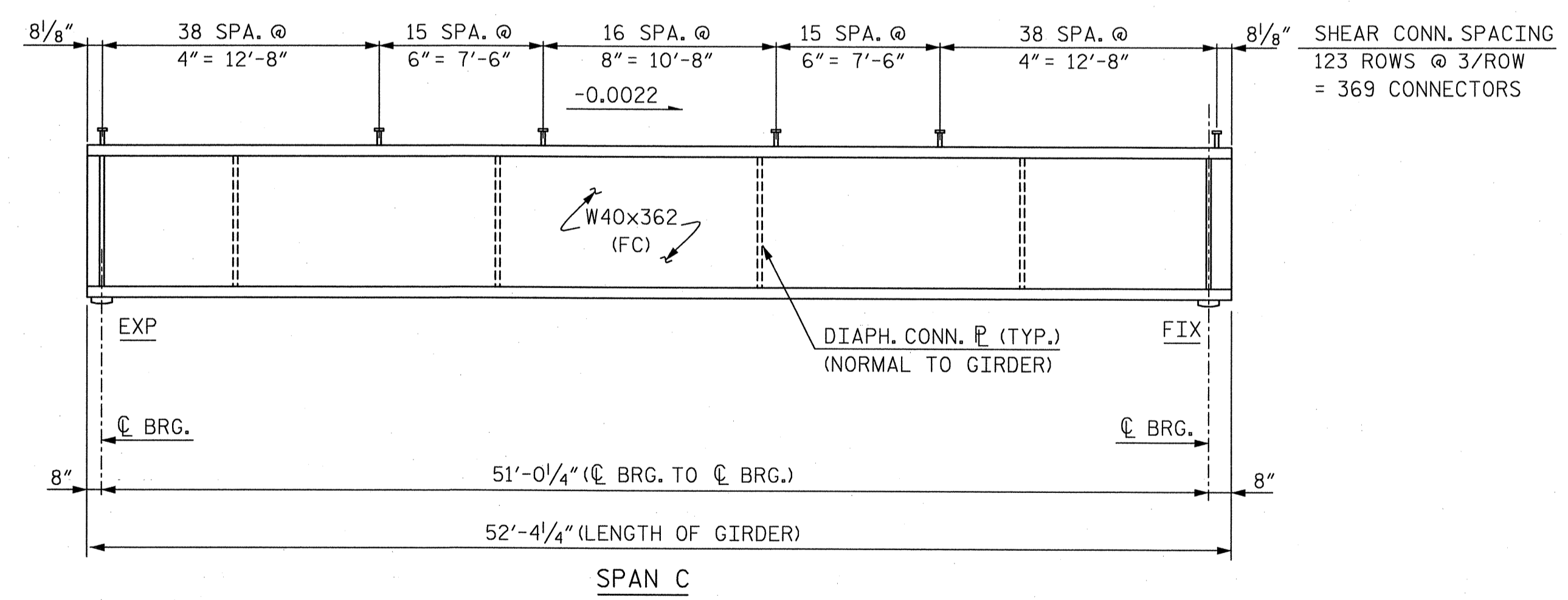
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1		3/12	3		
2		3/12	4		

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 License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
 DRAWN BY: J. BAYNE DATE: 3/12 DWG. NO. 12
 CHECKED BY: D. RAGAN DATE: 3/12

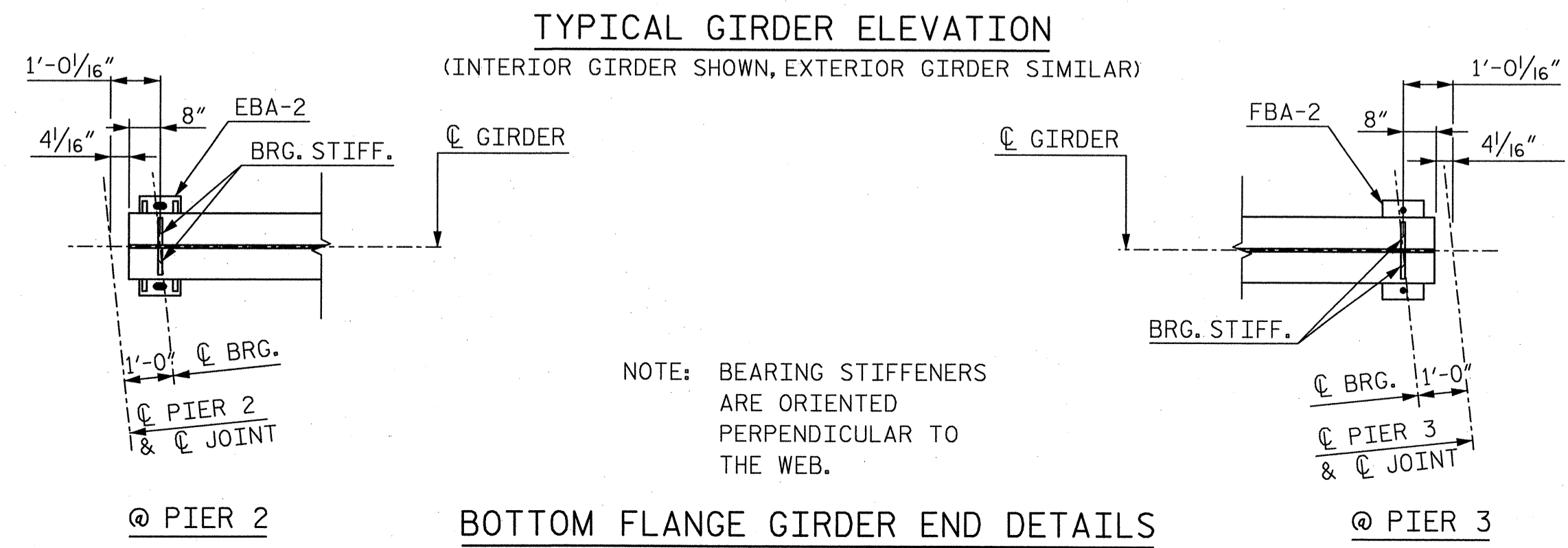
TOTAL SHEETS: 40



NOTES:
 ALL DIMENSIONS ON THIS DRAWING ARE HORIZONTAL.
 ALL $\text{\textcircled{C}}$ PIERS AND $\text{\textcircled{C}}$ BEARINGS ARE PARALLEL.
 NO SHOP CAMBER REQUIRED, TURN NATURAL MILL CAMBER UP.
 REFER TO "STRUCTURAL STEEL DETAILS" SHEET FOR:
 • STRUCTURE STEEL NOTES
 • DIAPHRAGM DETAILS
 • STIFFENER AND CONNECTOR $\text{\textcircled{P}}$ DETAILS
 • SHEAR CONNECTOR DETAILS
 FOR BEARINGS, SEE "BEARING DETAILS SPANS B & C" SHEET.
 FOR DRAIN PIPE SUPPORT DETAILS, SEE "STRUCTURE DRAINAGE DETAILS" SHEET 3 OF 4.
 FC = "FRACTURE CRITICAL"

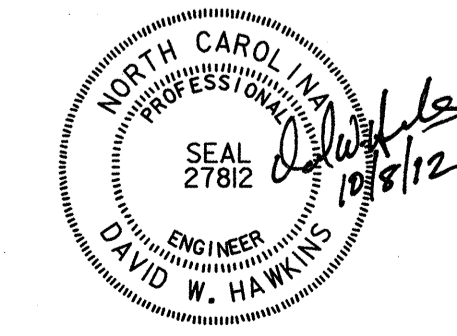
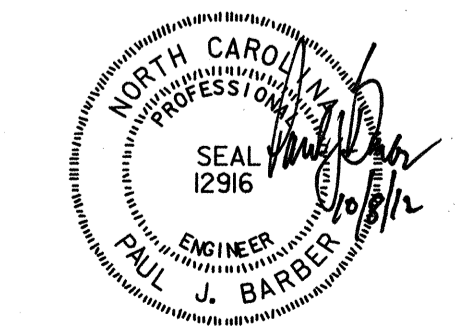


SPAN C GIRDER DIMENSIONS		
GIRDER	DIM. "A"	DIM. "B"
CG1	9'-0 1/4"	6'-0 1/16"
CG2	8'-8 1/4"	6'-4 1/16"
CG3	8'-4 3/16"	6'-8 7/8"
CG4	8'-0 3/16"	7'-0 1/8"
CG5	7'-8 3/16"	7'-4 1/8"
CG6	7'-4 1/8"	7'-8 3/16"
CG7	7'-0 1/8"	8'-0 3/16"
CG8	6'-8 1/8"	8'-4 3/16"
CG9	6'-4 1/16"	8'-8 1/4"
CG10	6'-0 1/16"	9'-0 1/4"



NOTE: BEARING STIFFENERS ARE ORIENTED PERPENDICULAR TO THE WEB.

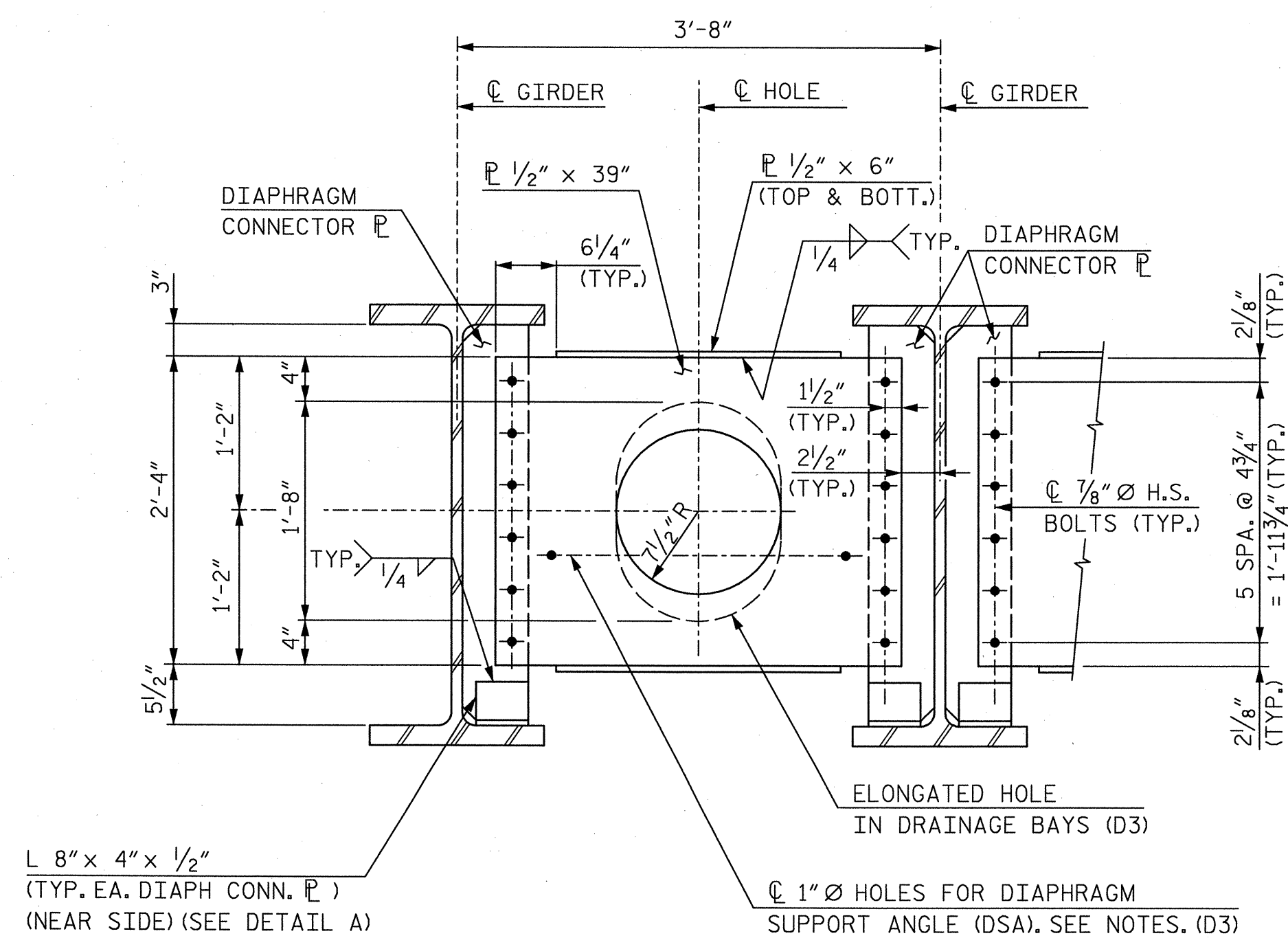
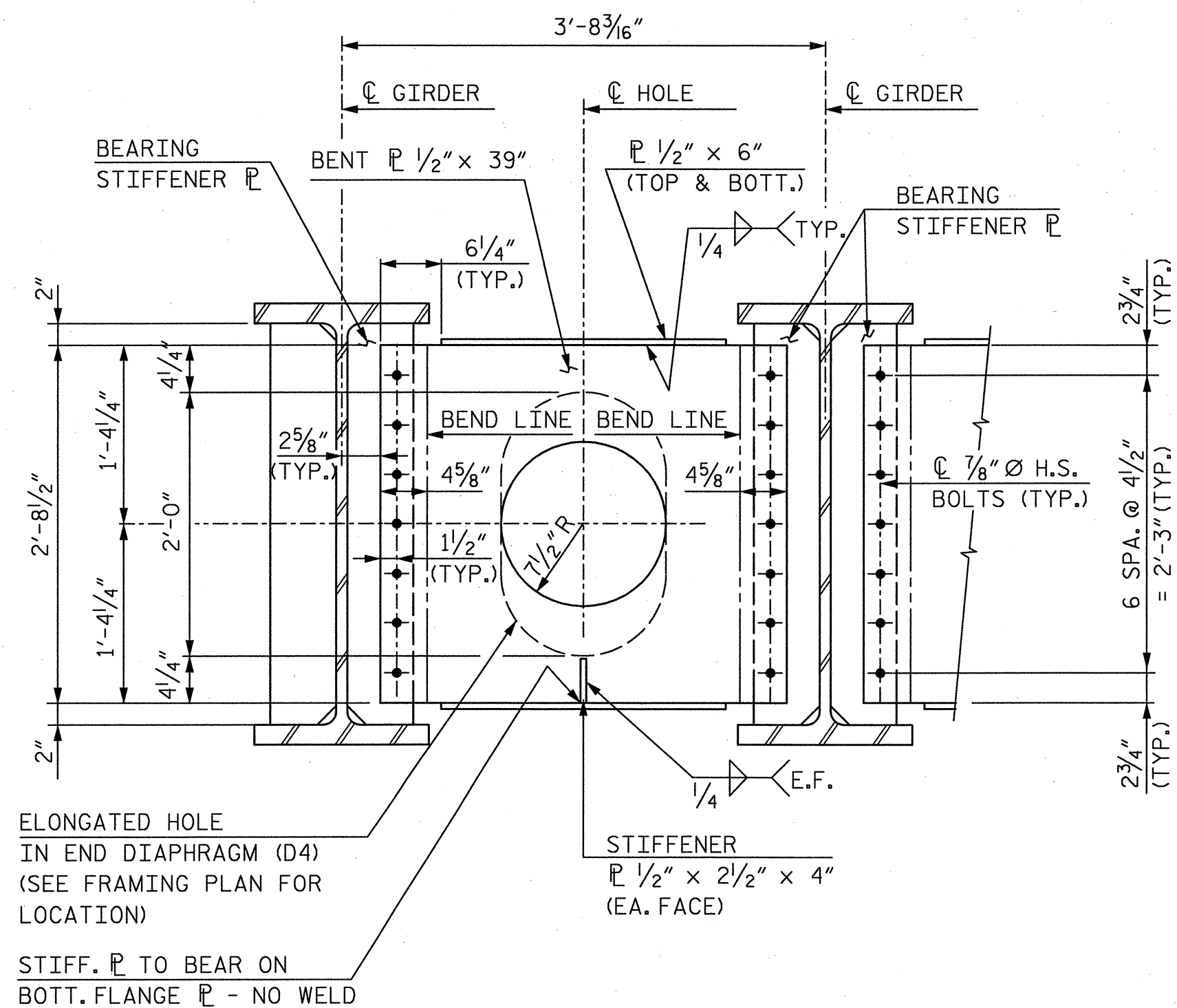
PROJECT NO. U-4716A/C
 DURHAM COUNTY
 STATION: POC STA. 3315+52.15 -MAIN-
 MILE POST: H64.60



HNTB HNTB NORTH CAROLINA, P.C.
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 DRAWN BY J. BAYNE DATE 3/12
 CHECKED BY D. RAGAN DATE 3/12 DWG. NO. 13

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH			
SUPERSTRUCTURE FRAMING PLAN AND GIRDER DETAILS SPAN C			
REVISIONS			
NO.	BY:	DATE:	DATE:
1		3	
2		4	

SHEET NO. S-13
TOTAL SHEETS 40



NOTES:

FOR DIAPHRAGM LOCATIONS, SEE FRAMING PLANS.

FOR DETAILS OF DIAPHRAGM SUPPORT ANGLES (DSA), SEE "STRUCTURE DRAINAGE DETAILS" SHEET 3 OF 4.

STRUCTURAL STEEL NOTES

STRUCTURAL STEEL: $f_s = 27.5$ ksi STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING ASTM SPECIFICATIONS:

W40x362 AND W40x211 MAIN GIRDERS:
A709, GRADE 50, WITH SUPPLEMENTALS S84-F2, S91 AND S93 APPLYING, AND WITH IMPACT TEST REQUIREMENT OF 25 ft-lb @ 40°F AS GOVERNED BY ASTM A673 FOR TEST FREQUENCY "P".

MISCELLANEOUS MATERIAL: A709, GRADE 50.

ANCHOR BOLTS FOR BEARING DEVICES SHALL CONFORM TO ASTM A449. ANCHOR BOLTS, NUTS, AND PLATE WASHERS SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH AASHTO M232.

STRUCTURAL STEEL ELEMENTS DENOTED AS "FC" ARE FRACTURE CRITICAL AND SHALL MEET IMPACT TEST REQUIREMENTS SET FORTH IN THE FRACTURE CONTROL PLAN OF THE AREMA MANUAL, CHAPTER 15, SECTION 1.2. TESTING SHALL BE BASED ON ZONE 2 REQUIREMENTS.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL UNLESS OTHERWISE NOTED.

MILL TEST REPORTS: NORFOLK SOUTHERN CORPORATION SHALL BE FURNISHED COPIES OF MILL TEST REPORTS FOR ALL MATERIALS EXCEPT MISCELLANEOUS PLATES AND SHAPES. REPORTS SHALL INDICATE COMPLIANCE WITH ALL SPECIFIED REQUIREMENTS.

INSPECTION: SHOP INSPECTION BY NORFOLK SOUTHERN CORPORATION OR ITS AUTHORIZED AGENT. SEE SPECIAL PROVISIONS FOR ADDITIONAL WELDING INSPECTION OF FLANGE PLATE TO WEB PLATE WELDS.

PAINTING STRUCTURAL STEEL: FOR ACRYLIC PAINT SYSTEM FOR STRUCTURAL STEEL, SEE SPECIAL PROVISIONS.

BOLTED CONNECTIONS SHALL BE MADE WITH 7/8" \bar{P} ASTM A325, TYPE 1 HIGH STRENGTH BOLTS WITH HARDENED WASHERS IN ACCORDANCE WITH A.R.E.M.A. SPECIFICATIONS USING THE TURN OF THE NUT METHOD. DIRECT TENSION INDICATORS SHALL NOT BE USED.

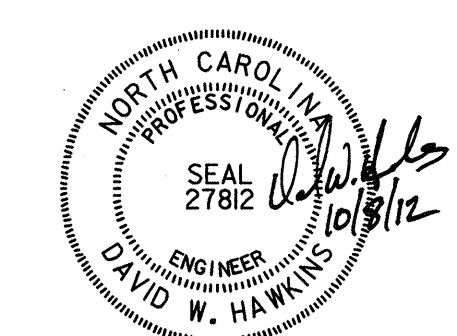
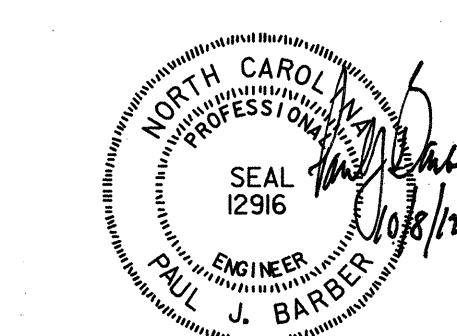
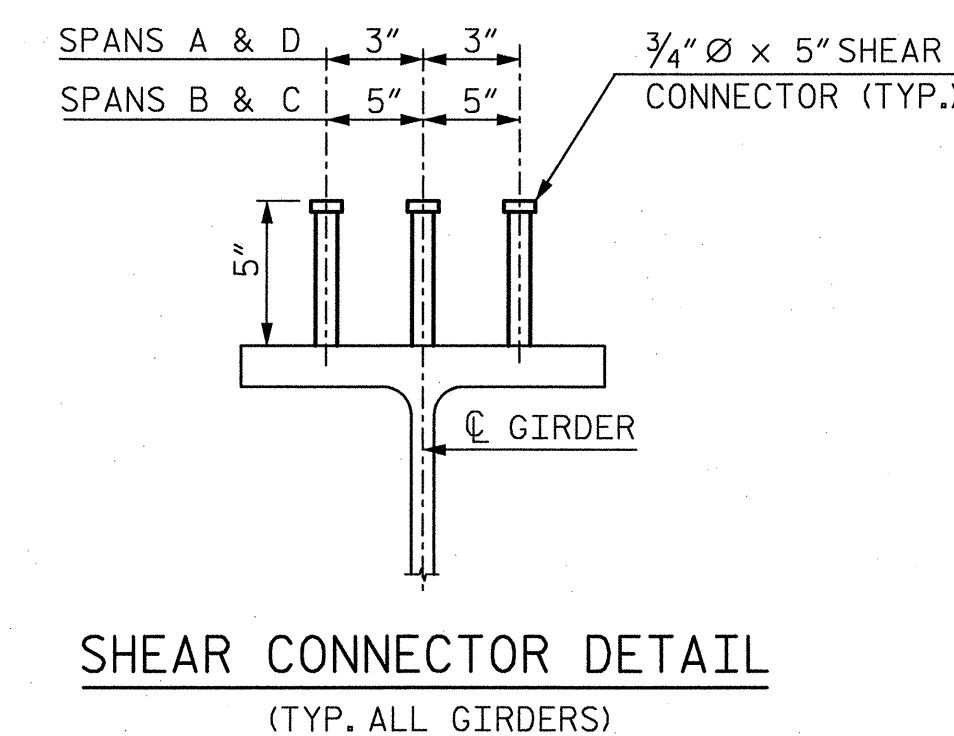
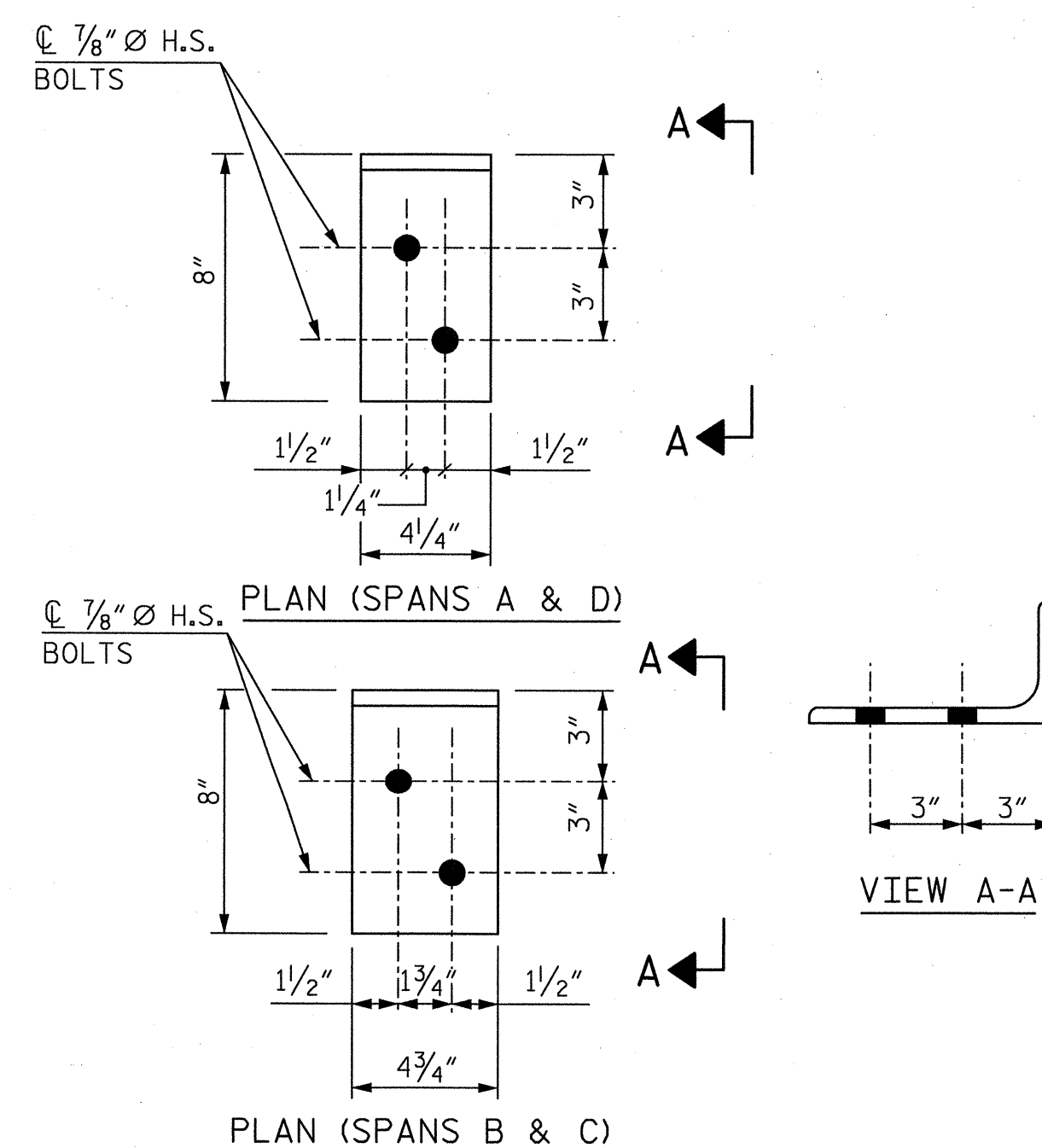
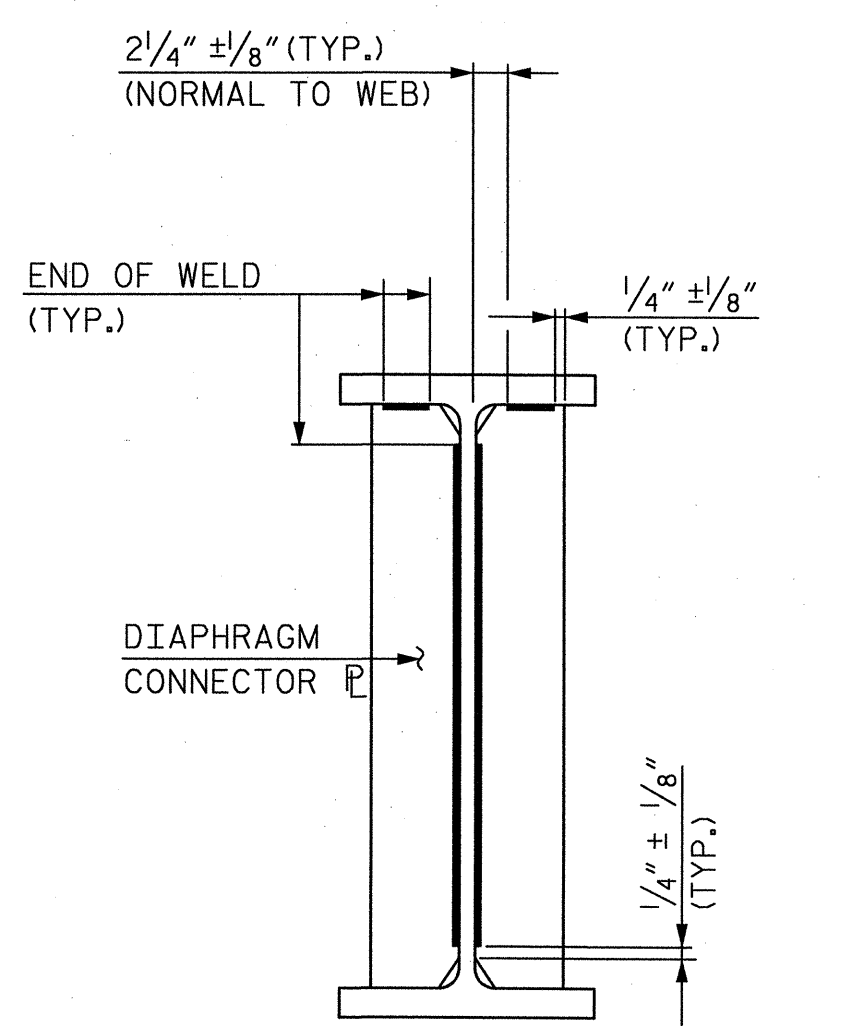
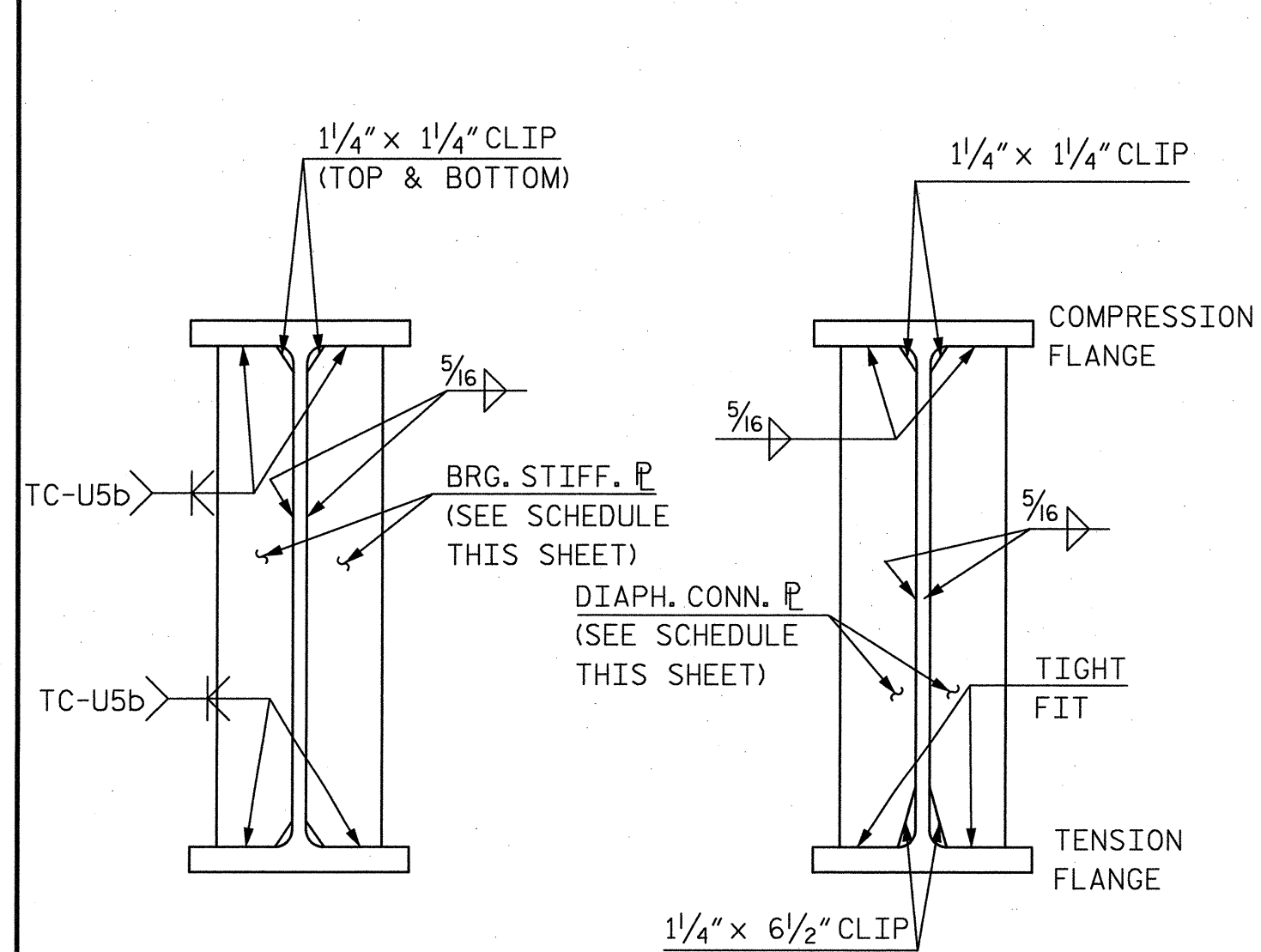
SHOP DRAWINGS: SHOP DRAWINGS SHALL BE APPROVED BY THE CHIEF ENGINEER - BRIDGES AND STRUCTURES, NORFOLK SOUTHERN CORPORATION, ATLANTA, G.A. SHOP DRAWINGS SHALL BE LABELED "NORFOLK SOUTHERN MP H-64.58".

HOLES: OPEN HOLES AS NOTED.

HIGH STRENGTH BOLTS, NUTS & WASHERS: ASTM DESIGNATION A325 AND SHALL BE GALVANIZED. IN ACCORDANCE WITH ASTM B695.

ANCHOR BOLTS SHALL BE 1/4" \bar{P} IN ACCORDANCE WITH A.R.E.M.A. SPECIFICATIONS AND SHALL BE GROUTED IN FORMED HOLES AFTER GIRDERS ARE ERECTED.

BEARING PADS SHALL BE USED WHENEVER STEEL MASONRY PLATE, OR OTHER STEEL BEARING PLATE, BEARS ON CONCRETE. PADS SHALL BE PREFORMED FABRIC BEARING PADS, 1/2" THICK. PREFORMED FABRIC BEARING PADS SHALL BE SHOCK PAD STYLE NO 15175 AS MANUFACTURED BY ALERT MANUFACTURING AND SUPPLY COMPANY, CHICAGO, ILLINOIS, OR FABREEKA PADS AS MANUFACTURED BY FABREEKA PRODUCTS COMPANY, BOSTON, MASSACHUSETTS, OR SORBTEX PADS AS MANUFACTURED BY VOSS ENGINEERING, INC., CHICAGO, ILLINOIS, OR APPROVED EQUAL.



PROJECT NO. U-4716A/C
DURHAM COUNTY
STATION: POC STA. 3315+52.15 -MAIN-
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
STRUCTURAL STEEL DETAILS

STIFFENER/CONN. \bar{P} SCHEDULE		
TYPE	SPANS A & D	SPANS B & C
BRG. STIFF.	\bar{P} 5/8" x 5 1/4"	\bar{P} 3/4" x 7 1/4"
DIAPH. CONN.	\bar{P} 1/2" x 5 1/4"	\bar{P} 1/2" x 6"

NOTE: SEE FRAMING PLANS FOR STIFFENER/CONN. \bar{P} LOCATIONS

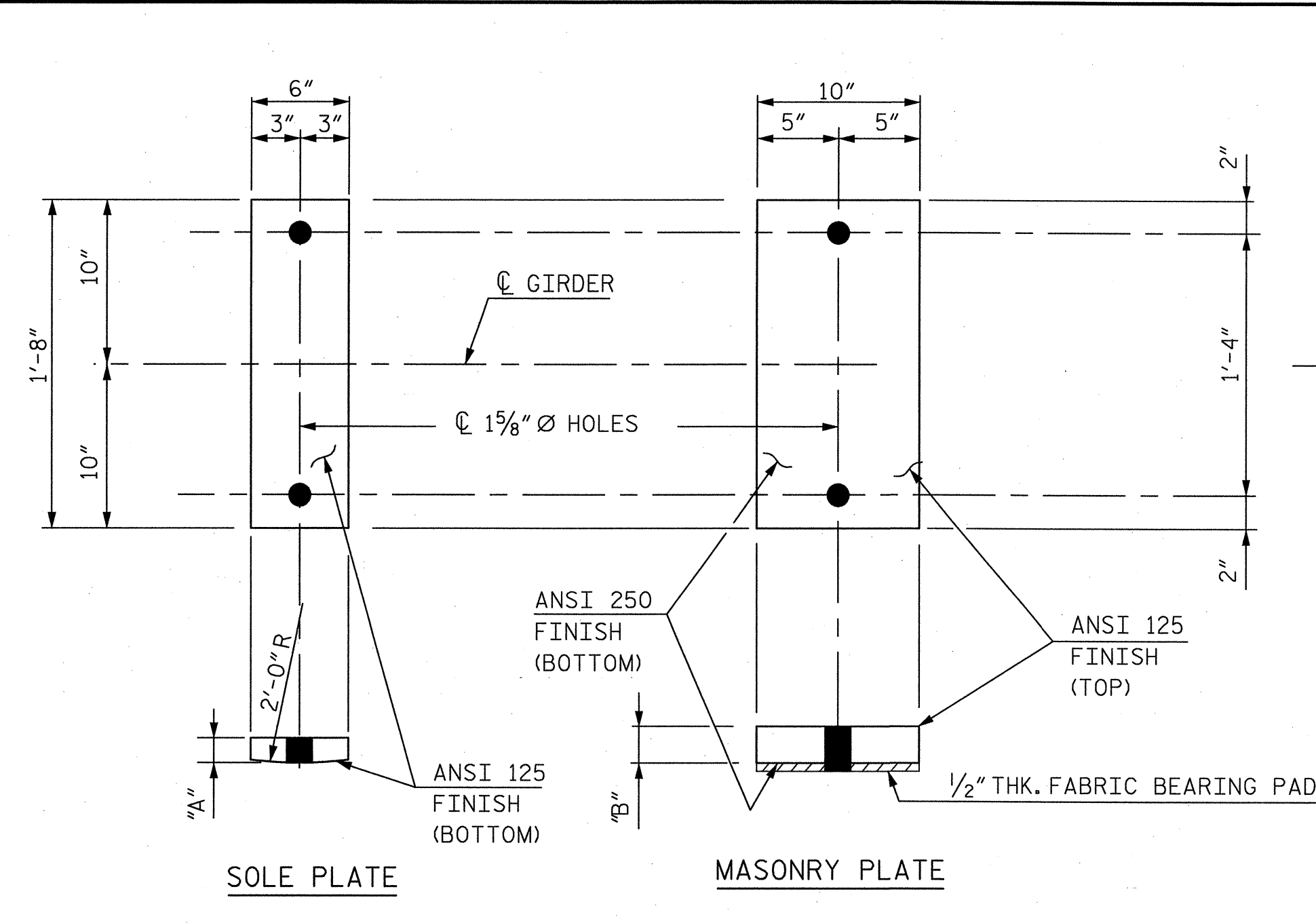
HNTB HNTB NORTH CAROLINA, P.C.
License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: J. BAYNE DATE: 3/12
CHECKED BY: K. DICKENS DATE: 3/12

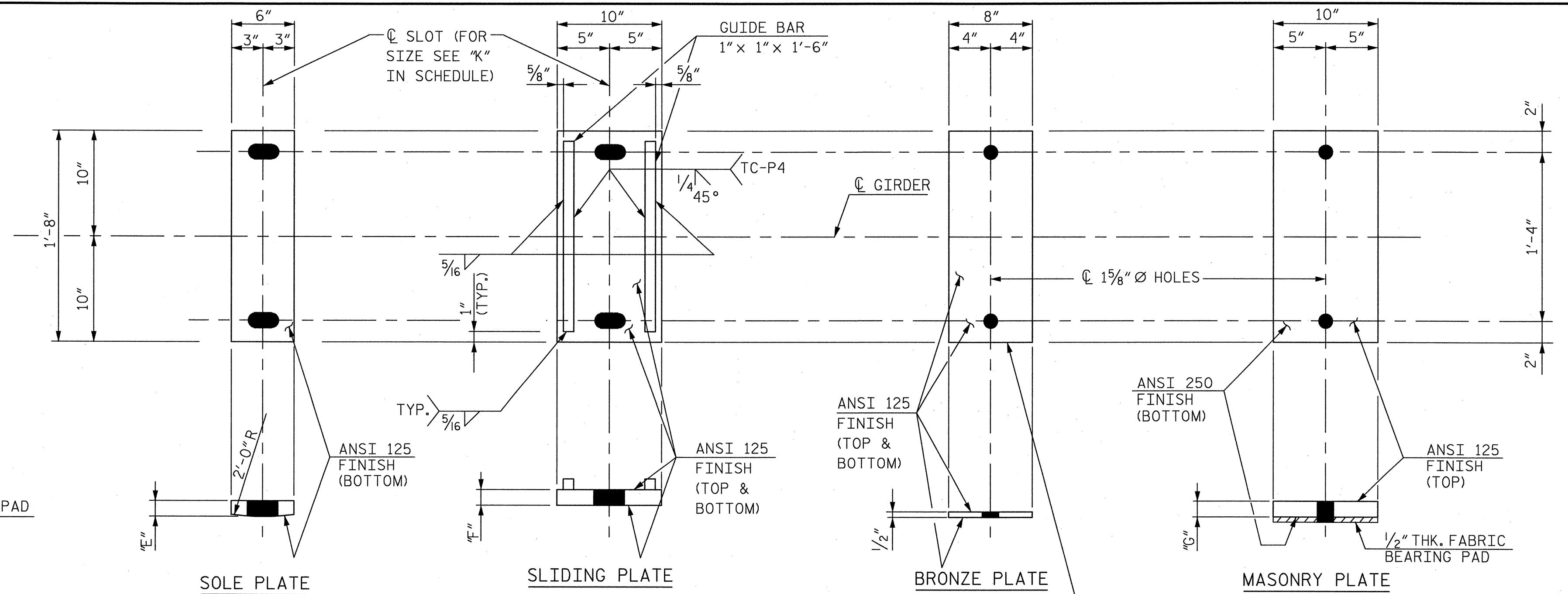
DWG. NO. 14

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TOTAL SHEETS: 40

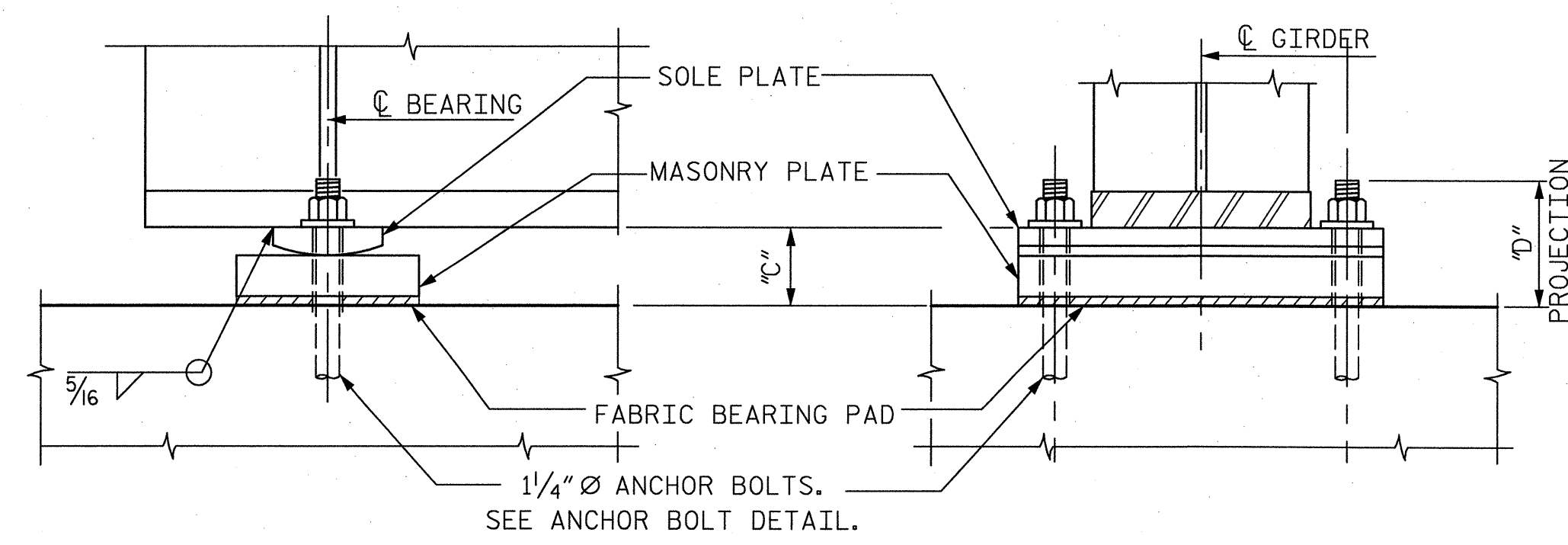


FIXED BEARINGS

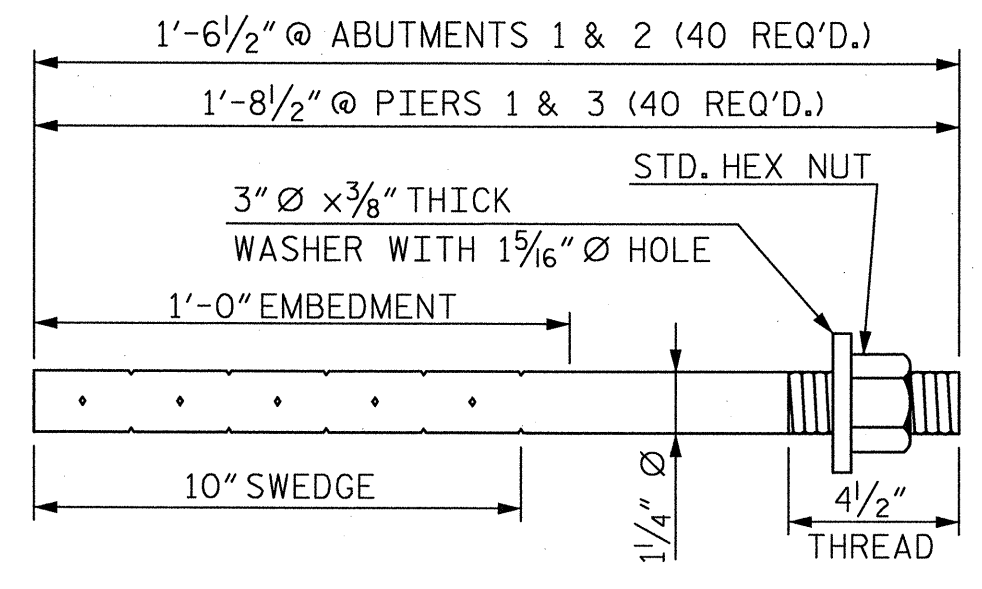


EXPANSION BEARINGS

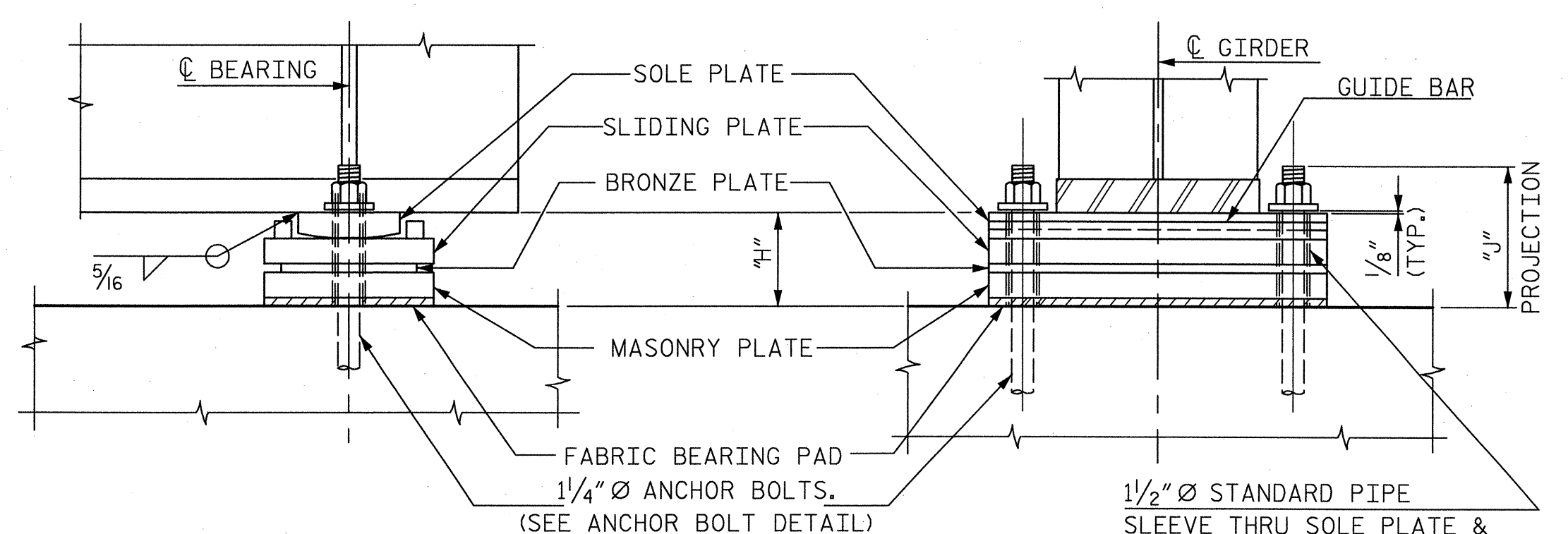
BRONZE PLATE TO BE ASTM B22 - COPPER ALLOY 913 OR ASTM B100 - COPPER ALLOY 510. TOP SURFACE TO BE SELF LUBRICATING.



FIXED BEARING ASSEMBLY (FBA-1)
(20 REQ'D)



ANCHOR BOLT DETAIL

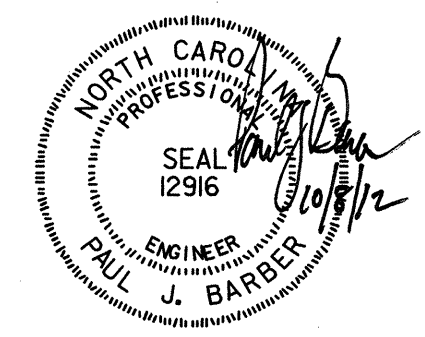


EXPANSION BEARING ASSEMBLY (EBA-1)
(20 REQ'D)

GIRDER	BEARING PLATE SCHEDULE									
	DIMENSIONS (in)									
	FIXED BEARING (FBA-1)				EXPANSION BEARING (EBA-1)					
	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"J"	"K"
AG1	1 1/2"	2 1/4"	4 1/4"	6 1/2"	1 1/2"	1 1/2"	1 1/2"	5 1/2"	8 1/2"	2" x 3"
AG2	1 1/2"	2 1/4"	4 1/4"	6 1/2"	1 1/2"	1 1/2"	1 1/2"	5 1/2"	8 1/2"	2" x 3"
AG3	1 1/2"	2 1/4"	4 1/4"	6 1/2"	1 1/2"	1 1/2"	1 1/2"	5 1/2"	8 1/2"	2" x 3"
AG4	1 1/2"	2 1/4"	4 1/4"	6 1/2"	1 1/2"	1 1/2"	1 1/2"	5 1/2"	8 1/2"	2" x 3"
AG5	1 1/2"	2 1/4"	4 1/4"	6 1/2"	1 1/2"	1 1/2"	1 1/2"	5 1/2"	8 1/2"	2" x 3"
AG6	1 1/2"	2 1/4"	4 1/4"	6 1/2"	1 1/2"	1 1/2"	1 1/2"	5 1/2"	8 1/2"	2" x 3"
AG7	1 1/2"	2 1/4"	4 1/4"	6 1/2"	1 1/2"	1 1/2"	1 1/2"	5 1/2"	8 1/2"	2" x 3"
AG8	1 1/2"	2 1/4"	4 1/4"	6 1/2"	1 1/2"	1 1/2"	1 1/2"	5 1/2"	8 1/2"	2" x 3"
AG9	1 1/2"	2 1/4"	4 1/4"	6 1/2"	1 1/2"	1 1/2"	1 1/2"	5 1/2"	8 1/2"	2" x 3"
AG10	1 1/2"	2 1/4"	4 1/4"	6 1/2"	1 1/2"	1 1/2"	1 1/2"	5 1/2"	8 1/2"	2" x 3"
DG1	1 1/2"	2 1/4"	4 1/4"	6 1/2"	1 1/2"	1 1/2"	1 5/8"	5 5/8"	8 1/2"	2" x 3"
DG2	1 1/2"	2 1/4"	4 1/4"	6 1/2"	1 1/2"	1 1/2"	1 5/8"	5 5/8"	8 1/2"	2" x 3"
DG3	1 1/2"	2 1/4"	4 1/4"	6 1/2"	1 1/2"	1 1/2"	1 1/2"	5 1/2"	8 1/2"	2" x 3"
DG4	1 1/2"	2 1/4"	4 1/4"	6 1/2"	1 1/2"	1 1/2"	1 1/2"	5 1/2"	8 1/2"	2" x 3"
DG5	1 1/2"	2 1/4"	4 1/4"	6 1/2"	1 1/2"	1 1/2"	1 1/2"	5 1/2"	8 1/2"	2" x 3"
DG6	1 1/2"	2 1/4"	4 1/4"	6 1/2"	1 1/2"	1 1/2"	1 1/2"	5 1/2"	8 1/2"	2" x 3"
DG7	1 1/2"	2 1/4"	4 1/4"	6 1/2"	1 1/2"	1 1/2"	1 1/2"	5 1/2"	8 1/2"	2" x 3"
DG8	1 1/2"	2 1/4"	4 1/4"	6 1/2"	1 1/2"	1 1/2"	1 1/2"	5 1/2"	8 1/2"	2" x 3"
DG9	1 1/2"	2 1/4"	4 1/4"	6 1/2"	1 1/2"	1 1/2"	1 1/2"	5 1/2"	8 1/2"	2" x 3"
DG10	1 1/2"	2 1/4"	4 1/4"	6 1/2"	1 1/2"	1 1/2"	1 1/2"	5 1/2"	8 1/2"	2" x 3"

NOTES:

- ANCHOR BOLTS, SLIDING PLATE (EXPANSION BEARING) AND MASONRY PLATE (FIXED AND EXPANSION BEARINGS) SHALL BE HOT DIPPED GALVANIZED.
- ALL PLATE SURFACES SHALL BE PAINTED WITH A 3 COAT PAINT SYSTEM EXCEPT AS SPECIFIED BELOW.
- (A) THE SLIDING PLATE (EXPANSION BEARING) SHALL NOT BE PAINTED BUT SHALL RECEIVE A COAT OF LUBRICATION.
- (B) THE MASONRY PLATE (FIXED AND EXPANSION BEARINGS) SHALL NOT BE PAINTED.
- (C) THE BOTTOM SURFACE OF THE SOLE PLATE SHALL NOT BE PAINTED BUT SHALL RECEIVE A SINGLE COAT OF PRIMER APPLIED IN THE SHOP.
- (D) THE TOP SURFACE OF THE SOLE PLATE SHALL NOT BE PAINTED IN THE VICINITY OF THE WELD BETWEEN THE SOLE PLATE AND THE BOTTOM FLANGE.
- FOR ACRYLIC PAINT SYSTEM FOR STRUCTURAL STEEL, SEE SPECIAL PROVISIONS.
- FOR SELF LUBRICATING EXPANSION BEARING ASSEMBLIES, SEE SPECIAL PROVISIONS.

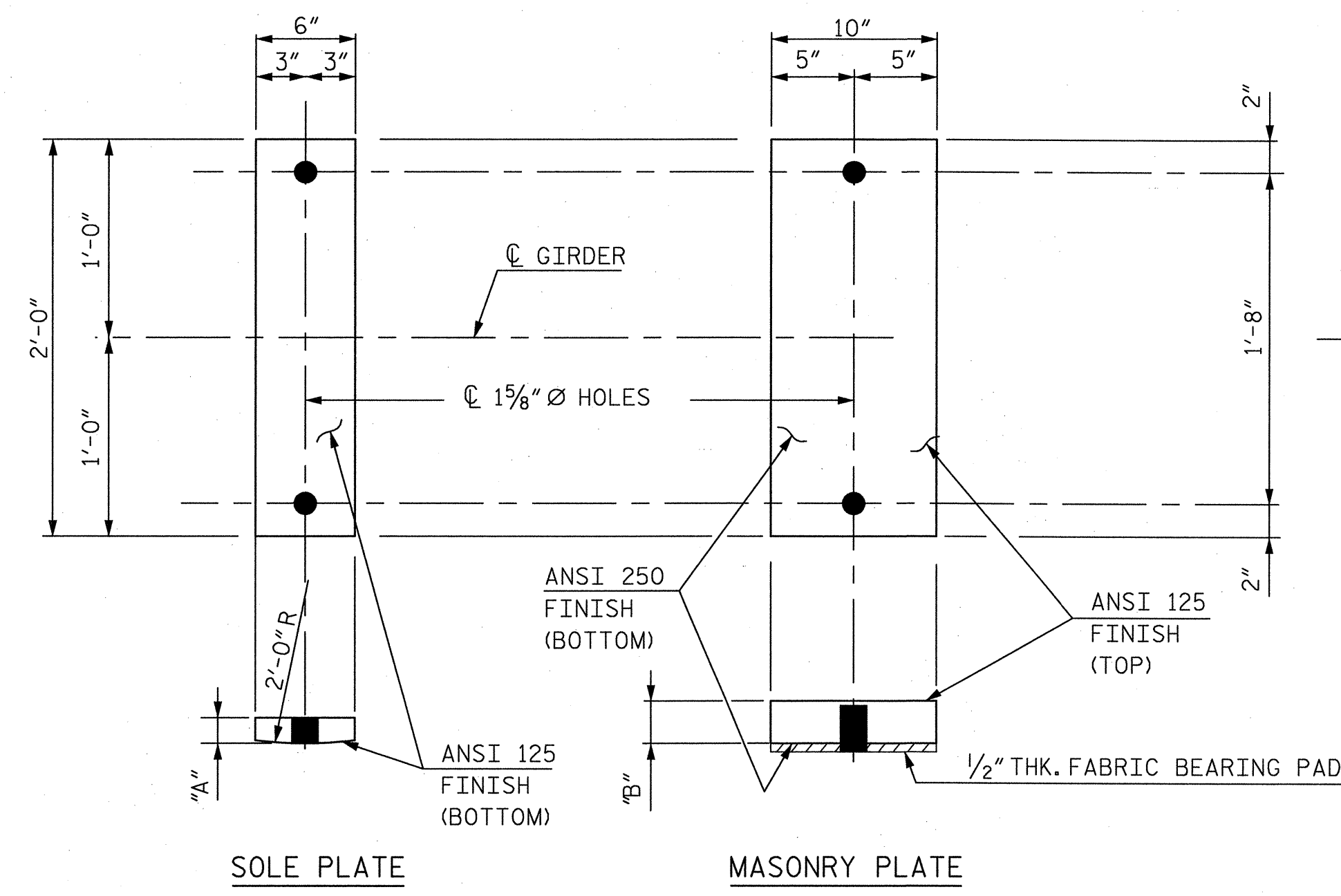


PROJECT NO. U-4716A/C
DURHAM COUNTY
STATION: POC STA. 3315+52.15 -MAIN-
MILE POST: H64.60

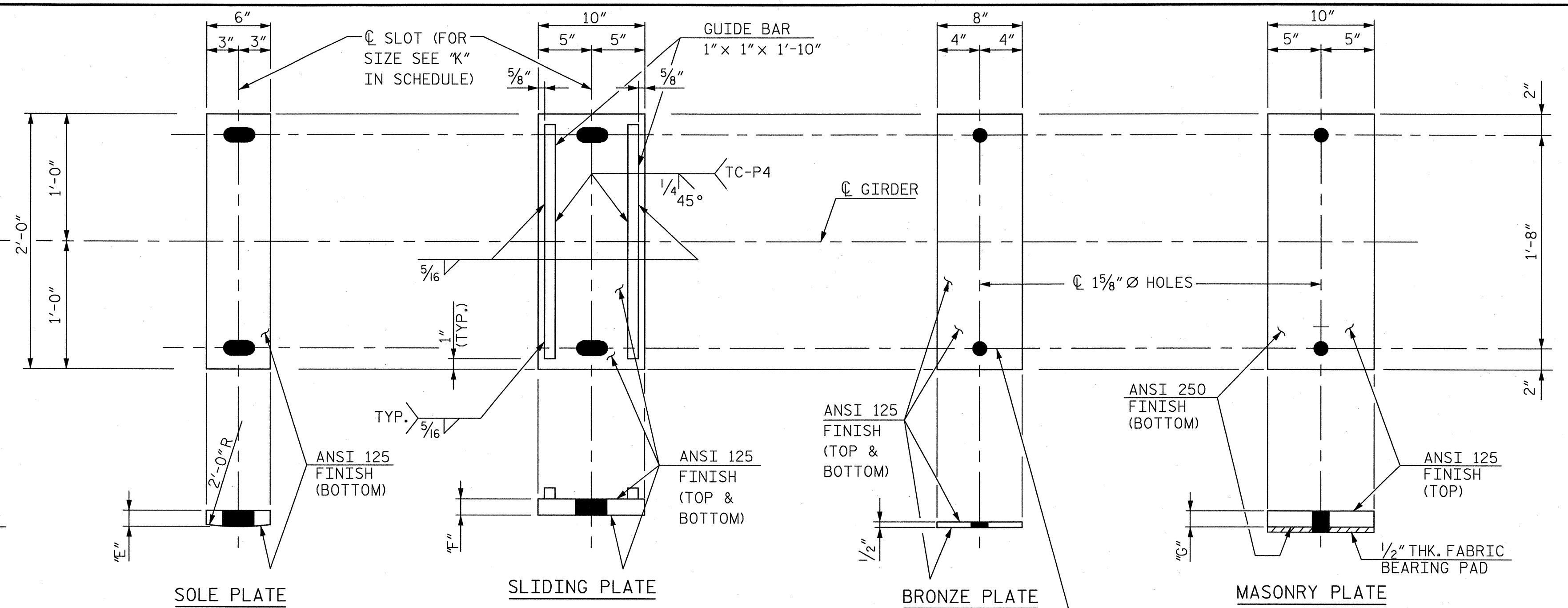
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
BEARING DETAILS
SPANS A & D

HNTB		HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: J. BAYNE	DATE: 3/12	DWG. NO. 15	
CHECKED BY: D. HAWKINS	DATE: 3/12		

REVISIONS				SHEET NO. S-15
NO.	BY:	DATE:	TOTAL SHEETS 40	
1				
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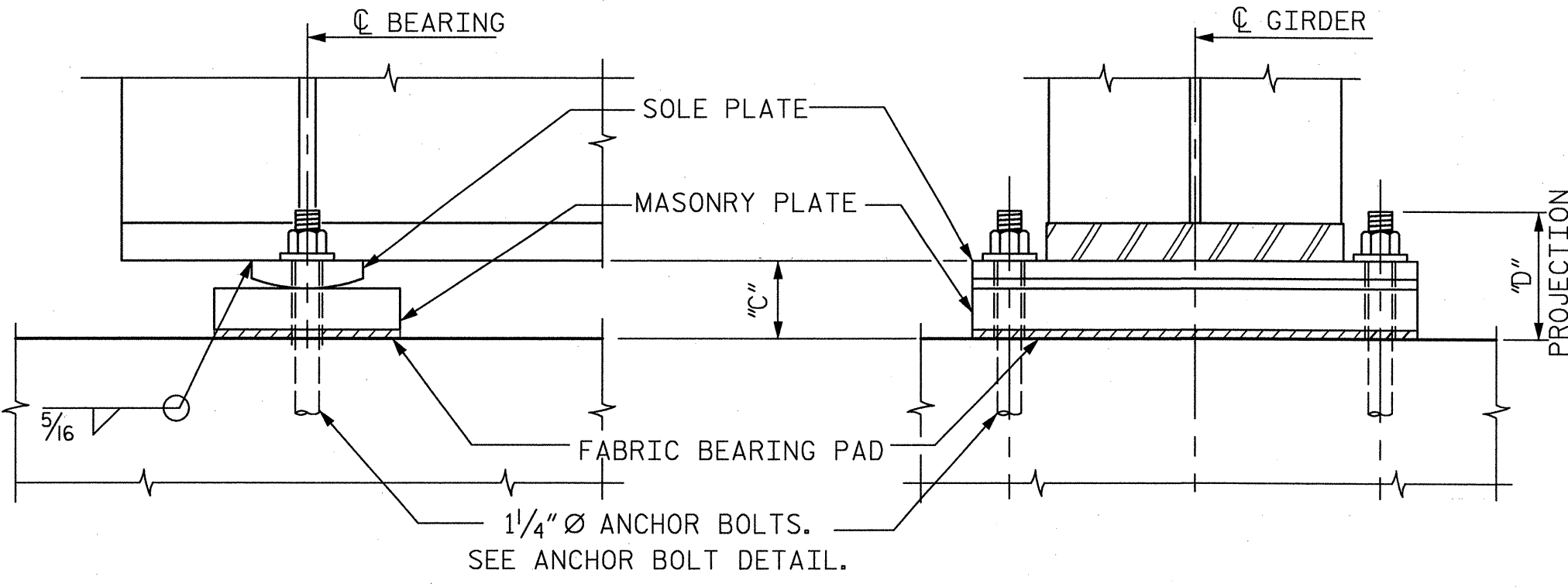


FIXED BEARINGS

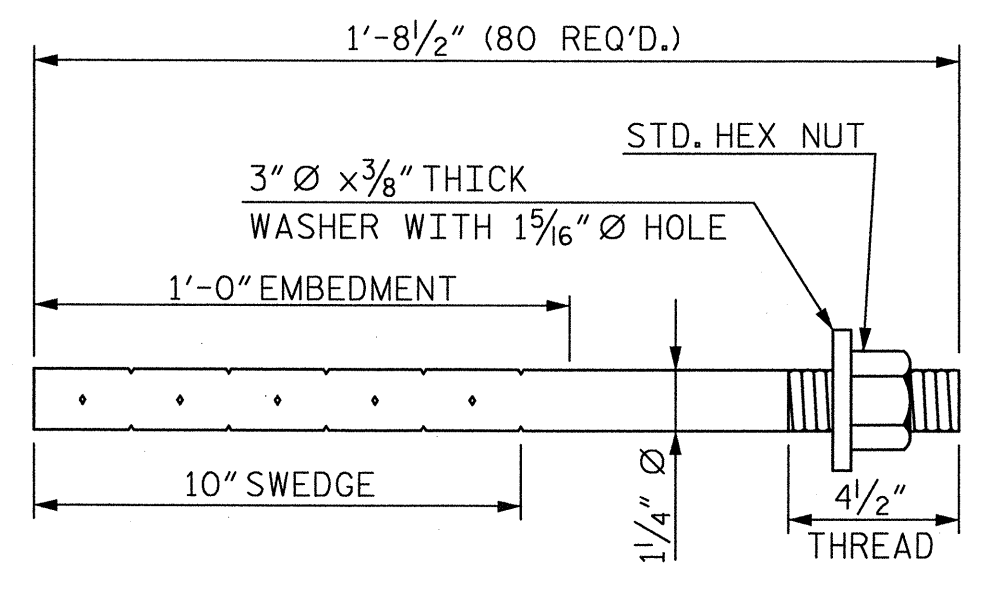


EXPANSION BEARINGS

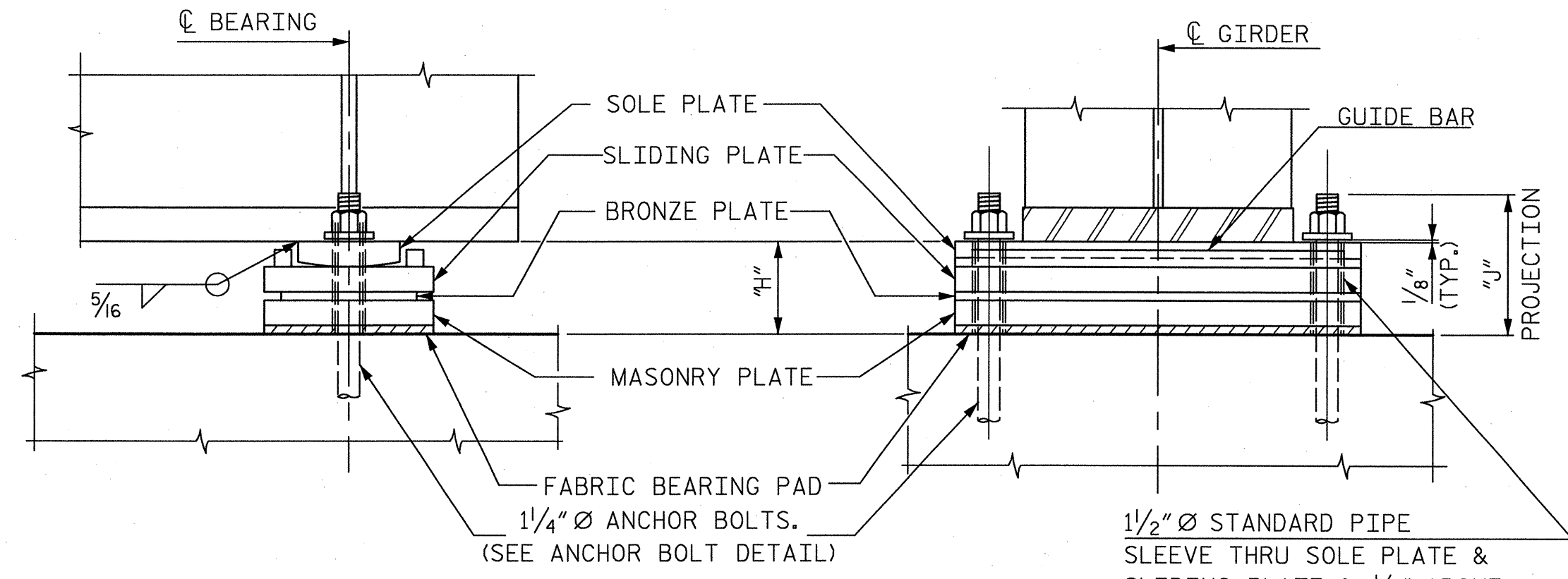
BRONZE PLATE TO BE ASTM B22 - COPPER ALLOY 913 OR ASTM B100 - COPPER ALLOY 510. TOP SURFACE TO BE SELF LUBRICATING.



FIXED BEARING ASSEMBLY (FBA-2)
(20 REQ'D)



ANCHOR BOLT DETAIL

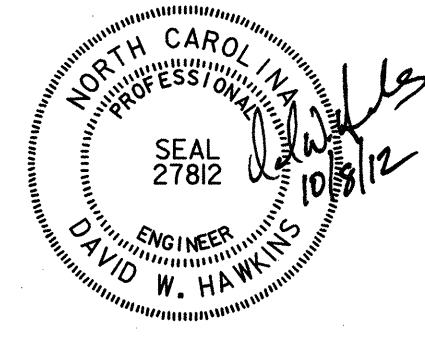
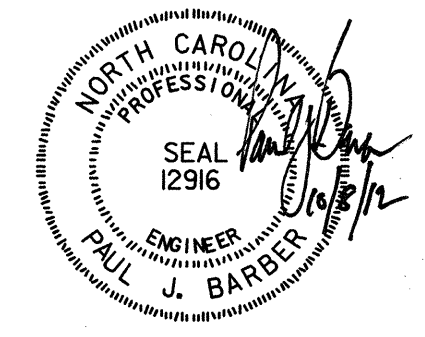


EXPANSION BEARING ASSEMBLY (EBA-2)
(20 REQ'D)

GIRDER	BEARING PLATE SCHEDULE									
	DIMENSIONS (In)									
	FIXED BEARING (FBA-2)					EXPANSION BEARING (EBA-2)				
	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"J"	"K"
BG1	1 1/2"	2 7/8"	4 7/8"	8 1/2"	1 1/2"	1 1/2"	1 7/8"	5 7/8"	8 1/2"	2" x 3 1/4"
BG2	1 1/2"	2 7/8"	4 7/8"	8 1/2"	1 1/2"	1 1/2"	1 7/8"	5 7/8"	8 1/2"	2" x 3 1/4"
BG3	1 1/2"	2 7/8"	4 7/8"	8 1/2"	1 1/2"	1 1/2"	1 3/4"	5 3/4"	8 1/2"	2" x 3 1/4"
BG4	1 1/2"	2 7/8"	4 7/8"	8 1/2"	1 1/2"	1 1/2"	1 3/4"	5 3/4"	8 1/2"	2" x 3 1/4"
BG5	1 1/2"	2 7/8"	4 7/8"	8 1/2"	1 1/2"	1 1/2"	1 3/4"	5 3/4"	8 1/2"	2" x 3 1/4"
BG6	1 1/2"	2 7/8"	4 7/8"	8 1/2"	1 1/2"	1 1/2"	1 3/4"	5 3/4"	8 1/2"	2" x 3 1/4"
BG7	1 1/2"	2 7/8"	4 7/8"	8 1/2"	1 1/2"	1 1/2"	1 3/4"	5 3/4"	8 1/2"	2" x 3 1/4"
BG8	1 1/2"	2 7/8"	4 7/8"	8 1/2"	1 1/2"	1 1/2"	1 3/4"	5 3/4"	8 1/2"	2" x 3 1/4"
BG9	1 1/2"	2 7/8"	4 7/8"	8 1/2"	1 1/2"	1 1/2"	1 3/4"	5 3/4"	8 1/2"	2" x 3 1/4"
BG10	1 1/2"	2 7/8"	4 7/8"	8 1/2"	1 1/2"	1 1/2"	1 3/4"	5 3/4"	8 1/2"	2" x 3 1/4"
CG1	1 1/2"	3"	5"	8 1/2"	1 1/2"	1 1/2"	1 3/4"	5 3/4"	8 1/2"	2" x 3 1/4"
CG2	1 1/2"	3"	5"	8 1/2"	1 1/2"	1 1/2"	1 3/4"	5 3/4"	8 1/2"	2" x 3 1/4"
CG3	1 1/2"	3"	5"	8 1/2"	1 1/2"	1 1/2"	1 3/4"	5 3/4"	8 1/2"	2" x 3 1/4"
CG4	1 1/2"	3"	5"	8 1/2"	1 1/2"	1 1/2"	1 3/4"	5 3/4"	8 1/2"	2" x 3 1/4"
CG5	1 1/2"	3"	5"	8 1/2"	1 1/2"	1 1/2"	1 3/4"	5 3/4"	8 1/2"	2" x 3 1/4"
CG6	1 1/2"	3"	5"	8 1/2"	1 1/2"	1 1/2"	1 3/4"	5 3/4"	8 1/2"	2" x 3 1/4"
CG7	1 1/2"	3"	5"	8 1/2"	1 1/2"	1 1/2"	1 3/4"	5 3/4"	8 1/2"	2" x 3 1/4"
CG8	1 1/2"	3"	5"	8 1/2"	1 1/2"	1 1/2"	1 3/4"	5 3/4"	8 1/2"	2" x 3 1/4"
CG9	1 1/2"	3"	5"	8 1/2"	1 1/2"	1 1/2"	1 3/4"	5 3/4"	8 1/2"	2" x 3 1/4"
CG10	1 1/2"	3"	5"	8 1/2"	1 1/2"	1 1/2"	1 3/4"	5 3/4"	8 1/2"	2" x 3 1/4"

NOTES:

- ANCHOR BOLTS, SLIDING PLATE (EXPANSION BEARING) AND MASONRY PLATE (FIXED AND EXPANSION BEARINGS) SHALL BE HOT DIPPED GALVANIZED.
 - ALL PLATE SURFACES SHALL BE PAINTED WITH A 3 COAT PAINT SYSTEM EXCEPT AS SPECIFIED BELOW.
 - (A) THE SLIDING PLATE (EXPANSION BEARING) SHALL NOT BE PAINTED BUT SHALL RECEIVE A COAT OF LUBRICATION.
 - (B) THE MASONRY PLATE (FIXED AND EXPANSION BEARINGS) SHALL NOT BE PAINTED.
 - (C) THE BOTTOM SURFACE OF THE SOLE PLATE SHALL NOT BE PAINTED BUT SHALL RECEIVE A SINGLE COAT OF PRIMER APPLIED IN THE SHOP.
 - (D) THE TOP SURFACE OF THE SOLE PLATE SHALL NOT BE PAINTED IN THE VICINITY OF THE WELD BETWEEN THE SOLE PLATE AND THE BOTTOM FLANGE.
- FOR ACRYLIC PAINT SYSTEM FOR STRUCTURAL STEEL, SEE SPECIAL PROVISIONS.
- FOR SELF LUBRICATING EXPANSION BEARING ASSEMBLIES, SEE SPECIAL PROVISIONS.

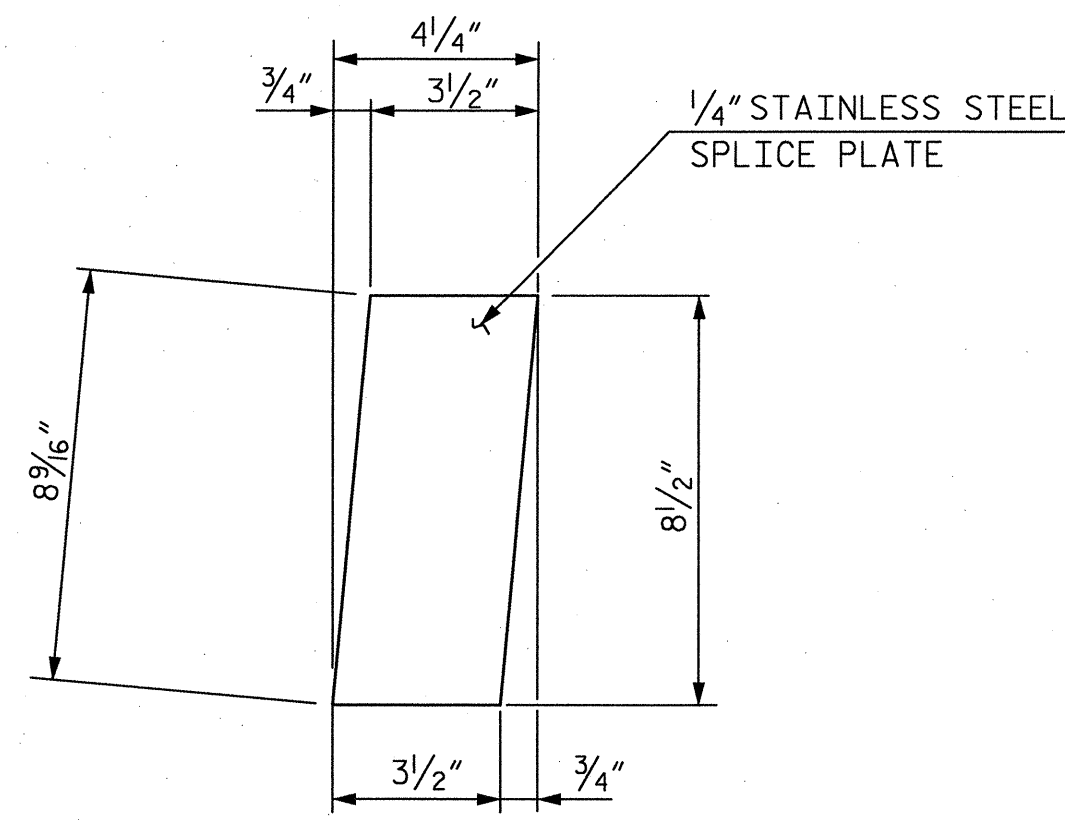


PROJECT NO. U-4716A/C
DURHAM COUNTY
STATION: POC STA. 3315+52.15 -MAIN-
MILE POST: H64.60

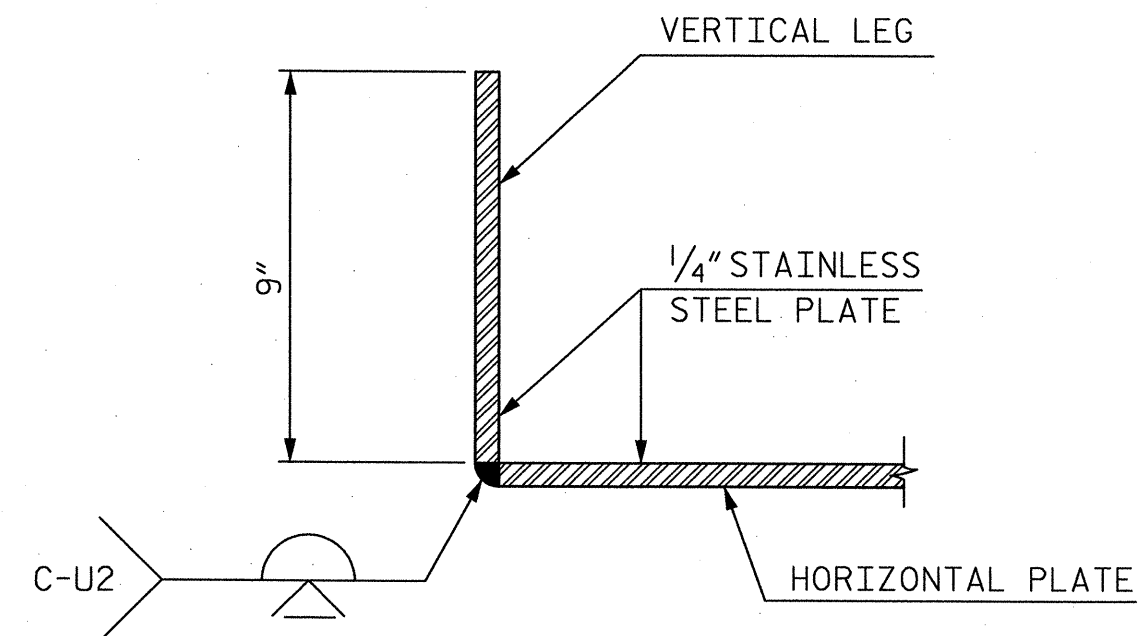
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
BEARING DETAILS
SPANS B & C

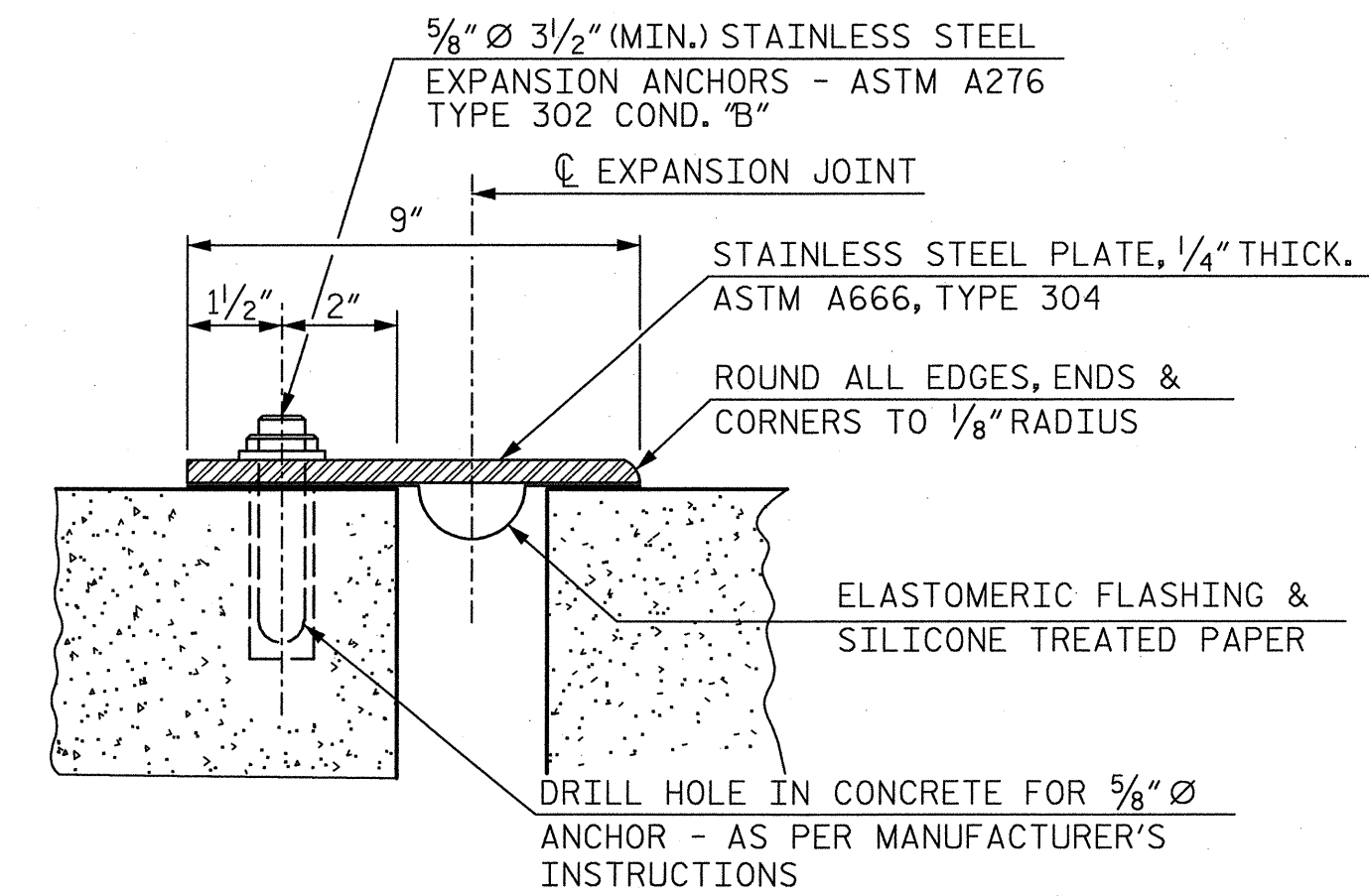
HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS		SHEET NO. S-16
DRAWN BY: J. BAYNE	DATE: 3/12	NO. 3	BY: DATE:	TOTAL SHEETS 40
CHECKED BY: D. DAWKINS	DATE: 3/12	NO. 4	BY: DATE:	
DWG. NO. 16				



DETAIL A



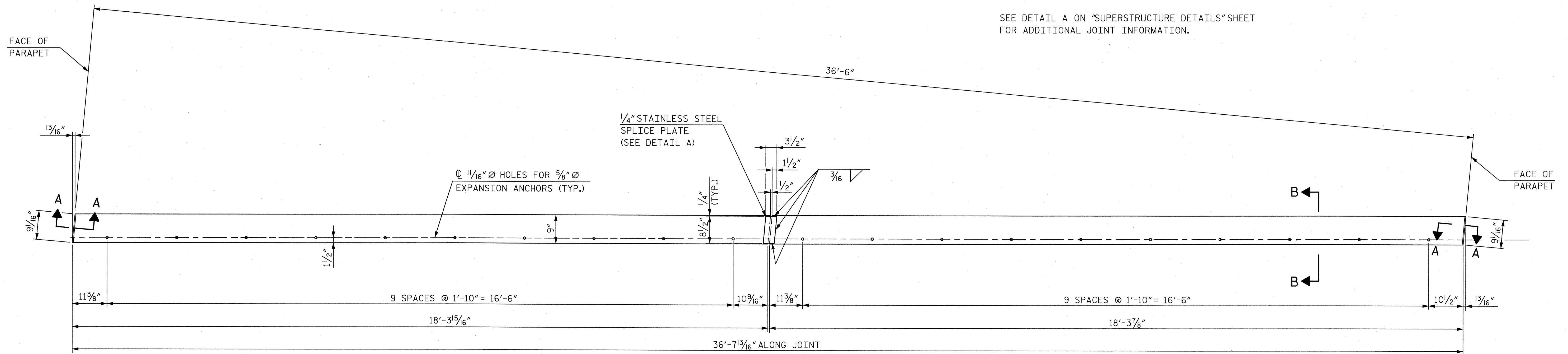
SECTION A-A



SECTION B-B

DETAIL OF EXPANSION ANCHOR AND PLATE

SEE DETAIL A ON "SUPERSTRUCTURE DETAILS" SHEET FOR ADDITIONAL JOINT INFORMATION.



PLAN - EXPANSION PLATE

(5 REQUIRED)

NOTE: PAYMENT FOR THE EXPANSION PLATE AND EXPANSION ANCHORS IS INCLUDED IN THE COST FOR STRUCTURE STEEL.

PLATE SHALL BE ANCHORED AT BACKWALL OF ABUTMENT 1 & 2, SPAN B SIDE OF PIER 1, SPAN B SIDE OF PIER 2 AND SPAN C SIDE OF PIER 3.

PROJECT NO. U-4716A/C

DURHAM COUNTY

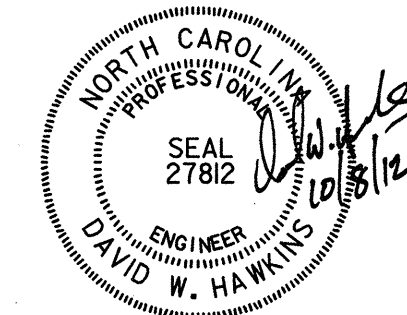
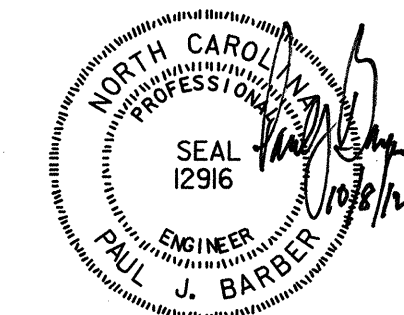
STATION: POC STA. 3315+52.15 -MAIN-

MILE POST: H64.60

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

EXPANSION PLATE DETAILS

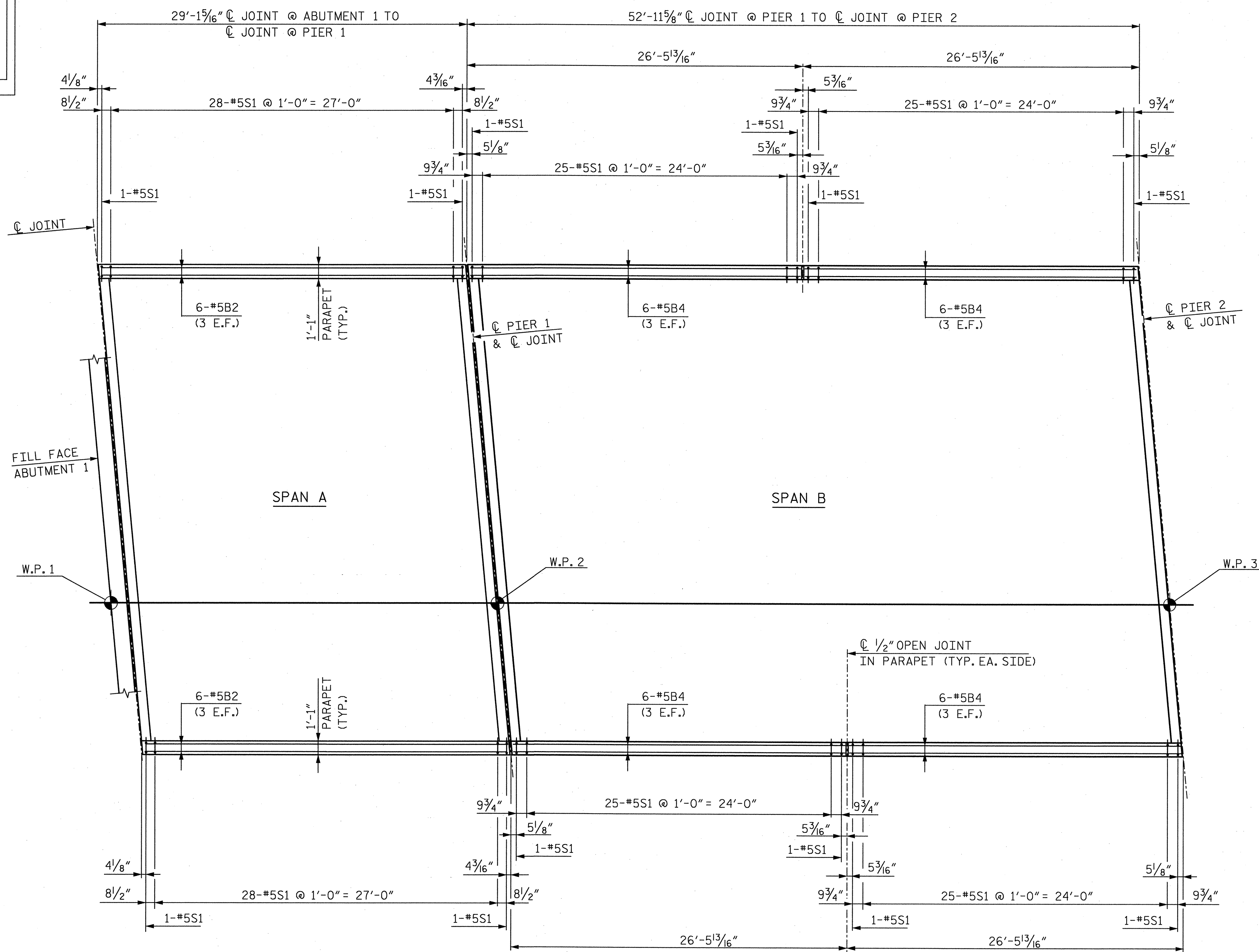


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DRAWN BY M. WRIGHT DATE 12/11
CHECKED BY P. BARBER DATE 2/12 DWG. NO. 17

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

TOTAL SHEETS 40



PLAN - SPAN A & SPAN B PARAPETS

NOTES:

METAL HANDRAIL NOT SHOWN FOR CLARITY.

ALL HORIZONTAL DIMENSIONS SHOWN ARE MEASURED ALONG EXTERIOR FACE OF PARAPET.

ALL REINFORCING SHALL BE EPOXY COATED.

FOR LOCATION AND DETAILS OF SIGNAL CONDUIT IN CONCRETE PARAPET, SEE "TYPICAL SECTION" SHEET.

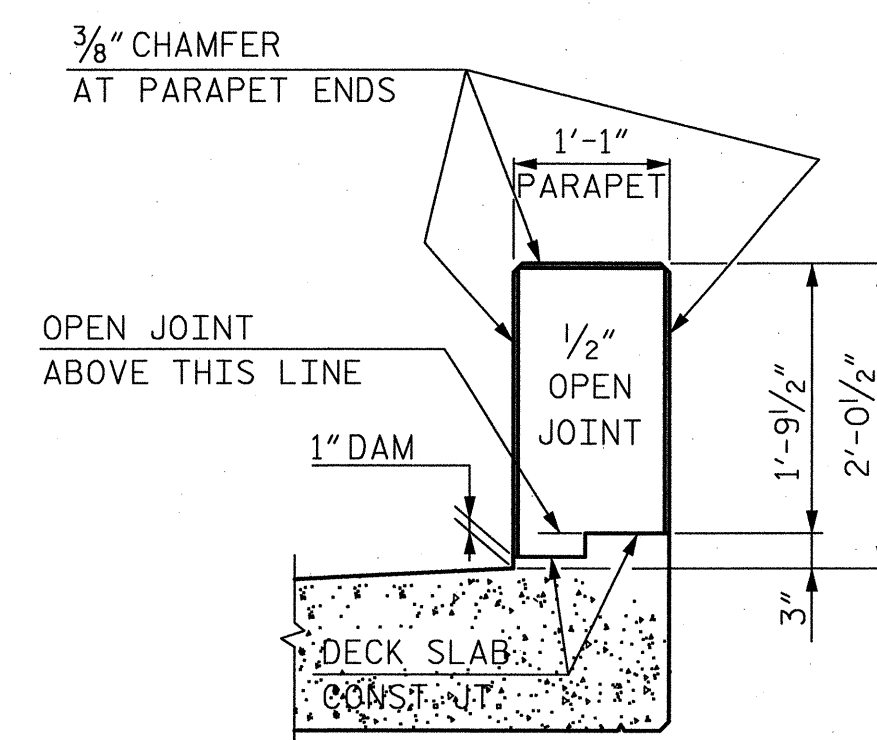
FOR ALUMINUM HANDRAIL DETAILS, SEE "HANDRAIL LAYOUT" AND "HANDRAIL DETAILS" SHEETS.

VERTICAL GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF PARAPET AND IN ACCORDANCE WITH THE SPECIAL PROVISION FOR "CONCRETE PARAPET". THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS.

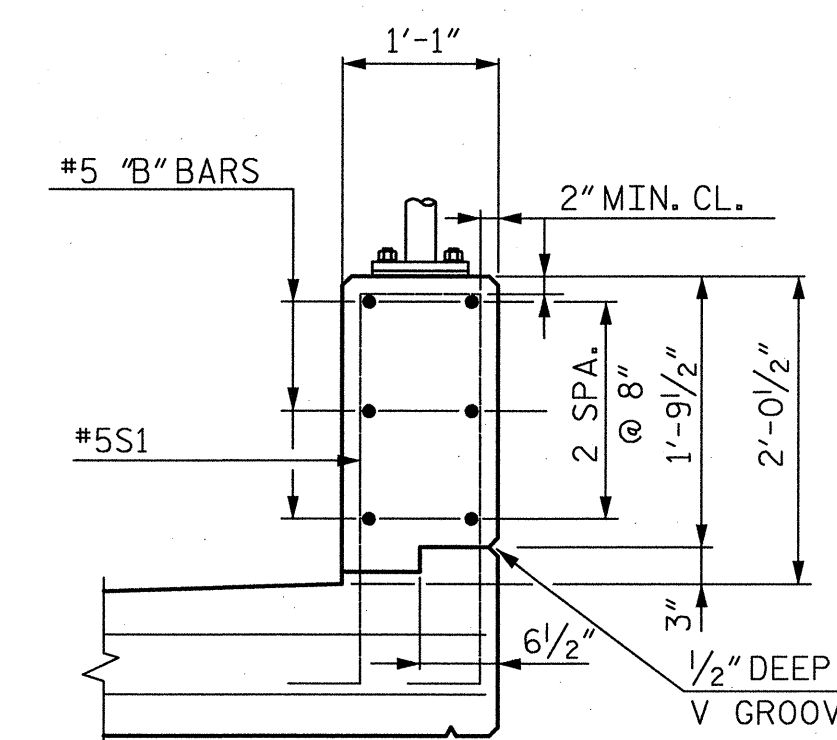
E.F. = EACH FACE

PAYMENT FOR CONCRETE PARAPET SHALL BE INCLUDED IN THE UNIT COST PAY ITEM FOR CONCRETE PARAPET.

PAY LENGTH = 324.3'



SECTION THRU OPEN JOINT IN PARAPET



SECTION THRU PARAPET

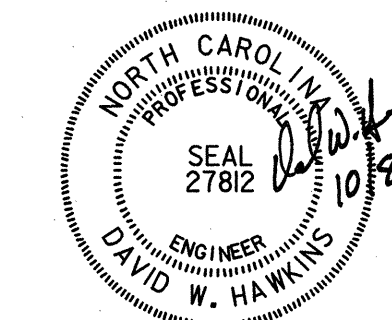
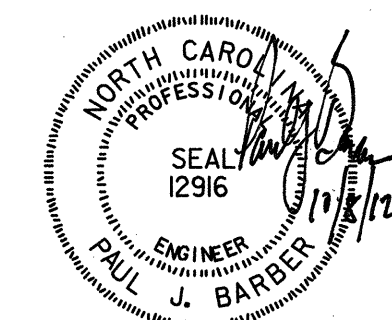
PROJECT NO. U-4716A/C
 DURHAM COUNTY
 STATION: POC STA. 3315+52.15 -MAIN-
 MILE POST: H64.60

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE

CONCRETE PARAPET DETAILS



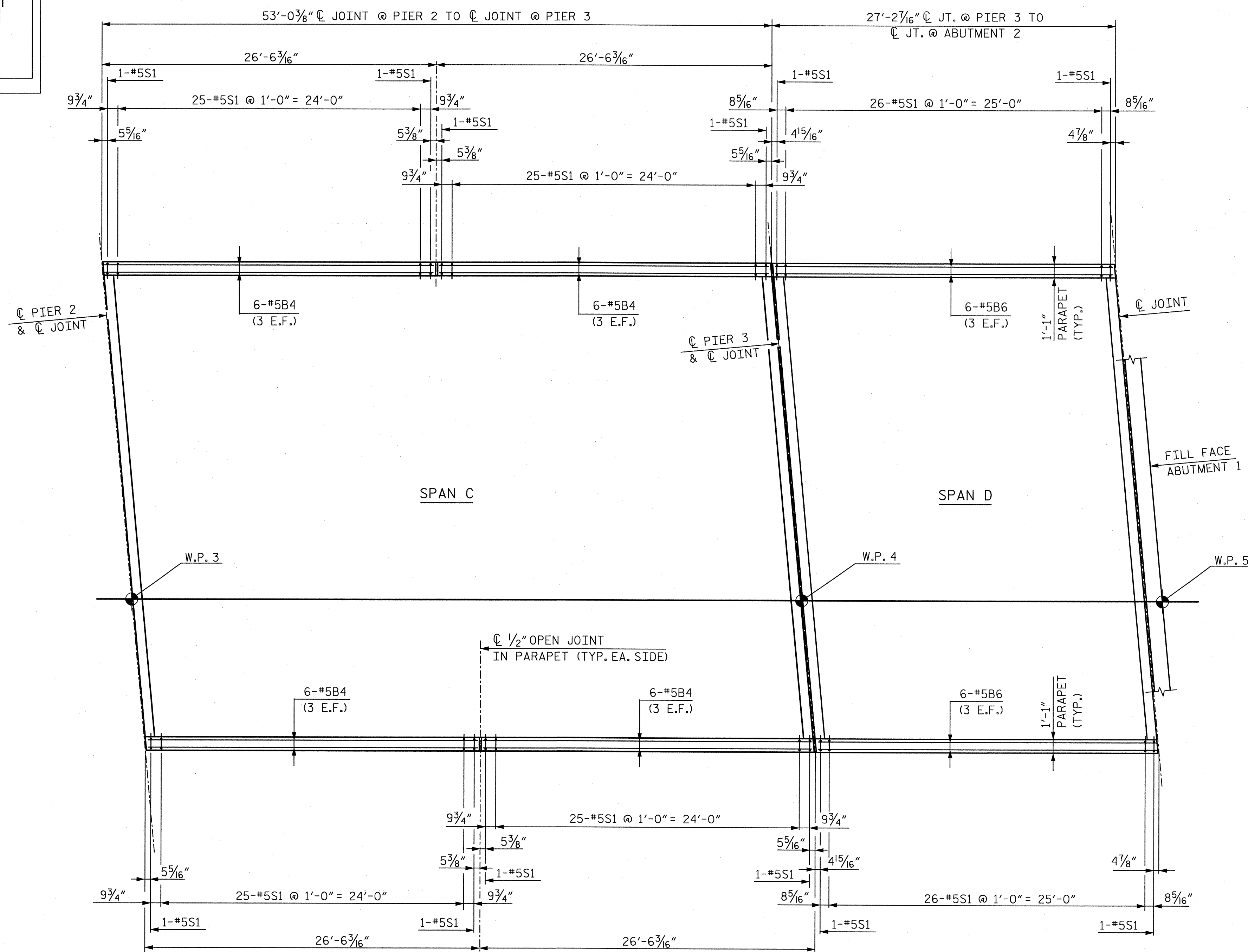
HNTB HNTB NORTH CAROLINA, P.C.
 License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
 DRAWN BY: J. BAYNE DATE: 9/12
 CHECKED BY: D. HAWKINS DATE: 10/12
 DWG. NO. 18

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

TOTAL SHEETS: 40

0371DEL_P17-18

NOTES:
SEE SHEET 1 OF 2 FOR NOTES.



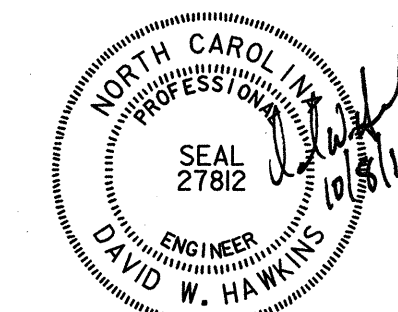
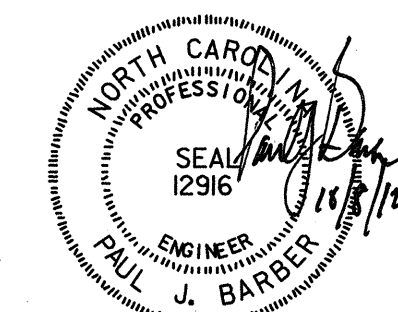
PLAN - SPAN C & SPAN D PARAPETS

PROJECT NO. U-4716A/C
DURHAM COUNTY
STATION: POC STA. 3315+52.15 -MAIN-

MILE POST: H64.60

SHEET 2 OF 2

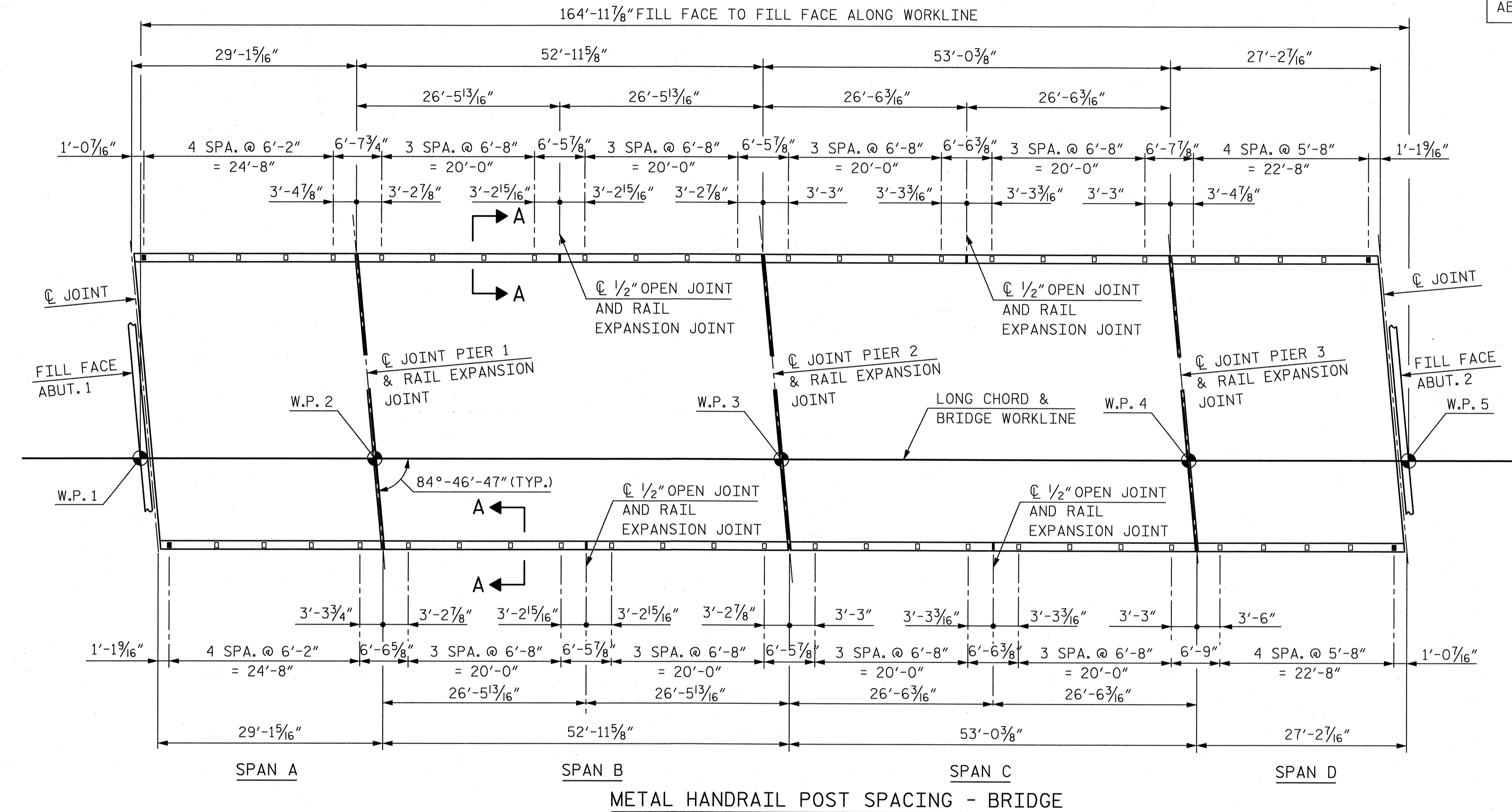
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
CONCRETE PARAPET DETAILS



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DRAWN BY: J. BAYNE DATE: 9/12
CHECKED BY: D. HAWKINS DATE: 10/12 DWG. NO. 19

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

SHEET NO.
S-19
TOTAL SHEETS
40



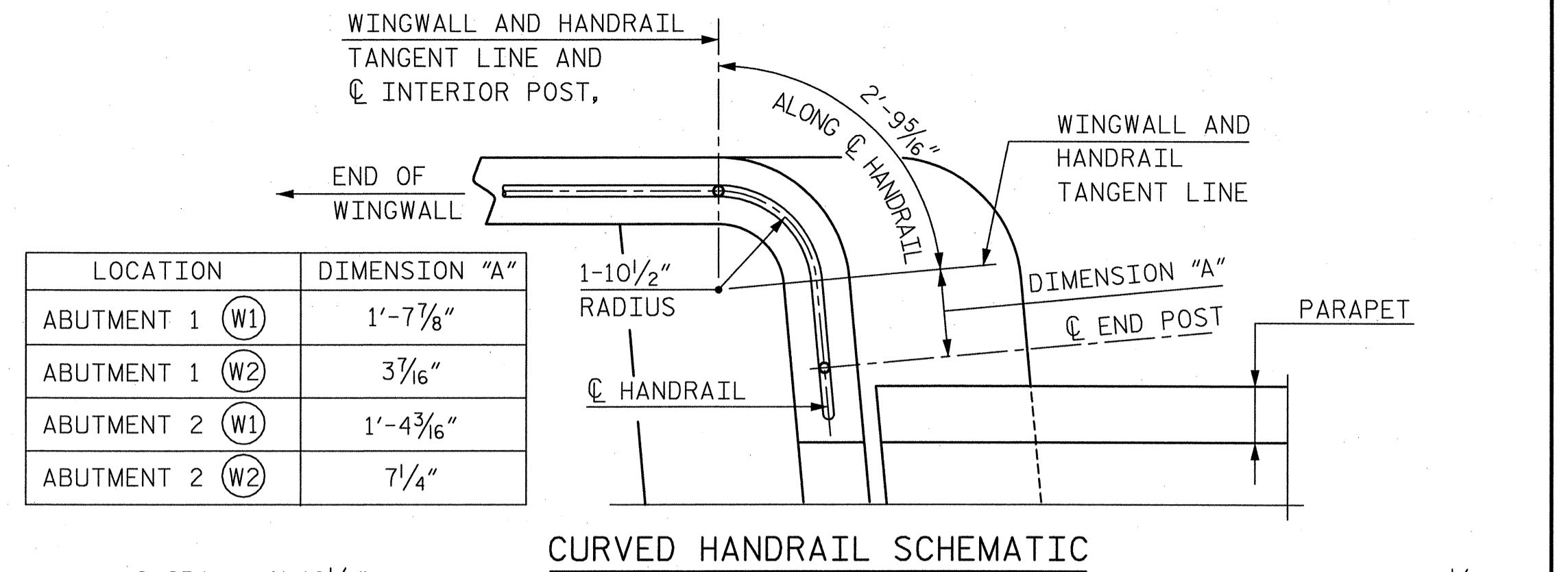
METAL HANDRAIL POST SPACING - BRIDGE

LEGEND:

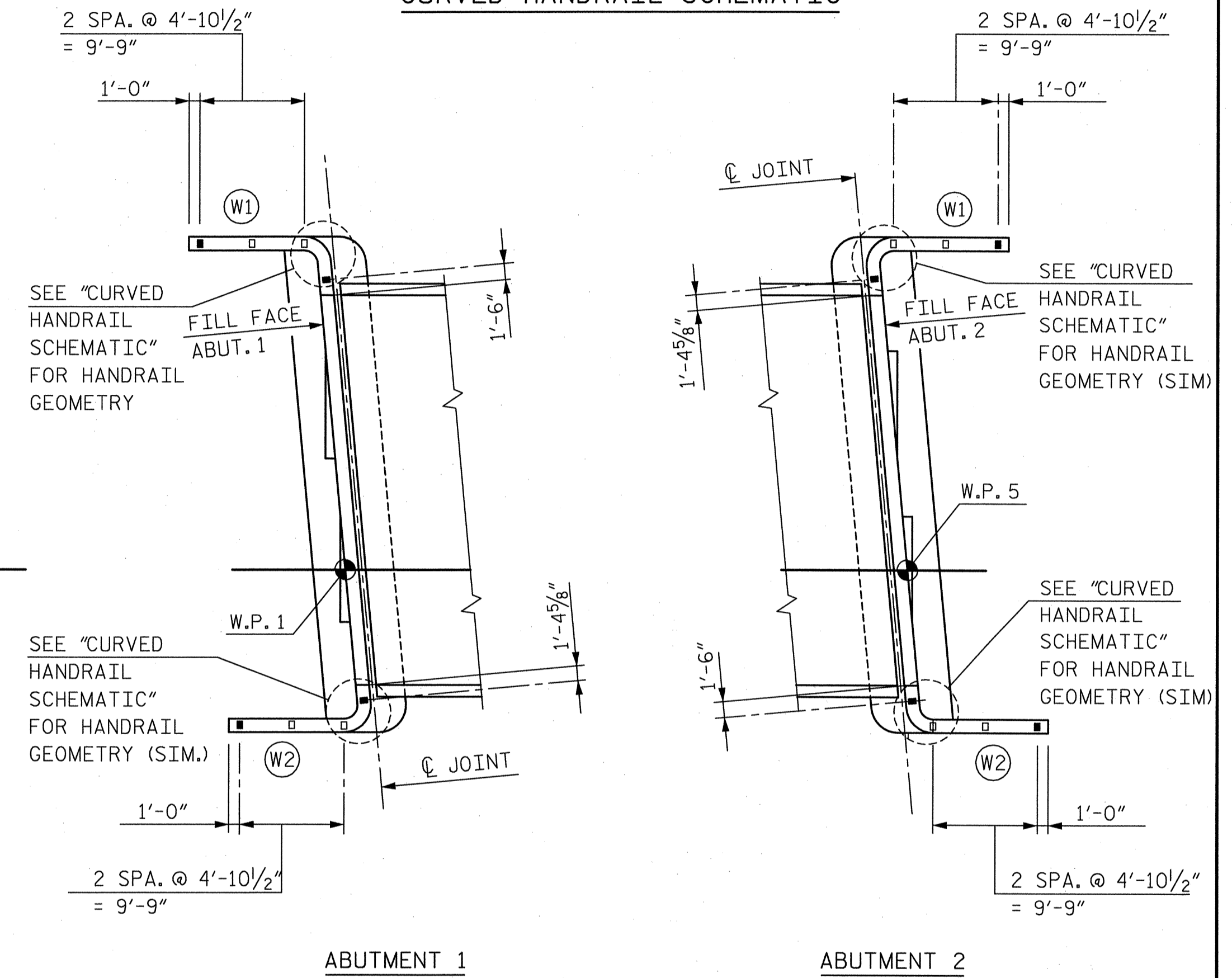
- - END POST
- - INTERIOR POST

NOTE: FOR SECTION A-A, SEE SHEET 2 OF 2.

ALL DIMENSIONS SHOWN ARE ALONG EXTERIOR FACE OF PARAPET/WINGWALL.



CURVED HANDRAIL SCHEMATIC



ABUTMENT 1

ABUTMENT 2

METAL HANDRAIL POST SPACING - WINGWALLS

PROJECT NO. U-4716A/C

DURHAM COUNTY

STATION: POC STA. 3315+52.15 -MAIN-

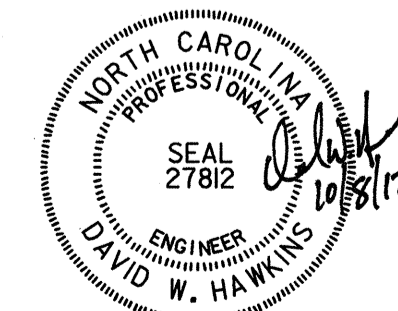
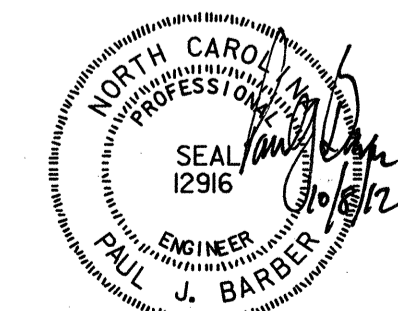
MILE POST: H64.60

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

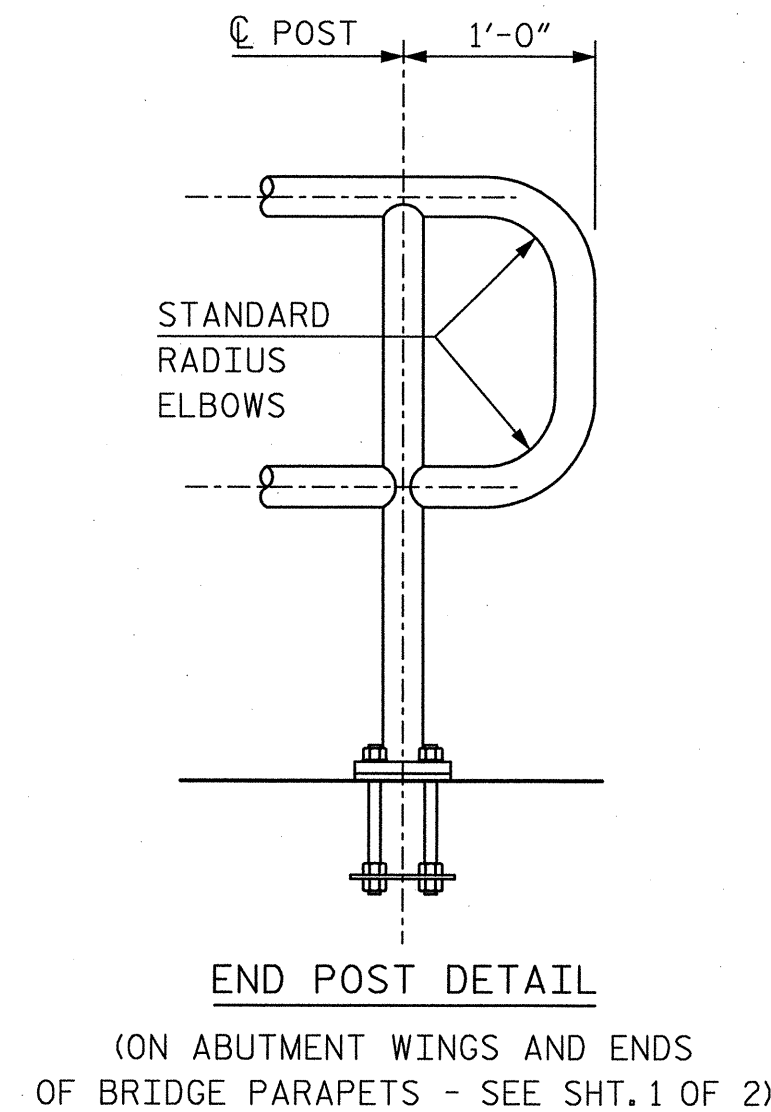
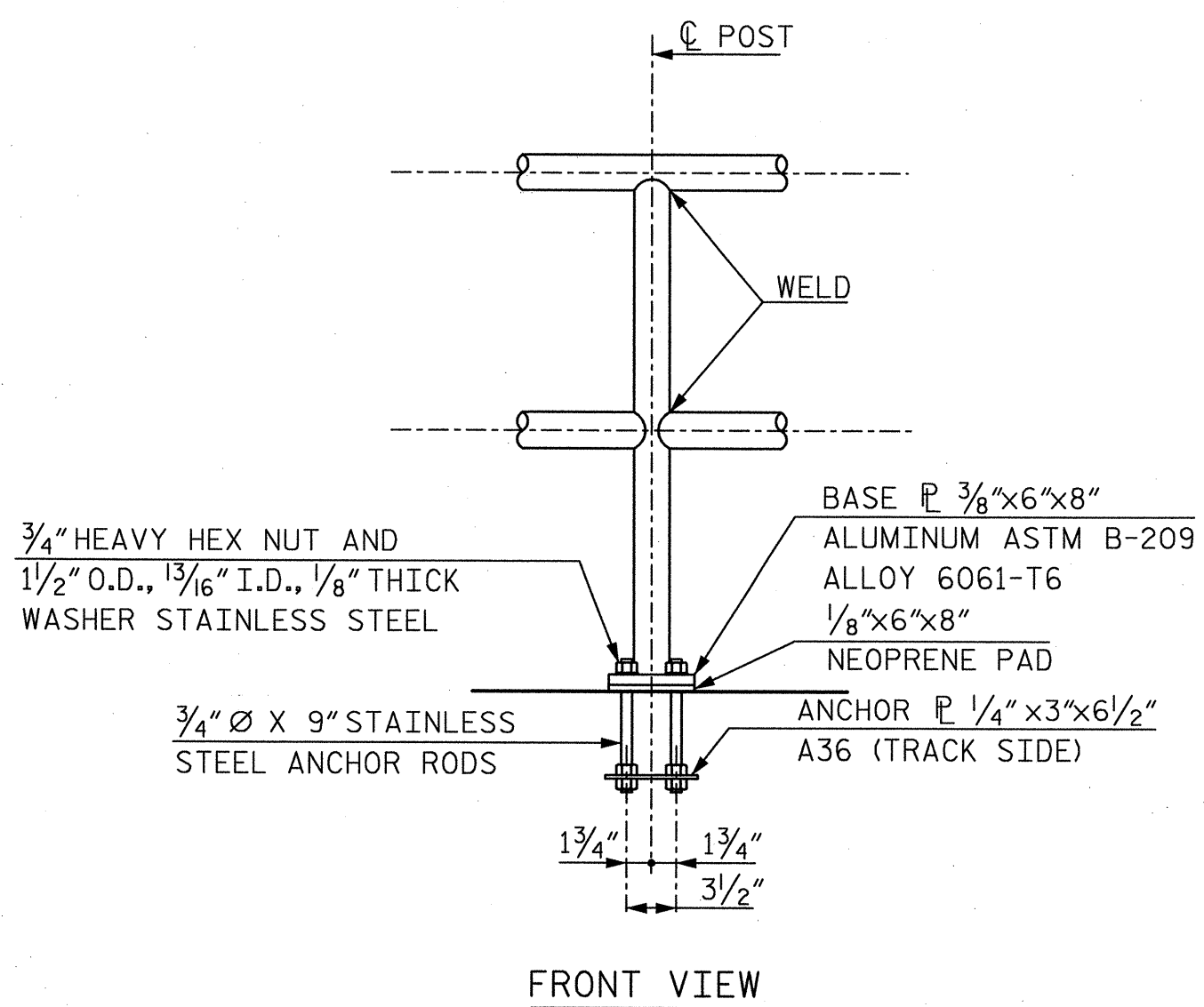
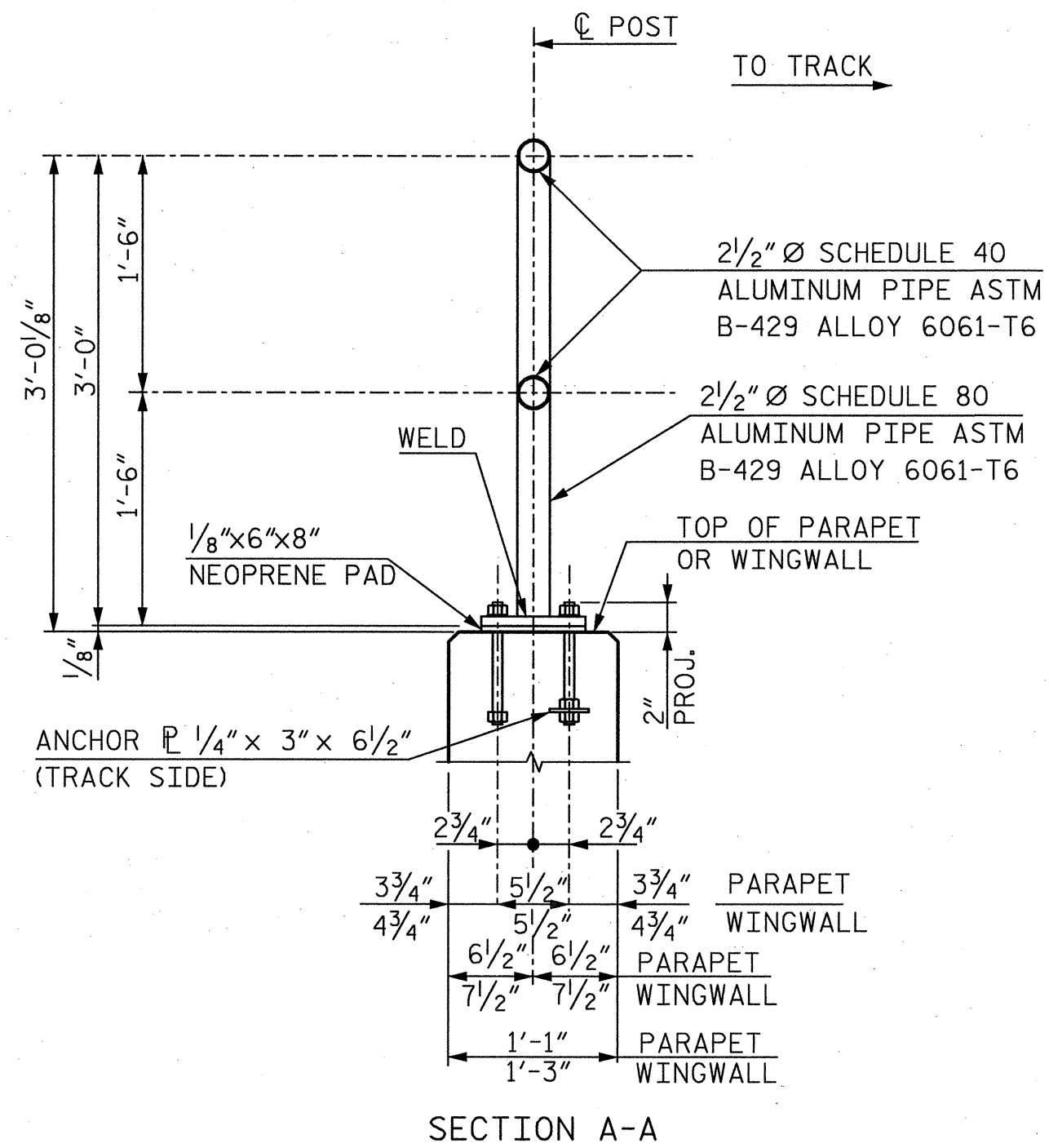
HANDRAIL
LAYOUT



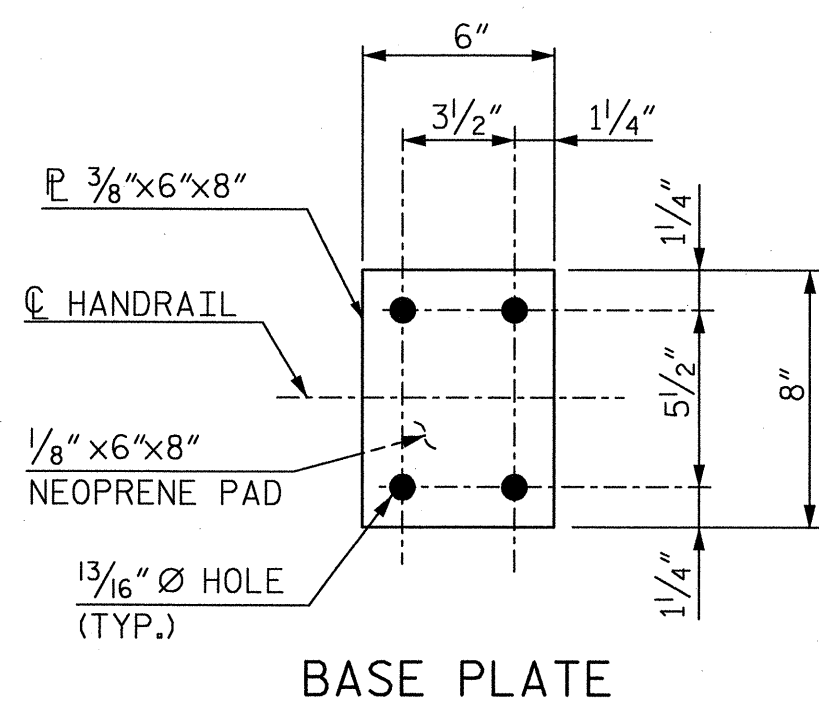
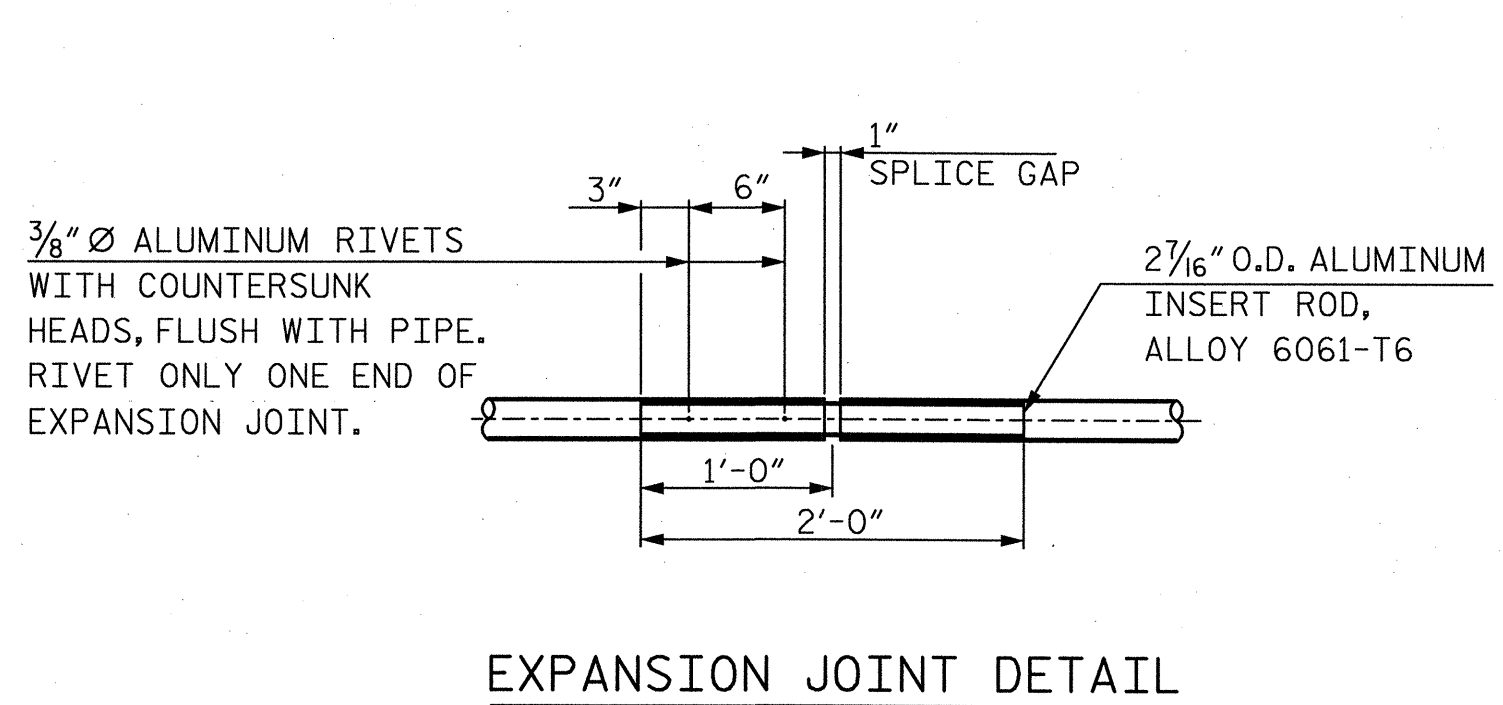
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DRAWN BY: J. BAYNE DATE: 9/12
CHECKED BY: D. HAWKINS DATE: 10/12 DWG. NO. 20

REVISIONS						SHEET NO. S-20
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 40
2			4			



ALUMINUM HANDRAIL AND POST



NOTES:

JOINTS IN RAILING (SPLICE GAP) SHALL BE LOCATED AS SHOWN IN POST SPACING PLAN.

ALUMINUM PIPE TO BE ASTM B-429, ALLOY 6061-T6 AND BASE PLATE TO BE ASTM B-209, ALLOY 6061-T6.

STAINLESS STEEL BOLTS, CAP SCREWS, AND NUTS TO BE ASTM A-276 TYPE 304. STAINLESS STEEL WASHERS TO BE ASTM A-276 TYPE 302.

POSTS TO BE SET PERPENDICULAR TO TOP OF PARAPET AND RAILS SHALL BE PLACED PARALLEL TO THE GRADE OF THE BRIDGE.

CERTIFIED MILL REPORTS ARE REQUIRED FOR RAIL AND POSTS. SHOP INSPECTIONS ARE NOT REQUIRED BY THE RAILROAD BUT MAY BE REQUIRED BY NCDOT.

AFTER ANCHOR ROD NUTS HAVE BEEN TIGHTENED, THREADS SHALL BE NICKED TO LOCK NUTS.

CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURES THE CONTRACTOR MAY AT HIS OPTION HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

ANCHOR PLATES SHALL BE STEEL CONFORMING TO ASTM SPECIFICATION A36.

ANCHOR RODS SHALL CONFORM TO ASTM SPECIFICATION A276 TYPE 302 OR 304, STAINLESS STEEL AND THREADS SHALL BE ROLLED, NOT CUT.

UPPER ANCHOR ROD NUTS SHALL BE HEAVY HEX NUTS, PER ASTM A276 TYPE 302 OR 304 STAINLESS STEEL.

LOWER ANCHOR ROD NUTS SHALL BE HEAVY STEEL HEX NUTS, PER ASTM A563.

THE CENTERLINE OF ANY SPLICE AND/OR EXPANSION JOINT IS TO BE LOCATED AT LEAST 2'-0" AWAY FROM CENTERLINE OF POST. EXPANSION AND/OR SPLICE JOINTS FOR EACH RAIL OF TWO RAILINGS ARE TO BE PLACED IN THE SAME LOCATION AND IN THE SAME PANEL.

WELDING SHALL BE IN ACCORDANCE WITH THE CURRENT AWS STRUCTURAL WELDING CODE - ALUMINUM.

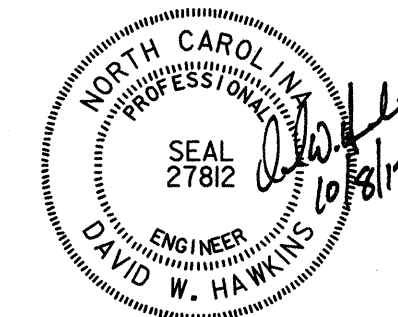
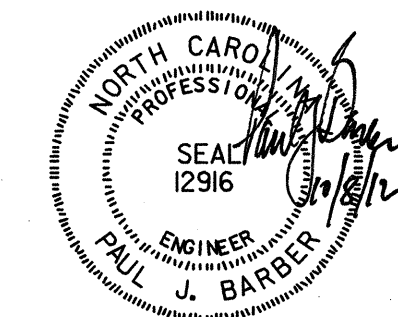
THE LENGTH OF METAL RAIL TO BE PAID FOR SHALL BE THE CONTINUOUS LENGTH MEASURED FROM END TO END OF RAIL, ALONG THE TOP RAIL.

PAY LENGTH = 386.3'

PROJECT NO. U-4716A/C
 DURHAM COUNTY
 STATION: POC STA. 3315+52.15 -MAIN-

MILE POST: H64.60

SHEET 2 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 HANDRAIL DETAILS

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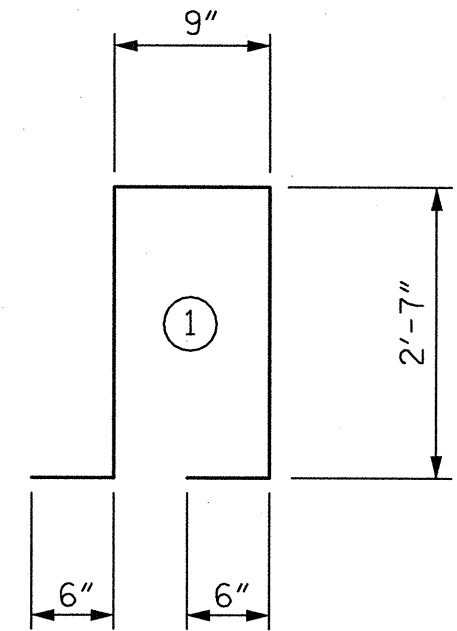
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NO.	BY:	DATE:	NO.	BY:	DATE:	
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2		10/12	4			

DRAWN BY: J. BAYNE DATE: 9/12
 CHECKED BY: D. HAWKINS DATE: 10/12 DWG. NO. 21

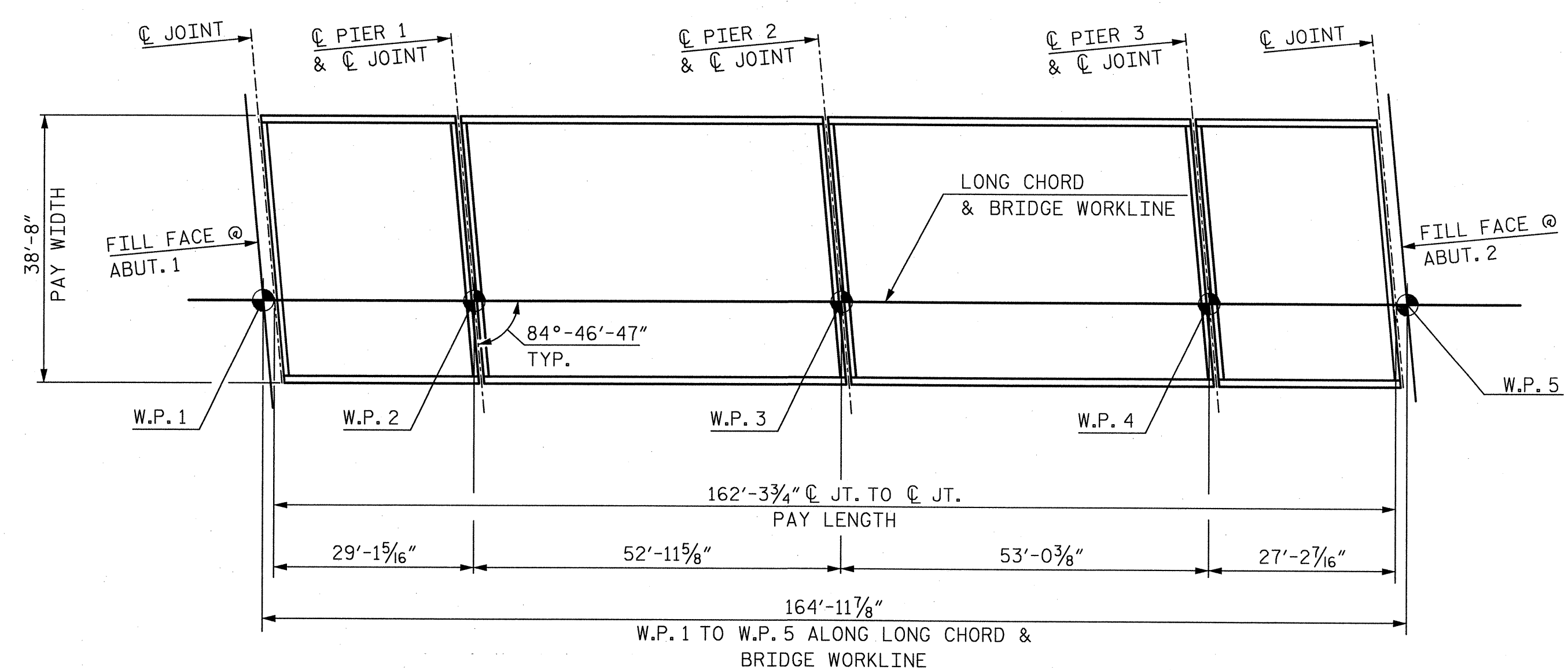
EPOXY-COATED REINFORCING STEEL

BAR TYPES

SPAN A						SPAN B						SPAN C						SPAN D					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	74	5	STR.	38'-4"	2,959	A1	143	5	STR.	38'-4"	5,717	A1	143	5	STR.	38'-4"	5,717	A1	68	5	STR.	38'-4"	2,719
A2	8	5	STR.	38'-5"	321	A2	8	5	STR.	38'-5"	321	A2	8	5	STR.	38'-5"	321	A2	8	5	STR.	38'-5"	321
A3	2	5	STR.	3'-0"	6	A3	2	5	STR.	3'-0"	6	A3	2	5	STR.	3'-0"	6	A3	2	5	STR.	3'-0"	6
A4	2	5	STR.	9'-4"	19	A4	2	5	STR.	9'-4"	19	A4	2	5	STR.	9'-4"	19	A4	2	5	STR.	9'-4"	19
A5	2	5	STR.	15'-9"	33	A5	2	5	STR.	15'-9"	33	A5	2	5	STR.	15'-9"	33	A5	2	5	STR.	15'-9"	33
A6	2	5	STR.	22'-2"	46	A6	2	5	STR.	22'-2"	46	A6	2	5	STR.	22'-2"	46	A6	2	5	STR.	22'-2"	46
A7	2	5	STR.	28'-7"	60	A7	2	5	STR.	28'-7"	60	A7	2	5	STR.	28'-7"	60	A7	2	5	STR.	28'-7"	60
A8	2	5	STR.	34'-11"	73	A8	2	5	STR.	34'-11"	73	A8	2	5	STR.	34'-11"	73	A8	2	5	STR.	34'-11"	73
A9	2	5	STR.	5'-3"	11	A9	2	5	STR.	5'-3"	11	A9	2	5	STR.	5'-3"	11	A9	2	5	STR.	5'-3"	11
A10	2	5	STR.	14'-5"	30	A10	2	5	STR.	14'-5"	30	A10	2	5	STR.	14'-5"	30	A10	2	5	STR.	14'-5"	30
A11	2	5	STR.	23'-7"	49	A11	2	5	STR.	23'-7"	49	A11	2	5	STR.	23'-7"	49	A11	2	5	STR.	23'-7"	49
A12	2	5	STR.	32'-8"	68	A12	2	5	STR.	32'-8"	68	A12	2	5	STR.	32'-8"	68	A12	2	5	STR.	32'-8"	68
B1	100	4	STR.	28'-7"	1,909	B3	210	4	STR.	27'-3"	3,823	B3	210	4	STR.	27'-3"	3,823	B5	100	4	STR.	26'-8"	1,781
B2	12	5	STR.	28'-7"	358	B4	24	5	STR.	25'-11"	649	B4	24	5	STR.	25'-11"	649	B6	12	5	STR.	26'-8"	334
S1	60	5	1	6'-11"	433	S1	108	5	1	6'-11"	779	S1	108	5	1	6'-11"	779	S1	56	5	1	6'-11"	404
TOTAL					6,375	TOTAL					11,684	TOTAL					11,684	TOTAL					5,954



ALL BAR DIMENSIONS ARE OUT TO OUT

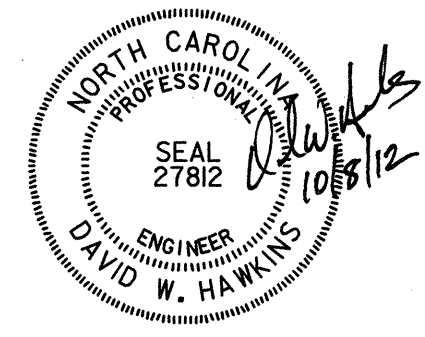
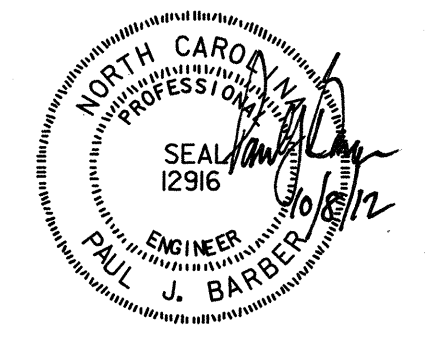


LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FEET = 6,276.1)

	EPOXY COATED REINFORCING STEEL (LBS.)	CLASS AA CONCRETE (CU. YDS.)	
		DECK SLAB	PARAPETS
SPAN "A"	6,375	38.9	4.4
SPAN "B"	11,684	68.7	7.9
SPAN "C"	11,684	68.8	8.0
SPAN "D"	5,954	36.4	4.1
TOTALS	35,697	212.8	24.4

	REINFORCED CONCRETE DECK SLAB SQ. FT.	EPOXY COATED REINFORCING STEEL LBS.	CLASS AA CONCRETE CU. YDS.
DECK SLAB	6,276.1	31,312	212.8
PARAPET		4,385	24.4
TOTALS	6,276.1	35,697	237.2

PROJECT NO. U-4716A/C
 DURHAM COUNTY
 STATION: POC STA. 3315+52.15 -MAIN-
 MILE POST: H64.60



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 BILL OF MATERIAL

HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS		SHEET NO. S-22
DRAWN BY: M. WRIGHT	DATE: 12/11	NO. 1	BY: [Signature]	TOTAL SHEETS: 40
CHECKED BY: P. BARBER	DATE: 2/12	NO. 2	BY: [Signature]	
DWG. NO. 22		NO. 3	BY: [Signature]	
		NO. 4	BY: [Signature]	

0371DEL_P17-18
0001ADD_P17-18

NOTES:

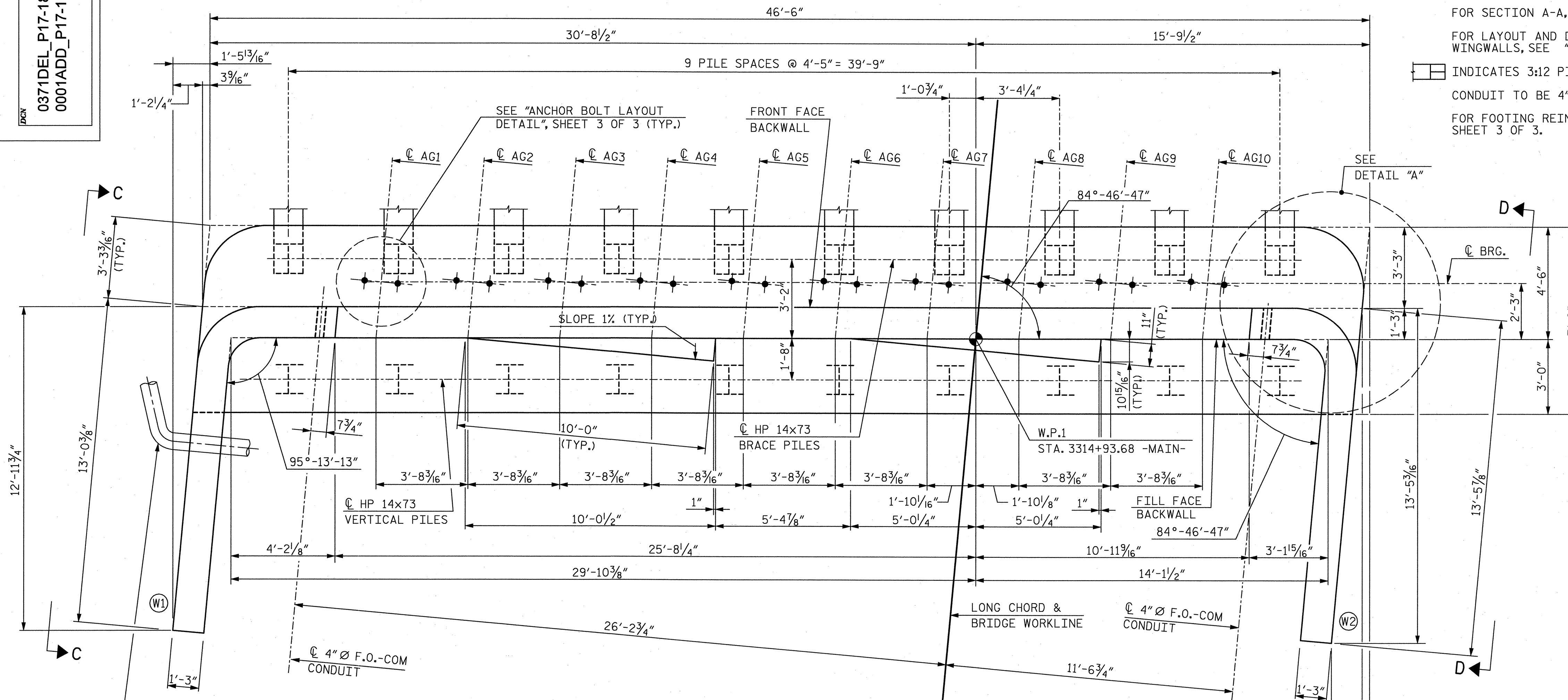
FOR SECTION A-A, SECTION B-B AND WINGWALL DETAILS, SEE SHEET 2 OF 3.

FOR LAYOUT AND DETAILS OF CONTINUOUS FRENCH DRAIN SYSTEM BETWEEN ABUTMENT WINGWALLS, SEE "STRUCTURE DRAINAGE DETAILS" SHEET 4 OF 4.

INDICATES 3:12 PILE BATTER IN DIRECTION SHOWN.

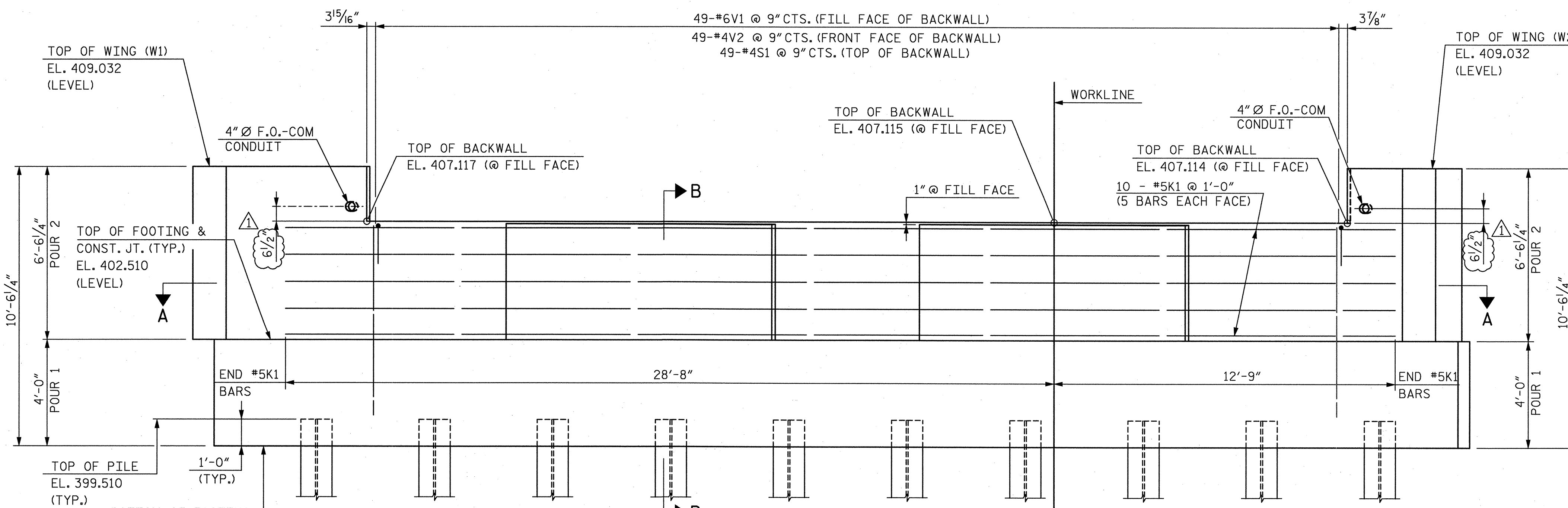
CONDUIT TO BE 4" Ø IN ACCORDANCE WITH UNDERWRITERS LABORATORY SPECIFICATIONS.

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

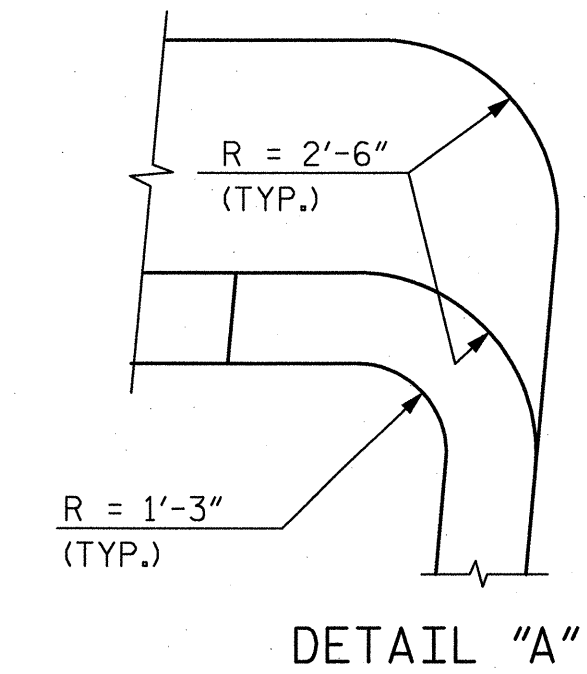


PLAN

STRUCTURE DRAINAGE SYSTEM
FOR PLAN AND DETAILS SEE
DRAINAGE LAYOUT AT ABUTMENT 1
ON "STRUCTURE DRAINAGE DETAILS"
SHEET 4 OF 4.



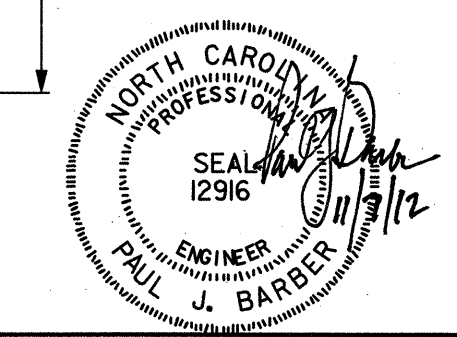
ELEVATION



DETAIL "A"

PROJECT NO. U-4716A/C
DURHAM COUNTY
STATION: POC STA. 3315+52.15 -MAIN-
MILE POST: H64.60
SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
ABUTMENT 1



HNTB HNTB NORTH CAROLINA, P.C.
License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY: M. WRIGHT DATE: 3/12
CHECKED BY: D. HAWKINS DATE: 3/12 DWG. NO. 23

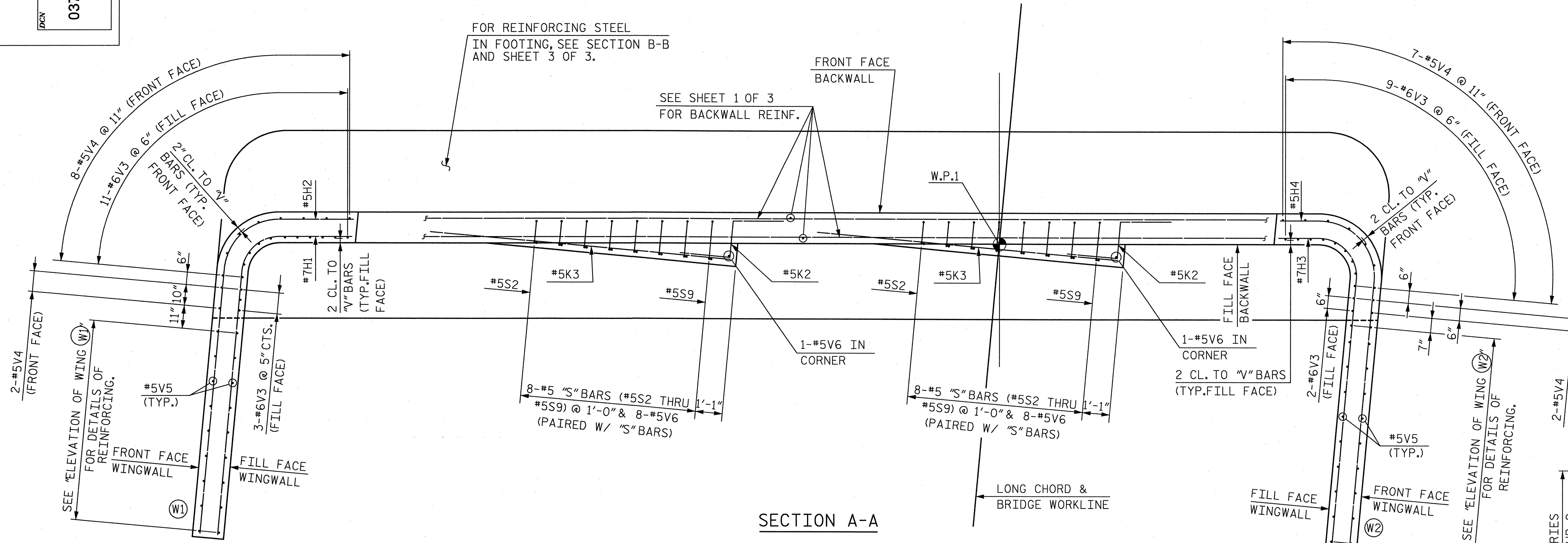
REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1	DWH	11/7/12	3	
2			4	

TOTAL SHEETS: 40

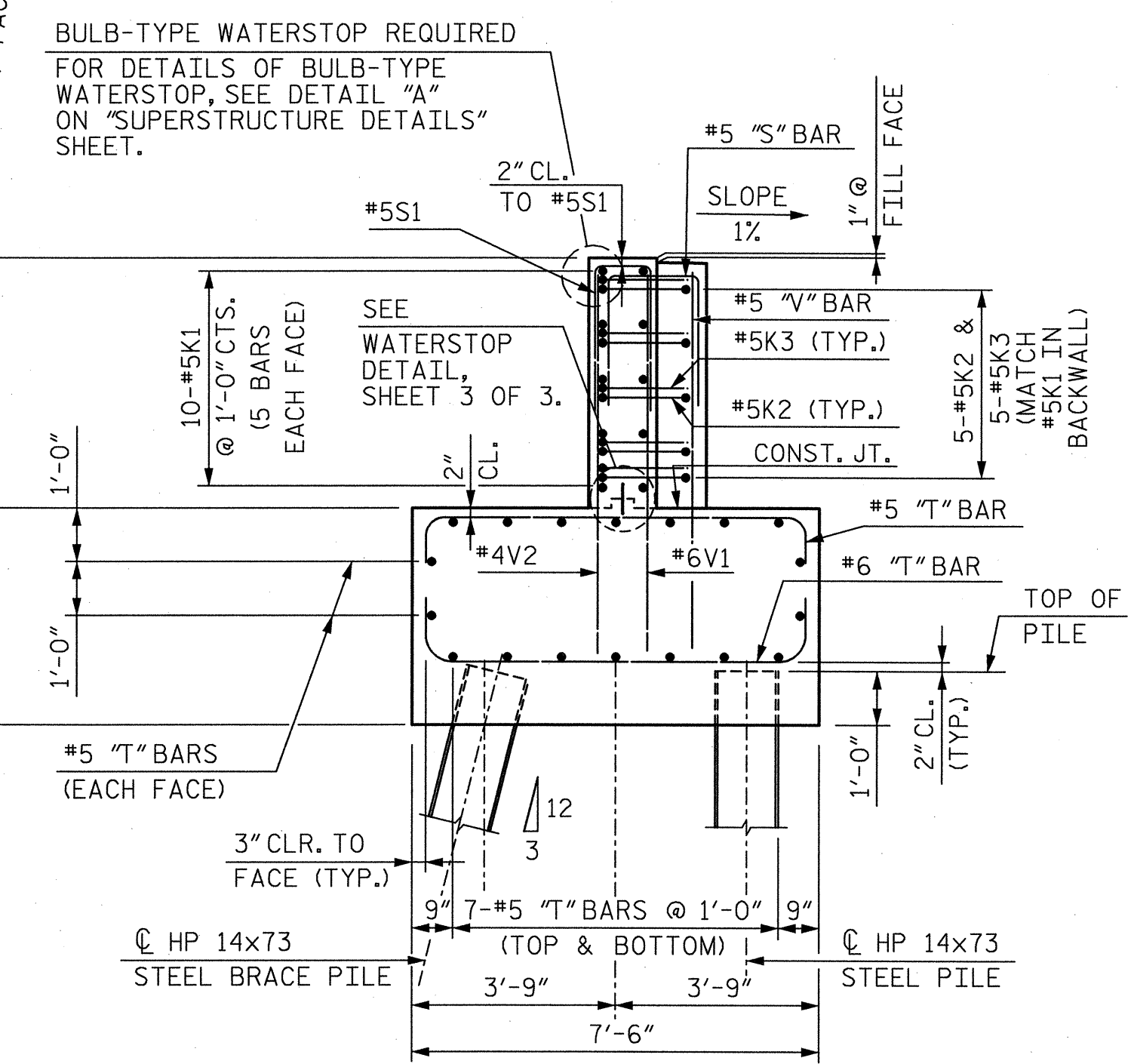
NOTES:

FOR ABUTMENT AND WINGWALL DIMENSIONS AND ELEVATIONS, SEE SHEET 1 OF 3.

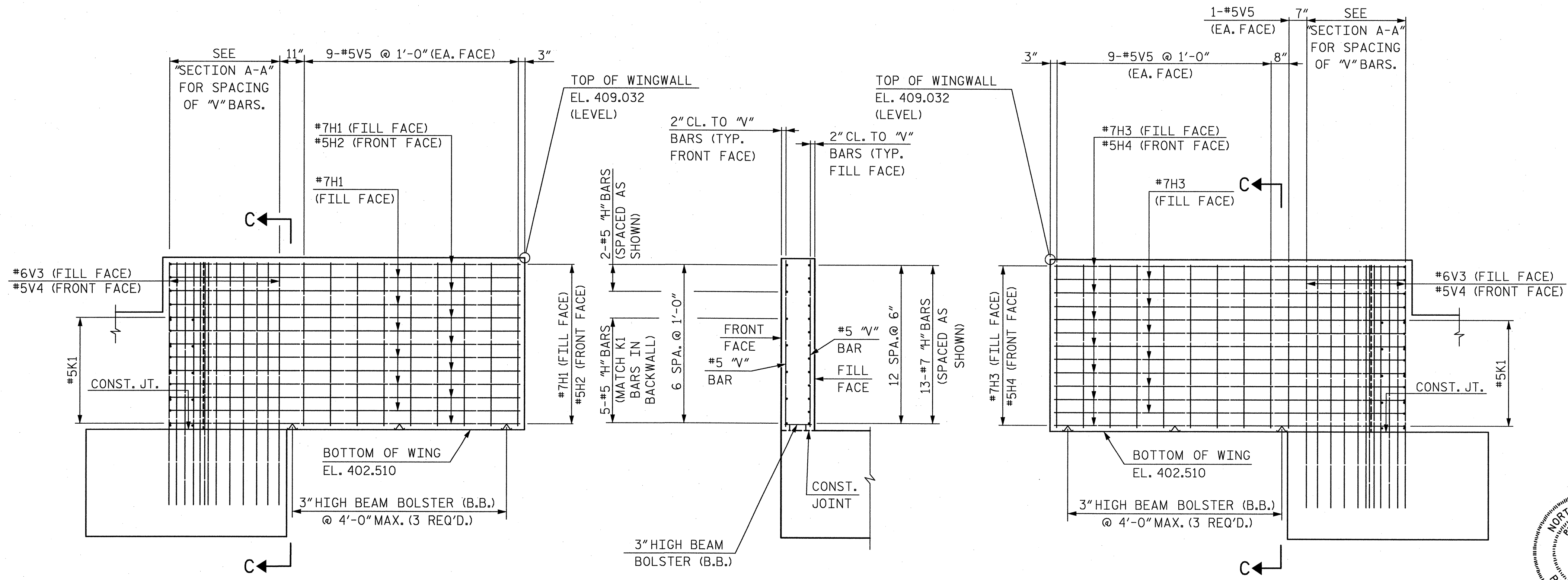
FOR LOCATIONS OF HANDRAIL ANCHORAGES IN TOP OF WINGWALLS, SEE "HANDRAIL LAYOUT" AND "HANDRAIL DETAILS" SHEETS.



SECTION A-A



SECTION B-B



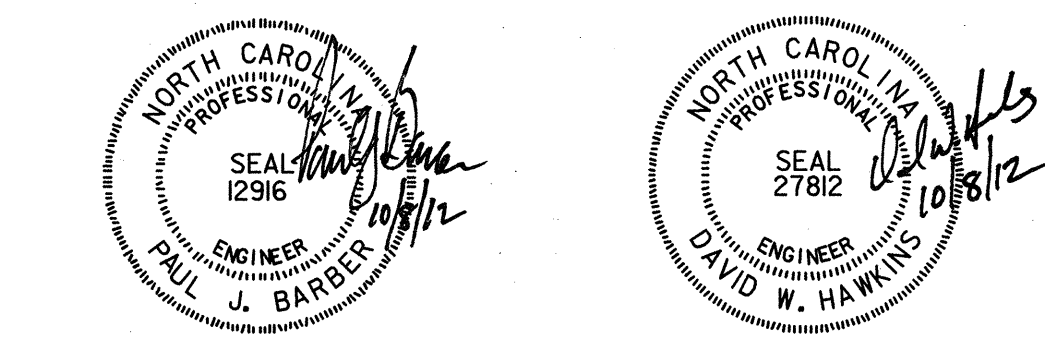
SECTION C-C

ELEVATION OF WING (W1)

ELEVATION OF WING (W2)

PROJECT NO. U-4716A/C
 DURHAM COUNTY
 STATION: POC STA. 3315+52.15 -MAIN-
 MILE POST: H64.60
 SHEET 2 OF 3

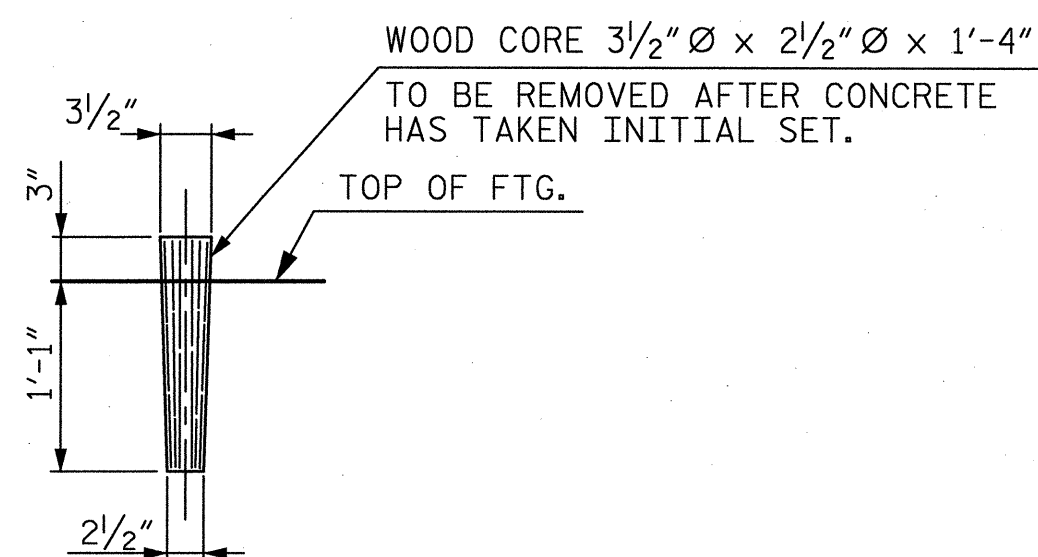
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 ABUTMENT 1



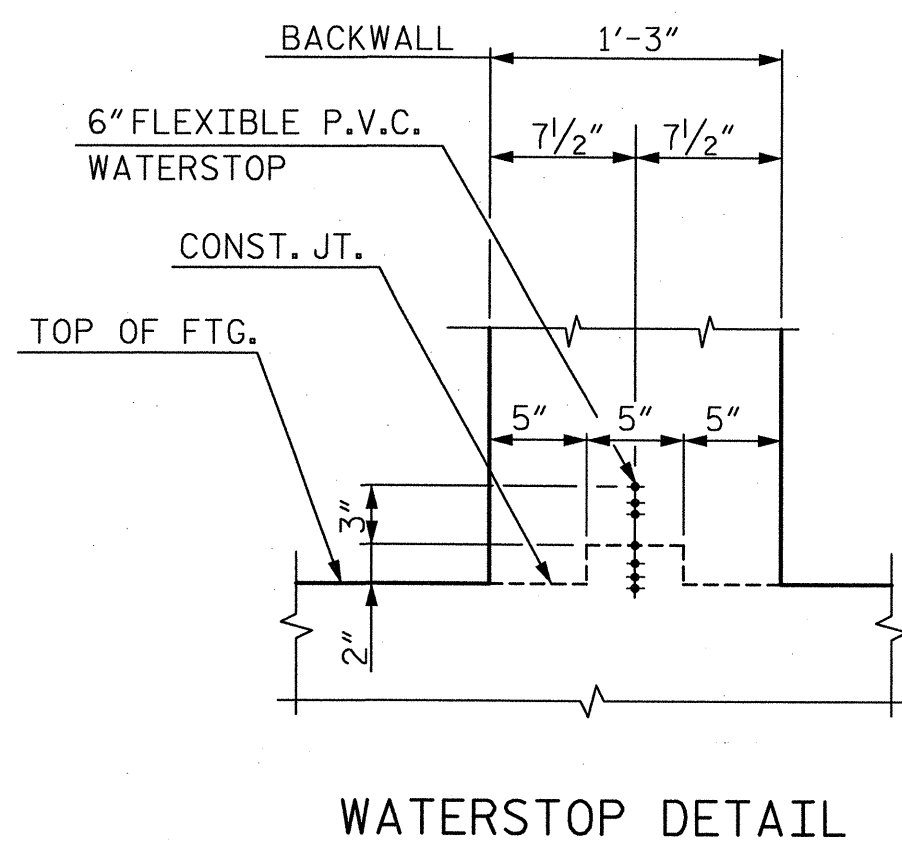
HNTB HNTB NORTH CAROLINA, P.C.
 License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
 DRAWN BY: M. WRIGHT DATE: 3/12
 CHECKED BY: D. HAWKINS DATE: 3/12
 DWG. NO. 24

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

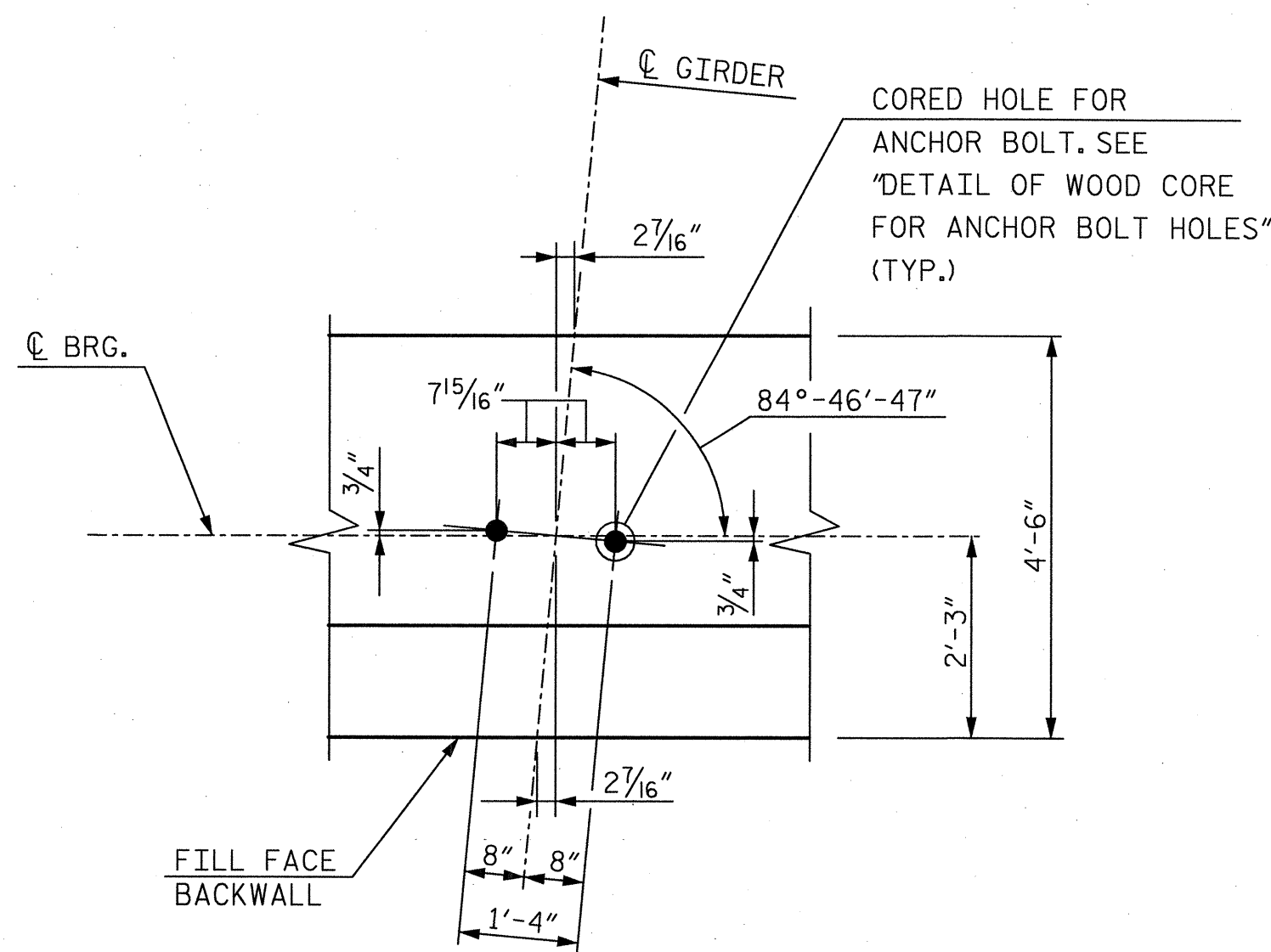
TOTAL SHEETS: 40



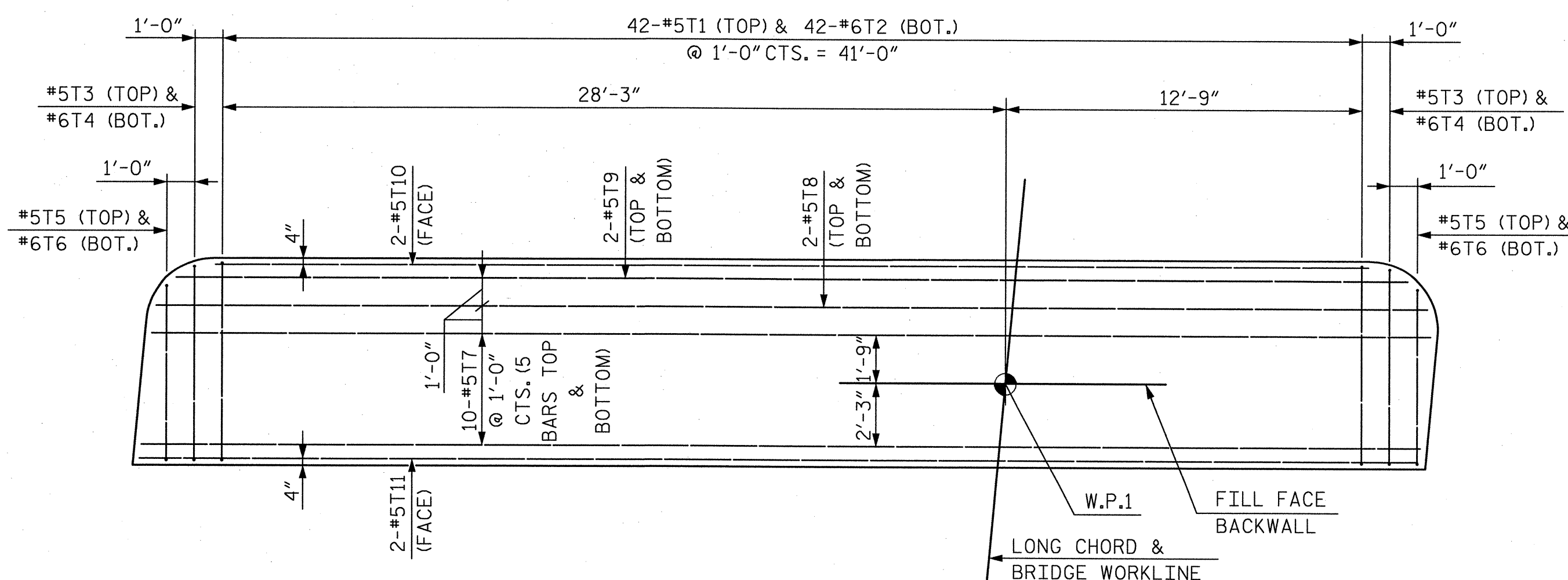
DETAIL OF WOOD CORE FOR ANCHOR BOLT HOLES



WATERSTOP DETAIL



ANCHOR BOLT LAYOUT DETAIL

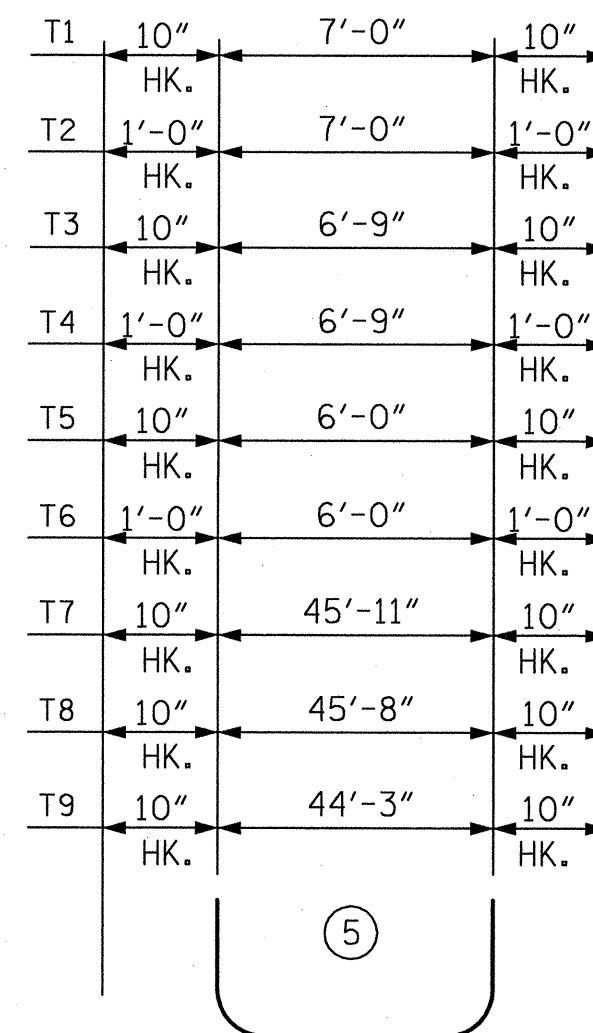
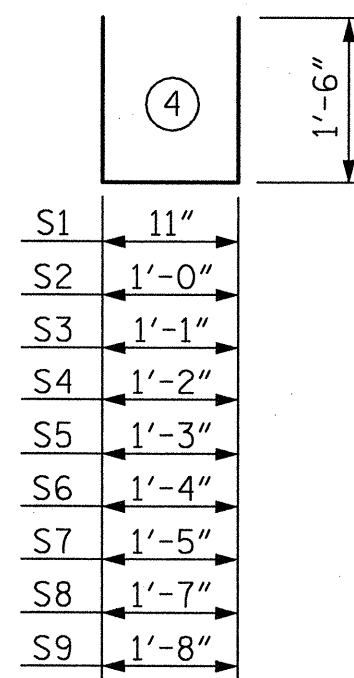
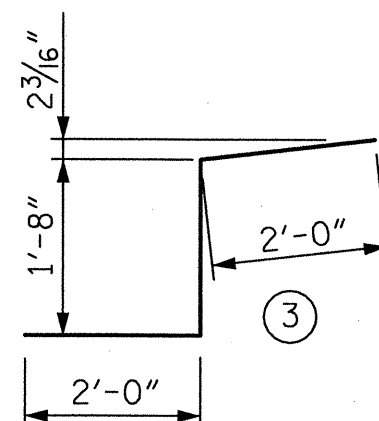
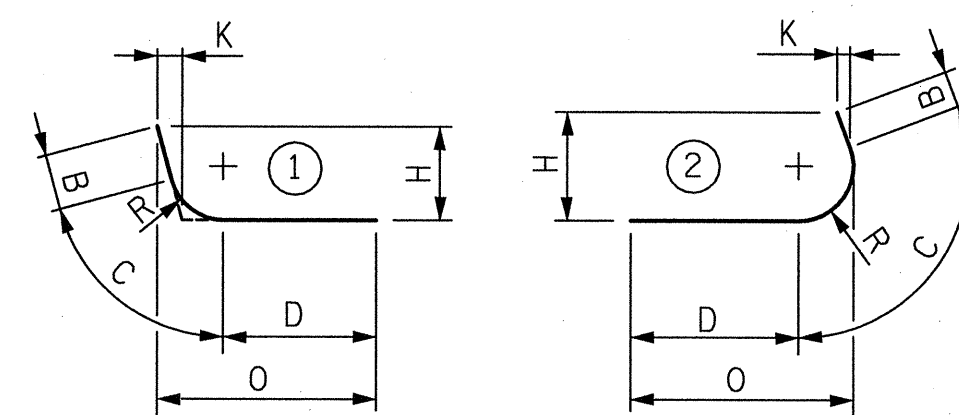


FOOTING REINFORCING PLAN

BAR TYPES

MARK	B	C	D	H	K	O	R
H1	2'-10 1/2"	2'-3 1/2"	10'-7"	4'-3 3/4"	4 3/4"	12'-4 3/4"	1'-6 7/8"
H2	2'-11"	3'-3"	10'-7"	4'-11 1/2"	5 1/2"	13'-1"	2'-2 3/4"
H3	1'-7"	2'-7"	10'-7"	3'-3 3/4"	1 3/4"	12'-1 3/4"	1'-6 7/8"
H4	1'-6"	3'-8"	10'-7"	3'-11 1/2"	1 3/4"	12'-9 3/4"	2'-2 3/4"

NOTE: 'D' IS PARALLEL TO WINGWALL.



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF REINFORCING

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT	MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
ABUTMENT 1											
H1	13	7	1	15'-9"	419	T1	42	5	5	8'-8"	380
H2	7	5	1	16'-9"	122	T2	42	6	5	9'-0"	568
H3	13	7	2	14'-9"	392	T3	2	5	5	8'-5"	18
H4	7	5	2	15'-9"	115	T4	2	6	5	8'-9"	26
						T5	2	5	5	7'-8"	16
						T6	2	6	5	8'-0"	24
K1	10	5	STR.	41'-5"	432	T7	10	5	5	47'-7"	496
K2	10	5	3	5'-8"	59	T8	2	5	5	47'-4"	99
K3	10	5	STR.	12'-0"	125	T9	2	5	5	45'-11"	96
						T10	2	5	STR.	41'-5"	86
						T11	2	5	STR.	45'-11"	96
S1	49	4	4	3'-11"	128	V1	49	6	STR.	7'-3"	534
S2	2	5	4	4'-0"	8	V2	49	4	STR.	7'-3"	237
S3	2	5	4	4'-1"	9	V3	25	6	STR.	9'-2"	344
S4	2	5	4	4'-2"	9	V4	19	5	STR.	9'-2"	182
S5	2	5	4	4'-3"	9	V5	38	5	STR.	6'-1"	241
S6	2	5	4	4'-4"	9	V6	18	5	STR.	7'-2"	135
S7	2	5	4	4'-5"	9						
S8	2	5	4	4'-7"	10						
S9	2	5	4	4'-8"	10						

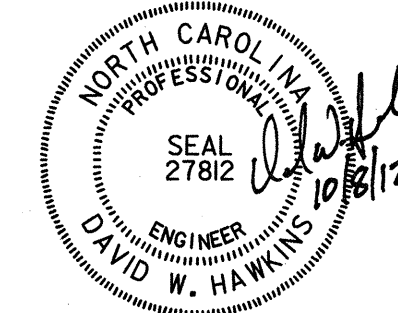
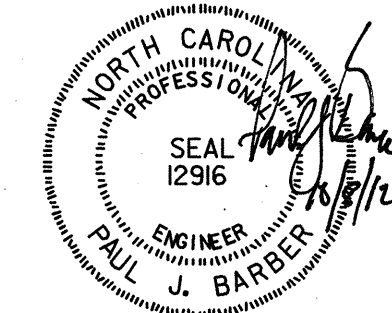
QUANTITIES

ITEM	TOTAL
REINFORCING STEEL	LBS. 5,443
CLASS AA CONCRETE BREAKDOWN:	
POUR 1	
FOOTING & BOTT. OF WINGS	CU. YDS 51.4
POUR 2	
BACKWALL & TOP OF WINGS	CU. YDS 18.9
TOTAL	CU. YDS 70.3
HP 14 X 73 STEEL PILES	NO. 20
	L.F. 600.0
PILE EXCAVATION IN SOIL	L.F. 510.0
PILE EXCAVATION NOT IN SOIL	L.F. 50.0

NOTES:

'T' BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR ANCHOR BOLTS.
FOR FOOTING LAYOUT AND DIMENSIONS, SEE SHEET 1 OF 3.

PROJECT NO. U-4716A/C
DURHAM COUNTY
STATION: POC STA. 3315+52.15 -MAIN-
MILE POST: H64.60
SHEET 3 OF 3



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

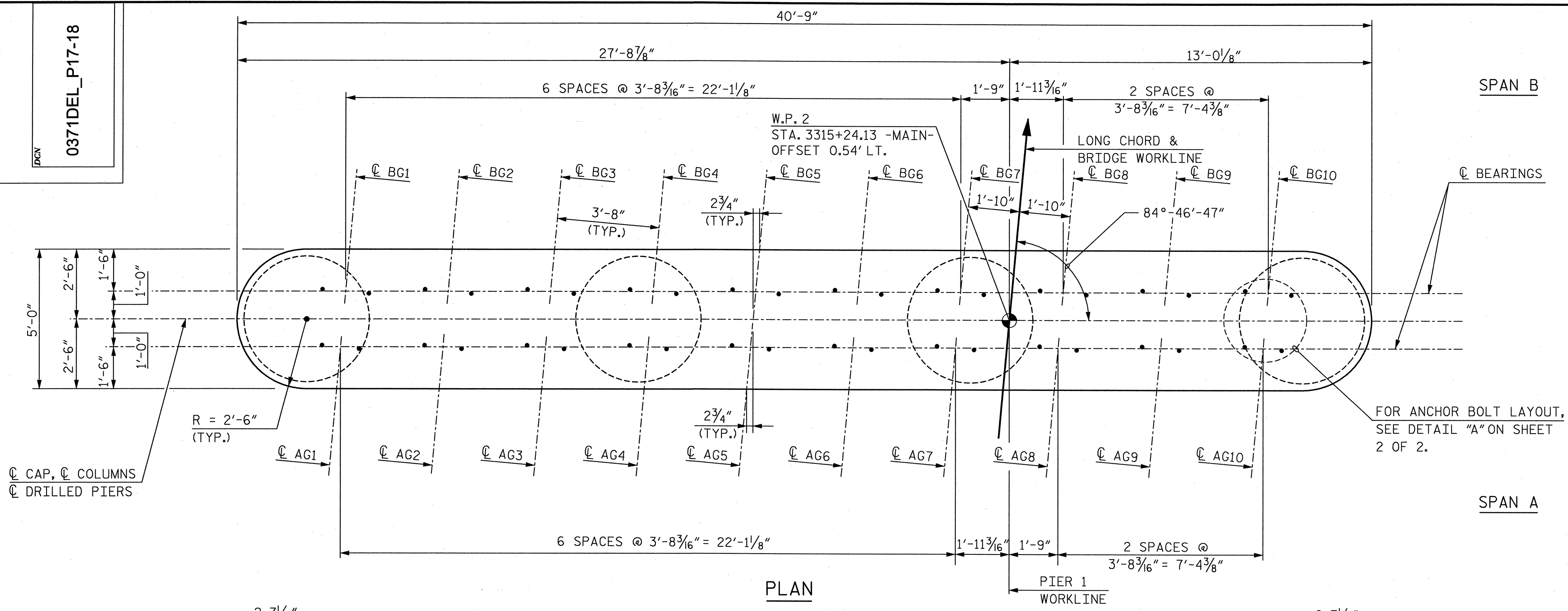
SUBSTRUCTURE
ABUTMENT 1

HNTB HNTB NORTH CAROLINA, P.C.
License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY: M. WRIGHT DATE: 3/12
CHECKED BY: D. HAWKINS DATE: 3/12 DWG. NO. 25

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

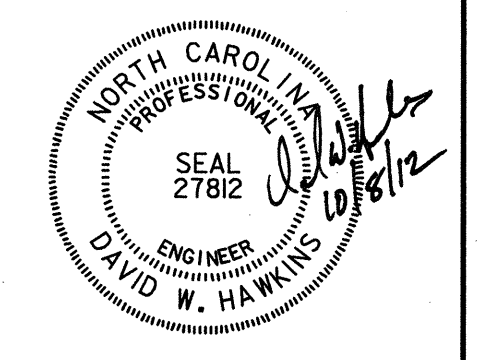
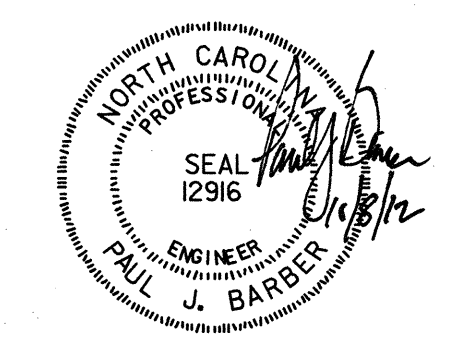
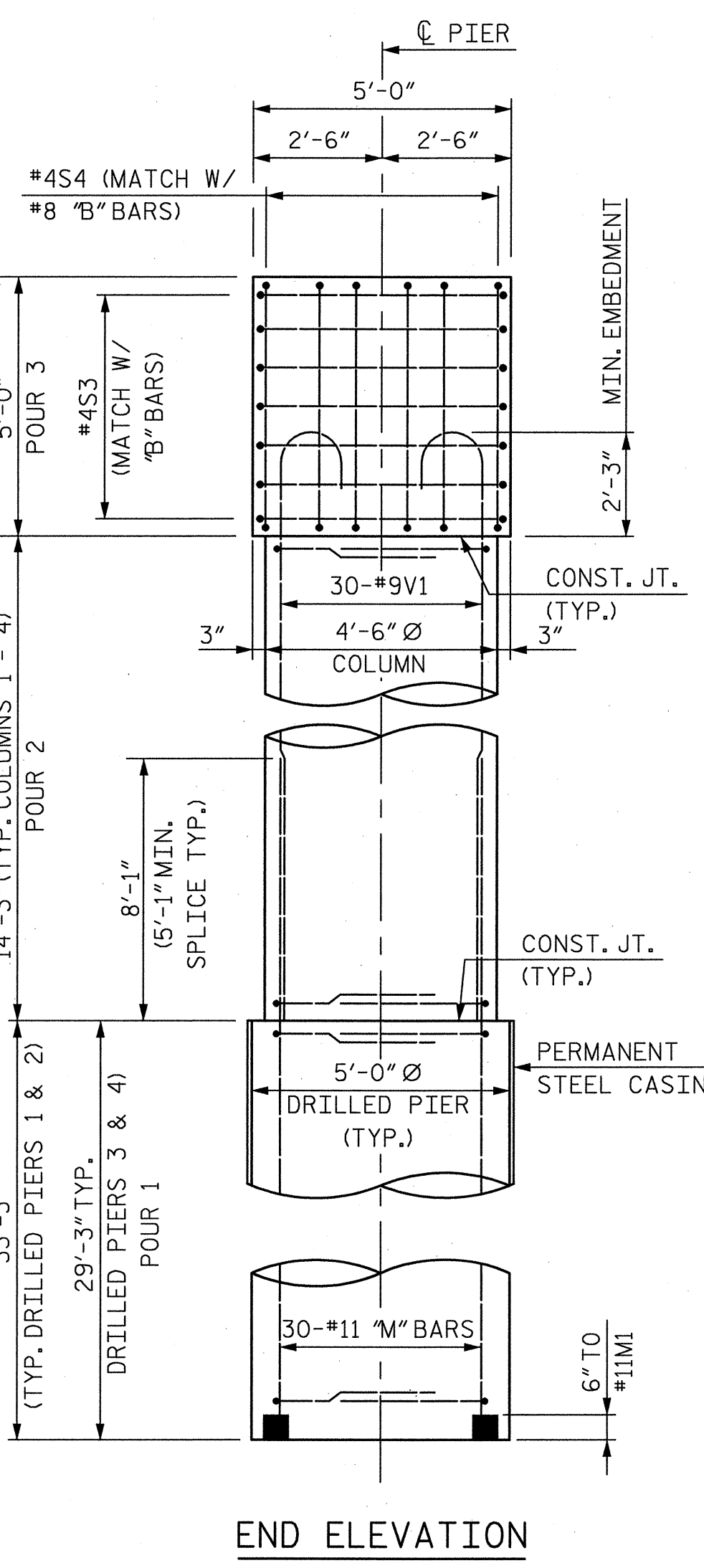
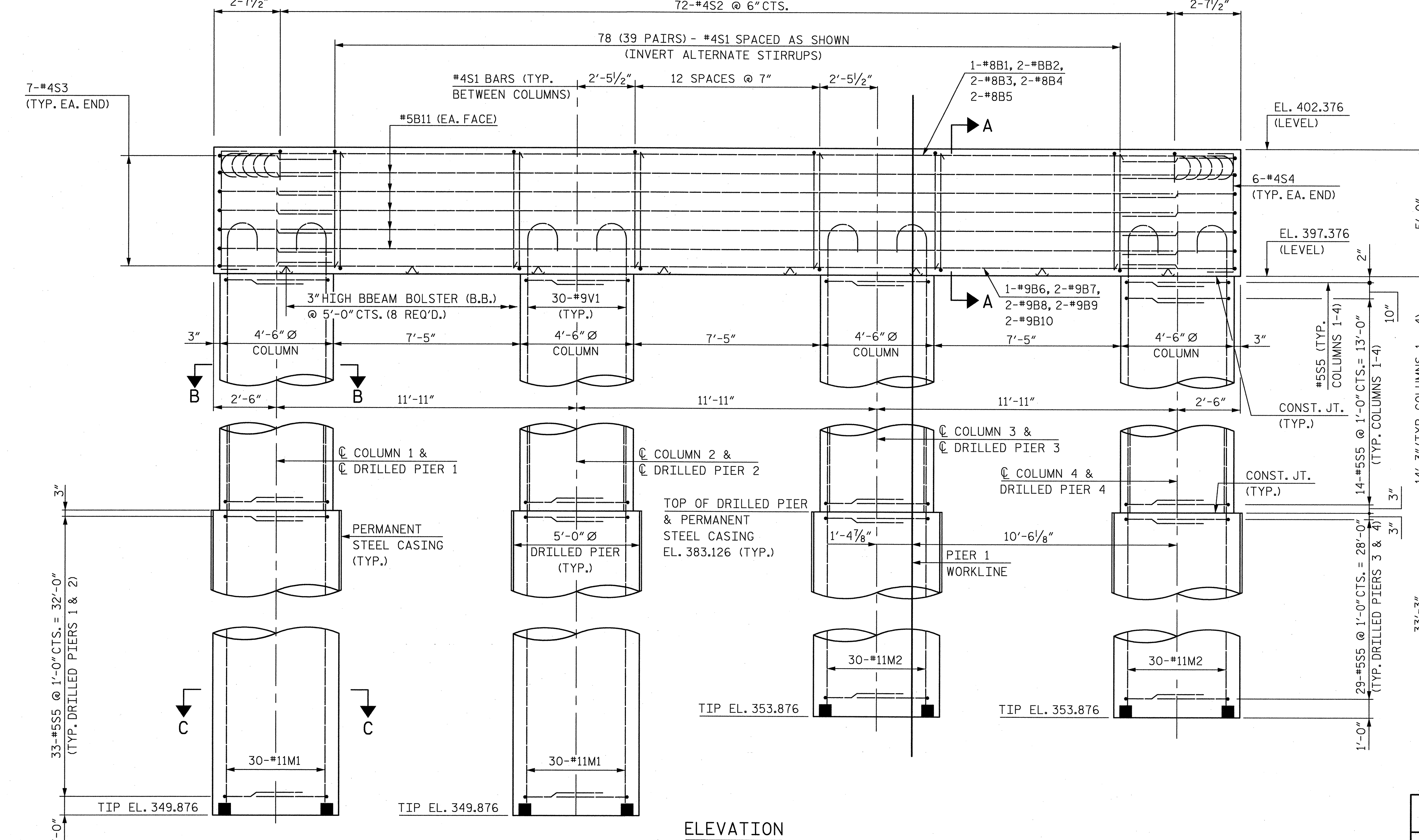
TOTAL SHEETS: 40

0371DEL_P17-18



NOTES:

ALL DIMENSIONS SHOWN ARE PARALLEL OR NORMAL TO C PIER UNLESS NOTED.
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
 ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL".
 THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FT. OF EXTRA LENGTH.
 THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIER IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1'-0" BELOW THE GROUND LINE.

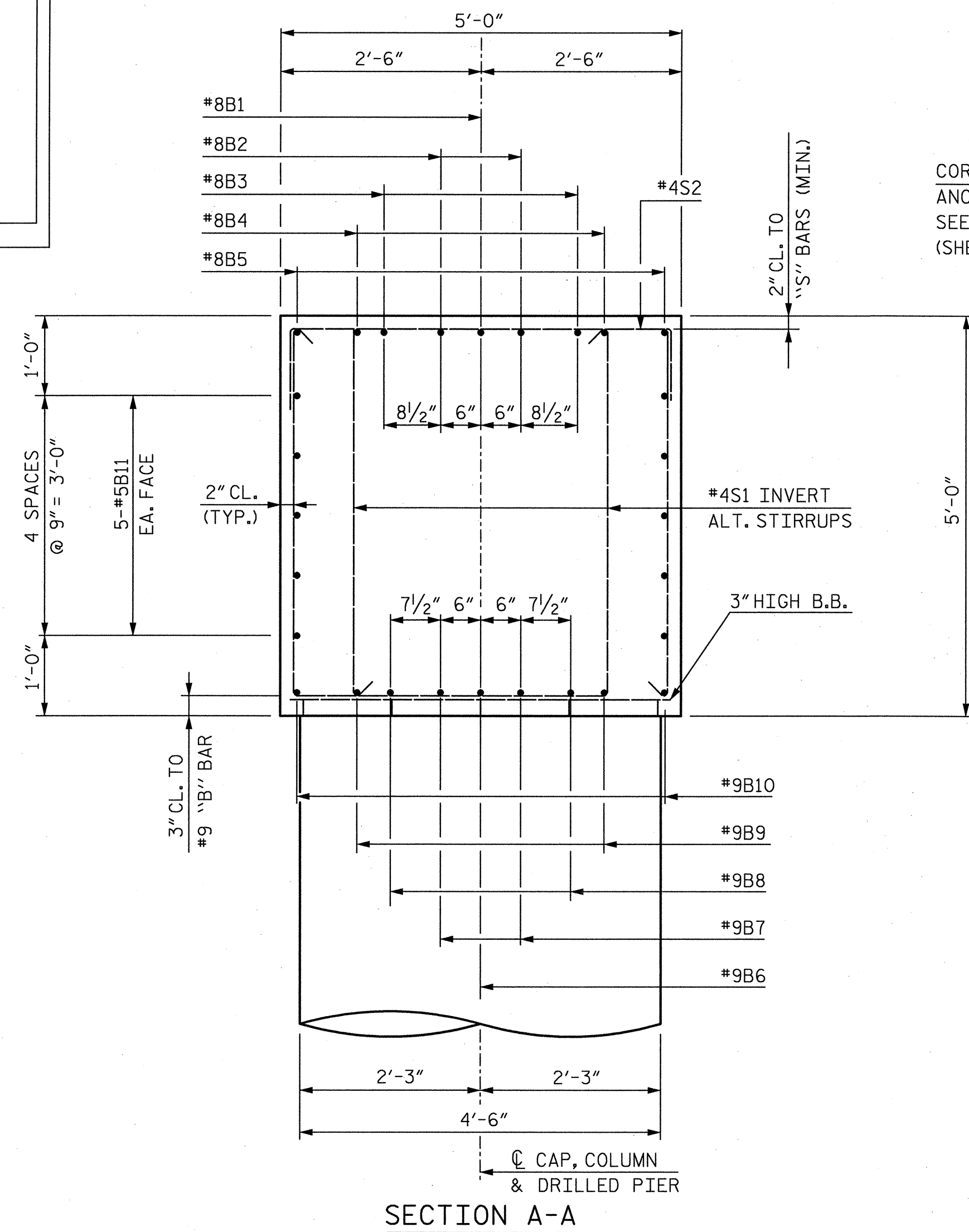


PROJECT NO. U-4716A/C
 DURHAM COUNTY
 STATION: POC STA. 3315+52.15 -MAIN-
 MILE POST: H64.60
 SHEET 1 OF 2

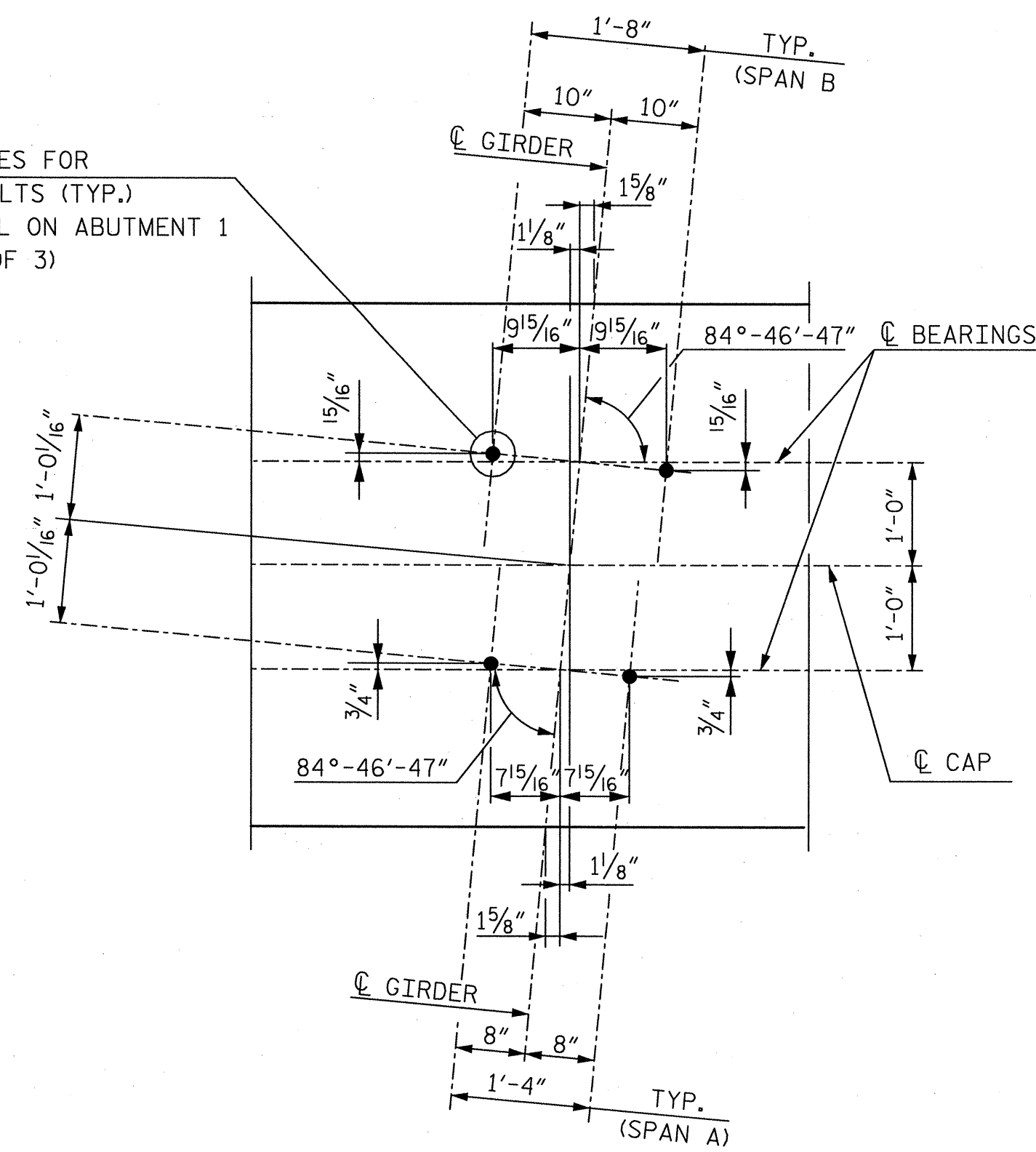
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 PIER 1

HNTB		HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: J. BAYNE	DATE: 3/12	DWG. NO. 26	
CHECKED BY: K. DICKENS	DATE: 3/12		

REVISIONS				SHEET NO.
NO.	BY:	DATE:		S-26
1				TOTAL SHEETS 40
2				
3				
4				

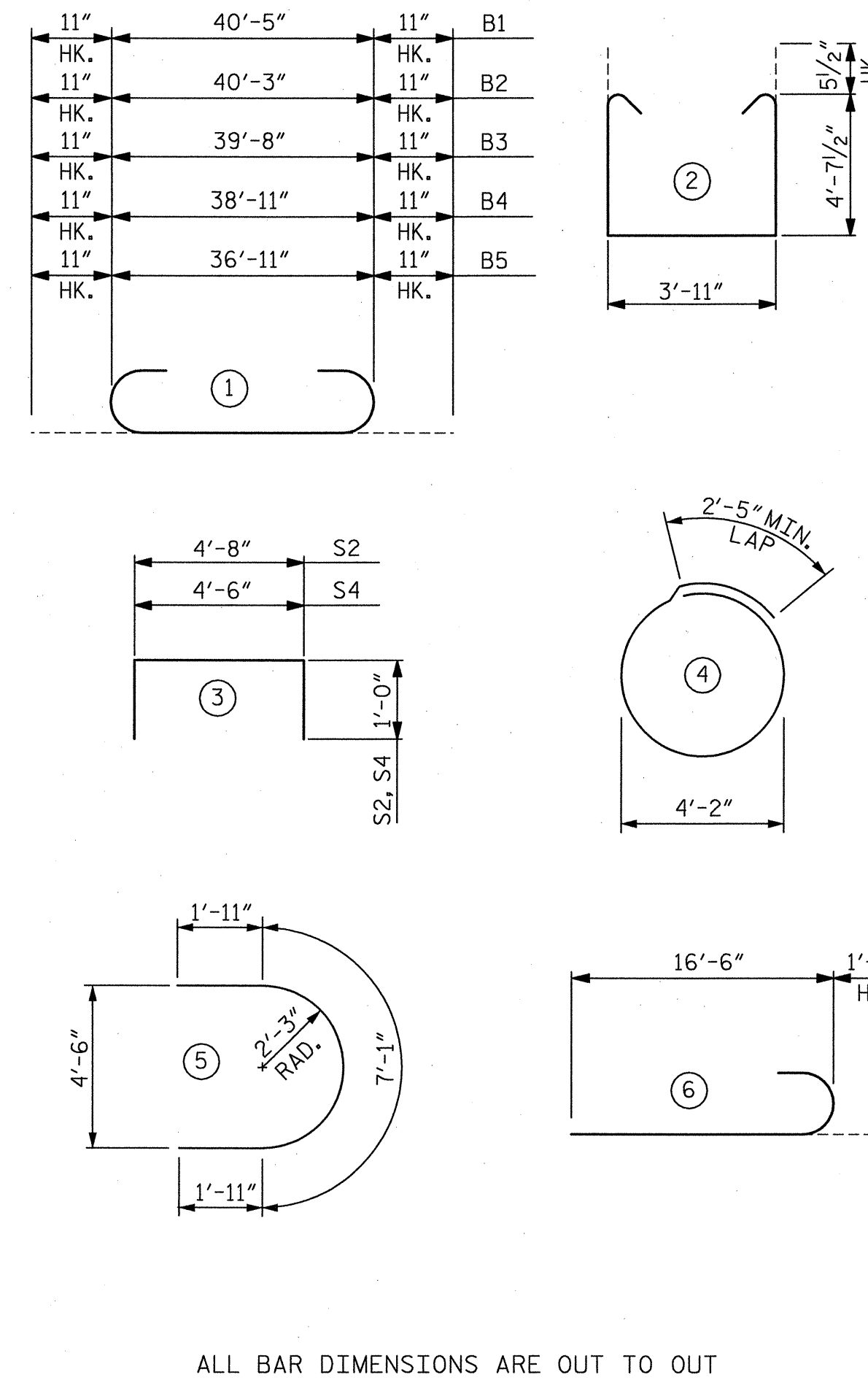


CORED HOLES FOR ANCHOR BOLTS (TYP.) SEE DETAIL ON ABUTMENT 1 (SHEET 3 OF 3)



DETAIL A

BAR TYPES



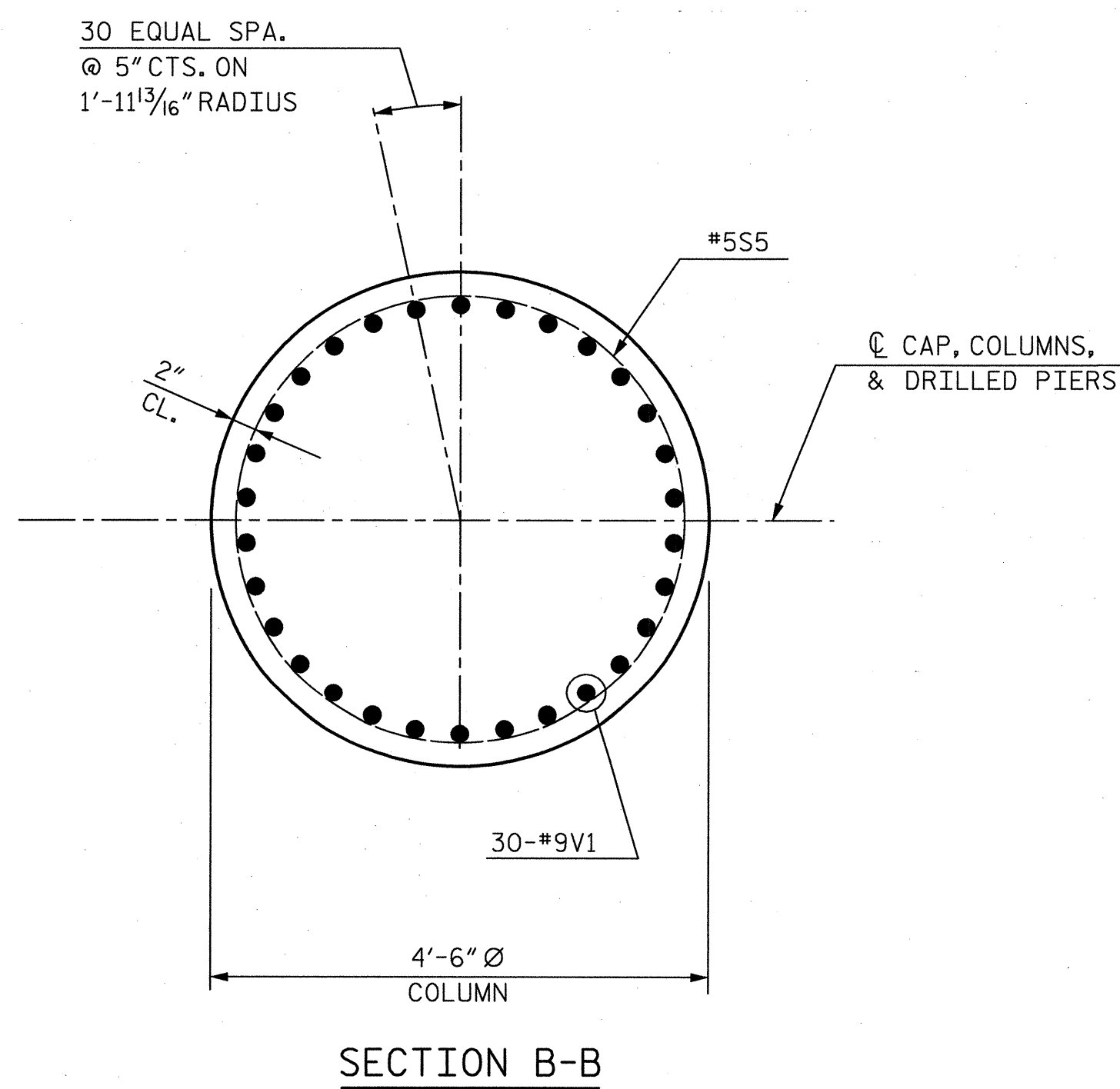
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF REINFORCING

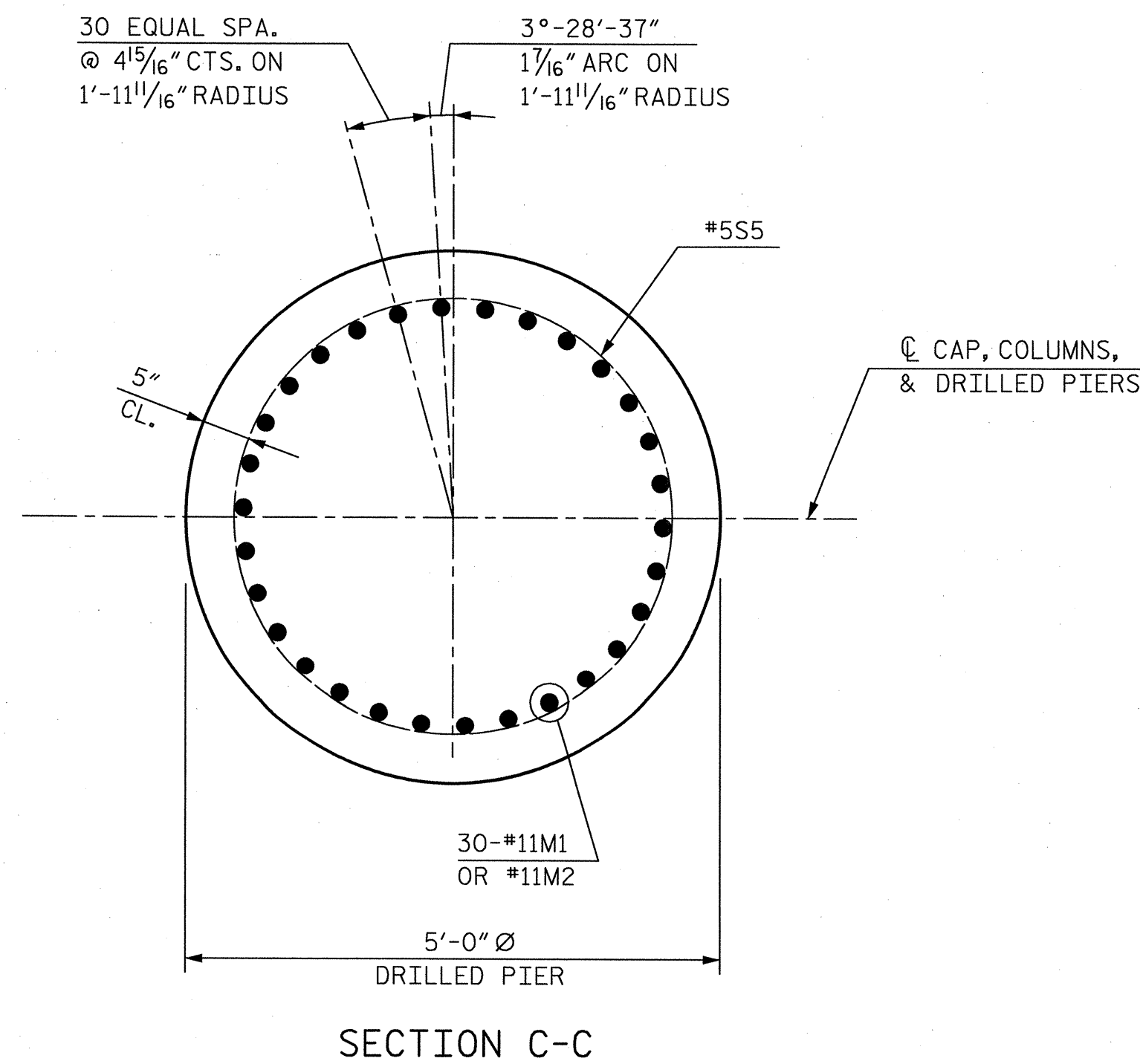
PIER 1					
MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	1	8		42'-3"	113
B2	2	8		42'-1"	225
B3	2	8		41'-6"	222
B4	2	8		40'-9"	218
B5	2	8		38'-9"	207
B6	1	9	STR.	40'-5"	137
B7	2	9	STR.	40'-3"	274
B8	2	9	STR.	39'-8"	270
B9	2	9	STR.	38'-11"	265
B10	2	9	STR.	36'-11"	251
B11	10	5	STR.	35'-9"	373
S1	78	4	2	14'-1"	734
S2	72	4	3	6'-8"	321
S3	14	4	5	10'-11"	102
S4	12	4	3	6'-6"	52
S5	184	5	4	15'-6"	2,975
M1	60	11	STR.	40'-10"	13,017
M2	60	11	STR.	36'-10"	11,742
V1	120	9	6	17'-9"	7,242

QUANTITIES

ITEM	TOTAL
REINFORCING STEEL	LBS 38,740
CLASS AA CONCRETE:	
POUR 2	C.Y. 33.6
POUR 3	C.Y. 36.7
TOTAL	C.Y. 70.3
5'-0" DIA. DRILLED PIERS	NO. 4
DRILLED PIER	L.F. 125.0
DRILLED PIER CONCRETE POUR 1	C.Y. 90.9
PERMANENT STEEL CASING FOR 5'-0" DIA. DRILLED PIER	L.F. 38.5



SECTION B-B

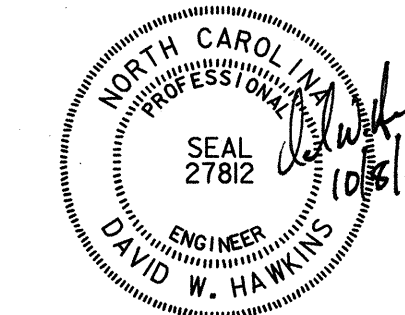
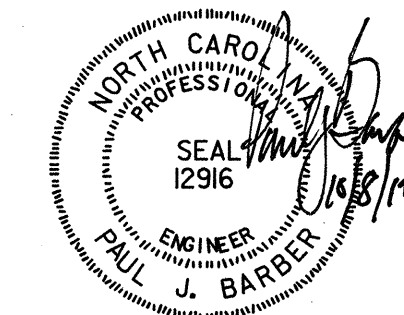


SECTION C-C

PROJECT NO. U-4716A/C
 DURHAM COUNTY
 STATION: POC STA. 3315+52.15 -MAIN-
 MILE POST: H64.60
 SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 PIER 1

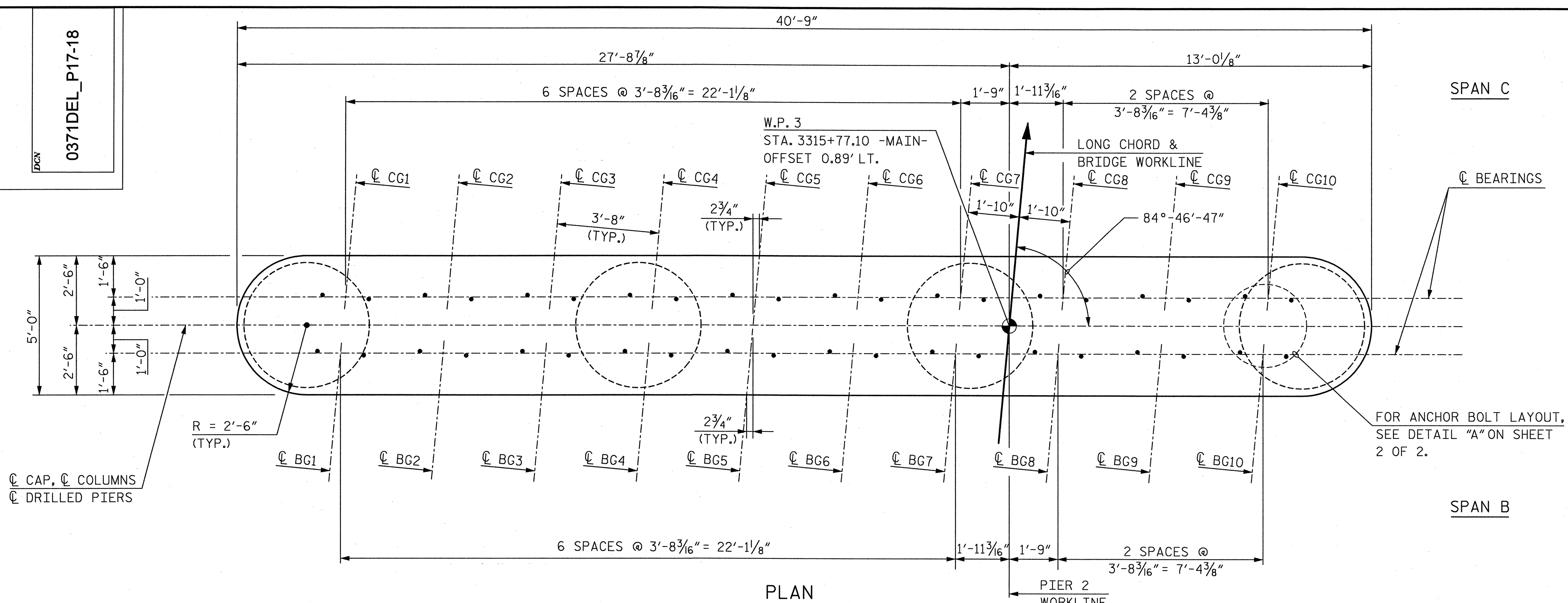


HNTB HNTB NORTH CAROLINA, P.C.
 License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
 DRAWN BY: J. BAYNE DATE: 3/12
 CHECKED BY: K. DICKENS DATE: 3/12 DWG. NO. 27

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

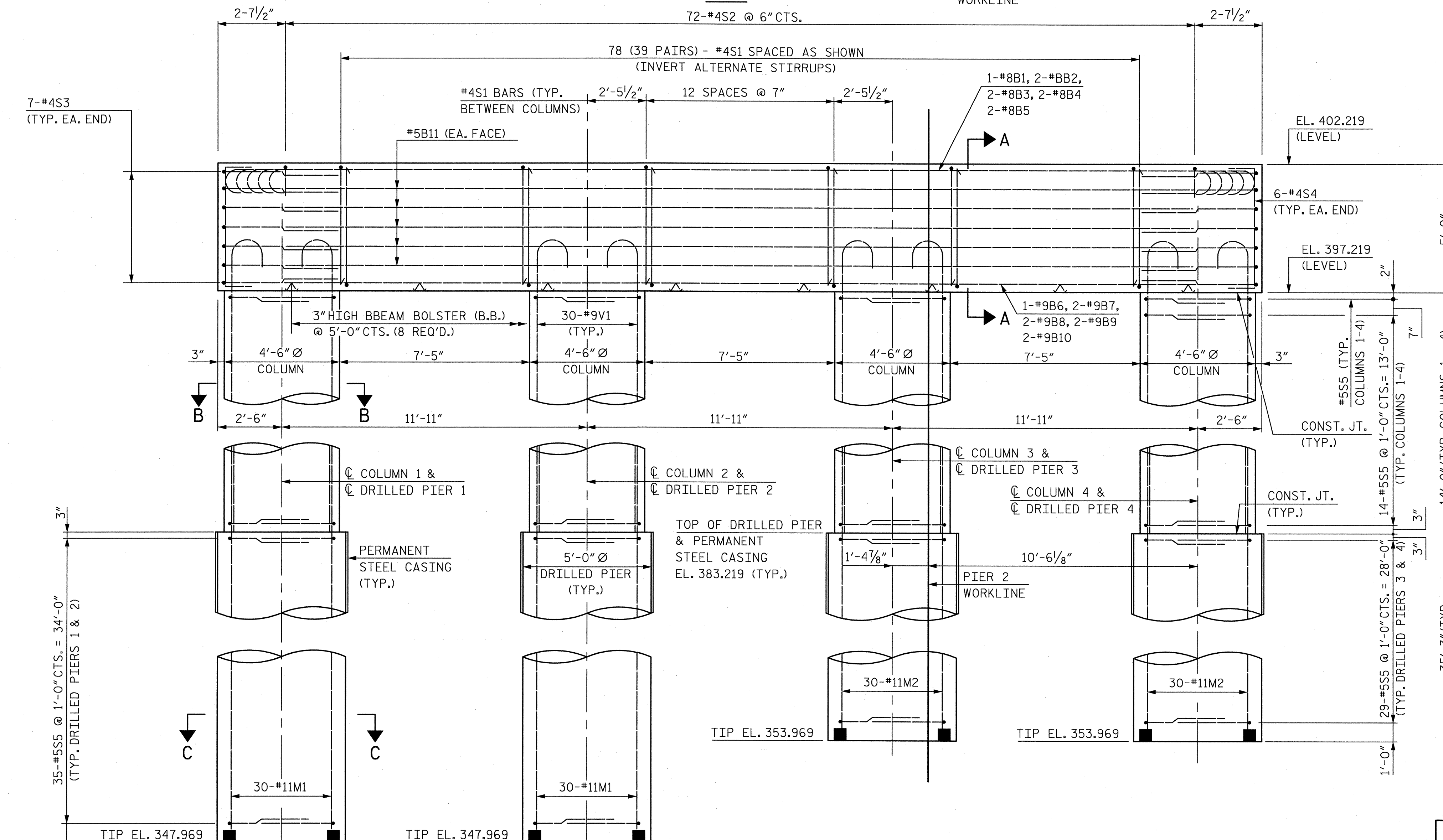
TOTAL SHEETS: 40

0371DEL_P17-18

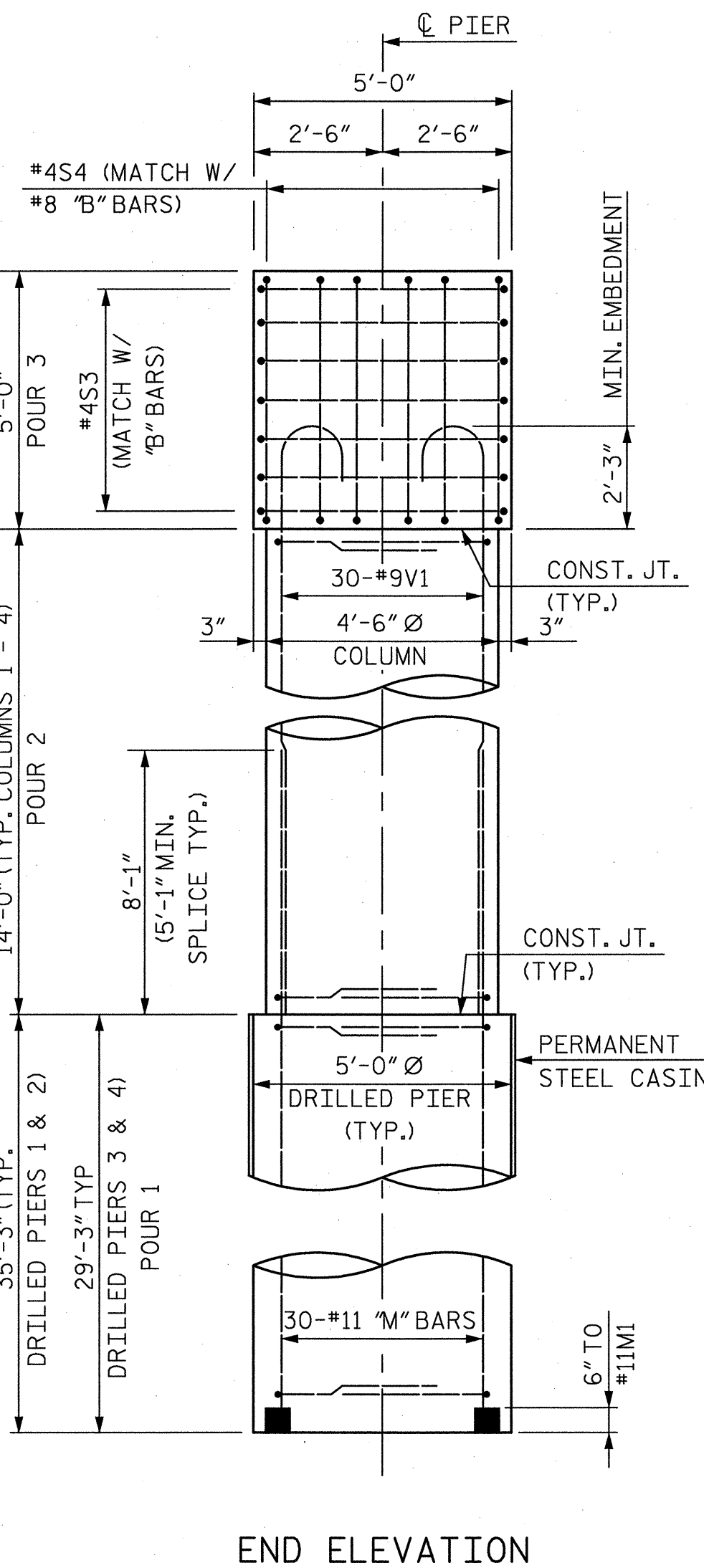


PLAN

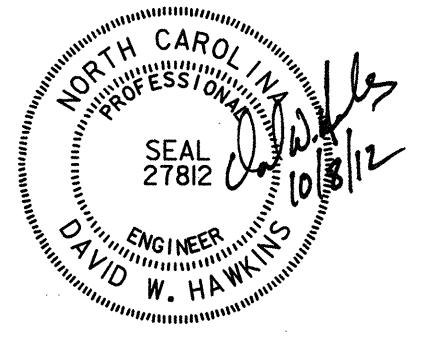
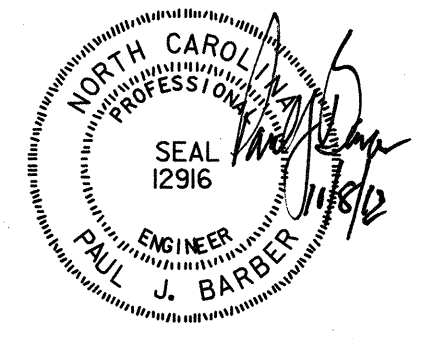
NOTES:
 ALL DIMENSIONS SHOWN ARE PARALLEL OR NORMAL TO C PIER UNLESS NOTED.
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
 ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL".
 THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FT. OF EXTRA LENGTH.
 THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIER IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1'-0" BELOW THE GROUND LINE.



ELEVATION



END ELEVATION



PROJECT NO. U-4716A/C
 DURHAM COUNTY
 STATION: POC STA. 3315+52.15 -MAIN-
 MILE POST: H64.60
 SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 PIER 2

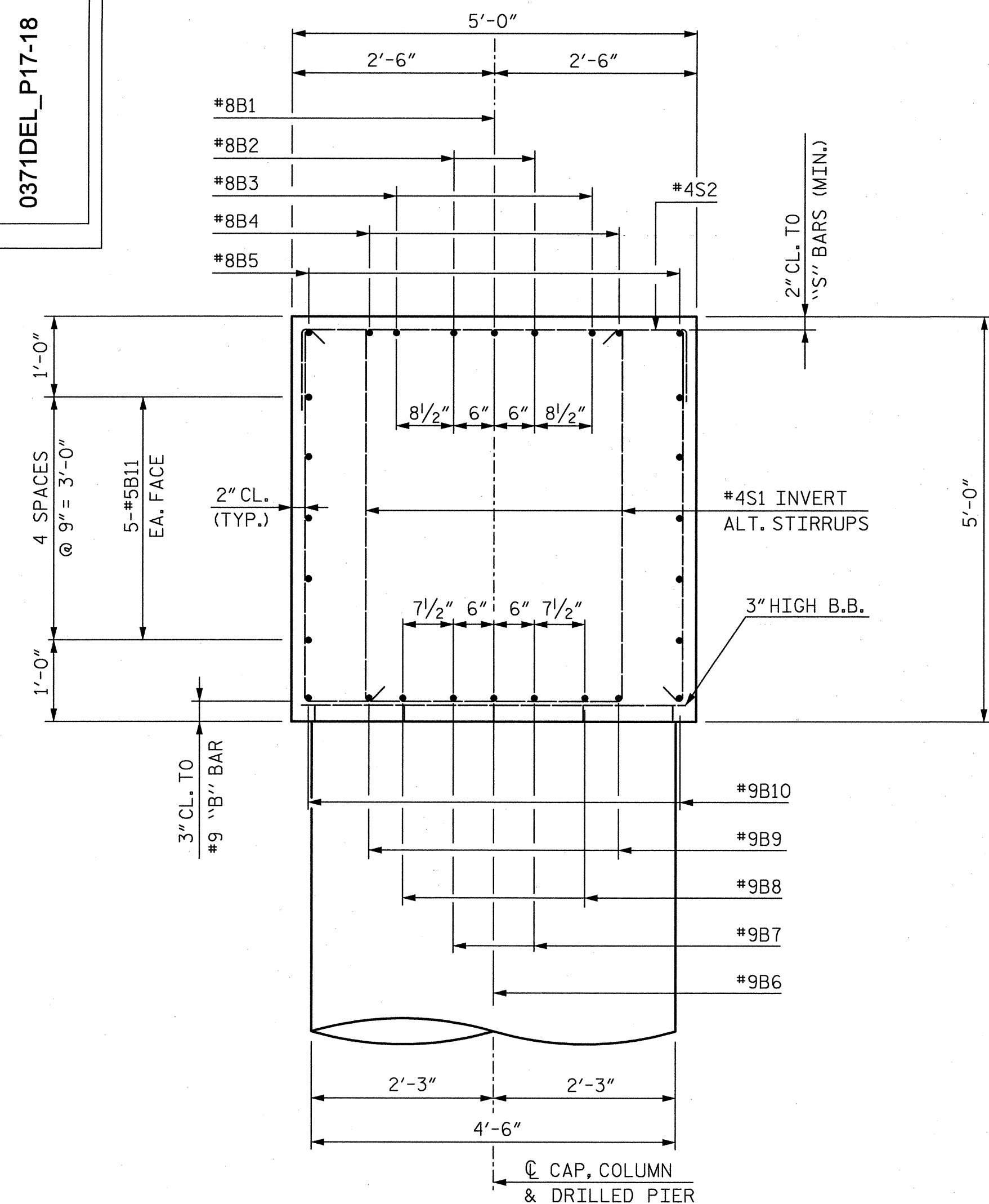
HNTB HNTB NORTH CAROLINA, P.C.
 License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, NC 27609

NO.	BY:	DATE:	NO.	BY:	DATE:
1	J. BAYNE	3/12	3		
2	K. DICKENS	3/12	4		

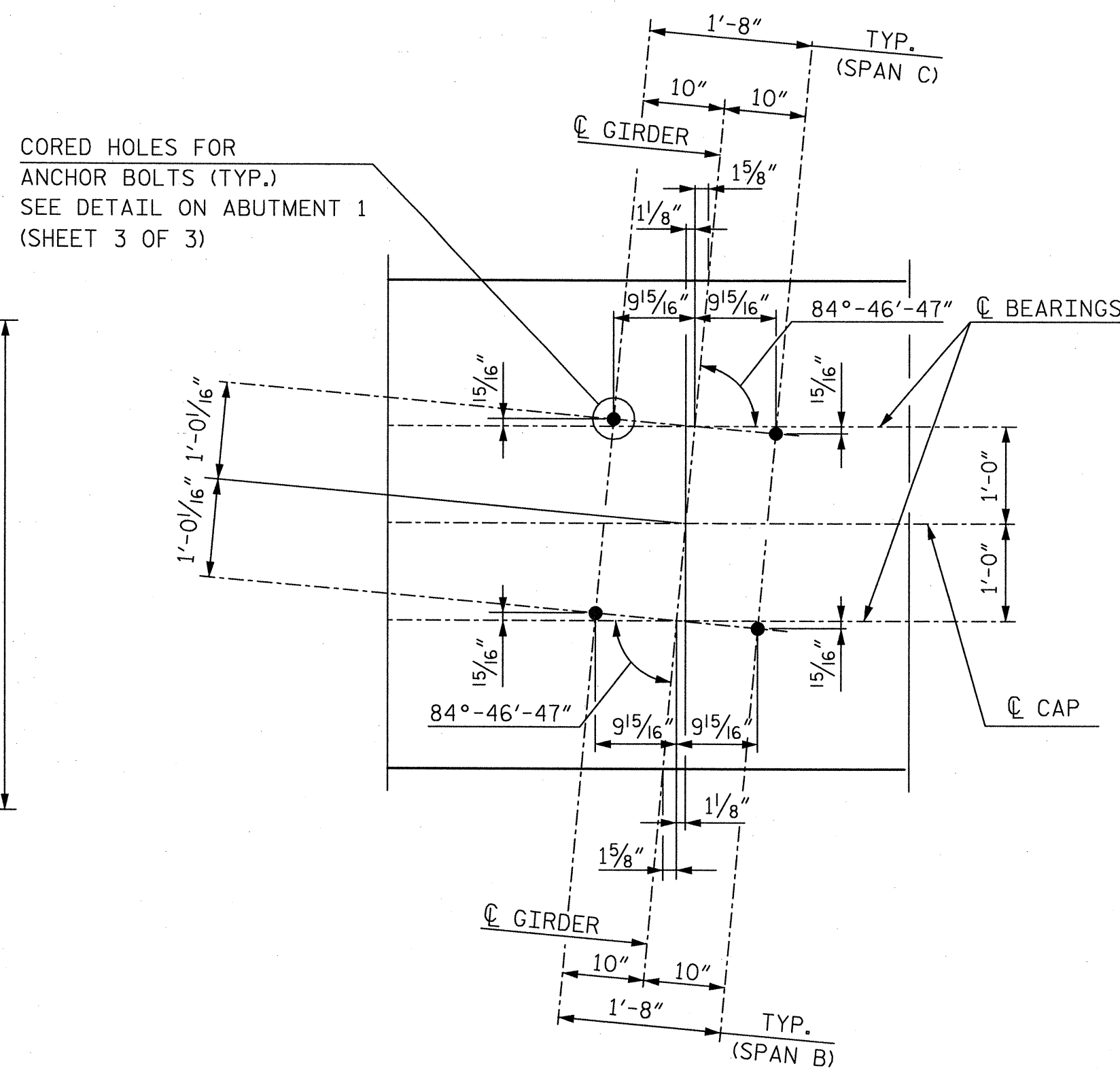
DWG. NO. 28

SHEET NO.
 S-28
 TOTAL SHEETS
 40

0371DEL_P17-18

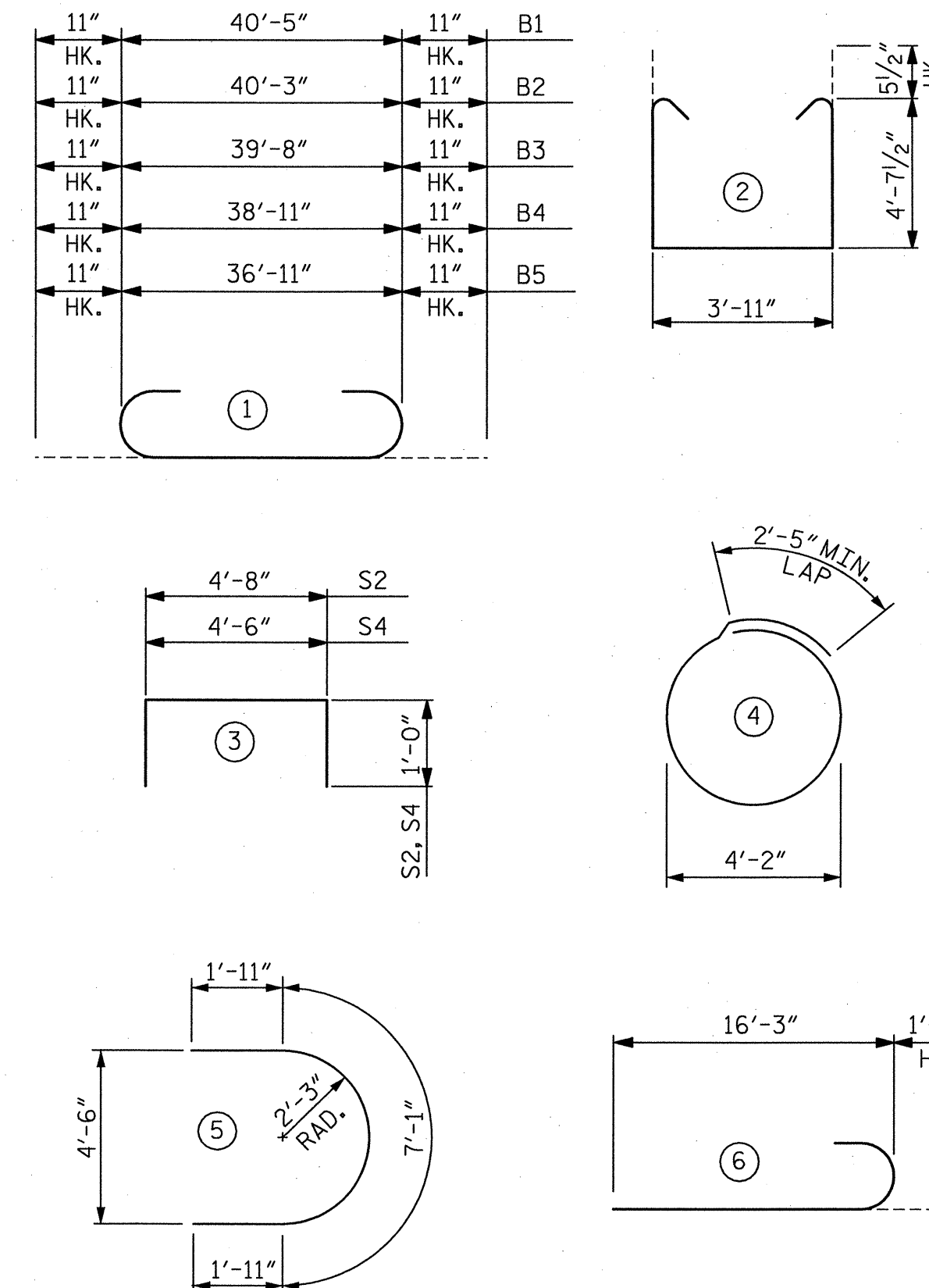


SECTION A-A



DETAIL A

BAR TYPES



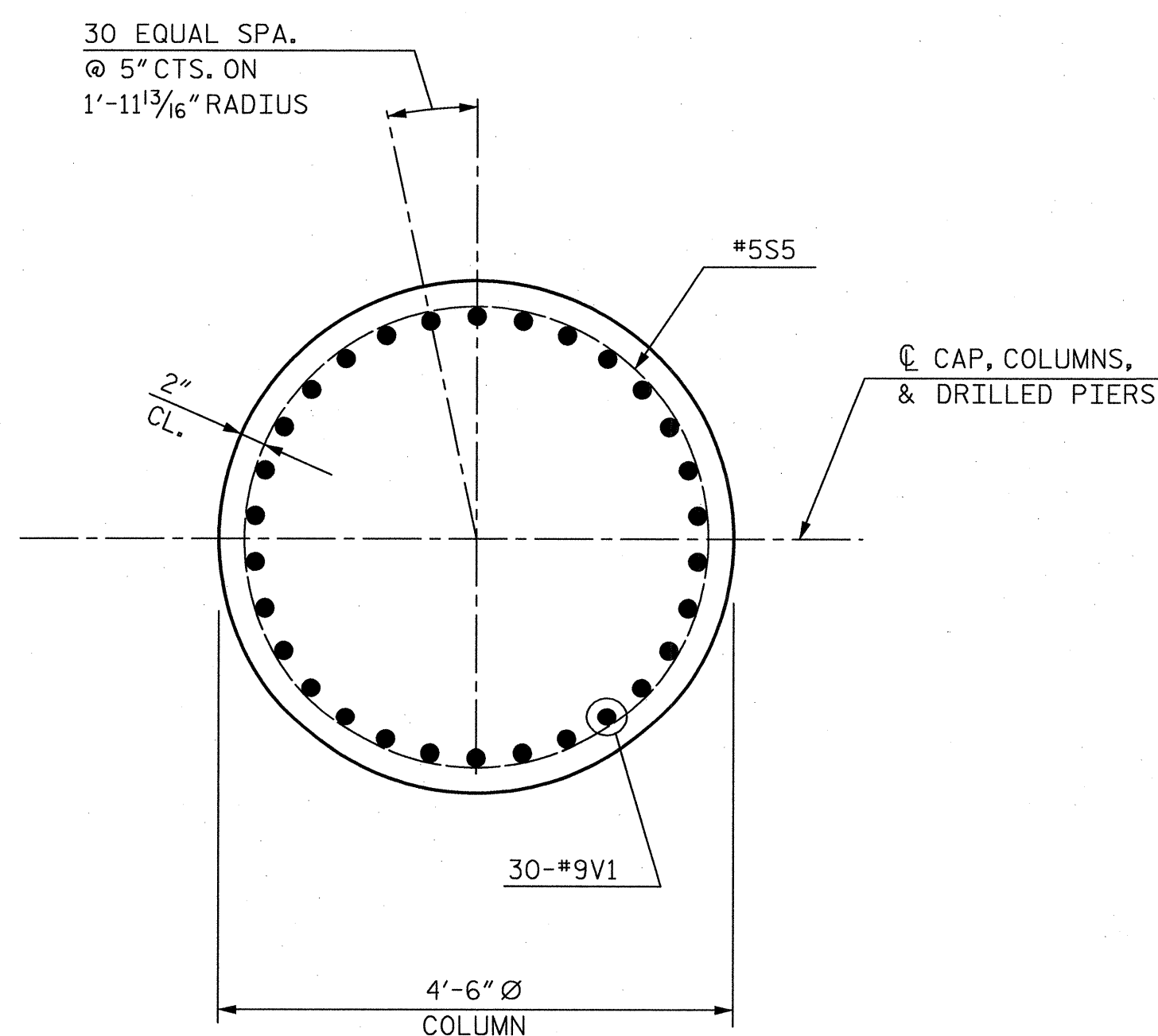
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF REINFORCING

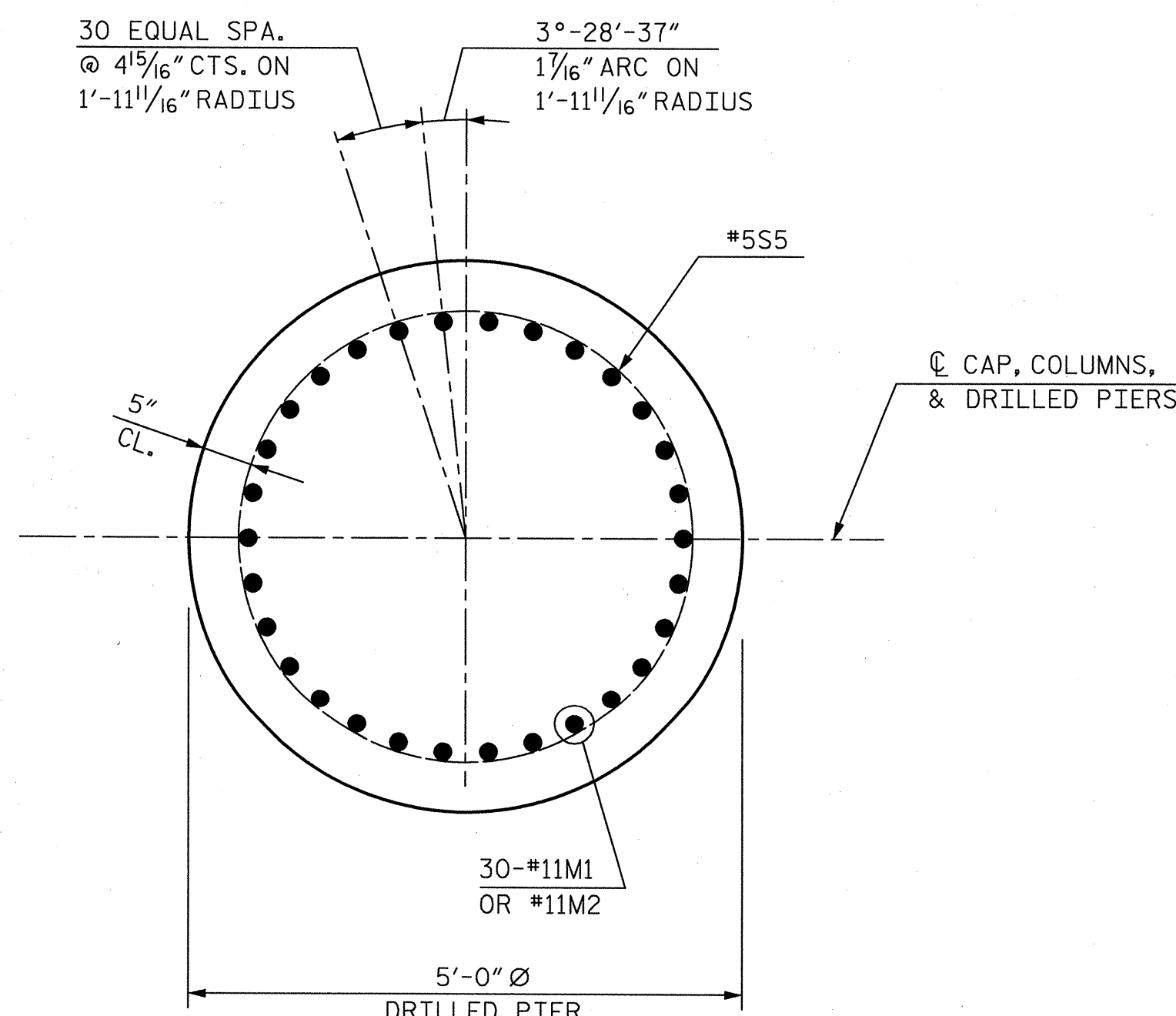
PIER 2					
MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	1	8	1	42'-3"	113
B2	2	8	1	42'-1"	225
B3	2	8	1	41'-6"	222
B4	2	8	1	40'-9"	218
B5	2	8	1	38'-9"	207
B6	1	9	STR.	40'-5"	137
B7	2	9	STR.	40'-3"	274
B8	2	9	STR.	39'-8"	270
B9	2	9	STR.	38'-11"	265
B10	2	9	STR.	36'-11"	251
B11	10	5	STR.	35'-9"	373
S1	78	4	2	14'-1"	734
S2	72	4	3	6'-8"	321
S3	14	4	5	10'-11"	102
S4	12	4	3	6'-6"	52
S5	188	5	4	15'-6"	3,039
M1	60	11	STR.	42'-10"	13,654
M2	60	11	STR.	36'-10"	11,742
V1	120	9	6	17'-6"	7,140

QUANTITIES

ITEM	TOTAL
REINFORCING STEEL	LBS 39,339
CLASS AA CONCRETE:	
POUR 2	C.Y. 33.0
POUR 3	C.Y. 36.7
TOTAL	C.Y. 69.7
5'-0" DIA. DRILLED PIERS	NO. 4
DRILLED PIER	L.F. 129.0
DRILLED PIER CONCRETE POUR 1	C.Y. 93.8
PERMANENT STEEL CASING FOR 5'-0" DIA. DRILLED PIER	L.F. 20.9



SECTION B-B



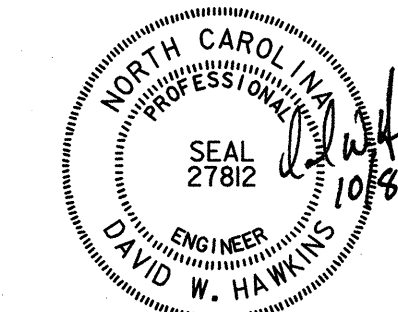
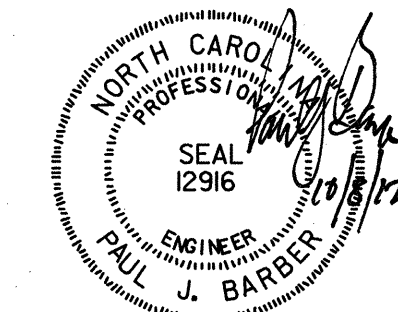
SECTION C-C

PROJECT NO. U-4716A/C
 DURHAM COUNTY
 STATION: POC STA. 3315+52.15 -MAIN-
 MILE POST: H64.60

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 PIER 2



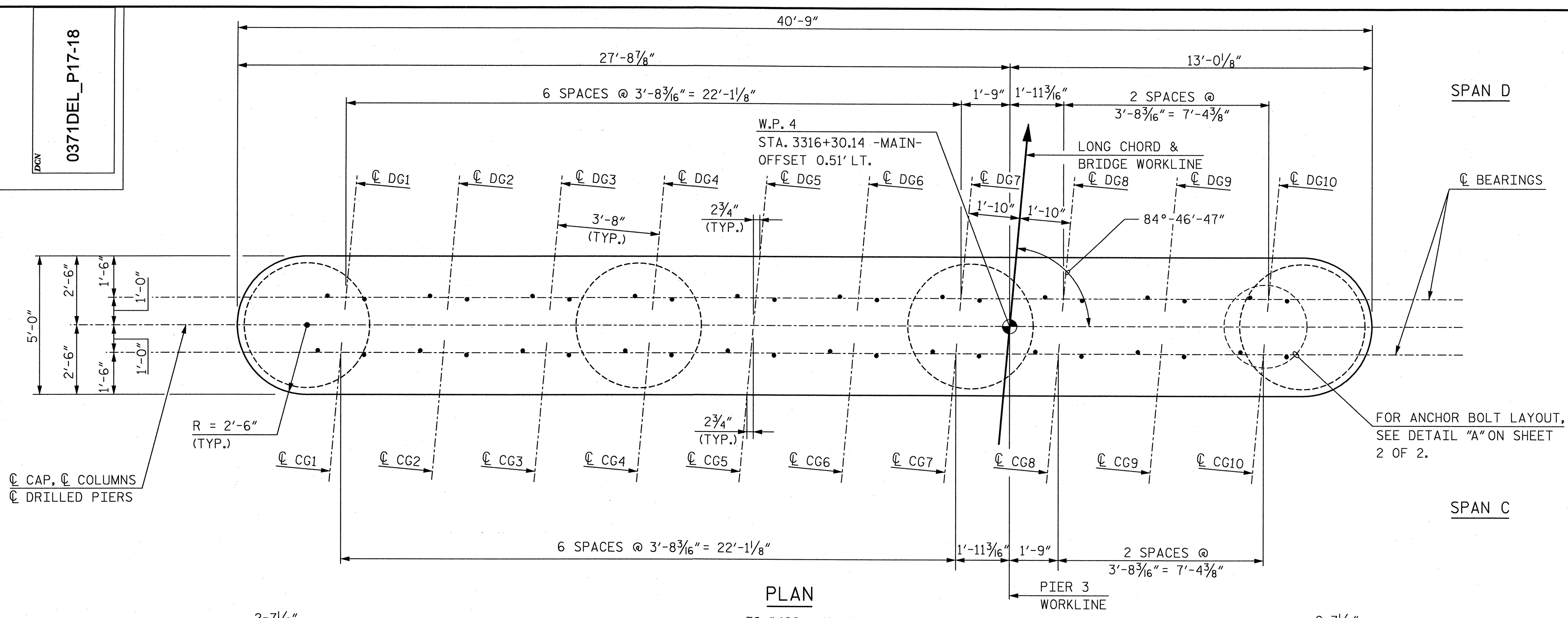
HNTB HNTB NORTH CAROLINA, P.C.
 License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: J. BAYNE DATE: 3/12
 CHECKED BY: K. DICKENS DATE: 3/12

DATE: 3/12 DWG. NO. 29

REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	S-29
1			3	TOTAL SHEETS
2			4	40

0371DEL_P17-18



NOTES:

ALL DIMENSIONS SHOWN ARE PARALLEL OR NORMAL TO C PIER UNLESS NOTED.

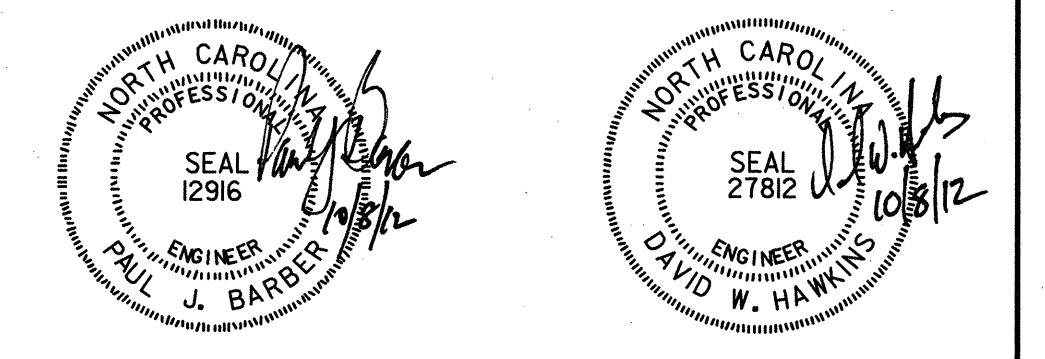
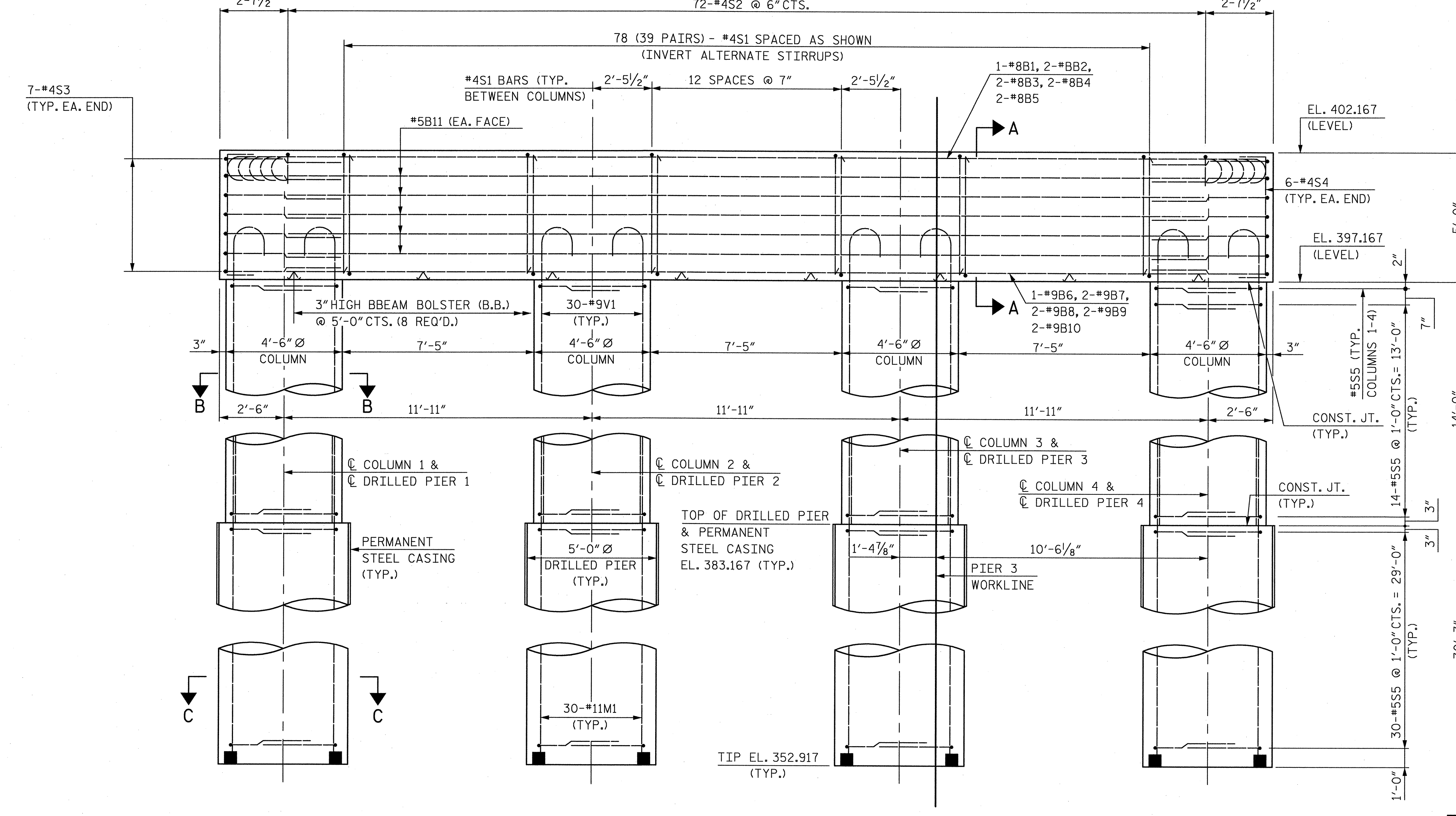
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

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

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

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIER IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1'-0" BELOW THE GROUND LINE.

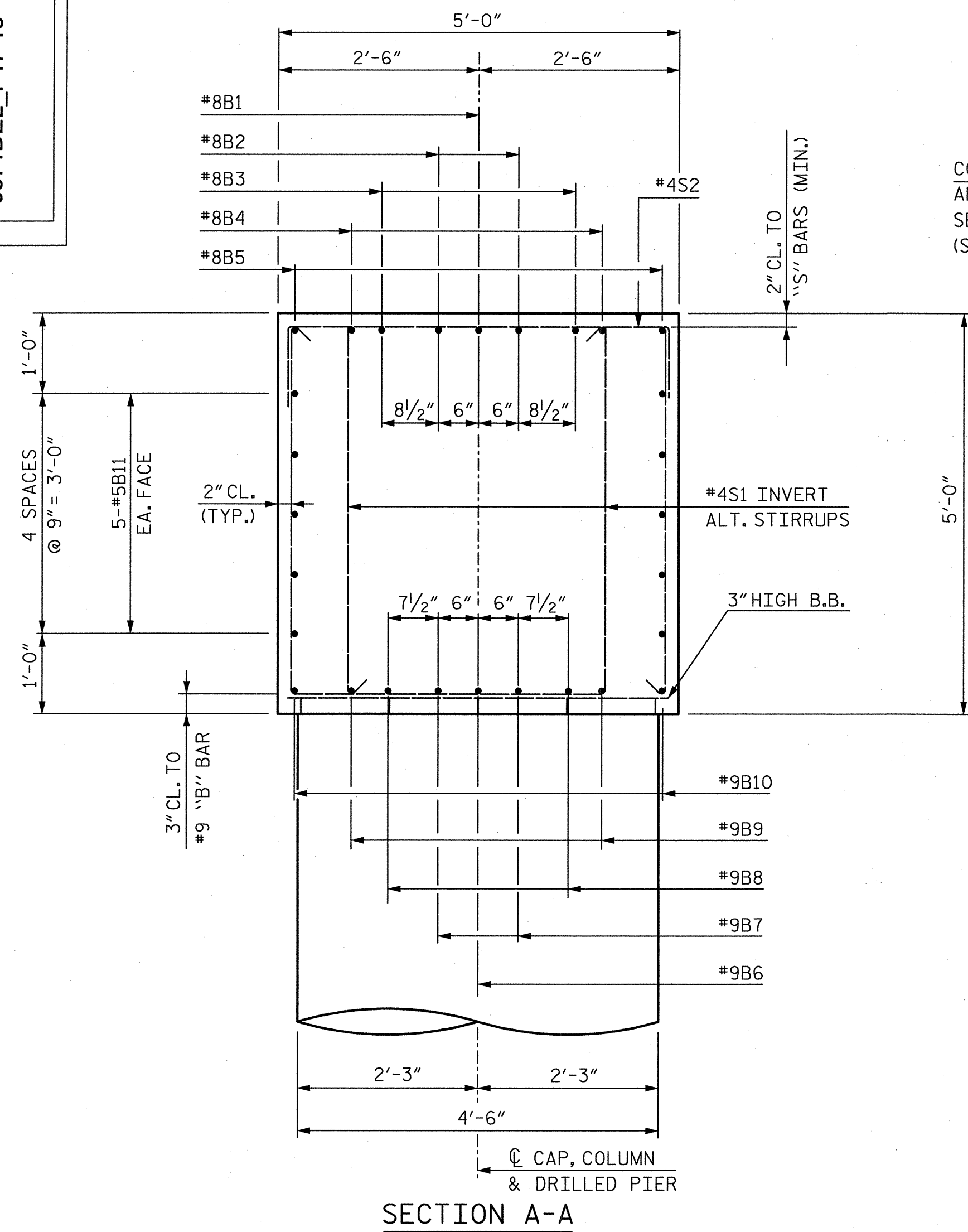


PROJECT NO. U-4716A/C
 DURHAM COUNTY
 STATION: POC STA. 3315+52.15 -MAIN-
 MILE POST: H64.60
 SHEET 1 OF 2

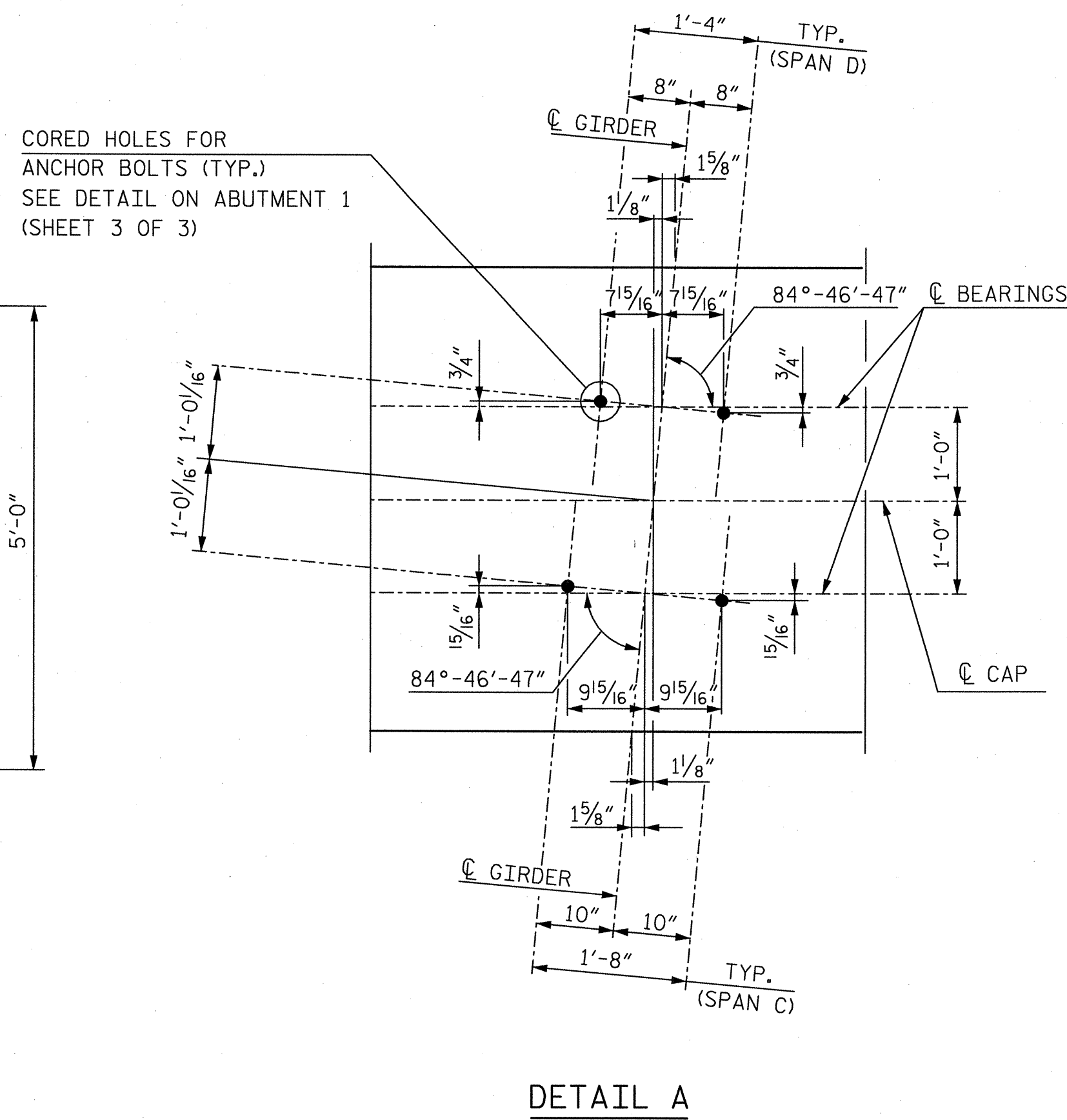
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 PIER 3

HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS		SHEET NO. S-30
NO.	BY:	DATE:	NO.	DATE:
1	J. BAYNE	3/12	3	
2	K. DICKENS	3/12	4	
DRAWN BY: J. BAYNE DATE: 3/12				TOTAL SHEETS: 40
CHECKED BY: K. DICKENS DATE: 3/12				
DWG. NO. 30				

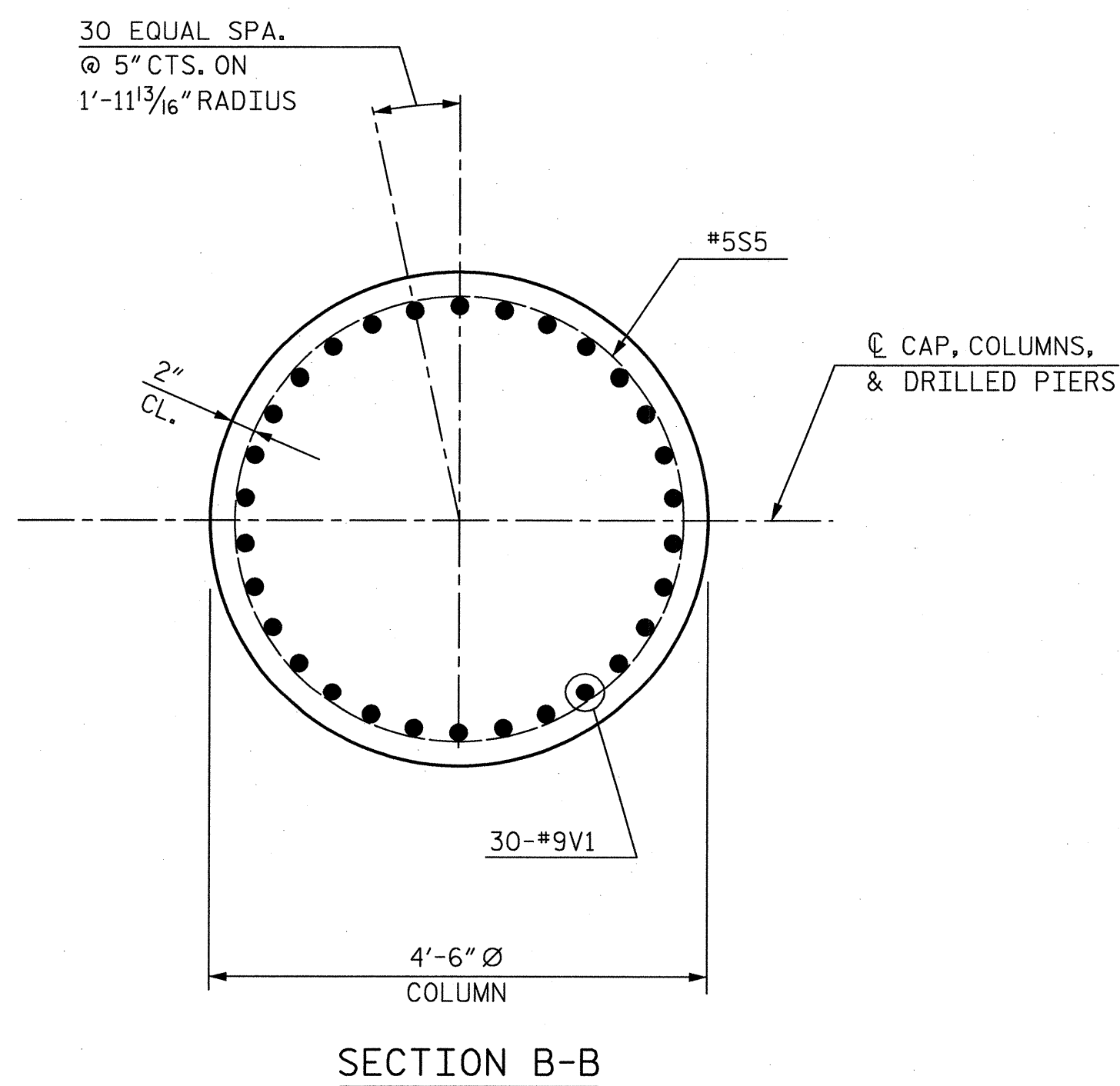
0371DEL_P17-18



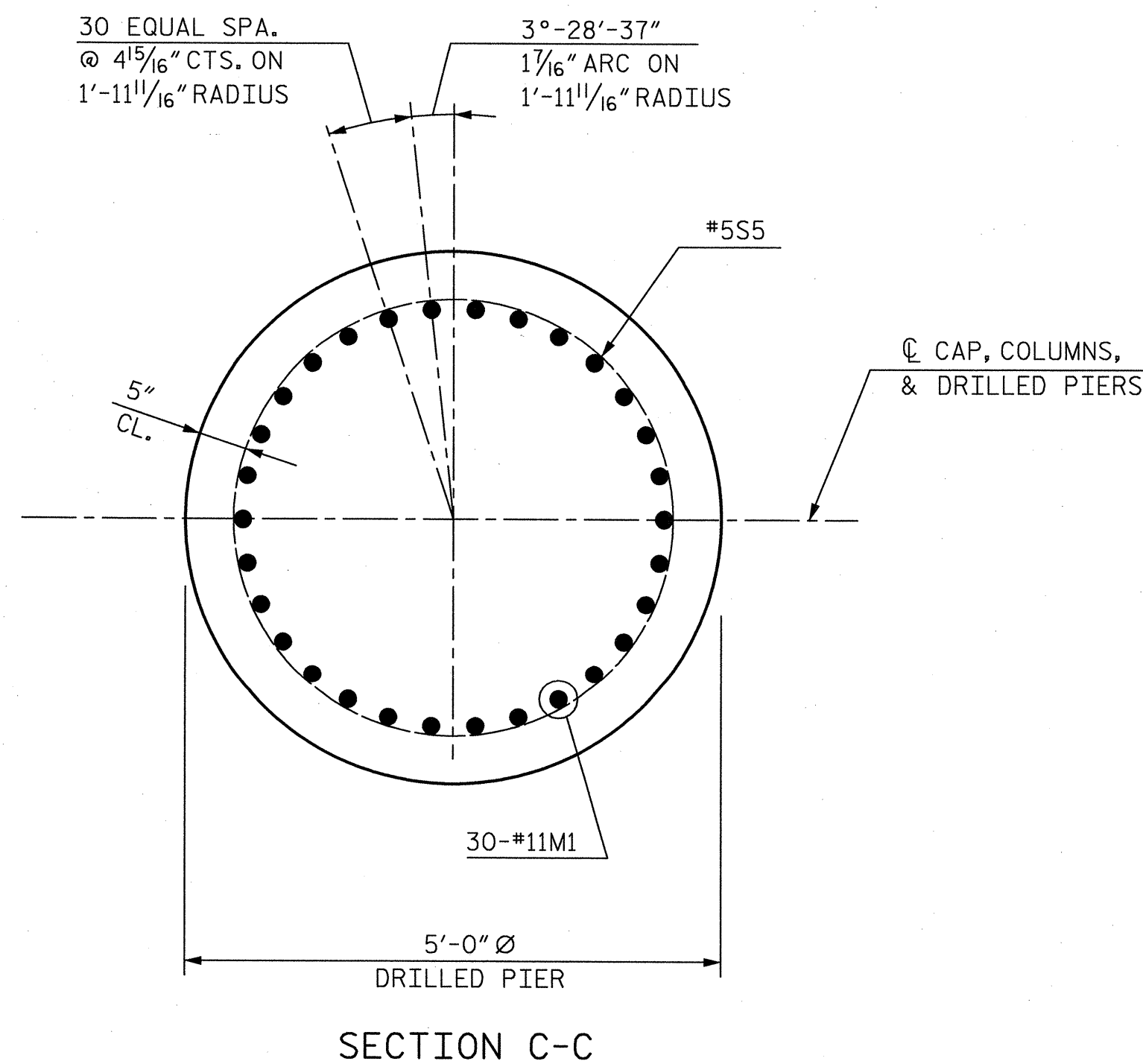
SECTION A-A



DETAIL A

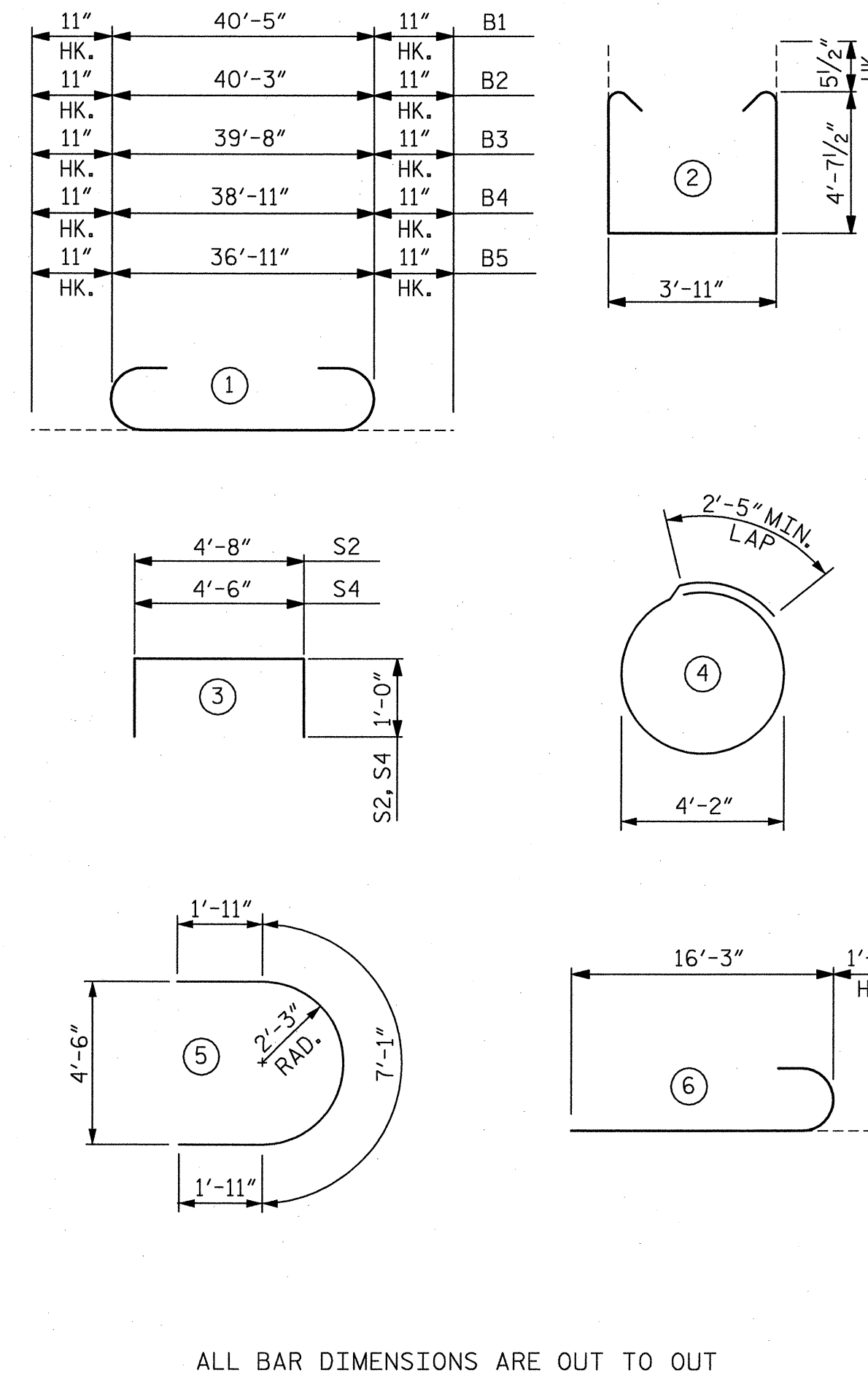


SECTION B-B



SECTION C-C

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF REINFORCING

PIER 3					
MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	1	8	1	42'-3"	113
B2	2	8	1	42'-1"	225
B3	2	8	1	41'-6"	222
B4	2	8	1	40'-9"	218
B5	2	8	1	38'-9"	207
B6	1	9	STR.	40'-5"	137
B7	2	9	STR.	40'-3"	274
B8	2	9	STR.	39'-8"	270
B9	2	9	STR.	38'-11"	265
B10	2	9	STR.	36'-11"	251
B11	10	5	STR.	35'-9"	273
S1	78	4	2	14'-1"	734
S2	72	4	3	6'-8"	321
S3	14	4	5	10'-11"	102
S4	12	4	3	6'-6"	52
S5	180	5	4	15'-6"	2,910
M1	120	11	STR.	37'-10"	24,121
V1	120	9	6	17'-6"	7,140

QUANTITIES

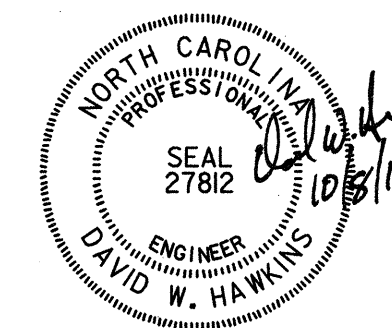
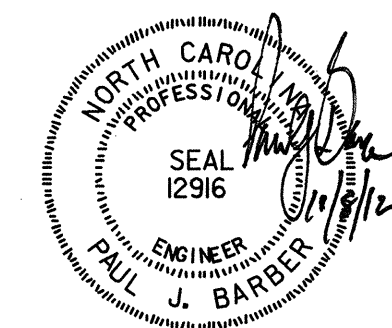
ITEM	TOTAL
REINFORCING STEEL	LBS 37,935
CLASS AA CONCRETE:	
POUR 2	C.Y. 33.0
POUR 3	C.Y. 36.7
TOTAL	C.Y. 69.7
5'-0" DIA. DRILLED PIERS	NO. 4
DRILLED PIER	L.F. 121.0
DRILLED PIER CONCRETE POUR 1	C.Y. 88.0
PERMANENT STEEL CASING	L.F. 20.7

PROJECT NO. U-4716A/C
 DURHAM COUNTY
 STATION: POC STA. 3315+52.15 -MAIN-

MILE POST: H64.60
 SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 PIER 3



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 License No. C-1554
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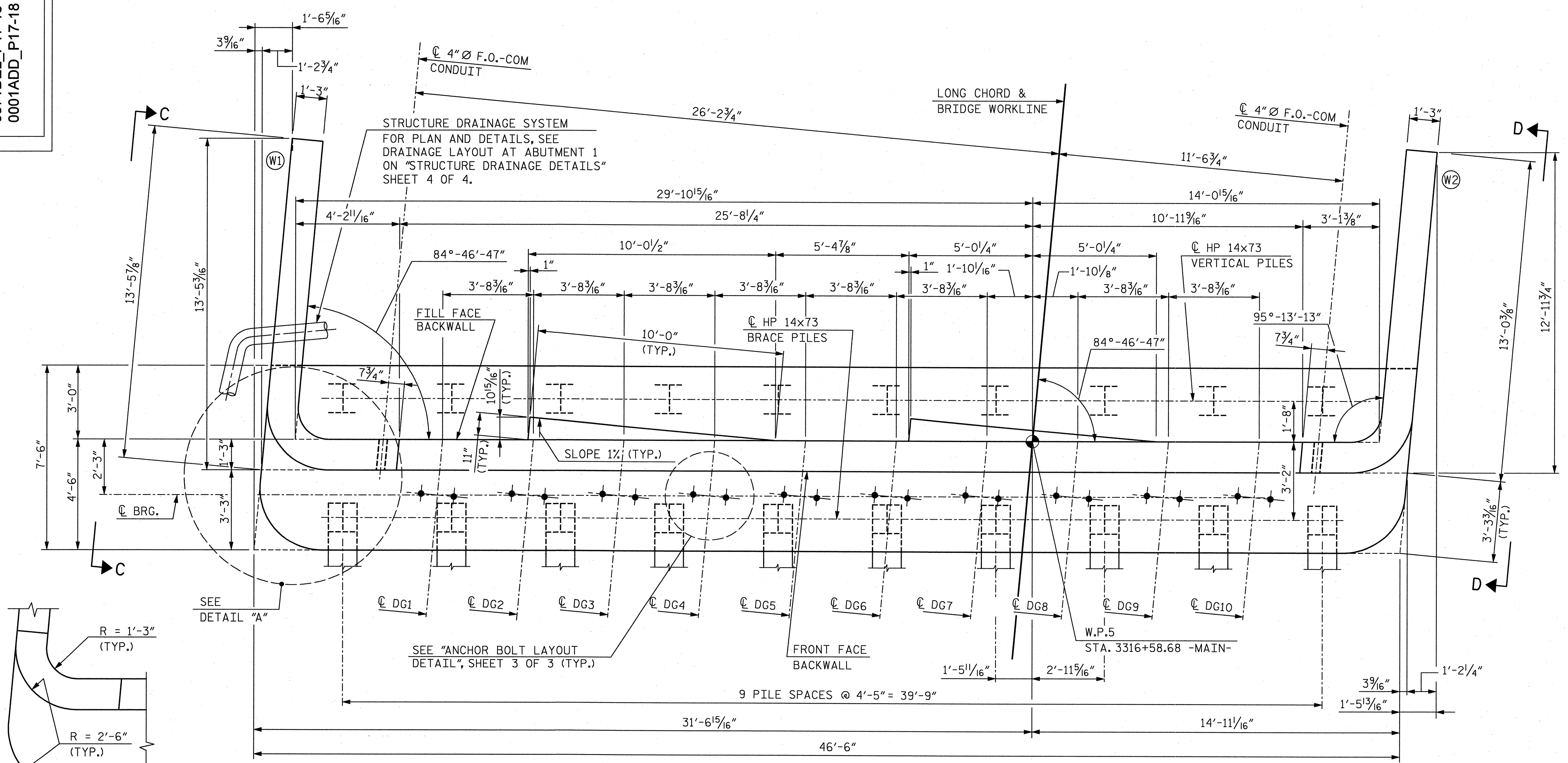
DRAWN BY: J. BAYNE DATE: 3/12
 CHECKED BY: K. DICKENS DATE: 3/12 DWG. NO. 31

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

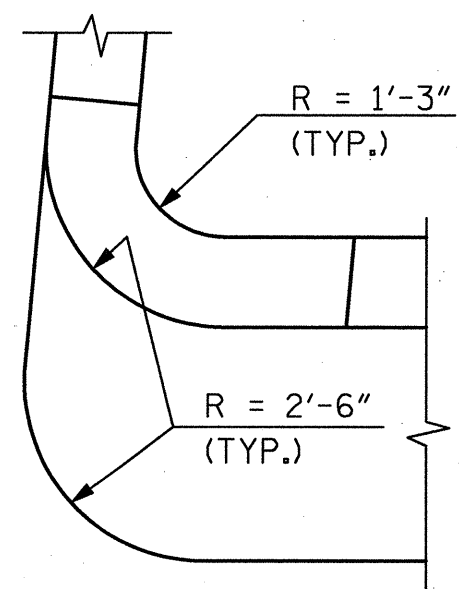
TOTAL SHEETS: 40

PROJ 0371DEL_P17-18
0001ADD_P17-18

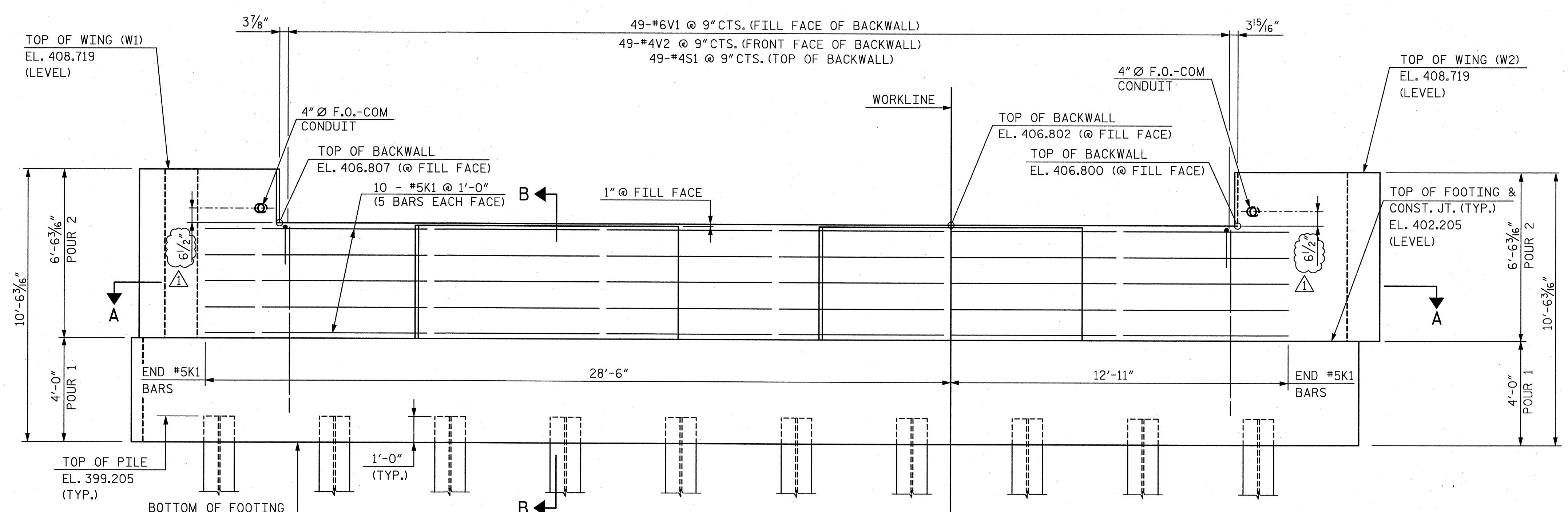
NOTES:
SEE ABUTMENT 1, SHEET 1 OF 3 FOR NOTES.



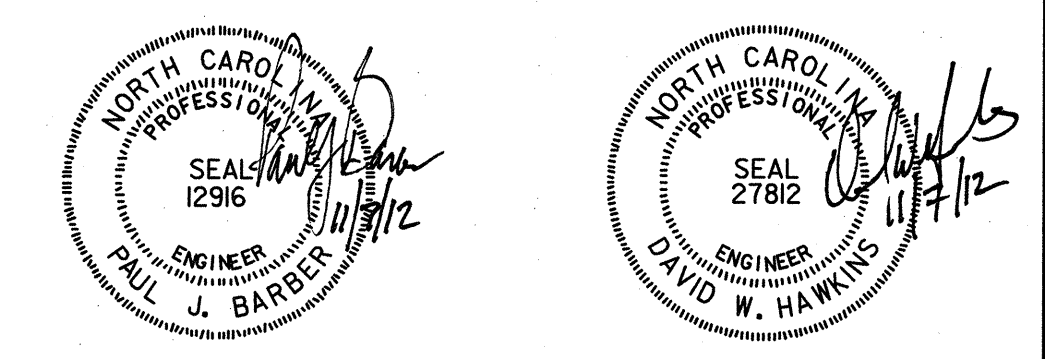
PLAN



DETAIL "A"



ELEVATION

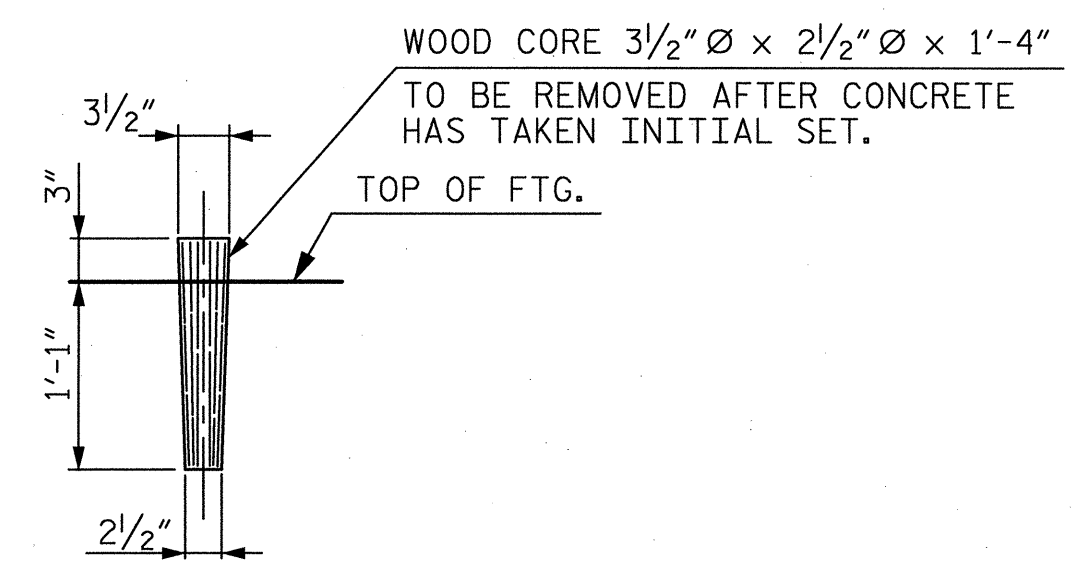


PROJECT NO. U-4716A/C
DURHAM COUNTY
STATION: POC STA. 3315+52.15 -MAIN-
MILE POST: H64.60
SHEET 1 OF 3

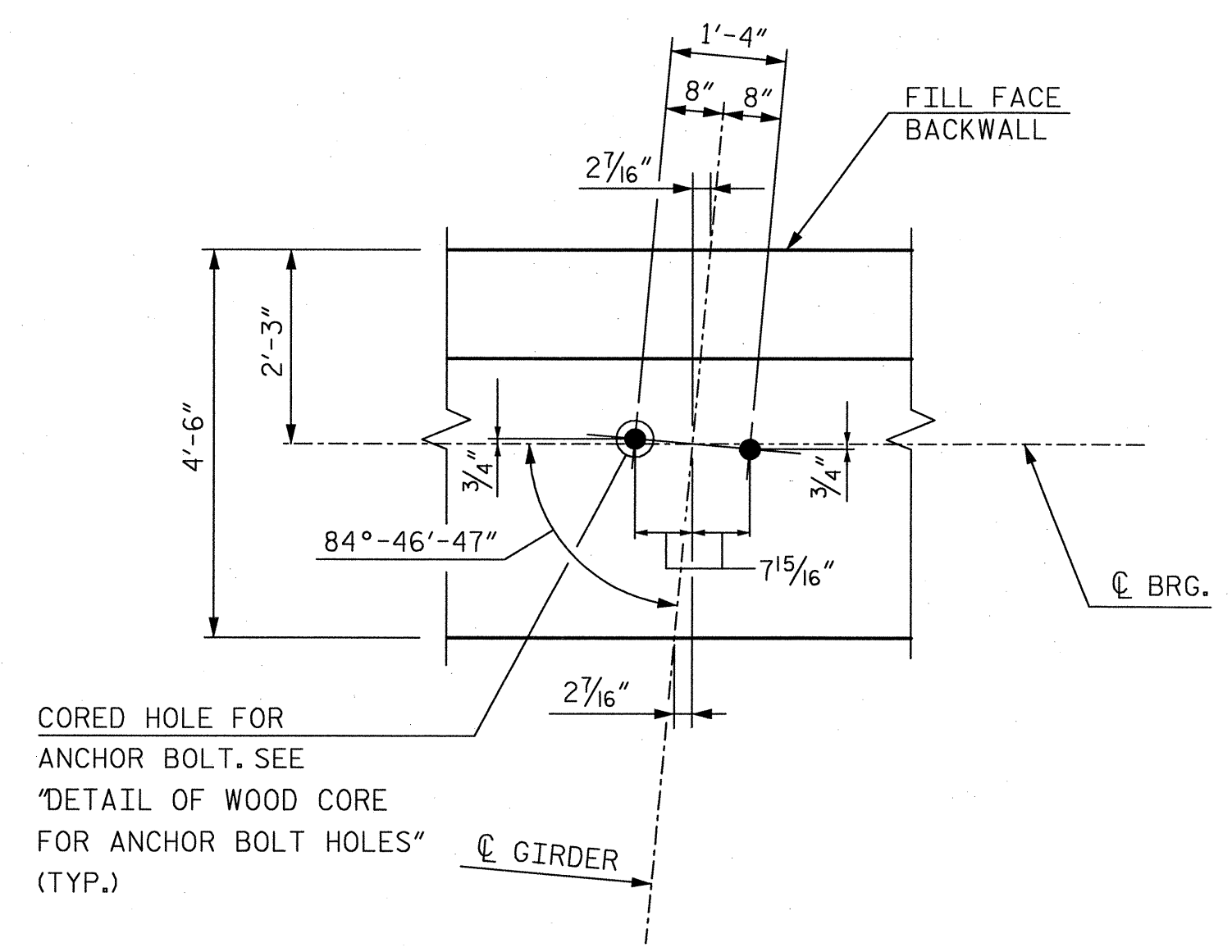
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
ABUTMENT 2

HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		REVISIONS		SHEET NO.
DRAWN BY: M. WRIGHT	DATE: 3/12	NO.:	BY:	DATE:
CHECKED BY: D. HAWKINS	DATE: 3/12	1	DWH	11/7/12
DWG. NO. 32		2		
				TOTAL SHEETS: 40
				5-32

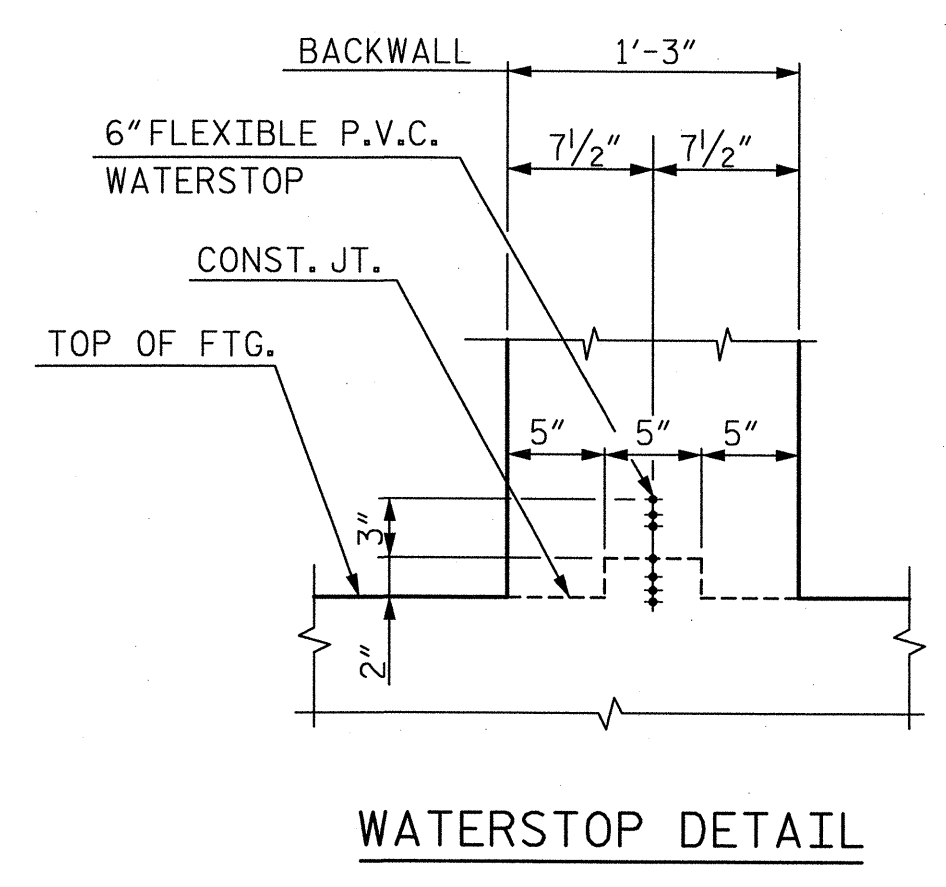
0371DEL_P17-18



DETAIL OF WOOD CORE FOR ANCHOR BOLT HOLES



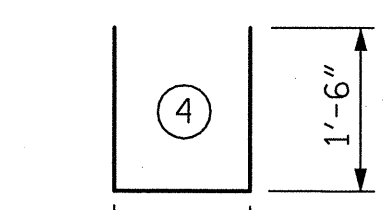
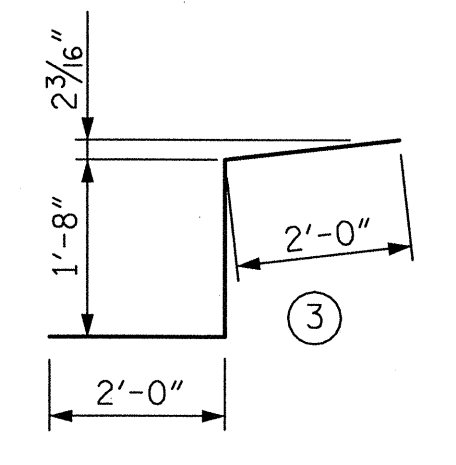
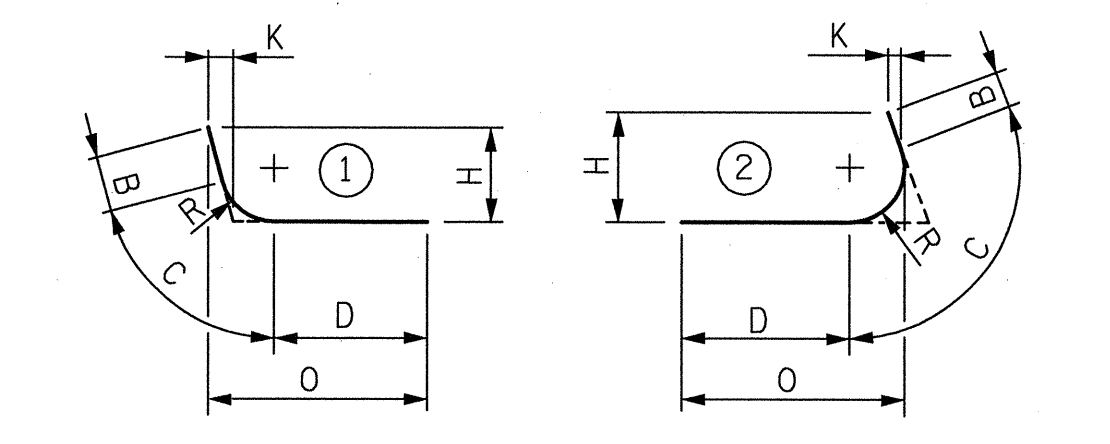
ANCHOR BOLT LAYOUT DETAIL



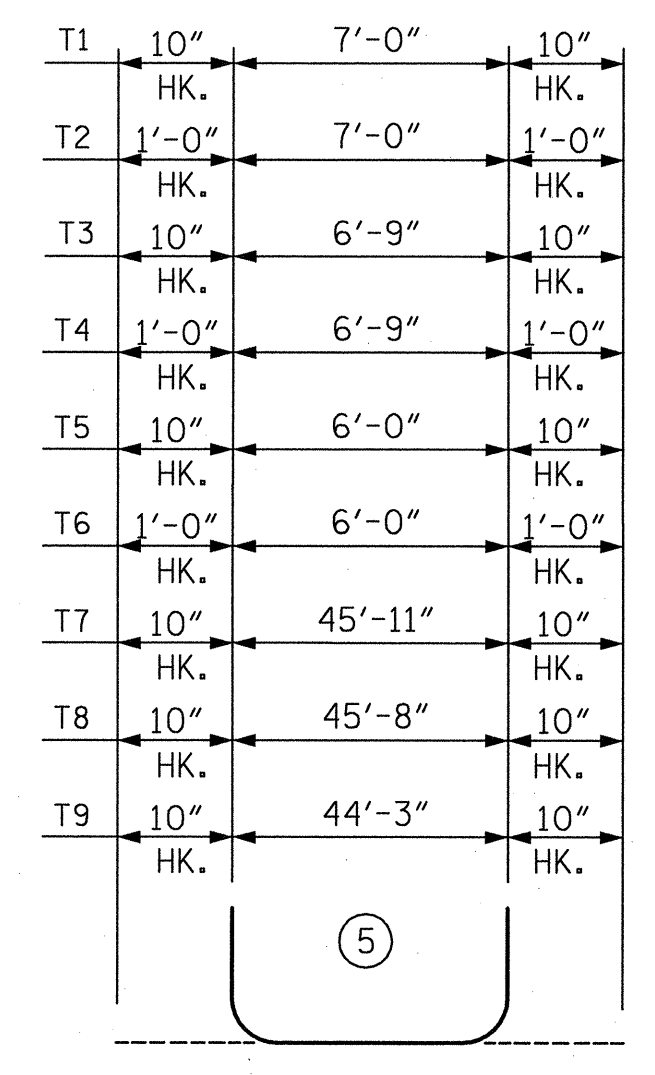
WATERSTOP DETAIL

BAR TYPES							
MARK	B	C	D	H	K	O	R
H1	1'-9 1/2"	2'-3 1/2"	10'-7"	3'-3"	3 1/2"	12'-3 3/4"	1'-6 7/8"
H2	1'-10"	3'-3"	10'-7"	3'-11"	4 1/4"	12'-11 3/4"	2'-2 3/4"
H3	2'-7"	2'-7"	10'-7"	4'-4 1/4"	2 3/4"	12'-1 3/4"	1'-6 7/8"
H4	2'-6"	3'-8"	10'-7"	5'-0 1/4"	2 3/4"	12'-9 3/4"	2'-2 3/4"

NOTE: 'D' IS PARALLEL TO WINGWALL.



- S1 11"
- S2 1'-0"
- S3 1'-1"
- S4 1'-2"
- S5 1'-3"
- S6 1'-4"
- S7 1'-5"
- S8 1'-7"
- S9 1'-8"

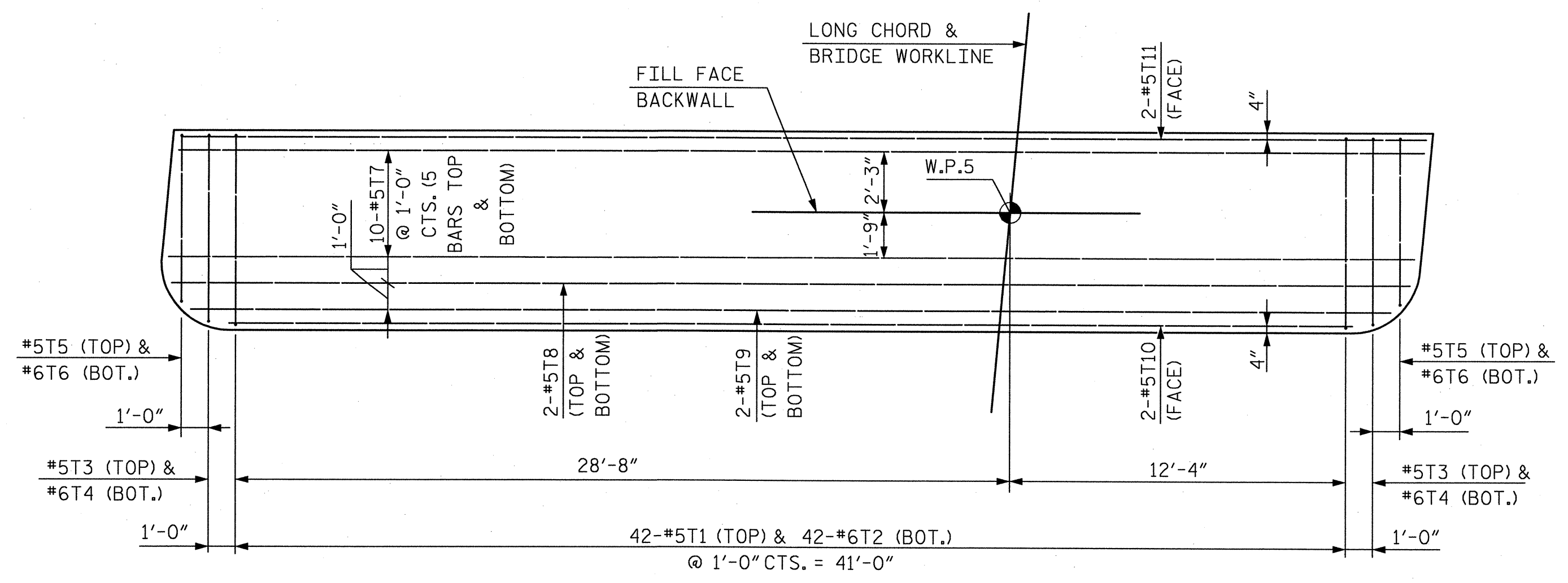


ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF REINFORCING											
MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT	MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
ABUTMENT 2											
H1	13	7	1	14'-8"	390	T1	42	5	5	8'-8"	380
H2	7	5	1	15'-8"	114	T2	42	6	5	9'-0"	568
H3	13	7	1	15'-9"	419	T3	2	5	5	8'-5"	18
H4	7	5	1	16'-9"	122	T4	2	6	5	8'-9"	26
						T5	2	5	5	7'-8"	16
K1	10	5	STR.	41'-5"	432	T6	2	6	5	8'-0"	24
K2	10	5	3	5'-8"	59	T7	10	5	5	47'-7"	496
K3	10	5	STR.	12'-0"	125	T8	2	5	5	47'-4"	99
						T9	2	5	5	45'-11"	96
S1	49	4	4	3'-11"	128	T10	2	5	STR.	41'-5"	86
S2	2	5	4	4'-0"	8	T11	2	5	STR.	45'-11"	96
S3	2	5	4	4'-1"	9						
S4	2	5	4	4'-2"	9	V1	49	6	STR.	7'-3"	534
S5	2	5	4	4'-3"	9	V2	49	4	STR.	7'-3"	237
S6	2	5	4	4'-4"	9	V3	27	6	STR.	9'-2"	372
S7	2	5	4	4'-5"	9	V4	18	5	STR.	9'-2"	172
S8	2	5	4	4'-7"	10	V5	38	5	STR.	6'-1"	241
S9	2	5	4	4'-8"	10	V6	18	5	STR.	7'-2"	135

QUANTITIES

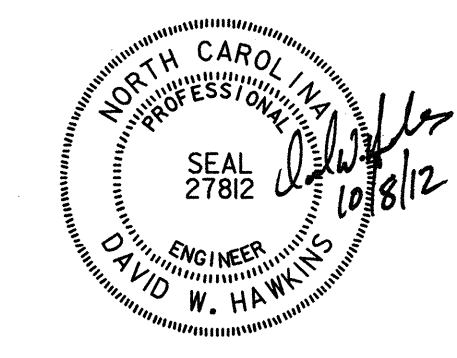
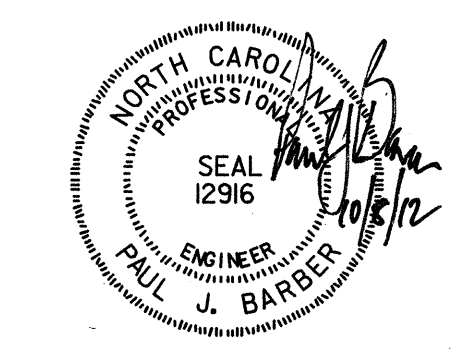
ITEM	TOTAL
REINFORCING STEEL	LBS 5,458
CLASS AA CONCRETE BREAKDOWN:	
POUR 1	
FOOTING & BOT. OF WINGS	CU. YDS 51.4
POUR 2	
BACKWALL & TOP OF WINGS	CU. YDS 18.9
TOTAL	CU. YDS 70.3
HP 14 X 73 STEEL PILES	NO. 20
	L.F. 700
PILE EXCAVATION IN SOIL	L.F. 415
PILE EXCAVATION NOT IN SOIL	L.F. 200



FOOTING REINFORCING PLAN

NOTES:

"T" BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR ANCHOR BOLTS.
FOR FOOTING LAYOUT AND DIMENSIONS, SEE SHEET 1 OF 3.

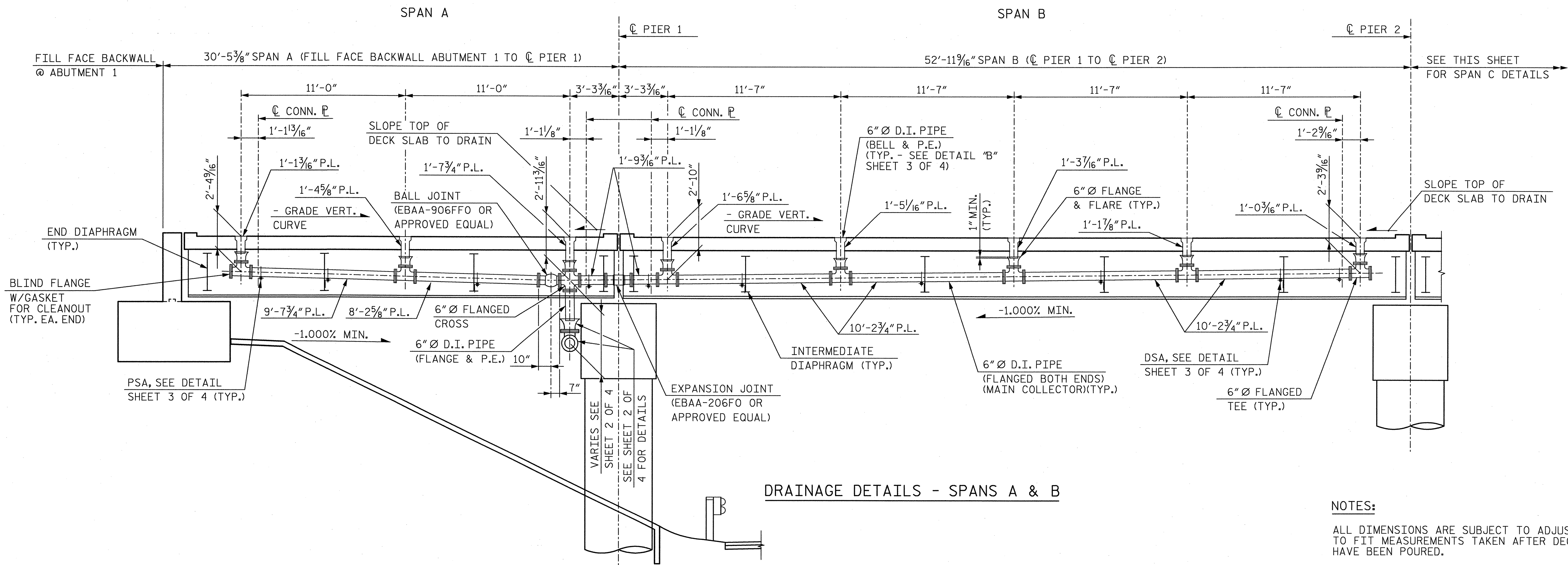


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License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY: M. WRIGHT DATE: 3/12
CHECKED BY: D. HAWKINS DATE: 3/12 DWG. NO. 34

PROJECT NO. U-4716A/C
DURHAM COUNTY
STATION: POC STA. 3315+52.15 -MAIN-
MILE POST: H64.60
SHEET 3 OF 3

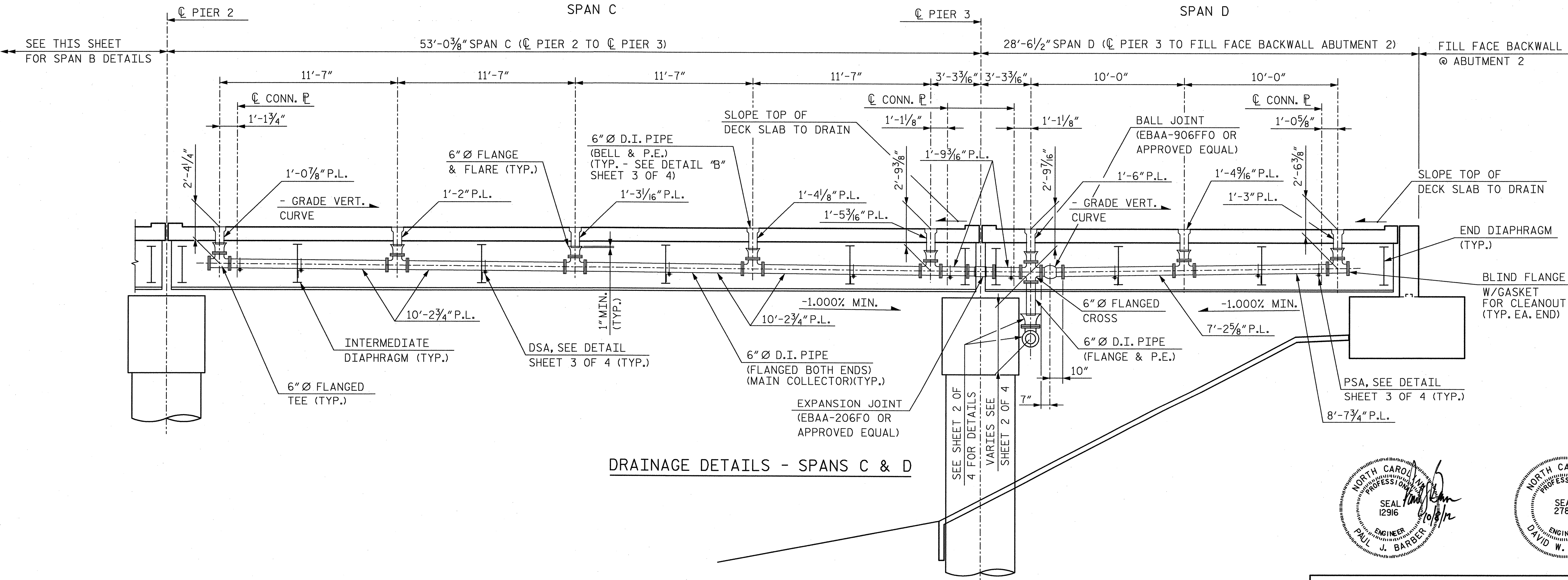
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
ABUTMENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS 40
2			4			



DRAINAGE DETAILS - SPANS A & B

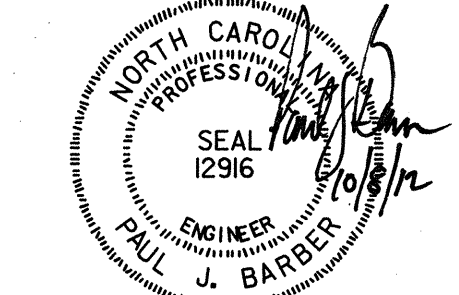
NOTES:
 ALL DIMENSIONS ARE SUBJECT TO ADJUSTMENTS TO FIT MEASUREMENTS TAKEN AFTER DECKS HAVE BEEN POURED.
 D.I. = DUCTILE IRON
 P.L. = PIPE LENGTH
 P.E. = PLAIN END



DRAINAGE DETAILS - SPANS C & D

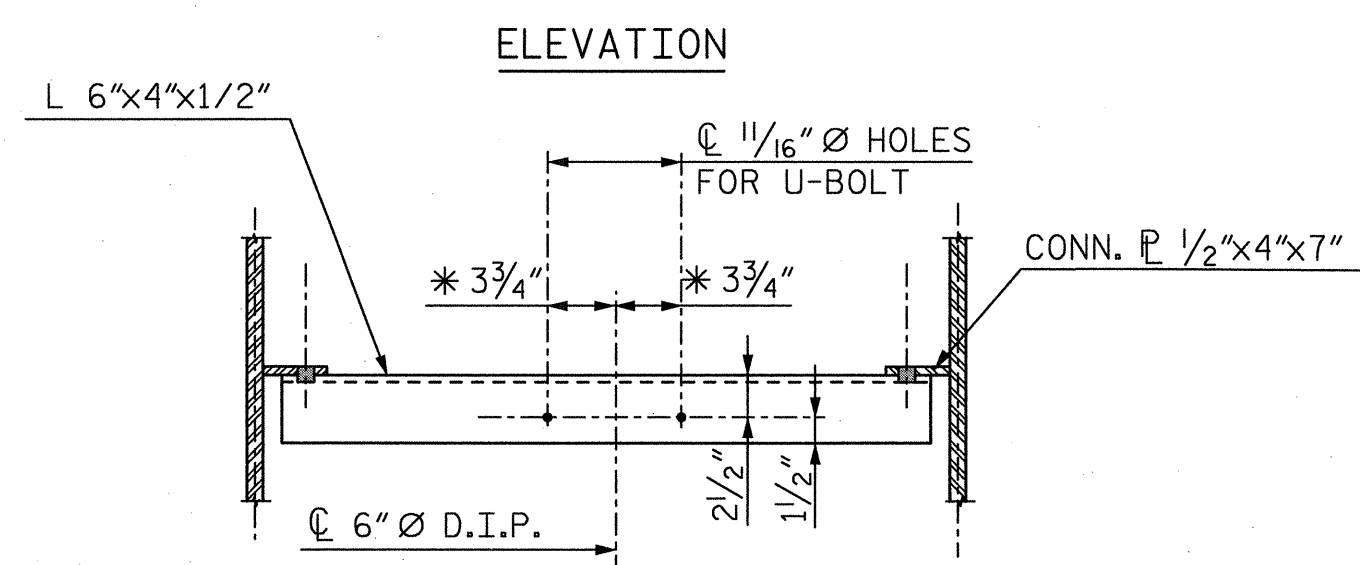
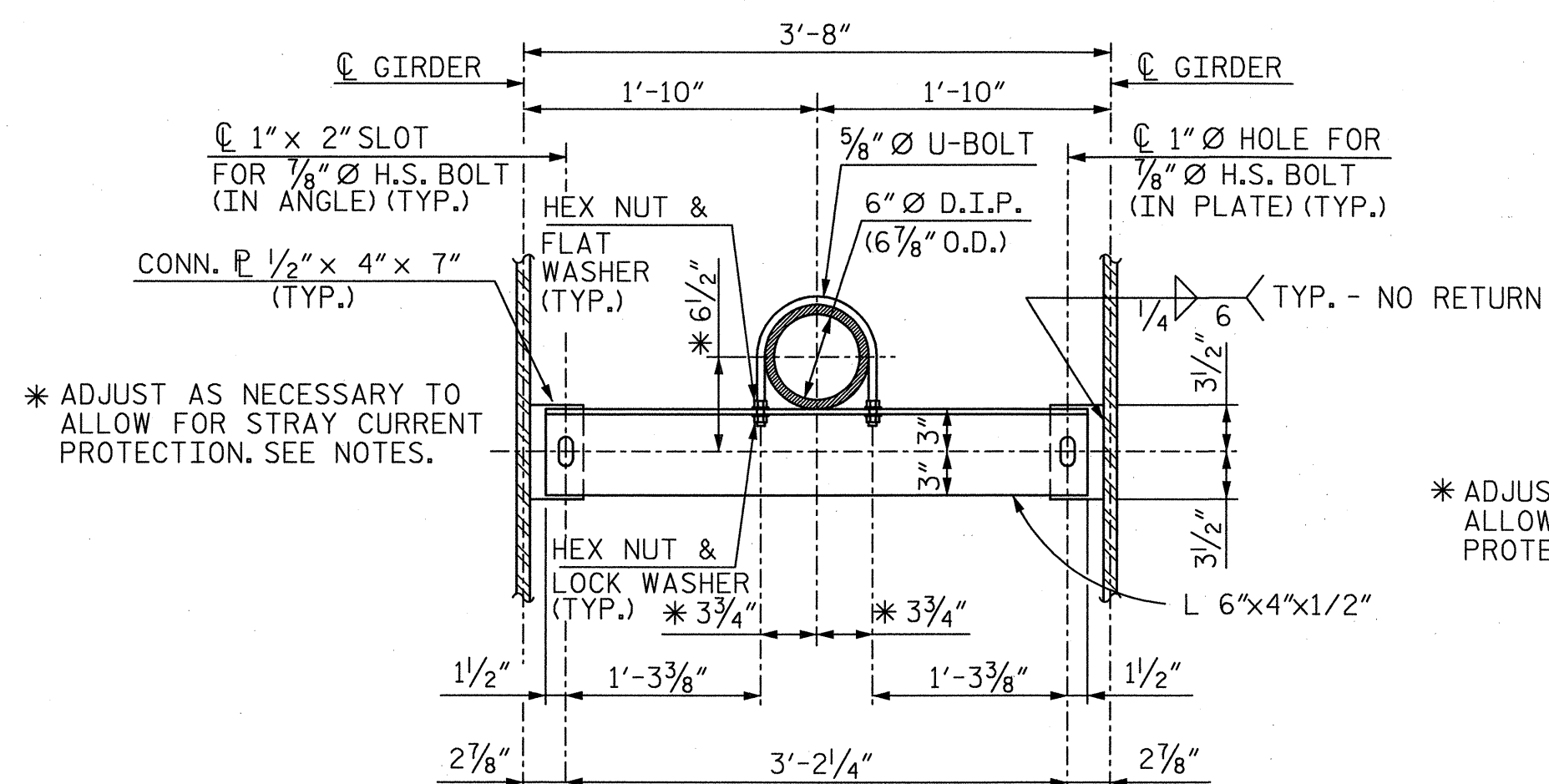
PROJECT NO. U-4716A/C
 DURHAM COUNTY
 STATION: POC STA. 3315+52.15 -MAIN-
 MILE POST: H64.60
 SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
STRUCTURE DRAINAGE DETAILS

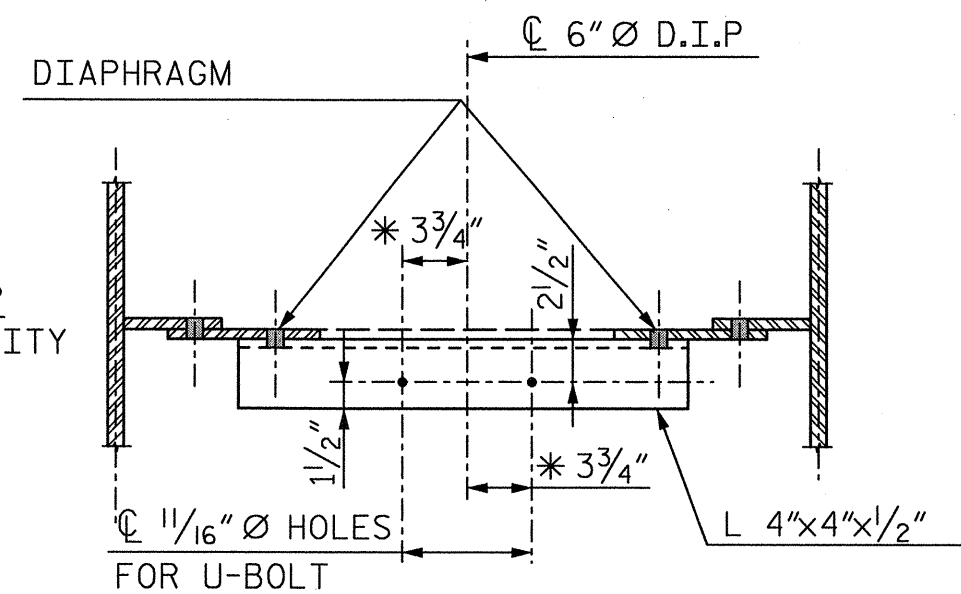
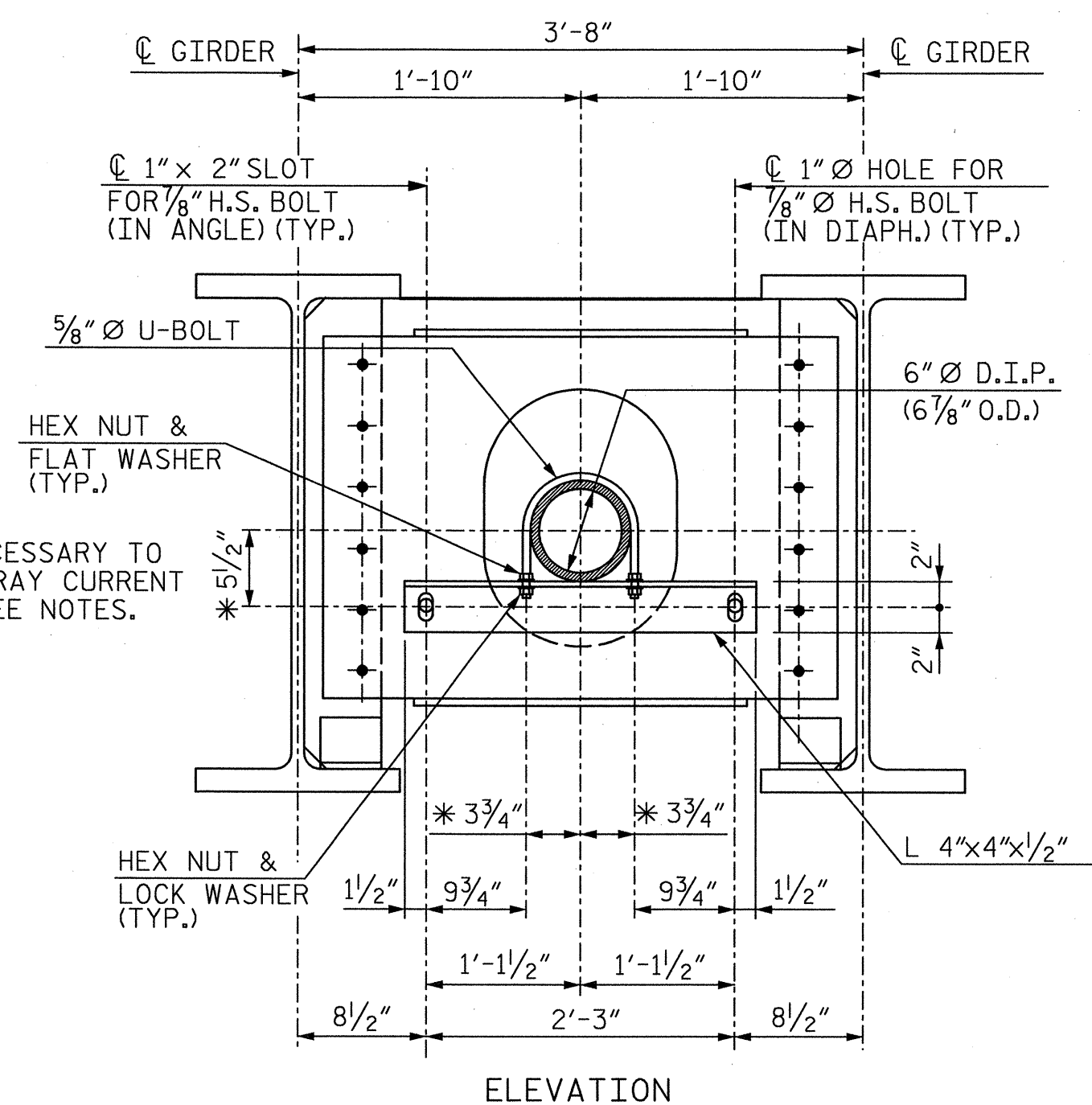
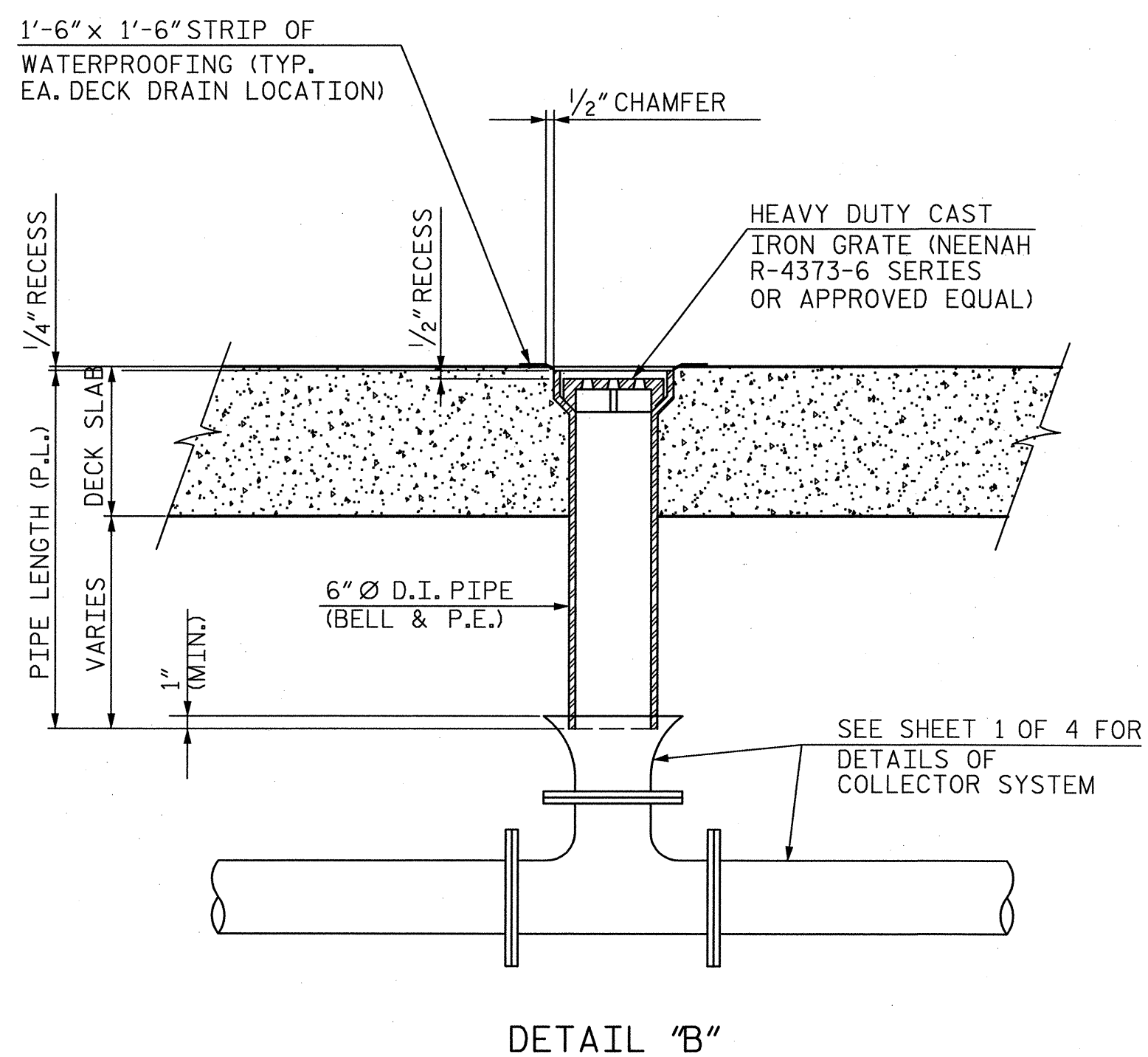


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 License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
 DRAWN BY: M. WRIGHT DATE: 3/12
 CHECKED BY: K. DICKENS DATE: 3/12 DWG. NO. 35

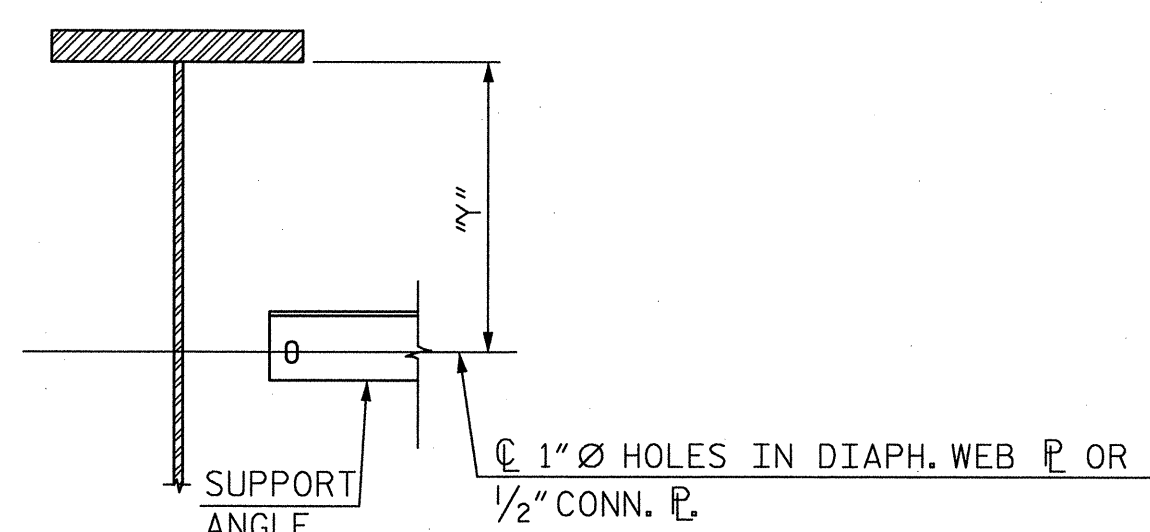
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			40



PIPE SUPPORT ANGLE (PSA)
(24 REQ'D.)



DIAPHRAGM SUPPORT ANGLE (DSA)
(36 REQ'D.)



DSA	"γ"	DSA	"γ"	DSA	"γ"	DSA	"γ"	PSA	"γ"
A1	2'-2 ³ / ₁₆ "	B1	2'-4 ¹ / ₂ "	C1	2'-0 ⁵ / ₁₆ "	D1	2'-3 ³ / ₄ "	A1	2'-0 ⁵ / ₁₆ "
A2	2'-5 ⁹ / ₁₆ "	B2	2'-2 ¹ / ₈ "	C2	2'-1 ¹ / ₁₆ "	D2	2'-2 ³ / ₈ "	A2	2'-6 ¹ / ₈ "
A3	2'-1 ³ / ₄ "	B3	2'-1 ³ / ₁₆ "	C3	2'-2 ⁹ / ₁₆ "	D3	2'-4"	B1	2'-5 ⁹ / ₁₆ "
A4	2'-4 ¹ / ₈ "	B4	1'-11 ¹ / ₂ "	C4	2'-3 ⁹ / ₈ "	D4	2'-2 ⁹ / ₁₆ "	B2	1'-11 ³ / ₁₆ "
A5	2'-1 ⁹ / ₁₆ "	B5	2'-4 ¹¹ / ₁₆ "	C5	2'-0 ³ / ₁₆ "	D5	2'-4 ³ / ₁₆ "	C1	1'-11 ¹³ / ₁₆ "
A6	2'-4 ¹ / ₁₆ "	B6	2'-3 ¹ / ₁₆ "	C6	2'-1 ⁵ / ₁₆ "	D6	2'-2 ³ / ₄ "	C2	2'-4 ¹ / ₁₆ "
		B7	2'-1 ¹ / ₁₆ "	C7	2'-2 ¹ / ₁₆ "			D1	2'-4 ¹ / ₁₆ "
		B8	1'-11 ¹¹ / ₁₆ "	C8	2'-3 ¹ / ₂ "			D2	2'-1 ⁵ / ₁₆ "
		B9	2'-4 ⁷ / ₈ "	C9	2'-0"				
		B10	2'-3 ¹ / ₄ "	C10	2'-1 ³ / ₁₆ "				
		B11	2'-1 ⁹ / ₁₆ "	C11	2'-2 ¹ / ₄ "				
		B12	1'-11 ⁷ / ₈ "	C12	2'-3 ³ / ₈ "				

NOTES:

ALL PIPES, FLANGES AND FITTINGS SHALL BE CLASS 53 DUCTILE IRON.
ALL BENDS TO BE SHORT RADIUS, INCLUDING FLANGE & FLARE BENDS, UNLESS OTHERWISE NOTED.

FOR LOCATIONS AND DESIGNATIONS OF DSA & PSA, SEE FRAMING PLAN.

PIPE LENGTHS SHOWN ALLOW FOR 1/8" THICK GASKETS TO BE USED AT ALL BOLTED FLANGE CONNECTIONS.

MAKE FINAL PIPE ALIGNMENT AND TIGHTEN U-BOLTS AFTER RAILROAD TRACK HAS BEEN LAID ACROSS THE BRIDGE.

PAYMENT FOR ALL MATERIALS, FABRICATION, INSTALLATION AND ADJUSTMENTS RELATED TO STRUCTURE DRAINAGE SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE BID FOR "STRUCTURE DRAINAGE SYSTEM". NO SEPARATE MEASUREMENT OR PAYMENT SHALL BE MADE FOR ANY COMPONENT OF THE STRUCTURE DRAINAGE SYSTEM INCLUDING, BUT NOT LIMITED TO:

- DUCTILE IRON PIPE AND FITTINGS AND CAST IRON GRATES
- GASKETS AND PVC OR NEOPRENE COATED STRIPS
- STEEL SUPPORT ANGLES AND PLATES
- U-BOLTS AND H.S. BOLTS, WASHERS AND NUTS
- OFFSET PIPE CLAMPS AND EXPANSION ANCHOR BOLTS
- EXPANSION JOINT
- BALL JOINT

PROVIDE PVC OR NEOPRENE-COATED STRIPS, EPOXY-CEMENTED TO THE U-BOLT OR PIPE FOR STRAY CURRENT PROTECTION.

THE OUTSIDE COATING FOR D.I. PIPE SHALL BE PAINTED WITH A SHOP PRIME COAT OF INORGANIC ZINC PRIMER AND A FINISH (FIELD) COATING OF ACRYLIC PAINT AS SPECIFIED FOR THE STRUCTURAL STEEL.

FOR STRUCTURE DRAINAGE SYSTEM, SEE SPECIAL PROVISIONS.

STRUCTURE DRAINAGE SYSTEM ESTIMATED QUANTITIES

ITEM	UNIT	TOTAL
8" I.D. DUCTILE IRON PIPE, CLASS 53 (FLANGED BOTH ENDS)	FEET	59'-5 ⁵ / ₈ "
8" I.D. DUCTILE IRON PIPE, CLASS 53 (FLANGE & P.E.)	FEET	2'-10 ¹ / ₈ "
8" I.D. DUCTILE IRON PIPE OFFSET, 250 psi P.R. (M.J. & P.E.)	LBS	390
8" I.D. DUCTILE IRON PIPE CONNECTING PIECE, 250 psi P.R. (M.J. & FLANGE)	LBS	170
8" I.D. DUCTILE IRON PIPE FLANGED FITTINGS, 250 psi P.R.	LBS	1880
8" I.D. DUCTILE IRON BLIND FLANGES	LBS	168
8" I.D. OFFSET PIPE CLAMPS	EA.	20
6" I.D. DUCTILE IRON PIPE, CLASS 53 (FLANGED BOTH ENDS)	FEET	367'-10 ¹ / ₂ "
6" I.D. DUCTILE IRON PIPE, CLASS 53 (FLANGE & P.E.)	FEET	12'-10 ³ / ₄ "
6" I.D. DUCTILE IRON PIPE, CLASS 53 (BELL & P.E.)	FEET	62'-10 ³ / ₈ "
6" I.D. DUCTILE IRON PIPE FLANGED FITTINGS, 250 psi P.R.	LBS	6,630
6" I.D. DUCTILE IRON BLIND FLANGES	LBS	300
BALL JOINT	EA.	6
EXPANSION JOINT	EA.	6
HEAVY DUTY CAST IRON GRATES	EA.	48
PIPE SUPPORT ANGLES (PSA) *	EA.	24
DIAPHRAGM SUPPORT ANGLES (DSA) *	EA.	36

* INCLUDES U-BOLTS, ANGLES, NUTS, BOLTS, WASHERS AND PLATES.

PROJECT NO. U-4716A/C

DURHAM COUNTY

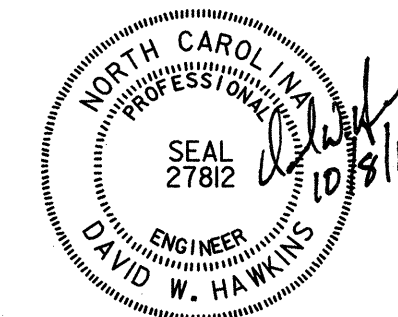
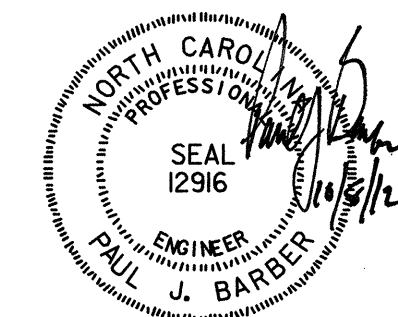
STATION: POC STA. 3315+52.15 -MAIN-

MILE POST: H64.60

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STRUCTURE
DRAINAGE
DETAILS

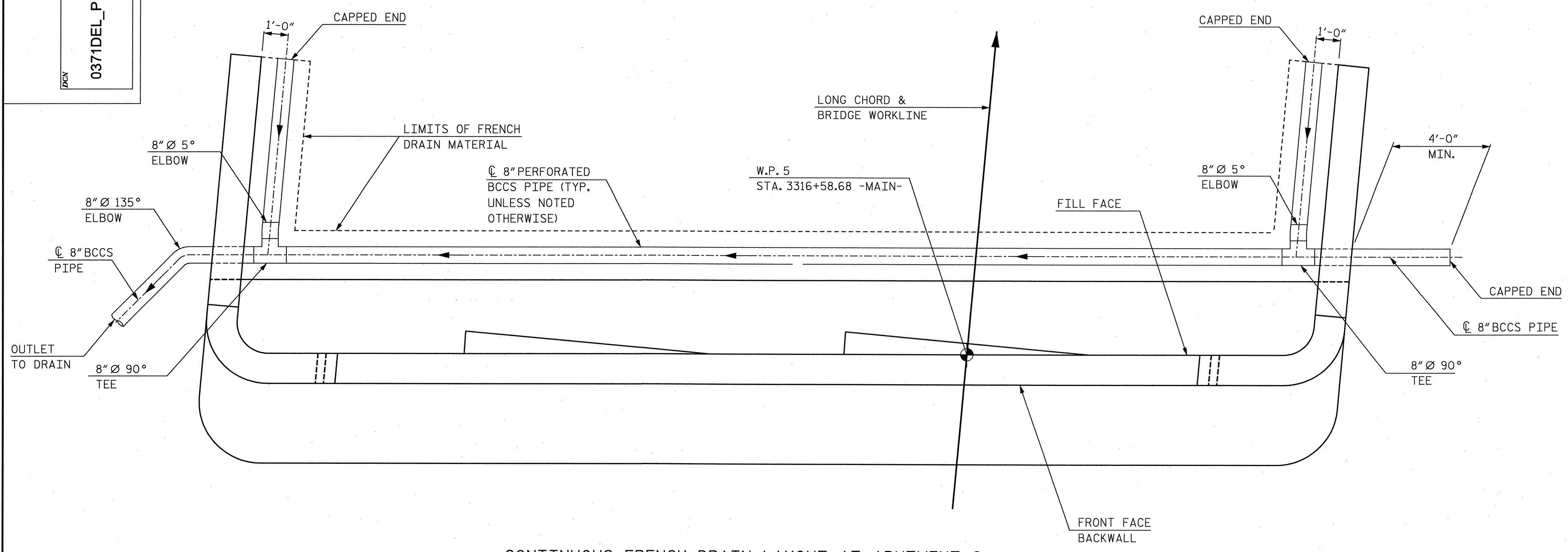


HNTB HNTB NORTH CAROLINA, P.C.
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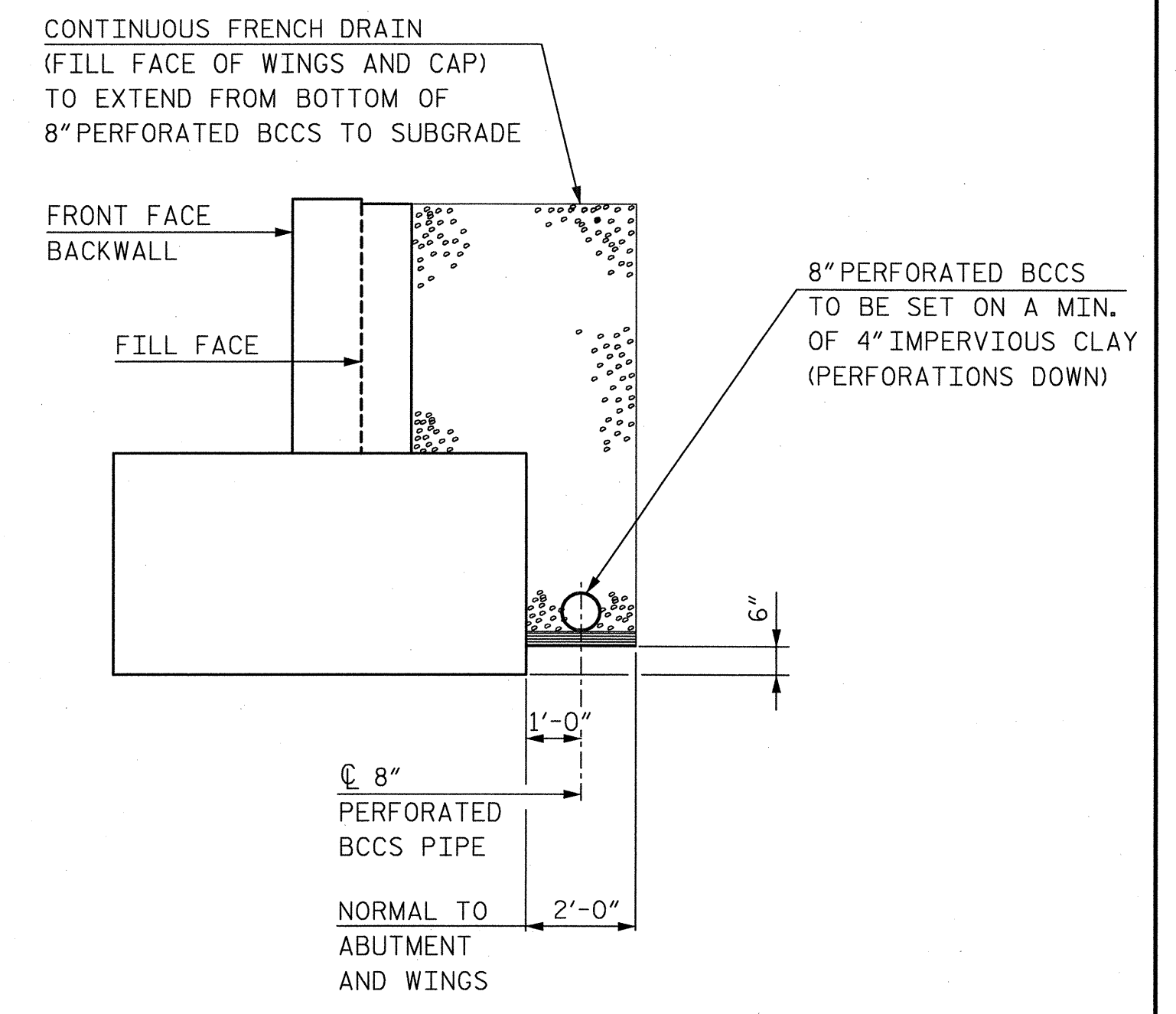
DRAWN BY: M. WRIGHT DATE: 3/12
CHECKED BY: K. DICKENS DATE: 3/12 DWG. NO. 37

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	37
1			3			TOTAL SHEETS
2			4			40

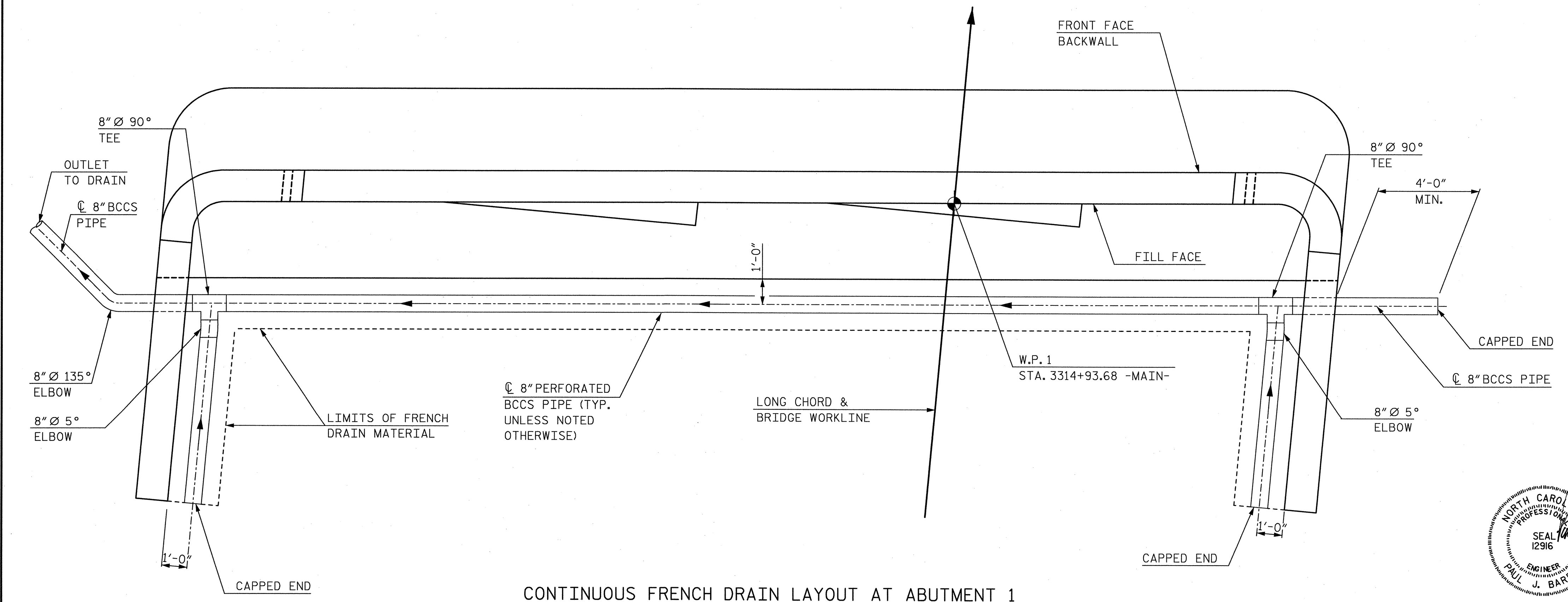
0371DEL_P17-18



CONTINUOUS FRENCH DRAIN LAYOUT AT ABUTMENT 2



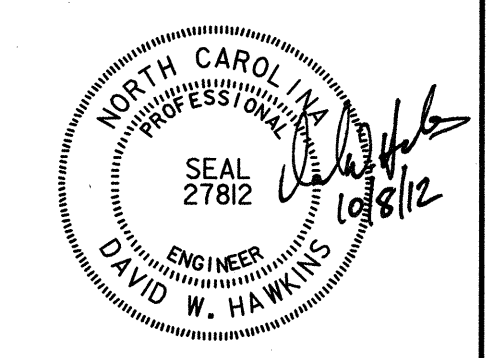
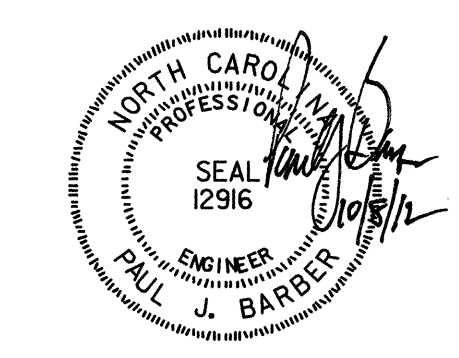
CONTINUOUS FRENCH DRAIN DETAIL



CONTINUOUS FRENCH DRAIN LAYOUT AT ABUTMENT 1

PROJECT NO. U-4716A/C
 DURHAM COUNTY
 STATION: POC STA. 3315+52.15 -MAIN-
 MILE POST: H64.60
 SHEET 4 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STRUCTURE
 DRAINAGE
 DETAILS

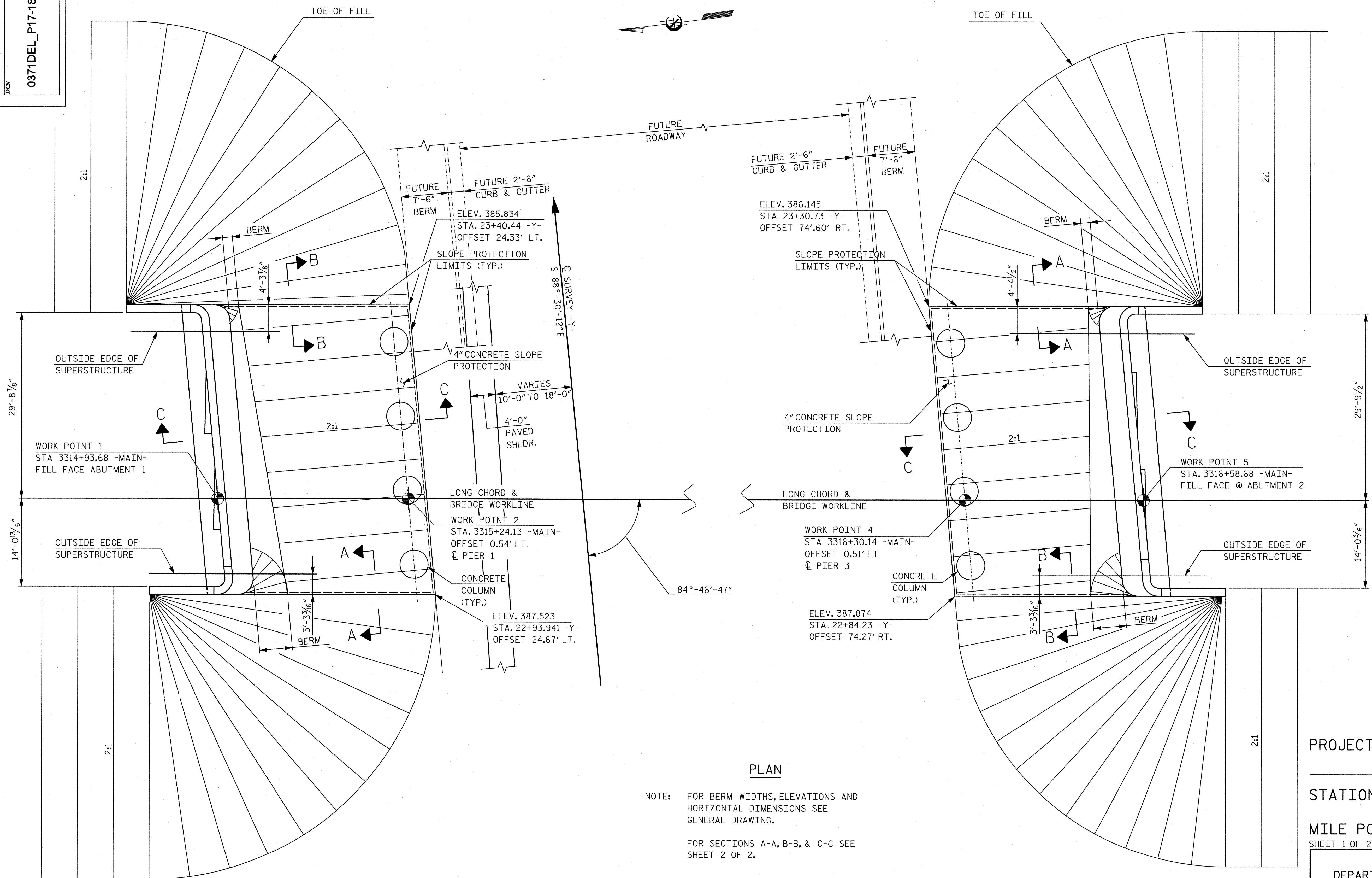


HNTB HNTB NORTH CAROLINA, P.C.
 License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
 DRAWN BY: J. BAYNE DATE: 3/12
 CHECKED BY: K. DICKENS DATE: 3/12
 DWG. NO. 38

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

TOTAL SHEETS: 40

0371DEL_P17-18

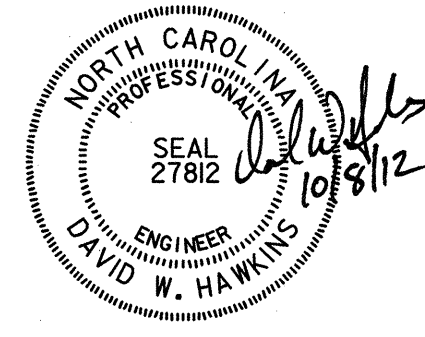
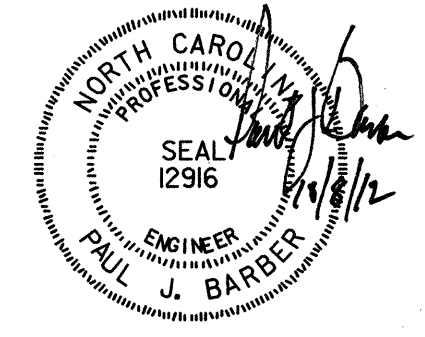


PLAN

NOTE: FOR BERM WIDTHS, ELEVATIONS AND HORIZONTAL DIMENSIONS SEE GENERAL DRAWING.
FOR SECTIONS A-A, B-B, & C-C SEE SHEET 2 OF 2.

PROJECT NO. U-4716A/C
DURHAM COUNTY
 STATION: POC STA. 3315+52.15 -MAIN-
 MILE POST: H64.60
 SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SLOPE PROTECTION
 DETAILS



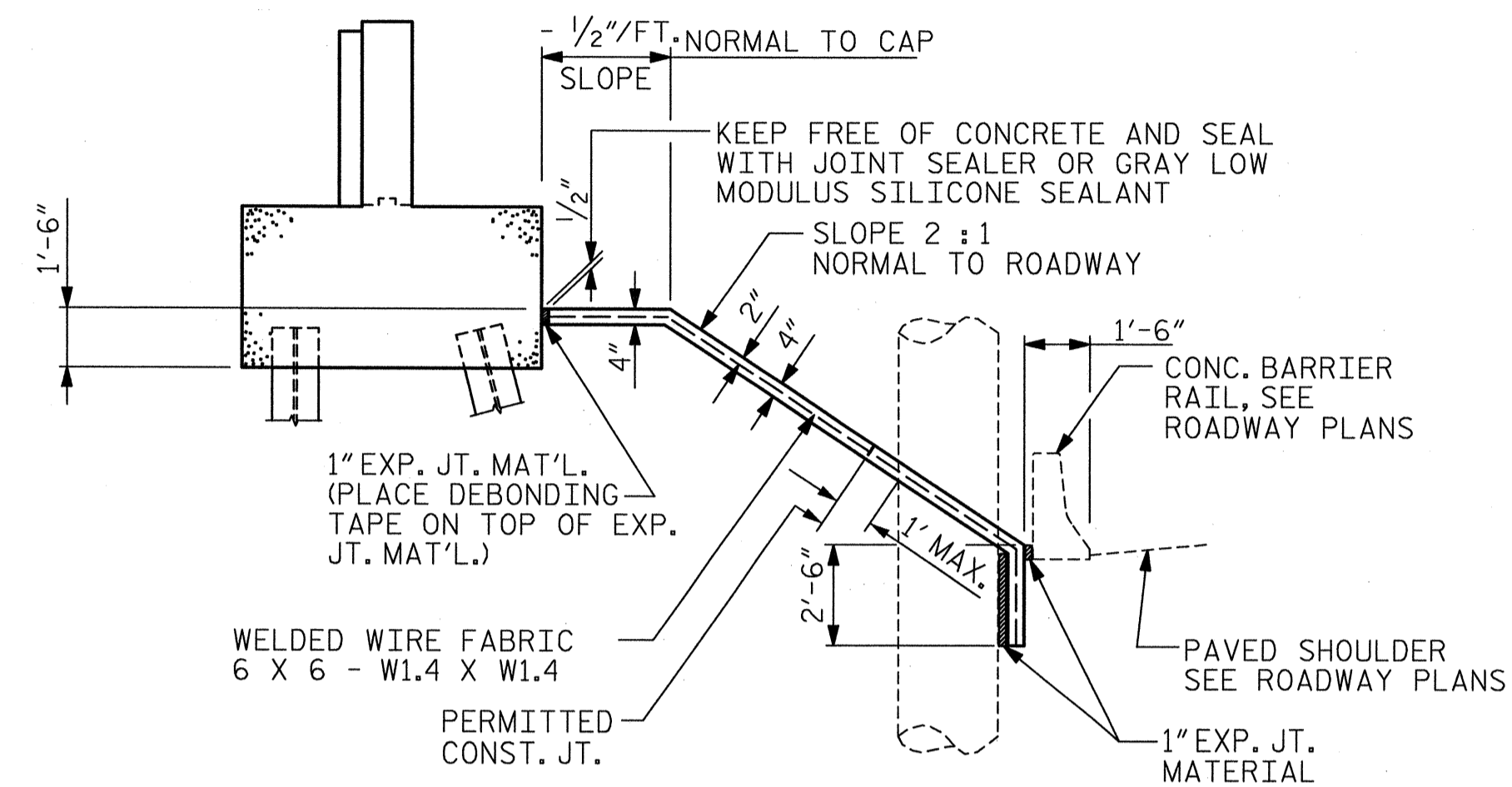
HNTB HNTB NORTH CAROLINA, P.C.
 License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
 DRAWN BY: J. BAYNE DATE: 3/12
 CHECKED BY: K. DICKENS DATE: 3/12 DWG. NO. 39

REVISIONS				SHEET NO. S-39
NO.	BY:	DATE:	DATE:	
1				TOTAL SHEETS 40
2				

GENERAL NOTES

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING.

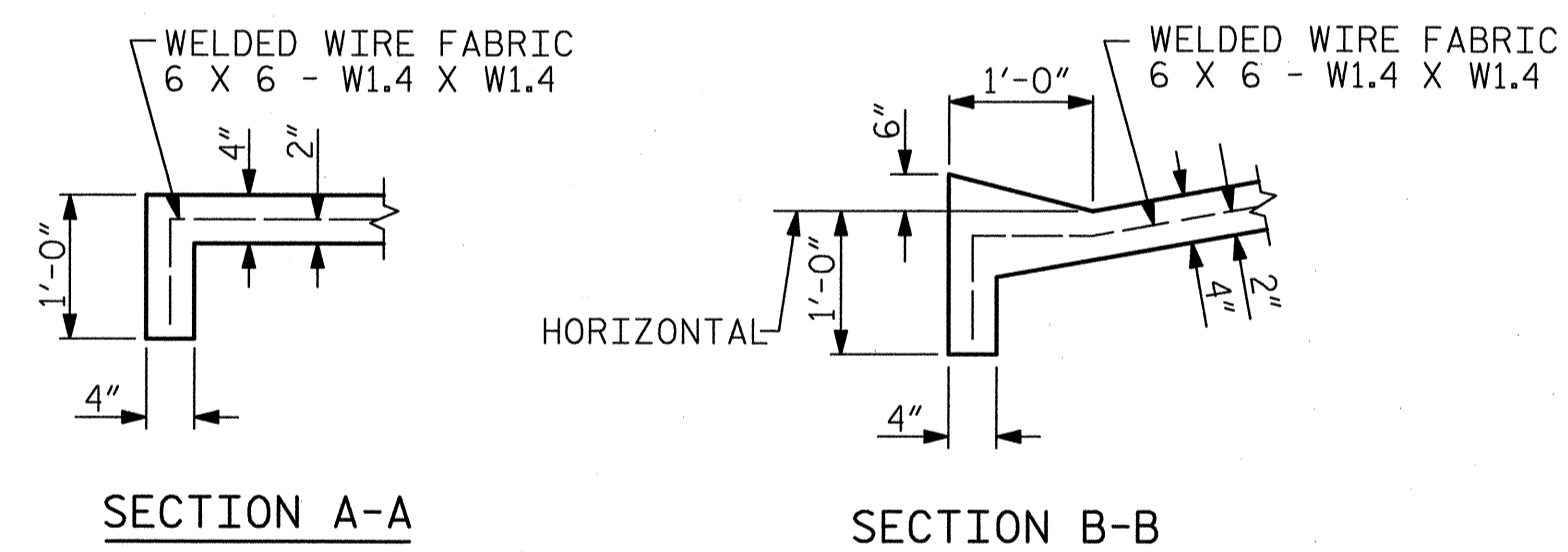
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 4'-6" STRIPS AS SHOWN IN THE "POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.



SECTION C-C

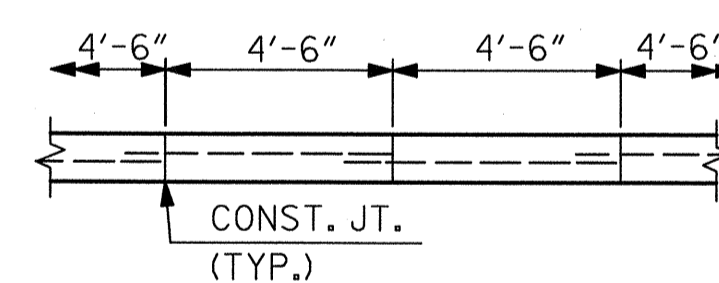
BRIDGE @ STA. 3315+52.15 -MAIN-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
ABUTMENT 1	179.2	382.7
ABUTMENT 2	168.9	362.0

* QUANTITY SHOWN IS BASED ON 4'-6" POURS.

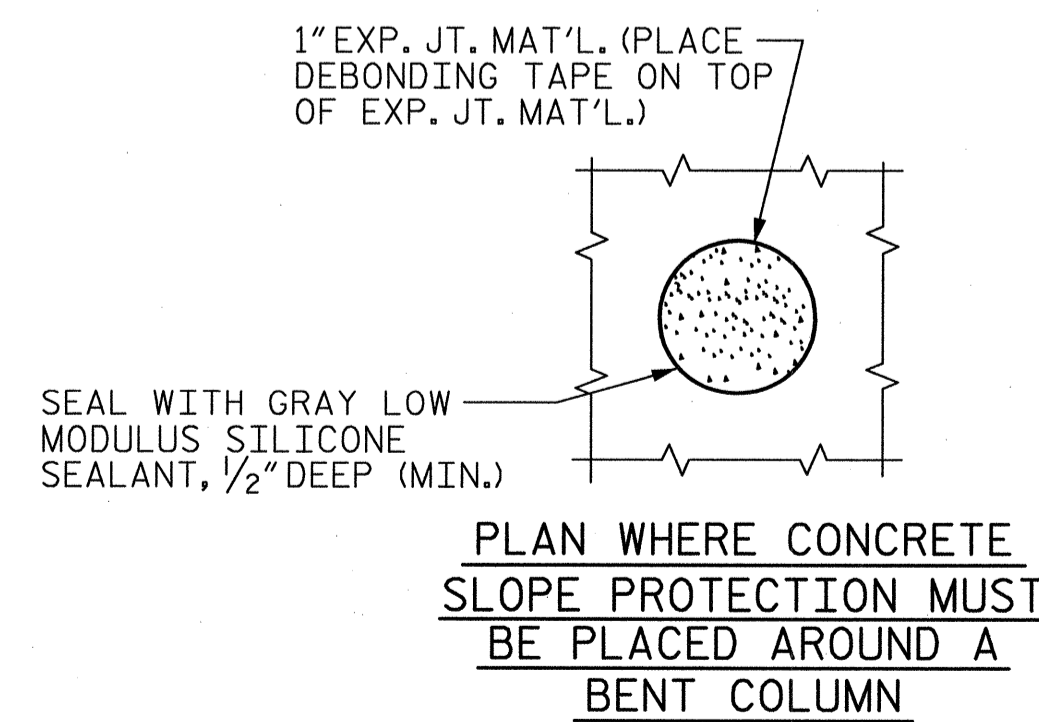


SECTION A-A

SECTION B-B

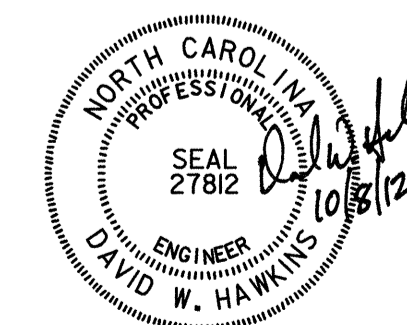
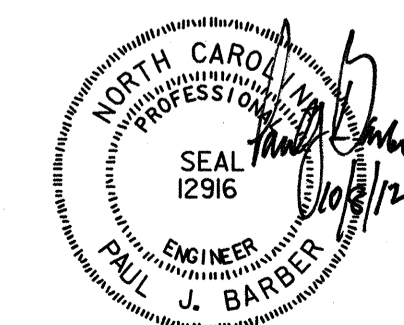


POURING DETAIL



PLAN WHERE CONCRETE SLOPE PROTECTION MUST BE PLACED AROUND A BENT COLUMN

PROJECT NO. U-4716A/C
DURHAM COUNTY
 STATION: POC STA. 3315+52.15 -MAIN-
 MILE POST: H64.60
 SHEET 2 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 SLOPE PROTECTION
 DETAILS

ASSEMBLED BY : J. BAYNE	DATE : 3/12
CHECKED BY : D. RAGAN	DATE : 3/12
DRAWN BY : ELR 5/92	REV. 5/1/06 TLA/GM
CHECKED BY : GRP 6/92	REV. 10/1/11 MAA/GM
	REV. 12/21/11 MAA/GM

HNTB	HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY : J. BAYNE	DATE : 3/12
CHECKED BY : D. RAGAN	DATE : 3/12
	DWG. NO. 40

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			40

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	-----	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	-----	SEE PLANS
IMPACT ALLOWANCE	-----	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF		
STRUCTURAL STEEL - AASHTO M270 GRADE 36	-	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	-	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	-	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION		
GRADE 60	--	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	-----	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	-----	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR		
UNTREATED - EXTREME FIBER STRESS	-----	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	-----	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	-----	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE. ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

ENGLISH

JANUARY, 1990