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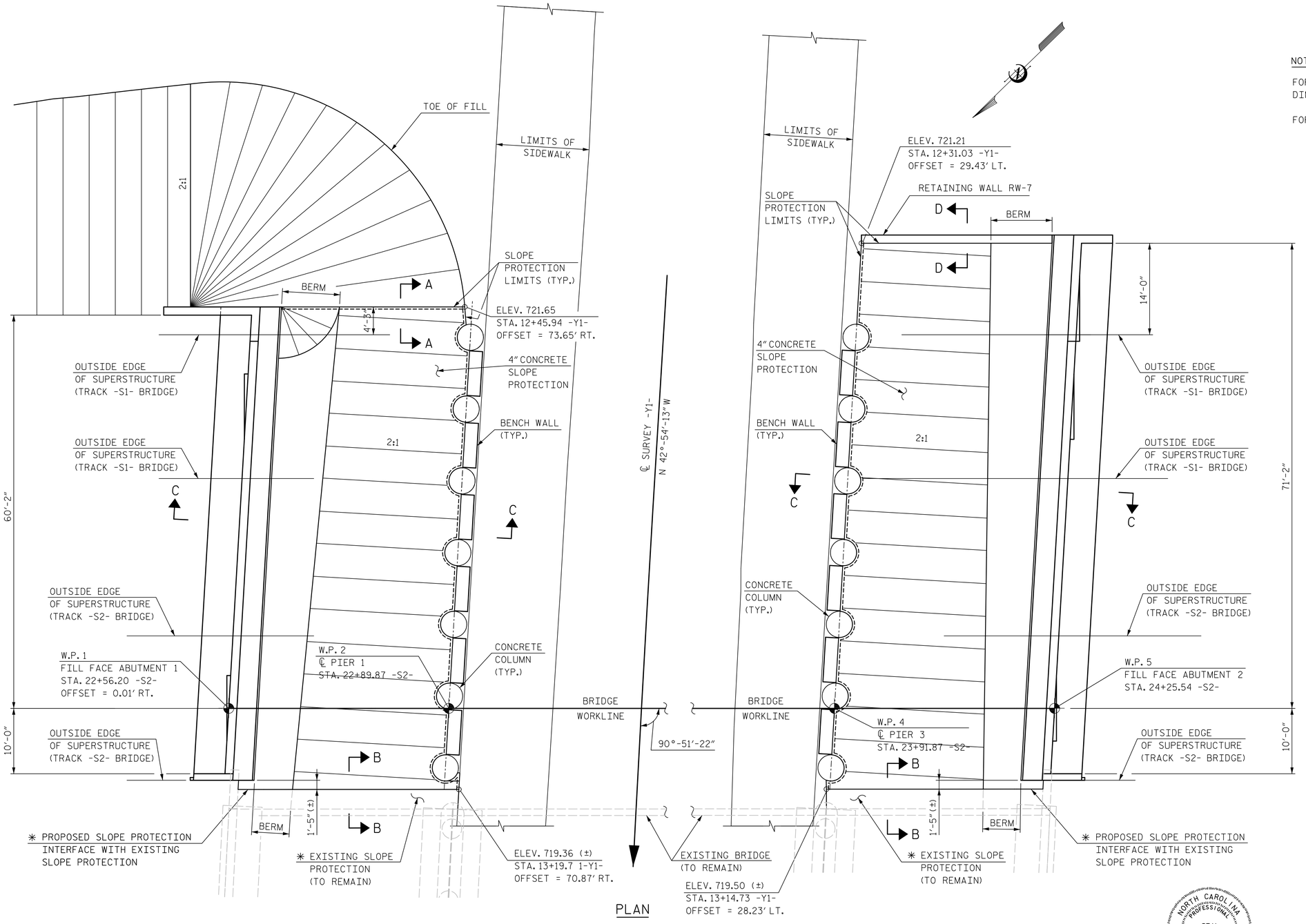

PLAN

NOTES:

FOR BERM WIDTHS, ELEVATIONS AND HORIZONTAL DIMENSIONS, SEE GENERAL DRAWING.

FOR SECTIONS A-A, B-B, C-C, & D-D SEE SHEET 2 OF 2.

* THE PROPOSED LIMITS OF SLOPE PROTECTION ADJACENT TO THE EXISTING SLOPE PROTECTION ARE BASED ON AN APPROXIMATE LOCATION OF THE CURRENT EDGE OF THE EXISTING SLOPE PROTECTION. THE CONTRACTOR SHALL ADJUST THE PROPOSED SLOPE PROTECTION LIMITS BASED ON THE ACTUAL LOCATION OF THE EXISTING SLOPE PROTECTION. IF THE EXISTING SLOPE PROTECTION IS DAMAGED OR PARTIALLY REMOVED DURING THE ABUTMENT OR PIER CONSTRUCTION OPERATIONS FOR THE PROPOSED BRIDGE, THAT EXISTING SLOPE PROTECTION SHALL BE REMOVED BACK TO THE NEAREST VERTICAL CONSTRUCTION JOINT FROM THE TOP OF THE EXISTING BERM TO THE TOE OF THE EXISTING SLOPE. THE LIMITS OF THE PROPOSED SLOPE PROTECTION WILL THEN BE EXTENDED TO MATCH AGAINST THE ADJUSTED EDGE OF EXISTING SLOPE PROTECTION.

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POT STA. 23+62.98 -S2-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SLOPE PROTECTION

DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

DocuSigned by: 55683197C22B434...

2/21/2018

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DWG. NO. 55

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-55
1			3			TOTAL SHEETS
2			4			56

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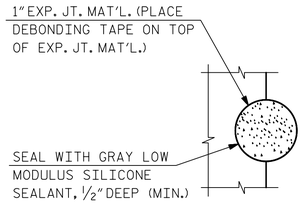
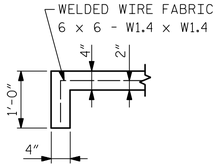
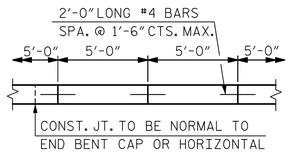


PLAN WHERE CONCRETE SLOPE PROTECTION MUST BE PLACED AROUND A PIER COLUMN

(BENCH WALL NOT SHOWN FOR CLARITY)

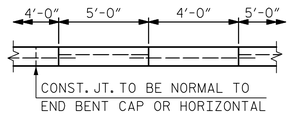


SECTION A-A



STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL



POUR A 4'-0" STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

OPTIONAL POURING DETAIL

GENERAL NOTES:

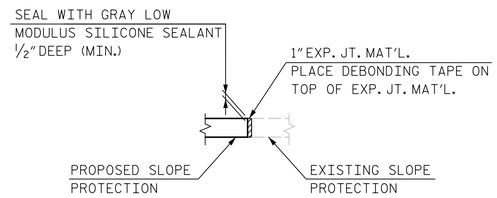
SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING.

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 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

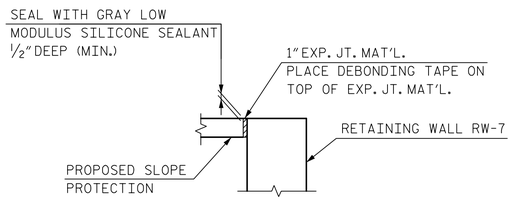
ADDITIONAL SLOPE PROTECTION REQUIRED TO PROPERLY MATCH UP TO EXISING SLOPE PROTECTION, AS DESCRIBED ON SHEET 1 OF 2, SHALL BE INCIDENTAL TO THE CONTRACT BID PRICE FOR THE PROVIDED QUANTITY.

BRIDGE @ STA. 23+62.98 -S2-	4 INCH SLOPE PROTECTION	✳ WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
ABUTMENT 1	282	508
ABUTMENT 2	315	567

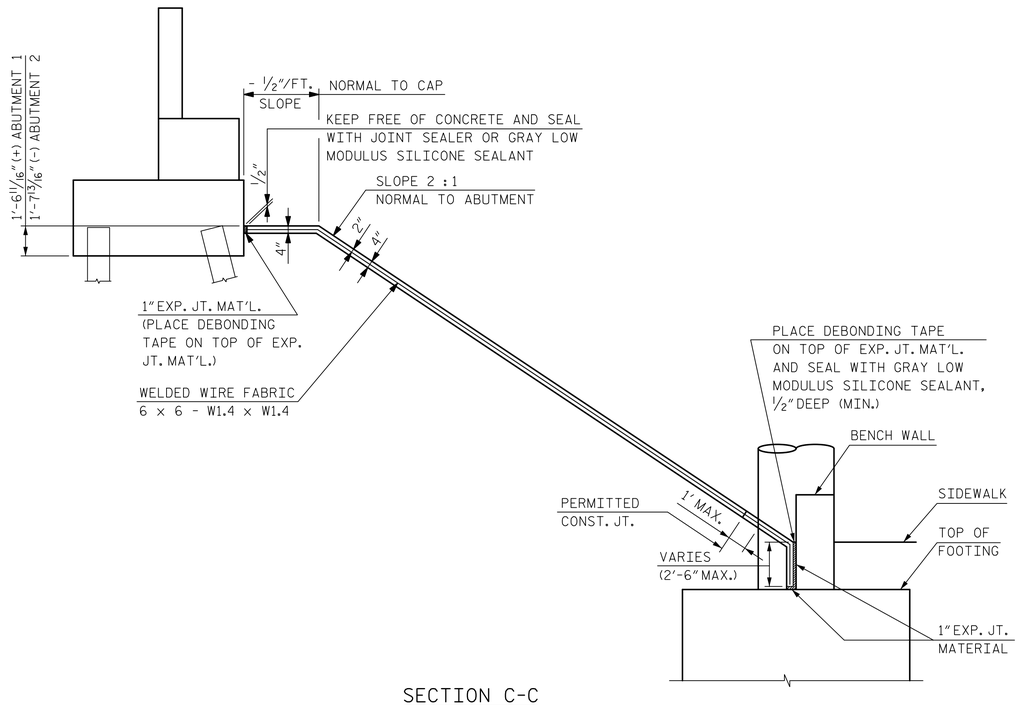
✳ QUANTITY SHOWN IS BASED ON 5'-0" POURS PER THE "POURING DETAIL".



SECTION B-B



SECTION D-D



SECTION C-C

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POT STA. 23+62.98 -S2-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SLOPE PROTECTION

DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-56
1			3			TOTAL SHEETS
2			4			56

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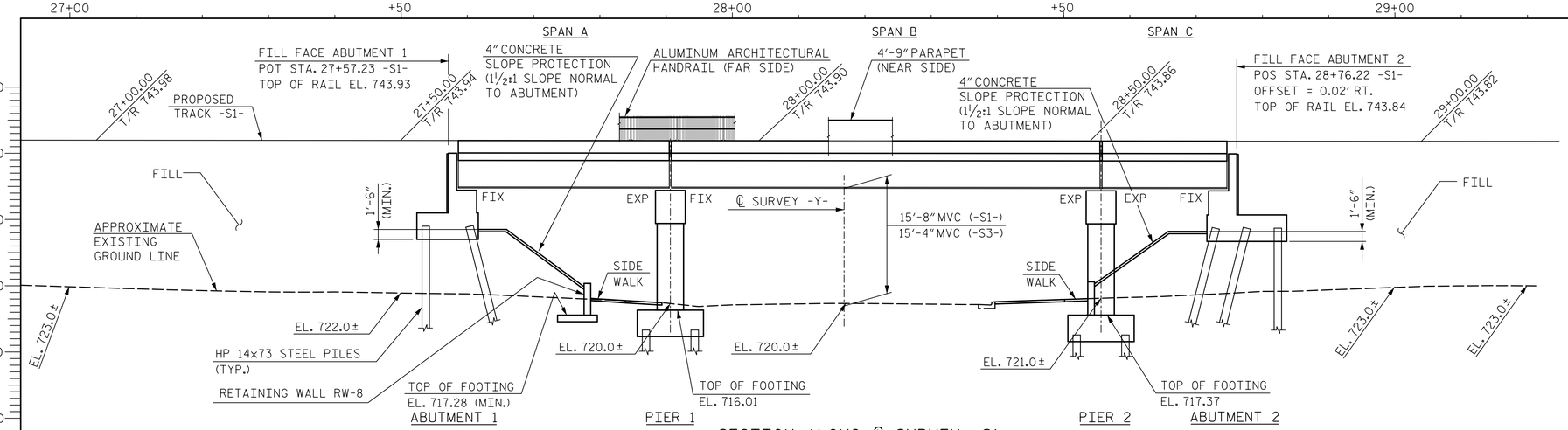
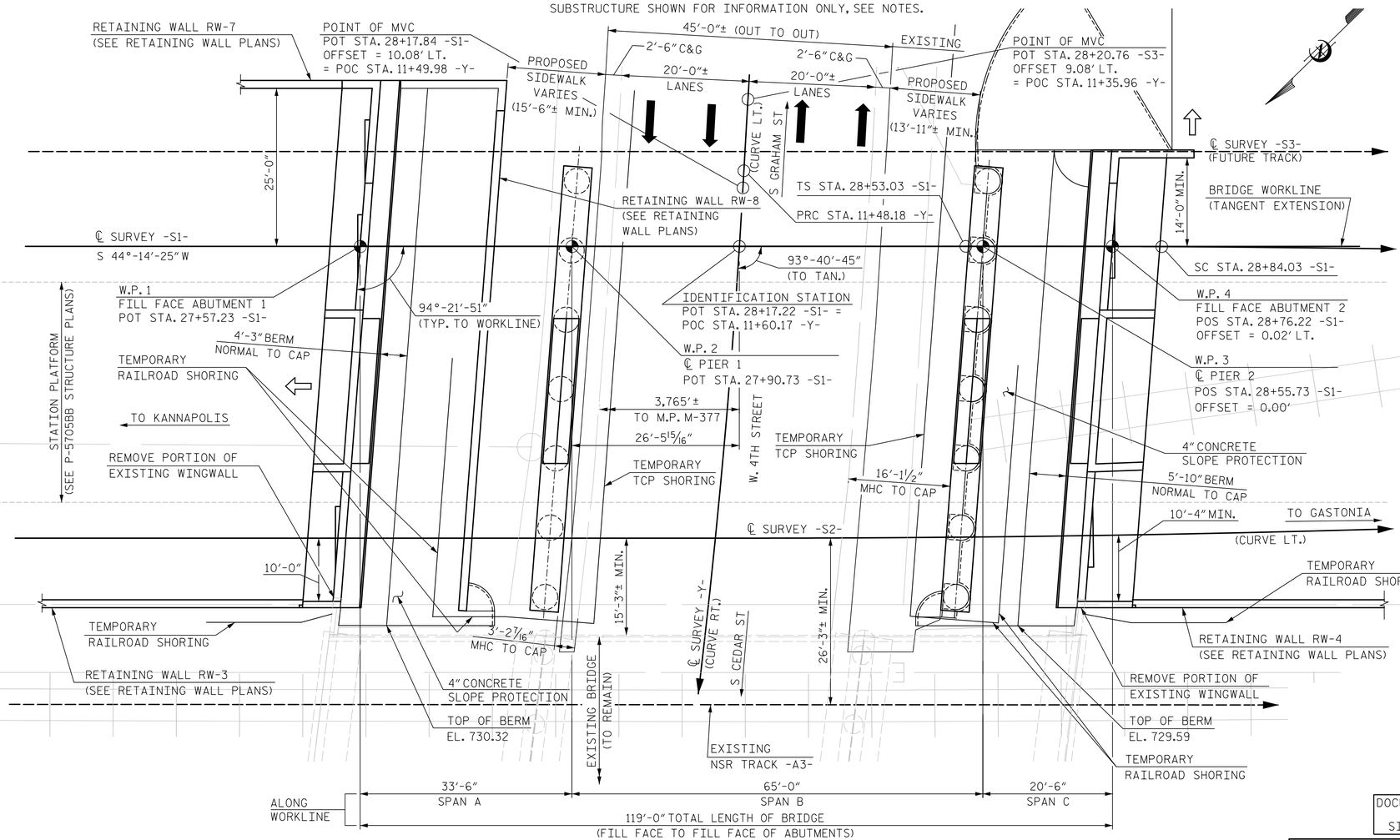


SECTION ALONG ℄ SURVEY -S1-

(ABUTMENTS AND PIERS ON SECTION AT RIGHT ANGLES TO ABUTMENTS AND PIERS)
SUBSTRUCTURE SHOWN FOR INFORMATION ONLY, SEE NOTES.



PLAN

NOTES: PILES NOT SHOWN FOR CLARITY.
ALL ABUTMENTS AND PIERS ARE PARALLEL.
SUBSTRUCTURE AND TEMPORARY WALLS SHOWN FOR INFORMATION ONLY, SEE NOTES.

NOTE:
SEE "GENERAL DRAWING: GENERAL NOTES (SHEET 3 OF 3)" FOR GENERAL NOTES.

FOR SUBSTRUCTURE SHEETS, REFER TO "BRIDGE ON STATION TRACK 2 OVER W 4TH STREET" PLANS.

MVC = MINIMUM VERTICAL CLEARANCE
MHC = MINIMUM HORIZONTAL CLEARANCE

⇦ STRUCTURE DRAINAGE OUTLET AND DIRECTION.

-Y- ROADWAY CURVE DATA

SEE ROADWAY PLANS.

SEE ROADWAY PLANS FOR EXISTING PAVEMENT ELEVATIONS.

GRADE DATA -Y-

-S1- TRACK CURVE DATA

PIs STA. 28+73.70
Δs = 0° 15' 30.0"
Ls = 31.00'
LT = 20.67'
ST = 10.33'

GRADE DATA -S1-

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: POT STA. 28+17.22 -S1- =
POC STA. 11+60.17 -Y-
MILE POST: NS 377.70
SHEET 1 OF 3 BRIDGE NO.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON STATION TRACK 1 OVER W 4TH STREET BETWEEN W TRADE STREET AND W MOREHEAD STREET

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP
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1			3			TOTAL SHEETS
2			4			19

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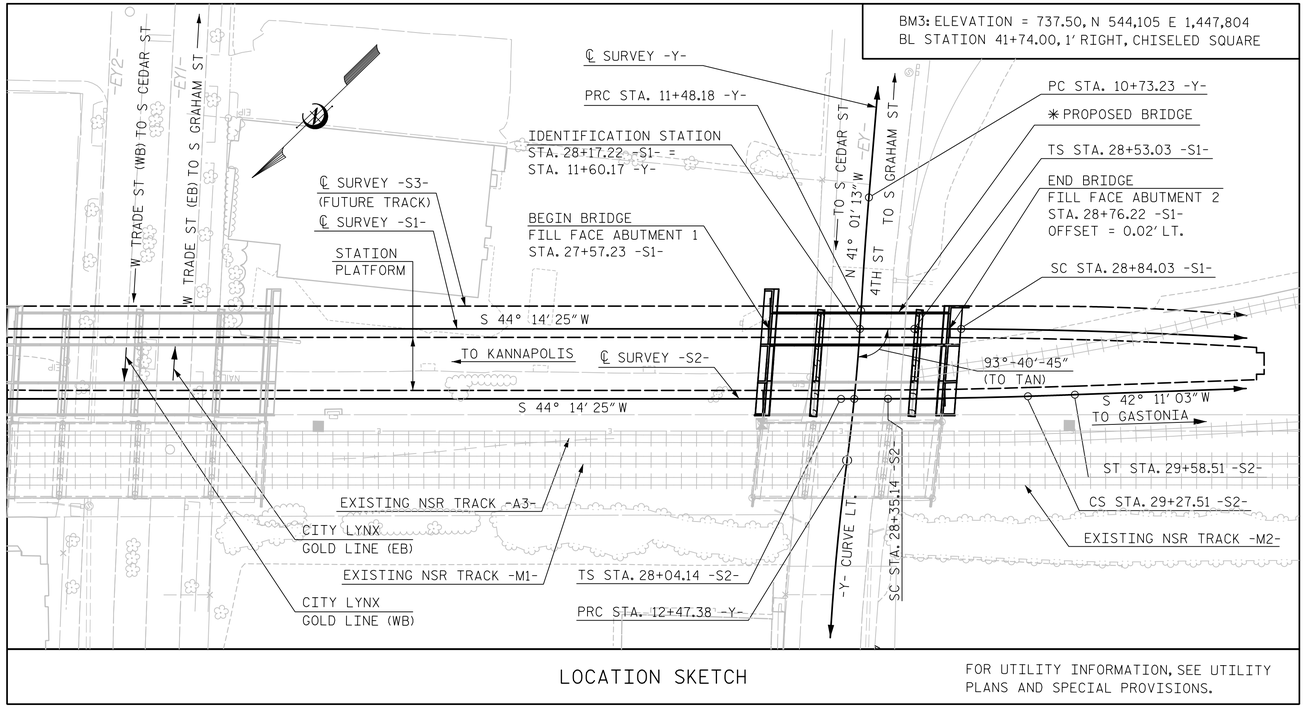

LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

NOTE:

FOR SUBSTRUCTURE BILL OF MATERIAL, REFER TO "BRIDGE ON STATION TRACK 2 OVER W 4TH STREET" PLANS.

✱ SUBSTRUCTURE SHOWN FOR INFORMATION ONLY. FOR SUBSTRUCTURE SHEETS, REFER TO "BRIDGE ON STATION TRACK 2 OVER W 4TH STREET" PLANS.

TOTAL BILL OF MATERIAL

	REINFORCED CONCRETE DECK SLAB	⚠1 APPROX. 233,588 LBS. STRUCTURAL STEEL	PAINTING OF STRUCTURAL STEEL	WATERPROOFING	CONCRETE PARAPET	SELF-LUBRICATING EXPANSION BEARING ASSEMBLIES	STRUCTURE DRAINAGE SYSTEM AT STA. 28+17.22 -S1-	APPLICATION OF BRIDGE COATING
	SQ. FEET	LUMP SUM	LUMP SUM	SQ. YARDS	L.F.	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	2,568.8	LUMP SUM	LUMP SUM	265.6	231.4	LUMP SUM	LUMP SUM	LUMP SUM
TOTAL	2,568.8	LUMP SUM	LUMP SUM	265.6	231.4	LUMP SUM	LUMP SUM	LUMP SUM

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POT STA. 28+17.22 -S1-

SHEET 2 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

LOCATION SKETCH
AND
TOTAL BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-2
1	JRR	05022018	3			TOTAL SHEETS
2			4			19

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GENERAL NOTES:

ASSUMED LIVE LOAD = AREMA E80 OR ALTERNATE LIVE LOAD

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

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2016 EDITION OF AREMA'S "MANUAL FOR RAILWAY ENGINEERING, VOL. 2, STRUCTURES", AND "NORFOLK SOUTHERN GUIDELINES FOR DESIGN OF GRADE SEPARATION STRUCTURES, UNDERPASS GRADE SEPARATION DESIGN CRITERIA".

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2016 EDITION OF AREMA'S" MANUAL FOR RAILWAY ENGINEERING VOL. 2, CHP. 9, SEISMIC DESIGN FOR RAILWAY".

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: 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.

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 LOCATION:
1. BRIDGE DECK AND INSIDE OF CONCRETE PARAPET AS SHOWN ON "TYPICAL SECTION" SHEET.

WATERPROOFING SHALL BE 24" WIDE AND SHALL BE CENTERED OVER JOINTS OR CRACKS.

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 2018, 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 THE 2016 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 ¾" 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 COMPLIANT WITH THE DESIGN STANDARDS OF NORFOLK SOUTHERN RAILWAY COMPANY. ALL METHODS OF HANDLING THE WORK AFFECTING THE SAFETY OF RAIL OPERATIONS MUST BE APPROVED BY THE RAILWAY COMPANY, AS A SUBMITTAL THROUGH THE ENGINEER, AT LEAST TWO WEEKS 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.

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

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 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.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

FOR APPLICATION OF BRIDGE COATING, SEE SPECIAL PROVISIONS.

FOR EXPANSION JOINTS, SEE SPECIAL PROVISIONS.

INDEX OF DRAWINGS

FOR SUBSTRUCTURE SHEETS, REFER TO "BRIDGE ON STATION TRACK 2 OVER W 4TH STREET" PLANS.

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POT STA. 28+17.22 -S1-

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

GENERAL NOTES

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-3
1			3			TOTAL SHEETS
2			4			19

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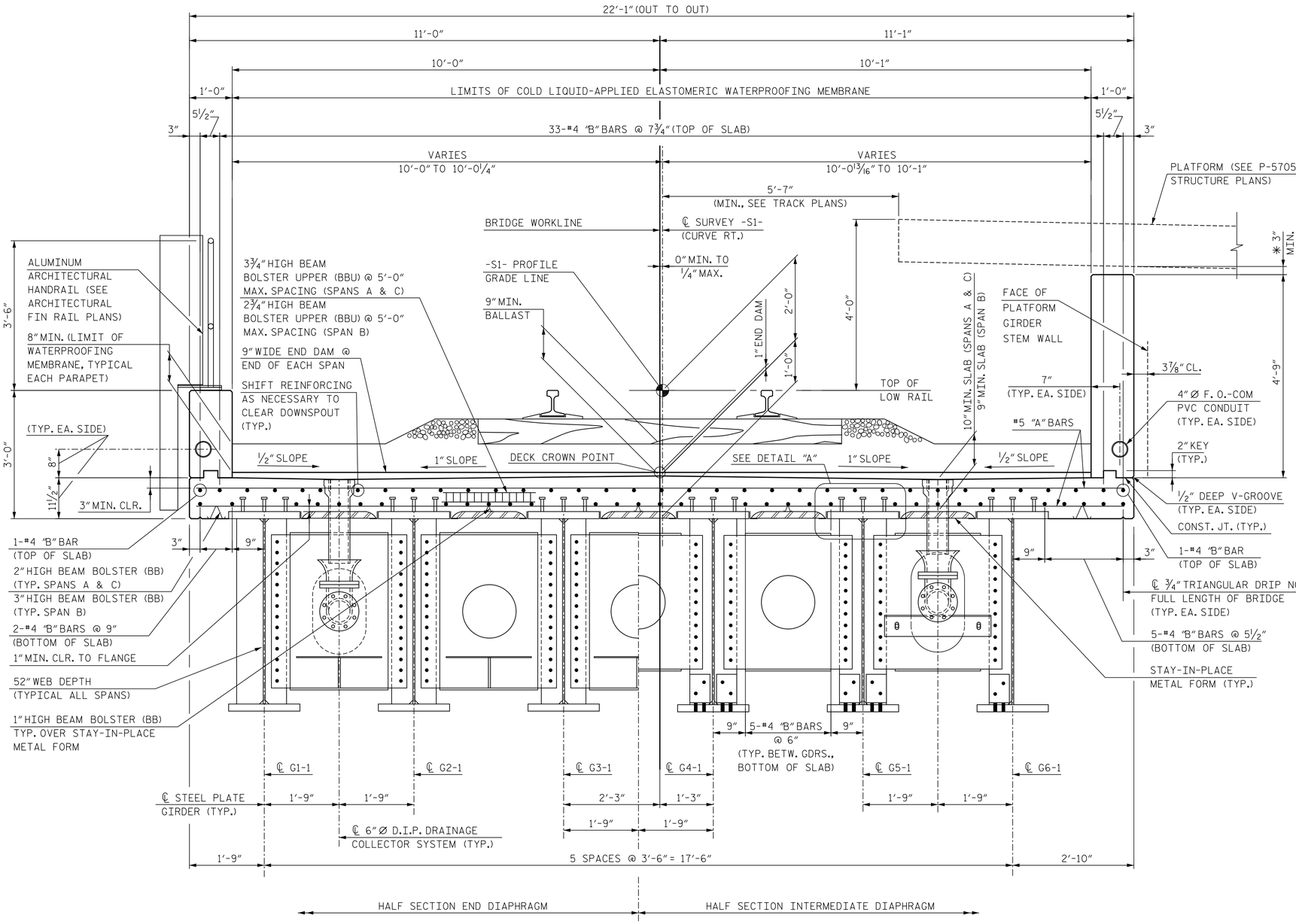
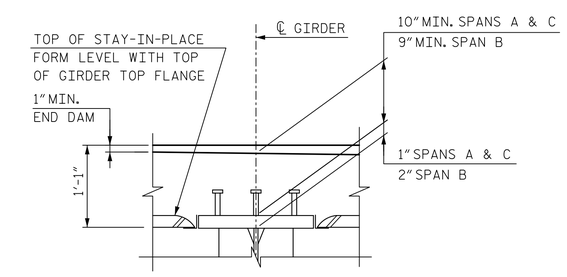


TYPICAL SECTION

(ALL SPANS SIMILAR)



DETAIL "A"

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 (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 ARCHITECTURAL HANDRAIL DETAILS, SEE ARCHITECTURAL FIN RAIL PLANS.

FOR PARAPET DETAILS, SEE "PARAPET DETAILS" SHEETS.

DESIGN INCLUDES WEIGHT OF 6″ ADDITIONAL BALLAST TO ACCOUNT FOR FUTURE RESURFACING OF TRACK.

✱ MINIMUM GAP REMAINING AFTER CONSIDERING ALL PLATFORM DEFLECTIONS.

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POT STA. 28+17.22 -S1-

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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STATE OF NORTH CAROLINA
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RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-4
1			3			TOTAL SHEETS
2			4			19

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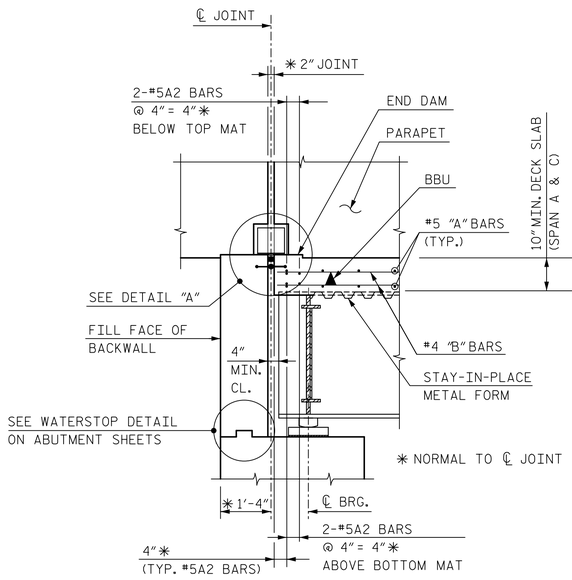
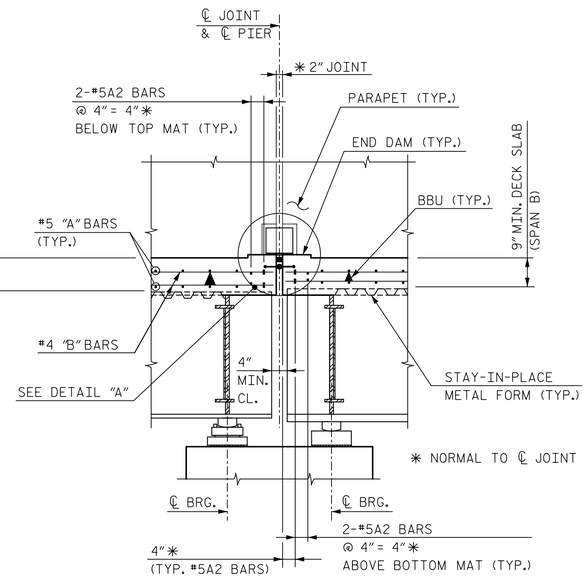


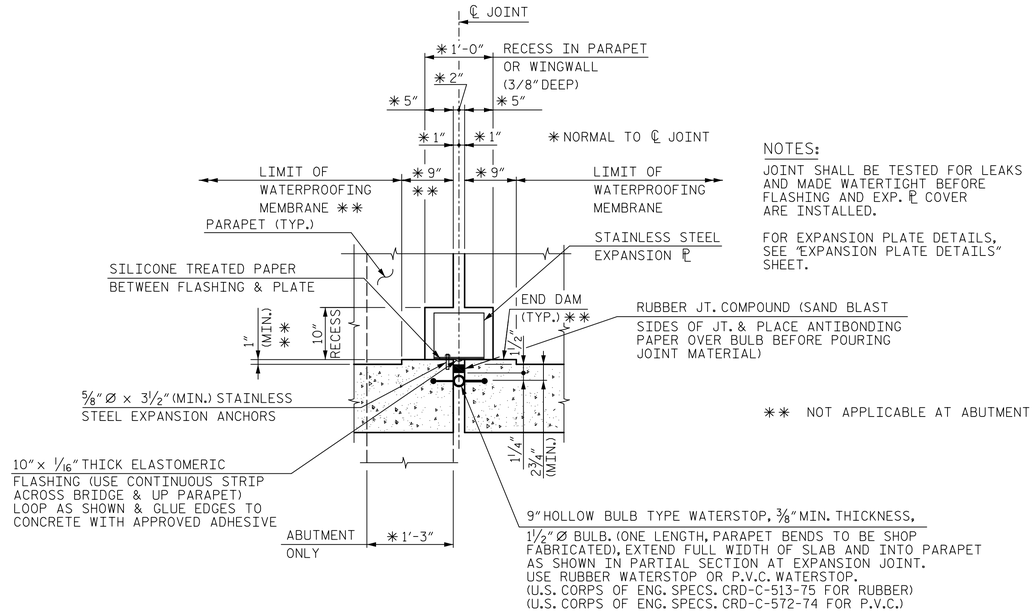
SECTION A-A

(ABUT. 1 SHOWN, ABUT. 2 SIMILAR)



SECTION B-B

(PIERS 1 & 2)
(PIER 1 SHOWN, PIER 2 SIMILAR)



NOTES:

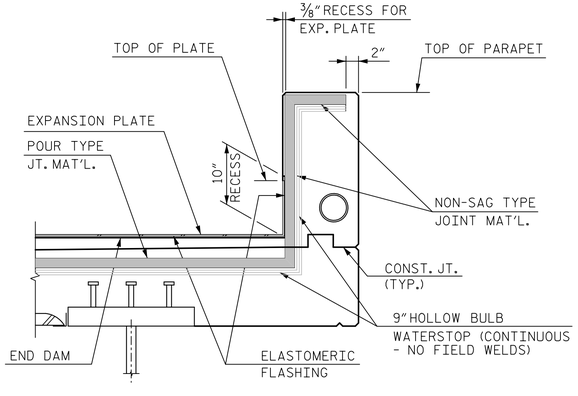
JOINT SHALL BE TESTED FOR LEAKS AND MADE WATERTIGHT BEFORE FLASHING AND EXP. ℙ COVER ARE INSTALLED.

FOR EXPANSION PLATE DETAILS, SEE "EXPANSION PLATE DETAILS" SHEET.

✱✱ NOT APPLICABLE AT ABUTMENT

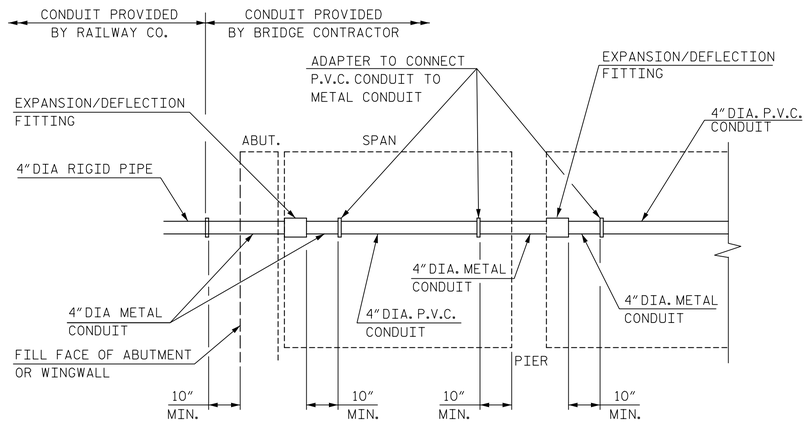
DETAIL "A"

(DECK REBAR NOT SHOWN FOR CLARITY)



PART SECTION AT EXPANSION JOINT

NOTE: FOR ADDITIONAL PARAPET DETAILS, SEE "PARAPET DETAILS" SHEETS.



CONDUIT LAYOUT

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POT STA. 28+17.22 -S1-

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

DocuSigned by: 556B3197C22B434...

2/21/2018

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CHECKED BY R. RAPP DATE 9/17
DWG. NO. 5

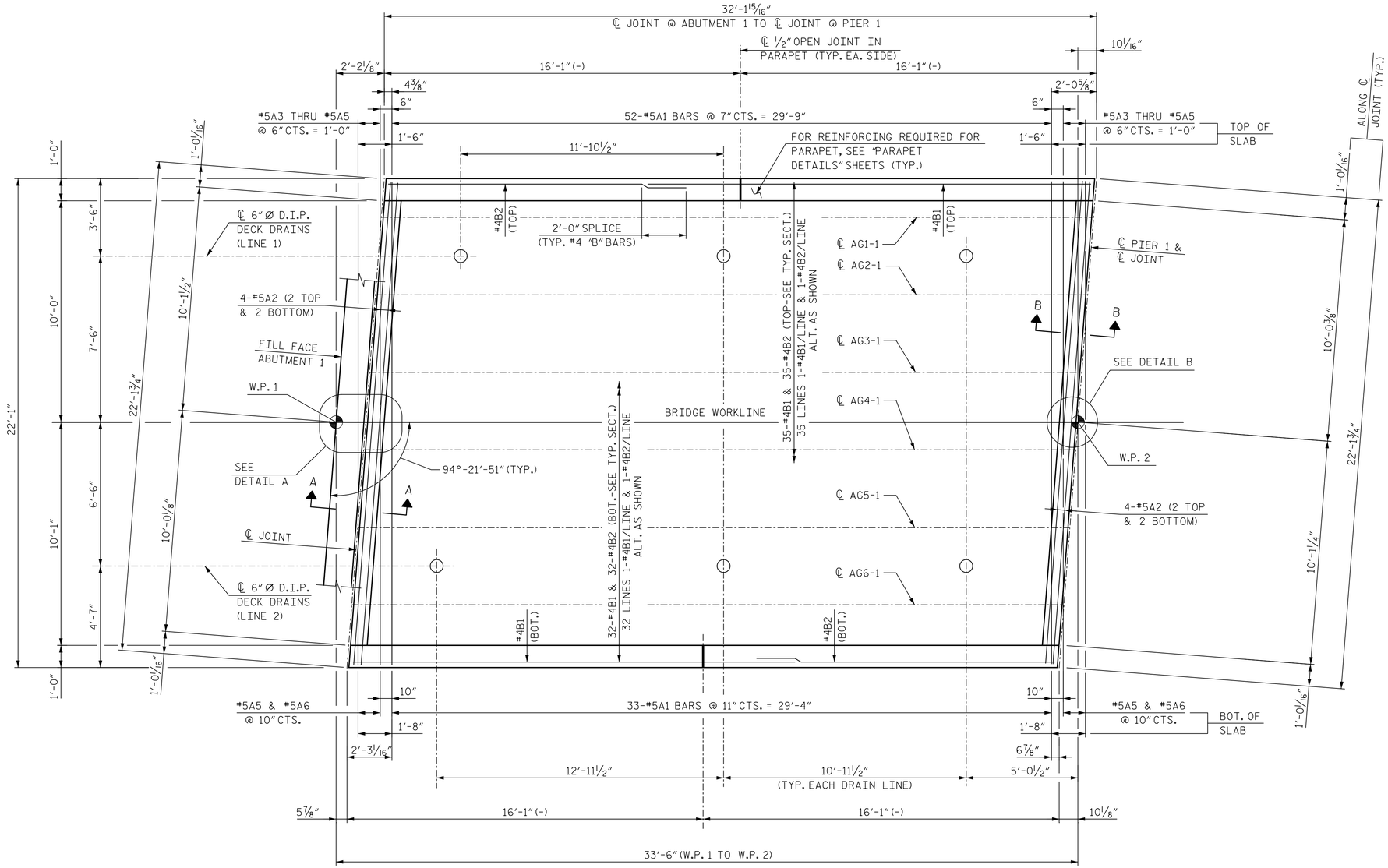
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

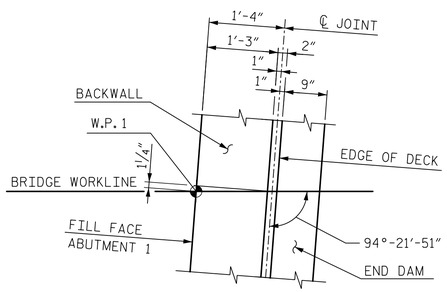
DECK DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-5
1			3			TOTAL SHEETS
2			4			19

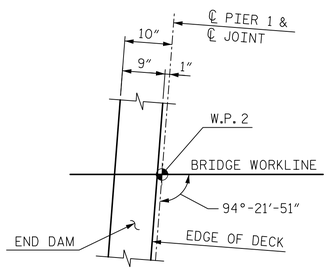
0012DEL_P28



PLAN - SPAN A



DETAIL A



DETAIL B

NOTES:

ALL REINFORCING SHALL BE EPOXY COATED.

FOR SECTIONS A-A & B-B SEE "DECK DETAILS" SHEET.

FOR DECK DRAIN DETAIL SEE DETAIL "B" ON "STRUCTURE: DRAINAGE DETAILS", SHEET 2 OF 2.

FOR PARAPET DETAILS, SEE "PARAPET DETAILS" SHEETS.

SLAB BARS MAY BE ADJUSTED TO AVOID DECK DRAIN LOCATIONS.

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POT STA. 28+17.22 -S1-

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF DECK - SPAN A

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-6
1			3			TOTAL SHEETS
2			4			19

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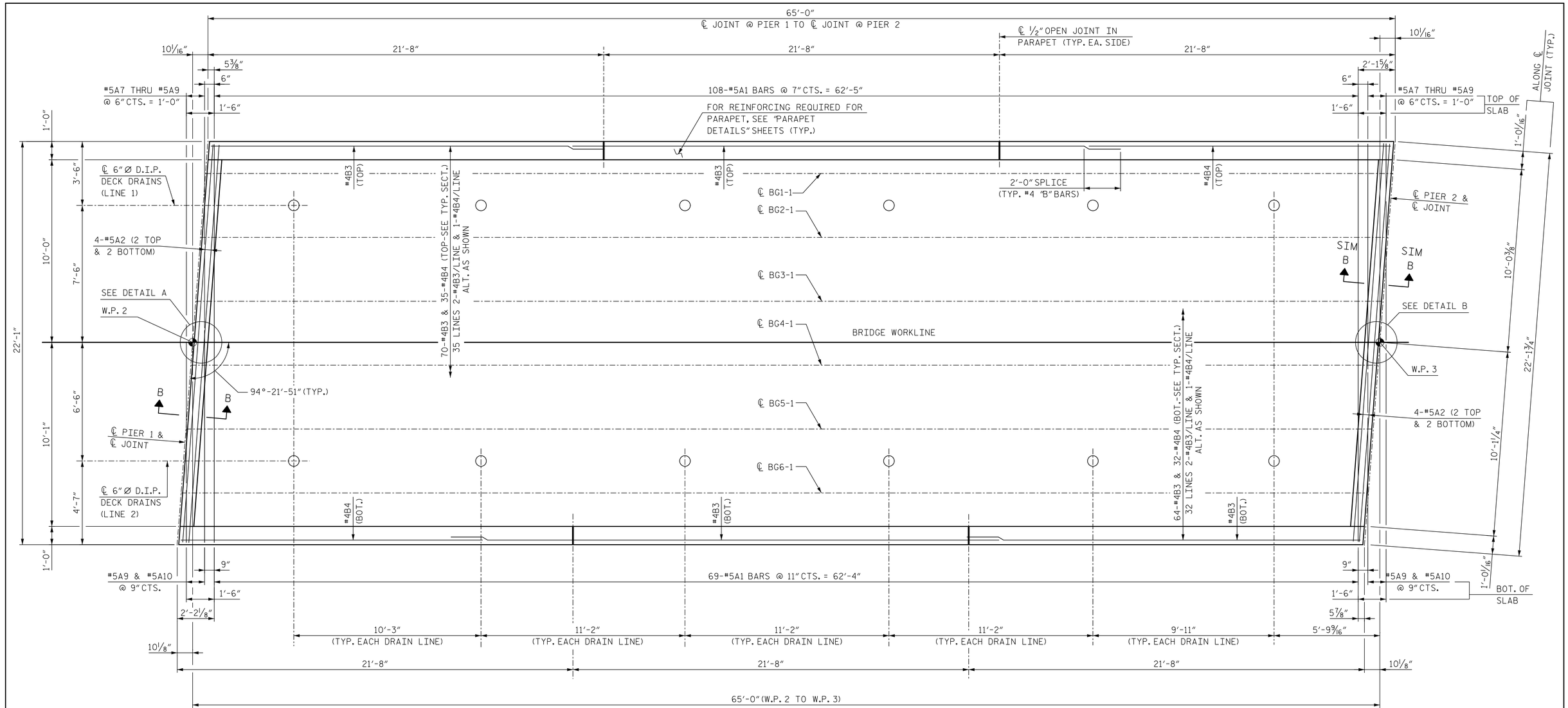
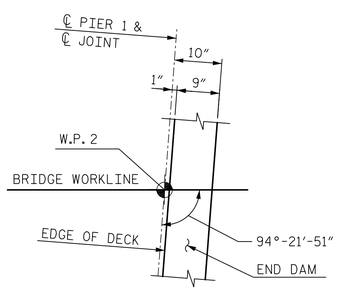


PLAN - SPAN B



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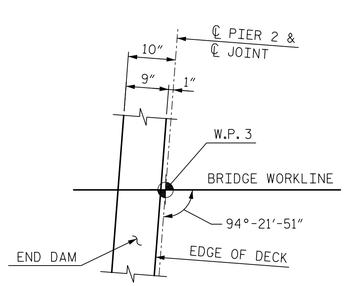

DETAIL B

NOTES:

ALL REINFORCING SHALL BE EPOXY COATED.

FOR SECTION B-B SEE "DECK DETAILS" SHEET.

FOR DECK DRAIN DETAIL SEE DETAIL "B" ON "STRUCTURE: DRAINAGE DETAILS", SHEET 2 OF 2.

FOR PARAPET DETAILS, SEE "PARAPET DETAILS" SHEETS.

SLAB BARS MAY BE ADJUSTED TO AVOID DECK DRAIN LOCATIONS.

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POT STA. 28+17.22 -S1-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF DECK - SPAN B

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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-7
1			3			TOTAL SHEETS
2			4			19

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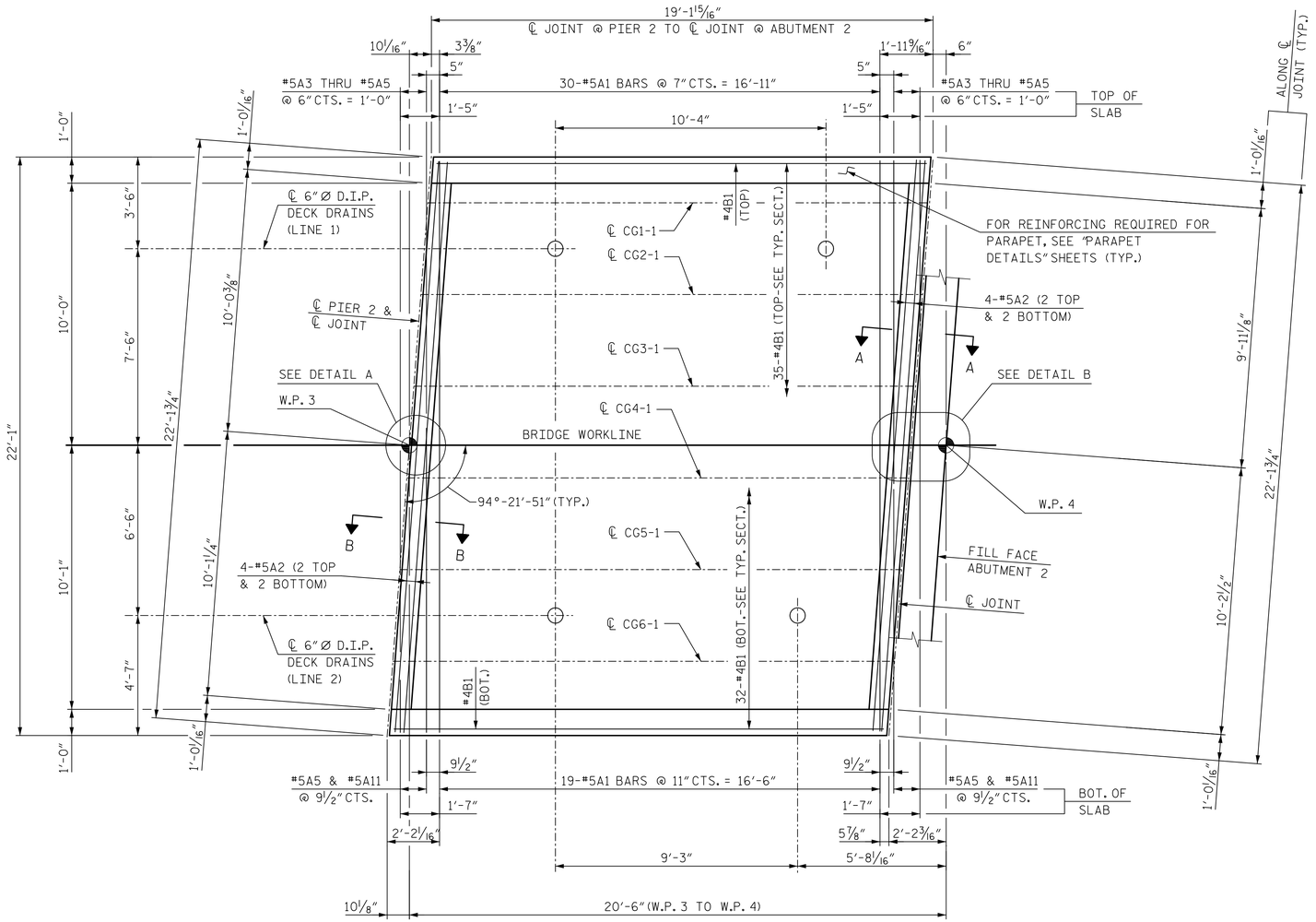


PLAN - SPAN C

NOTES:

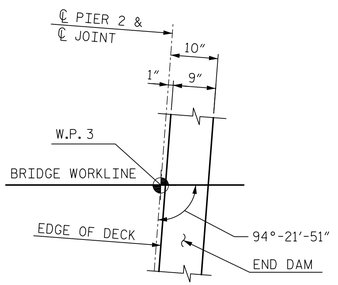
ALL REINFORCING SHALL BE EPOXY COATED.

FOR SECTIONS A-A & B-B SEE "DECK DETAILS" SHEET.

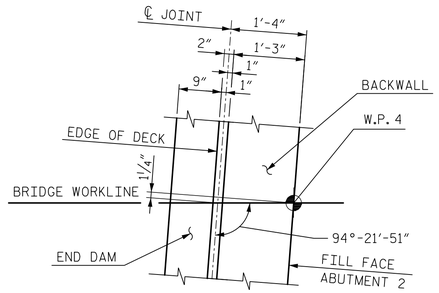
FOR DECK DRAIN DETAIL SEE DETAIL "B" ON "STRUCTURE: DRAINAGE DETAILS", SHEET 2 OF 2.

FOR PARAPET DETAILS, SEE "PARAPET DETAILS" SHEETS.

SLAB BARS MAY BE ADJUSTED TO AVOID DECK DRAIN LOCATIONS.



DETAIL A



DETAIL B

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POT STA. 28+17.22 -S1-

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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SUPERSTRUCTURE

PLAN OF DECK - SPAN C

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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-8
1			3			TOTAL SHEETS
2			4			19

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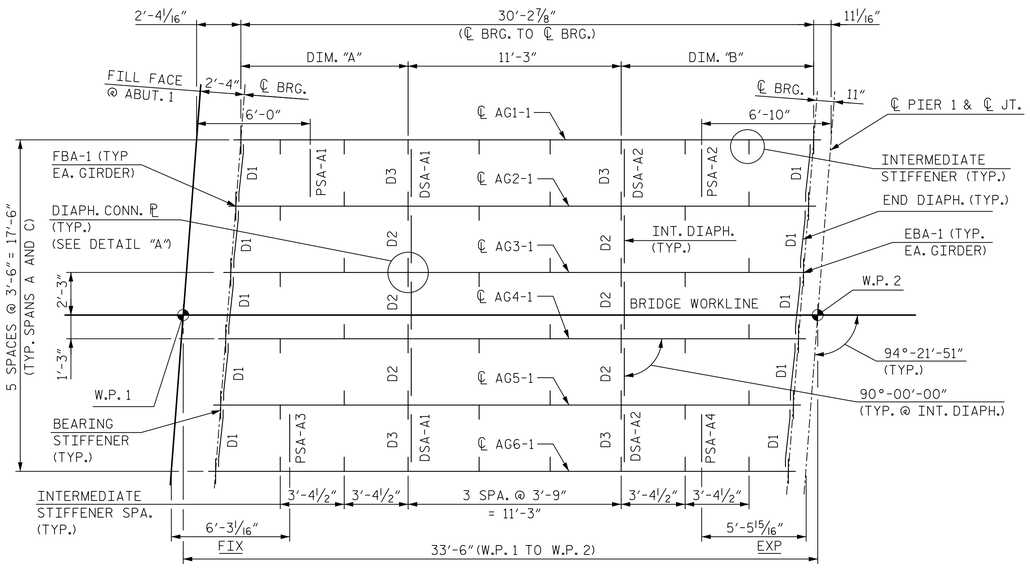
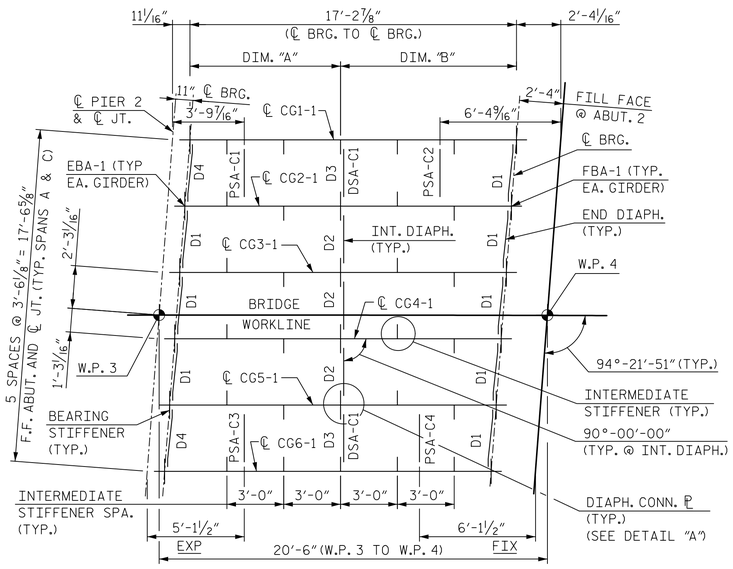


SPAN A

FRAMING PLAN



SPAN C

FRAMING PLAN

SPAN A

TYPICAL GIRDER ELEVATION

(INTERIOR GIRDER SHOWN, EXTERIOR GIRDER SIMILAR)

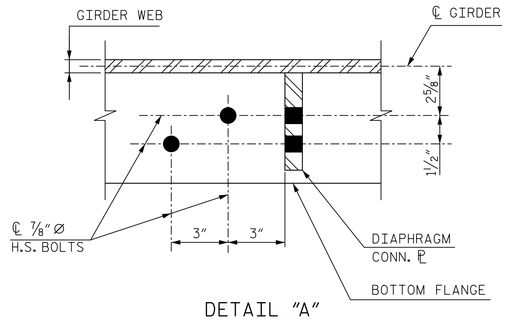
SPAN A GIRDER DIMENSIONS		
GIRDER	DIM. "A"	DIM. "B"
AG1-1	8'-9 15/16"	10'-1 15/16"
AG2-1	9'-1 1/8"	9'-10 3/4"
AG3-1	9'-4 15/16"	9'-7 9/16"
AG4-1	9'-7 9/16"	9'-4 15/16"
AG5-1	9'-10 3/4"	9'-1 1/8"
AG6-1	10'-1 15/16"	8'-9 15/16"

SPAN C

TYPICAL GIRDER ELEVATION

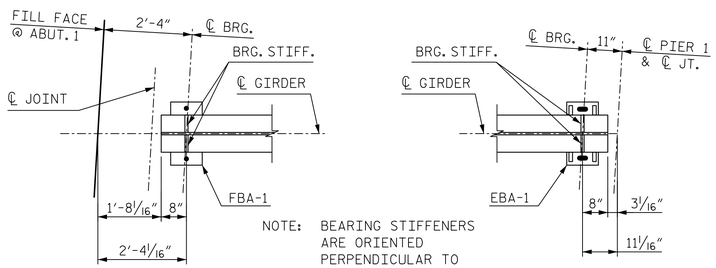
(INTERIOR GIRDER SHOWN, EXTERIOR GIRDER SIMILAR)

SPAN C GIRDER DIMENSIONS		
GIRDER	DIM. "A"	DIM. "B"
CG1-1	7'-11 7/16"	9'-3 7/16"
CG2-1	8'-2 5/8"	9'-0 1/4"
CG3-1	8'-5 13/16"	8'-9 1/16"
CG4-1	8'-9 1/16"	8'-5 13/16"
CG5-1	9'-0 1/4"	8'-2 5/8"
CG6-1	9'-3 7/16"	7'-11 7/16"



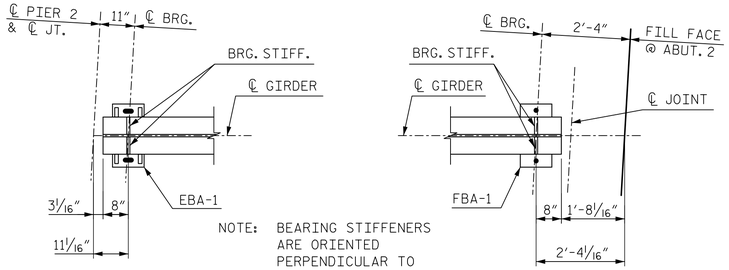
DETAIL "A"

(RIGHT SIDE OF WEB SHOWN, LEFT SIDE SIMILAR)



@ ABUTMENT 1 @ PIER 1

BOTTOM FLANGE GIRDER END DETAILS - SPAN A



@ PIER 2 @ ABUTMENT 2

BOTTOM FLANGE GIRDER END DETAILS - SPAN C

NOTES:

ALL DIMENSIONS ON THIS DRAWING ARE HORIZONTAL.

ALL ABUTMENT FILL FACES, ℄ PIERS, AND ℄ 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
- FLANGE TO WEB WELD DETAILS

FOR BEARINGS, SEE "BEARING DETAILS SPAN A AND SPAN C" SHEET.

FOR DRAIN PIPE SUPPORT DETAILS, SEE "STRUCTURE DRAINAGE DETAILS" SHEETS.

FLANGE AND WELD SHOP SPLICES SHALL BE MADE WITH FULL PENETRATION GROOVE WELDS. SEE DETAILS ON "STRUCTURAL STEEL DETAILS" SHEET. FABRICATOR IS TO SHOW WELD CONFIGURATION AND JOINT PREPARATION ON SHOP DRAWINGS FOR APPROVAL.

FLANGE AND WEB SHOP SPLICES SHALL BE STAGGERED LONGITUDINALLY A MINIMUM OF 2'-0". SEE "STRUCTURAL STEEL DETAILS" SHEET FOR DETAILS.

FC = "FRACTURE CRITICAL"

INT = NON-FRACTURE CRITICAL MEMBERS OR COMPONENTS REQUIRING IMPROVED NOTCH TOUGHNESS.

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POT STA. 28+17.22 -S1-

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

DocuSigned by: 556B3197C22B434...

2/21/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN AND GIRDER DETAILS SPAN A AND SPAN C

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NO.	BY	DATE	NO.	BY	DATE	S6-9
1			3			TOTAL SHEETS
2			4			19

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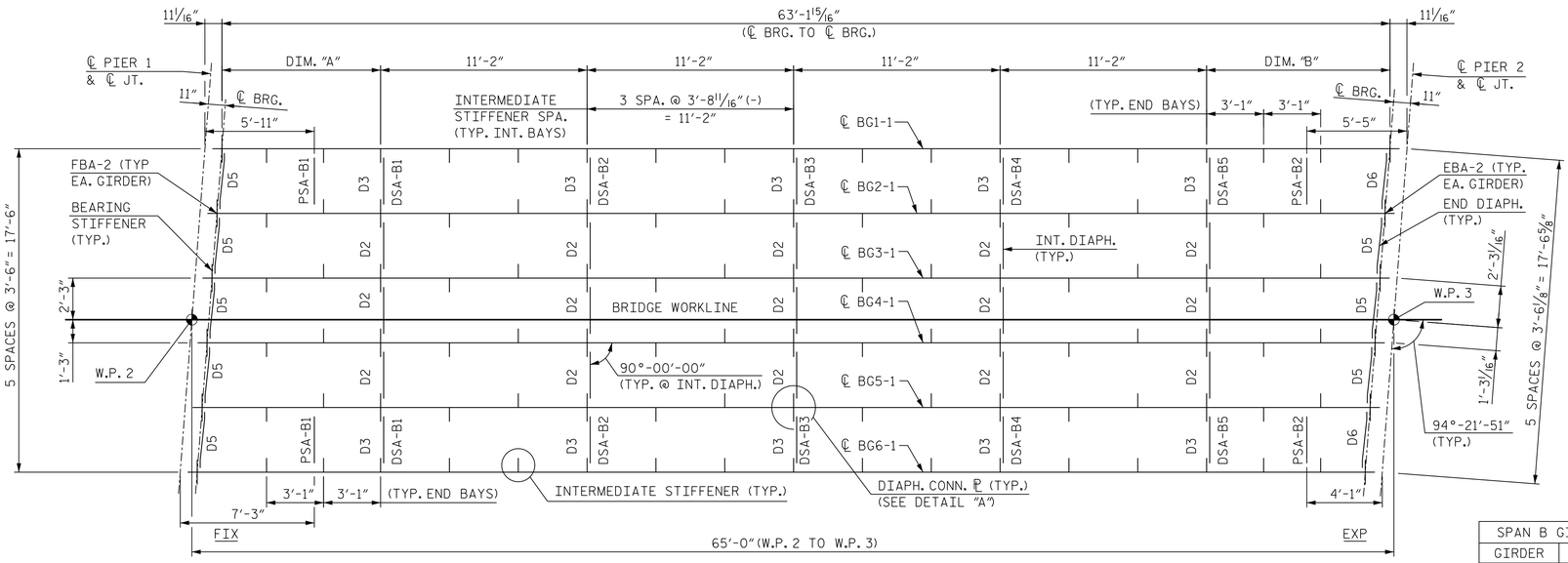

SPAN B

FRAMING PLAN

SPAN B GIRDER DIMENSIONS		
GIRDER	DIM. "A"	DIM. "B"
BG1-1	8'-6 15/16"	9'-11"
BG2-1	8'-10 3/16"	9'-7 3/4"
BG3-1	9'-1 3/8"	9'-4 9/16"
BG4-1	9'-4 9/16"	9'-1 3/8"
BG5-1	9'-7 3/4"	8'-10 3/16"
BG6-1	9'-11"	8'-6 15/16"

NOTES:

ALL DIMENSIONS ON THIS DRAWING ARE HORIZONTAL.

ALL ℄ PIERS AND ℄ 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
- FLANGE TO WEB WELD DETAILS

FOR BEARINGS, SEE "BEARING DETAILS SPAN B" SHEET.

FOR DRAIN PIPE SUPPORT DETAILS, SEE "STRUCTURE DRAINAGE DETAILS" SHEETS.

FLANGE AND WELD SHOP SPLICES SHALL BE MADE WITH FULL PENETRATION GROOVE WELDS. SEE DETAILS ON "STRUCTURAL STEEL DETAILS" SHEET. FABRICATOR IS TO SHOW WELD CONFIGURATION AND JOINT PREPARATION ON SHOP DRAWINGS FOR APPROVAL.

FLANGE AND WEB SHOP SPLICES SHALL BE STAGGERED LONGITUDINALLY A MINIMUM OF 2'-0". SEE "STRUCTURAL STEEL DETAILS" SHEET FOR DETAILS.

FC = "FRACTURE CRITICAL"

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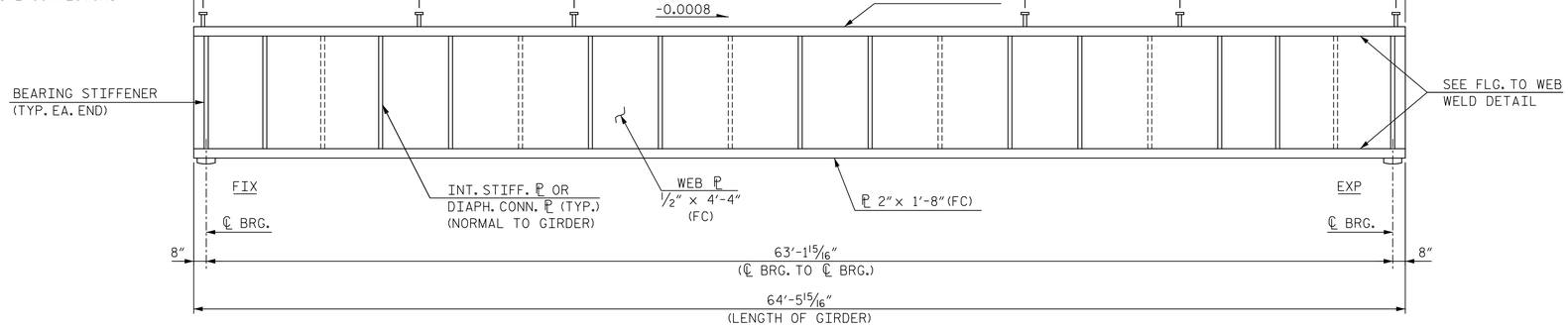
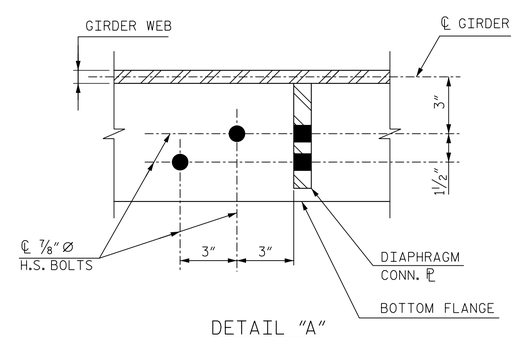


SPAN B

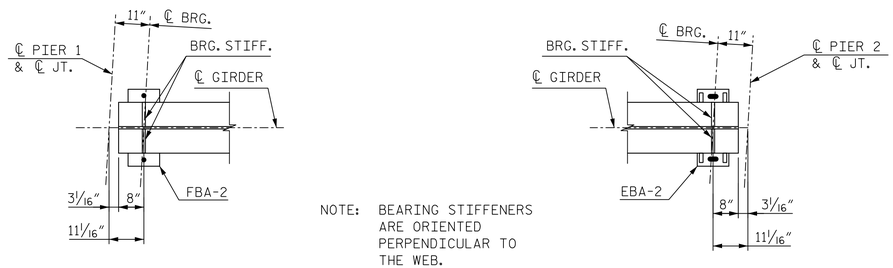
TYPICAL GIRDER ELEVATION

(INTERIOR GIRDER SHOWN, EXTERIOR GIRDER SIMILAR)



DETAIL "A"

(RIGHT SIDE OF WEB SHOWN, LEFT SIDE SIMILAR)



@ PIER 1 @ PIER 2

BOTTOM FLANGE GIRDER END DETAILS - SPAN B

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POT STA. 28+17.22 -S1-

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

DocuSigned by: 556B3197C228434...

2/21/2018

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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	S6-10
1			3			TOTAL SHEETS
2			4			19

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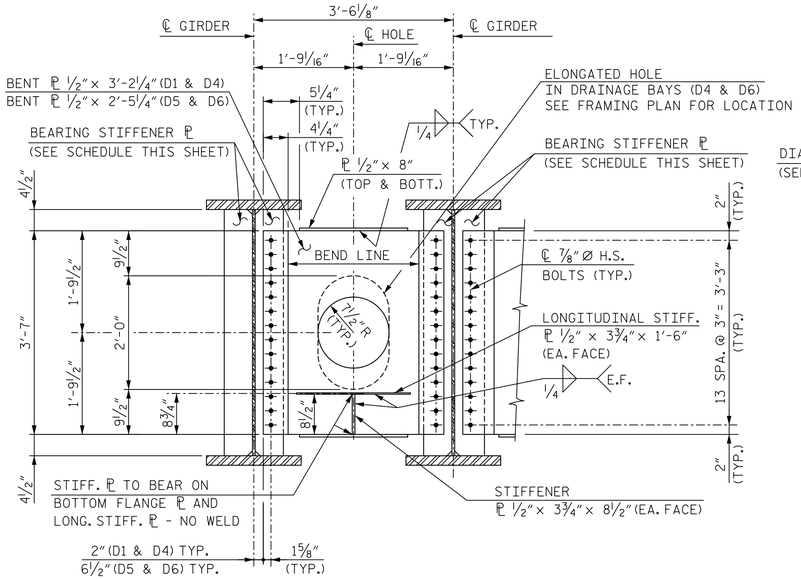
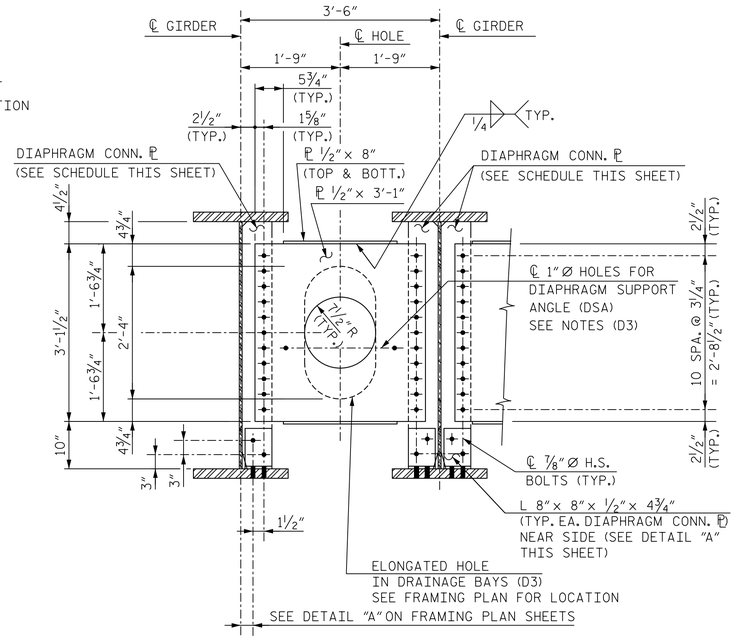


SECTION @ END DIAPHRAGM (D1, D4, D5, & D6)



SECTION @ INTERMEDIATE DIAPHRAGM (D2 & D3)

STRUCTURAL STEEL NOTES

STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING ASTM SPECIFICATIONS:

- GIRDER FLANGES AND WEB: A709, GRADE 50.
- MISCELLANEOUS MATERIAL: A709, GRADE 50.
- ANCHOR BOLTS FOR BEARING DEVICES SHALL CONFORM TO ASTM F1554, GRADE 105. ANCHOR BOLTS, NUTS, AND PLATE WASHERS SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM F2329.

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 1.14. NOTCH TOUGHNESS REQUIREMENTS AND TESTING SHALL BE BASED ON ZONE 2 REQUIREMENTS.

STRUCTURAL STEEL ELEMENTS DENOTED AS "INT" 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. ALL DIMENSIONS ARE SHOWN AT 60°F.

NC DOT RAILS DIVISION SHALL BE FURNISHED COPIES OF MILL TEST REPORTS FOR ALL MATERIALS EXCEPT MISCELLANEOUS PLATES AND SHAPES. REPORTS SHALL INDICATE COMPLIANCE WITH ALL SPECIFIED REQUIREMENTS.

SHOP INSPECTION SHALL BE BY NORFOLK SOUTHERN CORPORATION OR ITS AUTHORIZED AGENT. SEE STRUCTURAL STEEL SPECIAL PROVISION FOR ADDITIONAL WELDING INSPECTION OF FLANGE PLATE TO WEB PLATE WELDS.

FOR PAINTING STRUCTURAL STEEL, SEE SPECIAL PROVISIONS.

BOLTED CONNECTIONS SHALL BE MADE WITH 7/8" Ø ASTM A325, TYPE 1 HIGH STRENGTH BOLTS WITH HEAVY HEX HEAD, HEAVY HEX NUT AND 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 SHALL BE APPROVED BY THE CHIEF ENGINEER - BRIDGES AND STRUCTURES, NORFOLK SOUTHERN CORPORATION, ATLANTA, GA. SHOP DRAWINGS SHALL BE LABELED "NORFOLK SOUTHERN MP 377.70".

BOLT HOLES IN STRUCTURAL STEEL MEMBERS SHALL BE STANDARD SIZE UNLESS OTHERWISE INDICATED ON THE PLANS.

HIGH STRENGTH BOLTS, NUTS & WASHERS SHALL BE MECHANICALLY GALVANIZED IN ACCORDANCE WITH ASTM B695.

ANCHOR BOLTS SHALL BE 1 1/4" Ø 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. FOR PAD REQUIREMENTS, SEE STRUCTURAL STEEL SPECIAL PROVISIONS.

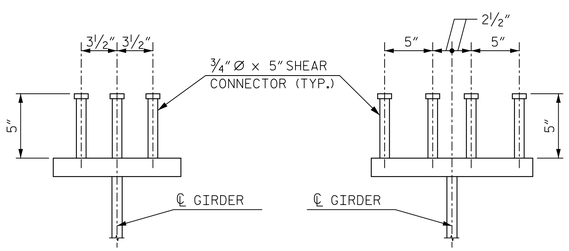
SHEAR CONNECTORS ON GIRDERS MAY BE SHIFTED AS NECESSARY TO CLEAR FLANGE SPLICE WELDS.

WEB SHOP SPLICES ARE PERMITTED TO LIMIT THE MAXIMUM REQUIRED WEB PIECE LENGTHS TO 45'-0". PERMITTED WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15'-0" OF MAXIMUM DEAD LOAD DEFLECTION AND SHALL BE LOCATED 6" MIN. FROM CONNECTOR PLATE OR INTERMEDIATE STIFFENER WELDS. FLANGE AND WEB SHOP SPLICES SHALL CONFORM TO SHOP SPLICE DETAILS SHOWN ON THE PLANS.

ALL WELDING CONNECTIONS SHALL BE MADE WITH SERIES E70 WELDING ELECTRODES.

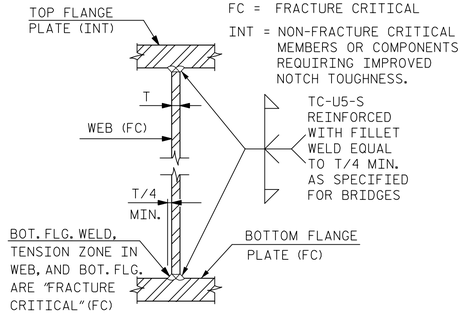
FOR DIAPHRAGM LOCATIONS, SEE FRAMING PLANS.

FOR DETAILS OF DIAPHRAGM SUPPORT ANGLES (DSA), SEE "STRUCTURE DRAINAGE DETAILS" SHEET 2 OF 2.



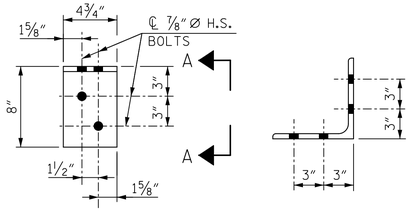
SPANS A & C — SPAN B

SHEAR CONNECTOR DETAILS



FLANGE TO WEB WELD DETAIL

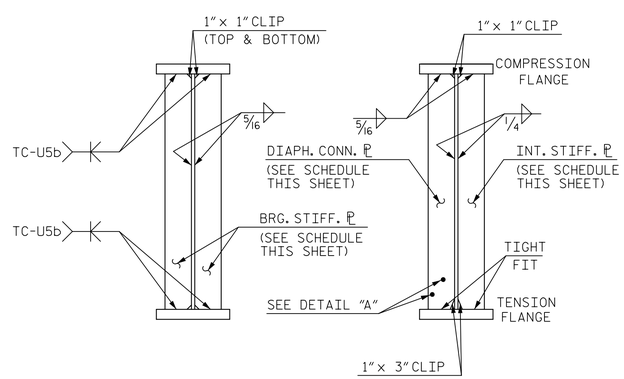
NO SCALE



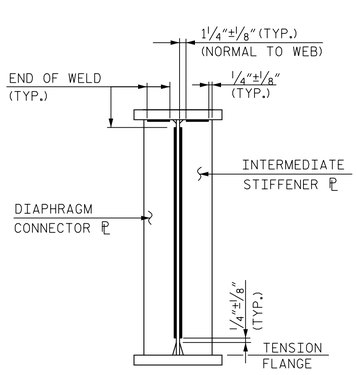
PLAN — VIEW A-A

DETAIL "A"

(L 8″ × 8″ × 1/2″ × 4 3/4″)

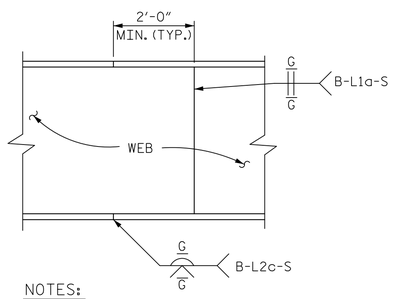


STIFFENER/CONN. ℙ DETAILS



WELD TERMINATION DETAILS

(FILLET WELDS ONLY)



SHOP SPLICE DETAILS

NOTES:

ELECTROSLAG WELDING IS NOT PERMITTED.

ULTRASONIC OR RADIOGRAPHIC INSPECTION IS REQUIRED FOR ALL FLANGE AND WEB SPLICE WELDS. SEE SPECIAL PROVISIONS.

GRIND WELDS IN DIRECTION OF STRESS ONLY (I.E. PARALLEL TO ℄ GIRDER).

STIFFENER/CONN. ℙ SCHEDULE		
TYPE	SPANS A & C	SPAN B
BRG. STIFF.	ℙ 1/2″ × 5″	ℙ 1″ × 9 1/2″
DIAPH. CONN. ℙ	ℙ 1/2″ × 5 1/2″	ℙ 1/2″ × 6″
INT. STIFF.	ℙ 1/2″ × 5 1/2″	ℙ 1/2″ × 6″

NOTE: SEE FRAMING PLANS FOR STIFFENER/CONN. ℙ LOCATIONS

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POT STA. 28+17.22 -S1-

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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2/21/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

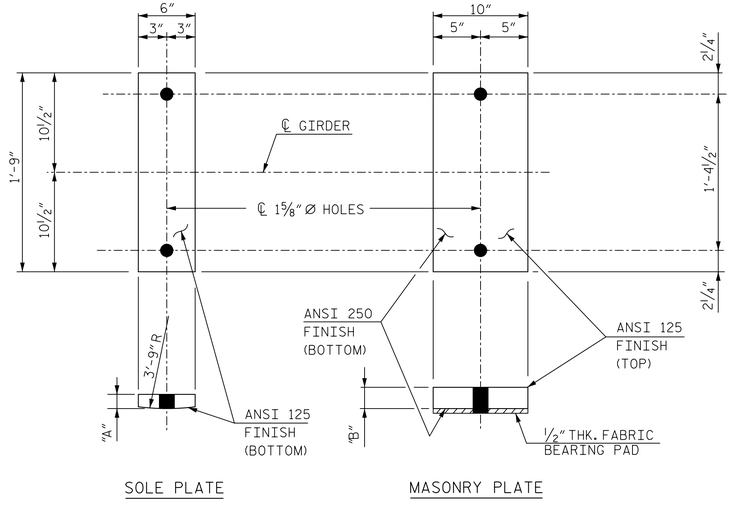
STRUCTURAL STEEL DETAILS

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

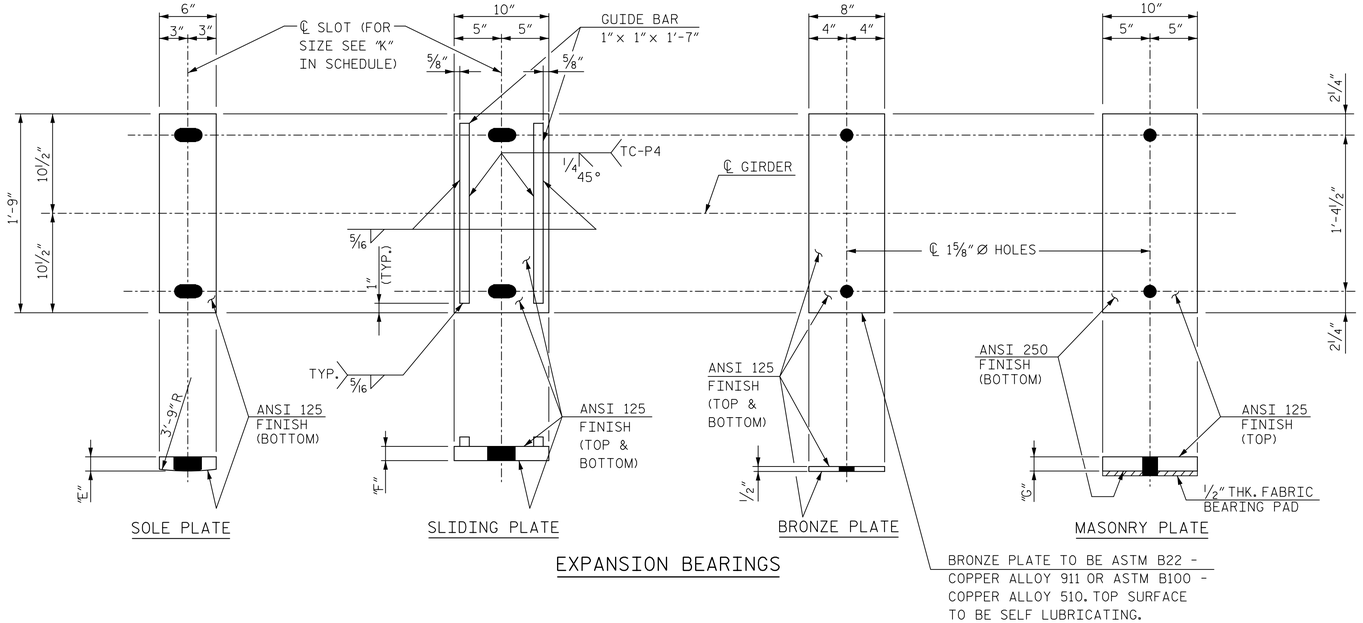
DRAWN BY B. VAUGHN DATE 8/17
CHECKED BY K. ERVIN DATE 9/17
DWG. NO. II

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-11
1			3			TOTAL SHEETS
2			4			19

0012DEL_P28

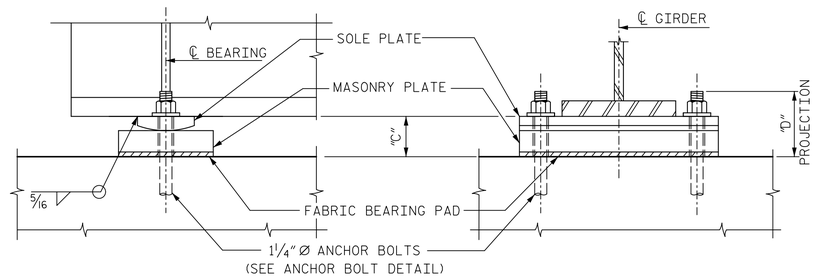


FIXED BEARINGS



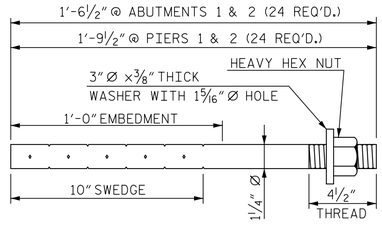
EXPANSION BEARINGS

BRONZE PLATE TO BE ASTM B22 - COPPER ALLOY 911 OR ASTM B100 - COPPER ALLOY 510. TOP SURFACE TO BE SELF LUBRICATING.

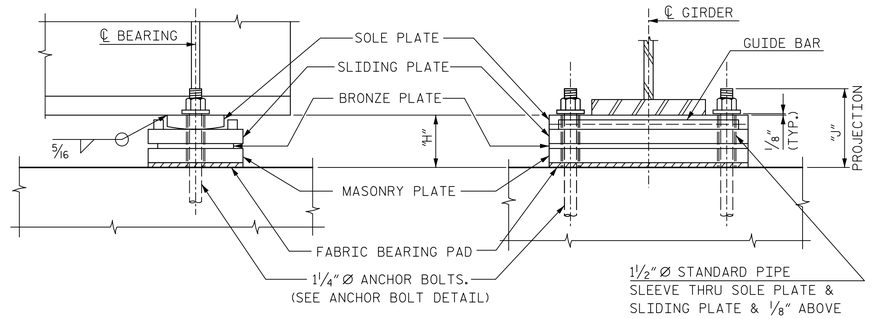


FIXED BEARING ASSEMBLY (FBA-1)

(12 REQ'D)



ANCHOR BOLT DETAIL



EXPANSION BEARING ASSEMBLY (EBA-1)

(12 REQ'D)

BEARING PLATE SCHEDULE										
GIRDER	DIMENSIONS									
	FIXED BEARING (FBA-1)				EXPANSION BEARING (EBA-1)					
	″A″	″B″	″C″	″D″	″E″	″F″	″G″	″H″	″J″	″K″
AG1-1	1½″	2″	4″	6½″	1½″	1½″	1¾″	5¾″	9½″	2″ × 3″
AG2-1	1½″	2″	4″	6½″	1½″	1½″	1¾″	5¾″	9½″	2″ × 3″
AG3-1	1½″	2″	4″	6½″	1½″	1½″	1¾″	5¾″	9½″	2″ × 3″
AG4-1	1½″	2″	4″	6½″	1½″	1½″	1¾″	5¾″	9½″	2″ × 3″
AG5-1	1½″	2″	4″	6½″	1½″	1½″	1¾″	5¾″	9½″	2″ × 3″
AG6-1	1½″	2″	4″	6½″	1½″	1½″	1¾″	5¾″	9½″	2″ × 3″
CG1-1	1½″	1¾″	3¾″	6½″	1½″	1½″	2⅝″	6⅝″	9½″	2″ × 3″
CG2-1	1½″	1¾″	3¾″	6½″	1½″	1½″	2⅝″	6⅝″	9½″	2″ × 3″
CG3-1	1½″	1¾″	3¾″	6½″	1½″	1½″	2⅝″	6⅝″	9½″	2″ × 3″
CG4-1	1½″	1¾″	3¾″	6½″	1½″	1½″	2¾″	6¾″	9½″	2″ × 3″
CG5-1	1½″	1¾″	3¾″	6½″	1½″	1½″	2¾″	6¾″	9½″	2″ × 3″
CG6-1	1½″	1¾″	3¾″	6½″	1½″	1½″	2¾″	6¾″	9½″	2″ × 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.

REFER TO "STRUCTURAL STEEL DETAILS" SHEET FOR ADDITIONAL NOTES.

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POT STA. 28+17.22 -S1-

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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DRAWN BY B. VAUGHN DATE 8/17
CHECKED BY R. RAPP DATE 9/17
DWG. NO. 12

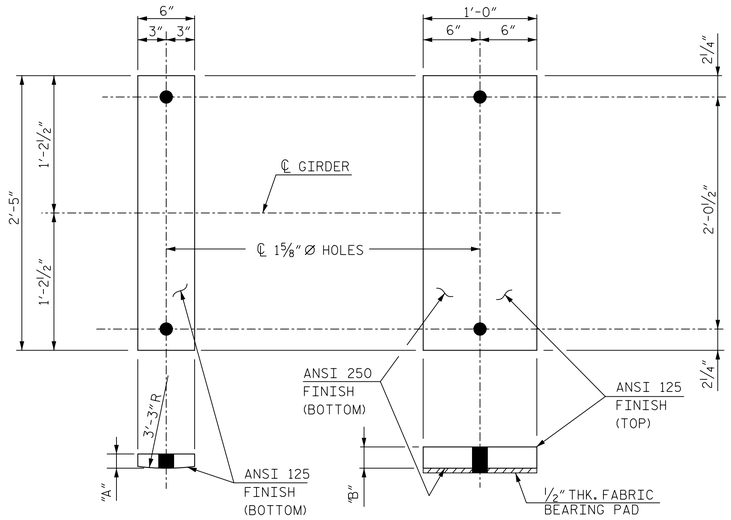
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BEARING DETAILS
SPAN A AND SPAN C

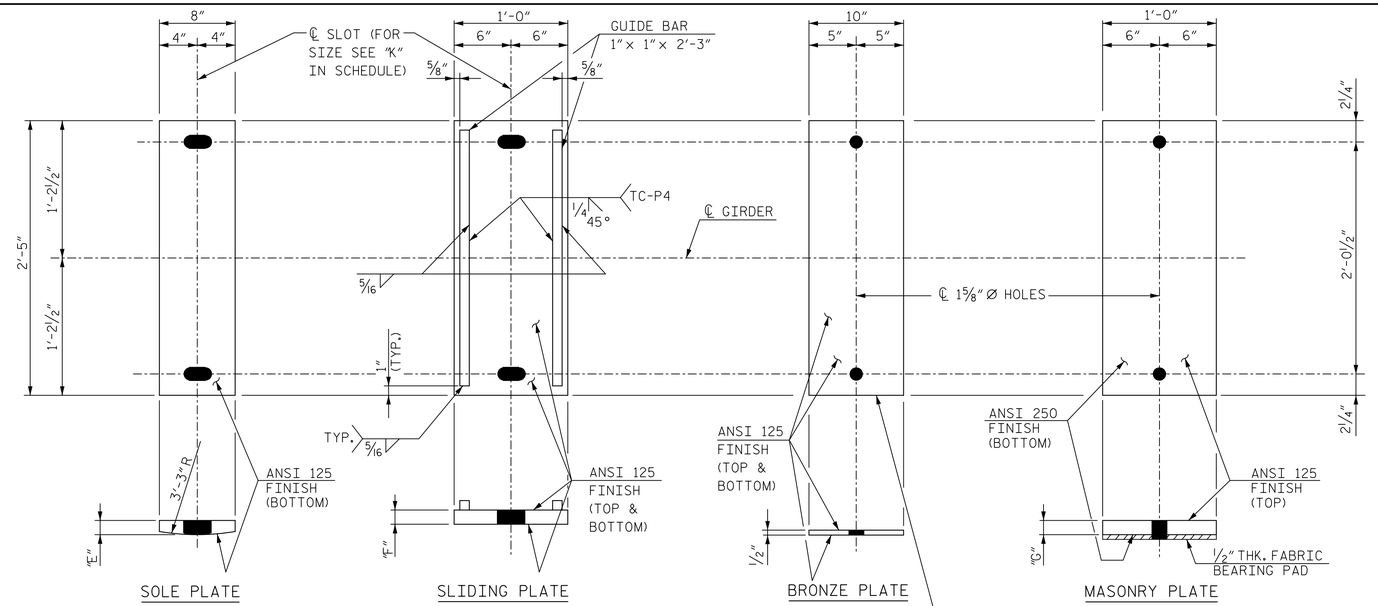
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-12
1			3			TOTAL SHEETS
2			4			19

0012DEL_P28



SOLE PLATE MASONRY PLATE

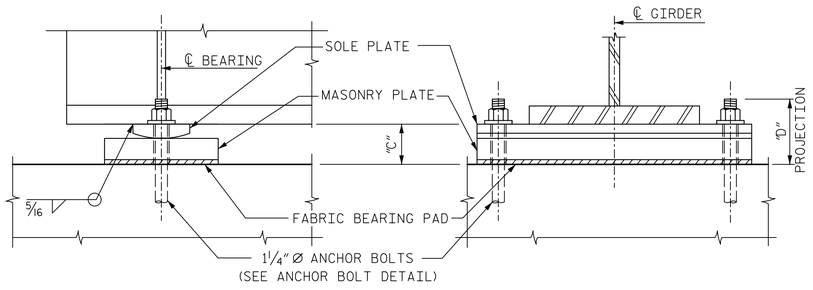
FIXED BEARINGS



SOLE PLATE SLIDING PLATE BRONZE PLATE MASONRY PLATE

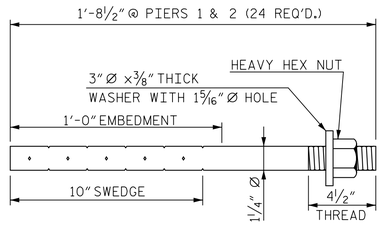
EXPANSION BEARINGS

BRONZE PLATE TO BE ASTM B22 - COPPER ALLOY 911 OR ASTM B100 - COPPER ALLOY 510. TOP SURFACE TO BE SELF LUBRICATING.



FIXED BEARING ASSEMBLY (FBA-2)

(6 REQ'D)



ANCHOR BOLT DETAIL

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.

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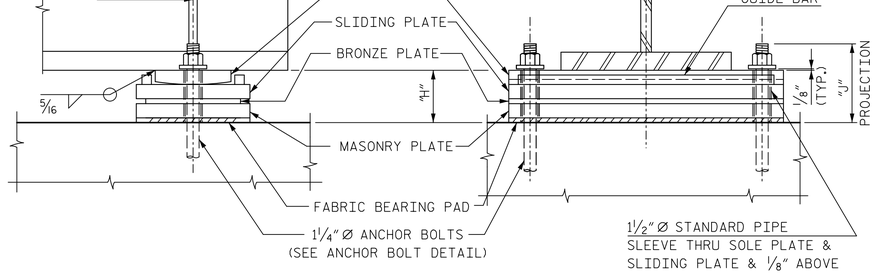
(C) THE BOTTOM SURFACE OF THE SOLE PLATE SHALL NOT BE PAINTED BUT SHALL RECEIVE A SINGLE COAT OF PRIMER APPLIED IN THE SHOP.

(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.

REFER TO "STRUCTURAL STEEL DETAILS" SHEET FOR ADDITIONAL NOTES.



EXPANSION BEARING ASSEMBLY (EBA-2)

(6 REQ'D)

BEARING PLATE SCHEDULE

GIRDER	DIMENSIONS									
	FIXED BEARING (FBA-2)				EXPANSION BEARING (EBA-2)					
	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"J"	"K"
BG1-1	1½″	2⅝″	4⅝″	8½″	1½″	1½″	1¾″	5¾″	8½″	2″ x 4″
BG2-1	1½″	2⅝″	4⅝″	8½″	1½″	1½″	1¾″	5¾″	8½″	2″ x 4″
BG3-1	1½″	2⅝″	4⅝″	8½″	1½″	1½″	1¾″	5¾″	8½″	2″ x 4″
BG4-1	1½″	2¾″	4¾″	8½″	1½″	1½″	1¾″	5¾″	8½″	2″ x 4″
BG5-1	1½″	2¾″	4¾″	8½″	1½″	1½″	1¾″	5¾″	8½″	2″ x 4″
BG6-1	1½″	2¾″	4¾″	8½″	1½″	1½″	1¾″	5¾″	8½″	2″ x 4″

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POT STA. 28+17.22 -S1-

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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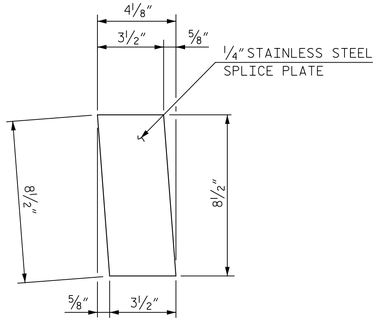
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

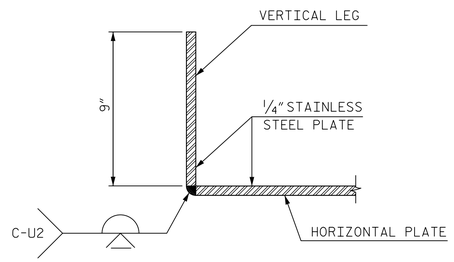
BEARING DETAILS
SPAN B

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-13
1			3			TOTAL SHEETS
2			4			19

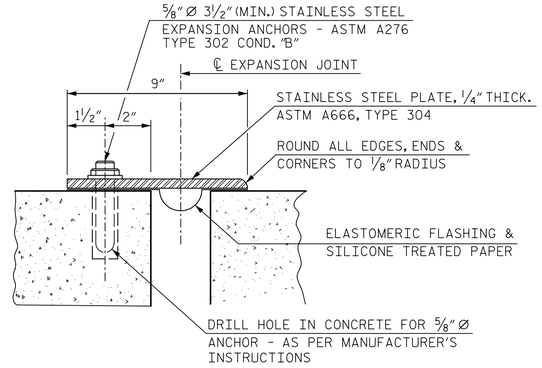
0012DEL_P28



DETAIL A



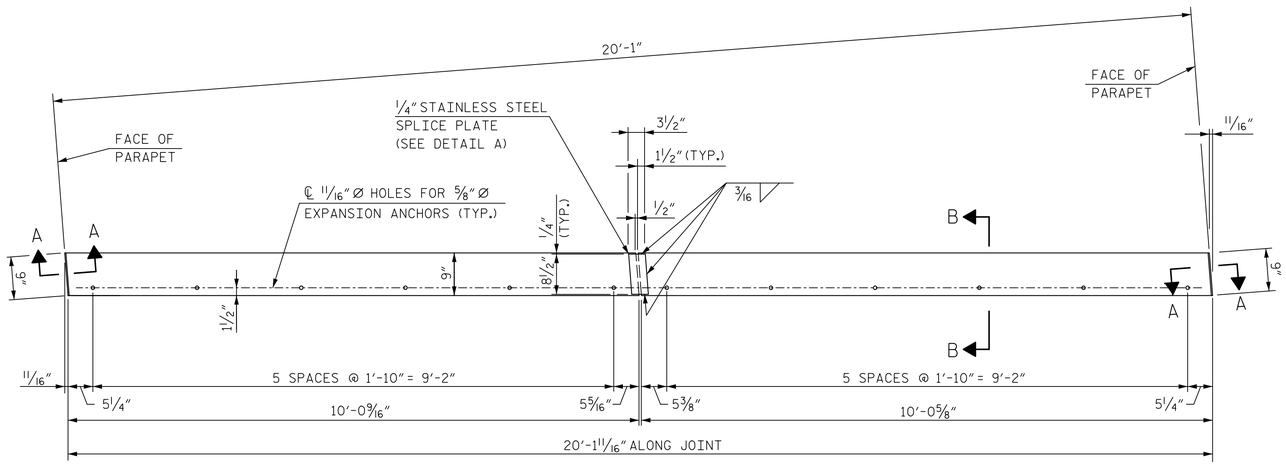
SECTION A-A



SECTION B-B

DETAIL OF EXPANSION ANCHOR AND PLATE

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



PLAN - EXPANSION PLATE
(4 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, AND SPAN B SIDE OF PIER 2.

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POT STA. 28+17.22 -S1-

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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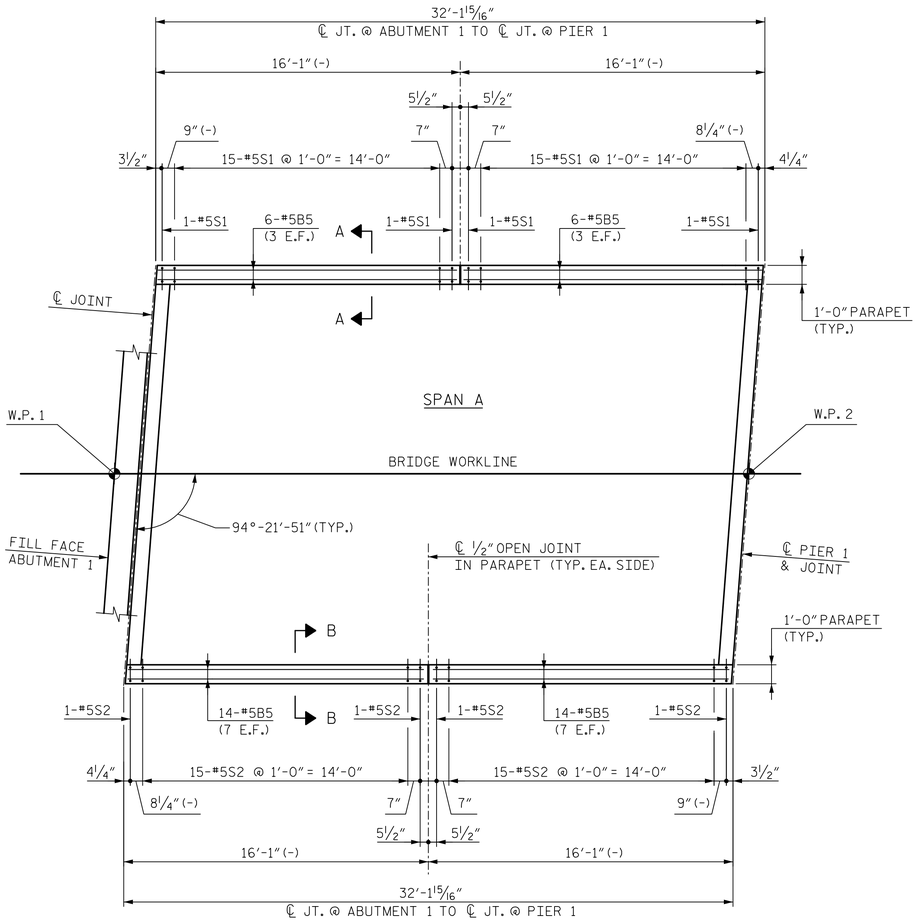
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

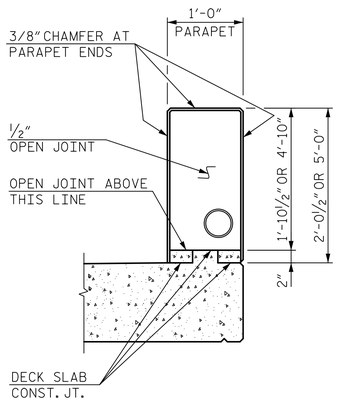
EXPANSION PLATE DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-14
1			3			TOTAL SHEETS
2			4			19

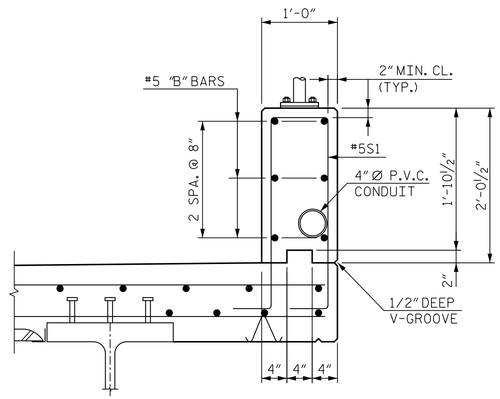
0012DEL_P28



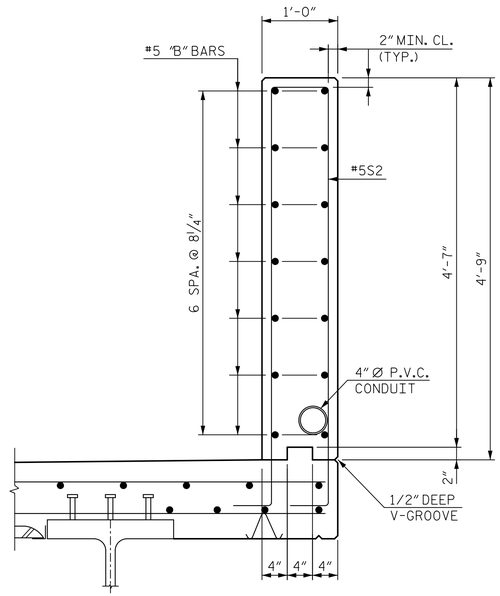
PLAN - SPAN A PARAPETS



SECTION THRU OPEN JOINT IN PARAPET



SECTION A-A THRU PARAPET



SECTION B-B THRU PARAPET

NOTES:

ALUMINUM ARCHITECTURAL 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 ARCHITECTURAL HANDRAIL DETAILS, SEE ARCHITECTURAL FIN RAIL PLANS.

VERTICAL GROOVED CONTRACTION JOINTS, ½" 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.

#5S1 AND #5S2 BARS IN PARAPET MAY BE SHIFTED SLIGHTLY TO MAINTAIN PROPER CLEARANCE TO EXPANSION JOINTS IN PARAPET.

E.F. = EACH FACE

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

PAY LENGTH = 231.4'

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: POT STA. 28+17.22 -S1-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PARAPET DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-15
1			3			TOTAL SHEETS
2			4			19

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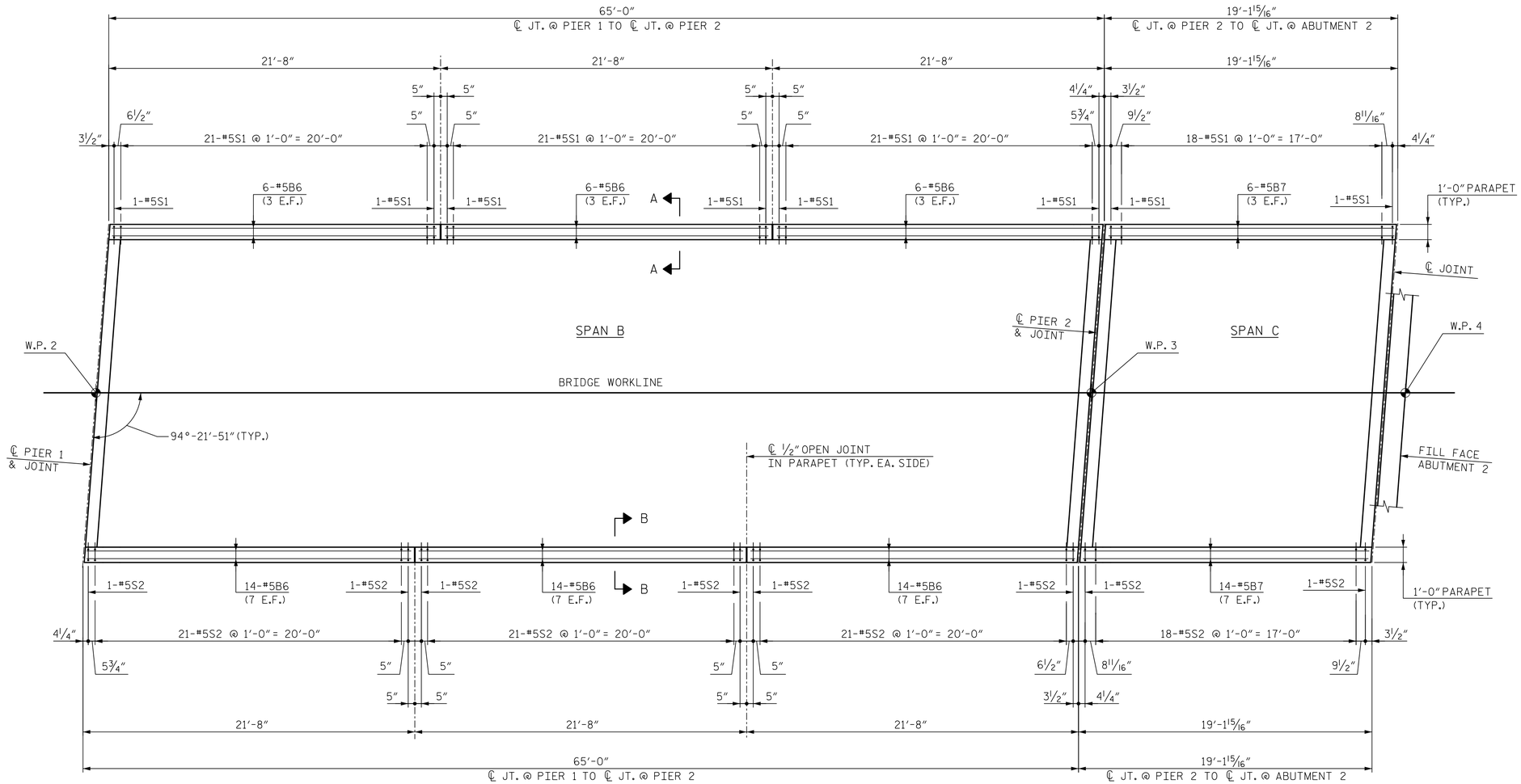

PLAN - SPAN B & SPAN C PARAPETS

NOTE:

SEE SHEET 1 OF 2 FOR NOTES AND SECTIONS.

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POT STA. 28+17.22 -S1-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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2/21/2018

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SUPERSTRUCTURE

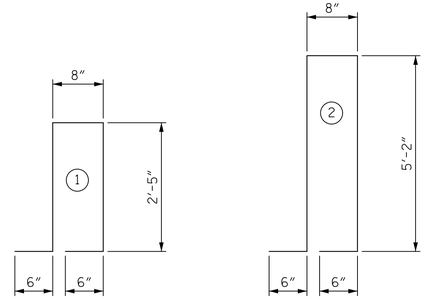
PARAPET DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-16
1			3			TOTAL SHEETS
2			4			19

0012DEL_P28

EPOXY-COATED REINFORCING STEEL

SPAN A						SPAN B						SPAN C					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	85	5	STR.	21′-9″	1,929	A1	177	5	STR.	21′-9″	4,016	A1	49	5	STR.	21′-9″	1,122
A2	8	5	STR.	21′-9″	188	A2	8	5	STR.	21′-9″	182	A2	8	5	STR.	21′-9″	182
A3	2	5	STR.	16′-10″	36	A7	2	5	STR.	17′-11″	38	A3	2	5	STR.	16′-10″	36
A4	2	5	STR.	10′-3″	22	A8	2	5	STR.	11′-4″	24	A4	2	5	STR.	10′-3″	22
A5	4	5	STR.	3′-8″	16	A9	4	5	STR.	4′-10″	21	A5	4	5	STR.	3′-8″	16
A6	2	5	STR.	15′-2″	32	A10	2	5	STR.	15′-2″	32	A11	2	5	STR.	14′-7″	31
B1	67	4	STR.	18′-7″	832	B3	134	4	STR.	30′-0″	2,686	B1	67	4	STR.	18′-7″	832
B2	67	4	STR.	15′-1″	676	B4	67	4	STR.	8′-6″	381	B7	20	5	STR.	18′-8″	390
B5	40	5	STR.	15′-7″	651	B6	60	5	STR.	21′-2″	1,325						
S1	34	5	1	6′-6″	231	S1	69	5	1	6′-6″	468	S1	20	5	1	6′-6″	136
S2	34	5	2	12′-0″	426	S2	69	5	2	12′-0″	864	S2	20	5	2	12′-0″	251
				TOTAL	5,039					TOTAL	10,037					TOTAL	3,018



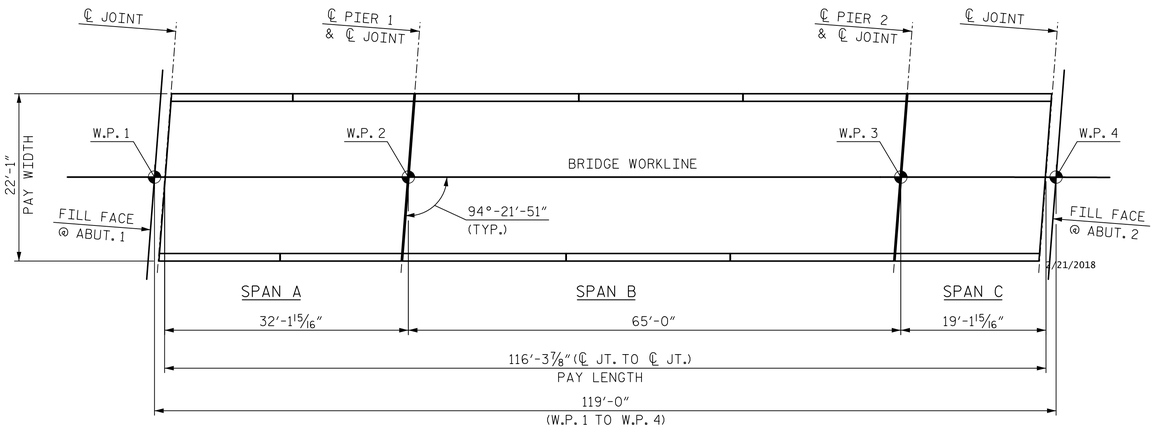
ALL BAR DIMENSIONS ARE OUT TO OUT

QUANTITY BREAKDOWN BY SPAN

	EPOXY COATED REINFORCING STEEL (LBS.)	CLASS AA CONCRETE (CU. YDS.)	
		DECK SLAB	PARAPETS
SPAN "A"	5,039	24.6	8.0
SPAN "B"	10,037	45.4	16.2
SPAN "C"	3,018	14.5	4.8
TOTALS	18,094	84.4	29.0

TOTAL SUPERSTRUCTURE QUANTITIES

	REINFORCED CONCRETE DECK SLAB	EPOXY COATED REINFORCING STEEL	CLASS AA CONCRETE
	SQ. FT.	LBS.	CU. YDS.
DECK SLAB	2,568.8	13,352	84.4
PARAPET	———	4,742	29.0
TOTALS	2,568.8	18,094	113.4



LAYOUT FOR COMPUTING AREA
OF REINFORCED CONCRETE DECK SLAB
(SQ. FEET = 2,568.8)

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: POT STA. 28+17.22 -S1-

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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2/21/2018

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DWG. NO. 17

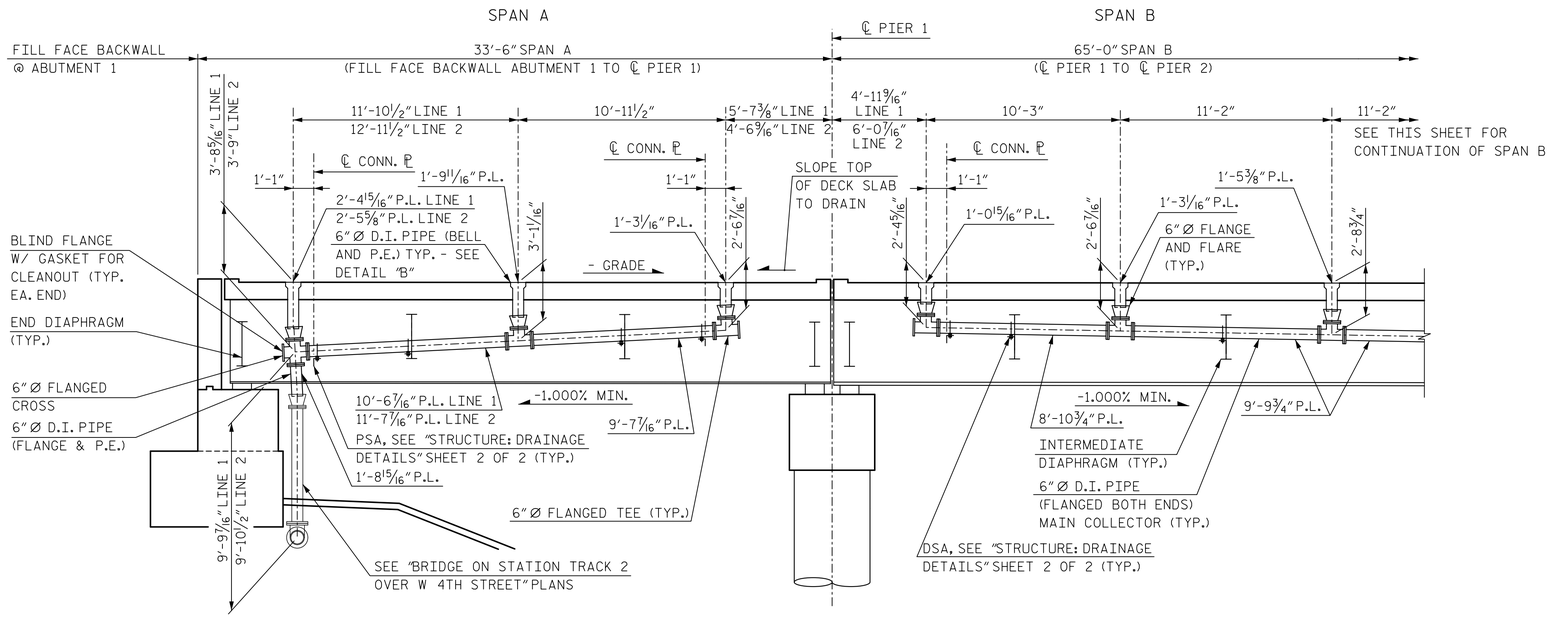
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

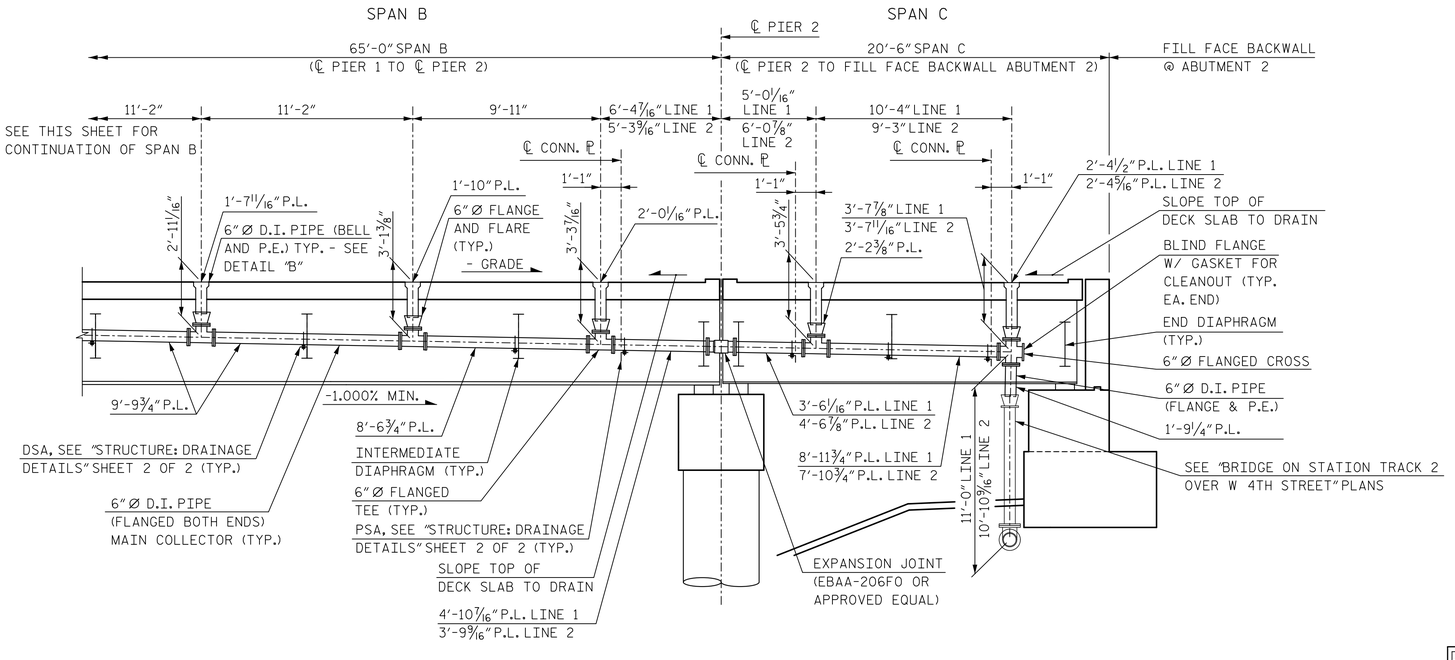
BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-17
1			3			TOTAL SHEETS
2			4			19

0012DEL_P28



DRAINAGE DETAILS - SPAN A AND PORTION OF SPAN B



DRAINAGE DETAILS - PORTION OF SPAN B AND SPAN C

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 LINE 1 IS LOCATED TO THE LEFT LOOKING AHEAD STATION AND DRAINAGE LINE 2 IS LOCATED TO THE RIGHT LOOKING AHEAD STATION.

FOR ADDITIONAL NOTES AND DETAILS, SEE "STRUCTURE: DRAINAGE DETAILS" SHEET 2 OF 2.

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POT STA. 28+17.22 -S1-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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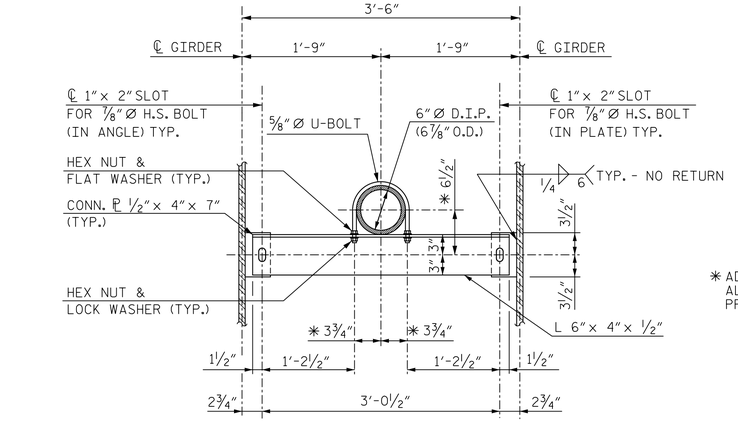
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STRUCTURE

DRAINAGE DETAILS

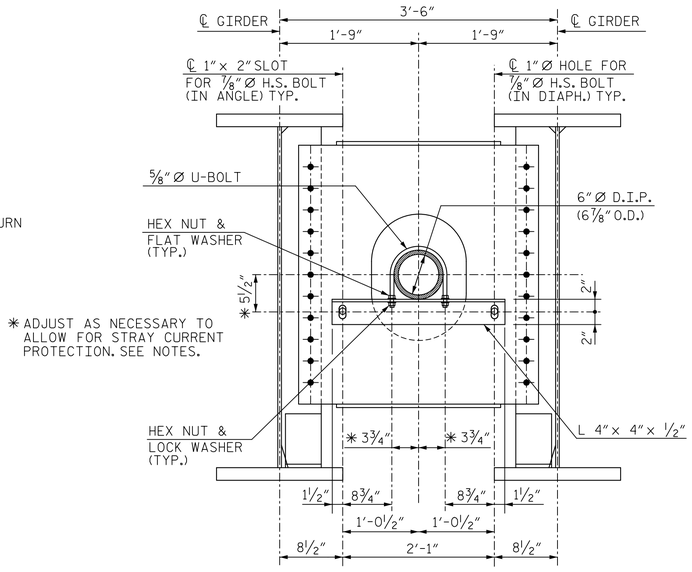
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-18
1			3			TOTAL SHEETS
2			4			19

0012DEL_P28



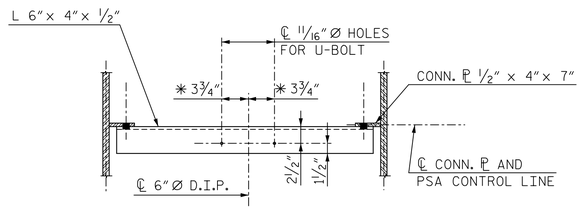
* ADJUST AS NECESSARY TO ALLOW FOR STRAY CURRENT PROTECTION. SEE NOTES.

ELEVATION



* ADJUST AS NECESSARY TO ALLOW FOR STRAY CURRENT PROTECTION. SEE NOTES.

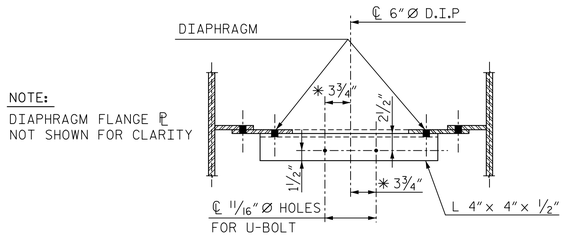
ELEVATION



PLAN

PIPE SUPPORT ANGLE (PSA)

(12 REQ'D.)



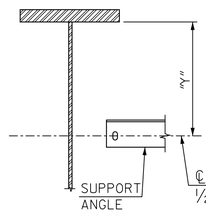
NOTE:
DIAPHRAGM FLANGE PL NOT SHOWN FOR CLARITY

PLAN

DIAPHRAGM SUPPORT ANGLE (DSA)

(16 REQ'D.)

DETAIL "B"



DSA	"Y"
A1	2'-11"
A2	2'-4 3/16"

DSA	"Y"
B1	1'-11 13/16"
B2	2'-2 1/8"
B3	2'-4 3/8"
B4	2'-6 11/16"
B5	2'-9"

DSA	"Y"
C1	3'-1 1/16"

PSA	"Y"
A1	3'-3 3/16"
A2	2'-2 9/16"
A3	3'-3 13/16"
A4	2'-2 9/16"
B1	2'-0 1/16"
B2	2'-11 1/8"
C1	3'-1 1/16"
C2	3'-3 3/16"
C3	3'-1 1/16"
C4	3'-2 15/16"

DETAIL "A"

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 SHEETS.

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

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.

SUPERSTRUCTURE DRAINAGE SYSTEM ESTIMATED QUANTITIES

ITEM	UNIT	TOTAL
6" I.D. DUCTILE IRON PIPE, CLASS 53 (FLANGED BOTH ENDS)	FEET	168'-9 15/16"
6" I.D. DUCTILE IRON PIPE, CLASS 53 (FLANGE & P.E.)	FEET	7'-0 3/8"
6" I.D. DUCTILE IRON PIPE, CLASS 53 (BELL & P.E.)	FEET	38'-7 15/16"
6" I.D. DUCTILE IRON PIPE FLANGED FITTINGS, 250 psi P.R.	LBS	3,070
6" I.D. DUCTILE IRON BLIND FLANGES	LBS	200
EXPANSION JOINT	EA.	2
HEAVY DUTY CAST IRON GRATES	EA.	22
PIPE SUPPORT ANGLES (PSA) *	EA.	12
DIAPHRAGM SUPPORT ANGLES (DSA) *	EA.	16

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

FOR SUBSTRUCTURE DRAINAGE SYSTEM ESTIMATED QUANTITIES, SEE "BRIDGE ON STATION TRACK 2 OVER W 4TH STREET" PLANS.

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POT STA. 28+17.22 -S1-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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2/21/2018

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DWG. NO. 19

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STRUCTURE

DRAINAGE DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-19
1			3			TOTAL SHEETS
2			4			19

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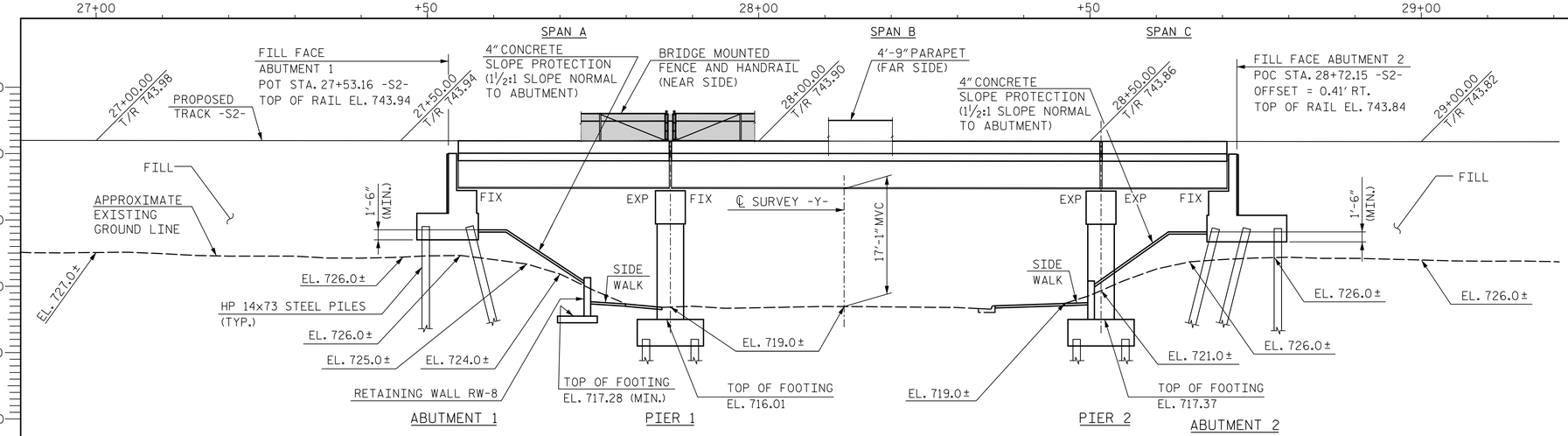
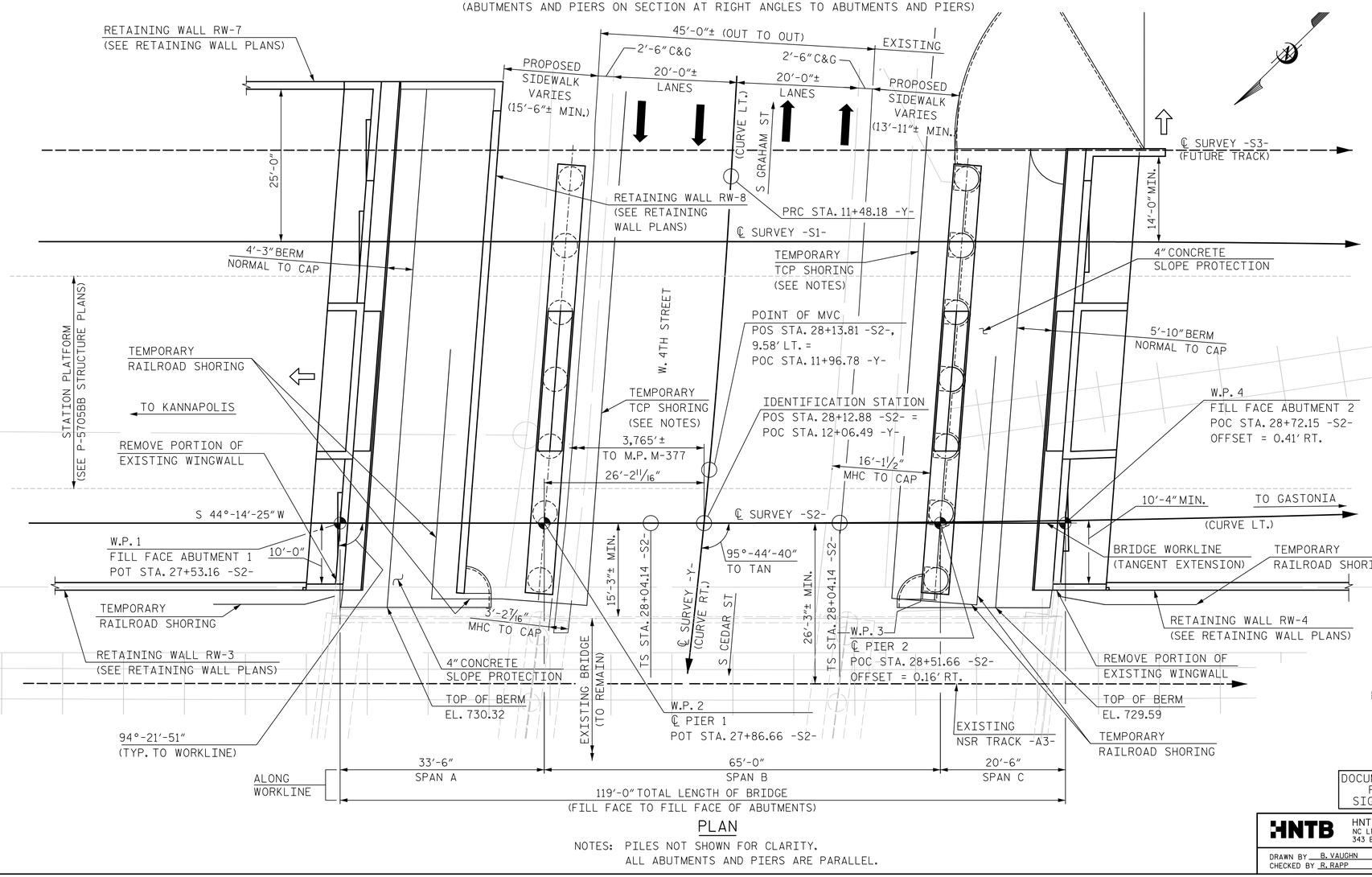


SECTION ALONG ℄ SURVEY -S2-

(ABUTMENTS AND PIERS ON SECTION AT RIGHT ANGLES TO ABUTMENTS AND PIERS)



PLAN

NOTES: PILES NOT SHOWN FOR CLARITY.
ALL ABUTMENTS AND PIERS ARE PARALLEL.

NOTE:

SEE "GENERAL DRAWING: GENERAL NOTES (SHEET 4 OF 4)" FOR GENERAL NOTES.

SEE ROADWAY PLANS FOR TEMPORARY TCP SHORING DETAILS AND PAY ITEMS.

MVC = MINIMUM VERTICAL CLEARANCE
MHC = MINIMUM HORIZONTAL CLEARANCE

⇦ STRUCTURE DRAINAGE OUTLET AND DIRECTION.

-Y- ROADWAY CURVE DATA

SEE ROADWAY PLANS.

-S2- TRACK CURVE DATA

PIs STA 28+24.81
Δs = 0° 15' 30.0"
Ls = 31.00'
LT = 20.67'
ST = 10.33'

PI STA 28+81.33
Δ = 1° 32' 22.2" (LT)
D = 1° 40' 00.0"
L = 92.37'
T = 46.19'
R = 3,437.87'

SEE ROADWAY PLANS FOR EXISTING PAVEMENT ELEVATIONS.

GRADE DATA -Y-

GRADE DATA -S2-

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: POS STA. 28+12.88 -S2- = POC STA. 12+06.49 -Y-
MILE POST: NS 377.70
SHEET 1 OF 4 BRIDGE NO.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON STATION TRACK 2 OVER W 4TH STREET BETWEEN W TRADE STREET AND W MOREHEAD STREET

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

DocuSigned by: Joel R. Rapp 55B8319TC22B434...
2/21/2018

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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-1
1			3			TOTAL SHEETS
2			4			51

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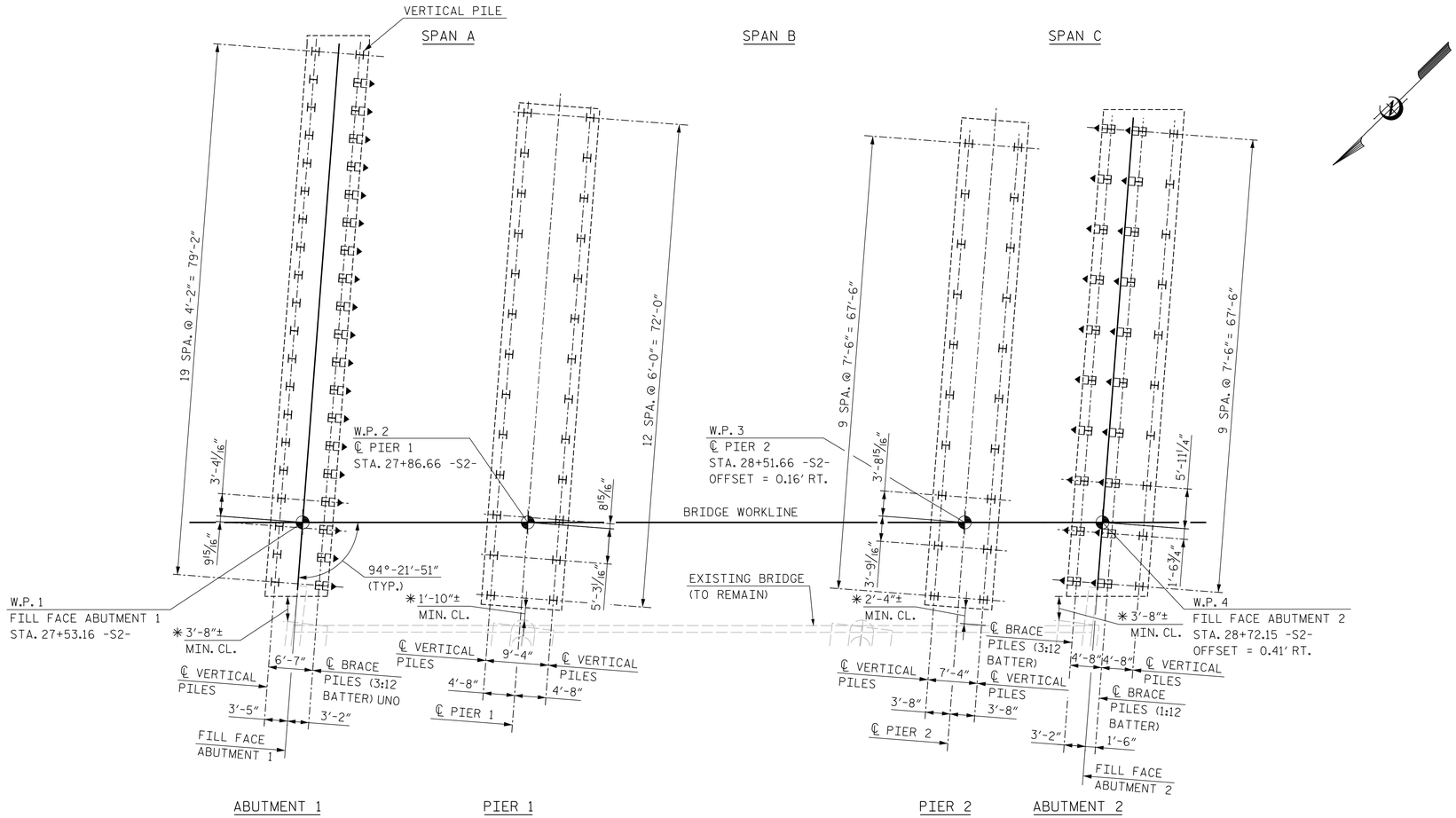

FOUNDATION LAYOUT

✳ CLEARANCE DIMENSIONS SHOWN TO THE EXISTING BRIDGE ARE BASED ON THE MINIMUM OF THE CLEARANCE TO THE EXISTING SUPERSTRUCTURE OR CLEARANCE TO THE EXISTING SUBSTRUCTURE.

FOUNDATION NOTES:

◀▭▶ INDICATES PILE TO BE BATTERED 3:12 OR 1:12 IN DIRECTION OF ARROW.

FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISION.

PILES AT ABUTMENT NO. 1 ARE DESIGNED FOR AN ALLOWABLE BEARING CAPACITY OF 80 TONS PER PILE.

DRIVE PILES AT ABUTMENT NO. 1 TO A REQUIRED BEARING CAPACITY OF 160 TONS PER PILE.

PILES AT PIER NO. 1 ARE DESIGNED FOR AN ALLOWABLE BEARING CAPACITY OF 115 TONS PER PILE.

DRIVE PILES AT PIER NO. 1 TO A REQUIRED BEARING CAPACITY OF 230 TONS PER PILE.

PREDRILLING FOR THE 8 RIGHTMOST PILES AT PIER NO. 1 IS REQUIRED. PREDRILL PILE LOCATIONS TO AN ELEVATION NO LOWER THAN 695 FT WITH EQUIPMENT THAT WILL RESULT IN A MAXIMUM PREDRILLING DIAMETER OF 12". FOR PREDRILLING PILES, SEE GEOTECHNICAL SPECIAL PROVISION. RIGHT IS DEFINED LOOKING AHEAD STATION.

PILES AT PIER NO. 2 ARE DESIGNED FOR AN ALLOWABLE BEARING CAPACITY OF 140 TONS PER PILE.

DRIVE PILES AT PIER NO. 2 TO A REQUIRED BEARING CAPACITY OF 280 TONS PER PILE.

PILES AT ABUTMENT NO. 2 ARE DESIGNED FOR AN ALLOWABLE BEARING CAPACITY OF 100 TONS PER PILE.

DRIVE PILES AT ABUTMENT NO. 2 TO A REQUIRED BEARING CAPACITY OF 200 TONS PER PILE.

TESTING THE FIRST PRODUCTION PILE AT ABUTMENT NO. 1, PIER NO. 1, PIER NO. 2, AND ABUTMENT NO. 2 WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT THIS SITE. FOR PDA TESTING, SEE GEOTECHNICAL SPECIAL PROVISION.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 20,000 TO 40,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT THIS SITE. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH GEOTECHNICAL SPECIAL PROVISION.

ALL DIMENSIONS ARE PARALLEL OR NORMAL TO FILL FACE ABUTMENTS OR ℄ PIERS.

FOR FOUNDATION ELEVATIONS AND DETAILS, SEE "SUBSTRUCTURE: ABUTMENT" AND "SUBSTRUCTURE: PIER" SHEETS.

ALL PILES ARE STEEL HP 14x73.

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

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POS STA. 28+12.88 -S2-

SHEET 2 OF 4

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOUNDATION LAYOUT AND FOUNDATION NOTES

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-2
1			3			TOTAL SHEETS
2			4			51

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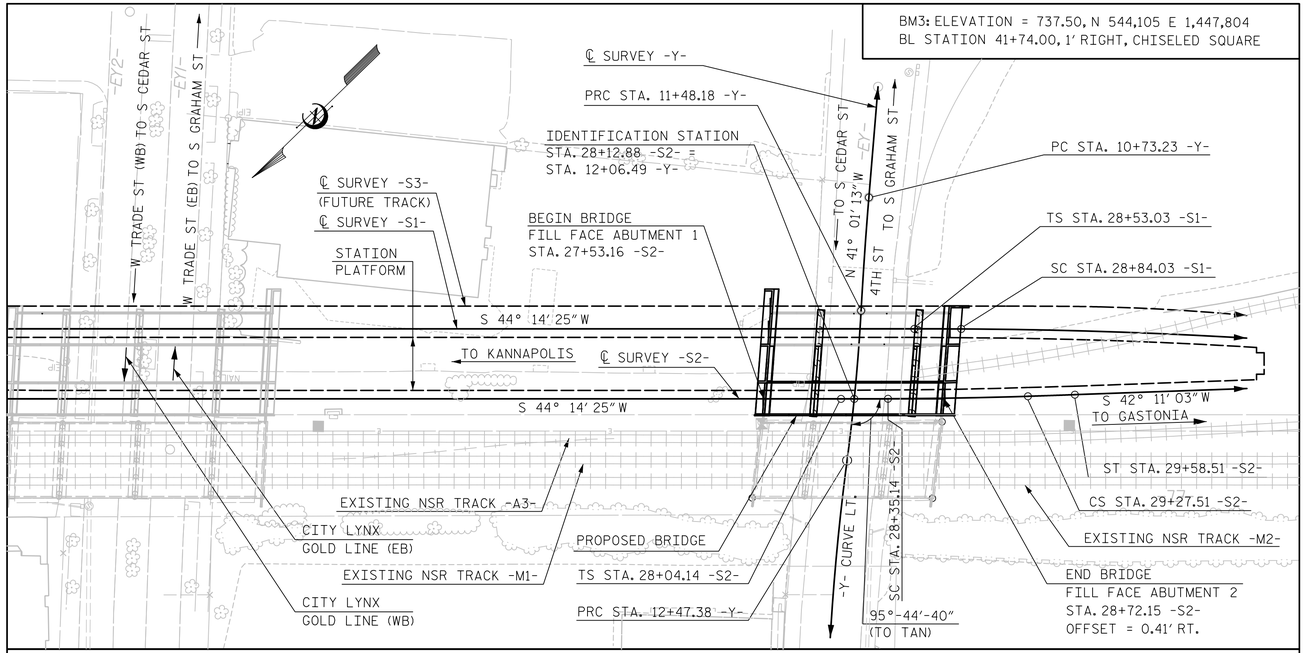
1001ADD_P28



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

NOTE:

FOR TRACK 1 SUPERSTRUCTURE BILL OF MATERIAL, REFER TO "BRIDGE ON STATION TRACK 1 OVER W 4TH STREET" PLANS.

TOTAL BILL OF MATERIAL

	TEMP. RAILROAD SHORING/ABUT. 1 STA. 28+12.88 -S2-	TEMP. RAILROAD SHORING/PIER 1 STA. 28+12.88 -S2-	TEMP. RAILROAD SHORING/PIER 2 STA. 28+12.88 -S2-	TEMP. RAILROAD SHORING/ABUT. 2 STA. 28+12.88 -S2-	REMOVAL OF EXIST. STRUCT. AT STA. 28+12.88 -S2-	FOUND. EXCAV. FOR PIER 1 AT STA. 28+12.88 -S2-	FOUND. EXCAV. FOR PIER 2 AT STA. 28+12.88 -S2-	PREDRILLING FOR PILES	PDA TESTING	REINFORCED CONCRETE DECK SLAB	CLASS AA CONCRETE	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	⚠1 APPROX. 233,588 LBS. STRUCTURAL STEEL	PAINTING OF STRUCTURAL STEEL
	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	L.F.	EACH	SQ. FEET	CU. YARDS	LBS.	LBS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	———	———	———	———	———	———	———	———	———	2,617.3	———	———	———	LUMP SUM	LUMP SUM
ABUTMENT 1	LUMP SUM	———	———	———	———	———	———	———	1	———	227.5	22,293	———	———	———
PIER 1	———	LUMP SUM	———	———	———	LUMP SUM	———	128	1	———	301.2	64,276	5,383	———	———
PIER 2	———	———	LUMP SUM	———	———	———	LUMP SUM	———	1	———	285.9	63,422	4,878	———	———
ABUTMENT 2	———	———	———	LUMP SUM	———	———	———	———	1	———	239.9	25,318	———	———	———
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	128	4	2,617.3	1,054.5	175,309	10,261	LUMP SUM	LUMP SUM

	HP 14 x 73 STEEL PILES		PILE DRIVING EQUIPMENT SETUP FOR HP14x73 STEEL PILES	WATERPROOFING	METHOD B DAMPPROOFING	METAL RAIL (ALUMINUM)	METAL RAIL (STEEL) & FENCE	CONCRETE PARAPET	4" SLOPE PROTECTION	SELF-LUBRICATING EXPANSION BEARING ASSEMBLIES	STRUCTURE DRAINAGE SYSTEM AT STA. 28+12.88 -S2-	APPLICATION OF BRIDGE COATING	ASBESTOS ASSESSMENT
	NO.	L.F.	EACH	SQ. YARDS	SQ. YARDS	L.F.	L.F.	L.F.	SQ. YARDS	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	——	——	———	270.7	———	———	116.3	231.4	———	LUMP SUM	LUMP SUM	LUMP SUM	———
ABUTMENT 1	40	2,133	40	64.2	203.0	20.5	5.6	———	175	———	LUMP SUM	LUMP SUM	———
PIER 1	26	1,083	26	26.9	37.0	———	———	———	———	———	———	LUMP SUM	———
PIER 2	20	733	20	53.0	90.1	———	———	———	———	———	———	LUMP SUM	———
ABUTMENT 2	30	1,200	30	71.3	227.2	16.5	8.3	———	258	———	LUMP SUM	LUMP SUM	———
TOTAL	116	5,149	116	486.1	557.3	37.0	130.2	231.4	433	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: POS STA. 28+12.88 -S2-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

LOCATION SKETCH
AND
TOTAL BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP
DocuSigned by: Joel R. Rapp 02DC72E6F2C64F8...
5/2/2018

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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-3
1	JRR	05022018	3			TOTAL SHEETS
2			4			51

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 2016 EDITION OF AREMA'S "MANUAL FOR RAILWAY ENGINEERING, VOL. 2, STRUCTURES", AND "NORFOLK SOUTHERN GUIDELINES FOR DESIGN OF GRADE SEPARATION STRUCTURES, UNDERPASS GRADE SEPARATION DESIGN CRITERIA".

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2016 EDITION OF AREMA'S "MANUAL FOR RAILWAY ENGINEERING VOL. 2, CHP. 9, SEISMIC DESIGN FOR RAILWAY".

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 THOUGH 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.

DAMPPROOFING: PIER COLUMNS AND BENCH WALLS UP TO GROUND LINE, BACK OF BACKWALL AND ABUTMENT SEATS, AND BACK OF WINGWALLS SHALL BE DAMPPROOFED WITH METHOD "B" DAMPPROOFING.

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 LOCATION:

1. BRIDGE DECK AND INSIDE OF CONCRETE PARAPET AS SHOWN ON "TYPICAL SECTION" SHEET.
2. ALONG FULL CIRCUMFERENCE/PERIMETER OF EACH BOTTOM OF COLUMN AND BENCH WALL TO TOP OF FOOTING INTERFACE. ALONG TOP AND SIDES OF FOOTING AT CONSTRUCTION JOINTS.
3. ALONG FILL FACE OF ALL HORIZONTAL AND VERTICAL CONSTRUCTION JOINTS AT EACH ABUTMENT.

WATERPROOFING SHALL BE 24" WIDE AND SHALL BE CENTERED OVER JOINTS OR CRACKS.

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 2018, 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 THE 2016 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 ¾" 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 COMPLIANT WITH THE DESIGN STANDARDS OF NORFOLK SOUTHERN RAILWAY COMPANY. ALL METHODS OF HANDLING THE WORK AFFECTING THE SAFETY OF RAIL OPERATIONS MUST BE APPROVED BY THE RAILWAY COMPANY, AS A SUBMITTAL THROUGH THE ENGINEER, AT LEAST TWO WEEKS 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.

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

FOR METAL RAIL (STEEL) AND FENCE, SEE SPECIAL PROVISIONS.

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.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

FOR APPLICATION OF BRIDGE COATING, SEE SPECIAL PROVISIONS.

FOR TEMPORARY RAILROAD SHORING, SEE SPECIAL PROVISIONS.

FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

FOR EXPANSION JOINTS, SEE SPECIAL PROVISIONS.

FOR JOINT SEALANT, SEE SPECIAL PROVISIONS.

INDEX OF DRAWINGS

FOR TRACK 1 SUPERSTRUCTURE SHEETS, REFER TO "BRIDGE ON STATION TRACK 1 OVER W 4TH STREET" PLANS.

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POS STA. 28+12.88 -S2-

SHEET 4 OF 4

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

DocuSigned by: 556B3197C22B434...

2/21/2018

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STATE OF NORTH CAROLINA
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RALEIGH

GENERAL DRAWING

GENERAL NOTES

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-4
1			3			TOTAL SHEETS
2			4			51

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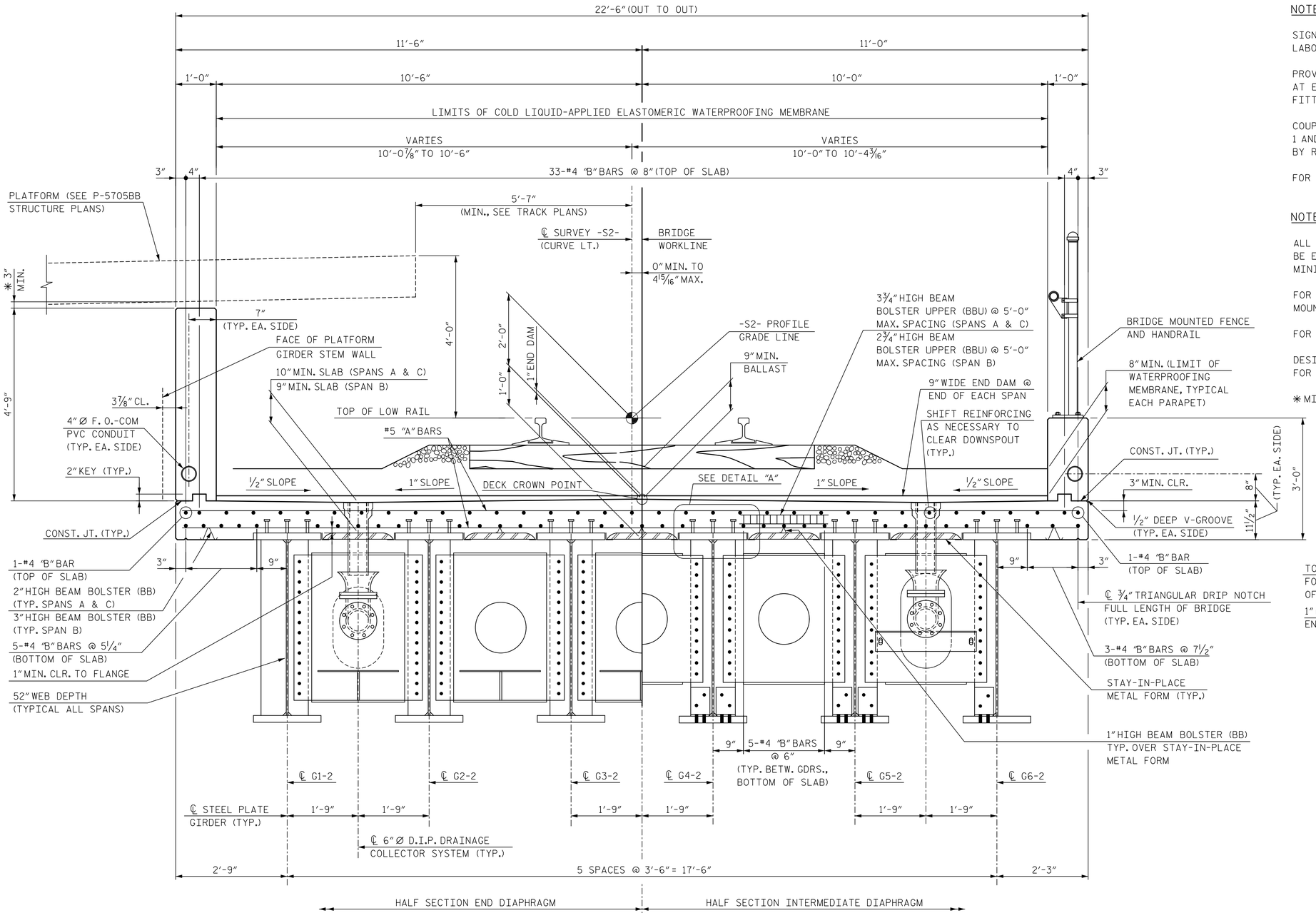
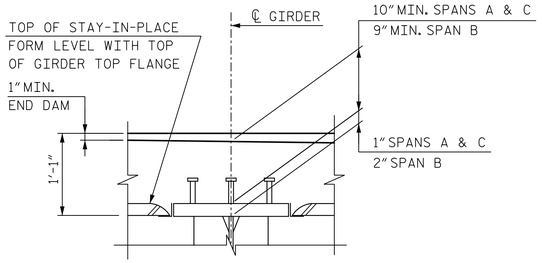


TYPICAL SECTION

(ALL SPANS SIMILAR)



DETAIL "A"

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 (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 BRIDGE MOUNTED FENCE AND HANDRAIL DETAILS, SEE "BRIDGE MOUNTED FENCE AND HANDRAIL DETAILS" SHEETS.

FOR PARAPET DETAILS, SEE "PARAPET DETAILS" SHEETS.

DESIGN INCLUDES WEIGHT OF 6" ADDITIONAL BALLAST TO ACCOUNT FOR FUTURE RESURFACING OF TRACK.

* MINIMUM GAP REMAINING AFTER CONSIDERING ALL PLATFORM DEFLECTIONS.

PROJECT NO. P-5705BA

MECKLENBURG **COUNTY**

STATION: POS STA. 28+12.88 -S2-

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

DocuSigned by: Joel R. Rapp 556B3197C228434...

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STATE OF NORTH CAROLINA
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RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-5
1			3			TOTAL SHEETS
2			4			51

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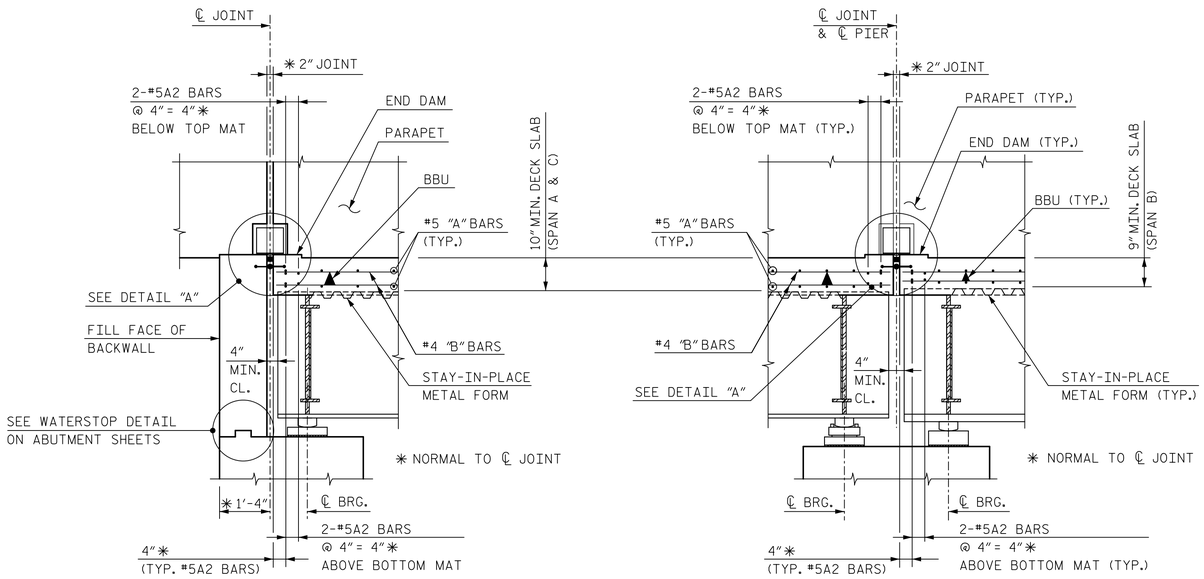
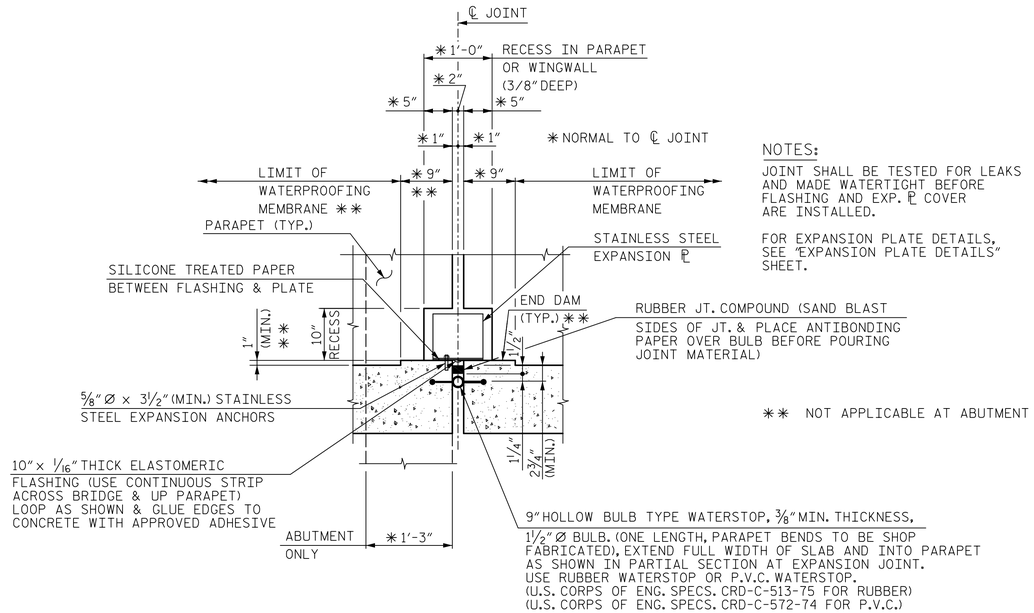


SECTION A-A

(ABUT. 1 SHOWN, ABUT. 2 SIMILAR)

SECTION B-B

(PIERS 1 & 2)
(PIER 1 SHOWN, PIER 2 SIMILAR)



NOTES:

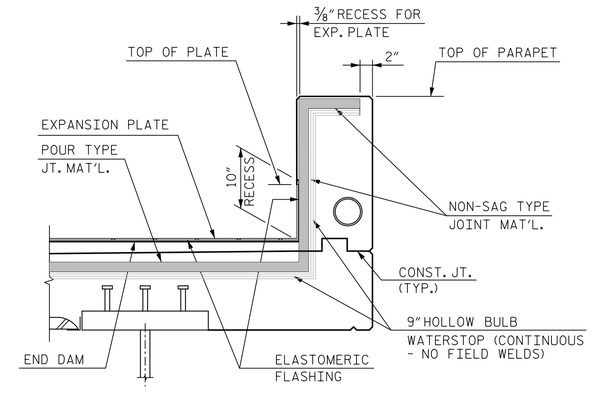
JOINT SHALL BE TESTED FOR LEAKS AND MADE WATERTIGHT BEFORE FLASHING AND EXP. ℄ COVER ARE INSTALLED.

FOR EXPANSION PLATE DETAILS, SEE "EXPANSION PLATE DETAILS" SHEET.

✱✱ NOT APPLICABLE AT ABUTMENT

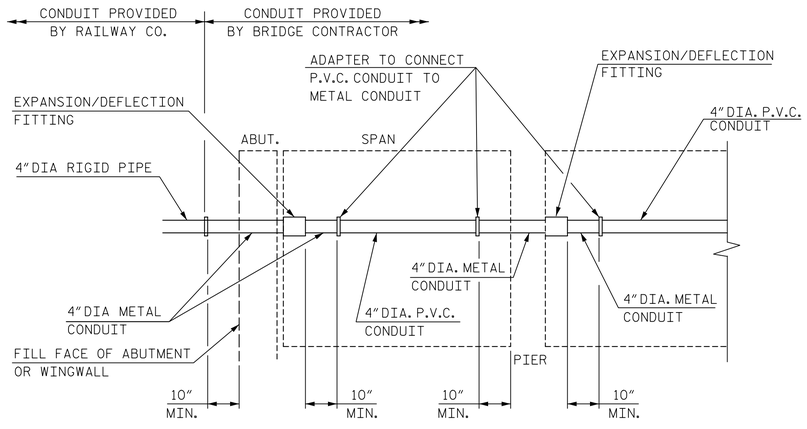
DETAIL "A"

(DECK REBAR NOT SHOWN FOR CLARITY)



PART SECTION AT EXPANSION JOINT

NOTE: FOR ADDITIONAL PARAPET DETAILS, SEE "PARAPET DETAILS" SHEETS.



CONDUIT LAYOUT

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POS STA. 28+12.88 -S2-

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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STATE OF NORTH CAROLINA
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RALEIGH

SUPERSTRUCTURE

DECK DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-6
1			3			TOTAL SHEETS
2			4			51

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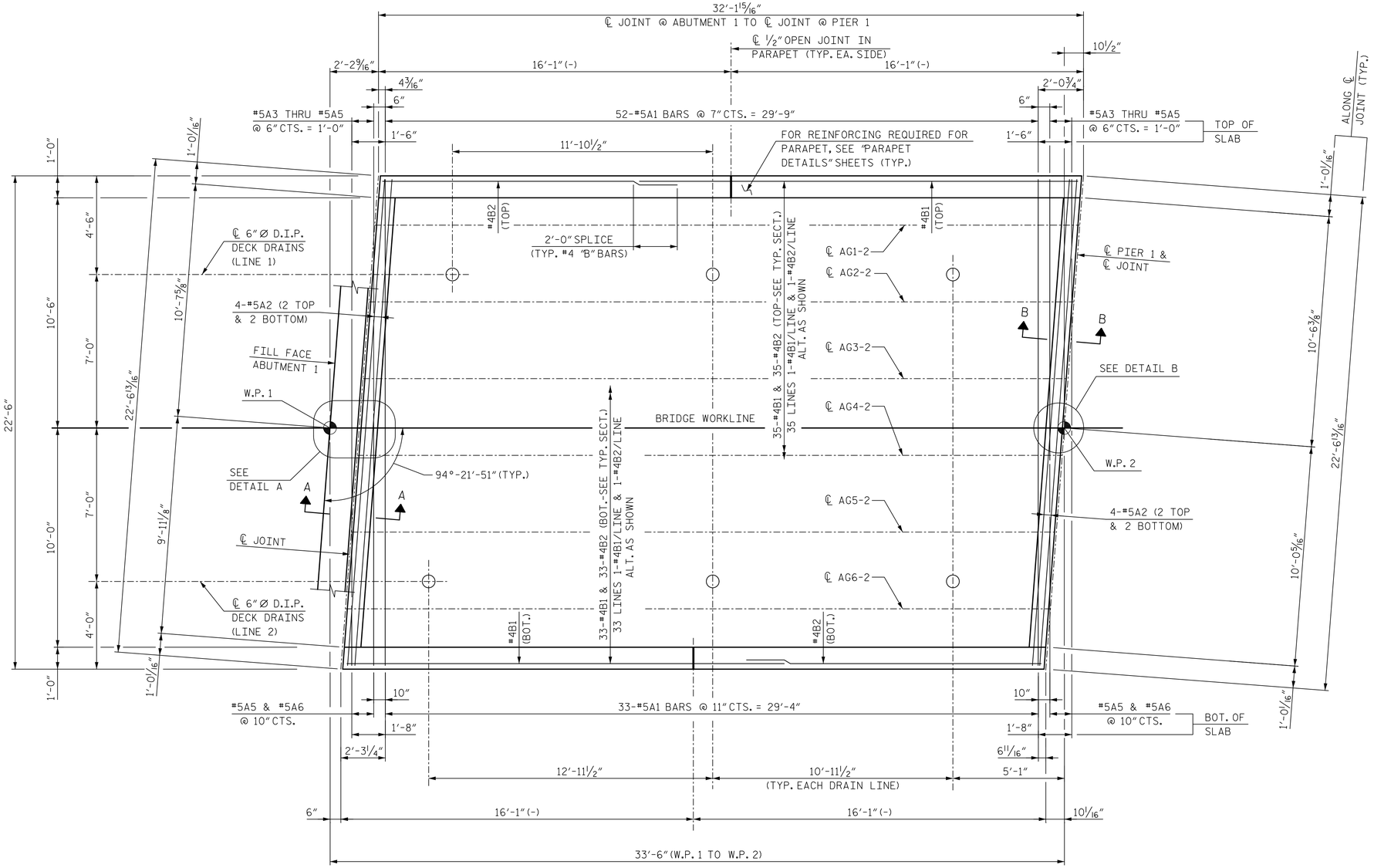
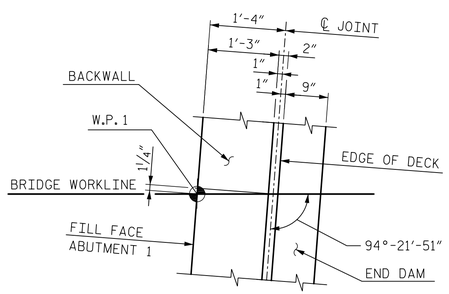
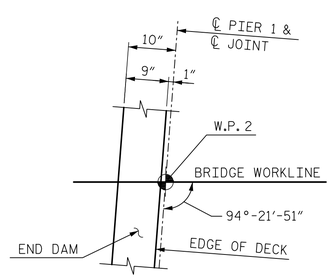


PLAN - SPAN A



DETAIL A



DETAIL B

NOTES:

ALL REINFORCING SHALL BE EPOXY COATED.

FOR SECTIONS A-A & B-B SEE "DECK DETAILS" SHEET.

FOR DECK DRAIN DETAIL SEE DETAIL "B" ON "STRUCTURE: DRAINAGE DETAILS", SHEET 2 OF 4.

FOR PARAPET DETAILS, SEE "PARAPET DETAILS" SHEETS.

SLAB BARS MAY BE AJUSTED TO AVOID DECK DRAIN LOCATIONS.

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POS STA. 28+12.88 -S2-

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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RALEIGH

SUPERSTRUCTURE

PLAN OF DECK - SPAN A

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-7
1			3			TOTAL SHEETS
2			4			51

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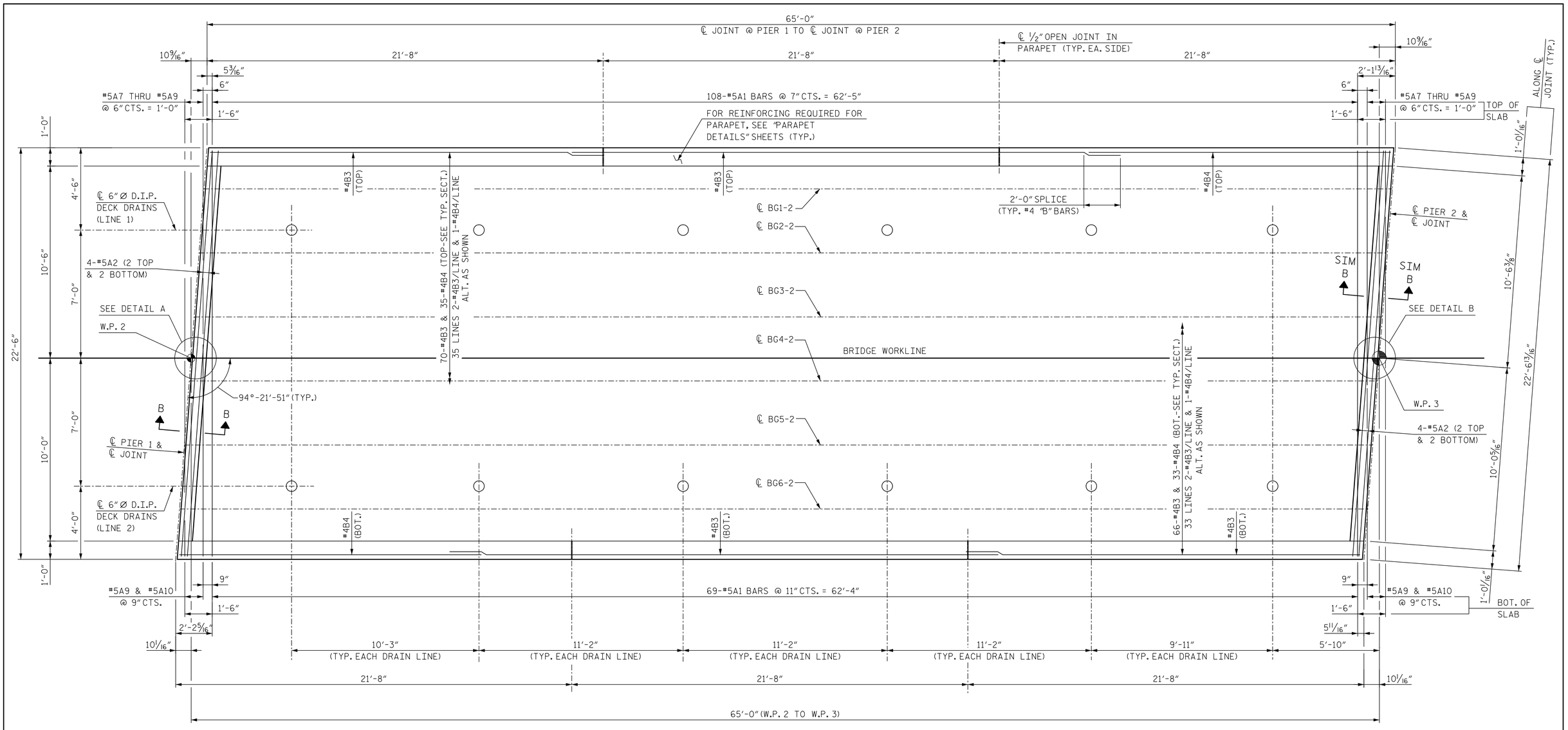
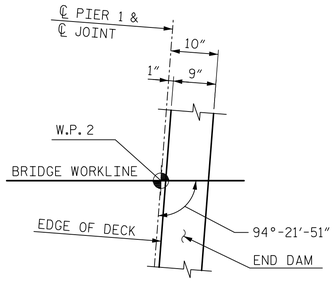
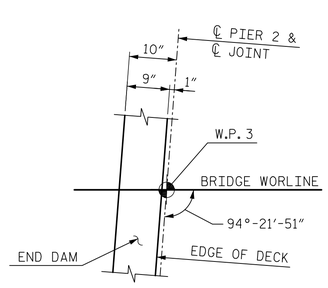


PLAN - SPAN B



DETAIL A



DETAIL B

NOTES:

ALL REINFORCING SHALL BE EPOXY COATED.

FOR SECTION B-B SEE "DECK DETAILS" SHEET.

FOR DECK DRAIN DETAIL SEE DETAIL "B" ON "STRUCTURE: DRAINAGE DETAILS", SHEET 2 OF 4.

FOR PARAPET DETAILS, SEE "PARAPET DETAILS" SHEETS.

SLAB BARS MAY BE ADJUSTED TO AVOID DECK DRAIN LOCATIONS.

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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SUPERSTRUCTURE

PLAN OF DECK - SPAN B

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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-8
1			3			TOTAL SHEETS
2			4			51

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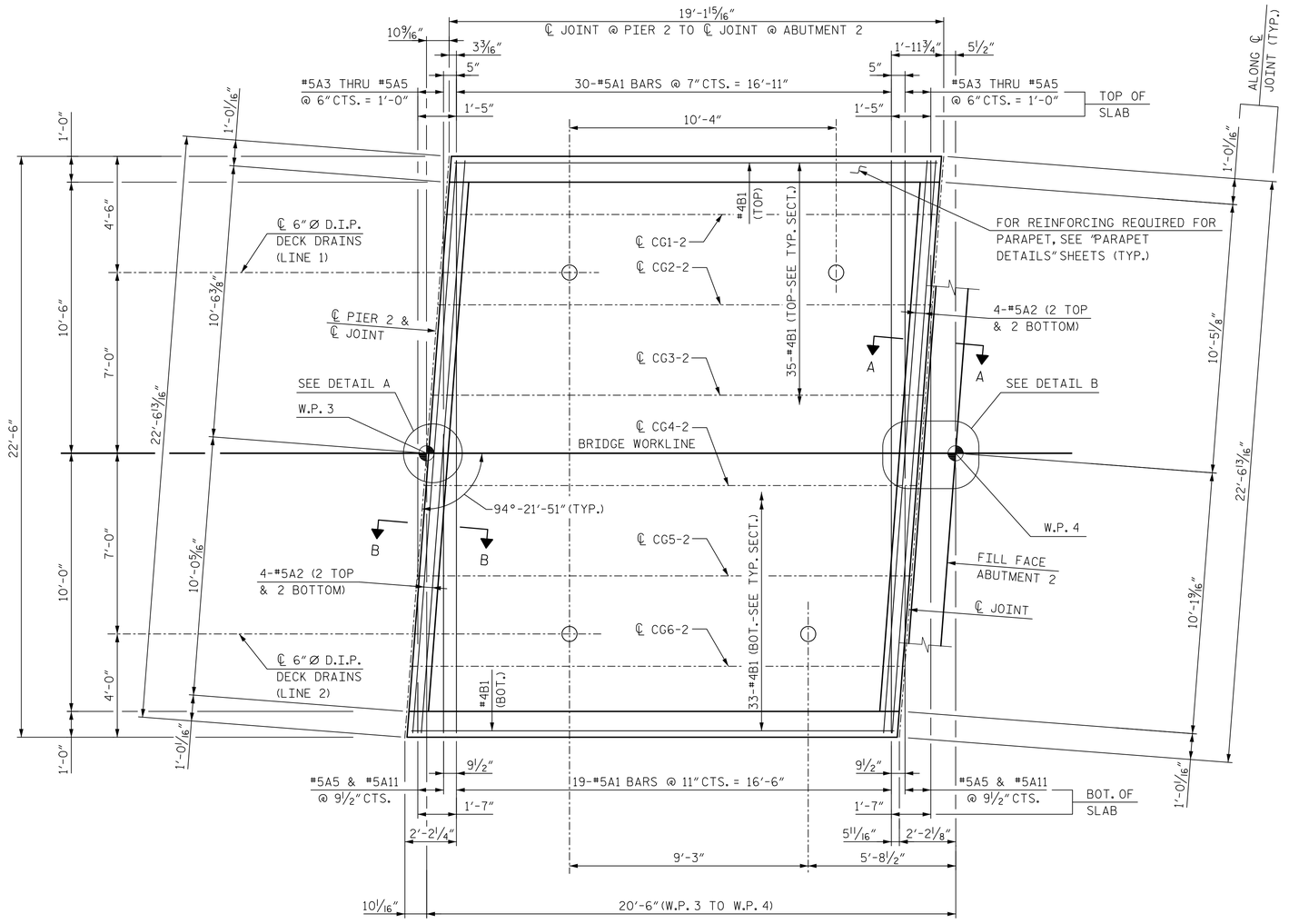
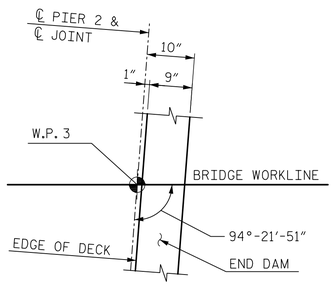
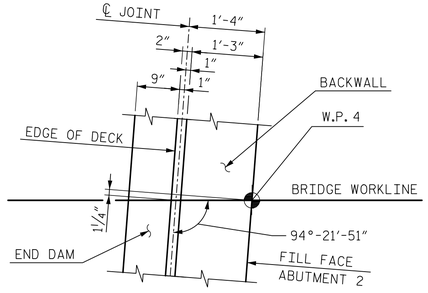


PLAN - SPAN C



DETAIL A



DETAIL B

NOTES:

ALL REINFORCING SHALL BE EPOXY COATED.

FOR SECTIONS A-A & B-B SEE "DECK DETAILS" SHEET.

FOR DECK DRAIN DETAIL SEE DETAIL "B" ON "STRUCTURE: DRAINAGE DETAILS", SHEET 2 OF 4.

FOR PARAPET DETAILS, SEE "PARAPET DETAILS" SHEETS.

SLAB BARS MAY BE ADJUSTED TO AVOID DECK DRAIN LOCATIONS.

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POS STA. 28+12.88 -S2-

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF DECK - SPAN C

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-9
1			3			TOTAL SHEETS
2			4			51

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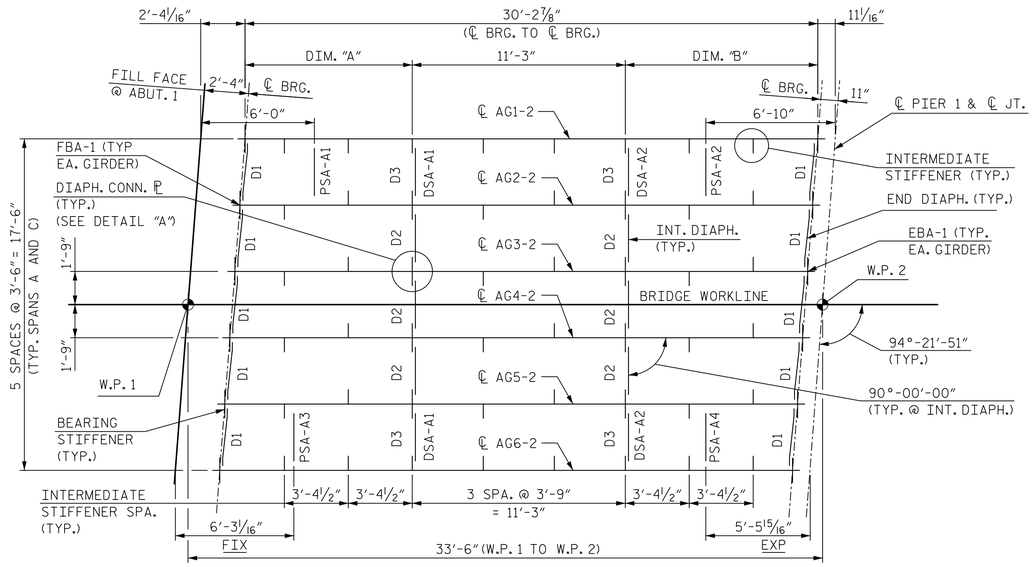
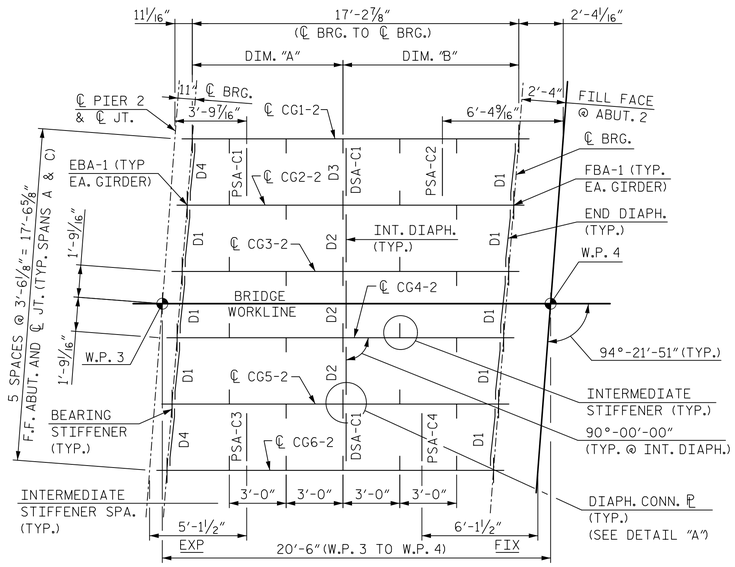


SPAN A

FRAMING PLAN



SPAN C

FRAMING PLAN

NOTES:

ALL DIMENSIONS ON THIS DRAWING ARE HORIZONTAL.

ALL ABUTMENT FILL FACES, ℄ PIERS, AND ℄ 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
- FLANGE TO WEB WELD DETAILS

FOR BEARINGS, SEE "BEARING DETAILS SPAN A AND SPAN C" SHEET.

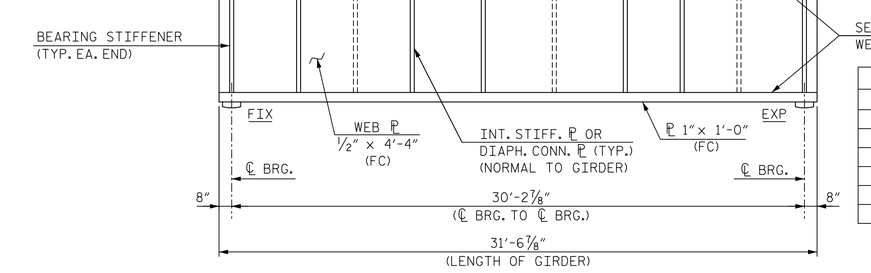
FOR DRAIN PIPE SUPPORT DETAILS, SEE "STRUCTURE DRAINAGE DETAILS" SHEETS.

FLANGE AND WELD SHOP SPLICES SHALL BE MADE WITH FULL PENETRATION GROOVE WELDS. SEE DETAILS ON "STRUCTURAL STEEL DETAILS" SHEET. FABRICATOR IS TO SHOW WELD CONFIGURATION AND JOINT PREPARATION ON SHOP DRAWINGS FOR APPROVAL.

FLANGE AND WEB SHOP SPLICES SHALL BE STAGGERED LONGITUDINALLY A MINIMUM OF 2'-0". SEE "STRUCTURAL STEEL DETAILS" SHEET FOR DETAILS.

FC = "FRACTURE CRITICAL"

INT = NON-FRACTURE CRITICAL MEMBERS OR COMPONENTS REQUIRING IMPROVED NOTCH TOUGHNESS.

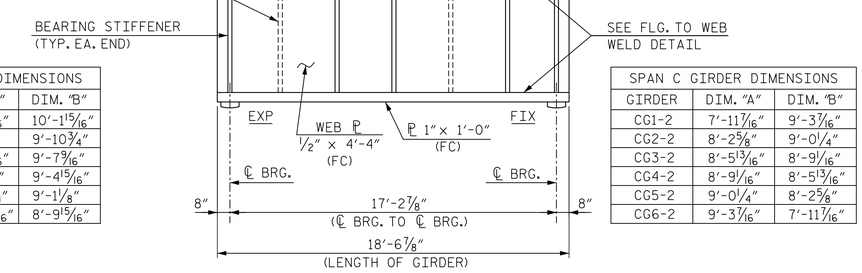


SPAN A

TYPICAL GIRDER ELEVATION

(INTERIOR GIRDER SHOWN, EXTERIOR GIRDER SIMILAR)

SPAN A GIRDER DIMENSIONS		
GIRDER	DIM. "A"	DIM. "B"
AG1-2	8'-9 15/16"	10'-1 15/16"
AG2-2	9'-1 1/8"	9'-10 3/4"
AG3-2	9'-4 15/16"	9'-7 9/16"
AG4-2	9'-7 9/16"	9'-4 15/16"
AG5-2	9'-10 3/4"	9'-1 1/8"
AG6-2	10'-1 15/16"	8'-9 15/16"

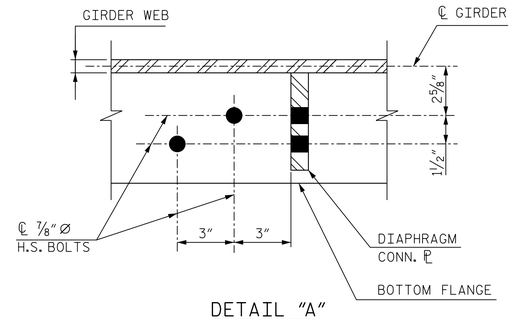


SPAN C

TYPICAL GIRDER ELEVATION

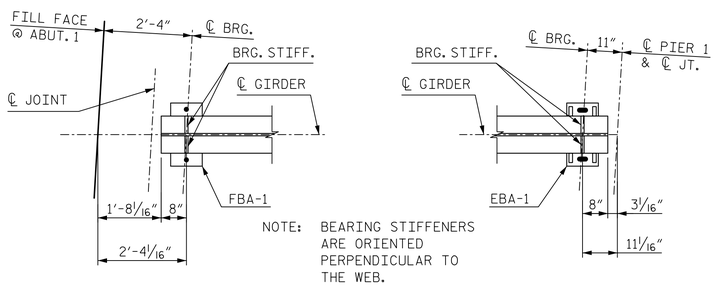
(INTERIOR GIRDER SHOWN, EXTERIOR GIRDER SIMILAR)

SPAN C GIRDER DIMENSIONS		
GIRDER	DIM. "A"	DIM. "B"
CG1-2	7'-11 7/16"	9'-3 7/16"
CG2-2	8'-2 5/8"	9'-0 1/4"
CG3-2	8'-5 13/16"	8'-9 1/16"
CG4-2	8'-9 1/16"	8'-5 13/16"
CG5-2	9'-0 1/4"	8'-2 5/8"
CG6-2	9'-3 7/16"	7'-11 7/16"



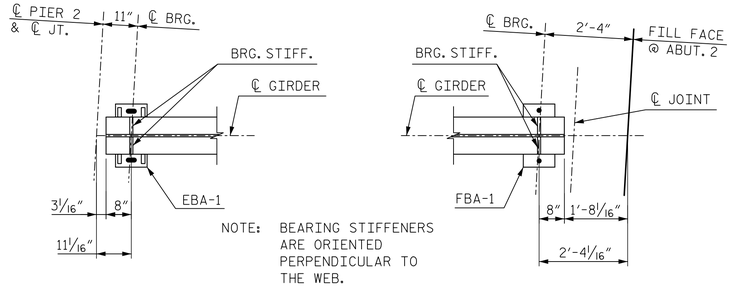
DETAIL "A"

(RIGHT SIDE OF WEB SHOWN, LEFT SIDE SIMILAR)



@ ABUTMENT 1 @ PIER 1

BOTTOM FLANGE GIRDER END DETAILS - SPAN A



@ PIER 2 @ ABUTMENT 2

BOTTOM FLANGE GIRDER END DETAILS - SPAN C

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POS STA. 28+12.88 -S2-

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

DocuSigned by: 55683197C228434...

2/21/2018

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NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. VAUGHN DATE 8/17

CHECKED BY R. RAPP DATE 9/17

DWG. NO. 10

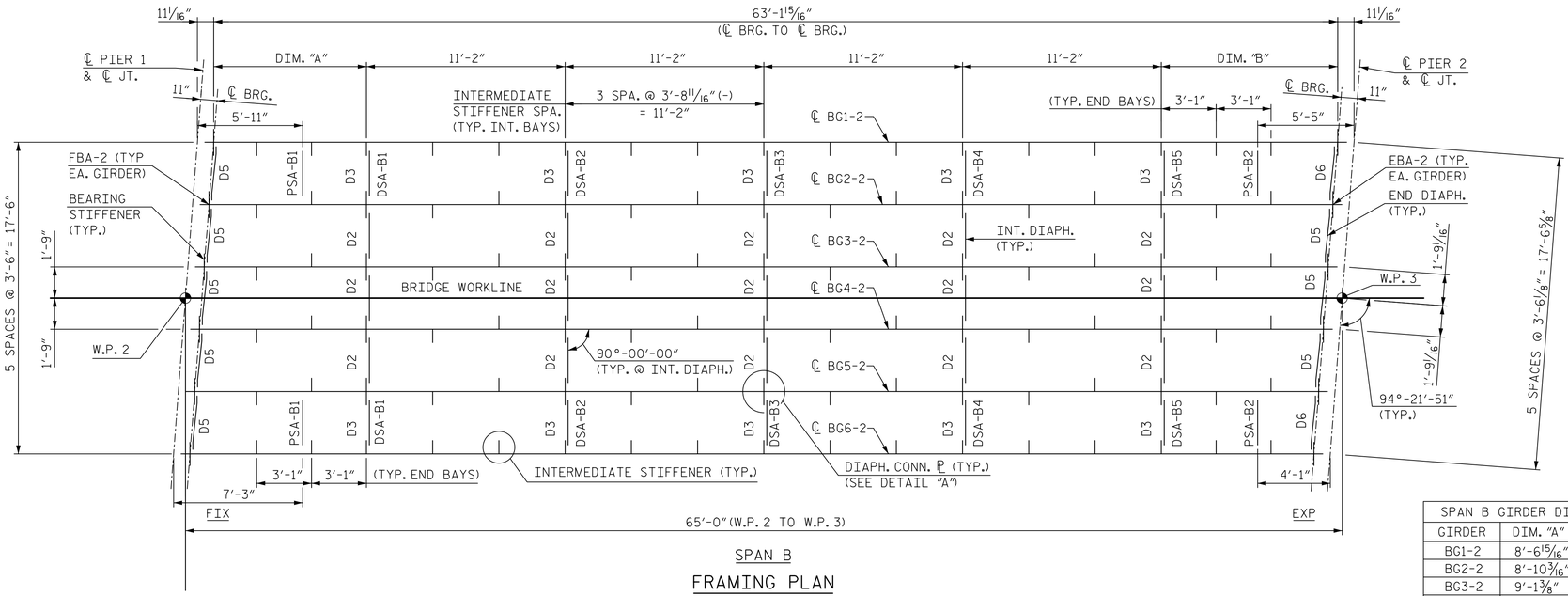
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN AND GIRDER DETAILS SPAN A AND SPAN C

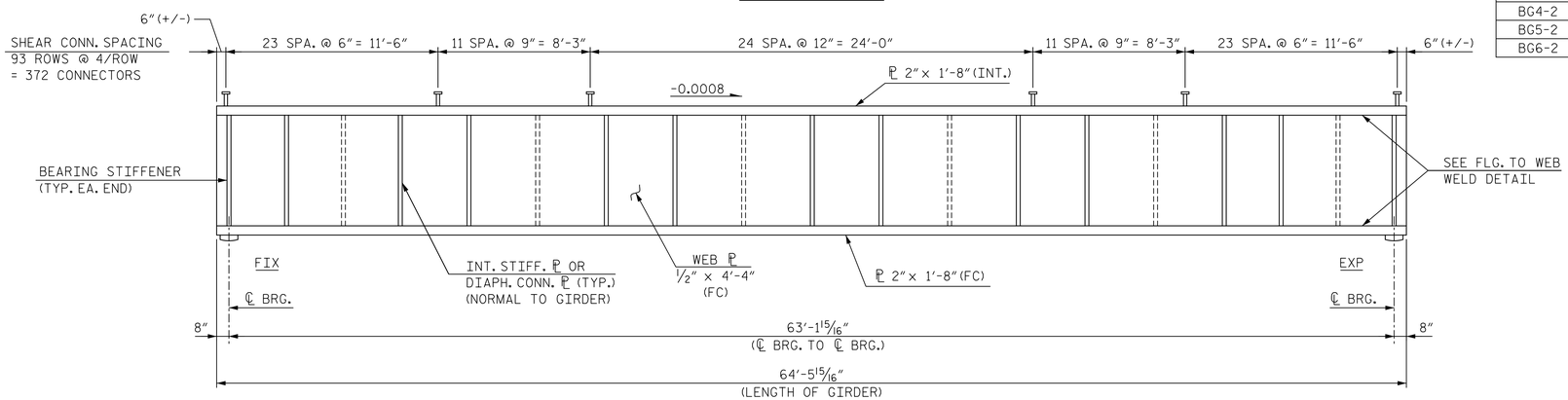
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-10
1			3			TOTAL SHEETS
2			4			51

0012DEL_P28



SPAN B

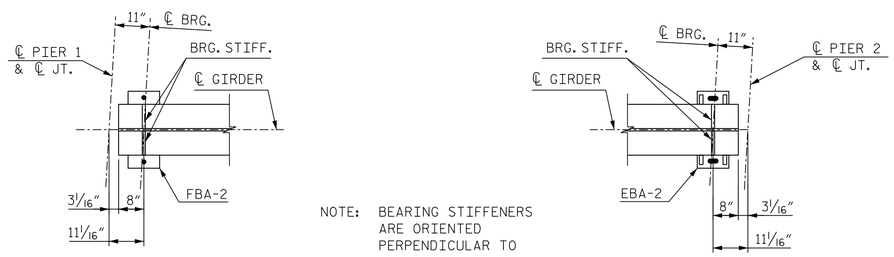
FRAMING PLAN



SPAN B

TYPICAL GIRDER ELEVATION

(INTERIOR GIRDER SHOWN, EXTERIOR GIRDER SIMILAR)



@ PIER 1 @ PIER 2

BOTTOM FLANGE GIRDER END DETAILS - SPAN B

SPAN B GIRDER DIMENSIONS		
GIRDER	DIM. "A"	DIM. "B"
BG1-2	8'-6 15/16"	9'-11"
BG2-2	8'-10 3/16"	9'-7 3/4"
BG3-2	9'-1 3/8"	9'-4 9/16"
BG4-2	9'-4 9/16"	9'-1 3/8"
BG5-2	9'-7 3/4"	8'-10 3/16"
BG6-2	9'-11"	8'-6 15/16"

NOTES:

ALL DIMENSIONS ON THIS DRAWING ARE HORIZONTAL.

ALL ℄ PIERS AND ℄ 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
- FLANGE TO WEB WELD DETAILS

FOR BEARINGS, SEE "BEARING DETAILS SPAN B" SHEET.

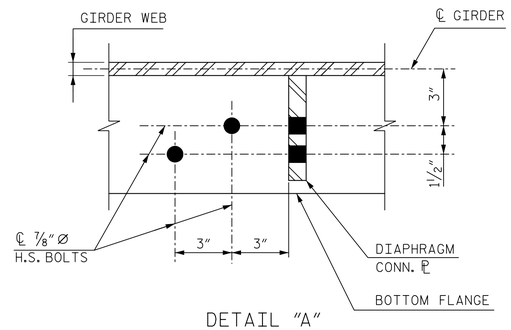
FOR DRAIN PIPE SUPPORT DETAILS, SEE "STRUCTURE DRAINAGE DETAILS" SHEETS.

FLANGE AND WELD SHOP SPLICES SHALL BE MADE WITH FULL PENETRATION GROOVE WELDS. SEE DETAILS ON "STRUCTURAL STEEL DETAILS" SHEET. FABRICATOR IS TO SHOW WELD CONFIGURATION AND JOINT PREPARATION ON SHOP DRAWINGS FOR APPROVAL.

FLANGE AND WEB SHOP SPLICES SHALL BE STAGGERED LONGITUDINALLY A MINIMUM OF 2'-0". SEE "STRUCTURAL STEEL DETAILS" SHEET FOR DETAILS.

FC = "FRACTURE CRITICAL"

INT = NON-FRACTURE CRITICAL MEMBERS OR COMPONENTS REQUIRING IMPROVED NOTCH TOUGHNESS.



DETAIL "A"

(RIGHT SIDE OF WEB SHOWN, LEFT SIDE SIMILAR)

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POS STA. 28+12.88 -S2-

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

DocuSigned by: 556B3197C228434...

2/21/2018

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343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. VAUGHN DATE 8/17
CHECKED BY R. RAPP DATE 9/17
DWG. NO. 11

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	S7-11
1			3			TOTAL SHEETS
2			4			51

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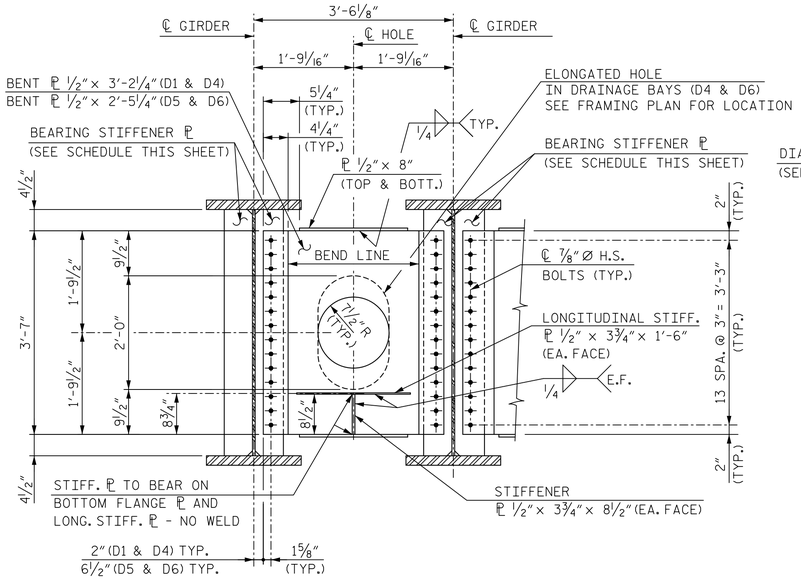
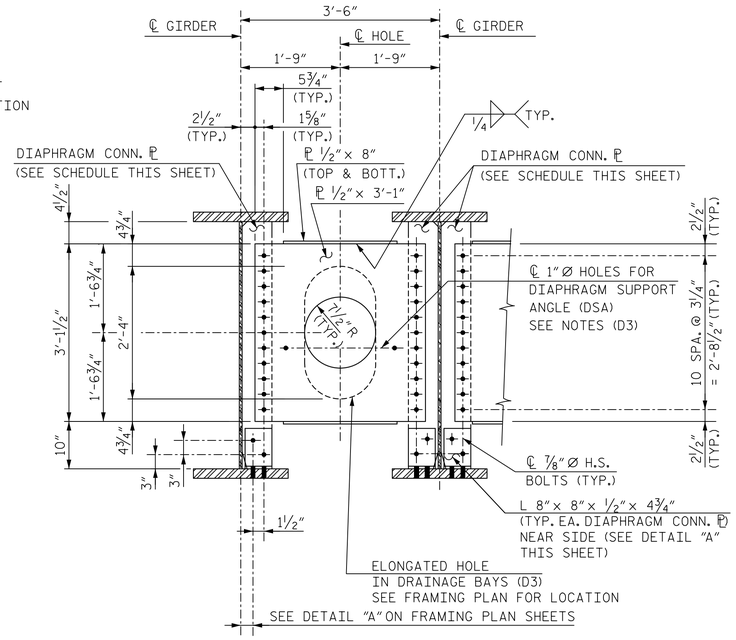


SECTION @ END DIAPHRAGM (D1, D4, D5, & D6)



SECTION @ INTERMEDIATE DIAPHRAGM (D2 & D3)

STRUCTURAL STEEL NOTES

STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING ASTM SPECIFICATIONS:

- GIRDER FLANGES AND WEB: A709, GRADE 50.
- MISCELLANEOUS MATERIAL: A709, GRADE 50.
- ANCHOR BOLTS FOR BEARING DEVICES SHALL CONFORM TO ASTM F1554, GRADE 105. ANCHOR BOLTS, NUTS, AND PLATE WASHERS SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM F2329.

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 1.14. NOTCH TOUGHNESS REQUIREMENTS AND TESTING SHALL BE BASED ON ZONE 2 REQUIREMENTS.

STRUCTURAL STEEL ELEMENTS DENOTED AS "INT" 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. ALL DIMENSIONS ARE SHOWN AT 60°F.

NC DOT RAILS DIVISION SHALL BE FURNISHED COPIES OF MILL TEST REPORTS FOR ALL MATERIALS EXCEPT MISCELLANEOUS PLATES AND SHAPES. REPORTS SHALL INDICATE COMPLIANCE WITH ALL SPECIFIED REQUIREMENTS.

SHOP INSPECTION SHALL BE BY NORFOLK SOUTHERN CORPORATION OR ITS AUTHORIZED AGENT. SEE STRUCTURAL STEEL SPECIAL PROVISION FOR ADDITIONAL WELDING INSPECTION OF FLANGE PLATE TO WEB PLATE WELDS.

FOR PAINTING STRUCTURAL STEEL, SEE SPECIAL PROVISIONS.

BOLTED CONNECTIONS SHALL BE MADE WITH 7/8″Ø ASTM A325, TYPE 1 HIGH STRENGTH BOLTS WITH HEAVY HEX HEAD, HEAVY HEX NUT AND 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 SHALL BE APPROVED BY THE CHIEF ENGINEER - BRIDGES AND STRUCTURES, NORFOLK SOUTHERN CORPORATION, ATLANTA, GA. SHOP DRAWINGS SHALL BE LABELED "NORFOLK SOUTHERN MP 377.70".

BOLT HOLES IN STRUCTURAL STEEL MEMBERS SHALL BE STANDARD SIZE UNLESS OTHERWISE INDICATED ON THE PLANS.

HIGH STRENGTH BOLTS, NUTS & WASHERS SHALL BE MECHANICALLY GALVANIZED IN ACCORDANCE WITH ASTM B695.

ANCHOR BOLTS SHALL BE 1 1/4″Ø 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. FOR PAD REQUIREMENTS, SEE STRUCTURAL STEEL SPECIAL PROVISIONS.

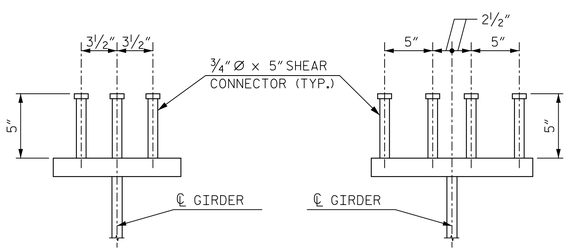
SHEAR CONNECTORS ON GIRDERS MAY BE SHIFTED AS NECESSARY TO CLEAR FLANGE SPLICE WELDS.

WEB SHOP SPLICES ARE PERMITTED TO LIMIT THE MAXIMUM REQUIRED WEB PIECE LENGTHS TO 45′-0″. PERMITTED WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15′-0″ OF MAXIMUM DEAD LOAD DEFLECTION AND SHALL BE LOCATED 6″ MIN. FROM CONNECTOR PLATE OR INTERMEDIATE STIFFENER WELDS. FLANGE AND WEB SHOP SPLICES SHALL CONFORM TO SHOP SPLICE DETAILS SHOWN ON THE PLANS.

ALL WELDING CONNECTIONS SHALL BE MADE WITH SERIES E70 WELDING ELECTRODES.

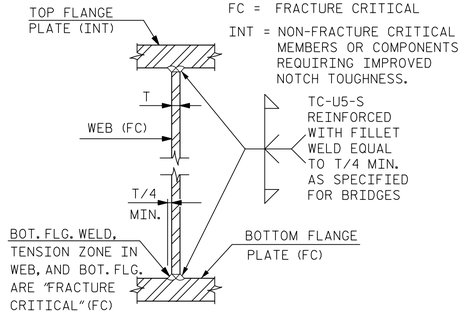
FOR DIAPHRAGM LOCATIONS, SEE FRAMING PLANS.

FOR DETAILS OF DIAPHRAGM SUPPORT ANGLES (DSA), SEE "STRUCTURE DRAINAGE DETAILS" SHEET 2 OF 4.



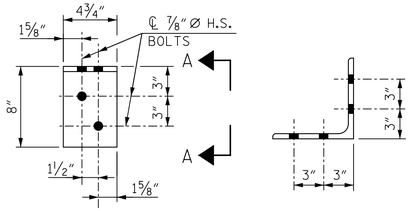
SPANS A & C SPAN B

SHEAR CONNECTOR DETAILS



FLANGE TO WEB WELD DETAIL

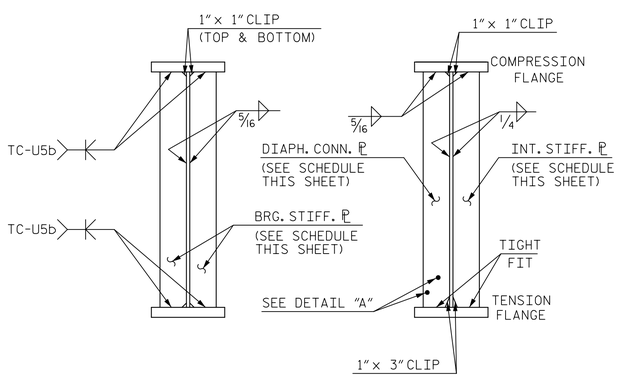
NO SCALE



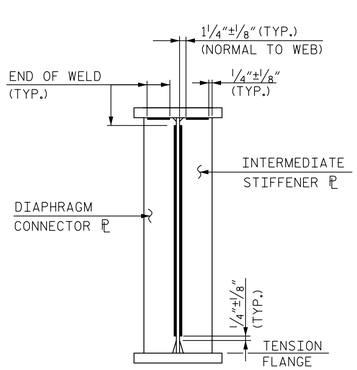
PLAN VIEW A-A

DETAIL "A"

(L 8″ × 8″ × 1/2″ × 4 3/4″)

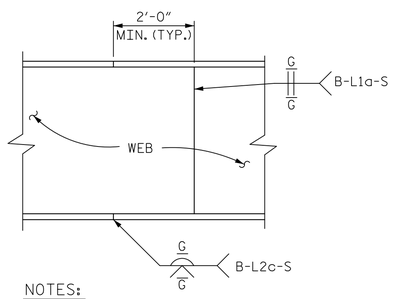


STIFFENER/CONN. ℙ DETAILS



WELD TERMINATION DETAILS

(FILLET WELDS ONLY)



SHOP SPLICE DETAILS

NOTES:

ELECTROSLAG WELDING IS NOT PERMITTED.

ULTRASONIC OR RADIOGRAPHIC INSPECTION IS REQUIRED FOR ALL FLANGE AND WEB SPLICE WELDS. SEE SPECIAL PROVISIONS.

GRIND WELDS IN DIRECTION OF STRESS ONLY (I.E. PARALLEL TO ℄ GIRDER).

STIFFENER/CONN. ℙ SCHEDULE		
TYPE	SPANS A & C	SPAN B
BRG. STIFF.	ℙ 1/2″ × 5″	ℙ 1″ × 9 1/2″
DIAPH. CONN. ℙ	ℙ 1/2″ × 5 1/2″	ℙ 1/2″ × 6″
INT. STIFF.	ℙ 1/2″ × 5 1/2″	ℙ 1/2″ × 6″

NOTE: SEE FRAMING PLANS FOR STIFFENER/CONN. ℙ LOCATIONS

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POS STA. 28+12.88 -S2-

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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2/21/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

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

DRAWN BY B. VAUGHN DATE 8/17
CHECKED BY K. ERVIN DATE 9/17
DWG. NO. 12

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-12
1			3			TOTAL SHEETS
2			4			51

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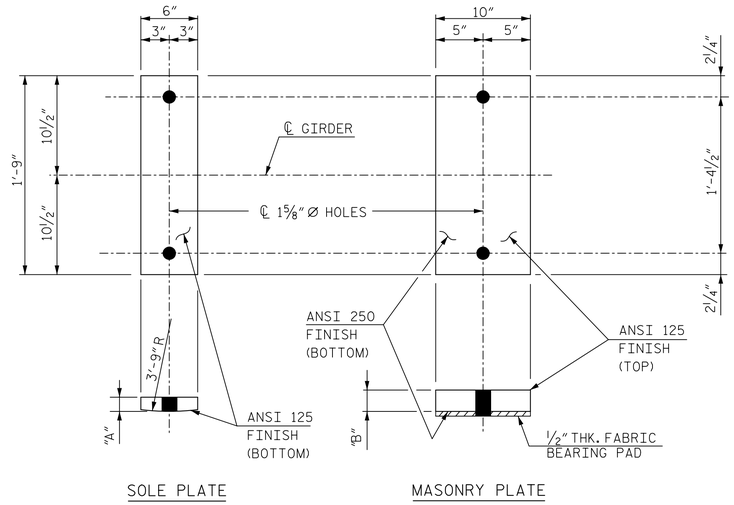
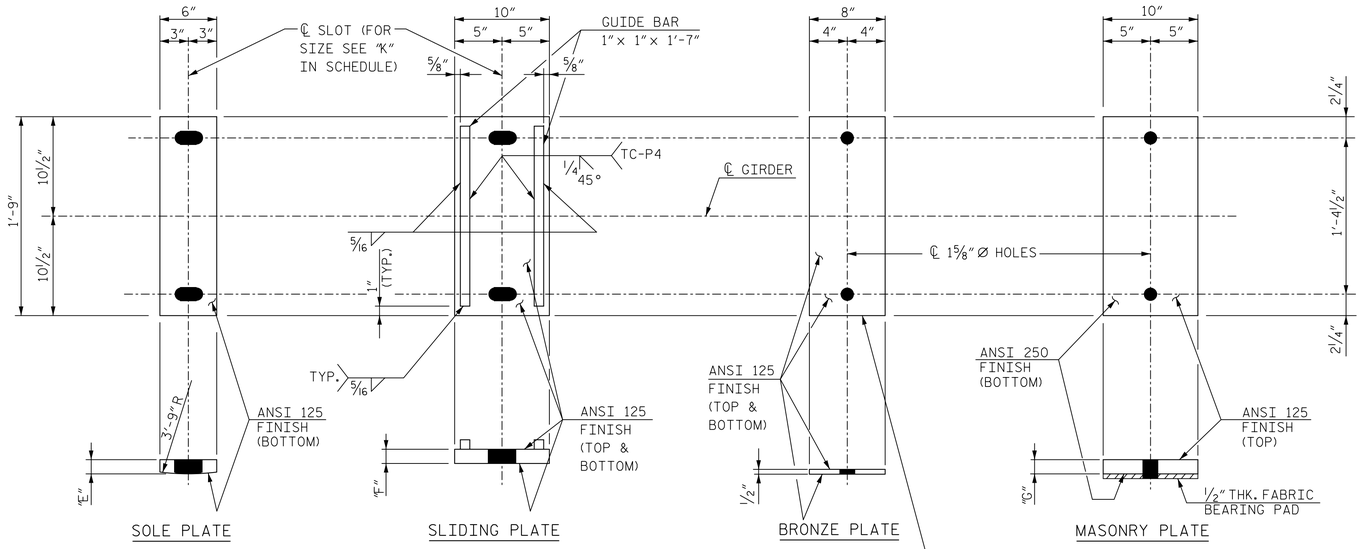


SOLE PLATE MASONRY PLATE

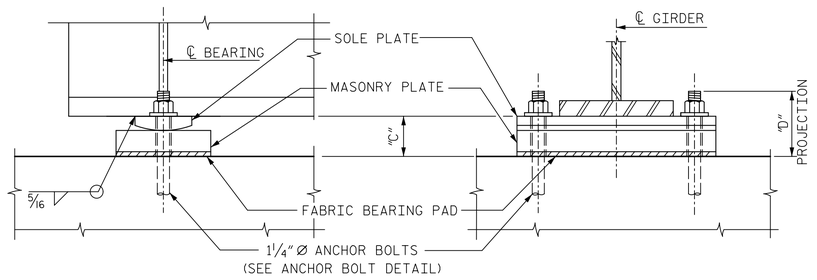
FIXED BEARINGS



SOLE PLATE SLIDING PLATE BRONZE PLATE MASONRY PLATE

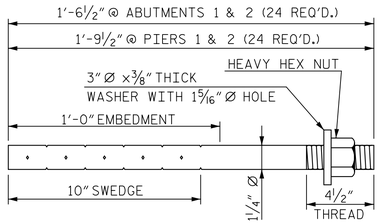
EXPANSION BEARINGS

BRONZE PLATE TO BE ASTM B22 - COPPER ALLOY 911 OR ASTM B100 - COPPER ALLOY 510. TOP SURFACE TO BE SELF LUBRICATING.

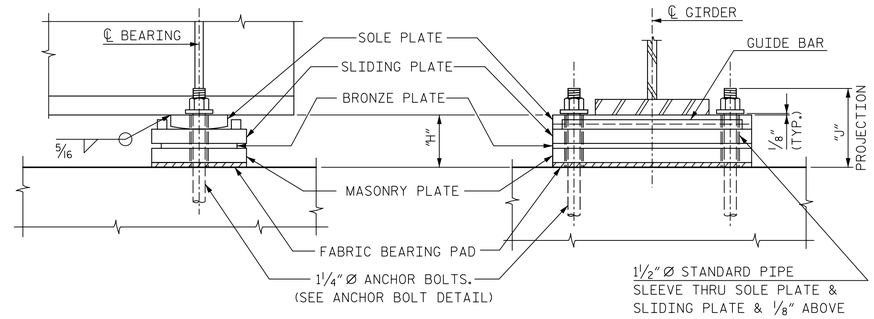


FIXED BEARING ASSEMBLY (FBA-1)

(12 REQ'D)



ANCHOR BOLT DETAIL



1½″ Ø STANDARD PIPE SLEEVE THRU SOLE PLATE & SLIDING PLATE & ⅛″ ABOVE SOLE PLATE (GALVANIZED STEEL PIPE) (TYP.)

EXPANSION BEARING ASSEMBLY (EBA-1)

(12 REQ'D)

BEARING PLATE SCHEDULE

GIRDER	DIMENSIONS									
	FIXED BEARING (FBA-1)				EXPANSION BEARING (EBA-1)					
	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"J"	"K"
AG1-2	1½″	2″	4″	6½″	1½″	1½″	1¾″	5¾″	9½″	2″ × 3″
AG2-2	1½″	2″	4″	6½″	1½″	1½″	1¾″	5¾″	9½″	2″ × 3″
AG3-2	1½″	2″	4″	6½″	1½″	1½″	1¾″	5¾″	9½″	2″ × 3″
AG4-2	1½″	2″	4″	6½″	1½″	1½″	1¾″	5¾″	9½″	2″ × 3″
AG5-2	1½″	2″	4″	6½″	1½″	1½″	1¾″	5¾″	9½″	2″ × 3″
AG6-2	1½″	2″	4″	6½″	1½″	1½″	1¾″	5¾″	9½″	2″ × 3″
CG1-2	1½″	1¾″	3¾″	6½″	1½″	1½″	2¾″	6¾″	9½″	2″ × 3″
CG2-2	1½″	1¾″	3¾″	6½″	1½″	1½″	2¾″	6¾″	9½″	2″ × 3″
CG3-2	1½″	1¾″	3¾″	6½″	1½″	1½″	2¾″	6¾″	9½″	2″ × 3″
CG4-2	1½″	1¾″	3¾″	6½″	1½″	1½″	2¾″	6¾″	9½″	2″ × 3″
CG5-2	1½″	1¾″	3¾″	6½″	1½″	1½″	2¾″	6¾″	9½″	2″ × 3″
CG6-2	1½″	1¾″	3¾″	6½″	1½″	1½″	2¾″	6¾″	9½″	2″ × 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.

REFER TO "STRUCTURAL STEEL DETAILS" SHEET FOR ADDITIONAL NOTES.

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POS STA. 28+12.88 -S2-

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

DocuSigned by: 556B3197C22B434...

2/21/2018

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343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BEARING DETAILS SPAN A AND SPAN C

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-13
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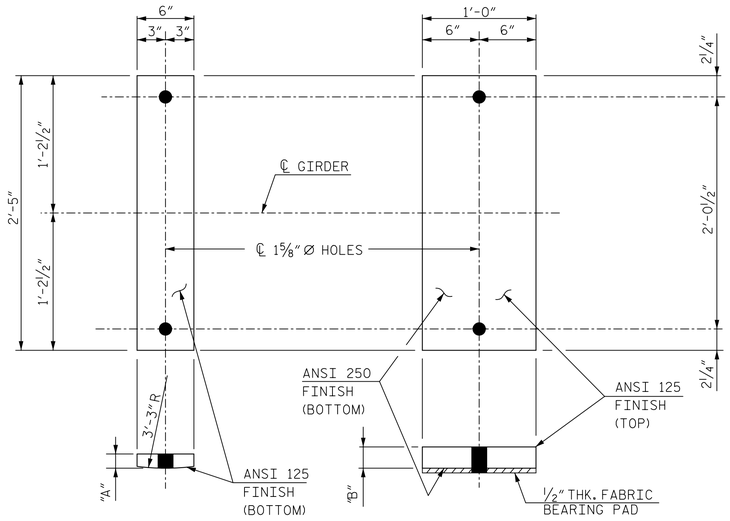
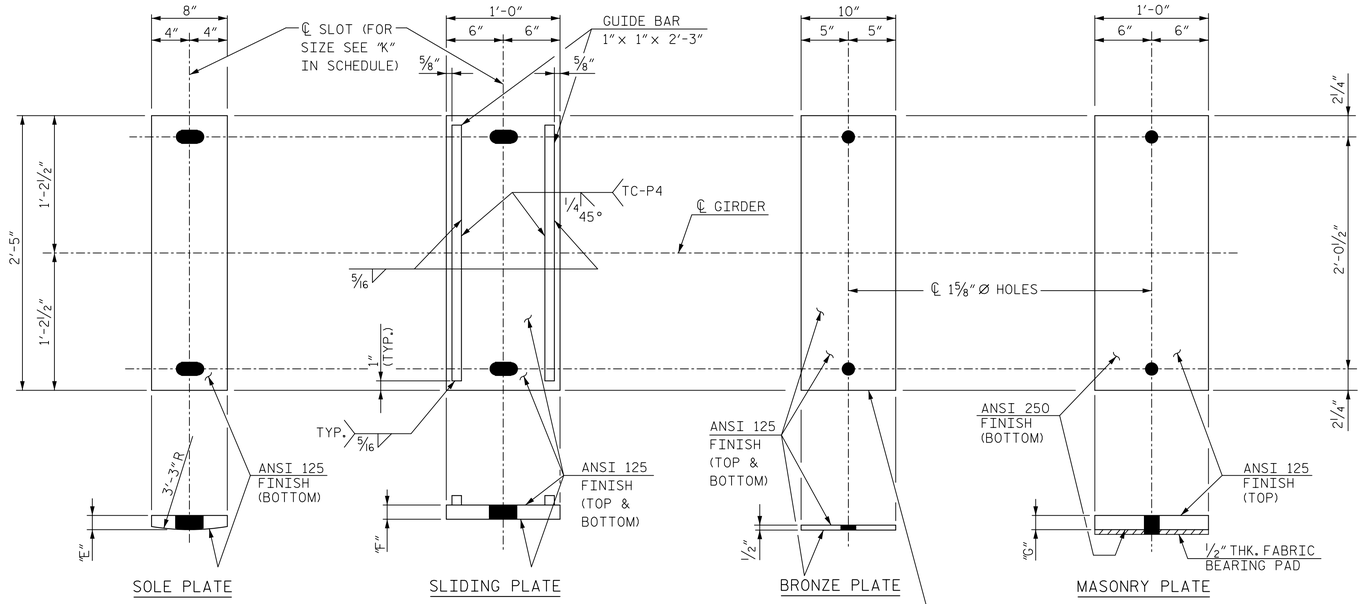
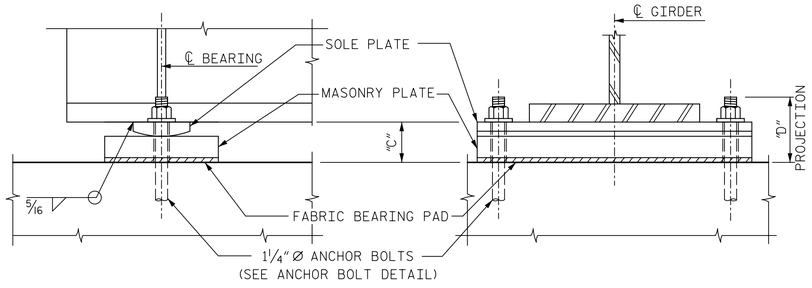


FIXED BEARINGS



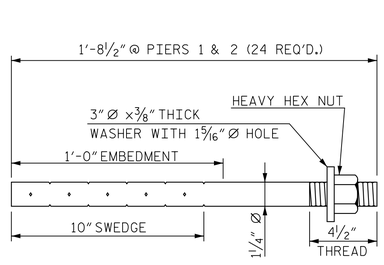
EXPANSION BEARINGS

BRONZE PLATE TO BE ASTM B22 - COPPER ALLOY 911 OR ASTM B100 - COPPER ALLOY 510. TOP SURFACE TO BE SELF LUBRICATING.



FIXED BEARING ASSEMBLY (FBA-2)

(6 REQ'D)



ANCHOR BOLT DETAIL

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.

REFER TO "STRUCTURAL STEEL DETAILS" SHEET FOR ADDITIONAL NOTES.

EXPANSION BEARING ASSEMBLY (EBA-2)

(6 REQ'D)

BEARING PLATE SCHEDULE

GIRDER	DIMENSIONS									
	FIXED BEARING (FBA-2)				EXPANSION BEARING (EBA-2)					
	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"J"	"K"
BG1-2	1½″	2¾″	4¾″	8½″	1½″	1½″	1¾″	5¾″	8½″	2″ x 4″
BG2-2	1½″	2¾″	4¾″	8½″	1½″	1½″	1¾″	5¾″	8½″	2″ x 4″
BG3-2	1½″	2¾″	4¾″	8½″	1½″	1½″	1¾″	5¾″	8½″	2″ x 4″
BG4-2	1½″	2¾″	4¾″	8½″	1½″	1½″	1¾″	5¾″	8½″	2″ x 4″
BG5-2	1½″	2¾″	4¾″	8½″	1½″	1½″	1¾″	5¾″	8½″	2″ x 4″
BG6-2	1½″	2¾″	4¾″	8½″	1½″	1½″	1¾″	5¾″	8½″	2″ x 4″

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POS STA. 28+12.88 -S2-

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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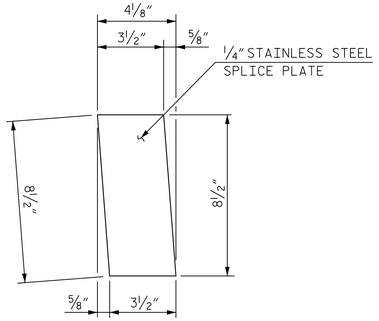
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

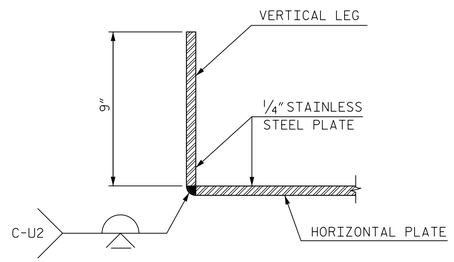
BEARING DETAILS
SPAN B

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-14
1			3			TOTAL SHEETS
2			4			51

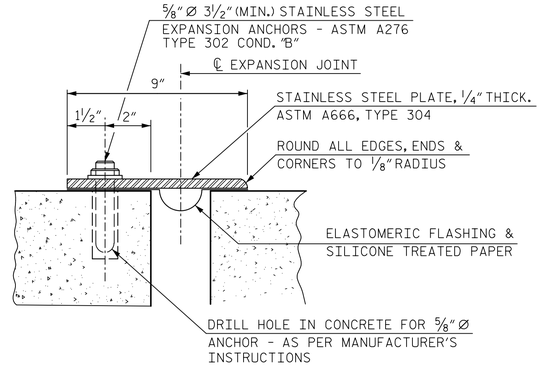
0012DEL_P28



DETAIL A



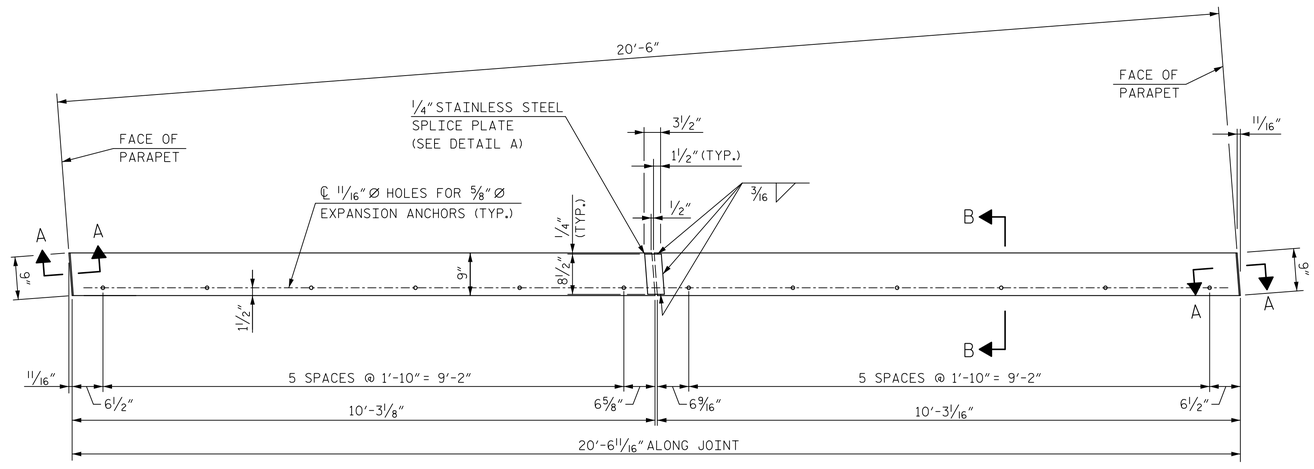
SECTION A-A



SECTION B-B

DETAIL OF EXPANSION ANCHOR AND PLATE

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



PLAN - EXPANSION PLATE
(4 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, AND SPAN B SIDE OF PIER 2.

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POS STA. 28+12.88 -S2-

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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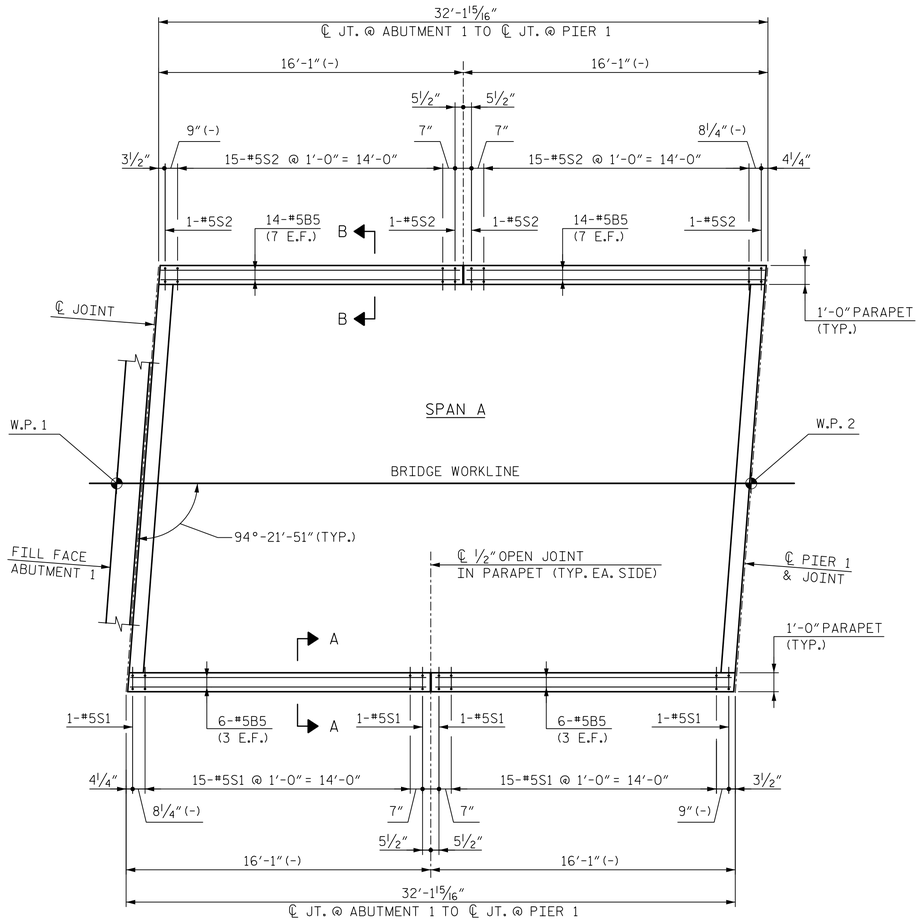
SUPERSTRUCTURE

EXPANSION PLATE DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-15
1			3			TOTAL SHEETS
2			4			51

0012DEL_P28



PLAN - SPAN A PARAPETS

NOTES:

BRIDGE MOUNTED FENCE AND 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 BRIDGE MOUNTED FENCE AND HANDRAIL DETAILS, SEE "BRIDGE MOUNTED FENCE AND HANDRAIL DETAILS" SHEETS.

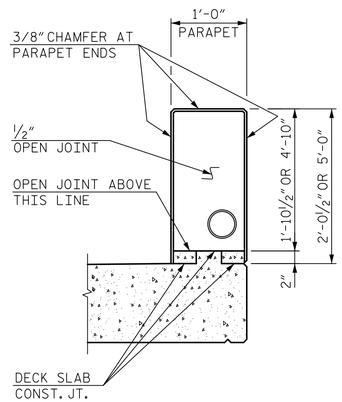
VERTICAL GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF PARAPET AND IN ACCORDANCE WITH THE SPECIAL PROVISION FOR "CONCRETE PARAPET". THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS.

#5S1 AND #5S2 BARS IN PARAPET MAY BE SHIFTED SLIGHTLY TO MAINTAIN PROPER CLEARANCE TO EXPANSION JOINTS IN PARAPET.

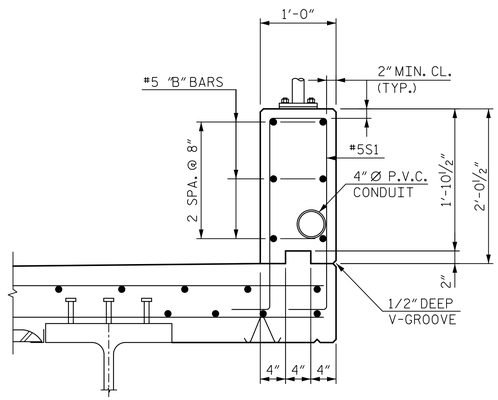
E.F. = EACH FACE

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

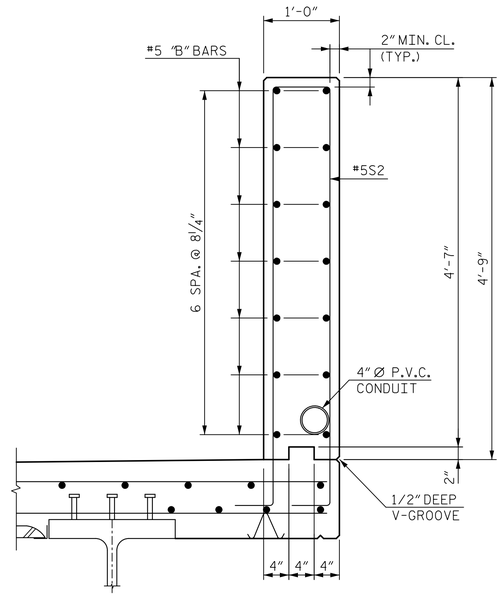
PAY LENGTH = 231.4′



SECTION THRU OPEN JOINT IN PARAPET



SECTION A-A THRU PARAPET



SECTION B-B THRU PARAPET

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POS STA. 28+12.88 -S2-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PARAPET DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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1			3			TOTAL SHEETS
2			4			51

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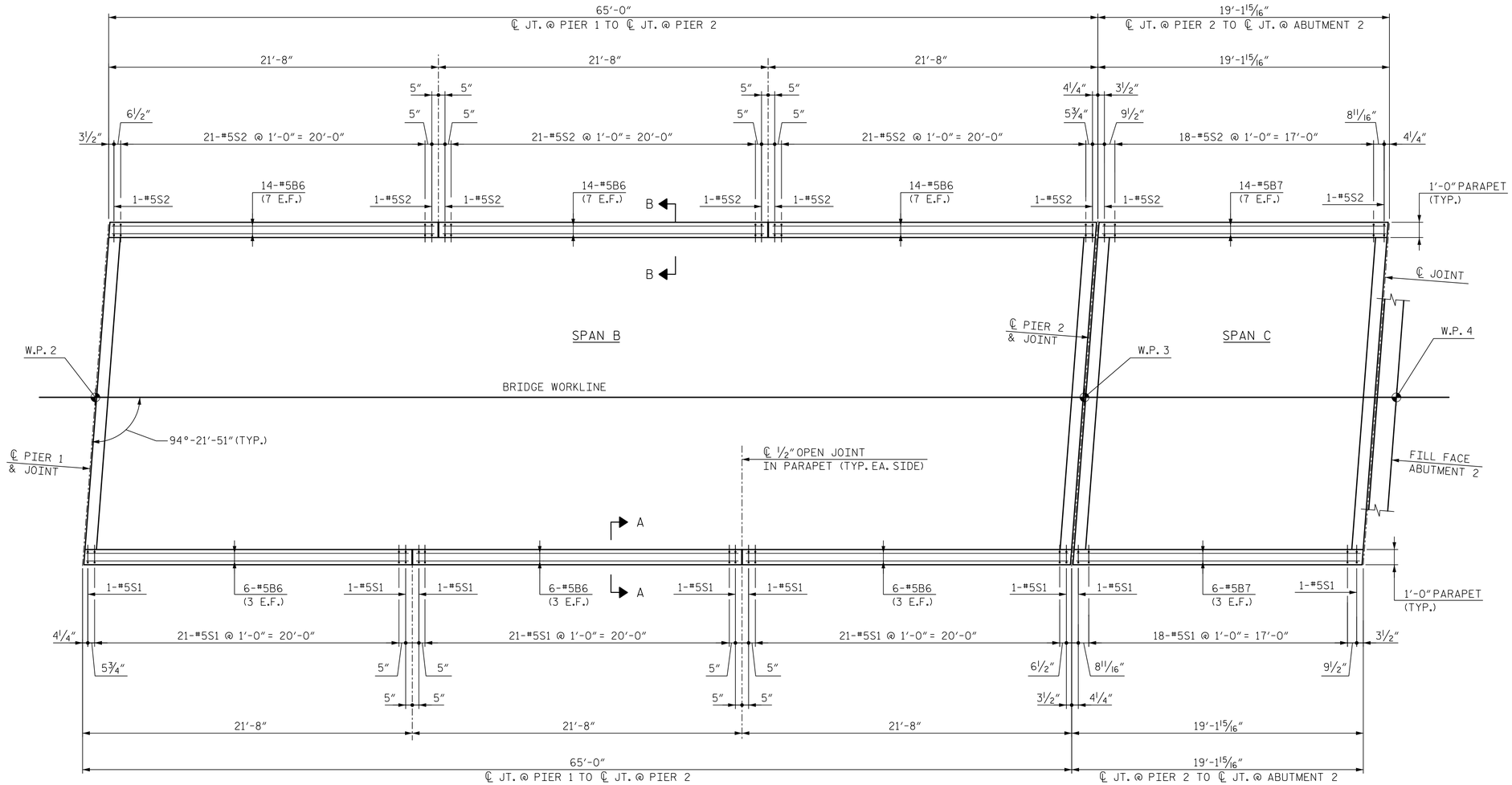

PLAN - SPAN B & SPAN C PARAPETS

NOTE:

SEE SHEET 1 OF 2 FOR NOTES AND SECTIONS.

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POS STA. 28+12.88 -S2-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PARAPET DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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1			3			TOTAL SHEETS
2			4			51

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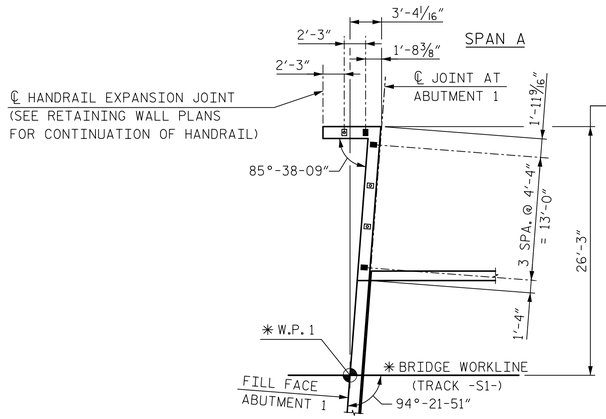
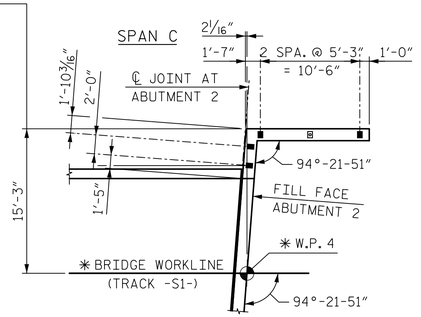


ABUTMENT 1



ABUTMENT 2

✳ FOR TRACK -S1- BRIDGE WORKLINE AND WORKPOINT DEFINITIONS, REFER TO "BRIDGE ON STATION TRACK 1 OVER W 4TH STREET" PLANS.

LEGEND:

■ - END POST (ALUMINUM HANDRAIL)

◘ - INTERIOR POST (FENCE AND STEEL HANDRAIL)

◘ - INTERIOR POST (ALUMINUM HANDRAIL)

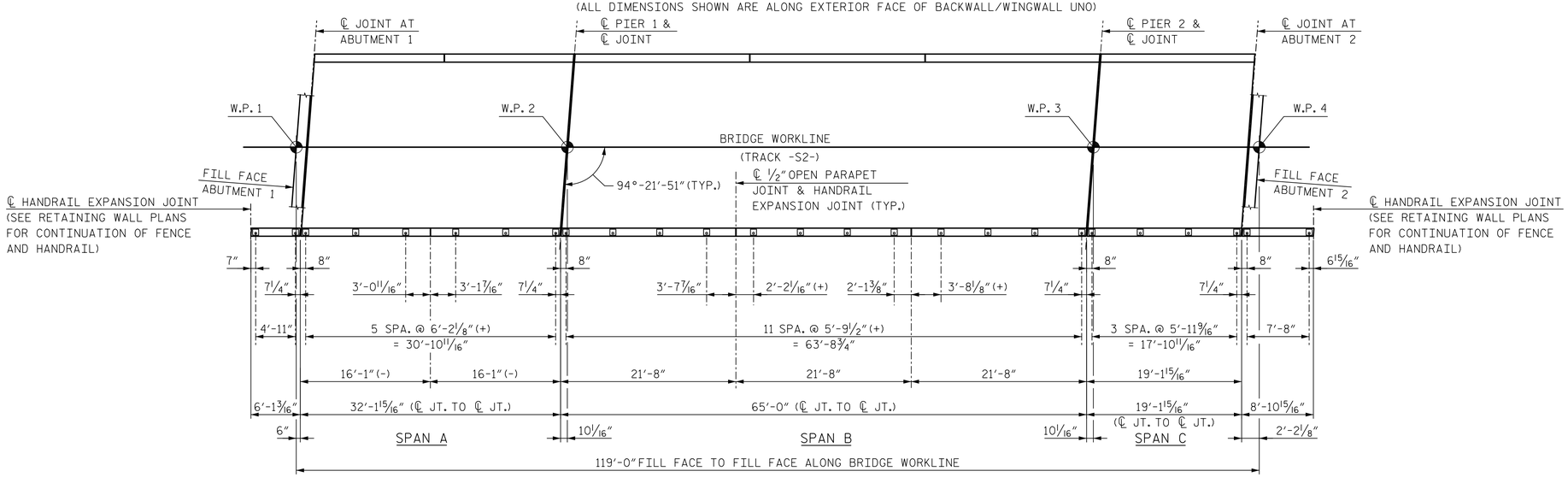
NOTES:

SEE SHEET 2 OF 3 FOR FENCE AND STEEL HANDRAIL DETAILS AND NOTES.

SEE SHEET 3 OF 3 FOR ALUMINUM HANDRAIL DETAILS AND NOTES.

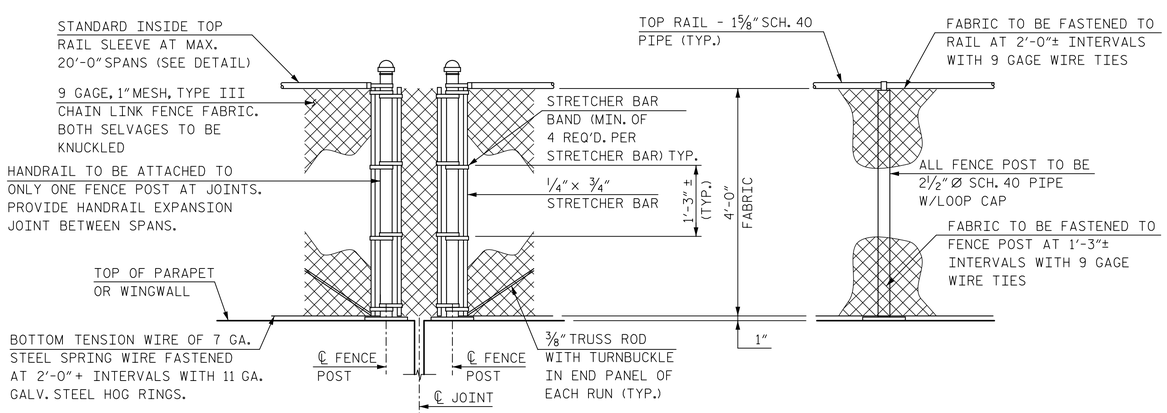
ALUMINUM HANDRAIL POST SPACING - BACKWALL/WINGWALL

(ALL DIMENSIONS SHOWN ARE ALONG EXTERIOR FACE OF BACKWALL/WINGWALL UNO)



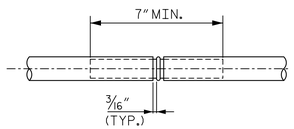
FENCE AND STEEL HANDRAIL POST SPACING - BRIDGE & WINGWALLS

(ALL DIMENSIONS SHOWN ARE ALONG EXTERIOR FACE OF PARAPET/WINGWALL)



DETAILS FOR CHAIN LINK FENCE

(HANDRAIL NOT SHOWN FOR CLARITY)



TOP RAIL SLEEVE DETAIL

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POS STA. 28+12.88 -S2-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BRIDGE MOUNTED FENCE AND HANDRAIL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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NO.	BY	DATE	NO.	BY	DATE	S7-18
1			3			TOTAL SHEETS
2			4			51

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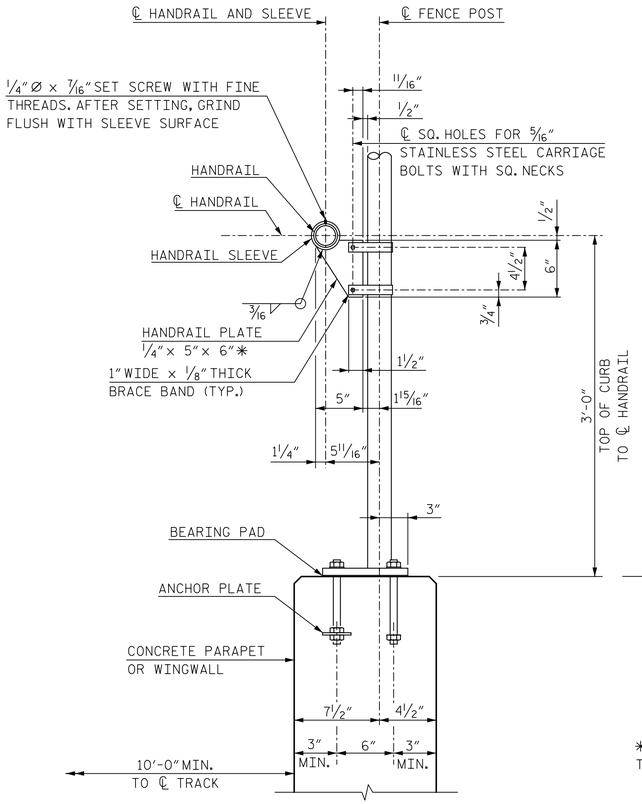
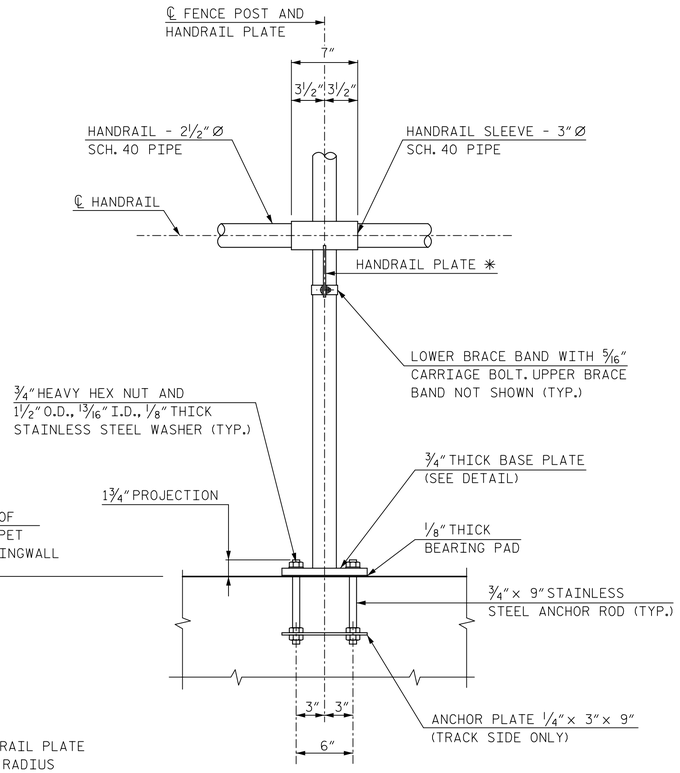


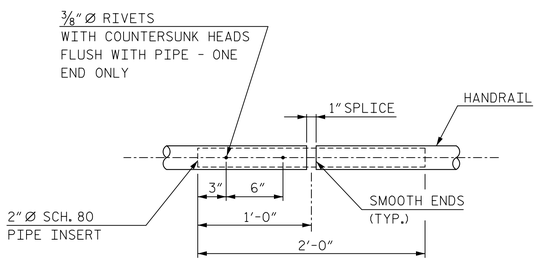
SECTION

*ALL EDGES ON HANDRAIL PLATE TO BE ROUNDED - 1/16" RADIUS

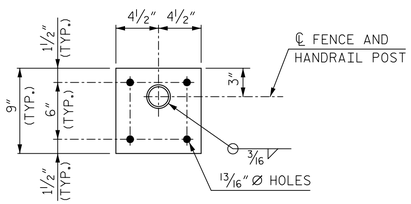


FRONT VIEW

DETAILS FOR PIPE RAILING



HANDRAIL EXPANSION JOINT DETAIL



BASE PLATE DETAIL

NOTES:

SEE "FENCE AND STEEL HANDRAIL POST SPACING - BRIDGE AND WINGWALLS" DETAIL ON SHEET 1 OF 3 FOR POST SPACING AND LOCATION OF EXPANSION JOINTS IN HANDRAIL.

ALL HANDRAIL PIPE, SLEEVES, AND EXPANSION JOINTS TO BE SMOOTH AND FREE OF SHARP EDGES.

FENCE POSTS, RAIL, AND HANDRAIL PIPE SHALL BE SCHEDULE 40 STEEL PIPE IN ACCORDACE WITH ASTM F1043.

PROVISIONS SHALL BE MADE FOR THE DRAINAGE OF WATER FROM INSIDE THE FENCE POSTS.

CHAIN LINK FABRIC AND FITTINGS SHALL MEET THE REQUIREMENTS OF ASTM F668 AND HAVE A BONDED BLACK FUSION VINYL COATING.

MISCELLANEOUS METAL COMPONENTS SHALL MEET THE REQUIREMENTS OF ASTM A36.

STAINLESS STEEL BOLTS, NUTS, AND ANCHOR RODS TO BE ASTM A276, TYPE 304. STAINLESS STEEL WASHERS TO BE ASTM A276, TYPE 302. ANCHOR ROD THREADS SHALL BE ROLLED, NOT CUT.

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

CERTIFIED MILL REPORTS ARE REQUIRED FOR POST, RAIL, AND FENCE FABRIC. SHOP INSPECTION IS NOT REQUIRED.

AFTER ANCHOR BOLT AND OTHER BOLT NUTS HAVE BEEN TIGHTENED, THREADS SHALL BE NICKED TO LOCK NUTS.

THE BRACE BANDS USED TO SECURE HANDRAIL SLEEVE SHALL BE OF SUCH SIZE NECESSARY TO CLAMP TIGHTLY TO FENCE POST.

WELDING SHALL BE IN ACCORDANCE WITH THE CURRENT AWS BRIDGE WELDING CODE.

ANCHOR PLATE SHALL BE STEEL CONFORMING TO ASTM SPECIFICATION A36.

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 HEX NUTS, PER ASTM A307.

FENCE FRAMEWORK INCLUDING BASE PLATES, HANDRAIL, HANDRAIL SLEEVES, AND ALL SUPPORT COMPONENTS TO HAVE A FUSION BONDED BLACK VINYL COATING IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM F1043.

SHOP DRAWINGS FOR FENCE AND HANDRAIL ARE REQUIRED AND SHALL BE SUBMITTED FOR APPROVAL.

PAY LENGTH = 130.2'

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POS STA. 28+12.88 -S2-

SHEET 2 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BRIDGE MOUNTED FENCE AND HANDRAIL DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-19
1			3			TOTAL SHEETS
2			4			51

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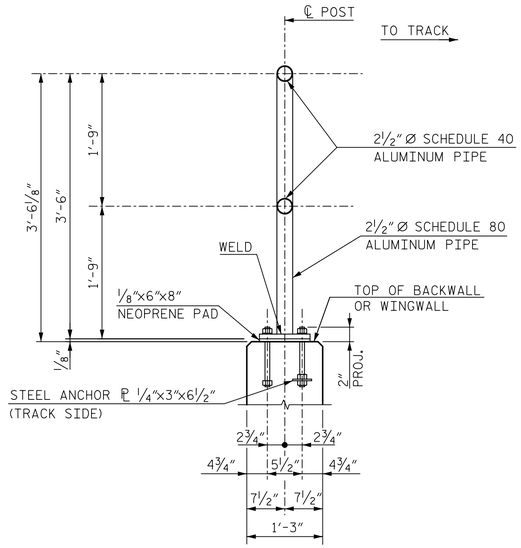
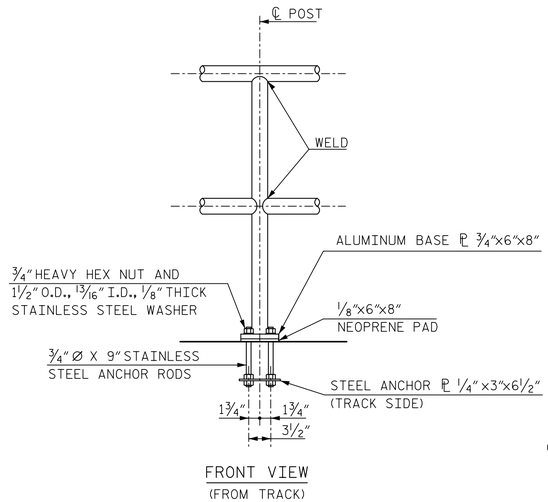
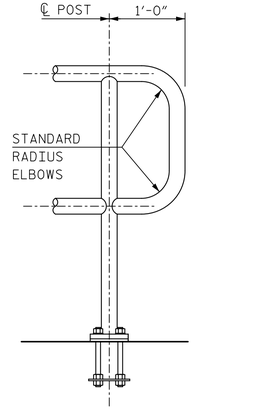


SECTION

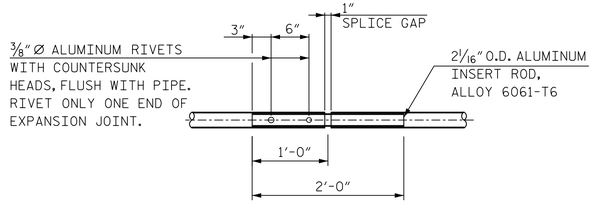


FRONT VIEW
(FROM TRACK)

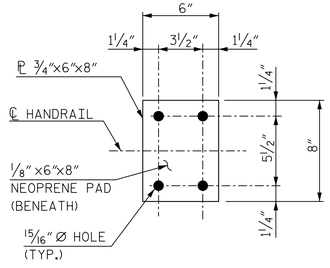


END POST DETAIL
(ON ABUTMENT BACKWALL AND WINGWALLS - SEE SHEET 1 OF 3)

ALUMINUM HANDRAIL AND POST



EXPANSION JOINT DETAIL



BASE PLATE

NOTES:

SEE "ALUMINUM HANDRAIL POST SPACING - BACKWALL/WINGWALL" DETAIL ON SHEET 1 OF 3 FOR POST SPACING AND LOCATION OF EXPANSION JOINTS IN HANDRAIL.

ALUMINUM PIPE TO BE ASTM B429, ALLOY 6061-T6 AND BASE PLATE TO BE ASTM B209, ALLOY 6061-T6.

STAINLESS STEEL BOLTS, CAP SCREWS, AND NUTS TO BE ASTM A276 TYPE 304. STAINLESS STEEL WASHERS TO BE ASTM A276 TYPE 302.

POSTS TO BE SET PERPENDICULAR TO TOP OF BACKWALL/WINGWALL 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.

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 FOR 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.

SHOP DRAWINGS FOR RAILINGS ARE REQUIRED AND SHALL BE SUBMITTED FOR APPROVAL.

FOR METAL RAIL (ALUMINUM), SEE SPECIAL PROVISIONS.

PAY LENGTH = 37.0'

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: POS STA. 28+12.88 -S2-

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BRIDGE MOUNTED FENCE AND HANDRAIL DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-20
1			3			TOTAL SHEETS
2			4			51

0012DEL_P28

EPOXY-COATED REINFORCING STEEL

SPAN A

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	85	5	STR.	22′-2″	1,966
A2	8	5	STR.	22′-2″	185
A3	2	5	STR.	17′-0″	36
A4	2	5	STR.	10′-6″	22
A5	4	5	STR.	3′-11″	17
A6	2	5	STR.	15′-5″	33
B1	68	4	STR.	18′-7″	845
B2	68	4	STR.	15′-1″	686
B5	40	5	STR.	15′-7″	651
S1	34	5	1	6′-6″	231
S2	34	5	2	12′-0″	426
				TOTAL	5,098

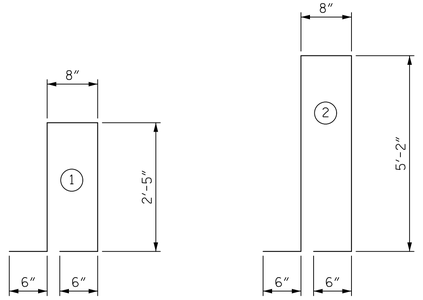
SPAN B

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	177	5	STR.	22′-2″	4,093
A2	8	5	STR.	22′-2″	185
A7	2	5	STR.	18′-2″	38
A8	2	5	STR.	11′-7″	25
A9	4	5	STR.	5′-0″	21
A10	2	5	STR.	15′-5″	33
B3	136	4	STR.	30′-0″	2,726
B4	68	4	STR.	8′-6″	387
B6	60	5	STR.	21′-2″	1,325
S1	69	5	1	6′-6″	468
S2	69	5	2	12′-0″	864
				TOTAL	10,165

SPAN C

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	49	5	STR.	22′-2″	1,133
A2	8	5	STR.	22′-2″	185
A3	2	5	STR.	17′-0″	36
A4	2	5	STR.	10′-6″	22
A5	4	5	STR.	3′-11″	17
A11	2	5	STR.	14′-10″	31
B1	68	4	STR.	18′-7″	845
B7	20	5	STR.	18′-8″	390
S1	20	5	1	6′-6″	136
S2	20	5	2	12′-0″	251
				TOTAL	3,046

BAR TYPES



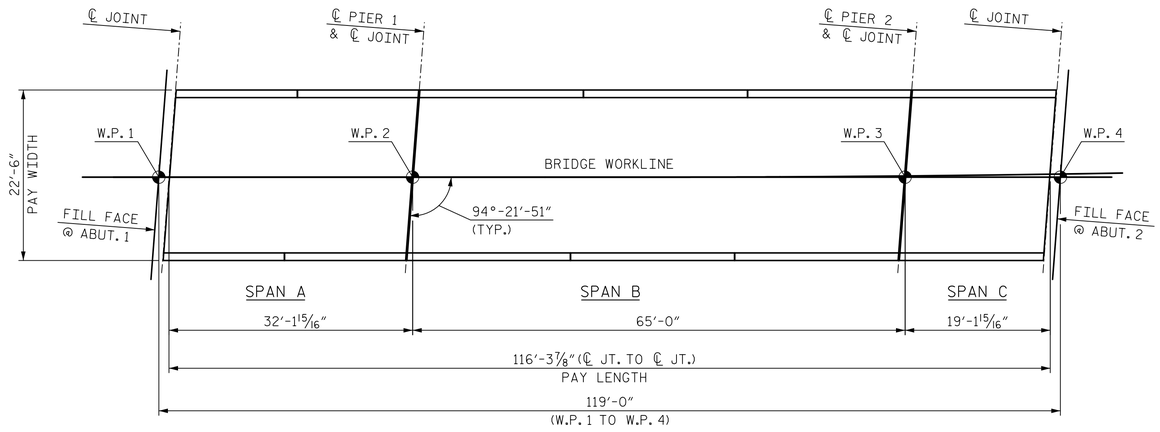
ALL BAR DIMENSIONS ARE OUT TO OUT

QUANTITY BREAKDOWN BY SPAN

	EPOXY COATED REINFORCING STEEL (LBS.)	CLASS AA CONCRETE (CU. YDS.)	
		DECK SLAB	PARAPETS
SPAN "A"	5,098	25.1	8.0
SPAN "B"	10,165	46.4	16.2
SPAN "C"	3,046	14.7	4.8
TOTALS	18,309	86.2	29.0

TOTAL SUPERSTRUCTURE QUANTITIES

	REINFORCED CONCRETE DECK SLAB	EPOXY COATED REINFORCING STEEL	CLASS AA CONCRETE
	SQ. FT.	LBS.	CU. YDS.
DECK SLAB	2,617.3	13,567	86.2
PARAPET	———	4,742	29.0
TOTALS	2,617.3	18,309	115.2



LAYOUT FOR COMPUTING AREA
OF REINFORCED CONCRETE DECK SLAB
(SQ. FEET = 2,617.3)

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: POS STA. 28+12.88 -S2-

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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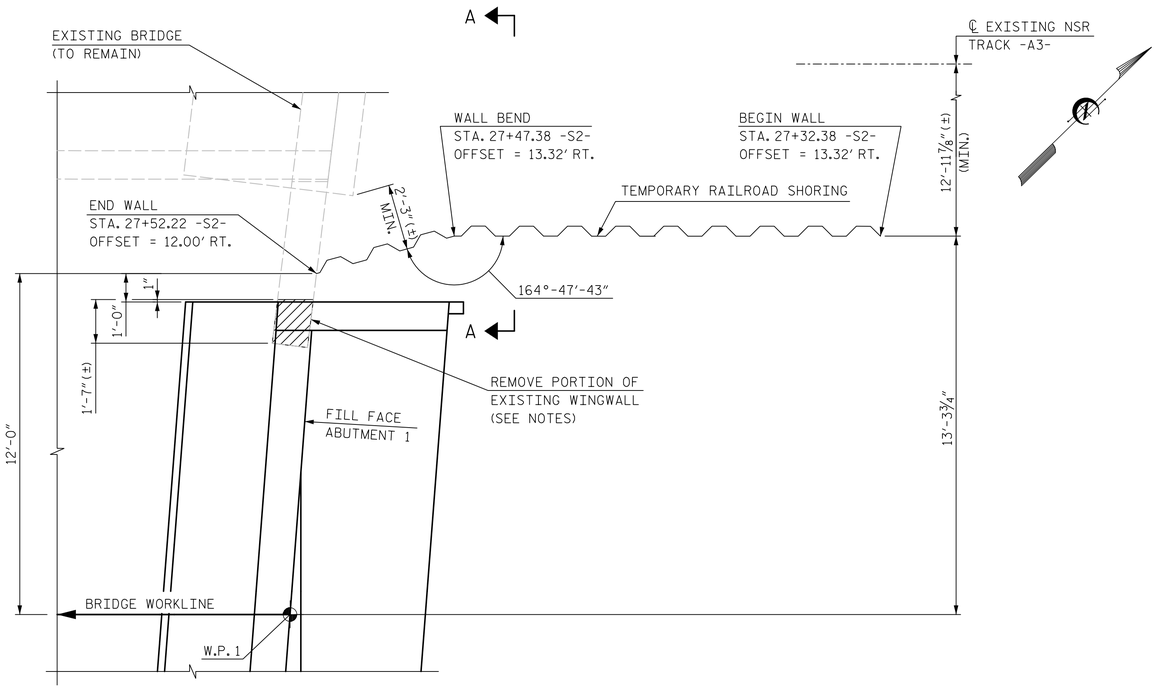
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

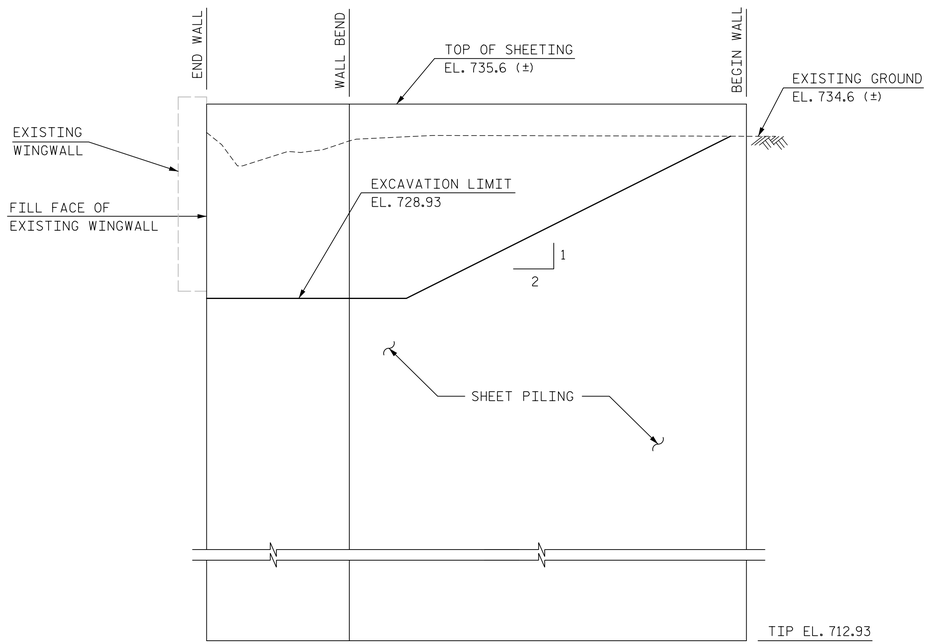
BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-21
1			3			TOTAL SHEETS
2			4			51

0012DEL_P28



TEMPORARY SHORING PLAN



TEMPORARY SHORING ELEVATION

(LOOKING NORTH TOWARDS EXISTING TRACK)

NOTES:

SHORING HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2016 EDITION OF AREMA'S "MANUAL FOR RAILWAY ENGINEERING, VOL. 2, STRUCTURES", AND "NORFOLK SOUTHERN GUIDELINES FOR DESIGN OF GRADE SEPARATION STRUCTURES, UNDERPASS GRADE SEPARATION DESIGN CRITERIA."

MAXIMUM WALL DEFLECTION LIMITED TO ⅜".

ALL SHORING MATERIAL SHALL BE IN "LIKE NEW" CONDITION.

SHEET PILING SHALL BE ASTM A572 GRADE 50 STEEL (HOT ROLLED) AND SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES:

MOMENT OF INERTIA/FT.	490.85 in^4
SECTION MODULUS/FT.	60.7 in^3

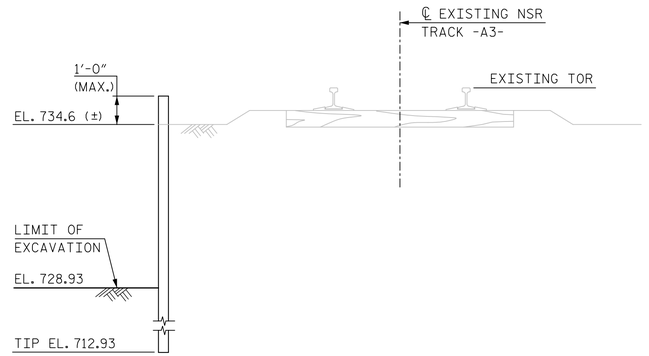
ASSUMED SOIL PARAMETERS
COARSE GRAINED SOILS:
- SOIL MOIST UNIT WEIGHT - 120 PCF
- SOIL FRICTION ANGLE - 30 DEGREES
- UNDRAINED SHEAR STRENGTH - 0 PSF

EXISTING WINGWALL TO BE PARTIALLY REMOVED IN ACCORDANCE WITH SECTION 402 OF THE STANDARD SPECIFICATIONS.

REBAR IN THE PORTION OF THE EXISTING WINGWALL TO REMAIN SHALL BE CUT BACK TO A MINIMUM DEPTH OF 1" BELOW CONCRETE SURFACE AND PATCHED WITH AN EPOXY COMPOUND.

CONSTRUCTION SEQUENCE:

1. INSTALL SHORING TO REQUIRED TIP ELEVATION.
2. REMOVE EXISTING WINGWALL TO LIMITS SHOWN.
3. CONSTRUCT PROPOSED ABUTMENT.
4. BACKFILL PROPOSED ABUTMENT.
5. REMOVE SHORING.



SECTION A-A

PROJECT NO. P-5705BA
MECKLENBURG **COUNTY**
STATION: POS STA. 28+12.88 -S2-

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STATE OF NORTH CAROLINA
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RALEIGH

SUBSTRUCTURE

ABUTMENT 1
SHORING

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-22
1			3			TOTAL SHEETS
2			4			51

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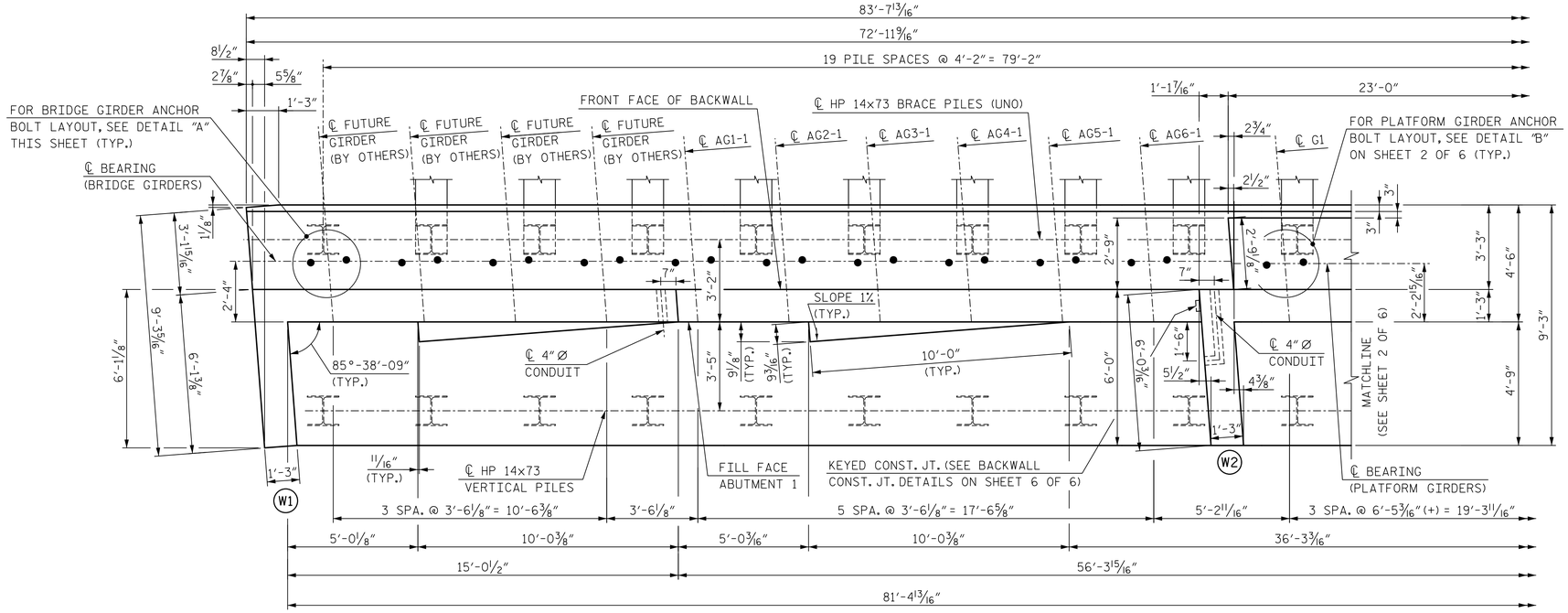
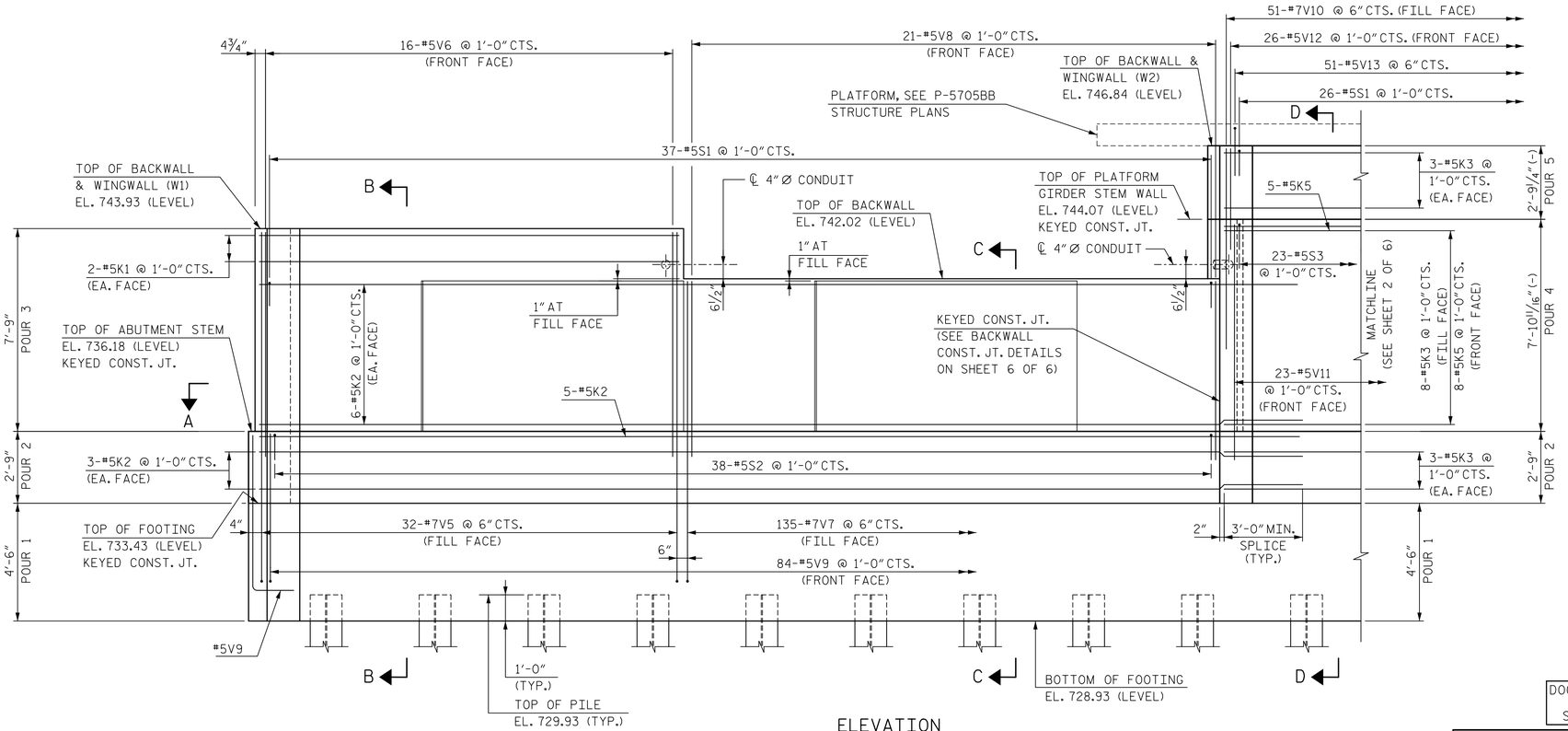


PLAN



ELEVATION

(LOOKING AHEAD STATION)

NOTES:

FOR SECTION A-A, SEE SHEETS 3 OF 6 AND 4 OF 6.

FOR SECTIONS B-B, C-C, AND D-D, SEE SHEET 5 OF 6.

FOR WINGWALL ELEVATIONS AND SECTIONS, SEE SHEETS 3 OF 6 AND 4 OF 6.

FOR LAYOUT AND DETAILS OF CONTINUOUS FRENCH DRAIN SYSTEM BEHIND ABUTMENT SEE "STRUCTURE DRAINAGE DETAILS" SHEETS 3 OF 4 AND 4 OF 4.

INDICATES 3:12 PILE BATTER IN DIRECTION SHOWN.

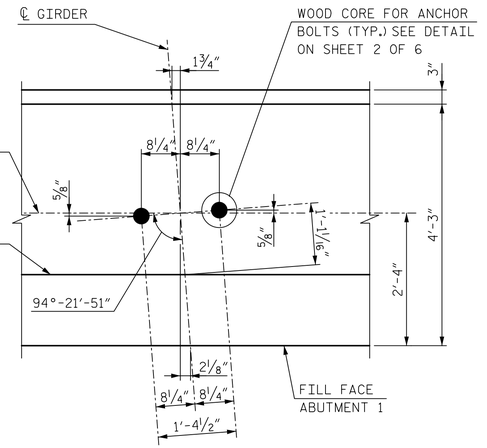
CONDUIT TO BE 4"Ø IN ACCORDANCE WITH UNDERWRITERS LABORATORY SPECIFICATIONS.

FOR LOCATIONS OF FENCE AND HANDRAIL ANCHORAGES IN TOP OF BACKWALL/WINGWALLS, SEE "SUPERSTRUCTURE: BRIDGE MOUNTED FENCE AND HANDRAIL DETAILS" SHEETS.

FOR FOOTING REINFORCING, SEE ABUTMENT SECTIONS AND FOOTING REINFORCING PLAN ON SHEET 5 OF 6.

#5K2, #5K4, #5K5, #5S2, AND #5S3 MAY BE ADJUSTED AS NECESSARY TO CLEAR ANCHOR BOLTS. DO NOT EXCEED 12" BETWEEN BARS.

FOR LIMITS OF EXISTING BRIDGE WINGWALL REMOVAL, SEE "ABUTMENT 1 SHORING" SHEET.



DETAIL A - BRIDGE GIRDER ANCHOR BOLT LAYOUT

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POS STA. 28+12.88 -S2-

SHEET 1 OF 6

STATE OF NORTH CAROLINA
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RALEIGH

SUBSTRUCTURE

ABUTMENT 1

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1			3			TOTAL SHEETS
2			4			51

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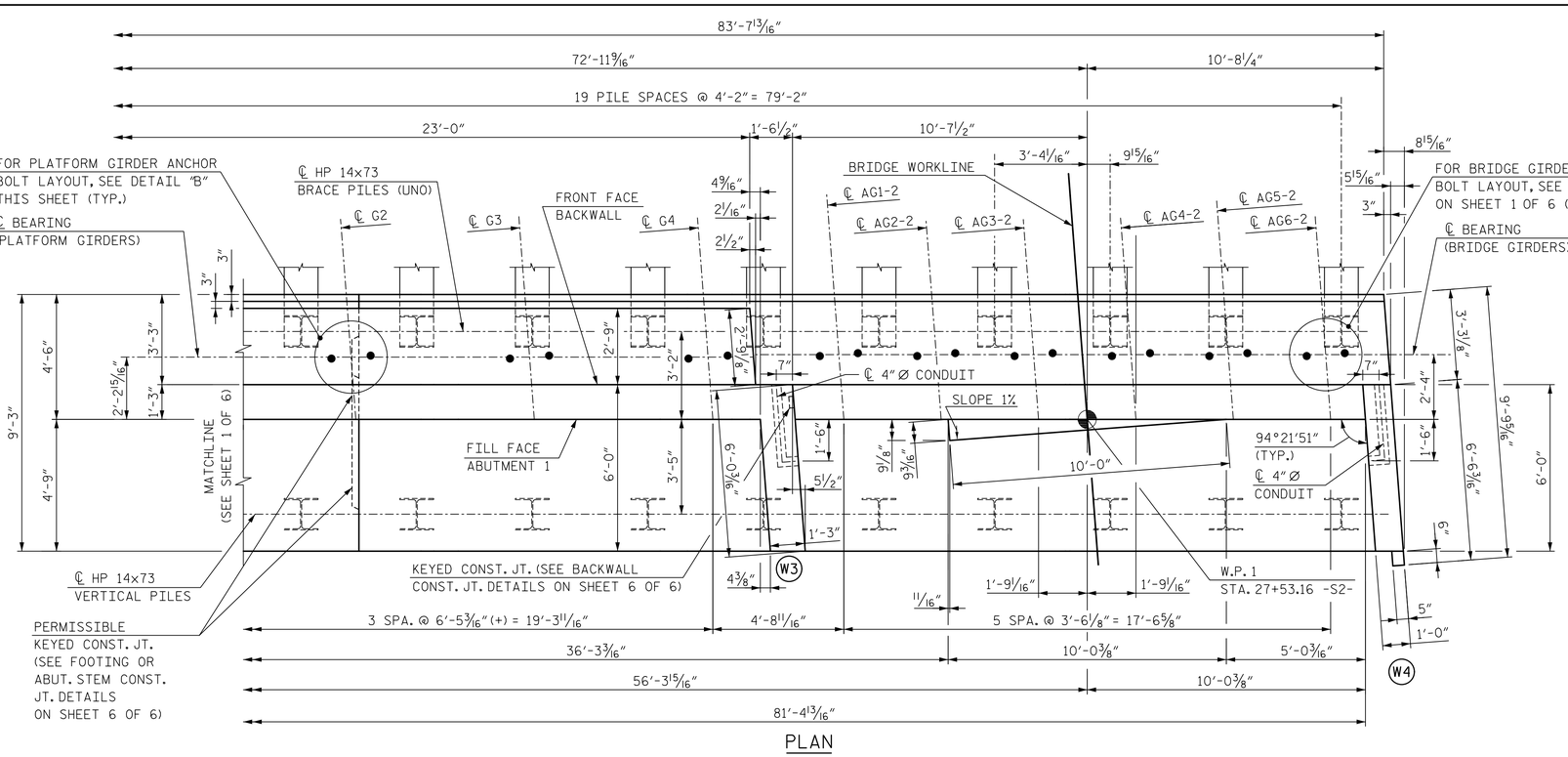
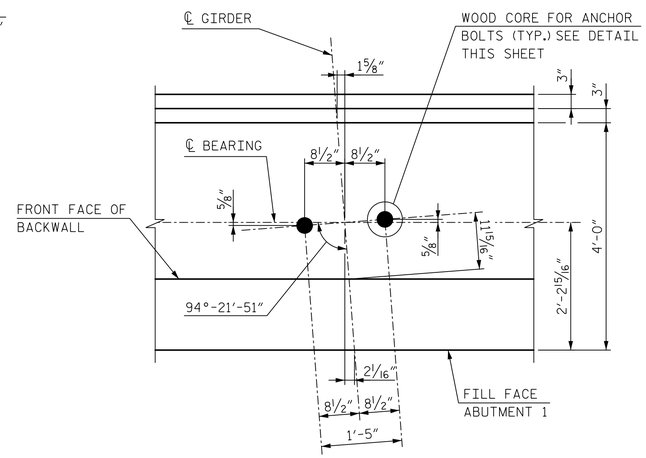
1001ADD_P28



PLAN

NOTE:
FOR NOTES, SEE SHEET 1 OF 6.



DETAIL B - PLATFORM GIRDER ANCHOR BOLT LAYOUT

DETAIL OF WOOD CORE FOR ANCHOR BOLT HOLES

ELEVATION
(LOOKING AHEAD STATION)

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: POS STA. 28+12.88 -S2-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
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RALEIGH

SUBSTRUCTURE

ABUTMENT 1

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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-24
1	JRR	05022018	3			TOTAL SHEETS
2			4			51

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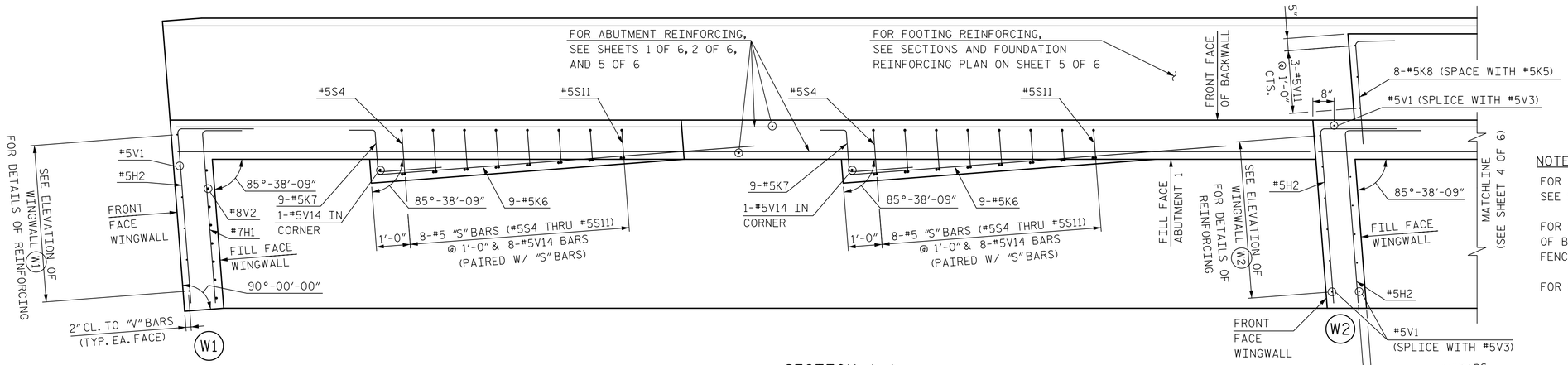


SECTION A-A

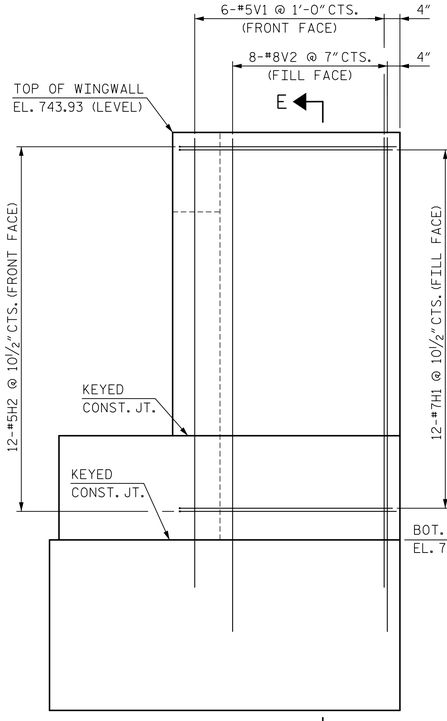
(#5V11 AND #7V10/#7V7 BARS ON FRONT FACE AND FILL FACE OF PLATFORM GIRDER STEM WALL NOT SHOWN FOR CLARITY)

NOTES:

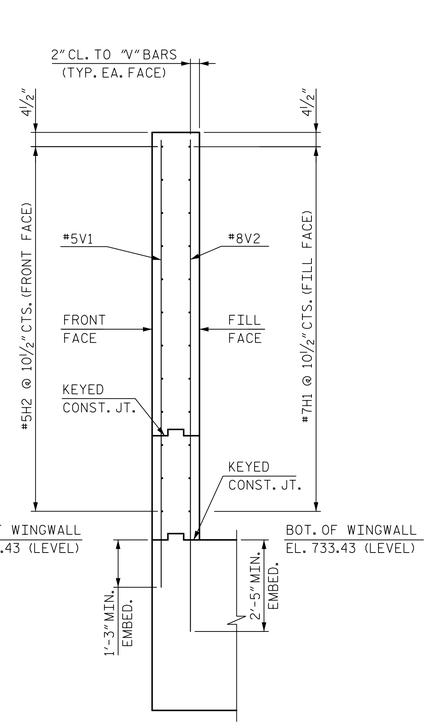
FOR ABUTMENT AND WINGWALL DIMENSIONS, AND ABUTMENT ELEVATION, SEE SHEETS 1 OF 6 AND 2 OF 6.

FOR LOCATIONS OF FENCE AND HANDRAIL ANCHORAGES IN TOP OF BACKWALL/WINGWALLS, SEE "SUPERSTRUCTURE: BRIDGE MOUNTED FENCE AND HANDRAIL DETAILS" SHEETS.

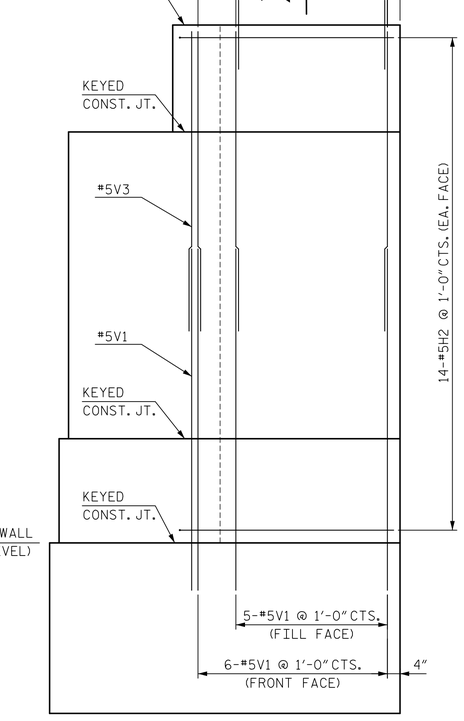
FOR KEYED CONSTRUCTION JOINT DETAILS, SEE SHEET 6 OF 6.



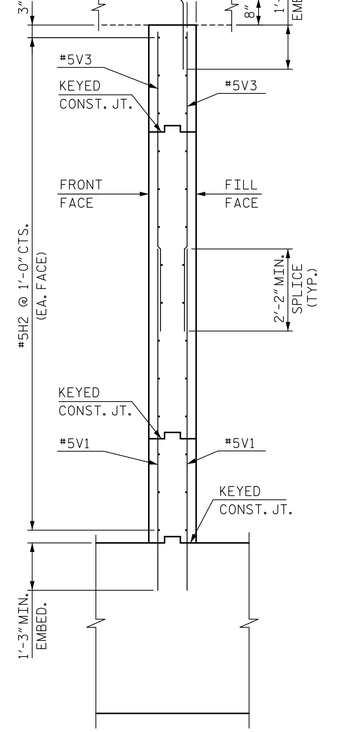
ELEVATION OF WINGWALL (W1)



SECTION E-E



ELEVATION OF WINGWALL (W2)



SECTION F-F

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POS STA. 28+12.88 -S2-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

ABUTMENT 1

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-25
1			3			TOTAL SHEETS
2			4			51

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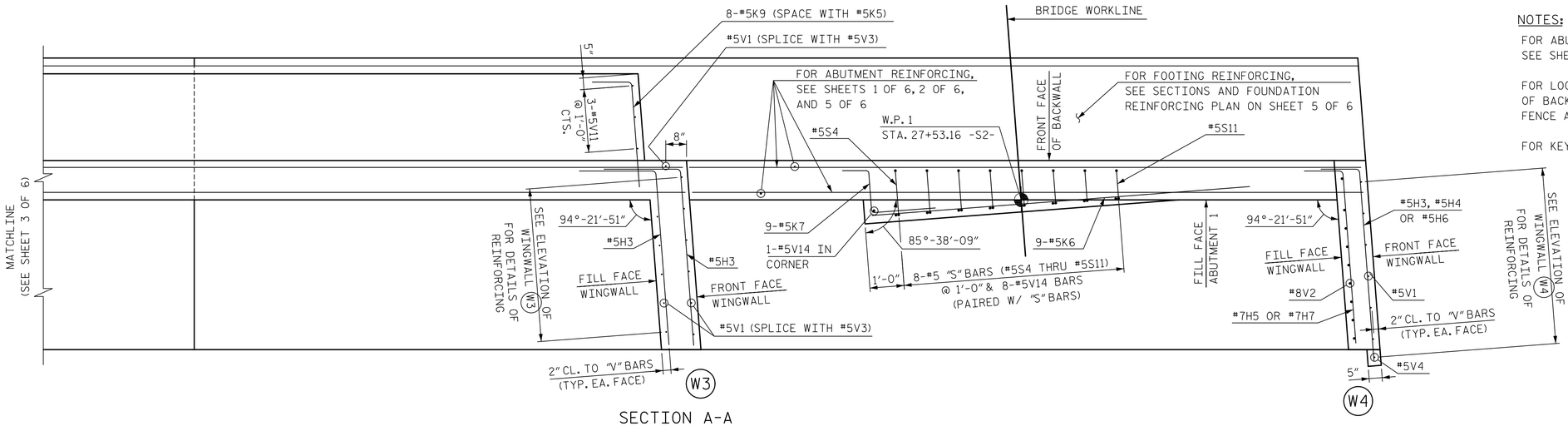
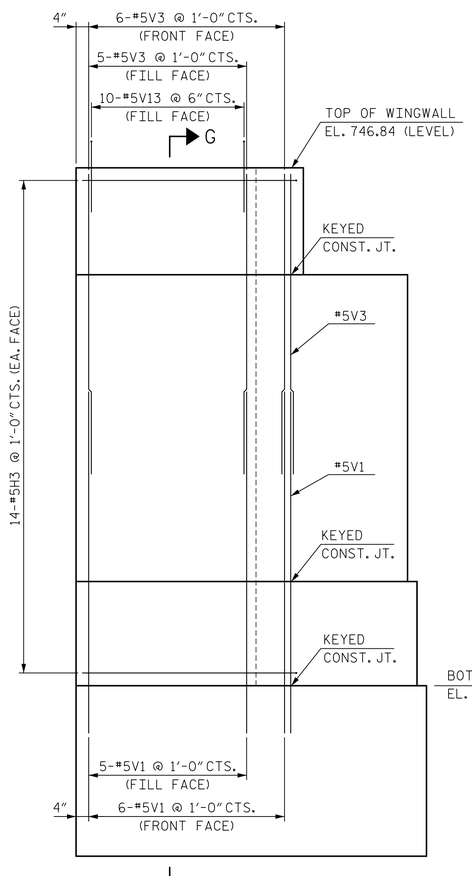
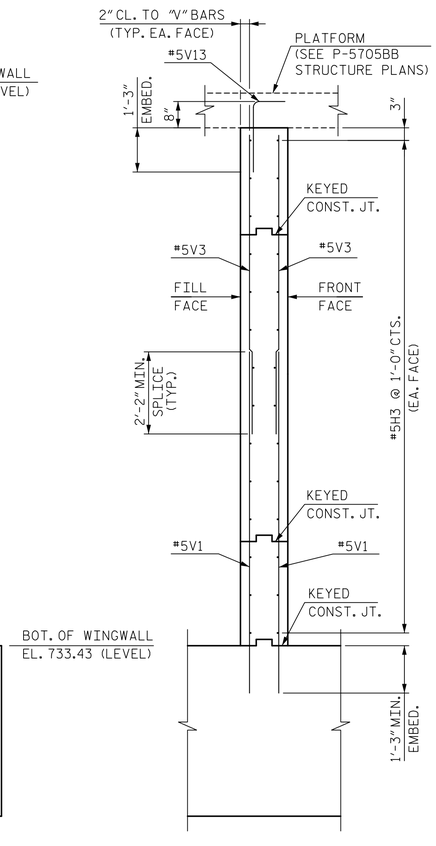
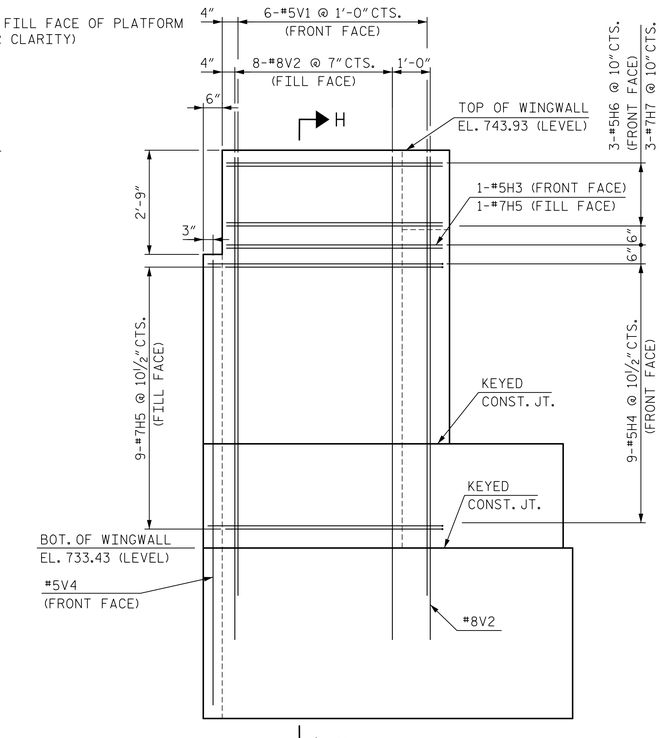


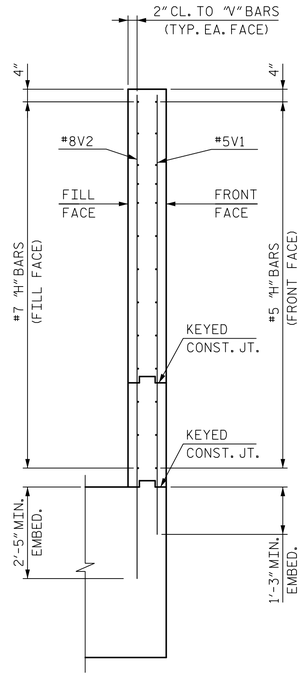
SECTION A-A

(#5V11 AND #7V10/#7V7 BARS ON FRONT FACE AND FILL FACE OF PLATFORM GIRDER STEM WALL NOT SHOWN FOR CLARITY)









NOTES:

FOR ABUTMENT AND WINGWALL DIMENSIONS, AND ABUTMENT ELEVATION, SEE SHEETS 1 OF 6 AND 2 OF 6.

FOR LOCATIONS OF FENCE AND HANDRAIL ANCHORAGES IN TOP OF BACKWALL/WINGWALLS, SEE "SUPERSTRUCTURE: BRIDGE MOUNTED FENCE AND HANDRAIL DETAILS" SHEETS.

FOR KEYED CONSTRUCTION JOINT DETAILS, SEE SHEET 6 OF 6.

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PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: POS STA. 28+12.88 -S2-

SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

ABUTMENT 1

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-26
1			3			TOTAL SHEETS
2			4			51

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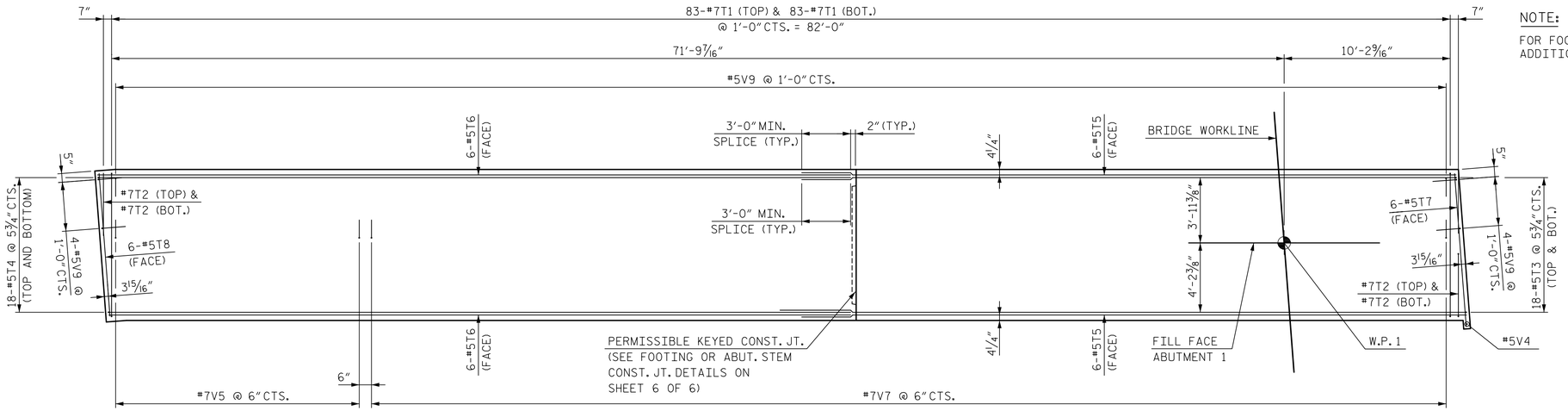
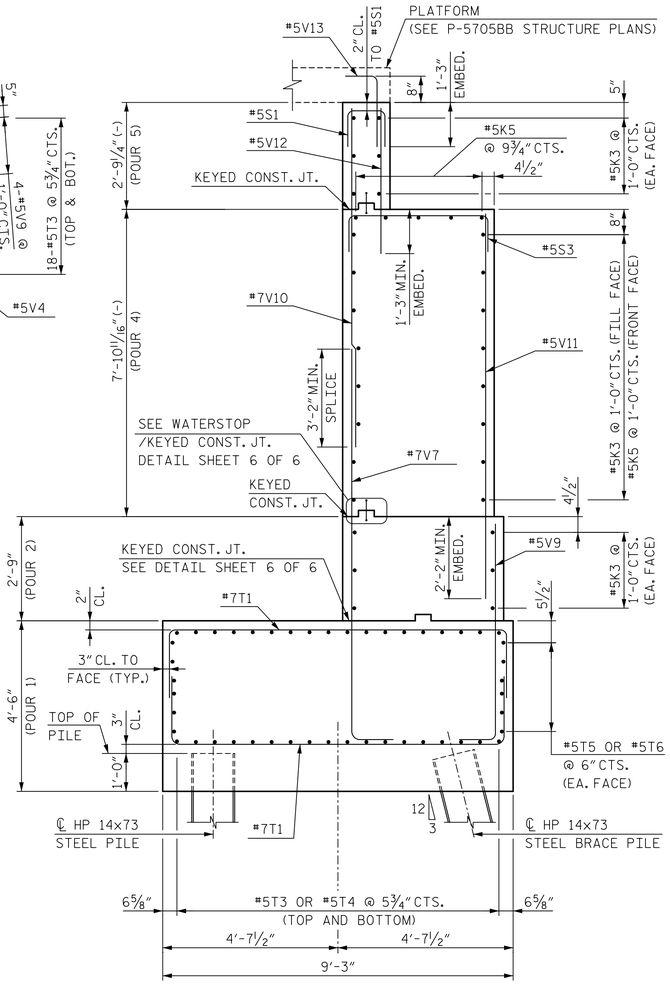


FOOTING REINFORCING PLAN

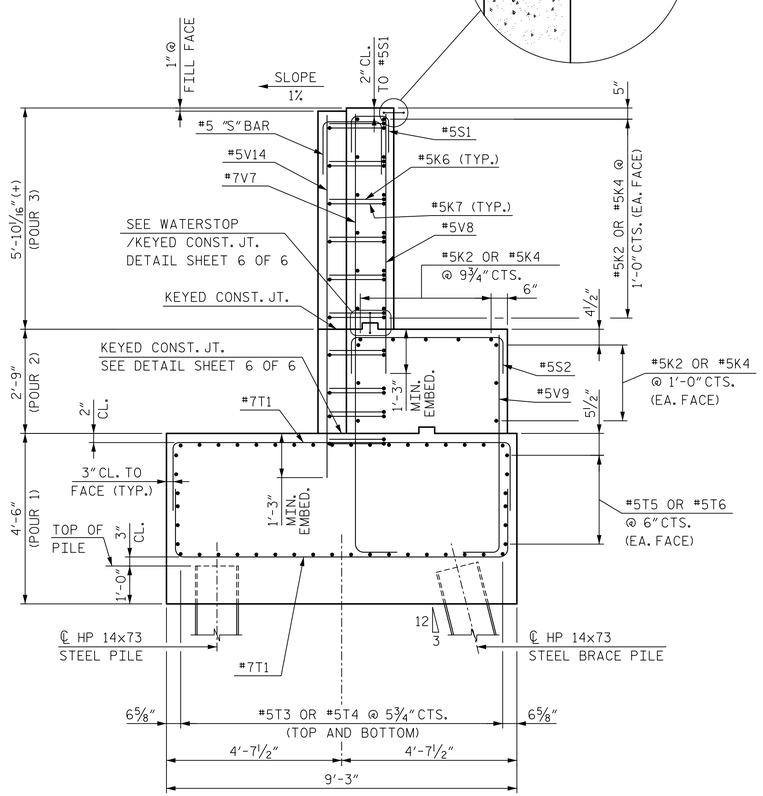
(WINGWALL BARS NOT SHOWN FOR CLARITY)

NOTE:

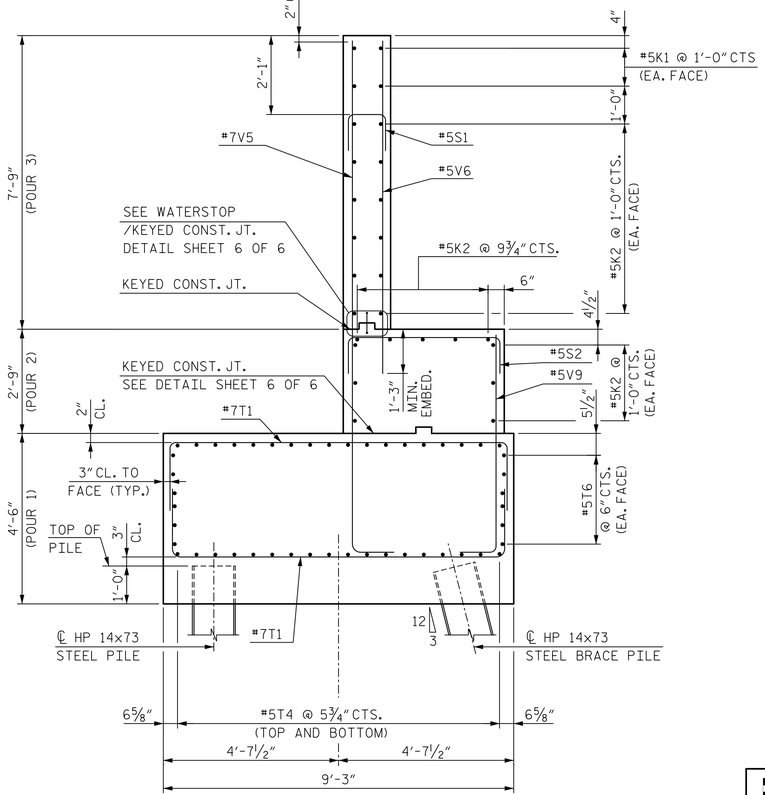
FOR FOOTING LAYOUT, LOCATIONS OF SECTIONS B-B, C-C, AND D-D, AND ADDITIONAL DIMENSIONS, SEE SHEETS 1 OF 6 AND 2 OF 6.



SECTION D-D



SECTION C-C



SECTION B-B

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POS STA. 28+12.88 -S2-

SHEET 5 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

ABUTMENT 1

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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-27
1			3			TOTAL SHEETS
2			4			51

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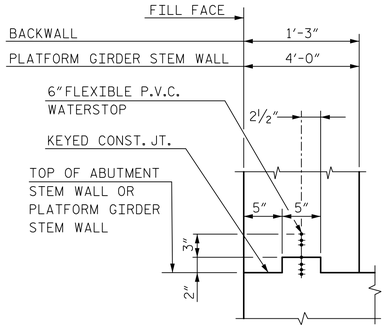
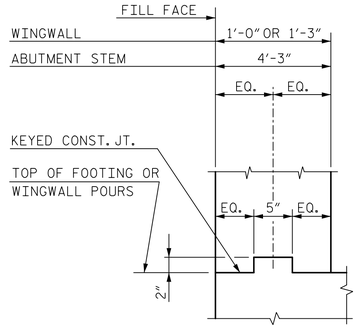
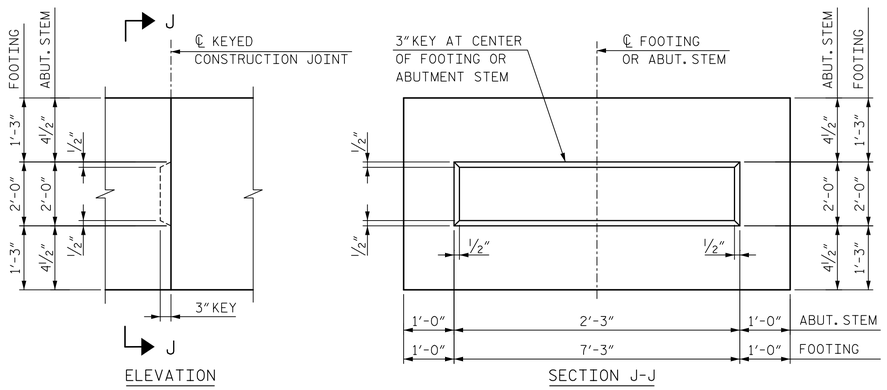


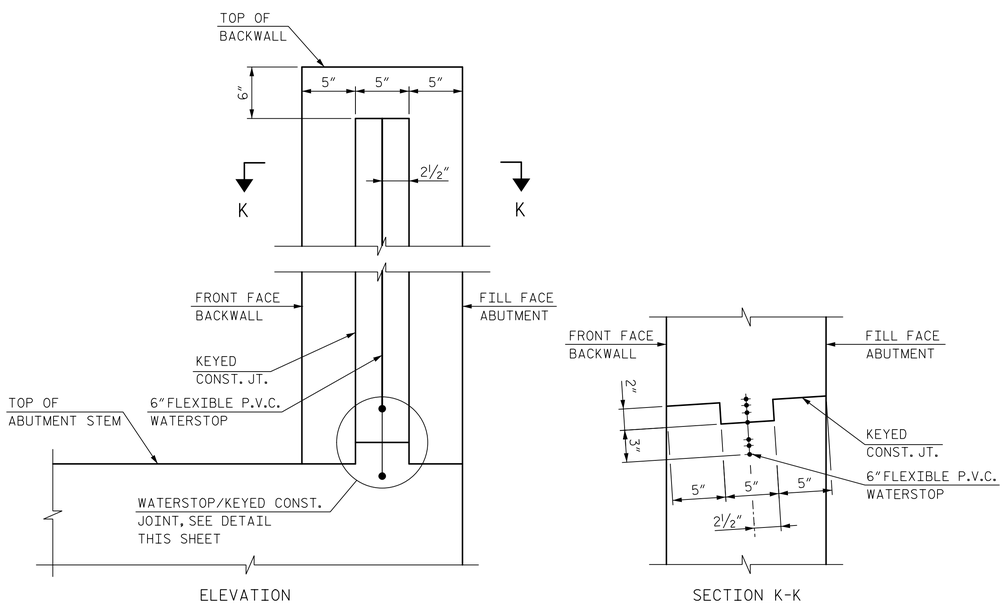
WATERSTOP/KEYED CONSTRUCTION JOINT DETAIL



KEYED CONSTRUCTION JOINT DETAIL



FOOTING OR ABUT. STEM CONSTRUCTION JOINT DETAILS

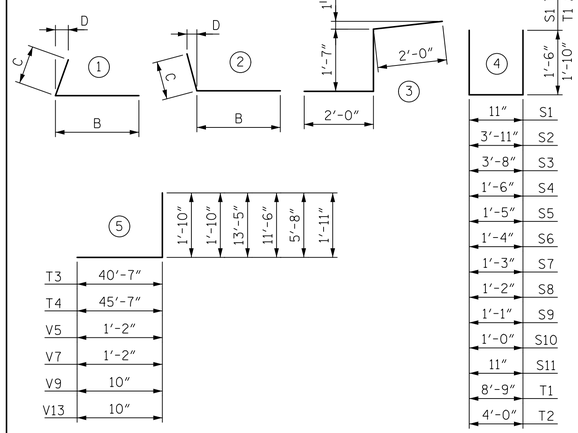


BACKWALL CONSTRUCTION JOINT DETAILS

BAR TYPES

MARK	B	C	D
H1	5'-7"	1'-2"	2"
H2	5'-7"	2'-5"	2¾"
H3	5'-7"	2'-5"	2⅛"
H4	6'-1"	10"	0¾"
H5	5'-7"	1'-2"	1 1/16"
K8	3'-7"	10"	1⅜"
K9	3'-7"	10"	0¾"

NOTE: "D" IS PARALLEL TO WINGWALL.



ALL BAR DIMENSIONS ARE OUT TO OUT

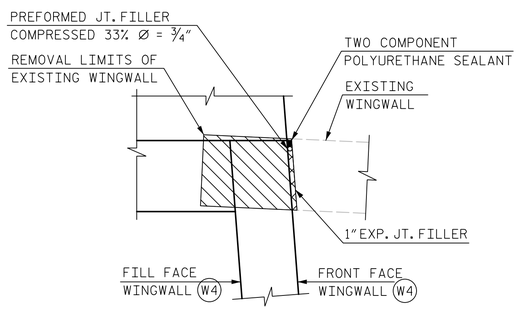
BILL OF REINFORCING

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
ABUTMENT 1					
H1	12	7	1	6'-9"	166
H2	40	5	1	8'-0"	334
H3	29	5	2	8'-0"	242
H4	9	5	2	6'-11"	65
H5	10	7	2	6'-9"	138
H6	3	5	STR.	5'-8"	18
H7	3	7	STR.	5'-8"	35
K1	4	5	STR.	15'-11"	67
K2	23	5	STR.	38'-8"	928
K3	20	5	STR.	25'-3"	527
K4	23	5	STR.	23'-9"	570
K5	13	5	STR.	22'-8"	308
K6	27	5	STR.	11'-0"	310
K7	27	5	3	5'-7"	158
K8	8	5	1	4'-5"	37
K9	8	5	2	4'-5"	37
S1	85	5	4	3'-11"	348
S2	61	5	4	6'-11"	441
S3	23	5	4	6'-8"	160
S4	3	5	4	4'-6"	15
S5	3	5	4	4'-5"	14
S6	3	5	4	4'-4"	14
S7	3	5	4	4'-3"	14
S8	3	5	4	4'-2"	14
S9	3	5	4	4'-1"	13
S10	3	5	4	4'-0"	13
S11	3	5	4	3'-11"	13

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
T1	166	7	4	12'-5"	4214
T2	4	7	4	7'-8"	63
T3	36	5	5	42'-5"	1593
T4	36	5	5	47'-5"	1781
T5	12	5	STR.	40'-7"	508
T6	12	5	STR.	45'-7"	571
T7	6	5	STR.	9'-3"	58
T8	6	5	STR.	8'-10"	56
V1	36	5	STR.	11'-7"	435
V2	17	8	STR.	12'-9"	579
V3	24	5	STR.	5'-5"	136
V4	1	5	STR.	11'-8"	13
V5	32	7	5	14'-7"	954
V6	16	5	STR.	8'-11"	149
V7	135	7	5	12'-8"	3496
V8	43	5	STR.	6'-11"	311
V9	92	5	5	6'-6"	624
V10	51	7	STR.	8'-3"	861
V11	29	5	STR.	10'-2"	308
V12	26	5	STR.	3'-11"	107
V13	71	5	5	2'-9"	204
V14	27	5	STR.	9'-8"	273

QUANTITIES

ITEM		TOTAL
REINFORCING STEEL	LBS.	22,293
CLASS AA CONCRETE BREAKDOWN:		
POUR 1 FOOTING	CU. YDS	129.0
POUR 2 ABUTMENT STEM & BOTT. OF WINGS	CU. YDS	39.7
POUR 3 BRIDGE BACKWALL AND WINGS	CU. YDS	23.0
POUR 4 PLATFORM GIRDER STEM WALL & WINGS	CU. YDS	31.3
POUR 5 PLATFORM GIRDER BACKWALL AND WINGS	CU. YDS	4.5
TOTAL	CU. YDS	227.5
HP 14 X 73 STEEL PILES	NO.	40
	L.F.	2,133



NOTE:
SEE "ABUTMENT 1 SHORING" SHEET FOR ADDITIONAL INFORMATION

EXISTING ABUTMENT INTERFACE DETAIL

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: POS STA. 28+12.88 -S2-

SHEET 6 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

ABUTMENT 1

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			51

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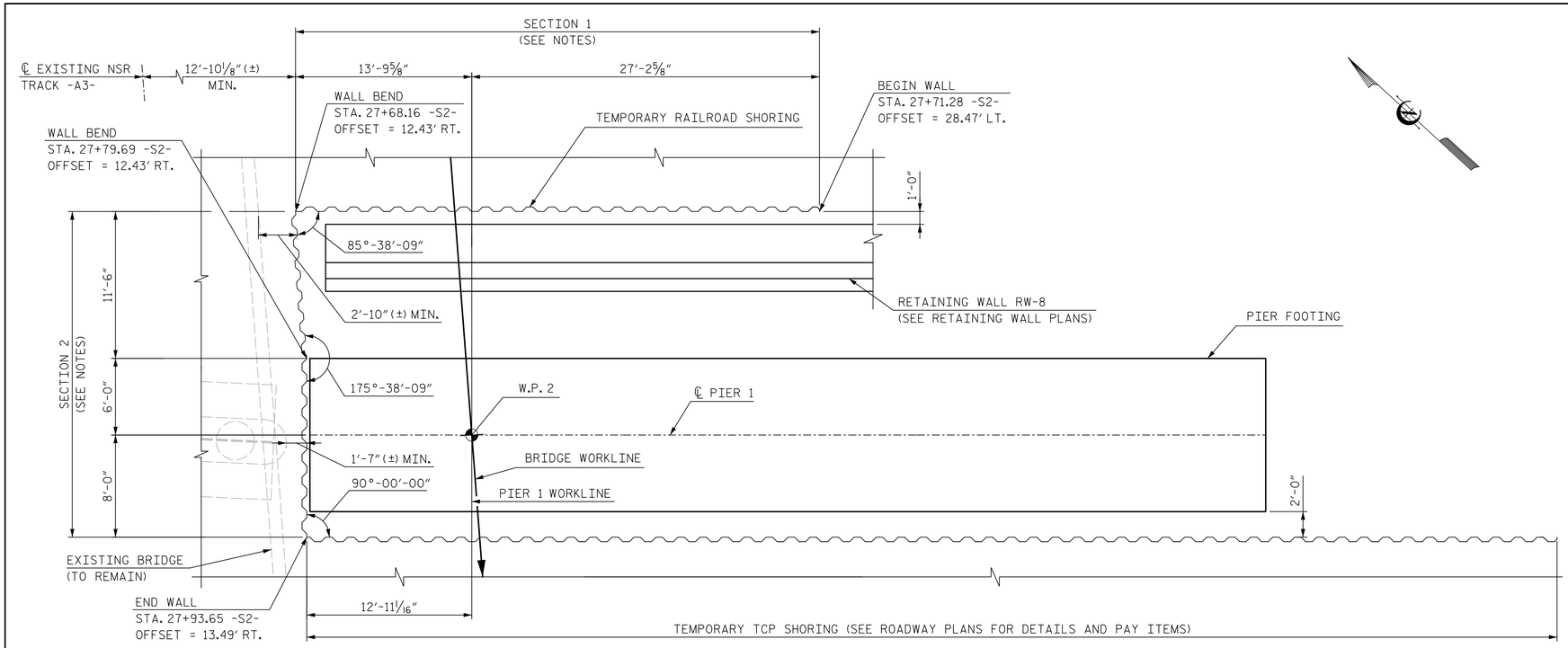
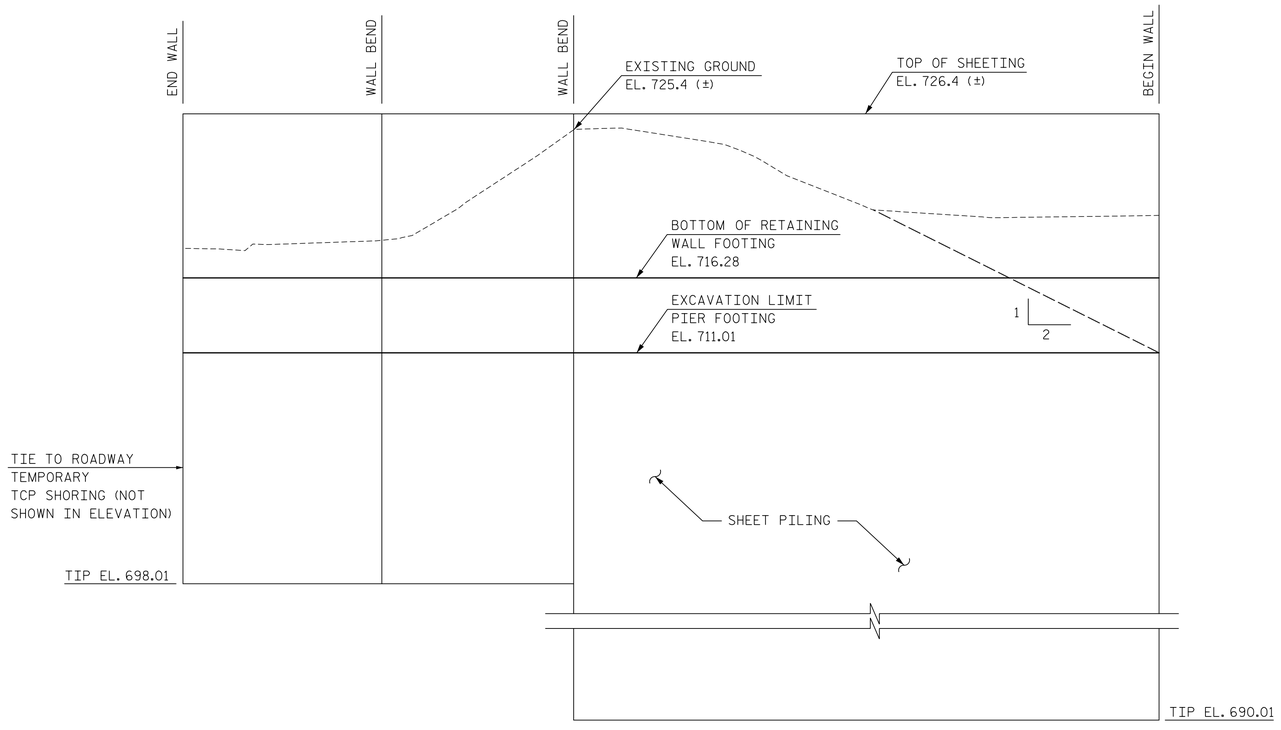


TEMPORARY SHORING PLAN



TEMPORARY SHORING ELEVATION

(LOOKING AWAY FROM FOOTING)

NOTES:

SHORING HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2016 EDITION OF AREMA'S "MANUAL FOR RAILWAY ENGINEERING, VOL. 2, STRUCTURES", AND "NORFOLK SOUTHERN GUIDELINES FOR DESIGN OF GRADE SEPARATION STRUCTURES, UNDERPASS GRADE SEPARATION DESIGN CRITERIA".

MAXIMUM WALL DEFLECTION LIMITED TO 1½".

ALL SHORING MATERIAL SHALL BE IN "LIKE NEW" CONDITION.

SHEET PILING SHALL BE ASTM A572 GRADE 50 STEEL (HOT ROLLED) AND SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES:

SECTION 1:
MOMENT OF INERTIA/FT. 656.2 in^4
SECTION MODULUS/FT. 66.8 in^3

SECTION 2:
MOMENT OF INERTIA/FT. 156.9 in^4
SECTION MODULUS/FT. 23.2 in^3

ASSUMED SOIL PARAMETERS
COARSE GRAINED SOILS:
SOIL MOIST UNIT WEIGHT - 120 PCF
SOIL FRICTION ANGLE - 30 DEGREES
UNDRAINED SHEAR STRENGTH - 0 PSF

* CONSTRUCTION SEQUENCE:

1. INSTALL SHORING TO REQUIRED TIP ELEVATION.
2. EXCAVATE TO EXCAVATION LIMIT SHOWN.
3. CONSTRUCT PROPOSED PIER.
4. BACKFILL PROPOSED PIER.
5. CONSTRUCT PROPOSED RETAINING WALL.
6. BACKFILL PROPOSED RETAINING WALL.
7. REMOVE SHORING.

* COMPLETE SHORING REMOVAL PRIOR TO ABUTMENT 1 EMBANKMENT CONSTRUCTION AND PILE INSTALLATION.

PROJECT NO. P-5705BA
MECKLENBURG COUNTY
STATION: POS STA. 28+12.88 -S2-

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

PIER 1
SHORING

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-29
1			3			TOTAL SHEETS
2			4			51

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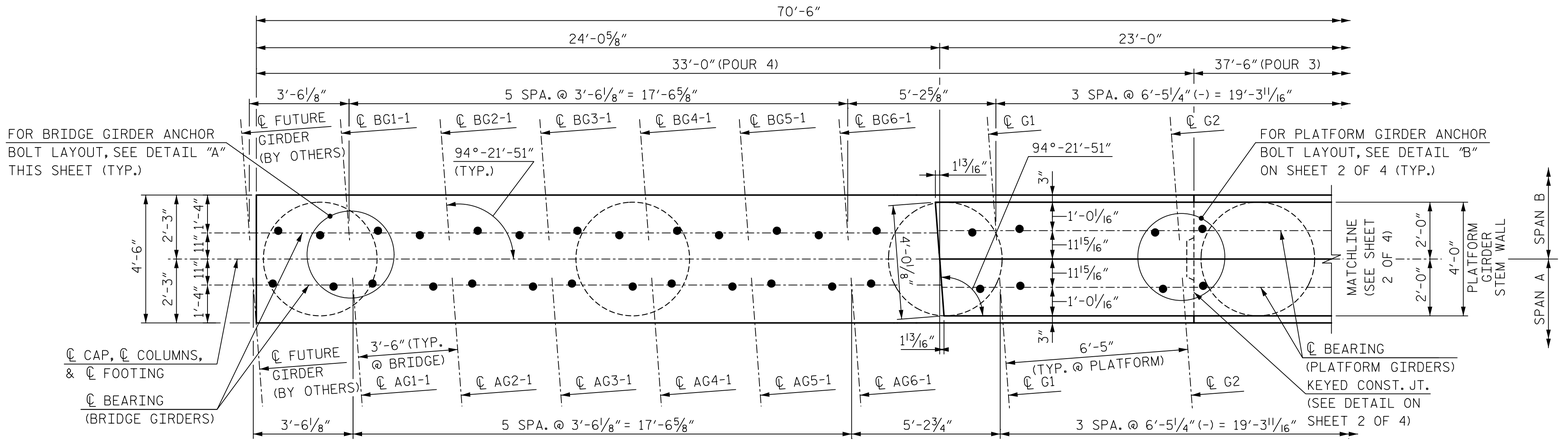
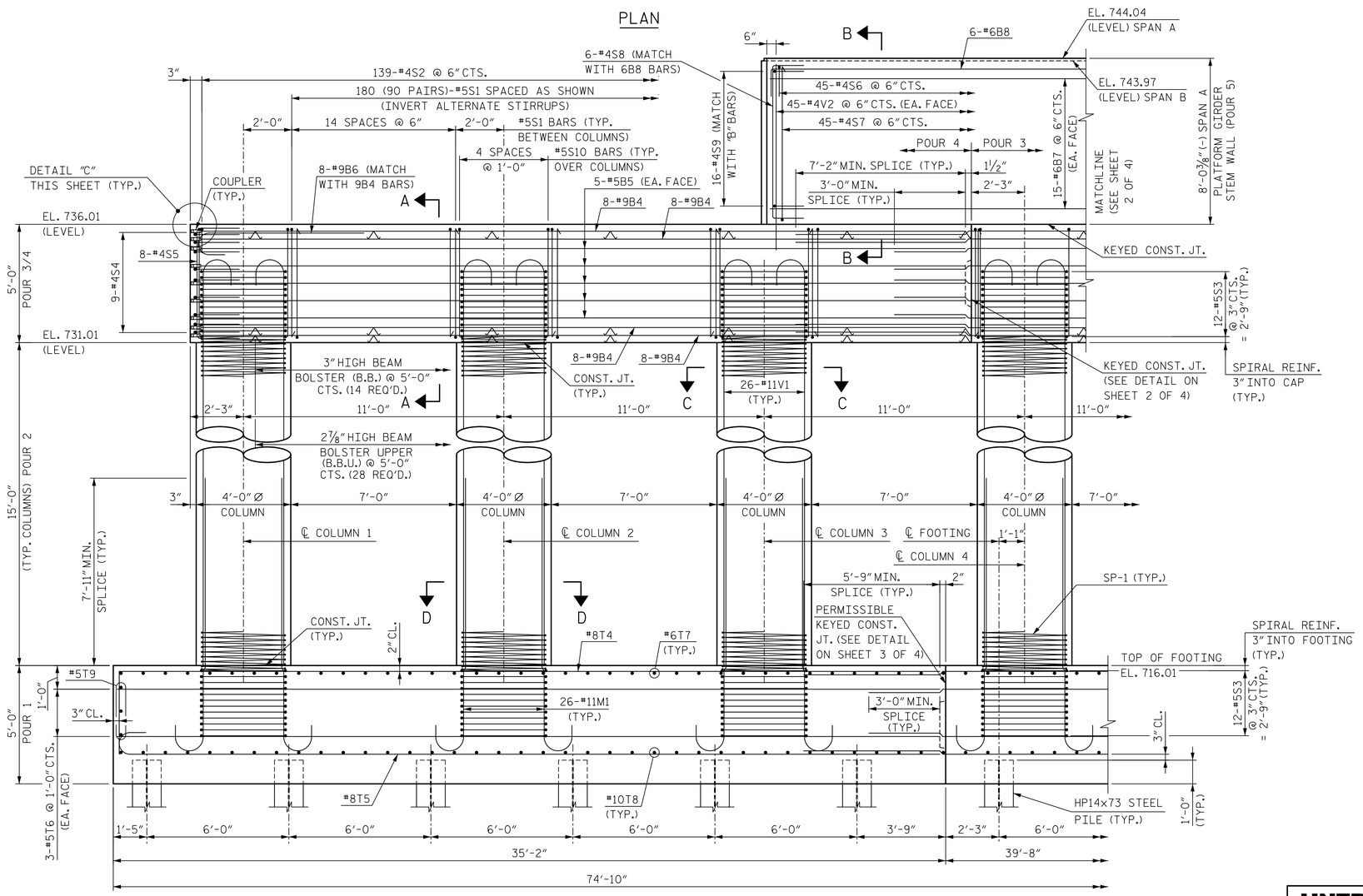


PLAN



ELEVATION

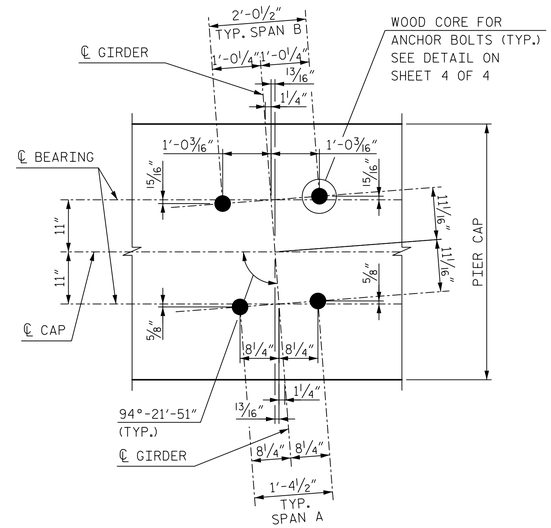
NOTES:

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

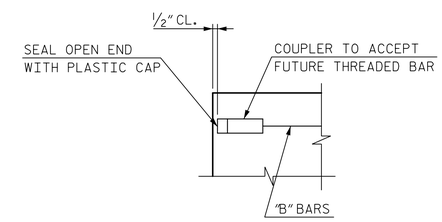
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

TOP MAT OF FOOTING LONGITUDINAL AND TRANSVERSE REINFORCEMENT MAY BE SHIFTED AS NECESSARY TO CLEAR COLUMN REINFORCEMENT. DO NOT EXCEED 12" BETWEEN BARS.



DETAIL A - BRIDGE GIRDER ANCHOR BOLT LAYOUT



DETAIL C

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POS STA. 28+12.88 -S2-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

PIER 1

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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2			4			51

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PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POS STA. 28+12.88 -S2-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

PIER 1

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2				4			

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TOTAL SHEETS 51

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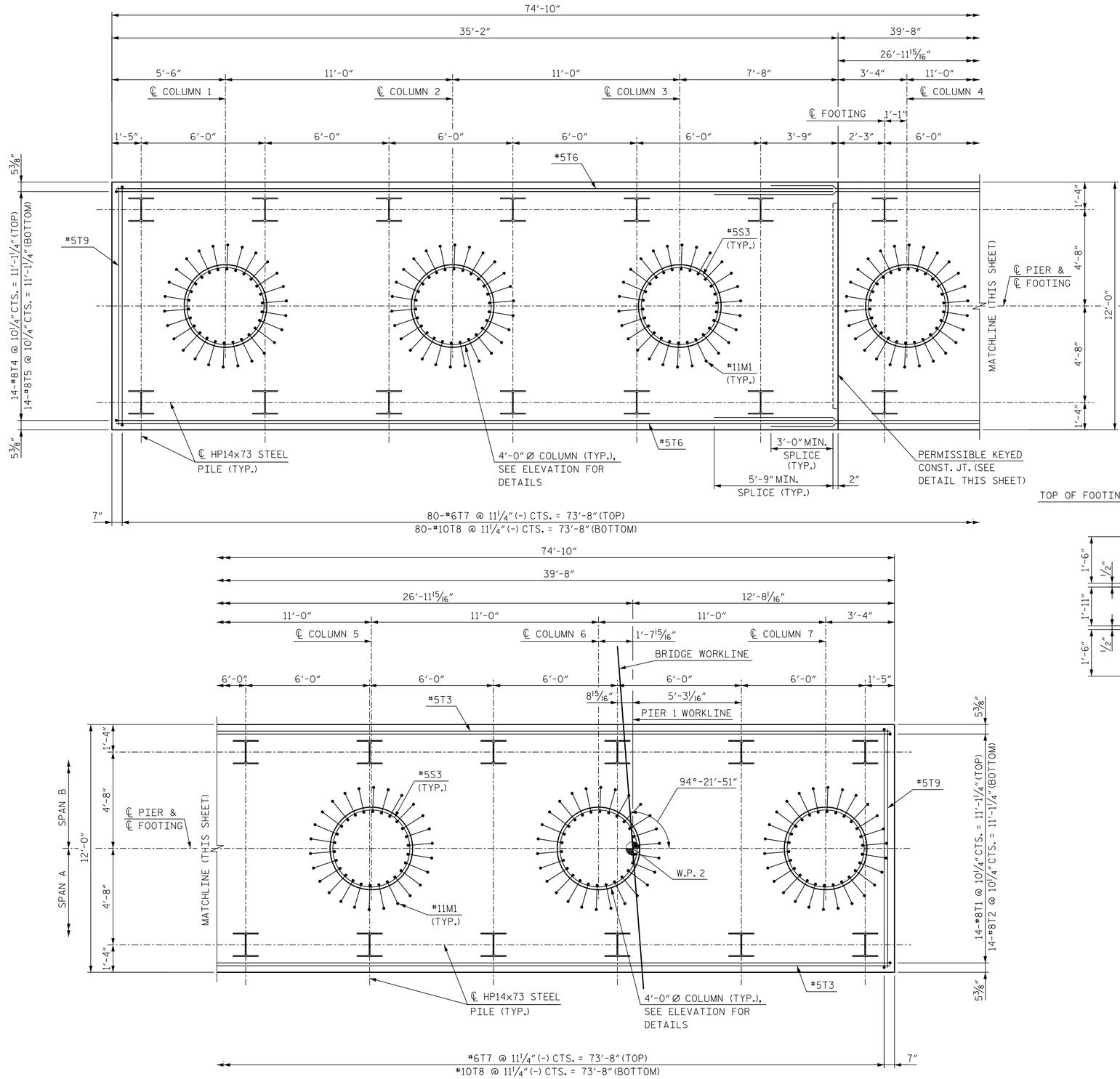
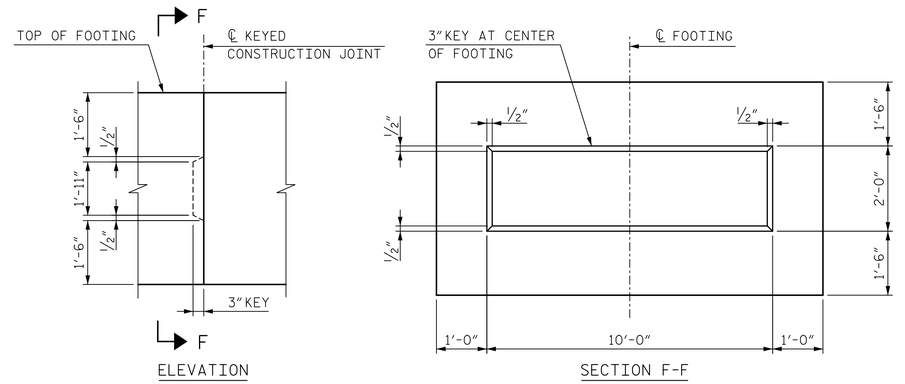


FOOTING REINFORCING PLAN



FOOTING CONSTRUCTION JOINT DETAILS

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POS STA. 28+12.88 -S2-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

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1			3			TOTAL SHEETS
2			4			51

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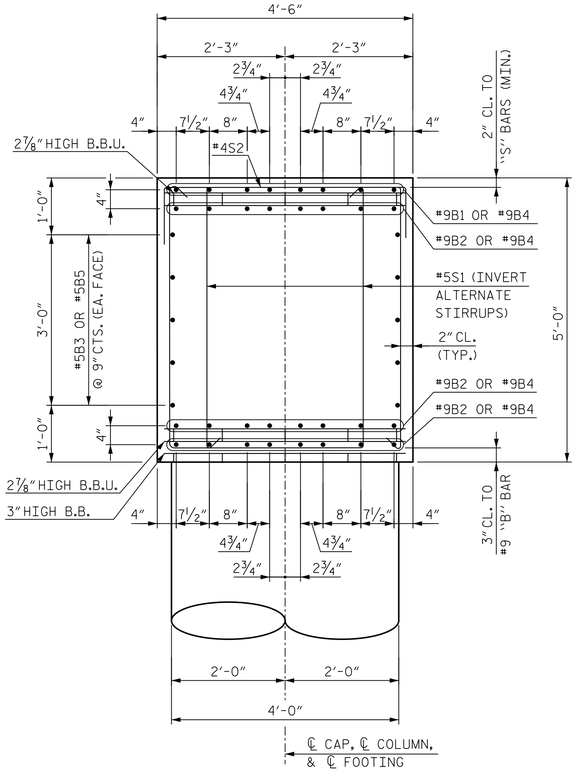
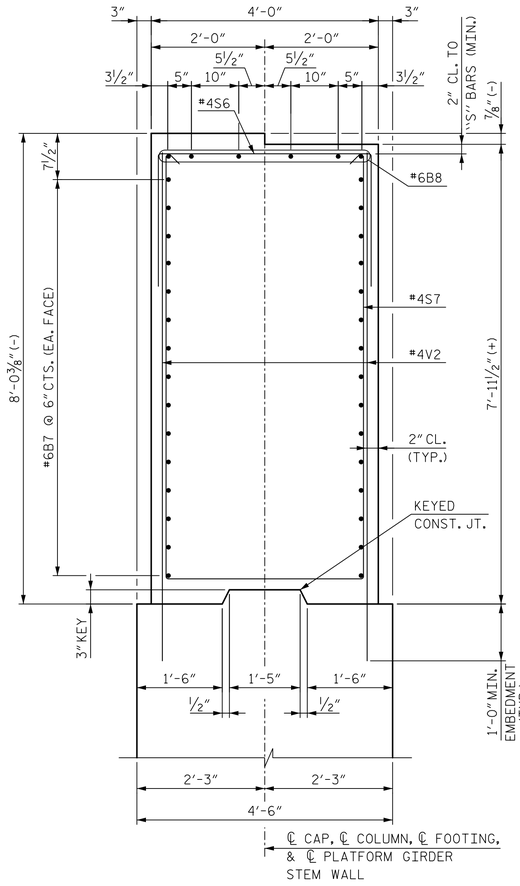


SECTION A-A

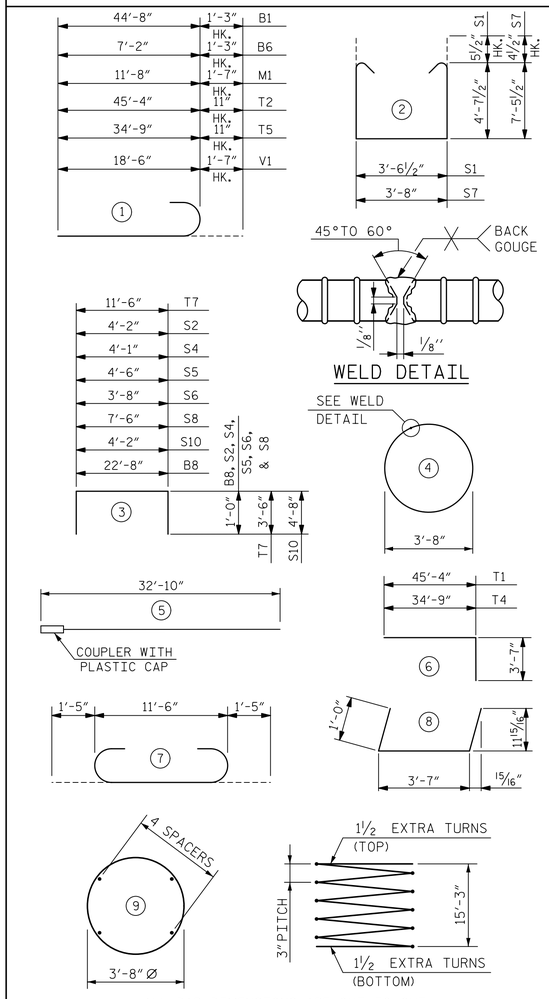
(COLUMN REINFORCING AND #5S10 BARS NOT SHOWN FOR CLARITY)



SECTION B-B

(CAP REINFORCING NOT SHOWN FOR CLARITY)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF REINFORCING

PIER 1

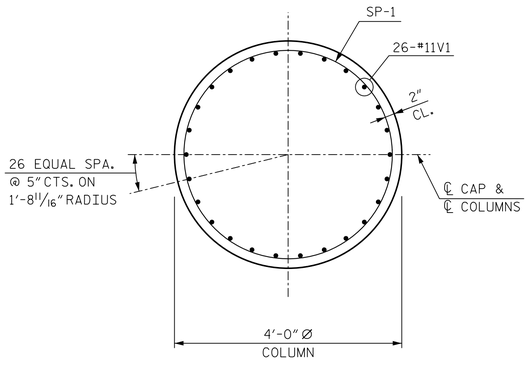
MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	9	1	45′-11″	1,249
B2	24	9	STR.	44′-8″	3,645
B3	10	5	STR.	40′-6″	422
B4	32	9	5	32′-10″	3,572
B5	10	5	5	32′-10″	342
B6	8	9	1	8′-5″	229
B7	30	6	STR.	22′-8″	1,021
B8	6	6	3	24′-8″	222
S1	180	5	2	13′-9″	2,581
S2	139	4	3	6′-2″	573
✳ S3	168	5	4	11′-7″	2,030
S4	18	4	3	6′-1″	73
S5	16	4	3	6′-6″	69
S6	45	4	3	5′-8″	170
S7	45	4	2	19′-4″	581
S8	12	4	3	9′-6″	76
S9	32	4	8	5′-7″	119
S10	35	5	3	13′-6″	493
M1	182	11	1	13′-3″	12,812
T1	14	8	6	48′-11″	1,829
T2	14	8	1	46′-3″	1,729
T3	6	5	STR.	42′-7″	266
T4	14	8	6	38′-4″	1,433
T5	14	8	1	35′-8″	1,333
T6	6	5	STR.	34′-9″	217
T7	80	6	3	18′-6″	2,223
T8	80	10	7	14′-4″	4,934
T9	6	5	STR.	11′-6″	72
V1	182	11	1	20′-1″	19,420
V2	90	4	STR.	9′-0″	541
SP-1	7	✳✳	9	737′-4″	5,383

QUANTITIES

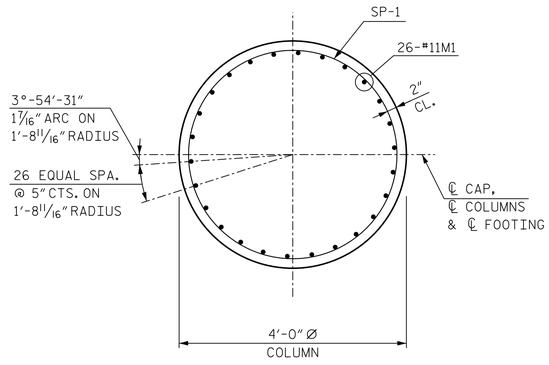
ITEM		TOTAL
REINFORCING STEEL	LBS	64,276
SPIRAL COLUMN REINFORCING STEEL	LBS	5,383
CLASS AA CONCRETE:		
POUR 1	C.Y.	166.3
POUR 2	C.Y.	48.9
POUR 3	C.Y.	31.3
POUR 4	C.Y.	27.5
POUR 5	C.Y.	27.2
TOTAL	C.Y.	301.2
HP14x73 STEEL PILES	NO. L.F.	26 1,083

✳ #5S3 CIRCULAR TIES SHALL BE ASTM DESIGNATION A706, GRADE 60. FABRICATION TO BE IN ACCORDANCE WITH THE "MANUAL OF STANDARD PRACTICE", A.C.I. 315.80.

✳✳ THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

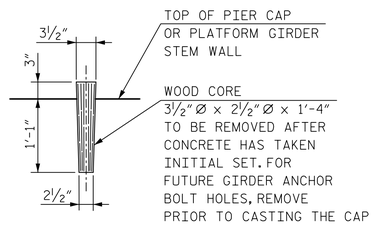


SECTION C-C



SECTION D-D

(V1 BARS NOT SHOWN FOR CLARITY)



DETAIL OF WOOD CORE FOR ANCHOR BOLT HOLES

PROJECT NO. P-5705BA

MECKLENBURG COUNTY

STATION: POS STA. 28+12.88 -S2-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

PIER 1

NORTH CAROLINA PROFESSIONAL SEAL 44886 ENGINEER JOEL RYAN RAPP

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1			3			TOTAL SHEETS
2			4			51